

COST ESTIMATES For Traffic Management



Linden Area Traffic Management Plan



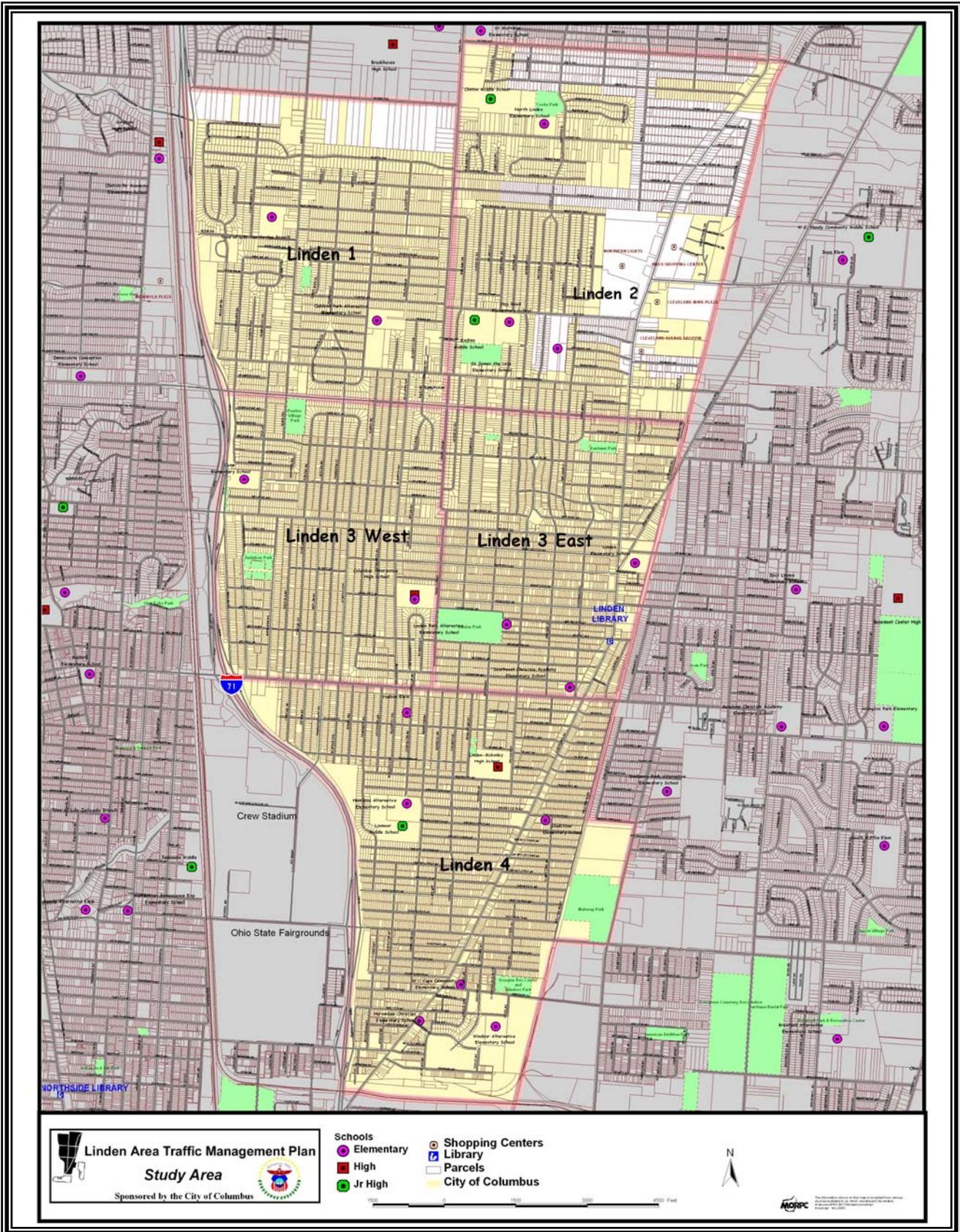
Prepared by:
Mid-Ohio Regional Planning Commission

Prepared for:
City of Columbus



May 2005

STUDY AREA



COST SUMMARY

LINDEN AREA TRAFFIC MANAGEMENT PLAN Program Cost Estimates

Northwest Linden

Traffic Calming Cost	\$2,370,694
Sidewalk Cost	\$3,893,971
TOTAL	\$6,264,665

Northeast Linden

Traffic Calming Cost	\$2,979,906
Sidewalk Cost	\$5,685,881
TOTAL	\$8,665,787

Central West Linden

Traffic Calming Cost	\$6,849,636
Sidewalk Cost	\$3,688,906
TOTAL	\$10,538,542

Central East Linden

Traffic Calming Cost	\$4,751,091
Sidewalk Cost	\$5,746,867
TOTAL	\$10,497,958

South Linden

Traffic Calming Cost	\$5,965,733
Sidewalk Cost	\$5,418,741
TOTAL	\$11,384,474

Total Traffic Calming Cost	\$22,917,060
Total Sidewalk Cost	\$24,434,366
Grand Total for Linden	\$47,351,426

NOTE: These estimates include traffic calming treatments and sidewalks in portions of Clinton Twp. which may be subject to funding and implementation constraints based on county and township authority.

