Livingston Avenue Improvements Study

May 2023

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- **Pastor John Bradford;** *Bethany Baptist Church*
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Key Stakeholders:

- **Livingston Avenue Area Commission**
- **Columbus South Side Area Commission**
- **Old Oaks Civic Association**
- **Southern Orchards Civic Association**
- **Central Ohio Transit Authority (COTA)**
- **Columbus City Schools**

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1

Executive Summary

A community focused street project to increase safety for all users, embrace community identity and foster development.

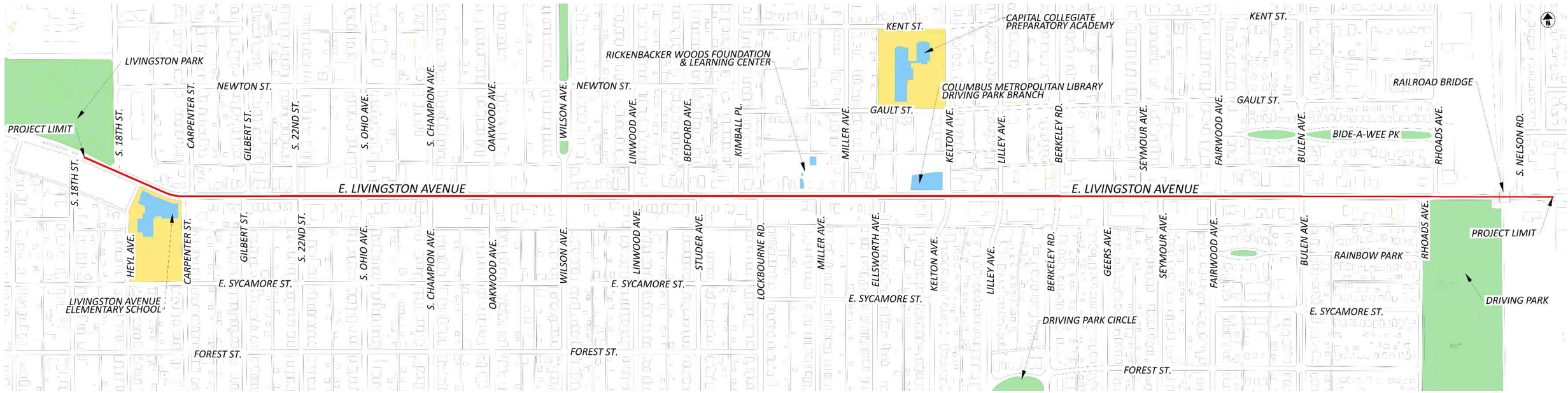


Figure 1-1: Project Area Map

1.0 Executive Summary

Every year in Columbus, more than 70 people are killed in crashes and 300 people are seriously injured on city streets. Every person is a loved one – a family member, a friend, a colleague. Each person has inherent value. Therefore, one preventable traffic death is one too many. The Vision Zero Columbus mission is to end crash-related fatalities and serious injuries on city streets. To advance this mission and bring the vision to reality, the city is taking action to prioritize safety for all users of its transportation systems. One method of action to accomplish this mission is to identify high-crash areas within the city and, together with the community, collaboratively determine a solution. The purpose of this report is to focus on one of these high-crash areas along Livingston Avenue and describe the steps taken to arrive at a plan that will serve, and ultimately help achieve, Vision Zero Columbus.

1.1 Study Limits

This improvements study is focused on the 1.5-mile-long corridor of Livingston Avenue from S. 18th Street to Nelson Road. The corridor is surrounded by diverse neighborhoods including Southern Orchards, Driving Park, Old Oaks, Hanford Village, and Livingston Park. Several businesses and institutions are found along the corridor and include Livingston Avenue Elementary, Rickenbacker Woods Foundation and Learning Center, and the Driving Park Community Recreation Center. This area of Livingston Avenue sits between a recent improvement at Nationwide Children's Hospital and a future joint improvement project along the southern limits of the City of Bexley. The project will address the area between those projects to make all of Livingston Avenue a safe and attractive corridor.

1.2 The Problem

The Mid-Ohio Regional Planning Commission (MORPC) has tracked crash occurrences within the central Ohio region and identified Livingston Avenue as a High Injury Network (HIN) due to the high number of crashes resulting in fatal and serious injuries. The project corridor has 6 times the fatality rate and 5 times the serious injury rate more than the general

metropolitan area. These statistics show the need for safety improvements on Livingston Avenue.

1.3 Goals of the Study

The goal of the study is to determine a preferred "Vision Zero" alternative for Livingston Avenue that addresses the safety and mobility concerns within the study limits by proactively working together with the local community for the benefit of all. The project is about saving lives and improving livelihoods for the entire community.

> ***" Vision Zero fundamentally changes the approach to traffic safety by looking holistically at our transportation system - using input from our local government agencies, institutions, and residents to prioritize safety for all users — motorists, bicyclists, pedestrians, and transit riders."***
>
> ***- Vision Zero Columbus***

1.4 Objectives of the Study

The following objectives have guided the planning process:

- Involve the community in the decision-making process.
- Identify infrastructure improvements that will increase pedestrian, bicycle, and motorist safety along the corridor.
- Enhance the beauty of the streetscape.

With these objectives in mind, the Steering Committee sought community feedback and inclusion through a variety of methods over a year-long period to determine a final recommendation.

1.5 Steering Committee Findings

Public input was gathered to get an idea of community perceptions, goals, and feedback on concepts. Community members provided the following comments in summary:

Traffic Safety

- Livingston Avenue is an unsafe road that sees a lot of speeding and needs to be improved.

Multimodal

- Improvements should be made to provide access for bicycles and pedestrians.

Community Identity

- The identity of the communities along the corridor should be stated in the proposed improvements.

Street Aesthetics

- The corridor should be an attractive and safe corridor for all users.

This feedback provided invaluable information in setting the goals for the project:

Traffic Safety

- Increase safety for all users and reduce the crash rate by implementing proven countermeasures along the corridor.

Multimodal

- Provide dedicated bike facilities and safe pedestrian accommodations.

> *"Safety should be the first item resolved for the corridor." – Steering Committee Member*

> *"Would love to see this project come to fruition to help bring this beautiful neighborhood back to life." – Public Comment*

> *"We need to make Livingston Avenue safe for all modes of transportation." – Public Comment*

Community Identity

- Integrate design elements with existing infrastructure that will express the unique character and identity of the area.

Street Aesthetics

- Incorporate aesthetic elements such as plantings and lighting to make an attractive corridor for all.

1.6 Traffic Analysis Summary

The traffic portion of this improvements study document was conducted using standards defined in the Highway Capacity Manual (HCM) and Highway Safety Manual (HSM). It focused on gathering data and understanding the issues with vehicular and pedestrian traffic on Livingston Avenue.

In-depth traffic analysis was conducted on vehicle crashes, vehicle speeding, pedestrian crashes, traffic volumes and other roadway characteristics. The speed study proved that the average speed was 5-10 mph over the posted speed limit. The crash analysis identified intersections with a high frequency of crashes so that countermeasures could be determined for each one. The traffic analysis also led to roadway design alternatives for the corridor recommendations that could improve safety and operations.

1.7 Safety Benefits of a Road Diet

The traffic analysis showed reducing the number of lanes, also called a road diet, is feasible with the amount of traffic projected. This would reduce the two lanes in each direction down to one lane in each direction with a center turn lane. The road diet concept has several benefits:

- Reduces rear-end and left-turn crashes due to dedicated left-turn lanes.
- Reduces right-angle crashes as side street motorists cross fewer travel lanes.
- Decreases crossing distance for pedestrians.
- Creates space for multimodal improvements.
- Establishes more consistent speeds and provides traffic calming.
- Provides a community-focused, Complete Streets environment that better accommodates the needs of all road users.

Many options of the road diet with bike lanes were presented to the Steering Committee and their input was gathered. These included having medians, parking, raised biked lanes, street-level bike lanes, a cycle track and more.

1.8 Summary of Recommendations

With crucial input from the steering committee, the preferred alternative recommended for design is the road diet with raised bike lanes.

The guidelines and recommendations laid out in the report do not cover every design aspect but are meant to highlight some of the key design elements that will be used in future phases of the project as the detailed design is completed. All guidance will follow appropriate City of Columbus Standards as well as input from Central Ohio Transit Authority (COTA) and the Ohio Department of Transportation (ODOT).

This preliminary engineering document is a result of hard work from the City of Columbus Design team and of Steering Committee members providing important guidance. The project will continue after the publishing of this report to get a final design prepared for construction starting in 2026. This Livingston Avenue section will be one of the most important street projects for the City of Columbus in the coming years.

Figure 1-2: Conceptual view of Livingston Avenue with Improvements

2

Planning Process

A community-focused approach to involve the public in the project process.

2.0 Planning Process

The Livingston Avenue Improvements Study was led by the City of Columbus Department of Public Service with support from multiple city departments including the Department of Public Service: Division of Design & Construction, Division of Traffic Management, Division of Mobility & Parking Services, and Communications & Public Affairs; the Department of Neighborhoods; and the Department of Development - UIRF (Urban Infrastructure Recovery Fund).

The City of Columbus is committed to building a safe, equitable transportation system that values all travel modes and all communities. Vision Zero is a strategy being adopted in Cities across the U.S. to eliminate all traffic fatalities and severe injuries, while increasing safe, healthy, equitable mobility for all. The City of Columbus adopted their own Vision Zero Action Plan in 2020. By acknowledging that serious injury and fatal crashes are preventable, making safety the top priority for transportation users, and utilizing data to identify trends and target solutions, Columbus aims to eliminate all fatal and serious injury crashes.

"Safety should be the first item resolved for the corridor" – Steering Committee Member

As part of the Vision Zero Action Plan, a High Injury Network (HIN) has been identified to guide the city's investments in infrastructure and programs to ensure that Vision Zero projects support those most in need. The City's High Injury Network comprises corridors consisting of a higher density of fatal, serious injury, and/or vulnerable road user crashes per half-mile segment.

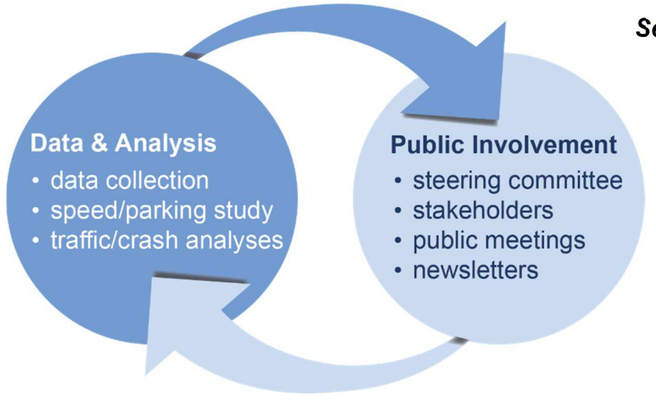
Livingston Avenue is on the City's High Injury Network. The Livingston Avenue project area between S. 18th Street and Nelson Road has 6 times the fatality rate and 5 times the rate of serious injuries as compared to the rest of the Columbus Metro area.

While the study's primary goal is to address safety issues, there is also a need for community reinvestment. The neighborhoods around Livingston Avenue are rich in history, however the construction of nearby interstate I-70 cut off access to important roads, removed homes, and divided the community. The lack of connections across and along Livingston Avenue further separates the community from its assets.

The study consisted of a four-phase process:

- *Data and information gathering*
- *Developing preliminary corridor recommendations*
- *Developing preferred corridor recommendations*
- *Documenting Study recommendations*

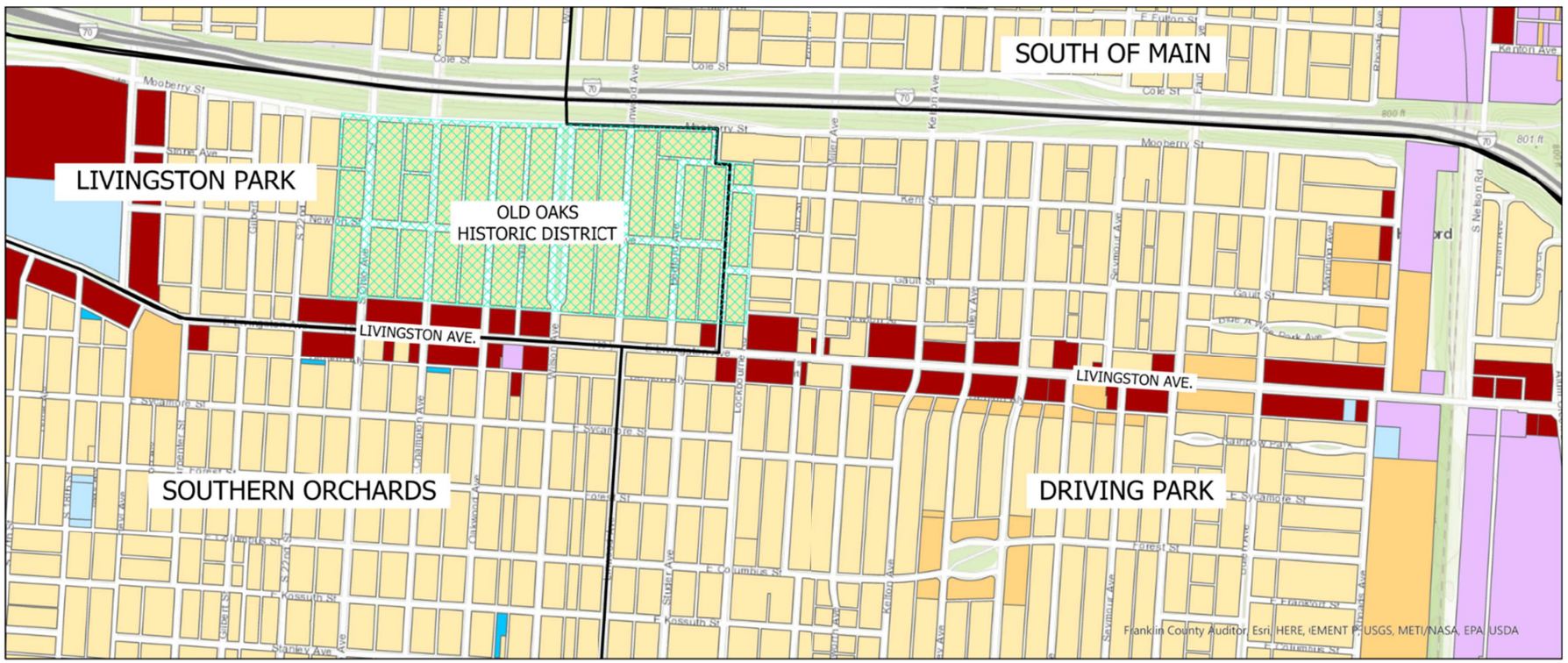
Building upon the main goal set forth in the Vision Zero Columbus initiative, to improve safety and end crash-related fatalities and serious injuries, the recommendations in this study were developed with input from residents, commuters, business owners, stakeholders, and other interest groups. The City of Columbus solicited community feedback throughout the planning process utilizing a variety of engagement strategies. Focusing on community engagement, a steering committee was formed. The Steering Committee members represented area residents, bike advocates, faith leaders, civic association members, area commissioners, and business owners. Stakeholders including nearby transit agencies (such as COTA), emergency services, schools, and other community and interest groups were engaged and updated regularly throughout the study. The engagement efforts and outreach methods are further described in ***Section 4: Public Involvement***.

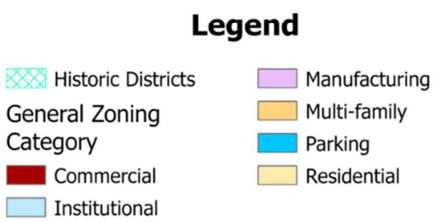


3

Existing Conditions

Livingston Avenue between S. 18th Street and Nelson Road encompassing neighborhoods from Livingston Park to Driving Park.





General Zoning Category	Percentage
Commercial	53%
Institutional	3%
Manufacturing	5%
Multi-family	8%
Residential	32%

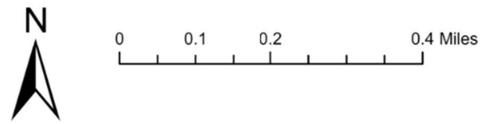


Figure 3-1: Existing Zoning Map of Livingston Avenue Area

3.0 Existing Conditions Analysis

3.1 Neighborhoods and Land Use

The Livingston Avenue Improvements Study focuses on the 1.5-mile section from S. 18th Street on the west end to Nelson Road on the east end. This section stretches from the Southern Orchards Neighborhood to the Driving Park Neighborhood. Other prominent neighborhoods in the area include Old Oaks, Hanford Village and Livingston Park. The roadway provides access to these neighborhoods in the Livingston Avenue Area along with many businesses and institutions such as: Livingston Avenue Elementary, Rickenbacker Woods Foundation and Learning Center, and the Driving Park Community Recreation Center. As seen in **Figure 3-1**, Livingston Avenue includes single family residential, multi-family residential, commercial, and institutional properties. While just over half the properties along the corridor are commercial, there are several blocks of residential intermixed within, making for a true mixed-use corridor.

3.2 Existing Roadway

The section of Livingston Avenue between 18th Street and Nelson Road is a part of U.S. Route 33 and consists of a 4-lane section with two lanes in each direction (see **Figure 3-2**). The outside lanes are 11' wide and the inside lanes are 10' wide, with a right-of-way between 60' and 66' wide. The four-lane section is also squeezed under the railroad bridge on the east end of the project near Nelson Road where the lanes under the bridge are approximately 9' wide, which is well below current standard.

The outside lanes of the existing four-lane section are parking restricted lanes. Parking is prohibited during peak-hour traffic periods and open during unrestricted times including overnight hours. Additionally, parking occurs on side streets or in parking lots at the local businesses. See more on parking in **Appendix 1**.

3.3 Existing Pedestrian and Bicycle Facilities

Livingston Avenue currently has a variable width sidewalk between 4'-7' for pedestrian traffic. Most of the sidewalk has a 2'-3' buffer from the edge of the travel lanes. The buffer strip composition varies between brick pavers and grass. The sidewalk occasionally widens to the back of curb at constrained locations, such as businesses with frontage at the right-of-way line. There are curb ramps and unmarked crosswalks at most unsignalized side street intersections. At signalized intersections, there are marked crosswalks for higher visibility.

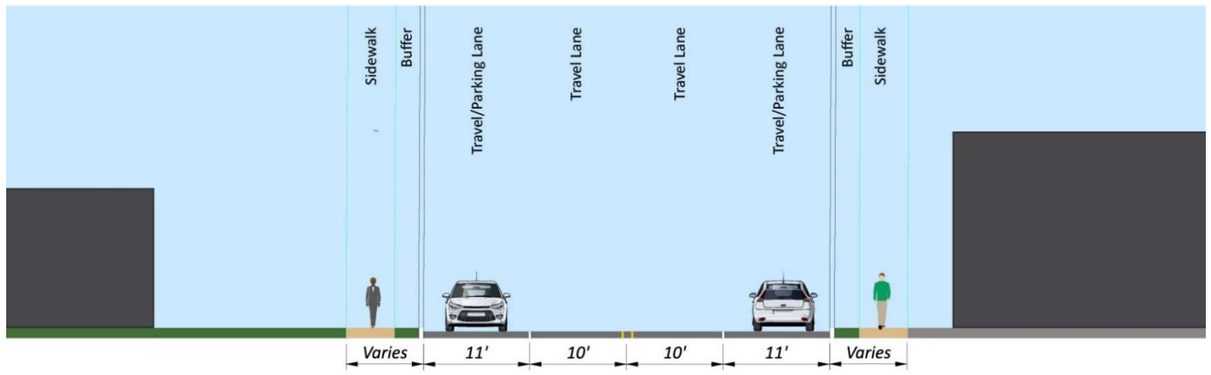


Figure 3-2: Existing Cross Section

Rectangular Rapid Flashing Beacons (RRFBs) have recently been added to the pedestrian crossings at Lilley Avenue, Wilson Avenue, and 22nd Street. These have been added to increase pedestrian visibility and safety.

Livingston Avenue has no bicycle facilities in the project area. Cyclists either must join vehicle traffic and ride on the road, ride on the sidewalk adjacent to the road, or find a different route.

Data has shown that less than 10% of cyclists feel comfortable riding on the road with traffic. See **Figure 3-3** for Bicyclist Design User Profiles as taken from the ODOT Multimodal Design Guide. Riding on the sidewalk is dangerous for all users as the sidewalk is not wide enough to be used as a shared use path. While Livingston Avenue does not currently see much bike traffic, well-designed and safe bike facilities will allow more access for cyclists that may not feel comfortable

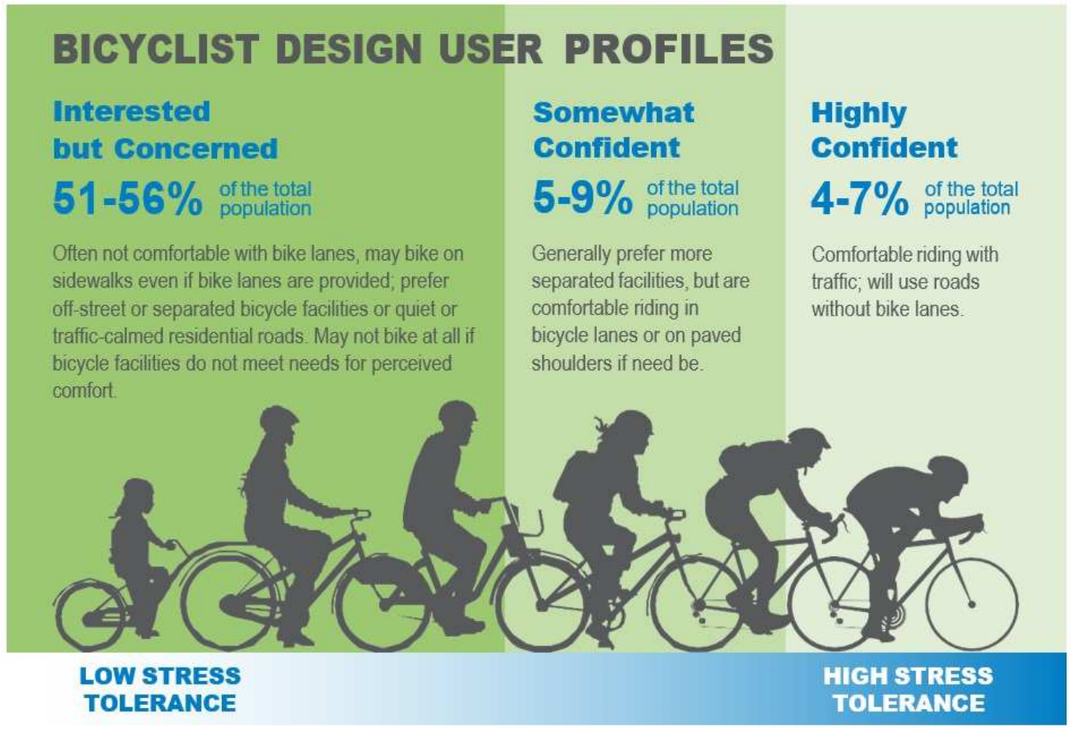


Figure 3-3: ODOT Multimodal Design Guide Figure 3-1; Bicyclists Design User Profile

Figure 3-4: Existing Roadway with Cyclist

with the existing conditions. Additionally, there has been the addition of on-street bicycle facilities on Livingston Avenue to the west of the project near Livingston Park. This Livingston Avenue Improvement Project offers potential for extending bicycle facilities along Livingston Avenue to Nelson Road and improving the nonexistent (see **Figure 3-4**) bicycle conditions.

3.4 Existing Transit

Livingston Avenue is a main transit route. COTA Bus Route #1 runs down the corridor and transports people from the Livingston Avenue area to Bexley and downtown. There are over 20 bus stops for Route #1 on Livingston Avenue in the project area. COTA Routes #22 and #11 also cross Livingston Avenue at Ohio Avenue/Champion Avenue and Nelson Road, respectively. These routes connect to neighborhoods to the north and south such as Olde Towne East or South Columbus. The existing bus stops along Livingston Avenue vary from full stops with shelters and benches to stops with just a sign. On the roadway, there are concrete pads for the bus stops. See **Figure 3-5** for an existing photo. These transit connections are important because they provide access and mobility for residents in the area.

3.5 Pedestrian Generator Analysis

A pedestrian generator map was created to illustrate the pedestrian infrastructure, points of interest, and pedestrian crash locations throughout the study area. The full pedestrian generator map can be found attached in

Figure 3-5: Existing Bus Stops at Champion Avenue

Appendix 2. The map highlights the following information:

- Central Ohio Transit Authority (COTA) Stops
- Traffic Signals
- Rectangular Rapid-Flashing Beacons (RRFB)/ Pedestrian Signals
- Marked/Unmarked Crosswalks
- Pedestrian Crashes
- Local Trip Generators including:
  - Community Centers
  - Grocery Stores
  - Schools & Libraries
  - Restaurants
  - Places of Worship

A field check was conducted to verify the information and finalize the existing features. The map assisted the study team in making these observations along the corridor:

- Pedestrian crashes occurred in between intersections at unmarked locations.
- Many people crossed at unmarked crosswalks at:
  - Carpenter Avenue
  - Gilbert Street
  - 22nd Street
  - Wilson Avenue
  - Bulen Avenue*
- There were clusters of pedestrian crashes at:
  - Champion Avenue
  - Lilley Avenue
  - Fairwood Avenue
- Existing brick crosswalk locations**
  - S. 18th Street
  - S. Ohio Avenue
  - S. Champion Avenue
  - Kelton Avenue
  - Fairwood Avenue

** There is a planned Pedestrian Safety Improvement Project (PSIP) at Bulen Avenue.*

***Brick crosswalks may provide decreased pedestrian visibility and are no longer a City of Columbus standard option.*

3.6 Existing Traffic Volume Analysis

Traffic volumes were collected by performing 8-hour turning movement counts from 6:00 – 10:00 AM and 3:00 – 7:00 PM at nine (9) study intersections. See **Figure 3-6** for the locations of the intersections.

1. Livingston Ave. at S. 18th St.
2. Livingston Ave. at Carpenter St.
3. Livingston Ave. at S. Ohio Ave.

4. Livingston Ave. at S. Champion Ave.
5. Livingston Ave. at Lockbourne Rd.
6. Livingston Ave. at Miller Ave.
7. Livingston Ave. at Kelton Ave.
8. Livingston Ave. at Fairwood Ave.
9. Livingston Ave. at Nelson Rd.

The data collection included the classification of passenger cars and heavy vehicles as part of the count as well as counts of pedestrians and bicycles.

In addition to the 8-hour turning counts, peak-hour counts from 8:00 - 9:00 AM and 3:00 - 4:00 PM were conducted corridor wide. These counts showed some variation due to driveways and other access points on the corridor but provided information on the existing peak traffic volumes for the study area. These counts and all supplemental existing volume information are included in **Appendix 3**.

Growth rates are used to project existing traffic volumes into the future to see how the roadway will perform in the design year. The design year is typically 20 years after the anticipated construction year for the project. For this project, the construction year is 2026 and the design year is 2046.

Linear growth rates are provided by the Mid-Ohio Regional Planning Commission (MORPC). MORPC takes into consideration potential developments and other factors to create a traffic demand model and get an anticipated growth rate. See **Appendix 4** for MORPC growth rates.

As a part of the traffic volume analysis, a Certified Traffic Memorandum was completed and approved by ODOT. This establishes the future traffic volumes to be used as a basis for design. These counts and calculated volumes are important for operational analysis of the roadway in multiple scenarios. More Certified Traffic information can be found in **Appendix 4**.

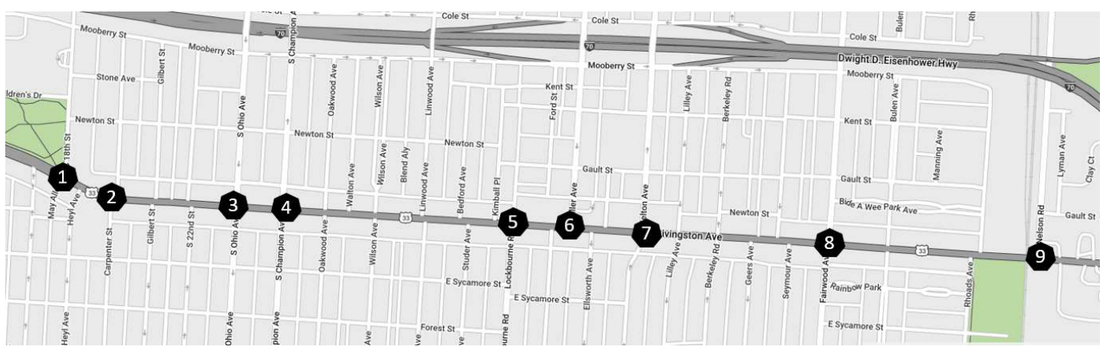


Figure 3-6: Traffic Volume Study Intersections

3.7 Existing Traffic Operations Analysis

Traffic operations analysis was conducted on the existing corridor based on traffic volumes, count data, and certified traffic. The operations analysis focused on traffic signals and the quality of traffic control service along the corridor.

One of the main factors defining traffic operations is the level of service (LOS). The LOS is typically expressed as a letter grade ranging from A to F to describe the quality of operations at a signalized or unsignalized intersection. This letter grade is defined by the amount of delay caused by the traffic control device at the intersection (traffic signal, stop sign, etc). See **Figure 3-7**. Typically, LOS D or better is acceptable on Columbus roadways. See more information on LOS in **Appendix 5.**

The traffic operations analyses were conducted for the existing year (2022), construction year (2026), and design year (2046).

For the existing year, every movement was operating at a LOS D or better except for southbound approaches at S. 18th Street and Nelson Road which were at LOS E. See **Appendix 5** for complete tables and analysis.

A "no build" scenario is where no physical changes are made to the roadway section, but the traffic operations are adjusted and optimized for future values in the years 2026 and 2046. This scenario saw operations of LOS D or better across the corridor with Livingston Avenue operating at LOS B.

Figure 3-7: Level of Service Visual

See Appendix 5 for complete tables. This analysis shows that proposed improvements can be constructed and provide satisfactory traffic operations.

3.8 Existing Traffic Safety Analysis

Crash data of the study area was analyzed between the years 2017-2021. In that four-year span, 847 crashes were reported. That averages out to a crash almost once every two days just on this 1.5-mile section of Livingston Avenue. **Figure 3-8** shows a hot spot analysis of the crashes during the four-year period. Blue shows a low frequency and red shows a high frequency of crashes.

Six of the highest crash frequency intersections had more detailed crash analysis completed. The six intersections are as follows:

- Champion Avenue
- Fairwood Avenue
- Kelton Avenue
- Miller Avenue
- Nelson Road
- Rhoads Avenue

Figure 3-8: Hot Spot Crash Analysis

This more detailed analysis involved looking at the type of crash and the crash severity. The "type of crash" (ex.- angle crash, rear end, side swipe, etc.) can provide insight into an underlying cause of the crash. The "crash severity" (ex.- property damage only, possible injury, minor injury, serious injury, or fatality) can provide insight into the seriousness of the underlying cause of a crash.

It was found that the most common crash types were rear end, angle and sideswipes. The left turn angle crashes tended to be the most common at the crash hotspot locations of Fairwood Avenue and Miller Avenue. As for crash severity, 35% of the crashes caused either a possible injury or a minor injury. There were six cases of serious injury and two fatal crashes along the corridor over the four-year span. See **Appendix 6** for complete details relating to this analysis.

The crash data indicates that vehicle crashes are a major problem along this corridor. On average, these six intersections see about 50% more crashes a year than expected based on other intersections in the area. Within the Livingston Avenue study area, it is six times as likely to be in serious injury or fatal crash when compared to the general metropolitan area. These statistics reinforce the importance of implementing safety improvements along the corridor in an effort to lower the crashes and make progress toward Vision Zero Columbus.

3.9 Speed Studies

In addition to the crash analysis, a speed study was conducted to gain insight on driver behavior. Speed data sets were collected at three intervals along the corridor:

- Between Carpenter Street and Gilbert Street. (West)
- Between Lockbourne Avenue and Miller Avenue. (Middle)
- Between Bulen Avenue and Rhoads Avenue. (East)

The "85th percentile speed" is the value considered to represent the normal flow of traffic for a section of roadway. It is identified from the speed data gathered at each interval. This value represents the upper limit of speeds while excluding high outliers that skew the data. See

Appendix 7 for the speed data and 85th percentile Summary.

The speed limit on Livingston Avenue is 35 mph. The "85th percentile speed" data collected showed that most vehicles are traveling 35-40 mph between Carpenter-Gilbert and between Lockbourne-Miller. However, in the Bulen-Rhoads segment, the 85th percentile speed was consistently 40 mph or higher, indicating an issue with speeding.

Speeding is one of the main contributors to the high frequency of crashes in the project study area. Out of all the unsignalized intersections, Rhoads Avenue and Bulen Avenue both had high numbers of angle crashes. Implementing countermeasures to promote safer vehicular speeds will decrease the number and severity of crashes in the corridor.

3.10 Existing Parking Analysis

A parking study was conducted to assess the existing parking utilization within the project area. The limits of this parking study include on-street parking along Livingston Avenue within the study area and each side street up to the first alley north and south from Livingston Avenue. Parking data was captured at multiple times throughout the day to analyze how parking is utilized. Detailed parking occupancy tables developed from this analysis can be found attached in **Appendix 8**.

The analysis showed a notable stratification of parking utilization at the 30% level. Most of the blocks along Livingston Avenue showed less than 30%. The only blocks that showed consistent utilization above 30% were as follows: (See **Figures 3-10 & 3-11**)

- Gilbert St. to 22nd St.
- Champion Ave. to Oakwood Ave.
- Studer Ave. to Kelton Ave.

For parking on side streets, the average occupancy is around 28%. Many side streets reached occupancy above 50%, such as Geers Avenue or Bedford Avenue while others, such as Lilley Avenue or Berkley Road, showed utilization close to 0%.

Overall, the findings of this study were that the parking along Livingston Avenue is used sparingly, with the parking along the side streets being utilized more often. These data and analyses help the City of Columbus and the design team be informed when making decisions on parking in future phases of the project.

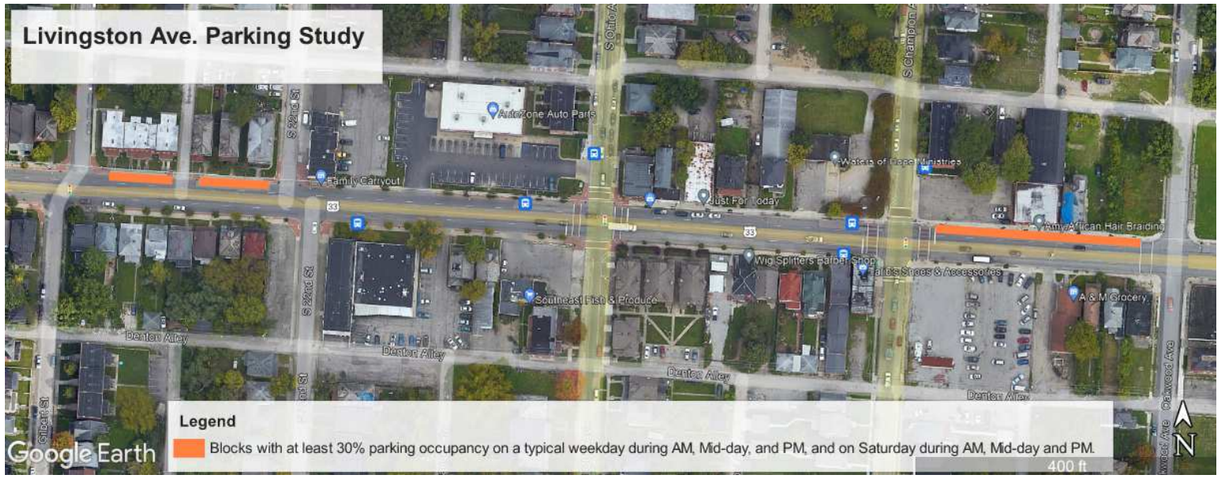


Figure 3-10: Parking Occupancy Above 30% Figures – From Gilbert Street to Oakwood Avenue

Figure 3-11: Parking Occupancy Above 30% - From Studer Avenue to Kelton Avenue

4

Public Involvement

Hearing the thoughts and input of community members to help make design decisions.

4.0 Public Involvement

The City of Columbus sought to utilize existing leaders within the community to provide guidance to the team and serve as community liaisons throughout the planning process. A Steering Committee comprised of 13 individuals representing neighborhood residents and businesses, faith and community organizations, bike advocates, civic associations, and Area Commissions was formed. The Steering Committee provided the team input, direction, support, and served as conduits and mobilizers for feedback from the community. The small group size allowed in-depth discussion regarding the different needs and perspectives of the community.

The City of Columbus identified a list of 30+ Stakeholders, comprised of local community interest groups, libraries, community recreation centers, transit agencies (such as COTA), schools, and safety/emergency services. Stakeholders were updated regularly of the process via an emailed newsletter. The list of stakeholders was updated as individuals or groups expressed interest in the project to maximize the Study's outreach efforts.

Meetings were held with the Steering Committee and members of the public at key points throughout the process. See a summary timeline of public involvement activities below **(Figure 4-1)**.

Figure 4-2 on the next page further explains the different public involvement groups that participated in this process.

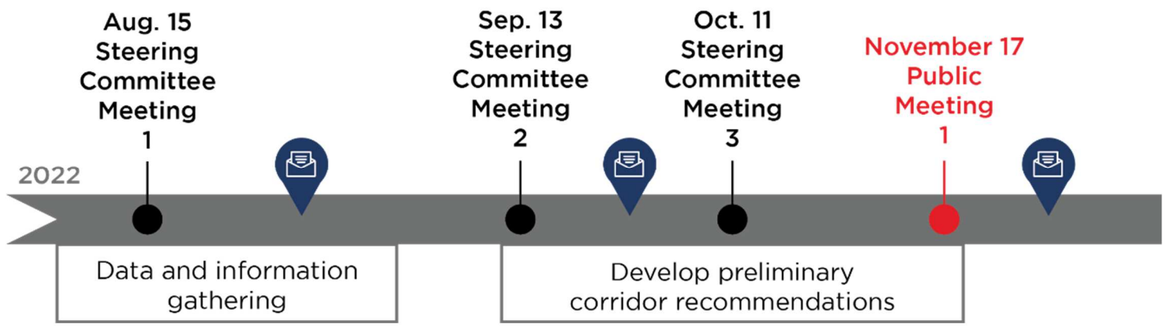


Figure 4-1:Timeline of Public Involvement Activities

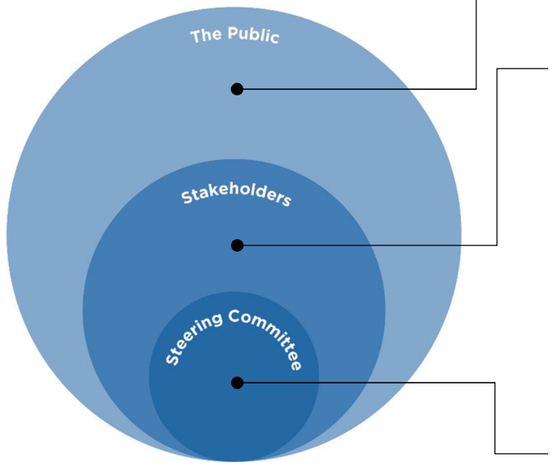


Figure 4-2: Public Involvement Groups

Public

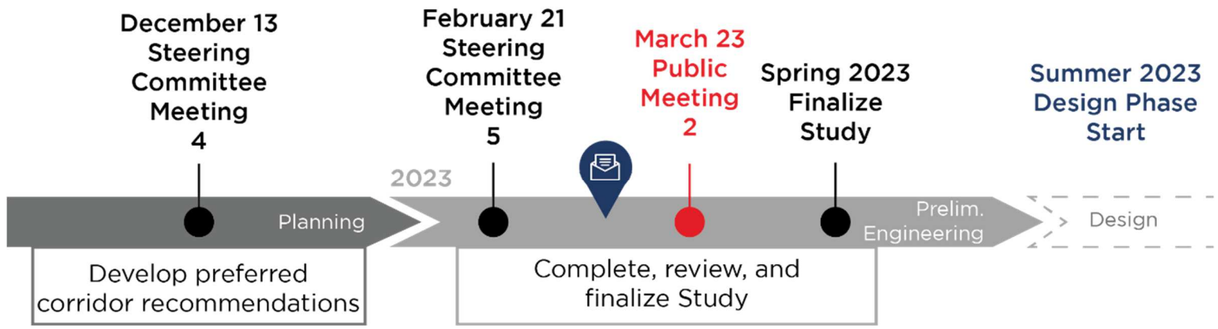
Comprised of residents, property owners, neighbors, business owners, commuters, and more. The public was informed on study progress through the Steering Committee, stakeholders, and public meetings.

Stakeholders

Comprised of 25-30 groups/individuals including COTA, local libraries, community recreation centers, area commissions, community organizations, City departments, safety & emergency services, Nationwide Children's Hospital, bike advocate groups, and any other interested parties. Groups were informed on the study progress through the Steering Committee, monthly newsletters, and public meetings.

Steering Committee

Comprised of 13 individuals representing different community groups and interests. The committee provided guidance to the team throughout the process and were kept informed through Steering Committee meetings, email outreach, phone calls, monthly newsletters, and public meetings.



Steering Committee Meetings

The Steering Committee met five times throughout the study process. The Steering Committee meetings were facilitated by project team members from the City of Columbus, Lawhon, and CHA. These meetings were held in the evening at the Columbus Metropolitan Library - Driving Park Branch.

Steering Committee Meeting #1

August 15, 2022

The first Steering Committee meeting introduced the study, outlined the schedule, and provided details on the roles and responsibilities for the team and Steering Committee. The planning team gathered data and conducted analysis of existing conditions to better understand current conditions on Livingston Avenue and presented them to the Committee. The Steering Committee provided feedback on transportation issues, concerns, and knowledge of existing conditions through discussion and a mapping activity. The mapping activity consisted of Livingston Avenue corridor map that Committee members marked areas of concern (red dot), areas they liked (green dot), and areas of high activity or usage (yellow dot). See **Figure 4-3** and pages 36-37 in **Appendix 8**.

After providing feedback on the map of Livingston Avenue, the Committee brainstormed their top concerns and goals for the Livingston Avenue corridor:

Top Concerns

- *Speeding*
- *Crashes*
- *Pedestrian Crossing [Safety]*
- *Parking [Needs]*
- *[Community] Character/Identity*

Top Goals

- *[Community] Identity*
- *Improve Safety*
- *Beautification*
- *Equitable Local Connectivity and Mobility*

The team discussed that this list was fluid and would continue to be refined throughout the study process.

To ensure the Steering Committee's goals and concerns were representative of the community, Steering Committee members were asked to distribute the take home surveys amongst their neighborhoods to collect community feedback.

All materials and notes from Steering Committee Meeting #1 can be found on pages 1-41 in **Appendix 8**.

Figure 4-3: *Steering Committee members provide input within the Livingston Avenue corridor at the first Steering Committee meeting.*

Steering Committee Meeting #2

September 13, 2022

At the second Steering Committee meeting, the team presented the results of the take-home surveys collected from the community. The top concerns and goals or improvements provided from the surveys indicated:

Top Concerns

- *Speeding*
- *Unsafe/lack of crosswalks*
- *No bike lane*

Top Goals/Improvements

- *Dedicated bike facility*
- *Traffic calming*
- *Pedestrian crossings*

The concerns and goals of the community closely aligned with the concerns and goals that the Steering Committee had developed during the first meeting. Based on feedback from the Committee at the first meeting, the project team presented a "design toolbox" of transportation strategies that could help address traffic safety concerns and achieve identified goals in the corridor. The "design toolbox" included strategies such as a road diet (reducing number of through lanes to reallocate space towards other uses), raised crosswalks, medians, dedicated bike facilities, shared use paths, and more. Committee members were split into groups and tasked with making different "ideal" layouts for Livingston Avenue by placing scaled paper cutouts of the strategies on a printout of the roadway. See **Figure 4-4**. Based on Committee feedback, and technical data collected so far, the team then worked to create preliminary corridor layouts to present at the next Steering Committee meeting.

All materials and notes from Steering Committee Meeting #2 can be found on pages 45-128 in **Appendix 8**.

***Figure 4-4**: Steering Committee members experiment with different roadway layouts at the second Steering Committee meeting.*

Steering Committee Meeting #3

October 11, 2022

At the third meeting, additional technical data and analysis, including parking data and pedestrian generator maps, was presented. The team took their knowledge from the technical analysis, combined with the layouts created by the Steering Committee at the previous meeting and produced four different preliminary corridor concepts to present to the Committee. See **Figure 4-5**. Feedback on the preliminary concepts was solicited by a live survey that asked Committee members to rank their interest in each concept. A summary of the survey results is below:

- *Road Diet with raised bike lanes received high interest.*
- *Road Diet with bike lanes received medium interest.*
- *Road Diet with cycle track received low to medium interest.*
- *Road Diet with a shared use path received low interest.*

A majority of the Steering Committee preferred the road diet with the raised bike lanes versus the street level bike lanes because it provides an additional layer of protection from vehicles. Based on the feedback given during this meeting, the team planned to present the road diet and raised bike lane concept at a public meeting to solicit additional feedback from the community.

All materials and notes from Steering Committee Meeting #3 can be found on pages 132-222 in **Appendix 8**.

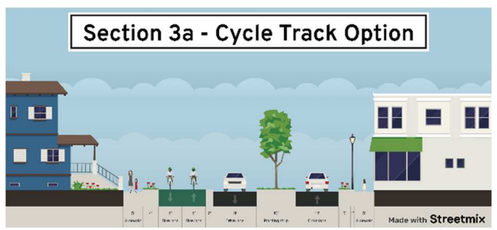


***Figure 4-5**: One of the preliminary concepts developed for the third Steering Committee meeting.*

Steering Committee Meeting #4

December 13, 2022

For the fourth meeting, the team presented feedback gathered from the public meeting and public comment forms received as of the meeting date. The previously identified goals were reviewed and compared to the public comments. Based on public comments received, additional feedback was solicited from the Steering Committee. The concept boards presented at the public meeting were available for the Steering Committee to review and provide targeted feedback related to topics of concern. See **Figure 4-6**.

The team used the feedback to refine the proposed concept and narrow down recommendations to be included in the study.

All materials and notes from Steering Committee Meeting #4 can be found on pages 226-269 in **Appendix 8**.

***Figure 4-6**: Steering Committee members leave sticky note comments on the concept boards presented at the public meeting.*

Steering Committee Meeting #5

February 21, 2023

During the final Steering Committee meeting, the project team reflected on what was accomplished during the study, presented the study recommendations, and discussed next steps and project schedule. The Steering Committee provided feedback on the recommendations and renderings so that revisions could be made prior to the second public meeting. The project team provided information on the upcoming public meeting and encouraged Steering Committee members to invite members of the community. See **Figure 4-7**.

All materials and notes from Steering Committee Meeting #5 can be found on pages 270-331 in **Appendix 8**.

***Figure 4-7**: Steering Committee members sit for a presentation on the study recommendations at the fifth Steering Committee meeting.*

Public Meetings

Two public meetings were hosted at the nearby Driving Park Community Recreation Center throughout the study process. Each meeting was held two times during the day (afternoon and evening) in order to make the meetings accessible for as many participants as possible. The notification area was developed to capture all properties within I-70 to the north and east, E. Whittier Street to the south, and Parsons Avenue to the West. Over 5,000 postcards were sent to surrounding property owners, residents, and businesses to inform them of the upcoming meetings. A website for the study was established at:

www.columbus.gov/LivingstonAvenuePedestrianSafetyStudy and housed all public meeting materials and surveys so that individuals could participate virtually. Materials were sent to Steering Committee members to distribute among neighbors and the community. Newsletters sent to stakeholders also advertised the meetings and invited recipients to participate in person or online.

Public Meeting #1

November 17, 2022

At the first public meeting, the project team presented the need for the study, the importance of the Steering Committee and public involvement, what had been done so far in the study process, and preliminary concepts for the corridor. The format of the meeting was an open house with a presentation, so that community members could come and go as their scheduled allowed. Project team members were on hand to answer questions or concerns. Separate meetings presenting the same information were held in the afternoon and evening to maximize public involvement. Feedback was requested from the public on their relationship to Livingston Avenue, what modes of transportation they regularly used, what they liked and disliked about the proposed recommendations, and any other questions or concerns they may have. Top themes from the comments received included:

- *Thought the concept will improve safety*
- *Positive feedback on dedicated, raised bike lane*
- *Positive feedback on medians, but concerns about cutting off access to certain side streets*
- *Some concern about reduced travel lanes, but overall positive feedback on road diet concept*
- *Mixed comments/feedback on removal of on-street parking*

Prompts in the “Community Corner” at the public meeting asked the community to provide insight into their neighborhood and existing assets. See **Figure 4-8**. See **Figure 4-9** for a photo of the public reviewing the corridor concept.

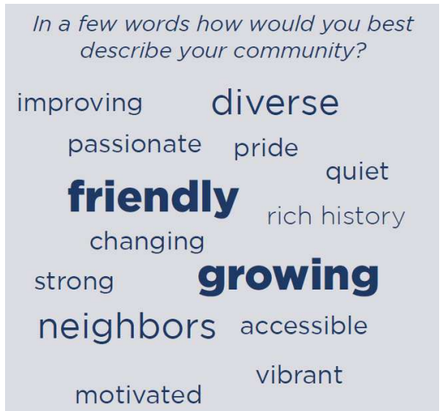


***Figure 4-8:** A word cloud generated from the responses received related to a prompt about community identity.*

After the meeting, the public could submit comments for the next 30 days. Meeting materials could also be requested and sent via postal mail. A total of 61 comments were received during the first public comment period. Comments were then summarized by the project team and provided a response. The responses were posted online and sent via mail and email to those who attended the meeting and/or provided comments. These responses were also made available at Public Meeting #2. All public meeting materials and a summary of comments received during Public Meeting #1 can be found on pages 332-405 in **Appendix 8**.

***Figure 4-9**: Attendees review and discuss the concept boards presented at the first public meeting.*

Public Meeting #2

March 23, 2023

At the second public meeting, the project team presented the need for the study, the importance of the Steering Committee and public involvement, what had been done so far in the process, and the recommendations to be included in the study. See **Figure 4-10**. The second set of public meetings followed the same format and timing as the first set of public meetings. Feedback was requested from the public on the proposed recommendations, priorities, and any other questions or concerns they may have. After the meeting, the public was able to submit comments for 30 days. Meeting materials could also be requested and sent via postal mail.

At this time, comments from the second public are still being accepted. Public meeting materials for Public Meeting #2 can be found on pages 406-457 in **Appendix 8**.

***Figure 4-10**: Mounted display boards showing renderings of the recommendations are set up for the second public meetings.*

The input gathered throughout the public involvement process, combined with analysis and data, established a foundation for the recommendations within this study. See **Figure 4-11** for additional public involvement photos.

The city anticipates further public involvement efforts during the Design Phase of the project.

Public meeting attendees view the concept boards at the first public meeting.

Steering Committee members provide input on areas of concern within the Livingston Avenue corridor at the first Steering Committee meeting.

A Steering Committee member provides targeted feedback on the proposed recommendations for the Livingston Avenue corridor.

Public meeting attendees fill out surveys and discuss after the presentation at the second public meeting.

Figure 4-11: Additional Meeting Pictures

5

Recommendations

A roadway design that increases safety and has facilities for pedestrians, bicyclists, and motorists.

5.0 Recommendations

Based on data gathered and input from the Steering Committee, the design alternatives considered for Livingston Avenue follow the goals of improving safety, lowering vehicle speeds, providing safe bicycle and pedestrian facilities, and improving the street aesthetically. They also will serve to meet the goals of Vision Zero Columbus. These recommendations are preliminary and will provide a starting point to begin detailed design.

5.1 Road Diet

A road diet layout was the base model for the roadway improvement alternatives. A road diet involves reducing the number of travel lanes on the roadway and the overall pavement width. Because Livingston Avenue is currently two lanes in each direction, a road diet will result in one lane in each direction with a center lane that can be used for left turn lanes, two-way left turn lanes, or a raised median. With the reduced travel way for vehicles, more options are opened for bicycle and pedestrian facilities. There are several benefits that the road diet concept provides:

- Reduces rear-end and left-turn crashes due to dedicated left-turn lanes.
- Reduces right-angle crashes as side street motorists cross fewer travel lanes.
- Decreases crossing distance for pedestrians.
- Creates space for multimodal improvements.
- Establishes more consistent speeds and provides traffic calming.
- Provides a community-focused, Complete Streets environment that better accommodates the needs of all users.

The benefits of a road diet align well with the Steering Committee's goals of reducing the crash rate, increasing safety for all users, and providing bike facilities. Right-of-way acquisition may be required to implement the full width of the road diet layout, likely consisting of longer acquisitions along the roadway length and a shorter width away from the road.

Alternative cross sections of the road along with sample aerial views were created by the design team and brought before the Steering Committee for review. The design team presented the advantages and disadvantages of each alternative, and the committee was able to ask questions and share their thoughts. The alternatives included:

- Road Diet with On-Street (traditional) Bike Lanes
- Road Diet with Raised Bike lanes
- Road Diet with Two-Way Cycle Track
- Road Diet with Shared Use Path

The alternative that received the most consensus from the Steering Committee and the design team was the road diet configuration with raised bike lanes in each direction.

5.2 Preferred Typical Section

The preferred typical section (shown in **Figure 5-1**) strives to increase safety and provide access for all users of the Livingston Avenue corridor:

- Raised bike lanes provide new dedicated space for cyclists to

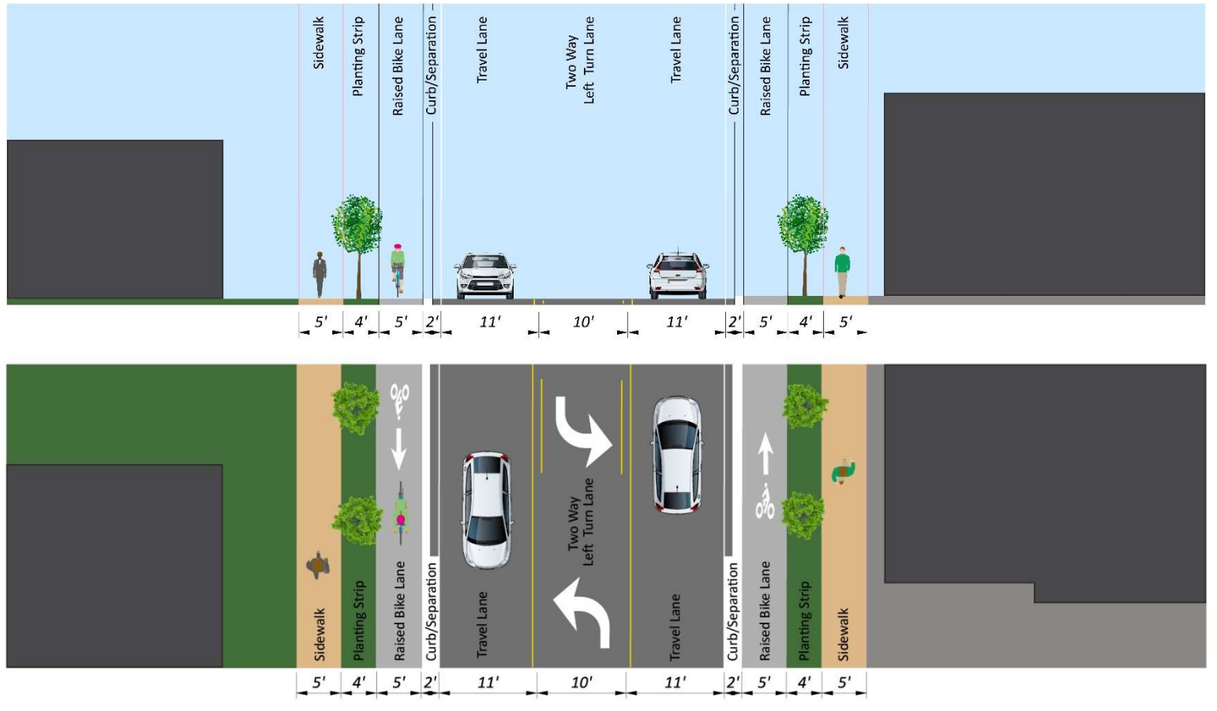


Figure 5-1: Preferred Conceptual Typical Section Views

travel. This separation increases cyclist comfort and safety.

- The reduced number of travel lanes provide traffic calming and promote safer speeds.
- The reduction in pavement width will mean shorter crossings for pedestrians, which will result in less exposure time to vehicular traffic.

This section will vary along the corridor as opportunities for other design elements present themselves, such as on-street parking, bus stops, left turn lanes (See **Figure 5-2**), and two-way left turn lanes. Left turn lanes will be located at signalized intersections and possibly other side streets that see high volumes of turning vehicles. Planted medians may be used as a streetscaping option. More detailed design of these elements will be finalized in future phases of the project.

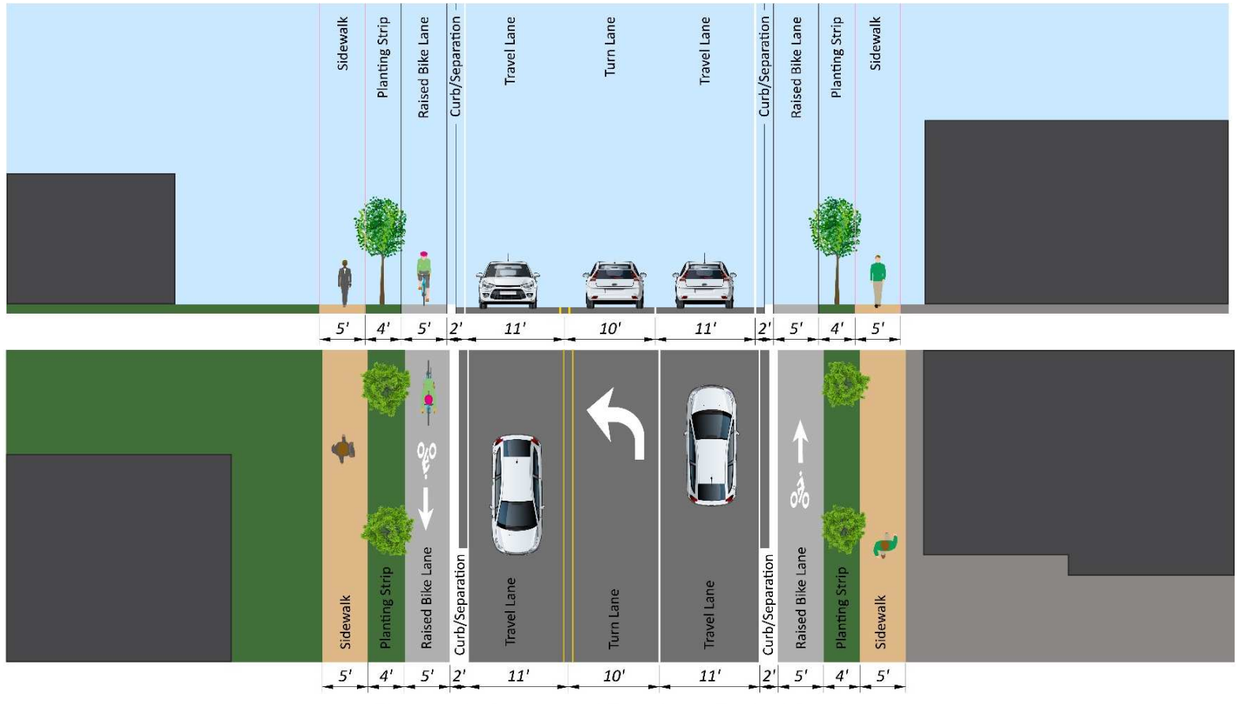


Figure 5-2: Conceptual Turn Lane Typical Section

5.3 Traffic Analysis on Preferred Typical Section

Traffic analyses were completed to determine the impact of the proposed road diet alternative (the "build" condition) on traffic operations and mobility along the study corridor. A traffic model was created to analyze the projected demand based on the certified traffic counts for the construction year (2026) and design year (2046). The model showed that the proposed road diet will operate with a similar level of service as the current condition, with only a slight increase in delay throughout the corridor. A more detailed explanation of the traffic analysis can be found in **Appendix 5** and includes discussion on the level of service (LOS) and turn lane length calculations.

5.4 Transitions at Project Limits

There will be transitions at each end of the project limits to connect the existing Livingston Avenue section with the road diet section. These transitions will be important for vehicle, pedestrian, and bicycle connectivity along the entire Livingston Avenue corridor.

At the western limit (See **Figure 5-3**), a new left-turn only lane is proposed for eastbound traffic turning left onto northbound S. 18th Street to ensure a smooth transition to a single eastbound

Figure 5-3: West End Transition Concept at Livingston Avenue and S. 18th Street

travel lane. This will allow the right lane to go through the intersection and become the travel lane for the new road diet section. Adding this turn lane and shifting the eastbound lanes toward the center of the road allows the raised bike lane on the south side of Livingston Avenue to begin further west and connect with the existing on-street bike lane at 17th Street. The raised bike lane on the north side of Livingston Avenue will extend west of 18th Street for a short length and exit onto the shared use path adjacent to Livingston Park until the on-street bike lane resumes at Ann Street.

At the eastern limit of the project (See **Figure 5-4**), the new road diet section will transition back to the four-lane section east of Nelson Road. It is important to keep only three lanes under the railroad bridge as the pavement width under the bridge is a design constraint. Currently, the four lanes under the bridge are undersized at 9' wide with a total pavement width of 36'. The road diet three-lane section under the bridge will take up 32'; therefore, the separated bike lanes will need to end prior to this constriction. As a result, the separated bike lanes will exit to the roadway or to the sidewalk just west of the railroad bridge. This is also needed, as there are no dedicated bicycle facilities east of Nelson Road on Livingston Avenue.

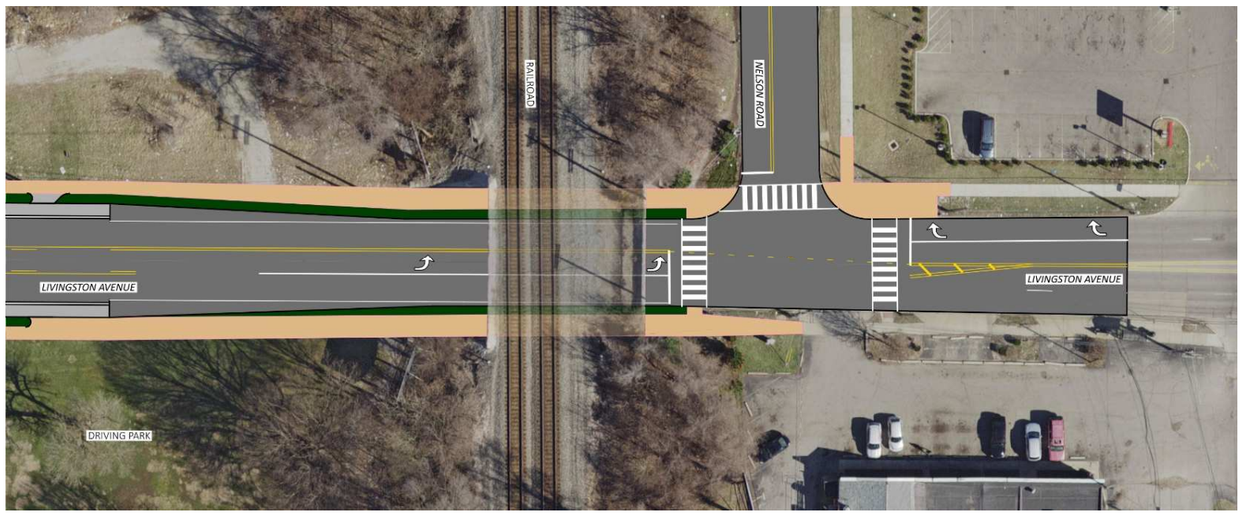


Figure 5-4: East End Transition Concept at Livingston Avenue and Nelson Road

5.5 Pedestrian Accommodations

Increasing pedestrian safety and access along with improving the sidewalk and streetscape are an important piece of this project. This will be accomplished by providing physical separation between the multiple modes of transportation. A 5' wide sidewalk (minimum) will be in place along the entirety of the corridor. A 4' buffer area will be between the sidewalk and bike lanes. The sidewalk may need to occasionally extend into the buffer area due to utilities or the existing storefront businesses. The main design requirement is to have detectable separation between the bike lanes and sidewalks. This involves the buffer being a different material (grass, plants, brick, etc.), containing delineating elements such as posts or planter boxes, or a small 2-inch curb that provides vertical separation. The design of the buffer space will be detailed for each location in the design phase of the project and will follow guidelines provided in ***Section 6: Design Standards***.

Crosswalks are important in providing safe access for pedestrians on Livingston Avenue. As mentioned previously in ***Section 3: Existing Conditions***, pedestrian generator maps were created for the Livingston Avenue corridor. These generator maps, along with pedestrian crash history, were utilized to make recommendations for pedestrian crossing treatments along the Livingston Avenue corridor. It is recommended that Livingston Avenue have a cohesive and consistent treatment for pedestrians and vehicles using the corridor. This helps with the safety of the pedestrians, and also serves to better establish the area's identity as a multimodal corridor. To achieve this cohesive look, the crosswalks within the larger Livingston Avenue corridor between Parsons Avenue and Nelson Road have been reviewed to generate recommendations for improvement. The crossing treatments that are recommended for the corridor are as follows:

All Crosswalks:

- Remove existing brick treatments and replace with white thermoplastic pavement markings to contrast with the new asphalt and increase visibility.

Crosswalks at Uncontrolled (Unsignalized) Intersections:

1. Type II crosswalk markings across Livingston Avenue
   - ***Section 6: Design Standards*** section provides additional information on the types of crosswalk markings.
2. Overhead and side-mounted Rectangular Rapid Flashing Beacons (RRFBs) in double-sided configuration.
   - A RRFB allow pedestrians to activate a flashing warning to drivers that they are using the crosswalk. Driver yield rates greatly increase when these are installed at unsignalized intersections.
   - **Figure 5-5** provides an example of a Rectangular Rapid Flashing Beacon installation.
3. Crosswalks should coincide with pedestrian refuge areas where longer medians are proposed and truck turn movements permit. See **Figure 5-6**.
4. In areas where truck turn movements conflict with pedestrian refuges, it is recommended that a shortened median (approx. 20' long) be installed just outside of the intersection to provide protection for pedestrians. See **Figure 5-7**.
5. RRFB crossing treatments are recommended to remain on the east approaches of 22nd Avenue, Wilson Avenue, and Lilley Avenue.
6. It is recommended that an RRFB crossing treatment be added at Rhoads Avenue.
   - This treatment should be installed on the east approach of the intersection and include a median island located just east of the crosswalk to protect pedestrians and prohibit drivers from entering the Two-Way Left Turn Lane (TWLTL) too soon.
   - In any proposed concept where Rhoads Avenue is realigned, the location of the crossing should be reevaluated.
7. These treatments will improve safety by providing clear indications of locations where pedestrians will be crossing the road, heightening the awareness of motorists.

Figure 5-5: Recently Built RRFB at Wilson Avenue

Figure 5-6: Pedestrian refuge in median just east of Project. (Brick material not recommended.)

Figure 5-7: Example of Pedestrian refuge with shortened median for truck turns

Crosswalks at Controlled (Signalized) Intersections:

1. Install Type I crosswalk markings on most approaches. Type II markings are recommended on Safe Routes to School (SRTS) routes and near schools and libraries. See ***Section 6: Design Standards*** for information on marking types.
2. Install Curb extensions on side street approaches for north and/or south sides of Livingston Avenue in the

parking lane(s) or where the number of lanes can be reduced.

- Ohio Avenue, Champion Avenue, and Kelton Avenue have been identified as potential candidates for curb extensions.
- Curb extensions improve safety by increasing the visibility of pedestrians and limiting the crossing distance.
- It is recommended that curb extensions in these locations leave room for existing and future bike lanes.
- **Figure 5-8** provides an example of a curb extension.

3. A pedestrian hybrid beacon (PHB) should be installed on the west side of the Carpenter Street intersection.
    - A PHB provides a signal for an otherwise unsignalized pedestrian crossing that stops traffic when the push button is activated to allow pedestrians to cross on an exclusive phase.
    - A PHB is considered one of the safest options for pedestrian crossings and is warranted for this location at Livingston Elementary School.

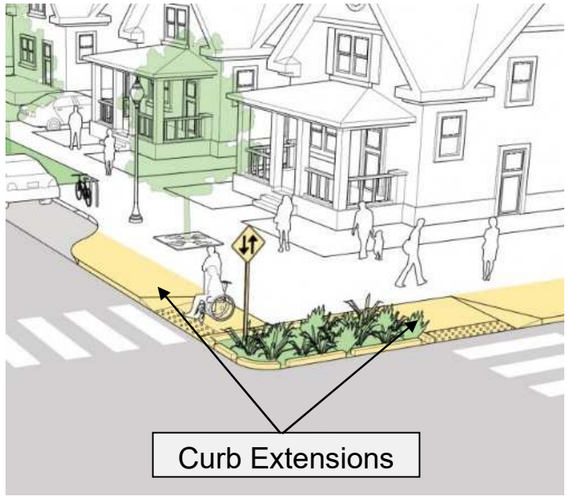


Figure 5-8: Curb Extension Graphic

Figure 5-9: PHB Example

- **Figure 5-9** provides an example of a pedestrian hybrid beacon Installation.

5.6 Parking Considerations

Parking along Livingston Avenue will be an ongoing design discussion. In the proposed road diet layout, there is not enough room in the current right-of-way to add a parking lane and maintain three lanes of traffic with raised bike lanes. There are opportunities for parking in areas that do not need a turn lane where vehicle traffic can shift to allow a parking lane on one side of the road while maintaining bicycle and pedestrian facilities. See **Figure 5-10** for a parking plan view and cross section. **Figure 5-11** shows a conceptual transition from the preferred typical section to an on-street parking section.

Parking is an evolving need based on residential and business influences and could change after construction of this project is complete.

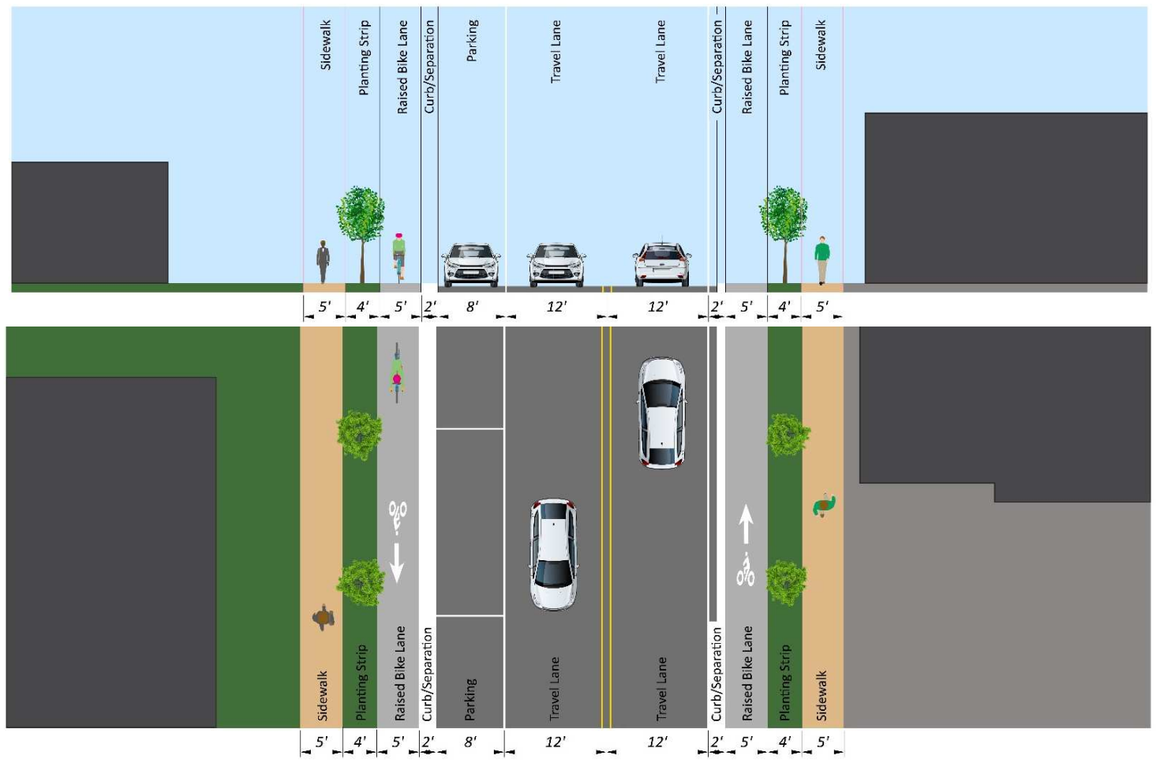


Figure 5-10: Conceptual On-street Parking Section View

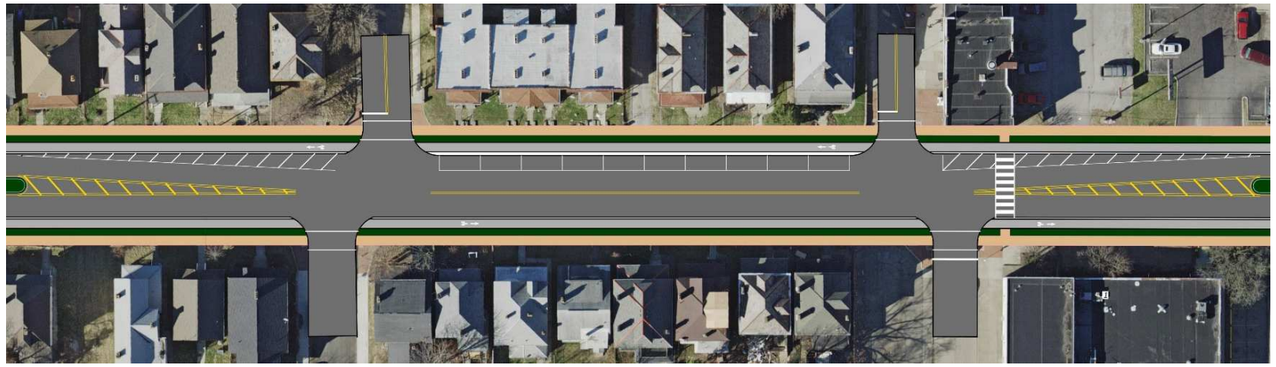


Figure 5-11: Conceptual Transition to On-street Parking

5.7 Bicyclist Accommodations

It is imperative that the project provide dedicated and separated bicycle facilities along the entire corridor. Dedicated and separated bicycle facilities have been shown to significantly increase the safety for bicyclists of all abilities and experience levels. Continuity through the corridor is important to provide connectivity to the greater bike network in the area. Designated Ohio Bikeway routes (routes that either have marked bike markings or are deemed bike-friendly) that intersect Livingston Avenue and may see future improvements include Ohio Avenue, Champion Avenue, South Lockbourne Road, North Miller Avenue, North Kelton Avenue, and Fairwood Avenue. The Alum Creek Trail is located approximately 0.2 miles east of the project limits at Nelson Road and is a major attraction for bike traffic. To reach that point along Livingston Avenue, bicyclists must travel beneath the railroad bridge west of Nelson Road as well as through the I-70 underpass. To avoid these constrained areas, bicyclists may choose to ride north on Fairwood Avenue, beneath I-70, and then go east on Main Street to the Alum Creek Trail access point located east of Alum Creek Drive.

5.8 Other Considerations

5.8.1 Bus Stops

Locations of COTA bus stops along the corridor will need consideration during design. It is recommended the design team closely coordinate with COTA to ensure efficient and safe transit infrastructure is included. Locations may possibly shift for bus stops at Carpenter Street and Wilson Avenue due to newly placed pedestrian crossing infrastructure (RRFB signals) that impact crossing locations. The bus stops at Rhoads Avenue will also potentially change to accommodate a pedestrian crossing. Additionally, ***Section 6: Design Standards*** provides more information on bus stop design with bicycle facilities.

5.8.2 Kelton Avenue

Kelton Avenue is one-way northbound and the recommendation of adding curb extensions would require a lane configuration change to reduce from two lanes to just one lane. Currently, Kelton has a right-turn lane and a through/left-turn lane. This change to one lane for the northbound approach was identified in the traffic analysis and does not negatively affect the LOS of the intersection. It is recommended that the curb extension leave room for a future bike lane, as there are bike lane connections further north on Kelton Avenue. See **Figure 5-12** for a visual concept and see **Appendix 5** for more information.

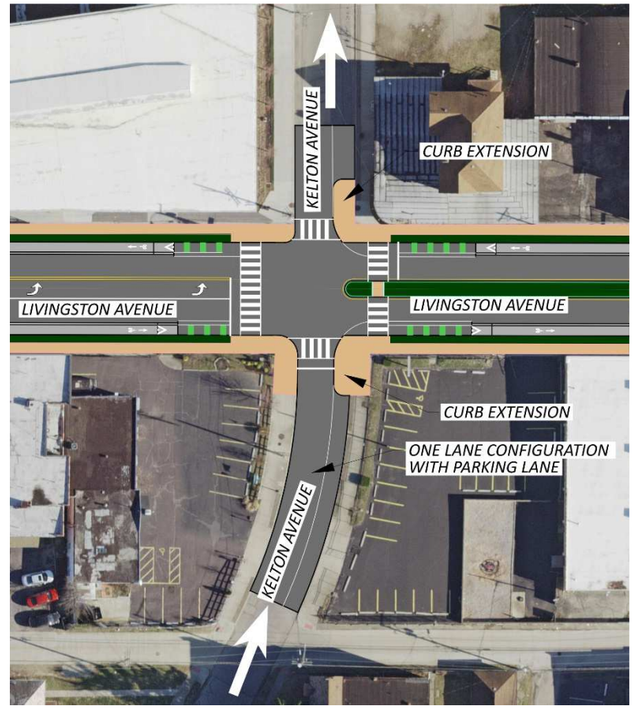


Figure 5-12: Kelton Avenue reconfiguration concept.

5.8.3 Additional Corridor Improvement Recommendations

Corridor-Wide

- Replace signal heads with 12" signal heads and provide backplates. See **Figure 5-13** below:

Figure 5-13: Example signal head with backplate

- Add additional supplemental signal heads as needed for side streets.
- Replace aging span wires with mast arms signals.
    - These signal improvements would increase safety by increasing the visibility of signal infrastructure.
- Include bus bulbs for high ridership COTA Bus Stops where parking is being considered (See ***Section 6: Design Standards***).
    - Bus bulbs increase safety by avoiding buses having to pull back into traffic.
- Pavement replacement and roadway reconstruction with standard lane and crosswalk markings as applicable for the road diet section.
    - New pavement marking standards will be used that will increase the width of pavement markings, increasing the visibility and overall safety.
- Retime signals and update clearance timing as needed throughout corridor.
    - This would increase safety by allowing more time for vehicles to clear the intersection before displaying the green for the following phase.

Carpenter Street

- Move existing Pedestrian Hybrid Beacon to west approach of the Carpenter Street intersection.

Champion Avenue

- Move stop bar and curb ramps forward by including curb extensions on Champion Avenue.

Miller Avenue (South Leg)

- Install median on Livingston Avenue to prevent left turns into and out of S. Miller Avenue to remove the conflict point and prevent crashes. See **Figure 5-14**.

Kelton Avenue

- Convert to a single lane and provide parking along one side of the road.

Fairwood Avenue

- Potentially realign intersection to reduce offset. This would alleviate visibility issues and lack of guidance through the intersection for vehicles on Fairwood Avenue.

Figure 5-14: Miller Avenue Median Concept

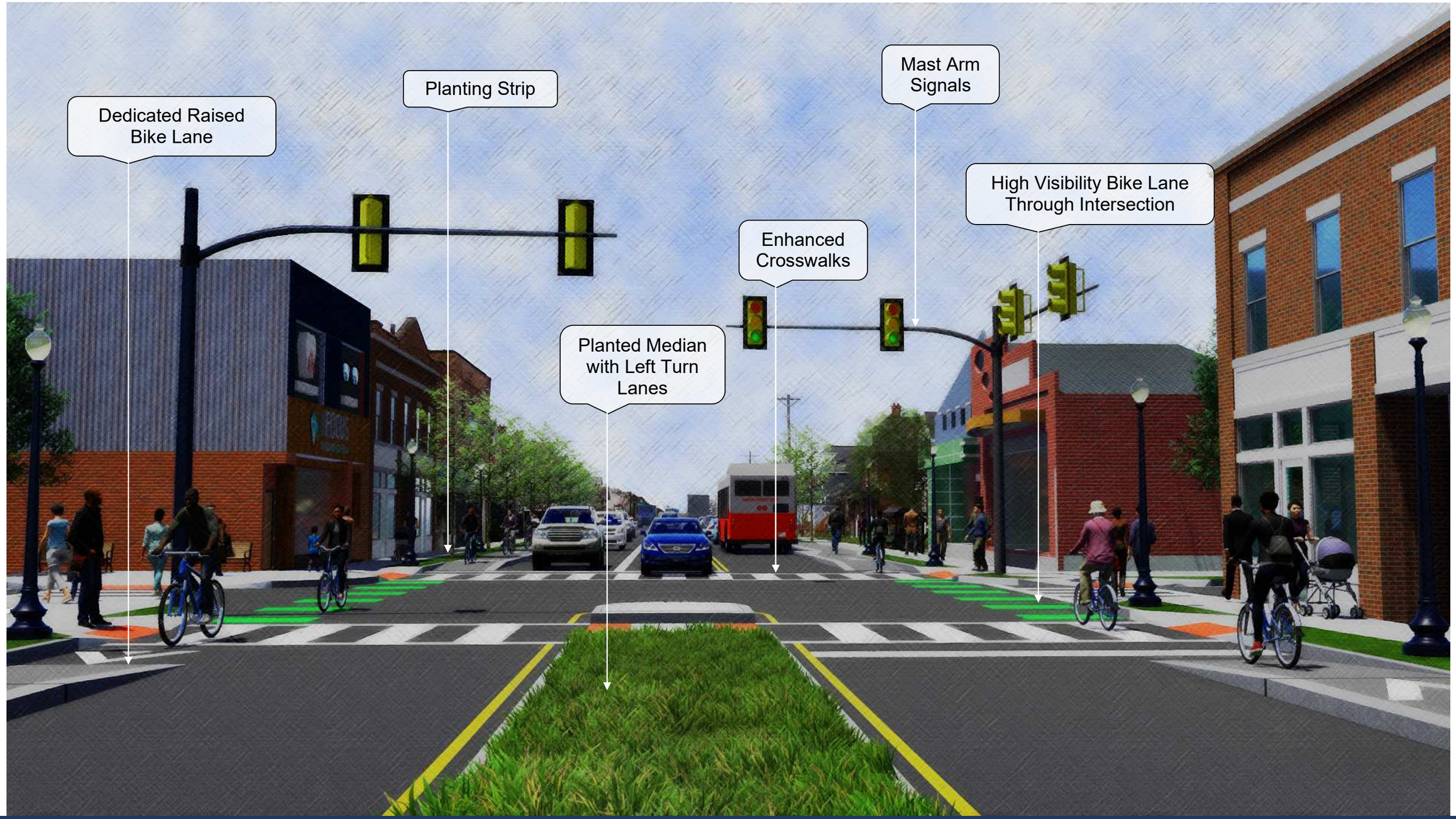
5.8.4 Community Identity

Stating the community identity is one of the main goals of the project. This goal may be accomplished within the corridor through enhancements such as landscaping (plantings, street trees) and public art. The addition of these elements would help transform Livingston Avenue into a beautiful public space that promotes community and togetherness. A safe and attractive corridor would have a huge benefit on quality of life and community pride.

5.9 Conceptual Renderings

The following pages of this section include graphic renderings including some of the recommendations. Please note these renderings are all conceptual and are not meant to represent the final design.

Conceptual Commercial Area Intersection



Conceptual Commercial Area with Parking and Curb Extension

Conceptual Residential Area with Turn Lane

Conceptual Residential Area with Planted Median

Conceptual Residential Area with Parking

6

Design Standards

The design aspects that will be taken into consideration when creating detailed design documents for construction.

6.0 Design Standards

The following design standards include some of the key guidelines on streetscape design, bicycle facility design, pavement markings, and roadway design. These will be used in the final design phase of the project and are based on City of Columbus standards as well as guidance from the Ohio Department of Transportation.

6.1 Streetscape Design

The streetscape design along Livingston Avenue from S. 18th Street to Nelson Road will be based on current City of Columbus (COC) standard drawings as well as City of Columbus Construction and Material Specifications (CMS). The design will also maintain the Pedestrian Accessible Route (PAR), which means a path through and contained within a pedestrian facility that has slope, grade, surface, and width characteristics that makes it usable by persons having certain mobility and sensory impairment conditions. The following are examples of certain features that may be applied to this corridor. Specific design elements and locations will be identified in the future design phase of the project. These examples will be separated into distinct parts of the roadway section: the buffer space, median, and sidewalk.

6.1.1 Buffer Space

The buffer space separates the sidewalk from the raised bike lane. The space will contain a detectable feature that will indicate a change between the walking area and the biking area. This buffer space could vary from plantings, raised planter boxes, curbed tree boxes, and rain gardens to a strip of pavers or detectable warning mats. This space is an important feature that allows for safe modal separation and provides many opportunities for beautification.

Any trees planted in the buffer space will be of a size and variety that maintains the PAR while providing shade and greenery. Species and location of trees in the buffer space will be determined in future phases of the project in coordination with the Columbus Recreation and Parks Department's Forestry section.

Figure 6-1: Potential Trees to Plant

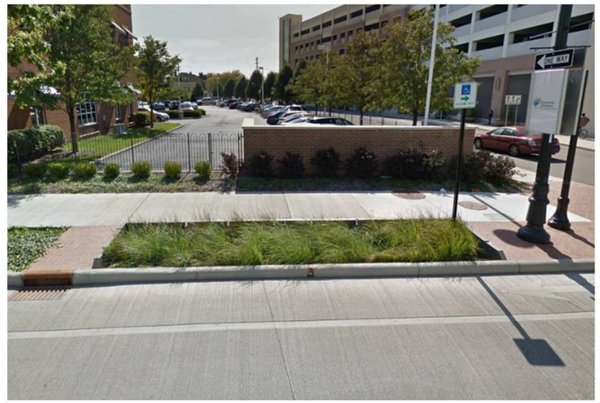


Figure 6-2: Example Buffer Space Stormwater Retention. Located West of Project on Livingston Avenue.

The buffer space may also be used as stormwater retention in the form of rain gardens or bio-retention basins. These will be implemented only if there is enough room in the buffer space to accommodate bike lanes and sidewalk.

The design will follow Blueprint Columbus Green Infrastructure Design Guidelines and the specific locations will be determined in later phases of the project.

The buffer space may also contain street lighting and provide an area for signal poles at intersections. These poles will follow City of Columbus design standards to add to the aesthetics of the streetscape. See **Figure 6-3** below for pictures providing existing examples in the area.

Figure 6-3: Signal and Lighting Pole Design Examples

6.1.2 Medians

Any potential median over 4’ in width will have ground cover plants or shrubs. These plants will be salt resistant and add to the beautification of the street, providing storm water infiltration while reducing impervious area. Medians will be raised from the pavement level by curbs, acting as a barrier between opposing lanes of traffic. The City of Columbus CMS will be used as a guide for species and installation of vegetation in the median. Concrete curbs for medians will be consistent with the median improvements on Livingston Avenue near Children’s Hospital as well as the planned Joint Livingston Avenue Plan between Columbus and Bexley.

Figure 6-4: Potential Sidewalk Amenities

6.1.3 Sidewalks

Sidewalks will be paved with concrete and will have a grooved finish. The width may vary based on location but will always maintain a 4’ minimum width to meet the Pedestrian Accessible Route (PAR) requirements. In areas where larger sidewalks can be accommodated, there are opportunities to add items such as benches, bike racks, and trash receptacles. **Figure 6-4** shows some examples of possible features that may be considered if conditions permit.

6.2 Bicycle Facilities

6.2.1 Pavement

Bike lanes will be constructed with asphalt pavement to provide a smooth surface for cyclists. The pavement build-up will follow the guidance of ODOT MDG section 12.3.3.

The raised bike lanes will be separated from the roadway by a raised concrete curb. It is recommended the curb be recoverable for a bicycle to increase safety. The effective separation of the bike lane and the travel lane will be 2’ minimum. **Figure 6-5** shows an example

Figure 6-5: Example of Raised Bike Lane in Minneapolis, MN.

of raised bike lanes in Minneapolis, MN that helps visualize this concept.

6.2.2 Transitions

The transition of the bike lane from raised to street level will involve a bicycle ramp. These ramps will follow design guidance that allows cyclists to easily transition to street level in a safe manner. Each ramp will include speed hump markings for better indication. The guidance for these transitions can be found in City of Columbus Department of Public Service (DPS) Design Memo

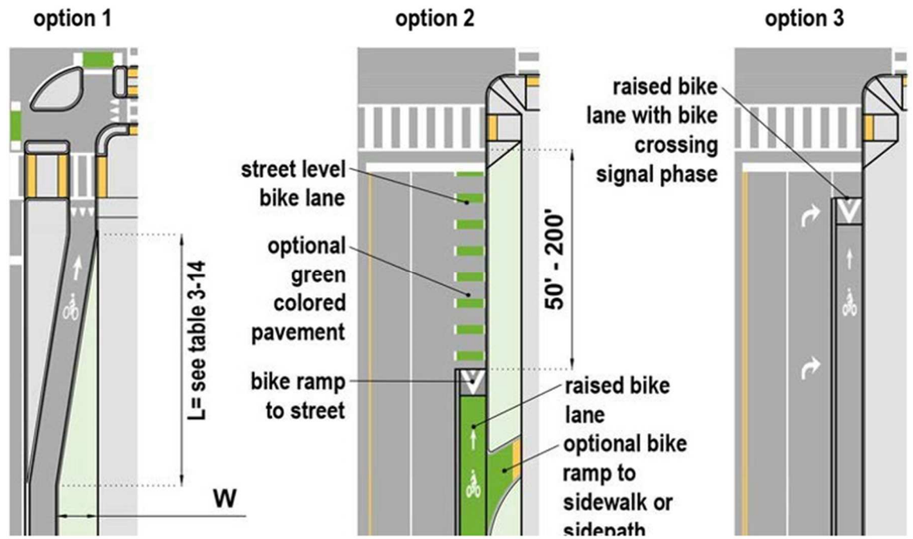


Figure 6-6: MDG Bike Lane Transitions at Intersections

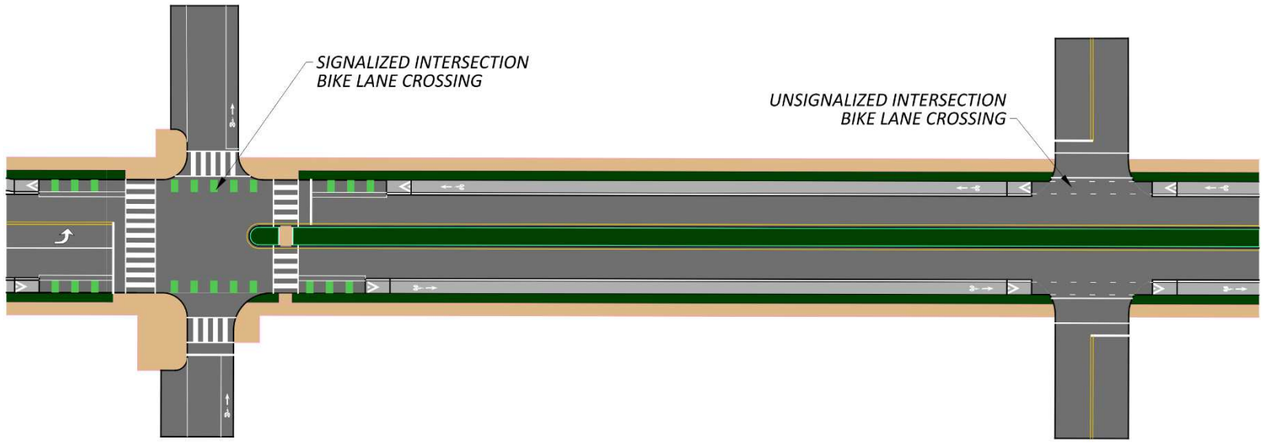


Figure 6-7: Bike Lane Intersection Markings Plan View

6.01 and the Ohio Department of Transportation (ODOT) Multimodal Design Guide (MDG).

The MDG has three options for bike lane transitions at signalized intersections; **See Figure 6-6.** Ideally, the raised bike lanes would stay separated from the travel lanes and be protected by raised medians, only conflicting with vehicles through the intersection directly as seen in Option 1. Due to the constrained nature of the Livingston Avenue corridor, Options 2 and 3 will be considered.

Option 2 shows the raised bike lane dropping to street level a minimum of 50’ ahead of the intersection. This improves the visibility of cyclists by vehicles using the intersection. Optional dashed green pavement can be applied while the bike lane is at street level for added visibility. The optional bike ramp to the sidewalk may be added if deemed necessary at specific locations.

While Option 2 works well for signalized intersections, there are many unsignalized intersections that will need to be accommodated. Since there will be no stopping condition for the traffic on Livingston Avenue (including bicycle traffic), the transitions will more closely follow Option 3. These ramps will be close to the intersection to reduce the amount of time bicycles are at street level. **Figure 6-7** shows the bike lane markings at intersections for both signalized and unsignalized conditions.

6.2.3 Markings

The markings for the raised bike lanes will follow guidance as described in DPS Memo 6.01. The raised bike lanes will have white bike symbols with directional arrows to indicate they are only to be used by cyclists. They will be placed near all intersections and at a minimum of 250’ apart. Any time the bike lane drops to street level, the edges will be delineated by white edge lines. The space between the bike lane and travel lane will keep a 2’ minimum width, following the “Narrow Buffer” guidance as seen in **Figure 6-8**.

At unsignalized intersections, the bike lanes at street level will have dotted lines through the intersection to indicate their location. At signalized intersections, the bike lanes will have dashed green pavement markings to indicated conflict zones to turning vehicles. There will also be turning boxes placed for connection to designated bikeways on other streets.

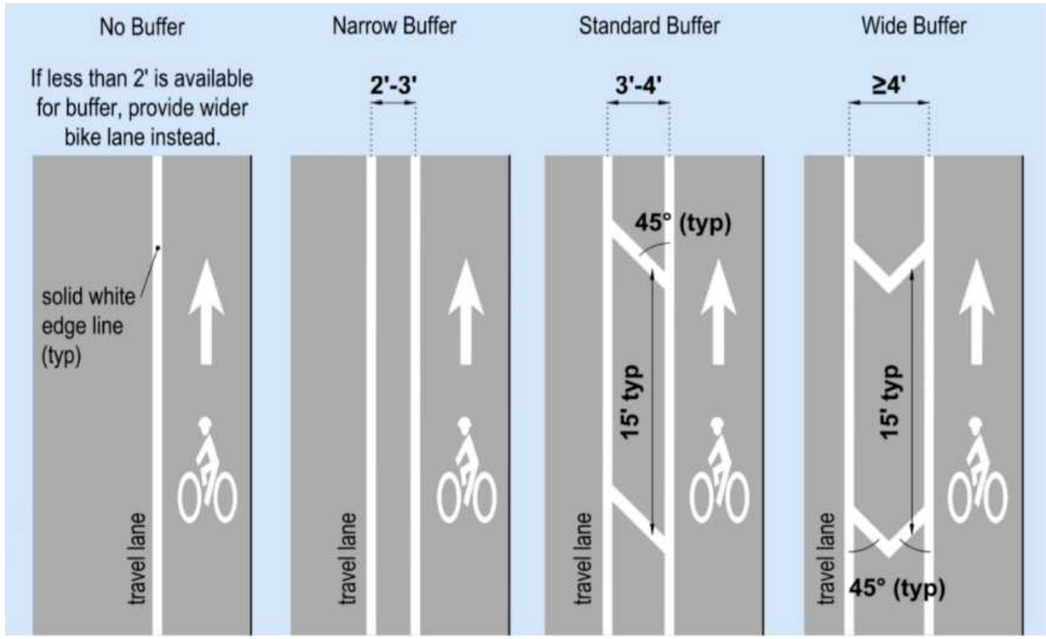


Figure 6-8: Bike Lane Buffer Guidelines

Intersection Type	Condition	Separated Bicycle Lane	Conventional/Buffered Bike Lane	Bicycle Boulevard
Signalized	Turn Conflict			No Markings
	No Turn Conflict			No Markings
	Bikeway Corridor Turns Left			
Unsignalized	High Turning Volume			No Markings*
	All other conditions			No Markings
	Bikeway Corridor Turns Left			No Markings

Figure 6-9: MDG Bike Lane Intersection Marking Guidance

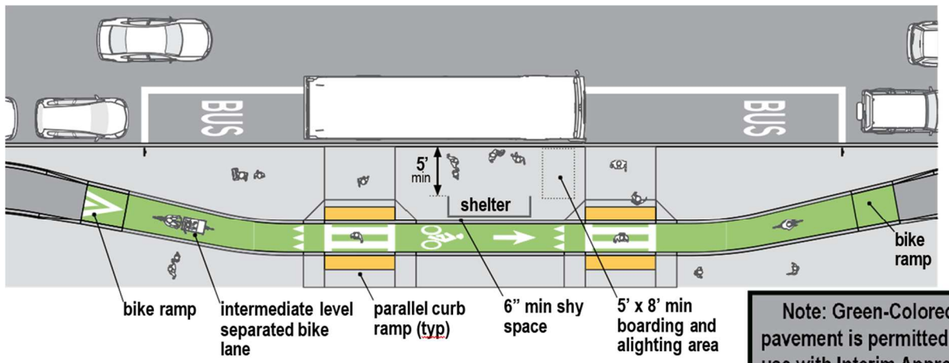
See **Figure 6-9** for pavement marking guidance that will be followed.

6.3 Bus Stop Guidance

Bus stops along the corridor will be designed in accordance with City of Columbus and Central Ohio Transit Authority (COTA) standards. Due to the width constraints of the corridor, the design of transit facilities will require careful planning and consideration.

With the constraints posed by the existing right-of-way, the bus stops will be located within the travel lanes. This helps allow buses to stay on schedule and is safer for all street users. Where raised bike lanes enter areas identified for bus stops, the bike lane will remain raised and will shift closer to the sidewalk, providing room for a “floating bus stop”. In this configuration, the bike lane shifts against the sidewalk, allowing for a 4’ minimum unloading/loading zone for passengers on the bus. The bikeway will be green-colored, and detectable warning mats indicate the mixing of pedestrian and bike traffic in the bus stop zone. **Figure 6-10** below shows this concept.

One notable difference from the figure is the raised bike lane will already be at sidewalk level and will not require a ramp. In other more constrained



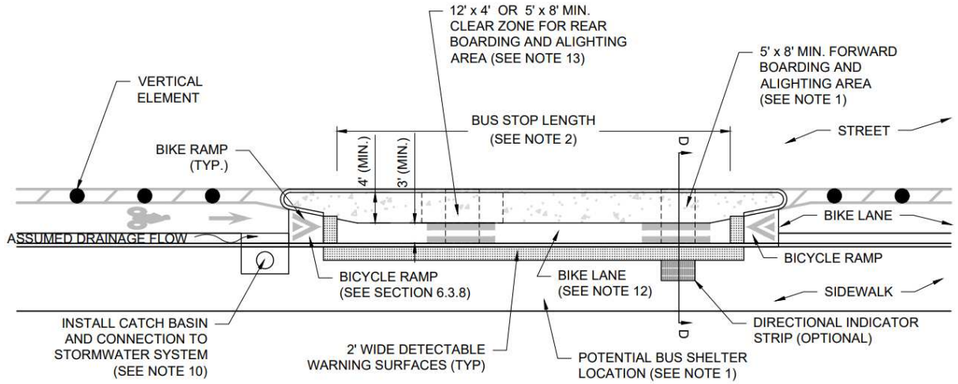


Figure 6-10: Floating Bus Stop Design Graphics

locations, the bike lane width may need to be reduced to 3.5’ minimum to stay within the right-of-way or to create more room for a potential bus shelter. The bike lane can move up against the sidewalk, provided that a detectable warning mat is placed between them while allowing enough room for the PAR to be maintained.

The aesthetics and streetscape around the bus stops will follow COTA guidelines. Some stops may have amenities such as shelters and benches if space allows, but other stops will follow guidance for constrained bus stop locations. Additional information on bus shelters, benches, and other streetscape design aspects can be found in COTA’s Bus Stop Guidelines.

6.4 Roadway Design

6.4.1 Materials

The roadway of Livingston Avenue will be asphalt pavement. The road diet layout will require new curbs and new drainage design. The design for all new roadway components will follow City of Columbus Standards that comply with ODOT standards. Complying with ODOT standards is necessary since this section of Livingston Avenue is designated as U.S. Route 33.

6.4.2 Crosswalks

All crosswalks will be designed according to DPS Design Memo 6.01. The guidance goes through what type of markings will be placed at each type of intersection. In general terms, Type 1 markings will be provided across side roads and at signalized intersections. At unsignalized intersections, Type 2 markings will be used across Livingston Avenue to provide greater visibility. See **Figure 6-11** below for descriptions on each type of crosswalk marking. The final crosswalk design of each intersection will be finalized in a later phase of this project.

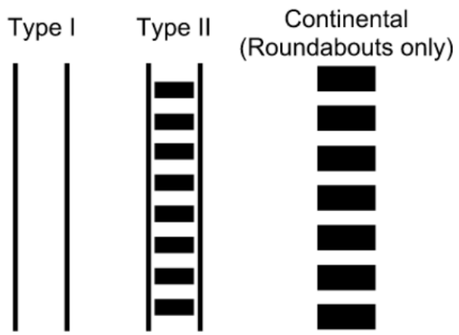


Figure 6-11: City of Columbus Crosswalk Types

All curb ramps along the corridor will follow City of Columbus Standard Drawings and comply with the Americans with Disability Act (ADA). Any recommended areas for curb ramp extensions (Ohio, Champion, Kelton) will follow DPS Design Memo 6.04. Providing full mobility to all users of Livingston Avenue is a vital component of the project.

6.5 Design Standard References

- City of Columbus Construction and Materials Specifications (CMS).: https://www.columbus.gov/WorkArea/DownloadAsset.aspx?id=2147528832

- City of Columbus DPS memo 6.01 On-Street Bike Facilities: https://www.columbus.gov/WorkArea/DownloadAsset.aspx?id=2147528528

- City of Columbus DPS Memo 6.03 - Sidewalks” : https://www.columbus.gov/WorkArea/DownloadAsset.aspx?id=2147528530

- City of Columbus DPS Design Memo 6.04 - Curb Extensions: https://www.columbus.gov/WorkArea/DownloadAsset.aspx?id=2147528531

- City of Columbus DPS Design Memo 6.41 – Crosswalks: https://www.columbus.gov/WorkArea/DownloadAsset.aspx?id=2147527270

- Ohio Department of Transportation Multimodal Design Guide (MDG): Multimodal Design Guide | Ohio Department of Transportation

-Blueprint Columbus Green Infrastructure Design Guidelines: https://www.columbus.gov/WorkArea/DownloadAsset.aspx?id=2147514191

7

Appendices

The following documents were produced in accordance with the improvements study and support the findings in the report.

1. Parking Analysis and Occupancy Tables
2. Pedestrian Generator Map
3. Traffic Volume Analysis and Synchro Outputs
4. Certified Traffic Memorandum and Growth Rates
5. Level of Service Tables and Analysis
6. Traffic Safety Data and Analysis
7. Speed Study Data
8. Public Involvement

7

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The following documents were produced in accordance with the improvements study and support the findings in the report.

1. Parking Analysis and Occupancy Tables
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Appendix 1: Parking Analysis & Occupancy Tables

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1. Introduction	1-1 to 1-2
2. Livingston Avenue Parking Summary	1-3
3. Livingston Avenue Side Streets Parking Summary	1-4
4. Livingston Avenue Parking Maps	1-5 to 1-10

Appendix 1: Parking Analysis & Occupancy Tables

A parking study was conducted to assess the existing parking utilization within the project area. The limits of this parking study included parking along Livingston Avenue and along each side street up to one block from Livingston Avenue. Parking data was captured using video recording on the following dates: Wednesday 5/25/2022, Thursday 6/2/2022, Friday 6/3/2022, Saturday 6/4/2022, and Saturday 6/18/2022. Using this data, the peak total number of vehicles parking in each block was noted at each peak hour analyzed (Weekday AM (5:00 – 7:00 AM), Midday (11:00 AM – 1:00 PM), and PM (6:00 – 8:00 PM) peaks as well as the same peaks on Saturday). This was then compared to the total number of parking spaces (assumed as 20' parking spaces) to determine the parking utilization percentage along each block for each peak hour. Detailed parking occupancy tables developed from this analysis can be found attached in this document.

Along Livingston Avenue, there are currently parking restrictions in the outside lanes for different peak travel times. These restrictions are in place to allow traffic to flow easier during times of high traffic when both lanes would need to be utilized. On the Livingston eastbound movement, the parking restriction is from 4:00pm - 6:00pm. On the Livingston westbound movement, the parking restriction is from 7:00am - 9:00am. There are also a few blocks where parking is always prohibited or where there may be extra restrictions due to turning movements. The parking occupancy tables attached show a "N/A" where parking is restricted or prohibited.

Based on this analysis, it was found that along Livingston Avenue most of the blocks showed less than 30% utilization under each peak hour analyzed. The exceptions with 30% or higher utilization were the north side of Livingston on the blocks from Gilbert Street to 22nd Street, from Champion Avenue to Oakwood Avenue, and from Lockbourne Road to N. Miller Avenue. No block along the south side of Livingston Avenue showed parking above a 30% utilization.

In comparison, each side street operated with an occupancy of approximately 28% on average. Some side streets reached occupancy above 50%, such as Geers Avenue or Bedford Avenue, while others such as Lilley Avenue or Berkley Road showed utilization

close to 0%. Overall, the findings of this study were that the parking along Livingston Avenue is used sparingly, with the parking along the side streets being utilized more often. There is available capacity along some side streets for additional parking.

See the tables and corresponding figures attached below for the parking occupancy.

Livingston Avenue Parking Summary

51

				Weekday			Weekend		
Street (name of street segment being counted)	**Blockface**	**From**	**To**	**Morning (5-7am) Occupancy %**	**Mid-day (11am-1pm) Occupancy %**	**Evening (6-8pm) Occupancy %**	**Morning (5-7am) Occupancy %**	**Mid-day (11am-1pm) Occupancy %**	**Evening (6-8pm) Occupancy %**
Livingston Avenue	S	18th St	Heyl Avenue	NA	NA	NA	NA	NA	NA
Livingston Avenue	S	Heyl Avenue	Carpenter St	NA	NA	NA	NA	NA	NA
Livingston Avenue	S	Carpenter St	Gilbert St	10.0%	10.0%	0.0%	20.0%	10.0%	20.0%
Livingston Avenue	S	Gilbert St	22nd St	0.0%	0.0%	0.0%	0.0%	8.3%	16.7%
Livingston Avenue	S	22nd St	S Ohio Ave	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Livingston Avenue	S	S Ohio Ave	S Champion Ave	0.0%	0.0%	10.0%	0.0%	0.0%	20.0%
Livingston Avenue	S	S Champion Ave	Oakwood Ave	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Livingston Avenue	S	Oakwood Ave	Wilson Ave	0.0%	0.0%	16.7%	0.0%	0.0%	0.0%
Livingston Avenue	S	Wilson Ave	Linwood Ave	0.0%	0.0%	0.0%	7.1%	14.3%	0.0%
Livingston Avenue	S	Linwood Ave	Studer Ave	9.1%	0.0%	9.1%	9.1%	18.2%	0.0%
Livingston Avenue	S	Studer Ave	Lockbourne Road	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Livingston Avenue	S	Lockbourne Road	Miller Ave	0.0%	0.0%	10.0%	0.0%	0.0%	0.0%
Livingston Avenue	S	Miller Ave	Ellsworth Ave	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Livingston Avenue	S	Ellsworth Ave	Kelton Ave	0.0%	16.7%	0.0%	0.0%	8.3%	0.0%
Livingston Avenue	S	Kelton Ave	Lilley Ave	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Livingston Avenue	S	Lilley Ave	Berkeley Road	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Livingston Avenue	S	Berkeley Road	Geers Ave	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Livingston Avenue	S	Geers Ave	Seymour Ave	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Livingston Avenue	S	Seymour Ave	Fairwood Ave	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Livingston Avenue	S	Fairwood Ave	Bulen Ave	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Livingston Avenue	S	Bulen Ave	Rhoads Ave	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Livingston Avenue	S	Rhoads Ave	S Nelson Road	NA	NA	NA	NA	NA	NA
Livingston Avenue	N	S Nelson Road	Rhoads Ave	NA	NA	NA	NA	NA	NA
Livingston Avenue	N	Rhoads Ave	Bulen Ave	NA	NA	NA	NA	NA	NA
Livingston Avenue	N	Bulen Ave	Fairwood Ave	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Livingston Avenue	N	Fairwood Ave	Seymour Ave	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Livingston Avenue	N	Seymour Ave	Berkeley Road	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Livingston Avenue	N	Berkeley Road	Lilley Ave	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Livingston Avenue	N	Lilley Ave	Kelton Ave	0.0%	0.0%	25.0%	0.0%	0.0%	0.0%
Livingston Avenue	N	Kelton Ave	Caney Aly	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Livingston Avenue	N	Caney Aly	Miller Ave	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Livingston Avenue	N	Miller Ave	Lockbourne Road	0.0%	0.0%	0.0%	0.0%	0.0%	14.3%
Livingston Avenue	N	Lockbourne Road	Kimball Pl	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Livingston Avenue	N	Kimball Pl	Bedford Ave	0.0%	0.0%	0.0%	33.3%	0.0%	0.0%
Livingston Avenue	N	Bedford Ave	Linwood Ave	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Livingston Avenue	N	Linwood Ave	Wilson Ave	0.0%	0.0%	0.0%	0.0%	7.1%	0.0%
Livingston Avenue	N	Wilson Ave	Walton Ave	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Livingston Avenue	N	Walton Ave	Oakwood Ave	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Livingston Avenue	N	Oakwood Ave	S Champion Ave	0.0%	37.5%	0.0%	0.0%	37.5%	50.0%
Livingston Avenue	N	S Champion Ave	S Ohio Ave	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Livingston Avenue	N	S Ohio Ave	22nd St	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Livingston Avenue	N	22nd St	Gilbert St	33.3%	0.0%	83.3%	50.0%	33.3%	16.7%
Livingston Avenue	N	Gilbert St	Carpenter St	0.0%	20.0%	0.0%	0.0%	0.0%	20.0%
Livingston Avenue	N	Carpenter St	18th St	NA	NA	NA	NA	NA	NA
COMBINED OCCUPANCY				1.3%	2.3%	3.2%	3.1%	4.2%	4.5%

Legend

- Parking occupancy less than 30%
- Parking occupancy between 30% and 50%
- Parking occupancy greater than or equal to 50%
- Parking not allowed/restricted

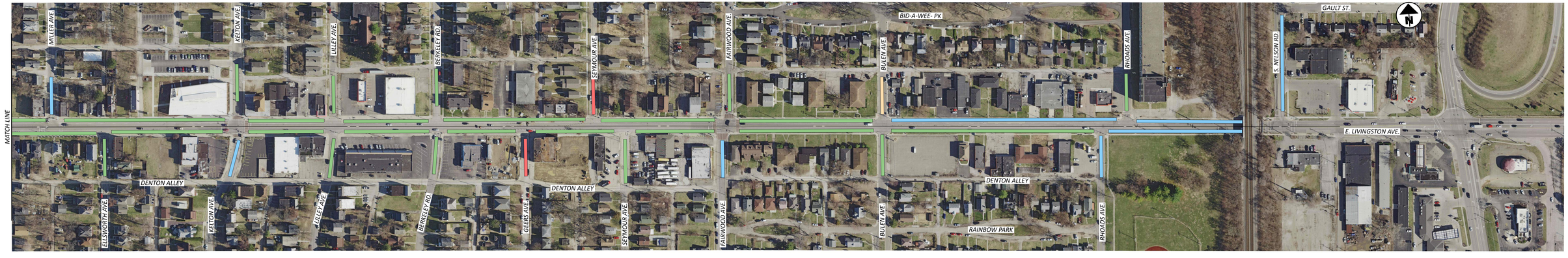
Livingston Avenue Side Street Parking Summary

				Weekday			Weekend		
Street (name of street segment being counted)	**Blockface**	**From**	**To**	**Morning (5-7am) Occupancy %**	**Mid-day (11am-1pm) Occupancy %**	**Evening (6-8pm) Occupancy %**	**Morning (5-7am) Occupancy %**	**Mid-day (11am-1pm) Occupancy %**	**Evening (6-8pm) Occupancy %**
18th St	E,W	Denton Alley	Livingston Ave	0.0%	62.5%	0.0%	0.0%	0.0%	12.5%
18th St	E,W	Newton St	Livingston Ave	NA	NA	NA	NA	NA	NA
Heyl Ave	E,W	Denton Alley	Livingston Ave	0.0%	75.0%	0.0%	0.0%	0.0%	0.0%
Carpenter St	E,W	Denton Alley	Livingston Ave	0.0%	NA	0.0%	0.0%	0.0%	0.0%
Carpenter St	E,W	First Alley/N	Livingston Ave	54.5%	27.3%	36.4%	63.6%	54.5%	63.6%
Gilbert St	E,W	Denton Alley	Livingston Ave	50.0%	10.0%	30.0%	20.0%	20.0%	30.0%
Gilbert St	E,W	First Alley/N	Livingston Ave	87.5%	12.5%	50.0%	75.0%	75.0%	75.0%
22nd St	E,W	Denton Alley	Livingston Ave	0.0%	10.0%	0.0%	0.0%	0.0%	10.0%
22nd St	E,W	First Alley/N	Livingston Ave	33.3%	33.3%	33.3%	0.0%	133.3%	100.0%
S Ohio Ave	E,W	Denton Alley	Livingston Ave	42.9%	14.3%	14.3%	28.6%	14.3%	42.9%
S Ohio Ave	E,W	First Alley/N	Livingston Ave	25.0%	50.0%	50.0%	37.5%	37.5%	25.0%
S Champion Ave	E,W	Denton Alley	Livingston Ave	0.0%	37.5%	0.0%	0.0%	37.5%	37.5%
S Champion Ave	E,W	First Alley/N	Livingston Ave	57.1%	57.1%	42.9%	57.1%	42.9%	28.6%
Oakwood Ave	E,W	Denton Alley	Livingston Ave	0.0%	10.0%	0.0%	0.0%	0.0%	0.0%
Oakwood Ave	E,W	First Alley/N	Livingston Ave	0.0%	0.0%	0.0%	0.0%	0.0%	12.5%
Wilson Ave	E,W	Denton Alley	Livingston Ave	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Wilson Ave	E,W	First Alley/N	Livingston Ave	77.8%	55.6%	44.4%	88.9%	55.6%	55.6%
Linwood Ave	E,W	Denton Alley	Livingston Ave	40.0%	20.0%	20.0%	40.0%	30.0%	30.0%
Linwood Ave	E,W	First Alley/N	Livingston Ave	37.5%	12.5%	50.0%	37.5%	37.5%	25.0%
Studer Ave	E,W	Denton Alley	Livingston Ave	50.0%	20.0%	40.0%	50.0%	40.0%	20.0%
Bedford Ave	E,W	First Alley/N	Livingston Ave	50.0%	62.5%	62.5%	50.0%	50.0%	37.5%
Lockbourne Road	E,W	Denton Alley	Livingston Ave	NA	NA	NA	NA	NA	NA
Kimball Pl	E,W	First Alley/N	Livingston Ave	0.0%	0.0%	0.0%	20.0%	20.0%	20.0%
Miller Ave	E,W	Denton Alley	Livingston Ave	28.6%	0.0%	14.3%	28.6%	14.3%	28.6%
Miller Ave	E,W	First Alley/N	Livingston Ave	NA	NA	NA	NA	NA	NA
Ellsworth Ave	E,W	Denton Alley	Livingston Ave	0.0%	25.0%	0.0%	0.0%	12.5%	0.0%
Kelton Ave	E,W	Denton Alley	Livingston Ave	NA	NA	NA	NA	NA	NA
Kelton Ave	E,W	First Alley/N	Livingston Ave	18.2%	9.1%	18.2%	0.0%	9.1%	0.0%
Lilley Ave	E,W	Denton Alley	Livingston Ave	0.0%	60.0%	20.0%	0.0%	20.0%	40.0%
Lilley Ave	E,W	First Alley/N	Livingston Ave	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Berkeley Road	E,W	Denton Alley	Livingston Ave	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Berkeley Road	E,W	First Alley/N	Livingston Ave	18.2%	63.6%	18.2%	18.2%	9.1%	18.2%
Geers Ave	E,W	Denton Alley	Livingston Ave	87.5%	87.5%	62.5%	75.0%	75.0%	62.5%
Seymour Ave	E,W	Denton Alley	Livingston Ave	10.0%	10.0%	60.0%	10.0%	10.0%	10.0%
Seymour Ave	E,W	First Alley/N	Livingston Ave	60.0%	50.0%	30.0%	60.0%	50.0%	50.0%
Fairwood Ave	E,W	Denton Alley	Livingston Ave	NA	NA	NA	NA	NA	NA
Fairwood Ave	E,W	First Alley/N	Livingston Ave	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Bulen Ave	E,W	Denton Alley	Livingston Ave	14.3%	28.6%	14.3%	14.3%	14.3%	14.3%
Bulen Ave	E,W	First Alley/N	Livingston Ave	37.5%	37.5%	37.5%	37.5%	37.5%	50.0%
Rhoads Ave	E,W	Denton Alley	Livingston Ave	NA	NA	NA	NA	NA	NA
Rhoads Ave	E,W	First Alley/N	Livingston Ave	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
S Nelson Road	E,W	Gault St	Livingston Ave	NA	NA	NA	NA	NA	NA
COMBINED OCCUPANCY OF SIDE STREETS				**27.9%**	**28.4%**	**23.4%**	**26.8%**	**26.0%**	**26.0%**

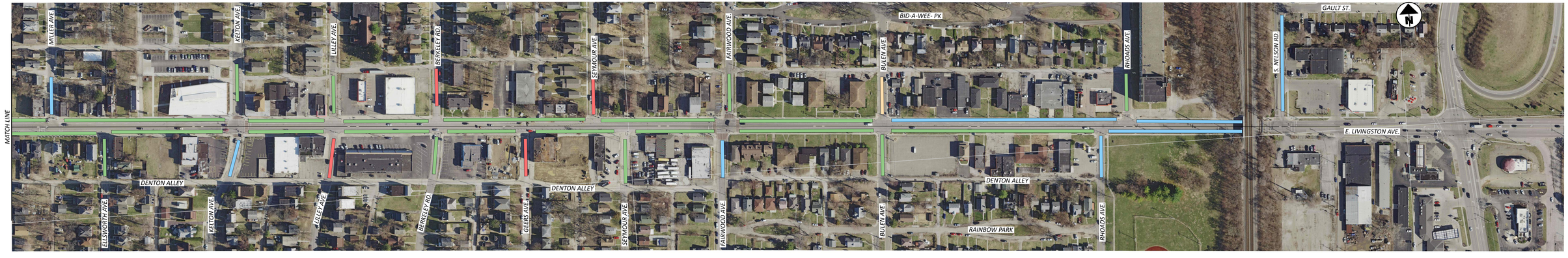
Legend

- Parking Occupancy less than 30%
- Parking occupancy Between 30% and 50%
- Parking occupancy greater than or equal to 50%
- Parking not allowed/restricted

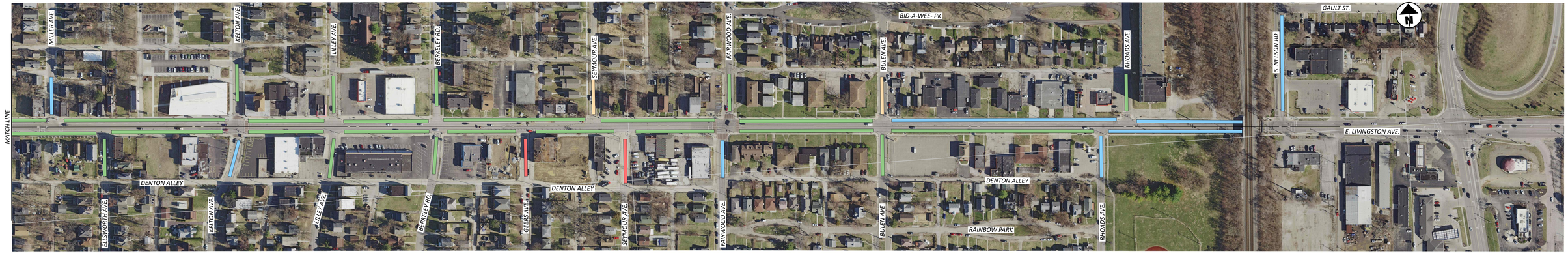
ON-STREET PARKING OCCUPANCY - WEEKDAY MORNING (5AM-7AM)



ON-STREET PARKING OCCUPANCY - WEEKDAY MID-DAY (11AM-1PM)

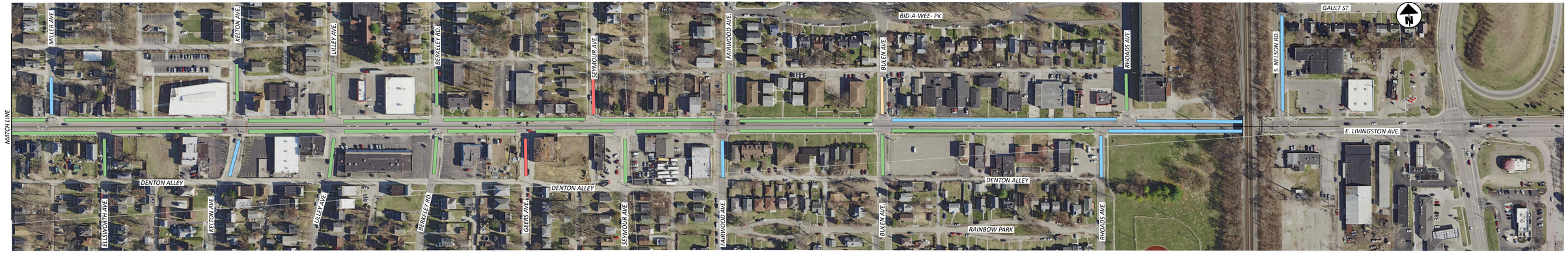


ON-STREET PARKING OCCUPANCY - WEEKDAY EVENING (6PM-8PM)



ON-STREET PARKING OCCUPANCY - WEEKEND MORNING (5AM-7AM)

ON-STREET PARKING OCCUPANCY - WEEKEND MID-DAY (11AM-1PM)



ON-STREET PARKING OCCUPANCY - WEEKEND EVENING (6PM-8PM)

Appendix 2: Pedestrian Generator Map

Contents:

1. Introduction 2-1 to 2-2

2. Pedestrian Generator Map 2-3 to 2-7

Appendix 2: Pedestrian Generator Map

A pedestrian generator map was created using ArcGIS to illustrate the existing multimodal infrastructure throughout the study area. A field check was conducted on Monday August, 22nd, 2022, to verify all the information taken from Google Maps was accurate in the field. This field check also determined any missing multimodal information that needed to be added to the map. The full pedestrian generator map can be found attached. The map highlights the following information:

- Central Ohio Transit Authority (COTA) Stops
- Traffic Signals
- Rectangular Rapid-Flashing Beacons (RRFB)/ Pedestrian Signals
- Marked/Unmarked Crosswalks
- Pedestrian Crashes
- Local Trip Generators including:
    - Community Centers
    - Grocery Stores
    - Schools & Libraries
    - Restaurants
    - Places of Worship

The pedestrian generator map also includes three Pedestrian Safety Improvement Program (PSIP) crossing locations that have been recently constructed with Rectangular Rapid-Flashing Beacon (RRFB) installations. Additionally, there is another PSIP project planned at Bulen Avenue.

This pedestrian generator map was used as a tool to understand the extent of existing multimodal facilities along Livingston Avenue and in public outreach to help provide an overview of existing conditions. The following observations were made during the development process of the pedestrian generator map:

- The following intersections have crosswalks with brick treatments*:
    - Livingston Avenue and S 18th Street

  - Livingston Avenue and S Ohio Avenue
  - Livingston Avenue and S Champion Avenue
  - Livingston Avenue and Kelton Avenue
  - Livingston Avenue and Fairwood Avenue

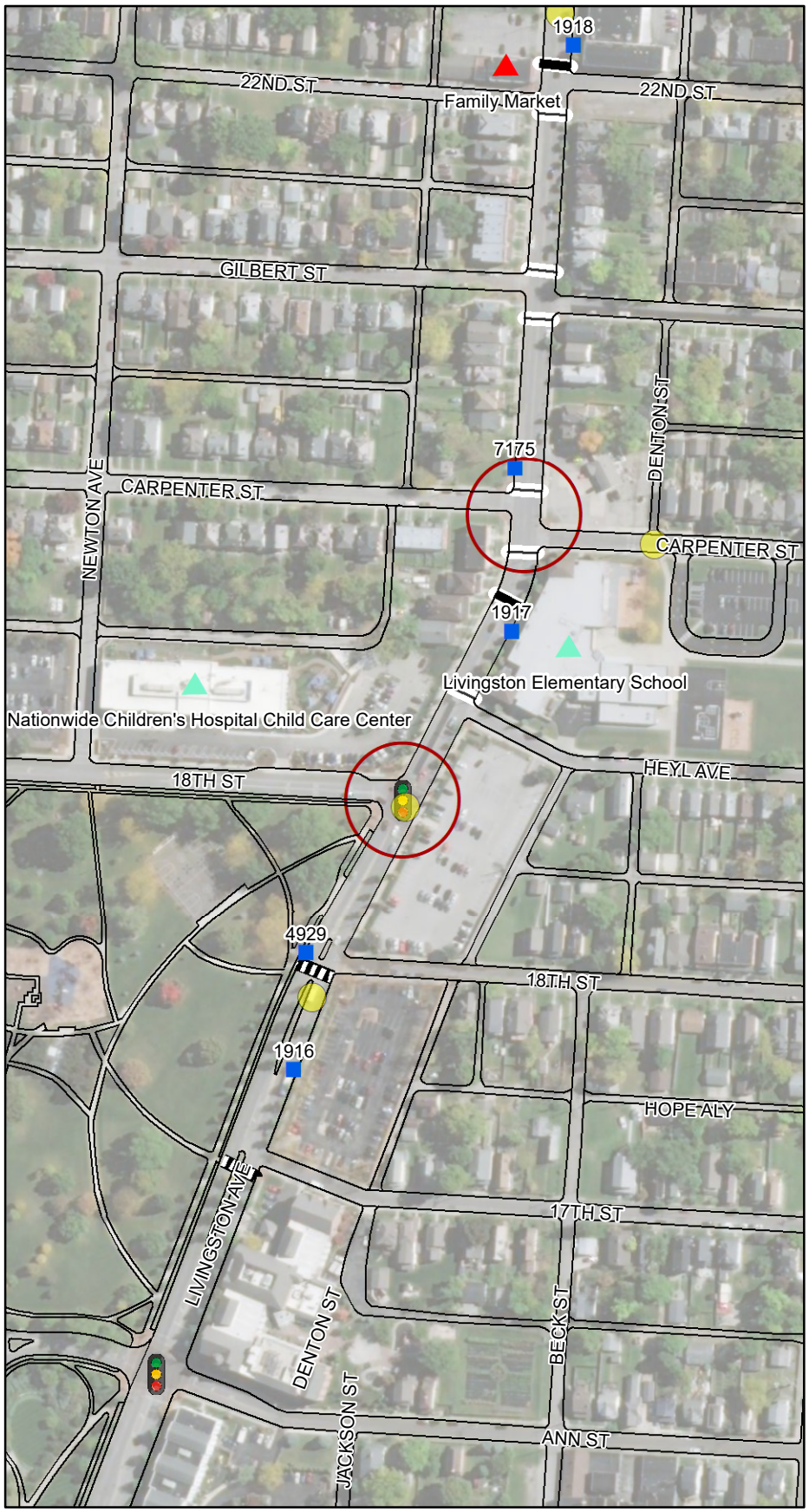
  **Brick crosswalks are no longer standard and may be providing decreased pedestrian visibility.*

- There has been a high frequency of crashes at the intersections of:
  - Livingston Avenue and Fairwood Avenue
  - Livingston Avenue and Champion Avenue
  - Livingston Avenue and Lilley Avenue
- It was noted that there were pedestrian crashes that occurred where there were no pedestrian crossings.
- There were many locations where people crossed the roadway where there was no marked pedestrian crossing including:
  - Livingston Avenue and Carpenter Street
  - Livingston Avenue and Gilbert Street
  - Livingston Avenue and 22nd Street
  - Livingston Avenue and Wilson Avenue
  - Livingston Avenue and Berkeley Road
  - Livingston Avenue and Bulen Avenue**

  * *There is a planned Pedestrian Safety Improvement Project (PSIP) at Bulen Avenue.*

Livingston Ave Corridor

Pedestrian Generators and Crashes



Legend

- Map Insert Area
- COTA Stop
- Study Intersection
- Traffic Signal
- RRFB/Ped Signal
- Marked Crosswalk
- Unmarked Crosswalk
- Community Center
- Gas
- Grocery
- School or Library
- Restaurant
- Worship
- Pedestrian Crash

COTA Bus Boardings (2020)

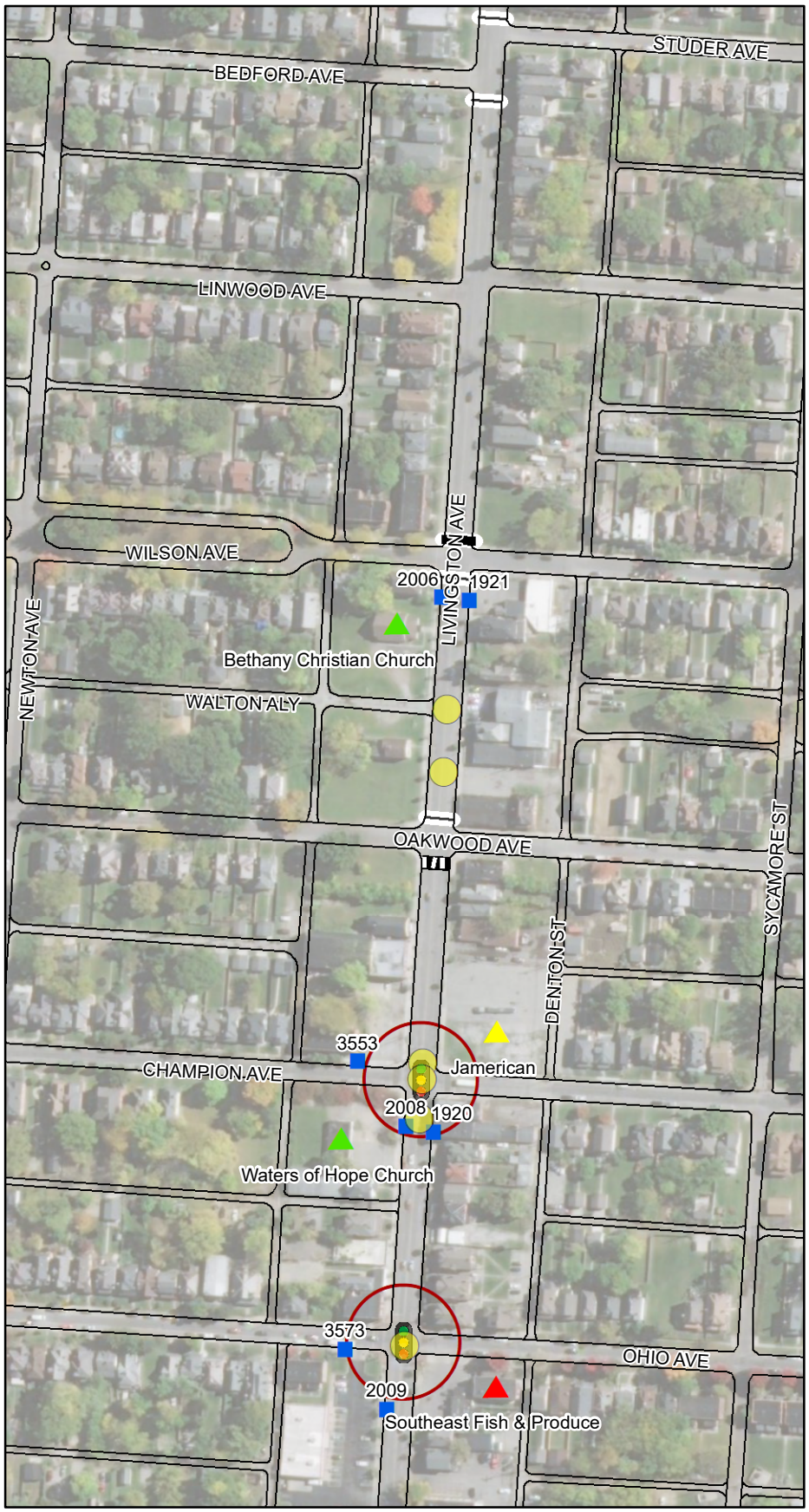
Stop ID	On	Off	Total	Lines
1916	8	7	15	001
1917	8	15	23	001
1918	20	39	59	001
4929	10	15	25	001
7175	15	9	24	001

0 125 250 500 Feet

N

Livingston Ave Corridor

Pedestrian Generators and Crashes



Legend

- Map Insert Area
- COTA Stop
- Study Intersection
- Traffic Signal
- RRFB/Ped Signal
- Marked Crosswalk
- Unmarked Crosswalk
- Community Center
- Gas
- Grocery
- School or Library
- Restaurant
- Worship
- Pedestrian Crash

COTA Bus Boardings (2020)

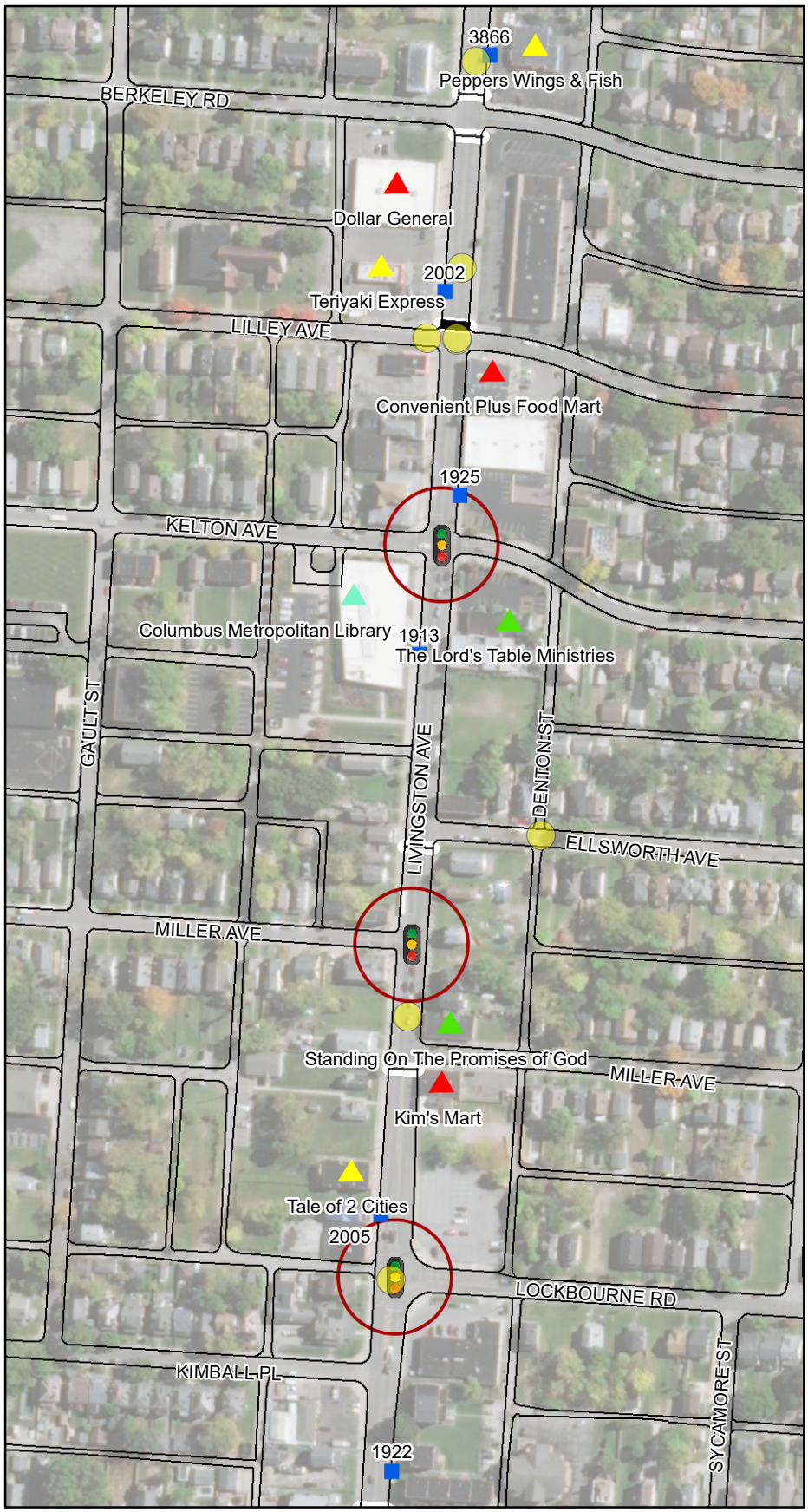
Stop ID	On	Off	Total	Lines
1920	80	36	116	001
1921	13	14	27	001
2006	16	17	33	001
2008	55	50	105	001
2009	36	66	102	001
3553	49	87	136	022
3573	78	43	121	022

0 125 250 500 Feet

N

Livingston Ave Corridor

Pedestrian Generators and Crashes



Legend

- Map Insert Area
- COTA Stop
- Study Intersection
- Traffic Signal
- RRFB/Ped Signal
- Marked Crosswalk
- Unmarked Crosswalk
- Community Center
- Gas
- Grocery
- School or Library
- Restaurant
- Worship
- Pedestrian Crash

COTA Bus Boardings (2020)

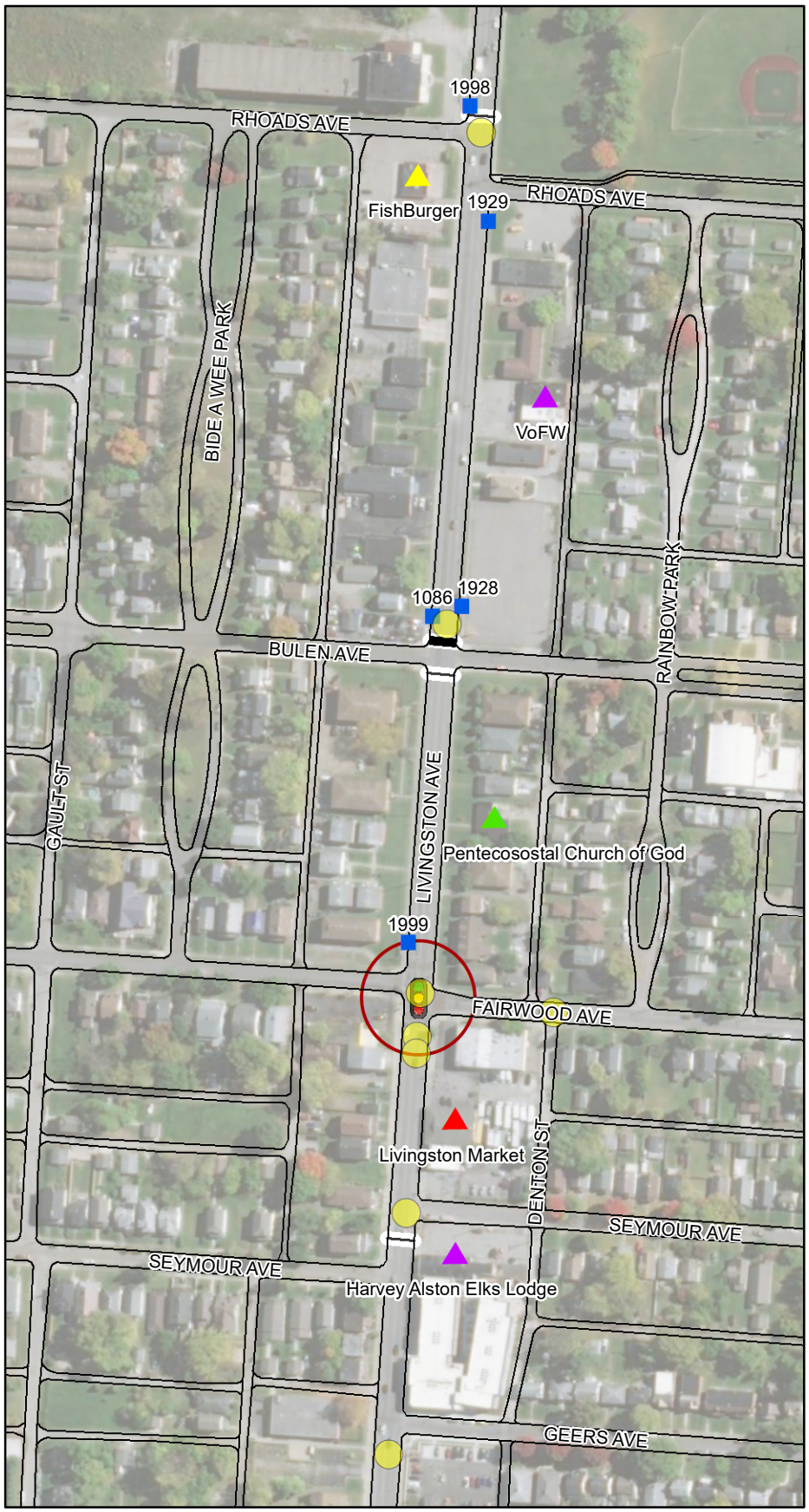
Stop ID	On	Off	Total	Lines
1913	28	12	40	001
1922	12	27	39	001
1925	24	50	74	001
2002	41	25	66	001
2005	27	13	40	001
3866	23	30	53	001

0 125 250 500 Feet

N

Livingston Ave Corridor

Pedestrian Generators and Crashes



Legend

- Map Insert Area
- COTA Stop
- Study Intersection
- Traffic Signal
- RRFB/Ped Signal
- Marked Crosswalk
- Unmarked Crosswalk
- Community Center
- Gas
- Grocery
- School or Library
- Restaurant
- Worship
- Pedestrian Crash

COTA Bus Boardings (2020)

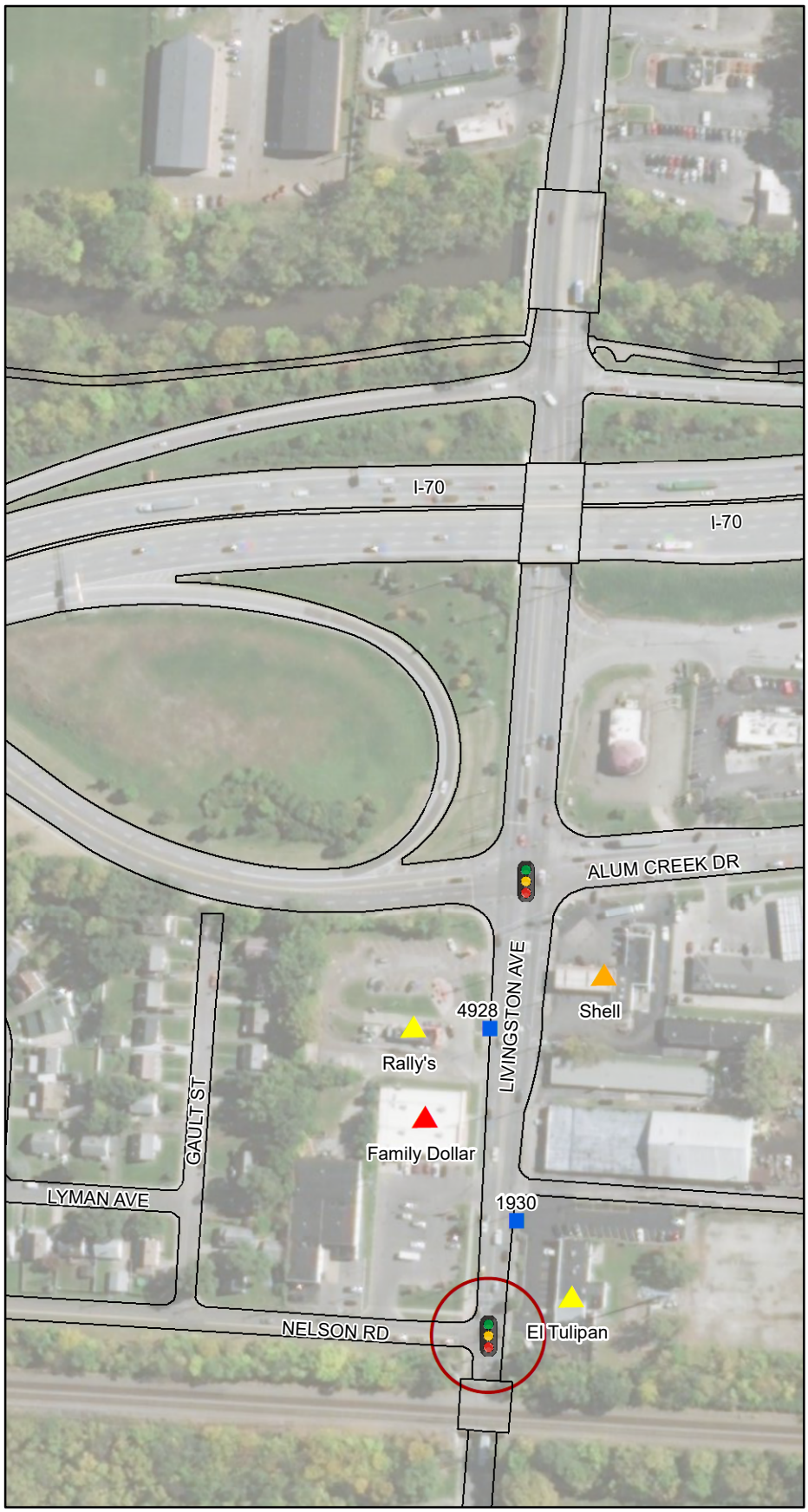
Stop ID	On	Off	Total	Lines
1086	9	9	18	001
1928	15	21	36	001
1929	7	10	17	001
1998	10	4	14	001
1999	31	19	50	001

0 125 250 500 Feet

N

Livingston Ave Corridor

Pedestrian Generators and Crashes



Legend

- Map Insert Area
- COTA Stop
- Study Intersection
- Traffic Signal
- RRFB/Ped Signal
- Marked Crosswalk
- Unmarked Crosswalk
- Community Center
- Gas
- Grocery
- School or Library
- Restaurant
- Worship
- Pedestrian Crash

COTA Bus Boardings (2020)

Stop ID	On	Off	Total	Lines
1930	25	46	71	001,011
4928	35	25	60	001

0 105 210 420 Feet

N

Appendix 3: Traffic Volume Analysis and Synchro Outputs

Contents:

1. Introduction	3-1 to 3-5
2. Pedestrian Generator Map	3-6 to 3-56
3. Construction and Design year “No-Build” Synchro Outputs	3-57 to 3-157
4. Construction and Design year “Build” Synchro Outputs	3-158 to 3-258

Appendix 3: Traffic Volume Analysis and Synchro Outputs

Existing Volume Analysis

Traffic volumes were collected by performing 8-hour turning movement counts from 6:00 – 10:00 AM and 3:00 – 7:00 PM at nine (9) study intersections. The data collection included the classification of passenger cars and heavy vehicles as part of the count as well as counts of pedestrians and bicycles. Counts were conducted on Thursday, May 5, 2022, with the following exceptions noted below:

1. Livingston Avenue at S. 18th Street (Tuesday, July 26, 2022)
2. Livingston Avenue at Carpenter Street (Thursday, May 12, 2022)
3. Livingston Avenue at South Ohio Avenue
4. Livingston Avenue at South Champion Avenue
5. Livingston Avenue at Lockbourne Road
6. Livingston Avenue at Miller Avenue
7. Livingston Avenue at Kelton Avenue
8. Livingston Avenue at Fairwood Avenue
9. Livingston Avenue at Nelson Road (Thursday, May 19, 2022)

A map of the study intersections can be found in **Figure 1** below:

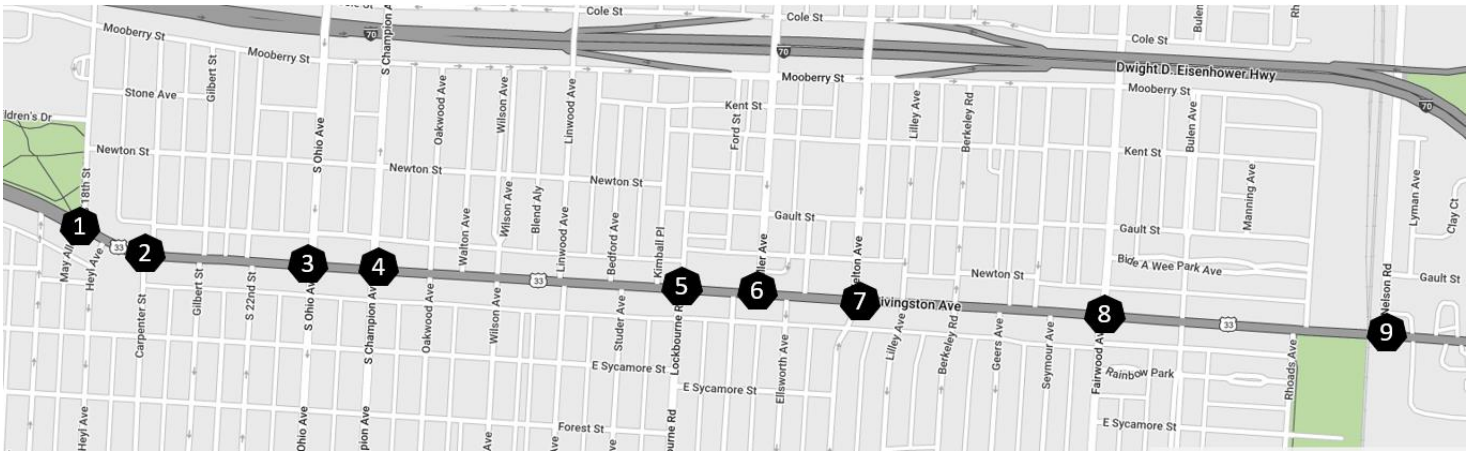


Figure 1: Traffic Study Intersections

Variations in peak hour traffic levels between signalized intersections were observed. These variations were expected due to the number of partial intersections (right-in/right-out drives) as well as full private driveways providing additional access within the corridor. To determine a corridor-wide peak, peak hour analysis was completed looking at total corridor volume. Based on this analysis, an AM peak hour of 8:00 – 9:00 AM and PM peak hour of 3:00 – 4:00 PM for the corridor was identified. Volume balancing was conducted for sections between South Ohio Avenue and South Champion Avenue, while the rest of the network remain unchanged due to the unknown influence of unsignalized intersections and driveways between counted intersections. The analysis did not take into consideration any pandemic volume adjustments. Existing traffic volumes are summarized in **Table 1** below. Detailed diagrams can be found attached to this document.

Table 1: Existing Traffic Volumes

Existing Volumes (veh/hr)		Eastbound (EB)			Westbound (WB)			Northbound (NB)			Southbound (SB)		
		L	T	R	L	T	R	L	T	R	L	T	R
Livingston Ave & S 18th St	2022 AM	91	179			363	57				42		153
	2022 PM	120	382			270	38				63		178
Livingston Avenue & Carpenter St	2022 AM	3	210			443	10	67	3	58	8		18
	2022 PM	5	494			354	4	51	6	51	12		19
Livingston Ave & S Ohio Ave	2022 AM		243	49	45	475					7	2	9
	2022 PM		559	72	71	357					8	4	10
Livingston Ave & S Champion Ave	2022 AM	24	226			472	51	48	79	23			
	2022 PM	42	525			388	84	41	117	41			
Livingston Ave & Lockbourne Ave	2022 AM		236	67	270	388	1	83	2	171		1	1
	2022 PM		542	87	293	363	2	105	4	265		1	4
Livingston Ave & Miller Ave	2022 AM		415			431					83		244
	2022 PM		798			403					152		290
Livingston Ave & Kelton Ave	2022 AM	179	298			423	63	8	72	19			
	2022 PM	279	655			391	94	8	73	22			
Livingston Ave & Fairwood Ave	2022 AM	6	280	42	13	428	34	8	167	51	16	140	17
	2022 PM	29	610	48	36	420	43	24	268	48	29	208	39
Livingston Ave & S Nelson Rd	2022 AM	33	454			522	160				153		63
	2022 PM	64	802			588	216				166		68

Growth Rates

Linear growth rates were provided by the Mid-Ohio Regional Planning Commission (MORPC) on July 11, 2022 and are summarized in **Table 2** below. When developing a growth rate for the study area, MORPC considered anticipated new developments in the

area that are included in their Travel Demand Model. Correspondence with MORPC regarding these growth rates can be found in **Appendix 4.**

Table 2: Linear Annual Growth Rates

Approach	Linear Annual Growth Rate [%]			
	Eastbound (EB)	Westbound (WB)	Northbound (NB)	Southbound (SB)
Livingston Ave & S 18th St	0.6	0.5	0.6	-
Livingston Ave & Carpenter St	0.6	0.6	0.6	0.6
Livingston Ave & S Ohio Ave	0.6	0.5	1.9	1.8
Livingston Ave & S Champion Ave	0.5	0.5	1.9	2.1
Livingston Ave & Lockbourne Ave	0.6	0.9	1.2	1.2
Livingston Ave & Miller Ave	0.9	0.6	2.0	-
Livingston Ave & Kelton Ave	0.6	0.5	0.4	0.5
Livingston Ave & Fairwood Ave	0.5	0.5	2.1	2.1
Livingston Ave & S Nelson Rd	0.6	0.4	0.4	-

Based on these growth rates, the existing volumes previously counted throughout the corridor were grown to the construction (2026) and design (2046) year while maintaining balancing rules established for the existing conditions analysis. **Table 3** summarizes “no-build” conditions traffic volumes for the construction (2026) and design (2046) years. Detailed diagrams can be found attached in this document.

Table 3: "No-Build" Conditions Traffic Volumes

Construction and Design Volumes (veh/hr)		Eastbound (EB)			Westbound (WB)			Northbound (NB)			Southbound (SB)		
		L	T	R	L	T	R	L	T	R	L	T	R
Livingston Ave & S 18th St	2026 AM	93	183			370	58				43		157
	2026 PM	123	391			275	39				65		182
	2046 AM	104	205			407	64				48		175
	2046 PM	137	437			302	43				72		204
Livingston Avenue & Carpenter St	2026 AM	3	215			454	10	69	3	59	8		18
	2026 PM	5	506			362	4	52	6	52	12		19
	2046 AM	3	240			507	11	77	3	66	9		21
	2046 PM	6	565			405	5	58	7	58	14		22
Livingston Ave & S Ohio Ave	2026 AM		249	50	46	485					8	2	10
	2026 PM		572	74	72	364					9	4	11
	2046 AM		278	56	50	532					10	3	13
	2046 PM		639	82	80	400					12	6	15
Livingston Ave & S Champion Ave	2026 AM	24	231			481	52	52	86	25			
	2026 PM	43	536			396	86	44	127	44			
	2046 AM	27	253			529	57	72	119	35			
	2046 PM	47	588			435	94	62	176	62			
Livingston Ave & Lockbourne Ave	2026 AM		242	69	280	402	1	87	2	179		1	1
	2026 PM		555	89	304	376	2	110	4	278		1	4
	2046 AM		270	77	328	472	1	107	3	220		1	1
	2046 PM		620	100	356	441	2	135	5	341		1	5
Livingston Ave & Miller Ave	2026 AM		430			441					90		264
	2026 PM		827			413					164		313
	2046 AM		505			493					123		361
	2046 PM		970			461					225		429
Livingston Ave & Kelton Ave	2026 AM	183	305			431	64	8	73	19			
	2026 PM	286	671			399	96	8	74	22			
	2046 AM	205	341			474	71	9	81	21			
	2046 PM	319	749			438	105	9	82	25			
Livingston Ave & Fairwood Ave	2026 AM	6	286	43	13	437	35	9	181	55	17	152	18
	2026 PM	30	622	49	37	428	44	26	291	52	31	225	42
	2046 AM	7	314	47	15	479	38	12	251	77	24	211	26
	2046 PM	32	683	54	40	470	48	36	403	72	44	313	59
Livingston Ave & S Nelson Rd	2026 AM	34	465			530	163				155		64
	2026 PM	66	821			597	219				169		69
	2046 AM	38	519			572	175				168		69
	2046 PM	73	917			644	237				182		75

Certified Traffic

As part of the traffic count analysis, a Certified Traffic Memorandum was completed and approved by the Ohio Department of Transportation (ODOT). The certified traffic memo provides future estimates of the following:

- Existing 2022 AM and PM Peak Hour Traffic Volumes
- Project Opening Year 2026 AM and PM Design Hour Volumes
- Project Design Year 2046 AM and PM Design Hour Volumes
- 2026 and 2046 Average Daily Traffic Volumes
- AM and PM Design Hour Truck Percentages

The memo was approved by ODOT on November 30, 2022. **Table 4** below summarizes the data based on the range of values found within the corridor for each parameter. The complete memo with approved traffic plates and background information can be found in **Appendix 4.**

Table 4: Certified Traffic Summary

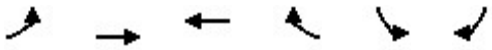
	Period	2022	2026	2046
Mainline Peak Hour Volumes	**AM**	220-680	276-693	309-747
	PM	310-940	314-956	345-1,068
Mainline Design Hour Volumes	**AM**	--	290-730	330-930
	PM	--	330-1,010	370-1,130
Average Daily Traffic Volumes (Directional)	**--**	--	4,370-9,800	4,850-10,970
Mainline Design Hour Truck Percentage	**AM**	3 - 7 %		
	PM	2 – 6 %		

Output Tables

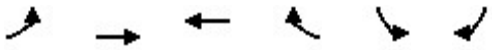
The following tables show volumes for each movement at the specified intersections along the corridor (see **Figure 1**). This was done for each intersection in the three scenarios of: Existing, “No-Build”, and “Build”. In the “No Build” and “Build” scenarios, the volumes were looked at for a construction year (2026) and design year (2046). See the following order for each volume scenario of the attached documents:

1. Existing Year Synchro Output (50 Pages)
2. Construction and Design Year “No Build” Synchro Output (100 pages)
3. Construction and Design Year “Build” Synchro Output (100 Pages)

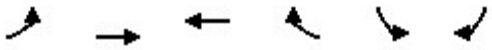
Existing Year Synchro Outputs



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	91	179	363	57	42	153
Future Volume (vph)	91	179	363	57	42	153
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	100			0	0	0
Storage Lanes	0			0	1	1
Taper Length (ft)	25				0	
Lane Util. Factor	0.95	0.95	0.95	0.95	1.00	1.00
Ped Bike Factor		1.00	1.00		1.00	0.97
Frt			0.980			0.850
Flt Protected		0.983			0.950	
Satd. Flow (prot)	0	3195	3089	0	1711	1546
Flt Permitted		0.729			0.950	
Satd. Flow (perm)	0	2368	3089	0	1709	1504
Right Turn on Red				Yes		No
Satd. Flow (RTOR)			29			
Link Speed (mph)		35	35		25	
Link Distance (ft)		304	440		328	
Travel Time (s)		5.9	8.6		8.9	
Confl. Peds. (#/hr)	2			2	1	15
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles (%)	10%	6%	4%	0%	2%	1%
Parking (#/hr)			5	5		
Adj. Flow (vph)	98	192	390	61	45	165
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	290	451	0	45	165
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(ft)		0	0		11	
Link Offset(ft)		0	0		0	
Crosswalk Width(ft)		16	16		16	
Two way Left Turn Lane						
Headway Factor	1.04	1.04	1.13	1.04	1.04	1.04
Turning Speed (mph)	15			9	15	9
Number of Detectors	1	2	2		1	1
Detector Template	Left	Thru	Thru		Left	Right
Leading Detector (ft)	20	100	100		20	20
Trailing Detector (ft)	0	0	0		0	0
Detector 1 Position(ft)	0	0	0		0	0
Detector 1 Size(ft)	20	6	6		20	20
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0		0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0		0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0		0.0	0.0
Detector 2 Position(ft)		94	94			
Detector 2 Size(ft)		6	6			
Detector 2 Type		Cl+Ex	Cl+Ex			
Detector 2 Channel						



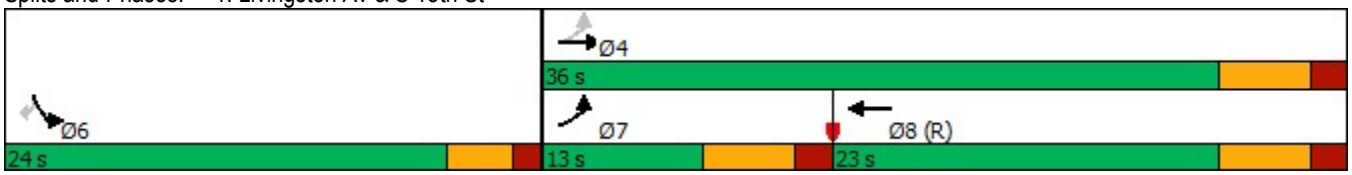
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Detector 2 Extend (s)		0.0	0.0			
Turn Type	pm+pt	NA	NA		Prot	Perm
Protected Phases	7	4	8		6	
Permitted Phases	4					6
Detector Phase	7	4	8		6	6
Switch Phase						
Minimum Initial (s)	5.0	7.0	16.0		10.0	10.0
Minimum Split (s)	10.8	21.8	21.8		22.3	22.3
Total Split (s)	13.0	36.0	23.0		24.0	24.0
Total Split (%)	21.7%	60.0%	38.3%		40.0%	40.0%
Maximum Green (s)	7.2	30.2	17.2		19.7	19.7
Yellow Time (s)	4.1	4.1	4.1		3.0	3.0
All-Red Time (s)	1.7	1.7	1.7		1.3	1.3
Lost Time Adjust (s)		0.0	0.0		0.0	0.0
Total Lost Time (s)		5.8	5.8		4.3	4.3
Lead/Lag	Lead		Lag			
Lead-Lag Optimize?	Yes		Yes			
Vehicle Extension (s)	3.7	3.7	3.7		5.0	5.0
Recall Mode	None	Max	C-Max		None	None
Walk Time (s)		7.0	7.0		7.0	7.0
Flash Dont Walk (s)		9.0	9.0		11.0	11.0
Pedestrian Calls (#/hr)		0	0		0	0
Act Effct Green (s)		40.1	40.1		13.8	13.8
Actuated g/C Ratio		0.67	0.67		0.23	0.23
v/c Ratio		0.18	0.22		0.11	0.48
Control Delay		6.2	5.8		17.4	24.0
Queue Delay		0.0	0.0		0.0	0.0
Total Delay		6.2	5.8		17.4	24.0
LOS		A	A		B	C
Approach Delay		6.2	5.8		22.6	
Approach LOS		A	A		C	
90th %ile Green (s)	0.0	31.6	31.6		18.3	18.3
90th %ile Term Code	Skip	Coord	Coord		Gap	Gap
70th %ile Green (s)	0.0	34.4	34.4		15.5	15.5
70th %ile Term Code	Skip	Coord	Coord		Gap	Gap
50th %ile Green (s)	0.0	36.3	36.3		13.6	13.6
50th %ile Term Code	Skip	Coord	Coord		Gap	Gap
30th %ile Green (s)	0.0	38.3	38.3		11.6	11.6
30th %ile Term Code	Skip	Coord	Coord		Gap	Gap
10th %ile Green (s)	0.0	54.2	54.2		0.0	0.0
10th %ile Term Code	Skip	Coord	Coord		Skip	Skip
Queue Length 50th (ft)		21	31		13	52
Queue Length 95th (ft)		46	63		31	91
Internal Link Dist (ft)		224	360		248	
Turn Bay Length (ft)						
Base Capacity (vph)		1583	2075		561	493
Starvation Cap Reductn		0	0		0	0
Spillback Cap Reductn		0	0		0	0
Storage Cap Reductn		0	0		0	0

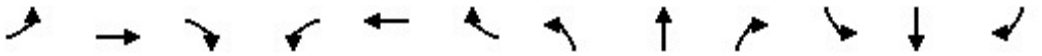


Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Reduced v/c Ratio		0.18	0.22		0.08	0.33

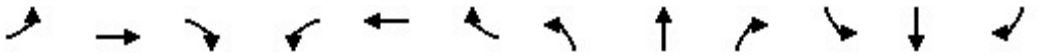
Intersection Summary			
Area Type:	Other		
Cycle Length: 60			
Actuated Cycle Length: 60			
Offset: 57 (95%), Referenced to phase 8:WBT, Start of Green			
Natural Cycle: 55			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.48			
Intersection Signal Delay: 9.6		Intersection LOS: A	
Intersection Capacity Utilization 45.1%		ICU Level of Service A	
Analysis Period (min) 15			

Splits and Phases: 1: Livingston Av & S 18th St





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	243	49	45	475	0	0	0	0	7	2	9
Future Volume (vph)	0	243	49	45	475	0	0	0	0	7	2	9
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	150		0	150		0	0		0	0		0
Storage Lanes	0		0	0		0	0		0	0		0
Taper Length (ft)	25			25			0			0		
Lane Util. Factor	1.00	0.95	0.95	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		1.00			1.00						0.99	
Frt		0.975									0.932	
Flt Protected					0.996						0.980	
Satd. Flow (prot)	0	3016	0	0	3083	0	0	0	0	0	1378	0
Flt Permitted					0.897						0.980	
Satd. Flow (perm)	0	3016	0	0	2776	0	0	0	0	0	1378	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		48									10	
Link Speed (mph)		35			35			35			35	
Link Distance (ft)		1031			383			200			188	
Travel Time (s)		20.1			7.5			3.9			3.7	
Confl. Peds. (#/hr)	5		1	1		5	3					3
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Heavy Vehicles (%)	0%	4%	12%	13%	5%	0%	0%	0%	0%	14%	0%	0%
Parking (#/hr)		5	5		5						5	5
Adj. Flow (vph)	0	276	56	51	540	0	0	0	0	8	2	10
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	332	0	0	591	0	0	0	0	0	20	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.04	1.13	1.04	1.04	1.13	1.04	1.04	1.04	1.04	1.04	1.24	1.04
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors		2		1	2					1	2	
Detector Template		Thru		Left	Thru					Left	Thru	
Leading Detector (ft)		100		20	100					20	100	
Trailing Detector (ft)		0		0	0					0	0	
Detector 1 Position(ft)		0		0	0					0	0	
Detector 1 Size(ft)		6		20	6					20	6	
Detector 1 Type		Cl+Ex		Cl+Ex	Cl+Ex					Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)		0.0		0.0	0.0					0.0	0.0	
Detector 1 Queue (s)		0.0		0.0	0.0					0.0	0.0	
Detector 1 Delay (s)		0.0		0.0	0.0					0.0	0.0	
Detector 2 Position(ft)		94			94						94	
Detector 2 Size(ft)		6			6						6	
Detector 2 Type		Cl+Ex			Cl+Ex						Cl+Ex	
Detector 2 Channel												

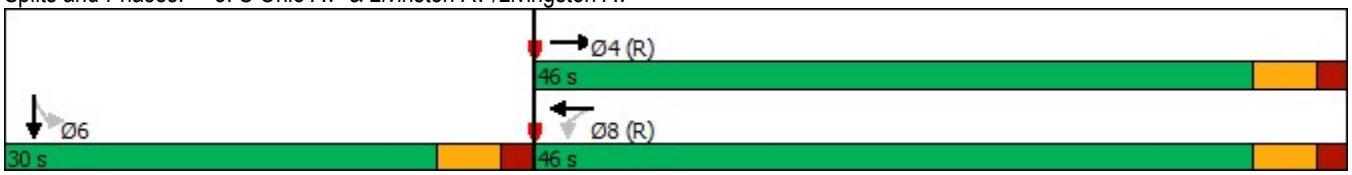


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 2 Extend (s)		0.0			0.0						0.0	
Turn Type		NA		Perm	NA					Perm	NA	
Protected Phases		4			8						6	
Permitted Phases				8						6		
Detector Phase		4		8	8					6	6	
Switch Phase												
Minimum Initial (s)		15.0		15.0	15.0					10.0	10.0	
Minimum Split (s)		27.0		27.0	27.0					26.5	26.5	
Total Split (s)		46.0		46.0	46.0					30.0	30.0	
Total Split (%)		60.5%		60.5%	60.5%					39.5%	39.5%	
Maximum Green (s)		40.6		40.6	40.6					24.4	24.4	
Yellow Time (s)		3.6		3.6	3.6					3.6	3.6	
All-Red Time (s)		1.8		1.8	1.8					2.0	2.0	
Lost Time Adjust (s)		0.0			0.0						0.0	
Total Lost Time (s)		5.4			5.4						5.6	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)		3.0		3.0	3.0					4.0	4.0	
Recall Mode		C-Max		C-Max	C-Max					None	None	
Walk Time (s)		8.0		8.0	8.0					7.0	7.0	
Flash Dont Walk (s)		7.0		7.0	7.0					7.0	7.0	
Pedestrian Calls (#/hr)		0		0	0					0	0	
Act Effct Green (s)		71.8			71.8						10.0	
Actuated g/C Ratio		0.94			0.94						0.13	
v/c Ratio		0.12			0.23						0.11	
Control Delay		1.0			0.6						22.1	
Queue Delay		0.0			0.0						0.0	
Total Delay		1.0			0.6						22.1	
LOS		A			A						C	
Approach Delay		1.0			0.6						22.1	
Approach LOS		A			A						C	
90th %ile Green (s)		55.0		55.0	55.0					10.0	10.0	
90th %ile Term Code		Coord		Coord	Coord					Min	Min	
70th %ile Green (s)		70.6		70.6	70.6					0.0	0.0	
70th %ile Term Code		Coord		Coord	Coord					Skip	Skip	
50th %ile Green (s)		70.6		70.6	70.6					0.0	0.0	
50th %ile Term Code		Coord		Coord	Coord					Skip	Skip	
30th %ile Green (s)		70.6		70.6	70.6					0.0	0.0	
30th %ile Term Code		Coord		Coord	Coord					Skip	Skip	
10th %ile Green (s)		70.6		70.6	70.6					0.0	0.0	
10th %ile Term Code		Coord		Coord	Coord					Skip	Skip	
Queue Length 50th (ft)		0			0						4	
Queue Length 95th (ft)		27			18						23	
Internal Link Dist (ft)		951			303			120			108	
Turn Bay Length (ft)												
Base Capacity (vph)		2852			2622						449	
Starvation Cap Reductn		0			0						0	
Spillback Cap Reductn		0			0						0	
Storage Cap Reductn		0			0						0	

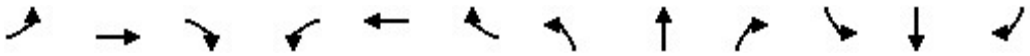
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Reduced v/c Ratio		0.12			0.23						0.04	

Intersection Summary			
Area Type:	Other		
Cycle Length: 76			
Actuated Cycle Length: 76			
Offset: 24 (32%), Referenced to phase 4:EBT and 8:WBTL, Start of Green			
Natural Cycle: 55			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.23			
Intersection Signal Delay: 1.2		Intersection LOS: A	
Intersection Capacity Utilization 49.3%		ICU Level of Service A	
Analysis Period (min) 15			

Splits and Phases: 3: S Ohio Av & Livinston Av /Livingston Av



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	24	226	0	0	472	51	48	79	23	0	0	0
Future Volume (vph)	24	226	0	0	472	51	48	79	23	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	150		0	0		0	0		0	0		0
Storage Lanes	0		0	0		0	0		0	0		0
Taper Length (ft)	25			0			0			0		
Lane Util. Factor	0.95	0.95	1.00	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		1.00			1.00			1.00				
Frt					0.985			0.979				
Flt Protected		0.995						0.984				
Satd. Flow (prot)	0	3142	0	0	3047	0	0	1413	0	0	0	0
Flt Permitted		0.885						0.984				
Satd. Flow (perm)	0	2793	0	0	3047	0	0	1412	0	0	0	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)					29			11				
Link Speed (mph)		35			35			35			35	
Link Distance (ft)		383			1949			182			211	
Travel Time (s)		7.5			38.0			3.5			4.1	
Confl. Peds. (#/hr)	6					6	2					2
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Heavy Vehicles (%)	0%	4%	0%	0%	6%	0%	15%	9%	0%	0%	0%	0%
Parking (#/hr)		5			5	5		5	5			
Adj. Flow (vph)	27	254	0	0	530	57	54	89	26	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	281	0	0	587	0	0	169	0	0	0	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.04	1.13	1.04	1.04	1.13	1.04	1.04	1.24	1.04	1.04	1.04	1.04
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2			2		1	2				
Detector Template	Left	Thru			Thru		Left	Thru				
Leading Detector (ft)	20	100			100		20	100				
Trailing Detector (ft)	0	0			0		0	0				
Detector 1 Position(ft)	0	0			0		0	0				
Detector 1 Size(ft)	20	6			6		20	6				
Detector 1 Type	Cl+Ex	Cl+Ex			Cl+Ex		Cl+Ex	Cl+Ex				
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0			0.0		0.0	0.0				
Detector 1 Queue (s)	0.0	0.0			0.0		0.0	0.0				
Detector 1 Delay (s)	0.0	0.0			0.0		0.0	0.0				
Detector 2 Position(ft)		94			94			94				
Detector 2 Size(ft)		6			6			6				
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex				
Detector 2 Channel												

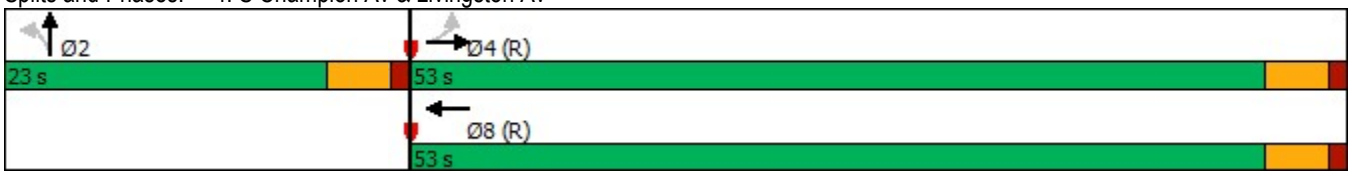


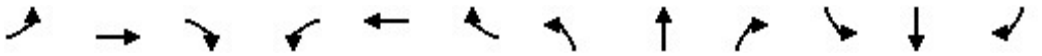
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 2 Extend (s)		0.0			0.0			0.0				
Turn Type	Perm	NA			NA		Perm	NA				
Protected Phases		4			8			2				
Permitted Phases	4						2					
Detector Phase	4	4			8		2	2				
Switch Phase												
Minimum Initial (s)	15.0	15.0			15.0		10.0	10.0				
Minimum Split (s)	26.5	26.5			27.0		19.8	19.8				
Total Split (s)	53.0	53.0			53.0		23.0	23.0				
Total Split (%)	69.7%	69.7%			69.7%		30.3%	30.3%				
Maximum Green (s)	48.3	48.3			48.3		18.2	18.2				
Yellow Time (s)	3.6	3.6			3.6		3.6	3.6				
All-Red Time (s)	1.1	1.1			1.1		1.2	1.2				
Lost Time Adjust (s)		0.0			0.0			0.0				
Total Lost Time (s)		4.7			4.7			4.8				
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	0.2	0.2			0.2		4.0	4.0				
Recall Mode	C-Max	C-Max			C-Max		None	None				
Walk Time (s)	8.0	8.0			8.0		7.0	7.0				
Flash Dont Walk (s)	7.0	7.0			7.0		8.0	8.0				
Pedestrian Calls (#/hr)	0	0			0		0	0				
Act Effct Green (s)		52.1			52.1			14.4				
Actuated g/C Ratio		0.69			0.69			0.19				
v/c Ratio		0.15			0.28			0.61				
Control Delay		4.2			6.7			35.6				
Queue Delay		0.0			0.0			0.0				
Total Delay		4.2			6.7			35.6				
LOS		A			A			D				
Approach Delay		4.2			6.7			35.6				
Approach LOS		A			A			D				
90th %ile Green (s)	48.3	48.3			48.3		18.2	18.2				
90th %ile Term Code	Coord	Coord			Coord		Max	Max				
70th %ile Green (s)	49.5	49.5			49.5		17.0	17.0				
70th %ile Term Code	Coord	Coord			Coord		Gap	Gap				
50th %ile Green (s)	51.9	51.9			51.9		14.6	14.6				
50th %ile Term Code	Coord	Coord			Coord		Gap	Gap				
30th %ile Green (s)	54.3	54.3			54.3		12.2	12.2				
30th %ile Term Code	Coord	Coord			Coord		Gap	Gap				
10th %ile Green (s)	56.5	56.5			56.5		10.0	10.0				
10th %ile Term Code	Coord	Coord			Coord		Min	Min				
Queue Length 50th (ft)		21			68			69				
Queue Length 95th (ft)		19			116			121				
Internal Link Dist (ft)		303			1869			102			131	
Turn Bay Length (ft)												
Base Capacity (vph)		1914			2097			346				
Starvation Cap Reductn		0			0			0				
Spillback Cap Reductn		0			0			0				
Storage Cap Reductn		0			0			0				

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Reduced v/c Ratio		0.15			0.28			0.49				

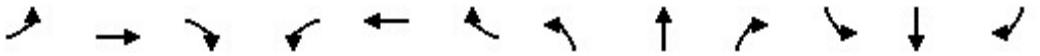
Intersection Summary			
Area Type:	Other		
Cycle Length: 76			
Actuated Cycle Length: 76			
Offset: 14 (18%), Referenced to phase 4:EBTL and 8:WBT, Start of Green			
Natural Cycle: 50			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.61			
Intersection Signal Delay: 10.7		Intersection LOS: B	
Intersection Capacity Utilization 47.7%		ICU Level of Service A	
Analysis Period (min) 15			

Splits and Phases: 4: S Champion Av & Livingston Av





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	236	67	270	388	1	83	2	171	0	1	1
Future Volume (vph)	0	236	67	270	388	1	83	2	171	0	1	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		150	110		0	75		0	0		0
Storage Lanes	0		0	1		0	1		0	0		0
Taper Length (ft)	25			25			0			0		
Lane Util. Factor	0.95	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		0.99		1.00	1.00			0.99				
Frt		0.967						0.852			0.932	
Flt Protected				0.950			0.950					
Satd. Flow (prot)	0	3028	0	1678	3116	0	1711	1499	0	0	1712	0
Flt Permitted				0.508			0.757					
Satd. Flow (perm)	0	3028	0	895	3116	0	1363	1499	0	0	1712	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		59			1			184			1	
Link Speed (mph)		35			35			35			25	
Link Distance (ft)		1949			512			199			214	
Travel Time (s)		38.0			10.0			3.9			5.8	
Confl. Peds. (#/hr)	6		2	2		6			1	1		
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles (%)	0%	3%	7%	4%	5%	0%	2%	0%	3%	0%	0%	0%
Parking (#/hr)		5	5		5	5						
Adj. Flow (vph)	0	254	72	290	417	1	89	2	184	0	1	1
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	326	0	290	418	0	89	186	0	0	2	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		11			11			11			11	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.04	1.13	1.04	1.04	1.13	1.04	1.04	1.04	1.04	1.04	1.04	1.04
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2		1	2			2	
Detector Template	Left	Thru		Left	Thru		Left	Thru			Thru	
Leading Detector (ft)	20	100		20	100		20	100			100	
Trailing Detector (ft)	0	0		0	0		0	0			0	
Detector 1 Position(ft)	0	0		0	0		0	0			0	
Detector 1 Size(ft)	20	6		20	6		20	6			6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex			Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0			0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0			0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0			0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												

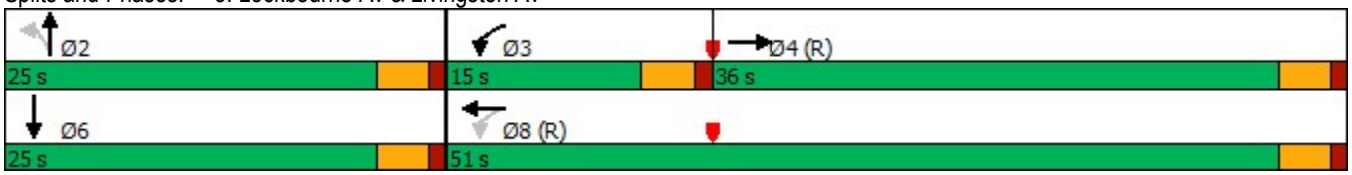


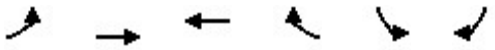
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type		NA		pm+pt	NA		Perm	NA			NA	
Protected Phases		4		3	8			2			6	
Permitted Phases				8			2					
Detector Phase		4		3	8		2	2			6	
Switch Phase												
Minimum Initial (s)		5.0		5.0	5.0		5.0	5.0			5.0	
Minimum Split (s)		18.0		9.0	18.0		18.0	18.0			18.0	
Total Split (s)		36.0		15.0	51.0		25.0	25.0			25.0	
Total Split (%)		47.4%		19.7%	67.1%		32.9%	32.9%			32.9%	
Maximum Green (s)		32.0		11.0	47.0		21.0	21.0			21.0	
Yellow Time (s)		3.0		3.0	3.0		3.0	3.0			3.0	
All-Red Time (s)		1.0		1.0	1.0		1.0	1.0			1.0	
Lost Time Adjust (s)		0.0		0.0	0.0		0.0	0.0			0.0	
Total Lost Time (s)		4.0		4.0	4.0		4.0	4.0			4.0	
Lead/Lag		Lag		Lead								
Lead-Lag Optimize?		Yes		Yes								
Vehicle Extension (s)		3.0		3.0	3.0		3.0	3.0			3.0	
Recall Mode		C-Max		None	C-Max		None	None			None	
Walk Time (s)		7.0			7.0		7.0	7.0			7.0	
Flash Dont Walk (s)		7.0			7.0		7.0	7.0			7.0	
Pedestrian Calls (#/hr)		0			0		0	0			0	
Act Effct Green (s)		44.0		57.7	57.7		10.3	10.3			10.3	
Actuated g/C Ratio		0.58		0.76	0.76		0.14	0.14			0.14	
v/c Ratio		0.18		0.37	0.18		0.48	0.51			0.01	
Control Delay		5.2		3.2	1.4		38.3	10.3			22.5	
Queue Delay		0.0		0.0	0.0		0.0	0.0			0.0	
Total Delay		5.2		3.2	1.4		38.3	10.3			22.5	
LOS		A		A	A		D	B			C	
Approach Delay		5.2			2.2			19.4			22.5	
Approach LOS		A			A			B			C	
90th %ile Green (s)		35.6		13.6	53.2		14.8	14.8			14.8	
90th %ile Term Code		Coord		Gap	Coord		Gap	Gap			Hold	
70th %ile Green (s)		41.1		10.8	55.9		12.1	12.1			12.1	
70th %ile Term Code		Coord		Gap	Coord		Gap	Gap			Hold	
50th %ile Green (s)		44.4		9.3	57.7		10.3	10.3			10.3	
50th %ile Term Code		Coord		Gap	Coord		Gap	Gap			Hold	
30th %ile Green (s)		47.6		8.0	59.6		8.4	8.4			8.4	
30th %ile Term Code		Coord		Gap	Coord		Gap	Gap			Hold	
10th %ile Green (s)		51.5		6.7	62.2		5.8	5.8			5.8	
10th %ile Term Code		Coord		Gap	Coord		Gap	Gap			Hold	
Queue Length 50th (ft)		15		11	8		39	1			0	
Queue Length 95th (ft)		33		32	18		77	51			6	
Internal Link Dist (ft)		1869			432			119			134	
Turn Bay Length (ft)				110			75					
Base Capacity (vph)		1779		798	2366		376	547			473	
Starvation Cap Reductn		0		0	0		0	0			0	
Spillback Cap Reductn		0		0	0		0	0			0	
Storage Cap Reductn		0		0	0		0	0			0	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Reduced v/c Ratio		0.18		0.36	0.18		0.24	0.34			0.00	

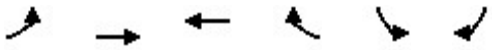
Intersection Summary			
Area Type:	Other		
Cycle Length: 76			
Actuated Cycle Length: 76			
Offset: 52 (68%), Referenced to phase 4:EBT and 8:WBTL, Start of Green			
Natural Cycle: 45			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.51			
Intersection Signal Delay: 6.5		Intersection LOS: A	
Intersection Capacity Utilization 47.9%		ICU Level of Service A	
Analysis Period (min) 15			

Splits and Phases: 5: Lockbourne Av & Livingston Av





Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	0	415	431	0	83	244
Future Volume (vph)	0	415	431	0	83	244
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	0.95	0.95	1.00	1.00	1.00
Ped Bike Factor						
Frt						0.850
Flt Protected					0.950	
Satd. Flow (prot)	0	3146	3116	0	1616	1501
Flt Permitted					0.950	
Satd. Flow (perm)	0	3146	3116	0	1616	1501
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)						257
Link Speed (mph)		35	35		25	
Link Distance (ft)		512	577		267	
Travel Time (s)		10.0	11.2		7.3	
Confl. Peds. (#/hr)	1			1		
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	0%	4%	5%	0%	8%	4%
Parking (#/hr)		5	5			
Adj. Flow (vph)	0	437	454	0	87	257
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	437	454	0	87	257
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(ft)		11	11		11	
Link Offset(ft)		0	0		0	
Crosswalk Width(ft)		16	16		16	
Two way Left Turn Lane						
Headway Factor	1.04	1.13	1.13	1.04	1.04	1.04
Turning Speed (mph)	15			9	15	9
Number of Detectors		2	2		1	1
Detector Template		Thru	Thru		Left	Right
Leading Detector (ft)		100	100		20	20
Trailing Detector (ft)		0	0		0	0
Detector 1 Position(ft)		0	0		0	0
Detector 1 Size(ft)		6	6		20	20
Detector 1 Type		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)		0.0	0.0		0.0	0.0
Detector 1 Queue (s)		0.0	0.0		0.0	0.0
Detector 1 Delay (s)		0.0	0.0		0.0	0.0
Detector 2 Position(ft)		94	94			
Detector 2 Size(ft)		6	6			
Detector 2 Type		Cl+Ex	Cl+Ex			
Detector 2 Channel						
Detector 2 Extend (s)		0.0	0.0			
Turn Type		NA	NA		Perm	Perm
Protected Phases		4	8			

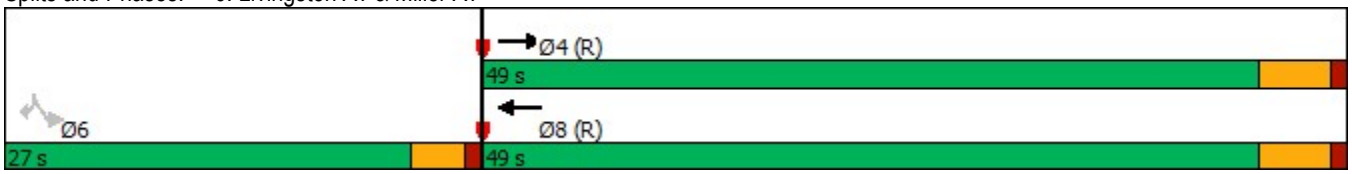


Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Permitted Phases					6	6
Detector Phase		4	8		6	6
Switch Phase						
Minimum Initial (s)		20.0	20.0		10.0	10.0
Minimum Split (s)		32.0	32.0		26.5	26.5
Total Split (s)		49.0	49.0		27.0	27.0
Total Split (%)		64.5%	64.5%		35.5%	35.5%
Maximum Green (s)		43.9	43.9		23.0	23.0
Yellow Time (s)		4.1	4.1		3.0	3.0
All-Red Time (s)		1.0	1.0		1.0	1.0
Lost Time Adjust (s)		0.0	0.0		0.0	0.0
Total Lost Time (s)		5.1	5.1		4.0	4.0
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)		1.0	1.0		4.0	4.0
Recall Mode		C-Max	C-Max		None	None
Walk Time (s)		13.0	13.0		7.0	7.0
Flash Dont Walk (s)		7.0	7.0		10.0	10.0
Pedestrian Calls (#/hr)		0	0		0	0
Act Effct Green (s)		55.3	55.3		11.6	11.6
Actuated g/C Ratio		0.73	0.73		0.15	0.15
v/c Ratio		0.19	0.20		0.36	0.58
Control Delay		3.3	1.5		32.4	9.6
Queue Delay		0.0	0.0		0.0	0.0
Total Delay		3.3	1.5		32.4	9.6
LOS		A	A		C	A
Approach Delay		3.3	1.5		15.4	
Approach LOS		A	A		B	
90th %ile Green (s)		51.3	51.3		15.6	15.6
90th %ile Term Code		Coord	Coord		Gap	Gap
70th %ile Green (s)		55.0	55.0		11.9	11.9
70th %ile Term Code		Coord	Coord		Gap	Gap
50th %ile Green (s)		56.6	56.6		10.3	10.3
50th %ile Term Code		Coord	Coord		Gap	Gap
30th %ile Green (s)		56.9	56.9		10.0	10.0
30th %ile Term Code		Coord	Coord		Min	Min
10th %ile Green (s)		56.9	56.9		10.0	10.0
10th %ile Term Code		Coord	Coord		Min	Min
Queue Length 50th (ft)		20	4		38	0
Queue Length 95th (ft)		53	5		74	57
Internal Link Dist (ft)		432	497		187	
Turn Bay Length (ft)						
Base Capacity (vph)		2290	2268		489	633
Starvation Cap Reductn		0	0		0	0
Spillback Cap Reductn		0	0		0	0
Storage Cap Reductn		0	0		0	0
Reduced v/c Ratio		0.19	0.20		0.18	0.41

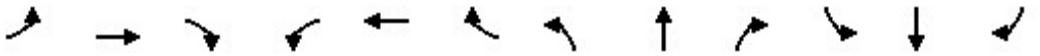
Intersection Summary

Area Type:	Other		
Cycle Length: 76			
Actuated Cycle Length: 76			
Offset: 40 (53%), Referenced to phase 4:EBT and 8:WBT, Start of Green			
Natural Cycle: 60			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.58			
Intersection Signal Delay: 6.0		Intersection LOS: A	
Intersection Capacity Utilization 39.4%		ICU Level of Service A	
Analysis Period (min) 15			

Splits and Phases: 6: Livingston Av & Miller Av



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	179	298	0	0	423	63	8	72	19	0	0	0
Future Volume (vph)	179	298	0	0	423	63	8	72	19	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	150		0	0		0	0		0	0		0
Storage Lanes	0		0	0		0	0		1	0		0
Taper Length (ft)	25			0			0			0		
Lane Util. Factor	0.95	0.95	1.00	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		1.00			1.00			1.00				
Frt					0.980				0.850			
Flt Protected		0.982						0.995				
Satd. Flow (prot)	0	3071	0	0	3042	0	0	1712	1561	0	0	0
Flt Permitted		0.646						0.995				
Satd. Flow (perm)	0	2016	0	0	3042	0	0	1712	1561	0	0	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)					37				34			
Link Speed (mph)		35			35			25			25	
Link Distance (ft)		577			1576			192			127	
Travel Time (s)		11.2			30.7			5.2			3.5	
Confl. Peds. (#/hr)	4		2	2		4	1					1
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles (%)	4%	5%	0%	0%	5%	5%	13%	6%	0%	0%	0%	0%
Parking (#/hr)		5			5	5						
Adj. Flow (vph)	192	320	0	0	455	68	9	77	20	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	512	0	0	523	0	0	86	20	0	0	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.04	1.13	1.04	1.04	1.13	1.04	1.04	1.04	1.04	1.04	1.04	1.04
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2			2		1	2	1			
Detector Template	Left	Thru			Thru		Left	Thru	Right			
Leading Detector (ft)	20	100			100		20	100	20			
Trailing Detector (ft)	0	0			0		0	0	0			
Detector 1 Position(ft)	0	0			0		0	0	0			
Detector 1 Size(ft)	20	6			6		20	6	20			
Detector 1 Type	Cl+Ex	Cl+Ex			Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex			
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0			0.0		0.0	0.0	0.0			
Detector 1 Queue (s)	0.0	0.0			0.0		0.0	0.0	0.0			
Detector 1 Delay (s)	0.0	0.0			0.0		0.0	0.0	0.0			
Detector 2 Position(ft)		94			94			94				
Detector 2 Size(ft)		6			6			6				
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex				
Detector 2 Channel												

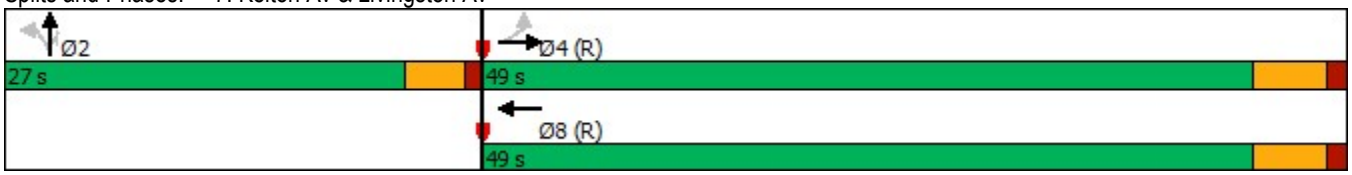


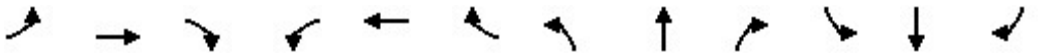
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 2 Extend (s)		0.0			0.0			0.0				
Turn Type	Perm	NA			NA		Perm	NA	Perm			
Protected Phases		4			8			2				
Permitted Phases	4						2		2			
Detector Phase	4	4			8		2	2	2			
Switch Phase												
Minimum Initial (s)	15.0	15.0			15.0		10.0	10.0	10.0			
Minimum Split (s)	27.0	27.0			27.0		26.5	26.5	26.5			
Total Split (s)	49.0	49.0			49.0		27.0	27.0	27.0			
Total Split (%)	64.5%	64.5%			64.5%		35.5%	35.5%	35.5%			
Maximum Green (s)	43.6	43.6			43.6		22.6	22.6	22.6			
Yellow Time (s)	4.1	4.1			4.1		3.4	3.4	3.4			
All-Red Time (s)	1.3	1.3			1.3		1.0	1.0	1.0			
Lost Time Adjust (s)		0.0			0.0			0.0	0.0			
Total Lost Time (s)		5.4			5.4			4.4	4.4			
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.7	3.7			3.7		4.0	4.0	4.0			
Recall Mode	C-Max	C-Max			C-Max		None	None	None			
Walk Time (s)	8.0	8.0			8.0		7.0	7.0	7.0			
Flash Dont Walk (s)	7.0	7.0			7.0		8.0	8.0	8.0			
Pedestrian Calls (#/hr)	0	0			0		0	0	0			
Act Effct Green (s)		59.1			59.1			11.1	11.1			
Actuated g/C Ratio		0.78			0.78			0.15	0.15			
v/c Ratio		0.33			0.22			0.35	0.08			
Control Delay		6.5			0.9			32.9	6.5			
Queue Delay		0.0			0.0			0.0	0.0			
Total Delay		6.5			0.9			32.9	6.5			
LOS		A			A			C	A			
Approach Delay		6.5			0.9			27.9				
Approach LOS		A			A			C				
90th %ile Green (s)	52.6	52.6			52.6		13.6	13.6	13.6			
90th %ile Term Code	Coord	Coord			Coord		Gap	Gap	Gap			
70th %ile Green (s)	54.6	54.6			54.6		11.6	11.6	11.6			
70th %ile Term Code	Coord	Coord			Coord		Gap	Gap	Gap			
50th %ile Green (s)	56.1	56.1			56.1		10.1	10.1	10.1			
50th %ile Term Code	Coord	Coord			Coord		Gap	Gap	Gap			
30th %ile Green (s)	56.2	56.2			56.2		10.0	10.0	10.0			
30th %ile Term Code	Coord	Coord			Coord		Min	Min	Min			
10th %ile Green (s)	70.6	70.6			70.6		0.0	0.0	0.0			
10th %ile Term Code	Coord	Coord			Coord		Skip	Skip	Skip			
Queue Length 50th (ft)		46			6			38	0			
Queue Length 95th (ft)		90			0			75	12			
Internal Link Dist (ft)		497			1496			112			47	
Turn Bay Length (ft)												
Base Capacity (vph)		1567			2373			509	488			
Starvation Cap Reductn		0			0			0	0			
Spillback Cap Reductn		0			0			0	0			
Storage Cap Reductn		0			0			0	0			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Reduced v/c Ratio		0.33			0.22			0.17	0.04			

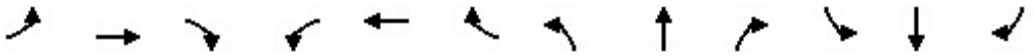
Intersection Summary			
Area Type:	Other		
Cycle Length: 76			
Actuated Cycle Length: 76			
Offset: 25 (33%), Referenced to phase 4:EBTL and 8:WBT, Start of Green			
Natural Cycle: 55			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.35			
Intersection Signal Delay: 5.9		Intersection LOS: A	
Intersection Capacity Utilization 50.3%		ICU Level of Service A	
Analysis Period (min) 15			

Splits and Phases: 7: Kelton Av & Livingston Av





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	6	280	42	13	428	34	8	167	51	16	140	17
Future Volume (vph)	6	280	42	13	428	34	8	167	51	16	140	17
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	150		0	150		0	0		0	0		0
Storage Lanes	0		0	0		0	0		0	0		0
Taper Length (ft)	25			25			0			0		
Lane Util. Factor	0.95	0.95	0.95	0.95	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		1.00			1.00			1.00			1.00	
Frt		0.981			0.989			0.969			0.987	
Flt Protected		0.999			0.999			0.998			0.995	
Satd. Flow (prot)	0	3052	0	0	3039	0	0	1597	0	0	1649	0
Flt Permitted		0.947			0.943			0.987			0.961	
Satd. Flow (perm)	0	2893	0	0	2868	0	0	1579	0	0	1593	0
Right Turn on Red			Yes			Yes			Yes			No
Satd. Flow (RTOR)		31			15			22				
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1576			932			368			414	
Travel Time (s)		35.8			21.2			8.4			9.4	
Confl. Peds. (#/hr)	3		4	4		3	9		2	2		9
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	17%	4%	7%	38%	5%	9%	0%	11%	12%	13%	9%	6%
Parking (#/hr)		5	5		5	5						
Adj. Flow (vph)	7	311	47	14	476	38	9	186	57	18	156	19
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	365	0	0	528	0	0	252	0	0	193	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.04	1.13	1.04	1.04	1.13	1.04	1.04	1.04	1.04	1.04	1.04	1.04
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (ft)	20	100		20	100		20	100		20	100	
Trailing Detector (ft)	0	0		0	0		0	0		0	0	
Detector 1 Position(ft)	0	0		0	0		0	0		0	0	
Detector 1 Size(ft)	20	6		20	6		20	6		20	6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												

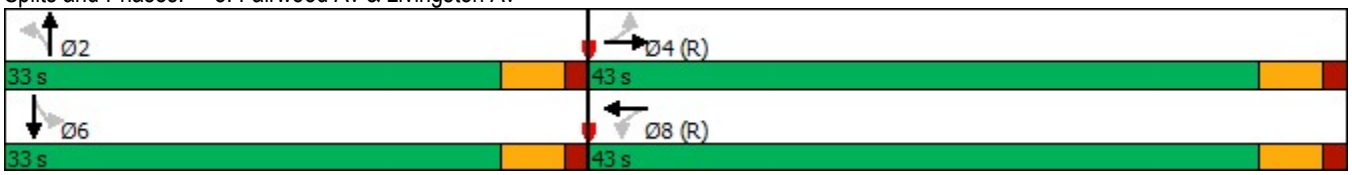


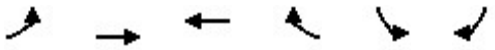
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	15.0	15.0		15.0	15.0		10.0	10.0		10.0	10.0	
Minimum Split (s)	27.0	27.0		27.0	27.0		26.5	26.5		26.5	26.5	
Total Split (s)	43.0	43.0		43.0	43.0		33.0	33.0		33.0	33.0	
Total Split (%)	56.6%	56.6%		56.6%	56.6%		43.4%	43.4%		43.4%	43.4%	
Maximum Green (s)	37.9	37.9		37.9	37.9		28.1	28.1		28.1	28.1	
Yellow Time (s)	3.6	3.6		3.6	3.6		3.6	3.6		3.6	3.6	
All-Red Time (s)	1.5	1.5		1.5	1.5		1.3	1.3		1.3	1.3	
Lost Time Adjust (s)		0.0			0.0			0.0			0.0	
Total Lost Time (s)		5.1			5.1			4.9			4.9	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		4.0	4.0		4.0	4.0	
Recall Mode	C-Max	C-Max		C-Max	C-Max		None	None		None	None	
Walk Time (s)	8.0	8.0		8.0	8.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	
Act Effct Green (s)		48.7			48.7			17.3			17.3	
Actuated g/C Ratio		0.64			0.64			0.23			0.23	
v/c Ratio		0.20			0.29			0.67			0.53	
Control Delay		4.8			7.1			32.5			30.1	
Queue Delay		0.0			0.0			0.0			0.0	
Total Delay		4.8			7.1			32.5			30.1	
LOS		A			A			C			C	
Approach Delay		4.8			7.1			32.5			30.1	
Approach LOS		A			A			C			C	
90th %ile Green (s)	42.0	42.0		42.0	42.0		24.0	24.0		24.0	24.0	
90th %ile Term Code	Coord	Coord		Coord	Coord		Gap	Gap		Hold	Hold	
70th %ile Green (s)	45.9	45.9		45.9	45.9		20.1	20.1		20.1	20.1	
70th %ile Term Code	Coord	Coord		Coord	Coord		Gap	Gap		Hold	Hold	
50th %ile Green (s)	48.6	48.6		48.6	48.6		17.4	17.4		17.4	17.4	
50th %ile Term Code	Coord	Coord		Coord	Coord		Gap	Gap		Hold	Hold	
30th %ile Green (s)	51.4	51.4		51.4	51.4		14.6	14.6		14.6	14.6	
30th %ile Term Code	Coord	Coord		Coord	Coord		Gap	Gap		Hold	Hold	
10th %ile Green (s)	55.4	55.4		55.4	55.4		10.6	10.6		10.6	10.6	
10th %ile Term Code	Coord	Coord		Coord	Coord		Gap	Gap		Hold	Hold	
Queue Length 50th (ft)		35			48			99			80	
Queue Length 95th (ft)		85			94			155			126	
Internal Link Dist (ft)		1496			852			288			334	
Turn Bay Length (ft)												
Base Capacity (vph)		1863			1841			597			588	
Starvation Cap Reductn		0			0			0			0	
Spillback Cap Reductn		0			0			0			0	
Storage Cap Reductn		0			0			0			0	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Reduced v/c Ratio		0.20			0.29			0.42			0.33	

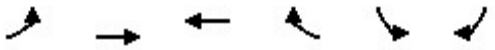
Intersection Summary			
Area Type:	Other		
Cycle Length: 76			
Actuated Cycle Length: 76			
Offset: 71 (93%), Referenced to phase 4:EBTL and 8:WBTL, Start of Green			
Natural Cycle: 55			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.67			
Intersection Signal Delay: 14.6		Intersection LOS: B	
Intersection Capacity Utilization 46.1%		ICU Level of Service A	
Analysis Period (min) 15			

Splits and Phases: 8: Fairwood Av & Livingston Av

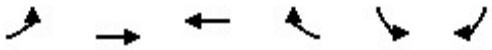




Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	33	454	522	160	153	63
Future Volume (vph)	33	454	522	160	153	63
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	150			0	0	0
Storage Lanes	0			0	1	0
Taper Length (ft)	25				0	
Lane Util. Factor	0.95	0.95	0.95	0.95	1.00	1.00
Ped Bike Factor		1.00	0.99		1.00	
Frt			0.965		0.961	
Flt Protected		0.997			0.966	
Satd. Flow (prot)	0	3098	2992	0	1646	0
Flt Permitted		0.867			0.966	
Satd. Flow (perm)	0	2694	2992	0	1643	0
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)			81		17	
Link Speed (mph)		35	35		35	
Link Distance (ft)		841	588		385	
Travel Time (s)		16.4	11.5		7.5	
Confl. Peds. (#/hr)	3			3	1	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Heavy Vehicles (%)	9%	5%	5%	4%	3%	5%
Parking (#/hr)	5	5	5	5		
Adj. Flow (vph)	35	483	555	170	163	67
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	518	725	0	230	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(ft)		11	11		11	
Link Offset(ft)		0	0		0	
Crosswalk Width(ft)		16	16		16	
Two way Left Turn Lane						
Headway Factor	1.04	1.13	1.13	1.04	1.04	1.04
Turning Speed (mph)	15			9	15	9
Number of Detectors	1	2	2		1	
Detector Template	Left	Thru	Thru		Left	
Leading Detector (ft)	20	100	100		20	
Trailing Detector (ft)	0	0	0		0	
Detector 1 Position(ft)	0	0	0		0	
Detector 1 Size(ft)	20	6	6		20	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0		0.0	
Detector 1 Queue (s)	0.0	0.0	0.0		0.0	
Detector 1 Delay (s)	0.0	0.0	0.0		0.0	
Detector 2 Position(ft)		94	94			
Detector 2 Size(ft)		6	6			
Detector 2 Type		Cl+Ex	Cl+Ex			
Detector 2 Channel						



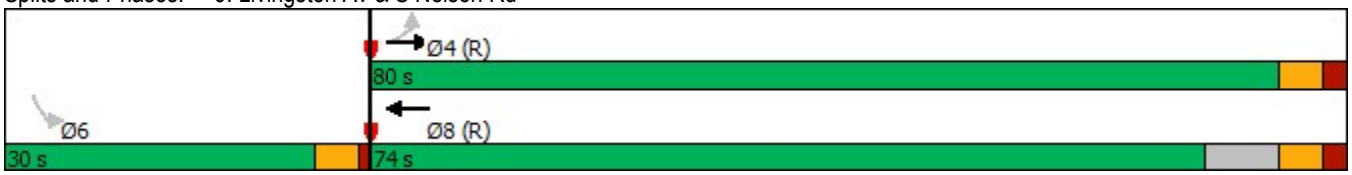
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Detector 2 Extend (s)		0.0	0.0			
Turn Type	Perm	NA	NA		Perm	
Protected Phases		4	8			
Permitted Phases	4				6	
Detector Phase	4	4	8		6	
Switch Phase						
Minimum Initial (s)	15.0	15.0	15.0		10.0	
Minimum Split (s)	27.0	27.0	27.0		26.5	
Total Split (s)	80.0	80.0	74.0		30.0	
Total Split (%)	72.7%	72.7%	67.3%		27.3%	
Maximum Green (s)	74.2	74.2	68.2		25.4	
Yellow Time (s)	3.6	3.6	3.6		3.6	
All-Red Time (s)	2.2	2.2	2.2		1.0	
Lost Time Adjust (s)		0.0	0.0		0.0	
Total Lost Time (s)		5.8	5.8		4.6	
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	0.2	0.2	4.0		0.2	
Recall Mode	C-Max	C-Max	C-Max		None	
Walk Time (s)	8.0	8.0	8.0		7.0	
Flash Dont Walk (s)	7.0	7.0	7.0		7.0	
Pedestrian Calls (#/hr)	0	0	0		0	
Act Effct Green (s)		82.4	82.4		17.2	
Actuated g/C Ratio		0.75	0.75		0.16	
v/c Ratio		0.26	0.32		0.85	
Control Delay		5.2	4.3		67.4	
Queue Delay		0.0	0.0		0.0	
Total Delay		5.2	4.3		67.4	
LOS		A	A		E	
Approach Delay		5.2	4.3		67.4	
Approach LOS		A	A		E	
90th %ile Green (s)	75.0	75.0	75.0		24.6	
90th %ile Term Code	Coord	Coord	Coord		Gap	
70th %ile Green (s)	79.3	79.3	79.3		20.3	
70th %ile Term Code	Coord	Coord	Coord		Gap	
50th %ile Green (s)	82.4	82.4	82.4		17.2	
50th %ile Term Code	Coord	Coord	Coord		Gap	
30th %ile Green (s)	85.5	85.5	85.5		14.1	
30th %ile Term Code	Coord	Coord	Coord		Gap	
10th %ile Green (s)	89.6	89.6	89.6		10.0	
10th %ile Term Code	Coord	Coord	Coord		Min	
Queue Length 50th (ft)		50	116		148	
Queue Length 95th (ft)		92	8		220	
Internal Link Dist (ft)		761	508		305	
Turn Bay Length (ft)						
Base Capacity (vph)		2017	2260		392	
Starvation Cap Reductn		0	0		0	
Spillback Cap Reductn		0	0		0	
Storage Cap Reductn		0	0		0	

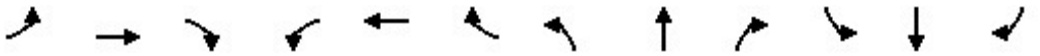


Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Reduced v/c Ratio		0.26	0.32		0.59	

Intersection Summary			
Area Type:	Other		
Cycle Length: 110			
Actuated Cycle Length: 110			
Offset: 100 (91%), Referenced to phase 4:EBTL and 8:WBT, Start of Green			
Natural Cycle: 55			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.85			
Intersection Signal Delay: 14.5		Intersection LOS: B	
Intersection Capacity Utilization 58.6%		ICU Level of Service B	
Analysis Period (min) 15			

Splits and Phases: 9: Livingston Av & S Nelson Rd

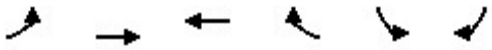




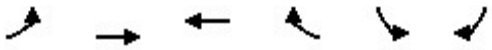
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	3	210	0	0	443	10	67	3	58	8	0	18
Future Volume (Veh/h)	3	210	0	0	443	10	67	3	58	8	0	18
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Hourly flow rate (vph)	3	231	0	0	487	11	74	3	64	9	0	20
Pedestrians								1			6	
Lane Width (ft)								11.0			11.0	
Walking Speed (ft/s)								3.5			3.5	
Percent Blockage								0			1	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)		440			1031							
pX, platoon unblocked												
vC, conflicting volume	504			232			502	742	116	686	736	255
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	504			232			502	742	116	686	736	255
tC, single (s)	4.1			4.1			7.5	7.8	6.9	7.8	6.5	7.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.7	3.3	3.6	4.0	3.5
p0 queue free %	100			100			83	99	93	97	100	97
cM capacity (veh/h)	1065			1346			441	236	913	285	346	697

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	80	154	325	173	141	29
Volume Left	3	0	0	0	74	9
Volume Right	0	0	0	11	64	20
cSH	1065	1700	1700	1700	562	481
Volume to Capacity	0.00	0.09	0.19	0.10	0.25	0.06
Queue Length 95th (ft)	0	0	0	0	25	5
Control Delay (s)	0.3	0.0	0.0	0.0	13.5	13.0
Lane LOS	A				B	B
Approach Delay (s)	0.1		0.0		13.5	13.0
Approach LOS					B	B

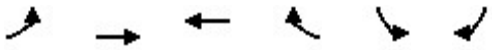
Intersection Summary				
Average Delay	2.6			
Intersection Capacity Utilization	32.0%	ICU Level of Service		A
Analysis Period (min)	15			



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	120	382	270	38	63	178
Future Volume (vph)	120	382	270	38	63	178
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	100			0	0	0
Storage Lanes	0			0	1	1
Taper Length (ft)	25				0	
Lane Util. Factor	0.95	0.95	0.95	0.95	1.00	1.00
Ped Bike Factor		1.00	1.00		1.00	0.97
Frt			0.981			0.850
Flt Protected		0.988			0.950	
Satd. Flow (prot)	0	3326	3086	0	1745	1531
Flt Permitted		0.754			0.950	
Satd. Flow (perm)	0	2533	3086	0	1741	1488
Right Turn on Red				Yes		No
Satd. Flow (RTOR)			15			
Link Speed (mph)		35	35		25	
Link Distance (ft)		304	440		328	
Travel Time (s)		5.9	8.6		8.9	
Confl. Peds. (#/hr)	5			5	1	8
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89
Heavy Vehicles (%)	9%	2%	4%	0%	0%	2%
Parking (#/hr)			5	5		
Adj. Flow (vph)	135	429	303	43	71	200
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	564	346	0	71	200
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(ft)		0	0		11	
Link Offset(ft)		0	0		0	
Crosswalk Width(ft)		16	16		16	
Two way Left Turn Lane						
Headway Factor	1.04	1.04	1.13	1.04	1.04	1.04
Turning Speed (mph)	15			9	15	9
Number of Detectors	1	2	2		1	1
Detector Template	Left	Thru	Thru		Left	Right
Leading Detector (ft)	20	100	100		20	20
Trailing Detector (ft)	0	0	0		0	0
Detector 1 Position(ft)	0	0	0		0	0
Detector 1 Size(ft)	20	6	6		20	20
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0		0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0		0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0		0.0	0.0
Detector 2 Position(ft)		94	94			
Detector 2 Size(ft)		6	6			
Detector 2 Type		Cl+Ex	Cl+Ex			
Detector 2 Channel						



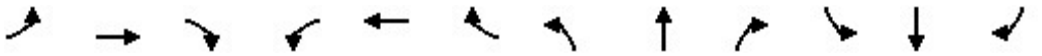
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Detector 2 Extend (s)		0.0	0.0			
Turn Type	pm+pt	NA	NA		Perm	Perm
Protected Phases	7	4	8			
Permitted Phases	4				6	6
Detector Phase	7	4	8		6	6
Switch Phase						
Minimum Initial (s)	5.0	7.0	16.0		10.0	10.0
Minimum Split (s)	10.8	26.5	26.5		26.5	26.5
Total Split (s)	25.0	75.0	50.0		45.0	45.0
Total Split (%)	20.8%	62.5%	41.7%		37.5%	37.5%
Maximum Green (s)	19.2	69.2	44.2		40.7	40.7
Yellow Time (s)	4.1	4.1	4.1		3.0	3.0
All-Red Time (s)	1.7	1.7	1.7		1.3	1.3
Lost Time Adjust (s)		0.0	0.0		0.0	0.0
Total Lost Time (s)		5.8	5.8		4.3	4.3
Lead/Lag	Lead		Lag			
Lead-Lag Optimize?	Yes		Yes			
Vehicle Extension (s)	3.7	3.7	3.7		5.0	5.0
Recall Mode	None	Max	C-Max		None	None
Walk Time (s)		7.0	7.0		7.0	7.0
Flash Dont Walk (s)		9.0	9.0		11.0	11.0
Pedestrian Calls (#/hr)		0	0		0	0
Act Effct Green (s)		86.6	86.6		23.3	23.3
Actuated g/C Ratio		0.72	0.72		0.19	0.19
v/c Ratio		0.31	0.16		0.21	0.69
Control Delay		7.2	5.8		40.0	57.0
Queue Delay		0.0	0.0		0.0	0.0
Total Delay		7.2	5.8		40.0	57.0
LOS		A	A		D	E
Approach Delay		7.2	5.8		52.6	
Approach LOS		A	A		D	
90th %ile Green (s)	0.0	78.7	78.7		31.2	31.2
90th %ile Term Code	Skip	Coord	Coord		Gap	Gap
70th %ile Green (s)	0.0	83.3	83.3		26.6	26.6
70th %ile Term Code	Skip	Coord	Coord		Gap	Gap
50th %ile Green (s)	0.0	86.6	86.6		23.3	23.3
50th %ile Term Code	Skip	Coord	Coord		Gap	Gap
30th %ile Green (s)	0.0	89.9	89.9		20.0	20.0
30th %ile Term Code	Skip	Coord	Coord		Gap	Gap
10th %ile Green (s)	0.0	94.5	94.5		15.4	15.4
10th %ile Term Code	Skip	Coord	Coord		Gap	Gap
Queue Length 50th (ft)		72	37		47	146
Queue Length 95th (ft)		123	66		81	208
Internal Link Dist (ft)		224	360		248	
Turn Bay Length (ft)						
Base Capacity (vph)		1827	2231		590	504
Starvation Cap Reductn		0	0		0	0
Spillback Cap Reductn		0	0		0	0
Storage Cap Reductn		0	0		0	0



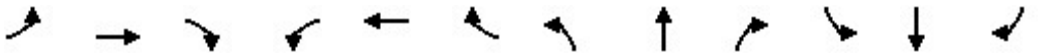
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Reduced v/c Ratio		0.31	0.16		0.12	0.40

Intersection Summary			
Area Type:	Other		
Cycle Length: 120			
Actuated Cycle Length: 120			
Offset: 45 (38%), Referenced to phase 8:WBT, Start of Green			
Natural Cycle: 65			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.69			
Intersection Signal Delay: 17.2		Intersection LOS: B	
Intersection Capacity Utilization 50.5%		ICU Level of Service A	
Analysis Period (min) 15			

Splits and Phases: 1: Livingston Av & S 18th St



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	559	72	71	357	1	0	0	0	8	4	10
Future Volume (vph)	0	559	72	71	357	1	0	0	0	8	4	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	150		0	150		0	0		0	0		0
Storage Lanes	0		0	0		0	0		0	0		0
Taper Length (ft)	25			25			0			0		
Lane Util. Factor	1.00	0.95	0.95	0.95	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		1.00			1.00						0.99	
Frt		0.983									0.938	
Flt Protected					0.992						0.982	
Satd. Flow (prot)	0	3101	0	0	3096	0	0	0	0	0	1405	0
Flt Permitted					0.756						0.982	
Satd. Flow (perm)	0	3101	0	0	2358	0	0	0	0	0	1404	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		27									11	
Link Speed (mph)		35			35			35			35	
Link Distance (ft)		1031			383			200			188	
Travel Time (s)		20.1			7.5			3.9			3.7	
Confl. Peds. (#/hr)	3		4	4		3	7		1	1		7
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Heavy Vehicles (%)	0%	3%	6%	4%	5%	0%	0%	0%	0%	0%	25%	0%
Parking (#/hr)		5	5		5						5	5
Adj. Flow (vph)	0	614	79	78	392	1	0	0	0	9	4	11
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	693	0	0	471	0	0	0	0	0	24	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.04	1.13	1.04	1.04	1.13	1.04	1.04	1.04	1.04	1.04	1.24	1.04
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors		2		1	2					1	2	
Detector Template		Thru		Left	Thru					Left	Thru	
Leading Detector (ft)		100		20	100					20	100	
Trailing Detector (ft)		0		0	0					0	0	
Detector 1 Position(ft)		0		0	0					0	0	
Detector 1 Size(ft)		6		20	6					20	6	
Detector 1 Type		Cl+Ex		Cl+Ex	Cl+Ex					Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)		0.0		0.0	0.0					0.0	0.0	
Detector 1 Queue (s)		0.0		0.0	0.0					0.0	0.0	
Detector 1 Delay (s)		0.0		0.0	0.0					0.0	0.0	
Detector 2 Position(ft)		94			94						94	
Detector 2 Size(ft)		6			6						6	
Detector 2 Type		Cl+Ex			Cl+Ex						Cl+Ex	
Detector 2 Channel												

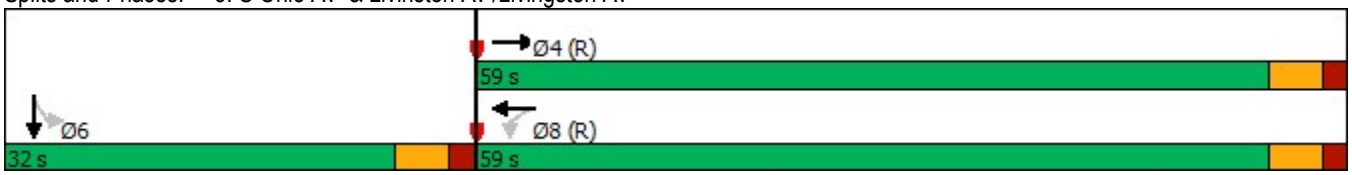


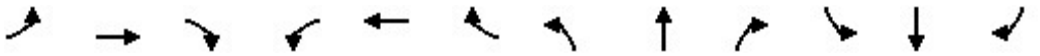
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 2 Extend (s)		0.0			0.0						0.0	
Turn Type		NA		Perm	NA					Perm	NA	
Protected Phases		4			8						6	
Permitted Phases				8						6		
Detector Phase		4		8	8					6	6	
Switch Phase												
Minimum Initial (s)		15.0		15.0	15.0					10.0	10.0	
Minimum Split (s)		27.0		27.0	27.0					26.5	26.5	
Total Split (s)		59.0		59.0	59.0					32.0	32.0	
Total Split (%)		64.8%		64.8%	64.8%					35.2%	35.2%	
Maximum Green (s)		53.6		53.6	53.6					26.4	26.4	
Yellow Time (s)		3.6		3.6	3.6					3.6	3.6	
All-Red Time (s)		1.8		1.8	1.8					2.0	2.0	
Lost Time Adjust (s)		0.0			0.0						0.0	
Total Lost Time (s)		5.4			5.4						5.6	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)		3.0		3.0	3.0					4.0	4.0	
Recall Mode		C-Max		C-Max	C-Max					None	None	
Walk Time (s)		8.0		8.0	8.0					7.0	7.0	
Flash Dont Walk (s)		7.0		7.0	7.0					7.0	7.0	
Pedestrian Calls (#/hr)		0		0	0					0	0	
Act Effct Green (s)		82.6			82.6						10.0	
Actuated g/C Ratio		0.91			0.91						0.11	
v/c Ratio		0.25			0.22						0.15	
Control Delay		1.8			1.2						27.8	
Queue Delay		0.0			0.0						0.0	
Total Delay		1.8			1.2						27.8	
LOS		A			A						C	
Approach Delay		1.8			1.2						27.8	
Approach LOS		A			A						C	
90th %ile Green (s)		70.0		70.0	70.0					10.0	10.0	
90th %ile Term Code		Coord		Coord	Coord					Min	Min	
70th %ile Green (s)		70.0		70.0	70.0					10.0	10.0	
70th %ile Term Code		Coord		Coord	Coord					Min	Min	
50th %ile Green (s)		85.6		85.6	85.6					0.0	0.0	
50th %ile Term Code		Coord		Coord	Coord					Skip	Skip	
30th %ile Green (s)		85.6		85.6	85.6					0.0	0.0	
30th %ile Term Code		Coord		Coord	Coord					Skip	Skip	
10th %ile Green (s)		85.6		85.6	85.6					0.0	0.0	
10th %ile Term Code		Coord		Coord	Coord					Skip	Skip	
Queue Length 50th (ft)		0			0						7	
Queue Length 95th (ft)		63			18						31	
Internal Link Dist (ft)		951			303			120			108	
Turn Bay Length (ft)												
Base Capacity (vph)		2817			2140						415	
Starvation Cap Reductn		0			0						0	
Spillback Cap Reductn		0			0						0	
Storage Cap Reductn		0			0						0	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Reduced v/c Ratio		0.25			0.22						0.06	

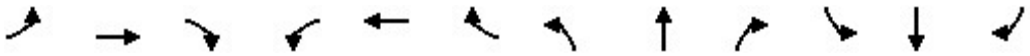
Intersection Summary			
Area Type:	Other		
Cycle Length: 91			
Actuated Cycle Length: 91			
Offset: 17 (19%), Referenced to phase 4:EBT and 8:WBTL, Start of Green			
Natural Cycle: 55			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.25			
Intersection Signal Delay: 2.0		Intersection LOS: A	
Intersection Capacity Utilization 53.0%		ICU Level of Service A	
Analysis Period (min) 15			

Splits and Phases: 3: S Ohio Av & Livinston Av /Livingston Av





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	42	525	0	0	388	84	41	117	41	0	0	0
Future Volume (vph)	42	525	0	0	388	84	41	117	41	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	150		0	0		0	0		0	0		0
Storage Lanes	0		0	0		0	0		0	0		0
Taper Length (ft)	25			0			0			0		
Lane Util. Factor	0.95	0.95	1.00	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		1.00			0.99			0.99				
Frt					0.973			0.972				
Flt Protected		0.996						0.990				
Satd. Flow (prot)	0	3188	0	0	3014	0	0	1446	0	0	0	0
Flt Permitted		0.887						0.990				
Satd. Flow (perm)	0	2833	0	0	3014	0	0	1438	0	0	0	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)					50			15				
Link Speed (mph)		35			35			35			35	
Link Distance (ft)		383			1949			182			211	
Travel Time (s)		7.5			38.0			3.5			4.1	
Confl. Peds. (#/hr)	19		7	7		19	15		3	3		15
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	5%	2%	0%	0%	4%	5%	7%	8%	2%	0%	0%	0%
Parking (#/hr)		5			5	5		5	5			
Adj. Flow (vph)	44	553	0	0	408	88	43	123	43	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	597	0	0	496	0	0	209	0	0	0	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.04	1.13	1.04	1.04	1.13	1.04	1.04	1.24	1.04	1.04	1.04	1.04
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2			2		1	2				
Detector Template	Left	Thru			Thru		Left	Thru				
Leading Detector (ft)	20	100			100		20	100				
Trailing Detector (ft)	0	0			0		0	0				
Detector 1 Position(ft)	0	0			0		0	0				
Detector 1 Size(ft)	20	6			6		20	6				
Detector 1 Type	Cl+Ex	Cl+Ex			Cl+Ex		Cl+Ex	Cl+Ex				
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0			0.0		0.0	0.0				
Detector 1 Queue (s)	0.0	0.0			0.0		0.0	0.0				
Detector 1 Delay (s)	0.0	0.0			0.0		0.0	0.0				
Detector 2 Position(ft)		94			94			94				
Detector 2 Size(ft)		6			6			6				
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex				
Detector 2 Channel												



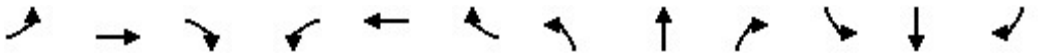
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 2 Extend (s)		0.0			0.0			0.0				
Turn Type	Perm	NA			NA		Perm	NA				
Protected Phases		4			8			2				
Permitted Phases	4						2					
Detector Phase	4	4			8		2	2				
Switch Phase												
Minimum Initial (s)	15.0	15.0			15.0		10.0	10.0				
Minimum Split (s)	26.5	26.5			27.0		19.8	19.8				
Total Split (s)	59.0	59.0			59.0		32.0	32.0				
Total Split (%)	64.8%	64.8%			64.8%		35.2%	35.2%				
Maximum Green (s)	54.3	54.3			54.3		27.2	27.2				
Yellow Time (s)	3.6	3.6			3.6		3.6	3.6				
All-Red Time (s)	1.1	1.1			1.1		1.2	1.2				
Lost Time Adjust (s)		0.0			0.0			0.0				
Total Lost Time (s)		4.7			4.7			4.8				
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	0.2	0.2			0.2		4.0	4.0				
Recall Mode	C-Max	C-Max			C-Max		None	None				
Walk Time (s)	8.0	8.0			8.0		7.0	7.0				
Flash Dont Walk (s)	7.0	7.0			7.0		8.0	8.0				
Pedestrian Calls (#/hr)	0	0			0		0	0				
Act Effct Green (s)		63.0			63.0			18.5				
Actuated g/C Ratio		0.69			0.69			0.20				
v/c Ratio		0.30			0.24			0.69				
Control Delay		5.3			7.7			42.2				
Queue Delay		0.0			0.0			0.0				
Total Delay		5.3			7.7			42.2				
LOS		A			A			D				
Approach Delay		5.3			7.7			42.2				
Approach LOS		A			A			D				
90th %ile Green (s)	55.9	55.9			55.9		25.6	25.6				
90th %ile Term Code	Coord	Coord			Coord		Gap	Gap				
70th %ile Green (s)	60.0	60.0			60.0		21.5	21.5				
70th %ile Term Code	Coord	Coord			Coord		Gap	Gap				
50th %ile Green (s)	63.0	63.0			63.0		18.5	18.5				
50th %ile Term Code	Coord	Coord			Coord		Gap	Gap				
30th %ile Green (s)	66.0	66.0			66.0		15.5	15.5				
30th %ile Term Code	Coord	Coord			Coord		Gap	Gap				
10th %ile Green (s)	70.3	70.3			70.3		11.2	11.2				
10th %ile Term Code	Coord	Coord			Coord		Gap	Gap				
Queue Length 50th (ft)		62			26			104				
Queue Length 95th (ft)		113			102			163				
Internal Link Dist (ft)		303			1869			102			131	
Turn Bay Length (ft)												
Base Capacity (vph)		1962			2103			440				
Starvation Cap Reductn		0			0			0				
Spillback Cap Reductn		0			0			0				
Storage Cap Reductn		0			0			0				

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Reduced v/c Ratio		0.30			0.24			0.47				

Intersection Summary			
Area Type:	Other		
Cycle Length: 91			
Actuated Cycle Length: 91			
Offset: 21 (23%), Referenced to phase 4:EBTL and 8:WBT, Start of Green			
Natural Cycle: 50			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.69			
Intersection Signal Delay: 12.1		Intersection LOS: B	
Intersection Capacity Utilization 59.0%		ICU Level of Service B	
Analysis Period (min) 15			

Splits and Phases: 4: S Champion Av & Livingston Av

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	542	87	293	363	2	105	4	265	0	1	4
Future Volume (vph)	0	542	87	293	363	2	105	4	265	0	1	4
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		150	110		0	75		0	0		0
Storage Lanes	0		0	1		0	1		0	0		0
Taper Length (ft)	25			25			0			0		
Lane Util. Factor	0.95	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		0.99		1.00	1.00		1.00	0.98			0.99	
Frt		0.979			0.999			0.852			0.892	
Flt Protected				0.950			0.950					
Satd. Flow (prot)	0	3123	0	1678	3113	0	1711	1482	0	0	1620	0
Flt Permitted				0.339			0.754					
Satd. Flow (perm)	0	3123	0	596	3113	0	1355	1482	0	0	1620	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		28			1			282			4	
Link Speed (mph)		35			35			35			25	
Link Distance (ft)		1949			512			199			214	
Travel Time (s)		38.0			10.0			3.9			5.8	
Confl. Peds. (#/hr)	4		6	6		4	1		2	2		1
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Heavy Vehicles (%)	0%	2%	2%	4%	5%	0%	2%	0%	4%	0%	0%	0%
Parking (#/hr)		5	5		5	5						
Adj. Flow (vph)	0	577	93	312	386	2	112	4	282	0	1	4
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	670	0	312	388	0	112	286	0	0	5	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		11			11			11			11	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.04	1.13	1.04	1.04	1.13	1.04	1.04	1.04	1.04	1.04	1.04	1.04
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2		1	2			2	
Detector Template	Left	Thru		Left	Thru		Left	Thru			Thru	
Leading Detector (ft)	20	100		20	100		20	100			100	
Trailing Detector (ft)	0	0		0	0		0	0			0	
Detector 1 Position(ft)	0	0		0	0		0	0			0	
Detector 1 Size(ft)	20	6		20	6		20	6			6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex			Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0			0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0			0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0			0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												

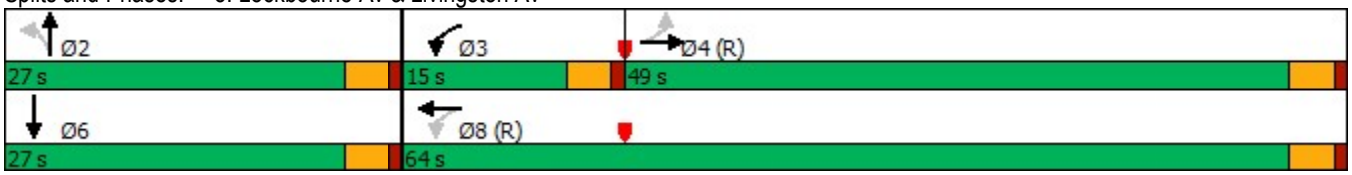


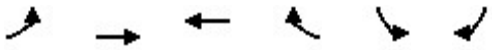
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type		NA		pm+pt	NA		Perm	NA			NA	
Protected Phases		4		3	8			2			6	
Permitted Phases	4			8			2					
Detector Phase	4	4		3	8		2	2			6	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0			5.0	
Minimum Split (s)	26.5	26.5		9.5	26.5		26.5	26.5			26.5	
Total Split (s)	49.0	49.0		15.0	64.0		27.0	27.0			27.0	
Total Split (%)	53.8%	53.8%		16.5%	70.3%		29.7%	29.7%			29.7%	
Maximum Green (s)	45.0	45.0		11.0	60.0		23.0	23.0			23.0	
Yellow Time (s)	3.0	3.0		3.0	3.0		3.0	3.0			3.0	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0			1.0	
Lost Time Adjust (s)		0.0		0.0	0.0		0.0	0.0			0.0	
Total Lost Time (s)		4.0		4.0	4.0		4.0	4.0			4.0	
Lead/Lag	Lag	Lag		Lead								
Lead-Lag Optimize?	Yes	Yes		Yes								
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0			3.0	
Recall Mode	C-Max	C-Max		None	C-Max		None	None			None	
Walk Time (s)	7.0	7.0			7.0		7.0	7.0			7.0	
Flash Dont Walk (s)	7.0	7.0			7.0		7.0	7.0			7.0	
Pedestrian Calls (#/hr)	0	0			0		0	0			0	
Act Effct Green (s)		55.5		70.0	70.0		13.0	13.0			13.0	
Actuated g/C Ratio		0.61		0.77	0.77		0.14	0.14			0.14	
v/c Ratio		0.35		0.53	0.16		0.58	0.63			0.02	
Control Delay		6.0		7.3	2.9		47.6	11.2			21.0	
Queue Delay		0.0		0.0	0.0		0.0	0.0			0.0	
Total Delay		6.0		7.3	2.9		47.6	11.2			21.0	
LOS		A		A	A		D	B			C	
Approach Delay		6.0			4.9			21.5			21.0	
Approach LOS		A			A			C			C	
90th %ile Green (s)	45.0	45.0		14.8	63.8		19.2	19.2			19.2	
90th %ile Term Code	Coord	Coord		Max	Coord		Gap	Gap			Hold	
70th %ile Green (s)	51.9	51.9		12.0	67.9		15.1	15.1			15.1	
70th %ile Term Code	Coord	Coord		Gap	Coord		Gap	Gap			Hold	
50th %ile Green (s)	56.0	56.0		10.2	70.2		12.8	12.8			12.8	
50th %ile Term Code	Coord	Coord		Gap	Coord		Gap	Gap			Hold	
30th %ile Green (s)	59.8	59.8		8.7	72.5		10.5	10.5			10.5	
30th %ile Term Code	Coord	Coord		Gap	Coord		Gap	Gap			Hold	
10th %ile Green (s)	64.6	64.6		7.2	75.8		7.2	7.2			7.2	
10th %ile Term Code	Coord	Coord		Gap	Coord		Gap	Gap			Hold	
Queue Length 50th (ft)		37		52	24		61	2			1	
Queue Length 95th (ft)		61		92	40		107	68			10	
Internal Link Dist (ft)		1869			432			119			134	
Turn Bay Length (ft)				110			75					
Base Capacity (vph)		1914		600	2396		342	585			412	
Starvation Cap Reductn		0		0	0		0	0			0	
Spillback Cap Reductn		0		0	0		0	0			0	
Storage Cap Reductn		0		0	0		0	0			0	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Reduced v/c Ratio		0.35		0.52	0.16		0.33	0.49			0.01	

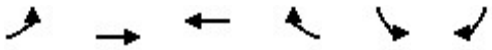
Intersection Summary			
Area Type:	Other		
Cycle Length: 91			
Actuated Cycle Length: 91			
Offset: 59 (65%), Referenced to phase 4:EBTL and 8:WBTL, Start of Green			
Natural Cycle: 65			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.63			
Intersection Signal Delay: 9.1		Intersection LOS: A	
Intersection Capacity Utilization 60.9%		ICU Level of Service B	
Analysis Period (min) 15			

Splits and Phases: 5: Lockbourne Av & Livingston Av





Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑	↑↑		↰	↱
Traffic Volume (vph)	0	798	403	0	152	290
Future Volume (vph)	0	798	403	0	152	290
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	0.95	0.95	1.00	1.00	1.00
Ped Bike Factor					1.00	
Frt						0.850
Flt Protected					0.950	
Satd. Flow (prot)	0	3176	3086	0	1662	1501
Flt Permitted					0.950	
Satd. Flow (perm)	0	3176	3086	0	1659	1501
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)						305
Link Speed (mph)		35	35		25	
Link Distance (ft)		512	577		267	
Travel Time (s)		10.0	11.2		7.3	
Confl. Peds. (#/hr)	3			3	1	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	0%	3%	6%	0%	5%	4%
Parking (#/hr)		5	5			
Adj. Flow (vph)	0	840	424	0	160	305
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	840	424	0	160	305
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(ft)		11	11		11	
Link Offset(ft)		0	0		0	
Crosswalk Width(ft)		16	16		16	
Two way Left Turn Lane						
Headway Factor	1.04	1.13	1.13	1.04	1.04	1.04
Turning Speed (mph)	15			9	15	9
Number of Detectors		2	2		1	1
Detector Template		Thru	Thru		Left	Right
Leading Detector (ft)		100	100		20	20
Trailing Detector (ft)		0	0		0	0
Detector 1 Position(ft)		0	0		0	0
Detector 1 Size(ft)		6	6		20	20
Detector 1 Type		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)		0.0	0.0		0.0	0.0
Detector 1 Queue (s)		0.0	0.0		0.0	0.0
Detector 1 Delay (s)		0.0	0.0		0.0	0.0
Detector 2 Position(ft)		94	94			
Detector 2 Size(ft)		6	6			
Detector 2 Type		Cl+Ex	Cl+Ex			
Detector 2 Channel						
Detector 2 Extend (s)		0.0	0.0			
Turn Type		NA	NA		Perm	Perm
Protected Phases		4	8			

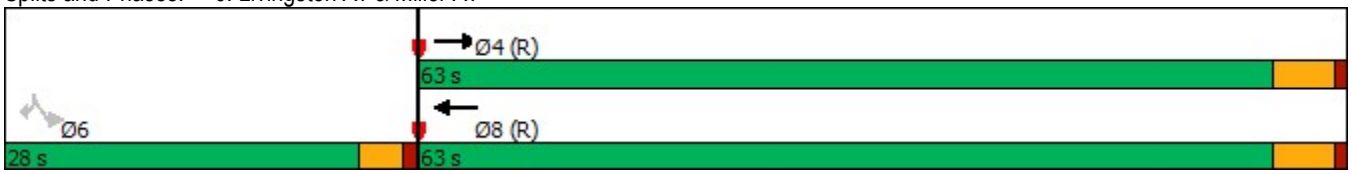


Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Permitted Phases					6	6
Detector Phase		4	8		6	6
Switch Phase						
Minimum Initial (s)		20.0	20.0		10.0	10.0
Minimum Split (s)		32.0	32.0		26.5	26.5
Total Split (s)		63.0	63.0		28.0	28.0
Total Split (%)		69.2%	69.2%		30.8%	30.8%
Maximum Green (s)		57.9	57.9		24.0	24.0
Yellow Time (s)		4.1	4.1		3.0	3.0
All-Red Time (s)		1.0	1.0		1.0	1.0
Lost Time Adjust (s)		0.0	0.0		0.0	0.0
Total Lost Time (s)		5.1	5.1		4.0	4.0
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)		1.0	1.0		4.0	4.0
Recall Mode		C-Max	C-Max		None	None
Walk Time (s)		13.0	13.0		7.0	7.0
Flash Dont Walk (s)		7.0	7.0		10.0	10.0
Pedestrian Calls (#/hr)		0	0		0	0
Act Effct Green (s)		66.6	66.6		15.3	15.3
Actuated g/C Ratio		0.73	0.73		0.17	0.17
v/c Ratio		0.36	0.19		0.57	0.60
Control Delay		2.8	3.8		42.2	9.2
Queue Delay		0.0	0.0		0.0	0.0
Total Delay		2.8	3.8		42.2	9.2
LOS		A	A		D	A
Approach Delay		2.8	3.8		20.6	
Approach LOS		A	A		C	
90th %ile Green (s)		60.8	60.8		21.1	21.1
90th %ile Term Code		Coord	Coord		Gap	Gap
70th %ile Green (s)		63.9	63.9		18.0	18.0
70th %ile Term Code		Coord	Coord		Gap	Gap
50th %ile Green (s)		67.0	67.0		14.9	14.9
50th %ile Term Code		Coord	Coord		Gap	Gap
30th %ile Green (s)		69.2	69.2		12.7	12.7
30th %ile Term Code		Coord	Coord		Gap	Gap
10th %ile Green (s)		71.9	71.9		10.0	10.0
10th %ile Term Code		Coord	Coord		Min	Min
Queue Length 50th (ft)		21	27		86	0
Queue Length 95th (ft)		30	47		138	65
Internal Link Dist (ft)		432	497		187	
Turn Bay Length (ft)						
Base Capacity (vph)		2323	2257		437	620
Starvation Cap Reductn		0	0		0	0
Spillback Cap Reductn		0	0		0	0
Storage Cap Reductn		0	0		0	0
Reduced v/c Ratio		0.36	0.19		0.37	0.49

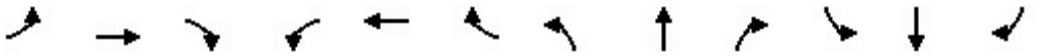
Intersection Summary

Area Type:	Other		
Cycle Length: 91			
Actuated Cycle Length: 91			
Offset: 69 (76%), Referenced to phase 4:EBT and 8:WBT, Start of Green			
Natural Cycle: 60			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.60			
Intersection Signal Delay: 7.8		Intersection LOS: A	
Intersection Capacity Utilization 42.2%		ICU Level of Service A	
Analysis Period (min) 15			

Splits and Phases: 6: Livingston Av & Miller Av



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	279	655	0	0	391	94	8	73	22	0	0	0
Future Volume (vph)	279	655	0	0	391	94	8	73	22	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	150		0	0		0	0		0	0		0
Storage Lanes	0		0	0		0	0		1	0		0
Taper Length (ft)	25			0			0			0		
Lane Util. Factor	0.95	0.95	1.00	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor								1.00	0.98			
Frt					0.971				0.850			
Flt Protected		0.985						0.995				
Satd. Flow (prot)	0	3129	0	0	3025	0	0	1787	1487	0	0	0
Flt Permitted		0.671						0.995				
Satd. Flow (perm)	0	2131	0	0	3025	0	0	1787	1456	0	0	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)					65				29			
Link Speed (mph)		35			35			25			25	
Link Distance (ft)		577			1576			192			127	
Travel Time (s)		11.2			30.7			5.2			3.5	
Confl. Peds. (#/hr)			2	2			2		5	5		2
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles (%)	3%	3%	0%	0%	6%	1%	13%	1%	5%	0%	0%	0%
Parking (#/hr)		5			5	5						
Adj. Flow (vph)	300	704	0	0	420	101	9	78	24	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	1004	0	0	521	0	0	87	24	0	0	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.04	1.13	1.04	1.04	1.13	1.04	1.04	1.04	1.04	1.04	1.04	1.04
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2			2		1	2	1			
Detector Template	Left	Thru			Thru		Left	Thru	Right			
Leading Detector (ft)	20	100			100		20	100	20			
Trailing Detector (ft)	0	0			0		0	0	0			
Detector 1 Position(ft)	0	0			0		0	0	0			
Detector 1 Size(ft)	20	6			6		20	6	20			
Detector 1 Type	Cl+Ex	Cl+Ex			Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex			
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0			0.0		0.0	0.0	0.0			
Detector 1 Queue (s)	0.0	0.0			0.0		0.0	0.0	0.0			
Detector 1 Delay (s)	0.0	0.0			0.0		0.0	0.0	0.0			
Detector 2 Position(ft)		94			94			94				
Detector 2 Size(ft)		6			6			6				
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex				
Detector 2 Channel												

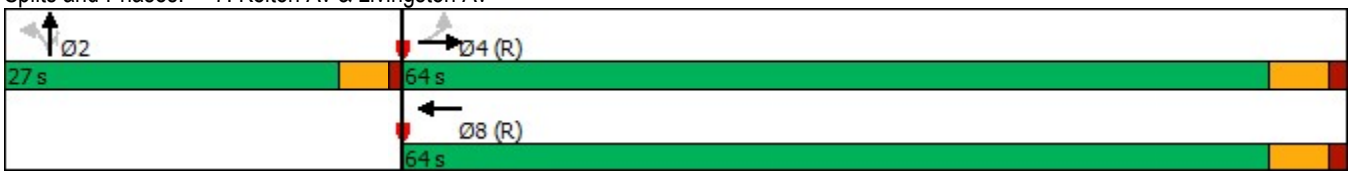


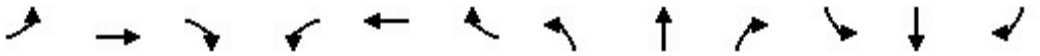
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 2 Extend (s)		0.0			0.0			0.0				
Turn Type	Perm	NA			NA		Perm	NA	Perm			
Protected Phases		4			8			2				
Permitted Phases	4						2		2			
Detector Phase	4	4			8		2	2	2			
Switch Phase												
Minimum Initial (s)	15.0	15.0			15.0		10.0	10.0	10.0			
Minimum Split (s)	27.0	27.0			27.0		26.5	26.5	26.5			
Total Split (s)	64.0	64.0			64.0		27.0	27.0	27.0			
Total Split (%)	70.3%	70.3%			70.3%		29.7%	29.7%	29.7%			
Maximum Green (s)	58.6	58.6			58.6		22.6	22.6	22.6			
Yellow Time (s)	4.1	4.1			4.1		3.4	3.4	3.4			
All-Red Time (s)	1.3	1.3			1.3		1.0	1.0	1.0			
Lost Time Adjust (s)		0.0			0.0			0.0	0.0			
Total Lost Time (s)		5.4			5.4			4.4	4.4			
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.7	3.7			3.7		4.0	4.0	4.0			
Recall Mode	C-Max	C-Max			C-Max		None	None	None			
Walk Time (s)	8.0	8.0			8.0		7.0	7.0	7.0			
Flash Dont Walk (s)	7.0	7.0			7.0		8.0	8.0	8.0			
Pedestrian Calls (#/hr)	0	0			0		0	0	0			
Act Effct Green (s)		73.7			73.7			11.5	11.5			
Actuated g/C Ratio		0.81			0.81			0.13	0.13			
v/c Ratio		0.58			0.21			0.39	0.12			
Control Delay		7.5			1.7			41.3	12.4			
Queue Delay		0.0			0.0			0.0	0.0			
Total Delay		7.5			1.7			41.3	12.4			
LOS		A			A			D	B			
Approach Delay		7.5			1.7			35.1				
Approach LOS		A			A			D				
90th %ile Green (s)	66.8	66.8			66.8		14.4	14.4	14.4			
90th %ile Term Code	Coord	Coord			Coord		Gap	Gap	Gap			
70th %ile Green (s)	69.0	69.0			69.0		12.2	12.2	12.2			
70th %ile Term Code	Coord	Coord			Coord		Gap	Gap	Gap			
50th %ile Green (s)	70.5	70.5			70.5		10.7	10.7	10.7			
50th %ile Term Code	Coord	Coord			Coord		Gap	Gap	Gap			
30th %ile Green (s)	71.2	71.2			71.2		10.0	10.0	10.0			
30th %ile Term Code	Coord	Coord			Coord		Min	Min	Min			
10th %ile Green (s)	85.6	85.6			85.6		0.0	0.0	0.0			
10th %ile Term Code	Coord	Coord			Coord		Skip	Skip	Skip			
Queue Length 50th (ft)		218			10			47	0			
Queue Length 95th (ft)		291			14			90	20			
Internal Link Dist (ft)		497			1496			112			47	
Turn Bay Length (ft)												
Base Capacity (vph)		1725			2462			443	383			
Starvation Cap Reductn		0			0			0	0			
Spillback Cap Reductn		0			0			0	0			
Storage Cap Reductn		0			0			0	0			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Reduced v/c Ratio		0.58			0.21			0.20	0.06			

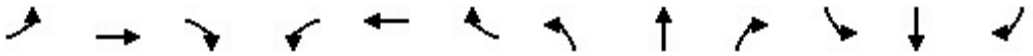
Intersection Summary			
Area Type:	Other		
Cycle Length: 91			
Actuated Cycle Length: 91			
Offset: 81 (89%), Referenced to phase 4:EBTL and 8:WBT, Start of Green			
Natural Cycle: 65			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.58			
Intersection Signal Delay: 7.5		Intersection LOS: A	
Intersection Capacity Utilization 63.5%		ICU Level of Service B	
Analysis Period (min) 15			

Splits and Phases: 7: Kelton Av & Livingston Av





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	29	610	48	36	420	43	24	268	48	29	208	39
Future Volume (vph)	29	610	48	36	420	43	24	268	48	29	208	39
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	150		0	150		0	0		0	0		0
Storage Lanes	0		0	0		0	0		0	0		0
Taper Length (ft)	25			25			0			0		
Lane Util. Factor	0.95	0.95	0.95	0.95	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		1.00			0.99			1.00			1.00	
Frt		0.989			0.987			0.981			0.981	
Flt Protected		0.998			0.996			0.997			0.995	
Satd. Flow (prot)	0	3106	0	0	3044	0	0	1696	0	0	1680	0
Flt Permitted		0.916			0.865			0.965			0.905	
Satd. Flow (perm)	0	2849	0	0	2641	0	0	1640	0	0	1527	0
Right Turn on Red			Yes			Yes			Yes			No
Satd. Flow (RTOR)		14			17			10				
Link Speed (mph)		35			35			35			35	
Link Distance (ft)		1576			932			368			414	
Travel Time (s)		30.7			18.2			7.2			8.1	
Confl. Peds. (#/hr)	11		13	13		11	9		10	10		9
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	14%	3%	4%	11%	4%	12%	25%	4%	4%	3%	7%	5%
Parking (#/hr)		5	5		5	5						
Adj. Flow (vph)	31	642	51	38	442	45	25	282	51	31	219	41
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	724	0	0	525	0	0	358	0	0	291	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.04	1.13	1.04	1.04	1.13	1.04	1.04	1.04	1.04	1.04	1.04	1.04
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (ft)	20	100		20	100		20	100		20	100	
Trailing Detector (ft)	0	0		0	0		0	0		0	0	
Detector 1 Position(ft)	0	0		0	0		0	0		0	0	
Detector 1 Size(ft)	20	6		20	6		20	6		20	6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												

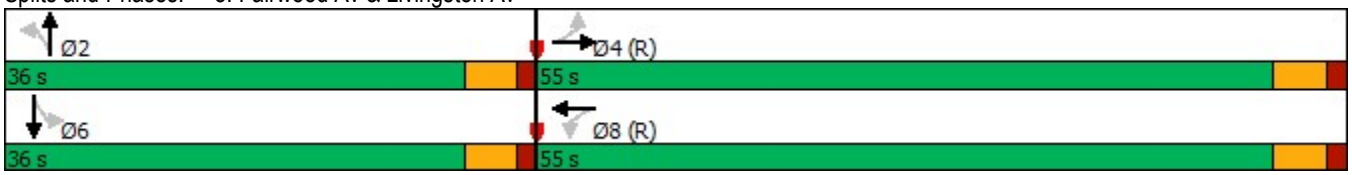


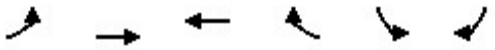
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	15.0	15.0		15.0	15.0		10.0	10.0		10.0	10.0	
Minimum Split (s)	27.0	27.0		27.0	27.0		26.5	26.5		26.5	26.5	
Total Split (s)	55.0	55.0		55.0	55.0		36.0	36.0		36.0	36.0	
Total Split (%)	60.4%	60.4%		60.4%	60.4%		39.6%	39.6%		39.6%	39.6%	
Maximum Green (s)	49.9	49.9		49.9	49.9		31.1	31.1		31.1	31.1	
Yellow Time (s)	3.6	3.6		3.6	3.6		3.6	3.6		3.6	3.6	
All-Red Time (s)	1.5	1.5		1.5	1.5		1.3	1.3		1.3	1.3	
Lost Time Adjust (s)		0.0			0.0			0.0			0.0	
Total Lost Time (s)		5.1			5.1			4.9			4.9	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		4.0	4.0		4.0	4.0	
Recall Mode	C-Max	C-Max		C-Max	C-Max		None	None		None	None	
Walk Time (s)	8.0	8.0		8.0	8.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	
Act Effct Green (s)		56.1			56.1			24.9			24.9	
Actuated g/C Ratio		0.62			0.62			0.27			0.27	
v/c Ratio		0.41			0.32			0.79			0.70	
Control Delay		14.1			9.5			41.8			38.2	
Queue Delay		0.0			0.0			0.0			0.0	
Total Delay		14.1			9.5			41.8			38.2	
LOS		B			A			D			D	
Approach Delay		14.1			9.5			41.8			38.3	
Approach LOS		B			A			D			D	
90th %ile Green (s)	49.9	49.9		49.9	49.9		31.1	31.1		31.1	31.1	
90th %ile Term Code	Coord	Coord		Coord	Coord		Max	Max		Hold	Hold	
70th %ile Green (s)	52.3	52.3		52.3	52.3		28.7	28.7		28.7	28.7	
70th %ile Term Code	Coord	Coord		Coord	Coord		Gap	Gap		Hold	Hold	
50th %ile Green (s)	55.5	55.5		55.5	55.5		25.5	25.5		25.5	25.5	
50th %ile Term Code	Coord	Coord		Coord	Coord		Gap	Gap		Hold	Hold	
30th %ile Green (s)	58.8	58.8		58.8	58.8		22.2	22.2		22.2	22.2	
30th %ile Term Code	Coord	Coord		Coord	Coord		Gap	Gap		Hold	Hold	
10th %ile Green (s)	63.9	63.9		63.9	63.9		17.1	17.1		17.1	17.1	
10th %ile Term Code	Coord	Coord		Coord	Coord		Gap	Gap		Hold	Hold	
Queue Length 50th (ft)		114			67			184			149	
Queue Length 95th (ft)		196			115			263			217	
Internal Link Dist (ft)		1496			852			288			334	
Turn Bay Length (ft)												
Base Capacity (vph)		1761			1634			567			521	
Starvation Cap Reductn		0			0			0			0	
Spillback Cap Reductn		0			0			0			0	
Storage Cap Reductn		0			0			0			0	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Reduced v/c Ratio		0.41			0.32			0.63			0.56	

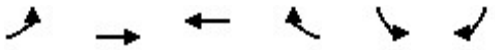
Intersection Summary			
Area Type:	Other		
Cycle Length: 91			
Actuated Cycle Length: 91			
Offset: 71 (78%), Referenced to phase 4:EBTL and 8:WBTL, Start of Green			
Natural Cycle: 55			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.79			
Intersection Signal Delay: 21.8		Intersection LOS: C	
Intersection Capacity Utilization 68.3%		ICU Level of Service C	
Analysis Period (min) 15			

Splits and Phases: 8: Fairwood Av & Livingston Av

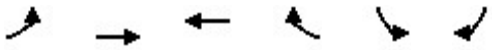




Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	64	802	588	216	166	68
Future Volume (vph)	64	802	588	216	166	68
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	150			0	0	0
Storage Lanes	0			0	1	0
Taper Length (ft)	25				0	
Lane Util. Factor	0.95	0.95	0.95	0.95	1.00	1.00
Ped Bike Factor		1.00	0.99		0.99	
Frt			0.960		0.961	
Flt Protected		0.996			0.966	
Satd. Flow (prot)	0	3192	3009	0	1653	0
Flt Permitted		0.800			0.966	
Satd. Flow (perm)	0	2563	3009	0	1644	0
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)			105		15	
Link Speed (mph)		35	35		35	
Link Distance (ft)		841	588		385	
Travel Time (s)		16.4	11.5		7.5	
Confl. Peds. (#/hr)	5			5	3	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	3%	2%	3%	4%	2%	6%
Parking (#/hr)	5	5	5	5		
Adj. Flow (vph)	67	844	619	227	175	72
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	911	846	0	247	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(ft)		11	11		11	
Link Offset(ft)		0	0		0	
Crosswalk Width(ft)		16	16		16	
Two way Left Turn Lane						
Headway Factor	1.04	1.13	1.13	1.04	1.04	1.04
Turning Speed (mph)	15			9	15	9
Number of Detectors	1	2	2		1	
Detector Template	Left	Thru	Thru		Left	
Leading Detector (ft)	20	100	100		20	
Trailing Detector (ft)	0	0	0		0	
Detector 1 Position(ft)	0	0	0		0	
Detector 1 Size(ft)	20	6	6		20	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0		0.0	
Detector 1 Queue (s)	0.0	0.0	0.0		0.0	
Detector 1 Delay (s)	0.0	0.0	0.0		0.0	
Detector 2 Position(ft)		94	94			
Detector 2 Size(ft)		6	6			
Detector 2 Type		Cl+Ex	Cl+Ex			
Detector 2 Channel						



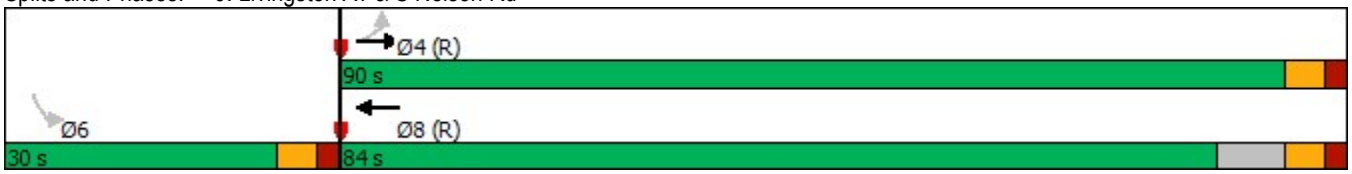
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Detector 2 Extend (s)		0.0	0.0			
Turn Type	Perm	NA	NA		Perm	
Protected Phases		4	8			
Permitted Phases	4				6	
Detector Phase	4	4	8		6	
Switch Phase						
Minimum Initial (s)	15.0	15.0	15.0		10.0	
Minimum Split (s)	27.0	27.0	27.0		26.5	
Total Split (s)	90.0	90.0	84.0		30.0	
Total Split (%)	75.0%	75.0%	70.0%		25.0%	
Maximum Green (s)	84.2	84.2	78.2		24.3	
Yellow Time (s)	3.6	3.6	3.6		3.6	
All-Red Time (s)	2.2	2.2	2.2		2.1	
Lost Time Adjust (s)		0.0	0.0		0.0	
Total Lost Time (s)		5.8	5.8		5.7	
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	0.2	0.2	0.2		4.0	
Recall Mode	C-Max	C-Max	C-Max		None	
Walk Time (s)	8.0	8.0	8.0		7.0	
Flash Dont Walk (s)	7.0	7.0	7.0		7.0	
Pedestrian Calls (#/hr)	0	0	0		0	
Act Effct Green (s)		87.0	87.0		21.5	
Actuated g/C Ratio		0.72	0.72		0.18	
v/c Ratio		0.49	0.38		0.81	
Control Delay		8.5	6.2		64.2	
Queue Delay		0.0	0.0		0.0	
Total Delay		8.5	6.2		64.2	
LOS		A	A		E	
Approach Delay		8.5	6.2		64.2	
Approach LOS		A	A		E	
90th %ile Green (s)	84.2	84.2	84.2		24.3	
90th %ile Term Code	Coord	Coord	Coord		Max	
70th %ile Green (s)	84.2	84.2	84.2		24.3	
70th %ile Term Code	Coord	Coord	Coord		Max	
50th %ile Green (s)	85.2	85.2	85.2		23.3	
50th %ile Term Code	Coord	Coord	Coord		Gap	
30th %ile Green (s)	88.4	88.4	88.4		20.1	
30th %ile Term Code	Coord	Coord	Coord		Gap	
10th %ile Green (s)	93.1	93.1	93.1		15.4	
10th %ile Term Code	Coord	Coord	Coord		Gap	
Queue Length 50th (ft)		148	105		171	
Queue Length 95th (ft)		198	142		#270	
Internal Link Dist (ft)		761	508		305	
Turn Bay Length (ft)						
Base Capacity (vph)		1858	2210		344	
Starvation Cap Reductn		0	0		0	
Spillback Cap Reductn		0	0		0	
Storage Cap Reductn		0	0		0	

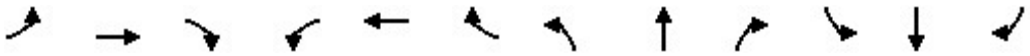


Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Reduced v/c Ratio		0.49	0.38		0.72	

Intersection Summary			
Area Type:	Other		
Cycle Length: 120			
Actuated Cycle Length: 120			
Offset: 49 (41%), Referenced to phase 4:EBTL and 8:WBT, Start of Green			
Natural Cycle: 60			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.81			
Intersection Signal Delay: 14.4		Intersection LOS: B	
Intersection Capacity Utilization 75.1%		ICU Level of Service D	
Analysis Period (min) 15			
# 95th percentile volume exceeds capacity, queue may be longer.			
Queue shown is maximum after two cycles.			

