

# Memorandum

TO: Beth Alden, AICP

FROM: Jennifer Straw, AICP

CC: Ned Baier, AICP  
Scott Pringle, AICP

DATE: January 17, 2012

RE: Funding Scenario Fact Sheets: Technical Appendices

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Public-friendly fact sheets were created to present elements of the research to the public to better facilitate a conversation regarding alternative funding sources to a countywide one-cent sales tax. This memorandum documents our approach and assumptions to calculating revenues, costs, and other data found on the Fact Sheets and Background Sheets.

## **Funding Scenario Appendices:**

**Appendix A - Local Gas Tax supporting data**

**Appendix B - Special Assessment District – SouthShore Community Improvements supporting data**

**Appendix C - Special Assessment District – Streetcar supporting data**

**Appendix D - Mobility Fee supporting data**

**Appendix E - Tolloed Express Lanes with Bus Rapid Transit supporting data**

**Appendix F - Tolloed Intersection Bypass Lanes with Bus Rapid Transit supporting data**

**Appendix G - Local Sales Tax supporting data**

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NOTE: There is no Appendix for the Public Service Tax on Utilities (Electricity) scenario.

All revenue calculations are provided on the Background sheet. This public service tax is currently levied in the Cities of Plant City, Tampa, and Temple Terrace, with revenues going into the municipalities' general funds. As a fee, rather than a tax, it can be established by local government without a public referendum.

## **Appendix A**

### **Local Gas Tax supporting data**

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Appendix A includes detailed revenue calculations for the Local Gas Tax scenario.

Revenues as shown on the Background sheet were calculated based on a five-cent local option gas tax. Revenue was also calculated for just the City of Tampa as well as the entirety of Hillsborough County. The City of Tampa's revenue was based on the distribution percentage that Tampa collects from the present local option fuel tax in Hillsborough County: 28.27 percent.

Local road and bridge maintenance shortfalls were obtained from Public Works Departments for Hillsborough County, Plant City, Tampa, and Temple Terrace.

Revenues generated from varying levels of Local Option Gas Tax

Additional 1-Cent Local Option	Municipality/Agency	2012				2013				2014				2015			
(1 cent per gallon of non-diesel fuel)	Hillsborough County	5,838,004	5,990,959	6,131,148	6,278,908												
	Tampa	1,650,404	1,693,644	1,733,275	1,775,047												
	Hillsborough County Total	5,838,004	11,828,963	17,960,111	24,239,019												
	Tampa Total	1,650,404	3,344,048	5,077,323	6,852,370												

Additional 2-Cent Local Option	Municipality/Agency	2012				2013				2014				2015			
(2 cents per gallon of non-diesel fuel)	Hillsborough County	11,676,008	11,981,918	12,262,296	12,557,816												
	Tampa	3,300,808	3,387,288	3,466,550	3,550,094												
	Hillsborough County Total	11,676,008	23,657,926	35,920,222	48,478,038												
	Tampa Total	3,300,808	6,688,096	10,154,646	13,704,740												

Additional 3-Cent Local Option	Municipality/Agency	2012				2013				2014				2015			
(3 cents per gallon of non-diesel fuel)	Hillsborough County	17,514,012	17,972,877	18,393,444	18,836,724												
	Tampa	4,951,212	5,080,932	5,199,825	5,325,141												
	Hillsborough County Total	17,514,012	35,486,889	53,880,333	72,717,057												
	Tampa Total	4,951,212	10,032,144	15,231,969	20,557,110												

Additional 4-Cent Local Option	Municipality/Agency	2012				2013				2014				2015			
(4 cents per gallon of non-diesel fuel)	Hillsborough County	23,352,016	23,963,836	24,524,592	25,115,632												
	Tampa	6,601,616	6,774,576	6,933,100	7,100,188												
	Hillsborough County Total	23,352,016	47,315,852	71,840,444	96,956,076												
	Tampa Total	6,601,616	13,376,192	20,309,292	27,409,480												

Additional 5-Cent Local Option	Municipality/Agency	2012				2013				2014				2015			
(5 cents per gallon of non-diesel fuel)	Hillsborough County	29,190,020	29,954,795	30,655,740	31,394,540												
	Tampa	8,252,020	8,468,220	8,666,375	8,875,235												
	Hillsborough County Total	29,190,020	59,144,815	89,800,555	121,195,095												
	Tampa Total	8,252,018	16,720,238	25,386,613	34,261,848												

Revenue Generated										
2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026
6,417,672	6,536,399	6,654,708	6,773,162	6,897,788	7,024,707	7,153,962	7,285,595	7,419,650	7,556,171	7,695,205
1,814,276	1,847,840	1,881,286	1,914,773	1,950,005	1,985,885	2,022,425	2,059,638	2,097,535	2,136,130	2,175,434
30,656,691	37,193,090	43,847,798	50,620,960	57,518,748	64,543,455	71,697,417	78,983,012	86,402,662	93,958,833	101,654,038
8,666,646	10,514,486	12,395,772	14,310,545	16,260,550	18,246,435	20,268,860	22,328,498	24,426,033	26,562,163	28,737,597

Revenue Generated										
2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026
12,835,344	13,072,798	13,309,416	13,546,324	13,795,576	14,049,414	14,307,924	14,571,190	14,839,300	15,112,342	15,390,410
3,628,552	3,695,680	3,762,572	3,829,546	3,900,010	3,971,770	4,044,850	4,119,276	4,195,070	4,272,260	4,350,868
61,313,382	74,386,180	87,695,596	101,241,920	115,037,496	129,086,910	143,394,834	157,966,024	172,805,324	187,917,666	203,308,076
17,333,292	21,028,972	24,791,544	28,621,090	32,521,100	36,492,870	40,537,720	44,656,996	48,852,066	53,124,326	57,475,194

