



Blueprint Columbus CAP Meeting June 2, 2015

THE CITY OF
COLUMBUS
MICHAEL B. COLEMAN, MAYOR

DEPARTMENT OF
PUBLIC UTILITIES

**BLUE
PRINT**
COLUMBUS

Clean streams.
Strong neighborhoods.

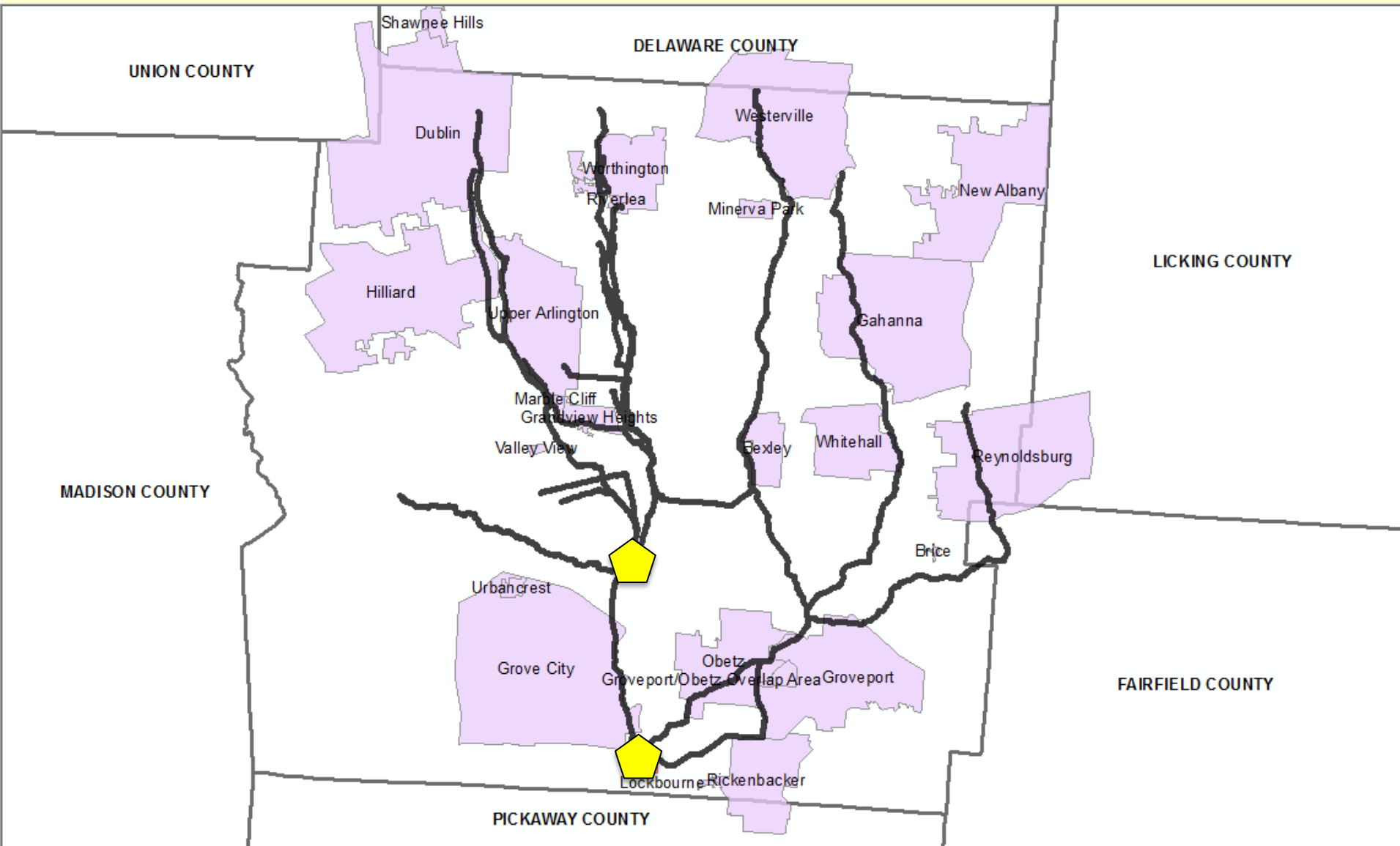
Agenda

- Review of Collection System Model
- Use of the Modeling Results
- Changes in Map
- Common Improvements Needed for Both Plans
- Blueprint Plan
- Gray Plan (2015 WWMP)
- Prioritization Update
- Green Infrastructure Design Update

Benefits of Collection System Modeling

- Identify deficiencies in the sewers
 - Overflows
 - Basement backups
 - Bypasses at the wastewater treatment plants
- Predict how future development will affect existing sewers
- Test proposed remedies without having to build them
- Can simulate more alternatives and is more accurate than hand calculations
- Accepted by EPA as way to measure future collection system performance

Columbus' System

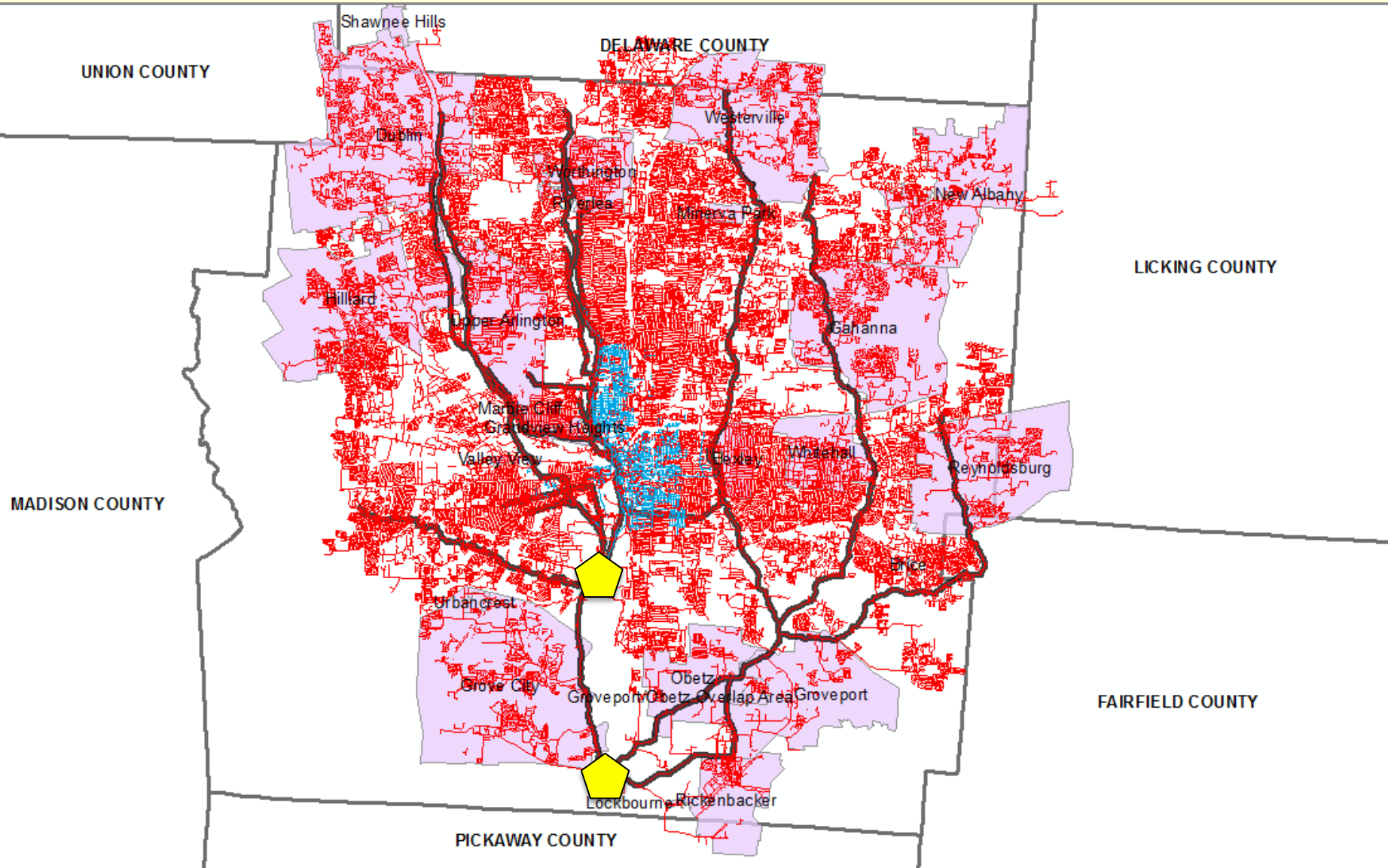


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Columbus' System



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How Model Was Used

- Changed the map
 - Refined which areas have SSOs and significant basement back-ups
- Used to generate two plans: Blueprint and gray
- Both plans meet requirements of consent orders
 - Address SSOs and basement back-ups in City
 - Generally, expect none in 10 year period
 - Control CSOs
 - Different levels for different CSOs
 - Levels developed in original plan and approved by Ohio EPA

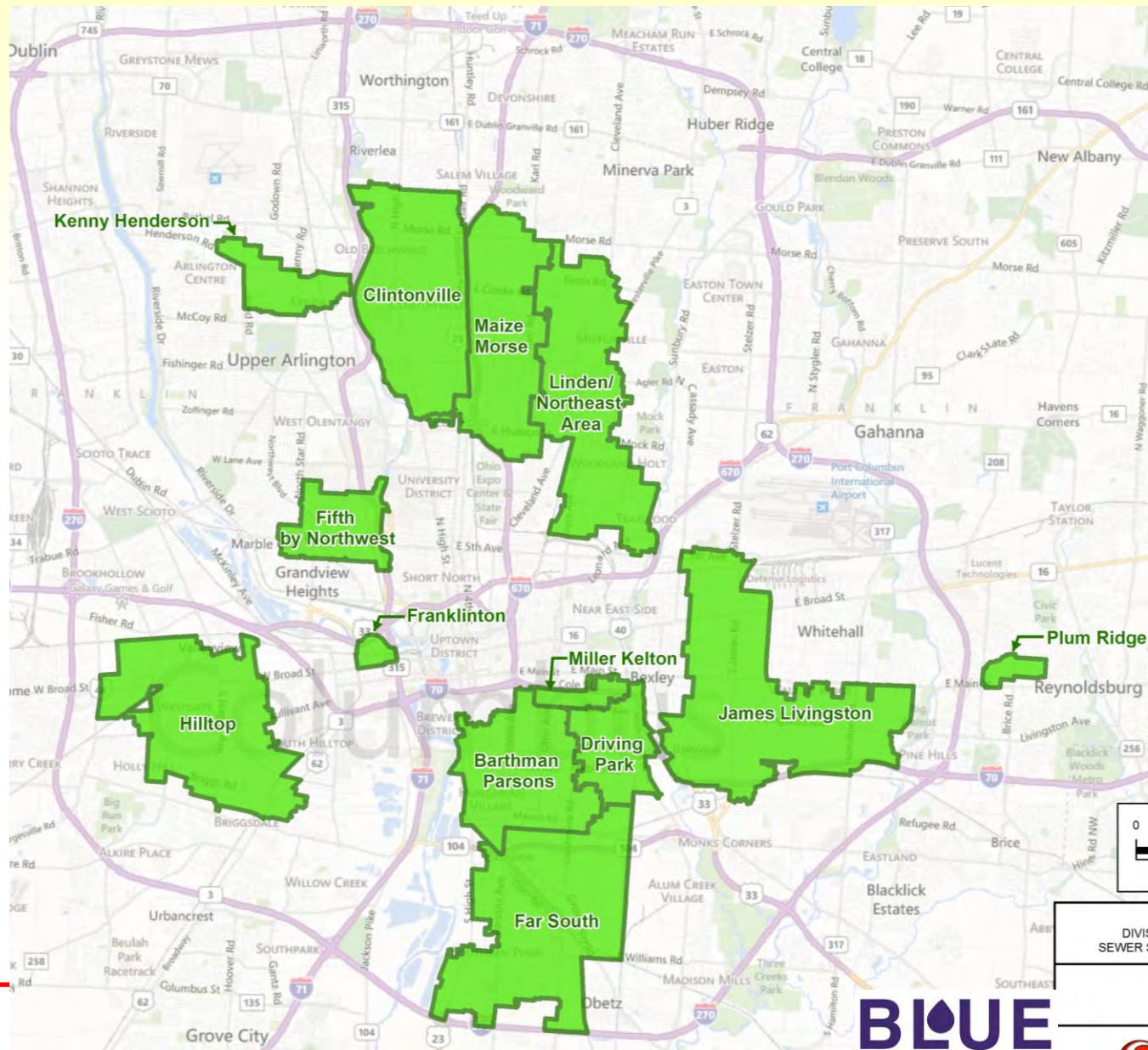
WIB Investigations

- Model assumes basements everywhere, 7 feet deep
- When potential WIBs are identified
 - Desktop search
 - Field surveys
- Verify presence and depth of basement