Splits and Phases: 9: Livingston Av & S Nelson Rd



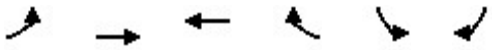


Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	5	494	0	0	354	4	51	6	51	12	0	19
Future Volume (Veh/h)	5	494	0	0	354	4	51	6	51	12	0	19
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Hourly flow rate (vph)	6	574	0	0	412	5	59	7	59	14	0	22
Pedestrians					3			11			7	
Lane Width (ft)					11.0			11.0			11.0	
Walking Speed (ft/s)					3.5			3.5			3.5	
Percent Blockage					0			1			1	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)		440			1031							
pX, platoon unblocked				0.97			0.97	0.97	0.97	0.97	0.97	
vC, conflicting volume	424			585			825	1021	301	786	1018	216
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	424			521			767	968	229	727	966	216
tC, single (s)	4.1			4.1			7.6	6.8	6.9	7.8	6.5	7.0
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.6	4.2	3.3	3.7	4.0	3.3
p0 queue free %	99			100			78	97	92	94	100	97
cM capacity (veh/h)	1139			1019			262	218	744	243	245	775

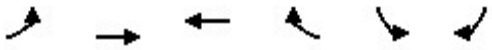
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	197	383	275	142	125	36
Volume Left	6	0	0	0	59	14
Volume Right	0	0	0	5	59	22
cSH	1139	1700	1700	1700	372	419
Volume to Capacity	0.01	0.23	0.16	0.08	0.34	0.09
Queue Length 95th (ft)	0	0	0	0	36	7
Control Delay (s)	0.3	0.0	0.0	0.0	19.5	14.4
Lane LOS	A				C	B
Approach Delay (s)	0.1		0.0		19.5	14.4
Approach LOS					C	B

Intersection Summary				
Average Delay	2.6			
Intersection Capacity Utilization	33.2%	ICU Level of Service	A	
Analysis Period (min)	15			

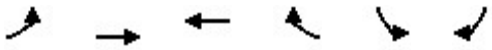
Design Year “No Build” Synchro Outputs



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	93	183	370	58	43	157
Future Volume (vph)	93	183	370	58	43	157
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	100			0	0	0
Storage Lanes	0			0	1	1
Taper Length (ft)	25				0	
Lane Util. Factor	0.95	0.95	0.95	0.95	1.00	1.00
Ped Bike Factor		1.00	1.00		1.00	0.97
Frt			0.980			0.850
Flt Protected		0.983			0.950	
Satd. Flow (prot)	0	3196	3089	0	1711	1546
Flt Permitted		0.719			0.950	
Satd. Flow (perm)	0	2336	3089	0	1709	1501
Right Turn on Red				Yes		No
Satd. Flow (RTOR)			32			
Link Speed (mph)		35	35		25	
Link Distance (ft)		304	440		328	
Travel Time (s)		5.9	8.6		8.9	
Confl. Peds. (#/hr)	2			2	1	15
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles (%)	10%	6%	4%	0%	2%	1%
Parking (#/hr)			5	5		
Adj. Flow (vph)	100	197	398	62	46	169
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	297	460	0	46	169
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(ft)		0	0		11	
Link Offset(ft)		0	0		0	
Crosswalk Width(ft)		16	16		16	
Two way Left Turn Lane						
Headway Factor	1.04	1.04	1.13	1.04	1.04	1.04
Turning Speed (mph)	15			9	15	9
Number of Detectors	1	2	2		1	1
Detector Template	Left	Thru	Thru		Left	Right
Leading Detector (ft)	20	100	100		20	20
Trailing Detector (ft)	0	0	0		0	0
Detector 1 Position(ft)	0	0	0		0	0
Detector 1 Size(ft)	20	6	6		20	20
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0		0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0		0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0		0.0	0.0
Detector 2 Position(ft)		94	94			
Detector 2 Size(ft)		6	6			
Detector 2 Type		Cl+Ex	Cl+Ex			
Detector 2 Channel						



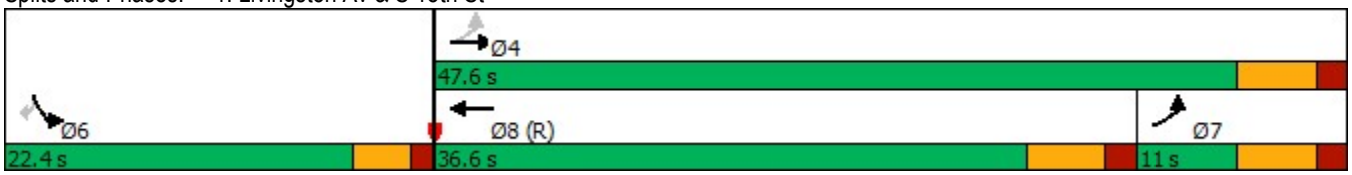
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Detector 2 Extend (s)		0.0	0.0			
Turn Type	pm+pt	NA	NA		Prot	Perm
Protected Phases	7	4	8		6	
Permitted Phases	4					6
Detector Phase	7	4	8		6	6
Switch Phase						
Minimum Initial (s)	5.0	7.0	16.0		10.0	10.0
Minimum Split (s)	10.8	21.8	21.8		22.3	22.3
Total Split (s)	11.0	47.6	36.6		22.4	22.4
Total Split (%)	15.7%	68.0%	52.3%		32.0%	32.0%
Maximum Green (s)	5.2	41.8	30.8		18.1	18.1
Yellow Time (s)	4.1	4.1	4.1		3.0	3.0
All-Red Time (s)	1.7	1.7	1.7		1.3	1.3
Lost Time Adjust (s)		0.0	0.0		0.0	0.0
Total Lost Time (s)		5.8	5.8		4.3	4.3
Lead/Lag	Lag		Lead			
Lead-Lag Optimize?	Yes		Yes			
Vehicle Extension (s)	3.7	3.7	3.7		5.0	5.0
Recall Mode	None	Max	C-Max		None	None
Walk Time (s)		7.0	7.0		7.0	7.0
Flash Dont Walk (s)		9.0	9.0		11.0	11.0
Pedestrian Calls (#/hr)		0	0		0	0
Act Effct Green (s)		45.4	45.4		14.5	14.5
Actuated g/C Ratio		0.65	0.65		0.21	0.21
v/c Ratio		0.20	0.23		0.13	0.54
Control Delay		5.9	6.2		22.0	31.0
Queue Delay		0.0	0.0		0.0	0.0
Total Delay		5.9	6.2		22.0	31.0
LOS		A	A		C	C
Approach Delay		5.9	6.2		29.1	
Approach LOS		A	A		C	
90th %ile Green (s)	0.0	41.8	41.8		18.1	18.1
90th %ile Term Code	Skip	Coord	Coord		Max	Max
70th %ile Green (s)	0.0	43.0	43.0		16.9	16.9
70th %ile Term Code	Skip	Coord	Coord		Gap	Gap
50th %ile Green (s)	0.0	45.1	45.1		14.8	14.8
50th %ile Term Code	Skip	Coord	Coord		Gap	Gap
30th %ile Green (s)	0.0	47.2	47.2		12.7	12.7
30th %ile Term Code	Skip	Coord	Coord		Gap	Gap
10th %ile Green (s)	0.0	49.9	49.9		10.0	10.0
10th %ile Term Code	Skip	Coord	Coord		Min	Min
Queue Length 50th (ft)		23	63		16	65
Queue Length 95th (ft)		45	95		39	115
Internal Link Dist (ft)		224	360		248	
Turn Bay Length (ft)						
Base Capacity (vph)		1515	2014		442	388
Starvation Cap Reductn		0	0		0	0
Spillback Cap Reductn		0	0		0	0
Storage Cap Reductn		0	0		0	0

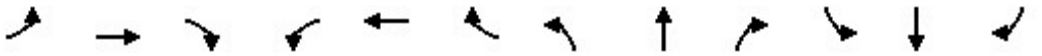


Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Reduced v/c Ratio		0.20	0.23		0.10	0.44

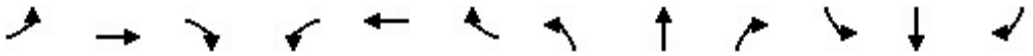
Intersection Summary			
Area Type:	Other		
Cycle Length: 70			
Actuated Cycle Length: 70			
Offset: 63 (90%), Referenced to phase 8:WBT, Start of Green			
Natural Cycle: 55			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.54			
Intersection Signal Delay: 11.2		Intersection LOS: B	
Intersection Capacity Utilization 45.3%		ICU Level of Service A	
Analysis Period (min) 15			

Splits and Phases: 1: Livingston Av & S 18th St





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	249	50	46	485	0	0	0	0	8	2	10
Future Volume (vph)	0	249	50	46	485	0	0	0	0	8	2	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	150		0	150		0	0		0	0		0
Storage Lanes	0		0	0		0	0		0	0		0
Taper Length (ft)	25			25			0			0		
Lane Util. Factor	1.00	0.95	0.95	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		1.00			1.00						0.99	
Frt		0.975									0.932	
Flt Protected					0.996						0.980	
Satd. Flow (prot)	0	3017	0	0	3083	0	0	0	0	0	1377	0
Flt Permitted					0.897						0.980	
Satd. Flow (perm)	0	3017	0	0	2776	0	0	0	0	0	1377	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		53									11	
Link Speed (mph)		35			35			35			35	
Link Distance (ft)		1031			383			200			188	
Travel Time (s)		20.1			7.5			3.9			3.7	
Confl. Peds. (#/hr)	5		1	1		5	3					3
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Heavy Vehicles (%)	0%	4%	12%	13%	5%	0%	0%	0%	0%	14%	0%	0%
Parking (#/hr)		5	5		5						5	5
Adj. Flow (vph)	0	283	57	52	551	0	0	0	0	9	2	11
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	340	0	0	603	0	0	0	0	0	22	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.04	1.13	1.04	1.04	1.13	1.04	1.04	1.04	1.04	1.04	1.24	1.04
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors		2		1	2					1	2	
Detector Template		Thru		Left	Thru					Left	Thru	
Leading Detector (ft)		100		20	100					20	100	
Trailing Detector (ft)		0		0	0					0	0	
Detector 1 Position(ft)		0		0	0					0	0	
Detector 1 Size(ft)		6		20	6					20	6	
Detector 1 Type		Cl+Ex		Cl+Ex	Cl+Ex					Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)		0.0		0.0	0.0					0.0	0.0	
Detector 1 Queue (s)		0.0		0.0	0.0					0.0	0.0	
Detector 1 Delay (s)		0.0		0.0	0.0					0.0	0.0	
Detector 2 Position(ft)		94			94						94	
Detector 2 Size(ft)		6			6						6	
Detector 2 Type		Cl+Ex			Cl+Ex						Cl+Ex	
Detector 2 Channel												

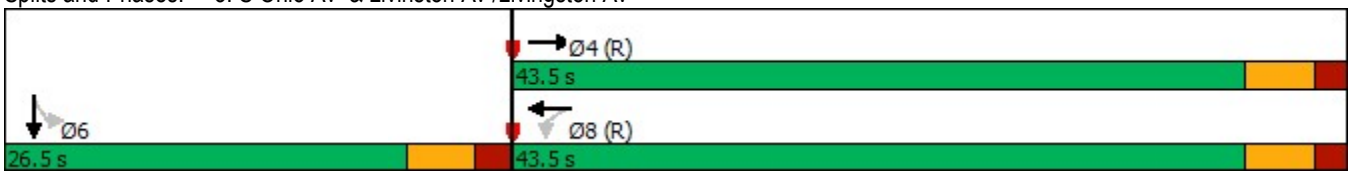


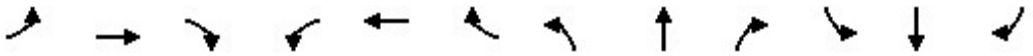
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 2 Extend (s)		0.0			0.0						0.0	
Turn Type		NA		Perm	NA					Perm	NA	
Protected Phases		4			8						6	
Permitted Phases				8						6		
Detector Phase		4		8	8					6	6	
Switch Phase												
Minimum Initial (s)		15.0		15.0	15.0					10.0	10.0	
Minimum Split (s)		27.0		27.0	27.0					26.5	26.5	
Total Split (s)		43.5		43.5	43.5					26.5	26.5	
Total Split (%)		62.1%		62.1%	62.1%					37.9%	37.9%	
Maximum Green (s)		38.1		38.1	38.1					20.9	20.9	
Yellow Time (s)		3.6		3.6	3.6					3.6	3.6	
All-Red Time (s)		1.8		1.8	1.8					2.0	2.0	
Lost Time Adjust (s)		0.0			0.0						0.0	
Total Lost Time (s)		5.4			5.4						5.6	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)		3.0		3.0	3.0					4.0	4.0	
Recall Mode		C-Max		C-Max	C-Max					None	None	
Walk Time (s)		8.0		8.0	8.0					7.0	7.0	
Flash Dont Walk (s)		7.0		7.0	7.0					7.0	7.0	
Pedestrian Calls (#/hr)		0		0	0					0	0	
Act Effct Green (s)		65.8			65.8						10.0	
Actuated g/C Ratio		0.94			0.94						0.14	
v/c Ratio		0.12			0.23						0.11	
Control Delay		0.9			0.5						20.1	
Queue Delay		0.0			0.0						0.0	
Total Delay		0.9			0.5						20.1	
LOS		A			A						C	
Approach Delay		0.9			0.5						20.1	
Approach LOS		A			A						C	
90th %ile Green (s)		49.0		49.0	49.0					10.0	10.0	
90th %ile Term Code		Coord		Coord	Coord					Min	Min	
70th %ile Green (s)		64.6		64.6	64.6					0.0	0.0	
70th %ile Term Code		Coord		Coord	Coord					Skip	Skip	
50th %ile Green (s)		64.6		64.6	64.6					0.0	0.0	
50th %ile Term Code		Coord		Coord	Coord					Skip	Skip	
30th %ile Green (s)		64.6		64.6	64.6					0.0	0.0	
30th %ile Term Code		Coord		Coord	Coord					Skip	Skip	
10th %ile Green (s)		64.6		64.6	64.6					0.0	0.0	
10th %ile Term Code		Coord		Coord	Coord					Skip	Skip	
Queue Length 50th (ft)		0			0						4	
Queue Length 95th (ft)		21			17						22	
Internal Link Dist (ft)		951			303			120			108	
Turn Bay Length (ft)												
Base Capacity (vph)		2839			2609						418	
Starvation Cap Reductn		0			0						0	
Spillback Cap Reductn		0			0						0	
Storage Cap Reductn		0			0						0	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Reduced v/c Ratio		0.12			0.23						0.05	

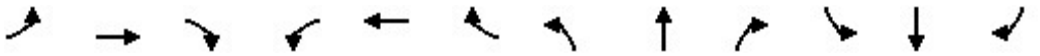
Intersection Summary			
Area Type:	Other		
Cycle Length: 70			
Actuated Cycle Length: 70			
Offset: 28 (40%), Referenced to phase 4:EBT and 8:WBTL, Start of Green			
Natural Cycle: 55			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.23			
Intersection Signal Delay: 1.1		Intersection LOS: A	
Intersection Capacity Utilization 49.6%		ICU Level of Service A	
Analysis Period (min) 15			

Splits and Phases: 3: S Ohio Av & Livinston Av /Livingston Av





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	24	231	0	0	481	52	52	86	25	0	0	0
Future Volume (vph)	24	231	0	0	481	52	52	86	25	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	150		0	0		0	0		0	0		0
Storage Lanes	0		0	0		0	0		0	0		0
Taper Length (ft)	25			0			0			0		
Lane Util. Factor	0.95	0.95	1.00	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		1.00			1.00			1.00				
Frt					0.985			0.979				
Flt Protected		0.995						0.984				
Satd. Flow (prot)	0	3141	0	0	3047	0	0	1414	0	0	0	0
Flt Permitted		0.886						0.984				
Satd. Flow (perm)	0	2796	0	0	3047	0	0	1412	0	0	0	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)					27			13				
Link Speed (mph)		30			30			35			35	
Link Distance (ft)		383			1949			182			211	
Travel Time (s)		8.7			44.3			3.5			4.1	
Confl. Peds. (#/hr)	6					6	2					2
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Heavy Vehicles (%)	0%	4%	0%	0%	6%	0%	15%	9%	0%	0%	0%	0%
Parking (#/hr)		5			5	5		5	5			
Adj. Flow (vph)	27	260	0	0	540	58	58	97	28	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	287	0	0	598	0	0	183	0	0	0	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.04	1.13	1.04	1.04	1.13	1.04	1.04	1.24	1.04	1.04	1.04	1.04
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2			2		1	2				
Detector Template	Left	Thru			Thru		Left	Thru				
Leading Detector (ft)	20	100			100		20	100				
Trailing Detector (ft)	0	0			0		0	0				
Detector 1 Position(ft)	0	0			0		0	0				
Detector 1 Size(ft)	20	6			6		20	6				
Detector 1 Type	Cl+Ex	Cl+Ex			Cl+Ex		Cl+Ex	Cl+Ex				
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0			0.0		0.0	0.0				
Detector 1 Queue (s)	0.0	0.0			0.0		0.0	0.0				
Detector 1 Delay (s)	0.0	0.0			0.0		0.0	0.0				
Detector 2 Position(ft)		94			94			94				
Detector 2 Size(ft)		6			6			6				
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex				
Detector 2 Channel												

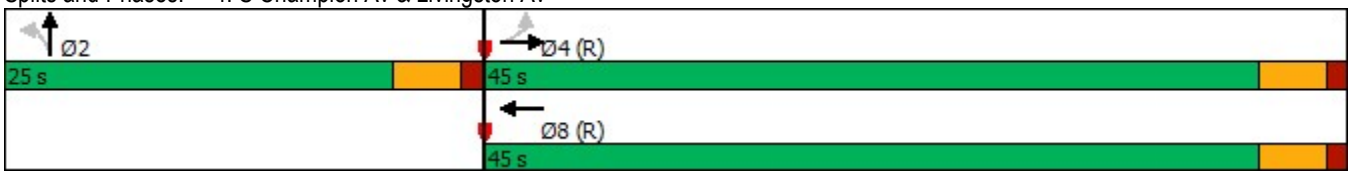


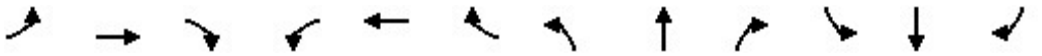
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 2 Extend (s)		0.0			0.0			0.0				
Turn Type	Perm	NA			NA		Perm	NA				
Protected Phases		4			8			2				
Permitted Phases	4						2					
Detector Phase	4	4			8		2	2				
Switch Phase												
Minimum Initial (s)	15.0	15.0			15.0		10.0	10.0				
Minimum Split (s)	26.5	26.5			27.0		19.8	19.8				
Total Split (s)	45.0	45.0			45.0		25.0	25.0				
Total Split (%)	64.3%	64.3%			64.3%		35.7%	35.7%				
Maximum Green (s)	40.3	40.3			40.3		20.2	20.2				
Yellow Time (s)	3.6	3.6			3.6		3.6	3.6				
All-Red Time (s)	1.1	1.1			1.1		1.2	1.2				
Lost Time Adjust (s)		0.0			0.0			0.0				
Total Lost Time (s)		4.7			4.7			4.8				
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	0.2	0.2			0.2		4.0	4.0				
Recall Mode	C-Max	C-Max			C-Max		None	None				
Walk Time (s)	8.0	8.0			8.0		7.0	7.0				
Flash Dont Walk (s)	7.0	7.0			7.0		8.0	8.0				
Pedestrian Calls (#/hr)	0	0			0		0	0				
Act Effct Green (s)		45.7			45.7			14.8				
Actuated g/C Ratio		0.65			0.65			0.21				
v/c Ratio		0.16			0.30			0.59				
Control Delay		4.3			4.0			30.5				
Queue Delay		0.0			0.0			0.0				
Total Delay		4.3			4.0			30.5				
LOS		A			A			C				
Approach Delay		4.3			4.0			30.5				
Approach LOS		A			A			C				
90th %ile Green (s)	40.3	40.3			40.3		20.2	20.2				
90th %ile Term Code	Coord	Coord			Coord		Max	Max				
70th %ile Green (s)	43.5	43.5			43.5		17.0	17.0				
70th %ile Term Code	Coord	Coord			Coord		Gap	Gap				
50th %ile Green (s)	45.9	45.9			45.9		14.6	14.6				
50th %ile Term Code	Coord	Coord			Coord		Gap	Gap				
30th %ile Green (s)	48.4	48.4			48.4		12.1	12.1				
30th %ile Term Code	Coord	Coord			Coord		Gap	Gap				
10th %ile Green (s)	50.5	50.5			50.5		10.0	10.0				
10th %ile Term Code	Coord	Coord			Coord		Min	Min				
Queue Length 50th (ft)		14			44			66				
Queue Length 95th (ft)		24			47			113				
Internal Link Dist (ft)		303			1869			102			131	
Turn Bay Length (ft)												
Base Capacity (vph)		1826			1999			416				
Starvation Cap Reductn		0			0			0				
Spillback Cap Reductn		0			0			0				
Storage Cap Reductn		0			0			0				

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Reduced v/c Ratio		0.16			0.30			0.44				

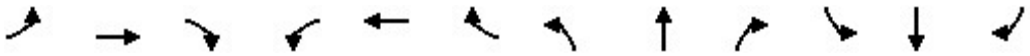
Intersection Summary			
Area Type:	Other		
Cycle Length: 70			
Actuated Cycle Length: 70			
Offset: 18 (26%), Referenced to phase 4:EBTL and 8:WBT, Start of Green			
Natural Cycle: 50			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.59			
Intersection Signal Delay: 8.6		Intersection LOS: A	
Intersection Capacity Utilization 48.5%		ICU Level of Service A	
Analysis Period (min) 15			

Splits and Phases: 4: S Champion Av & Livingston Av





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	242	69	280	402	1	87	2	179	0	1	1
Future Volume (vph)	0	242	69	280	402	1	87	2	179	0	1	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		150	110		0	75		0	0		0
Storage Lanes	0		0	1		0	1		0	0		0
Taper Length (ft)	25			25			0			0		
Lane Util. Factor	0.95	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		0.99		1.00	1.00			0.99				
Frt		0.967						0.852			0.932	
Flt Protected				0.950			0.950					
Satd. Flow (prot)	0	3028	0	1678	3116	0	1711	1499	0	0	1712	0
Flt Permitted				0.498			0.757					
Satd. Flow (perm)	0	3028	0	877	3116	0	1363	1499	0	0	1712	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		59			1			192			1	
Link Speed (mph)		35			35			35			25	
Link Distance (ft)		1949			512			199			214	
Travel Time (s)		38.0			10.0			3.9			5.8	
Confl. Peds. (#/hr)	6		2	2		6			1	1		
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles (%)	0%	3%	7%	4%	5%	0%	2%	0%	3%	0%	0%	0%
Parking (#/hr)		5	5		5	5						
Adj. Flow (vph)	0	260	74	301	432	1	94	2	192	0	1	1
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	334	0	301	433	0	94	194	0	0	2	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		11			11			11			11	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.04	1.13	1.04	1.04	1.13	1.04	1.04	1.04	1.04	1.04	1.04	1.04
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2		1	2			2	
Detector Template	Left	Thru		Left	Thru		Left	Thru			Thru	
Leading Detector (ft)	20	100		20	100		20	100			100	
Trailing Detector (ft)	0	0		0	0		0	0			0	
Detector 1 Position(ft)	0	0		0	0		0	0			0	
Detector 1 Size(ft)	20	6		20	6		20	6			6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex			Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0			0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0			0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0			0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												

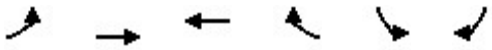


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type		NA		pm+pt	NA		Perm	NA			NA	
Protected Phases		4		3	8			2			6	
Permitted Phases	4			8			2					
Detector Phase	4	4		3	8		2	2			6	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0			5.0	
Minimum Split (s)	18.0	18.0		9.0	18.0		18.0	18.0			18.0	
Total Split (s)	30.0	30.0		20.0	50.0		20.0	20.0			20.0	
Total Split (%)	42.9%	42.9%		28.6%	71.4%		28.6%	28.6%			28.6%	
Maximum Green (s)	26.0	26.0		16.0	46.0		16.0	16.0			16.0	
Yellow Time (s)	3.0	3.0		3.0	3.0		3.0	3.0			3.0	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0			1.0	
Lost Time Adjust (s)		0.0		0.0	0.0		0.0	0.0			0.0	
Total Lost Time (s)		4.0		4.0	4.0		4.0	4.0			4.0	
Lead/Lag	Lag	Lag		Lead								
Lead-Lag Optimize?	Yes	Yes		Yes								
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0			3.0	
Recall Mode	C-Max	C-Max		None	C-Max		None	None			None	
Walk Time (s)	7.0	7.0			7.0		7.0	7.0			7.0	
Flash Dont Walk (s)	7.0	7.0			7.0		7.0	7.0			7.0	
Pedestrian Calls (#/hr)	0	0			0		0	0			0	
Act Effct Green (s)		38.1		51.9	51.9		10.1	10.1			10.1	
Actuated g/C Ratio		0.54		0.74	0.74		0.14	0.14			0.14	
v/c Ratio		0.20		0.40	0.19		0.48	0.51			0.01	
Control Delay		4.6		5.2	3.2		34.7	9.6			20.0	
Queue Delay		0.0		0.0	0.0		0.0	0.0			0.0	
Total Delay		4.6		5.2	3.2		34.7	9.6			20.0	
LOS		A		A	A		C	A			B	
Approach Delay		4.6			4.0			17.8			20.0	
Approach LOS		A			A			B			B	
90th %ile Green (s)	29.5	29.5		14.0	47.5		14.5	14.5			14.5	
90th %ile Term Code	Coord	Coord		Gap	Coord		Gap	Gap			Hold	
70th %ile Green (s)	35.1	35.1		11.0	50.1		11.9	11.9			11.9	
70th %ile Term Code	Coord	Coord		Gap	Coord		Gap	Gap			Hold	
50th %ile Green (s)	38.5	38.5		9.4	51.9		10.1	10.1			10.1	
50th %ile Term Code	Coord	Coord		Gap	Coord		Gap	Gap			Hold	
30th %ile Green (s)	41.6	41.6		8.1	53.7		8.3	8.3			8.3	
30th %ile Term Code	Coord	Coord		Gap	Coord		Gap	Gap			Hold	
10th %ile Green (s)	45.6	45.6		6.7	56.3		5.7	5.7			5.7	
10th %ile Term Code	Coord	Coord		Gap	Coord		Gap	Gap			Hold	
Queue Length 50th (ft)		29		38	18		38	1			0	
Queue Length 95th (ft)		35		83	38		75	49			6	
Internal Link Dist (ft)		1869			432			119			134	
Turn Bay Length (ft)				110			75					
Base Capacity (vph)		1673		833	2310		311	490			392	
Starvation Cap Reductn		0		0	0		0	0			0	
Spillback Cap Reductn		0		0	0		0	0			0	
Storage Cap Reductn		0		0	0		0	0			0	

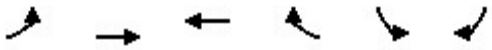
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Reduced v/c Ratio		0.20		0.36	0.19		0.30	0.40			0.01	

Intersection Summary			
Area Type:	Other		
Cycle Length: 70			
Actuated Cycle Length: 70			
Offset: 0 (0%), Referenced to phase 4:EBTL and 8:WBTL, Start of Green			
Natural Cycle: 45			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.51			
Intersection Signal Delay: 7.1		Intersection LOS: A	
Intersection Capacity Utilization 48.7%		ICU Level of Service A	
Analysis Period (min) 15			

Splits and Phases: 5: Lockbourne Av & Livingston Av



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	0	430	441	0	90	264
Future Volume (vph)	0	430	441	0	90	264
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	0.95	0.95	1.00	1.00	1.00
Ped Bike Factor						
Frt						0.850
Flt Protected					0.950	
Satd. Flow (prot)	0	3146	3116	0	1616	1501
Flt Permitted					0.950	
Satd. Flow (perm)	0	3146	3116	0	1616	1501
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)						278
Link Speed (mph)		35	35		25	
Link Distance (ft)		512	577		267	
Travel Time (s)		10.0	11.2		7.3	
Confl. Peds. (#/hr)	1			1		
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	0%	4%	5%	0%	8%	4%
Parking (#/hr)		5	5			
Adj. Flow (vph)	0	453	464	0	95	278
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	453	464	0	95	278
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(ft)		11	11		11	
Link Offset(ft)		0	0		0	
Crosswalk Width(ft)		16	16		16	
Two way Left Turn Lane						
Headway Factor	1.04	1.13	1.13	1.04	1.04	1.04
Turning Speed (mph)	15			9	15	9
Number of Detectors		2	2		1	1
Detector Template		Thru	Thru		Left	Right
Leading Detector (ft)		100	100		20	20
Trailing Detector (ft)		0	0		0	0
Detector 1 Position(ft)		0	0		0	0
Detector 1 Size(ft)		6	6		20	20
Detector 1 Type		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)		0.0	0.0		0.0	0.0
Detector 1 Queue (s)		0.0	0.0		0.0	0.0
Detector 1 Delay (s)		0.0	0.0		0.0	0.0
Detector 2 Position(ft)		94	94			
Detector 2 Size(ft)		6	6			
Detector 2 Type		Cl+Ex	Cl+Ex			
Detector 2 Channel						
Detector 2 Extend (s)		0.0	0.0			
Turn Type		NA	NA		Perm	Perm
Protected Phases		4	8			

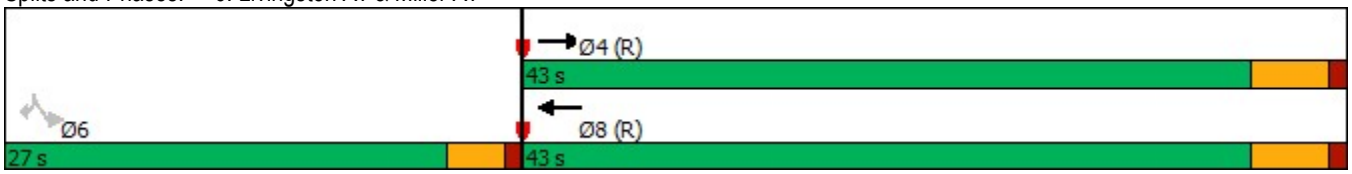


Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Permitted Phases					6	6
Detector Phase		4	8		6	6
Switch Phase						
Minimum Initial (s)		20.0	20.0		10.0	10.0
Minimum Split (s)		32.0	32.0		26.5	26.5
Total Split (s)		43.0	43.0		27.0	27.0
Total Split (%)		61.4%	61.4%		38.6%	38.6%
Maximum Green (s)		37.9	37.9		23.0	23.0
Yellow Time (s)		4.1	4.1		3.0	3.0
All-Red Time (s)		1.0	1.0		1.0	1.0
Lost Time Adjust (s)		0.0	0.0		0.0	0.0
Total Lost Time (s)		5.1	5.1		4.0	4.0
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)		1.0	1.0		4.0	4.0
Recall Mode		C-Max	C-Max		None	None
Walk Time (s)		13.0	13.0		7.0	7.0
Flash Dont Walk (s)		7.0	7.0		10.0	10.0
Pedestrian Calls (#/hr)		0	0		0	0
Act Effct Green (s)		49.3	49.3		11.6	11.6
Actuated g/C Ratio		0.70	0.70		0.17	0.17
v/c Ratio		0.20	0.21		0.36	0.58
Control Delay		5.9	2.2		29.1	8.8
Queue Delay		0.0	0.0		0.0	0.0
Total Delay		5.9	2.2		29.1	8.8
LOS		A	A		C	A
Approach Delay		5.9	2.2		14.0	
Approach LOS		A	A		B	
90th %ile Green (s)		45.2	45.2		15.7	15.7
90th %ile Term Code		Coord	Coord		Gap	Gap
70th %ile Green (s)		49.0	49.0		11.9	11.9
70th %ile Term Code		Coord	Coord		Gap	Gap
50th %ile Green (s)		50.5	50.5		10.4	10.4
50th %ile Term Code		Coord	Coord		Gap	Gap
30th %ile Green (s)		50.9	50.9		10.0	10.0
30th %ile Term Code		Coord	Coord		Min	Min
10th %ile Green (s)		50.9	50.9		10.0	10.0
10th %ile Term Code		Coord	Coord		Min	Min
Queue Length 50th (ft)		54	13		38	0
Queue Length 95th (ft)		85	19		72	56
Internal Link Dist (ft)		432	497		187	
Turn Bay Length (ft)						
Base Capacity (vph)		2215	2194		530	679
Starvation Cap Reductn		0	0		0	0
Spillback Cap Reductn		0	0		0	0
Storage Cap Reductn		0	0		0	0
Reduced v/c Ratio		0.20	0.21		0.18	0.41

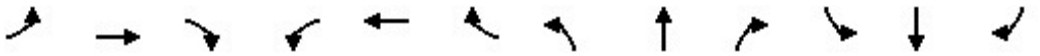
Intersection Summary

Area Type:	Other		
Cycle Length: 70			
Actuated Cycle Length: 70			
Offset: 24 (34%), Referenced to phase 4:EBT and 8:WBT, Start of Green			
Natural Cycle: 60			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.58			
Intersection Signal Delay: 6.9		Intersection LOS: A	
Intersection Capacity Utilization 40.6%		ICU Level of Service A	
Analysis Period (min) 15			

Splits and Phases: 6: Livingston Av & Miller Av



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	183	305	0	0	431	64	8	73	19	0	0	0
Future Volume (vph)	183	305	0	0	431	64	8	73	19	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	150		0	0		0	0		0	0		0
Storage Lanes	0		0	0		0	0		1	0		0
Taper Length (ft)	25			0			0			0		
Lane Util. Factor	0.95	0.95	1.00	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		1.00			1.00			1.00				
Frt					0.981				0.850			
Flt Protected		0.982						0.995				
Satd. Flow (prot)	0	3071	0	0	3045	0	0	1712	1561	0	0	0
Flt Permitted		0.645						0.995				
Satd. Flow (perm)	0	2014	0	0	3045	0	0	1712	1561	0	0	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)					37				37			
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		577			1576			192			127	
Travel Time (s)		13.1			35.8			4.4			2.9	
Confl. Peds. (#/hr)	4		2	2		4	1					1
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles (%)	4%	5%	0%	0%	5%	5%	13%	6%	0%	0%	0%	0%
Parking (#/hr)		5			5	5						
Adj. Flow (vph)	197	328	0	0	463	69	9	78	20	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	525	0	0	532	0	0	87	20	0	0	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.04	1.13	1.04	1.04	1.13	1.04	1.04	1.04	1.04	1.04	1.04	1.04
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2			2		1	2	1			
Detector Template	Left	Thru			Thru		Left	Thru	Right			
Leading Detector (ft)	20	100			100		20	100	20			
Trailing Detector (ft)	0	0			0		0	0	0			
Detector 1 Position(ft)	0	0			0		0	0	0			
Detector 1 Size(ft)	20	6			6		20	6	20			
Detector 1 Type	Cl+Ex	Cl+Ex			Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex			
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0			0.0		0.0	0.0	0.0			
Detector 1 Queue (s)	0.0	0.0			0.0		0.0	0.0	0.0			
Detector 1 Delay (s)	0.0	0.0			0.0		0.0	0.0	0.0			
Detector 2 Position(ft)		94			94			94				
Detector 2 Size(ft)		6			6			6				
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex				
Detector 2 Channel												

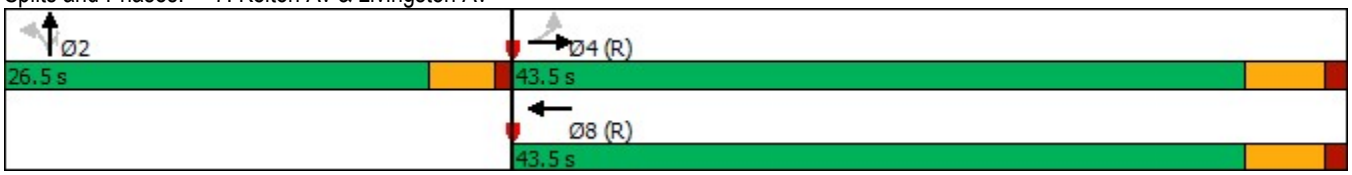


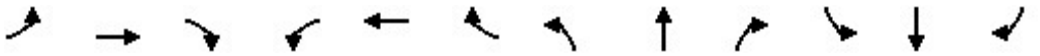
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 2 Extend (s)		0.0			0.0			0.0				
Turn Type	Perm	NA			NA		Perm	NA	Perm			
Protected Phases		4			8			2				
Permitted Phases	4						2		2			
Detector Phase	4	4			8		2	2	2			
Switch Phase												
Minimum Initial (s)	15.0	15.0			15.0		10.0	10.0	10.0			
Minimum Split (s)	27.0	27.0			27.0		26.5	26.5	26.5			
Total Split (s)	43.5	43.5			43.5		26.5	26.5	26.5			
Total Split (%)	62.1%	62.1%			62.1%		37.9%	37.9%	37.9%			
Maximum Green (s)	38.1	38.1			38.1		22.1	22.1	22.1			
Yellow Time (s)	4.1	4.1			4.1		3.4	3.4	3.4			
All-Red Time (s)	1.3	1.3			1.3		1.0	1.0	1.0			
Lost Time Adjust (s)		0.0			0.0			0.0	0.0			
Total Lost Time (s)		5.4			5.4			4.4	4.4			
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.7	3.7			3.7		4.0	4.0	4.0			
Recall Mode	C-Max	C-Max			C-Max		None	None	None			
Walk Time (s)	8.0	8.0			8.0		7.0	7.0	7.0			
Flash Dont Walk (s)	7.0	7.0			7.0		8.0	8.0	8.0			
Pedestrian Calls (#/hr)	0	0			0		0	0	0			
Act Effct Green (s)		53.3			53.3			10.9	10.9			
Actuated g/C Ratio		0.76			0.76			0.16	0.16			
v/c Ratio		0.34			0.23			0.33	0.07			
Control Delay		3.1			0.9			29.6	5.2			
Queue Delay		0.0			0.0			0.0	0.0			
Total Delay		3.1			0.9			29.6	5.2			
LOS		A			A			C	A			
Approach Delay		3.1			0.9			25.0				
Approach LOS		A			A			C				
90th %ile Green (s)	47.0	47.0			47.0		13.2	13.2	13.2			
90th %ile Term Code	Coord	Coord			Coord		Gap	Gap	Gap			
70th %ile Green (s)	49.0	49.0			49.0		11.2	11.2	11.2			
70th %ile Term Code	Coord	Coord			Coord		Gap	Gap	Gap			
50th %ile Green (s)	50.2	50.2			50.2		10.0	10.0	10.0			
50th %ile Term Code	Coord	Coord			Coord		Min	Min	Min			
30th %ile Green (s)	50.2	50.2			50.2		10.0	10.0	10.0			
30th %ile Term Code	Coord	Coord			Coord		Min	Min	Min			
10th %ile Green (s)	64.6	64.6			64.6		0.0	0.0	0.0			
10th %ile Term Code	Coord	Coord			Coord		Skip	Skip	Skip			
Queue Length 50th (ft)		27			4			34	0			
Queue Length 95th (ft)		34			7			70	10			
Internal Link Dist (ft)		497			1496			112			47	
Turn Bay Length (ft)												
Base Capacity (vph)		1533			2326			540	518			
Starvation Cap Reductn		0			0			0	0			
Spillback Cap Reductn		0			0			0	0			
Storage Cap Reductn		0			0			0	0			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Reduced v/c Ratio		0.34			0.23			0.16	0.04			

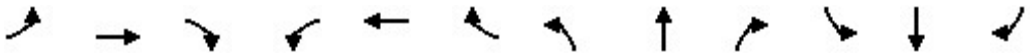
Intersection Summary			
Area Type:	Other		
Cycle Length: 70			
Actuated Cycle Length: 70			
Offset: 29 (41%), Referenced to phase 4:EBTL and 8:WBT, Start of Green			
Natural Cycle: 55			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.34			
Intersection Signal Delay: 4.1		Intersection LOS: A	
Intersection Capacity Utilization 50.9%		ICU Level of Service A	
Analysis Period (min) 15			

Splits and Phases: 7: Kelton Av & Livingston Av





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	6	286	43	13	437	35	9	181	55	17	152	18
Future Volume (vph)	6	286	43	13	437	35	9	181	55	17	152	18
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	150		0	150		0	0		0	0		0
Storage Lanes	0		0	0		0	0		0	0		0
Taper Length (ft)	25			25			0			0		
Lane Util. Factor	0.95	0.95	0.95	0.95	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		1.00			1.00			1.00			1.00	
Frt		0.981			0.989			0.970			0.987	
Flt Protected		0.999			0.999			0.998			0.995	
Satd. Flow (prot)	0	3053	0	0	3039	0	0	1599	0	0	1650	0
Flt Permitted		0.947			0.944			0.986			0.962	
Satd. Flow (perm)	0	2894	0	0	2872	0	0	1579	0	0	1595	0
Right Turn on Red			Yes			Yes			Yes			No
Satd. Flow (RTOR)		34			17			23				
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1576			932			368			414	
Travel Time (s)		35.8			21.2			8.4			9.4	
Confl. Peds. (#/hr)	3		4	4		3	9		2	2		9
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	17%	4%	7%	38%	5%	9%	0%	11%	12%	13%	9%	6%
Parking (#/hr)		5	5		5	5						
Adj. Flow (vph)	7	318	48	14	486	39	10	201	61	19	169	20
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	373	0	0	539	0	0	272	0	0	208	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.04	1.13	1.04	1.04	1.13	1.04	1.04	1.04	1.04	1.04	1.04	1.04
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (ft)	20	100		20	100		20	100		20	100	
Trailing Detector (ft)	0	0		0	0		0	0		0	0	
Detector 1 Position(ft)	0	0		0	0		0	0		0	0	
Detector 1 Size(ft)	20	6		20	6		20	6		20	6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												

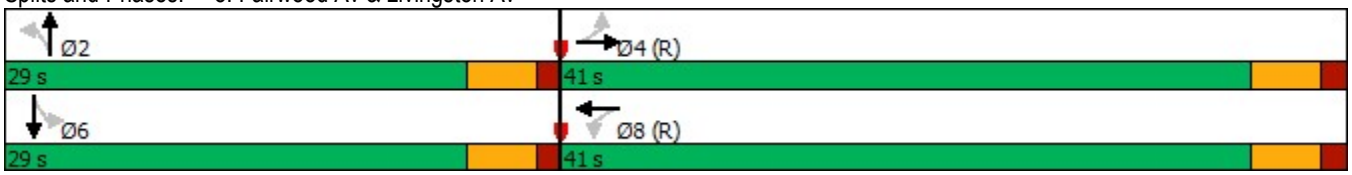


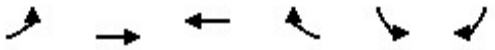
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	15.0	15.0		15.0	15.0		10.0	10.0		10.0	10.0	
Minimum Split (s)	27.0	27.0		27.0	27.0		26.5	26.5		26.5	26.5	
Total Split (s)	41.0	41.0		41.0	41.0		29.0	29.0		29.0	29.0	
Total Split (%)	58.6%	58.6%		58.6%	58.6%		41.4%	41.4%		41.4%	41.4%	
Maximum Green (s)	35.9	35.9		35.9	35.9		24.1	24.1		24.1	24.1	
Yellow Time (s)	3.6	3.6		3.6	3.6		3.6	3.6		3.6	3.6	
All-Red Time (s)	1.5	1.5		1.5	1.5		1.3	1.3		1.3	1.3	
Lost Time Adjust (s)		0.0			0.0			0.0			0.0	
Total Lost Time (s)		5.1			5.1			4.9			4.9	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		4.0	4.0		4.0	4.0	
Recall Mode	C-Max	C-Max		C-Max	C-Max		None	None		None	None	
Walk Time (s)	8.0	8.0		8.0	8.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	
Act Effct Green (s)		42.7			42.7			17.3			17.3	
Actuated g/C Ratio		0.61			0.61			0.25			0.25	
v/c Ratio		0.21			0.31			0.67			0.53	
Control Delay		2.4			4.6			29.2			26.7	
Queue Delay		0.0			0.0			0.0			0.0	
Total Delay		2.4			4.6			29.2			26.7	
LOS		A			A			C			C	
Approach Delay		2.4			4.6			29.2			26.7	
Approach LOS		A			A			C			C	
90th %ile Green (s)	35.9	35.9		35.9	35.9		24.1	24.1		24.1	24.1	
90th %ile Term Code	Coord	Coord		Coord	Coord		Max	Max		Hold	Hold	
70th %ile Green (s)	40.1	40.1		40.1	40.1		19.9	19.9		19.9	19.9	
70th %ile Term Code	Coord	Coord		Coord	Coord		Gap	Gap		Hold	Hold	
50th %ile Green (s)	42.7	42.7		42.7	42.7		17.3	17.3		17.3	17.3	
50th %ile Term Code	Coord	Coord		Coord	Coord		Gap	Gap		Hold	Hold	
30th %ile Green (s)	45.4	45.4		45.4	45.4		14.6	14.6		14.6	14.6	
30th %ile Term Code	Coord	Coord		Coord	Coord		Gap	Gap		Hold	Hold	
10th %ile Green (s)	49.4	49.4		49.4	49.4		10.6	10.6		10.6	10.6	
10th %ile Term Code	Coord	Coord		Coord	Coord		Gap	Gap		Hold	Hold	
Queue Length 50th (ft)		6			31			97			78	
Queue Length 95th (ft)		16			44			149			120	
Internal Link Dist (ft)		1496			852			288			334	
Turn Bay Length (ft)												
Base Capacity (vph)		1778			1758			558			549	
Starvation Cap Reductn		0			0			0			0	
Spillback Cap Reductn		0			0			0			0	
Storage Cap Reductn		0			0			0			0	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Reduced v/c Ratio		0.21			0.31			0.49			0.38	

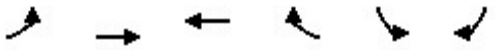
Intersection Summary			
Area Type:	Other		
Cycle Length: 70			
Actuated Cycle Length: 70			
Offset: 57 (81%), Referenced to phase 4:EBTL and 8:WBTL, Start of Green			
Natural Cycle: 55			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.67			
Intersection Signal Delay: 12.1		Intersection LOS: B	
Intersection Capacity Utilization 47.3%		ICU Level of Service A	
Analysis Period (min) 15			

Splits and Phases: 8: Fairwood Av & Livingston Av

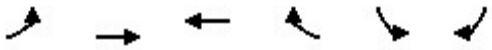




Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	34	465	530	163	155	64
Future Volume (vph)	34	465	530	163	155	64
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	150			0	0	0
Storage Lanes	0			0	1	0
Taper Length (ft)	25				0	
Lane Util. Factor	0.95	0.95	0.95	0.95	1.00	1.00
Ped Bike Factor		1.00	0.99		1.00	
Frt			0.965		0.961	
Flt Protected		0.997			0.966	
Satd. Flow (prot)	0	3098	2994	0	1646	0
Flt Permitted		0.877			0.966	
Satd. Flow (perm)	0	2725	2994	0	1644	0
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)			90		31	
Link Speed (mph)		30	30		30	
Link Distance (ft)		841	588		385	
Travel Time (s)		19.1	13.4		8.8	
Confl. Peds. (#/hr)	3			3	1	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Heavy Vehicles (%)	9%	5%	5%	4%	3%	5%
Parking (#/hr)	5	5	5	5		
Adj. Flow (vph)	36	495	564	173	165	68
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	531	737	0	233	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(ft)		11	11		11	
Link Offset(ft)		0	0		0	
Crosswalk Width(ft)		16	16		16	
Two way Left Turn Lane						
Headway Factor	1.04	1.13	1.13	1.04	1.04	1.04
Turning Speed (mph)	15			9	15	9
Number of Detectors	1	2	2		1	
Detector Template	Left	Thru	Thru		Left	
Leading Detector (ft)	20	100	100		20	
Trailing Detector (ft)	0	0	0		0	
Detector 1 Position(ft)	0	0	0		0	
Detector 1 Size(ft)	20	6	6		20	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0		0.0	
Detector 1 Queue (s)	0.0	0.0	0.0		0.0	
Detector 1 Delay (s)	0.0	0.0	0.0		0.0	
Detector 2 Position(ft)		94	94			
Detector 2 Size(ft)		6	6			
Detector 2 Type		Cl+Ex	Cl+Ex			
Detector 2 Channel						



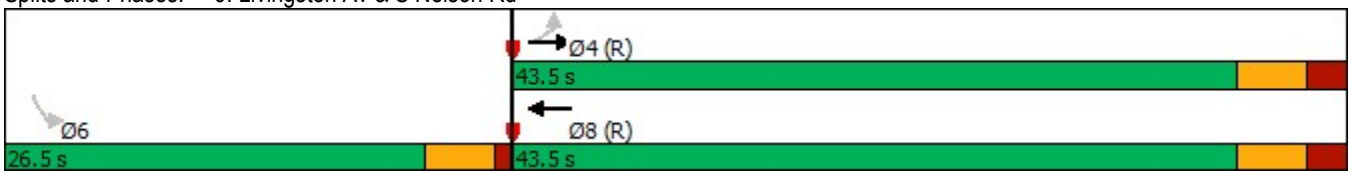
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Detector 2 Extend (s)		0.0	0.0			
Turn Type	Perm	NA	NA		Perm	
Protected Phases		4	8			
Permitted Phases	4				6	
Detector Phase	4	4	8		6	
Switch Phase						
Minimum Initial (s)	15.0	15.0	15.0		10.0	
Minimum Split (s)	27.0	27.0	27.0		26.5	
Total Split (s)	43.5	43.5	43.5		26.5	
Total Split (%)	62.1%	62.1%	62.1%		37.9%	
Maximum Green (s)	37.7	37.7	37.7		21.9	
Yellow Time (s)	3.6	3.6	3.6		3.6	
All-Red Time (s)	2.2	2.2	2.2		1.0	
Lost Time Adjust (s)		0.0	0.0		0.0	
Total Lost Time (s)		5.8	5.8		4.6	
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	0.2	0.2	4.0		0.2	
Recall Mode	C-Max	C-Max	C-Max		None	
Walk Time (s)	8.0	8.0	8.0		7.0	
Flash Dont Walk (s)	7.0	7.0	7.0		7.0	
Pedestrian Calls (#/hr)	0	0	0		0	
Act Effct Green (s)		46.9	46.9		12.7	
Actuated g/C Ratio		0.67	0.67		0.18	
v/c Ratio		0.29	0.36		0.72	
Control Delay		4.0	5.4		35.8	
Queue Delay		0.0	0.0		0.0	
Total Delay		4.0	5.4		35.8	
LOS		A	A		D	
Approach Delay		4.0	5.4		35.8	
Approach LOS		A	A		D	
90th %ile Green (s)	41.8	41.8	41.8		17.8	
90th %ile Term Code	Coord	Coord	Coord		Gap	
70th %ile Green (s)	45.4	45.4	45.4		14.2	
70th %ile Term Code	Coord	Coord	Coord		Gap	
50th %ile Green (s)	48.0	48.0	48.0		11.6	
50th %ile Term Code	Coord	Coord	Coord		Gap	
30th %ile Green (s)	49.6	49.6	49.6		10.0	
30th %ile Term Code	Coord	Coord	Coord		Min	
10th %ile Green (s)	49.6	49.6	49.6		10.0	
10th %ile Term Code	Coord	Coord	Coord		Min	
Queue Length 50th (ft)		30	48		84	
Queue Length 95th (ft)		50	99		140	
Internal Link Dist (ft)		761	508		305	
Turn Bay Length (ft)						
Base Capacity (vph)		1824	2034		535	
Starvation Cap Reductn		0	0		0	
Spillback Cap Reductn		0	0		0	
Storage Cap Reductn		0	0		0	

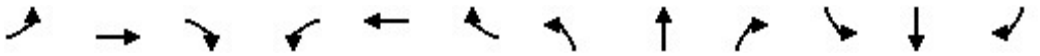


Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Reduced v/c Ratio		0.29	0.36		0.44	

Intersection Summary			
Area Type:	Other		
Cycle Length: 70			
Actuated Cycle Length: 70			
Offset: 24 (34%), Referenced to phase 4:EBTL and 8:WBT, Start of Green			
Natural Cycle: 55			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.72			
Intersection Signal Delay: 9.6		Intersection LOS: A	
Intersection Capacity Utilization 59.8%		ICU Level of Service B	
Analysis Period (min) 15			

Splits and Phases: 9: Livingston Av & S Nelson Rd

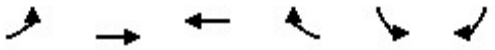




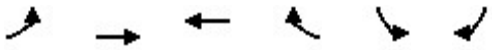
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	3	215	0	0	454	10	69	3	59	8	0	18
Future Volume (Veh/h)	3	215	0	0	454	10	69	3	59	8	0	18
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Hourly flow rate (vph)	3	236	0	0	499	11	76	3	65	9	0	20
Pedestrians								1			6	
Lane Width (ft)								11.0			11.0	
Walking Speed (ft/s)								3.5			3.5	
Percent Blockage								0			1	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)		440			1031							
pX, platoon unblocked												
vC, conflicting volume	516			237			512	759	119	701	754	261
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	516			237			512	759	119	701	754	261
tC, single (s)	4.1			4.1			7.5	7.8	6.9	7.8	6.5	7.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.7	3.3	3.6	4.0	3.5
p0 queue free %	100			100			82	99	93	97	100	97
cM capacity (veh/h)	1055			1341			433	230	909	277	338	691

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	82	157	333	177	144	29
Volume Left	3	0	0	0	76	9
Volume Right	0	0	0	11	65	20
cSH	1055	1700	1700	1700	553	472
Volume to Capacity	0.00	0.09	0.20	0.10	0.26	0.06
Queue Length 95th (ft)	0	0	0	0	26	5
Control Delay (s)	0.3	0.0	0.0	0.0	13.8	13.1
Lane LOS	A				B	B
Approach Delay (s)	0.1		0.0		13.8	13.1
Approach LOS					B	B

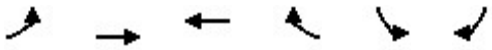
Intersection Summary				
Average Delay	2.6			
Intersection Capacity Utilization	32.6%	ICU Level of Service		A
Analysis Period (min)	15			



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	123	391	275	39	65	182
Future Volume (vph)	123	391	275	39	65	182
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	100			0	0	0
Storage Lanes	0			0	1	1
Taper Length (ft)	25				0	
Lane Util. Factor	0.95	0.95	0.95	0.95	1.00	1.00
Ped Bike Factor		1.00	1.00		1.00	0.98
Frt			0.981			0.850
Flt Protected		0.988			0.950	
Satd. Flow (prot)	0	3326	3088	0	1745	1531
Flt Permitted		0.762			0.950	
Satd. Flow (perm)	0	2561	3088	0	1743	1496
Right Turn on Red				Yes		No
Satd. Flow (RTOR)			24			
Link Speed (mph)		35	35		25	
Link Distance (ft)		304	440		328	
Travel Time (s)		5.9	8.6		8.9	
Confl. Peds. (#/hr)	5			5	1	8
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89
Heavy Vehicles (%)	9%	2%	4%	0%	0%	2%
Parking (#/hr)			5	5		
Adj. Flow (vph)	138	439	309	44	73	204
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	577	353	0	73	204
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(ft)		0	0		11	
Link Offset(ft)		0	0		0	
Crosswalk Width(ft)		16	16		16	
Two way Left Turn Lane						
Headway Factor	1.04	1.04	1.13	1.04	1.04	1.04
Turning Speed (mph)	15			9	15	9
Number of Detectors	1	2	2		1	1
Detector Template	Left	Thru	Thru		Left	Right
Leading Detector (ft)	20	100	100		20	20
Trailing Detector (ft)	0	0	0		0	0
Detector 1 Position(ft)	0	0	0		0	0
Detector 1 Size(ft)	20	6	6		20	20
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0		0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0		0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0		0.0	0.0
Detector 2 Position(ft)		94	94			
Detector 2 Size(ft)		6	6			
Detector 2 Type		Cl+Ex	Cl+Ex			
Detector 2 Channel						



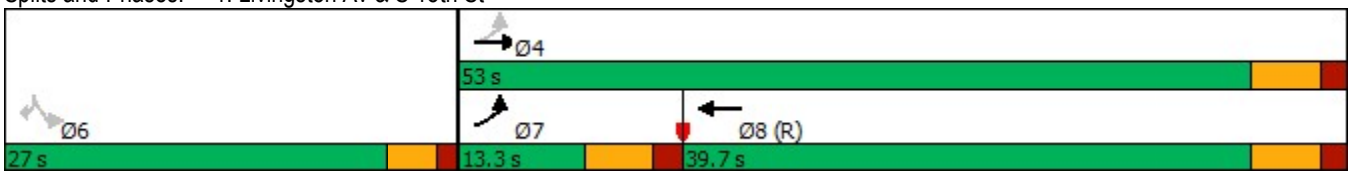
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Detector 2 Extend (s)		0.0	0.0			
Turn Type	pm+pt	NA	NA		Perm	Perm
Protected Phases	7	4	8			
Permitted Phases	4				6	6
Detector Phase	7	4	8		6	6
Switch Phase						
Minimum Initial (s)	5.0	7.0	16.0		10.0	10.0
Minimum Split (s)	10.8	26.5	26.5		26.5	26.5
Total Split (s)	13.3	53.0	39.7		27.0	27.0
Total Split (%)	16.6%	66.3%	49.6%		33.8%	33.8%
Maximum Green (s)	7.5	47.2	33.9		22.7	22.7
Yellow Time (s)	4.1	4.1	4.1		3.0	3.0
All-Red Time (s)	1.7	1.7	1.7		1.3	1.3
Lost Time Adjust (s)		0.0	0.0		0.0	0.0
Total Lost Time (s)		5.8	5.8		4.3	4.3
Lead/Lag	Lead		Lag			
Lead-Lag Optimize?	Yes		Yes			
Vehicle Extension (s)	3.7	3.7	3.7		5.0	5.0
Recall Mode	None	Max	C-Max		None	None
Walk Time (s)		7.0	7.0		7.0	7.0
Flash Dont Walk (s)		9.0	9.0		11.0	11.0
Pedestrian Calls (#/hr)		0	0		0	0
Act Effct Green (s)		52.4	52.4		17.5	17.5
Actuated g/C Ratio		0.66	0.66		0.22	0.22
v/c Ratio		0.34	0.17		0.19	0.62
Control Delay		7.5	3.3		25.0	36.2
Queue Delay		0.0	0.0		0.0	0.0
Total Delay		7.5	3.3		25.0	36.2
LOS		A	A		C	D
Approach Delay		7.5	3.3		33.3	
Approach LOS		A	A		C	
90th %ile Green (s)	0.0	47.2	47.2		22.7	22.7
90th %ile Term Code	Skip	Coord	Coord		Max	Max
70th %ile Green (s)	0.0	49.6	49.6		20.3	20.3
70th %ile Term Code	Skip	Coord	Coord		Gap	Gap
50th %ile Green (s)	0.0	52.1	52.1		17.8	17.8
50th %ile Term Code	Skip	Coord	Coord		Gap	Gap
30th %ile Green (s)	0.0	54.6	54.6		15.3	15.3
30th %ile Term Code	Skip	Coord	Coord		Gap	Gap
10th %ile Green (s)	0.0	58.4	58.4		11.5	11.5
10th %ile Term Code	Skip	Coord	Coord		Gap	Gap
Queue Length 50th (ft)		60	20		30	92
Queue Length 95th (ft)		103	32		58	146
Internal Link Dist (ft)		224	360		248	
Turn Bay Length (ft)						
Base Capacity (vph)		1676	2030		494	424
Starvation Cap Reductn		0	0		0	0
Spillback Cap Reductn		0	0		0	0
Storage Cap Reductn		0	0		0	0

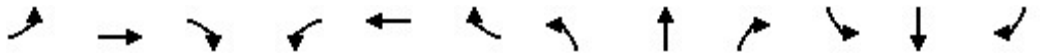


Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Reduced v/c Ratio		0.34	0.17		0.15	0.48

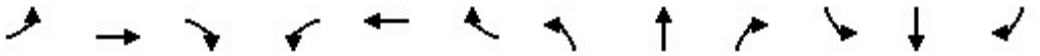
Intersection Summary			
Area Type:	Other		
Cycle Length: 80			
Actuated Cycle Length: 80			
Offset: 70 (88%), Referenced to phase 8:WBT, Start of Green			
Natural Cycle: 65			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.62			
Intersection Signal Delay: 12.2		Intersection LOS: B	
Intersection Capacity Utilization 50.9%		ICU Level of Service A	
Analysis Period (min) 15			

Splits and Phases: 1: Livingston Av & S 18th St





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	572	74	72	364	0	0	0	0	9	4	11
Future Volume (vph)	0	572	74	72	364	0	0	0	0	9	4	11
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	150		0	150		0	0		0	0		0
Storage Lanes	0		0	0		0	0		0	0		0
Taper Length (ft)	25			25			0			0		
Lane Util. Factor	1.00	0.95	0.95	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		1.00			1.00						0.99	
Frt		0.983									0.938	
Flt Protected					0.992						0.981	
Satd. Flow (prot)	0	3101	0	0	3096	0	0	0	0	0	1408	0
Flt Permitted					0.759						0.981	
Satd. Flow (perm)	0	3101	0	0	2367	0	0	0	0	0	1407	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		31									12	
Link Speed (mph)		35			35			35			35	
Link Distance (ft)		1031			383			200			188	
Travel Time (s)		20.1			7.5			3.9			3.7	
Confl. Peds. (#/hr)	3		4	4		3	7		1	1		7
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Heavy Vehicles (%)	0%	3%	6%	4%	5%	0%	0%	0%	0%	0%	25%	0%
Parking (#/hr)		5	5		5						5	5
Adj. Flow (vph)	0	629	81	79	400	0	0	0	0	10	4	12
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	710	0	0	479	0	0	0	0	0	26	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.04	1.13	1.04	1.04	1.13	1.04	1.04	1.04	1.04	1.04	1.24	1.04
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors		2		1	2					1	2	
Detector Template		Thru		Left	Thru					Left	Thru	
Leading Detector (ft)		100		20	100					20	100	
Trailing Detector (ft)		0		0	0					0	0	
Detector 1 Position(ft)		0		0	0					0	0	
Detector 1 Size(ft)		6		20	6					20	6	
Detector 1 Type		Cl+Ex		Cl+Ex	Cl+Ex					Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)		0.0		0.0	0.0					0.0	0.0	
Detector 1 Queue (s)		0.0		0.0	0.0					0.0	0.0	
Detector 1 Delay (s)		0.0		0.0	0.0					0.0	0.0	
Detector 2 Position(ft)		94			94						94	
Detector 2 Size(ft)		6			6						6	
Detector 2 Type		Cl+Ex			Cl+Ex						Cl+Ex	
Detector 2 Channel												

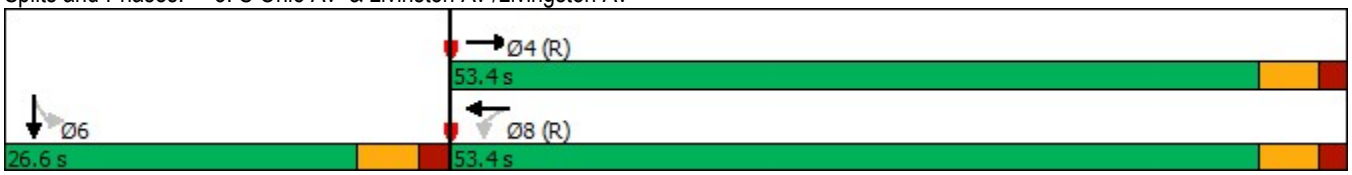


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 2 Extend (s)		0.0			0.0						0.0	
Turn Type		NA		Perm	NA					Perm	NA	
Protected Phases		4			8						6	
Permitted Phases				8						6		
Detector Phase		4		8	8					6	6	
Switch Phase												
Minimum Initial (s)		15.0		15.0	15.0					10.0	10.0	
Minimum Split (s)		27.0		27.0	27.0					26.5	26.5	
Total Split (s)		53.4		53.4	53.4					26.6	26.6	
Total Split (%)		66.8%		66.8%	66.8%					33.3%	33.3%	
Maximum Green (s)		48.0		48.0	48.0					21.0	21.0	
Yellow Time (s)		3.6		3.6	3.6					3.6	3.6	
All-Red Time (s)		1.8		1.8	1.8					2.0	2.0	
Lost Time Adjust (s)		0.0			0.0						0.0	
Total Lost Time (s)		5.4			5.4						5.6	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)		3.0		3.0	3.0					4.0	4.0	
Recall Mode		C-Max		C-Max	C-Max					None	None	
Walk Time (s)		8.0		8.0	8.0					7.0	7.0	
Flash Dont Walk (s)		7.0		7.0	7.0					7.0	7.0	
Pedestrian Calls (#/hr)		0		0	0					0	0	
Act Effct Green (s)		71.6			71.6						10.0	
Actuated g/C Ratio		0.90			0.90						0.12	
v/c Ratio		0.26			0.23						0.14	
Control Delay		2.3			1.5						23.8	
Queue Delay		0.0			0.0						0.0	
Total Delay		2.3			1.5						23.8	
LOS		A			A						C	
Approach Delay		2.3			1.5						23.8	
Approach LOS		A			A						C	
90th %ile Green (s)		59.0		59.0	59.0					10.0	10.0	
90th %ile Term Code		Coord		Coord	Coord					Min	Min	
70th %ile Green (s)		59.0		59.0	59.0					10.0	10.0	
70th %ile Term Code		Coord		Coord	Coord					Min	Min	
50th %ile Green (s)		74.6		74.6	74.6					0.0	0.0	
50th %ile Term Code		Coord		Coord	Coord					Skip	Skip	
30th %ile Green (s)		74.6		74.6	74.6					0.0	0.0	
30th %ile Term Code		Coord		Coord	Coord					Skip	Skip	
10th %ile Green (s)		74.6		74.6	74.6					0.0	0.0	
10th %ile Term Code		Coord		Coord	Coord					Skip	Skip	
Queue Length 50th (ft)		0			0						6	
Queue Length 95th (ft)		96			30						29	
Internal Link Dist (ft)		951			303			120			108	
Turn Bay Length (ft)												
Base Capacity (vph)		2779			2118						378	
Starvation Cap Reductn		0			0						0	
Spillback Cap Reductn		0			0						0	
Storage Cap Reductn		0			0						0	

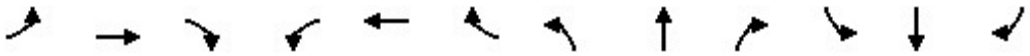
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Reduced v/c Ratio		0.26			0.23						0.07	

Intersection Summary			
Area Type:	Other		
Cycle Length: 80			
Actuated Cycle Length: 80			
Offset: 25 (31%), Referenced to phase 4:EBT and 8:WBTL, Start of Green			
Natural Cycle: 55			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.26			
Intersection Signal Delay: 2.5		Intersection LOS: A	
Intersection Capacity Utilization 53.5%		ICU Level of Service A	
Analysis Period (min) 15			

Splits and Phases: 3: S Ohio Av & Livinston Av /Livingston Av



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	43	536	0	0	396	86	44	127	44	0	0	0
Future Volume (vph)	43	536	0	0	396	86	44	127	44	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	150		0	0		0	0		0	0		0
Storage Lanes	0		0	0		0	0		0	0		0
Taper Length (ft)	25			0			0			0		
Lane Util. Factor	0.95	0.95	1.00	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		1.00			0.99			0.99				
Frt					0.973			0.973				
Flt Protected		0.996						0.990				
Satd. Flow (prot)	0	3188	0	0	3017	0	0	1448	0	0	0	0
Flt Permitted		0.887						0.990				
Satd. Flow (perm)	0	2834	0	0	3017	0	0	1441	0	0	0	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)					54			17				
Link Speed (mph)		30			30			35			35	
Link Distance (ft)		383			1949			182			211	
Travel Time (s)		8.7			44.3			3.5			4.1	
Confl. Peds. (#/hr)	19		7	7		19	15		3	3		15
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	5%	2%	0%	0%	4%	5%	7%	8%	2%	0%	0%	0%
Parking (#/hr)		5			5	5		5	5			
Adj. Flow (vph)	45	564	0	0	417	91	46	134	46	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	609	0	0	508	0	0	226	0	0	0	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.04	1.13	1.04	1.04	1.13	1.04	1.04	1.24	1.04	1.04	1.04	1.04
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2			2		1	2				
Detector Template	Left	Thru			Thru		Left	Thru				
Leading Detector (ft)	20	100			100		20	100				
Trailing Detector (ft)	0	0			0		0	0				
Detector 1 Position(ft)	0	0			0		0	0				
Detector 1 Size(ft)	20	6			6		20	6				
Detector 1 Type	Cl+Ex	Cl+Ex			Cl+Ex		Cl+Ex	Cl+Ex				
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0			0.0		0.0	0.0				
Detector 1 Queue (s)	0.0	0.0			0.0		0.0	0.0				
Detector 1 Delay (s)	0.0	0.0			0.0		0.0	0.0				
Detector 2 Position(ft)		94			94			94				
Detector 2 Size(ft)		6			6			6				
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex				
Detector 2 Channel												

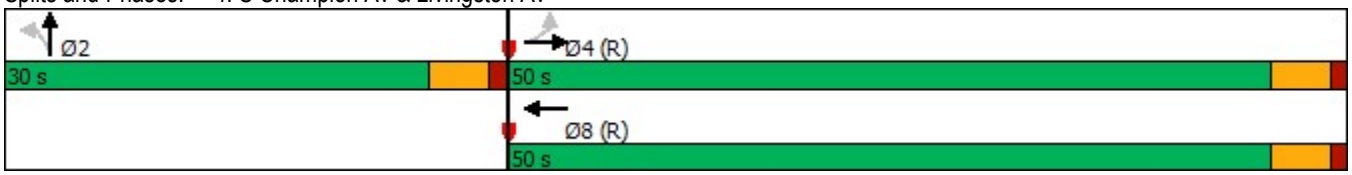


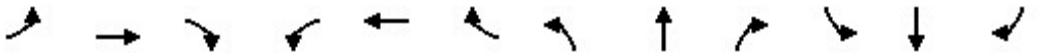
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 2 Extend (s)		0.0			0.0			0.0				
Turn Type	Perm	NA			NA		Perm	NA				
Protected Phases		4			8			2				
Permitted Phases	4						2					
Detector Phase	4	4			8		2	2				
Switch Phase												
Minimum Initial (s)	15.0	15.0			15.0		10.0	10.0				
Minimum Split (s)	26.5	26.5			27.0		19.8	19.8				
Total Split (s)	50.0	50.0			50.0		30.0	30.0				
Total Split (%)	62.5%	62.5%			62.5%		37.5%	37.5%				
Maximum Green (s)	45.3	45.3			45.3		25.2	25.2				
Yellow Time (s)	3.6	3.6			3.6		3.6	3.6				
All-Red Time (s)	1.1	1.1			1.1		1.2	1.2				
Lost Time Adjust (s)		0.0			0.0			0.0				
Total Lost Time (s)		4.7			4.7			4.8				
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	0.2	0.2			0.2		4.0	4.0				
Recall Mode	C-Max	C-Max			C-Max		None	None				
Walk Time (s)	8.0	8.0			8.0		7.0	7.0				
Flash Dont Walk (s)	7.0	7.0			7.0		8.0	8.0				
Pedestrian Calls (#/hr)	0	0			0		0	0				
Act Effct Green (s)		52.7			52.7			17.8				
Actuated g/C Ratio		0.66			0.66			0.22				
v/c Ratio		0.33			0.25			0.68				
Control Delay		5.4			5.4			36.0				
Queue Delay		0.0			0.0			0.0				
Total Delay		5.4			5.4			36.0				
LOS		A			A			D				
Approach Delay		5.4			5.4			36.0				
Approach LOS		A			A			D				
90th %ile Green (s)	45.9	45.9			45.9		24.6	24.6				
90th %ile Term Code	Coord	Coord			Coord		Gap	Gap				
70th %ile Green (s)	49.8	49.8			49.8		20.7	20.7				
70th %ile Term Code	Coord	Coord			Coord		Gap	Gap				
50th %ile Green (s)	52.7	52.7			52.7		17.8	17.8				
50th %ile Term Code	Coord	Coord			Coord		Gap	Gap				
30th %ile Green (s)	55.6	55.6			55.6		14.9	14.9				
30th %ile Term Code	Coord	Coord			Coord		Gap	Gap				
10th %ile Green (s)	59.7	59.7			59.7		10.8	10.8				
10th %ile Term Code	Coord	Coord			Coord		Gap	Gap				
Queue Length 50th (ft)		80			40			96				
Queue Length 95th (ft)		137			75			152				
Internal Link Dist (ft)		303			1869			102			131	
Turn Bay Length (ft)												
Base Capacity (vph)		1868			2007			465				
Starvation Cap Reductn		0			0			0				
Spillback Cap Reductn		0			0			0				
Storage Cap Reductn		0			0			0				

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Reduced v/c Ratio		0.33			0.25			0.49				

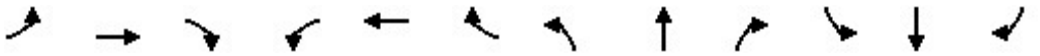
Intersection Summary			
Area Type:	Other		
Cycle Length: 80			
Actuated Cycle Length: 80			
Offset: 30 (38%), Referenced to phase 4:EBTL and 8:WBT, Start of Green			
Natural Cycle: 50			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.68			
Intersection Signal Delay: 10.6		Intersection LOS: B	
Intersection Capacity Utilization 60.4%		ICU Level of Service B	
Analysis Period (min) 15			

Splits and Phases: 4: S Champion Av & Livingston Av





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	555	89	304	376	2	110	4	278	0	1	4
Future Volume (vph)	0	555	89	304	376	2	110	4	278	0	1	4
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		150	110		0	75		0	0		0
Storage Lanes	0		0	1		0	1		0	0		0
Taper Length (ft)	25			25			0			0		
Lane Util. Factor	0.95	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		0.99		1.00	1.00		1.00	0.98			0.99	
Frt		0.979			0.999			0.852			0.892	
Flt Protected				0.950			0.950					
Satd. Flow (prot)	0	3124	0	1678	3113	0	1711	1483	0	0	1620	0
Flt Permitted				0.350			0.754					
Satd. Flow (perm)	0	3124	0	615	3113	0	1355	1483	0	0	1620	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		28			1			296			4	
Link Speed (mph)		35			35			35			25	
Link Distance (ft)		1949			512			199			214	
Travel Time (s)		38.0			10.0			3.9			5.8	
Confl. Peds. (#/hr)	4		6	6		4	1		2	2		1
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Heavy Vehicles (%)	0%	2%	2%	4%	5%	0%	2%	0%	4%	0%	0%	0%
Parking (#/hr)		5	5		5	5						
Adj. Flow (vph)	0	590	95	323	400	2	117	4	296	0	1	4
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	685	0	323	402	0	117	300	0	0	5	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		11			11			11			11	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.04	1.13	1.04	1.04	1.13	1.04	1.04	1.04	1.04	1.04	1.04	1.04
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2		1	2			2	
Detector Template	Left	Thru		Left	Thru		Left	Thru			Thru	
Leading Detector (ft)	20	100		20	100		20	100			100	
Trailing Detector (ft)	0	0		0	0		0	0			0	
Detector 1 Position(ft)	0	0		0	0		0	0			0	
Detector 1 Size(ft)	20	6		20	6		20	6			6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex			Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0			0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0			0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0			0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												

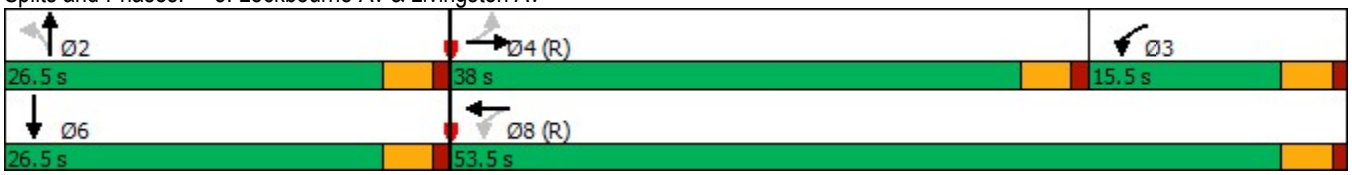


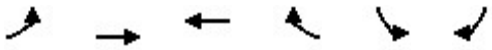
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type		NA		pm+pt	NA		Perm	NA			NA	
Protected Phases		4		3	8			2			6	
Permitted Phases	4			8			2					
Detector Phase	4	4		3	8		2	2			6	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0			5.0	
Minimum Split (s)	26.5	26.5		9.5	26.5		26.5	26.5			26.5	
Total Split (s)	38.0	38.0		15.5	53.5		26.5	26.5			26.5	
Total Split (%)	47.5%	47.5%		19.4%	66.9%		33.1%	33.1%			33.1%	
Maximum Green (s)	34.0	34.0		11.5	49.5		22.5	22.5			22.5	
Yellow Time (s)	3.0	3.0		3.0	3.0		3.0	3.0			3.0	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0			1.0	
Lost Time Adjust (s)		0.0		0.0	0.0		0.0	0.0			0.0	
Total Lost Time (s)		4.0		4.0	4.0		4.0	4.0			4.0	
Lead/Lag	Lead	Lead		Lag								
Lead-Lag Optimize?	Yes	Yes		Yes								
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0			3.0	
Recall Mode	C-Max	C-Max		None	C-Max		None	None			None	
Walk Time (s)	7.0	7.0			7.0		7.0	7.0			7.0	
Flash Dont Walk (s)	7.0	7.0			7.0		7.0	7.0			7.0	
Pedestrian Calls (#/hr)	0	0			0		0	0			0	
Act Effct Green (s)		44.0		59.5	59.5		12.5	12.5			12.5	
Actuated g/C Ratio		0.55		0.74	0.74		0.16	0.16			0.16	
v/c Ratio		0.40		0.53	0.17		0.55	0.62			0.02	
Control Delay		7.0		8.5	2.5		39.9	10.0			18.0	
Queue Delay		0.0		0.0	0.0		0.0	0.0			0.0	
Total Delay		7.0		8.5	2.5		39.9	10.0			18.0	
LOS		A		A	A		D	B			B	
Approach Delay		7.0			5.2			18.4			18.0	
Approach LOS		A			A			B			B	
90th %ile Green (s)	38.1	38.1		11.5	53.6		18.4	18.4			18.4	
90th %ile Term Code	Coord	Coord		Max	Coord		Gap	Gap			Hold	
70th %ile Green (s)	41.2	41.2		11.5	56.7		15.3	15.3			15.3	
70th %ile Term Code	Coord	Coord		Hold	Coord		Gap	Gap			Hold	
50th %ile Green (s)	44.3	44.3		11.5	59.8		12.2	12.2			12.2	
50th %ile Term Code	Coord	Coord		Hold	Coord		Gap	Gap			Hold	
30th %ile Green (s)	46.5	46.5		11.5	62.0		10.0	10.0			10.0	
30th %ile Term Code	Coord	Coord		Hold	Coord		Gap	Gap			Hold	
10th %ile Green (s)	49.7	49.7		11.5	65.2		6.8	6.8			6.8	
10th %ile Term Code	Coord	Coord		Hold	Coord		Gap	Gap			Hold	
Queue Length 50th (ft)		110		19	12		55	2			0	
Queue Length 95th (ft)		137		64	38		97	63			9	
Internal Link Dist (ft)		1869			432			119			134	
Turn Bay Length (ft)				110			75					
Base Capacity (vph)		1729		609	2314		381	629			458	
Starvation Cap Reductn		0		0	0		0	0			0	
Spillback Cap Reductn		0		0	0		0	0			0	
Storage Cap Reductn		0		0	0		0	0			0	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Reduced v/c Ratio		0.40		0.53	0.17		0.31	0.48			0.01	

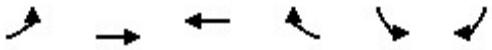
Intersection Summary			
Area Type:	Other		
Cycle Length: 80			
Actuated Cycle Length: 80			
Offset: 77 (96%), Referenced to phase 4:EBTL and 8:WBTL, Start of Green			
Natural Cycle: 65			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.62			
Intersection Signal Delay: 8.9		Intersection LOS: A	
Intersection Capacity Utilization 62.7%		ICU Level of Service B	
Analysis Period (min) 15			

Splits and Phases: 5: Lockbourne Av & Livingston Av





Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑	↑↑		↰	↱
Traffic Volume (vph)	0	827	413	0	164	313
Future Volume (vph)	0	827	413	0	164	313
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	0.95	0.95	1.00	1.00	1.00
Ped Bike Factor					1.00	
Frt						0.850
Flt Protected					0.950	
Satd. Flow (prot)	0	3176	3086	0	1662	1501
Flt Permitted					0.950	
Satd. Flow (perm)	0	3176	3086	0	1659	1501
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)						329
Link Speed (mph)		35	35		25	
Link Distance (ft)		512	577		267	
Travel Time (s)		10.0	11.2		7.3	
Confl. Peds. (#/hr)	3			3	1	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	0%	3%	6%	0%	5%	4%
Parking (#/hr)		5	5			
Adj. Flow (vph)	0	871	435	0	173	329
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	871	435	0	173	329
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(ft)		11	11		11	
Link Offset(ft)		0	0		0	
Crosswalk Width(ft)		16	16		16	
Two way Left Turn Lane						
Headway Factor	1.04	1.13	1.13	1.04	1.04	1.04
Turning Speed (mph)	15			9	15	9
Number of Detectors		2	2		1	1
Detector Template		Thru	Thru		Left	Right
Leading Detector (ft)		100	100		20	20
Trailing Detector (ft)		0	0		0	0
Detector 1 Position(ft)		0	0		0	0
Detector 1 Size(ft)		6	6		20	20
Detector 1 Type		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)		0.0	0.0		0.0	0.0
Detector 1 Queue (s)		0.0	0.0		0.0	0.0
Detector 1 Delay (s)		0.0	0.0		0.0	0.0
Detector 2 Position(ft)		94	94			
Detector 2 Size(ft)		6	6			
Detector 2 Type		Cl+Ex	Cl+Ex			
Detector 2 Channel						
Detector 2 Extend (s)		0.0	0.0			
Turn Type		NA	NA		Perm	Perm
Protected Phases		4	8			

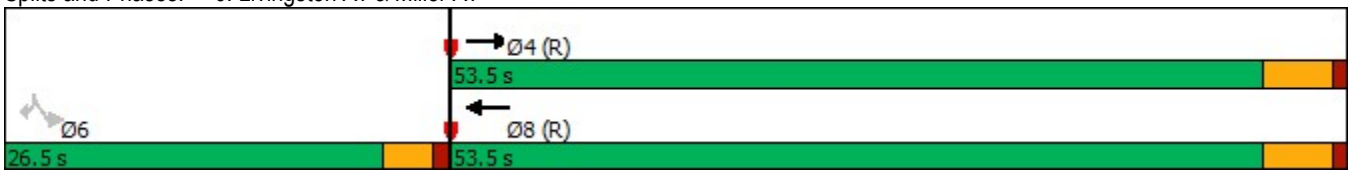


Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Permitted Phases					6	6
Detector Phase		4	8		6	6
Switch Phase						
Minimum Initial (s)		20.0	20.0		10.0	10.0
Minimum Split (s)		32.0	32.0		26.5	26.5
Total Split (s)		53.5	53.5		26.5	26.5
Total Split (%)		66.9%	66.9%		33.1%	33.1%
Maximum Green (s)		48.4	48.4		22.5	22.5
Yellow Time (s)		4.1	4.1		3.0	3.0
All-Red Time (s)		1.0	1.0		1.0	1.0
Lost Time Adjust (s)		0.0	0.0		0.0	0.0
Total Lost Time (s)		5.1	5.1		4.0	4.0
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)		1.0	1.0		4.0	4.0
Recall Mode		C-Max	C-Max		None	None
Walk Time (s)		13.0	13.0		7.0	7.0
Flash Dont Walk (s)		7.0	7.0		10.0	10.0
Pedestrian Calls (#/hr)		0	0		0	0
Act Effct Green (s)		55.8	55.8		15.1	15.1
Actuated g/C Ratio		0.70	0.70		0.19	0.19
v/c Ratio		0.39	0.20		0.55	0.60
Control Delay		2.2	3.0		35.3	8.1
Queue Delay		0.0	0.0		0.0	0.0
Total Delay		2.2	3.0		35.3	8.1
LOS		A	A		D	A
Approach Delay		2.2	3.0		17.5	
Approach LOS		A	A		B	
90th %ile Green (s)		49.6	49.6		21.3	21.3
90th %ile Term Code		Coord	Coord		Gap	Gap
70th %ile Green (s)		53.4	53.4		17.5	17.5
70th %ile Term Code		Coord	Coord		Gap	Gap
50th %ile Green (s)		56.4	56.4		14.5	14.5
50th %ile Term Code		Coord	Coord		Gap	Gap
30th %ile Green (s)		58.6	58.6		12.3	12.3
30th %ile Term Code		Coord	Coord		Gap	Gap
10th %ile Green (s)		60.9	60.9		10.0	10.0
10th %ile Term Code		Coord	Coord		Min	Min
Queue Length 50th (ft)		23	17		80	0
Queue Length 95th (ft)		60	29		127	60
Internal Link Dist (ft)		432	497		187	
Turn Bay Length (ft)						
Base Capacity (vph)		2214	2151		466	658
Starvation Cap Reductn		0	0		0	0
Spillback Cap Reductn		0	0		0	0
Storage Cap Reductn		0	0		0	0
Reduced v/c Ratio		0.39	0.20		0.37	0.50

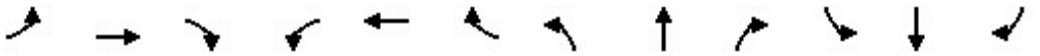
Intersection Summary

Area Type:	Other		
Cycle Length: 80			
Actuated Cycle Length: 80			
Offset: 72 (90%), Referenced to phase 4:EBT and 8:WBT, Start of Green			
Natural Cycle: 60			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.60			
Intersection Signal Delay: 6.7		Intersection LOS: A	
Intersection Capacity Utilization 43.6%		ICU Level of Service A	
Analysis Period (min) 15			

Splits and Phases: 6: Livingston Av & Miller Av



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	286	671	0	0	399	96	8	74	22	0	0	0
Future Volume (vph)	286	671	0	0	399	96	8	74	22	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	150		0	0		0	0		0	0		0
Storage Lanes	0		0	0		0	0		1	0		0
Taper Length (ft)	25			0			0			0		
Lane Util. Factor	0.95	0.95	1.00	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor								1.00	0.98			
Frt					0.971				0.850			
Flt Protected		0.985						0.995				
Satd. Flow (prot)	0	3129	0	0	3024	0	0	1788	1487	0	0	0
Flt Permitted		0.670						0.995				
Satd. Flow (perm)	0	2128	0	0	3024	0	0	1787	1457	0	0	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)					66				33			
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		577			1576			192			127	
Travel Time (s)		13.1			35.8			4.4			2.9	
Confl. Peds. (#/hr)			2	2			2		5	5		2
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles (%)	3%	3%	0%	0%	6%	1%	13%	1%	5%	0%	0%	0%
Parking (#/hr)		5			5	5						
Adj. Flow (vph)	308	722	0	0	429	103	9	80	24	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	1030	0	0	532	0	0	89	24	0	0	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.04	1.13	1.04	1.04	1.13	1.04	1.04	1.04	1.04	1.04	1.04	1.04
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2			2		1	2	1			
Detector Template	Left	Thru			Thru		Left	Thru	Right			
Leading Detector (ft)	20	100			100		20	100	20			
Trailing Detector (ft)	0	0			0		0	0	0			
Detector 1 Position(ft)	0	0			0		0	0	0			
Detector 1 Size(ft)	20	6			6		20	6	20			
Detector 1 Type	Cl+Ex	Cl+Ex			Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex			
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0			0.0		0.0	0.0	0.0			
Detector 1 Queue (s)	0.0	0.0			0.0		0.0	0.0	0.0			
Detector 1 Delay (s)	0.0	0.0			0.0		0.0	0.0	0.0			
Detector 2 Position(ft)		94			94			94				
Detector 2 Size(ft)		6			6			6				
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex				
Detector 2 Channel												

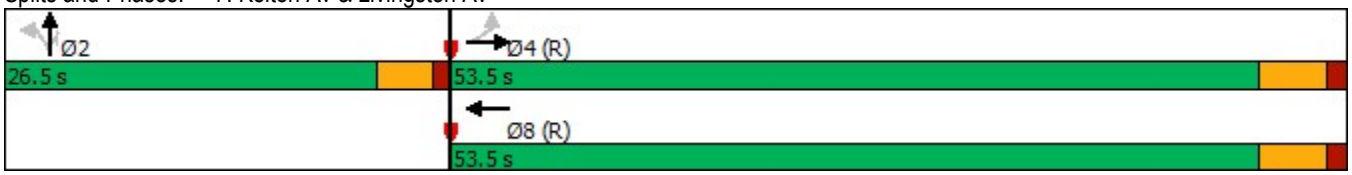


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 2 Extend (s)		0.0			0.0			0.0				
Turn Type	Perm	NA			NA		Perm	NA	Perm			
Protected Phases		4			8			2				
Permitted Phases	4						2		2			
Detector Phase	4	4			8		2	2	2			
Switch Phase												
Minimum Initial (s)	15.0	15.0			15.0		10.0	10.0	10.0			
Minimum Split (s)	27.0	27.0			27.0		26.5	26.5	26.5			
Total Split (s)	53.5	53.5			53.5		26.5	26.5	26.5			
Total Split (%)	66.9%	66.9%			66.9%		33.1%	33.1%	33.1%			
Maximum Green (s)	48.1	48.1			48.1		22.1	22.1	22.1			
Yellow Time (s)	4.1	4.1			4.1		3.4	3.4	3.4			
All-Red Time (s)	1.3	1.3			1.3		1.0	1.0	1.0			
Lost Time Adjust (s)		0.0			0.0			0.0	0.0			
Total Lost Time (s)		5.4			5.4			4.4	4.4			
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.7	3.7			3.7		4.0	4.0	4.0			
Recall Mode	C-Max	C-Max			C-Max		None	None	None			
Walk Time (s)	8.0	8.0			8.0		7.0	7.0	7.0			
Flash Dont Walk (s)	7.0	7.0			7.0		8.0	8.0	8.0			
Pedestrian Calls (#/hr)	0	0			0		0	0	0			
Act Effct Green (s)		63.0			63.0			11.2	11.2			
Actuated g/C Ratio		0.79			0.79			0.14	0.14			
v/c Ratio		0.61			0.22			0.36	0.10			
Control Delay		4.9			1.2			35.0	9.3			
Queue Delay		0.0			0.0			0.0	0.0			
Total Delay		4.9			1.2			35.0	9.3			
LOS		A			A			D	A			
Approach Delay		4.9			1.2			29.5				
Approach LOS		A			A			C				
90th %ile Green (s)	56.4	56.4			56.4		13.8	13.8	13.8			
90th %ile Term Code	Coord	Coord			Coord		Gap	Gap	Gap			
70th %ile Green (s)	58.5	58.5			58.5		11.7	11.7	11.7			
70th %ile Term Code	Coord	Coord			Coord		Gap	Gap	Gap			
50th %ile Green (s)	59.9	59.9			59.9		10.3	10.3	10.3			
50th %ile Term Code	Coord	Coord			Coord		Gap	Gap	Gap			
30th %ile Green (s)	60.2	60.2			60.2		10.0	10.0	10.0			
30th %ile Term Code	Coord	Coord			Coord		Min	Min	Min			
10th %ile Green (s)	74.6	74.6			74.6		0.0	0.0	0.0			
10th %ile Term Code	Coord	Coord			Coord		Skip	Skip	Skip			
Queue Length 50th (ft)		51			10			41	0			
Queue Length 95th (ft)		60			17			81	16			
Internal Link Dist (ft)		497			1496			112			47	
Turn Bay Length (ft)												
Base Capacity (vph)		1676			2395			493	426			
Starvation Cap Reductn		0			0			0	0			
Spillback Cap Reductn		0			0			0	0			
Storage Cap Reductn		0			0			0	0			

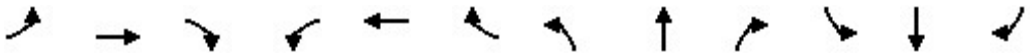
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Reduced v/c Ratio		0.61			0.22			0.18	0.06			

Intersection Summary			
Area Type:	Other		
Cycle Length: 80			
Actuated Cycle Length: 80			
Offset: 5 (6%), Referenced to phase 4:EBTL and 8:WBT, Start of Green			
Natural Cycle: 70			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.61			
Intersection Signal Delay: 5.4		Intersection LOS: A	
Intersection Capacity Utilization 64.5%		ICU Level of Service C	
Analysis Period (min) 15			

Splits and Phases: 7: Kelton Av & Livingston Av



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	30	622	49	37	428	44	26	291	52	31	225	42
Future Volume (vph)	30	622	49	37	428	44	26	291	52	31	225	42
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	150		0	150		0	0		0	0		0
Storage Lanes	0		0	0		0	0		0	0		0
Taper Length (ft)	25			25			0			0		
Lane Util. Factor	0.95	0.95	0.95	0.95	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		1.00			1.00			1.00			1.00	
Frt		0.989			0.987			0.981			0.981	
Flt Protected		0.998			0.996			0.997			0.995	
Satd. Flow (prot)	0	3107	0	0	3044	0	0	1696	0	0	1680	0
Flt Permitted		0.916			0.866			0.965			0.917	
Satd. Flow (perm)	0	2850	0	0	2645	0	0	1641	0	0	1547	0
Right Turn on Red			Yes			Yes			Yes			No
Satd. Flow (RTOR)		14			18			12				
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1576			932			368			414	
Travel Time (s)		35.8			21.2			8.4			9.4	
Confl. Peds. (#/hr)	11		13	13		11	9		10	10		9
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	14%	3%	4%	11%	4%	12%	25%	4%	4%	3%	7%	5%
Parking (#/hr)		5	5		5	5						
Adj. Flow (vph)	32	655	52	39	451	46	27	306	55	33	237	44
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	739	0	0	536	0	0	388	0	0	314	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.04	1.13	1.04	1.04	1.13	1.04	1.04	1.04	1.04	1.04	1.04	1.04
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (ft)	20	100		20	100		20	100		20	100	
Trailing Detector (ft)	0	0		0	0		0	0		0	0	
Detector 1 Position(ft)	0	0		0	0		0	0		0	0	
Detector 1 Size(ft)	20	6		20	6		20	6		20	6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												

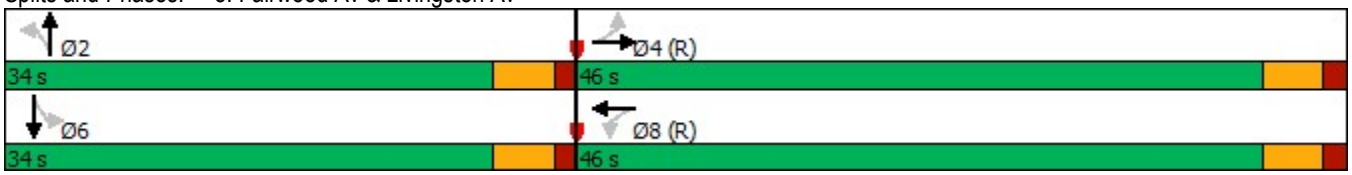


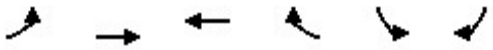
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	15.0	15.0		15.0	15.0		10.0	10.0		10.0	10.0	
Minimum Split (s)	27.0	27.0		27.0	27.0		26.5	26.5		26.5	26.5	
Total Split (s)	46.0	46.0		46.0	46.0		34.0	34.0		34.0	34.0	
Total Split (%)	57.5%	57.5%		57.5%	57.5%		42.5%	42.5%		42.5%	42.5%	
Maximum Green (s)	40.9	40.9		40.9	40.9		29.1	29.1		29.1	29.1	
Yellow Time (s)	3.6	3.6		3.6	3.6		3.6	3.6		3.6	3.6	
All-Red Time (s)	1.5	1.5		1.5	1.5		1.3	1.3		1.3	1.3	
Lost Time Adjust (s)		0.0			0.0			0.0			0.0	
Total Lost Time (s)		5.1			5.1			4.9			4.9	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		4.0	4.0		4.0	4.0	
Recall Mode	C-Max	C-Max		C-Max	C-Max		None	None		None	None	
Walk Time (s)	8.0	8.0		8.0	8.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	
Act Effct Green (s)		46.1			46.1			23.9			23.9	
Actuated g/C Ratio		0.58			0.58			0.30			0.30	
v/c Ratio		0.45			0.35			0.78			0.68	
Control Delay		5.2			6.2			35.7			31.9	
Queue Delay		0.0			0.0			0.0			0.0	
Total Delay		5.2			6.2			35.7			31.9	
LOS		A			A			D			C	
Approach Delay		5.2			6.2			35.7			31.9	
Approach LOS		A			A			D			C	
90th %ile Green (s)	40.9	40.9		40.9	40.9		29.1	29.1		29.1	29.1	
90th %ile Term Code	Coord	Coord		Coord	Coord		Max	Max		Max	Max	
70th %ile Green (s)	41.8	41.8		41.8	41.8		28.2	28.2		28.2	28.2	
70th %ile Term Code	Coord	Coord		Coord	Coord		Gap	Gap		Hold	Hold	
50th %ile Green (s)	45.5	45.5		45.5	45.5		24.5	24.5		24.5	24.5	
50th %ile Term Code	Coord	Coord		Coord	Coord		Gap	Gap		Hold	Hold	
30th %ile Green (s)	48.7	48.7		48.7	48.7		21.3	21.3		21.3	21.3	
30th %ile Term Code	Coord	Coord		Coord	Coord		Gap	Gap		Hold	Hold	
10th %ile Green (s)	53.6	53.6		53.6	53.6		16.4	16.4		16.4	16.4	
10th %ile Term Code	Coord	Coord		Coord	Coord		Gap	Gap		Hold	Hold	
Queue Length 50th (ft)		67			44			169			136	
Queue Length 95th (ft)		104			75			248			204	
Internal Link Dist (ft)		1496			852			288			334	
Turn Bay Length (ft)												
Base Capacity (vph)		1648			1532			604			562	
Starvation Cap Reductn		0			0			0			0	
Spillback Cap Reductn		0			0			0			0	
Storage Cap Reductn		0			0			0			0	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Reduced v/c Ratio		0.45			0.35			0.64			0.56	

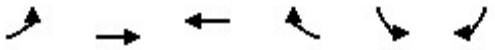
Intersection Summary			
Area Type:	Other		
Cycle Length: 80			
Actuated Cycle Length: 80			
Offset: 46 (58%), Referenced to phase 4:EBTL and 8:WBTL, Start of Green			
Natural Cycle: 55			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.78			
Intersection Signal Delay: 15.7		Intersection LOS: B	
Intersection Capacity Utilization 70.9%		ICU Level of Service C	
Analysis Period (min) 15			

Splits and Phases: 8: Fairwood Av & Livingston Av

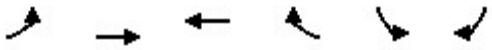




Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	66	821	597	219	169	69
Future Volume (vph)	66	821	597	219	169	69
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	150			0	0	0
Storage Lanes	0			0	1	0
Taper Length (ft)	25				0	
Lane Util. Factor	0.95	0.95	0.95	0.95	1.00	1.00
Ped Bike Factor		1.00	0.99		1.00	
Frt			0.960		0.961	
Flt Protected		0.996			0.966	
Satd. Flow (prot)	0	3192	3014	0	1653	0
Flt Permitted		0.815			0.966	
Satd. Flow (perm)	0	2612	3014	0	1647	0
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)			115		25	
Link Speed (mph)		30	30		30	
Link Distance (ft)		841	588		385	
Travel Time (s)		19.1	13.4		8.8	
Confl. Peds. (#/hr)	5			5	3	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	3%	2%	3%	4%	2%	6%
Parking (#/hr)	5	5	5	5		
Adj. Flow (vph)	69	864	628	231	178	73
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	933	859	0	251	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(ft)		11	11		11	
Link Offset(ft)		0	0		0	
Crosswalk Width(ft)		16	16		16	
Two way Left Turn Lane						
Headway Factor	1.04	1.13	1.13	1.04	1.04	1.04
Turning Speed (mph)	15			9	15	9
Number of Detectors	1	2	2		1	
Detector Template	Left	Thru	Thru		Left	
Leading Detector (ft)	20	100	100		20	
Trailing Detector (ft)	0	0	0		0	
Detector 1 Position(ft)	0	0	0		0	
Detector 1 Size(ft)	20	6	6		20	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0		0.0	
Detector 1 Queue (s)	0.0	0.0	0.0		0.0	
Detector 1 Delay (s)	0.0	0.0	0.0		0.0	
Detector 2 Position(ft)		94	94			
Detector 2 Size(ft)		6	6			
Detector 2 Type		Cl+Ex	Cl+Ex			
Detector 2 Channel						



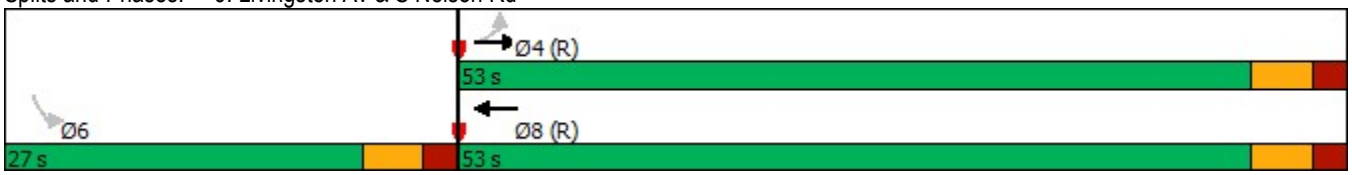
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Detector 2 Extend (s)		0.0	0.0			
Turn Type	Perm	NA	NA		Perm	
Protected Phases		4	8			
Permitted Phases	4				6	
Detector Phase	4	4	8		6	
Switch Phase						
Minimum Initial (s)	15.0	15.0	15.0		10.0	
Minimum Split (s)	27.0	27.0	27.0		26.5	
Total Split (s)	53.0	53.0	53.0		27.0	
Total Split (%)	66.3%	66.3%	66.3%		33.8%	
Maximum Green (s)	47.2	47.2	47.2		21.3	
Yellow Time (s)	3.6	3.6	3.6		3.6	
All-Red Time (s)	2.2	2.2	2.2		2.1	
Lost Time Adjust (s)		0.0	0.0		0.0	
Total Lost Time (s)		5.8	5.8		5.7	
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	0.2	0.2	0.2		4.0	
Recall Mode	C-Max	C-Max	C-Max		None	
Walk Time (s)	8.0	8.0	8.0		7.0	
Flash Dont Walk (s)	7.0	7.0	7.0		7.0	
Pedestrian Calls (#/hr)	0	0	0		0	
Act Effct Green (s)		51.8	51.8		16.7	
Actuated g/C Ratio		0.65	0.65		0.21	
v/c Ratio		0.55	0.43		0.69	
Control Delay		4.4	7.2		36.0	
Queue Delay		0.0	0.0		0.0	
Total Delay		4.4	7.2		36.0	
LOS		A	A		D	
Approach Delay		4.4	7.2		36.0	
Approach LOS		A	A		D	
90th %ile Green (s)	47.2	47.2	47.2		21.3	
90th %ile Term Code	Coord	Coord	Coord		Max	
70th %ile Green (s)	48.7	48.7	48.7		19.8	
70th %ile Term Code	Coord	Coord	Coord		Gap	
50th %ile Green (s)	51.3	51.3	51.3		17.2	
50th %ile Term Code	Coord	Coord	Coord		Gap	
30th %ile Green (s)	54.0	54.0	54.0		14.5	
30th %ile Term Code	Coord	Coord	Coord		Gap	
10th %ile Green (s)	57.8	57.8	57.8		10.7	
10th %ile Term Code	Coord	Coord	Coord		Gap	
Queue Length 50th (ft)		44	83		104	
Queue Length 95th (ft)		60	140		170	
Internal Link Dist (ft)		761	508		305	
Turn Bay Length (ft)						
Base Capacity (vph)		1691	1991		456	
Starvation Cap Reductn		0	0		0	
Spillback Cap Reductn		0	0		0	
Storage Cap Reductn		0	0		0	

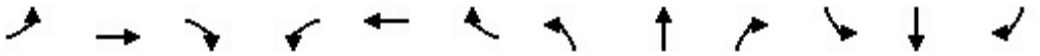


Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Reduced v/c Ratio		0.55	0.43		0.55	

Intersection Summary			
Area Type:	Other		
Cycle Length: 80			
Actuated Cycle Length: 80			
Offset: 0 (0%), Referenced to phase 4:EBTL and 8:WBT, Start of Green			
Natural Cycle: 60			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.69			
Intersection Signal Delay: 9.5		Intersection LOS: A	
Intersection Capacity Utilization 76.3%		ICU Level of Service D	
Analysis Period (min) 15			

Splits and Phases: 9: Livingston Av & S Nelson Rd

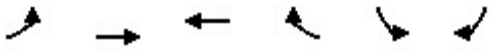




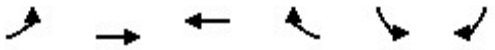
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	5	506	0	0	362	4	52	6	52	12	0	19
Future Volume (Veh/h)	5	506	0	0	362	4	52	6	52	12	0	19
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Hourly flow rate (vph)	6	588	0	0	421	5	60	7	60	14	0	22
Pedestrians					3			11			7	
Lane Width (ft)					11.0			11.0			11.0	
Walking Speed (ft/s)					3.5			3.5			3.5	
Percent Blockage					0			1			1	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)		440			1031							
pX, platoon unblocked				0.98			0.98	0.98	0.98	0.98	0.98	
vC, conflicting volume	433			599			844	1044	308	803	1042	220
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	433			539			789	995	241	748	992	220
tC, single (s)	4.1			4.1			7.6	6.8	6.9	7.8	6.5	7.0
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.6	4.2	3.3	3.7	4.0	3.3
p0 queue free %	99			100			76	97	92	94	100	97
cM capacity (veh/h)	1130			1005			253	210	733	234	236	770

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	202	392	281	145	127	36
Volume Left	6	0	0	0	60	14
Volume Right	0	0	0	5	60	22
cSH	1130	1700	1700	1700	360	407
Volume to Capacity	0.01	0.23	0.17	0.09	0.35	0.09
Queue Length 95th (ft)	0	0	0	0	39	7
Control Delay (s)	0.3	0.0	0.0	0.0	20.3	14.7
Lane LOS	A				C	B
Approach Delay (s)	0.1		0.0		20.3	14.7
Approach LOS					C	B

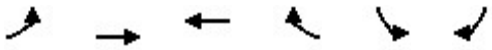
Intersection Summary				
Average Delay	2.7			
Intersection Capacity Utilization	33.7%	ICU Level of Service		A
Analysis Period (min)	15			



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	104	205	407	64	48	175
Future Volume (vph)	104	205	407	64	48	175
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	100			0	0	0
Storage Lanes	0			0	1	1
Taper Length (ft)	25				0	
Lane Util. Factor	0.95	0.95	0.95	0.95	1.00	1.00
Ped Bike Factor		1.00	1.00		1.00	0.97
Frt			0.980			0.850
Flt Protected		0.983			0.950	
Satd. Flow (prot)	0	3195	3089	0	1711	1546
Flt Permitted		0.697			0.950	
Satd. Flow (perm)	0	2264	3089	0	1709	1501
Right Turn on Red				Yes		No
Satd. Flow (RTOR)			32			
Link Speed (mph)		35	35		25	
Link Distance (ft)		304	440		328	
Travel Time (s)		5.9	8.6		8.9	
Confl. Peds. (#/hr)	2			2	1	15
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles (%)	10%	6%	4%	0%	2%	1%
Parking (#/hr)			5	5		
Adj. Flow (vph)	112	220	438	69	52	188
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	332	507	0	52	188
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(ft)		0	0		11	
Link Offset(ft)		0	0		0	
Crosswalk Width(ft)		16	16		16	
Two way Left Turn Lane						
Headway Factor	1.04	1.04	1.13	1.04	1.04	1.04
Turning Speed (mph)	15			9	15	9
Number of Detectors	1	2	2		1	1
Detector Template	Left	Thru	Thru		Left	Right
Leading Detector (ft)	20	100	100		20	20
Trailing Detector (ft)	0	0	0		0	0
Detector 1 Position(ft)	0	0	0		0	0
Detector 1 Size(ft)	20	6	6		20	20
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0		0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0		0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0		0.0	0.0
Detector 2 Position(ft)		94	94			
Detector 2 Size(ft)		6	6			
Detector 2 Type		Cl+Ex	Cl+Ex			
Detector 2 Channel						



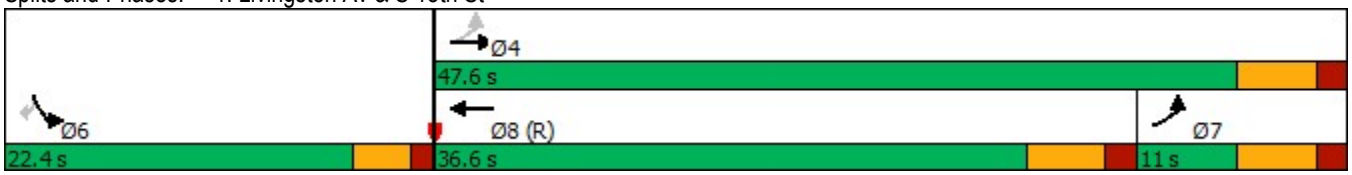
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Detector 2 Extend (s)		0.0	0.0			
Turn Type	pm+pt	NA	NA		Prot	Perm
Protected Phases	7	4	8		6	
Permitted Phases	4					6
Detector Phase	7	4	8		6	6
Switch Phase						
Minimum Initial (s)	5.0	7.0	16.0		10.0	10.0
Minimum Split (s)	10.8	21.8	21.8		22.3	22.3
Total Split (s)	11.0	47.6	36.6		22.4	22.4
Total Split (%)	15.7%	68.0%	52.3%		32.0%	32.0%
Maximum Green (s)	5.2	41.8	30.8		18.1	18.1
Yellow Time (s)	4.1	4.1	4.1		3.0	3.0
All-Red Time (s)	1.7	1.7	1.7		1.3	1.3
Lost Time Adjust (s)		0.0	0.0		0.0	0.0
Total Lost Time (s)		5.8	5.8		4.3	4.3
Lead/Lag	Lag		Lead			
Lead-Lag Optimize?	Yes		Yes			
Vehicle Extension (s)	3.7	3.7	3.7		5.0	5.0
Recall Mode	None	Max	C-Max		None	None
Walk Time (s)		7.0	7.0		7.0	7.0
Flash Dont Walk (s)		9.0	9.0		11.0	11.0
Pedestrian Calls (#/hr)		0	0		0	0
Act Effct Green (s)		44.9	44.9		15.0	15.0
Actuated g/C Ratio		0.64	0.64		0.21	0.21
v/c Ratio		0.23	0.25		0.14	0.58
Control Delay		6.3	6.3		21.8	31.8
Queue Delay		0.0	0.0		0.0	0.0
Total Delay		6.3	6.3		21.8	31.8
LOS		A	A		C	C
Approach Delay		6.3	6.3		29.6	
Approach LOS		A	A		C	
90th %ile Green (s)	0.0	41.8	41.8		18.1	18.1
90th %ile Term Code	Skip	Coord	Coord		Max	Max
70th %ile Green (s)	0.0	42.0	42.0		17.9	17.9
70th %ile Term Code	Skip	Coord	Coord		Gap	Gap
50th %ile Green (s)	0.0	44.2	44.2		15.7	15.7
50th %ile Term Code	Skip	Coord	Coord		Gap	Gap
30th %ile Green (s)	0.0	46.5	46.5		13.4	13.4
30th %ile Term Code	Skip	Coord	Coord		Gap	Gap
10th %ile Green (s)	0.0	49.8	49.8		10.1	10.1
10th %ile Term Code	Skip	Coord	Coord		Gap	Gap
Queue Length 50th (ft)		28	65		18	72
Queue Length 95th (ft)		51	98		42	127
Internal Link Dist (ft)		224	360		248	
Turn Bay Length (ft)						
Base Capacity (vph)		1450	1991		442	388
Starvation Cap Reductn		0	0		0	0
Spillback Cap Reductn		0	0		0	0
Storage Cap Reductn		0	0		0	0

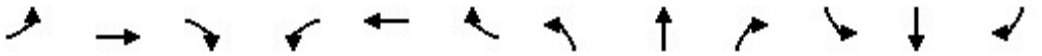


Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Reduced v/c Ratio		0.23	0.25		0.12	0.48

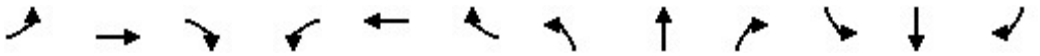
Intersection Summary			
Area Type:	Other		
Cycle Length: 70			
Actuated Cycle Length: 70			
Offset: 63 (90%), Referenced to phase 8:WBT, Start of Green			
Natural Cycle: 55			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.58			
Intersection Signal Delay: 11.5		Intersection LOS: B	
Intersection Capacity Utilization 46.2%		ICU Level of Service A	
Analysis Period (min) 15			

Splits and Phases: 1: Livingston Av & S 18th St





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	278	56	50	532	0	0	0	0	10	3	13
Future Volume (vph)	0	278	56	50	532	0	0	0	0	10	3	13
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	150		0	150		0	0		0	0		0
Storage Lanes	0		0	0		0	0		0	0		0
Taper Length (ft)	25			25			0			0		
Lane Util. Factor	1.00	0.95	0.95	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		1.00			1.00						0.99	
Frt		0.975									0.930	
Flt Protected					0.996						0.981	
Satd. Flow (prot)	0	3057	0	0	3124	0	0	0	0	0	1420	0
Flt Permitted					0.890						0.981	
Satd. Flow (perm)	0	3057	0	0	2791	0	0	0	0	0	1420	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		53									15	
Link Speed (mph)		35			35			35			35	
Link Distance (ft)		1031			383			200			188	
Travel Time (s)		20.1			7.5			3.9			3.7	
Confl. Peds. (#/hr)	5		1	1		5	3					3
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Heavy Vehicles (%)	0%	4%	12%	13%	5%	0%	0%	0%	0%	14%	0%	0%
Parking (#/hr)		0	0		0						0	0
Adj. Flow (vph)	0	316	64	57	605	0	0	0	0	11	3	15
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	380	0	0	662	0	0	0	0	0	29	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.04	1.12	1.04	1.04	1.12	1.04	1.04	1.04	1.04	1.04	1.19	1.04
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors		2		1	2					1	2	
Detector Template		Thru		Left	Thru					Left	Thru	
Leading Detector (ft)		100		20	100					20	100	
Trailing Detector (ft)		0		0	0					0	0	
Detector 1 Position(ft)		0		0	0					0	0	
Detector 1 Size(ft)		6		20	6					20	6	
Detector 1 Type		Cl+Ex		Cl+Ex	Cl+Ex					Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)		0.0		0.0	0.0					0.0	0.0	
Detector 1 Queue (s)		0.0		0.0	0.0					0.0	0.0	
Detector 1 Delay (s)		0.0		0.0	0.0					0.0	0.0	
Detector 2 Position(ft)		94			94						94	
Detector 2 Size(ft)		6			6						6	
Detector 2 Type		Cl+Ex			Cl+Ex						Cl+Ex	
Detector 2 Channel												

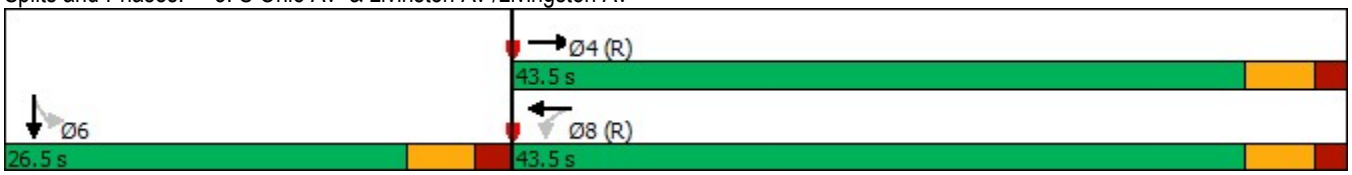


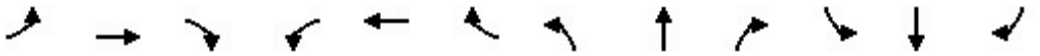
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 2 Extend (s)		0.0			0.0						0.0	
Turn Type		NA		Perm	NA					Perm	NA	
Protected Phases		4			8						6	
Permitted Phases				8						6		
Detector Phase		4		8	8					6	6	
Switch Phase												
Minimum Initial (s)		15.0		15.0	15.0					10.0	10.0	
Minimum Split (s)		27.0		27.0	27.0					26.5	26.5	
Total Split (s)		43.5		43.5	43.5					26.5	26.5	
Total Split (%)		62.1%		62.1%	62.1%					37.9%	37.9%	
Maximum Green (s)		38.1		38.1	38.1					20.9	20.9	
Yellow Time (s)		3.6		3.6	3.6					3.6	3.6	
All-Red Time (s)		1.8		1.8	1.8					2.0	2.0	
Lost Time Adjust (s)		0.0			0.0						0.0	
Total Lost Time (s)		5.4			5.4						5.6	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)		3.0		3.0	3.0					4.0	4.0	
Recall Mode		C-Max		C-Max	C-Max					None	None	
Walk Time (s)		8.0		8.0	8.0					7.0	7.0	
Flash Dont Walk (s)		7.0		7.0	7.0					7.0	7.0	
Pedestrian Calls (#/hr)		0		0	0					0	0	
Act Effct Green (s)		61.6			61.6						10.0	
Actuated g/C Ratio		0.88			0.88						0.14	
v/c Ratio		0.14			0.27						0.13	
Control Delay		1.6			0.8						19.3	
Queue Delay		0.0			0.0						0.0	
Total Delay		1.6			0.8						19.3	
LOS		A			A						B	
Approach Delay		1.6			0.8						19.3	
Approach LOS		A			A						B	
90th %ile Green (s)		49.0		49.0	49.0					10.0	10.0	
90th %ile Term Code		Coord		Coord	Coord					Min	Min	
70th %ile Green (s)		49.0		49.0	49.0					10.0	10.0	
70th %ile Term Code		Coord		Coord	Coord					Min	Min	
50th %ile Green (s)		64.6		64.6	64.6					0.0	0.0	
50th %ile Term Code		Coord		Coord	Coord					Skip	Skip	
30th %ile Green (s)		64.6		64.6	64.6					0.0	0.0	
30th %ile Term Code		Coord		Coord	Coord					Skip	Skip	
10th %ile Green (s)		64.6		64.6	64.6					0.0	0.0	
10th %ile Term Code		Coord		Coord	Coord					Skip	Skip	
Queue Length 50th (ft)		0			0						5	
Queue Length 95th (ft)		24			17						26	
Internal Link Dist (ft)		951			303			120			108	
Turn Bay Length (ft)												
Base Capacity (vph)		2696			2456						434	
Starvation Cap Reductn		0			0						0	
Spillback Cap Reductn		0			0						0	
Storage Cap Reductn		0			0						0	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Reduced v/c Ratio		0.14			0.27						0.07	

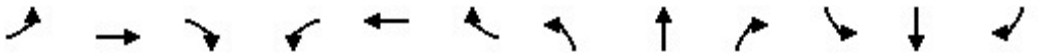
Intersection Summary			
Area Type:	Other		
Cycle Length: 70			
Actuated Cycle Length: 70			
Offset: 28 (40%), Referenced to phase 4:EBT and 8:WBTL, Start of Green			
Natural Cycle: 55			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.27			
Intersection Signal Delay: 1.6		Intersection LOS: A	
Intersection Capacity Utilization 51.0%		ICU Level of Service A	
Analysis Period (min) 15			

Splits and Phases: 3: S Ohio Av & Livinston Av /Livingston Av





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	27	253	0	0	529	57	72	119	35	0	0	0
Future Volume (vph)	27	253	0	0	529	57	72	119	35	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	150		0	0		0	0		0	0		0
Storage Lanes	0		0	0		0	0		0	0		0
Taper Length (ft)	25			0			0			0		
Lane Util. Factor	0.95	0.95	1.00	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		1.00			1.00			1.00				
Frt					0.985			0.979				
Flt Protected		0.995						0.984				
Satd. Flow (prot)	0	3142	0	0	3047	0	0	1413	0	0	0	0
Flt Permitted		0.875						0.984				
Satd. Flow (perm)	0	2761	0	0	3047	0	0	1412	0	0	0	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)					28			13				
Link Speed (mph)		30			30			35			35	
Link Distance (ft)		383			1949			182			211	
Travel Time (s)		8.7			44.3			3.5			4.1	
Confl. Peds. (#/hr)	6					6	2					2
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Heavy Vehicles (%)	0%	4%	0%	0%	6%	0%	15%	9%	0%	0%	0%	0%
Parking (#/hr)		5			5	5		5	5			
Adj. Flow (vph)	30	284	0	0	594	64	81	134	39	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	314	0	0	658	0	0	254	0	0	0	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.04	1.13	1.04	1.04	1.13	1.04	1.04	1.24	1.04	1.04	1.04	1.04
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2			2		1	2				
Detector Template	Left	Thru			Thru		Left	Thru				
Leading Detector (ft)	20	100			100		20	100				
Trailing Detector (ft)	0	0			0		0	0				
Detector 1 Position(ft)	0	0			0		0	0				
Detector 1 Size(ft)	20	6			6		20	6				
Detector 1 Type	Cl+Ex	Cl+Ex			Cl+Ex		Cl+Ex	Cl+Ex				
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0			0.0		0.0	0.0				
Detector 1 Queue (s)	0.0	0.0			0.0		0.0	0.0				
Detector 1 Delay (s)	0.0	0.0			0.0		0.0	0.0				
Detector 2 Position(ft)		94			94			94				
Detector 2 Size(ft)		6			6			6				
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex				
Detector 2 Channel												

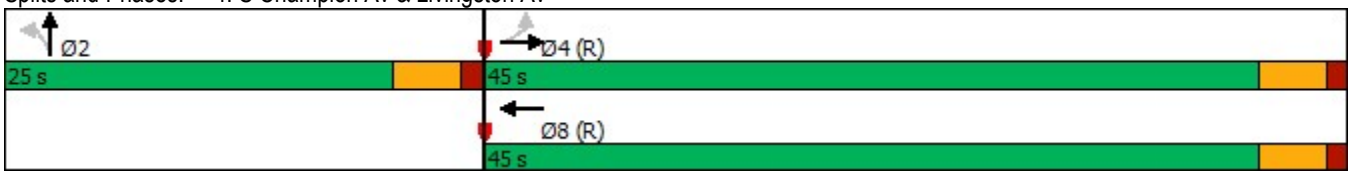


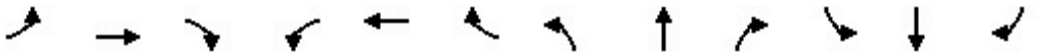
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 2 Extend (s)		0.0			0.0			0.0				
Turn Type	Perm	NA			NA		Perm	NA				
Protected Phases		4			8			2				
Permitted Phases	4						2					
Detector Phase	4	4			8		2	2				
Switch Phase												
Minimum Initial (s)	15.0	15.0			15.0		10.0	10.0				
Minimum Split (s)	26.5	26.5			27.0		19.8	19.8				
Total Split (s)	45.0	45.0			45.0		25.0	25.0				
Total Split (%)	64.3%	64.3%			64.3%		35.7%	35.7%				
Maximum Green (s)	40.3	40.3			40.3		20.2	20.2				
Yellow Time (s)	3.6	3.6			3.6		3.6	3.6				
All-Red Time (s)	1.1	1.1			1.1		1.2	1.2				
Lost Time Adjust (s)		0.0			0.0			0.0				
Total Lost Time (s)		4.7			4.7			4.8				
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	0.2	0.2			0.2		4.0	4.0				
Recall Mode	C-Max	C-Max			C-Max		None	None				
Walk Time (s)	8.0	8.0			8.0		7.0	7.0				
Flash Dont Walk (s)	7.0	7.0			7.0		8.0	8.0				
Pedestrian Calls (#/hr)	0	0			0		0	0				
Act Effct Green (s)		43.6			43.6			16.9				
Actuated g/C Ratio		0.62			0.62			0.24				
v/c Ratio		0.18			0.34			0.73				
Control Delay		4.7			4.7			35.3				
Queue Delay		0.0			0.0			0.0				
Total Delay		4.7			4.7			35.3				
LOS		A			A			D				
Approach Delay		4.7			4.7			35.3				
Approach LOS		A			A			D				
90th %ile Green (s)	40.3	40.3			40.3		20.2	20.2				
90th %ile Term Code	Coord	Coord			Coord		Max	Max				
70th %ile Green (s)	40.3	40.3			40.3		20.2	20.2				
70th %ile Term Code	Coord	Coord			Coord		Max	Max				
50th %ile Green (s)	42.6	42.6			42.6		17.9	17.9				
50th %ile Term Code	Coord	Coord			Coord		Gap	Gap				
30th %ile Green (s)	45.4	45.4			45.4		15.1	15.1				
30th %ile Term Code	Coord	Coord			Coord		Gap	Gap				
10th %ile Green (s)	49.6	49.6			49.6		10.9	10.9				
10th %ile Term Code	Coord	Coord			Coord		Gap	Gap				
Queue Length 50th (ft)		27			48			93				
Queue Length 95th (ft)		26			60			159				
Internal Link Dist (ft)		303			1869			102			131	
Turn Bay Length (ft)												
Base Capacity (vph)		1721			1910			416				
Starvation Cap Reductn		0			0			0				
Spillback Cap Reductn		0			0			0				
Storage Cap Reductn		0			0			0				

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Reduced v/c Ratio		0.18			0.34			0.61				

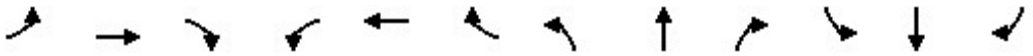
Intersection Summary			
Area Type:	Other		
Cycle Length: 70			
Actuated Cycle Length: 70			
Offset: 18 (26%), Referenced to phase 4:EBTL and 8:WBT, Start of Green			
Natural Cycle: 50			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.73			
Intersection Signal Delay: 11.1		Intersection LOS: B	
Intersection Capacity Utilization 54.9%		ICU Level of Service A	
Analysis Period (min) 15			

Splits and Phases: 4: S Champion Av & Livingston Av





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	270	77	328	472	1	107	3	220	0	1	1
Future Volume (vph)	0	270	77	328	472	1	107	3	220	0	1	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		150	110		0	75		0	0		0
Storage Lanes	0		0	1		0	1		0	0		0
Taper Length (ft)	25			25			0			0		
Lane Util. Factor	0.95	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		0.99		1.00	1.00			0.99				
Frt		0.967						0.852			0.932	
Flt Protected				0.950			0.950					
Satd. Flow (prot)	0	3028	0	1678	3116	0	1711	1500	0	0	1712	0
Flt Permitted				0.475			0.757					
Satd. Flow (perm)	0	3028	0	837	3116	0	1363	1500	0	0	1712	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		60			1			237			1	
Link Speed (mph)		35			35			35			25	
Link Distance (ft)		1949			512			199			214	
Travel Time (s)		38.0			10.0			3.9			5.8	
Confl. Peds. (#/hr)	6		2	2		6			1	1		
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles (%)	0%	3%	7%	4%	5%	0%	2%	0%	3%	0%	0%	0%
Parking (#/hr)		5	5		5	5						
Adj. Flow (vph)	0	290	83	353	508	1	115	3	237	0	1	1
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	373	0	353	509	0	115	240	0	0	2	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		11			11			11			11	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.04	1.13	1.04	1.04	1.13	1.04	1.04	1.04	1.04	1.04	1.04	1.04
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2		1	2			2	
Detector Template	Left	Thru		Left	Thru		Left	Thru			Thru	
Leading Detector (ft)	20	100		20	100		20	100			100	
Trailing Detector (ft)	0	0		0	0		0	0			0	
Detector 1 Position(ft)	0	0		0	0		0	0			0	
Detector 1 Size(ft)	20	6		20	6		20	6			6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex			Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0			0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0			0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0			0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												

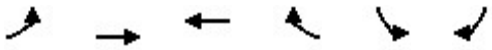


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type		NA		pm+pt	NA		Perm	NA			NA	
Protected Phases		4		3	8			2			6	
Permitted Phases	4			8			2					
Detector Phase	4	4		3	8		2	2			6	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0			5.0	
Minimum Split (s)	18.0	18.0		9.0	18.0		18.0	18.0			18.0	
Total Split (s)	30.0	30.0		20.0	50.0		20.0	20.0			20.0	
Total Split (%)	42.9%	42.9%		28.6%	71.4%		28.6%	28.6%			28.6%	
Maximum Green (s)	26.0	26.0		16.0	46.0		16.0	16.0			16.0	
Yellow Time (s)	3.0	3.0		3.0	3.0		3.0	3.0			3.0	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0			1.0	
Lost Time Adjust (s)		0.0		0.0	0.0		0.0	0.0			0.0	
Total Lost Time (s)		4.0		4.0	4.0		4.0	4.0			4.0	
Lead/Lag	Lag	Lag		Lead								
Lead-Lag Optimize?	Yes	Yes		Yes								
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0			3.0	
Recall Mode	C-Max	C-Max		None	C-Max		None	None			None	
Walk Time (s)	7.0	7.0			7.0		7.0	7.0			7.0	
Flash Dont Walk (s)	7.0	7.0			7.0		7.0	7.0			7.0	
Pedestrian Calls (#/hr)	0	0			0		0	0			0	
Act Effct Green (s)		35.8		50.9	50.9		11.1	11.1			11.1	
Actuated g/C Ratio		0.51		0.73	0.73		0.16	0.16			0.16	
v/c Ratio		0.24		0.48	0.22		0.53	0.55			0.01	
Control Delay		5.7		6.1	3.5		35.2	9.0			19.0	
Queue Delay		0.0		0.0	0.0		0.0	0.0			0.0	
Total Delay		5.7		6.1	3.5		35.2	9.0			19.0	
LOS		A		A	A		D	A			B	
Approach Delay		5.7			4.6			17.5			19.0	
Approach LOS		A			A			B			B	
90th %ile Green (s)	26.0	26.0		16.0	46.0		16.0	16.0			16.0	
90th %ile Term Code	Coord	Coord		Max	Coord		Max	Max			Hold	
70th %ile Green (s)	32.3	32.3		12.6	48.9		13.1	13.1			13.1	
70th %ile Term Code	Coord	Coord		Gap	Coord		Gap	Gap			Hold	
50th %ile Green (s)	36.4	36.4		10.5	50.9		11.1	11.1			11.1	
50th %ile Term Code	Coord	Coord		Gap	Coord		Gap	Gap			Hold	
30th %ile Green (s)	39.9	39.9		8.9	52.8		9.2	9.2			9.2	
30th %ile Term Code	Coord	Coord		Gap	Coord		Gap	Gap			Hold	
10th %ile Green (s)	44.6	44.6		7.2	55.8		6.2	6.2			6.2	
10th %ile Term Code	Coord	Coord		Gap	Coord		Gap	Gap			Hold	
Queue Length 50th (ft)		36		19	14		46	1			0	
Queue Length 95th (ft)		71		111	60		87	53			5	
Internal Link Dist (ft)		1869			432			119			134	
Turn Bay Length (ft)				110			75					
Base Capacity (vph)		1579		800	2265		311	525			392	
Starvation Cap Reductn		0		0	0		0	0			0	
Spillback Cap Reductn		0		0	0		0	0			0	
Storage Cap Reductn		0		0	0		0	0			0	

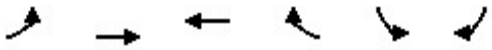
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Reduced v/c Ratio		0.24		0.44	0.22		0.37	0.46			0.01	

Intersection Summary			
Area Type:	Other		
Cycle Length: 70			
Actuated Cycle Length: 70			
Offset: 0 (0%), Referenced to phase 4:EBTL and 8:WBTL, Start of Green			
Natural Cycle: 50			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.55			
Intersection Signal Delay: 7.7		Intersection LOS: A	
Intersection Capacity Utilization 53.7%		ICU Level of Service A	
Analysis Period (min) 15			

Splits and Phases: 5: Lockbourne Av & Livingston Av



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑	↑↑		↰	↱
Traffic Volume (vph)	0	505	493	0	123	361
Future Volume (vph)	0	505	493	0	123	361
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	0.95	0.95	1.00	1.00	1.00
Ped Bike Factor						
Frt						0.850
Flt Protected					0.950	
Satd. Flow (prot)	0	3146	3116	0	1616	1501
Flt Permitted					0.950	
Satd. Flow (perm)	0	3146	3116	0	1616	1501
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)						313
Link Speed (mph)		35	35		25	
Link Distance (ft)		512	577		267	
Travel Time (s)		10.0	11.2		7.3	
Confl. Peds. (#/hr)	1			1		
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	0%	4%	5%	0%	8%	4%
Parking (#/hr)		5	5			
Adj. Flow (vph)	0	532	519	0	129	380
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	532	519	0	129	380
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(ft)		11	11		11	
Link Offset(ft)		0	0		0	
Crosswalk Width(ft)		16	16		16	
Two way Left Turn Lane						
Headway Factor	1.04	1.13	1.13	1.04	1.04	1.04
Turning Speed (mph)	15			9	15	9
Number of Detectors		2	2		1	1
Detector Template		Thru	Thru		Left	Right
Leading Detector (ft)		100	100		20	20
Trailing Detector (ft)		0	0		0	0
Detector 1 Position(ft)		0	0		0	0
Detector 1 Size(ft)		6	6		20	20
Detector 1 Type		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)		0.0	0.0		0.0	0.0
Detector 1 Queue (s)		0.0	0.0		0.0	0.0
Detector 1 Delay (s)		0.0	0.0		0.0	0.0
Detector 2 Position(ft)		94	94			
Detector 2 Size(ft)		6	6			
Detector 2 Type		Cl+Ex	Cl+Ex			
Detector 2 Channel						
Detector 2 Extend (s)		0.0	0.0			
Turn Type		NA	NA		Perm	Perm
Protected Phases		4	8			

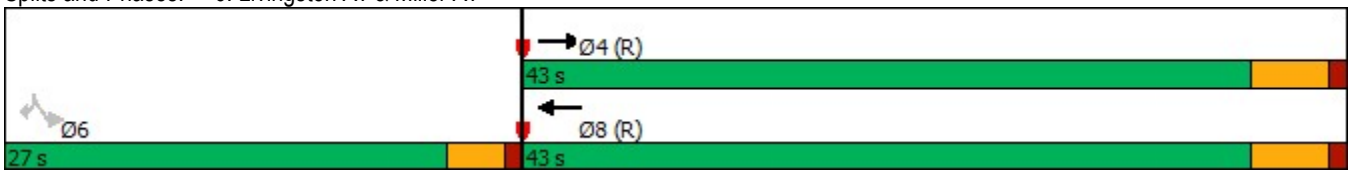


Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Permitted Phases					6	6
Detector Phase		4	8		6	6
Switch Phase						
Minimum Initial (s)		20.0	20.0		10.0	10.0
Minimum Split (s)		32.0	32.0		26.5	26.5
Total Split (s)		43.0	43.0		27.0	27.0
Total Split (%)		61.4%	61.4%		38.6%	38.6%
Maximum Green (s)		37.9	37.9		23.0	23.0
Yellow Time (s)		4.1	4.1		3.0	3.0
All-Red Time (s)		1.0	1.0		1.0	1.0
Lost Time Adjust (s)		0.0	0.0		0.0	0.0
Total Lost Time (s)		5.1	5.1		4.0	4.0
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)		1.0	1.0		4.0	4.0
Recall Mode		C-Max	C-Max		None	None
Walk Time (s)		13.0	13.0		7.0	7.0
Flash Dont Walk (s)		7.0	7.0		10.0	10.0
Pedestrian Calls (#/hr)		0	0		0	0
Act Effct Green (s)		47.1	47.1		13.8	13.8
Actuated g/C Ratio		0.67	0.67		0.20	0.20
v/c Ratio		0.25	0.25		0.41	0.70
Control Delay		7.3	2.6		27.1	12.6
Queue Delay		0.0	0.0		0.0	0.0
Total Delay		7.3	2.6		27.1	12.6
LOS		A	A		C	B
Approach Delay		7.3	2.6		16.2	
Approach LOS		A	A		B	
90th %ile Green (s)		39.1	39.1		21.8	21.8
90th %ile Term Code		Coord	Coord		Gap	Gap
70th %ile Green (s)		45.6	45.6		15.3	15.3
70th %ile Term Code		Coord	Coord		Gap	Gap
50th %ile Green (s)		49.1	49.1		11.8	11.8
50th %ile Term Code		Coord	Coord		Gap	Gap
30th %ile Green (s)		50.9	50.9		10.0	10.0
30th %ile Term Code		Coord	Coord		Min	Min
10th %ile Green (s)		50.9	50.9		10.0	10.0
10th %ile Term Code		Coord	Coord		Min	Min
Queue Length 50th (ft)		68	15		51	25
Queue Length 95th (ft)		112	23		81	89
Internal Link Dist (ft)		432	497		187	
Turn Bay Length (ft)						
Base Capacity (vph)		2117	2097		530	703
Starvation Cap Reductn		0	0		0	0
Spillback Cap Reductn		0	0		0	0
Storage Cap Reductn		0	0		0	0
Reduced v/c Ratio		0.25	0.25		0.24	0.54

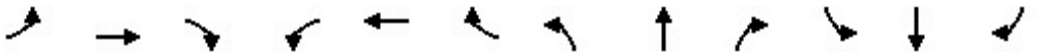
Intersection Summary

Area Type:	Other		
Cycle Length: 70			
Actuated Cycle Length: 70			
Offset: 24 (34%), Referenced to phase 4:EBT and 8:WBT, Start of Green			
Natural Cycle: 60			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.70			
Intersection Signal Delay: 8.6		Intersection LOS: A	
Intersection Capacity Utilization 46.6%		ICU Level of Service A	
Analysis Period (min) 15			

Splits and Phases: 6: Livingston Av & Miller Av



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	205	341	0	0	474	71	9	81	21	0	0	0
Future Volume (vph)	205	341	0	0	474	71	9	81	21	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	150		0	0		0	0		0	0		0
Storage Lanes	0		0	0		0	0		1	0		0
Taper Length (ft)	25			0			0			0		
Lane Util. Factor	0.95	0.95	1.00	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		1.00			1.00			1.00				
Frt					0.981				0.850			
Flt Protected		0.982						0.995				
Satd. Flow (prot)	0	3071	0	0	3045	0	0	1712	1561	0	0	0
Flt Permitted		0.630						0.995				
Satd. Flow (perm)	0	1967	0	0	3045	0	0	1712	1561	0	0	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)					37				37			
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		577			1576			192			127	
Travel Time (s)		13.1			35.8			4.4			2.9	
Confl. Peds. (#/hr)	4		2	2		4	1					1
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles (%)	4%	5%	0%	0%	5%	5%	13%	6%	0%	0%	0%	0%
Parking (#/hr)		5			5	5						
Adj. Flow (vph)	220	367	0	0	510	76	10	87	23	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	587	0	0	586	0	0	97	23	0	0	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.04	1.13	1.04	1.04	1.13	1.04	1.04	1.04	1.04	1.04	1.04	1.04
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2			2		1	2	1			
Detector Template	Left	Thru			Thru		Left	Thru	Right			
Leading Detector (ft)	20	100			100		20	100	20			
Trailing Detector (ft)	0	0			0		0	0	0			
Detector 1 Position(ft)	0	0			0		0	0	0			
Detector 1 Size(ft)	20	6			6		20	6	20			
Detector 1 Type	Cl+Ex	Cl+Ex			Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex			
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0			0.0		0.0	0.0	0.0			
Detector 1 Queue (s)	0.0	0.0			0.0		0.0	0.0	0.0			
Detector 1 Delay (s)	0.0	0.0			0.0		0.0	0.0	0.0			
Detector 2 Position(ft)		94			94			94				
Detector 2 Size(ft)		6			6			6				
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex				
Detector 2 Channel												

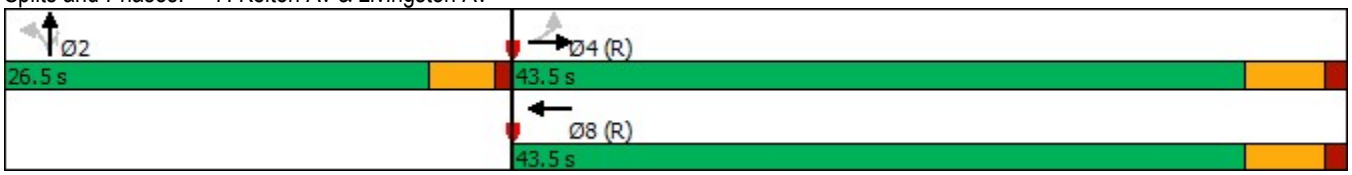


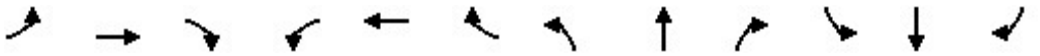
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 2 Extend (s)		0.0			0.0			0.0				
Turn Type	Perm	NA			NA		Perm	NA	Perm			
Protected Phases		4			8			2				
Permitted Phases	4						2		2			
Detector Phase	4	4			8		2	2	2			
Switch Phase												
Minimum Initial (s)	15.0	15.0			15.0		10.0	10.0	10.0			
Minimum Split (s)	27.0	27.0			27.0		26.5	26.5	26.5			
Total Split (s)	43.5	43.5			43.5		26.5	26.5	26.5			
Total Split (%)	62.1%	62.1%			62.1%		37.9%	37.9%	37.9%			
Maximum Green (s)	38.1	38.1			38.1		22.1	22.1	22.1			
Yellow Time (s)	4.1	4.1			4.1		3.4	3.4	3.4			
All-Red Time (s)	1.3	1.3			1.3		1.0	1.0	1.0			
Lost Time Adjust (s)		0.0			0.0			0.0	0.0			
Total Lost Time (s)		5.4			5.4			4.4	4.4			
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.7	3.7			3.7		4.0	4.0	4.0			
Recall Mode	C-Max	C-Max			C-Max		None	None	None			
Walk Time (s)	8.0	8.0			8.0		7.0	7.0	7.0			
Flash Dont Walk (s)	7.0	7.0			7.0		8.0	8.0	8.0			
Pedestrian Calls (#/hr)	0	0			0		0	0	0			
Act Effct Green (s)		53.0			53.0			11.1	11.1			
Actuated g/C Ratio		0.76			0.76			0.16	0.16			
v/c Ratio		0.39			0.25			0.36	0.08			
Control Delay		3.6			0.9			29.7	6.4			
Queue Delay		0.0			0.0			0.0	0.0			
Total Delay		3.6			0.9			29.7	6.4			
LOS		A			A			C	A			
Approach Delay		3.6			0.9			25.3				
Approach LOS		A			A			C				
90th %ile Green (s)	46.4	46.4			46.4		13.8	13.8	13.8			
90th %ile Term Code	Coord	Coord			Coord		Gap	Gap	Gap			
70th %ile Green (s)	48.5	48.5			48.5		11.7	11.7	11.7			
70th %ile Term Code	Coord	Coord			Coord		Gap	Gap	Gap			
50th %ile Green (s)	50.0	50.0			50.0		10.2	10.2	10.2			
50th %ile Term Code	Coord	Coord			Coord		Gap	Gap	Gap			
30th %ile Green (s)	50.2	50.2			50.2		10.0	10.0	10.0			
30th %ile Term Code	Coord	Coord			Coord		Min	Min	Min			
10th %ile Green (s)	64.6	64.6			64.6		0.0	0.0	0.0			
10th %ile Term Code	Coord	Coord			Coord		Skip	Skip	Skip			
Queue Length 50th (ft)		34			6			38	0			
Queue Length 95th (ft)		40			10			75	12			
Internal Link Dist (ft)		497			1496			112			47	
Turn Bay Length (ft)												
Base Capacity (vph)		1489			2315			540	518			
Starvation Cap Reductn		0			0			0	0			
Spillback Cap Reductn		0			0			0	0			
Storage Cap Reductn		0			0			0	0			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Reduced v/c Ratio		0.39			0.25			0.18	0.04			

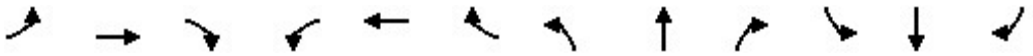
Intersection Summary			
Area Type:	Other		
Cycle Length: 70			
Actuated Cycle Length: 70			
Offset: 29 (41%), Referenced to phase 4:EBTL and 8:WBT, Start of Green			
Natural Cycle: 55			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.39			
Intersection Signal Delay: 4.4		Intersection LOS: A	
Intersection Capacity Utilization 54.9%		ICU Level of Service A	
Analysis Period (min) 15			

Splits and Phases: 7: Kelton Av & Livingston Av





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	7	314	47	15	479	38	12	251	77	24	211	26
Future Volume (vph)	7	314	47	15	479	38	12	251	77	24	211	26
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	150		0	150		0	0		0	0		0
Storage Lanes	0		0	0		0	0		0	0		0
Taper Length (ft)	25			25			0			0		
Lane Util. Factor	0.95	0.95	0.95	0.95	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		1.00			1.00			1.00			1.00	
Frt		0.981			0.989			0.969			0.986	
Flt Protected		0.999			0.999			0.998			0.995	
Satd. Flow (prot)	0	3053	0	0	3037	0	0	1597	0	0	1648	0
Flt Permitted		0.945			0.940			0.984			0.942	
Satd. Flow (perm)	0	2888	0	0	2857	0	0	1574	0	0	1560	0
Right Turn on Red			Yes			Yes			Yes			No
Satd. Flow (RTOR)		34			16			23				
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1576			932			368			414	
Travel Time (s)		35.8			21.2			8.4			9.4	
Confl. Peds. (#/hr)	3		4	4		3	9		2	2		9
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	17%	4%	7%	38%	5%	9%	0%	11%	12%	13%	9%	6%
Parking (#/hr)		5	5		5	5						
Adj. Flow (vph)	8	349	52	17	532	42	13	279	86	27	234	29
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	409	0	0	591	0	0	378	0	0	290	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.04	1.13	1.04	1.04	1.13	1.04	1.04	1.04	1.04	1.04	1.04	1.04
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (ft)	20	100		20	100		20	100		20	100	
Trailing Detector (ft)	0	0		0	0		0	0		0	0	
Detector 1 Position(ft)	0	0		0	0		0	0		0	0	
Detector 1 Size(ft)	20	6		20	6		20	6		20	6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												

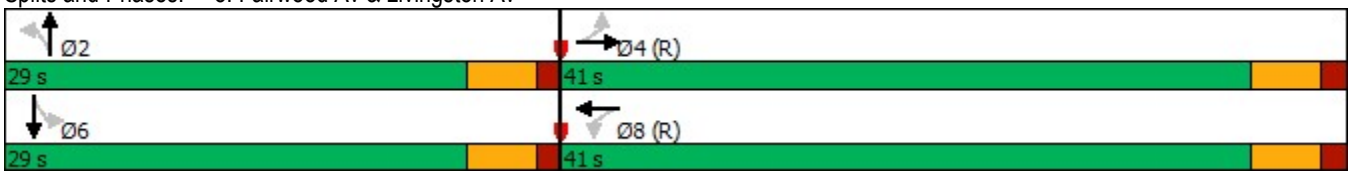


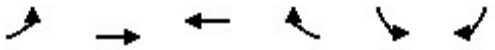
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	15.0	15.0		15.0	15.0		10.0	10.0		10.0	10.0	
Minimum Split (s)	27.0	27.0		27.0	27.0		26.5	26.5		26.5	26.5	
Total Split (s)	41.0	41.0		41.0	41.0		29.0	29.0		29.0	29.0	
Total Split (%)	58.6%	58.6%		58.6%	58.6%		41.4%	41.4%		41.4%	41.4%	
Maximum Green (s)	35.9	35.9		35.9	35.9		24.1	24.1		24.1	24.1	
Yellow Time (s)	3.6	3.6		3.6	3.6		3.6	3.6		3.6	3.6	
All-Red Time (s)	1.5	1.5		1.5	1.5		1.3	1.3		1.3	1.3	
Lost Time Adjust (s)		0.0			0.0			0.0			0.0	
Total Lost Time (s)		5.1			5.1			4.9			4.9	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		4.0	4.0		4.0	4.0	
Recall Mode	C-Max	C-Max		C-Max	C-Max		None	None		None	None	
Walk Time (s)	8.0	8.0		8.0	8.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	
Act Effct Green (s)		39.4			39.4			20.6			20.6	
Actuated g/C Ratio		0.56			0.56			0.29			0.29	
v/c Ratio		0.25			0.37			0.79			0.63	
Control Delay		2.8			5.9			33.6			27.5	
Queue Delay		0.0			0.0			0.0			0.0	
Total Delay		2.8			5.9			33.6			27.5	
LOS		A			A			C			C	
Approach Delay		2.8			5.9			33.6			27.5	
Approach LOS		A			A			C			C	
90th %ile Green (s)	35.9	35.9		35.9	35.9		24.1	24.1		24.1	24.1	
90th %ile Term Code	Coord	Coord		Coord	Coord		Max	Max		Max	Max	
70th %ile Green (s)	35.9	35.9		35.9	35.9		24.1	24.1		24.1	24.1	
70th %ile Term Code	Coord	Coord		Coord	Coord		Max	Max		Hold	Hold	
50th %ile Green (s)	38.2	38.2		38.2	38.2		21.8	21.8		21.8	21.8	
50th %ile Term Code	Coord	Coord		Coord	Coord		Gap	Gap		Hold	Hold	
30th %ile Green (s)	41.3	41.3		41.3	41.3		18.7	18.7		18.7	18.7	
30th %ile Term Code	Coord	Coord		Coord	Coord		Gap	Gap		Hold	Hold	
10th %ile Green (s)	45.9	45.9		45.9	45.9		14.1	14.1		14.1	14.1	
10th %ile Term Code	Coord	Coord		Coord	Coord		Gap	Gap		Hold	Hold	
Queue Length 50th (ft)		6			35			136			104	
Queue Length 95th (ft)		18			47			221			171	
Internal Link Dist (ft)		1496			852			288			334	
Turn Bay Length (ft)												
Base Capacity (vph)		1641			1616			556			537	
Starvation Cap Reductn		0			0			0			0	
Spillback Cap Reductn		0			0			0			0	
Storage Cap Reductn		0			0			0			0	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Reduced v/c Ratio		0.25			0.37			0.68			0.54	

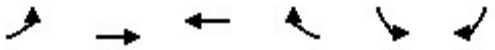
Intersection Summary			
Area Type:	Other		
Cycle Length: 70			
Actuated Cycle Length: 70			
Offset: 57 (81%), Referenced to phase 4:EBTL and 8:WBTL, Start of Green			
Natural Cycle: 55			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.79			
Intersection Signal Delay: 15.2		Intersection LOS: B	
Intersection Capacity Utilization 56.8%		ICU Level of Service B	
Analysis Period (min) 15			

Splits and Phases: 8: Fairwood Av & Livingston Av

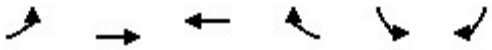




Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	38	519	572	175	168	69
Future Volume (vph)	38	519	572	175	168	69
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	150			0	0	0
Storage Lanes	0			0	1	0
Taper Length (ft)	25				0	
Lane Util. Factor	0.95	0.95	0.95	0.95	1.00	1.00
Ped Bike Factor		1.00	0.99		1.00	
Frt			0.965		0.961	
Flt Protected		0.997			0.966	
Satd. Flow (prot)	0	3098	2994	0	1646	0
Flt Permitted		0.867			0.966	
Satd. Flow (perm)	0	2694	2994	0	1644	0
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)			89		31	
Link Speed (mph)		30	30		30	
Link Distance (ft)		841	588		385	
Travel Time (s)		19.1	13.4		8.8	
Confl. Peds. (#/hr)	3			3	1	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Heavy Vehicles (%)	9%	5%	5%	4%	3%	5%
Parking (#/hr)	5	5	5	5		
Adj. Flow (vph)	40	552	609	186	179	73
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	592	795	0	252	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(ft)		11	11		11	
Link Offset(ft)		0	0		0	
Crosswalk Width(ft)		16	16		16	
Two way Left Turn Lane						
Headway Factor	1.04	1.13	1.13	1.04	1.04	1.04
Turning Speed (mph)	15			9	15	9
Number of Detectors	1	2	2		1	
Detector Template	Left	Thru	Thru		Left	
Leading Detector (ft)	20	100	100		20	
Trailing Detector (ft)	0	0	0		0	
Detector 1 Position(ft)	0	0	0		0	
Detector 1 Size(ft)	20	6	6		20	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0		0.0	
Detector 1 Queue (s)	0.0	0.0	0.0		0.0	
Detector 1 Delay (s)	0.0	0.0	0.0		0.0	
Detector 2 Position(ft)		94	94			
Detector 2 Size(ft)		6	6			
Detector 2 Type		Cl+Ex	Cl+Ex			
Detector 2 Channel						



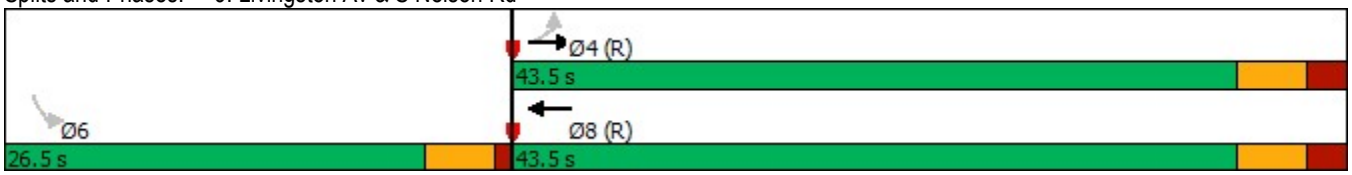
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Detector 2 Extend (s)		0.0	0.0			
Turn Type	Perm	NA	NA		Perm	
Protected Phases		4	8			
Permitted Phases	4				6	
Detector Phase	4	4	8		6	
Switch Phase						
Minimum Initial (s)	15.0	15.0	15.0		10.0	
Minimum Split (s)	27.0	27.0	27.0		26.5	
Total Split (s)	43.5	43.5	43.5		26.5	
Total Split (%)	62.1%	62.1%	62.1%		37.9%	
Maximum Green (s)	37.7	37.7	37.7		21.9	
Yellow Time (s)	3.6	3.6	3.6		3.6	
All-Red Time (s)	2.2	2.2	2.2		1.0	
Lost Time Adjust (s)		0.0	0.0		0.0	
Total Lost Time (s)		5.8	5.8		4.6	
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	0.2	0.2	4.0		0.2	
Recall Mode	C-Max	C-Max	C-Max		None	
Walk Time (s)	8.0	8.0	8.0		7.0	
Flash Dont Walk (s)	7.0	7.0	7.0		7.0	
Pedestrian Calls (#/hr)	0	0	0		0	
Act Effct Green (s)		46.3	46.3		13.3	
Actuated g/C Ratio		0.66	0.66		0.19	
v/c Ratio		0.33	0.40		0.75	
Control Delay		4.4	5.9		37.1	
Queue Delay		0.0	0.0		0.0	
Total Delay		4.4	5.9		37.1	
LOS		A	A		D	
Approach Delay		4.4	5.9		37.1	
Approach LOS		A	A		D	
90th %ile Green (s)	40.8	40.8	40.8		18.8	
90th %ile Term Code	Coord	Coord	Coord		Gap	
70th %ile Green (s)	44.5	44.5	44.5		15.1	
70th %ile Term Code	Coord	Coord	Coord		Gap	
50th %ile Green (s)	47.1	47.1	47.1		12.5	
50th %ile Term Code	Coord	Coord	Coord		Gap	
30th %ile Green (s)	49.6	49.6	49.6		10.0	
30th %ile Term Code	Coord	Coord	Coord		Min	
10th %ile Green (s)	49.6	49.6	49.6		10.0	
10th %ile Term Code	Coord	Coord	Coord		Min	
Queue Length 50th (ft)		37	57		92	
Queue Length 95th (ft)		61	116		149	
Internal Link Dist (ft)		761	508		305	
Turn Bay Length (ft)						
Base Capacity (vph)		1782	2011		535	
Starvation Cap Reductn		0	0		0	
Spillback Cap Reductn		0	0		0	
Storage Cap Reductn		0	0		0	

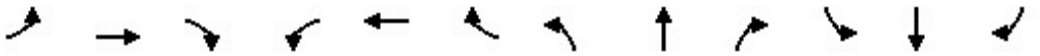


Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Reduced v/c Ratio		0.33	0.40		0.47	

Intersection Summary			
Area Type:	Other		
Cycle Length: 70			
Actuated Cycle Length: 70			
Offset: 24 (34%), Referenced to phase 4:EBTL and 8:WBT, Start of Green			
Natural Cycle: 55			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.75			
Intersection Signal Delay: 10.2		Intersection LOS: B	
Intersection Capacity Utilization 63.9%		ICU Level of Service B	
Analysis Period (min) 15			

Splits and Phases: 9: Livingston Av & S Nelson Rd

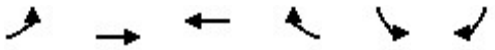




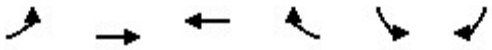
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	3	240	0	0	507	11	77	3	66	9	0	21
Future Volume (Veh/h)	3	240	0	0	507	11	77	3	66	9	0	21
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Hourly flow rate (vph)	3	264	0	0	557	12	85	3	73	10	0	23
Pedestrians								1			6	
Lane Width (ft)								11.0			11.0	
Walking Speed (ft/s)								3.5			3.5	
Percent Blockage								0			1	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)		440			1031							
pX, platoon unblocked												
vC, conflicting volume	575			265			572	846	133	782	840	290
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	575			265			572	846	133	782	840	290
tC, single (s)	4.1			4.1			7.5	7.8	6.9	7.8	6.5	7.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.7	3.3	3.6	4.0	3.5
p0 queue free %	100			100			78	98	92	96	100	97
cM capacity (veh/h)	1003			1310			390	199	891	238	301	660

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	91	176	371	198	161	33
Volume Left	3	0	0	0	85	10
Volume Right	0	0	0	12	73	23
cSH	1003	1700	1700	1700	511	430
Volume to Capacity	0.00	0.10	0.22	0.12	0.32	0.08
Queue Length 95th (ft)	0	0	0	0	33	6
Control Delay (s)	0.3	0.0	0.0	0.0	15.3	14.1
Lane LOS	A				C	B
Approach Delay (s)	0.1		0.0		15.3	14.1
Approach LOS					C	B

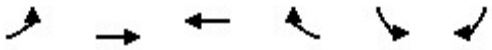
Intersection Summary				
Average Delay	2.9			
Intersection Capacity Utilization	35.7%	ICU Level of Service	A	
Analysis Period (min)	15			



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	137	437	302	43	72	204
Future Volume (vph)	137	437	302	43	72	204
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	100			0	0	0
Storage Lanes	0			0	1	1
Taper Length (ft)	25				0	
Lane Util. Factor	0.95	0.95	0.95	0.95	1.00	1.00
Ped Bike Factor		1.00	1.00		1.00	0.98
Frt			0.981			0.850
Flt Protected		0.988			0.950	
Satd. Flow (prot)	0	3326	3088	0	1745	1531
Flt Permitted		0.746			0.950	
Satd. Flow (perm)	0	2508	3088	0	1743	1496
Right Turn on Red				Yes		No
Satd. Flow (RTOR)			24			
Link Speed (mph)		35	35		25	
Link Distance (ft)		304	440		328	
Travel Time (s)		5.9	8.6		8.9	
Confl. Peds. (#/hr)	5			5	1	8
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89
Heavy Vehicles (%)	9%	2%	4%	0%	0%	2%
Parking (#/hr)			5	5		
Adj. Flow (vph)	154	491	339	48	81	229
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	645	387	0	81	229
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(ft)		0	0		11	
Link Offset(ft)		0	0		0	
Crosswalk Width(ft)		16	16		16	
Two way Left Turn Lane						
Headway Factor	1.04	1.04	1.13	1.04	1.04	1.04
Turning Speed (mph)	15			9	15	9
Number of Detectors	1	2	2		1	1
Detector Template	Left	Thru	Thru		Left	Right
Leading Detector (ft)	20	100	100		20	20
Trailing Detector (ft)	0	0	0		0	0
Detector 1 Position(ft)	0	0	0		0	0
Detector 1 Size(ft)	20	6	6		20	20
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0		0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0		0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0		0.0	0.0
Detector 2 Position(ft)		94	94			
Detector 2 Size(ft)		6	6			
Detector 2 Type		Cl+Ex	Cl+Ex			
Detector 2 Channel						



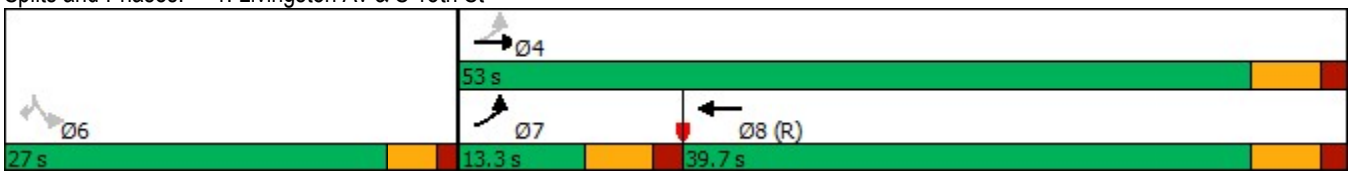
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Detector 2 Extend (s)		0.0	0.0			
Turn Type	pm+pt	NA	NA		Perm	Perm
Protected Phases	7	4	8			
Permitted Phases	4				6	6
Detector Phase	7	4	8		6	6
Switch Phase						
Minimum Initial (s)	5.0	7.0	16.0		10.0	10.0
Minimum Split (s)	10.8	26.5	26.5		26.5	26.5
Total Split (s)	13.3	53.0	39.7		27.0	27.0
Total Split (%)	16.6%	66.3%	49.6%		33.8%	33.8%
Maximum Green (s)	7.5	47.2	33.9		22.7	22.7
Yellow Time (s)	4.1	4.1	4.1		3.0	3.0
All-Red Time (s)	1.7	1.7	1.7		1.3	1.3
Lost Time Adjust (s)		0.0	0.0		0.0	0.0
Total Lost Time (s)		5.8	5.8		4.3	4.3
Lead/Lag	Lead		Lag			
Lead-Lag Optimize?	Yes		Yes			
Vehicle Extension (s)	3.7	3.7	3.7		5.0	5.0
Recall Mode	None	Max	C-Max		None	None
Walk Time (s)		7.0	7.0		7.0	7.0
Flash Dont Walk (s)		9.0	9.0		11.0	11.0
Pedestrian Calls (#/hr)		0	0		0	0
Act Effct Green (s)		51.4	51.4		18.5	18.5
Actuated g/C Ratio		0.64	0.64		0.23	0.23
v/c Ratio		0.40	0.19		0.20	0.66
Control Delay		8.4	3.3		24.5	37.1
Queue Delay		0.0	0.0		0.0	0.0
Total Delay		8.4	3.3		24.5	37.1
LOS		A	A		C	D
Approach Delay		8.4	3.3		33.8	
Approach LOS		A	A		C	
90th %ile Green (s)	0.0	47.2	47.2		22.7	22.7
90th %ile Term Code	Skip	Coord	Coord		Max	Max
70th %ile Green (s)	0.0	48.2	48.2		21.7	21.7
70th %ile Term Code	Skip	Coord	Coord		Gap	Gap
50th %ile Green (s)	0.0	50.8	50.8		19.1	19.1
50th %ile Term Code	Skip	Coord	Coord		Gap	Gap
30th %ile Green (s)	0.0	53.5	53.5		16.4	16.4
30th %ile Term Code	Skip	Coord	Coord		Gap	Gap
10th %ile Green (s)	0.0	57.4	57.4		12.5	12.5
10th %ile Term Code	Skip	Coord	Coord		Gap	Gap
Queue Length 50th (ft)		73	23		32	103
Queue Length 95th (ft)		120	34		63	164
Internal Link Dist (ft)		224	360		248	
Turn Bay Length (ft)						
Base Capacity (vph)		1612	1993		494	424
Starvation Cap Reductn		0	0		0	0
Spillback Cap Reductn		0	0		0	0
Storage Cap Reductn		0	0		0	0

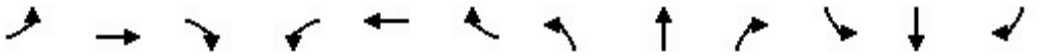


Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Reduced v/c Ratio		0.40	0.19		0.16	0.54

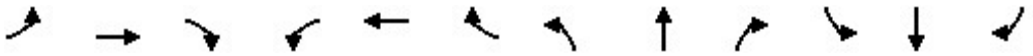
Intersection Summary			
Area Type:	Other		
Cycle Length: 80			
Actuated Cycle Length: 80			
Offset: 70 (88%), Referenced to phase 8:WBT, Start of Green			
Natural Cycle: 65			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.66			
Intersection Signal Delay: 12.8		Intersection LOS: B	
Intersection Capacity Utilization 52.5%		ICU Level of Service A	
Analysis Period (min) 15			

Splits and Phases: 1: Livingston Av & S 18th St





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	639	82	80	400	0	0	0	0	12	6	15
Future Volume (vph)	0	639	82	80	400	0	0	0	0	12	6	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	150		0	150		0	0		0	0		0
Storage Lanes	0		0	0		0	0		0	0		0
Taper Length (ft)	25			25			0			0		
Lane Util. Factor	1.00	0.95	0.95	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		1.00			1.00						0.99	
Frt		0.983									0.940	
Flt Protected					0.992						0.982	
Satd. Flow (prot)	0	3101	0	0	3096	0	0	0	0	0	1400	0
Flt Permitted					0.733						0.982	
Satd. Flow (perm)	0	3101	0	0	2286	0	0	0	0	0	1399	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		31									16	
Link Speed (mph)		35			35			35			35	
Link Distance (ft)		1031			383			200			188	
Travel Time (s)		20.1			7.5			3.9			3.7	
Confl. Peds. (#/hr)	3		4	4		3	7		1	1		7
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Heavy Vehicles (%)	0%	3%	6%	4%	5%	0%	0%	0%	0%	0%	25%	0%
Parking (#/hr)		5	5		5						5	5
Adj. Flow (vph)	0	702	90	88	440	0	0	0	0	13	7	16
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	792	0	0	528	0	0	0	0	0	36	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.04	1.13	1.04	1.04	1.13	1.04	1.04	1.04	1.04	1.04	1.24	1.04
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors		2		1	2					1	2	
Detector Template		Thru		Left	Thru					Left	Thru	
Leading Detector (ft)		100		20	100					20	100	
Trailing Detector (ft)		0		0	0					0	0	
Detector 1 Position(ft)		0		0	0					0	0	
Detector 1 Size(ft)		6		20	6					20	6	
Detector 1 Type		Cl+Ex		Cl+Ex	Cl+Ex					Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)		0.0		0.0	0.0					0.0	0.0	
Detector 1 Queue (s)		0.0		0.0	0.0					0.0	0.0	
Detector 1 Delay (s)		0.0		0.0	0.0					0.0	0.0	
Detector 2 Position(ft)		94			94						94	
Detector 2 Size(ft)		6			6						6	
Detector 2 Type		Cl+Ex			Cl+Ex						Cl+Ex	
Detector 2 Channel												

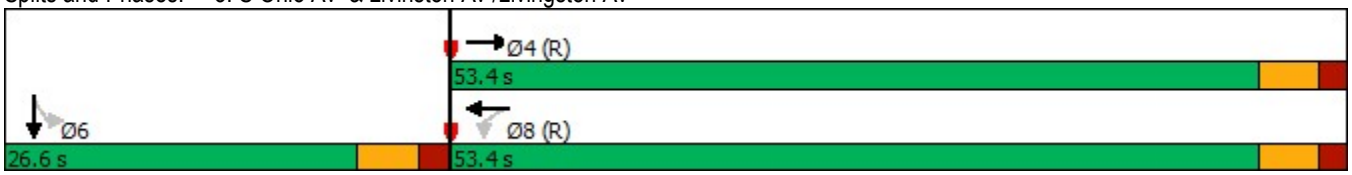


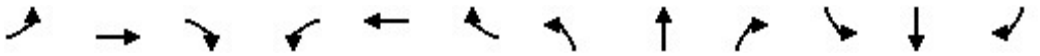
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 2 Extend (s)		0.0			0.0						0.0	
Turn Type		NA		Perm	NA					Perm	NA	
Protected Phases		4			8						6	
Permitted Phases				8						6		
Detector Phase		4		8	8					6	6	
Switch Phase												
Minimum Initial (s)		15.0		15.0	15.0					10.0	10.0	
Minimum Split (s)		27.0		27.0	27.0					26.5	26.5	
Total Split (s)		53.4		53.4	53.4					26.6	26.6	
Total Split (%)		66.8%		66.8%	66.8%					33.3%	33.3%	
Maximum Green (s)		48.0		48.0	48.0					21.0	21.0	
Yellow Time (s)		3.6		3.6	3.6					3.6	3.6	
All-Red Time (s)		1.8		1.8	1.8					2.0	2.0	
Lost Time Adjust (s)		0.0			0.0						0.0	
Total Lost Time (s)		5.4			5.4						5.6	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)		3.0		3.0	3.0					4.0	4.0	
Recall Mode		C-Max		C-Max	C-Max					None	None	
Walk Time (s)		8.0		8.0	8.0					7.0	7.0	
Flash Dont Walk (s)		7.0		7.0	7.0					7.0	7.0	
Pedestrian Calls (#/hr)		0		0	0					0	0	
Act Effct Green (s)		67.3			67.3						10.1	
Actuated g/C Ratio		0.84			0.84						0.13	
v/c Ratio		0.30			0.27						0.19	
Control Delay		3.4			1.9						23.7	
Queue Delay		0.0			0.0						0.0	
Total Delay		3.4			1.9						23.7	
LOS		A			A						C	
Approach Delay		3.4			1.9						23.7	
Approach LOS		A			A						C	
90th %ile Green (s)		58.6		58.6	58.6					10.4	10.4	
90th %ile Term Code		Coord		Coord	Coord					Gap	Gap	
70th %ile Green (s)		59.0		59.0	59.0					10.0	10.0	
70th %ile Term Code		Coord		Coord	Coord					Min	Min	
50th %ile Green (s)		59.0		59.0	59.0					10.0	10.0	
50th %ile Term Code		Coord		Coord	Coord					Min	Min	
30th %ile Green (s)		74.6		74.6	74.6					0.0	0.0	
30th %ile Term Code		Coord		Coord	Coord					Skip	Skip	
10th %ile Green (s)		74.6		74.6	74.6					0.0	0.0	
10th %ile Term Code		Coord		Coord	Coord					Skip	Skip	
Queue Length 50th (ft)		96			15						9	
Queue Length 95th (ft)		107			32						36	
Internal Link Dist (ft)		951			303			120			108	
Turn Bay Length (ft)												
Base Capacity (vph)		2614			1923						379	
Starvation Cap Reductn		0			0						0	
Spillback Cap Reductn		0			0						0	
Storage Cap Reductn		0			0						0	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Reduced v/c Ratio		0.30			0.27						0.09	

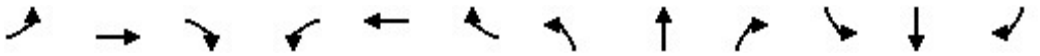
Intersection Summary			
Area Type:	Other		
Cycle Length: 80			
Actuated Cycle Length: 80			
Offset: 25 (31%), Referenced to phase 4:EBT and 8:WBTL, Start of Green			
Natural Cycle: 55			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.30			
Intersection Signal Delay: 3.4		Intersection LOS: A	
Intersection Capacity Utilization 56.8%		ICU Level of Service B	
Analysis Period (min) 15			

Splits and Phases: 3: S Ohio Av & Livinston Av /Livingston Av





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	47	588	0	0	435	94	62	176	62	0	0	0
Future Volume (vph)	47	588	0	0	435	94	62	176	62	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	150		0	0		0	0		0	0		0
Storage Lanes	0		0	0		0	0		0	0		0
Taper Length (ft)	25			0			0			0		
Lane Util. Factor	0.95	0.95	1.00	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		1.00			0.99			0.99				
Frt					0.973			0.972				
Flt Protected		0.996						0.990				
Satd. Flow (prot)	0	3188	0	0	3018	0	0	1446	0	0	0	0
Flt Permitted		0.879						0.990				
Satd. Flow (perm)	0	2809	0	0	3018	0	0	1439	0	0	0	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)					53			17				
Link Speed (mph)		30			30			35			35	
Link Distance (ft)		383			1949			182			211	
Travel Time (s)		8.7			44.3			3.5			4.1	
Confl. Peds. (#/hr)	19		7	7		19	15		3	3		15
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	5%	2%	0%	0%	4%	5%	7%	8%	2%	0%	0%	0%
Parking (#/hr)		5			5	5		5	5			
Adj. Flow (vph)	49	619	0	0	458	99	65	185	65	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	668	0	0	557	0	0	315	0	0	0	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.04	1.13	1.04	1.04	1.13	1.04	1.04	1.24	1.04	1.04	1.04	1.04
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2			2		1	2				
Detector Template	Left	Thru			Thru		Left	Thru				
Leading Detector (ft)	20	100			100		20	100				
Trailing Detector (ft)	0	0			0		0	0				
Detector 1 Position(ft)	0	0			0		0	0				
Detector 1 Size(ft)	20	6			6		20	6				
Detector 1 Type	Cl+Ex	Cl+Ex			Cl+Ex		Cl+Ex	Cl+Ex				
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0			0.0		0.0	0.0				
Detector 1 Queue (s)	0.0	0.0			0.0		0.0	0.0				
Detector 1 Delay (s)	0.0	0.0			0.0		0.0	0.0				
Detector 2 Position(ft)		94			94			94				
Detector 2 Size(ft)		6			6			6				
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex				
Detector 2 Channel												

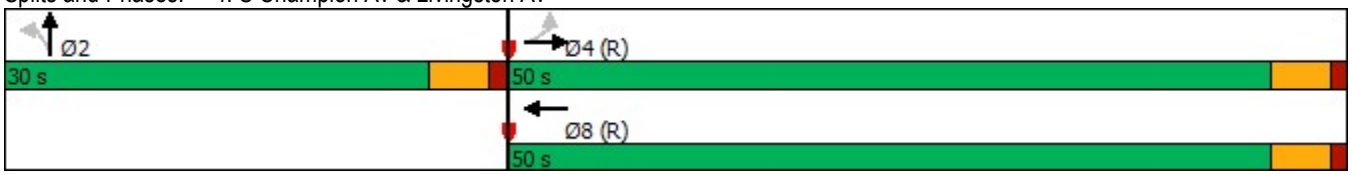


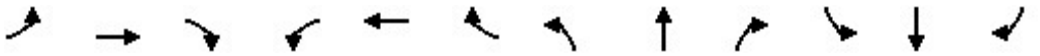
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 2 Extend (s)		0.0			0.0			0.0				
Turn Type	Perm	NA			NA		Perm	NA				
Protected Phases		4			8			2				
Permitted Phases	4						2					
Detector Phase	4	4			8		2	2				
Switch Phase												
Minimum Initial (s)	15.0	15.0			15.0		10.0	10.0				
Minimum Split (s)	26.5	26.5			27.0		19.8	19.8				
Total Split (s)	50.0	50.0			50.0		30.0	30.0				
Total Split (%)	62.5%	62.5%			62.5%		37.5%	37.5%				
Maximum Green (s)	45.3	45.3			45.3		25.2	25.2				
Yellow Time (s)	3.6	3.6			3.6		3.6	3.6				
All-Red Time (s)	1.1	1.1			1.1		1.2	1.2				
Lost Time Adjust (s)		0.0			0.0			0.0				
Total Lost Time (s)		4.7			4.7			4.8				
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	0.2	0.2			0.2		4.0	4.0				
Recall Mode	C-Max	C-Max			C-Max		None	None				
Walk Time (s)	8.0	8.0			8.0		7.0	7.0				
Flash Dont Walk (s)	7.0	7.0			7.0		8.0	8.0				
Pedestrian Calls (#/hr)	0	0			0		0	0				
Act Effct Green (s)		49.2			49.2			21.3				
Actuated g/C Ratio		0.62			0.62			0.27				
v/c Ratio		0.39			0.30			0.80				
Control Delay		6.4			7.0			40.7				
Queue Delay		0.0			0.0			0.0				
Total Delay		6.4			7.0			40.7				
LOS		A			A			D				
Approach Delay		6.4			7.0			40.7				
Approach LOS		A			A			D				
90th %ile Green (s)	45.3	45.3			45.3		25.2	25.2				
90th %ile Term Code	Coord	Coord			Coord		Max	Max				
70th %ile Green (s)	45.3	45.3			45.3		25.2	25.2				
70th %ile Term Code	Coord	Coord			Coord		Max	Max				
50th %ile Green (s)	47.9	47.9			47.9		22.6	22.6				
50th %ile Term Code	Coord	Coord			Coord		Gap	Gap				
30th %ile Green (s)	51.2	51.2			51.2		19.3	19.3				
30th %ile Term Code	Coord	Coord			Coord		Gap	Gap				
10th %ile Green (s)	56.1	56.1			56.1		14.4	14.4				
10th %ile Term Code	Coord	Coord			Coord		Gap	Gap				
Queue Length 50th (ft)		10			58			135				
Queue Length 95th (ft)		156			81			220				
Internal Link Dist (ft)		303			1869			102			131	
Turn Bay Length (ft)												
Base Capacity (vph)		1725			1874			464				
Starvation Cap Reductn		0			0			0				
Spillback Cap Reductn		0			0			0				
Storage Cap Reductn		0			0			0				

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Reduced v/c Ratio		0.39			0.30			0.68				

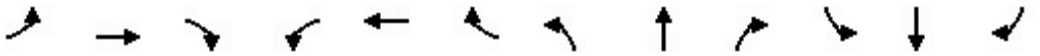
Intersection Summary			
Area Type:	Other		
Cycle Length: 80			
Actuated Cycle Length: 80			
Offset: 30 (38%), Referenced to phase 4:EBTL and 8:WBT, Start of Green			
Natural Cycle: 50			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.80			
Intersection Signal Delay: 13.6		Intersection LOS: B	
Intersection Capacity Utilization 68.0%		ICU Level of Service C	
Analysis Period (min) 15			

Splits and Phases: 4: S Champion Av & Livingston Av





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	620	100	356	441	2	135	5	341	0	1	5
Future Volume (vph)	0	620	100	356	441	2	135	5	341	0	1	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		150	110		0	75		0	0		0
Storage Lanes	0		0	1		0	1		0	0		0
Taper Length (ft)	25			25			0			0		
Lane Util. Factor	0.95	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		0.99		1.00	1.00		1.00	0.98			0.99	
Frt		0.979			0.999			0.852			0.887	
Flt Protected				0.950			0.950					
Satd. Flow (prot)	0	3124	0	1678	3113	0	1711	1483	0	0	1611	0
Flt Permitted				0.307			0.754					
Satd. Flow (perm)	0	3124	0	540	3113	0	1355	1483	0	0	1611	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		28			1			363			5	
Link Speed (mph)		35			35			35			25	
Link Distance (ft)		1949			512			199			214	
Travel Time (s)		38.0			10.0			3.9			5.8	
Confl. Peds. (#/hr)	4		6	6		4	1		2	2		1
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Heavy Vehicles (%)	0%	2%	2%	4%	5%	0%	2%	0%	4%	0%	0%	0%
Parking (#/hr)		5	5		5	5						
Adj. Flow (vph)	0	660	106	379	469	2	144	5	363	0	1	5
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	766	0	379	471	0	144	368	0	0	6	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		11			11			11			11	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.04	1.13	1.04	1.04	1.13	1.04	1.04	1.04	1.04	1.04	1.04	1.04
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2		1	2			2	
Detector Template	Left	Thru		Left	Thru		Left	Thru			Thru	
Leading Detector (ft)	20	100		20	100		20	100			100	
Trailing Detector (ft)	0	0		0	0		0	0			0	
Detector 1 Position(ft)	0	0		0	0		0	0			0	
Detector 1 Size(ft)	20	6		20	6		20	6			6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex			Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0			0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0			0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0			0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												

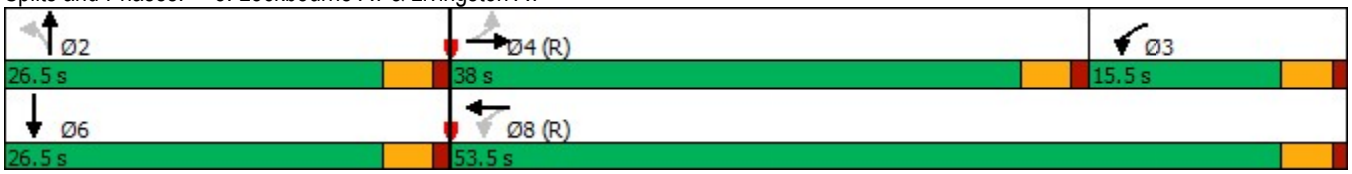


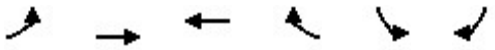
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type		NA		pm+pt	NA		Perm	NA			NA	
Protected Phases		4		3	8			2			6	
Permitted Phases	4			8			2					
Detector Phase	4	4		3	8		2	2			6	
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		5.0	5.0			5.0	
Minimum Split (s)	26.5	26.5		9.5	26.5		26.5	26.5			26.5	
Total Split (s)	38.0	38.0		15.5	53.5		26.5	26.5			26.5	
Total Split (%)	47.5%	47.5%		19.4%	66.9%		33.1%	33.1%			33.1%	
Maximum Green (s)	34.0	34.0		11.5	49.5		22.5	22.5			22.5	
Yellow Time (s)	3.0	3.0		3.0	3.0		3.0	3.0			3.0	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0			1.0	
Lost Time Adjust (s)		0.0		0.0	0.0		0.0	0.0			0.0	
Total Lost Time (s)		4.0		4.0	4.0		4.0	4.0			4.0	
Lead/Lag	Lead	Lead		Lag								
Lead-Lag Optimize?	Yes	Yes		Yes								
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0			3.0	
Recall Mode	C-Max	C-Max		None	C-Max		None	None			None	
Walk Time (s)	7.0	7.0			7.0		7.0	7.0			7.0	
Flash Dont Walk (s)	7.0	7.0			7.0		7.0	7.0			7.0	
Pedestrian Calls (#/hr)	0	0			0		0	0			0	
Act Effct Green (s)		42.1		57.6	57.6		14.4	14.4			14.4	
Actuated g/C Ratio		0.53		0.72	0.72		0.18	0.18			0.18	
v/c Ratio		0.46		0.69	0.21		0.59	0.65			0.02	
Control Delay		7.6		16.5	3.4		39.1	9.3			16.0	
Queue Delay		0.0		0.0	0.0		0.0	0.0			0.0	
Total Delay		7.6		16.5	3.4		39.1	9.3			16.0	
LOS		A		B	A		D	A			B	
Approach Delay		7.6			9.2			17.6			16.0	
Approach LOS		A			A			B			B	
90th %ile Green (s)	35.3	35.3		11.5	50.8		21.2	21.2			21.2	
90th %ile Term Code	Coord	Coord		Max	Coord		Gap	Gap			Hold	
70th %ile Green (s)	39.5	39.5		11.5	55.0		17.0	17.0			17.0	
70th %ile Term Code	Coord	Coord		Max	Coord		Gap	Gap			Hold	
50th %ile Green (s)	41.9	41.9		11.5	57.4		14.6	14.6			14.6	
50th %ile Term Code	Coord	Coord		Hold	Coord		Gap	Gap			Hold	
30th %ile Green (s)	45.2	45.2		11.5	60.7		11.3	11.3			11.3	
30th %ile Term Code	Coord	Coord		Hold	Coord		Gap	Gap			Hold	
10th %ile Green (s)	48.7	48.7		11.5	64.2		7.8	7.8			7.8	
10th %ile Term Code	Coord	Coord		Hold	Coord		Gap	Gap			Hold	
Queue Length 50th (ft)		36		40	24		66	2			0	
Queue Length 95th (ft)		213		#115	56		111	67			9	
Internal Link Dist (ft)		1869			432			119			134	
Turn Bay Length (ft)				110			75					
Base Capacity (vph)		1658		552	2242		381	678			456	
Starvation Cap Reductn		0		0	0		0	0			0	
Spillback Cap Reductn		0		0	0		0	0			0	
Storage Cap Reductn		0		0	0		0	0			0	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Reduced v/c Ratio		0.46		0.69	0.21		0.38	0.54			0.01	

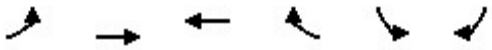
Intersection Summary			
Area Type:	Other		
Cycle Length: 80			
Actuated Cycle Length: 80			
Offset: 77 (96%), Referenced to phase 4:EBTL and 8:WBTL, Start of Green			
Natural Cycle: 70			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.69			
Intersection Signal Delay: 10.7		Intersection LOS: B	
Intersection Capacity Utilization 71.7%		ICU Level of Service C	
Analysis Period (min) 15			
# 95th percentile volume exceeds capacity, queue may be longer.			
Queue shown is maximum after two cycles.			

Splits and Phases: 5: Lockbourne Av & Livingston Av





Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑	↑↑		↰	↱
Traffic Volume (vph)	0	970	461	0	225	429
Future Volume (vph)	0	970	461	0	225	429
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	0.95	0.95	1.00	1.00	1.00
Ped Bike Factor					1.00	
Frt						0.850
Flt Protected					0.950	
Satd. Flow (prot)	0	3176	3086	0	1662	1501
Flt Permitted					0.950	
Satd. Flow (perm)	0	3176	3086	0	1659	1501
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)						382
Link Speed (mph)		35	35		25	
Link Distance (ft)		512	577		267	
Travel Time (s)		10.0	11.2		7.3	
Confl. Peds. (#/hr)	3			3	1	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	0%	3%	6%	0%	5%	4%
Parking (#/hr)		5	5			
Adj. Flow (vph)	0	1021	485	0	237	452
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	1021	485	0	237	452
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(ft)		11	11		11	
Link Offset(ft)		0	0		0	
Crosswalk Width(ft)		16	16		16	
Two way Left Turn Lane						
Headway Factor	1.04	1.13	1.13	1.04	1.04	1.04
Turning Speed (mph)	15			9	15	9
Number of Detectors		2	2		1	1
Detector Template		Thru	Thru		Left	Right
Leading Detector (ft)		100	100		20	20
Trailing Detector (ft)		0	0		0	0
Detector 1 Position(ft)		0	0		0	0
Detector 1 Size(ft)		6	6		20	20
Detector 1 Type		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)		0.0	0.0		0.0	0.0
Detector 1 Queue (s)		0.0	0.0		0.0	0.0
Detector 1 Delay (s)		0.0	0.0		0.0	0.0
Detector 2 Position(ft)		94	94			
Detector 2 Size(ft)		6	6			
Detector 2 Type		Cl+Ex	Cl+Ex			
Detector 2 Channel						
Detector 2 Extend (s)		0.0	0.0			
Turn Type		NA	NA		Perm	Perm
Protected Phases		4	8			

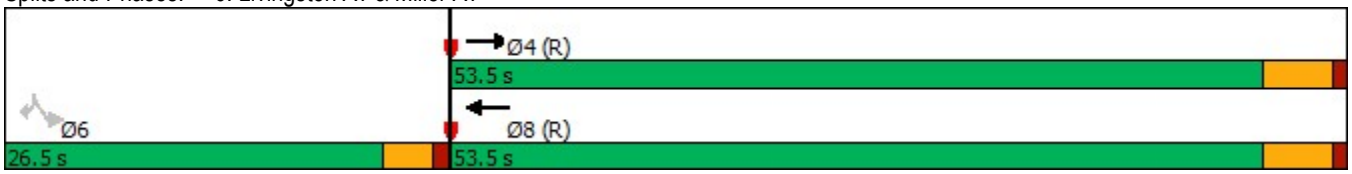


Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Permitted Phases					6	6
Detector Phase		4	8		6	6
Switch Phase						
Minimum Initial (s)		20.0	20.0		10.0	10.0
Minimum Split (s)		32.0	32.0		26.5	26.5
Total Split (s)		53.5	53.5		26.5	26.5
Total Split (%)		66.9%	66.9%		33.1%	33.1%
Maximum Green (s)		48.4	48.4		22.5	22.5
Yellow Time (s)		4.1	4.1		3.0	3.0
All-Red Time (s)		1.0	1.0		1.0	1.0
Lost Time Adjust (s)		0.0	0.0		0.0	0.0
Total Lost Time (s)		5.1	5.1		4.0	4.0
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)		1.0	1.0		4.0	4.0
Recall Mode		C-Max	C-Max		None	None
Walk Time (s)		13.0	13.0		7.0	7.0
Flash Dont Walk (s)		7.0	7.0		10.0	10.0
Pedestrian Calls (#/hr)		0	0		0	0
Act Effct Green (s)		53.0	53.0		17.9	17.9
Actuated g/C Ratio		0.66	0.66		0.22	0.22
v/c Ratio		0.49	0.24		0.64	0.72
Control Delay		3.0	3.4		35.7	12.2
Queue Delay		0.0	0.0		0.0	0.0
Total Delay		3.0	3.4		35.7	12.2
LOS		A	A		D	B
Approach Delay		3.0	3.4		20.2	
Approach LOS		A	A		C	
90th %ile Green (s)		48.4	48.4		22.5	22.5
90th %ile Term Code		Coord	Coord		Max	Max
70th %ile Green (s)		49.4	49.4		21.5	21.5
70th %ile Term Code		Coord	Coord		Gap	Gap
50th %ile Green (s)		52.6	52.6		18.3	18.3
50th %ile Term Code		Coord	Coord		Gap	Gap
30th %ile Green (s)		55.1	55.1		15.8	15.8
30th %ile Term Code		Coord	Coord		Gap	Gap
10th %ile Green (s)		59.6	59.6		11.3	11.3
10th %ile Term Code		Coord	Coord		Gap	Gap
Queue Length 50th (ft)		35	22		107	28
Queue Length 95th (ft)		75	31		168	116
Internal Link Dist (ft)		432	497		187	
Turn Bay Length (ft)						
Base Capacity (vph)		2105	2045		466	696
Starvation Cap Reductn		0	0		0	0
Spillback Cap Reductn		0	0		0	0
Storage Cap Reductn		0	0		0	0
Reduced v/c Ratio		0.49	0.24		0.51	0.65

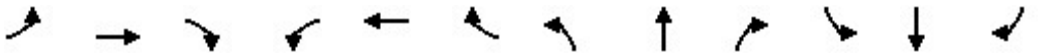
Intersection Summary

Area Type:	Other		
Cycle Length: 80			
Actuated Cycle Length: 80			
Offset: 72 (90%), Referenced to phase 4:EBT and 8:WBT, Start of Green			
Natural Cycle: 60			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.72			
Intersection Signal Delay: 8.5		Intersection LOS: A	
Intersection Capacity Utilization 50.8%		ICU Level of Service A	
Analysis Period (min) 15			

Splits and Phases: 6: Livingston Av & Miller Av



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	319	749	0	0	438	105	9	82	25	0	0	0
Future Volume (vph)	319	749	0	0	438	105	9	82	25	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	150		0	0		0	0		0	0		0
Storage Lanes	0		0	0		0	0		1	0		0
Taper Length (ft)	25			0			0			0		
Lane Util. Factor	0.95	0.95	1.00	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor								1.00	0.98			
Frt					0.971				0.850			
Flt Protected		0.985						0.995				
Satd. Flow (prot)	0	3129	0	0	3024	0	0	1788	1487	0	0	0
Flt Permitted		0.655						0.995				
Satd. Flow (perm)	0	2080	0	0	3024	0	0	1787	1457	0	0	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)					66				33			
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		577			1576			192			127	
Travel Time (s)		13.1			35.8			4.4			2.9	
Confl. Peds. (#/hr)			2	2			2		5	5		2
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles (%)	3%	3%	0%	0%	6%	1%	13%	1%	5%	0%	0%	0%
Parking (#/hr)		5			5	5						
Adj. Flow (vph)	343	805	0	0	471	113	10	88	27	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	1148	0	0	584	0	0	98	27	0	0	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.04	1.13	1.04	1.04	1.13	1.04	1.04	1.04	1.04	1.04	1.04	1.04
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2			2		1	2	1			
Detector Template	Left	Thru			Thru		Left	Thru	Right			
Leading Detector (ft)	20	100			100		20	100	20			
Trailing Detector (ft)	0	0			0		0	0	0			
Detector 1 Position(ft)	0	0			0		0	0	0			
Detector 1 Size(ft)	20	6			6		20	6	20			
Detector 1 Type	Cl+Ex	Cl+Ex			Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex			
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0			0.0		0.0	0.0	0.0			
Detector 1 Queue (s)	0.0	0.0			0.0		0.0	0.0	0.0			
Detector 1 Delay (s)	0.0	0.0			0.0		0.0	0.0	0.0			
Detector 2 Position(ft)		94			94			94				
Detector 2 Size(ft)		6			6			6				
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex				
Detector 2 Channel												



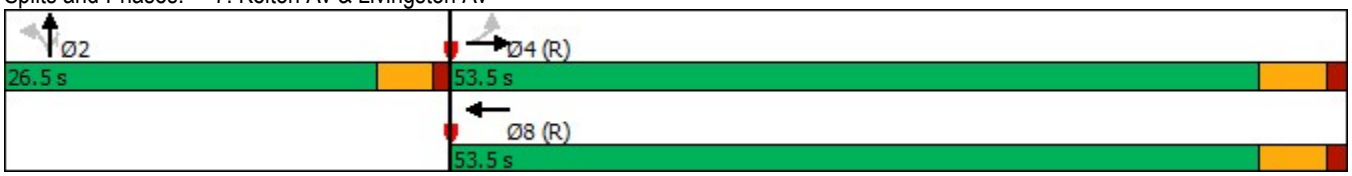
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 2 Extend (s)		0.0			0.0			0.0				
Turn Type	Perm	NA			NA		Perm	NA	Perm			
Protected Phases		4			8			2				
Permitted Phases	4						2		2			
Detector Phase	4	4			8		2	2	2			
Switch Phase												
Minimum Initial (s)	15.0	15.0			15.0		10.0	10.0	10.0			
Minimum Split (s)	27.0	27.0			27.0		26.5	26.5	26.5			
Total Split (s)	53.5	53.5			53.5		26.5	26.5	26.5			
Total Split (%)	66.9%	66.9%			66.9%		33.1%	33.1%	33.1%			
Maximum Green (s)	48.1	48.1			48.1		22.1	22.1	22.1			
Yellow Time (s)	4.1	4.1			4.1		3.4	3.4	3.4			
All-Red Time (s)	1.3	1.3			1.3		1.0	1.0	1.0			
Lost Time Adjust (s)		0.0			0.0			0.0	0.0			
Total Lost Time (s)		5.4			5.4			4.4	4.4			
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.7	3.7			3.7		4.0	4.0	4.0			
Recall Mode	C-Max	C-Max			C-Max		None	None	None			
Walk Time (s)	8.0	8.0			8.0		7.0	7.0	7.0			
Flash Dont Walk (s)	7.0	7.0			7.0		8.0	8.0	8.0			
Pedestrian Calls (#/hr)	0	0			0		0	0	0			
Act Effct Green (s)		62.7			62.7			11.4	11.4			
Actuated g/C Ratio		0.78			0.78			0.14	0.14			
v/c Ratio		0.70			0.24			0.38	0.11			
Control Delay		6.2			1.4			35.2	10.3			
Queue Delay		0.0			0.0			0.0	0.0			
Total Delay		6.2			1.4			35.2	10.3			
LOS		A			A			D	B			
Approach Delay		6.2			1.4			29.8				
Approach LOS		A			A			C				
90th %ile Green (s)	55.9	55.9			55.9		14.3	14.3	14.3			
90th %ile Term Code	Coord	Coord			Coord		Gap	Gap	Gap			
70th %ile Green (s)	58.0	58.0			58.0		12.2	12.2	12.2			
70th %ile Term Code	Coord	Coord			Coord		Gap	Gap	Gap			
50th %ile Green (s)	59.5	59.5			59.5		10.7	10.7	10.7			
50th %ile Term Code	Coord	Coord			Coord		Gap	Gap	Gap			
30th %ile Green (s)	60.2	60.2			60.2		10.0	10.0	10.0			
30th %ile Term Code	Coord	Coord			Coord		Min	Min	Min			
10th %ile Green (s)	74.6	74.6			74.6		0.0	0.0	0.0			
10th %ile Term Code	Coord	Coord			Coord		Skip	Skip	Skip			
Queue Length 50th (ft)		64			15			46	0			
Queue Length 95th (ft)		76			m21			86	18			
Internal Link Dist (ft)		497			1496			112			47	
Turn Bay Length (ft)												
Base Capacity (vph)		1631			2385			493	426			
Starvation Cap Reductn		0			0			0	0			
Spillback Cap Reductn		0			0			0	0			
Storage Cap Reductn		0			0			0	0			

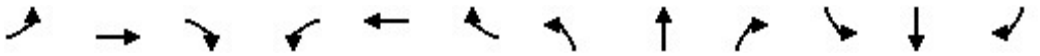
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Reduced v/c Ratio		0.70			0.24			0.20	0.06			

Intersection Summary			
Area Type:	Other		
Cycle Length: 80			
Actuated Cycle Length: 80			
Offset: 5 (6%), Referenced to phase 4:EBTL and 8:WBT, Start of Green			
Natural Cycle: 80			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.70			
Intersection Signal Delay: 6.3		Intersection LOS: A	
Intersection Capacity Utilization 69.7%		ICU Level of Service C	
Analysis Period (min) 15			

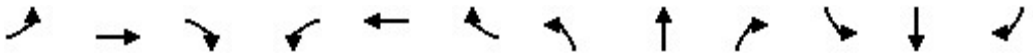
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 7: Kelton Av & Livingston Av





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	32	683	54	40	470	48	36	403	72	44	313	59
Future Volume (vph)	32	683	54	40	470	48	36	403	72	44	313	59
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	150		0	150		0	0		0	0		0
Storage Lanes	0		0	0		0	0		0	0		0
Taper Length (ft)	25			25			0			0		
Lane Util. Factor	0.95	0.95	0.95	0.95	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		1.00			1.00			1.00			1.00	
Frt		0.989			0.987			0.981			0.981	
Flt Protected		0.998			0.996			0.996			0.995	
Satd. Flow (prot)	0	3107	0	0	3044	0	0	1694	0	0	1680	0
Flt Permitted		0.911			0.854			0.947			0.871	
Satd. Flow (perm)	0	2835	0	0	2609	0	0	1610	0	0	1471	0
Right Turn on Red			Yes			Yes			Yes			No
Satd. Flow (RTOR)		14			18			12				
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1576			932			368			414	
Travel Time (s)		35.8			21.2			8.4			9.4	
Confl. Peds. (#/hr)	11		13	13		11	9		10	10		9
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	14%	3%	4%	11%	4%	12%	25%	4%	4%	3%	7%	5%
Parking (#/hr)		5	5		5	5						
Adj. Flow (vph)	34	719	57	42	495	51	38	424	76	46	329	62
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	810	0	0	588	0	0	538	0	0	437	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.04	1.13	1.04	1.04	1.13	1.04	1.04	1.04	1.04	1.04	1.04	1.04
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (ft)	20	100		20	100		20	100		20	100	
Trailing Detector (ft)	0	0		0	0		0	0		0	0	
Detector 1 Position(ft)	0	0		0	0		0	0		0	0	
Detector 1 Size(ft)	20	6		20	6		20	6		20	6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												

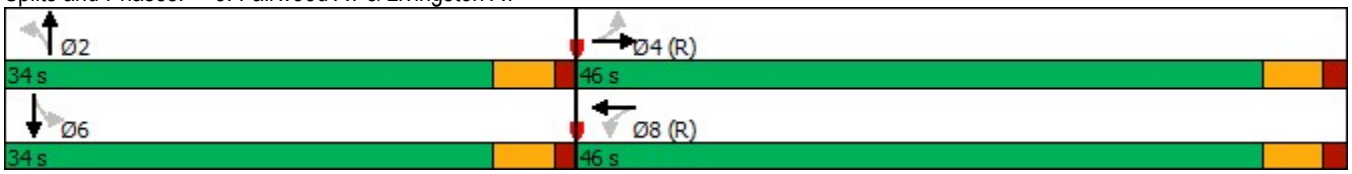


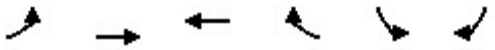
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	15.0	15.0		15.0	15.0		10.0	10.0		10.0	10.0	
Minimum Split (s)	27.0	27.0		27.0	27.0		26.5	26.5		26.5	26.5	
Total Split (s)	46.0	46.0		46.0	46.0		34.0	34.0		34.0	34.0	
Total Split (%)	57.5%	57.5%		57.5%	57.5%		42.5%	42.5%		42.5%	42.5%	
Maximum Green (s)	40.9	40.9		40.9	40.9		29.1	29.1		29.1	29.1	
Yellow Time (s)	3.6	3.6		3.6	3.6		3.6	3.6		3.6	3.6	
All-Red Time (s)	1.5	1.5		1.5	1.5		1.3	1.3		1.3	1.3	
Lost Time Adjust (s)		0.0			0.0			0.0			0.0	
Total Lost Time (s)		5.1			5.1			4.9			4.9	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		4.0	4.0		4.0	4.0	
Recall Mode	C-Max	C-Max		C-Max	C-Max		None	None		None	None	
Walk Time (s)	8.0	8.0		8.0	8.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	
Act Effct Green (s)		41.7			41.7			28.3			28.3	
Actuated g/C Ratio		0.52			0.52			0.35			0.35	
v/c Ratio		0.55			0.43			0.93			0.84	
Control Delay		7.4			8.3			50.1			40.2	
Queue Delay		0.0			0.0			0.0			0.0	
Total Delay		7.4			8.3			50.1			40.2	
LOS		A			A			D			D	
Approach Delay		7.4			8.3			50.1			40.2	
Approach LOS		A			A			D			D	
90th %ile Green (s)	40.9	40.9		40.9	40.9		29.1	29.1		29.1	29.1	
90th %ile Term Code	Coord	Coord		Coord	Coord		Max	Max		Max	Max	
70th %ile Green (s)	40.9	40.9		40.9	40.9		29.1	29.1		29.1	29.1	
70th %ile Term Code	Coord	Coord		Coord	Coord		Max	Max		Max	Max	
50th %ile Green (s)	40.9	40.9		40.9	40.9		29.1	29.1		29.1	29.1	
50th %ile Term Code	Coord	Coord		Coord	Coord		Max	Max		Max	Max	
30th %ile Green (s)	40.9	40.9		40.9	40.9		29.1	29.1		29.1	29.1	
30th %ile Term Code	Coord	Coord		Coord	Coord		Max	Max		Hold	Hold	
10th %ile Green (s)	44.9	44.9		44.9	44.9		25.1	25.1		25.1	25.1	
10th %ile Term Code	Coord	Coord		Coord	Coord		Gap	Gap		Hold	Hold	
Queue Length 50th (ft)		87			98			246			194	
Queue Length 95th (ft)		97			85			#441			#352	
Internal Link Dist (ft)		1496			852			288			334	
Turn Bay Length (ft)												
Base Capacity (vph)		1484			1368			593			535	
Starvation Cap Reductn		0			0			0			0	
Spillback Cap Reductn		0			0			0			0	
Storage Cap Reductn		0			0			0			0	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Reduced v/c Ratio		0.55			0.43			0.91			0.82	

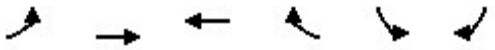
Intersection Summary			
Area Type:	Other		
Cycle Length: 80			
Actuated Cycle Length: 80			
Offset: 46 (58%), Referenced to phase 4:EBTL and 8:WBTL, Start of Green			
Natural Cycle: 55			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.93			
Intersection Signal Delay: 23.3		Intersection LOS: C	
Intersection Capacity Utilization 83.4%		ICU Level of Service E	
Analysis Period (min) 15			
# 95th percentile volume exceeds capacity, queue may be longer.			
Queue shown is maximum after two cycles.			

Splits and Phases: 8: Fairwood Av & Livingston Av

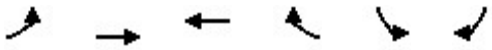




Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	73	917	644	237	182	75
Future Volume (vph)	73	917	644	237	182	75
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	150			0	0	0
Storage Lanes	0			0	1	0
Taper Length (ft)	25				0	
Lane Util. Factor	0.95	0.95	0.95	0.95	1.00	1.00
Ped Bike Factor		1.00	0.99		1.00	
Frt			0.960		0.961	
Flt Protected		0.996			0.966	
Satd. Flow (prot)	0	3192	3014	0	1653	0
Flt Permitted		0.796			0.966	
Satd. Flow (perm)	0	2551	3014	0	1647	0
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)			114		25	
Link Speed (mph)		30	30		30	
Link Distance (ft)		841	588		385	
Travel Time (s)		19.1	13.4		8.8	
Confl. Peds. (#/hr)	5			5	3	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	3%	2%	3%	4%	2%	6%
Parking (#/hr)	5	5	5	5		
Adj. Flow (vph)	77	965	678	249	192	79
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	1042	927	0	271	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(ft)		11	11		11	
Link Offset(ft)		0	0		0	
Crosswalk Width(ft)		16	16		16	
Two way Left Turn Lane						
Headway Factor	1.04	1.13	1.13	1.04	1.04	1.04
Turning Speed (mph)	15			9	15	9
Number of Detectors	1	2	2		1	
Detector Template	Left	Thru	Thru		Left	
Leading Detector (ft)	20	100	100		20	
Trailing Detector (ft)	0	0	0		0	
Detector 1 Position(ft)	0	0	0		0	
Detector 1 Size(ft)	20	6	6		20	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0		0.0	
Detector 1 Queue (s)	0.0	0.0	0.0		0.0	
Detector 1 Delay (s)	0.0	0.0	0.0		0.0	
Detector 2 Position(ft)		94	94			
Detector 2 Size(ft)		6	6			
Detector 2 Type		Cl+Ex	Cl+Ex			
Detector 2 Channel						



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Detector 2 Extend (s)		0.0	0.0			
Turn Type	Perm	NA	NA		Perm	
Protected Phases		4	8			
Permitted Phases	4				6	
Detector Phase	4	4	8		6	
Switch Phase						
Minimum Initial (s)	15.0	15.0	15.0		10.0	
Minimum Split (s)	27.0	27.0	27.0		26.5	
Total Split (s)	53.0	53.0	53.0		27.0	
Total Split (%)	66.3%	66.3%	66.3%		33.8%	
Maximum Green (s)	47.2	47.2	47.2		21.3	
Yellow Time (s)	3.6	3.6	3.6		3.6	
All-Red Time (s)	2.2	2.2	2.2		2.1	
Lost Time Adjust (s)		0.0	0.0		0.0	
Total Lost Time (s)		5.8	5.8		5.7	
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	0.2	0.2	0.2		4.0	
Recall Mode	C-Max	C-Max	C-Max		None	
Walk Time (s)	8.0	8.0	8.0		7.0	
Flash Dont Walk (s)	7.0	7.0	7.0		7.0	
Pedestrian Calls (#/hr)	0	0	0		0	
Act Effct Green (s)		51.1	51.1		17.4	
Actuated g/C Ratio		0.64	0.64		0.22	
v/c Ratio		0.64	0.47		0.72	
Control Delay		5.6	7.9		37.0	
Queue Delay		0.0	0.0		0.0	
Total Delay		5.6	7.9		37.0	
LOS		A	A		D	
Approach Delay		5.6	7.9		37.0	
Approach LOS		A	A		D	
90th %ile Green (s)	47.2	47.2	47.2		21.3	
90th %ile Term Code	Coord	Coord	Coord		Max	
70th %ile Green (s)	47.8	47.8	47.8		20.7	
70th %ile Term Code	Coord	Coord	Coord		Gap	
50th %ile Green (s)	50.4	50.4	50.4		18.1	
50th %ile Term Code	Coord	Coord	Coord		Gap	
30th %ile Green (s)	53.1	53.1	53.1		15.4	
30th %ile Term Code	Coord	Coord	Coord		Gap	
10th %ile Green (s)	57.1	57.1	57.1		11.4	
10th %ile Term Code	Coord	Coord	Coord		Gap	
Queue Length 50th (ft)		56	97		113	
Queue Length 95th (ft)		m74	156		185	
Internal Link Dist (ft)		761	508		305	
Turn Bay Length (ft)						
Base Capacity (vph)		1630	1967		456	
Starvation Cap Reductn		0	0		0	
Spillback Cap Reductn		0	0		0	
Storage Cap Reductn		0	0		0	

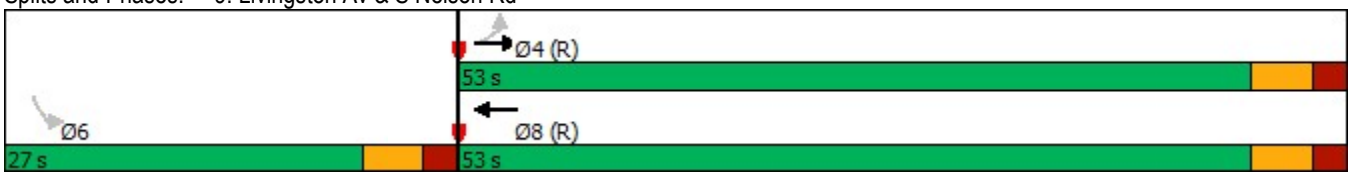


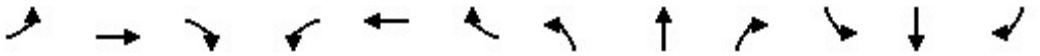
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Reduced v/c Ratio		0.64	0.47		0.59	

Intersection Summary			
Area Type:	Other		
Cycle Length: 80			
Actuated Cycle Length: 80			
Offset: 0 (0%), Referenced to phase 4:EBTL and 8:WBT, Start of Green			
Natural Cycle: 60			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.72			
Intersection Signal Delay: 10.4		Intersection LOS: B	
Intersection Capacity Utilization 82.1%		ICU Level of Service E	
Analysis Period (min) 15			

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 9: Livingston Av & S Nelson Rd



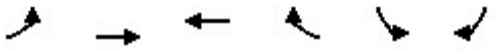


Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	6	565	0	0	405	5	58	7	58	14	0	22
Future Volume (Veh/h)	6	565	0	0	405	5	58	7	58	14	0	22
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Hourly flow rate (vph)	7	657	0	0	471	6	67	8	67	16	0	26
Pedestrians					3			11			7	
Lane Width (ft)					11.0			11.0			11.0	
Walking Speed (ft/s)					3.5			3.5			3.5	
Percent Blockage					0			1			1	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)		440			1031							
pX, platoon unblocked				0.96			0.96	0.96	0.96	0.96	0.96	
vC, conflicting volume	484			668			944	1166	342	898	1163	246
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	484			571			858	1089	231	810	1086	246
tC, single (s)	4.1			4.1			7.6	6.8	6.9	7.8	6.5	7.0
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.6	4.2	3.3	3.7	4.0	3.3
p0 queue free %	99			100			70	96	91	92	100	96
cM capacity (veh/h)	1083			962			220	180	731	203	205	741

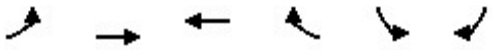
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	226	438	314	163	142	42
Volume Left	7	0	0	0	67	16
Volume Right	0	0	0	6	67	26
cSH	1083	1700	1700	1700	322	369
Volume to Capacity	0.01	0.26	0.18	0.10	0.44	0.11
Queue Length 95th (ft)	0	0	0	0	54	10
Control Delay (s)	0.3	0.0	0.0	0.0	24.7	16.0
Lane LOS	A				C	C
Approach Delay (s)	0.1		0.0		24.7	16.0
Approach LOS					C	C

Intersection Summary				
Average Delay	3.2			
Intersection Capacity Utilization	37.0%	ICU Level of Service		A
Analysis Period (min)	15			

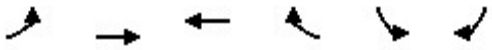
Design Year “Build” Synchro Outputs



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	93	183	370	58	43	157
Future Volume (vph)	93	183	370	58	43	157
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	100			0	0	0
Storage Lanes	1			0	1	1
Taper Length (ft)	25				0	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	1.00		1.00		1.00	0.95
Frt			0.982			0.850
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1586	1733	1520	0	1711	1546
Flt Permitted	0.424				0.950	
Satd. Flow (perm)	707	1733	1520	0	1707	1471
Right Turn on Red				Yes		No
Satd. Flow (RTOR)			14			
Link Speed (mph)		35	35		25	
Link Distance (ft)		304	440		328	
Travel Time (s)		5.9	8.6		8.9	
Confl. Peds. (#/hr)	2			2	1	15
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles (%)	10%	6%	4%	0%	2%	1%
Parking (#/hr)			5	5		
Adj. Flow (vph)	100	197	398	62	46	169
Shared Lane Traffic (%)						
Lane Group Flow (vph)	100	197	460	0	46	169
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(ft)		11	11		11	
Link Offset(ft)		0	0		0	
Crosswalk Width(ft)		16	16		16	
Two way Left Turn Lane						
Headway Factor	1.04	1.04	1.24	1.04	1.04	1.04
Turning Speed (mph)	15			9	15	9
Number of Detectors	1	2	2		1	1
Detector Template	Left	Thru	Thru		Left	Right
Leading Detector (ft)	20	100	100		20	20
Trailing Detector (ft)	0	0	0		0	0
Detector 1 Position(ft)	0	0	0		0	0
Detector 1 Size(ft)	20	6	6		20	20
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0		0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0		0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0		0.0	0.0
Detector 2 Position(ft)		94	94			
Detector 2 Size(ft)		6	6			
Detector 2 Type		Cl+Ex	Cl+Ex			
Detector 2 Channel						



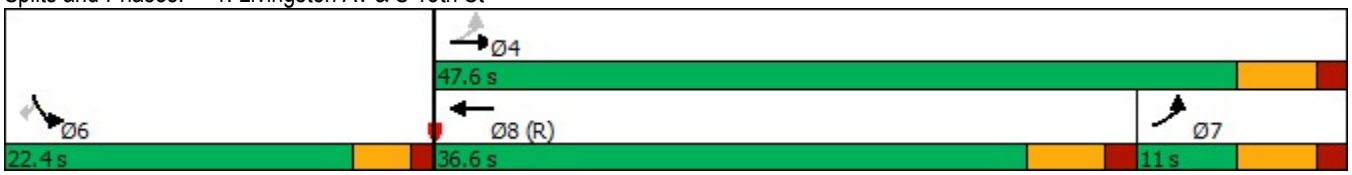
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Detector 2 Extend (s)		0.0	0.0			
Turn Type	pm+pt	NA	NA		Prot	Perm
Protected Phases	7	4	8		6	
Permitted Phases	4					6
Detector Phase	7	4	8		6	6
Switch Phase						
Minimum Initial (s)	5.0	7.0	16.0		10.0	10.0
Minimum Split (s)	10.8	21.8	21.8		22.3	22.3
Total Split (s)	11.0	47.6	36.6		22.4	22.4
Total Split (%)	15.7%	68.0%	52.3%		32.0%	32.0%
Maximum Green (s)	5.2	41.8	30.8		18.1	18.1
Yellow Time (s)	4.1	4.1	4.1		3.0	3.0
All-Red Time (s)	1.7	1.7	1.7		1.3	1.3
Lost Time Adjust (s)	0.0	0.0	0.0		0.0	0.0
Total Lost Time (s)	5.8	5.8	5.8		4.3	4.3
Lead/Lag	Lag		Lead			
Lead-Lag Optimize?	Yes		Yes			
Vehicle Extension (s)	3.7	3.7	3.7		5.0	5.0
Recall Mode	None	Max	C-Max		None	None
Walk Time (s)		7.0	7.0		7.0	7.0
Flash Dont Walk (s)		9.0	9.0		11.0	11.0
Pedestrian Calls (#/hr)		0	0		0	0
Act Effct Green (s)	45.3	45.3	36.5		14.6	14.6
Actuated g/C Ratio	0.65	0.65	0.52		0.21	0.21
v/c Ratio	0.19	0.18	0.58		0.13	0.55
Control Delay	7.2	6.0	12.6		21.9	31.2
Queue Delay	0.0	0.0	0.0		0.0	0.0
Total Delay	7.2	6.0	12.6		21.9	31.2
LOS	A	A	B		C	C
Approach Delay		6.4	12.6		29.2	
Approach LOS		A	B		C	
90th %ile Green (s)	5.2	41.8	30.8		18.1	18.1
90th %ile Term Code	Max	Coord	Coord		Max	Max
70th %ile Green (s)	5.2	42.8	31.8		17.1	17.1
70th %ile Term Code	Max	Coord	Coord		Gap	Gap
50th %ile Green (s)	5.2	44.9	33.9		15.0	15.0
50th %ile Term Code	Max	Coord	Coord		Gap	Gap
30th %ile Green (s)	5.2	47.1	36.1		12.8	12.8
30th %ile Term Code	Max	Coord	Coord		Gap	Gap
10th %ile Green (s)	0.0	49.9	49.9		10.0	10.0
10th %ile Term Code	Skip	Coord	Coord		Min	Min
Queue Length 50th (ft)	14	30	169		16	65
Queue Length 95th (ft)	35	62	193		39	115
Internal Link Dist (ft)		224	360		248	
Turn Bay Length (ft)	100					
Base Capacity (vph)	522	1121	799		442	380
Starvation Cap Reductn	0	0	0		0	0
Spillback Cap Reductn	0	0	0		0	0
Storage Cap Reductn	0	0	0		0	0

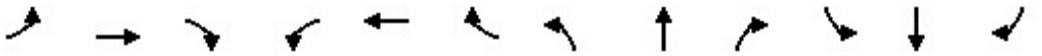


Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Reduced v/c Ratio	0.19	0.18	0.58		0.10	0.44

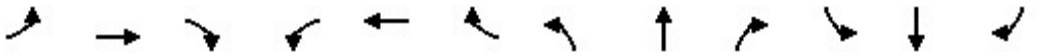
Intersection Summary			
Area Type:	Other		
Cycle Length: 70			
Actuated Cycle Length: 70			
Offset: 63 (90%), Referenced to phase 8:WBT, Start of Green			
Natural Cycle: 60			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.58			
Intersection Signal Delay: 14.4		Intersection LOS: B	
Intersection Capacity Utilization 52.4%		ICU Level of Service A	
Analysis Period (min) 15			

Splits and Phases: 1: Livingston Av & S 18th St





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	249	50	46	485	0	0	0	0	8	2	10
Future Volume (vph)	0	249	50	46	485	0	0	0	0	8	2	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	150		0	150		0	0		0	0		0
Storage Lanes	0		0	1		0	0		0	0		0
Taper Length (ft)	25			25			0			0		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		1.00		1.00							0.99	
Frt		0.977									0.932	
Flt Protected				0.950							0.980	
Satd. Flow (prot)	0	1485	0	1544	1531	0	0	0	0	0	1369	0
Flt Permitted				0.556							0.980	
Satd. Flow (perm)	0	1485	0	902	1531	0	0	0	0	0	1369	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		23									11	
Link Speed (mph)		35			35			35			35	
Link Distance (ft)		1031			383			200			188	
Travel Time (s)		20.1			7.5			3.9			3.7	
Confl. Peds. (#/hr)	5		1	1		5	3					3
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Heavy Vehicles (%)	0%	4%	12%	13%	5%	0%	0%	0%	0%	14%	0%	0%
Parking (#/hr)		5	5		5						5	5
Adj. Flow (vph)	0	283	57	52	551	0	0	0	0	9	2	11
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	340	0	52	551	0	0	0	0	0	22	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		11			11			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.04	1.24	1.04	1.04	1.24	1.04	1.04	1.04	1.04	1.04	1.24	1.04
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors		2		1	2					1	2	
Detector Template		Thru		Left	Thru					Left	Thru	
Leading Detector (ft)		100		20	100					20	100	
Trailing Detector (ft)		0		0	0					0	0	
Detector 1 Position(ft)		0		0	0					0	0	
Detector 1 Size(ft)		6		20	6					20	6	
Detector 1 Type		Cl+Ex		Cl+Ex	Cl+Ex					Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)		0.0		0.0	0.0					0.0	0.0	
Detector 1 Queue (s)		0.0		0.0	0.0					0.0	0.0	
Detector 1 Delay (s)		0.0		0.0	0.0					0.0	0.0	
Detector 2 Position(ft)		94			94						94	
Detector 2 Size(ft)		6			6						6	
Detector 2 Type		Cl+Ex			Cl+Ex						Cl+Ex	
Detector 2 Channel												



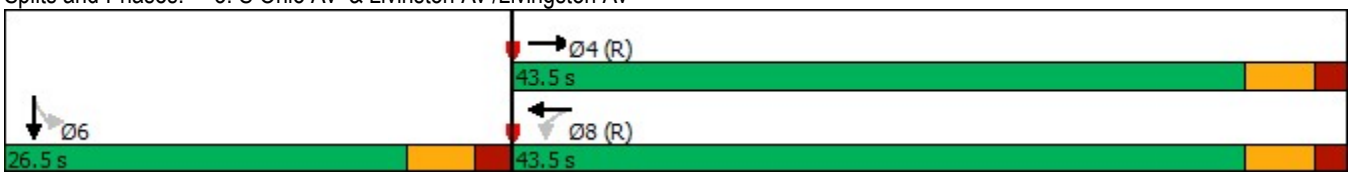
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 2 Extend (s)		0.0			0.0						0.0	
Turn Type		NA		Perm	NA					Perm	NA	
Protected Phases		4			8						6	
Permitted Phases				8						6		
Detector Phase		4		8	8					6	6	
Switch Phase												
Minimum Initial (s)		15.0		15.0	15.0					10.0	10.0	
Minimum Split (s)		27.0		27.0	27.0					26.5	26.5	
Total Split (s)		43.5		43.5	43.5					26.5	26.5	
Total Split (%)		62.1%		62.1%	62.1%					37.9%	37.9%	
Maximum Green (s)		38.1		38.1	38.1					20.9	20.9	
Yellow Time (s)		3.6		3.6	3.6					3.6	3.6	
All-Red Time (s)		1.8		1.8	1.8					2.0	2.0	
Lost Time Adjust (s)		0.0		0.0	0.0						0.0	
Total Lost Time (s)		5.4		5.4	5.4						5.6	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)		3.0		3.0	3.0					4.0	4.0	
Recall Mode		C-Max		C-Max	C-Max					None	None	
Walk Time (s)		8.0		8.0	8.0					7.0	7.0	
Flash Dont Walk (s)		7.0		7.0	7.0					7.0	7.0	
Pedestrian Calls (#/hr)		0		0	0					0	0	
Act Effct Green (s)		65.8		65.8	65.8						10.0	
Actuated g/C Ratio		0.94		0.94	0.94						0.14	
v/c Ratio		0.24		0.06	0.38						0.11	
Control Delay		1.6		0.5	0.9						20.1	
Queue Delay		0.0		0.0	0.0						0.0	
Total Delay		1.6		0.5	0.9						20.1	
LOS		A		A	A						C	
Approach Delay		1.6			0.9						20.1	
Approach LOS		A			A						C	
90th %ile Green (s)		49.0		49.0	49.0					10.0	10.0	
90th %ile Term Code		Coord		Coord	Coord					Min	Min	
70th %ile Green (s)		64.6		64.6	64.6					0.0	0.0	
70th %ile Term Code		Coord		Coord	Coord					Skip	Skip	
50th %ile Green (s)		64.6		64.6	64.6					0.0	0.0	
50th %ile Term Code		Coord		Coord	Coord					Skip	Skip	
30th %ile Green (s)		64.6		64.6	64.6					0.0	0.0	
30th %ile Term Code		Coord		Coord	Coord					Skip	Skip	
10th %ile Green (s)		64.6		64.6	64.6					0.0	0.0	
10th %ile Term Code		Coord		Coord	Coord					Skip	Skip	
Queue Length 50th (ft)		0		0	0						4	
Queue Length 95th (ft)		48		m3	32						22	
Internal Link Dist (ft)		951			303			120			108	
Turn Bay Length (ft)				150								
Base Capacity (vph)		1397		848	1439						416	
Starvation Cap Reductn		0		0	28						0	
Spillback Cap Reductn		0		0	0						0	
Storage Cap Reductn		0		0	0						0	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Reduced v/c Ratio		0.24		0.06	0.39						0.05	

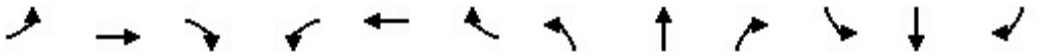
Intersection Summary			
Area Type:	Other		
Cycle Length: 70			
Actuated Cycle Length: 70			
Offset: 28 (40%), Referenced to phase 4:EBT and 8:WBTL, Start of Green			
Natural Cycle: 60			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.38			
Intersection Signal Delay: 1.6		Intersection LOS: A	
Intersection Capacity Utilization 61.8%		ICU Level of Service B	
Analysis Period (min) 15			

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 3: S Ohio Av & Livinston Av /Livingston Av



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	24	231	0	0	481	52	52	86	25	0	0	0
Future Volume (vph)	24	231	0	0	481	52	52	86	25	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	150		0	0		0	0		0	0		0
Storage Lanes	1		0	0		0	0		0	0		0
Taper Length (ft)	25			0			0			0		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	1.00				1.00			1.00				
Frt					0.987			0.979				
Flt Protected	0.950							0.984				
Satd. Flow (prot)	1745	1545	0	0	1500	0	0	1414	0	0	0	0
Flt Permitted	0.368							0.984				
Satd. Flow (perm)	673	1545	0	0	1500	0	0	1411	0	0	0	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)					13			13				
Link Speed (mph)		35			35			35			35	
Link Distance (ft)		383			1949			182			211	
Travel Time (s)		7.5			38.0			3.5			4.1	
Confl. Peds. (#/hr)	6					6	2					2
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Heavy Vehicles (%)	0%	4%	0%	0%	6%	0%	15%	9%	0%	0%	0%	0%
Parking (#/hr)		5			5	5		5	5			
Adj. Flow (vph)	27	260	0	0	540	58	58	97	28	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	27	260	0	0	598	0	0	183	0	0	0	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		11			11			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.04	1.24	1.04	1.04	1.24	1.04	1.04	1.24	1.04	1.04	1.04	1.04
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2			2		1	2				
Detector Template	Left	Thru			Thru		Left	Thru				
Leading Detector (ft)	20	100			100		20	100				
Trailing Detector (ft)	0	0			0		0	0				
Detector 1 Position(ft)	0	0			0		0	0				
Detector 1 Size(ft)	20	6			6		20	6				
Detector 1 Type	Cl+Ex	Cl+Ex			Cl+Ex		Cl+Ex	Cl+Ex				
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0			0.0		0.0	0.0				
Detector 1 Queue (s)	0.0	0.0			0.0		0.0	0.0				
Detector 1 Delay (s)	0.0	0.0			0.0		0.0	0.0				
Detector 2 Position(ft)		94			94			94				
Detector 2 Size(ft)		6			6			6				
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex				
Detector 2 Channel												

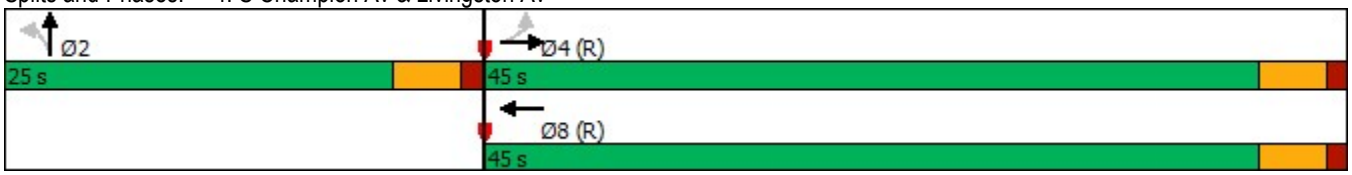


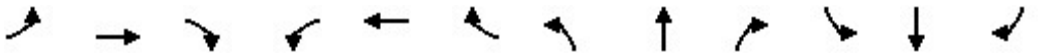
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 2 Extend (s)		0.0			0.0			0.0				
Turn Type	Perm	NA			NA		Perm	NA				
Protected Phases		4			8			2				
Permitted Phases	4						2					
Detector Phase	4	4			8		2	2				
Switch Phase												
Minimum Initial (s)	15.0	15.0			15.0		10.0	10.0				
Minimum Split (s)	26.5	26.5			27.0		19.8	19.8				
Total Split (s)	45.0	45.0			45.0		25.0	25.0				
Total Split (%)	64.3%	64.3%			64.3%		35.7%	35.7%				
Maximum Green (s)	40.3	40.3			40.3		20.2	20.2				
Yellow Time (s)	3.6	3.6			3.6		3.6	3.6				
All-Red Time (s)	1.1	1.1			1.1		1.2	1.2				
Lost Time Adjust (s)	0.0	0.0			0.0			0.0				
Total Lost Time (s)	4.7	4.7			4.7			4.8				
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	0.2	0.2			0.2		4.0	4.0				
Recall Mode	C-Max	C-Max			C-Max		None	None				
Walk Time (s)	8.0	8.0			8.0		7.0	7.0				
Flash Dont Walk (s)	7.0	7.0			7.0		8.0	8.0				
Pedestrian Calls (#/hr)	0	0			0		0	0				
Act Effct Green (s)	45.7	45.7			45.7			14.8				
Actuated g/C Ratio	0.65	0.65			0.65			0.21				
v/c Ratio	0.06	0.26			0.61			0.59				
Control Delay	4.5	4.9			11.8			30.5				
Queue Delay	0.0	0.0			0.0			0.0				
Total Delay	4.5	4.9			11.8			30.5				
LOS	A	A			B			C				
Approach Delay		4.9			11.8			30.5				
Approach LOS		A			B			C				
90th %ile Green (s)	40.3	40.3			40.3		20.2	20.2				
90th %ile Term Code	Coord	Coord			Coord		Max	Max				
70th %ile Green (s)	43.5	43.5			43.5		17.0	17.0				
70th %ile Term Code	Coord	Coord			Coord		Gap	Gap				
50th %ile Green (s)	45.9	45.9			45.9		14.6	14.6				
50th %ile Term Code	Coord	Coord			Coord		Gap	Gap				
30th %ile Green (s)	48.4	48.4			48.4		12.1	12.1				
30th %ile Term Code	Coord	Coord			Coord		Gap	Gap				
10th %ile Green (s)	50.5	50.5			50.5		10.0	10.0				
10th %ile Term Code	Coord	Coord			Coord		Min	Min				
Queue Length 50th (ft)	2	40			216			66				
Queue Length 95th (ft)	7	39			321			113				
Internal Link Dist (ft)		303			1869			102			131	
Turn Bay Length (ft)	150											
Base Capacity (vph)	439	1009			984			416				
Starvation Cap Reductn	0	0			0			0				
Spillback Cap Reductn	0	0			0			0				
Storage Cap Reductn	0	0			0			0				

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Reduced v/c Ratio	0.06	0.26			0.61			0.44				

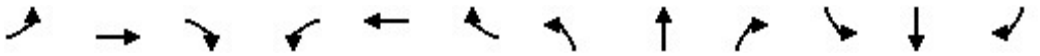
Intersection Summary			
Area Type:	Other		
Cycle Length: 70			
Actuated Cycle Length: 70			
Offset: 18 (26%), Referenced to phase 4:EBTL and 8:WBT, Start of Green			
Natural Cycle: 60			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.61			
Intersection Signal Delay: 13.1		Intersection LOS: B	
Intersection Capacity Utilization 61.8%		ICU Level of Service B	
Analysis Period (min) 15			

Splits and Phases: 4: S Champion Av & Livingston Av





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	242	69	280	402	1	87	2	179	0	1	1
Future Volume (vph)	0	242	69	280	402	1	87	2	179	0	1	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		150	0		0	75		0	0		0
Storage Lanes	0		1	1		0	1		0	0		0
Taper Length (ft)	25			25			0			0		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor			0.98	1.00	1.00			0.98				
Frt			0.850					0.852			0.932	
Flt Protected				0.950			0.950					
Satd. Flow (prot)	0	1560	1277	1678	1531	0	1711	1486	0	0	1712	0
Flt Permitted				0.522			0.757					
Satd. Flow (perm)	0	1560	1245	920	1531	0	1363	1486	0	0	1712	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			78					192			1	
Link Speed (mph)		35			35			35			25	
Link Distance (ft)		1949			512			199			214	
Travel Time (s)		38.0			10.0			3.9			5.8	
Confl. Peds. (#/hr)	6		2	2		6			1	1		
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles (%)	0%	3%	7%	4%	5%	0%	2%	0%	3%	0%	0%	0%
Parking (#/hr)		5	5		5	5						
Adj. Flow (vph)	0	260	74	301	432	1	94	2	192	0	1	1
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	260	74	301	433	0	94	194	0	0	2	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		11			11			11			11	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.04	1.24	1.24	1.04	1.24	1.04	1.04	1.04	1.04	1.04	1.04	1.04
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors		2	0	1	2		1	2			2	
Detector Template		Thru		Left	Thru		Left	Thru			Thru	
Leading Detector (ft)		100	0	20	100		20	100			100	
Trailing Detector (ft)		0	0	0	0		0	0			0	
Detector 1 Position(ft)		0	0	0	0		0	0			0	
Detector 1 Size(ft)		6	0	20	6		20	6			6	
Detector 1 Type		Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex			Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)		0.0	0.0	0.0	0.0		0.0	0.0			0.0	
Detector 1 Queue (s)		0.0	0.0	0.0	0.0		0.0	0.0			0.0	
Detector 1 Delay (s)		0.0	0.0	0.0	0.0		0.0	0.0			0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												

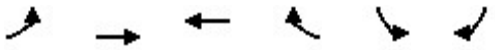


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type		NA	Perm	pm+pt	NA		Perm	NA			NA	
Protected Phases		4		3	8			2			6	
Permitted Phases			4	8			2					
Detector Phase		4	4	3	8		2	2			6	
Switch Phase												
Minimum Initial (s)		5.0	5.0	5.0	5.0		5.0	5.0			5.0	
Minimum Split (s)		18.0	18.0	9.0	18.0		18.0	18.0			18.0	
Total Split (s)		30.0	30.0	20.0	50.0		20.0	20.0			20.0	
Total Split (%)		42.9%	42.9%	28.6%	71.4%		28.6%	28.6%			28.6%	
Maximum Green (s)		26.0	26.0	16.0	46.0		16.0	16.0			16.0	
Yellow Time (s)		3.0	3.0	3.0	3.0		3.0	3.0			3.0	
All-Red Time (s)		1.0	1.0	1.0	1.0		1.0	1.0			1.0	
Lost Time Adjust (s)		0.0	0.0	0.0	0.0		0.0	0.0			0.0	
Total Lost Time (s)		4.0	4.0	4.0	4.0		4.0	4.0			4.0	
Lead/Lag		Lag	Lag	Lead								
Lead-Lag Optimize?		Yes	Yes	Yes								
Vehicle Extension (s)		3.0	3.0	3.0	3.0		3.0	3.0			3.0	
Recall Mode		C-Max	C-Max	None	C-Max		None	None			None	
Walk Time (s)		7.0	7.0		7.0		7.0	7.0			7.0	
Flash Dont Walk (s)		7.0	7.0		7.0		7.0	7.0			7.0	
Pedestrian Calls (#/hr)		0	0		0		0	0			0	
Act Effct Green (s)		38.1	38.1	51.9	51.9		10.1	10.1			10.1	
Actuated g/C Ratio		0.54	0.54	0.74	0.74		0.14	0.14			0.14	
v/c Ratio		0.31	0.10	0.38	0.38		0.48	0.51			0.01	
Control Delay		7.6	1.7	4.1	4.6		34.7	9.6			20.0	
Queue Delay		0.0	0.0	0.0	0.0		0.0	0.0			0.0	
Total Delay		7.6	1.7	4.1	4.6		34.7	9.6			20.0	
LOS		A	A	A	A		C	A			B	
Approach Delay		6.3			4.4			17.8			20.0	
Approach LOS		A			A			B			B	
90th %ile Green (s)		29.5	29.5	14.0	47.5		14.5	14.5			14.5	
90th %ile Term Code		Coord	Coord	Gap	Coord		Gap	Gap			Hold	
70th %ile Green (s)		35.1	35.1	11.0	50.1		11.9	11.9			11.9	
70th %ile Term Code		Coord	Coord	Gap	Coord		Gap	Gap			Hold	
50th %ile Green (s)		38.5	38.5	9.4	51.9		10.1	10.1			10.1	
50th %ile Term Code		Coord	Coord	Gap	Coord		Gap	Gap			Hold	
30th %ile Green (s)		41.6	41.6	8.1	53.7		8.3	8.3			8.3	
30th %ile Term Code		Coord	Coord	Gap	Coord		Gap	Gap			Hold	
10th %ile Green (s)		45.6	45.6	6.7	56.3		5.7	5.7			5.7	
10th %ile Term Code		Coord	Coord	Gap	Coord		Gap	Gap			Hold	
Queue Length 50th (ft)		55	0	17	39		38	1			0	
Queue Length 95th (ft)		123	0	60	118		75	49			6	
Internal Link Dist (ft)		1869			432			119			134	
Turn Bay Length (ft)			150				75					
Base Capacity (vph)		848	712	855	1135		311	487			392	
Starvation Cap Reductn		0	0	0	0		0	0			0	
Spillback Cap Reductn		0	0	0	0		0	0			0	
Storage Cap Reductn		0	0	0	0		0	0			0	

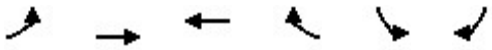
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Reduced v/c Ratio		0.31	0.10	0.35	0.38		0.30	0.40			0.01	

Intersection Summary			
Area Type:	Other		
Cycle Length: 70			
Actuated Cycle Length: 70			
Offset: 0 (0%), Referenced to phase 4:EBT and 8:WBTL, Start of Green			
Natural Cycle: 50			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.51			
Intersection Signal Delay: 7.7		Intersection LOS: A	
Intersection Capacity Utilization 49.7%		ICU Level of Service A	
Analysis Period (min) 15			

Splits and Phases: 5: Lockbourne Av & Livingston Av



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	0	430	441	0	90	264
Future Volume (vph)	0	430	441	0	90	264
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt						0.850
Flt Protected					0.950	
Satd. Flow (prot)	0	1545	1531	0	1616	1501
Flt Permitted					0.950	
Satd. Flow (perm)	0	1545	1531	0	1616	1501
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)						278
Link Speed (mph)		35	35		25	
Link Distance (ft)		512	577		267	
Travel Time (s)		10.0	11.2		7.3	
Confl. Peds. (#/hr)	1			1		
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	0%	4%	5%	0%	8%	4%
Parking (#/hr)		5	5			
Adj. Flow (vph)	0	453	464	0	95	278
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	453	464	0	95	278
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(ft)		11	11		11	
Link Offset(ft)		0	0		0	
Crosswalk Width(ft)		16	16		16	
Two way Left Turn Lane						
Headway Factor	1.04	1.24	1.24	1.04	1.04	1.04
Turning Speed (mph)	15			9	15	9
Number of Detectors		2	2		1	1
Detector Template		Thru	Thru		Left	Right
Leading Detector (ft)		100	100		20	20
Trailing Detector (ft)		0	0		0	0
Detector 1 Position(ft)		0	0		0	0
Detector 1 Size(ft)		6	6		20	20
Detector 1 Type		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)		0.0	0.0		0.0	0.0
Detector 1 Queue (s)		0.0	0.0		0.0	0.0
Detector 1 Delay (s)		0.0	0.0		0.0	0.0
Detector 2 Position(ft)		94	94			
Detector 2 Size(ft)		6	6			
Detector 2 Type		Cl+Ex	Cl+Ex			
Detector 2 Channel						
Detector 2 Extend (s)		0.0	0.0			
Turn Type		NA	NA		Perm	Perm
Protected Phases		4	8			

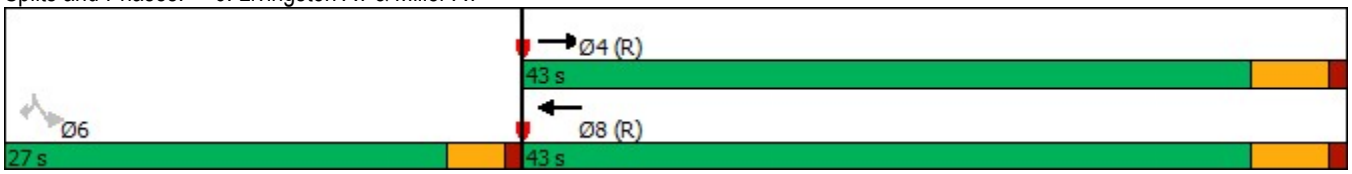


Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Permitted Phases					6	6
Detector Phase		4	8		6	6
Switch Phase						
Minimum Initial (s)		20.0	20.0		10.0	10.0
Minimum Split (s)		32.0	32.0		26.5	26.5
Total Split (s)		43.0	43.0		27.0	27.0
Total Split (%)		61.4%	61.4%		38.6%	38.6%
Maximum Green (s)		37.9	37.9		23.0	23.0
Yellow Time (s)		4.1	4.1		3.0	3.0
All-Red Time (s)		1.0	1.0		1.0	1.0
Lost Time Adjust (s)		0.0	0.0		0.0	0.0
Total Lost Time (s)		5.1	5.1		4.0	4.0
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)		1.0	1.0		4.0	4.0
Recall Mode		C-Max	C-Max		None	None
Walk Time (s)		13.0	13.0		7.0	7.0
Flash Dont Walk (s)		7.0	7.0		10.0	10.0
Pedestrian Calls (#/hr)		0	0		0	0
Act Effct Green (s)		49.3	49.3		11.6	11.6
Actuated g/C Ratio		0.70	0.70		0.17	0.17
v/c Ratio		0.42	0.43		0.36	0.58
Control Delay		9.3	2.8		29.1	8.8
Queue Delay		0.0	0.0		0.0	0.0
Total Delay		9.3	2.8		29.1	8.8
LOS		A	A		C	A
Approach Delay		9.3	2.8		14.0	
Approach LOS		A	A		B	
90th %ile Green (s)		45.2	45.2		15.7	15.7
90th %ile Term Code		Coord	Coord		Gap	Gap
70th %ile Green (s)		49.0	49.0		11.9	11.9
70th %ile Term Code		Coord	Coord		Gap	Gap
50th %ile Green (s)		50.5	50.5		10.4	10.4
50th %ile Term Code		Coord	Coord		Gap	Gap
30th %ile Green (s)		50.9	50.9		10.0	10.0
30th %ile Term Code		Coord	Coord		Min	Min
10th %ile Green (s)		50.9	50.9		10.0	10.0
10th %ile Term Code		Coord	Coord		Min	Min
Queue Length 50th (ft)		135	19		38	0
Queue Length 95th (ft)		208	42		72	56
Internal Link Dist (ft)		432	497		187	
Turn Bay Length (ft)						
Base Capacity (vph)		1088	1078		530	679
Starvation Cap Reductn		0	0		0	0
Spillback Cap Reductn		0	0		0	0
Storage Cap Reductn		0	0		0	0
Reduced v/c Ratio		0.42	0.43		0.18	0.41

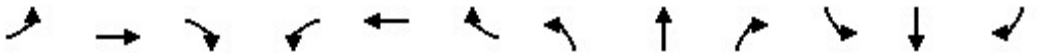
Intersection Summary

Area Type:	Other		
Cycle Length: 70			
Actuated Cycle Length: 70			
Offset: 24 (34%), Referenced to phase 4:EBT and 8:WBT, Start of Green			
Natural Cycle: 60			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.58			
Intersection Signal Delay: 8.3		Intersection LOS: A	
Intersection Capacity Utilization 60.1%		ICU Level of Service B	
Analysis Period (min) 15			

Splits and Phases: 6: Livingston Av & Miller Av



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	183	305	0	0	431	64	8	73	19	0	0	0
Future Volume (vph)	183	305	0	0	431	64	8	73	19	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	150		0	0		0	0		0	0		0
Storage Lanes	1		0	0		0	0		0	0		0
Taper Length (ft)	25			0			0			0		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	1.00				1.00			1.00				
Frt					0.982			0.975				
Flt Protected	0.950							0.996				
Satd. Flow (prot)	1678	1531	0	0	1497	0	0	1691	0	0	0	0
Flt Permitted	0.443							0.996				
Satd. Flow (perm)	780	1531	0	0	1497	0	0	1691	0	0	0	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)					17			17				
Link Speed (mph)		35			35			25			25	
Link Distance (ft)		577			1576			192			127	
Travel Time (s)		11.2			30.7			5.2			3.5	
Confl. Peds. (#/hr)	4		2	2		4	1					1
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles (%)	4%	5%	0%	0%	5%	5%	13%	6%	0%	0%	0%	0%
Parking (#/hr)		5			5	5						
Adj. Flow (vph)	197	328	0	0	463	69	9	78	20	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	197	328	0	0	532	0	0	107	0	0	0	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		11			11			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.04	1.24	1.04	1.04	1.24	1.04	1.04	1.04	1.04	1.04	1.04	1.04
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2			2		1	2				
Detector Template	Left	Thru			Thru		Left	Thru				
Leading Detector (ft)	20	100			100		20	100				
Trailing Detector (ft)	0	0			0		0	0				
Detector 1 Position(ft)	0	0			0		0	0				
Detector 1 Size(ft)	20	6			6		20	6				
Detector 1 Type	Cl+Ex	Cl+Ex			Cl+Ex		Cl+Ex	Cl+Ex				
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0			0.0		0.0	0.0				
Detector 1 Queue (s)	0.0	0.0			0.0		0.0	0.0				
Detector 1 Delay (s)	0.0	0.0			0.0		0.0	0.0				
Detector 2 Position(ft)		94			94			94				
Detector 2 Size(ft)		6			6			6				
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex				
Detector 2 Channel												

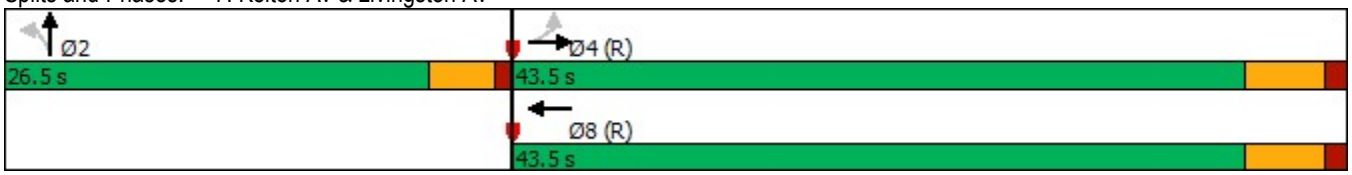


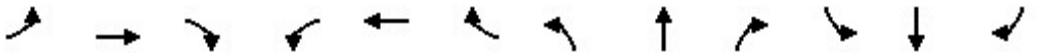
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 2 Extend (s)		0.0			0.0			0.0				
Turn Type	Perm	NA			NA		Perm	NA				
Protected Phases		4			8			2				
Permitted Phases	4						2					
Detector Phase	4	4			8		2	2				
Switch Phase												
Minimum Initial (s)	15.0	15.0			15.0		10.0	10.0				
Minimum Split (s)	27.0	27.0			27.0		26.5	26.5				
Total Split (s)	43.5	43.5			43.5		26.5	26.5				
Total Split (%)	62.1%	62.1%			62.1%		37.9%	37.9%				
Maximum Green (s)	38.1	38.1			38.1		22.1	22.1				
Yellow Time (s)	4.1	4.1			4.1		3.4	3.4				
All-Red Time (s)	1.3	1.3			1.3		1.0	1.0				
Lost Time Adjust (s)	0.0	0.0			0.0			0.0				
Total Lost Time (s)	5.4	5.4			5.4			4.4				
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.7	3.7			3.7		4.0	4.0				
Recall Mode	C-Max	C-Max			C-Max		None	None				
Walk Time (s)	8.0	8.0			8.0		7.0	7.0				
Flash Dont Walk (s)	7.0	7.0			7.0		8.0	8.0				
Pedestrian Calls (#/hr)	0	0			0		0	0				
Act Effct Green (s)	53.1	53.1			53.1			11.1				
Actuated g/C Ratio	0.76	0.76			0.76			0.16				
v/c Ratio	0.33	0.28			0.47			0.38				
Control Delay	3.4	2.4			4.7			26.0				
Queue Delay	0.0	0.0			0.0			0.0				
Total Delay	3.4	2.4			4.7			26.0				
LOS	A	A			A			C				
Approach Delay		2.8			4.7			26.0				
Approach LOS		A			A			C				
90th %ile Green (s)	46.3	46.3			46.3		13.9	13.9				
90th %ile Term Code	Coord	Coord			Coord		Gap	Gap				
70th %ile Green (s)	48.6	48.6			48.6		11.6	11.6				
70th %ile Term Code	Coord	Coord			Coord		Gap	Gap				
50th %ile Green (s)	50.2	50.2			50.2		10.0	10.0				
50th %ile Term Code	Coord	Coord			Coord		Min	Min				
30th %ile Green (s)	50.2	50.2			50.2		10.0	10.0				
30th %ile Term Code	Coord	Coord			Coord		Min	Min				
10th %ile Green (s)	64.6	64.6			64.6		0.0	0.0				
10th %ile Term Code	Coord	Coord			Coord		Skip	Skip				
Queue Length 50th (ft)	19	31			53			36				
Queue Length 95th (ft)	29	43			11			74				
Internal Link Dist (ft)		497			1496			112			47	
Turn Bay Length (ft)	150											
Base Capacity (vph)	591	1160			1138			545				
Starvation Cap Reductn	0	0			0			0				
Spillback Cap Reductn	0	0			0			0				
Storage Cap Reductn	0	0			0			0				

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Reduced v/c Ratio	0.33	0.28			0.47			0.20				

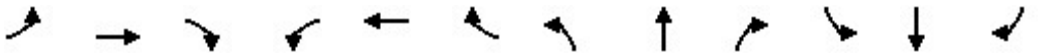
Intersection Summary			
Area Type:	Other		
Cycle Length: 70			
Actuated Cycle Length: 70			
Offset: 29 (41%), Referenced to phase 4:EBTL and 8:WBT, Start of Green			
Natural Cycle: 60			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.47			
Intersection Signal Delay: 5.8		Intersection LOS: A	
Intersection Capacity Utilization 60.1%		ICU Level of Service B	
Analysis Period (min) 15			

Splits and Phases: 7: Kelton Av & Livingston Av





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	6	286	43	13	437	35	9	181	55	17	152	18
Future Volume (vph)	6	286	43	13	437	35	9	181	55	17	152	18
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	150		0	375		0	0		0	0		0
Storage Lanes	1		0	1		0	0		0	0		0
Taper Length (ft)	25			25			0			0		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	1.00	1.00		1.00	1.00			0.99			1.00	
Frt		0.980			0.989			0.970			0.987	
Flt Protected	0.950			0.950				0.998			0.995	
Satd. Flow (prot)	1491	1503	0	1264	1506	0	0	1595	0	0	1647	0
Flt Permitted	0.402			0.519				0.986			0.962	
Satd. Flow (perm)	630	1503	0	687	1506	0	0	1575	0	0	1592	0
Right Turn on Red			Yes			Yes			Yes			No
Satd. Flow (RTOR)		16			8			23				
Link Speed (mph)		35			35			35			35	
Link Distance (ft)		1576			932			368			414	
Travel Time (s)		30.7			18.2			7.2			8.1	
Confl. Peds. (#/hr)	3		4	4		3	9		2	2		9
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	17%	4%	7%	38%	5%	9%	0%	11%	12%	13%	9%	6%
Parking (#/hr)		5	5		5	5						
Adj. Flow (vph)	7	318	48	14	486	39	10	201	61	19	169	20
Shared Lane Traffic (%)												
Lane Group Flow (vph)	7	366	0	14	525	0	0	272	0	0	208	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		11			11			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.04	1.24	1.04	1.04	1.24	1.04	1.04	1.04	1.04	1.04	1.04	1.04
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (ft)	20	100		20	100		20	100		20	100	
Trailing Detector (ft)	0	0		0	0		0	0		0	0	
Detector 1 Position(ft)	0	0		0	0		0	0		0	0	
Detector 1 Size(ft)	20	6		20	6		20	6		20	6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												



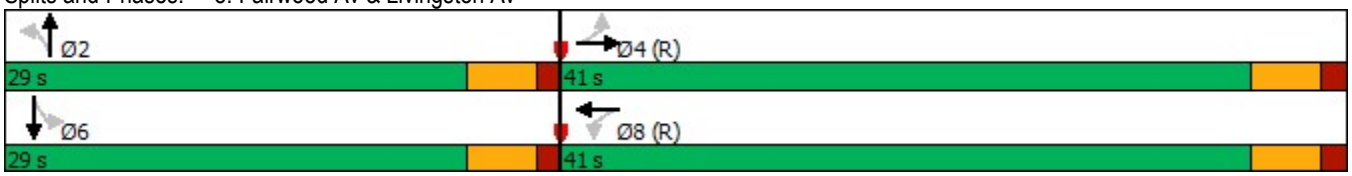
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	15.0	15.0		15.0	15.0		10.0	10.0		10.0	10.0	
Minimum Split (s)	27.0	27.0		27.0	27.0		26.5	26.5		26.5	26.5	
Total Split (s)	41.0	41.0		41.0	41.0		29.0	29.0		29.0	29.0	
Total Split (%)	58.6%	58.6%		58.6%	58.6%		41.4%	41.4%		41.4%	41.4%	
Maximum Green (s)	35.9	35.9		35.9	35.9		24.1	24.1		24.1	24.1	
Yellow Time (s)	3.6	3.6		3.6	3.6		3.6	3.6		3.6	3.6	
All-Red Time (s)	1.5	1.5		1.5	1.5		1.3	1.3		1.3	1.3	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0			0.0			0.0	
Total Lost Time (s)	5.1	5.1		5.1	5.1			4.9			4.9	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		4.0	4.0		4.0	4.0	
Recall Mode	C-Max	C-Max		C-Max	C-Max		None	None		None	None	
Walk Time (s)	8.0	8.0		8.0	8.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	
Act Effct Green (s)	42.7	42.7		42.7	42.7			17.3			17.3	
Actuated g/C Ratio	0.61	0.61		0.61	0.61			0.25			0.25	
v/c Ratio	0.02	0.40		0.03	0.57			0.67			0.53	
Control Delay	2.7	4.1		3.8	7.1			29.3			26.8	
Queue Delay	0.0	0.0		0.0	0.0			0.0			0.0	
Total Delay	2.7	4.1		3.8	7.1			29.3			26.8	
LOS	A	A		A	A			C			C	
Approach Delay		4.1			7.0			29.3			26.8	
Approach LOS		A			A			C			C	
90th %ile Green (s)	35.9	35.9		35.9	35.9		24.1	24.1		24.1	24.1	
90th %ile Term Code	Coord	Coord		Coord	Coord		Max	Max		Hold	Hold	
70th %ile Green (s)	40.1	40.1		40.1	40.1		19.9	19.9		19.9	19.9	
70th %ile Term Code	Coord	Coord		Coord	Coord		Gap	Gap		Hold	Hold	
50th %ile Green (s)	42.7	42.7		42.7	42.7		17.3	17.3		17.3	17.3	
50th %ile Term Code	Coord	Coord		Coord	Coord		Gap	Gap		Hold	Hold	
30th %ile Green (s)	45.4	45.4		45.4	45.4		14.6	14.6		14.6	14.6	
30th %ile Term Code	Coord	Coord		Coord	Coord		Gap	Gap		Hold	Hold	
10th %ile Green (s)	49.4	49.4		49.4	49.4		10.6	10.6		10.6	10.6	
10th %ile Term Code	Coord	Coord		Coord	Coord		Gap	Gap		Hold	Hold	
Queue Length 50th (ft)	0	14		1	44			97			78	
Queue Length 95th (ft)	m1	67		m2	61			149			120	
Internal Link Dist (ft)		1496			852			288			334	
Turn Bay Length (ft)	150			375								
Base Capacity (vph)	384	923		419	921			557			548	
Starvation Cap Reductn	0	0		0	0			0			0	
Spillback Cap Reductn	0	0		0	0			0			0	
Storage Cap Reductn	0	0		0	0			0			0	

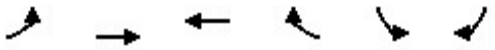
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Reduced v/c Ratio	0.02	0.40		0.03	0.57			0.49			0.38	

Intersection Summary			
Area Type:	Other		
Cycle Length: 70			
Actuated Cycle Length: 70			
Offset: 57 (81%), Referenced to phase 4:EBTL and 8:WBTL, Start of Green			
Natural Cycle: 60			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.67			
Intersection Signal Delay: 13.5		Intersection LOS: B	
Intersection Capacity Utilization 49.8%		ICU Level of Service A	
Analysis Period (min) 15			

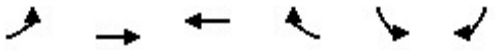
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 8: Fairwood Av & Livingston Av

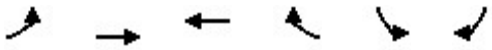




Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	34	465	530	163	155	64
Future Volume (vph)	34	465	530	163	155	64
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	150			0	0	0
Storage Lanes	1			1	1	0
Taper Length (ft)	25				0	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	1.00			0.97	1.00	
Frt				0.850	0.961	
Flt Protected	0.950				0.966	
Satd. Flow (prot)	1401	1531	1531	1313	1646	0
Flt Permitted	0.407				0.966	
Satd. Flow (perm)	599	1531	1531	1278	1644	0
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)				173	31	
Link Speed (mph)		35	35		35	
Link Distance (ft)		841	588		385	
Travel Time (s)		16.4	11.5		7.5	
Confl. Peds. (#/hr)	3			3	1	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Heavy Vehicles (%)	9%	5%	5%	4%	3%	5%
Parking (#/hr)	5	5	5	5		
Adj. Flow (vph)	36	495	564	173	165	68
Shared Lane Traffic (%)						
Lane Group Flow (vph)	36	495	564	173	233	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(ft)		11	11		11	
Link Offset(ft)		0	0		0	
Crosswalk Width(ft)		16	16		16	
Two way Left Turn Lane						
Headway Factor	1.24	1.24	1.24	1.24	1.04	1.04
Turning Speed (mph)	15			9	15	9
Number of Detectors	1	2	2	0	1	
Detector Template	Left	Thru	Thru		Left	
Leading Detector (ft)	20	100	100	0	20	
Trailing Detector (ft)	0	0	0	0	0	
Detector 1 Position(ft)	0	0	0	0	0	
Detector 1 Size(ft)	20	6	6	0	20	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(ft)		94	94			
Detector 2 Size(ft)		6	6			
Detector 2 Type		Cl+Ex	Cl+Ex			
Detector 2 Channel						