Revenue Generated										
2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026
19,253,016	19,609,197	19,964,124	20,319,486	20,693,364	21,074,121	21,461,886	21,856,785	22,258,950	22,668,513	23,085,615
5,442,828	5,543,520	5,643,858	5,744,319	5,850,015	5,957,655	6,067,275	6,178,914	6,292,605	6,408,390	6,526,302
91,970,073	111,579,270	131,543,394	151,862,880	172,556,244	193,630,365	215,092,251	236,949,036	259,207,986	281,876,499	304,962,114
25,999,938	31,543,458	37,187,316	42,931,635	48,781,650	54,739,305	60,806,580	66,985,494	73,278,099	79,686,489	86,212,791

Revenue Generated										
2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026
25,670,688	26,145,596	26,618,832	27,092,648	27,591,152	28,098,828	28,615,848	29,142,380	29,678,600	30,224,684	30,780,820
7,257,104	7,391,360	7,525,144	7,659,092	7,800,020	7,943,540	8,089,700	8,238,552	8,390,140	8,544,520	8,701,736
122,626,764	148,772,360	175,391,192	202,483,840	230,074,992	258,173,820	286,789,668	315,932,048	345,610,648	375,835,332	406,616,152
34,666,584	42,057,944	49,583,088	57,242,180	65,042,200	72,985,740	81,075,440	89,313,992	97,704,132	106,248,652	114,950,388

Revenue Generated										
2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026
32,088,360	32,681,995	33,273,540	33,865,810	34,488,940	35,123,535	35,769,810	36,427,975	37,098,250	37,780,855	38,476,025
9,071,380	9,239,200	9,406,430	9,573,865	9,750,025	9,929,425	10,112,125	10,298,190	10,487,675	10,680,650	10,877,170
153,283,455	185,965,450	219,238,990	253,104,800	287,593,740	322,717,275	358,487,085	394,915,060	432,013,310	469,794,165	508,270,190
43,333,228	52,572,428	61,978,858	71,552,723	81,302,748	91,232,173	101,344,298	111,642,488	122,130,163	132,810,813	143,687,983

2027	2028	2029	2030	2031	2032	2033	2034	2035
7,836,797	7,980,994	8,127,844	8,277,396	8,429,700	8,584,807	8,742,767	8,903,634	9,067,461
2,215,462	2,256,227	2,297,741	2,340,020	2,383,076	2,426,925	2,471,580	2,517,057	2,563,371
109,490,835	117,471,829	125,599,673	133,877,069	142,306,769	150,891,576	159,634,343	168,537,977	177,605,438
30,953,059	33,209,286	35,507,027	37,847,047	40,230,123	42,657,048	45,128,628	47,645,685	50,209,056

2027	2028	2029	2030	2031	2032	2033	2034	2035
15,673,594	15,961,988	16,255,688	16,554,792	16,859,400	17,169,614	17,485,534	17,807,268	18,134,922
4,430,924	4,512,454	4,595,482	4,680,040	4,766,152	4,853,850	4,943,160	5,034,114	5,126,742
218,981,670	234,943,658	251,199,346	267,754,138	284,613,538	301,783,152	319,268,686	337,075,954	355,210,876
61,906,118	66,418,572	71,014,054	75,694,094	80,460,246	85,314,096	90,257,256	95,291,370	100,418,112

2027	2028	2029	2030	2031	2032	2033	2034	2035
23,510,391	23,942,982	24,383,532	24,832,188	25,289,100	25,754,421	26,228,301	26,710,902	27,202,383
6,646,386	6,768,681	6,893,223	7,020,060	7,149,228	7,280,775	7,414,740	7,551,171	7,690,113
328,472,505	352,415,487	376,799,019	401,631,207	426,920,307	452,674,728	478,903,029	505,613,931	532,816,314
92,859,177	99,627,858	106,521,081	113,541,141	120,690,369	127,971,144	135,385,884	142,937,055	150,627,168

2027	2028	2029	2030	2031	2032	2033	2034	2035
31,347,188	31,923,976	32,511,376	33,109,584	33,718,800	34,339,228	34,971,068	35,614,536	36,269,844
8,861,848	9,024,908	9,190,964	9,360,080	9,532,304	9,707,700	9,886,320	10,068,228	10,253,484
437,963,340	469,887,316	502,398,692	535,508,276	569,227,076	603,566,304	638,537,372	674,151,908	710,421,752
123,812,236	132,837,144	142,028,108	151,388,188	160,920,492	170,628,192	180,514,512	190,582,740	200,836,224

2027	2028	2029	2030	2031	2032	2033	2034	2035
39,183,985	39,904,970	40,639,220	41,386,980	42,148,500	42,924,035	43,713,835	44,518,170	45,337,305
11,077,310	11,281,135	11,488,705	11,700,100	11,915,380	12,134,625	12,357,900	12,585,285	12,816,855
547,454,175	587,359,145	627,998,365	669,385,345	711,533,845	754,457,880	798,171,715	842,689,885	888,027,190
154,765,293	166,046,428	177,535,133	189,235,233	201,150,613	213,285,238	225,643,138	238,228,423	251,045,278

## Appendix B

### Special Assessment District - SouthShore Community Improvements supporting data

Revenue calculations are provided on the Background sheet, while more detailed revenue estimates and a listing of unfunded capital needs for the SouthShore Special Assessment District scenario are provided in Appendix B.