Northwest (NW) Linden Neighborhood: Traffic Calming Treatment Cost Estimates

NUMBER OF TREATMENTS	Street & Phase												
	Maize Road		Karl Road			North Broadway			Oakland Park	Hiawatha	Norris	Northridge	Lenore
	1	2	1	2	3	1	2	3					
Treatment Type													
Road Diet	1.2		1.4			0.6							
Green Street									1.5				
Speed Table													
Intersection Table													
Raised Intersection													
Modified Intersection							(1)		(2)				
Channelized Intersection													
Choker													
Chicane		4											
Median				3			11			3			
Median Tree Chicane													
Curb-Extension													
Mini-Circle											2	1	
Mini-Roundabout		2		2	2			1					
Roundabout													
Pedestrian Refuge Island													
Closure													
Pedestrian Connector													
Radii Reduction													
Other													
Total Cost Per Street/Phase	\$11,904	\$279,000	\$13,888	\$317,750	\$155,000	\$5,952	\$906,750	\$77,500	\$310,000	\$72,075	\$162,750	\$38,750	\$19,375

NOTES: (#) : See Table B: Estimated Special Costs

Table A: ESTIMATED UNIT COSTS

Treatment Type	Cost Per Unit	25% Continge	20% Engineer	10% Inspection	Total Cost	Unit
Road Diet	6,400	1,600	1,280	640	\$9,920	mile
Green Street	31,000	7,750	6,200	3,100	\$48,050	mile
Speed Table	4,500	1,125	900	450	\$6,975	item
Intersection Table	17,500	4,375	3,500	1,750	\$27,125	item
Raised Intersection	35,000	8,750	7,000	3,500	\$54,250	item
Modified Intersection	Varies with location (see Table B: Estimated Special Costs)					item
Channelized Intersection	Varies with location (see Table B: Estimated Special Costs)					item
Choker	20,000	5,000	4,000	2,000	\$31,000	item
Chicane	20,000	5,000	4,000	2,000	\$31,000	item
Median	35,000	8,750	7,000	3,500	\$54,250	100-foot
Median Tree Chicane	60,000	15,000	12,000	6,000	\$93,000	item
Curb-Extension	10,000	2,500	2,000	1,000	\$15,500	item
Mini-Circle	12,500	3,125	2,500	1,250	\$19,375	item
Mini-Roundabout	50,000	12,500	10,000	5,000	\$77,500	item
Roundabout	250,000	62,500	50,000	25,000	\$387,500	item
Pedestrian Refuge Island	35,000	8,750	7,000	3,500	\$54,250	item
Street Closure	15,000	3,750	3,000	1,500	\$23,250	item
Pedestrian Connector	20,000	5,000	4,000	2,000	\$31,000	item
Radii Reduction	Varies with location (see Table B: Estimated Special Costs)					item

Table B: ESTIMATED SPECIAL COSTS*

#	Treatment Type	Base Cost	25% Continge	20% Engineer	10% Inspection	Total Cost	Neighb'd
1	Modified Intersection	200,000	50,000	40,000	20,000	\$310,000	NW
2	Modified Intersection	200,000	50,000	40,000	20,000	\$310,000	NW
3	Channelized Intersection	75,000	18,750	15,000	7,500	\$116,250	NE
4	Channelized Intersection	75,000	18,750	15,000	7,500	\$116,250	NE
5	Other - Visual Treatments	1,000	250	200	100	\$1,550	NE
6	Other - Road Widening	900,000	225,000	180,000	90,000	\$1,395,000	CW
7	Other - Road Widening	780,000	195,000	156,000	78,000	\$1,209,000	CW
8	Other - 3 Conversions to 2-way	0	0	0	0	\$0	CW
9	Other - Road Widening	730,000	182,500	146,000	73,000	\$1,131,500	CE
10	Other - Road Widening	600,000	150,000	120,000	60,000	\$930,000	CE
11	Other - Add/Improve Xwalks	100,000	25,000	20,000	10,000	\$155,000	CE
12	Other - Rebuild Street	930,000	232,500	186,000	93,000	\$1,441,500	CE
13	Other - Improve Circles	20,000	5,000	4,000	2,000	\$31,000	CE
14	Other - 2 Improved Circles	40,000	10,000	8,000	4,000	\$62,000	CE
15	Other - 8 Conversions to 2-way	0	0	0	0	\$0	CE
16	Channelized Intersection	220,000	55,000	44,000	22,000	\$341,000	S
17	Other - Rebuild Street	2,300,000	575,000	460,000	230,000	\$3,565,000	S
18	Other - 19 Conversions to 2-way	0	0	0	0	\$0	S

* NOTES: Conversions to 2-way assume signage changes only, no costs were assigned; Road widenings and rebuildings use generalized budget-level cost estimates based on ODOT data, actual costs will vary depending on project details; other items are unique

Northeast (NE) Linden Neighborhood: Traffic Calming Treatment Cost Estimates

NUMBER OF TREATMENTS	Street & Phase												Northridge			
	Ferris Road		Cleveland Avenue		Cooke	Huy	Karl Road			Sale	Case	Dresden		Elmore	Walford	Walmar
	1	2	1	2			1	2	3							
Treatment Type	See NW Linden															
Road Diet	1.2													0.6		
Green Street																
Speed Table									3	3		4				
Intersection Table																
Raised Intersection																
Modified Intersection																
Channelized Intersection				(3)	(4)											
Choker																
Chicane																
Median					10	26										
Median Tree Chicane																
Curb-Extension																
Mini-Circle										1				1		
Mini-Roundabout		4				1						1				
Roundabout																
Pedestrian Refuge Island			2													
Closure																
Pedestrian Connector											1					
Radii Reduction											(5)					
Other																
Total Cost Per Street/Phase	\$11,904	\$310,000	\$108,500	\$116,250	\$658,750	\$1,488,000	\$0	\$0	\$0	\$20,925	\$41,850	\$31,000	\$105,400	\$5,952	\$19,375	\$62,000