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Detector 2 Extend (s)		0.0	0.0			
Turn Type	Perm	NA	NA	Perm	Perm	
Protected Phases		4	8			
Permitted Phases	4			8	6	
Detector Phase	4	4	8	8	6	
Switch Phase						
Minimum Initial (s)	15.0	15.0	15.0	15.0	10.0	
Minimum Split (s)	27.0	27.0	27.0	27.0	26.5	
Total Split (s)	43.5	43.5	43.5	43.5	26.5	
Total Split (%)	62.1%	62.1%	62.1%	62.1%	37.9%	
Maximum Green (s)	37.7	37.7	37.7	37.7	21.9	
Yellow Time (s)	3.6	3.6	3.6	3.6	3.6	
All-Red Time (s)	2.2	2.2	2.2	2.2	1.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	5.8	5.8	5.8	5.8	4.6	
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	0.2	0.2	4.0	4.0	0.2	
Recall Mode	C-Max	C-Max	C-Max	C-Max	None	
Walk Time (s)	8.0	8.0	8.0	8.0	7.0	
Flash Dont Walk (s)	7.0	7.0	7.0	7.0	7.0	
Pedestrian Calls (#/hr)	0	0	0	0	0	
Act Effct Green (s)	46.9	46.9	46.9	46.9	12.7	
Actuated g/C Ratio	0.67	0.67	0.67	0.67	0.18	
v/c Ratio	0.09	0.48	0.55	0.19	0.72	
Control Delay	4.1	6.2	9.4	1.6	35.8	
Queue Delay	0.0	0.0	0.0	0.0	0.0	
Total Delay	4.1	6.2	9.4	1.6	35.8	
LOS	A	A	A	A	D	
Approach Delay		6.1	7.6		35.8	
Approach LOS		A	A		D	
90th %ile Green (s)	41.8	41.8	41.8	41.8	17.8	
90th %ile Term Code	Coord	Coord	Coord	Coord	Gap	
70th %ile Green (s)	45.4	45.4	45.4	45.4	14.2	
70th %ile Term Code	Coord	Coord	Coord	Coord	Gap	
50th %ile Green (s)	48.0	48.0	48.0	48.0	11.6	
50th %ile Term Code	Coord	Coord	Coord	Coord	Gap	
30th %ile Green (s)	49.6	49.6	49.6	49.6	10.0	
30th %ile Term Code	Coord	Coord	Coord	Coord	Min	
10th %ile Green (s)	49.6	49.6	49.6	49.6	10.0	
10th %ile Term Code	Coord	Coord	Coord	Coord	Min	
Queue Length 50th (ft)	4	55	99	0	84	
Queue Length 95th (ft)	m10	87	233	21	140	
Internal Link Dist (ft)		761	508		305	
Turn Bay Length (ft)	150					
Base Capacity (vph)	401	1025	1025	912	535	
Starvation Cap Reductn	0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	

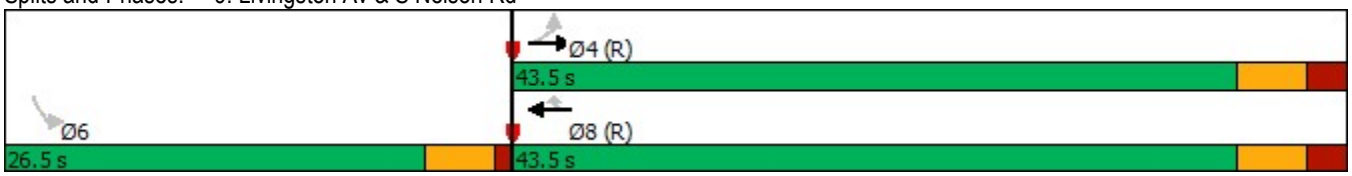


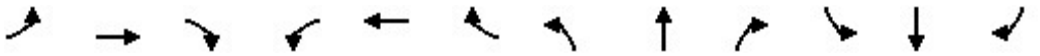
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Reduced v/c Ratio	0.09	0.48	0.55	0.19	0.44	

Intersection Summary			
Area Type:	Other		
Cycle Length: 70			
Actuated Cycle Length: 70			
Offset: 24 (34%), Referenced to phase 4:EBTL and 8:WBT, Start of Green			
Natural Cycle: 60			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.72			
Intersection Signal Delay: 11.4		Intersection LOS: B	
Intersection Capacity Utilization 49.4%		ICU Level of Service A	
Analysis Period (min) 15			

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 9: Livingston Av & S Nelson Rd

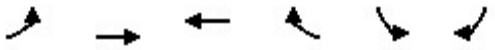




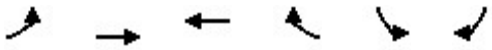
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	3	215	0	0	454	10	69	3	59	8	0	18
Future Volume (Veh/h)	3	215	0	0	454	10	69	3	59	8	0	18
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Hourly flow rate (vph)	3	236	0	0	499	11	76	3	65	9	0	20
Pedestrians								1			6	
Lane Width (ft)								11.0			11.0	
Walking Speed (ft/s)								3.5			3.5	
Percent Blockage								0			1	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)		440			1031							
pX, platoon unblocked				0.99			0.99	0.99	0.99	0.99	0.99	
vC, conflicting volume	516			237			768	759	237	819	754	510
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	516			220			758	749	220	810	744	510
tC, single (s)	4.1			4.1			7.1	7.2	6.2	7.2	6.5	6.4
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.6	3.3	3.6	4.0	3.5
p0 queue free %	100			100			75	99	92	96	100	96
cM capacity (veh/h)	1055			1342			307	267	808	254	338	532

Direction, Lane #	EB 1	EB 2	WB 1	NB 1	SB 1
Volume Total	3	236	510	144	29
Volume Left	3	0	0	76	9
Volume Right	0	0	11	65	20
cSH	1055	1700	1700	425	397
Volume to Capacity	0.00	0.14	0.30	0.34	0.07
Queue Length 95th (ft)	0	0	0	37	6
Control Delay (s)	8.4	0.0	0.0	17.8	14.8
Lane LOS	A			C	B
Approach Delay (s)	0.1		0.0	17.8	14.8
Approach LOS				C	B

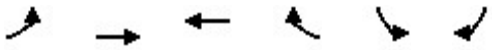
Intersection Summary				
Average Delay	3.3			
Intersection Capacity Utilization	44.1%	ICU Level of Service	A	
Analysis Period (min)	15			



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	123	391	275	39	65	182
Future Volume (vph)	123	391	275	39	65	182
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	100			0	0	0
Storage Lanes	1			0	1	1
Taper Length (ft)	25				0	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	1.00		1.00		1.00	0.96
Frt			0.983			0.850
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1601	1801	1520	0	1745	1531
Flt Permitted	0.423				0.950	
Satd. Flow (perm)	709	1801	1520	0	1741	1473
Right Turn on Red				Yes		No
Satd. Flow (RTOR)			11			
Link Speed (mph)		35	35		25	
Link Distance (ft)		304	440		328	
Travel Time (s)		5.9	8.6		8.9	
Confl. Peds. (#/hr)	5			5	1	8
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89
Heavy Vehicles (%)	9%	2%	4%	0%	0%	2%
Parking (#/hr)			5	5		
Adj. Flow (vph)	138	439	309	44	73	204
Shared Lane Traffic (%)						
Lane Group Flow (vph)	138	439	353	0	73	204
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(ft)		11	11		11	
Link Offset(ft)		0	0		0	
Crosswalk Width(ft)		16	16		16	
Two way Left Turn Lane						
Headway Factor	1.04	1.04	1.24	1.04	1.04	1.04
Turning Speed (mph)	15			9	15	9
Number of Detectors	1	2	2		1	1
Detector Template	Left	Thru	Thru		Left	Right
Leading Detector (ft)	20	100	100		20	20
Trailing Detector (ft)	0	0	0		0	0
Detector 1 Position(ft)	0	0	0		0	0
Detector 1 Size(ft)	20	6	6		20	20
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0		0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0		0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0		0.0	0.0
Detector 2 Position(ft)		94	94			
Detector 2 Size(ft)		6	6			
Detector 2 Type		Cl+Ex	Cl+Ex			
Detector 2 Channel						



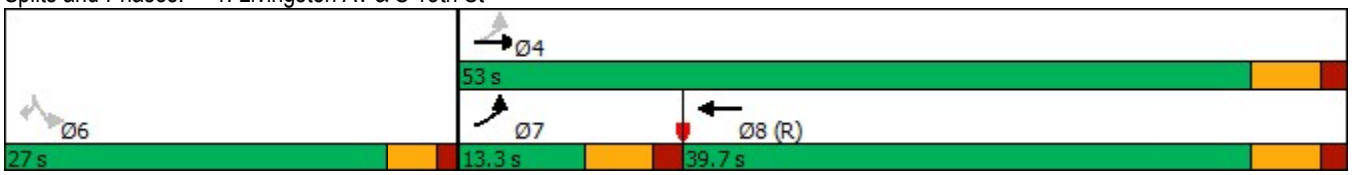
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Detector 2 Extend (s)		0.0	0.0			
Turn Type	pm+pt	NA	NA		Perm	Perm
Protected Phases	7	4	8			
Permitted Phases	4				6	6
Detector Phase	7	4	8		6	6
Switch Phase						
Minimum Initial (s)	5.0	7.0	16.0		10.0	10.0
Minimum Split (s)	10.8	26.5	26.5		26.5	26.5
Total Split (s)	13.3	53.0	39.7		27.0	27.0
Total Split (%)	16.6%	66.3%	49.6%		33.8%	33.8%
Maximum Green (s)	7.5	47.2	33.9		22.7	22.7
Yellow Time (s)	4.1	4.1	4.1		3.0	3.0
All-Red Time (s)	1.7	1.7	1.7		1.3	1.3
Lost Time Adjust (s)	0.0	0.0	0.0		0.0	0.0
Total Lost Time (s)	5.8	5.8	5.8		4.3	4.3
Lead/Lag	Lead		Lag			
Lead-Lag Optimize?	Yes		Yes			
Vehicle Extension (s)	3.7	3.7	3.7		5.0	5.0
Recall Mode	None	Max	C-Max		None	None
Walk Time (s)		7.0	7.0		7.0	7.0
Flash Dont Walk (s)		9.0	9.0		11.0	11.0
Pedestrian Calls (#/hr)		0	0		0	0
Act Effct Green (s)	52.3	52.3	38.4		17.6	17.6
Actuated g/C Ratio	0.65	0.65	0.48		0.22	0.22
v/c Ratio	0.25	0.37	0.48		0.19	0.63
Control Delay	7.4	8.3	12.5		24.8	36.5
Queue Delay	0.0	0.0	0.0		0.0	0.0
Total Delay	7.4	8.3	12.5		24.8	36.5
LOS	A	A	B		C	D
Approach Delay		8.0	12.5		33.4	
Approach LOS		A	B		C	
90th %ile Green (s)	7.5	47.2	33.9		22.7	22.7
90th %ile Term Code	Max	Coord	Coord		Max	Max
70th %ile Green (s)	9.7	49.4	33.9		20.5	20.5
70th %ile Term Code	Max	Coord	Coord		Gap	Gap
50th %ile Green (s)	8.8	51.9	37.3		18.0	18.0
50th %ile Term Code	Gap	Coord	Coord		Gap	Gap
30th %ile Green (s)	7.8	54.5	40.9		15.4	15.4
30th %ile Term Code	Gap	Coord	Coord		Gap	Gap
10th %ile Green (s)	6.7	58.3	45.8		11.6	11.6
10th %ile Term Code	Gap	Coord	Coord		Gap	Gap
Queue Length 50th (ft)	23	89	113		30	92
Queue Length 95th (ft)	52	166	139		58	147
Internal Link Dist (ft)		224	360		248	
Turn Bay Length (ft)	100					
Base Capacity (vph)	555	1176	734		494	417
Starvation Cap Reductn	0	0	0		0	0
Spillback Cap Reductn	0	0	0		0	0
Storage Cap Reductn	0	0	0		0	0

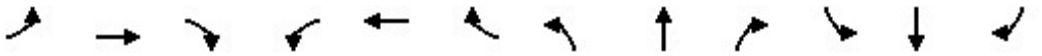


Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Reduced v/c Ratio	0.25	0.37	0.48		0.15	0.49

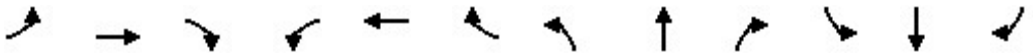
Intersection Summary			
Area Type:	Other		
Cycle Length: 80			
Actuated Cycle Length: 80			
Offset: 70 (88%), Referenced to phase 8:WBT, Start of Green			
Natural Cycle: 65			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.63			
Intersection Signal Delay: 15.2		Intersection LOS: B	
Intersection Capacity Utilization 46.9%		ICU Level of Service A	
Analysis Period (min) 15			

Splits and Phases: 1: Livingston Av & S 18th St





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	572	74	72	364	0	0	0	0	9	4	11
Future Volume (vph)	0	572	74	72	364	0	0	0	0	9	4	11
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	150		0	150		0	0		0	0		0
Storage Lanes	0		0	1		0	0		0	0		0
Taper Length (ft)	25			25			0			0		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		1.00									0.98	
Frt		0.985									0.938	
Flt Protected				0.950							0.981	
Satd. Flow (prot)	0	1526	0	1678	1531	0	0	0	0	0	1398	0
Flt Permitted				0.369							0.981	
Satd. Flow (perm)	0	1526	0	652	1531	0	0	0	0	0	1396	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		14									12	
Link Speed (mph)		35			35			35			35	
Link Distance (ft)		1031			383			200			188	
Travel Time (s)		20.1			7.5			3.9			3.7	
Confl. Peds. (#/hr)	3		4	4		3	7		1	1		7
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Heavy Vehicles (%)	0%	3%	6%	4%	5%	0%	0%	0%	0%	0%	25%	0%
Parking (#/hr)		5	5		5						5	5
Adj. Flow (vph)	0	629	81	79	400	0	0	0	0	10	4	12
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	710	0	79	400	0	0	0	0	0	26	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		11			11			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.04	1.24	1.04	1.04	1.24	1.04	1.04	1.04	1.04	1.04	1.24	1.04
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors		2		1	2					1	2	
Detector Template		Thru		Left	Thru					Left	Thru	
Leading Detector (ft)		100		20	100					20	100	
Trailing Detector (ft)		0		0	0					0	0	
Detector 1 Position(ft)		0		0	0					0	0	
Detector 1 Size(ft)		6		20	6					20	6	
Detector 1 Type		Cl+Ex		Cl+Ex	Cl+Ex					Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)		0.0		0.0	0.0					0.0	0.0	
Detector 1 Queue (s)		0.0		0.0	0.0					0.0	0.0	
Detector 1 Delay (s)		0.0		0.0	0.0					0.0	0.0	
Detector 2 Position(ft)		94			94						94	
Detector 2 Size(ft)		6			6						6	
Detector 2 Type		Cl+Ex			Cl+Ex						Cl+Ex	
Detector 2 Channel												



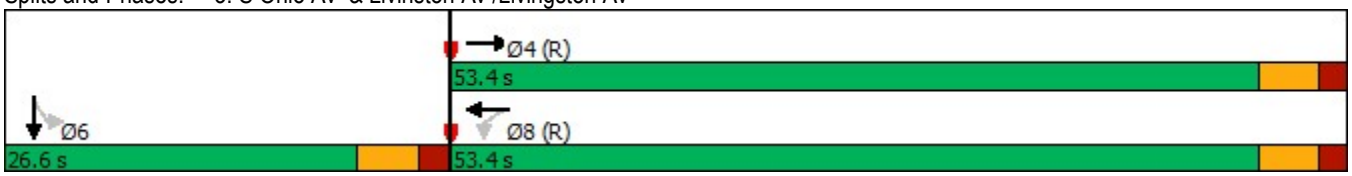
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 2 Extend (s)		0.0			0.0						0.0	
Turn Type		NA		Perm	NA					Perm	NA	
Protected Phases		4			8						6	
Permitted Phases				8						6		
Detector Phase		4		8	8					6	6	
Switch Phase												
Minimum Initial (s)		15.0		15.0	15.0					10.0	10.0	
Minimum Split (s)		27.0		27.0	27.0					26.5	26.5	
Total Split (s)		53.4		53.4	53.4					26.6	26.6	
Total Split (%)		66.8%		66.8%	66.8%					33.3%	33.3%	
Maximum Green (s)		48.0		48.0	48.0					21.0	21.0	
Yellow Time (s)		3.6		3.6	3.6					3.6	3.6	
All-Red Time (s)		1.8		1.8	1.8					2.0	2.0	
Lost Time Adjust (s)		0.0		0.0	0.0						0.0	
Total Lost Time (s)		5.4		5.4	5.4						5.6	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)		3.0		3.0	3.0					4.0	4.0	
Recall Mode		C-Max		C-Max	C-Max					None	None	
Walk Time (s)		8.0		8.0	8.0					7.0	7.0	
Flash Dont Walk (s)		7.0		7.0	7.0					7.0	7.0	
Pedestrian Calls (#/hr)		0		0	0					0	0	
Act Effct Green (s)		71.6		71.6	71.6						10.0	
Actuated g/C Ratio		0.90		0.90	0.90						0.12	
v/c Ratio		0.52		0.14	0.29						0.14	
Control Delay		6.2		2.0	1.8						23.8	
Queue Delay		0.0		0.0	0.0						0.0	
Total Delay		6.2		2.0	1.8						23.8	
LOS		A		A	A						C	
Approach Delay		6.2			1.8						23.8	
Approach LOS		A			A						C	
90th %ile Green (s)		59.0		59.0	59.0					10.0	10.0	
90th %ile Term Code		Coord		Coord	Coord					Min	Min	
70th %ile Green (s)		59.0		59.0	59.0					10.0	10.0	
70th %ile Term Code		Coord		Coord	Coord					Min	Min	
50th %ile Green (s)		74.6		74.6	74.6					0.0	0.0	
50th %ile Term Code		Coord		Coord	Coord					Skip	Skip	
30th %ile Green (s)		74.6		74.6	74.6					0.0	0.0	
30th %ile Term Code		Coord		Coord	Coord					Skip	Skip	
10th %ile Green (s)		74.6		74.6	74.6					0.0	0.0	
10th %ile Term Code		Coord		Coord	Coord					Skip	Skip	
Queue Length 50th (ft)		14		0	0						6	
Queue Length 95th (ft)		356		m12	48						29	
Internal Link Dist (ft)		951			303			120			108	
Turn Bay Length (ft)				150								
Base Capacity (vph)		1367		583	1370						375	
Starvation Cap Reductn		0		0	58						0	
Spillback Cap Reductn		15		0	0						0	
Storage Cap Reductn		0		0	0						0	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Reduced v/c Ratio		0.53		0.14	0.30						0.07	

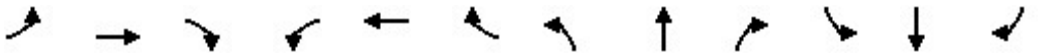
Intersection Summary			
Area Type:	Other		
Cycle Length: 80			
Actuated Cycle Length: 80			
Offset: 25 (31%), Referenced to phase 4:EBT and 8:WBTL, Start of Green			
Natural Cycle: 65			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.52			
Intersection Signal Delay: 4.9		Intersection LOS: A	
Intersection Capacity Utilization 69.8%		ICU Level of Service C	
Analysis Period (min) 15			

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 3: S Ohio Av & Livinston Av /Livingston Av



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	43	536	0	0	396	86	44	127	44	0	0	0
Future Volume (vph)	43	536	0	0	396	86	44	127	44	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	150		0	0		0	0		0	0		0
Storage Lanes	1		0	0		0	0		0	0		0
Taper Length (ft)	25			0			0			0		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	0.98				0.99			0.99				
Frt					0.976			0.973				
Flt Protected	0.950							0.990				
Satd. Flow (prot)	1662	1576	0	0	1487	0	0	1444	0	0	0	0
Flt Permitted	0.422							0.990				
Satd. Flow (perm)	725	1576	0	0	1487	0	0	1433	0	0	0	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)					23			17				
Link Speed (mph)		35			35			35			35	
Link Distance (ft)		383			1949			182			211	
Travel Time (s)		7.5			38.0			3.5			4.1	
Confl. Peds. (#/hr)	19		7	7		19	15		3	3		15
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	5%	2%	0%	0%	4%	5%	7%	8%	2%	0%	0%	0%
Parking (#/hr)		5			5	5		5	5			
Adj. Flow (vph)	45	564	0	0	417	91	46	134	46	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	45	564	0	0	508	0	0	226	0	0	0	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		11			11			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.04	1.24	1.04	1.04	1.24	1.04	1.04	1.24	1.04	1.04	1.04	1.04
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2			2		1	2				
Detector Template	Left	Thru			Thru		Left	Thru				
Leading Detector (ft)	20	100			100		20	100				
Trailing Detector (ft)	0	0			0		0	0				
Detector 1 Position(ft)	0	0			0		0	0				
Detector 1 Size(ft)	20	6			6		20	6				
Detector 1 Type	Cl+Ex	Cl+Ex			Cl+Ex		Cl+Ex	Cl+Ex				
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0			0.0		0.0	0.0				
Detector 1 Queue (s)	0.0	0.0			0.0		0.0	0.0				
Detector 1 Delay (s)	0.0	0.0			0.0		0.0	0.0				
Detector 2 Position(ft)		94			94			94				
Detector 2 Size(ft)		6			6			6				
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex				
Detector 2 Channel												



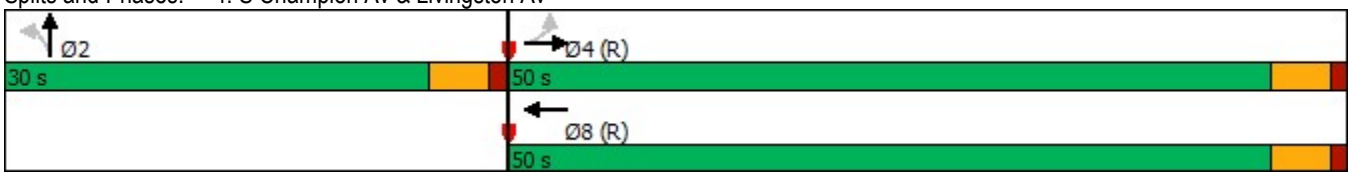
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 2 Extend (s)		0.0			0.0			0.0				
Turn Type	Perm	NA			NA		Perm	NA				
Protected Phases		4			8			2				
Permitted Phases	4						2					
Detector Phase	4	4			8		2	2				
Switch Phase												
Minimum Initial (s)	15.0	15.0			15.0		10.0	10.0				
Minimum Split (s)	26.5	26.5			27.0		19.8	19.8				
Total Split (s)	50.0	50.0			50.0		30.0	30.0				
Total Split (%)	62.5%	62.5%			62.5%		37.5%	37.5%				
Maximum Green (s)	45.3	45.3			45.3		25.2	25.2				
Yellow Time (s)	3.6	3.6			3.6		3.6	3.6				
All-Red Time (s)	1.1	1.1			1.1		1.2	1.2				
Lost Time Adjust (s)	0.0	0.0			0.0			0.0				
Total Lost Time (s)	4.7	4.7			4.7			4.8				
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	0.2	0.2			0.2		4.0	4.0				
Recall Mode	C-Max	C-Max			C-Max		None	None				
Walk Time (s)	8.0	8.0			8.0		7.0	7.0				
Flash Dont Walk (s)	7.0	7.0			7.0		8.0	8.0				
Pedestrian Calls (#/hr)	0	0			0		0	0				
Act Effct Green (s)	52.7	52.7			52.7			17.8				
Actuated g/C Ratio	0.66	0.66			0.66			0.22				
v/c Ratio	0.09	0.54			0.52			0.68				
Control Delay	2.9	7.2			9.9			36.0				
Queue Delay	0.0	0.3			0.0			0.0				
Total Delay	2.9	7.6			9.9			36.0				
LOS	A	A			A			D				
Approach Delay		7.2			9.9			36.0				
Approach LOS		A			A			D				
90th %ile Green (s)	45.8	45.8			45.8		24.7	24.7				
90th %ile Term Code	Coord	Coord			Coord		Gap	Gap				
70th %ile Green (s)	49.7	49.7			49.7		20.8	20.8				
70th %ile Term Code	Coord	Coord			Coord		Gap	Gap				
50th %ile Green (s)	52.6	52.6			52.6		17.9	17.9				
50th %ile Term Code	Coord	Coord			Coord		Gap	Gap				
30th %ile Green (s)	55.5	55.5			55.5		15.0	15.0				
30th %ile Term Code	Coord	Coord			Coord		Gap	Gap				
10th %ile Green (s)	59.7	59.7			59.7		10.8	10.8				
10th %ile Term Code	Coord	Coord			Coord		Gap	Gap				
Queue Length 50th (ft)	8	171			84			96				
Queue Length 95th (ft)	m5	142			265			152				
Internal Link Dist (ft)		303			1869			102			131	
Turn Bay Length (ft)	150											
Base Capacity (vph)	477	1037			986			463				
Starvation Cap Reductn	0	124			0			0				
Spillback Cap Reductn	0	0			0			0				
Storage Cap Reductn	0	0			0			0				

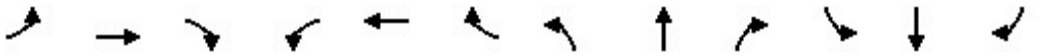
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Reduced v/c Ratio	0.09	0.62			0.52			0.49				

Intersection Summary			
Area Type:	Other		
Cycle Length: 80			
Actuated Cycle Length: 80			
Offset: 30 (38%), Referenced to phase 4:EBTL and 8:WBT, Start of Green			
Natural Cycle: 60			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.68			
Intersection Signal Delay: 13.1		Intersection LOS: B	
Intersection Capacity Utilization 69.8%		ICU Level of Service C	
Analysis Period (min) 15			

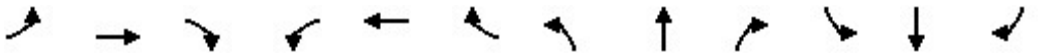
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 4: S Champion Av & Livingston Av





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	555	89	304	376	2	110	4	278	0	1	4
Future Volume (vph)	0	555	89	304	376	2	110	4	278	0	1	4
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		150	0		0	75		0	0		0
Storage Lanes	0		1	1		0	1		0	0		0
Taper Length (ft)	25			25			0			0		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor			0.96		1.00		1.00	0.97			0.98	
Frt			0.850		0.999			0.852			0.892	
Flt Protected				0.950			0.950					
Satd. Flow (prot)	0	1576	1339	1678	1529	0	1711	1467	0	0	1608	0
Flt Permitted				0.317			0.754					
Satd. Flow (perm)	0	1576	1290	560	1529	0	1354	1467	0	0	1608	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			88		1			296			4	
Link Speed (mph)		35			35			35			25	
Link Distance (ft)		1949			512			199			214	
Travel Time (s)		38.0			10.0			3.9			5.8	
Confl. Peds. (#/hr)	4		6	6		4	1		2	2		1
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Heavy Vehicles (%)	0%	2%	2%	4%	5%	0%	2%	0%	4%	0%	0%	0%
Parking (#/hr)		5	5		5	5						
Adj. Flow (vph)	0	590	95	323	400	2	117	4	296	0	1	4
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	590	95	323	402	0	117	300	0	0	5	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		11			11			11			11	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.04	1.24	1.24	1.04	1.24	1.04	1.04	1.04	1.04	1.04	1.04	1.04
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors		2	0	1	2		1	2			2	
Detector Template		Thru		Left	Thru		Left	Thru			Thru	
Leading Detector (ft)		100	0	20	100		20	100			100	
Trailing Detector (ft)		0	0	0	0		0	0			0	
Detector 1 Position(ft)		0	0	0	0		0	0			0	
Detector 1 Size(ft)		6	0	20	6		20	6			6	
Detector 1 Type		Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex			Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)		0.0	0.0	0.0	0.0		0.0	0.0			0.0	
Detector 1 Queue (s)		0.0	0.0	0.0	0.0		0.0	0.0			0.0	
Detector 1 Delay (s)		0.0	0.0	0.0	0.0		0.0	0.0			0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												



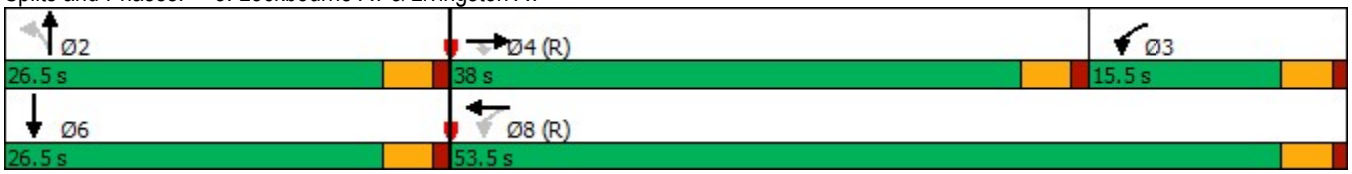
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type		NA	Perm	pm+pt	NA		Perm	NA			NA	
Protected Phases		4		3	8			2			6	
Permitted Phases			4	8			2					
Detector Phase		4	4	3	8		2	2			6	
Switch Phase												
Minimum Initial (s)		5.0	5.0	5.0	5.0		5.0	5.0			5.0	
Minimum Split (s)		26.5	26.5	9.5	26.5		26.5	26.5			26.5	
Total Split (s)		38.0	38.0	15.5	53.5		26.5	26.5			26.5	
Total Split (%)		47.5%	47.5%	19.4%	66.9%		33.1%	33.1%			33.1%	
Maximum Green (s)		34.0	34.0	11.5	49.5		22.5	22.5			22.5	
Yellow Time (s)		3.0	3.0	3.0	3.0		3.0	3.0			3.0	
All-Red Time (s)		1.0	1.0	1.0	1.0		1.0	1.0			1.0	
Lost Time Adjust (s)		0.0	0.0	0.0	0.0		0.0	0.0			0.0	
Total Lost Time (s)		4.0	4.0	4.0	4.0		4.0	4.0			4.0	
Lead/Lag		Lead	Lead	Lag								
Lead-Lag Optimize?		Yes	Yes	Yes								
Vehicle Extension (s)		3.0	3.0	3.0	3.0		3.0	3.0			3.0	
Recall Mode		C-Max	C-Max	None	C-Max		None	None			None	
Walk Time (s)		7.0	7.0		7.0		7.0	7.0			7.0	
Flash Dont Walk (s)		7.0	7.0		7.0		7.0	7.0			7.0	
Pedestrian Calls (#/hr)		0	0		0		0	0			0	
Act Effct Green (s)		44.0	44.0	59.5	59.5		12.5	12.5			12.5	
Actuated g/C Ratio		0.55	0.55	0.74	0.74		0.16	0.16			0.16	
v/c Ratio		0.68	0.13	0.56	0.35		0.55	0.63			0.02	
Control Delay		13.2	0.7	9.6	3.8		40.0	10.1			18.0	
Queue Delay		0.3	0.0	0.0	0.0		0.0	0.0			0.0	
Total Delay		13.4	0.7	9.6	3.8		40.0	10.2			18.0	
LOS		B	A	A	A		D	B			B	
Approach Delay		11.7			6.4			18.5			18.0	
Approach LOS		B			A			B			B	
90th %ile Green (s)		38.1	38.1	11.5	53.6		18.4	18.4			18.4	
90th %ile Term Code		Coord	Coord	Max	Coord		Gap	Gap			Hold	
70th %ile Green (s)		41.2	41.2	11.5	56.7		15.3	15.3			15.3	
70th %ile Term Code		Coord	Coord	Max	Coord		Gap	Gap			Hold	
50th %ile Green (s)		44.3	44.3	11.5	59.8		12.2	12.2			12.2	
50th %ile Term Code		Coord	Coord	Hold	Coord		Gap	Gap			Hold	
30th %ile Green (s)		46.5	46.5	11.5	62.0		10.0	10.0			10.0	
30th %ile Term Code		Coord	Coord	Hold	Coord		Gap	Gap			Hold	
10th %ile Green (s)		49.7	49.7	11.5	65.2		6.8	6.8			6.8	
10th %ile Term Code		Coord	Coord	Hold	Coord		Gap	Gap			Hold	
Queue Length 50th (ft)		229	0	19	25		55	2			0	
Queue Length 95th (ft)		#424	m0	74	93		97	63			9	
Internal Link Dist (ft)		1869			432			119			134	
Turn Bay Length (ft)			150				75					
Base Capacity (vph)		866	748	576	1136		380	625			455	
Starvation Cap Reductn		0	0	0	0		0	0			0	
Spillback Cap Reductn		35	0	0	0		0	6			0	
Storage Cap Reductn		0	0	0	0		0	0			0	

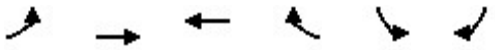
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Reduced v/c Ratio		0.71	0.13	0.56	0.35		0.31	0.48			0.01	

Intersection Summary			
Area Type:	Other		
Cycle Length: 80			
Actuated Cycle Length: 80			
Offset: 77 (96%), Referenced to phase 4:EBT and 8:WBTL, Start of Green			
Natural Cycle: 80			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.68			
Intersection Signal Delay: 11.1		Intersection LOS: B	
Intersection Capacity Utilization 73.7%		ICU Level of Service D	
Analysis Period (min) 15			

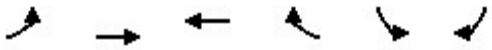
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 5: Lockbourne Av & Livingston Av





Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	0	827	413	0	164	313
Future Volume (vph)	0	827	413	0	164	313
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor					1.00	
Frt						0.850
Flt Protected					0.950	
Satd. Flow (prot)	0	1560	1516	0	1662	1501
Flt Permitted					0.950	
Satd. Flow (perm)	0	1560	1516	0	1658	1501
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)						329
Link Speed (mph)		35	35		25	
Link Distance (ft)		512	577		267	
Travel Time (s)		10.0	11.2		7.3	
Confl. Peds. (#/hr)	3			3	1	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	0%	3%	6%	0%	5%	4%
Parking (#/hr)		5	5			
Adj. Flow (vph)	0	871	435	0	173	329
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	871	435	0	173	329
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(ft)		11	11		11	
Link Offset(ft)		0	0		0	
Crosswalk Width(ft)		16	16		16	
Two way Left Turn Lane						
Headway Factor	1.04	1.24	1.24	1.04	1.04	1.04
Turning Speed (mph)	15			9	15	9
Number of Detectors		2	2		1	1
Detector Template		Thru	Thru		Left	Right
Leading Detector (ft)		100	100		20	20
Trailing Detector (ft)		0	0		0	0
Detector 1 Position(ft)		0	0		0	0
Detector 1 Size(ft)		6	6		20	20
Detector 1 Type		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)		0.0	0.0		0.0	0.0
Detector 1 Queue (s)		0.0	0.0		0.0	0.0
Detector 1 Delay (s)		0.0	0.0		0.0	0.0
Detector 2 Position(ft)		94	94			
Detector 2 Size(ft)		6	6			
Detector 2 Type		Cl+Ex	Cl+Ex			
Detector 2 Channel						
Detector 2 Extend (s)		0.0	0.0			
Turn Type		NA	NA		Perm	Perm
Protected Phases		4	8			



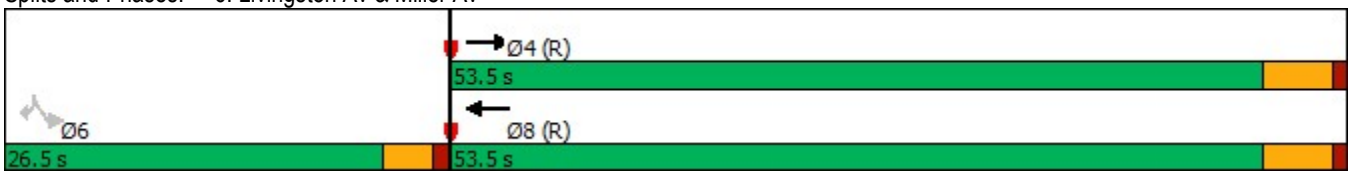
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Permitted Phases					6	6
Detector Phase		4	8		6	6
Switch Phase						
Minimum Initial (s)		20.0	20.0		10.0	10.0
Minimum Split (s)		32.0	32.0		26.5	26.5
Total Split (s)		53.5	53.5		26.5	26.5
Total Split (%)		66.9%	66.9%		33.1%	33.1%
Maximum Green (s)		48.4	48.4		22.5	22.5
Yellow Time (s)		4.1	4.1		3.0	3.0
All-Red Time (s)		1.0	1.0		1.0	1.0
Lost Time Adjust (s)		0.0	0.0		0.0	0.0
Total Lost Time (s)		5.1	5.1		4.0	4.0
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)		1.0	1.0		4.0	4.0
Recall Mode		C-Max	C-Max		None	None
Walk Time (s)		13.0	13.0		7.0	7.0
Flash Dont Walk (s)		7.0	7.0		10.0	10.0
Pedestrian Calls (#/hr)		0	0		0	0
Act Effct Green (s)		55.8	55.8		15.1	15.1
Actuated g/C Ratio		0.70	0.70		0.19	0.19
v/c Ratio		0.80	0.41		0.55	0.60
Control Delay		10.0	3.8		35.3	8.1
Queue Delay		0.0	0.0		0.0	0.0
Total Delay		10.0	3.8		35.3	8.1
LOS		B	A		D	A
Approach Delay		10.0	3.8		17.5	
Approach LOS		B	A		B	
90th %ile Green (s)		49.6	49.6		21.3	21.3
90th %ile Term Code		Coord	Coord		Gap	Gap
70th %ile Green (s)		53.4	53.4		17.5	17.5
70th %ile Term Code		Coord	Coord		Gap	Gap
50th %ile Green (s)		56.4	56.4		14.5	14.5
50th %ile Term Code		Coord	Coord		Gap	Gap
30th %ile Green (s)		58.6	58.6		12.3	12.3
30th %ile Term Code		Coord	Coord		Gap	Gap
10th %ile Green (s)		60.9	60.9		10.0	10.0
10th %ile Term Code		Coord	Coord		Min	Min
Queue Length 50th (ft)		47	28		80	0
Queue Length 95th (ft)		#613	63		127	60
Internal Link Dist (ft)		432	497		187	
Turn Bay Length (ft)						
Base Capacity (vph)		1087	1056		466	658
Starvation Cap Reductn		0	0		0	0
Spillback Cap Reductn		0	0		0	0
Storage Cap Reductn		0	0		0	0
Reduced v/c Ratio		0.80	0.41		0.37	0.50

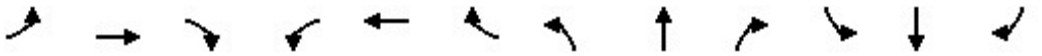
Intersection Summary

Area Type:	Other		
Cycle Length: 80			
Actuated Cycle Length: 80			
Offset: 72 (90%), Referenced to phase 4:EBT and 8:WBT, Start of Green			
Natural Cycle: 80			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.80			
Intersection Signal Delay: 10.6		Intersection LOS: B	
Intersection Capacity Utilization 64.3%		ICU Level of Service C	
Analysis Period (min) 15			

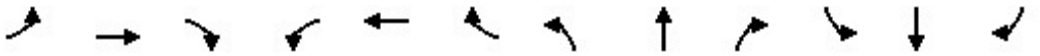
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 6: Livingston Av & Miller Av





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	286	671	0	0	399	96	8	74	22	0	0	0
Future Volume (vph)	286	671	0	0	399	96	8	74	22	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	150		0	0		0	0		0	0		0
Storage Lanes	1		0	0		0	0		0	0		0
Taper Length (ft)	25			0			0			0		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor								0.99				
Frt					0.974			0.971				
Flt Protected	0.950							0.996				
Satd. Flow (prot)	1694	1560	0	0	1490	0	0	1716	0	0	0	0
Flt Permitted	0.445							0.996				
Satd. Flow (perm)	794	1560	0	0	1490	0	0	1715	0	0	0	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)					27			17				
Link Speed (mph)		35			35			25			25	
Link Distance (ft)		577			1576			192			127	
Travel Time (s)		11.2			30.7			5.2			3.5	
Confl. Peds. (#/hr)			2	2			2		5	5		2
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles (%)	3%	3%	0%	0%	6%	1%	13%	1%	5%	0%	0%	0%
Parking (#/hr)		5			5	5						
Adj. Flow (vph)	308	722	0	0	429	103	9	80	24	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	308	722	0	0	532	0	0	113	0	0	0	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		11			11			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.04	1.24	1.04	1.04	1.24	1.04	1.04	1.04	1.04	1.04	1.04	1.04
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2			2		1	2				
Detector Template	Left	Thru			Thru		Left	Thru				
Leading Detector (ft)	20	100			100		20	100				
Trailing Detector (ft)	0	0			0		0	0				
Detector 1 Position(ft)	0	0			0		0	0				
Detector 1 Size(ft)	20	6			6		20	6				
Detector 1 Type	Cl+Ex	Cl+Ex			Cl+Ex		Cl+Ex	Cl+Ex				
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0			0.0		0.0	0.0				
Detector 1 Queue (s)	0.0	0.0			0.0		0.0	0.0				
Detector 1 Delay (s)	0.0	0.0			0.0		0.0	0.0				
Detector 2 Position(ft)		94			94			94				
Detector 2 Size(ft)		6			6			6				
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex				
Detector 2 Channel												



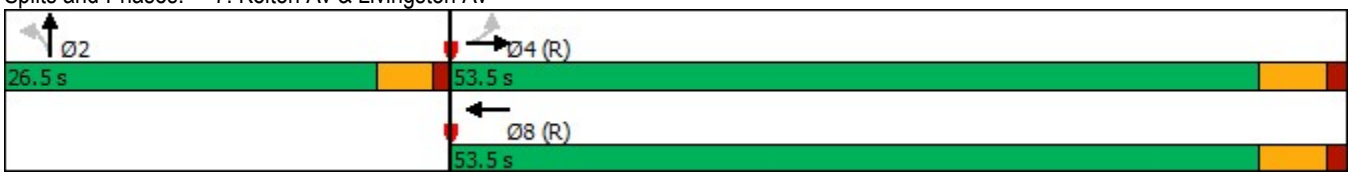
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 2 Extend (s)		0.0			0.0			0.0				
Turn Type	Perm	NA			NA		Perm	NA				
Protected Phases		4			8			2				
Permitted Phases	4						2					
Detector Phase	4	4			8		2	2				
Switch Phase												
Minimum Initial (s)	15.0	15.0			15.0		10.0	10.0				
Minimum Split (s)	27.0	27.0			27.0		26.5	26.5				
Total Split (s)	53.5	53.5			53.5		26.5	26.5				
Total Split (%)	66.9%	66.9%			66.9%		33.1%	33.1%				
Maximum Green (s)	48.1	48.1			48.1		22.1	22.1				
Yellow Time (s)	4.1	4.1			4.1		3.4	3.4				
All-Red Time (s)	1.3	1.3			1.3		1.0	1.0				
Lost Time Adjust (s)	0.0	0.0			0.0			0.0				
Total Lost Time (s)	5.4	5.4			5.4			4.4				
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.7	3.7			3.7		4.0	4.0				
Recall Mode	C-Max	C-Max			C-Max		None	None				
Walk Time (s)	8.0	8.0			8.0		7.0	7.0				
Flash Dont Walk (s)	7.0	7.0			7.0		8.0	8.0				
Pedestrian Calls (#/hr)	0	0			0		0	0				
Act Effct Green (s)	62.5	62.5			62.5			11.6				
Actuated g/C Ratio	0.78	0.78			0.78			0.14				
v/c Ratio	0.50	0.59			0.45			0.43				
Control Delay	4.6	4.3			3.3			31.1				
Queue Delay	0.0	0.2			0.0			0.0				
Total Delay	4.6	4.5			3.3			31.1				
LOS	A	A			A			C				
Approach Delay		4.5			3.3			31.1				
Approach LOS		A			A			C				
90th %ile Green (s)	55.3	55.3			55.3		14.9	14.9				
90th %ile Term Code	Coord	Coord			Coord		Gap	Gap				
70th %ile Green (s)	57.7	57.7			57.7		12.5	12.5				
70th %ile Term Code	Coord	Coord			Coord		Gap	Gap				
50th %ile Green (s)	59.4	59.4			59.4		10.8	10.8				
50th %ile Term Code	Coord	Coord			Coord		Gap	Gap				
30th %ile Green (s)	60.2	60.2			60.2		10.0	10.0				
30th %ile Term Code	Coord	Coord			Coord		Min	Min				
10th %ile Green (s)	74.6	74.6			74.6		0.0	0.0				
10th %ile Term Code	Coord	Coord			Coord		Skip	Skip				
Queue Length 50th (ft)	28	67			12			45				
Queue Length 95th (ft)	m37	m83			28			88				
Internal Link Dist (ft)		497			1496			112			47	
Turn Bay Length (ft)	150											
Base Capacity (vph)	620	1219			1170			486				
Starvation Cap Reductn	0	105			0			0				
Spillback Cap Reductn	0	0			0			0				
Storage Cap Reductn	0	0			0			0				

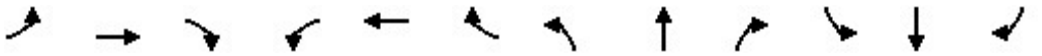
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Reduced v/c Ratio	0.50	0.65			0.45			0.23				

Intersection Summary			
Area Type:	Other		
Cycle Length: 80			
Actuated Cycle Length: 80			
Offset: 5 (6%), Referenced to phase 4:EBTL and 8:WBT, Start of Green			
Natural Cycle: 70			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.59			
Intersection Signal Delay: 5.9		Intersection LOS: A	
Intersection Capacity Utilization 64.3%		ICU Level of Service C	
Analysis Period (min) 15			

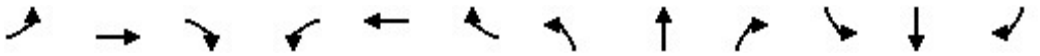
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 7: Kelton Av & Livingston Av





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	30	622	49	37	428	44	26	291	52	31	225	42
Future Volume (vph)	30	622	49	37	428	44	26	291	52	31	225	42
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	150		0	375		0	0		0	0		0
Storage Lanes	1		0	1		0	0		0	0		0
Taper Length (ft)	25			25			0			0		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	0.99	1.00			1.00			0.99			0.99	
Frt		0.989			0.986			0.981			0.981	
Flt Protected	0.950			0.950				0.997			0.995	
Satd. Flow (prot)	1531	1536	0	1572	1506	0	0	1692	0	0	1676	0
Flt Permitted	0.400			0.252				0.965			0.917	
Satd. Flow (perm)	638	1536	0	417	1506	0	0	1636	0	0	1543	0
Right Turn on Red			Yes			Yes			Yes			No
Satd. Flow (RTOR)		7			9			12				
Link Speed (mph)		35			35			35			35	
Link Distance (ft)		1576			932			368			414	
Travel Time (s)		30.7			18.2			7.2			8.1	
Confl. Peds. (#/hr)	11		13	13		11	9		10	10		9
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	14%	3%	4%	11%	4%	12%	25%	4%	4%	3%	7%	5%
Parking (#/hr)		5	5		5	5						
Adj. Flow (vph)	32	655	52	39	451	46	27	306	55	33	237	44
Shared Lane Traffic (%)												
Lane Group Flow (vph)	32	707	0	39	497	0	0	388	0	0	314	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		11			11			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.04	1.24	1.04	1.04	1.24	1.04	1.04	1.04	1.04	1.04	1.04	1.04
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (ft)	20	100		20	100		20	100		20	100	
Trailing Detector (ft)	0	0		0	0		0	0		0	0	
Detector 1 Position(ft)	0	0		0	0		0	0		0	0	
Detector 1 Size(ft)	20	6		20	6		20	6		20	6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												



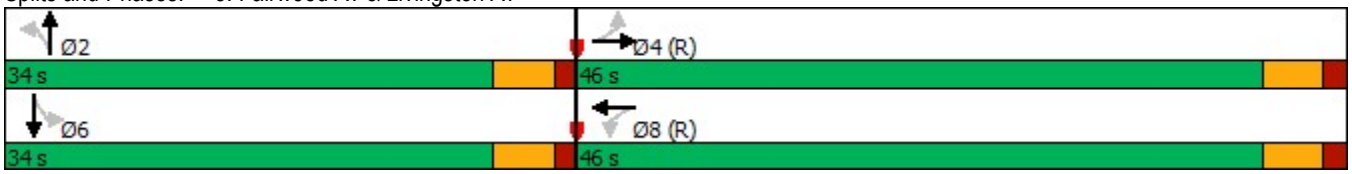
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	15.0	15.0		15.0	15.0		10.0	10.0		10.0	10.0	
Minimum Split (s)	27.0	27.0		27.0	27.0		26.5	26.5		26.5	26.5	
Total Split (s)	46.0	46.0		46.0	46.0		34.0	34.0		34.0	34.0	
Total Split (%)	57.5%	57.5%		57.5%	57.5%		42.5%	42.5%		42.5%	42.5%	
Maximum Green (s)	40.9	40.9		40.9	40.9		29.1	29.1		29.1	29.1	
Yellow Time (s)	3.6	3.6		3.6	3.6		3.6	3.6		3.6	3.6	
All-Red Time (s)	1.5	1.5		1.5	1.5		1.3	1.3		1.3	1.3	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0			0.0			0.0	
Total Lost Time (s)	5.1	5.1		5.1	5.1			4.9			4.9	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		4.0	4.0		4.0	4.0	
Recall Mode	C-Max	C-Max		C-Max	C-Max		None	None		None	None	
Walk Time (s)	8.0	8.0		8.0	8.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	
Act Effct Green (s)	46.1	46.1		46.1	46.1			23.9			23.9	
Actuated g/C Ratio	0.58	0.58		0.58	0.58			0.30			0.30	
v/c Ratio	0.09	0.80		0.16	0.57			0.78			0.68	
Control Delay	5.4	19.7		5.5	9.5			35.8			32.0	
Queue Delay	0.0	0.0		0.0	0.0			0.0			0.0	
Total Delay	5.4	19.7		5.5	9.5			35.8			32.0	
LOS	A	B		A	A			D			C	
Approach Delay		19.1			9.2			35.8			32.0	
Approach LOS		B			A			D			C	
90th %ile Green (s)	40.9	40.9		40.9	40.9		29.1	29.1		29.1	29.1	
90th %ile Term Code	Coord	Coord		Coord	Coord		Max	Max		Max	Max	
70th %ile Green (s)	41.8	41.8		41.8	41.8		28.2	28.2		28.2	28.2	
70th %ile Term Code	Coord	Coord		Coord	Coord		Gap	Gap		Hold	Hold	
50th %ile Green (s)	45.4	45.4		45.4	45.4		24.6	24.6		24.6	24.6	
50th %ile Term Code	Coord	Coord		Coord	Coord		Gap	Gap		Hold	Hold	
30th %ile Green (s)	48.7	48.7		48.7	48.7		21.3	21.3		21.3	21.3	
30th %ile Term Code	Coord	Coord		Coord	Coord		Gap	Gap		Hold	Hold	
10th %ile Green (s)	53.6	53.6		53.6	53.6		16.4	16.4		16.4	16.4	
10th %ile Term Code	Coord	Coord		Coord	Coord		Gap	Gap		Hold	Hold	
Queue Length 50th (ft)	6	303		4	165			169			135	
Queue Length 95th (ft)	m9	#76		m7	216			248			204	
Internal Link Dist (ft)		1496			852			288			334	
Turn Bay Length (ft)	150			375								
Base Capacity (vph)	367	887		240	871			602			561	
Starvation Cap Reductn	0	0		0	0			0			0	
Spillback Cap Reductn	0	0		0	0			0			0	
Storage Cap Reductn	0	0		0	0			0			0	

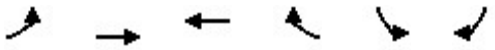
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Reduced v/c Ratio	0.09	0.80		0.16	0.57			0.64			0.56	

Intersection Summary			
Area Type:	Other		
Cycle Length: 80			
Actuated Cycle Length: 80			
Offset: 46 (58%), Referenced to phase 4:EBTL and 8:WBTL, Start of Green			
Natural Cycle: 65			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.80			
Intersection Signal Delay: 21.7		Intersection LOS: C	
Intersection Capacity Utilization 68.4%		ICU Level of Service C	
Analysis Period (min) 15			

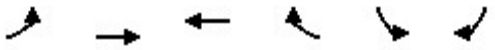
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 8: Fairwood Av & Livingston Av

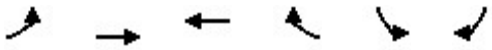




Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	66	821	597	219	169	69
Future Volume (vph)	66	821	597	219	169	69
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	150			0	0	0
Storage Lanes	1			1	1	0
Taper Length (ft)	25				0	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	1.00			0.97	1.00	
Frt				0.850	0.961	
Flt Protected	0.950				0.966	
Satd. Flow (prot)	1482	1576	1560	1313	1653	0
Flt Permitted	0.350				0.966	
Satd. Flow (perm)	544	1576	1560	1270	1647	0
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)				231	25	
Link Speed (mph)		35	35		35	
Link Distance (ft)		841	588		385	
Travel Time (s)		16.4	11.5		7.5	
Confl. Peds. (#/hr)	5			5	3	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	3%	2%	3%	4%	2%	6%
Parking (#/hr)	5	5	5	5		
Adj. Flow (vph)	69	864	628	231	178	73
Shared Lane Traffic (%)						
Lane Group Flow (vph)	69	864	628	231	251	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(ft)		11	11		11	
Link Offset(ft)		0	0		0	
Crosswalk Width(ft)		16	16		16	
Two way Left Turn Lane						
Headway Factor	1.24	1.24	1.24	1.24	1.04	1.04
Turning Speed (mph)	15			9	15	9
Number of Detectors	1	2	2	0	1	
Detector Template	Left	Thru	Thru		Left	
Leading Detector (ft)	20	100	100	0	20	
Trailing Detector (ft)	0	0	0	0	0	
Detector 1 Position(ft)	0	0	0	0	0	
Detector 1 Size(ft)	20	6	6	0	20	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(ft)		94	94			
Detector 2 Size(ft)		6	6			
Detector 2 Type		Cl+Ex	Cl+Ex			
Detector 2 Channel						



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Detector 2 Extend (s)		0.0	0.0			
Turn Type	Perm	NA	NA	Perm	Perm	
Protected Phases		4	8			
Permitted Phases	4			8	6	
Detector Phase	4	4	8	8	6	
Switch Phase						
Minimum Initial (s)	15.0	15.0	15.0	15.0	10.0	
Minimum Split (s)	27.0	27.0	27.0	27.0	26.5	
Total Split (s)	53.0	53.0	53.0	53.0	27.0	
Total Split (%)	66.3%	66.3%	66.3%	66.3%	33.8%	
Maximum Green (s)	47.2	47.2	47.2	47.2	21.3	
Yellow Time (s)	3.6	3.6	3.6	3.6	3.6	
All-Red Time (s)	2.2	2.2	2.2	2.2	2.1	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	5.8	5.8	5.8	5.8	5.7	
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	0.2	0.2	0.2	0.2	4.0	
Recall Mode	C-Max	C-Max	C-Max	C-Max	None	
Walk Time (s)	8.0	8.0	8.0	8.0	7.0	
Flash Dont Walk (s)	7.0	7.0	7.0	7.0	7.0	
Pedestrian Calls (#/hr)	0	0	0	0	0	
Act Effct Green (s)	51.8	51.8	51.8	51.8	16.7	
Actuated g/C Ratio	0.65	0.65	0.65	0.65	0.21	
v/c Ratio	0.20	0.85	0.62	0.26	0.69	
Control Delay	4.1	15.4	12.8	1.9	36.0	
Queue Delay	0.0	0.0	0.0	0.0	0.0	
Total Delay	4.1	15.4	12.8	1.9	36.0	
LOS	A	B	B	A	D	
Approach Delay		14.6	9.8		36.0	
Approach LOS		B	A		D	
90th %ile Green (s)	47.2	47.2	47.2	47.2	21.3	
90th %ile Term Code	Coord	Coord	Coord	Coord	Max	
70th %ile Green (s)	48.7	48.7	48.7	48.7	19.8	
70th %ile Term Code	Coord	Coord	Coord	Coord	Gap	
50th %ile Green (s)	51.3	51.3	51.3	51.3	17.2	
50th %ile Term Code	Coord	Coord	Coord	Coord	Gap	
30th %ile Green (s)	54.0	54.0	54.0	54.0	14.5	
30th %ile Term Code	Coord	Coord	Coord	Coord	Gap	
10th %ile Green (s)	57.8	57.8	57.8	57.8	10.7	
10th %ile Term Code	Coord	Coord	Coord	Coord	Gap	
Queue Length 50th (ft)	6	83	166	0	104	
Queue Length 95th (ft)	m10	#655	318	27	170	
Internal Link Dist (ft)		761	508		305	
Turn Bay Length (ft)	150					
Base Capacity (vph)	352	1020	1010	903	456	
Starvation Cap Reductn	0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	

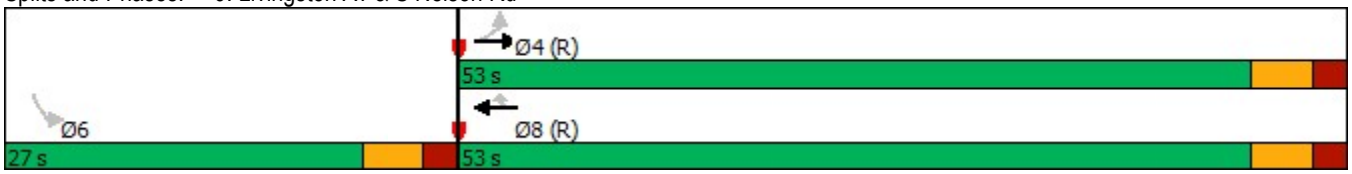


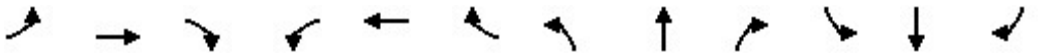
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Reduced v/c Ratio	0.20	0.85	0.62	0.26	0.55	

Intersection Summary			
Area Type:	Other		
Cycle Length: 80			
Actuated Cycle Length: 80			
Offset: 0 (0%), Referenced to phase 4:EBTL and 8:WBT, Start of Green			
Natural Cycle: 80			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.85			
Intersection Signal Delay: 15.2		Intersection LOS: B	
Intersection Capacity Utilization 71.9%		ICU Level of Service C	
Analysis Period (min) 15			

\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 9: Livingston Av & S Nelson Rd

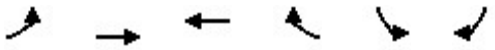




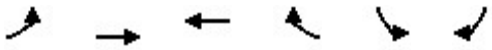
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	5	506	0	0	362	4	52	6	52	12	0	19
Future Volume (Veh/h)	5	506	0	0	362	4	52	6	52	12	0	19
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Hourly flow rate (vph)	6	588	0	0	421	5	60	7	60	14	0	22
Pedestrians					3			11			7	
Lane Width (ft)					11.0			11.0			11.0	
Walking Speed (ft/s)					3.5			3.5			3.5	
Percent Blockage					0			1			1	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)		440			1031							
pX, platoon unblocked				0.88			0.88	0.88	0.88	0.88	0.88	
vC, conflicting volume	433			599			1056	1044	602	1097	1042	430
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	433			482			999	985	485	1045	982	430
tC, single (s)	4.1			4.1			7.2	6.7	6.2	7.3	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.6	4.2	3.3	3.7	4.0	3.3
p0 queue free %	99			100			67	97	88	90	100	96
cM capacity (veh/h)	1130			956			182	203	509	144	218	615

Direction, Lane #	EB 1	EB 2	WB 1	NB 1	SB 1
Volume Total	6	588	426	127	36
Volume Left	6	0	0	60	14
Volume Right	0	0	5	60	22
cSH	1130	1700	1700	263	270
Volume to Capacity	0.01	0.35	0.25	0.48	0.13
Queue Length 95th (ft)	0	0	0	61	11
Control Delay (s)	8.2	0.0	0.0	30.8	20.4
Lane LOS	A			D	C
Approach Delay (s)	0.1		0.0	30.8	20.4
Approach LOS				D	C

Intersection Summary				
Average Delay	4.0			
Intersection Capacity Utilization	42.8%	ICU Level of Service		A
Analysis Period (min)	15			



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	104	205	407	64	48	175
Future Volume (vph)	104	205	407	64	48	175
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	100			0	0	0
Storage Lanes	1			0	1	1
Taper Length (ft)	25				0	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	1.00		1.00		1.00	0.95
Frt			0.982			0.850
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1586	1733	1520	0	1711	1546
Flt Permitted	0.383				0.950	
Satd. Flow (perm)	639	1733	1520	0	1707	1471
Right Turn on Red				Yes		No
Satd. Flow (RTOR)			14			
Link Speed (mph)		35	35		25	
Link Distance (ft)		304	440		328	
Travel Time (s)		5.9	8.6		8.9	
Confl. Peds. (#/hr)	2			2	1	15
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles (%)	10%	6%	4%	0%	2%	1%
Parking (#/hr)			5	5		
Adj. Flow (vph)	112	220	438	69	52	188
Shared Lane Traffic (%)						
Lane Group Flow (vph)	112	220	507	0	52	188
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(ft)		11	11		11	
Link Offset(ft)		0	0		0	
Crosswalk Width(ft)		16	16		16	
Two way Left Turn Lane						
Headway Factor	1.04	1.04	1.24	1.04	1.04	1.04
Turning Speed (mph)	15			9	15	9
Number of Detectors	1	2	2		1	1
Detector Template	Left	Thru	Thru		Left	Right
Leading Detector (ft)	20	100	100		20	20
Trailing Detector (ft)	0	0	0		0	0
Detector 1 Position(ft)	0	0	0		0	0
Detector 1 Size(ft)	20	6	6		20	20
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0		0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0		0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0		0.0	0.0
Detector 2 Position(ft)		94	94			
Detector 2 Size(ft)		6	6			
Detector 2 Type		Cl+Ex	Cl+Ex			
Detector 2 Channel						



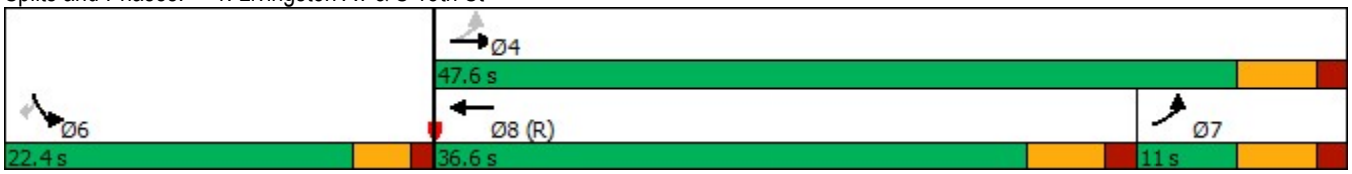
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Detector 2 Extend (s)		0.0	0.0			
Turn Type	pm+pt	NA	NA		Prot	Perm
Protected Phases	7	4	8		6	
Permitted Phases	4					6
Detector Phase	7	4	8		6	6
Switch Phase						
Minimum Initial (s)	5.0	7.0	16.0		10.0	10.0
Minimum Split (s)	10.8	21.8	21.8		22.3	22.3
Total Split (s)	11.0	47.6	36.6		22.4	22.4
Total Split (%)	15.7%	68.0%	52.3%		32.0%	32.0%
Maximum Green (s)	5.2	41.8	30.8		18.1	18.1
Yellow Time (s)	4.1	4.1	4.1		3.0	3.0
All-Red Time (s)	1.7	1.7	1.7		1.3	1.3
Lost Time Adjust (s)	0.0	0.0	0.0		0.0	0.0
Total Lost Time (s)	5.8	5.8	5.8		4.3	4.3
Lead/Lag	Lag		Lead			
Lead-Lag Optimize?	Yes		Yes			
Vehicle Extension (s)	3.7	3.7	3.7		5.0	5.0
Recall Mode	None	Max	C-Max		None	None
Walk Time (s)		7.0	7.0		7.0	7.0
Flash Dont Walk (s)		9.0	9.0		11.0	11.0
Pedestrian Calls (#/hr)		0	0		0	0
Act Effct Green (s)	44.8	44.8	36.0		15.1	15.1
Actuated g/C Ratio	0.64	0.64	0.51		0.22	0.22
v/c Ratio	0.23	0.20	0.64		0.14	0.59
Control Delay	8.1	6.4	13.8		21.7	32.1
Queue Delay	0.0	0.0	0.0		0.0	0.0
Total Delay	8.1	6.4	13.8		21.7	32.1
LOS	A	A	B		C	C
Approach Delay		7.0	13.8		29.8	
Approach LOS		A	B		C	
90th %ile Green (s)	5.2	41.8	30.8		18.1	18.1
90th %ile Term Code	Max	Coord	Coord		Max	Max
70th %ile Green (s)	5.2	41.8	30.8		18.1	18.1
70th %ile Term Code	Max	Coord	Coord		Max	Max
50th %ile Green (s)	5.2	44.1	33.1		15.8	15.8
50th %ile Term Code	Max	Coord	Coord		Gap	Gap
30th %ile Green (s)	5.2	46.4	35.4		13.5	13.5
30th %ile Term Code	Max	Coord	Coord		Gap	Gap
10th %ile Green (s)	0.0	49.7	49.7		10.2	10.2
10th %ile Term Code	Skip	Coord	Coord		Gap	Gap
Queue Length 50th (ft)	17	35	152		18	72
Queue Length 95th (ft)	38	69	#265		42	128
Internal Link Dist (ft)		224	360		248	
Turn Bay Length (ft)	100					
Base Capacity (vph)	478	1107	787		442	380
Starvation Cap Reductn	0	0	0		0	0
Spillback Cap Reductn	0	0	0		0	0
Storage Cap Reductn	0	0	0		0	0

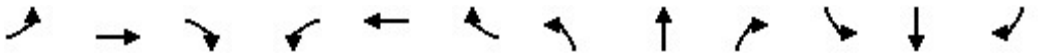
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Reduced v/c Ratio	0.23	0.20	0.64		0.12	0.49

Intersection Summary			
Area Type:	Other		
Cycle Length: 70			
Actuated Cycle Length: 70			
Offset: 63 (90%), Referenced to phase 8:WBT, Start of Green			
Natural Cycle: 65			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.64			
Intersection Signal Delay: 15.2		Intersection LOS: B	
Intersection Capacity Utilization 55.3%		ICU Level of Service B	
Analysis Period (min) 15			

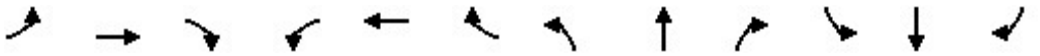
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 1: Livingston Av & S 18th St





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	278	56	50	532	0	0	0	0	10	3	13
Future Volume (vph)	0	278	56	50	532	0	0	0	0	10	3	13
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	150		0	150		0	0		0	0		0
Storage Lanes	0		0	1		0	0		0	0		0
Taper Length (ft)	25			25			0			0		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		1.00		1.00							0.99	
Frt		0.977									0.930	
Flt Protected				0.950							0.981	
Satd. Flow (prot)	0	1527	0	1544	1574	0	0	0	0	0	1412	0
Flt Permitted				0.536							0.981	
Satd. Flow (perm)	0	1527	0	870	1574	0	0	0	0	0	1412	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		23									15	
Link Speed (mph)		35			35			35			35	
Link Distance (ft)		1031			383			200			188	
Travel Time (s)		20.1			7.5			3.9			3.7	
Confl. Peds. (#/hr)	5		1	1		5	3					3
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Heavy Vehicles (%)	0%	4%	12%	13%	5%	0%	0%	0%	0%	14%	0%	0%
Parking (#/hr)		0	0		0						0	0
Adj. Flow (vph)	0	316	64	57	605	0	0	0	0	11	3	15
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	380	0	57	605	0	0	0	0	0	29	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		11			11			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.04	1.19	1.04	1.04	1.19	1.04	1.04	1.04	1.04	1.04	1.19	1.04
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors		2		1	2					1	2	
Detector Template		Thru		Left	Thru					Left	Thru	
Leading Detector (ft)		100		20	100					20	100	
Trailing Detector (ft)		0		0	0					0	0	
Detector 1 Position(ft)		0		0	0					0	0	
Detector 1 Size(ft)		6		20	6					20	6	
Detector 1 Type		Cl+Ex		Cl+Ex	Cl+Ex					Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)		0.0		0.0	0.0					0.0	0.0	
Detector 1 Queue (s)		0.0		0.0	0.0					0.0	0.0	
Detector 1 Delay (s)		0.0		0.0	0.0					0.0	0.0	
Detector 2 Position(ft)		94			94						94	
Detector 2 Size(ft)		6			6						6	
Detector 2 Type		Cl+Ex			Cl+Ex						Cl+Ex	
Detector 2 Channel												



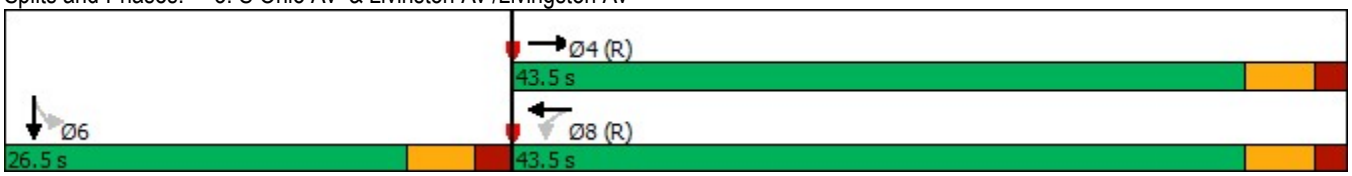
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 2 Extend (s)		0.0			0.0						0.0	
Turn Type		NA		Perm	NA					Perm	NA	
Protected Phases		4			8						6	
Permitted Phases				8						6		
Detector Phase		4		8	8					6	6	
Switch Phase												
Minimum Initial (s)		15.0		15.0	15.0					10.0	10.0	
Minimum Split (s)		27.0		27.0	27.0					26.5	26.5	
Total Split (s)		43.5		43.5	43.5					26.5	26.5	
Total Split (%)		62.1%		62.1%	62.1%					37.9%	37.9%	
Maximum Green (s)		38.1		38.1	38.1					20.9	20.9	
Yellow Time (s)		3.6		3.6	3.6					3.6	3.6	
All-Red Time (s)		1.8		1.8	1.8					2.0	2.0	
Lost Time Adjust (s)		0.0		0.0	0.0						0.0	
Total Lost Time (s)		5.4		5.4	5.4						5.6	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)		3.0		3.0	3.0					4.0	4.0	
Recall Mode		C-Max		C-Max	C-Max					None	None	
Walk Time (s)		8.0		8.0	8.0					7.0	7.0	
Flash Dont Walk (s)		7.0		7.0	7.0					7.0	7.0	
Pedestrian Calls (#/hr)		0		0	0					0	0	
Act Effct Green (s)		61.6		61.6	61.6						10.0	
Actuated g/C Ratio		0.88		0.88	0.88						0.14	
v/c Ratio		0.28		0.07	0.44						0.14	
Control Delay		2.6		0.9	1.3						19.3	
Queue Delay		0.0		0.0	0.0						0.0	
Total Delay		2.6		0.9	1.4						19.3	
LOS		A		A	A						B	
Approach Delay		2.6			1.3						19.3	
Approach LOS		A			A						B	
90th %ile Green (s)		49.0		49.0	49.0					10.0	10.0	
90th %ile Term Code		Coord		Coord	Coord					Min	Min	
70th %ile Green (s)		49.0		49.0	49.0					10.0	10.0	
70th %ile Term Code		Coord		Coord	Coord					Min	Min	
50th %ile Green (s)		64.6		64.6	64.6					0.0	0.0	
50th %ile Term Code		Coord		Coord	Coord					Skip	Skip	
30th %ile Green (s)		64.6		64.6	64.6					0.0	0.0	
30th %ile Term Code		Coord		Coord	Coord					Skip	Skip	
10th %ile Green (s)		64.6		64.6	64.6					0.0	0.0	
10th %ile Term Code		Coord		Coord	Coord					Skip	Skip	
Queue Length 50th (ft)		0		0	0						5	
Queue Length 95th (ft)		54		m3	33						26	
Internal Link Dist (ft)		951			303			120			108	
Turn Bay Length (ft)				150								
Base Capacity (vph)		1346		766	1385						432	
Starvation Cap Reductn		0		0	37						0	
Spillback Cap Reductn		0		0	0						0	
Storage Cap Reductn		0		0	0						0	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Reduced v/c Ratio		0.28		0.07	0.45						0.07	

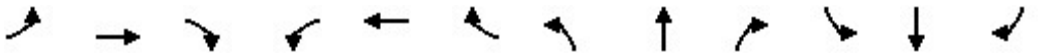
Intersection Summary			
Area Type:	Other		
Cycle Length: 70			
Actuated Cycle Length: 70			
Offset: 28 (40%), Referenced to phase 4:EBT and 8:WBTL, Start of Green			
Natural Cycle: 60			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.44			
Intersection Signal Delay: 2.2		Intersection LOS: A	
Intersection Capacity Utilization 68.1%		ICU Level of Service C	
Analysis Period (min) 15			

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 3: S Ohio Av & Livinston Av /Livingston Av



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	27	253	0	0	529	57	72	119	35	0	0	0
Future Volume (vph)	27	253	0	0	529	57	72	119	35	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	150		0	0		0	0		0	0		0
Storage Lanes	1		0	0		0	0		0	0		0
Taper Length (ft)	25			0			0			0		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	1.00				1.00			1.00				
Frt					0.987			0.979				
Flt Protected	0.950							0.984				
Satd. Flow (prot)	1745	1545	0	0	1500	0	0	1413	0	0	0	0
Flt Permitted	0.315							0.984				
Satd. Flow (perm)	577	1545	0	0	1500	0	0	1411	0	0	0	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)					13			13				
Link Speed (mph)		35			35			35			35	
Link Distance (ft)		383			1949			182			211	
Travel Time (s)		7.5			38.0			3.5			4.1	
Confl. Peds. (#/hr)	6					6	2					2
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Heavy Vehicles (%)	0%	4%	0%	0%	6%	0%	15%	9%	0%	0%	0%	0%
Parking (#/hr)		5			5	5		5	5			
Adj. Flow (vph)	30	284	0	0	594	64	81	134	39	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	30	284	0	0	658	0	0	254	0	0	0	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		11			11			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.04	1.24	1.04	1.04	1.24	1.04	1.04	1.24	1.04	1.04	1.04	1.04
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2			2		1	2				
Detector Template	Left	Thru			Thru		Left	Thru				
Leading Detector (ft)	20	100			100		20	100				
Trailing Detector (ft)	0	0			0		0	0				
Detector 1 Position(ft)	0	0			0		0	0				
Detector 1 Size(ft)	20	6			6		20	6				
Detector 1 Type	Cl+Ex	Cl+Ex			Cl+Ex		Cl+Ex	Cl+Ex				
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0			0.0		0.0	0.0				
Detector 1 Queue (s)	0.0	0.0			0.0		0.0	0.0				
Detector 1 Delay (s)	0.0	0.0			0.0		0.0	0.0				
Detector 2 Position(ft)		94			94			94				
Detector 2 Size(ft)		6			6			6				
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex				
Detector 2 Channel												

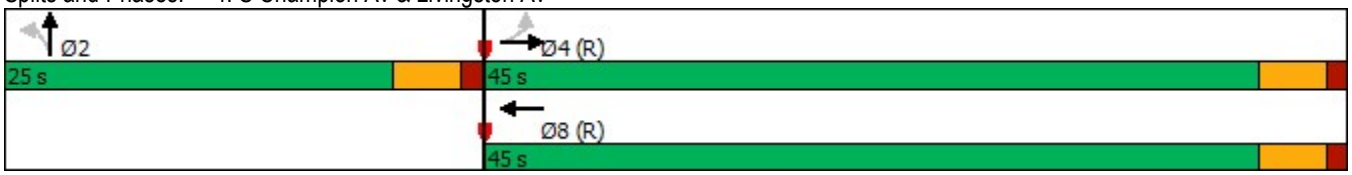


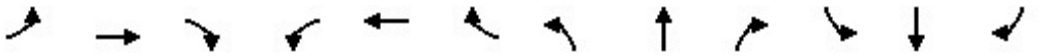
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 2 Extend (s)		0.0			0.0			0.0				
Turn Type	Perm	NA			NA		Perm	NA				
Protected Phases		4			8			2				
Permitted Phases	4						2					
Detector Phase	4	4			8		2	2				
Switch Phase												
Minimum Initial (s)	15.0	15.0			15.0		10.0	10.0				
Minimum Split (s)	26.5	26.5			27.0		19.8	19.8				
Total Split (s)	45.0	45.0			45.0		25.0	25.0				
Total Split (%)	64.3%	64.3%			64.3%		35.7%	35.7%				
Maximum Green (s)	40.3	40.3			40.3		20.2	20.2				
Yellow Time (s)	3.6	3.6			3.6		3.6	3.6				
All-Red Time (s)	1.1	1.1			1.1		1.2	1.2				
Lost Time Adjust (s)	0.0	0.0			0.0			0.0				
Total Lost Time (s)	4.7	4.7			4.7			4.8				
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	0.2	0.2			0.2		4.0	4.0				
Recall Mode	C-Max	C-Max			C-Max		None	None				
Walk Time (s)	8.0	8.0			8.0		7.0	7.0				
Flash Dont Walk (s)	7.0	7.0			7.0		8.0	8.0				
Pedestrian Calls (#/hr)	0	0			0		0	0				
Act Effct Green (s)	43.6	43.6			43.6			16.9				
Actuated g/C Ratio	0.62	0.62			0.62			0.24				
v/c Ratio	0.08	0.29			0.70			0.73				
Control Delay	4.8	5.3			14.4			35.3				
Queue Delay	0.0	0.0			0.0			0.0				
Total Delay	4.8	5.3			14.4			35.3				
LOS	A	A			B			D				
Approach Delay		5.2			14.4			35.3				
Approach LOS		A			B			D				
90th %ile Green (s)	40.3	40.3			40.3		20.2	20.2				
90th %ile Term Code	Coord	Coord			Coord		Max	Max				
70th %ile Green (s)	40.3	40.3			40.3		20.2	20.2				
70th %ile Term Code	Coord	Coord			Coord		Max	Max				
50th %ile Green (s)	42.6	42.6			42.6		17.9	17.9				
50th %ile Term Code	Coord	Coord			Coord		Gap	Gap				
30th %ile Green (s)	45.4	45.4			45.4		15.1	15.1				
30th %ile Term Code	Coord	Coord			Coord		Gap	Gap				
10th %ile Green (s)	49.6	49.6			49.6		10.9	10.9				
10th %ile Term Code	Coord	Coord			Coord		Gap	Gap				
Queue Length 50th (ft)	5	48			252			93				
Queue Length 95th (ft)	8	42			341			159				
Internal Link Dist (ft)		303			1869			102			131	
Turn Bay Length (ft)	150											
Base Capacity (vph)	359	963			940			416				
Starvation Cap Reductn	0	0			0			0				
Spillback Cap Reductn	0	0			0			0				
Storage Cap Reductn	0	0			0			0				

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Reduced v/c Ratio	0.08	0.29			0.70			0.61				

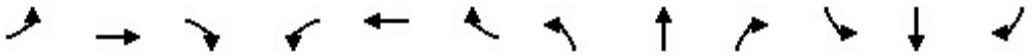
Intersection Summary			
Area Type:	Other		
Cycle Length: 70			
Actuated Cycle Length: 70			
Offset: 18 (26%), Referenced to phase 4:EBTL and 8:WBT, Start of Green			
Natural Cycle: 60			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.73			
Intersection Signal Delay: 16.4		Intersection LOS: B	
Intersection Capacity Utilization 68.1%		ICU Level of Service C	
Analysis Period (min) 15			

Splits and Phases: 4: S Champion Av & Livingston Av





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	270	77	328	472	1	107	3	220	0	1	1
Future Volume (vph)	0	270	77	328	472	1	107	3	220	0	1	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		150	0		0	75		0	0		0
Storage Lanes	0		1	1		0	1		0	0		0
Taper Length (ft)	25			25			0			0		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor			0.98	1.00	1.00			0.98				
Frt			0.850					0.852			0.932	
Flt Protected				0.950			0.950					
Satd. Flow (prot)	0	1560	1277	1678	1531	0	1711	1486	0	0	1712	0
Flt Permitted				0.487			0.757					
Satd. Flow (perm)	0	1560	1245	858	1531	0	1363	1486	0	0	1712	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			83					237			1	
Link Speed (mph)		35			35			35			25	
Link Distance (ft)		1949			512			199			214	
Travel Time (s)		38.0			10.0			3.9			5.8	
Confl. Peds. (#/hr)	6		2	2		6			1	1		
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles (%)	0%	3%	7%	4%	5%	0%	2%	0%	3%	0%	0%	0%
Parking (#/hr)		5	5		5	5						
Adj. Flow (vph)	0	290	83	353	508	1	115	3	237	0	1	1
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	290	83	353	509	0	115	240	0	0	2	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		11			11			11			11	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.04	1.24	1.24	1.04	1.24	1.04	1.04	1.04	1.04	1.04	1.04	1.04
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors		2	0	1	2		1	2			2	
Detector Template		Thru		Left	Thru		Left	Thru			Thru	
Leading Detector (ft)		100	0	20	100		20	100			100	
Trailing Detector (ft)		0	0	0	0		0	0			0	
Detector 1 Position(ft)		0	0	0	0		0	0			0	
Detector 1 Size(ft)		6	0	20	6		20	6			6	
Detector 1 Type		Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex			Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)		0.0	0.0	0.0	0.0		0.0	0.0			0.0	
Detector 1 Queue (s)		0.0	0.0	0.0	0.0		0.0	0.0			0.0	
Detector 1 Delay (s)		0.0	0.0	0.0	0.0		0.0	0.0			0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												



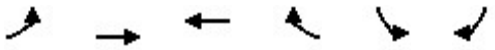
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type		NA	Perm	pm+pt	NA		Perm	NA			NA	
Protected Phases		4		3	8			2			6	
Permitted Phases			4	8			2					
Detector Phase		4	4	3	8		2	2			6	
Switch Phase												
Minimum Initial (s)		5.0	5.0	5.0	5.0		5.0	5.0			5.0	
Minimum Split (s)		18.0	18.0	9.0	18.0		18.0	18.0			18.0	
Total Split (s)		30.0	30.0	20.0	50.0		20.0	20.0			20.0	
Total Split (%)		42.9%	42.9%	28.6%	71.4%		28.6%	28.6%			28.6%	
Maximum Green (s)		26.0	26.0	16.0	46.0		16.0	16.0			16.0	
Yellow Time (s)		3.0	3.0	3.0	3.0		3.0	3.0			3.0	
All-Red Time (s)		1.0	1.0	1.0	1.0		1.0	1.0			1.0	
Lost Time Adjust (s)		0.0	0.0	0.0	0.0		0.0	0.0			0.0	
Total Lost Time (s)		4.0	4.0	4.0	4.0		4.0	4.0			4.0	
Lead/Lag		Lag	Lag	Lead								
Lead-Lag Optimize?		Yes	Yes	Yes								
Vehicle Extension (s)		3.0	3.0	3.0	3.0		3.0	3.0			3.0	
Recall Mode		C-Max	C-Max	None	C-Max		None	None			None	
Walk Time (s)		7.0	7.0		7.0		7.0	7.0			7.0	
Flash Dont Walk (s)		7.0	7.0		7.0		7.0	7.0			7.0	
Pedestrian Calls (#/hr)		0	0		0		0	0			0	
Act Effct Green (s)		35.8	35.8	50.9	50.9		11.1	11.1			11.1	
Actuated g/C Ratio		0.51	0.51	0.73	0.73		0.16	0.16			0.16	
v/c Ratio		0.36	0.12	0.47	0.46		0.53	0.55			0.01	
Control Delay		9.6	1.9	5.3	6.0		35.2	9.1			19.0	
Queue Delay		0.0	0.0	0.0	0.0		0.0	0.0			0.0	
Total Delay		9.6	1.9	5.3	6.0		35.2	9.1			19.0	
LOS		A	A	A	A		D	A			B	
Approach Delay		7.9			5.7			17.5			19.0	
Approach LOS		A			A			B			B	
90th %ile Green (s)		26.0	26.0	16.0	46.0		16.0	16.0			16.0	
90th %ile Term Code		Coord	Coord	Max	Coord		Max	Max			Hold	
70th %ile Green (s)		32.3	32.3	12.6	48.9		13.1	13.1			13.1	
70th %ile Term Code		Coord	Coord	Gap	Coord		Gap	Gap			Hold	
50th %ile Green (s)		36.4	36.4	10.5	50.9		11.1	11.1			11.1	
50th %ile Term Code		Coord	Coord	Gap	Coord		Gap	Gap			Hold	
30th %ile Green (s)		39.9	39.9	8.9	52.8		9.2	9.2			9.2	
30th %ile Term Code		Coord	Coord	Gap	Coord		Gap	Gap			Hold	
10th %ile Green (s)		44.6	44.6	7.2	55.8		6.2	6.2			6.2	
10th %ile Term Code		Coord	Coord	Gap	Coord		Gap	Gap			Hold	
Queue Length 50th (ft)		66	0	23	51		46	1			0	
Queue Length 95th (ft)		177	m8	95	187		87	53			5	
Internal Link Dist (ft)		1869			432			119			134	
Turn Bay Length (ft)			150				75					
Base Capacity (vph)		798	678	811	1112		311	522			392	
Starvation Cap Reductn		0	0	0	0		0	0			0	
Spillback Cap Reductn		0	0	0	0		0	0			0	
Storage Cap Reductn		0	0	0	0		0	0			0	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Reduced v/c Ratio		0.36	0.12	0.44	0.46		0.37	0.46			0.01	

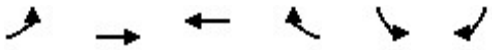
Intersection Summary			
Area Type:	Other		
Cycle Length: 70			
Actuated Cycle Length: 70			
Offset: 0 (0%), Referenced to phase 4:EBT and 8:WBTL, Start of Green			
Natural Cycle: 55			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.55			
Intersection Signal Delay: 8.9		Intersection LOS: A	
Intersection Capacity Utilization 56.3%		ICU Level of Service B	
Analysis Period (min) 15			

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 5: Lockbourne Av & Livingston Av



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	0	505	493	0	123	361
Future Volume (vph)	0	505	493	0	123	361
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt						0.850
Flt Protected					0.950	
Satd. Flow (prot)	0	1545	1531	0	1616	1501
Flt Permitted					0.950	
Satd. Flow (perm)	0	1545	1531	0	1616	1501
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)						312
Link Speed (mph)		35	35		25	
Link Distance (ft)		512	577		267	
Travel Time (s)		10.0	11.2		7.3	
Confl. Peds. (#/hr)	1			1		
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	0%	4%	5%	0%	8%	4%
Parking (#/hr)		5	5			
Adj. Flow (vph)	0	532	519	0	129	380
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	532	519	0	129	380
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(ft)		11	11		11	
Link Offset(ft)		0	0		0	
Crosswalk Width(ft)		16	16		16	
Two way Left Turn Lane						
Headway Factor	1.04	1.24	1.24	1.04	1.04	1.04
Turning Speed (mph)	15			9	15	9
Number of Detectors		2	2		1	1
Detector Template		Thru	Thru		Left	Right
Leading Detector (ft)		100	100		20	20
Trailing Detector (ft)		0	0		0	0
Detector 1 Position(ft)		0	0		0	0
Detector 1 Size(ft)		6	6		20	20
Detector 1 Type		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)		0.0	0.0		0.0	0.0
Detector 1 Queue (s)		0.0	0.0		0.0	0.0
Detector 1 Delay (s)		0.0	0.0		0.0	0.0
Detector 2 Position(ft)		94	94			
Detector 2 Size(ft)		6	6			
Detector 2 Type		Cl+Ex	Cl+Ex			
Detector 2 Channel						
Detector 2 Extend (s)		0.0	0.0			
Turn Type		NA	NA		Perm	Perm
Protected Phases		4	8			

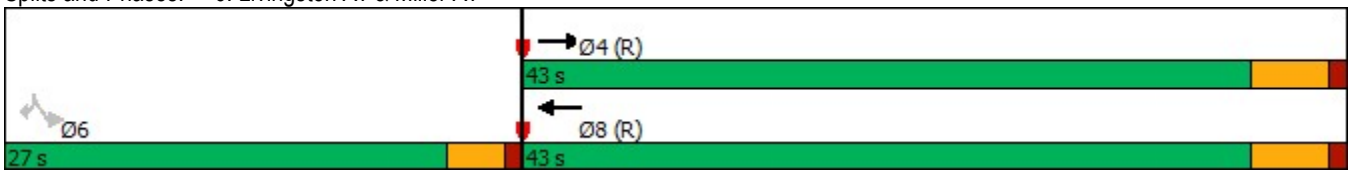


Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Permitted Phases					6	6
Detector Phase		4	8		6	6
Switch Phase						
Minimum Initial (s)		20.0	20.0		10.0	10.0
Minimum Split (s)		32.0	32.0		26.5	26.5
Total Split (s)		43.0	43.0		27.0	27.0
Total Split (%)		61.4%	61.4%		38.6%	38.6%
Maximum Green (s)		37.9	37.9		23.0	23.0
Yellow Time (s)		4.1	4.1		3.0	3.0
All-Red Time (s)		1.0	1.0		1.0	1.0
Lost Time Adjust (s)		0.0	0.0		0.0	0.0
Total Lost Time (s)		5.1	5.1		4.0	4.0
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)		1.0	1.0		4.0	4.0
Recall Mode		C-Max	C-Max		None	None
Walk Time (s)		13.0	13.0		7.0	7.0
Flash Dont Walk (s)		7.0	7.0		10.0	10.0
Pedestrian Calls (#/hr)		0	0		0	0
Act Effct Green (s)		47.1	47.1		13.8	13.8
Actuated g/C Ratio		0.67	0.67		0.20	0.20
v/c Ratio		0.51	0.50		0.41	0.70
Control Delay		12.2	4.4		27.1	12.6
Queue Delay		0.0	0.0		0.0	0.0
Total Delay		12.2	4.4		27.1	12.6
LOS		B	A		C	B
Approach Delay		12.2	4.4		16.3	
Approach LOS		B	A		B	
90th %ile Green (s)		39.1	39.1		21.8	21.8
90th %ile Term Code		Coord	Coord		Gap	Gap
70th %ile Green (s)		45.6	45.6		15.3	15.3
70th %ile Term Code		Coord	Coord		Gap	Gap
50th %ile Green (s)		49.1	49.1		11.8	11.8
50th %ile Term Code		Coord	Coord		Gap	Gap
30th %ile Green (s)		50.9	50.9		10.0	10.0
30th %ile Term Code		Coord	Coord		Min	Min
10th %ile Green (s)		50.9	50.9		10.0	10.0
10th %ile Term Code		Coord	Coord		Min	Min
Queue Length 50th (ft)		171	21		51	26
Queue Length 95th (ft)		321	82		81	89
Internal Link Dist (ft)		432	497		187	
Turn Bay Length (ft)						
Base Capacity (vph)		1039	1030		530	702
Starvation Cap Reductn		0	0		0	0
Spillback Cap Reductn		0	0		0	0
Storage Cap Reductn		0	0		0	0
Reduced v/c Ratio		0.51	0.50		0.24	0.54

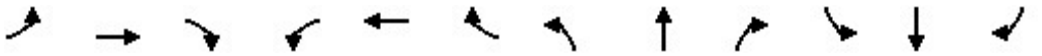
Intersection Summary

Area Type:	Other		
Cycle Length: 70			
Actuated Cycle Length: 70			
Offset: 24 (34%), Referenced to phase 4:EBT and 8:WBT, Start of Green			
Natural Cycle: 60			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.70			
Intersection Signal Delay: 10.9		Intersection LOS: B	
Intersection Capacity Utilization 62.8%		ICU Level of Service B	
Analysis Period (min) 15			

Splits and Phases: 6: Livingston Av & Miller Av



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	205	341	0	0	474	71	9	81	21	0	0	0
Future Volume (vph)	205	341	0	0	474	71	9	81	21	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	150		0	0		0	0		0	0		0
Storage Lanes	1		0	0		0	0		0	0		0
Taper Length (ft)	25			0			0			0		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	1.00				1.00			1.00				
Frt					0.982			0.974				
Flt Protected	0.950							0.996				
Satd. Flow (prot)	1678	1531	0	0	1497	0	0	1690	0	0	0	0
Flt Permitted	0.409							0.996				
Satd. Flow (perm)	720	1531	0	0	1497	0	0	1690	0	0	0	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)					17			18				
Link Speed (mph)		35			35			25			25	
Link Distance (ft)		577			1576			192			127	
Travel Time (s)		11.2			30.7			5.2			3.5	
Confl. Peds. (#/hr)	4		2	2		4	1					1
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles (%)	4%	5%	0%	0%	5%	5%	13%	6%	0%	0%	0%	0%
Parking (#/hr)		5			5	5						
Adj. Flow (vph)	220	367	0	0	510	76	10	87	23	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	220	367	0	0	586	0	0	120	0	0	0	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		11			11			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.04	1.24	1.04	1.04	1.24	1.04	1.04	1.04	1.04	1.04	1.04	1.04
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2			2		1	2				
Detector Template	Left	Thru			Thru		Left	Thru				
Leading Detector (ft)	20	100			100		20	100				
Trailing Detector (ft)	0	0			0		0	0				
Detector 1 Position(ft)	0	0			0		0	0				
Detector 1 Size(ft)	20	6			6		20	6				
Detector 1 Type	Cl+Ex	Cl+Ex			Cl+Ex		Cl+Ex	Cl+Ex				
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0			0.0		0.0	0.0				
Detector 1 Queue (s)	0.0	0.0			0.0		0.0	0.0				
Detector 1 Delay (s)	0.0	0.0			0.0		0.0	0.0				
Detector 2 Position(ft)		94			94			94				
Detector 2 Size(ft)		6			6			6				
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex				
Detector 2 Channel												

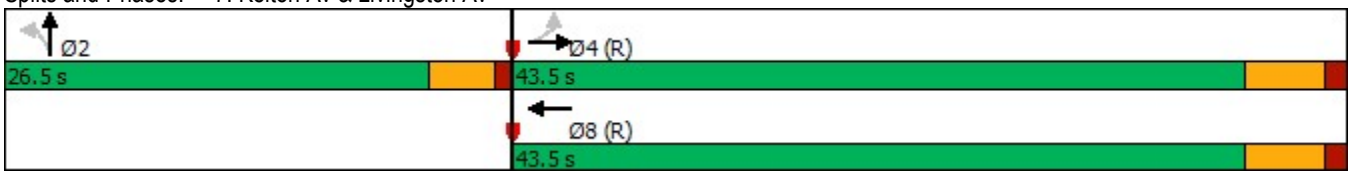


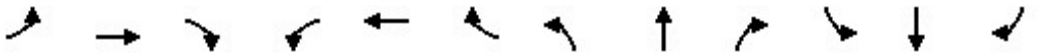
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 2 Extend (s)		0.0			0.0			0.0				
Turn Type	Perm	NA			NA		Perm	NA				
Protected Phases		4			8			2				
Permitted Phases	4						2					
Detector Phase	4	4			8		2	2				
Switch Phase												
Minimum Initial (s)	15.0	15.0			15.0		10.0	10.0				
Minimum Split (s)	27.0	27.0			27.0		26.5	26.5				
Total Split (s)	43.5	43.5			43.5		26.5	26.5				
Total Split (%)	62.1%	62.1%			62.1%		37.9%	37.9%				
Maximum Green (s)	38.1	38.1			38.1		22.1	22.1				
Yellow Time (s)	4.1	4.1			4.1		3.4	3.4				
All-Red Time (s)	1.3	1.3			1.3		1.0	1.0				
Lost Time Adjust (s)	0.0	0.0			0.0			0.0				
Total Lost Time (s)	5.4	5.4			5.4			4.4				
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.7	3.7			3.7		4.0	4.0				
Recall Mode	C-Max	C-Max			C-Max		None	None				
Walk Time (s)	8.0	8.0			8.0		7.0	7.0				
Flash Dont Walk (s)	7.0	7.0			7.0		8.0	8.0				
Pedestrian Calls (#/hr)	0	0			0		0	0				
Act Effct Green (s)	52.7	52.7			52.7			11.5				
Actuated g/C Ratio	0.75	0.75			0.75			0.16				
v/c Ratio	0.41	0.32			0.52			0.41				
Control Delay	4.3	2.7			4.1			26.2				
Queue Delay	0.0	0.0			0.0			0.0				
Total Delay	4.3	2.7			4.1			26.2				
LOS	A	A			A			C				
Approach Delay		3.3			4.1			26.3				
Approach LOS		A			A			C				
90th %ile Green (s)	45.6	45.6			45.6		14.6	14.6				
90th %ile Term Code	Coord	Coord			Coord		Gap	Gap				
70th %ile Green (s)	48.0	48.0			48.0		12.2	12.2				
70th %ile Term Code	Coord	Coord			Coord		Gap	Gap				
50th %ile Green (s)	49.7	49.7			49.7		10.5	10.5				
50th %ile Term Code	Coord	Coord			Coord		Gap	Gap				
30th %ile Green (s)	50.2	50.2			50.2		10.0	10.0				
30th %ile Term Code	Coord	Coord			Coord		Min	Min				
10th %ile Green (s)	64.6	64.6			64.6		0.0	0.0				
10th %ile Term Code	Coord	Coord			Coord		Skip	Skip				
Queue Length 50th (ft)	23	38			8			40				
Queue Length 95th (ft)	34	49			17			81				
Internal Link Dist (ft)		497			1496			112			47	
Turn Bay Length (ft)	150											
Base Capacity (vph)	542	1152			1131			545				
Starvation Cap Reductn	0	0			0			0				
Spillback Cap Reductn	0	0			0			0				
Storage Cap Reductn	0	0			0			0				

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Reduced v/c Ratio	0.41	0.32			0.52			0.22				

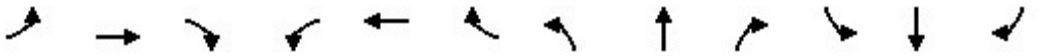
Intersection Summary			
Area Type:	Other		
Cycle Length: 70			
Actuated Cycle Length: 70			
Offset: 29 (41%), Referenced to phase 4:EBTL and 8:WBT, Start of Green			
Natural Cycle: 65			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.52			
Intersection Signal Delay: 5.8		Intersection LOS: A	
Intersection Capacity Utilization 62.8%		ICU Level of Service B	
Analysis Period (min) 15			

Splits and Phases: 7: Kelton Av & Livingston Av





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	7	314	47	15	479	38	12	251	77	24	211	26
Future Volume (vph)	7	314	47	15	479	38	12	251	77	24	211	26
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	150		0	375		0	0		0	0		0
Storage Lanes	1		0	1		0	0		0	0		0
Taper Length (ft)	25			25			0			0		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	1.00	1.00		1.00	1.00			0.99			1.00	
Frt		0.981			0.989			0.969			0.986	
Flt Protected	0.950			0.950				0.998			0.995	
Satd. Flow (prot)	1491	1505	0	1264	1507	0	0	1593	0	0	1645	0
Flt Permitted	0.343			0.477				0.984			0.942	
Satd. Flow (perm)	537	1505	0	632	1507	0	0	1570	0	0	1557	0
Right Turn on Red			Yes			Yes			Yes			No
Satd. Flow (RTOR)		16			8			23				
Link Speed (mph)		35			35			35			35	
Link Distance (ft)		1576			932			368			414	
Travel Time (s)		30.7			18.2			7.2			8.1	
Confl. Peds. (#/hr)	3		4	4		3	9		2	2		9
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	17%	4%	7%	38%	5%	9%	0%	11%	12%	13%	9%	6%
Parking (#/hr)		5	5		5	5						
Adj. Flow (vph)	8	349	52	17	532	42	13	279	86	27	234	29
Shared Lane Traffic (%)												
Lane Group Flow (vph)	8	401	0	17	574	0	0	378	0	0	290	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		11			11			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.04	1.24	1.04	1.04	1.24	1.04	1.04	1.04	1.04	1.04	1.04	1.04
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (ft)	20	100		20	100		20	100		20	100	
Trailing Detector (ft)	0	0		0	0		0	0		0	0	
Detector 1 Position(ft)	0	0		0	0		0	0		0	0	
Detector 1 Size(ft)	20	6		20	6		20	6		20	6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												



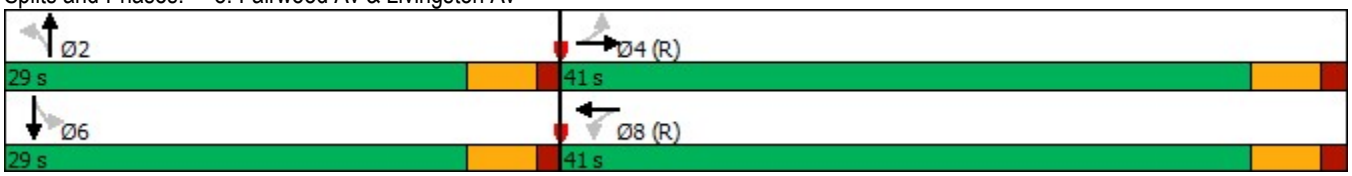
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	15.0	15.0		15.0	15.0		10.0	10.0		10.0	10.0	
Minimum Split (s)	27.0	27.0		27.0	27.0		26.5	26.5		26.5	26.5	
Total Split (s)	41.0	41.0		41.0	41.0		29.0	29.0		29.0	29.0	
Total Split (%)	58.6%	58.6%		58.6%	58.6%		41.4%	41.4%		41.4%	41.4%	
Maximum Green (s)	35.9	35.9		35.9	35.9		24.1	24.1		24.1	24.1	
Yellow Time (s)	3.6	3.6		3.6	3.6		3.6	3.6		3.6	3.6	
All-Red Time (s)	1.5	1.5		1.5	1.5		1.3	1.3		1.3	1.3	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0			0.0			0.0	
Total Lost Time (s)	5.1	5.1		5.1	5.1			4.9			4.9	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		4.0	4.0		4.0	4.0	
Recall Mode	C-Max	C-Max		C-Max	C-Max		None	None		None	None	
Walk Time (s)	8.0	8.0		8.0	8.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	
Act Effct Green (s)	39.4	39.4		39.4	39.4			20.6			20.6	
Actuated g/C Ratio	0.56	0.56		0.56	0.56			0.29			0.29	
v/c Ratio	0.03	0.47		0.05	0.67			0.79			0.63	
Control Delay	4.7	6.4		4.4	10.4			33.7			27.5	
Queue Delay	0.0	0.0		0.0	0.0			0.0			0.0	
Total Delay	4.7	6.4		4.4	10.4			33.7			27.5	
LOS	A	A		A	B			C			C	
Approach Delay		6.4			10.3			33.7			27.5	
Approach LOS		A			B			C			C	
90th %ile Green (s)	35.9	35.9		35.9	35.9		24.1	24.1		24.1	24.1	
90th %ile Term Code	Coord	Coord		Coord	Coord		Max	Max		Max	Max	
70th %ile Green (s)	35.9	35.9		35.9	35.9		24.1	24.1		24.1	24.1	
70th %ile Term Code	Coord	Coord		Coord	Coord		Max	Max		Hold	Hold	
50th %ile Green (s)	38.2	38.2		38.2	38.2		21.8	21.8		21.8	21.8	
50th %ile Term Code	Coord	Coord		Coord	Coord		Gap	Gap		Hold	Hold	
30th %ile Green (s)	41.2	41.2		41.2	41.2		18.8	18.8		18.8	18.8	
30th %ile Term Code	Coord	Coord		Coord	Coord		Gap	Gap		Hold	Hold	
10th %ile Green (s)	45.9	45.9		45.9	45.9		14.1	14.1		14.1	14.1	
10th %ile Term Code	Coord	Coord		Coord	Coord		Gap	Gap		Hold	Hold	
Queue Length 50th (ft)	0	55		1	139			136			104	
Queue Length 95th (ft)	m2	100		m3	67			221			171	
Internal Link Dist (ft)		1496			852			288			334	
Turn Bay Length (ft)	150			375								
Base Capacity (vph)	302	854		355	852			555			536	
Starvation Cap Reductn	0	0		0	0			0			0	
Spillback Cap Reductn	0	0		0	0			0			0	
Storage Cap Reductn	0	0		0	0			0			0	

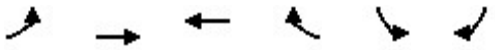
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Reduced v/c Ratio	0.03	0.47		0.05	0.67			0.68			0.54	

Intersection Summary			
Area Type:	Other		
Cycle Length: 70			
Actuated Cycle Length: 70			
Offset: 57 (81%), Referenced to phase 4:EBTL and 8:WBTL, Start of Green			
Natural Cycle: 60			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.79			
Intersection Signal Delay: 17.6		Intersection LOS: B	
Intersection Capacity Utilization 58.9%		ICU Level of Service B	
Analysis Period (min) 15			

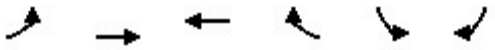
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 8: Fairwood Av & Livingston Av

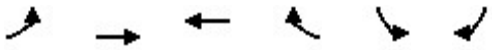




Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	38	519	572	175	168	69
Future Volume (vph)	38	519	572	175	168	69
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	150			0	0	0
Storage Lanes	1			1	1	0
Taper Length (ft)	25				0	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	1.00			0.97	1.00	
Frt				0.850	0.961	
Flt Protected	0.950				0.966	
Satd. Flow (prot)	1401	1531	1531	1313	1646	0
Flt Permitted	0.375				0.966	
Satd. Flow (perm)	552	1531	1531	1278	1644	0
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)				186	31	
Link Speed (mph)		35	35		35	
Link Distance (ft)		841	588		385	
Travel Time (s)		16.4	11.5		7.5	
Confl. Peds. (#/hr)	3			3	1	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Heavy Vehicles (%)	9%	5%	5%	4%	3%	5%
Parking (#/hr)	5	5	5	5		
Adj. Flow (vph)	40	552	609	186	179	73
Shared Lane Traffic (%)						
Lane Group Flow (vph)	40	552	609	186	252	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(ft)		11	11		11	
Link Offset(ft)		0	0		0	
Crosswalk Width(ft)		16	16		16	
Two way Left Turn Lane						
Headway Factor	1.24	1.24	1.24	1.24	1.04	1.04
Turning Speed (mph)	15			9	15	9
Number of Detectors	1	2	2	0	1	
Detector Template	Left	Thru	Thru		Left	
Leading Detector (ft)	20	100	100	0	20	
Trailing Detector (ft)	0	0	0	0	0	
Detector 1 Position(ft)	0	0	0	0	0	
Detector 1 Size(ft)	20	6	6	0	20	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(ft)		94	94			
Detector 2 Size(ft)		6	6			
Detector 2 Type		Cl+Ex	Cl+Ex			
Detector 2 Channel						



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Detector 2 Extend (s)		0.0	0.0			
Turn Type	Perm	NA	NA	Perm	Perm	
Protected Phases		4	8			
Permitted Phases	4			8	6	
Detector Phase	4	4	8	8	6	
Switch Phase						
Minimum Initial (s)	15.0	15.0	15.0	15.0	10.0	
Minimum Split (s)	27.0	27.0	27.0	27.0	26.5	
Total Split (s)	43.5	43.5	43.5	43.5	26.5	
Total Split (%)	62.1%	62.1%	62.1%	62.1%	37.9%	
Maximum Green (s)	37.7	37.7	37.7	37.7	21.9	
Yellow Time (s)	3.6	3.6	3.6	3.6	3.6	
All-Red Time (s)	2.2	2.2	2.2	2.2	1.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	5.8	5.8	5.8	5.8	4.6	
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	0.2	0.2	4.0	4.0	0.2	
Recall Mode	C-Max	C-Max	C-Max	C-Max	None	
Walk Time (s)	8.0	8.0	8.0	8.0	7.0	
Flash Dont Walk (s)	7.0	7.0	7.0	7.0	7.0	
Pedestrian Calls (#/hr)	0	0	0	0	0	
Act Effct Green (s)	46.3	46.3	46.3	46.3	13.3	
Actuated g/C Ratio	0.66	0.66	0.66	0.66	0.19	
v/c Ratio	0.11	0.54	0.60	0.20	0.75	
Control Delay	4.5	7.1	10.8	1.7	37.1	
Queue Delay	0.0	0.0	0.0	0.0	0.0	
Total Delay	4.5	7.1	10.8	1.7	37.1	
LOS	A	A	B	A	D	
Approach Delay		6.9	8.7		37.1	
Approach LOS		A	A		D	
90th %ile Green (s)	40.8	40.8	40.8	40.8	18.8	
90th %ile Term Code	Coord	Coord	Coord	Coord	Gap	
70th %ile Green (s)	44.5	44.5	44.5	44.5	15.1	
70th %ile Term Code	Coord	Coord	Coord	Coord	Gap	
50th %ile Green (s)	47.1	47.1	47.1	47.1	12.5	
50th %ile Term Code	Coord	Coord	Coord	Coord	Gap	
30th %ile Green (s)	49.6	49.6	49.6	49.6	10.0	
30th %ile Term Code	Coord	Coord	Coord	Coord	Min	
10th %ile Green (s)	49.6	49.6	49.6	49.6	10.0	
10th %ile Term Code	Coord	Coord	Coord	Coord	Min	
Queue Length 50th (ft)	4	70	119	0	92	
Queue Length 95th (ft)	m11	141	278	23	149	
Internal Link Dist (ft)		761	508		305	
Turn Bay Length (ft)	150					
Base Capacity (vph)	365	1013	1013	908	535	
Starvation Cap Reductn	0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	

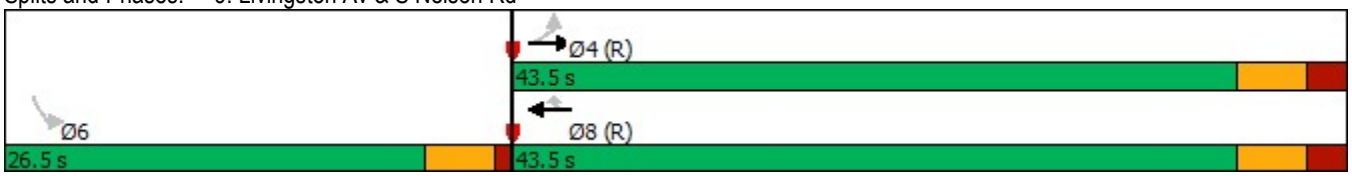


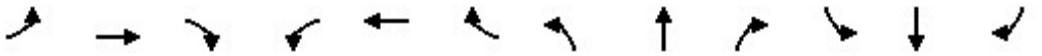
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Reduced v/c Ratio	0.11	0.54	0.60	0.20	0.47	

Intersection Summary			
Area Type:	Other		
Cycle Length: 70			
Actuated Cycle Length: 70			
Offset: 24 (34%), Referenced to phase 4:EBTL and 8:WBT, Start of Green			
Natural Cycle: 60			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.75			
Intersection Signal Delay: 12.4		Intersection LOS: B	
Intersection Capacity Utilization 53.8%		ICU Level of Service A	
Analysis Period (min) 15			

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 9: Livingston Av & S Nelson Rd

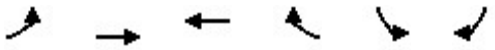




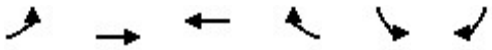
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	3	240	0	0	507	11	77	3	66	9	0	21
Future Volume (Veh/h)	3	240	0	0	507	11	77	3	66	9	0	21
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Hourly flow rate (vph)	3	264	0	0	557	12	85	3	73	10	0	23
Pedestrians								1			6	
Lane Width (ft)								11.0			11.0	
Walking Speed (ft/s)								3.5			3.5	
Percent Blockage								0			1	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)		440			1031							
pX, platoon unblocked	0.95			0.98			0.96	0.96	0.98	0.96	0.96	0.95
vC, conflicting volume	575			265			857	846	265	914	840	569
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	526			235			775	763	235	834	757	519
tC, single (s)	4.1			4.1			7.1	7.2	6.2	7.2	6.5	6.4
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.6	3.3	3.6	4.0	3.5
p0 queue free %	100			100			71	99	91	96	100	95
cM capacity (veh/h)	993			1311			289	255	784	235	323	499

Direction, Lane #	EB 1	EB 2	WB 1	NB 1	SB 1
Volume Total	3	264	569	161	33
Volume Left	3	0	0	85	10
Volume Right	0	0	12	73	23
cSH	993	1700	1700	404	372
Volume to Capacity	0.00	0.16	0.33	0.40	0.09
Queue Length 95th (ft)	0	0	0	47	7
Control Delay (s)	8.6	0.0	0.0	19.7	15.6
Lane LOS	A			C	C
Approach Delay (s)	0.1		0.0	19.7	15.6
Approach LOS				C	C

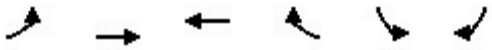
Intersection Summary				
Average Delay	3.6			
Intersection Capacity Utilization	48.7%	ICU Level of Service		A
Analysis Period (min)	15			



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	137	437	302	43	72	204
Future Volume (vph)	137	437	302	43	72	204
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	100			0	0	0
Storage Lanes	1			0	1	1
Taper Length (ft)	25				0	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	1.00		1.00		1.00	0.96
Frt			0.983			0.850
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1601	1801	1520	0	1745	1531
Flt Permitted	0.390				0.950	
Satd. Flow (perm)	654	1801	1520	0	1741	1473
Right Turn on Red				Yes		No
Satd. Flow (RTOR)			11			
Link Speed (mph)		35	35		25	
Link Distance (ft)		304	440		328	
Travel Time (s)		5.9	8.6		8.9	
Confl. Peds. (#/hr)	5			5	1	8
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89
Heavy Vehicles (%)	9%	2%	4%	0%	0%	2%
Parking (#/hr)			5	5		
Adj. Flow (vph)	154	491	339	48	81	229
Shared Lane Traffic (%)						
Lane Group Flow (vph)	154	491	387	0	81	229
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(ft)		11	11		11	
Link Offset(ft)		0	0		0	
Crosswalk Width(ft)		16	16		16	
Two way Left Turn Lane						
Headway Factor	1.04	1.04	1.24	1.04	1.04	1.04
Turning Speed (mph)	15			9	15	9
Number of Detectors	1	2	2		1	1
Detector Template	Left	Thru	Thru		Left	Right
Leading Detector (ft)	20	100	100		20	20
Trailing Detector (ft)	0	0	0		0	0
Detector 1 Position(ft)	0	0	0		0	0
Detector 1 Size(ft)	20	6	6		20	20
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0		0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0		0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0		0.0	0.0
Detector 2 Position(ft)		94	94			
Detector 2 Size(ft)		6	6			
Detector 2 Type		Cl+Ex	Cl+Ex			
Detector 2 Channel						



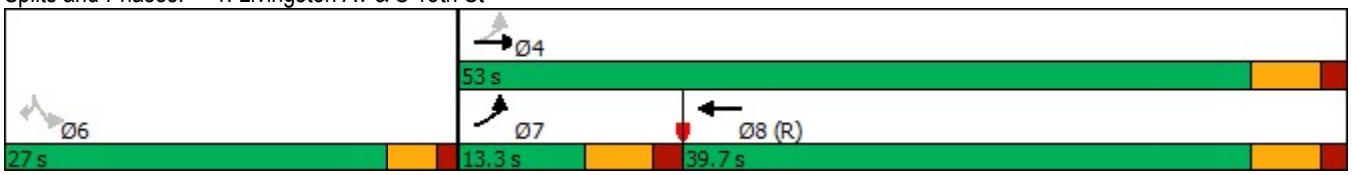
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Detector 2 Extend (s)		0.0	0.0			
Turn Type	pm+pt	NA	NA		Perm	Perm
Protected Phases	7	4	8			
Permitted Phases	4				6	6
Detector Phase	7	4	8		6	6
Switch Phase						
Minimum Initial (s)	5.0	7.0	16.0		10.0	10.0
Minimum Split (s)	10.8	26.5	26.5		26.5	26.5
Total Split (s)	13.3	53.0	39.7		27.0	27.0
Total Split (%)	16.6%	66.3%	49.6%		33.8%	33.8%
Maximum Green (s)	7.5	47.2	33.9		22.7	22.7
Yellow Time (s)	4.1	4.1	4.1		3.0	3.0
All-Red Time (s)	1.7	1.7	1.7		1.3	1.3
Lost Time Adjust (s)	0.0	0.0	0.0		0.0	0.0
Total Lost Time (s)	5.8	5.8	5.8		4.3	4.3
Lead/Lag	Lead		Lag			
Lead-Lag Optimize?	Yes		Yes			
Vehicle Extension (s)	3.7	3.7	3.7		5.0	5.0
Recall Mode	None	Max	C-Max		None	None
Walk Time (s)		7.0	7.0		7.0	7.0
Flash Dont Walk (s)		9.0	9.0		11.0	11.0
Pedestrian Calls (#/hr)		0	0		0	0
Act Effct Green (s)	51.3	51.3	37.5		18.6	18.6
Actuated g/C Ratio	0.64	0.64	0.47		0.23	0.23
v/c Ratio	0.30	0.43	0.54		0.20	0.67
Control Delay	8.1	9.2	12.9		24.5	37.5
Queue Delay	0.0	0.0	0.0		0.0	0.0
Total Delay	8.1	9.2	12.9		24.5	37.5
LOS	A	A	B		C	D
Approach Delay		9.0	12.9		34.1	
Approach LOS		A	B		C	
90th %ile Green (s)	7.5	47.2	33.9		22.7	22.7
90th %ile Term Code	Max	Coord	Coord		Max	Max
70th %ile Green (s)	8.3	48.0	33.9		21.9	21.9
70th %ile Term Code	Max	Coord	Coord		Gap	Gap
50th %ile Green (s)	9.3	50.7	35.6		19.2	19.2
50th %ile Term Code	Gap	Coord	Coord		Gap	Gap
30th %ile Green (s)	8.1	53.4	39.5		16.5	16.5
30th %ile Term Code	Gap	Coord	Coord		Gap	Gap
10th %ile Green (s)	6.8	57.4	44.8		12.5	12.5
10th %ile Term Code	Gap	Coord	Coord		Gap	Gap
Queue Length 50th (ft)	28	109	104		32	103
Queue Length 95th (ft)	57	192	172		63	165
Internal Link Dist (ft)		224	360		248	
Turn Bay Length (ft)	100					
Base Capacity (vph)	516	1155	719		494	417
Starvation Cap Reductn	0	0	0		0	0
Spillback Cap Reductn	0	0	0		0	0
Storage Cap Reductn	0	0	0		0	0

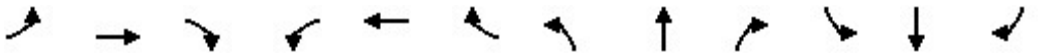


Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Reduced v/c Ratio	0.30	0.43	0.54		0.16	0.55

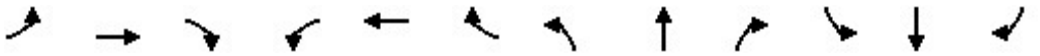
Intersection Summary			
Area Type:	Other		
Cycle Length: 80			
Actuated Cycle Length: 80			
Offset: 70 (88%), Referenced to phase 8:WBT, Start of Green			
Natural Cycle: 65			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.67			
Intersection Signal Delay: 15.9		Intersection LOS: B	
Intersection Capacity Utilization 49.3%		ICU Level of Service A	
Analysis Period (min) 15			

Splits and Phases: 1: Livingston Av & S 18th St





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	639	82	80	400	0	0	0	0	12	6	15
Future Volume (vph)	0	639	82	80	400	0	0	0	0	12	6	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	150		0	150		0	0		0	0		0
Storage Lanes	0		0	1		0	0		0	0		0
Taper Length (ft)	25			25			0			0		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		1.00									0.98	
Frt		0.985									0.940	
Flt Protected				0.950							0.982	
Satd. Flow (prot)	0	1527	0	1678	1531	0	0	0	0	0	1390	0
Flt Permitted				0.319							0.982	
Satd. Flow (perm)	0	1527	0	563	1531	0	0	0	0	0	1388	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		14									16	
Link Speed (mph)		35			35			35			35	
Link Distance (ft)		1031			383			200			188	
Travel Time (s)		20.1			7.5			3.9			3.7	
Confl. Peds. (#/hr)	3		4	4		3	7		1	1		7
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Heavy Vehicles (%)	0%	3%	6%	4%	5%	0%	0%	0%	0%	0%	25%	0%
Parking (#/hr)		5	5		5						5	5
Adj. Flow (vph)	0	702	90	88	440	0	0	0	0	13	7	16
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	792	0	88	440	0	0	0	0	0	36	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		11			11			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.04	1.24	1.04	1.04	1.24	1.04	1.04	1.04	1.04	1.04	1.24	1.04
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors		2		1	2					1	2	
Detector Template		Thru		Left	Thru					Left	Thru	
Leading Detector (ft)		100		20	100					20	100	
Trailing Detector (ft)		0		0	0					0	0	
Detector 1 Position(ft)		0		0	0					0	0	
Detector 1 Size(ft)		6		20	6					20	6	
Detector 1 Type		Cl+Ex		Cl+Ex	Cl+Ex					Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)		0.0		0.0	0.0					0.0	0.0	
Detector 1 Queue (s)		0.0		0.0	0.0					0.0	0.0	
Detector 1 Delay (s)		0.0		0.0	0.0					0.0	0.0	
Detector 2 Position(ft)		94			94						94	
Detector 2 Size(ft)		6			6						6	
Detector 2 Type		Cl+Ex			Cl+Ex						Cl+Ex	
Detector 2 Channel												



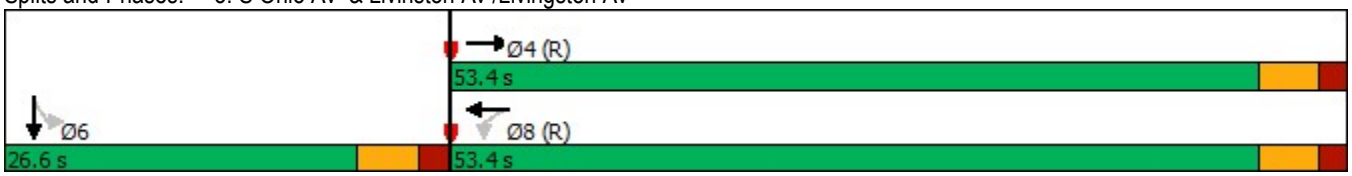
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 2 Extend (s)		0.0			0.0						0.0	
Turn Type		NA		Perm	NA					Perm	NA	
Protected Phases		4			8						6	
Permitted Phases				8						6		
Detector Phase		4		8	8					6	6	
Switch Phase												
Minimum Initial (s)		15.0		15.0	15.0					10.0	10.0	
Minimum Split (s)		27.0		27.0	27.0					26.5	26.5	
Total Split (s)		53.4		53.4	53.4					26.6	26.6	
Total Split (%)		66.8%		66.8%	66.8%					33.3%	33.3%	
Maximum Green (s)		48.0		48.0	48.0					21.0	21.0	
Yellow Time (s)		3.6		3.6	3.6					3.6	3.6	
All-Red Time (s)		1.8		1.8	1.8					2.0	2.0	
Lost Time Adjust (s)		0.0		0.0	0.0						0.0	
Total Lost Time (s)		5.4		5.4	5.4						5.6	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)		3.0		3.0	3.0					4.0	4.0	
Recall Mode		C-Max		C-Max	C-Max					None	None	
Walk Time (s)		8.0		8.0	8.0					7.0	7.0	
Flash Dont Walk (s)		7.0		7.0	7.0					7.0	7.0	
Pedestrian Calls (#/hr)		0		0	0					0	0	
Act Effct Green (s)		67.3		67.3	67.3						10.1	
Actuated g/C Ratio		0.84		0.84	0.84						0.13	
v/c Ratio		0.62		0.19	0.34						0.19	
Control Delay		9.4		2.5	2.1						23.7	
Queue Delay		0.0		0.0	0.1						0.0	
Total Delay		9.4		2.5	2.2						23.7	
LOS		A		A	A						C	
Approach Delay		9.4			2.3						23.7	
Approach LOS		A			A						C	
90th %ile Green (s)		58.5		58.5	58.5					10.5	10.5	
90th %ile Term Code		Coord		Coord	Coord					Gap	Gap	
70th %ile Green (s)		59.0		59.0	59.0					10.0	10.0	
70th %ile Term Code		Coord		Coord	Coord					Min	Min	
50th %ile Green (s)		59.0		59.0	59.0					10.0	10.0	
50th %ile Term Code		Coord		Coord	Coord					Min	Min	
30th %ile Green (s)		74.6		74.6	74.6					0.0	0.0	
30th %ile Term Code		Coord		Coord	Coord					Skip	Skip	
10th %ile Green (s)		74.6		74.6	74.6					0.0	0.0	
10th %ile Term Code		Coord		Coord	Coord					Skip	Skip	
Queue Length 50th (ft)		269		5	26						9	
Queue Length 95th (ft)		448		m10	45						35	
Internal Link Dist (ft)		951			303			120			108	
Turn Bay Length (ft)				150								
Base Capacity (vph)		1286		473	1288						376	
Starvation Cap Reductn		0		0	188						0	
Spillback Cap Reductn		13		0	0						0	
Storage Cap Reductn		0		0	0						0	

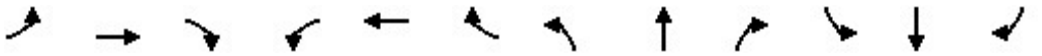
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Reduced v/c Ratio		0.62		0.19	0.40						0.10	

Intersection Summary			
Area Type:	Other		
Cycle Length: 80			
Actuated Cycle Length: 80			
Offset: 25 (31%), Referenced to phase 4:EBT and 8:WBTL, Start of Green			
Natural Cycle: 75			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.62			
Intersection Signal Delay: 7.0		Intersection LOS: A	
Intersection Capacity Utilization 73.8%		ICU Level of Service D	
Analysis Period (min) 15			

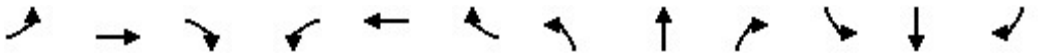
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 3: S Ohio Av & Livinston Av /Livingston Av





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	47	588	0	0	435	94	62	176	62	0	0	0
Future Volume (vph)	47	588	0	0	435	94	62	176	62	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	150		0	0		0	0		0	0		0
Storage Lanes	1		0	0		0	0		0	0		0
Taper Length (ft)	25			0			0			0		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	0.99				0.99			0.99				
Frt					0.976			0.972				
Flt Protected	0.950							0.990				
Satd. Flow (prot)	1662	1576	0	0	1487	0	0	1443	0	0	0	0
Flt Permitted	0.371							0.990				
Satd. Flow (perm)	639	1576	0	0	1487	0	0	1431	0	0	0	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)					22			17				
Link Speed (mph)		35			35			35			35	
Link Distance (ft)		383			1949			182			211	
Travel Time (s)		7.5			38.0			3.5			4.1	
Confl. Peds. (#/hr)	19		7	7		19	15		3	3		15
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	5%	2%	0%	0%	4%	5%	7%	8%	2%	0%	0%	0%
Parking (#/hr)		5			5	5		5	5			
Adj. Flow (vph)	49	619	0	0	458	99	65	185	65	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	49	619	0	0	557	0	0	315	0	0	0	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		11			11			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.04	1.24	1.04	1.04	1.24	1.04	1.04	1.24	1.04	1.04	1.04	1.04
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2			2		1	2				
Detector Template	Left	Thru			Thru		Left	Thru				
Leading Detector (ft)	20	100			100		20	100				
Trailing Detector (ft)	0	0			0		0	0				
Detector 1 Position(ft)	0	0			0		0	0				
Detector 1 Size(ft)	20	6			6		20	6				
Detector 1 Type	Cl+Ex	Cl+Ex			Cl+Ex		Cl+Ex	Cl+Ex				
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0			0.0		0.0	0.0				
Detector 1 Queue (s)	0.0	0.0			0.0		0.0	0.0				
Detector 1 Delay (s)	0.0	0.0			0.0		0.0	0.0				
Detector 2 Position(ft)		94			94			94				
Detector 2 Size(ft)		6			6			6				
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex				
Detector 2 Channel												



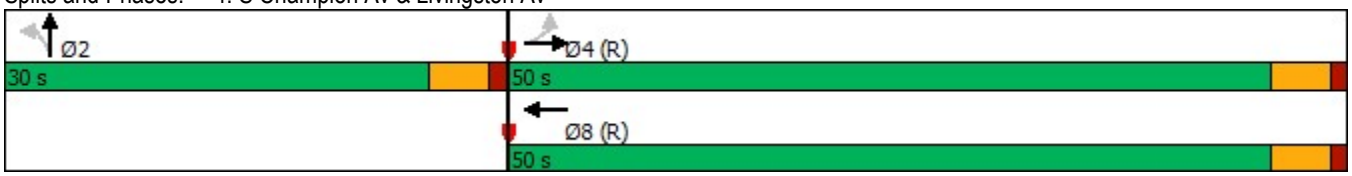
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 2 Extend (s)		0.0			0.0			0.0				
Turn Type	Perm	NA			NA		Perm	NA				
Protected Phases		4			8			2				
Permitted Phases	4						2					
Detector Phase	4	4			8		2	2				
Switch Phase												
Minimum Initial (s)	15.0	15.0			15.0		10.0	10.0				
Minimum Split (s)	26.5	26.5			27.0		19.8	19.8				
Total Split (s)	50.0	50.0			50.0		30.0	30.0				
Total Split (%)	62.5%	62.5%			62.5%		37.5%	37.5%				
Maximum Green (s)	45.3	45.3			45.3		25.2	25.2				
Yellow Time (s)	3.6	3.6			3.6		3.6	3.6				
All-Red Time (s)	1.1	1.1			1.1		1.2	1.2				
Lost Time Adjust (s)	0.0	0.0			0.0			0.0				
Total Lost Time (s)	4.7	4.7			4.7			4.8				
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	0.2	0.2			0.2		4.0	4.0				
Recall Mode	C-Max	C-Max			C-Max		None	None				
Walk Time (s)	8.0	8.0			8.0		7.0	7.0				
Flash Dont Walk (s)	7.0	7.0			7.0		8.0	8.0				
Pedestrian Calls (#/hr)	0	0			0		0	0				
Act Effct Green (s)	49.1	49.1			49.1			21.4				
Actuated g/C Ratio	0.61	0.61			0.61			0.27				
v/c Ratio	0.12	0.64			0.60			0.80				
Control Delay	2.9	8.3			13.0			40.9				
Queue Delay	0.0	0.5			0.0			0.0				
Total Delay	2.9	8.9			13.0			40.9				
LOS	A	A			B			D				
Approach Delay		8.4			13.0			40.9				
Approach LOS		A			B			D				
90th %ile Green (s)	45.3	45.3			45.3		25.2	25.2				
90th %ile Term Code	Coord	Coord			Coord		Max	Max				
70th %ile Green (s)	45.3	45.3			45.3		25.2	25.2				
70th %ile Term Code	Coord	Coord			Coord		Max	Max				
50th %ile Green (s)	47.8	47.8			47.8		22.7	22.7				
50th %ile Term Code	Coord	Coord			Coord		Gap	Gap				
30th %ile Green (s)	51.1	51.1			51.1		19.4	19.4				
30th %ile Term Code	Coord	Coord			Coord		Gap	Gap				
10th %ile Green (s)	56.0	56.0			56.0		14.5	14.5				
10th %ile Term Code	Coord	Coord			Coord		Gap	Gap				
Queue Length 50th (ft)	1	59			97			135				
Queue Length 95th (ft)	m4	142			314			221				
Internal Link Dist (ft)		303			1869			102			131	
Turn Bay Length (ft)	150											
Base Capacity (vph)	392	967			921			462				
Starvation Cap Reductn	0	95			0			0				
Spillback Cap Reductn	0	0			0			0				
Storage Cap Reductn	0	0			0			0				

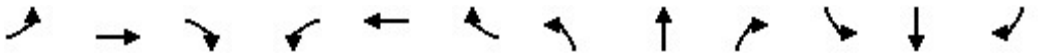
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Reduced v/c Ratio	0.13	0.71			0.60			0.68				

Intersection Summary			
Area Type:	Other		
Cycle Length: 80			
Actuated Cycle Length: 80			
Offset: 30 (38%), Referenced to phase 4:EBTL and 8:WBT, Start of Green			
Natural Cycle: 60			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.80			
Intersection Signal Delay: 16.7		Intersection LOS: B	
Intersection Capacity Utilization 73.8%		ICU Level of Service D	
Analysis Period (min) 15			

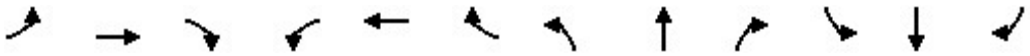
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 4: S Champion Av & Livingston Av





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	620	100	356	441	2	135	5	341	0	1	5
Future Volume (vph)	0	620	100	356	441	2	135	5	341	0	1	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		150	0		0	75		0	0		0
Storage Lanes	0		1	1		0	1		0	0		0
Taper Length (ft)	25			25			0			0		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor			0.96		1.00		1.00	0.97			0.98	
Frt			0.850		0.999			0.852			0.887	
Flt Protected				0.950			0.950					
Satd. Flow (prot)	0	1576	1339	1678	1529	0	1711	1467	0	0	1598	0
Flt Permitted				0.253			0.754					
Satd. Flow (perm)	0	1576	1290	447	1529	0	1354	1467	0	0	1598	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			88		1			363			5	
Link Speed (mph)		35			35			35			25	
Link Distance (ft)		1949			512			199			214	
Travel Time (s)		38.0			10.0			3.9			5.8	
Confl. Peds. (#/hr)	4		6	6		4	1		2	2		1
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Heavy Vehicles (%)	0%	2%	2%	4%	5%	0%	2%	0%	4%	0%	0%	0%
Parking (#/hr)		5	5		5	5						
Adj. Flow (vph)	0	660	106	379	469	2	144	5	363	0	1	5
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	660	106	379	471	0	144	368	0	0	6	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		11			11			11			11	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.04	1.24	1.24	1.04	1.24	1.04	1.04	1.04	1.04	1.04	1.04	1.04
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors		2	0	1	2		1	2			2	
Detector Template		Thru		Left	Thru		Left	Thru			Thru	
Leading Detector (ft)		100	0	20	100		20	100			100	
Trailing Detector (ft)		0	0	0	0		0	0			0	
Detector 1 Position(ft)		0	0	0	0		0	0			0	
Detector 1 Size(ft)		6	0	20	6		20	6			6	
Detector 1 Type		Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex			Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)		0.0	0.0	0.0	0.0		0.0	0.0			0.0	
Detector 1 Queue (s)		0.0	0.0	0.0	0.0		0.0	0.0			0.0	
Detector 1 Delay (s)		0.0	0.0	0.0	0.0		0.0	0.0			0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												



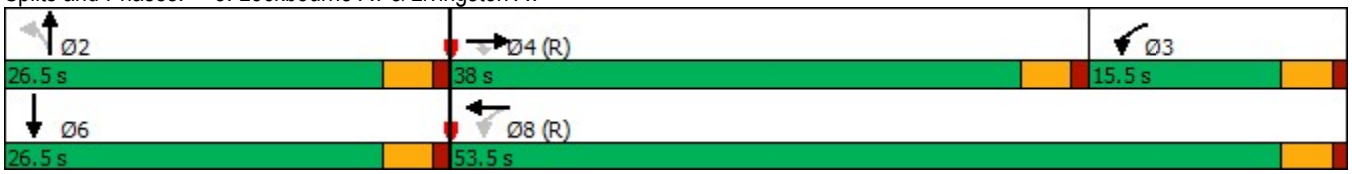
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type		NA	Perm	pm+pt	NA		Perm	NA			NA	
Protected Phases		4		3	8			2			6	
Permitted Phases			4	8			2					
Detector Phase		4	4	3	8		2	2			6	
Switch Phase												
Minimum Initial (s)		5.0	5.0	5.0	5.0		5.0	5.0			5.0	
Minimum Split (s)		26.5	26.5	9.5	26.5		26.5	26.5			26.5	
Total Split (s)		38.0	38.0	15.5	53.5		26.5	26.5			26.5	
Total Split (%)		47.5%	47.5%	19.4%	66.9%		33.1%	33.1%			33.1%	
Maximum Green (s)		34.0	34.0	11.5	49.5		22.5	22.5			22.5	
Yellow Time (s)		3.0	3.0	3.0	3.0		3.0	3.0			3.0	
All-Red Time (s)		1.0	1.0	1.0	1.0		1.0	1.0			1.0	
Lost Time Adjust (s)		0.0	0.0	0.0	0.0		0.0	0.0			0.0	
Total Lost Time (s)		4.0	4.0	4.0	4.0		4.0	4.0			4.0	
Lead/Lag		Lead	Lead	Lag								
Lead-Lag Optimize?		Yes	Yes	Yes								
Vehicle Extension (s)		3.0	3.0	3.0	3.0		3.0	3.0			3.0	
Recall Mode		C-Max	C-Max	None	C-Max		None	None			None	
Walk Time (s)		7.0	7.0		7.0		7.0	7.0			7.0	
Flash Dont Walk (s)		7.0	7.0		7.0		7.0	7.0			7.0	
Pedestrian Calls (#/hr)		0	0		0		0	0			0	
Act Effct Green (s)		42.1	42.1	57.6	57.6		14.4	14.4			14.4	
Actuated g/C Ratio		0.53	0.53	0.72	0.72		0.18	0.18			0.18	
v/c Ratio		0.80	0.15	0.76	0.43		0.59	0.66			0.02	
Control Delay		18.1	0.6	21.8	5.3		39.1	9.4			16.0	
Queue Delay		1.8	0.0	0.0	0.0		0.0	0.1			0.0	
Total Delay		19.8	0.6	21.8	5.3		39.1	9.5			16.0	
LOS		B	A	C	A		D	A			B	
Approach Delay		17.2			12.7			17.8			16.0	
Approach LOS		B			B			B			B	
90th %ile Green (s)		35.3	35.3	11.5	50.8		21.2	21.2			21.2	
90th %ile Term Code		Coord	Coord	Max	Coord		Gap	Gap			Hold	
70th %ile Green (s)		39.5	39.5	11.5	55.0		17.0	17.0			17.0	
70th %ile Term Code		Coord	Coord	Max	Coord		Gap	Gap			Hold	
50th %ile Green (s)		41.9	41.9	11.5	57.4		14.6	14.6			14.6	
50th %ile Term Code		Coord	Coord	Max	Coord		Gap	Gap			Hold	
30th %ile Green (s)		45.2	45.2	11.5	60.7		11.3	11.3			11.3	
30th %ile Term Code		Coord	Coord	Max	Coord		Gap	Gap			Hold	
10th %ile Green (s)		48.7	48.7	11.5	64.2		7.8	7.8			7.8	
10th %ile Term Code		Coord	Coord	Max	Coord		Gap	Gap			Hold	
Queue Length 50th (ft)		282	0	40	52		66	2			0	
Queue Length 95th (ft)		#528	m3	#199	130		111	67			9	
Internal Link Dist (ft)		1869			432			119			134	
Turn Bay Length (ft)			150				75					
Base Capacity (vph)		829	720	498	1101		380	673			453	
Starvation Cap Reductn		0	0	0	0		0	0			0	
Spillback Cap Reductn		66	0	0	0		0	15			0	
Storage Cap Reductn		0	0	0	0		0	0			0	

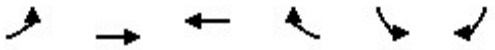
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Reduced v/c Ratio		0.87	0.15	0.76	0.43		0.38	0.56			0.01	

Intersection Summary			
Area Type:	Other		
Cycle Length: 80			
Actuated Cycle Length: 80			
Offset: 77 (96%), Referenced to phase 4:EBT and 8:WBTL, Start of Green			
Natural Cycle: 90			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.80			
Intersection Signal Delay: 15.5		Intersection LOS: B	
Intersection Capacity Utilization 83.9%		ICU Level of Service E	
Analysis Period (min) 15			

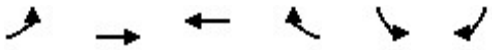
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 5: Lockbourne Av & Livingston Av





Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	0	970	461	0	225	429
Future Volume (vph)	0	970	461	0	225	429
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor					1.00	
Frt						0.850
Flt Protected					0.950	
Satd. Flow (prot)	0	1560	1516	0	1662	1501
Flt Permitted					0.950	
Satd. Flow (perm)	0	1560	1516	0	1658	1501
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)						382
Link Speed (mph)		35	35		25	
Link Distance (ft)		512	577		267	
Travel Time (s)		10.0	11.2		7.3	
Confl. Peds. (#/hr)	3			3	1	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	0%	3%	6%	0%	5%	4%
Parking (#/hr)		5	5			
Adj. Flow (vph)	0	1021	485	0	237	452
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	1021	485	0	237	452
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(ft)		11	11		11	
Link Offset(ft)		0	0		0	
Crosswalk Width(ft)		16	16		16	
Two way Left Turn Lane						
Headway Factor	1.04	1.24	1.24	1.04	1.04	1.04
Turning Speed (mph)	15			9	15	9
Number of Detectors		2	2		1	1
Detector Template		Thru	Thru		Left	Right
Leading Detector (ft)		100	100		20	20
Trailing Detector (ft)		0	0		0	0
Detector 1 Position(ft)		0	0		0	0
Detector 1 Size(ft)		6	6		20	20
Detector 1 Type		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)		0.0	0.0		0.0	0.0
Detector 1 Queue (s)		0.0	0.0		0.0	0.0
Detector 1 Delay (s)		0.0	0.0		0.0	0.0
Detector 2 Position(ft)		94	94			
Detector 2 Size(ft)		6	6			
Detector 2 Type		Cl+Ex	Cl+Ex			
Detector 2 Channel						
Detector 2 Extend (s)		0.0	0.0			
Turn Type		NA	NA		Perm	Perm
Protected Phases		4	8			



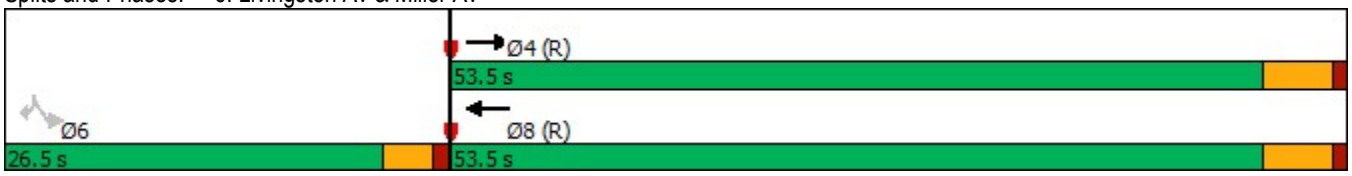
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Permitted Phases					6	6
Detector Phase		4	8		6	6
Switch Phase						
Minimum Initial (s)		20.0	20.0		10.0	10.0
Minimum Split (s)		32.0	32.0		26.5	26.5
Total Split (s)		53.5	53.5		26.5	26.5
Total Split (%)		66.9%	66.9%		33.1%	33.1%
Maximum Green (s)		48.4	48.4		22.5	22.5
Yellow Time (s)		4.1	4.1		3.0	3.0
All-Red Time (s)		1.0	1.0		1.0	1.0
Lost Time Adjust (s)		0.0	0.0		0.0	0.0
Total Lost Time (s)		5.1	5.1		4.0	4.0
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)		1.0	1.0		4.0	4.0
Recall Mode		C-Max	C-Max		None	None
Walk Time (s)		13.0	13.0		7.0	7.0
Flash Dont Walk (s)		7.0	7.0		10.0	10.0
Pedestrian Calls (#/hr)		0	0		0	0
Act Effct Green (s)		53.0	53.0		17.9	17.9
Actuated g/C Ratio		0.66	0.66		0.22	0.22
v/c Ratio		0.99	0.48		0.64	0.72
Control Delay		30.7	5.2		35.7	12.2
Queue Delay		2.3	0.0		0.0	0.0
Total Delay		33.0	5.2		35.7	12.2
LOS		C	A		D	B
Approach Delay		33.0	5.2		20.2	
Approach LOS		C	A		C	
90th %ile Green (s)		48.4	48.4		22.5	22.5
90th %ile Term Code		Coord	Coord		Max	Max
70th %ile Green (s)		49.4	49.4		21.5	21.5
70th %ile Term Code		Coord	Coord		Gap	Gap
50th %ile Green (s)		52.6	52.6		18.3	18.3
50th %ile Term Code		Coord	Coord		Gap	Gap
30th %ile Green (s)		55.1	55.1		15.8	15.8
30th %ile Term Code		Coord	Coord		Gap	Gap
10th %ile Green (s)		59.6	59.6		11.3	11.3
10th %ile Term Code		Coord	Coord		Gap	Gap
Queue Length 50th (ft)		100	35		107	28
Queue Length 95th (ft)		#793	103		168	116
Internal Link Dist (ft)		432	497		187	
Turn Bay Length (ft)						
Base Capacity (vph)		1033	1004		466	696
Starvation Cap Reductn		0	0		0	0
Spillback Cap Reductn		11	0		0	0
Storage Cap Reductn		0	0		0	0
Reduced v/c Ratio		1.00	0.48		0.51	0.65

Intersection Summary

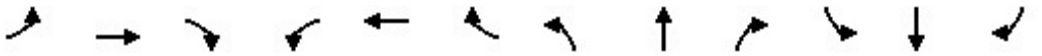
Area Type:	Other		
Cycle Length: 80			
Actuated Cycle Length: 80			
Offset: 72 (90%), Referenced to phase 4:EBT and 8:WBT, Start of Green			
Natural Cycle: 90			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.99			
Intersection Signal Delay: 22.9		Intersection LOS: C	
Intersection Capacity Utilization 71.1%		ICU Level of Service C	
Analysis Period (min) 15			

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 6: Livingston Av & Miller Av



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	319	749	0	0	438	105	9	82	25	0	0	0
Future Volume (vph)	319	749	0	0	438	105	9	82	25	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	150		0	0		0	0		0	0		0
Storage Lanes	1		0	0		0	0		0	0		0
Taper Length (ft)	25			0			0			0		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor								0.99				
Frt					0.974			0.971				
Flt Protected	0.950							0.996				
Satd. Flow (prot)	1694	1560	0	0	1490	0	0	1715	0	0	0	0
Flt Permitted	0.414							0.996				
Satd. Flow (perm)	738	1560	0	0	1490	0	0	1714	0	0	0	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)					27			17				
Link Speed (mph)		35			35			25			25	
Link Distance (ft)		577			1576			192			127	
Travel Time (s)		11.2			30.7			5.2			3.5	
Confl. Peds. (#/hr)			2	2			2		5	5		2
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles (%)	3%	3%	0%	0%	6%	1%	13%	1%	5%	0%	0%	0%
Parking (#/hr)		5			5	5						
Adj. Flow (vph)	343	805	0	0	471	113	10	88	27	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	343	805	0	0	584	0	0	125	0	0	0	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		11			11			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.04	1.24	1.04	1.04	1.24	1.04	1.04	1.04	1.04	1.04	1.04	1.04
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2			2		1	2				
Detector Template	Left	Thru			Thru		Left	Thru				
Leading Detector (ft)	20	100			100		20	100				
Trailing Detector (ft)	0	0			0		0	0				
Detector 1 Position(ft)	0	0			0		0	0				
Detector 1 Size(ft)	20	6			6		20	6				
Detector 1 Type	Cl+Ex	Cl+Ex			Cl+Ex		Cl+Ex	Cl+Ex				
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0			0.0		0.0	0.0				
Detector 1 Queue (s)	0.0	0.0			0.0		0.0	0.0				
Detector 1 Delay (s)	0.0	0.0			0.0		0.0	0.0				
Detector 2 Position(ft)		94			94			94				
Detector 2 Size(ft)		6			6			6				
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex				
Detector 2 Channel												



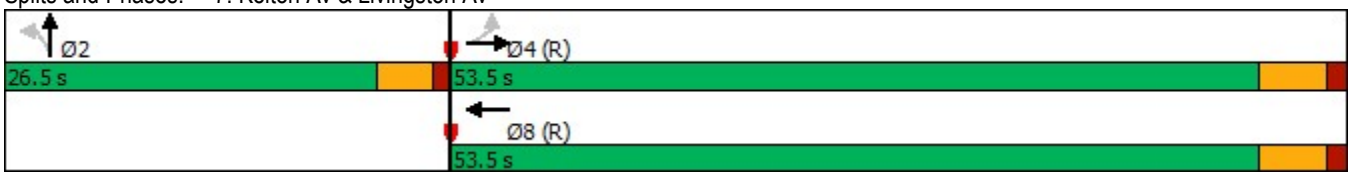
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 2 Extend (s)		0.0			0.0			0.0				
Turn Type	Perm	NA			NA		Perm	NA				
Protected Phases		4			8			2				
Permitted Phases	4						2					
Detector Phase	4	4			8		2	2				
Switch Phase												
Minimum Initial (s)	15.0	15.0			15.0		10.0	10.0				
Minimum Split (s)	27.0	27.0			27.0		26.5	26.5				
Total Split (s)	53.5	53.5			53.5		26.5	26.5				
Total Split (%)	66.9%	66.9%			66.9%		33.1%	33.1%				
Maximum Green (s)	48.1	48.1			48.1		22.1	22.1				
Yellow Time (s)	4.1	4.1			4.1		3.4	3.4				
All-Red Time (s)	1.3	1.3			1.3		1.0	1.0				
Lost Time Adjust (s)	0.0	0.0			0.0			0.0				
Total Lost Time (s)	5.4	5.4			5.4			4.4				
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.7	3.7			3.7		4.0	4.0				
Recall Mode	C-Max	C-Max			C-Max		None	None				
Walk Time (s)	8.0	8.0			8.0		7.0	7.0				
Flash Dont Walk (s)	7.0	7.0			7.0		8.0	8.0				
Pedestrian Calls (#/hr)	0	0			0		0	0				
Act Effct Green (s)	62.1	62.1			62.1			12.0				
Actuated g/C Ratio	0.78	0.78			0.78			0.15				
v/c Ratio	0.60	0.66			0.50			0.46				
Control Delay	5.6	4.7			3.5			31.9				
Queue Delay	0.0	0.5			0.0			0.0				
Total Delay	5.6	5.1			3.5			31.9				
LOS	A	A			A			C				
Approach Delay		5.3			3.5			31.9				
Approach LOS		A			A			C				
90th %ile Green (s)	54.5	54.5			54.5		15.7	15.7				
90th %ile Term Code	Coord	Coord			Coord		Gap	Gap				
70th %ile Green (s)	57.1	57.1			57.1		13.1	13.1				
70th %ile Term Code	Coord	Coord			Coord		Gap	Gap				
50th %ile Green (s)	58.9	58.9			58.9		11.3	11.3				
50th %ile Term Code	Coord	Coord			Coord		Gap	Gap				
30th %ile Green (s)	60.2	60.2			60.2		10.0	10.0				
30th %ile Term Code	Coord	Coord			Coord		Min	Min				
10th %ile Green (s)	74.6	74.6			74.6		0.0	0.0				
10th %ile Term Code	Coord	Coord			Coord		Skip	Skip				
Queue Length 50th (ft)	36	84			27			50				
Queue Length 95th (ft)	m39	m89			m37			95				
Internal Link Dist (ft)		497			1496			112			47	
Turn Bay Length (ft)	150											
Base Capacity (vph)	573	1211			1163			485				
Starvation Cap Reductn	0	113			0			0				
Spillback Cap Reductn	0	0			0			0				
Storage Cap Reductn	0	0			0			0				

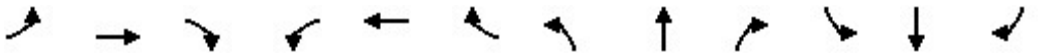
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Reduced v/c Ratio	0.60	0.73			0.50			0.26				

Intersection Summary			
Area Type:	Other		
Cycle Length: 80			
Actuated Cycle Length: 80			
Offset: 5 (6%), Referenced to phase 4:EBTL and 8:WBT, Start of Green			
Natural Cycle: 80			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.66			
Intersection Signal Delay: 6.5		Intersection LOS: A	
Intersection Capacity Utilization 71.1%		ICU Level of Service C	
Analysis Period (min) 15			

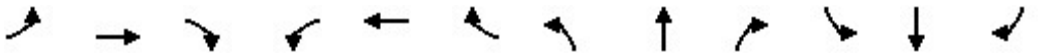
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 7: Kelton Av & Livingston Av





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	32	683	54	40	470	48	36	403	72	44	313	59
Future Volume (vph)	32	683	54	40	470	48	36	403	72	44	313	59
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	150		0	375		0	0		0	0		0
Storage Lanes	1		0	1		0	0		0	0		0
Taper Length (ft)	25			25			0			0		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	0.99	1.00			1.00			0.99			0.99	
Frt		0.989			0.986			0.981			0.981	
Flt Protected	0.950			0.950				0.996			0.995	
Satd. Flow (prot)	1531	1536	0	1572	1506	0	0	1690	0	0	1676	0
Flt Permitted	0.332			0.158				0.947			0.871	
Satd. Flow (perm)	530	1536	0	261	1506	0	0	1606	0	0	1467	0
Right Turn on Red			Yes			Yes			Yes			No
Satd. Flow (RTOR)		7			9			12				
Link Speed (mph)		35			35			35			35	
Link Distance (ft)		1576			932			368			414	
Travel Time (s)		30.7			18.2			7.2			8.1	
Confl. Peds. (#/hr)	11		13	13		11	9		10	10		9
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	14%	3%	4%	11%	4%	12%	25%	4%	4%	3%	7%	5%
Parking (#/hr)		5	5		5	5						
Adj. Flow (vph)	34	719	57	42	495	51	38	424	76	46	329	62
Shared Lane Traffic (%)												
Lane Group Flow (vph)	34	776	0	42	546	0	0	538	0	0	437	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		11			11			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.04	1.24	1.04	1.04	1.24	1.04	1.04	1.04	1.04	1.04	1.04	1.04
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2		1	2		1	2	
Detector Template	Left	Thru		Left	Thru		Left	Thru		Left	Thru	
Leading Detector (ft)	20	100		20	100		20	100		20	100	
Trailing Detector (ft)	0	0		0	0		0	0		0	0	
Detector 1 Position(ft)	0	0		0	0		0	0		0	0	
Detector 1 Size(ft)	20	6		20	6		20	6		20	6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												



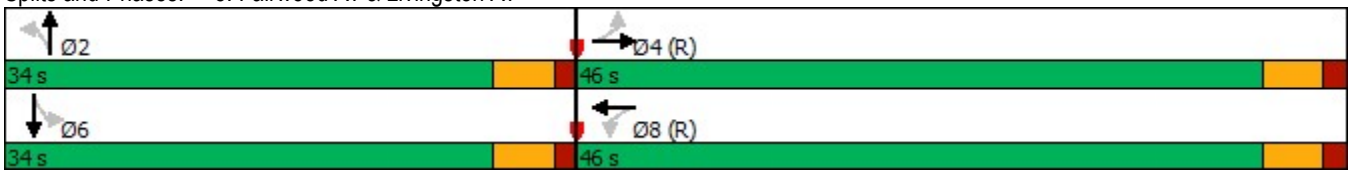
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	15.0	15.0		15.0	15.0		10.0	10.0		10.0	10.0	
Minimum Split (s)	27.0	27.0		27.0	27.0		26.5	26.5		26.5	26.5	
Total Split (s)	46.0	46.0		46.0	46.0		34.0	34.0		34.0	34.0	
Total Split (%)	57.5%	57.5%		57.5%	57.5%		42.5%	42.5%		42.5%	42.5%	
Maximum Green (s)	40.9	40.9		40.9	40.9		29.1	29.1		29.1	29.1	
Yellow Time (s)	3.6	3.6		3.6	3.6		3.6	3.6		3.6	3.6	
All-Red Time (s)	1.5	1.5		1.5	1.5		1.3	1.3		1.3	1.3	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0			0.0			0.0	
Total Lost Time (s)	5.1	5.1		5.1	5.1			4.9			4.9	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		4.0	4.0		4.0	4.0	
Recall Mode	C-Max	C-Max		C-Max	C-Max		None	None		None	None	
Walk Time (s)	8.0	8.0		8.0	8.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	
Act Effct Green (s)	41.7	41.7		41.7	41.7			28.3			28.3	
Actuated g/C Ratio	0.52	0.52		0.52	0.52			0.35			0.35	
v/c Ratio	0.12	0.97		0.31	0.69			0.93			0.84	
Control Delay	6.1	38.8		10.4	13.4			50.4			40.4	
Queue Delay	0.0	0.0		0.0	0.0			0.0			0.0	
Total Delay	6.1	38.8		10.4	13.4			50.4			40.4	
LOS	A	D		B	B			D			D	
Approach Delay		37.5			13.2			50.4			40.4	
Approach LOS		D			B			D			D	
90th %ile Green (s)	40.9	40.9		40.9	40.9		29.1	29.1		29.1	29.1	
90th %ile Term Code	Coord	Coord		Coord	Coord		Max	Max		Max	Max	
70th %ile Green (s)	40.9	40.9		40.9	40.9		29.1	29.1		29.1	29.1	
70th %ile Term Code	Coord	Coord		Coord	Coord		Max	Max		Max	Max	
50th %ile Green (s)	40.9	40.9		40.9	40.9		29.1	29.1		29.1	29.1	
50th %ile Term Code	Coord	Coord		Coord	Coord		Max	Max		Max	Max	
30th %ile Green (s)	40.9	40.9		40.9	40.9		29.1	29.1		29.1	29.1	
30th %ile Term Code	Coord	Coord		Coord	Coord		Max	Max		Hold	Hold	
10th %ile Green (s)	44.7	44.7		44.7	44.7		25.3	25.3		25.3	25.3	
10th %ile Term Code	Coord	Coord		Coord	Coord		Gap	Gap		Hold	Hold	
Queue Length 50th (ft)	7	395		9	221			246			194	
Queue Length 95th (ft)	m8	#221		m8	237			#442			#353	
Internal Link Dist (ft)		1496			852			288			334	
Turn Bay Length (ft)	150			375								
Base Capacity (vph)	275	803		135	788			591			533	
Starvation Cap Reductn	0	0		0	0			0			0	
Spillback Cap Reductn	0	0		0	0			0			0	
Storage Cap Reductn	0	0		0	0			0			0	

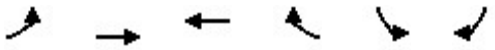
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Reduced v/c Ratio	0.12	0.97		0.31	0.69			0.91			0.82	

Intersection Summary			
Area Type:	Other		
Cycle Length: 80			
Actuated Cycle Length: 80			
Offset: 46 (58%), Referenced to phase 4:EBTL and 8:WBTL, Start of Green			
Natural Cycle: 80			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.97			
Intersection Signal Delay: 34.9		Intersection LOS: C	
Intersection Capacity Utilization 81.0%		ICU Level of Service D	
Analysis Period (min) 15			

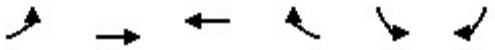
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 8: Fairwood Av & Livingston Av

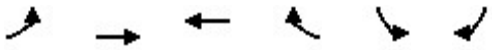




Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	73	917	644	237	182	75
Future Volume (vph)	73	917	644	237	182	75
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	150			0	0	0
Storage Lanes	1			1	1	0
Taper Length (ft)	25				0	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	1.00			0.97	1.00	
Frt				0.850	0.961	
Flt Protected	0.950				0.966	
Satd. Flow (prot)	1482	1576	1560	1313	1653	0
Flt Permitted	0.314				0.966	
Satd. Flow (perm)	489	1576	1560	1270	1647	0
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)				249	25	
Link Speed (mph)		35	35		35	
Link Distance (ft)		841	588		385	
Travel Time (s)		16.4	11.5		7.5	
Confl. Peds. (#/hr)	5			5	3	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	3%	2%	3%	4%	2%	6%
Parking (#/hr)	5	5	5	5		
Adj. Flow (vph)	77	965	678	249	192	79
Shared Lane Traffic (%)						
Lane Group Flow (vph)	77	965	678	249	271	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(ft)		11	11		11	
Link Offset(ft)		0	0		0	
Crosswalk Width(ft)		16	16		16	
Two way Left Turn Lane						
Headway Factor	1.24	1.24	1.24	1.24	1.04	1.04
Turning Speed (mph)	15			9	15	9
Number of Detectors	1	2	2	0	1	
Detector Template	Left	Thru	Thru		Left	
Leading Detector (ft)	20	100	100	0	20	
Trailing Detector (ft)	0	0	0	0	0	
Detector 1 Position(ft)	0	0	0	0	0	
Detector 1 Size(ft)	20	6	6	0	20	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(ft)		94	94			
Detector 2 Size(ft)		6	6			
Detector 2 Type		Cl+Ex	Cl+Ex			
Detector 2 Channel						



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Detector 2 Extend (s)		0.0	0.0			
Turn Type	Perm	NA	NA	Perm	Perm	
Protected Phases		4	8			
Permitted Phases	4			8	6	
Detector Phase	4	4	8	8	6	
Switch Phase						
Minimum Initial (s)	15.0	15.0	15.0	15.0	10.0	
Minimum Split (s)	27.0	27.0	27.0	27.0	26.5	
Total Split (s)	53.0	53.0	53.0	53.0	27.0	
Total Split (%)	66.3%	66.3%	66.3%	66.3%	33.8%	
Maximum Green (s)	47.2	47.2	47.2	47.2	21.3	
Yellow Time (s)	3.6	3.6	3.6	3.6	3.6	
All-Red Time (s)	2.2	2.2	2.2	2.2	2.1	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	5.8	5.8	5.8	5.8	5.7	
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	0.2	0.2	0.2	0.2	4.0	
Recall Mode	C-Max	C-Max	C-Max	C-Max	None	
Walk Time (s)	8.0	8.0	8.0	8.0	7.0	
Flash Dont Walk (s)	7.0	7.0	7.0	7.0	7.0	
Pedestrian Calls (#/hr)	0	0	0	0	0	
Act Effct Green (s)	51.1	51.1	51.1	51.1	17.4	
Actuated g/C Ratio	0.64	0.64	0.64	0.64	0.22	
v/c Ratio	0.25	0.96	0.68	0.28	0.72	
Control Delay	4.5	24.8	14.7	1.9	37.0	
Queue Delay	0.0	0.0	0.2	0.0	0.0	
Total Delay	4.5	24.8	14.9	1.9	37.0	
LOS	A	C	B	A	D	
Approach Delay		23.3	11.4		37.0	
Approach LOS		C	B		D	
90th %ile Green (s)	47.2	47.2	47.2	47.2	21.3	
90th %ile Term Code	Coord	Coord	Coord	Coord	Max	
70th %ile Green (s)	47.8	47.8	47.8	47.8	20.7	
70th %ile Term Code	Coord	Coord	Coord	Coord	Gap	
50th %ile Green (s)	50.4	50.4	50.4	50.4	18.1	
50th %ile Term Code	Coord	Coord	Coord	Coord	Gap	
30th %ile Green (s)	53.1	53.1	53.1	53.1	15.4	
30th %ile Term Code	Coord	Coord	Coord	Coord	Gap	
10th %ile Green (s)	57.1	57.1	57.1	57.1	11.4	
10th %ile Term Code	Coord	Coord	Coord	Coord	Gap	
Queue Length 50th (ft)	7	107	197	0	113	
Queue Length 95th (ft)	m10	m#628	365	27	185	
Internal Link Dist (ft)		761	508		305	
Turn Bay Length (ft)	150					
Base Capacity (vph)	312	1006	996	901	456	
Starvation Cap Reductn	0	0	33	0	0	
Spillback Cap Reductn	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	

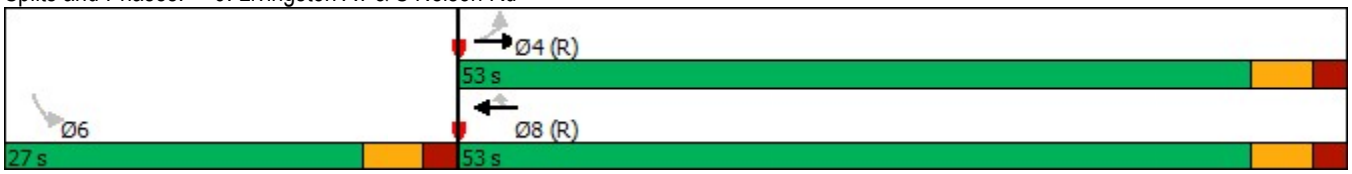


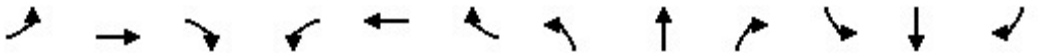
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Reduced v/c Ratio	0.25	0.96	0.70	0.28	0.59	

Intersection Summary			
Area Type:	Other		
Cycle Length: 80			
Actuated Cycle Length: 80			
Offset: 0 (0%), Referenced to phase 4:EBTL and 8:WBT, Start of Green			
Natural Cycle: 90			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.96			
Intersection Signal Delay: 20.0		Intersection LOS: C	
Intersection Capacity Utilization 75.5%		ICU Level of Service D	
Analysis Period (min) 15			

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 9: Livingston Av & S Nelson Rd





Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	6	565	0	0	405	5	58	7	58	14	0	22
Future Volume (Veh/h)	6	565	0	0	405	5	58	7	58	14	0	22
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Hourly flow rate (vph)	7	657	0	0	471	6	67	8	67	16	0	26
Pedestrians					3			11			7	
Lane Width (ft)					11.0			11.0			11.0	
Walking Speed (ft/s)					3.5			3.5			3.5	
Percent Blockage					0			1			1	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)		440			1031							
pX, platoon unblocked	0.99			0.85			0.86	0.86	0.85	0.86	0.86	0.99
vC, conflicting volume	484			668			1182	1166	671	1226	1163	481
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	477			525			1110	1092	529	1162	1088	474
tC, single (s)	4.1			4.1			7.2	6.7	6.2	7.3	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.6	4.2	3.3	3.7	4.0	3.3
p0 queue free %	99			100			54	95	86	86	100	95
cM capacity (veh/h)	1082			889			146	169	464	111	182	577

Direction, Lane #	EB 1	EB 2	WB 1	NB 1	SB 1
Volume Total	7	657	477	142	42
Volume Left	7	0	0	67	16
Volume Right	0	0	6	67	26
cSH	1082	1700	1700	218	222
Volume to Capacity	0.01	0.39	0.28	0.65	0.19
Queue Length 95th (ft)	0	0	0	99	17
Control Delay (s)	8.4	0.0	0.0	47.8	25.0
Lane LOS	A			E	D
Approach Delay (s)	0.1		0.0	47.8	25.0
Approach LOS				E	D

Intersection Summary				
Average Delay	6.0			
Intersection Capacity Utilization	46.9%	ICU Level of Service		A
Analysis Period (min)	15			

Appendix 4: Certified Traffic Memorandum and Growth Rates

Contents:

1. Introduction 4-1

2. Certified Traffic Memorandum & Correspondence 4-2 to 4-86

3. Alum Creek Dr. Traffic Count 4-87 to 4-92

Appendix 4: Certified Traffic Memorandum and Growth Rates

The following table provides a summary of the traffic volumes in the certified traffic memo found in this document. Please see **Appendix 3** for additional wording on how this memo is used.

Table 1: Certified Traffic Summary

	Period	2022	2026	2046
Mainline Peak Hour Volumes	**AM**	220-680	276-693	309-747
	PM	310-940	314-956	345-1,068
Mainline Design Hour Volumes	**AM**	--	290-730	330-930
	PM	--	330-1,010	370-1,130
Average Daily Traffic Volumes (Directional)	**--**	--	4,370-9,800	4,850-10,970
Mainline Design Hour Truck Percentage	**AM**	3 - 7 %		
	PM	2 – 6 %		

The following table highlights the growth used in projecting traffic volumes to future years. The growth rates were provided by the Mid-Ohio Regional Planning Commission. The correspondence for these growth rates is provided in this document.

Table 2: Linear Annual Growth Rates

	Linear Annual Growth Rate [%]			
Approach	Eastbound (EB)	Westbound (WB)	Northbound (NB)	Southbound (SB)
Livingston Ave & S 18th St	0.6	0.5	0.6	-
Livingston Ave & Carpenter St	0.6	0.6	0.6	0.6
Livingston Ave & S Ohio Ave	0.6	0.5	1.9	1.8
Livingston Ave & S Champion Ave	0.5	0.5	1.9	2.1
Livingston Ave & Lockbourne Ave	0.6	0.9	1.2	1.2
Livingston Ave & Miller Ave	0.9	0.6	2.0	-
Livingston Ave & Kelton Ave	0.6	0.5	0.4	0.5
Livingston Ave & Fairwood Ave	0.5	0.5	2.1	2.1
Livingston Ave & S Nelson Rd	0.6	0.4	0.4	-

INTER-OFFICE COMMUNICATION

TO: **Drew Hurst, District 6**

FROM: Bryan Raderstorf, Transportation Engineer, Division of Statewide Planning & Research, Modeling & Forecasting Section

SUBJECT: **FRA-33-15.58-NO PID**

DATE: November 30, 2022

Revisions sent November 21, 2022, plates have been reviewed and are reasonable for use. Attached are plates showing 2022 peak hours and 2026/2046 ADT, PM DHV, AM DHV, and existing truck factors (Td). K and D factors can be calculated from the plates as needed.

If you have any questions, please contact me at (614) 752-5736.

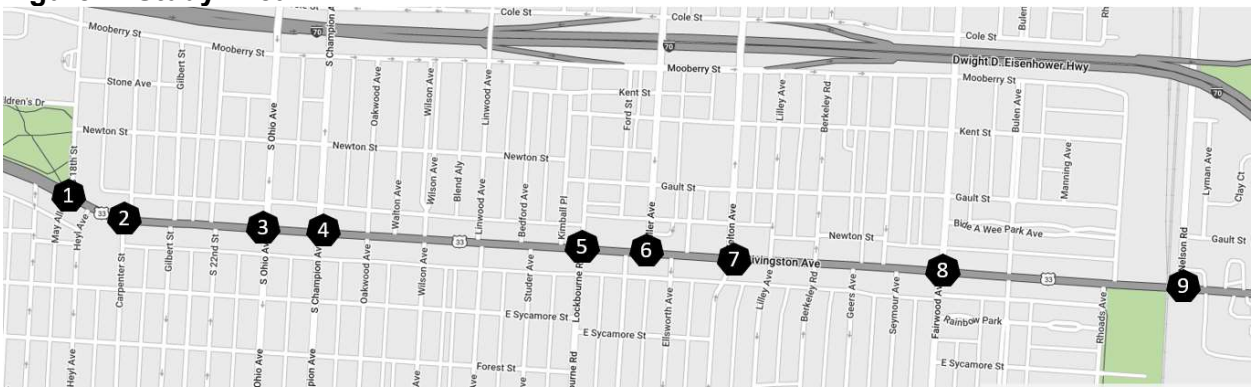
Certified Traffic Memorandum

To	**Michael H. Stevens** **Director, Department of Development, City of Columbus**
From	**John Gallagher, MS, PE, PTOE** **Vice President, Senior Principal Engineer, CHA Consulting, Inc.**
Date	**Revised November 21, 2022 (Original - August 26, 2022)**
City of Columbus Project #	**Capital Improvement Project 440005-102180**
CHA Project #	**074738**
Re:	**Livingston Avenue Pedestrian Safety Study** **Certified Traffic Memorandum**

INTRODUCTION

This Certified Traffic Memorandum presents certified traffic parameters for the Capital Improvement Project 44005-102180 on Livingston Avenue in the City of Columbus, Ohio. The Capital Improvement Project will upgrade traffic signals and modify roadway geometry at nine (9) intersections along Livingston Avenue in Columbus, Ohio (Study Area can be seen in **Figure 1**). Certified traffic will be used to evaluate the Build condition. New trip generation is not expected as part of the Build condition. However, when developing a growth rate, MORPC considered new developments in the area not directly associated with this project, which are expected to add traffic to the corridor after our traffic counts were conducted. Certified traffic was developed for 2026 (opening year) and 2046 (design year). The parameters include Average Daily Traffic (ADT), Design Hourly Volume (DHV), and Design hour Truck percentage (TD). A detailed description of the methodology for preparing forecasted traffic parameters is provided in the sections below.

Figure 1: Study Area



471 East Broad Street, Suite 2010, Columbus, OH 43215
T 614.225.8868 • F 614.225.8869 • www.chacompanies.com

DATA COLLECTION

The forecast of traffic parameters for this certified traffic request is included in the following data.

Turning Movement Counts:

Turning movement counts were collected from 6:00-10:00 AM and 3:00-7:00 PM at the nine (9) study intersections. Counts were conducted on Thursday, May 5, 2022, with the following exceptions noted below.

1. Livingston Avenue at S 18th Street (Tuesday, July 26, 2022)
2. Livingston Avenue at Carpenter Street (Thursday, May 12, 2022)
3. Livingston Avenue at South Ohio Avenue
4. Livingston Avenue at South Champion Avenue
5. Livingston Avenue at Lockbourne Road
6. Livingston Avenue at Miller Avenue
7. Livingston Avenue at Kelton Avenue
8. Livingston Avenue at Fairwood Avenue
9. Livingston Avenue at Nelson Road (Thursday, May 19, 2022)

The data collection included the classification of passenger cars and heavy vehicles. It should be noted that variations in peak hour traffic levels between signalized intersections were observed. These variations were expected due to the number of partial intersections (right-in/right-out drives) as well as full private driveways providing additional access within the roadway links within the study corridor. The systemwide peak hour determination identified an AM peak hour of 8:00 – 9:00 AM and a PM peak hour of 3:00 – 4:00 PM for the corridor. These peak hours were used for further analysis. Existing 2022 Peak Hour Traffic Volumes are provided in **Figure 2** (remaining figures are presented at the end of this report).

PROJECTED TRAFFIC PARAMETERS

Projected traffic parameters for this certified traffic request were developed from traffic data collected by CHA (see **Appendix**) and the following methodology.

Growth Rate

The linear annual growth rates were provided by the Mid-Ohio Regional Planning Commission (MORPC) on July 11, 2022, via e-mail (see **Appendix)** and are summarized in **Table 1**. It should be noted that the annual growth rate for the north leg of Livingston Avenue and 18th Street is assumed to be 0.6% which is the same as the south leg of the intersection.

Table 1: Linear Annual Growth Rates

Location	Linear Annual Growth Rate
Livingston Ave east of S 18th St	0.5 %
Livingston Ave west of S 18th St	0.6 %
18th St south of Livingston Ave	0.6 %
Livingston Ave east of Carpenter St	0.6 %
Carpenter St north of Livingston Ave	0.6 %
Livingston Ave west of Carpenter St	0.6 %
Livingston Ave east of Ohio Ave	0.5 %
Ohio Ave north of Livingston Ave	1.9 %
Livingston Ave west of Ohio Ave	0.6 %
Ohio Ave south of Livingston Ave	1.8 %
Livingston Ave east of Champion Ave	0.5 %
Champion Ave north of Livingston Ave	1.9 %
Livingston Ave west of Champion Ave	0.5 %
Champion Ave south of Livingston Ave	2.1 %
Livingston Ave east of Lockbourne Rd	0.9 %
Livingston Ave west of Lockbourne Rd	0.6 %
Lockbourne Rd south of Livingston Rd	1.2 %
Livingston Ave east of Miller Ave	0.6 %
Miller Ave north of Livingston Ave	2.0 %
Livingston Ave west of Miller Ave	0.9 %
Livingston Ave east of Kelton Ave	0.5 %
Kelton Ave north of Livingston Ave	0.4 %
Livingston Ave west of Kelton Ave	0.6 %
Kelton Ave south of Livingston Ave	0.5 %
Livingston Ave east of Fairwood Ave	0.5 %
Fairwood Ave north of Livingston Ave	2.1 %
Livingston Ave west of Fairwood Ave	0.5 %
Fairwood Ave south of Livingston Ave	2.1 %
Livingston Ave east of Nelson Rd	0.4 %
Nelson Rd north of Livingston Ave	0.4 %
Livingston Ave west of Nelson Rd	0.6 %

Design Hour Volume

Design hour factors published by the Ohio Department of Transportation (ODOT) were used to convert peak hour volumes to Design Hourly Volumes (DHV). The following equation was used to calculate DHV.

DHV = Design Hour Factor x Peak Hour Traffic Volume

For the purpose of this analysis, DHVs were calculated for the AM and PM peak hours for 2026 (opening year) and 2046 (design year). ODOT publishes design hour factors for calculating DHV based on the functional classification of the roadway and the day of the week and month traffic counts were collected along the roadway[1]. Design hour factors used for projecting traffic parameters are summarized in **Table 2**. Project Opening Year 2026 DHVs are provided in **Figure 3**. Project Design Year 2046 DHVs are provided in **Figure 4**.

[1] https://transportation.ohio.gov/static/Programs/StatewidePlanning/Modeling-Forecasting/Pk2DhrFactors_2018.xlsx

Table 2: Design Hour Factors

Functional Classification	Study Area Roadway (s)	Peak Hour to Design Hour Factor (Thursday for month of May)
Urban Principal Arterial, Urban Minor Arterial, & Urban Minor Collector	All	1.06

Average Daily Traffic

Average daily traffic (ADT) values were calculated by estimating K-Factors (i.e., the percentage of the AADT that occurs during the design hour), then dividing the higher of the AM and PM intersection DHV values by this factor.

ODOT continuous count stations were not available for the entire study area, and as such, Automatic Traffic Recorder (ATR) data were collected at several locations in May 2022, which can be found in the **Appendix**. K-Factors along the study area roadway segments were evaluated using two different methods.

The first method involved estimating K-Factors from the ratio of the DHV (methodology shown in the previous section) to the AADT (estimated from ATR counts using a seasonal adjustment factor[2]).

The second method involved the determination of the proxy K-Factor for roadways with similar functional classifications and AADT values from ODOT's K & D Factors Report[3]. According to the Ohio Traffic Forecasting Manual[4] , the proxy K-Factor should be used if there is no continuous count station nearby. Following the recommended methodology (page 19 of the manual), the proxy K-Factor was determined by identifying facilities with the same functional class, area type, and similar AADT values. With a determined proxy K-Factor, a DHV factor was then calculated according to the formula provided on page 19 of the manual:

$$DHV\ Factor = \frac{Proxy\ K \text{ x } AADT_{site}}{AADT_{site}}$$

The DHV factor calculation returned a value greater than 1, suggesting the proxy K-factor should be used for further analysis.

Detailed calculations performed to develop K-factor are provided in the **Appendix**.

K-Factors developed for the study are summarized in **Table 3**.

[2]https://transportation.ohio.gov/static/Programs/StatewidePlanning/Modeling-Forecasting/CertifiedTrafficToolsData/Seasonal-Adjustment-Factors-2021.pdf
[3] https://www.transportation.ohio.gov/programs/technical-services/traffic-monitoring/k-and-d-factors
[4] https://transportation.ohio.gov/static/Programs/StatewidePlanning/Modeling-Forecasting/Vol-2-ForecastingMethodologies.pdf

Table 3: K-Factors

Roadway Segment	Functional Classification	AADT	K-Factor (site)	Proxy K-Factor	K-Factor used for forecasting
Livingston Ave	Urban Principal Arterial	17,309	9.9%	10.3%	10.3%

2026 and 2046 Average Daily Traffic Volumes are provided in **Figure 5**.

Design Hour and Daily Truck Percentages

The values for the design hour truck percentage (T_D) were calculated from existing 2022 peak hour manual turning movement counts. Design Hour Truck Percentages are provided in **Figure 6**. As 24-hour truck data was not available, the daily truck percentage (T_{24}) are calculated using an assumed daily truck volume. The assumed daily truck volumes are 150% of peak-hour truck volumes observed in the field.

The following traffic plates were compiled for review and are attached for reference:

Figure 2 – Existing 2022 Peak Hour Traffic Volumes
Figure 3 – Project Opening Year 2026 Design Hour Volumes
Figure 4 – Project Design Year 2046 Design Hour Volumes
Figure 5 – 2026 and 2046 Average Daily Traffic Volumes
Figure 6 – Design Hour Truck Percentage T_D

Figure 2 – Existing 2022 Peak Hour Traffic Volumes

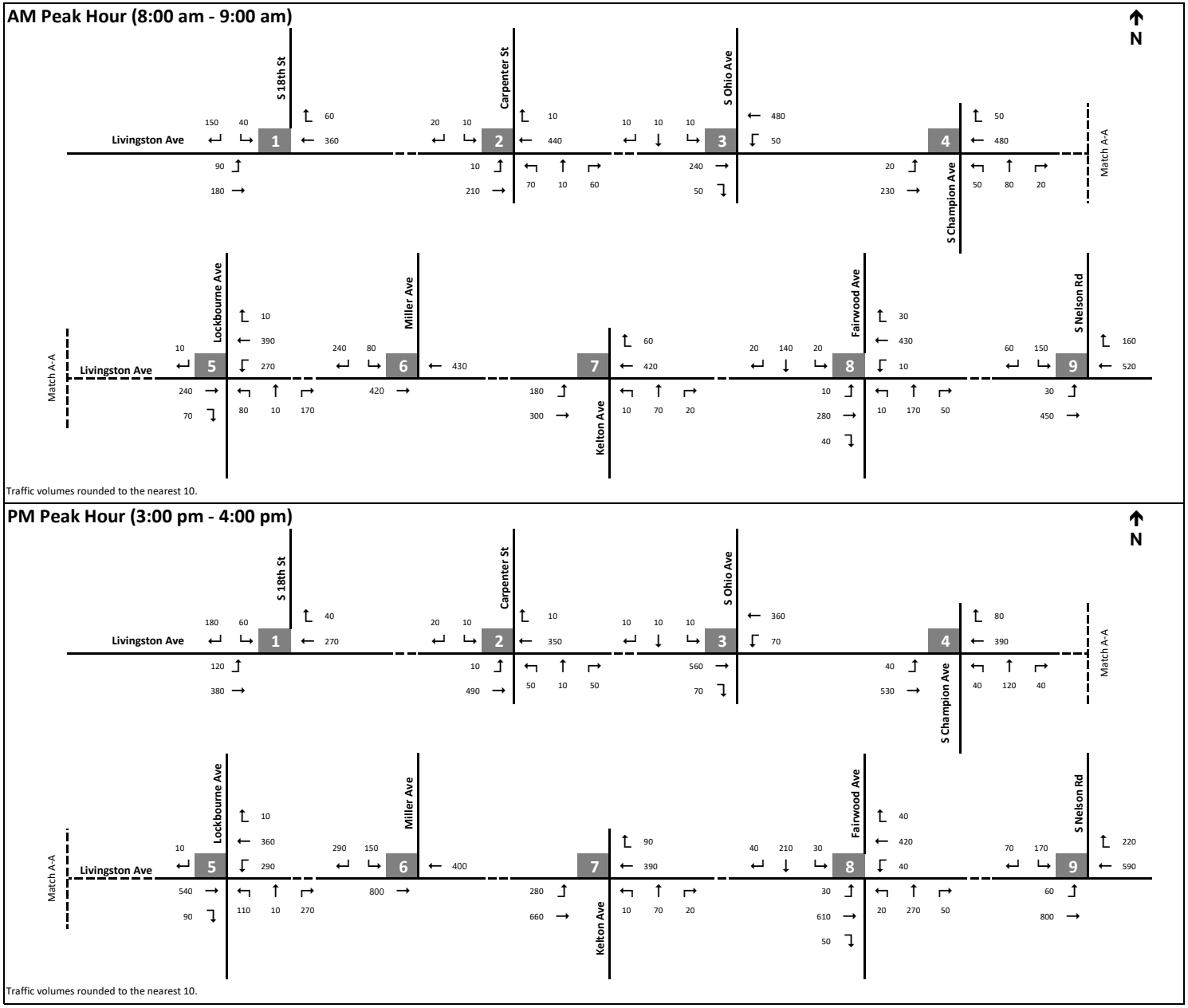
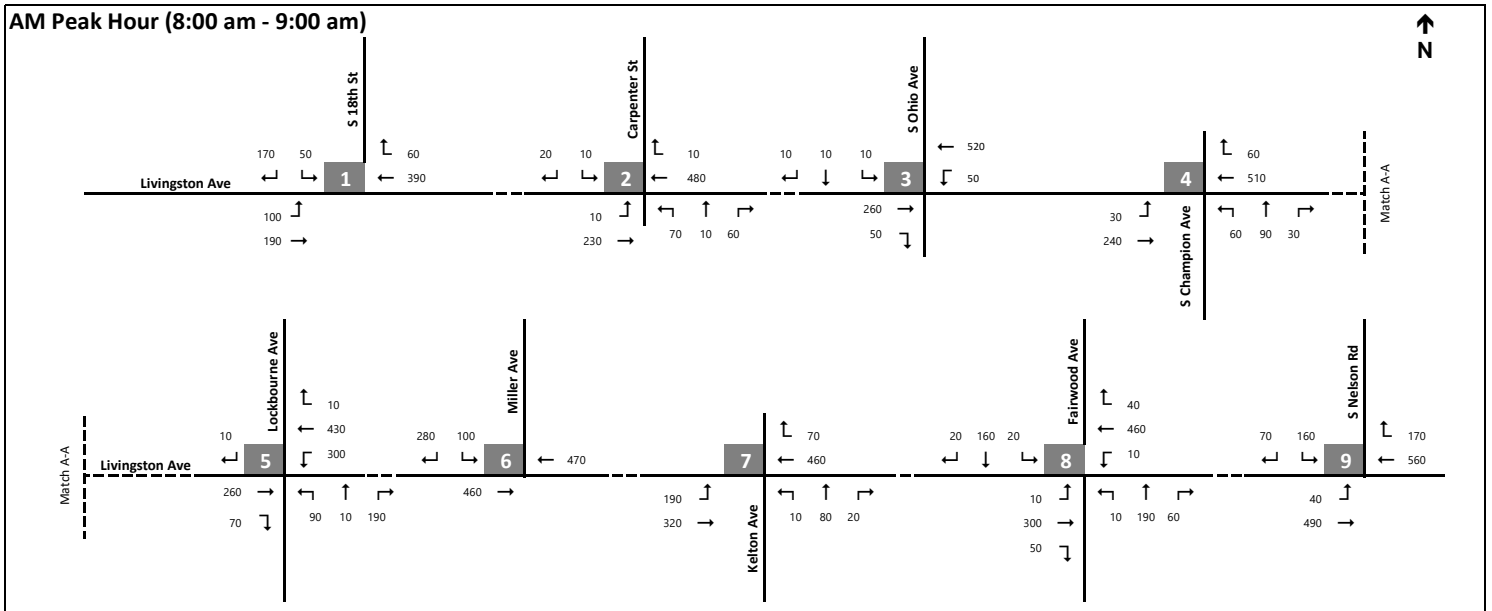
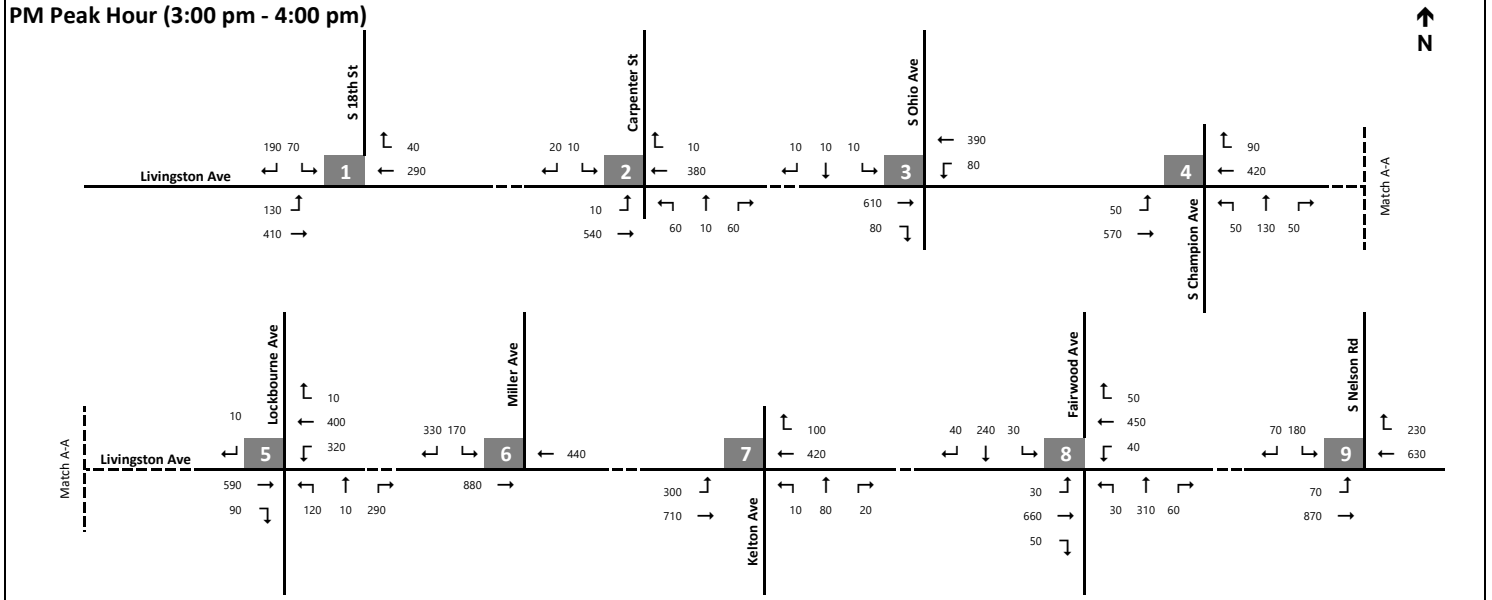


Figure 3 – Project Opening Year (2026) Design Hour Volumes



Traffic volumes rounded to the nearest 10.



Traffic volumes rounded to the nearest 10.

Figure 4 – Project Design Year (2046) Design Hour Volumes

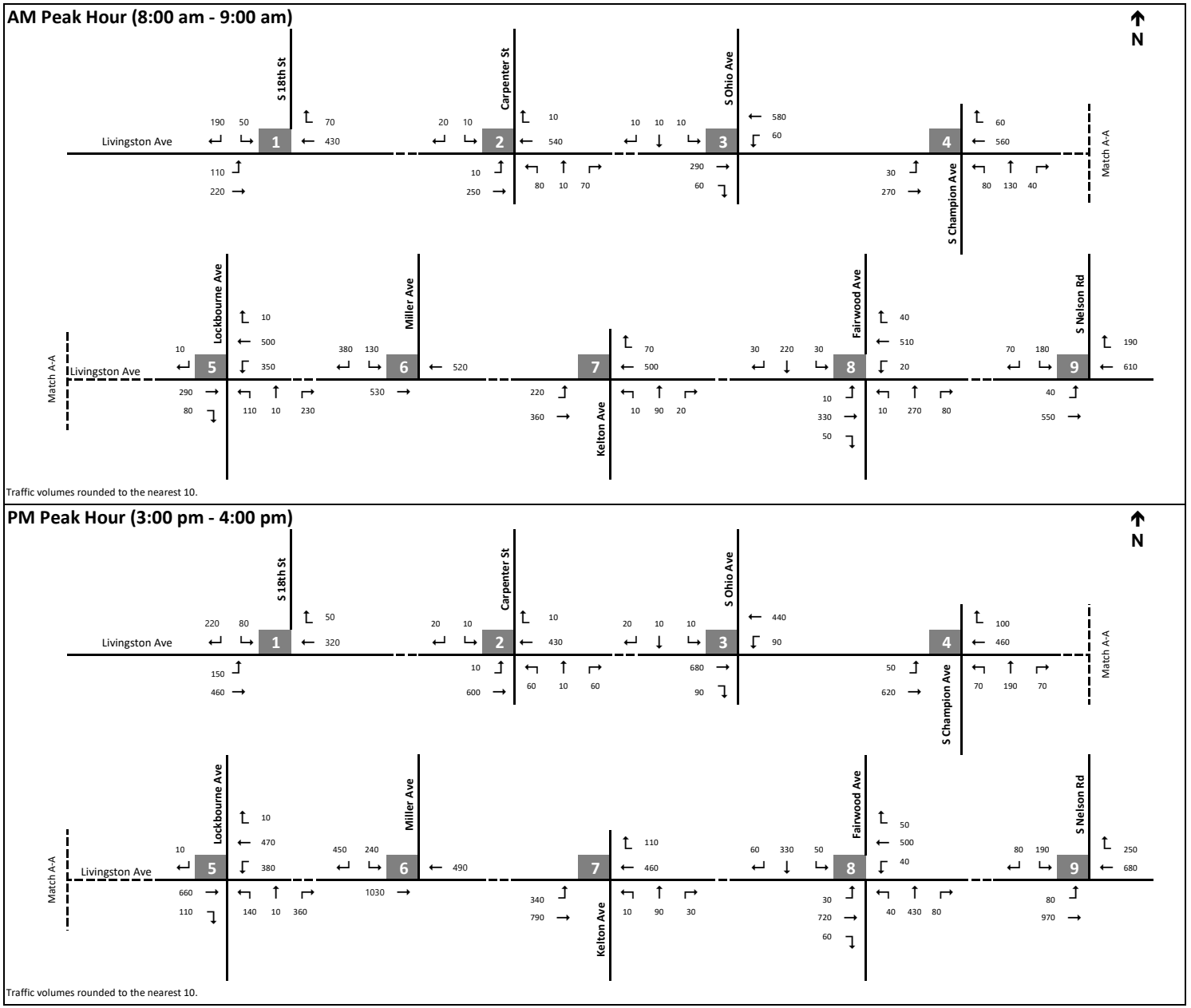


Figure 5 – 2026 and 2046 Average Daily Traffic Volumes

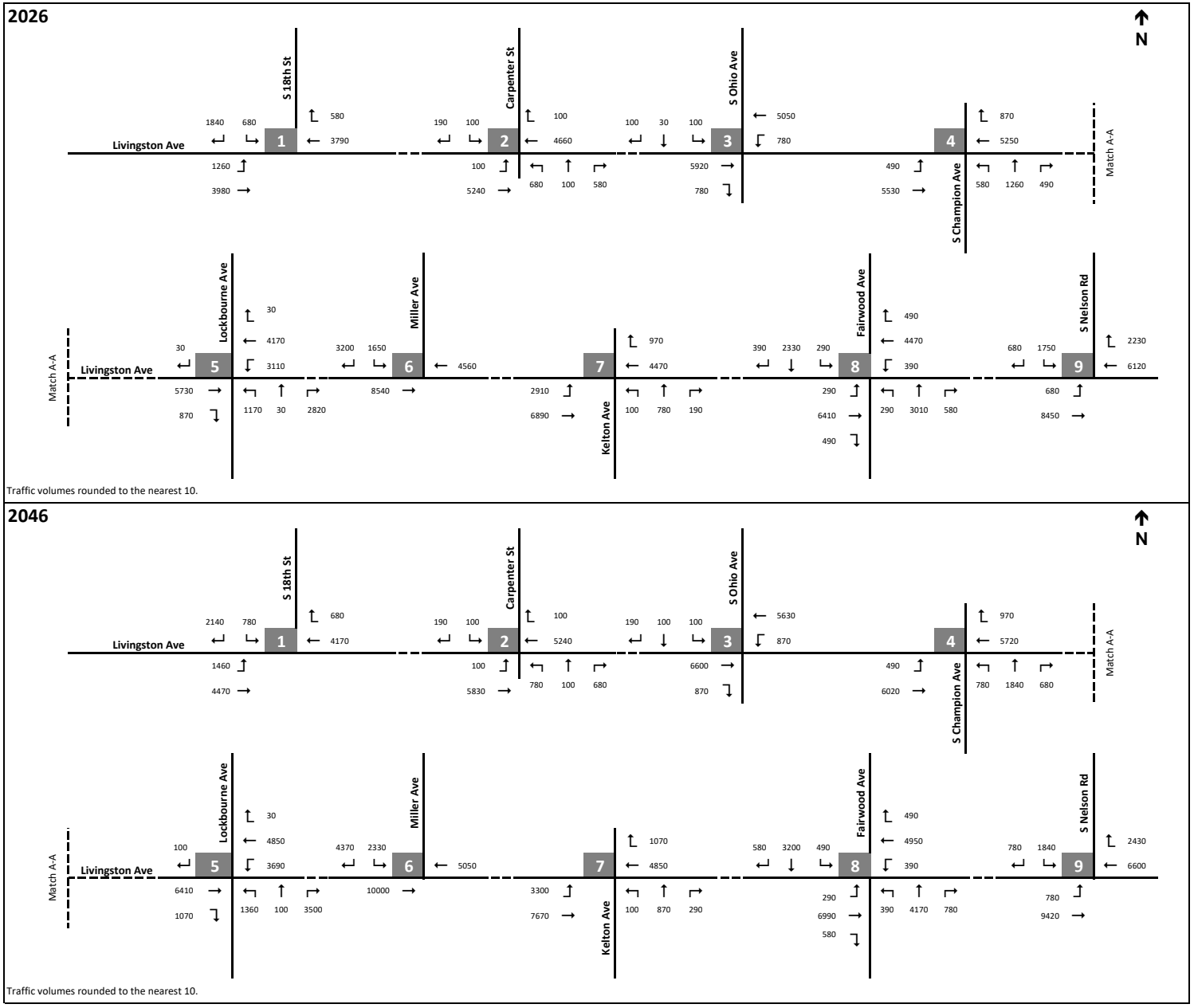
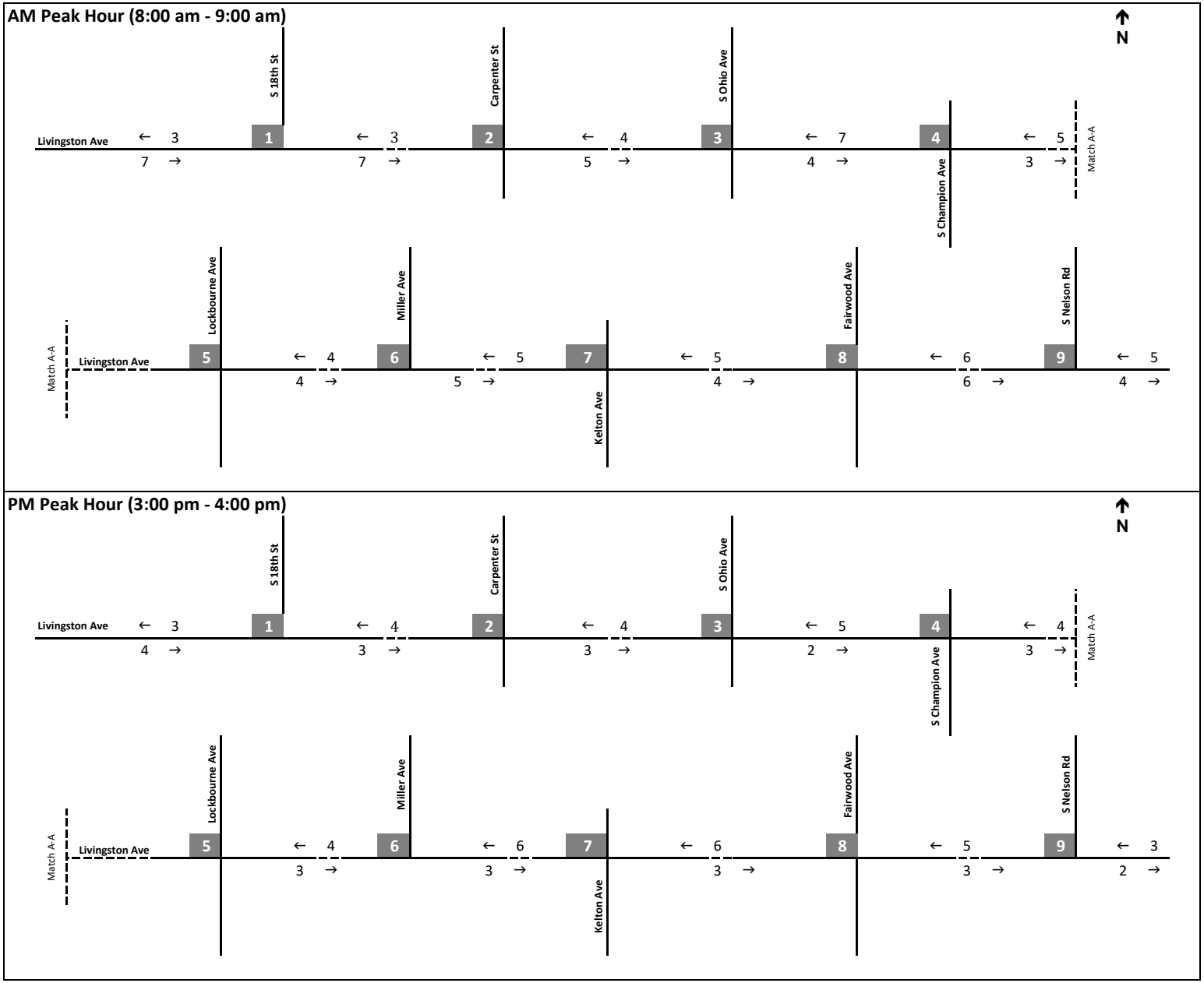


Figure 6 – Design Hour Truck Percentage (T_D)



Appendix

- Annual Growth Rates from the Mid-Ohio Regional Planning Commission (MORPC)
- Automatic Traffic Recorder data (ATR)
- Turning Movement Count Data
- K-factor Calculation Sheet

Annual Growth Rates from the Mid-Ohio Regional Planning Commission (MORPC)

From: Hwashik Jang <hjang@morpc.org>
Sent: Monday, July 11, 2022 3:05 PM
To: Sprungle, Greg R. <GRSprungle@columbus.gov>
Cc: Fought, Patricia R. <prfought@columbus.gov>; Lambert, S. Eric <SELambert@columbus.gov>; Gallagher, John <JGallagher@chacompanies.com>; Lamb, Cory <CLamb@chacompanies.com>; Nick Gill <NGILL@morpc.org>; Maria Schaper <mschaper@morpc.org>
Subject: [--EXTERNAL--]: RE: Livingston Between 18th and Nelson Growth Rates

Greg,

We have completed processing growth rates for your Livingston Ave traffic study.

Please use linear annual growth rates as summarized below.

Location	Linear Annual Growth Rate
Livingston Ave e/o 18th St	0.50%
Livingston Ave w/o 18th St	0.60%
18th St s/o Livingston Ave	0.60%
Livingston Ave e/o Carpenter St	0.60%
Carpenter St n/o Livingston Ave	0.60%
Livingston Ave w/o Carpenter St	0.60%
Livingston Ave e/o Ohio Ave	0.50%
Ohio Ave n/o Livingston Ave	1.90%
Livingston Ave w/o Ohio Ave	0.60%
Ohio Ave s/o Livingston Ave	1.80%
Livingston Ave e/o Champion Ave	0.50%
Champion Ave n/o Livingston Ave	1.90%
Livingston Ave w/o Champion Ave	0.50%
Champion Ave s/o Livingston Ave	2.10%
Livingston Ave e/o Lockbourne Rd	0.90%
Livingston Ave w/o Lockbourne Rd	0.60%
Lockbourne Rd s/o Livingston Rd	1.20%
Livingston Ave e/o Miller Ave	0.60%
Miller Ave n/o Livingston Ave	2.00%
Livingston Ave w/o Miller Ave	0.90%
Livingston Ave e/o Kelton Ave	0.50%
Kelton Ave n/o Livingston Ave	0.40%
Livingston Ave w/o Kelton Ave	0.60%

Kelton Ave s/o Livingston Ave	0.50%
Livingston Ave e/o Fairwood Ave	0.50%
Fairwood Ave n/o Livingston Ave	2.10%
Livingston Ave w/o Fairwood Ave	0.50%
Fairwood Ave s/o Livingston Ave	2.10%
Livingston Ave e/o Nelson Rd	0.40%
Nelson Rd n/o Livingston Ave	0.40%
Livingston Ave w/o Nelson Rd	0.60%

Note: *The above rate was derived based on planning level analysis by using MORPC's regional travel demand model.*

If you have any questions, please let me know.

Thanks,

HWASHIK JANG
Senior Planner | **Mid-Ohio Regional Planning Commission**
T: 614.233.4145 | hjang@morpc.org
111 Liberty Street, Suite 100 | Columbus, OH 43215

From: Sprungle, Greg R. <GRSprungle@columbus.gov>
Sent: Thursday, June 9, 2022 11:26 AM
To: Maria Schaper <mschaper@morpc.org>; Nick Gill <NGILL@morpc.org>; Hwashik Jang <hjang@morpc.org>
Cc: Fought, Patricia R. <prfought@columbus.gov>; Lambert, S. Eric <SELambert@columbus.gov>; Gallagher, John <JGallagher@chacompanies.com>; Lamb, Cory <CLamb@chacompanies.com>
Subject: Livingston Between 18th and Nelson Growth Rates

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All,
We are requesting growth rates for the attached counted intersections. The opening year is 2026 and the design year is 2046. We will have ADT counts at 3 locations along the corridor available in the near future to supplement this data. Please let me know if you need any additional information.

Thanks,

Greg R. Sprungle, P.E.
Traffic Studies Engineer
Division of Traffic Management

HE | HIM | HIS

Automatic Traffic Recorder data (ATR)

Smart Services, Inc.
88 W. Church Street
Newark, OH 43055
(740) 345-4700

Counter 17
Livingston Ave
BTW Carpenter St & Gilbert St

Site: 1EB
5/18/2022
Wednesday

Daily Volume, per Channel (Volume factor 0.5)

EB

Interval Start			Interval Start		
12:00 AM	14	52	12:00 PM	98	340
12:15 AM	9		12:15 PM	71	
12:30 AM	19		12:30 PM	88	
12:45 AM	10		12:45 PM	83	
1:00 AM	10	63	1:00 PM	110	353
1:15 AM	22		1:15 PM	86	
1:30 AM	18		1:30 PM	69	
1:45 AM	13		1:45 PM	88	
2:00 AM	10	32	2:00 PM	92	392
2:15 AM	6		2:15 PM	105	
2:30 AM	8		2:30 PM	95	
2:45 AM	8		2:45 PM	100	
3:00 AM	10	30	3:00 PM	106	563
3:15 AM	3		3:15 PM	139	
3:30 AM	6		3:30 PM	171	
3:45 AM	11		3:45 PM	147	
4:00 AM	5	18	4:00 PM	146	535
4:15 AM	6		4:15 PM	105	
4:30 AM	1		4:30 PM	150	
4:45 AM	6		4:45 PM	134	
5:00 AM	11	41	5:00 PM	144	457
5:15 AM	6		5:15 PM	108	
5:30 AM	12		5:30 PM	105	
5:45 AM	12		5:45 PM	100	
6:00 AM	21	91	6:00 PM	98	336
6:15 AM	21		6:15 PM	80	
6:30 AM	20		6:30 PM	98	
6:45 AM	29		6:45 PM	60	
7:00 AM	43	233	7:00 PM	76	285
7:15 AM	46		7:15 PM	65	
7:30 AM	82		7:30 PM	82	
7:45 AM	62		7:45 PM	62	
8:00 AM	65	291	8:00 PM	80	265
8:15 AM	62		8:15 PM	72	
8:30 AM	78		8:30 PM	64	
8:45 AM	86		8:45 PM	49	
9:00 AM	80	291	9:00 PM	60	213
9:15 AM	66		9:15 PM	55	
9:30 AM	66		9:30 PM	48	
9:45 AM	79		9:45 PM	50	
10:00 AM	76	296	10:00 PM	38	174
10:15 AM	64		10:15 PM	46	
10:30 AM	83		10:30 PM	44	
10:45 AM	73		10:45 PM	46	
11:00 AM	70	349	11:00 PM	40	135
11:15 AM	99		11:15 PM	31	
11:30 AM	88		11:30 PM	44	
11:45 AM	92		11:45 PM	20	

24 Hour Total 5835

12:00 AM - 12:00 PM	
12 Hour Count	1787
Peak Hour	11:00 AM
Peak Volume	349
Factor	0.88

12:00 PM - 12:00 AM	
12 Hour Count	4048
Peak Hour	3:15 PM
Peak Volume	603
Factor	0.88

Smart Services, Inc.
88 W. Church Street
Newark, OH 43055
(740) 345-4700

Counter 7D
Livingston Ave
BTW Carpenter St & Gilbert St

Site: 1WB
5/19/2022
Thursday

Daily Volume, per Channel (Volume factor 0.5)

	WB				
Interval Start			Interval Start		
12:00 AM	12	45	12:00 PM	80	357
12:15 AM	12		12:15 PM	87	
12:30 AM	15		12:30 PM	94	
12:45 AM	6		12:45 PM	96	
1:00 AM	7	28	1:00 PM	92	353
1:15 AM	7		1:15 PM	99	
1:30 AM	10		1:30 PM	69	
1:45 AM	4		1:45 PM	93	
2:00 AM	7	21	2:00 PM	82	355
2:15 AM	4		2:15 PM	97	
2:30 AM	6		2:30 PM	90	
2:45 AM	4		2:45 PM	86	
3:00 AM	5	26	3:00 PM	92	372
3:15 AM	8		3:15 PM	89	
3:30 AM	4		3:30 PM	91	
3:45 AM	9		3:45 PM	100	
4:00 AM	4	45	4:00 PM	92	363
4:15 AM	10		4:15 PM	102	
4:30 AM	16		4:30 PM	73	
4:45 AM	15		4:45 PM	96	
5:00 AM	17	128	5:00 PM	94	362
5:15 AM	26		5:15 PM	95	
5:30 AM	36		5:30 PM	84	
5:45 AM	49		5:45 PM	89	
6:00 AM	49	342	6:00 PM	80	353
6:15 AM	68		6:15 PM	87	
6:30 AM	101		6:30 PM	94	
6:45 AM	124		6:45 PM	92	
7:00 AM	89	485	7:00 PM	57	258
7:15 AM	140		7:15 PM	69	
7:30 AM	127		7:30 PM	70	
7:45 AM	129		7:45 PM	62	
8:00 AM	107	469	8:00 PM	53	237
8:15 AM	116		8:15 PM	55	
8:30 AM	112		8:30 PM	57	
8:45 AM	134		8:45 PM	72	
9:00 AM	90	357	9:00 PM	52	175
9:15 AM	93		9:15 PM	33	
9:30 AM	84		9:30 PM	53	
9:45 AM	90		9:45 PM	37	
10:00 AM	82	331	10:00 PM	47	170
10:15 AM	89		10:15 PM	41	
10:30 AM	84		10:30 PM	40	
10:45 AM	76		10:45 PM	42	
11:00 AM	78	315	11:00 PM	37	110
11:15 AM	80		11:15 PM	26	
11:30 AM	81		11:30 PM	30	
11:45 AM	76		11:45 PM	17	

24 Hour Total 6057

12:00 AM - 12:00 PM	
12 Hour Count	2592
Peak Hour	7:15 AM
Peak Volume	503
Factor	0.90

12:00 PM - 12:00 AM	
12 Hour Count	3465
Peak Hour	3:30 PM
Peak Volume	385
Factor	0.94

Smart Services, Inc.
88 W. Church Street
Newark, OH 43055
(740) 345-4700

Counter 44
Livingston Ave
BTW Lockbourne Rd & Miller Ave

Site: 2EB
5/25/2022
Wednesday

Daily Volume, per Channel (Volume factor 0.5)

	EB			EB	
Interval Start			Interval Start		
12:00 AM	34	129	12:00 PM	150	541
12:15 AM	44		12:15 PM	164	
12:30 AM	28		12:30 PM	122	
12:45 AM	23		12:45 PM	105	
1:00 AM	24	87	1:00 PM	132	514
1:15 AM	31		1:15 PM	130	
1:30 AM	17		1:30 PM	117	
1:45 AM	15		1:45 PM	135	
2:00 AM	13	50	2:00 PM	117	572
2:15 AM	14		2:15 PM	140	
2:30 AM	13		2:30 PM	152	
2:45 AM	10		2:45 PM	163	
3:00 AM	14	51	3:00 PM	175	764
3:15 AM	14		3:15 PM	202	
3:30 AM	11		3:30 PM	203	
3:45 AM	12		3:45 PM	184	
4:00 AM	7	54	4:00 PM	191	716
4:15 AM	20		4:15 PM	167	
4:30 AM	15		4:30 PM	176	
4:45 AM	12		4:45 PM	182	
5:00 AM	18	91	5:00 PM	186	700
5:15 AM	26		5:15 PM	175	
5:30 AM	20		5:30 PM	172	
5:45 AM	27		5:45 PM	167	
6:00 AM	38	197	6:00 PM	128	508
6:15 AM	38		6:15 PM	124	
6:30 AM	65		6:30 PM	128	
6:45 AM	56		6:45 PM	128	
7:00 AM	88	408	7:00 PM	129	488
7:15 AM	99		7:15 PM	118	
7:30 AM	113		7:30 PM	118	
7:45 AM	108		7:45 PM	123	
8:00 AM	102	446	8:00 PM	128	448
8:15 AM	103		8:15 PM	104	
8:30 AM	111		8:30 PM	106	
8:45 AM	130		8:45 PM	110	
9:00 AM	108	422	9:00 PM	121	380
9:15 AM	104		9:15 PM	100	
9:30 AM	110		9:30 PM	77	
9:45 AM	100		9:45 PM	82	
10:00 AM	112	461	10:00 PM	70	277
10:15 AM	107		10:15 PM	74	
10:30 AM	124		10:30 PM	69	
10:45 AM	118		10:45 PM	64	
11:00 AM	148	533	11:00 PM	49	210
11:15 AM	126		11:15 PM	62	
11:30 AM	127		11:30 PM	57	
11:45 AM	132		11:45 PM	42	

24 Hour Total 9047

12:00 AM - 12:00 PM	
12 Hour Count	2929
Peak Hour	11:00 AM
Peak Volume	533
Factor	0.90

12:00 PM - 12:00 AM	
12 Hour Count	6118
Peak Hour	3:15 PM
Peak Volume	780
Factor	0.96

Smart Services, Inc.
88 W. Church Street
Newark, OH 43055
(740) 345-4700

Counter 7D
Livingston Ave
BTW Lockbourne Rd & Miller Ave

Site: 2WB
5/25/2022
Wednesday

Daily Volume, per Channel (Volume factor 0.5)

	WB				
Interval Start			Interval Start		
12:00 AM	50	133	12:00 PM	148	599
12:15 AM	33		12:15 PM	138	
12:30 AM	32		12:30 PM	171	
12:45 AM	18		12:45 PM	142	
1:00 AM	28	98	1:00 PM	116	527
1:15 AM	25		1:15 PM	136	
1:30 AM	26		1:30 PM	129	
1:45 AM	19		1:45 PM	146	
2:00 AM	20	61	2:00 PM	158	624
2:15 AM	10		2:15 PM	158	
2:30 AM	15		2:30 PM	150	
2:45 AM	16		2:45 PM	158	
3:00 AM	20	55	3:00 PM	152	692
3:15 AM	13		3:15 PM	190	
3:30 AM	11		3:30 PM	166	
3:45 AM	11		3:45 PM	184	
4:00 AM	13	60	4:00 PM	171	666
4:15 AM	16		4:15 PM	162	
4:30 AM	15		4:30 PM	168	
4:45 AM	16		4:45 PM	165	
5:00 AM	30	195	5:00 PM	154	624
5:15 AM	37		5:15 PM	159	
5:30 AM	53		5:30 PM	164	
5:45 AM	75		5:45 PM	147	
6:00 AM	82	410	6:00 PM	182	684
6:15 AM	81		6:15 PM	174	
6:30 AM	121		6:30 PM	164	
6:45 AM	126		6:45 PM	164	
7:00 AM	134	587	7:00 PM	128	552
7:15 AM	151		7:15 PM	146	
7:30 AM	142		7:30 PM	150	
7:45 AM	160		7:45 PM	128	
8:00 AM	165	692	8:00 PM	134	518
8:15 AM	180		8:15 PM	124	
8:30 AM	185		8:30 PM	118	
8:45 AM	162		8:45 PM	142	
9:00 AM	158	561	9:00 PM	108	414
9:15 AM	136		9:15 PM	110	
9:30 AM	107		9:30 PM	102	
9:45 AM	160		9:45 PM	94	
10:00 AM	116	506	10:00 PM	67	330
10:15 AM	142		10:15 PM	103	
10:30 AM	118		10:30 PM	82	
10:45 AM	130		10:45 PM	78	
11:00 AM	134	543	11:00 PM	58	229
11:15 AM	138		11:15 PM	51	
11:30 AM	152		11:30 PM	64	
11:45 AM	119		11:45 PM	56	

24 Hour Total 10360

12:00 AM - 12:00 PM	
12 Hour Count	3901
Peak Hour	8:00 AM
Peak Volume	692
Factor	0.94

12:00 PM - 12:00 AM	
12 Hour Count	6459
Peak Hour	3:15 PM
Peak Volume	711
Factor	0.94

Smart Services, Inc.
88 W. Church Street
Newark, OH 43055
(740) 345-4700

Counter 3D
Livingston Ave
BTW Bulen Ave & Rhoads Ave

Site: 3EB
5/18/2022
Wednesday

Daily Volume, per Channel (Volume factor 0.5)

EB

Interval Start			Interval Start		
12:00 AM	31	131	12:00 PM	140	502
12:15 AM	27		12:15 PM	125	
12:30 AM	36		12:30 PM	135	
12:45 AM	37		12:45 PM	102	
1:00 AM	24	96	1:00 PM	121	482
1:15 AM	28		1:15 PM	129	
1:30 AM	23		1:30 PM	127	
1:45 AM	21		1:45 PM	105	
2:00 AM	21	63	2:00 PM	124	520
2:15 AM	11		2:15 PM	136	
2:30 AM	21		2:30 PM	123	
2:45 AM	10		2:45 PM	137	
3:00 AM	12	38	3:00 PM	158	674
3:15 AM	12		3:15 PM	160	
3:30 AM	8		3:30 PM	164	
3:45 AM	6		3:45 PM	192	
4:00 AM	13	50	4:00 PM	189	667
4:15 AM	9		4:15 PM	170	
4:30 AM	12		4:30 PM	166	
4:45 AM	16		4:45 PM	142	
5:00 AM	21	95	5:00 PM	185	662
5:15 AM	24		5:15 PM	190	
5:30 AM	27		5:30 PM	142	
5:45 AM	23		5:45 PM	145	
6:00 AM	33	168	6:00 PM	118	471
6:15 AM	40		6:15 PM	125	
6:30 AM	47		6:30 PM	129	
6:45 AM	48		6:45 PM	99	
7:00 AM	74	331	7:00 PM	115	425
7:15 AM	76		7:15 PM	94	
7:30 AM	89		7:30 PM	116	
7:45 AM	92		7:45 PM	100	
8:00 AM	82	377	8:00 PM	114	395
8:15 AM	93		8:15 PM	96	
8:30 AM	104		8:30 PM	102	
8:45 AM	98		8:45 PM	83	
9:00 AM	88	350	9:00 PM	88	334
9:15 AM	80		9:15 PM	82	
9:30 AM	96		9:30 PM	85	
9:45 AM	86		9:45 PM	79	
10:00 AM	90	390	10:00 PM	78	297
10:15 AM	96		10:15 PM	74	
10:30 AM	100		10:30 PM	69	
10:45 AM	104		10:45 PM	76	
11:00 AM	109	456	11:00 PM	58	207
11:15 AM	122		11:15 PM	62	
11:30 AM	126		11:30 PM	56	
11:45 AM	99		11:45 PM	31	

24 Hour Total 8181

12:00 AM - 12:00 PM	
12 Hour Count	2545
Peak Hour	10:45 AM
Peak Volume	461
Factor	0.91

12:00 PM - 12:00 AM	
12 Hour Count	5636
Peak Hour	3:45 PM
Peak Volume	717
Factor	0.93

Smart Services, Inc.
88 W. Church Street
Newark, OH 43055
(740) 345-4700

Counter 44
Livingston Ave
BTW Bulen Ave & Rhoads Ave

Site: 3WB
5/18/2022
Wednesday

Daily Volume, per Channel (Volume factor 0.5)

	WB			WB	
Interval Start			Interval Start		
12:00 AM	31	127	12:00 PM	104	420
12:15 AM	42		12:15 PM	104	
12:30 AM	31		12:30 PM	92	
12:45 AM	23		12:45 PM	120	
1:00 AM	35	96	1:00 PM	122	474
1:15 AM	20		1:15 PM	92	
1:30 AM	26		1:30 PM	148	
1:45 AM	15		1:45 PM	112	
2:00 AM	16	58	2:00 PM	114	475
2:15 AM	18		2:15 PM	122	
2:30 AM	17		2:30 PM	121	
2:45 AM	7		2:45 PM	118	
3:00 AM	13	53	3:00 PM	122	503
3:15 AM	11		3:15 PM	142	
3:30 AM	11		3:30 PM	129	
3:45 AM	18		3:45 PM	110	
4:00 AM	5	61	4:00 PM	124	512
4:15 AM	14		4:15 PM	121	
4:30 AM	20		4:30 PM	115	
4:45 AM	22		4:45 PM	152	
5:00 AM	26	136	5:00 PM	132	515
5:15 AM	25		5:15 PM	125	
5:30 AM	41		5:30 PM	114	
5:45 AM	44		5:45 PM	144	
6:00 AM	58	320	6:00 PM	111	464
6:15 AM	80		6:15 PM	126	
6:30 AM	94		6:30 PM	108	
6:45 AM	88		6:45 PM	119	
7:00 AM	84	460	7:00 PM	87	391
7:15 AM	94		7:15 PM	106	
7:30 AM	134		7:30 PM	98	
7:45 AM	148		7:45 PM	100	
8:00 AM	135	499	8:00 PM	100	316
8:15 AM	118		8:15 PM	66	
8:30 AM	122		8:30 PM	90	
8:45 AM	124		8:45 PM	60	
9:00 AM	106	464	9:00 PM	70	275
9:15 AM	122		9:15 PM	86	
9:30 AM	116		9:30 PM	56	
9:45 AM	120		9:45 PM	63	
10:00 AM	74	332	10:00 PM	51	233
10:15 AM	82		10:15 PM	72	
10:30 AM	86		10:30 PM	60	
10:45 AM	90		10:45 PM	50	
11:00 AM	102	408	11:00 PM	48	169
11:15 AM	100		11:15 PM	38	
11:30 AM	100		11:30 PM	53	
11:45 AM	106		11:45 PM	30	

24 Hour Total 7761

12:00 AM - 12:00 PM	
12 Hour Count	3014
Peak Hour	7:30 AM
Peak Volume	535
Factor	0.90

12:00 PM - 12:00 AM	
12 Hour Count	4747
Peak Hour	4:30 PM
Peak Volume	524
Factor	0.86

Turning Movement Count Data

1) Livingston Ave & 18th St - TMC

Thu May 5, 2022
Full Length (6 AM-10 AM, 3 PM-7 PM)
All Classes (Lights and Motorcycles, Heavy, Scooters (Standing), Pedestrians, Bicycles on Road, Bicycles on Crosswalk)
All Movements
ID: 949457, Location: 39.950753, -82.977506, Site Code: 1

Provided by: Smart Services, Inc.
88 W. Church Street,
Newark, OH, 43055, US

Leg Direction	Livingston Ave Eastbound					Livingston Ave Westbound					18th St Northbound					
Time	T	R	U	**App**	Ped*	L	T	U	**App**	Ped*	L	R	U	**App**	Ped*	**Int**
2022-05-05 6:00AM	33	0	0	**33**	1	0	81	0	**81**	0	4	1	0	**5**	0	**119**
6:15AM	31	0	0	**31**	0	0	73	0	**73**	0	1	1	0	**2**	1	**106**
6:30AM	40	0	0	**40**	2	0	118	0	**118**	0	2	2	0	**4**	1	**162**
6:45AM	52	0	0	**52**	4	0	145	0	**145**	0	2	7	0	**9**	1	**206**
Hourly Total	156	0	0	**156**	7	0	417	0	**417**	0	9	11	0	**20**	3	**593**
7:00AM	53	0	0	**53**	0	0	98	0	**98**	0	3	4	0	**7**	1	**158**
7:15AM	78	0	0	**78**	0	0	140	0	**140**	0	2	5	0	**7**	3	**225**
7:30AM	98	0	0	**98**	1	0	135	0	**135**	0	4	6	0	**10**	0	**243**
7:45AM	97	0	0	**97**	1	0	130	0	**130**	0	2	6	0	**8**	0	**235**
Hourly Total	326	0	0	**326**	2	0	503	0	**503**	0	11	21	0	**32**	4	**861**
8:00AM	96	0	0	**96**	0	0	147	0	**147**	2	4	9	0	**13**	1	**256**
8:15AM	78	0	0	**78**	1	0	144	0	**144**	0	2	3	0	**5**	3	**227**
8:30AM	74	0	0	**74**	1	0	151	0	**151**	1	7	5	0	**12**	1	**237**
8:45AM	91	0	0	**91**	4	0	147	0	**147**	0	4	6	0	**10**	1	**248**
Hourly Total	339	0	0	**339**	6	0	589	0	**589**	3	17	23	0	**40**	6	**968**
9:00AM	62	0	0	**62**	2	0	134	0	**134**	0	3	2	0	**5**	1	**201**
9:15AM	81	0	0	**81**	1	0	106	0	**106**	0	2	4	0	**6**	0	**193**
9:30AM	74	0	0	**74**	0	0	122	0	**122**	0	3	4	0	**7**	0	**203**
9:45AM	81	0	0	**81**	1	0	124	0	**124**	0	4	4	0	**8**	0	**213**
Hourly Total	298	0	0	**298**	4	0	486	0	**486**	0	12	14	0	**26**	1	**810**
3:00PM	132	0	0	**132**	3	0	134	0	**134**	0	1	7	0	**8**	3	**274**
3:15PM	132	0	0	**132**	3	0	123	0	**123**	0	6	15	0	**21**	2	**276**
3:30PM	149	0	0	**149**	2	0	137	1	**138**	0	5	9	0	**14**	1	**301**
3:45PM	135	0	0	**135**	1	0	149	0	**149**	0	6	7	0	**13**	1	**297**
Hourly Total	548	0	0	**548**	9	0	543	1	**544**	0	18	38	0	**56**	7	**1148**
4:00PM	127	0	0	**127**	0	0	135	0	**135**	0	8	11	0	**19**	3	**281**
4:15PM	129	0	0	**129**	1	0	134	0	**134**	0	6	7	0	**13**	1	**276**
4:30PM	161	0	0	**161**	1	0	138	0	**138**	0	17	11	0	**28**	8	**327**
4:45PM	157	0	0	**157**	5	0	139	0	**139**	0	9	13	0	**22**	7	**318**
Hourly Total	574	0	0	**574**	7	0	546	0	**546**	0	40	42	0	**82**	19	**1202**
5:00PM	153	0	0	**153**	1	0	153	0	**153**	0	5	8	0	**13**	1	**319**
5:15PM	146	0	0	**146**	1	0	120	0	**120**	0	6	13	0	**19**	1	**285**
5:30PM	112	0	0	**112**	0	0	122	0	**122**	0	8	7	0	**15**	3	**249**
5:45PM	113	0	0	**113**	0	0	136	0	**136**	0	4	4	0	**8**	0	**257**
Hourly Total	524	0	0	**524**	2	0	531	0	**531**	0	23	32	0	**55**	5	**1110**
6:00PM	106	0	0	**106**	0	0	105	0	**105**	0	0	8	0	**8**	0	**219**
6:15PM	98	0	0	**98**	0	0	101	0	**101**	0	1	6	0	**7**	0	**206**
6:30PM	72	0	0	**72**	0	0	116	0	**116**	0	6	5	0	**11**	2	**199**
6:45PM	101	0	0	**101**	0	0	113	0	**113**	0	3	3	0	**6**	1	**220**
Hourly Total	377	0	0	**377**	0	0	435	0	**435**	0	10	22	0	**32**	3	**844**
Total	3142	0	0	**3142**	37	0	4050	1	**4051**	3	140	203	0	**343**	48	**7536**
% Approach	100%	0%	0%	**-**	-	0%	100.0%	0%	**-**	-	40.8%	59.2%	0%	**-**	-	-
% Total	41.7%	0%	0%	**41.7%**	-	0%	53.7%	0%	**53.8%**	-	1.9%	2.7%	0%	**4.6%**	-	-
Lights and Motorcycles	2974	0	0	**2974**	-	0	3927	1	**3928**	-	137	189	0	**326**	-	7228
% Lights and Motorcycles	94.7%	0%	0%	**94.7%**	-	0%	97.0%	100%	**97.0%**	-	97.9%	93.1%	0%	**95.0%**	-	95.9%
Heavy	166	0	0	**166**	-	0	119	0	**119**	-	2	13	0	**15**	-	300
% Heavy	5.3%	0%	0%	**5.3%**	-	0%	2.9%	0%	**2.9%**	-	1.4%	6.4%	0%	**4.4%**	-	4.0%
Scooters (Standing)	1	0	0	**1**	-	0	0	0	**0**	-	1	0	0	**1**	-	2
% Scooters (Standing)	0%	0%	0%	**0%**	-	0%	0%	0%	**0%**	-	0.7%	0%	0%	**0.3%**	-	0%
Bicycles on Road	1	0	0	**1**	-	0	4	0	**4**	-	0	1	0	**1**	-	6
% Bicycles on Road	0%	0%	0%	**0%**	-	0%	0.1%	0%	**0.1%**	-	0%	0.5%	0%	**0.3%**	-	0.1%
Pedestrians	-	-	-	-	34	-	-	-	-	3	-	-	-	-	43	
% Pedestrians	-	-	-	-	91.9%	-	-	-	-	100%	-	-	-	-	89.6%	-

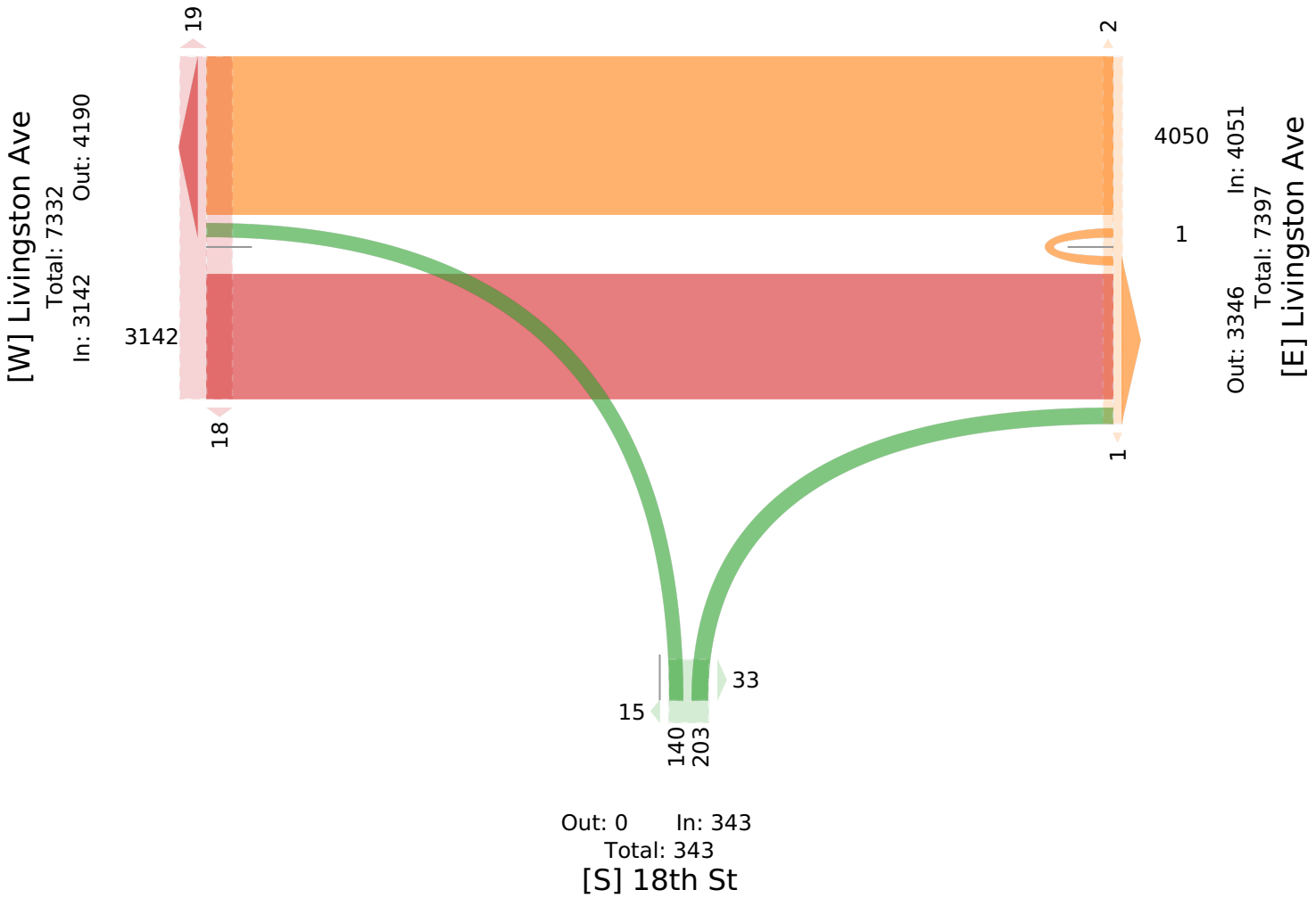
Leg	Livingston Ave					Livingston Ave					18th St					
Direction	Eastbound					Westbound					Northbound					
Time	T	R	U	**App**	Ped*	L	T	U	**App**	Ped*	L	R	U	**App**	Ped*	**Int**
Bicycles on Crosswalk	-	-	-	-	3	-	-	-	-	0	-	-	-	-	5	
% Bicycles on Crosswalk	-	-	-	-	8.1%	-	-	-	-	0%	-	-	-	-	10.4%	-

*Pedestrians and Bicycles on Crosswalk. L: Left, R: Right, T: Thru, U: U-Turn

1) Livingston Ave & 18th St - TMC

Thu May 5, 2022
Full Length (6 AM-10 AM, 3 PM-7 PM)
All Classes (Lights and Motorcycles, Heavy, Scooters (Standing), Pedestrians, Bicycles on Road, Bicycles on Crosswalk)
All Movements
ID: 949457, Location: 39.950753, -82.977506, Site Code: 1

Provided by: Smart Services, Inc.
88 W. Church Street,
Newark, OH, 43055, US



1) Livingston Ave & 18th St - TMC

Thu May 5, 2022
AM Peak (8 AM - 9 AM)
All Classes (Lights and Motorcycles, Heavy, Scooters (Standing), Pedestrians, Bicycles on Road, Bicycles on Crosswalk)
All Movements
ID: 949457, Location: 39.950753, -82.977506, Site Code: 1

Provided by: Smart Services, Inc.
88 W. Church Street,
Newark, OH, 43055, US

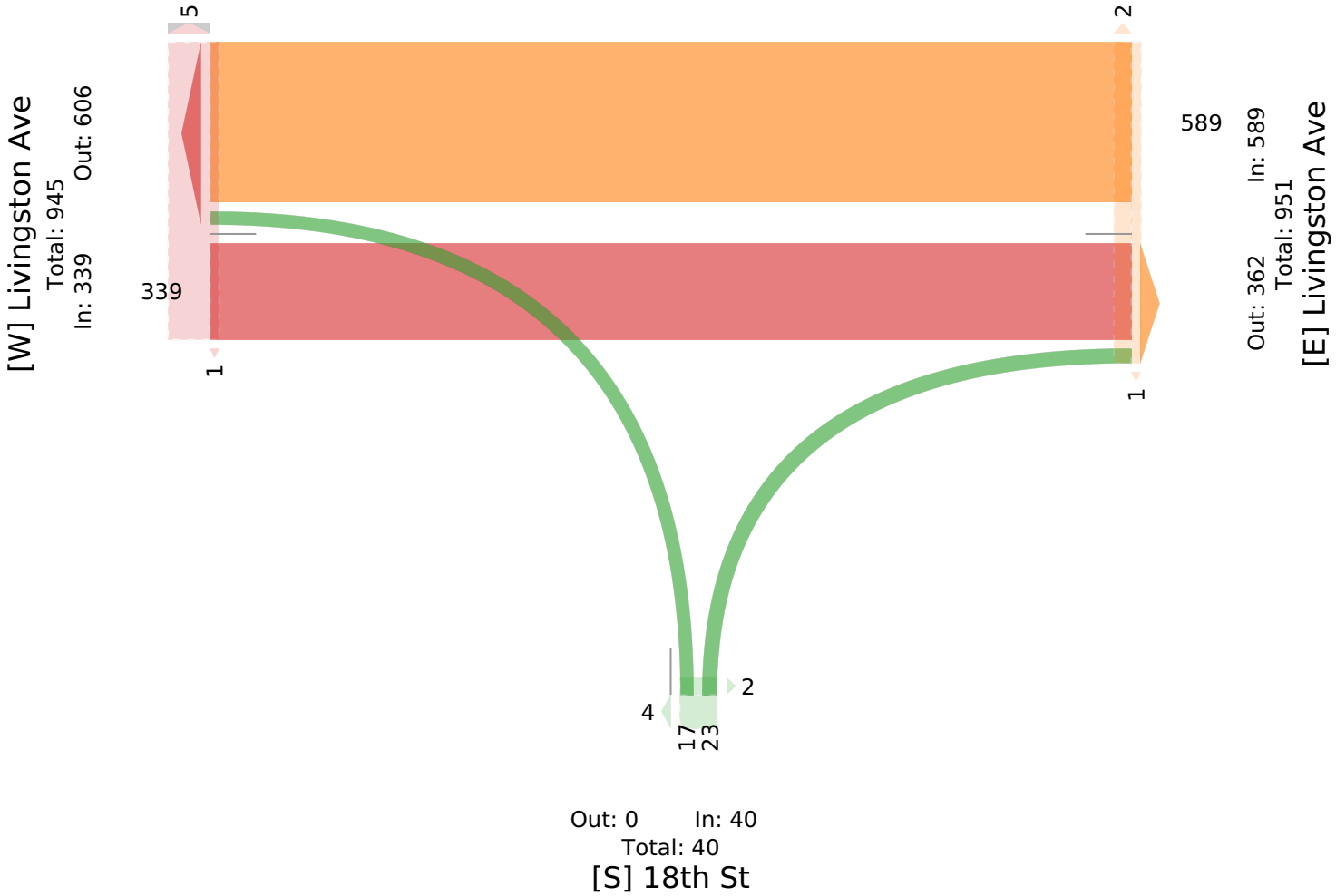
Leg Direction	Livingston Ave Eastbound					Livingston Ave Westbound					18th St Northbound					
Time	T	R	U	**App**	Ped*	L	T	U	**App**	Ped*	L	R	U	**App**	Ped*	**Int**
2022-05-05 8:00AM	96	0	0	**96**	0	0	147	0	**147**	2	4	9	0	**13**	1	**256**
8:15AM	78	0	0	**78**	1	0	144	0	**144**	0	2	3	0	**5**	3	**227**
8:30AM	74	0	0	**74**	1	0	151	0	**151**	1	7	5	0	**12**	1	**237**
8:45AM	91	0	0	**91**	4	0	147	0	**147**	0	4	6	0	**10**	1	**248**
Total	339	0	0	**339**	6	0	589	0	**589**	3	17	23	0	**40**	6	**968**
% Approach	100%	0%	0%	**-**	-	0%	100%	0%	**-**	-	42.5%	57.5%	0%	**-**	-	-
% Total	35.0%	0%	0%	**35.0%**	-	0%	60.8%	0%	**60.8%**	-	1.8%	2.4%	0%	**4.1%**	-	-
PHF	0.883	-	-	**0.883**	-	-	0.974	-	**0.974**	-	0.607	0.639	-	**0.769**	-	0.944
Lights and Motorcycles	316	0	0	**316**	-	0	566	0	**566**	-	17	21	0	**38**	-	920
% Lights and Motorcycles	93.2%	0%	0%	**93.2%**	-	0%	96.1%	0%	**96.1%**	-	100%	91.3%	0%	**95.0%**	-	95.0%
Heavy	23	0	0	**23**	-	0	22	0	**22**	-	0	2	0	**2**	-	47
% Heavy	6.8%	0%	0%	**6.8%**	-	0%	3.7%	0%	**3.7%**	-	0%	8.7%	0%	**5.0%**	-	4.9%
Scooters (Standing)	0	0	0	**0**	-	0	0	0	**0**	-	0	0	0	**0**	-	0
% Scooters (Standing)	0%	0%	0%	**0%**	-	0%	0%	0%	**0%**	-	0%	0%	0%	**0%**	-	0%
Bicycles on Road	0	0	0	**0**	-	0	1	0	**1**	-	0	0	0	**0**	-	1
% Bicycles on Road	0%	0%	0%	**0%**	-	0%	0.2%	0%	**0.2%**	-	0%	0%	0%	**0%**	-	0.1%
Pedestrians	-	-	-	-	5	-	-	-	-	3	-	-	-	-	3	
% Pedestrians	-	-	-	-	83.3%	-	-	-	-	100%	-	-	-	-	50.0%	-
Bicycles on Crosswalk	-	-	-	-	1	-	-	-	-	0	-	-	-	-	3	
% Bicycles on Crosswalk	-	-	-	-	16.7%	-	-	-	-	0%	-	-	-	-	50.0%	-

*Pedestrians and Bicycles on Crosswalk. L: Left, R: Right, T: Thru, U: U-Turn

1) Livingston Ave & 18th St - TMC

Thu May 5, 2022
AM Peak (8 AM - 9 AM)
All Classes (Lights and Motorcycles, Heavy, Scooters (Standing), Pedestrians, Bicycles on Road, Bicycles on Crosswalk)
All Movements
ID: 949457, Location: 39.950753, -82.977506, Site Code: 1

Provided by: Smart Services, Inc.
88 W. Church Street,
Newark, OH, 43055, US



1) Livingston Ave & 18th St - TMC

Thu May 5, 2022
PM Peak (4:30 PM - 5:30 PM) - Overall Peak Hour
All Classes (Lights and Motorcycles, Heavy, Scooters (Standing), Pedestrians, Bicycles on Road, Bicycles on Crosswalk)
All Movements
ID: 949457, Location: 39.950753, -82.977506, Site Code: 1

Provided by: Smart Services, Inc.
88 W. Church Street,
Newark, OH, 43055, US

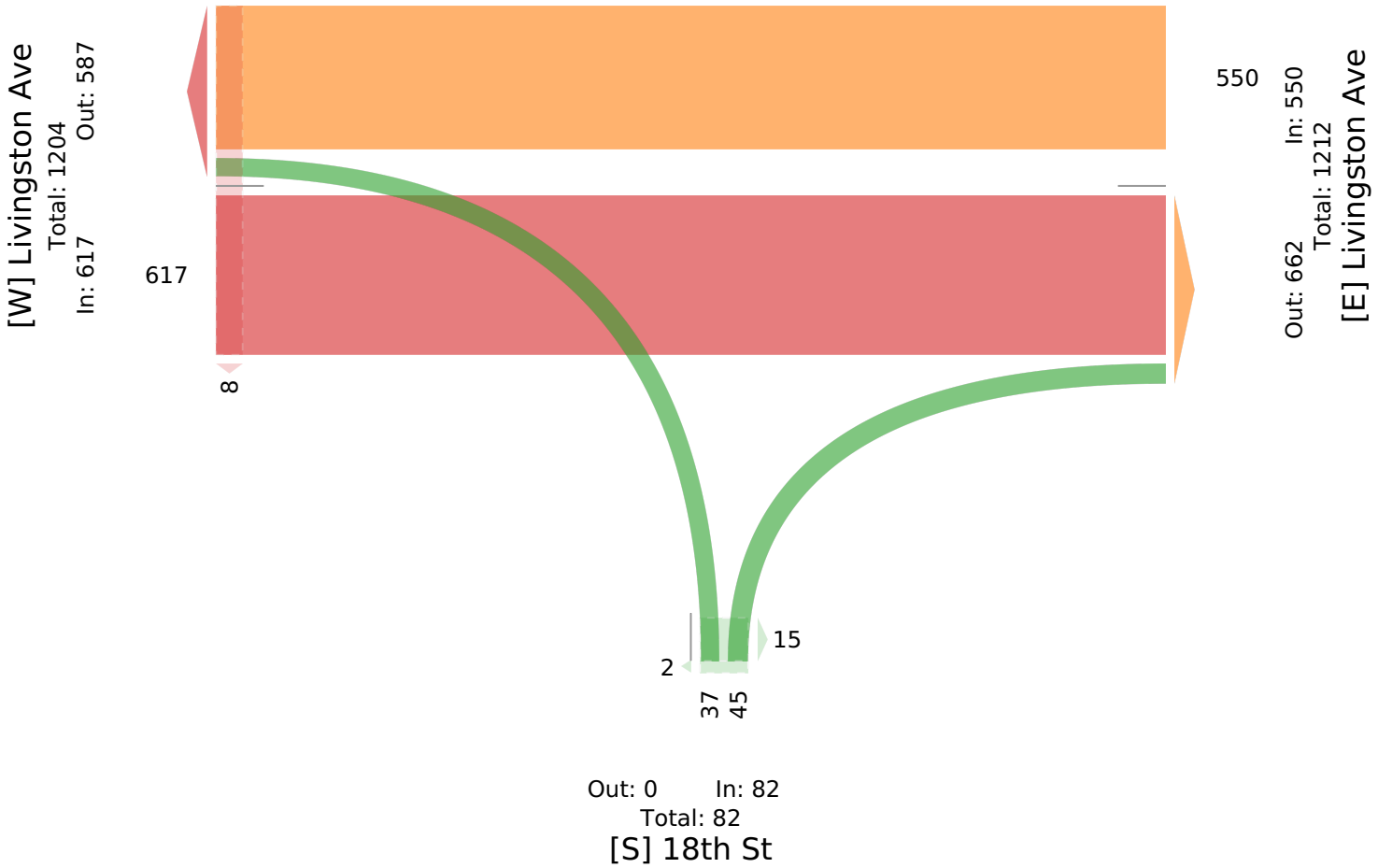
Leg Direction	Livingston Ave Eastbound					Livingston Ave Westbound					18th St Northbound					
Time	T	R	U	**App**	Ped*	L	T	U	**App**	Ped*	L	R	U	**App**	Ped*	**Int**
2022-05-05 4:30PM	161	0	0	**161**	1	0	138	0	**138**	0	17	11	0	**28**	8	**327**
4:45PM	157	0	0	**157**	5	0	139	0	**139**	0	9	13	0	**22**	7	**318**
5:00PM	153	0	0	**153**	1	0	153	0	**153**	0	5	8	0	**13**	1	**319**
5:15PM	146	0	0	**146**	1	0	120	0	**120**	0	6	13	0	**19**	1	**285**
Total	617	0	0	**617**	8	0	550	0	**550**	0	37	45	0	**82**	17	**1249**
% Approach	100%	0%	0%	**-**	-	0%	100%	0%	**-**	-	45.1%	54.9%	0%	**-**	-	**-**
% Total	49.4%	0%	0%	**49.4%**	-	0%	44.0%	0%	**44.0%**	-	3.0%	3.6%	0%	**6.6%**	-	**-**
PHF	0.958	-	-	**0.958**	-	-	0.899	-	**0.899**	-	0.544	0.865	-	**0.732**	-	0.955
Lights and Motorcycles	585	0	0	**585**	-	0	535	0	**535**	-	37	43	0	**80**	-	1200
% Lights and Motorcycles	94.8%	0%	0%	**94.8%**	-	0%	97.3%	0%	**97.3%**	-	100%	95.6%	0%	**97.6%**	-	96.1%
Heavy	32	0	0	**32**	-	0	15	0	**15**	-	0	2	0	**2**	-	49
% Heavy	5.2%	0%	0%	**5.2%**	-	0%	2.7%	0%	**2.7%**	-	0%	4.4%	0%	**2.4%**	-	3.9%
Scooters (Standing)	0	0	0	**0**	-	0	0	0	**0**	-	0	0	0	**0**	-	0
% Scooters (Standing)	0%	0%	0%	**0%**	-	0%	0%	0%	**0%**	-	0%	0%	0%	**0%**	-	0%
Bicycles on Road	0	0	0	**0**	-	0	0	0	**0**	-	0	0	0	**0**	-	0
% Bicycles on Road	0%	0%	0%	**0%**	-	0%	0%	0%	**0%**	-	0%	0%	0%	**0%**	-	0%
Pedestrians	-	-	-	-	8	-	-	-	-	0	-	-	-	-	17	
% Pedestrians	-	-	-	-	100%	-	-	-	-	-	-	-	-	-	100%	-
Bicycles on Crosswalk	-	-	-	-	0	-	-	-	-	0	-	-	-	-	0	
% Bicycles on Crosswalk	-	-	-	-	0%	-	-	-	-	-	-	-	-	-	0%	-

*Pedestrians and Bicycles on Crosswalk. L: Left, R: Right, T: Thru, U: U-Turn

1) Livingston Ave & 18th St - TMC

Thu May 5, 2022
PM Peak (4:30 PM - 5:30 PM) - Overall Peak Hour
All Classes (Lights and Motorcycles, Heavy, Scooters (Standing), Pedestrians, Bicycles on Road, Bicycles on Crosswalk)
All Movements
ID: 949457, Location: 39.950753, -82.977506, Site Code: 1

Provided by: Smart Services, Inc.
88 W. Church Street,
Newark, OH, 43055, US



2) Livingston Ave & Carpenter St - TMC

Thu May 12, 2022
Full Length (6 AM-10 AM, 3 PM-7 PM)
All Classes (Lights and Motorcycles, Heavy, e-Scooters, Pedestrians, Bicycles on Road, Bicycles on Crosswalk)
All Movements
ID: 951028, Location: 39.949933, -82.975181, Site Code: 2

Provided by: Smart Services, Inc.
88 W. Church Street,
Newark, OH, 43055, US

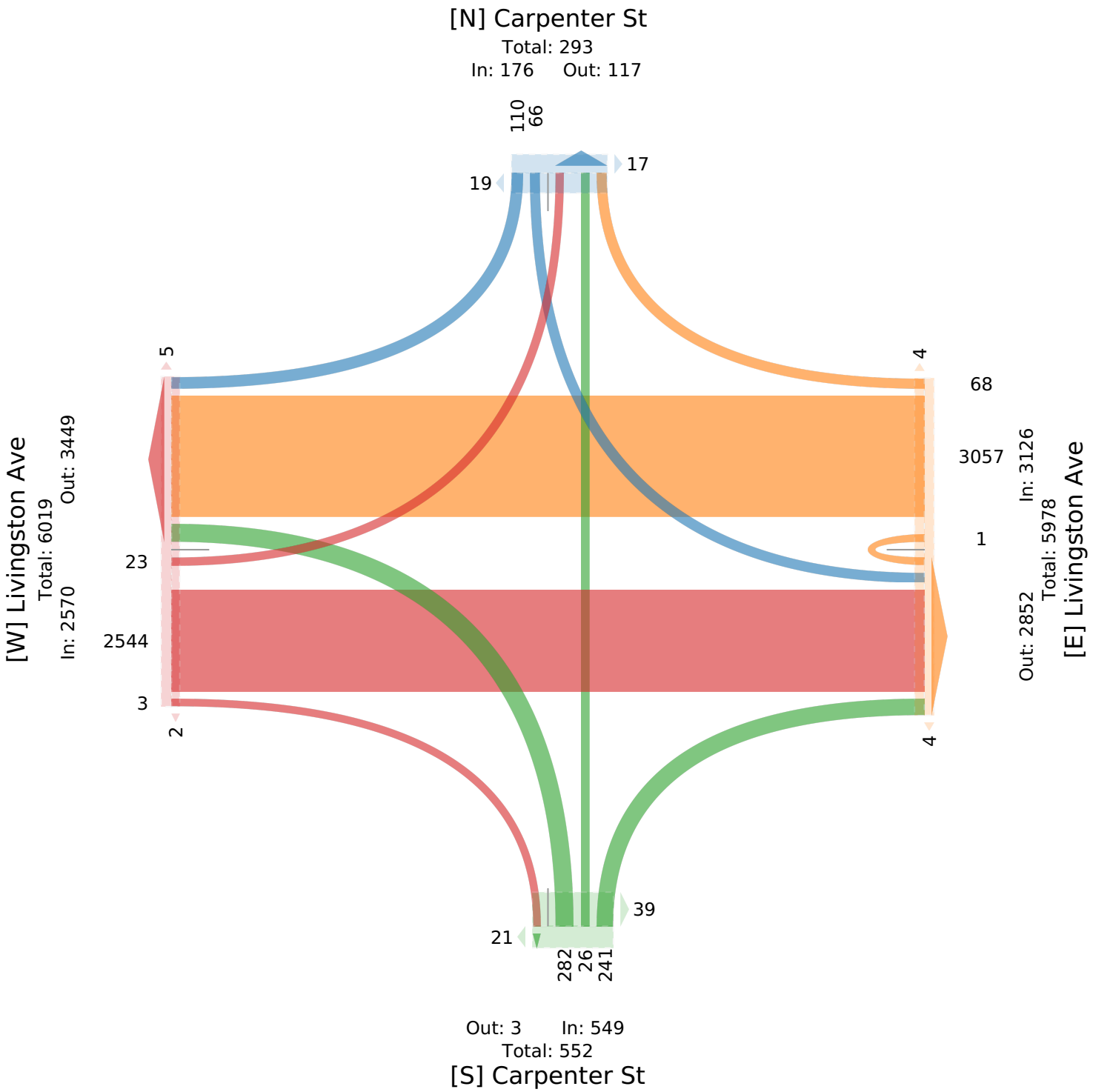
Leg / Direction	Livingston Ave Eastbound						Livingston Ave Westbound						Carpenter St Northbound						Carpenter St Southbound						
Time	L	T	R	U	App	Ped*	L	T	R	U	App	Ped*	L	T	R	U	App	Ped*	L	T	R	U	App	Ped*	Int
2022-05-12 6:00AM	0	22	0	0	**22**	0	0	52	2	0	**54**	0	3	0	2	0	**5**	0	0	0	2	0	**2**	0	**83**
6:15AM	1	17	0	0	**18**	0	0	65	1	0	**66**	0	5	0	1	0	**6**	0	0	0	0	0	**0**	0	**90**
6:30AM	0	26	0	0	**26**	0	0	108	1	0	**109**	1	10	0	2	0	**12**	1	1	0	4	0	**5**	0	**152**
6:45AM	0	35	0	0	**35**	0	0	116	2	0	**118**	0	2	2	2	0	**6**	0	3	0	2	0	**5**	0	**164**
Hourly Total	1	100	0	0	**101**	0	0	341	6	0	**347**	1	20	2	7	0	**29**	1	4	0	8	0	**12**	0	**489**
7:00AM	0	48	0	0	**48**	0	0	88	1	0	**89**	0	9	1	2	0	**12**	0	1	0	1	0	**2**	0	**151**
7:15AM	0	44	0	0	**44**	0	0	125	0	1	**126**	0	8	0	2	0	**10**	1	2	0	5	0	**7**	1	**187**
7:30AM	2	71	0	0	**73**	0	0	137	1	0	**138**	0	7	0	7	0	**14**	2	1	0	4	0	**5**	2	**230**
7:45AM	3	64	0	0	**67**	0	0	123	3	0	**126**	0	4	2	1	0	**7**	1	5	0	2	0	**7**	2	**207**
Hourly Total	5	227	0	0	**232**	0	0	473	5	1	**479**	0	28	3	12	0	**43**	4	9	0	12	0	**21**	5	**775**
8:00AM	1	66	1	0	**68**	0	0	108	1	0	**109**	0	10	2	5	0	**17**	0	1	0	3	0	**4**	1	**198**
8:15AM	0	60	0	0	**60**	0	0	110	2	0	**112**	0	8	0	1	0	**9**	1	1	0	4	0	**5**	2	**186**
8:30AM	1	43	0	0	**44**	0	0	115	4	0	**119**	0	28	1	24	0	**53**	0	5	0	5	0	**10**	2	**226**
8:45AM	1	41	0	0	**42**	0	0	110	3	0	**113**	0	21	0	28	0	**49**	0	1	0	6	0	**7**	1	**211**
Hourly Total	3	210	1	0	**214**	0	0	443	10	0	**453**	0	67	3	58	0	**128**	1	8	0	18	0	**26**	6	**821**
9:00AM	1	55	0	0	**56**	0	0	95	1	0	**96**	1	13	0	16	0	**29**	0	2	0	2	0	**4**	3	**185**
9:15AM	1	53	0	0	**54**	0	0	107	1	0	**108**	0	9	1	3	0	**13**	1	1	0	3	0	**4**	1	**179**
9:30AM	0	65	0	0	**65**	2	0	97	1	0	**98**	0	7	1	10	0	**18**	2	2	0	0	0	**2**	2	**183**
9:45AM	0	69	0	0	**69**	0	0	89	3	0	**92**	0	7	0	5	0	**12**	2	1	0	0	0	**1**	1	**174**
Hourly Total	2	242	0	0	**244**	2	0	388	6	0	**394**	1	36	2	34	0	**72**	5	6	0	5	0	**11**	7	**721**
3:00PM	1	125	0	0	**126**	0	0	80	0	0	**80**	0	7	2	2	0	**11**	1	6	0	6	0	**12**	3	**229**
3:15PM	3	106	0	0	**109**	0	0	87	1	0	**88**	1	8	0	11	0	**19**	0	3	0	5	0	**8**	1	**224**
3:30PM	0	143	0	0	**143**	1	0	95	1	0	**96**	2	15	3	25	0	**43**	9	1	0	6	0	**7**	2	**289**
3:45PM	1	121	0	0	**122**	0	0	92	2	0	**94**	0	21	1	13	0	**35**	1	2	0	2	0	**4**	1	**255**
Hourly Total	5	495	0	0	**500**	1	0	354	4	0	**358**	3	51	6	51	0	**108**	11	12	0	19	0	**31**	7	**997**
4:00PM	0	140	0	0	**140**	0	0	90	3	0	**93**	0	9	0	9	0	**18**	0	2	0	5	0	**7**	2	**258**
4:15PM	2	140	0	0	**142**	0	0	90	2	0	**92**	0	8	2	6	0	**16**	0	1	0	1	0	**2**	3	**252**
4:30PM	0	131	0	0	**131**	0	0	91	1	0	**92**	1	1	0	6	0	**7**	3	0	0	9	0	**9**	1	**239**
4:45PM	1	111	1	0	**113**	0	0	88	0	0	**88**	0	8	1	5	0	**14**	4	1	0	4	0	**5**	0	**220**
Hourly Total	3	522	1	0	**526**	0	0	359	6	0	**365**	1	26	3	26	0	**55**	7	4	0	19	0	**23**	6	**969**
5:00PM	0	128	0	0	**128**	2	0	78	4	0	**82**	0	5	2	11	0	**18**	0	5	0	3	0	**8**	2	**236**
5:15PM	1	116	0	0	**117**	0	0	76	2	0	**78**	0	10	1	9	0	**20**	6	3	0	8	0	**11**	0	**226**
5:30PM	2	98	0	0	**100**	0	0	86	7	0	**93**	0	13	1	11	0	**25**	5	3	0	7	0	**10**	1	**228**
5:45PM	0	97	0	0	**97**	0	0	97	5	0	**102**	1	6	0	6	0	**12**	0	2	0	2	0	**4**	0	**215**
Hourly Total	3	439	0	0	**442**	2	0	337	18	0	**355**	1	34	4	37	0	**75**	11	13	0	20	0	**33**	3	**905**
6:00PM	1	82	0	0	**83**	0	0	95	3	0	**98**	0	2	0	3	0	**5**	19	1	0	6	0	**7**	0	**193**
6:15PM	0	87	0	0	**87**	0	0	88	0	0	**88**	0	10	1	2	0	**13**	0	2	0	0	0	**2**	2	**190**
6:30PM	0	64	0	0	**64**	2	0	91	5	0	**96**	1	3	1	6	0	**10**	1	2	0	2	0	**4**	0	**174**
6:45PM	0	76	1	0	**77**	0	0	88	5	0	**93**	0	5	1	5	0	**11**	0	5	0	1	0	**6**	0	**187**
Hourly Total	1	309	1	0	**311**	2	0	362	13	0	**375**	1	20	3	16	0	**39**	20	10	0	9	0	**19**	2	**744**
Total	23	2544	3	0	**2570**	7	0	3057	68	1	**3126**	8	282	26	241	0	**549**	60	66	0	110	0	**176**	36	**6421**
% Approach	0.9%	99.0%	0.1%	0%	**-**	-	0%	97.8%	2.2%	0%	**-**	-	51.4%	4.7%	43.9%	0%	**-**	-	37.5%	0%	62.5%	0%	**-**	-	-
% Total	0.4%	39.6%	0%	0%	**40.0%**	-	0%	47.6%	1.1%	0%	**48.7%**	-	4.4%	0.4%	3.8%	0%	**8.6%**	-	1.0%	0%	1.7%	0%	**2.7%**	-	-
Lights and Motorcycles	23	2448	2	0	**2473**	-	0	2958	59	1	**3018**	-	270	20	227	0	**517**	-	59	0	102	0	**161**	-	6169
% Lights and Motorcycles	100%	96.2%	66.7%	0%	**96.2%**	-	0%	96.8%	86.8%	100%	**96.5%**	-	95.7%	76.9%	94.2%	0%	**94.2%**	-	89.4%	0%	92.7%	0%	**91.5%**	-	96.1%
Heavy	0	95	0	0	**95**	-	0	95	9	0	**104**	-	11	4	14	0	**29**	-	7	0	8	0	**15**	-	243
% Heavy	0%	3.7%	0%	0%	**3.7%**	-	0%	3.1%	13.2%	0%	**3.3%**	-	3.9%	15.4%	5.8%	0%	**5.3%**	-	10.6%	0%	7.3%	0%	**8.5%**	-	3.8%
Bicycles on Road	0	1	1	0	**2**	-	0	4	0	0	**4**	-	1	2	0	0	**3**	-	0	0	0	0	**0**	-	9
% Bicycles on Road	0%	0%	33.3%	0%	**0.1%**	-	0%	0.1%	0%	0%	**0.1%**	-	0.4%	7.7%	0%	0%	**0.5%**	-	0%	0%	0%	0%	**0%**	-	0.1%
e-Scooters	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	3	-	-	-	-	-	0	
% e-Scooters	-	-	-	-	-	0%	-	-	-	-	-	0%	-	-	-	-	-	5.0%	-	-	-	-	-	0%	-
Pedestrians	-	-	-	-	-	6	-	-	-	-	-	8	-	-	-	-	-	55	-	-	-	-	-	36	
% Pedestrians	-	-	-	-	-	85.7%	-	-	-	-	-	100%	-	-	-	-	-	91.7%	-	-	-	-	-	100%	-
Bicycles on Crosswalk	-	-	-	-	-	1	-	-	-	-	-	0	-	-	-	-	-	2	-	-	-	-	-	0	
% Bicycles on Crosswalk	-	-	-	-	-	14.3%	-	-	-	-	-	0%	-	-	-	-	-	3.3%	-	-	-	-	-	0%	-