For this scenario, anticipated revenues were estimated for implementing a Special Assessment District in the SouthShore area of unincorporated Hillsborough County based on property types. The capital improvements for the District were selected from the Hillsborough County MPO 2035 Long Range Transportation Plan and as County-identified unfunded capital needs. The map below shows the portion of the county included in the calculations for this scenario.

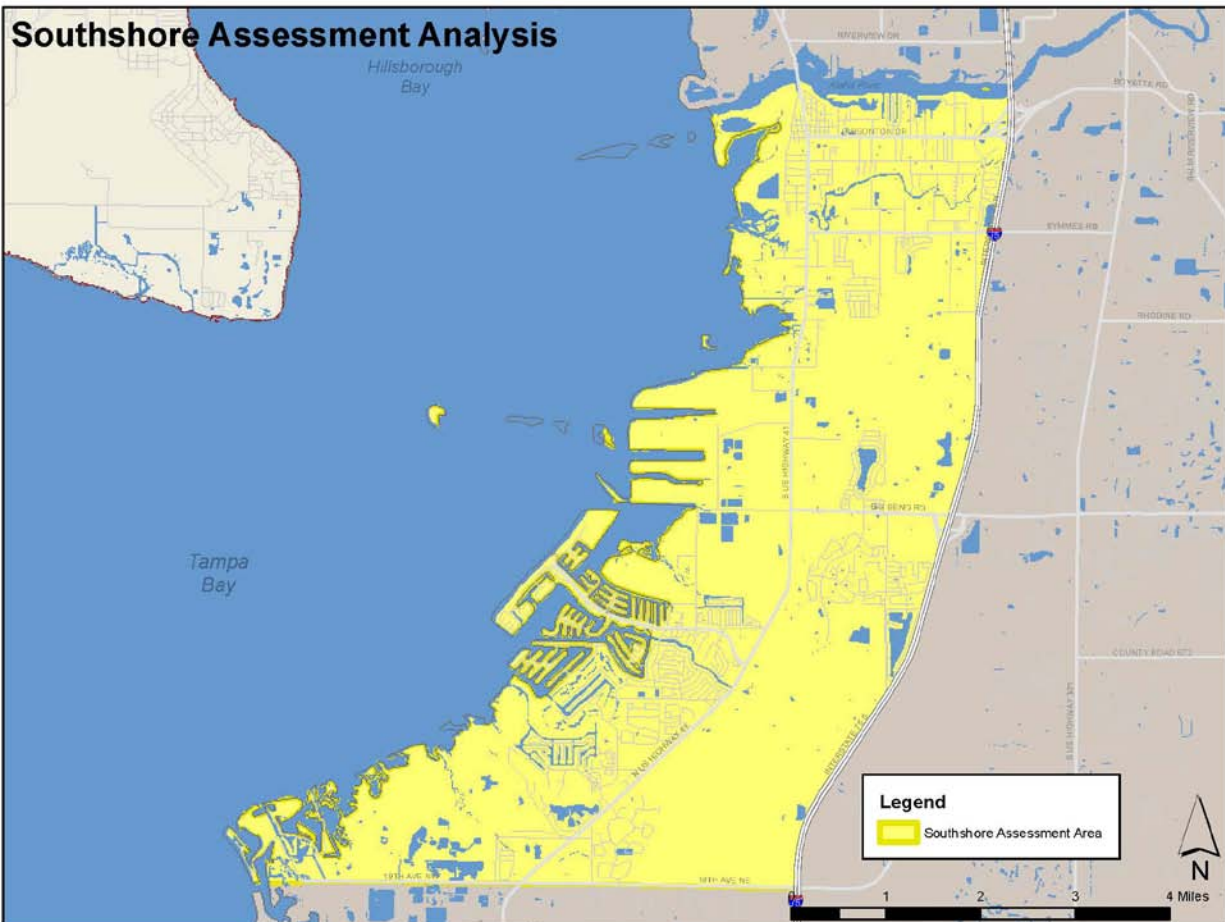


Figure 1. SouthShore Special Assessment District Boundary for Calculation

**SouthShore Special Assessment:**

TOA calculated the potential revenues for the residential and non-residential properties in the SouthShore district of Hillsborough County (as shown in the map in the body of this document) for 2011. Based on a 1.0 mil assessment rate, non-residential properties would generate \$478,385 and residential properties would generate \$1,050,216.

**Table 1: SouthShore Assessment District**

Land Use	Taxable Value	% of Total
Residential	\$1,050,215,766	69%
Nonresidential	\$478,384,963	31%
<b>Total</b>	<b>\$1,528,600,729</b>	-

**Table 2: SouthShore District Millage Scenarios**

Land Use	1 mil	0.5 mils	0.33 mils
Residential	\$1,050,216	\$525,108	\$346,571
Nonresidential	\$478,385	\$239,192	\$157,867
<b>Total</b>	<b>\$1,528,601</b>	<b>\$764,300</b>	<b>\$504,438</b>

