TECHNICAL MEMORANDUM

EAST-WEST ROAD CONCEPT UPDATE STUDY

Prepared For:

City of Tampa, Florida

Prepared By:





April 2015

TABLE OF CONTENTS

Secti	<u>tion</u>	<u>Page</u>
1.0	INTRODUCTION	1-1
	1.1 Project Location and Limits	1-1
2.0	PROJECT TRAFFIC FORECASTS	2-1
	2.1 Analysis Year	2-1
	2.2 Travel Demand Modeling	
	Alternative 1	2-1
	Alternative 2	
	Alternative 3	
	Alternative 4	
	2.3 Future Year TRAFFIC Volumes	2-2
3.0	FUTURE CONDITIONS TRAFFIC OPERATIONS ANALYSIS	3-1
	3.1 Future Build Operations Analysis	3-1
4.0	CONCEPTUAL ROADWAY PLAN	4-1
5.0	PRELIMINARY COST ESTIMATES	5-1
6.0	CONSISTENCY WITH FHWA & FDOT STANDARDS & POLI	CIES6-1
7.0	FEASIBILITY REVIEW	7-1
	What's Next?	7-4

LIST OF APPENDICES

Travel Demand Model & Annual Growth Calculations

Design Year (2040) HCS Analyses

Concept Plan Sheets

Appendix A Appendix B

Appendix C

Appe	endix D Preliminary Cost Estimates	
	LIST OF TABLES	
<u>Tabl</u>	<u>e</u>	<u>Page</u>
3-1	Design Year (2040) Levels of Service	3-3
5-1	Preliminary Cost Estimates	5-1
	LIST OF FIGURES	
Figu	<u>re</u>	<u>Page</u>
1-1	Project Location	1-1
2-1	Design Year (2040) Annual Average Daily Traffic (AADT)	2-3
2-2	Design Year (2040) Directional Design Hourly Volumes (DDHVs)	2-4
3-1	Design Year (2040) Number of Lanes	3-2
4-1	East-West Road Preferred Alternative	
7-1	Potential Tolling Facilities in North Tampa	7-2

Section 1.0 INTRODUCTION

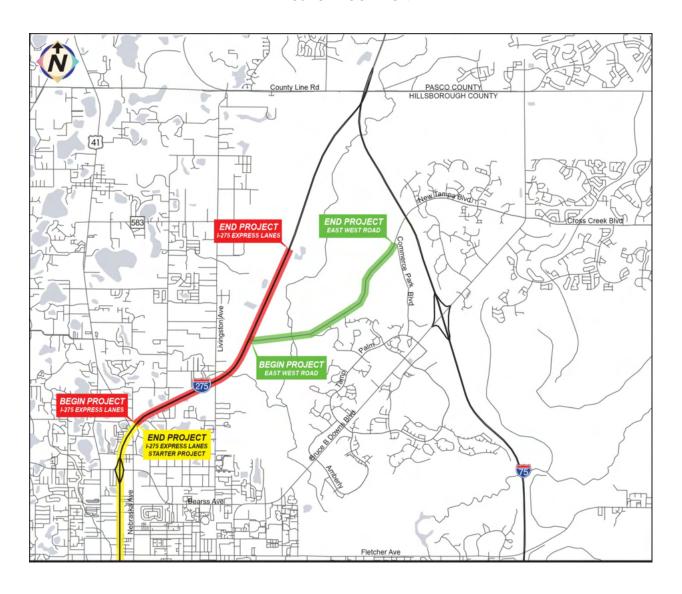
The City of Tampa (City) is conducting a Concept Update Study for a proposed East-West Road, which could operate with express lanes between Commerce Park Boulevard/New Tampa Boulevard and the Starter Projects (Starter Projects) that support the ultimate Tampa Bay Express (TBX) Master Plan on Interstate 275 (I-275), as shown in **Figure 1-1**. The purpose of this *Technical Memorandum* is to document the findings of the feasibility assessment, including future traffic conditions within the study area.

1.1 PROJECT LOCATION AND LIMITS

The East-West Road corridor is proposed to be a four-lane limited access toll facility (two-lanes in each direction) on new alignment in the New Tampa area of northeastern Hillsborough County, Florida. The project includes a proposed connection to a potential I-275 Starter Project between the I-275/Bearss Avenue interchange and the Interstate 75 (I-75)/I-275 junction. Just east of I-275, East-West Road is proposed to transition from four to two lanes (one in each direction) where it continues on the I-275 express lanes ramps to/from the south.

As illustrated on **Figure 1-1**, the project limits of the proposed East-West Road corridor span from the proposed connection to the I-275 Starter Projects to Commerce Park Boulevard/New Tampa Boulevard. In addition, the project includes an extension of the express lanes on I-275 from the northern terminus of the Starter Project to north of the proposed East-West Road connection with I-275.

FIGURE 1-1 PROJECT LOCATION



Section 2.0 PROJECT TRAFFIC FORECASTS

This section describes the travel demand modeling procedure as well as the development of future year Annual Average Daily Traffic (AADT) volumes and Directional Design Hourly Volumes (DDHVs) for the East-West Road corridor.

2.1 ANALYSIS YEAR

A Design Year of 2040 was assumed for the project traffic forecasts and analysis.

2.2 TRAVEL DEMAND MODELING

The 2035 Tampa Bay Regional Planning Model for Managed Lanes (TBRPM-ML) endorsed by the Florida Department of Transportation (FDOT) District Seven Systems Planning Office was used in development of traffic projections for this study. The TBRPM-ML is based on the Florida Standard Urban Transportation Modeling Structure (FSUTMS) and is recognized by the Tampa Bay Area Metropolitan Planning Organizations (MPOs) as an accepted travel demand forecasting tool. The ultimate roadway network used reflects the latest available adopted Cost Affordable Long Range Transportation Plans (LRTPs) for all counties in the region, as well as the I-275 Starter Projects. The model was reviewed to ensure that it accurately reflects the timing of improvements to the surrounding roadway network. In addition, the socioeconomic (SE) data was reviewed to ensure that the latest approved development totals, including those specifically located within the New Tampa area, are represented.

For the a.m. and p.m. peak periods, as well as the off-peak periods, the "variable time of day" tolls from the TBX Master Plan were used. Multiple alternatives were initially modeled for the proposed East-West Road and connection with I-275 to preliminarily evaluate the traffic demand generated in 2035. A brief description of each alternative is as follows:

ALTERNATIVE 1

East-West Road and interchange with express lane (toll) ramps to/from I-275 south. New express lanes join the I-275 Starter Project north of Bearss Avenue. This alternative generates 18,100 vehicles per day (vpd) in 2035 on the East-West Road corridor.

ALTERNATIVE 2

Addition of express lane (toll) ramps to/from I-275 north to the Alternative 1 model. This alternative generates 300 vpd more than Alternative 1 in 2035 on the East-West Road corridor for total of 18,400 vpd.

ALTERNATIVE 3

Addition of express lanes (toll) on I-275 through the East-West Road interchange to south of the I-75/I-275 junction to the Alternative 1 model. This alternative generates 12,600 vpd in 2035 on the new I-275 toll facility north of the East-West Road interchange. The total I-275 toll facility traffic north of Bearss Avenue is 31,700 vpd in 2035.

ALTERNATIVE 4

Addition of express lane (toll) ramps to/from I-275 general use lanes at a location north of Bearss Avenue. This alternative generates 8,500 vpd in 2035 on I-275 with total I-275 toll facility traffic north of Bearss Avenue at 34,800 vpd in 2035. East West Road generates 23,400 vpd and 11,400 vpd on I-275 toll facility north of East West Road.

The traffic projections and conceptual roadway plans for all alternatives were presented to the City of Tampa. Based on the total volume of potential toll traffic projected on the East-West Road facilities in 2035, Alternative 4 was approved by the City Project Manager as the preferred alternative for further analysis.

2.3 FUTURE YEAR TRAFFIC VOLUMES

The Peak Season Weekday Average Daily Traffic (PSWADT) volumes obtained from the 2035 TBRPM-ML model were converted to the respective AADT volumes through multiplication by a factor of 0.95, which is the Model Output Conversion Factor (MOCF) used in the TBX Master Plan. The DDHVs were also obtained from the TBRPM-ML, which is a "time of day" model and provides forecasts for the a.m. and p.m. peak periods. The travel demand model output and the annual growth calculations are documented in **Appendix A**. The AADT volumes and DDHVs for the Design Year (2040) are provided on **Figure 2-1** and **Figure 2-2**.

FIGURE 2-1 DESIGN YEAR (2040) ANNUAL AVERAGE DAILY TRAFFIC (AADT)

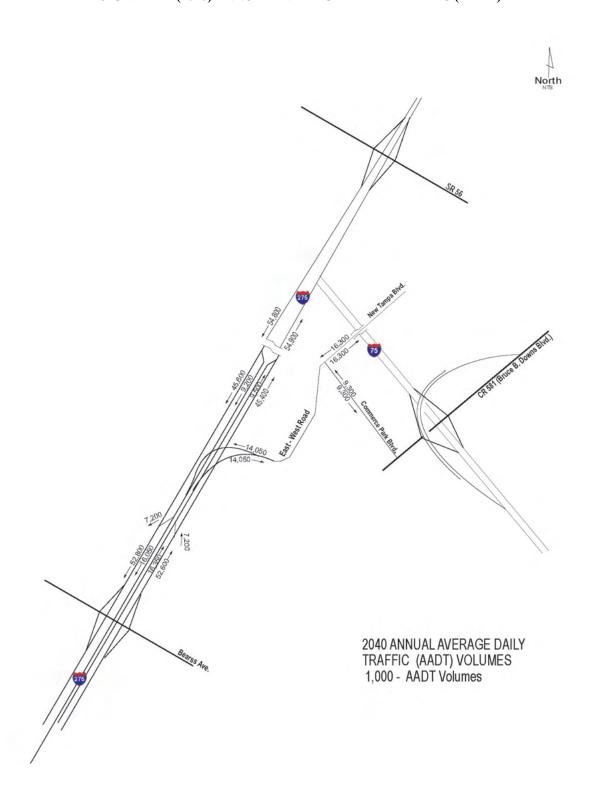
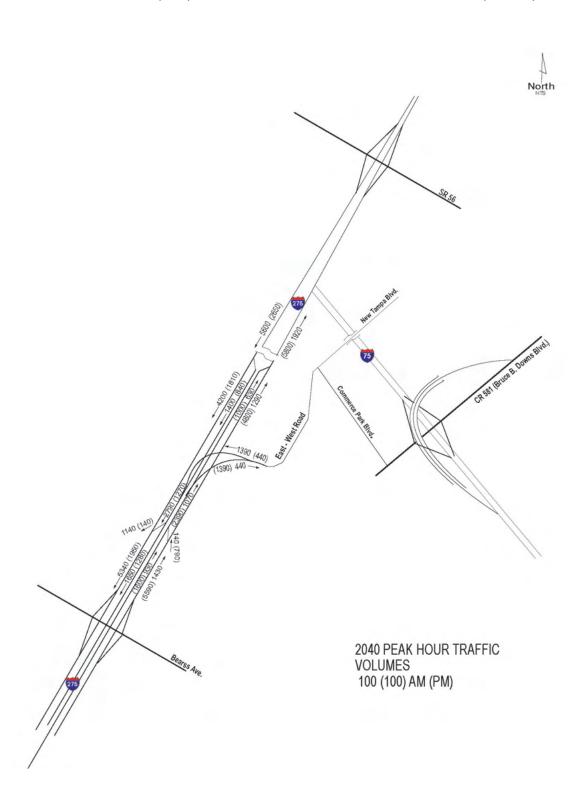


FIGURE 2-2 DESIGN YEAR (2040) DIRECTIONAL DESIGN HOURLY VOLUMES (DDHVS)



Section 3.0 FUTURE CONDITIONS TRAFFIC OPERATIONS ANALYSIS

A future conditions traffic operations analysis was conducted to evaluate the performance of the roadways within the study area. The future conditions analysis was performed using the Highway Capacity Software (HCS) 2010, Version 6.5.

3.1 FUTURE BUILD OPERATIONS ANALYSIS

The number of lanes used in the future analysis of the East-West Road from Commerce Park Boulevard/New Tampa Boulevard and I-275 from Bearss Avenue to the I-75/I-275 junction are provided on **Figure 3-1**. This geometry and the DDHVs provided on Figure 2-2 for the a.m. and p.m. peak period were input into the HCS and the level of service was determined. The levels of service for highways, established by the Transportation Research Board's Levels of Service criteria, range from LOS A through LOS F, where LOS A is the best level of service and LOS F is the worst traffic conditions. The projected levels of service and the associated density in the Design Year (2040) for the East-West Road and the I-275 general use and express lanes are summarized in **Table 3-1**.

In the Design Year (2040), the East-West Road is anticipated to operate at LOS B or better in the a.m. and p.m. peak periods. The proposed express lanes on I-275 are anticipated to operate at LOS D or better with the addition of the East-West Road and interchange. North of the proposed express lane terminus, the general use lanes on I-275 are anticipated to operate at LOS E in the northbound direction during the p.m. peak hour. The Design Year (2040) HCS analyses results are provided in **Appendix B**.

FIGURE 3-1 DESIGN YEAR (2040) NUMBER OF LANES

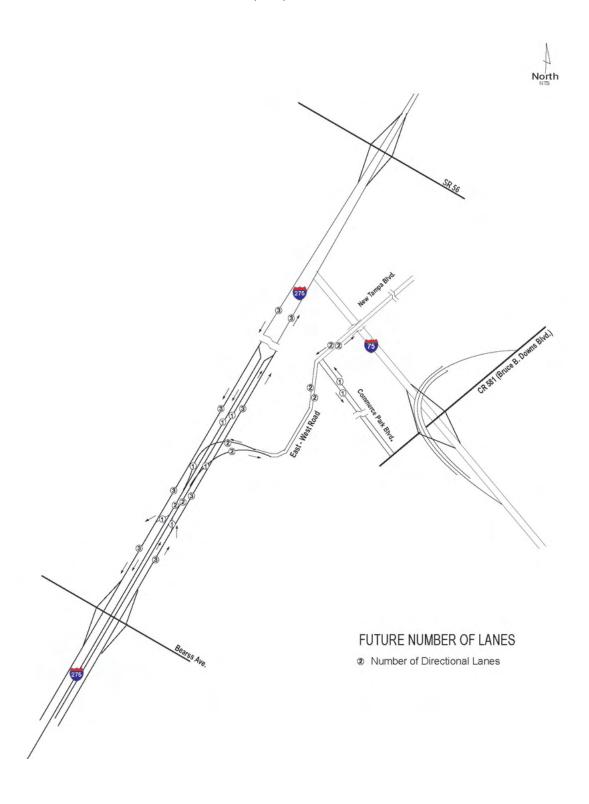


TABLE 3-1 DESIGN YEAR (2040) LEVELS OF SERVICE

				AM Pea	ık Hour		PM Peak Hour			
			Main	line	Ram Merge/Di Area	verge	Mainli	ne	Ran Merge/I Arc	iverge
Roadway	Location	Direction	Density ¹	LOS	Density ¹	LOS	Density ¹	LOS	Density ¹	LOS
East-West	I-275 to Commerce Park Blvd./New Tampa	Eastbound	4.0	A	-	-	12.6	В	-	-
Road	Blvd.	Westbound	12.6	В	-	-	4.0	A	-	-
	Bearss Ave. to Express Slip Ramp		7.5	A	-	-	33.4	D	-	-
	Express Slip Ramp		-	-	8.5	A	-	-	34.7	D
	Express Slip Ramp to Express Terminus	Northbound	6.8	A	-	-	26.6	D	-	-
	Express Terminus Ramp		-	-	11.2	В	-	-	33.7	D
I-275 General Use	Express Terminus to I-75/I-275 Junction		10.1	A	-	-	35.6	Е	-	-
Lanes	I-75/I-275 Junction to Express Begin		33.5	D	-	-	13.9	В	-	-
	Express Begin Ramp		-	-	34.2	D	-	-	17.9	В
	Express Begin to Express Slip Ramp	Southbound	22.5	С	-	-	9.5	A	-	-
	Express Slip Ramp		-	-	34.4	D	-	-	12.6	В
	Express Slip Ramp to Bearss Ave.		31.1	D	-	-	10.2	A	-	-
	Bearss Ave. to Express Slip Ramp		14.4	В	-	-	26.1	D	-	-
	Express Slip Ramp to East-West Off-Ramp	Northbound	8.3	A	-	-	18.6	C	-	-
I-275	East-West Off-Ramp to Express Terminus		9.8	A	-	-	15.5	В	-	-
Express Lanes	Express Begin to East-West On-Ramp		21.6	С	-	-	13.0	В	-	-
	East-West On-Ramp to Express Slip Ramp	Southbound	22.0	С	-	-	9.9	A	-	-
	Express Slip Ramp to Bearss Ave.		27.2	D	-	-	20.0	C	-	-

¹ Density = passenger cars per mile per lane

Section 4.0 CONCEPTUAL ROADWAY PLAN

Preliminary engineering criteria used to develop the project are consistent with the requirements of the *Plans Preparation Manual*, FDOT (January 2014) and *A Policy on Geometric Design of Highways and Streets*, AASHTO (2004). In addition, the criteria applied for the I-275 express lanes, and separation of those lanes from the I-275 general use lanes, are consistent with current practices included in the *Draft TBX Master Plan* (January 2015).

Figure 4-1 provides the conceptual roadway plan for the East-West Road preferred alternative. Detailed plan sheets are provided in **Appendix C**.

FIGURE 4-1 EAST-WEST ROAD PREFERRED ALTERNATIVE





Section 5.0 PRELIMINARY COST ESTIMATES

Preliminary estimates were developed for the construction costs associated with the preferred Alternative 4 for the East-West Road, interchange at I-275 and additional express lanes on I-275. These costs include Preliminary Engineering (PE)/Design; Mitigation; Permitting; Change Order Contingency; and Construction, Engineering, and Inspection (CEI). A summary of the conceptual cost estimates is provided in **Table 5-1**. For a detailed breakdown of the cost estimate, refer to **Appendix D**. All East-West Road and associated improvements are in current dollars without escalation to the construction year.

TABLE 5-1 PRELIMINARY COST ESTIMATES

		C	Construction (Cost Summar	y		Total		
Roadway	Construction	PE/Design	CEI	Mitigation	Permitting	Change Order Contingency	Construction Cost		
East-West Road & Interchange Ramps	\$87,222,000	\$10,466,640	\$1,569,996	\$3,132,570	\$62,651	\$4,517,729	\$106,971,586		
I-275 Express Lanes	\$41,396,000	\$4,967,520	\$6,209,400	\$0 ¹	\$827,920	\$2,069,800	\$55,470,640		
	PROJECT TOTAL COST:								

All mitigation costs for the project are included in the estimate for the East-West Roadway & Interchange Ramps

Section 6.0 CONSISTENCY WITH FHWA & FDOT STANDARDS & POLICIES

The Federal Highway Administration (FHWA) regulates the addition and modification of access points along the interstate system and, as such, has eight requirements that must be met before a new connection is approved. The following summarizes how the proposed interchange of East-West Road and the Interstate 275 (I-275) Express Lanes will satisfy each requirement.

The need being addressed by the request cannot be adequately satisfied by existing interchanges to the Interstate, and/or local roads and streets in the corridor can neither provide the desired access, nor can they be reasonably improved (such as access control along surface streets, improving traffic control, modifying ramp terminals and intersections, adding turn bays or lengthening storage) to satisfactorily accommodate the design-year traffic demands (23 CFR 625.2(a)).

The need for a network of managed/express lanes in the Tampa Bay region has previously been established by FDOT. A traffic analysis of existing conditions conducted as part of the TBX Master Plan established that the existing system (general use lanes on I-275 and the connecting roadway network) operate at or over capacity, even with improvements proposed in Hillsborough and Pasco Counties' LRTP. Further, there is no direct connection to I-275 from the New Tampa area and southern Pasco County.

As such, it has been determined through development of the TBX Master Plan and Hillsborough and Pasco Counties' LRTPs that all reasonable improvements have been explored and will not satisfactorily accommodate the design-year traffic demands served by the proposed East-West Road and interchange.

- The need being addressed by the request cannot be adequately satisfied by reasonable transportation system management (such as ramp metering, mass transit, and HOV facilities), geometric design, and alternative improvements to the Interstate without the proposed change(s) in access (23 CFR 625.2(a)).
 - Non-traditional transportation modes such as ramp metering, Travel Demand Management, and Mass Transit were considered as part of Hillsborough and Pasco Counties' LRTP processes and determined to be not sufficient to meet the travel demands that will be addressed by the proposed East-West Road and interchange.
- An operational and safety analysis has concluded that the proposed change in access does not have a significant adverse impact on the safety and operation of the Interstate facility (which includes mainline lanes, existing, new, or modified ramps, ramp

intersections with crossroad) or on the local street network based on both the current and the planned future traffic projections. The analysis shall, particularly in urbanized areas, include at least the first adjacent existing or proposed interchange on either side of the proposed change in access (23 CFR 625.2(a), 655.603(d) and 771.111(f)). The crossroads and the local street network, to at least the first major intersection on either side of the proposed change in access, shall be included in this analysis to the extent necessary to fully evaluate the safety and operational impacts that the proposed change in access and other transportation improvements may have on the local street network (23 CFR 625.2(a) and 655.603(d)). Requests for a proposed change in access must include a description and assessment of the impacts and ability of the proposed changes to safely and efficiently collect, distribute and accommodate traffic on the Interstate facility, ramps, intersection of ramps with crossroad, and local street network (23 CFR 625.2(a) and 655.603(d)). Each request must also include a conceptual plan of the type and location of the signs proposed to support each design alternative (23 U.S.C. 109(d) and 23 CFR 655.603(d)).

As the access requested for the East-West Road is directly to the express lanes of I-275, the project is not anticipated to degrade the levels of service on the general use lanes of the interstate system. The proposed interchange of East-West Road and the I-275 express lanes is expected to relieve congestion and improve traffic operations at several critical locations in the study area, including the I-75/State Road 56 (SR 56) interchange, the CR 581 (Bruce B. Downs Boulevard)/I-75 interchange, and the section of I-75 south of SR 56. Motorists now accessing I-75 at CR 581 (Bruce B. Downs Boulevard) will be provided convenient access to I-275, which has lower traffic volumes and more available capacity than the parallel portion of I-75. Furthermore, the proposed interchange will enhance incident management capabilities by providing additional detour route options and enhance emergency management capabilities by increasing roadway capacity from the Strategic Intermodal System (SIS) and hurricane evaluation routes to the emergency evacuation centers located in the New Tampa area and southern Pasco County.

The proposed access connects to a public road only and will provide for all traffic movements. Less than "full interchanges" may be considered on a case-by-case basis for applications requiring special access for managed lanes (e.g., transit, HOVs, HOT lanes) or park and ride lots. The proposed access will be designed to meet or exceed current standards (23 CFR 625.2(a), 625.4(a)(2), and 655.603(d)).

The Build Alternative interchange configuration is proposed to access an extension of the I-275 express lanes via Commerce Park Boulevard/New Tampa Boulevard, which are County roadways. Traffic movements are proposed to/from the express lanes on I-275 south. Note that at this time, there are no plans to extend East-West Road west of I-275.

AASHTO recommends a minimum interchange spacing of 3.0 miles in rural areas and 1.0 mile in urban areas. Further, FDOT recommends a minimum spacing of 2.0 miles for urbanized areas and 3.0 miles for transitioning urbanized areas. The location of the

proposed I-275/East-West Road interchange is approximately 3.0 miles north of the I-275/Bearss Avenue interchange and approximately 5.9 miles south of the I-75/SR 56 interchange. As such, the proposed interchange spacing between adjacent interchanges exceeds design guidelines established by the FHWA and the FDOT.

The proposal considers and is consistent with local and regional land use and transportation plans. Prior to receiving final approval, all requests for new or revised access must be included in an adopted Metropolitan Transportation Plan, in the adopted Statewide or Metropolitan Transportation Improvement Program (STIP or TIP), and the Congestion Management Process within transportation management areas, as appropriate, and as specified in 23 CFR part 450, and the transportation conformity requirements of 40 CFR parts 51 and 93.

The need for improved access to/from the New Tampa area and southern Pasco County has long been recognized by the Hillsborough and Pasco County MPO and the City of Tampa. The East-West Road is identified as an unfunded need in the Hillsborough County adopted 2035 LRTP and a potential cost feasible project (depending on the adopted investment scenario) in the 2040 LRTP currently being developed. The East-West Road is also proposed to be included on the latest *Future Transportation Network Map* as part of the Hillsborough County Comprehensive Plan Update.

In corridors where the potential exists for future multiple interchange additions, a comprehensive corridor or network study must accompany all requests for new or revised access with recommendations that address all of the proposed and desired access changes within the context of a longer-range system or network plan (23 U.S.C. 109(d), 23 CFR 625.2(a), 655.603(d), and 771.111).

The East-West Road and proposed connection to the I-275 express lanes will be incorporated into the TBX Master Plan at the appropriate stage of the project development process.

When a new or revised access point is due to a new, expanded, or substantial change in current or planned future development or land use, requests must demonstrate appropriate coordination has occurred between the development and any proposed transportation system improvements (23 CFR 625.2(a) and 655.603(d)). The request must describe the commitments agreed upon to assure adequate collection and dispersion of the traffic resulting from the development with the adjoining local street network and Interstate access point (23 CFR 625.2(a) and 655.603(d)).

Approved and planned developments in the area have been integrated into the travel demand forecasting for this study. Several planned developments have integrated the proposed roadway into their site plans. In addition, Developments of Regional Impact (DRI) have been approved based upon the assumption that capacity provided by the proposed East-West Road will be available in the near future to mitigate traffic impacts

resulting from those developments. The East-West Road is also proposed to be included on the latest *Future Transportation Network Map* as part of the Hillsborough County Comprehensive Plan Update.

8 The proposal can be expected to be included as an alternative in the required environmental evaluation, review and processing. The proposal should include supporting information and current status of the environmental processing (23 CFR 771.111).

A Project Development and Environment (PD&E) Study for the East-West Road and interchange with the I-275 Express Lanes will need to be prepared concurrent with an Interchange Justification Report (IJR). Any environmental impacts for the proposed roadway and interchange will need to be fully evaluated and documented during the PD&E Study following all procedures and requirements of the National Environmental Policy Act (NEPA).

Section 7.0 FEASIBILITY REVIEW

After review of the four potential alternatives, Alternative 4 was approved by the City Project Manager as the preferred alternative for further analysis in this study based on the total volume of potential toll traffic projected on the East-West Road associated facilities. As stated previously in this report, this scenario is projected to generate approximately 28,100 to 32,600 vpd on the East-West Road toll facility and associated I-275 Express Lanes, which warrants the need for a four-lane roadway (two lanes in each direction) on the majority of the East-West Road and I-275 corridor. Based on the projected travel demand and number of lanes, the East-West Road is recommended for further evaluation as a potential Public Private Partnership (P3) project. **Figure 7-1** shows the three components of the potential new toll facilities in north Tampa.

As this study focused on the project's feasibility from a traffic demand perspective, an evaluation of potential toll revenues generated by the project will need to be documented in a Preliminary Toll Revenue Study. In addition, an FDOT PD&E/NEPA Study for the East-West Road and interchange with the I-275 express lanes will need to be prepared concurrent with an Interchange Justification Report (IJR). Note that Alternative 4 proposes a new connection to the interstate system and, therefore, constitutes a federal action through the IJR and NEPA process. As such, any environmental impacts for the proposed roadway and interchange will need to be fully evaluated and documented following all procedures and requirements of the NEPA process. The anticipated level of environmental documentation will be an Environmental Assessment (EA) and Finding of No Significant Impact (FONSI).

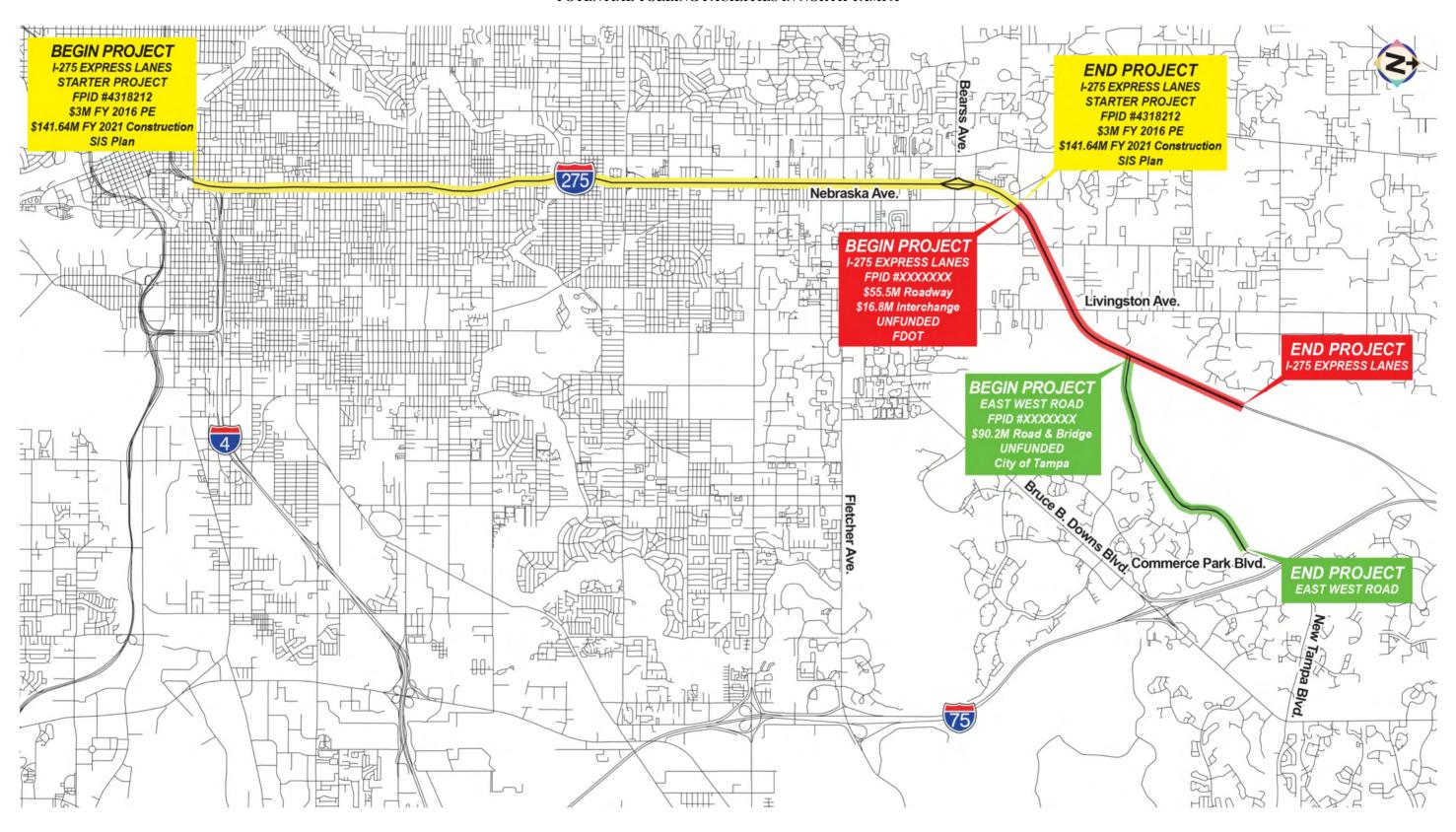
FACTS

- East West Road in Hillsborough Long Range Transportation Plan (Needs)
 - LRTP 2012-2025 Design \$6.75M
 - LRTP 2031-2040 Construction \$74.89M
 - Revenue Source: Local Sales Tax (if 2016 referendum approved)
- Tampa Bay Express (TBX) I-275 from Jefferson-Orange to North of Bearss Avenue Starter Project in FDOT SIS Plan #4318212
 - FY 2016 PE \$3M / FY 2021 Construction \$141.64M

POSSIBLE ADVANCE AS P3

• TBX I-275 North FPID #4318212 –Jefferson/Orange Access East Side CBD (Funded)

FIGURE 7-1
POTENTIAL TOLLING FACILITIES IN NORTH TAMPA



- TBX I-275 Extension north of Bearss Ave to East West Road Interchange (Unfunded)
- East West Road Commerce Park Blvd to I-275 TBX (Unfunded)

FLORIDA DOT UNSOLICITED PROPOSAL - FLORIDA STATUTE 334.30

Public-private transportation facilities may advance projects programmed in the

- Adopted Five Year Work Program (FY2015-FY2020 or FY2016-FY2021) or
- Projects increasing transportation capacity and greater than \$500 million in the
- 10-year Strategic Intermodal Plan using funds provided by P3s or
- Private entities to be reimbursed from department funds for the project as programmed in the adopted work program.
- Florida DOT Unsolicited Proposal Process:
 - Proposers should begin conceptual discussions with the Project Finance Manager, (Leon Corbett) in the Office of the Comptroller, Project Finance Section to gain an understanding of program basics.
 - If proposal meets basic program requirements, proposers should continue conceptual discussions with the District/Turnpike to determine District/Turnpike interest.
 - If District/Turnpike is interested, the concept should receive executive direction (Secretary/Assistant Secretary/District Secretary) before proceeding further.
 - Central Office will determine if the project involves federal aid and/or is state-funded. District/Turnpike should request a Cash Availability Schedule from Central Office.
 - Proposer submits to the Project Finance Manager an Unsolicited Proposal with \$50,000 deposit. Proposal may be a brief concept statement. If acceptable and within Executive Direction, the Department begins 120-day advertisement period.
 - During the advertisement period no evaluation or analysis is performed on the proposal(s).
 - All proposals must be complete and sufficient for evaluation by the end of the advertisement period or will be rejected and returned.
 - At the end of the advertisement period, District/Turnpike and Central Office will evaluate the proposal(s) as may be appropriate and select Best Value Proposal for negotiation.