NOTES: (#) : See Table B: Estimated Special Costs

Table A: ESTIMATED UNIT COSTS

Treatment Type	Cost Per Unit	25% Continge	20% Engineer	10% Inspection	Total Cost	Unit
Road Diet	6,400	1,600	1,280	640	\$9,920	mile
Green Street	31,000	7,750	6,200	3,100	\$48,050	mile
Speed Table	4,500	1,125	900	450	\$6,975	item
Intersection Table	17,500	4,375	3,500	1,750	\$27,125	item
Raised Intersection	35,000	8,750	7,000	3,500	\$54,250	item
Modified Intersection	Varies with location (see Table B: Estimated Special Costs)					item
Channelized Intersection	Varies with location (see Table B: Estimated Special Costs)					item
Choker	20,000	5,000	4,000	2,000	\$31,000	item
Chicane	20,000	5,000	4,000	2,000	\$31,000	item
Median	35,000	8,750	7,000	3,500	\$54,250	100-foot
Median Tree Chicane	60,000	15,000	12,000	6,000	\$93,000	item
Curb-Extension	10,000	2,500	2,000	1,000	\$15,500	item
Mini-Circle	12,500	3,125	2,500	1,250	\$19,375	item
Mini-Roundabout	50,000	12,500	10,000	5,000	\$77,500	item
Roundabout	250,000	62,500	50,000	25,000	\$387,500	item
Pedestrian Refuge Island	35,000	8,750	7,000	3,500	\$54,250	item
Street Closure	15,000	3,750	3,000	1,500	\$23,250	item
Pedestrian Connector	20,000	5,000	4,000	2,000	\$31,000	item
Radii Reduction	Varies with location (see Table B: Estimated Special Costs)					item

Table B: ESTIMATED SPECIAL COSTS*

#	Treatment Type	Base Cost	25% Continge	20% Engineer	10% Inspection	Total Cost	Neighb'd
1	Modified Intersection	200,000	50,000	40,000	20,000	\$310,000	NW
2	Modified Intersection	200,000	50,000	40,000	20,000	\$310,000	NW
3	Channelized Intersection	75,000	18,750	15,000	7,500	\$116,250	NE
4	Channelized Intersection	75,000	18,750	15,000	7,500	\$116,250	NE
5	Other - Visual Treatments	1,000	250	200	100	\$1,550	NE
6	Other - Road Widening	900,000	225,000	180,000	90,000	\$1,395,000	CW
7	Other - Road Widening	780,000	195,000	156,000	78,000	\$1,209,000	CW
8	Other - 3 Conversions to 2-way	0	0	0	0	\$0	CW
9	Other - Road Widening	730,000	182,500	146,000	73,000	\$1,131,500	CE
10	Other - Road Widening	600,000	150,000	120,000	60,000	\$930,000	CE
11	Other - Add/Improve Xwalks	100,000	25,000	20,000	10,000	\$155,000	CE
12	Other - Rebuild Street	930,000	232,500	186,000	93,000	\$1,441,500	CE
13	Other - Improve Circles	20,000	5,000	4,000	2,000	\$31,000	CE
14	Other - 2 Improved Circles	40,000	10,000	8,000	4,000	\$62,000	CE
15	Other - 8 Conversions to 2-way	0	0	0	0	\$0	CE
16	Channelized Intersection	220,000	55,000	44,000	22,000	\$341,000	S
17	Other - Rebuild Street	2,300,000	575,000	460,000	230,000	\$3,565,000	S
18	Other - 19 Conversions to 2-way	0	0	0	0	\$0	S

* NOTES: Conversions to 2-way assume signage changes only, no costs were assigned; Road widenings and rebuildings use generalized budget-level cost estimates based on ODOT data, actual costs will vary depending on project details; other items are unique

Central West (CW) Linden Neighborhood: Traffic Calming Treatment Cost Estimates

NUMBER OF TREATMENTS	Street & Phase										Como	Reis	Howey	Hamilton	Misc. streets
	McGuffey Road		Weber Road			Hudson Street		North Broadway							
Treatment Type	1	2	1	2	3	1	2	1	2	3					
	See also intersecting streets					See NW Linden									
Road Diet	1.5		1.2			1.1									
Green Street											0.8				
Speed Table												1			9
Intersection Table															
Raised Intersection															
Modified Intersection															
Channelized Intersection															
Choker															
Chicane															
Median				20		20						1			
Median Tree Chicane		6											2	4	
Curb-Extension		12												6	
Mini-Circle															
Mini-Roundabout		1					1								
Roundabout															
Pedestrian Refuge Island		2				4									
Closure															
Pedestrian Connector															
Radii Reduction					(6)		(7)								(8)
Other															
Total Cost Per Street/Phase	\$14,880	\$930,000	\$11,904	\$1,085,000	\$1,395,000	\$1,312,912	\$1,286,500	\$0	\$0	\$0	\$38,440	\$61,225	\$186,000	\$465,000	\$62,775