**Property Valuation**

**Table 3: Future Southshore District**

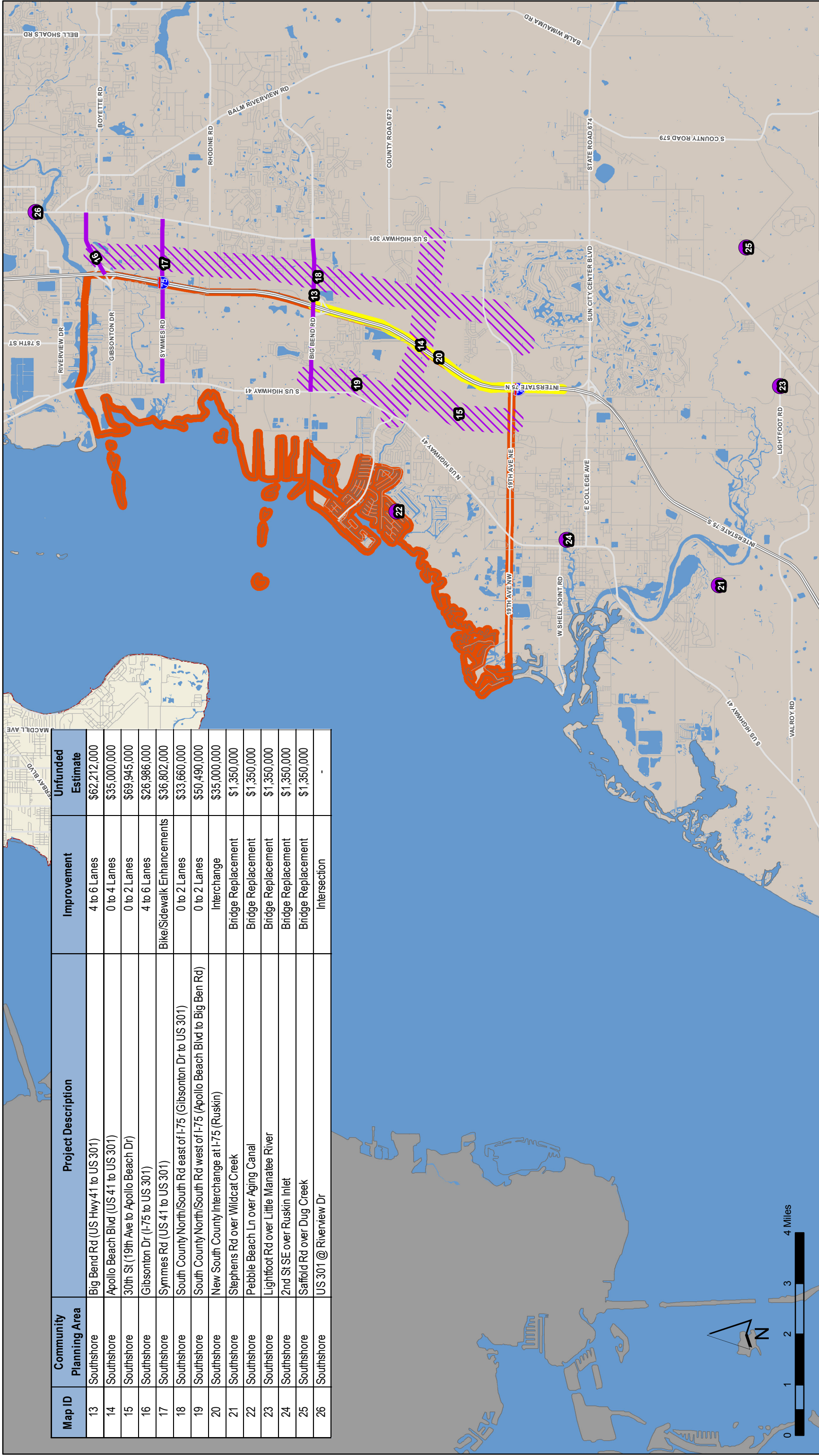
Land Use	Taxable Value	% of Total	Parcel Counts	Value/ Parcel
Residential (HSE only)	\$615,195,600	40%	5982	\$102,841
Non-Residential	\$911,920,463	60%	5167	\$176,489
<b>Total</b>	<b>\$1,527,116,063</b>	-		

**Table 4: Property Valuation Per Parcel**

Land Use	1 mil	0.5 mils	0.33 mils
Residential (HSE only)	\$103	\$51	\$34
Non-Residential	\$176	\$88	\$58
<b>Total</b>	<b>\$279</b>	<b>\$139</b>	<b>\$92</b>

**Notes:**

Residential includes homestead exempt only.  
Nonresidential includes residential non-HS exempt.  
Excludes gov't/non-profit land uses.



Map ID	Community Planning Area	Project Description	Improvement	Unfunded Estimate
13	Southshore	Big Bend Rd (US Hwy 41 to US 301)	4 to 6 Lanes	\$62,212,000
14	Southshore	Apollo Beach Blvd (US 41 to US 301)	0 to 4 Lanes	\$35,000,000
15	Southshore	30th St (19th Ave to Apollo Beach Dr)	0 to 2 Lanes	\$69,945,000
16	Southshore	Gibsonton Dr (I-75 to US 301)	4 to 6 Lanes	\$26,986,000
17	Southshore	Symmes Rd (US 41 to US 301)	Bike/Sidewalk Enhancements	\$36,802,000
18	Southshore	South County North/South Rd east of I-75 (Gibsonton Dr to US 301)	0 to 2 Lanes	\$33,660,000
19	Southshore	South County North/South Rd west of I-75 (Apollo Beach Blvd to Big Ben Rd)	0 to 2 Lanes	\$50,490,000
20	Southshore	New South County Interchange at I-75 (Ruskin)	Interchange	\$35,000,000
21	Southshore	Stephens Rd over Wildcat Creek	Bridge Replacement	\$1,350,000
22	Southshore	Pebble Beach Ln over Aging Canal	Bridge Replacement	\$1,350,000
23	Southshore	Lightfoot Rd over Little Manatee River	Bridge Replacement	\$1,350,000
24	Southshore	2nd St SE over Ruskin Inlet	Bridge Replacement	\$1,350,000
25	Southshore	Saffold Rd over Dug Creek	Bridge Replacement	\$1,350,000
26	Southshore	US 301 @ Riverview Dr	Intersection	-

# FY 2012 Unfunded Capital Needs Southshore District

- Unfunded Capital Needs Projects
- Unfunded Capital Needs Projects - New Roadway
- Unfunded Capital Needs Projects - New Interchange
- Intersection/Bridge Project
- District Boundary



# Appendix C

## Special Assessment District – Streetcar supporting data

Basic revenue and cost estimate calculations are provided on the Background sheet, and more detailed revenue estimates, and a thorough operations discussion and calculations can be found in Appendix C.