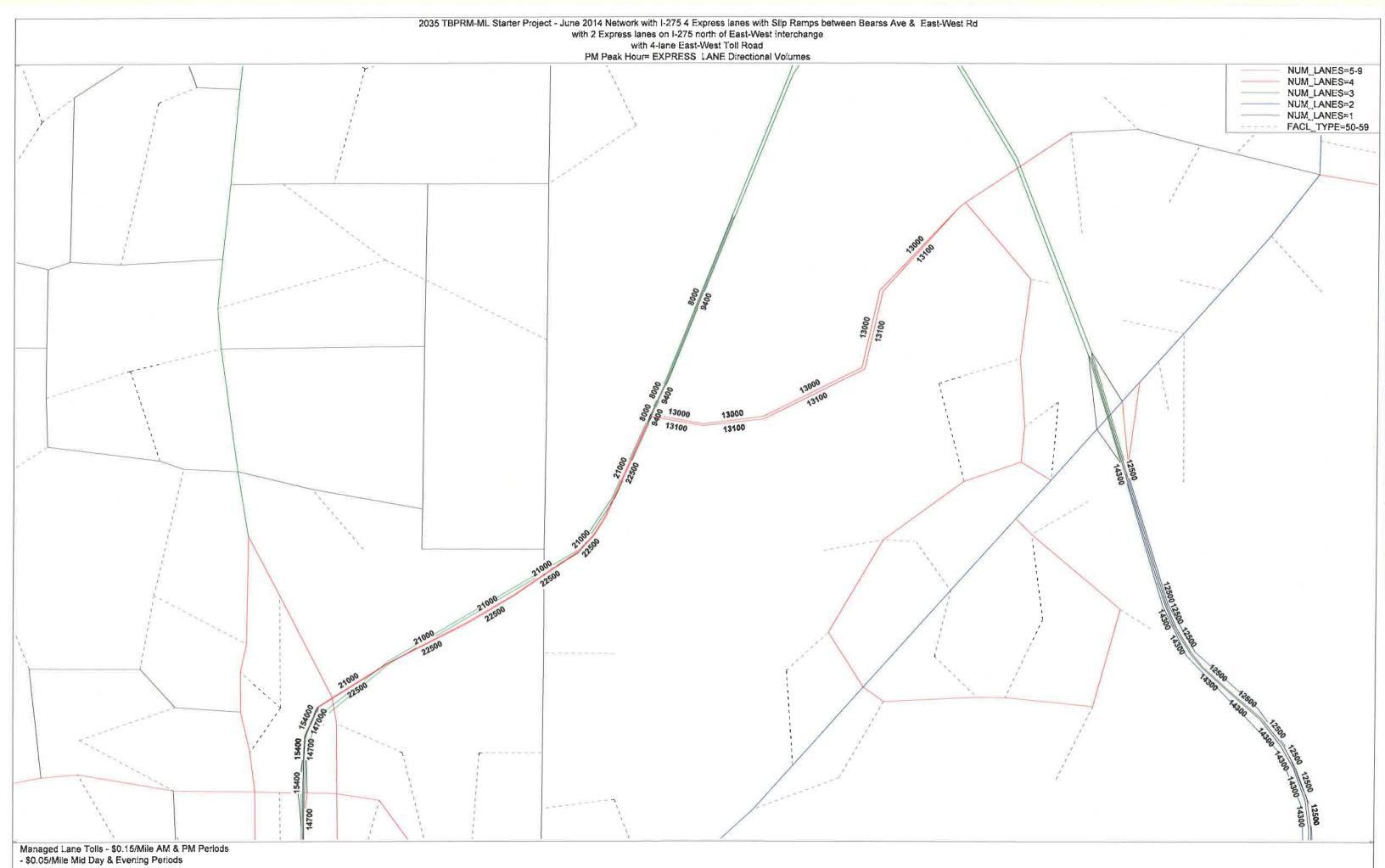
- If executive direction is to proceed, then award/execute contract with the final selected proposer.
- Project is produced by the District/Turnpike according to the negotiated procurement documents
- East West Road Commerce Park Blvd to I-275 TBX (Unfunded)
 - City/County 1% Sales Tax Initiative 2016 Referendum required (\$83.16M)
 - Seek Federal Transit Administration "Premium Transit" funding for "guideway"
 - Potential Tolls on City of Tampa East West Road dedicated to funding 2040 AADT 28,100

WHAT'S NEXT?

City requests FDOT, Hillsborough County, Tampa Hillsborough Expressway Authority, and MPO to cooperate on funding the East West Road and TBX I-275 north extension to tie East West Road to TBX I-275. Potential funding scenarios to advance the project are:

- Seek FDOT \$55.5M SIS funds for new TBX extension from current programmed TBX project #4318212 (does not include #16.8M for East West Road/I-275 interchange)
- Seek FDOT to provide I-275 Interchange (\$16.8M) at East West Road as part of TBX extension north from current TBX project #4318212
- City and/or County funding \$23.81M "gap" in 2021-2025 (\$106.97M \$83.16 = \$23.81) assumes 2016 Hillsborough 1% Sales Tax already committed for \$83.16M without I-275 interchange
- FDOT/Florida Turnpike Alternative and THEA/P3 Alternative assumes transfer ownership of East West Road from City and becomes part of State Road system
- City of Tampa could reinitiate the LAP agreement with FDOT D7 to fund revised IJR and PD&E using basic information updated from 2009 East West Road shutdown. Possible use of FDOT funding for LAP and subsequent design/build or P3 funding.





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	SEGMENT		SEGMEN		SEGMEN	T NO. 3	Segmen	t No. 4	Segmen	t No. 5	TOTAL OF AL	L SEGMENTS
	1-275	i	CR 5	81	CR 6	81	Bearse	Ave	Livingte	n Rd		
YEAR	N. of Bears	s Ave.	South o	f J-75	North o	t i-75			South o	1-276		
	Station #1	9-2001	Station #1	0-5729	Station #	10-6730	Station #	10-0109	\$tation #	10-5700		
	Counts	Trend	Counts	Trend	Counts	Trend	Counts	Trend			Counts	Trend
1998	26,000	24,400					42,000	39,600				
1999	30,000	26,600					42,500	40,600				
2000	26,000	28,900					42,500	41,600				
2001	24,000	31,100					40,000	42,500				
2002	32,000	33,400					42,000	43,500			1	
2003	36,000	35,600					42,500	44,500				
2004	37,000	37,900					47,500	45,500				
2005	40,000	40,100					52,500	46,400				
2006	42,000	42,400					53,500	47,400				
2007	55,500	44,600					48,500	48,400				
2008	50,000	46,900	41,000	48,400	48,500	58,100	50,000	49,400	11,900	11,000	201,400	216,200
2009	52,000	49,100	54,000	49,100	67,500	60,100	48,000	50,400	12,000	13,000	233,500	220,400
2010	49000	51,400	53000	49,800	66500	62,200	48,000	51,300	12300	15,000	228,800	224,700
2011	51000	53,600	53000	50,500	66500	64,300	49,000	52,300	13000	17,000	232,500	228,900
2012	51000	55,900	54000	51,200	67500	66,400	49,500	53,300	13000	19,000	235,000	233,200
2013	58500	58,100	46000	52,000	63000	68,400	49,000	54,300	13000	21,100	229,500	237,400
2035		107,500		67,700		114,000		75,800		65,400		330,900
2040		118,800		71,200		124,400		80,700		75,400		352,100
DOT TREND		3.86%		1.37%		3.03%		1.80%		9.54%		1.799
2013 - 2040)		- 1		- 1								
		- 1										
BRPM-MLV24 L	INEAR	5.39%		1.10%		1.25%		1.48%				2.31%
ROJECTION (20	008 to 2035)	- 1										
		- 1										
		I										
VERAGE GROV	WTH	- 1										2.05%
		- 1		- 1								



I-275 2040 AM-PM Peak Hour HCS Freeway Analysis

	BASIC FR	EEWAY SE	GMENTS WORKSHE	ET	
General Information			Site Information		
Analyst			Highway/Direction of Trav	ei <i>I-275/</i> N	IB
Agency or Company	URS		From/To		Ave/Express Slip
Date Performed Analysis Time Period	10/6/2014 AM		Jurisdiction Analysis Year	Ramp Hillsboi 2040	rough County
Project Description East-	West Rd				
▼ Oper.(LOS)			Des.(N)	□Pla	nning Data
Flow Inputs					
Volume, V AADT	1430	veh/h veh/day	Peak-Hour Factor, PHF %Trucks and Buses, P _T	0.92 3	
Peak-Hr Prop. of AADT, K Peak-Hr Direction Prop, D DDHV = AADT x K x D		veh/h	%RVs, P _R General Terrain: Grade % Length Up/Down %	0 Level mi	
Calculate Flow Adjus	tments				
fp	1.00		E _R	1.2	
E _T	1,5		$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R -$	1)] 0.985	
Speed Inputs			Calc Speed Adj and	FFS	
Lane Width		ft			
Rt-Side Lat. Clearance		ft	f _{LW}		mph
Number of Lanes, N	3		f _{LC}		mph
Total Ramp Density, TRD		ramps/mi	TRD Adjustment		mph
FFS (measured)	70.0	mph	FFS	70.0	mph
Base free-flow Speed, BFFS		mph	113	70.0	трт
LOS and Performance	e Measures		Design (N)		
Operational (LOS) v _p = (V or DDHV) / (PHF x I x f _p)	√x f _{HV} 526	pc/h/in	Design (N) Design LOS v _p = (V or DDHV) / (PHF x	N x f _{HV}	pc/h/ln
S	70.0	mph	x f _p)		
D = v _p / S	7.5	pc/mi/in	D = 1. / C		mph
.os	Α		D = v _p / S Required Number of Lanes	s, N	pc/mi/ln
Glossary			Factor Location		
N - Number of lanes V - Hourly volume V _p - Flow rate LOS - Level of service speed DDHV - Directional design h	BFFS - Bas		E _R - Exhibits 11-10, 11-12 E _T - Exhibits 11-10, 11-11, f _p - Page 11-18 LOS, S, FFS, v _p - Exhibits 11-3	11-13	f _{LW} - Exhibit 11-8 f _{LC} - Exhibit 11-9 TRD - Page 11-1

HCS 2010TM Version 6.50

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General Information			Site Information		
Analyst			Highway/Direction of Trave		
Agency or Company	URS		From/To	EL Slip Termin	Ramp/E-W
Date Performed Analysis Time Period	10/16/2014 AM		Jurisdiction Analysis Year		rough County
Project Description East-					
✓ Oper.(LOS)	N		Des.(N)	☐ Pla	nning Data
Flow Inputs					
Volume, V AADT	1290	veh/h veh/day	Peak-Hour Factor, PHF %Trucks and Buses, P _T	0.92 3	
Peak-Hr Prop. of AADT, K			%RVs, P _R	0	
Peak-Hr Direction Prop, D DDHV = AADT x K x D		veh/h	General Terrain: Grade % Length Up/Down %	Level mi	
Calculate Flow Adjus	tments				
fp	1.00		E _R	1.2	
E _T	1.5		$f_{HV} = 1/(1+P_T(E_T - 1) + P_R(E_R - 1)$)] <i>0</i> .985	
Speed Inputs			Calc Speed Adj and	FFS	
ane Width		ft			
Rt-Side Lat. Clearance		ft	f _{LW}		mph
Number of Lanes, N	3	5	f _{LC}		mph
Total Ramp Density, TRD		ramps/mi	TRD Adjustment		mph
FFS (measured)	70.0	mph	FFS	70.0	mph
Base free-flow Speed, BFFS		mph	,,,,		
LOS and Performance	e Measures		Design (N)		
Operational (LOS)	J v f		Design (N) Design LOS		
$V_p = (V \text{ or DDHV}) / (PHF x)$ (f_p)		pc/h/ln	$v_p = (V \text{ or DDHV}) / (PHF x x f_p)$	N x f _{HV}	pc/h/ln
3	70.0	mph	s ^p		mph
$0 = v_p / S$	6.8	pc/mi/ln	D = v _p / S		pc/mi/ln
.os	Α		Required Number of Lanes	, N	p
Glossary			Factor Location		
I - Number of lanes / - Hourly volume p - Flow rate OS - Level of service peed DHV - Directional design i	S - Speed D - Densit FFS - Free BFFS - Bas	ty -flow speed	E_R - Exhibits 11-10, 11-12 E_T - Exhibits 11-10, 11-11, f_p - Page 11-18 LOS, S, FFS, v_p - Exhibits 11-3		f _{LW} - Exhibit 11-8 f _{LC} - Exhibit 11-9 TRD - Page 11-1

HCS 2010TM Version 6.50 Generated: 10/16/2014 3:43 PM

	BASIC FR	EEWAY SE	GMENTS WORKSHEE	. [
General Information			Site Information		
Analyst			Highway/Direction of Trave		
Agency or Company	URS		From/To	Slip Rai Junctioi	mp/l-75/l-275
Date Performed Analysis Time Period	10/6/2014 AM		Jurisdiction Analysis Year		ough County
Project Description East-	West Rd.				
		r :	0es.(N)	☐ Pla	nning Data
Flow Inputs					
Volume, V AADT	1920	veh/h veh/day	Peak-Hour Factor, PHF %Trucks and Buses, P _T	0.92 3	
Peak-Hr Prop. of AADT, K Peak-Hr Direction Prop, D DDHV = AADT x K x D		veh/h	%RVs, P _R General Terrain: Grade % Length Up/Down %	0 Level mi	
Calculate Flow Adjus	tments				
fp	1.00		E _R	1.2	
E _T	1.5		$f_{HV} = 1/(1+P_T(E_T-1) + P_R(E_R-1)$)] 0.985	
Speed inputs			Calc Speed Adj and	FFS	
Lane Width		ft			
Rt-Side Lat. Clearance		ft	f _{cw}		mph
Number of Lanes, N	3		f _{LC}		mph
Total Ramp Density, TRD		ramps/mi	TRD Adjustment		mph
FFS (measured)	70.0	mph	FFS	70.0	mph
Base free-flow Speed, BFFS		mph			
LOS and Performance	e Measures	5	Design (N)		
Operational (LOS) v _p = (V or DDHV) / (PHF x N	N x f _{HV} 706	pc/h/ln	<u>Design (N)</u> Design LOS v _p = (V or DDHV) / (PHF x	N x f _{HV}	pc/h/ln
x f _p)	70.0	mnh	x f _p)		possui
\$ D=v /8	10.1	mph pc/mi/ln	s		mph
D=v _p /S LOS	70.1 A	ролили	$D = v_p / S$		pc/mi/ln
103	Α		Required Number of Lanes	s, N	
Glossary			Factor Location		
N - Number of lanes / - Hourly volume / _p - Flow rate LOS - Level of service speed DDHV - Directional design h	BFFS - Ba		E _R - Exhibits 11-10, 11-12 E _T - Exhibits 11-10, 11-11, f _p - Page 11-18 LOS, S, FFS, v _p - Exhibits 11-3		f _{LW} - Exhibit 11-8 f _{LC} - Exhibit 11-9 TRD - Page 11-1

HCS 2010TM Version 6.50

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	BASIC FR	EEWAY SE	GMENTS WORKSHEE	T	
General Information			Site Information		
Analyst Agency or Company Date Performed Analysis Time Period Project Description East-	URS 10/6/2014 AM		Highway/Direction of Trave From/To Jurisdiction Analysis Year	Bearss	B Express Lanes Ave/E-W Slip Ramp ough County
✓ Oper.(LOS)	Prost Noda		Pes.(N)	□ Plar	nning Data
Flow Inputs					
Volume, V AADT Peak-Hr Prop. of AADT, K Peak-Hr Direction Prop, D DDHV = AADT x K x D	1860	veh/h veh/day veh/h	Peak-Hour Factor, PHF %Trucks and Buses, P _T %RVs, P _R General Terrain: Grade % Length	0.92 0 0 Level mi	
			Up/Down %		
Calculate Flow Adjus	tments				
f_p	1.00		E _R	1.2	
E _T	1.5		$f_{HV} = 1/(1+P_T(E_T - 1) + P_R(E_R - 1)$)] 1.000	
Speed Inputs			Calc Speed Adj and I	FFS	
Lane Width		ft			
Rt-Side Lat. Clearance		ft	f _{LW}		mph
Number of Lanes, N	2		f _{LC}		mph
Total Ramp Density, TRD		ramps/mi	TRD Adjustment		mph
FFS (measured) Base free-flow Speed, BFFS	70.0	mph mph	FFS	70.0	mph
LOS and Performanc	e Measures		Design (N)		
Operational (LOS) v _p = (V or DDHV) / (PHF x I x f _p) S D = v _p / S LOS	N x f _{HV} 1011 70.0 14.4 B	pc/h/ln mph pc/mi/ln	Design (N) Design LOS v _p = (V or DDHV) / (PHF x x f _p) S D = v _p / S Required Number of Lanes		pc/h/in mph pc/mi/ln
Glossary			Factor Location		
N - Number of lanes V - Hourly volume v _p - Flow rate LOS - Level of service speed DDHV - Directional design i	BFFS - Ba		E_R - Exhibits 11-10, 11-12 E_T - Exhibits 11-10, 11-11, f_p - Page 11-18 LOS, S, FFS, v_p - Exhibits 11-3		f _{LW} - Exhibit 11-8 f _{LC} - Exhibit 11-9 TRD - Page 11-11

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=	BASIC FR	EEWAY SE	GMENTS WORKSHEE	T	
General Information			Site Information		
Analyst			Highway/Direction of Trave	∋l <i>I-275 E</i>	xpress/NB
Agency or Company	URS		From/To	EW Slip	Ramp - E-W Off-
Date Performed Analysis Time Period	10/6/2014 AM		Jurisdiction Analysis Year	Ramp Hillsbor 2040	rough County
Project Description East-	West Raod				
Oper.(LOS)		Г	Des.(N)	□Pla	nning Data
Flow Inputs					
Volume, V AADT	1070	veh/h veh/day	Peak-Hour Factor, PHF %Trucks and Buses, P _T	0.92 0	
Peak-Hr Prop. of AADT, K Peak-Hr Direction Prop, D DDHV = AADT x K x D		veh/h	%RVs, P _R General Terrain: Grade % Length Up/Down %	0 Level mi	
Calculate Flow Adjus	tments				
f _p	1.00		E _R	1.2	
E _T	1.5		$f_{HV} = 1/(1+P_T(E_T - 1) + P_R(E_R - 1)$)] 1.000	
Speed Inputs			Calc Speed Adj and I	FFS	
Lane Width		ft			
Rt-Side Lat. Clearance		ft	f _{LW}		mph
Number of Lanes, N	2		f _{LC}		mph
Total Ramp Density, TRD		ramps/mi	TRD Adjustment		mph
FFS (measured)	70.0	mph	FFS	70.0	mph
Base free-flow Speed, BFFS		mph		70.0	прп
LOS and Performance	e Measures		Design (N)		
<u>Operational (LOS)</u> / _p = (V or DDHV) / (PHF x N < f _p)	√x f _{HV} 582	pc/h/in	Design (N) Design LOS v _p = (V or DDHV) / (PHF x	N x f _{HV}	pc/h/ln
5	70.0	mph	x f _p)		p-4/
) = v _o / S	8.3	pc/mi/ln	S		mph
.os	A	P	D = v _p / S Required Number of Lanes	, N	pc/mi/in
Glossary			Factor Location		
I - Number of lanes - Hourly volume - Flow rate OS - Level of service peed DHV - Directional design h	S - Speed D - Densit FFS - Free BFFS - Bas nour volume	ty -flow speed	E _R - Exhibits 11-10, 11-12 E _T - Exhibits 11-10, 11-11, f _p - Page 11-18 LOS, S, FFS, v _p - Exhibits 11-3		f _{LW} - Exhibit 11-8 f _{LC} - Exhibit 11-9 TRD - Page 11-1

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BASIC FR	EEWAY SE	GMENTS WORKSHEE	: 1	
		To:4 (
			-1 (OTE /	Evene AMD
UDO		* .		Express/NB f-Ramp/Express
			Termin	ius
AM		Jurisdiction Analysis Year	Hillsbo 2040	rough County
West Road				
	F C	Des.(N)	☐ Pia	inning Data
1260	veh/h	Peak-Hour Factor, PHF	0.92	
	veh/day	,	0	
		• • • • • • • • • • • • • • • • • • • •	0	
	uoh/h			
	venn	•	1111	
tments		0		
		E	1.2	
1.5				
		Calc Speed Adj and	FFS	
	ft			
	ft	f _{rw}		mph
2				mph
	ramps/mi			mph
70.0	mph		70.0	mph
	mnh		70.0	titbu
e Measures		Design (N)		
		Design (N)		
Juf		Design LOS		
`^' ^{HV} 685	pc/h/in	$v_p = (V \text{ or DDHV}) / (PHF x)$	N x f _{HV}	/l- //
70.0	b	· ·		pc/h/in
		s		mph
	pc/mi/in	D = v ₀ / S		pc/mi/ln
Α		· ·	, N	•
S Space	4	Tactor Ecoution		
•		E _R - Exhibits 11-10, 11-12		f _{LW} - Exhibit 11-8
	•	E _T - Exhibits 11-10, 11-11,	11-13	f _{LC} - Exhibit 11-9
		f _p - Page 11-18		TRD - Page 11-11
DELO - DS	PE HEE-HOW	LOS, S, FFS, v _p - Exhibits	11-2,	
our volume		11-3		
	URS 10/16/2014 AM West Road 1260 tments 1.00 1.5 2 70.0 Measures X f _{HV} 685 70.0 9.8 A S - Speed D - Densit FFS - Free- BFFS - Bas	URS 10/16/2014 AM West Road 1260 veh/h veh/day veh/h tments 1.00 1.5 ft ft ft 2 ramps/mi 70.0 mph mph mph Measures Ix f _{HV} 685 pc/h/ln 70.0 mph 9.8 pc/mi/ln A S - Speed D - Density FFS - Free-flow speed BFFS - Base free-flow	Site Information Highway/Direction of Trave From/To 10/16/2014 Jurisdiction Analysis Year West Road F Des.(N) 1260	Highway/Direction of Travel 1-275/2

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	BASIC FR	EEWAY SE	GMENTS WORKSHEE	T	
				·	
General Information			Site Information		
Analyst Agency or Company Date Performed Analysis Time Period	URS 10/6/2014 AM		Highway/Direction of Trave From/To Jurisdiction Analysis Year	Slip Ra	General Use Ln/SB amp/l-75/l-275 rough County
Project Description East-	vvest Ra.		Dog (M)		in- Data
□ Oper.(LOS)		J L	Des.(N)	ı Pia	nning Data
<i>Flow Inputs</i> Volume, V AADT	5600	veh/h veh/day	Peak-Hour Factor, PHF %Trucks and Buses, P _T	0.92 3	
Peak-Hr Prop. of AADT, K Peak-Hr Direction Prop, D DDHV = AADT x K x D		veh/h	%RVs, P _R General Terrain: Grade % Length Up/Down %	0 Level mi	
Calculate Flow Adjus	tments				
f _ρ E _T	1.00 1.5		E_{R} $f_{HV} = 1/[1+P_{T}(E_{T}-1)+P_{R}(E_{R}-1)]$	1.2 0.985	_
Speed Inputs			Calc Speed Adj and		
Lane Width Rt-Side Lat. Clearance Number of Lanes, N Total Ramp Density, TRD FFS (measured) Base free-flow Speed, BFFS	3 70.0	ft ft ramps/mi mph mph	f _{LW} f _{LC} TRD Adjustment FFS	70.0	mph mph mph mph
LOS and Performance	e Measures		Design (N)		
Operational (LOS) v _p = (V or DDHV) / (PHF x N x f _p) S D = v _p / S LOS	N x f _{HV} 2059 61.4 33.5 D	pc/h/ln mph pc/mi/ln	Design (N) Design LOS v _p = (V or DDHV) / (PHF x x f _p) S D = v _p / S Required Number of Lanes		pc/h/ln mph pc/mi/ln
Glossary			Factor Location		
N - Number of lanes V - Hourly volume V _p - Flow rate LOS - Level of service speed DDHV - Directional design h	BFFS - Ba		E_R - Exhibits 11-10, 11-12 E_T - Exhibits 11-10, 11-11, f_p - Page 11-18 LOS, S, FFS, v_p - Exhibits 11-3		f _{LW} - Exhibit 11-8 f _{LC} - Exhibit 11-9 TRD - Page 11-11

General Information			Site Information		
Analyst			Highway/Direction of Travel	I-275 General Use Ln/SB	
Agency or Company	URS		From/To	Slip Ramp - East-West On/Slip Hillsborough County 2040	
Date Performed Analysis Time Period	10/6/2014 AM		Jurisdiction Analysis Year		
Project Description East-	West Road				
☑ Oper.(LOS)		Des.(N)	(N) Planning Data		
Flow Inputs					
Volume, V AADT	4200	veh/h veh/day	Peak-Hour Factor, PHF %Trucks and Buses, P _T	0.92 3	
Peak-Hr Prop. of AADT, K Peak-Hr Direction Prop, D DDHV = AADT x K x D		veh/h	%RVs, P _R General Terrain: Grade % Length Up/Down %	0 Level mi	
Calculate Flow Adjus	tments				
fp	1.00		E _R	1.2	
ÉT	1.5		$f_{HV} = 1/[1+P_{\uparrow}(E_{\uparrow}-1) + P_{R}(E_{R}-1)]$	0.985	
Speed Inputs			Calc Speed Adj and F	FS	
Lane Width		ft			
Rt-Side Lat. Clearance		ft	f _{LW}		mph
Number of Lanes, N	3		f _{LC}		mph
Total Ramp Density, TRD		ramps/mi	TRD Adjustment		mph
FFS (measured)	70.0	mph	FFS	70.0	mph
Base free-flow Speed, BFFS		mph		7 0.0	itip::
LOS and Performance	• Measures		Design (N)		
Operational (LOS) /p = (V or DDHV) / (PHF x N	l x f _{HV} 1545	pc/h/in	<u>Design (N)</u> Design LOS v _p = (V or DDHV) / (PHF x N	x f _{HV}	pc/h/ln
(f _p) S	68.6	mph	x f _p)		релинг
) = v _p / S	22.5	pc/mi/in	S		mph
.OS	C	pormin	D=v _p /S		pc/mi/ln
			Required Number of Lanes,	N	
Blossary			Factor Location		
- Number of lanes S - Speed - Hourly volume D - Density - Flow rate FFS - Free-flow speed - S - Level of service BFFS - Base free-flow seed - DHV - Directional design hour volume		E _R - Exhibits 11-10, 11-12 E _T - Exhibits 11-10, 11-11, 1 f _p - Page 11-18 LOS, S, FFS, v _p - Exhibits 1: 11-3		f _{LW} - Exhibit 11-8 f _{LC} - Exhibit 11-9 TRD - Page 11-1	

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	BASIC FR	EEWAY SE	GMENTS WORKSHEE	Т	
General Information			Site Information		
Analyst			Highway/Direction of Trave	el <i>I-275</i> G	eneral Use Ln/SB
Agency or Company	URS		From/To	E-W Or Ramp/E	n Ramp-Slip
Date Performed Analysis Time Period	10/6/2014 AM		Jurisdiction Analysis Year		ough County
Project Description East-	West Road				
		f c	es.(N)	☐ Plai	nning Data
Flow Inputs					
Volume, V AADT	5340	veh/h veh/day	Peak-Hour Factor, PHF %Trucks and Buses, P _T	0.92 3	
Peak-Hr Prop. of AADT, K Peak-Hr Direction Prop, D DDHV = AADT x K x D		veh/h	%RVs, P _R General Terrain: Grade % Length Up/Down %	0 Level mi	
Calculate Flow Adjus	tments				
fp	1.00		E _R	1.2	
E _T	1.5		$f_{HV} = 1/[1+P_T(E_T-1) + P_R(E_R-1)]$	1)] 0.985	
Speed Inputs			Calc Speed Adj and	FFS	
Lane Width		ft			
Rt-Side Lat. Clearance		ft	f _{LW}		mph
Number of Lanes, N	3		f _{LC}		mph
Total Ramp Density, TRD		ramps/mi	TRD Adjustment		mph
FFS (measured)	70.0	mph	FFS	70.0	mph
Base free-flow Speed, BFFS		mph			
LOS and Performance	e Measures		Design (N)		
<u>Operational (LOS)</u> v _p = (V or DDHV) / (PHF x !	N x f _{HV} 1964	pc/h/ln	<u>Design (N)</u> Design LOS v _p = (V or DDHV) / (PHF x	N x f _{HV}	pc/h/in
x f _p) S	63.2	mph	x f _p)		релип
D = v _p / S	31.1	pc/mi/ln	S		mph
LOS	D	ролини	D = v _p / S	- N1	pc/mi/in
01			Required Number of Lanes	5, 14	
Glossary			Factor Location		
N - Number of lanes	S - Spee		E _R - Exhibits 11-10, 11-12		f _{LW} - Exhibit 11-8
V - Hourly volume	D - Densi	-	E _T - Exhibits 11-10, 11-11,	11-13	f _{LC} - Exhibit 11-9
v _p - Flow rate LOS - Level of service speed		e-flow speed se free-flow	f _p - Page 11-18 LOS, S, FFS, v _p - Exhibits	11-2,	TRD - Page 11-1
DDHV - Directional design t	nour volume		11-3		

HCS 2010TM Version 6.50

General Information			Site Information		
Analyst			Highway/Direction of Travel		
Agency or Company	URS		From/To	Beginnin On-Ram	g of Express/EW
Date Performed Analysis Time Period	10/6/2014 AM		Jurisdiction Analysis Year		ugh County
Project Description East-	West Road				
✓ Oper.(LOS)		F E	Des.(N)	☐ Planr	ning Data
Flow Inputs					
Volume, V AADT	2800	veh/h veh/day	Peak-Hour Factor, PHF %Trucks and Buses, P _T	0.94 0	
Peak-Hr Prop. of AADT, K Peak-Hr Direction Prop, D DDHV = AADT x K x D		veh/h	%RVs, P _R General Terrain: Grade % Length Up/Down %	0 Level mi	
Calculate Flow Adjus	tments				
f _p	1.00		E _R	1.2	
E _T	1.5		$f_{HV} = 1/[1+P_T(E_T-1)+P_R(E_R-1)]$	1.000	
Speed inputs			Calc Speed Adj and F	FS	
_ane Width		ft			
Rt-Side Lat. Clearance		ft	f _{LW}		mph
Number of Lanes, N	2		f _{LC}		mph
Total Ramp Density, TRD		ramps/mi	TRD Adjustment		mph
FFS (measured)	70.0	mph	FFS	70.0	mph
Base free-flow Speed, BFFS		mph	770	70.0	прп
LOS and Performance	e Measures		Design (N)		
Operational (LOS) /p = (V or DDHV) / (PHF x N	N x f _{HV} 1489	pc/h/ln	Design (N) Design LOS v _p = (V or DDHV) / (PHF x N	I x f	
(f _p)		p 0.7 m. m.	× f _p)	HV	pc/h/ln
3	69.0	mph	s p		mph
$D = v_p / S$	21.6	pc/mi/in	D=v _p /S		pc/mi/in
.OS	С		Required Number of Lanes,	N	po
Glossary			Factor Location		
I - Number of lanes - Hourly volume - Flow rate OS - Level of service peed DHV - Directional design h	BFFS - Ba		E _R - Exhibits 11-10, 11-12 E _T - Exhibits 11-10, 11-11, 1 f _p - Page 11-18 LOS, S, FFS, v _p - Exhibits 1 11-3	1-13	f _{LW} - Exhibit 11-8 f _{LC} - Exhibit 11-9 TRD - Page 11-1

