

**HILLSBOROUGH COUNTY MPO  
2035 LONG RANGE TRANSPORTATION PLAN**

**Needs Assessment Cost Estimates  
Technical Memorandum**

**DRAFT**

Prepared For:



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## INTRODUCTION

The 2035 Needs Assessment was designed to document transportation needs within Hillsborough County through the year 2035. It focuses on the major roadway network, including facilities for pedestrians and cyclists, as well as public transit services and facilities, and off-road multi-use trails. Forecasts of future demand for transportation facilities and services were based on estimates of future growth in population and jobs, which are described in a separate technical memorandum.

According to the Florida MPO Advisory Council, transportation projects included in the MPO Needs Plan should be appropriate to meet the identified transportation need while advancing the goals and policies of the MPO. Cost should be given significant consideration when choosing among various alternative options (such as route or type of improvement) to meet an identified need.

Certain types of projects should not be considered a “needed” project if they are extremely unlikely to be implemented and unnecessarily inflate the total estimated cost of transportation “needs” in the metropolitan area. The cost of such a project should not be included in an MPO Needs Plan. Such projects may include:

- o Projects that cannot be implemented due to policy constraints;
- o Projects that cannot be implemented due to physical constraints;
- o Projects that are unlikely to be implemented due to potential significant environmental constraints;
- o Projects that are unlikely to be implemented due to potential significant environmental justice or civil rights impacts.

Federal regulations require MPOs to prioritize the needed projects, and balance their costs against available funds, to ensure that the Long Range Transportation Plan is cost affordable. The cost affordable element of the Plan identifies candidate projects from the overall list of needs that could be reasonably funded from anticipated revenues of transportation implementing agencies in the metropolitan area. This means that expected financial resources must be sufficient to cover all of the projected capital, operating, and maintenance costs of the recommended transportation system, including both existing and planned facilities and services, through the year 2035.

In an effort to determine the costs associated with projects identified in the Needs Assessment, the following methodology was developed.

## 1.0 ROADWAY NEEDS COST ESTIMATES

### 1.1 Cost Estimate Methodology

Some roadway projects have been studied in detail, with detailed cost estimates prepared. Such estimates were used wherever available. In all other cases, roadway cost estimates were calculated using information provided by the Florida Department of Transportation (FDOT), District Seven. They are based on average unit costs per centerline mile, as identified by FDOT in June 2009, using Long Range Estimates (LRE) by facility and improvement type. The cost estimates also include standard contingencies for mitigation of traffic impacts associated with construction of the project, as well as variables for design and construction management. Detailed descriptions of these unit costs are provided in **Appendix A**.

Construction contingencies assumed for all roadway projects are as follows:

1. Travel Impacts Associated with Construction: 10% of construction per mile
2. Mobilization: 10% of construction per mile
3. Project Unknowns and Mitigation: 25% of total construction
4. Preliminary Engineering (PE)/ Design and/or Project Development & Environmental (PD&E) studies 15% of total construction
5. Construction Management: 15% of total construction

### 1.2 Right-of-Way Costs

Roadway projects that include the construction of new facilities or widening of an existing facility for increased capacity need to consider potential acquisition of additional Right-of-Way (ROW). Taking geographic location (inside or outside the Urban Service Area) and facility type into account, ROW cost factors were applied as described below and in **Tables 1a and 1b**.

#### *ROW Factors*

- H= "High" cost assumes that the ROW will cost 100 percent of the total construction cost
- M= "Medium" cost assumes that the ROW will cost 50 percent of the total construction cost
- L= "Low" cost assumes that the ROW will cost 25 percent of the total construction cost

TABLE 1a: Within the Urban Services Area

Existing No. of Lanes	Divided or Undivided	Existing Typical Section	Future No. of Lanes	Future Undivided, Divided or Enhanced	Future Typical Section	R/W Cost Factor
0	N/A	New	2	U, D, E	Urban	H
2	U or D	Rural	2	D or E	Urban	L
0	N/A	New	4	U, D, E	Urban	H
2	U or D	Rural	4	U, D, E	Urban	M
0	N/A	New	6	U, D, E	Urban	H
2	U or D	Rural	6	D or E	Urban	H
4	U	Rural	4	D or E	Urban	L
4	U or D	Rural	6	D or E	Urban	M
2	U	Urban	2	D or E	Urban	M
2	U or D	Urban	4	U	Urban	M
2	U or D	Urban	4	D or E	Urban	H
2	U or D	Urban	6	D or E	Urban	H
4	U	Urban	4	D or E	Urban	M
4	U or D	Urban	6	D or E	Urban	H