Capital and operating costs were estimated for streetcar extensions to East Tampa (from its existing Centennial Park Station at 8<sup>th</sup> Avenue & 20<sup>th</sup> Street to 22<sup>nd</sup> Street & Lake Street or MLK, Jr. Boulevard), and to the Hyde Park/South Tampa area (via Marion Street transit mall to the Marion Transit Station, to arts district, and along the CSX to S Howard Avenue). To develop practical costs, assumptions were made regarding the type of vehicle (modern vehicle vs. historic streetcar to allow for commuter-style operations), operating characteristics (i.e. service hours, frequency, etc.), right-of-way needs (general alignment, exclusive operating vs. shared), and number of stations.

Revenues were calculated based on the streetcar extension alignment and a one-quarter-mile “benefit area” surrounding the alignment as shown in Figure 2.

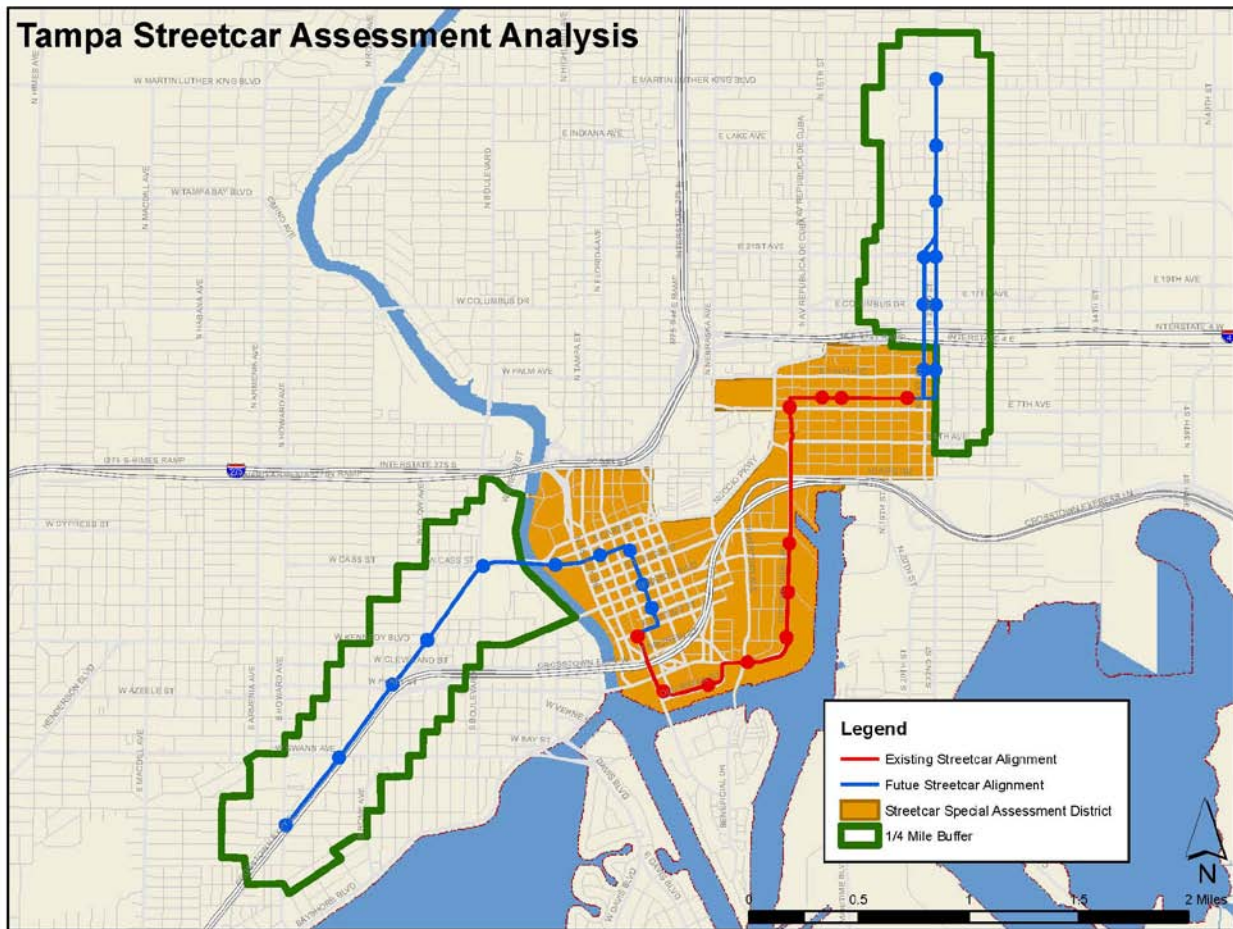


Figure 2. Tampa Streetcar Extension Special Assessment District Boundary for Calculation

## Hillsborough County - Streetcar Assessment Property Valuation and Revenue Estimates

### Existing Streetcar Special Assessment District

The existing Streetcar Special Assessment District has a millage rate of 0.33 mils.