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General Information			Site Information		
Analyst Agency or Company Date Performed Analysis Time Period	URS 10/6/2014 AM		Highway/Direction of Trave From/To Jurisdiction Analysis Year	EW Oi Ramp	Express/SB n-Ramp/ EW Slip rough County
Project Description East-	West Road				
▽ Oper.(LOS)		ا تا	Des.(N)	∏ Pla	anning Data
Flow Inputs					
Volume, V AADT	2790	veh/h veh/day	Peak-Hour Factor, PHF %Trucks and Buses, P _T	0.92 0	
Peak-Hr Prop. of AADT, K Peak-Hr Direction Prop, D DDHV = AADT x K x D		veh/h	%RVs, P _R General Terrain: Grade % Length Up/Down %	0 Level mi	
Calculate Flow Adjus	tments				
f _p E _⊤	1.00 1.5		E_R $f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	1.2	
Speed Inputs			Calc Speed Adj and I		
ane Width		ft	Jaio opoda / (a) aiia (, ,	
Rt-Side Lat. Clearance	•	ft	f _{LW}		mph
Number of Lanes, N Total Ramp Density, TRD	2	ramps/mi	f _{LC} TRD Adjustment		mph
FS (measured) Base free-flow Speed, BFFS	70.0	mph mph	FFS	70.0	mph mph
OS and Performance	e Measures		Design (N)		
Operational (LOS) p = (V or DDHV) / (PHF x N	N x f _{HV4540}	0 . 11	<u>Design (N)</u> Design LOS	.1	
f _p)	68.8	pc/h/ln mph	v _p = (V or DDHV) / (PHF x ! x f _p)	A X I ^{HA}	pc/ħ/ln
= v _p / S OS	22.0 C	pc/mi/ln	S D = v _p / S Required Number of Lanes,	N	mph pc/mi/ln
iossary			Factor Location		
- Number of lanes - Hourly volume , - Flow rate OS - Level of service beed DHV - Directional design h	S - Speed D - Densi FFS - Free BFFS - Bas	ty -flow speed	E _R - Exhibits 11-10, 11-12 E _T - Exhibits 11-10, 11-11, 1 f _p - Page 11-18 LOS, S, FFS, v _p - Exhibits 1 11-3		f _{LW} - Exhibit 11-6 f _{LC} - Exhibit 11-9 TRD - Page 11-

General Information			Site Information		
Analyst Agency or Company Date Performed Analysis Time Period	URS 10/6/2014 AM		Highway/Direction of Trave From/To Jurisdiction Analysis Year	EW Slip	xpress/SB o Ramp/Bearss Av roough County
Project Description East-	West Road		129.33		
☑ Oper.(LOS)			Des.(N)	_	nning Data
Flow Inputs					
Volume, V AADT Peak-Hr Prop. of AADT, K Peak-Hr Direction Prop. D	3300	veh/h veh/day	Peak-Hour Factor, PHF %Trucks and Buses, P _T %RVs, P _R General Terrain:	0.92 0 0 Level	
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	mi	
Calculate Flow Adjus	tments				
f _p	1.00		E _R	1.2	
E _T	1.5		$f_{HV} = 1/[1+P_{T}(E_{T}-1)+P_{R}(E_{R}-1)]$		
Speed Inputs			Calc Speed Adj and	FFS	
_ane Width		ft			
Rt-Side Lat. Clearance		ft	f _{LW}		mph
Number of Lanes, N	2		f _{LC}		mph
Total Ramp Density, TRD		ramps/mi	TRD Adjustment		mph
FS (measured)	70.0	mph	FFS	70.0	mph
Base free-flow Speed, BFFS		mph			
OS and Performance	e Measures		Design (N)		
Operational (LOS) /p = (V or DDHV) / (PHF x N	N x f _{HV}		Design (N) Design LOS		
(f _p)	65.9	pc/h/ln	$v_p = (V \text{ or DDHV}) / (PHF x x f_p)$	N X I _{HV}	pc/h/in
	27.2	mph pc/mi/in	s		mph
D = v _p / S .OS	D D	рентин	$D = v_p / S$		pc/mi/ln
.00	D		Required Number of Lanes	, N	
Glossary			Factor Location		
 Number of lanes Hourly volume Flow rate Level of service peed DHV - Directional design h 	BFFS - Ba		E _R - Exhibits 11-10, 11-12 E _τ - Exhibits 11-10, 11-11, f _p - Page 11-18 LOS, S, FFS, v _p - Exhibits 11-3		f _{LW} - Exhibit 11-8 f _{LC} - Exhibit 11-9 TRD - Page 11-1

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Lane Width Rt-Side Lat. Clearance Number of Lanes, N Total Ramp Density, TRD FFS (measured) Base free-flow Speed, BFFS LOS and Performance Measures Tt ft ftw fLC TRD Adjustment FFS mph Design (N) Design (N)	Bearss A Ramp Hillsbord 2040 Plan Plan 0 Level th mi 1 %	B Ave/Express Slip ough County nning Data
Agency or Company Date Performed Analysis Time Period PM Analysis Time Period PM Analysis Time Period PM Analysis Year Project Description East-West Rd Oper.(LOS) Flow Inputs Volume, V AADT Veh/day Peak-Hour Factor, Phych/day WTrucks and Buses, Mercy, Pageneral Terrain: Peak-Hr Prop. of AADT, K Peak-Hr Direction Prop, D DDHV = AADT x K x D Calculate Flow Adjustments fp 1.00 ET 1.5 Fet Fet Fet Fet Fet Fet Fet Fet Fet Fe	Bearss A Ramp Hillsbord 2040 Plan Plan 0 Level th mi 1 %	Ave/Express Slip ough County
Date Performed PM Analysis Time Period PM Analysis Year Project Description	Ramp Hillsbord 2040 Plan Plan 0.92 1.0 Level h mi 1.%	ough County
Analysis Time Period PM Analysis Year Project Description East-West Rd Project Description East-West Rd Project Description East-West Rd Poper.(LOS) Flow Inputs Volume, V 5590 veh/h Peak-Hour Factor, Phack-Hr Prop. of AADT, K Peak-Hr Prop. of AADT, K Peak-Hr Direction Prop, D DDHV = AADT x K x D Calculate Flow Adjustments In the state of the stat	Hillsbord 2040 Plan IF 0.92 P _T 3 0 Level th mi 1 %	
Flow Inputs Volume, V 5590 veh/h Peak-Hour Factor, PhaADT veh/day %Trucks and Buses, I Reak-Hr Prop. of AADT, K Reak-Hr Direction Prop, D General Terrain: Grade % Leng Up/Down Calculate Flow Adjustments fp 1.00 ER Fr 1.5 from From Calculate Flow Adjustments Annual Speed Inputs Lane Width ft Rt-Side Lat. Clearance ft	(F 0.92 T 3 0 Level th mi 1 % 1.2 (E _R - 1)] 0.985	nning Data
Volume, V 5590 veh/h Peak-Hour Factor, PhAADT veh/day %Trucks and Buses, I %RVs, PR General Terrain: Peak-Hr Prop. of AADT, K %RVs, PR General Terrain: DDHV = AADT x K x D veh/h Grade % Leng Up/Dowl Calculate Flow Adjustments fp 1.00 ER FL 1.5 fHV = 1/(1+Pr(ET-1)+PR FLC Table Lat. Clearance ft	(F 0.92 T 3 0 Level th mi 1 % 1.2 (E _R - 1)] 0.985	nning Data
Volume, V 5590 veh/h veh/day %Trucks and Buses, I veh/day %Trucks and Buses, I weh/day %Trucks and Buses, I weh/day %Trucks and Buses, I weh/day %RVs, P_R General Terrain: Grade % Leng Up/Down Calculate Flow Adjustments $f_p $	0 Level th mi 1 % 1.2 (E _R - 1)] 0.985	
AADT veh/day %Trucks and Buses, Peak-Hr Prop. of AADT, K Peak-Hr Direction Prop, D DDHV = AADT x K x D Calculate Flow Adjustments f_p 1.00 E_T 1.5 Speed Inputs Lane Width ft Rt-Side Lat. Clearance ft Number of Lanes, N 3 Total Ramp Density, TRD ramps/mi FFS (measured) 70.0 mph Base free-flow Speed, BFFS LOS and Performance Measures Veh/h Grade % Leng Up/Down E_R E_R E_R $f_{HV} = 1/[1+P_T(E_T - 1) + P_R)$ f_{LW} f_{LW} f_{LW} f_{LC} TRD Adjustment FFS Design (N) Design (N)	0 Level th mi 1 % 1.2 (E _R - 1)] 0.985	
Peak-Hr Direction Prop, D DDHV = AADT x K x D veh/h Calculate Flow Adjustments fp 1.00 E _R E _T 1.5 f _{HV} = 1/(1+P _T (E _T -1)+P _R Speed Inputs Lane Width ft Rt-Side Lat. Clearance ft Number of Lanes, N 3 Total Ramp Density, TRD ramps/mi FFS (measured) 70.0 mph Base free-flow Speed, BFFS LOS and Performance Measures General Terrain: Grade % Leng Up/Down E _R f _{HV} = 1/(1+P _T (E _T -1)+P _R f _{LC} TRD Adjustment FFS TRD Adjustment FFS Design (N) Design (N) Design (N)	Level th mi 1 % 1.2 (E _R - 1)] 0.985	
$\begin{array}{cccccccccccccccccccccccccccccccccccc$	(E _R - 1)) 0.985	
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	(E _R - 1)) 0.985	
E_T 1.5 $f_{HV} = 1/[1+P_T(E_T-1)+P_R]$ Speed InputsCalc Speed Adj aLane WidthftRt-Side Lat. ClearanceftNumber of Lanes, N3Total Ramp Density, TRDramps/miFFS (measured)70.0Base free-flow Speed, BFFSmphLOS and Performance MeasuresDesign (N)Operational (LOS)Design (N)		
Lane Width Rt-Side Lat. Clearance Number of Lanes, N Total Ramp Density, TRD FFS (measured) Base free-flow Speed, BFFS LOS and Performance Measures Tt ft	nd FFS	
Rt-Side Lat. Clearance ft Number of Lanes, N 3 Total Ramp Density, TRD ramps/mi FFS (measured) 70.0 mph Base free-flow Speed, BFFS LOS and Performance Measures Design (N) Design (N)		
Number of Lanes, N 3 Total Ramp Density, TRD ramps/mi FFS (measured) 70.0 mph Base free-flow Speed, BFFS LOS and Performance Measures Design (N) Design (N) Design (N)		
Number of Lanes, N 3 Total Ramp Density, TRD ramps/mi FFS (measured) 70.0 mph Base free-flow Speed, BFFS LOS and Performance Measures Design (N) Design (N)		mph
Total Ramp Density, TRD ramps/mi FFS (measured) 70.0 mph Base free-flow Speed, BFFS mph LOS and Performance Measures Design (N) Operational (LOS)		mph
FFS (measured) Base free-flow Speed, BFFS LOS and Performance Measures Design (N) Design (N)		mph
Base free-flow Speed, BFFS LOS and Performance Measures Design (N) Design (N) Operational (LOS)	70.0	mph
Operational (LOS) Design (N)	70.0	
Operational (LOS)		
$V_p = (V \text{ or DDHV}) / (PHF \times N \times t_{HV} 2056)$ pc/h/ln $V_p = (V \text{ or DDHV}) / (P_p \times f_p)$	HF x N x f _{HV}	pc/h/ln
61.5 mph (**)		na n b
D = v / S 33.4 pc/mi/ln S		mph
LOS $D = v_p / S$ Required Number of I	anes, N	pc/mi/in
Glossary Factor Location		
N - Number of lanes S - Speed E _R - Exhibits 11-10, 1	1-12	f _{LW} - Exhibit 11-8
V - Hourly volume D - Density E_{τ} - Exhibits 11-10, 1		f _{LC} - Exhibit 11-9
v _p - Flow rate FFS - Free-flow speed f _p - Page 11-18	,	TRD - Page 11-1
LOS - Level of service BFFS - Base free-flow LOS, S, FFS, v _p - Ext	ibits 11-2,	
DDHV - Directional design hour volume		

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	BASIC FR	EEWAY SE	GMENTS WORKSHEET		
General Information			Site Information		
Analyst			Highway/Direction of Travel	Lanes	3 General Use
Agency or Company	URS		From/To	Express Terminu	Slip Ramp-E-W
Date Performed	10/6/2014		Jurisdiction		ough County
Analysis Time Period	PM		Analysis Year	2040	
Project Description East-	West Road				
		Гр	es.(N)	☐ Plar	ning Data
Flow Inputs					
Volume, V	4800	veh/h	Peak-Hour Factor, PHF	0.92	
AADT		veh/day	%Trucks and Buses, P _T	3	
Peak-Hr Prop. of AADT, K			%RVs, P _R	0	
Peak-Hr Direction Prop, D			General Terrain:	Level	
DDHV = AADT x K x D		veh/h	Grade % Length	mi	
			Up/Down %		
Calculate Flow Adjus	tments				
f_p	1.00		E _R	1.2	
E _T	1.5		$f_{HV} = 1/[1+P_T(E_T-1)+P_R(E_R-1)]$	0.985	
Speed Inputs			Calc Speed Adj and F	FS	
ane Width		ft	40		
Rt-Side Lat. Clearance		ft	f _{LW}		mph
Number of Lanes, N	3		f _{LC}		mph
Total Ramp Density, TRD		ramps/mi			mph
FFS (measured)	70.0	mph	TRD Adjustment		·
Base free-flow Speed,	70.0	·	FFS	70.0	mph
BFFS		mph			
LOS and Performance	e Measures		Design (N)		
			Design (N)		
Operational (LOS)			Design LOS		
$v_p = (V \text{ or DDHV}) / (PHF x)$	N X 1 _{HV} 1765	pc/h/!n	$v_p = (V \text{ or DDHV}) / (PHF x N$	Lx f _{BV}	
(f _p)		P • · · · · · · ·	x f _p)	114	pc/h/ln
3	66.3	mph	C. 'p'		mph
$D = v_p / S$	26.6	pc/mi/ln	D = 11 (S		·
os	D		$D = v_p / S$		pc/mi/ln
			Required Number of Lanes,	N	
Glossary			Factor Location		
I - Number of lanes	S - Spee	d	E _R - Exhibits 11-10, 11-12		f _{LW} - Exhibit 11-8
/ - Hourly volume	D - Densi	ity	E _T - Exhibits 11-10, 11-11, 1	1-13	f _{LC} - Exhibit 11-9
- Flow rate	FFS - Free	-flow speed	f _a - Page 11-18		TRD - Page 11-1
.OS - Level of service	BFFS - Ba	se free-flow	I P	4.2	TVD - Lade (1-)
peed			LOS, S, FFS, v _p - Exhibits 1	⊥ -∠ ,	
DHV - Directional design h	our volume		11-3		
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General Information			Site Information		
Analyst			Highway/Direction of Trave		
Agency or Company	URS		From/To	Slip Ra Junctio	mp/l-75/l-275
Date Performed Analysis Time Period	10/6/2014 PM		Jurisdiction Analysis Year		rough County
Project Description East-	West Rd.				
		<u> </u>	Des.(N)	☐ Pla	nning Data
Flow Inputs					
Volume, V AADT	5800	veh/h veh/day	Peak-Hour Factor, PHF %Trucks and Buses, P _T	0.92 3	
Peak-Hr Prop. of AADT, K Peak-Hr Direction Prop, D DDHV = AADT x K x D		veh/h	%RVs, P _R General Terrain: Grade % Length Up/Down %	0 Level mi	
Calculate Flow Adjus	tments				
f _p	1.00		E _R	1.2	
É _T	1.5		$f_{HV} = 1/(1+P_T(E_T \cdot 1) + P_R(E_R \cdot 1)$	0.985	
Speed Inputs			Calc Speed Adj and I		
ane Width		ft			
Rt-Side Lat. Clearance		ft	f _{tw}		mph
Number of Lanes, N	3		f _{LC}		mph
Total Ramp Density, TRD		ramps/mi	TRD Adjustment		mph
FFS (measured)	70.0	mph	FFS	70.0	mph
Base free-flow Speed, BFFS		mph			
OS and Performance	e Measures		Design (N)		
Operational (LOS) /p = (V or DDHV) / (PHF x)	N x f _{ear} ,		<u>Design (N)</u> Design LOS		
(f _p)	¹¹ 2133 59.9	pc/h/ln	$v_p = (V \text{ or DDHV}) / (PHF x)$ $x f_p$	V x f _{HV}	pc/h/ln
) = v / S	35.6	mph pc/mi/in	s		mph
) = v _p / S OS	55.0 E	hounti	$D = v_p / S$		pc/mi/ln
05	E		Required Number of Lanes	, N	
Blossary			Factor Location		
- Number of lanes - Hourly volume - Flow rate OS - Level of service peed DHV - Directional design h	BFFS - Ba		E _R - Exhibits 11-10, 11-12 E _T - Exhibits 11-10, 11-11, f _p - Page 11-18 LOS, S, FFS, v _p - Exhibits 1 11-3		f _{LW} - Exhibit 11-6 f _{LC} - Exhibit 11-9 TRD - Page 11-1

	BASIC FR	EEWAY SE	GMENTS WORKSHEE	T	
General Information			Site Information		
Analyst Agency or Company Date Performed Analysis Time Period Project Description East-	URS 10/6/2014 AM		Highway/Direction of Trave From/To Jurisdiction Analysis Year	Bearss	IB Express Lanes : Ave/E-W Slip Ram rough County
✓ Oper.(LOS)		(r	Des.(N)		nning Data
Flow Inputs		, ,	7C3.(N)	, 116	Inning Data
Volume, V AADT Peak-Hr Prop. of AADT, K Peak-Hr Direction Prop, D	3200	veh/h veh/day	Peak-Hour Factor, PHF %Trucks and Buses, P _T %RVs, P _R General Terrain:	0.92 0 0 Level	
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	mi	
Calculate Flow Adjus	tments				
f _p E _T	1.00 1.5		E_R $f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	1.2)]1.000	
Speed Inputs			Calc Speed Adj and I	FFS	
Lane Width Rt-Side Lat. Clearance Number of Lanes, N Total Ramp Density, TRD FFS (measured) Base free-flow Speed, BFFS	70.0	ft ft ramps/mi mph mph	f _{LW} f _{LC} TRD Adjustment FFS	70.0	mph mph mph mph
LOS and Performance	e Measures	i	Design (N)		
Operational (LOS) $v_p = (V \text{ or DDHV}) / (PHF x N x f_p)$ $S = v_p / S$ LOS	N x f _{HV} 1739 66.6 26.1 D	pc/h/ln mph pc/mi/ln	Design (N) Design LOS $v_p = (V \text{ or DDHV}) / (PHF \times f_p)$ S $D = v_p / S$ Required Number of Lanes		pc/h/ln mph pc/mi/ln
Glossary			Factor Location		
N - Number of lanes / - Hourly volume / - Flow rate OS - Level of service peed DDHV - Directional design h	BFFS - Bas		E _R - Exhibits 11-10, 11-12 E _T - Exhibits 11-10, 11-11, f _p - Page 11-18 LOS, S, FFS, v _p - Exhibits 11-3		f _{LW} - Exhibit 11-8 f _{LC} - Exhibit 11-9 TRD - Page 11-11

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	BASIC FR	EEWAY SE	GMENTS WORKSHEE	T	
General Information			Site Information		
Analyst			Highway/Direction of Trave	el <i>I-275 E</i>	xpress/NB
Agency or Company	URS		From/To		Ramp - E-W Off-
Date Performed Analysis Time Period	10/6/2014 AM		Jurisdiction Analysis Year	Ramp Hillsbor 2040	rough County
Project Description East-	West Raod				
™ Oper.(LOS)			Des.(N)	ſ Pla	nning Data
Flow Inputs					
Volume, V AADT	2390	veh/h veh/day	Peak-Hour Factor, PHF %Trucks and Buses, P _T	0.92 0	
Peak-Hr Prop. of AADT, K Peak-Hr Direction Prop, D DDHV = AADT x K x D		veh/h	%RVs, P _R General Terrain: Grade % Length Up/Down %	0 Level mi	
Calculate Flow Adjus	tments				
f _p	1.00		E _R	1.2	
E _T	1.5		$f_{HV} = 1/(1+P_T(E_T - 1) + P_R(E_R - 1)$	1)] 1.000	
Speed Inputs			Calc Speed Adj and	FFS	
Lane Width		ft			
Rt-Side Lat. Clearance		ft	f _{LW}		mph
Number of Lanes, N	2		f _{LC}		mph
Total Ramp Density, TRD		ramps/mi	TRD Adjustment		mph
FFS (measured)	70.0	mph	FFS	70.0	mph
Base free-flow Speed, BFFS		mph		7 0.0	111911
LOS and Performance	e Measures	\$	Design (N)		
<u>Operational (LOS)</u> v _p = (V or DDHV) / (PHF x f x f _p)	N x f _{HV} 1299	pc/h/ln	Design (N) Design LOS v _p = (V or DDHV) / (PHF x	N x f _{HV}	pc/h/lin
S	69.9	mph	x f _p)		
D = v _p / S	18.6	pc/mi/ln	S		mph
Los	Ç	·	$D = v_p / S$		pc/mi/ln
			Required Number of Lanes	5, N	
Glossary			Factor Location		
N - Number of lanes V - Hourly volume v _p - Flow rate LOS - Level of service speed			E_R - Exhibits 11-10, 11-12 E_T - Exhibits 11-10, 11-11, f_p - Page 11-18 LOS, S, FFS, v_p - Exhibits		f _{LW} - Exhibit 11-8 f _{LC} - Exhibit 11-9 TRD - Page 11-11
DDHV - Directional design h	nour volume		11-3		

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	BASIC FR	EEWAY SE	GMENTS WORKSHEE	T	
General Information			Site Information		
Analyst			Highway/Direction of Trave	el <i>I-275/ E</i>	Express/NB
Agency or Company	URS		From/To	EW Off	-Ramp/Express
Date Performed Analysis Time Period	10/6/2014 PM		Jurisdiction Analysis Year	Termin Hillsboi 2040	us rough County
Project Description East-	West Road				
			Des.(N)	ſ [™] Pla	nning Data
Flow Inputs					
Volume, V AADT	2000	veh/h veh/day	Peak-Hour Factor, PHF %Trucks and Buses, P _T	0.92 0	
Peak-Hr Prop. of AADT, K Peak-Hr Direction Prop, D DDHV = AADT x K x D		veh/h	%RVs, P _R General Terrain: Grade % Length Up/Down %	0 Level mi	
Calculate Flow Adjus	tments				
f _p	1.00		E _R	1,2	
Ë _T	1.5		$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$)] 1.000	
Speed Inputs			Calc Speed Adj and	FFS	
Lane Width		ft			
Rt-Side Lat. Clearance		ft	f _{LW}		mph
Number of Lanes, N	2		fLC		m p h
Total Ramp Density, TRD		ramps/mi	TRD Adjustment		mph
FFS (measured)	70.0	mph	FFS	70.0	mph
Base free-flow Speed, BFFS		mph	113	7 0.0	тири
LOS and Performance	e Measures	\$	Design (N)		
Operational (LOS) v _p = (V or DDHV) / (PHF x N	N x f _{HV} 1087	pc/h/ln	Design (N) Design LOS v _o = (V or DDHV) / (PHF x	N x f _{HV}	pc/h/in
(f _p)	70.0	mnh	x f _p)		pon#iii
) D=v /S	70.0 15.5	mph pc/mi/ln	s		mph
D=v _p /S LOS	10.0 B	рениян	D = v _p / S		pc/mi/in
			Required Number of Lanes	s, N	
Glossary			Factor Location	_	
N - Number of lanes / - Hourly volume /p - Flow rate LOS - Level of service speed	BFFS - Ba		E _R - Exhibits 11-10, 11-12 E _T - Exhibits 11-10, 11-11, f _p - Page 11-18 LOS, S, FFS, v _p - Exhibits 11-3		f _{LW} - Exhibit 11-8 f _{LC} - Exhibit 11-9 TRD - Page 11-1
DDHV - Directional design h	our volume				

	BASIC FR	EEWAY SE	GMENTS WORKSHEE	T	
General Information			Site Information		
Analyst Agency or Company Date Performed Analysis Time Period	URS 10/6/2014 PM		Highway/Direction of Trave From/To Jurisdiction Analysis Year	Slip Ra	General Use Ln/SB mp/l-75/l-275 rough County
Project Description East- Project Description East- Oper.(LOS)	vvest Ra.		Des.(N)	T pia	nning Data
Flow Inputs		1 4	7e5.(IV)	ć 1-1 c i	illing Data
Volume, V AADT Peak-Hr Prop. of AADT, K Peak-Hr Direction Prop, D DDHV = AADT x K x D	2650	veh/h veh/day veh/h	Peak-Hour Factor, PHF %Trucks and Buses, P _T %RVs, P _R General Terrain: Grade % Length Up/Down %	0.92 3 0 Level mi	
Calculate Flow Adjus	tments		Оргион п		
f _p E _T	1.00		E_{R} $f_{HV} = 1/[1+P_{T}(E_{T}-1)+P_{R}(E_{R}-1)]$	1.2))0.985	
Speed Inputs			Calc Speed Adj and		
Lane Width Rt-Side Lat. Clearance Number of Lanes, N Fotal Ramp Density, TRD FFS (measured) Base free-flow Speed, BFFS	3 70.0	ft ft ramps/mi mph mph	f _{tw} f _{LC} TRD Adjustment FFS	70.0	mph mph mph mph
OS and Performance	e Measures		Design (N)		
Operational (LOS) /p = (V or DDHV) / (PHF x N (f _p) S D = v _p / S LOS	N x f _{HV} 975 70.0 13.9 B	pc/h/in mph pc/mi/ln	Design (N) Design LOS v _p = (V or DDHV) / (PHF x x f _p) S D = v _p / S Required Number of Lanes		pc/h/in mph pc/mi/in
Glossary			Factor Location		
N - Number of lanes - Hourly volume - Flow rate OS - Level of service DDHV - Directional design h	BFFS - Ba		E_R - Exhibits 11-10, 11-12 E_T - Exhibits 11-10, 11-11, f_p - Page 11-18 LOS, S, FFS, v_p - Exhibits 11-3		f _{LW} - Exhibit 11-8 f _{LC} - Exhibit 11-9 TRD - Page 11-1

HCS 2010TM Version 6.50

	BASIC FR	EEWAY SE	GMENTS WORKSHEE	:T	
General Information			Site Information		
Analyst			Highway/Direction of Trave		
Agency or Company	URS		From/To	Slip Ra On/Slip	mp - East-West
Date Performed	10/6/2014		Jurisdiction		rough County
Analysis Time Period	PM		Analysis Year	2040	
Project Description East-	West Road			PAGE	
✓ Oper.(LOS)			Des.(N)	l Pia	nning Data
Flow Inputs					
Volume, V	1810	veh/h	Peak-Hour Factor, PHF	0.92	
AADT		veh/day	%Trucks and Buses, P _T	3	
Peak-Hr Prop. of AADT, K			%RVs, P _R	0	
Peak-Hr Direction Prop, D DDHV = AADT x K x D		veh/h	General Terrain: Grade % Length	Level mi	
DDITY TOLD I X IX X D		• • • • • • • • • • • • • • • • • • • •	Up/Down %	****	
Calculate Flow Adjus	tments				
f _p	1.00		E _R	1.2	
É _T	1.5		$f_{HV} = 1/(1+P_T(E_T - 1) + P_R(E_R - 1)$)] <i>0.985</i>	
Speed Inputs			Calc Speed Adj and	FFS	
Lane Width		ft			
Rt-Side Lat. Clearance		ft	f _{Lw}		mph
Number of Lanes, N	3		f _{LC}		mph
Total Ramp Density, TRD		ramps/mi	TRD Adjustment		mph
FFS (measured)	70.0	mph	FFS	70.0	mph
Base free-flow Speed,		mph	ILL9	70.0	nipii
BFFS					
LOS and Performance	e Measures	3	Design (N)		
Operational (LOS)			Design (N)		
	Nyf		Design LOS		
$v_p = (V \text{ or DDHV}) / (PHF \times V_p + V_p$	1 A HV 666	pc/h/ln	$v_p = (V \text{ or DDHV}) / (PHF x)$	N x f _{HV}	pc/h/ln
(f _p) S	70.0	mph	x f _p)		portition
) = v _p / S	9.5	pc/mi/ln	s		mph
F		рениян	$D = v_p / S$		pc/mi/ln
LOS	Α		Required Number of Lanes	s, N	
Glossary			Factor Location		
l - Number of lanes	S - Spee	ed	E _R - Exhibits 11-10, 11-12		f _{rw} - Exhibit 11-8
/ - Hourly volume	D - Dens	sity	$E_{\rm T}$ - Exhibits 11-10, 11-11,		f _{I.C} - Exhibit 11-9
n Flow rate	FFS - Free	e-flow speed	f _n - Page 11-18	11-10	TRD - Page 11-1
OS - Level of service	BFF\$ - Ba	ise free-flow	I F	112	TND - mage TI-1
peed			LOS, S, FFS, v _p - Exhibits 11-3	+ 1"Z ₁	
DHV - Directional design h	nour volume				

HCS 2010TM Version 6.50

	BASIC FR	EEWAY SE	GMENTS WORKSHEE	ET	
General Information			Site Information		
Analyst			Highway/Direction of Trav	el <i>I-275 G</i>	eneral Use Ln/SB
Agency or Company	URS		From/To	E-W Oi Ramp/l	n Ramp-Slip Bearss
Date Performed Analysis Time Period	10/6/2014 PM		Jurisdiction Analysis Year		rough County
Project Description East-	West Road				
✓ Oper.(LOS)		Γ.	es.(N)	Pla	nning Data
Flow Inputs					
Volume, V AADT	1950	veh/h veh/day	Peak-Hour Factor, PHF %Trucks and Buses, P _T	0.92 3	
Peak-Hr Prop. of AADT, K Peak-Hr Direction Prop, D DDHV = AADT x K x D		veh/h	%RVs, P _R General Terrain: Grade % Length Up/Down %	0 Level mi	
Calculate Flow Adjus	tments				
fp	1.00		E _R	1.2	
E _T	1.5		$f_{HV} = 1/(1+P_T(E_T - 1) + P_R(E_R - 1)$	1)] <i>0</i> .985	
Speed Inputs			Calc Speed Adj and	FF S	
Lane Width		ft			
Rt-Side Lat. Clearance		ft	f _{LW}		mph
Number of Lanes, N	3		f _{LC}		mph
Total Ramp Density, TRD		ramps/mi	TRD Adjustment		mph
FFS (measured)	70.0	mph	FFS	70.0	mph
Base free-flow Speed, BFFS		mph	110	70.0	111941
LOS and Performance	e Measures		Design (N)		
Operational (LOS) v _p = (V or DDHV) / (PHF x N	√x f _{HV 717}	pc/h/ln	Design (N) Design LOS V _p = (V or DDHV) / (PHF x	N x f	
x f _p)	, , ,	pormin	× f _p)	HV	pc/h/ln
\$	70.0	mph	S P		mph
$D = v_p / S$	10.2	pc/mi/ln	D = v _p / S		pc/mi/ln
LOS	Α		Required Number of Lanes	s, N	port.in.
Glossary			Factor Location		
N - Number of lanes / - Hourly volume /p - Flow rate LOS - Level of service speed DDHV - Directional design h	BFFS - Ba		E _R - Exhibits 11-10, 11-12 E _T - Exhibits 11-10, 11-11, f _p - Page 11-18 LOS, S, FFS, v _p - Exhibits 11-3		f _{LW} - Exhibit 11-8 f _{LC} - Exhibit 11-9 TRD - Page 11-1

HCS 2010TM Version 6.50

	BASIC FR	EEWAY SE	GMENTS WORKSHEE	T	
General Information			Site Information		
Analyst			Highway/Direction of Trave	el <i>I-275E</i> x	cpress/SB
Agency or Company	URS		From/To		ing of Express/EW
Date Performed Analysis Time Period	10/6/2014 PM		Jurisdiction Analysis Year	On-Rar Hillsbor 2040	rough County
Project Description East-	West Road				
✓ Oper.(LOS)		Γ [Des.(N)	∏ Pla	nning Data
Flow Inputs					
Volume, V AADT	1680	veh/h veh/day	Peak-Hour Factor, PHF %Trucks and Buses, P _T	0.92 0	
Peak-Hr Prop. of AADT, K Peak-Hr Direction Prop, D DDHV = AADT x K x D		veh/h	%RVs, P _R General Terrain: Grade % Length Up/Down %	0 Level mi	
Calculate Flow Adjus	tments				
f _p	1.00		E _R	1.2	
E _T	1.5		$f_{HV} = 1/(1+P_T(E_T - 1) + P_R(E_R - 1)$)] 1.000	
Speed Inputs			Calc Speed Adj and	FFS	
Lane Width		ft			
Rt-Side Lat. Clearance		ft	f _{LW}		mph
Number of Lanes, N	2		f _{LC}		mph
Total Ramp Density, TRD		ramps/mi	TRD Adjustment		mph
FFS (measured)	70.0	mph	FFS	70.0	•
Base free-flow Speed, BFFS		mph	FFS	70.0	mph
LOS and Performance	e Measures		Design (N)		
Operational (LOS) V _p = (V or DDHV) / (PHF x N	√x f _{HVα13}	pc/h/ln	<u>Design (N)</u> Design LOS v _p = (V or DDHV) / (PHF x	Nyf	
(f _p)	910	pormit	$x f_{p}$	HV	pc/h/ln
8	70.0	mph	S P		mph
$D = v_p / S$	13.0	pc/mi/ln	$D = v_p / S$		pc/mi/ln
OS	В		Required Number of Lanes	, N	poman
Glossary			Factor Location		
N - Number of lanes / - Hourly volume /p - Flow rate .OS - Level of service speed DDHV - Directional design h	BFFS - Bas		E _R - Exhibits 11-10, 11-12 E _T - Exhibits 11-10, 11-11, f _p - Page 11-18 LOS, S, FFS, v _p - Exhibits 11-3		f _{LW} - Exhibit 11-8 f _{LC} - Exhibit 11-9 TRD - Page 11-1