NOTES: (#) : See Table B: Estimated Special Costs

Table A: ESTIMATED UNIT COSTS

Treatment Type	Cost Per Unit	25% Continge	20% Engineer	10% Inspection	Total Cost	Unit
Road Diet	6,400	1,600	1,280	640	\$9,920	mile
Green Street	31,000	7,750	6,200	3,100	\$48,050	mile
Speed Table	4,500	1,125	900	450	\$6,975	item
Intersection Table	17,500	4,375	3,500	1,750	\$27,125	item
Raised Intersection	35,000	8,750	7,000	3,500	\$54,250	item
Modified Intersection	Varies with location (see Table B: Estimated Special Costs)					item
Channelized Intersection	Varies with location (see Table B: Estimated Special Costs)					item
Choker	20,000	5,000	4,000	2,000	\$31,000	item
Chicane	20,000	5,000	4,000	2,000	\$31,000	item
Median	35,000	8,750	7,000	3,500	\$54,250	100-foot
Median Tree Chicane	60,000	15,000	12,000	6,000	\$93,000	item
Curb-Extension	10,000	2,500	2,000	1,000	\$15,500	item
Mini-Circle	12,500	3,125	2,500	1,250	\$19,375	item
Mini-Roundabout	50,000	12,500	10,000	5,000	\$77,500	item
Roundabout	250,000	62,500	50,000	25,000	\$387,500	item
Pedestrian Refuge Island	35,000	8,750	7,000	3,500	\$54,250	item
Street Closure	15,000	3,750	3,000	1,500	\$23,250	item
Pedestrian Connector	20,000	5,000	4,000	2,000	\$31,000	item
Radii Reduction	Varies with location (see Table B: Estimated Special Costs)					item

Table B: ESTIMATED SPECIAL COSTS*

#	Treatment Type	Base Cost	25% Continge	20% Engineer	10% Inspection	Total Cost	Neighb'd
1	Modified Intersection	200,000	50,000	40,000	20,000	\$310,000	NW
2	Modified Intersection	200,000	50,000	40,000	20,000	\$310,000	NW
3	Channelized Intersection	75,000	18,750	15,000	7,500	\$116,250	NE
4	Channelized Intersection	75,000	18,750	15,000	7,500	\$116,250	NE
5	Other - Visual Treatments	1,000	250	200	100	\$1,550	NE
6	Other - Road Widening	900,000	225,000	180,000	90,000	\$1,395,000	CW
7	Other - Road Widening	780,000	195,000	156,000	78,000	\$1,209,000	CW
8	Other - 3 Conversions to 2-way	0	0	0	0	\$0	CW
9	Other - Road Widening	730,000	182,500	146,000	73,000	\$1,131,500	CE
10	Other - Road Widening	600,000	150,000	120,000	60,000	\$930,000	CE
11	Other - Add/Improve Xwalks	100,000	25,000	20,000	10,000	\$155,000	CE
12	Other - Rebuild Street	930,000	232,500	186,000	93,000	\$1,441,500	CE
13	Other - Improve Circles	20,000	5,000	4,000	2,000	\$31,000	CE
14	Other - 2 Improved Circles	40,000	10,000	8,000	4,000	\$62,000	CE
15	Other - 8 Conversions to 2-way	0	0	0	0	\$0	CE
16	Channelized Intersection	220,000	55,000	44,000	22,000	\$341,000	S
17	Other - Rebuild Street	2,300,000	575,000	460,000	230,000	\$3,565,000	S
18	Other - 19 Conversions to 2-way	0	0	0	0	\$0	S

* NOTES: Conversions to 2-way assume signage changes only, no costs were assigned; Road widenings and rebuildings use generalized budget-level cost estimates based on ODOT data, actual costs will vary depending on project details; other items are unique

Central East (CE) Linden Neighborhood: Traffic Calming Treatment Cost Estimates

NUMBER OF TREATMENTS	Street & Phase														
	Weber Road			Hudson Street		Cleveland Avenue			Myrtle	Melrose	Ontario	Medina	Hamilton	Dresden	Misc. streets
	1	2	3	1	2	1	2	3							
Treatment Type	See also intersecting streets														
Road Diet	1.0			0.8											
Green Street										0.7					
Speed Table								1							
Intersection Table								2							
Raised Intersection															
Modified Intersection															
Channelized Intersection															
Choker															
Chicane															
Median															
Median Tree Chicane										1	1				
Curb-Extension															
Mini-Circle										1					
Mini-Roundabout													1		
Roundabout														1	
Pedestrian Refuge Island				4											
Closure															
Pedestrian Connector															
Radii Reduction															
Other			(9)		(10)	(11)	(12)			(13)			(14)	(15)	
Total Cost Per Street/Phase	\$9,920	\$0	\$1,131,500	\$224,936	\$930,000	\$155,000	\$1,441,500	\$387,500	\$61,225	\$31,000	\$146,010	\$93,000	\$0	\$139,500	\$0

NOTES: (#) : See Table B: Estimated Special Costs

Table A: ESTIMATED UNIT COSTS

Treatment Type	Cost Per Unit	25% Continge	20% Engineer	10% Inspection	Total Cost	Unit
Road Diet	6,400	1,600	1,280	640	\$9,920	mile
Green Street	31,000	7,750	6,200	3,100	\$48,050	mile
Speed Table	4,500	1,125	900	450	\$6,975	item
Intersection Table	17,500	4,375	3,500	1,750	\$27,125	item
Raised Intersection	35,000	8,750	7,000	3,500	\$54,250	item
Modified Intersection	Varies with location (see Table B: Estimated Special Costs)					item
Channelized Intersection	Varies with location (see Table B: Estimated Special Costs)					item
Choker	20,000	5,000	4,000	2,000	\$31,000	item
Chicane	20,000	5,000	4,000	2,000	\$31,000	item
Median	35,000	8,750	7,000	3,500	\$54,250	100-foot
Median Tree Chicane	60,000	15,000	12,000	6,000	\$93,000	item
Curb-Extension	10,000	2,500	2,000	1,000	\$15,500	item
Mini-Circle	12,500	3,125	2,500	1,250	\$19,375	item
Mini-Roundabout	50,000	12,500	10,000	5,000	\$77,500	item
Roundabout	250,000	62,500	50,000	25,000	\$387,500	item
Pedestrian Refuge Island	35,000	8,750	7,000	3,500	\$54,250	item
Street Closure	15,000	3,750	3,000	1,500	\$23,250	item
Pedestrian Connector	20,000	5,000	4,000	2,000	\$31,000	item
Radii Reduction	Varies with location (see Table B: Estimated Special Costs)					item