TABLE 1b: Outside the Urban Services Area

Existing No. of Lanes	Divided or Undivided	Existing Typical Section	Future No. of Lanes	Future Undivided, Divided or Enhanced	Future Typical Section	R/W Cost Factor
0	N/A	New	2	U, D, E	Rural	H
2	U	Rural	2	D or E	Rural	M
0	N/A	New	4	U, D, E	Rural	H
2	U or D	Rural	4	U	Rural	M
2	U or D	Rural	4	D or E	Rural	H
0	N/A	New	6	U, D, E	Rural	H
2	U or D	Rural	6	D or E	Rural	H
4	U	Rural	4	D or E	Rural	M
4	U or D	Rural	6	D or E	Rural	H

### 1.3 Roadway Enhancement Projects

Adding through lanes is not the only way that roads can be improved. And in some cases, adding through lanes may not be desirable due to impacts on adjacent neighborhoods, businesses, or environmentally sensitive areas. The Needs Assessment identifies roadways in need of enhancements other than continuous through lanes. Enhancements can include intersection improvements to help traffic flow better such as turn lanes and smart traffic signals; stormwater drainage improvements that reduce on-street ponding; facilities for walking, cycling, and transit, and aesthetic treatments.

To estimate costs associated with these kinds of enhancements, two packages of typical improvements were identified. Right of way costs associated with these typical enhancement packages are shown in **Table 1a-1b**.

#### *Enhanced Roads – Urban*

- Closed drainage (piped drainage with removal of open swale)
- Continuous sidewalk on at least one side (estimated as new sidewalk for entire length of roadway on one side; an equivalent amount of sidewalk may be used to infill gaps on roads where some sidewalk exists already)
- Bike lanes on both sides
- Turn lanes at intersections (assuming 2 intersections per mile)
- Concrete pads and ADA compliant curb cuts for bus stops (assuming 8 per mile, or four in each direction of travel)
- ITS coordinated traffic signals (assuming 2 per mile)
- High visibility crosswalk with ADA compliant curb cuts (assuming 4 per mile)
- Pedestrian-activated, flashing warning signs at mid-block crosswalks or at free-flowing right turn lanes (assuming 2 per mile)

#### *Enhanced Roads – Rural*

- Open drainage (open swale)
- Continuous sidewalk on at least one side (estimated as new sidewalk for entire length of roadway on one side; an equivalent amount of sidewalk may be used to infill gaps on roads where some sidewalk exists already)
- Bike shoulder on both sides
- Turn lanes at intersections (assuming 1 intersection per mile)
- Concrete pads and ADA compliant curb cuts for bus stops (assuming 2 per mile, or 1 in each direction of travel)
- High visibility crosswalk with ADA compliant curb cuts (assuming 4 per mile)
- Pedestrian-activated, flashing warning signs at mid-block crosswalks or at free-flowing right turn lanes (assuming 2 per mile)

## 1.4 Summary Roadway Needs Project Costs

Based on the cost estimating method described above, the following tables (**Table 3 and Table 4**) summarize the costs associated with all 2035 Needs Assessment Roadway Projects. Detailed cost estimates by project have been provided in **Appendix B**.

**TABLE 3: Total Roadway Needs Project Cost Estimates**

Total Construction Costs (\$2009)	\$ 3,604 Million
Total ROW Acquisition Costs (\$2009)	\$ 2,813 Million
Total PE/ Design &/or PD&E Costs (\$2009)	\$ 410 Million
Total Construction Management (\$2009)	\$ 344 Million
Total Enhancement Costs (\$2009)	\$ 221 Million
<b>Combined Total</b>	<b>\$ 7,392 Million</b>

**TABLE 4: Roadway Needs Project Cost Estimates by Facility Type**

Facility Type	Cost (\$ 2009)	% of Total Cost	
New Facilities (Including I-4 Connector & Gandy Blvd.)	\$ 2,106 Million	(+/-)	22.0%
Two Lane Roadway Enhancements (Enhancements Only)	\$ 27 Million	(+/-)	0.2%
Two Lane Roadway Widening (With Enhancements)	\$ 3,041 Million	(+/-)	32.0%
Four Lane (or Greater) Roadway Enhancements (Enhancements Only)	\$ 12 Million	(+/-)	0.1%
Four Lane (or Greater) Roadway Widening (With Enhancements)	\$ 2,157 Million	(+/-)	23.0%
SIS Facility Widening or Improvements	\$ 2,133 Million	(+/-)	22.0%

## 2.0 TRANSIT NEEDS COST ESTIMATES

### 2.1 Cost Estimate Methodology

Estimated costs for transit projects identified in the 2035 Needs Assessment were calculated using information from multiple sources. The cost estimate for each project is provided in **Appendix D**.

Costs for short distance rail, long distance rail, regional bus, water transit, and vanpool vehicles were developed by FDOT for the Tampa Bay Area Regional Transportation Authority's (TBARTA) Master Plan of 2009. These costs were developed with reference to previous studies, including the Tampa Rail Project EIS and the Hillsborough MPO 2050 Transit Concept, as well as regional and national examples. Where the TBARTA Master Plan showed a range of costs from low to high, the midpoint has been used.