HCS 2010TM Version 6.50

	BASIC FR	EEWAY SE	GMENTS WORKSHEE	: 1	
General Information			Site Information		
Analyst			Highway/Direction of Trave		
Agency or Company	URS		From/To		-Ramp/ EW Slip
Date Performed Analysis Time Period	10/6/2014 PM		Jurisdiction Analysis Year	Ramp Hillsbor 2040	rough County
Project Description East-	Vest Road				
☑ Oper.(LOS)		ات ا	es.(N)	l Pla	nning Data
Flow Inputs					
Volume, V AADT	1270	veh/h veh/day	Peak-Hour Factor, PHF %Trucks and Buses, P _T	0.92 0	
Peak-Hr Prop. of AADT, K Peak-Hr Direction Prop, D DDHV = AADT x K x D		veh/h	%RVs, P _R General Terrain: Grade % Length Up/Down %	0 Level mi	
Calculate Flow Adjus	tments				
fp	1.00		E _R	1.2	
E _T	1.5		$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$)] 1.000	
Speed Inputs			Calc Speed Adj and	FFS	
Lane Width		ft			
Rt-Side Lat. Clearance		ft	f _{LW}		mph
Number of Lanes, N	2		f _{LC}		mph
Total Ramp Density, TRD		ramps/mi	TRD Adjustment		mph
FFS (measured)	70.0	mph	FFS	70.0	mph
Base free-flow Speed, BFFS		mph			
LOS and Performance	e Measures		Design (N)		
Operational (LOS) v _p = (V or DDHV) / (PHF x N	l x f _{HV} 690	pc/h/ln	Design (N) Design LOS v _p = (V or DDHV) / (PHF x	N x f _{HV}	no Palla
x f _p)	70.0		x f _p)		pc/h/in
S / 6	70.0	mph	s *		mph
D = v _p / S	9.9	pc/mi/ln	$D = v_p / S$		pc/mi/ln
LOS	Α		Required Number of Lanes	s, N	
Glossary			Factor Location		
N - Number of lanes / - Hourly volume /p - Flow rate _OS - Level of service speed			E _R - Exhibits 11-10, 11-12 E _T - Exhibits 11-10, 11-11, f _p - Page 11-18 LOS, S, FFS, v _p - Exhibits 11-3		f _{LW} - Exhibit 11-8 f _{LC} - Exhibit 11-9 TRD - Page 11-1

HCS 2010TM Version 6.50

	BASIC FR	EEWAY SE	GMENTS WORKSHEE	T	
General Information			Site Information		
Analyst Agency or Company Date Performed Analysis Time Period	URS 10/6/2014 PM		Highway/Direction of Trave From/To Jurisdiction Analysis Year	EW Slip	xpress/SB o Ramp/Bearss Ave roough County
Project Description East-			Des.(N)		nning Data
✓ Oper.(LOS)			7C5.(N)	1 1 161	ming Data
Flow Inputs Volume, V AADT Peak-Hr Prop. of AADT, K Peak-Hr Direction Prop, D DDHV = AADT x K x D	2560	veh/h veh/day veh/h	Peak-Hour Factor, PHF %Trucks and Buses, P _T %RVs, P _R General Terrain: Grade % Length Up/Down %	0.92 0 0 Level mi	
Calculate Flow Adjus	tments				
f _p E _T	1.00 1.5		E_R $f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	1.2 1)] 1.000	
Speed Inputs			Calc Speed Adj and	FFS	
Lane Width Rt-Side Lat. Clearance Number of Lanes, N Total Ramp Density, TRD FFS (measured) Base free-flow Speed, BFFS	2 70.0	ft ft ramps/mi mph mph	f _{LW} f _{LC} TRD Adjustment FFS	70.0	mph mph mph mph
LOS and Performanc	e Measures	i	Design (N)		
Operational (LOS) v _p = (V or DDHV) / (PHF x) x f _p) S D = v _p / S LOS		pc/h/ln mph pc/mi/ln	Design (N) Design LOS v _p = (V or DDHV) / (PHF x x f _p) S D = v _p / S Required Number of Lane		pc/h/in mph pc/mi/in
Glossary			Factor Location		
N - Number of lanes V - Hourly volume v _p - Flow rate LOS - Level of service speed DDHV - Directional design l	BFFS - Ba		E _R - Exhibits 11-10, 11-12 E _T - Exhibits 11-10, 11-11, f _p - Page 11-18 LOS, S, FFS, v _p - Exhibits 11-3	11-13	f _{LW} - Exhibit 11-8 f _{LC} - Exhibit 11-9 TRD - Page 11-11

HCS 2010TM Version 6.50

I-275 2040 AM-PM Peak Hour HCS Merge-Diverge Analysis

General Info	rmation	10 (1)11	S AND RAN	Site Info						
			E	reeway/Dir of T		1275/N	0			
Analyst Agency or Compan	URS			ieeway/Diff of 1				of E-W (1)		
agency or Compan Date Performed		/2014		arisdiction		-	e to EL, 3. rough Cou			
ale Fellonneo Analysis Time Perio		2014		nalysis Year		2040	nough coo	iity		
Project Description		ad	^	naiyaia reai		2040				
nputs	Edst-West No	au								
		Ezopuray Muza	ber of Lanes, N	3						
Upstream Adj l	Ramp	1 '							Downstrea Ramp	am Adj
┌ Yes 「	- 00	Ramp Numbe		1					Manib	
i tes i	Oli	Acceleration L	ane Length, L _A						□ Yes	∏ On
₹ No I	Off	Deceteration I	ane Length L _D	700					IF No	□ O#
	<i>~</i> "	Freeway Volu	me, V _e	1430						, Оп
£ up =	ft	Ramp Volume	. V ₀	140					L _{down} ∺	ft
op.			-Flow Speed, S _{ee}	70.0					E	
V _u = \	/eh/h								V _D =	veh/h
	12 12		ow Speed, S _{FR}	55.0						
Conversion	T	der Base	Conditions				- 1			
(pc/h)	(Veh/hr)	PHF	Terrain	%Truck	%Rv		f _{HV}	fp	v = V/PHF	x f _{HV} x f _r
reeway	1430	0.92	Level	3	0	0	.985	1.00	16	78
	140	0.92	Level	0	0	_	.000	1.00		52
Ramp JpStream	140	0.92	revei	, v	0	+-	.000	1.00		JA
DownStream	<u> </u>				 	+		-		
JOMII GOGGIII	!	Merge Areas						Diverge Areas		
stimation o		and go through			Estimati	ion c				
		(D)			-				١m	
	$V_{12} = V_{p}$	7 117					1	= V _R + (V _F - V _I		
EQ =	(Equa	tion 13-6 or	13-7)		LEO =		(Equation 13-1	2 or 13-13)
FM [±]	using	Equation (E	xhibit 13-6)		P _{FD} =		0.	714 using Eq	uation (Exhi	bit 13-7)
12 =	pc/h				V ₁₂ =		1	170 pc/h		
3 or V _{av34}	pc/h (Equation 13	14 or 13-17)		V ₃ or V _{av34}		41	08 pc/h (Equa	tion 13-14	or 13-17
s V ₃ or V _{av34} > 2,70			,			> 2.7		Yes 🗸 No		
s V ₃ or V _{av34} > 1.5								Yes ₹ No		
			16, 13-18, or					oc/h (Equation	13-16-13-	.18 or 13
Yes,V _{12a} =	13-19)		10, 10-10, 01		If Yes,V _{12a} ≖	:		9)	10 10, 10	10,0110
Capacity Che					Capacity	y Ch	ecks	***		
	Actual	С	apacity	LOS F?	1		Actual	Ca	pacity	LOS F
					V _F		1578	Exhibit 13-8	7200	No
1/		Exhibit 13-8			$V_{FO} = V_F$	V.	1426	Exhibit 13-8	7200	No
V_{FO}		EXIMUL 13-0				v R				_
	<u> </u>				V _R		152	Exhibit 13-1		No
low Enterin	g Merge In	***			Flow En	-		rge influen		
	Actual	· ·	Desirable	Violation?		-	Actual	Max Desirat		Violation
V _{R12}		Exhibit 13-8			V ₁₂		1170	Exhibit 13-8	4400:All	No
evel of Serv	rice Detern	nination (i	f not F)		Level of	Sen	∕ice De	terminatio	n (if not i	F)
D _p = 5.475 + 0	.00734 v _p + (0.0078 V ₁₂ -	0.00627 L _A		1) _R = 4	.252 + 0	.0086 V ₁₂ - 0.	009 L _D	
_R = (pc/mi/lr		12			D _R = 8.5	 5 (pc/r	ni/ln)	***		
• •					The state of the s		oit 13-2)			
OS = (Exhibit										
peed Deteri	nination				Speed D					
s = (Exibit 1	3-11)				L		xhibit 13	-		
-	nibit 13-11)				S _R = 64	.9 mph	(Exhibit	13-12)		
					L.					
	ibit 13-111				$S_0 = 76$.8 mph	(Exhibit	13-12)		
mph (Ext	nibit 13-11) nibit 13-13)				,		(Exhibit (Exhibit	-		

	RA	MPS AND	RAMP JUN	CTIONS W	ORKSH	EET	6			
General Info	rmation			Site Infor	mation					
Analyst Agency or Compan Date Performed	10/7/	2014	Ju Ju	eeway/Dir of Tr nction risdiction	Express Terminus N. of EW (3) Hillsborough County					
inalysis Time Perio			Ar	nalysis Year		2040				
Project Description	East-West Roa	ad				_				
nputs		le	b (1) M			_				
Jpstream Adj Ram	p	Ramp Numbe	ber of Lanes, N	3 †					Downstrea Ramp	am Ađj
⊏Yes ΓO	n		ane Length, L _A	1100					ΓYes	□On
FNo FO	ff	I	Lane Length L _D						₽ No	□ Off
		Freeway Volu		1290					rqowo =	ft
up = ft		Ramp Volume	• • • • • • • • • • • • • • • • • • • •	630					gowu	**
/u = veh/	h		-Flow Speed, S _{FF}	70.0 55.0				1	V _D =	veh/h
Conversion	to nc/h line		ow Speed, S _{FR}	55.0						
(pc/h)	V	PHF	Terrain	%Truck	%Rv	Ĭ	f _{HV}	f _p	v = V/PHF	x f _{HV} x f _n
Freeway	(Veħ/hr) 1290	0.92	Level	3	0	+ (0.985	1.00	1	423
Ramp	630	0.92	Level	0	0		1.000	1.00		385
UpStream										
DownStream		Merge Areas				1_	<u>l</u>	iverge Areas		
stimation o		Mei As Wiss			Estimati	on		ITCING AIGUS		
	V ₁₂ = V _F	(P _{r+} ,)						L LOL M	\O	
EQ =	,,	ation 13-6 or	13-7)					/ _R + (V _F - V _R) Equation 13-	,	3)
FM =			ion (Exhibit 13-6)		L _{EQ} = P _{FD} =			sing Equation		
12 =	866 p	c/h			V ₁₂ =			c/h	TT (EMILION TO	1
or V _{av34}		c/h (Equatio	n 13-14 or 13-		V ₃ or V _{av34}		,	c/h (Equation 1	3-14 or 13-1	7)
s V ₃ or V _{av34} > 2,7	17) 00 oc/b2 ⊏ ∨o	o DZ Mo				_a > 2,		Yes □ No		•
s V ₃ or V _{av34} > 1.5							5 * V ₁₂ /2 [Yes ☐ No		
Yes,V _{12a} =		c/h (Equatio	n 13-16, 13-18,		If Yes,V _{12a} =			c/h (Equatior -19)	n 13-16, 13	3-18, or
Capacity Ch		10)			Capacity	/ Cł	iecks			
	Actual	C	apacity	LOS F?			Actual		acity	LOS F?
					V _F			Exhibit 13-8	-	
V_{FO}	2108	Exhibit 13-8		No	$V_{FO} = V_F$	- V _R		Exhibit 13-8		
					V _R			Exhibit 13- 10		
low Enterin	g Merge In	fluence A	rea		Flow En	teri	ng Diver	ge Influen	ce Area	1
	Actual	Max	Desirable	Violation?			Actual	Max Desi	rable	Violation?
V _{R12}	1654	Exhibit 13-8	4600:All	No	V ₁₂	Ť	D :	Exhibit 13-8	- /!E 4	<i>p</i> -1
evel of Serv					-			erminatio 0086 V ₁₂ - 0.		F)
	0.00734 v _R + 0		10021 LA		i.	^z R c/mi/		712 ° 0.	000 ED	
_R = 11.2 (pc/n OS = B (Exhibit							it 13-2)			
Speed Deteri					Speed D			n		
							13-12)	100		
	(Exhibit 13-11)						hibil 13-12)			
	(Exhibit 13-11)				11	-	hibil 13-12)			
,	(Exhibit 13-13)				ľ		hibit 13-13)			
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Conoral Info	rmation	CAMIL	S AND RAM	Site Infor	The second section is a second	, itic				
General Info						10254	n			
Analyst	URS			reeway/Dir of Ti		1275/N	_	of E 1M Dd /4		
lgency or Compan Date Performed		10044		unction urisdiction		-		of E-W Rd (1		
vate Perionned Analysis Time Perio						2040	rough Cou	шку		
Project Description		ad	^	naiysis rear		2040				
nputs	Easi-West No	du								
nputs		[han af hanna bi						i -	
Upstream Adj I	Ramp	1 '	ber of Lanes, N	3					Downstre	am Adj
	- 0.	Ramp Numbe	r of Lanes, N	1					Ramp	
□Yes [On	Acceleration t	ane Length, L _A						┌ Yes	□ On
ENA 8	► No 1 Off Deceleration Lane Length L ₀								[N:	Г о″
7 140	Ott	Freeway Volu	me. V _e	5590					I No	□ Off
L _{up} =	ft	Ramp Volume		790					L _{down} =	ft
··up			• • •							
V,, = \(\sqrt{1}\)	/eh/h	l.	-Flow Speed, S _{FF}	70.0					V _D =	veh/h
		Ramp Free-F	ow Speed, S _{FR}	55.0						
Conversion	to pc/h Un	der Base	Conditions							
(pc/h)	V V	PHF	Terrain	%Truck	%Rv		f _{HV}	fp	v = V/PHF	x f _{av} x f.
	(Veh/hr)	-								
reeway	5590	0.92	Level	3	0		.985	1.00		167
Ramp	790	0.92	Level	0	0	1.	.000	1.00	8	59
JpStream						+-				
DownStream	<u> </u>	Marga Araga						I Diverge Areas		
etimatian a		Merge Areas			Estimati	ion c		Diverge Areas		
stimation o	1 12				Lauman	1011 0				
	V ₁₂ = V _F	(P _{EM})					V ₁₂ =	= V _R + (V _F - V _I	R)PFD	
EQ =	(Equa	ition 13-6 or	13-7)		L _{EQ} =		(Equation 13-1	2 or 13-13	3)
 FM =	usina	Equation (6	xhibit 13-6)		P _{F0} =		0	.566 using Eq	uation (Exh	ibit 13-7)
12 =	pc/h		,		V ₁₂ =			865 pc/h	,	•
₃ or V _{av34}	•	Earration 12	-14 or 13-17)		V ₃ or V _{av34}			302 pc/h (Equ	ation 13.1	4 or 12.17
			-14 01 13-17)			- 07		, , ,	ation 10-1	4 07 13-17
s V ₃ or V _{av34} > 2,76								Yes F No		
$V_3 \text{ or } V_{av34} > 1.5$					Is V ₃ or V _{av3}	34 > 1.5		Yes ₹ No	40 40 40	
Yes,V _{12a} =			-16, 13-18, or		If Yes,V _{12a} =	:		oc/h (Equation 9)	13-16, 13	-18, or 13
Capacity Che	13-19)				Capacity			3)		
apacity Cire	v	T c	anasih.	T 100.00	Capacit	011		Co	pacity	LOSF
	Actual	l ĭ	apacity	LOS F?	- 1/	_	Actual		-	1
					V _F		6167	Exhibit 13-8		No
V _{FO}		Exhibit 13-8		1	$V_{FO} = V_{F}$	-V _R	5308	Exhibit 13-8	7200	No
				1	V _R		859	Exhibit 13-1	0 2200	No
low Entering	a Merae In	fluence A	rea		Flow En	terin	a Dive	rge Influen	ce Area	
	Actual		Desirable	Violation?			Actual	Max Desirat		Violation
V _{R12}		Exhibit 13-8			V ₁₂	_	3865	Exhibit 13-8	4400:All	No
evel of Serv	ico Dotore		f not El					terminatio		
										17
$D_R = 5.475 \pm 0$, ,	0.0078 V ₁₂ =	0.00827 LA		le .	• • • • • • • • • • • • • • • • • • • •		.0086 V ₁₂ - 0.	noa rD	
_R = (pc/mi//r	1)				D _R = 34	.7 (pc	/mi/ln)			
OS = (Exhibit	13-2)				LOS = D	(Exhil	oit 13-2)			
peed Deterr	nination				Speed D	eter	minatio	on		
							xhibit 13			
s = (Exibit 1	•				200					
S _R = mph (Exhibit 13-11)					\$ _R = 63.1 mph (Exhibit 13-12)					
•	-				D		A Pref	44 4A1		
,≖ mph (Exf	nibit 13-11) nibit 13-13)				l *		(Exhibit (Exhibit			

0		AWIPS AND	RAMP JUN			EET			
General Info	ormation			115.255555	rmation				
Analyst				reeway/Dir of		1-275 General I			
Agericy or Compa Date Performed	•	-		unction			ous N. of EW (3)		
Date Perionileu Analysis Time Per		7/2014		urisdiction		Hillsborough Co	ounty		
Project Description			<i>P</i>	inalysis Year		2040			
Inputs	Last-West No	000							
		Freeway Nun	nber of Lanes, N	3				r	
Upstream Adj Ran	ıp			-				Downstr	eam Adj
ΓYes Γ)n		er of Lanes, N	1				Ramp	
			Lane Length, L _A	1100	ı			⊢ Yes	∏ On
F No F (Off		Lane Length L _o					⊮ No	□Off
		Freeway Volu	ime, V _F	4800					
_{-up} = ft		Ramp Volume	e, V _R	1000				L _{down} =	ft
		Freeway Free	Flow Speed, See	70.0					
√ _ບ = veh	/h		low Speed, S _{FR}	55.0				V _D =	veh/h
Conversion	to nc/h Hn								
	V V	T		Γ	_	T	Т —		
(pc/h)	(Veh/hr)	PHF	Terrain	%Truck	%Rv	f _{HV}	fp	v = V/PH	Fxf _{HV} xf _t
Freeway	4800	0.92	Level	3	0	0.985	1.00		5296
Ramp	1000	0.92	Level	0	0	1.000	1.00		1087
UpStream									
DownStream									
		Merge Areas					Diverge Areas		
Estimation o	of v ₁₂				Estimation	on of V ₁₂			
	V ₁₂ = V _F	(Pess)							
EQ ⁼		ation 13-6 or	13-7)			V ₁₂ =	$V_R + (V_F - V_R)$, -	
) FM =			ion (Exhibit 13-6)		L _{EQ} =		(Equation 13-	12 or 13-1	13)
			ion (Exhibit 13-6)		P _{FO} =		using Equation	n (Exhibit 1	3-7)
12 =	3222	•	n 40 44 + 40		V ₁₂ #		pc/h		
3 or V _{av34}	17)	pe/n (Equation	on 13-14 or 13-		V ₃ or V _{av34}		pc/h (Equation 13	3-14 or 13-	17)
s V ₃ or V _{av34} > 2,7		s 🗁 No			Is V ₃ or V _{av3d}	> 2,700 pc/h?	「Yes □ No		
s V ₃ or V _{av34} > 1.5							□Yes □No		
			on 13-16, 13-		1		pc/h (Equation	: 13-16. 1	3-18. ог
Yes, V _{12a} =		13-19)	M1 10*10, 10-		If Yes,V _{12a} =		3-19)		
Capacity Ch					Capacity	Checks			
	Actual	Ca	apacity	LOS F?	1	Actual	Capa	acity	LOS F?
			ake on colo		V _F		Exhibit 13-8	T	2001.
17		C 10 3 40 0				V	Exhibit 13-8	—	-
V_{FO}	6383	Exhibit 13-8		No	V _{FO} = V _F -	[∨] R			
		1 1			V _R		Exhibit 13- 10	1	1
low Enterin	a Merae In	fluence A	rea		Flow Ente	erina Dive	rge Influenc	o Aros	
	Actual		esirable	Violation?	7007 2.11	Actual	Max Desira		Violation?
V _{R12}	4695	Exhibit 13-8	4600:Afl	Yes	V ₁₂	11010011	Exhibit 13-8	30.0	VIOIGIOIT:
evel of Serv	ice Detern			1.00		Sorvice De	termination	lif not	El
	0.00734 v _R + 0								<u>r)</u>
	**	12 0.00	VOZI CA				.0086 V ₁₂ - 0.0	na r ^D	
= 34.7 (pc/n	_					mi/ln)			
S = D (Exhibit					LOS = (Ext	hibit 13-2)			
peed Deteri	nination				Speed De	terminatio	on		
	bit 13-11)					ibit 13-12)			
= 0.627 (Exi	14 17				N. Control of the Con	•			
	(Exhibit 13-14)				o _o = mon	(EXhibit 13472)			
= 52.5 mph	(Exhibit 13-11)					(Exhibit 13-12)			
= 52.5 mph = 65.7 mph	(Exhibit 13-11) (Exhibit 13-11) (Exhibit 13-13)				S _o = mph	(Exhibit 13-12) (Exhibit 13-12) (Exhibit 13-13)			

General Infor		··· writtle	RAMP JUN	Site Infor					
<i>General Intori</i> Analyst	mation URS		Çr	eeway/Dir of Tr		275/SB			
Analyst Agency or Company	6AU			nction		S. of E-W Rd. o	n RP fr. EL (6)		
Date Performed	9/25/	2014		risdiction		Hillsborough Co			
Analysis Time Period		4014		nalysis Year		2040	,		
Project Description		ad							
Inputs		27.5							
Upstream Adj Ramp		Freeway Nur	nber of Lanes, N	3				Downstream Adj	
oponoum raj ramp		Ramp Numbe	er of Lanes, N	1				Ramp	
□Yes □On		Acceleration	Lane Length, L _A	700				FYes FOn	
™ No □Off		Deceleration	Lane Length L _D					I No L Off	
		Freeway Volu		4200				L _{down} = ft	
_{-up} = ft		Ramp Volum	• • • • • • • • • • • • • • • • • • • •	1140				gown	
V _u = veh/h		Freeway Free	e-Flow Speed, S _{FF}	70.0				V _D = veh/h	
*u *G(3)31		Ramp Free-F	tow Speed, S _{FR}	55.0					
Conversion to	pc/h Une	der Base	Conditions				,	,	
(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f _{HV}	fp	v = V/PHF x f _{HV} x f _p	
Freeway	4200	0.92	Level	3	0	0.985	1.00	4634	
Ramp	1140	0.92	Level	0	0	1.000	1.00	1239	
UpStream									
DownStream									
		Merge Areas					Diverge Areas		
Estimation of	V ₁₂				Estimati	on of v ₁₂			
	V ₁₂ = V _F	(Pou)				ν.	= V _R + (V _F · V	/P	
L _{EQ} =		ation 13-6 o	r 13-7)			V 12	**	R/' FD 3-12 or 13-13)	
			tion (Exhibit 13-6)		LEO ≅		•		
P _{FM} =		•	nore (Exhibit 15-0)		P _{FD} =		using Equat	ion (Exhibit 13-7)	
V ₁₂ =	2767		40 44 40		V ₁₂ =		pc/h		
V ₃ or V _{av34}	17)	pe/n (Equat	ion 13-14 or 13-		V ₃ or V _{av34}			13-14 or 13-17)	
Is V ₃ or V _{av34} > 2,700		s 17 No			Is V ₃ or V _{av3}	4 > 2,700 pc/h?	□Yes □No		
Is V_3 or $V_{av34} > 1.5$					Is V ₃ or V _{av3}	> 1.5 * V ₁₂ /2	□ Yes □ No		
			ion 13-16, 13-		If Yes,V _{12a} =		pc/h (Equati	on 13-16, 13-18, or	
if Yes,V _{12a} ≖	18, or		011 10-10, 10-		1 1 30, 1 129		13-19)		
Capacity Che					Capacity	/ Checks			
	Actual		Capacity	LOS F?	"	Actua	i C	apacity LOS F?	
					٧ _۶		Exhibit 13	3-8	
16	F070	E. 1.1.1.40.0		Ala.	V _{FO} = V _F	- V _D	Exhibit 13	3-8	
V _{FO}	5873	Exhibit 13-8		No			Exhibit 1		
					V _R		10		
Elow Entoring	Merge In	fluence A	rea		Flow En	tering Div	erge Influe	nce Area	
Flow Entering	Actual		Desirable	Violation?		Actual	Max De	sirable Violation	
Flow Entering		Exhibit 13-8	4600:All	No	V ₁₂		Exhibit 13-8		
	4338		The state of the s	-	Level of	Service D	eterminati	on (if not F)	
V _{R12}		nination	if not F)		D _B = 4.252 + 0.0086 V ₁₂ - 0.009 L _D				
V _{R12} Level of Servi	ce Detern					$O_{R} = 4.252 +$	0.0086 V ₁₂ -	0.009 L _D	
V _{R12} Level of Servi D _R = 5.475 +	ice Detern 0.00734 v _R + 0				I .	**	0.0086 V ₁₂ -	0.009 L _D	
V _{R12} Level of Servi D _R = 5.475 + 0 D _R = 34.4 (pc/mi	i ce Detern 0.00734 v _R + (/ln)				D _R = (pr	c/mi/ln)	0.0086 V ₁₂ -	0.909 L _D	
V_{R12} Level of Servi $D_R = 5.475 + 0.00$ $D_R = 34.4 (pc/mi)$ LOS $= 0.00$ (Exhibit	i ce Detern 0.00734 v _R + (/ln) 13-2)				D _R = (po LOS = (E	c/mi/ln) xhibit 13-2)		0.009 L _D	
V _{R12} Level of Servi D _R = 5.475 + 0 D _R = 34.4 (pc/mi LOS = D (Exhibit of Speed Determine)	ice Detern 0.00734 v _R + (/ln) 13-2) nination				D _R = (po LOS = (E Speed D	c/ml/ln) xhibit 13-2) leterminat		0.009 L _D	
V _{R12} Level of Servi D _R = 5.475 + 0 D _R = 34.4 (pc/mi LOS = D (Exhibit of Speed Determine)	ice Detern 0.00734 v _R + (/ln) 13-2) nination				$D_R = (p)$ $LOS = (E)$ $Speed D$ $D_S = (E)$	c/mi/ln) (xhibit 13-2) Peterminat (xhibit 13-12)	ion	0.009 L _D	
V_{R12} Level of Servi $D_R = 5.475 + 0.08 = 0.08 = 0.08$ Speed Determ $M_S = 0.543$ (Exit	ice Detern 0.00734 v _R + (/ln) 13-2) nination				$D_R = (p_1)$ $LOS = (E)$ $Speed D$ $D_S = (E)$ $S_R = mp$	c/mi/ln) (xhibit 13-2) (eterminat (xhibit 13-12) (ch (Exhibit 13-1	ion	0.009 L _D	
V_{R12} Level of Servi $D_R = 5.475 + 0$ $D_R = 34.4 \langle pc/million D \langle Exhibit Cos = 0.543 \langle Exite Cos D \langle Exhibit Cos = 0.543 \langle Exite Cos $	ice Determ 0.00734 v _R + (/(n) 13-2) nination bit 13-11)				$D_R = (p)$ $LOS = (E)$ $Speed D$ $D_S = (E)$ $S_R = mp$	c/mi/ln) (xhibit 13-2) Peterminat (xhibit 13-12)	ion	0.009 L _D	

	£	KAWI	S AND RAM			התס	MEEL			
General In	formation			Site Infor						
Analyst				reeway/Dir of Tr		1-275/9				
Agency or Comp				ınction			_	g of Express		
ate Performed	7	//2014		ırisdiction			rough Cou	nty		
Analysis Time P			Ai	nalysis Year		2040				
Project Descript	ion East-West Ro	ad								
nputs									,	
Upstream A	ldj Ramp	1 '	nber of Lanes, N	3					Downstrea	am Adj
	r= -	Ramp Numbe	er of Lanes, N	1					Ramp	
☐ Yes	Г On	Acceleration	Lane Length, L _A						ΓYes	□On
₽ No	□ Off	Deceteration	Lane Length L _D	700					⊮ No	∏ Off
		Freeway Volu	ıme, V _F	2650						
L _{up} =	ft	Ramp Volum	e, V _R	840					L _{down} =	ft
		Freeway Free	e-Flow Speed, S _{FF}	70.0					V _D =	ven/h
∨ _u =	veh/h		low Speed, Spe	55.0					, D	VC11/11
Conversio	n to pc/h Un		111							
	V	PHF	Terrain	%Truck	%Rv	Т	f _{HV}	fp	v = V/PHF	x f x f
(pc/h)	(Veħ/hr)									
reeway	2650	0.92	Level	3	0	_	985	1.00	-	24
Ramp	840	0.92	Level	0	0	1.	000	1.00	9	13
JpStream						-				
DownStream					-			Diverge Areas		
		Merge Areas			Estimati	iono		Nisai de Vicas		
Estimation	101 12				Esuman	1011 0				
	V ₁₂ = V _F	(P _{FM})					V ₁₂ =	= V _R + (V _F - V	R)P _{FD}	
EQ =	(Equa	ation 13-6 or	13-7)		L _{EO} =		(Equation 13-1	12 or 13-13)
FM =	usino	Equation (Exhibit 13-6)		P _{FD} =		0.	645 using Eq	uation (Exhi	bit 13-7)
/ ₁₂ =	pc/h	, - 4 ,	,		V ₁₂ =			210 pc/h		,
		(Canadian 15	111 0 42 171		V ₃ or V _{av34}			14 pc/h (Equa	tion 13.14	or 13,17)
3 or V _{av34}			3-14 or 13-17)			. 07		. , .	KIOH 10-14	UI 10-17)
	2,700 pc/h?							Yes ☑ No		
$s V_3 \text{ or } V_{av34} >$	1.5 * V ₁₂ /2 The Ye				is V ₃ or V _{av3}	₃₄ > 1.5		Yes I No		40 40
Yes,V _{12a} =			-16, 13-18, or		If Yes, V _{12a} =			oc/h (Equation	13-16, 13	-18, or 13
	13-19)						9)		
Capacity C					Capacit	Cn			Contract No.	1.005
	Actual	-	Capacity	LOS F?	<u> </u>	-	Actual		pacity	ŁOSF
					V _F		2924	Exhibit 13-	+-	No
V_{FO}		Exhibit 13-8			$V_{FO} = V_{F}$	- V _R	2011	Exhibit 13-	7200	No
					V _R		913	Exhibit 13-1	0 2200	No
low Enter	ring Merge Ir	fluence (roa			terin	a Dive	rge Influen	ce Area	
TOW LITTE	Actual		Desirable	Violation?	7077 1277	_	Actual	Max Desiral		Violation
V	Acidai	Exhibit 13-8	Desirable	Trosacion:	V ₁₂		210	Exhibit 13-8	4400:All	No
V _{R12}			25 m = 4 F)					terminatio		
	ervice Deteri				-					
$D_{R} = 5.475 -$	+ 0.00734 v _R +	0.0078 V ₁₂	- 0.00627 L _A		'	J _R = 4	1.252 + 0	.0086 V ₁₂ - 0.	009 FD	
R [≠] (pc/m	ni/ln)				D _R = 17	'.9 (pc/	/mi/ln)			
O\$ = (Exhi	bit 13-2)				LOS≃ B	(Exhib	oit 13-2)			
00 (tours in					Speed D			on		
							xhibit 13			
Speed Det	. 40 445				s 0.4	200 (E.		-		
peed Dete	it 13-11)				9 - 00	A	(E.A.TED	43 431		
peed Det	it 13-11) Exhibit 13-11)					,	(Exhibit			
peed Dete s = (Exibi R = mph (8	•					,	(Exhibit (Exhibit			