Table B: ESTIMATED SPECIAL COSTS*

#	Treatment Type	Base Cost	25% Continge	20% Engineer	10% Inspection	Total Cost	Neighb'd
1	Modified Intersection	200,000	50,000	40,000	20,000	\$310,000	NW
2	Modified Intersection	200,000	50,000	40,000	20,000	\$310,000	NW
3	Channelized Intersection	75,000	18,750	15,000	7,500	\$116,250	NE
4	Channelized Intersection	75,000	18,750	15,000	7,500	\$116,250	NE
5	Other - Visual Treatments	1,000	250	200	100	\$1,550	NE
6	Other - Road Widening	900,000	225,000	180,000	90,000	\$1,395,000	CW
7	Other - Road Widening	780,000	195,000	156,000	78,000	\$1,209,000	CW
8	Other - 3 Conversions to 2-way	0	0	0	0	\$0	CW
9	Other - Road Widening	730,000	182,500	146,000	73,000	\$1,131,500	CE
10	Other - Road Widening	600,000	150,000	120,000	60,000	\$930,000	CE
11	Other - Add/Improve Xwalks	100,000	25,000	20,000	10,000	\$155,000	CE
12	Other - Rebuild Street	930,000	232,500	186,000	93,000	\$1,441,500	CE
13	Other - Improve Circles	20,000	5,000	4,000	2,000	\$31,000	CE
14	Other - 2 Improved Circles	40,000	10,000	8,000	4,000	\$62,000	CE
15	Other - 8 Conversions to 2-way	0	0	0	0	\$0	CE
16	Channelized Intersection	220,000	55,000	44,000	22,000	\$341,000	S
17	Other - Rebuild Street	2,300,000	575,000	460,000	230,000	\$3,565,000	S
18	Other - 19 Conversions to 2-way	0	0	0	0	\$0	S

* NOTES: Conversions to 2-way assume signage changes only, no costs were assigned; Road widenings and rebuildings use generalized budget-level cost estimates based on ODOT data, actual costs will vary depending on project details; other items are unique

South (S) Linden Neighborhood: Traffic Calming Treatment Cost Estimates

NUMBER OF TREATMENTS	Street & Phase															
	Cleveland Avenue		17th Avenue		11th Avenue		Hudson Street		Hamilton Avenue		Hiawatha Park	Dresden	Duxberry	Ontario	Grasmere	Misc. streets
	1	2	1	2	1	2	1	2	1	2						
Treatment Type															See CW & CE Linden	
Road Diet	1.8								0.6							
Green Street														6.0		
Speed Table																
Intersection Table												2	1	1	1	
Raised Intersection																
Modified Intersection																
Channelized Intersection											(16)					
Choker																
Chicane																
Median															6	
Median Tree Chicane																
Curb-Extension																
Mini-Circle																
Mini-Roundabout				2		2				6	1					
Roundabout																
Pedestrian Refuge Island	5		2		1											
Closure																
Pedestrian Connector																
Radii Reduction																
Other		(17)														(18)
Total Cost Per Street/Phase	\$289,106	\$3,565,000	\$108,500	\$155,000	\$54,250	\$155,000	\$0	\$0	\$5,952	\$465,000	\$418,500	\$54,250	\$27,125	\$315,425	\$352,625	\$0

NOTES: (#) : See Table B: Estimated Special Costs

Table A: ESTIMATED UNIT COSTS

Treatment Type	Cost Per Unit	25% Continge	20% Engineer	10% Inspection	Total Cost	Unit
Road Diet	6,400	1,600	1,280	640	\$9,920	mile
Green Street	31,000	7,750	6,200	3,100	\$48,050	mile
Speed Table	4,500	1,125	900	450	\$6,975	item
Intersection Table	17,500	4,375	3,500	1,750	\$27,125	item
Raised Intersection	35,000	8,750	7,000	3,500	\$54,250	item
Modified Intersection	Varies with location (see Table B: Estimated Special Costs)					item
Channelized Intersection	Varies with location (see Table B: Estimated Special Costs)					item
Choker	20,000	5,000	4,000	2,000	\$31,000	item
Chicane	20,000	5,000	4,000	2,000	\$31,000	item
Median	35,000	8,750	7,000	3,500	\$54,250	100-foot
Median Tree Chicane	60,000	15,000	12,000	6,000	\$93,000	item
Curb-Extension	10,000	2,500	2,000	1,000	\$15,500	item
Mini-Circle	12,500	3,125	2,500	1,250	\$19,375	item
Mini-Roundabout	50,000	12,500	10,000	5,000	\$77,500	item
Roundabout	250,000	62,500	50,000	25,000	\$387,500	item
Pedestrian Refuge Island	35,000	8,750	7,000	3,500	\$54,250	item
Street Closure	15,000	3,750	3,000	1,500	\$23,250	item
Pedestrian Connector	20,000	5,000	4,000	2,000	\$31,000	item
Radii Reduction	Varies with location (see Table B: Estimated Special Costs)					item