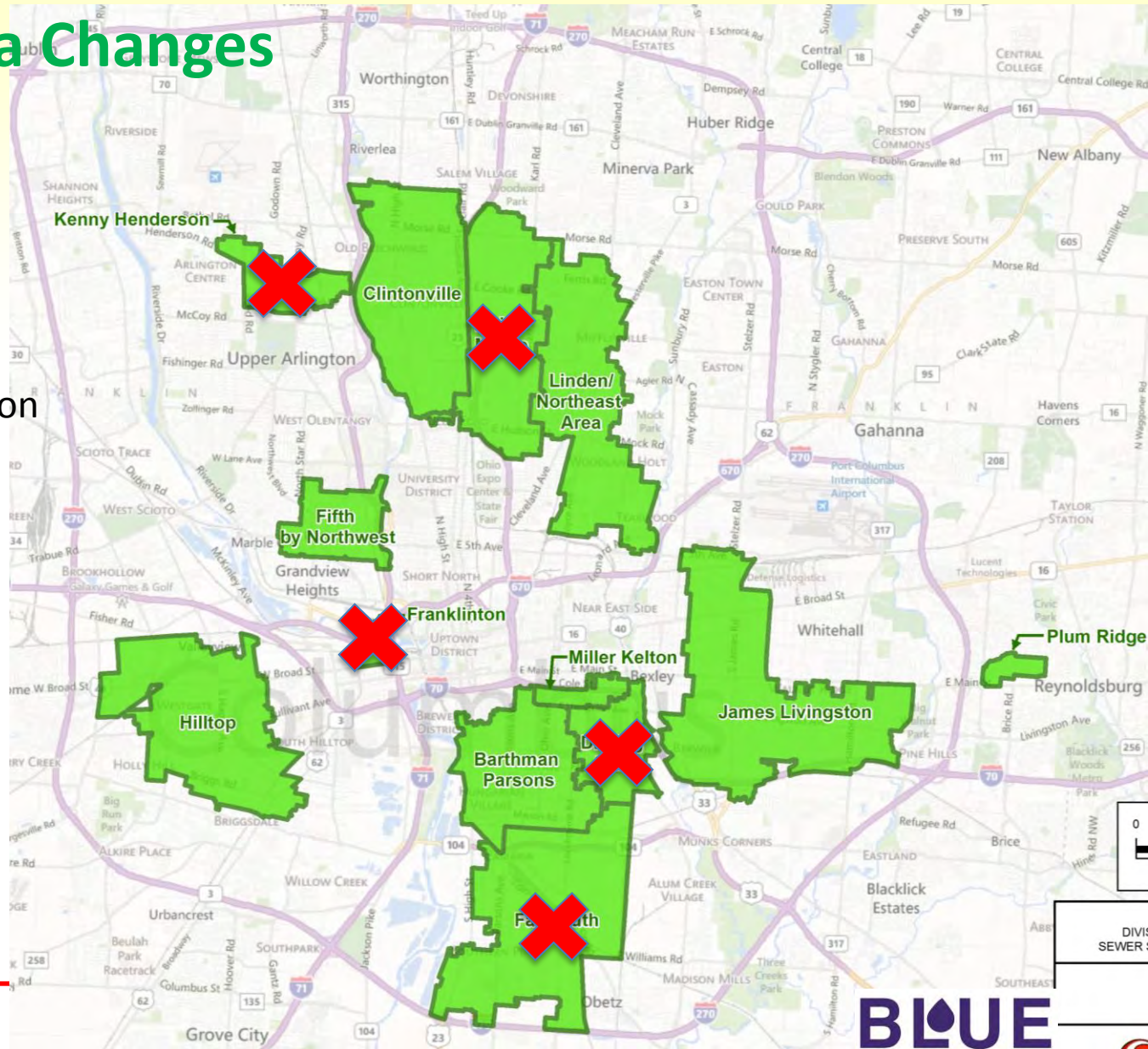
Original Blueprint Areas

- 29,739 acres



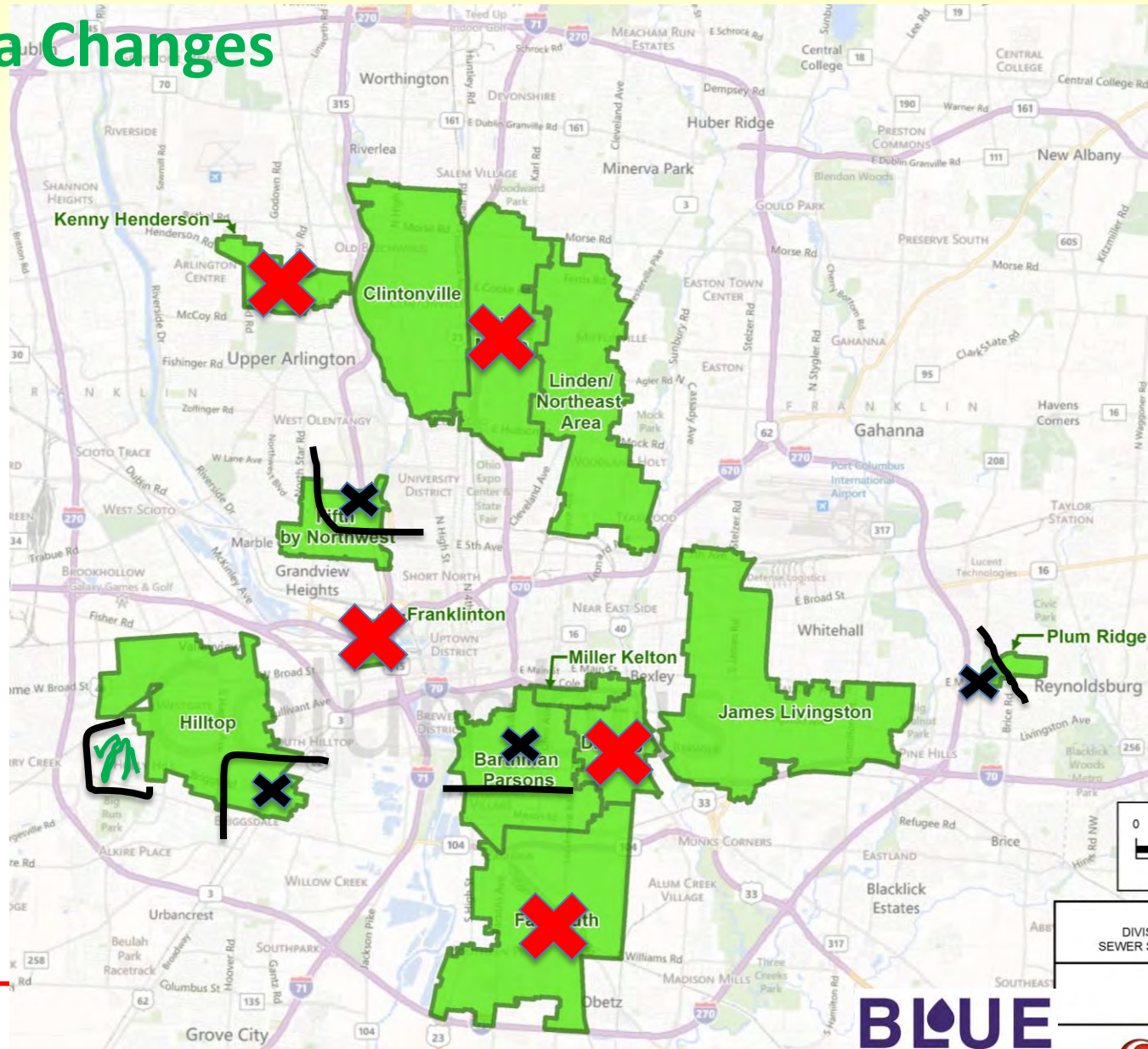
Blueprint Area Changes

- Areas Eliminated:
 - Maize Morse
 - Far South
 - Kenny Henderson
 - Franklinton
 - Driving Park



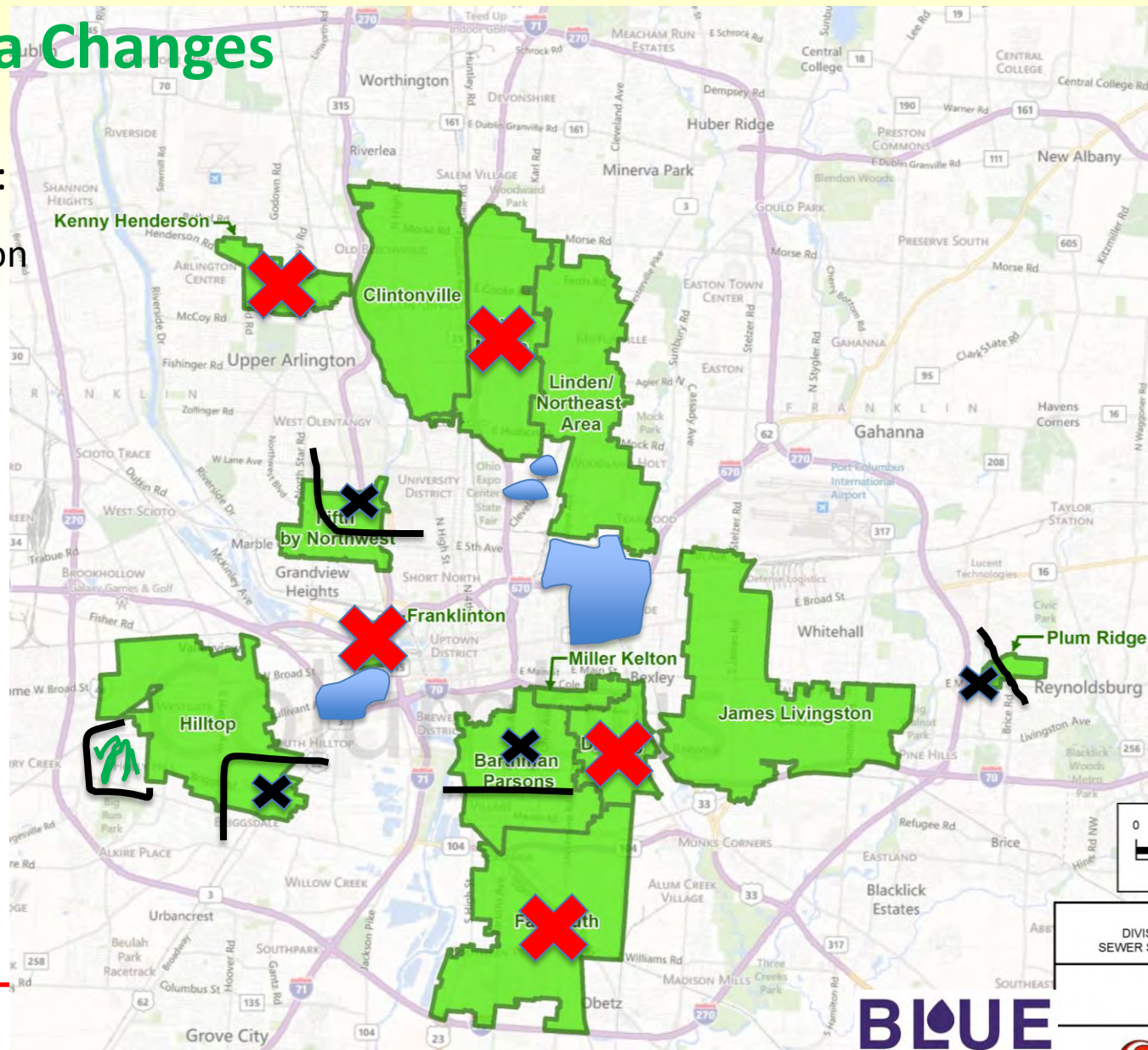
Blueprint Area Changes

- Areas Reduced or Modified in Size:
 - Fifth by Northwest
 - Plum Ridge
 - Hilltop
 - Barthman Parsons/Near South

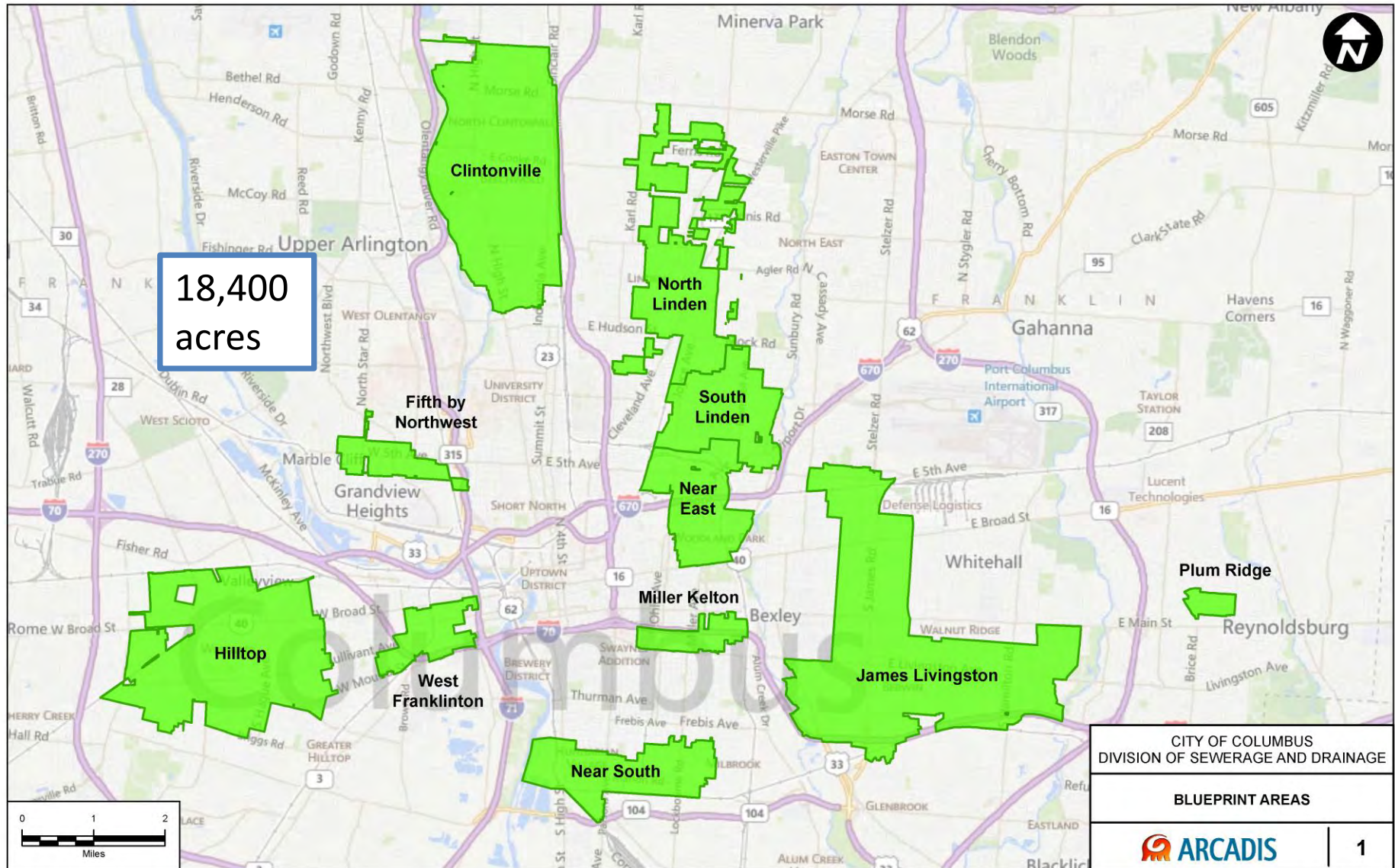


Blueprint Area Changes

- New areas added:
 - West Franklinton
 - Linden
 - Near East



Final Blueprint Map

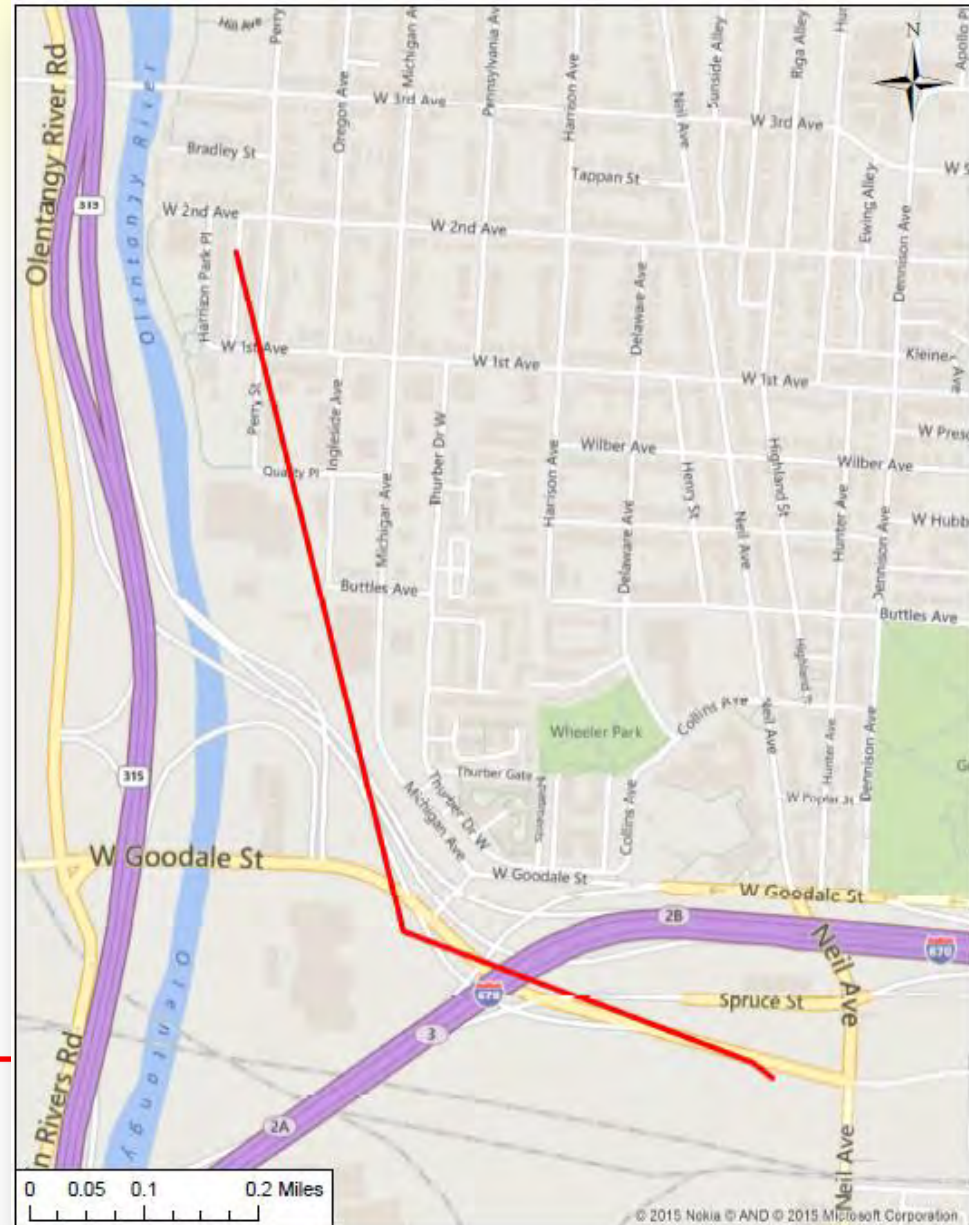


Improvements Needed in Both Plans

- It was determined that the Blueprint Plan would need to have some gray infrastructure included
 - Tunnel on the west side known as Lower Olentangy Tunnel
- The tunnel needed in the Blueprint Plan for two reasons
 - Completion of the CSO program
 - Certain areas not solved with Blueprint alone
- The gray plan will include this tunnel, plus more tunnels

Lower Olentangy Tunnel, Phase 1

- From Arena District to Second Ave
- Will provide relief to the Fifth by Northwest area SSOs
- Will provide required relief for Olentangy CSOs
- Will need to be installed and operational by July 1, 2025



