

Appendix G

Technical Information

For

Development of Alternatives

Appendix G-1

Design Criteria

Design Criteria SR-235 Corridor Management Study

10/5/2012

	Within Park Layne Limits	Outside Park Layne Limits	L&D Reference
Classification	Urban Collector	Urban Collector	
ADT (2005)	13,800	13,800	Traffic Counts, May 2010
ADT (2030)	18,285	18,285	Traffic Counts, May 2010
% Trucks	3.5%	3.5%	Traffic Counts, May 2010
Posted Speed	45 mph	55 mph	
Design Speed	50 mph	60 mph	
Horizontal Alignment			
Max. Centerline deflection w/o horizontal curve	1° 15'	1° 00'	Fig. 202-1E
Max degree of curve	6° 45'	4° 15'	Fig. 202-2E
Max degree of curve w/o superelevation	0° 47'	0° 33'	Fig. 202-3E
Superelevation transition rate "G"	200	222	Fig. 202-4E
Maximum superelevation	0.06 ft/ft	0.06 ft/ft	Fig. 202-8E
Max degree of curve w/o a spiral	4° 30'	3° 00'	Fig. 20 2-11E
Transition (taper) rate	600 ft	720 ft	Sect. 301.1.4
Lateral clearance on bridge	4' min/8' pref.	4' min/8' pref.	Fig. 302-1E
Vertical Alignment			
Maximum Grade (Level Terrain)	7%	6%	Fig 203-1E
Maximum change in vert. alignment w/o vertical curve	0.45%	0.30%	Fig. 203-2E
Stopping sight distance	425 feet	570 feet	Fig. 203-3E
K - Crest vertical curve	84	151	Fig. 203-3E
K - Sag vertical curve	96	136	Fig. 203-6E
Sight Distance			
Horizontal stopping sight distance	425 feet	570 feet	Fig. 201-1E
Passing sight distance	1835 feet	2135 feet	Fig. 201-3E
Intersection sight distance	555 feet	665 feet	Fig. 201-5E
Decision sight distance - Stop	910 feet	1150 feet	Fig. 201-6E
Decision sight distance - speed/path/direction change	1030 feet	1280 feet	Fig. 201-6E
Typical Section			
Lane width	11' min/12' pref.	11' min/12' pref.	Fig. 301-4E
Shoulder width - no curb and gutter (includes bike lane)	4' paved 8' graded	4' paved 8' graded	Fig. 301-4E
Shoulder width - with curb and gutter (includes bike lane)	3.5' paved **	3.5' paved **	Fig. 301-6
Clear zone width	19	30	Fig. 600-1
Other Criteria to be Referenced			
Pavement cross slope			Sect. 301.1.5
Curve Widening			Fig. 301-5bE
Crossroad Alignment			Sect. 401.3

** Allows for 5' from edge line to face of curb assuming 18" gutter width.

Appendix G-2

Pedestrian Mid-Block Crossing Study



Memo

1105 Schrock Road
Suite 400
Columbus, Ohio 43229

T 614-433-7800
F 614-846-2602

www.transystems.com

To: Aaron Grilliot
Date: 5/25/2012
From: David Shipps
Subject: CLA-SR 235 Corridor Management Study
Pedestrian Mid-Block Crossing Feasibility

Comments:

At the May 16, 2012 Stakeholder Meeting, a portion of the discussion centered on the feasibility of pedestrian mid-block crossings along SR 235 in the vicinity of the Park Layne area. Specifically, crossings were discussed at two locations: south of Hartley and near Hocker (if the SR 235/Hocker intersection is closed). I have put together the following information on the Study Background, Existing Roadway Conditions, Pedestrian Issues, General Standards, and other information regarding the crossings in those locations.

Study Background

The Clark County Springfield-Transportation Coordinating Committee (TCC) in conjunction with the Ohio Department of Transportation (ODOT) are undertaking a study to analyze several key factors that could impact the SR 235 transportation corridor for years to come. Some of those factors include access management policies, safety improvements, bicycle and pedestrian improvements, streetscape improvements, as well as future economic development opportunities. The goal of the study is to identify improvements for the corridor that will provide the safest, most efficient system for the years to come.

Existing Roadway Conditions

The following roadway conditions exist in the vicinity of the Park Layne area (from south of Dalton to north of Hartley) which is the focus of this pedestrian mid-block crossing feasibility.