Costs for local bus, express bus, bus rapid transit, circulators and flex routes, the existing TECO Line Streetcar, and ADA-complementary paratransit services were developed by Hillsborough Area Regional Transit (HART) for its Transit Development Plan and Long Range Plan. Costs for a short extension of the TECO Line Streetcar from Whiting Street to Polk Street were based on unit costs reported by HART.

Costs for commuter services programs and operational costs of the regional vanpool program were provided by Bay Area Commuter Services.

Costs associated with the construction and operation of high speed rail from Downtown Tampa to Orlando were developed for an Environmental Impact Statement (EIS) by the Florida High Speed Rail Authority, approved in 2005.

Costs for paratransit services that are part of the Transportation Disadvantaged Program were based on the Transportation Disadvantaged Service Plan and Annual Operating Report.

### 2.2 Transit Unit Costs for Major Capital Expenses

Similar to the roadway cost estimates for the LRTP, the transit estimates use unit costs per mile for major capital expenses. Capital expenses for transit are defined as any cost associated with the construction of corridor infrastructure needed to support the transit service; to purchase vehicles; to house or maintain vehicles; or provide other supportive infrastructure such as shelters, "smart" technology, etc. Because plans for rail are yet to be refined, a large contingency factor— 50% of all capital costs – has been included to cover the significant unknowns, such as how many grade-separated crossings will be required by detailed traffic analysis. Rail capital cost estimates also include factors for mitigation, design and construction management. The unit costs are itemized in **Appendix C**.

## 3.0 PEDESTRIAN AND BICYCLE NEEDS COST ESTIMATES

### 3.1 Cost Estimate Methodology

An estimated construction cost for each bicycle or pedestrian project identified in the 2035 Needs Assessment was calculated using information provided by the Florida Department of Transportation (FDOT), District Seven. Average unit costs per centerline mile were identified by FDOT using Long Range Estimates (LRE) by facility and improvement type in June 2009. These unit costs were used to calculate estimates for the MPO's Needs Assessment and Needs projects identified by MPO staff. Each estimate also included standard contingencies for mitigation of traffic impacts associated with construction of the project, as well as variables for design and construction management. The unit costs are itemized in **Appendix A**.

Construction contingencies assumed for bicycle and pedestrian projects are as follows:

- Travel Impacts Associated with Construction: 5% of construction per mile
- Mobilization: 5% of construction per mile
- Project Unknowns and Mitigation: 25% of total construction
- PE Design and/or PD&E: 15% of total construction
- Construction Management: 15% of total construction

### 3.2 Bicycling System Projects

Project types included on-road bicycle facilities and off-road multi-use trails.

- Trails were estimated as a 12' wide asphalt path. Right-of-way was assumed to be provided through separate means, as trail facilities often are constructed on land acquired for parks or recreation, or set aside through development agreements.
- On-road bicycle facilities were estimated as the cost of adding a 5' wide paved shoulder or designated bicycle lane to an existing road, or as the cost of re-striping an existing road where current pavement width can already accommodate a bicycle lane adjacent to a vehicle lane. Assumptions for each project are shown in **Appendix E**.

### 3.3 Pedestrian System Projects

Project types included sidewalk gaps on major roads, and pedestrian enhancement corridors.

- The cost of filling sidewalk gaps on major roads in each jurisdiction was based on an inventory of the major road network that identified segments with no sidewalks at all (also referred to as "100% missing"). The cost estimate is based on constructing a 5' wide sidewalk on at least one side of each of those segments.

- “Pedestrian Enhancement Corridors” are identified in the Needs Assessment to improve the safety of pedestrians crossing major roads. Cost estimates are based on adding:
  - High visibility crosswalks, with curb bulb-outs and ADA compliant curb cuts (assuming 4 intersections per mile)
  - Flashing pedestrian warning signs (assuming 2 per mile)

### 3.3 Coordination with Roadway Needs Projects

All bicycle and pedestrian projects were cross-referenced with all roadway projects. Where there was overlap, it has been assumed that the needed bicycle or pedestrian facility would be provided as part of the roadway project. The costs of these bicycle and pedestrian facilities have been removed from the total Needs Cost Estimate to avoid double-counting.

### 3.4 Summary Bicycle and Pedestrian Needs

The following table (**Table 6**) summarizes the costs associated with all 2035 Needs Assessment Projects. Detailed cost estimates identified by project have been provided in **Appendix E**.