Lower Olentangy Tunnel, Phase 2

- From Second Ave to Dodridge Street
- Will provide relief to SSOs in:
 - Clintonville
 - Kenny Henderson



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The Blueprint Plan

- Applied modeling assumptions on all of the map areas
- Checked to make sure SSOs and WIBs are eliminated
 - (this is when the need for LOT was identified)
- Checked to make sure not making things worse outside Columbus
- Determined that Blueprint could be successful without any participation from suburban areas
- Some areas solved with just Blueprint, some required additional solutions
- Includes green infrastructure (not depicted on maps yet)

Blueprint Modeling Assumptions

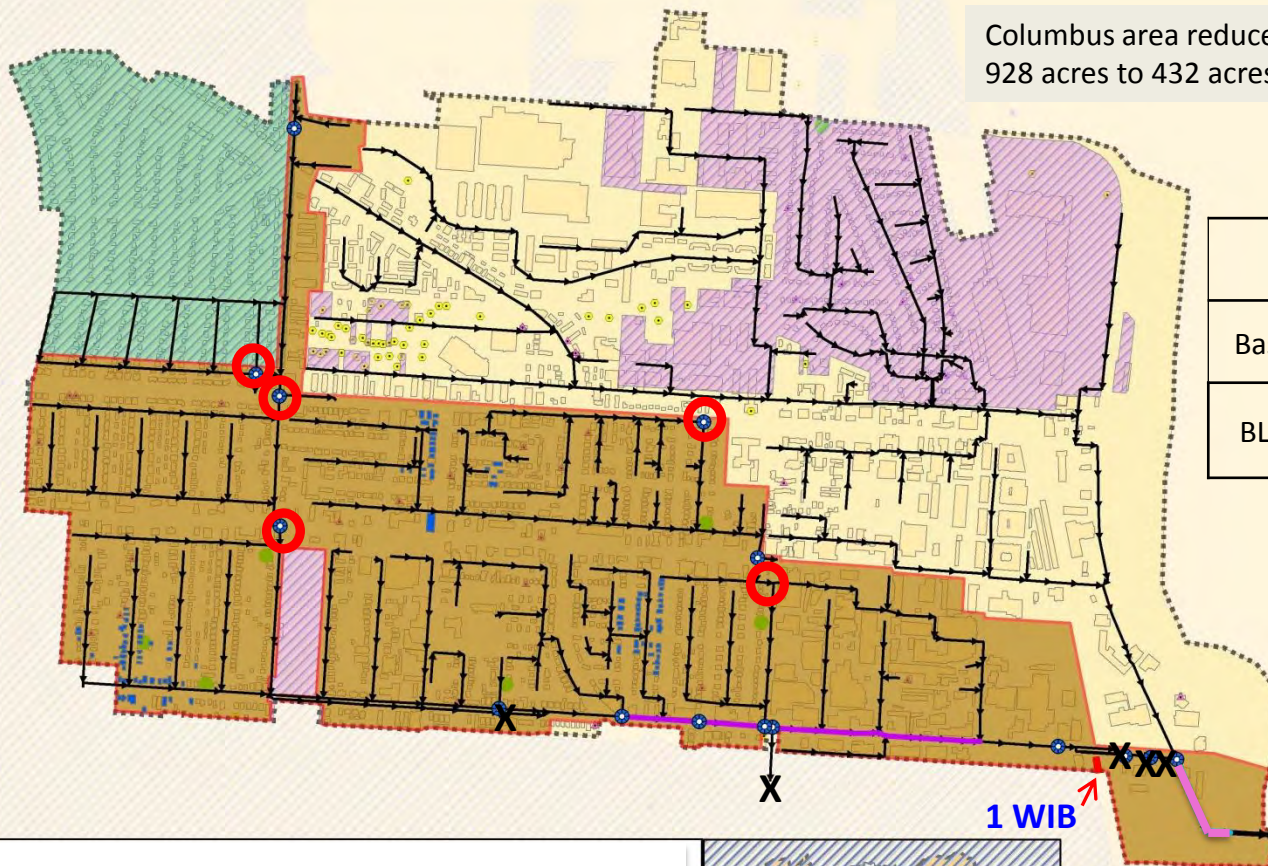
I/I Source	Mitigation Technology	Participation
Roof drainage from a splash block	Route roof water to street via 'storm lateral'	50%
Lateral	Lining lateral pipes	90%
Mainline sewers	Lining mainline sewers and manholes	100%
Buffer area around buildings	Sump pumps	25%



Columbus area reduced from
928 acres to 432 acres

No work in
Upper
Arlington
or Franklin
County

	WIBs	DSRs
Base	103	10
BLU	1	0



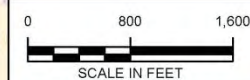
X = DSR or Connection Closed

O = Weir Raised/Reconfigured

— = New Pipes Installed

DRAFT

To LOT/FM



Fifth by
Northwest
Blue

	WIBs	DSRs
Base	1547	12
BLU	2	0

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10" pipe from Worthington
Directed to Olentangy Main

Area upstream DSR 346
has increased sump pump
participation (50%)

X = DSR Closed

0 = WIBs
Remaining

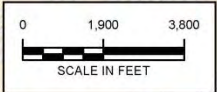
— = New Pipes
Installed

Relief also
provided by LOT2
at Dodridge Street

Additional Relief
pipe

WIBs

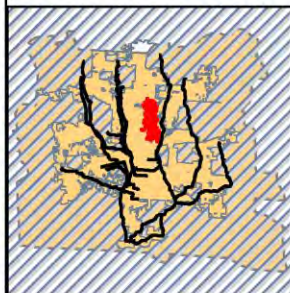
Closed DSR 328



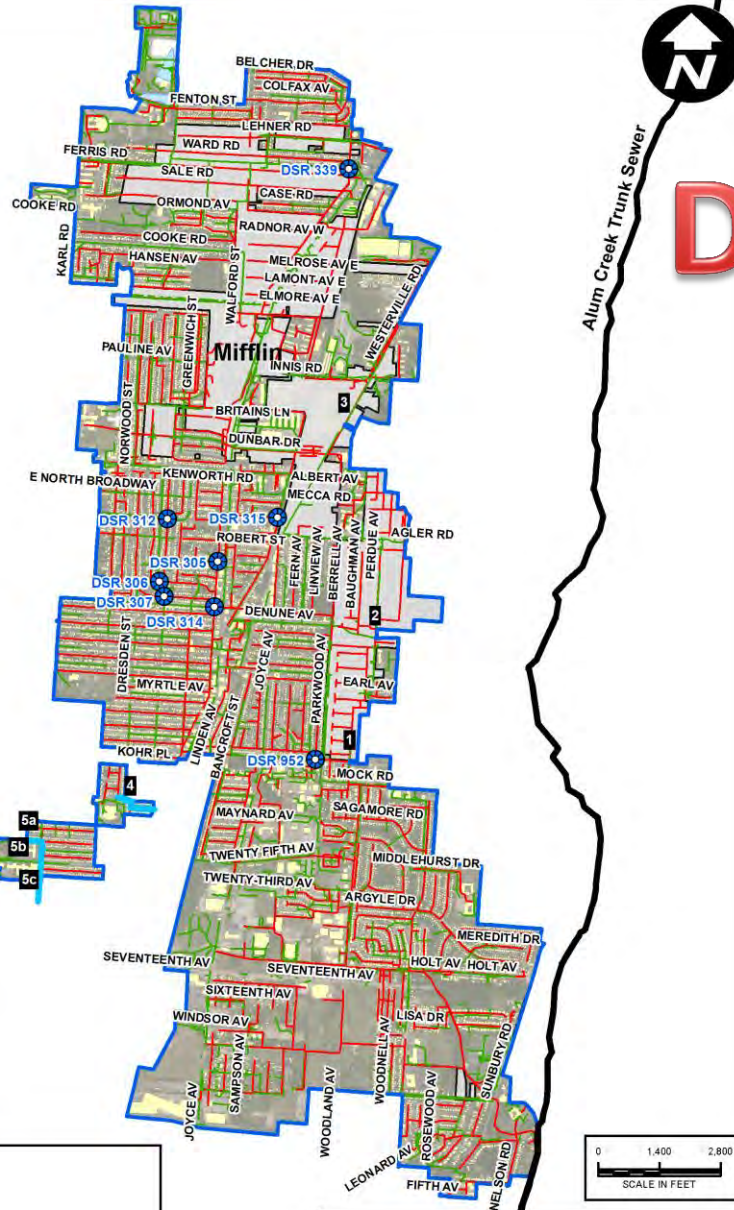
Clintonville
Blue

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	WIBs	DSRs
Base	1260	4
BLU	2	0

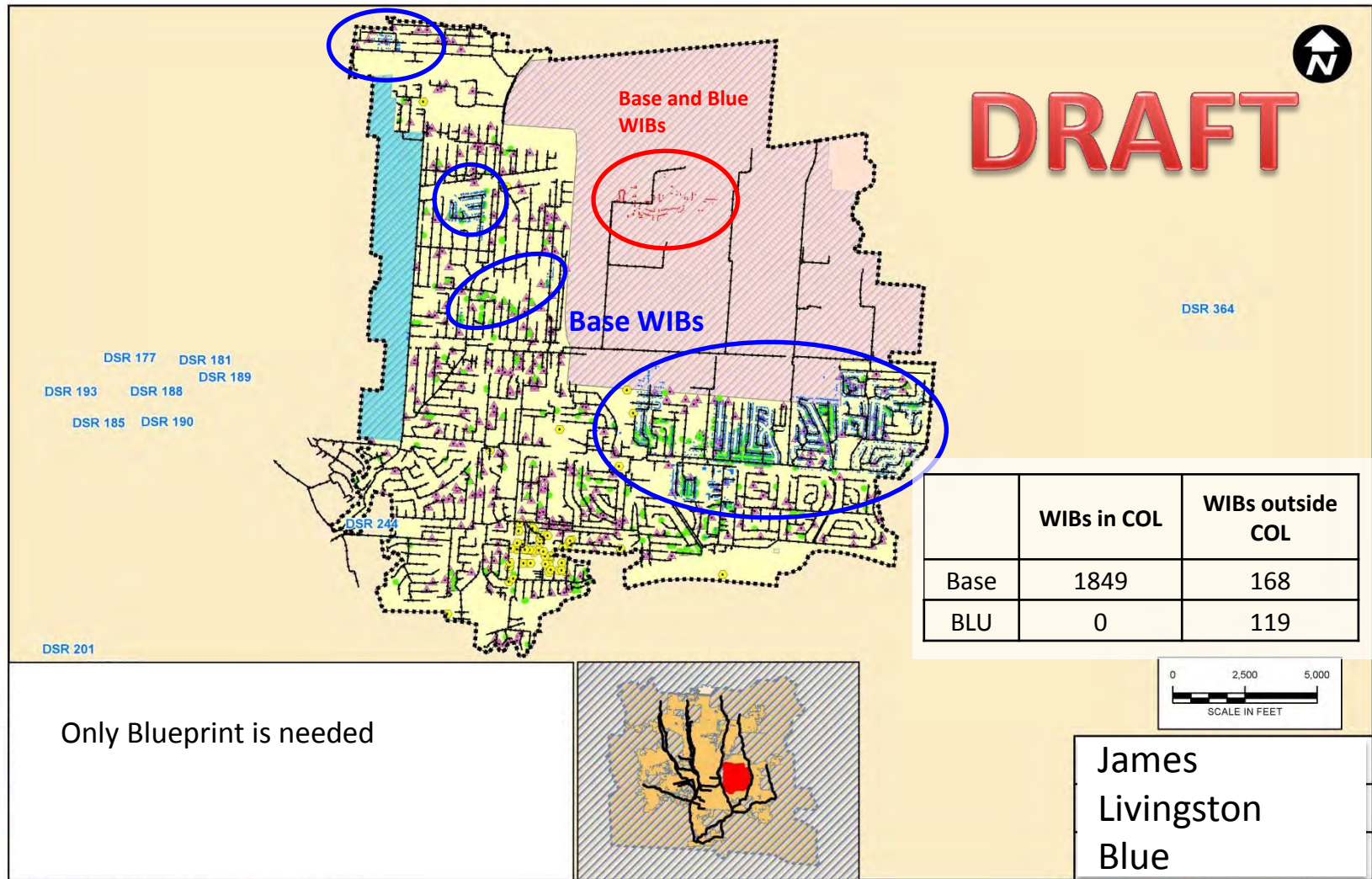


5a
5b
5c



Only Blueprint is
needed, individual
WIB locations
remain.

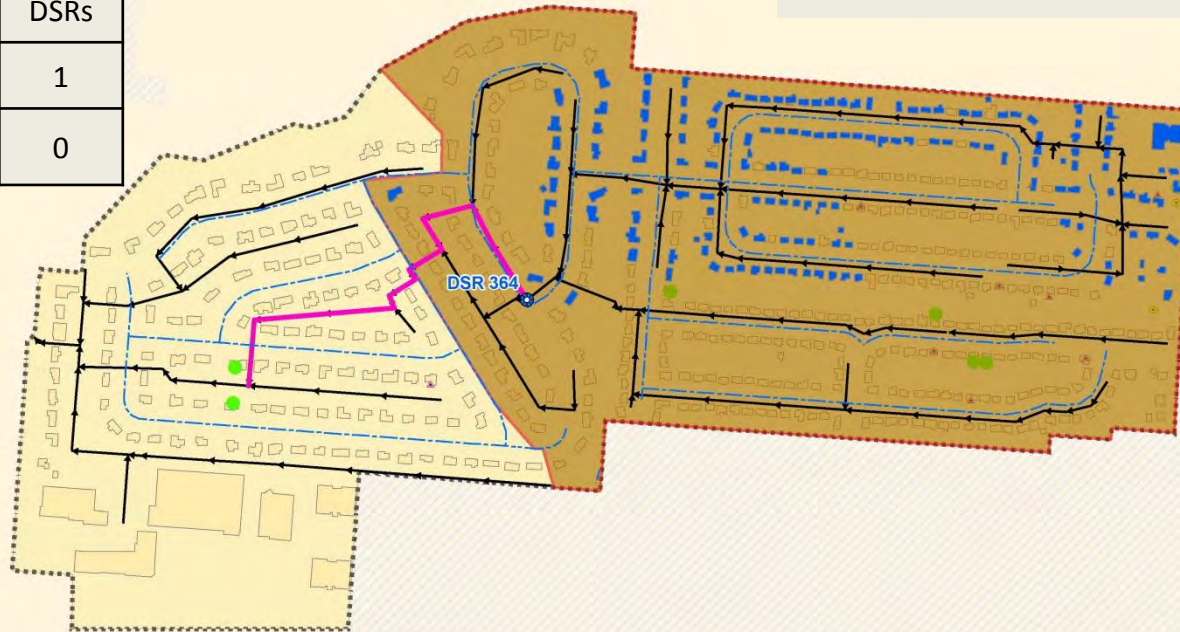
Linden
Blue





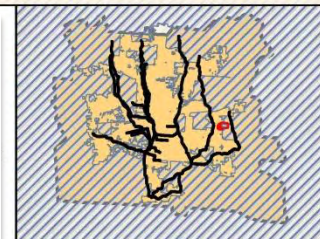
Area reduced from 230 acres
to 139 acres