- ✓ Three lanes (Two 12-foot travel lanes and a two-way 12-foot center turn lane from Dalton to Dille)
- ✓ 8-foot shoulders on either side
- ✓ Existing signal at Styer (painted crosswalk on south leg with ped push buttons)
- ✓ 45 MPH speed limit from south of Dalton to north of Hartley
- ✓ 13,800 ADT (3.5% trucks)

Pedestrian Issues

The SR 235 corridor includes a sizeable commercial area that serves the surrounding residents that stretches for over a half a mile from just south of Dille Road and just south of Dalton Drive. The commercial area includes several restaurants and businesses that are accessed primarily via SR 235 or McAdams Drive, which is a service road to the east of SR 235 between Hocker and Hartley. Additionally, the Park Layne area includes approximately 100 single-family homes (which are primarily to the east of SR 235) and three large apartment complexes (with the largest to the west of SR 235). There is a congregation of popular restaurants (Mel-O-Dee and Rancher's Roast Beef) and the two largest apartment complexes adjacent to the SR 235 and Hocker intersection. Each of the restaurants and apartments are on opposite sides of SR 235. Additionally, the apartments and surrounding homes are populated with middle to lower income residents who are much more likely to walk versus utilize an automobile.



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ODOT D7 located one of their video vans within this area to witness the vehicular and pedestrian issues along SR 235 and the adjacent McAdams Drive. The video van recorded film for a 12-hour period during one day.

Upon reviewing the video, it was apparent that there was no proper place for pedestrians to cross SR 235 as nothing has been defined. Furthermore, the primary crossing location is between the apartments and restaurants. While the overall pedestrian numbers were not high, the video showed that every crossing was a potential safety issue. This was due to the speed of traffic, lack of safe crossing locations, and the number of vehicle turning movements due to the amount of property access points.

General Standards

Per the L&D Manual 401.8 Designing Roadways to Accommodate Pedestrians

...the wider the roadway, the more difficult it is for pedestrians to cross, and the greater the barrier effect of this roadway on the communities through which it passes. The designer must keep in mind that, as important as it is for the motorist to see everything adjacent to the roadway, it is of equal importance for the pedestrian, particularly children and wheelchair users, to be able to view and react to potential conflicts.

Within the Park Layne area SR 235 includes three 12-foot travel lanes along with 8-foot paved shoulders on either side. Additionally, McAdams Drive is located immediately adjacent to SR 235 between Hocker and Hartley on the east side of the road. McAdams Drive includes two 12-foot travel lanes along with 3-foot unpaved shoulders. McAdams Drive is mostly slower moving traffic accessing adjacent businesses and homes; however, the combined width of McAdams and SR 235 provides a daunting challenge to even the most seasoned pedestrian or bicyclist. Additionally, there is no proper place for pedestrians to cross other than the signalized intersection at Styer Drive. However, this is over 900 feet north of the major pedestrian crossing location near Hocker Drive.

Per the 2009 MUTCD

New marked crosswalks alone, without other measures designed to reduce traffic speeds, shorten crossing distances, enhance driver awareness of the crossing, and/or provide active warning of pedestrian presence, should not be installed across uncontrolled roadways where the speed limit exceeds 40 mph and either:

- A. *The roadway has four or more lanes of travel without a raised median or pedestrian refuge island and an ADT of 12,000 vehicles per day or greater; or*
- B. *The roadway has four or more lanes of travel with a raised median or pedestrian refuge island and an ADT of 15,000 vehicles per day or greater.*

SR 235 has three lanes of travel and a current ADT of 13,800 vehicles. With anticipated growth over the next 20 years the ADT will increase to just shy of 15,000 ADT. Providing a mid-block crossing at one or more locations along SR 235 with a raised median, lighting, proper signage, and paint is one of the intended goals of the study.

Per the Recommended Practice for Midblock Crossings (from ITE)



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The decision to locate a midblock crosswalk will be based on numerous factors. Generally, however, consider providing a marked midblock crossing when protected intersection crossings are spaced greater than 400 feet or so that crosswalks are located no greater than 200 to 300 feet apart in high pedestrian volume locations, and meet the criteria below. Midblock crosswalks should be located at least 100 feet from the nearest side street or driveway so that drivers turning onto the major street have a chance to notice pedestrians and properly yield to pedestrians who are crossing the street.