**TABLE 6: Total Bicycle & Pedestrian Needs Cost Estimates (2035)**

Facility Type	Cost (\$ 2008)	Cost (\$ 2008)- After Coordination with Roadway Needs
Top Priority Pedestrian Enhancement Corridors	\$ 14.84 Million	\$ 14.84 Million
Secondary Priority Pedestrian Enhancement Corridors	\$ 47.93 Million	\$ 47.93 Million
<i>Pedestrian Enhancement Corridors Total</i>	<i>\$ 62.77 Million</i>	<i>\$ 62.77 Million</i>
Top Priority Off-Road Trails	\$ 28.03 Million	\$ 28.03 Million
Secondary Off-Road Trails	\$ 42.17 Million	\$ 42.17 Million
<i>Off-Road Trails Total</i>	<i>\$ 70.20 Million</i>	<i>\$ 70.20 Million</i>
Top Priority On-Road Bicycle Facilities: City of Tampa	\$ 24.16 Million	\$ 18.80 Million
Other On-Road Bicycle Facilities: City of Tampa	TBD	TBD
Top Priority On-Road Bicycle Facilities: Unincorporated Hillsborough County	\$ 26.39 Million	\$ 22.74 Million
Other On-Road Bicycle Facilities: Unincorporated Hillsborough County	TBD	TBD
Top Priority On-Road Bicycle Facilities: City of Plant City	\$ 1.20 Million	\$ 1.17 Million
Other On-Road Bicycle Facilities: City of Plant City	TBD	TBD

Top Priority On-Road Bicycle Facilities: City of Temple Terrace	\$ 1.09 Million	\$ 1.09 Million
Other On-Road Bicycle Facilities: City of Temple Terrace	TBD	TBD
<i>On-Road Bicycle Facilities Total</i>	<i>\$ 52.84 Million</i>	<i>\$ 43.81 Million</i>
Sidewalk Gaps: City of Tampa	\$ 14.79 Million	\$ 14.79 Million
Sidewalk Gaps: Unincorporated Hillsborough County	\$ 49.33 Million	\$ 49.33 Million
Sidewalk Gaps: City of Plant City	\$ 2.27 Million	\$ 2.27 Million
Sidewalk Gaps: City of Temple Terrace	\$ 0.60 Million	\$ 0.60 Million
<i>Sidewalk Needs Total</i>	<i>\$ 66.99 Million</i>	<i>\$ 66.99 Million</i>
<b>Combined Total: Bicycle &amp; Pedestrian Needs</b>	<b>\$ 252.80 Million</b>	<b>\$ 243.77 Million</b>