	WIBs	DSRs
Base	152	1
BLU	0	0



Removed direct driveway storm connections

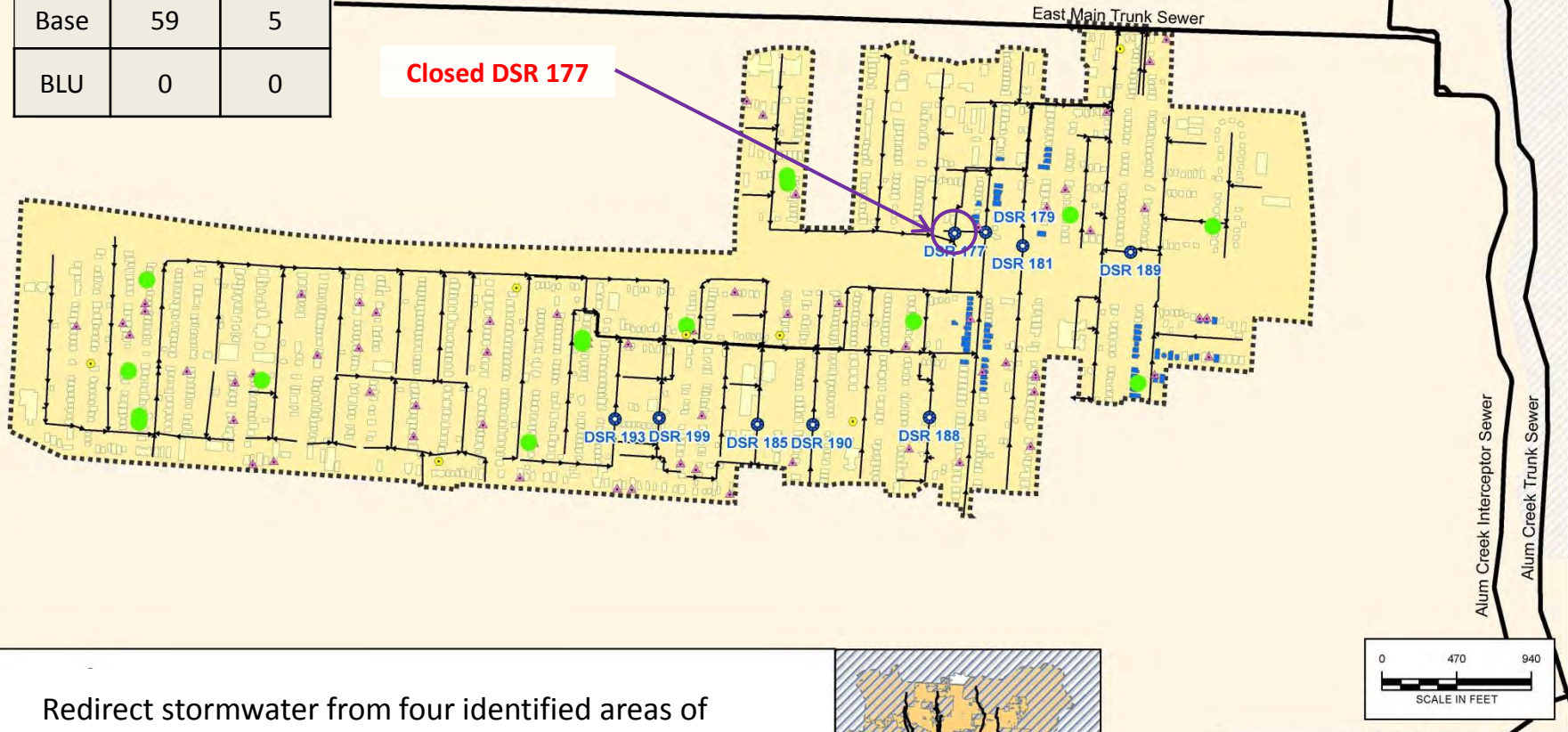
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Plum Ridge
Blue

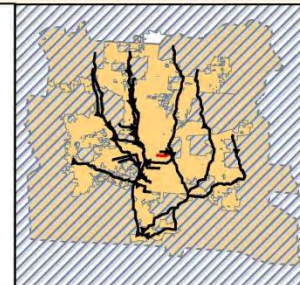
	WIBs	DSRs
Base	59	5
BLU	0	0

Closed DSR 177

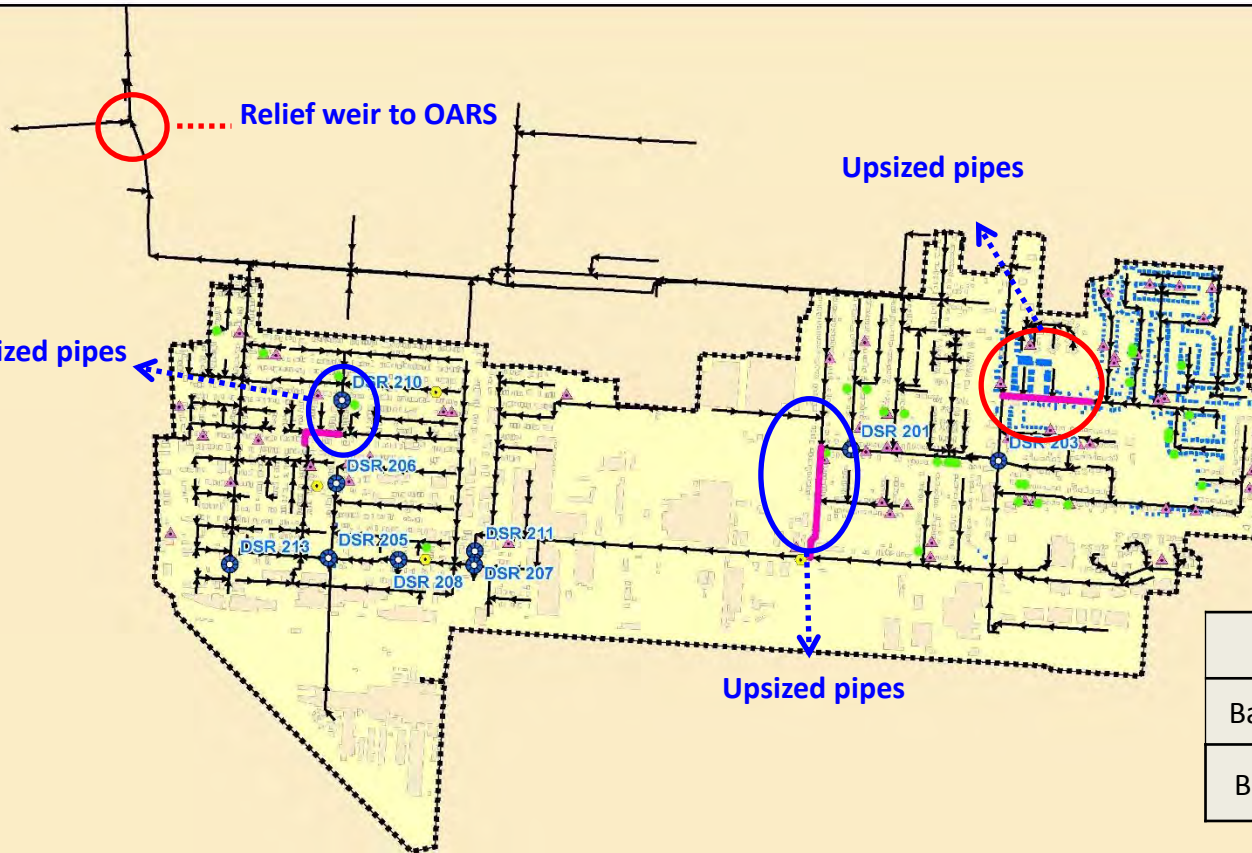


Redirect stormwater from four identified areas of public source inflow

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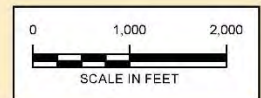
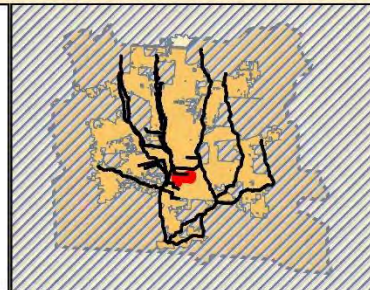
Miller Kelton
Blue



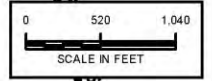
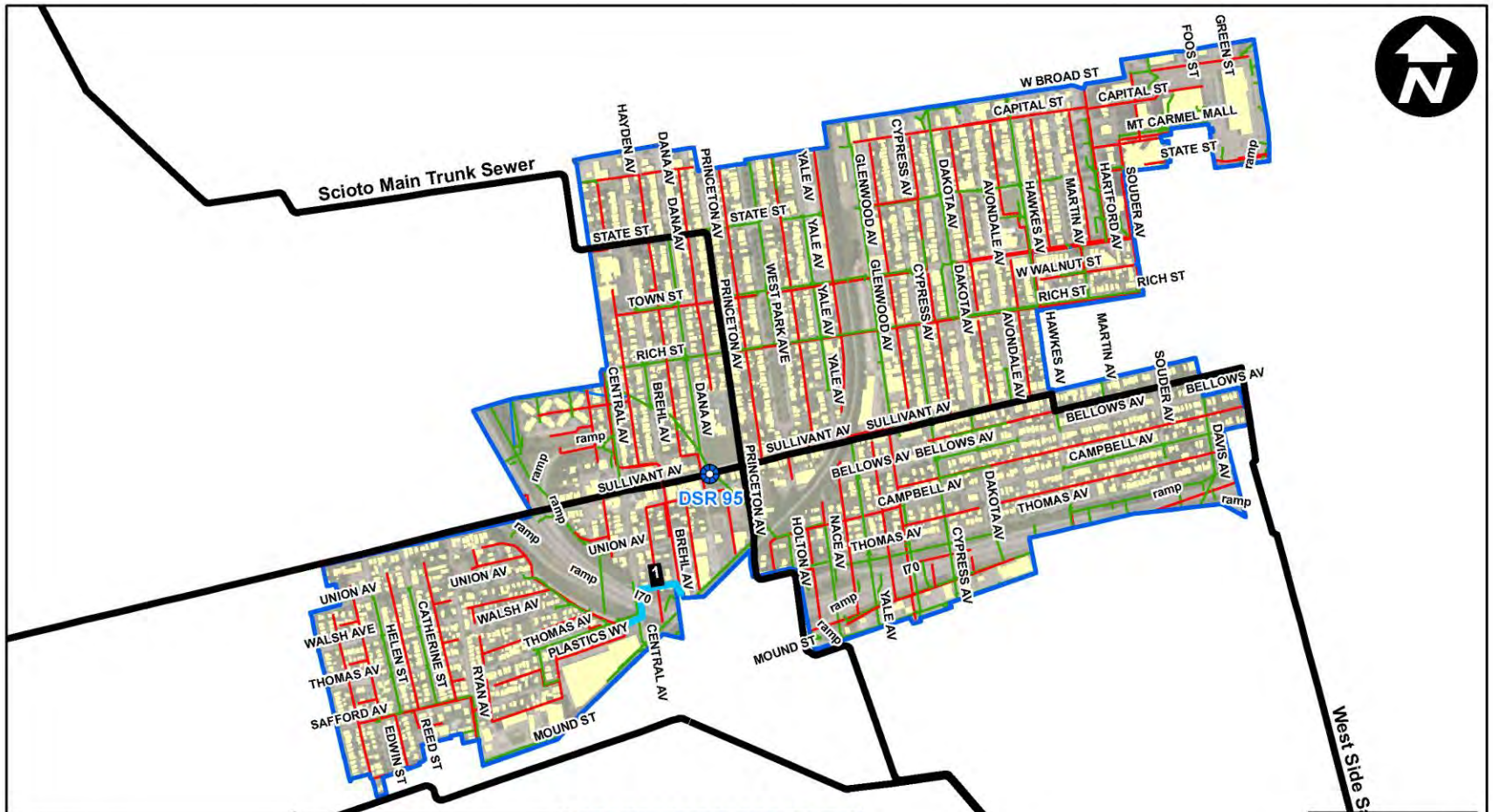
	WIBs	DSRs
Base	392	6
BLU	0	0

— = New Pipes Installed

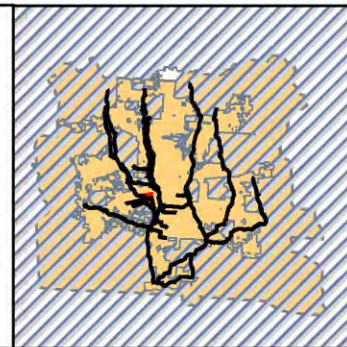
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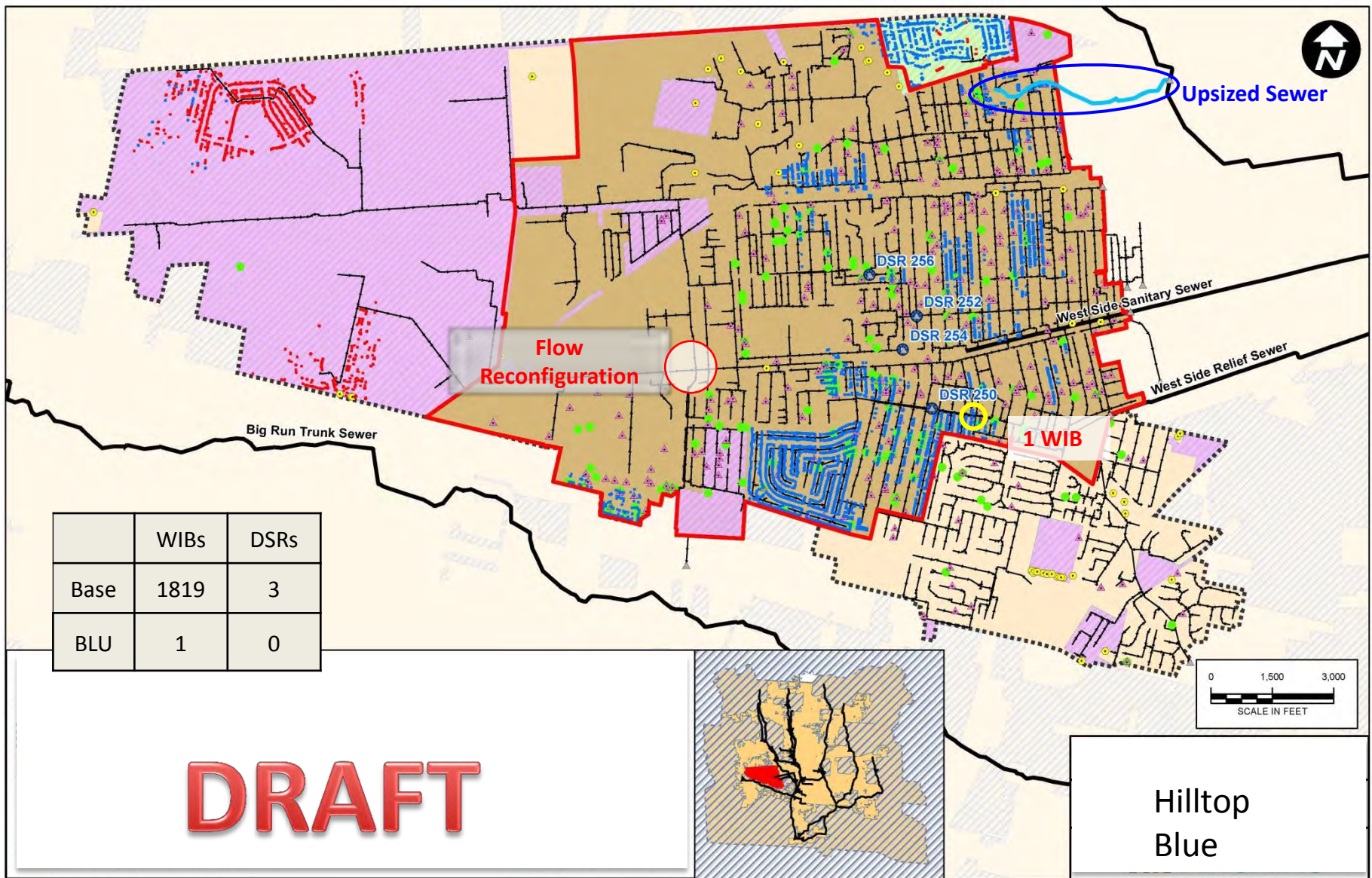
Near South
Blue