The two proposed locations for mid-block crossings are located over 800 feet north and south of the Styer Drive signalized intersection. Additionally, the northern crossing is proposed approximately 150 feet south of the intersection of Hartley Avenue. There are no drives within 500 feet of that location on the east side of SR 235, but there are three drives on the west side of SR 235. Another measure proposed for consideration within this study is the reduction of multiple access points to individual properties. The three drives in close proximity to the proposed mid-block crossing location could be consolidated and meet the proper spacing recommendation. The southern location is proposed approximately 150 feet north of the Dalton Drive intersection, which is where the current Hocker Drive intersection is located. The study has proposed that the Hocker Drive intersection be removed at that location and combined with McAdams Drive to intersect SR 235 roughly 500 feet further north. There are no other drives on the east side of SR 235 within 150 feet of this proposed location. There are three drives within close proximity of the proposed location on the west side of SR 235. The same driveway consolidation practice would be considered here as well to allow for the recommended spacing.

FHWA's Proven Safety Countermeasures

Earlier this year, the Federal Highway Administration (FHWA) released a document related to acceptable safety countermeasures related to pedestrian and bicycle accommodations. FHWA's goal was to encourage the use of specific proven pedestrian safety countermeasures that can help achieve local, State and National safety goals. One of those countermeasures is the inclusion of raised medians. FHWA's Safety Office has promoted the evidence-based safety benefits of raised medians (or refuge areas).

http://safety.fhwa.dot.gov/provencountermeasures/fhwa_sa_12_011.htm

It should also be mentioned that a prior study done in 2002 by Charlie Zegeer mentioned that mid-block crossings give pedestrians a false sense of security. Mr. Zegeer has since said the results are inconclusive due to improper data and multiple-threat crashes on roadways with four lanes or greater. I have attached a PDF of his presentation given in early 2010. It also has some great photos of examples from around the country.

Recommendation

Considering all of the above information, my recommendation is that we move forward with the consideration of a mid-block crossing near the current intersection of Hocker Drive and SR 235 and just south of the intersection of Hartley Avenue intersection. I further recommend that the crossings should include a raised median to be located within the current two-way left turn lane and a two-staged crossing configuration. This will allow for pedestrians to face oncoming traffic before the second crossing. Furthermore, the crossing island could include acceptable "fencing" to guide pedestrians from one crossing to the other. Additionally, overhead warning beacons and appropriate lighting could be installed to further identify the crossing to vehicular traffic. An photographic example from Charlie Zegeer has been provided below.



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1105 Schrock Road
Suite 400
Columbus, Ohio 43229