## 2035 LRTP Roadway Needs: Unit Costs

Improvement	Item	Quantity	Unit	Unit Cost	Price Per Mile
<b>ROADWAY: RURAL ARTERIAL</b>	Construction (2-Lane Roadway) with 5' Paved Shoulders	1	Per Mile	\$4,524,370.00 Rural002U	<b>\$4,524,370.00</b>
	Construction (4-Lane Roadway) with 5' Paved Shoulders	1	Per Mile	\$6,991,163.00 Rural004D	<b>\$6,991,163.00</b>
	New Construction (6-Lane Roadway) with 5' Paved Shoulders	1	Per Mile	\$8,805,269.00 Rural006D	<b>\$8,805,269.00</b>
	Milling and Resurfacing (4-Lane Roadway) with 5' Paved Shoulders	1	Per Mile	\$1,180,057.00	<b>\$1,180,057.00</b>
	Milling and Resurfacing (6-Lane Roadway) with 5' Paved Shoulders	1	Per Mile	\$1,715,672.00	<b>\$1,715,672.00</b>
	Add Lanes (2 to 4 Lanes) with 5' Paved Shoulders (Includes milling and resurfacing of existing pavement)	1	Per Mile	\$4,829,198.00 Rural2U4D	<b>\$4,829,198.00</b>
	Add Lanes (4 to 6 Lanes) with 5' Paved Shoulders (Includes milling and resurfacing of existing pavement)	1	Per Mile	\$5,297,756.00 Rural4D6D	<b>\$5,297,756.00</b>
	Add Lanes (4 to 8 Lanes) with 5' Paved Shoulders (Includes milling and resurfacing of existing pavement)	1	Per Mile	\$7,070,561.00 Rural4D8D	<b>\$7,070,561.00</b>
	Add Lanes (6 to 8 Lanes) with 5' Paved Shoulders (Includes milling and resurfacing of existing pavement)	1	Per Mile	\$6,666,176.00 Rural6D8D	<b>\$6,666,176.00</b>
	Add 1 Through Lane on Inside (To Existing) with 5' Paved Shoulders	1	Per Mile	\$1,148,617.00	<b>\$1,148,617.00</b>
	Add 1 Through Lane on Outside (To Existing) with 5' Paved Shoulders	1	Per Mile	\$1,765,466.00 Rural2O3O	<b>\$1,765,466.00</b>
	Add 300' Exclusive Left Turn Lane	2	Per Mile	\$54,198.00	<b>\$108,396.00</b>
	Add 300' Exclusive Right Turn Lane	2	Per Mile	\$132,555.00	<b>\$265,110.00</b>
	Source: FDOT D7 Roadway Cost Per Centerline Mile, June 2009				
<b>ROADWAY: URBAN ARTERIAL</b>	New Construction (2-Lane Roadway) with 5' Sidewalk, and Curb & Gutter	1	Per Mile	\$6,095,198.00 Urban002U	<b>\$6,095,198.00</b>
	New Construction (4-Lane Roadway) with 5' Sidewalk, and Curb & Gutter	1	Per Mile	\$8,537,780.00 Urban004D	<b>\$8,537,780.00</b>
	New Construction (6-Lane Roadway) with 5' Sidewalk, and Curb & Gutter	1	Per Mile	\$10,447,044.00 Urban006D	<b>\$10,447,044.00</b>
	Milling and Resurfacing (4-Lane Roadway) with 5' Sidewalk, and Curb & Gutter	1	Per Mile	\$1,259,576.00	<b>\$1,259,576.00</b>
	Milling and Resurfacing (6-Lane Roadway) with 5' Sidewalk, and Curb & Gutter	1	Per Mile	\$1,784,574.00	<b>\$1,784,574.00</b>
	Add Lanes (2 to 4 Lanes) with 5' Sidewalk, and Curb & Gutter (Includes milling and resurfacing existing pavement)	1	Per Mile	\$5,763,328.00 Urban2U4D	<b>\$5,763,328.00</b>
	Add Lanes (4 to 6 Lanes) with 5' Sidewalk, and Curb & Gutter (Includes milling and resurfacing existing pavement)	1	Per Mile	\$6,349,351.00 Urban4D6D	<b>\$6,349,351.00</b>
	Add Lanes (4 to 8 Lanes) with 5' Sidewalk, and Curb & Gutter (Includes milling and resurfacing existing pavement)	1	Per Mile	\$8,599,679.00 Urban4D8D	<b>\$8,599,679.00</b>
	Add Lanes (6 to 8 Lanes) with 5' Sidewalk, and Curb & Gutter (Includes milling and resurfacing existing pavement)	1	Per Mile	\$7,641,191.00 Urban6D8D	<b>\$7,641,191.00</b>
	Add 1 Through Lane on Inside (To Existing) with 5' Sidewalk, and Curb & Gutter	1	Per Mile	\$1,165,936.00	<b>\$1,165,936.00</b>
	Add 1 Through Lane on Outside (To Existing) with 5' Sidewalk, and Curb & Gutter	1	Per Mile	\$2,585,883.00 Urban2O3O	<b>\$2,585,883.00</b>
	Add 300' Exclusive Left Turn Lane	2	Per Mile	\$72,032.00	<b>\$144,064.00</b>
	Add 300' Exclusive Right Turn Lane	2	Per Mile	\$151,875.00	<b>\$303,750.00</b>
	Source: FDOT D7 Roadway Cost Per Centerline Mile, June 2009				

RoadwayUnitCost

<b>ITS COORDINATED SIGNALS</b>					
Signal Coordination (per mile)	Conduit	5280	LF	\$5.00	\$26,400.00
	Fiber Optic Cable	5280	LF	\$3.00	\$15,840.00
	Fiber Optic Pullboxes	11	EA	\$900.00	\$9,900.00
Cost of signalized intersection	Signalized Intersection	2	MILE	\$120,000.00	\$240,000.00
(Source: FDOT D7 LRE)				<b>TOTAL PER MILE</b>	<b>\$292,140.00</b>
<b>ITS VARIABLE MESSAGE SIGN</b>					
ITS Dynamic Message Signs	Arterial DMS	1	EA	\$25,000.00	\$25,000.00
	Mast Arm Support	1	EA	\$30,000.00	\$30,000.00
(Source: FDOT D7 LRE)		2	Per Mile	<b>TOTAL PER MILE</b>	<b>\$110,000.00</b>
<b>HIGH VISIBILTY PED CROSS WALK</b>					
High Visibility Ped Crosswalks (per intersection)	12" white thermoplastic	800	SF	\$1.95	\$1,560.00
Textured Pavers (per intersection)	Brick Pavers	2600	SF	\$7.50	\$19,500.00
(Source: FDOT D7 LRE)		4	Per Mile	<b>TOTAL PER MILE</b>	<b>\$84,240.00</b>
<b>FLASHING PEDESTRIAN WARNING SIGNS</b>					
Flashing Ped Crossing Signs (per crossing)	Sign Assembly with beacon	2	AS	\$2,900.00	\$5,800.00
	Solar Power panel and storage	2	AS	\$1,200.00	\$2,400.00
(Source: FDOT D7 LRE)		2	Per Mile	<b>TOTAL PER MILE</b>	<b>\$16,400.00</b>
<b>ADA COMPLIANT SIDEWALK BULB-OUT</b>					
	4" Conc. Pavement	20	SY	\$44.00	\$880.00
(Source: FDOT D7 LRE)		4	Per Mile	<b>TOTAL PER MILE</b>	<b>\$3,520.00</b>
<b>ADDING BIKE LANES TO RURAL SECTIONS AND URBAN SECTIONS</b>					
Urban Typical	Assumes 5' width (includes paving and striping)	2	Per Mile	\$133,017.00	\$266,034.00
Rural Typical	Assumes 5' width (includes striping on shoulder)	2	Per Mile	\$79,525.00	\$159,050.00
Barrier Between Bike lane and Travel Lane	Shoulder concrete barrier wall	10560	LF	\$178.81	\$1,888,233.60
(Source: FDOT D7)					
<b>ADA COMPLIANT TRANSIT CURB-CUTS</b>					
Urban Typical	Concrete Pad (Boarding and Alighting Area)	1	Per Stop	\$600.00	\$600.00
	ADA Curb-Cut and Connecting Path	1	Per Stop	\$7,000.00	\$7,000.00
		8	Per Mile	<b>TOTAL PER MILE</b>	<b>\$56,000.00</b>
Rural Typical	Concrete Pad (Boarding and Alighting Area)	1	Per Stop	\$600.00	\$600.00
	ADA Curb-Cut and Connecting Path	1	Per Stop	\$7,000.00	\$6,500.00
Source: HART January 2008		2	Per Mile	<b>TOTAL PER MILE</b>	<b>\$13,000.00</b>
Bus Stop & Facility Accessibility Study					