Table 1a: Existing Streetcar Assessment District

Land Use	Taxable Value	% of Total	Parcel Counts	Value/Parcel
Residential (HSE only)	\$47,546,513	3%	591	\$80,451
Non-Residential	\$1,416,320,856	97%	3464	\$408,869
<b>Total</b>	<b>\$1,463,867,369</b>	-		

Table 1b: Existing Streetcar Assessment District Valuation Per Parcel

Land Use	1 mil	0.5 mils	0.33 mils
Residential (HSE only)	\$80	\$40	\$27
Non-Residential	\$409	\$204	\$135
<b>Total</b>	<b>\$489</b>	<b>\$244</b>	<b>\$162</b>

Table 1c: Existing Streetcar Assessment District Millage Scenarios

Land Use	1 mil	0.5 mils	0.33 mils
Residential (HSE only)	\$47,547	\$23,773	\$15,690
Non-Residential	\$1,416,321	\$708,160	\$467,386
<b>Total</b>	<b>\$1,463,868</b>	<b>\$731,933</b>	<b>\$483,076</b>

### Proposed Ybor City North Streetcar Special Assessment District

Table 2a: Proposed Streetcar District – Ybor City North

Land Use	Taxable Value	% of Total	Parcel Counts	Value/Parcel
Residential (HSE only)	\$2,419,398	5%	150	\$16,129
Non-Residential	\$49,357,847	95%	1205	\$40,961
<b>Total</b>	<b>\$51,777,245</b>	-		

Table 2b: Proposed Streetcar District Valuation Per Parcel – Ybor City North

Land Use	1 mil	0.5 mils	0.33 mils
Residential (HSE only)	\$16	\$8	\$5
Non-Residential	\$41	\$20	\$14
<b>Total</b>	<b>\$57</b>	<b>\$28</b>	<b>\$19</b>

Table 2c: Proposed Streetcar District Millage Scenarios – Ybor City North

Land Use	1 mil	0.5 mils	0.33 mils
Residential (HSE only)	\$2,419	\$1,210	\$798
Non-Residential	\$49,358	\$24,679	\$16,288
<b>Total</b>	<b>\$51,777</b>	<b>\$25,889</b>	<b>\$17,086</b>

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**Proposed Hyde Park/SoHo Streetcar Special Assessment District**

Table 3a: Proposed Streetcar District Valuation - Hyde Park/SoHo

Land Use	Taxable Value	% of Total	Parcel Counts	Value/Parcel
Residential (HSE only)	\$152,481,892	29%	891	\$171,136
Non-Residential	\$381,665,848	71%	1098	\$347,601
<b>Total</b>	<b>\$534,147,740</b>	-		

Table 3b: Proposed Streetcar District Valuation Per Parcel – Hyde Park/SoHo

Land Use	1 mil	0.5 mils	0.33 mils
Residential (HSE only)	\$171	\$86	\$56
Non-Residential	\$348	\$174	\$115
<b>Total</b>	<b>\$519</b>	<b>\$260</b>	<b>\$171</b>

Table 3c: Proposed Streetcar District Millage Scenarios – Hyde Park/SoHo

Land Use	1 mil	0.5 mils	0.33 mils
Residential (HSE only)	\$152,482	\$76,241	\$50,319
Non-Residential	\$381,666	\$190,833	\$125,950
<b>Total</b>	<b>\$534,148</b>	<b>\$267,074</b>	<b>\$176,269</b>

# Tampa Streetcar Extension – Hillsborough MPO

## Alignment Assumptions and Capital and Operating Cost Estimation

### Methodology & Results

#### Tampa Streetcar Extensions: Alignment Alternatives

This technical analysis is designed to assist the Hillsborough MPO in examining various transit service improvements for consideration under the upcoming Long Range Transportation Plan Update. One possible transit improvement is the expansion of the existing Tampa Streetcar system. Under this analysis, the existing Tampa Streetcar System is proposed to be extended in two directions:

- Northeast, from its existing Centennial Park Station at 8<sup>th</sup> Avenue and 20<sup>th</sup> Street to north on 22<sup>nd</sup> Street to Dr. Martin Luther King Boulevard (defined as the **Northeast Extension**), and
- Southwest, from its current Downtown Tampa Whiting station at Franklin Street and Whiting Street to the South Howard Avenue (SOHO) entertainment district (defined as the **Southwest Extension**).

In addition to northeast and southwest extensions, an additional option is under consideration to only extend the existing streetcar system north through Downtown Tampa to the HART Marion Street Transit Center (defined as the **Downtown Extension**).

Additionally, service is proposed to be operated more frequently and the span of service hours are proposed to expand to hours more consistent with commute travel (i.e., earlier in the mornings) and entertainment travel (i.e., later in the evenings and on weekends). The existing streetcar operates limited hours of service not conducive to work commute travel. The existing Tampa Streetcar operates the following hours at 15 to 20 minute service frequencies.

#### Existing Service Hours:

- Monday – Thursday: 11:00 a.m. – 10:00 p.m.
- Fridays and Saturdays: 11:00 a.m. – 2:00 a.m.
- Sunday: 12:00 p.m. – 8:00 p.m.

#### Proposed Service Hours:

- Monday – Thursday: 5:00 a.m. – 10:00 p.m.
- Fridays: 5:00 a.m. – 2:00 a.m.
- Saturdays: 6:00 a.m. – 2:00 a.m.
- Sunday: 7:00 a.m. – 8:00 p.m.