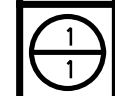
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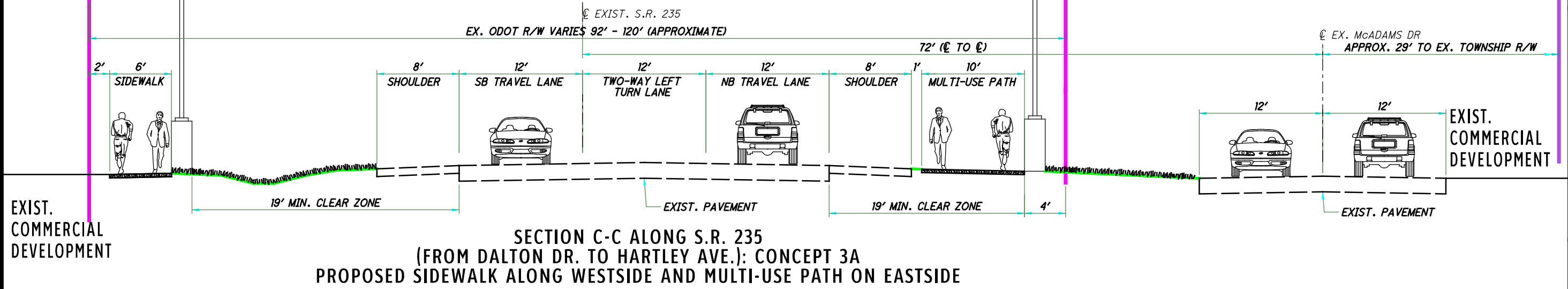
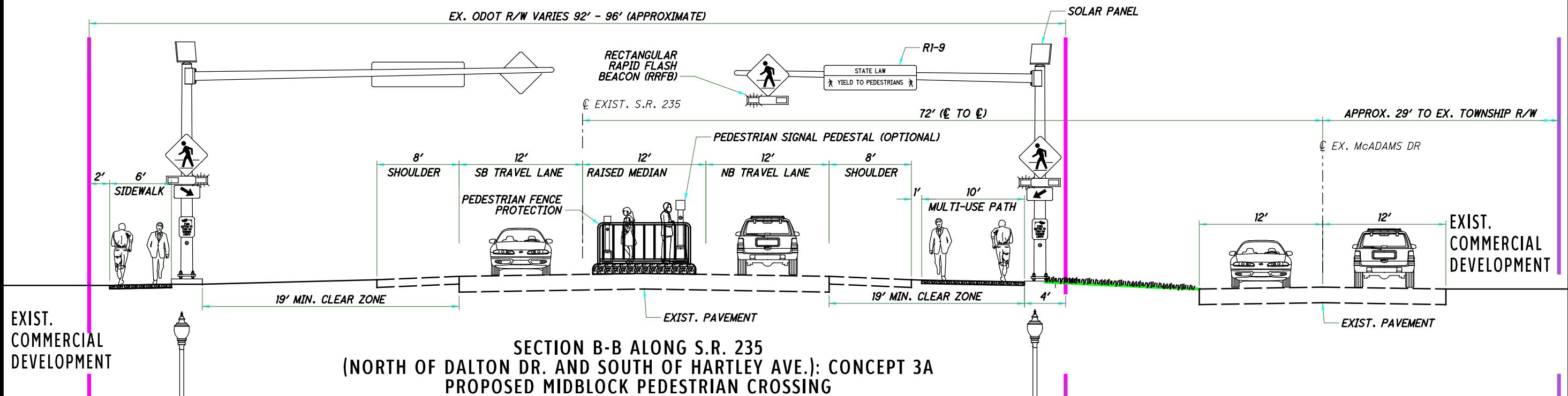
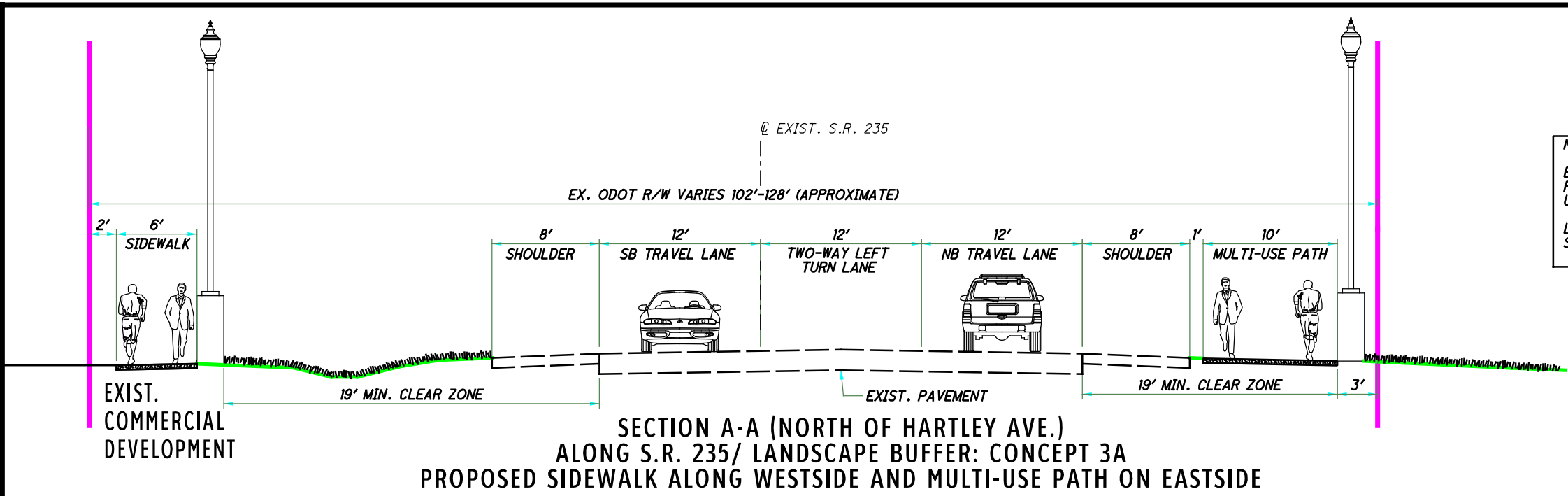