*Pedestrians and Bicycles on Crosswalk. L: Left, R: Right, T: Thru, U: U-Turn

2) Livingston Ave & Carpenter St - TMC

Thu May 12, 2022
Full Length (6 AM-10 AM, 3 PM-7 PM)
All Classes (Lights and Motorcycles, Heavy, e-Scooters, Pedestrians, Bicycles on Road, Bicycles on Crosswalk)
All Movements
ID: 951028, Location: 39.949933, -82.975181, Site Code: 2

Provided by: Smart Services, Inc.
88 W. Church Street,
Newark, OH, 43055, US



2) Livingston Ave & Carpenter St - TMC

Thu May 12, 2022
AM Peak (7:15 AM - 8:15 AM)
All Classes (Lights and Motorcycles, Heavy, e-Scooters, Pedestrians, Bicycles on Road, Bicycles on Crosswalk)
All Movements
ID: 951028, Location: 39.949933, -82.975181, Site Code: 2

Provided by: Smart Services, Inc.
88 W. Church Street,
Newark, OH, 43055, US

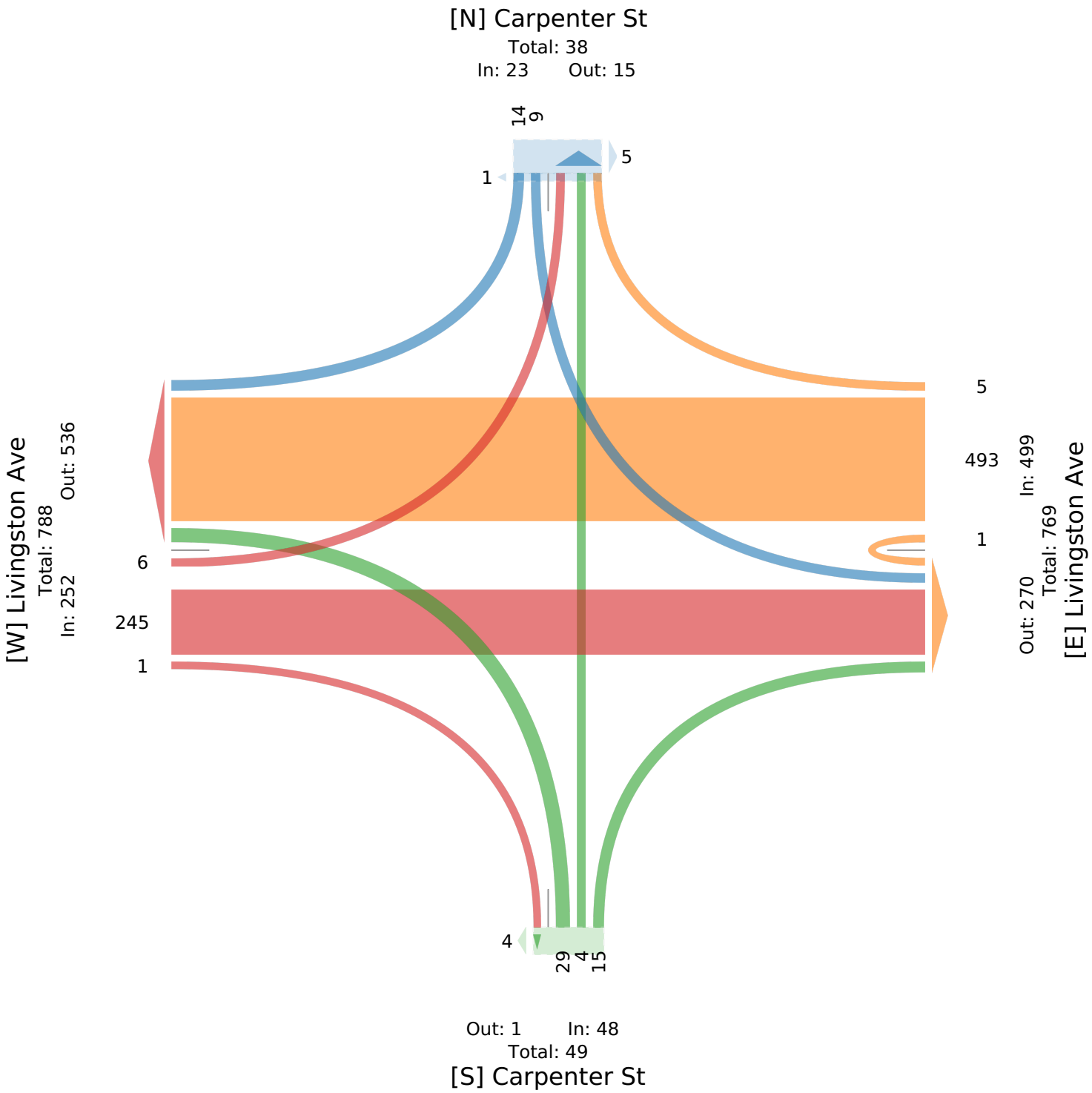
Leg / Direction	Livingston Ave Eastbound						Livingston Ave Westbound						Carpenter St Northbound						Carpenter St Southbound						
Time	L	T	R	U	**App**	Ped*	L	T	R	U	**App**	Ped*	L	T	R	U	**App**	Ped*	L	T	R	U	**App**	Ped*	**Int**
2022-05-12 7:15AM	0	44	0	0	**44**	0	0	125	0	1	**126**	0	8	0	2	0	**10**	1	2	0	5	0	**7**	1	**187**
7:30AM	2	71	0	0	**73**	0	0	137	1	0	**138**	0	7	0	7	0	**14**	2	1	0	4	0	**5**	2	**230**
7:45AM	3	64	0	0	**67**	0	0	123	3	0	**126**	0	4	2	1	0	**7**	1	5	0	2	0	**7**	2	**207**
8:00AM	1	66	1	0	**68**	0	0	108	1	0	**109**	0	10	2	5	0	**17**	0	1	0	3	0	**4**	1	**198**
Total	6	245	1	0	**252**	0	0	493	5	1	**499**	0	29	4	15	0	**48**	4	9	0	14	0	**23**	6	**822**
% Approach	2.4%	97.2%	0.4%	0%	**-**	-	0%	98.8%	1.0%	0.2%	**-**	-	60.4%	8.3%	31.3%	0%	**-**	-	39.1%	0%	60.9%	0%	**-**	-	-
% Total	0.7%	29.8%	0.1%	0%	**30.7%**	-	0%	60.0%	0.6%	0.1%	**60.7%**	-	3.5%	0.5%	1.8%	0%	**5.8%**	-	1.1%	0%	1.7%	0%	**2.8%**	-	-
PHF	0.500	0.863	0.250	-	**0.863**	-	-	0.898	0.417	0.250	**0.902**	-	0.725	0.500	0.536	-	**0.706**	-	0.450	-	0.700	-	**0.821**	-	0.892
Lights and Motorcycles	6	231	1	0	**238**	-	0	474	5	1	**480**	-	29	3	13	0	**45**	-	7	0	13	0	**20**	-	783
% Lights and Motorcycles	100%	94.3%	100%	0%	**94.4%**	-	0%	96.1%	100%	100%	**96.2%**	-	100%	75.0%	86.7%	0%	**93.8%**	-	77.8%	0%	92.9%	0%	**87.0%**	-	95.3%
Heavy	0	14	0	0	**14**	-	0	18	0	0	**18**	-	0	1	2	0	**3**	-	2	0	1	0	**3**	-	38
% Heavy	0%	5.7%	0%	0%	**5.6%**	-	0%	3.7%	0%	0%	**3.6%**	-	0%	25.0%	13.3%	0%	**6.3%**	-	22.2%	0%	7.1%	0%	**13.0%**	-	4.6%
Bicycles on Road	0	0	0	0	**0**	-	0	1	0	0	**1**	-	0	0	0	0	**0**	-	0	0	0	0	**0**	-	1
% Bicycles on Road	0%	0%	0%	0%	**0%**	-	0%	0.2%	0%	0%	**0.2%**	-	0%	0%	0%	0%	**0%**	-	0%	0%	0%	0%	**0%**	-	0.1%
e-Scooters	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	
% e-Scooters	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0%	-	-	-	-	-	0%	-
Pedestrians	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	4	-	-	-	-	-	6	
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	100%	-	-	-	-	-	100%	-
Bicycles on Crosswalk	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0%	-	-	-	-	-	0%	-

*Pedestrians and Bicycles on Crosswalk. L: Left, R: Right, T: Thru, U: U-Turn

2) Livingston Ave & Carpenter St - TMC

Thu May 12, 2022
AM Peak (7:15 AM - 8:15 AM)
All Classes (Lights and Motorcycles, Heavy, e-Scooters, Pedestrians, Bicycles on Road, Bicycles on Crosswalk)
All Movements
ID: 951028, Location: 39.949933, -82.975181, Site Code: 2

Provided by: Smart Services, Inc.
88 W. Church Street,
Newark, OH, 43055, US



2) Livingston Ave & Carpenter St - TMC

Thu May 12, 2022
PM Peak (3:30 PM - 4:30 PM) - Overall Peak Hour
All Classes (Lights and Motorcycles, Heavy, e-Scooters, Pedestrians, Bicycles on Road, Bicycles on Crosswalk)
All Movements
ID: 951028, Location: 39.949933, -82.975181, Site Code: 2

Provided by: Smart Services, Inc.
88 W. Church Street,
Newark, OH, 43055, US

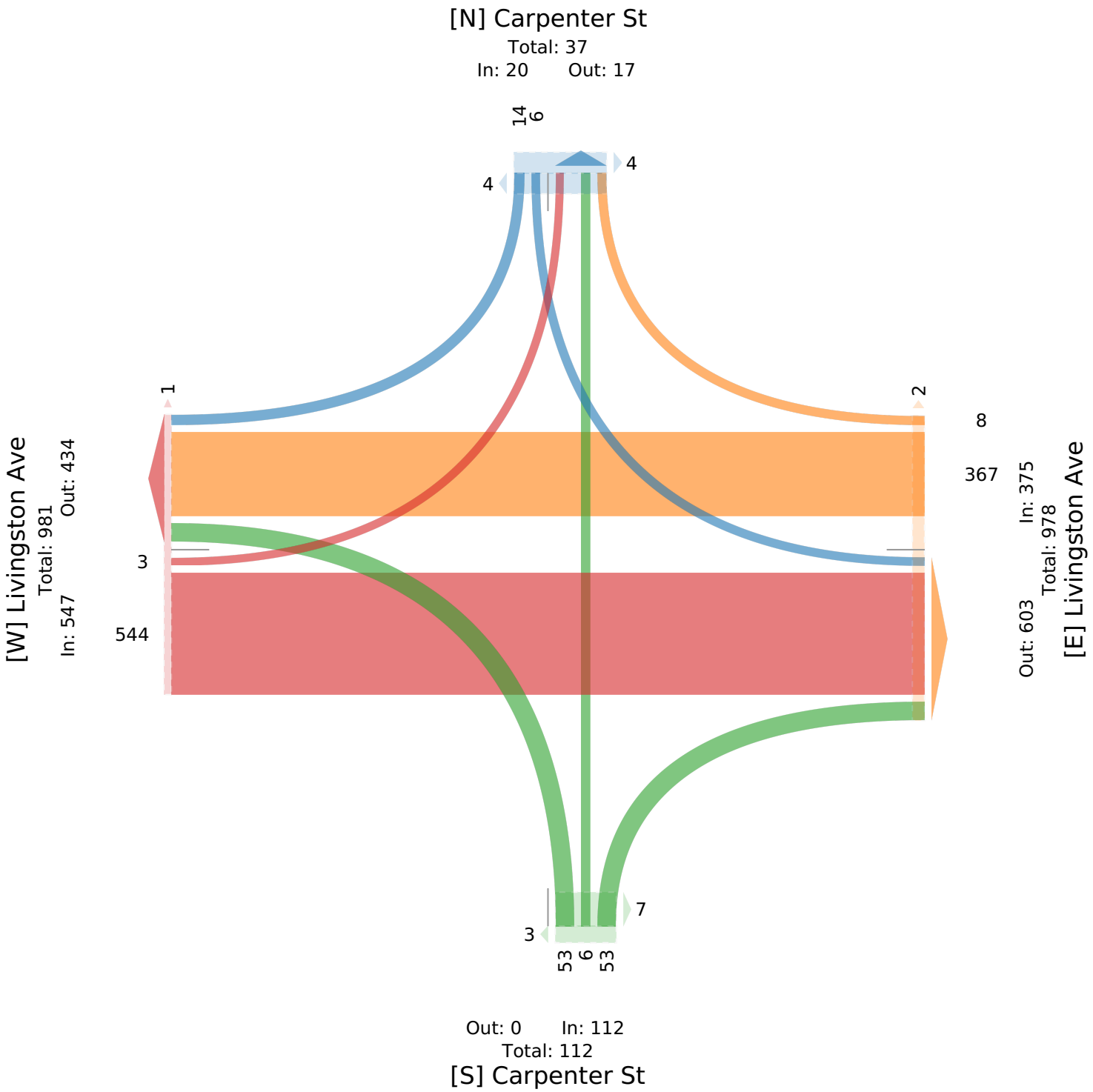
Leg	Livingston Ave						Livingston Ave						Carpenter St						Carpenter St						
Direction	Eastbound						Westbound						Northbound						Southbound						
Time	L	T	R	U	App	Ped*	L	T	R	U	App	Ped*	L	T	R	U	App	Ped*	L	T	R	U	App	Ped*	Int
2022-05-12 3:30PM	0	143	0	0	**143**	1	0	95	1	0	**96**	2	15	3	25	0	**43**	9	1	0	6	0	**7**	2	**289**
3:45PM	1	121	0	0	**122**	0	0	92	2	0	**94**	0	21	1	13	0	**35**	1	2	0	2	0	**4**	1	**255**
4:00PM	0	140	0	0	**140**	0	0	90	3	0	**93**	0	9	0	9	0	**18**	0	2	0	5	0	**7**	2	**258**
4:15PM	2	140	0	0	**142**	0	0	90	2	0	**92**	0	8	2	6	0	**16**	0	1	0	1	0	**2**	3	**252**
Total	3	544	0	0	**547**	1	0	367	8	0	**375**	2	53	6	53	0	**112**	10	6	0	14	0	**20**	8	**1054**
% Approach	0.5%	99.5%	0%	0%	**-**	-	0%	97.9%	2.1%	0%	**-**	-	47.3%	5.4%	47.3%	0%	**-**	-	30.0%	0%	70.0%	0%	**-**	-	**-**
% Total	0.3%	51.6%	0%	0%	**51.9%**	-	0%	34.8%	0.8%	0%	**35.6%**	-	5.0%	0.6%	5.0%	0%	**10.6%**	-	0.6%	0%	1.3%	0%	**1.9%**	-	-
PHF	0.375	0.956	-	-	**0.961**	-	-	0.966	0.667	-	**0.977**	-	0.631	0.500	0.530	-	**0.651**	-	0.750	-	0.583	-	**0.714**	-	0.914
Lights and Motorcycles	3	528	0	0	**531**	-	0	355	7	0	**362**	-	49	5	52	0	**106**	-	6	0	13	0	**19**	-	1018
% Lights and Motorcycles	100%	97.1%	0%	0%	**97.1%**	-	0%	96.7%	87.5%	0%	**96.5%**	-	92.5%	83.3%	98.1%	0%	**94.6%**	-	100%	0%	92.9%	0%	**95.0%**	-	96.6%
Heavy	0	15	0	0	**15**	-	0	12	1	0	**13**	-	4	1	1	0	**6**	-	0	0	1	0	**1**	-	35
% Heavy	0%	2.8%	0%	0%	**2.7%**	-	0%	3.3%	12.5%	0%	**3.5%**	-	7.5%	16.7%	1.9%	0%	**5.4%**	-	0%	0%	7.1%	0%	**5.0%**	-	3.3%
Bicycles on Road	0	1	0	0	**1**	-	0	0	0	0	**0**	-	0	0	0	0	**0**	-	0	0	0	0	**0**	-	1
% Bicycles on Road	0%	0.2%	0%	0%	**0.2%**	-	0%	0%	0%	0%	**0%**	-	0%	0%	0%	0%	**0%**	-	0%	0%	0%	0%	**0%**	-	0.1%
e-Scooters	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	
% e-Scooters	-	-	-	-	-	0%	-	-	-	-	-	0%	-	-	-	-	-	0%	-	-	-	-	-	0%	-
Pedestrians	-	-	-	-	-	0	-	-	-	-	-	2	-	-	-	-	-	10	-	-	-	-	-	8	
% Pedestrians	-	-	-	-	-	0%	-	-	-	-	-	100%	-	-	-	-	-	100%	-	-	-	-	-	100%	-
Bicycles on Crosswalk	-	-	-	-	-	1	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	
% Bicycles on Crosswalk	-	-	-	-	-	100%	-	-	-	-	-	0%	-	-	-	-	-	0%	-	-	-	-	-	0%	-

*Pedestrians and Bicycles on Crosswalk. L: Left, R: Right, T: Thru, U: U-Turn

2) Livingston Ave & Carpenter St - TMC

Thu May 12, 2022
PM Peak (3:30 PM - 4:30 PM) - Overall Peak Hour
All Classes (Lights and Motorcycles, Heavy, e-Scooters, Pedestrians, Bicycles on Road, Bicycles on Crosswalk)
All Movements
ID: 951028, Location: 39.949933, -82.975181, Site Code: 2

Provided by: Smart Services, Inc.
88 W. Church Street,
Newark, OH, 43055, US



3) Livingston Ave & Ohio Ave - TMC

Thu May 5, 2022
Full Length (6 AM-10 AM, 3 PM-7 PM)
All Classes (Lights and Motorcycles, Heavy, Scooters (Standing), e-Scooters, Pedestrians, Bicycles on Road, Bicycles on Crosswalk)
All Movements
ID: 949507, Location: 39.949747, -82.971503, Site Code: 3

Provided by: Smart Services, Inc.
88 W. Church Street,
Newark, OH, 43055, US

Leg	Livingston Ave						Livingston Ave						Ohio Ave						Ohio Ave						
Direction	Eastbound						Westbound						Northbound						Southbound						
Time	L	T	R	U	App	Ped*	L	T	R	U	App	Ped*	L	T	R	U	App	Ped*	L	T	R	U	App	Ped*	Int
2022-05-05 6:00AM	0	26	6	0	**32**	7	4	67	0	0	**71**	0	0	0	0	0	**0**	1	0	0	0	0	**0**	0	**103**
6:15AM	0	25	3	0	**28**	4	2	58	1	0	**61**	0	0	0	0	0	**0**	0	0	0	1	0	**1**	0	**90**
6:30AM	0	32	6	0	**38**	1	6	98	0	0	**104**	0	0	0	0	0	**0**	1	0	0	0	0	**0**	2	**142**
6:45AM	0	35	2	0	**37**	2	7	110	0	0	**117**	0	0	0	0	0	**0**	0	0	1	1	0	**2**	1	**156**
Hourly Total	0	118	17	0	**135**	14	19	333	1	0	**353**	0	0	0	0	0	**0**	2	0	1	2	0	**3**	3	**491**
7:00AM	0	37	3	0	**40**	1	7	83	0	0	**90**	1	0	0	0	0	**0**	0	0	1	1	0	**2**	0	**132**
7:15AM	0	46	5	0	**51**	1	3	97	0	0	**100**	1	0	0	0	0	**0**	0	0	0	0	0	**0**	0	**151**
7:30AM	0	77	6	0	**83**	2	3	129	0	0	**132**	0	0	0	0	0	**0**	0	1	1	0	0	**2**	0	**217**
7:45AM	0	67	12	0	**79**	0	10	131	0	0	**141**	0	0	0	0	0	**0**	0	0	0	5	0	**5**	0	**225**
Hourly Total	0	227	26	0	**253**	4	23	440	0	0	**463**	2	0	0	0	0	**0**	0	1	2	6	0	**9**	0	**725**
8:00AM	0	63	13	0	**76**	1	9	97	0	0	**106**	0	0	0	0	0	**0**	0	2	0	1	0	**3**	1	**185**
8:15AM	0	43	9	0	**52**	0	13	118	0	0	**131**	0	0	0	0	0	**0**	1	0	0	1	0	**1**	1	**184**
8:30AM	0	72	16	0	**88**	0	10	126	0	0	**136**	0	0	0	0	0	**0**	2	4	0	6	0	**10**	2	**234**
8:45AM	0	64	11	0	**75**	2	13	130	0	0	**143**	0	0	0	0	0	**0**	0	1	2	1	0	**4**	1	**222**
Hourly Total	0	242	49	0	**291**	3	45	471	0	0	**516**	0	0	0	0	0	**0**	3	7	2	9	0	**18**	5	**825**
9:00AM	0	53	11	0	**64**	0	13	95	0	0	**108**	1	0	0	0	0	**0**	0	1	0	2	0	**3**	1	**175**
9:15AM	1	73	9	0	**83**	0	10	84	0	0	**94**	0	0	0	0	0	**0**	1	1	0	0	0	**1**	0	**178**
9:30AM	0	69	7	0	**76**	0	9	80	0	0	**89**	0	0	0	0	0	**0**	3	1	2	4	0	**7**	0	**172**
9:45AM	0	64	13	0	**77**	0	6	83	0	0	**89**	0	0	0	0	0	**0**	1	0	0	0	0	**0**	0	**166**
Hourly Total	1	259	40	0	**300**	0	38	342	0	0	**380**	1	0	0	0	0	**0**	5	3	2	6	0	**11**	1	**691**
3:00PM	0	139	16	0	**155**	2	14	99	0	0	**113**	0	0	0	0	0	**0**	0	1	0	2	0	**3**	0	**271**
3:15PM	0	134	17	0	**151**	1	14	76	1	0	**91**	1	0	0	0	0	**0**	1	0	3	1	0	**4**	0	**246**
3:30PM	0	164	20	0	**184**	1	17	88	0	0	**105**	0	0	0	0	0	**0**	3	4	0	1	0	**5**	1	**294**
3:45PM	0	122	19	0	**141**	3	24	88	0	0	**112**	0	0	0	0	0	**0**	0	3	1	6	0	**10**	2	**263**
Hourly Total	0	559	72	0	**631**	7	69	351	1	0	**421**	1	0	0	0	0	**0**	4	8	4	10	0	**22**	3	**1074**
4:00PM	0	111	13	0	**124**	3	20	70	0	0	**90**	0	0	0	0	0	**0**	2	2	1	3	0	**6**	1	**220**
4:15PM	0	102	15	0	**117**	1	20	84	0	0	**104**	0	0	0	0	0	**0**	2	4	1	3	0	**8**	1	**229**
4:30PM	0	118	16	0	**134**	2	9	81	0	0	**90**	0	0	0	0	0	**0**	2	1	2	2	0	**5**	0	**229**
4:45PM	0	137	19	0	**156**	3	26	73	0	0	**99**	0	0	0	0	0	**0**	2	1	2	1	0	**4**	1	**259**
Hourly Total	0	468	63	0	**531**	9	75	308	0	0	**383**	0	0	0	0	0	**0**	8	8	6	9	0	**23**	3	**937**
5:00PM	0	120	16	0	**136**	0	12	86	0	0	**98**	2	0	0	0	0	**0**	1	1	3	1	0	**5**	2	**239**
5:15PM	0	120	21	0	**141**	4	15	75	0	0	**90**	0	0	0	0	0	**0**	0	0	2	3	0	**5**	3	**236**
5:30PM	0	101	15	0	**116**	3	15	82	0	0	**97**	0	0	0	0	0	**0**	0	0	0	1	0	**1**	0	**214**
5:45PM	0	96	18	0	**114**	1	16	104	0	0	**120**	0	0	0	1	0	**1**	0	0	3	4	0	**7**	0	**242**
Hourly Total	0	437	70	0	**507**	8	58	347	0	0	**405**	2	0	0	1	0	**1**	1	1	8	9	0	**18**	5	**931**
6:00PM	0	96	23	0	**119**	0	22	76	0	0	**98**	0	0	0	0	0	**0**	1	0	0	1	0	**1**	0	**218**
6:15PM	0	75	10	0	**85**	1	18	83	0	0	**101**	0	0	0	0	0	**0**	3	2	2	0	0	**4**	0	**190**
6:30PM	0	76	16	0	**92**	0	17	66	0	0	**83**	0	0	0	0	0	**0**	0	2	0	0	0	**2**	3	**177**
6:45PM	0	83	19	0	**102**	0	28	70	0	0	**98**	0	0	0	0	0	**0**	1	0	1	0	0	**1**	0	**201**
Hourly Total	0	330	68	0	**398**	1	85	295	0	0	**380**	0	0	0	0	0	**0**	5	4	3	1	0	**8**	3	**786**
Total	1	2640	405	0	**3046**	46	412	2887	2	0	**3301**	6	0	0	1	0	**1**	28	32	28	52	0	**112**	23	**6460**
% Approach	0%	86.7%	13.3%	0%	**-**	-	12.5%	87.5%	0.1%	0%	**-**	-	0%	0%	100%	0%	**-**	-	28.6%	25.0%	46.4%	0%	**-**	-	-
% Total	0%	40.9%	6.3%	0%	**47.2%**	-	6.4%	44.7%	0%	0%	**51.1%**	-	0%	0%	0%	0%	**0%**	-	0.5%	0.4%	0.8%	0%	**1.7%**	-	-
Lights and Motorcycles	1	2536	362	0	**2899**	-	388	2762	2	0	**3152**	-	0	0	1	0	**1**	-	28	27	51	0	**106**	-	6158
% Lights and Motorcycles	100%	96.1%	89.4%	0%	**95.2%**	-	94.2%	95.7%	100%	0%	**95.5%**	-	0%	0%	100%	0%	**100%**	-	87.5%	96.4%	98.1%	0%	**94.6%**	-	95.3%
Heavy	0	103	42	0	**145**	-	22	121	0	0	**143**	-	0	0	0	0	**0**	-	4	1	1	0	**6**	-	294
% Heavy	0%	3.9%	10.4%	0%	**4.8%**	-	5.3%	4.2%	0%	0%	**4.3%**	-	0%	0%	0%	0%	**0%**	-	12.5%	3.6%	1.9%	0%	**5.4%**	-	4.6%
Scooters (Standing)	0	1	0	0	**1**	-	2	1	0	0	**3**	-	0	0	0	0	**0**	-	0	0	0	0	**0**	-	4
% Scooters (Standing)	0%	0%	0%	0%	**0%**	-	0.5%	0%	0%	0%	**0.1%**	-	0%	0%	0%	0%	**0%**	-	0%	0%	0%	0%	**0%**	-	0.1%
Bicycles on Road	0	0	1	0	**1**	-	0	3	0	0	**3**	-	0	0	0	0	**0**	-	0	0	0	0	**0**	-	4
% Bicycles on Road	0%	0%	0.2%	0%	**0%**	-	0%	0.1%	0%	0%	**0.1%**	-	0%	0%	0%	0%	**0%**	-	0%	0%	0%	0%	**0%**	-	0.1%
e-Scooters	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	1	-	-	-	-	-	0	
% e-Scooters	-	-	-	-	-	0%	-	-	-	-	-	0%	-	-	-	-	-	3.6%	-	-	-	-	-	0%	-
Pedestrians	-	-	-	-	-	46	-	-	-	-	-	6	-	-	-	-	-	24	-	-	-	-	-	22	

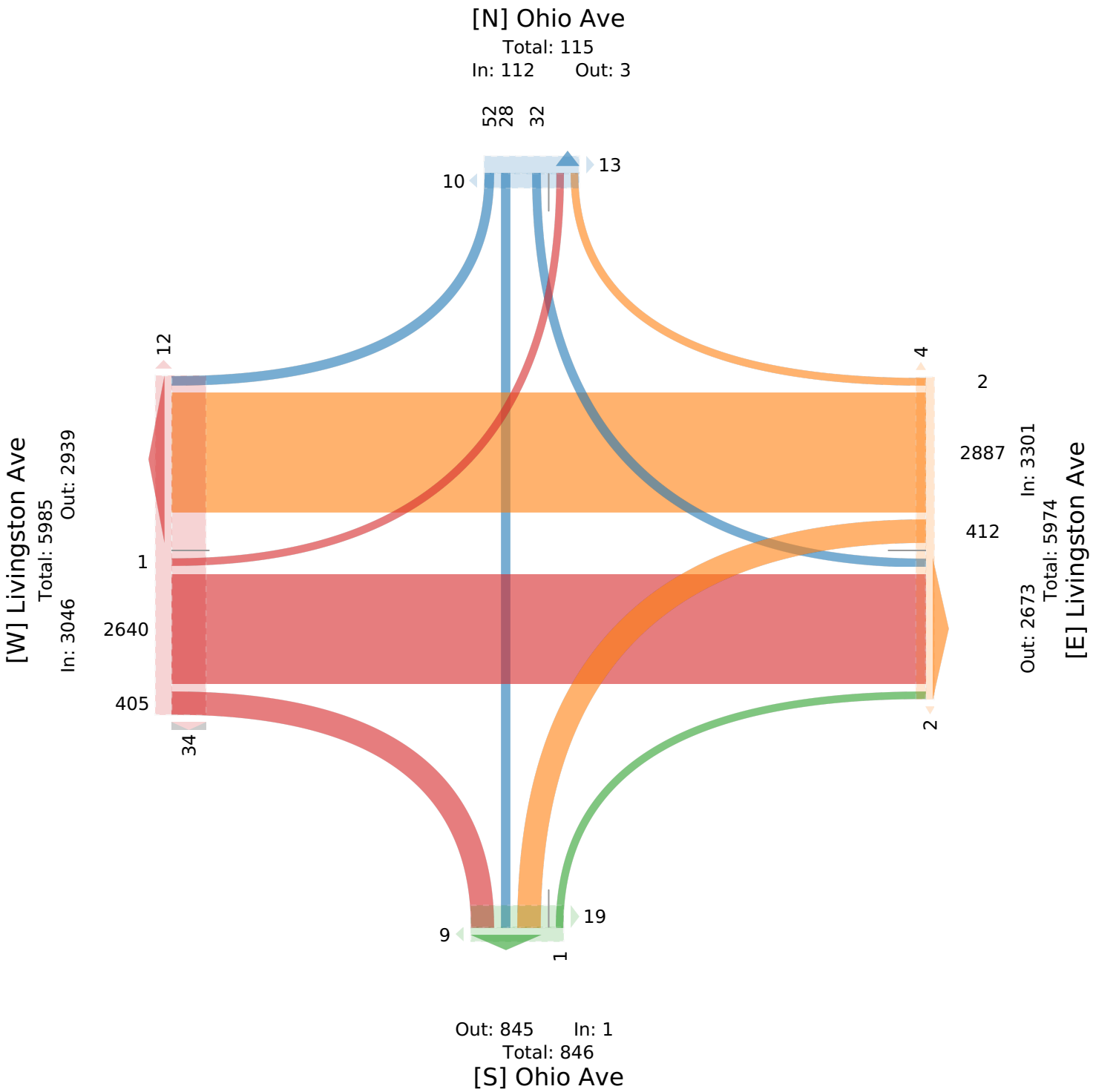
Leg Direction	Livingston Ave Eastbound						Livingston Ave Westbound						Ohio Ave Northbound						Ohio Ave Southbound						
Time	L	T	R	U	**App**	Ped*	L	T	R	U	**App**	Ped*	L	T	R	U	**App**	Ped*	L	T	R	U	**App**	Ped*	**Int**
% Pedestrians	-	-	-	-	-	100%	-	-	-	-	-	100%	-	-	-	-	-	85.7%	-	-	-	-	-	95.7%	-
Bicycles on Crosswalk	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	3	-	-	-	-	-	1	
% Bicycles on Crosswalk	-	-	-	-	-	0%	-	-	-	-	-	0%	-	-	-	-	-	10.7%	-	-	-	-	-	4.3%	-

*Pedestrians and Bicycles on Crosswalk. L: Left, R: Right, T: Thru, U: U-Turn

3) Livingston Ave & Ohio Ave - TMC

Thu May 5, 2022
Full Length (6 AM-10 AM, 3 PM-7 PM)
All Classes (Lights and Motorcycles, Heavy, Scooters (Standing), e-Scooters, Pedestrians, Bicycles on Road, Bicycles on Crosswalk)
All Movements
ID: 949507, Location: 39.949747, -82.971503, Site Code: 3

Provided by: Smart Services, Inc.
88 W. Church Street,
Newark, OH, 43055, US



3) Livingston Ave & Ohio Ave - TMC

Thu May 5, 2022
AM Peak (7:45 AM - 8:45 AM)
All Classes (Lights and Motorcycles, Heavy, Scooters (Standing), e-Scooters, Pedestrians, Bicycles on Road, Bicycles on Crosswalk)
All Movements
ID: 949507, Location: 39.949747, -82.971503, Site Code: 3

Provided by: Smart Services, Inc.
88 W. Church Street,
Newark, OH, 43055, US

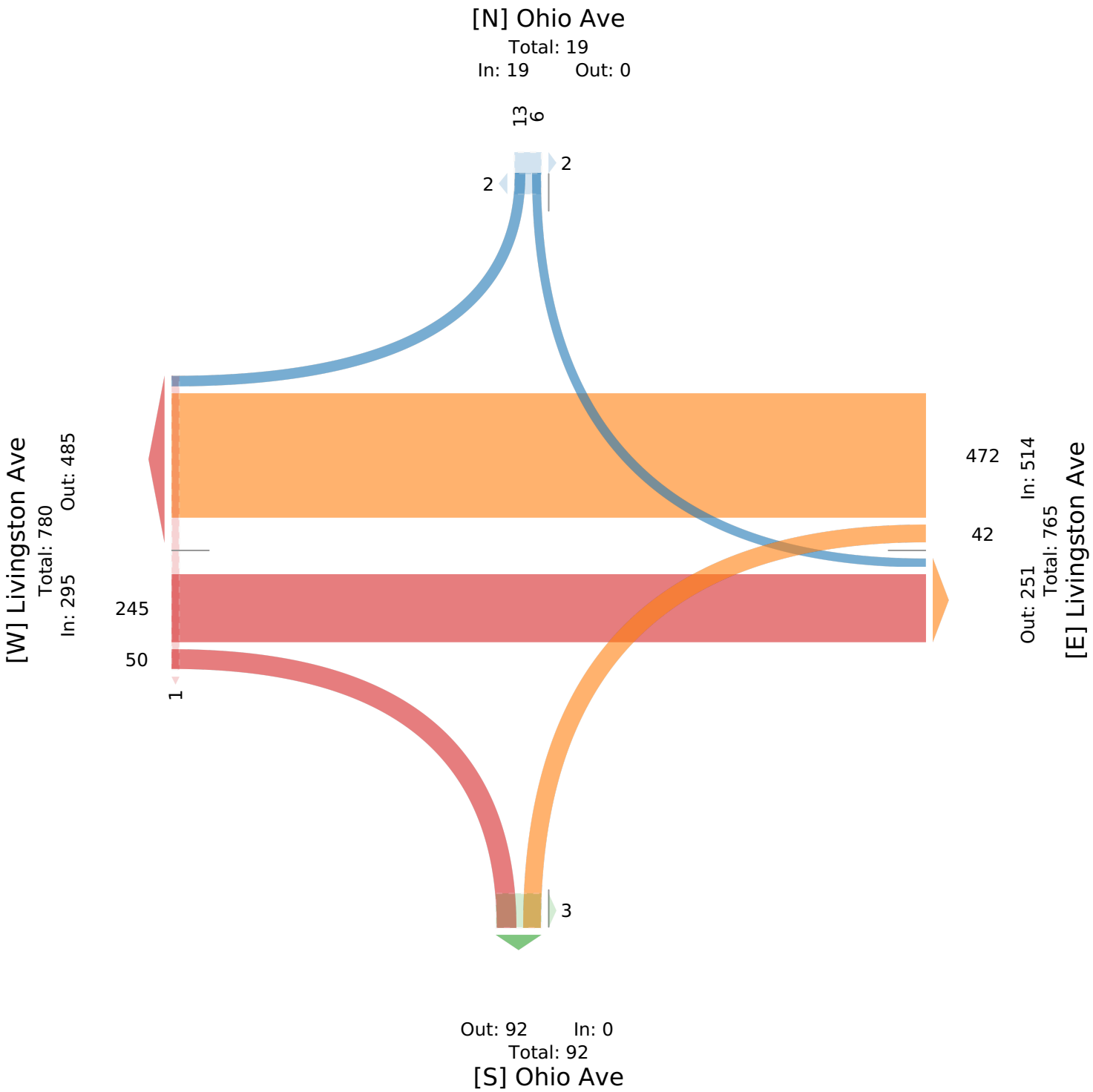
Leg / Direction	Livingston Ave Eastbound						Livingston Ave Westbound						Ohio Ave Northbound						Ohio Ave Southbound						
Time	L	T	R	U	App	Ped*	L	T	R	U	App	Ped*	L	T	R	U	App	Ped*	L	T	R	U	App	Ped*	Int
2022-05-05 7:45AM	0	67	12	0	**79**	0	10	131	0	0	**141**	0	0	0	0	0	**0**	0	0	0	5	0	**5**	0	**225**
8:00AM	0	63	13	0	**76**	1	9	97	0	0	**106**	0	0	0	0	0	**0**	0	2	0	1	0	**3**	1	**185**
8:15AM	0	43	9	0	**52**	0	13	118	0	0	**131**	0	0	0	0	0	**0**	1	0	0	1	0	**1**	1	**184**
8:30AM	0	72	16	0	**88**	0	10	126	0	0	**136**	0	0	0	0	0	**0**	2	4	0	6	0	**10**	2	**234**
Total	0	245	50	0	**295**	1	42	472	0	0	**514**	0	0	0	0	0	**0**	3	6	0	13	0	**19**	4	**828**
% Approach	0%	83.1%	16.9%	0%	**-**	-	8.2%	91.8%	0%	0%	**-**	-	0%	0%	0%	0%	**-**	-	31.6%	0%	68.4%	0%	**-**	-	-
% Total	0%	29.6%	6.0%	0%	**35.6%**	-	5.1%	57.0%	0%	0%	**62.1%**	-	0%	0%	0%	0%	**0%**	-	0.7%	0%	1.6%	0%	**2.3%**	-	-
PHF	-	0.851	0.781	-	**0.838**	-	0.808	0.901	-	-	**0.911**	-	-	-	-	-	**-**	-	0.375	-	0.542	-	**0.475**	-	0.885
Lights and Motorcycles	0	237	42	0	**279**	-	36	448	0	0	**484**	-	0	0	0	0	**0**	-	5	0	12	0	**17**	-	780
% Lights and Motorcycles	0%	96.7%	84.0%	0%	**94.6%**	-	85.7%	94.9%	0%	0%	**94.2%**	-	0%	0%	0%	0%	**-**	-	83.3%	0%	92.3%	0%	**89.5%**	-	94.2%
Heavy	0	8	8	0	**16**	-	6	24	0	0	**30**	-	0	0	0	0	**0**	-	1	0	1	0	**2**	-	48
% Heavy	0%	3.3%	16.0%	0%	**5.4%**	-	14.3%	5.1%	0%	0%	**5.8%**	-	0%	0%	0%	0%	**-**	-	16.7%	0%	7.7%	0%	**10.5%**	-	5.8%
Scooters (Standing)	0	0	0	0	**0**	-	0	0	0	0	**0**	-	0	0	0	0	**0**	-	0	0	0	0	**0**	-	0
% Scooters (Standing)	0%	0%	0%	0%	**0%**	-	0%	0%	0%	0%	**0%**	-	0%	0%	0%	0%	**-**	-	0%	0%	0%	0%	**0%**	-	0%
Bicycles on Road	0	0	0	0	**0**	-	0	0	0	0	**0**	-	0	0	0	0	**0**	-	0	0	0	0	**0**	-	0
% Bicycles on Road	0%	0%	0%	0%	**0%**	-	0%	0%	0%	0%	**0%**	-	0%	0%	0%	0%	**-**	-	0%	0%	0%	0%	**0%**	-	0%
e-Scooters	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	
% e-Scooters	-	-	-	-	-	0%	-	-	-	-	-	-	-	-	-	-	-	0%	-	-	-	-	-	0%	-
Pedestrians	-	-	-	-	-	1	-	-	-	-	-	0	-	-	-	-	-	1	-	-	-	-	-	4	
% Pedestrians	-	-	-	-	-	100%	-	-	-	-	-	-	-	-	-	-	-	33.3%	-	-	-	-	-	100%	-
Bicycles on Crosswalk	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	2	-	-	-	-	-	0	
% Bicycles on Crosswalk	-	-	-	-	-	0%	-	-	-	-	-	-	-	-	-	-	-	66.7%	-	-	-	-	-	0%	-

*Pedestrians and Bicycles on Crosswalk. L: Left, R: Right, T: Thru, U: U-Turn

3) Livingston Ave & Ohio Ave - TMC

Thu May 5, 2022
AM Peak (7:45 AM - 8:45 AM)
All Classes (Lights and Motorcycles, Heavy, Scooters (Standing), e-Scooters, Pedestrians, Bicycles on Road, Bicycles on Crosswalk)
All Movements
ID: 949507, Location: 39.949747, -82.971503, Site Code: 3

Provided by: Smart Services, Inc.
88 W. Church Street,
Newark, OH, 43055, US



3) Livingston Ave & Ohio Ave - TMC

Thu May 5, 2022
PM Peak (3 PM - 4 PM) - Overall Peak Hour
All Classes (Lights and Motorcycles, Heavy, Scooters (Standing), e-Scooters, Pedestrians, Bicycles on Road, Bicycles on Crosswalk)
All Movements
ID: 949507, Location: 39.949747, -82.971503, Site Code: 3

Provided by: Smart Services, Inc.
88 W. Church Street,
Newark, OH, 43055, US

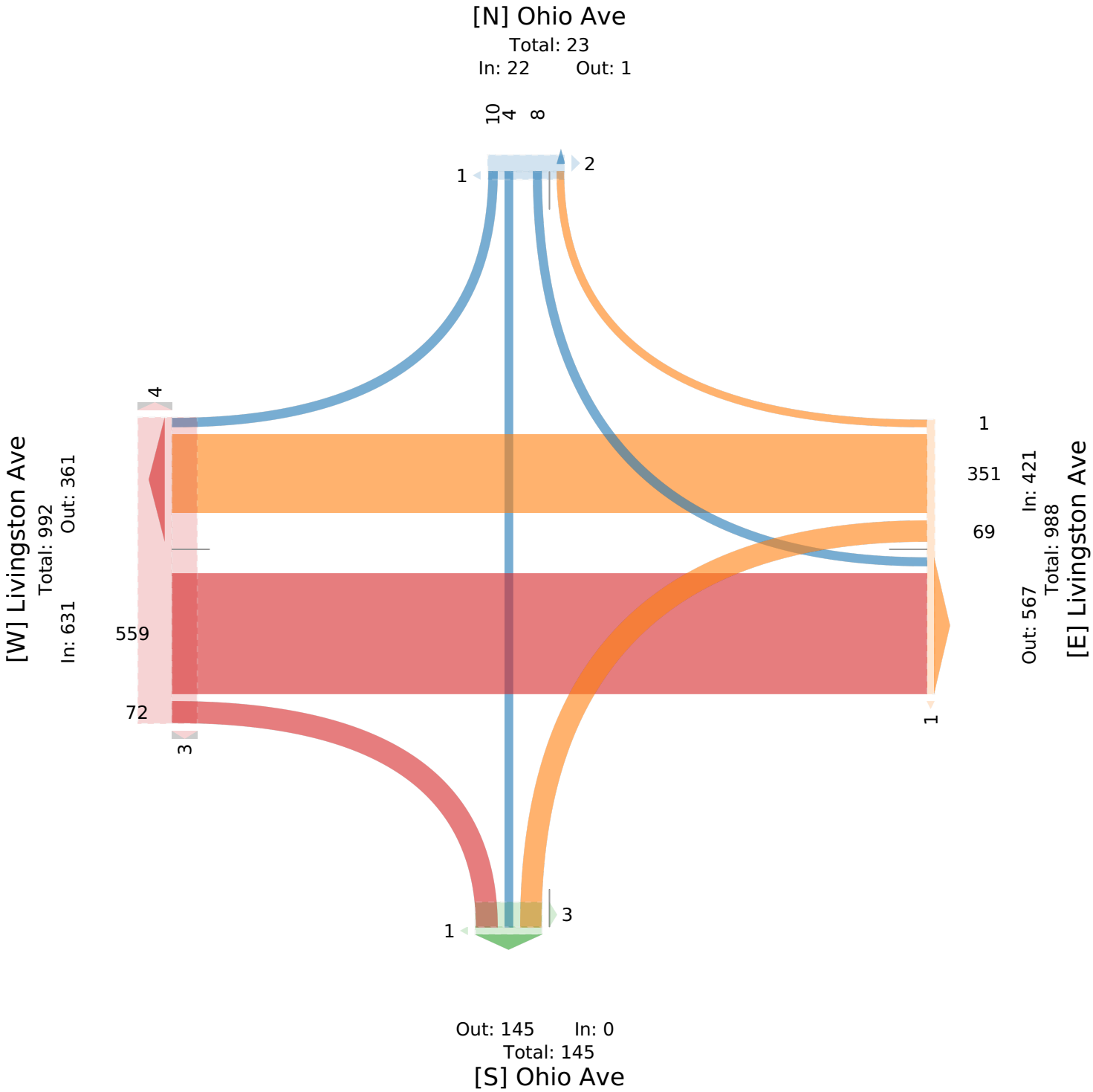
Leg / Direction	Livingston Ave Eastbound						Livingston Ave Westbound						Ohio Ave Northbound						Ohio Ave Southbound						
Time	L	T	R	U	App	Ped*	L	T	R	U	App	Ped*	L	T	R	U	App	Ped*	L	T	R	U	App	Ped*	Int
2022-05-05 3:00PM	0	139	16	0	**155**	2	14	99	0	0	**113**	0	0	0	0	0	**0**	0	1	0	2	0	**3**	0	**271**
3:15PM	0	134	17	0	**151**	1	14	76	1	0	**91**	1	0	0	0	0	**0**	1	0	3	1	0	**4**	0	**246**
3:30PM	0	164	20	0	**184**	1	17	88	0	0	**105**	0	0	0	0	0	**0**	3	4	0	1	0	**5**	1	**294**
3:45PM	0	122	19	0	**141**	3	24	88	0	0	**112**	0	0	0	0	0	**0**	0	3	1	6	0	**10**	2	**263**
Total	0	559	72	0	**631**	7	69	351	1	0	**421**	1	0	0	0	0	**0**	4	8	4	10	0	**22**	3	**1074**
% Approach	0%	88.6%	11.4%	0%	**-**	-	16.4%	83.4%	0.2%	0%	**-**	-	0%	0%	0%	0%	**-**	-	36.4%	18.2%	45.5%	0%	**-**	-	-
% Total	0%	52.0%	6.7%	0%	**58.8%**	-	6.4%	32.7%	0.1%	0%	**39.2%**	-	0%	0%	0%	0%	**0%**	-	0.7%	0.4%	0.9%	0%	**2.0%**	-	-
PHF	-	0.852	0.900	-	**0.857**	-	0.719	0.886	0.250	-	**0.931**	-	-	-	-	-	**-**	-	0.500	0.333	0.417	-	**0.550**	-	0.913
Lights and Motorcycles	0	545	68	0	**613**	-	66	334	1	0	**401**	-	0	0	0	0	**0**	-	8	3	10	0	**21**	-	1035
% Lights and Motorcycles	0%	97.5%	94.4%	0%	**97.1%**	-	95.7%	95.2%	100%	0%	**95.2%**	-	0%	0%	0%	0%	**-**	-	100%	75.0%	100%	0%	**95.5%**	-	96.4%
Heavy	0	14	4	0	**18**	-	3	17	0	0	**20**	-	0	0	0	0	**0**	-	0	1	0	0	**1**	-	39
% Heavy	0%	2.5%	5.6%	0%	**2.9%**	-	4.3%	4.8%	0%	0%	**4.8%**	-	0%	0%	0%	0%	**-**	-	0%	25.0%	0%	0%	**4.5%**	-	3.6%
Scooters (Standing)	0	0	0	0	**0**	-	0	0	0	0	**0**	-	0	0	0	0	**0**	-	0	0	0	0	**0**	-	0
% Scooters (Standing)	0%	0%	0%	0%	**0%**	-	0%	0%	0%	0%	**0%**	-	0%	0%	0%	0%	**-**	-	0%	0%	0%	0%	**0%**	-	0%
Bicycles on Road	0	0	0	0	**0**	-	0	0	0	0	**0**	-	0	0	0	0	**0**	-	0	0	0	0	**0**	-	0
% Bicycles on Road	0%	0%	0%	0%	**0%**	-	0%	0%	0%	0%	**0%**	-	0%	0%	0%	0%	**-**	-	0%	0%	0%	0%	**0%**	-	0%
e-Scooters	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	
% e-Scooters	-	-	-	-	-	0%	-	-	-	-	-	0%	-	-	-	-	-	0%	-	-	-	-	-	0%	-
Pedestrians	-	-	-	-	-	7	-	-	-	-	-	1	-	-	-	-	-	4	-	-	-	-	-	3	
% Pedestrians	-	-	-	-	-	100%	-	-	-	-	-	100%	-	-	-	-	-	100%	-	-	-	-	-	100%	-
Bicycles on Crosswalk	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	
% Bicycles on Crosswalk	-	-	-	-	-	0%	-	-	-	-	-	0%	-	-	-	-	-	0%	-	-	-	-	-	0%	-

*Pedestrians and Bicycles on Crosswalk. L: Left, R: Right, T: Thru, U: U-Turn

3) Livingston Ave & Ohio Ave - TMC

Thu May 5, 2022
PM Peak (3 PM - 4 PM) - Overall Peak Hour
All Classes (Lights and Motorcycles, Heavy, Scooters (Standing), e-Scooters, Pedestrians, Bicycles on Road, Bicycles on Crosswalk)
All Movements
ID: 949507, Location: 39.949747, -82.971503, Site Code: 3

Provided by: Smart Services, Inc.
88 W. Church Street,
Newark, OH, 43055, US



4) Livingston Ave & Champion Ave - TMC

Thu May 5, 2022
Full Length (6 AM-10 AM, 3 PM-7 PM)
All Classes (Lights and Motorcycles, Heavy, Scooters (Standing), Pedestrians, Bicycles on Road, Bicycles on Crosswalk)
All Movements
ID: 949512, Location: 39.949678, -82.970093, Site Code: 4

Provided by: Smart Services, Inc.
88 W. Church Street,
Newark, OH, 43055, US

Leg / Direction	Livingston Ave Eastbound						Livingston Ave Westbound						Champion Ave Northbound						Champion Ave Southbound						
Time	L	T	R	U	App	Ped*	L	T	R	U	App	Ped*	L	T	R	U	App	Ped*	L	T	R	U	App	Ped*	Int
2022-05-05 6:00AM	2	23	0	0	**25**	0	0	70	2	0	**72**	0	2	5	1	0	**8**	0	0	0	0	0	**0**	0	**105**
6:15AM	1	25	0	0	**26**	1	0	59	3	0	**62**	0	1	8	4	0	**13**	1	0	0	0	0	**0**	0	**101**
6:30AM	1	31	0	0	**32**	3	0	92	4	0	**96**	0	9	8	4	0	**21**	1	0	0	0	0	**0**	3	**149**
6:45AM	3	32	0	0	**35**	0	0	104	5	0	**109**	0	13	6	6	0	**25**	0	0	0	0	0	**0**	0	**169**
Hourly Total	7	111	0	0	**118**	4	0	325	14	0	**339**	0	25	27	15	0	**67**	2	0	0	0	0	**0**	3	**524**
7:00AM	1	34	0	0	**35**	1	0	77	4	0	**81**	0	14	17	7	0	**38**	0	0	0	0	0	**0**	0	**154**
7:15AM	4	44	0	0	**48**	0	0	97	6	0	**103**	0	9	10	9	0	**28**	0	0	0	0	0	**0**	0	**179**
7:30AM	5	70	0	0	**75**	1	0	111	10	0	**121**	0	16	26	7	0	**49**	0	0	0	0	0	**0**	0	**245**
7:45AM	5	66	0	0	**71**	1	0	128	10	0	**138**	0	9	22	8	0	**39**	0	0	0	0	0	**0**	1	**248**
Hourly Total	15	214	0	0	**229**	3	0	413	30	0	**443**	0	48	75	31	0	**154**	0	0	0	0	0	**0**	1	**826**
8:00AM	4	59	0	0	**63**	2	0	101	7	0	**108**	0	8	17	5	0	**30**	0	0	0	0	0	**0**	2	**201**
8:15AM	3	42	0	0	**45**	0	0	122	17	0	**139**	0	7	18	6	0	**31**	0	0	0	0	0	**0**	2	**215**
8:30AM	8	67	0	0	**75**	0	0	123	11	0	**134**	0	17	25	8	0	**50**	2	0	0	0	0	**0**	1	**259**
8:45AM	9	58	0	0	**67**	0	0	127	16	0	**143**	0	16	19	5	0	**40**	0	0	0	0	0	**0**	1	**250**
Hourly Total	24	226	0	0	**250**	2	0	473	51	0	**524**	0	48	79	24	0	**151**	2	0	0	0	0	**0**	6	**925**
9:00AM	7	44	0	0	**51**	0	0	102	17	0	**119**	0	3	15	5	0	**23**	0	0	0	0	0	**0**	2	**193**
9:15AM	5	70	0	0	**75**	2	0	83	7	0	**90**	1	12	25	7	0	**44**	0	0	0	0	0	**0**	1	**209**
9:30AM	5	65	0	0	**70**	3	0	87	15	0	**102**	2	5	19	2	0	**26**	0	0	0	0	0	**0**	1	**198**
9:45AM	5	59	0	0	**64**	1	0	83	13	0	**96**	0	8	24	5	0	**37**	0	0	0	0	0	**0**	0	**197**
Hourly Total	22	238	0	0	**260**	6	0	355	52	0	**407**	3	28	83	19	0	**130**	0	0	0	0	0	**0**	4	**797**
3:00PM	10	128	0	0	**138**	3	0	106	21	0	**127**	1	8	20	7	0	**35**	1	0	0	0	0	**0**	9	**300**
3:15PM	10	124	0	0	**134**	6	0	81	30	0	**111**	1	11	36	11	0	**58**	2	0	0	0	0	**0**	4	**303**
3:30PM	14	142	0	0	**156**	2	0	95	19	0	**114**	1	12	33	11	0	**56**	3	0	0	0	0	**0**	1	**326**
3:45PM	8	127	0	0	**135**	4	0	106	14	0	**120**	0	10	28	12	0	**50**	1	0	0	0	0	**0**	5	**305**
Hourly Total	42	521	0	0	**563**	15	0	388	84	0	**472**	3	41	117	41	0	**199**	7	0	0	0	0	**0**	19	**1234**
4:00PM	6	113	0	0	**119**	1	0	81	23	0	**104**	0	9	26	9	0	**44**	1	0	0	0	0	**0**	1	**267**
4:15PM	13	95	0	0	**108**	3	0	93	9	0	**102**	1	12	25	5	0	**42**	0	0	0	0	0	**0**	5	**252**
4:30PM	7	115	0	0	**122**	0	0	86	16	0	**102**	0	12	36	8	0	**56**	2	0	0	0	0	**0**	4	**280**
4:45PM	11	125	0	0	**136**	5	0	80	16	0	**96**	2	8	32	14	0	**54**	1	0	0	0	0	**0**	0	**286**
Hourly Total	37	448	0	0	**485**	9	0	340	64	0	**404**	3	41	119	36	0	**196**	4	0	0	0	0	**0**	10	**1085**
5:00PM	11	112	0	0	**123**	1	0	90	12	0	**102**	1	7	29	9	0	**45**	2	0	0	0	0	**0**	2	**270**
5:15PM	9	109	0	0	**118**	1	0	78	13	0	**91**	0	11	25	11	0	**47**	0	0	0	0	0	**0**	3	**256**
5:30PM	5	97	0	0	**102**	1	0	87	29	0	**116**	0	10	26	7	0	**43**	0	0	0	0	0	**0**	1	**261**
5:45PM	7	93	0	0	**100**	0	0	102	19	0	**121**	0	17	13	15	0	**45**	0	0	0	0	0	**0**	0	**266**
Hourly Total	32	411	0	0	**443**	3	0	357	73	0	**430**	1	45	93	42	0	**180**	2	0	0	0	0	**0**	6	**1053**
6:00PM	9	85	0	0	**94**	1	0	87	8	0	**95**	0	11	28	9	0	**48**	0	0	0	0	0	**0**	2	**237**
6:15PM	7	71	0	0	**78**	1	0	94	7	0	**101**	0	8	20	5	0	**33**	1	0	0	0	0	**0**	1	**212**
6:30PM	4	72	0	0	**76**	1	0	76	10	0	**86**	0	6	19	12	0	**37**	1	0	0	0	0	**0**	2	**199**
6:45PM	4	84	0	0	**88**	0	0	88	10	0	**98**	0	9	15	9	0	**33**	0	0	0	0	0	**0**	0	**219**
Hourly Total	24	312	0	0	**336**	3	0	345	35	0	**380**	0	34	82	35	0	**151**	2	0	0	0	0	**0**	5	**867**
Total	203	2481	0	0	**2684**	45	0	2996	403	0	**3399**	10	310	675	243	0	**1228**	19	0	0	0	0	**0**	54	**7311**
% Approach	7.6%	92.4%	0%	0%	**-**	-	0%	88.1%	11.9%	0%	**-**	-	25.2%	55.0%	19.8%	0%	**-**	-	0%	0%	0%	0%	**-**	-	-
% Total	2.8%	33.9%	0%	0%	**36.7%**	-	0%	41.0%	5.5%	0%	**46.5%**	-	4.2%	9.2%	3.3%	0%	**16.8%**	-	0%	0%	0%	0%	**0%**	-	-
Lights and Motorcycles	186	2392	0	0	**2578**	-	0	2864	381	0	**3245**	-	291	614	231	0	**1136**	-	0	0	0	0	**0**	-	6959
% Lights and Motorcycles	91.6%	96.4%	0%	0%	**96.1%**	-	0%	95.6%	94.5%	0%	**95.5%**	-	93.9%	91.0%	95.1%	0%	**92.5%**	-	0%	0%	0%	0%	**-**	-	95.2%
Heavy	17	89	0	0	**106**	-	0	129	22	0	**151**	-	18	59	11	0	**88**	-	0	0	0	0	**0**	-	345
% Heavy	8.4%	3.6%	0%	0%	**3.9%**	-	0%	4.3%	5.5%	0%	**4.4%**	-	5.8%	8.7%	4.5%	0%	**7.2%**	-	0%	0%	0%	0%	**-**	-	4.7%
Scooters (Standing)	0	0	0	0	**0**	-	0	1	0	0	**1**	-	0	1	0	0	**1**	-	0	0	0	0	**0**	-	2
% Scooters (Standing)	0%	0%	0%	0%	**0%**	-	0%	0%	0%	0%	**0%**	-	0%	0.1%	0%	0%	**0.1%**	-	0%	0%	0%	0%	**-**	-	0%
Bicycles on Road	0	0	0	0	**0**	-	0	2	0	0	**2**	-	1	1	1	0	**3**	-	0	0	0	0	**0**	-	5
% Bicycles on Road	0%	0%	0%	0%	**0%**	-	0%	0.1%	0%	0%	**0.1%**	-	0.3%	0.1%	0.4%	0%	**0.2%**	-	0%	0%	0%	0%	**-**	-	0.1%
Pedestrians	-	-	-	-	-	44	-	-	-	-	-	8	-	-	-	-	-	16	-	-	-	-	-	54	

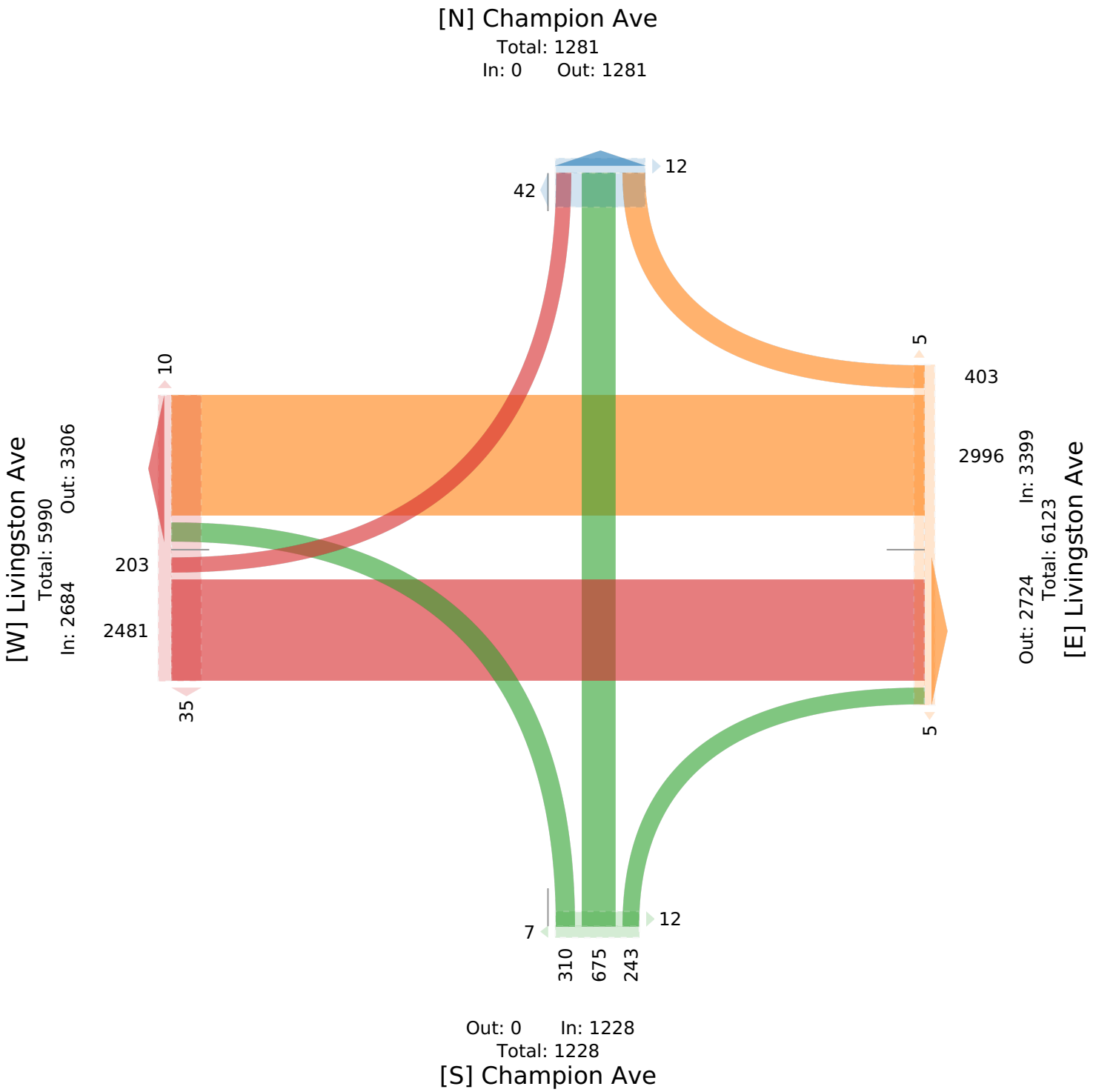
Leg Direction	Livingston Ave Eastbound						Livingston Ave Westbound						Champion Ave Northbound						Champion Ave Southbound						
Time	L	T	R	U	**App**	Ped*	L	T	R	U	**App**	Ped*	L	T	R	U	**App**	Ped*	L	T	R	U	**App**	Ped*	**Int**
% Pedestrians	-	-	-	-	-	97.8%	-	-	-	-	-	80.0%	-	-	-	-	-	84.2%	-	-	-	-	-	100%	-
Bicycles on Crosswalk	-	-	-	-	-	1	-	-	-	-	-	2	-	-	-	-	-	3	-	-	-	-	-	0	
% Bicycles on Crosswalk	-	-	-	-	-	2.2%	-	-	-	-	-	20.0%	-	-	-	-	-	15.8%	-	-	-	-	-	0%	-

*Pedestrians and Bicycles on Crosswalk. L: Left, R: Right, T: Thru, U: U-Turn

4) Livingston Ave & Champion Ave - TMC

Thu May 5, 2022
Full Length (6 AM-10 AM, 3 PM-7 PM)
All Classes (Lights and Motorcycles, Heavy, Scooters (Standing), Pedestrians, Bicycles on Road, Bicycles on Crosswalk)
All Movements
ID: 949512, Location: 39.949678, -82.970093, Site Code: 4

Provided by: Smart Services, Inc.
88 W. Church Street,
Newark, OH, 43055, US



4) Livingston Ave & Champion Ave - TMC

Thu May 5, 2022
AM Peak (8 AM - 9 AM)
All Classes (Lights and Motorcycles, Heavy, Scooters (Standing), Pedestrians, Bicycles on Road, Bicycles on Crosswalk)
All Movements
ID: 949512, Location: 39.949678, -82.970093, Site Code: 4

Provided by: Smart Services, Inc.
88 W. Church Street,
Newark, OH, 43055, US

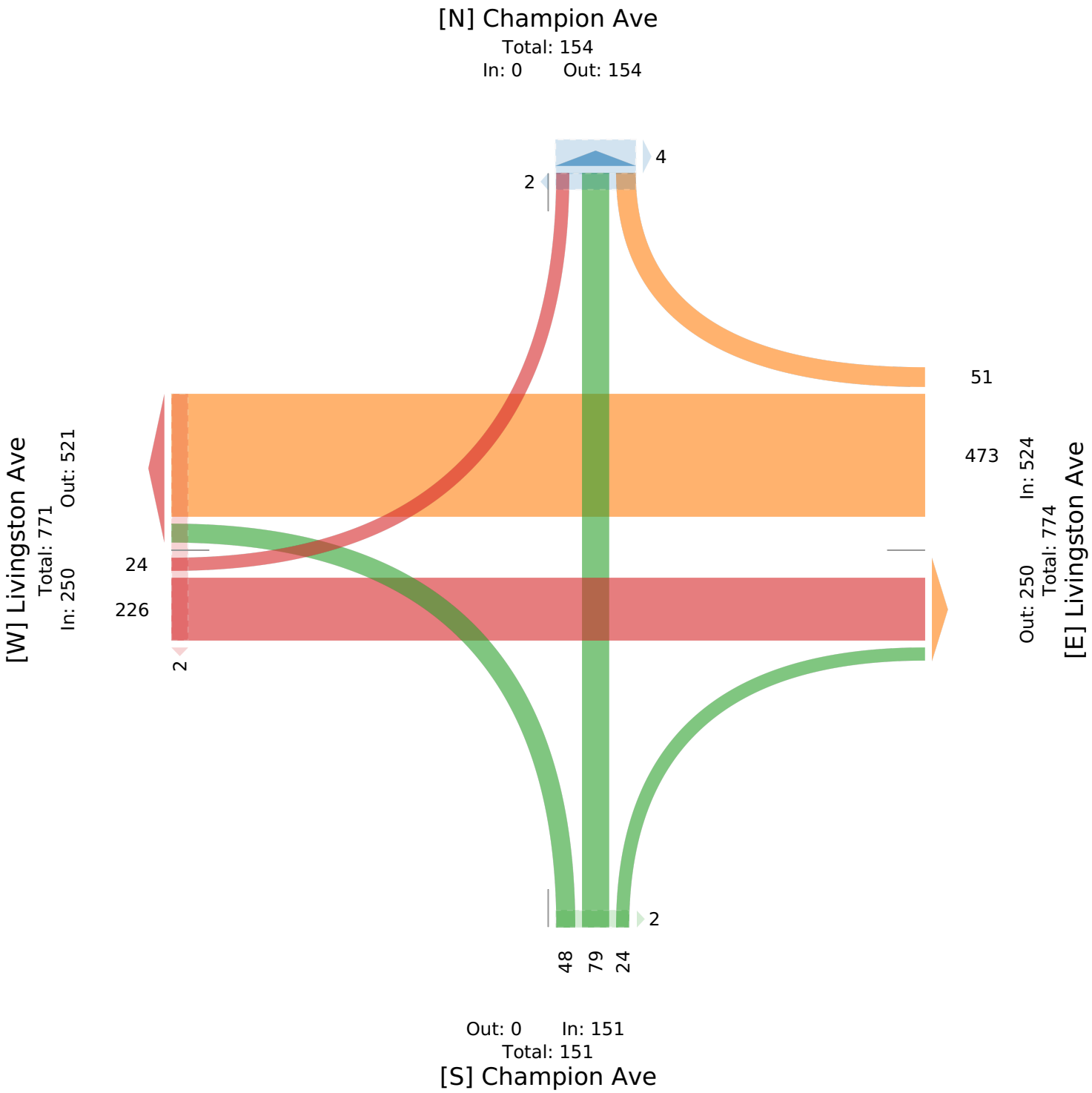
Leg / Direction	Livingston Ave Eastbound						Livingston Ave Westbound						Champion Ave Northbound						Champion Ave Southbound						
Time	L	T	R	U	**App**	Ped*	L	T	R	U	**App**	Ped*	L	T	R	U	**App**	Ped*	L	T	R	U	**App**	Ped*	**Int**
2022-05-05 8:00AM	4	59	0	0	**63**	2	0	101	7	0	**108**	0	8	17	5	0	**30**	0	0	0	0	0	**0**	2	**201**
8:15AM	3	42	0	0	**45**	0	0	122	17	0	**139**	0	7	18	6	0	**31**	0	0	0	0	0	**0**	2	**215**
8:30AM	8	67	0	0	**75**	0	0	123	11	0	**134**	0	17	25	8	0	**50**	2	0	0	0	0	**0**	1	**259**
8:45AM	9	58	0	0	**67**	0	0	127	16	0	**143**	0	16	19	5	0	**40**	0	0	0	0	0	**0**	1	**250**
Total	24	226	0	0	**250**	2	0	473	51	0	**524**	0	48	79	24	0	**151**	2	0	0	0	0	**0**	6	**925**
% Approach	9.6%	90.4%	0%	0%	**-**	-	0%	90.3%	9.7%	0%	**-**	-	31.8%	52.3%	15.9%	0%	**-**	-	0%	0%	0%	0%	**-**	-	-
% Total	2.6%	24.4%	0%	0%	**27.0%**	-	0%	51.1%	5.5%	0%	**56.6%**	-	5.2%	8.5%	2.6%	0%	**16.3%**	-	0%	0%	0%	0%	**0%**	-	-
PHF	0.667	0.843	-	-	**0.833**	-	-	0.929	0.750	-	**0.914**	-	0.706	0.790	0.821	-	**0.765**	-	-	-	-	-	**-**	-	0.894
Lights and Motorcycles	24	216	0	0	**240**	-	0	446	51	0	**497**	-	41	72	23	0	**136**	-	0	0	0	0	**0**	-	873
% Lights and Motorcycles	100%	95.6%	0%	0%	**96.0%**	-	0%	94.3%	100%	0%	**94.8%**	-	85.4%	91.1%	95.8%	0%	**90.1%**	-	0%	0%	0%	0%	**-**	-	94.4%
Heavy	0	10	0	0	**10**	-	0	26	0	0	**26**	-	7	7	0	0	**14**	-	0	0	0	0	**0**	-	50
% Heavy	0%	4.4%	0%	0%	**4.0%**	-	0%	5.5%	0%	0%	**5.0%**	-	14.6%	8.9%	0%	0%	**9.3%**	-	0%	0%	0%	0%	**-**	-	5.4%
Scooters (Standing)	0	0	0	0	**0**	-	0	0	0	0	**0**	-	0	0	0	0	**0**	-	0	0	0	0	**0**	-	0
% Scooters (Standing)	0%	0%	0%	0%	**0%**	-	0%	0%	0%	0%	**0%**	-	0%	0%	0%	0%	**0%**	-	0%	0%	0%	0%	**-**	-	0%
Bicycles on Road	0	0	0	0	**0**	-	0	1	0	0	**1**	-	0	0	1	0	**1**	-	0	0	0	0	**0**	-	2
% Bicycles on Road	0%	0%	0%	0%	**0%**	-	0%	0.2%	0%	0%	**0.2%**	-	0%	0%	4.2%	0%	**0.7%**	-	0%	0%	0%	0%	**-**	-	0.2%
Pedestrians	-	-	-	-	-	2	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	6	
% Pedestrians	-	-	-	-	-	100%	-	-	-	-	-	-	-	-	-	-	-	0%	-	-	-	-	-	100%	-
Bicycles on Crosswalk	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	2	-	-	-	-	-	0	
% Bicycles on Crosswalk	-	-	-	-	-	0%	-	-	-	-	-	-	-	-	-	-	-	100%	-	-	-	-	-	0%	-

*Pedestrians and Bicycles on Crosswalk. L: Left, R: Right, T: Thru, U: U-Turn

4) Livingston Ave & Champion Ave - TMC

Thu May 5, 2022
AM Peak (8 AM - 9 AM)
All Classes (Lights and Motorcycles, Heavy, Scooters (Standing), Pedestrians, Bicycles on Road, Bicycles on Crosswalk)
All Movements
ID: 949512, Location: 39.949678, -82.970093, Site Code: 4

Provided by: Smart Services, Inc.
88 W. Church Street,
Newark, OH, 43055, US



4) Livingston Ave & Champion Ave - TMC

Thu May 5, 2022
PM Peak (3 PM - 4 PM) - Overall Peak Hour
All Classes (Lights and Motorcycles, Heavy, Scooters (Standing), Pedestrians, Bicycles on Road, Bicycles on Crosswalk)
All Movements
ID: 949512, Location: 39.949678, -82.970093, Site Code: 4

Provided by: Smart Services, Inc.
88 W. Church Street,
Newark, OH, 43055, US

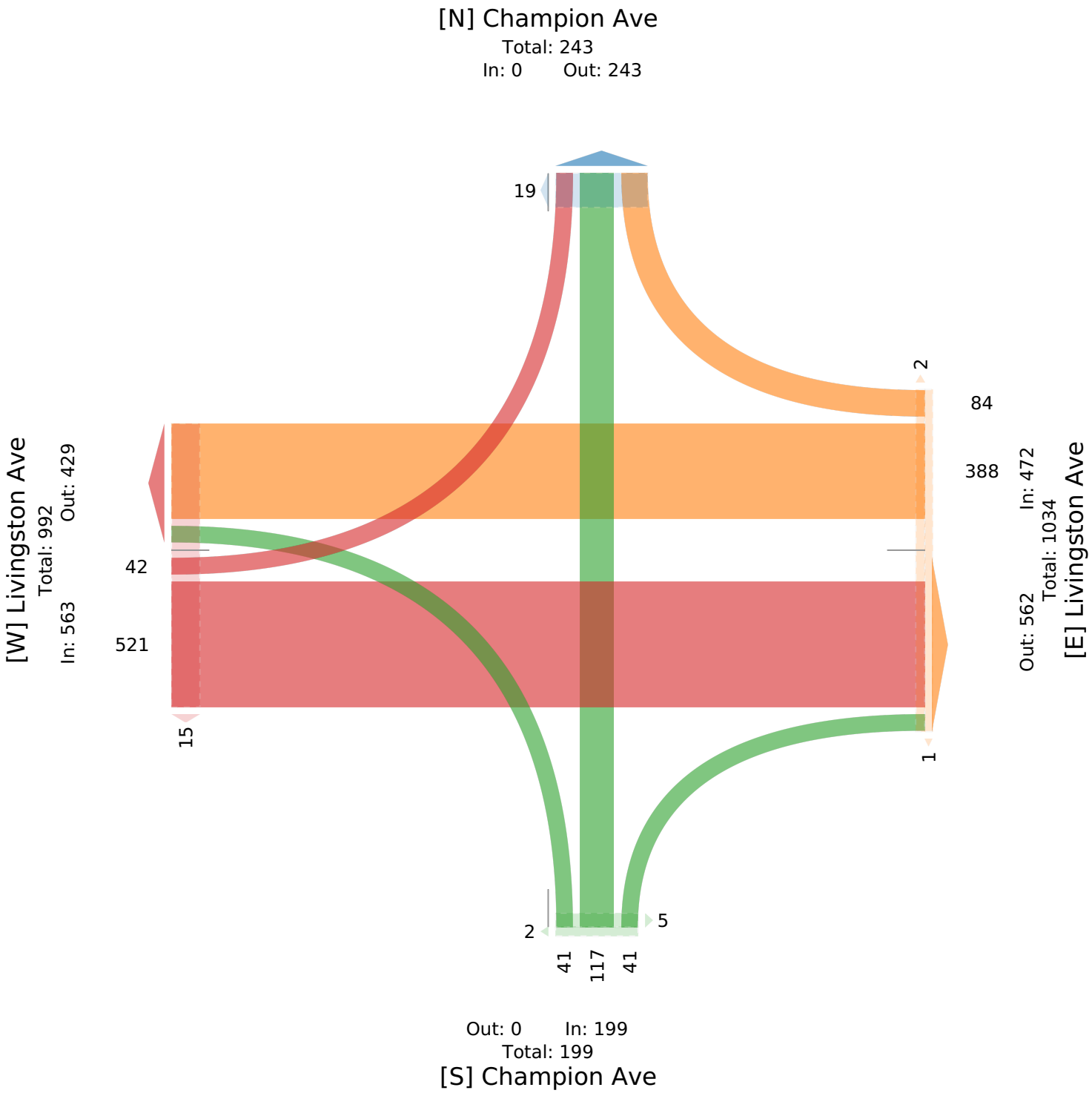
Leg / Direction	Livingston Ave Eastbound						Livingston Ave Westbound						Champion Ave Northbound						Champion Ave Southbound						
Time	L	T	R	U	**App**	Ped*	L	T	R	U	**App**	Ped*	L	T	R	U	**App**	Ped*	L	T	R	U	**App**	Ped*	**Int**
2022-05-05 3:00PM	10	128	0	0	**138**	3	0	106	21	0	**127**	1	8	20	7	0	**35**	1	0	0	0	0	**0**	9	**300**
3:15PM	10	124	0	0	**134**	6	0	81	30	0	**111**	1	11	36	11	0	**58**	2	0	0	0	0	**0**	4	**303**
3:30PM	14	142	0	0	**156**	2	0	95	19	0	**114**	1	12	33	11	0	**56**	3	0	0	0	0	**0**	1	**326**
3:45PM	8	127	0	0	**135**	4	0	106	14	0	**120**	0	10	28	12	0	**50**	1	0	0	0	0	**0**	5	**305**
Total	42	521	0	0	**563**	15	0	388	84	0	**472**	3	41	117	41	0	**199**	7	0	0	0	0	**0**	19	**1234**
% Approach	7.5%	92.5%	0%	0%	**-**	-	0%	82.2%	17.8%	0%	**-**	-	20.6%	58.8%	20.6%	0%	**-**	-	0%	0%	0%	0%	**-**	-	-
% Total	3.4%	42.2%	0%	0%	**45.6%**	-	0%	31.4%	6.8%	0%	**38.2%**	-	3.3%	9.5%	3.3%	0%	**16.1%**	-	0%	0%	0%	0%	**0%**	-	-
PHF	0.750	0.917	-	-	**0.902**	-	-	0.915	0.700	-	**0.929**	-	0.854	0.813	0.854	-	**0.858**	-	-	-	-	-	**-**	-	0.946
Lights and Motorcycles	40	509	0	0	**549**	-	0	371	80	0	**451**	-	38	108	40	0	**186**	-	0	0	0	0	**0**	-	1186
% Lights and Motorcycles	95.2%	97.7%	0%	0%	**97.5%**	-	0%	95.6%	95.2%	0%	**95.6%**	-	92.7%	92.3%	97.6%	0%	**93.5%**	-	0%	0%	0%	0%	**-**	-	96.1%
Heavy	2	12	0	0	**14**	-	0	17	4	0	**21**	-	3	9	1	0	**13**	-	0	0	0	0	**0**	-	48
% Heavy	4.8%	2.3%	0%	0%	**2.5%**	-	0%	4.4%	4.8%	0%	**4.4%**	-	7.3%	7.7%	2.4%	0%	**6.5%**	-	0%	0%	0%	0%	**-**	-	3.9%
Scooters (Standing)	0	0	0	0	**0**	-	0	0	0	0	**0**	-	0	0	0	0	**0**	-	0	0	0	0	**0**	-	0
% Scooters (Standing)	0%	0%	0%	0%	**0%**	-	0%	0%	0%	0%	**0%**	-	0%	0%	0%	0%	**0%**	-	0%	0%	0%	0%	**-**	-	0%
Bicycles on Road	0	0	0	0	**0**	-	0	0	0	0	**0**	-	0	0	0	0	**0**	-	0	0	0	0	**0**	-	0
% Bicycles on Road	0%	0%	0%	0%	**0%**	-	0%	0%	0%	0%	**0%**	-	0%	0%	0%	0%	**0%**	-	0%	0%	0%	0%	**-**	-	0%
Pedestrians	-	-	-	-	-	15	-	-	-	-	-	3	-	-	-	-	-	7	-	-	-	-	-	19	
% Pedestrians	-	-	-	-	-	100%	-	-	-	-	-	100%	-	-	-	-	-	100%	-	-	-	-	-	100%	-
Bicycles on Crosswalk	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	
% Bicycles on Crosswalk	-	-	-	-	-	0%	-	-	-	-	-	0%	-	-	-	-	-	0%	-	-	-	-	-	0%	-

*Pedestrians and Bicycles on Crosswalk. L: Left, R: Right, T: Thru, U: U-Turn

4) Livingston Ave & Champion Ave - TMC

Thu May 5, 2022
PM Peak (3 PM - 4 PM) - Overall Peak Hour
All Classes (Lights and Motorcycles, Heavy, Scooters (Standing), Pedestrians, Bicycles on Road, Bicycles on Crosswalk)
All Movements
ID: 949512, Location: 39.949678, -82.970093, Site Code: 4

Provided by: Smart Services, Inc.
88 W. Church Street,
Newark, OH, 43055, US



5) Livingston Ave & Lockbourne Rd - TMC

Thu May 5, 2022
Full Length (6 AM-10 AM, 3 PM-7 PM)
All Classes (Lights and Motorcycles, Heavy, Scooters (Standing), Pedestrians, Bicycles on Road, Bicycles on Crosswalk)
All Movements
ID: 949521, Location: 39.94932, -82.963159, Site Code: 5

Provided by: Smart Services, Inc.
88 W. Church Street,
Newark, OH, 43055, US

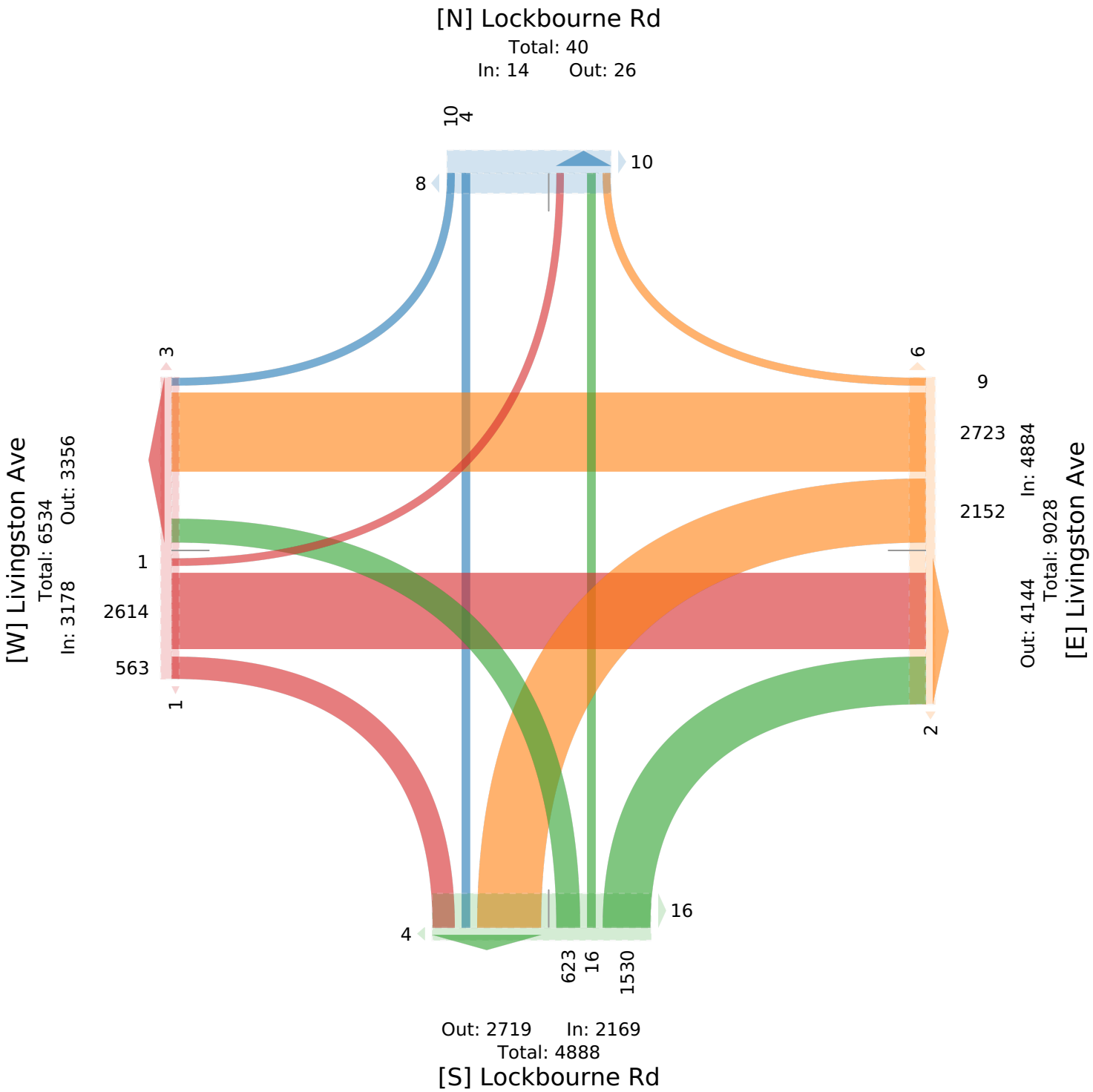
Leg	Livingston Ave						Livingston Ave						Lockbourne Rd						Lockbourne Rd						
Direction	Eastbound						Westbound						Northbound						Southbound						
Time	L	T	R	U	App	Ped*	L	T	R	U	App	Ped*	L	T	R	U	App	Ped*	L	T	R	U	App	Ped*	Int
2022-05-05 6:00AM	0	21	12	0	**33**	1	26	52	0	0	**78**	0	8	0	12	0	**20**	0	0	0	0	0	**0**	0	**131**
6:15AM	0	24	6	0	**30**	1	38	51	0	0	**89**	0	9	0	24	0	**33**	0	0	0	1	0	**1**	0	**153**
6:30AM	0	34	10	0	**44**	0	58	86	0	0	**144**	0	10	0	27	0	**37**	0	0	0	0	0	**0**	1	**225**
6:45AM	0	46	3	0	**49**	0	62	76	0	0	**138**	1	11	0	26	0	**37**	0	0	0	0	0	**0**	2	**224**
Hourly Total	0	125	31	0	**156**	2	184	265	0	0	**449**	1	38	0	89	0	**127**	0	0	0	1	0	**1**	3	**733**
7:00AM	0	38	12	0	**50**	0	39	62	0	0	**101**	0	17	0	38	0	**55**	0	0	0	0	0	**0**	0	**206**
7:15AM	0	55	4	0	**59**	0	56	91	0	0	**147**	2	13	0	43	0	**56**	0	0	0	0	0	**0**	1	**262**
7:30AM	0	81	14	0	**95**	0	60	82	0	0	**142**	0	17	0	39	0	**56**	0	0	0	0	0	**0**	0	**293**
7:45AM	0	75	6	0	**81**	0	71	107	0	0	**178**	0	14	1	48	0	**63**	0	0	0	0	0	**0**	0	**322**
Hourly Total	0	249	36	0	**285**	0	226	342	0	0	**568**	2	61	1	168	0	**230**	0	0	0	0	0	**0**	1	**1083**
8:00AM	0	63	17	0	**80**	0	71	85	1	0	**157**	1	12	1	22	0	**35**	0	0	1	0	0	**1**	2	**273**
8:15AM	0	52	18	0	**70**	0	65	103	0	0	**168**	0	21	1	35	0	**57**	0	0	0	1	0	**1**	1	**296**
8:30AM	0	61	21	0	**82**	0	58	102	0	0	**160**	0	22	0	66	0	**88**	2	0	0	0	0	**0**	0	**330**
8:45AM	0	61	11	0	**72**	0	76	98	0	0	**174**	0	28	0	49	0	**77**	1	0	0	0	0	**0**	3	**323**
Hourly Total	0	237	67	0	**304**	0	270	388	1	0	**659**	1	83	2	172	0	**257**	3	0	1	1	0	**2**	6	**1222**
9:00AM	0	46	14	0	**60**	0	65	81	0	0	**146**	0	28	0	48	0	**76**	0	0	0	0	0	**0**	0	**282**
9:15AM	0	68	26	0	**94**	0	55	72	1	0	**128**	0	17	0	36	0	**53**	2	0	0	0	0	**0**	0	**275**
9:30AM	0	64	15	0	**79**	0	59	86	0	0	**145**	1	17	0	33	0	**50**	0	0	0	0	0	**0**	0	**274**
9:45AM	1	65	14	0	**80**	0	48	83	0	0	**131**	0	21	0	41	0	**62**	1	0	0	0	0	**0**	0	**273**
Hourly Total	1	243	69	0	**313**	0	227	322	1	0	**550**	1	83	0	158	0	**241**	3	0	0	0	0	**0**	0	**1104**
3:00PM	0	142	22	0	**164**	0	71	96	0	0	**167**	1	28	2	53	0	**83**	1	0	0	0	0	**0**	0	**414**
3:15PM	0	116	19	0	**135**	0	74	76	0	0	**150**	1	29	0	74	0	**103**	3	0	1	3	0	**4**	1	**392**
3:30PM	0	146	27	0	**173**	0	73	105	1	0	**179**	0	23	1	69	0	**93**	0	0	0	0	0	**0**	1	**445**
3:45PM	0	138	19	0	**157**	1	75	86	1	0	**162**	0	25	1	69	0	**95**	2	0	0	1	0	**1**	2	**415**
Hourly Total	0	542	87	0	**629**	1	293	363	2	0	**658**	2	105	4	265	0	**374**	6	0	1	4	0	**5**	4	**1666**
4:00PM	0	115	32	0	**147**	0	74	83	0	0	**157**	0	26	2	59	0	**87**	0	0	0	0	0	**0**	0	**391**
4:15PM	0	87	26	0	**113**	0	97	88	0	0	**185**	0	20	0	55	0	**75**	0	0	0	0	0	**0**	1	**373**
4:30PM	0	115	33	0	**148**	0	79	92	1	0	**172**	0	25	0	69	0	**94**	0	0	0	0	0	**0**	0	**414**
4:45PM	0	142	21	0	**163**	0	78	84	0	0	**162**	0	30	1	56	0	**87**	3	0	0	0	0	**0**	1	**412**
Hourly Total	0	459	112	0	**571**	0	328	347	1	0	**676**	0	101	3	239	0	**343**	3	0	0	0	0	**0**	2	**1590**
5:00PM	0	106	27	0	**133**	1	73	82	1	0	**156**	1	13	0	64	0	**77**	2	0	1	2	0	**3**	0	**369**
5:15PM	0	114	21	0	**135**	0	75	92	0	0	**167**	0	17	0	58	0	**75**	0	0	1	0	0	**1**	1	**378**
5:30PM	0	93	16	0	**109**	0	82	98	1	0	**181**	0	22	2	53	0	**77**	0	0	0	0	0	**0**	0	**367**
5:45PM	0	103	24	0	**127**	0	67	95	2	0	**164**	0	21	1	47	0	**69**	0	0	0	1	0	**1**	0	**361**
Hourly Total	0	416	88	0	**504**	1	297	367	4	0	**668**	1	73	3	222	0	**298**	2	0	2	3	0	**5**	1	**1475**
6:00PM	0	92	26	0	**118**	0	86	82	0	0	**168**	0	24	2	71	0	**97**	0	0	0	1	0	**1**	0	**384**
6:15PM	0	80	15	0	**95**	0	83	82	0	0	**165**	0	16	1	49	0	**66**	2	0	0	0	0	**0**	0	**326**
6:30PM	0	89	23	0	**112**	0	84	78	0	0	**162**	0	23	0	54	0	**77**	0	0	0	0	0	**0**	0	**351**
6:45PM	0	82	9	0	**91**	0	74	87	0	0	**161**	0	16	0	43	0	**59**	1	0	0	0	0	**0**	1	**311**
Hourly Total	0	343	73	0	**416**	0	327	329	0	0	**656**	0	79	3	217	0	**299**	3	0	0	1	0	**1**	1	**1372**
Total	1	2614	563	0	**3178**	4	2152	2723	9	0	**4884**	8	623	16	1530	0	**2169**	20	0	4	10	0	**14**	18	**10245**
% Approach	0%	82.3%	17.7%	0%	**-**	-	44.1%	55.8%	0.2%	0%	**-**	-	28.7%	0.7%	70.5%	0%	**-**	-	0%	28.6%	71.4%	0%	**-**	-	-
% Total	0%	25.5%	5.5%	0%	**31.0%**	-	21.0%	26.6%	0.1%	0%	**47.7%**	-	6.1%	0.2%	14.9%	0%	**21.2%**	-	0%	0%	0.1%	0%	**0.1%**	-	-
Lights and Motorcycles	1	2523	539	0	**3063**	-	2083	2615	9	0	**4707**	-	603	16	1482	0	**2101**	-	0	4	9	0	**13**	-	9884
% Lights and Motorcycles	100%	96.5%	95.7%	0%	**96.4%**	-	96.8%	96.0%	100%	0%	**96.4%**	-	96.8%	100%	96.9%	0%	**96.9%**	-	0%	100%	90.0%	0%	**92.9%**	-	96.5%
Heavy	0	90	24	0	**114**	-	68	107	0	0	**175**	-	20	0	47	0	**67**	-	0	0	0	0	**0**	-	356
% Heavy	0%	3.4%	4.3%	0%	**3.6%**	-	3.2%	3.9%	0%	0%	**3.6%**	-	3.2%	0%	3.1%	0%	**3.1%**	-	0%	0%	0%	0%	**0%**	-	3.5%
Scooters (Standing)	0	0	0	0	**0**	-	1	0	0	0	**1**	-	0	0	0	0	**0**	-	0	0	0	0	**0**	-	1
% Scooters (Standing)	0%	0%	0%	0%	**0%**	-	0%	0%	0%	0%	**0%**	-	0%	0%	0%	0%	**0%**	-	0%	0%	0%	0%	**0%**	-	0%
Bicycles on Road	0	1	0	0	**1**	-	0	1	0	0	**1**	-	0	0	1	0	**1**	-	0	0	1	0	**1**	-	4
% Bicycles on Road	0%	0%	0%	0%	**0%**	-	0%	0%	0%	0%	**0%**	-	0%	0%	0.1%	0%	**0%**	-	0%	0%	10.0%	0%	**7.1%**	-	0%
Pedestrians	-	-	-	-	-	4	-	-	-	-	-	8	-	-	-	-	-	19	-	-	-	-	-	18	
% Pedestrians	-	-	-	-	-	100%	-	-	-	-	-	100%	-	-	-	-	-	95.0%	-	-	-	-	-	100%	-
Bicycles on Crosswalk	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	1	-	-	-	-	-	0	
% Bicycles on Crosswalk	-	-	-	-	-	0%	-	-	-	-	-	0%	-	-	-	-	-	5.0%	-	-	-	-	-	0%	-

*Pedestrians and Bicycles on Crosswalk. L: Left, R: Right, T: Thru, U: U-Turn

5) Livingston Ave & Lockbourne Rd - TMC

Thu May 5, 2022
Full Length (6 AM-10 AM, 3 PM-7 PM)
All Classes (Lights and Motorcycles, Heavy, Scooters (Standing), Pedestrians, Bicycles on Road, Bicycles on Crosswalk)
All Movements
ID: 949521, Location: 39.94932, -82.963159, Site Code: 5

Provided by: Smart Services, Inc.
88 W. Church Street,
Newark, OH, 43055, US



5) Livingston Ave & Lockbourne Rd - TMC

Thu May 5, 2022
AM Peak (8:15 AM - 9:15 AM)
All Classes (Lights and Motorcycles, Heavy, Scooters (Standing), Pedestrians, Bicycles on Road, Bicycles on Crosswalk)
All Movements
ID: 949521, Location: 39.94932, -82.963159, Site Code: 5

Provided by: Smart Services, Inc.
88 W. Church Street,
Newark, OH, 43055, US

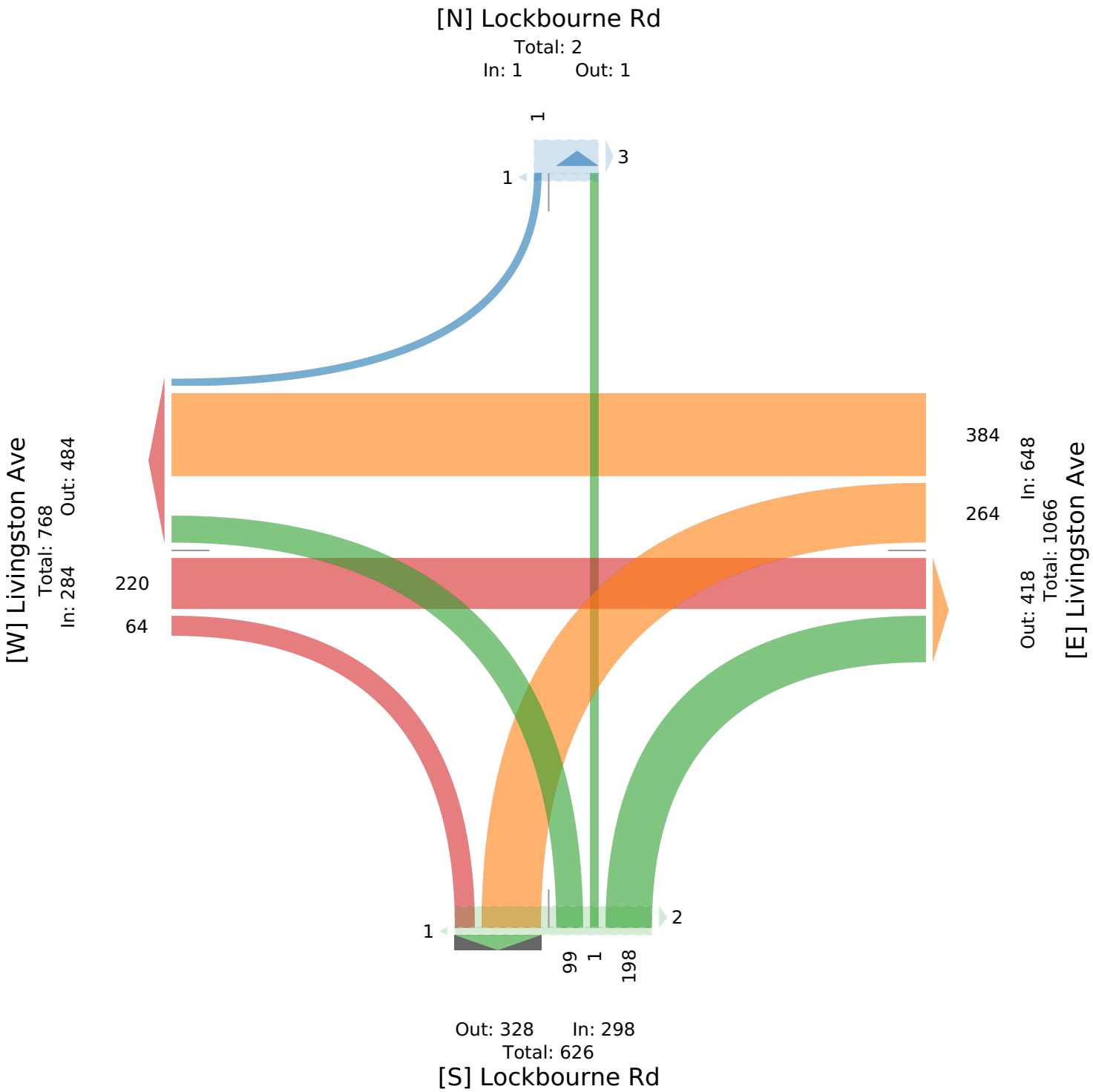
Leg / Direction	Livingston Ave Eastbound						Livingston Ave Westbound						Lockbourne Rd Northbound						Lockbourne Rd Southbound						
Time	L	T	R	U	**App**	Ped*	L	T	R	U	**App**	Ped*	L	T	R	U	**App**	Ped*	L	T	R	U	**App**	Ped*	**Int**
2022-05-05 8:15AM	0	52	18	0	**70**	0	65	103	0	0	**168**	0	21	1	35	0	**57**	0	0	0	1	0	**1**	1	**296**
8:30AM	0	61	21	0	**82**	0	58	102	0	0	**160**	0	22	0	66	0	**88**	2	0	0	0	0	**0**	0	**330**
8:45AM	0	61	11	0	**72**	0	76	98	0	0	**174**	0	28	0	49	0	**77**	1	0	0	0	0	**0**	3	**323**
9:00AM	0	46	14	0	**60**	0	65	81	0	0	**146**	0	28	0	48	0	**76**	0	0	0	0	0	**0**	0	**282**
Total	0	220	64	0	**284**	0	264	384	0	0	**648**	0	99	1	198	0	**298**	3	0	0	1	0	**1**	4	**1231**
% Approach	0%	77.5%	22.5%	0%	**-**	-	40.7%	59.3%	0%	0%	**-**	-	33.2%	0.3%	66.4%	0%	**-**	-	0%	0%	100%	0%	**-**	-	-
% Total	0%	17.9%	5.2%	0%	**23.1%**	-	21.4%	31.2%	0%	0%	**52.6%**	-	8.0%	0.1%	16.1%	0%	**24.2%**	-	0%	0%	0.1%	0%	**0.1%**	-	-
PHF	-	0.898	0.762	-	**0.873**	-	0.868	0.932	-	-	**0.931**	-	0.884	0.250	0.758	-	**0.853**	-	-	-	0.250	-	**0.250**	-	0.937
Lights and Motorcycles	0	211	57	0	**268**	-	252	366	0	0	**618**	-	97	1	192	0	**290**	-	0	0	1	0	**1**	-	1177
% Lights and Motorcycles	0%	95.9%	89.1%	0%	**94.4%**	-	95.5%	95.3%	0%	0%	**95.4%**	-	98.0%	100%	97.0%	0%	**97.3%**	-	0%	0%	100%	0%	**100%**	-	95.6%
Heavy	0	8	7	0	**15**	-	12	18	0	0	**30**	-	2	0	5	0	**7**	-	0	0	0	0	**0**	-	52
% Heavy	0%	3.6%	10.9%	0%	**5.3%**	-	4.5%	4.7%	0%	0%	**4.6%**	-	2.0%	0%	2.5%	0%	**2.3%**	-	0%	0%	0%	0%	**0%**	-	4.2%
Scooters (Standing)	0	0	0	0	**0**	-	0	0	0	0	**0**	-	0	0	0	0	**0**	-	0	0	0	0	**0**	-	0
% Scooters (Standing)	0%	0%	0%	0%	**0%**	-	0%	0%	0%	0%	**0%**	-	0%	0%	0%	0%	**0%**	-	0%	0%	0%	0%	**0%**	-	0%
Bicycles on Road	0	1	0	0	**1**	-	0	0	0	0	**0**	-	0	0	1	0	**1**	-	0	0	0	0	**0**	-	2
% Bicycles on Road	0%	0.5%	0%	0%	**0.4%**	-	0%	0%	0%	0%	**0%**	-	0%	0%	0.5%	0%	**0.3%**	-	0%	0%	0%	0%	**0%**	-	0.2%
Pedestrians	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	2	-	-	-	-	-	4	
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	66.7%	-	-	-	-	-	100%	-
Bicycles on Crosswalk	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	1	-	-	-	-	-	0	
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	33.3%	-	-	-	-	-	0%	-

*Pedestrians and Bicycles on Crosswalk. L: Left, R: Right, T: Thru, U: U-Turn

5) Livingston Ave & Lockbourne Rd - TMC

Thu May 5, 2022
AM Peak (8:15 AM - 9:15 AM)
All Classes (Lights and Motorcycles, Heavy, Scooters (Standing), Pedestrians, Bicycles on Road, Bicycles on Crosswalk)
All Movements
ID: 949521, Location: 39.94932, -82.963159, Site Code: 5

Provided by: Smart Services, Inc.
88 W. Church Street,
Newark, OH, 43055, US



5) Livingston Ave & Lockbourne Rd - TMC

Thu May 5, 2022
PM Peak (3 PM - 4 PM) - Overall Peak Hour
All Classes (Lights and Motorcycles, Heavy, Scooters (Standing), Pedestrians, Bicycles on Road, Bicycles on Crosswalk)
All Movements
ID: 949521, Location: 39.94932, -82.963159, Site Code: 5

Provided by: Smart Services, Inc.
88 W. Church Street,
Newark, OH, 43055, US

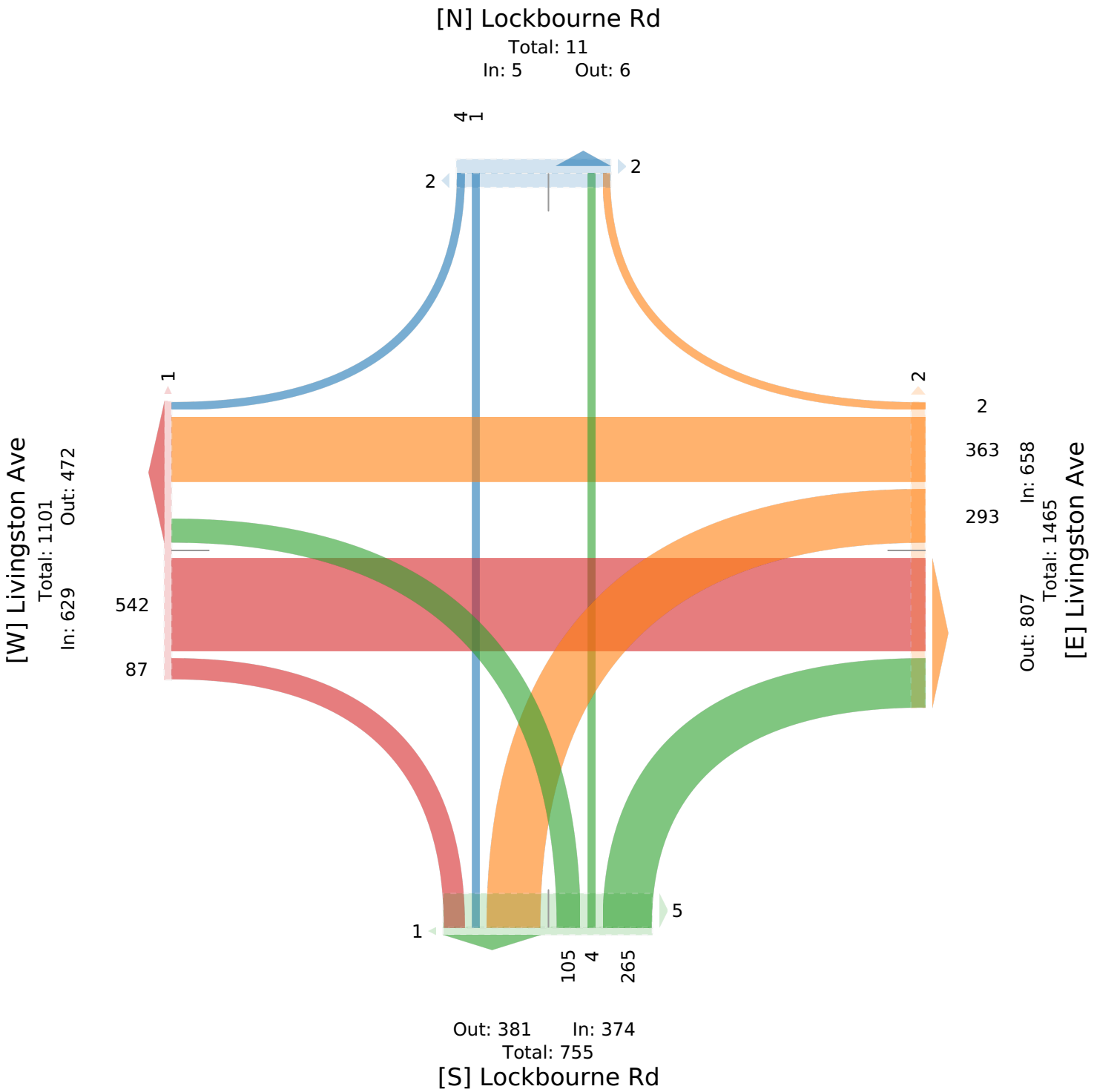
Leg	Livingston Ave						Livingston Ave						Lockbourne Rd						Lockbourne Rd						
Direction	Eastbound						Westbound						Northbound						Southbound						
Time	L	T	R	U	**App**	Ped*	L	T	R	U	**App**	Ped*	L	T	R	U	**App**	Ped*	L	T	R	U	**App**	Ped*	**Int**
2022-05-05 3:00PM	0	142	22	0	**164**	0	71	96	0	0	**167**	1	28	2	53	0	**83**	1	0	0	0	0	**0**	0	**414**
3:15PM	0	116	19	0	**135**	0	74	76	0	0	**150**	1	29	0	74	0	**103**	3	0	1	3	0	**4**	1	**392**
3:30PM	0	146	27	0	**173**	0	73	105	1	0	**179**	0	23	1	69	0	**93**	0	0	0	0	0	**0**	1	**445**
3:45PM	0	138	19	0	**157**	1	75	86	1	0	**162**	0	25	1	69	0	**95**	2	0	0	1	0	**1**	2	**415**
Total	0	542	87	0	**629**	1	293	363	2	0	**658**	2	105	4	265	0	**374**	6	0	1	4	0	**5**	4	**1666**
% Approach	0%	86.2%	13.8%	0%	**-**	-	44.5%	55.2%	0.3%	0%	**-**	-	28.1%	1.1%	70.9%	0%	**-**	-	0%	20.0%	80.0%	0%	**-**	-	**-**
% Total	0%	32.5%	5.2%	0%	**37.8%**	-	17.6%	21.8%	0.1%	0%	**39.5%**	-	6.3%	0.2%	15.9%	0%	**22.4%**	-	0%	0.1%	0.2%	0%	**0.3%**	-	**-**
PHF	-	0.928	0.806	-	**0.909**	-	0.977	0.864	0.500	-	**0.919**	-	0.905	0.500	0.895	-	**0.908**	-	-	0.250	0.333	-	**0.313**	-	0.936
Lights and Motorcycles	0	529	85	0	**614**	-	280	345	2	0	**627**	-	103	4	255	0	**362**	-	0	1	4	0	**5**	-	1608
% Lights and Motorcycles	0%	97.6%	97.7%	0%	**97.6%**	-	95.6%	95.0%	100%	0%	**95.3%**	-	98.1%	100%	96.2%	0%	**96.8%**	-	0%	100%	100%	0%	**100%**	-	96.5%
Heavy	0	13	2	0	**15**	-	13	18	0	0	**31**	-	2	0	10	0	**12**	-	0	0	0	0	**0**	-	58
% Heavy	0%	2.4%	2.3%	0%	**2.4%**	-	4.4%	5.0%	0%	0%	**4.7%**	-	1.9%	0%	3.8%	0%	**3.2%**	-	0%	0%	0%	0%	**0%**	-	3.5%
Scooters (Standing)	0	0	0	0	**0**	-	0	0	0	0	**0**	-	0	0	0	0	**0**	-	0	0	0	0	**0**	-	0
% Scooters (Standing)	0%	0%	0%	0%	**0%**	-	0%	0%	0%	0%	**0%**	-	0%	0%	0%	0%	**0%**	-	0%	0%	0%	0%	**0%**	-	0%
Bicycles on Road	0	0	0	0	**0**	-	0	0	0	0	**0**	-	0	0	0	0	**0**	-	0	0	0	0	**0**	-	0
% Bicycles on Road	0%	0%	0%	0%	**0%**	-	0%	0%	0%	0%	**0%**	-	0%	0%	0%	0%	**0%**	-	0%	0%	0%	0%	**0%**	-	0%
Pedestrians	-	-	-	-	-	1	-	-	-	-	-	2	-	-	-	-	-	6	-	-	-	-	-	4	
% Pedestrians	-	-	-	-	-	100%	-	-	-	-	-	100%	-	-	-	-	-	100%	-	-	-	-	-	100%	-
Bicycles on Crosswalk	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	
% Bicycles on Crosswalk	-	-	-	-	-	0%	-	-	-	-	-	0%	-	-	-	-	-	0%	-	-	-	-	-	0%	-

*Pedestrians and Bicycles on Crosswalk. L: Left, R: Right, T: Thru, U: U-Turn

5) Livingston Ave & Lockbourne Rd - TMC

Thu May 5, 2022
PM Peak (3 PM - 4 PM) - Overall Peak Hour
All Classes (Lights and Motorcycles, Heavy, Scooters (Standing), Pedestrians, Bicycles on Road, Bicycles on Crosswalk)
All Movements
ID: 949521, Location: 39.94932, -82.963159, Site Code: 5

Provided by: Smart Services, Inc.
88 W. Church Street,
Newark, OH, 43055, US



6) Livingston Ave & Miller Ave (East) - TMC

Thu May 5, 2022
Full Length (6 AM-10 AM, 3 PM-7 PM)
All Classes (Lights and Motorcycles, Heavy, Pedestrians, Bicycles on Road, Bicycles on Crosswalk)
All Movements
ID: 949522, Location: 39.949262, -82.961401, Site Code: 6

Provided by: Smart Services, Inc.
88 W. Church Street,
Newark, OH, 43055, US

Leg Direction	Livingston Ave Eastbound					Livingston Ave Westbound					Miller Ave Southbound					
Time	L	T	U	**App**	Ped*	T	R	U	**App**	Ped*	L	R	U	**App**	Ped*	**Int**
2022-05-05 6:00AM	0	34	0	**34**	0	49	0	0	**49**	0	7	31	0	**38**	0	**121**
6:15AM	0	50	0	**50**	0	52	0	0	**52**	0	11	43	0	**54**	0	**156**
6:30AM	0	61	0	**61**	0	97	0	0	**97**	0	19	46	0	**65**	0	**223**
6:45AM	0	67	0	**67**	0	78	0	0	**78**	0	20	65	0	**85**	1	**230**
Hourly Total	0	212	0	**212**	0	276	0	0	**276**	0	57	185	0	**242**	1	**730**
7:00AM	0	80	0	**80**	0	68	0	0	**68**	0	13	34	0	**47**	0	**195**
7:15AM	0	95	0	**95**	0	83	0	0	**83**	0	19	59	0	**78**	0	**256**
7:30AM	0	119	0	**119**	0	93	0	0	**93**	0	14	57	0	**71**	0	**283**
7:45AM	0	132	0	**132**	0	114	0	0	**114**	0	20	70	0	**90**	0	**336**
Hourly Total	0	426	0	**426**	0	358	0	0	**358**	0	66	220	0	**286**	0	**1070**
8:00AM	0	88	0	**88**	0	108	0	0	**108**	0	21	53	0	**74**	0	**270**
8:15AM	0	93	0	**93**	0	113	0	0	**113**	0	22	58	0	**80**	0	**286**
8:30AM	0	128	0	**128**	0	102	0	0	**102**	0	17	63	0	**80**	0	**310**
8:45AM	0	107	0	**107**	0	108	0	0	**108**	0	23	70	0	**93**	1	**308**
Hourly Total	0	416	0	**416**	0	431	0	0	**431**	0	83	244	0	**327**	1	**1174**
9:00AM	0	97	0	**97**	1	86	0	0	**86**	0	22	60	0	**82**	1	**265**
9:15AM	0	109	0	**109**	0	87	0	0	**87**	0	25	47	0	**72**	0	**268**
9:30AM	0	93	0	**93**	0	88	0	0	**88**	0	17	62	0	**79**	0	**260**
9:45AM	0	107	0	**107**	0	93	0	0	**93**	0	27	43	0	**70**	0	**270**
Hourly Total	0	406	0	**406**	1	354	0	0	**354**	0	91	212	0	**303**	1	**1063**
3:00PM	0	192	0	**192**	0	116	0	0	**116**	0	34	63	0	**97**	2	**405**
3:15PM	0	182	0	**182**	0	82	0	0	**82**	1	35	77	0	**112**	0	**376**
3:30PM	0	214	0	**214**	0	112	0	0	**112**	0	40	68	0	**108**	1	**434**
3:45PM	0	210	0	**210**	0	93	0	0	**93**	0	43	82	0	**125**	0	**428**
Hourly Total	0	798	0	**798**	0	403	0	0	**403**	1	152	290	0	**442**	3	**1643**
4:00PM	0	169	0	**169**	0	88	0	0	**88**	0	32	83	0	**115**	0	**372**
4:15PM	0	146	0	**146**	2	89	0	0	**89**	0	33	95	0	**128**	0	**363**
4:30PM	0	163	0	**163**	0	92	0	0	**92**	0	42	85	0	**127**	0	**382**
4:45PM	0	217	0	**217**	0	90	0	0	**90**	0	40	81	0	**121**	1	**428**
Hourly Total	0	695	0	**695**	2	359	0	0	**359**	0	147	344	0	**491**	1	**1545**
5:00PM	0	169	0	**169**	0	98	0	0	**98**	0	38	61	0	**99**	1	**366**
5:15PM	0	179	0	**179**	0	103	0	0	**103**	0	43	71	0	**114**	0	**396**
5:30PM	0	152	0	**152**	0	101	0	0	**101**	0	34	89	0	**123**	0	**376**
5:45PM	0	152	0	**152**	0	106	0	0	**106**	0	38	72	0	**110**	0	**368**
Hourly Total	0	652	0	**652**	0	408	0	0	**408**	0	153	293	0	**446**	1	**1506**
6:00PM	1	163	0	**164**	0	92	0	0	**92**	0	36	80	0	**116**	0	**372**
6:15PM	0	132	0	**132**	0	87	0	0	**87**	0	26	82	0	**108**	0	**327**
6:30PM	0	134	0	**134**	1	86	0	0	**86**	0	34	78	0	**112**	0	**332**
6:45PM	0	126	0	**126**	0	84	0	0	**84**	0	24	82	0	**106**	0	**316**
Hourly Total	1	555	0	**556**	1	349	0	0	**349**	0	120	322	0	**442**	0	**1347**
Total	1	4160	0	**4161**	4	2938	0	0	**2938**	1	869	2110	0	**2979**	8	**10078**
% Approach	0%	100.0%	0%	**-**	-	100%	0%	0%	**-**	-	29.2%	70.8%	0%	**-**	-	-
% Total	0%	41.3%	0%	**41.3%**	-	29.2%	0%	0%	**29.2%**	-	8.6%	20.9%	0%	**29.6%**	-	-
Lights and Motorcycles	1	4020	0	**4021**	-	2815	0	0	**2815**	-	832	2044	0	**2876**	-	9712
% Lights and Motorcycles	100%	96.6%	0%	**96.6%**	-	95.8%	0%	0%	**95.8%**	-	95.7%	96.9%	0%	**96.5%**	-	96.4%
Heavy	0	139	0	**139**	-	121	0	0	**121**	-	37	66	0	**103**	-	363
% Heavy	0%	3.3%	0%	**3.3%**	-	4.1%	0%	0%	**4.1%**	-	4.3%	3.1%	0%	**3.5%**	-	3.6%
Bicycles on Road	0	1	0	**1**	-	2	0	0	**2**	-	0	0	0	**0**	-	3
% Bicycles on Road	0%	0%	0%	**0%**	-	0.1%	0%	0%	**0.1%**	-	0%	0%	0%	**0%**	-	0%
Pedestrians	-	-	-	-	4	-	-	-	-	1	-	-	-	-	8	
% Pedestrians	-	-	-	-	100%	-	-	-	-	100%	-	-	-	-	100%	-
Bicycles on Crosswalk	-	-	-	-	0	-	-	-	-	0	-	-	-	-	0	
% Bicycles on Crosswalk	-	-	-	-	0%	-	-	-	-	0%	-	-	-	-	0%	-

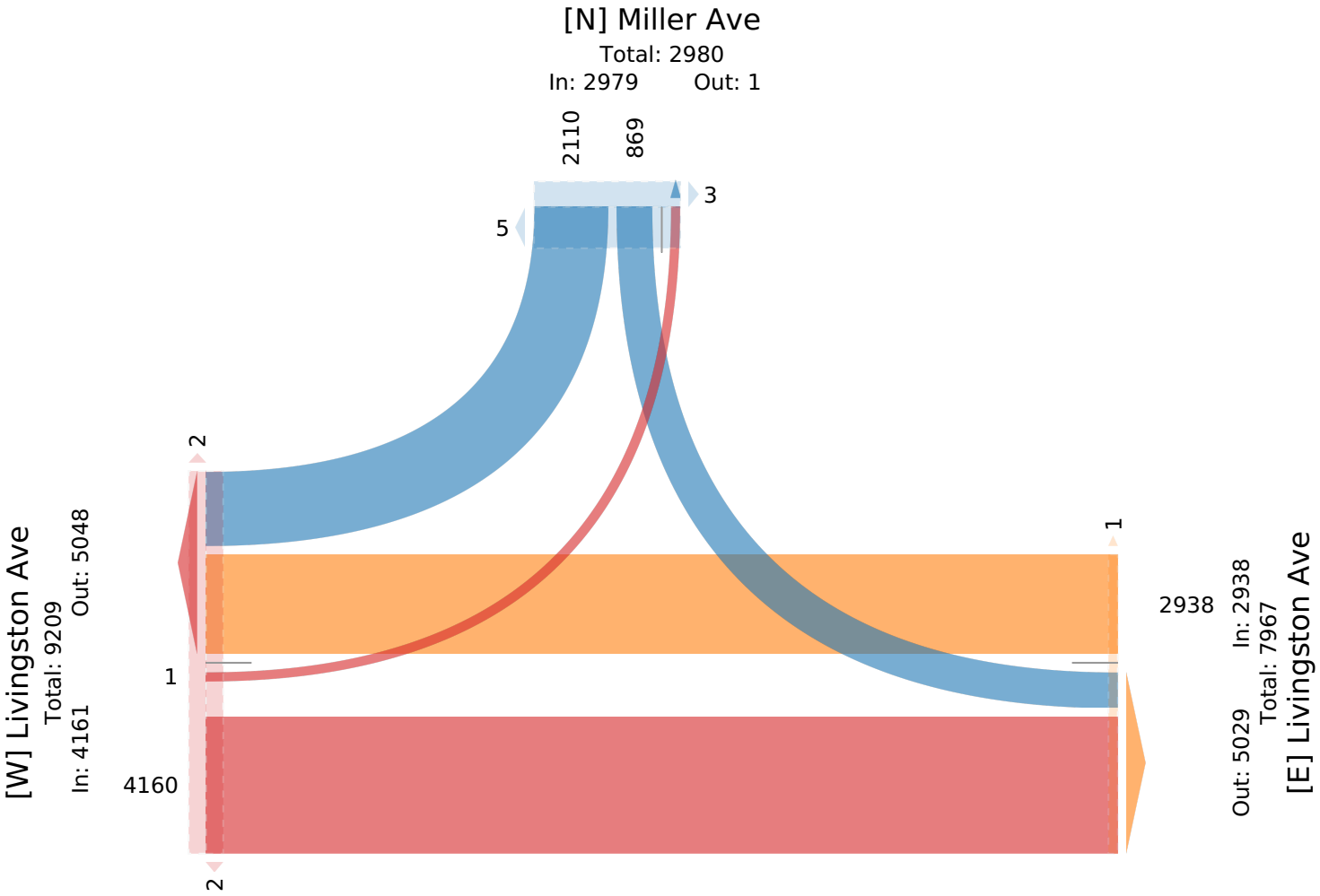
Leg	Livingston Ave					Livingston Ave					Miller Ave					
Direction	Eastbound					Westbound					Southbound					
Time	L	T	U	**App**	Ped*	T	R	U	**App**	Ped*	L	R	U	**App**	Ped*	**Int**

*Pedestrians and Bicycles on Crosswalk. L: Left, R: Right, T: Thru, U: U-Turn

6) Livingston Ave & Miller Ave (East) - TMC

Thu May 5, 2022
Full Length (6 AM-10 AM, 3 PM-7 PM)
All Classes (Lights and Motorcycles, Heavy, Pedestrians, Bicycles on Road, Bicycles on Crosswalk)
All Movements
ID: 949522, Location: 39.949262, -82.961401, Site Code: 6

Provided by: Smart Services, Inc.
88 W. Church Street,
Newark, OH, 43055, US



6) Livingston Ave & Miller Ave (East) - TMC

Thu May 5, 2022
AM Peak (7:45 AM - 8:45 AM)
All Classes (Lights and Motorcycles, Heavy, Pedestrians, Bicycles on Road, Bicycles on Crosswalk)
All Movements
ID: 949522, Location: 39.949262, -82.961401, Site Code: 6

Provided by: Smart Services, Inc.
88 W. Church Street,
Newark, OH, 43055, US

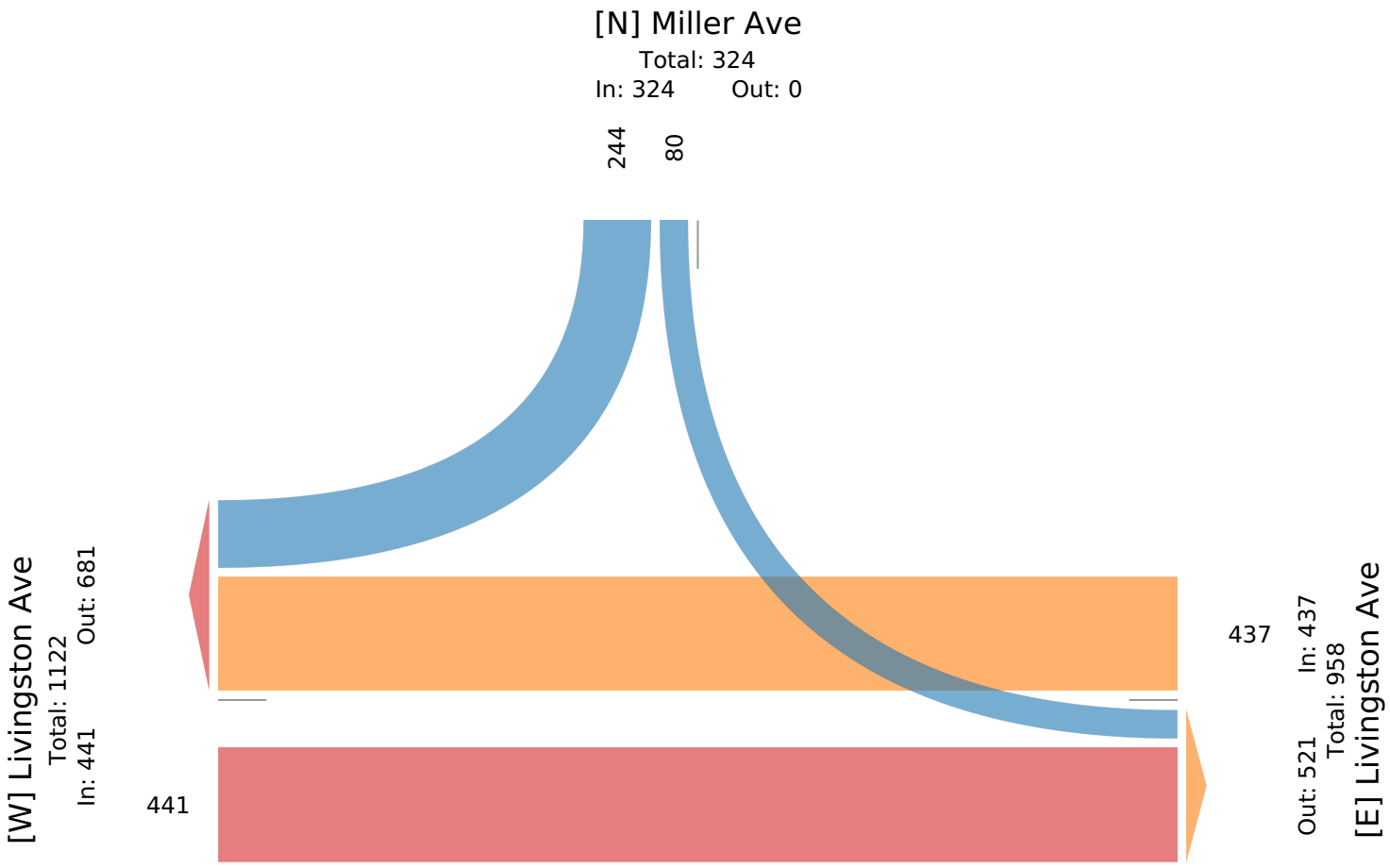
Leg Direction	Livingston Ave Eastbound					Livingston Ave Westbound					Miller Ave Southbound					
Time	L	T	U	**App**	Ped*	T	R	U	**App**	Ped*	L	R	U	**App**	Ped*	**Int**
2022-05-05 7:45AM	0	132	0	**132**	0	114	0	0	**114**	0	20	70	0	**90**	0	**336**
8:00AM	0	88	0	**88**	0	108	0	0	**108**	0	21	53	0	**74**	0	**270**
8:15AM	0	93	0	**93**	0	113	0	0	**113**	0	22	58	0	**80**	0	**286**
8:30AM	0	128	0	**128**	0	102	0	0	**102**	0	17	63	0	**80**	0	**310**
Total	0	441	0	**441**	0	437	0	0	**437**	0	80	244	0	**324**	0	**1202**
% Approach	0%	100%	0%	**-**	-	100%	0%	0%	**-**	-	24.7%	75.3%	0%	**-**	-	-
% Total	0%	36.7%	0%	**36.7%**	-	36.4%	0%	0%	**36.4%**	-	6.7%	20.3%	0%	**27.0%**	-	-
PHF	-	0.833	-	**0.833**	-	0.958	-	-	**0.958**	-	0.909	0.871	-	**0.900**	-	0.894
Lights and Motorcycles	0	427	0	**427**	-	413	0	0	**413**	-	75	232	0	**307**	-	1147
% Lights and Motorcycles	0%	96.8%	0%	**96.8%**	-	94.5%	0%	0%	**94.5%**	-	93.8%	95.1%	0%	**94.8%**	-	95.4%
Heavy	0	13	0	**13**	-	24	0	0	**24**	-	5	12	0	**17**	-	54
% Heavy	0%	2.9%	0%	**2.9%**	-	5.5%	0%	0%	**5.5%**	-	6.3%	4.9%	0%	**5.2%**	-	4.5%
Bicycles on Road	0	1	0	**1**	-	0	0	0	**0**	-	0	0	0	**0**	-	1
% Bicycles on Road	0%	0.2%	0%	**0.2%**	-	0%	0%	0%	**0%**	-	0%	0%	0%	**0%**	-	0.1%
Pedestrians	-	-	-	-	0	-	-	-	-	0	-	-	-	-	0	
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bicycles on Crosswalk	-	-	-	-	0	-	-	-	-	0	-	-	-	-	0	
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

*Pedestrians and Bicycles on Crosswalk. L: Left, R: Right, T: Thru, U: U-Turn

6) Livingston Ave & Miller Ave (East) - TMC

Thu May 5, 2022
AM Peak (7:45 AM - 8:45 AM)
All Classes (Lights and Motorcycles, Heavy, Pedestrians, Bicycles on Road, Bicycles on Crosswalk)
All Movements
ID: 949522, Location: 39.949262, -82.961401, Site Code: 6

Provided by: Smart Services, Inc.
88 W. Church Street,
Newark, OH, 43055, US



6) Livingston Ave & Miller Ave (East) - TMC

Thu May 5, 2022
PM Peak (3 PM - 4 PM) - Overall Peak Hour
All Classes (Lights and Motorcycles, Heavy, Pedestrians, Bicycles on Road, Bicycles on Crosswalk)
All Movements
ID: 949522, Location: 39.949262, -82.961401, Site Code: 6

Provided by: Smart Services, Inc.
88 W. Church Street,
Newark, OH, 43055, US

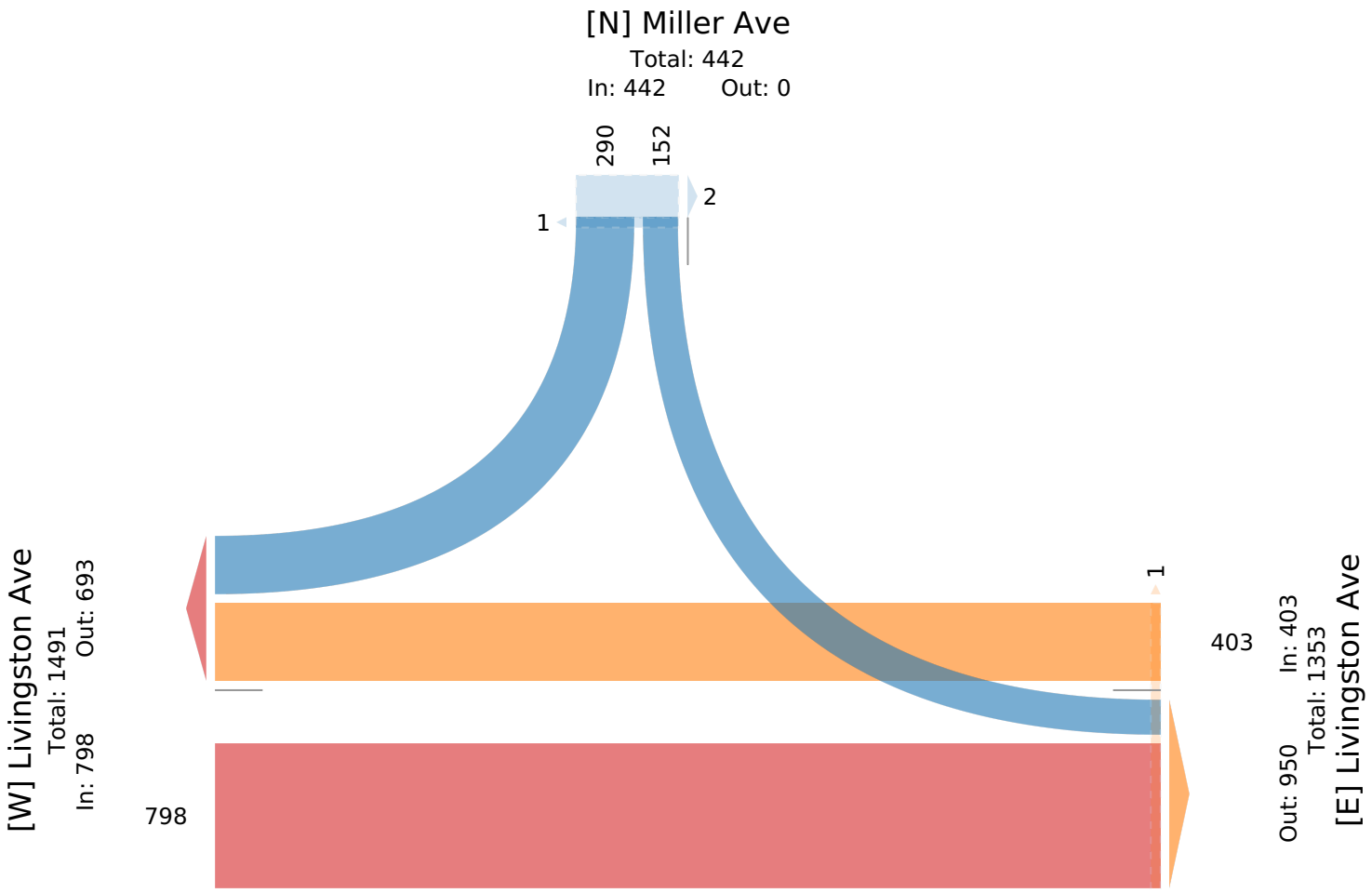
Leg Direction	Livingston Ave Eastbound					Livingston Ave Westbound					Miller Ave Southbound					
Time	L	T	U	**App**	Ped*	T	R	U	**App**	Ped*	L	R	U	**App**	Ped*	**Int**
2022-05-05 3:00PM	0	192	0	**192**	0	116	0	0	**116**	0	34	63	0	**97**	2	**405**
3:15PM	0	182	0	**182**	0	82	0	0	**82**	1	35	77	0	**112**	0	**376**
3:30PM	0	214	0	**214**	0	112	0	0	**112**	0	40	68	0	**108**	1	**434**
3:45PM	0	210	0	**210**	0	93	0	0	**93**	0	43	82	0	**125**	0	**428**
Total	0	798	0	**798**	0	403	0	0	**403**	1	152	290	0	**442**	3	**1643**
% Approach	0%	100%	0%	**-**	-	100%	0%	0%	**-**	-	34.4%	65.6%	0%	**-**	-	**-**
% Total	0%	48.6%	0%	**48.6%**	-	24.5%	0%	0%	**24.5%**	-	9.3%	17.7%	0%	**26.9%**	-	**-**
PHF	-	0.932	-	**0.932**	-	0.869	-	-	**0.869**	-	0.884	0.884	-	**0.884**	-	0.946
Lights and Motorcycles	0	775	0	**775**	-	379	0	0	**379**	-	145	279	0	**424**	-	1578
% Lights and Motorcycles	0%	97.1%	0%	**97.1%**	-	94.0%	0%	0%	**94.0%**	-	95.4%	96.2%	0%	**95.9%**	-	96.0%
Heavy	0	23	0	**23**	-	24	0	0	**24**	-	7	11	0	**18**	-	65
% Heavy	0%	2.9%	0%	**2.9%**	-	6.0%	0%	0%	**6.0%**	-	4.6%	3.8%	0%	**4.1%**	-	4.0%
Bicycles on Road	0	0	0	**0**	-	0	0	0	**0**	-	0	0	0	**0**	-	0
% Bicycles on Road	0%	0%	0%	**0%**	-	0%	0%	0%	**0%**	-	0%	0%	0%	**0%**	-	0%
Pedestrians	-	-	-	-	0	-	-	-	-	1	-	-	-	-	3	
% Pedestrians	-	-	-	-	-	-	-	-	-	100%	-	-	-	-	100%	-
Bicycles on Crosswalk	-	-	-	-	0	-	-	-	-	0	-	-	-	-	0	
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	0%	-	-	-	-	0%	-

*Pedestrians and Bicycles on Crosswalk. L: Left, R: Right, T: Thru, U: U-Turn

6) Livingston Ave & Miller Ave (East) - TMC

Thu May 5, 2022
PM Peak (3 PM - 4 PM) - Overall Peak Hour
All Classes (Lights and Motorcycles, Heavy, Pedestrians, Bicycles on Road, Bicycles on Crosswalk)
All Movements
ID: 949522, Location: 39.949262, -82.961401, Site Code: 6

Provided by: Smart Services, Inc.
88 W. Church Street,
Newark, OH, 43055, US



7) Livingston Ave & Kelton Ave - TMC

Thu May 5, 2022
Full Length (6 AM-10 AM, 3 PM-7 PM)
All Classes (Lights and Motorcycles, Heavy, Pedestrians, Bicycles on Road, Bicycles on Crosswalk)
All Movements
ID: 949525, Location: 39.949149, -82.959266, Site Code: 7

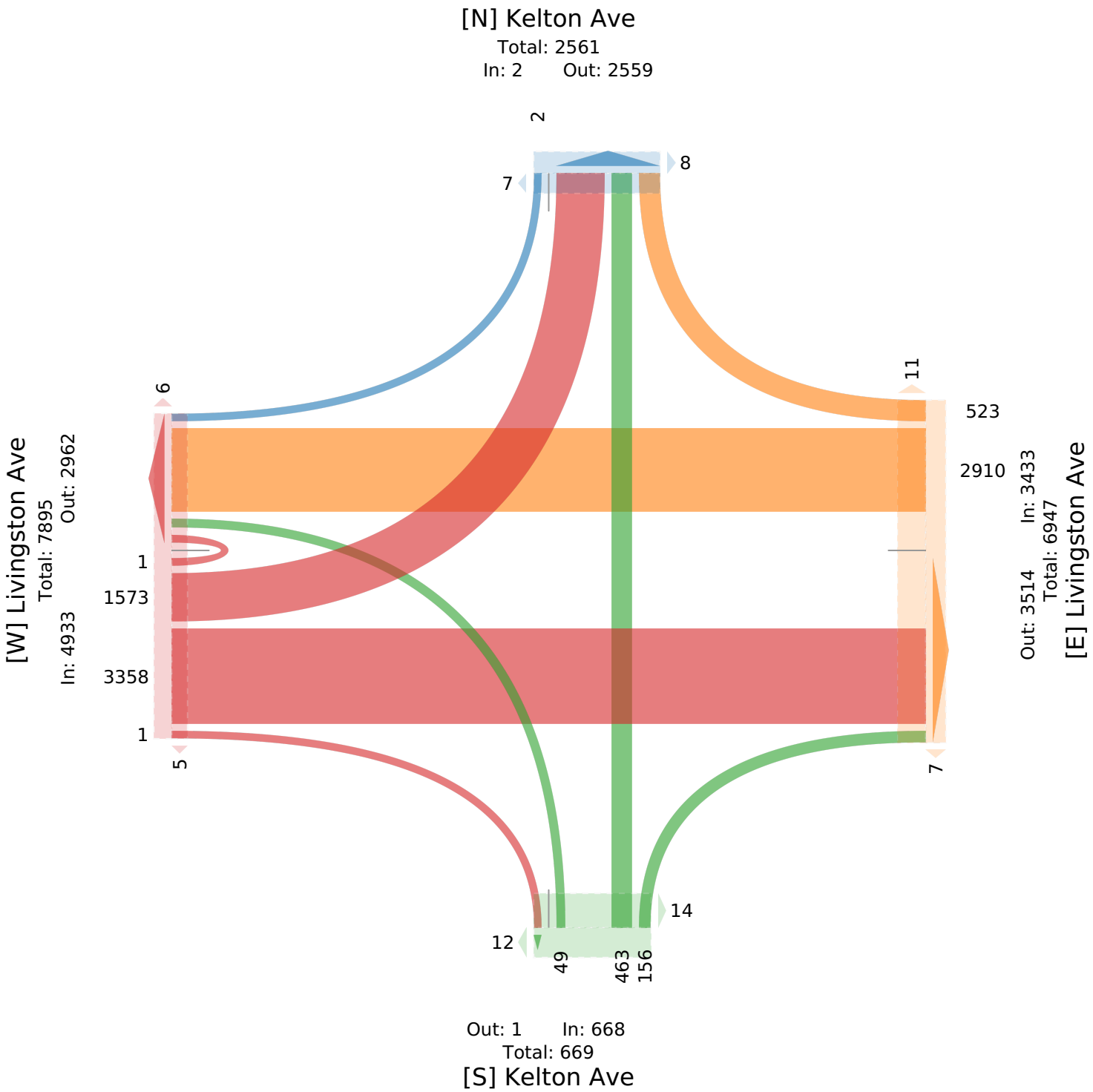
Provided by: Smart Services, Inc.
88 W. Church Street,
Newark, OH, 43055, US

Leg	Livingston Ave						Livingston Ave						Kelton Ave						Kelton Ave						
Direction	Eastbound						Westbound						Northbound						Southbound						
Time	L	T	R	U	App	Ped*	L	T	R	U	App	Ped*	L	T	R	U	App	Ped*	L	T	R	U	App	Ped*	Int
2022-05-05 6:00AM	15	30	0	0	**45**	0	0	50	6	0	**56**	0	0	9	1	0	**10**	0	0	0	0	0	**0**	0	**111**
6:15AM	28	28	0	0	**56**	0	0	48	13	0	**61**	0	0	8	4	0	**12**	0	0	0	0	0	**0**	1	**129**
6:30AM	26	55	0	0	**81**	0	0	99	13	0	**112**	0	0	8	1	0	**9**	1	0	0	0	0	**0**	0	**202**
6:45AM	27	59	0	0	**86**	0	0	75	16	0	**91**	0	1	12	2	0	**15**	0	0	0	0	0	**0**	1	**192**
Hourly Total	96	172	0	0	**268**	0	0	272	48	0	**320**	0	1	37	8	0	**46**	1	0	0	0	0	**0**	2	**634**
7:00AM	46	42	0	0	**88**	0	0	71	15	0	**86**	0	1	11	4	0	**16**	1	0	0	0	0	**0**	0	**190**
7:15AM	50	65	0	0	**115**	0	0	86	14	0	**100**	0	0	14	5	0	**19**	1	0	0	0	0	**0**	0	**234**
7:30AM	66	69	0	0	**135**	0	0	99	17	0	**116**	0	2	13	1	0	**16**	0	0	0	0	0	**0**	0	**267**
7:45AM	52	96	0	0	**148**	0	0	110	12	0	**122**	0	3	14	4	0	**21**	0	0	0	0	0	**0**	0	**291**
Hourly Total	214	272	0	0	**486**	0	0	366	58	0	**424**	0	6	52	14	0	**72**	2	0	0	0	0	**0**	0	**982**
8:00AM	31	70	0	0	**101**	1	0	107	14	0	**121**	0	1	16	4	0	**21**	1	0	0	0	0	**0**	0	**243**
8:15AM	43	63	1	0	**107**	0	0	105	14	0	**119**	0	3	19	6	0	**28**	0	0	0	0	0	**0**	1	**254**
8:30AM	54	88	0	0	**142**	0	0	96	12	0	**108**	0	4	23	5	0	**32**	2	0	0	0	0	**0**	1	**282**
8:45AM	51	78	0	0	**129**	0	0	115	24	0	**139**	1	0	14	4	0	**18**	2	0	0	0	0	**0**	2	**286**
Hourly Total	179	299	1	0	**479**	1	0	423	64	0	**487**	1	8	72	19	0	**99**	5	0	0	0	0	**0**	4	**1065**
9:00AM	39	77	0	0	**116**	0	0	84	12	0	**96**	1	1	16	2	0	**19**	0	0	0	0	0	**0**	1	**231**
9:15AM	36	97	0	0	**133**	0	0	86	16	0	**102**	1	1	13	1	0	**15**	0	0	0	0	0	**0**	1	**250**
9:30AM	26	82	0	0	**108**	0	0	88	14	0	**102**	0	1	11	6	0	**18**	1	0	0	0	0	**0**	0	**228**
9:45AM	41	90	0	0	**131**	0	0	87	13	0	**100**	0	2	12	3	0	**17**	2	0	0	1	0	**1**	0	**249**
Hourly Total	142	346	0	0	**488**	0	0	345	55	0	**400**	2	5	52	12	0	**69**	3	0	0	1	0	**1**	2	**958**
3:00PM	78	149	0	0	**227**	1	0	109	31	0	**140**	1	1	17	1	0	**19**	1	0	0	1	0	**1**	0	**387**
3:15PM	53	159	0	0	**212**	1	0	81	19	0	**100**	4	5	25	6	0	**36**	0	0	0	0	0	**0**	0	**348**
3:30PM	72	178	0	0	**250**	0	0	108	25	0	**133**	0	1	19	5	0	**25**	0	0	0	0	0	**0**	0	**408**
3:45PM	76	169	0	0	**245**	1	0	93	19	0	**112**	0	1	12	10	0	**23**	1	0	0	0	0	**0**	0	**380**
Hourly Total	279	655	0	0	**934**	3	0	391	94	0	**485**	5	8	73	22	0	**103**	2	0	0	1	0	**1**	0	**1523**
4:00PM	73	122	0	0	**195**	0	0	88	20	0	**108**	1	3	15	5	0	**23**	0	0	0	0	0	**0**	0	**326**
4:15PM	48	123	0	0	**171**	0	0	83	14	0	**97**	0	4	19	6	0	**29**	0	0	0	0	0	**0**	1	**297**
4:30PM	61	155	0	1	**217**	1	0	88	18	0	**106**	0	4	19	12	0	**35**	2	0	0	0	0	**0**	0	**358**
4:45PM	75	167	0	0	**242**	0	0	97	21	0	**118**	3	2	14	9	0	**25**	0	0	0	0	0	**0**	1	**385**
Hourly Total	257	567	0	1	**825**	1	0	356	73	0	**429**	4	13	67	32	0	**112**	2	0	0	0	0	**0**	2	**1366**
5:00PM	64	140	0	0	**204**	0	0	99	22	0	**121**	2	0	17	6	0	**23**	3	0	0	0	0	**0**	2	**348**
5:15PM	60	155	0	0	**215**	0	0	100	19	0	**119**	2	1	13	7	0	**21**	0	0	0	0	0	**0**	2	**355**
5:30PM	54	127	0	0	**181**	0	0	103	12	0	**115**	0	1	26	9	0	**36**	2	0	0	0	0	**0**	0	**332**
5:45PM	46	135	0	0	**181**	1	0	100	16	0	**116**	0	0	13	2	0	**15**	0	0	0	0	0	**0**	1	**312**
Hourly Total	224	557	0	0	**781**	1	0	402	69	0	**471**	4	2	69	24	0	**95**	5	0	0	0	0	**0**	5	**1347**
6:00PM	54	148	0	0	**202**	1	0	96	15	0	**111**	0	3	10	12	0	**25**	1	0	0	0	0	**0**	0	**338**
6:15PM	48	106	0	0	**154**	0	0	91	17	0	**108**	1	1	12	5	0	**18**	0	0	0	0	0	**0**	0	**280**
6:30PM	45	129	0	0	**174**	4	0	87	14	0	**101**	0	0	11	6	0	**17**	2	0	0	0	0	**0**	0	**292**
6:45PM	35	107	0	0	**142**	0	0	81	16	0	**97**	1	2	8	2	0	**12**	3	0	0	0	0	**0**	0	**251**
Hourly Total	182	490	0	0	**672**	5	0	355	62	0	**417**	2	6	41	25	0	**72**	6	0	0	0	0	**0**	0	**1161**
Total	1573	3358	1	1	**4933**	11	0	2910	523	0	**3433**	18	49	463	156	0	**668**	26	0	0	2	0	**2**	15	**9036**
% Approach	31.9%	68.1%	0%	0%	**-**	-	0%	84.8%	15.2%	0%	**-**	-	7.3%	69.3%	23.4%	0%	**-**	-	0%	0%	100%	0%	**-**	-	-
% Total	17.4%	37.2%	0%	0%	**54.6%**	-	0%	32.2%	5.8%	0%	**38.0%**	-	0.5%	5.1%	1.7%	0%	**7.4%**	-	0%	0%	0%	0%	**0%**	-	-
Lights and Motorcycles	1525	3233	1	1	**4760**	-	0	2790	510	0	**3300**	-	45	451	153	0	**649**	-	0	0	2	0	**2**	-	8711
% Lights and Motorcycles	96.9%	96.3%	100%	100%	**96.5%**	-	0%	95.9%	97.5%	0%	**96.1%**	-	91.8%	97.4%	98.1%	0%	**97.2%**	-	0%	0%	100%	0%	**100%**	-	96.4%
Heavy	48	124	0	0	**172**	-	0	119	12	0	**131**	-	4	10	3	0	**17**	-	0	0	0	0	**0**	-	320
% Heavy	3.1%	3.7%	0%	0%	**3.5%**	-	0%	4.1%	2.3%	0%	**3.8%**	-	8.2%	2.2%	1.9%	0%	**2.5%**	-	0%	0%	0%	0%	**0%**	-	3.5%
Bicycles on Road	0	1	0	0	**1**	-	0	1	1	0	**2**	-	0	2	0	0	**2**	-	0	0	0	0	**0**	-	5
% Bicycles on Road	0%	0%	0%	0%	**0%**	-	0%	0%	0.2%	0%	**0.1%**	-	0%	0.4%	0%	0%	**0.3%**	-	0%	0%	0%	0%	**0%**	-	0.1%
Pedestrians	-	-	-	-	-	10	-	-	-	-	-	17	-	-	-	-	-	23	-	-	-	-	-	15	
% Pedestrians	-	-	-	-	-	90.9%	-	-	-	-	-	94.4%	-	-	-	-	-	88.5%	-	-	-	-	-	100%	-
Bicycles on Crosswalk	-	-	-	-	-	1	-	-	-	-	-	1	-	-	-	-	-	3	-	-	-	-	-	0	
% Bicycles on Crosswalk	-	-	-	-	-	9.1%	-	-	-	-	-	5.6%	-	-	-	-	-	11.5%	-	-	-	-	-	0%	-

*Pedestrians and Bicycles on Crosswalk. L: Left, R: Right, T: Thru, U: U-Turn

7) Livingston Ave & Kelton Ave - TMC
Thu May 5, 2022
Full Length (6 AM-10 AM, 3 PM-7 PM)
All Classes (Lights and Motorcycles, Heavy, Pedestrians, Bicycles on Road, Bicycles on Crosswalk)
All Movements
ID: 949525, Location: 39.949149, -82.959266, Site Code: 7

Provided by: Smart Services, Inc.
88 W. Church Street,
Newark, OH, 43055, US



7) Livingston Ave & Kelton Ave - TMC

Thu May 5, 2022
AM Peak (7:45 AM - 8:45 AM)
All Classes (Lights and Motorcycles, Heavy, Pedestrians, Bicycles on Road, Bicycles on Crosswalk)
All Movements
ID: 949525, Location: 39.949149, -82.959266, Site Code: 7

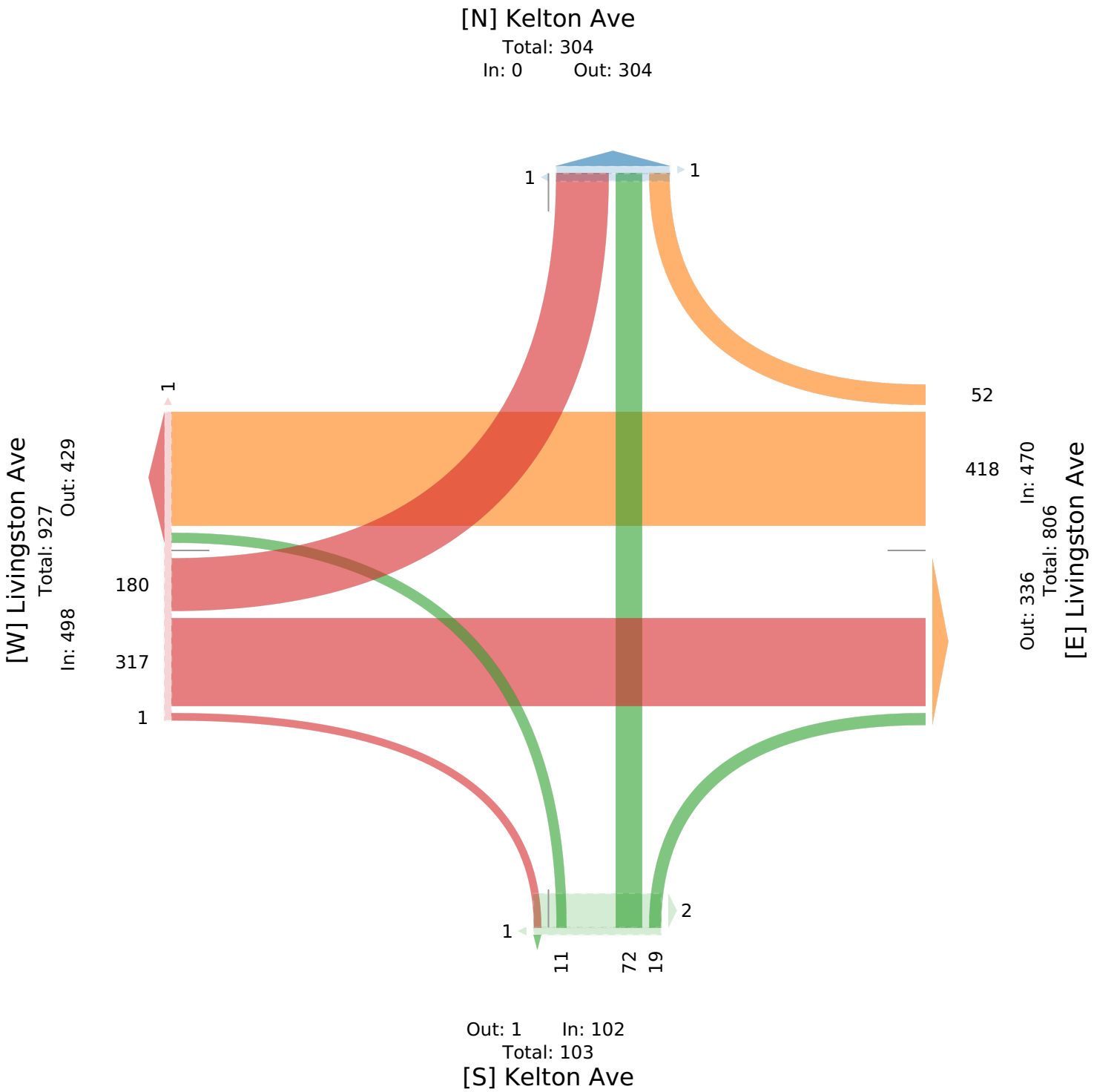
Provided by: Smart Services, Inc.
88 W. Church Street,
Newark, OH, 43055, US

Leg / Direction	Livingston Ave Eastbound						Livingston Ave Westbound						Kelton Ave Northbound						Kelton Ave Southbound						
Time	L	T	R	U	**App**	Ped*	L	T	R	U	**App**	Ped*	L	T	R	U	**App**	Ped*	L	T	R	U	**App**	Ped*	**Int**
2022-05-05 7:45AM	52	96	0	0	**148**	0	0	110	12	0	**122**	0	3	14	4	0	**21**	0	0	0	0	0	**0**	0	**291**
8:00AM	31	70	0	0	**101**	1	0	107	14	0	**121**	0	1	16	4	0	**21**	1	0	0	0	0	**0**	0	**243**
8:15AM	43	63	1	0	**107**	0	0	105	14	0	**119**	0	3	19	6	0	**28**	0	0	0	0	0	**0**	1	**254**
8:30AM	54	88	0	0	**142**	0	0	96	12	0	**108**	0	4	23	5	0	**32**	2	0	0	0	0	**0**	1	**282**
Total	180	317	1	0	**498**	1	0	418	52	0	**470**	0	11	72	19	0	**102**	3	0	0	0	0	**0**	2	**1070**
% Approach	36.1%	63.7%	0.2%	0%	**-**	-	0%	88.9%	11.1%	0%	**-**	-	10.8%	70.6%	18.6%	0%	**-**	-	0%	0%	0%	0%	**-**	-	-
% Total	16.8%	29.6%	0.1%	0%	**46.5%**	-	0%	39.1%	4.9%	0%	**43.9%**	-	1.0%	6.7%	1.8%	0%	**9.5%**	-	0%	0%	0%	0%	**0%**	-	-
PHF	0.833	0.823	0.250	-	**0.840**	-	-	0.950	0.929	-	**0.963**	-	0.688	0.783	0.792	-	**0.797**	-	-	-	-	-	**-**	-	0.918
Lights and Motorcycles	173	306	1	0	**480**	-	0	396	48	0	**444**	-	9	68	19	0	**96**	-	0	0	0	0	**0**	-	1020
% Lights and Motorcycles	96.1%	96.5%	100%	0%	**96.4%**	-	0%	94.7%	92.3%	0%	**94.5%**	-	81.8%	94.4%	100%	0%	**94.1%**	-	0%	0%	0%	0%	**-**	-	95.3%
Heavy	7	10	0	0	**17**	-	0	22	4	0	**26**	-	2	4	0	0	**6**	-	0	0	0	0	**0**	-	49
% Heavy	3.9%	3.2%	0%	0%	**3.4%**	-	0%	5.3%	7.7%	0%	**5.5%**	-	18.2%	5.6%	0%	0%	**5.9%**	-	0%	0%	0%	0%	**-**	-	4.6%
Bicycles on Road	0	1	0	0	**1**	-	0	0	0	0	**0**	-	0	0	0	0	**0**	-	0	0	0	0	**0**	-	1
% Bicycles on Road	0%	0.3%	0%	0%	**0.2%**	-	0%	0%	0%	0%	**0%**	-	0%	0%	0%	0%	**0%**	-	0%	0%	0%	0%	**-**	-	0.1%
Pedestrians	-	-	-	-	-	1	-	-	-	-	-	0	-	-	-	-	-	1	-	-	-	-	-	2	
% Pedestrians	-	-	-	-	-	100%	-	-	-	-	-	-	-	-	-	-	-	33.3%	-	-	-	-	-	100%	-
Bicycles on Crosswalk	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	2	-	-	-	-	-	0	
% Bicycles on Crosswalk	-	-	-	-	-	0%	-	-	-	-	-	-	-	-	-	-	-	66.7%	-	-	-	-	-	0%	-

*Pedestrians and Bicycles on Crosswalk. L: Left, R: Right, T: Thru, U: U-Turn

7) Livingston Ave & Kelton Ave - TMC
Thu May 5, 2022
AM Peak (7:45 AM - 8:45 AM)
All Classes (Lights and Motorcycles, Heavy, Pedestrians, Bicycles on Road, Bicycles on Crosswalk)
All Movements
ID: 949525, Location: 39.949149, -82.959266, Site Code: 7

Provided by: Smart Services, Inc.
88 W. Church Street,
Newark, OH, 43055, US



7) Livingston Ave & Kelton Ave - TMC

Thu May 5, 2022
PM Peak (3 PM - 4 PM) - Overall Peak Hour
All Classes (Lights and Motorcycles, Heavy, Pedestrians, Bicycles on Road, Bicycles on Crosswalk)
All Movements
ID: 949525, Location: 39.949149, -82.959266, Site Code: 7

Provided by: Smart Services, Inc.
88 W. Church Street,
Newark, OH, 43055, US

Leg / Direction	Livingston Ave Eastbound						Livingston Ave Westbound						Kelton Ave Northbound						Kelton Ave Southbound						
Time	L	T	R	U	App	Ped*	L	T	R	U	App	Ped*	L	T	R	U	App	Ped*	L	T	R	U	App	Ped*	Int
2022-05-05 3:00PM	78	149	0	0	**227**	1	0	109	31	0	**140**	1	1	17	1	0	**19**	1	0	0	1	0	**1**	0	**387**
3:15PM	53	159	0	0	**212**	1	0	81	19	0	**100**	4	5	25	6	0	**36**	0	0	0	0	0	**0**	0	**348**
3:30PM	72	178	0	0	**250**	0	0	108	25	0	**133**	0	1	19	5	0	**25**	0	0	0	0	0	**0**	0	**408**
3:45PM	76	169	0	0	**245**	1	0	93	19	0	**112**	0	1	12	10	0	**23**	1	0	0	0	0	**0**	0	**380**
Total	279	655	0	0	**934**	3	0	391	94	0	**485**	5	8	73	22	0	**103**	2	0	0	1	0	**1**	0	**1523**
% Approach	29.9%	70.1%	0%	0%	**-**	-	0%	80.6%	19.4%	0%	**-**	-	7.8%	70.9%	21.4%	0%	**-**	-	0%	0%	100%	0%	**-**	-	**-**
% Total	18.3%	43.0%	0%	0%	**61.3%**	-	0%	25.7%	6.2%	0%	**31.8%**	-	0.5%	4.8%	1.4%	0%	**6.8%**	-	0%	0%	0.1%	0%	**0.1%**	-	**-**
PHF	0.894	0.920	-	-	**0.934**	-	-	0.897	0.758	-	**0.866**	-	0.400	0.730	0.550	-	**0.715**	-	-	-	0.250	-	**0.250**	-	0.933
Lights and Motorcycles	270	636	0	0	**906**	-	0	367	93	0	**460**	-	7	72	21	0	**100**	-	0	0	1	0	**1**	-	1467
% Lights and Motorcycles	96.8%	97.1%	0%	0%	**97.0%**	-	0%	93.9%	98.9%	0%	**94.8%**	-	87.5%	98.6%	95.5%	0%	**97.1%**	-	0%	0%	100%	0%	**100%**	-	96.3%
Heavy	9	19	0	0	**28**	-	0	24	1	0	**25**	-	1	1	1	0	**3**	-	0	0	0	0	**0**	-	56
% Heavy	3.2%	2.9%	0%	0%	**3.0%**	-	0%	6.1%	1.1%	0%	**5.2%**	-	12.5%	1.4%	4.5%	0%	**2.9%**	-	0%	0%	0%	0%	**0%**	-	3.7%
Bicycles on Road	0	0	0	0	**0**	-	0	0	0	0	**0**	-	0	0	0	0	**0**	-	0	0	0	0	**0**	-	0
% Bicycles on Road	0%	0%	0%	0%	**0%**	-	0%	0%	0%	0%	**0%**	-	0%	0%	0%	0%	**0%**	-	0%	0%	0%	0%	**0%**	-	0%
Pedestrians	-	-	-	-	-	2	-	-	-	-	-	5	-	-	-	-	-	2	-	-	-	-	-	0	
% Pedestrians	-	-	-	-	-	66.7%	-	-	-	-	-	100%	-	-	-	-	-	100%	-	-	-	-	-	-	-
Bicycles on Crosswalk	-	-	-	-	-	1	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	
% Bicycles on Crosswalk	-	-	-	-	-	33.3%	-	-	-	-	-	0%	-	-	-	-	-	0%	-	-	-	-	-	-	-

*Pedestrians and Bicycles on Crosswalk. L: Left, R: Right, T: Thru, U: U-Turn

7) Livingston Ave & Kelton Ave - TMC

Thu May 5, 2022

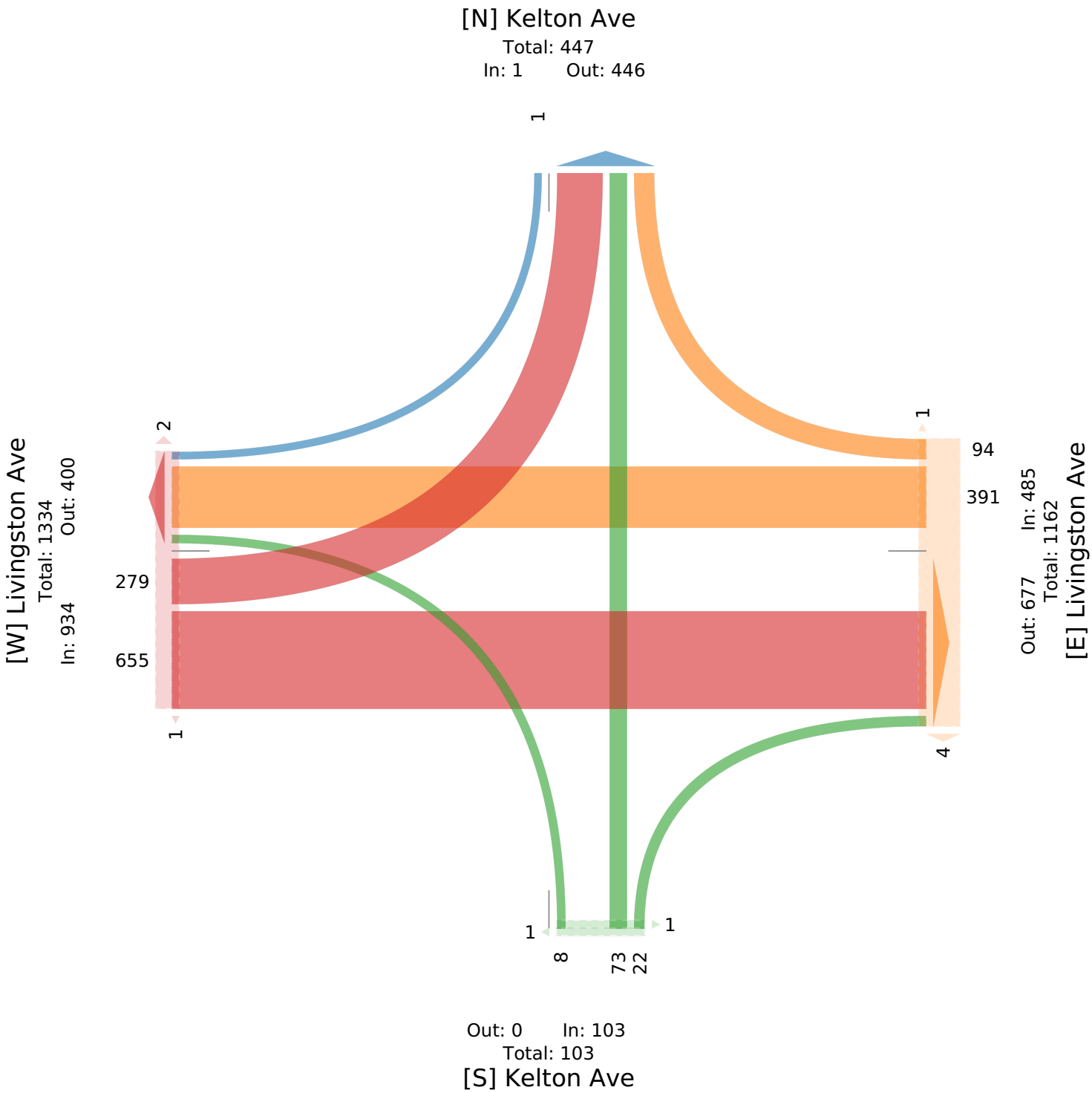
PM Peak (3 PM - 4 PM) - Overall Peak Hour

All Classes (Lights and Motorcycles, Heavy, Pedestrians, Bicycles on Road, Bicycles on Crosswalk)

All Movements

ID: 949525, Location: 39.949149, -82.959266, Site Code: 7

Provided by: Smart Services, Inc.
88 W. Church Street,
Newark, OH, 43055, US



8) Livingston Ave & Fairwood Ave - TMC

Thu May 5, 2022
Full Length (6 AM-10 AM, 3 PM-7 PM)
All Classes (Lights and Motorcycles, Heavy, Scooters (Standing), Pedestrians, Bicycles on Road, Bicycles on Crosswalk)
All Movements
ID: 949528, Location: 39.948872, -82.953659, Site Code: 8

Provided by: Smart Services, Inc.
88 W. Church Street,
Newark, OH, 43055, US

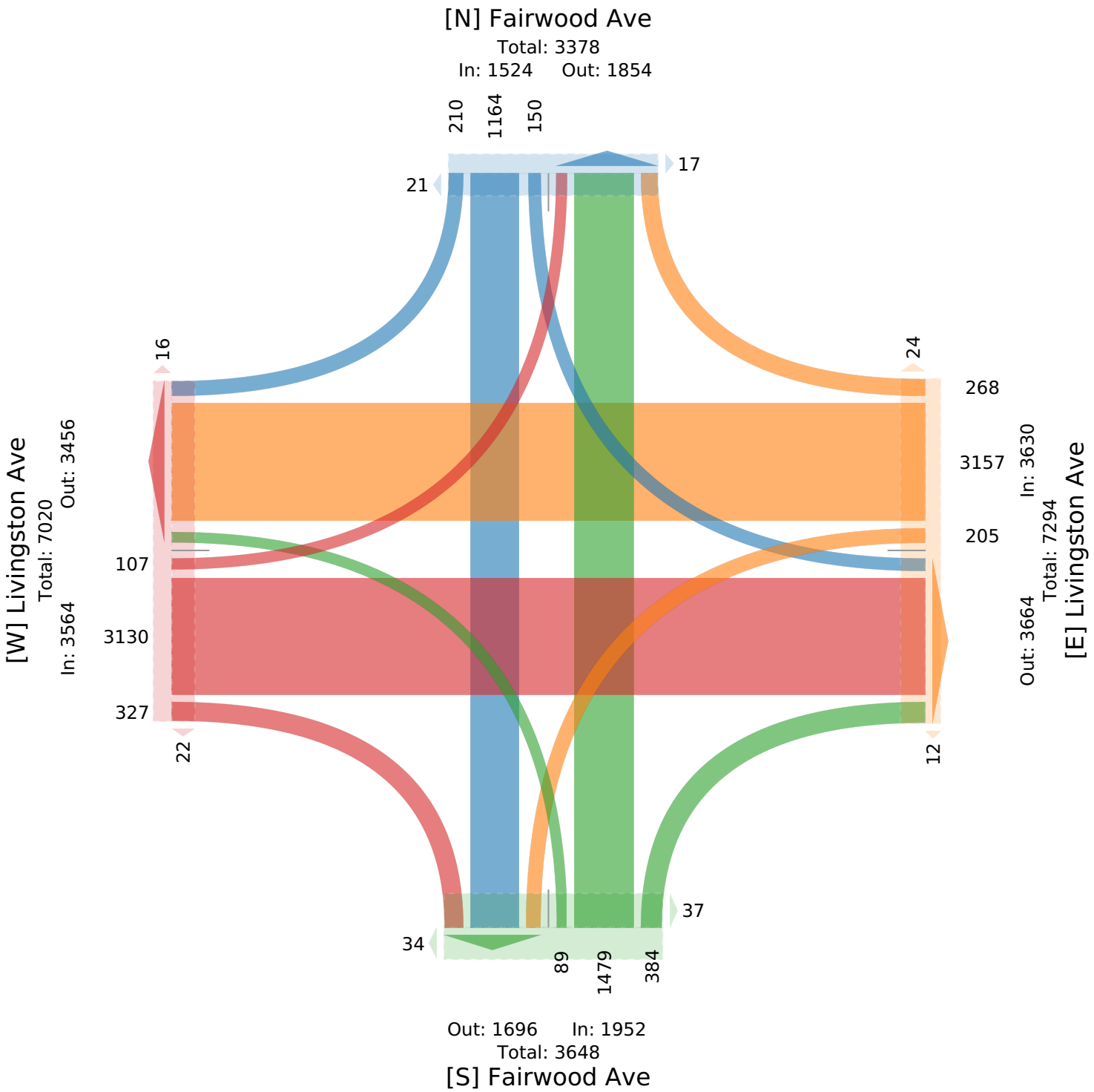
Leg	Livingston Ave						Livingston Ave						Fairwood Ave						Fairwood Ave						
Direction	Eastbound						Westbound						Northbound						Southbound						
Time	L	T	R	U	App	Ped*	L	T	R	U	App	Ped*	L	T	R	U	App	Ped*	L	T	R	U	App	Ped*	Int
2022-05-05 6:00AM	0	20	8	0	**28**	0	3	48	2	0	**53**	1	1	17	6	0	**24**	1	3	7	1	0	**11**	0	**116**
6:15AM	5	29	6	0	**40**	0	8	48	1	0	**57**	0	2	27	2	0	**31**	0	1	13	3	0	**17**	1	**145**
6:30AM	6	43	8	0	**57**	2	7	98	3	0	**108**	0	2	26	7	0	**35**	0	1	24	4	0	**29**	1	**229**
6:45AM	1	52	12	0	**65**	0	10	75	6	0	**91**	0	5	29	4	0	**38**	0	6	30	4	0	**40**	0	**234**
Hourly Total	12	144	34	0	**190**	2	28	269	12	0	**309**	1	10	99	19	0	**128**	1	11	74	12	0	**97**	2	**724**
7:00AM	0	44	7	0	**51**	0	5	74	5	0	**84**	0	2	30	8	0	**40**	0	3	31	7	0	**41**	0	**216**
7:15AM	1	64	7	0	**72**	0	2	83	5	0	**90**	1	3	36	12	0	**51**	1	2	45	3	0	**50**	2	**263**
7:30AM	1	62	8	0	**71**	0	0	104	9	0	**113**	0	2	50	6	0	**58**	1	1	39	6	0	**46**	0	**288**
7:45AM	0	84	11	0	**95**	0	4	108	7	0	**119**	0	1	42	14	0	**57**	1	4	35	6	0	**45**	0	**316**
Hourly Total	2	254	33	0	**289**	0	11	369	26	0	**406**	1	8	158	40	0	**206**	3	10	150	22	0	**182**	2	**1083**
8:00AM	1	64	11	0	**76**	2	0	102	7	0	**109**	0	2	43	7	0	**52**	1	5	26	4	0	**35**	0	**272**
8:15AM	2	64	7	0	**73**	0	4	103	9	0	**116**	1	2	39	13	0	**54**	0	2	42	3	0	**47**	0	**290**
8:30AM	2	83	5	0	**90**	5	3	99	8	0	**110**	1	2	48	15	0	**65**	2	6	31	4	0	**41**	0	**306**
8:45AM	1	69	19	0	**89**	2	6	124	10	0	**140**	0	2	37	16	0	**55**	3	3	41	6	0	**50**	3	**334**
Hourly Total	6	280	42	0	**328**	9	13	428	34	0	**475**	2	8	167	51	0	**226**	6	16	140	17	0	**173**	3	**1202**
9:00AM	4	75	9	0	**88**	0	4	98	15	0	**117**	4	0	39	8	0	**47**	4	6	37	3	0	**46**	0	**298**
9:15AM	2	80	11	0	**93**	2	7	92	7	0	**106**	4	1	30	10	0	**41**	1	8	17	8	0	**33**	2	**273**
9:30AM	6	72	15	0	**93**	3	10	87	9	0	**106**	4	4	43	17	0	**64**	8	2	21	7	0	**30**	5	**293**
9:45AM	1	91	6	0	**98**	1	4	96	6	0	**106**	0	3	38	6	0	**47**	1	3	21	3	0	**27**	1	**278**
Hourly Total	13	318	41	0	**372**	6	25	373	37	0	**435**	12	8	150	41	0	**199**	14	19	96	21	0	**136**	8	**1142**
3:00PM	9	148	10	0	**167**	0	11	113	9	0	**133**	3	7	67	11	0	**85**	2	9	57	6	0	**72**	2	**457**
3:15PM	6	152	8	0	**166**	1	5	94	11	0	**110**	4	8	68	7	0	**83**	5	7	43	6	0	**56**	1	**415**
3:30PM	6	153	16	0	**175**	7	9	104	13	0	**126**	2	4	76	12	0	**92**	2	7	55	18	0	**80**	6	**473**
3:45PM	8	157	14	0	**179**	1	11	109	10	0	**130**	1	5	58	18	0	**81**	4	6	53	9	0	**68**	2	**458**
Hourly Total	29	610	48	0	**687**	9	36	420	43	0	**499**	10	24	269	48	0	**341**	13	29	208	39	0	**276**	11	**1803**
4:00PM	1	133	4	0	**138**	0	8	111	3	0	**122**	5	4	94	12	0	**110**	6	3	56	5	0	**64**	0	**434**
4:15PM	3	115	11	0	**129**	1	1	99	8	0	**108**	1	3	56	11	0	**70**	2	3	54	8	0	**65**	1	**372**
4:30PM	3	132	11	0	**146**	1	4	100	22	0	**126**	0	1	52	11	0	**64**	3	5	47	7	0	**59**	1	**395**
4:45PM	4	161	13	0	**178**	1	6	110	7	0	**123**	0	0	50	21	0	**71**	2	5	36	10	0	**51**	0	**423**
Hourly Total	11	541	39	0	**591**	3	19	420	40	0	**479**	6	8	252	55	0	**315**	13	16	193	30	0	**239**	2	**1624**
5:00PM	8	136	9	0	**153**	0	5	107	12	0	**124**	0	2	52	19	0	**73**	4	4	54	8	0	**66**	1	**416**
5:15PM	2	137	14	0	**153**	1	3	114	12	0	**129**	0	1	53	18	0	**72**	3	1	48	9	0	**58**	2	**412**
5:30PM	5	125	15	0	**145**	0	10	111	11	0	**132**	1	3	60	23	0	**86**	2	8	38	9	0	**55**	1	**418**
5:45PM	2	134	11	0	**147**	0	10	111	2	0	**123**	0	3	44	18	0	**65**	2	10	41	10	0	**61**	0	**396**
Hourly Total	17	532	49	0	**598**	1	28	443	37	0	**508**	1	9	209	78	0	**296**	11	23	181	36	0	**240**	4	**1642**
6:00PM	5	134	14	0	**153**	1	9	109	10	0	**128**	3	2	37	14	0	**53**	5	4	32	9	0	**45**	1	**379**
6:15PM	5	111	8	0	**124**	2	11	115	10	0	**136**	0	5	37	9	0	**51**	0	8	37	7	0	**52**	2	**363**
6:30PM	2	112	9	0	**123**	4	16	112	9	0	**137**	0	4	49	16	0	**69**	5	4	24	8	0	**36**	2	**365**
6:45PM	5	94	10	0	**109**	1	9	99	10	0	**118**	0	3	52	13	0	**68**	0	10	29	9	0	**48**	1	**343**
Hourly Total	17	451	41	0	**509**	8	45	435	39	0	**519**	3	14	175	52	0	**241**	10	26	122	33	0	**181**	6	**1450**
Total	107	3130	327	0	**3564**	38	205	3157	268	0	**3630**	36	89	1479	384	0	**1952**	71	150	1164	210	0	**1524**	38	**10670**
% Approach	3.0%	87.8%	9.2%	0%	**-**	-	5.6%	87.0%	7.4%	0%	**-**	-	4.6%	75.8%	19.7%	0%	**-**	-	9.8%	76.4%	13.8%	0%	**-**	-	-
% Total	1.0%	29.3%	3.1%	0%	**33.4%**	-	1.9%	29.6%	2.5%	0%	**34.0%**	-	0.8%	13.9%	3.6%	0%	**18.3%**	-	1.4%	10.9%	2.0%	0%	**14.3%**	-	-
Lights and Motorcycles	94	3042	311	0	**3447**	-	190	3047	251	0	**3488**	-	79	1377	359	0	**1815**	-	142	1086	201	0	**1429**	-	10179
% Lights and Motorcycles	87.9%	97.2%	95.1%	0%	**96.7%**	-	92.7%	96.5%	93.7%	0%	**96.1%**	-	88.8%	93.1%	93.5%	0%	**93.0%**	-	94.7%	93.3%	95.7%	0%	**93.8%**	-	95.4%
Heavy	12	88	16	0	**116**	-	15	109	17	0	**141**	-	10	100	25	0	**135**	-	8	78	9	0	**95**	-	487
% Heavy	11.2%	2.8%	4.9%	0%	**3.3%**	-	7.3%	3.5%	6.3%	0%	**3.9%**	-	11.2%	6.8%	6.5%	0%	**6.9%**	-	5.3%	6.7%	4.3%	0%	**6.2%**	-	4.6%
Scooters (Standing)	1	0	0	0	**1**	-	0	0	0	0	**0**	-	0	1	0	0	**1**	-	0	0	0	0	**0**	-	2
% Scooters (Standing)	0.9%	0%	0%	0%	**0%**	-	0%	0%	0%	0%	**0%**	-	0%	0.1%	0%	0%	**0.1%**	-	0%	0%	0%	0%	**0%**	-	0%
Bicycles on Road	0	0	0	0	**0**	-	0	1	0	0	**1**	-	0	1	0	0	**1**	-	0	0	0	0	**0**	-	2
% Bicycles on Road	0%	0%	0%	0%	**0%**	-	0%	0%	0%	0%	**0%**	-	0%	0.1%	0%	0%	**0.1%**	-	0%	0%	0%	0%	**0%**	-	0%
Pedestrians	-	-	-	-	-	38	-	-	-	-	-	36	-	-	-	-	-	69	-	-	-	-	-	38	
% Pedestrians	-	-	-	-	-	100%	-	-	-	-	-	100%	-	-	-	-	-	97.2%	-	-	-	-	-	100%	-
Bicycles on Crosswalk	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	2	-	-	-	-	-	0	
% Bicycles on Crosswalk	-	-	-	-	-	0%	-	-	-	-	-	0%	-	-	-	-	-	2.8%	-	-	-	-	-	0%	-

*Pedestrians and Bicycles on Crosswalk. L: Left, R: Right, T: Thru, U: U-Turn

8) Livingston Ave & Fairwood Ave - TMC

Thu May 5, 2022
Full Length (6 AM-10 AM, 3 PM-7 PM)
All Classes (Lights and Motorcycles, Heavy, Scooters (Standing), Pedestrians, Bicycles on Road, Bicycles on Crosswalk)
All Movements
ID: 949528, Location: 39.948872, -82.953659, Site Code: 8

Provided by: Smart Services, Inc.
88 W. Church Street,
Newark, OH, 43055, US



8) Livingston Ave & Fairwood Ave - TMC

Thu May 5, 2022
AM Peak (8:15 AM - 9:15 AM)
All Classes (Lights and Motorcycles, Heavy, Scooters (Standing), Pedestrians, Bicycles on Road, Bicycles on Crosswalk)
All Movements
ID: 949528, Location: 39.948872, -82.953659, Site Code: 8

Provided by: Smart Services, Inc.
88 W. Church Street,
Newark, OH, 43055, US

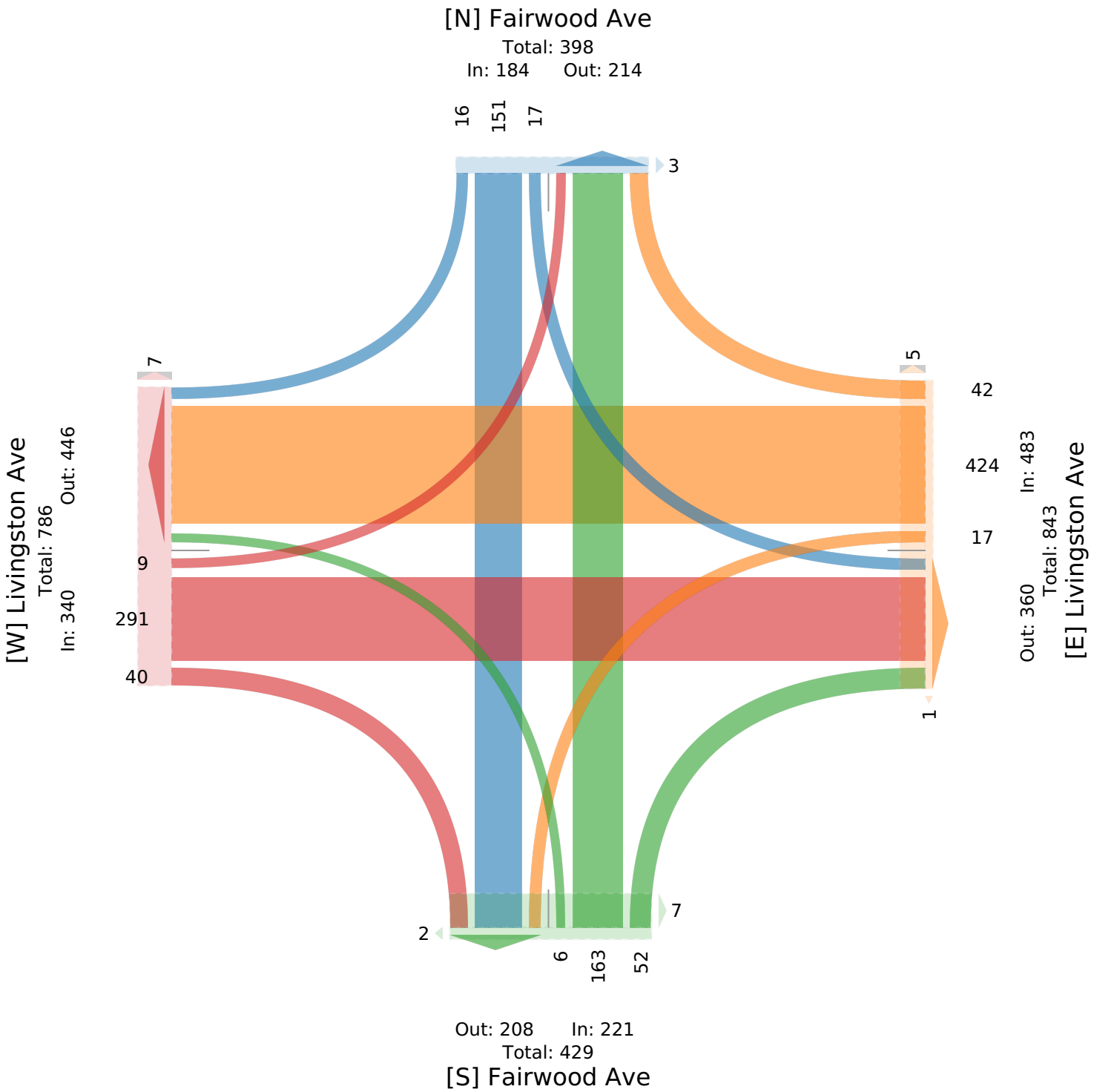
Leg / Direction	Livingston Ave Eastbound						Livingston Ave Westbound						Fairwood Ave Northbound						Fairwood Ave Southbound						
Time	L	T	R	U	App	Ped*	L	T	R	U	App	Ped*	L	T	R	U	App	Ped*	L	T	R	U	App	Ped*	Int
2022-05-05 8:15AM	2	64	7	0	**73**	0	4	103	9	0	**116**	1	2	39	13	0	**54**	0	2	42	3	0	**47**	0	**290**
8:30AM	2	83	5	0	**90**	5	3	99	8	0	**110**	1	2	48	15	0	**65**	2	6	31	4	0	**41**	0	**306**
8:45AM	1	69	19	0	**89**	2	6	124	10	0	**140**	0	2	37	16	0	**55**	3	3	41	6	0	**50**	3	**334**
9:00AM	4	75	9	0	**88**	0	4	98	15	0	**117**	4	0	39	8	0	**47**	4	6	37	3	0	**46**	0	**298**
Total	9	291	40	0	**340**	7	17	424	42	0	**483**	6	6	163	52	0	**221**	9	17	151	16	0	**184**	3	**1228**
% Approach	2.6%	85.6%	11.8%	0%	**-**	-	3.5%	87.8%	8.7%	0%	**-**	-	2.7%	73.8%	23.5%	0%	**-**	-	9.2%	82.1%	8.7%	0%	**-**	-	-
% Total	0.7%	23.7%	3.3%	0%	**27.7%**	-	1.4%	34.5%	3.4%	0%	**39.3%**	-	0.5%	13.3%	4.2%	0%	**18.0%**	-	1.4%	12.3%	1.3%	0%	**15.0%**	-	-
PHF	0.563	0.877	0.526	-	**0.944**	-	0.708	0.855	0.700	-	**0.863**	-	0.750	0.849	0.813	-	**0.850**	-	0.708	0.899	0.667	-	**0.920**	-	0.919
Lights and Motorcycles	8	284	36	0	**328**	-	12	409	39	0	**460**	-	6	146	46	0	**198**	-	16	136	15	0	**167**	-	1153
% Lights and Motorcycles	88.9%	97.6%	90.0%	0%	**96.5%**	-	70.6%	96.5%	92.9%	0%	**95.2%**	-	100%	89.6%	88.5%	0%	**89.6%**	-	94.1%	90.1%	93.8%	0%	**90.8%**	-	93.9%
Heavy	1	7	4	0	**12**	-	5	15	3	0	**23**	-	0	17	6	0	**23**	-	1	15	1	0	**17**	-	75
% Heavy	11.1%	2.4%	10.0%	0%	**3.5%**	-	29.4%	3.5%	7.1%	0%	**4.8%**	-	0%	10.4%	11.5%	0%	**10.4%**	-	5.9%	9.9%	6.3%	0%	**9.2%**	-	6.1%
Scooters (Standing)	0	0	0	0	**0**	-	0	0	0	0	**0**	-	0	0	0	0	**0**	-	0	0	0	0	**0**	-	0
% Scooters (Standing)	0%	0%	0%	0%	**0%**	-	0%	0%	0%	0%	**0%**	-	0%	0%	0%	0%	**0%**	-	0%	0%	0%	0%	**0%**	-	0%
Bicycles on Road	0	0	0	0	**0**	-	0	0	0	0	**0**	-	0	0	0	0	**0**	-	0	0	0	0	**0**	-	0
% Bicycles on Road	0%	0%	0%	0%	**0%**	-	0%	0%	0%	0%	**0%**	-	0%	0%	0%	0%	**0%**	-	0%	0%	0%	0%	**0%**	-	0%
Pedestrians	-	-	-	-	-	7	-	-	-	-	-	6	-	-	-	-	-	7	-	-	-	-	-	3	
% Pedestrians	-	-	-	-	-	100%	-	-	-	-	-	100%	-	-	-	-	-	77.8%	-	-	-	-	-	100%	-
Bicycles on Crosswalk	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	2	-	-	-	-	-	0	
% Bicycles on Crosswalk	-	-	-	-	-	0%	-	-	-	-	-	0%	-	-	-	-	-	22.2%	-	-	-	-	-	0%	-

*Pedestrians and Bicycles on Crosswalk. L: Left, R: Right, T: Thru, U: U-Turn

8) Livingston Ave & Fairwood Ave - TMC

Thu May 5, 2022
AM Peak (8:15 AM - 9:15 AM)
All Classes (Lights and Motorcycles, Heavy, Scooters (Standing), Pedestrians, Bicycles on Road, Bicycles on Crosswalk)
All Movements
ID: 949528, Location: 39.948872, -82.953659, Site Code: 8

Provided by: Smart Services, Inc.
88 W. Church Street,
Newark, OH, 43055, US



8) Livingston Ave & Fairwood Ave - TMC

Thu May 5, 2022
PM Peak (3 PM - 4 PM) - Overall Peak Hour
All Classes (Lights and Motorcycles, Heavy, Scooters (Standing), Pedestrians, Bicycles on Road, Bicycles on Crosswalk)
All Movements
ID: 949528, Location: 39.948872, -82.953659, Site Code: 8

Provided by: Smart Services, Inc.
88 W. Church Street,
Newark, OH, 43055, US

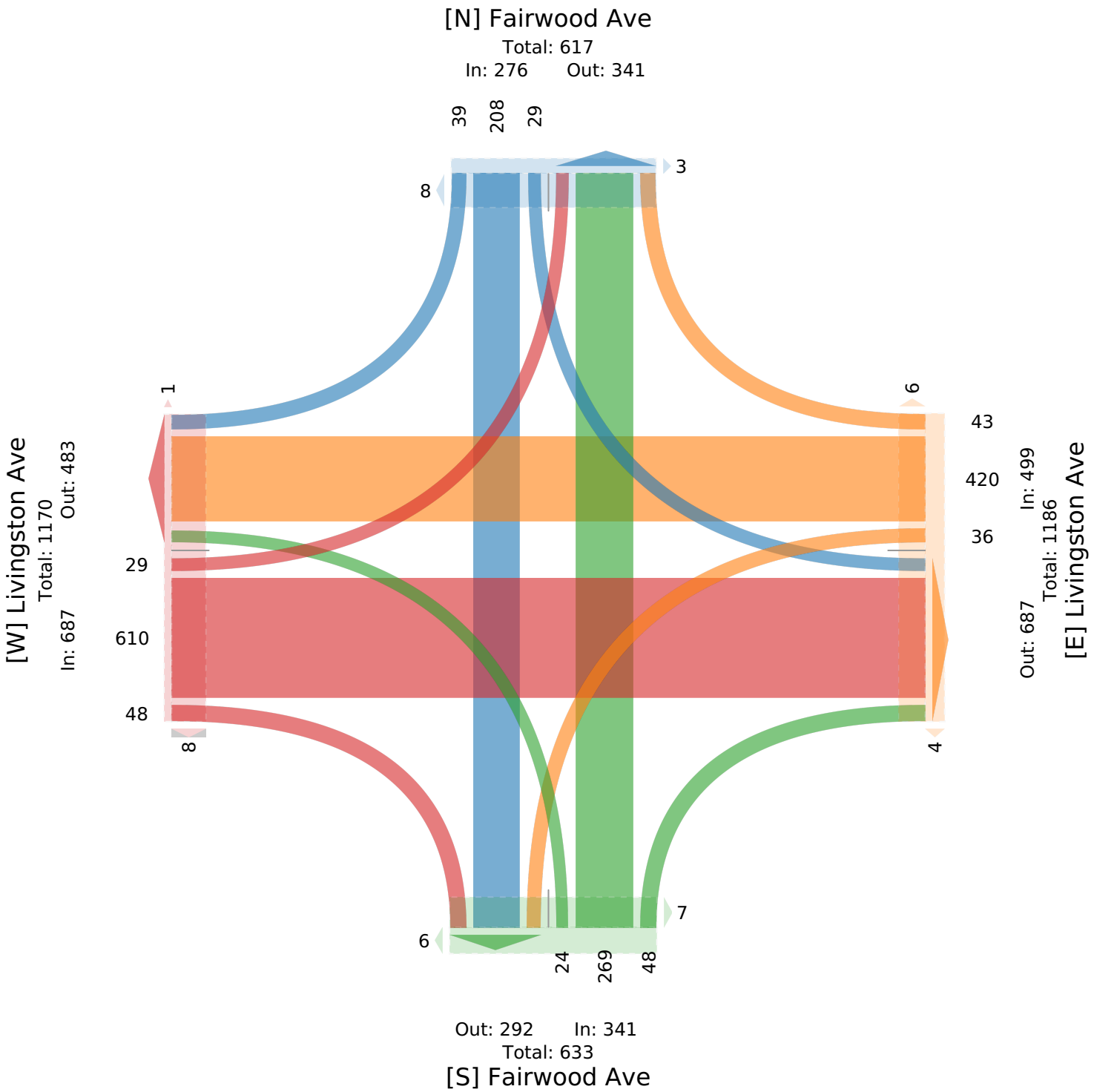
Leg / Direction	Livingston Ave Eastbound						Livingston Ave Westbound						Fairwood Ave Northbound						Fairwood Ave Southbound						
Time	L	T	R	U	App	Ped*	L	T	R	U	App	Ped*	L	T	R	U	App	Ped*	L	T	R	U	App	Ped*	Int
2022-05-05 3:00PM	9	148	10	0	**167**	0	11	113	9	0	**133**	3	7	67	11	0	**85**	2	9	57	6	0	**72**	2	**457**
3:15PM	6	152	8	0	**166**	1	5	94	11	0	**110**	4	8	68	7	0	**83**	5	7	43	6	0	**56**	1	**415**
3:30PM	6	153	16	0	**175**	7	9	104	13	0	**126**	2	4	76	12	0	**92**	2	7	55	18	0	**80**	6	**473**
3:45PM	8	157	14	0	**179**	1	11	109	10	0	**130**	1	5	58	18	0	**81**	4	6	53	9	0	**68**	2	**458**
Total	29	610	48	0	**687**	9	36	420	43	0	**499**	10	24	269	48	0	**341**	13	29	208	39	0	**276**	11	**1803**
% Approach	4.2%	88.8%	7.0%	0%	**-**	-	7.2%	84.2%	8.6%	0%	**-**	-	7.0%	78.9%	14.1%	0%	**-**	-	10.5%	75.4%	14.1%	0%	**-**	-	-
% Total	1.6%	33.8%	2.7%	0%	**38.1%**	-	2.0%	23.3%	2.4%	0%	**27.7%**	-	1.3%	14.9%	2.7%	0%	**18.9%**	-	1.6%	11.5%	2.2%	0%	**15.3%**	-	-
PHF	0.806	0.971	0.750	-	**0.959**	-	0.818	0.929	0.827	-	**0.938**	-	0.750	0.885	0.667	-	**0.927**	-	0.806	0.912	0.542	-	**0.863**	-	0.953
Lights and Motorcycles	25	594	46	0	**665**	-	32	403	38	0	**473**	-	18	258	46	0	**322**	-	28	193	37	0	**258**	-	1718
% Lights and Motorcycles	86.2%	97.4%	95.8%	0%	**96.8%**	-	88.9%	96.0%	88.4%	0%	**94.8%**	-	75.0%	95.9%	95.8%	0%	**94.4%**	-	96.6%	92.8%	94.9%	0%	**93.5%**	-	95.3%
Heavy	4	16	2	0	**22**	-	4	17	5	0	**26**	-	6	10	2	0	**18**	-	1	15	2	0	**18**	-	84
% Heavy	13.8%	2.6%	4.2%	0%	**3.2%**	-	11.1%	4.0%	11.6%	0%	**5.2%**	-	25.0%	3.7%	4.2%	0%	**5.3%**	-	3.4%	7.2%	5.1%	0%	**6.5%**	-	4.7%
Scooters (Standing)	0	0	0	0	**0**	-	0	0	0	0	**0**	-	0	1	0	0	**1**	-	0	0	0	0	**0**	-	1
% Scooters (Standing)	0%	0%	0%	0%	**0%**	-	0%	0%	0%	0%	**0%**	-	0%	0.4%	0%	0%	**0.3%**	-	0%	0%	0%	0%	**0%**	-	0.1%
Bicycles on Road	0	0	0	0	**0**	-	0	0	0	0	**0**	-	0	0	0	0	**0**	-	0	0	0	0	**0**	-	0
% Bicycles on Road	0%	0%	0%	0%	**0%**	-	0%	0%	0%	0%	**0%**	-	0%	0%	0%	0%	**0%**	-	0%	0%	0%	0%	**0%**	-	0%
Pedestrians	-	-	-	-	-	9	-	-	-	-	-	10	-	-	-	-	-	13	-	-	-	-	-	11	
% Pedestrians	-	-	-	-	-	100%	-	-	-	-	-	100%	-	-	-	-	-	100%	-	-	-	-	-	100%	-
Bicycles on Crosswalk	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	
% Bicycles on Crosswalk	-	-	-	-	-	0%	-	-	-	-	-	0%	-	-	-	-	-	0%	-	-	-	-	-	0%	-

*Pedestrians and Bicycles on Crosswalk. L: Left, R: Right, T: Thru, U: U-Turn

8) Livingston Ave & Fairwood Ave - TMC

Thu May 5, 2022
PM Peak (3 PM - 4 PM) - Overall Peak Hour
All Classes (Lights and Motorcycles, Heavy, Scooters (Standing), Pedestrians, Bicycles on Road, Bicycles on Crosswalk)
All Movements
ID: 949528, Location: 39.948872, -82.953659, Site Code: 8

Provided by: Smart Services, Inc.
88 W. Church Street,
Newark, OH, 43055, US



9) Livingston Ave & Nelson Rd - TMC

Thu May 19, 2022
Full Length (6 AM-10 AM, 3 PM-7 PM)
All Classes (Lights and Motorcycles, Heavy, e-Scooters, Pedestrians, Bicycles on Road, Bicycles on Crosswalk)
All Movements
ID: 954665, Location: 39.948563, -82.947292, Site Code: 9

Provided by: Smart Services, Inc.
88 W. Church Street,
Newark, OH, 43055, US

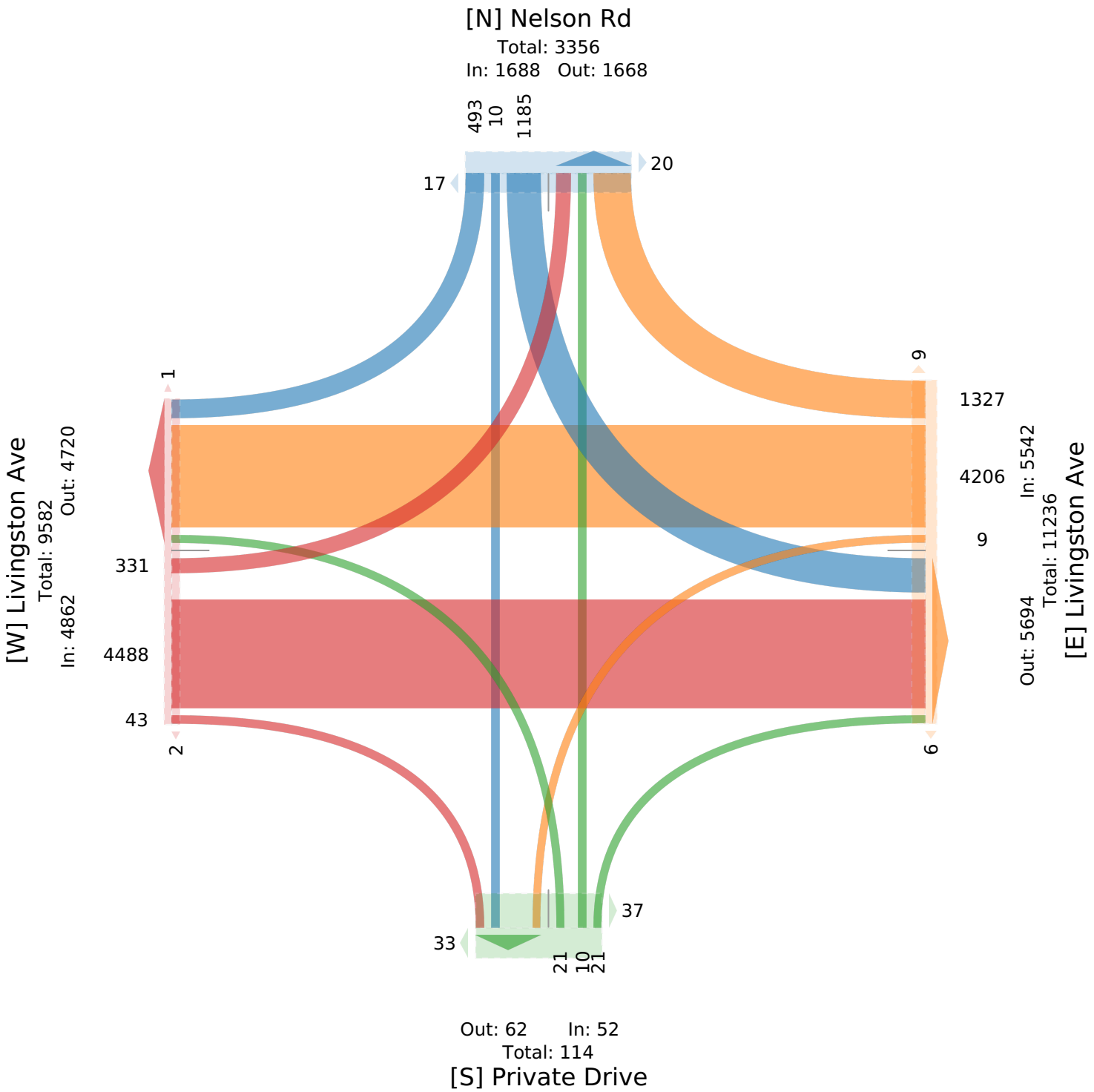
Leg	Livingston Ave						Livingston Ave						Private Drive						Nelson Rd						
Direction	Eastbound						Westbound						Northbound						Southbound						
Time	L	T	R	U	App	Ped*	L	T	R	U	App	Ped*	L	T	R	U	App	Ped*	L	T	R	U	App	Ped*	Int
2022-05-19 6:00AM	4	37	0	0	**41**	0	0	54	13	0	**67**	0	0	0	0	0	**0**	1	9	0	4	0	**13**	0	**121**
6:15AM	5	47	0	0	**52**	0	0	67	15	0	**82**	0	0	0	0	0	**0**	2	5	0	3	0	**8**	1	**142**
6:30AM	8	43	0	0	**51**	0	0	114	28	0	**142**	0	0	0	0	0	**0**	0	18	0	5	0	**23**	0	**216**
6:45AM	12	72	0	0	**84**	0	0	109	34	0	**143**	0	0	0	0	0	**0**	0	17	0	9	0	**26**	1	**253**
Hourly Total	29	199	0	0	**228**	0	0	344	90	0	**434**	0	0	0	0	0	**0**	3	49	0	21	0	**70**	2	**732**
7:00AM	9	83	1	0	**93**	0	0	99	33	0	**132**	0	0	0	0	0	**0**	0	22	0	17	0	**39**	0	**264**
7:15AM	11	91	0	0	**102**	0	0	138	41	0	**179**	0	0	0	0	0	**0**	0	24	0	12	0	**36**	0	**317**
7:30AM	7	101	0	0	**108**	0	0	119	49	0	**168**	0	0	0	0	0	**0**	3	26	0	7	0	**33**	0	**309**
7:45AM	9	114	1	0	**124**	0	0	130	47	0	**177**	0	0	0	0	0	**0**	2	45	0	10	0	**55**	0	**356**
Hourly Total	36	389	2	0	**427**	0	0	486	170	0	**656**	0	0	0	0	0	**0**	5	117	0	46	0	**163**	0	**1246**
8:00AM	5	107	0	0	**112**	0	0	129	47	0	**176**	0	0	0	0	0	**0**	1	37	1	15	0	**53**	0	**341**
8:15AM	14	110	2	0	**126**	0	0	124	42	0	**166**	0	0	0	0	0	**0**	4	43	0	17	0	**60**	0	**352**
8:30AM	5	109	0	0	**114**	0	0	133	28	0	**161**	1	1	0	1	0	**2**	2	38	0	16	0	**54**	1	**331**
8:45AM	9	128	3	0	**140**	0	0	136	43	0	**179**	0	0	0	1	0	**1**	2	35	0	15	0	**50**	2	**370**
Hourly Total	33	454	5	0	**492**	0	0	522	160	0	**682**	1	1	0	2	0	**3**	9	153	1	63	0	**217**	3	**1394**
9:00AM	15	119	0	0	**134**	0	0	116	44	0	**160**	0	0	1	1	0	**2**	3	35	0	13	0	**48**	3	**344**
9:15AM	8	107	1	0	**116**	0	0	102	41	0	**143**	0	1	0	1	0	**2**	1	30	2	7	0	**39**	1	**300**
9:30AM	7	106	1	0	**114**	0	0	119	34	0	**153**	0	0	0	0	0	**0**	1	34	0	12	0	**46**	1	**313**
9:45AM	13	131	1	0	**145**	0	0	115	31	0	**146**	1	0	1	0	0	**1**	0	33	0	16	0	**49**	1	**341**
Hourly Total	43	463	3	0	**509**	0	0	452	150	0	**602**	1	1	2	2	0	**5**	5	132	2	48	0	**182**	6	**1298**
3:00PM	15	174	1	0	**190**	0	1	123	50	0	**174**	0	0	0	0	0	**0**	1	44	0	17	0	**61**	2	**425**
3:15PM	14	225	1	0	**240**	0	2	155	53	0	**210**	3	2	0	1	0	**3**	4	37	0	16	0	**53**	1	**506**
3:30PM	18	191	3	0	**212**	0	0	142	58	0	**200**	0	2	1	1	0	**4**	3	57	0	21	0	**78**	2	**494**
3:45PM	17	213	3	0	**233**	0	0	168	55	0	**223**	0	2	0	0	0	**2**	0	28	0	14	0	**42**	0	**500**
Hourly Total	64	803	8	0	**875**	0	3	588	216	0	**807**	3	6	1	2	0	**9**	8	166	0	68	0	**234**	5	**1925**
4:00PM	5	202	2	0	**209**	1	0	154	51	0	**205**	0	2	0	0	0	**2**	2	50	0	17	0	**67**	0	**483**
4:15PM	13	183	1	0	**197**	0	0	138	51	0	**189**	0	1	1	1	0	**3**	3	62	0	9	0	**71**	1	**460**
4:30PM	6	190	1	0	**197**	0	0	143	42	0	**185**	0	1	1	0	0	**2**	3	54	0	23	0	**77**	1	**461**
4:45PM	14	196	0	0	**210**	0	1	174	61	0	**236**	0	3	0	0	0	**3**	2	49	0	21	0	**70**	3	**519**
Hourly Total	38	771	4	0	**813**	1	1	609	205	0	**815**	0	7	2	1	0	**10**	10	215	0	70	0	**285**	5	**1923**
5:00PM	7	212	2	0	**221**	0	1	145	48	0	**194**	0	2	2	2	0	**6**	3	41	0	20	0	**61**	2	**482**
5:15PM	10	185	1	0	**196**	0	2	156	44	0	**202**	0	0	0	2	0	**2**	1	46	2	22	0	**70**	1	**470**
5:30PM	13	179	2	0	**194**	1	0	143	50	0	**193**	2	1	2	3	0	**6**	6	60	0	23	0	**83**	1	**476**
5:45PM	9	172	6	0	**187**	0	1	165	49	0	**215**	3	0	0	3	0	**3**	5	47	2	25	0	**74**	5	**479**
Hourly Total	39	748	11	0	**798**	1	4	609	191	0	**804**	5	3	4	10	0	**17**	15	194	4	90	0	**288**	9	**1907**
6:00PM	17	183	4	0	**204**	0	1	150	22	0	**173**	2	1	0	1	0	**2**	3	50	0	21	0	**71**	2	**450**
6:15PM	13	165	0	0	**178**	0	0	168	49	0	**217**	1	1	0	0	0	**1**	2	34	2	24	0	**60**	1	**456**
6:30PM	11	150	3	0	**164**	1	0	152	37	0	**189**	2	0	0	2	0	**2**	7	42	0	22	0	**64**	2	**419**
6:45PM	8	163	3	0	**174**	0	0	126	37	0	**163**	0	1	1	1	0	**3**	3	33	1	20	0	**54**	2	**394**
Hourly Total	49	661	10	0	**720**	1	1	596	145	0	**742**	5	3	1	4	0	**8**	15	159	3	87	0	**249**	7	**1719**
Total	331	4488	43	0	**4862**	3	9	4206	1327	0	**5542**	15	21	10	21	0	**52**	70	1185	10	493	0	**1688**	37	**12144**
% Approach	6.8%	92.3%	0.9%	0%	**-**	-	0.2%	75.9%	23.9%	0%	**-**	-	40.4%	19.2%	40.4%	0%	**-**	-	70.2%	0.6%	29.2%	0%	**-**	-	-
% Total	2.7%	37.0%	0.4%	0%	**40.0%**	-	0.1%	34.6%	10.9%	0%	**45.6%**	-	0.2%	0.1%	0.2%	0%	**0.4%**	-	9.8%	0.1%	4.1%	0%	**13.9%**	-	-
Lights and Motorcycles	321	4352	43	0	**4716**	-	9	4071	1294	0	**5374**	-	21	10	21	0	**52**	-	1145	10	480	0	**1635**	-	11777
% Lights and Motorcycles	97.0%	97.0%	100%	0%	**97.0%**	-	100%	96.8%	97.5%	0%	**97.0%**	-	100%	100%	100%	0%	**100%**	-	96.6%	100%	97.4%	0%	**96.9%**	-	97.0%
Heavy	10	132	0	0	**142**	-	0	135	32	0	**167**	-	0	0	0	0	**0**	-	40	0	13	0	**53**	-	362
% Heavy	3.0%	2.9%	0%	0%	**2.9%**	-	0%	3.2%	2.4%	0%	**3.0%**	-	0%	0%	0%	0%	**0%**	-	3.4%	0%	2.6%	0%	**3.1%**	-	3.0%
Bicycles on Road	0	4	0	0	**4**	-	0	0	1	0	**1**	-	0	0	0	0	**0**	-	0	0	0	0	**0**	-	5
% Bicycles on Road	0%	0.1%	0%	0%	**0.1%**	-	0%	0%	0.1%	0%	**0%**	-	0%	0%	0%	0%	**0%**	-	0%	0%	0%	0%	**0%**	-	0%
e-Scooters	-	-	-	-	-	0	-	-	-	-	-	2	-	-	-	-	-	2	-	-	-	-	-	0	
% e-Scooters	-	-	-	-	-	0%	-	-	-	-	-	13.3%	-	-	-	-	-	2.9%	-	-	-	-	-	0%	-
Pedestrians	-	-	-	-	-	3	-	-	-	-	-	13	-	-	-	-	-	55	-	-	-	-	-	35	
% Pedestrians	-	-	-	-	-	100%	-	-	-	-	-	86.7%	-	-	-	-	-	78.6%	-	-	-	-	-	94.6%	-
Bicycles on Crosswalk	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	13	-	-	-	-	-	2	
% Bicycles on Crosswalk	-	-	-	-	-	0%	-	-	-	-	-	0%	-	-	-	-	-	18.6%	-	-	-	-	-	5.4%	-

*Pedestrians and Bicycles on Crosswalk. L: Left, R: Right, T: Thru, U: U-Turn

9) Livingston Ave & Nelson Rd - TMC

Thu May 19, 2022
Full Length (6 AM-10 AM, 3 PM-7 PM)
All Classes (Lights and Motorcycles, Heavy, e-Scooters, Pedestrians, Bicycles on Road, Bicycles on Crosswalk)
All Movements
ID: 954665, Location: 39.948563, -82.947292, Site Code: 9

Provided by: Smart Services, Inc.
88 W. Church Street,
Newark, OH, 43055, US



9) Livingston Ave & Nelson Rd - TMC

Thu May 19, 2022
AM Peak (8:15 AM - 9:15 AM)
All Classes (Lights and Motorcycles, Heavy, e-Scooters, Pedestrians, Bicycles on Road, Bicycles on Crosswalk)
All Movements
ID: 954665, Location: 39.948563, -82.947292, Site Code: 9

Provided by: Smart Services, Inc.
88 W. Church Street,
Newark, OH, 43055, US

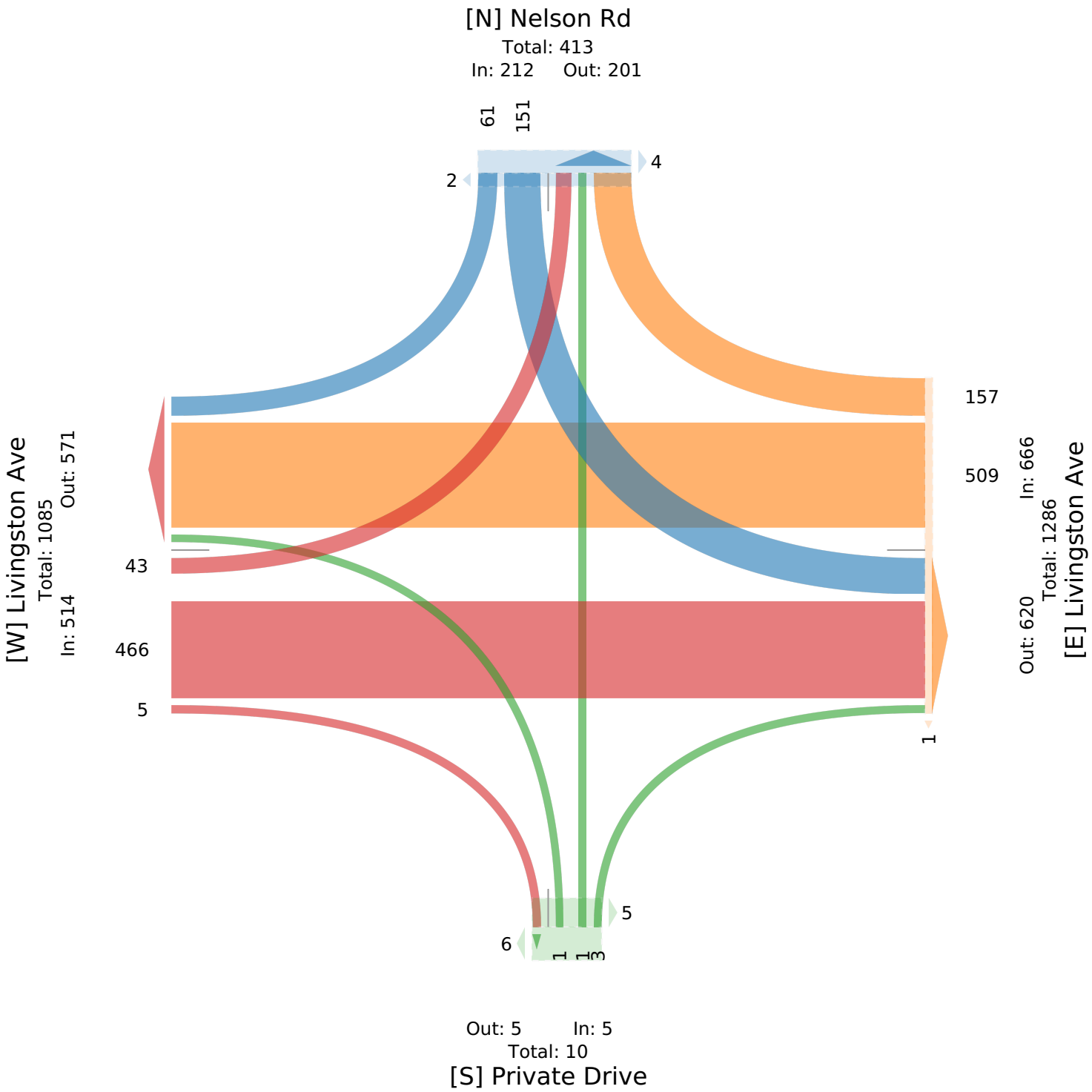
Leg	Livingston Ave						Livingston Ave						Private Drive						Nelson Rd						
Direction	Eastbound						Westbound						Northbound						Southbound						
Time	L	T	R	U	**App**	Ped*	L	T	R	U	**App**	Ped*	L	T	R	U	**App**	Ped*	L	T	R	U	**App**	Ped*	**Int**
2022-05-19 8:15AM	14	110	2	0	**126**	0	0	124	42	0	**166**	0	0	0	0	0	**0**	4	43	0	17	0	**60**	0	**352**
8:30AM	5	109	0	0	**114**	0	0	133	28	0	**161**	1	1	0	1	0	**2**	2	38	0	16	0	**54**	1	**331**
8:45AM	9	128	3	0	**140**	0	0	136	43	0	**179**	0	0	0	1	0	**1**	2	35	0	15	0	**50**	2	**370**
9:00AM	15	119	0	0	**134**	0	0	116	44	0	**160**	0	0	1	1	0	**2**	3	35	0	13	0	**48**	3	**344**
Total	43	466	5	0	**514**	0	0	509	157	0	**666**	1	1	1	3	0	**5**	11	151	0	61	0	**212**	6	**1397**
% Approach	8.4%	90.7%	1.0%	0%	**-**	-	0%	76.4%	23.6%	0%	**-**	-	20.0%	20.0%	60.0%	0%	**-**	-	71.2%	0%	28.8%	0%	**-**	-	-
% Total	3.1%	33.4%	0.4%	0%	**36.8%**	-	0%	36.4%	11.2%	0%	**47.7%**	-	0.1%	0.1%	0.2%	0%	**0.4%**	-	10.8%	0%	4.4%	0%	**15.2%**	-	-
PHF	0.717	0.910	0.417	-	**0.918**	-	-	0.936	0.892	-	**0.930**	-	0.250	0.250	0.750	-	**0.625**	-	0.878	-	0.897	-	**0.883**	-	0.944
Lights and Motorcycles	40	447	5	0	**492**	-	0	483	152	0	**635**	-	1	1	3	0	**5**	-	145	0	60	0	**205**	-	1337
% Lights and Motorcycles	93.0%	95.9%	100%	0%	**95.7%**	-	0%	94.9%	96.8%	0%	**95.3%**	-	100%	100%	100%	0%	**100%**	-	96.0%	0%	98.4%	0%	**96.7%**	-	95.7%
Heavy	3	19	0	0	**22**	-	0	26	5	0	**31**	-	0	0	0	0	**0**	-	6	0	1	0	**7**	-	60
% Heavy	7.0%	4.1%	0%	0%	**4.3%**	-	0%	5.1%	3.2%	0%	**4.7%**	-	0%	0%	0%	0%	**0%**	-	4.0%	0%	1.6%	0%	**3.3%**	-	4.3%
Bicycles on Road	0	0	0	0	**0**	-	0	0	0	0	**0**	-	0	0	0	0	**0**	-	0	0	0	0	**0**	-	0
% Bicycles on Road	0%	0%	0%	0%	**0%**	-	0%	0%	0%	0%	**0%**	-	0%	0%	0%	0%	**0%**	-	0%	0%	0%	0%	**0%**	-	0%
e-Scooters	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	
% e-Scooters	-	-	-	-	-	-	-	-	-	-	-	0%	-	-	-	-	-	0%	-	-	-	-	-	0%	-
Pedestrians	-	-	-	-	-	0	-	-	-	-	-	1	-	-	-	-	-	10	-	-	-	-	-	6	
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	100%	-	-	-	-	-	90.9%	-	-	-	-	-	100%	-
Bicycles on Crosswalk	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	1	-	-	-	-	-	0	
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	-	0%	-	-	-	-	-	9.1%	-	-	-	-	-	0%	-

*Pedestrians and Bicycles on Crosswalk. L: Left, R: Right, T: Thru, U: U-Turn

9) Livingston Ave & Nelson Rd - TMC

Thu May 19, 2022
AM Peak (8:15 AM - 9:15 AM)
All Classes (Lights and Motorcycles, Heavy, e-Scooters, Pedestrians, Bicycles on Road, Bicycles on Crosswalk)
All Movements
ID: 954665, Location: 39.948563, -82.947292, Site Code: 9

Provided by: Smart Services, Inc.
88 W. Church Street,
Newark, OH, 43055, US



9) Livingston Ave & Nelson Rd - TMC

Thu May 19, 2022
PM Peak (3:15 PM - 4:15 PM) - Overall Peak Hour
All Classes (Lights and Motorcycles, Heavy, e-Scooters, Pedestrians, Bicycles on Road, Bicycles on Crosswalk)
All Movements
ID: 954665, Location: 39.948563, -82.947292, Site Code: 9

Provided by: Smart Services, Inc.
88 W. Church Street,
Newark, OH, 43055, US

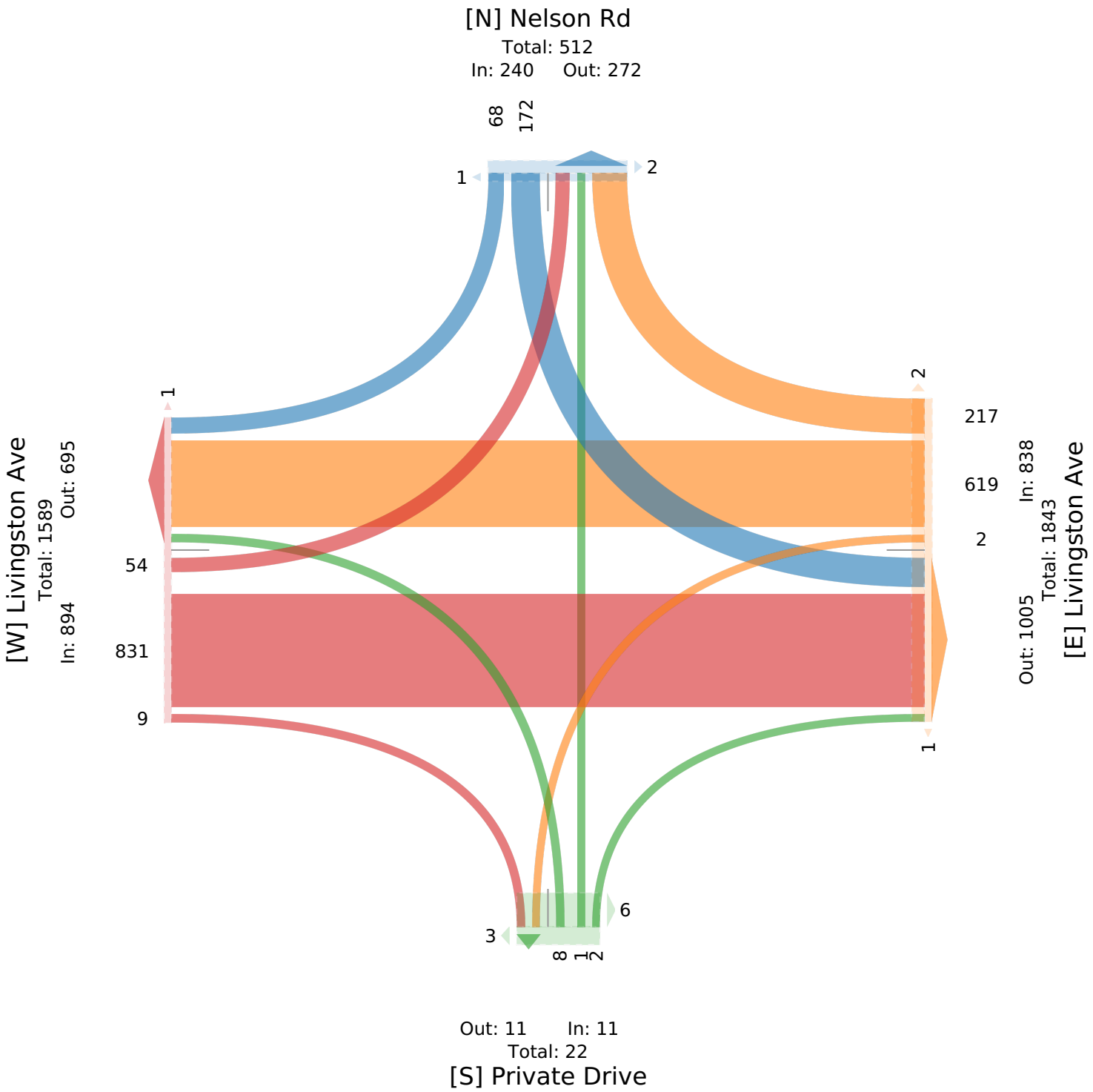
Leg / Direction	Livingston Ave Eastbound						Livingston Ave Westbound						Private Drive Northbound						Nelson Rd Southbound						
Time	L	T	R	U	**App**	Ped*	L	T	R	U	**App**	Ped*	L	T	R	U	**App**	Ped*	L	T	R	U	**App**	Ped*	**Int**
2022-05-19 3:15PM	14	225	1	0	**240**	0	2	155	53	0	**210**	3	2	0	1	0	**3**	4	37	0	16	0	**53**	1	**506**
3:30PM	18	191	3	0	**212**	0	0	142	58	0	**200**	0	2	1	1	0	**4**	3	57	0	21	0	**78**	2	**494**
3:45PM	17	213	3	0	**233**	0	0	168	55	0	**223**	0	2	0	0	0	**2**	0	28	0	14	0	**42**	0	**500**
4:00PM	5	202	2	0	**209**	1	0	154	51	0	**205**	0	2	0	0	0	**2**	2	50	0	17	0	**67**	0	**483**
Total	54	831	9	0	**894**	1	2	619	217	0	**838**	3	8	1	2	0	**11**	9	172	0	68	0	**240**	3	**1983**
% Approach	6.0%	93.0%	1.0%	0%	**-**	-	0.2%	73.9%	25.9%	0%	**-**	-	72.7%	9.1%	18.2%	0%	**-**	-	71.7%	0%	28.3%	0%	**-**	-	**-**
% Total	2.7%	41.9%	0.5%	0%	**45.1%**	-	0.1%	31.2%	10.9%	0%	**42.3%**	-	0.4%	0.1%	0.1%	0%	**0.6%**	-	8.7%	0%	3.4%	0%	**12.1%**	-	**-**
PHF	0.750	0.926	0.750	-	**0.934**	-	0.250	0.921	0.935	-	**0.939**	-	1.000	0.250	0.500	-	**0.688**	-	0.754	-	0.810	-	**0.769**	-	0.981
Lights and Motorcycles	52	806	9	0	**867**	-	2	598	211	0	**811**	-	8	1	2	0	**11**	-	169	0	63	0	**232**	-	1921
% Lights and Motorcycles	96.3%	97.0%	100%	0%	**97.0%**	-	100%	96.6%	97.2%	0%	**96.8%**	-	100%	100%	100%	0%	**100%**	-	98.3%	0%	92.6%	0%	**96.7%**	-	96.9%
Heavy	2	24	0	0	**26**	-	0	21	6	0	**27**	-	0	0	0	0	**0**	-	3	0	5	0	**8**	-	61
% Heavy	3.7%	2.9%	0%	0%	**2.9%**	-	0%	3.4%	2.8%	0%	**3.2%**	-	0%	0%	0%	0%	**0%**	-	1.7%	0%	7.4%	0%	**3.3%**	-	3.1%
Bicycles on Road	0	1	0	0	**1**	-	0	0	0	0	**0**	-	0	0	0	0	**0**	-	0	0	0	0	**0**	-	1
% Bicycles on Road	0%	0.1%	0%	0%	**0.1%**	-	0%	0%	0%	0%	**0%**	-	0%	0%	0%	0%	**0%**	-	0%	0%	0%	0%	**0%**	-	0.1%
e-Scooters	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	
% e-Scooters	-	-	-	-	-	0%	-	-	-	-	-	0%	-	-	-	-	-	0%	-	-	-	-	-	0%	-
Pedestrians	-	-	-	-	-	1	-	-	-	-	-	3	-	-	-	-	-	8	-	-	-	-	-	3	
% Pedestrians	-	-	-	-	-	100%	-	-	-	-	-	100%	-	-	-	-	-	88.9%	-	-	-	-	-	100%	-
Bicycles on Crosswalk	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	1	-	-	-	-	-	0	
% Bicycles on Crosswalk	-	-	-	-	-	0%	-	-	-	-	-	0%	-	-	-	-	-	11.1%	-	-	-	-	-	0%	-

*Pedestrians and Bicycles on Crosswalk. L: Left, R: Right, T: Thru, U: U-Turn

9) Livingston Ave & Nelson Rd - TMC

Thu May 19, 2022
PM Peak (3:15 PM - 4:15 PM) - Overall Peak Hour
All Classes (Lights and Motorcycles, Heavy, e-Scooters, Pedestrians, Bicycles on Road, Bicycles on Crosswalk)
All Movements
ID: 954665, Location: 39.948563, -82.947292, Site Code: 9

Provided by: Smart Services, Inc.
88 W. Church Street,
Newark, OH, 43055, US



K Factor Calculation Sheet

K-factor Calculation Sheet

STEP 1 - CALCULATE K-FACTOR USING SITE SPECIFIC DATA (ATR COUNTS); AADT DETERMINED USING TOTAL DAILY TRAFFIC FROM ATR AND SEASONAL FACTOR

Site	Total Daily Traffic	Peak Hour Traffic	K-factor (site)
Livingston Ave EB (Between Carpenter St-Gilbert St)	5835	603	
Livingston Ave WB (Between Carpenter St-Gilbert St)	6057	385	
AADT	10616	988	9.9%
Livingston Ave EB (Between Lockbourne Rd-Miller Av)	9047	780	
Livingston Ave WB (Between Lockbourne Rd-Miller Av)	10360	711	
AADT	17309	1491	9.1%
Livingston Ave EB (Between Bulen Av-Rhoads Av)	8181	717	
Livingston Ave WB (Between Bulen Av-Rhoads Av)	7761	524	
AADT	14243	1241	9.2%
Max	17309		9.9%

$$K = K_{Count} \times DHV\ Factor = \frac{Counted\ Peak\ Hour\ Volume_{site}}{AADT_{site}} \times DHV\ Factor$$

Statewide Average DHV Factor

DHV	1.06

Seasonal Adjustment Factor (2021)

Wed	May	0.909
Thu	May	0.877

STEP 2 - DETRMINE K-FACTOR FROM STATEWIDE DATA

Loc ID	Rural or Urban	FC	Site	County	Route	Route Type	AADT	Daily Volume	% AADT	Hour	Hr Vol	% AADT K-Factor
9876	U	3	550	Stark	62	US	17575	20767	1.1816	15	1712	9.74%
11831	U	3	523	Hamilton	22	US	18590	21574	1.1605	17	1975	10.62%
13532	U	3	725	Hancock	68	US	18889	24277	1.2852	16	1965	10.40%
25978	U	3	543	Trumbull	422	US	17129	19255	1.1241	16	1698	9.91%
29305	U	3	786	Athens	33	US	16251	20484	1.2605	16	1792	11.03%
										AVERAGE PROXY-K		10.34%

STEP 3 - CALCULATE DHV FACTOR USING PROXY-K FACTOR (USE IF VALUE > 1)

Location	DHV (using Proxy-K)	K-factor (used)
Carpenter St - Gilbert St	1.1	10.34%
Lockbourne Rd - Miller Av	1.20	10.34%
Bulen Av - Rhoads Av	1.19	10.34%

$$DHV\ Factor = \frac{\text{Proxy K} \times AADT_{site}}{Counted\ Peak\ Hour\ Volume_{site}}$$

Roadway Segment	Functional Classification	AADT	K-Factor	K-Factor (ODOT)	K-Factor Used for Forecasting
Livingston Ave	Urban Principal Arterial	17309	9.9%	10.34%	10.34

Alum Creek Dr & Livingston Ave - TMC

Thu Mar 3, 2022
Full Length (6 AM-10 AM, 3 PM-7 PM)
All Classes (Lights and Motorcycles, Heavy, Pedestrians, Bicycles on Road, Bicycles on Crosswalk)
All Movements
ID: 955750, Location: 39.948458, -82.945229

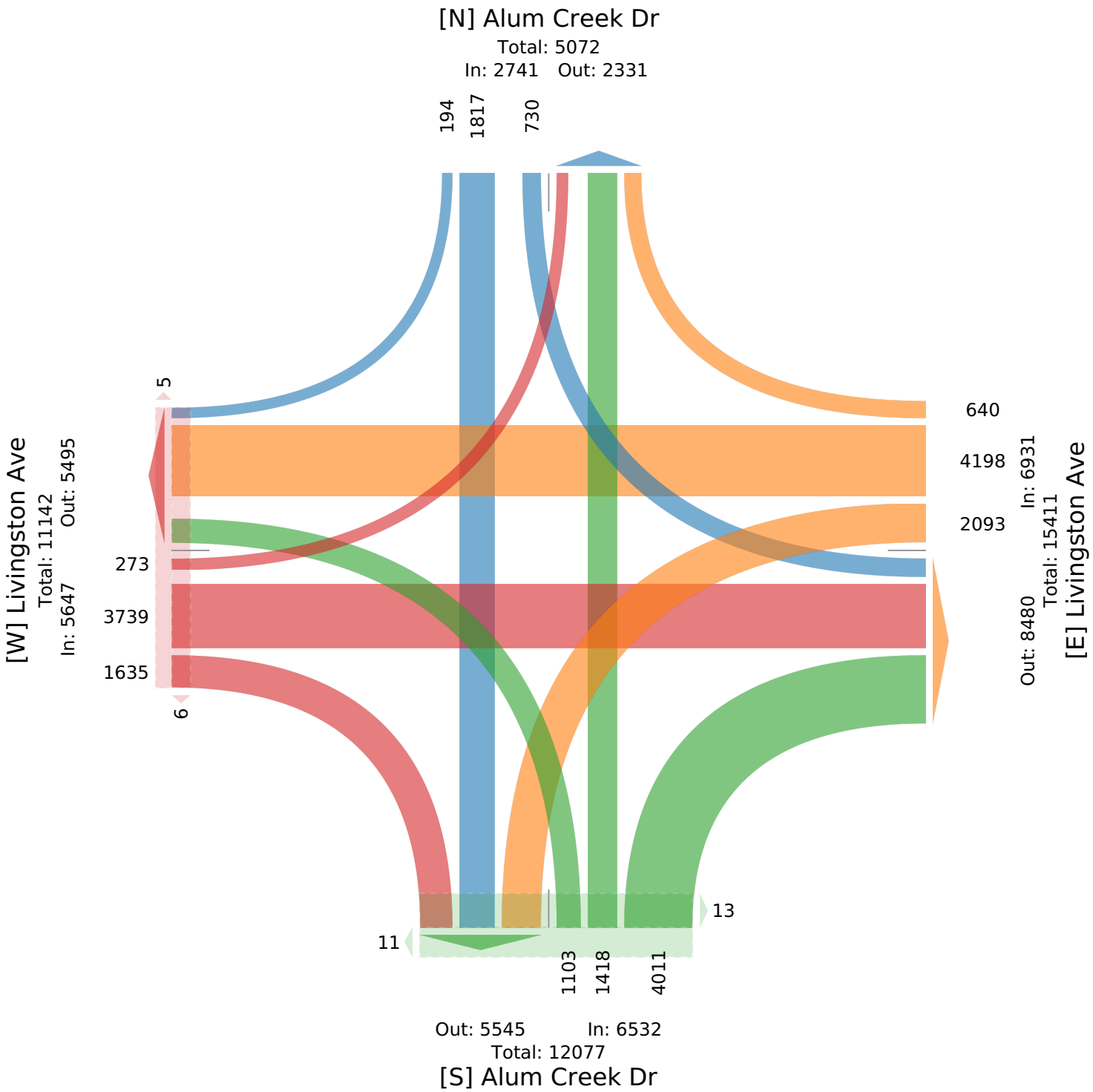
Provided by: Smart Services, Inc.
88 W. Church Street,
Newark, OH, 43055, US

Leg	Livingston Ave						Livingston Ave						Alum Creek Dr						Alum Creek Dr						
Direction	Eastbound						Westbound						Northbound						Southbound						
Time	L	T	R	U	App	Ped*	L	T	R	U	App	Ped*	L	T	R	U	App	Ped*	L	T	R	U	App	Ped*	Int
2022-03-03 6:00AM	1	27	18	0	**46**	0	23	53	8	0	**84**	0	6	17	47	0	**70**	0	6	23	2	0	**31**	0	**231**
6:15AM	4	28	24	0	**56**	0	54	64	5	0	**123**	0	17	14	50	0	**81**	0	6	13	1	0	**20**	0	**280**
6:30AM	3	36	38	0	**77**	0	51	106	17	0	**174**	0	31	24	63	0	**118**	0	6	25	0	0	**31**	0	**400**
6:45AM	1	52	37	0	**90**	0	75	109	10	0	**194**	0	16	27	51	0	**94**	0	3	33	0	0	**36**	0	**414**
Hourly Total	9	143	117	0	**269**	0	203	332	40	0	**575**	0	70	82	211	0	**363**	0	21	94	3	0	**118**	0	**1325**
7:00AM	2	56	45	0	**103**	0	59	94	14	0	**167**	0	16	30	61	0	**107**	1	5	28	1	0	**34**	0	**411**
7:15AM	3	66	30	0	**99**	0	81	125	14	0	**220**	0	30	37	93	0	**160**	2	16	48	1	0	**65**	0	**544**
7:30AM	6	79	53	0	**138**	0	92	142	14	0	**248**	0	30	32	119	0	**181**	1	6	68	5	0	**79**	0	**646**
7:45AM	7	79	61	0	**147**	1	100	153	30	0	**283**	0	36	49	101	0	**186**	1	13	74	9	0	**96**	0	**712**
Hourly Total	18	280	189	0	**487**	1	332	514	72	0	**918**	0	112	148	374	0	**634**	5	40	218	16	0	**274**	0	**2313**
8:00AM	7	64	57	0	**128**	0	72	139	24	0	**235**	0	32	43	106	0	**181**	0	12	54	3	0	**69**	0	**613**
8:15AM	5	86	38	0	**129**	0	62	118	22	0	**202**	0	25	34	110	0	**169**	0	10	50	4	0	**64**	0	**564**
8:30AM	4	87	54	0	**145**	0	70	119	21	0	**210**	0	29	53	108	0	**190**	0	13	46	8	0	**67**	0	**612**
8:45AM	5	101	56	0	**162**	1	85	132	27	0	**244**	0	28	40	121	0	**189**	0	17	66	5	0	**88**	0	**683**
Hourly Total	21	338	205	0	**564**	1	289	508	94	0	**891**	0	114	170	445	0	**729**	0	52	216	20	0	**288**	0	**2472**
9:00AM	12	100	55	0	**167**	0	83	94	18	0	**195**	0	40	53	137	0	**230**	2	14	50	9	0	**73**	0	**665**
9:15AM	8	77	56	0	**141**	0	64	128	29	0	**221**	0	31	37	111	0	**179**	2	16	58	6	0	**80**	0	**621**
9:30AM	7	91	39	0	**137**	0	61	95	13	0	**169**	0	39	34	136	0	**209**	3	10	52	4	0	**66**	0	**581**
9:45AM	4	84	52	0	**140**	0	58	111	16	0	**185**	0	26	24	90	0	**140**	0	12	46	10	0	**68**	0	**533**
Hourly Total	31	352	202	0	**585**	0	266	428	76	0	**770**	0	136	148	474	0	**758**	7	52	206	29	0	**287**	0	**2400**
3:00PM	11	175	77	0	**263**	0	70	137	26	0	**233**	0	37	31	148	0	**216**	1	27	69	7	0	**103**	0	**815**
3:15PM	11	133	68	0	**212**	1	81	175	23	0	**279**	0	40	54	184	0	**278**	1	43	72	11	0	**126**	0	**895**
3:30PM	11	191	72	0	**274**	1	70	177	18	0	**265**	0	60	85	177	0	**322**	1	30	67	6	0	**103**	0	**964**
3:45PM	12	177	62	0	**251**	1	69	161	25	0	**255**	0	51	79	185	0	**315**	1	27	86	4	0	**117**	0	**938**
Hourly Total	45	676	279	0	**1000**	3	290	650	92	0	**1032**	0	188	249	694	0	**1131**	4	127	294	28	0	**449**	0	**3612**
4:00PM	18	201	64	0	**283**	0	64	133	21	0	**218**	0	46	65	179	0	**290**	3	47	82	7	0	**136**	0	**927**
4:15PM	11	212	46	0	**269**	0	60	138	23	0	**221**	0	56	73	165	0	**294**	0	49	86	10	0	**145**	0	**929**
4:30PM	12	189	70	0	**271**	2	59	153	36	0	**248**	0	47	63	179	0	**289**	0	51	63	8	0	**122**	0	**930**
4:45PM	17	174	59	0	**250**	1	60	164	22	0	**246**	0	66	83	189	0	**338**	0	49	86	10	0	**145**	0	**979**
Hourly Total	58	776	239	0	**1073**	3	243	588	102	0	**933**	0	215	284	712	0	**1211**	3	196	317	35	0	**548**	0	**3765**
5:00PM	12	176	59	0	**247**	1	49	145	17	0	**211**	0	43	68	167	0	**278**	0	43	72	11	0	**126**	0	**862**
5:15PM	15	159	48	0	**222**	1	75	186	22	0	**283**	0	45	57	192	0	**294**	1	50	76	7	0	**133**	0	**932**
5:30PM	20	177	60	0	**257**	0	71	177	29	0	**277**	0	36	50	171	0	**257**	0	31	52	6	0	**89**	0	**880**
5:45PM	9	142	50	0	**201**	0	64	128	17	0	**209**	0	40	36	129	0	**205**	2	37	72	8	0	**117**	0	**732**
Hourly Total	56	654	217	0	**927**	2	259	636	85	0	**980**	0	164	211	659	0	**1034**	3	161	272	32	0	**465**	0	**3406**
6:00PM	8	154	64	0	**226**	0	49	138	24	0	**211**	0	32	37	112	0	**181**	2	24	62	7	0	**93**	0	**711**
6:15PM	11	119	34	0	**164**	0	61	146	16	0	**223**	0	28	37	111	0	**176**	0	26	52	10	0	**88**	0	**651**
6:30PM	7	135	48	0	**190**	1	53	135	25	0	**213**	0	23	21	109	0	**153**	0	12	45	10	0	**67**	0	**623**
6:45PM	9	112	41	0	**162**	0	48	123	14	0	**185**	0	21	31	110	0	**162**	0	19	41	4	0	**64**	0	**573**
Hourly Total	35	520	187	0	**742**	1	211	542	79	0	**832**	0	104	126	442	0	**672**	2	81	200	31	0	**312**	0	**2558**
Total	273	3739	1635	0	**5647**	11	2093	4198	640	0	**6931**	0	1103	1418	4011	0	**6532**	24	730	1817	194	0	**2741**	0	**21851**
% Approach	4.8%	66.2%	29.0%	0%	**-**	-	30.2%	60.6%	9.2%	0%	**-**	-	16.9%	21.7%	61.4%	0%	**-**	-	26.6%	66.3%	7.1%	0%	**-**	-	-
% Total	1.2%	17.1%	7.5%	0%	**25.8%**	-	9.6%	19.2%	2.9%	0%	**31.7%**	-	5.0%	6.5%	18.4%	0%	**29.9%**	-	3.3%	8.3%	0.9%	0%	**12.5%**	-	-
Lights and Motorcycles	268	3640	1580	0	**5488**	-	1959	4081	621	0	**6661**	-	1065	1363	3805	0	**6233**	-	719	1727	189	0	**2635**	-	21017
% Lights and Motorcycles	98.2%	97.4%	96.6%	0%	**97.2%**	-	93.6%	97.2%	97.0%	0%	**96.1%**	-	96.6%	96.1%	94.9%	0%	**95.4%**	-	98.5%	95.0%	97.4%	0%	**96.1%**	-	96.2%
Heavy	5	98	55	0	**158**	-	134	115	19	0	**268**	-	37	55	206	0	**298**	-	11	90	5	0	**106**	-	830
% Heavy	1.8%	2.6%	3.4%	0%	**2.8%**	-	6.4%	2.7%	3.0%	0%	**3.9%**	-	3.4%	3.9%	5.1%	0%	**4.6%**	-	1.5%	5.0%	2.6%	0%	**3.9%**	-	3.8%
Bicycles on Road	0	1	0	0	**1**	-	0	2	0	0	**2**	-	1	0	0	0	**1**	-	0	0	0	0	**0**	-	4
% Bicycles on Road	0%	0%	0%	0%	**0%**	-	0%	0%	0%	0%	**0%**	-	0.1%	0%	0%	0%	**0%**	-	0%	0%	0%	0%	**0%**	-	0%
Pedestrians	-	-	-	-	-	7	-	-	-	-	-	0	-	-	-	-	-	23	-	-	-	-	-	0	
% Pedestrians	-	-	-	-	-	63.6%	-	-	-	-	-	-	-	-	-	-	-	95.8%	-	-	-	-	-	-	-
Bicycles on Crosswalk	-	-	-	-	-	4	-	-	-	-	-	0	-	-	-	-	-	1	-	-	-	-	-	0	
% Bicycles on Crosswalk	-	-	-	-	-	36.4%	-	-	-	-	-	-	-	-	-	-	-	4.2%	-	-	-	-	-	-	-

*Pedestrians and Bicycles on Crosswalk. L: Left, R: Right, T: Thru, U: U-Turn

Alum Creek Dr & Livingston Ave - TMC
Thu Mar 3, 2022
Full Length (6 AM-10 AM, 3 PM-7 PM)
All Classes (Lights and Motorcycles, Heavy, Pedestrians, Bicycles on Road, Bicycles on Crosswalk)
All Movements
ID: 955750, Location: 39.948458, -82.945229

Provided by: Smart Services, Inc.
88 W. Church Street,
Newark, OH, 43055, US



Alum Creek Dr & Livingston Ave - TMC

Thu Mar 3, 2022
AM Peak (8:30 AM - 9:30 AM)
All Classes (Lights and Motorcycles, Heavy, Pedestrians, Bicycles on Road, Bicycles on Crosswalk)
All Movements
ID: 955750, Location: 39.948458, -82.945229

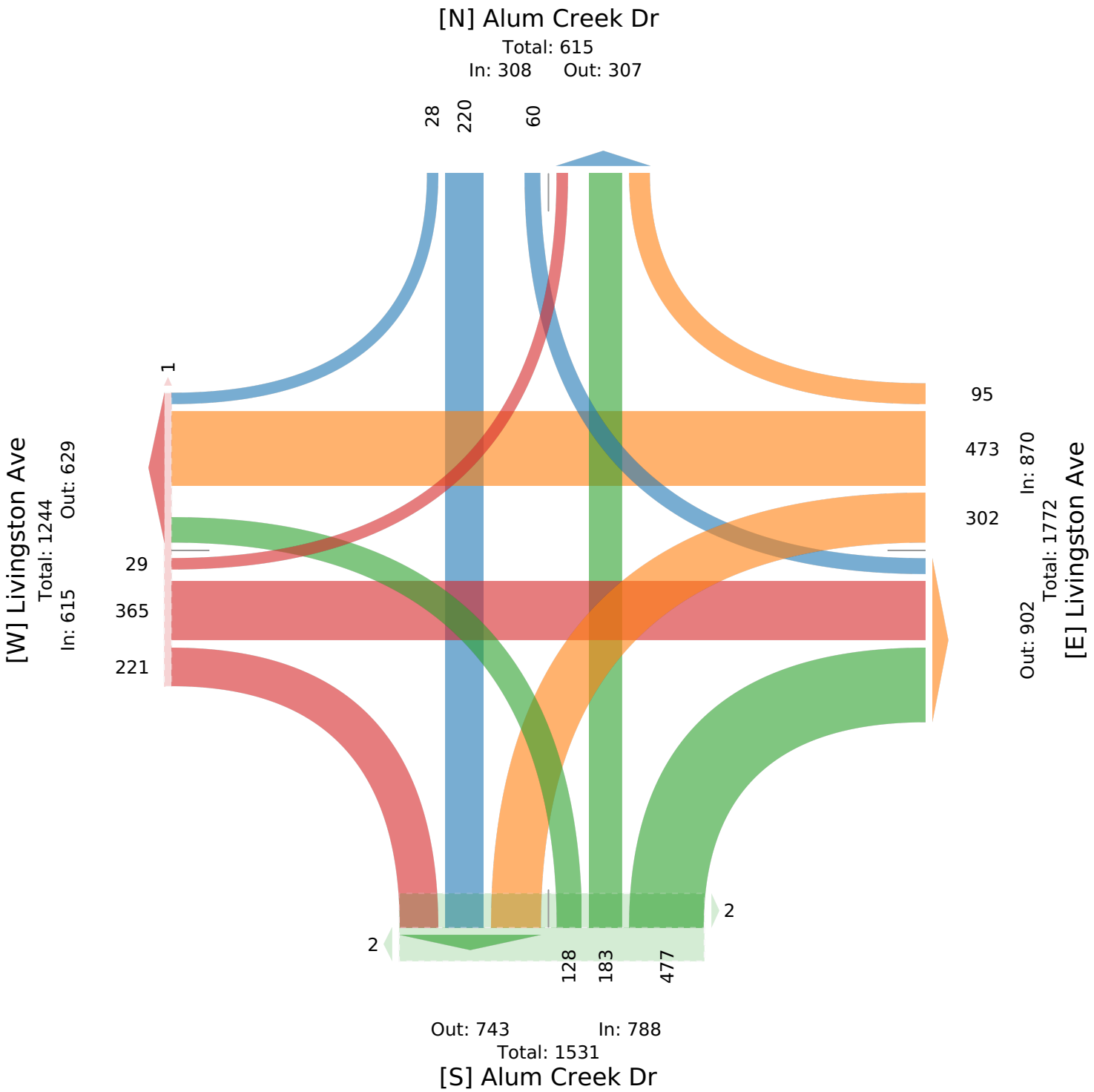
Provided by: Smart Services, Inc.
88 W. Church Street,
Newark, OH, 43055, US

Leg	Livingston Ave						Livingston Ave						Alum Creek Dr						Alum Creek Dr						
Direction	Eastbound						Westbound						Northbound						Southbound						
Time	L	T	R	U	**App**	Ped*	L	T	R	U	**App**	Ped*	L	T	R	U	**App**	Ped*	L	T	R	U	**App**	Ped*	**Int**
2022-03-03 8:30AM	4	87	54	0	**145**	0	70	119	21	0	**210**	0	29	53	108	0	**190**	0	13	46	8	0	**67**	0	**612**
8:45AM	5	101	56	0	**162**	1	85	132	27	0	**244**	0	28	40	121	0	**189**	0	17	66	5	0	**88**	0	**683**
9:00AM	12	100	55	0	**167**	0	83	94	18	0	**195**	0	40	53	137	0	**230**	2	14	50	9	0	**73**	0	**665**
9:15AM	8	77	56	0	**141**	0	64	128	29	0	**221**	0	31	37	111	0	**179**	2	16	58	6	0	**80**	0	**621**
Total	29	365	221	0	**615**	1	302	473	95	0	**870**	0	128	183	477	0	**788**	4	60	220	28	0	**308**	0	**2581**
% Approach	4.7%	59.3%	35.9%	0%	**-**	-	34.7%	54.4%	10.9%	0%	**-**	-	16.2%	23.2%	60.5%	0%	**-**	-	19.5%	71.4%	9.1%	0%	**-**	-	-
% Total	1.1%	14.1%	8.6%	0%	**23.8%**	-	11.7%	18.3%	3.7%	0%	**33.7%**	-	5.0%	7.1%	18.5%	0%	**30.5%**	-	2.3%	8.5%	1.1%	0%	**11.9%**	-	-
PHF	0.604	0.903	0.987	-	**0.921**	-	0.888	0.901	0.819	-	**0.894**	-	0.800	0.863	0.870	-	**0.857**	-	0.882	0.833	0.778	-	**0.875**	-	0.946
Lights and Motorcycles	28	353	208	0	**589**	-	268	452	91	0	**811**	-	119	172	439	0	**730**	-	60	194	28	0	**282**	-	2412
% Lights and Motorcycles	96.6%	96.7%	94.1%	0%	**95.8%**	-	88.7%	95.6%	95.8%	0%	**93.2%**	-	93.0%	94.0%	92.0%	0%	**92.6%**	-	100%	88.2%	100%	0%	**91.6%**	-	93.5%
Heavy	1	12	13	0	**26**	-	34	20	4	0	**58**	-	9	11	38	0	**58**	-	0	26	0	0	**26**	-	168
% Heavy	3.4%	3.3%	5.9%	0%	**4.2%**	-	11.3%	4.2%	4.2%	0%	**6.7%**	-	7.0%	6.0%	8.0%	0%	**7.4%**	-	0%	11.8%	0%	0%	**8.4%**	-	6.5%
Bicycles on Road	0	0	0	0	**0**	-	0	1	0	0	**1**	-	0	0	0	0	**0**	-	0	0	0	0	**0**	-	1
% Bicycles on Road	0%	0%	0%	0%	**0%**	-	0%	0.2%	0%	0%	**0.1%**	-	0%	0%	0%	0%	**0%**	-	0%	0%	0%	0%	**0%**	-	0%
Pedestrians	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	4	-	-	-	-	-	0	
% Pedestrians	-	-	-	-	-	0%	-	-	-	-	-	-	-	-	-	-	-	100%	-	-	-	-	-	-	-
Bicycles on Crosswalk	-	-	-	-	-	1	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	
% Bicycles on Crosswalk	-	-	-	-	-	100%	-	-	-	-	-	-	-	-	-	-	-	0%	-	-	-	-	-	-	-

*Pedestrians and Bicycles on Crosswalk. L: Left, R: Right, T: Thru, U: U-Turn

Alum Creek Dr & Livingston Ave - TMC
Thu Mar 3, 2022
AM Peak (8:30 AM - 9:30 AM)
All Classes (Lights and Motorcycles, Heavy, Pedestrians, Bicycles on Road, Bicycles on Crosswalk)
All Movements
ID: 955750, Location: 39.948458, -82.945229

Provided by: Smart Services, Inc.
88 W. Church Street,
Newark, OH, 43055, US



Alum Creek Dr & Livingston Ave - TMC

Thu Mar 3, 2022
PM Peak (4 PM - 5 PM) - Overall Peak Hour
All Classes (Lights and Motorcycles, Heavy, Pedestrians, Bicycles on Road, Bicycles on Crosswalk)
All Movements
ID: 955750, Location: 39.948458, -82.945229

Provided by: Smart Services, Inc.
88 W. Church Street,
Newark, OH, 43055, US

Leg	Livingston Ave						Livingston Ave						Alum Creek Dr						Alum Creek Dr						
Direction	Eastbound						Westbound						Northbound						Southbound						
Time	L	T	R	U	**App**	Ped*	L	T	R	U	**App**	Ped*	L	T	R	U	**App**	Ped*	L	T	R	U	**App**	Ped*	**Int**
2022-03-03 4:00PM	18	201	64	0	**283**	0	64	133	21	0	**218**	0	46	65	179	0	**290**	3	47	82	7	0	**136**	0	**927**
4:15PM	11	212	46	0	**269**	0	60	138	23	0	**221**	0	56	73	165	0	**294**	0	49	86	10	0	**145**	0	**929**
4:30PM	12	189	70	0	**271**	2	59	153	36	0	**248**	0	47	63	179	0	**289**	0	51	63	8	0	**122**	0	**930**
4:45PM	17	174	59	0	**250**	1	60	164	22	0	**246**	0	66	83	189	0	**338**	0	49	86	10	0	**145**	0	**979**
Total	58	776	239	0	**1073**	3	243	588	102	0	**933**	0	215	284	712	0	**1211**	3	196	317	35	0	**548**	0	**3765**
% Approach	5.4%	72.3%	22.3%	0%	**-**	-	26.0%	63.0%	10.9%	0%	**-**	-	17.8%	23.5%	58.8%	0%	**-**	-	35.8%	57.8%	6.4%	0%	**-**	-	-
% Total	1.5%	20.6%	6.3%	0%	**28.5%**	-	6.5%	15.6%	2.7%	0%	**24.8%**	-	5.7%	7.5%	18.9%	0%	**32.2%**	-	5.2%	8.4%	0.9%	0%	**14.6%**	-	-
PHF	0.806	0.915	0.854	-	**0.948**	-	0.949	0.896	0.708	-	**0.941**	-	0.814	0.855	0.942	-	**0.896**	-	0.961	0.922	0.875	-	**0.945**	-	0.961
Lights and Motorcycles	57	760	231	0	**1048**	-	222	575	99	0	**896**	-	209	277	694	0	**1180**	-	194	311	35	0	**540**	-	3664
% Lights and Motorcycles	98.3%	97.9%	96.7%	0%	**97.7%**	-	91.4%	97.8%	97.1%	0%	**96.0%**	-	97.2%	97.5%	97.5%	0%	**97.4%**	-	99.0%	98.1%	100%	0%	**98.5%**	-	97.3%
Heavy	1	16	8	0	**25**	-	21	13	3	0	**37**	-	6	7	18	0	**31**	-	2	6	0	0	**8**	-	101
% Heavy	1.7%	2.1%	3.3%	0%	**2.3%**	-	8.6%	2.2%	2.9%	0%	**4.0%**	-	2.8%	2.5%	2.5%	0%	**2.6%**	-	1.0%	1.9%	0%	0%	**1.5%**	-	2.7%
Bicycles on Road	0	0	0	0	**0**	-	0	0	0	0	**0**	-	0	0	0	0	**0**	-	0	0	0	0	**0**	-	0
% Bicycles on Road	0%	0%	0%	0%	**0%**	-	0%	0%	0%	0%	**0%**	-	0%	0%	0%	0%	**0%**	-	0%	0%	0%	0%	**0%**	-	0%
Pedestrians	-	-	-	-	-	3	-	-	-	-	-	0	-	-	-	-	-	3	-	-	-	-	-	0	
% Pedestrians	-	-	-	-	-	100%	-	-	-	-	-	-	-	-	-	-	-	100%	-	-	-	-	-	-	-
Bicycles on Crosswalk	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	
% Bicycles on Crosswalk	-	-	-	-	-	0%	-	-	-	-	-	-	-	-	-	-	-	0%	-	-	-	-	-	-	-

*Pedestrians and Bicycles on Crosswalk. L: Left, R: Right, T: Thru, U: U-Turn

Alum Creek Dr & Livingston Ave - TMC
Thu Mar 3, 2022
PM Peak (4 PM - 5 PM) - Overall Peak Hour
All Classes (Lights and Motorcycles, Heavy, Pedestrians, Bicycles on Road, Bicycles on Crosswalk)
All Movements
ID: 955750, Location: 39.948458, -82.945229

Provided by: Smart Services, Inc.
88 W. Church Street,
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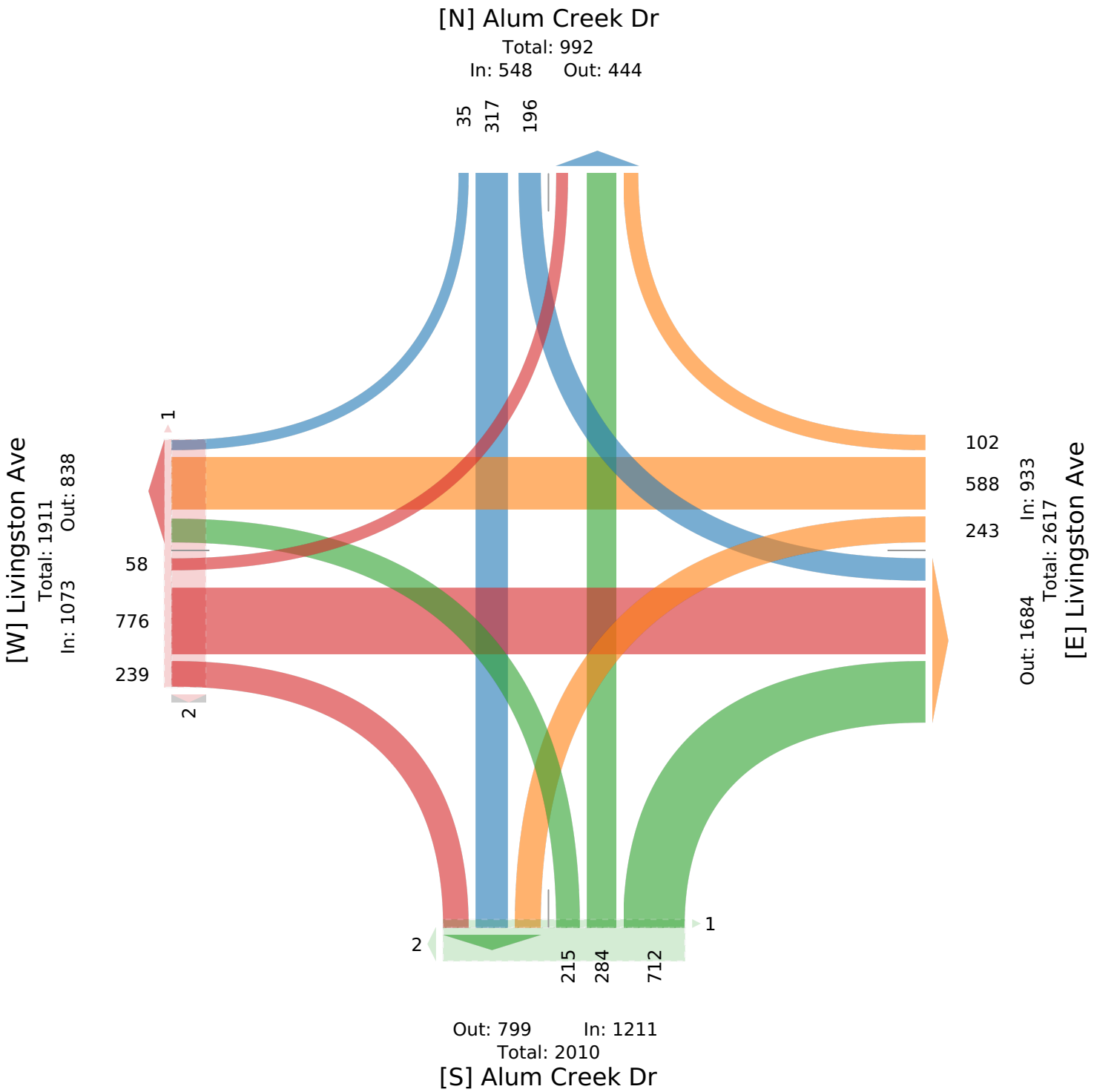

Appendix 5: Level of Service Tables and Analysis

Contents:

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2. Existing LOS Table 5-7
3. “No-Build” LOS Table 5-8
4. “Build” LOS Table 5-9

Appendix 5: Level of Service Tables and Analysis

Level of Service Definition

A capacity analysis using Synchro 11 was completed for the following "no-build" scenarios: existing (2022); construction (2026); and design (2046). Output reports for the analyzed conditions are included in **Appendix 3**. A summary table for Level of Service (LOS) and vehicle delay for all movements and all analysis conditions are also included in this appendix.