Table B: ESTIMATED SPECIAL COSTS*

#	Treatment Type	Base Cost	25% Continge	20% Engineer	10% Inspection	Total Cost	Neighb'd
1	Modified Intersection	200,000	50,000	40,000	20,000	\$310,000	NW
2	Modified Intersection	200,000	50,000	40,000	20,000	\$310,000	NW
3	Channelized Intersection	75,000	18,750	15,000	7,500	\$116,250	NE
4	Channelized Intersection	75,000	18,750	15,000	7,500	\$116,250	NE
5	Other - Visual Treatments	1,000	250	200	100	\$1,550	NE
6	Other - Road Widening	900,000	225,000	180,000	90,000	\$1,395,000	CW
7	Other - Road Widening	780,000	195,000	156,000	78,000	\$1,209,000	CW
8	Other - 3 Conversions to 2-way	0	0	0	0	\$0	CW
9	Other - Road Widening	730,000	182,500	146,000	73,000	\$1,131,500	CE
10	Other - Road Widening	600,000	150,000	120,000	60,000	\$930,000	CE
11	Other - Add/Improve Xwalks	100,000	25,000	20,000	10,000	\$155,000	CE
12	Other - Rebuild Street	930,000	232,500	186,000	93,000	\$1,441,500	CE
13	Other - Improve Circles	20,000	5,000	4,000	2,000	\$31,000	CE
14	Other - 2 Improved Circles	40,000	10,000	8,000	4,000	\$62,000	CE
15	Other - 8 Conversions to 2-way	0	0	0	0	\$0	CE
16	Channelized Intersection	220,000	55,000	44,000	22,000	\$341,000	S
17	Other - Rebuild Street	2,300,000	575,000	460,000	230,000	\$3,565,000	S
18	Other - 19 Conversions to 2-way	0	0	0	0	\$0	S

* NOTES: Conversions to 2-way assume signage changes only, no costs were assigned; Road widenings and rebuildings use generalized budget-level cost estimates based on ODOT data, actual costs will vary depending on project details; other items are unique

Traffic Calming Treatment Descriptions with Estimated Unit Costs

Estimated Unit Cost Assumptions: The estimated unit costs for various traffic calming treatments are approximate and have been determined after analyzing and comparing the costs incurred for similar treatments by the City of Columbus and other cities throughout the nation. *It should be noted that all costs assume the basic installation price and do not include the cost of right-of-way (ROW) acquisition, landscaping, and aesthetic enhancements.* There are a variety of other factors that influence the cost of treatments including: the availability of required materials, labor rates, right-of-way acquisition, existing site conditions such as geometry and drainage. Actual cost can be determined only with detailed site surveys, engineering analysis, design and quantity estimates.

a) Road-Diets: Road-diets are generally used to visually narrow streets that are too wide. This helps in reducing the comfort level of a motorist when operating at higher speeds, thus encouraging speed reduction and improving safety in a neighborhood. Road diets can be achieved most simply by striping the edges and centerline of the street. Where extra street width remains, painting the shoulder helps better define the travel way.

Estimated Unit Cost:

\$6,400 per mile of edge line striping (one 5-inch line on each side of the road).

\$28,000 per mile of edge lines striping and painting 8-foot shoulders.

Additionally, road diets can incorporate other devices such as curb bulb-outs or chicanes (see below for description and cost).



b) Sidewalks: The sidewalks should be included adjacent to all streets, except where they are prohibited by law. Curb and gutter should be included with sidewalks but are not always necessary depending on context and character of the location. The sidewalk should be separated from the curb by a buffer of landscaping and/or on-street parking. When located adjacent to the curb sidewalk width should be expanded accordingly to allow a comfort zone for the pedestrian. The recommended minimum sidewalk width is 5 feet. This width is in conformance with ADA's minimum width requirement of 3 feet and most commonly practiced width of 5 feet. Sidewalks are generally built of concrete, but along business corridors, such as Cleveland Avenue, it may be built using other materials, such as asphalt, sandstone, depending upon the availability of funds and materials for the reasons of convenience and aesthetics.

Estimated Unit Cost:

\$11 per square foot (or \$55 per linear foot of 5-foot wide concrete sidewalk)

\$3,000 per ADA ramp

c) Medians: Medians are island barriers located along the centerline of a street and they also serves as pedestrian refuge island to help protect pedestrians from oncoming motor vehicle while crossing the street. They may continue through an intersection so as to block through movement at a cross street. Medians can be aesthetically improved with landscaping.

Estimated Unit Cost:

\$35,000 per 100 feet, 5' wide (includes landscaping)

\$50 per foot for 5' wide striped median.



This median serves as a pedestrian refuge island.

d) Pedestrian Refuge Island: This is a raised island between street lanes that allows pedestrians to pause while crossing a street. The island can be a median (see above) or a separator between a free-flow turning lane and other traffic lanes.