Consul Infe		HI O MINE	RAMP JUNG	Site Infor					
General Info						375/00			
Analyst	URS	i		eeway/Dir of T		275/SB	DD# CLIO		
Agency or Company		70044		nction		i, of E-W Rd. of			
Date Performed		/2014		risdiction		lillsborough Co	unty		
Analysis Time Perio			Ar	alysis Year		040			
Project Description	East-West Ro	ad							
Inputs		I						Т	
Jpstream Adj Ramp		Freeway Nur	nber of Lanes, N	3				Downstre	am Adj
		Ramp Numb	er of Lanes, N	1				Ramp	
Γ″Yes ΓΟι	1	Acceleration	Lane Length, L	700				. T Yes	□ On
	_	1	Lane Length L					1	
™No FOt	f			4010				I No	☐ Off
6		Freeway Vol		1810				L _{down} =	ft
_{up} = ft		Ramp Volum	• • • • • • • • • • • • • • • • • • • •	140				GOWN	11
/ =b.#		Freeway Free	e-Flow Speed, S _{FF}	70.0				V ₀ ≃	veh/h
/ ₀ =veh/ł	1	Ramp Free-F	low Speed, S _{FR}	55.0				1	
Conversion t	o pc/h Uni	der Base	Conditions						
(pc/h)	V	PHF	Terrain	%Truck	%Rv	f _{HV}	f _p	v = V/PHF	x f _{HV} x f,
	(Veh/hr)								
Freeway	1810	0.92	Level	3	0	0.985	1.00		997
Ramp	140	0.92	Level	0	0	1.000	1.00	_	152
UpStream									
DownStream						L	Discours Assess		
		Merge Areas			E-Almandia		Diverge Areas		
Estimation of	V ₁₂				Estimatio	on or v ₁₂			
	V ₁₂ ≈ V _E	(P _{EM})				V =	V _R + (V _F - V	-1P	
	12 1	ation 13-6 o	r 13-7)			* 12			91
EQ =					LEO =		(Equation 13		
FM ^{II}			tion (Exhibit 13-6)		P _{FD} =		using Equati	on (Exhibit 13	3-7)
/ ₁₂ =	1192	,			V ₁₂ =		pc/h		
√ ₃ or V _{av34}		c/h (Equatio	on 13-14 or 13-		V ₃ or V _{av34}		pc/h (Equation	13-14 or 13-1	7)
	17)	_				> 2 700 pc/h?	T Yes T No		
Is V_3 or $V_{av34} > 2,70$							□Yes □No		
Is V ₃ or V _{av34} > 1.51	'V ₁₂ /2	s F No			1	1.5 12/2	pc/h (Equation) ND 13-16 11	3.18 or
f Yes,V _{12a} =			ion 13-16, 13-		If Yes,V _{12a} =	,	13-19))II 10-10, 1	J-10, Oi
	10,01	13-19)			0 "				
Capacity Che				T	Capacity			and mile .	Loca
	Actual	-	Capacity	LOS F?		Actua		pacity	LOSF
				1	V _F		Exhibit 13		
V _{FO}	2149	Exhibit 13-8		No	V _{FO} = V _F -	VR	Exhibit 13	-8	
740	2170	L. C.			- 1/		Exhibit 13	3-	
					V _R		10		
low Entering	g Merge In	fluence A	Area		Flow Ent	ering Dive	erge Influe		
	Actual	Max	Desirable	Violation?		Actual	Max De	sirable	Violation
V _{R12}	1487	Exhibit 13-8	4600:All	No	V ₁₂		Exhibit 13-8		
evel of Serv	ice Detern	nination (if not F)		Level of	Service D	eterminatio	on (if not	F)
	0.00734 v _R + (D	R = 4.252 +	0.0086 V ₁₂ - 0	0.009 L _D	
) _R = 12.6 (pc/m		16			D _R = (pc	/mi/ln)		-	
	-				.,	thibit 13-2)			
OS = B (Exhibit						lon			
Speed Detern	nination				-	eterminati	on		
				3	hibit 13-12)				
1 _s ≃ 0.261 (Exi					IC - mak	n (Exhibit 13-12	η.		
	(Exhibit 13-11)				S _R = mpt	((CXIIIDIC 10-12	7		
62.7 mph	(Exhibit 13-11)					r (Exhibit 13-12			
$S_R = 62.7 \text{ mph}$ $S_0 = 69.4 \text{ mph}$	(Exhibit 13-11) (Exhibit 13-11) (Exhibit 13-13)				S ₀ = mpt		2)		

East-West Road 2040 AM-PM Peak Hour HCS Multi-Lane Analysis

M	ULTILANE HIGHWAYS	WORKSHEET(Directi	on 1)
<u></u>			
General Information		Site Information	
Analyst		Highway/Direction to Travel	East-West Road
Agency or Company	URS	From/To Jurisdiction	I-275/Commerce Pk Blvd City of Tampa
Date Performed	10/7/2014	Analysis Year	2040
Analysis Time Period	AM		
Project Description East-Wes		** (\$.1k	C Blan (va)
Coper.(LOS)		Des. (N)	☐ Plan. (vp)
Flow Inputs			***
Volume, V (veh/h)	440	Peak-Hour Factor, PHF	0.92
AADT(veh/h)		%Trucks and Buses, P _T	0
Peak-Hour Prop of AADT (veh/k	d)	%RVs, P _R General Terrain:	0 Levei
Peak-Hour Direction Prop, D DDHV (veh/h)		Grade Length (mi)	0.00
Driver Type Adjustment	1.00	Up/Down %	0.00
		Number of Lanes	2
Calculate Flow Adjus	stments		
fp	1.00	E _R	1.2
E _T	1.5	f_{HV}	1.000
Speed Inputs		Calc Speed Adj and	FFS
Lane Width, LW (ft)	12.0	f _{LW} (mi/h)	0.0
Total Lateral Clearance, LC (ft)	12.0		0.0
Access Points, A (A/mi)	0	f _{LC} (mi/h)	
Median Type, M	Divided	f _A (mi/h)	0.0
FFS (measured)		f _M (mi/h)	0.0
Base Free-Flow Speed, BFFS	60.0	FFS (mi/h)	60.0
Operations		Design	
		Design (N)	
Operational (LOS)		Required Number of Lanes, N	
Flow Rate, v _p (pc/h/ln)	239	Flow Rate, v _p (pc/h)	
Speed, S (mi/h)	60.0	Max Service Flow Rate (pc/h/ln)	
) (pc/mi/in)	4.0		
.os	A	Design LOS	
Bicycle Level of Service	39 Alignetic		
neyers cerei or service			

M	MULTILANE HIGHWAYS WORKSHEET(Direction 2)						
1 -							
General Information		Site Information					
Analyst		Highway/Direction to Travel	East-West Road				
Agency or Company	URS	From/To	I-275/Commerce Pk Blvd				
Date Performed	10/7/2014	Jurisdiction Analysis Year	City of Tampa 2040				
Analysis Time Period	AM	Allalysis Toal					
Project Description East-West		II III	7 Mar - 10 N				
☐ Oper.(LOS)		es. (N)	Plan. (vp)				
Flow Inputs			0.00				
Volume, V (veh/h)	1390	Peak-Hour Factor, PHF	0.92				
AADT(veh/h)		%Trucks and Buses, P _T	0				
Peak-Hour Prop of AADT (veh/d	")	%RVs, P _R	0 Level				
Peak-Hour Direction Prop, D		General Terrain: Grade Length (mi)	0.00				
DDHV (veh/h) Driver Type Adjustment	1.00	Up/Down %	0.00				
		Number of Lanes	2				
Calculate Flow Adjus	tments						
fp	1.00	E_R	1.2				
ÉT	1.5	f _{HV}	1.000				
Speed Inputs		Calc Speed Adj and I	FS				
Lane Width, LW (ft)	12.0	f _{Lw} (mi/h)	0.0				
Total Lateral Clearance, LC (ft)	12.0	f _{LC} (mi/h)	0.0				
Access Points, A (A/mi)	0		0.0				
Median Type, M	Divided	f _A (mi/h)					
FFS (measured)		f _M (mi/h)	0.0				
Base Free-Flow Speed, BFFS	60.0	FFS (mi/h)	60.0				
Operations		Design					
•							
		Design (N)					
Operational (LOS)		Required Number of Lanes, N					
Flow Rate, v _p (pc/h/ln)	755	Flow Rate, v _p (pc/h)					
Speed, S (mi/h)	60.0	Max Service Flow Rate (pc/h/ln)					
D (pc/mi/ln)	12.6	Design LOS					
LOS	8	Ť					
Bicycle Level of Service							

M	MULTILANE HIGHWAYS WORKSHEET(Direction 1)						
			,	,			
General Information		Sit	e Information				
Analyst Agency or Company Date Performed Analysis Time Period Project Description East-Wes	URS 10/7/2014 PM	From Juris	way/Direction to Travel n/To diction ysis Year		est Road ommerce Pk Blvd "ampa		
☐ Oper.(LOS)		P Des. (N)	Г	Plan. (vp)		
Flow Inputs Volume, V (veh/h) AADT(veh/h)	1390	%Tru	Hour Factor, PHF cks and Buses, P _T	0.92			
Peak-Hour Prop of AADT (veh/o Peak-Hour Direction Prop, D DDHV (veh/h) Driver Type Adjustment	1.00	Grade	ral Terrain:	0 Level 0.00 0.00 2			
Calculate Flow Adjus	stments						
f _p E _T	1.00 1.5	E _R f _{HV}		1.2 1.000			
Speed Inputs		Cal	c Speed Adj and	FFS			
Lane Width, LW (ft) Total Lateral Clearance, LC (ft) Access Points, A (A/mi) Median Type, M FFS (measured) Base Free-Flow Speed, BFFS	12.0 12.0 0 Divided	f _{LW} (I f _{LC} (I f _A (m f _M (n FFS	ni/h) i/h)	0.0 0.0 0.0 0.0 0.0 60.0			
Operations		Des	ign				
Operational (LOS) Flow Rate, v _p (pc/h/ln) Speed, S (mi/h) O (pc/mi/ln) OS	755 60.0 12.6 B	Desig Requi Flow Max S		·)			
licycle Level of Service	100				···		

Ceneral Information	M	MULTILANE HIGHWAYS WORKSHEET(Direction 2)					
Analyst							
Agency or Company URS Date Performed 1077/2014 Urrisdiction City of Tampa 2040	General Information		Site Information				
Des. (N)	Agency or Company Date Performed Analysis Time Period	10/7/2014 PM	From/To Jurisdiction	I-275/Commerce Pk Blvd City of Tampa			
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$			Des. (N)	☐ Plan. (vp)			
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	Flow Inputs						
Form	Volume, V (veh/h) AADT(veh/h)	d) -	%Trucks and Buses, P _T %RVs, P _R General Terrain: Grade Length (mi) Up/Down %	0 Level 0.00 0.00			
Form	Calculate Flow Adjus	tments					
Lane Width, LW (ft) 12.0 f_{LW} (mi/h) 0.0 Total Lateral Clearance, LC (ft) 12.0 f_{LC} (mi/h) 0.0 Access Points, A (A/mi) 0 f_{A} (mi/h) 0.0 Median Type, M Divided f_{M} (mi/h) 0.0 FFS (measured) f_{M} (mi/h) 0.0 FFS (mi/h) 60.0 Design (N) Required Number of Lanes, N Flow Rate, v_{p} (pc/h/ln) 4.0 OS A	f _p E _T	1.00					
Total Lateral Clearance, LC (ft) 12.0 f_{LC} (mi/h) 0.0 Access Points, A (A/mi) 0 f_A (mi/h) 0.0 Median Type, M Divided f_M (mi/h) 0.0 FFS (measured) f_M (mi/h) 0.0 FFS (mi/h) 60.0 Design Design Design (N) Required Number of Lanes, N Flow Rate, v_p (pc/h) Max Service Flow Rate (pc/h/ln) Design LOS OS A	Speed Inputs		Calc Speed Adj and I	FFS			
Design (N) Design (N) Required Number of Lanes, N Flow Rate, v _p (pc/h) Design (N) Required Number of Lanes, N Flow Rate, v _p (pc/h) Max Service Flow Rate (pc/h/ln) Design LOS Design (N) Required Number of Lanes, N Flow Rate, v _p (pc/h) Max Service Flow Rate (pc/h/ln) Design LOS	Lane Width, LW (ft) Total Lateral Clearance, LC (ft) Access Points, A (A/mi) Median Type, M FFS (measured) Base Free-Flow Speed, BFFS	12.0 0 Divided	f _{LC} (mi/h) f _A (mi/h) f _M (mi/h)	0.0 0.0 0.0			
Design (N) Design (N) Required Number of Lanes, N Flow Rate, v _p (pc/h) Design (N) Required Number of Lanes, N Flow Rate, v _p (pc/h) Max Service Flow Rate (pc/h/ln) Design LOS	Operations		Design				
Icycle Level of Service	Operational (LOS) Flow Rate, v _p (pc/h/ln) Speed, S (mi/h) O (pc/mi/ln) OS	60.0 4.0	Required Number of Lanes, N Flow Rate, v _p (pc/h) Max Service Flow Rate (pc/h/ln)				
	Bicycle Level of Service						



AI SHEEL

ity Of Tampa

From I-

Eas -

levard/New Tampa Boulevard

ALTERNATIVE 4

PREPARED BY
URS CORPORATION SOUTHERN

URS CORPORATION SOUTHERN PASCO COUNTY HILLSBOROUGH COUNTY K-Y - T

LOCATION OF PROJECT

- PLANS

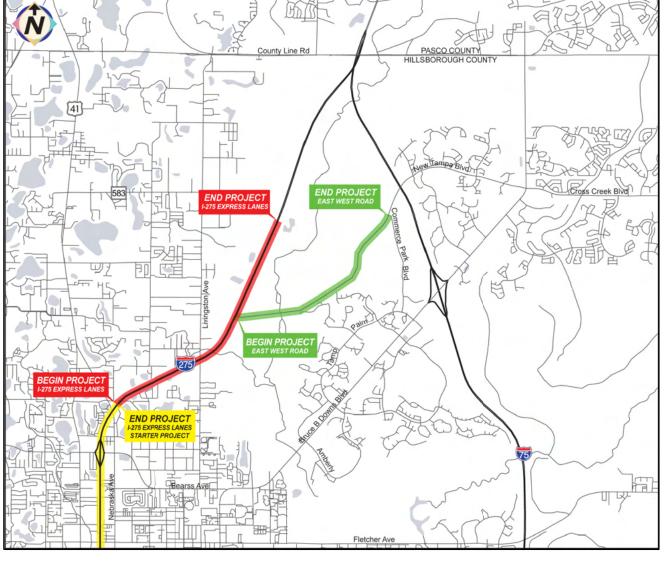
Aerial Photography Date: 2011

SHEET DESCRIPTION

COVER SHEET
LEGEND/SHEET LAYOUT

INDEX OF PLANS

SHEET N .



URS Corpora ion Southern 7650 West Courtney Campbell Causeway Tampa, FL 3360 -

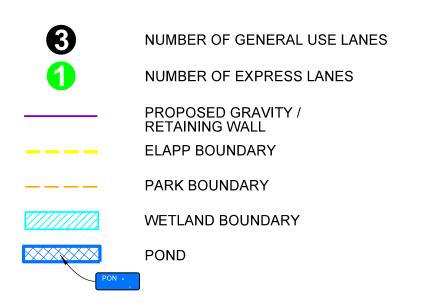
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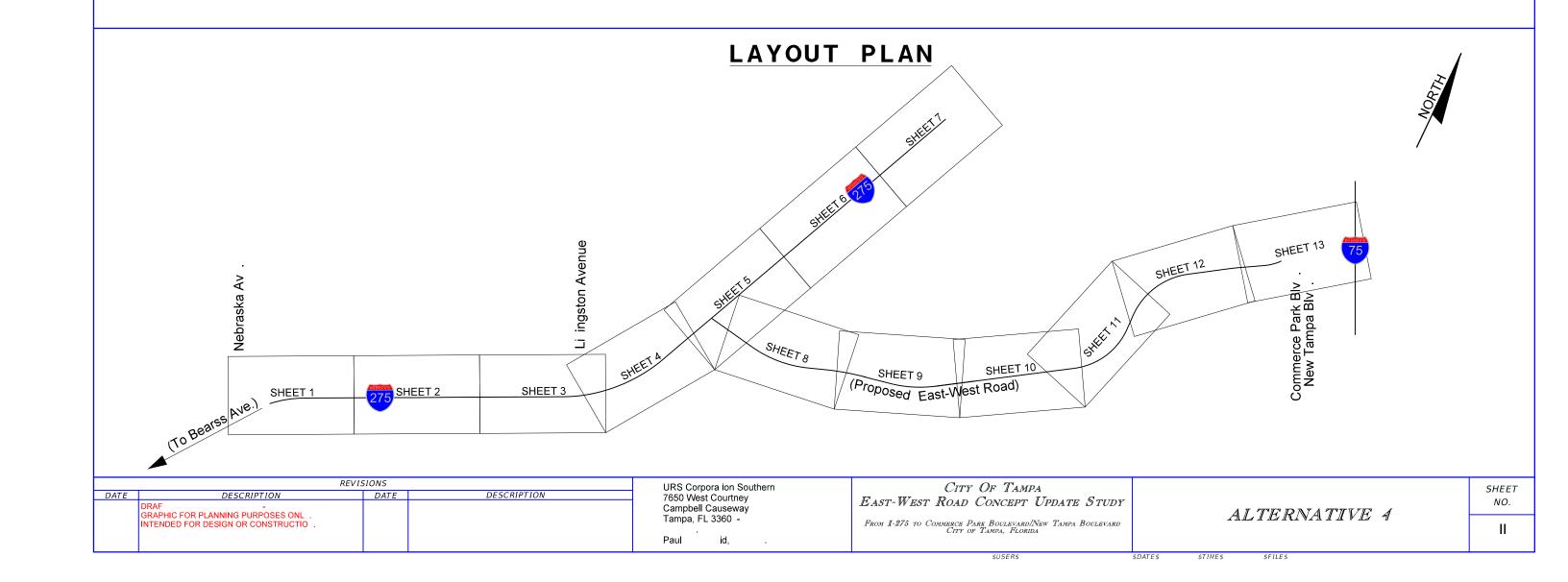
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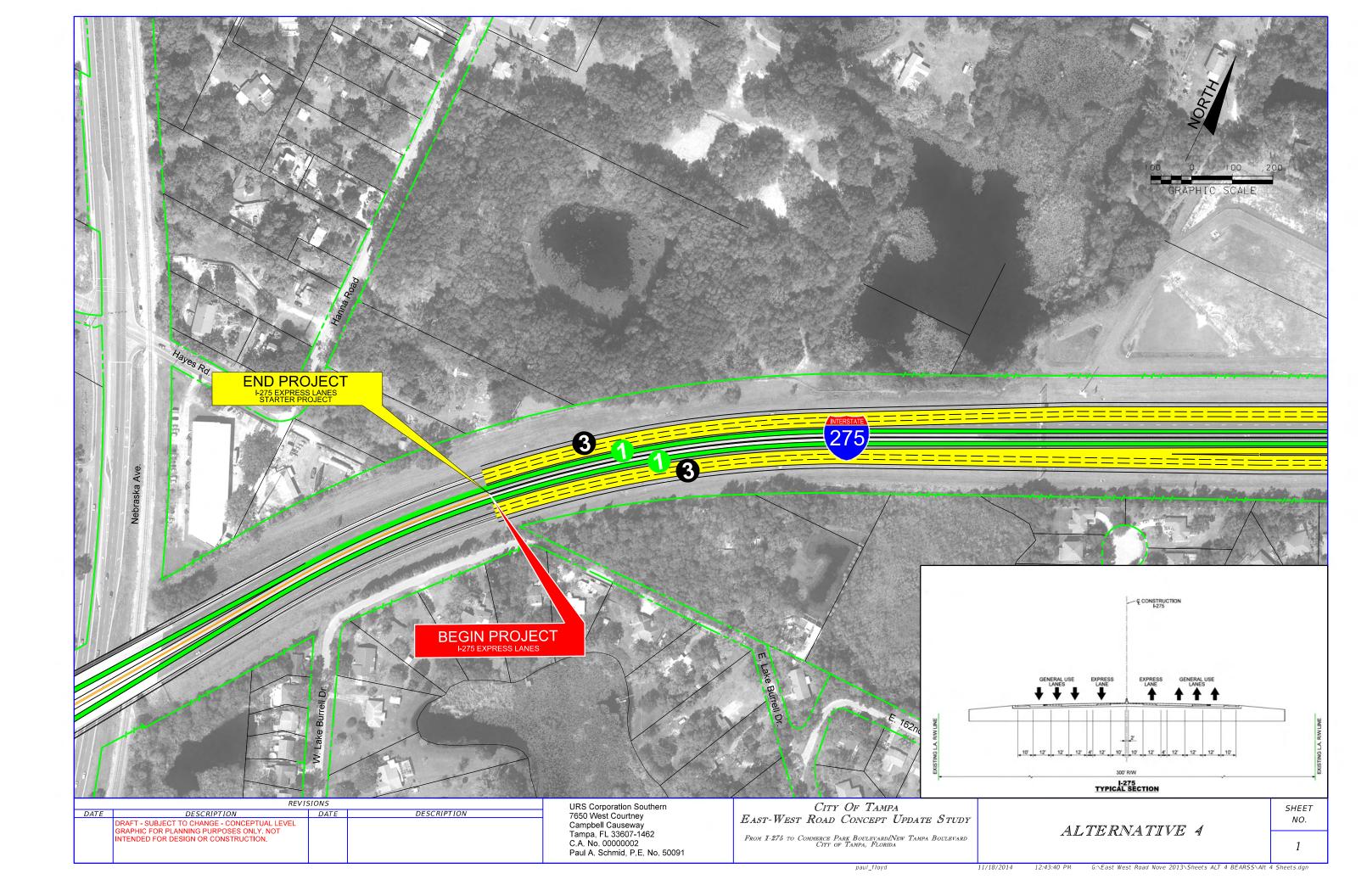
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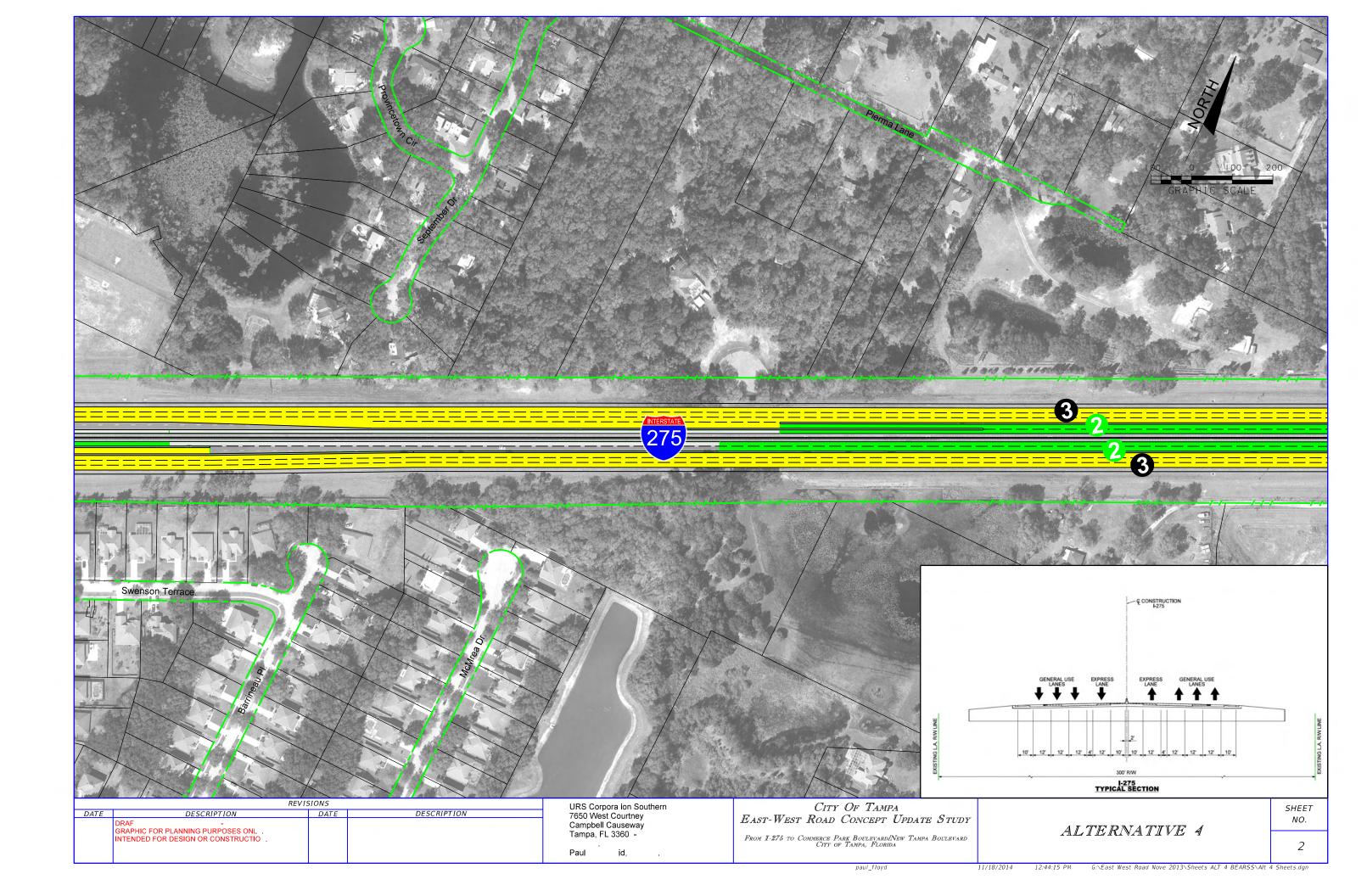
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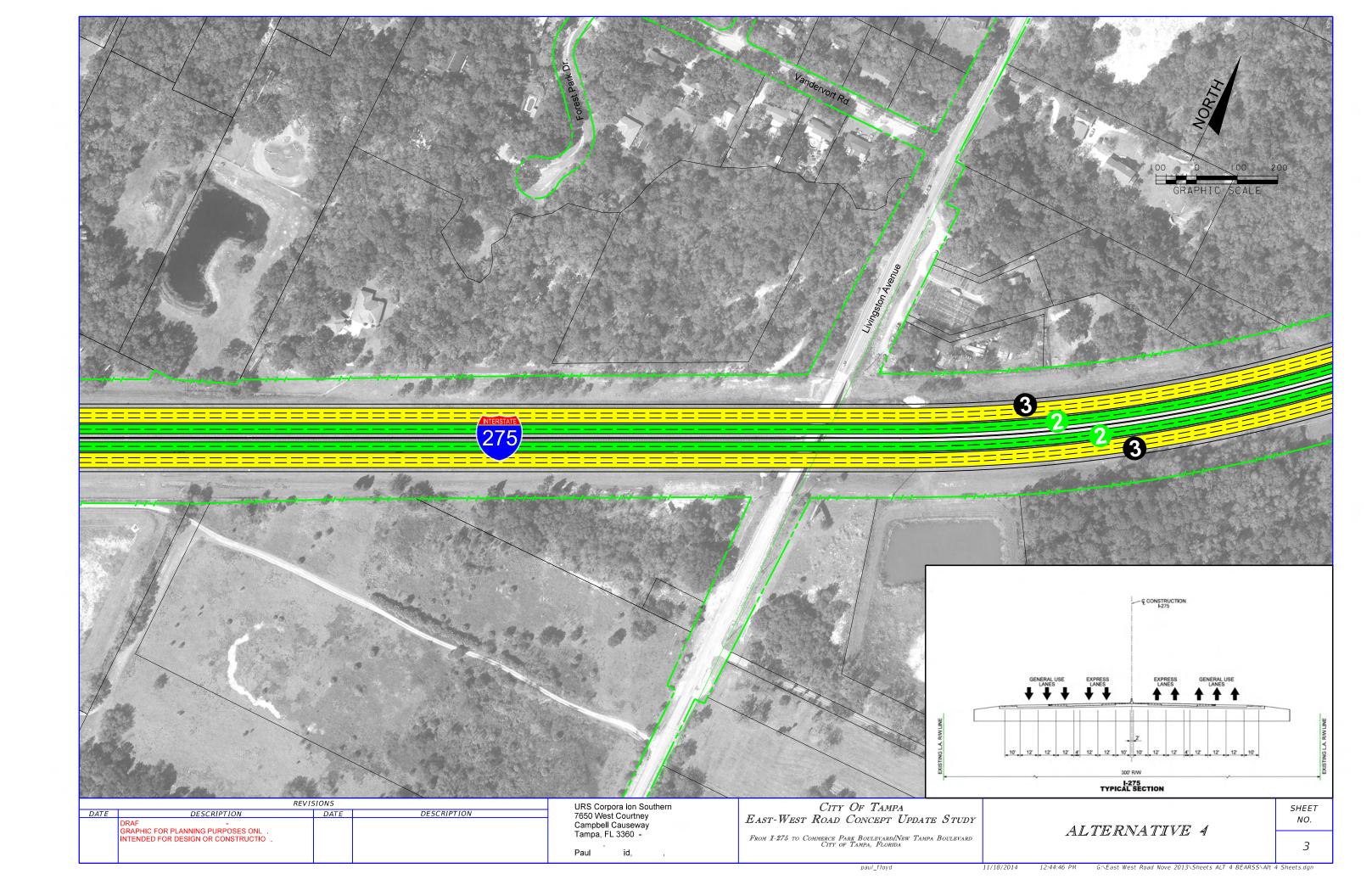
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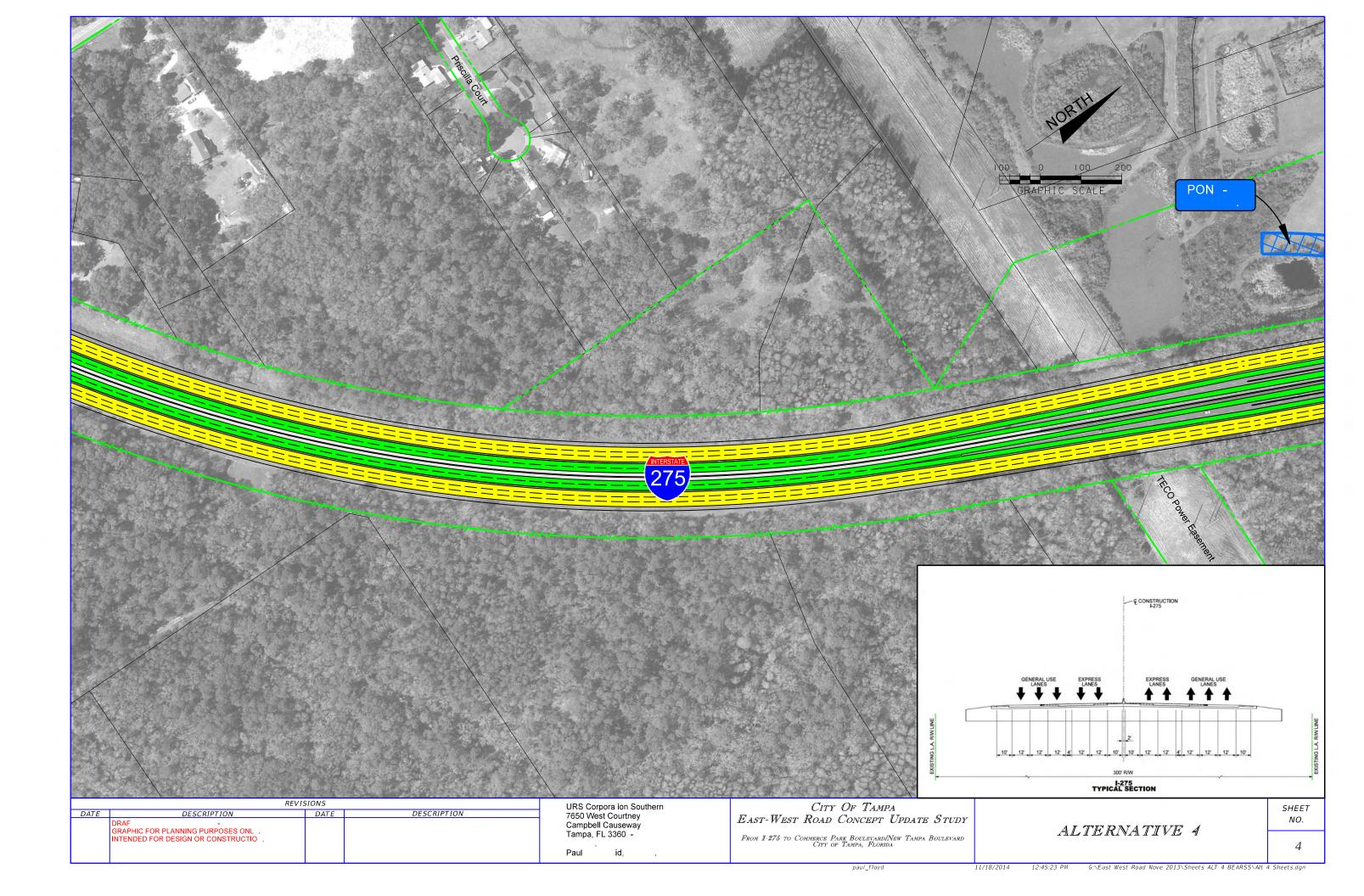