Table 1 identifies the **proposed service frequencies** would be as follows:

**Table 1: Proposed Streetcar Service Frequencies**

Day of Week	Peak Periods	Day Time	Evening	Early Morning / Late Evening
Weekday	10 minutes	15 minutes	20 minutes	30 minutes
Saturday	n/a	15 minutes	20 minutes	30 minutes
Sunday	n/a	15 minutes	20 minutes	30 minutes

**Existing Streetcar Operations:**

The Existing Tampa Streetcar operations consist of primarily single track operations with a small portion double track and a couple other passing track segments. In order to operate the proposed commuter oriented level of service noted above (i.e., higher service frequencies and a greater span of service hours); the existing streetcar track alignment will be required to operate along double track its entire length.

Following are brief descriptions of the three possible streetcar extensions: Northwest, Southwest and Downtown only. New travel times have been estimated for the existing alignment given double tracking. The estimated travel time from the existing end-of-line station at Centennial Park to the Whiting Station is approximately 15 minutes. Travel times for the extensions to the northeast, southwest and to the Marion Street Transit Center are noted below.

**Northeast Extension:**

The Tampa Streetcar northeast extension would begin at the existing Centennial Park Station; travel east on 8<sup>th</sup> Avenue and north on 22<sup>nd</sup> Street to Dr. Martin Luther King Boulevard. Streetcar operations between 8<sup>th</sup> Avenue and 23<sup>rd</sup> Avenue are assumed to operate single track in the one-way roadway pairs of 22<sup>nd</sup> Street northbound and 21<sup>st</sup> Street southbound, with complimentary stations along each direction. Figure 1 illustrates the northeast alignment extension and possible station locations. New stations are proposed at the following locations:

- 22<sup>nd</sup> Street & 10<sup>th</sup> Avenue (northbound), 21<sup>st</sup> Street & Palm Avenue (southbound)
- 22<sup>nd</sup> Street & Columbus Drive (northbound), 21<sup>st</sup> Street & Columbus Drive (southbound)
- 22<sup>nd</sup> Street & 21<sup>st</sup> Avenue (northbound), 21<sup>st</sup> Street & 21<sup>st</sup> Avenue (southbound)
- 22<sup>nd</sup> Street & 26<sup>th</sup> Avenue
- 22<sup>nd</sup> Street & Lake Avenue
- 22<sup>nd</sup> Street & Martin Luther King Boulevard

Exclusive right-of-way is assumed along the entire extension. Signal prioritization is assumed at all signalized intersections with right-of-way protection (i.e., crossing gates, signals, etc.) to prevent non-signalized intersection conflicts.

One-way travel time estimates for the northeast extension consisting of six new stations (three of which are split along 21<sup>st</sup> and 22<sup>nd</sup> Streets) is approximately 9.5 minutes.

### **Southwest Extension:**

The Tampa Streetcar southwest extension would begin at the existing Whiting Station located at Franklin Street and Whiting Street, continue east on Whiting Street, north on the Marion Street Transitway (serving existing station locations), continue west on the railroad right-of-way at Polk Street. The line would follow the railroad line west and southwest to South Howard Avenue, near the railroad / Selmon Expressway. This alternative option also minimizes new right-of-way requirements and costs by utilizing the existing railroad infrastructure. Figure 2 illustrates the southwest alignment and possible station locations. New stations are proposed at the following locations:

- Marion Street & Washington Street
- Marion Street & Kennedy Boulevard
- Marion Street & Polk Street
- Polk Street & Tampa Street
- CSX Railroad & Museum of Art
- CSX Railroad & North Boulevard
- CSX Railroad & Kennedy Boulevard
- CSX Railroad & Platt Street
- CSX Railroad & Swann Avenue
- CSX Railroad & South Howard Avenue

Exclusive right-of-way is assumed along the entire extension. Signal prioritization is assumed at all signalized intersections with right-of-way protection (i.e., crossing gates, signals, etc.) to prevent non-signalized intersection conflicts.

One-way travel time estimates for the southwest extension consisting of ten new stations is approximately 16.5 minutes.

### **Downtown Extension to Marion Street Transit Center:**

The downtown extension along the Marion Street Transitway to the Marion Street Transit Center would begin at the existing Whiting Station located at Franklin Street and Whiting Street, continue east on Whiting Street and north on the Marion Street Transitway serving stations located at Washington Street, Kennedy Boulevard, Polk Street, Tyler Street and the Marion Street Transit Center. This alignment, much like the Southwest extension, minimizes the need for new right-of-way by utilizing the Marion Street Transitway. Exclusive right-of-way is assumed along the entire extension. Signal prioritization is assumed at all signalized intersections with right-of-way protection (i.e., crossing gates, signals, etc.) to prevent non-signalized intersection conflicts.

One-way travel time estimates for the downtown extension consisting of five new stations is approximately 7 ½ minutes. Table 2 identifies the daily and annual operating requirements for the downtown extension of the streetcar line between the Whiting Station and the Marions Street Transit Center. Figure 3 illustrates the downtown extension alignment and possible station locations.