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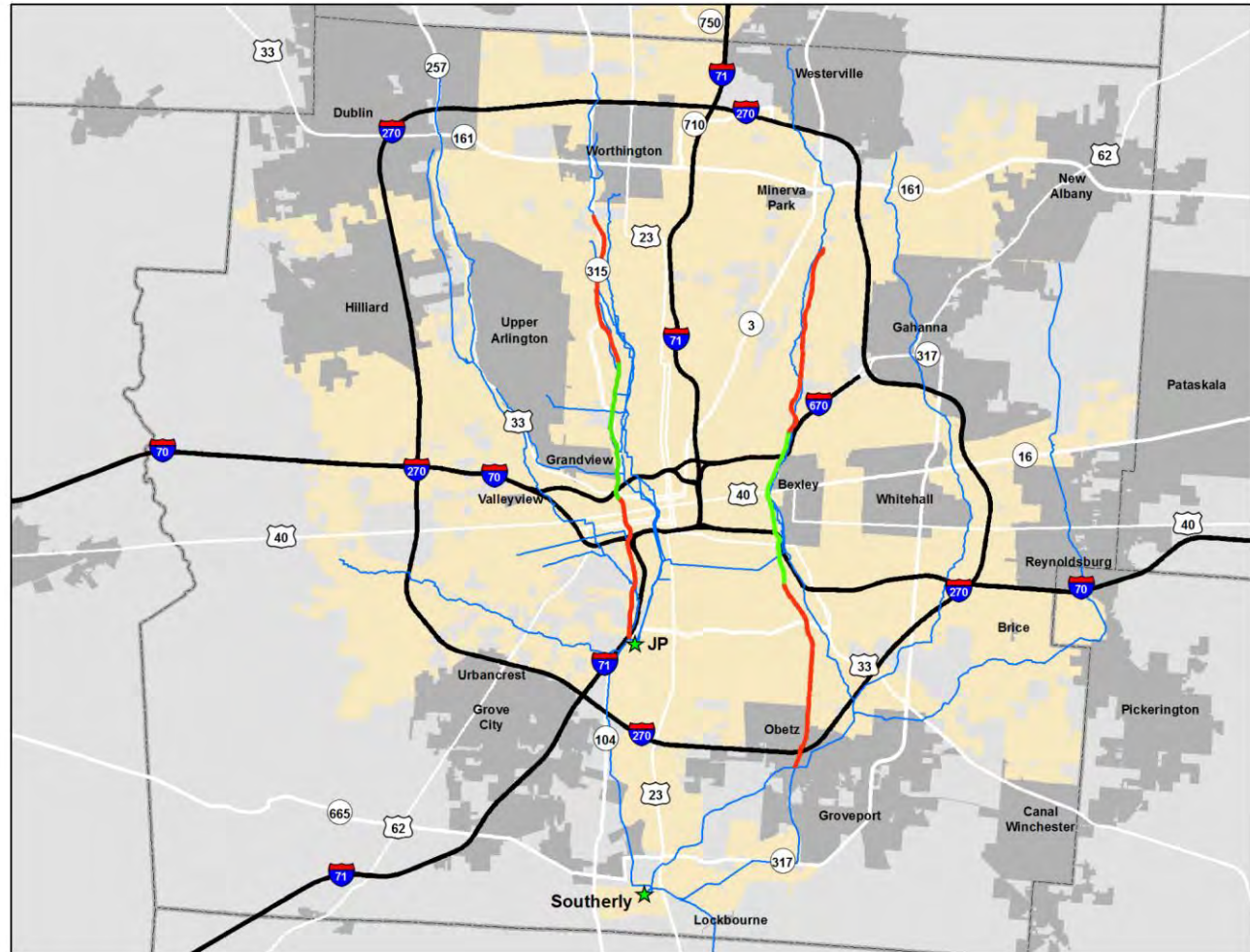
West
Franklinton
Blue



Gray Plan / 2015 WWMP

- Used new model to re-examine 2005 WWMP
- Tunnels and additional pipes are still the backbone of the gray plan
- Tunnels cut in half
 - 28 miles in 2005 WWMP
 - 14 miles in 2015 WWMP
- Lower Olentangy Tunnel and shortened ART

Original WWMP



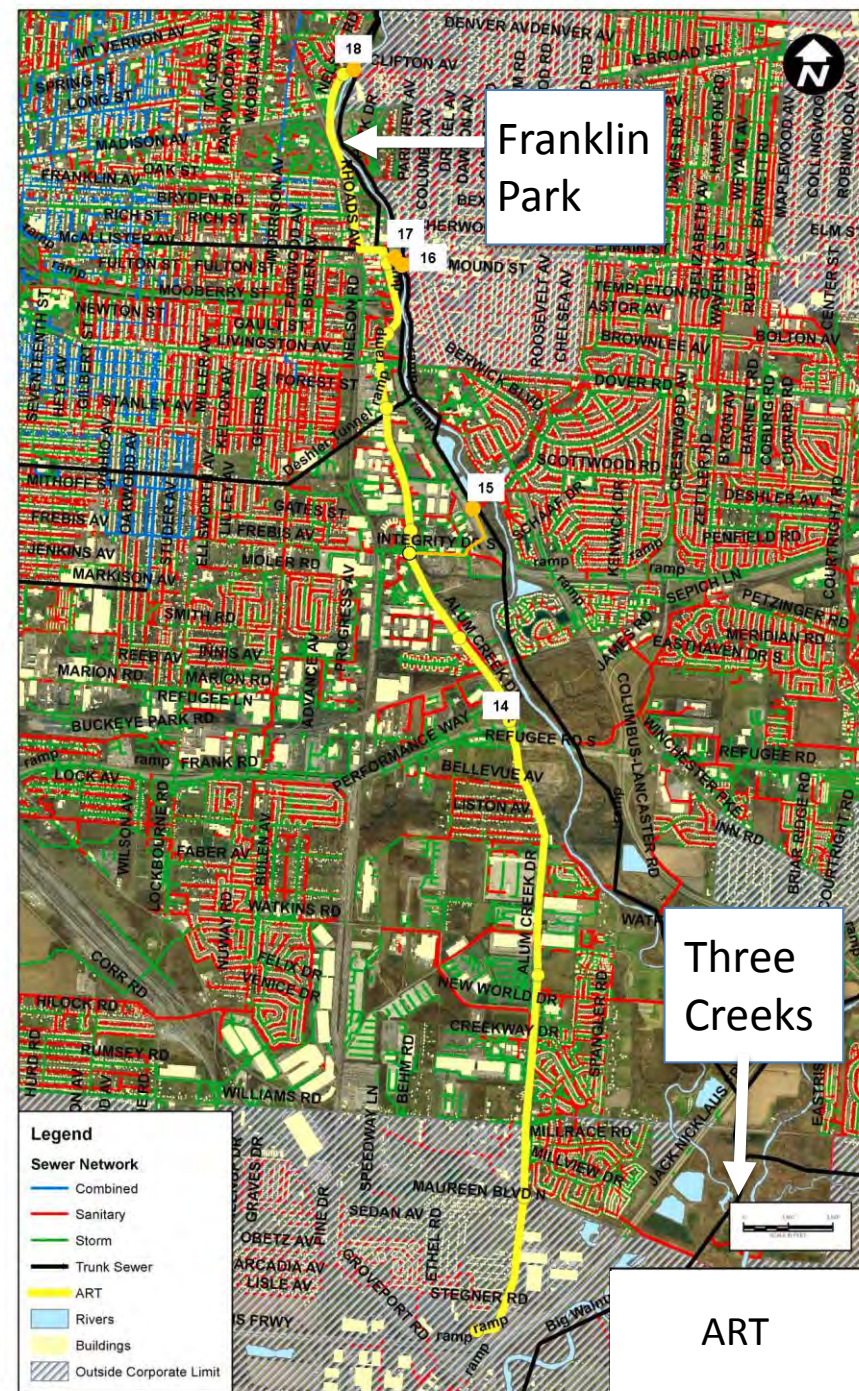
Lower Olentangy Tunnel, Phase 3

- This phase is not in the Blueprint Plan
 - From the cemetery north of Dodridge Street to just south of Bethel Road
- Provides relief to the Olentangy Main and DSRs in Clintonville

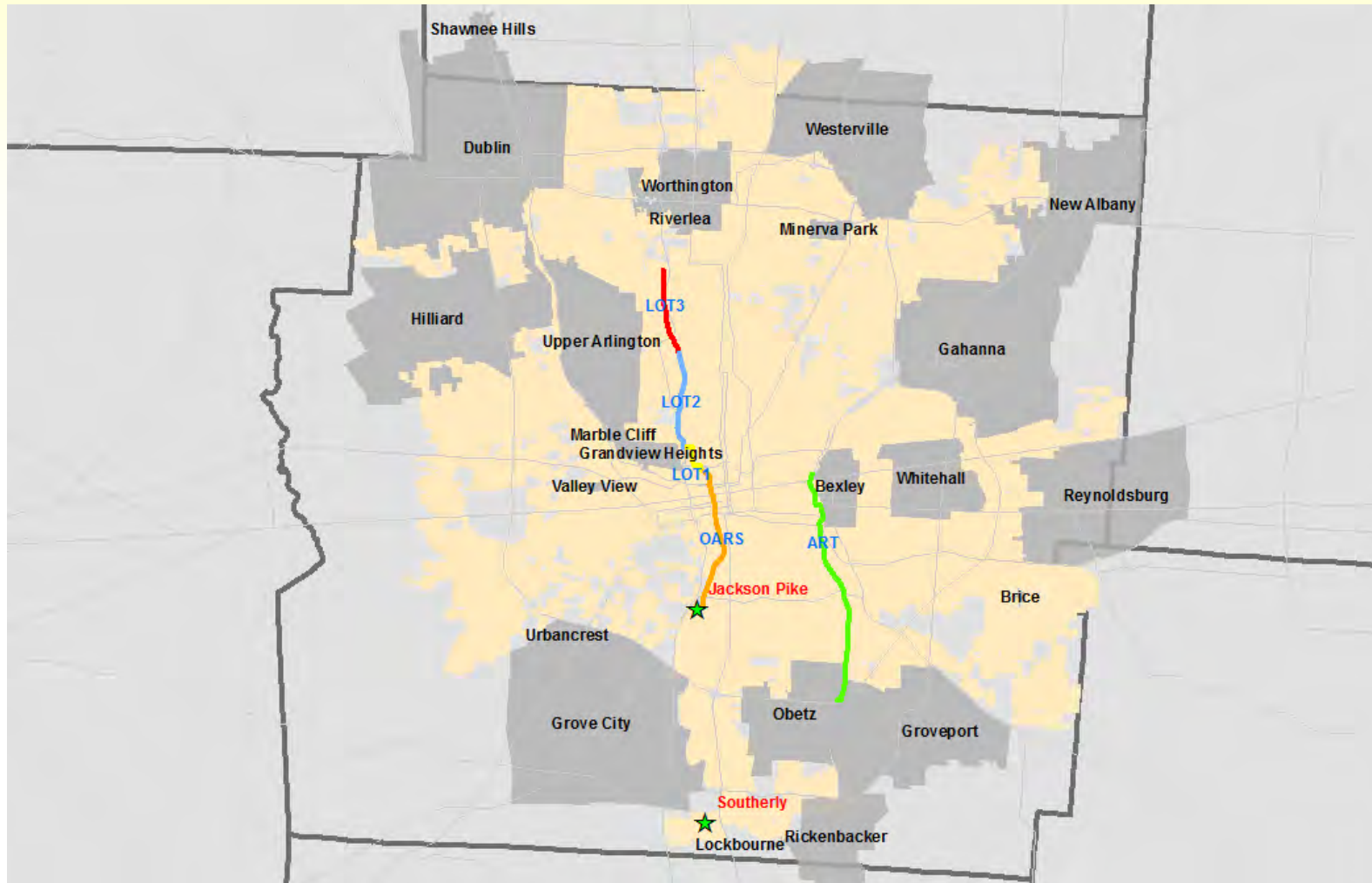


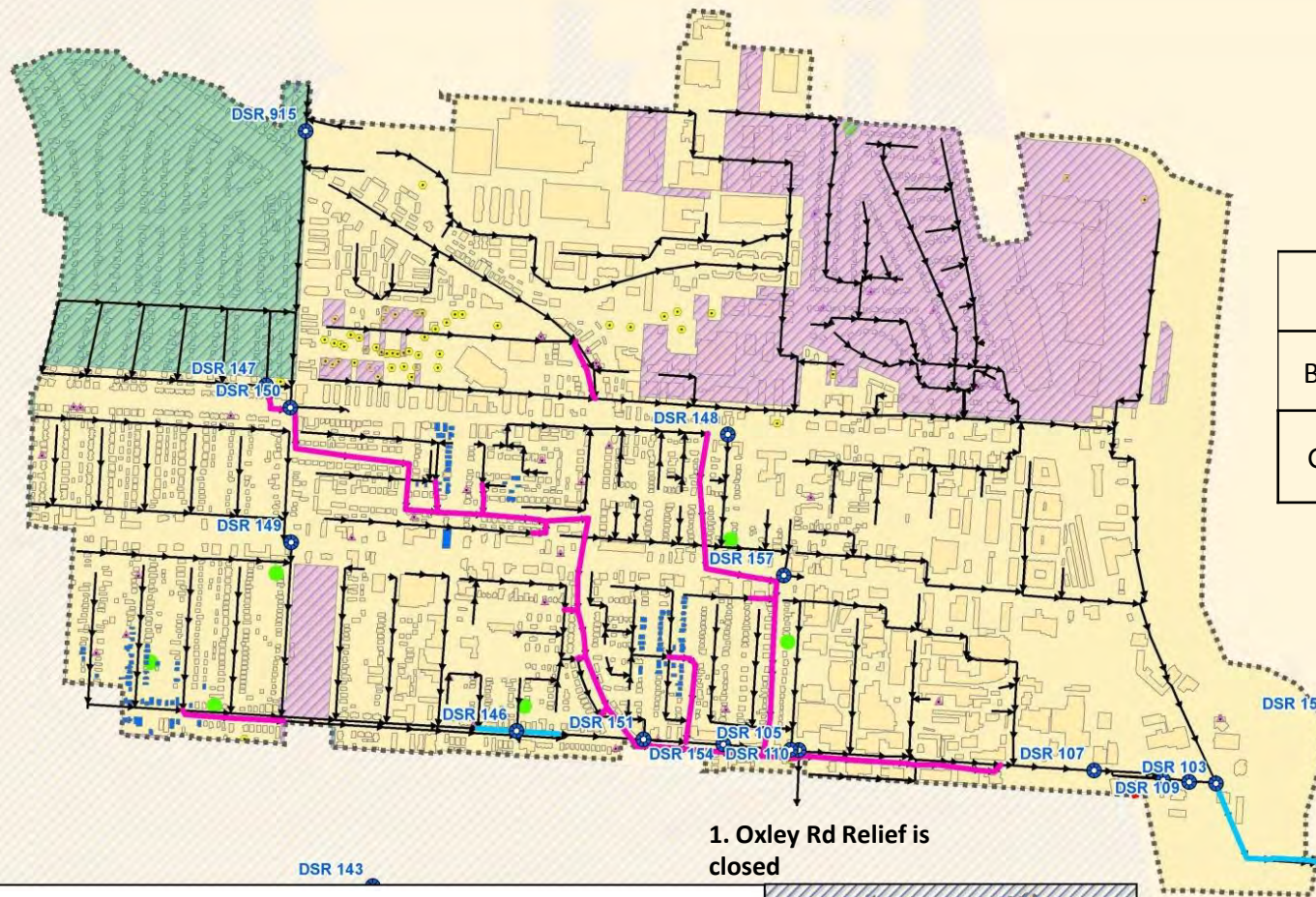
Alum Creek Relief Tunnel

- This tunnel is not in the Blueprint Plan
- Travels from the BWARI to just north of Franklin Park Conservatory
- Provides relief for the Alum Creek Trunk and Alum Creek Interceptor Sewer
- Provides storage to reduce bypasses at Southerly WWTP
- Would likely be built in two phases



2015 WWMP





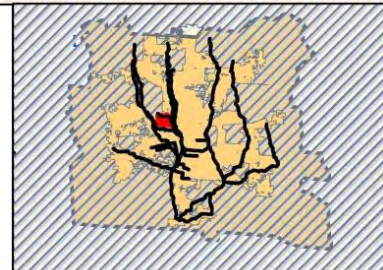
2. LOT1 provides free boundary condition

0 800 1,600

SCALE IN FEET

Fifth by
Northwest
Gray

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Relief 1 to LOT3
Closed DSR 360