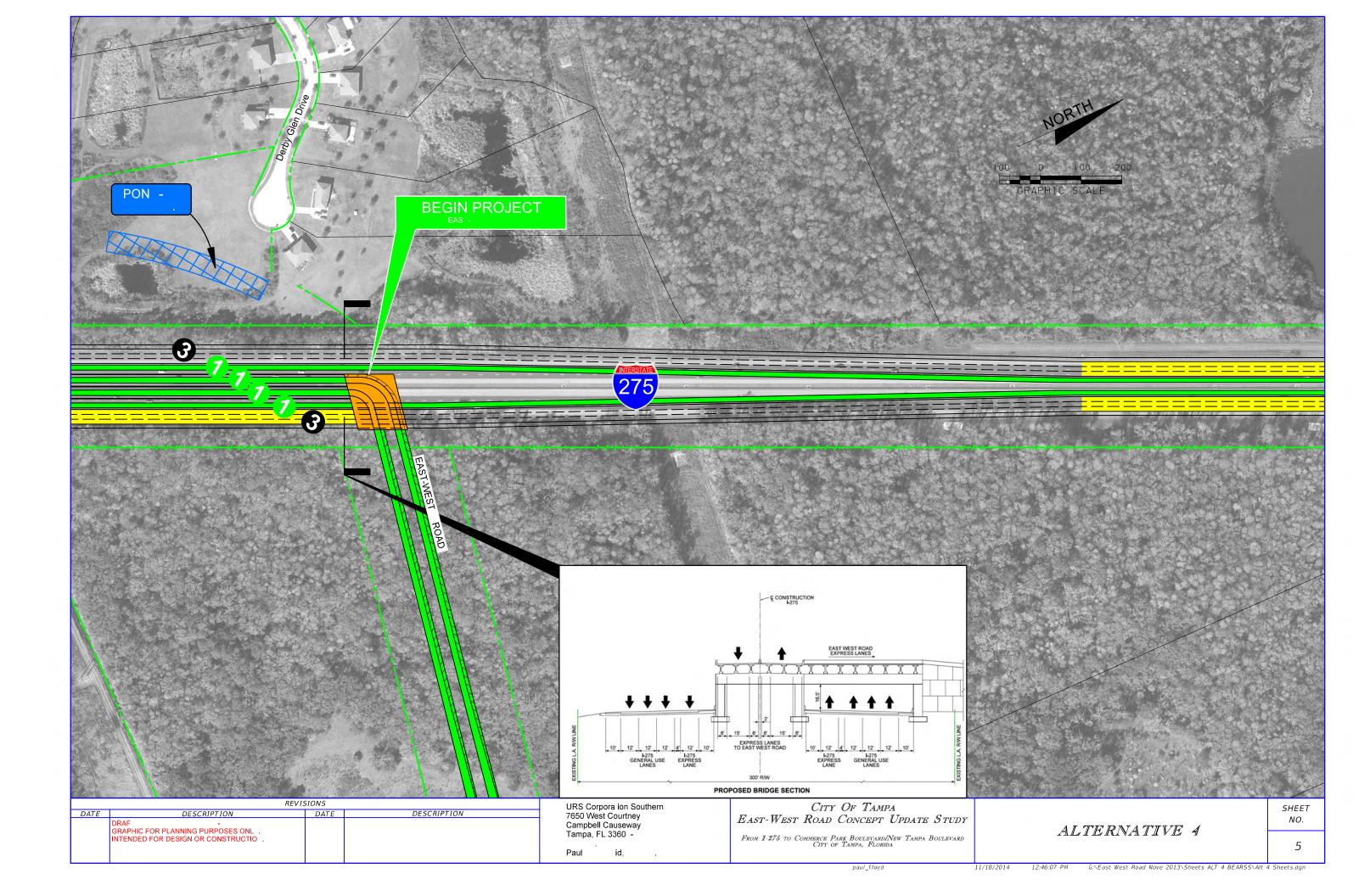




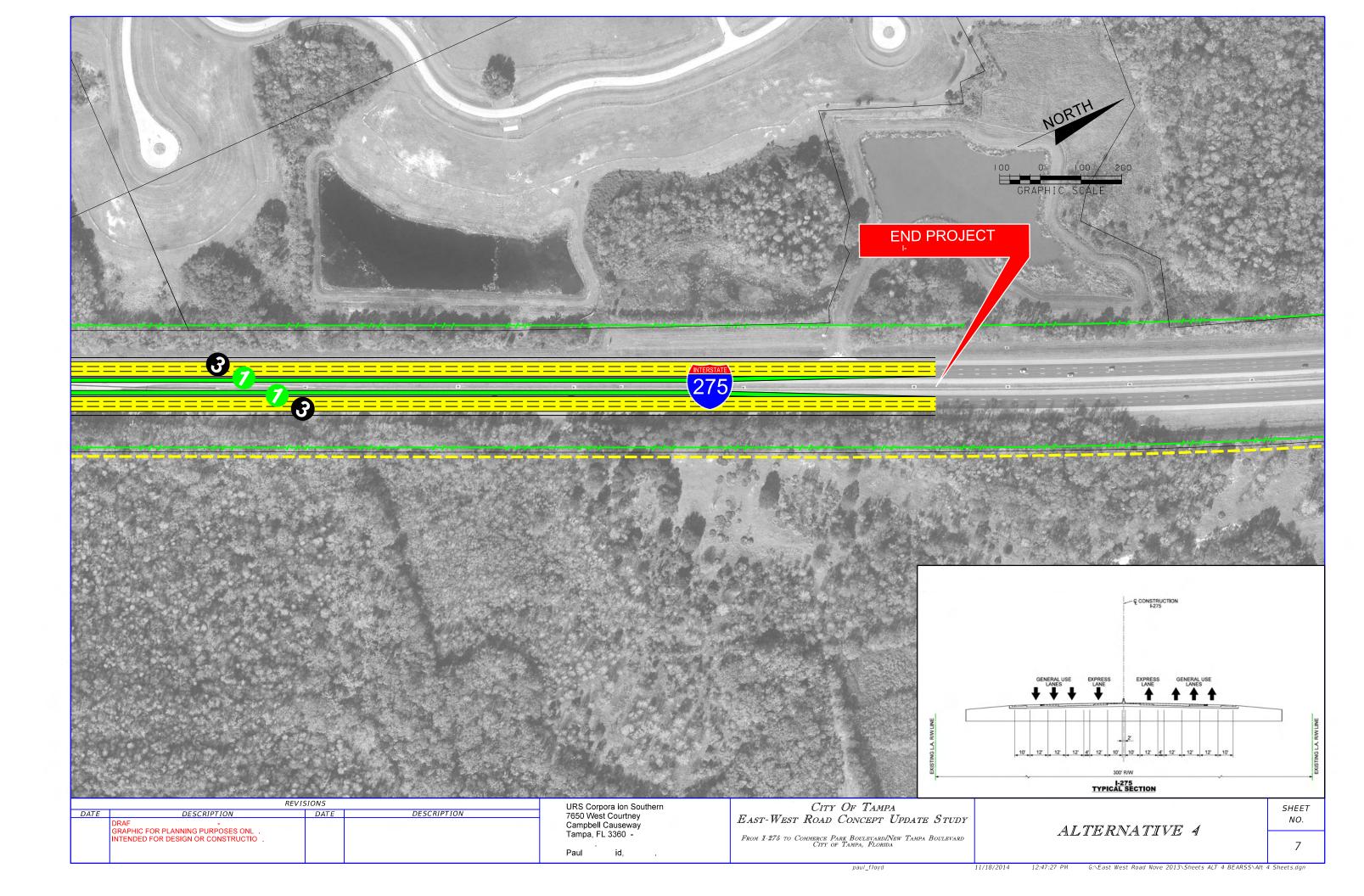


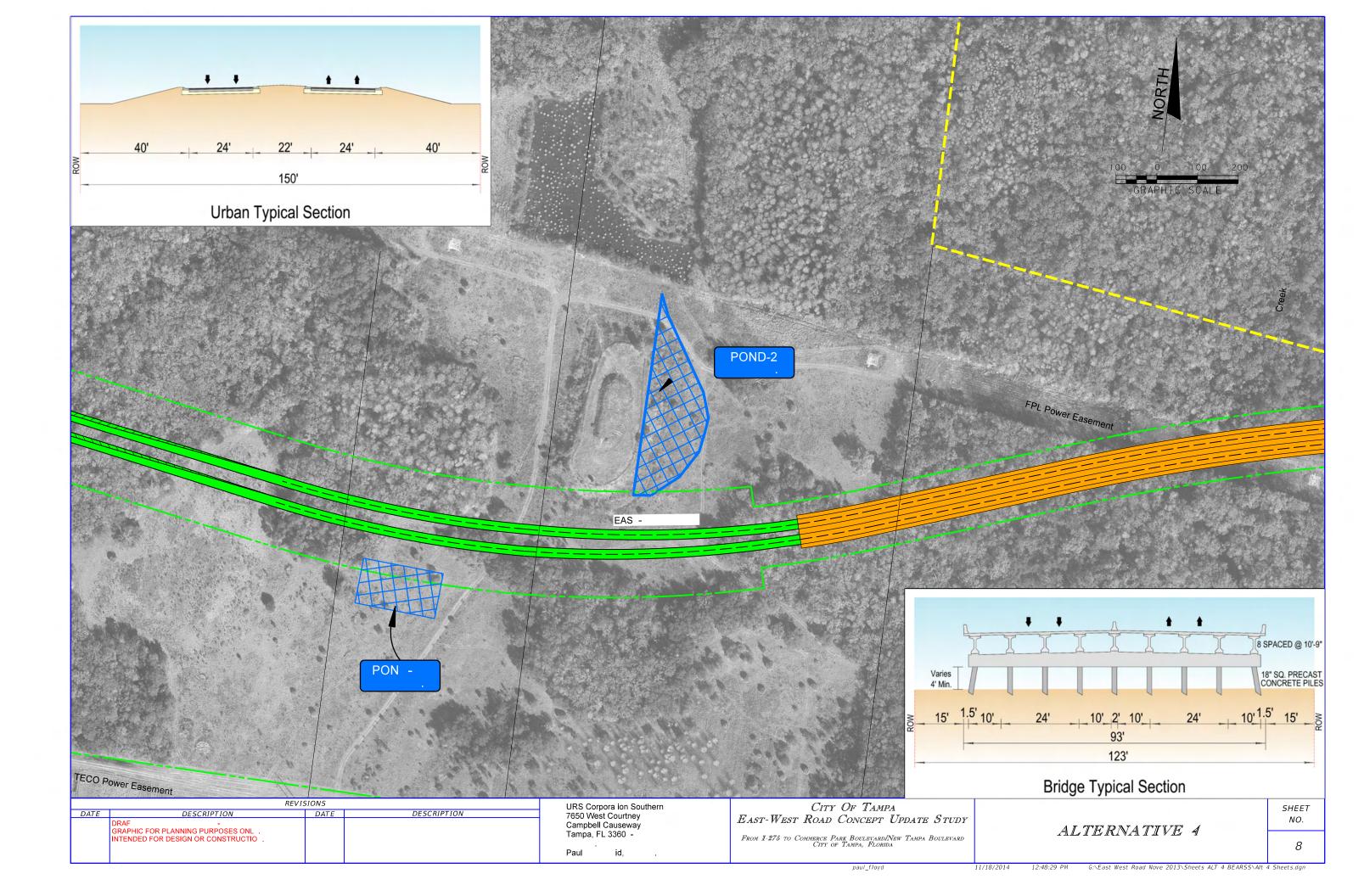


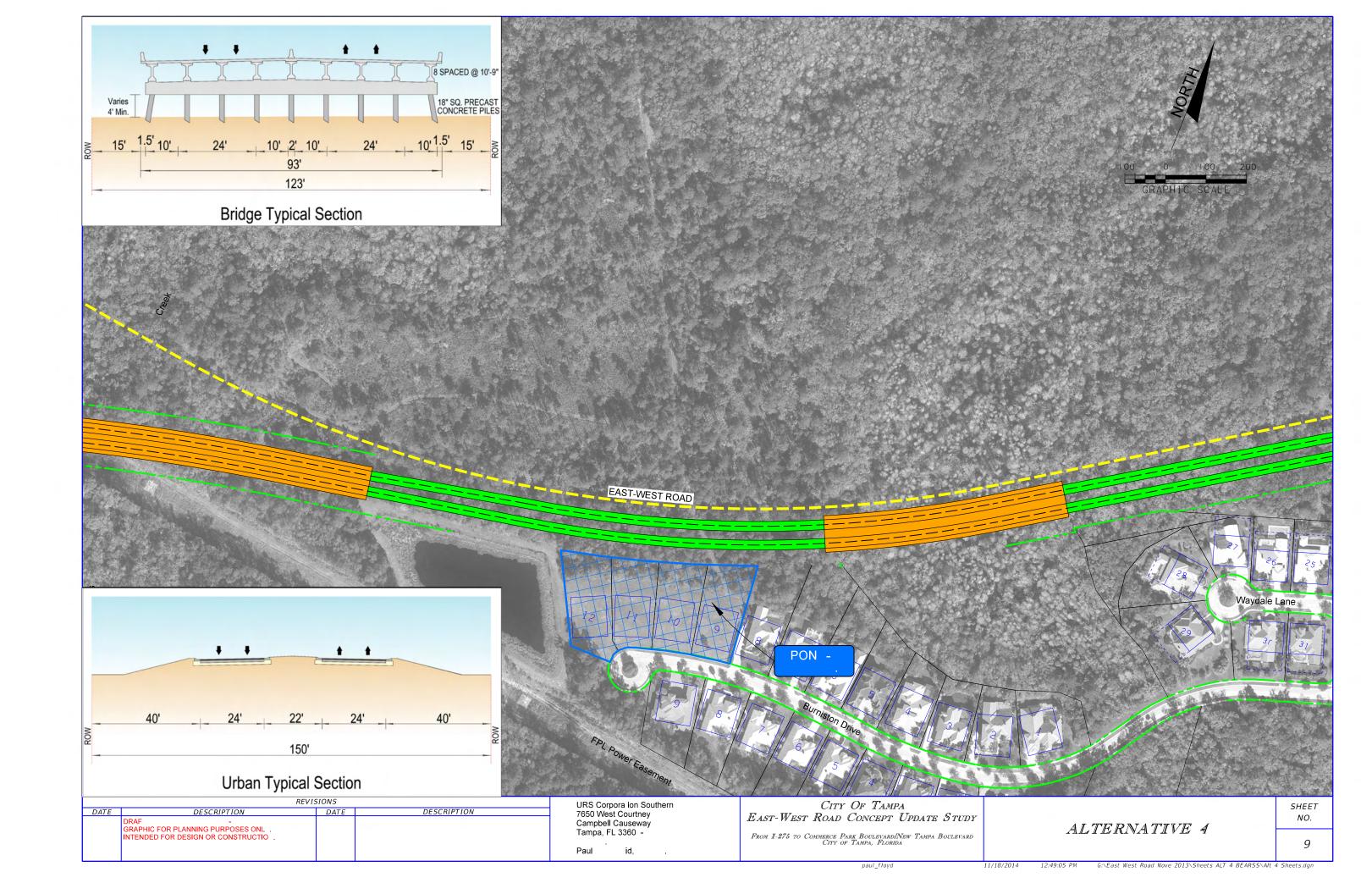


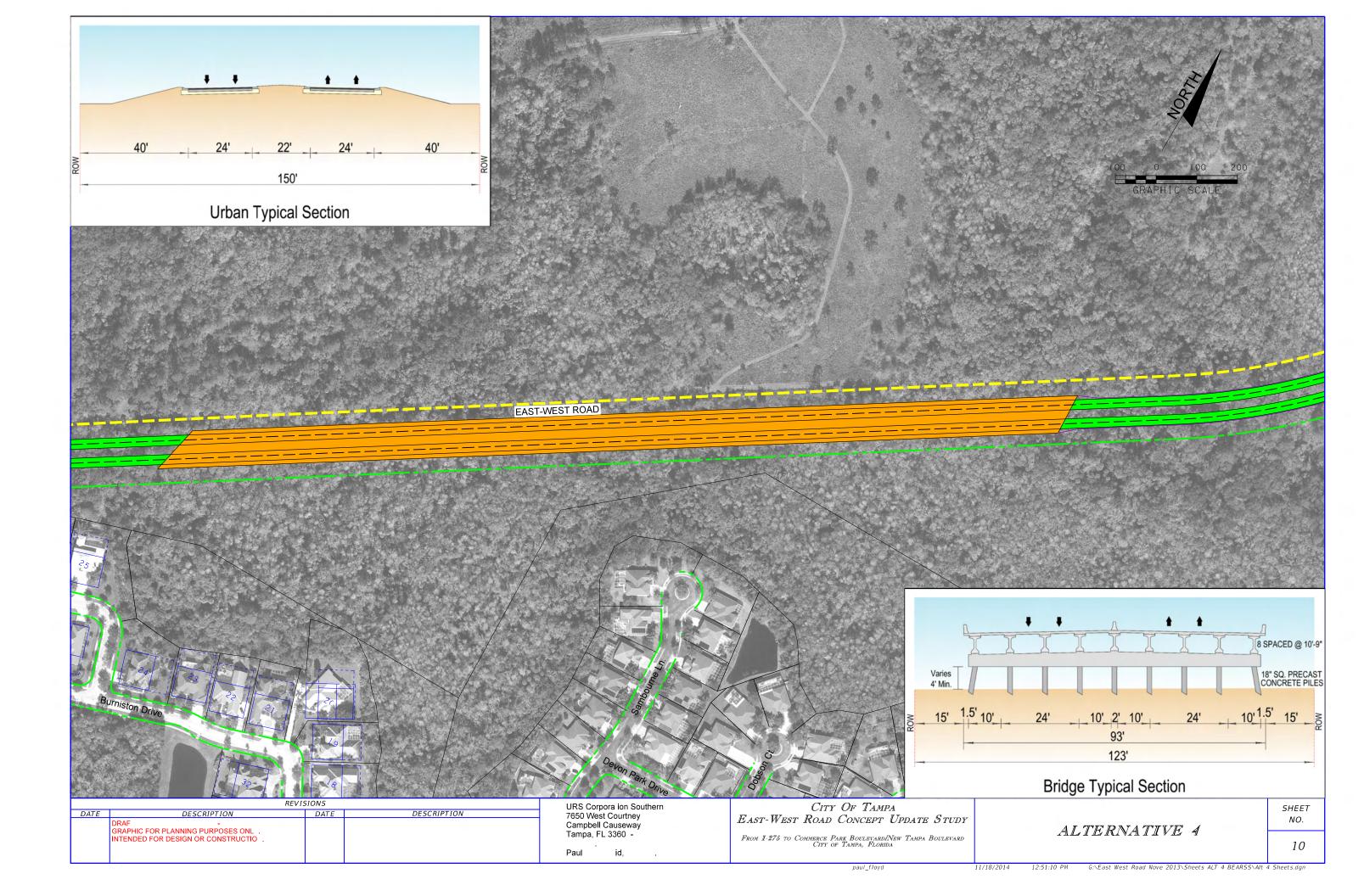


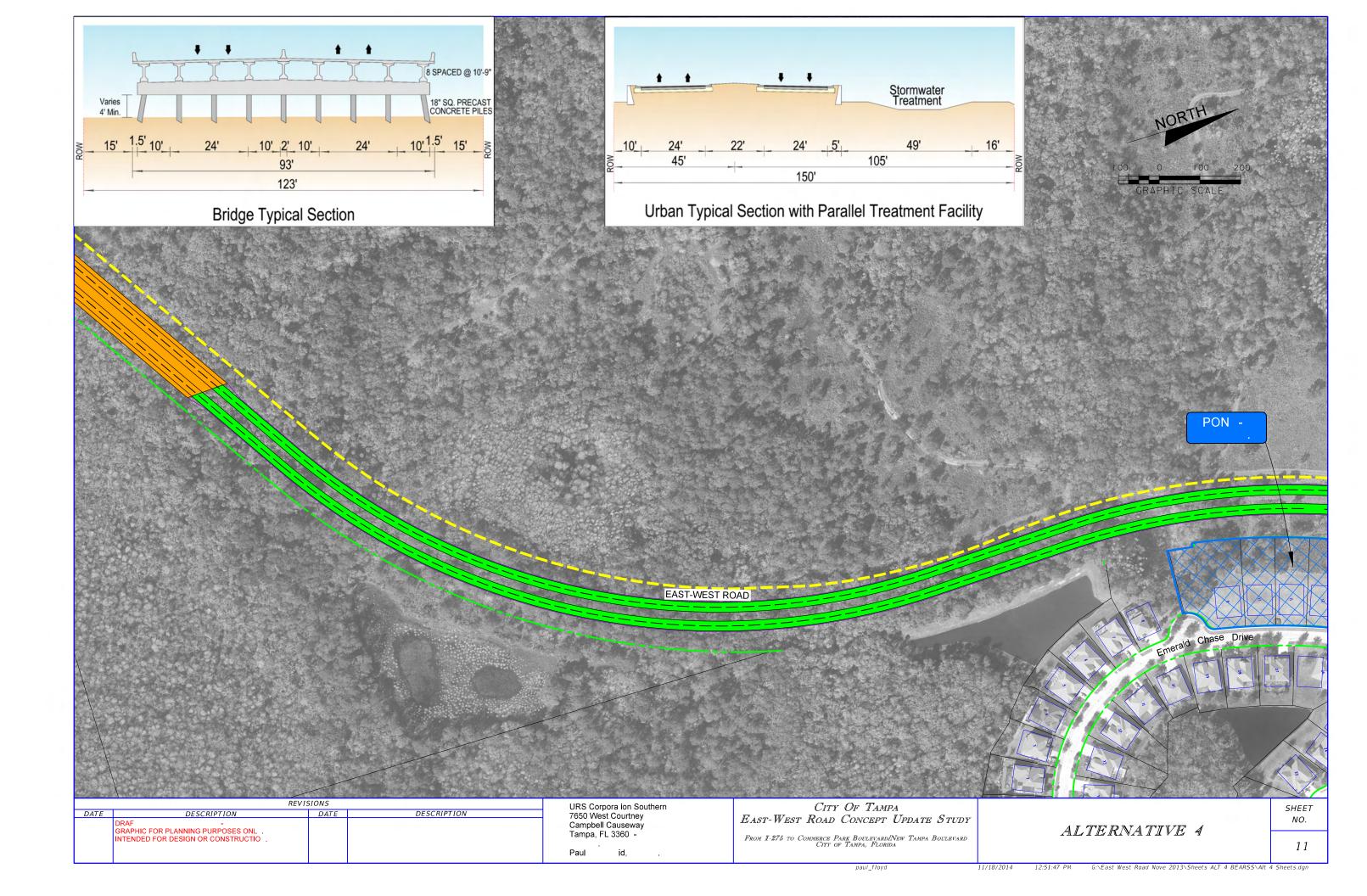


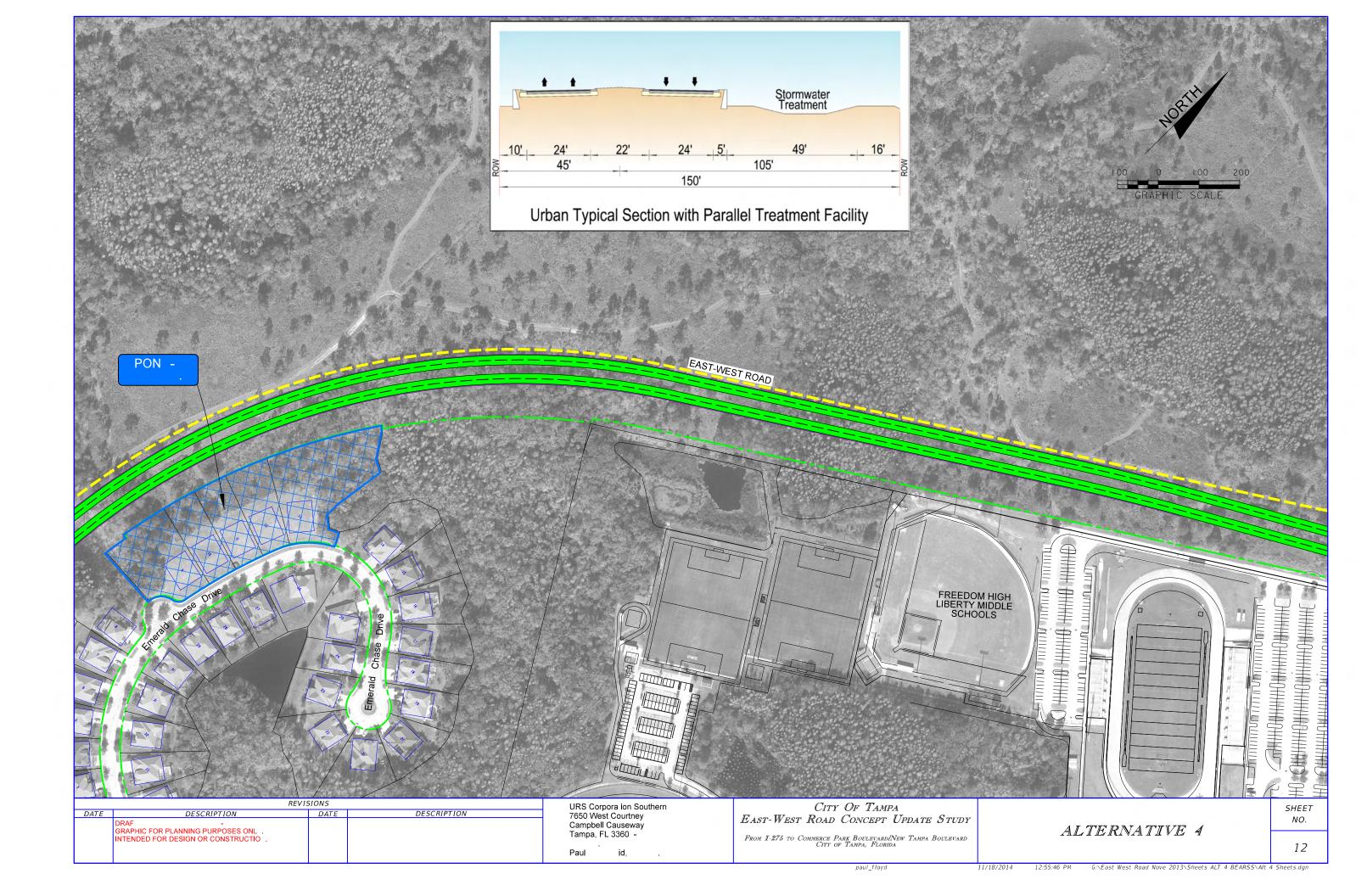


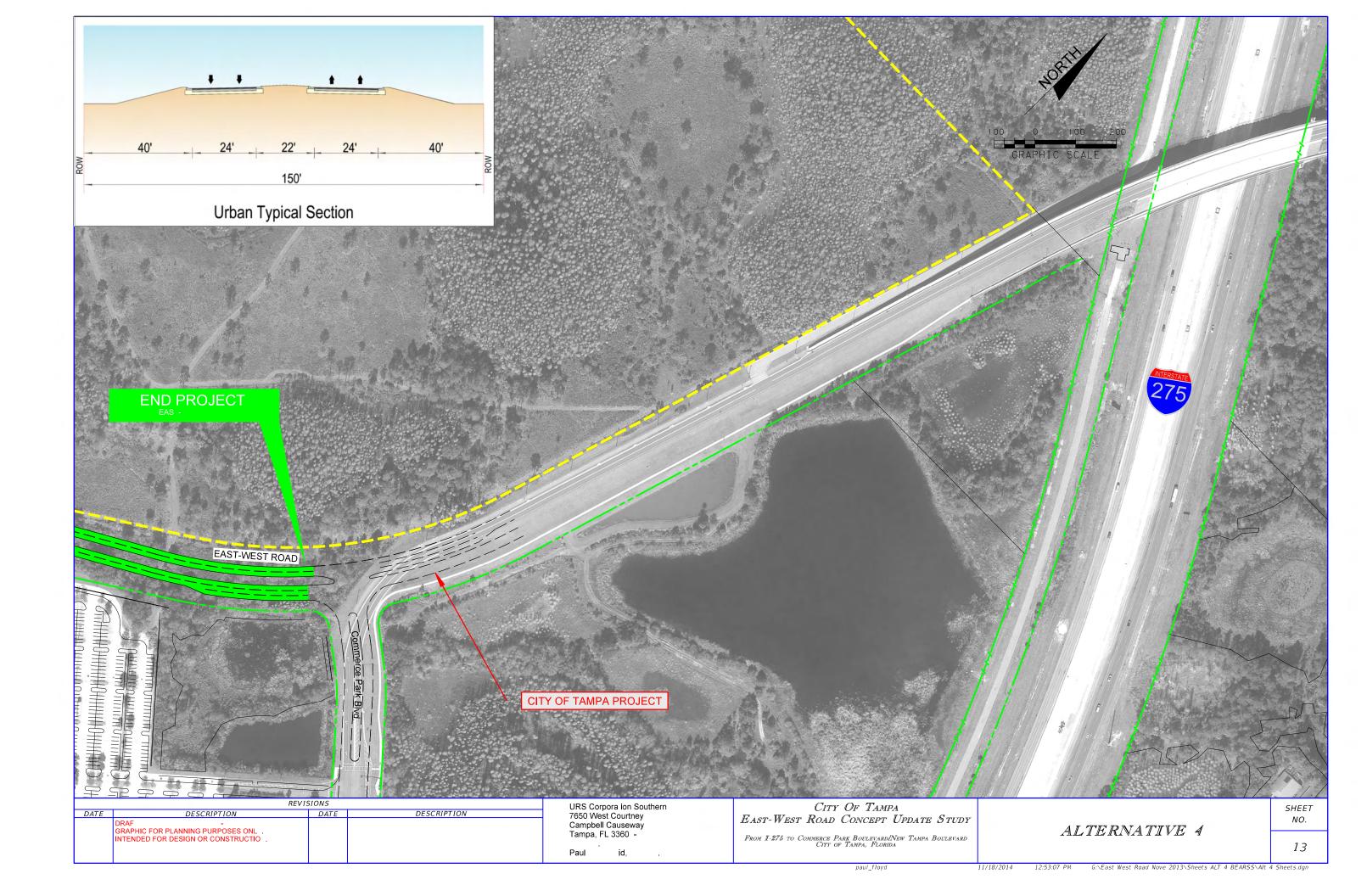














URS CORPORATION EAST WEST ROAD ALTERNATE 4 (4 LANES)

Preliminary Cost Estimate March 10, 2015

DESCRIPTION	Alternative 4
	Directional
	Toll Option
EAST-WEST ROAD (Urban 4 Lane Divided)	\$73,537,000
Roadway	\$23,834,831
Bridges	\$49,702,169
RAMPS	\$13,685,000
Roadway	\$9,828,188
Bridges	\$3,856,812
ACMOTOLICAL YOUR	607.000.000
CONSTRUCTION TOTAL Design Faces (12.0%)	\$87,222,000 \$10,466,640
Design Fees (12.0%) CE&I Fees (15.0%)	\$1,569,996
Mitigation	\$3,132,570
Permitting (2.0%)	\$62,651
Change Order Contingency (5.0%)	\$4,517,729
4 LANE PROJECT DEVELOPMENT TOTAL	\$106,971,586

EXPRESS LANES (NB & SB) ON I-275	\$41,396,000
Roadway	\$41,396,000
CONSTRUCTION TOTAL	\$41,396,000
Design Fees (12.0%)	\$4,967,520
CE&I Fees (15.0%)	\$6,209,400
Mitigation (All mitigation incl. above)	\$0
Permitting (2.0%)	\$827,920
Change Order Contingency (5.0%)	\$2,069,800
I-275 EXPRESS LANES DEVELOPMENT TOTAL	\$55,470,640

PROJECT TOTAL COST	\$162,442,226

NOTES:

- 1. Costs for all other bridges are based on average span AASHTO girder
- Costs do not include Right of Way acquisition.
 Costs do not include legal or administrative costs.
- 4. Costs include a gantry type open road toll collection facility.5. All mitigation costs are included in the initial 4 Lane project.
- 6. All costs are present day cost.