## 2035 LRTP Bicycle & Pedestrian Needs: Unit Costs

Improvement	Item	Quantity	Unit	Unit Cost	Price Per Mile	
<b>ITS COORDINATED SIGNALS</b>						
Signal Coordination (per mile)	Conduit	5280	LF	\$5.00	\$26,400.00	
	Fiber Optic Cable	5280	LF	\$3.00	\$15,840.00	
	Fiber Optic Pullboxes	11	EA	\$900.00	\$9,900.00	
Cost of signalized intersection (Source: FDOT D7 LRE)	Signalized Intersection	2	MILE	\$120,000.00	\$240,000.00	
				<b>TOTAL PER MILE</b>	<b>\$292,140.00</b>	
<b>ITS VARIABLE MESSAGE SIGN</b>						
ITS Dynamic Message Signs  (Source: FDOT D7 LRE)	Arterial DMS	1	EA	\$25,000.00	\$25,000.00	
	Mast Arm Support	1	EA	\$30,000.00	\$30,000.00	
		2	Per Mile	<b>TOTAL PER MILE</b>	<b>\$110,000.00</b>	
<b>HIGH VISIBILITY PED CROSS WALK</b>						
High Visibility Ped Crosswalks (per intersection)	12" white thermoplastic	800	SF	\$1.95	\$1,560.00	
Textured Pavers (per intersection) (Source: FDOT D7 LRE)	Brick Pavers	2600	SF	\$7.50	\$19,500.00	
		4	Per Mile	<b>TOTAL PER MILE</b>	<b>\$84,240.00</b>	
<b>FLASHING PEDESTRIAN WARNING SIGNS</b>						
Flashing Ped Crossing Signs (per crossing)  (Source: FDOT D7 LRE)	Sign Assembly with beacon	2	AS	\$2,900.00	\$5,800.00	
	Solar Power panel and storage	2	AS	\$1,200.00	\$2,400.00	
		2	Per Mile	<b>TOTAL PER MILE</b>	<b>\$16,400.00</b>	
<b>SIDEWALK</b>						
FDOT Generic Cost Estimate of "Sidewalk construction, 5' sidewalk one side, 4 inches deep  (Source: FDOT D7 June 2009)						
		4" Conc. Pavement (5' Wide)	5280	Mile	<b>TOTAL PER MILE</b>	<b>\$95,539.00</b>
<b>ADA COMPLIANT SIDEWALK BULB-OUT</b>						
(Source: FDOT D7 LRE)	4" Conc. Pavement	20	SY	\$44.00	\$880.00	
			4	Per Mile	<b>TOTAL PER MILE</b>	<b>\$3,520.00</b>
<b>ADDING BIKE LANES TO RURAL SECTIONS AND URBAN SECTIONS</b>						
Urban Typical	Assumes 5' width (includes paving	2	Per Mile	\$133,017.00	\$266,034.00	
Rural Typical	Assumes 5' width (includes stripin	2	Per Mile	\$79,525.00	\$159,050.00	
Barrier Between Bike lane and Travel Lane (Source: FDOT D7)	Shoulder concrete barrier wall	10560	LF	\$178.81	\$1,888,233.60	
<b>RE-STRIPE BIKE LANES TO RURAL SECTIONS AND URBAN SECTIONS (ASSUME 4' BIKE LANES)</b>						
			Page 1			
		Center Stripe & Side Stripe		LF	\$1.42	1.42