As described in the Highway Capacity Manual (HCM) 7th Edition, traffic operations as shown in this section and later sections are described by a LOS letter grade to describe the quality of traffic operations at the study location. For unsignalized and signalized intersections, control delay is the measure of effectiveness used to determine the LOS Grade. Control Delay for each movement is described as the delay on the movement due to the traffic control (signal, stop sign, etc.). The LOS Table used to describe operations in this report is shown in **Table 1** below.

Table 1: HCM 7th Edition Level of Service Grades

Level of Service	Average Control Delay (sec/veh)	
	Signalized	Unsignalized
A	≤ 10	≤ 10
B	10 – 20	10 – 15
C	20 – 35	15 – 25
D	35 – 55	25 – 35
E	55 – 80	35 – 50
F	> 80	> 50

"No Build" Existing Year (2022)

Table 2 summarizes the intersection-level performance measures for the "no-build" condition under the existing year volumes. A full summary of the operations of each movement at each analysis intersection within the study can be found summarized in this document, and includes summaries of LOS, control delay, 95th percentile queue, and volume to capacity ratio (v/c) for each movement.

Table 2: "No-Build" Operations (Existing Year 2022)

"No-Build" Condition	2022 AM		2022 PM	
Intersection	LOS	Control Delay (s/veh)	LOS	Control Delay (s/veh)
Livingston Ave & S 18th Street	A	9.6	B	17.2
Livingston Ave & Carpenter Street	A	2.6	A	2.6
Livingston Ave & S Ohio Ave	A	1.2	A	2.0
Livingston Ave & S Champion Ave	B	10.7	B	12.1
Livingston Ave & Lockbourne Ave	A	6.5	A	9.1
Livingston Ave & Miller Ave	A	6.0	A	7.8
Livingston Ave & Kelton Ave	A	5.9	A	7.5
Livingston Ave & Fairwood Ave	B	14.6	C	21.8
Livingston Ave & S Nelson Rd	B	14.5	B	14.4

For the signalized intersections, the overall Intersection LOS is typically LOS C or better under the existing conditions. Looking at the operations by movement, the mainline typically operates at LOS A while side street approaches operate at a LOS ranging between B and D for most approaches, except for a select few approaches which operate at LOS E (e.g. the southbound approach at S 18th Street, and the southbound approach at Nelson Street).

The only unsignalized intersection observed in the operational analysis is Livingston Avenue at Carpenter Street. At this intersection, side street approaches operate at LOS B or LOS C dependent on peak hour.

"No-Build" Construction (2026) and Design (2046) Year Analysis

Traffic operations analysis of "no-build" conditions was conducted for the construction (2026) and design years (2046). The analysis provided various traffic operations measures of service including level of service (LOS), control delay, volume to capacity ratio, and 95th percentile queues for the analysis intersections along the corridor. To ensure an optimal signal timing operation in 2026 and 2046, signal timing optimization was performed in Synchro and provided optimal cycle length and intersection offset values throughout the corridor. **Table 3** below summarizes the intersection-level performance measures for the "no-build" condition under the construction and design year volumes. A full summary of the operations of each movement at each analysis

intersection within the study can be found in this document, and includes LOS, control delay, 95th percentile queue, and volume to capacity ratio (v/c) for each movement.

Table 3: "No-Build" Operations (Construction Year 2026 and Design Year 2046)

"No-Build" Condition	2026 AM		2026 PM		2046 AM		2046 PM	
Intersection	LOS	Control Delay (s/veh)	LOS	Control Delay (s/veh)	LOS	Control Delay (s/veh)	LOS	Control Delay (s/veh)
Livingston Ave. & S. 18th St.	B	11.2	B	12.2	B	11.5	B	12.8
Livingston Ave. & Carpenter St.	A	2.6	A	2.7	A	2.9	A	3.2
Livingston Ave. & S Ohio Ave	A	1.1	A	2.5	A	1.6	A	3.4
Livingston Ave. & S Champion Ave.	A	8.6	B	10.6	B	11.1	B	13.6
Livingston Ave. & Lockbourne Ave.	A	7.1	A	8.9	A	7.7	B	10.7
Livingston Ave. & Miller Ave.	A	6.9	A	6.7	A	8.6	A	8.5
Livingston Ave. & Kelton Ave.	A	4.1	A	5.4	A	4.4	A	6.3
Livingston Ave. & Fairwood Ave.	B	12.1	B	15.7	B	15.2	C	23.3
Livingston Ave. & S. Nelson Rd.	A	9.6	A	9.5	B	10.2	B	10.4

Looking at the construction year analysis, the intersection-level operations are at LOS B or better throughout the corridor. In the AM peak hour, the mainline operates at LOS B or better and the side street approaches are predominantly at LOS C or better. In the PM peak hour, a similar trend was observed along the mainline, while the majority of side street approaches operate at LOS D or better.

Similar trends are observed for the design year as seen in the construction year. Again, the expected operation along the mainline stays at LOS B or better, while the majority of the side street approaches will operate at LOS D or better. The highest increase in delay values is expected at the northbound approach of Fairwood Avenue, where delay will increase by almost 15 seconds in the afternoon. A modest increase in delay, by typically 1-4 seconds, is expected at other side street approaches throughout the corridor, with no substantial decline in performance measures throughout the corridor. More details for the LOS of each movement can be found attached in this document.

Traffic Analysis on Preferred Alternative

As part of the development of the proposed road diet alternative, traffic analysis was completed to determine the impact of this "build" condition on the traffic operations and mobility along the study corridor. An updated Synchro model was created to analyze the projected demand for the construction year (2026) and design year (2046). The same volumes used for the "no-build" conditions were used in this analysis as new trip generation is not expected due to the "build" condition.

The analysis provided various traffic operations measures of service including Level of Service (LOS), control delay, volume to capacity ratio, and 95th percentile queues for the intersections along the corridor. **Table 4** below summarizes the intersection-level performance measures for the "build" condition. A full summary of the operations of each movement at each intersection analyzed within the study can be found attached in this document.

Table 4: "Build" Operations (Construction 2026 and Design 2046 Years)

"Build" Condition	Construction (2026) Year				Design (2046) Year			
	AM		PM		AM		PM	
Intersection	LOS	Control Delay (s/veh)	LOS	Control Delay (s/veh)	LOS	Control Delay (s/veh)	LOS	Control Delay (s/veh)
Livingston Ave. & S. 18th St.	B	14.4	B	15.2	B	15.2	B	15.9
Livingston Ave. & Carpenter St.	A	3.3	A	6	A	3.6	A	6
Livingston Ave. & S. Ohio Ave.	A	1.6	A	4.9	A	2.2	A	7
Livingston Ave. & S. Champion Ave.	B	13.1	B	13.1	B	16.4	B	16.7
Livingston Ave. & Lockbourne Ave.	A	7.7	B	11.1	A	8.9	B	15.5
Livingston Ave. & Miller Ave.	A	8.3	B	10.6	B	10.9	C	22.9
Livingston Ave. & Kelton Ave.	A	5.8	A	5.9	A	5.8	A	6.5
Livingston Ave. & Fairwood Ave.	B	13.5	C	21.7	B	17.6	C	34.9
Livingston Ave & S. Nelson Rd.	B	11.4	B	15.2	B	12.4	C	20

Looking at the results, the overall intersection LOS is typically LOS C or better under both the construction and design year volumes for the ""build" condition. No significant impact was observed along the unsignalized side street approaches and they still

operate at LOS D or better under the construction and design volumes. Pease see this document for complete LOS tables.

As compared to the “no-build” condition, the ”build” condition finds that the mainline maintains similar levels of service with slightly higher delay throughout the corridor. The largest impact of the road diet is expected to occur at the eastbound approach of the Fairwood Avenue intersection where delay is likely to increase by almost 30 seconds. Looking at overall intersection LOS, most intersections maintain the same LOS with a few moving to a slightly lower LOS. Operationally, the road diet will allow Livingston Avenue to a stable traffic flow.

Turn Length Calculations

For each proposed turn lane in the study area, turn lane length calculations have been completed. The required left turn lane lengths and anticipated thru-block length from the adjacent through lane were calculated per ODOT’s Location & Design Manual (L&D), Volume 1, Section 401.6. The turn lane lengths and 95th percentile queue information for each proposed turn lane are presented in **Table 5.**

Table 5: Turn Lane Length and 95th Percentile Queue Comparison

Street	Movement	ODOT L&D Left Turn Lane Length (ft)	ODOT L&D Thru-Block Length (ft)	95th Percentile Queue (ft)
Fairwood Ave.	EBL	165	525	8
	WBL	165	375	8
Kelton Ave.	EBL	390	600	39
Lockbourne Rd.	WBL	440	375	199
S. Champion Ave.	EBL	165	475	8
S. Ohio Ave.	WBL	215	350	10
S. 18th St.	EBL	265	375	57
Nelson Rd.	EBL	215	675	10

In the calculations for the turn lane lengths per the L&D Manual, storage and deceleration length requirements are included. Looking at the above table, it can be inferred that the ODOT recommended turn lane lengths are providing more than sufficient storage capacity. Other than the Lockbourne Road intersection westbound left turn lane, all other locations have relatively low queues and could potentially be given a shorter turn lane

than that calculated per the L&D Manual as needed based on factors such as proximity to unsignalized crossings or driveways, safety, or other considerations.

Signal Warrants

Traffic signal warrants and pedestrian hybrid beacon warrants were reviewed for the Livingston Avenue corridor using the traffic count data collected in 2022 for the project. It was determined that all existing signalized intersections should remain signalized, but the school half-signal near Carpenter Street should be reconfigured to a Pedestrian Hybrid Beacon (PHB) at the corner of Carpenter Street to increase safety and better serve Livingston Elementary School.

Existing Conditions Level of Service Analysis

Int #	Intersection & Approach	EXISTING AM Peak					EXISTING PM Peak				
		Lane Group	LOS	Delay (sec)	v/c Ratio	95th Queue Length (ft)	Lane Group	LOS	Delay (sec)	v/c Ratio	95th Queue Length (ft)
1	**Livingston Ave & S 18th St**										
	Eastbound	LT	A	6.2	0.18	46.0	LT	A	7.2	0.31	123.0
		Approach	A	6.2			Approach	A	7.2		
	Westbound	TR	A	5.8	0.22	63.0	TR	A	5.8	0.16	66.0
		Approach	A	5.8			Approach	A	5.8		
	Southbound	L	B	17.4	0.11	31.0	L	D	40.0	0.21	81.0
		R	C	24.0	0.48	91.0	R	E	57.0	0.69	208.0
		Approach	C	22.6			Approach	D	52.6		
		Intersection	A	9.6			Intersection	B	17.2		
2	**Livingston Avenue & Carpenter St**										
	Eastbound	LT	A	-		-	LT	A	-		-
		Approach	A	-		-	Approach	A	-		-
	Westbound	TR	A	-		-	TR	A	-		-
		Approach	A	-		-	Approach	A	-		-
	Southbound	LTR	B	13.0	0.1	-	LTR	B	14.4	0.1	-
		Approach	B	13.0	0.1	-	Approach	B	14.4	0.1	-
	Northbound	LTR	B	13.5	0.25	-	LTR	C	19.5	0.35	-
		Approach	B	13.5	0.25	-	Approach	C	19.5	0.35	-
		Intersection	A	2.6	0.25	-	Intersection	A	2.6	0.33	-
3	**Livingston Ave & S Ohio Ave**										
	Eastbound	TR	A	1.0	0.12	27.0	TR	A	1.8	0.25	63.0
		Approach	A	1.0			Approach	A	1.8		
	Westbound	LT	A	0.6	0.23	18.0	LT	A	1.2	0.22	18.0
		Approach	A	0.6			Approach	A	1.2		
	Southbound	LTR	C	22.1	0.11	23.0	LTR	C	27.8	0.15	31.0
		Approach	C	22.1			Approach	C	27.8		
		Intersection	A	1.2			Intersection	A	2.0		
4	**Livingston Ave & S Champion Ave**										
	Eastbound	LT	A	4.2	0.15	19.0	LT	A	5.3	0.30	113.0
		Approach	A	4.2			Approach	A	5.3		
	Westbound	TR	A	6.7	0.28	116.0	TR	A	7.7	0.24	102.0
		Approach	A	6.7			Approach	A	7.7		
	Northbound	LTR	D	35.6	0.61	121.0	LTR	D	42.2	0.69	163.0
		Approach	D	35.6			Approach	D	42.2		
		Intersection	B	10.7			Intersection	B	12.1		
5	**Livingston Ave & Lockbourne Ave**										
	Eastbound	LTR	A	5.2	0.18	33.0	LTR	A	6.0	0.35	61.0
		Approach	A	5.2			Approach	A	6.0		
	Westbound	TR	A	1.4	0.18	18.0	TR	A	2.9	0.16	40.0
		L	A	3.2	0.37	32.0	L	A	7.3	0.53	92.0
		Approach	A	2.2			Approach	A	4.9		
	Northbound	TR	B	10.3	0.51	51.0	TR	B	11.2	0.63	68.0
		L	D	38.3	0.48	77.0	L	D	47.6	0.58	107.0
		Approach	B	19.4			Approach	C	21.5		
	Southbound	TR	C	22.5	0.01	6.0	TR	C	21.0	0.02	10.0
		Approach	C	22.5			Approach	C	21.0		
		Intersection	A	6.5			Intersection	A	9.1		
6	**Livingston Ave & Miller Ave**										
	Eastbound	T	A	3.3	0.19	53.0	T	A	2.8	0.36	30.0
		Approach	A	3.3			Approach	A	2.8		
	Westbound	T	A	1.5	0.20	5.0	T	A	3.8	0.19	47.0
		Approach	A	1.5			Approach	A	3.8		
	Southbound	L	C	32.4	0.36	74.0	L	D	42.2	0.57	138.0
		R	A	9.6	0.58	57.0	R	A	9.2	0.60	65.0
		Approach	B	15.4			Approach	C	20.6		
		Intersection	A	6.0			Intersection	A	7.8		
7	**Livingston Ave & Kelton Ave**										
	Eastbound	LT	A	6.5	0.33	90.0	LT	A	7.5	0.58	291.0
		Approach	A	6.5			Approach	A	7.5		
	Westbound	TR	A	0.9	0.22	0.0	TR	A	1.7	0.21	14.0
		Approach	A	0.9			Approach	A	1.7		
	Northbound	LT	C	32.9	0.35	75.0	LT	D	41.3	0.39	90.0
		R	A	6.5	0.08	12.0	R	B	12.4	0.12	20.0
		Approach	C	27.9			Approach	D	35.1		
		Intersection	A	5.9			Intersection	A	7.5		
8	**Livingston Ave & Fairwood Ave**										
	Eastbound	LT	A	4.8	0.20	85.0	LT	B	14.1	0.41	196.0
		Approach	A	4.8			Approach	B	14.1		
	Westbound	LTR	A	7.1	0.29	94.0	LTR	A	9.5	0.32	115.0
		Approach	A	7.1			Approach	A	9.5		
	Northbound	LTR	C	32.5	0.67	155.0	LTR	D	41.8	0.79	263.0
		Approach	C	32.5			Approach	D	41.8		
	Southbound	LTR	C	30.1	0.53	126.0	LTR	D	38.2	0.70	217.0
		Approach	C	30.1			Approach	D	38.3		
		Intersection	B	14.6			Intersection	C	21.8		
9	**Livingston Ave & S Nelson Rd**										
	Eastbound	LT	A	5.2	0.26	92.0	LT	A	8.5	0.49	198.0
		Approach	A	5.2			Approach	A	8.5		
	Westbound	TR	A	4.3	0.32	8.0	TR	A	6.2	0.38	142.0
		Approach	A	4.3			Approach	A	6.2		
	Southbound	LR	E	67.4	0.85	220.0	LR	E	64.2	0.81	270
		Approach	E	67.4			Approach	E	64.2		
		Intersection	B	14.5			Intersection	B	14.4		

No Build Conditions Level of Service Analysis

#	Intersection & Approach	2026 AM Peak					2026 PM Peak					2046 AM Peak					2046 PM Peak				
		Lane Group	LOS	Delay (sec)	v/c Ratio	95th Queue Length (ft)	Lane Group	LOS	Delay (sec)	v/c Ratio	95th Queue Length (ft)	Lane Group	LOS	Delay (sec)	v/c Ratio	95th Queue Length (ft)	Lane Group	LOS	Delay (sec)	v/c Ratio	95th Queue Length (ft)
1	**Livingston Ave & S 18th St**																**Livingston Ave & S 18th St**				
	Eastbound	LT	A	5.9	0.20	45.0	LT	A	7.5	0.34	103.0	LT	A	6.3	0.23	51.0	LT	A	8.4	0.40	120.0
		Approach	A	5.9			Approach	A	7.5			Approach	A	6.3			Approach	A	8.4		
	Westbound	TR	A	6.2	0.23	95.0	TR	A	3.3	0.17	32.0	TR	A	6.3	0.25	98.0	T	A	3.3	0.19	34.0
		Approach	A	6.2			Approach	A	3.3			Approach	A	6.3			Approach	A	3.3	0.19	
	Southbound	L	C	22.0	0.13	39.0	L	C	25.0	0.19	58.0	L	C	21.8	0.14	42.0	L	C	24.5	0.20	63.0
		R	C	31.0	0.54	115.0	R	D	36.2	0.62	146.0	R	C	31.8	0.58	127.0	R	D	37.1	0.66	164.0
		Approach	C	29.1			Approach	C	33.3			Approach	C	29.6			Approach	C	33.8		
		Intersection	B	11.2			Intersection	B	12.2			Intersection	B	11.5			Intersection	B	12.8		
2	**Livingston Avenue & Carpenter St**																**Livingston Avenue & Carpenter St**				
	Eastbound	LT	A	-		-	LT	A	-		-	LT	A	-		-	LT	A	-		-
		Approach	A	-		-	Approach	A	-		-	Approach	A	-		-	Approach	A	-		-
	Westbound	TR	A	-		-	TR	A	-		-	TR	A	-		-	TR	A	-		-
		Approach	A	-		-	Approach	A	-		-	Approach	A	-		-	Approach	A	-		-
	Southbound	LTR	B	13.1	0.1	-	LTR	B	14.7	0.1	-	LTR	B	14.1	0.1	-	LTR	C	16.0	0.1	-
		Approach	B	13.1	0.1	-	Approach	B	14.7	0.1	-	Approach	B	14.1	0.1	-	Approach	C	16.0	0.1	-
	Northbound	LTR	B	13.8	0.26	-	LTR	C	20.3	0.35	-	LTR	C	15.3	0.3	-	LTR	C	24.7	0.4	-
		Approach	B	13.8	0.26	-	Approach	C	20.3	0.35	-	Approach	C	15.3	0.3	-	Approach	C	24.7	0.4	-
		Intersection	A	2.6	0.26	-	Intersection	A	2.7	0.34	-	Intersection	A	2.9	0.4	-	Intersection	A	3.2	0.4	-
3	**Livingston Ave & S Ohio Ave**																**Livingston Ave & S Ohio Ave**				
	Eastbound	TR	A	0.9	0.12	21.0	TR	A	2.3	0.26	96.0	TR	A	1.6	0.14	24.0	T	A	3.4	0.30	107.0
		Approach	A	0.9			Approach	A	2.3			Approach	A	1.6			Approach	A	3.4		
	Westbound	LT	A	0.5	0.23	17.0	LT	A	1.5	0.23	30.0	LT	A	0.8	0.27	17.0	T	A	1.9	0.27	32.0
		Approach	A	0.5			Approach	A	1.5			Approach	A	0.8			Approach	A	1.9	0.27	
	Southbound	LTR	C	20.1	0.11	22.0	LTR	C	23.8	0.14	29.0	LTR	B	19.3	0.13	26.0	LTR	C	23.7	0.19	36.0
		Approach	C	20.1			Approach	C	23.8			Approach	B	19.3			Approach	C	23.7		
		Intersection	A	1.1			Intersection	A	2.5			Intersection	A	1.6			Intersection	A	3.4		
4	**Livingston Ave & S Champion Ave**																**Livingston Ave & S Champion Ave**				
	Eastbound	LT	A	4.3	0.16	24.0	LT	A	5.4	0.33	137.0	LT	A	4.7	0.18	26.0	T	A	6.4	0.39	156.0
		Approach	A	4.3			Approach	A	5.4			Approach	A	4.7			Approach	A	6.4		
	Westbound	TR	A	4.0	0.30	47.0	TR	A	5.4	0.25	75.0	TR	A	4.7	0.34	60.0	TR	A	7.0	0.30	81.0
		Approach	A	4.0			Approach	A	5.4			Approach	A	4.7			Approach	A	7.0	0.30	
	Northbound	LTR	C	30.5	0.59	113.0	LTR	D	36.0	0.68	152.0	LTR	D	35.3	0.73	159.0	TR	D	40.7	0.80	220.0
		Approach	C	30.5			Approach	D	36.0			Approach	D	35.3			Approach	D	40.7		
		Intersection	A	8.6			Intersection	B	10.6			Intersection	B	11.1			Intersection	B	13.6		
5	**Livingston Ave & Lockbourne Ave**																**Livingston Ave & Lockbourne Ave**				
	Eastbound	LTR	A	4.6	0.20	35.0	LTR	A	7.0	0.40	137.0	LTR	A	5.7	0.24	71.0	TR	A	7.6	0.46	213.0
		Approach	A	4.6			Approach	A	7.0			Approach	A	5.7			Approach	A	7.6		
	Westbound	TR	A	3.2	0.19	38.0	TR	A	2.5	0.17	38.0	TR	A	3.5	0.22	60.0	TR	A	3.4	0.21	56.0
		L	A	5.2	0.40	83.0	L	A	8.5	0.53	64.0	L	A	6.1	0.48	111.0	L	B	16.5	0.69	115
		Approach	A	4.0			Approach	A	5.2			Approach	A	4.6			Approach	A	9.2	0.21	
	Northbound	TR	A	9.6	0.51	49.0	TR	B	10.0	0.62	63.0	TR	A	9.0	0.55	53.0	TR	A	9.3	0.65	67.0
		L	C	34.7	0.48	75.0	L	D	39.9	0.55	97.0	L	D	35.2	0.53	87.0	L	D	39.1	0.59	111.0
		Approach	B	17.8			Approach	B	18.4			Approach	B	17.5			Approach	B	17.6		
	Southbound	TR	B	20.0	0.01	6.0	TR	B	18.0	0.02	9.0	TR	B	19.0	0.01	5.0	TR	B	16.0	0.02	9.0
		Approach	B	20.0			Approach	B	18.0			Approach	B	19.0			Approach	B	16.0		
		Intersection	A	7.1			Intersection	A	8.9			Intersection	A	7.7			Intersection	B	10.7		
6	**Livingston Ave & Miller Ave**																**Livingston Ave & Miller Ave**				
	Eastbound	T	A	5.9	0.20	85.0	T	A	2.2	0.39	60.0	T	A	7.3	0.25	112.0	T	A	3.0	0.49	75.0
		Approach	A	5.9			Approach	A	2.2			Approach	A	7.3			Approach	A	3.0		
	Westbound	T	A	2.2	0.21	19.0	T	A	3.0	0.20	29.0	T	A	2.6	0.25	23.0	T	A	3.4	0.24	31.0
		Approach	A	2.2			Approach	A	3.0			Approach	A	2.6			Approach	A	3.4	0.24	
	Southbound	L	C	29.1	0.36	72.0	L	D	35.3	0.55	127.0	L	C	27.1	0.41	81.0	L	D	35.7	0.64	168.0
		R	A	8.8	0.58	56.0	R	A	8.1	0.60	60.0	R	B	12.6	0.70	89.0	R	B	12.2	0.72	116.0
		Approach	B	14.0			Approach	B	17.5			Approach	B	16.2			Approach	C	20.2		
		Intersection	A	6.9			Intersection	A	6.7			Intersection	A	8.6			Intersection	A	8.5		
7	**Livingston Ave & Kelton Ave**																**Livingston Ave & Kelton Ave**				
	Eastbound	LT	A	3.1	0.34	34.0	LT	A	4.9	0.61	60.0	LT	A	3.6	0.39	40.0	TR	A	6.2	0.70	76.0
		Approach	A	3.1			Approach	A	4.9			Approach	A	3.6			Approach	A	6.2		
	Westbound	TR	A	0.9	0.23	7.0	TR	A	1.2	0.22	17.0	TR	A	0.9	0.25	10.0	TR	A	1.4	0.24	21
		Approach	A	0.9			Approach	A	1.2			Approach	A	0.9			Approach	A	1.4	0.24	
	Northbound	LT	C	29.6	0.33	70.0	LT	D	35.0	0.36	81.0	LT	C	29.7	0.36	75.0	LT	D	35.2	0.38	86.0
		R	A	5.2	0.07	10.0	R	A	9.3	0.10	16.0	R	A	6.4	0.08	12.0	R	B	10.3	0.11	18.0
		Approach	C	25.0			Approach	C	29.5			Approach	C	25.3			Approach	C	29.8		
		Intersection	A	4.1			Intersection	A	5.4			Intersection	A	4.4			Intersection	A	6.3		
8	**Livingston Ave & Fairwood Ave**																**Livingston Ave & Fairwood Ave**				
	Eastbound	LT	A	2.4	0.21	16.0	LT	A	5.2	0.45	104.0	LT	A	2.8	0.25	18.0	TR	A	7.4	0.55	97.0
		Approach	A	2.4			Approach	A	5.2			Approach	A	2.8			Approach	A	7.4		
	Westbound	LTR	A	4.6	0.31	44.0	LTR	A	6.2	0.35	75.0	LTR	A	5.9	0.37	47.0	TR	A	8.3	0.43	85.0
		Approach	A	4.6			Approach	A	6.2			Approach	A	5.9			Approach	A	8.3	0.43	
	Northbound	LTR	C	29.2	0.67	149.0	LTR	D	35.7	0.78	248.0	LTR	C	33.6	0.79	221.0	LT	D	50.1	0.93	441
		Approach	C	29.2			Approach	D	35.7			Approach	C	33.6			Approach	D	50.1		
	Southbound	LTR	C	26.7	0.53	120.0	LTR	C	31.9	0.68	204.0	LTR	C	27.5	0.63	171.0	R	D	40.2	0.84	352
		Approach	C	26.7			Approach	C	31.9			Approach	C	27.5			Approach	D	40.2		
		Intersection	B	12.1			Intersection	B	15.7			Intersection	B	15.2			Intersection	C	23.3		
9	**Livingston Ave & S Nelson Rd**																**Livingston Ave & S Nelson Rd**				
	Eastbound	LT	A	4.0	0.29	50.0	LT	A	4.4	0.55	60.0	LT	A	4.4	0.33	61.0	TR	A	5.6	0.64	74
		Approach	A	4.0			Approach	A	4.4			Approach	A	4.4			Approach	A	5.6		
	Westbound	TR	A	5.4	0.36	99.0	TR	A	7.2	0.43	140.0	TR	A	5.9	0.40	116.0	TR	A	7.9	0.47	156.0
		Approach	A	5.4			Approach	A	7.2			Approach	A	5.9			Approach	A	7.9	0.47	
	Southbound	LR	D	35.8	0.72	140.0	LR	D	36.0	0.69	170.0	LR	D	37.1	0.75	149.0	LT	D	37.0	0.72	185.0
		Approach	D	35.8			Approach	D	36.0			Approach	D	37.1			Approach	D	37.0		
		Intersection	A	9.6			Intersection	A	9.5			Intersection	B	10.2			Intersection	B	10.4		

Build Conditions Level of Service Analysis

#	Intersection & Approach	2026 AM Peak					2026 PM Peak					2046 AM Peak					2046 PM Peak				
		Lane Group	LOS	Delay (sec)	v/c Ratio	95th Queue Length (ft)	Lane Group	LOS	Delay (sec)	v/c Ratio	95th Queue Length (ft)	Lane Group	LOS	Delay (sec)	v/c Ratio	95th Queue Length (ft)	Lane Group	LOS	Delay (sec)	v/c Ratio	95th Queue Length (ft)
1	**Livingston Ave & S 18th St**																**Livingston Ave & S 18th St**				
	Eastbound	T	A	6.0	0.18	62.0	T	A	8.3	0.37	166.0	T	A	6.4	0.20	69.0	T	A	9.2	0.43	192.0
		L	A	7.2	0.19	35.0	L	A	7.4	0.25	52.0	L	A	8.1	0.23	38.0	L	A	8.1	0.30	57.0
		Approach	A	6.4			Approach	A	8.0			Approach	A	7.0			Approach	A	9.0		
	Westbound	T	B	12.6	0.58	193.0	T	B	12.5	0.48	139.0	T	B	13.8	0.64	265	T	B	12.9	0.54	172.0
		Approach	B	12.6			Approach	B	12.5			Approach	B	13.8			Approach	B	12.9	0.54	
	Southbound	L	C	21.9	0.13	39.0	L	C	24.8	0.19	58.0	L	C	21.7	0.14	42.0	L	C	24.5	0.20	63.0
		R	C	31.2	0.55	115.0	R	D	36.5	0.63	147.0	R	C	32.1	0.59	128.0	R	D	37.5	0.67	165.0
		Approach	C	29.2			Approach	C	33.4			Approach	C	29.8			Approach	C	34.1		
		Intersection	B	14.4			Intersection	B	15.2			Intersection	B	15.2			Intersection	B	15.9		
2	**Livingston Ave & Carpenter St**																**Livingston Ave & Carpenter St**				
	Eastbound	T	A	-	0.1		T	A	-	0.01		T	A	0.0	0.2		T	A	0.0	0.4	
		L	A	8.4	0		L	A	8.2	0		L	A	8.6	0		L	A	8.4	0	
		Approach	A	0.1			Approach	A	0.1			Approach	A	0.1			Approach	A	0.1		
	Westbound	T	A	-			T	A	-			T	A	-			T	A	-		
		Approach	A	-			Approach	A	-			Approach	A	-			Approach	A	-		
	Southbound	LTR	B	14.8	0.1		LTR	C	20.4	0.1		LTR	C	15.6	0.1		LTR	D	25.0	0.2	
		Approach	B	14.8	0.1		Approach	C	20.4	0.1		Approach	C	15.6	0.1		Approach	D	25.0	0.2	
	Northbound	LTR	C	17.8	0.3		LTR	D	30.8	0.5		LTR	C	19.7	0.4		LTR	E	47.8	0.65	
		Approach	C	17.8	0.3		Approach	D	30.8	0.5		Approach	C	19.7	0.4		Approach	E	47.8	0.65	
		Intersection	A	3.3	0.4		Intersection	A	6.0	0.47		Intersection	A	3.6	0.4		Intersection	A	6.0	0.65	
3	**Livingston Ave & S Ohio Ave**																**Livingston Ave & S Ohio Ave**				
	Eastbound	TR	A	1.6	0.24	48.0	TR	A	6.2	0.52	356.0	TR	A	2.6	0.28	54.0	TR	A	9.4	0.62	448.0
		Approach	A	1.6			Approach	A	6.2			Approach	A	2.6			Approach	A	9.4		
	Westbound	T	A	0.9	0.38	32.0	T	A	1.8	0.29	48.0	T	A	1.4	0.44	33.0	T	A	2.2	0.34	45.0
		L	A	0.5	0.06	3	L	A	2.0	0.14	12	L	A	0.9	0.07	3	L	A	2.5	0.19	10
		Approach	A	0.9			Approach	A	1.8			Approach	A	1.3			Approach	A	2.3	0.34	
	Southbound	LTR	C	20.1	0.11	22.0	LTR	C	23.8	0.14	29.0	LTR	B	19.3	0.14	26.0	LTR	C	23.7	0.19	35.0
		Approach	C	20.1			Approach	C	23.8			Approach	B	19.3			Approach	C	23.7		
		Intersection	A	1.6			Intersection	A	4.9			Intersection	A	2.2			Intersection	A	7.0		
4	**Livingston Ave & S Champion Ave**																**Livingston Ave & S Champion Ave**				
	Eastbound	T	A	4.9	0.26	39.0	T	A	7.6	0.54	142.0	T	A	5.3	0.29	42.0	T	A	8.9	0.64	142.0
		L	A	4.5	0.06	7.0	L	A	2.9	0.09	5	L	A	4.8	0.08	8.0	L	A	2.9	0.12	4
		Approach	A	4.9			Approach	A	7.2			Approach	A	5.2			Approach	A	8.4		
	Westbound	TR	B	11.8	0.61	321.0	TR	A	9.9	0.52	265.0	TR	B	14.4	0.70	341.0	TR	B	13.0	0.60	314.0
		Approach	B	11.8			Approach	A	9.9			Approach	B	14.4			Approach	B	13.0	0.60	
	Northbound	LTR	C	30.5	0.59	113.0	LTR	D	36.0	0.68	152.0	LTR	D	35.3	0.73	159.0	LTR	D	40.9	0.80	221.0
		Approach	C	30.5			Approach	D	36.0			Approach	D	35.3			Approach	D	40.9		
		Intersection	B	13.1			Intersection	B	13.1			Intersection	B	16.4			Intersection	B	16.7		
5	**Livingston Ave & Lockbourne Ave**																**Livingston Ave & Lockbourne Ave**				
	Eastbound	T	A	7.6	0.31	123.0	T	B	13.4	0.68	424	T	A	9.6	0.36	177.0	T	B	19.8	0.80	528
		R	A	1.7	0.10	0.0	R	A	0.7	0.13	0	R	A	1.9	0.12	8	R	A	0.6	0.15	3
		Approach	A	6.3			Approach	B	11.7			Approach	A	7.9			Approach	B	17.2		
	Westbound	TR	A	4.6	0.38	118.0	TR	A	3.8	0.35	93.0	TR	A	6.0	0.46	187.0	TR	A	5.3	0.43	130.0
		L	A	4.1	0.38	60.0	L	A	9.6	0.56	74.0	L	A	5.3	0.47	95.0	L	C	21.8	0.76	199
		Approach	A	4.4			Approach	A	6.4			Approach	A	5.7			Approach	B	12.7	0.43	
	Northbound	TR	A	9.6	0.51	49.0	TR	B	10.2	0.63	63.0	TR	A	9.1	0.55	53.0	TR	A	9.5	0.66	67.0
		L	C	34.7	0.48	75.0	L	D	40.0	0.55	97.0	L	D	35.2	0.53	87.0	L	D	39.1	0.59	111.0
		Approach	B	17.8			Approach	B	18.5			Approach	B	17.5			Approach	B	17.8		
	Southbound	TR	B	20.0	0.01	6.0	TR	B	18.0	0.02	9.0	TR	B	19.0	0.01	5.0	TR	B	16.0	0.02	9.0
		Approach	B	20.0			Approach	B	18.0			Approach	B	19.0			Approach	B	16.0		
		Intersection	A	7.7			Intersection	B	11.1			Intersection	A	8.9			Intersection	B	15.5		
6	**Livingston Ave & Miller Ave**																**Livingston Ave & Miller Ave**				
	Eastbound	T	A	9.3	0.42	208.0	T	B	10.0	0.80	613	T	B	12.2	0.51	321.0	T	C	33.0	0.99	793
		Approach	A	9.3			Approach	B	10.0			Approach	B	12.2			Approach	C	33.0		
	Westbound	T	A	2.8	0.43	42.0	T	A	3.8	0.41	63.0	T	A	4.4	0.50	82.0	T	A	5.2	0.48	103.0
		Approach	A	2.8			Approach	A	3.8			Approach	A	4.4			Approach	A	5.2	0.48	
	Southbound	L	C	29.1	0.36	72.0	L	D	35.3	0.55	127.0	L	C	27.1	0.41	81.0	L	D	35.7	0.64	168.0
		R	A	8.8	0.58	56.0	R	A	8.1	0.60	60.0	R	B	12.6	0.70	89.0	R	B	12.2	0.72	116.0
		Approach	B	14.0			Approach	B	17.5			Approach	B	16.3			Approach	C	20.2		
		Intersection	A	8.3			Intersection	B	10.6			Intersection	B	10.9			Intersection	C	22.9		
7	**Livingston Ave & Kelton Ave**																**Livingston Ave & Kelton Ave**				
	Eastbound	T	A	2.4	0.28	43.0	T	A	4.5	0.59	83	T	A	2.7	0.32	49.0	T	A	5.1	0.66	89
		L	A	3.4	0.33	29.0	L	A	4.6	0.50	37	L	A	4.3	0.41	34.0	L	A	5.6	0.60	39
		Approach	A	2.8			Approach	A	4.5			Approach	A	3.3			Approach	A	5.3		
	Westbound	TR	A	4.7	0.47	11.0	TR	A	3.3	0.45	28.0	TR	A	4.1	0.52	17.0	TR	A	3.5	0.50	37
		Approach	A	4.7			Approach	A	3.3			Approach	A	4.1			Approach	A	3.5	0.50	
	Northbound	LTR	C	26.0	0.38	74.0	LTR	C	31.1	0.43	88.0	LTR	C	26.2	0.41	81.0	LTR	C	31.9	0.46	95.0
		Approach	C	26.0			Approach	C	31.1			Approach	C	26.3			Approach	C	31.9		
		Intersection	A	5.8			Intersection	A	5.9			Intersection	A	5.8			Intersection	A	6.5		
8	**Livingston Ave & Fairwood Ave**																**Livingston Ave & Fairwood Ave**				
	Eastbound	TR	A	4.1	0.40	67.0	TR	B	19.7	0.80	76	TR	A	6.4	0.47	100.0	TR	D	38.8	0.97	221
		L	A	2.7	0.02	1	L	A	5.4	0.09	9	L	A	4.7	0.03	2	L	A	6.1	0.12	8
		Approach	A	4.1			Approach	B	19.1			Approach	A	6.4			Approach	D	37.5		
	Westbound	TR	A	7.1	0.57	61.0	TR	A	9.5	0.57	216.0	TR	B	10.4	0.67	67.0	TR	B	13.4	0.69	237.0
		L	A	3.8	0.03	2	L	A	5.5	0.16	7	L	A	4.4	0.05	3	L	B	10.4	0.31	8
		Approach	A	7.0			Approach	A	9.2			Approach	B	10.3			Approach	B	13.2	0.69	
	Northbound	LTR	C	29.3	0.67	149.0	LTR	D	35.8	0.78	248.0	LTR	C	33.7	0.79	221.0	LTR	D	50.4	0.93	442
		Approach	C	29.3			Approach	D	35.8			Approach	C	33.7			Approach	D	50.4		
	Southbound	LTR	C	26.8	0.53	120.0	LTR	C	32.0	0.68	204.0	LTR	C	27.5	0.63	171.0	LTR	D	40.4	0.84	353
		Approach	C	26.8			Approach	C	32.0			Approach	C	27.5			Approach	D	40.4		
		Intersection	B	13.5			Intersection	C	21.7			Intersection	B	17.6			Intersection	C	34.9		
9	**Livingston Ave & S Nelson Rd**																**Livingston Ave & S Nelson Rd**				
	Eastbound	T	A	6.2	0.48	87.0	T	B	15.4	0.85	655	T	A	7.1	0.54	141.0	T	C	24.8	0.96	628
		L	A	4.1	0.09	10	L	A	4.1	0.20	10	L	A	4.5	0.11	11	L	A	4.5	0.25	10
		Approach	A	6.1			Approach	B	14.6			Approach	A	6.9			Approach	C	23.3		
	Westbound	T	A	9.4	0.55	233.0	T	B	12.8	0.62	318.0	T	B	10.8	0.60	278.0	T	B	14.9	0.68	365.0
		R	A	1.6	0.19	21.0	R	A	1.9	0.26	27.0	R	A	1.7	0.20	23.0	R	A	1.9	0.28	27.0
		Approach	A	7.6			Approach	A	9.8			Approach	A	8.7			Approach	B	11.4	0.68	
	Southbound	LR	D	35.8	0.72	140.0	LR	D	36.0	0.69	170.0	LR	D	37.1	0.75	149.0	LR	D	37.0	0.72	185.0
		Approach	D	35.8			Approach	D	36.0			Approach	D	37.1			Approach	D	37.0		
		Intersection	B	11.4			Intersection	B	15.2			Intersection	B	12.4			Intersection	C	20.0		

Appendix 6: Traffic Safety Data and Analysis

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Appendix 6: Traffic Safety Data and Analysis

Traffic Safety Analysis

Safety was thoroughly analyzed throughout the project area. This was done by compiling and reviewing the existing crash data, obtaining traffic volume count data and growing these volumes to future levels, in order to develop approved certified traffic volumes that could be used for modeling purposes.

Crash Data

Crash data throughout the study corridor from 2017-2021 was downloaded using the ODOT's GIS Crash Analysis Tool (GCAT). Within the study area, a total of 847 crashes were recorded. A hotspot crash analysis was completed to determine the areas with the highest concentrations of crashes (See **Figure 1**).

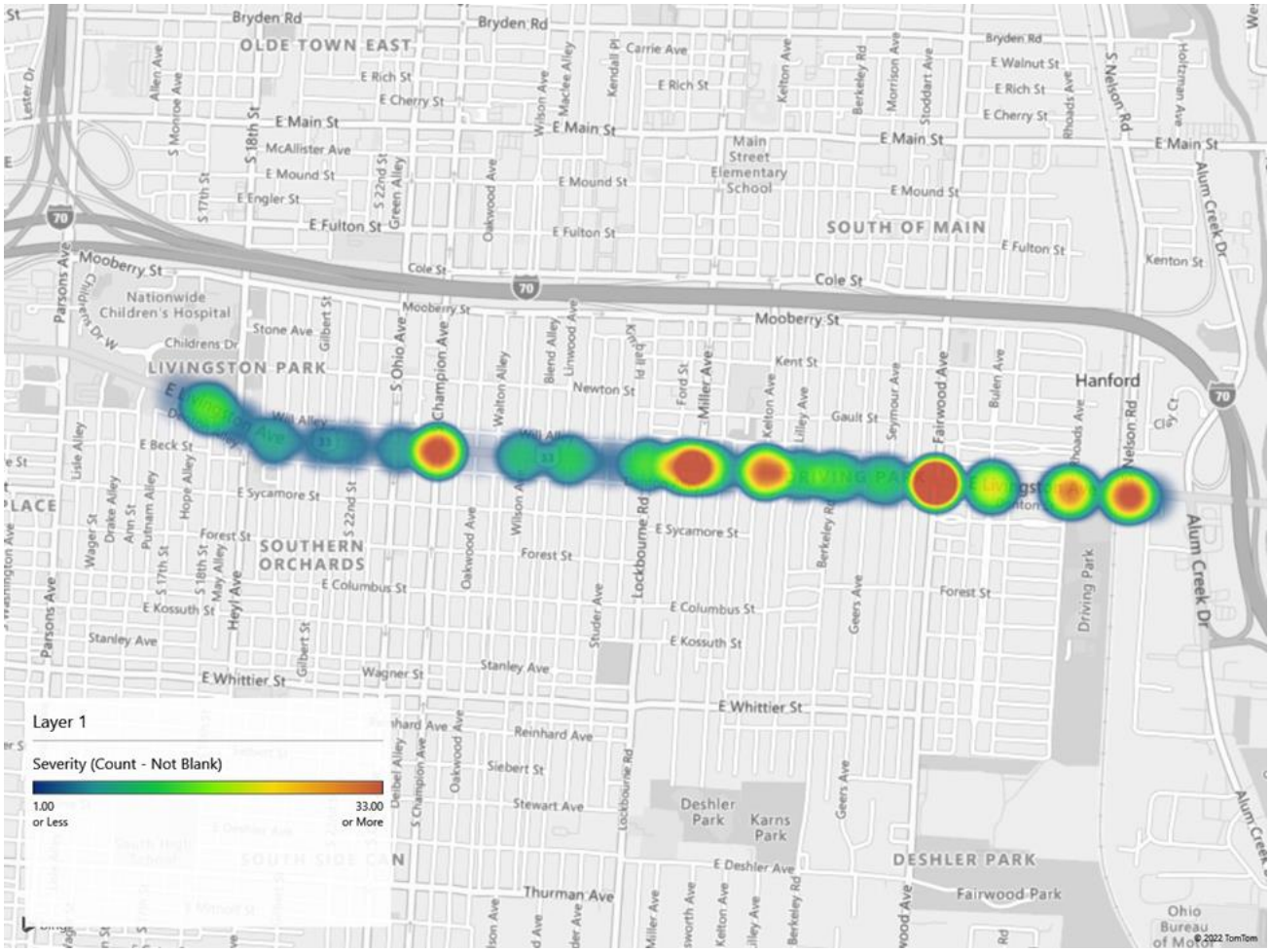


Figure 1: Hot Spot Crash Analysis

Based on this analysis, the six intersections showing the highest frequency of crashes were chosen for detailed crash data analysis. The intersections chosen for detailed analysis are as follows:

- Champion Avenue
- Fairwood Avenue
- Kelton Avenue
- Miller Avenue
- Nelson Road
- Rhoads Avenue

For these six intersections, filtered crash data was imported into ODOT's Crash Analysis Module (CAM) tool to summarize the results. **Table 1 and 2** summarize the crash results by crash type and by severity. Crash diagrams were developed for each of these intersections. The full reports from this analysis and the crash diagrams for each intersection can be found attached in this document.

The crash types found to be the most frequent at these intersections were typically Rear End, Left Turn, and Sideswipe-Passing crashes. While these were the three most common types, left turn crashes were found to be highly frequent at spot locations such as Fairwood Avenue and Miller Avenue. Crash severity results show that around 35% of crashes caused non-incapacitating (22% of total crashes) and possible injury crashes (11% of total crashes) and accounted for the majority of injury crashes at these intersections. It should be noted that while less common, there were a handful of incapacitating injury crashes at multiple intersections and two fatal crashes that occurred at the Nelson Road and at the Rhoads Avenue intersections. These two fatal crashes involved a motorcycle in each, both occurring because motorcyclists failed to either stop at a stop sign or stop at a red light. Based on this crash analysis, it was noted that there are issues related to signal visibility and signal timing as seen by the high frequency of rear end crashes. There are issues related to left turning movements, sight distance restrictions, and traffic gap availability, as seen by the high frequency of

left turn and angle crashes. There are issues related to speed and passing, as seen by the high frequency of sideswipe-passing crashes. In regard to passing-sideswipe crashes, it was noted that the bridge near Nelson Road had a high frequency of these crashes due to the travel lanes that are less than 10' in width.

Table 1: Crash Data by Crash Types

Crash Type	Intersection					
	Champion Ave	**Fairwood Ave**	**Kelton Ave**	**Miller Ave**	**Nelson Rd**	**Rhoads Ave**
Angle	25	21	27	24	8	7
Rear End	10	21	16	13	20	16
Sideswipe-Passing	4	11	12	9	27	14
Pedestrian	4	4	0	1	0	2
Parked Vehicle	4	2	2	2	1	1
Right Turn	2	2	0	6	3	3
Left Turn	2	18	6	11	8	9
Fixed Object	1	4	3	1	7	6
Sideswipe-Meeting	0	1	1	0	0	1
Head On	0	1	1	1	0	0
Backing	0	0	0	3	0	0
Bicycles	0	1	2	1	0	0
Other Non-Collision	1	0	0	0	3	0
Unknown	0	0	0	0	0	1

Table 2: Crash Data by Crash Severity

Intersection	Crash Severity				
	Fatal (K)	Serious Injury Suspected (A)	Minor Injury Suspected (B)	Injury Possible (C)	Property Damage Only (PDO)
Champion Ave	0	0	11	8	34
Fairwood Ave	0	0	22	10	54
Kelton Ave	0	2	13	8	47
Miller Ave	0	1	27	7	37
Nelson Rd	1	2	11	5	58
Rhoads Ave	1	1	9	8	41

Potential for Safety Improvement

The Highway Safety Manual (HSM) predictive method for Urban & Suburban Arterial Intersections was applied to the study area to estimate the potential for safety improvement. This was completed using ODOT's Economic Crash Analysis Tool (ECAT). A summary of the results is presented in **Table 3.** Each line in this table shows the predicted and expected average annual crash frequency for the segment or intersection and the potential for safety improvement is determined by the difference between these two values. For further detail on ECAT results, see the attached documents below.

Table 3: ECAT Crash Analysis Results

Intersection	Predicted Average Crash Frequency	Expected Average Crash Frequency – Existing Conditions	Expected Excess Crashes	Potential for Improvement
Champion Ave	6.2297	7.7057	1.476	Yes
Fairwood Ave	9.5071	13.2856	3.7785	Yes
Kelton Ave	9.1089	11.7076	2.5987	Yes
Miller Ave	5.4324	8.4943	3.0619	Yes
Nelson Rd	8.3323	11.96	3.6277	Yes
Rhoads Ave	2.3634	5.0421	2.6787	Yes

This table shows that the highest crash intersections in the corridor are experiencing more crashes annually than predicted based on peer intersections. Based on this analysis, it is found that there is a potential to reduce crashes with safety improvements at these locations and within the corridor overall.

Short Term Countermeasures

Based on the crash analysis completed for the corridor, a list of intersection-level short term countermeasures was compiled. These countermeasures apply to six of the highest crash intersections that could use immediate improvement before implementation of a new roadway design. **Table 4** summarizes the short-term countermeasures by intersection.

Table 4: Short Term Countermeasures

Intersection	Countermeasures
Champion Ave	1) Improve visibility of signal heads a) 12" Signal Heads b) Back Plates 2) Signal retiming a) Increase yellow interval and all red interval b) Dilemma zone detection
Fairwood Ave	
Kelton Ave	
Miller Ave	
Nelson Rd	No Short-Term Improvements
Rhoads Ave	1) Prohibit left turns from Livingston Ave 2) Install RRFB crosswalk

The countermeasures range from adjusting signal timing to more adding highly visible intersection components. At Nelson Road, there are no *short-term* countermeasures that can address the type of crashes seen there and will need long term measures to reduce crashes.

Table 5 summarizes the benefit-cost (B/C) analysis results for the short-term intersection-level improvements proposed for each intersection. If the B/C Ratio for an intersection is more than 1.0, the short-term countermeasure will provide a net benefit in reducing crashes versus cost to implement. The higher the ratio value, the more benefit received for cost of implementation. Detailed benefit-cost analysis reports from ECAT are included in the attached documents.

Table 5-2: Benefit Cost (B/C) Ratio

	Short Term Countermeasure B/C				
	Champion Ave	**Fairwood Ave**	**Kelton Ave**	**Miller Ave**	**Rhoads Ave**
Expected Annual Crash Adjustment	**-0.611**	**-1.054**	**-0.928**	**-0.83**	**-4.423**
NPV of Project	$17,760.00	$11,985.00	$19,860.00	$19,860.00	$57,850.00
NPV of Safety Benefit	$211,045.00	$369,650.00	$292,640.76	$318,035.97	$1,129,120.42
Benefit-Cost Ratio	**11.88**	**30.84**	**14.74**	**16.01**	**19.52**

Intersection Crash Heat Map

Livingston Ave Corridor - Hot-Spot Recommendation

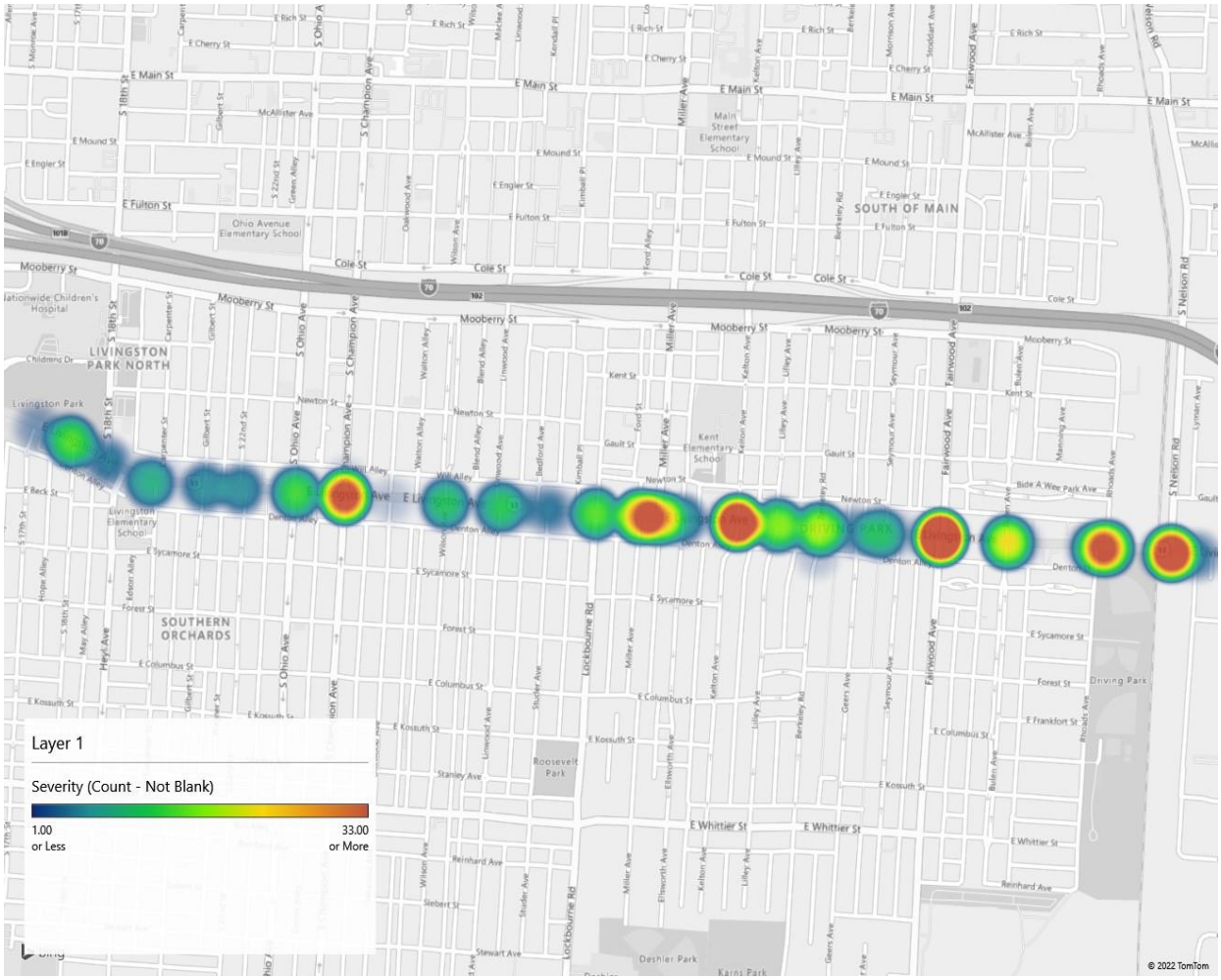
A. All crashes from 2017 – 2021 on Livingston Ave with a 250' buffer (S. 18th St. to Nelson Rd.)

a. A total of 847 crashes

b. Six Livingston Ave. intersection hot spots are identified based on the map below:

1. Champion Ave.
2. Miller Ave.
3. Kelton Ave.
4. Fairwood Ave.
5. Rhoads Ave.
6. S. Nelson Rd.

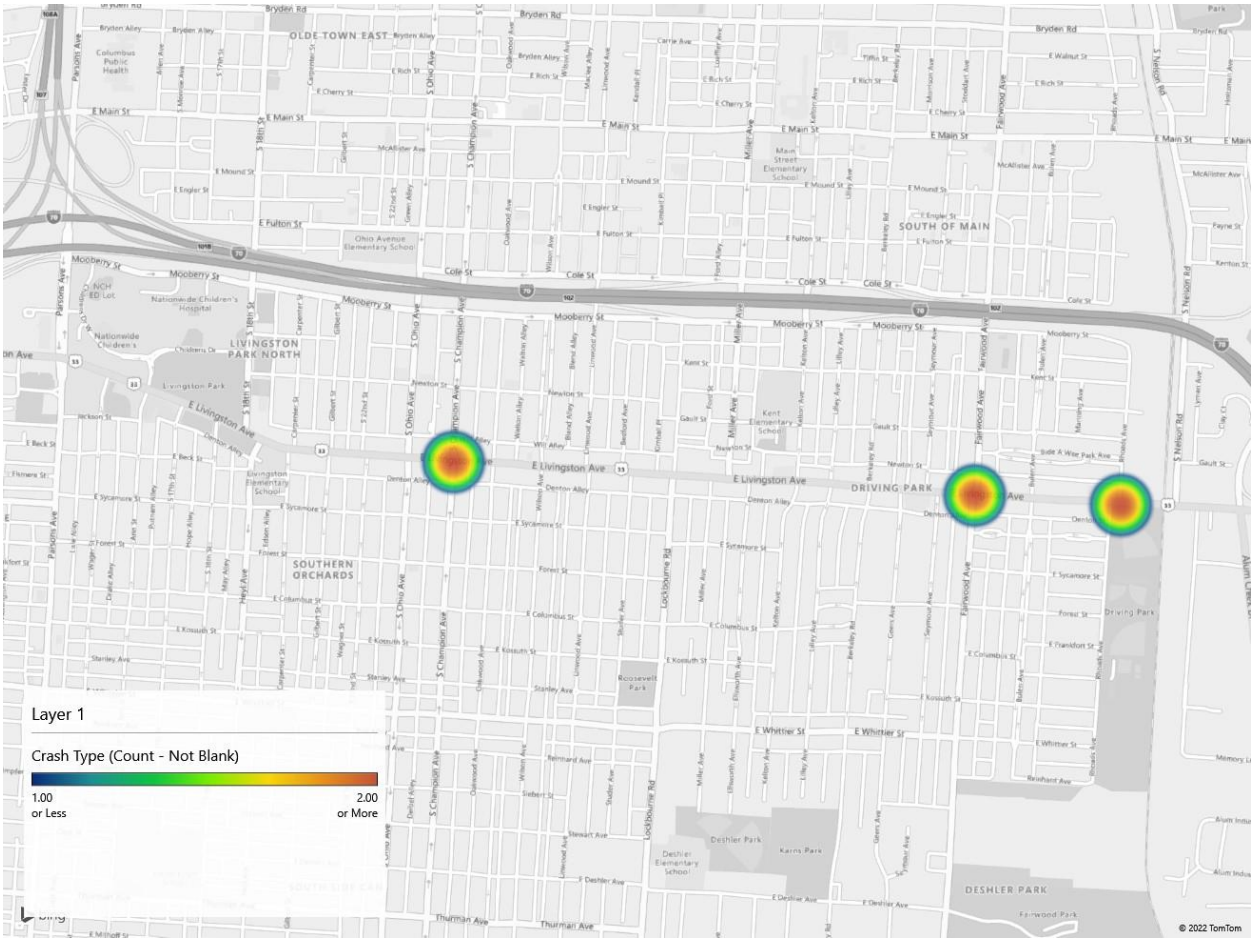
c. Each of these intersections have around 33 crashes in this period



B. Heat map showing only pedestrian crashes on Livingston Ave.

a. Three Livingston Ave. intersections are shown to be hot spots based on the map below:
    1. Champion Ave.
    2. Fairwood Ave.
    3. Rhoads Ave.

b. These are three of the six intersections listed in A.b. above



C. Fatalities and serious injuries are primarily concentrated around the Miller Ave./Kelton Ave. area and the Rhoads Ave./Nelson Rd. area.

a. These are four of the six intersections listed in A.b.

<u>Based on the above analysis and a general look at all data for the corridor, the six intersections listed in A.b. should be considered the hot spots for this project.</u>

Combined CAM Tool Results

Livingston Ave at Champion Ave

Crash Summary Sheet

Fatalities	0
Serious Injuries	0
Other Injuries	25

Crashes Per Year	10.60
Fatal and All Injury Crashes	19
Percent Injury	35.8%
Equivalent PDO Index Value	2.67

Crash Severity	Crashes	%
(3) Minor Injury Suspected	11	20.75%
(4) Injury Possible	8	15.09%
(5) PDO/No Injury	34	64.15%
Grand Total	53	100.00%

Year	Crashes	%
2017	10	18.87%
2018	6	11.32%
2019	10	18.87%
2020	13	24.53%
2021	14	26.42%
Grand Total	53	100.00%

Day of Week	Crashes	%
(1) Sunday	6	11.32%
(2) Monday	2	3.77%
(3) Tuesday	10	18.87%
(4) Wednesday	13	24.53%
(5) Thursday	6	11.32%
(6) Friday	6	11.32%
(7) Saturday	10	18.87%
Grand Total	53	100.00%

Crash Type	Crashes	%
Angle	25	47.17%
Rear End	10	18.87%
Sideswipe - Passing	4	7.55%
Pedestrian	4	7.55%
Parked Vehicle	4	7.55%
Right Turn	2	3.77%
Left Turn	2	3.77%
Fixed Object	1	1.89%
Other Non-Collision	1	1.89%
Grand Total	53	100.00%

Hour of Day	Crashes	%
2	2	3.77%
3	1	1.89%
6	1	1.89%
7	2	3.77%
8	6	11.32%
9	4	7.55%
10	1	1.89%
11	4	7.55%
12	3	5.66%
13	3	5.66%
14	5	9.43%
15	6	11.32%
16	2	3.77%
17	4	7.55%
18	3	5.66%
19	2	3.77%
20	1	1.89%
21	1	1.89%
22	2	3.77%
Grand Total	53	100.00%

Month	Crashes	%
1	2	3.77%
2	4	7.55%
3	5	9.43%
4	4	7.55%
5	3	5.66%
6	5	9.43%
7	2	3.77%
8	7	13.21%
9	6	11.32%
10	7	13.21%
11	3	5.66%
12	5	9.43%
Grand Total	53	100.00%

Livingston Ave at Champion Ave

Crash Summary Sheet

Weather Condition	Crashes	%
Clear	41	77.36%
Cloudy	6	11.32%
Snow	3	5.66%
Unknown	2	3.77%
Rain	1	1.89%
Grand Total	53	100.00%

Road Condition	Crashes	%
Dry	42	79.25%
Wet	6	11.32%
Snow	2	3.77%
Other / Unknown	2	3.77%
Ice	1	1.89%
Grand Total	53	100.00%

Light Condition	Crashes	%
Daylight	39	73.58%
Dark - Lighted Roadway	8	15.09%
Dawn/Dusk	4	7.55%
Other / Unknown	1	1.89%
Dark - Unknown Roadway Lighting	1	1.89%
Grand Total	53	100.00%

Number of Units	Crashes	%
2	47	88.68%
3	3	5.66%
1	2	3.77%
4	1	1.89%
Grand Total	53	100.00%

ODOT Location	Crashes	%
Not An Intersection	24	45.28%
Four-Way Intersection	19	35.85%
T-Intersection	10	18.87%
Grand Total	53	100.00%

Work Zone Related	Crashes	%
No	53	100.00%
Grand Total	53	100.00%

Alcohol Related	Crashes	%
No	53	100.00%
Grand Total	53	100.00%

Drug Related (Inc. Marijuana)	Crashes	%
No	53	100.00%
Grand Total	53	100.00%

Contour	Crashes	%
Straight Level	53	100.00%
Grand Total	53	100.00%

Marijuana Related	Crashes	%
No	53	100.00%
Grand Total	53	100.00%

Roadway Departure	Crashes	%
No	48	90.57%
Yes	5	9.43%
Grand Total	53	100.00%

Older Driver (65+)	Crashes	%
No	48	90.57%
Yes	5	9.43%
Grand Total	53	100.00%

Intersection Related	Crashes	%
Yes	42	79.25%
No	11	20.75%
Grand Total	53	100.00%

Young Driver (15-25)	Crashes	%
No	35	66.04%
Yes	18	33.96%
Grand Total	53	100.00%

Speed Related	Crashes	%
No	52	98.11%
Yes	1	1.89%
Grand Total	53	100.00%

Motorcycle Involved	Crashes	%
No	52	98.11%
Yes	1	1.89%
Grand Total	53	100.00%

Livingston Ave at Champion Ave

Crash Summary Sheet

Unit 1 Summary

Unit 1 Pre-Crash Action	Crashes	%
Straight Ahead	38	71.70%
Making Left Turn	5	9.43%
Other / Unknown	2	3.77%
Slowing or Stopped In Traffic	2	3.77%
Changing Lanes	2	3.77%
Making Right Turn	2	3.77%
Walking, Running, Jogging, Playing	1	1.89%
Leaving Traffic Lane	1	1.89%
Grand Total	53	100.00%

Unit 1 Contributing Factor	Crashes	%
Ran Red Light	18	33.96%
Other Improper Action	12	22.64%
Following Too Closely/ACDA	8	15.09%
Not Discernible	5	9.43%
Failure to Yield	4	7.55%
Improper Lane Change	3	5.66%
None	3	5.66%
Grand Total	53	100.00%

Unit 1 Object Struck	Crashes	%
Nothing Struck	49	92.45%
Tree	2	3.77%
Utility Pole	1	1.89%
Building	1	1.89%
Grand Total	53	100.00%

Unit 1 Traffic Control	Crashes	%
Signal	37	69.81%
No Control	15	28.30%
Stop Sign	1	1.89%
Grand Total	53	100.00%

Unit 1 Posted Speed	Crashes	%
0	6	11.32%
25	10	18.87%
35	37	69.81%
Grand Total	53	100.00%

Unit 1 Direction From	Crashes	%
East	19	35.85%
West	16	30.19%
South	14	26.42%
Unknown	4	7.55%
Grand Total	53	100.00%

Unit 1 Direction To	Crashes	%
West	18	33.96%
East	14	26.42%
North	14	26.42%
Unknown	4	7.55%
South	3	5.66%
Grand Total	53	100.00%

Livingston Ave at Champion Ave

Crash Summary Sheet

Unit 1 Summary

Unit 1 Type	Crashes	%
Passenger Car	26	49.06%
Sport Utility Vehicle	12	22.64%
Unknown or Hit/Skip	4	7.55%
Cargo Van	3	5.66%
Pick up	3	5.66%
Passenger Van (minivan)	2	3.77%
Other Vehicle	1	1.89%
Pedestrian/Skater	1	1.89%
Bus (16+ Passengers)	1	1.89%
Grand Total	53	100.00%

Unit 1 Special Function	Crashes	%
None	50	94.34%
Other / Unknown	2	3.77%
Bus – Transit/Commuter	1	1.89%
Grand Total	53	100.00%

Livingston Ave at Champion Ave
Crash Summary Sheet

Unit 2 Summary

Unit 2 Pre-Crash Action	Crashes	%
Straight Ahead	35	66.04%
Slowing or Stopped In Traffic	8	15.09%
Parked	4	7.55%
Walking, Running, Jogging, Playing	2	3.77%
	2	3.77%
Other / Unknown	1	1.89%
Making Right Turn	1	1.89%
Grand Total	53	100.00%

Unit 2 Contributing Factor	Crashes	%
None	44	83.02%
Not Discernible	4	7.55%
Other Improper Action	3	5.66%
	2	3.77%
Grand Total	53	100.00%

Unit 2 Direction From	Crashes	%
	3	5.66%
East	11	20.75%
North	2	3.77%
South	26	49.06%
Unknown	1	1.89%
West	10	18.87%
Grand Total	53	100.00%

Unit 2 Direction To	Crashes	%
	3	5.66%
East	11	20.75%
North	25	47.17%
South	2	3.77%
Unknown	1	1.89%
West	11	20.75%
Grand Total	53	100.00%

Unit 2 Type	Crashes	%
Passenger Car	27	50.94%
Sport Utility Vehicle	12	22.64%
Bus (16+ Passengers)	4	7.55%
Pedestrian/Skater	3	5.66%
	2	3.77%
Single Unit Truck	1	1.89%
Pick up	1	1.89%
Motorcycle 2 Wheeled	1	1.89%
Cargo Van	1	1.89%
Passenger Van (minivan)	1	1.89%
Grand Total	53	100.00%

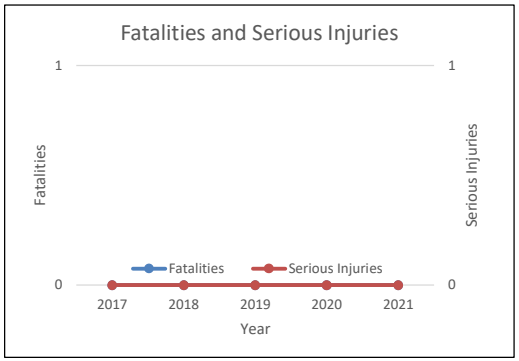
Unit 2 Special Function	Crashes	%
None	45	84.91%
	4	7.55%
Bus – Intercity	2	3.77%
Bus – Transit/Commuter	1	1.89%
School Transport	1	1.89%
Grand Total	53	100.00%

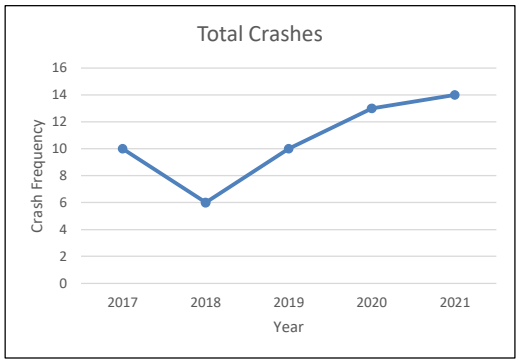
Livingston Ave at Champion Ave

Crash Summary Sheet

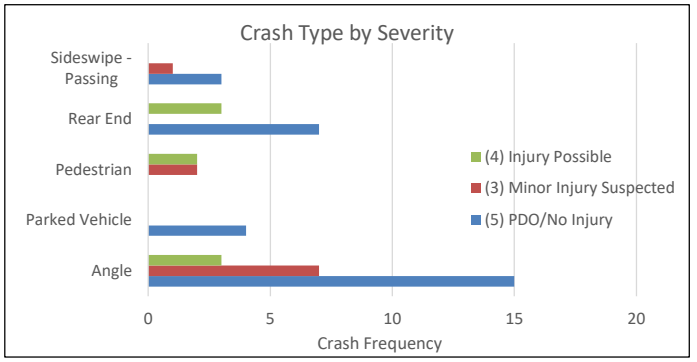
Crashes Per Year	10.60	Percent Injury	35.8%	EPDO	2.67

Year	Total Crashes	Fatalities	Serious Injuries
2017	10	0	0
2018	6	0	0
2019	10	0	0
2020	13	0	0
2021	14	0	0
Grand Total	53	0	0





Total Crashes Crash Type	Injury Level (3) Minor Injury	(4) Injury Possi	(5) PDO/No Inj	Grand Total
Angle	7	3	15	25
Rear End	0	3	7	10
Sideswipe - Passing	1	0	3	4
Pedestrian	2	2	0	4
Parked Vehicle	0	0	4	4
Right Turn	0	0	2	2
Left Turn	0	0	2	2
Fixed Object	0	0	1	1
Other Non-Collision	1	0	0	1
Grand Total	11	8	34	53



Livingston Ave at Champion Ave
Crash Summary Sheet

Crashes Per Year	10.60	Percent Injury	35.8%	EPDO	2.67

Road Condition	Total Crashes	Fatalities	Serious Injuries
Dry	42	0	0
Ice	1	0	0
Snow	2	0	0
Wet	6	0	0
Other / Unknown	2	0	0
Grand Total	53	0	0

Weather	Total Crashes	Fatalities	Serious Injuries
Clear	41	0	0
Cloudy	6	0	0
Snow	3	0	0
Unknown	2	0	0
Rain	1	0	0
Grand Total	53	0	0

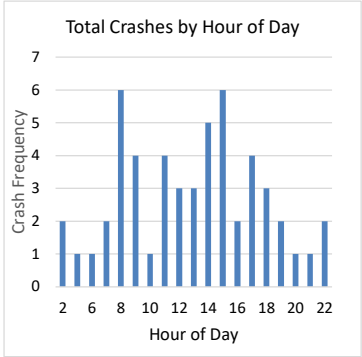
Crash Location	Total Crashes	Fatalities	Serious Injuries
Four-Way Intersection	19	0	0
Not An Intersection	24	0	0
T-Intersection	10	0	0
Grand Total	53	0	0

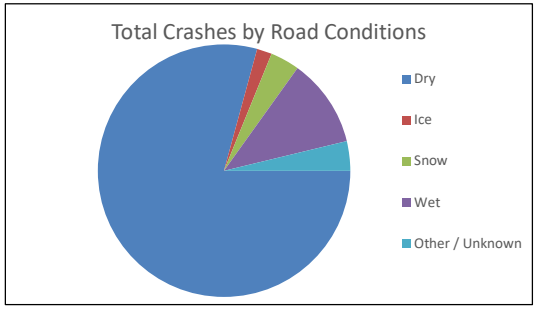
Roadway Contour	Total Crashes	Fatalities	Serious Injuries
Straight Level	53	0	0
Grand Total	53	0	0

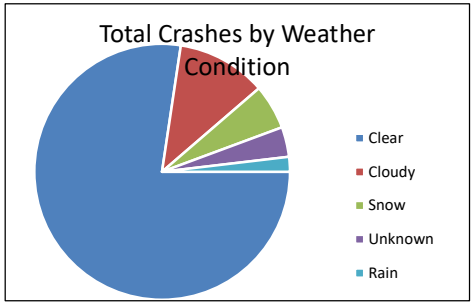
Hour of Day	Total Crashes
2	2
3	1
6	1
7	2
8	6
9	4
10	1
11	4
12	3
13	3
14	5
15	6
16	2
17	4
18	3
19	2
20	1
21	1
22	2
Grand Total	53

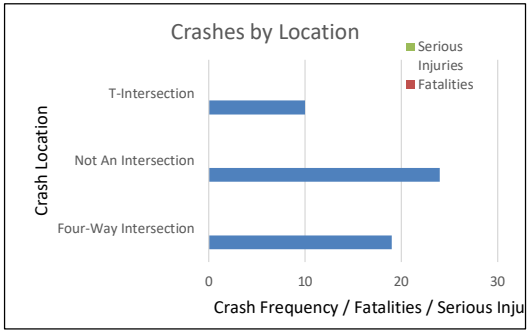
Month	Total Crashes
January	2
February	4
March	5
April	4
May	3
June	5
July	2
August	7
September	6
October	7
November	3
December	5
Grand Total	53

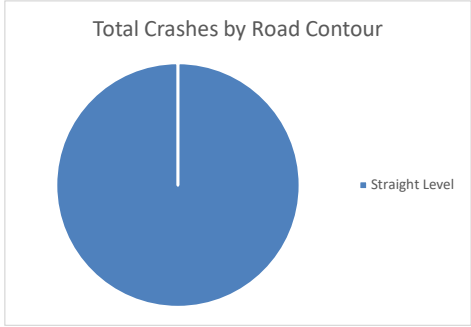
Day in Week	Total Crashes
(1) Sunday	6
(2) Monday	2
(3) Tuesday	10
(4) Wednesday	13
(5) Thursday	6
(6) Friday	6
(7) Saturday	10
Grand Total	53











Livingston Ave at Champion Ave

Unit 1 Crash Summary

Type of Unit	Total Crashes	Fatalities	Serious Injuries
Passenger Car	26	0	0
Sport Utility Vehicle	12	0	0
Unknown or Hit/Skip	4	0	0
Cargo Van	3	0	0
Pick up	3	0	0
Passenger Van (minivan)	2	0	0
Other Vehicle	1	0	0
Bus (16+ Passengers)	1	0	0
Pedestrian/Skater	1	0	0
Grand Total	53	0	0

Special Function	Total Crashes	Fatalities	Serious Injuries
None	50	0	0
Other / Unknown	2	0	0
Bus – Transit/Commuter	1	0	0
Grand Total	53	0	0

Pre-Crash Action	Total Crashes	Fatalities	Serious Injuries
Straight Ahead	38	0	0
Making Left Turn	5	0	0
Slowing or Stopped In Traffic	2	0	0
Other / Unknown	2	0	0
Changing Lanes	2	0	0
Making Right Turn	2	0	0
Walking, Running, Jogging, Playing	1	0	0
Leaving Traffic Lane	1	0	0
Grand Total	53	0	0

Livingston Ave at Champion Ave

Unit 1 Crash Summary

Gender	Total Crashes	Fatalities	Serious Injuries
Male	26	0	0
Female	20	0	0
Unknown	7	0	0
Grand Total	53	0	0

Driver Age	Total Crashes	Fatalities	Serious Injuries
<15	12	0	0
15-19	2	0	0
20-24	7	0	0
25-29	4	0	0
30-34	9	0	0
35-39	4	0	0
40-44	7	0	0
50-54	4	0	0
55-59	1	0	0
60-64	1	0	0
65-69	1	0	0
70-74	1	0	0
Grand Total	53	0	0

Livingston Ave at Champion Ave

Unit 1 Crash Summary

Traffic Control	Total Crashes	Fatalities	Serious Injuries
Signal	37	0	0
No Control	15	0	0
Stop Sign	1	0	0
Grand Total	53	0	0

Object Struck	Total Crashes	Fatalities	Serious Injuries
Tree	2	0	0
Utility Pole	1	0	0
Grand Total	3	0	0

Contributing Circumstances	Total Crashes	Fatalities	Serious Injuries
Ran Red Light	18	0	0
Other Improper Action	12	0	0
Following Too Closely/ACDA	8	0	0
Not Discernible	5	0	0
Failure to Yield	4	0	0
Improper Lane Change	3	0	0
None	3	0	0
Grand Total	53	0	0

Livingston Ave at Champion Ave

Unit 1 Crash Summary

Alcohol Involved	Total Crashes	Fatalities	Serious Injuries
No	53	0	0
Grand Total	53	0	0

Distracted By	Total Crashes	Fatalities	Serious Injuries
Not Distracted	39	0	0
Other / Unknown	10	0	0
Other distraction outside the vehicle	3	0	0
Other distraction inside the vehicle	1	0	0
Grand Total	53	0	0

Non-Motorist Location	Total Crashes	Fatalities	Serious Injuries
Grand Total	0	0	0

Estimated Speed	Total Crashes	Fatalities	Serious Injuries
<15	20	0	0
15-19	3	0	0
20-24	3	0	0
25-29	8	0	0
30-34	10	0	0
35-39	8	0	0
40-44	1	0	0
Grand Total	53	0	0

Relative Severity Index Calculation

ODOT District	6
Urban Area	Yes
Freeway	No

Fill in the Number of Crashes by Crash Type

Crash Type	Number of Crashes	Crash Type Severity Calc	RSI Multiplier
Unknown	0	$0	26,018.00
Head On	0	$0	80,739.00
Rear End	10	$245,550	24,555.00
Backing	0	$0	10,808.00
Sideswipe - Meeting	0	$0	26,746.00
Sideswipe - Passing	4	$71,332	17,833.00
Angle	25	$934,275	37,371.00
Parked Vehicle	4	$64,032	16,008.00
Pedestrian	4	$579,192	144,798.00
Animal	0	$0	12,427.00
Train	0	$0	60,693.00
Pedalcycles	0	$0	93,645.00
Other Non-Vehicle	0	$0	190,625.00
Fixed Object	1	$37,622	37,622.00
Other Object	0	$0	17,835.00
Overturning	0	$0	106,003.00
Other Non-Collision	1	$36,805	36,805.00
Left Turn	2	$79,904	39,952.00
Right Turn	2	$41,924	20,962.00
Totals	**53**	**$2,090,636**	

RSI Value = 39,445.96

Livingston Ave at Champion Ave

Begin Year	2017	End Year	2021	*(Available Years: 2017-2021)*
Select Authority:		**All**		

Total Crashes	
Crashes	53
Fatalities	0
Serious Injuries	0

Non-Intersection	
Crashes	11
Fatalities	0
Serious Injuries	0

Intersection	
Crashes	42
Fatalities	0
Serious Injuries	0

Roadway Departure	
Crashes	4
Fatalities	0
Serious Injuries	0

Crash Types	
Rank 1	
Parked Vehicle	
Crashes	3
Fatalities	0
Serious Injuries	0
Rank 2	
Fixed Object	
Crashes	1
Fatalities	0
Serious Injuries	0
Rank 3	
Rear End	
Crashes	0
Fatalities	0
Serious Injuries	0

Other	
Crashes	7
Fatalities	0
Serious Injuries	0

Crash Types	
Rank 1	
Sideswipe - Passing	
Crashes	3
Fatalities	0
Serious Injuries	0
Rank 2	
Pedestrian	
Crashes	2
Fatalities	0
Serious Injuries	0
Rank 3	
Rear End	
Crashes	1
Fatalities	0
Serious Injuries	0

Signalized	
Crashes	37
Fatalities	0
Serious Injuries	0

Crash Types	
Rank 1	
Angle	
Crashes	24
Fatalities	0
Serious Injuries	0
Rank 2	
Rear End	
Crashes	8
Fatalities	0
Serious Injuries	0
Rank 3	
Right Turn	
Crashes	2
Fatalities	0
Serious Injuries	0

Unsignalized	
Crashes	1
Fatalities	0
Serious Injuries	0

Crash Types	
Rank 1	
Angle	
Crashes	1
Fatalities	0
Serious Injuries	0
Rank 2	
Rear End	
Crashes	0
Fatalities	0
Serious Injuries	0
Rank 3	
Fixed Object	
Crashes	0
Fatalities	0
Serious Injuries	0

Other	
Crashes	4
Fatalities	0
Serious Injuries	0

Crash Types	
Rank 1	
Rear End	
Crashes	1
Fatalities	0
Serious Injuries	0
Rank 2	
Sideswipe - Passing	
Crashes	1
Fatalities	0
Serious Injuries	0
Rank 3	
Left Turn	
Crashes	1
Fatalities	0
Serious Injuries	0

Livingston Ave at Fairwood Ave

Crash Summary Sheet

Fatalities	0
Serious Injuries	0
Other Injuries	54

Crashes Per Year	17.20
Fatal and All Injury Crashes	32
Percent Injury	37.2%
Equivalent PDO Index Value	2.82

Crash Severity	Crashes	%
(3) Minor Injury Suspected	22	25.58%
(4) Injury Possible	10	11.63%
(5) PDO/No Injury	54	62.79%
Grand Total	86	100.00%

Year	Crashes	%
2017	17	19.77%
2018	22	25.58%
2019	18	20.93%
2020	14	16.28%
2021	15	17.44%
Grand Total	86	100.00%

Day of Week	Crashes	%
(1) Sunday	6	6.98%
(2) Monday	11	12.79%
(3) Tuesday	17	19.77%
(4) Wednesday	8	9.30%
(5) Thursday	13	15.12%
(6) Friday	21	24.42%
(7) Saturday	10	11.63%
Grand Total	86	100.00%

Crash Type	Crashes	%
Rear End	21	24.42%
Angle	21	24.42%
Left Turn	18	20.93%
Sideswipe - Passing	11	12.79%
Fixed Object	4	4.65%
Pedestrian	4	4.65%
Right Turn	2	2.33%
Parked Vehicle	2	2.33%
Sideswipe - Meeting	1	1.16%
Head On	1	1.16%
Pedalcycles	1	1.16%
Grand Total	86	100.00%

Hour of Day	Crashes	%
0	1	1.16%
1	1	1.16%
2	1	1.16%
5	1	1.16%
6	5	5.81%
7	6	6.98%
8	4	4.65%
9	3	3.49%
10	6	6.98%
11	6	6.98%
12	6	6.98%
13	10	11.63%
14	2	2.33%
15	5	5.81%
16	7	8.14%
17	3	3.49%
18	3	3.49%
19	6	6.98%
20	2	2.33%
21	4	4.65%
22	3	3.49%
23	1	1.16%
Grand Total	86	100.00%

Month	Crashes	%
1	6	6.98%
2	12	13.95%
4	9	10.47%
5	6	6.98%
6	11	12.79%
7	11	12.79%
8	9	10.47%
9	7	8.14%
10	5	5.81%
11	3	3.49%
12	7	8.14%
Grand Total	86	100.00%

Livingston Ave at Fairwood Ave

Crash Summary Sheet

Weather Condition	Crashes	%
Clear	61	70.93%
Cloudy	15	17.44%
Rain	7	8.14%
Snow	3	3.49%
Grand Total	86	100.00%

Road Condition	Crashes	%
Dry	72	83.72%
Wet	12	13.95%
Snow	2	2.33%
Grand Total	86	100.00%

Light Condition	Crashes	%
Daylight	63	73.26%
Dark - Lighted Roadway	19	22.09%
Dawn/Dusk	4	4.65%
Grand Total	86	100.00%

Number of Units	Crashes	%
2	75	87.21%
3	6	6.98%
1	4	4.65%
4	1	1.16%
Grand Total	86	100.00%

ODOT Location	Crashes	%
Four-Way Intersection	49	56.98%
Not An Intersection	35	40.70%
5 Or More Point Intersection	2	2.33%
Grand Total	86	100.00%

Work Zone Related	Crashes	%
No	86	100.00%
Grand Total	86	100.00%

Alcohol Related	Crashes	%
No	85	98.84%
Yes	1	1.16%
Grand Total	86	100.00%

Drug Related (Inc. Marijuana)	Crashes	%
No	86	100.00%
Grand Total	86	100.00%

Contour	Crashes	%
Straight Level	86	100.00%
Grand Total	86	100.00%

Marijuana Related	Crashes	%
No	86	100.00%
Grand Total	86	100.00%

Roadway Departure	Crashes	%
No	80	93.02%
Yes	6	6.98%
Grand Total	86	100.00%

Older Driver (65+)	Crashes	%
No	74	86.05%
Yes	12	13.95%
Grand Total	86	100.00%

Intersection Related	Crashes	%
Yes	67	77.91%
No	19	22.09%
Grand Total	86	100.00%

Young Driver (15-25)	Crashes	%
No	61	70.93%
Yes	25	29.07%
Grand Total	86	100.00%

Speed Related	Crashes	%
No	82	95.35%
Yes	4	4.65%
Grand Total	86	100.00%

Motorcycle Involved	Crashes	%
No	86	100.00%
Grand Total	86	100.00%

Livingston Ave at Fairwood Ave

Crash Summary Sheet

Unit 1 Summary

Unit 1 Pre-Crash Action	Crashes	%
Straight Ahead	47	54.65%
Making Left Turn	19	22.09%
Changing Lanes	6	6.98%
Other / Unknown	4	4.65%
Making Right Turn	3	3.49%
Entering Traffic Lane	2	2.33%
Slowing or Stopped In Traffic	1	1.16%
Other Non-Motorist	1	1.16%
Driverless	1	1.16%
Data Not Valid or Not Provided	1	1.16%
Leaving Traffic Lane	1	1.16%
Grand Total	86	100.00%

Unit 1 Contributing Factor	Crashes	%
Following Too Closely/ACDA	21	24.42%
Failure to Yield	21	24.42%
Ran Red Light	12	13.95%
Other Improper Action	8	9.30%
None	7	8.14%
Improper Lane Change	6	6.98%
Improper Turn	5	5.81%
Swerving to Avoid	1	1.16%
Drove off Road	1	1.16%
Wrong Way	1	1.16%
Not Discernible	1	1.16%
Left of Center	1	1.16%
Improper Crossing	1	1.16%
Grand Total	86	100.00%

Unit 1 Object Struck	Crashes	%
Nothing Struck	78	90.70%
Utility Pole	3	3.49%
Wall	2	2.33%
Other / Unknown	1	1.16%
Other Post, Pole Or Support	1	1.16%
Other Fixed Object	1	1.16%
Grand Total	86	100.00%

Unit 1 Traffic Control	Crashes	%
Signal	59	68.60%
No Control	25	29.07%
Stop Sign	2	2.33%
Grand Total	86	100.00%

Unit 1 Posted Speed	Crashes	%
0	16	18.60%
25	4	4.65%
35	66	76.74%
Grand Total	86	100.00%

Unit 1 Direction From	Crashes	%
East	37	43.02%
West	28	32.56%
South	13	15.12%
North	7	8.14%
Unknown	1	1.16%
Grand Total	86	100.00%

Unit 1 Direction To	Crashes	%
West	28	32.56%
North	21	24.42%
East	20	23.26%
South	12	13.95%
Southwest	2	2.33%
Northeast	2	2.33%
Unknown	1	1.16%
Grand Total	86	100.00%

Livingston Ave at Fairwood Ave

Crash Summary Sheet

Unit 1 Summary

Unit 1 Type	Crashes	%
Passenger Car	47	54.65%
Sport Utility Vehicle	19	22.09%
Pick up	5	5.81%
Passenger Van (minivan)	5	5.81%
Single Unit Truck	4	4.65%
Unknown or Hit/Skip	3	3.49%
Pedestrian/Skater	2	2.33%
Cargo Van	1	1.16%
Grand Total	86	100.00%

Unit 1 Special Function	Crashes	%
None	80	93.02%
Other / Unknown	5	5.81%
Construction Equipment	1	1.16%
Grand Total	86	100.00%

Livingston Ave at Fairwood Ave
Crash Summary Sheet

Unit 2 Summary

Unit 2 Pre-Crash Action	Crashes	%
Straight Ahead	54	62.79%
Slowing or Stopped In Traffic	20	23.26%
	4	4.65%
Making Left Turn	2	2.33%
Other / Unknown	2	2.33%
Other Non-Motorist	1	1.16%
Walking, Running, Jogging, Playing	1	1.16%
Making Right Turn	1	1.16%
Parked	1	1.16%
Grand Total	86	100.00%

Unit 2 Contributing Factor	Crashes	%
None	75	87.21%
	4	4.65%
Other Improper Action	4	4.65%
Not Discernible	2	2.33%
Lying in Roadway	1	1.16%
Grand Total	86	100.00%

Unit 2 Direction From	Crashes	%
	4	4.65%
East	29	33.72%
North	9	10.47%
South	13	15.12%
Southwest	1	1.16%
Unknown	1	1.16%
West	29	33.72%
Grand Total	86	100.00%

Unit 2 Direction To	Crashes	%
	4	4.65%
East	30	34.88%
North	14	16.28%
South	8	9.30%
Unknown	1	1.16%
West	29	33.72%
Grand Total	86	100.00%

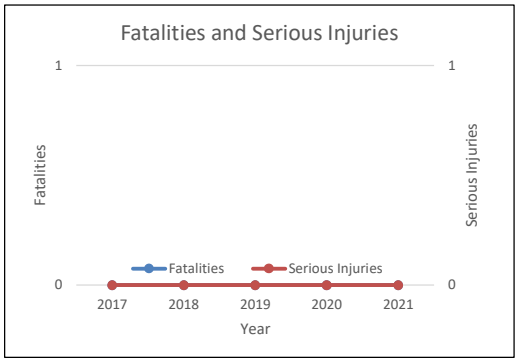
Unit 2 Type	Crashes	%
Passenger Car	53	61.63%
Sport Utility Vehicle	18	20.93%
Pick up	4	4.65%
	4	4.65%
Passenger Van (minivan)	2	2.33%
Pedestrian/Skater	2	2.33%
Bicycle	1	1.16%
Other Vehicle	1	1.16%
Cargo Van	1	1.16%
Grand Total	86	100.00%

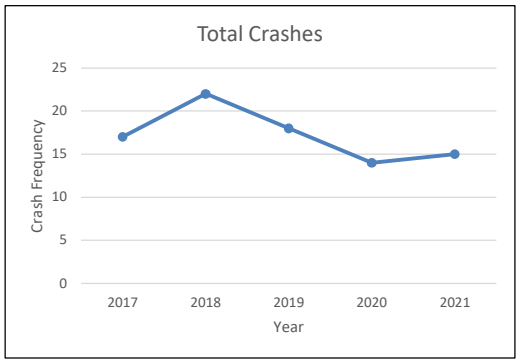
Unit 2 Special Function	Crashes	%
None	78	90.70%
	5	5.81%
Ambulance	1	1.16%
Taxi	1	1.16%
Other / Unknown	1	1.16%
Grand Total	86	100.00%

Livingston Ave at Fairwood Ave
Crash Summary Sheet

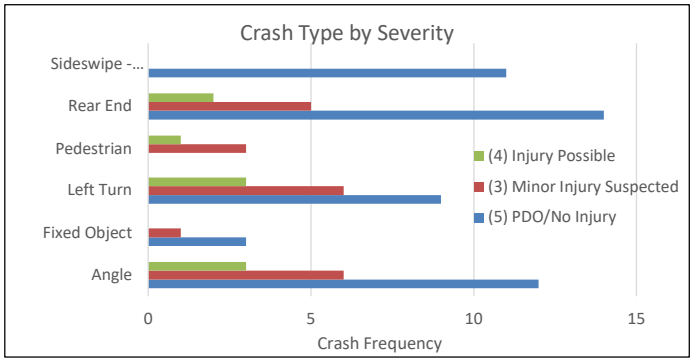
Crashes Per Year	17.20	Percent Injury	37.2%	EPDO	2.82

Year	Total Crashes	Fatalities	Serious Injuries
2017	17	0	0
2018	22	0	0
2019	18	0	0
2020	14	0	0
2021	15	0	0
Grand Total	86	0	0





Total Crashes Crash Type	Injury Level (3) Minor Injury	(4) Injury Possi	(5) PDO/No Inj	Grand Total
Rear End	5	2	14	21
Angle	6	3	12	21
Left Turn	6	3	9	18
Sideswipe - Passing	0	0	11	11
Fixed Object	1	0	3	4
Pedestrian	3	1	0	4
Right Turn	0	0	2	2
Parked Vehicle	1	0	1	2
Sideswipe - Meeting	0	0	1	1
Head On	0	0	1	1
Pedalcycles	0	1	0	1
Grand Total	22	10	54	86



Livingston Ave at Fairwood Ave
Crash Summary Sheet

Crashes Per Year	17.20	Percent Injury	37.2%	EPDO	2.82

Road Condition	Total Crashes	Fatalities	Serious Injuries
Dry	72	0	0
Snow	2	0	0
Wet	12	0	0
Grand Total	86	0	0

Weather	Total Crashes	Fatalities	Serious Injuries
Clear	61	0	0
Cloudy	15	0	0
Rain	7	0	0
Snow	3	0	0
Grand Total	86	0	0

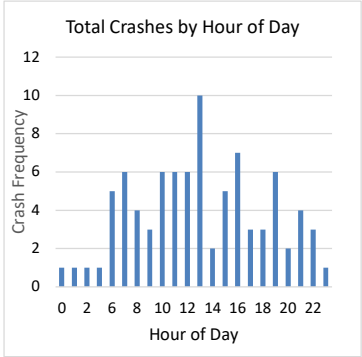
Crash Location	Total Crashes	Fatalities	Serious Injuries
5 Or More Point Intersection	2	0	0
Four-Way Intersection	49	0	0
Not An Intersection	35	0	0
Grand Total	86	0	0

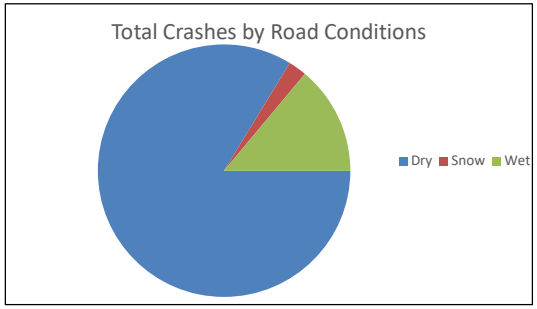
Roadway Contour	Total Crashes	Fatalities	Serious Injuries
Straight Level	86	0	0
Grand Total	86	0	0

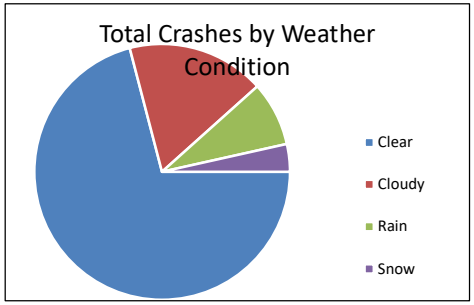
Hour of Day	Total Crashes
0	1
1	1
2	1
5	1
6	5
7	6
8	4
9	3
10	6
11	6
12	6
13	10
14	2
15	5
16	7
17	3
18	3
19	6
20	2
21	4
22	3
23	1
Grand Total	86

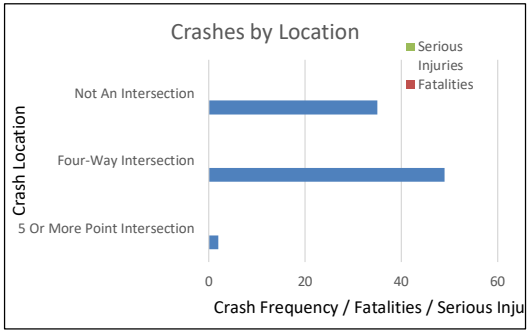
Month	Total Crashes
January	6
February	12
April	9
May	6
June	11
July	11
August	9
September	7
October	5
November	3
December	7
Grand Total	86

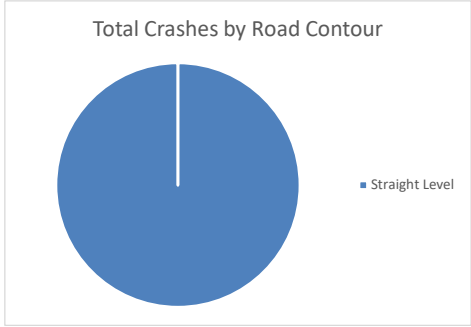
Day in Week	Total Crashes
(1) Sunday	6
(2) Monday	11
(3) Tuesday	17
(4) Wednesday	8
(5) Thursday	13
(6) Friday	21
(7) Saturday	10
Grand Total	86











Livingston Ave at Fairwood Ave

Unit 1 Crash Summary

Type of Unit	Total Crashes	Fatalities	Serious Injuries
Passenger Car	47	0	0
Sport Utility Vehicle	19	0	0
Passenger Van (minivan)	5	0	0
Pick up	5	0	0
Single Unit Truck	4	0	0
Unknown or Hit/Skip	3	0	0
Pedestrian/Skater	2	0	0
Cargo Van	1	0	0
Grand Total	86	0	0

Special Function	Total Crashes	Fatalities	Serious Injuries
None	80	0	0
Other / Unknown	5	0	0
Construction Equipment	1	0	0
Grand Total	86	0	0

Pre-Crash Action	Total Crashes	Fatalities	Serious Injuries
Straight Ahead	47	0	0
Making Left Turn	19	0	0
Changing Lanes	6	0	0
Other / Unknown	4	0	0
Making Right Turn	3	0	0
Entering Traffic Lane	2	0	0
Driverless	1	0	0
Data Not Valid or Not Provided	1	0	0
Slowing or Stopped In Traffic	1	0	0
Other Non-Motorist	1	0	0
Leaving Traffic Lane	1	0	0
Grand Total	86	0	0

Livingston Ave at Fairwood Ave

Unit 1 Crash Summary

Gender	Total Crashes	Fatalities	Serious Injuries
Female	33	0	0
Male	30	0	0
Unknown	23	0	0
Grand Total	86	0	0

Driver Age	Total Crashes	Fatalities	Serious Injuries
<15	31	0	0
15-19	5	0	0
20-24	7	0	0
25-29	5	0	0
30-34	5	0	0
35-39	6	0	0
40-44	5	0	0
45-49	3	0	0
50-54	4	0	0
55-59	5	0	0
60-64	8	0	0
65-69	2	0	0
Grand Total	86	0	0

Livingston Ave at Fairwood Ave

Unit 1 Crash Summary

Traffic Control	Total Crashes	Fatalities	Serious Injuries
Signal	59	0	0
No Control	25	0	0
Stop Sign	2	0	0
Grand Total	86	0	0

Object Struck	Total Crashes	Fatalities	Serious Injuries
Utility Pole	3	0	0
Other Fixed Object	1	0	0
Other Post, Pole Or Support	1	0	0
Grand Total	5	0	0

Contributing Circumstances	Total Crashes	Fatalities	Serious Injuries
Following Too Closely/ACDA	21	0	0
Failure to Yield	21	0	0
Ran Red Light	12	0	0
Other Improper Action	8	0	0
None	7	0	0
Improper Lane Change	6	0	0
Improper Turn	5	0	0
Wrong Way	1	0	0
Not Discernible	1	0	0
Left of Center	1	0	0
Improper Crossing	1	0	0
Drove off Road	1	0	0
Swerving to Avoid	1	0	0
Grand Total	86	0	0

Livingston Ave at Fairwood Ave

Unit 1 Crash Summary

Alcohol Involved	Total Crashes	Fatalities	Serious Injuries
No	85	0	0
Yes	1	0	0
Grand Total	86	0	0

Distracted By	Total Crashes	Fatalities	Serious Injuries
Not Distracted	63	0	0
Other / Unknown	21	0	0
Passenger	1	0	0
Other distraction outside the vehicle	1	0	0
Grand Total	86	0	0

Non-Motorist Location	Total Crashes	Fatalities	Serious Injuries
Grand Total	0	0	0

Estimated Speed	Total Crashes	Fatalities	Serious Injuries
<15	39	0	0
15-19	9	0	0
20-24	6	0	0
25-29	7	0	0
30-34	8	0	0
35-39	15	0	0
45-49	2	0	0
Grand Total	86	0	0

Relative Severity Index Calculation

ODOT District	6
Urban Area	Yes
Freeway	No

Fill in the Number of Crashes by Crash Type

Crash Type	Number of Crashes	Crash Type Severity Calc	RSI Multiplier
Unknown	0	$0	26,018.00
Head On	1	$80,739	80,739.00
Rear End	21	$515,655	24,555.00
Backing	0	$0	10,808.00
Sideswipe - Meeting	1	$26,746	26,746.00
Sideswipe - Passing	11	$196,163	17,833.00
Angle	21	$784,791	37,371.00
Parked Vehicle	2	$32,016	16,008.00
Pedestrian	4	$579,192	144,798.00
Animal	0	$0	12,427.00
Train	0	$0	60,693.00
Pedalcycles	1	$93,645	93,645.00
Other Non-Vehicle	0	$0	190,625.00
Fixed Object	4	$150,488	37,622.00
Other Object	0	$0	17,835.00
Overturning	0	$0	106,003.00
Other Non-Collision	0	$0	36,805.00
Left Turn	18	$719,136	39,952.00
Right Turn	2	$41,924	20,962.00
Totals	**86**	**$3,220,495**	

RSI Value = 37,447.62

Livingston Ave at Fairwood Ave

Begin Year	2017	End Year	2021	*(Available Years: 2017-2021)*
Select Authority:		**All**		

Total Crashes	
Crashes	86
Fatalities	0
Serious Injuries	0

Non-Intersection	
Crashes	19
Fatalities	0
Serious Injuries	0

Intersection	
Crashes	67
Fatalities	0
Serious Injuries	0

Roadway Departure	
Crashes	4
Fatalities	0
Serious Injuries	0

Crash Types	
Rank 1	
Fixed Object	
Crashes	3
Fatalities	0
Serious Injuries	0
Rank 2	
Parked Vehicle	
Crashes	1
Fatalities	0
Serious Injuries	0
Rank 3	
Rear End	
Crashes	0
Fatalities	0
Serious Injuries	0

Other	
Crashes	15
Fatalities	0
Serious Injuries	0

Crash Types	
Rank 1	
Sideswipe - Passing	
Crashes	5
Fatalities	0
Serious Injuries	0
Rank 2	
Rear End	
Crashes	4
Fatalities	0
Serious Injuries	0
Rank 3	
Left Turn	
Crashes	2
Fatalities	0
Serious Injuries	0

Signalized	
Crashes	59
Fatalities	0
Serious Injuries	0

Crash Types	
Rank 1	
Angle	
Crashes	18
Fatalities	0
Serious Injuries	0
Rank 2	
Rear End	
Crashes	15
Fatalities	0
Serious Injuries	0
Rank 3	
Left Turn	
Crashes	15
Fatalities	0
Serious Injuries	0

Unsignalized	
Crashes	2
Fatalities	0
Serious Injuries	0

Crash Types	
Rank 1	
Angle	
Crashes	1
Fatalities	0
Serious Injuries	0
Rank 2	
Pedestrian	
Crashes	1
Fatalities	0
Serious Injuries	0
Rank 3	
Rear End	
Crashes	0
Fatalities	0
Serious Injuries	0

Other	
Crashes	6
Fatalities	0
Serious Injuries	0

Crash Types	
Rank 1	
Rear End	
Crashes	2
Fatalities	0
Serious Injuries	0
Rank 2	
Fixed Object	
Crashes	1
Fatalities	0
Serious Injuries	0
Rank 3	
Left Turn	
Crashes	1
Fatalities	0
Serious Injuries	0

Livingston Ave at Kelton Ave

Crash Summary Sheet

Fatalities	0
Serious Injuries	2
Other Injuries	26

Crashes Per Year	14.00
Fatal and All Injury Crashes	23
Percent Injury	32.9%
Equivalent PDO Index Value	3.69

Crash Severity	Crashes	%
(2) Serious Injury Suspected	2	2.86%
(3) Minor Injury Suspected	13	18.57%
(4) Injury Possible	8	11.43%
(5) PDO/No Injury	47	67.14%
Grand Total	70	100.00%

Year	Crashes	%
2017	15	21.43%
2018	19	27.14%
2019	12	17.14%
2020	9	12.86%
2021	15	21.43%
Grand Total	70	100.00%

Day of Week	Crashes	%
(1) Sunday	12	17.14%
(2) Monday	13	18.57%
(3) Tuesday	14	20.00%
(4) Wednesday	8	11.43%
(5) Thursday	7	10.00%
(6) Friday	9	12.86%
(7) Saturday	7	10.00%
Grand Total	70	100.00%

Crash Type	Crashes	%
Angle	27	38.57%
Rear End	16	22.86%
Sideswipe - Passing	12	17.14%
Left Turn	6	8.57%
Fixed Object	3	4.29%
Pedalcycles	2	2.86%
Parked Vehicle	2	2.86%
Head On	1	1.43%
Sideswipe - Meeting	1	1.43%
Grand Total	70	100.00%

Hour of Day	Crashes	%
0	3	4.29%
2	2	2.86%
6	3	4.29%
8	3	4.29%
9	4	5.71%
10	2	2.86%
11	4	5.71%
12	3	4.29%
13	4	5.71%
14	3	4.29%
15	6	8.57%
16	10	14.29%
17	4	5.71%
18	7	10.00%
19	3	4.29%
20	4	5.71%
21	2	2.86%
22	1	1.43%
23	2	2.86%
Grand Total	70	100.00%

Month	Crashes	%
1	4	5.71%
2	6	8.57%
3	9	12.86%
4	7	10.00%
5	3	4.29%
6	9	12.86%
7	5	7.14%
8	10	14.29%
9	2	2.86%
10	5	7.14%
11	7	10.00%
12	3	4.29%
Grand Total	70	100.00%

Livingston Ave at Kelton Ave

Crash Summary Sheet

Weather Condition	Crashes	%
Clear	56	80.00%
Rain	7	10.00%
Cloudy	6	8.57%
Snow	1	1.43%
Grand Total	70	100.00%

Road Condition	Crashes	%
Dry	57	81.43%
Wet	10	14.29%
Snow	1	1.43%
Ice	1	1.43%
Other / Unknown	1	1.43%
Grand Total	70	100.00%

Light Condition	Crashes	%
Daylight	47	67.14%
Dark - Lighted Roadway	18	25.71%
Dawn/Dusk	4	5.71%
Dark - Unknown Roadway Lighting	1	1.43%
Grand Total	70	100.00%

Number of Units	Crashes	%
2	56	80.00%
3	8	11.43%
4	3	4.29%
1	3	4.29%
Grand Total	70	100.00%

ODOT Location	Crashes	%
Four-Way Intersection	34	48.57%
Not An Intersection	20	28.57%
T-Intersection	13	18.57%
5 Or More Point Intersection	3	4.29%
Grand Total	70	100.00%

Work Zone Related	Crashes	%
No	70	100.00%
Grand Total	70	100.00%

Alcohol Related	Crashes	%
No	70	100.00%
Grand Total	70	100.00%

Drug Related (Inc. Marijuana)	Crashes	%
No	70	100.00%
Grand Total	70	100.00%

Contour	Crashes	%
Straight Level	70	100.00%
Grand Total	70	100.00%

Marijuana Related	Crashes	%
No	70	100.00%
Grand Total	70	100.00%

Roadway Departure	Crashes	%
No	63	90.00%
Yes	7	10.00%
Grand Total	70	100.00%

Older Driver (65+)	Crashes	%
No	62	88.57%
Yes	8	11.43%
Grand Total	70	100.00%

Intersection Related	Crashes	%
Yes	57	81.43%
No	13	18.57%
Grand Total	70	100.00%

Young Driver (15-25)	Crashes	%
No	54	77.14%
Yes	16	22.86%
Grand Total	70	100.00%

Speed Related	Crashes	%
No	65	92.86%
Yes	5	7.14%
Grand Total	70	100.00%

Motorcycle Involved	Crashes	%
No	69	98.57%
Yes	1	1.43%
Grand Total	70	100.00%

Livingston Ave at Kelton Ave

Crash Summary Sheet

Unit 1 Summary

Unit 1 Pre-Crash Action	Crashes	%
Straight Ahead	47	67.14%
Other / Unknown	5	7.14%
Making Left Turn	5	7.14%
Overtaking/Passing	3	4.29%
Changing Lanes	3	4.29%
Leaving Traffic Lane	2	2.86%
Data Not Valid or Not Provided	2	2.86%
Making Right Turn	1	1.43%
Entering or Crossing Specified Location	1	1.43%
Slowing or Stopped In Traffic	1	1.43%
Grand Total	70	100.00%

Unit 1 Contributing Factor	Crashes	%
Ran Red Light	19	27.14%
Following Too Closely/ACDA	13	18.57%
Other Improper Action	12	17.14%
None	6	8.57%
Not Discernible	5	7.14%
Improper Lane Change	5	7.14%
Failure to Yield	5	7.14%
Wrong Way	1	1.43%
Improper Turn	1	1.43%
Drove off Road	1	1.43%
Improper Crossing	1	1.43%
Swerving to Avoid	1	1.43%
Grand Total	70	100.00%

Unit 1 Object Struck	Crashes	%
Nothing Struck	64	91.43%
Utility Pole	4	5.71%
Fence	1	1.43%
Light/Luminaries Support	1	1.43%
Grand Total	70	100.00%

Unit 1 Traffic Control	Crashes	%
Signal	49	70.00%
No Control	21	30.00%
Grand Total	70	100.00%

Unit 1 Posted Speed	Crashes	%
0	10	14.29%
25	10	14.29%
30	1	1.43%
35	49	70.00%
Grand Total	70	100.00%

Unit 1 Direction From	Crashes	%
West	34	48.57%
East	20	28.57%
South	14	20.00%
North	1	1.43%
Unknown	1	1.43%
Grand Total	70	100.00%

Unit 1 Direction To	Crashes	%
East	29	41.43%
North	20	28.57%
West	19	27.14%
Unknown	1	1.43%
South	1	1.43%
Grand Total	70	100.00%

Livingston Ave at Kelton Ave

Crash Summary Sheet

Unit 1 Summary

Unit 1 Type	Crashes	%
Passenger Car	42	60.00%
Sport Utility Vehicle	11	15.71%
Pick up	6	8.57%
Unknown or Hit/Skip	4	5.71%
Passenger Van (minivan)	3	4.29%
Cargo Van	2	2.86%
Heavy Equipment	1	1.43%
Bicycle	1	1.43%
Grand Total	70	100.00%

Unit 1 Special Function	Crashes	%
None	66	94.29%
Other / Unknown	3	4.29%
Fire	1	1.43%
Grand Total	70	100.00%

Livingston Ave at Kelton Ave
Crash Summary Sheet

Unit 2 Summary

Unit 2 Pre-Crash Action	Crashes	%
Straight Ahead	43	61.43%
Slowing or Stopped In Traffic	15	21.43%
Parked	3	4.29%
	3	4.29%
Making Right Turn	2	2.86%
Other / Unknown	2	2.86%
Walking, Running, Jogging, Playing	1	1.43%
Making Left Turn	1	1.43%
Grand Total	70	100.00%

Unit 2 Contributing Factor	Crashes	%
None	60	85.71%
	3	4.29%
Not Discernible	3	4.29%
Other Improper Action	2	2.86%
Following Too Closely/ACDA	1	1.43%
Ran Red Light	1	1.43%
Grand Total	70	100.00%

Unit 2 Direction From	Crashes	%
	3	4.29%
East	20	28.57%
South	25	35.71%
West	22	31.43%
Grand Total	70	100.00%

Unit 2 Direction To	Crashes	%
	3	4.29%
East	20	28.57%
North	29	41.43%
West	18	25.71%
Grand Total	70	100.00%

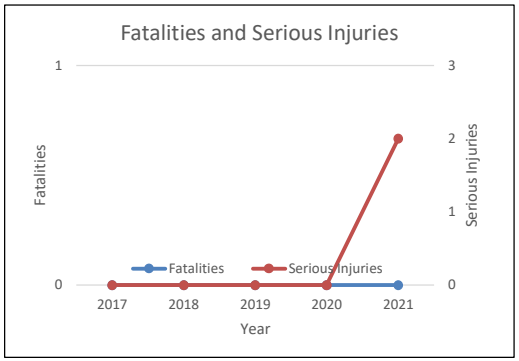
Unit 2 Type	Crashes	%
Passenger Car	44	62.86%
Sport Utility Vehicle	15	21.43%
	3	4.29%
Pick up	2	2.86%
Bus (16+ Passengers)	1	1.43%
Passenger Van (minivan)	1	1.43%
Unknown or Hit/Skip	1	1.43%
Cargo Van	1	1.43%
Bicycle	1	1.43%
Motorcycle 2 Wheeled	1	1.43%
Grand Total	70	100.00%

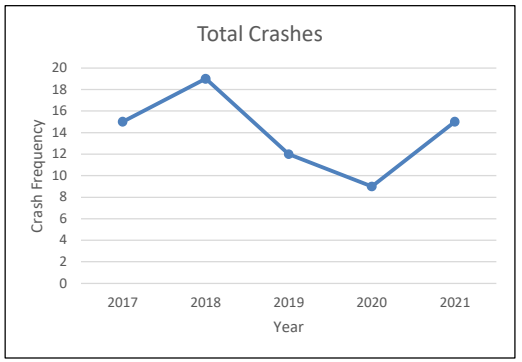
Unit 2 Special Function	Crashes	%
None	63	90.00%
	3	4.29%
Taxi	1	1.43%
School Transport	1	1.43%
Public Utility	1	1.43%
Other / Unknown	1	1.43%
Grand Total	70	100.00%

Livingston Ave at Kelton Ave
Crash Summary Sheet

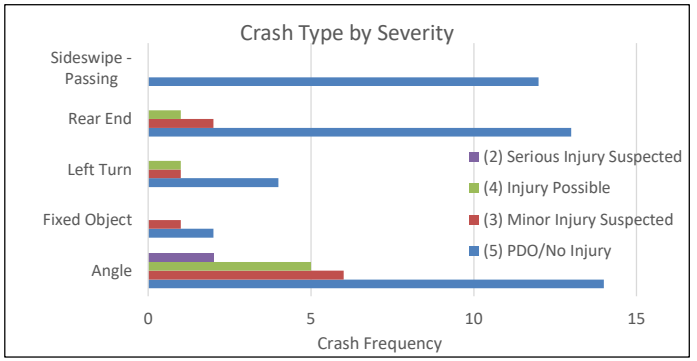
Crashes Per Year	14.00	Percent Injury	32.9%	EPDO	3.69

Year	Total Crashes	Fatalities	Serious Injuries
2017	15	0	0
2018	19	0	0
2019	12	0	0
2020	9	0	0
2021	15	0	2
Grand Total	70	0	2





Total Crashes Crash Type	Injury Level (2) Serious Inju	(3) Minor Injury	(4) Injury Possi	(5) PDO/No Inj	Grand Total
Angle	2	6	5	14	27
Rear End	0	2	1	13	16
Sideswipe - Passing	0	0	0	12	12
Left Turn	0	1	1	4	6
Fixed Object	0	1	0	2	3
Pedalcycles	0	2	0	0	2
Parked Vehicle	0	0	1	1	2
Head On	0	1	0	0	1
Sideswipe - Meeting	0	0	0	1	1
Grand Total	2	13	8	47	70



Livingston Ave at Kelton Ave
Crash Summary Sheet

Crashes Per Year	14.00	Percent Injury	32.9%	EPDO	3.69

Road Condition	Total Crashes	Fatalities	Serious Injuries
Dry	57	0	2
Ice	1	0	0
Snow	1	0	0
Wet	10	0	0
Other / Unknown	1	0	0
Grand Total	70	0	2

Weather	Total Crashes	Fatalities	Serious Injuries
Clear	56	0	2
Rain	7	0	0
Cloudy	6	0	0
Snow	1	0	0
Grand Total	70	0	2

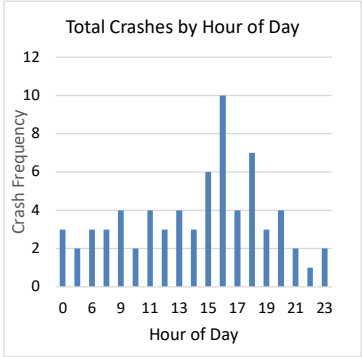
Crash Location	Total Crashes	Fatalities	Serious Injuries
5 Or More Point Intersection	3	0	0
Four-Way Intersection	34	0	2
Not An Intersection	20	0	0
T-Intersection	13	0	0
Grand Total	70	0	2

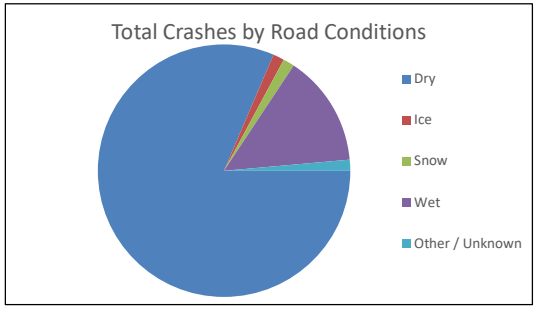
Roadway Contour	Total Crashes	Fatalities	Serious Injuries
Straight Level	70	0	2
Grand Total	70	0	2

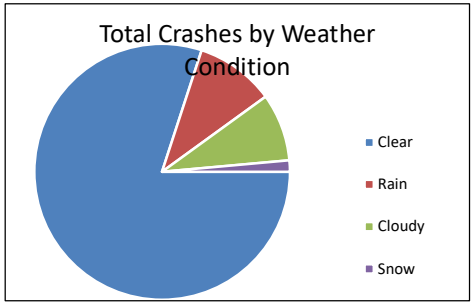
Hour of Day	Total Crashes
0	3
2	2
6	3
8	3
9	4
10	2
11	4
12	3
13	4
14	3
15	6
16	10
17	4
18	7
19	3
20	4
21	2
22	1
23	2
Grand Total	70

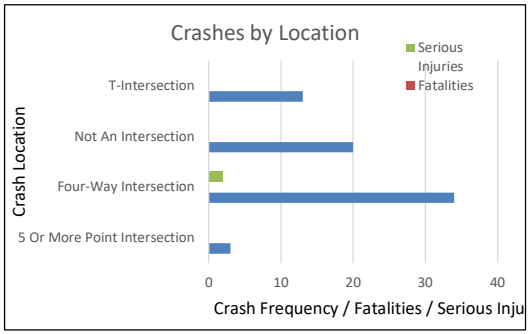
Month	Total Crashes
January	4
February	6
March	9
April	7
May	3
June	9
July	5
August	10
September	2
October	5
November	7
December	3
Grand Total	70

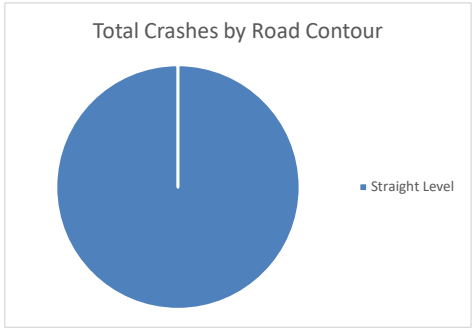
Day in Week	Total Crashes
(1) Sunday	12
(2) Monday	13
(3) Tuesday	14
(4) Wednesday	8
(5) Thursday	7
(6) Friday	9
(7) Saturday	7
Grand Total	70











Livingston Ave at Kelton Ave

Unit 1 Crash Summary

Type of Unit	Total Crashes	Fatalities	Serious Injuries
Passenger Car	42	0	1
Sport Utility Vehicle	11	0	1
Pick up	6	0	0
Unknown or Hit/Skip	4	0	0
Passenger Van (minivan)	3	0	0
Cargo Van	2	0	0
Heavy Equipment	1	0	0
Bicycle	1	0	0
Grand Total	70	0	2

Special Function	Total Crashes	Fatalities	Serious Injuries
None	66	0	2
Other / Unknown	3	0	0
Fire	1	0	0
Grand Total	70	0	2

Pre-Crash Action	Total Crashes	Fatalities	Serious Injuries
Straight Ahead	47	0	1
Other / Unknown	5	0	1
Making Left Turn	5	0	0
Overtaking/Passing	3	0	0
Changing Lanes	3	0	0
Data Not Valid or Not Provided	2	0	0
Leaving Traffic Lane	2	0	0
Entering or Crossing Specified Location	1	0	0
Slowing or Stopped In Traffic	1	0	0
Making Right Turn	1	0	0
Grand Total	70	0	2

Livingston Ave at Kelton Ave

Unit 1 Crash Summary

Gender	Total Crashes	Fatalities	Serious Injuries
Male	31	0	0
Unknown	20	0	1
Female	19	0	1
Grand Total	70	0	2

Driver Age	Total Crashes	Fatalities	Serious Injuries
<15	32	0	1
15-19	2	0	0
20-24	6	0	0
25-29	4	0	0
30-34	6	0	1
35-39	3	0	0
40-44	5	0	0
45-49	1	0	0
55-59	5	0	0
60-64	3	0	0
65-69	1	0	0
70-74	1	0	0
85-90	1	0	0
Grand Total	70	0	2

Livingston Ave at Kelton Ave

Unit 1 Crash Summary

Traffic Control	Total Crashes	Fatalities	Serious Injuries
Signal	49	0	1
No Control	21	0	1
Grand Total	70	0	2

Object Struck	Total Crashes	Fatalities	Serious Injuries
Utility Pole	4	0	0
Fence	1	0	0
Light/Luminaries Support	1	0	0
Grand Total	6	0	0

Contributing Circumstances	Total Crashes	Fatalities	Serious Injuries
Ran Red Light	19	0	1
Following Too Closely/ACDA	13	0	0
Other Improper Action	12	0	0
None	6	0	1
Not Discernible	5	0	0
Improper Lane Change	5	0	0
Failure to Yield	5	0	0
Wrong Way	1	0	0
Drove off Road	1	0	0
Improper Turn	1	0	0
Improper Crossing	1	0	0
Swerving to Avoid	1	0	0
Grand Total	70	0	2

Livingston Ave at Kelton Ave

Unit 1 Crash Summary

Alcohol Involved	Total Crashes	Fatalities	Serious Injuries
No	70	0	2
Grand Total	70	0	2

Distracted By	Total Crashes	Fatalities	Serious Injuries
Not Distracted	52	0	1
Other / Unknown	16	0	1
Other distraction outside the vehicle	1	0	0
Manually operating an electronic commun	1	0	0
Grand Total	70	0	2

Non-Motorist Location	Total Crashes	Fatalities	Serious Injuries
Sidewalk	1	0	0
Grand Total	1	0	0

Estimated Speed	Total Crashes	Fatalities	Serious Injuries
<15	32	0	1
15-19	3	0	0
20-24	3	0	0
25-29	10	0	0
30-34	5	0	0
35-39	15	0	1
40-44	1	0	0
50-54	1	0	0
Grand Total	70	0	2

Relative Severity Index Calculation

ODOT District	6
Urban Area	Yes
Freeway	No

Fill in the Number of Crashes by Crash Type

Crash Type	Number of Crashes	Crash Type Severity Calc	RSI Multiplier
Unknown	0	$0	26,018.00
Head On	1	$80,739	80,739.00
Rear End	16	$392,880	24,555.00
Backing	0	$0	10,808.00
Sideswipe - Meeting	1	$26,746	26,746.00
Sideswipe - Passing	12	$213,996	17,833.00
Angle	27	$1,009,017	37,371.00
Parked Vehicle	2	$32,016	16,008.00
Pedestrian	0	$0	144,798.00
Animal	0	$0	12,427.00
Train	0	$0	60,693.00
Pedalcycles	2	$187,290	93,645.00
Other Non-Vehicle	0	$0	190,625.00
Fixed Object	3	$112,866	37,622.00
Other Object	0	$0	17,835.00
Overturning	0	$0	106,003.00
Other Non-Collision	0	$0	36,805.00
Left Turn	6	$239,712	39,952.00
Right Turn	0	$0	20,962.00
Totals	**70**	**$2,295,262**	

RSI Value = 32,789.46

Livingston Ave at Kelton Ave

Begin Year	2017	End Year	2021	*(Available Years: 2017-2021)*
Select Authority:		**All**		

Total Crashes	
Crashes	70
Fatalities	0
Serious Injuries	2

Non-Intersection	
Crashes	13
Fatalities	0
Serious Injuries	0

Intersection	
Crashes	57
Fatalities	0
Serious Injuries	2

Roadway Departure	
Crashes	4
Fatalities	0
Serious Injuries	0

Other	
Crashes	9
Fatalities	0
Serious Injuries	0

Signalized	
Crashes	49
Fatalities	0
Serious Injuries	1

Unsignalized	
Crashes	0
Fatalities	0
Serious Injuries	0

Other	
Crashes	8
Fatalities	0
Serious Injuries	1

Crash Types	
Rank 1	
Parked Vehicle	
Crashes	2
Fatalities	0
Serious Injuries	0
Rank 2	
Fixed Object	
Crashes	1
Fatalities	0
Serious Injuries	0
Rank 3	
Sideswipe - Meeting	
Crashes	1
Fatalities	0
Serious Injuries	0

Crash Types	
Rank 1	
Rear End	
Crashes	5
Fatalities	0
Serious Injuries	0
Rank 2	
Sideswipe - Passing	
Crashes	2
Fatalities	0
Serious Injuries	0
Rank 3	
Left Turn	
Crashes	1
Fatalities	0
Serious Injuries	0

Crash Types	
Rank 1	
Angle	
Crashes	24
Fatalities	0
Serious Injuries	1
Rank 2	
Rear End	
Crashes	10
Fatalities	0
Serious Injuries	0
Rank 3	
Sideswipe - Passing	
Crashes	7
Fatalities	0
Serious Injuries	0

Crash Types	
Rank 1	
Rear End	
Crashes	0
Fatalities	0
Serious Injuries	0
Rank 2	
Fixed Object	
Crashes	0
Fatalities	0
Serious Injuries	0
Rank 3	
Sideswipe - Passing	
Crashes	0
Fatalities	0
Serious Injuries	0

Crash Types	
Rank 1	
Sideswipe - Passing	
Crashes	3
Fatalities	0
Serious Injuries	0
Rank 2	
Angle	
Crashes	2
Fatalities	0
Serious Injuries	1
Rank 3	
Rear End	
Crashes	1
Fatalities	0
Serious Injuries	0

Livingston Ave at Miller Ave

Crash Summary Sheet

Fatalities	0
Serious Injuries	1
Other Injuries	55

Crashes Per Year	14.40
Fatal and All Injury Crashes	35
Percent Injury	48.6%
Equivalent PDO Index Value	4.03

Crash Severity	Crashes	%
(2) Serious Injury Suspected	1	1.39%
(3) Minor Injury Suspected	27	37.50%
(4) Injury Possible	7	9.72%
(5) PDO/No Injury	37	51.39%
Grand Total	72	100.00%

Year	Crashes	%
2017	15	20.83%
2018	11	15.28%
2019	16	22.22%
2020	11	15.28%
2021	19	26.39%
Grand Total	72	100.00%

Day of Week	Crashes	%
(1) Sunday	14	19.44%
(2) Monday	9	12.50%
(3) Tuesday	6	8.33%
(4) Wednesday	13	18.06%
(5) Thursday	14	19.44%
(6) Friday	10	13.89%
(7) Saturday	6	8.33%
Grand Total	72	100.00%

Crash Type	Crashes	%
Angle	24	33.33%
Rear End	13	18.06%
Left Turn	11	15.28%
Sideswipe - Passing	9	12.50%
Right Turn	6	8.33%
Backing	3	4.17%
Parked Vehicle	2	2.78%
Pedalcycles	1	1.39%
Head On	1	1.39%
Pedestrian	1	1.39%
Fixed Object	1	1.39%
Grand Total	72	100.00%

Hour of Day	Crashes	%
0	4	5.56%
1	4	5.56%
7	1	1.39%
8	5	6.94%
9	1	1.39%
10	6	8.33%
11	2	2.78%
12	5	6.94%
13	5	6.94%
14	4	5.56%
15	5	6.94%
16	7	9.72%
17	5	6.94%
18	6	8.33%
19	2	2.78%
20	2	2.78%
21	3	4.17%
22	4	5.56%
23	1	1.39%
Grand Total	72	100.00%

Month	Crashes	%
1	4	5.56%
2	3	4.17%
3	9	12.50%
4	7	9.72%
5	2	2.78%
6	7	9.72%
7	8	11.11%
8	5	6.94%
9	6	8.33%
10	11	15.28%
11	3	4.17%
12	7	9.72%
Grand Total	72	100.00%

Livingston Ave at Miller Ave

Crash Summary Sheet

Weather Condition	Crashes	%
Clear	49	68.06%
Cloudy	14	19.44%
Rain	8	11.11%
Unknown	1	1.39%
Grand Total	72	100.00%

Road Condition	Crashes	%
Dry	63	87.50%
Wet	9	12.50%
Grand Total	72	100.00%

Light Condition	Crashes	%
Daylight	50	69.44%
Dark - Lighted Roadway	19	26.39%
Dawn/Dusk	2	2.78%
Dark - Unknown Roadway Lighting	1	1.39%
Grand Total	72	100.00%

Number of Units	Crashes	%
2	63	87.50%
3	7	9.72%
4	1	1.39%
1	1	1.39%
Grand Total	72	100.00%

ODOT Location	Crashes	%
T-Intersection	32	44.44%
Not An Intersection	31	43.06%
5 Or More Point Intersection	5	6.94%
Four-Way Intersection	3	4.17%
Driveway/Alley Access	1	1.39%
Grand Total	72	100.00%

Work Zone Related	Crashes	%
No	72	100.00%
Grand Total	72	100.00%

Alcohol Related	Crashes	%
No	71	98.61%
Yes	1	1.39%
Grand Total	72	100.00%

Drug Related (Inc. Marijuana)	Crashes	%
No	71	98.61%
Yes	1	1.39%
Grand Total	72	100.00%

Contour	Crashes	%
Straight Level	72	100.00%
Grand Total	72	100.00%

Marijuana Related	Crashes	%
No	72	100.00%
Grand Total	72	100.00%

Roadway Departure	Crashes	%
No	66	91.67%
Yes	6	8.33%
Grand Total	72	100.00%

Older Driver (65+)	Crashes	%
No	65	90.28%
Yes	7	9.72%
Grand Total	72	100.00%

Intersection Related	Crashes	%
Yes	59	81.94%
No	13	18.06%
Grand Total	72	100.00%

Young Driver (15-25)	Crashes	%
No	48	66.67%
Yes	24	33.33%
Grand Total	72	100.00%

Speed Related	Crashes	%
No	67	93.06%
Yes	5	6.94%
Grand Total	72	100.00%

Motorcycle Involved	Crashes	%
No	72	100.00%
Grand Total	72	100.00%

Livingston Ave at Miller Ave

Crash Summary Sheet

Unit 1 Summary

Unit 1 Pre-Crash Action	Crashes	%
Straight Ahead	39	54.17%
Making Left Turn	14	19.44%
Making Right Turn	6	8.33%
Backing	3	4.17%
Data Not Valid or Not Provided	2	2.78%
Changing Lanes	2	2.78%
Other / Unknown	2	2.78%
Overtaking/Passing	2	2.78%
Walking, Running, Jogging, Playing	1	1.39%
Slowing or Stopped In Traffic	1	1.39%
Grand Total	72	100.00%

Unit 1 Contributing Factor	Crashes	%
Ran Red Light	15	20.83%
Failure to Yield	15	20.83%
Following Too Closely/ACDA	10	13.89%
Other Improper Action	6	8.33%
Improper Lane Change	5	6.94%
Improper Turn	5	6.94%
None	5	6.94%
Improper Backing	3	4.17%
Not Discernible	3	4.17%
Left of Center	3	4.17%
Improper Crossing	1	1.39%
Ran Stop Sign	1	1.39%
Grand Total	72	100.00%

Unit 1 Object Struck	Crashes	%
Nothing Struck	71	98.61%
Tree	1	1.39%
Grand Total	72	100.00%

Unit 1 Traffic Control	Crashes	%
Signal	36	50.00%
No Control	30	41.67%
Stop Sign	5	6.94%
Flasher	1	1.39%
Grand Total	72	100.00%

Unit 1 Posted Speed	Crashes	%
0	11	15.28%
15	2	2.78%
25	16	22.22%
35	43	59.72%
Grand Total	72	100.00%

Unit 1 Direction From	Crashes	%
East	34	47.22%
North	21	29.17%
West	10	13.89%
South	7	9.72%
Grand Total	72	100.00%

Unit 1 Direction To	Crashes	%
West	29	40.28%
South	25	34.72%
East	11	15.28%
North	5	6.94%
Southeast	1	1.39%
Northeast	1	1.39%
Grand Total	72	100.00%

Livingston Ave at Miller Ave

Crash Summary Sheet

Unit 1 Summary

Unit 1 Type	Crashes	%
Passenger Car	40	55.56%
Sport Utility Vehicle	15	20.83%
Pick up	5	6.94%
Passenger Van (minivan)	4	5.56%
Semi-Tractor	2	2.78%
Unknown or Hit/Skip	2	2.78%
Cargo Van	1	1.39%
Pedestrian/Skater	1	1.39%
Bus (16+ Passengers)	1	1.39%
Other Vehicle	1	1.39%
Grand Total	72	100.00%

Unit 1 Special Function	Crashes	%
None	69	95.83%
Towing	1	1.39%
Bus – Intercity	1	1.39%
Other / Unknown	1	1.39%
Grand Total	72	100.00%

Livingston Ave at Miller Ave
Crash Summary Sheet

Unit 2 Summary

Unit 2 Pre-Crash Action	Crashes	%
Straight Ahead	30	41.67%
Slowing or Stopped In Traffic	15	20.83%
Making Left Turn	14	19.44%
Parked	4	5.56%
Making Right Turn	3	4.17%
	2	2.78%
Walking, Running, Jogging, Playing	1	1.39%
Changing Lanes	1	1.39%
Backing	1	1.39%
Entering Traffic Lane	1	1.39%
Grand Total	72	100.00%

Unit 2 Contributing Factor	Crashes	%
None	64	88.89%
Not Discernible	3	4.17%
Other Improper Action	2	2.78%
	1	1.39%
Improper Backing	1	1.39%
Ran Red Light	1	1.39%
Grand Total	72	100.00%

Unit 2 Direction From	Crashes	%
	1	1.39%
East	12	16.67%
North	33	45.83%
South	3	4.17%
West	23	31.94%
Grand Total	72	100.00%

Unit 2 Direction To	Crashes	%
	1	1.39%
East	37	51.39%
North	2	2.78%
South	18	25.00%
West	14	19.44%
Grand Total	72	100.00%

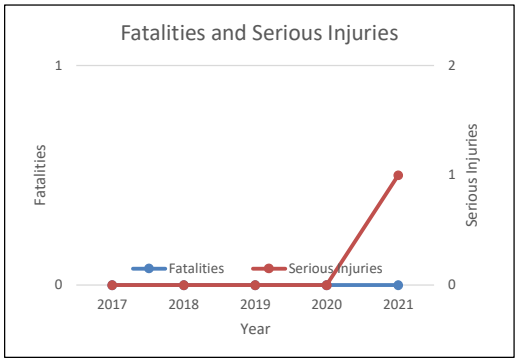
Unit 2 Type	Crashes	%
Passenger Car	46	63.89%
Sport Utility Vehicle	17	23.61%
Pick up	5	6.94%
Passenger Van (minivan)	2	2.78%
Bicycle	1	1.39%
	1	1.39%
Grand Total	72	100.00%

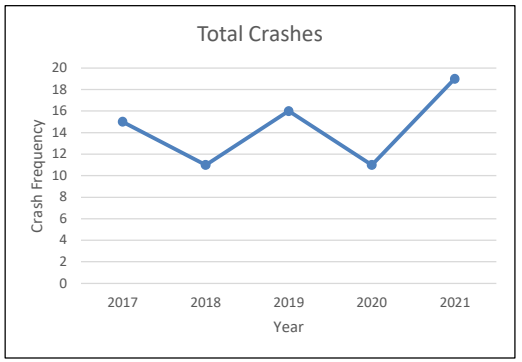
Unit 2 Special Function	Crashes	%
None	67	93.06%
	2	2.78%
Taxi	2	2.78%
Other / Unknown	1	1.39%
Grand Total	72	100.00%

Livingston Ave at Miller Ave
Crash Summary Sheet

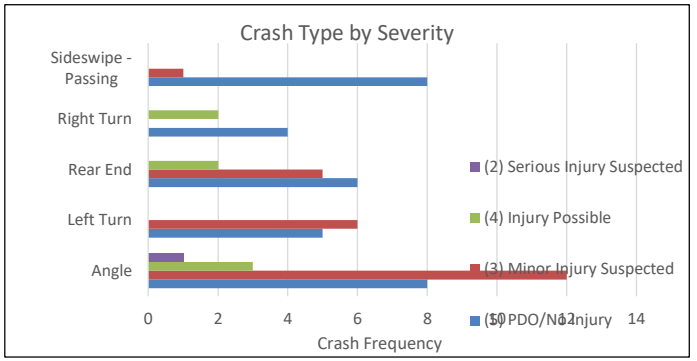
Crashes Per Year	14.40	Percent Injury	48.6%	EPDO	4.03

Year	Total Crashes	Fatalities	Serious Injuries
2017	15	0	0
2018	11	0	0
2019	16	0	0
2020	11	0	0
2021	19	0	1
Grand Total	72	0	1





Total Crashes Crash Type	Injury Level (2) Serious Inju	(3) Minor Injury	(4) Injury Possi	(5) PDO/No Inj	Grand Total
Angle	1	12	3	8	24
Rear End	0	5	2	6	13
Left Turn	0	6	0	5	11
Sideswipe - Passing	0	1	0	8	9
Right Turn	0	0	2	4	6
Backing	0	0	0	3	3
Parked Vehicle	0	1	0	1	2
Pedalcycles	0	1	0	0	1
Head On	0	0	0	1	1
Pedestrian	0	1	0	0	1
Fixed Object	0	0	0	1	1
Grand Total	1	27	7	37	72



Livingston Ave at Miller Ave
Crash Summary Sheet

Crashes Per Year	14.40	Percent Injury	48.6%	EPDO	4.03

Road Condition	Total Crashes	Fatalities	Serious Injuries
Dry	63	0	1
Wet	9	0	0
Grand Total	72	0	1

Weather	Total Crashes	Fatalities	Serious Injuries
Clear	49	0	1
Cloudy	14	0	0
Rain	8	0	0
Unknown	1	0	0
Grand Total	72	0	1

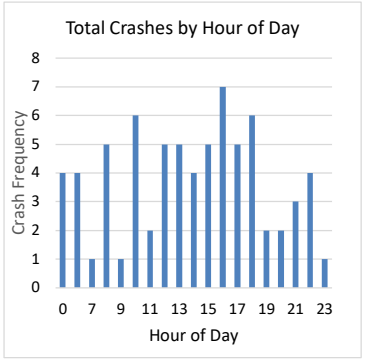
Crash Location	Total Crashes	Fatalities	Serious Injuries
5 Or More Point Intersection	5	0	0
Driveway/Alley Access	1	0	0
Four-Way Intersection	3	0	0
Not An Intersection	31	0	1
T-Intersection	32	0	0
Grand Total	72	0	1

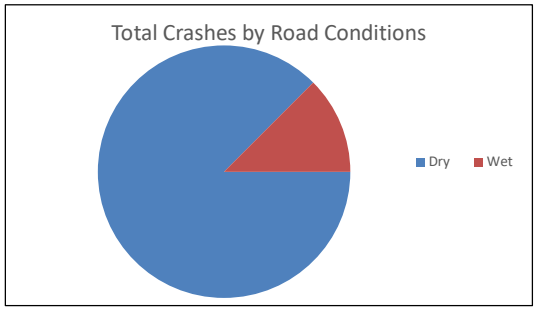
Roadway Contour	Total Crashes	Fatalities	Serious Injuries
Straight Level	72	0	1
Grand Total	72	0	1

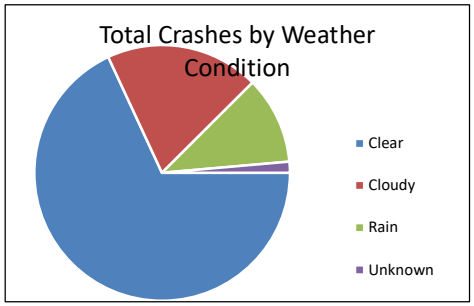
Hour of Day	Total Crashes
0	4
1	4
7	1
8	5
9	1
10	6
11	2
12	5
13	5
14	4
15	5
16	7
17	5
18	6
19	2
20	2
21	3
22	4
23	1
Grand Total	72

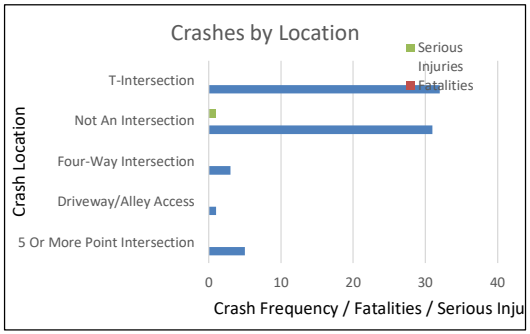
Month	Total Crashes
January	4
February	3
March	9
April	7
May	2
June	7
July	8
August	5
September	6
October	11
November	3
December	7
Grand Total	72

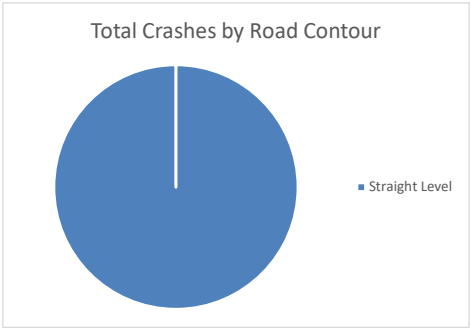
Day in Week	Total Crashes
(1) Sunday	14
(2) Monday	9
(3) Tuesday	6
(4) Wednesday	13
(5) Thursday	14
(6) Friday	10
(7) Saturday	6
Grand Total	72











Livingston Ave at Miller Ave

Unit 1 Crash Summary

Type of Unit	Total Crashes	Fatalities	Serious Injuries
Passenger Car	40	0	1
Sport Utility Vehicle	15	0	0
Pick up	5	0	0
Passenger Van (minivan)	4	0	0
Unknown or Hit/Skip	2	0	0
Semi-Tractor	2	0	0
Bus (16+ Passengers)	1	0	0
Other Vehicle	1	0	0
Pedestrian/Skater	1	0	0
Cargo Van	1	0	0
Grand Total	72	0	1

Special Function	Total Crashes	Fatalities	Serious Injuries
None	69	0	1
Towing	1	0	0
Bus – Intercity	1	0	0
Other / Unknown	1	0	0
Grand Total	72	0	1

Pre-Crash Action	Total Crashes	Fatalities	Serious Injuries
Straight Ahead	39	0	1
Making Left Turn	14	0	0
Making Right Turn	6	0	0
Backing	3	0	0
Other / Unknown	2	0	0
Data Not Valid or Not Provided	2	0	0
Changing Lanes	2	0	0
Overtaking/Passing	2	0	0
Walking, Running, Jogging, Playing	1	0	0
Slowing or Stopped In Traffic	1	0	0
Grand Total	72	0	1

Livingston Ave at Miller Ave

Unit 1 Crash Summary

Gender	Total Crashes	Fatalities	Serious Injuries
Male	35	0	0
Female	23	0	1
Unknown	14	0	0
Grand Total	72	0	1

Driver Age	Total Crashes	Fatalities	Serious Injuries
<15	22	0	0
15-19	3	0	0
20-24	8	0	0
25-29	7	0	0
30-34	8	0	0
35-39	6	0	0
40-44	6	0	0
45-49	3	0	1
50-54	5	0	0
60-64	2	0	0
65-69	2	0	0
Grand Total	72	0	1

Livingston Ave at Miller Ave

Unit 1 Crash Summary

Traffic Control	Total Crashes	Fatalities	Serious Injuries
Signal	36	0	0
No Control	30	0	1
Stop Sign	5	0	0
Flasher	1	0	0
Grand Total	72	0	1

Object Struck	Total Crashes	Fatalities	Serious Injuries
Tree	1	0	0
Grand Total	1	0	0

Contributing Circumstances	Total Crashes	Fatalities	Serious Injuries
Ran Red Light	15	0	0
Failure to Yield	15	0	0
Following Too Closely/ACDA	10	0	0
Other Improper Action	6	0	0
Improper Lane Change	5	0	0
None	5	0	0
Improper Turn	5	0	0
Not Discernible	3	0	0
Improper Backing	3	0	0
Left of Center	3	0	1
Improper Crossing	1	0	0
Ran Stop Sign	1	0	0
Grand Total	72	0	1

Livingston Ave at Miller Ave
Unit 1 Crash Summary

Alcohol Involved	Total Crashes	Fatalities	Serious Injuries
No	71	0	1
Yes	1	0	0
Grand Total	72	0	1

Distracted By	Total Crashes	Fatalities	Serious Injuries
Not Distracted	57	0	1
Other / Unknown	14	0	0
Other distraction inside the vehicle	1	0	0
Grand Total	72	0	1

Non-Motorist Location	Total Crashes	Fatalities	Serious Injuries
Grand Total	0	0	0

Estimated Speed	Total Crashes	Fatalities	Serious Injuries
<15	42	0	0
15-19	1	0	0
20-24	5	0	0
25-29	7	0	0
30-34	3	0	1
35-39	12	0	0
40-44	1	0	0
50-54	1	0	0
Grand Total	72	0	1

Relative Severity Index Calculation

ODOT District	6
Urban Area	Yes
Freeway	No

Fill in the Number of Crashes by Crash Type

Crash Type	Number of Crashes	Crash Type Severity Calc	RSI Multiplier
Unknown	0	$0	26,018.00
Head On	1	$80,739	80,739.00
Rear End	13	$319,215	24,555.00
Backing	3	$32,424	10,808.00
Sideswipe - Meeting	0	$0	26,746.00
Sideswipe - Passing	9	$160,497	17,833.00
Angle	24	$896,904	37,371.00
Parked Vehicle	2	$32,016	16,008.00
Pedestrian	1	$144,798	144,798.00
Animal	0	$0	12,427.00
Train	0	$0	60,693.00
Pedalcycles	1	$93,645	93,645.00
Other Non-Vehicle	0	$0	190,625.00
Fixed Object	1	$37,622	37,622.00
Other Object	0	$0	17,835.00
Overturning	0	$0	106,003.00
Other Non-Collision	0	$0	36,805.00
Left Turn	11	$439,472	39,952.00
Right Turn	6	$125,772	20,962.00
Totals	**72**	**$2,363,104**	

RSI Value = 32,820.89

Livingston Ave at Miller Ave

Begin Year	2017	End Year	2021	*(Available Years: 2017-2021)*
Select Authority:		**All**		

Total Crashes	
Crashes	72
Fatalities	0
Serious Injuries	1

Non-Intersection	
Crashes	13
Fatalities	0
Serious Injuries	1

Intersection	
Crashes	59
Fatalities	0
Serious Injuries	0

Roadway Departure	
Crashes	3
Fatalities	0
Serious Injuries	1

Crash Types	
Rank 1	
Parked Vehicle	
Crashes	2
Fatalities	0
Serious Injuries	0
Rank 2	
Angle	
Crashes	1
Fatalities	0
Serious Injuries	1
Rank 3	
Rear End	
Crashes	0
Fatalities	0
Serious Injuries	0

Other	
Crashes	10
Fatalities	0
Serious Injuries	0

Crash Types	
Rank 1	
Sideswipe - Passing	
Crashes	3
Fatalities	0
Serious Injuries	0
Rank 2	
Rear End	
Crashes	2
Fatalities	0
Serious Injuries	0
Rank 3	
Angle	
Crashes	2
Fatalities	0
Serious Injuries	0

Signalized	
Crashes	36
Fatalities	0
Serious Injuries	0

Crash Types	
Rank 1	
Angle	
Crashes	17
Fatalities	0
Serious Injuries	0
Rank 2	
Rear End	
Crashes	9
Fatalities	0
Serious Injuries	0
Rank 3	
Sideswipe - Passing	
Crashes	4
Fatalities	0
Serious Injuries	0

Unsignalized	
Crashes	6
Fatalities	0
Serious Injuries	0

Crash Types	
Rank 1	
Rear End	
Crashes	1
Fatalities	0
Serious Injuries	0
Rank 2	
Fixed Object	
Crashes	1
Fatalities	0
Serious Injuries	0
Rank 3	
Left Turn	
Crashes	1
Fatalities	0
Serious Injuries	0

Other	
Crashes	17
Fatalities	0
Serious Injuries	0

Crash Types	
Rank 1	
Left Turn	
Crashes	9
Fatalities	0
Serious Injuries	0
Rank 2	
Angle	
Crashes	3
Fatalities	0
Serious Injuries	0
Rank 3	
Sideswipe - Passing	
Crashes	2
Fatalities	0
Serious Injuries	0

Livingston Ave at Nelson Rd

Crash Summary Sheet

Fatalities	1
Serious Injuries	3
Other Injuries	23

Crashes Per Year	15.40
Fatal and All Injury Crashes	19
Percent Injury	24.7%
Equivalent PDO Index Value	3.74

Crash Severity	Crashes	%
(1) Fatal	1	1.30%
(2) Serious Injury Suspected	2	2.60%
(3) Minor Injury Suspected	11	14.29%
(4) Injury Possible	5	6.49%
(5) PDO/No Injury	58	75.32%
Grand Total	77	100.00%

Year	Crashes	%
2017	18	23.38%
2018	16	20.78%
2019	21	27.27%
2020	14	18.18%
2021	8	10.39%
Grand Total	77	100.00%

Day of Week	Crashes	%
(1) Sunday	8	10.39%
(2) Monday	9	11.69%
(3) Tuesday	15	19.48%
(4) Wednesday	14	18.18%
(5) Thursday	13	16.88%
(6) Friday	7	9.09%
(7) Saturday	11	14.29%
Grand Total	77	100.00%

Crash Type	Crashes	%
Sideswipe - Passing	27	35.06%
Rear End	20	25.97%
Angle	8	10.39%
Left Turn	8	10.39%
Fixed Object	7	9.09%
Right Turn	3	3.90%
Other Non-Collision	3	3.90%
Parked Vehicle	1	1.30%
Grand Total	77	100.00%

Hour of Day	Crashes	%
0	1	1.30%
1	1	1.30%
2	1	1.30%
3	1	1.30%
5	1	1.30%
6	2	2.60%
7	1	1.30%
8	1	1.30%
9	6	7.79%
10	1	1.30%
11	6	7.79%
12	5	6.49%
13	5	6.49%
14	10	12.99%
15	7	9.09%
16	6	7.79%
17	6	7.79%
18	4	5.19%
19	4	5.19%
20	3	3.90%
21	1	1.30%
22	3	3.90%
23	1	1.30%
Grand Total	77	100.00%

Month	Crashes	%
1	6	7.79%
2	7	9.09%
3	7	9.09%
4	8	10.39%
5	6	7.79%
6	7	9.09%
7	1	1.30%
8	9	11.69%
9	7	9.09%
10	8	10.39%
11	7	9.09%
12	4	5.19%
Grand Total	77	100.00%

Livingston Ave at Nelson Rd

Crash Summary Sheet

Weather Condition	Crashes	%
Clear	50	64.94%
Cloudy	19	24.68%
Rain	7	9.09%
Snow	1	1.30%
Grand Total	77	100.00%

Road Condition	Crashes	%
Dry	63	81.82%
Wet	13	16.88%
Ice	1	1.30%
Grand Total	77	100.00%

Light Condition	Crashes	%
Daylight	57	74.03%
Dark - Lighted Roadway	17	22.08%
Dawn/Dusk	3	3.90%
Grand Total	77	100.00%

Number of Units	Crashes	%
2	61	79.22%
1	10	12.99%
3	5	6.49%
4	1	1.30%
Grand Total	77	100.00%

ODOT Location	Crashes	%
Not An Intersection	48	62.34%
T-Intersection	27	35.06%
Four-Way Intersection	2	2.60%
Grand Total	77	100.00%

Work Zone Related	Crashes	%
No	77	100.00%
Grand Total	77	100.00%

Alcohol Related	Crashes	%
No	73	94.81%
Yes	4	5.19%
Grand Total	77	100.00%

Drug Related (Inc. Marijuana)	Crashes	%
No	76	98.70%
Yes	1	1.30%
Grand Total	77	100.00%

Contour	Crashes	%
Straight Grade	1	1.30%
Straight Level	76	98.70%
Grand Total	77	100.00%

Marijuana Related	Crashes	%
No	77	100.00%
Grand Total	77	100.00%

Roadway Departure	Crashes	%
No	65	84.42%
Yes	12	15.58%
Grand Total	77	100.00%

Older Driver (65+)	Crashes	%
No	71	92.21%
Yes	6	7.79%
Grand Total	77	100.00%

Intersection Related	Crashes	%
Yes	52	67.53%
No	25	32.47%
Grand Total	77	100.00%

Young Driver (15-25)	Crashes	%
No	52	67.53%
Yes	25	32.47%
Grand Total	77	100.00%

Speed Related	Crashes	%
No	71	92.21%
Yes	6	7.79%
Grand Total	77	100.00%

Motorcycle Involved	Crashes	%
No	74	96.10%
Yes	3	3.90%
Grand Total	77	100.00%

Livingston Ave at Nelson Rd

Crash Summary Sheet

Unit 1 Summary

Unit 1 Pre-Crash Action	Crashes	%
Straight Ahead	44	57.14%
Changing Lanes	10	12.99%
Making Left Turn	8	10.39%
Making Right Turn	5	6.49%
Slowing or Stopped In Traffic	3	3.90%
Data Not Valid or Not Provided	2	2.60%
Other / Unknown	2	2.60%
Parked	1	1.30%
Entering Traffic Lane	1	1.30%
Overtaking/Passing	1	1.30%
Grand Total	77	100.00%

Unit 1 Contributing Factor	Crashes	%
Following Too Closely/ACDA	21	27.27%
Other Improper Action	13	16.88%
Improper Lane Change	12	15.58%
Failure to Yield	8	10.39%
None	8	10.39%
Not Discernible	5	6.49%
Ran Red Light	3	3.90%
Improper Turn	2	2.60%
Drove off Road	2	2.60%
Stopped or Parked Illegally	1	1.30%
Improper Passing	1	1.30%
Left of Center	1	1.30%
Grand Total	77	100.00%

Unit 1 Object Struck	Crashes	%
Nothing Struck	67	87.01%
Utility Pole	6	7.79%
Light/Luminaries Support	2	2.60%
Other Post, Pole Or Support	1	1.30%
Other / Unknown	1	1.30%
Grand Total	77	100.00%

Unit 1 Traffic Control	Crashes	%
Signal	40	51.95%
No Control	37	48.05%
Grand Total	77	100.00%

Unit 1 Posted Speed	Crashes	%
0	8	10.39%
25	4	5.19%
35	63	81.82%
40	1	1.30%
70	1	1.30%
Grand Total	77	100.00%

Unit 1 Direction From	Crashes	%
West	34	44.16%
East	28	36.36%
North	10	12.99%
South	4	5.19%
Unknown	1	1.30%
Grand Total	77	100.00%

Unit 1 Direction To	Crashes	%
East	29	37.66%
West	28	36.36%
North	10	12.99%
South	7	9.09%
Southeast	1	1.30%
Northeast	1	1.30%
Unknown	1	1.30%
Grand Total	77	100.00%

Livingston Ave at Nelson Rd

Crash Summary Sheet

Unit 1 Summary

Unit 1 Type	Crashes	%
Passenger Car	37	48.05%
Sport Utility Vehicle	21	27.27%
Pick up	6	7.79%
Cargo Van	3	3.90%
Unknown or Hit/Skip	2	2.60%
Motorcycle 2 Wheeled	2	2.60%
Bus (16+ Passengers)	2	2.60%
Other Vehicle	2	2.60%
Single Unit Truck	1	1.30%
Heavy Equipment	1	1.30%
Grand Total	77	100.00%

Unit 1 Special Function	Crashes	%
None	69	89.61%
Other / Unknown	3	3.90%
School Transport	2	2.60%
Taxi	2	2.60%
Police	1	1.30%
Grand Total	77	100.00%

Livingston Ave at Nelson Rd
Crash Summary Sheet

Unit 2 Summary

Unit 2 Pre-Crash Action	Crashes	%
Straight Ahead	36	46.75%
Slowing or Stopped In Traffic	25	32.47%
	10	12.99%
Making Left Turn	4	5.19%
Other / Unknown	1	1.30%
Making Right Turn	1	1.30%
Grand Total	77	100.00%

Unit 2 Contributing Factor	Crashes	%
None	60	77.92%
	10	12.99%
Not Discernible	3	3.90%
Other Improper Action	2	2.60%
Left of Center	1	1.30%
Swerving to Avoid	1	1.30%
Grand Total	77	100.00%

Unit 2 Direction From	Crashes	%
	10	12.99%
East	24	31.17%
North	8	10.39%
Unknown	1	1.30%
West	34	44.16%
Grand Total	77	100.00%

Unit 2 Direction To	Crashes	%
	10	12.99%
East	35	45.45%
North	3	3.90%
South	6	7.79%
West	23	29.87%
Grand Total	77	100.00%

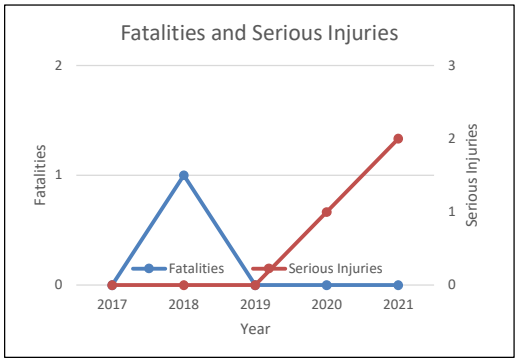
Unit 2 Type	Crashes	%
Passenger Car	35	45.45%
Sport Utility Vehicle	12	15.58%
	10	12.99%
Pick up	8	10.39%
Bus (16+ Passengers)	3	3.90%
Cargo Van	2	2.60%
Other Vehicle	2	2.60%
Van (9-15 Seats)	2	2.60%
Single Unit Truck	1	1.30%
Motorcycle 2 Wheeled	1	1.30%
Passenger Van (minivan)	1	1.30%
Grand Total	77	100.00%

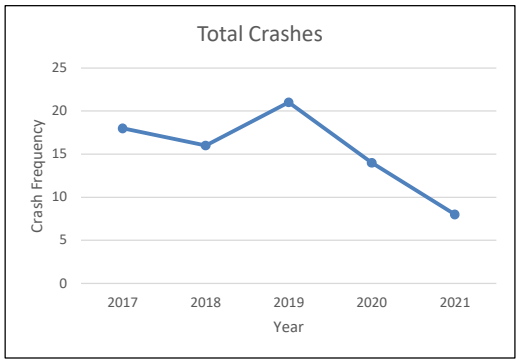
Unit 2 Special Function	Crashes	%
None	57	74.03%
	11	14.29%
Bus – Transit/Commuter	4	5.19%
Public Utility	2	2.60%
Police	1	1.30%
Ambulance	1	1.30%
Other / Unknown	1	1.30%
Grand Total	77	100.00%

Livingston Ave at Nelson Rd
Crash Summary Sheet

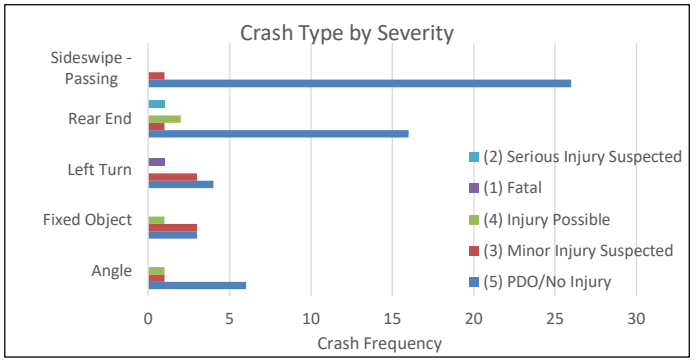
Crashes Per Year	15.40	Percent Injury	24.7%	EPDO	3.74

Year	Total Crashes	Fatalities	Serious Injuries
2017	18	0	0
2018	16	1	0
2019	21	0	0
2020	14	0	1
2021	8	0	2
Grand Total	77	1	3





Total Crashes Crash Type	Injury Level (1) Fatal	(2) Serious Inju	(3) Minor Injury	(4) Injury Possi	(5) PDO/No Inj	Grand Total
Sideswipe - Passing	0	0	1	0	26	27
Rear End	0	1	1	2	16	20
Angle	0	0	1	1	6	8
Left Turn	1	0	3	0	4	8
Fixed Object	0	0	3	1	3	7
Right Turn	0	0	0	0	3	3
Other Non-Collision	0	1	1	1	0	3
Parked Vehicle	0	0	1	0	0	1
Grand Total	1	2	11	5	58	77



Livingston Ave at Nelson Rd
Crash Summary Sheet

Crashes Per Year	15.40	Percent Injury	24.7%	EPDO	3.74

Road Condition	Total Crashes	Fatalities	Serious Injuries
Dry	63	1	3
Ice	1	0	0
Wet	13	0	0
Grand Total	77	1	3

Weather	Total Crashes	Fatalities	Serious Injuries
Clear	50	0	2
Cloudy	19	1	1
Rain	7	0	0
Snow	1	0	0
Grand Total	77	1	3

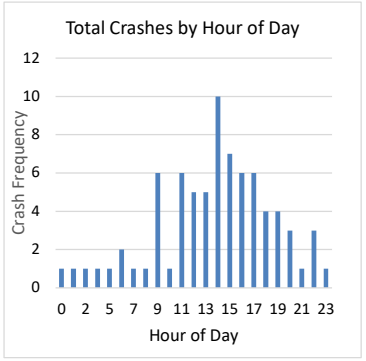
Crash Location	Total Crashes	Fatalities	Serious Injuries
Four-Way Intersection	2	0	0
Not An Intersection	48	0	2
T-Intersection	27	1	1
Grand Total	77	1	3

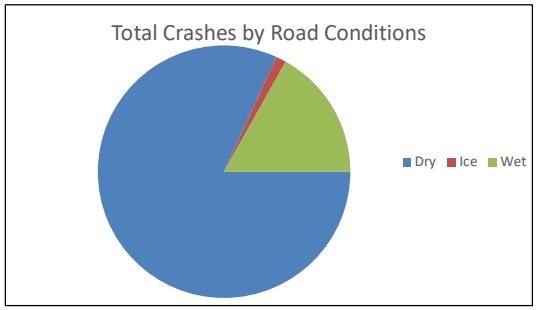
Roadway Contour	Total Crashes	Fatalities	Serious Injuries
Straight Level	76	1	3
Straight Grade	1	0	0
Grand Total	77	1	3

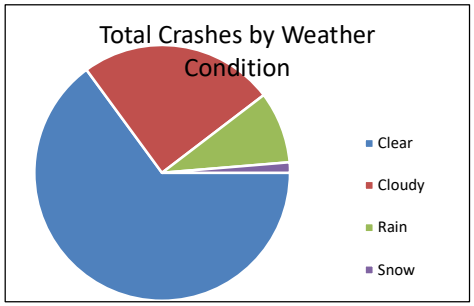
Hour of Day	Total Crashes
0	1
1	1
2	1
3	1
5	1
6	2
7	1
8	1
9	6
10	1
11	6
12	5
13	5
14	10
15	7
16	6
17	6
18	4
19	4
20	3
21	1
22	3
23	1
Grand Total	77

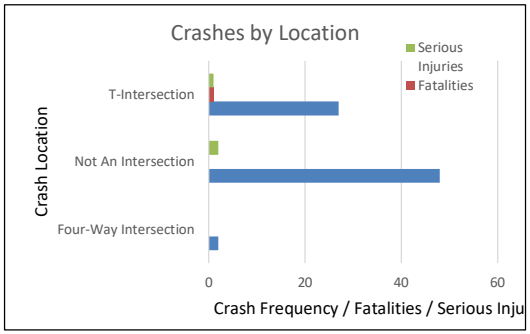
Month	Total Crashes
January	6
February	7
March	7
April	8
May	6
June	7
July	1
August	9
September	7
October	8
November	7
December	4
Grand Total	77

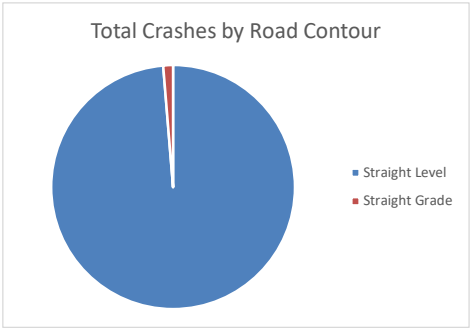
Day in Week	Total Crashes
(1) Sunday	8
(2) Monday	9
(3) Tuesday	15
(4) Wednesday	14
(5) Thursday	13
(6) Friday	7
(7) Saturday	11
Grand Total	77











Livingston Ave at Nelson Rd

Unit 1 Crash Summary

Type of Unit	Total Crashes	Fatalities	Serious Injuries
Passenger Car	37	0	1
Sport Utility Vehicle	21	0	0
Pick up	6	0	0
Cargo Van	3	0	0
Other Vehicle	2	0	0
Unknown or Hit/Skip	2	0	2
Bus (16+ Passengers)	2	0	0
Motorcycle 2 Wheeled	2	1	0
Single Unit Truck	1	0	0
Heavy Equipment	1	0	0
Grand Total	77	1	3

Special Function	Total Crashes	Fatalities	Serious Injuries
None	69	1	3
Other / Unknown	3	0	0
School Transport	2	0	0
Taxi	2	0	0
Police	1	0	0
Grand Total	77	1	3

Pre-Crash Action	Total Crashes	Fatalities	Serious Injuries
Straight Ahead	44	1	3
Changing Lanes	10	0	0
Making Left Turn	8	0	0
Making Right Turn	5	0	0
Slowing or Stopped In Traffic	3	0	0
Data Not Valid or Not Provided	2	0	0
Other / Unknown	2	0	0
Entering Traffic Lane	1	0	0
Parked	1	0	0
Overtaking/Passing	1	0	0
Grand Total	77	1	3

Livingston Ave at Nelson Rd

Unit 1 Crash Summary

Gender	Total Crashes	Fatalities	Serious Injuries
Male	44	1	1
Female	18	0	0
Unknown	15	0	2
Grand Total	77	1	3

Driver Age	Total Crashes	Fatalities	Serious Injuries
<15	25	0	2
15-19	3	0	0
20-24	9	0	0
25-29	4	0	0
30-34	3	0	0
35-39	5	0	1
40-44	2	1	0
45-49	11	0	0
50-54	7	0	0
55-59	4	0	0
60-64	4	0	0
Grand Total	77	1	3

Livingston Ave at Nelson Rd

Unit 1 Crash Summary

Traffic Control	Total Crashes	Fatalities	Serious Injuries
Signal	40	1	3
No Control	37	0	0
Grand Total	77	1	3

Object Struck	Total Crashes	Fatalities	Serious Injuries
Utility Pole	6	0	0
Light/Luminaries Support	2	0	0
Other Post, Pole Or Support	1	0	0
Grand Total	9	0	0

Contributing Circumstances	Total Crashes	Fatalities	Serious Injuries
Following Too Closely/ACDA	21	0	2
Other Improper Action	13	0	0
Improper Lane Change	12	0	0
None	8	0	0
Failure to Yield	8	0	0
Not Discernible	5	0	0
Ran Red Light	3	1	0
Drove off Road	2	0	1
Improper Turn	2	0	0
Left of Center	1	0	0
Improper Passing	1	0	0
Stopped or Parked Illegally	1	0	0
Grand Total	77	1	3

Livingston Ave at Nelson Rd

Unit 1 Crash Summary

Alcohol Involved	Total Crashes	Fatalities	Serious Injuries
No	73	1	2
Yes	4	0	1
Grand Total	77	1	3

Distracted By	Total Crashes	Fatalities	Serious Injuries
Not Distracted	59	1	1
Other / Unknown	16	0	2
Other distraction inside the vehicle	2	0	0
Grand Total	77	1	3

Non-Motorist Location	Total Crashes	Fatalities	Serious Injuries
Grand Total	0	0	0

Estimated Speed	Total Crashes	Fatalities	Serious Injuries
<15	38	0	2
15-19	4	0	0
20-24	3	0	0
25-29	8	0	0
30-34	7	0	0
35-39	12	0	0
40-44	2	1	0
50-54	2	0	1
55-59	1	0	0
Grand Total	77	1	3

Relative Severity Index Calculation

ODOT District	6
Urban Area	Yes
Freeway	No

Fill in the Number of Crashes by Crash Type

Crash Type	Number of Crashes	Crash Type Severity Calc	RSI Multiplier
Unknown	0	$0	26,018.00
Head On	0	$0	80,739.00
Rear End	20	$491,100	24,555.00
Backing	0	$0	10,808.00
Sideswipe - Meeting	0	$0	26,746.00
Sideswipe - Passing	27	$481,491	17,833.00
Angle	8	$298,968	37,371.00
Parked Vehicle	1	$16,008	16,008.00
Pedestrian	0	$0	144,798.00
Animal	0	$0	12,427.00
Train	0	$0	60,693.00
Pedalcycles	0	$0	93,645.00
Other Non-Vehicle	0	$0	190,625.00
Fixed Object	7	$263,354	37,622.00
Other Object	0	$0	17,835.00
Overturning	0	$0	106,003.00
Other Non-Collision	3	$110,415	36,805.00
Left Turn	8	$319,616	39,952.00
Right Turn	3	$62,886	20,962.00
Totals	**77**	**$2,043,838**	

RSI Value = 26,543.35

Livingston Ave at Nelson Rd

Begin Year	2017	End Year	2021	*(Available Years: 2017-2021)*
Select Authority:		**All**		

Total Crashes	
Crashes	77
Fatalities	1
Serious Injuries	3

Non-Intersection	
Crashes	25
Fatalities	0
Serious Injuries	0

Intersection	
Crashes	52
Fatalities	1
Serious Injuries	3

Roadway Departure	
Crashes	5
Fatalities	0
Serious Injuries	0

Crash Types	
Rank 1	
Fixed Object	
Crashes	2
Fatalities	0
Serious Injuries	0
Rank 2	
Other Non-Collision	
Crashes	2
Fatalities	0
Serious Injuries	0
Rank 3	
Parked Vehicle	
Crashes	1
Fatalities	0
Serious Injuries	0

Other	
Crashes	20
Fatalities	0
Serious Injuries	0

Crash Types	
Rank 1	
Sideswipe - Passing	
Crashes	11
Fatalities	0
Serious Injuries	0
Rank 2	
Rear End	
Crashes	4
Fatalities	0
Serious Injuries	0
Rank 3	
Left Turn	
Crashes	2
Fatalities	0
Serious Injuries	0

Signalized	
Crashes	40
Fatalities	1
Serious Injuries	3

Crash Types	
Rank 1	
Rear End	
Crashes	13
Fatalities	0
Serious Injuries	2
Rank 2	
Sideswipe - Passing	
Crashes	10
Fatalities	0
Serious Injuries	0
Rank 3	
Left Turn	
Crashes	6
Fatalities	0
Serious Injuries	0

Unsignalized	
Crashes	0
Fatalities	0
Serious Injuries	0

Crash Types	
Rank 1	
Rear End	
Crashes	0
Fatalities	0
Serious Injuries	0
Rank 2	
Fixed Object	
Crashes	0
Fatalities	0
Serious Injuries	0
Rank 3	
Sideswipe - Passing	
Crashes	0
Fatalities	0
Serious Injuries	0

Other	
Crashes	12
Fatalities	0
Serious Injuries	0

Crash Types	
Rank 1	
Sideswipe - Passing	
Crashes	6
Fatalities	0
Serious Injuries	0
Rank 2	
Rear End	
Crashes	3
Fatalities	0
Serious Injuries	0
Rank 3	
Angle	
Crashes	3
Fatalities	0
Serious Injuries	0

Livingston Ave at Rhoads Ave

Crash Summary Sheet

Fatalities	1
Serious Injuries	1
Other Injuries	23

Crashes Per Year	12.00
Fatal and All Injury Crashes	19
Percent Injury	31.7%
Equivalent PDO Index Value	3.76

Crash Severity	Crashes	%
(1) Fatal	1	1.67%
(2) Serious Injury Suspected	1	1.67%
(3) Minor Injury Suspected	9	15.00%
(4) Injury Possible	8	13.33%
(5) PDO/No Injury	41	68.33%
Grand Total	60	100.00%

Year	Crashes	%
2017	16	26.67%
2018	10	16.67%
2019	12	20.00%
2020	14	23.33%
2021	8	13.33%
Grand Total	60	100.00%

Day of Week	Crashes	%
(1) Sunday	7	11.67%
(2) Monday	9	15.00%
(3) Tuesday	5	8.33%
(4) Wednesday	10	16.67%
(5) Thursday	9	15.00%
(6) Friday	11	18.33%
(7) Saturday	9	15.00%
Grand Total	60	100.00%

Crash Type	Crashes	%
Rear End	16	26.67%
Sideswipe - Passing	14	23.33%
Left Turn	9	15.00%
Angle	7	11.67%
Fixed Object	6	10.00%
Right Turn	3	5.00%
Pedestrian	2	3.33%
Sideswipe - Meeting	1	1.67%
Unknown	1	1.67%
Parked Vehicle	1	1.67%
Grand Total	60	100.00%

Hour of Day	Crashes	%
0	1	1.67%
1	2	3.33%
5	1	1.67%
6	1	1.67%
8	1	1.67%
9	3	5.00%
10	3	5.00%
12	2	3.33%
13	4	6.67%
14	4	6.67%
15	7	11.67%
16	2	3.33%
17	6	10.00%
18	5	8.33%
19	5	8.33%
20	7	11.67%
21	3	5.00%
22	1	1.67%
23	2	3.33%
Grand Total	60	100.00%

Month	Crashes	%
1	5	8.33%
2	5	8.33%
3	6	10.00%
4	5	8.33%
5	5	8.33%
6	3	5.00%
7	6	10.00%
8	8	13.33%
9	3	5.00%
10	2	3.33%
11	5	8.33%
12	7	11.67%
Grand Total	60	100.00%

Livingston Ave at Rhoads Ave

Crash Summary Sheet

Weather Condition	Crashes	%
Clear	42	70.00%
Rain	9	15.00%
Cloudy	5	8.33%
Snow	3	5.00%
Fog, Smog, Smoke	1	1.67%
Grand Total	60	100.00%

Road Condition	Crashes	%
Dry	47	78.33%
Wet	12	20.00%
Ice	1	1.67%
Grand Total	60	100.00%

Light Condition	Crashes	%
Daylight	36	60.00%
Dark - Lighted Roadway	20	33.33%
Dawn/Dusk	3	5.00%
Dark - Roadway Not Lighted	1	1.67%
Grand Total	60	100.00%

Number of Units	Crashes	%
2	50	83.33%
1	6	10.00%
3	3	5.00%
5	1	1.67%
Grand Total	60	100.00%

ODOT Location	Crashes	%
Not An Intersection	25	41.67%
T-Intersection	19	31.67%
Four-Way Intersection	15	25.00%
5 Or More Point Intersection	1	1.67%
Grand Total	60	100.00%

Work Zone Related	Crashes	%
No	60	100.00%
Grand Total	60	100.00%

Alcohol Related	Crashes	%
No	55	91.67%
Yes	5	8.33%
Grand Total	60	100.00%

Drug Related (Inc. Marijuana)	Crashes	%
No	59	98.33%
Yes	1	1.67%
Grand Total	60	100.00%

Contour	Crashes	%
Straight Level	60	100.00%
Grand Total	60	100.00%

Marijuana Related	Crashes	%
No	60	100.00%
Grand Total	60	100.00%

Roadway Departure	Crashes	%
No	53	88.33%
Yes	7	11.67%
Grand Total	60	100.00%

Older Driver (65+)	Crashes	%
No	52	86.67%
Yes	8	13.33%
Grand Total	60	100.00%

Intersection Related	Crashes	%
Yes	38	63.33%
No	22	36.67%
Grand Total	60	100.00%

Young Driver (15-25)	Crashes	%
No	38	63.33%
Yes	22	36.67%
Grand Total	60	100.00%

Speed Related	Crashes	%
No	52	86.67%
Yes	8	13.33%
Grand Total	60	100.00%

Motorcycle Involved	Crashes	%
No	59	98.33%
Yes	1	1.67%
Grand Total	60	100.00%

Livingston Ave at Rhoads Ave

Crash Summary Sheet

Unit 1 Summary

Unit 1 Pre-Crash Action	Crashes	%
Straight Ahead	25	41.67%
Making Left Turn	15	25.00%
Changing Lanes	9	15.00%
Making Right Turn	3	5.00%
Data Not Valid or Not Provided	2	3.33%
Other / Unknown	2	3.33%
Entering Traffic Lane	1	1.67%
Standing	1	1.67%
Leaving Traffic Lane	1	1.67%
Slowing or Stopped In Traffic	1	1.67%
Grand Total	60	100.00%

Unit 1 Contributing Factor	Crashes	%
Other Improper Action	15	25.00%
Failure to Yield	13	21.67%
Following Too Closely/ACDA	11	18.33%
Improper Lane Change	10	16.67%
Improper Turn	3	5.00%
None	3	5.00%
Drove off Road	2	3.33%
Unsafe Speed	1	1.67%
Not Discernible	1	1.67%
Ran Stop Sign	1	1.67%
Grand Total	60	100.00%

Unit 1 Object Struck	Crashes	%
Nothing Struck	52	86.67%
Utility Pole	2	3.33%
Other Post, Pole Or Support	1	1.67%
Curb	1	1.67%
Wall	1	1.67%
Fence	1	1.67%
Building	1	1.67%
Light/Luminaries Support	1	1.67%
Grand Total	60	100.00%

Unit 1 Traffic Control	Crashes	%
No Control	43	71.67%
Stop Sign	16	26.67%
Signal	1	1.67%
Grand Total	60	100.00%

Unit 1 Posted Speed	Crashes	%
0	10	16.67%
25	9	15.00%
35	41	68.33%
Grand Total	60	100.00%

Unit 1 Direction From	Crashes	%
East	29	48.33%
West	15	25.00%
South	8	13.33%
North	7	11.67%
Unknown	1	1.67%
Grand Total	60	100.00%

Unit 1 Direction To	Crashes	%
West	25	41.67%
East	15	25.00%
North	11	18.33%
South	6	10.00%
Southeast	1	1.67%
Northeast	1	1.67%
Unknown	1	1.67%
Grand Total	60	100.00%

Livingston Ave at Rhoads Ave

Crash Summary Sheet

Unit 1 Summary

Unit 1 Type	Crashes	%
Passenger Car	37	61.67%
Sport Utility Vehicle	10	16.67%
Unknown or Hit/Skip	4	6.67%
Other Vehicle	2	3.33%
Passenger Van (minivan)	2	3.33%
Motorcycle 2 Wheeled	1	1.67%
Pedestrian/Skater	1	1.67%
Heavy Equipment	1	1.67%
Pick up	1	1.67%
Semi-Tractor	1	1.67%
Grand Total	60	100.00%

Unit 1 Special Function	Crashes	%
None	54	90.00%
Other / Unknown	5	8.33%
Mowing	1	1.67%
Grand Total	60	100.00%

Livingston Ave at Rhoads Ave
Crash Summary Sheet

Unit 2 Summary

Unit 2 Pre-Crash Action	Crashes	%
Straight Ahead	34	56.67%
Slowing or Stopped In Traffic	15	25.00%
	6	10.00%
Making Right Turn	2	3.33%
Parked	1	1.67%
Entering or Crossing Specified Location	1	1.67%
Entering Traffic Lane	1	1.67%
Grand Total	60	100.00%

Unit 2 Contributing Factor	Crashes	%
None	51	85.00%
	6	10.00%
Other Improper Action	1	1.67%
Failure to Yield	1	1.67%
Improper Crossing	1	1.67%
Grand Total	60	100.00%

Unit 2 Direction From	Crashes	%
	6	10.00%
East	33	55.00%
North	2	3.33%
South	6	10.00%
West	13	21.67%
Grand Total	60	100.00%

Unit 2 Direction To	Crashes	%
	6	10.00%
East	14	23.33%
North	5	8.33%
South	1	1.67%
West	34	56.67%
Grand Total	60	100.00%

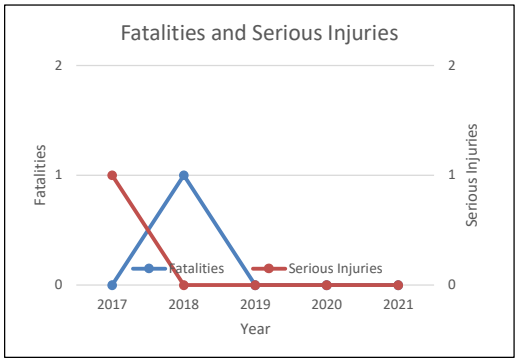
Unit 2 Type	Crashes	%
Passenger Car	30	50.00%
Sport Utility Vehicle	12	20.00%
	6	10.00%
Bus (16+ Passengers)	4	6.67%
Single Unit Truck	2	3.33%
Pick up	2	3.33%
Passenger Van (minivan)	2	3.33%
Other Vehicle	1	1.67%
Pedestrian/Skater	1	1.67%
Grand Total	60	100.00%

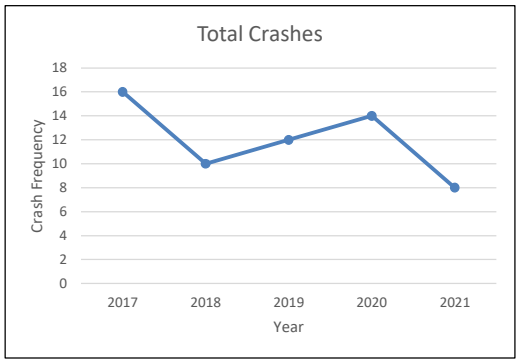
Unit 2 Special Function	Crashes	%
None	49	81.67%
	6	10.00%
Bus – Transit/Commuter	3	5.00%
Fire	1	1.67%
School Transport	1	1.67%
Grand Total	60	100.00%

Livingston Ave at Rhoads Ave
Crash Summary Sheet

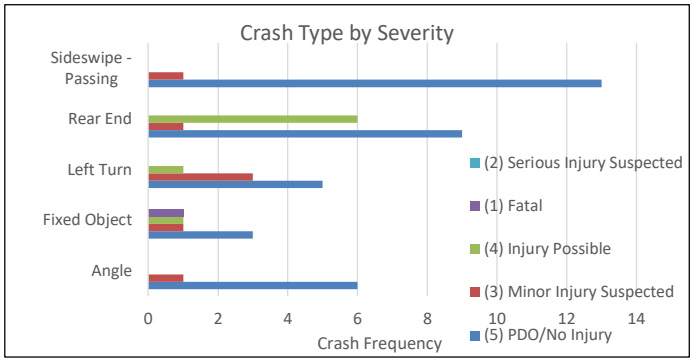
Crashes Per Year	12.00	Percent Injury	31.7%	EPDO	3.76

Year	Total Crashes	Fatalities	Serious Injuries
2017	16	0	1
2018	10	1	0
2019	12	0	0
2020	14	0	0
2021	8	0	0
Grand Total	60	1	1





Total Crashes Crash Type	Injury Level (1) Fatal	(2) Serious Inju	(3) Minor Injury	(4) Injury Possi	(5) PDO/No Inj	Grand Total
Rear End	0	0	1	6	9	16
Sideswipe - Passing	0	0	1	0	13	14
Left Turn	0	0	3	1	5	9
Angle	0	0	1	0	6	7
Fixed Object	1	0	1	1	3	6
Right Turn	0	0	0	0	3	3
Pedestrian	0	1	1	0	0	2
Sideswipe - Meeting	0	0	0	0	1	1
Unknown	0	0	0	0	1	1
Parked Vehicle	0	0	1	0	0	1
Grand Total	1	1	9	8	41	60



Livingston Ave at Rhoads Ave
Crash Summary Sheet

Crashes Per Year	12.00	Percent Injury	31.7%	EPDO	3.76

Road Condition	Total Crashes	Fatalities	Serious Injuries
Dry	47	1	1
Ice	1	0	0
Wet	12	0	0
Grand Total	60	1	1

Weather	Total Crashes	Fatalities	Serious Injuries
Clear	42	0	1
Rain	9	0	0
Cloudy	5	1	0
Snow	3	0	0
Fog, Smog, Smoke	1	0	0
Grand Total	60	1	1

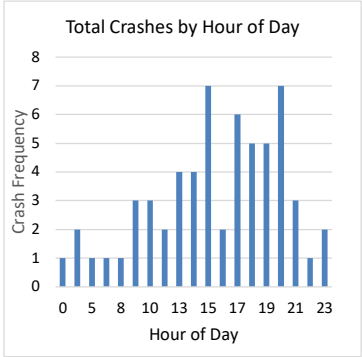
Crash Location	Total Crashes	Fatalities	Serious Injuries
5 Or More Point Intersection	1	0	0
Four-Way Intersection	15	0	0
Not An Intersection	25	0	1
T-Intersection	19	1	0
Grand Total	60	1	1

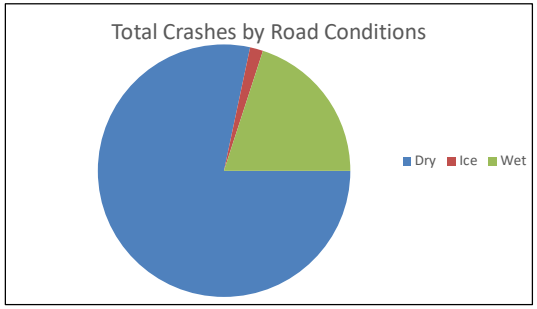
Roadway Contour	Total Crashes	Fatalities	Serious Injuries
Straight Level	60	1	1
Grand Total	60	1	1

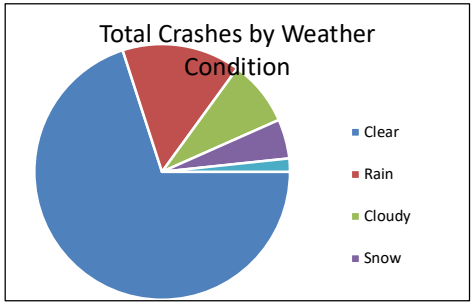
Hour of Day	Total Crashes
0	1
1	2
5	1
6	1
8	1
9	3
10	3
12	2
13	4
14	4
15	7
16	2
17	6
18	5
19	5
20	7
21	3
22	1
23	2
Grand Total	60

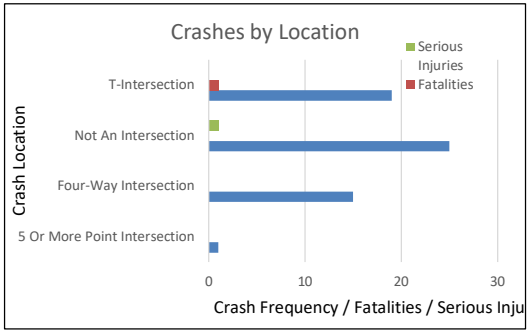
Month	Total Crashes
January	5
February	5
March	6
April	5
May	5
June	3
July	6
August	8
September	3
October	2
November	5
December	7
Grand Total	60

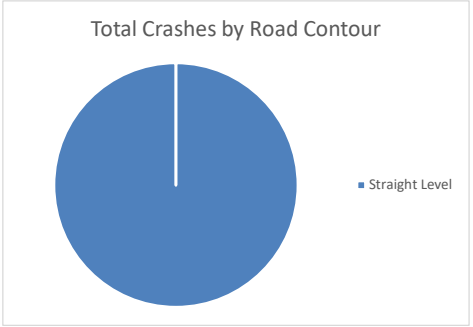
Day in Week	Total Crashes
(1) Sunday	7
(2) Monday	9
(3) Tuesday	5
(4) Wednesday	10
(5) Thursday	9
(6) Friday	11
(7) Saturday	9
Grand Total	60











Livingston Ave at Rhoads Ave

Unit 1 Crash Summary

Type of Unit	Total Crashes	Fatalities	Serious Injuries
Passenger Car	37	0	1
Sport Utility Vehicle	10	0	0
Unknown or Hit/Skip	4	0	0
Passenger Van (minivan)	2	0	0
Other Vehicle	2	0	0
Heavy Equipment	1	0	0
Motorcycle 2 Wheeled	1	1	0
Semi-Tractor	1	0	0
Pedestrian/Skater	1	0	0
Pick up	1	0	0
Grand Total	60	1	1

Special Function	Total Crashes	Fatalities	Serious Injuries
None	54	1	1
Other / Unknown	5	0	0
Mowing	1	0	0
Grand Total	60	1	1

Pre-Crash Action	Total Crashes	Fatalities	Serious Injuries
Straight Ahead	25	1	1
Making Left Turn	15	0	0
Changing Lanes	9	0	0
Making Right Turn	3	0	0
Other / Unknown	2	0	0
Data Not Valid or Not Provided	2	0	0
Entering Traffic Lane	1	0	0
Slowing or Stopped In Traffic	1	0	0
Leaving Traffic Lane	1	0	0
Standing	1	0	0
Grand Total	60	1	1

Livingston Ave at Rhoads Ave

Unit 1 Crash Summary

Gender	Total Crashes	Fatalities	Serious Injuries
Male	26	1	0
Female	24	0	1
Unknown	10	0	0
Grand Total	60	1	1

Driver Age	Total Crashes	Fatalities	Serious Injuries
<15	18	0	1
15-19	4	0	0
20-24	4	0	0
25-29	2	1	0
30-34	7	0	0
35-39	6	0	0
40-44	3	0	0
45-49	4	0	0
50-54	3	0	0
55-59	1	0	0
60-64	3	0	0
65-69	1	0	0
70-74	2	0	0
75-79	2	0	0
Grand Total	60	1	1

Livingston Ave at Rhoads Ave

Unit 1 Crash Summary

Traffic Control	Total Crashes	Fatalities	Serious Injuries
No Control	43	0	1
Stop Sign	16	1	0
Signal	1	0	0
Grand Total	60	1	1

Object Struck	Total Crashes	Fatalities	Serious Injuries
Utility Pole	2	0	0
Curb	1	0	0
Other Post, Pole Or Support	1	0	0
Fence	1	0	0
Light/Luminaries Support	1	0	0
Grand Total	6	0	0

Contributing Circumstances	Total Crashes	Fatalities	Serious Injuries
Other Improper Action	15	1	0
Failure to Yield	13	0	0
Following Too Closely/ACDA	11	0	0
Improper Lane Change	10	0	0
None	3	0	1
Improper Turn	3	0	0
Drove off Road	2	0	0
Ran Stop Sign	1	0	0
Not Discernible	1	0	0
Unsafe Speed	1	0	0
Grand Total	60	1	1

Livingston Ave at Rhoads Ave

Unit 1 Crash Summary

Alcohol Involved	Total Crashes	Fatalities	Serious Injuries
No	55	1	0
Yes	5	0	1
Grand Total	60	1	1

Distracted By	Total Crashes	Fatalities	Serious Injuries
Not Distracted	45	1	1
Other / Unknown	14	0	0
Other activity with an electronic device	1	0	0
Grand Total	60	1	1

Non-Motorist Location	Total Crashes	Fatalities	Serious Injuries
Grand Total	0	0	0

Estimated Speed	Total Crashes	Fatalities	Serious Injuries
<15	32	0	0
15-19	4	0	0
20-24	3	0	0
25-29	4	0	0
30-34	5	0	1
35-39	7	0	0
40-44	2	0	0
50-54	2	1	0
60-64	1	0	0
Grand Total	60	1	1

Relative Severity Index Calculation

ODOT District	6
Urban Area	Yes
Freeway	No

Fill in the Number of Crashes by Crash Type

Crash Type	Number of Crashes	Crash Type Severity Calc	RSI Multiplier
Unknown	1	$26,018	26,018.00
Head On	0	$0	80,739.00
Rear End	16	$392,880	24,555.00
Backing	0	$0	10,808.00
Sideswipe - Meeting	1	$26,746	26,746.00
Sideswipe - Passing	14	$249,662	17,833.00
Angle	7	$261,597	37,371.00
Parked Vehicle	1	$16,008	16,008.00
Pedestrian	2	$289,596	144,798.00
Animal	0	$0	12,427.00
Train	0	$0	60,693.00
Pedalcycles	0	$0	93,645.00
Other Non-Vehicle	0	$0	190,625.00
Fixed Object	6	$225,732	37,622.00
Other Object	0	$0	17,835.00
Overturning	0	$0	106,003.00
Other Non-Collision	0	$0	36,805.00
Left Turn	9	$359,568	39,952.00
Right Turn	3	$62,886	20,962.00
Totals	**60**	**$1,910,693**	

RSI Value = 31,844.88

Livingston Ave at Rhoads Ave

Begin Year	2017	End Year	2021	*(Available Years: 2017-2021)*
Select Authority:		**All**		

Total Crashes	
Crashes	60
Fatalities	1
Serious Injuries	1

Non-Intersection	
Crashes	22
Fatalities	1
Serious Injuries	1

Intersection	
Crashes	38
Fatalities	0
Serious Injuries	0

Roadway Departure	
Crashes	5
Fatalities	1
Serious Injuries	0

Crash Types	
Rank 1	
Fixed Object	
Crashes	4
Fatalities	1
Serious Injuries	0
Rank 2	
Parked Vehicle	
Crashes	1
Fatalities	0
Serious Injuries	0
Rank 3	
Rear End	
Crashes	0
Fatalities	0
Serious Injuries	0

Other	
Crashes	17
Fatalities	0
Serious Injuries	1

Crash Types	
Rank 1	
Sideswipe - Passing	
Crashes	8
Fatalities	0
Serious Injuries	0
Rank 2	
Rear End	
Crashes	4
Fatalities	0
Serious Injuries	0
Rank 3	
Left Turn	
Crashes	3
Fatalities	0
Serious Injuries	0

Signalized	
Crashes	1
Fatalities	0
Serious Injuries	0

Crash Types	
Rank 1	
Sideswipe - Passing	
Crashes	1
Fatalities	0
Serious Injuries	0
Rank 2	
Rear End	
Crashes	0
Fatalities	0
Serious Injuries	0
Rank 3	
Fixed Object	
Crashes	0
Fatalities	0
Serious Injuries	0

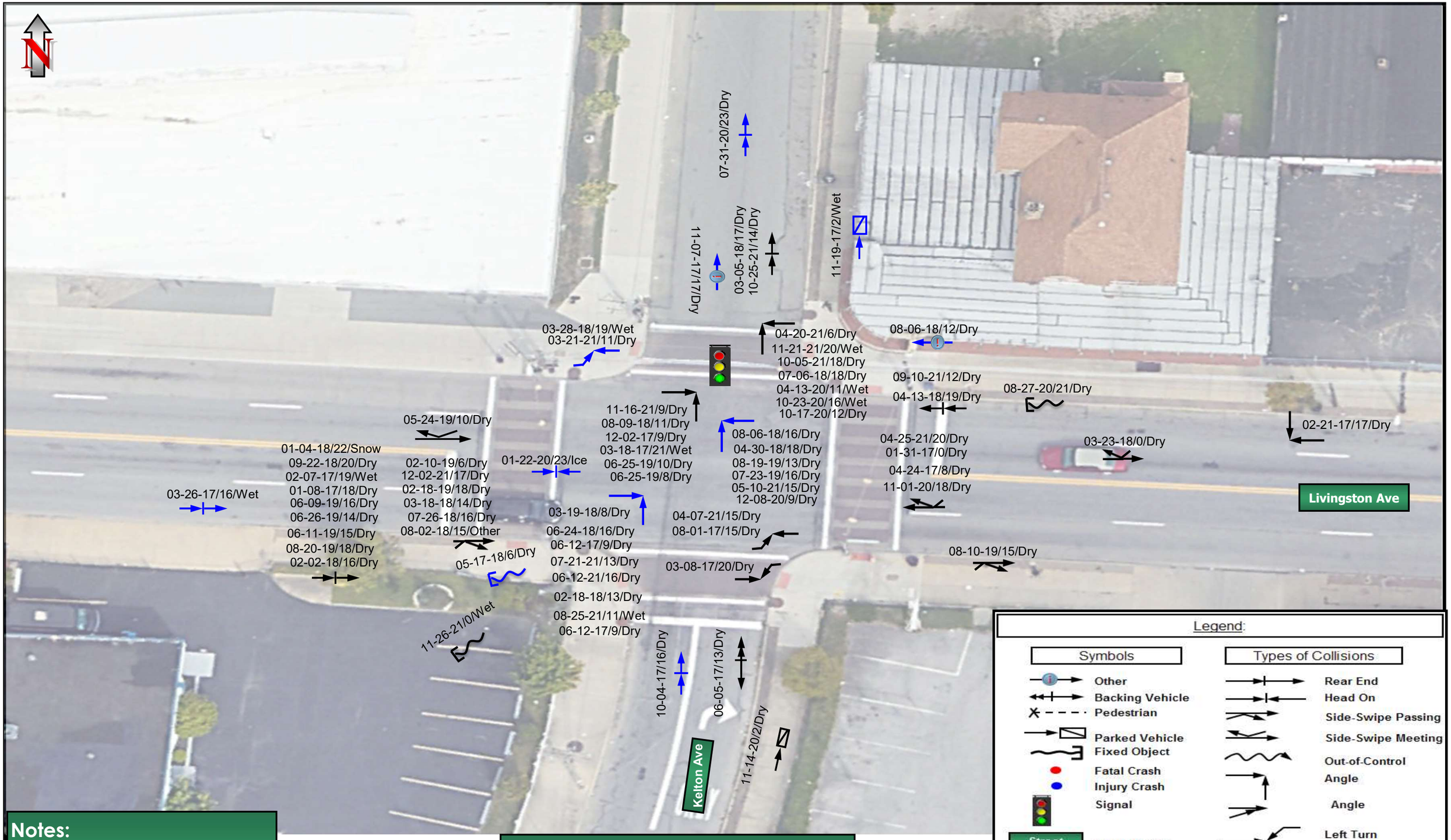
Unsignalized	
Crashes	15
Fatalities	0
Serious Injuries	0

Crash Types	
Rank 1	
Angle	
Crashes	7
Fatalities	0
Serious Injuries	0
Rank 2	
Rear End	
Crashes	4
Fatalities	0
Serious Injuries	0
Rank 3	
Fixed Object	
Crashes	1
Fatalities	0
Serious Injuries	0

Other	
Crashes	22
Fatalities	0
Serious Injuries	0

Crash Types	
Rank 1	
Rear End	
Crashes	8
Fatalities	0
Serious Injuries	0
Rank 2	
Left Turn	
Crashes	5
Fatalities	0
Serious Injuries	0
Rank 3	
Sideswipe - Passing	
Crashes	4
Fatalities	0
Serious Injuries	0

Combined Crash Diagrams



Notes:
Crashes By Year

2017: 15	2020:9
2018: 19	2021:15
2019: 12	

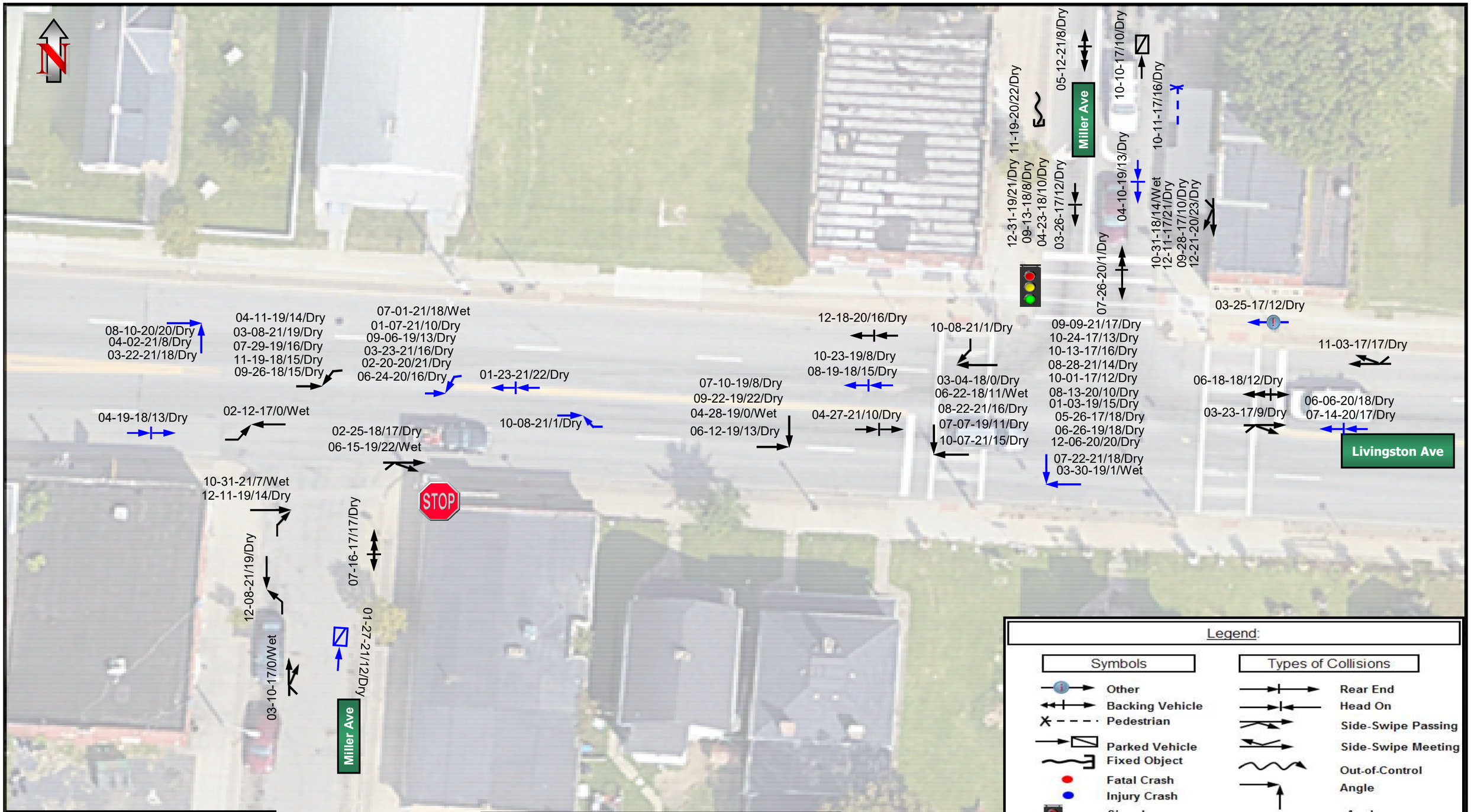
CRASH DIAGRAM

Livingston Ave at Kelton Ave - 07/21/2022

Legend:

Symbols	Types of Collisions
Other	Rear End
Backing Vehicle	Head On
Pedestrian	Side-Swipe Passing
Parked Vehicle	Side-Swipe Meeting
Fixed Object	Out-of-Control
Fatal Crash	Angle
Injury Crash	Angle
Signal	Left Turn
Street — Street Name	Right Turn
STOP — Stop Sign	Right Turn
Animal	

Crash Label: Date/Hour/Road Condition



Notes:
Crashes By Year
2017: 15 2020:11
2018: 11 2021:19
2019: 16

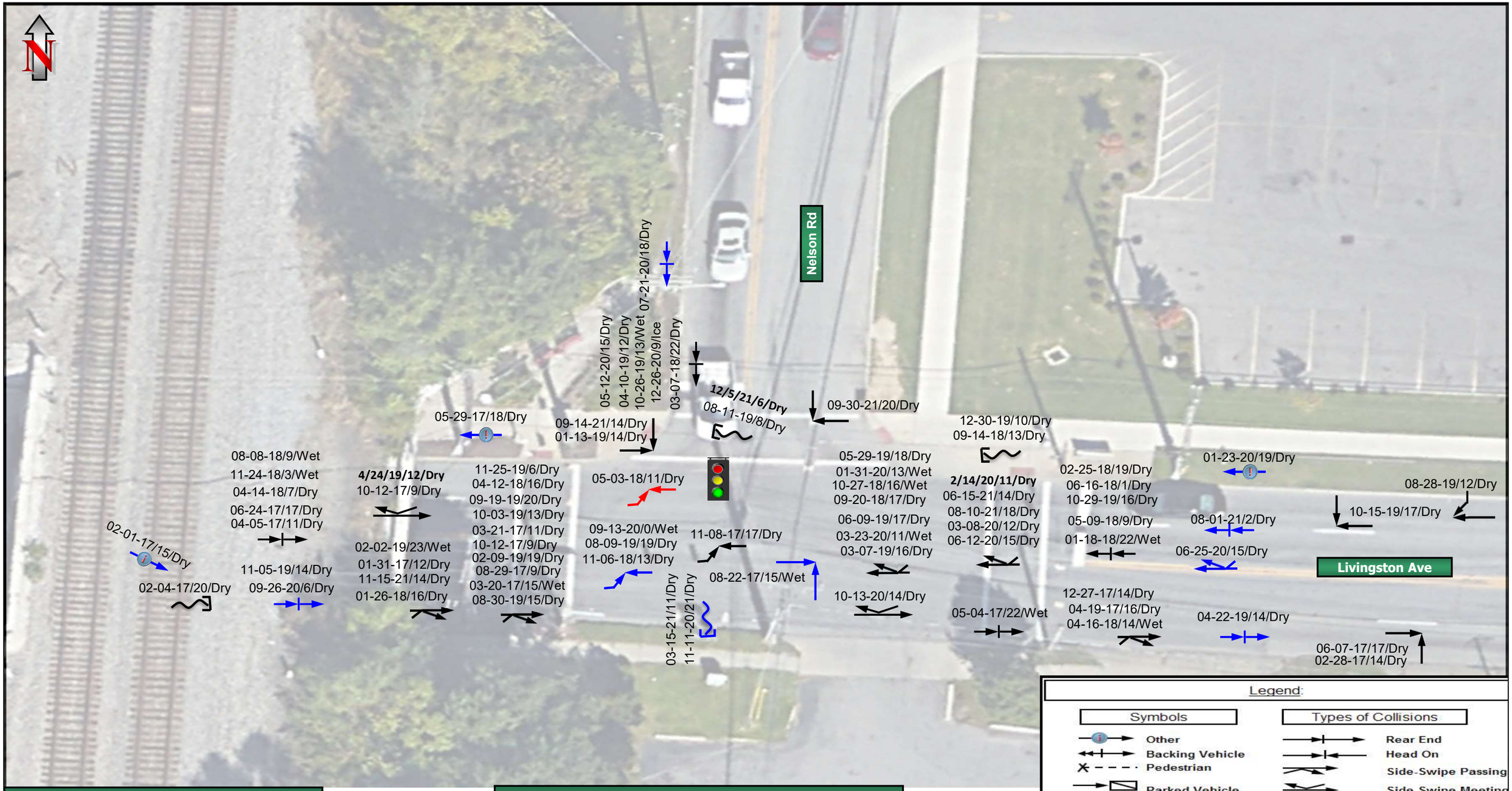
CRASH DIAGRAM

Livingston Ave at Miller Ave - 07/21/2022

Legend:

Symbols	Types of Collisions
Other	Rear End
Backing Vehicle	Head On
Pedestrian	Side-Swipe Passing
Parked Vehicle	Side-Swipe Meeting
Fixed Object	Out-of-Control
Fatal Crash	Angle
Injury Crash	Angle
Signal	Left Turn
Street Name	Right Turn
Stop Sign	

Crash Label: Date/Hour/Road Condition



Notes:
Crashes By Year
2017: 18 2020:14
2018: 16 2021:8
2019: 21

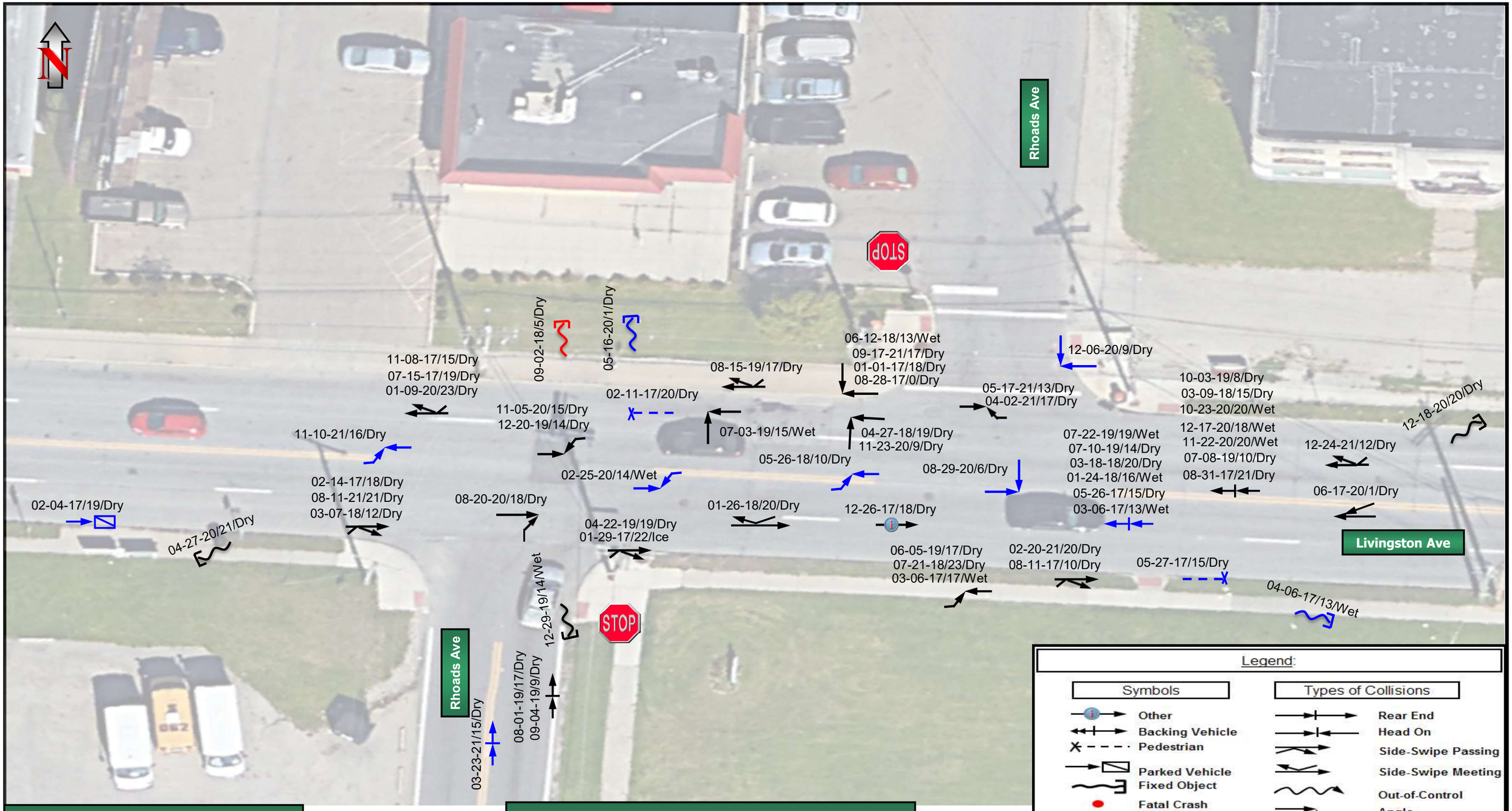
CRASH DIAGRAM

Livingston Ave at Nelson Rd - 07/21/2022

Legend:

Symbols	Types of Collisions
Other	Rear End
Backing Vehicle	Head On
Pedestrian	Side-Swipe Passing
Parked Vehicle	Side-Swipe Meeting
Fixed Object	Out-of-Control
Fatal Crash	Angle
Injury Crash	Angle
Signal	Left Turn
Street — Street Name	Right Turn
STOP — Stop Sign	Right Turn
Animal	

Crash Label: Date/Hour/Road Condition



Notes:
Crashes By Year
2017: 16 2020:14
2018: 10 2021:8
2019: 12

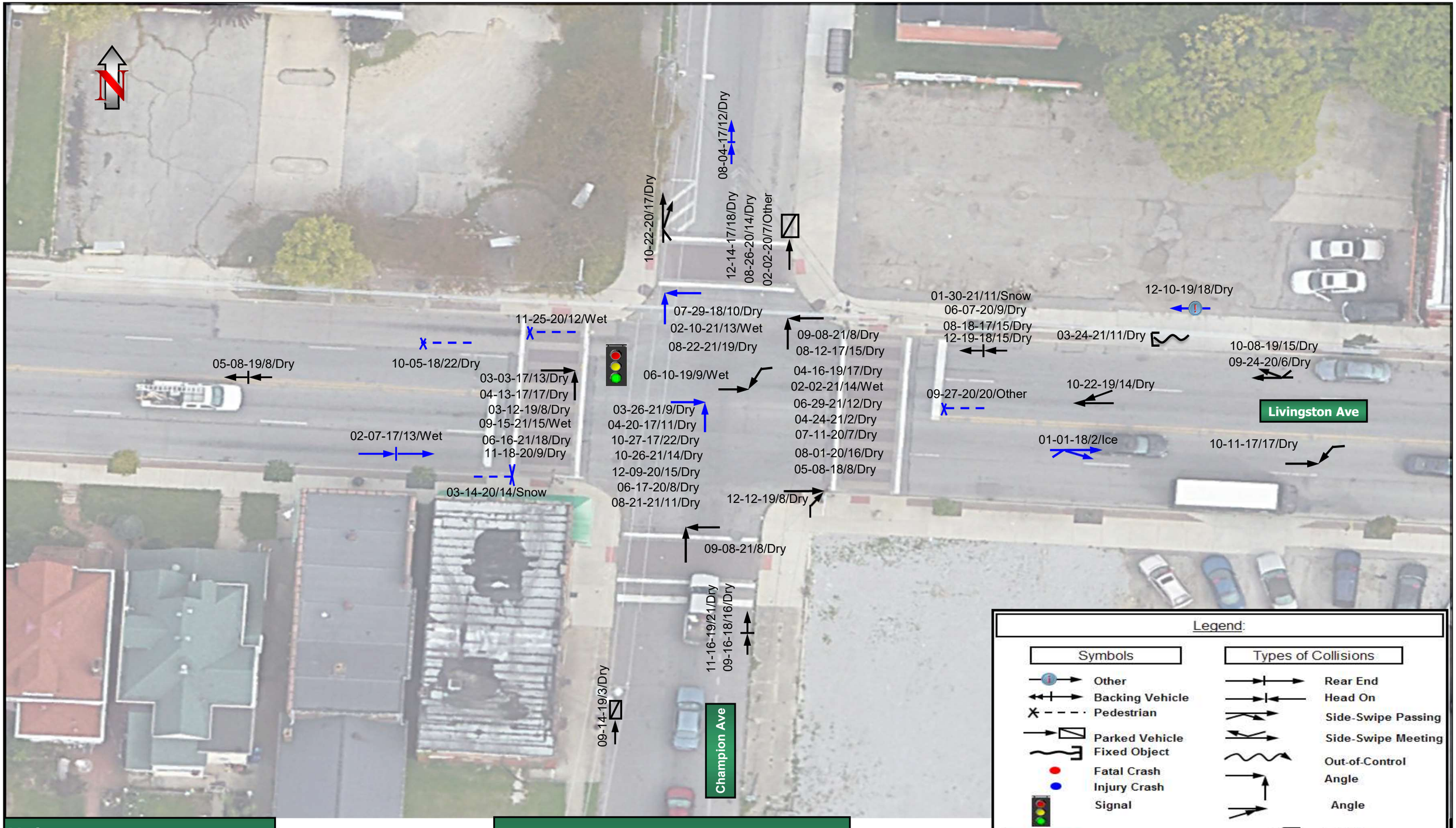
CRASH DIAGRAM

Livingston Ave at Rhoads Ave - 07/22/2022

Legend:

Symbols	Types of Collisions
Other	Rear End
Backing Vehicle	Head On
Pedestrian	Side-Swipe Passing
Parked Vehicle	Side-Swipe Meeting
Fixed Object	Out-of-Control
Fatal Crash	Angle
Injury Crash	Angle
Signal	Left Turn
Street Name	Right Turn
Stop Sign	Right Turn
Animal	

Crash Label: Date/Hour/Road Condition



Notes:
Crashes By Year
2017: 10 2020:13
2018: 6 2021:14
2019: 10

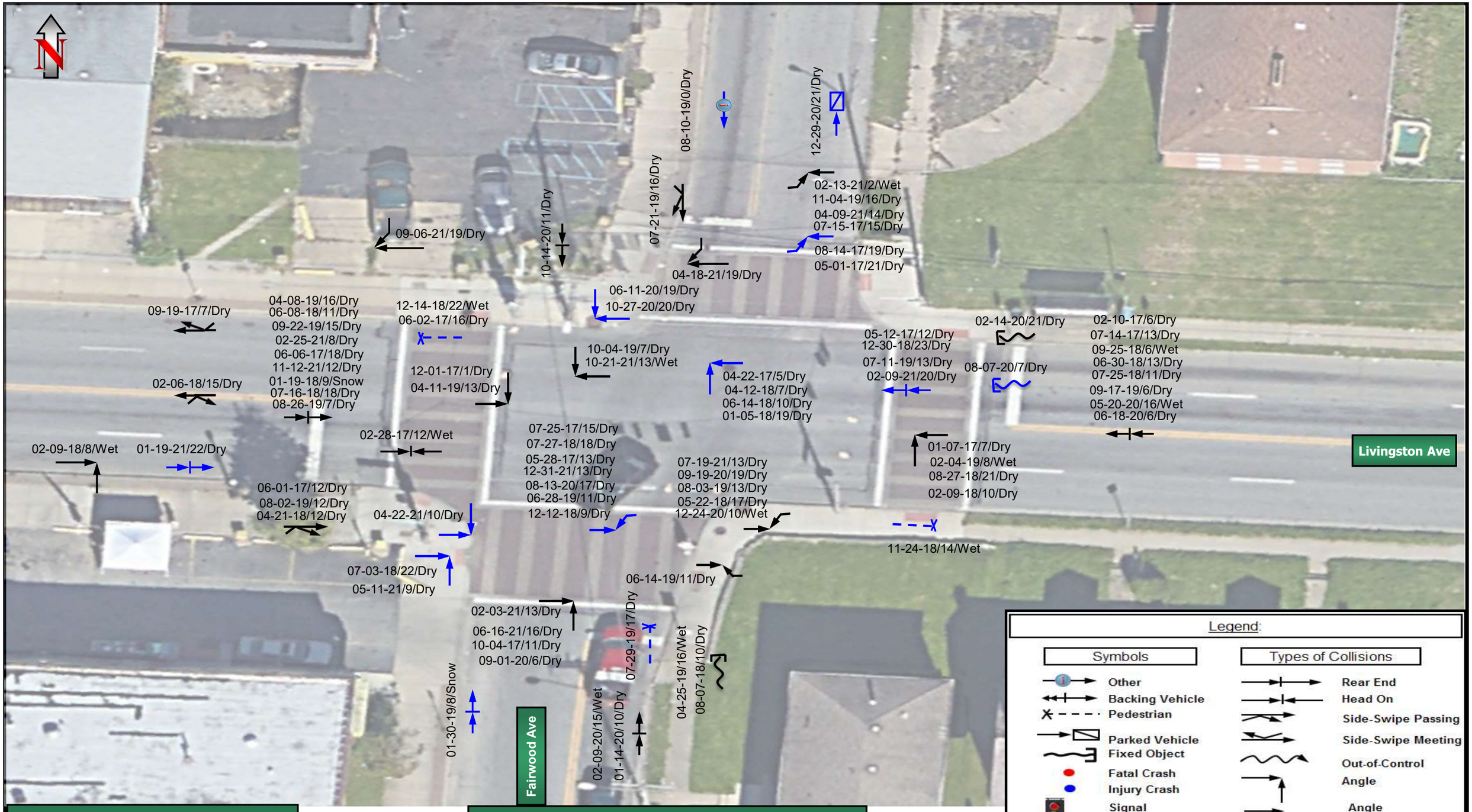
CRASH DIAGRAM

Livingston Ave at Champion Ave - 08/02/2022

Legend:

Symbols	Types of Collisions
Other	Rear End
Backing Vehicle	Head On
Pedestrian	Side-Swipe Passing
Parked Vehicle	Side-Swipe Meeting
Fixed Object	Out-of-Control
Fatal Crash	Angle
Injury Crash	Angle
Signal	Left Turn
Street — Street Name	Right Turn
STOP — Stop Sign	Right Turn
Animal	

Crash Label: Date/Hour/Road Condition



Notes:
Crashes By Year
2017: 17 2020:14
2018: 22 2021:15
2019: 18

CRASH DIAGRAM

Livingston Ave at Fairwood Ave - 08/2/2022

Legend:

Symbols	Types of Collisions
Other	Rear End
Backing Vehicle	Head On
Pedestrian	Side-Swipe Passing
Parked Vehicle	Side-Swipe Meeting
Fixed Object	Out-of-Control
Fatal Crash	Angle
Injury Crash	Angle
Signal	Left Turn
Street Name	Right Turn
Stop Sign	Right Turn
Animal	

Crash Label: Date/Hour/Road Condition

Combined ECAT Results

Project Information

General Information

Project Name	Livingston Ave Corridor Study	Contact Email	tilakcnagaraju@chacompanies.com
Project Description	Safety analysis at the intersection of Livingston Ave and Champion Ave	Contact Phone	(614) 362-7517
Reference Number		Date Performed	7/26/2022
Analyst	TCN	Analysis Year	2022
Agency/Company	CHA Consulting Inc.		
Perform Benefit Cost Analysis?	Yes		

Do the proposed improvements fundamentally change the conditions of the base safety performance function (SPF), Or is crash data unavailable for the analysis condition, Or is only predicted (and not expected) analysis needed for the existing or proposed condition?	**No**

(Examples: unsignalized to signalized, undivided to divided, increase or decrease in the number of lanes, change the number of approaches to an intersection, significant realignment of the roadway)

Project Elements Description Table

Project Element ID (Must be Unique)	Site Type	Intersection Control Type	Location Information					
			NLFID	Begin Logpoint/ Intersection Midpoint	End Logpoint *(Leave blank for Intersection)*	Length (mi) OR Intersection Radius Buffer (mi)	Cross Route NLFID(s)	Common Name
US33; 125.172	Urban & Suburban Arterial Intersection	Signalized	SFRAUS00033**C	125.172		0.05	MFRAMR042	Livingston Ave at Champion Ave

Traffic Volume Growth Rate Calculation For Benefit Cost Analysis

	Year	AADT	
Present ADT (PADT)	2022	11,719	veh / day
Future ADT (FADT)	2026	12,305	veh / day
Annual Linear Growth Rate		0.0125	

Project Elements Description Table

Project Element ID (Must be Unique)	Site Type	Intersection Control Type	Location Information					
			NLFID	Begin Logpoint/ Intersection Midpoint	End Logpoint *(Leave blank for Intersection)*	Length (mi) OR Intersection Radius Buffer (mi)	Cross Route NLFID(s)	Common Name

Select Other Non-Site Characteristic Based Countermeasures For Entire Project

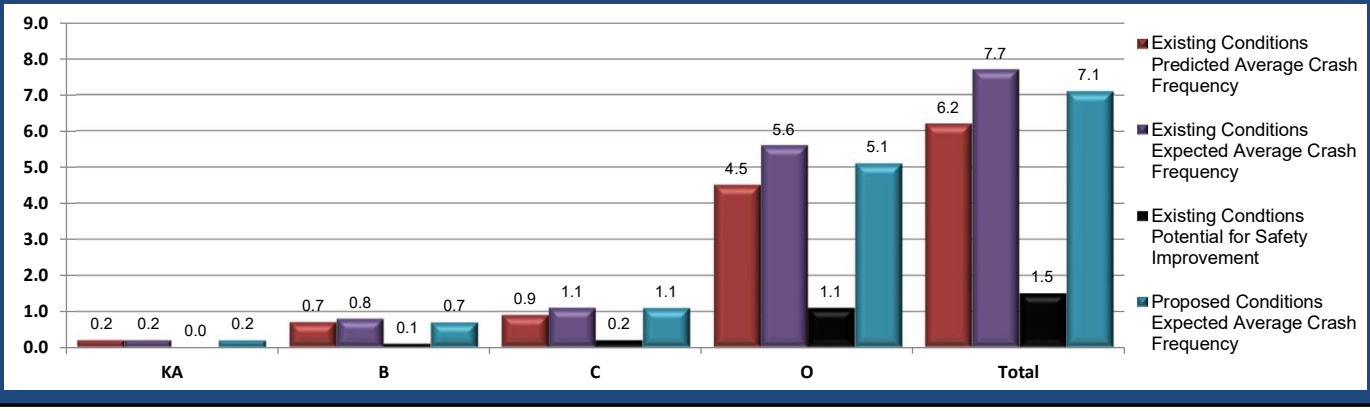
CMF Nbr	Countermeasure	CMF KA Value	CMF B Value	CMF C Value	CMF O Value	CMF Valid for the Following Site Types
CMF 1						
CMF 2	Improve visibility of signal heads	0.93	0.93	0.93	0.93	7
CMF 3	Increase yellow interval and all red interval	0.99	0.99	0.99	0.99	7
CMF 4						
CMF 5						
CMF 6						
CMF 7						
CMF 8						
CMF 9						
CMF 10						

Project Safety Performance Report

General Information

Project Name	Livingston Ave Corridor Study	Contact Email	tilakcnagaraju@chacompanies.com
Project Description	Safety analysis at the intersection of Livingston Ave and Champion Ave	Contact Phone	(614) 362-7517
Reference Number		Date Performed	7/26/2022
Analyst	TCN	Analysis Year	2022
Agency/Company	CHA Consulting Inc.		

Summary of Anticipated Safety Performance of the Project (average crashes/year)



Project Summary Results (Without Animal Crashes)

	KA	B	C	O	Total
$N_{predicted}$ - Existing Conditions	0.1511	0.6589	0.9034	4.5163	6.2297
$N_{expected}$ - Existing Conditions	0.1803	0.8061	1.1490	5.5703	7.7057
$N_{potential\ for\ improvement}$ - Existing Conditions	**0.0292**	**0.1472**	**0.2456**	**1.0540**	**1.4760**
$N_{expected}$ - Proposed Conditions	0.1660	0.7422	1.0579	5.1286	7.0947

Project Safety Performance Report

General Information

Project Name	Livingston Ave Corridor Study	Contact Email	tilakcnagaraju@chacompanies.com
Project Description	Safety analysis at the intersection of Livingston Ave and Champion Ave	Contact Phone	(614) 362-7517
Reference Number		Date Performed	7/26/2022
Analyst	TCN	Analysis Year	2022
Agency/Company	CHA Consulting Inc.		

Existing Conditions Project Element Predicted Crash Summary (Without Animal Crashes)

Project Element ID	Common Name	Crash Severity Level				
		KA	B	C	O	Total
US33: 125.172	Livingston Ave at Champion Ave	0.1511	0.6589	0.9034	4.5163	6.2297

Project Safety Performance Report

General Information

Project Name	Livingston Ave Corridor Study	Contact Email	tilakcnagaraju@chacompanies.com
Project Description	Safety analysis at the intersection of Livingston Ave and Champion Ave	Contact Phone	(614) 362-7517
Reference Number		Date Performed	7/26/2022
Analyst	TCN	Analysis Year	2022
Agency/Company	CHA Consulting Inc.		

Existing Conditions Project Element Expected Crash Summary (Without Animal Crashes)

Project Element ID	Common Name	Crash Severity Level				
		KA	B	C	O	Total
US33: 125.172	Livingston Ave at Champion Ave	0.1803	0.8061	1.149	5.5703	7.7057

Project Safety Performance Report

General Information

Project Name	Livingston Ave Corridor Study	Contact Email	tilakcnagaraju@chacompanies.com
Project Description	Safety analysis at the intersection of Livingston Ave and Champion Ave	Contact Phone	(614) 362-7517
Reference Number		Date Performed	7/26/2022
Analyst	TCN	Analysis Year	2022
Agency/Company	CHA Consulting Inc.		

Existing Conditions Project Element Potential for Safety Improvement Summary (Without Animal Crashes)

Project Element ID	Common Name	Crash Severity Level				
		KA	B	C	O	Total
US33: 125.172	Livingston Ave at Champion Ave	0.0292	0.1472	0.2456	1.054	1.476

Project Safety Performance Report

General Information

Project Name	Livingston Ave Corridor Study	Contact Email	tilakcnagaraju@chacompanies.com
Project Description	Safety analysis at the intersection of Livingston Ave and Champion Ave	Contact Phone	(614) 362-7517
Reference Number		Date Performed	7/26/2022
Analyst	TCN	Analysis Year	2022
Agency/Company	CHA Consulting Inc.		

Proposed Conditions Project Element Expected Crash Summary (Without Animal Crashes)

Project Element ID	Common Name	Crash Severity Level				
		KA	B	C	O	Total
US33: 125.172	Livingston Ave at Champion Ave	0.166	0.7422	1.0579	5.1286	7.0947

Project Safety Performance Report

General Information

Project Name	Livingston Ave Corridor Study	Contact Email	tilakcnagaraju@chacompanies.com
Project Description	Safety analysis at the intersection of Livingston Ave and Champion Ave	Contact Phone	(614) 362-7517
Reference Number		Date Performed	7/26/2022
Analyst	TCN	Analysis Year	2022
Agency/Company	CHA Consulting Inc.		

Summary by Crash Type

Crash Type	Existing			Proposed
	Predicted Crash Frequency	Expected Crash Frequency	PSI	Expected Crash Frequency
Unknown	0.0044	0.0052	**0.0008**	0.0047
Head On	0.0538	0.0565	**0.0027**	0.0510
Rear End	4.3255	4.2851	-0.0405	3.8656
Backing	0.2263	0.2145	-0.0119	0.1935
Sideswipe - Meeting	0.1225	0.1230	**0.0005**	0.1110
Sideswipe - Passing	1.0631	1.0244	-0.0387	0.9241
Angle	1.5688	1.5805	**0.0117**	0.8525
Parked Vehicle	0.1542	0.1866	**0.0324**	0.1684
Pedestrian	0.1159	0.1344	**0.0185**	0.1212
Animal	0.0000	0.0000	0.0000	0.0000
Train	0.0003	0.0003	0.0000	0.0002
Pedalcycles	0.2984	0.2298	-0.0686	0.2073
Other Non-Vehicle	0.0000	0.0000	0.0000	0.0000
Fixed Object	0.2488	0.2930	**0.0443**	0.2644
Other Object	0.0088	0.0106	**0.0018**	0.0096
Overturning	0.0139	0.0149	**0.0010**	0.0135
Other Non-Collision	0.0331	0.0395	**0.0064**	0.0356
Left Turn	0.9175	0.9405	**0.0230**	0.8484
Right Turn	0.0000	0.0000	0.0000	0.0000

Existing Conditions: General Information and Data for Urban And Suburban Arterial Intersection					
General Information		**Location Information**			
Analyst	TCN	Route	US33		
Agency or Company	CHA Consulting Inc.	Logpoint	125.172		
Date Performed	07/26/22	Common Name	Livingston Ave at Champion Ave		
Intersection	US33; 125.172	Analysis Year	2022		
Signalized/Unsignalized	Signalized				
Input Data				**Existing Conditions**	**HSM Base Conditions**
Intersection type (3ST, 3SG, 4ST, 4SG)				4SG	--
AADT $_{major}$ (veh/day) (total entering on major approaches)*	$AADT_{MAX}$ =	67,700	(veh/day)	11,719	--
AADT $_{minor}$ (veh/day) (total entering on minor approaches)*	$AADT_{MAX}$ =	33,400	(veh/day)	2,392	--
Intersection lighting (present/not present)				Present	Not Present
Calibration factor, C_i				Varies, See Below	1.00
Data for unsignalized intersections only:					
Number of major-road approaches with left-turn lanes					0
Number of major-road approaches with right-turn lanes					0
Data for signalized intersections only:					
Number of approaches with left-turn lanes				0	0
Number of approaches with right-turn lanes				0	0
Number of approaches with left-turn signal phasing				0	--
Type of left-turn signal phasing for Leg #1				Permissive	Permissive
Type of left-turn signal phasing for Leg #2				Permissive	--
Type of left-turn signal phasing for Leg #3				Permissive	--
Type of left-turn signal phasing for Leg #4				Not Applicable	--
Number of approaches with right-turn-on-red prohibited				0	0
Intersection red light cameras (present/not present)				Not Present	Not Present
Sum of all pedestrian crossing volumes (PedVol)				240	--
Maximum number of lanes crossed by a pedestrian (n_{lanesx})				2	--
Number of bus stops within 300 m (1,000 ft) of the intersection				3 or more	0
Schools within 300 m (1,000 ft) of the intersection (present/not present)				Not Present	Not Present
Number of alcohol sales establishments within 300 m (1,000 ft) of the intersection				1 to 8	0
Locality:				State System	

Existing Conditions: Crash Modification Factors (CMFs) for Urban And Suburban Arterial Intersection						
(1)	(2)	(3)	(4)	(5)	(6)	(7)
CMF for Left-Turn Lanes	CMF for Left-Turn Signal Phasing	CMF for Right-Turn Lanes	CMF for Right Turn on Red	CMF for Lighting	CMF for Red Light Cameras	Combined CMF
CMF 1i	*CMF 2i*	*CMF 3i*	*CMF 4i*	*CMF 5i*	*CMF 6i*	*CMF $_{COMB}$*
from Table 12-24	from Table 12-25	from Table 12-26	from Equation 12-35	from Equation 12-36	from Equation 12-37	(1)*(2)*(3)*(4)*(5)*(6)
1.0000	1.0000	1.0000	1.0000	0.9999	1.0000	0.9999

Federal law 23 USC § 409 prohibits the discovery or admission into evidence of "reports, surveys, schedules, lists, or data" compiled or collected for the purpose of highway safety improvement projects that might qualify for federal safety improvement funding.

Existing Conditions: Multiple-Vehicle Crash Summary for Urban And Suburban Arterial Intersection									
(1)	(2)			(3)	(4)	(5)	(6)	(7)	(8)	(6)*(7)*(8)
Crash Severity Level	**SPF Coefficients** from Table 12-10			**Overdispersion Parameter, k** from Table 12-10	**Initial N_{bimv}** from Equation 12-21	**Proportion of Total Crashes**	**Adjusted N_{bimv}** $(4)_{TOTAL}$*(5)	**Combined CMFs** (7) from Worksheet 2B	**Calibration Factor, C_i**	**Predicted N_{bimv}**
	a	b	c							
Total	-10.99	1.07	0.23	0.39	2.280	1.000	2.280	1.00	2.48	5.654
Fatal and Injury (FI)	-13.14	1.18	0.22	0.33	0.689	$(4)_{FI}/((4)_{FI}+(4)_{PDO})$ = 0.315	0.718	1.00	1.91	1.372
Property Damage Only (PDO)	-11.02	1.02	0.24	0.44	1.497	$(5)_{TOTAL}-(5)_{FI}$ = 0.685	1.562	1.00	2.75	4.294

Existing Conditions: Single-Vehicle Crash Summary for Urban And Suburban Arterial Intersection										
(1)	(2)			(3)	(4)	(5)	(6)	(7)	(8)	(9)
Crash Severity Level	**SPF Coefficients** from Table 12-12			**Overdispersion Parameter, k** from Table 12-12	**Initial N_{bisv}** from Eqn. 12-24; (FI) from Eqn. 12-24 or 12-27	**Proportion of Total Crashes**	**Adjusted N_{bimv}** $(4)_{TOTAL}$*(5)	**Combined CMFs** (7) from Worksheet 2B	**Calibration Factor, C_i**	**Predicted N_{bisv}** (6)*(7)*(8)
	a	b	c							
Total	-10.21	0.68	0.27	0.36	0.176	1.000	0.176	1.00	1.70	0.299
Fatal and Injury (FI)	-9.25	0.43	0.29	0.09	0.052	$(4)_{FI}/((4)_{FI}+(4)_{PDO})$ = 0.294	0.052	1.00	1.48	0.076
Property Damage Only (PDO)	-11.34	0.78	0.25	0.44	0.124	$(5)_{TOTAL}-(5)_{FI}$ = 0.706	0.124	1.00	1.79	0.222

Existing Conditions: Vehicle-Pedestrian Crash Summary at Urban And Suburban Arterial Stop-Controlled Intersections						
(1)	(2)	(3)	(4)	(5)	(6)	(7)
Crash Severity Level	**Predicted N_{bimv}** (9) from Worksheet 2C	**Predicted N_{bisv}** (9) from Worksheet 2E	**Predicted N_{bi}** (2) + (3)	**f_{pedi}** from Table 12-16	**Calibration factor, C_i**	**Predicted N_{pedi}** (4)*(5)*(6)
Total	--	--	--	--	--	--
Fatal and injury (FI)	--	--	--	--	--	--

Existing Conditions: CMFs for Vehicle-Pedestrian Crash Summary for Urban And Suburban Arterial Signalized Intersections			
(1)	(2)	(3)	(4)
CMF for Bus Stops	CMF for Schools	CMF for Alcohol Sales Establishments	Combined CMF
CMF_{1p}	CMF_{2p}	CMF_{3p}	
from Table 12-28	from Table 12-29	from Table 12-30	(1)*(2)*(3)
4.15	1.00	1.12	4.65

Existing Conditions: Vehicle-Pedestrian Crash Summary at Urban And Suburban Arterial Signalized Intersections										
(1)	(2)					(3)	(4)	(5)	(6)	(7)
Crash Severity Level	**SPF Coefficients** from Table 12-14					**Overdispersion Parameter, k**	**$N_{pedbase}$** from Equation 12-29	**Combined CMF** (4) from Worksheet 2H	**Calibration factor, C_i**	**Predicted N_{pedi}** (4)*(5)*(6)
	a	b	c	d	e					
Total	-9.53	0.40	0.26	0.45	0.04	0.24	0.028	4.65	0.47	0.061
Fatal and Injury (FI)	--	--	--	--	--	--	--	--	0.47	0.061

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Existing Conditions: Vehicle-Bicycle Crash Summary for Urban And Suburban Arterial Intersection						
(1)	(2)	(3)	(4)	(5)	(6)	(7)
Crash Severity Level	**Predicted N_{bimv}**	**Predicted N_{bisv}**	**Predicted N_{bi}**	**f_{bikei}**	**Calibration factor, C_i**	**Predicted N_{bikei}**
	(9) from Worksheet 2C	(9) from Worksheet 2E	(2) + (3)	from Table 12-17		(4)*(5)*(6)
Total	5.654	0.299	5.953	0.0076	4.51	0.204
Fatal and injury (FI)	--	--	--	--	4.51	0.204

Federal law 23 USC § 409 prohibits the discovery or admission into evidence of "reports, surveys, schedules, lists, or data" compiled or collected for the purpose of highway safety improvement projects that might qualify for federal safety improvement funding.

Federal law 23 USC § 409 prohibits the discovery or admission into evidence of "reports, surveys, schedules, lists, or data" compiled or collected for the purpose of highway safety improvement projects that might qualify for federal safety improvement funding.

Project Cost Estimate

Project Name	Livingston Ave Corridor Study	Contact Email	tilakcnagaraju@chacompanies.com
Project Description	Safety analysis at the intersection of Livingston Ave and	Contact Phone	(614) 362-7517
Reference Number		Date Performed	7/26/2022
Analyst	TCN	Analysis Year	2022
Agency/Company	CHA Consulting Inc.		

Engineering Design %	20%
Contingency %	10%

Countermeasures	Construction Costs	Right of Way Costs	Engineering Design Costs	Contingency Amount	Total Cost of Countermeasure	Annual Maintenance & Energy Costs	Salvage Value
Site Characteristic Improvements (i.e. Lane widening)			$0.00	$0.00	**$0.00**		
Site Characteristic Improvements (i.e. Lighting)			$0.00	$0.00	**$0.00**		
Site Characteristic Improvements (i.e. Signal Phasing)			$0.00	$0.00	**$0.00**		
Site Characteristic Improvements (i.e. Added Right Turn Lane)			$0.00	$0.00	**$0.00**		
			$0.00	$0.00	**$0.00**		
CMF 2 - Improve visibility of signal heads	$7,200.00	$0.00	$1,440.00	$720.00	**$9,360.00**		
CMF 3 - Increase yellow interval and all red interval	$1,250.00	$0.00	$1,250.00	$125.00	**$2,625.00**		
		$0.00	$0.00	$0.00	**$0.00**		
			$0.00	$0.00	**$0.00**		
			$0.00	$0.00	**$0.00**		
			$0.00	$0.00	**$0.00**		
			$0.00	$0.00	**$0.00**		
			$0.00	$0.00	**$0.00**		
Totals	**$8,450.00**	**$0.00**	**$2,690.00**	**$845.00**	**$11,985.00**	**$0.00**	**$0.00**

Inflation %	9%

Final Costruction Cost:	**$13,063.65**

*Final construction cost should match the Project Cost Estimate

Safety Benefit - Cost Analysis

General Information

Project Name	Livingston Ave Corridor Study	Contact Email	tilakcnagaraju@chacompanies.com
Project Description	Safety analysis at the intersection of Livingston Ave and Champion Ave	Contact Phone	(614) 362-7517
Reference Number		Date Performed	7/26/2022
Analyst	TCN	Analysis Year	2022
Agency/Company	CHA Consulting Inc.		

Select Site Types to be used in Benefit-Cost Analysis:

All Sites

Comments:

Countermeasure Service Lives, Costs, and Safety Benefits

Countermeasures	Service Life (Years)	Initial Cost of Countermeasure	Annual Maintenance & Energy Costs	Salvage Value	Net Present Cost of Countermeasure	Total Cost of Countermeasures	Summary of Annual Crash Modifications	Net Present Value of Safety Benefits
Site Characteristic Improvements (i.e. Lane widening)		$0.00			$0.00	$0.00	0.000	$0
Site Characteristic Improvements (i.e. Lighting)		$0.00			$0.00	$0.00		
Site Characteristic Improvements (i.e. Signal Phasing)		$0.00			$0.00	$0.00		
Site Characteristic Improvements (i.e. Added Right Turn Lane)		$0.00			$0.00	$0.00		
		$0.00			$0.00	$0.00	0.000	$0
CMF 2 - Improve visibility of signal heads	20	$9,360.00			$9,360.00	$9,360.00	-0.539	$186,130
CMF 3 - Increase yellow interval and all red interval	5	$2,100.00			$8,400.00	$11,545.47	-0.072	$24,915
		$0.00			$0.00	$0.00	0.000	$0
		$0.00			$0.00	$0.00	0.000	$0
		$0.00			$0.00	$0.00	0.000	$0
		$0.00			$0.00	$0.00	0.000	$0
		$0.00			$0.00	$0.00	0.000	$0
		$0.00			$0.00	$0.00	0.000	$0
		$0.00			$0.00	$0.00	0.000	$0
Totals		**$11,460.00**	**$0.00**	**$0.00**	**$17,760.00**	**$20,905.47**	**-0.611**	**$211,045**

Safety Benefit - Cost Analysis

ECAT Economic Crash Analysis Tool

General Information

Project Name	Livingston Ave Corridor Study	Contact Email	tilakcnagaraju@chacompanies.com
Project Description	Safety analysis at the intersection of Livingston Ave and Champion Ave	Contact Phone	(614) 362-7517
Reference Number		Date Performed	7/26/2022
Analyst	TCN	Analysis Year	2022
Agency/Company	CHA Consulting Inc.		

Benefit - Cost Calculator

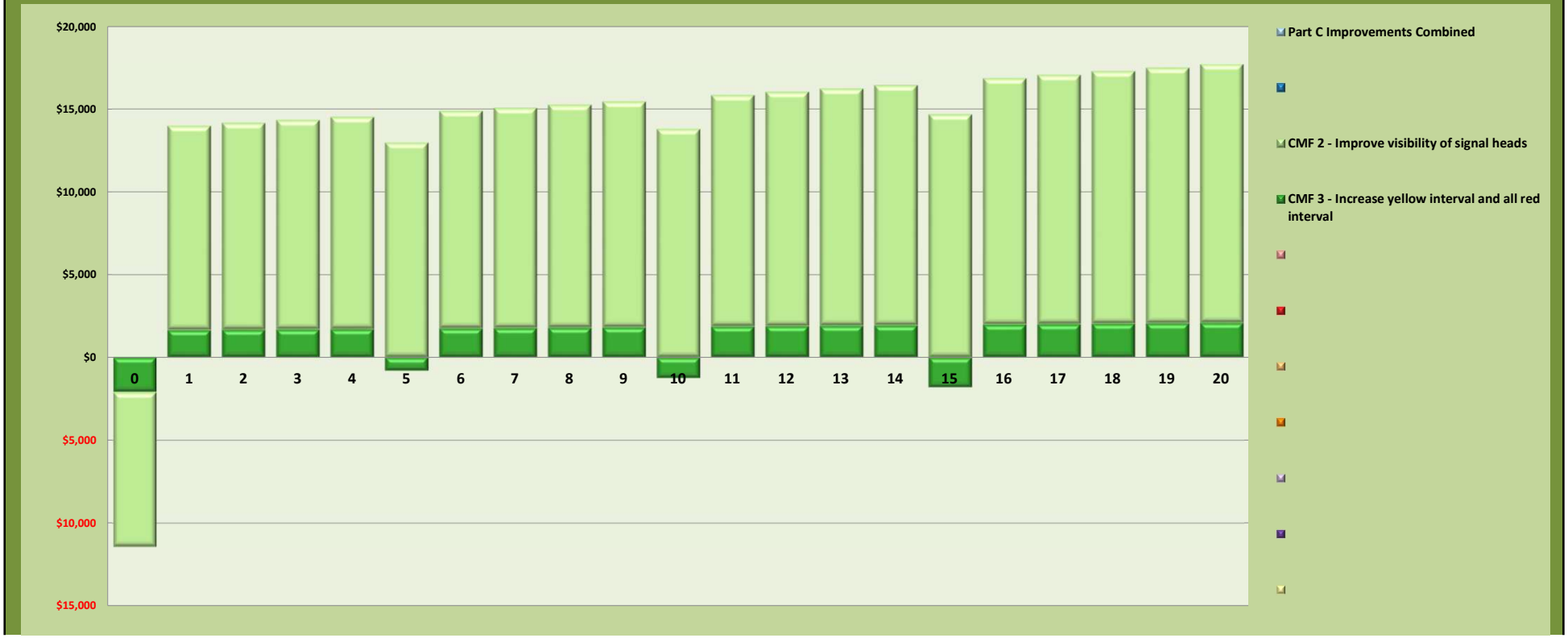
Net Present Value of Project	$17,760.00
Net Present Value of Safety Benefits	$211,045.05
Net Benefit	$193,285.05
Benefit / Cost Ratio	11.88

Expected Annual Crash Adjustment

Number of Fatal & Incapacitating Injury Crashes	-0.014
Number of Injury Crashes	-0.169
Number of Total Crashes	-0.611

Comments:

Safety Benefits and Project Costs Combined Cash Flows By Countermeasure Per Year



Safety Benefit - Cost Analysis

General Information

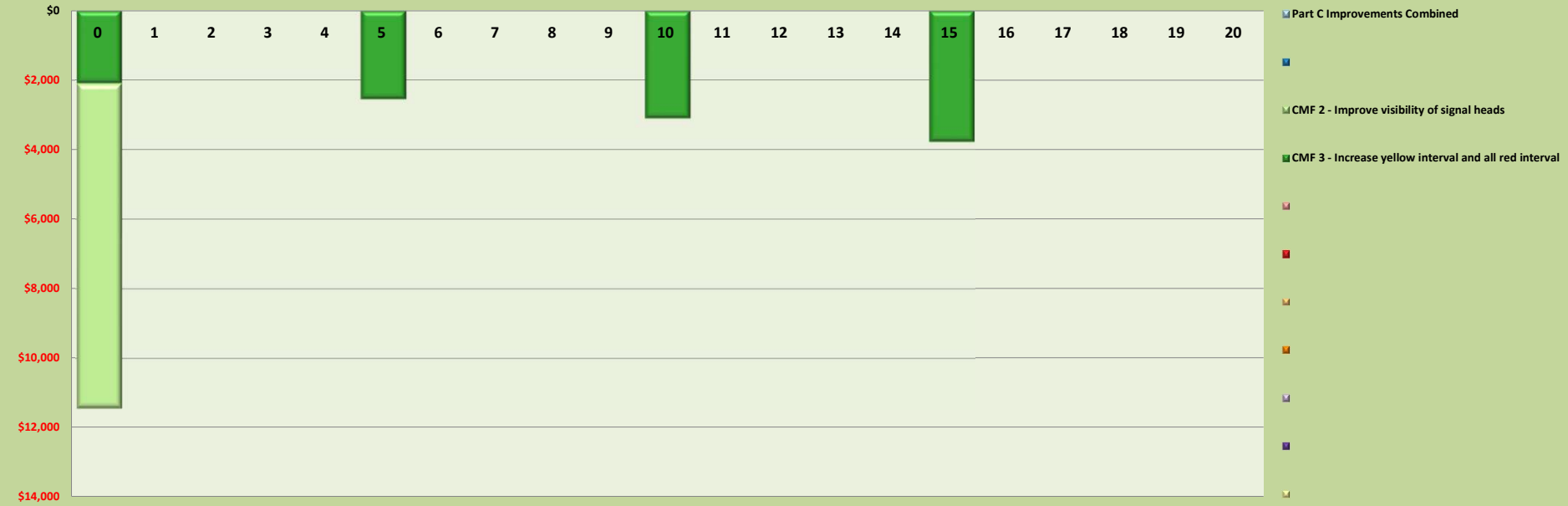
Project Name	Livingston Ave Corridor Study	Contact Email	tilakcnagaraju@chacompanies.com
Project Description	Safety analysis at the intersection of Livingston Ave and Champion Ave	Contact Phone	(614) 362-7517
Reference Number		Date Performed	7/26/2022
Analyst	TCN	Analysis Year	2022
Agency/Company	CHA Consulting Inc.		