City of Tampa - East / West Road Concept Update PD&E Study

Alternative 4 - Urban 4 Lane

Construction Cost Estimate

URS Corporation / GLF

nstruction Cost Estimate DESCRIPTION		OHANTITY	HAUT	U.P.	poration / GLF
DESCRIPTION		QUANTITY	UNII	U.F.	C051
ROADWAY					\$17,128,929
CLEARING & GRUBBING		29.44	ac	\$25,000.00	\$736,000
EROSION CONTROL		1.619	mi	\$29,257.26	\$47,371
REGULAR EXCAVATION		24,618	су	\$4.97	\$122,351
EMBANKMENT (BORROW)(BANK	MEAS.)	182,685	СУ	\$16.00	\$2,922,960
POND CONSTRUCTION	1 acres each	4.00	each	\$153,331.30	\$613,325
STORM DRAINAGE SYSTEM	NDU	1.62	miles	\$1,217,678.46	\$1,971,578
TYPE 8 STABILIZATION		49,071	sy	\$3.79	\$185,979
ROADWAY BASE - OPTIONAL BAS	SE, BASE GROUP 11	46,545	sy	\$22.31	\$1,038,419
ROADWAY ASPHALT - SUPERPAY	VE ASPHALTIC CONC, TRAFFIC D (4 inches)	10,135.0	tons	\$104.47	\$1,058,803
SHOULDER BASE -			sy		
SHOULDER ASPHALT- (inches)			tons		
ASPHALT CONCRETE FRICTION	COURSE, INC BIT, FC-5, PG 76-22, PMA	1,959.0	tons	\$132.53	\$259,626
MILLING / OVERLAY			sy		
CONCRETE CURB & GUTTER, TY	PE E	17,098		\$21.33	\$364,700
CONCRETE SIDEWALK AND DRIV			sy	\$33.06	*
MISCELLANEOUS ASPHALT PAVE			tons	\$168.54	
SHOULDER GUTTER- CONCRETE			If	\$19.41	
PERFORMANCE TURF	10% Sod	94,039	sv	\$0.62	\$58,304
SIGNS (Post & Misc.)			Miles	\$7,155.00	\$11,585
43	PEN GRADED ASPHALT SURFACES, WHITE, SKIP, 6".	3.000		\$2,032.25	\$6,097
-/	PEN GRADED ASPHALT SURFACES WHITE, SOLID, 6	6.000		\$4,633.02	\$27,798
RETRO-REFLECTIVE PAVEMENT		396		\$3.75	\$1,485
TRUSS SIGNS - None			ea		
		1	ea		
LIGHTING	Conventional (Average Pole Spacing)	43	ea	\$10,050.66	\$432,178
TRAFFIC SIGNALS (Model 1)	None				
TRAFFIC SIGNALS (Model 2)	None				
TRAFFIC SIGNALS (Model 3)	None				
Extra Items					
CONCRETE CLASS NS, GRAVITY	WALL	2768	C.Y.	\$548.80	\$1,519,078
RETAINING WALL SYSTEM, PERM		37564		\$34.24	\$1,286,191
	RRIER, WITH JUNCTION SLAB, 42" F SHAPE		L.F.	\$278.66	\$668,784
MEDIAN CONCRETE BARRIER W			L.F.	\$195.74	\$234,888
ITS/Tolling			EA	\$3,500,000.00	\$3,500,000
*	TURE, F&I, CANTILEVER, 41-50 FT		EA	\$61,425.50	\$61,426

STRUCTURES					\$35,718,520
APPROACH SLAB CONCRETE		639	су	\$379.51	\$242,590
APPROACH SLAB REINFORCING		134,236	-	\$1.12	\$150,345
EW West Bridge	PRESTR CONC GIRDER (SIMPLE SPAN)	133,920.00	sf	\$103.50	\$13,860,720

STRUCTURES					\$35,718,520
APPROACH SLAB CONCRETE		639	су	\$379.51	\$242,590
APPROACH SLAB REINFORCE	ING	134,236	lbs	\$1.12	\$150,345
EW West Bridge	PRESTR CONC GIRDER (SIMPLE SPAN)	133,920.00	sf	\$103.50	\$13,860,720
EVV Middle Bridge	PRESTR CONC GIRDER (SIMPLE SPAN)	44,640.00	sf.	\$103.50	\$4,620,240
EW East Bridge	PRESTR CONC GIRDER (SIMPLE SPAN)	162,750.00	sf	\$103.50	\$16,844,625

SUBTOTAL		\$52,847,449
MOT	10.0%	\$5,284,745
Mobilization	10.0%	\$5,813,219
SUBTOTAL		\$63,945,413
Contingency	15.0%	\$9,591,812
CONSTRUCTION	ON TOTAL (Rounded)	\$73,537,000

City of Tampa - East / West Road Concept Update PD&E Study

Alt 4 I-275 to EW XPRS Interchange w/S Ramps

Construction Cost Estimate

URS Corporation / GLF

ESCRIPTION	QUANTITY	UNIT	U.P.	COST
ROADWAY				\$7,063,109
CLEARING & GRUBBING	7.29	ac	\$25,000.00	\$182,25
EROSION CONTROL	0.251	mi	\$30,699.38	\$7,69
REGULAR EXCAVATION	3,813	СУ	\$4.97	\$18,94
EMBANKMENT (BORROW)(BANK MEAS.)	146,134	СУ	\$16.00	\$2,338,14
POND CONSTRUCTION 1 acres each	4.00	each	\$153,331.30	\$613,32
STORM DRAINAGE SYSTEM NDR	0.25	miles	\$287,234.36	\$72,02
TYPE B STABILIZATION	27,313	sy	\$3.79	\$103,51
ROADWAY BASE - OPTIONAL BASE, BASE GROUP 11	19,272	\$y	\$22.31	\$429,95
ROADWAY ASPHALT - SUPERPAVE ASPHALTIC CONC, TRAFFIC D (4 inches)	4,224.0	tons	\$104.47	\$441,28
SHOULDER BASE - OPTIONAL BASE, BASE GROUP 07	5,884.0	sy	\$41.78	\$245,83
SHOULDER ASPHALT- SUPERPAVE ASPHALTIC CONC, TRAFFIC C (4 inches)	1,294.0	tons	\$95.15	\$123,12
ASPHALT CONCRETE FRICTION COURSE, INC BIT, FC-5, PG 76-22, PMA	801.0	tons	\$132.53	\$106,15
MILLING / OVERLAY		sy		
CONCRETE CURB & GUTTER, TYPE E	2,648	If	\$21.33	\$56,48
CONCRETE SIDEWALK AND DRIVEWAYS, 4" THICK		sy	\$33.06	
MISCELLANEOUS ASPHALT PAVEMENT		tons	\$168.54	
SHOULDER GUTTER- CONCRETE		If	\$19.41	
PERFORMANCE TURF 10% Sod	9,856	sy	\$0.62	\$6,11
SIGNS (Post & Misc.)	0.25	Miles	\$8,109.00	\$2,03
THERMOPLASTIC, STANDARD-OPEN GRADED ASPHALT SURFACES, WHITE, SKIP, 8".	1.000	N.M.	\$2,032.25	\$2,03
THERMOPLASTIC, STANDARD-OPEN GRADED ASPHALT SURFACES WHITE, SOLID, 6	2.000	N.M.	\$4,633.02	\$9,26
RETRO-REFLECTIVE PAVEMENT MARKERS	132	ea	\$3.75	\$49
TRUSS SIGNS - None		63		
CANTILEVER SIGNS - None		ea		
LIGHTING Conventional (Average Pole Spacing)	7	ęa	\$10,050.66	\$70,35
TRAFFIC SIGNALS (Model 1) None				
TRAFFIC SIGNALS (Model 2) None				
TRAFFIC SIGNALS (Model 3) None				
xtra Items				
RETAINING WALL SYSTEM, PERMANANT, EXCLUDING BARRIER	36952	S.F.	\$34.24	\$1,265,23
CONCRETE TRAFFIC RAILING BARRIER, WITH JUNCTION SLAB, 42" F SHAPE	2400	L.Fa	\$278.66	\$668,78
MEDIAN CONCRETE BARRIER WALL	1324	L.Fa	\$195.74	\$259,16
SHOULDER CONCRETE BARRIER WALL, RIGID RETAINING	300	L.E ₂	\$136.31	\$40,89

STRUCTURES					\$2,771,730
APPROACH SLAB CONCRETE		312	су	\$379.51	\$118,252
APPROACH SLAB REINFORCING		65,434	lbs	\$1.12	\$73,286
I-275 / EW Interchange	PRESTR CONC GIRDER (SIMPLE SPAN)	16,864.00	sf	\$153.00	\$2,580,192

PSR COT East West (Alt 4) 10-28-14.xlsm

SUBTOTAL		\$9,834,840
MOT	10.0%	\$983,484
Mobilization	10.0%	\$1,081,832
SUBTOTAL.		\$11,900,166
Contingency	15.0%	\$1,785,023
CONSTRUCT	ION TOTAL (Rounded)	\$13,685,000

City of Tampa - East / West Road Concept Update PD&E Study

Alt 4 I-275 From Interchange 4 Lanes Roadway (South)

Construction Cost Estimate

URS Corporation / GLF

CLEARING & GRUBBING	DESCRIPTION		QUANTITY	UNIT	U.P.	COST
CLEARING & GRUBBING 29.38 ac \$25,000.00 \$734,500 EROSION CONTROL 21.496 mil \$24,386.88 \$36,491 \$113,063 \$24,386.88 \$36,491 \$113,063 \$24,386.88 \$36,491 \$113,063 \$24,386.98 \$36,491 \$113,063 \$24,386.98 \$36,491 \$113,063 \$24,386.98 \$36,491 \$13,063 \$24,386.98 \$36,491 \$36,391.00 \$22,515,120 \$200 NO CONSTRUCTION 1 acres each 4.00 each \$153,331.30 \$513,325	ROADWAY					\$17,116,467
REGULAR EXCAVATION EMBANKMENT (BORROW)(BANK MEAS.) EMBANKMENT (BORROW)(BANK MEAS.) POND CONSTRUCTION 1 acres each S157,195 cy 157,195 cy 1513,033 130 32,515,120 POND CONSTRUCTION 1 acres each S153,331.30 S613,325 STORM DRAINAGE SYSTEM WDR 1.50 miles S143,887.42 S215,286 TYPE B STABILIZATION ROADWAY BASE - OPTIONAL BASE, BASE GROUP 11 ROADWAY ASPHALT - SUPERPAVE ASPHALTIC CONC, TRAFFIC D (4 inches) SHOULDER BASE - OPTIONAL BASE, BASE GROUP 07 SHOULDER BASE - OPTIONAL BASE, BASE GROUP 07 SHOULDER BASE - OPTIONAL BASE, BASE GROUP 07 SHOULDER ASPHALT - SUPERPAVE ASPHALTIC CONC, TRAFFIC C (4 inches) SHOULDER ASPHALT - SUPERPAVE ASPHALTIC CONC, TRAFFIC C (4 inches) SHOULDER ASPHALT - SUPERPAVE ASPHALTIC CONC, TRAFFIC C (4 inches) ASPHALT CONCRETE FRICTION COURSE, INC BIT, FC-5, PG 76-22, PMA SHOULDER ASPHALT SUPERPAVE ASPHALTIC CONC, TRAFFIC C (4 inches) ASPHALT CONCRETE FRICTION COURSE, INC BIT, FC-5, PG 76-22, PMA SHOULDER GUTTER THOTON COURSE, INC BIT, FC-5, PG 76-22, PMA SHOULDER GUTTER SIDEWALK AND DRIVEWAYS, 4" THICK SY S330,6 MISCELLANEOUS ASPHALT PAVEMENT CONCRETE SIDEWALK AND DRIVEWAYS, 4" THICK SY S330,6 MISCELLANEOUS ASPHALT PAVEMENT THORMOPLASTIC, STANDARD-OPEN GRADED ASPHALT SURFACES, WHITE, SKIP, 6", 6.000 N.M. S103,056,078 THERMOPLASTIC, STANDARD-OPEN GRADED ASPHALT SURFACES, WHITE, SKIP, 6", 6.000 N.M. S2,032.25 S12,194 THERMOPLASTIC, STANDARD-OPEN GRADED ASPHALT SURFACES, WHITE, SKIP, 6", 6.000 N.M. S4,633,02 S455,598 RETRO-REFLECTIVE PAVEMENT MARKERS PER CONCRETE PRICTIVE PAVEMENT MARKERS PER CONCRETE SIGNS - None CANTILEVER SIGNS - NONE CANTILETER - N	CLEARING & GRUBBING		29.38	ac	\$25,000.00	\$734,500
EMBANKMENT (BORROW)(BANK MEAS.) POND CONSTRUCTION 1 acres each 4.00 each \$153,335 .00 \$513,325 STORM DRAINAGE SYSTEM WDR 1.50 miles \$143,887.42 \$215,286 STORM DRAINAGE SYSTEM WDR 1.50 miles \$143,887.42 \$215,286 STORM DRAINAGE SYSTEM WDR 1.23,468 by \$3.79 \$467,944 ROADWAY BASE - OPTIONAL BASE, BASE GROUP 11 71,100 by \$2.231 \$1,586,241 ROADWAY BASE - OPTIONAL BASE, BASE GROUP 11 71,100 by \$2.231 \$1,586,241 ROADWAY ASPHALT - SUPERPAVE ASPHALTIC CONC, TRAFFIC D (4 inches) 15,545.0 tons \$104.47 \$1,623,986 SHOULDER BASE - OPTIONAL BASE, BASE GROUP 07 35,111.0 by \$41.76 \$1,623,986 SHOULDER ASPHALT - SUPERPAVE ASPHALTIC CONC, TRAFFIC C (4 inches) 7,724.0 tons \$95.15 \$734,939 ASPHALT CONCRETE FRICTION COURSE, INC BIT, FC-5, PG 76-22, PMA 2,969.0 tons \$192.53 \$393,482 MILLING / OVERLAY - Mill 2,5" - Overlay 2,5" 42,133 by \$9.81 \$413,298 CONCRETE SIDEWALK AND DRIVEWAYS, 4" THICK by \$9.33.06 CONCRETE CURB & GUTTER, TYPE E 15,800 If \$21.33 \$337,014 CONCRETE SIDEWALK AND DRIVEWAYS, 4" THICK by \$9.33.06 MISCELLANEOUS ASPHALT PAVEMENT tons \$168.54 SHOULDER GUTTER - CONCRETE 10% Sod 30,722 by \$0.62 \$19,048 SIGNS (Post & Misc.) 1.50 Miles \$13,356.00 \$19,983 THERMOPLASTIC, STANDARD-OPEN GRADED ASPHALT SURFACES, WHITE, SKIP, 6", 6.00 N.M. \$4,633.02 \$55,596 RETO-REFLECTIVE PAVEMENT MARKERS 69.20 STANDARD-OPEN GRADED ASPHALT SURFACES WHITE, SKIP, 6", 6.00 N.M. \$4,633.02 \$55,596 RETO-REFLECTIVE PAVEMENT MARKERS 792 ea \$3.75 \$2,970 TRUSS SIGNS - None ea \$3.75 \$2,970 TRUSS SIGNS - None CANTILEVER SIGNS - None ea \$3.75 \$2,970 TRUSS SIGNALS (Model 1) None TRAFFIC SIGNALS (Model 2) None TRAFFIC SIGNALS (Model 3) None Extra Islams MEDIAN CONCRETE BARRIER WALL 7900 L.F. \$195.74 \$1,546,346	EROSION CONTROL		1.496	mi	\$24,388.98	\$36,491
## POND CONSTRUCTION 1 acres each 4.00 each \$153,331.30 \$613,325 \$TORM DRAINAGE SYSTEM WDR 1.50 miles \$143,887.42 \$215,286 TYPE B STABILIZATION 123.468 sy \$3.79 \$467,944 ROADWAY BASE - OPTIONAL BASE, BASE GROUP 11 71,100 sy \$2.231 \$1,586,241 ROADWAY ASPHALT - SUPERPAVE ASPHALTIC CONC, TRAFFIC D (4 inches) 15,545.0 tons \$104.47 \$1,623,986 SHOULDER BASE - OPTIONAL BASE, BASE GROUP 07 35,111.0 sy \$41.78 \$1,466,938 SHOULDER ASPHALT - SUPERPAVE ASPHALTIC CONC, TRAFFIC C (4 inches) 7,724.0 tons \$95.15 \$734,939 ASPHALT C ONCRETE FRICTION COURSE, INC BIT, FC-5, PG 76-22, PMA 2,969.0 tons \$132.53 \$393,402 MILLING / OVERLAY - MIII 2.5" - Overlay 2.5" 42,133 sy \$9.81 \$413,298 CONCRETE CURB & GUTTER, TYPE E 15,800 If \$21.33 \$337,014 CONCRETE SIDEWALK AND DRIVEWAYS, 4" THICK sy \$33.06 MISCELLANEOUS ASPHALT PAVEMENT tons \$168.54 SHOULDER GUTTER - CONCRETE PERFORMANCE TURF 10% Spd 30,722 sy \$0.62 \$19,048 SIGNS (Post & Misc.) THERMOPLASTIC, STANDARD-OPEN GRADED ASPHALT SURFACES, WHITE, SKIP, 6" 6.000 N.M. \$2,032.25 \$12,194 THERMOPLASTIC, STANDARD-OPEN GRADED ASPHALT SURFACES, WHITE, SKIP, 6" 6.000 N.M. \$4,633.02 \$55,586 RETRO-REFLECTIVE PAVEMENT 62 CONVENTIONAL (Average Pole Spacing) 40 ea \$10,050.66 \$402,026 TRAFFIC SIGNALS (Model 1) None TRAFFIC SIGNALS (Model 2) None TRAFFIC SIGNALS (Model 2) None TRAFFIC SIGNALS (Model 2) None TRAFFIC SIGNALS (Model 3) None Extra Identation	REGULAR EXCAVATION		22,749	су	\$4.97	\$113,063
STORM DRAINAGE SYSTEM WDR 1.50 miles \$143,887.42 \$215,286 TYPE B STABILIZATION 123,468 Sy \$3.79 \$467,944 ROADWAY BASE - OPTIONAL BASE, BASE GROUP 11 71,100 Sy \$22.31 \$1,586,241 ROADWAY ASPHALT - SUPERPAVE ASPHALTIC CONC, TRAFFIC D (4 inches) 15,545.0 tons \$104.47 \$1,669,938 SHOULDER BASE - OPTIONAL BASE, BASE GROUP 07 36,111.0 Sy \$41.78 \$1,466,938 SHOULDER BASE - OPTIONAL BASE, BASE GROUP 07 36,111.0 Sy \$41.78 \$1,466,938 SHOULDER ASPHALT - SUPERPAVE ASPHALTIC CONC, TRAFFIC C (4 inches) 7,724.0 tons \$95.15 \$734,939 ASPHALT CONCRETE FRICTION COURSE, INC BIT, FC-5, PG 76-22, PMA 2,969.0 tons \$132.53 \$393,492 MILLING / OVERLAY - MIII 2.5" - Overlay 2.5" 42,133 Sy \$9.81 \$413,298 CONCRETE CURB & GUTTER, TYPE E 15,800 If \$21.33 \$337,014 CONCRETE SIDEWALK AND DRIVEWAYS, 4" THICK Sy \$33.06 MISCELLANEOUS ASPHALT PAVEMENT tons \$168.54 SHOULDER GUTTER. CONCRETE 10% Sod 30,722 Sy \$0.62 \$19,048 SIGNS (Post & Misc.) 1.50 Miles \$13,356.00 \$19,048 SIGNS (Post & Misc.) 1.50 Miles \$13,356.00 \$19,048 THERMOPLASTIC, STANDARD-OPEN GRADED ASPHALT SURFACES, WHITE, SKIP, 6", 6.000 N.M. \$4,633.02 \$55,598 RETRO-REFLECTIVE PAVEMENT MARKERS 792 ea \$3.75 \$2,970 TRAFFIC SIGNALS (Model 1) None CANTILEVER SIGNS - None ea CANTILEVER SIGNS - None ea CANTILEVER SIGNS - None CANTILEVER SIGNS - None CANTILEVER SIGNS - None CANTILEVER SIGNALS (Model 2) None TRAFFIC SIGNALS (Model 2) None TRAFFIC SIGNALS (Model 3) None CANTILEVER SIGNALS (MODEL 2) NONE CANTILEVER SIGNALS (MODEL 2)	EMBANKMENT (BORROW)(BAN)	(MEAS.)	157,195	су	\$16.00	\$2,515,120
TYPE B STABILIZATION ROADWAY BASE - OPTIONAL BASE, BASE GROUP 11 ROADWAY ASPHALT - SUPERPAVE ASPHALTIC CONC, TRAFFIC D (4 inches) SHOULDER BASE - OPTIONAL BASE, BASE GROUP O7 SHOULDER ASPHALT - SUPERPAVE ASPHALTIC CONC, TRAFFIC C (4 inches) ROBERT - MILLING / OVERLAY AMBRIT - OVERLAY CONCRETE CURB & GUTTER, TYPE E CONCRETE SIDEWALK AND DRIVEWAYS, 4" THICK SUPERPAVE ASPHALT PAVEMENT SHOULDER GUTTER - CONCRETE PERFORMANCE TURF PERFORMANCE TURF 10% Sod SIGNS (Post & Misc.) THERMOPLASTIC, STANDARD-OPEN GRADED ASPHALT SURFACES, WHITE, SKIP, 6" GOOD N.M. SCAUSC STANDARD-OPEN GRADED ASPHALT SURFACES WHITE, SKIP, 6" FUND STANDARD - OPEN GRADED ASPHALT SURFACES WHITE, SKIP, 6" FUND STANDARD - OPEN GRADED ASPHALT SURFACES WHITE, SKIP, 6" FUND STANDARD - OPEN GRADED ASPHALT SURFACES WHITE, SKIP, 6" FUND STANDARD - OPEN GRADED ASPHALT SURFACES WHITE, SKIP, 6" FUND STANDARD - OPEN GRADED ASPHALT SURFACES WHITE, SKIP, 6" FUND STANDARD - OPEN GRADED ASPHALT SURFACES WHITE, SKIP, 6" FUND STANDARD - OPEN GRADED ASPHALT SURFACES WHITE, SKIP, 6" FUND STANDARD - OPEN GRADED ASPHALT SURFACES WHITE, SKIP, 6" FUND STANDARD - OPEN GRADED ASPHALT SURFACES WHITE, SKIP, 6" FUND STANDARD - OPEN GRADED ASPHALT SURFACES WHITE, SKIP, 6" FUND STANDARD - OPEN GRADED ASPHALT SURFACES WHITE, SKIP, 6" FUND STANDARD - OPEN GRADED ASPHALT SURFACES WHITE, SKIP, 6" FUND STANDARD - OPEN GRADED ASPHALT SURFACES WHITE, SKIP, 6" FUND STANDARD - OPEN GRADED ASPHALT SURFACES WHITE, SKIP, 6" FUND STANDARD - OPEN GRADED ASPHALT SURFACES WHITE, SKIP, 6" FUND STANDARD - OPEN GRADED ASPHALT SURFACES WHITE, SKIP, 6" FUND STANDARD - OPEN GRADED ASPHALT SURFACES WHITE, SKIP, 6" FUND STANDARD - OPEN GRADED ASPHALT SURFACES WHITE, SKIP, 6" FUND STANDARD - OPEN GRADED ASPHALT SURFACES WHITE, SKIP, 6" FUND STAND	POND CONSTRUCTION	1 acres each	4.00	each	\$153,331.30	\$613,325
ROADWAY BASE - OPTIONAL BASE, BASE GROUP 11 ROADWAY ASPHALT - SUPERPAVE ASPHALTIC CONC, TRAFFIC D (4 inches) SHOULDER BASE - OPTIONAL BASE, BASE GROUP 07 SHOULDER BASE - OPTIONAL BASE, BASE GROUP 07 SHOULDER ASPHALT - SUPERPAVE ASPHALTIC CONC, TRAFFIC C (4 inches) SHOULDER ASPHALT - SUPERPAVE ASPHALTIC CONC, TRAFFIC C (4 inches) ASPHALT CONCRETE FRICTION COURSE, INC BIT, FC-5, PG 76-22, PMA ASPHALT CONCRETE FRICTION COURSE, INC BIT, FC-5, PG 76-22, PMA MILLING / OVERLAY MILLING / OVERLAY MILLING / OVERLAY MILLING / OVERLAY MISTER SIDEWALK AND DRIVEWAYS, 4" THICK SY SOUNDER SUPEWALK AND DRIVEWAYS, 4" THICK SY STAMPALT PAVEMENT CONCRETE SIDEWALK AND DRIVEWAYS, 4" THICK SY STAMPALT PAVEMENT SHOULDER GUTTER- CONCRETE BISSON (POST & Misc.) THERMOPLASTIC, STANDARD-OPEN GRADED ASPHALT SURFACES, WHITE, SKIP, 6", 6.000 N.M. \$2,032.25 \$19,048 REFRO-REFICETIVE PAVEMENT MARKERS RETRO-REFILECTIVE PAVEMENT MARKERS RETRO-REFILECTIVE PAVEMENT MARKERS RETRO-REFILECTIVE PAVEMENT MARKERS TRUSS SIGNS - None CANTILEVER SIGNS (Model 1) None TRAFFIC SIGNALS (Model 2) None TRAFFIC SIGNALS (Model 3) None Extra Items MEDIAN CONCRETE BARRIER WALL 7900 L.F. \$195.74 \$1,546,346	STORM DRAINAGE SYSTEM	WDR	1.50	miles	\$143,887.42	\$215,286
ROADWAY ASPHALT - SUPERPAVE ASPHALTIC CONC, TRAFFIC D (4 inches) SHOULDER BASE - OPTIONAL BASE, BASE GROUP 07 SHOULDER ASPHALT - SUPERPAVE ASPHALTIC CONC, TRAFFIC C (4 inches) SHOULDER ASPHALT - SUPERPAVE ASPHALTIC CONC, TRAFFIC C (4 inches) ASPHALT CONCRETE FRICTION COURSE, INC. BIT, FC-5, PG 76-22, PMA ASPHALT CONCRETE FRICTION COURSE, INC. BIT, FC-5, PG 76-22, PMA ASPHALT CONCRETE FRICTION COURSE, INC. BIT, FC-5, PG 76-22, PMA ASPHALT CONCRETE FRICTION COURSE, INC. BIT, FC-5, PG 76-22, PMA ASPHALT CONCRETE SUPERPAVE ASPHALT PG 5, PG 76-22, PMA ASPHALT CONCRETA GUITTER, TYPE E CONCRETE CURB & GUTTER, TYPE E 15,800 If \$21.33 \$333,06 tons \$132.53 \$393,482 CONCRETE SIDEWALK AND DRIVEWAYS, 4" THICK SY \$330.66 MISCELLANEOUS ASPHALT PAVEMENT SHOULDER GUTTER- CONCRETE 15,800 If \$19.41 \$306,678 SIGNS (POST & Misc.) THERMOPLASTIC, STANDARD-OPEN GRADED ASPHALT SURFACES, WHITE, SKIP, 6", 6.000 N.M. \$2.032.25 THERMOPLASTIC, STANDARD-OPEN GRADED ASPHALT SURFACES, WHITE, SKIP, 6", 6.000 N.M. \$2.032.25 THERMOPLASTIC, STANDARD-OPEN GRADED ASPHALT SURFACES WHITE, SCID, 6 RETRO-REFLECTIVE PAVEMENT MARKERS TO BE AS SIGNS - None CANTILEVER SIGNS - None LIGHTING CONVENTIONAL (Average Pole Spacing) TRAFFIC SIGNALS (Model 1) None TRAFFIC SIGNALS (Model 2) None TRAFFIC SIGNALS (Model 3) None Extra Items MEDIAN CONCRETE BARRIER WALL. 7800 L.F. \$195.74 \$1,546,346	TYPE B STABILIZATION		123,468	sy	\$3.79	\$467,944
SHOULDER BASE - OPTIONAL BASE, BASE GROUP 07 SHOULDER ASPHALT - SUPERPAVE ASPHALTIC CONC, TRAFFIC C (4 inches) ASPHALT - SUPERPAVE ASPHALTIC CONC, TRAFFIC C (4 inches) ASPHALT - SUPERPAVE ASPHALTIC CONC, TRAFFIC C (4 inches) ASPHALT - SUPERPAVE ASPHALTIC CONC, TRAFFIC C (4 inches) ASPHALT - SUPERPAVE ASPHALTIC CONC, TRAFFIC C (4 inches) ASPHALT CONCRETE FRICTION COURSE, INC BIT, FC-5, PG 76-22, PMA 2,969.0 tons \$132.53 \$393.462 MILLING / OVERLAY - Mill 2.5" - Overlay 2.5" 42,133 sy \$9.81 \$413.288 CONCRETE SIDEWALK AND DRIVEWAYS, 4" THICK sy \$330.6 MISCELLANEOUS ASPHALT PAVEMENT tons \$168.54 SHOULDER GUTTER - CONCRETE 15,800 if \$19.41 \$306,678 PERFORMANCE TURF 10% Sod 30,722 sy \$0.62 \$19,048 SIGNS (Post & Misc.) 1.50 Miles \$13,356.00 \$19,963 THERMOPLASTIC, STANDARD-OPEN GRADED ASPHALT SURFACES, WHITE, SKIP, 6", THERMOPLASTIC, STANDARD-OPEN GRADED ASPHALT SURFACES, WHITE, SKIP, 6", TREMOPLASTIC, STANDARD-OPEN GRADED ASPHALT SURFACES WHITE, SOLID, 6 RETRO-REFLECTIVE PAVEMENT MARKERS RETRO-REFLECTIVE PAVEMENT MARKERS TYPE ea \$3.75 \$2,970 TRUSS SIGNS - None CANTILEVER SIGNS - None CANTILEVER SIGNS - None CANTILEVER SIGNS - None CANTILEVER SIGNS (Model 1) None TRAFFIC SIGNALS (Model 2) None TRAFFIC SIGNALS (Model 2) None Extra Items MEDIAN CONCRETE BARRIER WALL 7800 L.F. \$195.74 \$1,546,346	ROADWAY BASE - OPTIONAL BA	ASE, BASE GROUP 11	71,100	sy	\$22.31	\$1,586,241
SHOULDER ASPHALT- SUPERPAVE ASPHALTIC CONC, TRAFFIC C (4 inches) 7,724.0 tons \$95.15 \$734,939 ASPHALT CONCRETE FRICTION COURSE, INC BIT, FC-5, PG 76-22, PMA 2,969.0 tons \$132.53 \$393,482 MILLING / OVERLAY - Mill 2.5" - Overlay 2.5" 42,133 sy \$9.81 \$413,298 CONCRETE CURB & GUTTER, TYPE E 15,800 if \$21.33 \$337,014 CONCRETE SIDEWALK AND DRIVEWAYS, 4" THICK sy \$330.6 MISCELLANEOUS ASPHALT PAVEMENT tons \$168.54 SHOULDER GUTTER- CONCRETE 15,800 if \$19.41 \$306,678 SHOULDER GUTTER- CONCRETE 10% Sod 30,722 sy \$0.62 \$19,048 SIGNS (Post & Misc.) 1,500 Miles \$13,356.00 \$19,963 THERMOPLASTIC, STANDARD-OPEN GRADED ASPHALT SURFACES, WHITE, SKIP, 6", 6.000 N.M. \$2,032.25 \$12,194 THERMOPLASTIC, STANDARD-OPEN GRADED ASPHALT SURFACES WHITE, SKIP, 6", 6.000 N.M. \$4,633.02 \$55,596 RETRO-REFLECTIVE PAVEMENT MARKERS 792 ea \$3.75 \$2,970 TRUSS SIGNS - None ea	ROADWAY ASPHALT - SUPERPA	AVE ASPHALTIC CONC, TRAFFIC D (4 inches)	15,545.0	tons	\$104.47	\$1,623,986
ASPHALT CONCRETE FRICTION COURSE, INC BIT, FC-5, PG 76-22, PMA MILLING / OVERLAY - MIII 2.5" - Overlay 2.5" MILLING / OVERLAY - MIII 2.5" - Overlay 2.5" CONCRETE CURB & GUTTER, TYPE E CONCRETE SIDEWALK AND DRIVEWAYS, 4" THICK MISCELLANEOUS ASPHALT PAVEMENT SHOULDER GUTTER - CONCRETE PERFORMANCE TURF PERFORMANCE TURF 10% Sod 30,722 sy \$0.62 \$19,048 SIGNS (Post & Misc.) THERMOPLASTIC, STANDARD-OPEN GRADED ASPHALT SURFACES, WHITE, SKIP, 6", 6.000 RETRO-REFLECTIVE PAVEMENT MARKERS RETRO-REFLECTIVE PAVEMENT MARKERS THUS SIGNS - None CANTILEVER SIGNS - None LIGHTING Conventional (Average Pole Spacing) TRAFFIC SIGNALS (Model 1) None TRAFFIC SIGNALS (Model 2) None Extra Items MEDIAN CONCRETE BARRIER WALL. 7800 L.F. \$195.74 \$1,546,346	SHOULDER BASE - OPTIONAL B	ASE, BASE GROUP 07	35,111.0	sy	\$41.78	\$1,466,938
MILLING / OVERLAY - Mill 2.5" - Overlay 2.5" 42,133 sy \$9.81 \$413,298 CONCRETE CURB & GUTTER, TYPE E 15,800 if \$21.33 \$337,014 CONCRETE SIDEWALK AND DRIVEWAYS, 4" THICK sy \$33.06 MISCELLANEOUS ASPHALT PAVEMENT tons \$168.54 SHOULDER GUTTER - CONCRETE 10% Sod 30,722 sy \$0.62 \$19,048 SIGNS (Post & Misc.) 15,800 if \$19,41 \$306,678 PERFORMANCE TURF 10% Sod 30,722 sy \$0.62 \$19,048 SIGNS (Post & Misc.) 1.50 Miles \$13,356.00 \$19,983 THERMOPLASTIC, STANDARD-OPEN GRADED ASPHALT SURFACES, WHITE, SKIP, 6", 6.000 N.M. \$2,032.25 \$12,194 THERMOPLASTIC, STANDARD-OPEN GRADED ASPHALT SURFACES WHITE, SOLID, 6 12,000 N.M. \$4,633.02 \$55,596 RETRO-REFLECTIVE PAVEMENT MARKERS 792 ea \$3.75 \$2,970 TRUSS SIGNS - None ea CANTILEVER SIGNS - None ea CANTILEVER SIGNS - None LIGHTING Conventional (Average Pole Spacing) 40 ea \$10,050.66 \$402,026 TRAFFIC SIGNALS (Model 1) None TRAFFIC SIGNALS (Model 2) None TRAFFIC SIGNALS (Model 3) None Extra Items MEDIAN CONCRETE BARRIER WALL 7900 L.F. \$195.74 \$1,546,346	SHOULDER ASPHALT- SUPERPA	AVE ASPHALTIC CONC, TRAFFIC C (4 inches)	7,724.0	tons	\$95.15	\$734,939
CONCRETE CURB & GUTTER, TYPE E CONCRETE SIDEWALK AND DRIVEWAYS, 4" THICK MISCELLANEOUS ASPHALT PAVEMENT SHOULDER GUTTER- CONCRETE PERFORMANCE TURF 10% Sod SIGNS (POST & Misc.) THERMOPLASTIC, STANDARD-OPEN GRADED ASPHALT SURFACES, WHITE, SKIP, 6", 6.000 N.M. \$2,032.25 \$12,194 THERMOPLASTIC, STANDARD-OPEN GRADED ASPHALT SURFACES WHITE, SCID, 6 12.000 N.M. \$4,633.02 \$55,596 RETRO-REFLECTIVE PAVEMENT MARKERS 792 ea \$3.75 \$2,970 TRUSS SIGNS - None CANTILEVER SIGNS - None LIGHTING Conventional (Average Pole Spacing) TRAFFIC SIGNALS (Model 1) None TRAFFIC SIGNALS (Model 2) None TRAFFIC SIGNALS (Model 3) None Extra Items MEDIAN CONCRETE BARRIER WALL 15,800 If \$21.33 \$337,014 \$21.33 \$337,014 \$15,800 If \$21.33 \$337,014 \$10.050.66 \$10.050.67 \$10.0	ASPHALT CONCRETE FRICTION	COURSE, INC BIT, FC-5, PG 78-22, PMA	2,969.0	tons	\$132.53	\$393,482
CONCRETE SIDEWALK AND DRIVEWAYS, 4" THICK MISCELLANEOUS ASPHALT PAVEMENT SHOULDER GUTTER- CONCRETE SHOULDER GUTTER- CONCRETE 15,800 if \$19,41 \$306,678 PERFORMANCE TURF 10% Sod 30,722 sy \$0.62 \$19,048 SIGNS (Post & Misc.) THERMOPLASTIC, STANDARD-OPEN GRADED ASPHALT SURFACES, WHITE, SKIP, 6", 6.000 N.M. \$2,032.25 \$12,194 THERMOPLASTIC, STANDARD-OPEN GRADED ASPHALT SURFACES WHITE, SOLID, 6 12.000 N.M. \$4,633.02 \$55,596 RETRO-REFLECTIVE PAVEMENT MARKERS 792 ea \$3.75 \$2,970 TRUSS SIGNS - None CANTILEVER SIGNS - None LIGHTING Conventional (Average Pole Spacing) 40 ea \$10,050.66 \$402,026 TRAFFIC SIGNALS (Model 1) None TRAFFIC SIGNALS (Model 2) None TRAFFIC SIGNALS (Model 3) None Extra Items MEDIAN CONCRETE BARRIER WALL 7900 L.F. \$195.74 \$1,546,346	MILLING / OVERLAY	- Mill 2.5" - Overlay 2.5"	42,133	sy	\$9.81	\$413,298
MISCELLANEOUS ASPHALT PAVEMENT SHOULDER GUTTER- CONCRETE SHOULDER GUTTER- CONCRETE 10% Sod 15,800 if \$19,41 \$306,678 PERFORMANCE TURF 10% Sod 30,722 sy \$0.62 \$19,048 SIGNS (Post & Misc.) 1.50 Miles \$13,356.00 \$19,983 THERMOPLASTIC, STANDARD-OPEN GRADED ASPHALT SURFACES, WHITE, SKIP, 6", 6.000 N.M. \$2,032.25 \$12,194 THERMOPLASTIC, STANDARD-OPEN GRADED ASPHALT SURFACES WHITE, SOLID, 6 12.000 N.M. \$4,633.02 \$55,596 RETRO-REFLECTIVE PAVEMENT MARKERS 792 ea \$3.75 \$2,970 TRUSS SIGNS - None CANTILEVER SIGNS - None LIGHTING Conventional (Average Pole Spacing) 40 ea \$10,050.66 \$402,026 TRAFFIC SIGNALS (Model 1) None TRAFFIC SIGNALS (Model 2) None TRAFFIC SIGNALS (Model 3) None Extra Items MEDIAN CONCRETE BARRIER WALL. 7900 L.F. \$195.74 \$1,546,346	CONCRETE CURB & GUTTER, T	YPEE	15,800	If	\$21.33	\$337,014
SHOULDER GUTTER- CONCRETE 15,800 If \$19,41 \$306,678 PERFORMANCE TURF 10% Sod 30,722 sy \$0.62 \$19,048 SIGNS (Post & Misc.) 1.50 Miles \$13,356.00 \$19,983 THERMOPLASTIC, STANDARD-OPEN GRADED ASPHALT SURFACES, WHITE, SKIP, 6". 6.000 N.M. \$2,032.25 \$12,194 THERMOPLASTIC, STANDARD-OPEN GRADED ASPHALT SURFACES WHITE, SOLID, 6 12.000 N.M. \$4,633.02 \$55,596 RETRO-REFLECTIVE PAVEMENT MARKERS 792 ea \$3.75 \$2,970 TRUSS SIGNS - None ea ea CANTILEVER SIGNS - None ea ea LIGHTING Conventional (Average Pole Spacing) 40 ea \$10,050.66 \$402,026 TRAFFIC SIGNALS (Model 1) None TRAFFIC SIGNALS (Model 2) None TRAFFIC SIGNALS (Model 3) None Extra Items MEDIAN CONCRETE BARRIER WALL 7900 L.F. \$195.74 \$1,546,346	CONCRETE SIDEWALK AND DRI	VEWAYS, 4" THICK		sy	\$33.06	
PERFORMANCE TURF 10% Sod 30,722 sy \$0.62 \$19,048 SIGNS (Post & Misc.) 1.50 Miles \$13,356.00 \$19,983 THERMOPLASTIC, STANDARD-OPEN GRADED ASPHALT SURFACES, WHITE, SKIP, 6", 6.000 N.M. \$2,032.25 \$12,194 THERMOPLASTIC, STANDARD-OPEN GRADED ASPHALT SURFACES WHITE, SOLID, 6 12,000 N.M. \$4,633.02 \$55,596 RETRO-REFLECTIVE PAVEMENT MARKERS 792 ea \$3.75 \$2,970 TRUSS SIGNS - None ea \$2,970 CANTILEVER SIGNS - None ea \$10,050.66 \$402,026 TRAFFIC SIGNALS (Model 1) None \$10,050.66 \$402,026 TRAFFIC SIGNALS (Model 2) None \$1,546,346 Extra Items 7900 L.F. \$195.74 \$1,546,346	MISCELLANEOUS ASPHALT PAV	/EMENT		tons	\$168.54	
SIGNS (Post & Misc.) 1.50 Miles \$13,356.00 \$19,983	SHOULDER GUTTER- CONCRET	TE.	15,800	if	\$19.41	\$306,678
THERMOPLASTIC, STANDARD-OPEN GRADED ASPHALT SURFACES, WHITE, SKIP, 6", 6.000 N.M. \$2,032.25 \$12,194 THERMOPLASTIC, STANDARD-OPEN GRADED ASPHALT SURFACES WHITE, SOLID, 6 12.000 N.M. \$4,633.02 \$55,596 RETRO-REFLECTIVE PAVEMENT MARKERS 792 ea \$3.75 \$2,970 TRUSS SIGNS - None ea CANTILEVER SIGNS - None ea LIGHTING Conventional (Average Pole Spacing) 40 ea \$10,050.66 \$402,026 TRAFFIC SIGNALS (Model 1) None TRAFFIC SIGNALS (Model 2) None TRAFFIC SIGNALS (Model 3) None Extra Items MEDIAN CONCRETE BARRIER WALL. 7900 L.F. \$195.74 \$1,546,346	PERFORMANCE TURF	10% Sod	30,722	sy	\$0.62	\$19,048
THERMOPLASTIC, STANDARD-OPEN GRADED ASPHALT SURFACES WHITE, SOLID, 6 RETRO-REFLECTIVE PAVEMENT MARKERS 792 ea \$3.75 \$2,970 TRUSS SIGNS - None CANTILEVER SIGNS - None LIGHTING Conventional (Average Pole Spacing) TRAFFIC SIGNALS (Model 1) None TRAFFIC SIGNALS (Model 2) None TRAFFIC SIGNALS (Model 3) None Extra Items MEDIAN CONCRETE BARRIER WALL 7900 L.F. \$195.74 \$1,546,346	SIGNS (Post & Misc.)		1.50	Miles	\$13,356.00	\$19,983
RETRO-REFLECTIVE PAVEMENT MARKERS 792 ea \$3.75 \$2,970 TRUSS SIGNS - None ea CANTILEVER SIGNS - None ea LIGHTING Conventional (Average Pole Spacing) 40 ea \$10,050.66 \$402,026 TRAFFIC SIGNALS (Model 1) None TRAFFIC SIGNALS (Model 2) None Extra Items MEDIAN CONCRETE BARRIER WALL 7900 L.F. \$195.74 \$1,546,346	THERMOPLASTIC, STANDARD-C	PEN GRADED ASPHALT SURFACES, WHITE, SKIP, 6",	6.000	N.M.	\$2,032.25	\$12,194
TRUSS SIGNS - None ea CANTILEVER SIGNS - None ea LIGHTING Conventional (Average Pole Spacing) 40 ea \$10,050.66 \$402,026 TRAFFIC SIGNALS (Model 1) None TRAFFIC SIGNALS (Model 2) None TRAFFIC SIGNALS (Model 3) None Extra Items MEDIAN CONCRETE BARRIER WALL 7900 L.F. \$195.74 \$1,546,346	THERMOPLASTIC, STANDARD-C	PEN GRADED ASPHALT SURFACES WHITE, SOLID, 6	12.000	N.M.	\$4,633.02	\$55,598
CANTILEVER SIGNS - None LIGHTING Conventional (Average Pole Spacing) 40 ea \$10,050.66 \$402,026 TRAFFIC SIGNALS (Model 1) None TRAFFIC SIGNALS (Model 2) None TRAFFIC SIGNALS (Model 3) None Extra Items MEDIAN CONCRETE BARRIER WALL 7900 L.F. \$195.74 \$1,546,346	RETRO-REFLECTIVE PAVEMENT	T MARKERS	792	ęa	\$3.75	\$2,970
LIGHTING Conventional (Average Pole Spacing) 40 ea \$10,050.66 \$402,026 TRAFFIC SIGNALS (Model 1) None TRAFFIC SIGNALS (Model 2) None TRAFFIC SIGNALS (Model 3) None Extra Items MEDIAN CONCRETE BARRIER WALL 7900 L.F. \$195.74 \$1,546,346	TRUSS SIGNS - None			ea		
TRAFFIC SIGNALS (Model 1) None TRAFFIC SIGNALS (Model 2) None TRAFFIC SIGNALS (Model 3) None Extra Items MEDIAN CONCRETE BARRIER WALL 7900 L.F. \$195.74 \$1,546,346	CANTILEVER SIGNS - None			ea		
TRAFFIC SIGNALS (Model 2) None TRAFFIC SIGNALS (Model 3) None Extra Items MEDIAN CONCRETE BARRIER WALL 7900 L.F. \$195.74 \$1,546,346	LIGHTING	Conventional (Average Pole Spacing)	40	ea	\$10,050.66	\$402,026
TRAFFIC SIGNALS (Model 3) None Extra Items MEDIAN CONCRETE BARRIER WALL 7900 L.F. \$195.74 \$1,546,346	TRAFFIC SIGNALS (Model 1)	None				
Extra Items MEDIAN CONCRETE BARRIER WALL 7900 L.F. \$195.74 \$1,546,346	TRAFFIC SIGNALS (Model 2)	None				
MEDIAN CONCRETE BARRIER WALL 7900 L.F. \$195.74 \$1,546,346	TRAFFIC SIGNALS (Model 3)	None				
	Extra Items					
iTS/Tolling 1 EA \$3,500,000.00 \$3,500,000	MEDIAN CONCRETE BARRIER V	VALt.	7900	LLF _o	\$195.74	\$1,546,346
	ITS/Tolling		1	EA	\$3,500,000.00	\$3,500,000