Appendix G-3

Typical Sections



NOTES:
 EXISTING RIGHT-OF-WAY INFORMATION SHOWN FOR CONCEPTUAL PURPOSES ONLY. EXISTING GROUND SURVEY WILL BE REQUIRED UPON FURTHER DETAILED STAGES OF DESIGN.
 LIGHTING SHOWN FOR GRAPHICAL PURPOSES. SPACING AND STYLE TO BE DETERMINED AT A LATER TIME.



Appendix G-4 Cost Estimates

S.R. 235
PRELIMINARY CONSTRUCTION COST ESTIMATE

			SR 235	
			Concept 3A	
	UNIT	UNIT COST	QUANTITY	COST
SIDEWALK				
4" CONCRETE WALK	SQ FT	\$4	16425	\$65,700
SEEDING AND MULCHING	SQ YD	\$1	5475	\$5,475
SHARED USE PATH				
ASPHALT PATH*	SQ YD	\$22	4390	\$96,580
SEEDING AND MULCHING	SQ YD	\$1	6583	\$6,583
GUARDRAIL	FT	\$12	2300	\$27,600
LIGHTING				
LIGHT POLES	EACH	\$7,000	96	\$672,000
PEDESTRIAN CROSSOVERS				
CONCRETE MEDIAN	SQ YD	\$50	210	\$10,500
FENCING	FT	\$10	160	\$1,600
SIGNS, FLAT SHEET	SQ FT	\$12	40	\$480
SIGN POSTS	FT	\$7	60	\$420
MAST ARMS W/ BEACONS	EACH	\$50,000	4	\$200,000
CURB RAMPS	SQ YD	\$68	30	\$2,040
PAVEMENT MARKINGS	FT	\$3	256	\$768
LIGHT POLES	EACH	\$7,000	4	\$28,000
STYER INTERSECTION	EACH	\$150,000	1	\$150,000
HOCKER AVE REDIRECT				
ASPH. PAVT. (includes compactio	SQ YD	\$45	70	\$3,150
PAVEMENT REMOVAL	SQ YD	\$8	140	\$1,120
SEEDING AND MULCHING	SQ YD	\$1	97	\$97
MCADAMS DRIVE WORK				
ASPH. PAVT. (includes compactio	SQ YD	\$45	1220	\$54,900
PAVEMENT REMOVAL	SQ YD	\$8	1250	\$10,000
SEEDING AND MULCHING	SQ YD	\$1	550	\$550
EROSION CONTROL				
EROSION CONTROL PLAN	LUMP			\$10,000.00
EROSION CONTROL ITEMS	LUMP			\$6,000.00
MOT	LUMP			\$50,000.00
SUB-TOTAL				\$1,403,563
PDP RISK	LUMP			25.00%
SUB-TOTAL				\$1,754,453.75

INCIDENTAL		
FIELD OFFICE	LUMP	\$15,000.00
LAYOUT STAKES	LUMP	\$10,000.00
MOBILIZATION	LUMP	\$100,000.00
SUB-TOTAL		\$1,879,453.75
INFLATION (TO 2018)		
ODOT INFLATION CALCULATOR	LUMP	32.60%
SUB-TOTAL		\$2,492,155.67
ENGINEERING AND PLANNING**	LUMP	\$280,712.60
CE&I		
ADD 10%	LUMP	10.00%
TOTAL		\$3,022,083.84

Green shaded items indicate work to be paid for by a 90%/10% split (90% Fed/State / 10% Local/Township).

* Asphalt pavement for shared use path includes 6" aggregate and 3" asphalt concrete layers.

** Engineering and planning includes the following: acquisition of geotechnical and survey data, environmental studies, engineering design, and project planning

Note: The costs shown in this estimate do not include costs associated with right-of-way acquisition. The costs shown in this estimate represent an estimate of probable construction costs prepared in good faith and with reasonable care. TranSystems has no control over the costs of construction labor, materials, or equipment, and does not make any commitment or assume any duty to assure that bids or negotiated prices will not vary from this estimate.