Safety Benefit - Cost Analysis

General Information

Project Name	Livingston Ave Corridor Study	Contact Email	tilakcnagaraju@chacompanies.com
Project Description	Safety analysis at the intersection of Livingston Ave and Champion Ave	Contact Phone	(614) 362-7517
Reference Number		Date Performed	7/26/2022
Analyst	TCN	Analysis Year	2022
Agency/Company	CHA Consulting Inc.		

Project Costs Only Cash Flows By Countermeasure Per Year



Return on Investment (Safety Benefits and Project Investments)

First year to observe a positive return on investiment: 2023 (1 years)

Percentage of Service Life to observe a continuous Positive Return on Investment: 100.00%

Project Information

General Information

Project Name	Livingston Ave Corridor Study	Contact Email	tilakcnagaraju@chacompanies.com
Project Description	Safety analysis at the intersection of Livingston Ave and Fairwood Ave	Contact Phone	(614) 362-7517
Reference Number		Date Performed	7/26/2022
Analyst	TCN	Analysis Year	2022
Agency/Company	CHA Consulting Inc.		
Perform Benefit Cost Analysis?	Yes		

Do the proposed improvements fundamentally change the conditions of the base safety performance function (SPF), Or is crash data unavailable for the analysis condition, Or is only predicted (and not expected) analysis needed for the existing or proposed condition?	**No**

(Examples: unsignalized to signalized, undivided to divided, increase or decrease in the number of lanes, change the number of approaches to an intersection, significant realignment of the roadway)

Project Elements Description Table

Project Element ID (Must be Unique)	Site Type	Intersection Control Type	Location Information					
			NLFID	Begin Logpoint/ Intersection Midpoint	End Logpoint *(Leave blank for Intersection)*	Length (mi) OR Intersection Radius Buffer (mi)	Cross Route NLFID(s)	Common Name
US33; 126.052	Urban & Suburban Arterial Intersection	Signalized	SFRAUS00033**C	126.052		0.05	MFRAMR008	Livingston Ave at Fairwood Ave

Traffic Volume Growth Rate Calculation For Benefit Cost Analysis

	Year	AADT	
Present ADT (PADT)	2022	13,960	veh / day
Future ADT (FADT)	2026	14,686	veh / day
Annual Linear Growth Rate		0.0130	

Project Elements Description Table

Project Element ID (Must be Unique)	Site Type	Intersection Control Type	Location Information					
			NLFID	Begin Logpoint/ Intersection Midpoint	End Logpoint *(Leave blank for Intersection)*	Length (mi) OR Intersection Radius Buffer (mi)	Cross Route NLFID(s)	Common Name

Select Other Non-Site Characteristic Based Countermeasures For Entire Project

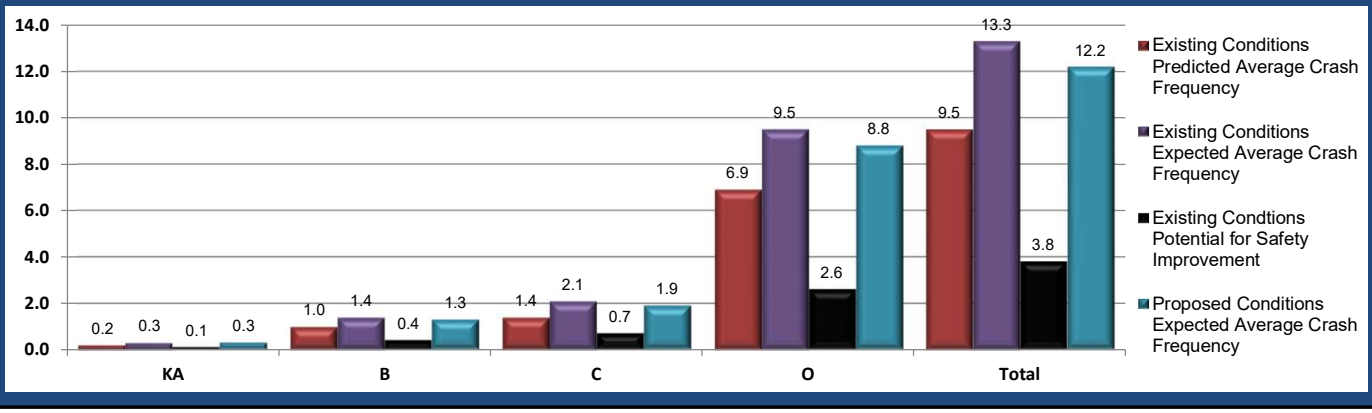
CMF Nbr	Countermeasure	CMF KA Value	CMF B Value	CMF C Value	CMF O Value	CMF Valid for the Following Site Types
CMF 1						
CMF 2	Improve visibility of signal heads	0.93	0.93	0.93	0.93	7
CMF 3	Increase yellow interval and all red interval	0.99	0.99	0.99	0.99	7
CMF 4						
CMF 5						
CMF 6						
CMF 7						
CMF 8						
CMF 9						
CMF 10						

Project Safety Performance Report

General Information

Project Name	Livingston Ave Corridor Study	Contact Email	tilakcnagaraju@chacompanies.com
Project Description	Safety analysis at the intersection of Livingston Ave and Fairwood Ave	Contact Phone	(614) 362-7517
Reference Number		Date Performed	7/26/2022
Analyst	TCN	Analysis Year	2022
Agency/Company	CHA Consulting Inc.		

Summary of Anticipated Safety Performance of the Project (average crashes/year)



Project Summary Results (Without Animal Crashes)

	KA	B	C	O	Total
$N_{predicted}$ - Existing Conditions	0.2242	0.9970	1.3789	6.9070	9.5071
$N_{expected}$ - Existing Conditions	0.3073	1.4148	2.0503	9.5132	13.2856
$N_{potential\ for\ improvement}$ - Existing Conditions	**0.0831**	**0.4178**	**0.6714**	**2.6062**	**3.7785**
$N_{expected}$ - Proposed Conditions	0.2829	1.3026	1.8877	8.7588	12.2320

Project Safety Performance Report

General Information

Project Name	Livingston Ave Corridor Study	Contact Email	tilakcnagaraju@chacompanies.com
Project Description	Safety analysis at the intersection of Livingston Ave and Fairwood Ave	Contact Phone	(614) 362-7517
Reference Number		Date Performed	7/26/2022
Analyst	TCN	Analysis Year	2022
Agency/Company	CHA Consulting Inc.		

Existing Conditions Project Element Predicted Crash Summary (Without Animal Crashes)

Project Element ID	Common Name	Crash Severity Level				
		KA	B	C	O	Total
US33: 126.052	Livingston Ave at Fairwood Ave	0.2242	0.997	1.3789	6.907	9.5071

Project Safety Performance Report

General Information

Project Name	Livingston Ave Corridor Study	Contact Email	tilakcnagaraju@chacompanies.com
Project Description	Safety analysis at the intersection of Livingston Ave and Fairwood Ave	Contact Phone	(614) 362-7517
Reference Number		Date Performed	7/26/2022
Analyst	TCN	Analysis Year	2022
Agency/Company	CHA Consulting Inc.		

Existing Conditions Project Element Expected Crash Summary (Without Animal Crashes)

Project Element ID	Common Name	Crash Severity Level				
		KA	B	C	O	Total
US33: 126.052	Livingston Ave at Fairwood Ave	0.3073	1.4148	2.0503	9.5132	13.2856

Project Safety Performance Report

General Information

Project Name	Livingston Ave Corridor Study	Contact Email	tilakcnagaraju@chacompanies.com
Project Description	Safety analysis at the intersection of Livingston Ave and Fairwood Ave	Contact Phone	(614) 362-7517
Reference Number		Date Performed	7/26/2022
Analyst	TCN	Analysis Year	2022
Agency/Company	CHA Consulting Inc.		

Existing Conditions Project Element Potential for Safety Improvement Summary (Without Animal Crashes)

Project Element ID	Common Name	Crash Severity Level				
		KA	B	C	O	Total
US33: 126.052	Livingston Ave at Fairwood Ave	0.0831	0.4178	0.6714	2.6062	3.7785

Project Safety Performance Report

General Information

Project Name	Livingston Ave Corridor Study	Contact Email	tilakcnagaraju@chacompanies.com
Project Description	Safety analysis at the intersection of Livingston Ave and Fairwood Ave	Contact Phone	(614) 362-7517
Reference Number		Date Performed	7/26/2022
Analyst	TCN	Analysis Year	2022
Agency/Company	CHA Consulting Inc.		

Proposed Conditions Project Element Expected Crash Summary (Without Animal Crashes)

Project Element ID	Common Name	Crash Severity Level				
		KA	B	C	O	Total
US33: 126.052	Livingston Ave at Fairwood Ave	0.2829	1.3026	1.8877	8.7588	12.232

Project Safety Performance Report

General Information

Project Name	Livingston Ave Corridor Study	Contact Email	tilakcnagaraju@chacompanies.com
Project Description	Safety analysis at the intersection of Livingston Ave and Fairwood Ave	Contact Phone	(614) 362-7517
Reference Number		Date Performed	7/26/2022
Analyst	TCN	Analysis Year	2022
Agency/Company	CHA Consulting Inc.		

Summary by Crash Type

Crash Type	Existing			Proposed
	Predicted Crash Frequency	Expected Crash Frequency	PSI	Expected Crash Frequency
Unknown	0.0042	0.0048	**0.0006**	0.0043
Head On	0.0570	0.0840	**0.0270**	0.0750
Rear End	4.5376	6.4767	**1.9391**	5.7842
Backing	0.2357	0.3285	**0.0928**	0.2934
Sideswipe - Meeting	0.1288	0.1852	**0.0564**	0.1654
Sideswipe - Passing	1.1100	1.5611	**0.4512**	1.3942
Angle	1.6506	2.3772	**0.7266**	1.2694
Parked Vehicle	0.1497	0.1728	**0.0231**	0.1543
Pedestrian	0.0600	0.0705	**0.0105**	0.0630
Animal	0.0000	0.0000	0.0000	0.0000
Train	0.0002	0.0003	0.0000	0.0002
Pedalcycles	0.3126	0.2858	-0.0268	0.2553
Other Non-Vehicle	0.0000	0.0000	0.0000	0.0000
Fixed Object	0.2389	0.2711	**0.0322**	0.2421
Other Object	0.0085	0.0098	**0.0013**	0.0088
Overturning	0.0129	0.0138	**0.0009**	0.0123
Other Non-Collision	0.0320	0.0365	**0.0046**	0.0326
Left Turn	0.9682	1.4075	**0.4393**	1.2570
Right Turn	0.0000	0.0000	0.0000	0.0000

Existing Conditions: General Information and Data for Urban And Suburban Arterial Intersection					
General Information		**Location Information**			
Analyst	TCN	Route	US33		
Agency or Company	CHA Consulting Inc.	Logpoint	126.052		
Date Performed	07/26/22	Common Name	Livingston Ave at Fairwood Ave		
Intersection	US33; 126.052	Analysis Year	2022		
Signalized/Unsignalized	Signalized				
Input Data				**Existing Conditions**	**HSM Base Conditions**
Intersection type (3ST, 3SG, 4ST, 4SG)				4SG	--
AADT $_{major}$ (veh/day) (total entering on major approaches)*	$AADT_{MAX}$ =	67,700	(veh/day)	13,960	--
AADT $_{minor}$ (veh/day) (total entering on minor approaches)*	$AADT_{MAX}$ =	33,400	(veh/day)	6,813	--
Intersection lighting (present/not present)				Present	Not Present
Calibration factor, C_i				Varies, See Below	1.00
Data for unsignalized intersections only:					
Number of major-road approaches with left-turn lanes					0
Number of major-road approaches with right-turn lanes					0
Data for signalized intersections only:					
Number of approaches with left-turn lanes				0	0
Number of approaches with right-turn lanes				0	0
Number of approaches with left-turn signal phasing				0	--
Type of left-turn signal phasing for Leg #1				Permissive	Permissive
Type of left-turn signal phasing for Leg #2				Permissive	--
Type of left-turn signal phasing for Leg #3				Permissive	--
Type of left-turn signal phasing for Leg #4				Permissive	--
Number of approaches with right-turn-on-red prohibited				0	0
Intersection red light cameras (present/not present)				Not Present	Not Present
Sum of all pedestrian crossing volumes (PedVol)				240	--
Maximum number of lanes crossed by a pedestrian (n_{lanesx})				2	--
Number of bus stops within 300 m (1,000 ft) of the intersection				1 or 2	0
Schools within 300 m (1,000 ft) of the intersection (present/not present)				Not Present	Not Present
Number of alcohol sales establishments within 300 m (1,000 ft) of the intersection				1 to 8	0
Locality:				State System	

Existing Conditions: Crash Modification Factors (CMFs) for Urban And Suburban Arterial Intersection						
(1)	(2)	(3)	(4)	(5)	(6)	(7)
CMF for Left-Turn Lanes	CMF for Left-Turn Signal Phasing	CMF for Right-Turn Lanes	CMF for Right Turn on Red	CMF for Lighting	CMF for Red Light Cameras	Combined CMF
CMF 1i	*CMF 2i*	*CMF 3i*	*CMF 4i*	*CMF 5i*	*CMF 6i*	*CMF $_{COMB}$*
from Table 12-24	from Table 12-25	from Table 12-26	from Equation 12-35	from Equation 12-36	from Equation 12-37	(1)*(2)*(3)*(4)*(5)*(6)
1.0000	1.0000	1.0000	1.0000	0.9999	1.0000	0.9999

Federal law 23 USC § 409 prohibits the discovery or admission into evidence of "reports, surveys, schedules, lists, or data" compiled or collected for the purpose of highway safety improvement projects that might qualify for federal safety improvement funding.

Existing Conditions: Multiple-Vehicle Crash Summary for Urban And Suburban Arterial Intersection

(1)	(2)			(3)	(4)	(5)	(6)	(7)	(8)	(6)*(7)*(8)
Crash Severity Level	**SPF Coefficients**			**Overdispersion Parameter, k**	**Initial N_{bimv}**	**Proportion of Total Crashes**	**Adjusted N_{bimv}**	**Combined CMFs**	**Calibration Factor, C_i**	**Predicted N_{bimv}**
	from Table 12-10			from Table 12-10	from Equation 12-21		$(4)_{TOTAL}$*(5)	(7) from Worksheet 2B		
	a	b	c							
Total	-10.99	1.07	0.23	0.39	3.498	1.000	3.498	1.00	2.48	8.674
Fatal and Injury (FI)	-13.14	1.18	0.22	0.33	1.066	$(4)_{FI}/((4)_{FI}+(4)_{PDO})$ = 0.317	1.107	1.00	1.91	2.115
Property Damage Only (PDO)	-11.02	1.02	0.24	0.44	2.301	$(5)_{TOTAL}-(5)_{FI}$ = 0.683	2.390	1.00	2.75	6.573

Existing Conditions: Single-Vehicle Crash Summary for Urban And Suburban Arterial Intersection

(1)	(2)			(3)	(4)	(5)	(6)	(7)	(8)	(9)
Crash Severity Level	**SPF Coefficients**			**Overdispersion Parameter, k**	**Initial N_{bisv}**	**Proportion of Total Crashes**	**Adjusted N_{bimv}**	**Combined CMFs**	**Calibration Factor, C_i**	**Predicted N_{bisv}**
	from Table 12-12			from Table 12-12	from Eqn. 12-24; (FI) from Eqn. 12-24 or 12-27		$(4)_{TOTAL}$*(5)	(7) from Worksheet 2B		(6)*(7)*(8)
	a	b	c							
Total	-10.21	0.68	0.27	0.36	0.263	1.000	0.263	1.00	1.70	0.446
Fatal and Injury (FI)	-9.25	0.43	0.29	0.09	0.075	$(4)_{FI}/((4)_{FI}+(4)_{PDO})$ = 0.290	0.076	1.00	1.48	0.113
Property Damage Only (PDO)	-11.34	0.78	0.25	0.44	0.185	$(5)_{TOTAL}-(5)_{FI}$ = 0.710	0.187	1.00	1.79	0.334

Existing Conditions: Vehicle-Pedestrian Crash Summary at Urban And Suburban Arterial Stop-Controlled Intersections

(1)	(2)	(3)	(4)	(5)	(6)	(7)
Crash Severity Level	**Predicted N_{bimv}**	**Predicted N_{bisv}**	**Predicted N_{bi}**	**f_{pedi}**	**Calibration factor, C_i**	**Predicted N_{pedi}**
	(9) from Worksheet 2C	(9) from Worksheet 2E	(2) + (3)	from Table 12-16		(4)*(5)*(6)
Total	--	--	--	--	--	--
Fatal and injury (FI)	--	--	--	--	--	--

Existing Conditions: CMFs for Vehicle-Pedestrian Crash Summary for Urban And Suburban Arterial Signalized Intersections

(1)	(2)	(3)	(4)
CMF for Bus Stops	CMF for Schools	CMF for Alcohol Sales Establishments	Combined CMF
CMF_{1p}	CMF_{2p}	CMF_{3p}	
from Table 12-28	from Table 12-29	from Table 12-30	(1)*(2)*(3)
2.78	1.00	1.12	3.11

Existing Conditions: Vehicle-Pedestrian Crash Summary at Urban And Suburban Arterial Signalized Intersections

(1)	(2)					(3)	(4)	(5)	(6)	(7)
Crash Severity Level	**SPF Coefficients**					**Overdispersion Parameter, k**	**$N_{pedbase}$**	**Combined CMF**	**Calibration factor, C_i**	**Predicted N_{pedi}**
	from Table 12-14						from Equation 12-29	(4) from Worksheet 2H		(4)*(5)*(6)
	a	b	c	d	e					
Total	-9.53	0.40	0.26	0.45	0.04	0.24	0.041	3.11	0.47	0.060
Fatal and Injury (FI)	--	--	--	--	--	--	--	--	0.47	0.060

Federal law 23 USC § 409 prohibits the discovery or admission into evidence of "reports, surveys, schedules, lists, or data" compiled or collected for the purpose of highway safety improvement projects that might qualify for federal safety improvement funding.

Existing Conditions: Vehicle-Bicycle Crash Summary for Urban And Suburban Arterial Intersection						
(1)	(2)	(3)	(4)	(5)	(6)	(7)
Crash Severity Level	**Predicted N_{bimv}**	**Predicted N_{bisv}**	**Predicted N_{bi}**	**f_{bikei}**	**Calibration factor, C_i**	**Predicted N_{bikei}**
	(9) from Worksheet 2C	(9) from Worksheet 2E	(2) + (3)	from Table 12-17		(4)*(5)*(6)
Total	8.674	0.446	9.120	0.0076	4.51	0.313
Fatal and injury (FI)	--	--	--	--	4.51	0.313

Federal law 23 USC § 409 prohibits the discovery or admission into evidence of "reports, surveys, schedules, lists, or data" compiled or collected for the purpose of highway safety improvement projects that might qualify for federal safety improvement funding.

Federal law 23 USC § 409 prohibits the discovery or admission into evidence of "reports, surveys, schedules, lists, or data" compiled or collected for the purpose of highway safety improvement projects that might qualify for federal safety improvement funding.

Project Cost Estimate

Project Name	Livingston Ave Corridor Study	Contact Email	tilakcnagaraju@chacompanies.com
Project Description	Safety analysis at the intersection of Livingston Ave and	Contact Phone	(614) 362-7517
Reference Number		Date Performed	7/26/2022
Analyst	TCN	Analysis Year	2022
Agency/Company	CHA Consulting Inc.		

Engineering Design %	20%
Contingency %	10%

Countermeasures	Construction Costs	Right of Way Costs	Engineering Design Costs	Contingency Amount	Total Cost of Countermeasure	Annual Maintenance & Energy Costs	Salvage Value
Site Characteristic Improvements (i.e. Lane widening)			$0.00	$0.00	**$0.00**		
Site Characteristic Improvements (i.e. Lighting)			$0.00	$0.00	**$0.00**		
Site Characteristic Improvements (i.e. Signal Phasing)			$0.00	$0.00	**$0.00**		
Site Characteristic Improvements (i.e. Added Right Turn Lane)			$0.00	$0.00	**$0.00**		
			$0.00	$0.00	**$0.00**		
CMF 2 - Improve visibility of signal heads	$7,200.00	$0.00	$1,440.00	$720.00	**$9,360.00**		
CMF 3 - Increase yellow interval and all red interval	$1,250.00	$0.00	$1,250.00	$125.00	**$2,625.00**		
			$0.00	$0.00	**$0.00**		
			$0.00	$0.00	**$0.00**		
			$0.00	$0.00	**$0.00**		
			$0.00	$0.00	**$0.00**		
			$0.00	$0.00	**$0.00**		
			$0.00	$0.00	**$0.00**		
Totals	**$8,450.00**	**$0.00**	**$2,690.00**	**$845.00**	**$11,985.00**	**$0.00**	**$0.00**

Inflation %	9%

Final Costruction Cost:	**$13,063.65**

*Final construction cost should match the Project Cost Estimate

Safety Benefit - Cost Analysis

General Information

Project Name	Livingston Ave Corridor Study	Contact Email	tilakcnagaraju@chacompanies.com
Project Description	Safety analysis at the intersection of Livingston Ave and Fairwood Ave	Contact Phone	(614) 362-7517
Reference Number		Date Performed	7/26/2022
Analyst	TCN	Analysis Year	2022
Agency/Company	CHA Consulting Inc.		

Select Site Types to be used in Benefit-Cost Analysis:

All Sites

Comments:

Countermeasure Service Lives, Costs, and Safety Benefits

Countermeasures	Service Life (Years)	Initial Cost of Countermeasure	Annual Maintenance & Energy Costs	Salvage Value	Net Present Cost of Countermeasure	Total Cost of Countermeasures	Summary of Annual Crash Modifications	Net Present Value of Safety Benefits
Site Characteristic Improvements (i.e. Lane widening)		$0.00			$0.00	$0.00	0.000	$0
Site Characteristic Improvements (i.e. Lighting)		$0.00			$0.00	$0.00		
Site Characteristic Improvements (i.e. Signal Phasing)		$0.00			$0.00	$0.00		
Site Characteristic Improvements (i.e. Added Right Turn Lane)		$0.00			$0.00	$0.00		
		$0.00			$0.00	$0.00	0.000	$0
CMF 2 - Improve visibility of signal heads	20	$9,360.00			$9,360.00	$9,360.00	-0.930	$325,992
CMF 3 - Increase yellow interval and all red interval	20	$2,625.00			$2,625.00	$2,625.00	-0.124	$43,658
		$0.00			$0.00	$0.00	0.000	$0
		$0.00			$0.00	$0.00	0.000	$0
		$0.00			$0.00	$0.00	0.000	$0
		$0.00			$0.00	$0.00	0.000	$0
		$0.00			$0.00	$0.00	0.000	$0
		$0.00			$0.00	$0.00	0.000	$0
		$0.00			$0.00	$0.00	0.000	$0
Totals		**$11,985.00**	**$0.00**	**$0.00**	**$11,985.00**	**$11,985.00**	**-1.054**	**$369,650**

Safety Benefit - Cost Analysis

ECAT Economic Crash Analysis Tool

General Information

Project Name	Livingston Ave Corridor Study	Contact Email	tilakcnagaraju@chacompanies.com
Project Description	Safety analysis at the intersection of Livingston Ave and Fairwood Ave	Contact Phone	(614) 362-7517
Reference Number		Date Performed	7/26/2022
Analyst	TCN	Analysis Year	2022
Agency/Company	CHA Consulting Inc.		

Benefit - Cost Calculator

Net Present Value of Project	$11,985.00
Net Present Value of Safety Benefits	$369,650.06
Net Benefit	$357,665.06
Benefit / Cost Ratio	30.84

Expected Annual Crash Adjustment

Number of Fatal & Incapacitating Injury Crashes	-0.024
Number of Injury Crashes	-0.299
Number of Total Crashes	-1.054

Comments:

Safety Benefits and Project Costs Combined Cash Flows By Countermeasure Per Year

Safety Benefit - Cost Analysis

General Information

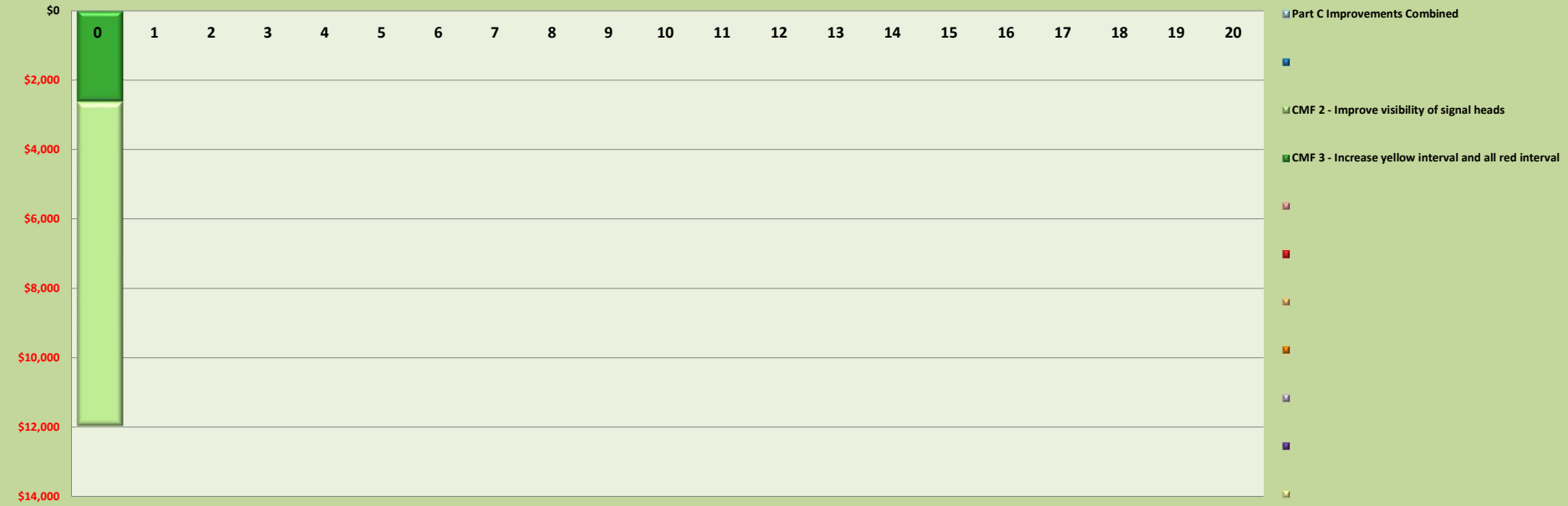
Project Name	Livingston Ave Corridor Study	Contact Email	tilakcnagaraju@chacompanies.com
Project Description	Safety analysis at the intersection of Livingston Ave and Fairwood Ave	Contact Phone	(614) 362-7517
Reference Number		Date Performed	7/26/2022
Analyst	TCN	Analysis Year	2022
Agency/Company	CHA Consulting Inc.		

Safety Benefit - Cost Analysis

General Information

Project Name	Livingston Ave Corridor Study	Contact Email	tilakcnagaraju@chacompanies.com
Project Description	Safety analysis at the intersection of Livingston Ave and Fairwood Ave	Contact Phone	(614) 362-7517
Reference Number		Date Performed	7/26/2022
Analyst	TCN	Analysis Year	2022
Agency/Company	CHA Consulting Inc.		

Project Costs Only Cash Flows By Countermeasure Per Year



Return on Investment (Safety Benefits and Project Investments)

First year to observe a positive return on investiment: 2023 (1 years)

Percentage of Service Life to observe a continuous Positive Return on Investment: 100.00%

Project Information

General Information

Project Name	Livingston Ave Corridor Study	Contact Email	tilakcnagaraju@chacompanies.com
Project Description	Safety analysis at the intersection of Livingston Ave and Kelton Ave	Contact Phone	(614) 362-7517
Reference Number		Date Performed	7/26/2022
Analyst	TCN	Analysis Year	2022
Agency/Company	CHA Consulting Inc.		
Perform Benefit Cost Analysis?	Yes		

Do the proposed improvements fundamentally change the conditions of the base safety performance function (SPF), Or is crash data unavailable for the analysis condition, Or is only predicted (and not expected) analysis needed for the existing or proposed condition?	**No**

(Examples: unsignalized to signalized, undivided to divided, increase or decrease in the number of lanes, change the number of approaches to an intersection, significant realignment of the roadway)

Project Elements Description Table

Project Element ID (Must be Unique)	Site Type	Intersection Control Type	Location Information					
			NLFID	Begin Logpoint/ Intersection Midpoint	End Logpoint *(Leave blank for Intersection)*	Length (mi) OR Intersection Radius Buffer (mi)	Cross Route NLFID(s)	Common Name
US33; 125.763	Urban & Suburban Arterial Intersection	Signalized	SFRAUS00033**C	125.763		0.05	MFRAMR011	Livingston Ave at Kelton Ave

Traffic Volume Growth Rate Calculation For Benefit Cost Analysis

	Year	AADT	
Present ADT (PADT)	2022	15,107	veh / day
Future ADT (FADT)	2026	15,409	veh / day
Annual Linear Growth Rate		0.0050	

Project Elements Description Table

Project Element ID (Must be Unique)	Site Type	Intersection Control Type	Location Information					
			NLFID	Begin Logpoint/ Intersection Midpoint	End Logpoint *(Leave blank for Intersection)*	Length (mi) OR Intersection Radius Buffer (mi)	Cross Route NLFID(s)	Common Name

Select Other Non-Site Characteristic Based Countermeasures For Entire Project

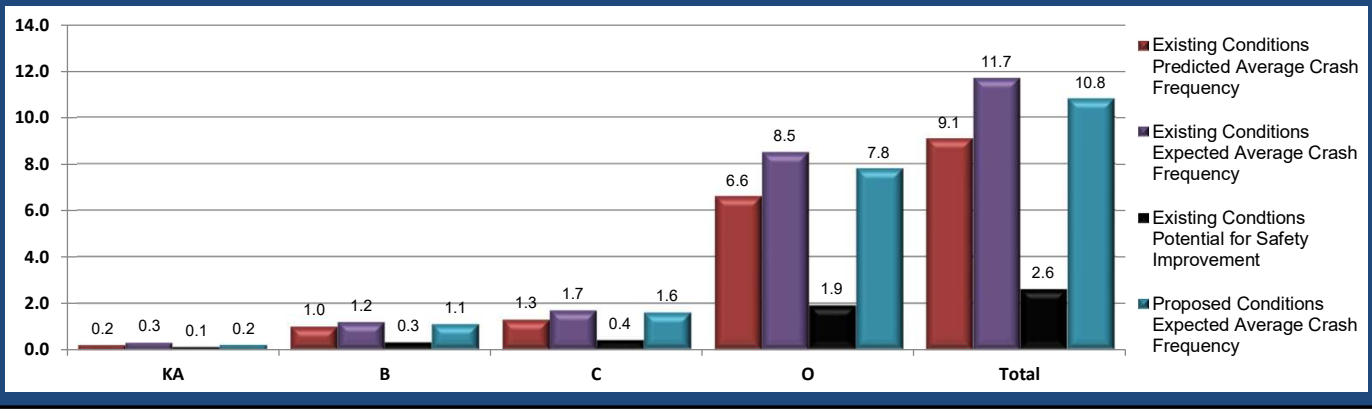
CMF Nbr	Countermeasure	CMF KA Value	CMF B Value	CMF C Value	CMF O Value	CMF Valid for the Following Site Types
CMF 1						
CMF 2	Improve visibility of signal heads	0.93	0.93	0.93	0.93	7
CMF 3	Increase yellow interval and all red interval	0.99	0.99	0.99	0.99	7
CMF 4						
CMF 5						
CMF 6						
CMF 7						
CMF 8						
CMF 9						
CMF 10						

Project Safety Performance Report

General Information

Project Name	Livingston Ave Corridor Study	Contact Email	tilakcnagaraju@chacompanies.com
Project Description	Safety analysis at the intersection of Livingston Ave and Kelton Ave	Contact Phone	(614) 362-7517
Reference Number		Date Performed	7/26/2022
Analyst	TCN	Analysis Year	2022
Agency/Company	CHA Consulting Inc.		

Summary of Anticipated Safety Performance of the Project (average crashes/year)



Project Summary Results (Without Animal Crashes)

	KA	B	C	O	Total
$N_{predicted}$ - Existing Conditions	0.2099	0.9534	1.3322	6.6134	9.1089
$N_{expected}$ - Existing Conditions	0.2633	1.2184	1.7416	8.4843	11.7076
$N_{potential\ for\ improvement}$ - Existing Conditions	**0.0534**	**0.2650**	**0.4094**	**1.8709**	**2.5987**
$N_{expected}$ - Proposed Conditions	0.2425	1.1218	1.6035	7.8115	10.7793

Project Safety Performance Report

General Information

Project Name	Livingston Ave Corridor Study	Contact Email	tilakcnagaraju@chacompanies.com
Project Description	Safety analysis at the intersection of Livingston Ave and Kelton Ave	Contact Phone	(614) 362-7517
Reference Number		Date Performed	7/26/2022
Analyst	TCN	Analysis Year	2022
Agency/Company	CHA Consulting Inc.		

Existing Conditions Project Element Predicted Crash Summary (Without Animal Crashes)

Project Element ID	Common Name	Crash Severity Level				
		KA	B	C	O	Total
US33: 125.763	Livingston Ave at Kelton Ave	0.2099	0.9534	1.3322	6.6134	9.1089

Project Safety Performance Report

General Information

Project Name	Livingston Ave Corridor Study	Contact Email	tilakcnagaraju@chacompanies.com
Project Description	Safety analysis at the intersection of Livingston Ave and Kelton Ave	Contact Phone	(614) 362-7517
Reference Number		Date Performed	7/26/2022
Analyst	TCN	Analysis Year	2022
Agency/Company	CHA Consulting Inc.		

Existing Conditions Project Element Expected Crash Summary (Without Animal Crashes)

Project Element ID	Common Name	Crash Severity Level				
		KA	B	C	O	Total
US33: 125.763	Livingston Ave at Kelton Ave	0.2633	1.2184	1.7416	8.4843	11.7076

Project Safety Performance Report

General Information

Project Name	Livingston Ave Corridor Study	Contact Email	tilakcnagaraju@chacompanies.com
Project Description	Safety analysis at the intersection of Livingston Ave and Kelton Ave	Contact Phone	(614) 362-7517
Reference Number		Date Performed	7/26/2022
Analyst	TCN	Analysis Year	2022
Agency/Company	CHA Consulting Inc.		

Existing Conditions Project Element Potential for Safety Improvement Summary (Without Animal Crashes)

Project Element ID	Common Name	Crash Severity Level				
		KA	B	C	O	Total
US33: 125.763	Livingston Ave at Kelton Ave	0.0534	0.265	0.4094	1.8709	2.5987

Project Safety Performance Report

General Information

Project Name	Livingston Ave Corridor Study	Contact Email	tilakcnagaraju@chacompanies.com
Project Description	Safety analysis at the intersection of Livingston Ave and Kelton Ave	Contact Phone	(614) 362-7517
Reference Number		Date Performed	7/26/2022
Analyst	TCN	Analysis Year	2022
Agency/Company	CHA Consulting Inc.		

Proposed Conditions Project Element Expected Crash Summary (Without Animal Crashes)

Project Element ID	Common Name	Crash Severity Level				
		KA	B	C	O	Total
US33: 125.763	Livingston Ave at Kelton Ave	0.2425	1.1218	1.6035	7.8115	10.7793

Project Safety Performance Report

General Information

Project Name	Livingston Ave Corridor Study	Contact Email	tilakcnagaraju@chacompanies.com
Project Description	Safety analysis at the intersection of Livingston Ave and Kelton Ave	Contact Phone	(614) 362-7517
Reference Number		Date Performed	7/26/2022
Analyst	TCN	Analysis Year	2022
Agency/Company	CHA Consulting Inc.		

Summary by Crash Type

Crash Type	Existing			Proposed
	Predicted Crash Frequency	Expected Crash Frequency	PSI	Expected Crash Frequency
Unknown	0.0039	0.0043	**0.0004**	0.0038
Head On	0.0552	0.0726	**0.0174**	0.0649
Rear End	4.3701	5.6929	**1.3228**	5.0842
Backing	0.2261	0.2924	**0.0663**	0.2611
Sideswipe - Meeting	0.1242	0.1621	**0.0380**	0.1448
Sideswipe - Passing	1.0664	1.3830	**0.3165**	1.2351
Angle	1.5919	2.0796	**0.4877**	1.1105
Parked Vehicle	0.1388	0.1525	**0.0136**	0.1362
Pedestrian	0.0261	0.0259	-0.0002	0.0231
Animal	0.0000	0.0000	0.0000	0.0000
Train	0.0002	0.0002	0.0000	0.0002
Pedalcycles	0.3010	0.3238	**0.0229**	0.2892
Other Non-Vehicle	0.0000	0.0000	0.0000	0.0000
Fixed Object	0.2204	0.2398	**0.0193**	0.2141
Other Object	0.0079	0.0087	**0.0008**	0.0078
Overturning	0.0117	0.0123	**0.0006**	0.0110
Other Non-Collision	0.0295	0.0323	**0.0027**	0.0288
Left Turn	0.9353	1.2253	**0.2900**	1.0943
Right Turn	0.0000	0.0000	0.0000	0.0000

Existing Conditions: General Information and Data for Urban And Suburban Arterial Intersection					
General Information		**Location Information**			
Analyst	TCN	Route	US33		
Agency or Company	CHA Consulting Inc.	Logpoint	125.763		
Date Performed	07/26/22	Common Name	Livingston Ave at Kelton Ave		
Intersection	US33; 125.763	Analysis Year	2022		
Signalized/Unsignalized	Signalized				
Input Data				**Existing Conditions**	**HSM Base Conditions**
Intersection type (3ST, 3SG, 4ST, 4SG)				4SG	--
AADT $_{major}$ (veh/day) (total entering on major approaches)*	$AADT_{MAX}$ =	67,700	(veh/day)	15,107	--
AADT $_{minor}$ (veh/day) (total entering on minor approaches)*	$AADT_{MAX}$ =	33,400	(veh/day)	4,820	--
Intersection lighting (present/not present)				Present	Not Present
Calibration factor, C_i				Varies, See Below	1.00
Data for unsignalized intersections only:					
Number of major-road approaches with left-turn lanes					0
Number of major-road approaches with right-turn lanes					0
Data for signalized intersections only:					
Number of approaches with left-turn lanes				0	0
Number of approaches with right-turn lanes				1	0
Number of approaches with left-turn signal phasing				0	--
Type of left-turn signal phasing for Leg #1				Permissive	Permissive
Type of left-turn signal phasing for Leg #2				Permissive	--
Type of left-turn signal phasing for Leg #3				Permissive	--
Type of left-turn signal phasing for Leg #4				Not Applicable	--
Number of approaches with right-turn-on-red prohibited				0	0
Intersection red light cameras (present/not present)				Not Present	Not Present
Sum of all pedestrian crossing volumes (PedVol)				50	--
Maximum number of lanes crossed by a pedestrian (n_{lanesx})				2	--
Number of bus stops within 300 m (1,000 ft) of the intersection				1 or 2	0
Schools within 300 m (1,000 ft) of the intersection (present/not present)				Not Present	Not Present
Number of alcohol sales establishments within 300 m (1,000 ft) of the intersection				1 to 8	0
Locality:				State System	

Existing Conditions: Crash Modification Factors (CMFs) for Urban And Suburban Arterial Intersection						
(1)	(2)	(3)	(4)	(5)	(6)	(7)
CMF for Left-Turn Lanes	CMF for Left-Turn Signal Phasing	CMF for Right-Turn Lanes	CMF for Right Turn on Red	CMF for Lighting	CMF for Red Light Cameras	Combined CMF
CMF 1i	*CMF 2i*	*CMF 3i*	*CMF 4i*	*CMF 5i*	*CMF 6i*	*CMF $_{COMB}$*
from Table 12-24	from Table 12-25	from Table 12-26	from Equation 12-35	from Equation 12-36	from Equation 12-37	(1)*(2)*(3)*(4)*(5)*(6)
1.0000	1.0000	0.9600	1.0000	0.9999	1.0000	0.9599

Federal law 23 USC § 409 prohibits the discovery or admission into evidence of "reports, surveys, schedules, lists, or data" compiled or collected for the purpose of highway safety improvement projects that might qualify for federal safety improvement funding.

Existing Conditions: Multiple-Vehicle Crash Summary for Urban And Suburban Arterial Intersection									
(1)	(2)			(3)	(4)	(5)	(6)	(7)	(8)	(6)*(7)*(8)
Crash Severity Level	**SPF Coefficients** from Table 12-10			**Overdispersion Parameter, k** from Table 12-10	**Initial N_{bimv}** from Equation 12-21	**Proportion of Total Crashes**	**Adjusted N_{bimv}** $(4)_{TOTAL}$*(5)	**Combined CMFs** (7) from Worksheet 2B	**Calibration Factor, C_i**	**Predicted N_{bimv}**
	a	b	c							
Total	-10.99	1.07	0.23	0.39	3.515	1.000	3.515	0.96	2.48	8.368
Fatal and Injury (FI)	-13.14	1.18	0.22	0.33	1.084	$(4)_{FI}/((4)_{FI}+(4)_{PDO})$ = 0.321	1.128	0.96	1.91	2.068
Property Damage Only (PDO)	-11.02	1.02	0.24	0.44	2.295	$(5)_{TOTAL}-(5)_{FI}$ = 0.679	2.387	0.96	2.75	6.302

Existing Conditions: Single-Vehicle Crash Summary for Urban And Suburban Arterial Intersection										
(1)	(2)			(3)	(4)	(5)	(6)	(7)	(8)	(9)
Crash Severity Level	**SPF Coefficients** from Table 12-12			**Overdispersion Parameter, k** from Table 12-12	**Initial N_{bisv}** from Eqn. 12-24; (FI) from Eqn. 12-24 or 12-27	**Proportion of Total Crashes**	**Adjusted N_{bimv}** $(4)_{TOTAL}$*(5)	**Combined CMFs** (7) from Worksheet 2B	**Calibration Factor, C_i**	**Predicted N_{bisv}** (6)*(7)*(8)
	a	b	c							
Total	-10.21	0.68	0.27	0.36	0.252	1.000	0.252	0.96	1.70	0.412
Fatal and Injury (FI)	-9.25	0.43	0.29	0.09	0.070	$(4)_{FI}/((4)_{FI}+(4)_{PDO})$ = 0.281	0.071	0.96	1.48	0.101
Property Damage Only (PDO)	-11.34	0.78	0.25	0.44	0.180	$(5)_{TOTAL}-(5)_{FI}$ = 0.719	0.181	0.96	1.79	0.312

Existing Conditions: Vehicle-Pedestrian Crash Summary at Urban And Suburban Arterial Stop-Controlled Intersections						
(1)	(2)	(3)	(4)	(5)	(6)	(7)
Crash Severity Level	**Predicted N_{bimv}** (9) from Worksheet 2C	**Predicted N_{bisv}** (9) from Worksheet 2E	**Predicted N_{bi}** (2) + (3)	**f_{pedi}** from Table 12-16	**Calibration factor, C_i**	**Predicted N_{pedi}** (4)*(5)*(6)
Total	--	--	--	--	--	--
Fatal and injury (FI)	--	--	--	--	--	--

Existing Conditions: CMFs for Vehicle-Pedestrian Crash Summary for Urban And Suburban Arterial Signalized Intersections			
(1)	(2)	(3)	(4)
CMF for Bus Stops	CMF for Schools	CMF for Alcohol Sales Establishments	Combined CMF
CMF_{1p}	CMF_{2p}	CMF_{3p}	
from Table 12-28	from Table 12-29	from Table 12-30	(1)*(2)*(3)
2.78	1.00	1.12	3.11

Existing Conditions: Vehicle-Pedestrian Crash Summary at Urban And Suburban Arterial Signalized Intersections									
(1)	(2)					(3)	(4)	(5)	(6)	(7)
Crash Severity Level	**SPF Coefficients** from Table 12-14					**Overdispersion Parameter, k**	**$N_{pedbase}$** from Equation 12-29	**Combined CMF** (4) from Worksheet 2H	**Calibration factor, C_i**	**Predicted N_{pedi}** (4)*(5)*(6)
	a	b	c	d	e					
Total	-9.53	0.40	0.26	0.45	0.04	0.24	0.018	3.11	0.47	0.026
Fatal and Injury (FI)	--	--	--	--	--	--	--	--	0.47	0.026

Federal law 23 USC § 409 prohibits the discovery or admission into evidence of "reports, surveys, schedules, lists, or data" compiled or collected for the purpose of highway safety improvement projects that might qualify for federal safety improvement funding.

Existing Conditions: Vehicle-Bicycle Crash Summary for Urban And Suburban Arterial Intersection						
(1)	(2)	(3)	(4)	(5)	(6)	(7)
Crash Severity Level	**Predicted N_{bimv}**	**Predicted N_{bisv}**	**Predicted N_{bi}**	**f_{bikei}**	**Calibration factor, C_i**	**Predicted N_{bikei}**
	(9) from Worksheet 2C	(9) from Worksheet 2E	(2) + (3)	from Table 12-17		(4)*(5)*(6)
Total	8.368	0.412	8.779	0.0076	4.51	0.301
Fatal and injury (FI)	--	--	--	--	4.51	0.301

Federal law 23 USC § 409 prohibits the discovery or admission into evidence of "reports, surveys, schedules, lists, or data" compiled or collected for the purpose of highway safety improvement projects that might qualify for federal safety improvement funding.

Federal law 23 USC § 409 prohibits the discovery or admission into evidence of "reports, surveys, schedules, lists, or data" compiled or collected for the purpose of highway safety improvement projects that might qualify for federal safety improvement funding.

Project Cost Estimate

Project Name	Livingston Ave Corridor Study	Contact Email	tilakcnagaraju@chacompanies.com
Project Description	Safety analysis at the intersection of Livingston Ave and	Contact Phone	(614) 362-7517
Reference Number		Date Performed	7/26/2022
Analyst	TCN	Analysis Year	2022
Agency/Company	CHA Consulting Inc.		

Engineering Design %	20%
Contingency %	10%

Countermeasures	Construction Costs	Right of Way Costs	Engineering Design Costs	Contingency Amount	Total Cost of Countermeasure	Annual Maintenance & Energy Costs	Salvage Value
Site Characteristic Improvements (i.e. Lane widening)			$0.00	$0.00	**$0.00**		
Site Characteristic Improvements (i.e. Lighting)			$0.00	$0.00	**$0.00**		
Site Characteristic Improvements (i.e. Signal Phasing)			$0.00	$0.00	**$0.00**		
Site Characteristic Improvements (i.e. Added Right Turn Lane)			$0.00	$0.00	**$0.00**		
			$0.00	$0.00	**$0.00**		
CMF 2 - Improve visibility of signal heads	$7,200.00	$0.00	$1,440.00	$720.00	**$9,360.00**		
CMF 3 - Increase yellow interval and all red interval	$1,250.00	$0.00	$1,250.00	$125.00	**$2,625.00**		
			$0.00	$0.00	**$0.00**		
			$0.00	$0.00	**$0.00**		
			$0.00	$0.00	**$0.00**		
			$0.00	$0.00	**$0.00**		
			$0.00	$0.00	**$0.00**		
			$0.00	$0.00	**$0.00**		
Totals	**$8,450.00**	**$0.00**	**$2,690.00**	**$845.00**	**$11,985.00**	**$0.00**	**$0.00**

Inflation %	9%

Final Costruction Cost:	**$13,063.65**

*Final construction cost should match the Project Cost Estimate

Safety Benefit - Cost Analysis

ECAT Economic Crash Analysis Tool

General Information

Project Name	Livingston Ave Corridor Study	Contact Email	tilakcnagaraju@chacompanies.com
Project Description	Safety analysis at the intersection of Livingston Ave and Kelton Ave	Contact Phone	(614) 362-7517
Reference Number		Date Performed	7/26/2022
Analyst	TCN	Analysis Year	2022
Agency/Company	CHA Consulting Inc.		

Select Site Types to be used in Benefit-Cost Analysis:

All Sites

Comments:

Countermeasure Service Lives, Costs, and Safety Benefits

Countermeasures	Service Life (Years)	Initial Cost of Countermeasure	Annual Maintenance & Energy Costs	Salvage Value	Net Present Cost of Countermeasure	Total Cost of Countermeasures	Summary of Annual Crash Modifications	Net Present Value of Safety Benefits
Site Characteristic Improvements (i.e. Lane widening)		$0.00			$0.00	$0.00	0.000	$0
Site Characteristic Improvements (i.e. Lighting)		$0.00			$0.00	$0.00		
Site Characteristic Improvements (i.e. Signal Phasing)		$0.00			$0.00	$0.00		
Site Characteristic Improvements (i.e. Added Right Turn Lane)		$0.00			$0.00	$0.00		
		$0.00			$0.00	$0.00	0.000	$0
CMF 2 - Improve visibility of signal heads	20	$9,360.00			$9,360.00	$9,360.00	-0.820	$258,577
CMF 3 - Increase yellow interval and all red interval	5	$2,625.00			$10,500.00	$14,431.83	-0.109	$34,064
		$0.00			$0.00	$0.00	0.000	$0
		$0.00			$0.00	$0.00	0.000	$0
		$0.00			$0.00	$0.00	0.000	$0
		$0.00			$0.00	$0.00	0.000	$0
		$0.00			$0.00	$0.00	0.000	$0
		$0.00			$0.00	$0.00	0.000	$0
		$0.00			$0.00	$0.00	0.000	$0
Totals		**$11,985.00**	**$0.00**	**$0.00**	**$19,860.00**	**$23,791.83**	**-0.928**	**$292,641**

Safety Benefit - Cost Analysis

ECAT Economic Crash Analysis Tool

General Information

Project Name	Livingston Ave Corridor Study	Contact Email	tilakcnagaraju@chacompanies.com
Project Description	Safety analysis at the intersection of Livingston Ave and Kelton Ave	Contact Phone	(614) 362-7517
Reference Number		Date Performed	7/26/2022
Analyst	TCN	Analysis Year	2022
Agency/Company	CHA Consulting Inc.		

Benefit - Cost Calculator

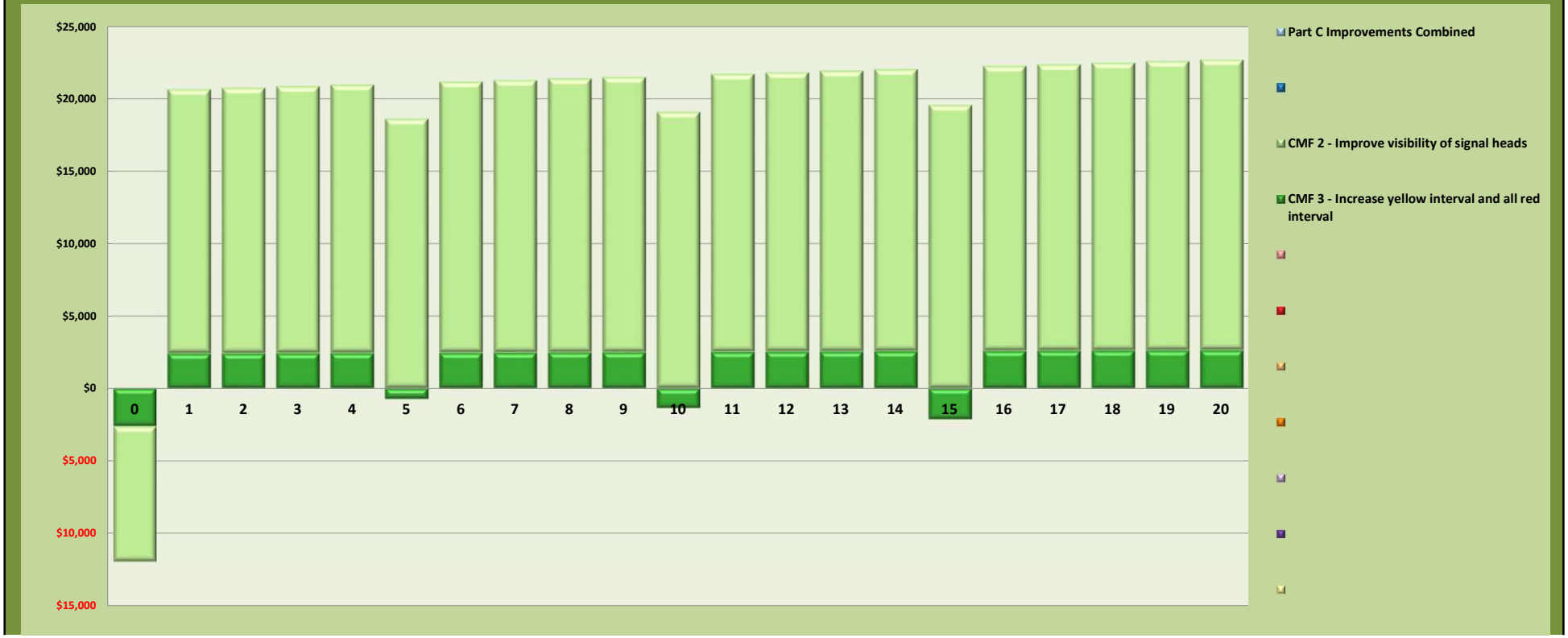
Net Present Value of Project	$19,860.00
Net Present Value of Safety Benefits	$292,640.76
Net Benefit	$272,780.76
Benefit / Cost Ratio	14.74

Expected Annual Crash Adjustment

Number of Fatal & Incapacitating Injury Crashes	-0.021
Number of Injury Crashes	-0.256
Number of Total Crashes	-0.928

Comments:

Safety Benefits and Project Costs Combined Cash Flows By Countermeasure Per Year



Created by the Office of Systems Planning and Program Management

Ohio Department of Transportation

Safety Benefit - Cost Analysis

General Information

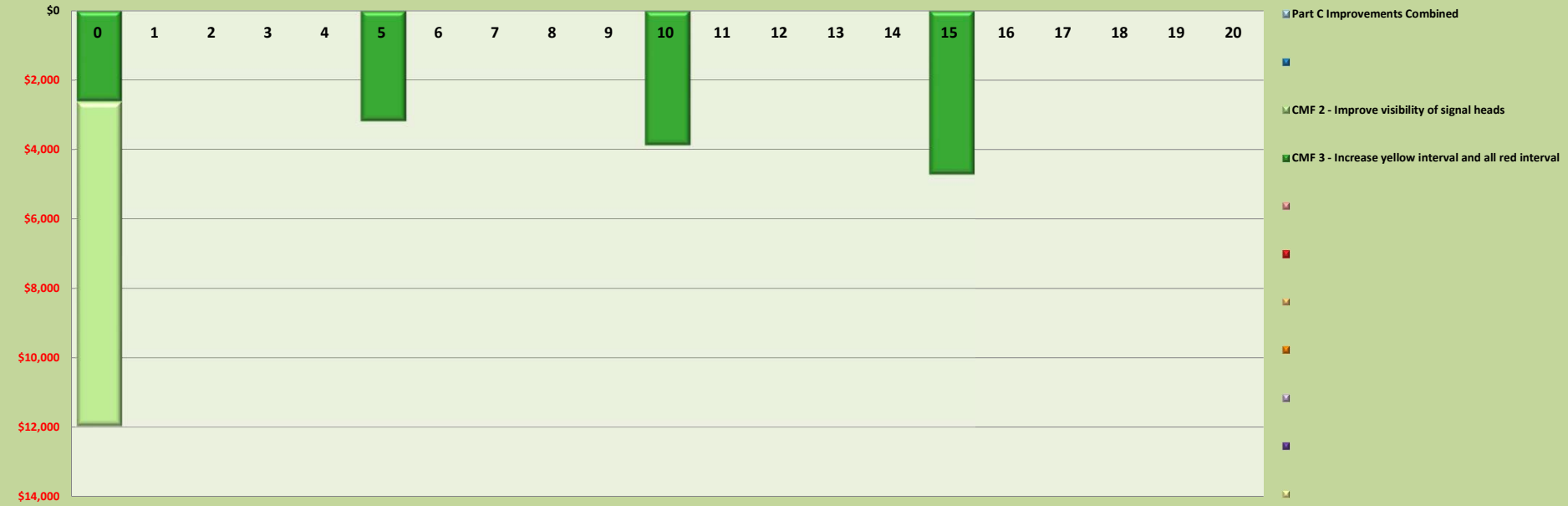
Project Name	Livingston Ave Corridor Study	Contact Email	tilakcnagaraju@chacompanies.com
Project Description	Safety analysis at the intersection of Livingston Ave and Kelton Ave	Contact Phone	(614) 362-7517
Reference Number		Date Performed	7/26/2022
Analyst	TCN	Analysis Year	2022
Agency/Company	CHA Consulting Inc.		

Safety Benefit - Cost Analysis

General Information

Project Name	Livingston Ave Corridor Study	Contact Email	tilakcnagaraju@chacompanies.com
Project Description	Safety analysis at the intersection of Livingston Ave and Kelton Ave	Contact Phone	(614) 362-7517
Reference Number		Date Performed	7/26/2022
Analyst	TCN	Analysis Year	2022
Agency/Company	CHA Consulting Inc.		

Project Costs Only Cash Flows By Countermeasure Per Year



Return on Investment (Safety Benefits and Project Investments)

First year to observe a positive return on investiment: 2023 (1 years)

Percentage of Service Life to observe a continuous Positive Return on Investment: 100.00%

Project Information

General Information

Project Name	Livingston Ave Corridor Study	Contact Email	tilakcnagaraju@chacompanies.com
Project Description	Safety analysis at the intersection of Livingston Ave and Miller Ave	Contact Phone	(614) 362-7517
Reference Number		Date Performed	7/26/2022
Analyst	TCN	Analysis Year	2022
Agency/Company	CHA Consulting Inc.		
Perform Benefit Cost Analysis?	Yes		

Do the proposed improvements fundamentally change the conditions of the base safety performance function (SPF), Or is crash data unavailable for the analysis condition, Or is only predicted (and not expected) analysis needed for the existing or proposed condition?	**No**

(Examples: unsignalized to signalized, undivided to divided, increase or decrease in the number of lanes, change the number of approaches to an intersection, significant realignment of the roadway)

Project Elements Description Table

Project Element ID (Must be Unique)	Site Type	Intersection Control Type	Location Information					
			NLFID	Begin Logpoint/ Intersection Midpoint	End Logpoint *(Leave blank for Intersection)*	Length (mi) OR Intersection Radius Buffer (mi)	Cross Route NLFID(s)	Common Name
US33; 125.625	Urban & Suburban Arterial Intersection	Signalized	SFRAUS00033**C	125.625		0.05	MFRAMR043	Livingston Ave at Miller Ave

Traffic Volume Growth Rate Calculation For Benefit Cost Analysis

	Year	AADT	
Present ADT (PADT)	2022	17,626	veh / day
Future ADT (FADT)	2026	18,449	veh / day
Annual Linear Growth Rate		0.0117	

Project Elements Description Table

Project Element ID (Must be Unique)	Site Type	Intersection Control Type	Location Information					
			NLFID	Begin Logpoint/ Intersection Midpoint	End Logpoint *(Leave blank for Intersection)*	Length (mi) OR Intersection Radius Buffer (mi)	Cross Route NLFID(s)	Common Name

Select Other Non-Site Characteristic Based Countermeasures For Entire Project

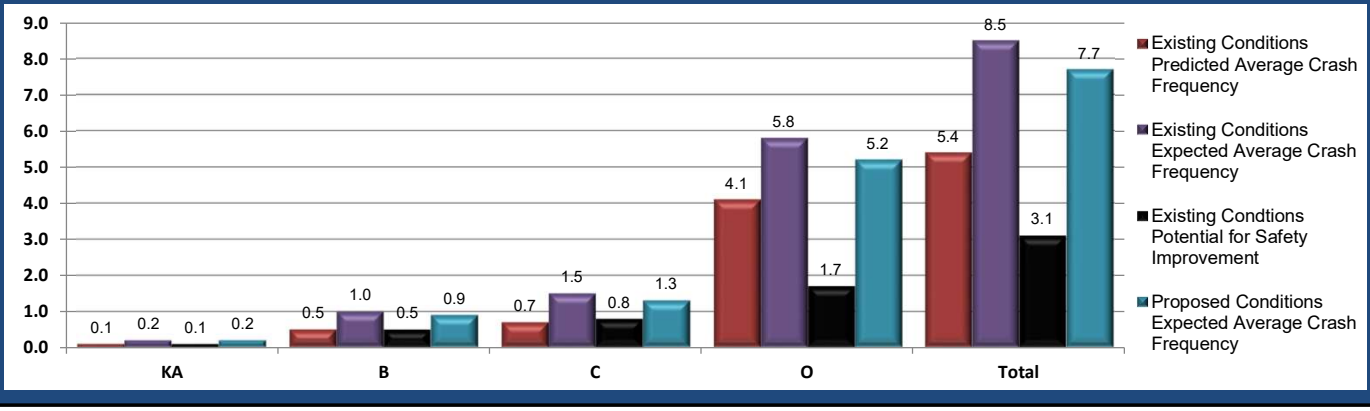
CMF Nbr	Countermeasure	CMF KA Value	CMF B Value	CMF C Value	CMF O Value	CMF Valid for the Following Site Types
CMF 1						
CMF 2	Improve visibility of signal heads	0.93	0.93	0.93	0.93	7
CMF 3	Increase yellow interval and all red interval	0.99	0.99	0.99	0.99	7
CMF 4						
CMF 5						
CMF 6						
CMF 7						
CMF 8						
CMF 9						
CMF 10						

Project Safety Performance Report

General Information

Project Name	Livingston Ave Corridor Study	Contact Email	tilakcnagaraju@chacompanies.com
Project Description	Safety analysis at the intersection of Livingston Ave and Miller Ave	Contact Phone	(614) 362-7517
Reference Number		Date Performed	7/26/2022
Analyst	TCN	Analysis Year	2022
Agency/Company	CHA Consulting Inc.		

Summary of Anticipated Safety Performance of the Project (average crashes/year)



Project Summary Results (Without Animal Crashes)

	KA	B	C	O	Total
$N_{predicted}$ - Existing Conditions	0.1173	0.5297	0.7331	4.0523	5.4324
$N_{expected}$ - Existing Conditions	0.2125	1.0088	1.4909	5.7821	8.4943
$N_{potential\ for\ improvement}$ - Existing Conditions	**0.0952**	**0.4791**	**0.7578**	**1.7298**	**3.0619**
$N_{expected}$ - Proposed Conditions	0.1918	0.9103	1.3452	5.2171	7.6644

Project Safety Performance Report

General Information

Project Name	Livingston Ave Corridor Study	Contact Email	tilakcnagaraju@chacompanies.com
Project Description	Safety analysis at the intersection of Livingston Ave and Miller Ave	Contact Phone	(614) 362-7517
Reference Number		Date Performed	7/26/2022
Analyst	TCN	Analysis Year	2022
Agency/Company	CHA Consulting Inc.		

Existing Conditions Project Element Predicted Crash Summary (Without Animal Crashes)

Project Element ID	Common Name	Crash Severity Level				
		KA	B	C	O	Total
US33: 125.625	Livingston Ave at Miller Ave	0.1173	0.5297	0.7331	4.0523	5.4324

Project Safety Performance Report

General Information

Project Name	Livingston Ave Corridor Study	Contact Email	tilakcnagaraju@chacompanies.com
Project Description	Safety analysis at the intersection of Livingston Ave and Miller Ave	Contact Phone	(614) 362-7517
Reference Number		Date Performed	7/26/2022
Analyst	TCN	Analysis Year	2022
Agency/Company	CHA Consulting Inc.		

Existing Conditions Project Element Expected Crash Summary (Without Animal Crashes)

Project Element ID	Common Name	Crash Severity Level				
		KA	B	C	O	Total
US33: 125.625	Livingston Ave at Miller Ave	0.2125	1.0088	1.4909	5.7821	8.4943

Project Safety Performance Report

General Information

Project Name	Livingston Ave Corridor Study	Contact Email	tilakcnagaraju@chacompanies.com
Project Description	Safety analysis at the intersection of Livingston Ave and Miller Ave	Contact Phone	(614) 362-7517
Reference Number		Date Performed	7/26/2022
Analyst	TCN	Analysis Year	2022
Agency/Company	CHA Consulting Inc.		

Existing Conditions Project Element Potential for Safety Improvement Summary (Without Animal Crashes)

Project Element ID	Common Name	Crash Severity Level				
		KA	B	C	O	Total
US33: 125.625	Livingston Ave at Miller Ave	0.0952	0.4791	0.7578	1.7298	3.0619

Project Safety Performance Report

General Information

Project Name	Livingston Ave Corridor Study	Contact Email	tilakcnagaraju@chacompanies.com
Project Description	Safety analysis at the intersection of Livingston Ave and Miller Ave	Contact Phone	(614) 362-7517
Reference Number		Date Performed	7/26/2022
Analyst	TCN	Analysis Year	2022
Agency/Company	CHA Consulting Inc.		

Proposed Conditions Project Element Expected Crash Summary (Without Animal Crashes)

Project Element ID	Common Name	Crash Severity Level				
		KA	B	C	O	Total
US33: 125.625	Livingston Ave at Miller Ave	0.1918	0.9103	1.3452	5.2171	7.6644

Project Safety Performance Report

General Information

Project Name	Livingston Ave Corridor Study	Contact Email	tilakcnagaraju@chacompanies.com
Project Description	Safety analysis at the intersection of Livingston Ave and Miller Ave	Contact Phone	(614) 362-7517
Reference Number		Date Performed	7/26/2022
Analyst	TCN	Analysis Year	2022
Agency/Company	CHA Consulting Inc.		

Summary by Crash Type

Crash Type	Existing			Proposed
	Predicted Crash Frequency	Expected Crash Frequency	PSI	Expected Crash Frequency
Unknown	0.0027	0.0030	**0.0002**	0.0027
Head On	0.0318	0.0569	**0.0251**	0.0514
Rear End	2.6003	4.1638	**1.5634**	3.7569
Backing	0.1378	0.2023	**0.0646**	0.1826
Sideswipe - Meeting	0.0733	0.1206	**0.0472**	0.1088
Sideswipe - Passing	0.6441	0.9776	**0.3335**	0.8821
Angle	0.9385	1.5521	**0.6136**	1.4004
Parked Vehicle	0.0935	0.1013	**0.0077**	0.0914
Pedestrian	0.0054	0.0059	**0.0005**	0.0054
Animal	0.0000	0.0000	0.0000	0.0000
Train	0.0002	0.0002	0.0000	0.0002
Pedalcycles	0.1658	0.1706	**0.0049**	0.1539
Other Non-Vehicle	0.0000	0.0000	0.0000	0.0000
Fixed Object	0.1570	0.1682	**0.0112**	0.1518
Other Object	0.0054	0.0058	**0.0004**	0.0053
Overturning	0.0099	0.0103	**0.0004**	0.0093
Other Non-Collision	0.0205	0.0221	**0.0016**	0.0199
Left Turn	0.5460	0.9335	**0.3874**	0.8422
Right Turn	0.0000	0.0000	0.0000	0.0000

Existing Conditions: General Information and Data for Urban And Suburban Arterial Intersection					
General Information		**Location Information**			
Analyst	TCN	Route	US33		
Agency or Company	CHA Consulting Inc.	Logpoint	125.625		
Date Performed	07/26/22	Common Name	Livingston Ave at Miller Ave		
Intersection	US33; 125.625	Analysis Year	2022		
Signalized/Unsignalized	Signalized				
Input Data				**Existing Conditions**	**HSM Base Conditions**
Intersection type (3ST, 3SG, 4ST, 4SG)				3SG	--
AADT $_{major}$ (veh/day) (total entering on major approaches)*	$AADT_{MAX}$ =	58,100	(veh/day)	17,626	--
AADT $_{minor}$ (veh/day) (total entering on minor approaches)*	$AADT_{MAX}$ =	16,400	(veh/day)	5,565	--
Intersection lighting (present/not present)				Not Present	Not Present
Calibration factor, C_i				Varies, See Below	1.00
Data for unsignalized intersections only:					
Number of major-road approaches with left-turn lanes					0
Number of major-road approaches with right-turn lanes					0
Data for signalized intersections only:					
Number of approaches with left-turn lanes				1	0
Number of approaches with right-turn lanes				1	0
Number of approaches with left-turn signal phasing				1	--
Type of left-turn signal phasing for Leg #1				Permissive	Permissive
Type of left-turn signal phasing for Leg #2				Permissive	--
Type of left-turn signal phasing for Leg #3				Protected	--
Not Applicable				Not Applicable	--
Number of approaches with right-turn-on-red prohibited				0	0
Intersection red light cameras (present/not present)				Not Present	Not Present
Sum of all pedestrian crossing volumes (PedVol)				20	--
Maximum number of lanes crossed by a pedestrian (n_{lanesx})				2	--
Number of bus stops within 300 m (1,000 ft) of the intersection				0	0
Schools within 300 m (1,000 ft) of the intersection (present/not present)				Not Present	Not Present
Number of alcohol sales establishments within 300 m (1,000 ft) of the intersection				1 to 8	0
Locality:				State System	

Existing Conditions: Crash Modification Factors (CMFs) for Urban And Suburban Arterial Intersection						
(1)	(2)	(3)	(4)	(5)	(6)	(7)
CMF for Left-Turn Lanes	CMF for Left-Turn Signal Phasing	CMF for Right-Turn Lanes	CMF for Right Turn on Red	CMF for Lighting	CMF for Red Light Cameras	Combined CMF
CMF 1i	*CMF 2i*	*CMF 3i*	*CMF 4i*	*CMF 5i*	*CMF 6i*	*CMF $_{COMB}$*
from Table 12-24	from Table 12-25	from Table 12-26	from Equation 12-35	from Equation 12-36	from Equation 12-37	(1)*(2)*(3)*(4)*(5)*(6)
0.9300	0.9400	0.9600	1.0000	1.0000	1.0000	0.8392

Federal law 23 USC § 409 prohibits the discovery or admission into evidence of "reports, surveys, schedules, lists, or data" compiled or collected for the purpose of highway safety improvement projects that might qualify for federal safety improvement funding.

Existing Conditions: Multiple-Vehicle Crash Summary for Urban And Suburban Arterial Intersection										
(1)	(2)			(3)	(4)	(5)	(6)	(7)	(8)	(6)*(7)*(8)
Crash Severity Level	**SPF Coefficients** from Table 12-10			**Overdispersion Parameter, k** from Table 12-10	**Initial N_{bimv}** from Equation 12-21	**Proportion of Total Crashes**	**Adjusted N_{bimv}** $(4)_{TOTAL}$*(5)	**Combined CMFs** (7) from Worksheet 2B	**Calibration Factor, C_i**	**Predicted N_{bimv}**
	a	b	c							
Total	-12.13	1.11	0.26	0.33	2.625	1.000	2.625	0.84	2.25	4.956
Fatal and Injury (FI)	-11.58	1.02	0.17	0.30	0.868	$(4)_{FI}/((4)_{FI}+(4)_{PDO})$ = 0.347	0.909	0.84	1.46	1.114
Property Damage Only (PDO)	-13.24	1.14	0.30	0.36	1.638	$(5)_{TOTAL}-(5)_{FI}$ = 0.653	1.715	0.84	2.68	3.858

Existing Conditions: Single-Vehicle Crash Summary for Urban And Suburban Arterial Intersection										
(1)	(2)			(3)	(4)	(5)	(6)	(7)	(8)	(9)
Crash Severity Level	**SPF Coefficients** from Table 12-12			**Overdispersion Parameter, k** from Table 12-12	**Initial N_{bisv}** from Eqn. 12-24; (FI) from Eqn. 12-24 or 12-27	**Proportion of Total Crashes**	**Adjusted N_{bimv}** $(4)_{TOTAL}$*(5)	**Combined CMFs** (7) from Worksheet 2B	**Calibration Factor, C_i**	**Predicted N_{bisv}** (6)*(7)*(8)
	a	b	c							
Total	-9.02	0.42	0.40	0.36	0.231	1.000	0.231	0.84	1.49	0.289
Fatal and Injury (FI)	-9.75	0.27	0.51	0.24	0.066	$(4)_{FI}/((4)_{FI}+(4)_{PDO})$ = 0.294	0.068	0.84	1.66	0.095
Property Damage Only (PDO)	-9.08	0.45	0.33	0.53	0.160	$(5)_{TOTAL}-(5)_{FI}$ = 0.706	0.163	0.84	1.42	0.195

Existing Conditions: Vehicle-Pedestrian Crash Summary at Urban And Suburban Arterial Stop-Controlled Intersections						
(1)	(2)	(3)	(4)	(5)	(6)	(7)
Crash Severity Level	**Predicted N_{bimv}** (9) from Worksheet 2C	**Predicted N_{bisv}** (9) from Worksheet 2E	**Predicted N_{bi}** (2) + (3)	**f_{pedi}** from Table 12-16	**Calibration factor, C_i**	**Predicted N_{pedi}** (4)*(5)*(6)
Total	--	--	--	--	--	--
Fatal and injury (FI)	--	--	--	--	--	--

Existing Conditions: CMFs for Vehicle-Pedestrian Crash Summary for Urban And Suburban Arterial Signalized Intersections			
(1)	(2)	(3)	(4)
CMF for Bus Stops	CMF for Schools	CMF for Alcohol Sales Establishments	Combined CMF
CMF_{1p}	CMF_{2p}	CMF_{3p}	
from Table 12-28	from Table 12-29	from Table 12-30	(1)*(2)*(3)
1.00	1.00	1.12	1.12

Existing Conditions: Vehicle-Pedestrian Crash Summary at Urban And Suburban Arterial Signalized Intersections									
(1)	(2)					(3)	(4)	(5)	(6)	(7)
Crash Severity Level	**SPF Coefficients** from Table 12-14					**Overdispersion Parameter, k**	**$N_{pedbase}$** from Equation 12-29	**Combined CMF** (4) from Worksheet 2H	**Calibration factor, C_i**	**Predicted N_{pedi}** (4)*(5)*(6)
	a	b	c	d	e					
Total	-6.60	0.05	0.24	0.41	0.09	0.52	0.007	1.12	0.69	0.005
Fatal and Injury (FI)	--	--	--	--	--	--	--	--	0.69	0.005

Federal law 23 USC § 409 prohibits the discovery or admission into evidence of "reports, surveys, schedules, lists, or data" compiled or collected for the purpose of highway safety improvement projects that might qualify for federal safety improvement funding.

Existing Conditions: Vehicle-Bicycle Crash Summary for Urban And Suburban Arterial Intersection						
(1)	(2)	(3)	(4)	(5)	(6)	(7)
Crash Severity Level	**Predicted N_{bimv}**	**Predicted N_{bisv}**	**Predicted N_{bi}**	**f_{bikei}**	**Calibration factor, C_i**	**Predicted N_{bikei}**
	(9) from Worksheet 2C	(9) from Worksheet 2E	(2) + (3)	from Table 12-17		(4)*(5)*(6)
Total	4.956	0.289	5.245	0.0079	4.00	0.166
Fatal and injury (FI)	--	--	--	--	4.00	0.166

Federal law 23 USC § 409 prohibits the discovery or admission into evidence of "reports, surveys, schedules, lists, or data" compiled or collected for the purpose of highway safety improvement projects that might qualify for federal safety improvement funding.

Federal law 23 USC § 409 prohibits the discovery or admission into evidence of "reports, surveys, schedules, lists, or data" compiled or collected for the purpose of highway safety improvement projects that might qualify for federal safety improvement funding.

Project Cost Estimate

Project Name	Livingston Ave Corridor Study	Contact Email	tilakcnagaraju@chacompanies.com
Project Description	Safety analysis at the intersection of Livingston Ave and	Contact Phone	(614) 362-7517
Reference Number		Date Performed	7/26/2022
Analyst	TCN	Analysis Year	2022
Agency/Company	CHA Consulting Inc.		

Engineering Design %	20%
Contingency %	10%

Countermeasures	Construction Costs	Right of Way Costs	Engineering Design Costs	Contingency Amount	Total Cost of Countermeasure	Annual Maintenance & Energy Costs	Salvage Value
Site Characteristic Improvements (i.e. Lane widening)			$0.00	$0.00	**$0.00**		
Site Characteristic Improvements (i.e. Lighting)			$0.00	$0.00	**$0.00**		
Site Characteristic Improvements (i.e. Signal Phasing)			$0.00	$0.00	**$0.00**		
Site Characteristic Improvements (i.e. Added Right Turn Lane)			$0.00	$0.00	**$0.00**		
			$0.00	$0.00	**$0.00**		
CMF 2 - Improve visibility of signal heads	$7,200.00	$0.00	$1,440.00	$720.00	**$9,360.00**		
CMF 3 - Increase yellow interval and all red interval	$1,250.00	$0.00	$1,250.00	$125.00	**$2,625.00**		
			$0.00	$0.00	**$0.00**		
			$0.00	$0.00	**$0.00**		
			$0.00	$0.00	**$0.00**		
			$0.00	$0.00	**$0.00**		
			$0.00	$0.00	**$0.00**		
			$0.00	$0.00	**$0.00**		
Totals	**$8,450.00**	**$0.00**	**$2,690.00**	**$845.00**	**$11,985.00**	**$0.00**	**$0.00**

Inflation %	9%

Final Costruction Cost:	**$13,063.65**

*Final construction cost should match the Project Cost Estimate

Safety Benefit - Cost Analysis

ECAT Economic Crash Analysis Tool

General Information

Project Name	Livingston Ave Corridor Study	Contact Email	tilakcnagaraju@chacompanies.com
Project Description	Safety analysis at the intersection of Livingston Ave and Miller Ave	Contact Phone	(614) 362-7517
Reference Number		Date Performed	7/26/2022
Analyst	TCN	Analysis Year	2022
Agency/Company	CHA Consulting Inc.		

Select Site Types to be used in Benefit-Cost Analysis:

All Sites

Comments:

Countermeasure Service Lives, Costs, and Safety Benefits

Countermeasures	Service Life (Years)	Initial Cost of Countermeasure	Annual Maintenance & Energy Costs	Salvage Value	Net Present Cost of Countermeasure	Total Cost of Countermeasures	Summary of Annual Crash Modifications	Net Present Value of Safety Benefits
Site Characteristic Improvements (i.e. Lane widening)		$0.00			$0.00	$0.00	-0.170	$64,794
Site Characteristic Improvements (i.e. Lighting)		$0.00			$0.00	$0.00		
Site Characteristic Improvements (i.e. Signal Phasing)		$0.00			$0.00	$0.00		
Site Characteristic Improvements (i.e. Added Right Turn Lane)		$0.00			$0.00	$0.00		
		$0.00			$0.00	$0.00	0.000	$0
CMF 2 - Improve visibility of signal heads	20	$9,360.00			$9,360.00	$9,360.00	-0.583	$223,758
CMF 3 - Increase yellow interval and all red interval	5	$2,625.00			$10,500.00	$14,431.83	-0.077	$29,485
		$0.00			$0.00	$0.00	0.000	$0
		$0.00			$0.00	$0.00	0.000	$0
		$0.00			$0.00	$0.00	0.000	$0
		$0.00			$0.00	$0.00	0.000	$0
		$0.00			$0.00	$0.00	0.000	$0
		$0.00			$0.00	$0.00	0.000	$0
		$0.00			$0.00	$0.00	0.000	$0
Totals		**$11,985.00**	**$0.00**	**$0.00**	**$19,860.00**	**$23,791.83**	**-0.830**	**$318,036**

Safety Benefit - Cost Analysis

ECAT Economic Crash Analysis Tool

General Information

Project Name	Livingston Ave Corridor Study	Contact Email	tilakcnagaraju@chacompanies.com
Project Description	Safety analysis at the intersection of Livingston Ave and Miller Ave	Contact Phone	(614) 362-7517
Reference Number		Date Performed	7/26/2022
Analyst	TCN	Analysis Year	2022
Agency/Company	CHA Consulting Inc.		

Benefit - Cost Calculator

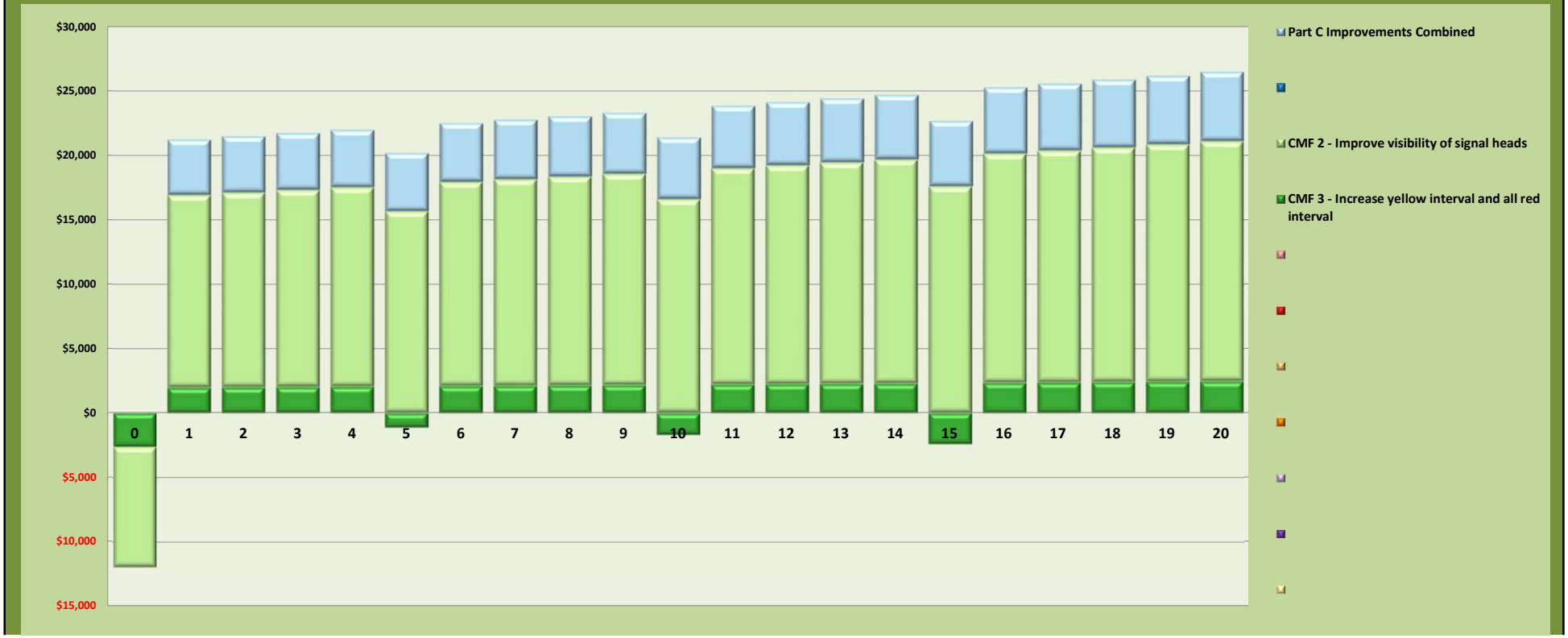
Net Present Value of Project	$19,860.00
Net Present Value of Safety Benefits	$318,035.97
Net Benefit	$298,175.97
Benefit / Cost Ratio	16.01

Expected Annual Crash Adjustment

Number of Fatal & Incapacitating Injury Crashes	-0.021
Number of Injury Crashes	-0.265
Number of Total Crashes	-0.830

Comments:

Safety Benefits and Project Costs Combined Cash Flows By Countermeasure Per Year



Safety Benefit - Cost Analysis

General Information

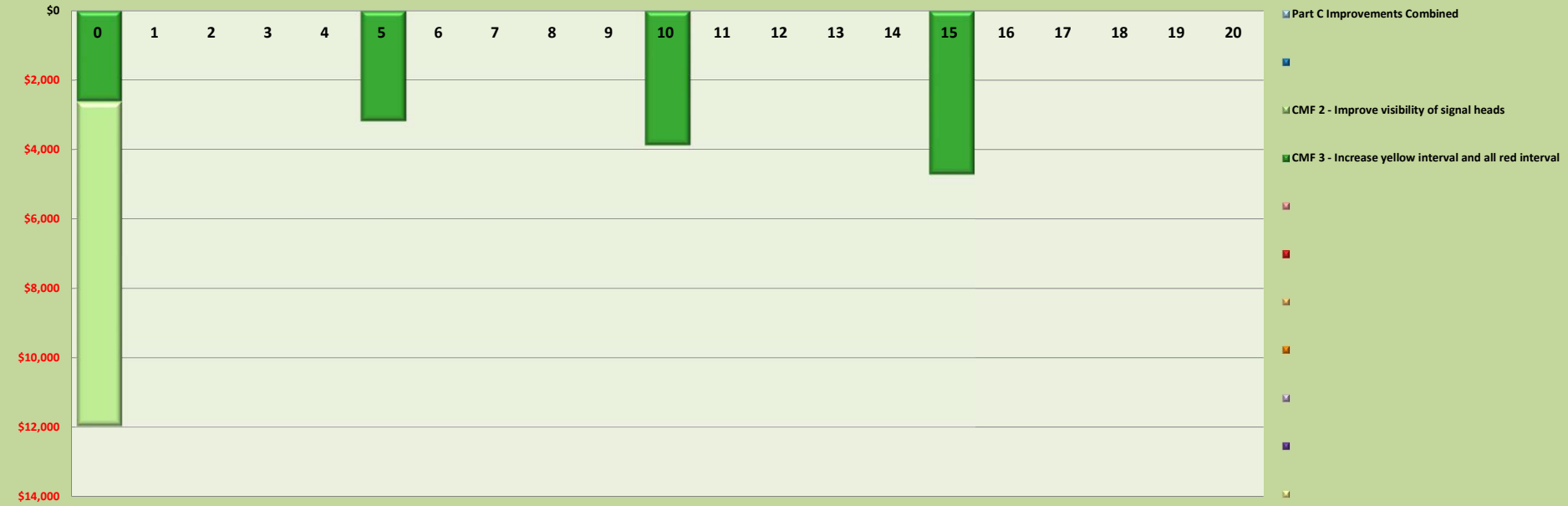
Project Name	Livingston Ave Corridor Study	Contact Email	tilakcnagaraju@chacompanies.com
Project Description	Safety analysis at the intersection of Livingston Ave and Miller Ave	Contact Phone	(614) 362-7517
Reference Number		Date Performed	7/26/2022
Analyst	TCN	Analysis Year	2022
Agency/Company	CHA Consulting Inc.		

Safety Benefit - Cost Analysis

General Information

Project Name	Livingston Ave Corridor Study	Contact Email	tilakcnagaraju@chacompanies.com
Project Description	Safety analysis at the intersection of Livingston Ave and Miller Ave	Contact Phone	(614) 362-7517
Reference Number		Date Performed	7/26/2022
Analyst	TCN	Analysis Year	2022
Agency/Company	CHA Consulting Inc.		

Project Costs Only Cash Flows By Countermeasure Per Year



Return on Investment (Safety Benefits and Project Investments)

First year to observe a positive return on investiment: 2023 (1 years)

Percentage of Service Life to observe a continuous Positive Return on Investment: 100.00%

Project Information

General Information

Project Name	Livingston Ave Corridor Study	Contact Email	tilakcnagaraju@chacompanies.com
Project Description	Safety analysis at the intersections of Livingston Ave and Rhoads Ave	Contact Phone	(614) 362-7517
Reference Number		Date Performed	7/26/2022
Analyst	TCN	Analysis Year	2022
Agency/Company	CHA Consulting Inc.		
Perform Benefit Cost Analysis?	Yes		

Do the proposed improvements fundamentally change the conditions of the base safety performance function (SPF), Or is crash data unavailable for the analysis condition, Or is only predicted (and not expected) analysis needed for the existing or proposed condition?	**No**

(Examples: unsignalized to signalized, undivided to divided, increase or decrease in the number of lanes, change the number of approaches to an intersection, significant realignment of the roadway)

Project Elements Description Table

Project Element ID (Must be Unique)	Site Type	Intersection Control Type	Location Information					
			NLFID	Begin Logpoint/ Intersection Midpoint	End Logpoint *(Leave blank for Intersection)*	Length (mi) OR Intersection Radius Buffer (mi)	Cross Route NLFID(s)	Common Name
US33; 126.286	Urban & Suburban Arterial Intersection	Unsignalized	SFRAUS00033**C	126.286		0.05	MFRAMR016	Livingston Ave at Rhoads Ave

Traffic Volume Growth Rate Calculation For Benefit Cost Analysis

	Year	AADT	
Present ADT (PADT)	2022	18,458	veh / day
Future ADT (FADT)	2026	18,827	veh / day
Annual Linear Growth Rate		0.0050	

Project Elements Description Table

Project Element ID (Must be Unique)	Site Type	Intersection Control Type	Location Information					
			NLFID	Begin Logpoint/ Intersection Midpoint	End Logpoint *(Leave blank for Intersection)*	Length (mi) OR Intersection Radius Buffer (mi)	Cross Route NLFID(s)	Common Name

Select Other Non-Site Characteristic Based Countermeasures For Entire Project

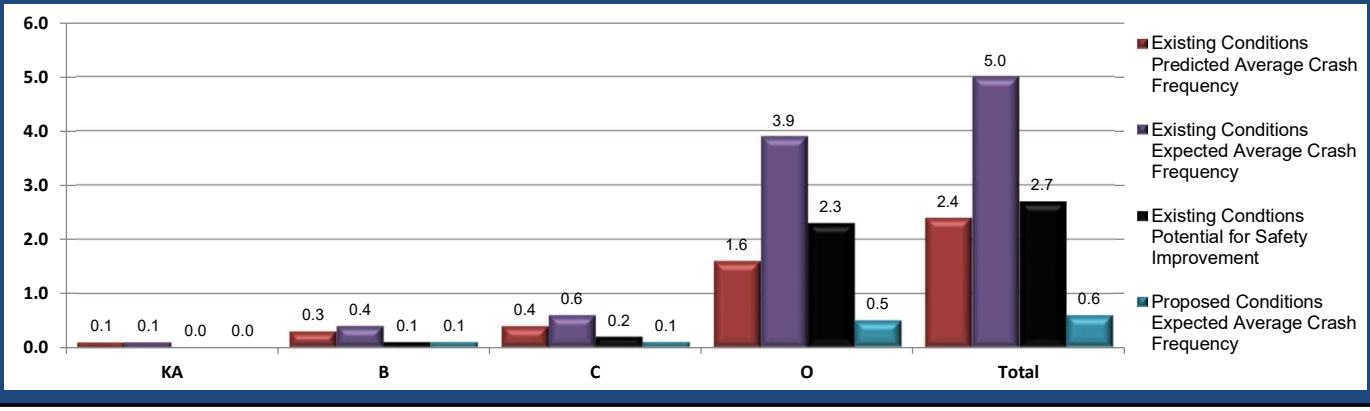
CMF Nbr	Countermeasure	CMF KA Value	CMF B Value	CMF C Value	CMF O Value	CMF Valid for the Following Site Types
CMF 1	Prohibit Left Turns With "No Left Turn" Sign	0.32	0.32	0.32	0.32	7
CMF 2	Install RRFB crosswalk	0.526	0.526	0.526	0.526	7
CMF 3						
CMF 4						
CMF 5						
CMF 6						
CMF 7						
CMF 8						
CMF 9						
CMF 10						

Project Safety Performance Report

General Information

Project Name	Livingston Ave Corridor Study	Contact Email	tilakcnagaraju@chacompanies.com
Project Description	Safety analysis at the intersections of Livingston Ave and Rhoads Ave	Contact Phone	(614) 362-7517
Reference Number		Date Performed	7/26/2022
Analyst	TCN	Analysis Year	2022
Agency/Company	CHA Consulting Inc.		

Summary of Anticipated Safety Performance of the Project (average crashes/year)



Project Summary Results (Without Animal Crashes)

	KA	B	C	O	Total
$N_{predicted}$ - Existing Conditions	0.0648	0.2737	0.3892	1.6357	2.3634
$N_{expected}$ - Existing Conditions	0.0884	0.4223	0.6385	3.8929	5.0421
$N_{potential\ for\ improvement}$ - Existing Conditions	**0.0236**	**0.1486**	**0.2493**	**2.2572**	**2.6787**
$N_{expected}$ - Proposed Conditions	0.0109	0.0519	0.0784	0.4784	0.6196

Project Safety Performance Report

General Information

Project Name	Livingston Ave Corridor Study	Contact Email	tilakcnagaraju@chacompanies.com
Project Description	Safety analysis at the intersections of Livingston Ave and Rhoads Ave	Contact Phone	(614) 362-7517
Reference Number		Date Performed	7/26/2022
Analyst	TCN	Analysis Year	2022
Agency/Company	CHA Consulting Inc.		

Existing Conditions Project Element Predicted Crash Summary (Without Animal Crashes)

Project Element ID	Common Name	Crash Severity Level				
		KA	B	C	O	Total
US33; 126.286	Livingston Ave at Rhoads Ave	0.0648	0.2737	0.3892	1.6357	2.3634

Project Safety Performance Report

General Information

Project Name	Livingston Ave Corridor Study	Contact Email	tilakcnagaraju@chacompanies.com
Project Description	Safety analysis at the intersections of Livingston Ave and Rhoads Ave	Contact Phone	(614) 362-7517
Reference Number		Date Performed	7/26/2022
Analyst	TCN	Analysis Year	2022
Agency/Company	CHA Consulting Inc.		

Existing Conditions Project Element Expected Crash Summary (Without Animal Crashes)

Project Element ID	Common Name	Crash Severity Level				
		KA	B	C	O	Total
US33; 126.286	Livingston Ave at Rhoads Ave	0.0884	0.4223	0.6385	3.8929	5.0421

Project Safety Performance Report

General Information

Project Name	Livingston Ave Corridor Study	Contact Email	tilakcnagaraju@chacompanies.com
Project Description	Safety analysis at the intersections of Livingston Ave and Rhoads Ave	Contact Phone	(614) 362-7517
Reference Number		Date Performed	7/26/2022
Analyst	TCN	Analysis Year	2022
Agency/Company	CHA Consulting Inc.		

Existing Conditions Project Element Potential for Safety Improvement Summary (Without Animal Crashes)

Project Element ID	Common Name	Crash Severity Level				
		KA	B	C	O	Total
US33; 126.286	Livingston Ave at Rhoads Ave	0.0236	0.1486	0.2493	2.2572	2.6787

Project Safety Performance Report

General Information

Project Name	Livingston Ave Corridor Study	Contact Email	tilakcnagaraju@chacompanies.com
Project Description	Safety analysis at the intersections of Livingston Ave and Rhoads Ave	Contact Phone	(614) 362-7517
Reference Number		Date Performed	7/26/2022
Analyst	TCN	Analysis Year	2022
Agency/Company	CHA Consulting Inc.		

Proposed Conditions Project Element Expected Crash Summary (Without Animal Crashes)

Project Element ID	Common Name	Crash Severity Level				
		KA	B	C	O	Total
US33; 126.286	Livingston Ave at Rhoads Ave	0.0109	0.0519	0.0784	0.4784	0.6196

Project Safety Performance Report

General Information

Project Name	Livingston Ave Corridor Study	Contact Email	tilakcnagaraju@chacompanies.com
Project Description	Safety analysis at the intersections of Livingston Ave and Rhoads Ave	Contact Phone	(614) 362-7517
Reference Number		Date Performed	7/26/2022
Analyst	TCN	Analysis Year	2022
Agency/Company	CHA Consulting Inc.		

Summary by Crash Type

Crash Type	Existing			Proposed
	Predicted Crash Frequency	Expected Crash Frequency	PSI	Expected Crash Frequency
Unknown	0.0018	0.0025	**0.0007**	0.0003
Head On	0.0146	0.0303	**0.0157**	0.0037
Rear End	1.0940	2.4904	**1.3964**	0.3060
Backing	0.0542	0.1324	**0.0782**	0.0163
Sideswipe - Meeting	0.0315	0.0702	**0.0387**	0.0086
Sideswipe - Passing	0.2599	0.6181	**0.3582**	0.0760
Angle	0.4050	0.8977	**0.4927**	0.1103
Parked Vehicle	0.0632	0.0858	**0.0226**	0.0105
Pedestrian	0.0513	0.0000	-0.0513	0.0000
Animal	0.0000	0.0000	0.0000	0.0000
Train	0.0001	0.0002	**0.0001**	0.0000
Pedalcycles	0.0203	0.0199	-0.0004	0.0024
Other Non-Vehicle	0.0000	0.0000	0.0000	0.0000
Fixed Object	0.1026	0.1412	**0.0386**	0.0174
Other Object	0.0036	0.0049	**0.0013**	0.0006
Overturning	0.0059	0.0084	**0.0025**	0.0010
Other Non-Collision	0.0136	0.0186	**0.0050**	0.0023
Left Turn	0.2419	0.5215	**0.2797**	0.0641
Right Turn	0.0000	0.0000	0.0000	0.0000

Existing Conditions: General Information and Data for Urban And Suburban Arterial Intersection					
General Information		**Location Information**			
Analyst	TCN	Route	US33		
Agency or Company	CHA Consulting Inc.	Logpoint	126.286		
Date Performed	07/26/22	Common Name	Livingston Ave at Rhoads Ave		
Intersection	US33; 126.286	Analysis Year	2022		
Signalized/Unsignalized	Unsignalized				
Input Data				**Existing Conditions**	**HSM Base Conditions**
Intersection type (3ST, 3SG, 4ST, 4SG)				4ST	--
AADT $_{major}$ (veh/day) (total entering on major approaches)*	$AADT_{MAX}$ =	46,800	(veh/day)	17,579	--
AADT $_{minor}$ (veh/day) (total entering on minor approaches)*	$AADT_{MAX}$ =	5,900	(veh/day)	2,000	--
Intersection lighting (present/not present)				Not Present	Not Present
Calibration factor, C_i				Varies, See Below	1.00
Data for unsignalized intersections only:					
Number of major-road approaches with left-turn lanes				0	0
Number of major-road approaches with right-turn lanes				0	0
Data for signalized intersections only:					
Number of approaches with left-turn lanes					0
Number of approaches with right-turn lanes					0
Number of approaches with left-turn signal phasing					--
Type of left-turn signal phasing for Leg #1					Permissive
Type of left-turn signal phasing for Leg #2					--
Type of left-turn signal phasing for Leg #3					--
Type of left-turn signal phasing for Leg #4					--
Number of approaches with right-turn-on-red prohibited					0
Intersection red light cameras (present/not present)					Not Present
Sum of all pedestrian crossing volumes (PedVol)					--
Maximum number of lanes crossed by a pedestrian (n_{lanesx})					--
Number of bus stops within 300 m (1,000 ft) of the intersection					0
Schools within 300 m (1,000 ft) of the intersection (present/not present)					Not Present
Number of alcohol sales establishments within 300 m (1,000 ft) of the intersection					0
Locality:				State System	

Existing Conditions: Crash Modification Factors (CMFs) for Urban And Suburban Arterial Intersection						
(1)	(2)	(3)	(4)	(5)	(6)	(7)
CMF for Left-Turn Lanes	CMF for Left-Turn Signal Phasing	CMF for Right-Turn Lanes	CMF for Right Turn on Red	CMF for Lighting	CMF for Red Light Cameras	Combined CMF
CMF 1i	*CMF 2i*	*CMF 3i*	*CMF 4i*	*CMF 5i*	*CMF 6i*	*CMF $_{COMB}$*
from Table 12-24	from Table 12-25	from Table 12-26	from Equation 12-35	from Equation 12-36	from Equation 12-37	(1)*(2)*(3)*(4)*(5)*(6)
1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000

Federal law 23 USC § 409 prohibits the discovery or admission into evidence of "reports, surveys, schedules, lists, or data" compiled or collected for the purpose of highway safety improvement projects that might qualify for federal safety improvement funding.

Existing Conditions: Multiple-Vehicle Crash Summary for Urban And Suburban Arterial Intersection										
(1)	(2)			(3)	(4)	(5)	(6)	(7)	(8)	(6)*(7)*(8)
Crash Severity Level	**SPF Coefficients**			**Overdispersion Parameter, k**	**Initial N_{bimv}**	**Proportion of Total Crashes**	**Adjusted N_{bimv}**	**Combined CMFs**	**Calibration Factor, C_i**	**Predicted N_{bimv}**
	from Table 12-10			from Table 12-10	from Equation 12-21		$(4)_{TOTAL}$*(5)	(7) from Worksheet 2B		
	a	b	c							
Total	-8.90	0.82	0.25	0.40	2.760	1.000	2.760	1.00	0.76	2.098
Fatal and Injury (FI)	-11.13	0.93	0.28	0.48	1.093	$(4)_{FI}/((4)_{FI}+(4)_{PDO})$	1.077	1.00	0.56	0.603
						0.390				
Property Damage Only (PDO)	-8.74	0.77	0.23	0.40	1.707	$(5)_{TOTAL}-(5)_{FI}$	1.683	1.00	0.89	1.498
						0.610				

Existing Conditions: Single-Vehicle Crash Summary for Urban And Suburban Arterial Intersection										
(1)	(2)			(3)	(4)	(5)	(6)	(7)	(8)	(9)
Crash Severity Level	**SPF Coefficients**			**Overdispersion Parameter, k**	**Initial N_{bisv}**	**Proportion of Total Crashes**	**Adjusted N_{bimv}**	**Combined CMFs**	**Calibration Factor, C_i**	**Predicted N_{bisv}**
	from Table 12-12			from Table 12-12	from Eqn. 12-24; (FI) from Eqn. 12-24 or 12-27		$(4)_{TOTAL}$*(5)	(7) from Worksheet 2B		(6)*(7)*(8)
	a	b	c							
Total	-5.33	0.33	0.12	0.65	0.304	1.000	0.304	1.00	0.63	0.191
Fatal and Injury (FI)	--	--	--	--	0.085	$(4)_{FI}/((4)_{FI}+(4)_{PDO})$	0.091	1.00	0.58	0.053
						0.301				
Property Damage Only (PDO)	-7.04	0.36	0.25	0.54	0.198	$(5)_{TOTAL}-(5)_{FI}$	0.212	1.00	0.65	0.138
						0.699				

Existing Conditions: Vehicle-Pedestrian Crash Summary at Urban And Suburban Arterial Stop-Controlled Intersections						
(1)	(2)	(3)	(4)	(5)	(6)	(7)
Crash Severity Level	**Predicted N_{bimv}**	**Predicted N_{bisv}**	**Predicted N_{bi}**	**f_{pedi}**	**Calibration factor, C_i**	**Predicted N_{pedi}**
	(9) from Worksheet 2C	(9) from Worksheet 2E	(2) + (3)	from Table 12-16		(4)*(5)*(6)
Total	2.098	0.191	2.289	0.018	1.28	0.051
Fatal and injury (FI)	--	--	--	--	1.28	0.051

Existing Conditions: CMFs for Vehicle-Pedestrian Crash Summary for Urban And Suburban Arterial Signalized Intersections			
(1)	(2)	(3)	(4)
CMF for Bus Stops	CMF for Schools	CMF for Alcohol Sales Establishments	Combined CMF
CMF_{1p}	CMF_{2p}	CMF_{3p}	
from Table 12-28	from Table 12-29	from Table 12-30	(1)*(2)*(3)
--	--	--	--

Existing Conditions: Vehicle-Pedestrian Crash Summary at Urban And Suburban Arterial Signalized Intersections										
(1)	(2)					(3)	(4)	(5)	(6)	(7)
Crash Severity Level	**SPF Coefficients**					**Overdispersion Parameter, k**	**$N_{pedbase}$**	**Combined CMF**	**Calibration factor, C_i**	**Predicted N_{pedi}**
	from Table 12-14						from Equation 12-29	(4) from Worksheet 2H		(4)*(5)*(6)
	a	b	c	d	e					
Total	--	--	--	--	--	--	--	--	--	--
Fatal and Injury (FI)	--	--	--	--	--	--	--	--	--	--

Federal law 23 USC § 409 prohibits the discovery or admission into evidence of "reports, surveys, schedules, lists, or data" compiled or collected for the purpose of highway safety improvement projects that might qualify for federal safety improvement funding.

Existing Conditions: Vehicle-Bicycle Crash Summary for Urban And Suburban Arterial Intersection						
(1)	(2)	(3)	(4)	(5)	(6)	(7)
Crash Severity Level	**Predicted N_{bimv}**	**Predicted N_{bisv}**	**Predicted N_{bi}**	**f_{bikei}**	**Calibration factor, C_i**	**Predicted N_{bikei}**
	(9) from Worksheet 2C	(9) from Worksheet 2E	(2) + (3)	from Table 12-17		(4)*(5)*(6)
Total	2.098	0.191	2.289	0.0077	1.15	0.020
Fatal and injury (FI)	--	--	--	--	1.15	0.020

Federal law 23 USC § 409 prohibits the discovery or admission into evidence of "reports, surveys, schedules, lists, or data" compiled or collected for the purpose of highway safety improvement projects that might qualify for federal safety improvement funding.

Federal law 23 USC § 409 prohibits the discovery or admission into evidence of "reports, surveys, schedules, lists, or data" compiled or collected for the purpose of highway safety improvement projects that might qualify for federal safety improvement funding.

Project Cost Estimate

Project Name	Livingston Ave Corridor Study	Contact Email	tilakcnagaraju@chacompanies.com
Project Description	Safety analysis at the intersections of Livingston Ave and	Contact Phone	(614) 362-7517
Reference Number		Date Performed	7/26/2022
Analyst	TCN	Analysis Year	2022
Agency/Company	CHA Consulting Inc.		

Engineering Design %	20%
Contingency %	10%

Countermeasures	Construction Costs	Right of Way Costs	Engineering Design Costs	Contingency Amount	Total Cost of Countermeasure	Annual Maintenance & Energy Costs	Salvage Value
Site Characteristic Improvements (i.e. Lane widening)			$0.00	$0.00	**$0.00**		
Site Characteristic Improvements (i.e. Lighting)			$0.00	$0.00	**$0.00**		
Site Characteristic Improvements (i.e. Signal Phasing)			$0.00	$0.00	**$0.00**		
Site Characteristic Improvements (i.e. Added Right Turn Lane)			$0.00	$0.00	**$0.00**		
CMF 1 - Prohibit Left Turns With "No Left Turn" Sign	$500.00	$0.00	$100.00	$50.00	**$650.00**		
CMF 2 - Install RRFB crosswalk	$22,000.00	$0.00	$4,400.00	$2,200.00	**$28,600.00**		
			$0.00	$0.00	**$0.00**		
			$0.00	$0.00	**$0.00**		
			$0.00	$0.00	**$0.00**		
			$0.00	$0.00	**$0.00**		
			$0.00	$0.00	**$0.00**		
			$0.00	$0.00	**$0.00**		
			$0.00	$0.00	**$0.00**		
			$0.00	$0.00	**$0.00**		
Totals	**$22,500.00**	**$0.00**	**$4,500.00**	**$2,250.00**	**$29,250.00**	**$0.00**	**$0.00**

Inflation %	9%

Final Costruction Cost:	**$31,882.50**

*Final construction cost should match the Project Cost Estimate

Safety Benefit - Cost Analysis

General Information

Project Name	Livingston Ave Corridor Study	Contact Email	tilakcnagaraju@chacompanies.com
Project Description	Safety analysis at the intersections of Livingston Ave and Rhoads Ave	Contact Phone	(614) 362-7517
Reference Number		Date Performed	7/26/2022
Analyst	TCN	Analysis Year	2022
Agency/Company	CHA Consulting Inc.		

Select Site Types to be used in Benefit-Cost Analysis:

All Sites

Comments:

Countermeasure Service Lives, Costs, and Safety Benefits

Countermeasures	Service Life (Years)	Initial Cost of Countermeasure	Annual Maintenance & Energy Costs	Salvage Value	Net Present Cost of Countermeasure	Total Cost of Countermeasures	Summary of Annual Crash Modifications	Net Present Value of Safety Benefits
Site Characteristic Improvements (i.e. Lane widening)		$0.00			$0.00	$0.00	-1.361	$347,209
Site Characteristic Improvements (i.e. Lighting)		$0.00			$0.00	$0.00		
Site Characteristic Improvements (i.e. Signal Phasing)		$0.00			$0.00	$0.00		
Site Characteristic Improvements (i.e. Added Right Turn Lane)		$0.00			$0.00	$0.00		
CMF 1 - Prohibit Left Turns With "No Left Turn" Sign	20	$650.00			$650.00	$650.00	-2.503	$639,246
CMF 2 - Install RRFB crosswalk	10	$28,600.00			$57,200.00	$70,934.99	-0.558	$142,665
		$0.00			$0.00	$0.00	0.000	$0
		$0.00			$0.00	$0.00	0.000	$0
		$0.00			$0.00	$0.00	0.000	$0
		$0.00			$0.00	$0.00	0.000	$0
		$0.00			$0.00	$0.00	0.000	$0
		$0.00			$0.00	$0.00	0.000	$0
		$0.00			$0.00	$0.00	0.000	$0
		$0.00			$0.00	$0.00	0.000	$0
Totals		**$29,250.00**	**$0.00**	**$0.00**	**$57,850.00**	**$71,584.99**	**-4.423**	**$1,129,120**

Safety Benefit - Cost Analysis

General Information

Project Name	Livingston Ave Corridor Study	Contact Email	tilakcnagaraju@chacompanies.com
Project Description	Safety analysis at the intersections of Livingston Ave and Rhoads Ave	Contact Phone	(614) 362-7517
Reference Number		Date Performed	7/26/2022
Analyst	TCN	Analysis Year	2022
Agency/Company	CHA Consulting Inc.		

Benefit - Cost Calculator

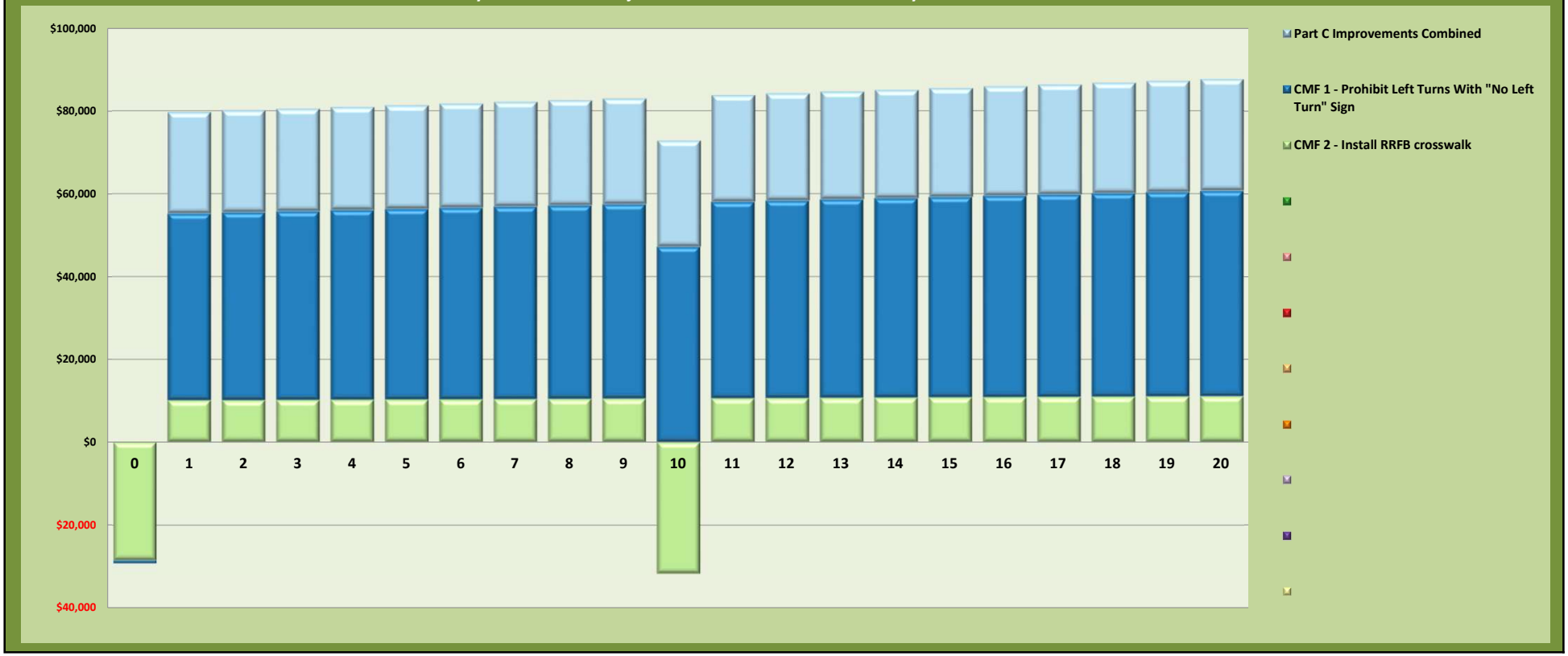
Net Present Value of Project	$57,850.00
Net Present Value of Safety Benefits	$1,129,120.42
Net Benefit	$1,071,270.42
Benefit / Cost Ratio	19.52

Expected Annual Crash Adjustment

Number of Fatal & Incapacitating Injury Crashes	-0.078
Number of Injury Crashes	-1.008
Number of Total Crashes	-4.423

Comments:

Safety Benefits and Project Costs Combined Cash Flows By Countermeasure Per Year

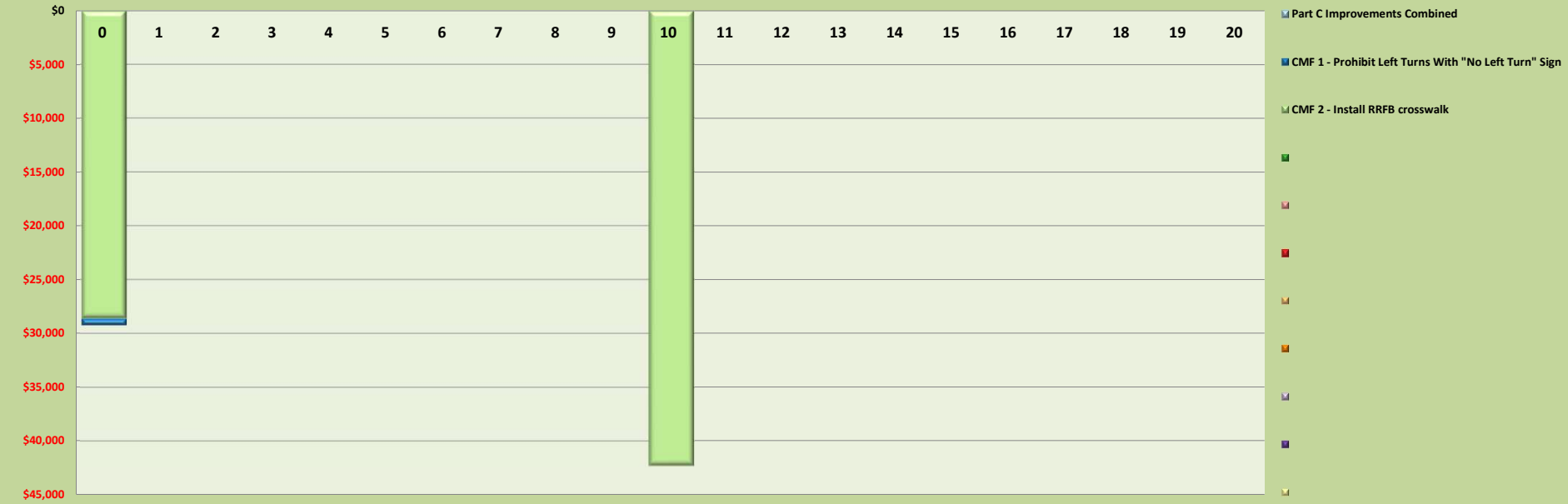


Safety Benefit - Cost Analysis

General Information

Project Name	Livingston Ave Corridor Study	Contact Email	tilakcnagaraju@chacompanies.com
Project Description	Safety analysis at the intersections of Livingston Ave and Rhoads Ave	Contact Phone	(614) 362-7517
Reference Number		Date Performed	7/26/2022
Analyst	TCN	Analysis Year	2022
Agency/Company	CHA Consulting Inc.		

Project Costs Only Cash Flows By Countermeasure Per Year



Return on Investment (Safety Benefits and Project Investments)

First year to observe a positive return on investiment: 2023 (1 years)

Percentage of Service Life to observe a continuous Positive Return on Investment: 100.00%

Project Information

General Information

Project Name	Livingston Ave Corridor Study	Contact Email	tilakcnagaraju@chacompanies.com
Project Description	Safety analysis at the intersection of Livingston Ave and Nelson Rd	Contact Phone	(614) 362-7517
Reference Number		Date Performed	7/26/2022
Analyst	TCN	Analysis Year	2022
Agency/Company	CHA Consulting Inc.		
Perform Benefit Cost Analysis?	Yes		

Do the proposed improvements fundamentally change the conditions of the base safety performance function (SPF), Or is crash data unavailable for the analysis condition, Or is only predicted (and not expected) analysis needed for the existing or proposed condition?	**No**

(Examples: unsignalized to signalized, undivided to divided, increase or decrease in the number of lanes, change the number of approaches to an intersection, significant realignment of the roadway)

Project Elements Description Table

Project Element ID (Must be Unique)	Site Type	Intersection Control Type	Location Information					
			NLFID	Begin Logpoint/ Intersection Midpoint	End Logpoint *(Leave blank for Intersection)*	Length (mi) OR Intersection Radius Buffer (mi)	Cross Route NLFID(s)	Common Name
US33; 126.395	Urban & Suburban Arterial Intersection	Signalized	SFRAUS00033**C	126.395		0.05	MFRAMR042	Livingston Ave at Nelson Rd

Traffic Volume Growth Rate Calculation For Benefit Cost Analysis

	Year	AADT	
Present ADT (PADT)	2022	21,505	veh / day
Future ADT (FADT)	2026	21,907	veh / day
Annual Linear Growth Rate		0.0047	

Project Elements Description Table								
Project Element ID (Must be Unique)	Site Type	Intersection Control Type	Location Information					
			NLFID	Begin Logpoint/ Intersection Midpoint	End Logpoint *(Leave blank for Intersection)*	Length (mi) OR Intersection Radius Buffer (mi)	Cross Route NLFID(s)	Common Name

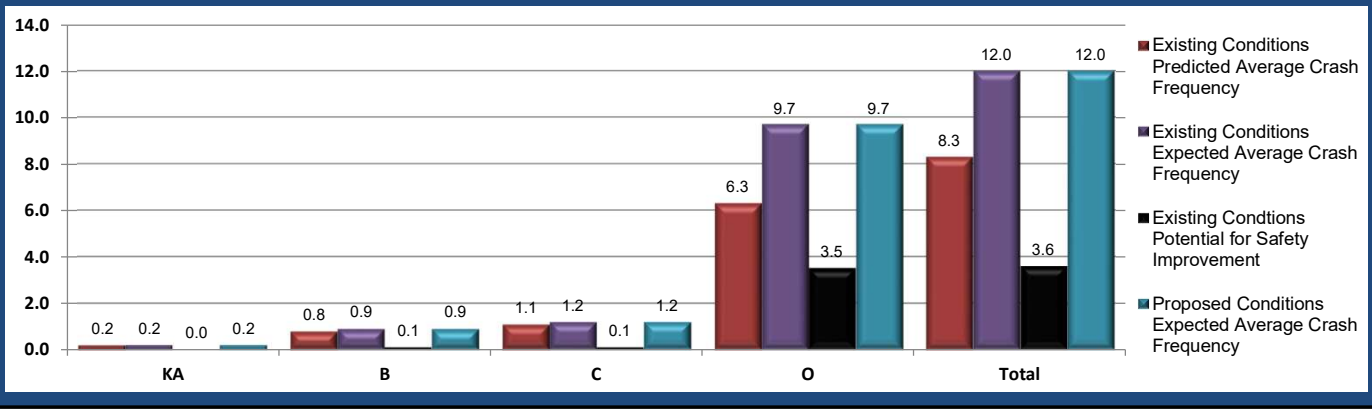
Select Other Non-Site Characteristic Based Countermeasures For Entire Project						
CMF Nbr	Countermeasure	CMF KA Value	CMF B Value	CMF C Value	CMF O Value	CMF Valid for the Following Site Types
CMF 1						
CMF 2						
CMF 3						
CMF 4						
CMF 5						
CMF 6						
CMF 7						
CMF 8						
CMF 9						
CMF 10						

Project Safety Performance Report

General Information

Project Name	Livingston Ave Corridor Study	Contact Email	tilakcnagaraju@chacompanies.com
Project Description	Safety analysis at the intersection of Livingston Ave and Nelson Rd	Contact Phone	(614) 362-7517
Reference Number		Date Performed	7/26/2022
Analyst	TCN	Analysis Year	2022
Agency/Company	CHA Consulting Inc.		

Summary of Anticipated Safety Performance of the Project (average crashes/year)



Project Summary Results (Without Animal Crashes)

	KA	B	C	O	Total
$N_{predicted}$ - Existing Conditions	0.1791	0.7977	1.0980	6.2575	8.3323
$N_{expected}$ - Existing Conditions	0.1897	0.8521	1.1976	9.7206	11.9600
$N_{potential\ for\ improvement}$ - Existing Conditions	**0.0106**	**0.0544**	**0.0996**	**3.4631**	**3.6277**
$N_{expected}$ - Proposed Conditions	0.1897	0.8521	1.1976	9.7206	11.9600

Project Safety Performance Report

General Information

Project Name	Livingston Ave Corridor Study	Contact Email	tilakcnagaraju@chacompanies.com
Project Description	Safety analysis at the intersection of Livingston Ave and Nelson Rd	Contact Phone	(614) 362-7517
Reference Number		Date Performed	7/26/2022
Analyst	TCN	Analysis Year	2022
Agency/Company	CHA Consulting Inc.		

Existing Conditions Project Element Predicted Crash Summary (Without Animal Crashes)

Project Element ID	Common Name	Crash Severity Level				
		KA	B	C	O	Total
US33: 126.395	Livingston Ave at Nelson Rd	0.1791	0.7977	1.098	6.2575	8.3323

Project Safety Performance Report

General Information

Project Name	Livingston Ave Corridor Study	Contact Email	tilakcnagaraju@chacompanies.com
Project Description	Safety analysis at the intersection of Livingston Ave and Nelson Rd	Contact Phone	(614) 362-7517
Reference Number		Date Performed	7/26/2022
Analyst	TCN	Analysis Year	2022
Agency/Company	CHA Consulting Inc.		

Existing Conditions Project Element Expected Crash Summary (Without Animal Crashes)

Project Element ID	Common Name	Crash Severity Level				
		KA	B	C	O	Total
US33; 126.395	Livingston Ave at Nelson Rd	0.1897	0.8521	1.1976	9.7206	11.96

Project Safety Performance Report

General Information

Project Name	Livingston Ave Corridor Study	Contact Email	tilakcnagaraju@chacompanies.com
Project Description	Safety analysis at the intersection of Livingston Ave and Nelson Rd	Contact Phone	(614) 362-7517
Reference Number		Date Performed	7/26/2022
Analyst	TCN	Analysis Year	2022
Agency/Company	CHA Consulting Inc.		

Existing Conditions Project Element Potential for Safety Improvement Summary (Without Animal Crashes)

Project Element ID	Common Name	Crash Severity Level				
		KA	B	C	O	Total
US33; 126.395	Livingston Ave at Nelson Rd	0.0106	0.0544	0.0996	3.4631	3.6277

Project Safety Performance Report

General Information

Project Name	Livingston Ave Corridor Study	Contact Email	tilakcnagaraju@chacompanies.com
Project Description	Safety analysis at the intersection of Livingston Ave and Nelson Rd	Contact Phone	(614) 362-7517
Reference Number		Date Performed	7/26/2022
Analyst	TCN	Analysis Year	2022
Agency/Company	CHA Consulting Inc.		

Proposed Conditions Project Element Expected Crash Summary (Without Animal Crashes)

Project Element ID	Common Name	Crash Severity Level				
		KA	B	C	O	Total
US33: 126.395	Livingston Ave at Nelson Rd	0.1897	0.8521	1.1976	9.7206	11.96

Project Safety Performance Report

General Information

Project Name	Livingston Ave Corridor Study	Contact Email	tilakcnagaraju@chacompanies.com
Project Description	Safety analysis at the intersection of Livingston Ave and Nelson Rd	Contact Phone	(614) 362-7517
Reference Number		Date Performed	7/26/2022
Analyst	TCN	Analysis Year	2022
Agency/Company	CHA Consulting Inc.		

Summary by Crash Type

Crash Type	Existing			Proposed
	Predicted Crash Frequency	Expected Crash Frequency	PSI	Expected Crash Frequency
Unknown	0.0037	0.0045	**0.0008**	0.0034
Head On	0.0485	0.0659	**0.0174**	0.0493
Rear End	4.0061	5.9122	**1.9062**	4.4224
Backing	0.2137	0.3325	**0.1188**	0.2487
Sideswipe - Meeting	0.1127	0.1635	**0.0507**	0.1223
Sideswipe - Passing	0.9966	1.5212	**0.5246**	1.1379
Angle	1.4419	2.0818	**0.6399**	1.5572
Parked Vehicle	0.1272	0.1508	**0.0236**	0.1128
Pedestrian	0.0309	0.0304	-0.0005	0.0227
Animal	0.0000	0.0000	0.0000	0.0000
Train	0.0003	0.0004	**0.0001**	0.0003
Pedalcycles	0.2524	0.2015	-0.0509	0.1507
Other Non-Vehicle	0.0000	0.0000	0.0000	0.0000
Fixed Object	0.2131	0.2572	**0.0441**	0.1924
Other Object	0.0073	0.0087	**0.0014**	0.0065
Overturning	0.0134	0.0169	**0.0036**	0.0127
Other Non-Collision	0.0279	0.0334	**0.0055**	0.0250
Left Turn	0.8365	1.1791	**0.3426**	0.8820
Right Turn	0.0000	0.0000	0.0000	0.0000

Existing Conditions: General Information and Data for Urban And Suburban Arterial Intersection					
General Information		**Location Information**			
Analyst	TCN	Route	US33		
Agency or Company	CHA Consulting Inc.	Logpoint	126.395		
Date Performed	07/26/22	Common Name	Livingston Ave at Nelson Rd		
Intersection	US33; 126.395	Analysis Year	2022		
Signalized/Unsignalized	Signalized				
Input Data				**Existing Conditions**	**HSM Base Conditions**
Intersection type (3ST, 3SG, 4ST, 4SG)				3SG	--
AADT $_{major}$ (veh/day) (total entering on major approaches)*	$AADT_{MAX}$ =	58,100	(veh/day)	21,505	--
AADT $_{minor}$ (veh/day) (total entering on minor approaches)*	$AADT_{MAX}$ =	16,400	(veh/day)	6,268	--
Intersection lighting (present/not present)				Present	Not Present
Calibration factor, C_i				Varies, See Below	1.00
Data for unsignalized intersections only:					
Number of major-road approaches with left-turn lanes					0
Number of major-road approaches with right-turn lanes					0
Data for signalized intersections only:					
Number of approaches with left-turn lanes				0	0
Number of approaches with right-turn lanes				0	0
Number of approaches with left-turn signal phasing				0	--
Type of left-turn signal phasing for Leg #1				Permissive	Permissive
Type of left-turn signal phasing for Leg #2				Permissive	--
Type of left-turn signal phasing for Leg #3				Permissive	--
Not Applicable				Not Applicable	--
Number of approaches with right-turn-on-red prohibited				0	0
Intersection red light cameras (present/not present)				Not Present	Not Present
Sum of all pedestrian crossing volumes (PedVol)				120	--
Maximum number of lanes crossed by a pedestrian (n_{lanesx})				2	--
Number of bus stops within 300 m (1,000 ft) of the intersection				1 or 2	0
Schools within 300 m (1,000 ft) of the intersection (present/not present)				Not Present	Not Present
Number of alcohol sales establishments within 300 m (1,000 ft) of the intersection				1 to 8	0
Locality:				State System	

Existing Conditions: Crash Modification Factors (CMFs) for Urban And Suburban Arterial Intersection						
(1)	(2)	(3)	(4)	(5)	(6)	(7)
CMF for Left-Turn Lanes	CMF for Left-Turn Signal Phasing	CMF for Right-Turn Lanes	CMF for Right Turn on Red	CMF for Lighting	CMF for Red Light Cameras	Combined CMF
CMF 1i	*CMF 2i*	*CMF 3i*	*CMF 4i*	*CMF 5i*	*CMF 6i*	*CMF $_{COMB}$*
from Table 12-24	from Table 12-25	from Table 12-26	from Equation 12-35	from Equation 12-36	from Equation 12-37	(1)*(2)*(3)*(4)*(5)*(6)
1.0000	1.0000	1.0000	1.0000	0.9999	1.0000	0.9999

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Existing Conditions: Multiple-Vehicle Crash Summary for Urban And Suburban Arterial Intersection									
(1)	(2)			(3)	(4)	(5)	(6)	(7)	(8)	(6)*(7)*(8)
Crash Severity Level	**SPF Coefficients** from Table 12-10			**Overdispersion Parameter, k** from Table 12-10	**Initial N_{bimv}** from Equation 12-21	**Proportion of Total Crashes**	**Adjusted N_{bimv}** $(4)_{TOTAL}$*(5)	**Combined CMFs** (7) from Worksheet 2B	**Calibration Factor, C_i**	**Predicted N_{bimv}**
	a	b	c							
Total	-12.13	1.11	0.26	0.33	3.376	1.000	3.376	1.00	2.25	7.595
Fatal and Injury (FI)	-11.58	1.02	0.17	0.30	1.085	$(4)_{FI}/((4)_{FI}+(4)_{PDO})$ = 0.338	1.140	1.00	1.46	1.664
Property Damage Only (PDO)	-13.24	1.14	0.30	0.36	2.129	$(5)_{TOTAL}-(5)_{FI}$ = 0.662	2.236	1.00	2.68	5.992

Existing Conditions: Single-Vehicle Crash Summary for Urban And Suburban Arterial Intersection										
(1)	(2)			(3)	(4)	(5)	(6)	(7)	(8)	(9)
Crash Severity Level	**SPF Coefficients** from Table 12-12			**Overdispersion Parameter, k** from Table 12-12	**Initial N_{bisv}** from Eqn. 12-24; (FI) from Eqn. 12-24 or 12-27	**Proportion of Total Crashes**	**Adjusted N_{bimv}** $(4)_{TOTAL}$*(5)	**Combined CMFs** (7) from Worksheet 2B	**Calibration Factor, C_i**	**Predicted N_{bisv}** (6)*(7)*(8)
	a	b	c							
Total	-9.02	0.42	0.40	0.36	0.264	1.000	0.264	1.00	1.49	0.393
Fatal and Injury (FI)	-9.75	0.27	0.51	0.24	0.074	$(4)_{FI}/((4)_{FI}+(4)_{PDO})$ = 0.291	0.077	1.00	1.66	0.127
Property Damage Only (PDO)	-9.08	0.45	0.33	0.53	0.182	$(5)_{TOTAL}-(5)_{FI}$ = 0.709	0.187	1.00	1.42	0.266

Existing Conditions: Vehicle-Pedestrian Crash Summary at Urban And Suburban Arterial Stop-Controlled Intersections						
(1)	(2)	(3)	(4)	(5)	(6)	(7)
Crash Severity Level	**Predicted N_{bimv}** (9) from Worksheet 2C	**Predicted N_{bisv}** (9) from Worksheet 2E	**Predicted N_{bi}** (2) + (3)	**f_{pedi}** from Table 12-16	**Calibration factor, C_i**	**Predicted N_{pedi}** (4)*(5)*(6)
Total	--	--	--	--	--	--
Fatal and injury (FI)	--	--	--	--	--	--

Existing Conditions: CMFs for Vehicle-Pedestrian Crash Summary for Urban And Suburban Arterial Signalized Intersections			
(1)	(2)	(3)	(4)
CMF for Bus Stops	CMF for Schools	CMF for Alcohol Sales Establishments	Combined CMF
CMF_{1p}	CMF_{2p}	CMF_{3p}	
from Table 12-28	from Table 12-29	from Table 12-30	(1)*(2)*(3)
2.78	1.00	1.12	3.11

Existing Conditions: Vehicle-Pedestrian Crash Summary at Urban And Suburban Arterial Signalized Intersections									
(1)	(2)					(3)	(4)	(5)	(6)	(7)
Crash Severity Level	**SPF Coefficients** from Table 12-14					**Overdispersion Parameter, k**	**$N_{pedbase}$** from Equation 12-29	**Combined CMF** (4) from Worksheet 2H	**Calibration factor, C_i**	**Predicted N_{pedi}** (4)*(5)*(6)
	a	b	c	d	e					
Total	-6.60	0.05	0.24	0.41	0.09	0.52	0.014	3.11	0.69	0.031
Fatal and Injury (FI)	--	--	--	--	--	--	--	--	0.69	0.031

Federal law 23 USC § 409 prohibits the discovery or admission into evidence of "reports, surveys, schedules, lists, or data" compiled or collected for the purpose of highway safety improvement projects that might qualify for federal safety improvement funding.

Existing Conditions: Vehicle-Bicycle Crash Summary for Urban And Suburban Arterial Intersection						
(1)	(2)	(3)	(4)	(5)	(6)	(7)
Crash Severity Level	**Predicted N_{bimv}**	**Predicted N_{bisv}**	**Predicted N_{bi}**	**f_{bikei}**	**Calibration factor, C_i**	**Predicted N_{bikei}**
	(9) from Worksheet 2C	(9) from Worksheet 2E	(2) + (3)	from Table 12-17		(4)*(5)*(6)
Total	7.595	0.393	7.988	0.0079	4.00	0.252
Fatal and injury (FI)	--	--	--	--	4.00	0.252

Federal law 23 USC § 409 prohibits the discovery or admission into evidence of "reports, surveys, schedules, lists, or data" compiled or collected for the purpose of highway safety improvement projects that might qualify for federal safety improvement funding.

Appendix 7: Speed Study Data

Contents:

1. Introduction	7-1 to 7-2
2. Livingston Avenue Eastbound from Carpenter St. to Gilbert St.	7-3 to 7-7
3. Livingston Avenue Westbound from Carpenter St. to Gilbert St.	7-8 to 7-10
4. Livingston Avenue Eastbound from Lockbourne Rd. to Miller Ave.	7-11 to 7-13
5. Livingston Avenue Westbound from Lockbourne Rd. to Miller Ave. (6-7622)	7-14 to 7-15
6. Livingston Avenue Westbound from Lockbourne Rd. to Miller Ave. (6-8-22)	7-16 to 7-17
7. Livingston Avenue Eastbound from Bulen Ave. to Rhoads Ave.	7-18 to 7-21
8. Livingston Avenue Westbound from Bulen Ave. to Rhoads Ave.	7-22 to 7-25

Appendix 7: Speed Study Data

As a part of this analysis, a total of six (6) 48-hour to 72-hour speed studies were conducted. Each speed study was completed over a Tuesday to Thursday time period in May and June of 2022. For each location studied, two (2) separate counts were taken, one for eastbound traffic and another for westbound traffic. The results of these speed studies can be found in **Table 1** below. The full speed study data is attached in this document.

Table 1: Speed Study Summary

Speed Study Segment	Parameters	Tuesday		Wednesday		Thursday	
		Eastbound	Westbound	Eastbound	Westbound	Eastbound	Westbound
Between Carpenter Street & Gilbert Street	85th Percentile Speed (mph)	35.9	–	35.9	38	36.2	37.9
	Pace Range (mph)	25.9 - 35.9	–	25.9 - 35.9	28.1 - 38.1	26.5 - 36.5	28.1 - 38.1
Between Lockbourne Rd & Miller Avenue	85th Percentile Speed (mph)	34.7	32.2	35.5	32.7	–	–
	Pace Range (mph)	23.1 - 33.1	21.0 - 31.0	23.6 - 33.6	20.9 - 30.9	–	–
Between Bulen Avenue & Rhoads Avenue	85th Percentile Speed (mph)	41.1	40.6	40.6	40.5	40.9	40.5
	Pace Range (mph)	30.9 - 40.9	30.3 - 40.3	30.9 - 40.9	30.3 - 40.3	30.9 - 40.9	29.6 - 39.6

The posted speed limit on Livingston Avenue is currently 35 mph. Looking at the results of these speed studies, the following is noted:

- In the segment between Carpenter Street and Gilbert Street, as well as between Lockbourne Rd and Miller Avenue, the 85th percentile speed did not exceed the posted speed limit by more than 5 mph. In the segment between Bulen Avenue and Rhoads Avenue, the 85th percentile speed exceeds the posted speed limit by more than 5 mph and shows a larger issue with speeding.

The following documents display the speed data collected for this analysis:

1. Livingston Avenue Eastbound Between Carpenter St. & Gilbert St.
2. Livingston Avenue Westbound Between Carpenter St. & Gilbert St.
3. Livingston Avenue Eastbound Between Lockbourne Rd. & Miller Ave.
4. Livingston Avenue Westbound Between Lockbourne Rd. & Miller Ave. (6-7-22)
5. Livingston Avenue Westbound Between Lockbourne Rd. & Miller Ave. (6-8-22)
6. Livingston Avenue Eastbound Between Bulen Ave. and Rhoads Ave.
7. Livingston Avenue Westbound Between Bulen Ave. and Rhoads Ave.

Livingston Avenue Eastbound Between Carpenter St. & Gilbert St.

Smart Services, Inc.
88 W. Church Street
Newark, OH 43055
(740) 345-4700

Counter 17
Livingston Ave
BTW Carpenter St & Gilbert St

Site: 1EB
5/17/2022
Tuesday

24 Hour Speed

EB

mph	Total	0 - < 15	15 - < 20	20 - < 25	25 - < 30	30 - < 35	35 - < 40	40 - < 45	45 - < 50	50 - < 55	55 - < 60	60 - < 65	65 - < 70	70 - < 200	Avg.
12:00 PM	367	5	7	29	86	159	66	13	1	1	0	0	0	0	31.1
1:00 PM	320	3	4	12	107	122	54	15	3	0	0	0	0	0	31.7
2:00 PM	417	6	12	38	103	174	69	13	2	0	0	0	0	0	30.7
3:00 PM	562	9	24	106	203	161	53	6	0	0	0	0	0	0	28.5
4:00 PM	530	4	23	35	146	200	103	18	1	0	0	0	0	0	31.0
5:00 PM	456	3	8	16	125	200	91	11	1	0	0	0	0	1	31.9
6:00 PM	336	1	4	9	87	136	76	19	3	1	0	0	0	0	32.5
7:00 PM	269	1	2	7	55	109	70	24	1	0	0	0	0	0	33.2
8:00 PM	268	1	5	28	78	103	42	9	2	0	0	0	0	0	31.0
9:00 PM	219	0	3	17	67	100	27	2	3	0	0	0	0	0	30.9
10:00 PM	172	0	0	9	44	69	41	8	1	0	0	0	0	0	32.4
11:00 PM	138	1	3	5	26	60	34	8	1	0	0	0	0	0	32.7
5/18/2022 12:00 AM	52	0	0	2	14	21	10	5	0	0	0	0	0	0	32.4
1:00 AM	62	0	2	3	11	22	21	2	0	0	1	0	0	0	33.2
2:00 AM	29	0	1	3	4	10	9	2	0	0	0	0	0	0	32.3
3:00 AM	30	0	0	5	7	7	8	2	1	0	0	0	0	0	32.2
4:00 AM	17	0	0	0	5	7	5	0	0	0	0	0	0	0	31.9
5:00 AM	41	0	0	1	13	19	8	0	0	0	0	0	0	0	31.4
6:00 AM	90	0	0	11	21	36	16	6	0	0	0	0	0	0	32.0
7:00 AM	227	0	2	11	52	91	59	10	1	1	0	0	0	0	32.6
8:00 AM	279	3	21	73	93	70	14	4	1	0	0	0	0	0	27.3
9:00 AM	263	6	12	47	98	64	33	3	0	0	0	0	0	0	28.4
10:00 AM	274	5	10	40	86	107	19	7	0	0	0	0	0	0	29.2
11:00 AM	338	0	12	37	122	121	37	9	0	0	0	0	0	0	30.0
Total	5756	48	155	544	1653	2168	965	196	22	3	1	0	0	1	30.8
%		0.8	2.7	9.5	28.7	37.7	16.8	3.4	0.4	0.1	0.0	0.0	0.0	0.0	

Average (Mean) 30.8 mph **Minimum** 10.4 mph **Maximum** 78.7 mph **Pace Range** 25.9 - 35.9 mph 3979 vehicles (69.1%)

Percentile Speeds	10%	15%	50%	85%	90%
(mph)	24.0	25.6	31.1	35.9	37.2

Speeds Exceeded	25 mph	35 mph	45 mph	55 mph	65 mph	75 mph
	86.8% (4999)	19.9% (1144)	0.5% (26)	0.0% (2)	0.0% (1)	0.0% (1)

Smart Services, Inc.
88 W. Church Street
Newark, OH 43055
(740) 345-4700

Counter 17
Livingston Ave
BTW Carpenter St & Gilbert St

Site: 1EB
5/18/2022
Wednesday

24 Hour Speed

EB

mph	Total	0 - < 15	15 - < 20	20 - < 25	25 - < 30	30 - < 35	35 - < 40	40 - < 45	45 - < 50	50 - < 55	55 - < 60	60 - < 65	65 - < 70	70 - < 200	Avg.
12:00 PM	330	1	8	32	108	117	55	9	0	0	0	0	0	0	30.5
1:00 PM	342	8	14	47	88	125	50	8	1	0	1	0	0	0	29.9
2:00 PM	381	3	6	49	134	136	46	7	0	0	0	0	0	0	29.8
3:00 PM	552	20	48	156	190	106	29	3	0	0	0	0	0	0	26.3
4:00 PM	526	2	12	53	196	186	66	11	0	0	0	0	0	0	30.0
5:00 PM	445	4	10	61	140	158	64	8	0	0	0	0	0	0	29.9
6:00 PM	331	1	1	18	87	152	63	9	0	0	0	0	0	0	31.7
7:00 PM	281	0	3	33	75	108	50	11	1	0	0	0	0	0	31.1
8:00 PM	261	1	1	16	93	97	42	9	1	1	0	0	0	0	31.3
9:00 PM	209	2	3	12	71	79	33	7	2	0	0	0	0	0	31.0
10:00 PM	167	0	0	5	40	68	41	13	0	0	0	0	0	0	33.0
11:00 PM	133	1	0	5	29	61	25	11	1	0	0	0	0	0	32.8
5/19/2022 12:00 AM	64	0	0	3	16	24	15	5	0	1	0	0	0	0	33.2
1:00 AM	52	0	0	0	5	23	11	10	3	0	0	0	0	0	35.5
2:00 AM	38	0	0	0	6	17	10	5	0	0	0	0	0	0	34.4
3:00 AM	23	0	0	2	4	8	7	2	0	0	0	0	0	0	33.4
4:00 AM	22	0	0	1	5	8	7	1	0	0	0	0	0	0	33.2
5:00 AM	45	0	1	6	11	14	10	3	0	0	0	0	0	0	31.4
6:00 AM	101	0	2	11	25	36	22	5	0	0	0	0	0	0	31.5
7:00 AM	224	1	5	10	30	93	67	17	1	0	0	0	0	0	33.2
8:00 AM	266	6	16	72	82	51	31	8	0	0	0	0	0	0	27.9
9:00 AM	281	2	9	27	91	93	53	6	0	0	0	0	0	0	30.5
10:00 AM	293	3	6	26	70	110	61	12	5	0	0	0	0	0	31.6
11:00 AM	321	4	4	24	84	144	50	9	2	0	0	0	0	0	31.1
Total	5688	59	149	669	1680	2014	908	189	17	2	1	0	0	0	30.4
%		1.0	2.6	11.8	29.5	35.4	16.0	3.3	0.3	0.0	0.0	0.0	0.0	0.0	

Average (Mean) 30.4 mph **Minimum** 10.2 mph **Maximum** 56.4 mph **Pace Range** 25.9 - 35.9 mph 3786 vehicles (66.6%)

Percentile Speeds	10%	15%	50%	85%	90%
(mph)	23.3	24.9	30.7	35.9	37.1

Speeds Exceeded	25 mph	35 mph	45 mph	55 mph	65 mph	75 mph
	84.4% (4798)	19.0% (1083)	0.3% (17)	0.0% (1)	0% (0)	0% (0)

Smart Services, Inc.
88 W. Church Street
Newark, OH 43055
(740) 345-4700

Counter 17
Livingston Ave
BTW Carpenter St & Gilbert St

Site: 1EB
5/19/2022
Thursday

24 Hour Speed

EB

mph	Total	0 - < 15	15 - < 20	20 - < 25	25 - < 30	30 - < 35	35 - < 40	40 - < 45	45 - < 50	50 - < 55	55 - < 60	60 - < 65	65 - < 70	70 - < 200	Avg.
12:00 PM	318	2	4	14	66	150	68	13	1	0	0	0	0	0	32.3
1:00 PM	358	2	7	24	116	128	66	13	2	0	0	0	0	0	31.2
2:00 PM	387	5	12	37	88	172	58	13	2	0	0	0	0	0	30.9
3:00 PM	588	7	39	111	211	158	53	9	0	0	0	0	0	0	28.1
4:00 PM	555	5	12	39	142	238	97	16	5	1	0	0	0	0	31.4
5:00 PM	520	4	16	36	143	208	94	18	1	0	0	0	0	0	31.1
6:00 PM	361	1	4	17	78	167	76	13	4	0	1	0	0	0	32.3
7:00 PM	312	2	5	11	73	138	62	17	4	0	0	0	0	0	32.3
8:00 PM	249	1	1	11	55	123	45	11	2	0	0	0	0	0	32.2
9:00 PM	249	3	4	19	72	99	39	9	2	1	0	0	0	1	31.4
10:00 PM	226	0	4	13	62	98	41	4	2	2	0	0	0	0	31.6
11:00 PM	156	2	3	2	47	52	40	8	1	1	0	0	0	0	32.3
5/20/2022 12:00 AM	98	1	0	4	24	29	32	8	0	0	0	0	0	0	33.2
1:00 AM	75	0	1	2	15	32	20	4	1	0	0	0	0	0	33.1
2:00 AM	43	0	0	2	6	17	13	4	1	0	0	0	0	0	34.0
3:00 AM	38	1	0	1	6	16	11	3	0	0	0	0	0	0	33.4
4:00 AM	26	0	1	3	3	7	11	1	0	0	0	0	0	0	32.6
5:00 AM	47	0	1	5	17	17	4	3	0	0	0	0	0	0	30.4
6:00 AM	113	0	1	7	27	55	19	4	0	0	0	0	0	0	31.6
7:00 AM	198	1	1	15	54	88	37	2	0	0	0	0	0	0	31.2
8:00 AM	245	1	19	72	84	53	16	0	0	0	0	0	0	0	27.0
9:00 AM	278	8	4	38	92	89	35	12	0	0	0	0	0	0	29.8
10:00 AM	283	2	8	17	85	111	42	16	2	0	0	0	0	0	31.0
11:00 AM	310	3	4	23	84	127	56	11	0	2	0	0	0	0	31.3
Total	6033	51	151	523	1650	2372	1035	212	30	7	1	0	0	1	31.0
%		0.8	2.5	8.7	27.3	39.3	17.2	3.5	0.5	0.1	0.0	0.0	0.0	0.0	

Average (Mean) 31.0 mph **Minimum** 10.1 mph **Maximum** 74.5 mph **Pace Range** 26.5 - 36.5 mph 4218 vehicles (69.9%)

Percentile Speeds	10%	15%	50%	85%	90%
(mph)	24.3	25.9	31.3	36.2	37.4

Speeds Exceeded	25 mph	35 mph	45 mph	55 mph	65 mph	75 mph
	87.8% (5297)	20.8% (1252)	0.6% (37)	0.0% (2)	0.0% (1)	0% (0)

Smart Services, Inc.
88 W. Church Street
Newark, OH 43055
(740) 345-4700

Counter 17
Livingston Ave
BTW Carpenter St & Gilbert St

Site: 1EB
5/20/2022
Friday

24 Hour Speed

EB

mph	Total	0 - < 15	15 - < 20	20 - < 25	25 - < 30	30 - < 35	35 - < 40	40 - < 45	45 - < 50	50 - < 55	55 - < 60	60 - < 65	65 - < 70	70 - < 200	Avg.
12:00 PM	364	5	8	33	113	142	49	12	1	0	0	0	0	1	30.6
Total	364	5	8	33	113	142	49	12	1	0	0	0	0	1	30.6
%		1.4	2.2	9.1	31.0	39.0	13.5	3.3	0.3	0.0	0.0	0.0	0.0	0.3	

Average (Mean) 30.6 mph **Minimum** 10.1 mph **Maximum** 75.5 mph **Pace Range** 25.9 - 35.9 mph 262 vehicles (72.0%)

Percentile Speeds	10%	15%	50%	85%	90%
(mph)	24.1	25.6	30.8	35.4	36.4

Speeds Exceeded	25 mph	35 mph	45 mph	55 mph	65 mph	75 mph
	87.4% (318)	16.8% (61)	0.3% (1)	0.3% (1)	0.3% (1)	0.3% (1)

Livingston Avenue Westbound Between Carpenter St. & Gilbert St.

Smart Services, Inc.
88 W. Church Street
Newark, OH 43055
(740) 345-4700

Counter 7D
Livingston Ave
BTW Carpenter St & Gilbert St

Site: 1WB
5/18/2022
Wednesday

24 Hour Speed

Combined Channels

mph	Total	0 - < 15	15 - < 20	20 - < 25	25 - < 30	30 - < 35	35 - < 40	40 - < 45	45 - < 50	50 - < 55	55 - < 60	60 - < 65	65 - < 70	70 - < 200	Avg.
12:00 PM	306	1	9	7	64	121	83	18	3	0	0	0	0	0	32.8
1:00 PM	331	2	7	11	77	146	74	14	0	0	0	0	0	0	32.1
2:00 PM	329	0	2	16	71	145	74	20	1	0	0	0	0	0	32.6
3:00 PM	351	8	29	81	94	85	38	15	1	0	0	0	0	0	28.2
4:00 PM	311	0	4	5	61	136	73	27	4	1	0	0	0	0	33.4
5:00 PM	332	0	2	10	74	140	84	18	4	0	0	0	0	0	32.8
6:00 PM	330	0	2	10	66	140	96	16	0	0	0	0	0	0	33.0
7:00 PM	219	1	3	6	31	100	65	10	3	0	0	0	0	0	33.3
8:00 PM	171	0	0	4	36	76	42	12	1	0	0	0	0	0	33.2
9:00 PM	182	1	5	7	30	71	53	10	4	0	1	0	0	0	33.1
10:00 PM	128	0	0	4	13	52	36	21	1	1	0	0	0	0	35.4
11:00 PM	90	2	1	2	14	40	20	7	4	0	0	0	0	0	33.5
5/19/2022 12:00 AM	44	0	0	0	6	20	14	3	0	1	0	0	0	0	34.3
1:00 AM	28	0	0	1	8	8	6	1	3	1	0	0	0	0	34.6
2:00 AM	21	0	0	1	4	5	8	1	1	0	1	0	0	0	35.5
3:00 AM	26	0	0	3	2	3	10	5	1	2	0	0	0	0	36.5
4:00 AM	45	0	0	0	4	18	17	3	3	0	0	0	0	0	35.7
5:00 AM	129	0	3	2	6	40	47	23	8	0	0	0	0	0	36.1
6:00 AM	339	0	3	5	38	133	124	28	6	2	0	0	0	0	34.7
7:00 AM	481	0	0	8	78	201	144	42	5	3	0	0	0	0	34.2
8:00 AM	444	17	69	100	79	109	49	17	3	1	0	0	0	0	27.3
9:00 AM	352	2	9	38	57	141	79	23	1	2	0	0	0	0	32.0
10:00 AM	321	0	0	17	36	147	99	18	2	1	1	0	0	0	33.9
11:00 AM	307	1	1	19	66	126	67	23	4	0	0	0	0	0	32.8
Total	5617	35	149	357	1015	2203	1402	375	63	15	3	0	0	0	32.6
%		0.6	2.7	6.4	18.1	39.2	25.0	6.7	1.1	0.3	0.1	0.0	0.0	0.0	

Average (Mean) 32.6 mph **Minimum** 10.6 mph **Maximum** 58.2 mph **Pace Range** 28.1 - 38.1 mph 3814 vehicles (67.9%)

Percentile Speeds	10%	15%	50%	85%	90%
(mph)	25.2	27.1	33.0	38.0	39.2

Speeds Exceeded	25 mph	35 mph	45 mph	55 mph	65 mph	75 mph
	90.3% (5070)	32.1% (1802)	1.4% (76)	0.1% (3)	0% (0)	0% (0)

Smart Services, Inc.
88 W. Church Street
Newark, OH 43055
(740) 345-4700

Counter 7D
Livingston Ave
BTW Carpenter St & Gilbert St

Site: 1WB
5/19/2022
Thursday

24 Hour Speed

Combined Channels

mph	Total	0 - < 15	15 - < 20	20 - < 25	25 - < 30	30 - < 35	35 - < 40	40 - < 45	45 - < 50	50 - < 55	55 - < 60	60 - < 65	65 - < 70	70 - < 200	Avg.
12:00 PM	349	0	3	22	60	127	106	25	5	1	0	0	0	0	33.4
1:00 PM	348	2	6	14	61	126	102	26	9	1	1	0	0	0	33.5
2:00 PM	348	1	5	13	60	140	100	21	8	0	0	0	0	0	33.2
3:00 PM	365	5	30	82	89	98	49	9	3	0	0	0	0	0	28.5
4:00 PM	356	6	9	28	82	135	77	13	4	2	0	0	0	0	31.5
5:00 PM	358	1	3	31	78	138	83	22	2	0	0	0	0	0	32.3
6:00 PM	348	2	3	11	65	137	104	22	4	0	0	0	0	0	33.2
7:00 PM	254	4	3	6	36	93	77	27	5	3	0	0	0	0	34.1
8:00 PM	235	0	3	6	29	116	59	17	4	1	0	0	0	0	33.8
9:00 PM	172	0	3	11	38	63	46	7	4	0	0	0	0	0	32.7
10:00 PM	170	0	0	5	28	64	54	17	2	0	0	0	0	0	34.2
11:00 PM	107	0	1	3	18	42	26	11	4	1	0	0	1	0	34.5
5/20/2022 12:00 AM	54	0	0	0	2	28	17	6	1	0	0	0	0	0	35.4
1:00 AM	39	0	0	0	3	16	10	8	2	0	0	0	0	0	36.5
2:00 AM	23	0	0	1	3	8	5	4	2	0	0	0	0	0	35.4
3:00 AM	27	0	0	2	2	5	9	7	2	0	0	0	0	0	36.9
4:00 AM	45	2	0	0	3	19	14	4	1	2	0	0	0	0	34.8
5:00 AM	131	0	1	6	20	47	40	13	4	0	0	0	0	0	34.2
6:00 AM	308	0	4	6	40	122	107	27	2	0	0	0	0	0	34.1
7:00 AM	403	0	5	14	56	225	91	11	1	0	0	0	0	0	32.6
8:00 AM	429	16	52	144	97	69	41	9	1	0	0	0	0	0	26.2
9:00 AM	367	1	11	40	74	138	80	18	4	1	0	0	0	0	31.7
10:00 AM	331	1	5	16	46	124	109	25	2	2	0	0	1	0	33.7
11:00 AM	303	1	2	8	40	126	97	21	6	2	0	0	0	0	34.1
Total	5870	42	149	469	1030	2206	1503	370	82	16	1	0	2	0	32.5
%		0.7	2.5	8.0	17.5	37.6	25.6	6.3	1.4	0.3	0.0	0.0	0.0	0.0	

Average (Mean) 32.5 mph **Minimum** 10.1 mph **Maximum** 68.5 mph **Pace Range** 28.1 - 38.1 mph 3957 vehicles (67.4%)

Percentile Speeds	10%	15%	50%	85%	90%
(mph)	24.3	26.5	33.0	37.9	39.3

Speeds Exceeded	25 mph	35 mph	45 mph	55 mph	65 mph	75 mph
	88.7% (5204)	32.8% (1924)	1.6% (95)	0.1% (3)	0.0% (2)	0% (0)

Livingston Avenue Eastbound Between Lockbourne Rd. & Miller Ave.

Smart Services, Inc.
88 W. Church Street
Newark, OH 43055
(740) 345-4700

Counter 44
Livingston Ave
BTW Lockbourne Rd & Miller Ave

Site: 2EB
5/24/2022
Tuesday

24 Hour Speed

Combined Channels

mph	Total	0 - < 15	15 - < 20	20 - < 25	25 - < 30	30 - < 35	35 - < 40	40 - < 45	45 - < 50	50 - < 55	55 - < 60	60 - < 65	65 - < 70	70 - < 200	Avg.
12:00 PM	524	8	30	121	168	132	48	12	3	2	0	0	0	0	28.3
1:00 PM	519	4	20	97	177	133	71	14	2	1	0	0	0	0	29.2
2:00 PM	604	0	24	120	228	136	72	18	6	0	0	0	0	0	29.1
3:00 PM	714	15	26	166	275	164	58	6	4	0	0	0	0	0	27.9
4:00 PM	748	24	31	132	296	177	70	15	2	1	0	0	0	0	28.2
5:00 PM	662	6	35	160	237	146	64	12	1	1	0	0	0	0	28.1
6:00 PM	544	5	35	149	181	118	39	15	2	0	0	0	0	0	27.6
7:00 PM	480	1	23	131	142	106	64	7	3	3	0	0	0	0	28.5
8:00 PM	431	11	46	122	124	91	33	3	0	1	0	0	0	0	26.6
9:00 PM	361	16	44	126	114	50	9	2	0	0	0	0	0	0	25.0
10:00 PM	314	18	51	90	101	34	15	4	0	1	0	0	0	0	24.9
11:00 PM	228	6	30	61	71	45	11	4	0	0	0	0	0	0	26.3
5/25/2022 12:00 AM	120	0	17	23	31	27	13	7	2	0	0	0	0	0	28.2
1:00 AM	85	0	0	5	24	27	23	5	1	0	0	0	0	0	32.5
2:00 AM	50	0	2	8	15	14	9	2	0	0	0	0	0	0	30.1
3:00 AM	51	1	2	6	10	23	6	2	1	0	0	0	0	0	30.4
4:00 AM	53	0	0	14	16	14	6	1	1	1	0	0	0	0	29.6
5:00 AM	91	0	5	13	37	21	14	1	0	0	0	0	0	0	29.1
6:00 AM	189	1	2	30	67	44	31	10	2	2	0	0	0	0	30.5
7:00 AM	402	0	12	68	128	98	63	24	9	0	0	0	0	0	30.4
8:00 AM	426	2	12	77	129	122	59	23	2	0	0	0	0	0	30.0
9:00 AM	407	1	20	97	118	97	57	11	5	1	0	0	0	0	29.2
10:00 AM	436	3	14	103	152	94	52	14	4	0	0	0	0	0	29.0
11:00 AM	511	5	17	115	172	111	73	14	3	1	0	0	0	0	28.9
Total	8950	127	498	2034	3013	2024	960	226	53	15	0	0	0	0	28.3
%		1.4	5.6	22.7	33.7	22.6	10.7	2.5	0.6	0.2	0.0	0.0	0.0	0.0	

Average (Mean) 28.3 mph **Minimum** 10.0 mph **Maximum** 54.2 mph **Pace Range** 23.1 - 33.1 mph 5537 vehicles (61.9%)

Percentile Speeds	10%	15%	50%	85%	90%
(mph)	21.2	22.5	27.9	34.7	36.3

Speeds Exceeded	25 mph	35 mph	45 mph	55 mph	65 mph	75 mph
	69.8% (6249)	13.7% (1224)	0.7% (65)	0% (0)	0% (0)	0% (0)

Smart Services, Inc.
88 W. Church Street
Newark, OH 43055
(740) 345-4700

Counter 44
Livingston Ave
BTW Lockbourne Rd & Miller Ave

Site: 2EB
5/25/2022
Wednesday

24 Hour Speed

Combined Channels

mph	Total	0 - < 15	15 - < 20	20 - < 25	25 - < 30	30 - < 35	35 - < 40	40 - < 45	45 - < 50	50 - < 55	55 - < 60	60 - < 65	65 - < 70	70 - < 200	Avg.
12:00 PM	514	1	28	130	159	103	74	12	6	0	1	0	0	0	28.7
1:00 PM	493	2	22	99	168	122	58	18	3	1	0	0	0	0	29.1
2:00 PM	557	9	26	111	176	144	76	10	3	1	1	0	0	0	29.0
3:00 PM	702	29	38	136	249	160	70	15	5	0	0	0	0	0	27.9
4:00 PM	680	7	42	134	238	169	74	15	1	0	0	0	0	0	28.4
5:00 PM	669	12	15	134	273	143	67	18	5	1	1	0	0	0	28.7
6:00 PM	505	2	14	80	182	114	84	23	6	0	0	0	0	0	30.2
7:00 PM	481	0	11	100	176	120	60	10	4	0	0	0	0	0	29.2
8:00 PM	437	2	5	79	133	138	64	12	1	3	0	0	0	0	30.0
9:00 PM	371	0	9	83	131	99	37	7	4	1	0	0	0	0	29.0
10:00 PM	275	3	13	39	88	86	35	9	2	0	0	0	0	0	29.7
11:00 PM	210	0	2	38	54	67	37	7	3	2	0	0	0	0	31.0
5/26/2022 12:00 AM	132	0	1	26	48	36	16	5	0	0	0	0	0	0	29.8
1:00 AM	81	0	2	6	23	25	10	10	5	0	0	0	0	0	32.6
2:00 AM	53	0	1	7	18	11	8	6	1	0	1	0	0	0	31.8
3:00 AM	48	0	0	3	17	13	5	4	5	1	0	0	0	0	33.6
4:00 AM	45	0	1	7	15	11	5	3	2	1	0	0	0	0	31.5
5:00 AM	89	0	0	11	34	26	9	6	3	0	0	0	0	0	31.2
6:00 AM	193	0	2	36	74	34	33	10	3	1	0	0	0	0	30.3
7:00 AM	375	2	4	69	120	79	78	17	4	1	1	0	0	0	30.5
8:00 AM	410	3	20	101	122	92	56	11	4	0	1	0	0	0	28.9
9:00 AM	401	4	19	84	140	99	48	7	0	0	0	0	0	0	28.6
Total	7721	76	275	1513	2638	1891	1004	235	70	13	6	0	0	0	29.3
%		1.0	3.6	19.6	34.2	24.5	13.0	3.0	0.9	0.2	0.1	0.0	0.0	0.0	

Average (Mean) 29.3 mph **Minimum** 10.0 mph **Maximum** 57.0 mph **Pace Range** 23.6 - 33.6 mph 4770 vehicles (61.8%)

Percentile Speeds	10%	15%	50%	85%	90%
(mph)	22.2	23.4	28.7	35.5	37.1

Speeds Exceeded	25 mph	35 mph	45 mph	55 mph	65 mph	75 mph
	75.4% (5824)	16.8% (1298)	1.1% (85)	0.1% (5)	0% (0)	0% (0)

Livingston Avenue Westbound Between Lockbourne Rd. & Miller Ave. (6-7-22)

Smart Services, Inc.
88 W. Church Street
Newark, OH 43055
(740) 345-4700

Counter 44
Livingston Ave
BTW Lockbourne Rd & Miller Ave

Site: 2WB
6/7/2022
Tuesday

24 Hour Speed

Combined Channels

mph	Total	0 - < 15	15 - < 20	20 - < 25	25 - < 30	30 - < 35	35 - < 40	40 - < 45	45 - < 50	50 - < 55	55 - < 60	60 - < 65	65 - < 70	70 - < 200	Avg.
10:00 AM	462	7	29	103	150	113	48	9	3	0	0	0	0	0	28.2
11:00 AM	492	11	48	129	152	109	38	3	2	0	0	0	0	0	27.0
12:00 PM	503	18	63	141	168	76	23	11	3	0	0	0	0	0	26.0
1:00 PM	538	29	86	153	140	89	36	3	1	1	0	0	0	0	25.4
2:00 PM	516	31	109	167	134	50	18	5	1	1	0	0	0	0	23.9
3:00 PM	541	41	107	155	139	72	22	5	0	0	0	0	0	0	24.2
4:00 PM	579	37	107	164	159	78	28	3	3	0	0	0	0	0	24.6
5:00 PM	586	24	80	153	180	119	23	5	2	0	0	0	0	0	25.9
Total	4217	198	629	1165	1222	706	236	44	15	2	0	0	0	0	25.6
%		4.7	14.9	27.6	29.0	16.7	5.6	1.0	0.4	0.0	0.0	0.0	0.0	0.0	

Average (Mean) 25.6 mph **Minimum** 10.1 mph **Maximum** 54.8 mph **Pace Range** 21.0 - 31.0 mph 2434 vehicles (57.7%)

Percentile Speeds	10%	15%	50%	85%	90%
(mph)	17.4	18.9	25.4	32.2	33.7

Speeds Exceeded	25 mph	35 mph	45 mph	55 mph	65 mph	75 mph
	52.3% (2206)	6.9% (292)	0.4% (16)	0% (0)	0% (0)	0% (0)

Livingston Avenue Westbound Between Lockbourne Rd. & Miller Ave. (6-8-22)

Smart Services, Inc.
88 W. Church Street
Newark, OH 43055
(740) 345-4700

Counter 44
Livingston Ave
BTW Lockbourne Rd & Miller Ave

Site: 2WB
6/8/2022
Wednesday

24 Hour Speed

Combined Channels

mph	Total	0 - < 15	15 - < 20	20 - < 25	25 - < 30	30 - < 35	35 - < 40	40 - < 45	45 - < 50	50 - < 55	55 - < 60	60 - < 65	65 - < 70	70 - < 200	Avg.
11:00 AM	512	18	65	127	158	105	29	6	1	2	0	0	0	1	26.5
12:00 PM	565	20	72	140	173	109	36	10	5	0	0	0	0	0	26.5
1:00 PM	563	14	85	136	168	108	43	8	1	0	0	0	0	0	26.6
2:00 PM	535	24	74	147	142	98	38	9	3	0	0	0	0	0	26.2
3:00 PM	546	42	91	145	147	83	33	3	2	0	0	0	0	0	24.8
4:00 PM	559	57	121	156	116	69	31	6	2	1	0	0	0	0	23.9
5:00 PM	604	47	107	195	141	77	29	6	2	0	0	0	0	0	24.3
6:00 PM	582	30	83	174	154	109	27	4	1	0	0	0	0	0	25.4
7:00 PM	451	13	43	116	149	87	33	6	2	1	1	0	0	0	27.0
8:00 PM	405	5	34	107	131	98	19	8	2	1	0	0	0	0	27.4
9:00 PM	351	6	23	81	134	79	21	3	2	2	0	0	0	0	27.5
10:00 PM	300	2	12	64	103	79	31	6	3	0	0	0	0	0	28.8
11:00 PM	209	0	7	43	74	53	25	6	0	1	0	0	0	0	29.2
Total	6182	278	817	1631	1790	1154	395	81	26	8	1	0	0	1	26.1
%		4.5	13.2	26.4	29.0	18.7	6.4	1.3	0.4	0.1	0.0	0.0	0.0	0.0	

Average (Mean) 26.1 mph **Minimum** 10.0 mph **Maximum** 72.1 mph **Pace Range** 20.9 - 30.9 mph 3554 vehicles (57.5%)

Percentile Speeds	10%	15%	50%	85%	90%
(mph)	17.8	19.4	26.0	32.7	34.3

Speeds Exceeded	25 mph	35 mph	45 mph	55 mph	65 mph	75 mph
	55.6% (3436)	8.1% (499)	0.6% (35)	0.0% (2)	0.0% (1)	0% (0)

Livingston Avenue Eastbound Between Bulen Ave. and Rhoads Ave.

Smart Services, Inc.
88 W. Church Street
Newark, OH 43055
(740) 345-4700

Counter 3D
Livingston Ave
BTW Bulen Ave & Rhoads Ave

Site: 3EB
5/17/2022
Tuesday

24 Hour Speed

Combined Channels

mph	Total	0 - < 15	15 - < 20	20 - < 25	25 - < 30	30 - < 35	35 - < 40	40 - < 45	45 - < 50	50 - < 55	55 - < 60	60 - < 65	65 - < 70	70 - < 200	Avg.
1:00 PM	546	4	3	28	66	162	197	62	19	3	0	1	0	1	34.9
2:00 PM	558	0	2	21	39	156	215	95	23	3	2	2	0	0	36.3
3:00 PM	706	4	6	25	84	234	248	73	25	6	1	0	0	0	34.8
4:00 PM	661	0	7	28	59	195	244	99	27	2	0	0	0	0	35.4
5:00 PM	655	5	2	23	67	151	284	100	16	5	2	0	0	0	35.6
6:00 PM	539	2	1	18	49	140	193	102	31	3	0	0	0	0	36.3
7:00 PM	506	2	9	17	47	131	178	88	29	3	1	1	0	0	35.9
8:00 PM	511	3	3	17	63	189	162	55	15	4	0	0	0	0	34.5
9:00 PM	404	2	3	22	65	137	116	46	9	2	2	0	0	0	34.2
10:00 PM	285	0	1	5	33	78	89	54	18	4	2	0	1	0	36.6
11:00 PM	243	0	3	6	23	66	82	40	13	5	3	2	0	0	36.7
5/18/2022 12:00 AM	130	0	1	9	8	40	47	17	7	1	0	0	0	0	35.4
1:00 AM	96	0	2	5	11	19	35	16	5	0	3	0	0	0	36.0
2:00 AM	62	0	0	1	10	16	16	12	5	1	1	0	0	0	36.4
3:00 AM	38	0	0	4	6	11	9	5	3	0	0	0	0	0	34.4
4:00 AM	50	0	1	4	2	15	16	10	2	0	0	0	0	0	35.7
5:00 AM	94	0	4	4	9	19	34	14	8	2	0	0	0	0	35.8
6:00 AM	164	0	3	11	13	36	52	39	9	0	1	0	0	0	36.1
7:00 AM	322	1	2	11	23	75	120	72	13	4	1	0	0	0	36.7
8:00 AM	364	2	6	26	55	93	118	49	13	1	0	0	1	0	34.3
9:00 AM	339	3	4	19	34	116	110	36	13	2	2	0	0	0	34.7
10:00 AM	373	6	7	22	41	110	131	40	14	1	1	0	0	0	34.2
11:00 AM	441	4	9	10	58	123	174	48	11	4	0	0	0	0	34.8
12:00 PM	492	6	4	13	63	157	187	46	14	1	0	1	0	0	34.5
Total	8579	44	83	349	928	2469	3057	1218	342	57	22	7	2	1	35.3
%		0.5	1.0	4.1	10.8	28.8	35.6	14.2	4.0	0.7	0.3	0.1	0.0	0.0	

Average (Mean) 35.3 mph **Minimum** 10.0 mph **Maximum** 87.3 mph **Pace Range** 30.9 - 40.9 mph 5618 vehicles (65.5%)

Percentile Speeds	10%	15%	50%	85%	90%
(mph)	27.7	29.6	35.6	41.1	42.5

Speeds Exceeded	25 mph	35 mph	45 mph	55 mph	65 mph	75 mph
	94.4% (8095)	53.9% (4627)	4.8% (410)	0.3% (29)	0.0% (3)	0.0% (1)

Smart Services, Inc.
88 W. Church Street
Newark, OH 43055
(740) 345-4700

Counter 3D
Livingston Ave
BTW Bulen Ave & Rhoads Ave

Site: 3EB
5/18/2022
Wednesday

24 Hour Speed

Combined Channels

mph	Total	0 - < 15	15 - < 20	20 - < 25	25 - < 30	30 - < 35	35 - < 40	40 - < 45	45 - < 50	50 - < 55	55 - < 60	60 - < 65	65 - < 70	70 - < 200	Avg.
1:00 PM	470	2	5	21	44	137	185	64	11	0	1	0	0	0	35.0
2:00 PM	510	3	6	25	47	176	175	60	11	3	4	0	0	0	34.7
3:00 PM	663	1	3	20	87	194	241	93	18	2	3	1	0	0	35.2
4:00 PM	649	2	8	25	87	233	216	60	17	0	1	0	0	0	34.3
5:00 PM	655	1	10	42	96	223	205	63	14	1	0	0	0	0	33.8
6:00 PM	466	2	7	20	53	149	155	63	15	2	0	0	0	0	34.6
7:00 PM	414	3	8	28	58	114	131	53	17	1	1	0	0	0	34.1
8:00 PM	388	0	3	12	35	153	128	50	6	1	0	0	0	0	34.7
9:00 PM	333	2	6	11	23	104	130	44	10	3	0	0	0	0	35.3
10:00 PM	293	2	0	11	39	83	98	35	19	2	2	1	1	0	35.8
11:00 PM	208	0	2	9	24	61	74	27	9	1	1	0	0	0	35.2
5/19/2022 12:00 AM	100	1	1	7	11	27	37	14	2	0	0	0	0	0	34.4
1:00 AM	77	0	2	3	3	19	29	14	5	2	0	0	0	0	36.9
2:00 AM	62	0	0	3	6	17	21	7	5	1	1	1	0	0	36.7
3:00 AM	51	0	2	6	8	9	18	3	3	2	0	0	0	0	34.0
4:00 AM	59	0	0	6	5	17	16	13	2	0	0	0	0	0	35.3
5:00 AM	88	0	2	6	12	21	23	19	2	2	1	0	0	0	35.3
6:00 AM	182	0	2	10	27	38	63	30	10	1	1	0	0	0	35.4
7:00 AM	346	1	7	21	25	75	124	73	15	4	1	0	0	0	35.9
8:00 AM	389	2	4	11	56	97	140	56	18	5	0	0	0	0	35.3
9:00 AM	404	1	3	20	33	106	151	70	15	2	2	1	0	0	35.8
10:00 AM	416	3	7	20	39	113	150	70	14	0	0	0	0	0	35.1
11:00 AM	467	2	1	17	52	126	175	80	10	3	1	0	0	0	35.5
12:00 PM	518	1	4	15	54	142	189	83	26	2	0	1	1	0	35.9
Total	8208	29	93	369	924	2434	2874	1144	274	40	20	5	2	0	35.0
%		0.4	1.1	4.5	11.3	29.7	35.0	13.9	3.3	0.5	0.2	0.1	0.0	0.0	

Average (Mean) 35.0 mph **Minimum** 11.4 mph **Maximum** 66.1 mph **Pace Range** 30.9 - 40.9 mph 5392 vehicles (65.7%)

Percentile Speeds	10%	15%	50%	85%	90%
(mph)	27.3	29.3	35.4	40.6	42.2

Speeds Exceeded	25 mph	35 mph	45 mph	55 mph	65 mph	75 mph
	93.9% (7709)	52.4% (4302)	3.9% (323)	0.3% (25)	0.0% (2)	0% (0)

Smart Services, Inc.
88 W. Church Street
Newark, OH 43055
(740) 345-4700

Counter 3D
Livingston Ave
BTW Bulen Ave & Rhoads Ave

Site: 3EB
5/19/2022
Thursday

24 Hour Speed

Combined Channels

mph	Total	0 - < 15	15 - < 20	20 - < 25	25 - < 30	30 - < 35	35 - < 40	40 - < 45	45 - < 50	50 - < 55	55 - < 60	60 - < 65	65 - < 70	70 - < 200	Avg.
1:00 PM	509	1	5	13	66	141	168	87	25	2	1	0	0	0	35.6
2:00 PM	577	3	4	24	53	165	201	100	23	2	1	1	0	0	35.6
3:00 PM	697	1	4	28	87	190	227	121	26	10	3	0	0	0	35.7
4:00 PM	675	1	5	21	79	202	243	95	20	6	1	1	1	0	35.5
5:00 PM	655	0	5	14	71	187	217	113	35	9	3	1	0	0	36.2
6:00 PM	587	0	7	18	51	136	237	113	21	2	1	1	0	0	36.1
7:00 PM	540	3	22	31	65	178	170	57	11	2	1	0	0	0	33.6
8:00 PM	457	7	17	37	77	158	117	37	4	3	0	0	0	0	32.2
9:00 PM	183	3	5	7	39	69	42	15	3	0	0	0	0	0	32.6
10:00 PM	100	1	2	4	13	41	25	11	2	1	0	0	0	0	34.0
11:00 PM	230	0	1	16	30	91	66	19	1	5	1	0	0	0	33.9
5/20/2022 12:00 AM	141	0	2	5	22	45	40	21	5	1	0	0	0	0	34.7
1:00 AM	112	0	1	3	6	29	40	20	11	1	0	1	0	0	37.2
2:00 AM	86	0	2	3	9	20	32	13	4	2	1	0	0	0	36.2
3:00 AM	71	0	0	3	9	19	27	9	1	1	2	0	0	0	35.8
4:00 AM	54	0	0	4	7	16	18	6	3	0	0	0	0	0	34.7
5:00 AM	90	0	2	5	12	20	32	17	2	0	0	0	0	0	35.0
6:00 AM	177	0	1	11	23	47	60	29	4	2	0	0	0	0	35.0
7:00 AM	331	1	8	22	42	87	128	29	12	2	0	0	0	0	34.3
8:00 AM	328	0	3	20	53	117	98	32	5	0	0	0	0	0	33.7
9:00 AM	288	1	3	17	42	77	82	53	10	3	0	0	0	0	34.9
10:00 AM	190	2	3	6	21	69	58	19	12	0	0	0	0	0	34.7
11:00 AM	200	0	3	7	23	53	68	35	10	1	0	0	0	0	35.8
Total	7278	24	105	319	900	2157	2396	1051	250	55	15	5	1	0	35.0
%		0.3	1.4	4.4	12.4	29.6	32.9	14.4	3.4	0.8	0.2	0.1	0.0	0.0	

Average (Mean) 35.0 mph **Minimum** 10.2 mph **Maximum** 66.5 mph **Pace Range** 30.9 - 40.9 mph 4631 vehicles (63.6%)

Percentile Speeds	10%	15%	50%	85%	90%
(mph)	27.0	29.0	35.2	40.9	42.5

Speeds Exceeded	25 mph	35 mph	45 mph	55 mph	65 mph	75 mph
	93.7% (6820)	50.9% (3708)	4.3% (312)	0.3% (20)	0.0% (1)	0% (0)

Livingston Avenue Westbound Between Bulen Ave. and Rhoads Ave.

Smart Services, Inc.
88 W. Church Street
Newark, OH 43055
(740) 345-4700

Counter 44
Livingston Ave
BTW Bulen Ave & Rhoads Ave

Site: 3WB
5/17/2022
Tuesday

24 Hour Speed

Combined Channels

mph	Total	0 - < 15	15 - < 20	20 - < 25	25 - < 30	30 - < 35	35 - < 40	40 - < 45	45 - < 50	50 - < 55	55 - < 60	60 - < 65	65 - < 70	70 - < 200	Avg.
2:00 PM	479	4	7	19	80	142	153	53	18	3	0	0	0	0	34.4
3:00 PM	509	7	8	14	73	167	156	67	15	2	0	0	0	0	34.5
4:00 PM	465	0	2	20	53	128	172	64	19	5	1	1	0	0	35.6
5:00 PM	512	1	3	18	68	136	171	83	24	8	0	0	0	0	35.5
6:00 PM	515	4	6	15	71	155	161	79	19	4	1	0	0	0	35.0
7:00 PM	423	0	2	4	50	136	142	63	16	5	3	2	0	0	36.1
8:00 PM	429	1	2	20	59	141	129	56	8	10	2	1	0	0	35.0
9:00 PM	350	0	1	12	47	115	113	42	14	6	0	0	0	0	35.1
10:00 PM	268	0	1	6	33	82	104	34	6	1	1	0	0	0	35.4
11:00 PM	202	0	2	6	20	61	81	29	3	0	0	0	0	0	35.2
5/18/2022 12:00 AM	126	0	0	4	14	42	45	17	4	0	0	0	0	0	35.3
1:00 AM	95	0	1	3	10	35	28	12	4	2	0	0	0	0	35.3
2:00 AM	57	2	0	2	4	15	18	9	5	1	0	1	0	0	36.6
3:00 AM	53	0	1	1	5	17	19	6	3	0	1	0	0	0	36.1
4:00 AM	61	0	0	1	6	21	24	6	2	1	0	0	0	0	35.5
5:00 AM	136	0	0	1	8	42	51	22	11	0	0	1	0	0	37.1
6:00 AM	313	0	4	2	21	78	129	55	19	5	0	0	0	0	36.9
7:00 AM	445	4	2	13	31	121	189	67	14	3	1	0	0	0	35.9
8:00 AM	485	2	3	18	92	148	159	44	14	5	0	0	0	0	34.1
9:00 AM	455	1	4	32	74	150	128	44	20	2	0	0	0	0	33.9
10:00 AM	318	0	7	7	43	102	114	37	7	1	0	0	0	0	34.5
11:00 AM	392	4	4	5	54	125	134	48	16	2	0	0	0	0	35.1
12:00 PM	409	3	7	18	57	121	147	41	11	3	1	0	0	0	34.3
1:00 PM	456	3	8	10	54	169	145	51	11	2	2	1	0	0	34.6
Total	7953	36	75	251	1027	2449	2712	1029	283	71	13	7	0	0	35.1
%		0.5	0.9	3.2	12.9	30.8	34.1	12.9	3.6	0.9	0.2	0.1	0.0	0.0	

Average (Mean) 35.1 mph **Minimum** 10.2 mph **Maximum** 63.8 mph **Pace Range** 30.3 - 40.3 mph 5244 vehicles (65.9%)

Percentile Speeds	10%	15%	50%	85%	90%
(mph)	27.9	29.4	35.2	40.6	42.0

Speeds Exceeded	25 mph	35 mph	45 mph	55 mph	65 mph	75 mph
	95.4% (7587)	51.0% (4054)	4.5% (355)	0.2% (19)	0% (0)	0% (0)

Smart Services, Inc.
88 W. Church Street
Newark, OH 43055
(740) 345-4700

Counter 44
Livingston Ave
BTW Bulen Ave & Rhoads Ave

Site: 3WB
5/18/2022
Wednesday

24 Hour Speed

Combined Channels

mph	Total	0 - < 15	15 - < 20	20 - < 25	25 - < 30	30 - < 35	35 - < 40	40 - < 45	45 - < 50	50 - < 55	55 - < 60	60 - < 65	65 - < 70	70 - < 200	Avg.
2:00 PM	459	5	5	21	69	145	145	50	14	3	2	0	0	0	34.0
3:00 PM	493	5	5	17	73	151	164	57	18	1	2	0	0	0	34.5
4:00 PM	503	0	6	14	60	156	161	84	17	4	0	0	0	1	35.4
5:00 PM	505	1	11	34	82	160	157	38	18	1	2	0	0	1	33.9
6:00 PM	454	0	6	17	69	152	151	50	7	1	1	0	0	0	34.2
7:00 PM	382	1	7	18	71	138	98	39	9	1	0	0	0	0	33.4
8:00 PM	311	0	2	9	37	111	117	28	6	1	0	0	0	0	34.5
9:00 PM	273	1	0	5	39	87	96	33	12	0	0	0	0	0	35.1
10:00 PM	229	0	0	8	23	67	77	35	14	2	2	1	0	0	36.4
11:00 PM	167	0	0	11	17	61	51	26	1	0	0	0	0	0	34.5
5/19/2022 12:00 AM	105	0	0	3	12	30	36	16	4	3	0	1	0	0	36.0
1:00 AM	67	0	0	2	8	24	23	5	3	2	0	0	0	0	35.3
2:00 AM	58	0	1	2	6	11	22	7	4	3	2	0	0	0	37.5
3:00 AM	40	0	1	3	6	9	11	7	1	2	0	0	0	0	35.1
4:00 AM	62	0	1	2	4	19	22	9	3	1	1	0	0	0	36.4
5:00 AM	140	0	3	3	8	32	62	20	9	3	0	0	0	0	36.8
6:00 AM	307	0	3	2	24	72	116	65	22	2	1	0	0	0	37.2
7:00 AM	437	1	1	7	50	121	160	73	22	2	0	0	0	0	36.1
8:00 AM	469	2	3	20	56	147	164	65	10	2	0	0	0	0	34.9
9:00 AM	410	2	1	7	46	118	154	55	19	5	1	2	0	0	35.9
10:00 AM	375	3	1	19	48	131	127	34	11	0	1	0	0	0	34.3
11:00 AM	443	4	5	21	65	169	122	39	14	2	1	0	1	0	33.9
12:00 PM	487	3	2	17	54	163	166	57	20	4	1	0	0	0	35.0
1:00 PM	467	4	8	21	33	148	156	72	16	6	1	2	0	0	35.3
Total	7643	32	72	283	960	2422	2558	964	274	51	18	6	1	2	34.9
%		0.4	0.9	3.7	12.6	31.7	33.5	12.6	3.6	0.7	0.2	0.1	0.0	0.0	

Average (Mean) 34.9 mph **Minimum** 10.5 mph **Maximum** 72.1 mph **Pace Range** 30.3 - 40.3 mph 5055 vehicles (66.1%)

Percentile Speeds	10%	15%	50%	85%	90%
(mph)	27.7	29.3	35.0	40.5	42.0

Speeds Exceeded	25 mph	35 mph	45 mph	55 mph	65 mph	75 mph
	94.9% (7250)	49.7% (3802)	4.3% (331)	0.3% (25)	0.0% (3)	0% (0)

Smart Services, Inc.
88 W. Church Street
Newark, OH 43055
(740) 345-4700

Counter 44
Livingston Ave
BTW Bulen Ave & Rhoads Ave

Site: 3WB
5/19/2022
Thursday

24 Hour Speed

Combined Channels

mph	Total	0 - < 15	15 - < 20	20 - < 25	25 - < 30	30 - < 35	35 - < 40	40 - < 45	45 - < 50	50 - < 55	55 - < 60	60 - < 65	65 - < 70	70 - < 200	Avg.
2:00 PM	494	7	5	17	64	165	154	58	18	5	1	0	0	0	34.5
3:00 PM	520	7	7	17	60	170	175	70	10	3	1	0	0	0	34.6
4:00 PM	516	1	1	20	56	155	185	76	17	5	0	0	0	0	35.5
5:00 PM	503	3	6	23	54	142	172	71	27	4	0	0	1	0	35.2
6:00 PM	487	1	3	11	63	122	167	85	29	5	1	0	0	0	36.1
7:00 PM	439	0	4	15	56	133	143	61	18	5	4	0	0	0	35.5
8:00 PM	420	1	4	24	55	132	148	40	10	5	1	0	0	0	34.4
9:00 PM	342	0	7	15	49	138	93	32	6	2	0	0	0	0	33.5
10:00 PM	314	2	7	22	56	98	89	26	11	2	1	0	0	0	33.3
11:00 PM	207	0	1	15	25	74	61	18	7	5	0	1	0	0	34.5
5/20/2022 12:00 AM	119	0	1	4	9	46	35	16	6	1	0	1	0	0	35.7
1:00 AM	96	0	0	3	7	34	29	15	4	3	1	0	0	0	36.4
2:00 AM	70	1	1	2	4	24	23	10	4	0	1	0	0	0	35.5
3:00 AM	63	0	0	2	6	13	23	15	3	1	0	0	0	0	36.7
4:00 AM	55	0	0	1	4	13	23	13	1	0	0	0	0	0	36.4
5:00 AM	134	0	0	3	6	44	52	19	8	1	1	0	0	0	36.8
6:00 AM	302	1	3	7	26	98	109	47	7	4	0	0	0	0	35.6
7:00 AM	404	9	7	24	72	156	106	25	5	0	0	0	0	0	32.5
8:00 AM	466	3	2	18	92	183	123	38	6	1	0	0	0	0	33.4
9:00 AM	399	1	1	11	67	138	122	42	16	1	0	0	0	0	34.5
10:00 AM	398	3	5	19	58	135	113	49	14	1	0	1	0	0	34.3
11:00 AM	400	4	3	8	44	110	147	63	17	4	0	0	0	0	35.8
Total	7148	44	68	281	933	2323	2292	889	244	58	12	3	1	0	34.7
%		0.6	1.0	3.9	13.1	32.5	32.1	12.4	3.4	0.8	0.2	0.0	0.0	0.0	

Average (Mean) 34.7 mph **Minimum** 10.2 mph **Maximum** 66.5 mph **Pace Range** 29.6 - 39.6 mph 4686 vehicles (65.6%)

Percentile Speeds	10%	15%	50%	85%	90%
(mph)	27.6	29.1	34.8	40.5	42.0

Speeds Exceeded	25 mph	35 mph	45 mph	55 mph	65 mph	75 mph
	94.4% (6749)	48.1% (3438)	4.2% (299)	0.2% (13)	0.0% (1)	0% (0)

Appendix 8: Public Involvement

Contents:

1. Public involvement Comments and Questions

Steering Committee Meeting #1
Meeting Minutes

Meeting Minutes

Meeting Name:	Livingston Avenue Steering Committee #1	
Date:	August 15, 2022	**Time: 5:30 PM**
Location:	Columbus Metropolitan Library, Driving Park Branch	**Host:** City of Columbus
Attendees:	Livingston Avenue Steering Committee members City of Columbus CHA Lawhon and Associates See Attachment A for a list of attendees	

Introduction:

- The meeting started around 5:35 PM. The agenda can be seen in Attachment B.
- A PowerPoint presentation was utilized to guide the meeting and is included as Attachment C.
- Eric Lambert introduced himself, as did the other City of Columbus, CHA, and Lawhon attendees. The committee members introduced themselves and stated their connection to the corridor.
- The agenda was presented along with the goals for the meeting.
- Project Overview (presented by the City of Columbus): A project background, project parameters, and discussion of Vision Zero was presented.
- Planning Study Outline (presented by CHA): All tasks of the improvement study were presented.
- Plan Process and Schedule (presented by Lawhon): A high-level schedule of the study and public engagement process was presented.

Livingston Avenue Site Visit:

- Due to storms prior to the meeting, the site visits were canceled and were done virtually using Google Street View. Two intersections in the corridor were visited virtually and the committee was prompted for their thoughts about the intersections. Committee members were provided a site visit worksheet for their use (Attachment D).
- Champion Avenue feedback:
    - Positive Observations
        - Long term businesses in existence
        - Street trees exist here but not in other parts of the corridor
        - Businesses are close to the road, which was seen as positive, but it creates narrow sidewalks (perceived as less safe) and sight distance issues
    - Issues
        - This area used to have more commercial activity which provided a better “feel” to the area
        - Turning vehicles from Champion Avenue create conflicts with bikes in the bike-lane
        - Speeds on Livingston Avenue are high here; slowing down traffic would be good for businesses and the community
        - More lighting may be desirable like on the west end of the project area
            - Note: new pedestrian scale street lighting in design for Livingston Ave between Studer and Ohio
- Rhoads Avenue
    - High volume of traffic on roads
    - Traffic data should be collected here
    - Fire station nearby which is very active relative to other stations in the city
    - Rhoads and the alley behind the station are too narrow for the trucks to use
    - The fire station has no fire signal so they must manually stop Livingston Avenue traffic when leaving and returning to the station
    - The old cookie factory will be redeveloped [124 affordable housing units were proposed in April 2022]
    - This development will lead to more pedestrian crossings of Livingston, especially youth, with the rec center as their destination
    - Major pedestrian generators include the Library, Fairwood Elementary, and the Rec Center
    - Traffic will back up to this intersection due to congestion at the I-70 interchange to the east
    - There is a bus stop here but no marked crosswalks
    - No left turn bay which was considered an issue
    - A pedestrian bridge was mentioned but considered by the group as impractical here
    - A road diet was mentioned for this part of the corridor to be implemented to slow vehicles down and incorporate a dedicated turn lane

- General feedback
    - Developing a sense of community is important
    - Livingston not being used as a throughway
    - Some residents park on the street to slow down traffic
    - Road safety may not be the top priority; the opportunity to develop a sense of community should not be lost
    - A lot of youth pedestrian activity in the corridor due to the rec center, library, schools, etc.
    - The need for parking in the corridor was mentioned several times
        - Parking prohibitions now are inconsistent and confusing
        - Parking prohibitions lead to higher speeds
        - Parking is needed for residents on Livingston Avenue as well as the businesses
        - May need parking in some areas but not in others
        - Not all residents have parking in the alley behind their residences
        - Something similar to the German Village on-street parking where parking is cut out and designated more consistently
        - Note: not all residents on Livingston Avenue have garages
    - Some welcomed a road diet in the entire corridor; this was mentioned multiple times by several members of the committee
    - The feel of High Steet in the Short North was mentioned several times as desirable for this corridor [this area is a 3-lane roadway with on-street parking]
    - The Parsons Avenue road diet was considered a possible model for this corridor; however, it was mentioned that it was uncomfortable for cyclists [Parsons Avenue was converted from a roadway almost identical to Livingston Avenue into a 3-lane road with on-street parking allowed in some areas]
    - If parking is to remain, having it recessed into the curb line, so cyclists don't have to weave around parked cars as they do now in the corridor
    - Assure the final concept is cohesive with the adjacent projects to the east and west of the study area; do not want this section to be the "speeding" section or a commuter route
    - A landscaped median is desirable but not if that eliminates all parking

<u>Working Session:</u>

- The committee members were presented with two scroll-plots of the corridor and asked to place colored dots on locations of concern and community assets. The results are in Attachment E.
- The group was then asked to develop and prioritize their top five overall *concerns* and *goals* for the corridor knowing that these could change as the process proceeds:
    - Concerns:
        1. Speeding
        2. Crashes
        3. Pedestrian Crossing [Safety]
        4. Parking [Needs]
        5. [Community] Character/Identity
    - Goals
        1. [Community] Identity
        2. Improve Safety
        3. Beautification
        4. Equitable Local Connectivity and Mobility
        5. [blank – a fifth was not provided by the committee]

<u>Wrap Up:</u>

- Steering Committee #2 will be September 13, 2022, in the same location with a goal to have them monthly on the 2nd Tuesday of the month.
- An agenda will be provided ahead of the meeting
- Tasks for the next meeting were presented
- A take home worksheet was provided (Attachment F)
- A pulse-check questionnaire was provided for them to complete before leaving the meeting (Attachment G)

ATTACHMENT A

Attendee List

Livingston Avenue Improvements Study – Steering Committee #1 August 4, 2022

Attendees

Steering Committee:

- Mike Aaron
- Danielle Dillard
- David Gray
- Stacee Green
- George Holliman
- Rachel Robinson
- Jerry Saunders
- Erin Synk
- Ralph Walker

City of Columbus:

- Tricia Fought
- Justin Goodwin
- Emma Kogge
- Eric Lambert
- Matt Lorenz
- Jesus Ovalle
- Alex Sauersmith
- Kelly Scocco
- Greg Sprungle
- Nancy Sully-Prior

CHA:

- John Gallagher
- Cory Lamb

Lawhon:

- Abby Anacki
- Chantil Milam

ATTACHMENT B

Meeting Agenda

Livingston Avenue Improvements Study – 18th St to Nelson Road
Steering Committee Meeting 1 Agenda

Date: Thursday, August 4th, 2023
Time: 5:30 – 7:15 pm
Location: Columbus Metropolitan Library Driving Park Branch, Meeting Rooms 2 and 3

5:30 – 5:35 Introductions

5:35 – 5:55 Presentation

- Project overview
- Roles and responsibilities
- Planning study outline
- Plan process and schedule

5:55 – 6:40 Livingston Avenue Site Visit

6:40 – 7:10 Priorities Debrief

- Work session to identify project goals and needs
- Round table discussion/whiteboard session

7:10 – 7:15 Next steps

- Outline upcoming events
- Steering committee tasks (solicit feedback from public, take home worksheet)
- Pulse check questionnaire

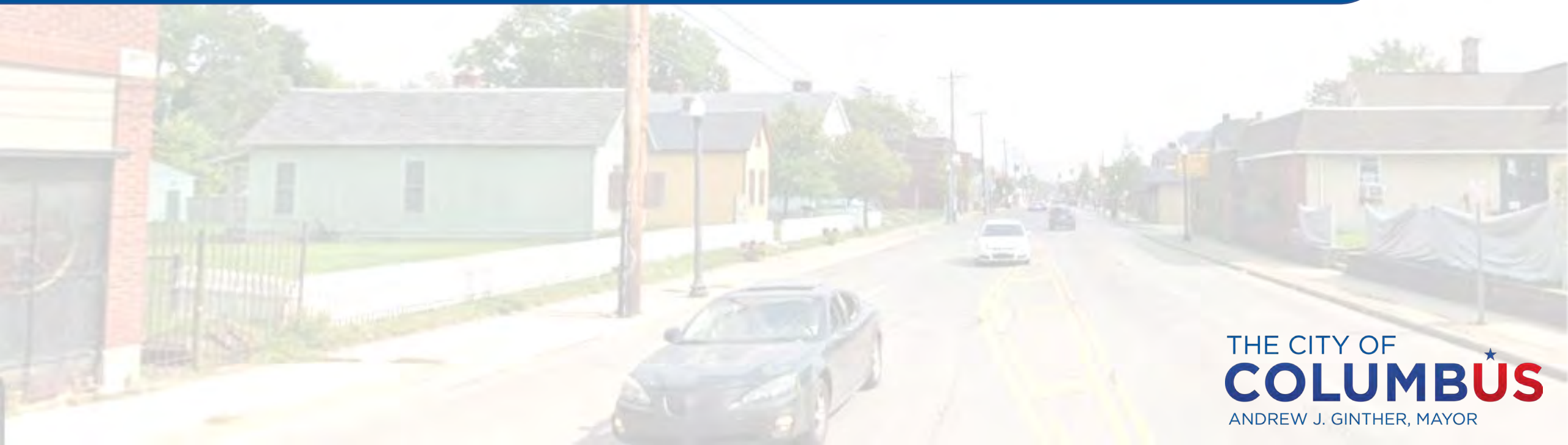
ATTACHMENT C

PowerPoint Presentation

Livingston Avenue Improvements Study – 18th St to Nelson Rd

Steering Committee Meeting #1

August 4, 2022



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ANDREW J. GINTHER, MAYOR

Meet the Project Team

City of Columbus - Dept. of Public Service

- Design and Construction
- Planning
- Public Affairs
- Traffic Management

CHA

- Engineering and Design

Lawhon and Associates

- Public Involvement

Steering Committee Introductions

- Name
- Relationship to Livingston Avenue / Area

(Resident, Commission Member, Association Member, etc.)

Steering Committee

Mike Aaron
Rickenbacker Woods Community Fdn.
Pastor John Bradford
Bethany Baptist Church
Danielle Dillard
Livingston Avenue Area Comm.
David Gray
Livingston Avenue Area Comm.
Stacee Green
Driving Park Civic Assoc.
Rita Hallaveld
Resident & cyclist
Molly Hogue
Resident
George Holliman
Livingston Avenue Area Comm.
Jerry Saunders
Africentric Personal Dev. Shop
Erin Synk
Columbus South Side Area Comm.
Ralph Walker
Livingston Ave. Columbus, OH Safety Group
Rachel Robinson
Southern Orchards Civic Assoc.
Sherman Willis
Community business owner

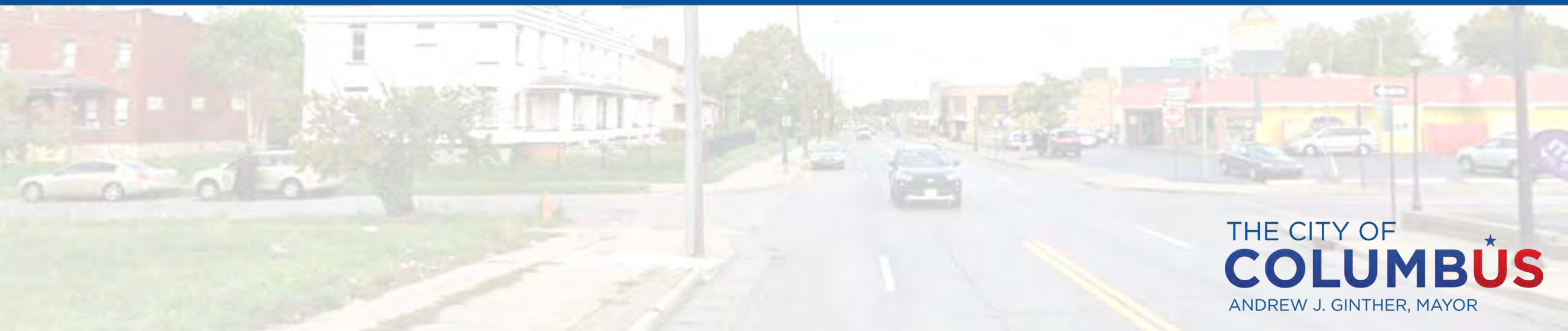
Agenda (1 hour 45 minutes)

1. **Presentation (20 min)**
    a. Project overview
    b. Roles and responsibilities
    c. Planning study outline
    d. Plan process and schedule
2. **Livingston Avenue Site Visit (45 min)**
3. **Priorities Debrief (30 min)**
4. **Next Steps (5 min)**
    a. Outline Upcoming Events
    b. Steering Committee Tasks (Solicit Feedback from Public)
    c. Pulse Check Questionnaire

What is the goal for today?

- Introduce the study
- Discuss roles and schedule
- Gather initial input from you
- Discuss next steps

Project Overview



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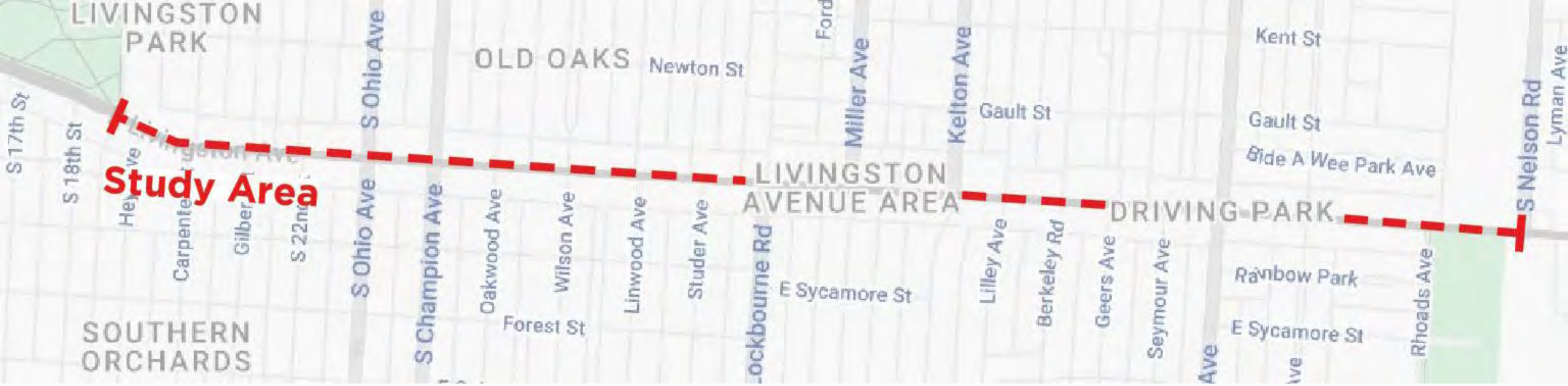
Project Background

Other Projects Improvements

- City of Columbus
  - Livingston Neighborhood Commercial Revitalization Project, Miller St – Fairwood Ave (2000)
  - Parsons/Livingston Improvements, 9th St – Ohio Ave (2010)
  - Livingston Streetscape, Ohio Ave to Fairwood Ave (2013)
- ODOT - Pedestrian Safety Improvement Project (22nd St, Lilley, and Wilson)

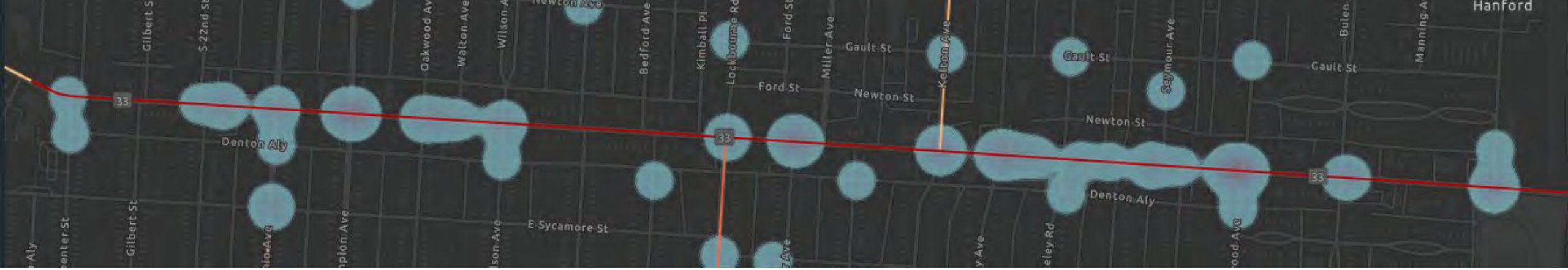
Previous Studies

- Near Nationwide Children's, joint plan with Bexley
- History of crashes / speeding



Project Parameters

- Project limits – along Livingston Avenue from 18th St to Nelson Road
- Existing facilities – multi-modal access and connectivity
- Funding
- Community goals



Vision Zero

- End fatal and serious injury crashes
- Increase safe, healthy, and equitable mobility for all
- Plan and build safe streets for all users

VISION ZERO COLUMBUS
DRIVE SAFE. WALK SAFE. BIKE SAFE.

https://vision-zero-columbus.hub.arcgis.com/

Roles and Responsibilities

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Roles and Responsibilities

City of Columbus

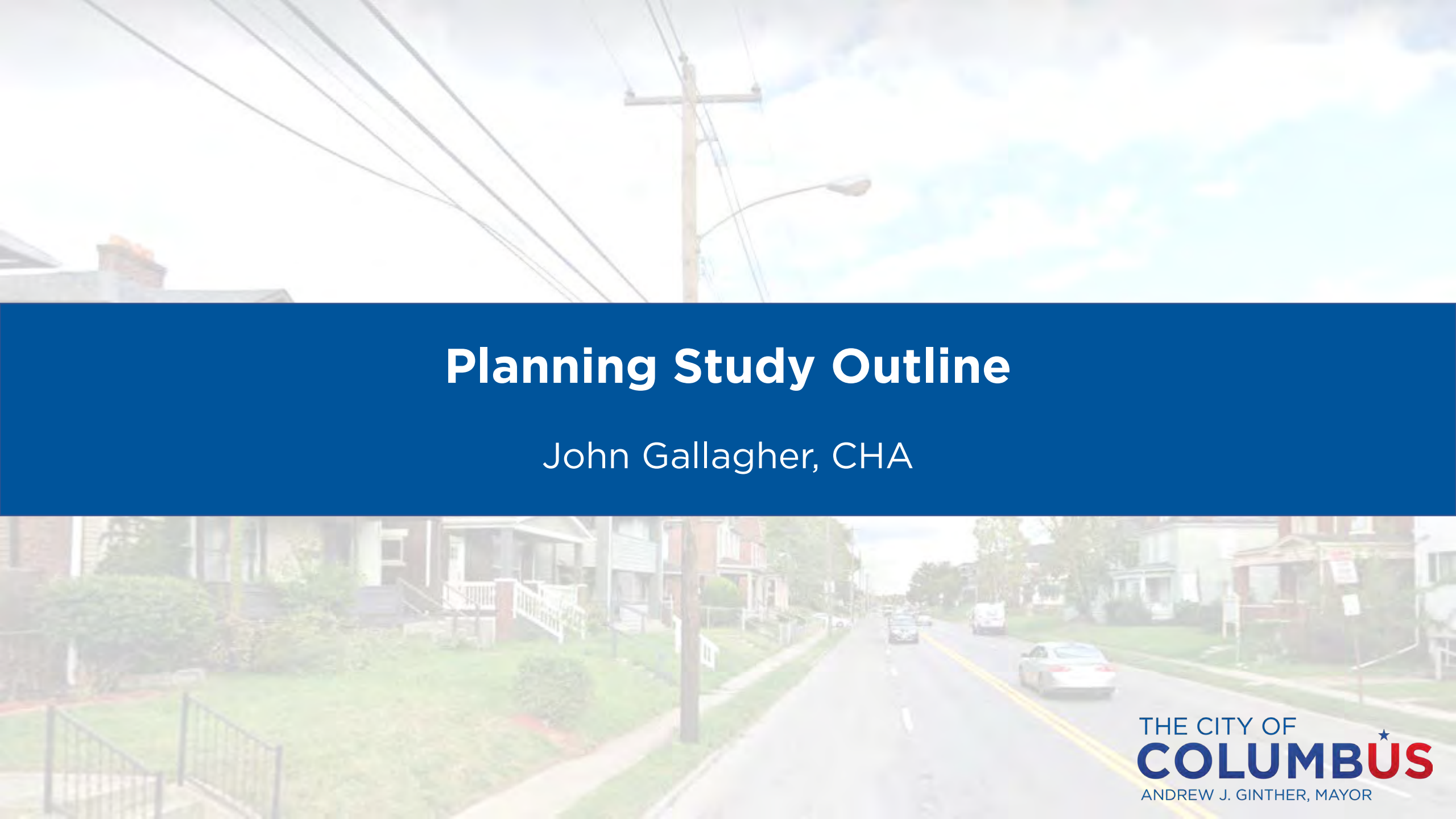
- Facilitate the Project, provide resources, support Consultants, expedite the process
- Ensure Project supports Vision Zero Goals and remains economically feasible

Consultants

- CHA – Engineering & Design
- Lawhon & Associates – Facilitate the Public Involvement Process

Role of Steering Committee Members

- Attend meetings to give input and advice when needed
- Share information and surveys with your friends and neighbors in the community
- Invite key people to share their voice with us at Public Meetings



Planning Study Outline

John Gallagher, CHA

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Planning Study

Data Collection

- ✓ Parking Study
- ✓ Traffic Counts
- ✓ Speed Study
- ✓ Future Traffic Volumes

Safety

Pedestrian Generator Map

Unmarked Pedestrian Crossings Analysis

Crash Analysis & Mitigation Strategy

Traffic Analysis

Traffic Signal Analysis

Traffic Flow Analysis

Plan Process and Schedule

Chantil Milam, Lawhon and Associates

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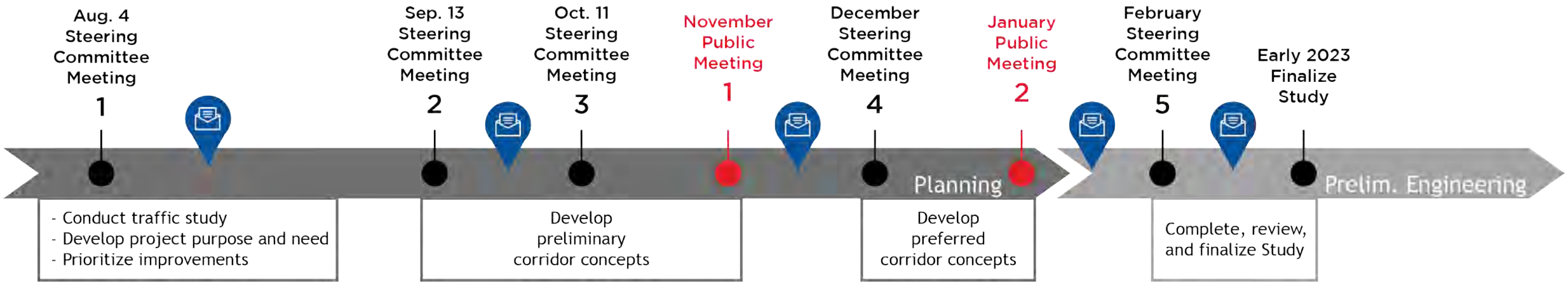
Plan Schedule



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Livingston Avenue Site Visit

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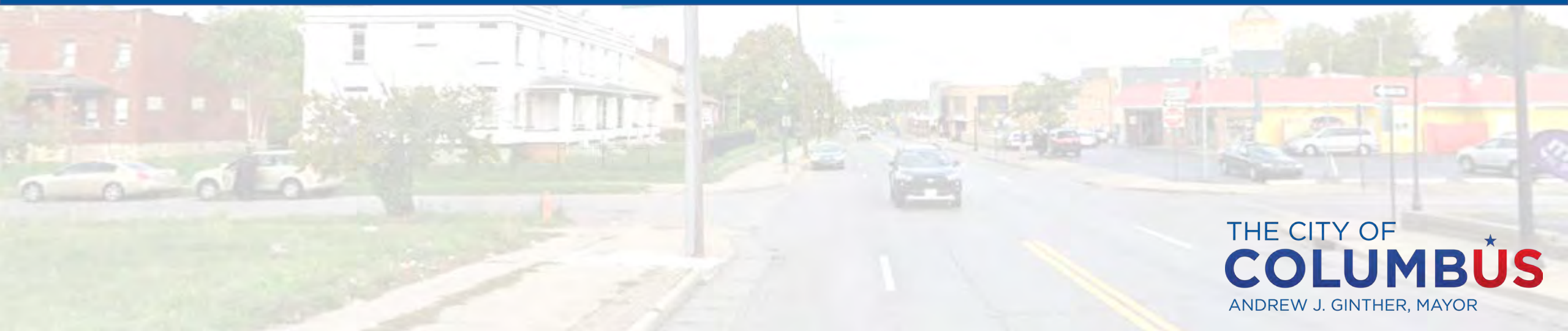
ANDREW J. GINTHER, MAYOR

Site Visit Debrief

Chantil Milam & Abby Anacki, Lawhon and Associates



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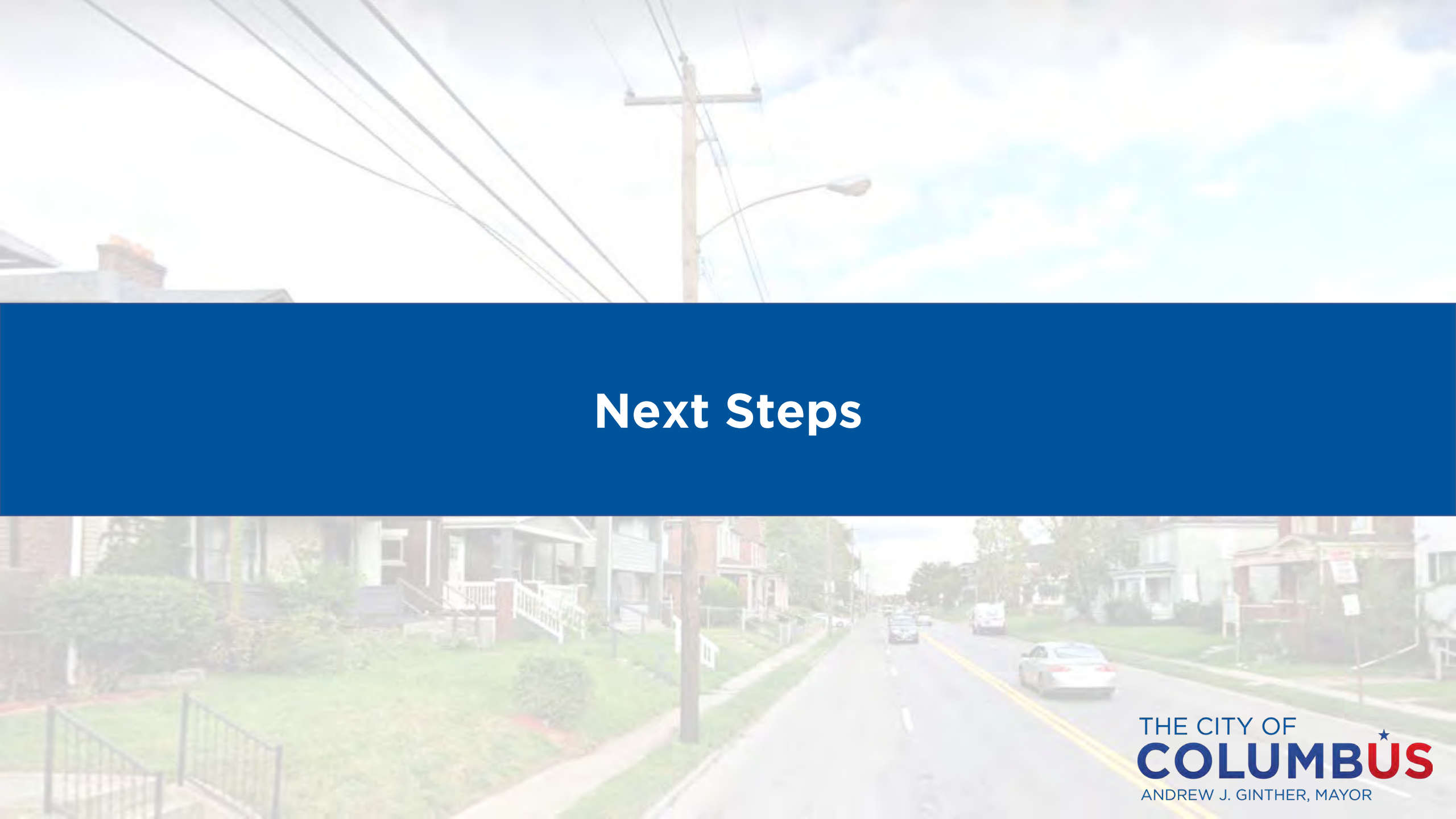

Next Steps

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Next Steering Committee Meeting

- September 13, 2022
- Same location (Library – Driving Park Branch)
- Agenda will be sent prior to meeting

Tasks for Next Meeting

- Take home worksheet
- Committee members to provide feedback based on community outreach
- Technical input from design team
- Define project needs

Pulse Check Questionnaire

Let us know how we're doing!

- Please complete survey (paper copy or online) before you leave

Thank you!

ATTACHMENT D

Site Visit Worsheet

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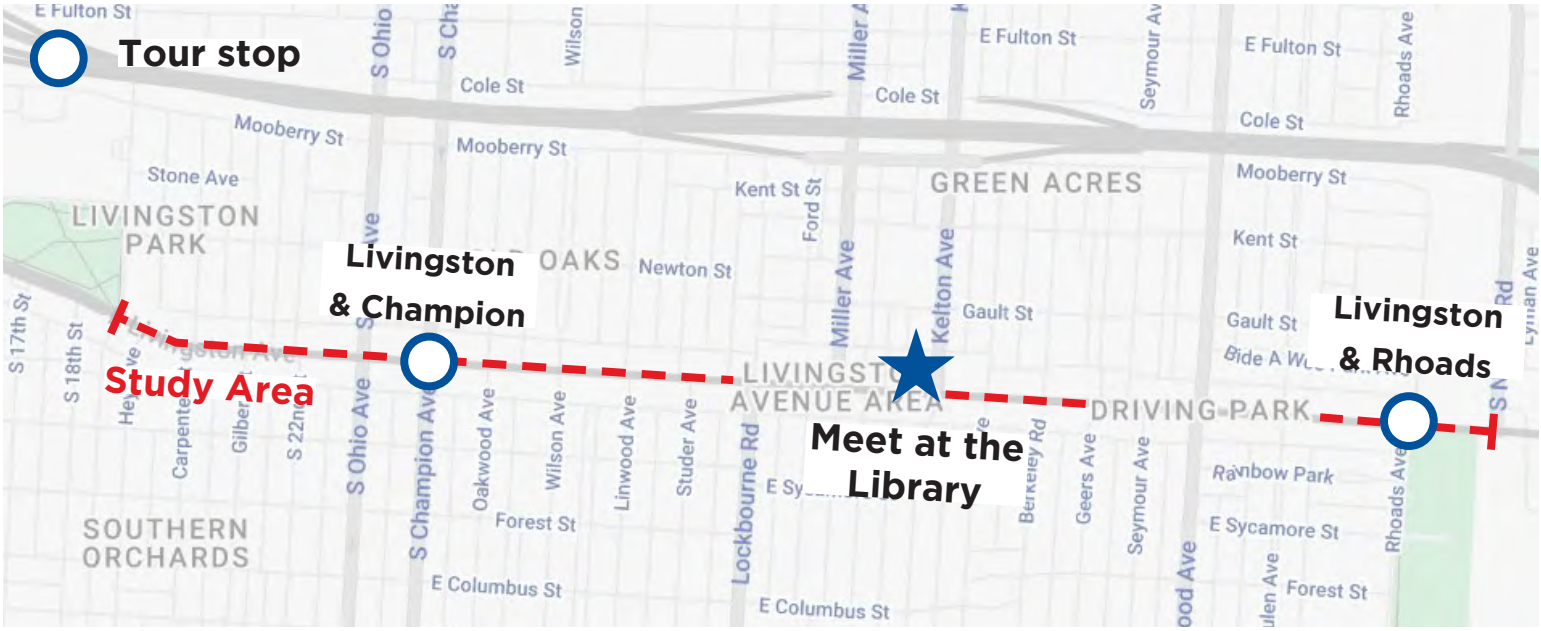
Livingston Avenue Improvements Study

Site Visit Worksheet



Stop Name: _____

What are some unique features at this location?

What are some issues at this location?

Are there any characteristics that are unique to the surrounding area or location?

Stop Name: _____

What are some unique features at this location?

What are some issues at this location?

Are there any characteristics that are unique to the surrounding area or location?

Extra Notes:

ATTACHMENT E

Dot Map

Too fast all the way down
Needs to be posted and designed at 25 mph
Loitering
Loitering
Bike lanes crossing intersections don't work well
Right turning cars are scary
High Crash
Library
High Crash
Loitering
High volume intersection w/ no light
Hard to see cars pulling out
Red light runners
Loitering
High volume intersection w/ no light
Panhandling
Needs crossings
DPCC
E. LIVINGSTON AVE.
CITY OF COLUMBUS

ATTACHMENT F

Take Home Worksheet

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Livingston Avenue Improvements Study

Take Home Worksheet Survey

1. What, and where, are the TOP 5 transportation (vehicles, public transportation, bicycle, pedestrian, etc.) problems in the corridor?

1._____

_____

2._____

_____

3._____

_____

4._____

_____

5._____

_____

2. What, and where, are the TOP 3 transportation improvements you would like to see?

1._____

_____

2._____

_____

3._____

_____

3. Are there any transportation improvements or strategies you have seen around the City of Columbus that you would like to see incorporated here?

_____

_____

_____

_____

_____

_____

NAME:

Thank you!

ATTACHMENT G

Pulse Survey

Livingston Avenue Improvement Study

Steering Committee Pulse Check

August 4, 2022

1. Rate the effectiveness of:	Very Poor	Poor	Good	Very Good
a) The information covered	☐	☐	☐	☐
b) Discussion opportunities	☐	☐	☐	☐
c) The format of today's meeting	☐	☐	☐	☐
d) Your comfort speaking up	☐	☐	☐	☐

2. Based on today's session:	Strongly Disagree	Disagree	Agree	Strongly Agree
a) I understand the purpose of the Livingston Avenue Study	☐	☐	☐	☐
b) I understand the role of the team	☐	☐	☐	☐
c) I believe this project will lead to meaningful results	☐	☐	☐	☐
d) I am committed to support this team's success	☐	☐	☐	☐
e) I believe that the City of Columbus demonstrates commitment to the work of this team	☐	☐	☐	☐

3. Rate the following:	Very Poor	Poor	Good	Very Good
a) Steering Committee's preparedness for today's meeting	☐	☐	☐	☐
b) Steering Committee's ability to work together at today's meeting	☐	☐	☐	☐

4. What went well today? _____

_____

5. What could have been improved? _____

_____

6. How do you feel about the progress of the team so far? _____

_____

7. What is one key learning experience you have had thus far? _____

_____

Name: _____ ***THANK YOU!***

Newsletter #1

THE CITY OF COLUMBUS

Livingston Avenue Improvements Study
18th St to Nelson Rd

Newsletter 1 - September 2, 2022

Highlights

- City of Columbus completing study to make improvements to Livingston Avenue from 18th St. to Nelson Rd.
- First Steering Committee meeting held August 4th
- Newsletter will be sent throughout study to provide updates to public
- Next newsletter anticipated October 7th

Questions or Comments?

Contact:

Eric Lambert
City of Columbus
Project Manager

614-645-2732

SELambert@columbus.gov

For more information:

www.columbus.gov/
LivingstonAvenuePedestrianSafetyStudy

This newsletter provides information and updates on the Livingston Avenue Improvements Study.

Project Background

Livingston Avenue is on the Vision Zero Columbus High Injury Network. The corridor has a higher density of fatal and serious injury crashes that threaten the safety of pedestrians, cyclists, transit users and drivers. The city is addressing safety concerns along the corridor, with the Livingston Avenue Improvements Study focused on the section from 18th Street to Nelson Road to promote safety for all roadway users and reduce vehicle speeds and severe crashes.

Current Status

The city's project team worked with the community to form a diverse and representative steering committee of residents, business owners and other community stakeholders who will be engaged throughout the study process. Steering committee members will play an active role in sharing information and soliciting feedback from the communities they represent as the study progresses.

Steering Committee Meeting #1
The project team introduced the study, and goals were discussed and defined with the steering committee. The committee's roles and responsibilities were defined, and the study schedule was outlined. A virtual street tour of the corridor was conducted and a mapping activity and discussion on priorities was held.

Current Status (continued)

Top 5 Concerns

1. Speeding
2. Crashes
3. Pedestrian Crossing (Safety)
4. Parking (Needs)
5. (Community) Character/Identity

Top 4 Goals

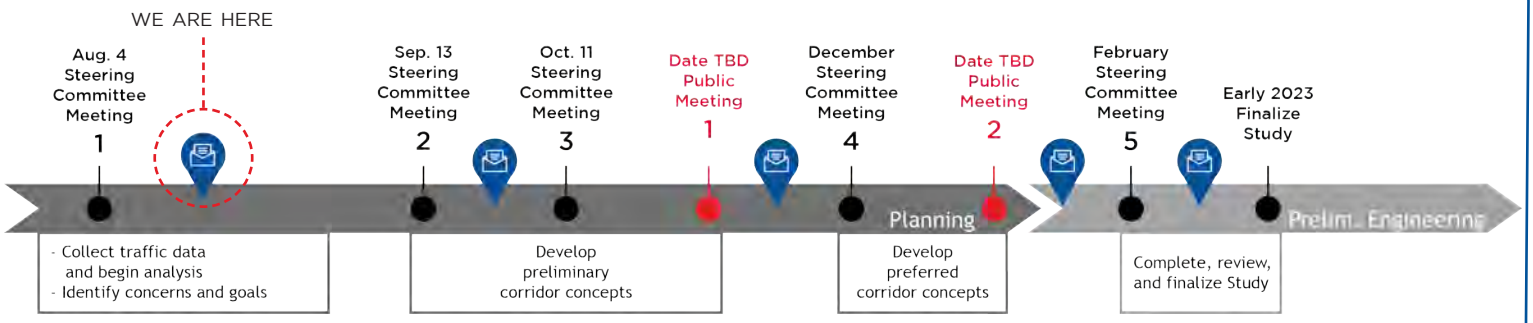
1. (Community) Identity
2. Improve Safety
3. Beautification
4. Equitable Local Connectivity

The committee was asked to identify their top concerns and goals. These concerns and goals may change as the study advances and more feedback is received.

Looking Ahead

To prepare for the second steering committee meeting in September, the project team asked committee members to begin gathering input from the community. Take-home surveys were provided to help solicit input regarding transportation issues along the corridor, possible transportation improvements to consider, and examples of improvements elsewhere in the city that may be successfully implemented on the Livingston corridor. Survey results will be discussed at the next meeting.

Next Steps



Steering Committee Members

Michael Aaron
Rickenbacker Woods Community Foundation

Pastor Jonathan Bradford
Bethany Baptist Church

Danielle Dillard
Livingston Avenue Area Commission

David Gray
Livingston Avenue Area Commission

Stacee Green
Driving Park Civic Association

Rita Hallaveld
Resident & Cyclist

Molly Hogue
Resident

George Holliman
Livingston Avenue Area Commission

Rachel Robinson
Southern Orchards Civic Association

Jerry Saunders
Africentric Personal Development Shop

Erin Synk
Columbus South Side Area Commission

Ralph Walker
Livingston Ave. Columbus OH Safety Group

Sherman Willis
Community Business Owner

Steering Committee Meeting #2
Meeting Minutes

Meeting Minutes

Meeting Name:	Livingston Avenue Steering Committee #2	
Date:	September 13, 2022	**Time: 5:30 PM**
Location:	Columbus Metropolitan Library, Driving Park Branch	**Host:** City of Columbus
Attendees:	Livingston Avenue Steering Committee members City of Columbus CHA Lawhon and Associates See *Attachment A* for a list of attendees	

Introduction:

- The meeting started around 5:35 PM. The agenda can be seen in *Attachment B*.
- A PowerPoint presentation was utilized to guide the meeting and is included as *Attachment C*.
- Duane Mabry introduced himself as the Columbus Police Department (CPD) Zone 5 Commander. He is a new hire and wanted to introduce himself to some community members. He represents the Livingston Avenue area and provided his contact information if he can be of any assistance to the committee members and larger community (614-645-4149).
- Eric Lambert noted that any site-specific zoning issues on the corridor can be referred to building and zoning or by contacting the project team.
- The meeting agenda was presented as well as a recap of the events and conclusions from the first stakeholder meeting.
- Eric reviewed the pulse check questionnaire responses from the previous meeting. Items for improvement include improving acoustics by speaking up, and continuing interaction between committee members. Demographic data came up at the last meeting and the project team is working on providing this information/resources to the steering committee.

Take Home Surveys:

- Abby asked the steering committee if they had any comments on take home surveys prior to reviewing the results/summary of the ones sent to her.
    - Committee members highlighted some concerns around parking and busses being able to navigate traffic.
    - Beautification was brought up, as there is a desire for the study area to reflect similarly to the short north corridor and the area near Children's Hospital.
    - One steering committee member remarked that there is no need for two lanes of traffic to exist each way on Livingston Avenue.
    - Another committee member noted that runners often use Livingston Avenue, and it would feel much safer if traffic was slower and there was greater separation between the sidewalk and roadway.
    - A dedicated bike lane (with more protection than simply pavement markings) is desired, with either a berm separating the bike lane or a landscaped/tree-lined median.
- Abby presented a summary of the take home surveys received from the project team.
    - Top issues from the take home surveys included the following:
        1. Speed
        2. Pedestrian crossings
        3. No bike lane
    - Improvements included:
        1. Bike lane
        2. Traffic calming
        3. Pedestrian crossings/safety improvements

Goal Setting Discussion:

- Abby reviewed the goals previously set at the first steering committee meeting and asked whether these should be changed or updated based on feedback heard from take home surveys.
- There was a question regarding the equitable local connectivity goal. It was explained that this goal is representing multiple transportation modes and making Livingston Avenue safe to walk, bike, ride the bus, and drive; as well as connecting to neighborhoods north and south of Livingston Avenue.
- There is a desire to connect to the Alum Creek trail with a dedicated bike facility.
- There was discussion around the community (identity) goal and how it relates to the traffic study.

- Some committee members wanted to combine identity with beautification, while others highlighted how identity will be incorporated into the final design (such as how sidewalks will look, streetlight options, and bus stop design).
- Identity will also impact other goals and can be framed as themes that are carried into the design phase.
- The team and committee members discussed reworking the goals (no numbers/ranking) into primary and secondary needs or something similar.

Technical Data:

- John Gallagher went over the technical data results, including the crash analysis and speed counts.
- Six key locations had a higher number of crashes and were reviewed in greater depth. John noted that he can provide more detail on crash type and other factors if anyone is interested.
- The corridor overall has high speeds, though higher speeds were seen on the east end of the corridor near the interchange versus the west side near Children's Hospital.
- A parking study was also completed for the Livingston Avenue corridor and side streets. The parking was light overall and occurring more frequently on side streets.
- Traffic signals are also being studied for whether any changes are needed to timing, etc.

Toolbox:

- John reviewed several options as part of a "Toolbox" to improve pedestrian and traffic safety, and highlighted the pros and cons of each item:
  - Road diet
  - Curb extensions (bump-out/bulb-out)
  - Raised crosswalks/raised intersections
  - Median
  - Bicycle lanes
  - Shared use path/multi-use path
  - Leading pedestrian interval
  - Other traffic control at crossings, such as Rectangular Rapid Flashing Beacon (RRFB) and Pedestrian Hybrid Beacon (PHB)

Plan View Exercise:

- The steering committee members were separated into two groups to participate in an activity that involved envisioning different scenarios on the corridor using an aerial map and several cut-outs representing pieces of the roadway (including travel lanes, turn lanes, medians, bike lanes, parking lanes, sidewalks, grass buffers, and shared use paths).
- Two aerials were given for different scenarios/layouts: a midblock segment and an intersection approach segment
- There was discussion on providing different amenities in separate parts of the corridor to meet that specific area's need, such as parking in the business pockets and providing wider medians in other areas.
- Both groups identified protected bike lanes with medians in the mid-block section of the corridor.
- Group 1 identified the left turn lane as a must-have and liked the idea of a shared use path or sidewalk for the intersection segment.
- Group 1 identified a protected bike lane, median, and grass strip as a must-have for the midblock segment. Group 2 also felt that parking could be incorporated in some pockets of the corridor by utilizing a bump/bulb out.
- Group 2 also identified a left turn lane and protected bike lanes as must haves for the intersection segment.
- Group 2 identified thru lanes with a median, protected two-way bike lanes or standard protected bike lanes. Sidewalks with grass strips, medians, and protected bike lanes were a must for Group 2. They did not feel like parking was a must and suggested that existing lots be used instead; they also would like to see bus bulbs as an option.
- A worksheet was provided to help document and guide the discussion for the two groups (*Attachment D*).
- Photos of some of the groups different preferred layouts can be seen in *Attachment E.*

Next Steps:

- The next meeting will take place on October 11th at the same time and location. The project team will present preliminary conceptual layouts at the next meeting.
- Eric reminded the steering committee members to submit letters of support for the grant application, to secure additional funds for future improvements on Livingston Avenue.
- A pulse-check questionnaire was provided for committee members to complete before leaving the meeting (*Attachment F*).
- The meeting was adjourned at around 7:10pm.

ATTACHMENT A

Attendee List

Livingston Avenue Improvements Study – Steering Committee #2 September 13, 2022

Attendees

Steering Committee:

- Michael Aaron
- Danielle Dillard
- David Gray
- Stacee Green
- George Holliman
- Rachel Robinson
- Molly Hogue

City of Columbus:

- Tricia Fought
- Justin Goodwin
- Emma Kogge
- Eric Lambert
- Matt Lorenz
- Duane Mabry - Commander Zone 5 (CPD)
- Jesus Ovalle
- Alex Sauersmith
- Kelly Scocco
- Greg Sprungle
- Nancy Sully-Prior

CHA:

- John Gallagher
- Cory Lamb

Lawhon:

- Abby Anacki
- Chantil Milam

ATTACHMENT B

Meeting Agenda

Livingston Avenue Improvements Study – 18th St to Nelson Road
Steering Committee Meeting 2 Agenda

Date: Tuesday, September 13th, 2022
Time: 5:30 – 7:00
Location: Columbus Metropolitan Library, Driving Park Branch, Meeting Rooms 2 and 3

5:30 – 5:35 Greeting & Meeting 1 Recap

- Pulse Check Questionnaire Results

5:35 – 5:50 Take Home Survey Recap

- Themes, Summary Points
- Previously Identified Goals

5:50 – 6:15 Technical Data and Design Toolbox

- Review of Technical Data Collection
- Introduction to Design Toolbox

6:15 – 6:40 Plan View Exercise – Groups

- ~ 15 Minutes to Create/Discuss/Analyze
- ~ 10 Minutes for Groups to Report

6:40 – 6:50 Exercise Debrief

- Compare & Contrast

6:50 – 7:00 Next Steps

- Outline Upcoming Events
- Pulse Check Questionnaire

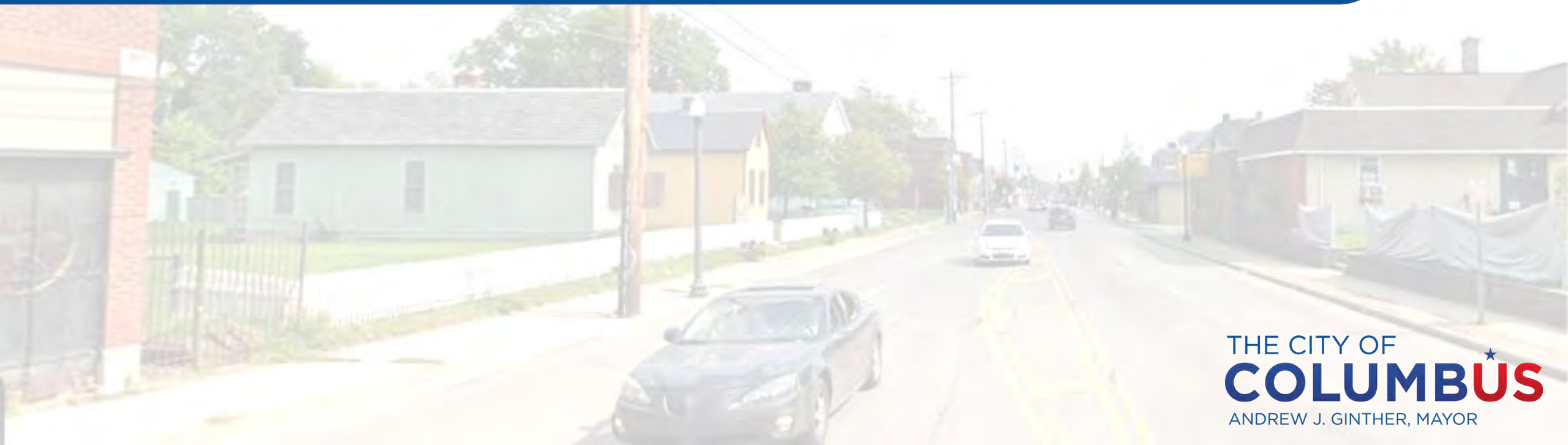
ATTACHMENT C

PowerPoint Presentation

Livingston Avenue Improvements Study – 18th St to Nelson Rd

Steering Committee Meeting #2

September 13, 2022



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ANDREW J. GINTHER, MAYOR

Agenda (1 hour 30 minutes)

1. **Greeting & Meeting 1 Recap (5 min)**
    a. Pulse Check Questionnaire Results
2. **Take Home Survey Recap (15 min)**
3. **Technical Data & Design Toolbox (25 min)**
4. **Plan View Exercise (25 min)**
5. **Exercise Debrief (10 min)**
6. **Next Steps (10 min)**

Meeting 1 Recap

Eric Lambert, City of Columbus

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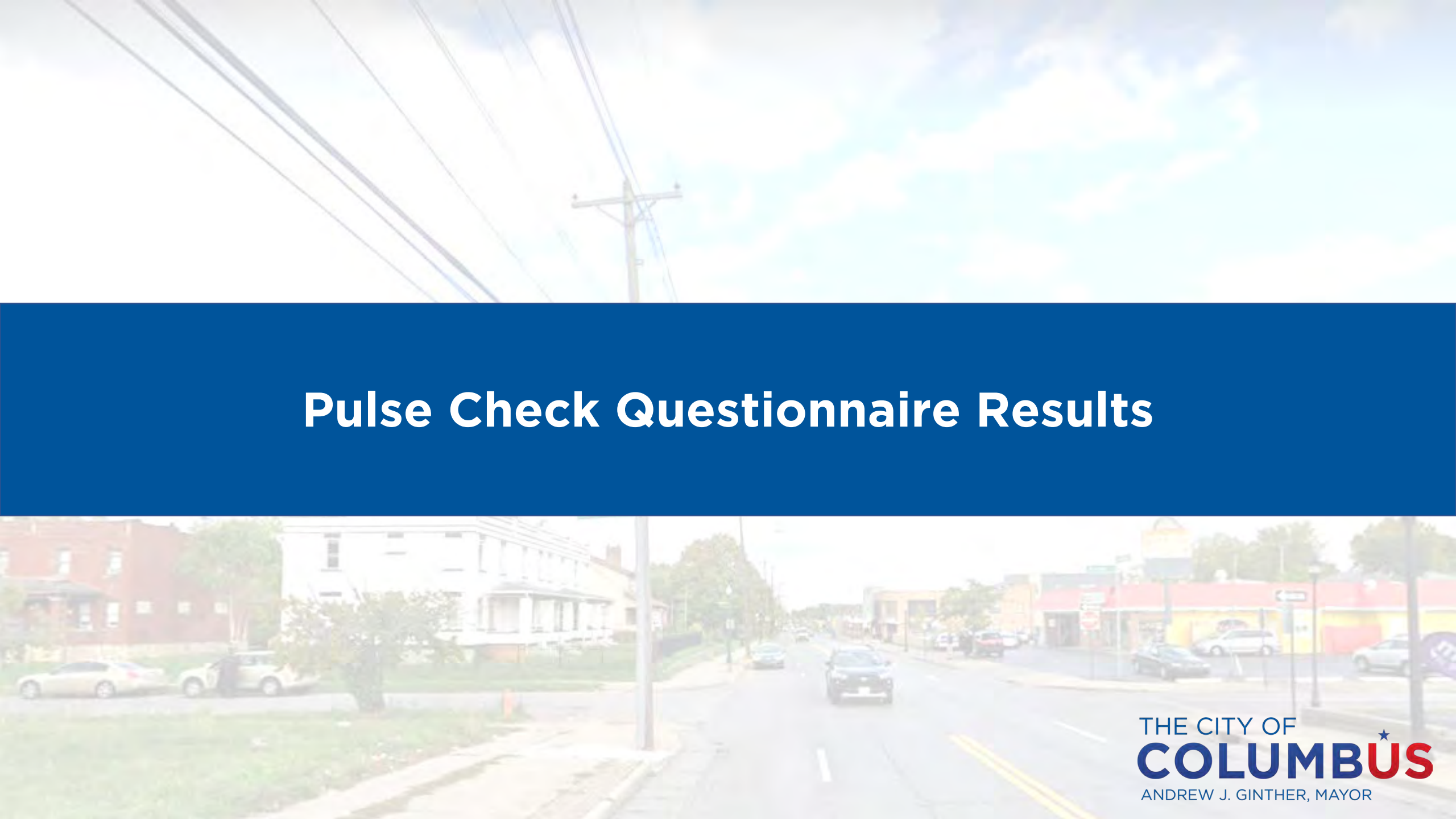
Meeting 1 Recap

- Team Forming
  - Identify the purpose of the Team
  - Identify Role & Responsibilities of Team Members
  - Review the Study Process and Schedule
- Google Maps virtual site visit
- Round table exercise to identify project goals and needs

Pulse Check Questionnaire Results



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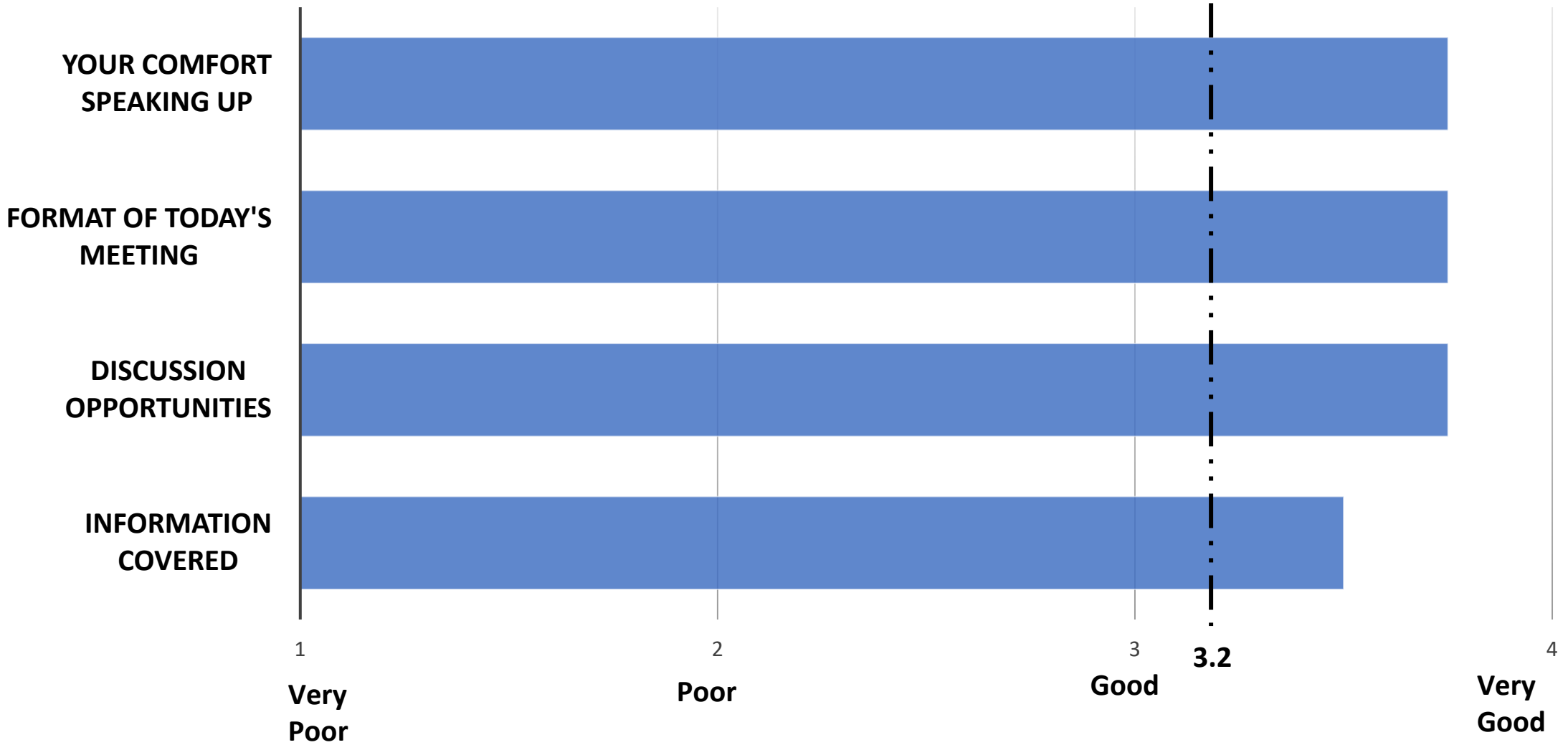
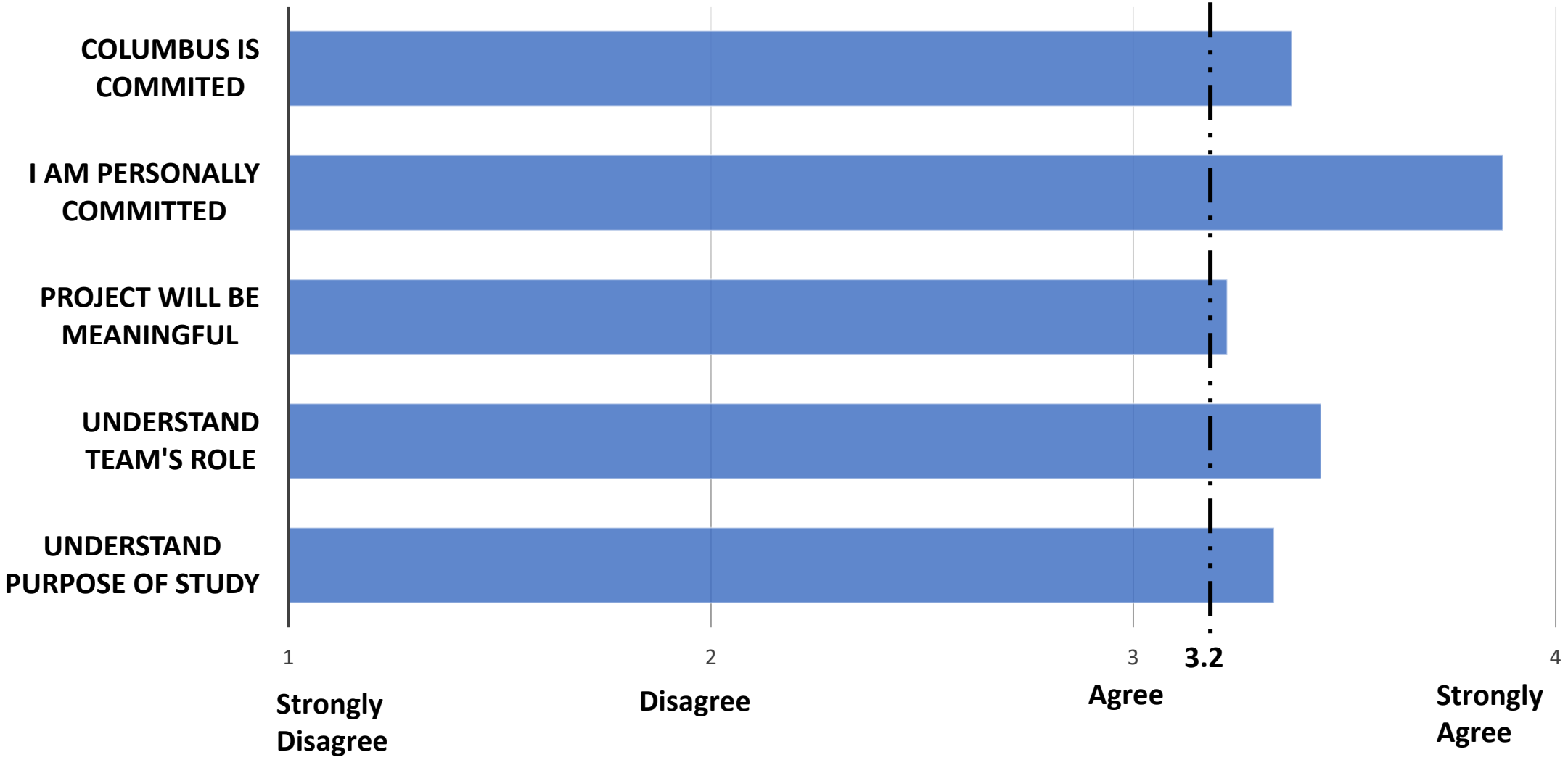
Effectiveness of Meeting



Understanding & Commitment



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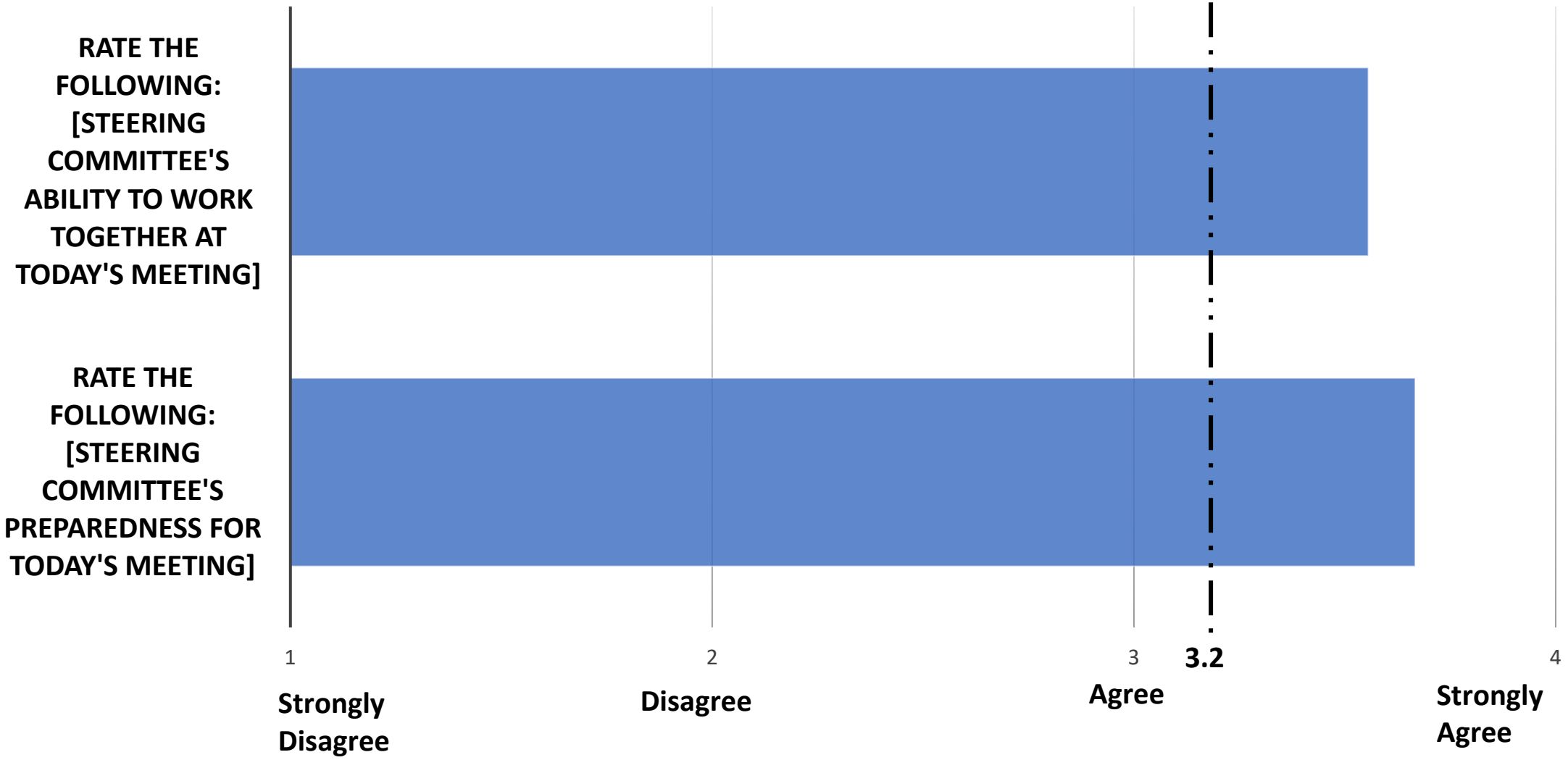
Steering Committee Self-Evaluation



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What went well today?...

- Overview
- Organized, clear direction
- Information provided
- Exchange of information
- The participation of all members
- Describing the goal of committee, relying on members to identify needs / problems
- Very well organized. Respect for all and comments were welcome and well received
- Showing photos of street on Google Maps
- Great introduction to project

What could have improved?...

- Some people talk too long or too much... some can’t get a word in
- Acoustics
- Good start
- More interaction between members, but this will occur over time.
- Please use the term "crash" instead of accident

How do you feel about the progress of the Team so far?...

- Too early to tell
- N/A Good
- Good
- Good
- Good
- We got off to a fast start. Very Productive.
- It was a good kickoff meeting. More to come.
- Progress is consistent with timing of project.

What is one key learning experience you have had thus far?...

- N/A
- Open minded and compassionate team
- Great group of friendly helpful people
- I would like more data at a future meeting on demographics along corridor: race, income, car ownership, etc. As well as info on crashed & level of comfort rating done by MORPC.