PedBikeUnitCost

(Source: FDOT D7)	5280.000	Mile	<b>TOTAL PER MILE</b>	<b>\$7,497.60</b>
<b>MUTLI-USE PATH</b>				
<b>(ASSUME 12' MULTI-DIRECTIONAL)</b>				
Center Stripe & Side Stripe		Mile	\$170,591.00	\$170,591.00
	1	Mile	<b>TOTAL PER MILE</b>	<b>\$170,591.00</b>
<b>SINGLE POST SIGN, F&amp;I, LESS THAN 12 SF</b>				
	1.000	AS	\$289.22	\$289.22
	4	Mile	<b>TOTAL PER MILE</b>	<b>\$1,156.88</b>
<b>PAVED SHOULDER</b>				
<b>(ASSUME REMILLING AND RESURFACING OF ENTIRE 2 LANE RURAL TYPICAL WITH 5' PAVED SHOULDERS</b>				
Resurface 2 Lane with Paved Shc	1.000	Mile	\$246,051.58	\$246,051.58
	1	Mile	<b>TOTAL PER MILE</b>	<b>\$246,051.58</b>

**TBARTA Regional Network  
Capital Cost Units**

<b>2035 LRTP</b>				
<b>DRAFT Unit Costs for 2035 Transit Needs</b>				
<b>Mode Construction Costs (FTA Cat. 10,40,50)</b>	<b>Low (\$/mi)</b>	<b>High (\$/mi)</b>	<b>R.O.W. Width (ft)</b>	<b>References</b>
Managed Lanes - Interstates	\$15.6	\$17.6	88	FDOT D-7 Highway Construction Costs Jun 08 and LRE
Managed Lanes - Arterials	\$4.9	\$7.2	34	FDOT D-7 Highway Construction Costs Jun 08
Busway in existing CSX corridor	\$10.0	\$20.6	46	FDOT D-7 Highway Construction Costs Jun 08 and Jacobs Oct 08
Mixed Traffic BRT Corridor	\$2.5	\$5.0	0	Local Transportation Improvement Programs 08
At-Grade Short Distance Rail (Electrified, Ballasted/Street Running)	\$16.0	\$28.3	40	Hillsborough MPO Transit Study Dec 07, FTA cat. 10, 40, 50/Hudson Bergen Northern Branch
Short Distance Rail in existing CSX corridor (Diesel/Electrified with Crash Barrier)	\$11.6	\$38.9	60	Jacobs estimate Oct 08/Hudson Bergen Northern Branch 09
Long Distance Rail	\$8.5	\$15.0	40	Hillsborough MPO Transit Study Dec 07, FTA cat. 10, 40, 50
<b>Stations &amp; Facilities (FTA Cat. 20,30)</b>	<b>Low (\$M)</b>	<b>High (\$M)</b>		
At Grade Bus Station	\$0.3	\$2.0		SFRTA Oct 07
At Grade Light Rail or Busway Station	\$1.5	\$3.5		DART May 08, Hillsborough MPO Transit Study Dec 07
At Grade Commuter Rail Station	\$2.9	\$4.7		FasTracks APE Unit Rates 08
Local Bus Stops - Shelters & Amenities	\$0.020	\$0.080		Local Transit Development Plans 08
Local Bus Stops - Ped & Bike Access	\$0.080	\$0.300		Temple Terrace Multimodal District Improvement Program
Park & Ride - Structured	\$2.0	\$4.0		FasTracks APE Unit Rates 08
Park & Ride - At Grade	\$0.5	\$1.6		FasTracks APE Unit Rates 08, Broward County P&R Dec 08
Maintenance Facility - Bus	\$40.0	\$60.0		LeeTran Facility 2008
Maintenance Facility - Light Rail	\$30.0	\$100.0		SFRTA Oct 07/high estimate = Jacobs March 09 (Arch Street project )
Maintenance Facility - Commuter Rail	\$20.0	\$30.0		SFRTA Oct 07
Water Station Docks	\$0.7	\$2.0		<a href="http://www.virginiadot.org/projects/studynova-ferrychap3.asp">http://www.virginiadot.org/projects/studynova-ferrychap3.asp</a>
<b>Vehicles (FTA Cat. 20,30)</b>	<b>Low (\$M)</b>	<b>High (\$M)</b>		
Premium Bus/BRT	\$0.4	\$2.0		
Light Rail (2 per train)	\$2.9	\$4.0		FDOT Transit System Costs Sept 08
Commuter Rail Passenger Car (2 per train)	\$1.4	\$2.5		SFRTA Oct 07
Commuter Rail Locomotive	\$2.4	\$6.0		SFRTA Oct 07/high estimate = Jacobs 09 (Hudson Bergen Northern Branch)
Commuter Rail Self-Propelled	\$3.7	\$4.4		FasTracks APE Unit Rates 08
Waterborne	\$3.0	\$8.0		VADOT, Golden Gate Ferry,
Local Fixed Route Bus	\$0.3	\$0.8		FDOT Transit System Costs Sept 08
Vanpool Vehicle	\$0.0240	\$0.0300		Spacecoast VPSI Oct 08 procurement
Streetcar Vehicle	\$0.9			HART
<b>Structures (Elevated Sections &amp; Bridges)</b>	<b>Low (\$/mi)</b>	<b>High (\$/mi)</b>		
Bridges: Rail - single track	not used	not used		
Bridges: Rail - double track	\$42.2	\$65.5		FDOT D-7 Freight Study (low), FDOT Intercity Passenger Rail (high)
Bridges: Mgd Lanes-Interstate	\$69.7	\$92.9		FDOT D-7 Highway Construction Costs Jun 08
Bridges: Mgd Lanes-Arterials	\$26.9	\$35.9		FDOT D-7 Highway Construction Costs Jun 08
Bridges: Busway	\$36.4	\$48.6		FDOT D-7 Highway Construction Costs Jun 08
Howard Frankland Bridge	\$87.0	\$153.0		Jacobs Structures Estimate '09 using FDOT Existing Plans (Widening/N
Managed Lanes Bus Slip Ramps	\$17.0	\$22.0		FDOT D-7 Hillsborough PD&E Concept (Not Used), Using LRE Cost Es