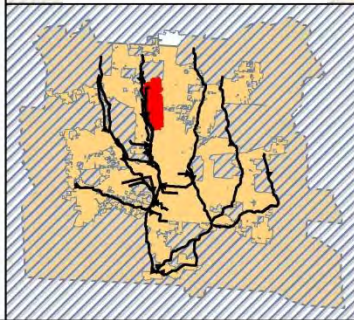
Relief 2 to LOT3
Closed DSR 346

DSR 349
Raised Weir Elevation

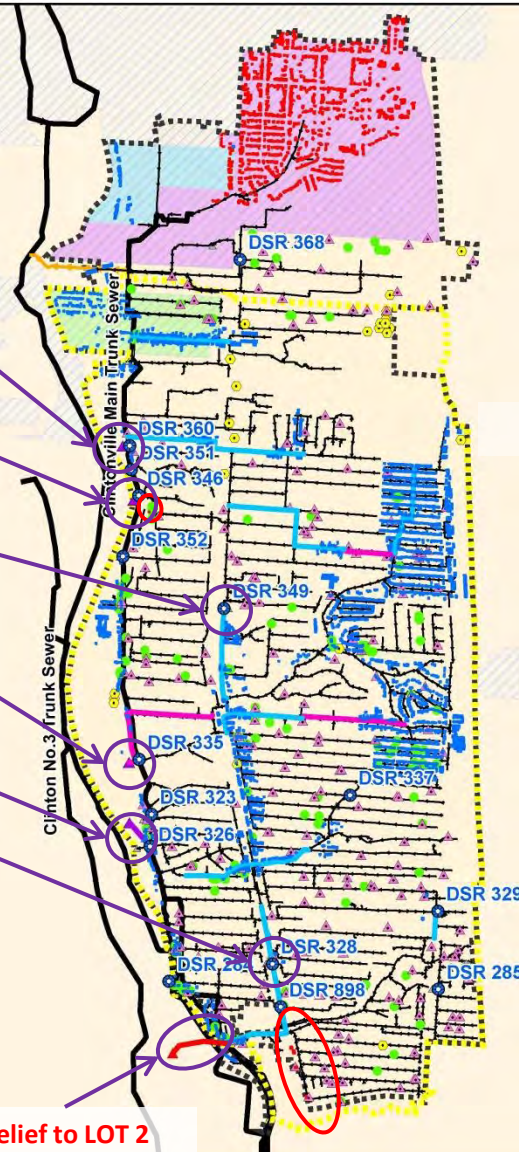
Relief 3 to LOT3
Closed DSR 335

Relief 4 to LOT3
Closed DSR 326

Closed DSR 328

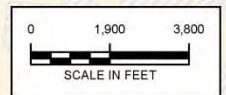


Relief to LOT 2



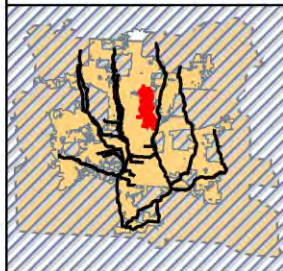
WIBs in GRY+

	WIBs	DSRs
Base	1547	12
GRY	9	0

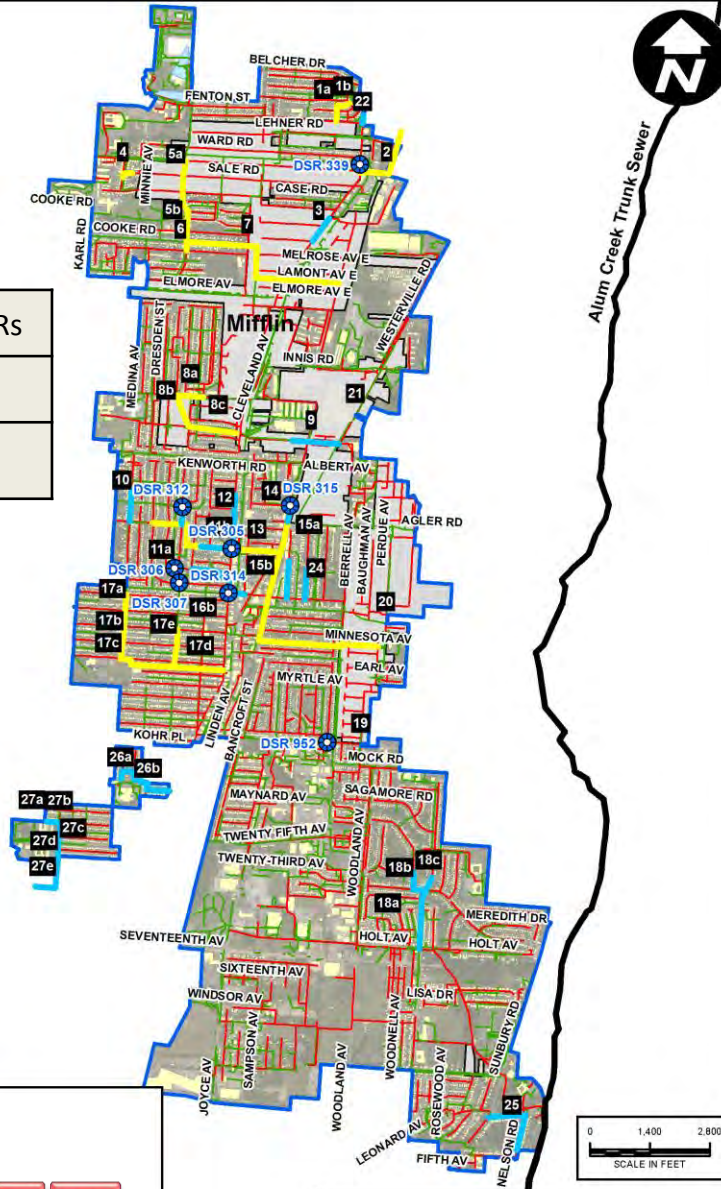


Clintonville
Gray

	WIBs	DSRs
Base	1260	4
GRY	10	0



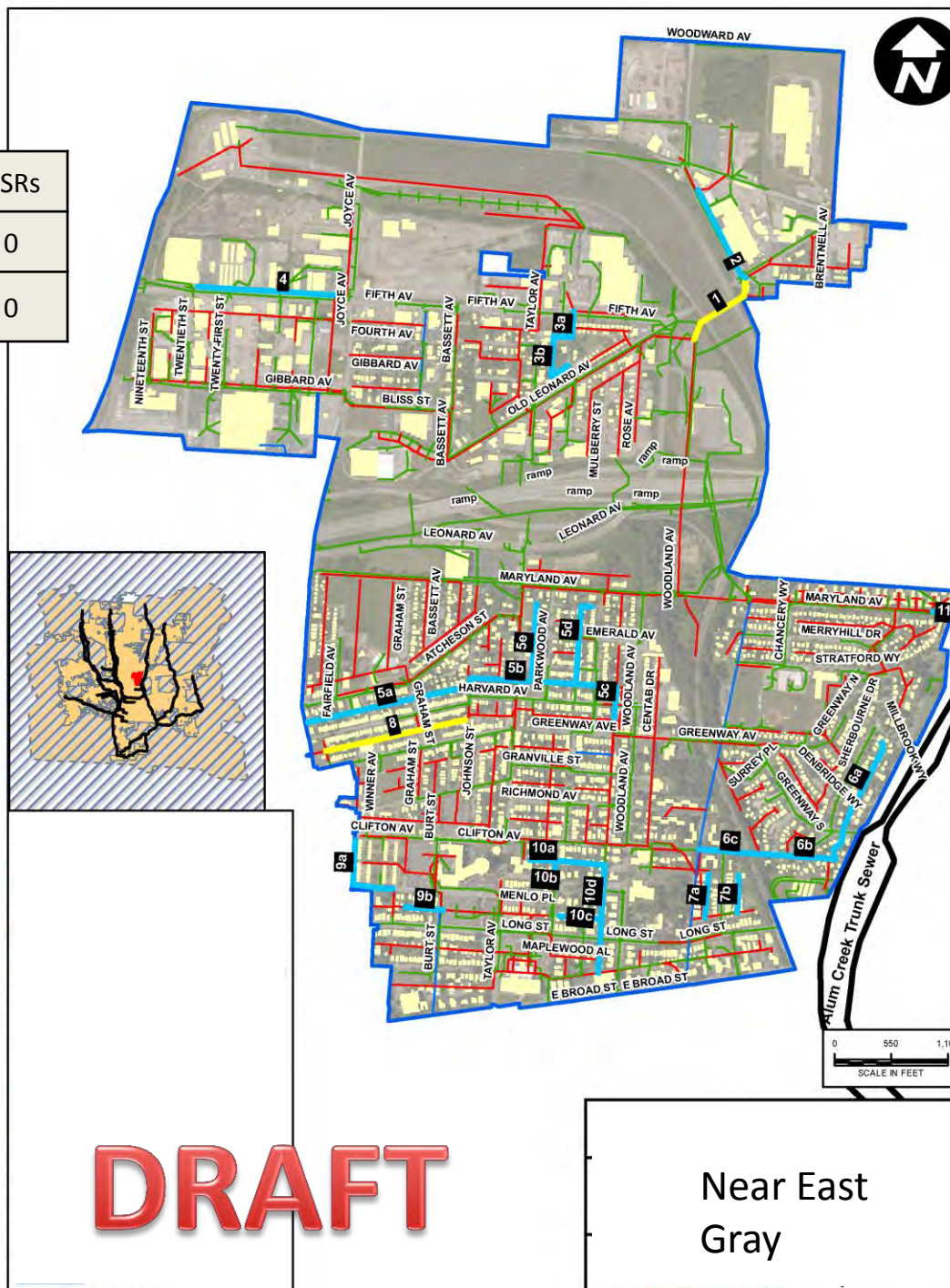
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Linden
Gray

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2015 Microsoft

	WIBs	DSRs
Base	473	0
GRY	1	0



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Near East
 Gray



Upsized Sewer



Relief Sewer

DSR 177 DSR 181
DSR 193 DSR 188 DSR 189
DSR 185 DSR 190

Upsized Sewer



Relief Sewer

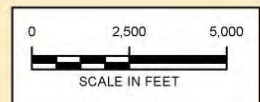
DSR 364



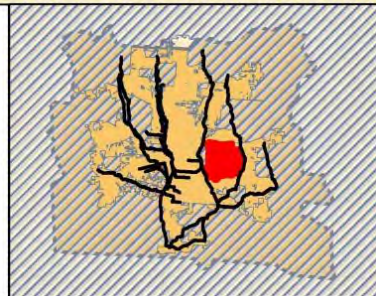
DSR 244

DSR 201

	WIBs	DSRs
Base	1849	0
GRY	1	0



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James
Livingston
Gray

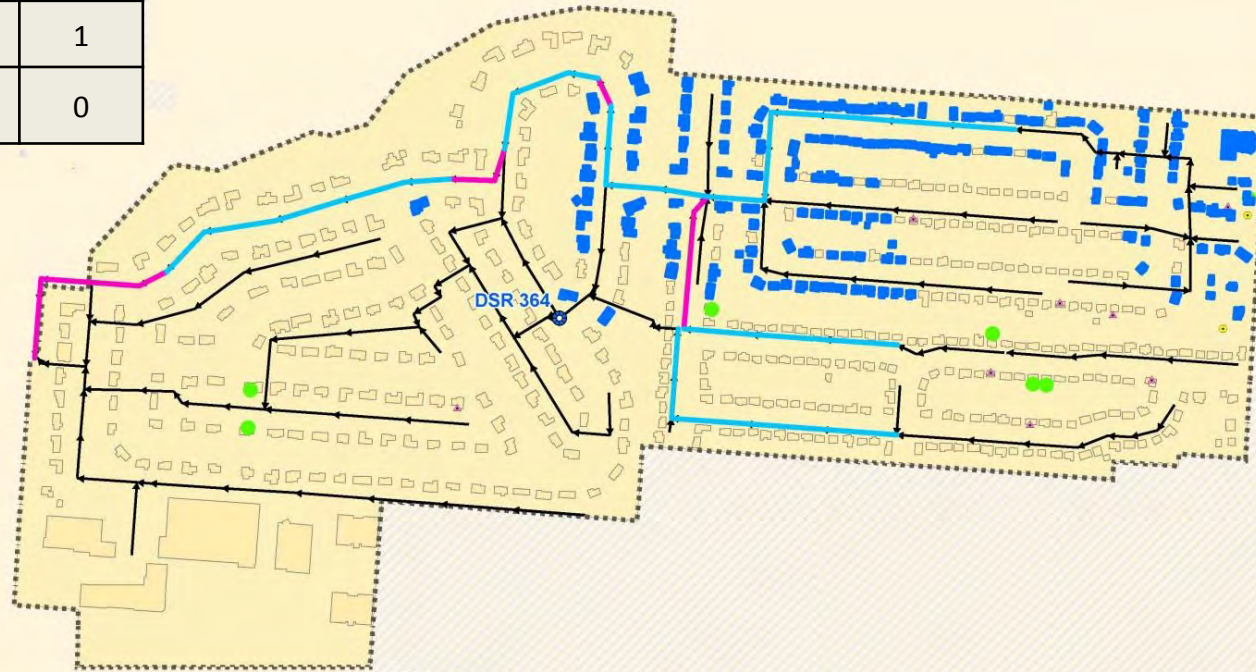
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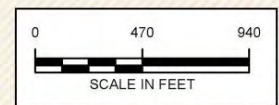
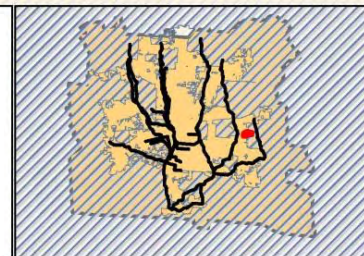


	WIBs	DSRs
Base	152	1
BLU	0	0



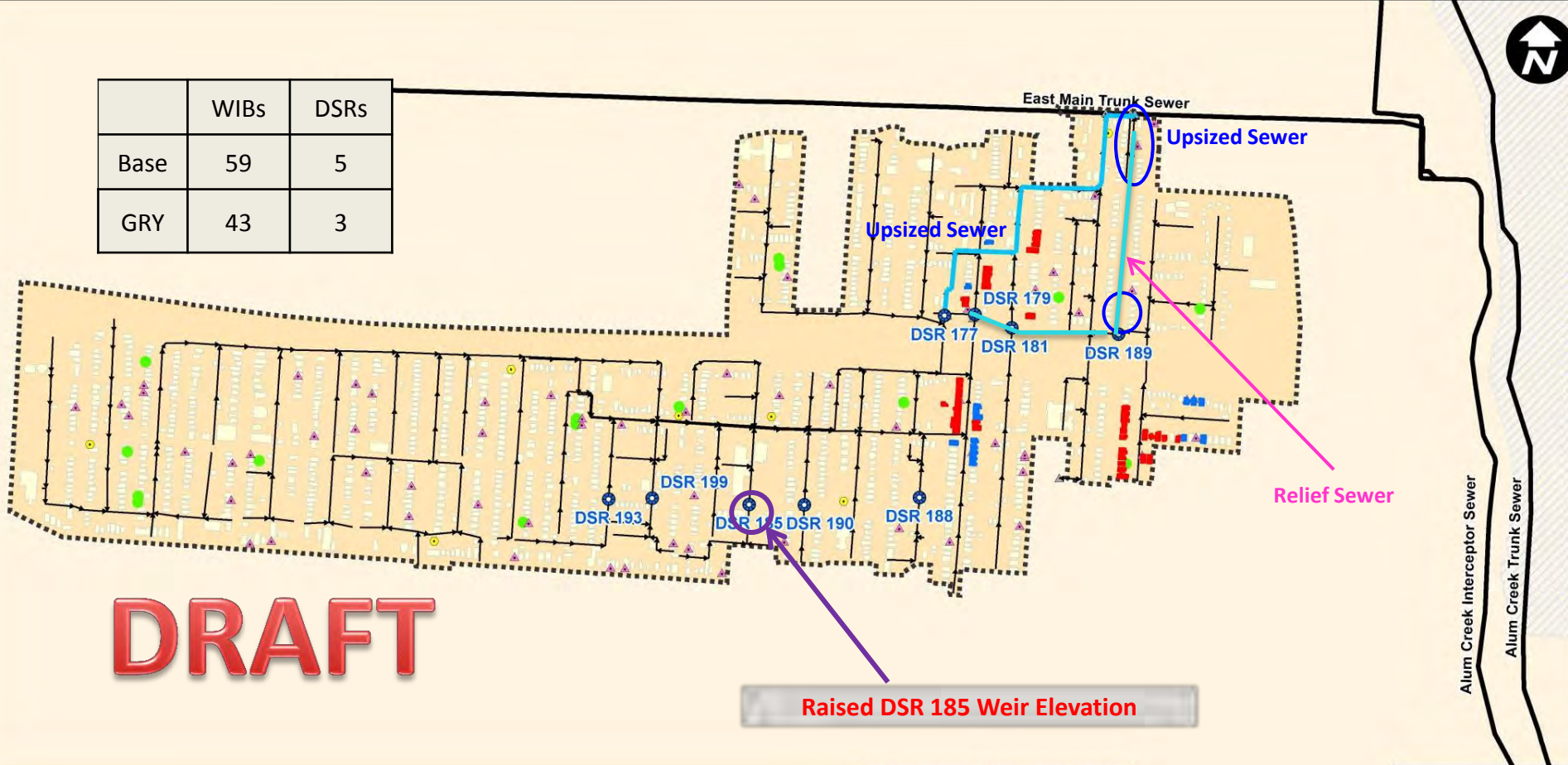
Removed direct driveway storm connections