Estimated Unit Cost:

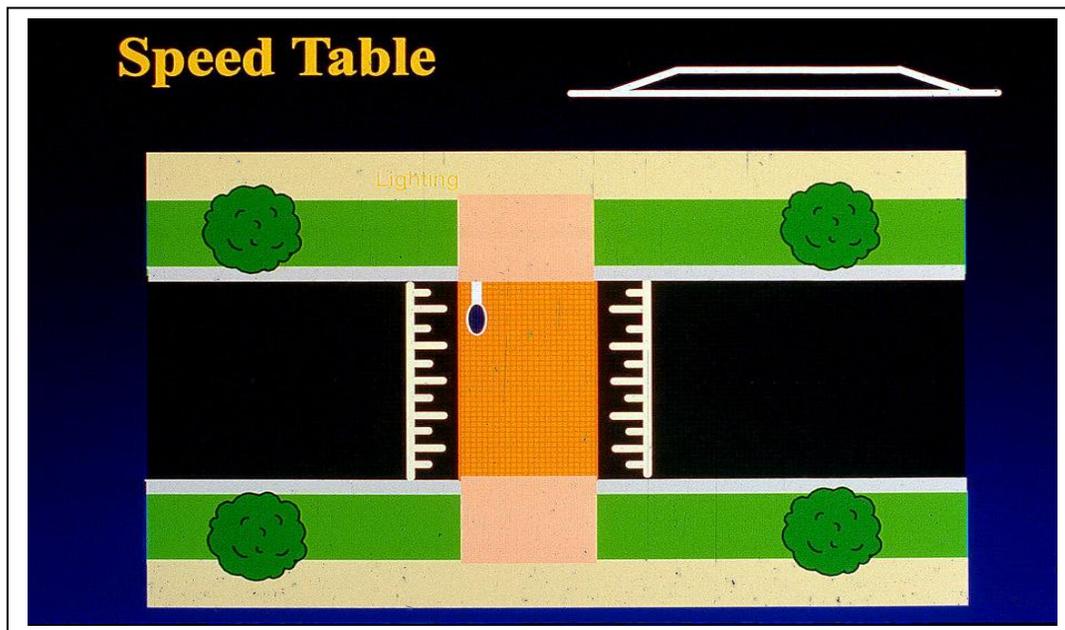
\$35,000: 75 feet long, 8 feet wide (includes landscaping)

e) Speed Table: Speed tables (also called intersection table at an intersection) are essentially flat-topped speed humps often constructed with brick or other textured materials on the flat section. They are generally 3 to 4 inch high and 22 feet long (6 feet ramps at the ends and a 10 feet flat on the top) in the direction of travel. Most commonly, they are placed in the mid-block sections of streets, but can be recommended at intersections also, to function similar to raised intersections, and are more economical. They slow down the traffic through vertical deflection, and best suited for pedestrians and bicyclists crossings. Their most common placements are mid-block at school, parks, local streets, and on some moderate volume roads.

Estimated Unit Cost:

\$4,500 per mid-block location, 4" high and 22' long with 3' ramps in each side (using asphalt)

\$17,500 per intersection location, 4" high and 3' ramps on each approach covering the entire intersection area (using asphalt)



f) Raised Intersections: Raised intersections (also called raised crosswalks) are flat elevated areas covering an entire intersection, often with brick or other textured materials on the flat section. They are vertical traffic calming measures that slow traffic in three ways: first they create an attractive, distinct shape; second, they create a vertical deflection forcing a low speed approach, and third, they bring the crossing to the level of the sidewalk (ADA access improvement). The typical slope of the ramp is 1:40.

Estimated Unit Cost:

\$35,000 per 36' x 36' intersection (using bricks on the flat section)



g) Curb-extensions: Curb-extensions (also called bulb-outs) are a type of traffic calming tool used to facilitate pedestrian crossing of a street. Extending the curb into streets provides the visual clues of the need for traffic to slow down. Curb-extensions also provide the pedestrian a shorter crossing distance at the intersection. Curb-extensions are effective tools for slowing speeds at intersections. There may be a loss of on-street parking depending on the street width and its geometry. The parking loss most often occurs at intersections if the length of the curb-extension extends beyond the crosswalk into on-street parking spaces. Curb extensions may or may not alter drainage depending on their design.

Estimated Unit Cost:

\$10,000 per extension, 15' long and 8' wide – *this does not include changes to drainage*



h) Chokers: Chokers (also called neckdowns) are two curb extensions on exact opposite sides of a street at mid-block or intersections that narrow a street by widening the sidewalk or planting strip. If marked appropriately Chokers can be used for mid-block pedestrian crossings. They help in reducing speeding by narrowing passageways at appropriate points. Chokers should include landscaping, so that they can be seen from a distance. They are designed such as to reduce the street width to 20 feet. Chokers may or may not alter drainage depending on their design.

Estimated Unit Cost:

\$20,000 per set of two curb-extensions, 15' long and 8' wide each – *this does not include changes to drainage*

i) Chicanes: Chicanes are sets of curb extensions that alternate from one side of the street to the other, thus creating a horizontal diversion of traffic. They are highly effective traffic calming tools and work on all sizes of vehicles. It may cause losses in on-street parking depending upon the number of chicanes and the existing parking arrangement. Chicanes may or may not alter drainage depending on their design.

Estimated Unit Cost:

\$20,000 per set of two curb-extensions, 15' long and 8' wide each – *this does not include changes to drainage*



A chicane is particularly useful on relatively narrow streets.

j) Median Tree Chicanes: This special type of chicane is especially suited to wider streets. It utilizes a landscaped median between two standard chicanes. As with a standard chicane, it may cause losses in on-street parking depending upon its placement and existing parking usage and restrictions.

Estimated Unit Cost:

\$60,000 for a short median (5' wide and 30' long) and four curb-extensions (8' wide and 15' long each) – *this does not include changes to drainage*

A median tree chicane that protects the parking lane and does not alter drainage patterns.



k) Roundabouts: Roundabouts are circular intersections with specific design and traffic control features, such as yield control of all entering traffic, channelized approaches, and appropriate geometric curvature to ensure that travel speeds on the circulatory roadway are typically less than 20 mph. They are primarily placed on arterial and collector streets, substituting for traffic signals or all-way STOP signs. The inscribed circle diameter (i.e., the distance from one curb corner to diagonally opposite curb corner) of a single urban roundabout varies from 100 feet to 130 feet.