**TBARTA Regional Network  
Capital Cost Units**

<b>Right of Way (FTA Cat. 70)</b>	<u>Low (\$)</u>	<u>High (\$)</u>	
Fees, Per Parcel	\$75,000	\$100,000	FDOT D-7 ROW office, Jul 08
Land (sf) - Citrus, Hernando, Northern Pasco	\$6.35	\$19.99	Listings Oct 08, Loopnet.com
Land (sf) - Western Pasco	\$12.21	\$31.91	Listings Oct 08, Loopnet.com
Land (sf) - Eastern Pasco	\$11.05	\$23.01	Listings Oct 08, Loopnet.com
Land (sf) - Pinellas	\$19.73	\$56.55	Listings Oct 08, Loopnet.com
Land (sf) - Central Hillsborough	\$6.17	\$38.07	Listings Oct 08, Loopnet.com
Land (sf) - Eastern Hillsborough	\$6.67	\$23.72	Listings Oct 08, Loopnet.com
Land (sf) - Manatee	\$18.76	\$24.35	Listings Oct 08, Loopnet.com
Land (sf) - Northern Sarasota	\$24.36	\$71.95	Listings Oct 08, Loopnet.com
Land (sf) - Southern Sarasota	\$26.39	\$40.31	Listings Oct 08, Loopnet.com
CSX (\$M/mi) - purchase with freight easemt.*	\$2.44	\$7.40	Central Florida Rail Corridor CSX-FDOT Agreements Nov 07

## TBARTA Regional Network Capital Cost Units

Contingencies & Soft Costs (FTA Cat. 80)			
Design	10%	of construction costs	FasTracks APE Unit Rates 08
Construction Mgmt.	12%	of construction costs	FasTracks APE Unit Rates 08
Contingency - Construction	50%	of construction costs	
Contingency - Land	200%	of ROW costs	FasTracks Aug 08
Mitigation & Other Factors (FTA Cat. 90)			
Drainage	5%	of construction costs	FasTracks APE Unit Rates 08
Utility Relocation	4%	of construction costs	FasTracks APE Unit Rates 08
<b>Drainage &amp; Utilities</b>	<b>9%</b>		
Noise Mitigation	2%	of construction costs	FasTracks APE Unit Rates 08
Wetlands Mitigation	2%	of construction costs	FasTracks APE Unit Rates 08
Hazardous Materials	2.5%	of construction costs	FasTracks APE Unit Rates 08
<b>Mitigation</b>	<b>6.5%</b>		
Signing & Striping	1%	of construction costs	FasTracks APE Unit Rates 08
Urban Design/ Landscaping	1.5%	of construction costs	FasTracks APE Unit Rates 08
Maintenance of Traffic	2%	of construction costs	FasTracks APE Unit Rates 08
<b>Sign/Stripe, Landscape, MOT</b>	<b>5%</b>		
<b>Pedestrian &amp; Non-Motorized Access</b>	<b>7%</b>	of station costs	Sim. to 1/2-1 mi of sidewalk, FDOT D-7 Hwy. Constr. Costs Jun 08
Notes			
*Liability insurance in CSX corridors is not included above.			
All units cost are based on information developed for the TBARTA Master Plan			
<b>Last updated: 3/30/09</b>			