Take Home Survey Recap

Abby Anacki, Lawhon & Associates

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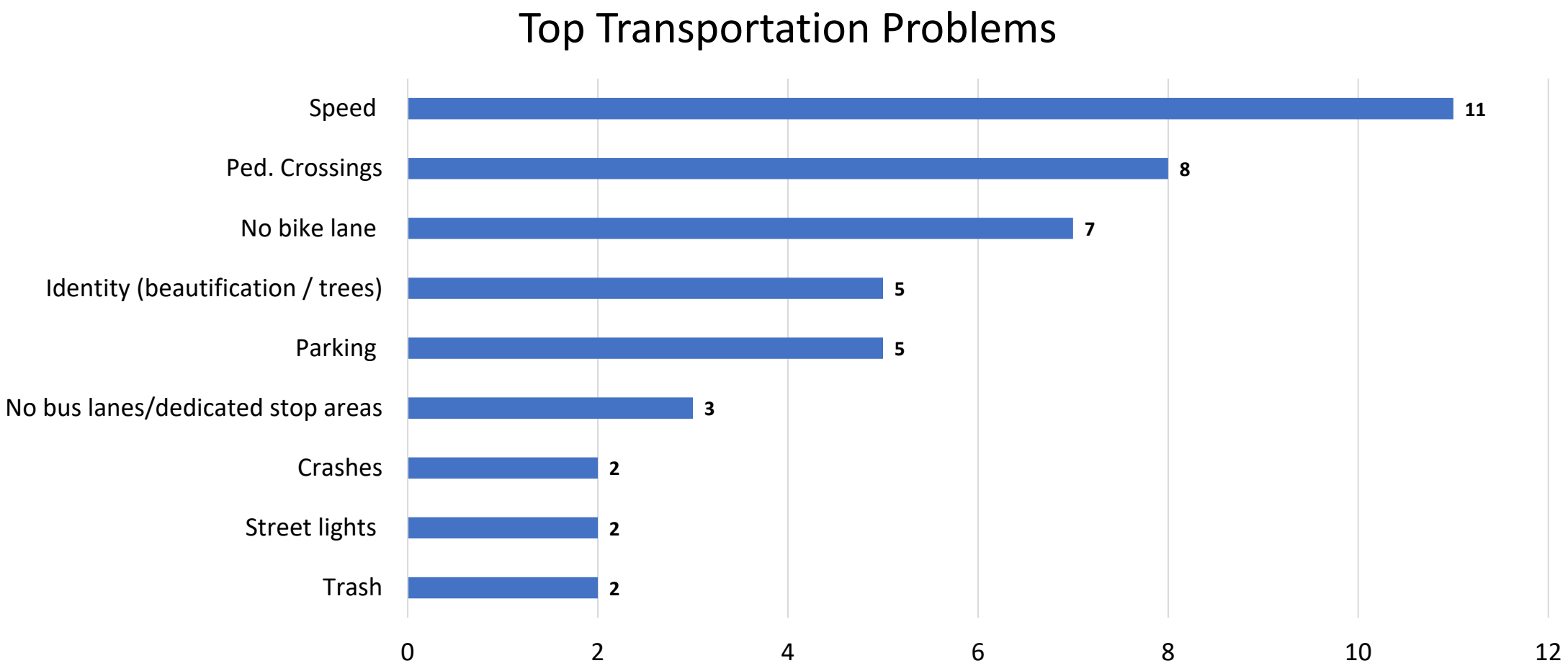
Take Home Surveys

- 1-2 minutes per committee member
- Themes, Summary Points

Take Home Surveys



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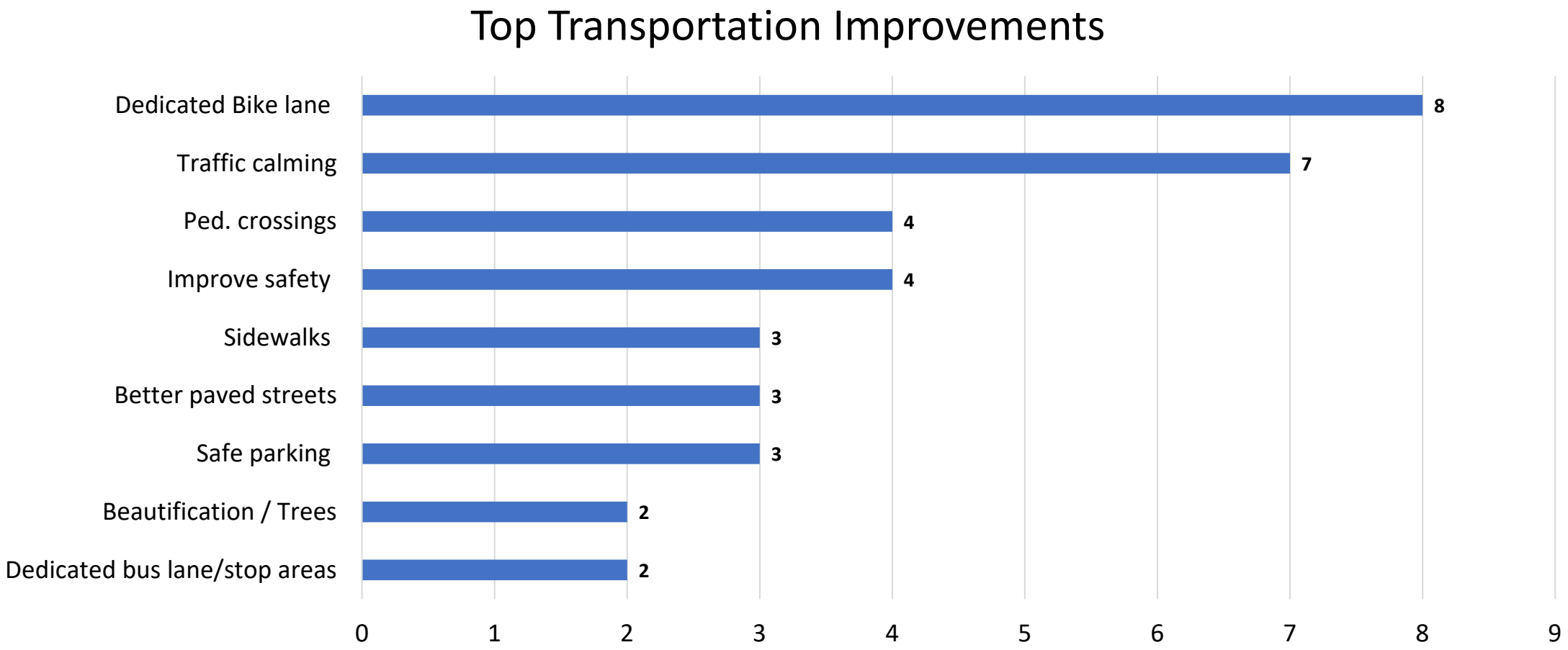
Take Home Surveys



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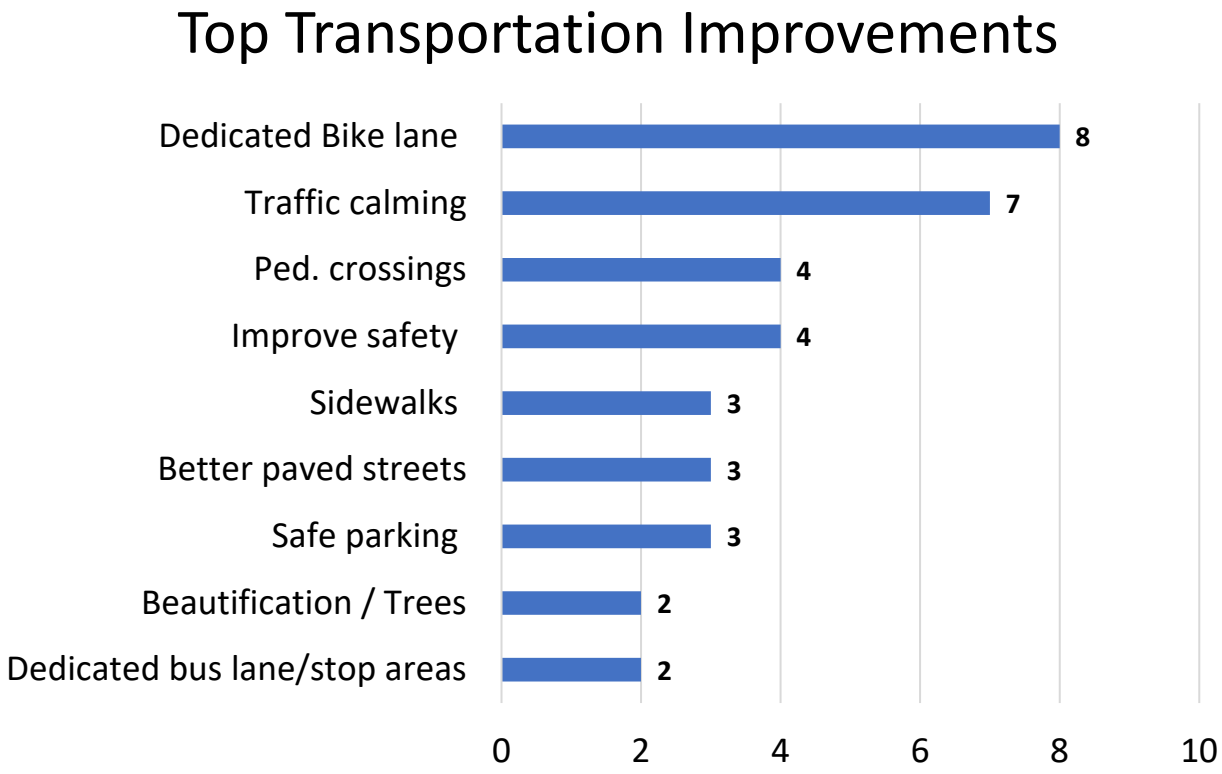
Previously Identified Goals

1. (Community) Identity
2. Improve Safety
3. Beautification
4. Equitable Local Connectivity



Technical Data

John Gallagher, CHA

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Technical Data

- Crashes are an issue in the corridor
  - All were looked into
  - 6 key locations selected for more in-depth study

Crash Heat Map

1. Livingston Ave at Champion Ave
2. Livingston Ave at Miller Ave
3. Livingston Ave at Kelton St
4. Livingston Ave at Fairwood Ave
5. Livingston Ave at Rhoads Ave
6. Livingston Ave at S Nelson Ave

Technical Data

- Speeds higher east end vs. west end
- On east end, nearly half are above speed limit

Technical Data

- Some congestion exists in peak hours, not extreme
- Initial analysis shows a road diet still gives acceptable congestion levels

Technical Data

- Parking on Livingston is light
- Side streets have parking capacity

Technical Data

- Traffic signals are being studied to determine if changes are needed

Toolbox

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Design Toolbox

A lot of tools are available to improve:

- A corridor and its traffic flow
- Pedestrian safety
- Bicyclist safety

Road Diet

Road Diet

Pros

- Reduces speeds
- Can divert traffic to other routes
- Reduces the number of conflict points for all vehicle types
- Fewer lanes for pedestrians to cross
- A “street” and not a “roadway”
- Travel lanes farther from sidewalk

Road Diet

Creates additional room for:

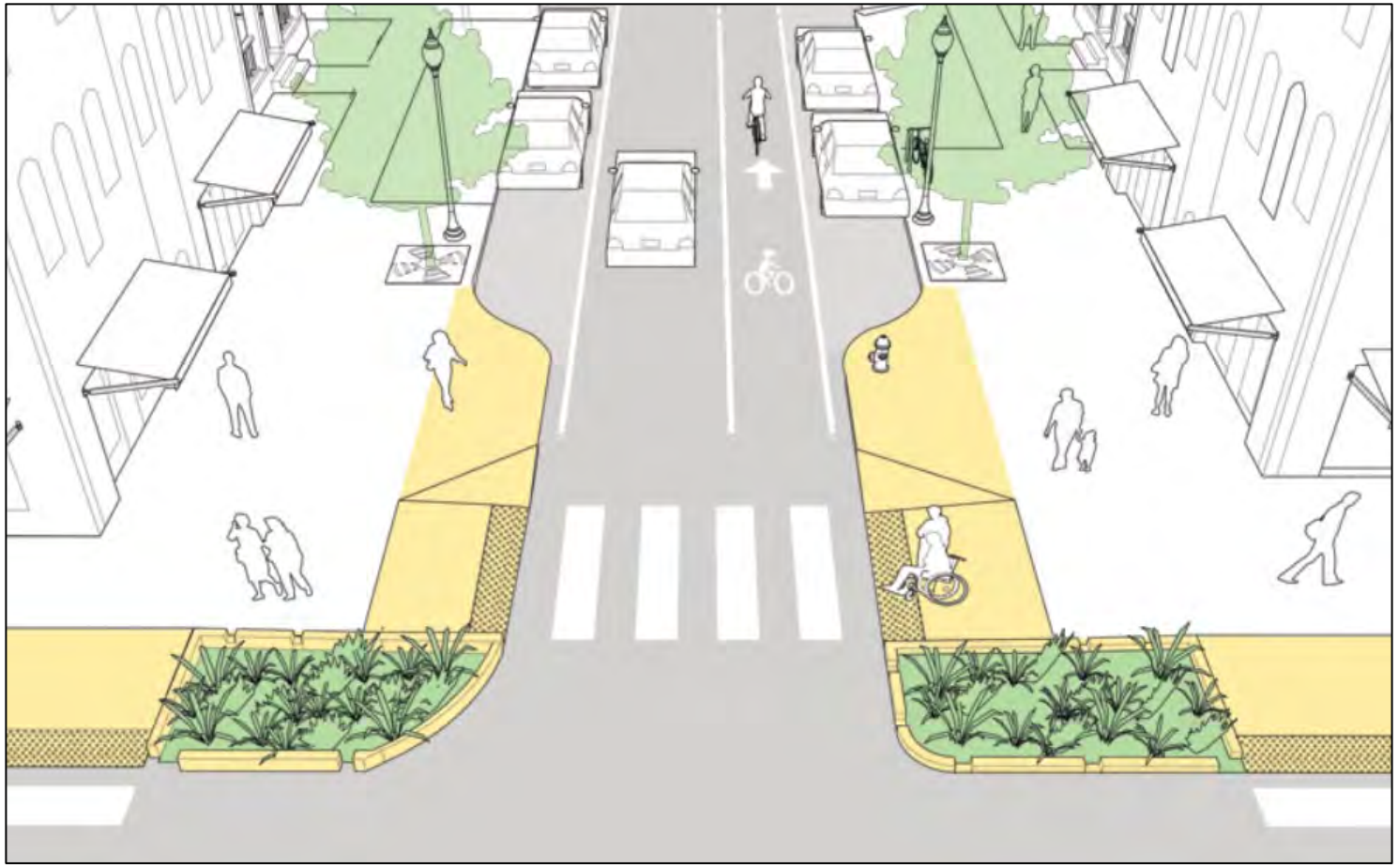
- Bike lanes
- Multi-use path
- Wider sidewalks
- Landscaped areas
- Physical medians
- 24/7 parking stalls
- Bus stops out of the travel lane

Road Diet

Cons

- Reduced speeds
- Can divert traffic to other routes
- Increased delay and travel times
- Possible increased emergency response times
- Harder for side-street traffic due to less gaps
- Can lead to an initial increase in traffic

Curb Extension (Bump Out/Bulb Out)



Curb Extension

Pros

- Reduces crossing distance (increased safety)
- Improves driver sightline to pedestrians
- Increases opportunities for streetscaping
- Reduce turning speeds
- Reduce illegal parking at intersections

Curb Extension

Cons

- Inhibits right turn on red
- Drainage can be tricky and expensive
- Can reduce parking areas (midblock crossings)
- Only done in conjunction with on-street parking

Raised Crosswalk/Intersection

Raised Crosswalk/Intersection

Pros

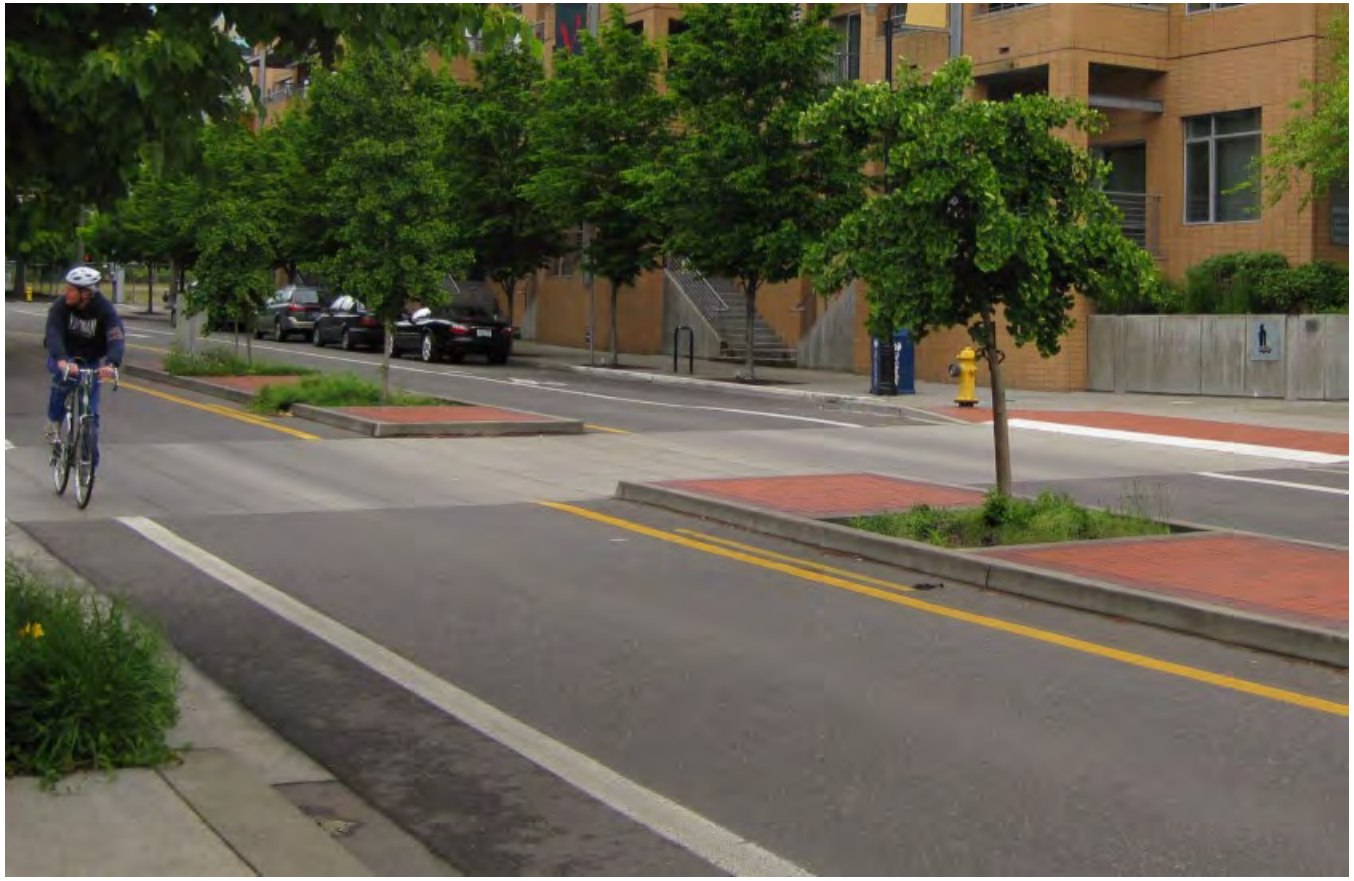
- Reduces speeds
- Draws driver attention to intersection and pedestrians

Raised Crosswalk/Intersection

Cons

- Reduces speeds
- Can be an issue for snowplows
- Maintenance can be an issue
- Emergency response issues
- Noise at the transitions
- Drainage can be tricky
- Suitable for low-speed roadways

Median



Median

Pros

- Separates directions of travel
- Can be a pedestrian refuge (increase safety)
- Can be used to deter j-walking (increase safety)
- Can be landscaped if width is appropriate
- Can be used to limit vehicle movements at intersections and other access points

Median

Cons

- May require maintenance agreement
- Requires roadway width that can be used for parking and other roadway items
- Can encourage j-walking if not properly designed
- Can limit property access

Bicycle Lanes

Bicycle Lanes

Pros

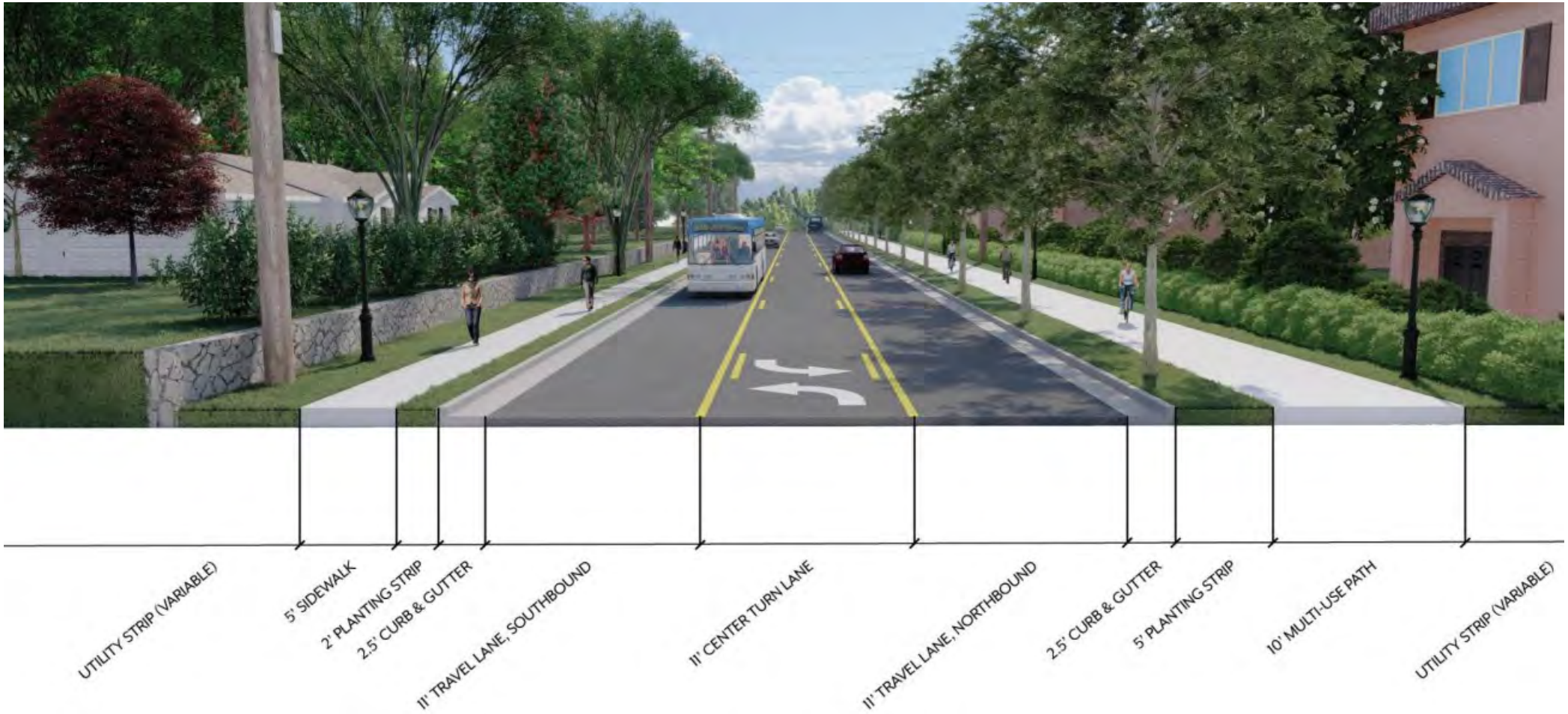
- Separates bicycles from cars/trucks
- Clearly depicts where bicycles and vehicles should travel
- Can encourage more bicycling (which produces many more benefits)

Bicycle Lanes

Cons

- White line may not be sufficient to make all types of bicyclists feel comfortable
- When next to parking lane, “dooring” can be an issue
- Sometimes pedestrians/joggers will use them

Shared Use Path/Multiuse Path



Shared Use Path/Multiuse Path

Pros

- Provides separation of distance and grade from the roadway for bicyclists
- Serves all non-vehicular modes of travel

Shared Use Path/Multiuse Path

Cons

- Mixes slower pedestrians and faster bicyclists
- Drivers may not expect bicyclists crossing side streets in the crosswalk

Leading Pedestrian Interval

Leading Pedestrian Interval

Pros

- Allows pedestrians to establish themselves in the crosswalk prior to vehicles being given the green
- Improves pedestrian safety

Leading Pedestrian Interval

Cons

- Increases delay
- Adds unnecessary delay to vehicles when no pedestrians are crossing

Various Traffic Control at Crossings

Various Traffic Control at Crossings

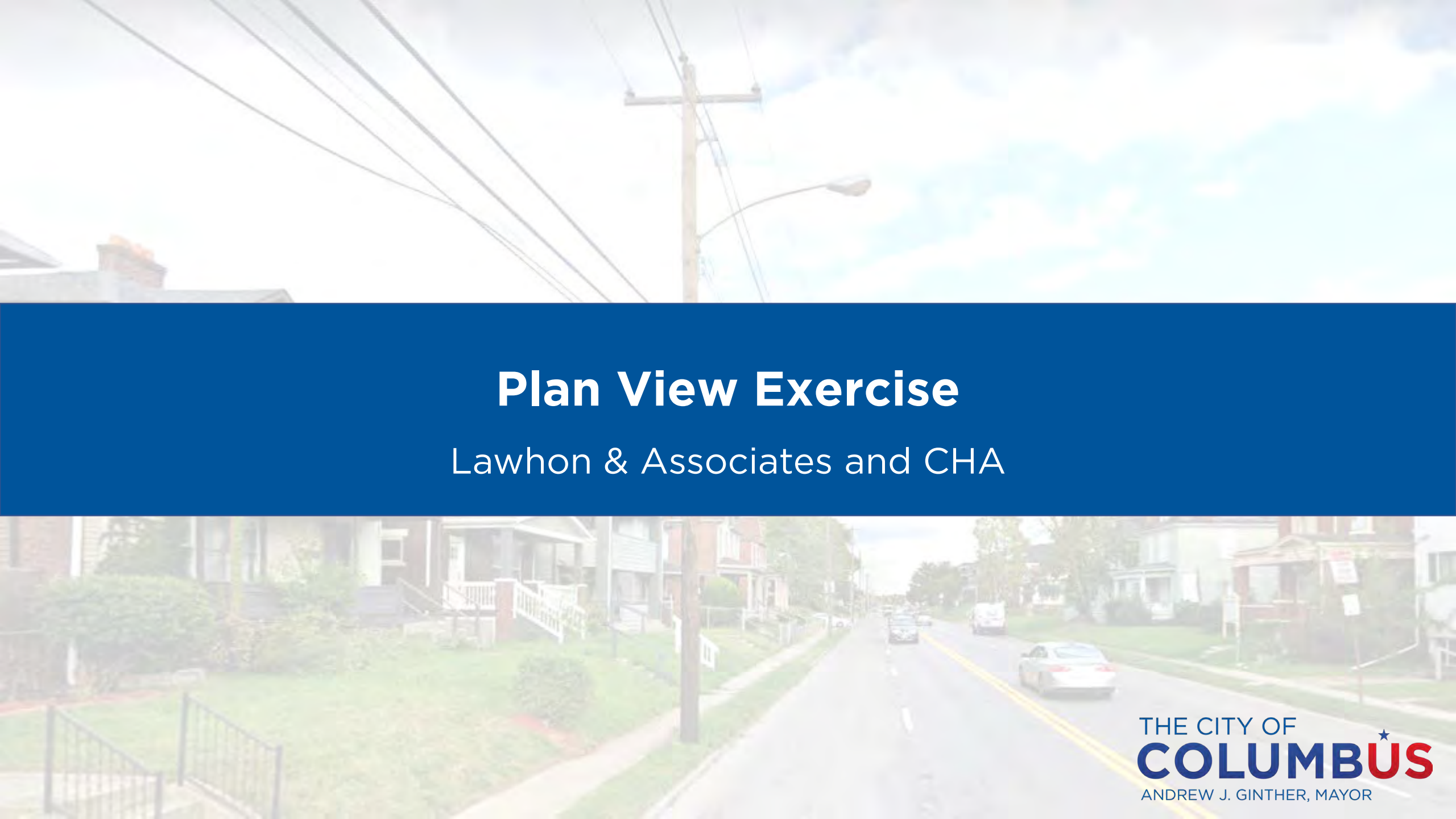
Pros

- Advanced warning to vehicles that someone is crossing
- Some types stop vehicles like a traditional traffic signal

Various Traffic Control at Crossings

Cons

- Pedestrians do not always activate it if vehicular volumes are low or gaps in traffic are present
- Due to requirements, faster pedestrians complete their cross and the crossing control remains active causing unneeded vehicle delay
- Item above can lead to driver non-compliance



Plan View Exercise

Lawhon & Associates and CHA

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Plan View Exercise

- Split into groups
- ~15 min to create/discuss/analyze
- ~10 min for groups to report to one another
- ~10 minute debrief/discussion

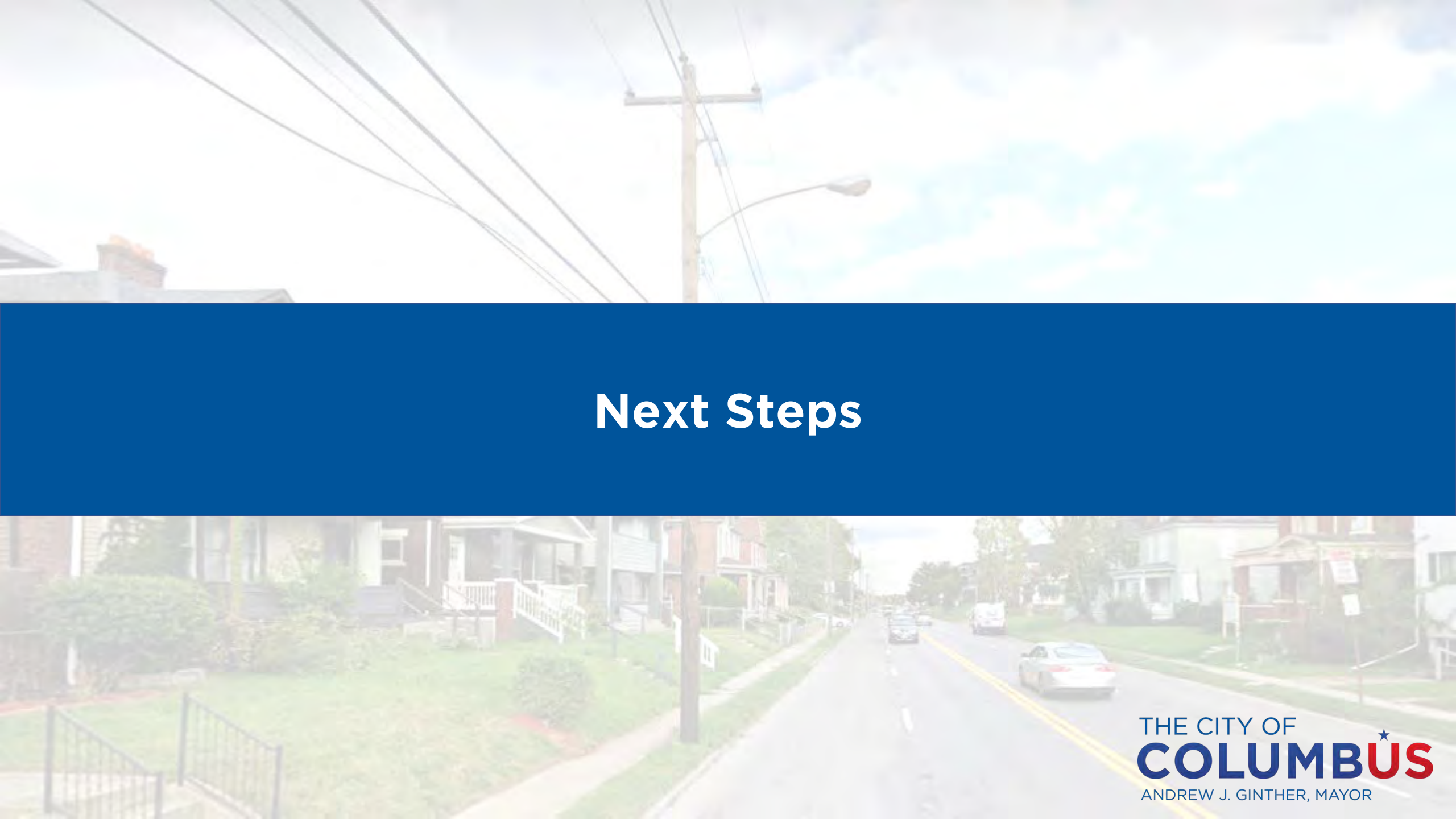
Plan View Exercise Instructions

- Lay out different components to create ideal street segment and intersection approach
  - Can go outside of right-of-way
- Designate spokesperson for group to report out and take notes

Report Out

Explain what components your group ended up placing

- What were some “must haves” for your group?
- Pieces you wanted to make work but couldn’t?

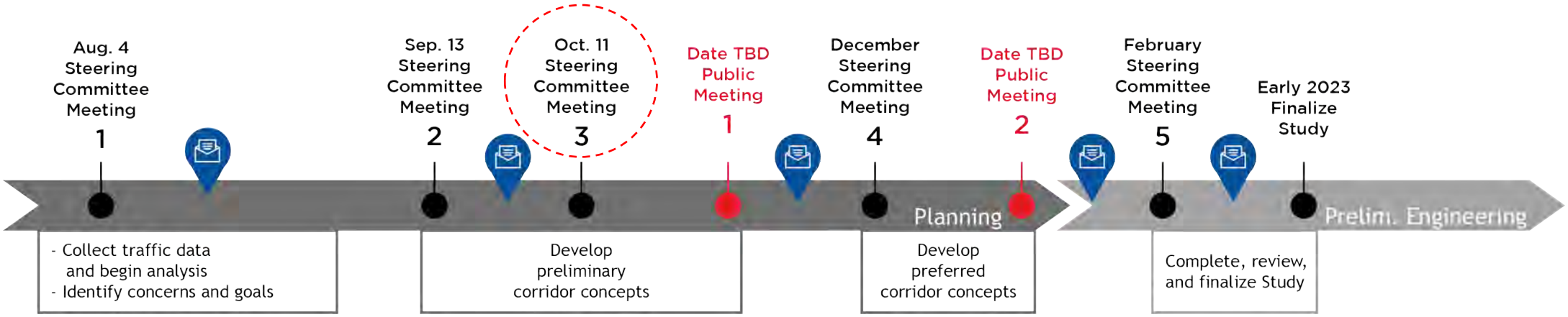


Next Steps

THE CITY OF
COLUMBUS
ANDREW J. GINTHER, MAYOR

Next Steering Committee Meeting

- October 11, 2022
- Same location (Library – Driving Park Branch)
- Agenda will be sent prior to meeting
  - Present preliminary conceptual layouts based on input and refining of project goals



THE CITY OF COLUMBUS
ANDREW J. GINTHER, MAYOR

Pulse Check Questionnaire

Let us know how we're doing!

- Please complete survey (paper copy or online) before you leave

Thank you!

ATTACHMENT D

Plan View Exercise Worksheet

GROUP 1

Group Notes for Midblock Segment:

Combinations that worked well

(ex. sidewalk + grass strip + lane + median + lane + multi-use path)

1. SIDEWALK + BIKE LANE + MEDIAN + LANE + MEDIAN + LANE + MEDIAN + BIKE LANE + GRASS STRIP + SIDEWALK
2.
3. SIDEWALK + BIKE LANE + BIKE LANE + LANE + MEDIAN + LANE + PARKING + SIDEWALK
4. SUP + GRASS STRIP + PARKING + MEDIAN + LANE + GRASS STRIP
5.

What were some "must haves" for your group?

Were there pieces you wanted to make work but couldn't?

GROUP 1

Group Notes for Intersection:

Combinations that worked well

(ex. sidewalk + grass strip + lane + left turn lane + lane + multi-use path)

1. SIDEWALK + GRASS STRIP + BIKE LANE + LANE + LEFT TURN LANE + LANE + BIKE LANE + GRASS STRIP + SIDEWALK
2. _____
3. SIDEWALK + GRASS STRIP + BIKE + BIKE + LANE + LEFT TURN + LANE + SIDEWALK
4. _____
5. _____

What were some "must haves" for your group?

Were there pieces you wanted to make work but couldn't?

GROUP 2

Group Notes for Midblock Segment:

Combinations that worked well

(ex. sidewalk + grass strip + lane + median + lane + multi-use path)

1. 1 lane each way + 2 way protected bike lane + median 3 + each side sidewalk + grass strip each side
2. Same as #1 but with protected bike lane each side
3. ~~protected bike lane each way + 1 lane each way + grass/sidewalk each way~~ + ~~median 3 taper into turn lane~~
4.
5.

What were some "must haves" for your group?

protected bike lanes
grass strips
sidewalks
large medians

Were there pieces you wanted to make work but couldn't?

GROUP 2

Group Notes for Intersection:

Combinations that worked well

(ex. sidewalk + grass strip + lane + left turn lane + lane + multi-use path)

1. protected bike lane each way + 1 through lane each way + grass/sidewalk + median & tapered into left turn lane each way
2. _____
3. _____
4. _____
5. _____

What were some "must haves" for your group?

Were there pieces you wanted to make work but couldn't?

ATTACHMENT E

Plan View Exercise Photos

Livingston Ave. Mid Block - *West of Ohio Ave.*

Group Notes for Midblock Segment:

1. Combinations that worked well
   a. sidewalk + grass strip + lane + median + lane + multi-use path)
   b. Sidewalk + Bike Lane + median + lane + bike lane + sidewalk

Group 1

Group 1
SIDEWALK
Median 3

SCHOOL HELP CENTERS
E. LIVINGSTON AVE
CITY OF COLUMBUS
SIDEWALK
GRASS STRIP
Median 1
Median 2
Median 3
Group 1

Median 2

Protected Bike Lane

GRASS STRIP

SIDEWALK

SIDEWALK

E. LIVINGSTON AVE.
CITY OF COLUMBUS

SCALE IN FEET

Abby Anacki
Lawton and Associates

Report Out

Explain what components your group ended up placing
- What were some "must haves" for your group?
- Pieces you wanted to make work but couldn't?

Group Notes for Midblock Segment

Livingston Ave. Mid Block - West of Ohio Ave.

SHARED USE PATH
GRASS STRIP
Parking Lane
Median 2
GRASS STRIP
SHARED USE PATH
Median 2

SHARED USE PATH

Median 2

E. LIVINGSTON AVE.
CITY OF COLUMBUS

SHARED USE PATH

SIDEWALK

Eric Lambert
City of Columbus

Gary Lewis
CHA

Median 1

Median 2

Group Notes for Midblock Segment:

Combinations that worked well

(ex. sideways = grass strip + lane + median + lane + 2-way protected bike lane each side)

1. Bike each side protected bike lane each side
2. Same as #1 each side protected bike lane each side, median 3 = grass strip + shared LT
3. Sideways = grass strip + lane + median + lane + grass strip

What were some things that were hard for your group?

1
2
3
4
5

We're given pieces you wanted to make work but couldn't?

E. LIVINGSTON AVE.
CITY OF COLUMBUS

DESIGN AGENCY

E. LIVINGSTON AVE.
CITY OF COLUMBUS

E. LIVINGSTON AVE
CITY OF COLUMBUS

ATTACHMENT F

Pulse Survey

Livingston Avenue Improvement Study

Steering Committee Pulse Check

September 13, 2022

1. Rate the effectiveness of:	Very Poor	Poor	Good	Very Good
a) The information covered	☐	☐	☐	☐
b) Discussion opportunities	☐	☐	☐	☐
c) The format of today's meeting	☐	☐	☐	☐
d) Your comfort speaking up	☐	☐	☐	☐

2. Based on today's session:	Strongly Disagree	Disagree	Agree	Strongly Agree
a) I understand the purpose of the Livingston Avenue Study	☐	☐	☐	☐
b) I understand the role of the team	☐	☐	☐	☐
c) I believe this project will lead to meaningful results	☐	☐	☐	☐
d) I am committed to support this team's success	☐	☐	☐	☐
e) I believe that the City of Columbus demonstrates commitment to the work of this team	☐	☐	☐	☐

3. Rate the following:	Very Poor	Poor	Good	Very Good
a) Steering Committee's preparedness for today's meeting	☐	☐	☐	☐
b) Steering Committee's ability to work together at today's meeting	☐	☐	☐	☐

4. What went well today? _____

_____

5. What could have been improved? _____

_____

6. How do you feel about the progress of the team so far? _____

_____

7. What is one key learning experience you have had thus far? _____

_____

Name: _____ ***THANK YOU!***

Newsletter #2

THE CITY OF COLUMBUS

Livingston Avenue Improvements Study
18th St to Nelson Rd

Newsletter 2 - October 7, 2022

Highlights

- City of Columbus completing study to make improvements to Livingston Avenue from 18th St. to Nelson Rd.
- Second Steering Committee meeting held September 13th
- Next newsletter update anticipated November 4th
- Public meeting planned for November 17, 2022
- Public meeting details will be posted on the project webpage below

Questions or Comments?

Contact:

Eric Lambert
City of Columbus, Project Manager
614-645-2732
SELambert@columbus.gov

For more information:

www.columbus.gov/LivingstonAvenuePedestrianSafetyStudy

This newsletter provides information and updates on the Livingston Avenue Improvements Study.

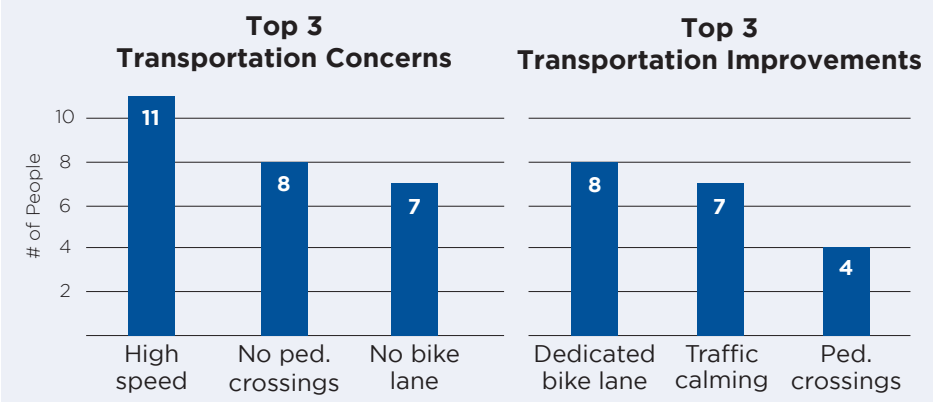
Project Background

Livingston Avenue is on the Vision Zero Columbus High Injury Network. The corridor has a higher density of fatal and serious injury crashes that threaten the safety of pedestrians, cyclists, transit users and drivers. The city is addressing this issue along the corridor, with the Livingston Avenue Improvements Study focused on the section from 18th Street to Nelson Road to promote safety for all roadway users and reduce vehicle speeds and severe crashes.

Current Status

Steering Committee Meeting #1 Take-Home Survey

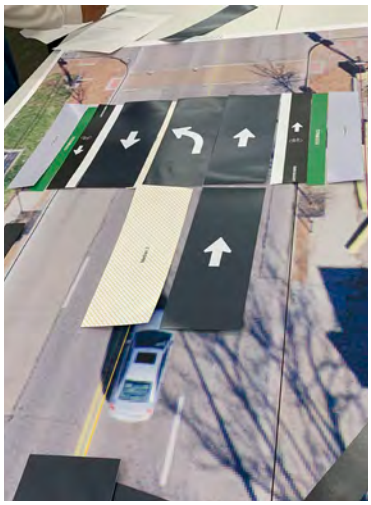
At the conclusion of the first meeting, steering committee members were tasked with asking members of their community a series of survey questions identifying issues and improvements for Livingston Avenue (results below). The results lead to a larger discussion about prioritizing goals for the study discussed at the first meeting.



Current Status (continued)

Steering Committee Meeting #2

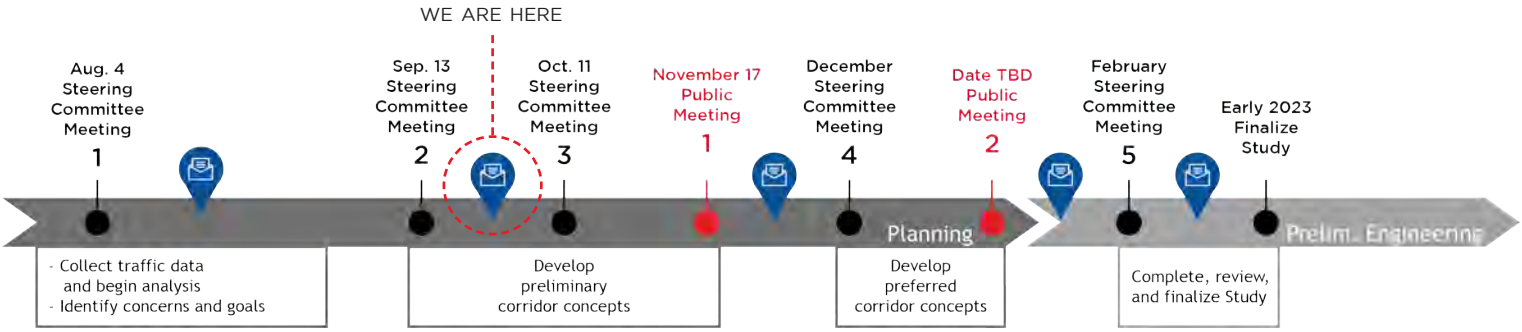
During the second meeting, a "design toolbox" was presented that explained a variety of roadway strategies to help improve transportation safety issues on Livingston Avenue. After the presentation, committee members were split into groups and tasked with making different "ideal" layouts for two types of sections of Livingston Avenue: an intersection approach and a mid-block segment. Examples of some of the ideal layouts created are shown to the right. Based on committee feedback and technical data collected so far, the team plans to present preliminary conceptual layouts for the corridor at the next steering committee meeting.



Intersection approach concept.

Mid-block section concept.

Next Steps



Steering Committee Members

Michael Aaron
Rickenbacker Woods Community Foundation

Pastor Jonathan Bradford
Bethany Baptist Church

Danielle Dillard
Livingston Avenue Area Commission

David Gray
Livingston Avenue Area Commission

Stacee Green
Driving Park Civic Association

Rita Hallaveld
Resident & Cyclist

Molly Hogue
Resident

George Holliman
Livingston Avenue Area Commission

Rachel Robinson
Southern Orchards Civic Association

Jerry Saunders
Africentric Personal Development Shop

Erin Synk
Columbus South Side Area Commission

Ralph Walker
Livingston Ave. Columbus OH Safety Group

Sherman Willis
Community Business Owner

Steering Committee Meeting #3
Meeting Minutes

Meeting Minutes

Meeting Name:	Livingston Avenue Steering Committee #3	
Date:	October 11, 2022	**Time: 5:30 PM**
Location:	Columbus Metropolitan Library, Driving Park Branch	**Host:** City of Columbus
Attendees:	Livingston Avenue Steering Committee members City of Columbus CHA Lawhon and Associates See *Attachment A* for a list of attendees	

Introduction:

- The meeting started around 5:35 PM. The agenda can be seen in *Attachment B*.
- A PowerPoint presentation was utilized to guide the meeting and is included as *Attachment C*.
- Eric Lambert (City of Columbus) reviewed the pulse check questionnaire responses from the previous meeting. Responses were trending upwards, with positive feedback on working together as a group and progress being made. A suggestion for improvement was to allow for more time during the steering committee meetings, though Eric noted the need to balance the time commitment of steering committee members.

Technical Data Update:

- John Gallagher (CHA) provided an overview of the parking study and noted the relatively light parking utilization across the corridor, especially in comparison to other commercial corridors in the city.
- He showed several maps of blocks on Livingston Ave with 30% or greater parking utilization. These blocks were showing parking on the north side of the street and nearby the Oakwood/Champion area and Lockbourne/Miller area. A steering committee member noted that there are many households without vehicle ownership according to Census Tracts overlapping the study area. The blocks in which there was higher parking utilization were a mix of both residential and commercial uses, and most buildings have off-street parking available. The project team will continue to assess off-street parking options.
- A pedestrian generator map was shown that depicts areas generating significant pedestrian activity. The steering committee was asked to provide additional information on areas that the project team may have missed or where new categories may need to be added. Areas circled in red on the map include signalized intersections that have a greater distribution of crashes. The steering committee was asked to take home the draft pedestrian generator map to assess additional locations. The Take-Home Pedestrian Generator Map and Activity is included as *Attachment D*.

Preliminary Corridor Sections/Layouts:

- Cory Lamb (CHA) reviewed several alternatives for the corridor, in section view and plan view layouts. Existing conditions on the corridor account for an average curb-to-curb width of 40'-44' (including on-street parking and travel lanes within the existing curbs) and an average right-of-way width of 63'-66' (including sidewalks). Note on the typical sections that the utility poles are absent but would be present in final alternatives.
- Throughout all of the alternatives, the road diet configuration will be maintained as this will provide better accessibility and reduce vehicular speeds, making the corridor safer for all users.
- Cory reviewed several images related to bikeway alternatives, including separated and protected bike lanes. Separated bike lanes typically have a striped buffer against vehicular traffic and may use flexible posts, parked cars, or other materials to delineate the bike lane as separate from motor vehicle traffic. Protected bike lanes are physically separated from the roadway through more substantial materials such as raised concrete medians. Challenges for separated and protected bike lanes include snow and debris removal.
- Raised bike lanes are sidewalk level bike facilities that are further protected from motor vehicle traffic. These delineate the pedestrian and bicyclist space through separation via planters or pathway materials. Planters can help to divert stormwater runoff.
- Two-way bike lanes or cycle tracks can be physically separated from motor vehicle traffic through the use of curbs, or visually separated using parked cars, flexible posts, or other materials. Curbs can complicate drainage and raise construction costs.
    - Comment: The Ohio/Champion painted bike lanes are faded and not buffered, so cars often park in them.
    - The bike facilities reviewed would also receive additional signage and in some cases like the cycle track, specialized traffic signals.
- Raised two-way bike lanes or cycle tracks are separated by curbs or other protection on either side and delineated from both the pedestrian walkway and motor vehicle travel lanes or parking lanes.
- The shared use path was the last alternative, which could be used by both pedestrians and bicyclists. These are typically wider paths that can be striped to delineate two ways of travel.

- Note: Scooters are supposed to use a bike facility or shared use path if available.

- Each section represents one alternative with several configurations:
  - Section 1: Road Diet with Bike Lanes
  - Section 2: Road diet with raised bike lanes
    - Similar to section 1 but with bike lanes raised to sidewalk level, offering greater protection from motor vehicles
  - Section 3: Road diet with cycle track
  - Section 4: Road diet and shared use path
- Questions and comments
  - Are there any crash impacts with the "salmon" parking effect? (When parking lanes switch from one side of the street to the other.)
    - For example, Parsons Avenue functions in this way, but without a bike facility, and it is intimidating to navigate on a bicycle (per steering committee member).
    - Another example is on Whittier St. where motorists will pass bicyclists by using the parking lane.
  - How do we accommodate both buses and bicyclists; how is that user experience?
    - Typically with a bike facility, there will be a "floating" bus stop and signage/pavement markings to notify bicyclists of pedestrians crossing.
    - The City and project team are coordinating with COTA on this study; COTA may also revise their route scheduling to lessen the need for COTA buses to wait.
  - Buses are a MUST on Livingston Avenue and the only way to accommodate bikeways, transit, and vehicular travel is to remove parking.
  - The line 1 on Livingston is among the busiest in the city and a major stakeholder for this study.
  - How much parking is available off-street for businesses?
    - This is something that the project team is looking into.
  - In case of protected and raised bike lane, who is responsible for snow removal?
    - Currently this type of bike lane configuration does not exist in the city, so there would need to be an operational policy put forth in concert with such an alternative.
    - With the road diet in each of these scenarios, the crossing distance across travel lanes will be greatly reduced for pedestrians.
  - What is the current vehicular volume on Livingston Ave?
    - About 14,000 a day
  - How would bike lanes on this section of Livingston connect to other bike facilities and underneath the railroad bridge near Nelson Rd?
    - The bike lane connection could be incorporated into Bexley's proposal for a pedestrian bridge across Astor Ave connecting Schneider Park into the Alum Creek Trail.

<u>Live Survey & Debrief:</u>

- Steering committee members participated in a live, anonymous survey on the four transportation alternatives presented. The raised bike lanes were the most preferred option, followed by the separated bike lanes, cycle track, and shared use path. The alternatives survey sheet is available in *Attachment E*. Results of the survey are in *Attachment F*.
- The raised bike lanes were also deemed the "most useful" option.
- The raised curb for the protected bike lanes is helpful for safety and inclusive for people who are biking. It was noted that the "identity" of the corridor is still missing in these options.
- It was also noted that off-street parking is plentiful on the corridor, though it may be less convenient than on-street parking. Side street parking may also be available.
- It's important to keep an eye on the future to increase public transit, better pedestrian facilities, and bike lanes.
- A steering committee member suggested including electric vehicle charging stations as part of the parking solution (and potentially funded by the federal government).

<u>Next Steps:</u>

- Public Meeting
  - The public meeting is scheduled for November 17th at the Driving Park Rec Center. Two open-house style meetings will be held around lunchtime and in the evening with the same information. Direct notifications will be sent to people within a quarter mile of the study area, and a press release will be published advertising the meeting. Details will be shared with the Steering Committee Members as well. The goal of the meeting is to share the progress thus far and receive feedback on alternatives.
  - It was suggested that an "ideas table" or something similar be present during the public meeting to get input on the identity goal for this study. How greenspace is used will also create a unique corridor identity and provide an opportunity for feedback during the public meeting.
- The next Steering Committee meeting will take place on December 13th at the same time and location.

- Steering committee members were instructed to take home the pedestrian generator maps and assess additional locations. These comments are due back to the project team by December 2nd.
- The final report for the study will be available to the steering committee members and will include the safety and parking analysis.
- A pulse-check questionnaire was provided for them to complete before leaving the meeting (*Attachment F*).
- The meeting was adjourned at around 7:15pm.

ATTACHMENT A

Attendee List

Livingston Avenue Improvements Study – Steering Committee #3 October 11, 2022

Attendees

Steering Committee:

- David Gray
- Stacee Green
- Rita Hallaveld
- Molly Hogue
- Jerry Saunders
- Erin Synk
- Ralph Walker

City of Columbus:

- Justin Goodwin
- Emma Kogge
- Eric Lambert
- Matt Lorenz
- Alex Sauersmith
- Greg Sprungle

CHA:

- John Gallagher
- Cory Lamb

Lawhon:

- Abby Anacki
- Chantil Milam

ATTACHMENT B

Meeting Agenda

Livingston Avenue Improvements Study – 18th St to Nelson Road
Steering Committee Meeting 3 Agenda

Date: Tuesday, October 11th, 2022
Time: 5:30 – 7:00
Location: Columbus Metropolitan Library, Driving Park Branch, Meeting Rooms 2 and 3

5:30 – 5:35 Greeting & Meeting 2 Recap

- Pulse Check Questionnaire Results

5:35 – 5:45 Technical Data Update

- Parking Analysis
- Pedestrian Generator Map

5:45 – 6:45 Preliminary Corridor Sections/Layouts

- Walkthrough
- Survey
- Debrief

6:45 – 7:00 Next Steps

- Outline Upcoming Events (Public Meeting)
- Take-home Pedestrian Generator Map Activity
- Pulse Check Questionnaire

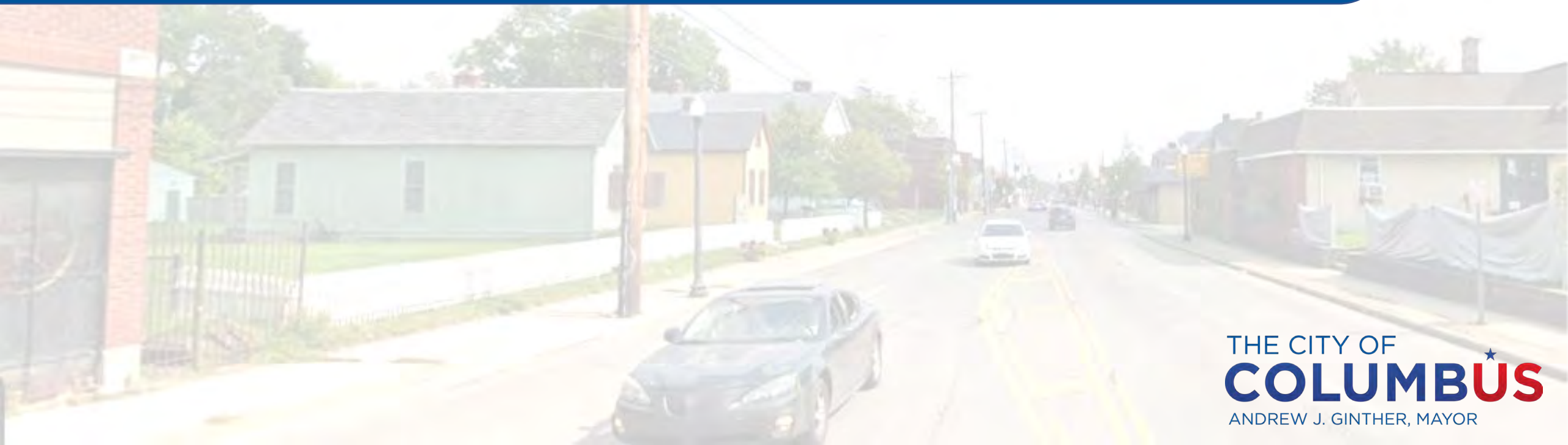
ATTACHMENT C

PowerPoint Presentation

Livingston Avenue Improvements Study – 18th St to Nelson Rd

Steering Committee Meeting #3

October 11, 2022



THE CITY OF COLUMBUS

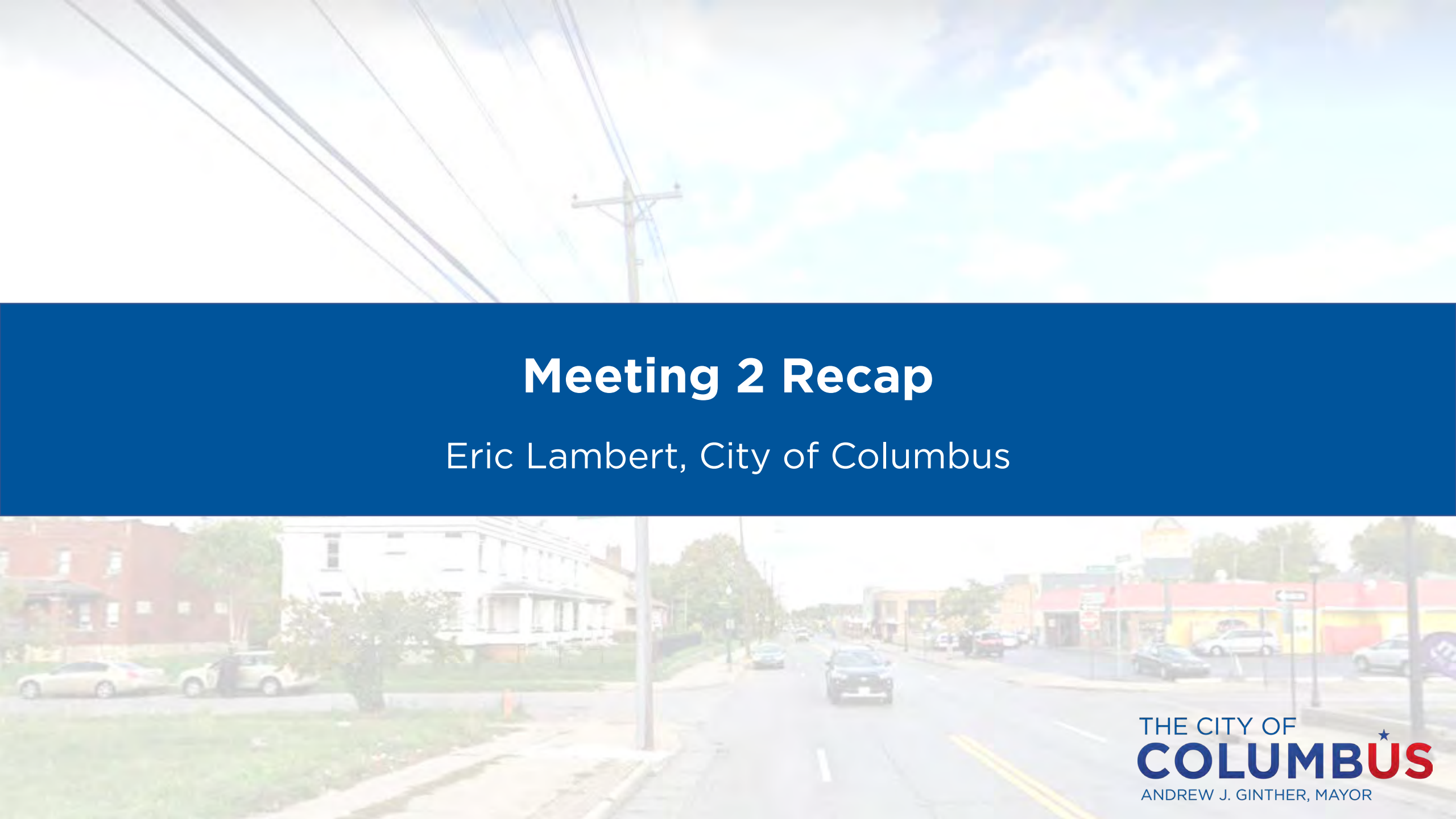
ANDREW J. GINTHER, MAYOR

Agenda (1 hour 30 minutes)

1. **Greeting & Meeting 2 Recap (5 min)**
   a. Pulse Check Questionnaire Results
2. **Technical Data Update (10 min)**
3. **Preliminary Corridor Sections/Layouts (60 min)**
   a. Walkthrough
   b. Survey
   c. Debrief
4. **Next Steps (15 min)**

Meeting 2 Recap

Eric Lambert, City of Columbus



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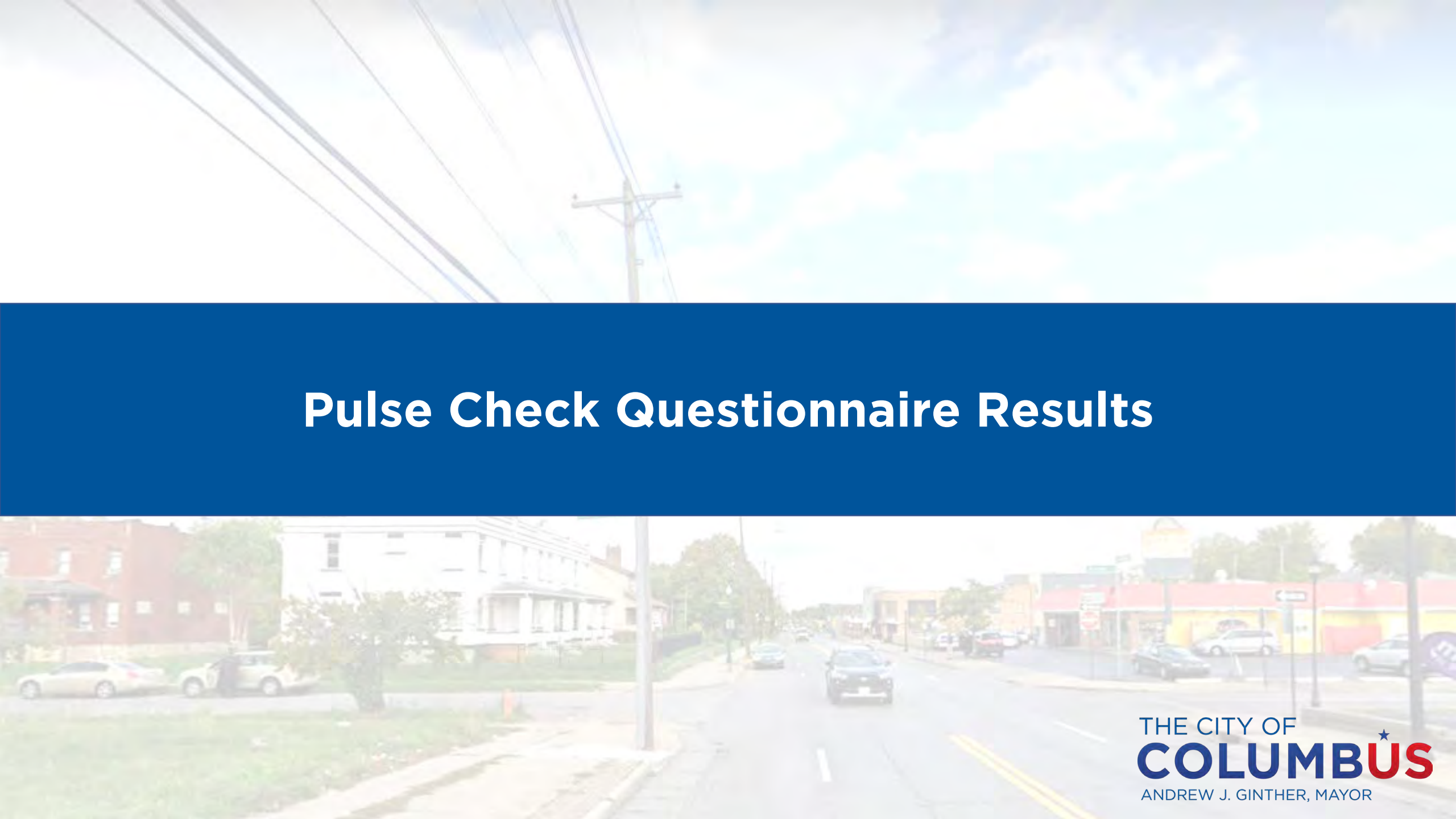
Steering Committee Meeting #2 – September 13, 2022

- Review of Technical Data (Crash Data, Speed Counts, Parking, etc.)
- "Toolbox" Discussion:
  - Road Diet
  - Curb Extensions/Bump-out/Bulb Out
  - Raised Crosswalks/Raised Intersections
  - Medians
  - Bicycle Lanes
  - Shared-Use Path (SUP)/Multi-Use Path
  - Leading Pedestrian Interval
  - Other Traffic Control at Crossings
- Plan View Exercise

Pulse Check Questionnaire Results



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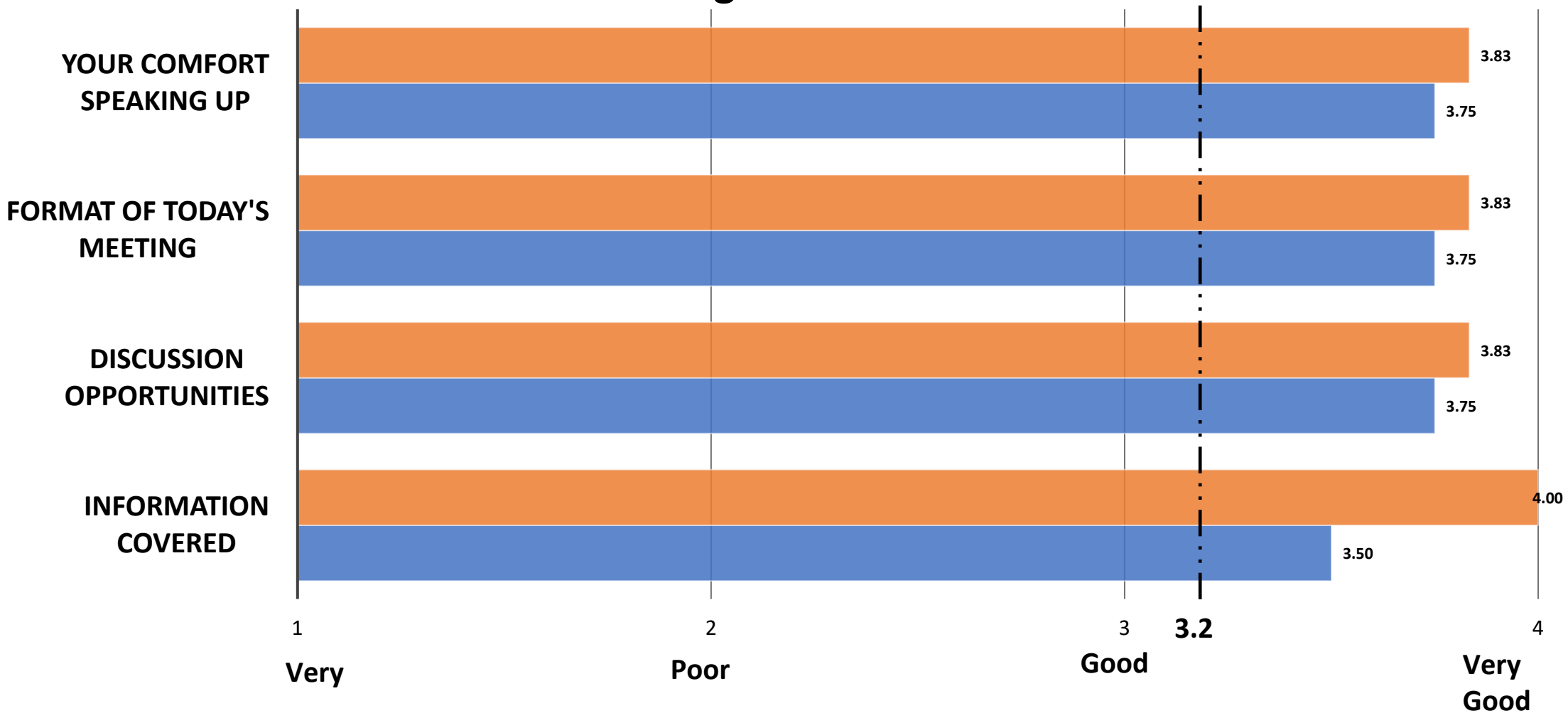
Meeting Effectiveness



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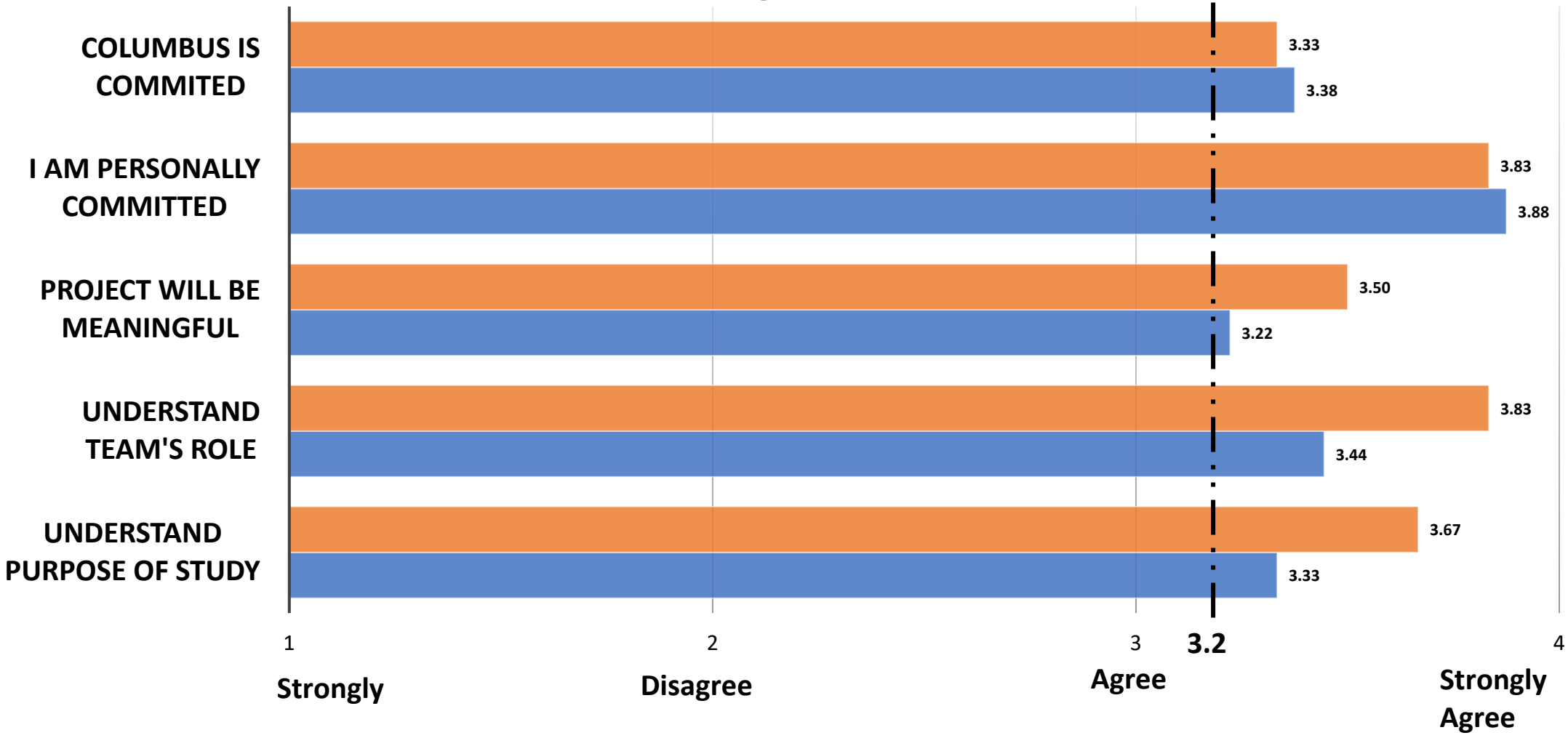
ANDREW J. GINTHER, MAYOR

Understanding & Commitment



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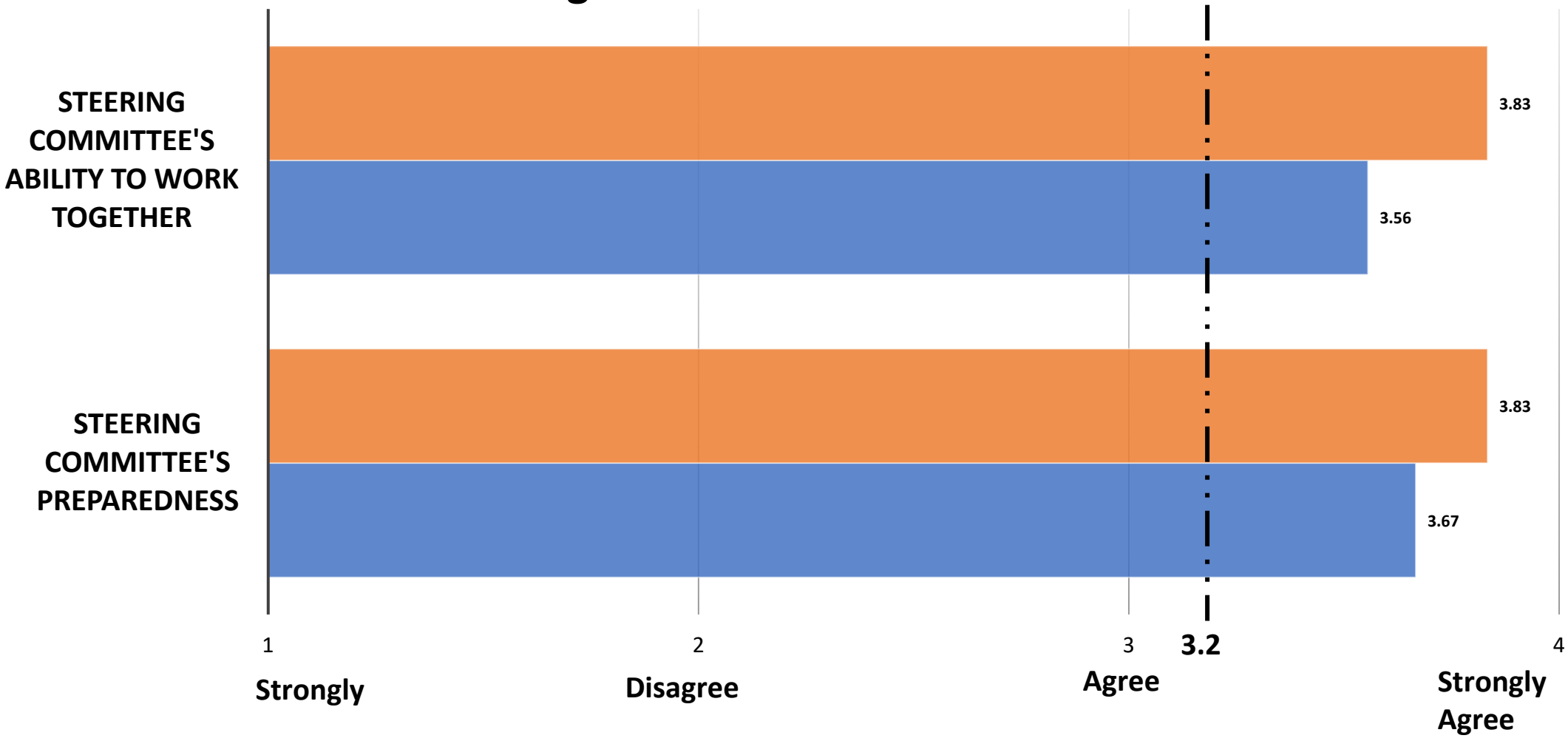
Steering Committee Self-Evaluation



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ANDREW J. GINTHER, MAYOR

What went well today?...

- I think my neighbors are designing for today and not THE FUTURE of Livingston Ave.
- Breakout Group
- Information disseminated was good - Helped with pros & cons
- The Team sharing
- Today's meeting was helpful, informative and well structured.
- Good overview of how different tools work to achieve various traffic goals.

What could have improved?...

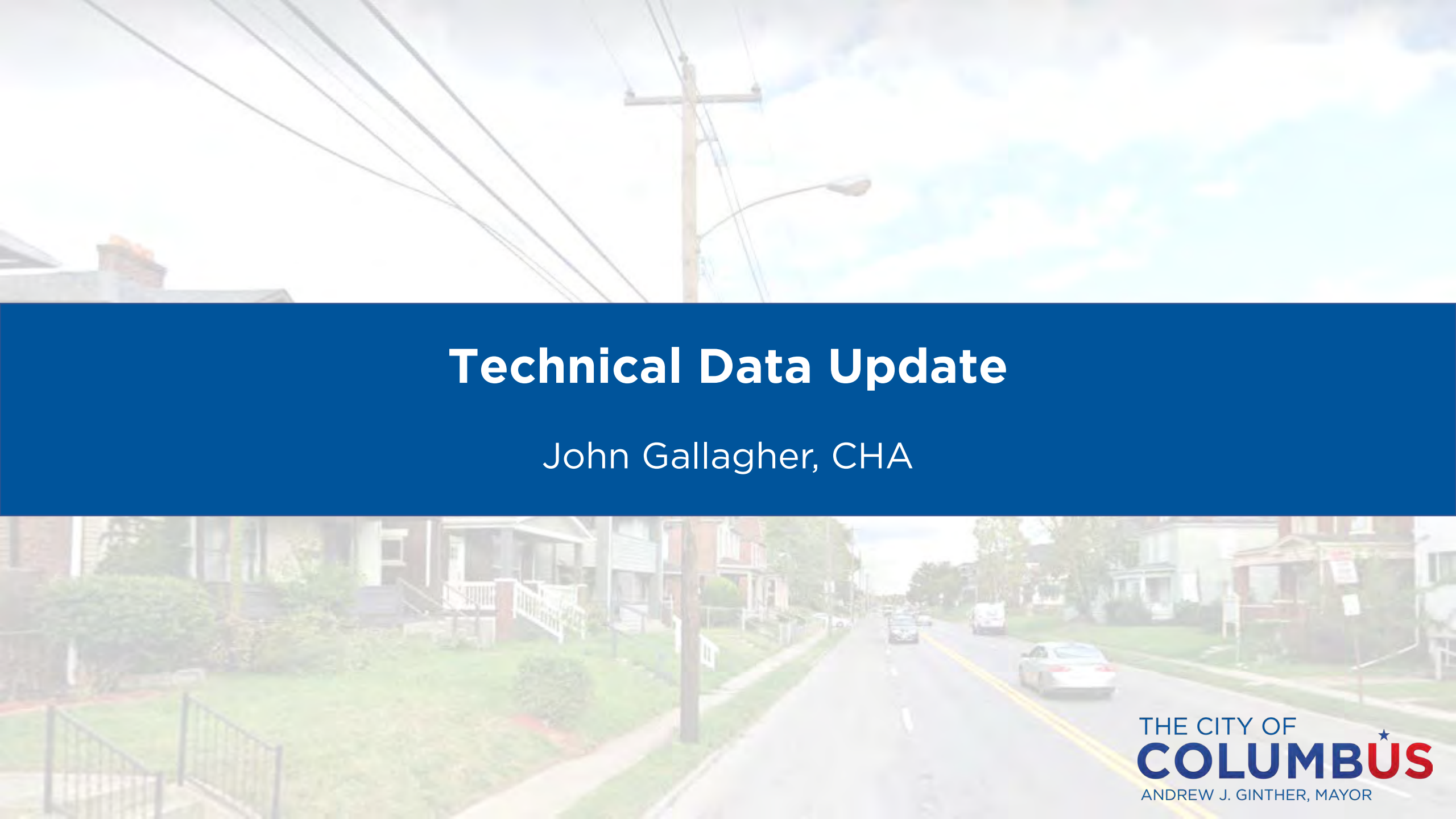
- You all are doing great.
- More time
- Speaker's voice was a little soft

How do you feel about the progress of the Team so far?...

- Progress is fine
- Two thumbs up!!
- I think progress was made. Also, I learned a lot today.
- I feel that we are making progress in creating a layout.
- Team works well together, would like to understand how things will be prioritized based on funds.

What is one key learning experience you have had thus far?...

- Pros & Cons to Road Diet
- I was very impressed with the toolbox information
- Conceptualizing the elements in the toolbox.
- There are a lot of tools available that I wasn't aware of



Technical Data Update

John Gallagher, CHA

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Parking

- Collected data AM, PM, Midday, and Saturday
- Parking is relatively light
- Only a few blocks were more than 30% filled

Parking

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ANDREW J. GINTHER, MAYOR

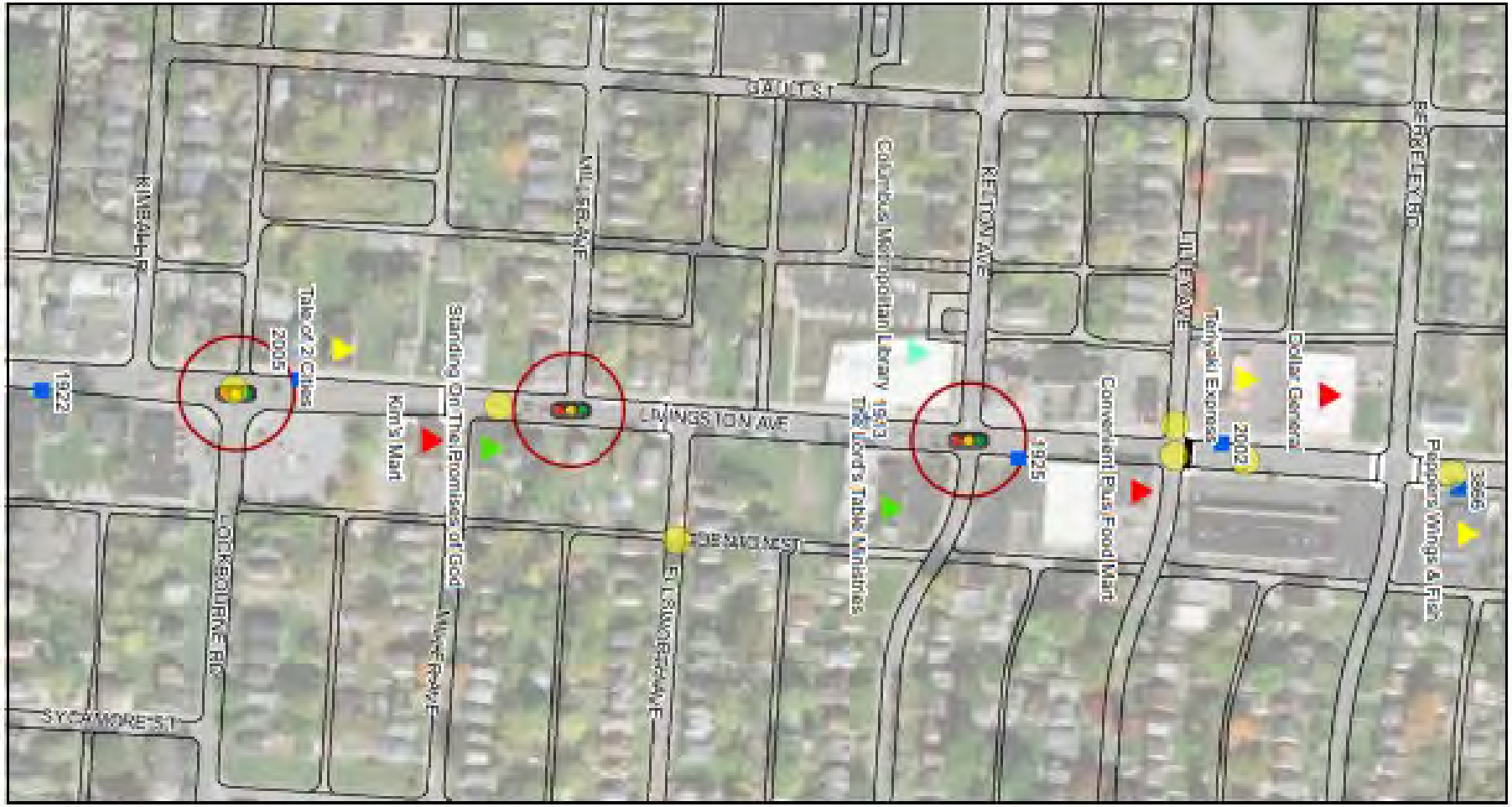
Parking

THE CITY OF COLUMBUS
ANDREW J. GINTHER, MAYOR

Pedestrian Generator Map

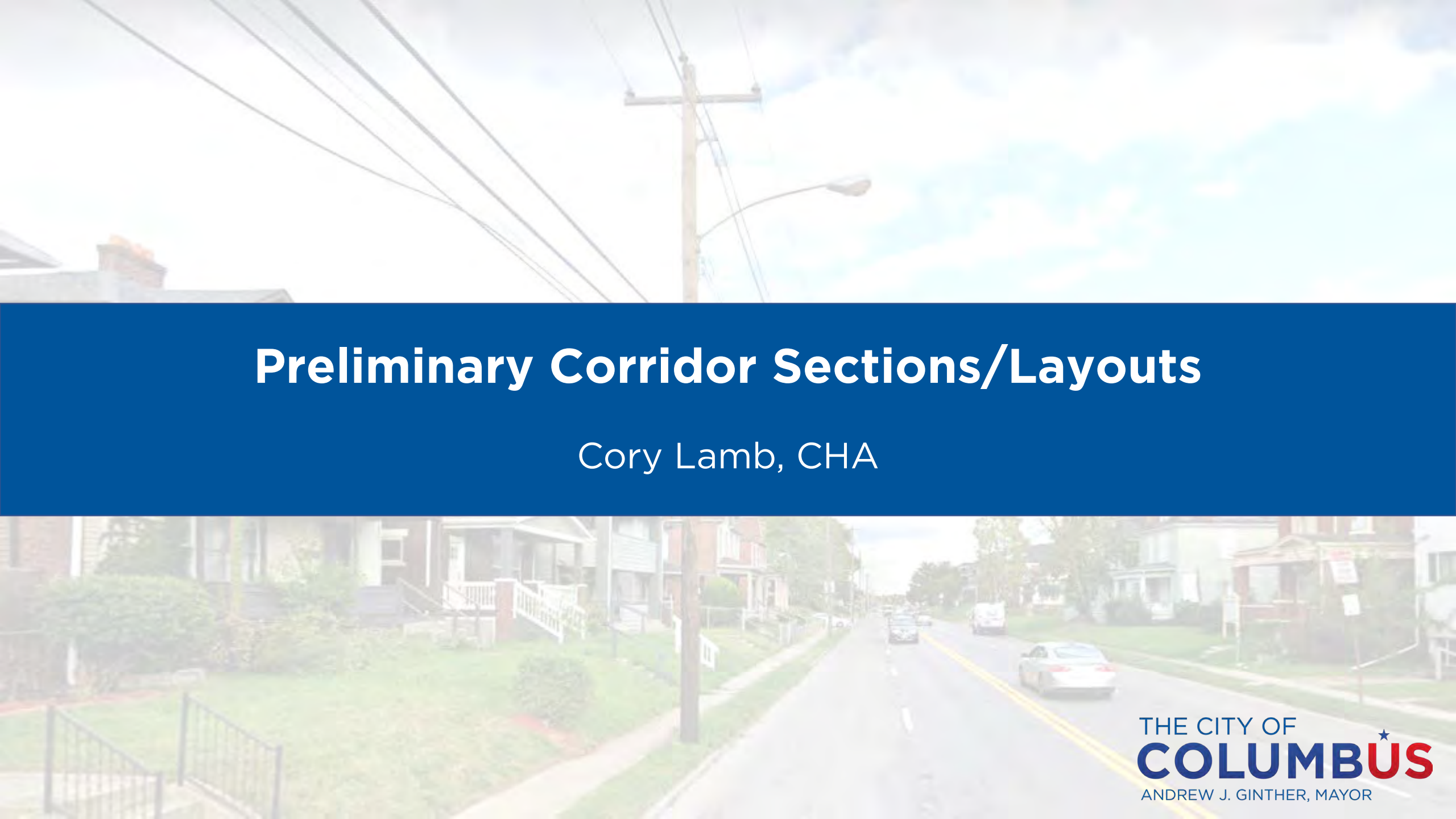
- Identifies key places people walk to/from
- Please help us to identify others

Pedestrian Generator Map



Legend

- Map Insert Area
- COTA Stop
- Study Intersection
- Traffic Signal
- RRFB/Ped Signal
- Marked Crosswalk
- Unmarked Crosswalk
- Community Center
- Gas
- Grocery
- School or Library
- Restaurant
- Worship
- Pedestrian Crash



Preliminary Corridor Sections/Layouts

Cory Lamb, CHA

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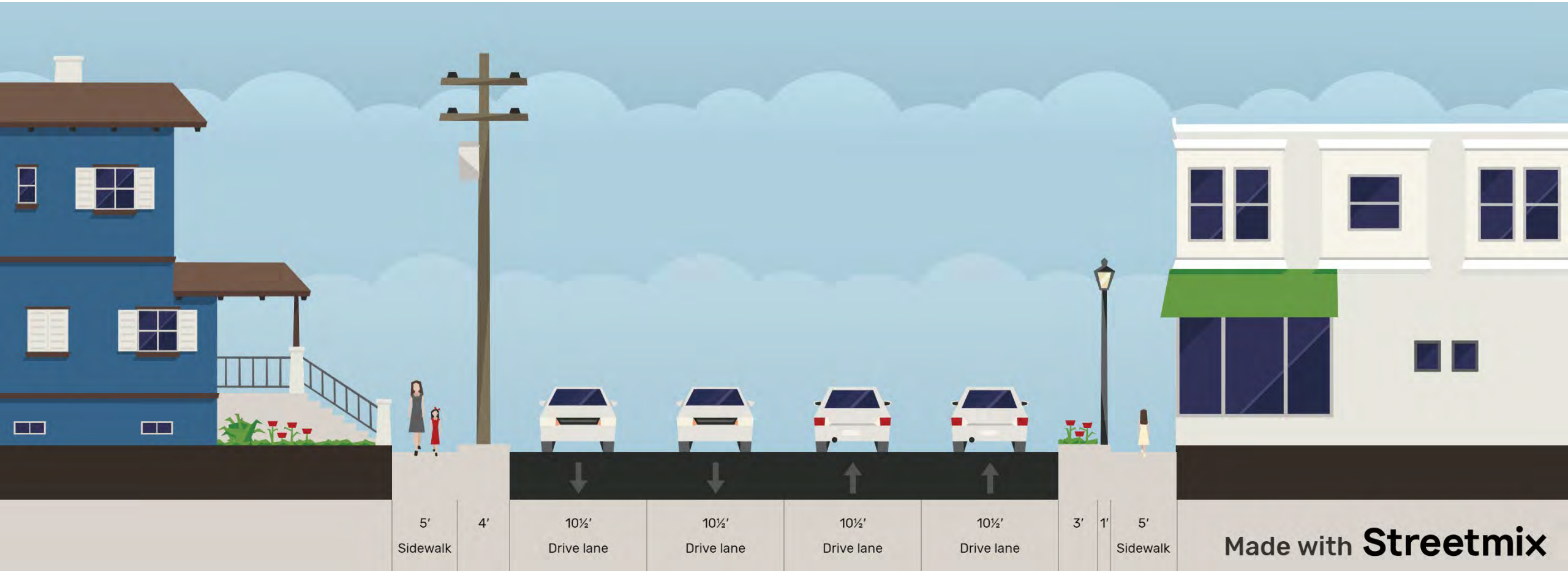
Existing Conditions



Road Diet

Bicycle Alternatives – Separated/Protected Bike Lanes

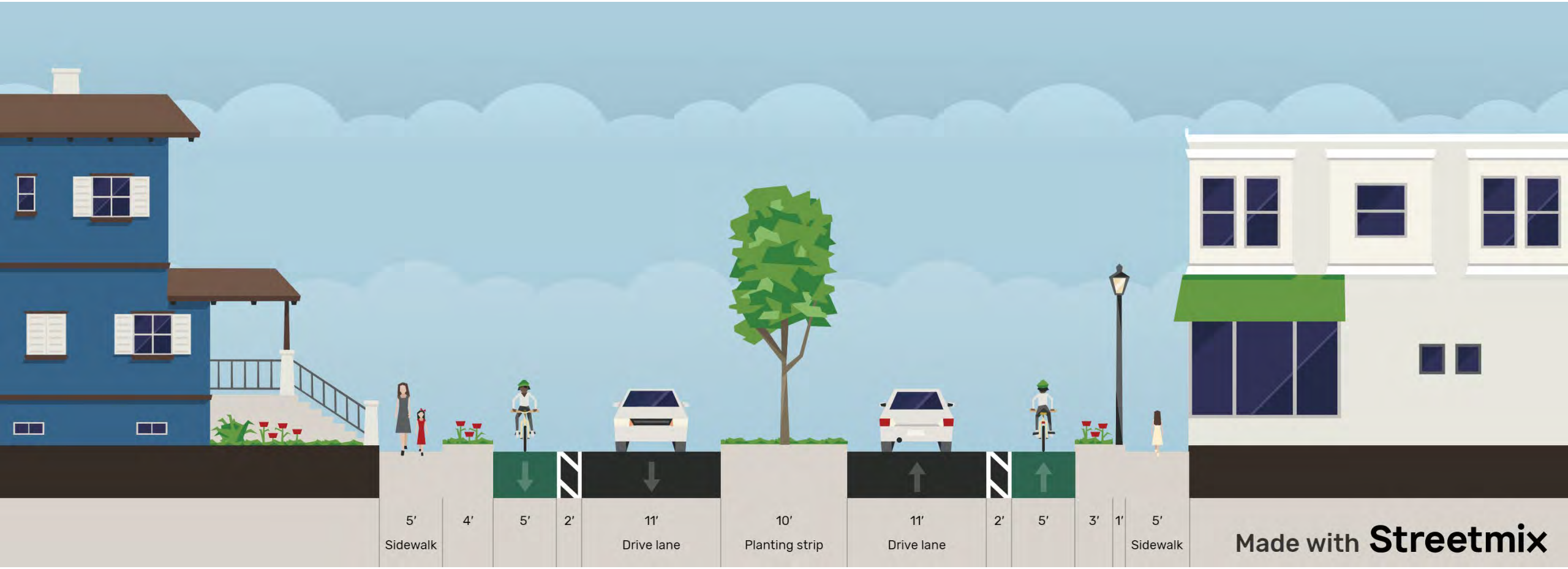
Bicycle Alternatives – Raised Bike Lanes

Bicycle Alternatives – Two-Way Protected Bike Lanes

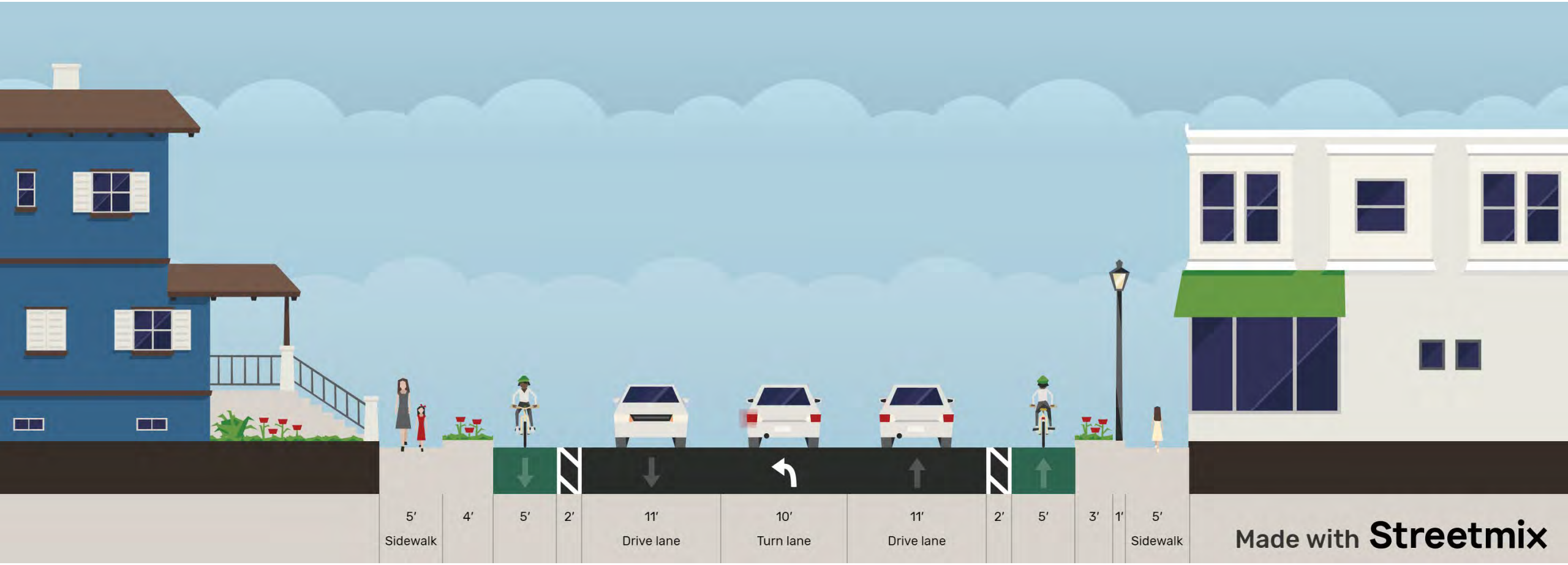
Bicycle Alternatives – Raised Two-Way Bike Lanes

Bicycle Alternatives – Shared Use Path

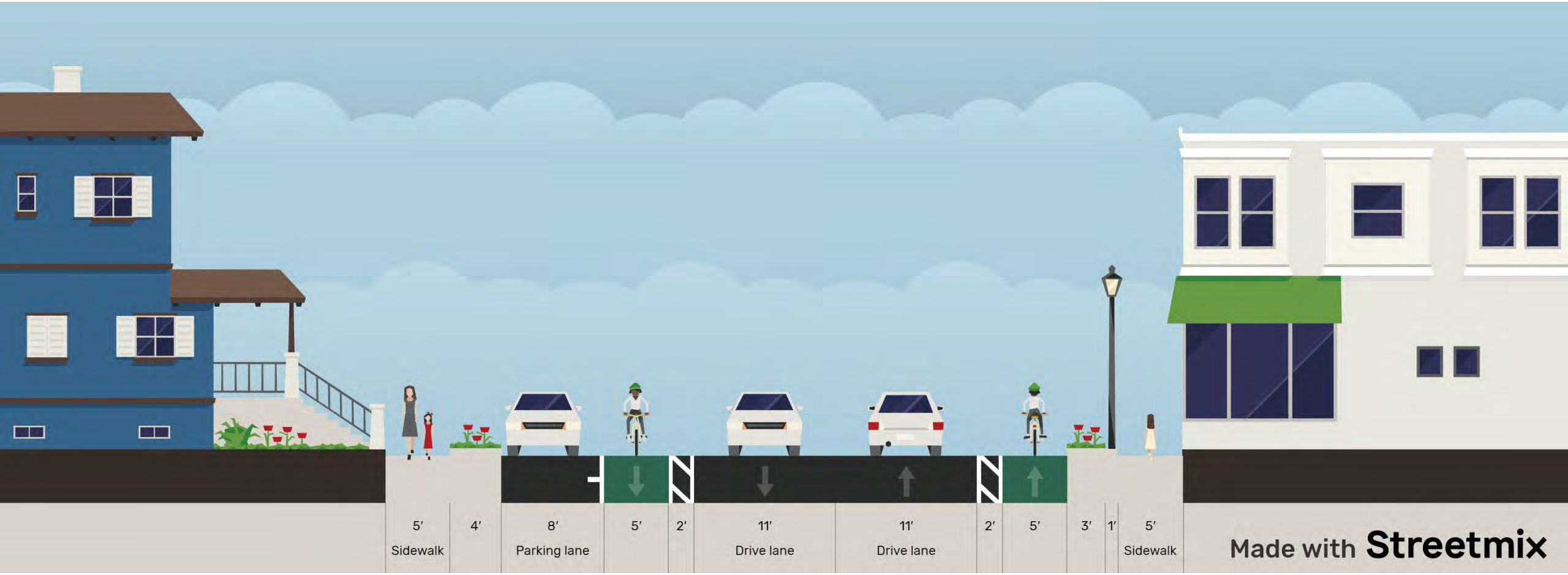
Section 1a – Road Diet w/ Bike Lanes



Section 1b – Road Diet w/ Bike Lanes & Turn Lanes

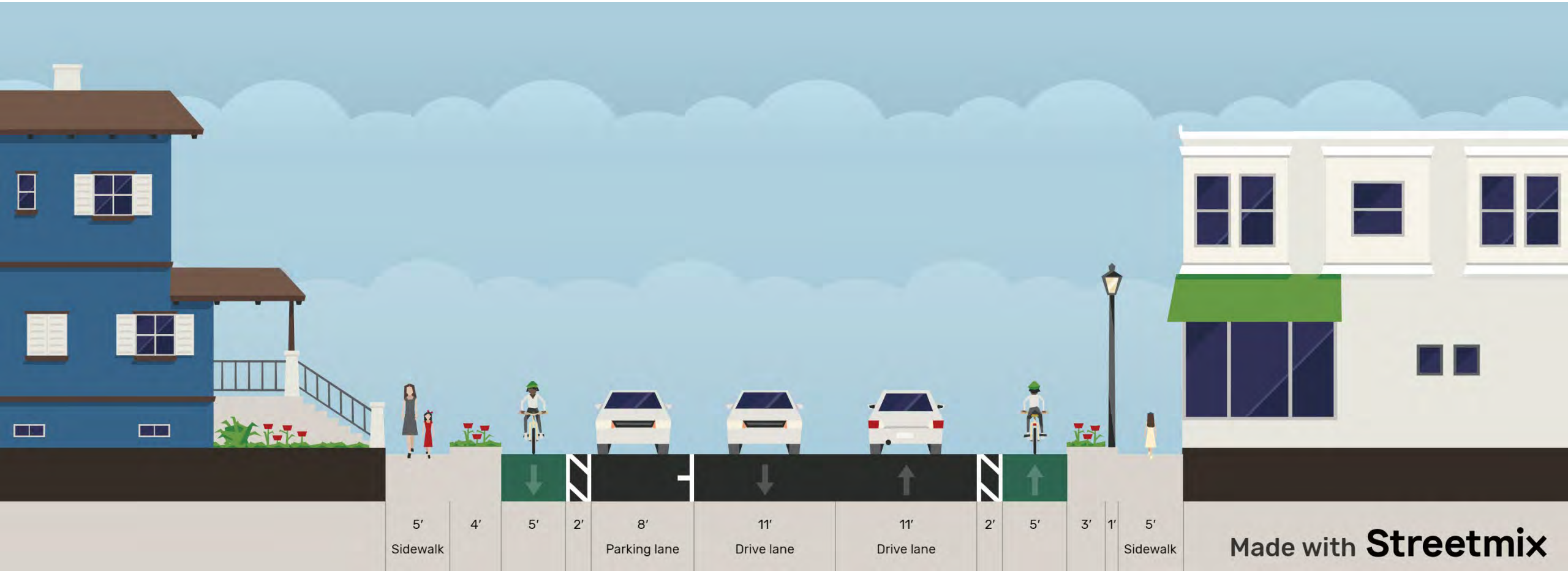


Section 1c – Road Diet w/ Bike Lanes & Parking



THE CITY OF COLUMBUS
ANDREW J. GINTHER, MAYOR

Section 1d – Road Diet w/ Bike Lanes & Parking



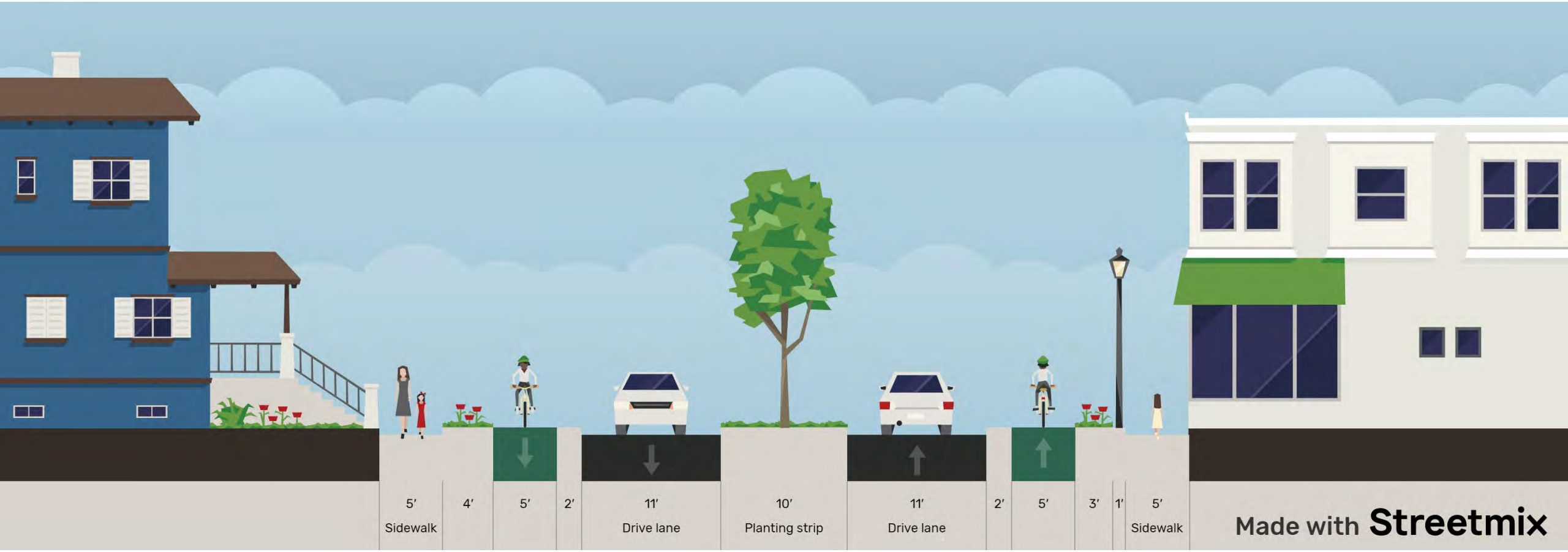
Plan 1 – Ohio Avenue and Champion Avenue

THE CITY OF COLUMBUS
ANDREW J. GINTHER, MAYOR

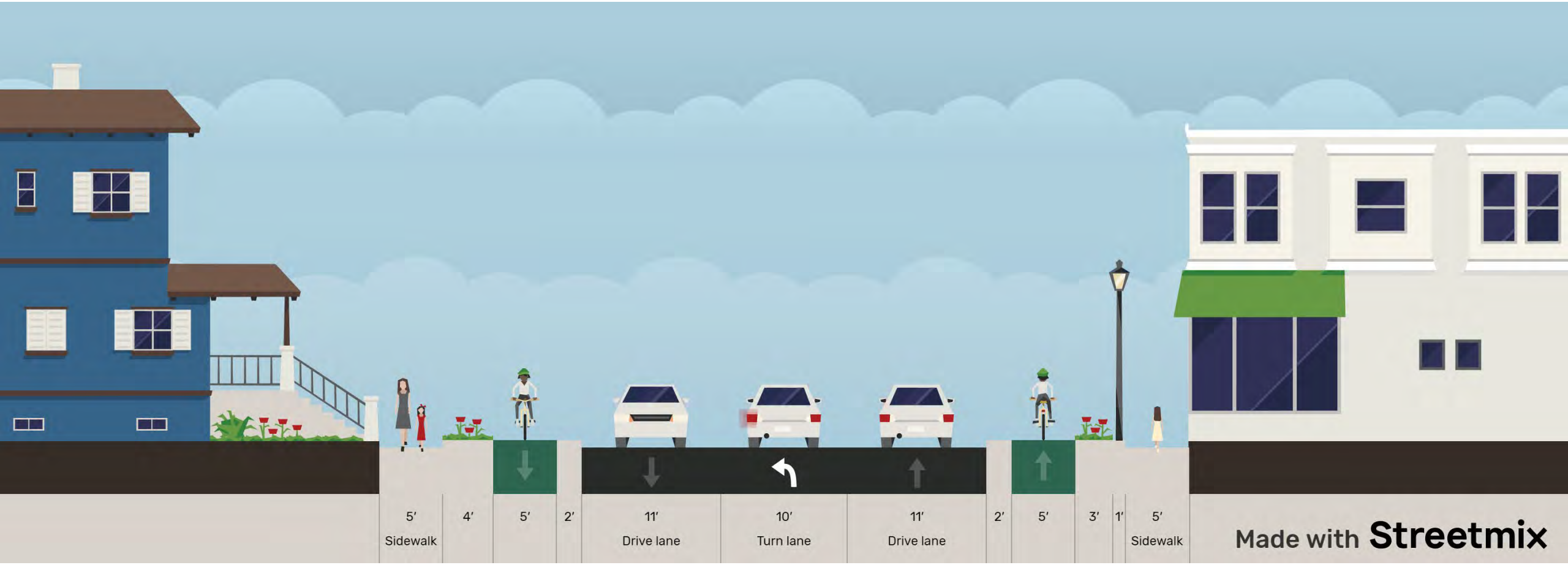
Plan 1 – Kelton Avenue and Lilley Avenue

THE CITY OF COLUMBUS
ANDREW J. GINTHER, MAYOR

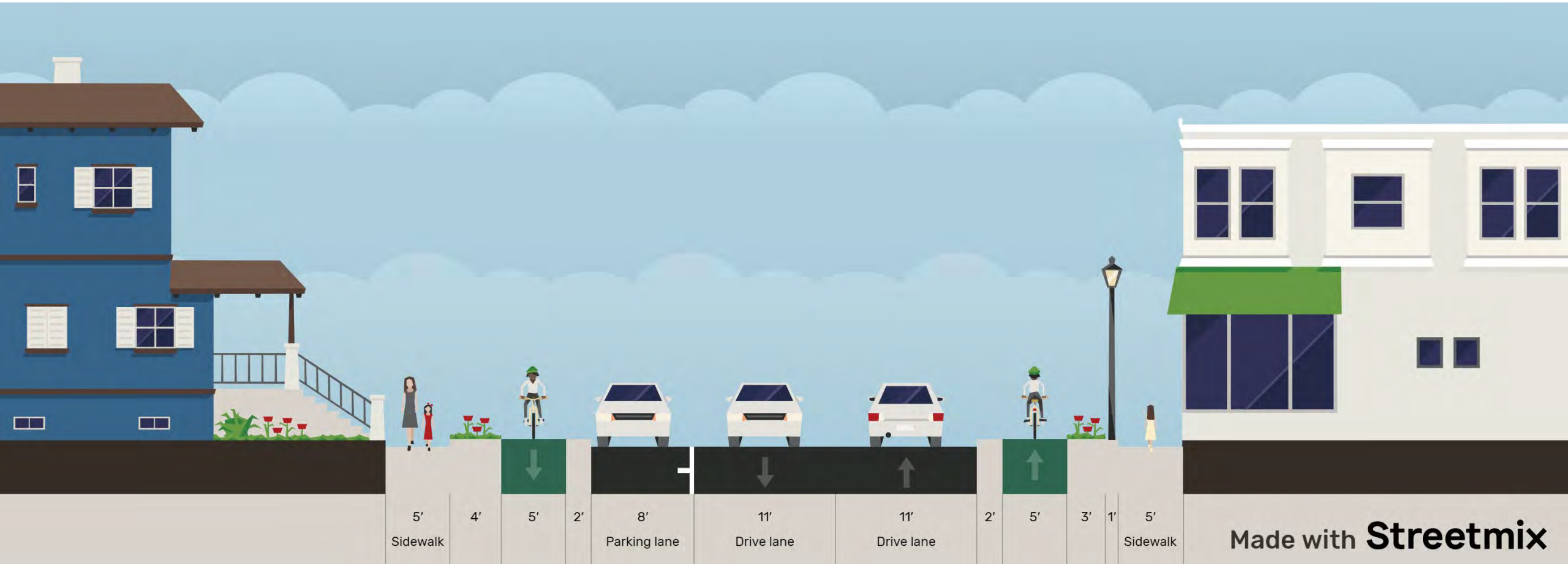
Section 2a – Road Diet w/ Raised Bike Path



Section 2b – Raised Bike Path w/ Turn Lane



Section 2c – Raised Bike Path w/ Parking



Plan 2 – Ohio Avenue and Champion Avenue

THE CITY OF COLUMBUS
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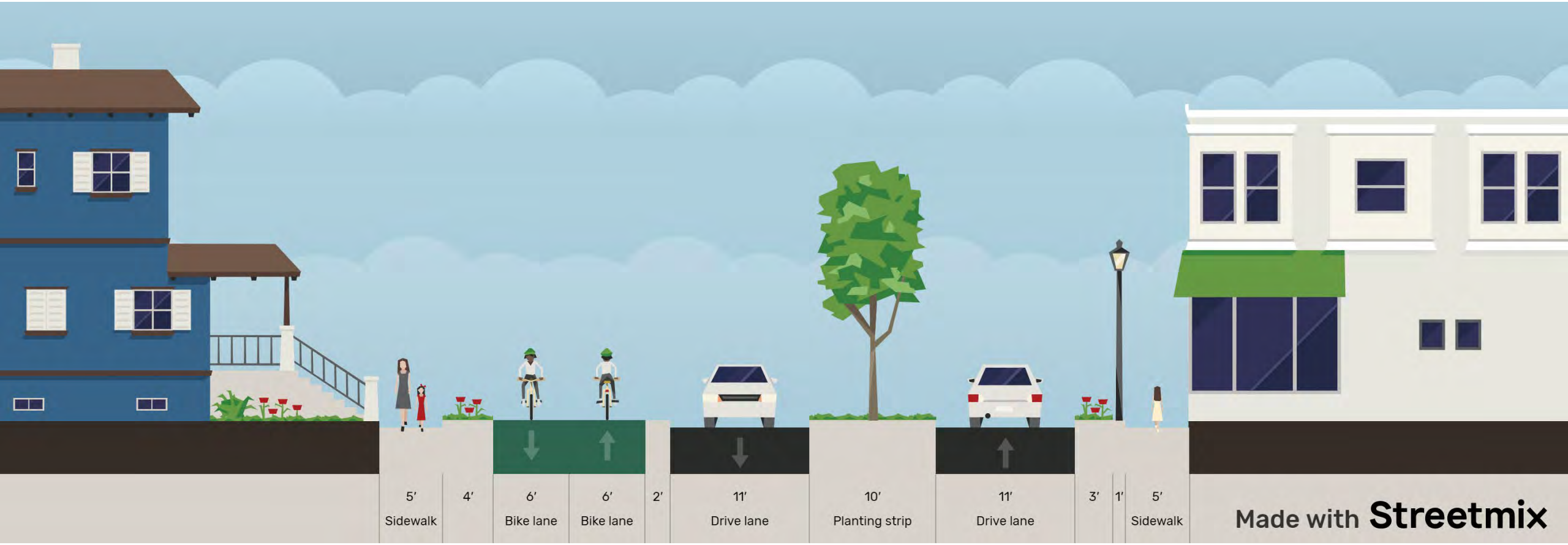
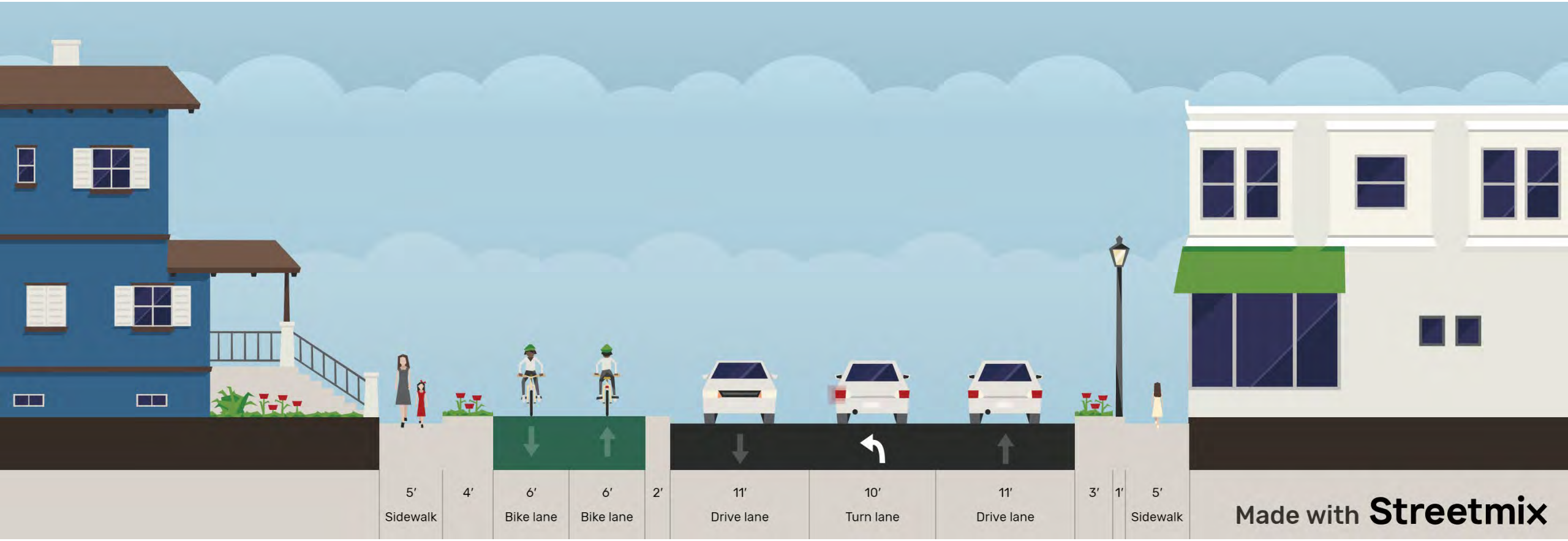
Plan 2 – Kelton Avenue and Lilley Avenue

THE CITY OF COLUMBUS
ANDREW J. GINTHER, MAYOR

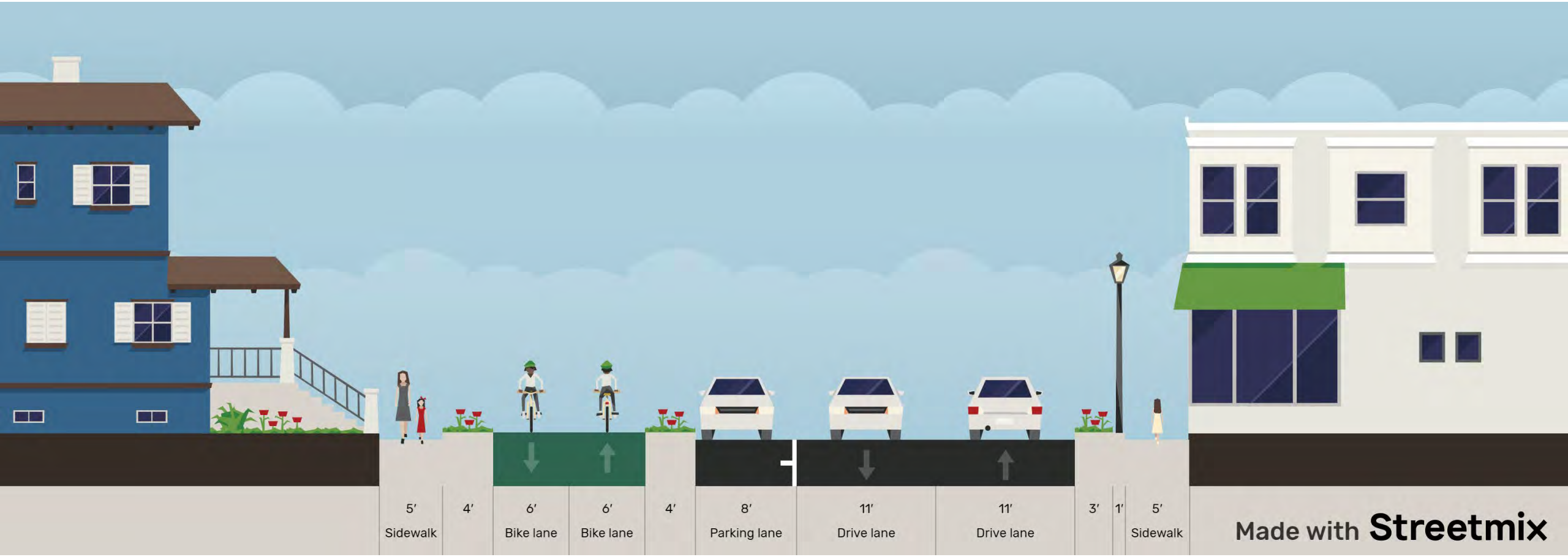
Section 3a – Road Diet w/ Cycle Track



Section 3b – Cycle Track w/ Turn Lane



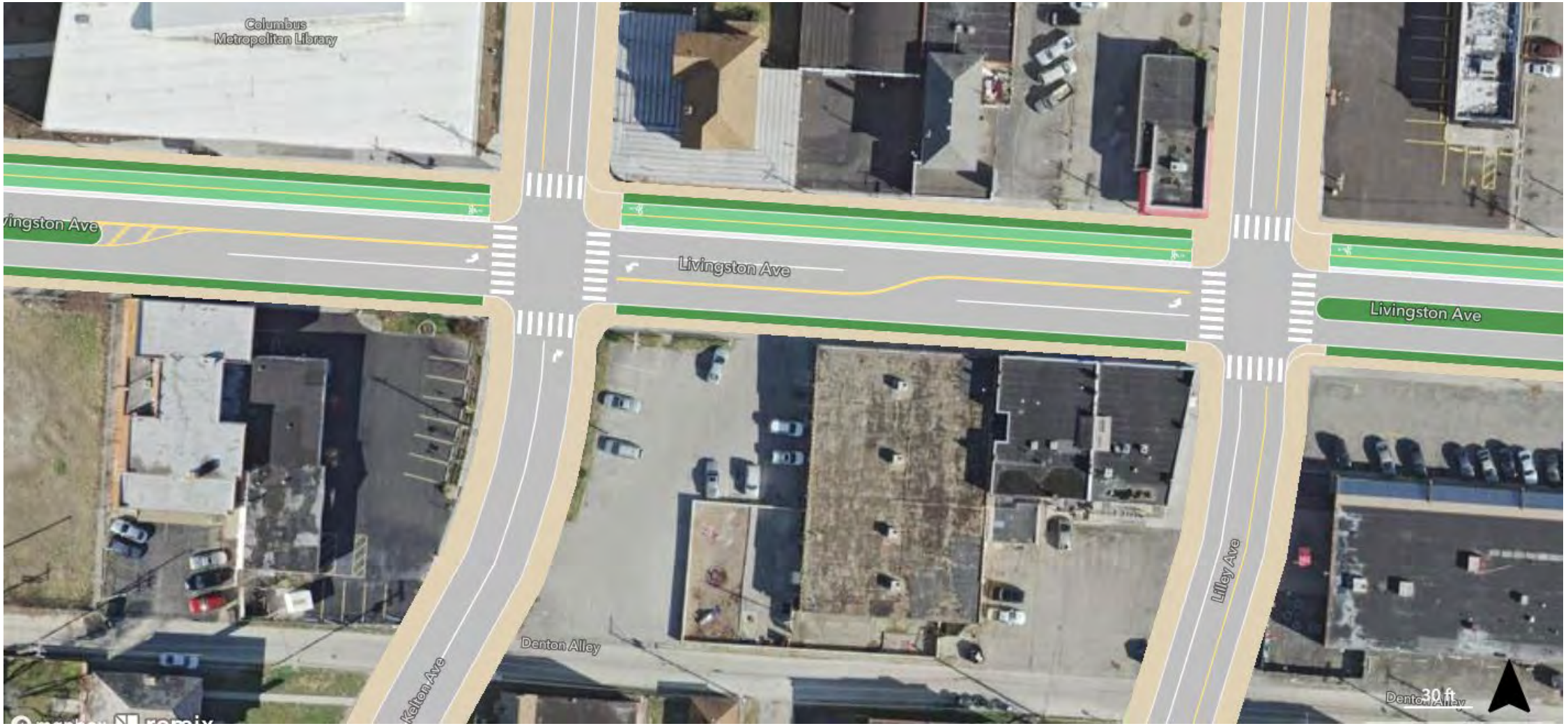
Section 3c – Cycle Track w/ Parking



Plan 3 – Ohio Avenue and Champion Avenue

THE CITY OF COLUMBUS
ANDREW J. GINTHER, MAYOR

Plan 3 – Kelton Avenue and Lilley Avenue



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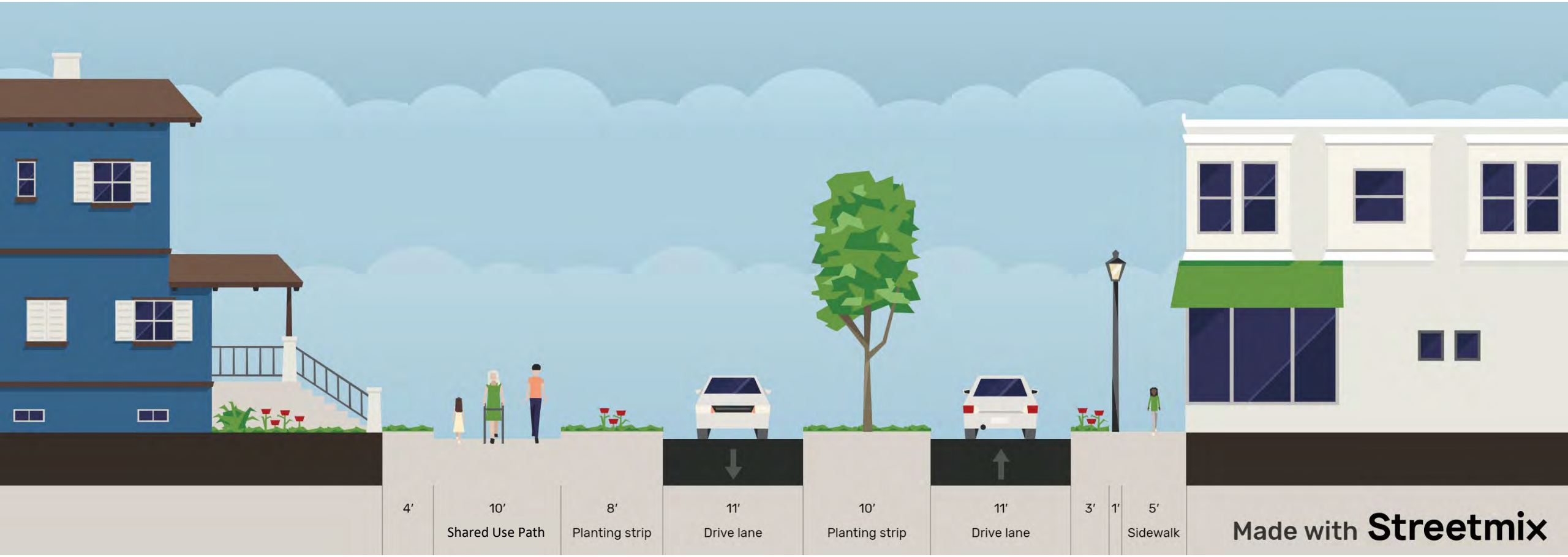
Section 4a – Road Diet w/ Shared Use Path



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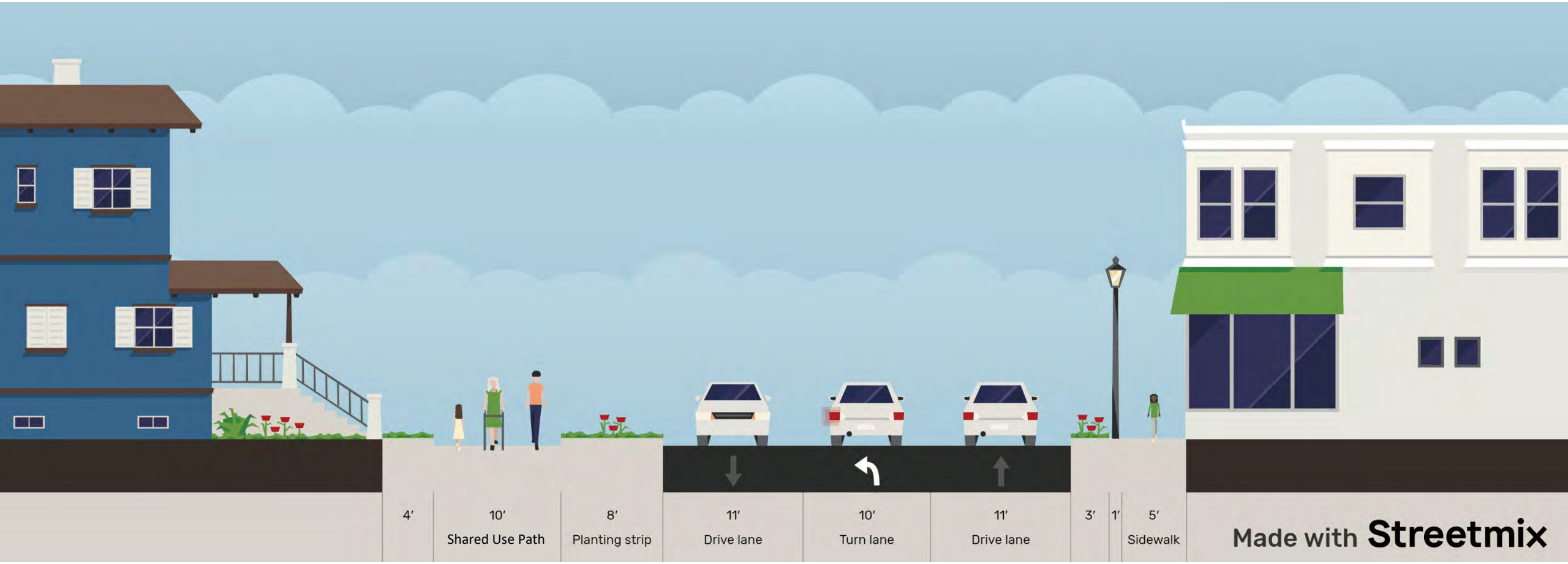
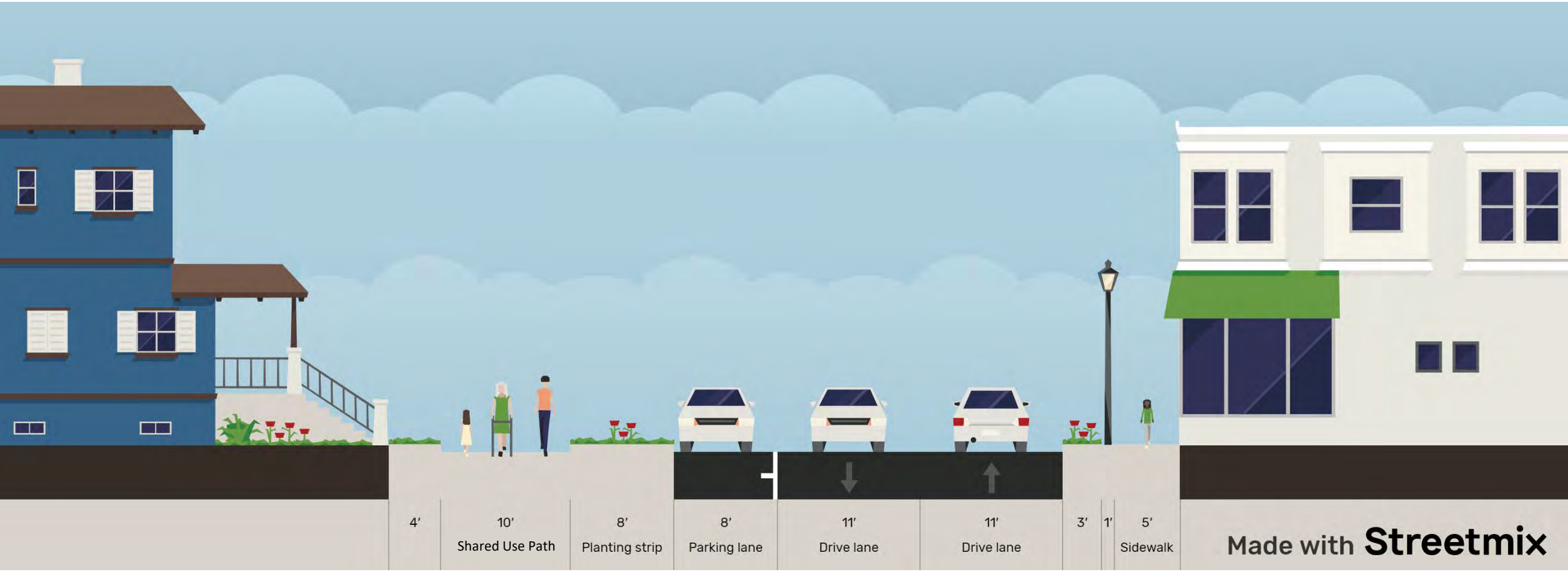
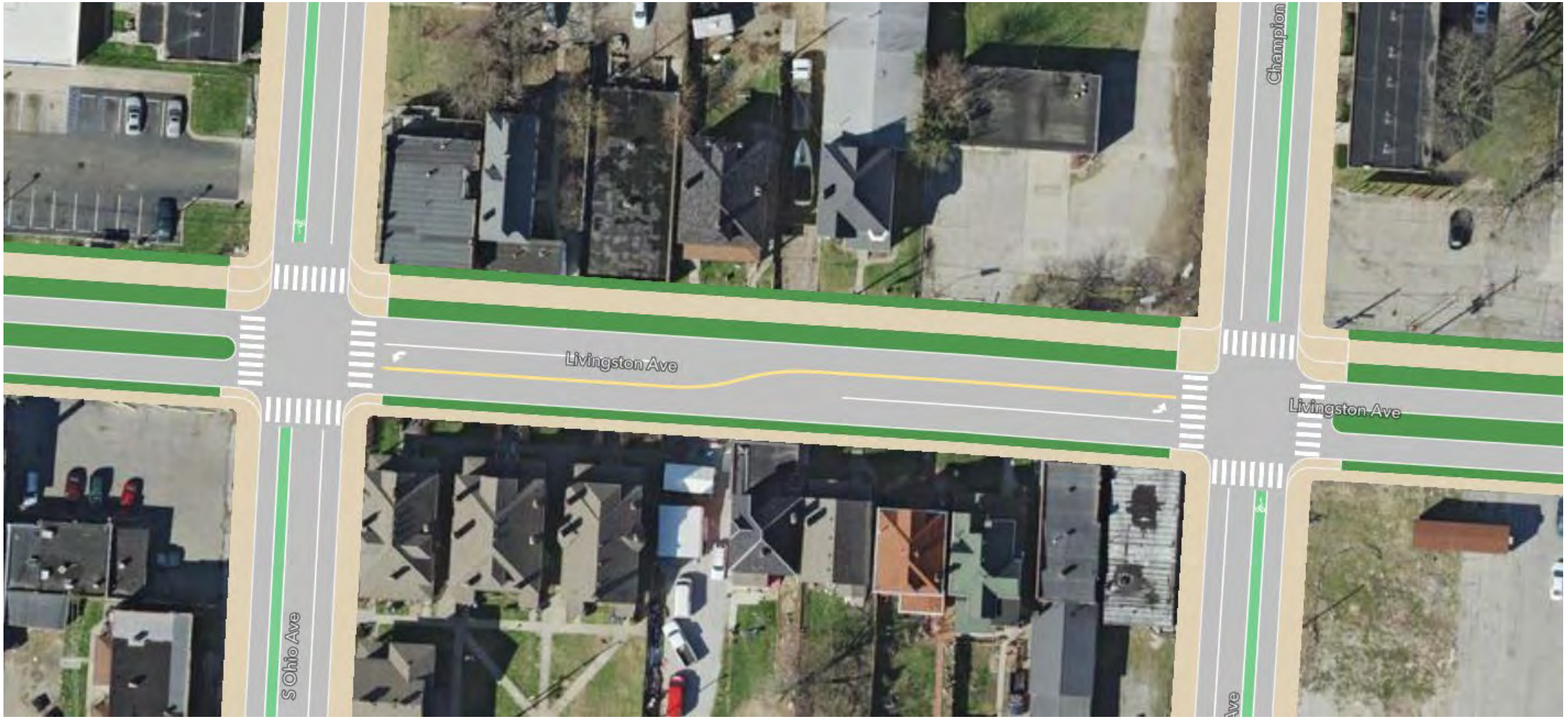
Section 4b – Shared Use Path w/ Turn Lane



Section 4c – Shared Use Path w/ Parking



Plan 4 – Ohio Avenue and Champion Avenue



THE CITY OF COLUMBUS
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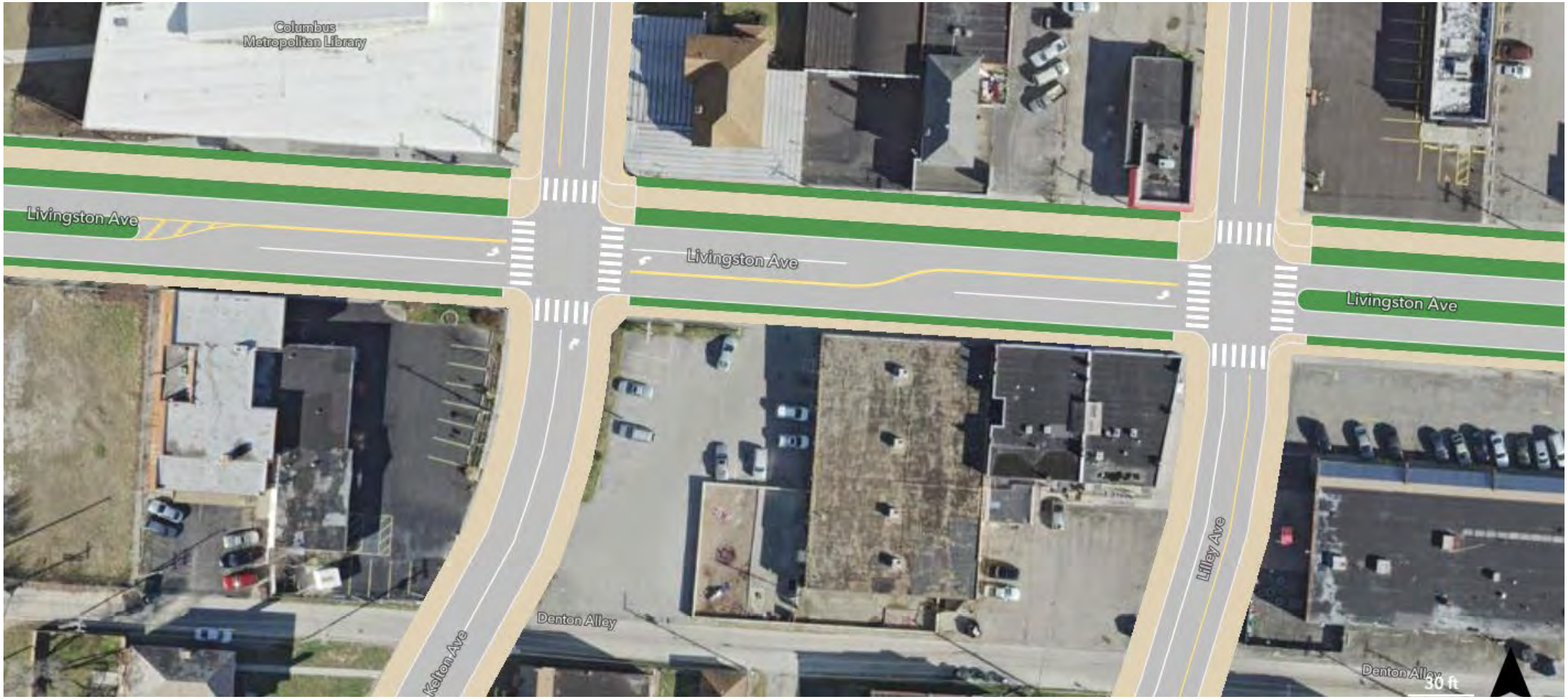
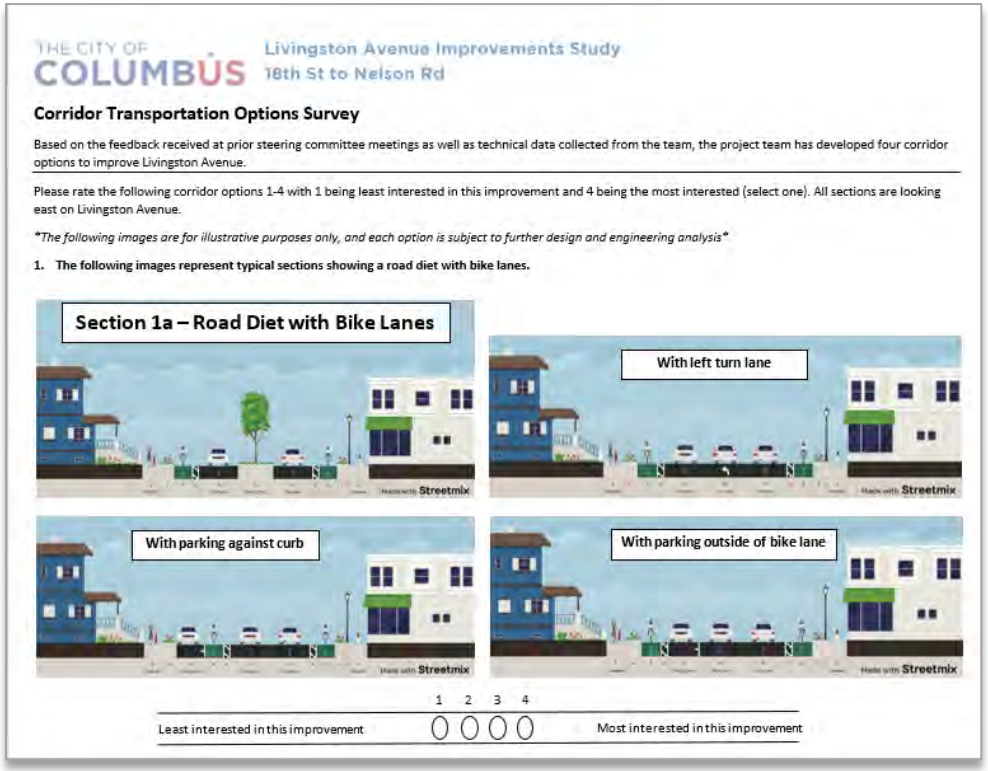
Plan 4 – Kelton Avenue and Lilley Avenue



THE CITY OF COLUMBUS
ANDREW J. GINTHER, MAYOR

Live Survey

- Please take a few minutes to fill out the survey at your seat
- This survey is anonymous
- Once you've completed the survey, please bring it up and I will enter it into our system
- We will then share and discuss the results



THE CITY OF COLUMBUS

Livingston Avenue Improvements Study
18th St to Nelson Rd

Corridor Transportation Options Survey

Based on the feedback received at prior steering committee meetings as well as technical data collected from the team, the project team has developed four corridor options to improve Livingston Avenue.

Please rate the following corridor options 1-4 with 1 being least interested in this improvement and 4 being the most interested (select one). All sections are looking east on Livingston Avenue.

The following images are for illustrative purposes only, and each option is subject to further design and engineering analysis

1. **The following images represent typical sections showing a road diet with bike lanes.**

Section 1a – Road Diet with Bike Lanes

1 2 3 4

Least interested in this improvement ○ ○ ○ ○ Most interested in this improvement

Section 1: Road Diet with Bike Lanes

0.0

Average Ranking

Section 2: Road Diet with Raised Bike Lanes

0.0

Average Ranking

Section 3: Road Diet with Cycle Track

0.0

Average Ranking

Section 4: Road Diet with Shared Use Path

0.0

Average Ranking

Which corridor option do you think would be the most useful to you?

Debrief

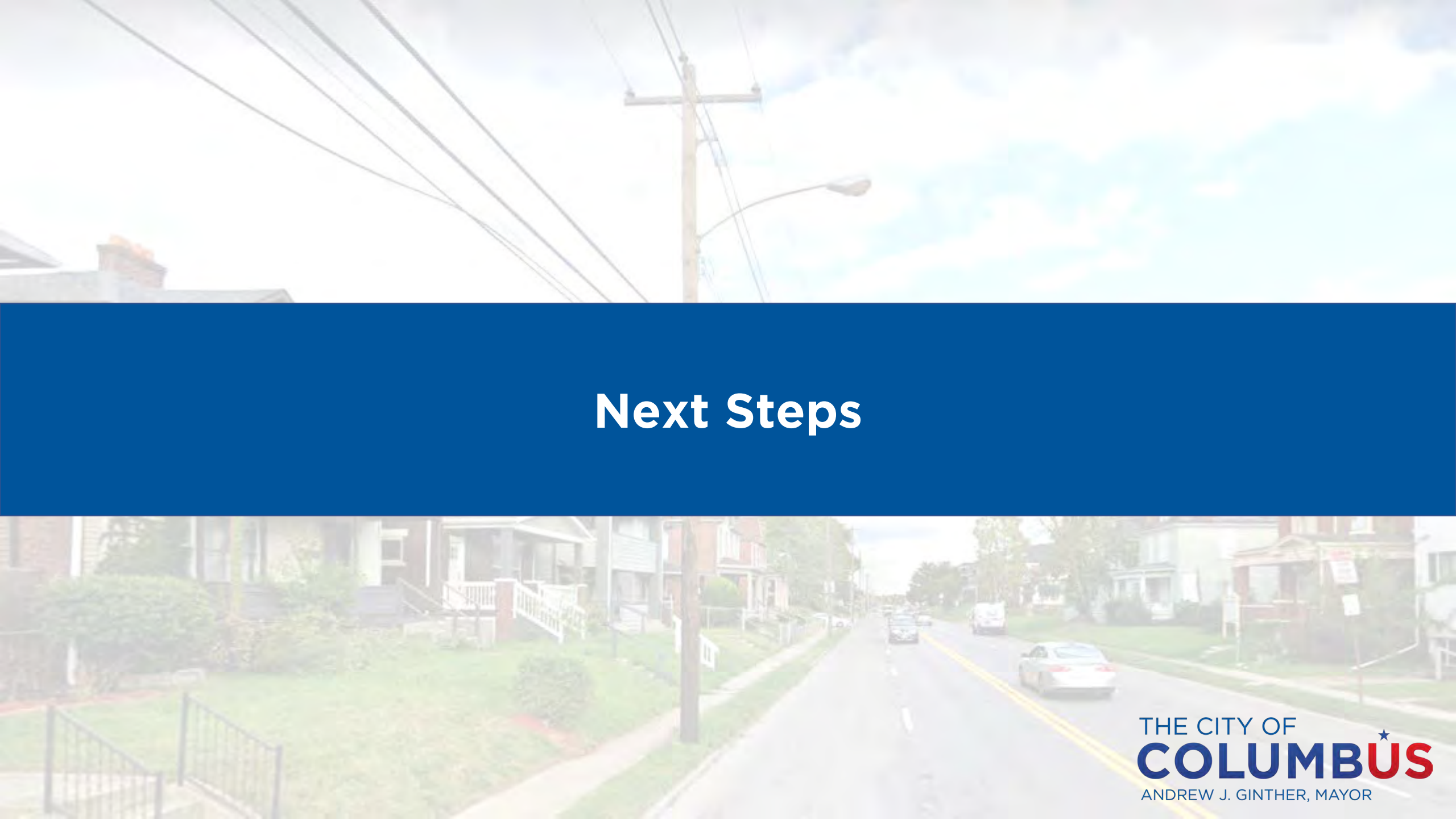
Overall thoughts on sections

Presenting options to the public

- Anything we should tweak?
- Any feedback we should expect?

Public Meeting

- Time of day?



Next Steps

THE CITY OF
COLUMBUS
ANDREW J. GINTHER, MAYOR

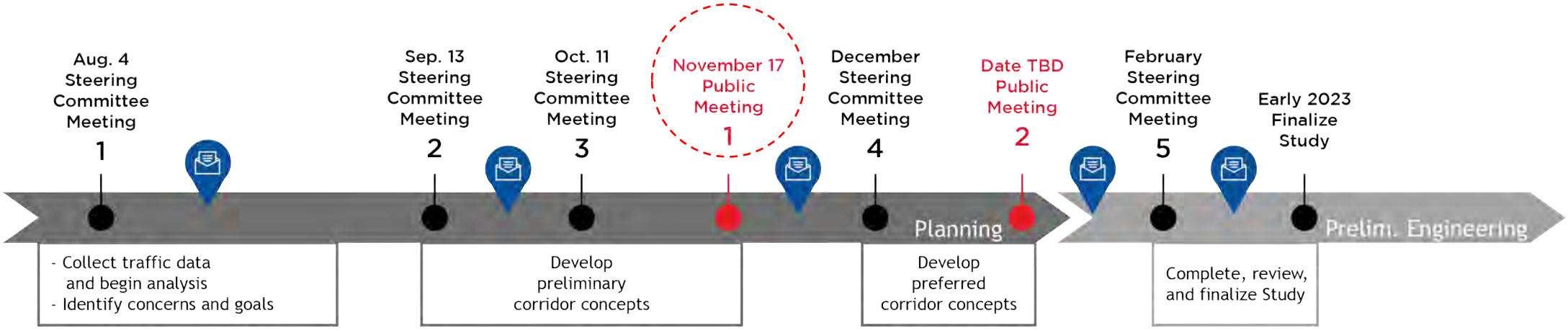
Upcoming Public Meeting

November 17, 2022

Driving Park Recreation Center (Small Gym)

Still working out specific times

- Likely lunch time option and evening option



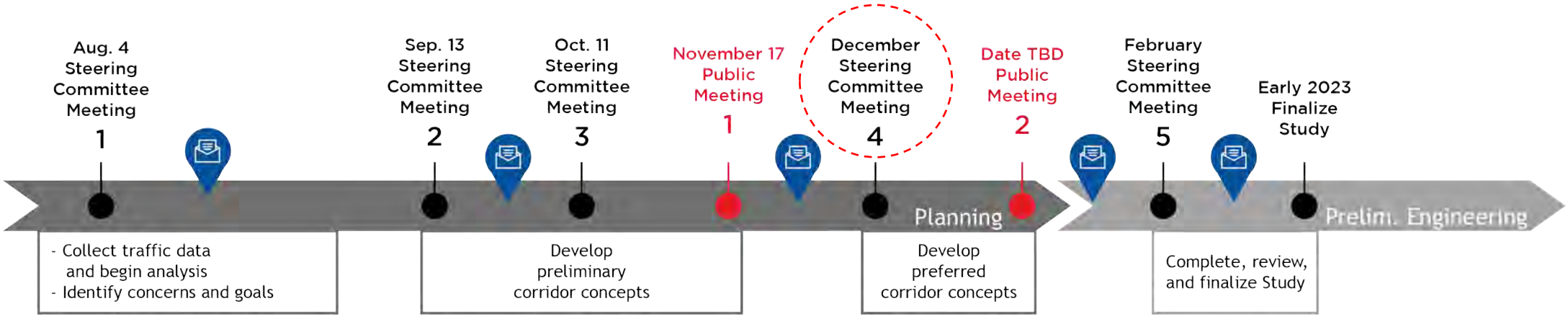
Next Steering Committee Meeting

December 13, 2022

Same location (Library – Driving Park Branch)

Agenda will be sent prior to meeting

- Present what we heard at public meeting



THE CITY OF COLUMBUS
ANDREW J. GINTHER, MAYOR

Pedestrian Generator Map Activity

- Take home survey provided
- Additional generator locations? Anything we're missing?
- Please provide responses to team (send to Abby) by December 2

Pulse Check Questionnaire

Let us know how we're doing!

- Please complete survey (paper copy or online) before you leave

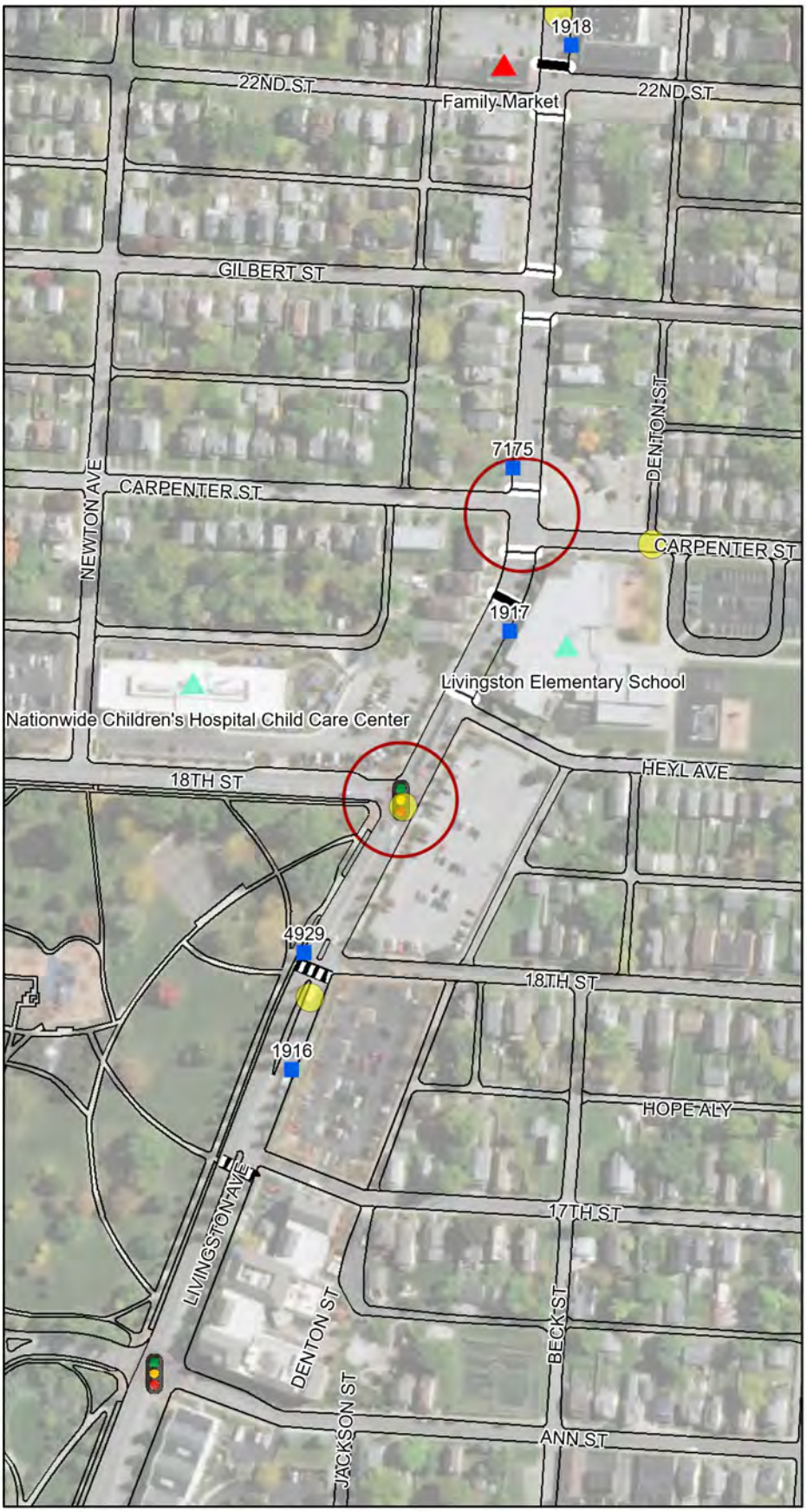
Thank you!

ATTACHMENT D

Pedestrian Generator Map and Activity

Livingston Ave Corridor

Pedestrian Generators and Crashes



Legend

- Map Insert Area
- COTA Stop
- Study Intersection
- Traffic Signal
- RRFB/Ped Signal
- Marked Crosswalk
- Unmarked Crosswalk
- Community Center
- Gas
- Grocery
- School or Library
- Restaurant
- Worship
- Pedestrian Crash

COTA Bus Boardings (2020)

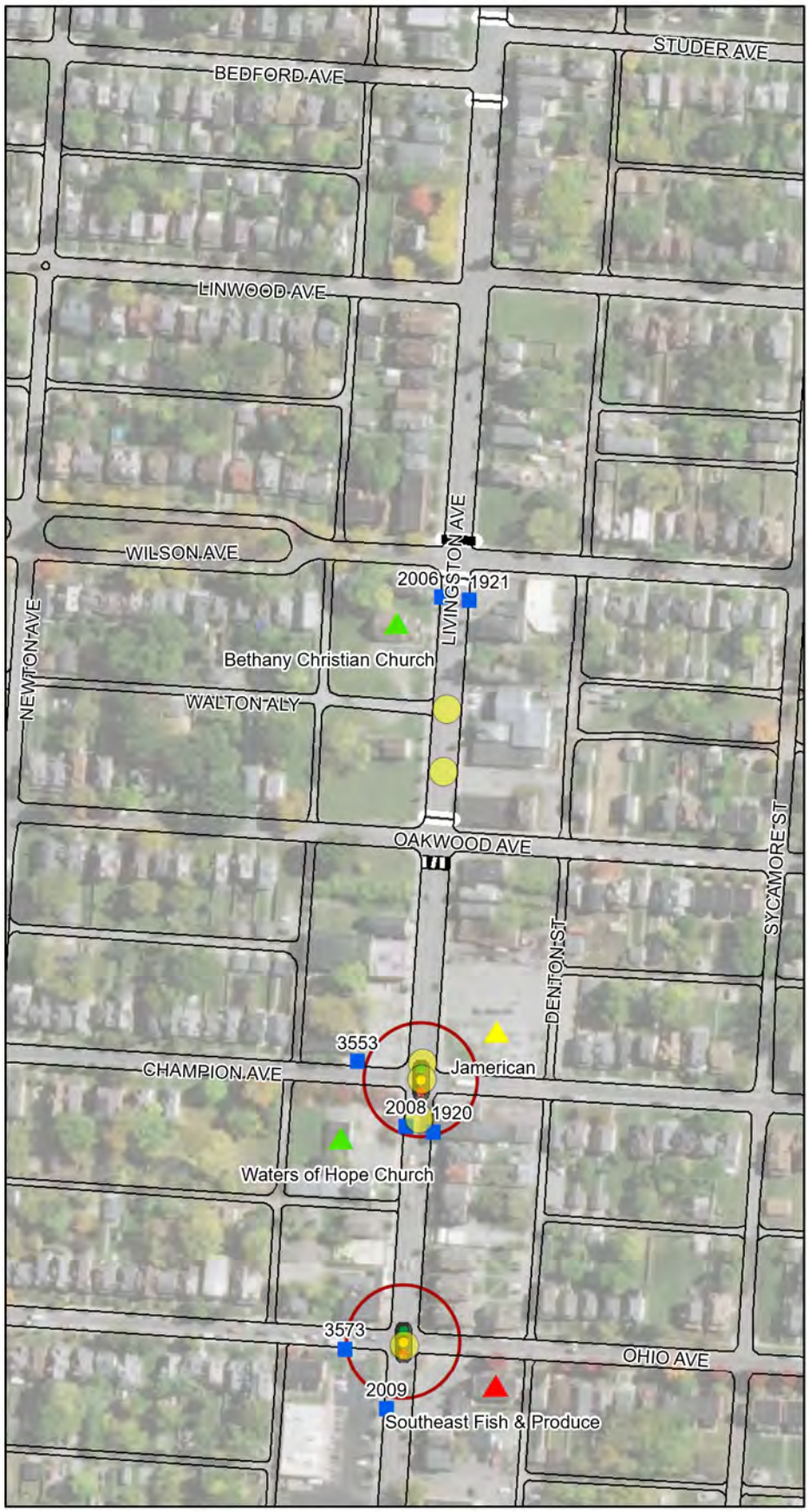
Stop ID	On	Off	Total	Lines
1916	8	7	15	001
1917	8	15	23	001
1918	20	39	59	001
4929	10	15	25	001
7175	15	9	24	001

0 125 250 500 Feet

N

Livingston Ave Corridor

Pedestrian Generators and Crashes



Legend

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- COTA Stop
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- RRFB/Ped Signal
- Marked Crosswalk
- Unmarked Crosswalk
- Community Center
- Gas
- Grocery
- School or Library
- Restaurant
- Worship
- Pedestrian Crash

0 125 250 500 Feet

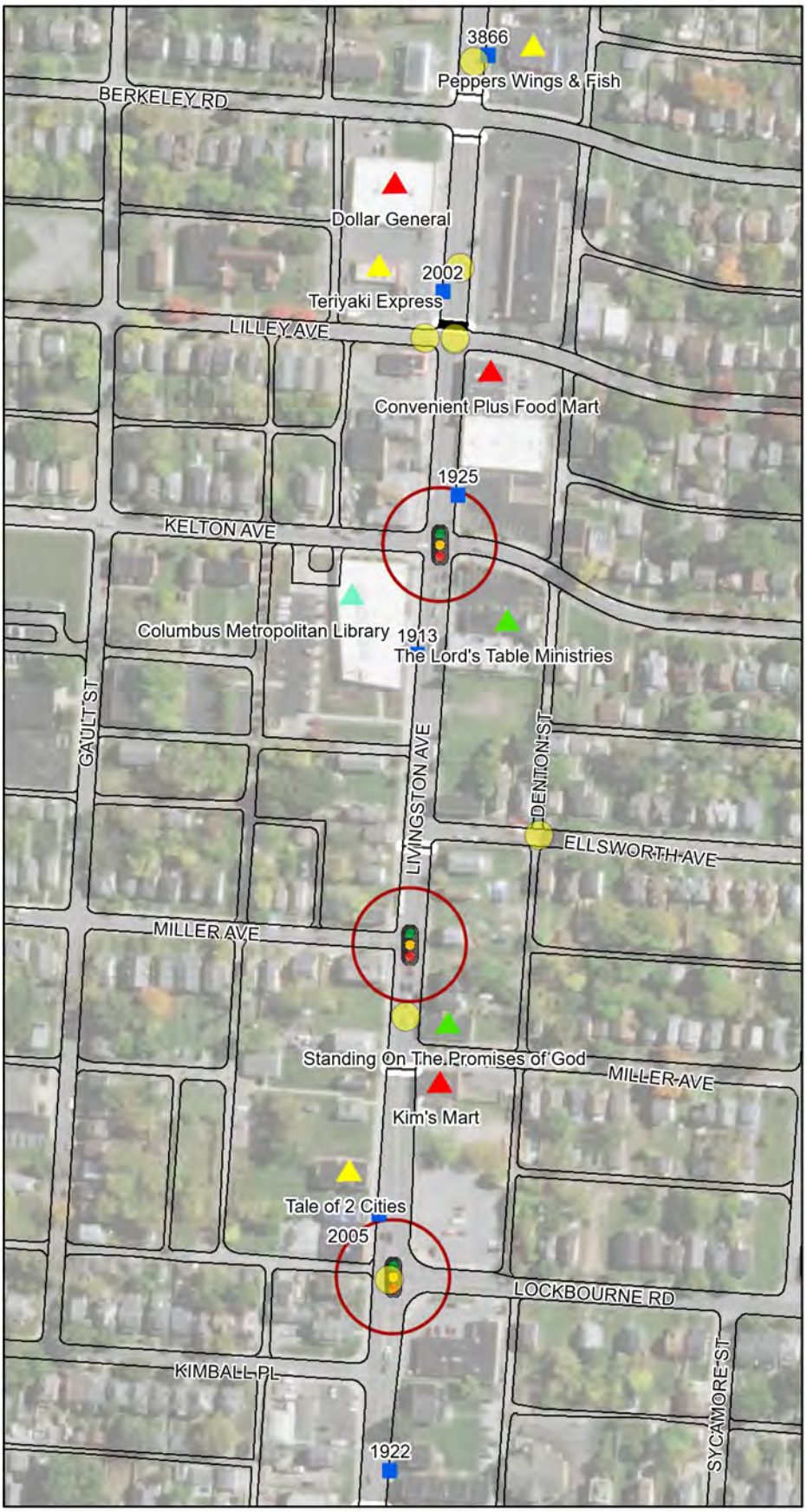
N

COTA Bus Boardings (2020)

Stop ID	On	Off	Total	Lines
1920	80	36	116	001
1921	13	14	27	001
2006	16	17	33	001
2008	55	50	105	001
2009	36	66	102	001
3553	49	87	136	022
3573	78	43	121	022

Livingston Ave Corridor

Pedestrian Generators and Crashes



Legend

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- COTA Stop
- Study Intersection
- Traffic Signal
- RRFB/Ped Signal
- Marked Crosswalk
- Unmarked Crosswalk
- Community Center
- Gas
- Grocery
- School or Library
- Restaurant
- Worship
- Pedestrian Crash

COTA Bus Boardings (2020)

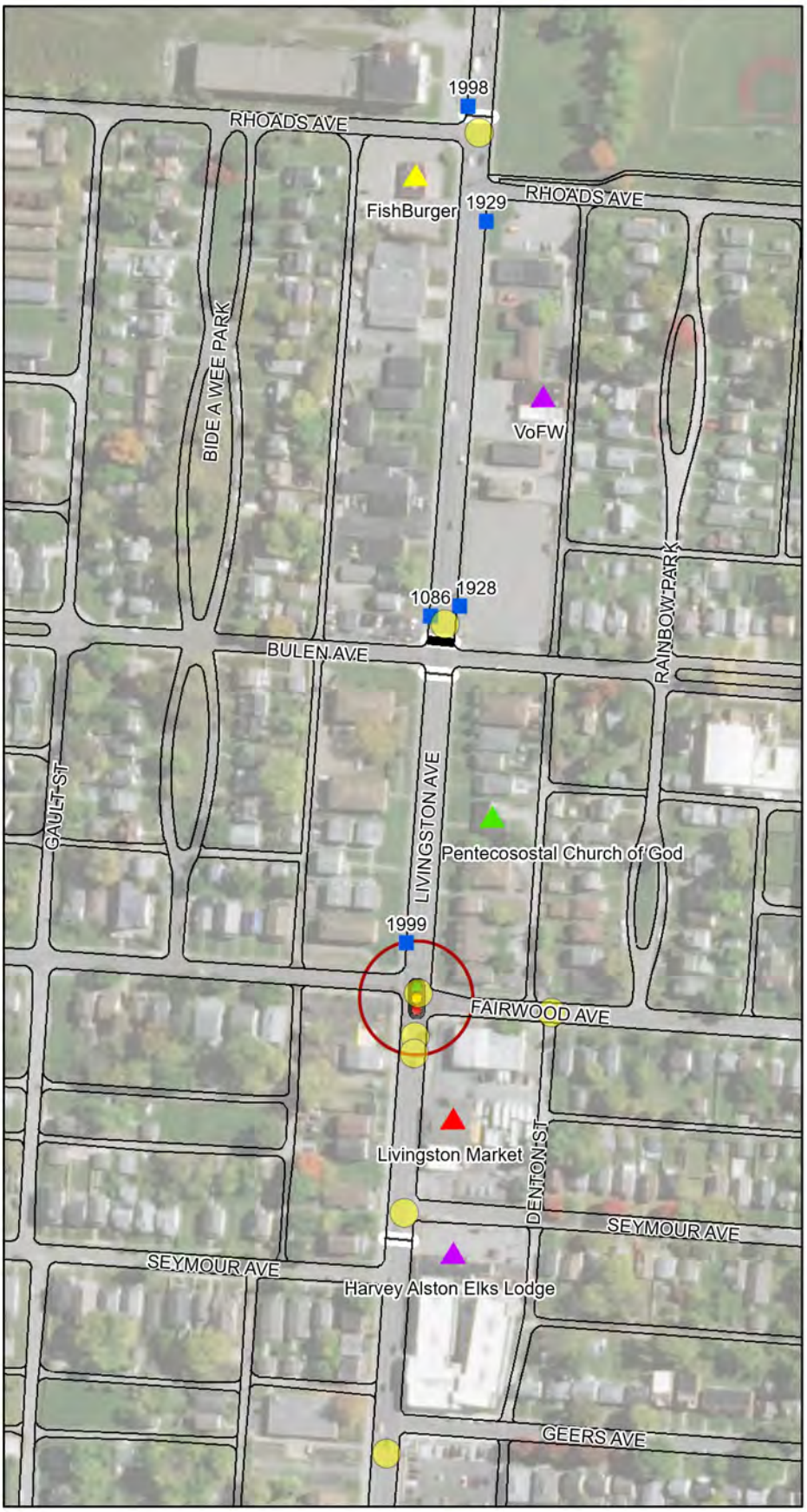
Stop ID	On	Off	Total	Lines
1913	28	12	40	001
1922	12	27	39	001
1925	24	50	74	001
2002	41	25	66	001
2005	27	13	40	001
3866	23	30	53	001

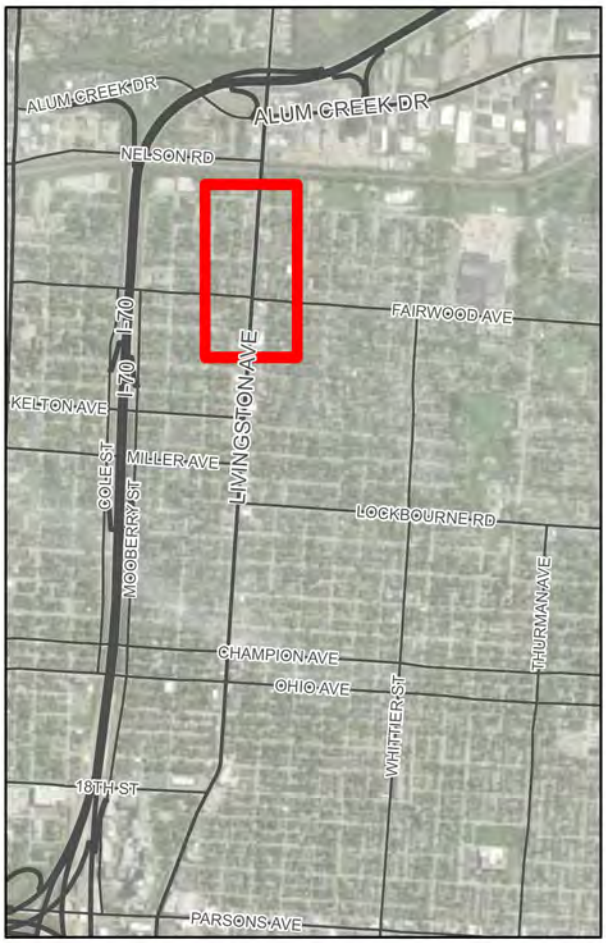
0 125 250 500 Feet

N

Livingston Ave Corridor

Pedestrian Generators and Crashes





Legend

- Map Insert Area
- COTA Stop
- Study Intersection
- Traffic Signal
- RRFB/Ped Signal
- Marked Crosswalk
- Unmarked Crosswalk
- Community Center
- Gas
- Grocery
- School or Library
- Restaurant
- Worship
- Pedestrian Crash

COTA Bus Boardings (2020)

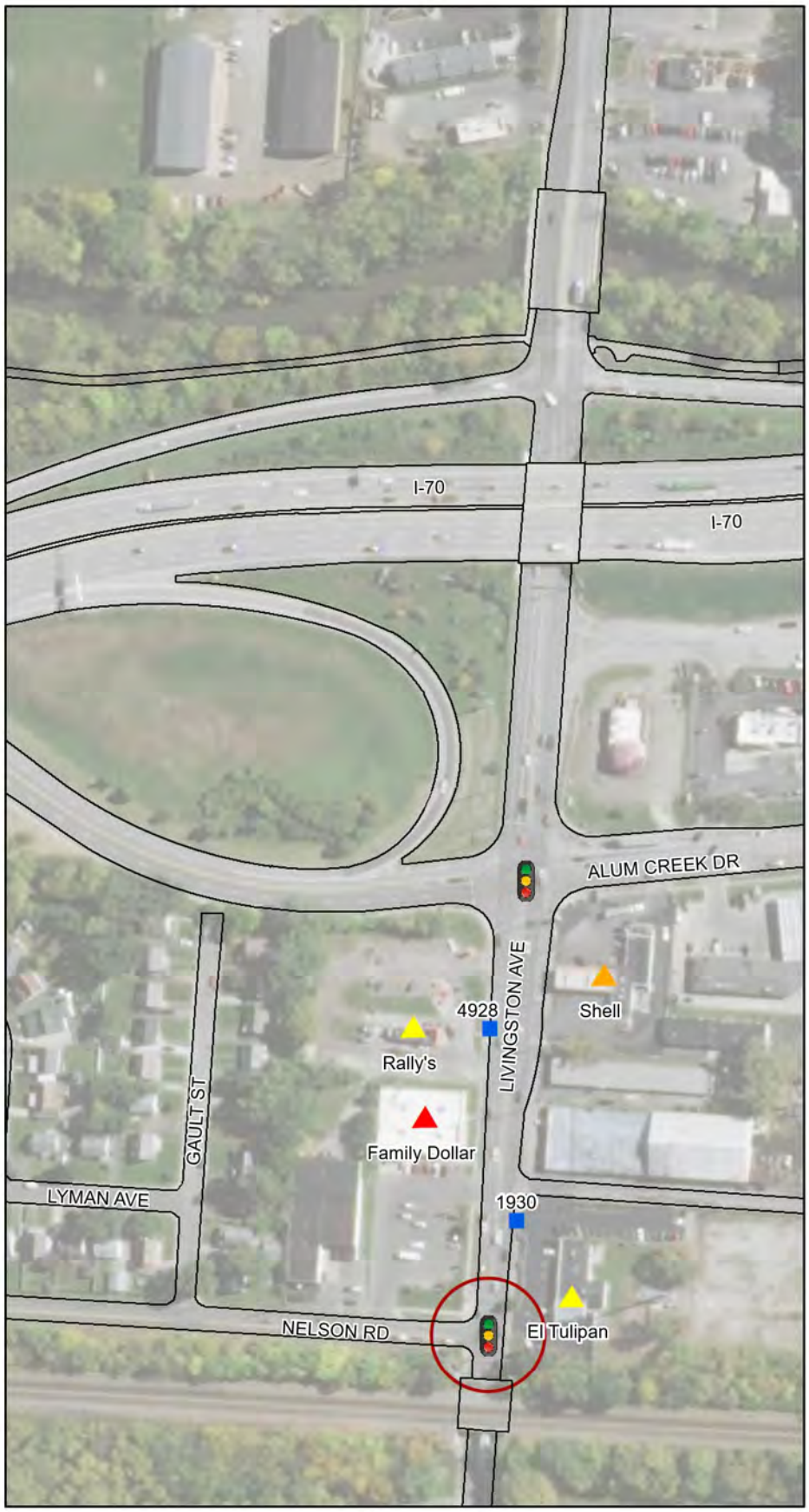
Stop ID	On	Off	Total	Lines
1086	9	9	18	001
1928	15	21	36	001
1929	7	10	17	001
1998	10	4	14	001
1999	31	19	50	001

0 125 250 500 Feet

N

Livingston Ave Corridor

Pedestrian Generators and Crashes



Legend

- Map Insert Area
- COTA Stop
- Study Intersection
- Traffic Signal
- RRFB/Ped Signal
- Marked Crosswalk
- Unmarked Crosswalk
- Community Center
- Gas
- Grocery
- School or Library
- Restaurant
- Worship
- Pedestrian Crash

COTA Bus Boardings (2020)

Stop ID	On	Off	Total	Lines
1930	25	46	71	001,011
4928	35	25	60	001

0 105 210 420 Feet

N

THE CITY OF COLUMBUS

Livingston Avenue Improvements Study
18th St to Nelson Rd

Pedestrian Generator Map Take-Home Activity

Please provide responses to Abby (aanacki@lawhon-assoc.com, 614-481-8600 ext. 175) by December 2, 2022.

1. **Are there any additional pedestrian generator locations that aren't identified?**

2. **Is there anything else we're missing that the data can't show us?**

ATTACHMENT E

Corridor Alternatives Survey

THE CITY OF COLUMBUS

Livingston Avenue Improvements Study
18th St to Nelson Rd

Corridor Transportation Options Survey

Based on the feedback received at prior steering committee meetings as well as technical data collected from the team, the project team has developed four corridor options to improve Livingston Avenue.

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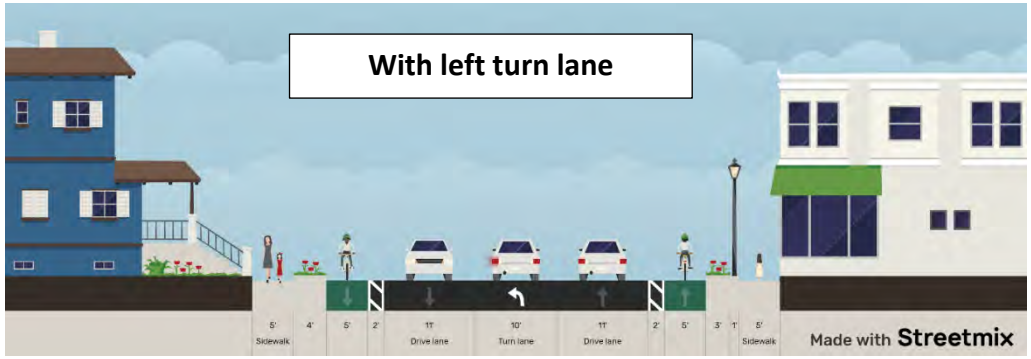
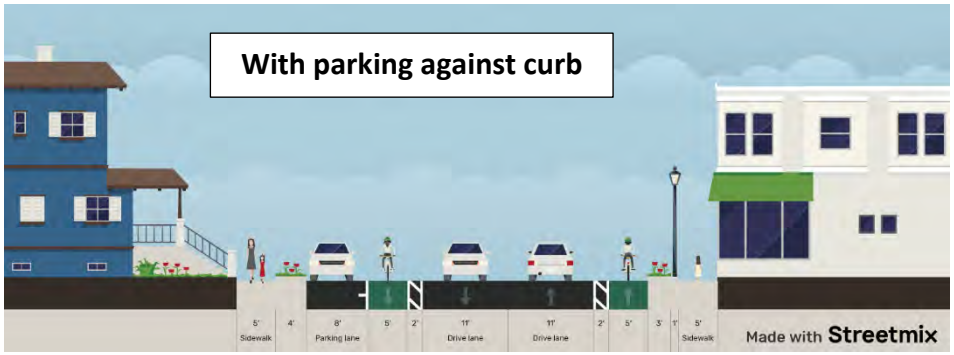
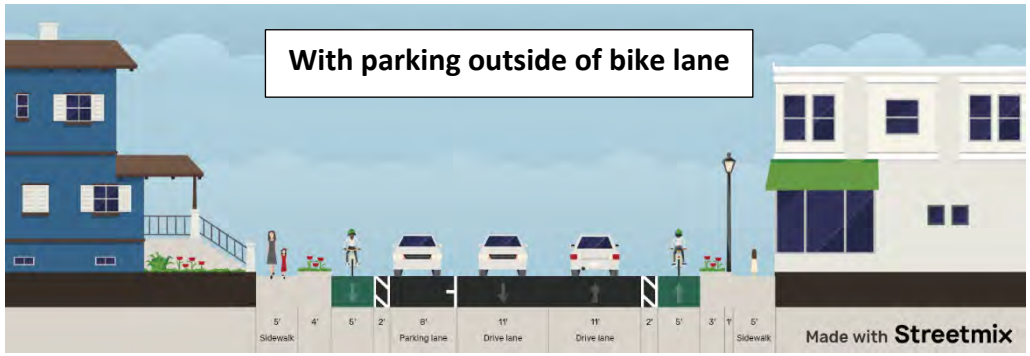
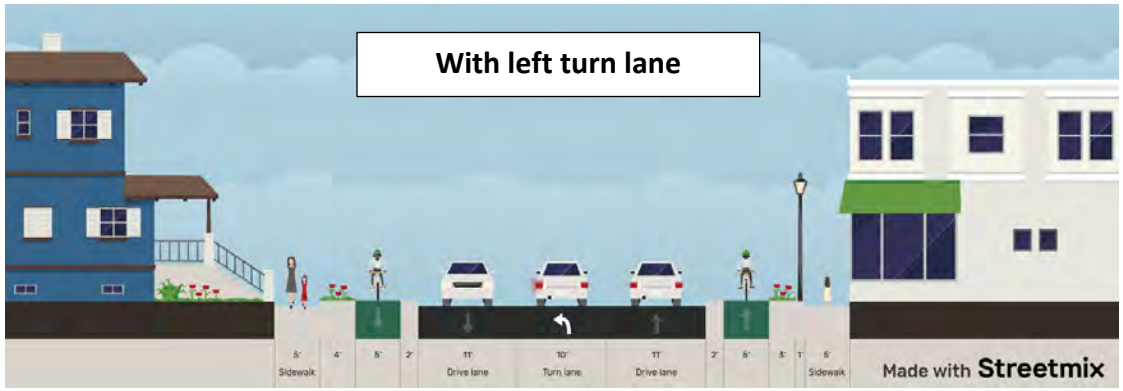


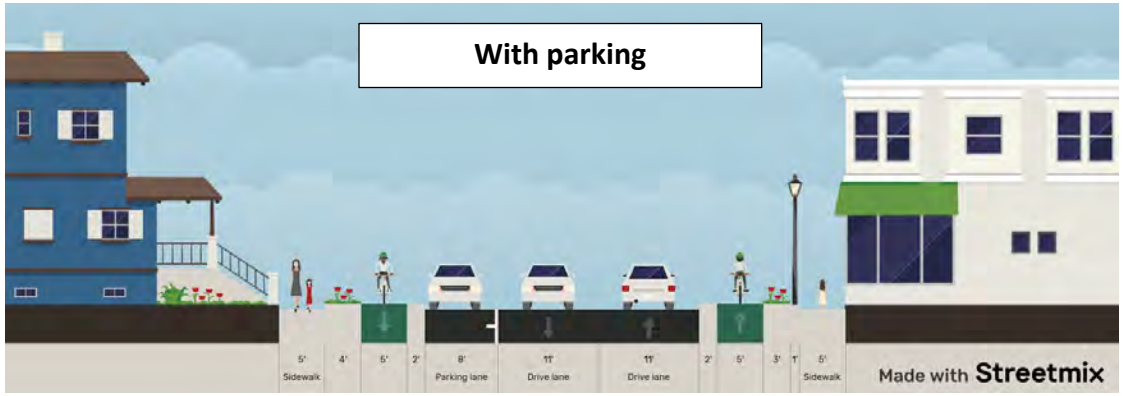




	1	2	3	4	
Least interested in this improvement	○	○	○	○	Most interested in this improvement

2. The following images represent typical sections showing a road diet with raised bike lanes.

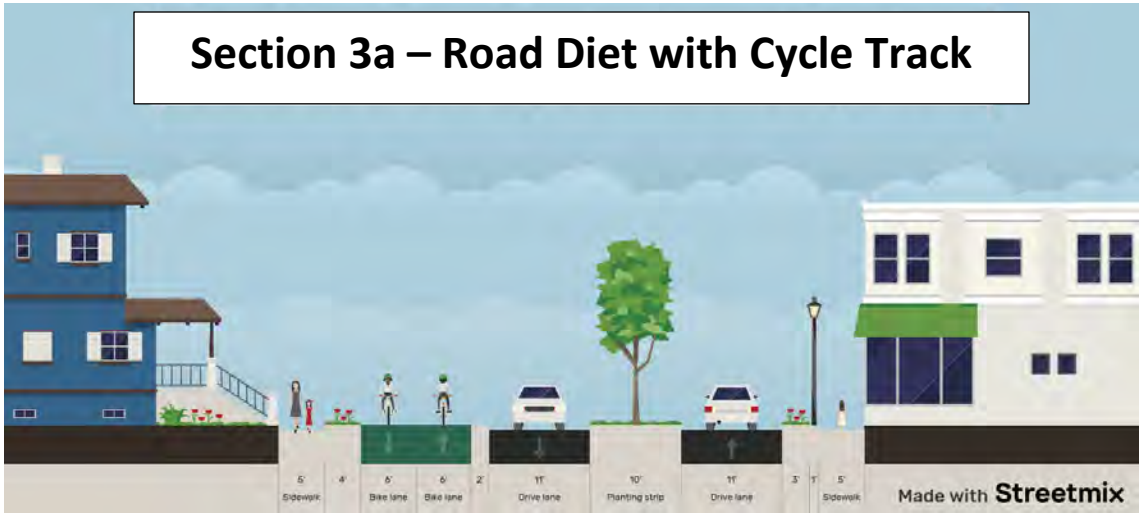


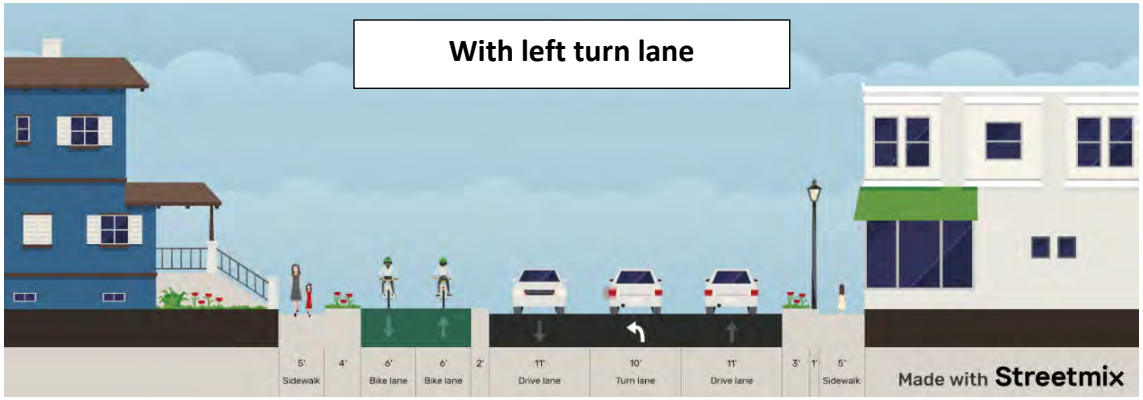


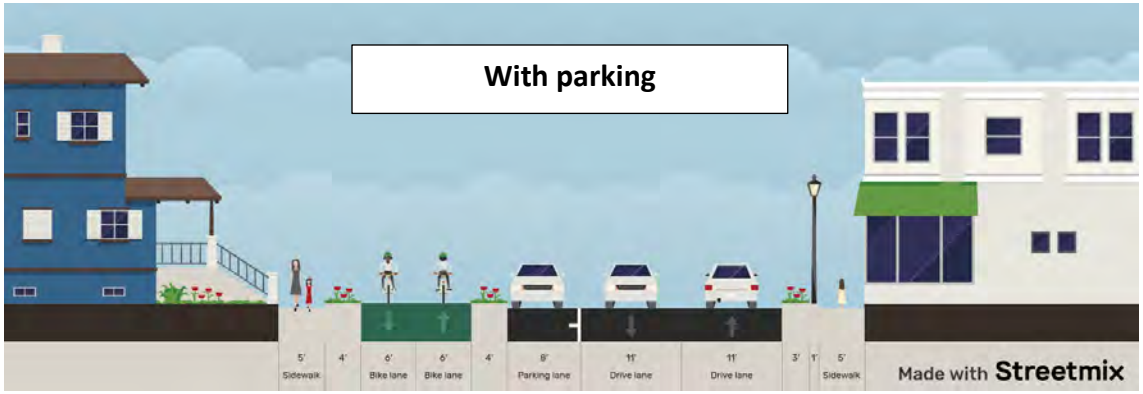
1 2 3 4

Least interested in this improvement ○ ○ ○ ○ Most interested in this improvement

3. The following images represent typical sections showing a road diet with a cycle track.

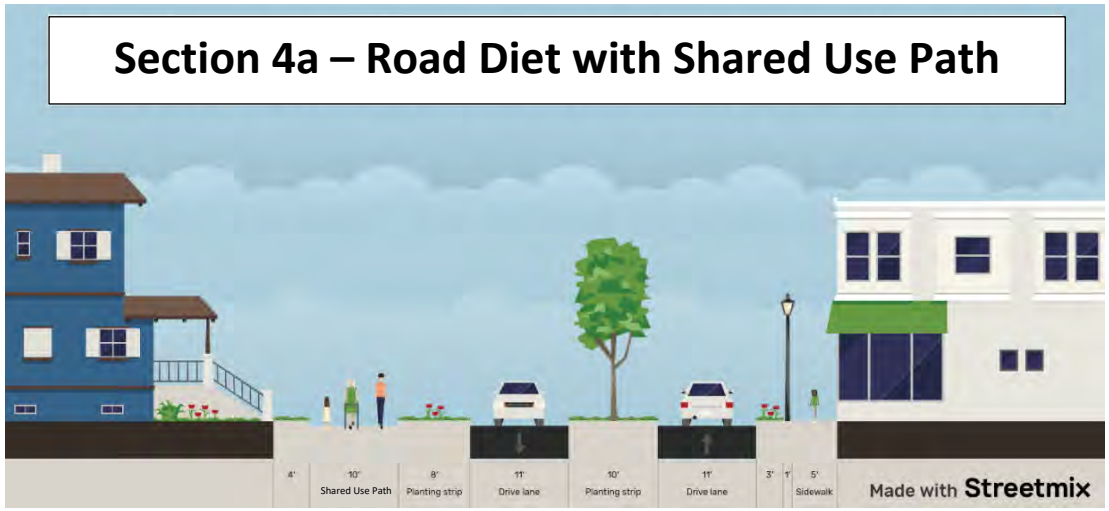


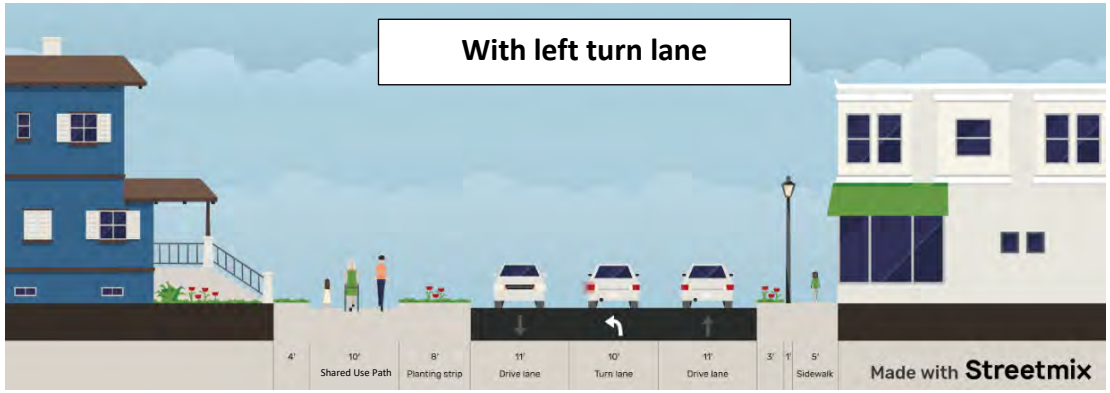


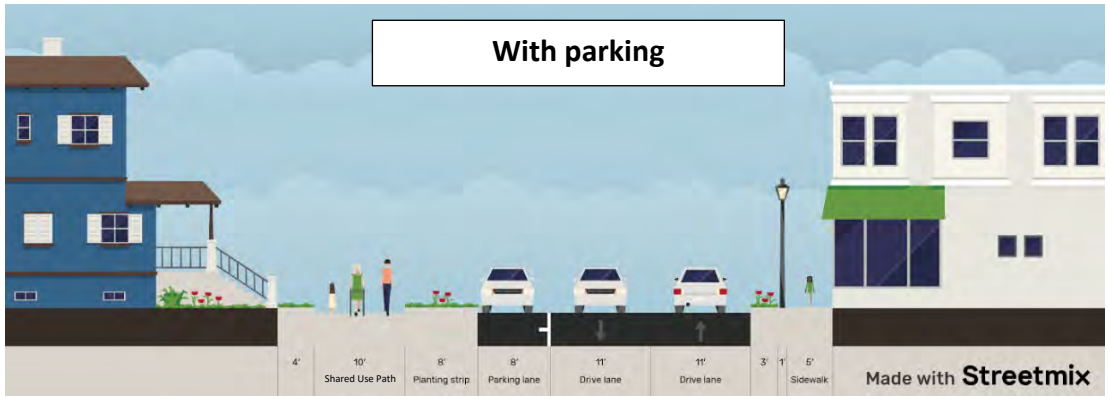


	1	2	3	4	
Least interested in this improvement	○	○	○	○	Most interested in this improvement

4. The following images represent typical sections showing a road diet with a shared use path.







	1	2	3	4	
Least interested in this improvement	○	○	○	○	Most interested in this improvement

5. Which corridor option do you think would be most useful to you?

   ◯ Road Diet with Bike Lanes

   ◯ Road Diet with Raised Bike Lanes

   ◯ Road Diet with Cycle Track

   ◯ Road Diet with Shared Use Path

   ◯ Other: _____

6. Why would this corridor option be most useful to you? If you chose none or other, what option would be more useful, and why?

   _____

   _____

   _____

   _____

   _____

7. Is there anything else you would like us to know?

   _____

   _____

   _____

   _____

   _____

ATTACHMENT F

Alternatives Survey Results

Live Survey

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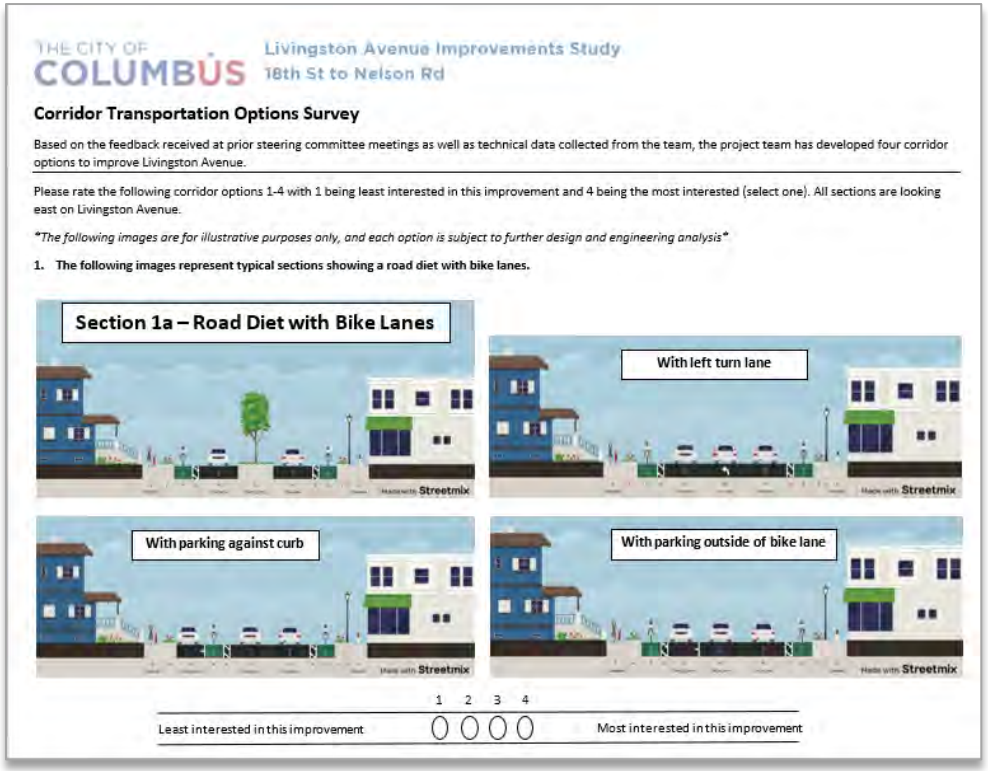
- We will then share and discuss the results



THE CITY OF COLUMBUS

Livingston Avenue Improvements Study
18th St to Nelson Rd

Corridor Transportation Options Survey

Based on the feedback received at prior steering committee meetings as well as technical data collected from the team, the project team has developed four corridor options to improve Livingston Avenue.

Please rate the following corridor options 1-4 with 1 being least interested in this improvement and 4 being the most interested (select one). All sections are looking east on Livingston Avenue.

The following images are for illustrative purposes only, and each option is subject to further design and engineering analysis

1. **The following images represent typical sections showing a road diet with bike lanes.**

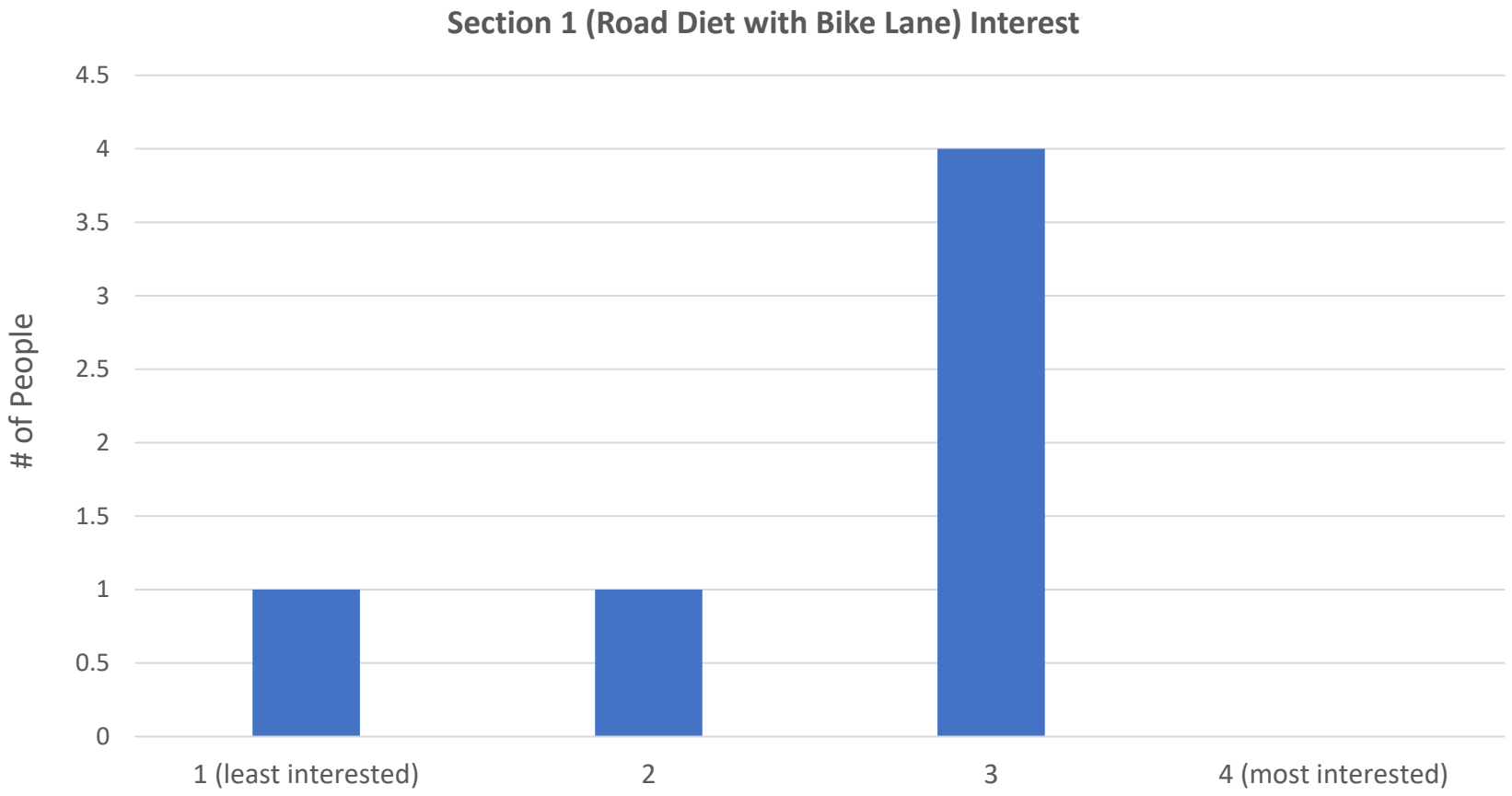
Section 1a – Road Diet with Bike Lanes

1 2 3 4

Least interested in this improvement ○ ○ ○ ○ Most interested in this improvement

THE CITY OF COLUMBUS
ANDREW J. GINTHER, MAYOR

Section 1: Road Diet with Bike Lanes



2.5

Average Ranking

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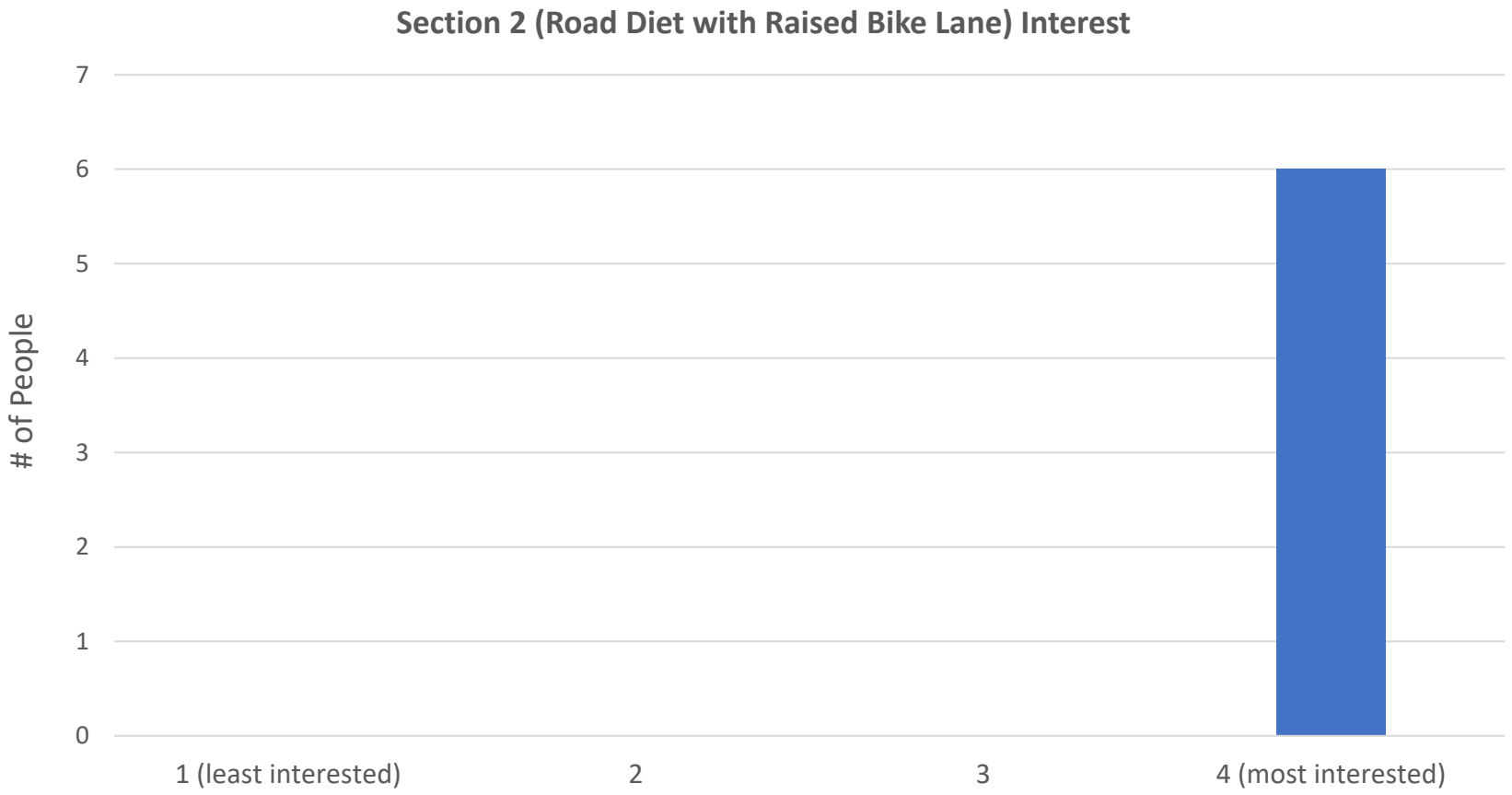
Section 2: Road Diet with Raised Bike Lanes



4.0

Average Ranking

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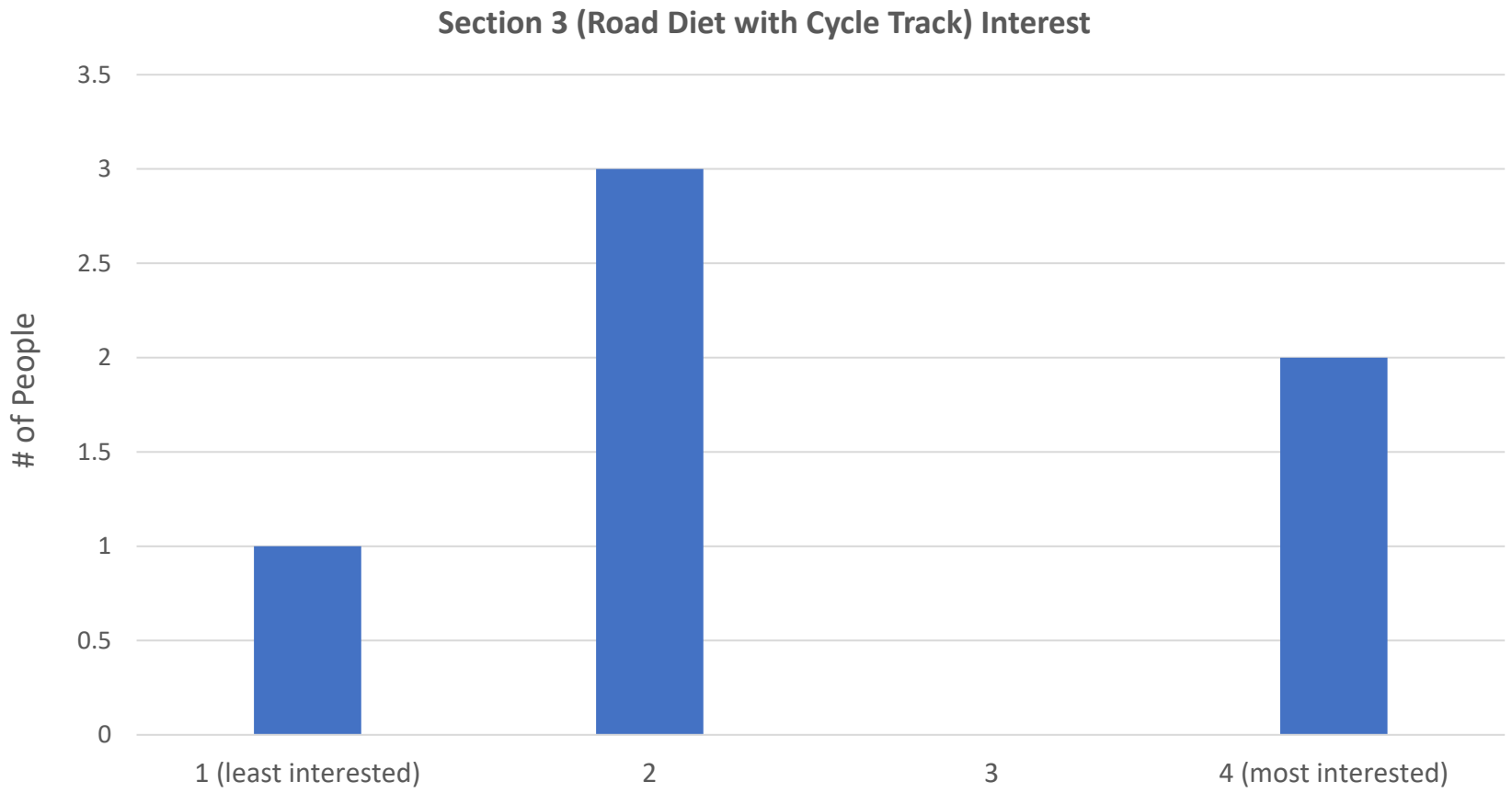
ANDREW J. GINTHER, MAYOR

Section 3: Road Diet with Cycle Track



2.5

Average Ranking

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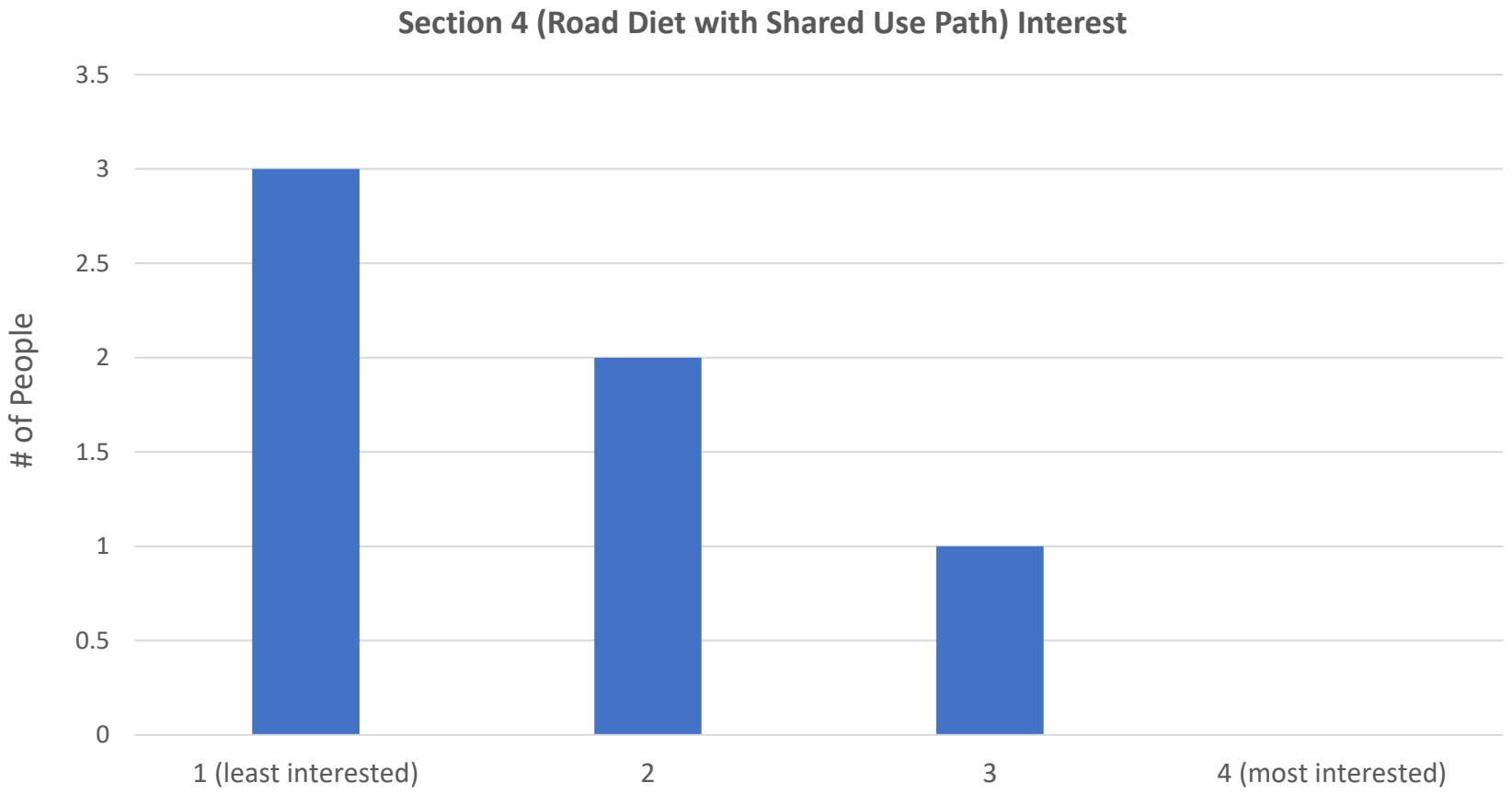
ANDREW J. GINTHER, MAYOR

Section 4: Road Diet with Shared Use Path



1.6

Average Ranking

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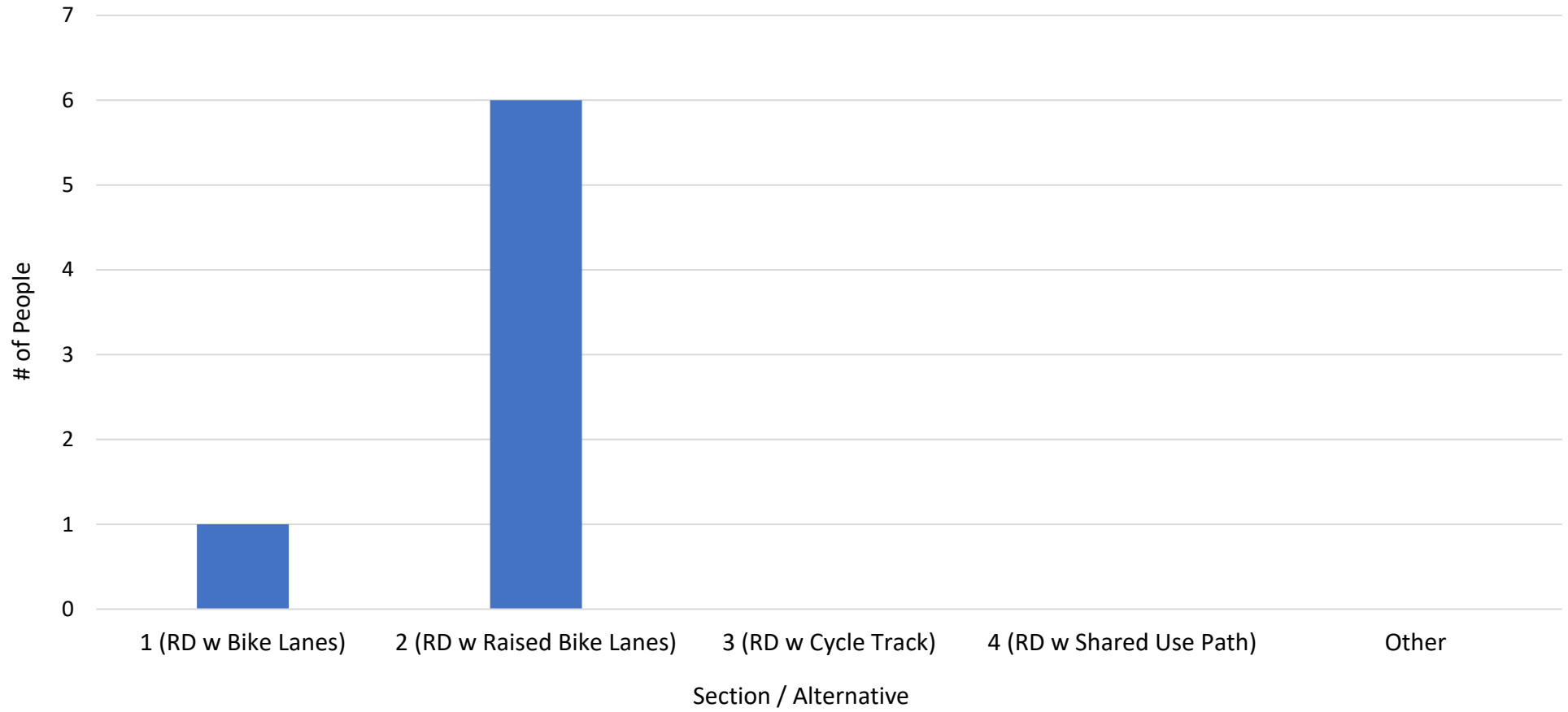
Which corridor option do you think would be the most useful to you?

*Please note, one survey marked 2 options for this question



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ATTACHMENT G

Pulse Survey

Livingston Avenue Improvement Study

Steering Committee Pulse Check

September 13, 2022

1. Rate the effectiveness of:	Very Poor	Poor	Good	Very Good
a) The information covered	☐	☐	☐	☐
b) Discussion opportunities	☐	☐	☐	☐
c) The format of today's meeting	☐	☐	☐	☐
d) Your comfort speaking up	☐	☐	☐	☐

2. Based on today's session:	Strongly Disagree	Disagree	Agree	Strongly Agree
a) I understand the purpose of the Livingston Avenue Study	☐	☐	☐	☐
b) I understand the role of the team	☐	☐	☐	☐
c) I believe this project will lead to meaningful results	☐	☐	☐	☐
d) I am committed to support this team's success	☐	☐	☐	☐
e) I believe that the City of Columbus demonstrates commitment to the work of this team	☐	☐	☐	☐

3. Rate the following:	Very Poor	Poor	Good	Very Good
a) Steering Committee's preparedness for today's meeting	☐	☐	☐	☐
b) Steering Committee's ability to work together at today's meeting	☐	☐	☐	☐

4. What went well today? _____

_____

5. What could have been improved? _____

_____

6. How do you feel about the progress of the team so far? _____

_____

7. What is one key learning experience you have had thus far? _____

_____

Name: _____ ***THANK YOU!***

Newsletter #3

THE CITY OF COLUMBUS

Livingston Avenue Improvements Study
18th St to Nelson Rd

Newsletter 3 - November 4, 2022

Highlights

- City of Columbus completing study to make improvements to Livingston Avenue from 18th St. to Nelson Rd.
- Third Steering Committee meeting held October 11th
- Public meeting is November 17, 2022
- Public meeting details will be posted on the project webpage below
- Next newsletter update anticipated January 6

Questions or Comments?

Contact:

Eric Lambert
City of Columbus, Project Manager
614-645-2732
SELambert@columbus.gov

For more information:

www.columbus.gov/LivingstonAvenuePedestrianSafetyStudy

This newsletter provides information and updates on the Livingston Avenue Improvements Study.

Project Background

Livingston Avenue is on the Vision Zero Columbus High Injury Network. The corridor has a higher density of fatal and serious injury crashes that threaten the safety of pedestrians, cyclists, transit users and drivers. The city is addressing this issue along the corridor, with the Livingston Avenue Improvements Study focused on the section from 18th Street to Nelson Road to promote safety for all roadway users and reduce vehicle speeds and severe crashes.

Process Recap

Steering Committee Meeting #1

- Introduced the study and schedule
- Outlined roles and responsibilities
- Defined goals for the Study

Steering Committee Meeting #2

- Presented design "toolbox"
- Committee members brainstormed corridor concepts/layouts
- Started to conceptualize corridor concepts

Steering Committee Meeting #3

- Presented preliminary corridor concepts
- Received feedback/interest in each concept
- Revised/narrowed corridor concepts based on feedback

Upcoming Public Meeting Open House

The purpose of the first public meeting is to present draft layouts and ideas for this section of Livingston Avenue and receive feedback. The layouts to improve mobility and safety were developed with input from the project Steering Committee, comprised of neighborhood residents and business, faith and community organization representatives.

Since the meeting will be held in an open house style format, you're welcome to join us at any time during the timeframes listed to the right. The same information will be presented at both meetings. There will be a presentation at 12:30 p.m. and 6 p.m. City staff and the study project team will be on hand to help answer questions.

To receive a copy of the materials presented at the public open house by mail or if you need other special accommodations to participate, please contact Eric Lambert at the contact information provided on the previous page.

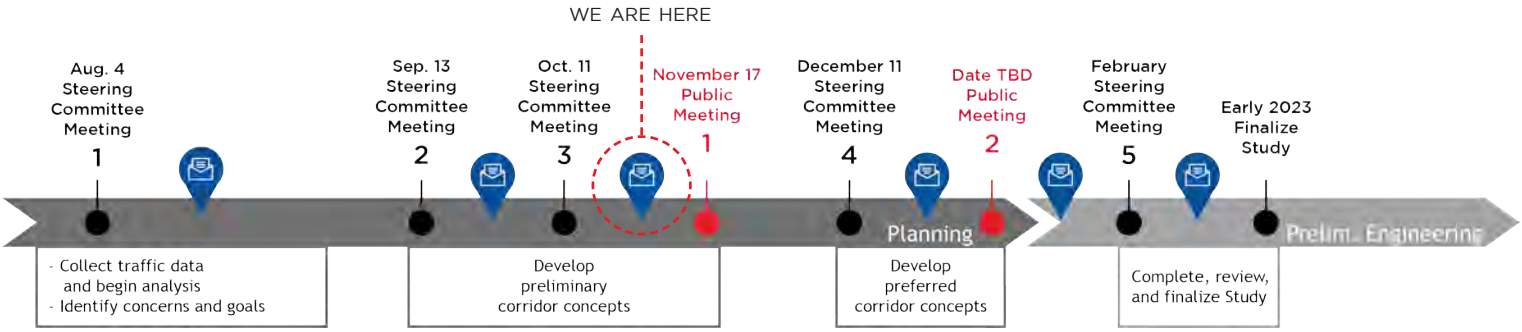
All are welcome!

November 17

Driving Park Community Center

12 p.m. - 2 p.m.
Presentation at 12:30 p.m.
&
5:30 p.m. - 7:30 p.m.
Presentation at 6:00 p.m.

Next Steps



Steering Committee Members

Michael Aaron
Rickenbacker Woods Community Foundation

Pastor Jonathan Bradford
Bethany Baptist Church

Danielle Dillard
Livingston Avenue Area Commission

David Gray
Livingston Avenue Area Commission

Stacee Green
Driving Park Civic Association

Rita Hallaveld
Resident & Cyclist

Molly Hogue
Resident

George Holliman
Livingston Avenue Area Commission

Rachel Robinson
Southern Orchards Civic Association

Jerry Saunders
Africentric Personal Development Shop

Erin Synk
Columbus South Side Area Commission

Ralph Walker
Livingston Ave. Columbus OH Safety Group

Sherman Willis
Community Business Owner

Steering Committee Meeting #4
Meeting Minutes

Meeting Minutes

Meeting Name:	Livingston Avenue Steering Committee #4	
Date:	December 13, 2022	**Time: 5:30 PM**
Location:	Columbus Metropolitan Library, Driving Park Branch	**Host:** City of Columbus
Attendees:	Livingston Avenue Steering Committee members City of Columbus CHA Lawhon and Associates See *Attachment A* for a list of attendees	

Greeting & Introduction:

- The meeting started around 5:35 PM. The agenda can be seen in *Attachment B*.
- A PowerPoint presentation was utilized to guide the meeting and is included as *Attachment C*.
- Eric Lambert (City of Columbus) reviewed the pulse check questionnaire responses from the previous meeting.
- Meeting effectiveness scores decreased slightly compared to last meeting, discussion opportunities has decreased from both the first and second steering committee meeting
- Overall, the understanding of the study and commitment to the study increased from previous meetings
- The steering committee's ability to work together was ranked a 4/4 by all respondents

Revisit Identified Goals:

- Chantil Milam (Lawhon) reviewed issues and goals established throughout previous meetings. Emphasis was placed on the purpose and need statement, which will serve as the basis for identifying environmental impacts within the alternatives analysis. Issues identified previously include safety, and in particular reducing speeding and crashes on the corridor; and increasing mobility and access across all transportation modes, including transit, walking, and biking.

Public Meeting Recap and What We Heard:

- The public comment period remains open until Saturday, December 17th.
- The steering committee members weighed in on what they heard from residents regarding the public meeting:
    - On-street parking came up as an issue.
    - The presentation was clear and went smoothly.
    - The primary concern is the median preventing access to side streets.
    - Concern that residents living directly on Livingston Avenue were not represented.
- Many of the comments received came from residents of the area, or business/property owners that use Livingston Avenue daily
- Abby Anacki (Lawhon) reported that roughly 90% of respondents to the public survey were interested in the road diet with raised bike lanes.

Discussion & Board Activity:

- Cory Lamb (CHA) reviewed the proposed configuration from the public meeting and asked steering committee members whether this was still consistent with the project goals. Eric requested that committee members focus on making a recommendation to the City regarding the proposed configuration of Livingston Avenue and stressed the importance of coming to a consensus, as it would present a stronger argument for change.
- Jerry Saunders (Steering Committee) identified the root of the issue as community identity and that on-street parking and bike lanes were simply symptoms of a larger issue that was not being addressed. He stressed the importance of planning for the future and how limited access (due to the median configuration) may impact residents and businesses.
- Rita Hallaveld (Steering Committee) agreed but also reasoned that this project won't necessarily address everything. This project would be able to make the community safer with slower traffic and greater walkability, which in turn would make the corridor more attractive to businesses. She cited case studies outlining positive impacts to businesses when areas are walkable and have protected bike facilities. She requested additional information on how to accommodate transit, as it would be the goal to increase transit use over time and not lessen it.
- Cory noted that COTA has been engaged on this project and will continue to weigh in on COTA bus routing and stops throughout the design process.
- Mike Aaron (Steering Committee) noted that the community identity could be addressed through design, at which time aesthetics can be added and create that identity. He stressed planning for the future, which may happen quickly (5-10 years) with the rate that the City is growing. He described the City as still car-centric, and that on-street parking is still needed, especially in the commercial areas between Champion and Ohio, and Kelton and Fairwood. He said that most people rely on on-street parking who live on

Livingston Avenue. He stated that he is for walkability and bike paths, but that he wants some vibrancy and color to be included, such as green bike lanes (example in Tel Aviv).

- Jerry suggested using vacant lots for parking lots or electric vehicle charging stations.
- Danielle Dillard (Steering Committee) noted that this project is still in its conceptual phase and that identity could be added later on in design. The on-street parking is a chicken and egg problem – creating corridors that are pedestrian and transit focus may cause growing pains, but even with some parking set aside, there will never be enough parking for everyone. Danielle also stated that she is an urban core neighborhood resident, and as such, expects for people to park on her street, and that this is common in big cities. She also said many of the existing businesses have off-street parking lots available. The City's vision is for transit and pedestrian focused streets. She is not opposed to adding parking, but believes that only minimal parking is necessary (if that).
- George Holliman (Steering Committee) noted that Livingston Avenue residents don't feel safe parking behind their residences in the alley. Older people may need to park on-street. He questioned the consensus with only five steering committee members in attendance and the 63 people represented during the public meetings. He feels that the process seems rushed to have only one public meeting.
- Danielle said that the community involvement should also be a responsibility of the committee members, and that they should be encouraging people to take the public survey and provide comments. She doesn't think the process was rushed – they've had several months to get the word out. George noted that the postcards were sent during election season, which caused many people to just throw them away; he suggested a more boots on the ground approach and knocking on doors to get people involved.
- Kelly Scocco (City of Columbus) clarified that the medians wouldn't necessarily be included within the entire length of Livingston Avenue. She suggested for the cross sections to change across the corridor, accounting for on-street parking or medians. The configuration shown at the public meeting was a starting point and can be refined, especially during the design phase.
- Rita stated that safety should be the first item resolved for the corridor and is an essential starting point. She thought that everyone agreed that infrastructure for other modes should be provided. She also posed a question to the group, do we have a sense of which homes do NOT have off-street parking? She suggested this be determined through further research and consider where to focus trade-offs for on-street parking. Jerry agreed with researching the parking further, but also asked how many people were riding bikes. Rita countered that protected bike lanes protected all users and studies have shown that they also help to increase retail sales.
- Danielle added that if people felt safe then people would ride bikes more. She said you cannot gauge that parking is more important versus bike infrastructure when the infrastructure isn't in place.
- Cory clarified that on-street parking wouldn't conflict with the bike lanes as proposed; and that the bike lanes need to be continuous to provide clear direction for users. Where right-of-way is limited could impact where on-street parking is placed.
- Mike asked about a two-way bike facility on one side of the street (commonly referred to as a cycle track) instead of bike lanes on both sides.
- Cory noted that a cycle track was reviewed as part of the alternatives analysis, but the same challenges would be present. In particular, Rita noted that it would be more difficult for commuters and harder to access bus stops on the other side of the street.

Board Activity:

- Steering committee members were urged to provide specific feedback on the boards presented during the public meeting (I.e. on street parking should be from x street to x road, the median should be broken at x street, the median should remain at x road so that access is restricted).
- The board comments were organized and can be viewed in *Attachment D.*

Next Steps:

- The next meeting will take place in February. The project team will update the roll plot with comments from this meeting. The goal will be to provide a draft recommendation to design. There will also be another public meeting early next year.
- Abby and Chantil will explore other engagement methods for the next public meeting and will also check data from the public survey to see if there were any responses from residents living on Livingston Avenue.
- Eric Lambert (City of Columbus) asked steering committee members to fill out the pulse check questionnaire before leaving. Pulse check questionnaire can be viewed in *Attachment E*.
- The meeting was adjourned at 7:30 p.m.

ATTACHMENT A

Attendee List

Livingston Avenue Improvements Study – Steering Committee #4 December 13, 2022

Attendees

Steering Committee:

- Mike Aaron
- Danielle Dillard
- Rita Hallaveld
- George Holliman
- Jerry Saunders

City of Columbus:

- Justin Goodwin
- Emma Kogge
- Eric Lambert
- Kelly Scocco
- Matt Lorenz
- Alex Sauersmith
- Greg Sprungle

CHA:

- John Gallagher
- Cory Lamb

Lawhon:

- Abby Anacki
- Chantil Milam

ATTACHMENT B

Meeting Agenda

Livingston Avenue Improvements Study – 18th St to Nelson Road
Steering Committee Meeting 4 Agenda

Date: Tuesday, December 13, 2022
Time: 5:30 – 7:00
Location: Columbus Metropolitan Library, Driving Park Branch, Meeting Rooms 2 and 3

5:30 – 5:35 Greeting

- Pulse check questionnaire results

5:35 – 5:45 Revisit Identified Goals

5:45 – 5:55 Public Meeting Recap & What We Heard

5:55 – 6:55 Discussion & Board Activity

- Board Activity Recap

6:55 – 7:00 Next Steps

- Next meeting date
- Pulse Check

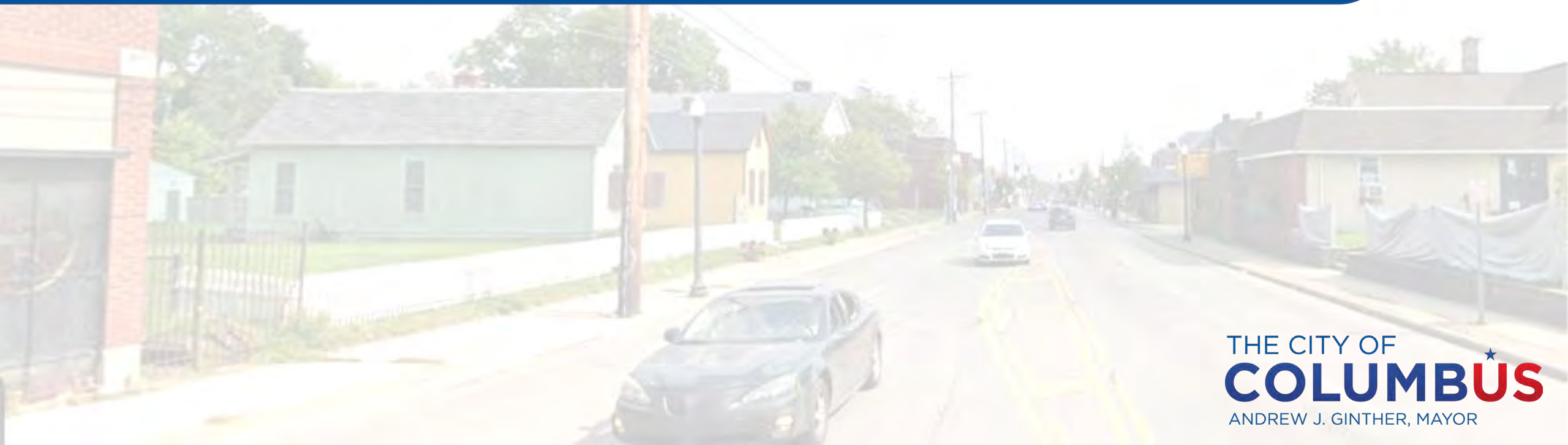
ATTACHMENT C

PowerPoint Presentation

Livingston Avenue Improvements Study – 18th St to Nelson Rd

Steering Committee Meeting #4

December 13, 2022



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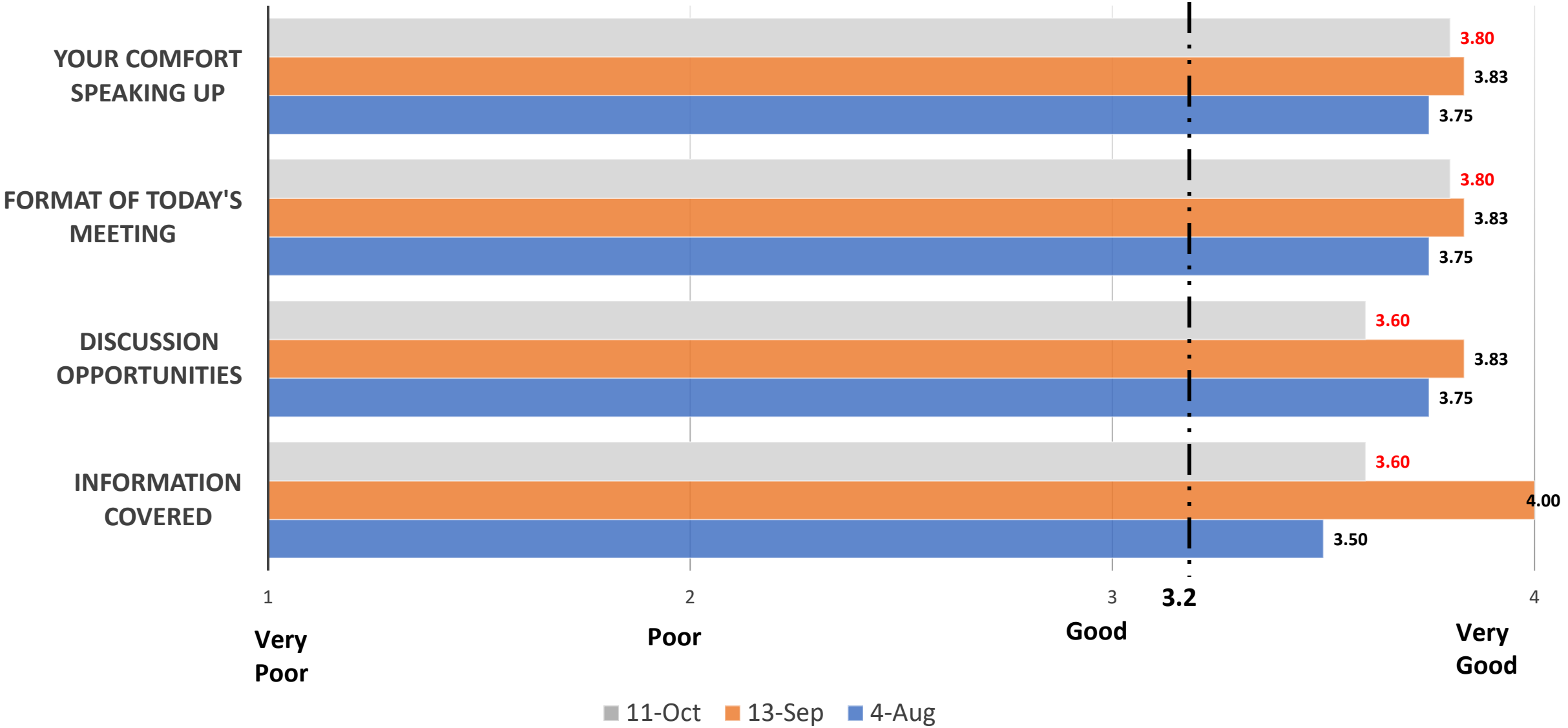
ANDREW J. GINTHER, MAYOR

Agenda (1 hour 30 minutes)

1. Greeting (5 min)
   - Pulse Check Questionnaire
2. Revisit Identified Goals (10 min)
3. Public Meeting Recap & What We Heard (10 min)
4. Discussion & Board Activity (60 min)
   - Board Activity Recap
5. Next Steps (5 min)
   - Next meeting date
   - Pulse Check

Meeting Effectiveness



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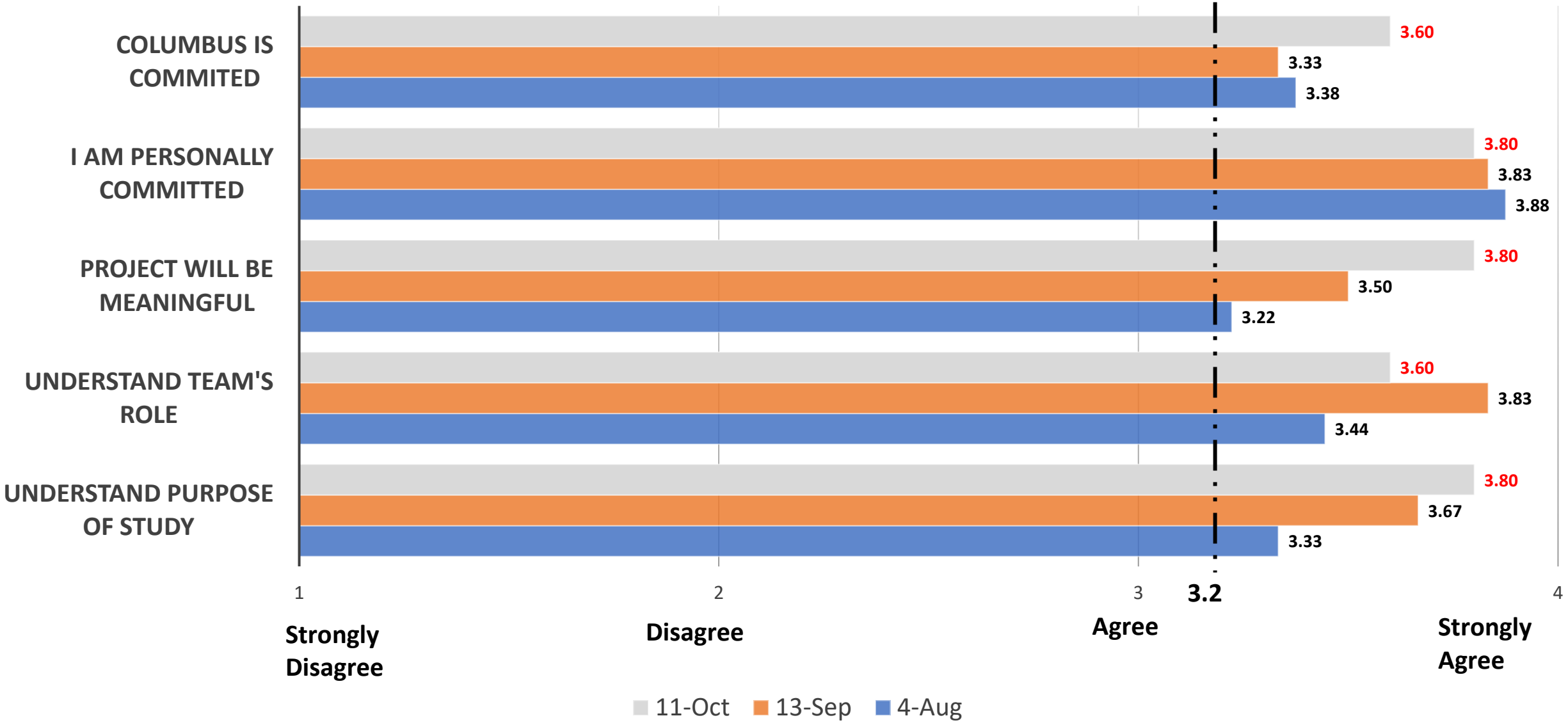
ANDREW J. GINTHER, MAYOR

Understanding & Commitment



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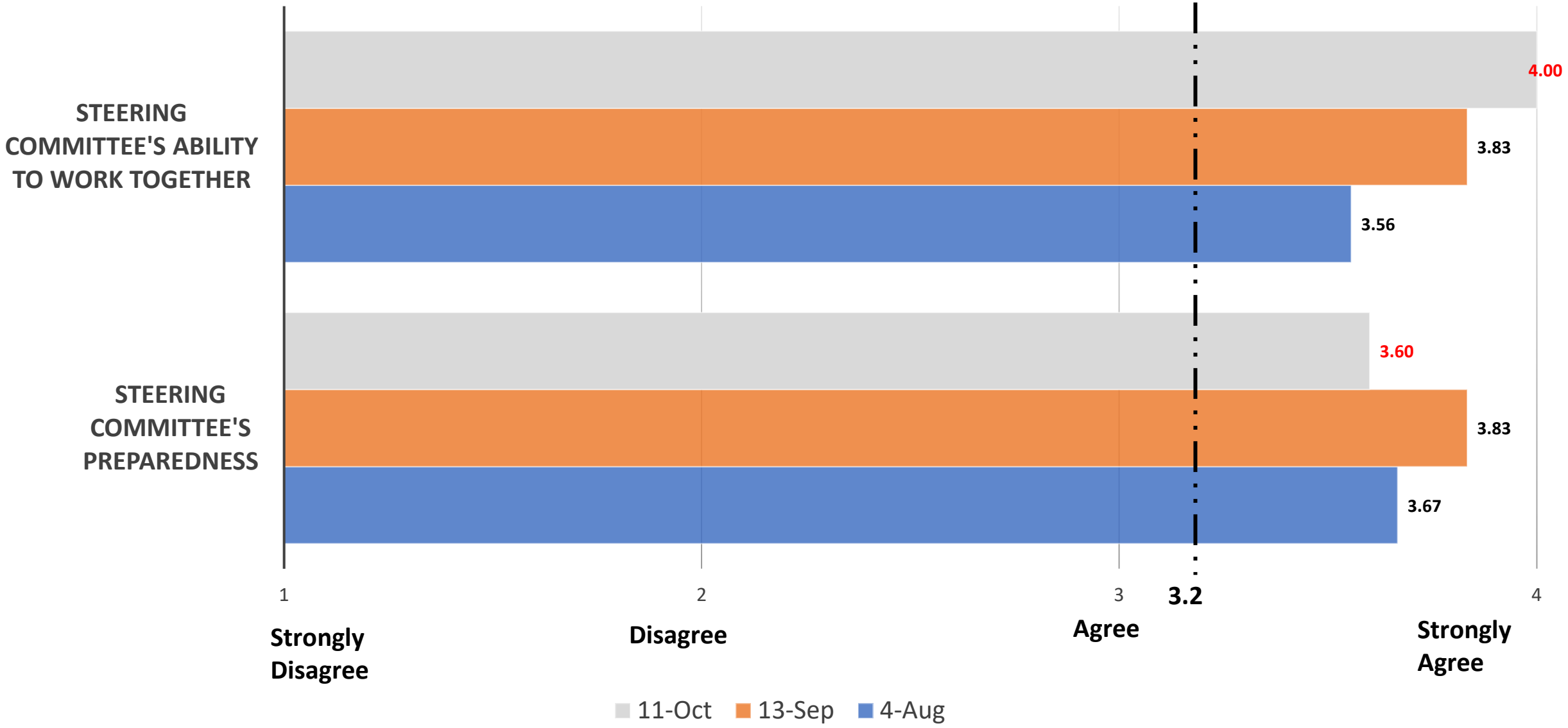
Steering Committee Effectiveness



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ANDREW J. GINTHER, MAYOR

What went well today?...

- Discussion
- Great description of how options work.
- Great Discussion - Sharing & Listening
- I feel the meeting went smoothly. The program was very well planned.

What could have improved?...

- Lack of clarity on "30%" use of parking at four different times.
- Make sure that we are inclusive of all residents for transportation needs.
- Don't know.

How do you feel about the progress of the Team so far?...

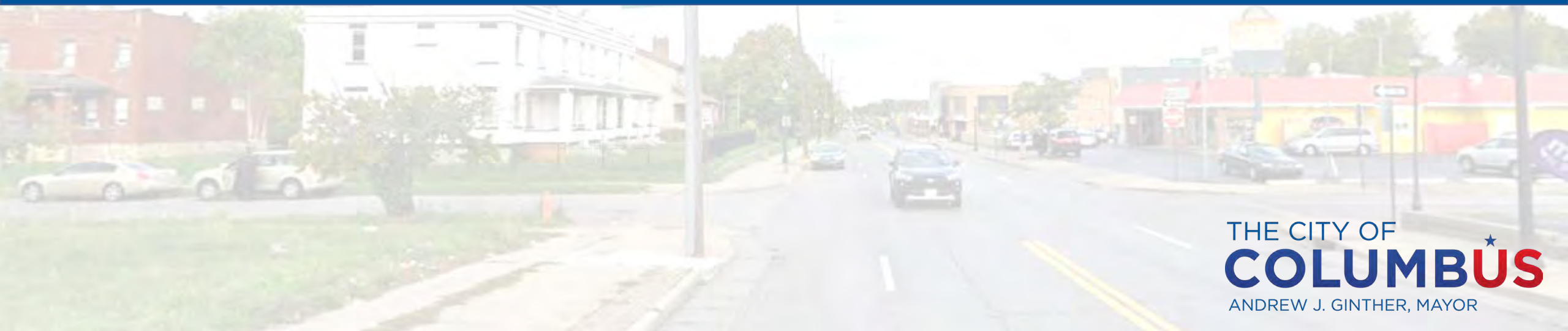
- Good, I'm optimistic about non car transit considerations
- Pretty good.
- Very Good. Love that we're coalescing around a format/design.
- Good
- Great progress. A lot of work was put into this meeting. I liked the presentation sheets and graphics.

What is one key learning experience you have had thus far?...

- Learning about bike paths.

Revisit Identified Goals

Chantil Milam & Abby Anacki, Lawhon & Associates



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Steering Committee Identified Goals

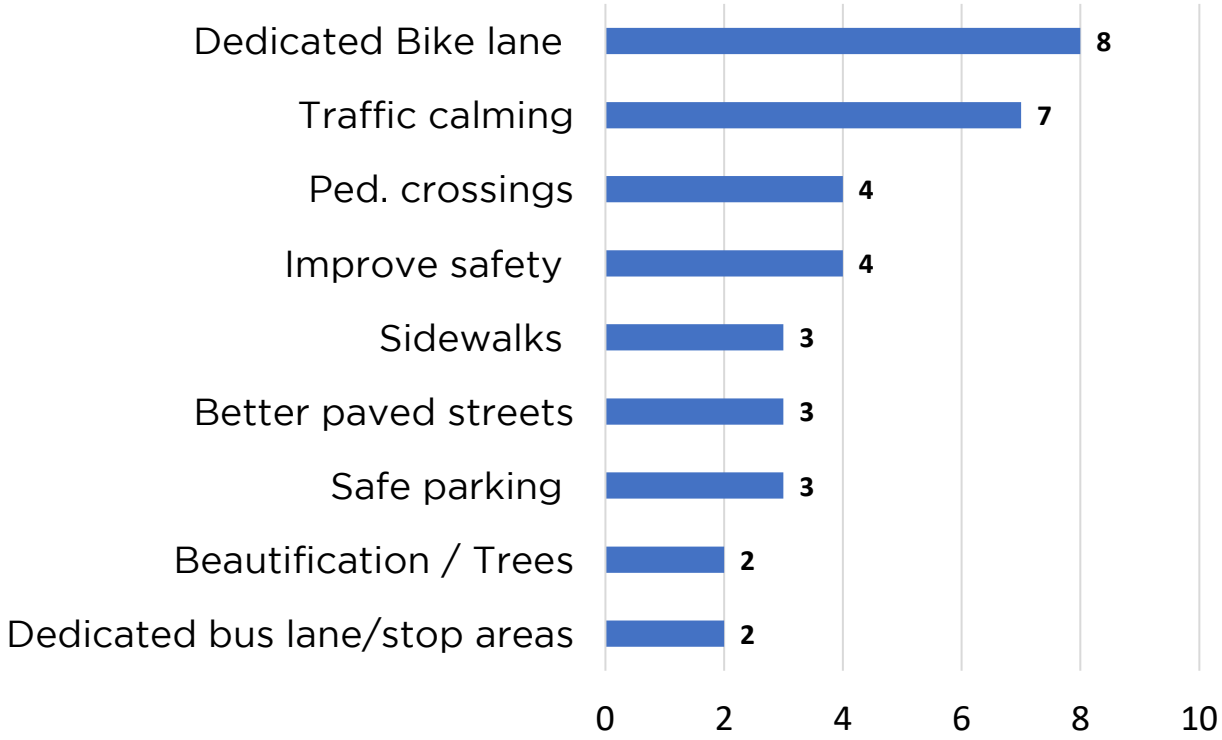
Top 5 Concerns

- Speeding
- Crashes
- Pedestrian Crossing (Safety)
- Parking (Needs)
- (Community) Character/Identity

Top 4 Goals

- (Community) Identity
- Improve Safety
- Beautification
- Equitable Local Connectivity

Top Transportation Improvements
(Take Home Surveys)



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Steering Committee Identified Goals

	(Community) Identity	Improve Safety	Beautification	Equitable Local Connectivity
Road Diet w/ Raised Bike Lanes	√	√	√	√

Purpose & Need

Development of Purpose and Need Statements

- Following ODOT's "Developing Purpose and Need Guidance" https://www.transportation.ohio.gov/programs/environmental-services/manuals-guidance-landing/purpose-and-need
- The **Purpose** defines the transportation problem(s) to be addressed.
  - *Reference to solutions or prescriptive outcomes is not included.*
- The **Need** elements uses quantified data to explain the transportation problem(s) to be solved by the proposed project. Focuses on critical elements that need to be addressed as part of the project.

Purpose & Need

- Identified goals consistent with take home surveys

Identified Transportation Needs

- Safety
  - Speed
  - Reduce crashes

- Mobility and Access
  - Access for active transportation users
  - Access to transit along the corridor

Public Meeting Recap & What We Heard

Abby Anacki, Lawhon & Associates

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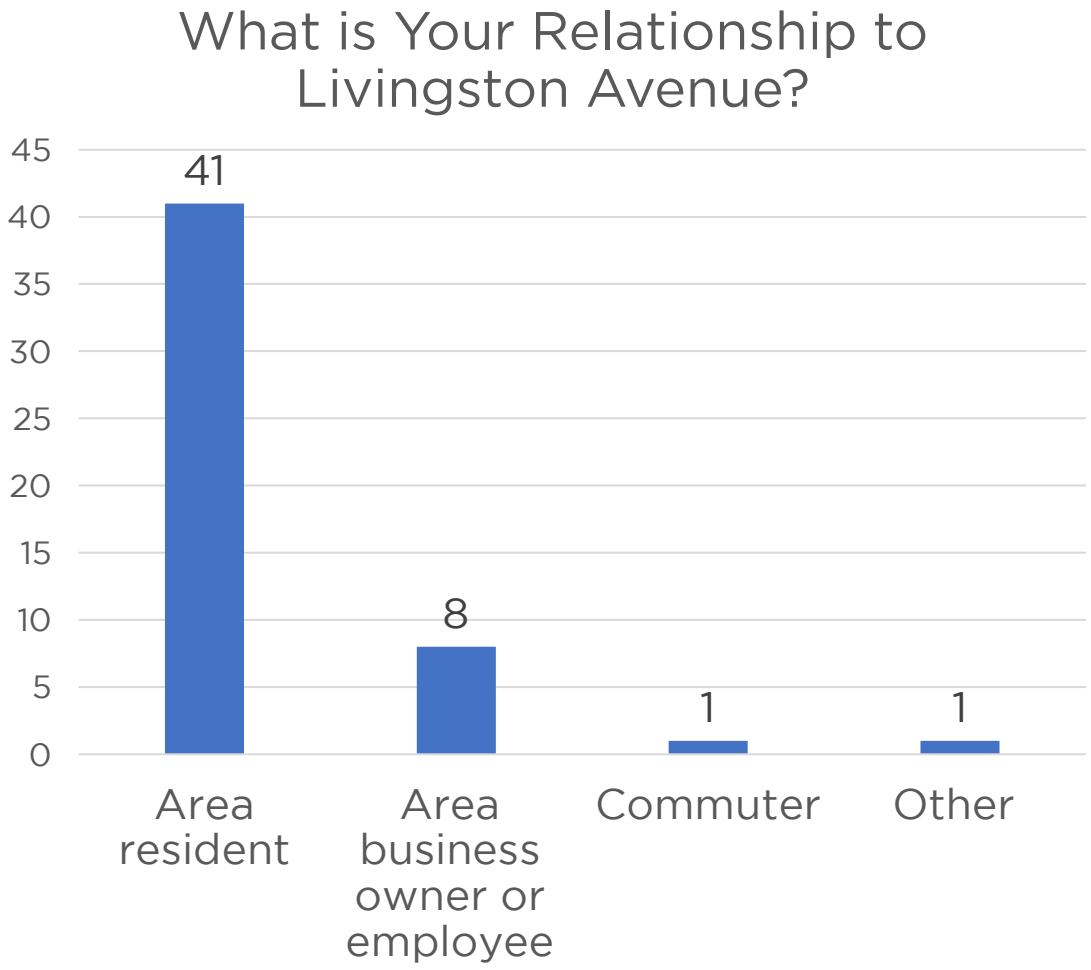
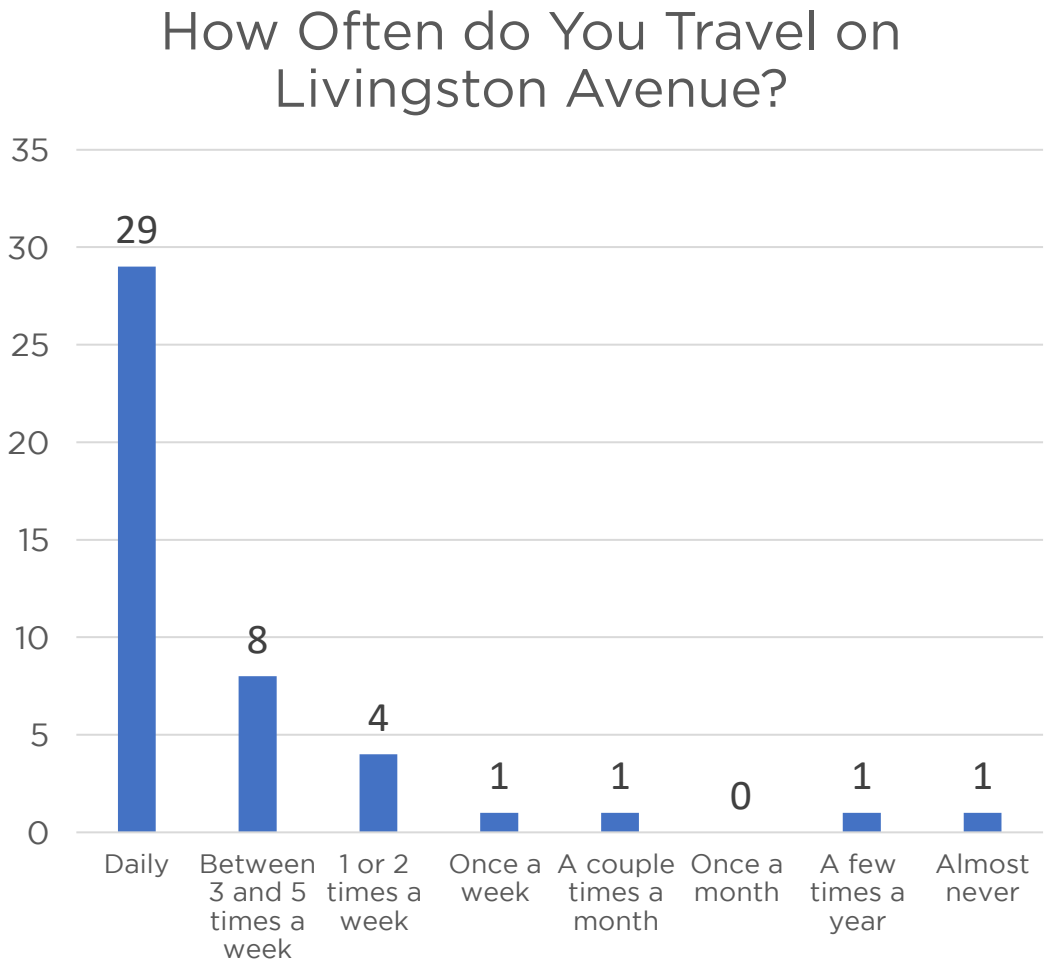
Public Meeting

November 16, 2022

- ~5,500 notification post cards sent, targeted social media posts, email invitations to stakeholders
- 63 meeting attendees
- ~50 comments so far
- Comment period ends Saturday!
- Thoughts on meeting? What have you heard since?

Who We Heard From





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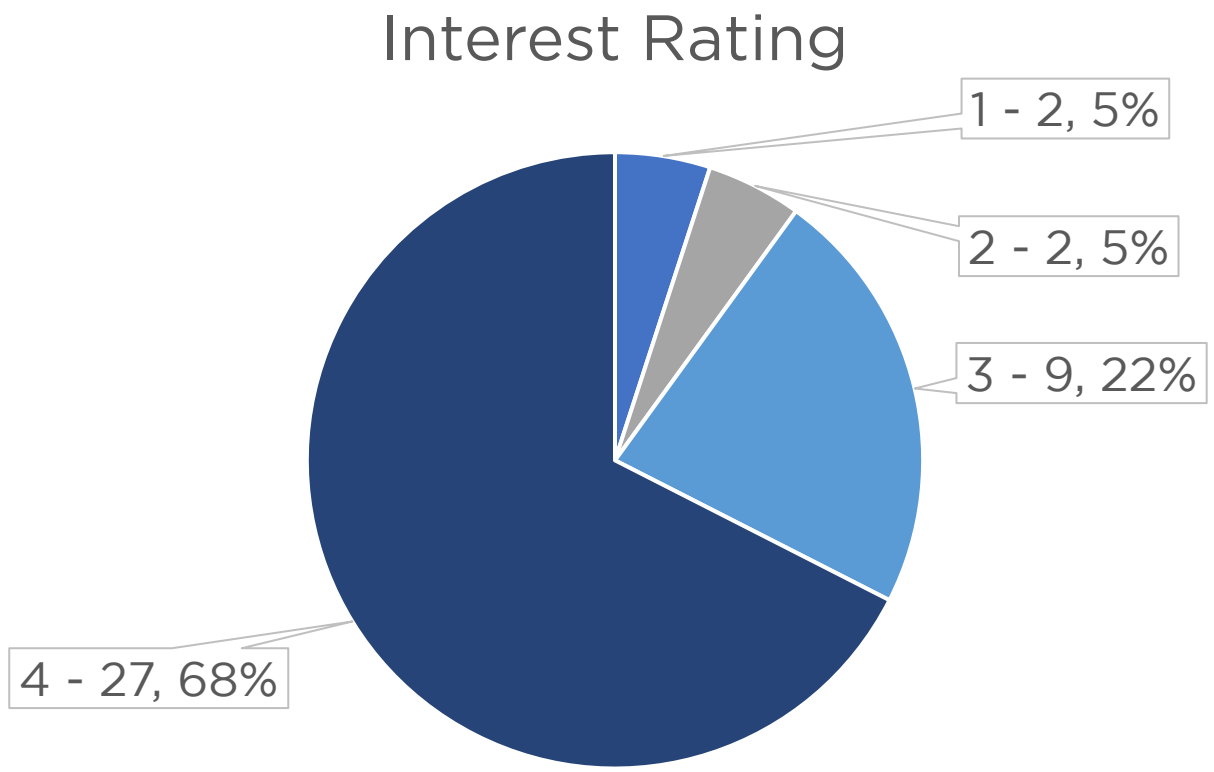
ANDREW J. GINTHER, MAYOR

How would you rate your interest in the corridor option/layout of a road diet with a raised bike lane?

(1 being least interested in this improvement and 4 being the most interested)



What We Heard

What do you *like* about this preliminary concept/layout for Livingston Avenue?

- Dedicated bike lanes (17)
- Raised bike lanes (12)
- Concept will slow traffic/improve safety (10)
- Green space/medians (9)
- Reduced lanes of traffic (8)
- It's something/a good start/cool (6)
- Removal of on-street parking (6)
- Aesthetically pleasing (4)
  - Will increase business activity in area (3)
- Improved sidewalks (2)
- Crosswalks

What We Heard

What do you *dislike* about this preliminary concept/layout for Livingston Avenue?

- Medians too long/limited access to side streets and left turns (10)
  - Access cut off from neighborhoods (Old Oaks)
- Removal of on-street parking (8)
- Reduced lanes of traffic (6)
- Timeline/schedule (4)
- Not enough crosswalks (4)
  - Between Linwood and Lockbourne
- Project area too small (3)
  - Should be expanded on some side streets
- Raised bike lanes (makes bikers less aware)
- Bus stop and bike conflicts
- Vacant buildings

What We Heard

General Comments?

- Happy/supportive of project (5)
- Concerned about navigation of buses (COTA & School) (5)
  - Turning too tight for buses
  - Increased times to navigate
- Area around Rhoads / fire station / new development (3)
- Don’t do what was done on Parsons
- Lessons learned from project between College and James?
- Curb issue on Gilbert Street
- Speed should be lowered
- Would like to see utilities moved underground
- Reduce heavy vehicle traffic on side streets
- Installation of stone placards, landscape lighting, other aesthetics
- Cost too high
- Need retail, restaurants, grocery options

Discussion

Cory Lamb, CHA

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ANDREW J. GINTHER, MAYOR

Discussion

- Public meeting comments consistent with steering committee feedback – overall positive
- Road diet seems well received
- Are the public meeting comments consistent with identified goals/feelings of committee?

Trade-offs

Balancing different elements

Medians

- Purpose/benefits - Access management, ped crossing safety, beautification
- Parameters - 100’ length minimum, left-turn lanes, width, maintenance

Bike Lane

- Purpose/benefits – Provide alternative mode of transit, improve traffic flow
- Parameters – Continuous, protected

Parking

- Purpose/benefits – Accessibility
- Parameters – Locality, mutually exclusive w/ median

Trade-offs

Where can we make these tradeoffs?