Estimated Unit Cost:

\$250,000 - 100' diameter roundabout.



l) Mini-Roundabouts: Mini-Roundabouts are small roundabouts used in lower-volume urban environments. The inscribed circle diameter of a mini-roundabout varies from 45 feet to 80 feet.

Estimated Unit Cost:

\$50,000 - 45' diameter roundabout



m) Mini-Circles: Mini-Circles are raised circular islands constructed in the center of street intersections. They reduce vehicle speeds by forcing motorists to maneuver around them. Mini-Circles are similar to Mini-Roundabouts but do not have splitter island or other treatments on the intersection approaches and typically do not change the curb line.

Estimated Unit Cost:

\$12,500 for 12' diameter mini-circle with landscaping.

n) Street Closure: A street closure is recommended when other traffic calming approaches have failed to improve a problem or when a particular access point into an area is no longer needed. Closures can be as simple and temporary as placing obstacles in the roadway or as elaborate and permanent as constructing a landscaped barrier or removing the roadway altogether. Caution should be emphasized with closures to avoid barriers with poor aesthetic quality, especially if a closure is expected to be long-term or permanent. A closure should retain pedestrian and bicycle access.

Estimated Unit Cost:

\$15,000 but cost can vary considerably based on location and design

o) Pedestrian Connector: This is a generic term for any facility that connects two pedestrian facilities, such as a sidewalk connecting the trails at two parks. It may also provide pedestrian passage through an area closed to other types of traffic.

Estimated Unit Cost:

\$20,000 but cost can vary considerably based on location and design

p) Radius Reduction: A “Radius” refers to the sharpness of a corner where a motorist might make a turn. Intersections with rounded corners have relative large turning radii, while those with sharp corners have small turning radii. The purpose of a Radius Reduction is to slow the speed of vehicles as they turn a corner. This also has the effect of extending the sidewalk further into the intersection and shortening pedestrian crossing distances.

**Estimated Unit Cost:
Varies by Location**

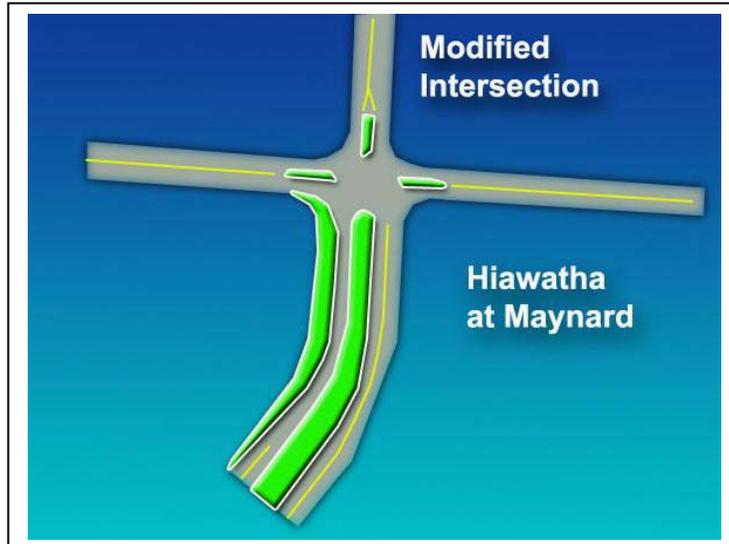
q) Green Street: The term and concept “green street” is applied to any special corridor where walking, bicycling and low speed travel is emphasized. Such streets become the equivalent of a freeway for walking and bicycling, and only grant low speed access to motorists. A Green Street is akin to a “bicycle boulevard” where the volume of motorized traffic is carefully controlled, where direct walking and bicycling routes make it easy to go places, and where significant new walking and bicycling takes place. Placement of parking, mailbox locations and other street details, including lighting, is determined with advice of residents who help design the street. In order to enhance it as a pedestrian and bicycle travel route, a Green Street requires enhanced natural facilities: landscaping and shade trees. At certain blocks, traffic controls are oriented to allow the green street to be the through street and intersecting streets become stop- or yield-controlled. Often mini-circles, raised intersections, chokers or other tools are used. In other cases motorists traveling on a green street are diverted to other streets at some intersections. When a green street is remade with significant geometric changes it takes on the quality of a *woonerf* or “living street” where no motorist can travel more than 12 mph comfortably.

**Estimated Unit Cost:
\$31,000 per mile (with street trees, pavement markings and minor pavement modifications)**



r) Modified Intersections: These mainly consist of modified T-intersections or “Intersection Median Barriers” and may involve other geometrical modifications such as changes in alignments, depending on the existing site conditions. Due to the unique nature of each intersection modification it is not possible to provide estimated unit costs. However, it may be possible to gauge the cost of a modification by combining the costs of other treatments that collectively make up the modification.

**Estimated Unit Cost:
Varies by Location**



Note: Main sources of information for the above cost estimates are:

- ITE (www.ite.org).
- City of Columbus, Traffic Calming Guide.
- Engineering Division of Franklin County.
- Department of Transportation, City of Portland, Oregon.
- Department of Transportation, City of San Jose, California.
- Department of Transportation, City of Dublin, Ohio.
- Roundabouts: An Informational Guide, FHWA.
- Walkable Communities, Inc. (www.walkable.org).
- Modern Roundabouts (www.roundabouts.net).
- FHWA, Walkinginfo (www.walkinginfo.org).
- FHWA Roundabouts: An informational guide.