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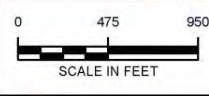
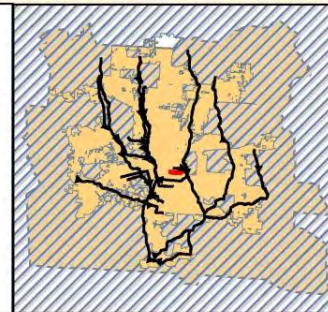
Plum Ridge
Gray

	WIBs	DSRs
Base	59	5
GRY	43	3

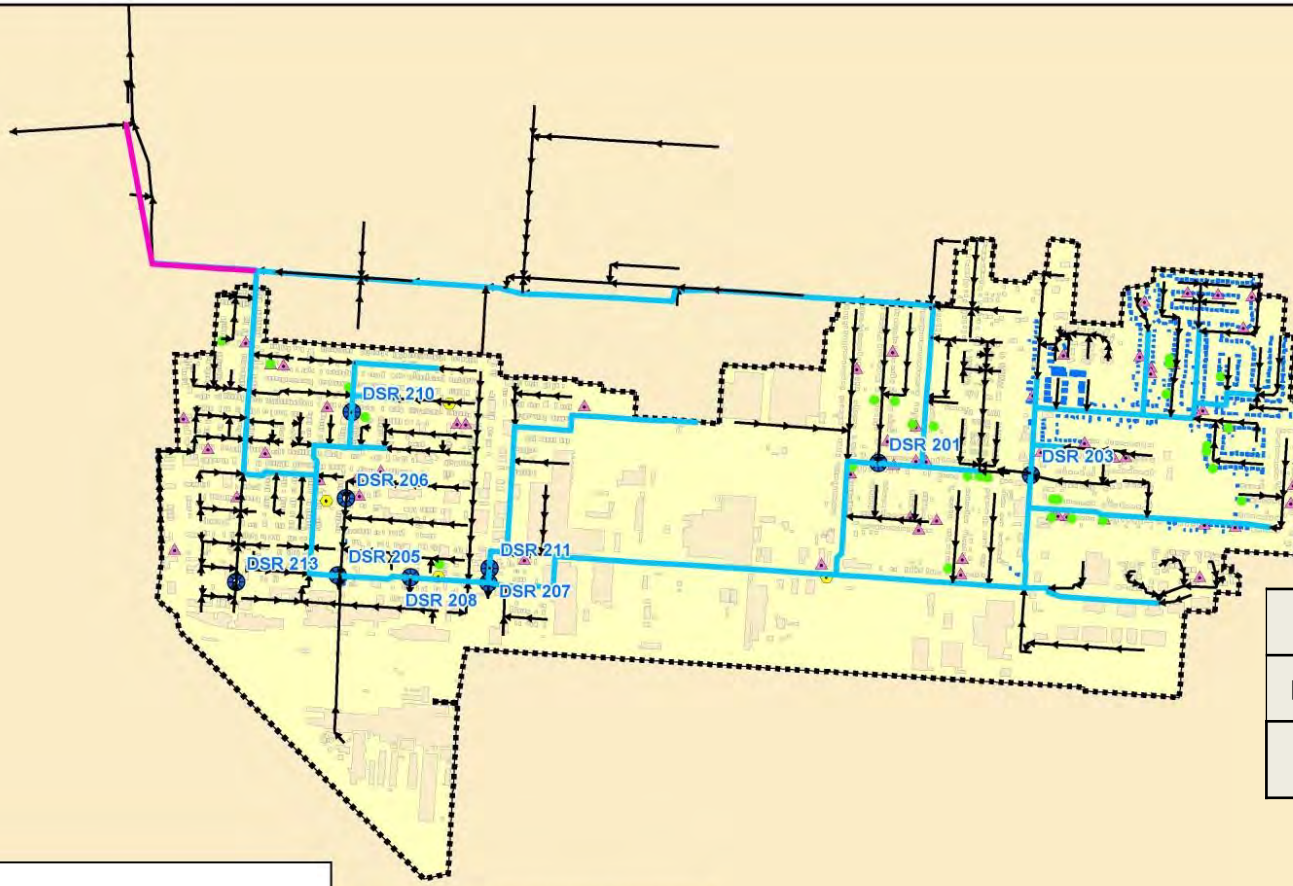


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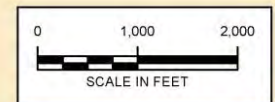
Redirect stormwater from four identified areas of public source inflow.



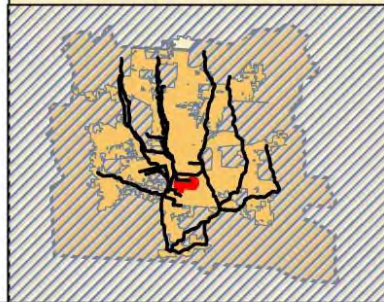
Miller Kelton
Gray



	WIBs	DSRs
Base	392	6
GRY	0	0



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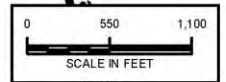
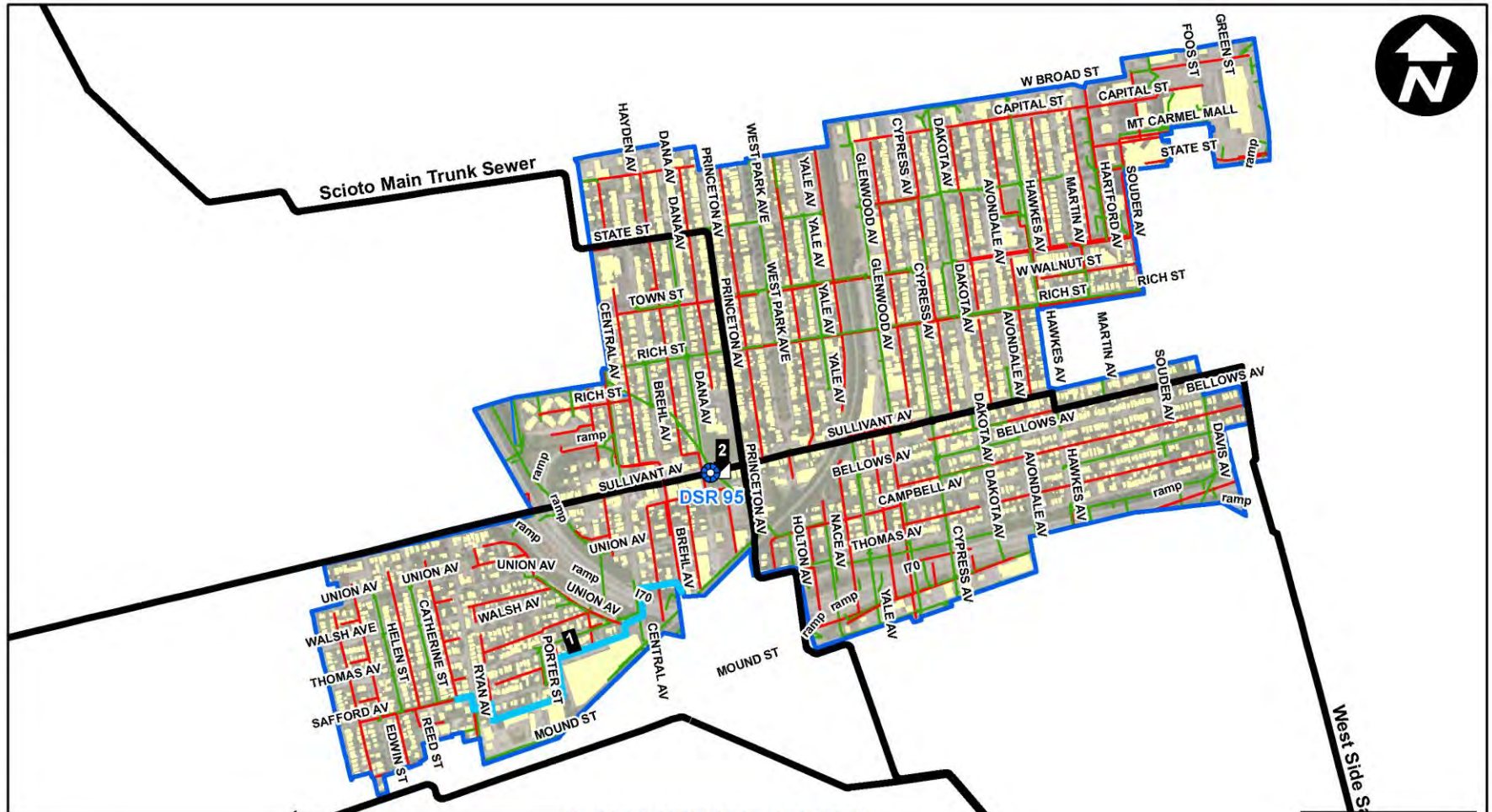


Near South
Gray

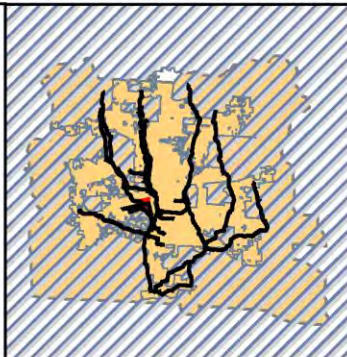
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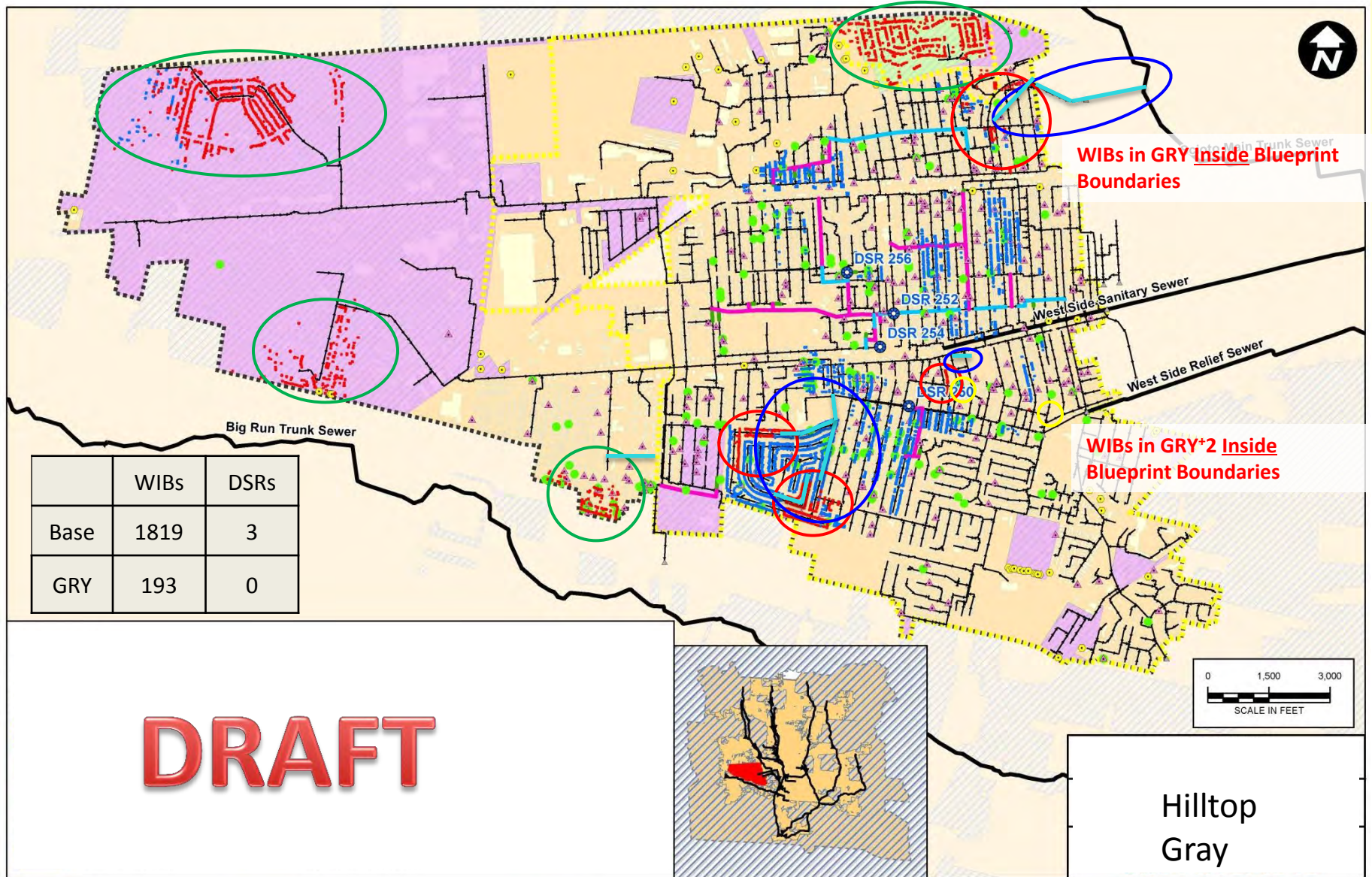
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West Franklinton

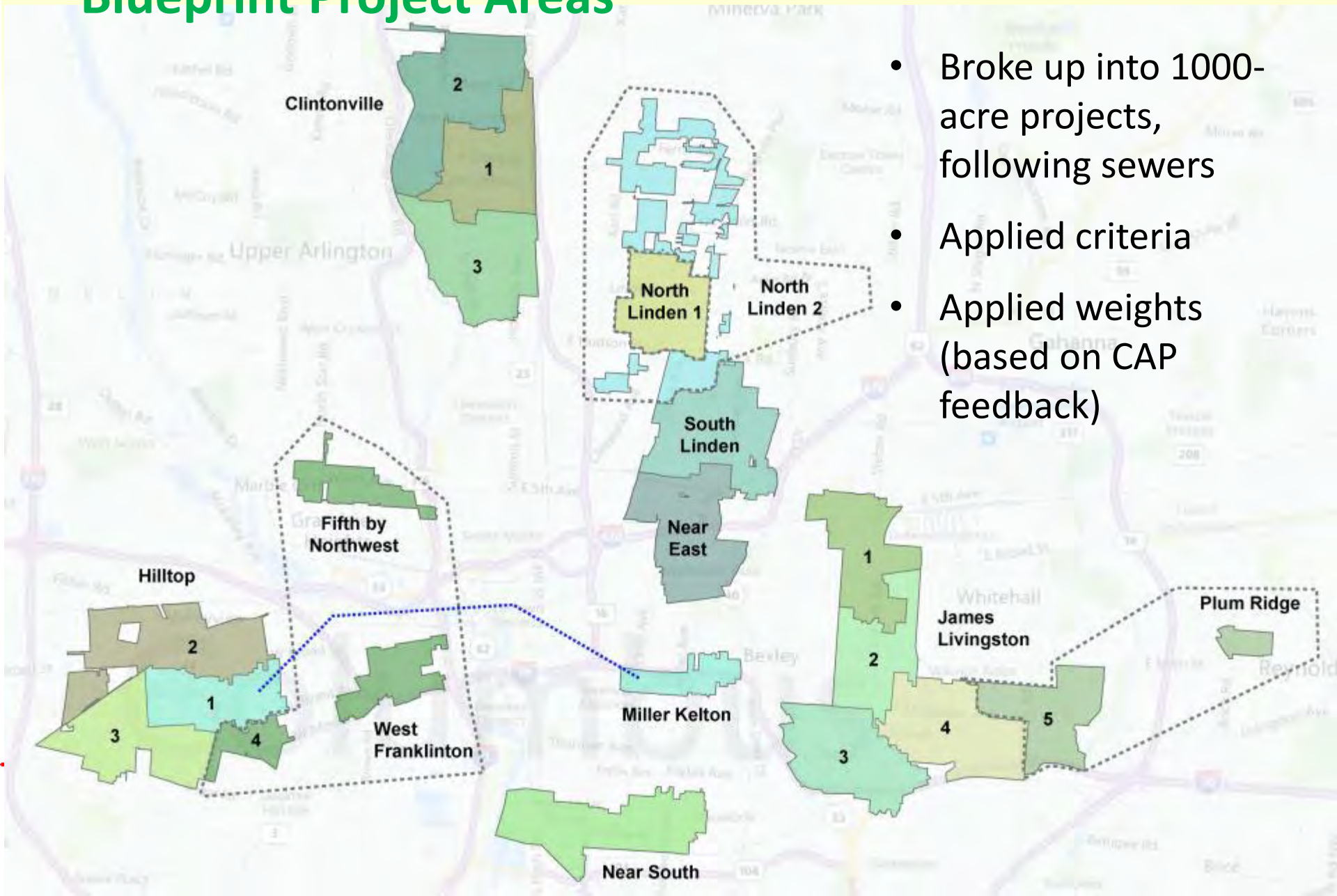


Prioritization Update



Blueprint Project Areas

- Broke up into 1000-acre projects, following sewers
- Applied criteria
- Applied weights (based on CAP feedback)