STRUCTURES			
APPROACH SLAB CONCRETE	су	\$379.51	
APPROACH SLAB REINFORCING	Ibs	\$1.12	

SUBTOTAL		\$17,116,467
MOT	10.0%	\$1,711,647
Mobilization	10.0%	\$1,882,811
SUBTOTAL		\$20,710,926
Contingency	15.0%	\$3,106,639
CONSTRUCT	ION TOTAL (Rounded)	\$23,818,000

City of Tampa - East / West Road Concept Update PD&E Study

Alt 4 I-275 From Interchange 2 Lanes Roadway (North)

Construction Cost Estimate

URS Corporation / GLF

CLEARING & GRUBBING	DESCRIPTION		QUANTITY	UNIT	U.P.	COST
CLEARING & GRUBBING 22.31 ac \$25,000.00 \$557,750 EROSION CONTROL 11.136 mil \$24,388.98 \$27,715 EROSION CONTROL 17.278 cy \$4.97 \$35,571,750 \$25,000.00 \$1.574,224 \$25,000.00 \$1.574,224 \$25,000.00 \$1.574,224 \$25,000.00 \$1.574,224 \$25,000.00 \$1.574,224 \$25,000.00 \$25,000	BOADWAY					\$12,632,566
EROSION CONTROL 1.136 ml \$24,388.98 \$27,715 REGULAR EXCAVATION 17,276 cy \$4.97 \$85,871 EMBANKMENT (BORROW)(BANK MEAS.) 98,389 cy \$16,00 \$1,574,224 POND CONSTRUCTION 1 acres each 4.00 each \$153,331.30 \$613,325 STORM DRAINAGE SYSTEM WDR 1.14 miles \$143,887.42 \$163,508 TYPE B STABILIZATION 75,333 sy \$3.79 \$285,512 ROADWAY ASPHALT - SUPERRAVE ASPHALTIC CONC, TRAFFIC D (4 inches) 8,287.0 tons \$104.47 \$865,743 ROADWAY ASPHALT - SUPERRAVE ASPHALTIC CONC, TRAFFIC C (4 inches) 6,667.0 sy \$41.78 \$1,141.47 SHOULDER ASPHALT - SUPERRAVE ASPHALTIC CONC, TRAFFIC C (4 inches) 6,667.0 tons \$95.15 \$25.667.0 sy \$41.78 ASPHALT CONCRETE FRICTION COURSE, INC BIT, FC-5, PG 76-22, PMA 1,595.0 tons \$132.53 \$211,385 MILLING / OVERLAY - Mill 2.5" - Overlay 2.5" 32.000 sy \$9.81 \$313,390 CONCRETE SIDEWALK AND DRIVEWAYS, 4" THICK 5y \$33.06 \$313,390 \$4.60 \$19.41 \$232,292	Management of the Control of the Con		22.31	ac	\$25,000,00	
REGULAR EXCAVATION	* · · · · · · · · · · · · · · · · · ·				•	
EMBANKMENT (BORROW)(BANK MEAS.) 98,389 by \$16,00 \$1,574,224 POND CONSTRUCTION 1 acres each 4.00 each \$153,331.30 \$613,325 STORM DRAINAGE SYSTEM WOR 1.14 miles \$143,867.42 \$163,508 TYPE B STABILIZATION 75,333 sy \$3.79 \$285,512 ROADWAY BASE - OPTIONAL BASE. BASE GROUP 11 38,000 sy \$22.231 \$847,780 ROADWAY ASPHALT - SUPERPAVE ASPHALTIC CONC, TRAFFIC D (4 inches) 26,667.0 sy \$41.78 \$11,14,147 SHOULDER BASE - OPTIONAL BASE. BASE GROUP 07 26,667.0 sy \$41.78 \$11,14,147 SHOULDER ASPHALT - SUPERPAVE ASPHALTIC CONC, TRAFFIC C (4 inches) 5,897.0 tons \$95.15 \$556,245 ASPHALT CONCRETE FRICTION COURSE, INC BIT, FC-5, PG 76-22, PMA 1,595.0 tons \$132,533 \$211,385 MILLING / OVERLAY - MILI 2.5" - Overlay 2.5" 1 y \$33.06 \$313,390 MISCELLANEOUS ASPHALT PAVEMENT 1 5 y \$33.06 \$168.54 SHOULDER GUTTER- CONCRETE 1 1 1 1 \$19.41 \$232,920 PE			17,278	CV	\$4,97	\$85,871
POND CONSTRUCTION		(MEAS.)	98,389	CV	\$16.00	\$1,574,224
TYPE B STABILIZATION ROADWAY BASE - OPTIONAL BASE, BASE GROUP 11 ROADWAY ASPHALT - SUPERPAVE ASPHALTIC CONC, TRAFFIC D (4 inches) ROADWAY ASPHALT - SUPERPAVE ASPHALTIC CONC, TRAFFIC D (4 inches) SHOULDER BASE - OPTIONAL BASE, BASE GROUP 07 26,667.0 sy \$41.78 \$1,114,147 SHOULDER ASPHALT- SUPERPAVE ASPHALTIC CONC, TRAFFIC C (4 inches) ASPHALT CONCRETE FRICTION COURSE, INC BIT, FC-5, PG 76-22, PMA 1,595.0 tons \$192.53 \$132.53 \$123.53 \$132.53 \$133.300 If CONCRETE SIDEWALK AND DRIVEWAYS, 4" THICK SHOULDER GUTTER- CONCRETE 10% Sod MISCELLANEOUS ASPHALT PAVEMENT 10% Sod 41,333 5y \$10.000 \$108.54 \$108.54 SHOULDER GUTTER- CONCRETE 10% Sod 41,333 5y \$0.000 \$108.54 \$133.356.00 \$151,177 THERMOPLASTIC, STANDARD-OPEN GRADED ASPHALT SURFACES, WHITE, SKIP, 6", 24,000 REFUGATION, STANDARD-OPEN GRADED ASPHALT SURFACES, WHITE, SKIP, 6", 24,000 REFUGATION, STANDARD-OPEN GRADED ASPHALT SURFACES, WHITE, SKIP, 6", 24,000 REFUGATION, STANDARD-OPEN GRADED ASPHALT SURFACES, WHITE, SKIP, 6", 24,000 RETURN SIGNS - None CANTILLEYER SIGNS - None CANTILLEYER SIGNS - None CANTILLEYER SIGNS - None CLIGHTING CONOVENTIONAL (Average Pole Spacing) TRAFFIC SIGNALS (Model 1) None TRAFFIC SIGNALS (Model 2) None TRAFFIC SIGNALS (Model 3) None Extra Itemse MEDIAN CONCRETE BARRIER WALL MEDIAN CONCRETE BARRIER WALL MEDIAN CONCRETE BARRIER WALL 1 EA \$3,500,000.00 \$3,500,000		,	4.00	each	\$153,331.30	\$613,325
ROADWAY BASE - OPTIONAL BASE, BASE GROUP 11 38,000 8y \$22.31 \$847,780 ROADWAY ASPHALT - SUPERPAVE ASPHALTIC CONC, TRAFFIC D (4 inches) 8,287.0 tons \$104.47 \$865,743 \$840,000 \$100,0	STORM DRAINAGE SYSTEM	WOR	1.14	miles	\$143,887.42	\$163,508
ROADWAY ASPHALT - SUPERPAVE ASPHALTIC CONC, TRAFFIC D (4 inches) 8,287.0 tons \$104.47 \$865,743 \$10000 \$10000 \$10000 \$10000 \$10000 \$10000 \$10000 \$10000 \$10000 \$10000 \$10000 \$10000 \$100000 \$100000 \$1000000 \$100000000 \$10000000000	TYPE B STABILIZATION		75,333	sy	\$3.79	\$285,512
SHOULDER BASE - OPTIONAL BASE, BASE GROUP 07 26,667.0 sy \$41.78 \$1,114,147 SHOULDER ASPHALT- SUPERPAVE ASPHALTIC CONC, TRAFFIC C (4 inches) 5,867.0 tons \$95.15 \$558,245 ASPHALT CONCRETE FRICTION COURSE, INC BIT, FC-5, PG 76-22, PMA 1,595.0 tons \$132.53 \$211,385 MILLING / OVERLAY	ROADWAY BASE - OPTIONAL BA			sy	\$22.31	\$847,780
SHOULDER BASE - OPTIONAL BASE, BASE GROUP 07	ROADWAY ASPHALT - SUPERPA			tons	\$104.47	\$865,743
ASPHALT CONCRETE FRICTION COURSE, INC BIT, FC-5, PG 76-22, PMA 1,595.0 tons \$132.53 \$211,385 MILLING / OVERLAY - MIII 2.5" - Overlay 2.5" 32,000 sy \$9.81 \$313,900 If \$313,900 CONCRETE SIDEWALK AND DRIVEWAYS, 4" THICK \$9 \$33.06 MISCELLANEOUS ASPHALT PAVEMENT tons \$168.54 SHOULDER GUTTER- CONCRETE \$12,000 if \$19.41 \$232,920 PERFORMANCE TURF 10% Sod 41,333 sy \$0.62 \$25,626 SIGNS (Post & Misc.) \$1.14 Miles \$13,356.00 \$15,177 THERMOPLASTIC, STANDARD-OPEN GRADED ASPHALT SURFACES, WHITE, SKIP, 6" 24,000 N.M. \$2,032.25 \$48,774 THERMOPLASTIC, STANDARD-OPEN GRADED ASPHALT SURFACES WHITE, SKIP, 6" 24,000 N.M. \$4,633.02 \$41,697 RETRO-REFLECTIVE PAVEMENT MARKERS 3,168 ea \$3.75 \$11,880 TRUSS SIGNS - None ea \$10,050.66 \$301,520 TRAFFIC SIGNALS (Model 1) None TRAFFIC SIGNALS (Model 2) None TRAFFIC SIGNALS (Model 2) None Extra Items MEDIAN CONCRETE BARRIER WALL 60.00 N.O. \$1,174,400 ITS/Tolling MEDIAN CONCRETE BARRIER WALL 51,174,400 ITS/Tolling 60.00 L.F. \$195.74 \$1,174,400 ITS/Tolling 60.00 L.F. \$195.74 \$1,174,400 ITS/Tolling 60.00 L.F. \$195.74 \$1,174,400			26,667.0	\$y	\$41.78	\$1,114,147
MILLING / OVERLAY - MIII 2.5" - Overlay 2.5" 32,000 sy \$9.81 \$313,900 CONCRETE SIDEWALK AND DRIVEWAYS, 4" THICK sy \$33.06 15 MISCELLANEOUS ASPHALT PAVEMENT tons \$168.54 SHOULDER GUTTER- CONCRETE 12,000 If \$19.41 \$232,920 PERFORMANCE TURF 10% Sod 41,333 sy \$0.62 \$25,626 SIGNS (Post & Misc.) 1.14 Miles \$13,356.00 \$15,177 THERMOPLASTIC, STANDARD-OPEN GRADED ASPHALT SURFACES, WHITE, SKIP, 6" 24,000 N.M. \$2,032.25 \$48,774 TRETRO-REFLECTIVE PAVEMENT MARKERS 3,168 ea \$3.75 \$11,880 TRUSS SIGNS - None ea \$3,168 ea \$3.75 \$11,880 TRUSS SIGNS - None ea \$3,168 ea \$3.00,000 \$301,520 TRAFFIC SIGNALS (Model 1) None ea \$1,0050.66 \$301,520 TRAFFIC SIGNALS (Model 2) None \$3,000.000.00 \$3,500.000.00 \$3,500.000.00 \$3,500.000.00 Extra Items			5,867.0	tons	\$95.15	\$558,245
If	ASPHALT CONCRETE FRICTION	COURSE, INC BIT, FC-5, PG 76-22, PMA	1,595.0	tons	\$132.53	\$211,385
CONCRETE SIDEWALK AND DRIVEWAYS, 4" THICK sy \$33.06 MISCELLANEOUS ASPHALT PAVEMENT tons \$168.54 SHOULDER GUTTER- CONCRETE 12,000 If \$19.41 \$232,920 PERFORMANCE TURF 10% Sod 41,333 sy \$0.62 \$25,626 SIGNS (Post & Misc.) 1.14 Miles \$13,356.00 \$15,177 THERMOPLASTIC, STANDARD-OPEN GRADED ASPHALT SURFACES, WHITE, SKIP, 6". 24.000 N.M. \$2,032.25 \$48,774 THERMOPLASTIC, STANDARD-OPEN GRADED ASPHALT SURFACES WHITE, SOLID, 6 9.000 N.M. \$4,633.02 \$41,697 RETRO-REFLECTIVE PAVEMENT MARKERS 3,168 ea \$3.75 \$11,800 TRUSS SIGNS - None ea ea \$3.00 \$301,520 LIGHTING Conventional (Average Pole Spacing) 30 ea \$10,050.66 \$301,520 TRAFFIC SIGNALS (Model 1) None TRAFFIC SIGNALS (Model 2) None \$1,174,440 TRAFFIC SIGNALS (Model 3) None \$33,500,000.00 \$33,500,000.00 \$33,500,000.00 \$33,500,000.00	MILLING / OVERLAY	- Mill 2.5" - Overlay 2.5"	32,000	sy	\$9.81	\$313,900
MISCELLANEOUS ASPHALT PAVEMENT tons \$168.54 SHOULDER GUTTER- CONCRETE 12,000 lf \$19.41 \$232,920 PERFORMANCE TURF 10% Sod 41,333 sy \$0.62 \$25,626 SIGNS (Post & Misc.) 1.14 Miles \$13,356.00 \$15,177 THERMOPLASTIC, STANDARD-OPEN GRADED ASPHALT SURFACES, WHITE, SKIP, 6" 24.000 N.M. \$2,032.25 \$48,774 THERMOPLASTIC, STANDARD-OPEN GRADED ASPHALT SURFACES WHITE, SOLID, 6 9.000 N.M. \$4,633.02 \$41,697 RETRO-REFLECTIVE PAVEMENT MARKERS 3,168 ea \$3.75 \$11,880 TRUSS SIGNS - None ea \$3,168 ea \$3.75 \$11,880 TRUSS SIGNS - None ea \$3,168 ea \$3.75 \$11,880 TRAFFIC SIGNALS (Model 1) None ea \$10,050.66 \$301,520 TRAFFIC SIGNALS (Model 1) None *** ****				if		
SHOULDER GUTTER- CONCRETE	CONCRETE SIDEWALK AND DRI	CONCRETE SIDEWALK AND DRIVEWAYS, 4" THICK		sy	\$33.06	
PERFORMANCE TURF 10% Sod 41,333 sy \$0.62 \$25,626 SIGNS (Post & Misc.) 1.14 Miles \$13,356.00 \$15,177 THERMOPLASTIC, STANDARD-OPEN GRADED ASPHALT SURFACES, WHITE, SKIP, 6". 24,000 N.M. \$2,032.25 \$48,774 THERMOPLASTIC, STANDARD-OPEN GRADED ASPHALT SURFACES WHITE, SOLID, 6 9.000 N.M. \$4,633.02 \$41,697 RETRO-REFLECTIVE PAVEMENT MARKERS 3,168 ea \$3.75 \$11,880 TRUSS SIGNS - None ea \$3.168 ea \$3.75 \$11,880 CANTILEVER SIGNS - None ea \$10,050.66 \$301,520 TRAFFIC SIGNALS (Model 1) None \$10,050.66 \$301,520 TRAFFIC SIGNALS (Model 2) None \$10,050.66 \$301,520 Extra Items 6000 L.F. \$195.74 \$1,174,440 ITS/Tolling \$3,500,000.00 \$3,500,000.00 \$3,500,000.00	MISCELLANEOUS ASPHALT PAVEMENT			tons	\$168.54	
SIGNS (Post & Misc.)	SHOULDER GUTTER- CONCRET	SHOULDER GUTTER- CONCRETE		If	\$19.41	\$232,920
THERMOPLASTIC, STANDARD-OPEN GRADED ASPHALT SURFACES, WHITE, SKIP, 6". 24.000 N.M. \$2,032.25 \$48,774 THERMOPLASTIC, STANDARD-OPEN GRADED ASPHALT SURFACES WHITE, SOLID, 6 9.000 N.M. \$4,633.02 \$41,697 RETRO-REFLECTIVE PAVEMENT MARKERS 3,168 ea \$3.75 \$11,880 TRUSS SIGNS - None ea	PERFORMANCE TURF	10% Sod	41,333	sy	\$0.62	\$25,626
### THERMOPLASTIC, STANDARD-OPEN GRADED ASPHALT SURFACES WHITE, SOLID, 6 9.000 N.M. \$4,633.02 \$41,697 RETRO-REFLECTIVE PAVEMENT MARKERS 3,168 ea \$3.75 \$11,880 TRUSS SIGNS - None ea CANTILEVER SIGNS - None ea LIGHTING Conventional (Average Pote Spacing) 30 ea \$10,050.66 \$301,520 TRAFFIC SIGNALS (Model 1) None TRAFFIC SIGNALS (Model 2) None TRAFFIC SIGNALS (Model 3) None Extra Items	SIGNS (Post & Misc.)		1.14	Miles	\$13,356.00	\$15,177
RETRO-REFLECTIVE PAVEMENT MARKERS 3,168 ea \$3.75 \$11,880 TRUSS SIGNS - None ea CANTILEVER SIGNS - None ea \$10,050.66 \$301,520 LIGHTING Conventional (Average Pote Spacing) 30 ea \$10,050.66 \$301,520 TRAFFIC SIGNALS (Model 1) None TRAFFIC SIGNALS (Model 2) None Extra Items MEDIAN CONCRETE BARRIER WALL 6000 L.F. \$195.74 \$1,174,440 ITS/Tolling 1 EA \$3,500,000 \$3,500,000	THERMOPLASTIC, STANDARD-OPEN GRADED ASPHALT SURFACES, WHITE, SKIP, 6",		24.000	N.M.	\$2,032.25	\$48,774
TRUSS SIGNS - None ea CANTILEVER SIGNS - None ea LIGHTING Conventional (Average Pole Spacing) 30 ea \$10,050.66 \$301,520 TRAFFIC SIGNALS (Model 1) None TRAFFIC SIGNALS (Model 2) None TRAFFIC SIGNALS (Model 3) None Extra Items MEDIAN CONCRETE BARRIER WALL 6000 L.F. \$195.74 \$1,174,440 ITS/Tolling 1 EA \$3,500,000.00 \$3,500,000	THERMOPLASTIC, STANDARD-OPEN GRADED ASPHALT SURFACES WHITE, SOLID, 6		9.000	N.M.	\$4,633.02	\$41,697
CANTILEVER SIGNS - None ea LIGHTING Conventional (Average Pote Spacing) 30 ea \$10,050.66 \$301,520 TRAFFIC SIGNALS (Model 1) None TRAFFIC SIGNALS (Model 2) None TRAFFIC SIGNALS (Model 3) None Extra Items MEDIAN CONCRETE BARRIER WALL ITS/Tolling 6000 L.F. \$195.74 \$1,174,440 ITS/Tolling 1 EA \$3,500,000.00 \$3,500,000	RETRO-REFLECTIVE PAVEMENT	「MARKERS	3,168	ea	\$3.75	\$11,880
LIGHTING Conventional (Average Pole Spacing) 30 ea \$10,050.66 \$301,520 TRAFFIC SIGNALS (Model 1) None TRAFFIC SIGNALS (Model 2) None None TRAFFIC SIGNALS (Model 3) TRAFFIC SIGNALS (Model 3) None TRAFFIC SIGNALS (Model 3) TRAFFIC SIG	TRUSS SIGNS - None			ea		
TRAFFIC SIGNALS (Model 1) None TRAFFIC SIGNALS (Model 2) None TRAFFIC SIGNALS (Model 3) None Extra Items MEDIAN CONCRETE BARRIER WALL ITS/Tolling 1 EA \$3,500,000.00 \$3,500,000	CANTILEVER SIGNS - None			ea		
TRAFFIC SIGNALS (Model 2) None TRAFFIC SIGNALS (Model 3) None Extra Items MEDIAN CONCRETE BARRIER WALL 6000 L.F. \$195.74 \$1,174,440 ITS/Tolling 1 EA \$3,500,000.00 \$3,500,000.00	LIGHTING	Conventional (Average Pote Spacing)	30	ea	\$10,050.66	\$301,520
TRAFFIC SIGNALS (Model 3) None Extra Items 6000 L.F. \$195.74 \$1,174,440 ITS/Tolling 1 EA \$3,500,000.00 \$3,500,000.00	TRAFFIC SIGNALS (Model 1)	None				
Extra Items 6000 L.F. \$195.74 \$1,174,440 ITS/Tolling 1 EA \$3,500,000.00 \$3,500,000	TRAFFIC SIGNALS (Model 2)	None				
MEDIAN CONCRETE BARRIER WALL 6000 L.F. \$195.74 \$1,174,440 ITS/Tolling 1 EA \$3,500,000.00 \$3,500,000	TRAFFIC SIGNALS (Model 3)	None				
ITS/Tolling 1 EA \$3,500,000.00 \$3,500,000	Extra Items					
C. C. Villing	MEDIAN CONCRETE BARRIER WALL				\$195.74	\$1,174,440
OVERHEAD STATIC SIGN STRUCTURE, F&I, CANTILEVER, 41-50 FT 1 EA \$61,425.50 \$61,426	!TS/Tolling					
	OVERHEAD STATIC SIGN STRUC	CTURE, F&I, CANTILEVER, 41-50 FT	1	EA	\$61,425.50	\$61,426

STRUCTURES		
APPROACH SLAB CONCRETE	су	\$379.51
APPROACH SLAB REINFORCING	!bs	\$1.12

SUBTOTAL		\$12,632,566
MOT	10.0%	\$1,263,257
Mobilization	10.0%	\$1,389,582
SUBTOTAL		\$15,285,405
Contingency	15.0%	\$2,292,811
CONSTRUCTION TOTAL (Rounded)		\$17,578,000