Board Activity

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Board Activity Recap

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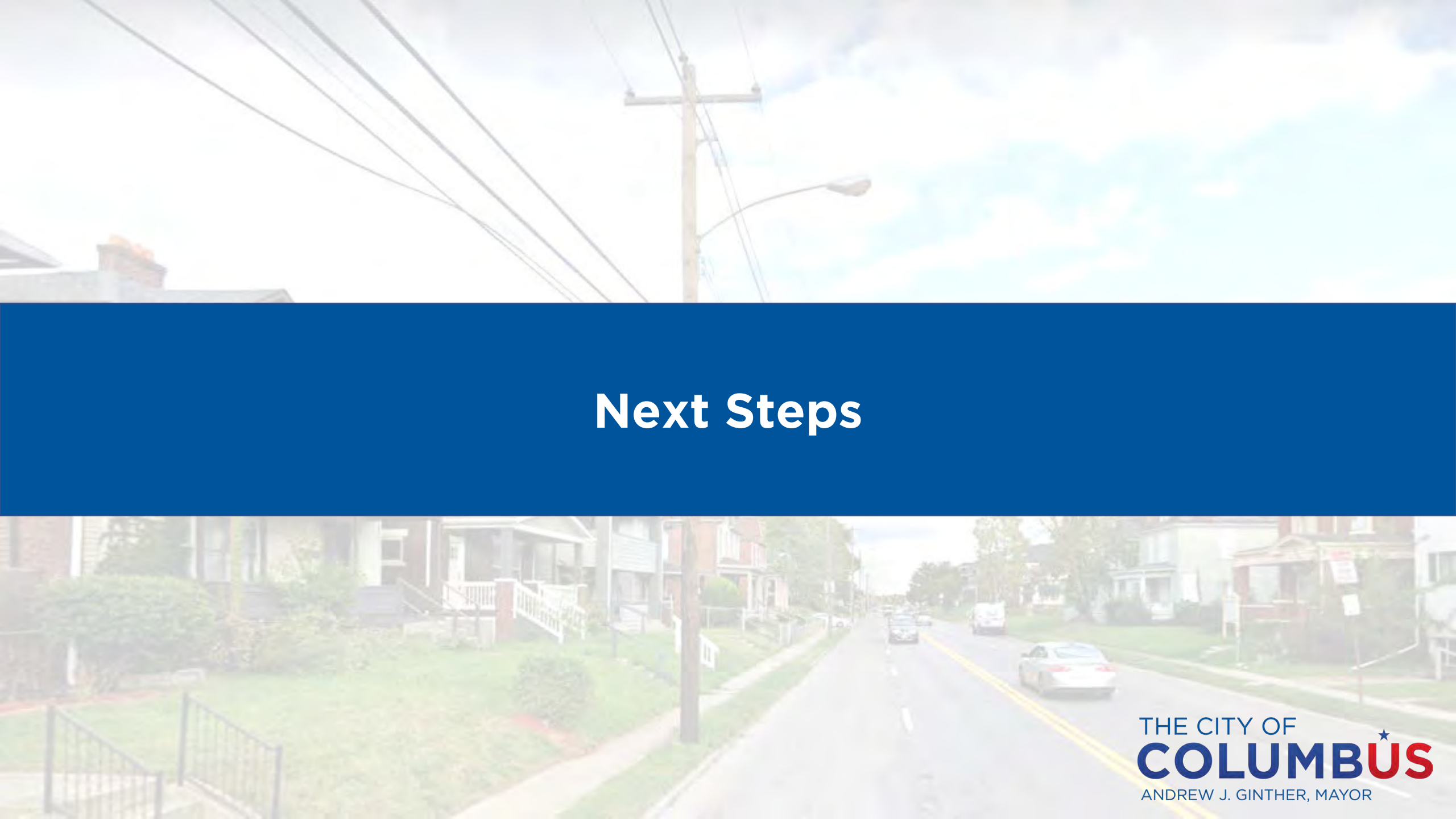
ANDREW J. GINTHER, MAYOR



Next Steps

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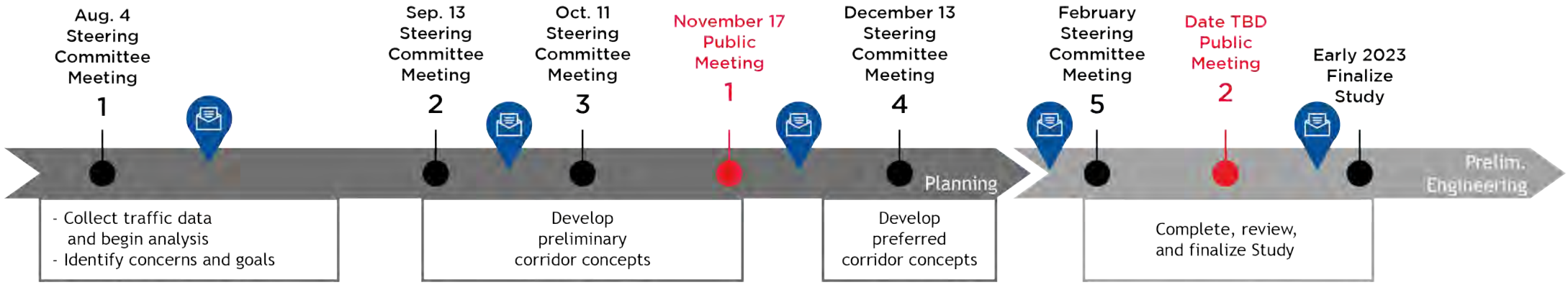
ANDREW J. GINTHER, MAYOR

Next Steering Committee Meeting

Will be coming back to steering committee with recommendations prior to finalization



Pulse Check Questionnaire

Let us know how we're doing!

- Please complete survey (paper copy or online) before you leave

Thank you!

ATTACHMENT D

Board Activity Comments

Sticky Note board comment West to East along Livingston Corridor			
Number	Location	Comment	
1	S. 18th St.	Why not extend project/bike lanes West of 18th St.	
2	S. 18th St.	removal of bike lane is quesionable at transition	
3	18th St. to 22nd St.	Removal of Medians in Certain Areas	
4	22nd st. to Ohio Ave.	Suggests comercial parking in this area	
5	Champion Ave.	Bike Lane realignment/bump out at champion is good	
6	Champion to Oakwood	Parking commerical	
7	Oakwood-Wilson	some parking spaces with indentation	
8	Wilson	Is this an Okay place to break the median?	
9	Miller South of Livingston	Yes. Like the Median. Lot of crashes here.	
10	miller North	Limited sight distance. Suggests a mirror	
11	Miller area	Add breaks in median along entire strip	
12	Ellsworth	How to get on ellsworth from livingston headed west?	
13	ellsworth Kelton	Bike trails on one side	
14	Kelton (Library)	Bus stop in front of the Library is missing	
15	Kelton (Library)	Parking requested here	
16	Kelton	Is this a good place for a left turn box for the bike lane?	
17	Lilley	comment for a left turn to lilley SB (one way)	
18	Lilley	No left turn to Lilley	
19	Berkeley Rd.	Need one left turn lane around this area for access	
20	Geers	There is now a parking lot for the adjacent apartment comlex at the SW corner of Livingston and Geers	
21	Geers	Lots of street parking use on geers and it gets crowded and dangerous	
22	Geers	I turn here (at geers) often since it is very difficult to turn at fariwood without a protected left	
23	Seymour	Add parking near seymour	
24	Seymour	New housing project near seymour area	
25	Fairwood	Difficulty with left turn going North and south	
26	Fairwood	Put a left arrow (protected left) for the intersection at fairwoood	
27	Fire Station	Move median down past fire station	
28	fire station	Need deicated flashing ligts for fire station (+1)	
29	Rhoads	No lefts in either direction at Rhoades	
30	Rhoads	Left turn lane would help with congestion	

31	Rhoades	Ped bridge over Livingston for park access.	

ATTACHMENT E

Pulse Survey

Livingston Avenue Improvement Study

Steering Committee Pulse Check

December 13, 2022

1. Rate the effectiveness of:	Very Poor	Poor	Good	Very Good
a) The information covered	☐	☐	☐	☐
b) Discussion opportunities	☐	☐	☐	☐
c) The format of today's meeting	☐	☐	☐	☐
d) Your comfort speaking up	☐	☐	☐	☐

2. Based on today's session:	Strongly Disagree	Disagree	Agree	Strongly Agree
a) I understand the purpose of the Livingston Avenue Study	☐	☐	☐	☐
b) I understand the role of the team	☐	☐	☐	☐
c) I believe this project will lead to meaningful results	☐	☐	☐	☐
d) I am committed to support this team's success	☐	☐	☐	☐
e) I believe that the City of Columbus demonstrates commitment to the work of this team	☐	☐	☐	☐

3. Rate the following:	Very Poor	Poor	Good	Very Good
a) Steering Committee's preparedness for today's meeting	☐	☐	☐	☐
b) Steering Committee's ability to work together at today's meeting	☐	☐	☐	☐

4. What went well today? _____

_____

5. What could have been improved? _____

_____

6. How do you feel about the progress of the team so far? _____

_____

7. What is one key learning experience you have had thus far? _____

_____

Name: _____ ***THANK YOU!***

Steering Committee Meeting #5
Meeting Minutes

Meeting Minutes

Meeting Name:	Livingston Avenue Steering Committee #5	
Date:	February 21, 2022	**Time: 5:30 PM**
Location:	Columbus Metropolitan Library, Driving Park Branch	**Host:** City of Columbus
Attendees:	Livingston Avenue Steering Committee members City of Columbus CHA Lawhon and Associates See *Attachment A* for a list of attendees	

Greeting & Introduction:

- The meeting started around 5:35 PM. The agenda can be seen in *Attachment B*.
- A PowerPoint presentation was utilized to guide the meeting and is included as *Attachment C*.
- Eric Lambert (City of Columbus) introduced the meeting with an update on the pulse check, report draft, and project funding updates. He reviewed the pulse check questionnaire responses from the previous meeting, which included less responses following each meeting. However, the sentiment that the project will be meaningful has increased over the course of the study.
- He also noted that the meetings appear to have continued to be effective according to scores, and the belief that the project will lead to something meaningful has continually risen (rated a 4/4 at the most recent meeting)
- After last meeting, the steering committees ability to work together and preparedness was ranked a 2/4 and 3/4, respectively. Eric speculated that this is because at the last meeting we had honest and passionate discussions surrounding different perspectives around parking.
- The scroll plot will not be included within the final report and the purpose of this meeting was to share a sneak peek of the draft report.
- The Safe Streets for All Grant was awarded to the City for this project and will fund $12 million of the project construction with the City matching this for a total of $24 million allocated to the project.

Updated Public Meeting Comments:

- Abby Anacki (Lawhon) briefly reviewed the public comments, which focused on the preliminary concept presented during the public meeting. Only a few additional responses were added since the last steering committee meeting. All of the comments shared at the previous meeting were consistent with new comments received.

Planning Process & Public Engagement:

- Chantil Milam (Lawhon) discussed the overall planning process and public engagement over the past six-month study. She emphasized that steering committee involvement will carry into the design phase of the project. She reviewed the trajectory of the steering committee meetings, beginning with setting priorities in the first meeting, moving onto design elements in the second meeting, and preliminary corridor concepts presented in the third meeting. The public meeting focused on the process and overall corridor concept. The fourth steering committee meeting focused on what we heard at the public meeting and what needed additional input.

Study Overview:

- Cory Lamb (CHA) presented a summary of the study process and next steps. He showed the existing conditions for Livingston Avenue including primarily residential and commercial land use along the corridor. Right-of-way has been a constraint throughout the corridor, with many competing uses. Analysis by CHA including traffic volumes and speed studies confirmed speeding in the corridor, with speeds averaging anywhere from 5-10 mph over the posted speed on average. Pedestrian generators informed the crosswalk evaluation, and four years of crash data determined potential safety improvements.
- Recommendations included short-term countermeasures; bicycle, pedestrian, and parking considerations; typical sections; and design standards. Short-term countermeasures are planned to be phased within a few years and include items such as signal back-plates for increased visibility, signal retiming, prohibit left turns at intersections with high crash rates, and crosswalk improvements (such as rectangular rapid flashing beacons).
- Cory reviewed the various alternatives that were under review by the project team and steering committee, including a road diet with a two-way left-turn lane, medians, and parking. The typical section for the corridor involves two transition zones at either ends for the bike facility. West of 18th Street is a transition to the existing bike lanes. Steering committee members noted that this is a poor-quality bike facility, as it is narrow and has a gutter pan in areas.
- Design standards showed differed streetscape elements, such as rain gardens, street trees, lighting, and roadside amenities like bike racks, trash receptacles, and benches. Cory presented two renderings showing what the corridor could look like both commercially and residentially. Eric reviewed the next steps, including finalizing the study and moving the project into the design phase. The

schedule includes the grant funding timeframe and showed the design phase occurring from summer of 2023 through the end of 2025, with construction planned for 2026 through 2028.

Discussion:

- Rita Hallaveld (Steering Committee) asked about the transition between the bike facility on Livingston and the Alum Creek Trail, particularly in relation to the Joint Columbus Bexley study.
- Kelly Scocco (City of Columbus) explained that the portion between Nelson and the Alum Creek Trail will be part of a larger project, as the Joint study will be funding a project from I-70 to James Rd. This last piece from Nelson to I-70 will be phase 3 and require its own funding due to engineering challenges with the existing bridge structures and highway ramps.
- Mike Aaron (Steering Committee) asked about the commercial rendering and lack of parking.
- Justin Goodwin (City of Columbus) explained that parking could be added with new development (such as moving the curb line with future development to accommodate parking). A new strategic parking plan will be in development soon, and there are also options to work with property owners to establish off-street parking areas.
- Eric noted that a parking utilization study was completed as part of this study, with counts collected along Livingston Avenue and one block north and south of Livingston Avenue on all of the side streets.
- Jerry Saunders (Steering Committee) remarked that the peak parking restrictions were changed from 4-6pm to 2-6pm with no notice to property owners. He also noted that it is important to include items such as street trees in the renderings to address air quality and urban heat island effects.
- Stacee Green (Steering Committee) recognized Livingston Avenue as a residential corridor, without much development occurring to make it more of a commercial corridor. She remarked that the largest parcel on the corridor is being developed for affordable housing.
- Rita made the point that the Safe Streets for All grant purpose is to reduce fatal and serious injury crashes and prioritize safety, which should be reflected in the preferred concept.
- George Holliman (Steering Committee) asked about the proposed medians shown at the public meeting, which would restrict access to side streets and cause a “North and South divide”.
- Erin Synk (Steering Committee) offered a different perspective, that the medians would provide better connectivity between north and south sides of the street for people walking and biking and would enable safer street crossings. She also noted the balance between the bike lanes and where parking might be added according to some of the cross-section layouts.
- Eric summarized the corridor concept as a road diet with raised bike lanes, with turn lanes and medians where possible, and parking where appropriate.
- Danielle Dillard (Steering Committee) asked how the two-way left-turn lane (TWLTL) is determined.
- Cory said that it depends on access, and in areas such as the fire station, a TWLTL would be appropriate to allow for access in and out. There is more analysis needed for turn lanes and signals.
- The renderings show overhead utilities, but they are in the background. Utilities will not be buried with this project. Instead, some utilities may need relocated during construction. Streetlights are included within the proposed project.
- Jerry Saunders (Steering Committee) recommended that the renderings be updated to show parking for the public meeting, because people won’t be able to see that it’s shown in the renderings and will give the wrong impression.
- Rachel Robinson (Steering Committee) inquired about access for emergency vehicles with continuous medians. This will be worked out in design (such as median length) and there will also be coordination with all of the relevant stakeholders, including emergency services and the fire department.
- Ralph Walker (Steering Committee) said that the proposed concept will be better for the community and that all the proposed changes are positive.

Next Steps:

- The next public meeting is scheduled for March 23, 2023. A newsletter will be sent out prior to the public meeting. The project team would like feedback from the Steering Committee on how best to present the report items to the public.
- The project team will work on developing additional renderings to address parking concepts. These renderings will be developed for the public meeting.
- The study will be finalized in Spring of 2023. The design phase will begin in Summer of 2023. To meet the requirements set forth in the SS4A grant, the project will need to be completed (constructed) by the end of 2028.
- The City will continue to keep the public involved in the process and input will be gathered at key points throughout the design phase.
- Eric Lambert (City of Columbus) asked steering committee members to fill out the pulse check questionnaire before leaving. Pulse check questionnaire can be viewed in *Attachment D*.
- The meeting was adjourned at 7:30 p.m.

ATTACHMENT A

Attendee List

Livingston Avenue Improvements Study – Steering Committee #5 February 21, 2023

Attendees

Steering Committee:

- Mike Aaron
- Danielle Dillard
- Rita Hallaveld
- George Holliman
- Jerry Saunders
- Stacee Green
- Erin Synk
- Ralph Walker
- David Gray
- Rachel Robinson

City of Columbus:

- Justin Goodwin
- Emma Kogge
- Eric Lambert
- Kelly Scocco
- Matt Lorenz
- Alex Sauersmith
- Greg Sprungle
- Jesus Ovalle

CHA:

- Jeremy Williams
- Cory Lamb

Lawhon:

- Abby Anacki
- Chantil Milam

ATTACHMENT B

Meeting Agenda

Livingston Avenue Improvements Study – 18th St to Nelson Road
Steering Committee Meeting 5 Agenda

Date: Tuesday, February 21, 2023
Time: 5:30 – 7:00
Location: Columbus Metropolitan Library, Driving Park Branch, Meeting Room 3

5:30 – 5:35 Greeting

- Pulse Check Questionnaire Recap
- Funding – The Great News to Share

5:35 – 5:40 Public Comments Update

5:40 – 6:00 Planning Process and Public Engagement

- Milestones & Process Refresh

6:00 – 6:40 Livingston Avenue Improvement Study

- Existing Conditions, Traffic Analysis, Recommendations, Design Standards

6:40 – 7:00 Next Steps

- Finalization of Study, Public Meeting, Move into Design
- Pulse Check

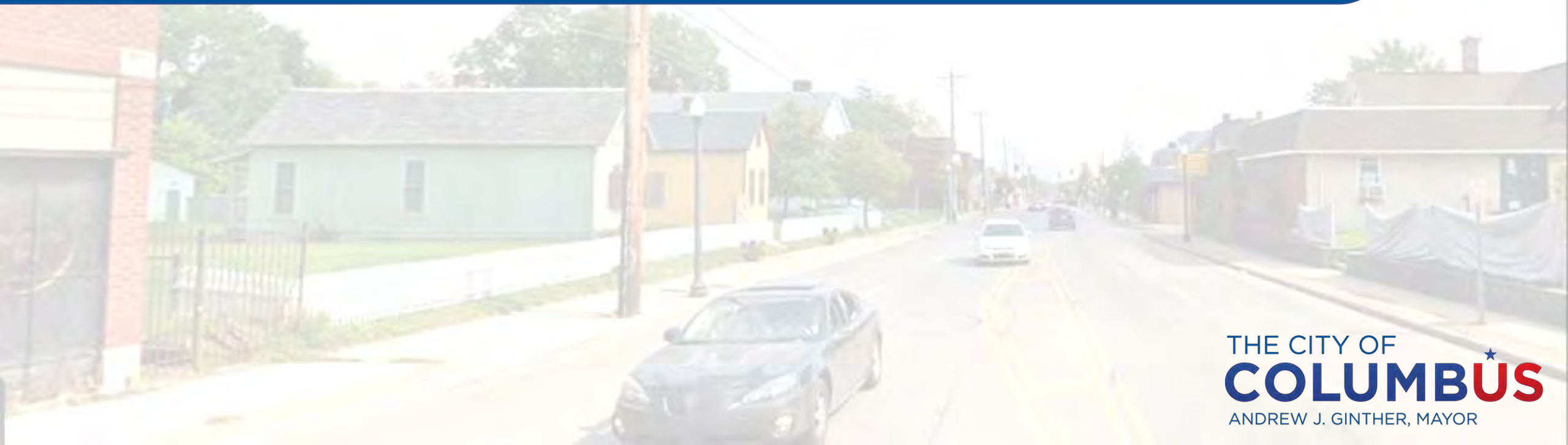
ATTACHMENT C

PowerPoint Presentation

Livingston Avenue Improvements Study – 18th Street to Nelson Road

Steering Committee Meeting #5

February 21, 2023



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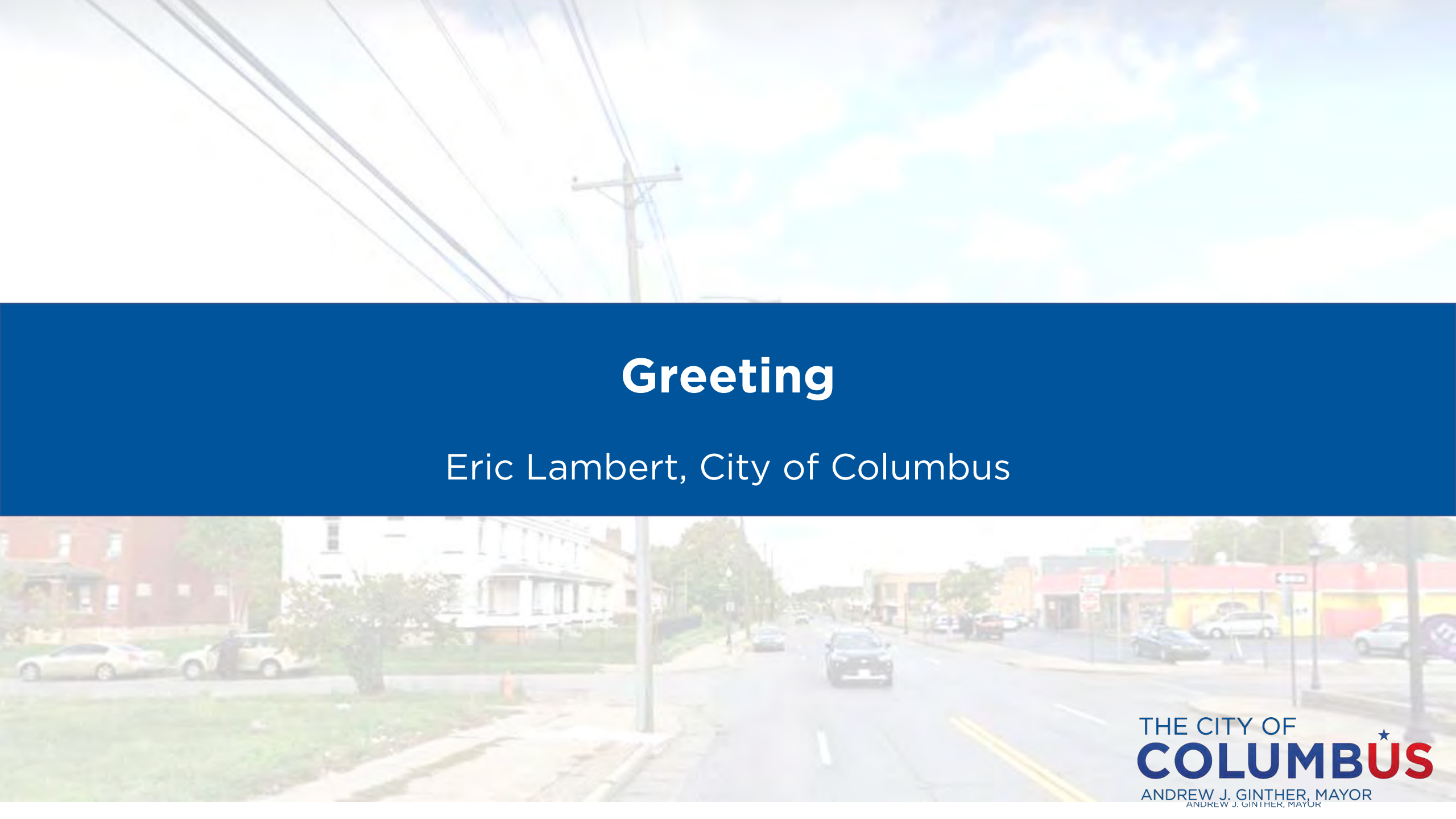
ANDREW J. GINTHER, MAYOR

Agenda (1 hour 30 minutes)

1. **Greeting (5 min) - Eric**
   - Pulse Check Questionnaire Recap
   - Funding – The Great News to Share
2. **Public Comments Update (5 min) – Abby**
3. **Planning Process and Public Engagement (20 min) – Chantil**
   - Milestones & Process Refresh
4. **Livingston Avenue Improvement Study (40 min) - Cory**
   - Existing Conditions, Traffic Analysis, Recommendations, Design Standards
5. **Next Steps (20 min) - Eric**
   - Finalization of Study, Public Meeting, Move into Design
   - Pulse Check



Greeting

Eric Lambert, City of Columbus

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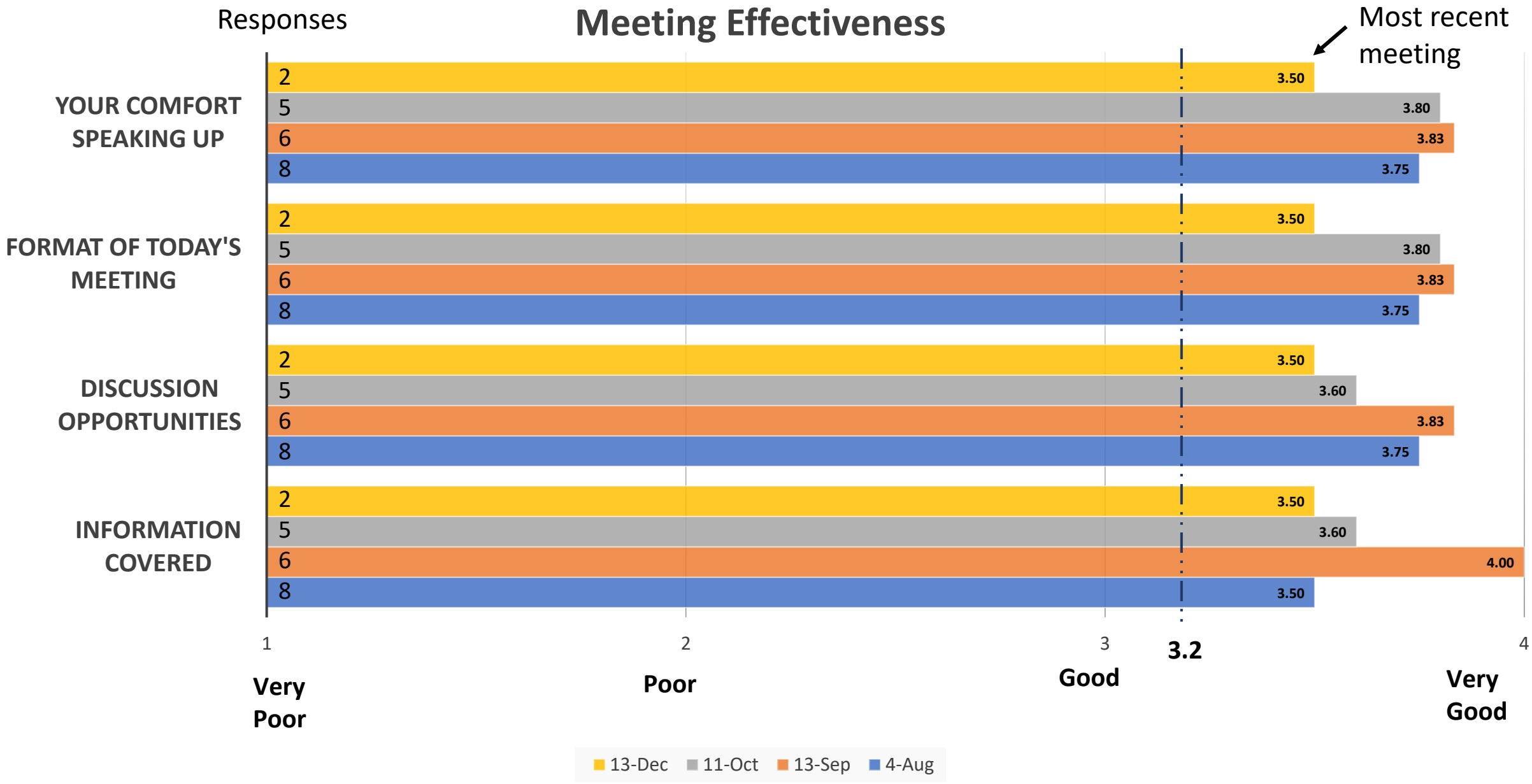

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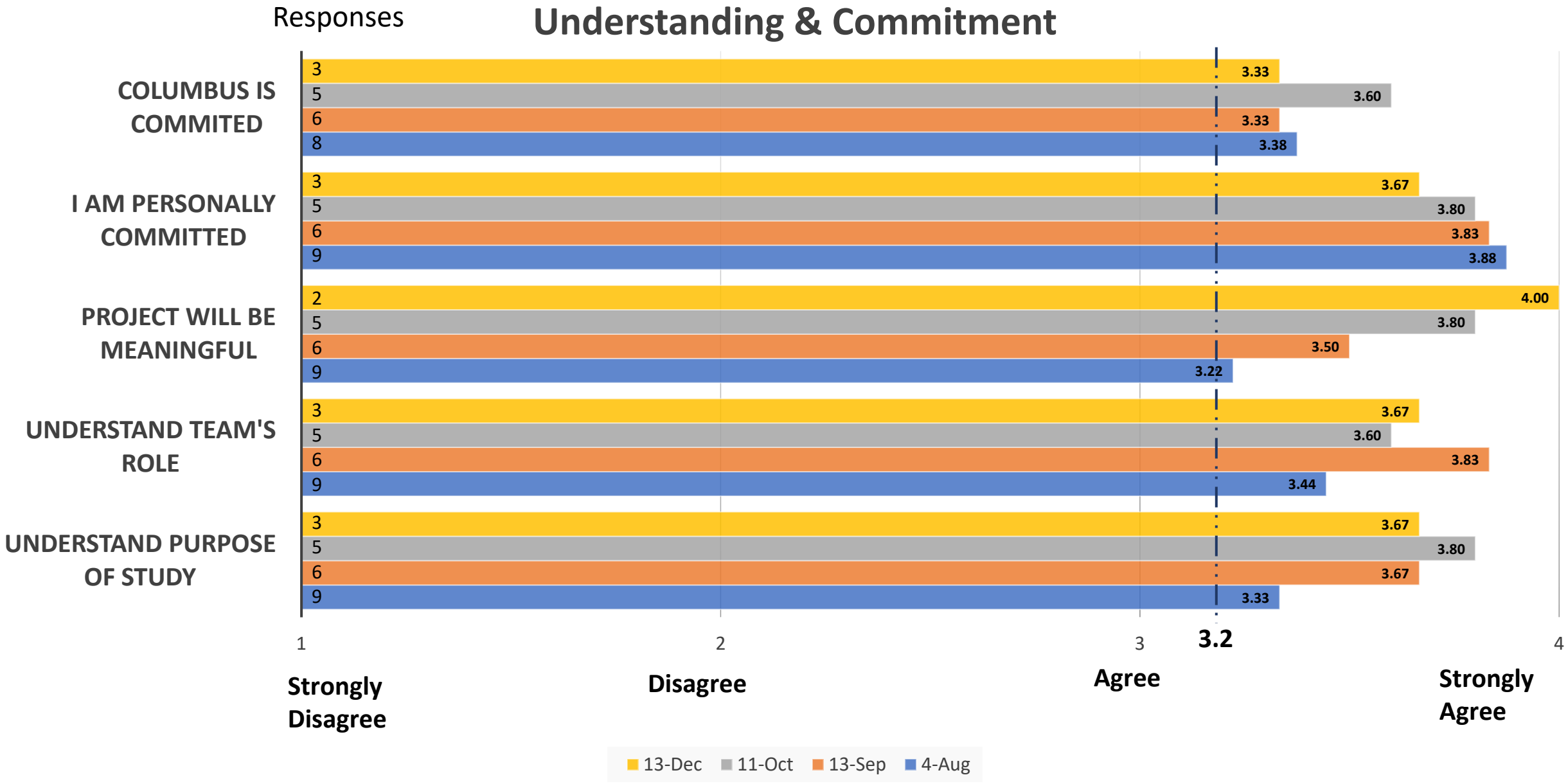
Understanding & Commitment



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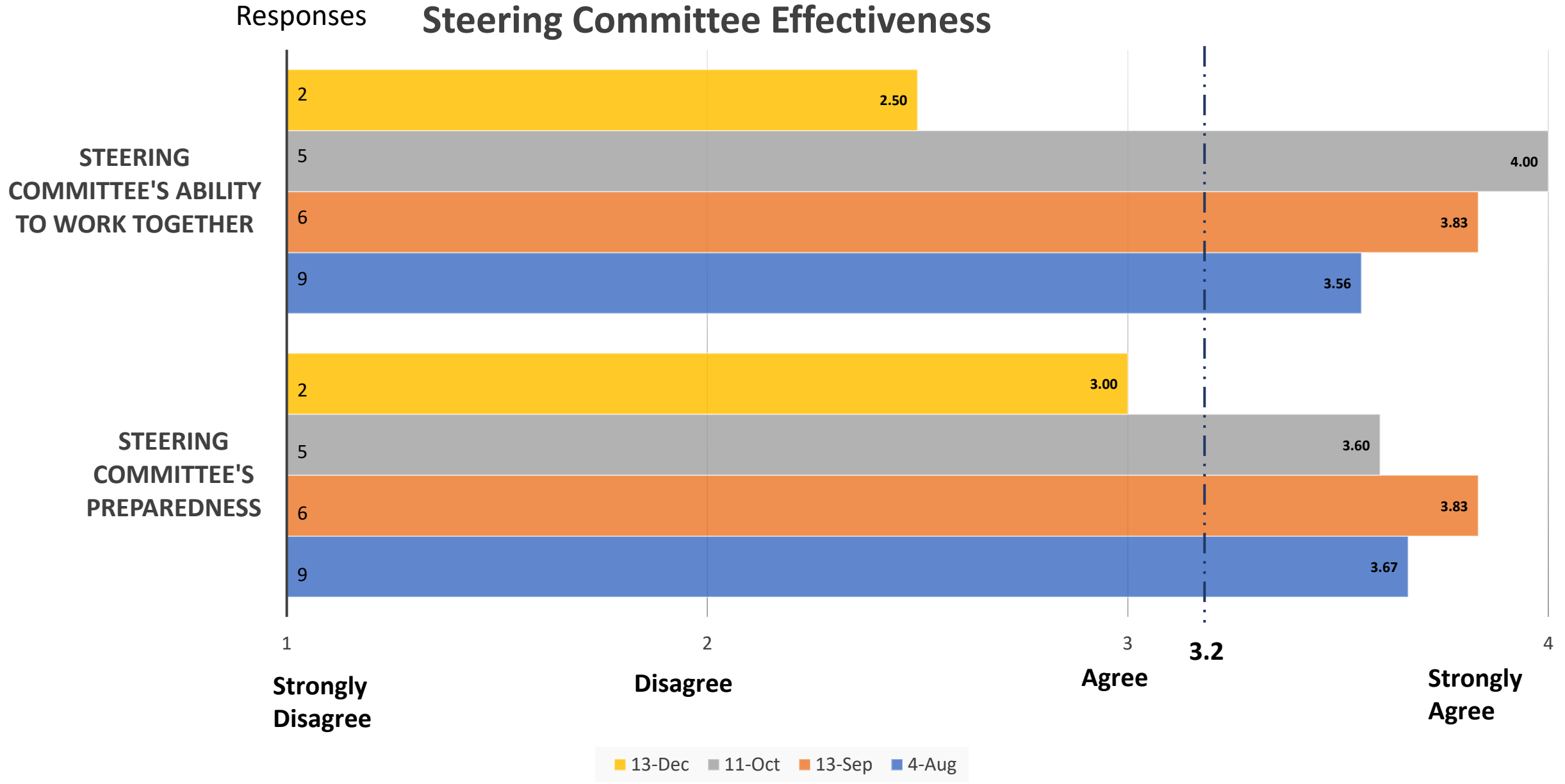
Steering Committee Effectiveness



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What went well today?...

- Real talk... real conversation.
- A lot of time devoted to discussion and clarification of goals for the committee at this stage.
- Good discussion on parking.

What could have improved?...

- Parking!!
- Facilitating meeting so that steering speakers were better contained, and everyone could get their ideas in without being talked over. The city needs to spend some time going through what the data shows about various design elements to get past all the opinions and anecdotes.
- Better clarification that the renderings are a starting point. Some people are too hung up on the parking aspect.

How do you feel about the progress of the Team so far?...

- So far... so good.
- Pretty good.
- Some members don't seem to understand the purpose of what we're doing. Mostly the team works well together though.

What is one key learning experience you have had thus far?...

- We need an identity.

UPDATE: Safe Street for All (SS4A) Grant

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Safe Street For All Grant

SHERROD BROWN
U.S. Senator for Ohio

For Immediate Release
Tuesday, January 31, 2023
Contact: Trudy Perkins/Dani Carlson
(202) 224-3978

BROWN ANNOUNCES MORE THAN $15 MILLION FOR STREET SAFETY ACROSS OHIO

WASHINGTON, D.C. – Today, U.S. Senator Sherrod Brown (D-OH), chairman of the Senate Banking, Housing, and Urban Affairs Committee, announced that the U.S. Department of Transportation (DOT) awarded 14 Safer Streets for All (SS4A) grants totaling $15,414,000 to 14 communities across Ohio. This funding was included in the ***Infrastructure Investment and Jobs Act***, also known as the Bipartisan Infrastructure Law – legislation that **Brown helped write and pass** – and will support the development of safety action plans and safety improvements.

"With this investment from the Bipartisan Infrastructure Law, we are working to make Ohio roads safer for the thousands of Ohioans who travel on them each day," said Brown. **"This funding will put in place safety plans that will help to prevent serious accidents and keep pedestrians, bicyclists and drivers safe."**

"I am grateful to the Biden administration, Transportation Secretary Buttigieg, Senator Brown and Congresswoman Beatty and so many of our residents for their support of the Livingston Avenue project," said Mayor Andrew J. Ginther. **"This investment will significantly improve the safety and accessibility of the corridor, businesses and other community assets. It will help Driving Park and the surrounding neighborhoods reconnect with their rich histories and celebrate residents who made significant impacts on American history."**

For Immediate Release

February 1, 2023
Contact: Debbie Briner
614-645-6467
dsbriner@columbus.gov

City of Columbus Awarded a $12 Million Safe Streets for All Grant to Help End Serious Crashes on E. Livingston Avenue

The City of Columbus has been awarded a $12 million federal Safe Streets for All Implementation Grant to fund transportation safety improvements along E. Livingston Avenue in the Driving Park neighborhood. The grant, combined with a $12 million city investment, funds planning, design and construction of infrastructure changes that will make it safer to walk, bike and drive along

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Federal Funding Update

- U.S. Department of Transportation (DOT) awarded 510 grants for a total of $800,000,000
- 37 Implementation Grants
- $12 Million Received for Livingston Avenue

“This investment will significantly improve the safety and accessibility of the corridor, businesses and other community assets. It will help Driving Park and the surrounding neighborhoods reconnect with their rich histories and celebrate residents who made significant impacts on American history.” – Mayor Ginther

Public Comments Update

Abby Anacki, Lawhon & Associates

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ANDREW J. GINTHER, MAYOR

Public Comments (Updated)

What do you *like* about this preliminary concept/layout for Livingston Avenue?

- Dedicated bike lanes (23)
- Raised bike lanes (16)
- Concept will slow traffic/improve safety (15)
- Reduced lanes of traffic (11)
- Removal of on-street parking (6)

What do you *dislike* about this preliminary concept/layout for Livingston Avenue?

- Medians too long/limited access to side streets and left turns (10)
  - Access cut off from neighborhoods
- Removal of on-street parking (8)
- Reduced lanes of traffic (6)

Public Comments (Updated)

General Comments?

Happy/supportive of project (6)

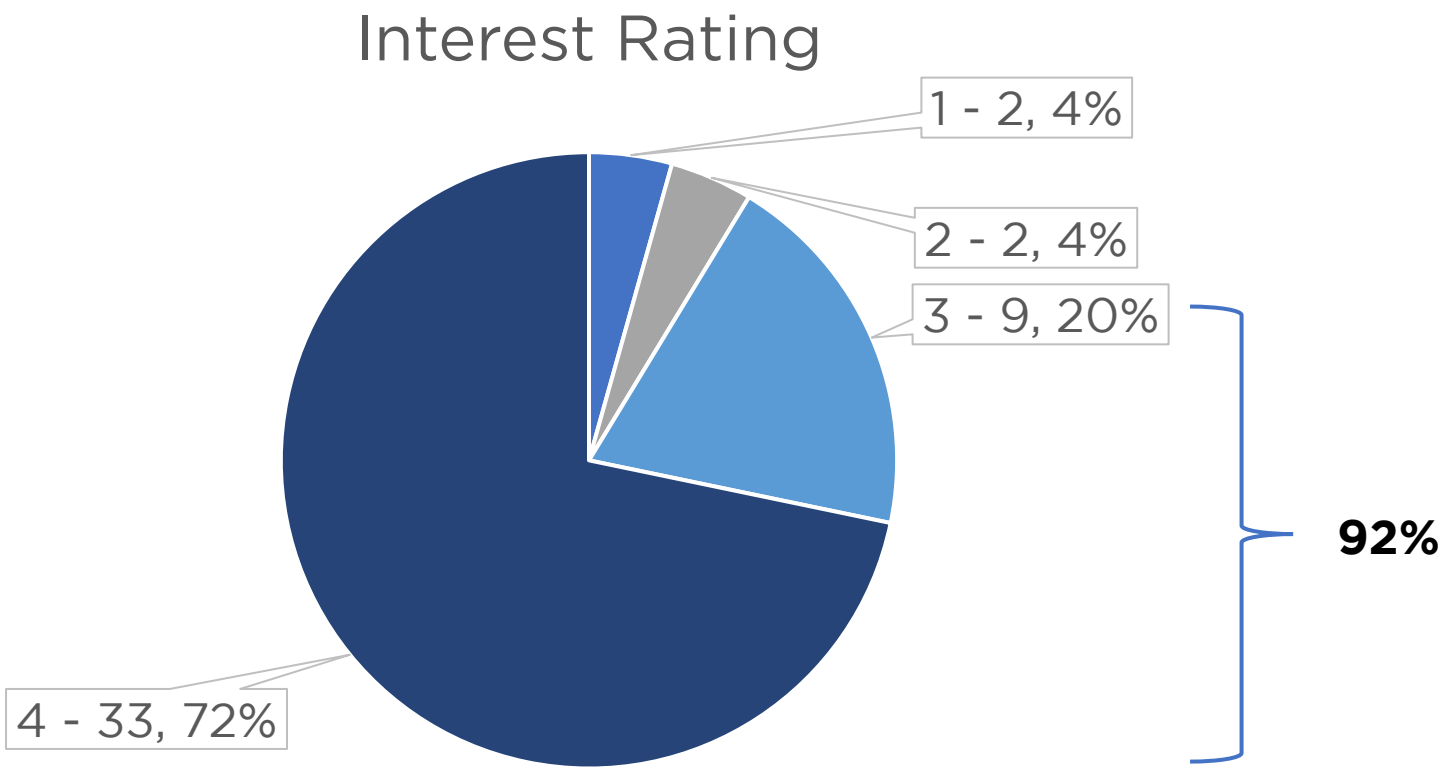
Concerned about navigation of buses (COTA & School) (5)

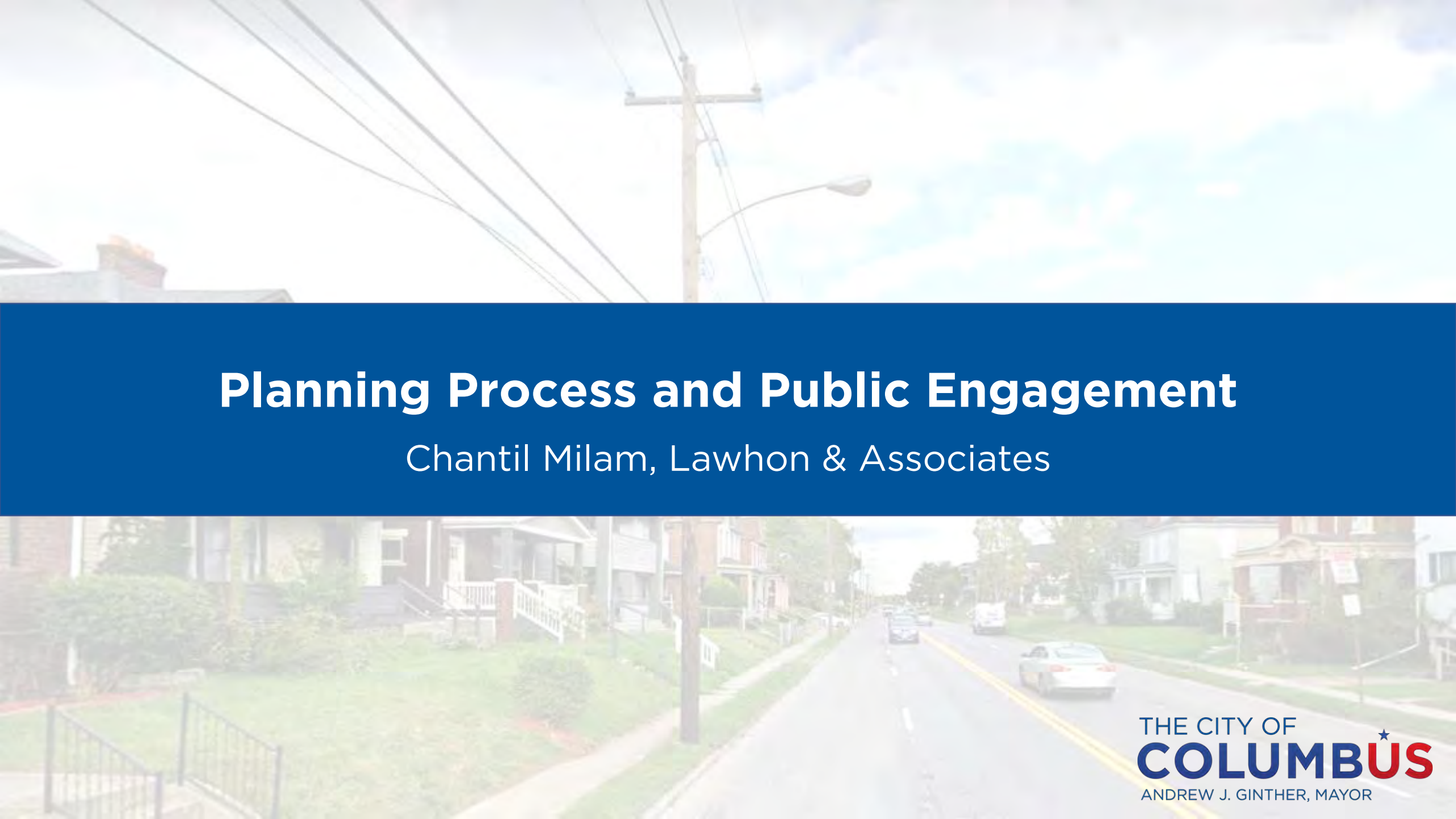
- Turning too tight for buses
- Increased times to navigate

Concerns with area around Rhoads / Fire Station / New development (3)

How would you rate your interest in the corridor option/layout of a road diet with a raised bike lane?

(1 being least interested in this improvement and 4 being the most interested)





Planning Process and Public Engagement

Chantil Milam, Lawhon & Associates

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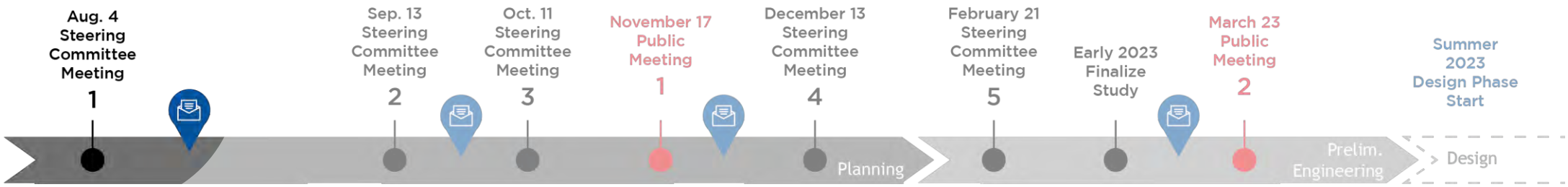
Steering Committee Meeting #1

- Introduce the study and schedule
- Outline roles and responsibilities
- Identify priorities/transportation issues
- Take home survey



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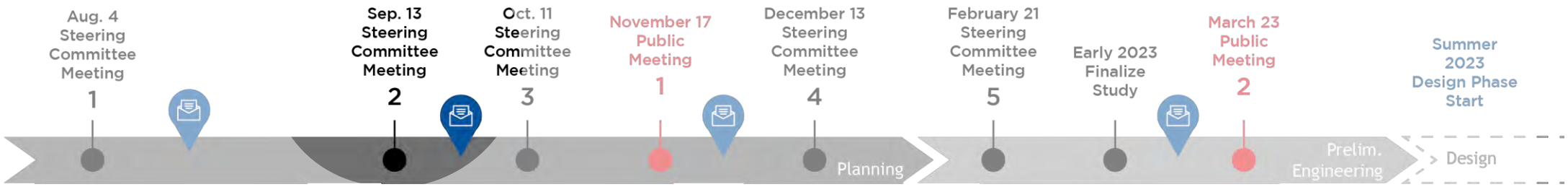
Steering Committee Meeting #2

- Identify priorities & transportation issues (take home survey results)
- Present “design toolbox”
- Create ideal roadway layouts



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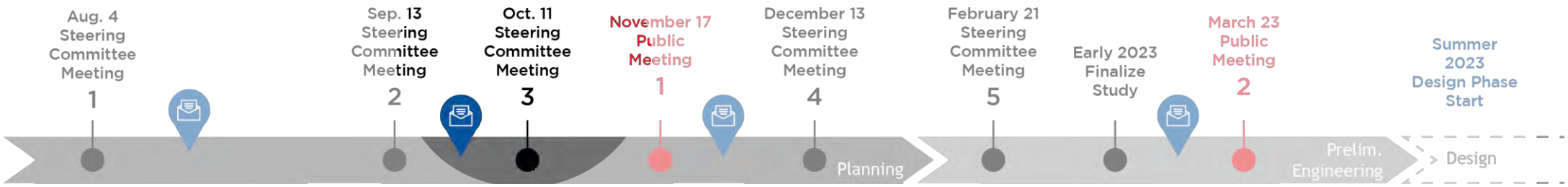
Steering Committee Meeting #3

- Present preliminary corridor concepts
- Receive feedback/interest in each concept (live survey)
- Revise concepts based on feedback to present to public



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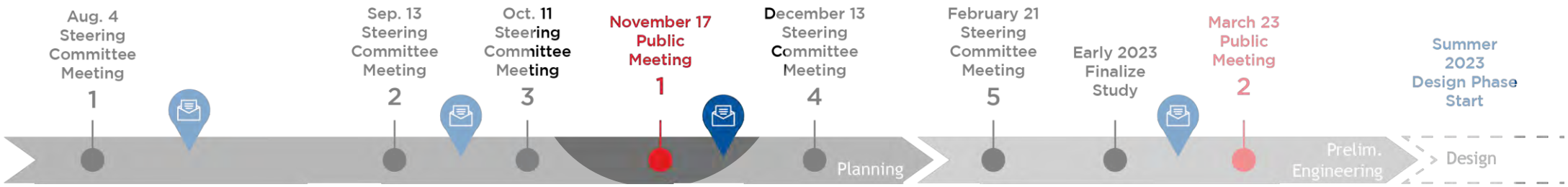
Public Meeting

- Introduce study & process
- Present preliminary corridor concepts
- Receive feedback/interest
- Revise concepts based on feedback



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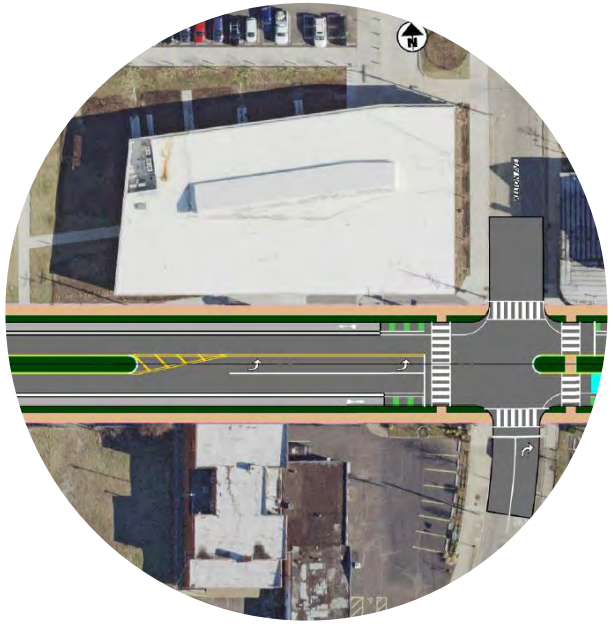
Steering Committee Meeting #4



- Public meeting recap
- Discussion
- Board activity (specific feedback on concept)

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What We Heard

- Improve safety for both pedestrians and vehicles
- Explore dedicated bike facilities (local, regional connectivity)
- Create opportunities to add character/beauty into corridor
- Balance identified needs with existing infrastructure (on-street parking, busses)

Livingston Avenue Improvement Study

Cory Lamb, CHA

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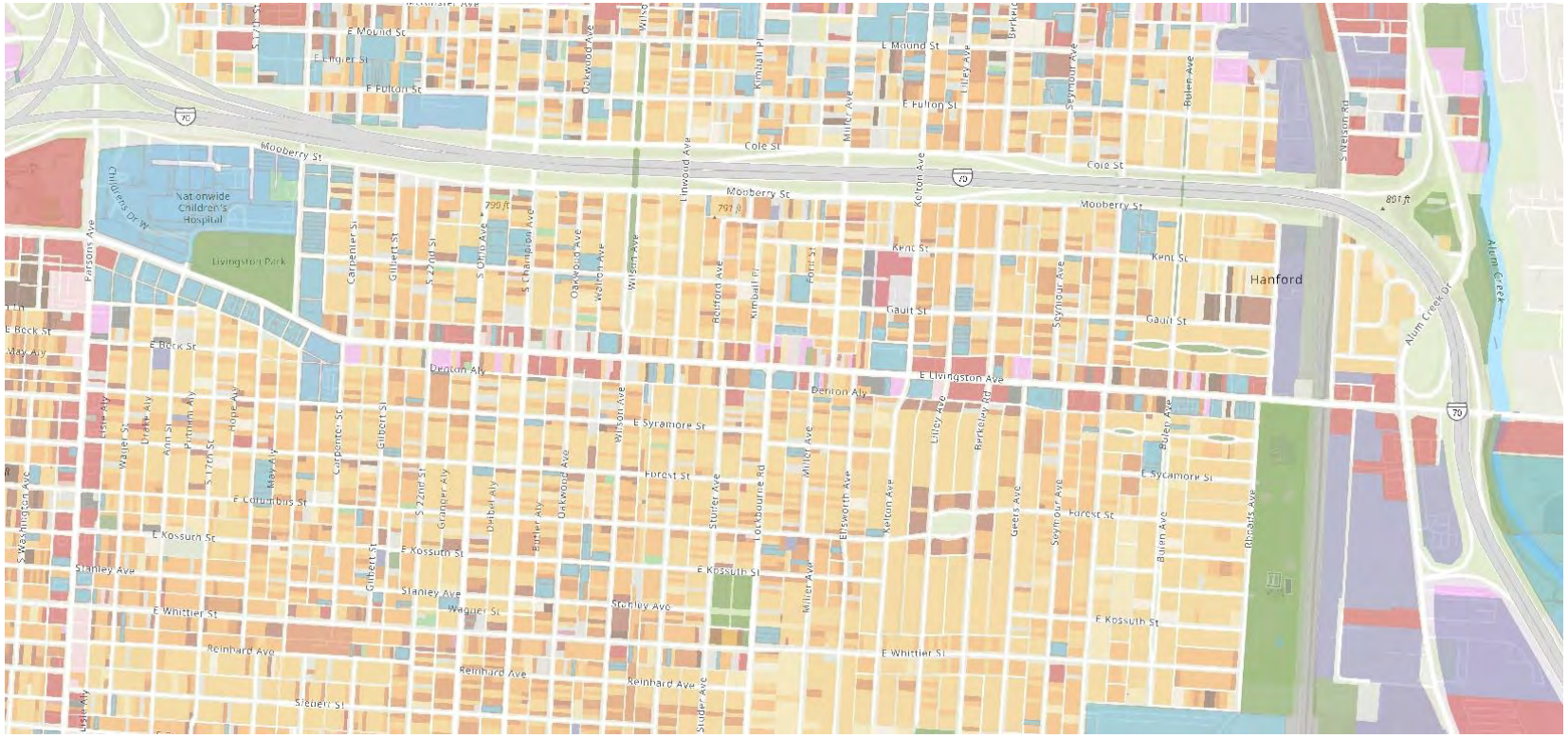
What We've Done

- Existing Conditions
- Traffic Analysis
- Recommendations
- Design Standards

What We've Done – Existing Conditions

Neighborhood and Land Use



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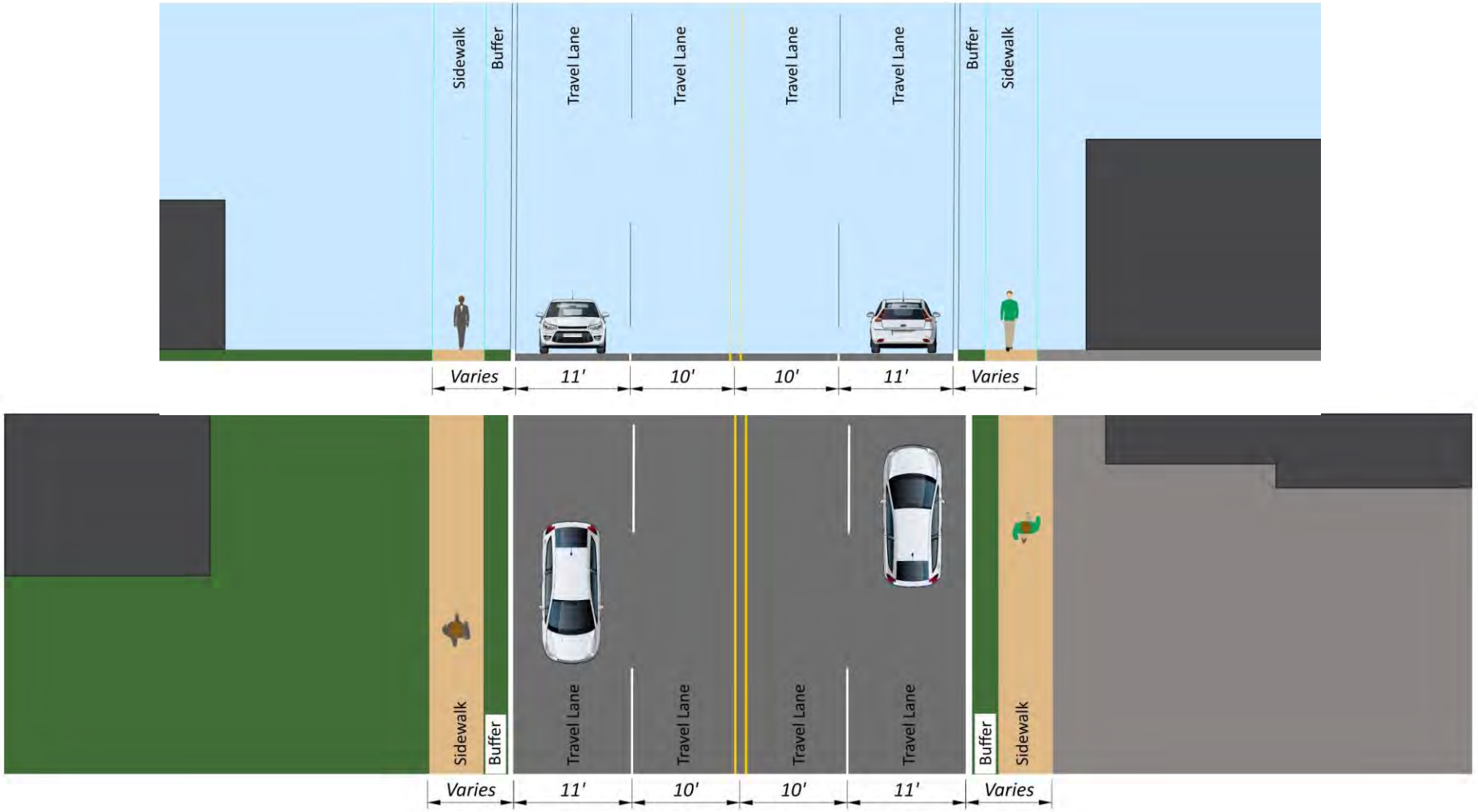
What We've Done – Existing Conditions

Roadway Cross Section



What We've Done – Existing Conditions

Pedestrian, Bicycle and Transit Facilities

What We've Done – Existing Conditions

Traffic

What We've Done – Traffic Analysis

- ✓ Traffic Counts
- ✓ Speed Study
- ✓ Parking Study
- ✓ Future Traffic Volumes

- ✓ Pedestrian Generator Map
- ✓ Unmarked Pedestrian Crossings Analysis
- ✓ Crash Analysis & Mitigation Strategy

- ✓ Traffic Signal Analysis
- ✓ Traffic Flow Analysis

What We've Done – Recommendations

- Short Term Countermeasures
- Bicycles, Pedestrians and Parking
- Road Diet Typical Sections
- Project Transitions

What We've Done – Recommendations

Short Term Countermeasures

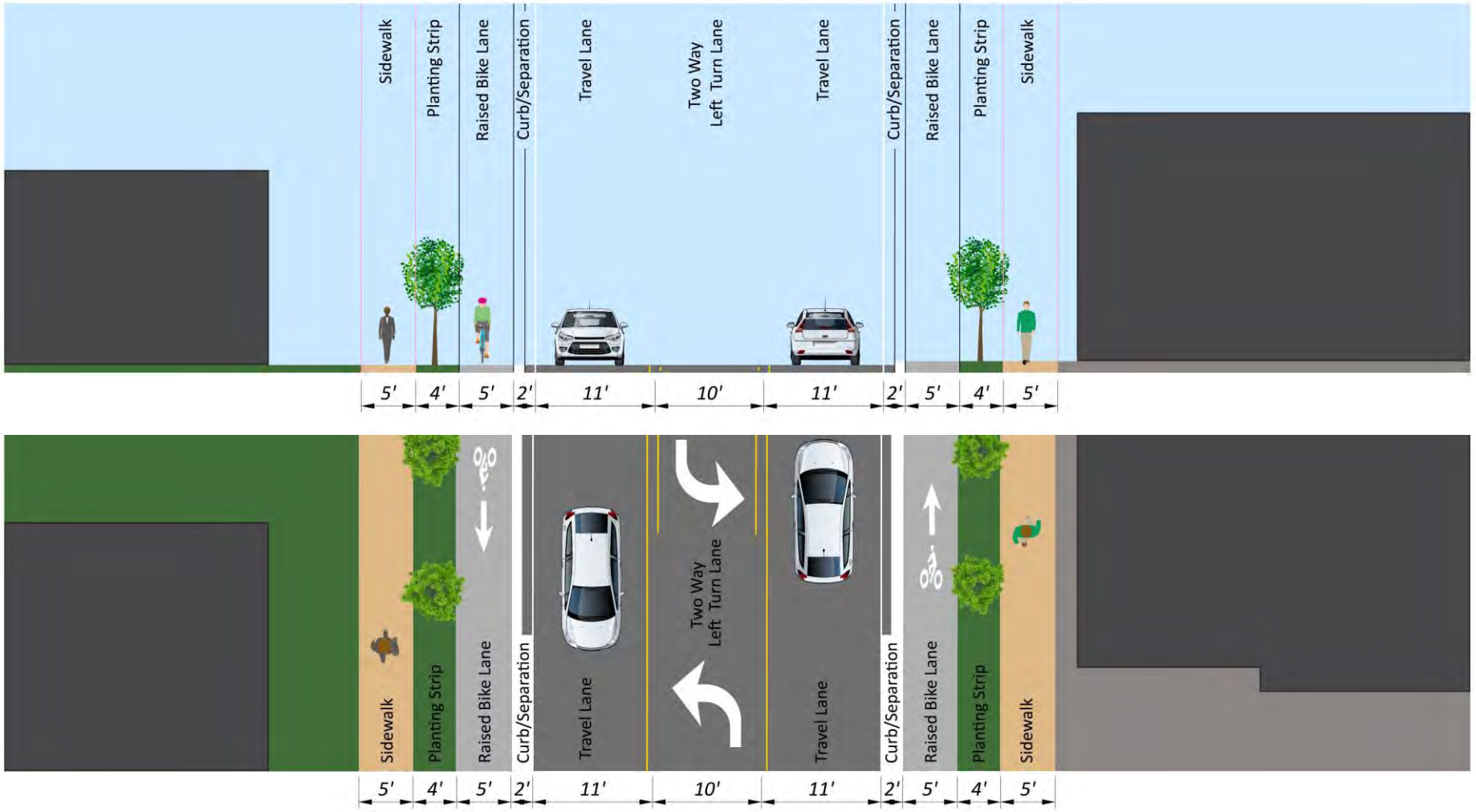
- Improve Signal Visibility
- Signal Retiming
- Prohibit Left Turns
- Pedestrian Crosswalk

What We've Done – Recommendations

Bicycle Lanes, Pedestrians and Parking

What We've Done – Recommendations

Road Diet with Two-Way Left Turn Lanes



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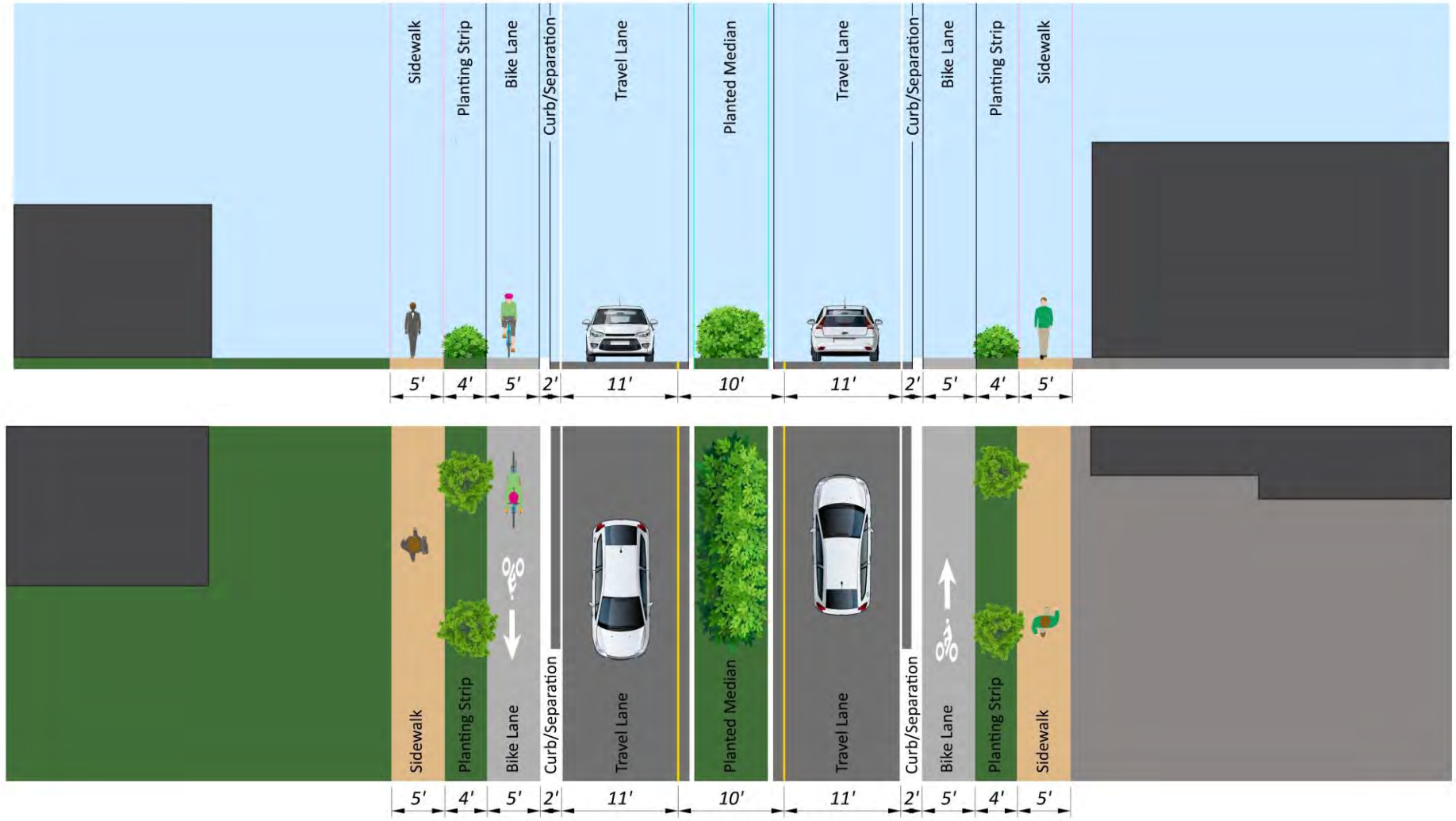
ANDREW J. GINTHER, MAYOR

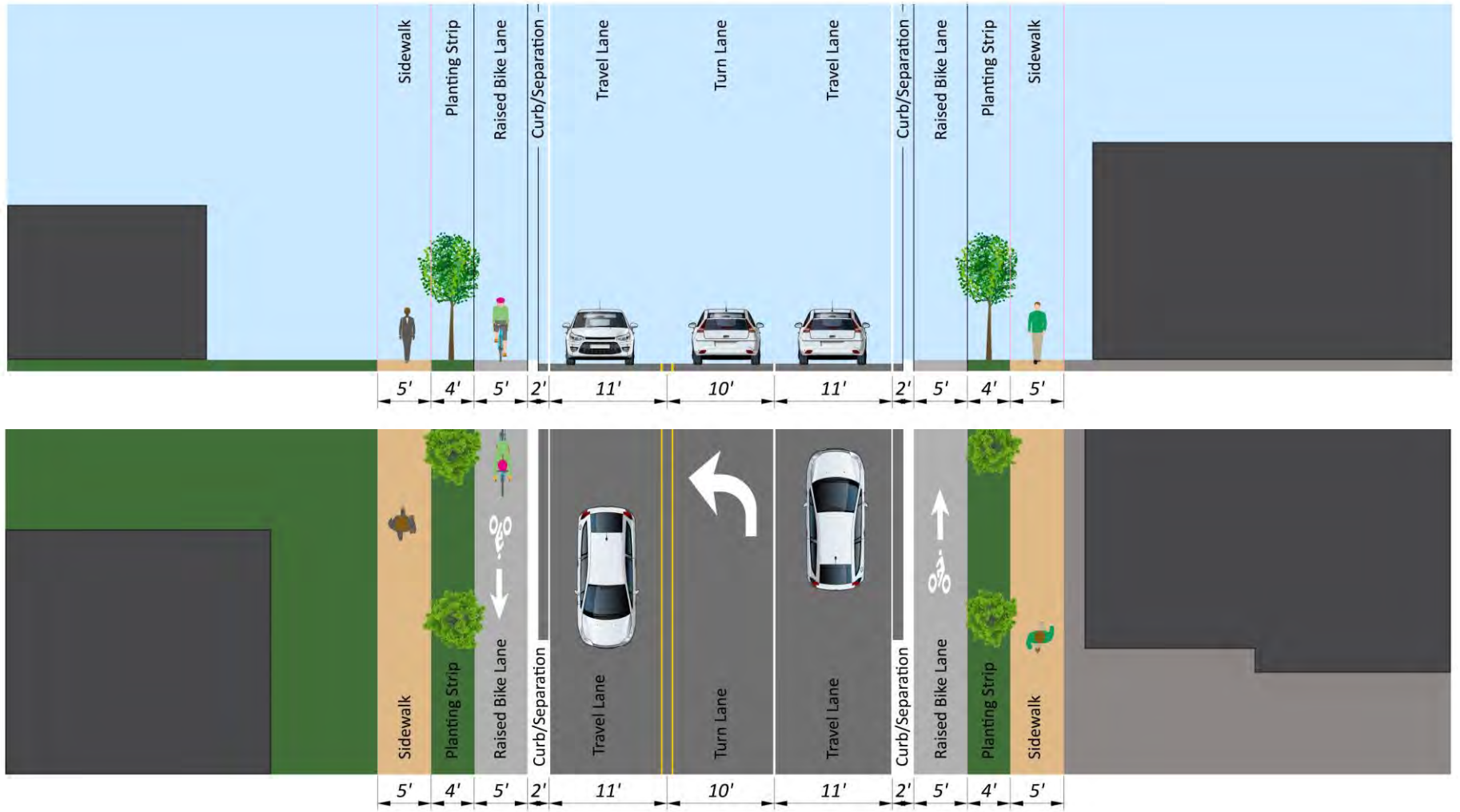
What We've Done – Recommendations

Road Diet with Median



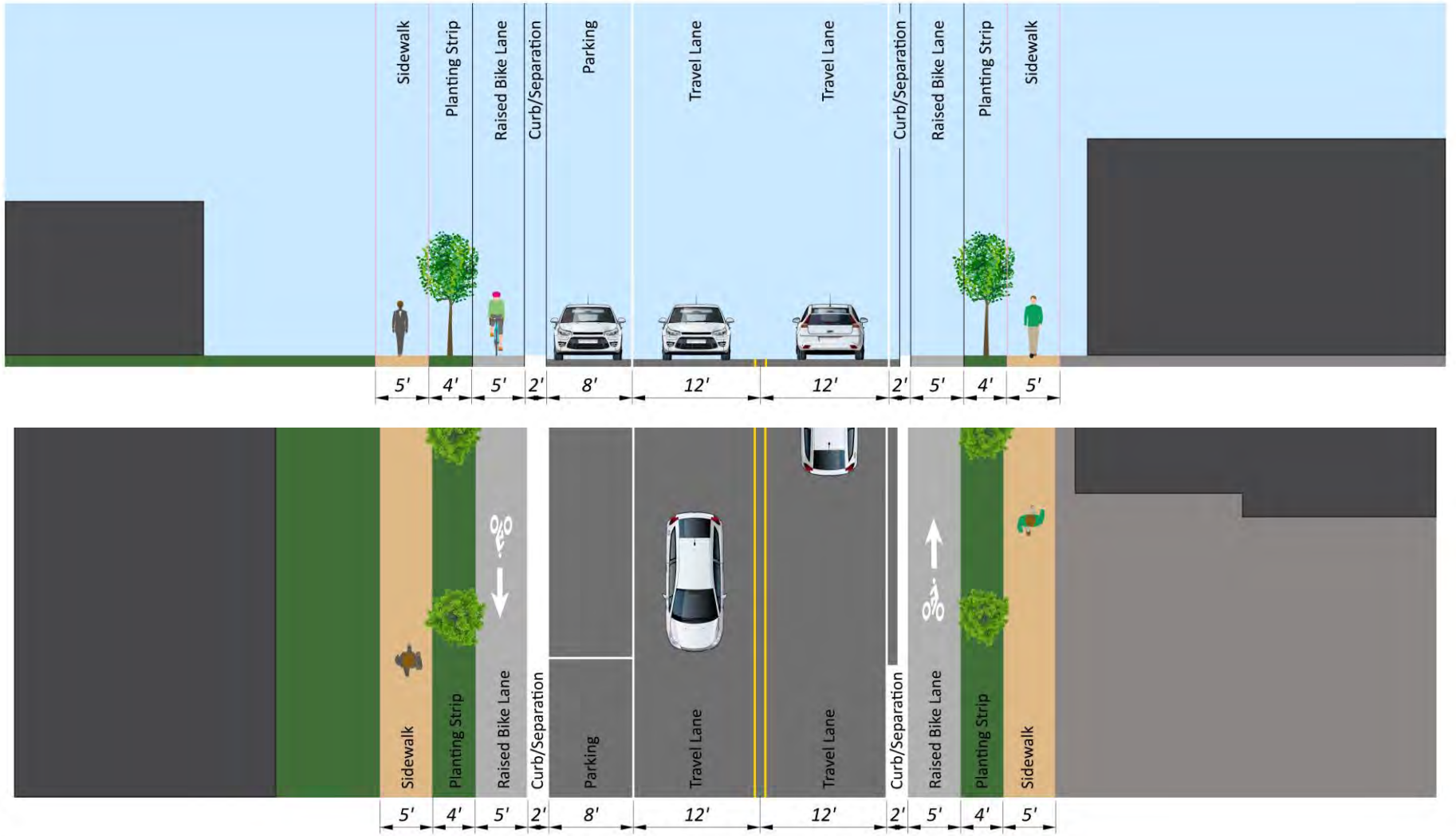
What We've Done – Recommendations

Road Diet with Turn Lanes



What We've Done – Recommendations

Road Diet with Parking



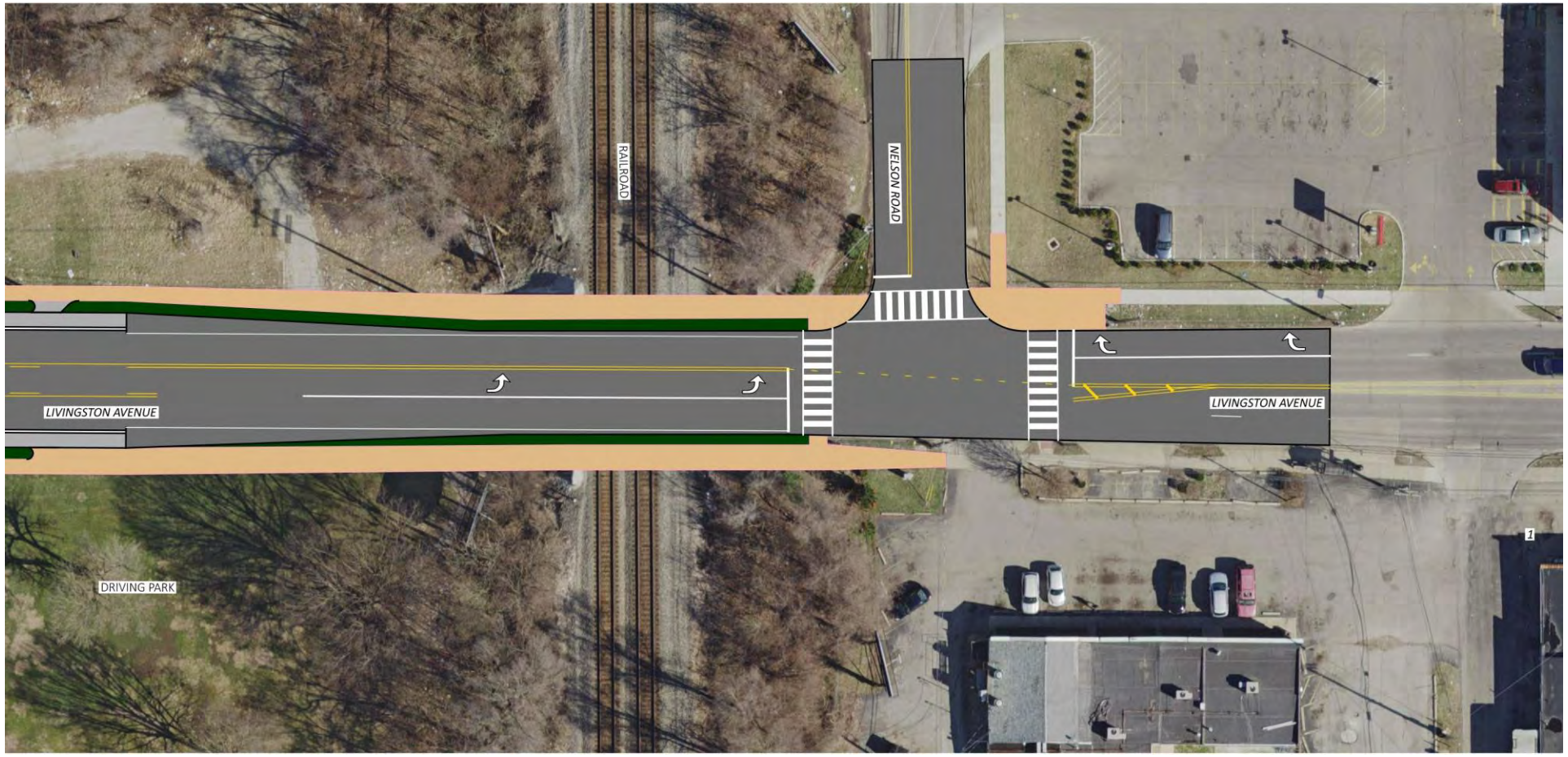
CITY OF COLUMBUS
ANDREW J. GINTHER, MAYOR

What We've Done – Recommendations

Project Transition – Western Limit

What We've Done – Recommendations

Project Transition – Eastern Limit



What We've Done – Recommendations

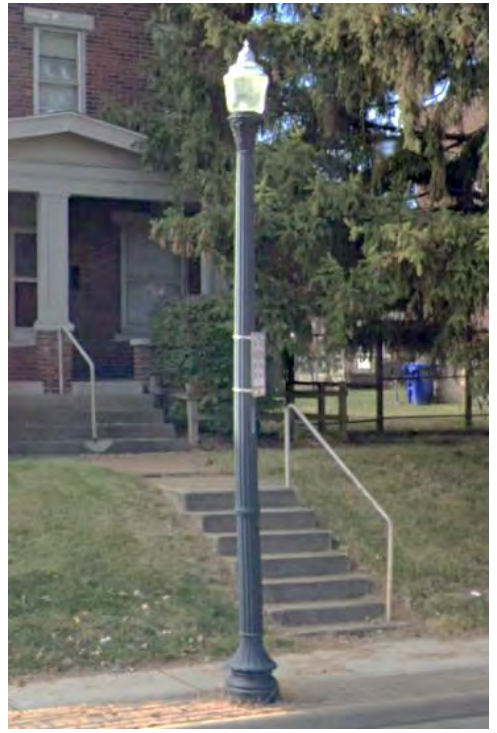
Design Standards

- Streetscape Design
- Bicycle Facilities
- Bus Stop Guidance

What We've Done – Recommendations

Design Standards – Streetscape Design

- Trees
- Buffer Space
- Signals and Light
- Roadside Amenities



What We've Done – Recommendations

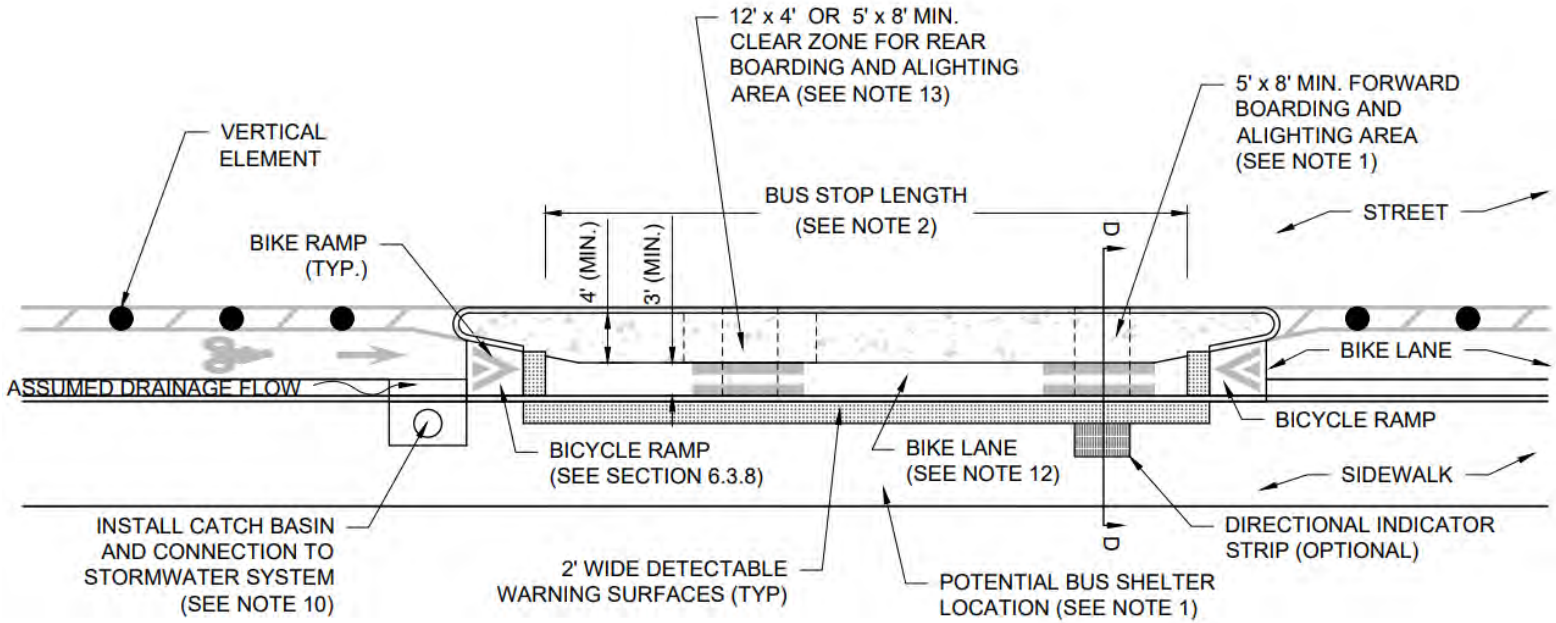
Design Standards – Bicycle Facilities

- Pavement, Transitions and Markings

What We've Done – Recommendations

Design Standards – Bus Stop Guidance

- Floating Bus Stop

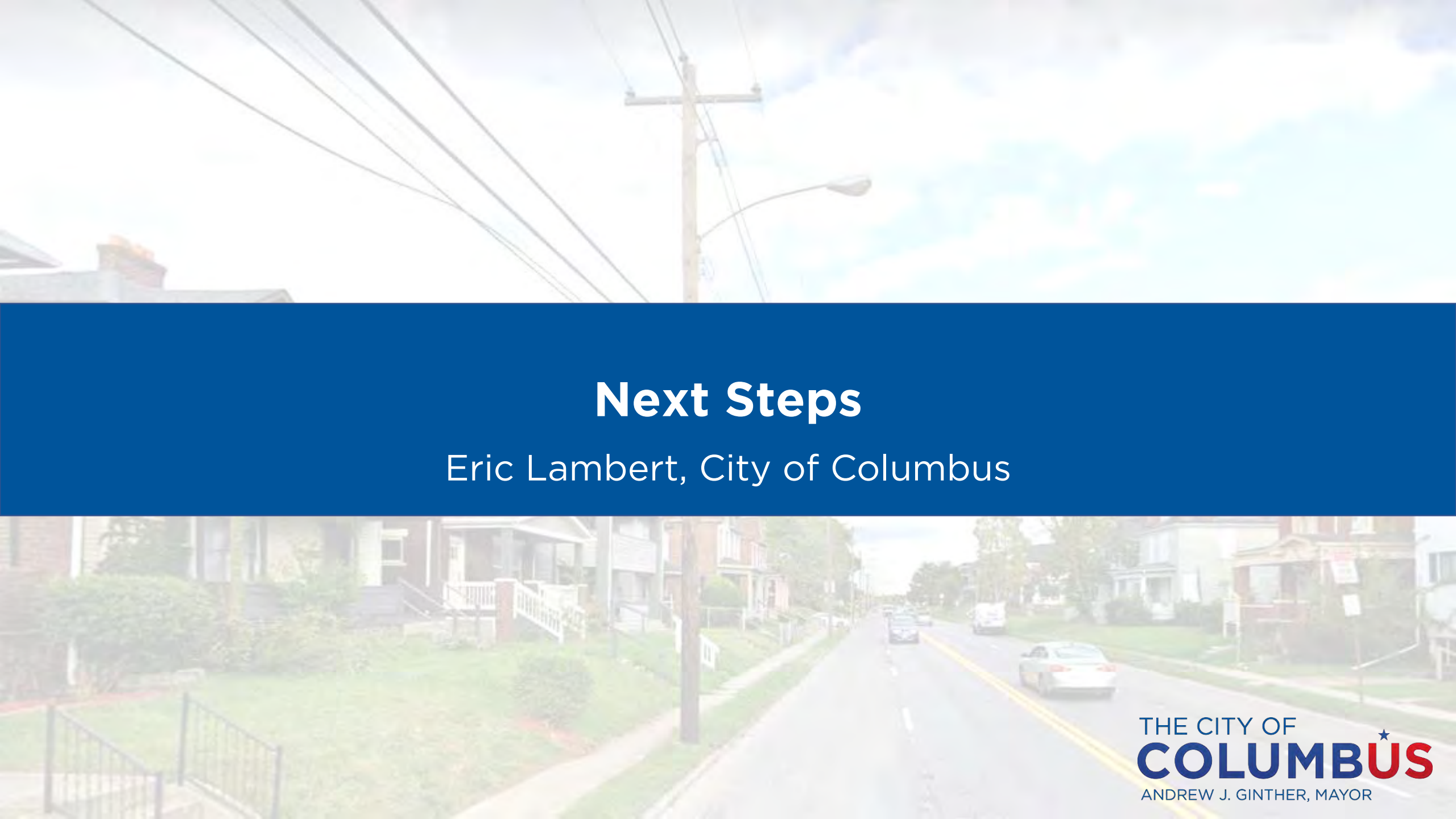


FLOATING BUS STOP
CONSTRAINED CONFIGURATION

Livingston Avenue Improvements – Commercial Area

THE CITY OF COLUMBUS
ANDREW J. GINTHER, MAYOR

Livingston Avenue Improvements – Residential Area

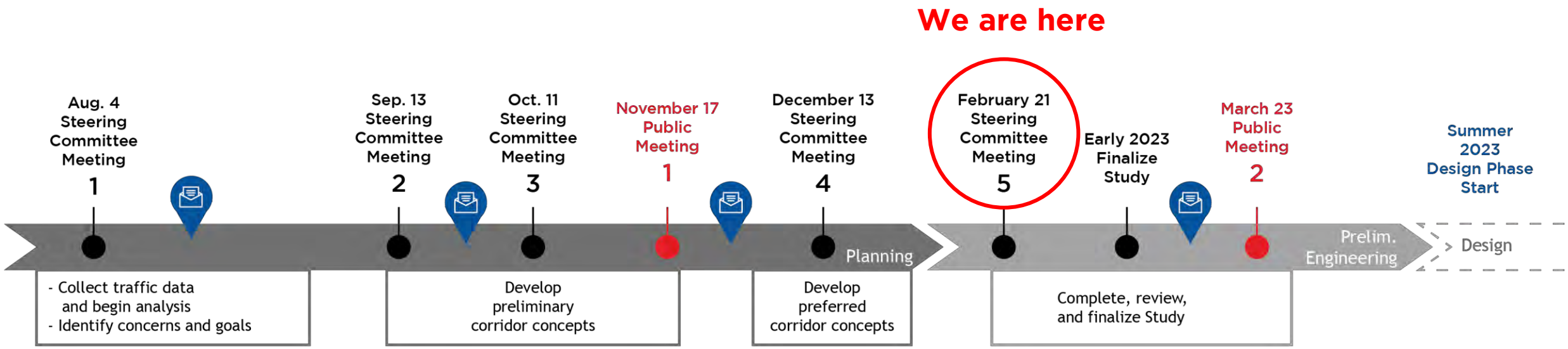


Next Steps

Eric Lambert, City of Columbus

THE CITY OF COLUMBUS
ANDREW J. GINTHER, MAYOR

Next Steps: Study Phase



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ANDREW J. GINTHER, MAYOR

Next Steps: Project Schedule

The following schedule is set to meet requirements of the SS4A and conform to the ODOT process for performing a project.

Study: Complete Spring 2023

Design: Summer 2023 to End 2025

Right of Way Acquisition: Spring 2025 to Spring 2026

Utility Relocation: Spring 2025 to Spring 2026

Construction: Beginning 2026 to End 2028

Next Steps: Study Phase → Design Phase

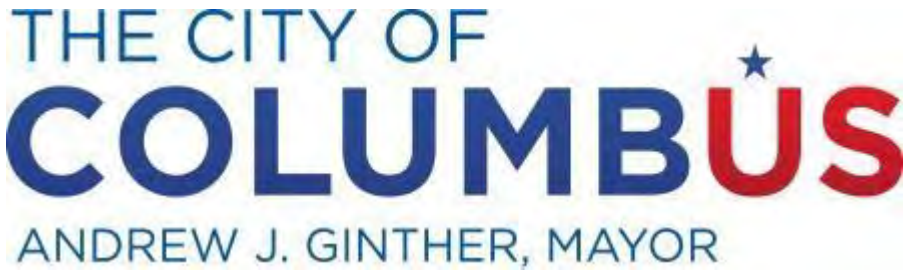
- Study recommendations/concepts will be implemented in the design phase
  - Additional data collection and analysis may be necessary
- Design Phase will coordinate with the following entities during design:
  - COTA
  - City of Columbus – DPS, CRPD, DOSD, DOW, DOP, DOT, Fire Dept., etc.
  - Private Utilities
  - ODOT
- Continued public involvement at key points during design phase

Pulse Check Questionnaire

One last time!

- Please complete survey (paper copy or online) before you leave

Thank you!



ATTACHMENT D

Pulse Check Survey

Livingston Avenue Improvement Study

Steering Committee Pulse Check

February 21, 2023

1. Rate the effectiveness of:	Very Poor	Poor	Good	Very Good
a) The information covered	☐	☐	☐	☐
b) Discussion opportunities	☐	☐	☐	☐
c) The format of today's meeting	☐	☐	☐	☐
d) Your comfort speaking up	☐	☐	☐	☐

2. Based on today's session:	Strongly Disagree	Disagree	Agree	Strongly Agree
a) I understand the purpose of the Livingston Avenue Study	☐	☐	☐	☐
b) I understand the role of the team	☐	☐	☐	☐
c) I believe this project will lead to meaningful results	☐	☐	☐	☐
d) I am committed to support this team's success	☐	☐	☐	☐
e) I believe that the City of Columbus demonstrates commitment to the work of this team	☐	☐	☐	☐

3. Rate the following:	Very Poor	Poor	Good	Very Good
a) Steering Committee's preparedness for today's meeting	☐	☐	☐	☐
b) Steering Committee's ability to work together at today's meeting	☐	☐	☐	☐

4. What went well today? _____

_____

5. What could have been improved? _____

_____

6. How do you feel about the progress of the team so far? _____

_____

7. What is one key learning experience you have had thus far? _____

_____

Name: _____ ***THANK YOU!***

Public Meeting #1

THE CITY OF COLUMBUS

You're Invited!

Livingston Avenue Improvements Study Public Meeting Open House

This is the community's opportunity to review preliminary concepts designed for safer travel on Livingston Avenue. The concepts were shaped with input from the project Steering Committee, representing neighborhood residents and business, faith and community organizations. Let us know what you think, and engage with city staff and the project team during the open house events!

November 17

Driving Park Community Center

12 p.m. - 2 p.m.
Presentation at 12:30 p.m.

&

5:30 p.m. - 7:30 p.m.
Presentation at 6:00 p.m.

For more information:

www.columbus.gov/LivingstonAvenuePedestrianSafetyStudy

Questions or Comments?

Contact:

Eric Lambert
City of Columbus, Project Manager

614-645-2732

SELambert@columbus.gov

Livingston Avenue Improvements Study - 18th Street to Nelson Road
Public Meeting Open House

Date: Thursday, November 17, 2022

Time: Noon to 2 p.m. and 5:30 to 7:30 p.m.
Presentation at 12:30 p.m. and 6 p.m.

Location: Driving Park Community Center
1100 Rhoads Ave., Columbus, OH 43206

What: The project team will share preliminary corridor concepts and receive feedback.

Format: Open House with Presentation (the same presentation at both meetings)

More project information: www.columbus.gov/LivingstonAvenuePedestrianSafetyStudy ⟶

Questions or comments? Contact:
City of Columbus, Project Manager
Eric Lambert
(614) 645-2732
SELambert@columbus.gov

About the Project

The Livingston Avenue corridor is identified on the Vision Zero Columbus High Injury Network because it has a higher density of fatal and serious injury crashes that present safety issues for pedestrians, cyclists, transit users and drivers. The City is working to address these issues along the corridor, with the Livingston Avenue Improvements Study. The goal of the study is to identify and develop concepts to promote safety for all roadway users and reduce speeds and severe crashes.

About the Meeting

The public meeting is being held to present preliminary corridor concepts and receive feedback. The concepts were developed with input from the project Steering Committee, comprised of neighborhood residents and business, faith and community organization representatives. This is an open house style meeting, and you may join us at any time during the times listed above. A presentation on the concepts will be made at 12:30 p.m. and at 6 p.m. Please note: The same presentation will be made at both meetings. City staff and the design project team will be on hand to help answer your questions.

To receive a copy of the materials presented at the public open house by mail, please contact the project manager at the contact information provided in the top right corner.

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THE CITY OF COLUMBUS

Attn: Eric Lambert
111 N Front Street
Columbus, OH 43215

LIVINGSTON AVENUE
PUBLIC MEETING OPEN HOUSE

Public Meeting Open House
Thursday, Nov. 17, 2022

See reverse for details.

The project team will share preliminary corridor concepts for the Livingston Avenue Improvements Study and receive feedback.

THE CITY OF COLUMBUS

Attn: Eric Lambert
111 N Front Street
Columbus, OH 43215

LIVINGSTON AVENUE
PUBLIC MEETING OPEN HOUSE

Public Meeting Open House
Thursday, Nov. 17, 2022

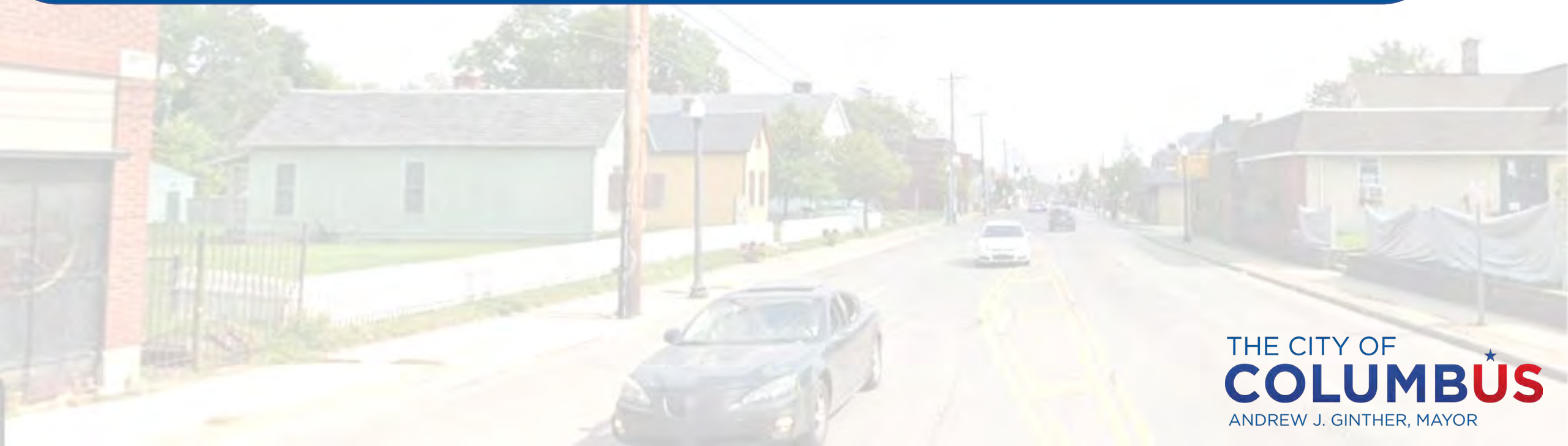
See reverse for details.

The project team will share preliminary corridor concepts for the Livingston Avenue Improvements Study and receive feedback.

Livingston Avenue Improvements Study
S. 18th Street to Nelson Road

Public Meeting

November 17, 2022



THE CITY OF
COLUMBUS
ANDREW J. GINTHER, MAYOR

Meet the Team

City of Columbus -

Dept. of Public Service

- Design and Construction
- Planning
- Public Affairs
- Traffic Management

Steering Committee

CHA

- Engineering and Design

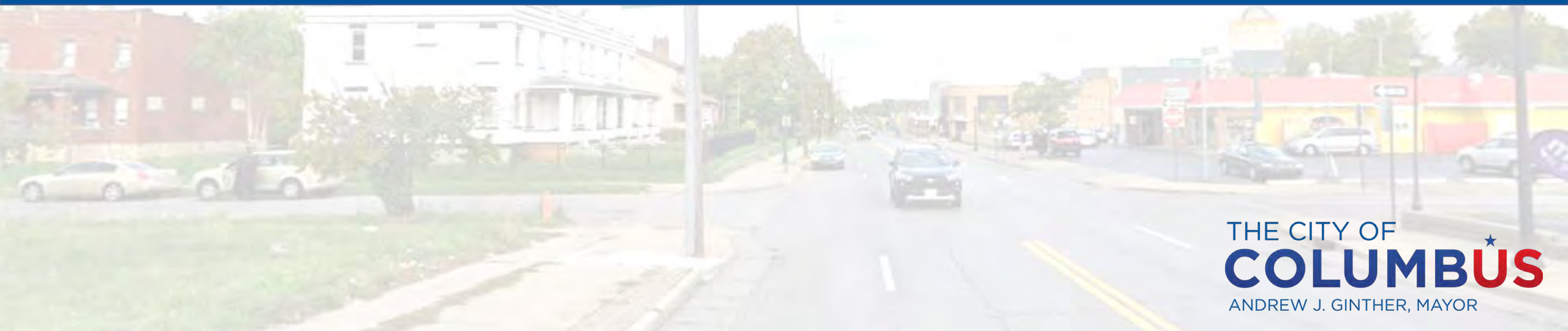
Lawhon & Associates

- Public Involvement

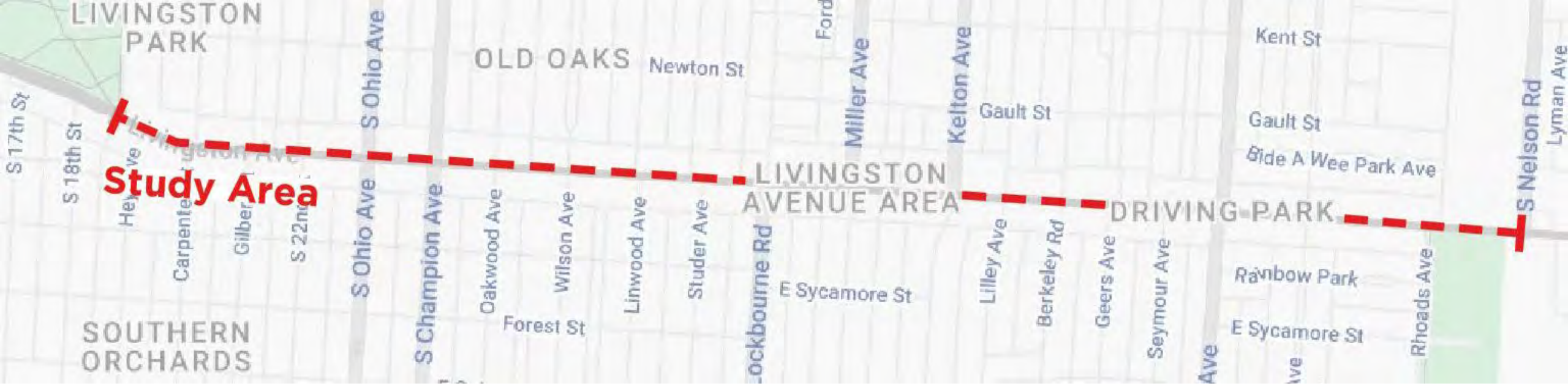
Steering Committee

Michael Aaron
Rickenbacker Woods Community Fdn.
Pastor Jonathan Bradford
Bethany Baptist Church
Danielle Dillard
Livingston Avenue Area Comm.
David Gray
Livingston Avenue Area Comm.
Stacee Green
Driving Park Civic Assoc.
Rita Hallaveld
Resident & cyclist
Molly Hogue
Resident
George Holliman
Livingston Avenue Area Comm.
Rachel Robinson
Southern Orchards Civic Assoc.
Jerry Saunders
Africentric Personal Dev. Shop
Erin Synk
Columbus South Side Area Comm.
Ralph Walker
Livingston Ave. Columbus, OH Safety Group
Sherman Willis
Community business owner

Study Parameters



THE CITY OF COLUMBUS
ANDREW J. GINTHER, MAYOR



Study Limits

- Study limits extend along Livingston Avenue from S. 18th Street to Nelson Road
- This section of Livingston Avenue is also designated as a part of US 33

Relevant Project History in Corridor

Other Projects Improvements

City of Columbus

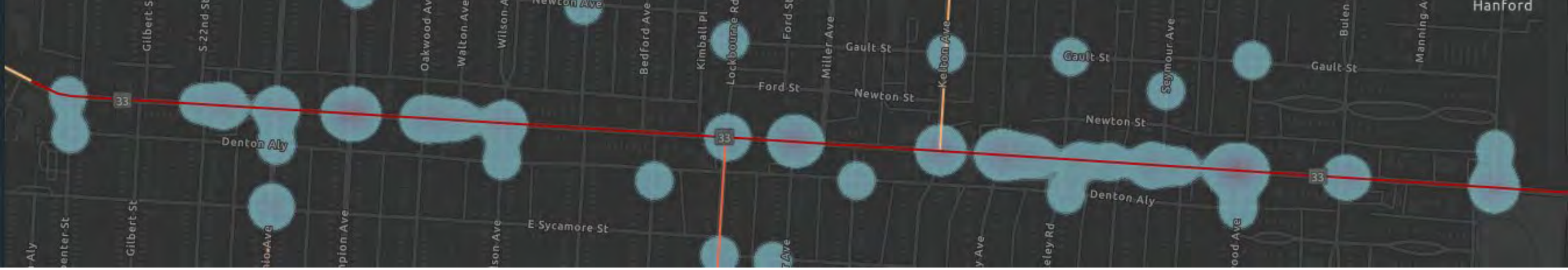
- Livingston Neighborhood Commercial Revitalization Project, Miller St. – Fairwood Ave. (2000)
- Parsons/Livingston Improvements, 9th St – Ohio Ave. (2010)
- Livingston Streetscape, Ohio Ave. to Fairwood Ave. (2013)

ODOT

- Pedestrian Safety Improvement Project (22nd St., Lilley, and Wilson) (2022)

Previous Studies

- Near Nationwide Children's, joint plan with Bexley
- History of crashes & speeding



Why?

Vision Zero

- Project corridor has **6x** the fatality rate, and **5x** the serious injury rate than the general MORPC MPO area.
- The corridor is part of the city and regional High Injury Networks.
- Speeding and safety concerns significantly limit opportunities for residents and businesses.

VISION ZERO COLUMBUS

DRIVE SAFE. WALK SAFE. BIKE SAFE.

https://vision-zero-columbus.hub.arcgis.com/

THE CITY OF COLUMBUS
ANDREW J. GINTHER, MAYOR

Why?

- Many of the communities along Livingston Avenue have been historically disadvantaged

"When you look at where interstates are routed, they are an exact road map through the communities that lacked the political power to not have them constructed through those communities."

- ODOT Director Jack Marchbanks.

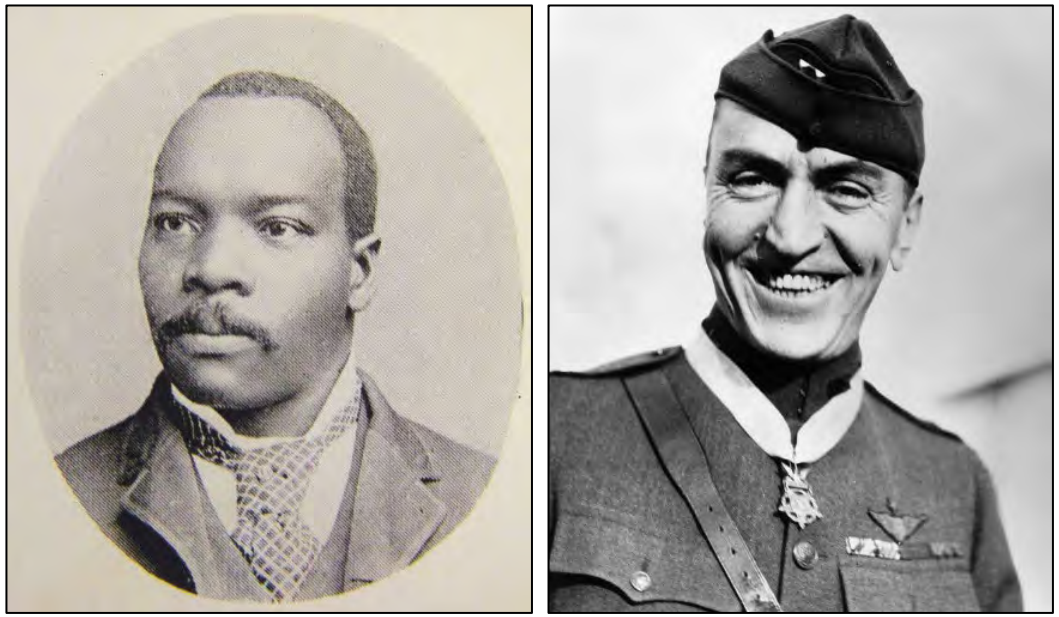
Desired Outcomes

Study

- Work **with** the Community to develop clear design objectives
- Perform necessary traffic analyses to develop effective countermeasures to speeding and safety concerns

Project as a whole

- Address community and transportation safety
- Improve access to businesses and other community assets throughout the corridor and beyond
- Celebrate the community and its rich history



Hall of Fame Inventor Granville T. Woods (l), and Medal of Honor recipient Eddie Rickenbacker. Source: Wikimedia Commons

Study/Project Support

Columbus is seeking a $12m Safe Streets for All (SS4A) Implementation Grant with a local match of $12-15 million.

Elected Officials
- United States Senate - Senator Sherrod Brown
- United States Senate - Senator Rob Portman
- United States House of Representatives - Congresswoman Joyce Beatty
- Ohio State Representative Latyna M. Humphrey
- Franklin County Board of Commissioners
- Franklin County Auditor Michael Stinziano
- Franklin County Clerk of Courts Maryellen O'Shaughnessy
- Franklin County Engineer Cornell R. Robertson
- Franklin County Recorder Daniel J. O'Connor Jr.
- City of Columbus – Mayor Andrew Ginther
- Columbus City Council

State and Local Governments
- City of Bexley

Agencies & Coalitions
- Affordable Housing Alliance of Central Ohio
- Age Friendly Communities
- CelebrateOne
- Central Ohio Hospital Council
- Central Ohio Transit Authority
- Columbus Chamber of Commerce
- Columbus Downtown Development Corporation
- Columbus Metropolitan Housing Authority
- Columbus-Franklin County Finance Authority
- Mid-Ohio Regional Planning Commission
- Workforce Development Board of Central Ohio

Corporations & Private Business
- The Mannik and Smith Group
- Woda Cooper Companies, Inc.

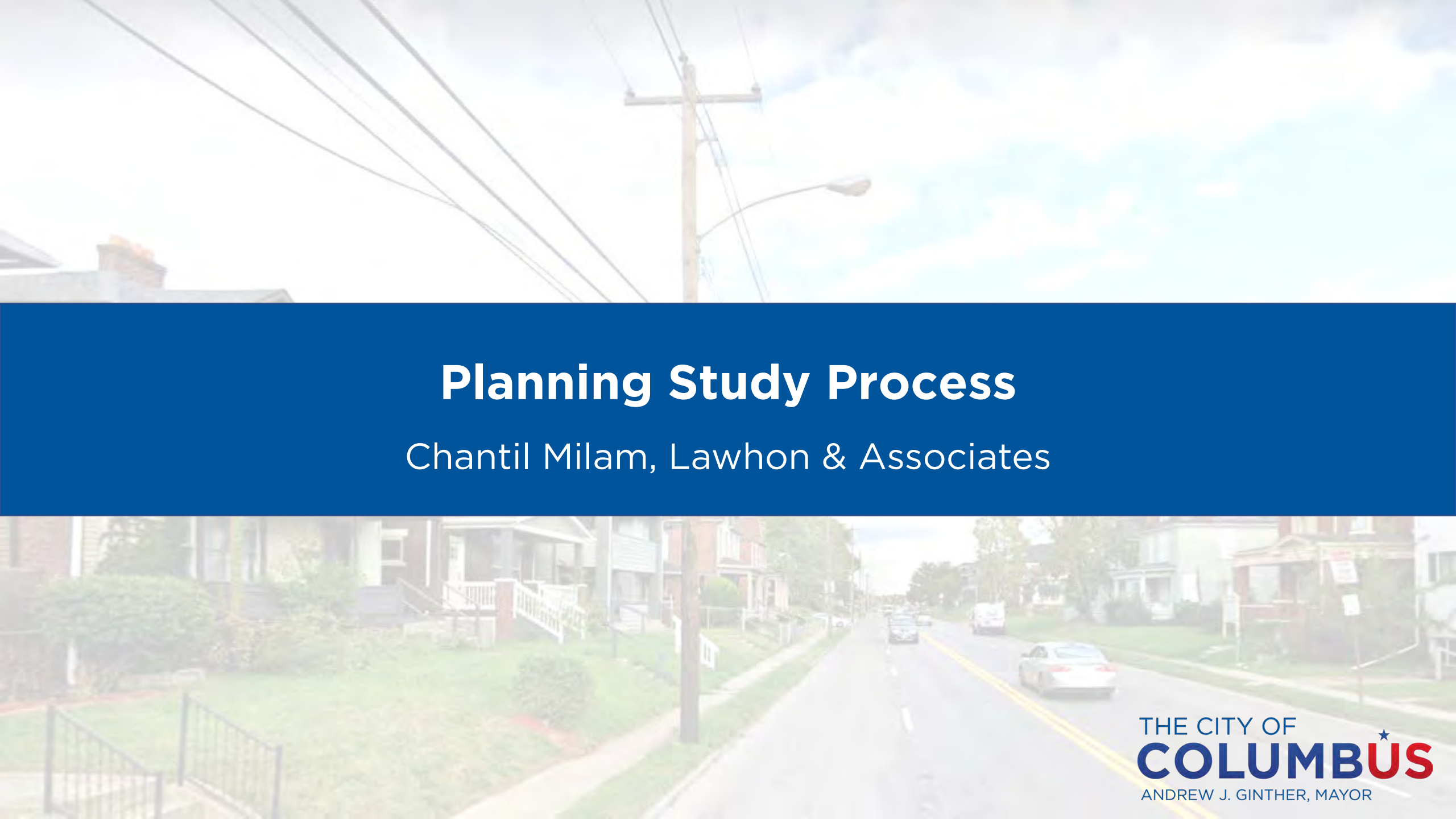
Hospitals & Non-Profit Agencies
- AAA Ohio Auto Club
- Catholic Social Services
- Columbus Foundation
- Columbus Metropolitan Library
- Community Development for All People
- Community Housing Network
- Homeport
- Nationwide Children's Hospital
- Ohio Business Development Center
- Rise Together Innovation Center
- South Side Thrive Collaborative

Educational Institutions
- Columbus Board of Education
- Columbus City Schools

Professional Organizations & Trade Associations
- American Council of Engineering Companies (ACEC) of Ohio
- Building Industry Association of Central Ohio
- Urban Land Institute Columbus District Council

Neighborhood Organizations
- Old Oaks Historic District

Other Stakeholders
- More than 30 community residents



Planning Study Process

Chantil Milam, Lawhon & Associates

THE CITY OF
COLUMBUS
ANDREW J. GINTHER, MAYOR

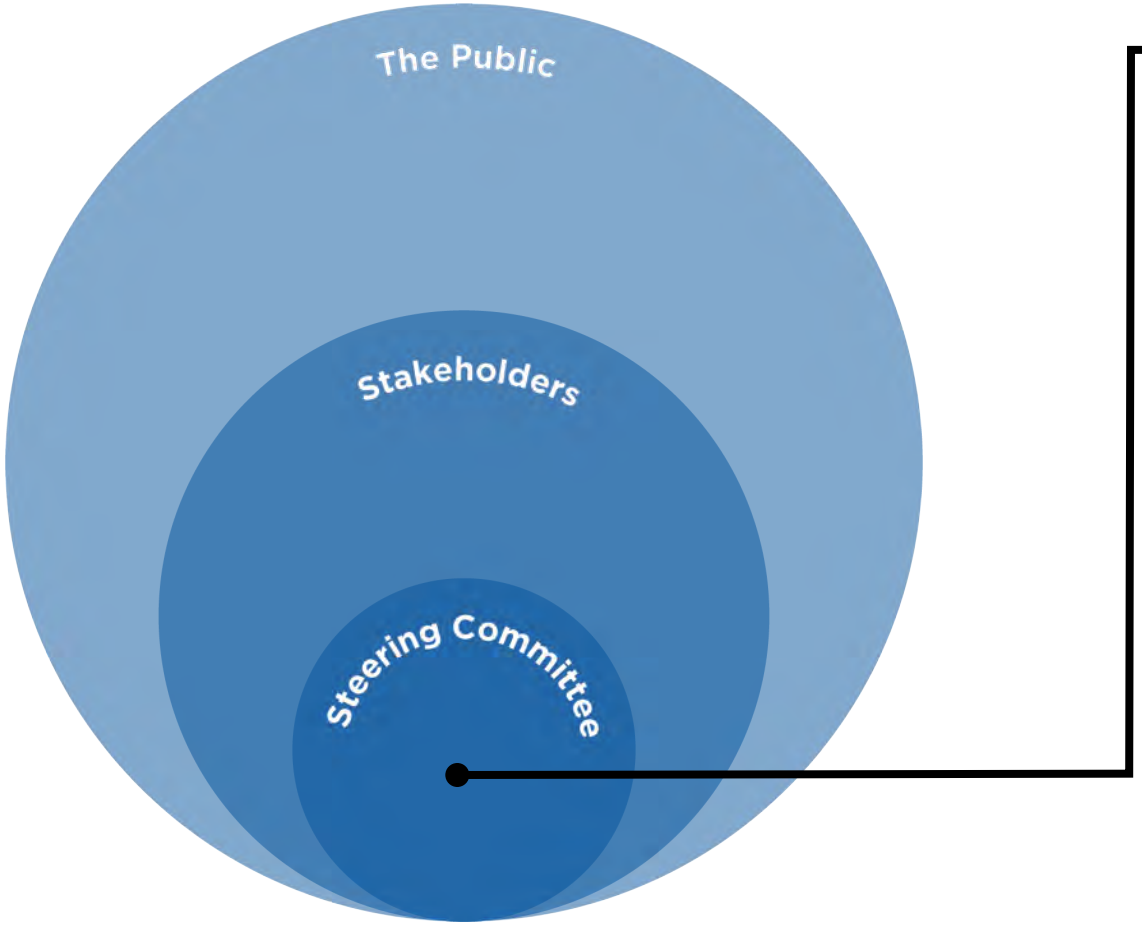
What is the goal for today?

- Introduce the study
- Discuss the study process
- Present what we've done so far
- Present preliminary corridor concepts
- Discuss next steps
- Gather input from you

How We Will Use the Study

- Study used to identify issues, conduct analysis, receive and document input, narrow down solutions
- Study is then used as a roadmap/reference for future project(s)

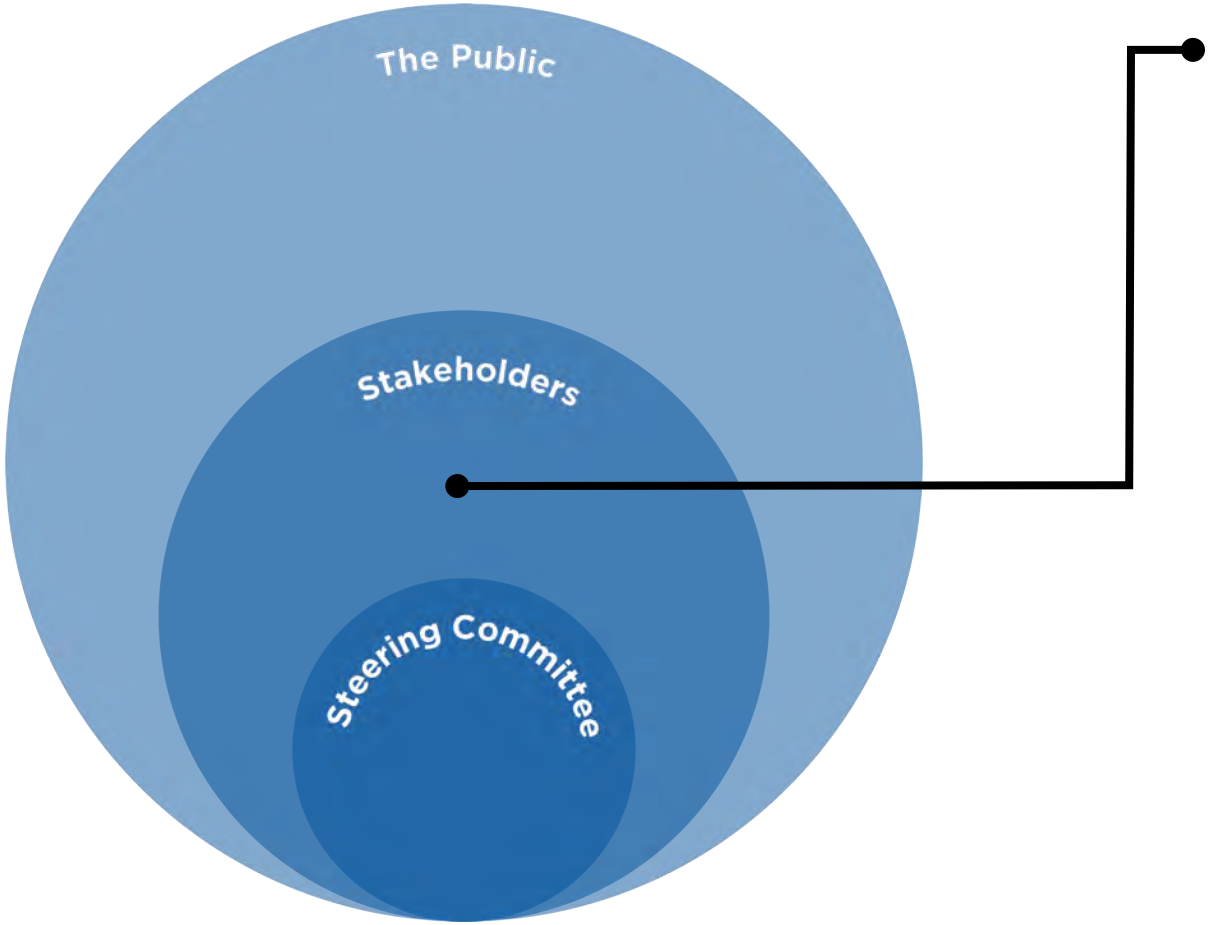
Planning Study Input



Steering Committee

- 13 members
  - Comprised of residents and business, faith and community organization representatives
- Provide guidance to team throughout study
  - 3 meetings to date
- Represent and provide feedback from public & stakeholders to team

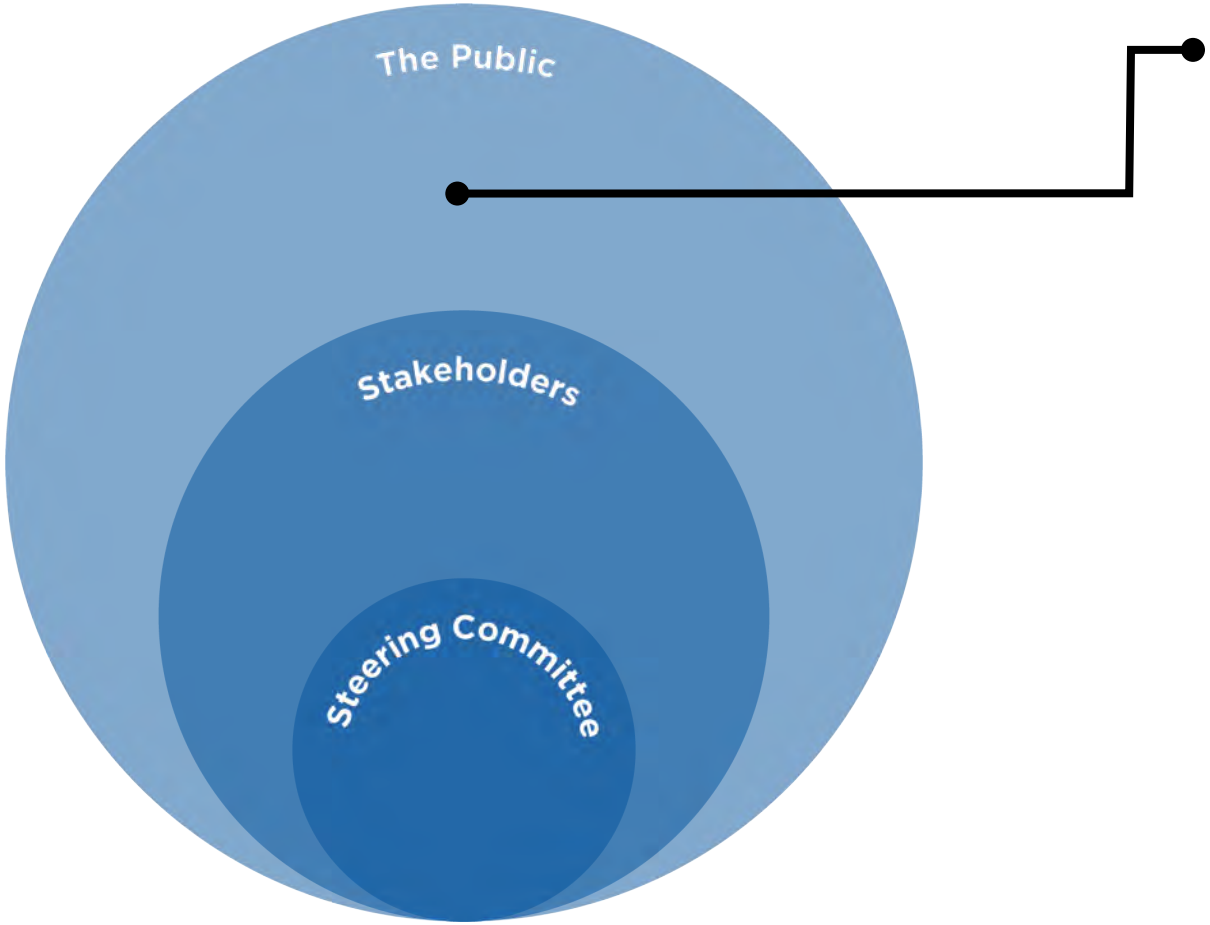
Planning Study Input



Stakeholders

- 25-30 groups/individuals
  - COTA, library, rec. center, area commissions, community organizations, City departments, safety & emergency services, Nationwide Childrens
- Informed on study progress
  - Newsletters (monthly)
- Outreach and Input to:
  - Share study findings
  - Answer questions
  - Receive feedback

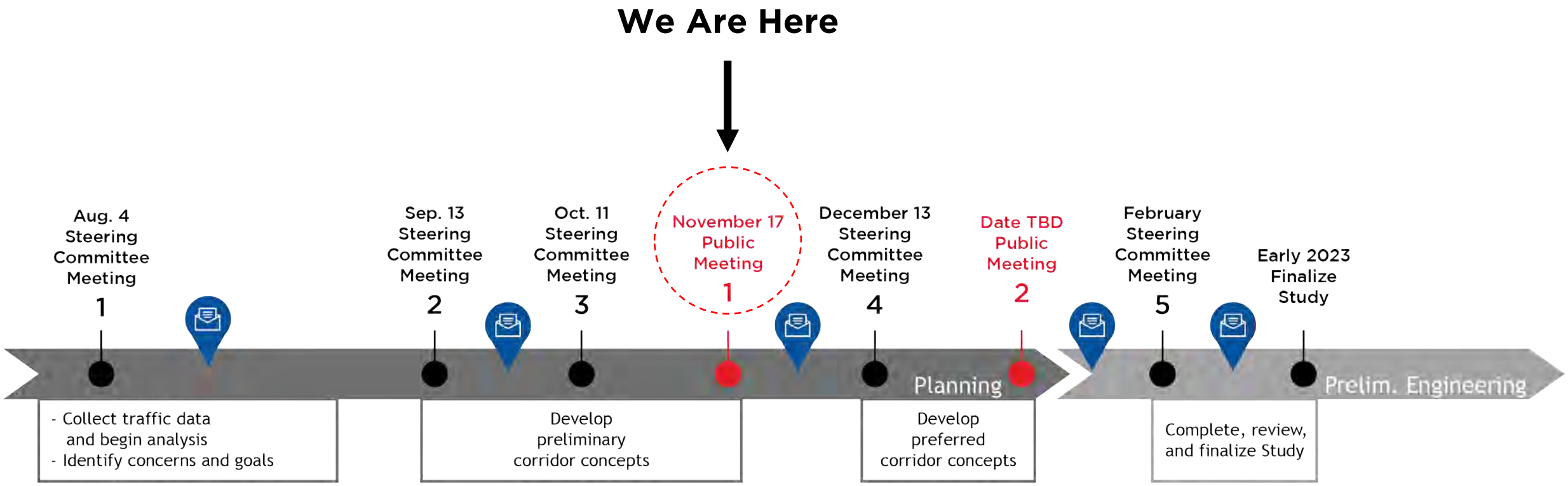
Planning Study Input



Public

- Residents, neighbors, business owners, commuters, etc.
- Informed on study progress through steering committee, stakeholders and public meeting
- Outreach and Input to:
  - Share study findings
  - Answer questions
  - Receive feedback

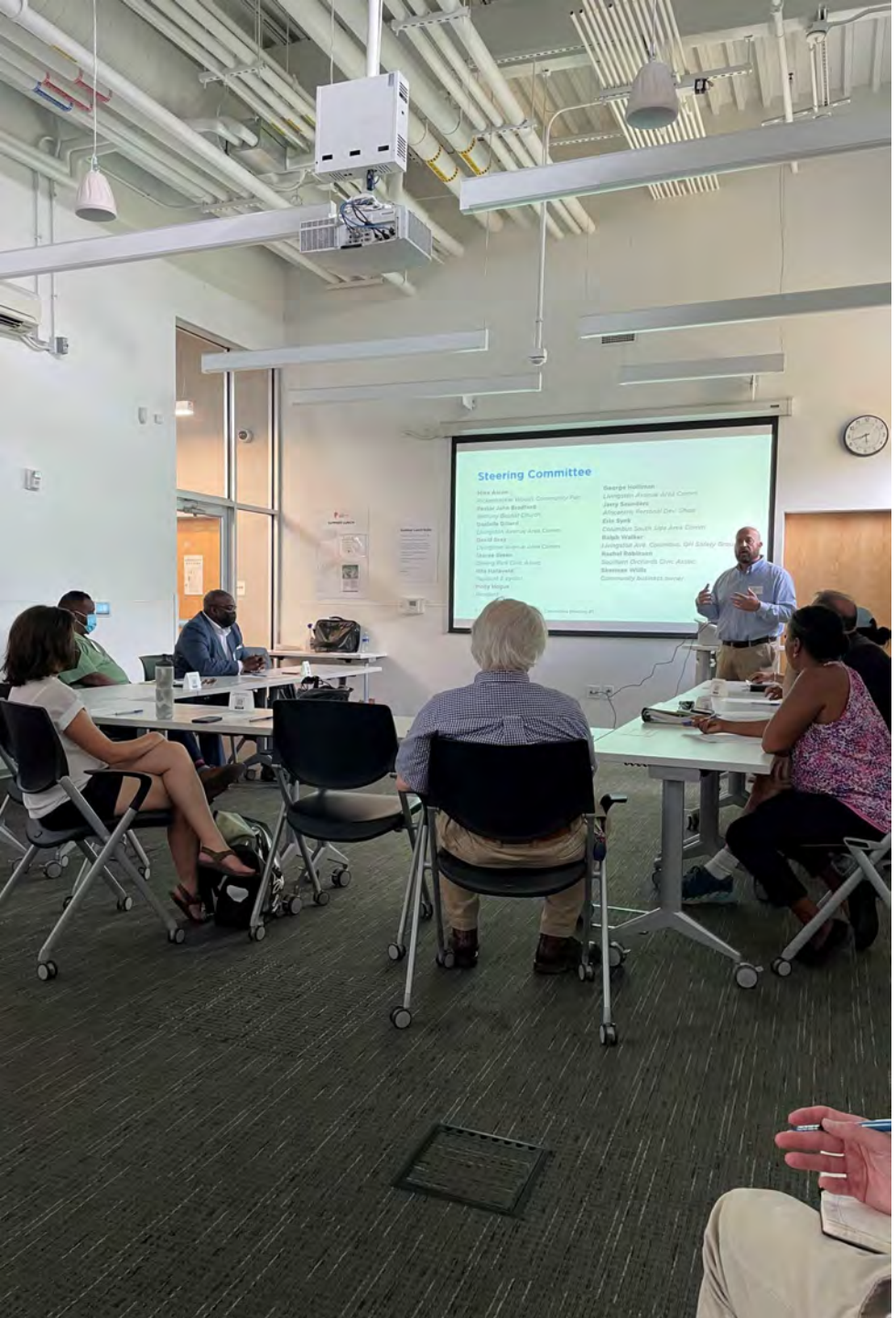
Plan Process Overview



THE CITY OF COLUMBUS
ANDREW J. GINTHER, MAYOR

What We've Done So Far

THE CITY OF COLUMBUS
ANDREW J. GINTHER, MAYOR



Steering Committee Meeting #1
August 15, 2022

Meeting Goals

- Introduce the study and schedule
- Outline roles and responsibilities
- Identify priorities/transportation issues
- Take home survey provided to committee members to gain input from community

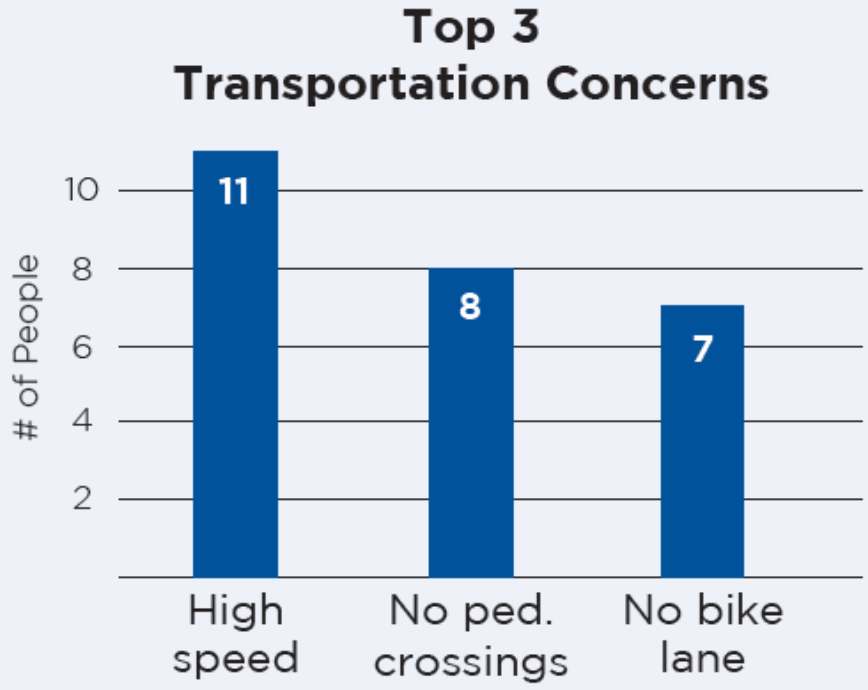
Steering Committee Meeting #1
August 15, 2022

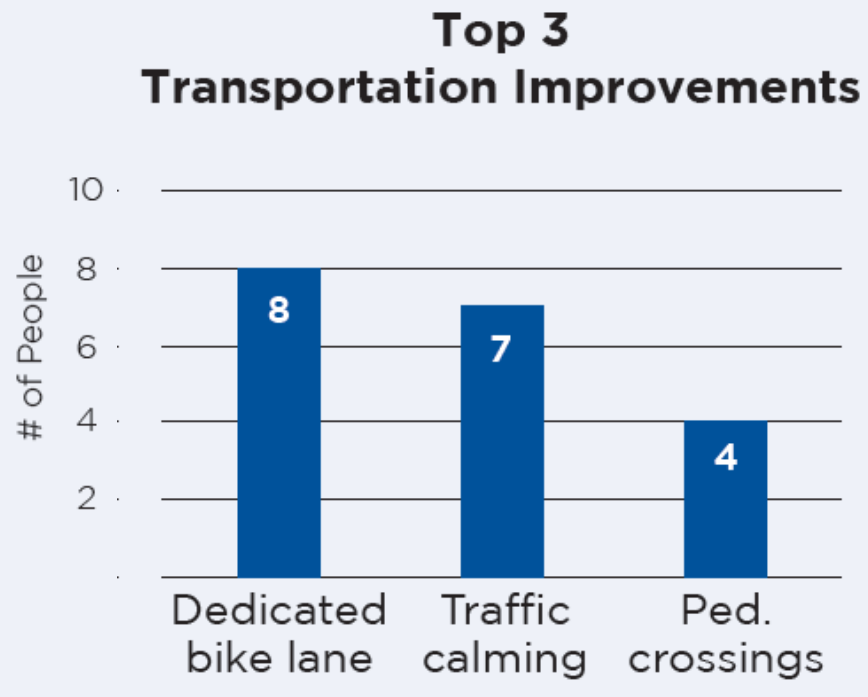
Top 5 Concerns

- Speeding
- Crashes
- Pedestrian Crossing (safety)
- Parking (needs)
- (Community) Identity

Top 4 Goals

- (Community) Identity
- Improve Safety
- Beautification
- Equitable Local Connectivity





Steering Committee Meeting #2
September 13, 2022

Meeting Goals

- Identify priorities & transportation issues (take home survey results)
- Present “design toolbox”
- Create ideal roadway layouts

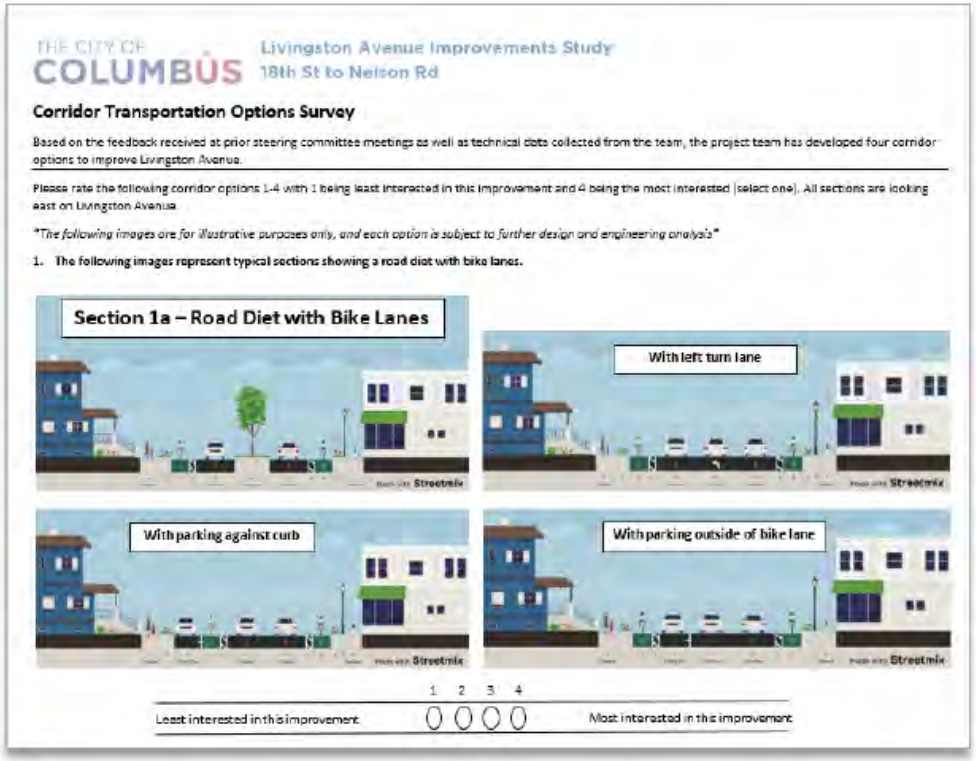
Steering Committee Meeting #2: September 13, 2022

Steering Committee Meeting #3
October 11, 2022

Meeting Goals

- Present preliminary corridor concepts (based on layouts developed at previous meeting)
- Receive feedback/interest in each concept (live survey)
- Revise concepts based on feedback to present to public

Steering Committee Meeting #3
October 11, 2022


THE CITY OF COLUMBUS
Livingston Avenue Improvements Study
18th St to Nelson Rd

Corridor Transportation Options Survey

Based on the feedback received at prior steering committee meetings as well as technical data collected from the team, the project team has developed four corridor options to improve Livingston Avenue.

Please rate the following corridor options 1-4 with 1 being least interested in this improvement and 4 being the most interested (select one). All sections are looking east on Livingston Avenue.

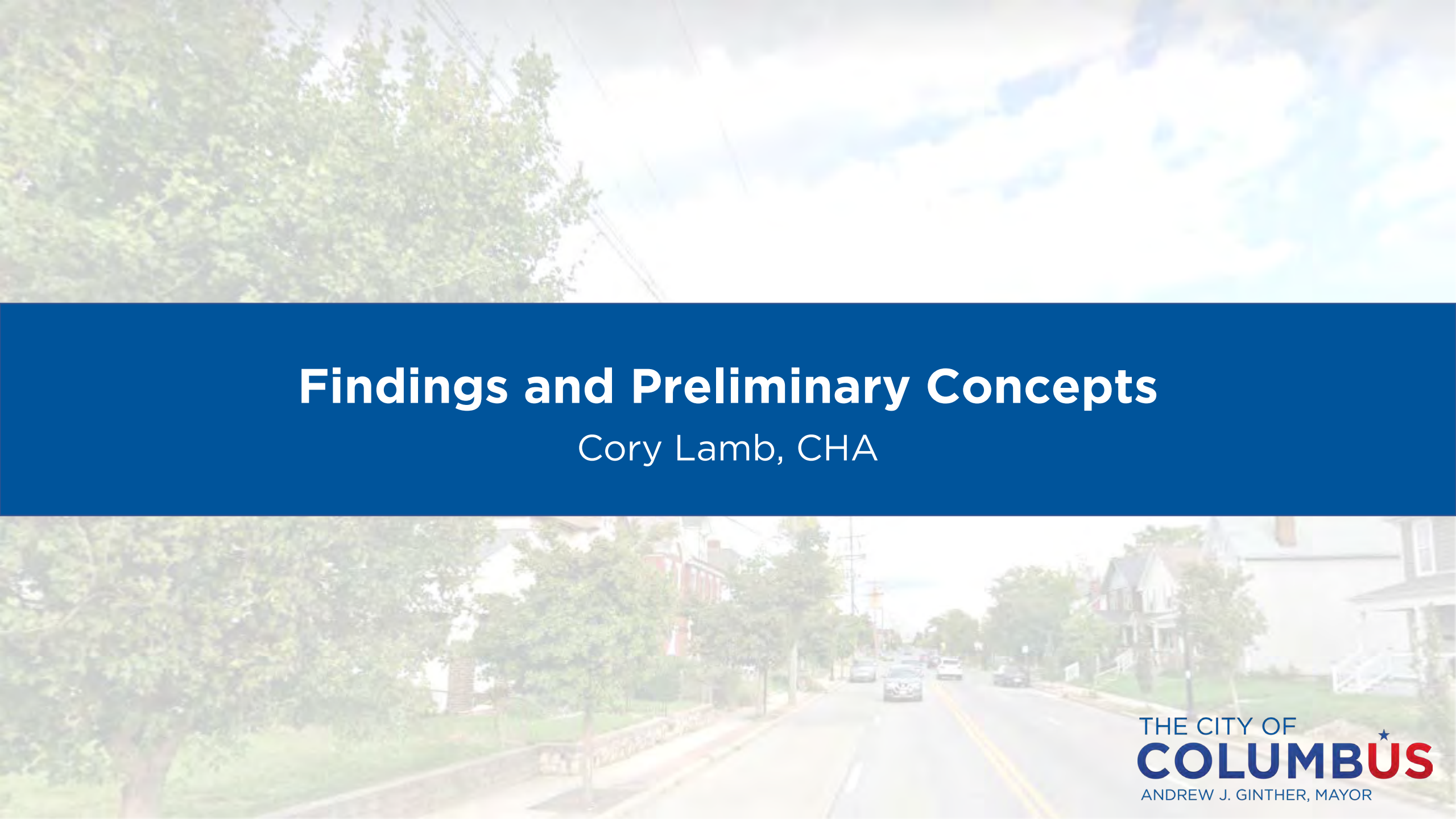
"The following images are for illustrative purposes only, and each option is subject to further design and engineering analysis"

1. **The following images represent typical sections showing a road diet with bike lanes.**

Live Survey Results

- Road Diet with raised bike lane (high interest)
- Road Diet with bike lanes (med interest)
- Road Diet with cycle track (low/med interest)
- Road Diet with shared use path (low interest)

Majority preferred RD with raised bike lane



Findings and Preliminary Concepts

Cory Lamb, CHA

THE CITY OF
COLUMBUS
ANDREW J. GINTHER, MAYOR

Collected Traffic Information

- Counted traffic at major intersections (traffic signals)
- Measured speeds in various locations
- Inventoried utilized parking AM, PM, Lunch, and weekend
- Collected crash data for last several years
- Inventoried land uses that people are walking to/from

Analysis of Data

Counted traffic

- Analyzed major intersections to get a baseline for traffic flow conditions
- Analyzed traffic flow for each scenario

✓Road diet flows well

Analysis of Data

Measured speeds in 4 locations

- ✓Average speed around 5 mph over speed limit
- ✓Some *very* high speeds were measured
- ✓In general, speeds get higher east to west

Analysis of Data

Inventoried utilized parking AM, PM, Lunch, and weekend

- ✓Only 3 blocks had parking *at least* 30% utilized
- ✓Only 2 blocks were 50% utilized and only for one time period collected
- ✓*All* these locations were on the north side of Livingston (south side never exceeded 30%)

Block		Block Face	Time	Occupancy %
From	To			
22nd St	Gilbert St	N	Friday, 5:48:00 AM	33.33%
		N	Thursday, 6:31:00 PM	83.33%
		N	Saturday, 5:48:00 AM	50.00%
		N	Saturday, 11:30:00 AM	33.33%
Oakwood Ave	S Champion Ave	N	Wednesday, 11:19:00 AM	37.50%
		N	Saturday, 5:30:00 AM	37.50%
		N	Saturday, 6:12:00 PM	50.00%
Kimball Pl	Bedford Ave	N	Saturday, 5:47:00 AM	33.33%

Blocks at least 30% Parked

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Blocks at least 30% Parked

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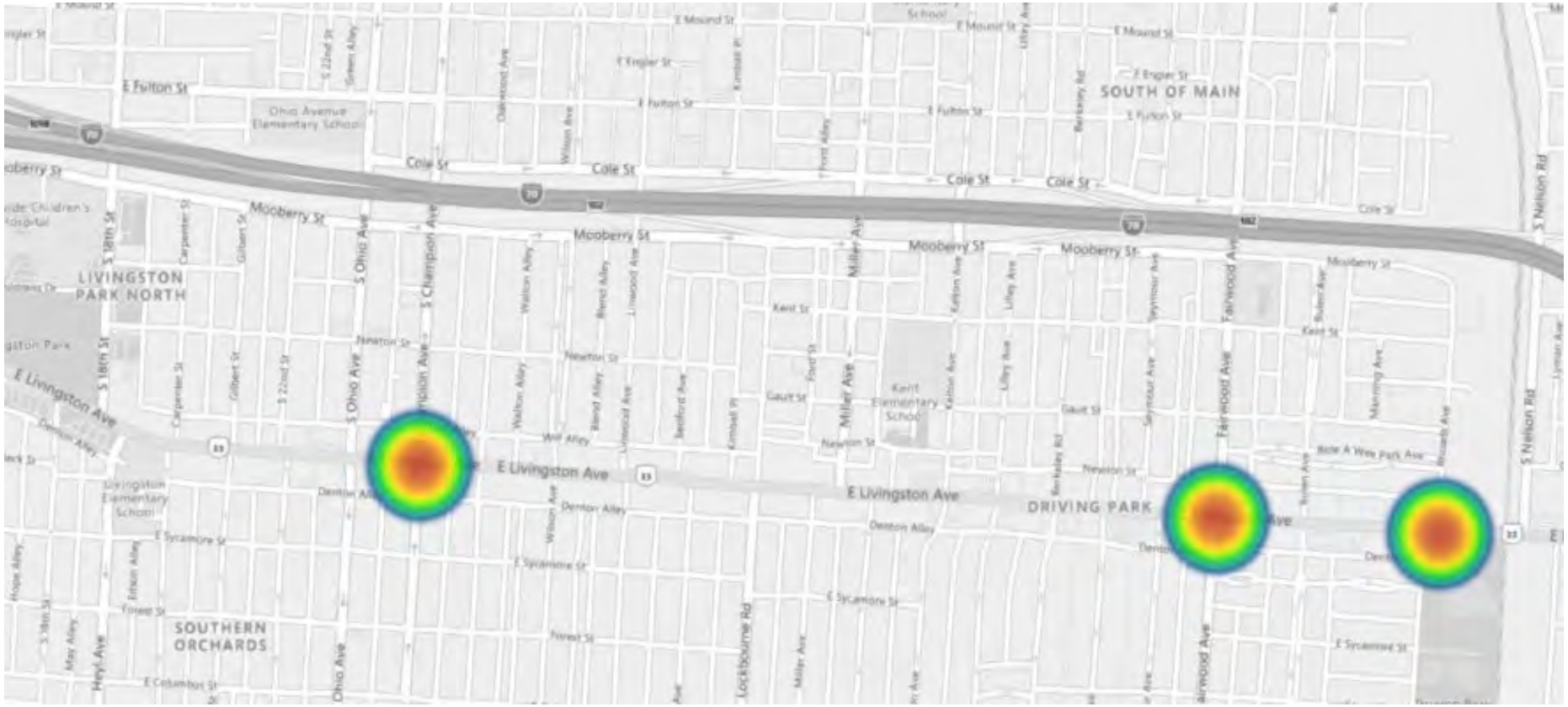
Analysis of Data

Collected crash data for last several years

✓Six major hot spots identified for further analysis

Pedestrian Crash Hot Spots



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Severe Crash Hot Spots

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Overall Crash Hot Spots

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Analysis of Data

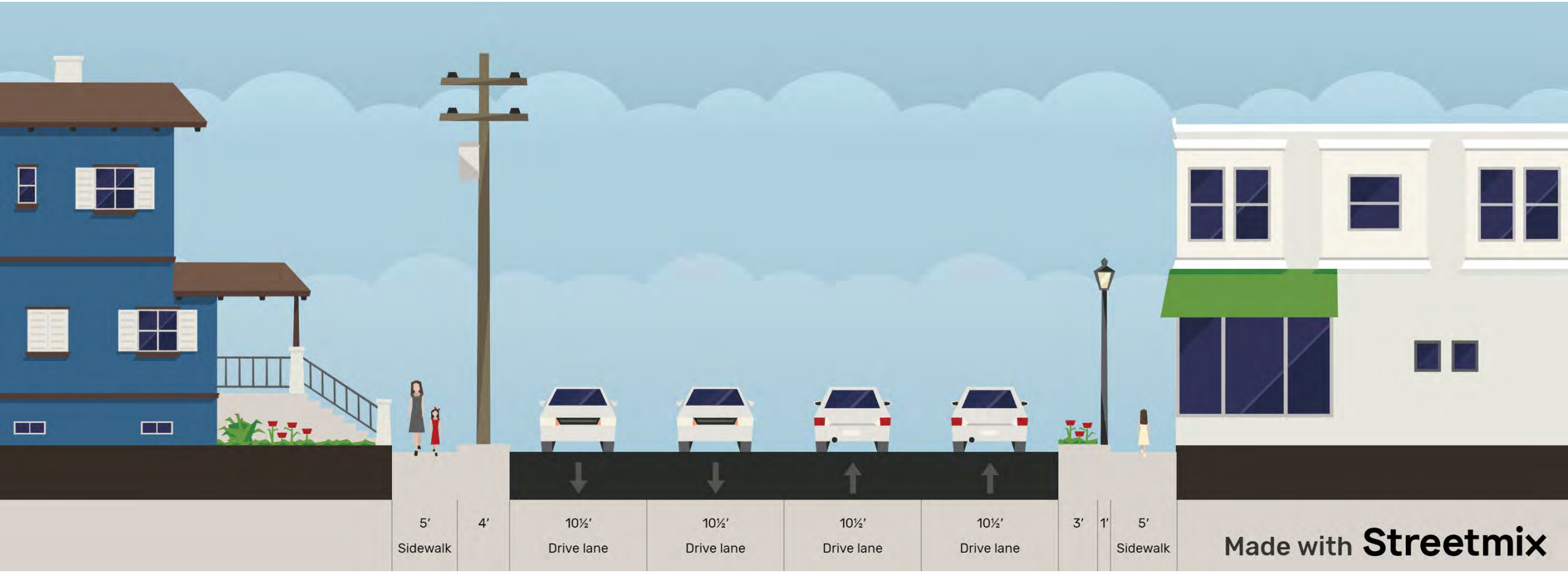
- Inventoried land uses that people are walking to/from
- Analysis to determine if
  - ✓New marked crossings are needed
  - ✓Existing crossings need enhanced pedestrian protection

Analysis of Data

Legend

- Map Insert Area
- COTA Stop
- Study Intersection
- Traffic Signal
- RRFB/Ped Signal
- Marked Crosswalk
- Unmarked Crosswalk
- Community Center
- Gas
- Grocery
- School or Library
- Restaurant
- Worship
- Pedestrian Crash

Existing Conditions



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Bicycle Alternatives – Separated/Protected Bike Lanes

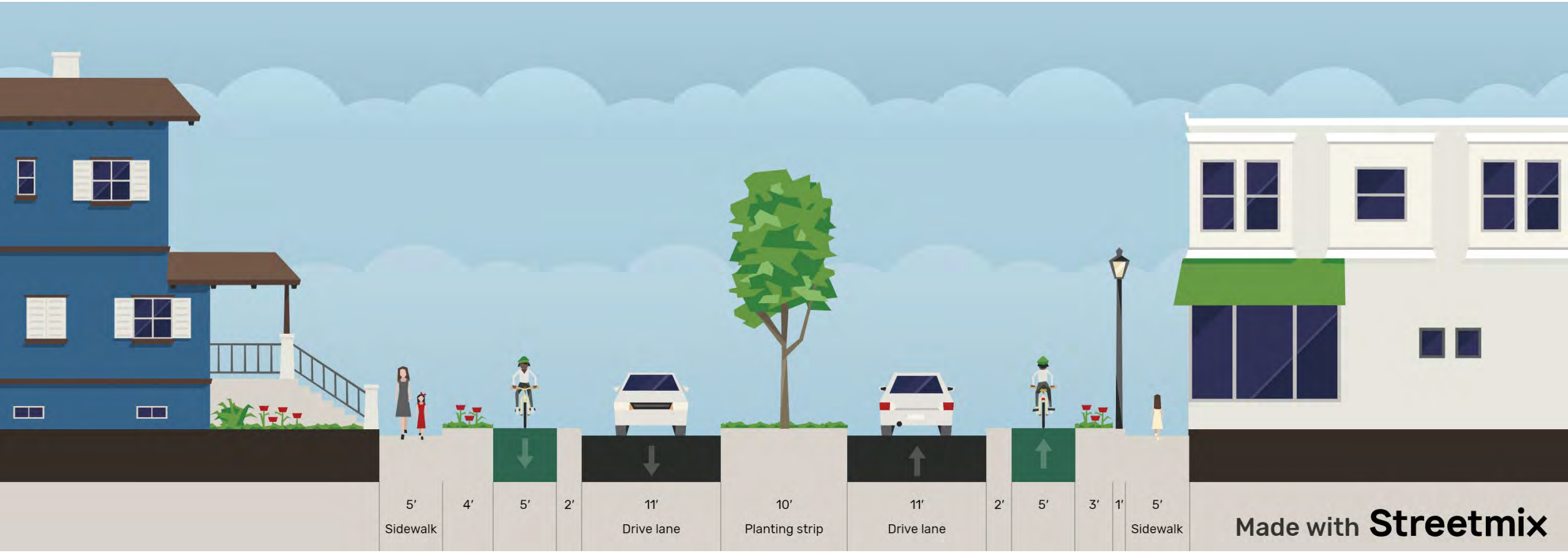
Bicycle Alternatives – Raised Bike Lanes

Bicycle Alternatives – Two-Way Protected Bike Lanes

Bicycle Alternatives – Raised Two-Way Bike Lanes

Bicycle Alternatives – Shared Use Path

Cross Section – Road Diet w/ Raised Bike Path



Note: This is a conceptual image for illustrative purposes only. Green is being used to illustrate the location of bike lanes. Final pavement markings will be determined in design.

Road Diet

Note: This is a conceptual image for illustrative purposes only. Final pavement markings will be determined in design.

Road Diet with Turn Lanes

Note: This is a conceptual image for illustrative purposes only. Final pavement markings will be determined in design.

Road Diet near Fire Station

Note: This is a conceptual image for illustrative purposes only. Final pavement markings will be determined in design.

Next Steps

Abby Anacki, Lawhon & Associates

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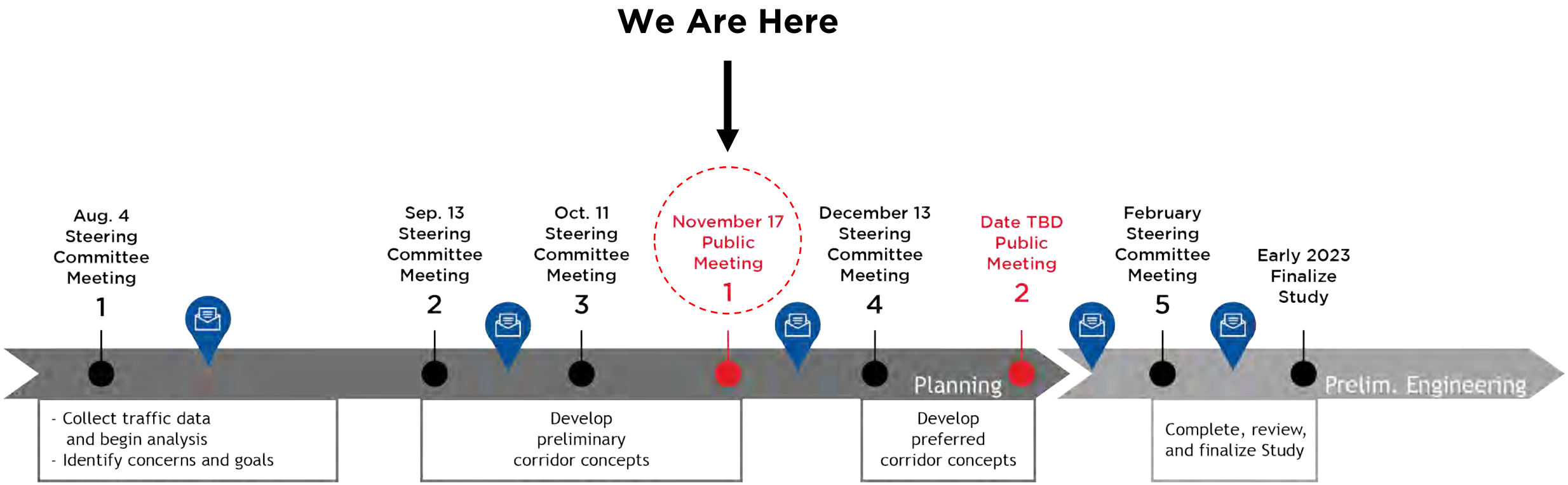
Next Steps: Study Phase



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Next Steps: Project

Study: Spring 2022 to Spring 2023

Design: Summer 2023 to Fall 2025

Right of Way Acquisition: Spring 2025 to Spring 2026

Utility Relocation: Spring 2025 to Spring 2026

Construction: Winter 2026 to Winter 2028

How to Submit Comments

At the Meeting

Comment form/survey at comment table

After the Meeting

Online (QR to the right)

Project Manager, Eric Lambert

- Call: 614-645-2732
- Email: SELambert@columbus.gov
- Mail a comment form to:

  Eric Lambert

  111 N. Front Street, 6th Floor

  Columbus, OH 43215

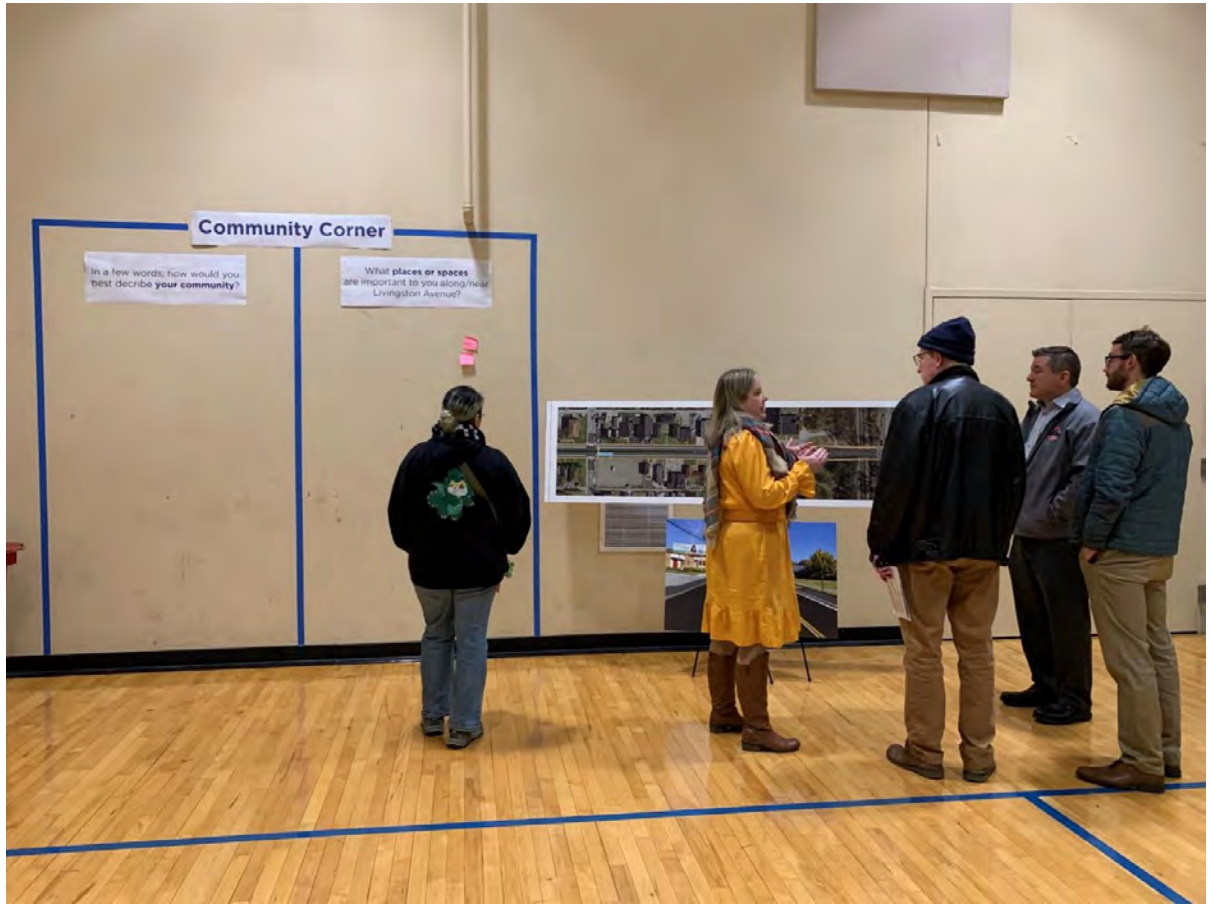
www.tinyurl.com/SurveyLivingston

Thank you!

Livingston Avenue Improvements Study
S. 18th Street to Nelson Road
Public Meeting
November 17, 2022
COLUMBUS

EXIT

STORAGE


Community Corner
In a few words, how would you best decribe your community?
What places or spaces are important to you along/near Livingston Avenue?

EXIT
Community Corner

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ANDREW J. GINTHER, MAYOR

LIVINGSTON AVENUE IMPROVEMENTS STUDY
FREQUENTLY ASKED QUESTIONS – NOVEMBER 2022

1. **Why is this study needed?**
   The Livingston Avenue corridor is identified on the Vision Zero Columbus High Injury Network because it has a higher density of fatal and serious injury crashes that present safety issues for pedestrians, cyclists, transit users and drivers. Compared to the rest of Columbus, fatal crashes are six times more likely to occur along Livingston Avenue. Many individual improvements have been made to the corridor, however a comprehensive study for this area has yet to be done. The City is working to address these issues along the corridor, with the Livingston Avenue Improvements Study.

2. **What is the purpose of the study?**

   The Study is focused on Livingston Avenue from 18th Street to Nelson Road. The goal of the study is to identify improvements to the corridor to promote safety for all roadway users and reduce vehicle speeds and severe crashes. The study process will identify issues, conduct analysis, receive and record input, and narrow down solutions. The process will result in a study that will compile all information in a reader-friendly document and will be shared with the public. The study is then used as a roadmap/reference for future project(s).

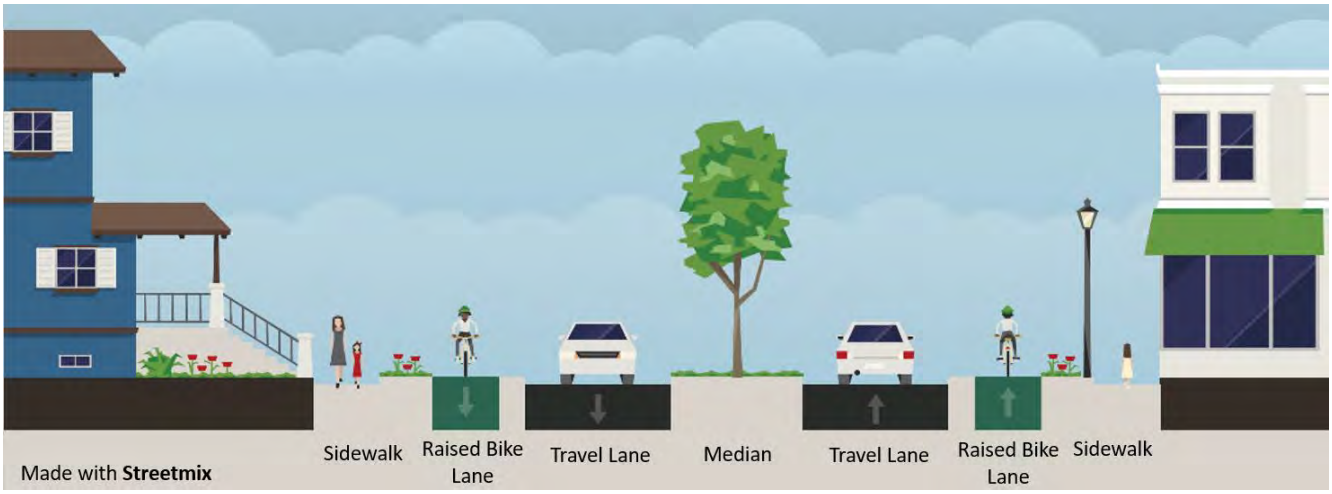
3. **What's been done so far?**
   The city and consultant team have been working with a Steering Committee, comprised of neighborhood residents and business, faith, and community organization representatives, to develop a preliminary corridor layout/concept for Livingston Avenue. Three steering committee meetings have been held so far to develop the preliminary corridor layout:

   Steering Committee Meeting #1 Summary
   - Introduced the study and schedule
   - Outlined roles and responsibilities
   - Defined goals for the study (take home worksheet for neighbors/community members)

   Steering committee Meeting #2 Summary
   - Presented design "toolbox"
   - Committee members brainstormed different corridor layouts
   - Started to put together corridor concepts

   Steering Committee Meeting #3 Summary
   - Presented preliminary corridor concepts
   - Received feedback/interest in each concept
   - Identified preliminary concepts based on feedback

4. **What is the preliminary concept for Livingston Avenue?**
   Based on the feedback received at prior steering committee meetings as well as technical data collected from the team, the project team has developed a preliminary corridor layout to improve Livingston Avenue. The preliminary corridor layout is a road diet with raised bike lanes. The following image represents a view of what this layout may look like on Livingston Avenue.



Note: This is a conceptual image for illustrative purposes only. Green is being used to illustrate the location of bike lanes. Final pavement markings will be determined in design.

5. **What is the purpose of the public meeting?**
   The public meeting is being held for the project team to present their ideas and hear what you think! We also want the community to be aware of the study, what we've been working on so far and who to contact for questions or comments.

6. **What is the anticipated schedule for the study?**

Feedback received at this meeting will be used to further define the corridor concepts/layout for Livingston Avenue. Another Steering Committee meeting will be held to discuss the feedback received from the first public meeting and any changes to be made. Another public meeting will be held in early 2023 to discuss what we heard from the first meeting, any changes that have been made as a result, and request any additional feedback prior to finalizing the study. A final Steering Committee meeting will be held to present a final draft plan and receive comments. The study is expected to be complete by early 2023.

7. **When will this get built?**

   It is anticipated that construction will begin Winter 2026 and end Winter 2028. A general schedule from study completion (Spring 2023) to construction is below:

   - **Livingston Avenue Improvements Study:** Spring 2022 to Spring 2023
   - **Design:** Summer 2023 to Fall 2026
   - **R/W Acquisition:** Spring 2025 to Spring 2026
   - **Utility Relocation:** Spring 2026 to Spring 2027
   - **Construction:** Winter 2026 to Winter 2028

8. **How can I submit comments?**

   At the meeting, you can fill out a comment form at the comment table and give it to a team member or place it in the "Comments" box. You may also take a comment form home and submit it at a later time. Comments will be accepted at any time, however comments submitted by December 17th will be documented in the study and provided a response. If you'd like to submit a comment after the meeting, you can do so by the following methods:

   Online comment form:
   https://tinyurl.com/SurveyLivingston

   SCAN ME

   Contact Project Manager Eric Lambert:

   Call Eric: 614-645-2732

   Email Eric: SELambert@columbus.gov

   Mail a comment form to:
   Eric Lambert
   111 N. Front Street, 6th Floor
   Columbus, OH 43215

Livingston Avenue Public Comments Received Summary

Likes

- Dedicated bike lanes (23)
- Raised bike lanes (16)
- Concept will slow traffic/improve safety (15)
- Reduced lanes of traffic (11)
- Green space/medians (10)
- It's something/a good start/cool (6)
- No on-street parking (7)
- Aesthetically pleasing (4)
    - Will increase business activity in area (3)
- Improved sidewalks (4)
- Crosswalks

Dislikes

- Medians too long/limited access to side streets and left turns (10)
    - Access cut off from Old Oaks
- No on-street parking (8)
- Reduced lanes of traffic (6)
- Timeline/schedule (4)
- Not enough crosswalks (4)
    - Between Linwood and Lockburn
- Project area too small (3)
    - Should be expanded on some side streets
- Raised bike lanes/wish there was more barrier between bikes and cars (4)
- Wish there could be more trees along Livingston, benefits to tree canopy vs plants (2)
- Bus stop and bike conflicts
- Vacant buildings

General Comments

- Happy/supportive of project (6)
- Concerned about navigation of buses (COTA & School) (5)
    - Turning too tight for buses
    - Increased times to navigate
- Area around Rhoads / Fire Station / New development (3)
    - Installation of fire station triggered stop light near fire station?
- Don't do what was done on Parsons
- Lessons learned from project between College and James?
    - Short term fix could be what was done between Alum Creek and James
- Curb issue on Gilbert Street
- Speed should be lowered
- Would like to see underground utilities
- Reduce heavy vehicle traffic on side streets

- Installation of stone placards, landscape lighting, other aesthetics
- Raised bike lanes should be continuous through intersections which will act as speed bumps for drivers to slow down
- Cost too high
- Need retail, restaurants, grocery options

JENNIFER GALLAGHER

Director

THE CITY OF
COLUMBUS
ANDREW J. GINTHER, MAYOR

March 16, 2023

Subject: **Response to Public Comments and Study Update**
Re: **Livingston Avenue Improvements Study (18th Street to Nelson Road)**

Dear Interested Party,

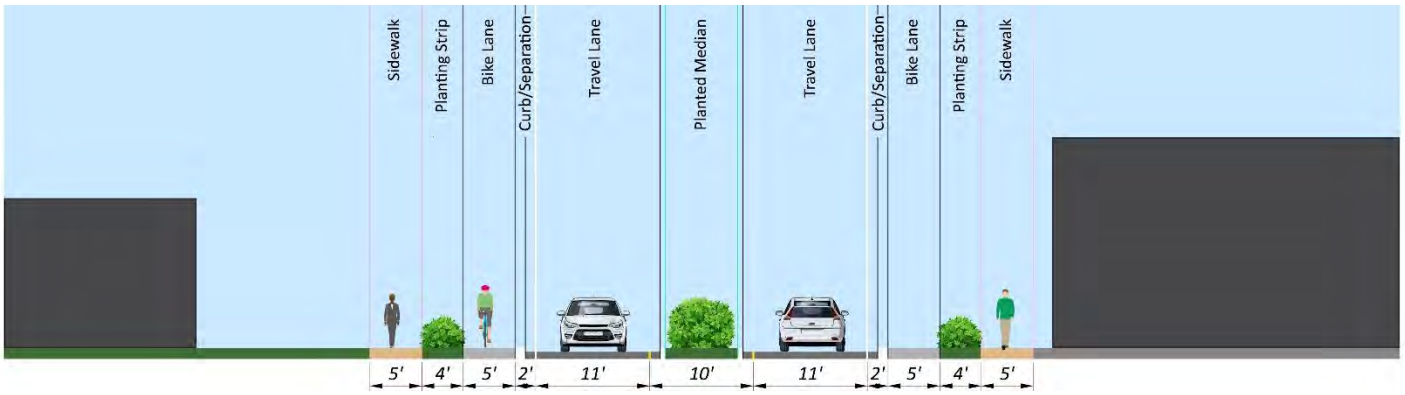
Thank you for attending and/or providing comments at the public meeting(s) on November 17, 2022, for the 18th Street to Nelson Road Livingston Avenue Improvements Study. The general concept presented at the public meetings was a road diet (reduced to 2 through lanes with center or left turn lane/median) with a raised bike lane on either side, grass tree lawn area, and sidewalk improvements (shown below).

Comments were accepted for 30 days after the meeting via email, phone, mailed letter/comment form, or online comment form.

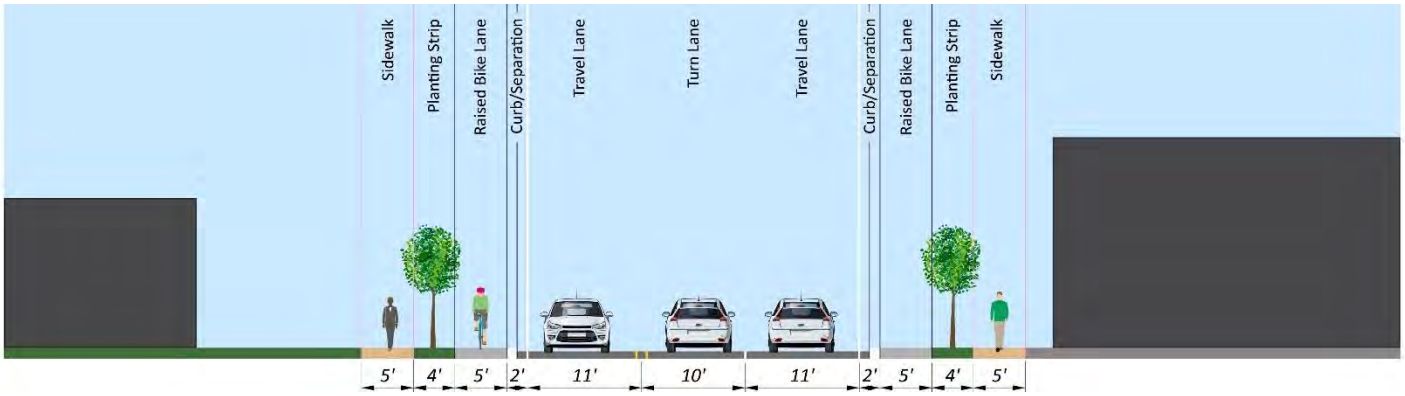
The project team has reviewed the comments received, compiled a summary of comments and has provided responses in a table included in this letter. Many comments received during the public meetings and 30-day comment period were related to the dedicated/raised bike lane, safety improvements, medians, road diet, and parking.

Considering public and steering committee feedback, the team will include the following recommendations in the study for further development in the design phase:

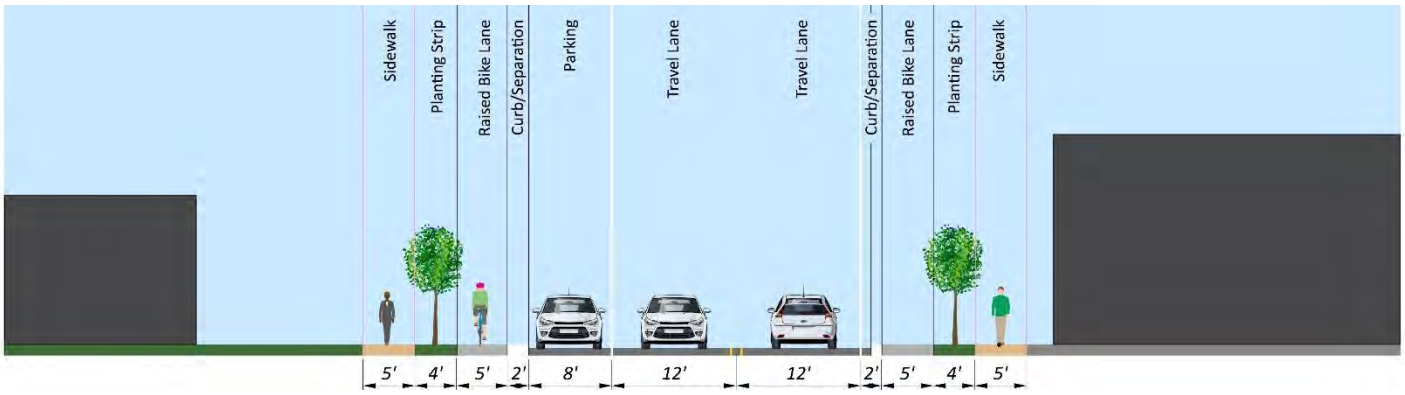
- Road Diet. The road diet will reduce the number of lanes from two through lanes in each direction to one through lane in each direction. The two lanes will then be reallocated to other uses, such as bike facilities, medians, turn lanes, or parking. The typical sections on the reverse page show the variety of layouts that may be utilized along Livingston Avenue.
- Transitions at project limits (to tie into existing bike and pedestrian infrastructure for better connectivity)
- Pedestrian accommodations
- Parking considerations
- Other recommendations such as bus stops, cross-street realignments, and consideration for opportunities to include community identity or beautification elements



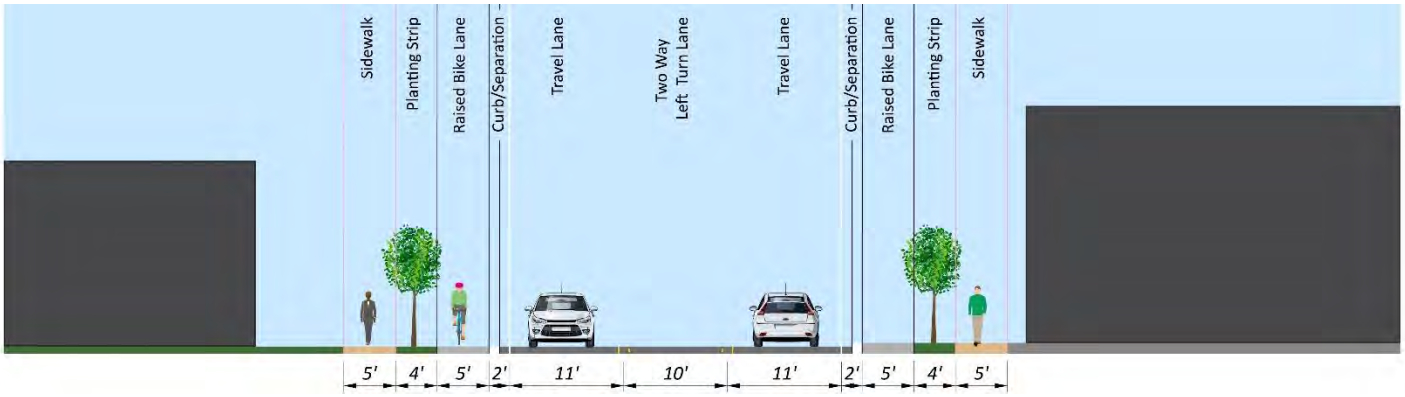
Above: Road Diet Recommendation (shown with planted median)



Above: Road Diet Recommendation (shown with left turn lane)



Above: Road Diet Recommendation (shown with on street parking)



Above: Road Diet Recommendation (shown with two way left turn lane)

All recommendations made in the study will be considered in the design phase. Traffic analysis is ongoing.

The city invites you to our upcoming public meeting open house to learn more about the recommendations and findings presented in the Livingston Avenue Improvements Study and next steps for the project. The meeting will be held on Thursday, March 23, 2023, at the Driving Park Community Recreation Center (1100 Rhoads Avenue, Columbus, OH 43206). This is an open house style meeting, and you may join us at any time from noon to 2 p.m. and/or 5:30 to 7:30 p.m. A presentation will be made at 12:30 p.m. and at 6 p.m. City staff and the project team will be on hand to help answer your questions.

Meeting presentation materials may be requested by contacting me by phone at 614-645-2732, or by email at SELambert@columbus.gov.

Sincerely,

Ric Lambert

Eric Lambert, Project Manager

Topic/Theme	Comment/Question (Summarized)	Project Team Response
Safety	I like the concept and think that it will slow traffic/improve safety.	Thank you for your comment. We also believe the concept will improve safety and slow speeds. The Federal Highway Administration (FHWA) has done numerous studies on the benefits of road diets. A road diet is a roadway technique that reduces the number of vehicle lanes for space to be reallocated for other uses. Narrowing a roadway from 4 lanes to 3 lanes can provide a 19-47% reduction in total crashes (www.highways.dot.gov/safety/other/road-diets). The reduction in lanes provides room for additional safety improvements such as medians and pedestrian refuge islands, crosswalk enhancements, bicycle lanes, and access management. Incorporating pedestrian and bicycle facilities can increase drivers' recognition of these users. These visible cues increase driver awareness and encourage motorists to slow down and pay attention.
	The speed should be lowered on Livingston.	Thank you for your comment. Studies have shown that most drivers tend to drive at a speed with which they are comfortable, so raising or lowering the speed limits may not have a significant effect on actual speed along the roadway. Additionally, Livingston Avenue is also U.S. Route 33, which limits the city's ability to change the speed limit. However, changing the environment of a roadway by installing traffic calming measures, such as a road diet, can reduce speed and change how drivers behave in the roadway. Environmental adjustments, such as narrowing roadways or installing physical barriers, force motorists to pay attention to their surroundings and alter their driving behaviors, resulting in lower speeds and safer driving. Narrowing a roadway from 4 lanes to 3 lanes can provide a 19-47% reduction in total crashes (www.highways.dot.gov/safety/other/road-diets).
	How will the area around Rhoads / Fire Station / New Development work? Lots of pedestrians cross at that area.	Thank you for your comment. The recommended road diet will help improve safety and comfort for pedestrians and cyclists by reducing overall pedestrian crossing distance and reducing vehicle speeds. The team is currently studying different options at the Rhoads intersection to try to satisfy the various needs of the area (fire station and community center access, vehicle safety, and pedestrian safety) and make the area safer for all modes of transportation. Coordination with surrounding property owners, including the fire station and other agencies, will occur prior to finalizing the roadway configuration. This area will continue to be a focus as the project moves into detailed design.
	Is there any way to reduce heavy vehicle traffic on side streets?	Thank you for your comment. The study recommends the strategic installation of medians along Livingston Avenue to increase safety, provide access management, and allow opportunities for beautification. Medians can restrict vehicular access to residential roadways and redirect traffic to other nearby streets that are more equipped for heavy traffic volumes. This can help reduce heavy vehicle traffic on side streets.

Topic/Theme	Comment/Question (Summarized)	Project Team Response
Bike Lanes	I like that there is a dedicated bike lane.	Thank you for your comment. Installing a dedicated bike lane along Livingston Avenue will provide residents, commuters, and visitors an alternate mode of transportation in the corridor. Protected bike lanes help eliminate perceived risk and fear of collisions, reduce the risk of crashing into car doors, and add a level of predictability making streets safer for everyone. Installing a dedicated bike lane for cyclists can reduce total crashes up to 30% on urban 2-lane undivided collectors and local roads. (https://highways.dot.gov/sites/fhwa.dot.gov/files/2022-08/PSC_New_Bicycle%20Lanes.pdf)
	I like that the bike lane is raised.	Thank you for your comment. The steering committee preferred the raised bike lane versus the street level bike lane because it provides an additional layer of protection from vehicles. This makes the raised bike lane more attractive to a wider range of bicyclists at all levels and abilities than a lane that is shared or at the same level as motorized vehicles. Raising the bikeway above the street grade can further discourage motorists from encroaching into the raised bike lane.
	I don't like that the bike lane is raised. It makes cyclist and drivers less aware of their surroundings.	Thank you for your comment. A variety of different bike facilities were considered during the planning process. The raised bike lane was chosen as the recommended bike facility because of the additional safety benefits of a dedicated, separated bikeway. Additionally, the corridor has limited width, and raised bike lanes are efficient with space in tight corridors.
Medians	I like the added greenspace/medians in the concept.	Thank you for your comment. There are many benefits to installing raised medians. The FHWA shows that raised medians provide a refuge space for crossing pedestrians (resulting in a 46% reduction in pedestrian crashes), can reduce motor vehicle crashes by 15%, reduce vehicle speeds on the roadway, and provide a space for vegetation to help "soften" the feel of a corridor. Medians also provide access management to nearby side streets.
	The medians are too long and cut off access to neighborhoods/side streets.	Thank you for your comment. Medians were included in the concept presented at the first public meeting so that feedback could be gathered from the public. Additional turn lanes and access points ("breaks" in the medians) are anticipated to manage access properly. The design phase will be responsible for determining the best use of medians to balance safety benefits while managing access.

Topic/Theme	Comment/Question (Summarized)	Project Team Response
Parking	I like that the on-street parking was removed on Livingston.	Thank you for your comment. Parking usage data was gathered by the project team on a typical weekday during the morning, midday, and evening as well as on a Saturday in the morning, evening, and midday. The data showed that parking on Livingston Avenue is relatively light. Only a few blocks were more than 30% filled. The blocks that had above 30% utilization were: along the north side of Livingston between Gilbert St. and S 22nd St., along the north side of Livingston between S Champion Ave. and Oakwood Ave., and along the north side of Livingston between Lockbourne Rd. and Miller Ave. The project team understands that parking can provide challenges for some roadway users yet is important for others. Due to the limited space within right-of-way, parking cannot be implemented where a turning lane is required or where a median is needed/desired. A parking option is included in the recommendations for areas where parking may be warranted (now or in the future) while not conflicting with necessary turning lanes. The design process will be responsible for properly employing the recommendations from the study and deciding where parking may be implemented.
	I dislike that the on-street parking was removed on Livingston.	Thank you for your comment. Please refer to the above response.
Road Diet	I like that the traffic lanes are being reduced.	Thank you for your comment. The reduction in travel lanes is also referred to as a “road diet.” Studies by the FHWA show that road diets can reduce crashes by 19 to 47% and reduce vehicle speeds. A road diet on Livingston Avenue will improve safety for all roadway users, roadway operations, and better meet the needs of multiple modes of transportation and the community as a whole.
	I dislike that the traffic lanes are being reduced. - Increased travel times - Stuck behind busses	Thank you for your comment. Currently, all the signalized intersections on Livingston Avenue operate at an acceptable Level of Service. Traffic models show that with the implementation of a road diet, all signalized intersections remain in the acceptable range. Although the traffic lanes are being reduced, the installation of additional dedicated left turn lanes will improve operations on Livingston Avenue by removing cars slowing down to make left turns. Some users may also elect to reroute their trip entirely around Livingston Avenue due to the slower speed, which will decrease traffic on Livingston Avenue, allowing it to flow more smoothly. With the additional roadway available for the installation of bike lanes, other users may bike instead of drive on Livingston Avenue, further decreasing traffic on the roadway. Coordination with COTA is ongoing as the project moves into the design phase.

Topic/Theme	Comment/Question (Summarized)	Project Team Response
Beautification / Aesthetics	I think there should be more beautification in the concept: Installation of stone placards, landscape lighting, other aesthetics.	Thank you for your comment. The Steering Committee and comments received from the public indicate that there is a high level of interest in creating a community identity and beautification/aesthetics as part of the Livingston Avenue improvements. At this stage in the study, specific aesthetic treatments and options have not been identified. Details on beautification/aesthetic elements will be determined during the design phase. Public involvement will be ongoing.
	I think the concept is aesthetically pleasing.	Thank you for your comment.
Project & Schedule	I like that there's something being done about the safety along Livingston Avenue.	Thank you for your comment. Livingston Avenue is on the City's High Injury Network, which means that it has a higher proportion of fatal, serious injury, and/or vulnerable user crashes. Vulnerable road users include pedestrians, bicyclists, or motorcyclists - individuals who are inherently more at risk of injury when involved in any traffic crash. Vision Zero Columbus is focused on ending crash-related fatalities and serious injuries on our streets, while increasing safe, healthy, and equitable mobility for all. We're excited to take this first step in much needed improvements to Livingston Avenue.
	I wish the project would be done sooner than the expected schedule.	Thank you for your comment. We also wish this project could be accomplished sooner. The project funding includes a recently awarded $12 million from the U.S. DOT, which requires the project to fully comply with applicable federal laws and regulations. The efforts required to fully comply with these laws can add time to a project schedule when compared to the same project that is funded completely with local funds. It is the city's goal to complete this project as quickly as possible.
	The project area is too small. It should extend along some side streets.	Thank you for your comment. The project limits are along Livingston Avenue from 18th Street to Nelson Road. However, we anticipate that the improvements of the project will extend where needed (north, south, east, or west) to properly tie into the rest of the corridor and transition properly within the surrounding neighborhoods.
	Were any lessons learned from the project between College and James that will be incorporated into this project?	Thank you for your question. The city employs a continuous improvement process to improve the quality of each project it delivers. While there are similarities between projects, each project presents its own unique challenges.
	The project cost is too high.	Thank you for your comment. The city believes the Livingston Corridor is very worthy of this investment, especially considering the proposed safety benefits for the traveling public. Estimated project costs were developed based on actual costs of similar projects. The city was successful in securing a $12 million grant from USDOT to help leverage local funds being provided for this project.

Topic/Theme	Comment/Question (Summarized)	Project Team Response
Crosswalks	I like the additional crosswalks.	Thank you for your comment. Studies from the FHWA show that high-visibility crosswalks can reduce pedestrian injury crashes up to 40% (https://highways.dot.gov/safety/proven-safety-countermeasures/crosswalk-visibility-enhancements). Safe and frequent crosswalks will support pedestrian movement on Livingston Avenue. Crosswalks have been recommended in areas where pedestrian traffic is anticipated and encouraged.
	I don't think enough crosswalks have been added. - More between Linwood and Lockbourne	Thank you for your comment. The study recommends crosswalks on Livingston Avenue at existing signalized intersections and areas where pedestrian traffic is anticipated. Rectangular rapid flashing beacons (RRFB) placed recently at 22nd Street, Oakwood Avenue, and Lilley Avenue will remain. Additionally, a RRFB will be added to the intersection of Livingston Avenue and Bulen Avenue. Pedestrians are encouraged to cross at these signalized crosswalks because it is safer than crossing in an area without a marked crosswalk and drivers will expect pedestrians in these areas. Studies from the FHWA show that high-visibility crosswalks can reduce pedestrian injury crashed up to 40% (https://highways.dot.gov/safety/proven-safety-countermeasures/crosswalk-visibility-enhancements). The recommended road diet will also significantly increase the safety for pedestrians crossing Livingston Avenue by reducing the crossing distance pedestrians will travel and potential impact points. The sections of Livingston Avenue with a median will allow for additional safety benefits since the median provides a refuge space for crossing pedestrians. The study also undertook efforts to identify which areas were likely to need pedestrian facilities, such as the Pedestrian Generator Map, to identify crossing points and areas of high pedestrian traffic. Intersections such as Carpenter Street and Rhoads Avenue have been identified as such areas and were recommended to receive additional pedestrian safety countermeasures.
Busses	How will the busses navigate with the bike lane? The intersections seem too tight.	Thank you for your comment. A preliminary layout of the concept on Livingston Avenue shows that there is enough room for buses to travel through Livingston Avenue without issue. As the project moves into detailed design, coordination with COTA will ensure that the project will be designed so that buses will be able to travel and provide efficient service throughout the study area.
	Bus routes will be delayed because of the reduction in travel lanes.	Thank you for your comment. We do not anticipate a significant change in travel time for transit. As the project moves into detailed design, coordination with COTA will ensure that the project will be designed so that buses will be able to travel and provide efficient service throughout the study area.

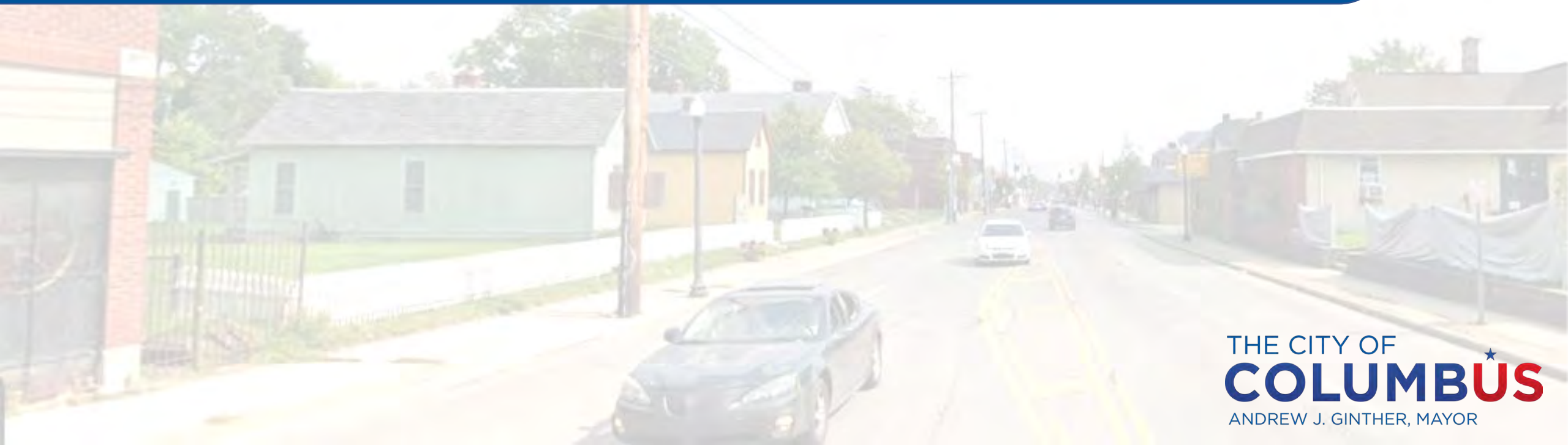
Topic/Theme	Comment/Question (Summarized)	Project Team Response
Economic Activity	We need retail, restaurants, grocery options on Livingston.	Thank you for your comment. The scope of this project is limited to improvements within the right-of-way. The FWHA released information about the economic impacts of a road diet, such as proposed in the Livingston Avenue Improvements Study. The research found that replacing vehicle travel lanes with pedestrian and bike facilities make the corridor a more attractive area and thus more appealing to business and development interest. From the FHWA Road Diet Resources, *Road Diets' Economic Impacts*: "In 2008, the City of Indianapolis, IN, used Road Diets to complete the 8-mile-long Indianapolis Cultural Trail that encourages biking and walking along the cultural districts, neighborhoods, and the city's greenway system. The redesign brought more people on foot and vitalized the area. Over $300 million of new development was constructed along the route between 2008 and 2012."
	I think the improvements will increase business activity in the area.	Thank you for your comment. The FHWA released information about the economic impacts of a road diet and found that for many local businesses, a road diet can improve economic vitality by changing the corridor "from a place that people 'drive-through' to one that they 'drive-to'." A case study from Charlotte, NC showed that after the implementation of a road diet there was a $43 million increase in the non-residential tax value of properties fronting the East Boulevard Road Diet.
Misc.	Don't do what was done on Parsons.	Thank you for your comment. The city aims to genuinely evaluate and learn lessons from every project. If you're like to discuss further please contact the project manager, Eric Lambert at SELambert@columbus.gov.
	I don't like the vacant buildings along Livingston.	Thank you for your comment. Although this is out of the scope of the project, the FHWA has released information about the economic impacts of a road diet and found that for many local businesses, a road diet can improve economic vitality. The installation of a road diet on Livingston Avenue may be attractive to business owners and developers that would seek to revitalize vacant buildings.
	There is a curb issue on Gilbert Street	Thank you for your comment. This is out of the scope of this study; however, a request can be submitted to report the curb issue to the city via our 311 customer service center online at www.columbus.gov/311, via email at 311@columbus.gov, or by phone at (614) 645-3111.
	I like the improved sidewalks.	Thank you for your comment. Pedestrian infrastructure is key to mobility for a variety of users. Adequate sidewalks are shown to improve pedestrian safety, improve the health of nearby residents, increase property values, and generally improve quality of life. According to the FHWA, roadways without sidewalks are more than twice as likely to have pedestrian crashes as sites with sidewalks on both sides of the street.
	Will the utilities be put underground? I would like to see that. It makes the area look much nicer.	Thank you for your comment. At this point in the project, there is no plan to move the overhead utilities underground. This is due to cost factors and existence of current underground utilities along Livingston.

Public Meeting #2

Livingston Avenue Improvements Study
18th Street to Nelson Road

Public Meeting #2

March 23, 2023



THE CITY OF
COLUMBUS
ANDREW J. GINTHER, MAYOR

Meet the Team

City of Columbus:

Dept. of Public Service

- Design and Construction
- Planning
- Public Affairs
- Traffic Management

Dept. of Development

Dept. of Neighborhoods

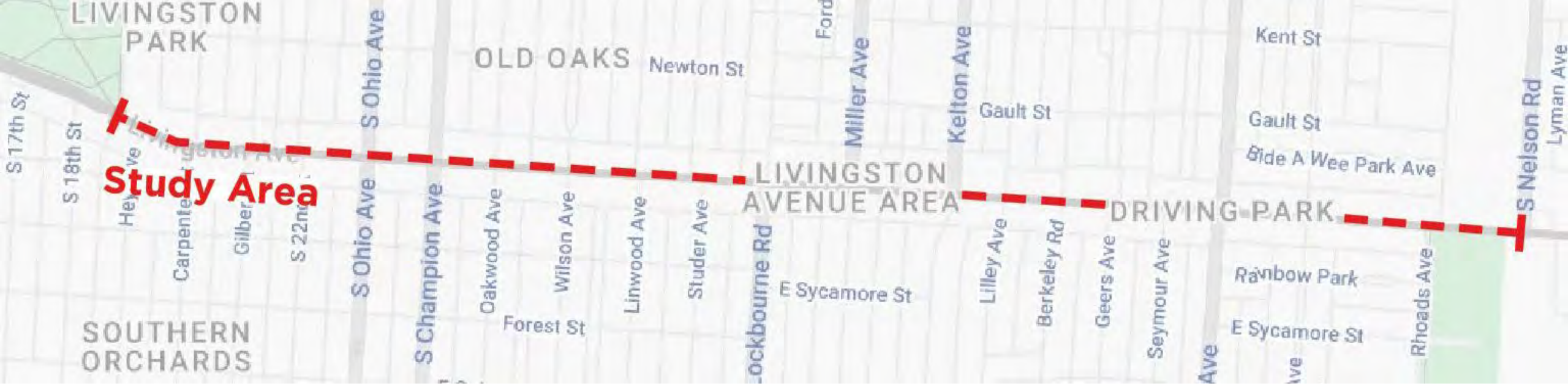
Steering Committee

CHA (Engineering and Design)

Lawhon & Associates (Public Involvement)

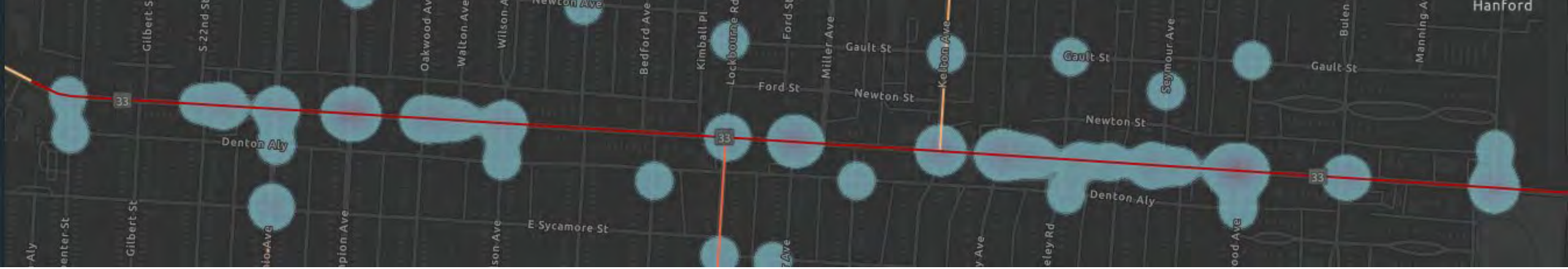
Steering Committee

Michael Aaron
Rickenbacker Woods Community Fdn.
Pastor Jonathan Bradford
Bethany Baptist Church
Danielle Dillard
Livingston Avenue Area Comm.
David Gray
Livingston Avenue Area Comm.
Stacee Green
Driving Park Civic Assoc.
Rita Hallaveld
Resident & cyclist
Molly Hogue
Resident
George Holliman
Livingston Avenue Area Comm.
Rachel Robinson
Southern Orchards Civic Assoc.
Jerry Saunders
Africentric Personal Dev. Shop
Erin Synk
Columbus South Side Area Comm.
Ralph Walker
Livingston Ave. Columbus, OH Safety Group
Sherman Willis
Community business owner



Study Limits

- Study limits extend along Livingston Avenue from S. 18th Street to Nelson Road
- This section of Livingston Avenue is also designated as a part of U.S. Rt. 33



Why?

Vision Zero

- Project corridor has **6x** the fatality rate, and **5x** the serious injury rate than the Columbus Metro area.
- The corridor is part of the city and regional High Injury Networks.
- Speeding and safety concerns significantly limit opportunities for residents and businesses.

VISION ZERO COLUMBUS

DRIVE SAFE. WALK SAFE. BIKE SAFE.

https://vision-zero-columbus.hub.arcgis.com/

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ANDREW J. GINTHER, MAYOR

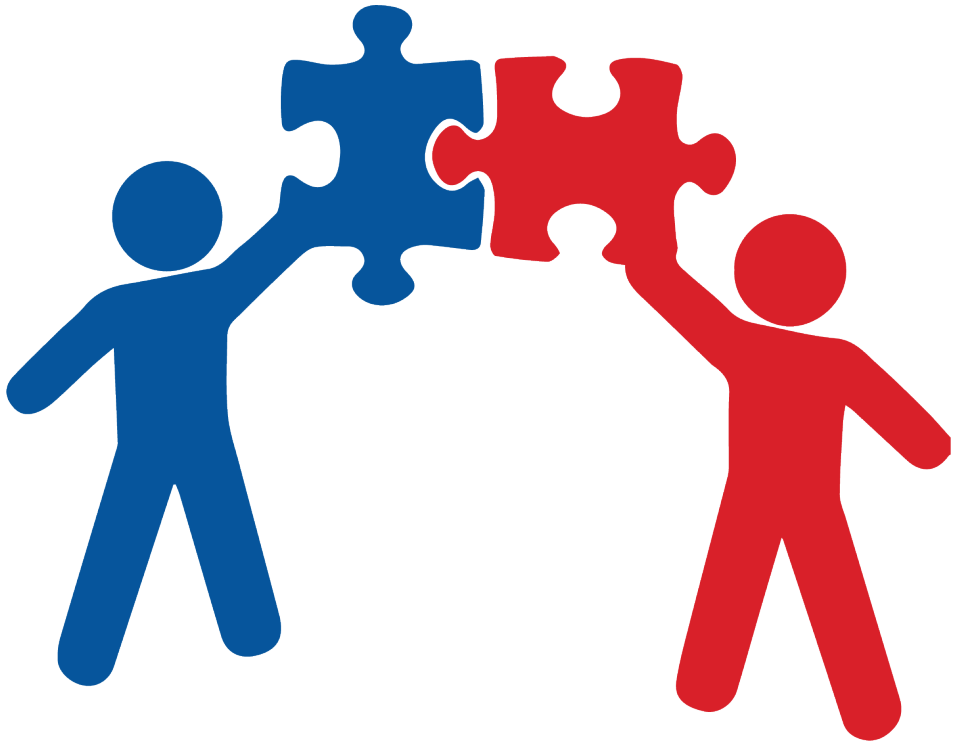
Desired Outcomes

Study

- Work **with** the Community to develop clear design objectives
- Perform necessary traffic analyses to develop effective countermeasures to speeding and safety concerns

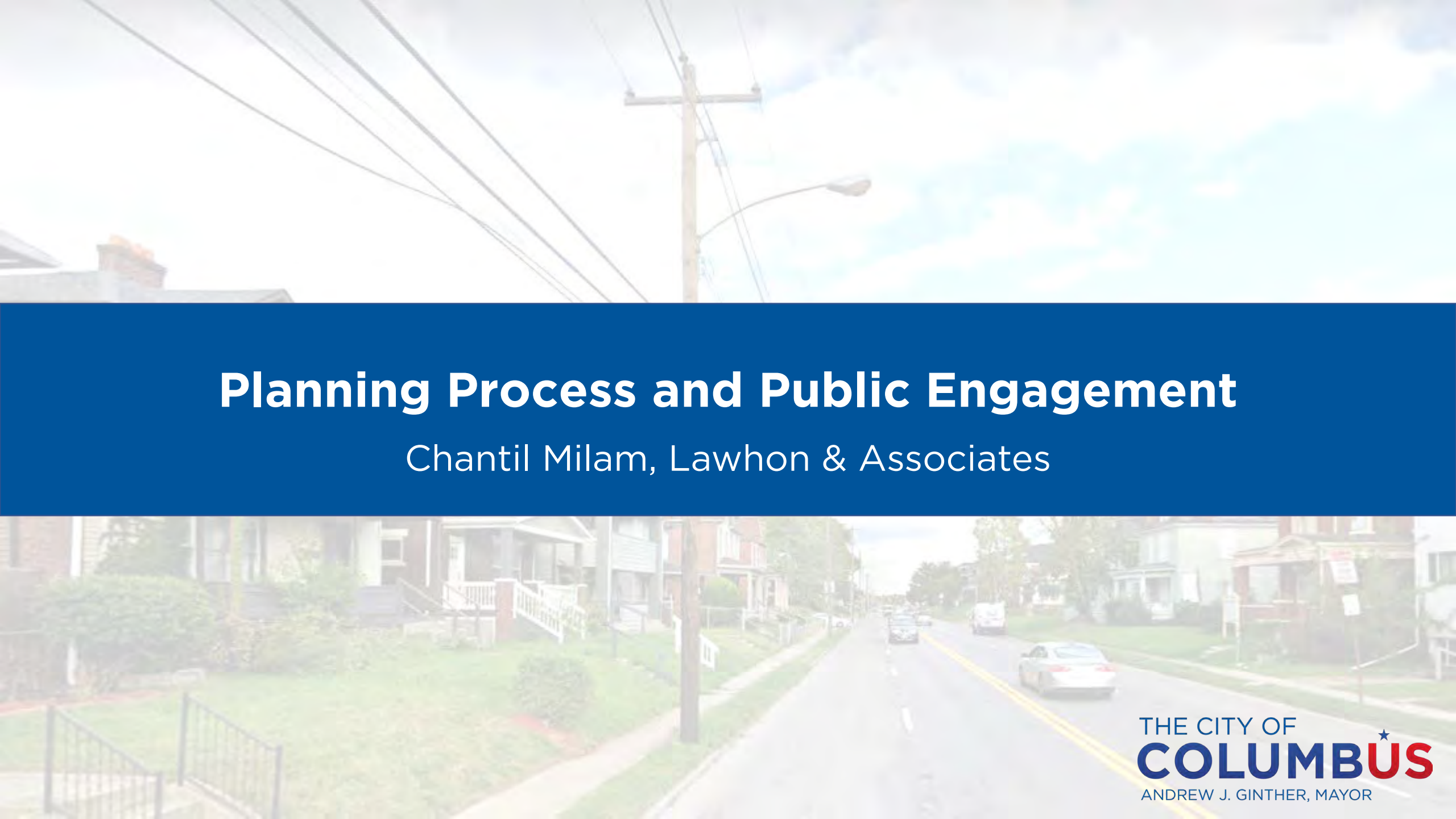
Project as a whole

- Address safety concerns for all modes of transportation
- Improve access to businesses and other community assets throughout the corridor and beyond
- Celebrate the community and its rich history



What is the goal for today?

- Discuss the study process
- Present what we've done so far
- Present findings and recommendations from study
- Discuss next steps



Planning Process and Public Engagement

Chantil Milam, Lawhon & Associates

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ANDREW J. GINTHER, MAYOR

How We Will Use the Study

- Study used to identify issues, conduct analysis, receive and document input, narrow down solutions, provide recommendations
- Study then used as a roadmap/reference for future project(s)

Public Involvement

Aug. 4 Steering Committee Meeting 1

Sep. 13 Steering Committee Meeting 2

Oct. 11 Steering Committee Meeting 3

November 17 Public Meeting 1

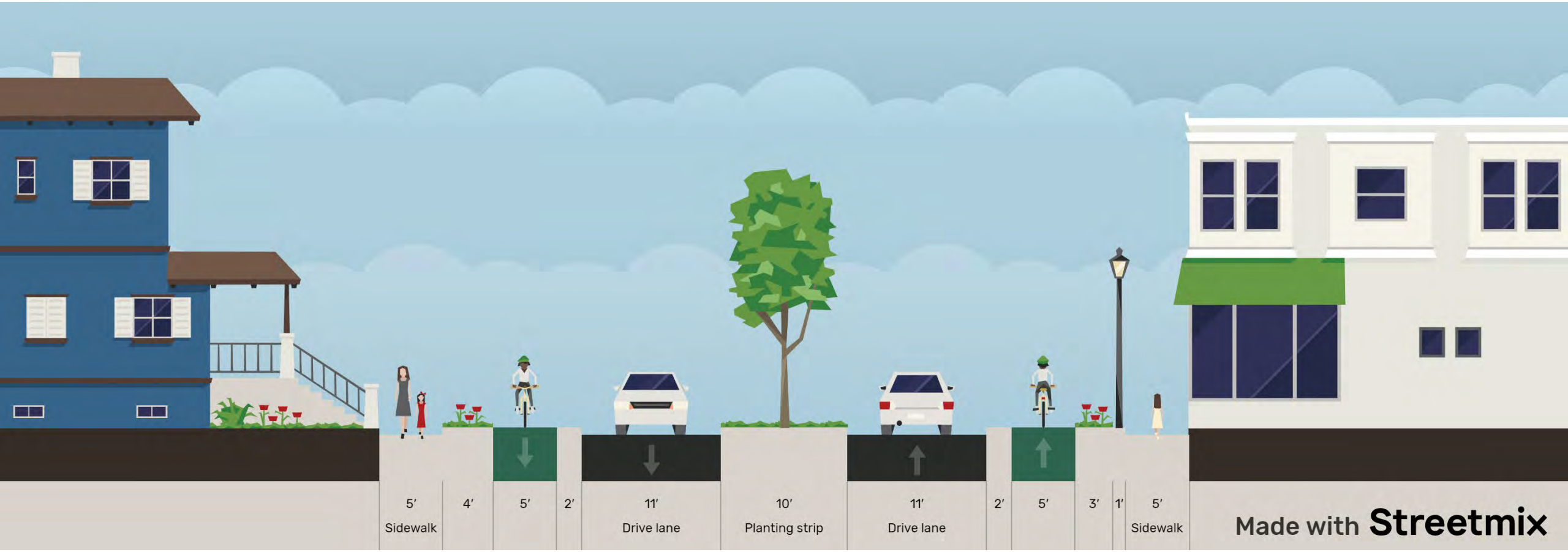
December 13 Steering Committee Meeting 4

February 21 Steering Committee Meeting 5

Planning

THE CITY OF COLUMBUS
ANDREW J. GINTHER, MAYOR

Public Meeting #1 – Recommended Concept



Note: This is a conceptual image for illustrative purposes only. Green is being used to illustrate the location of bike lanes. Final pavement markings will be determined in design.

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ANDREW J. GINTHER, MAYOR

Public Comments

What do you *like* about this preliminary concept/layout for Livingston Avenue?

- Dedicated bike lanes (23)
- Raised bike lanes (16)
- Concept will slow traffic/improve safety (15)
- Reduced lanes of traffic (11)
- Removal of on-street parking (6)

What do you *dislike* about this preliminary concept/layout for Livingston Avenue?

- Medians too long/limited access to side streets and left turns (10)
- Removal of on-street parking (8)
- Reduced lanes of traffic (6)

What We Heard

- Improve safety for both pedestrians and motorists
- Explore dedicated bike facilities (local, regional connectivity)
- Create opportunities to add character/beauty into corridor
- Balance identified needs with existing infrastructure (on-street parking, busses)

Livingston Avenue Improvement Study

Cory Lamb, CHA

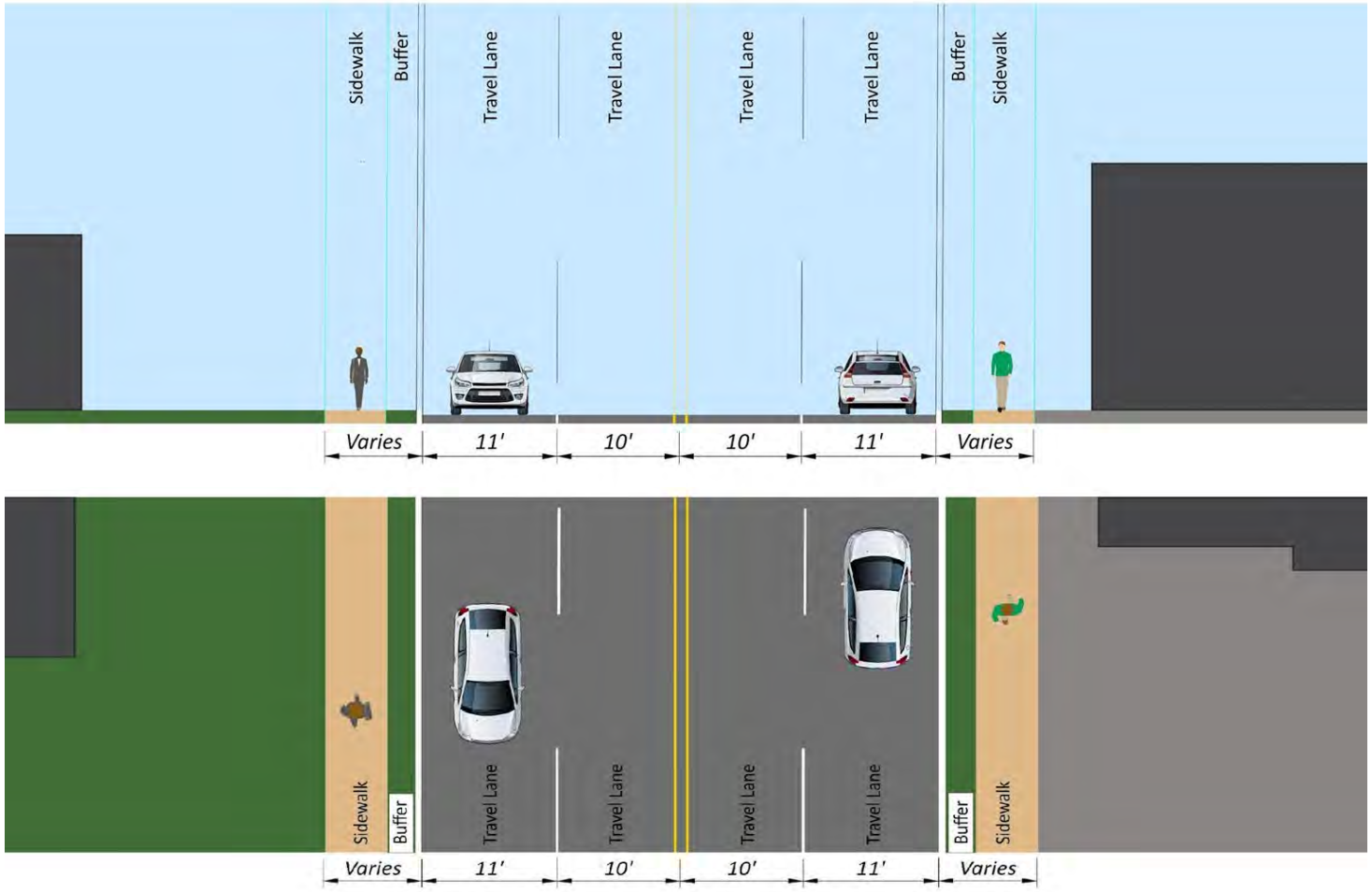
THE CITY OF COLUMBUS
ANDREW J. GINTHER, MAYOR

What We've Done

- Existing Conditions
- Traffic Analysis
- Recommendations
- Design Standards

What We've Done – Existing Conditions

Roadway Cross Section



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What We've Done – Existing Conditions and Traffic

Pedestrian, Bicycle, Transit and Vehicular Facilities

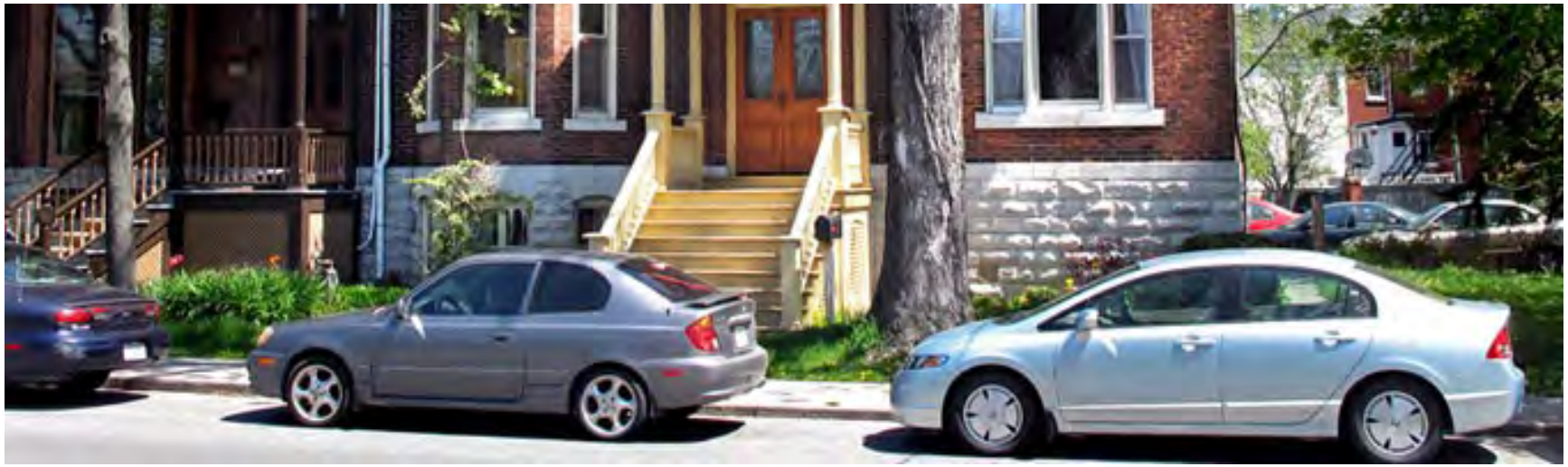
What We've Done – Recommendations

Short Term Countermeasures

- Improve Signal Visibility
- Signal Retiming
- Prohibit Left Turns
- Pedestrian Crosswalk

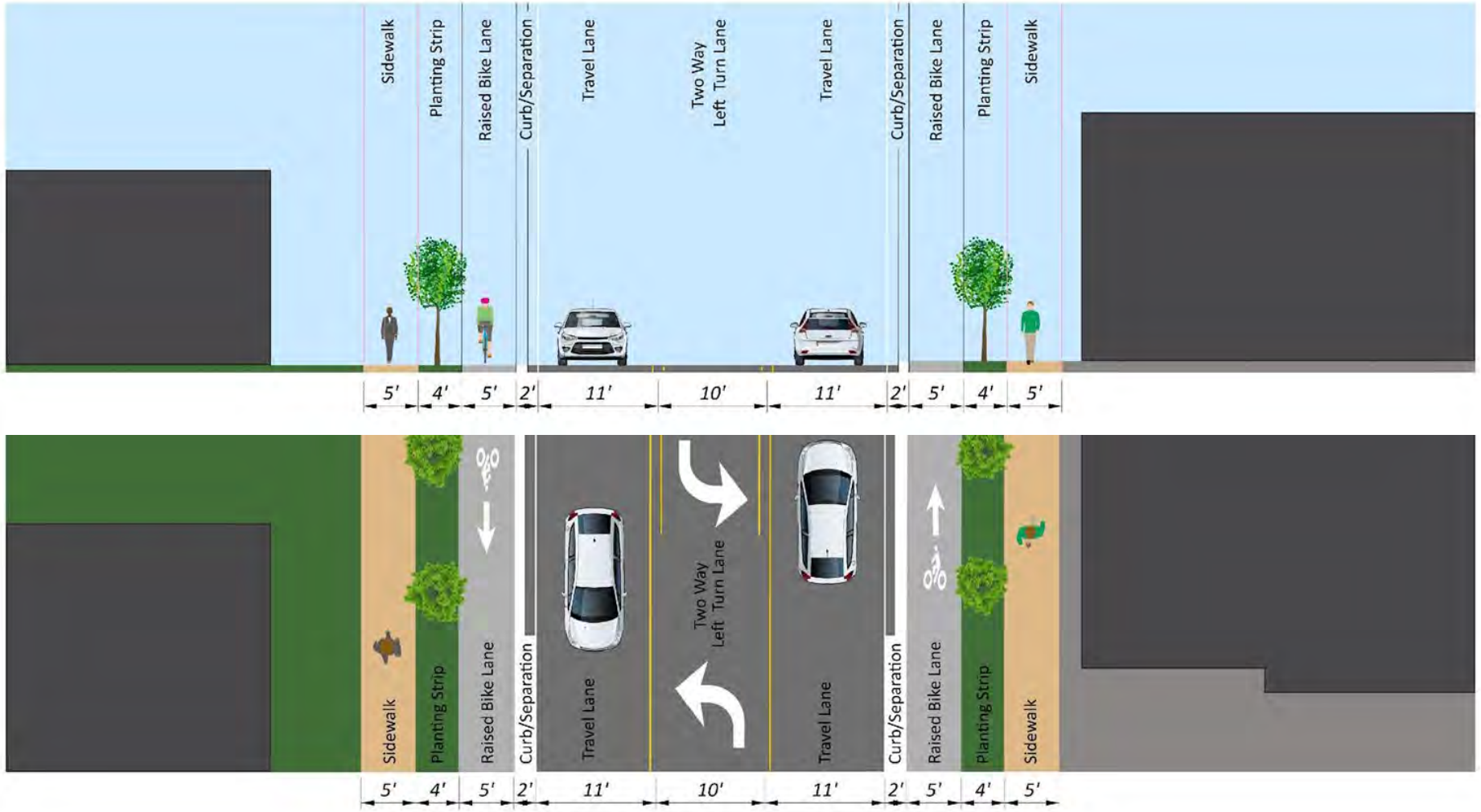
What We've Done – Recommendations

Bicycle Lanes, Pedestrians and Parking



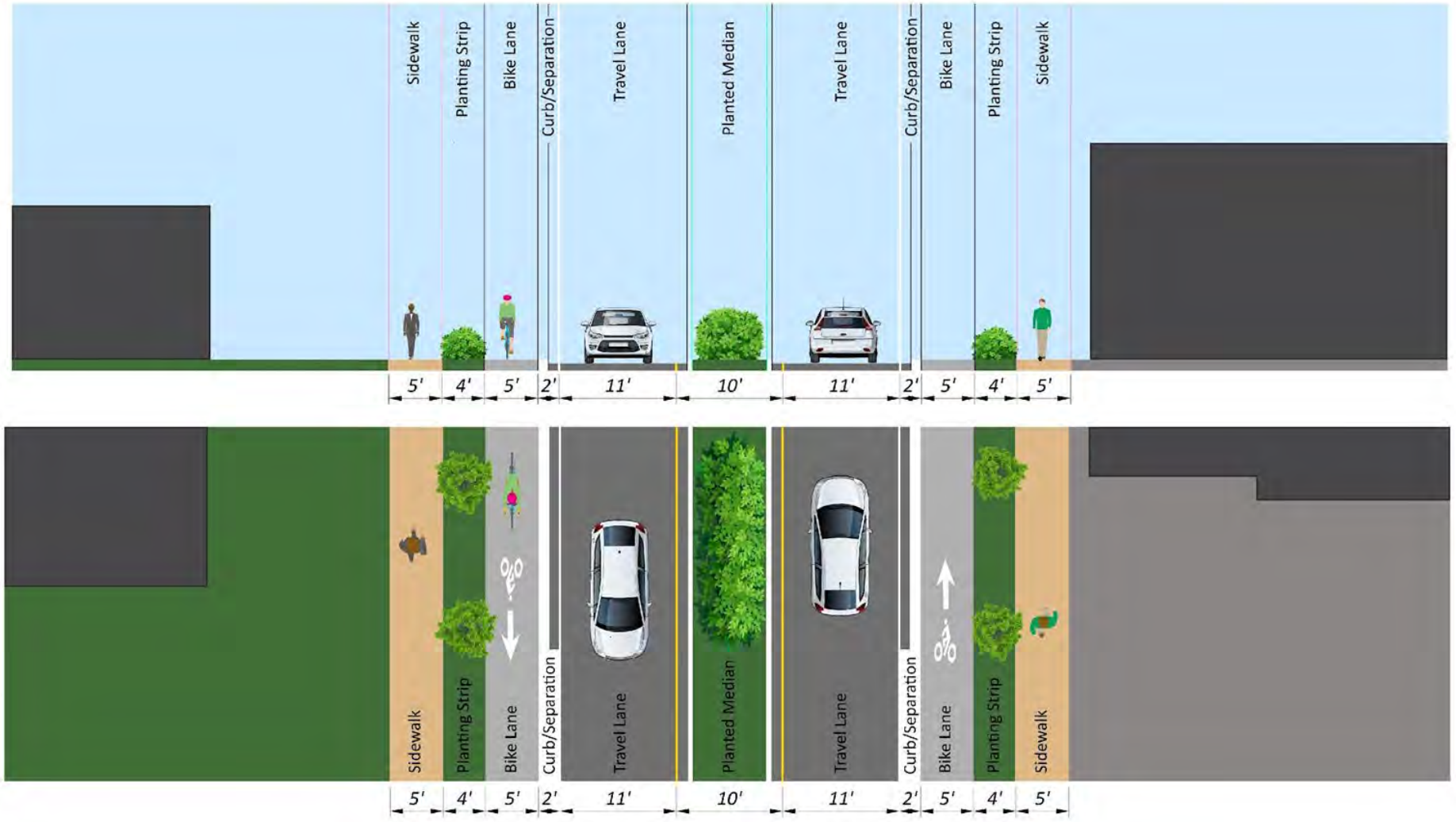
What We've Done – Recommendations

Road Diet with Two-Way Left Turn Lanes



What We've Done – Recommendations

Road Diet with Median



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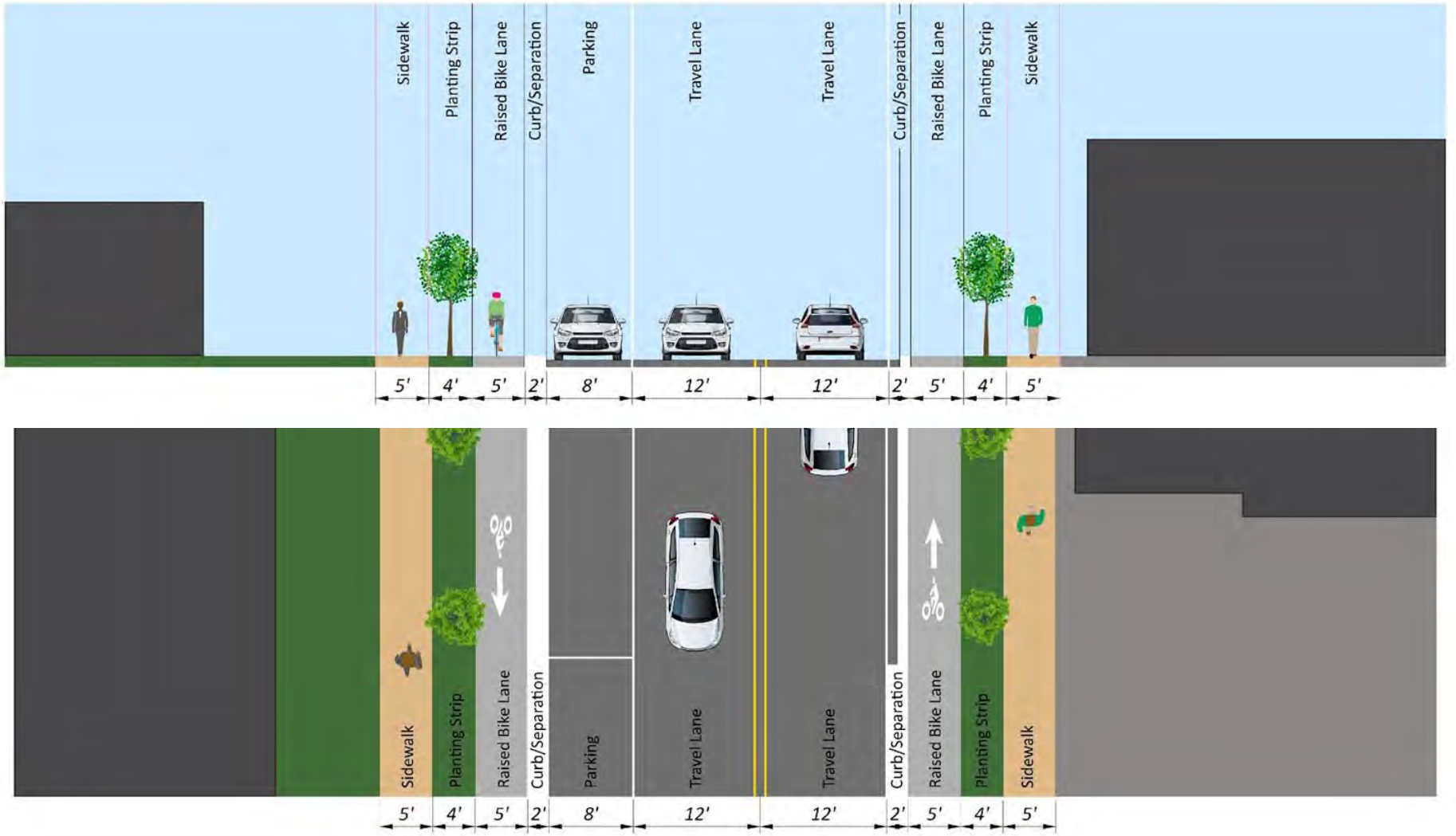
What We've Done – Recommendations

Road Diet with Parking



What We've Done – Recommendations

Project Transitions – Eastern and Western Limit

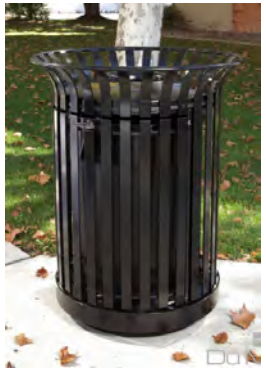
Western project limit

Eastern project limit

What We've Done – Recommendations

Design Standards

- Streetscape Design
- Bicycle Facilities
- Bus Stop Guidance



What We've Done – Recommendations

Design Standards – Bus Stop Guidance

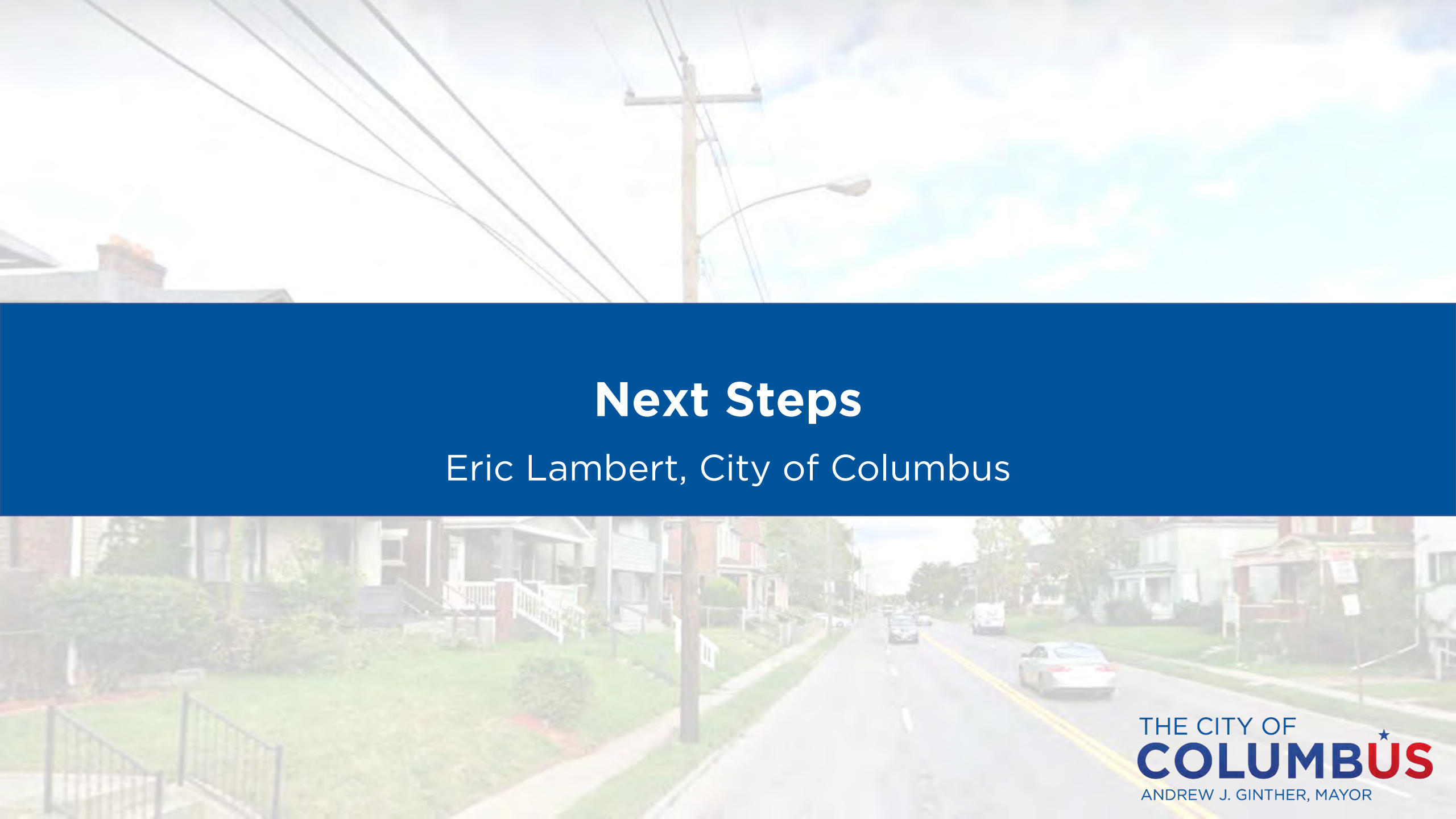
Livingston Avenue Improvements – Commercial Area

Livingston Avenue Improvements – Commercial Area

Livingston Avenue Improvements – Residential Area

Livingston Avenue Improvements – Residential Area

Livingston Avenue Improvements – Residential Area



Next Steps

Eric Lambert, City of Columbus

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ANDREW J. GINTHER, MAYOR

Study/Project Support

Columbus recently awarded $12 million for Safe Streets for All (SS4A) Implementation Grant with a local match of $12 million for a total of $24 million.

"This investment will significantly improve the safety and accessibility of the corridor, businesses and other community assets. It will help Driving Park and the surrounding neighborhoods reconnect with their rich histories and celebrate residents who made significant impacts on American history." – Mayor Ginther

SHERROD BROWN
U.S. Senator for Ohio

For Immediate Release
Tuesday, January 31, 2023
Contact: Trudy Perkins/Dani Carlson
(202) 224-3978

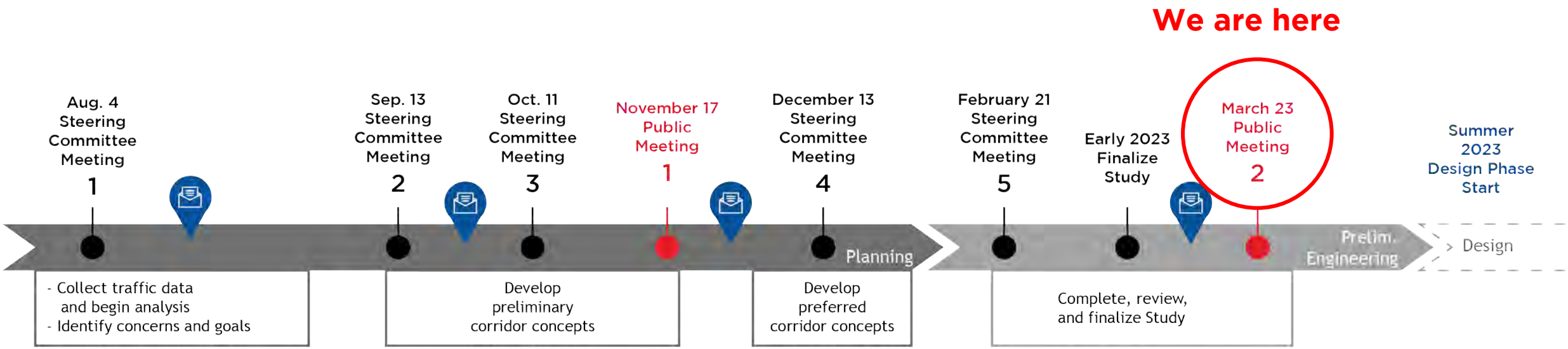
BROWN ANNOUNCES MORE THAN $15 MILLION FOR STREET SAFETY ACROSS OHIO

WASHINGTON, D.C. – Today, U.S. Senator Sherrod Brown (D-OH), chairman of the Senate Banking, Housing, and Urban Affairs Committee, announced that the U.S. Department of Transportation (DOT) awarded 14 Safer Streets for All (SS4A) grants totaling $15,414,000 to 14 communities across Ohio. This funding was included in the ***Infrastructure Investment and Jobs Act***, also known as the Bipartisan Infrastructure Law – legislation that Brown helped write and pass – and will support the development of safety action plans and safety improvements.

"With this investment from the Bipartisan Infrastructure Law, we are working to make Ohio roads safer for the thousands of Ohioans who travel on them each day," said Brown. **"This funding will put in place safety plans that will help to prevent serious accidents and keep pedestrians, bicyclists and drivers safe."**

"I am grateful to the Biden administration, Transportation Secretary Buttigieg, Senator Brown and Congresswoman Beatty and so many of our residents for their support of the Livingston Avenue project," said Mayor Andrew J. Ginther. **"This investment will significantly improve the safety and accessibility of the corridor, businesses and other community assets. It will help Driving Park and the surrounding neighborhoods reconnect with their rich histories and celebrate residents who made significant impacts on American history."**

Next Steps: Study Phase



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ANDREW J. GINTHER, MAYOR

Next Steps: Study Phase → Design Phase

- Study recommendations/concepts will be implemented in the design phase
  - Additional data collection and analysis may be necessary
- Design Phase will coordinate with the following entities during design:
  - COTA
  - City of Columbus – DPS, CRPD, DOSD, DOW, DOP, DOT, Fire Dept., etc.
  - Private Utilities
  - ODOT
- Continued public involvement at key points during design phase

Next Steps: Anticipated Project Schedule

The following anticipated schedule is set to meet requirements of the Safe Streets for All grant agreement.

Study: Complete Spring 2023

Design: Summer 2023 to End 2025

Right of Way Acquisition: Spring 2025 to Spring 2026

Utility Relocation: Spring 2025 to Spring 2026

Construction: Summer 2026 to End 2028

How to Submit Comments

At the Meeting

Comment form at comment table

After the Meeting

Online (QR to the right)

Project Manager, Eric Lambert

- Email: SELambert@columbus.gov
- Mail a comment form to:

  Eric Lambert

  111 N. Front Street, 6th Floor

  Columbus, OH 43215

www.tinyurl.com/LivingstonSurvey2

Please submit comments by April 23!

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ANDREW J. GINTHER, MAYOR

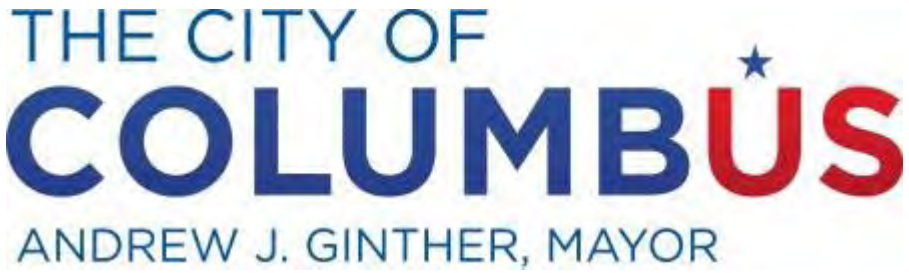
Future Project Updates

Project website - https://www.columbus.gov/LivingstonAvenuePedestrianSafetyStudy/

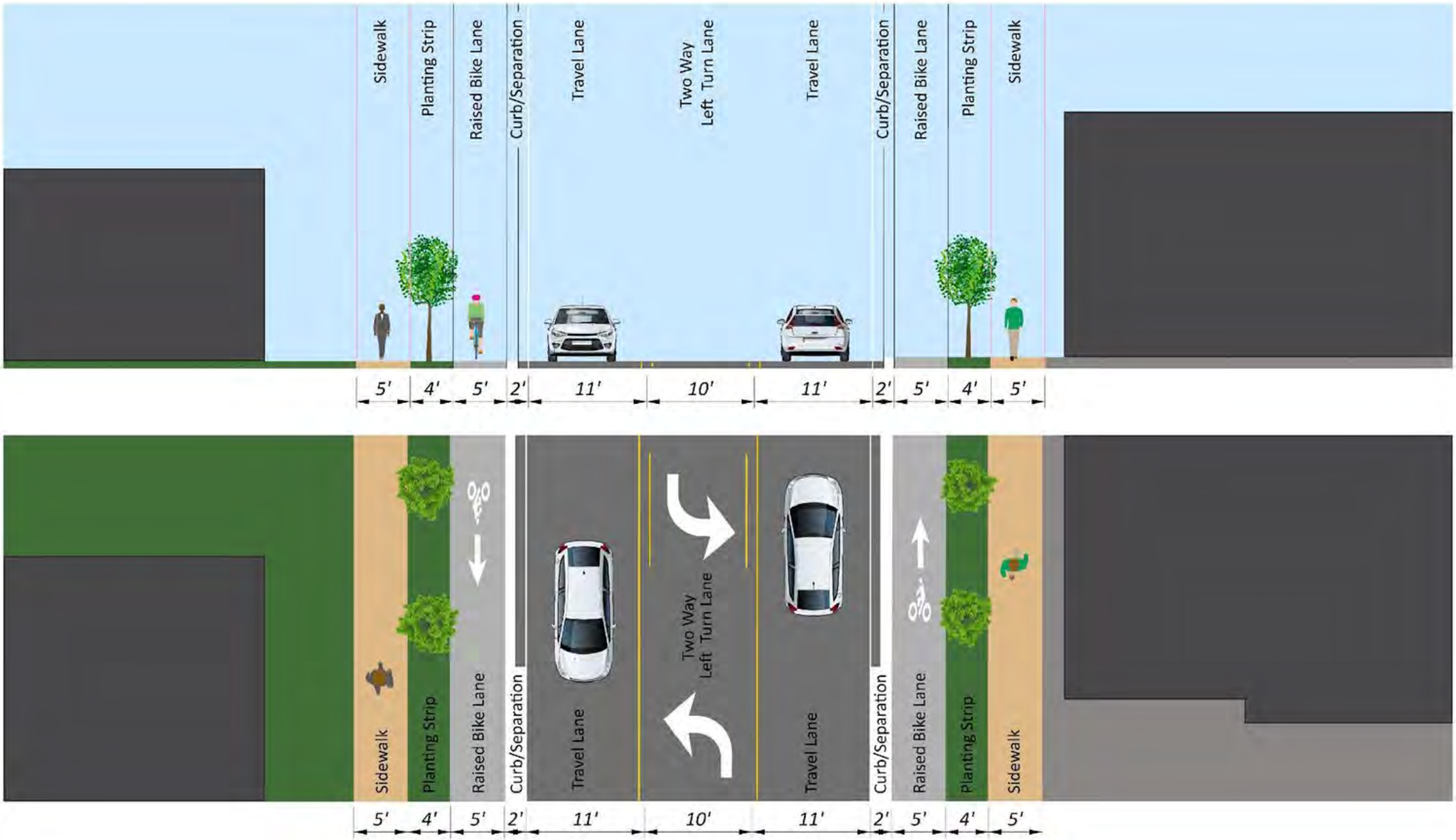
- General Project Information
- Updates on Public Involvement Events
- Newletters
- Public Meeting Materials
- General Public Comment Form

Public Comment Form: https://docs.google.com/forms/d/e/1FAIpQLSdmld62mfTY0UD7qEEV8h7J423lg6Kq5ufoqCiG3a8pr9gb8A/viewform

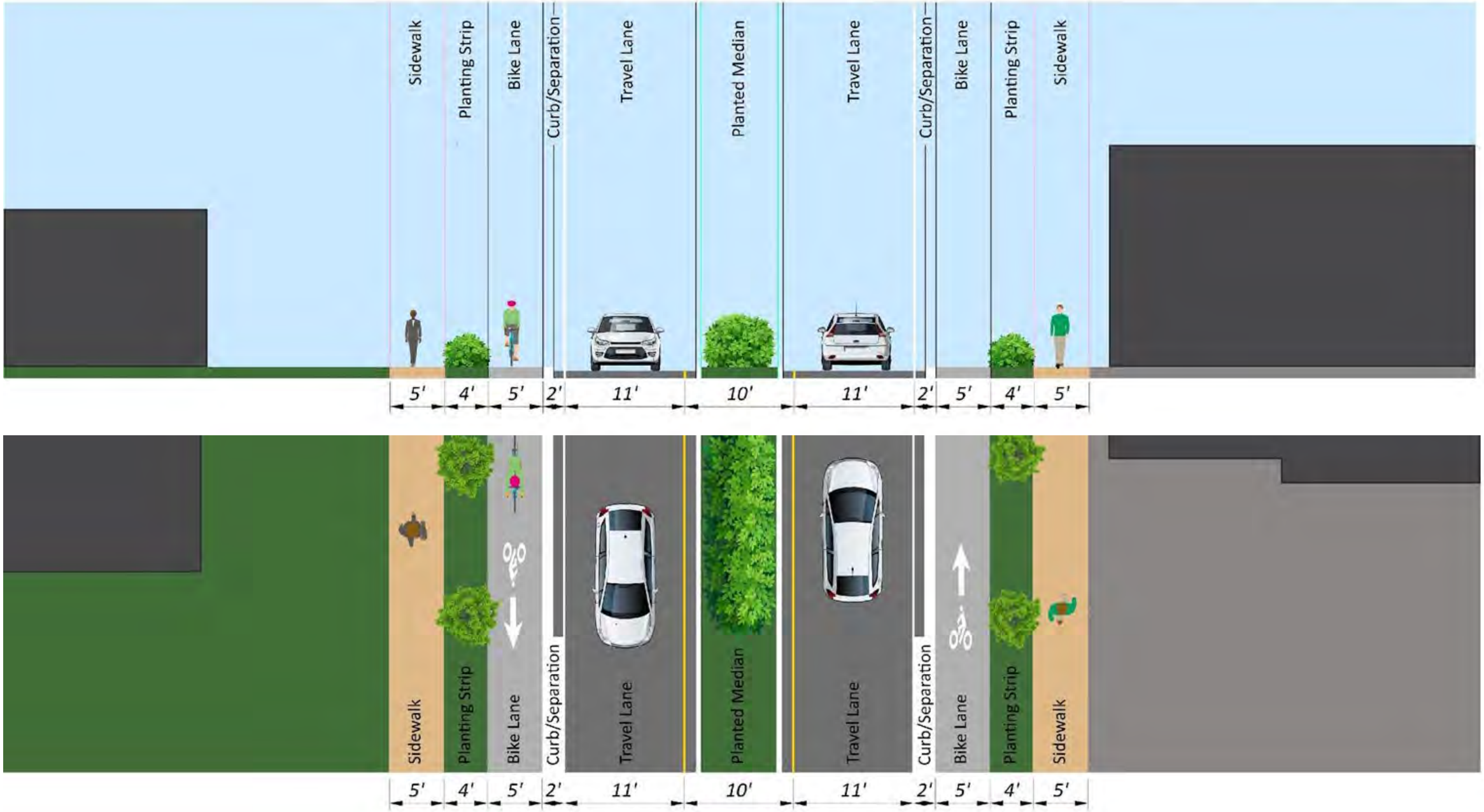
Thank you!



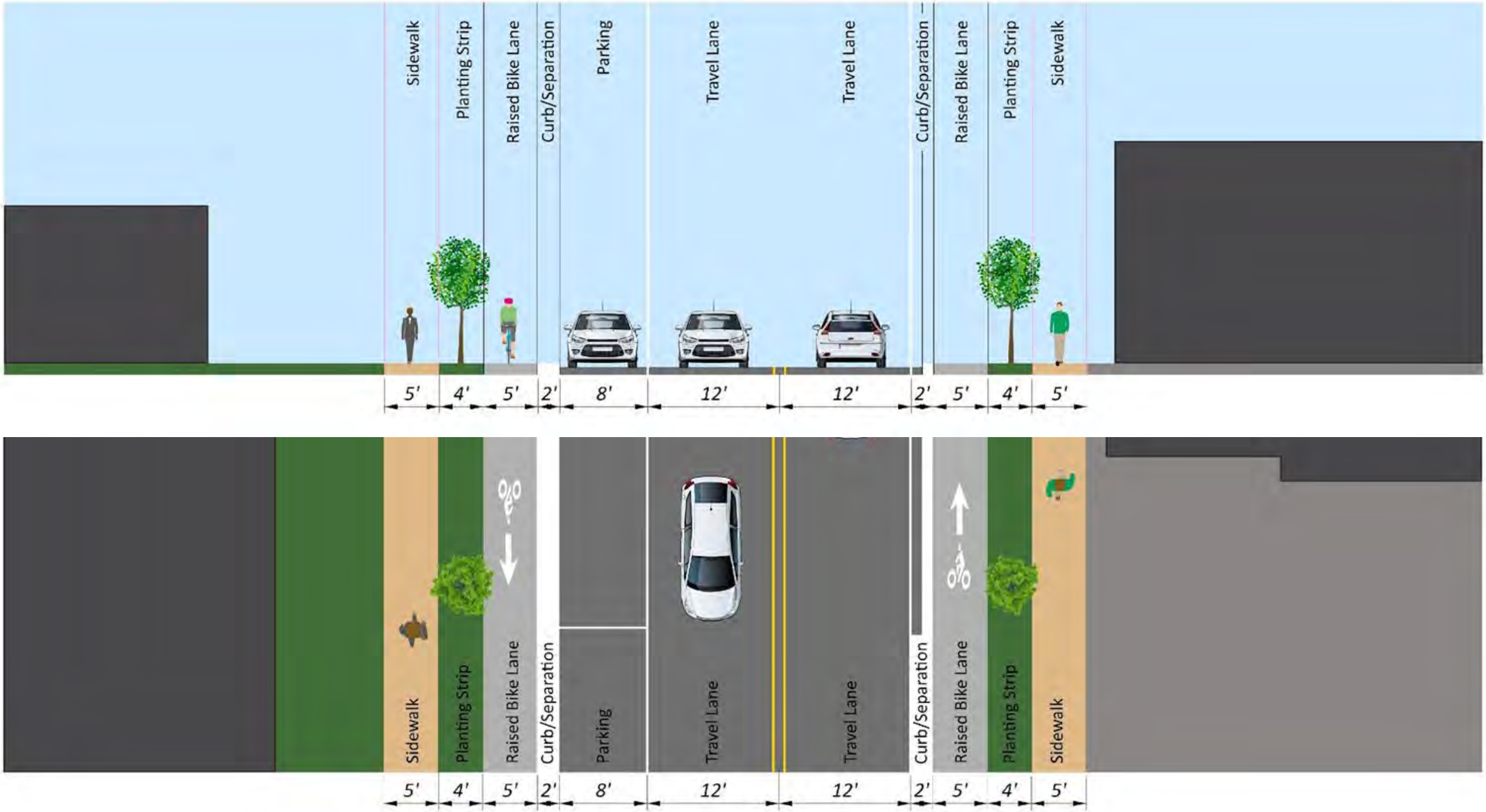
Study Recommendation shown with Two Way Left Turn Lane



Study Recommendation shown with Planted Median



Study Recommendation shown with Parking



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ANDREW J. GINTHER, MAYOR

LIVINGSTON AVENUE IMPROVEMENTS STUDY
FREQUENTLY ASKED QUESTIONS – MARCH 2023

1. **Why is this study needed?**
   The Livingston Avenue corridor is identified on the Vision Zero Columbus High Injury Network because it has a higher density of fatal and serious injury crashes that present safety issues for pedestrians, cyclists, transit users and drivers. Compared to the rest of Columbus, fatal crashes are six times more likely to occur along Livingston Avenue. Many individual improvements have been made to the corridor, however a comprehensive study for this area has yet to be done. The City is working to address these issues along the corridor, with the Livingston Avenue Improvements Study.

2. **What is the purpose of the study?**

   The study is focused on Livingston Avenue from 18th Street to Nelson Road. The goal of the study is to identify improvements to the corridor to promote safety for all roadway users and reduce vehicle speeds and severe crashes. The study process will identify issues, conduct analysis, receive and record input, and narrow down solutions. The process will result in a report that will compile all information in a reader-friendly document and will be shared with the public. The results of the study are then used as a roadmap/reference for future project(s).

3. **What's been done so far?**
   The city and consultant team have been working with a Steering Committee, comprised of neighborhood residents and business, faith, and community organization representatives, to develop recommendations to improve safety on Livingston Avenue. Based on the feedback received at steering committee meetings 1-3, as well as technical data collected from the team, the project team developed preliminary corridor recommendations to improve Livingston Avenue. These recommendations were presented at the first public meeting so that attendees could provide feedback. The general concept presented at the first public meeting was a road diet (reduced to 2 through lanes with center or left turn lane/median) with a raised bike lane on either side, grass tree lawn area, and sidewalk improvements.

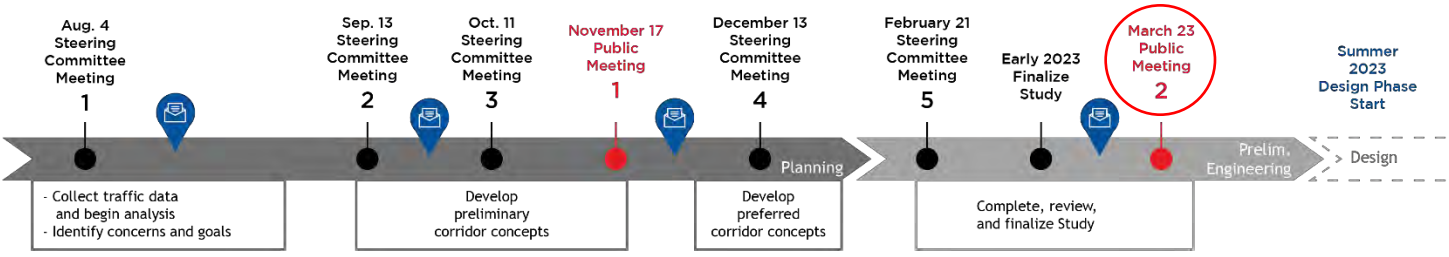
   Top themes from comments received at the first public meeting include:
   - Many commenters thought the concept will improve safety
   - Positive feedback on dedicated, raised bike lane
   - Positive feedback on medians, but concerns about cutting off access to certain side streets on Livingston
   - Some concern about reduced travel lanes, but overall positive feedback on road diet concept
   - Mixed comments/feedback on removal of on-street parking

4. **What is the purpose of the second public meeting?**
   The purpose of the second public meeting is to present the recommendations and findings made during the study and planning process. The team will also share the next steps for the overall project.

5. **What recommendations will be included in the study?**
   Considering public and steering committee feedback, the team will include the following recommendations for further development in the design phase:
   - Road Diet. The road diet will reduce the number of lanes from two through lanes in each direction to one through lane in each direction. The two lanes will then be reallocated to other uses, such as bike facilities, medians, turn lanes, or parking. The typical sections on the reverse page show the variety of layouts that may be utilized along Livingston Avenue.
   - Transitions at project limits (to tie into existing bike and pedestrian infrastructure for better connectivity)
   - Pedestrian accommodations
   - Parking considerations
   - Other recommendations such as bus stops, cross-street realignments, and consideration for opportunities to include community identity or beautification elements

   All recommendations made in the study will be considered in the design phase. Traffic analysis is ongoing.

6. **What is the anticipated schedule for the study?**
   Below is the study timeline, with design beginning in summer 2023:



7. **What is the difference between the study phase and the design phase?**
   During the study phase, corridor issues and project goals were identified, traffic analysis was conducted, and input was received to identify recommended concepts to improve safe travel along the corridor. This information will be documented in the Livingston Avenue Improvements Study report. The study will be used as a road map/reference for the project as it moves into the design phase to be implemented. The design phase will begin to work through the recommendation details to prepare for construction of the improvements.

8. **Will the public be updated on progress during the design phase?**
   Yes, public involvement and opportunities to comment will continue into the design phase. Please let us know on the comment form how the team can best provide project updates in the future.

9. **When will this get built?**

   It is anticipated that construction will begin Summer 2026 and end Winter 2028. A general schedule from study completion (Spring 2023) to construction is below:

   - **Livingston Avenue Improvements Study:** Complete Spring 2023
   - **Design:** Summer 2023 to End 2025
   - **R/W Acquisition:** Spring 2025 to Spring 2026
   - **Utility Relocation:** Spring 2025 to Spring 2026
   - **Construction:** Summer 2026 to End 2028

10. **How can I submit comments?**
    At the meeting, you can fill out a comment form at the comment table and give it to a team member or place it in the "Comments" box. If you'd like to submit a comment after the meeting, you can do so by the following methods:

    Online comment form:
    https://tinyurl.com/LivingstonSurvey2 →

    Email Eric: SELambert@columbus.gov

    Mail a comment form to:
    Eric Lambert
    111 N. Front Street, 6th Floor
    Columbus, OH 43215

    Comments will be accepted at any time; however, comments submitted by April 23, 2023, will be documented in the study and provided a response.

THE CITY OF COLUMBUS

Livingston Avenue Improvements Study
18th St. to Nelson Road

Public Meeting #2 Survey & Comment Form

Comments will be accepted at any time; however, comments submitted by **April 23, 2023** will be documented in the study and provided a response.

Online Comment Form: www.tinyurl.com/LivingstonSurvey2 ⟶

SCAN ME

Contact Information

Name: _____

Email (for future updates on the project): _____

Survey

1. How did you hear about the public meeting? (Select all that apply)

- ☐ City website
- ☐ Mailed postcard
- ☐ Social media
- ☐ TV or radio
- ☐ Church
- ☐ Word-of-mouth
- ☐ Other: _____

2. What are the most effective communication methods to provide project updates or invitations for future project meetings? (Select all that apply)

- ☐ City website
- ☐ Mailed postcard
- ☐ Social media
- ☐ Email list
- ☐ Area Commission meetings
- ☐ Periodic newsletter
- ☐ Other: _____

3. What is your relationship to Livingston Avenue? (Select all that apply)

- ☐ Area resident
- ☐ Area business owner or employee
- ☐ Commuter
- ☐ Other: _____

4. What is your primary mode of transportation during a typical work week? (Select all that apply)

- ☐ Personal vehicle
- ☐ Carpool
- ☐ Bicycle
- ☐ Ride share
- ☐ Public transit
- ☐ Walk
- ☐ Other: _____

5. How often, on average, do you typically bike or walk on Livingston Avenue? (Select one)

- ☐ Daily
- ☐ Weekly
- ☐ Monthly
- ☐ A few times a year
- ☐ Almost never

6. How often, on average, do you typically ride the bus or use public transportation? (Select one)

- ☐ Daily
- ☐ Weekly
- ☐ Monthly
- ☐ A few times a year
- ☐ Almost never

Proposed Improvements

Please rate the following options 1-5 with 1 being least interested in this improvement and 5 being the most interested **(please circle only one)**.

The following images represent a typical section on Livingston Avenue with a road diet (reducing travel lanes to one in each direction) and raised bike lanes. Each image represents a different use for the remaining roadway space, including a planted median and on-street parking.

Planted Median

Least interested in this improvement 1 2 3 4 5 **Most interested in this improvement**

On-Street Parking

Least interested in this improvement 1 2 3 4 5 **Most interested in this improvement**

Comments or Feedback:

This comment form may be submitted to Eric Lambert, the Project Manager, by the following methods:

In-person at the meeting: Drop into the comment box
Email to: SELambert@columbus.gov
Mail to: Eric Lambert
111 N. Front Street
Columbus, OH 43215

Online Comment Form

SCAN ME