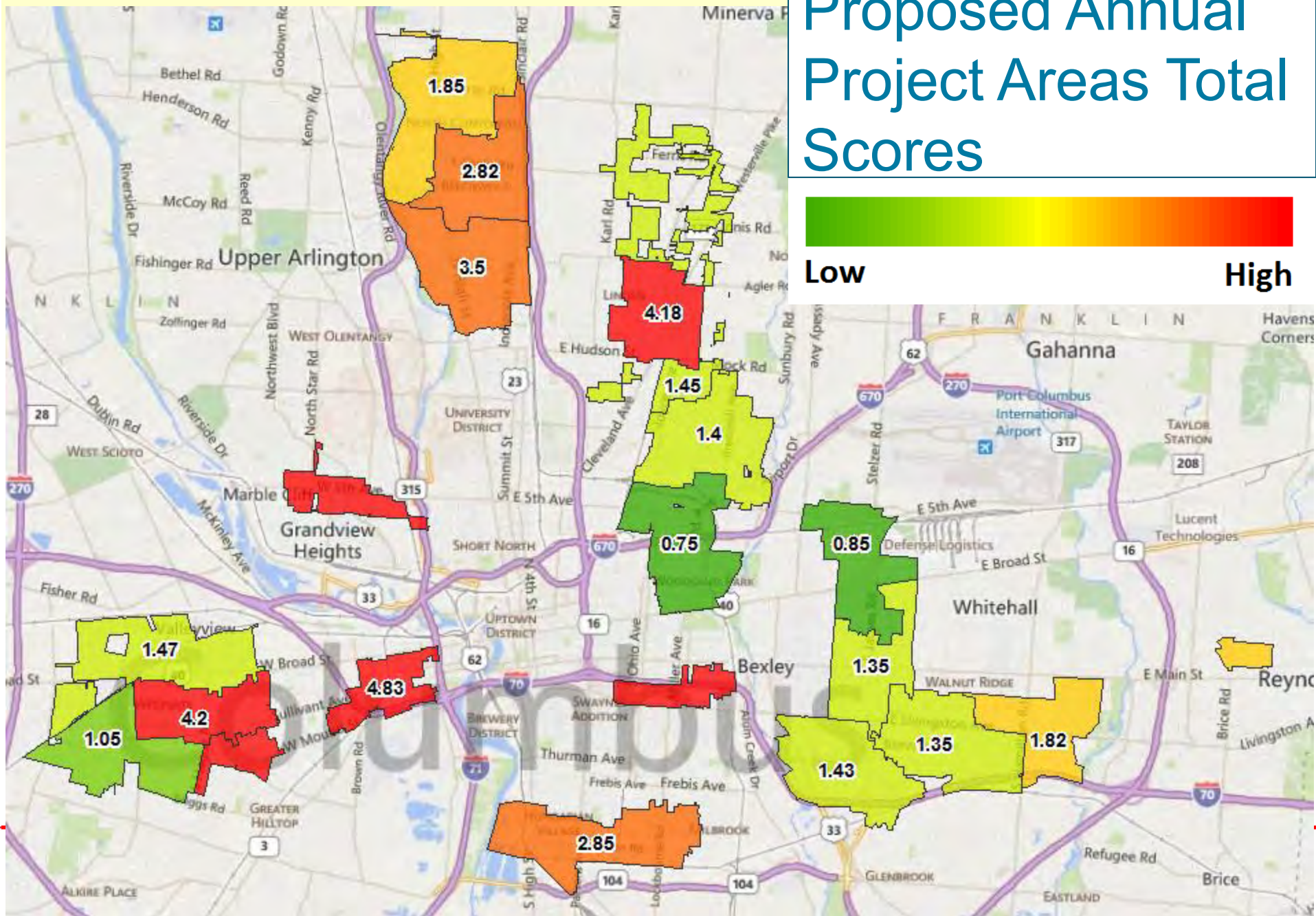


Proposed Annual Project Areas Total Scores

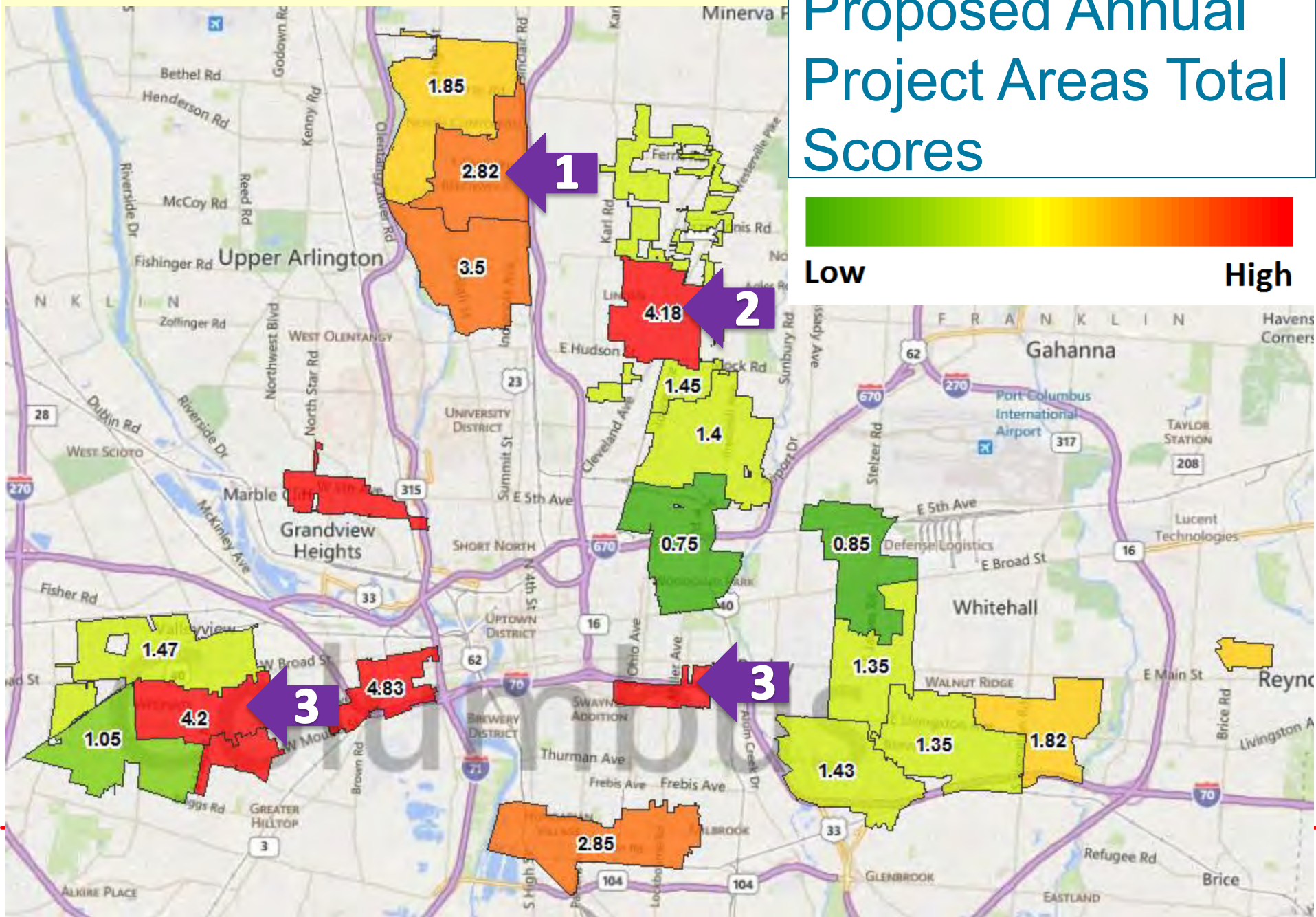


Low

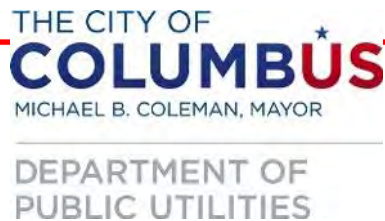
High



Proposed Annual Project Areas Total Scores



- Clintonville Pilot Area
- Do No Harm
 - Street flooding will not get worse
 - Green infrastructure will be sized to receive redirected flow
- 20% reduction in Total Suspended Solids



Next Steps

- Finalizing costs for both plans
- Once costs are known, will perform affordability analysis
 - Include measures of success we discussed with you
- Affordability analysis will drive development of schedules
 - Schedule needs to be no longer than 30 years, hopefully shorter
- Write everything down
- Submit to Ohio EPA on Sept. 15 (105 days)

Discussion



Public Outreach and Community Engagement Update

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Clean streams.
Strong neighborhoods.

Community Outreach: Education & Engagement Process

July 2013 – May 2015

High-Level City-
Wide Education
and Engagement
Forums

Community
Education
and Baseline
Research

Data
Analysis/Process
Evaluation

Measuring
Community
Perceptions and
Attitudes

Phase Data
Analysis/Process
Evaluation

Our Engagement Activities

Community Outreach (Educating)

- Presentations at community events and forums
- Road shows – the mobile “booth to go”
- Direct mail and handouts
- Door-to-door canvassing
- Focus groups
- Website and video

Assessing Perceptions & Attitudes (Market Research)

- Surveys:
 - Phone polling
 - Mail back
 - Face-to face
 - Interactive audience response & moderator
 - Focus Groups

**...and many other tools
and tactics**

Accomplishments: Community awareness & education

Collateral and Residential Canvassing: 44,966		
Baseline Educational Materials (passive canvassing in the 4 target areas) 28,269	Reinforcing Educational Materials (active canvassing to a subset in the 4 target areas 9,965	General ongoing literature distribution (includes Clintonville): 6,732
“Roadshows” and Events: 85		
Four Target Blueprint Areas, (Libraries, Community Centers, Civic Groups, etc.) 40	City-wide Events, (Fairs & Neighborhood Festivals, Community events, etc.) 45	
Business & Civic Outreach		
Active canvassing to local businesses in the 4 target areas: 291	Civic Associations, Area Commissions and Faith-based: 18	
Clintonville Engagement		
Door-to-door canvassing with reinforcement educational materials: 3,000 homes	Invites to 3 educational open houses and 6 neighborhood meetings	

Overall Accomplishments

Determining perceptions & attitudes of Blueprint approach:

- Door-to-door polling in four focus areas
- Community and civic event polling: 19
- Mail back survey flier: up to 5,000 disseminated



Overall Accomplishments

Another way of thinking about it:

- Walked **2,665 miles** – that's like taking a stroll from Columbus to Los Angeles and then heading to Tucson for dinner....
- Nearly **300 hours talking with residents** at events – or earning the equivalent of a PhD in class hours + dissertation writing....
- Visited over **28,000 residences**...

An exceptional investment in community engagement....

Findings at a Glance

From the polling conducted:

- Response to Blueprint Columbus **was overwhelmingly positive or neutral**, and this finding remained constant across the four target areas, as well as the city at large. **Over 70% of all survey participants support the Blueprint Columbus** approach; less than three percent were not in support.
- Anecdotally, we found residents to be quite interested in the proposed Blueprint solutions, thoughtful about them and simply surprised and delighted they were informed and asked for their input.

Reactions to the Blueprint solutions

- **Green infrastructure ranked #1**, with over 60% of survey respondents selecting green infrastructure as something they particularly liked about the Blueprint approach.
- **Lateral lining was the most popular feature among homeowners** (62%). This level of property enhancement was a strong personal motivator for many individuals.
- **Downspout redirection was a favorable aspect with over half of respondents.** This was especially true in relation to how it can tie into rain gardens and keep water away from a home's foundation.
- **Sump Pumps was one of the favorite aspects to 39% of homeowners.** During presentations in the community this feature of the program elicited the strongest, most positive reaction.

Blueprint moving forward...

- **Area specific outreach in Clintonville**
 - 3 Open Houses at Whetstone Shelter House:
 - June 15, June 22, June 29, from 6-8 PM
 - **Clintonville Neighborhood meetings:**
 - Mid to late July at two local churches
- **4 Pillar Collateral: The big reveal!!**

Green Infrastructure: Using Nature to Manage Stormwater



Green Infrastructure

Using Nature to Manage Stormwater



Site Visit:

The City's design team first visits potential sites on City-owned property to determine the best locations for green infrastructure. Locations may include parks or right-of-ways, such as curb lawns, on residential streets. The team will especially want to know where existing underground storm sewers are, since the green infrastructure will connect to those sewers.



Survey:

After a general location is selected, the team surveys the site to check for potential obstacles, such as underground utilities, and may need to take soil samples. Once satisfied with the location, the design team prepares detailed construction plans.



Construction:

The rain garden site is excavated and the subsurface is prepared by adding layers of stone and soil designed to filter stormwater. Plants and mulch make up the top layer of rain gardens. For porous pavement, the subsurface is prepared in much the same way, except the top layer is porous concrete. Both allow water to soak into the layers beneath it.



Operation and Maintenance:

The City of Columbus is responsible for maintaining its green infrastructure. This includes periodic inspection, removing litter and weeds on a regular basis and pruning, trimming or replacing plants as needed.

Why Green Infrastructure?

It rains in Columbus about 140 days per year. Managing all that rain water is the function of our storm sewers. Our storm sewer system includes a series of curb inlets and underground pipes, known as gray infrastructure, that drains untreated rain water and any trash or pollutants it picks up along its path directly into our streams and rivers.

Rain gardens and porous pavement, known as green infrastructure, are rapidly becoming an important part of the storm sewer system in Columbus. Rain water is routed through the green infrastructure, filtering through layers of stone, soil and plants before draining into the pipes that empty into our rivers. This natural filtering process slows the release of stormwater and keeps pollutants and trash out of the system, which protects our rivers and streams.

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Clean streams.
Strong neighborhoods.

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DEPARTMENT OF
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Green Infrastructure FAQ

FAQ

Why is the City building green infrastructure in my neighborhood?

In Columbus, there are sanitary sewers and storm sewers. Sanitary sewers take waste water from your house to a waste water treatment facility. Storm sewers take rain water from streets and driveways to a nearby river or stream. When rain gets into sanitary sewers through cracks and joints in the pipes, untreated sewage diluted by the rain water can overflow into our rivers or back up into basements.

Blueprint Columbus will stop the rain water from getting into sanitary sewers and will direct it to the green infrastructure, which will capture stormwater that might otherwise flood roadways. Blueprint Columbus will be implemented in neighborhoods where a large amount of rain water gets into sanitary sewers.

What is a right-of-way?

The right of way is the area in your yard along a street that is owned by the City of Columbus. If there is a sidewalk along the street, the right of way usually includes the sidewalk and may extend several more feet into the yard.

What is porous pavement?

Porous pavement can be concrete or blacktop designed so that rain water seeps into it instead of just running across the surface. Pollutants carried by the rain water are filtered out by layers of gravel beneath the surface and the stormwater slowly releases into the drain that connects to the storm sewer.

Where will the green infrastructure be located?

City contractors will install green infrastructure on City property in neighborhoods, including in the right of way. Rain gardens are constructed below street level, allowing rain water to easily flow in and filter slowly to the sewers underneath.

What if I don't want green infrastructure in the right-of-way in front of my house?

There will be public meetings in your area so you can learn the exact location of the proposed green infrastructure and provide feedback to City staff. The design team will take all concerns into consideration. However, in some instances other locations may not be possible.

Will the rain gardens attract mosquitoes?

No, rain gardens are designed to drain in 48 hours or less. Mosquitoes require a minimum of 72 hours in standing water for larvae to develop.

Will the green infrastructure prevent parking on the street or walking on the sidewalk?

Green infrastructure will not interfere with sidewalks. Design guidelines include a 2 ½ foot buffer area between the curb and the edge of a rain garden. Parking spaces may be replaced by a bump out to assist in traffic calming if it is determined that this benefits the neighborhood.

Who removes litter and maintains the plants in the rain garden?

The City of Columbus is responsible for maintaining all parts of our storm sewer system including the new rain gardens and porous pavement. Litter and weeds will be removed on a regular basis and plants will be pruned, trimmed or replaced as needed.

Will the green infrastructure fix street flooding?

Green infrastructure is designed to manage stormwater and may improve local drainage issues. However, the green infrastructure is not designed to solve all street flooding issues.

HOW CAN I LEARN MORE?

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