**Table 2: Downtown Extension Streetcar Line Operating Requirements**

From	To	Run Time Distance		Day	Headway				Consist				Vehicles		Annual		
		(minutes)	(miles)		Peak	Base	Eve.	E/L	Peak	Base	Eve.	E/L	Peak	Total	Car-Miles	Car-Hrs	Train-Hrs
Centennial Park	Marion St TC	22.22	3.38	M-Th	10	15	20	30	2	1	1	1	12	15	139,270	20,600	14,480
				F	10	15	20	30	2	1	1	1			0	0	0
				Sat	n/a	15	20	30	0	1	1	1			21,030	3,110	3,110
				Sun	n/a	15	20	30	0	1	1	1			18,030	2,670	2,670
<b>ESTIMATED ANNUAL TOTALS:</b>												<b>12</b>	<b>15</b>	<b>178,330</b>	<b>26,380</b>	<b>20,260</b>	

**Full Streetcar Line**

Total one-way travel time including the northeast Extension, the existing line double tracked, and the southwest extension is approximately 41.5 minutes one-way. The alignment one-way distance is 6.85 miles. Table 3 identifies the daily and annual operating requirements for the full streetcar line between Martin Luther King Boulevard through downtown Tampa to South Howard Avenue.

**Table 3: Full Streetcar Line Operating Requirements**

From	To	Run Time Distance		Day	Headway				Consist				Vehicles		Annual		
		(minutes)	(miles)		Peak	Base	Eve.	E/L	Peak	Base	Eve.	E/L	Peak	Total	Car-Miles	Car-Hrs	Train-Hrs
South Howard	MLK	41.55	6.85	M-Th	10	15	20	30	2	1	1	1	20	24	282,370	35,090	24,890
				F	10	15	20	30	2	1	1	1			77,680	9,780	7,180
				Sat	n/a	15	20	30	0	1	1	1			42,630	5,610	5,610
				Sun	n/a	15	20	30	0	1	1	1			36,560	4,700	4,700
<b>ESTIMATED ANNUAL TOTALS:</b>												<b>20</b>	<b>24</b>	<b>439,240</b>	<b>55,180</b>	<b>42,380</b>	

Figure 1: Tampa Streetcar Northeast Extension

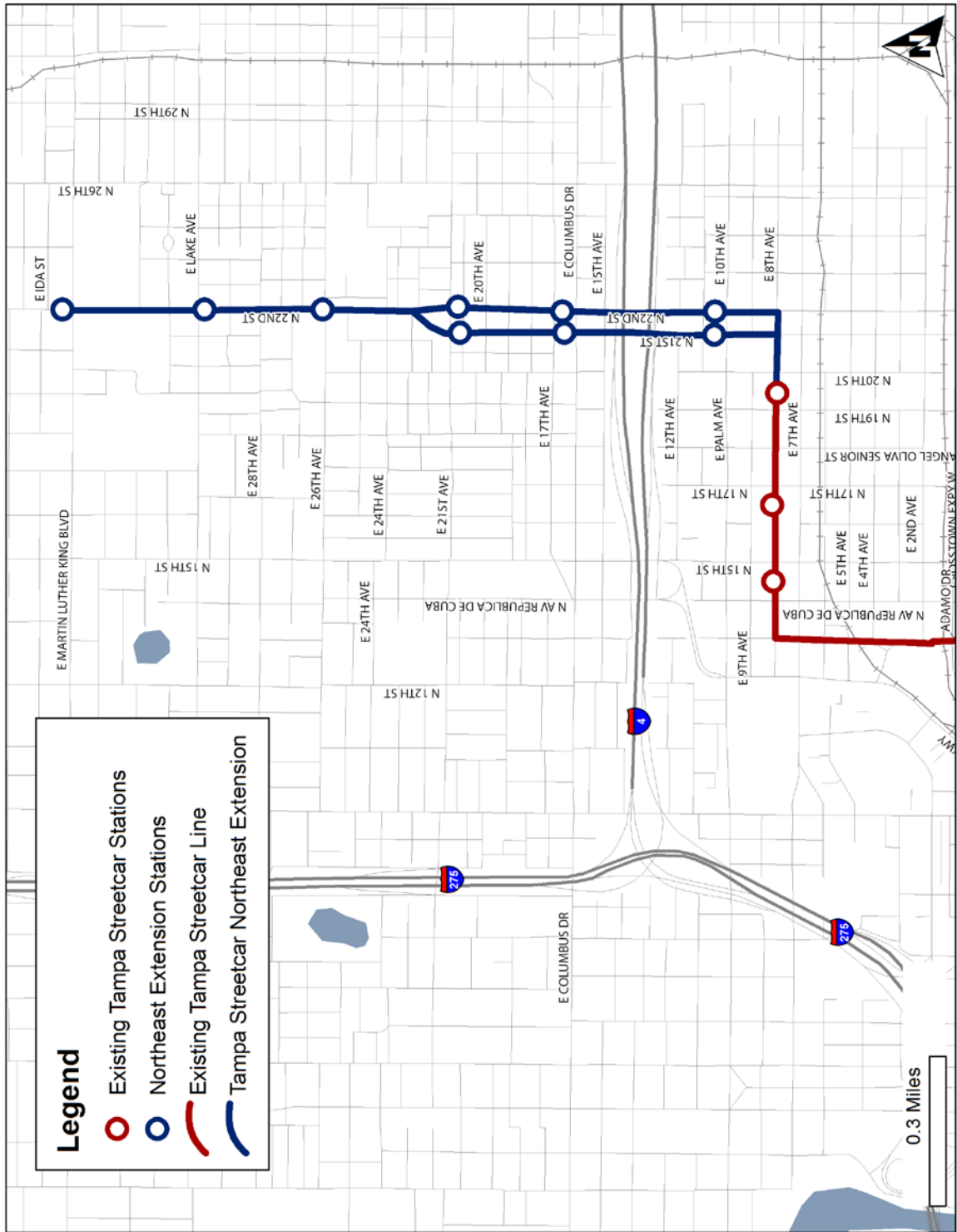




Figure 2: Tampa Streetcar Southwest Extension

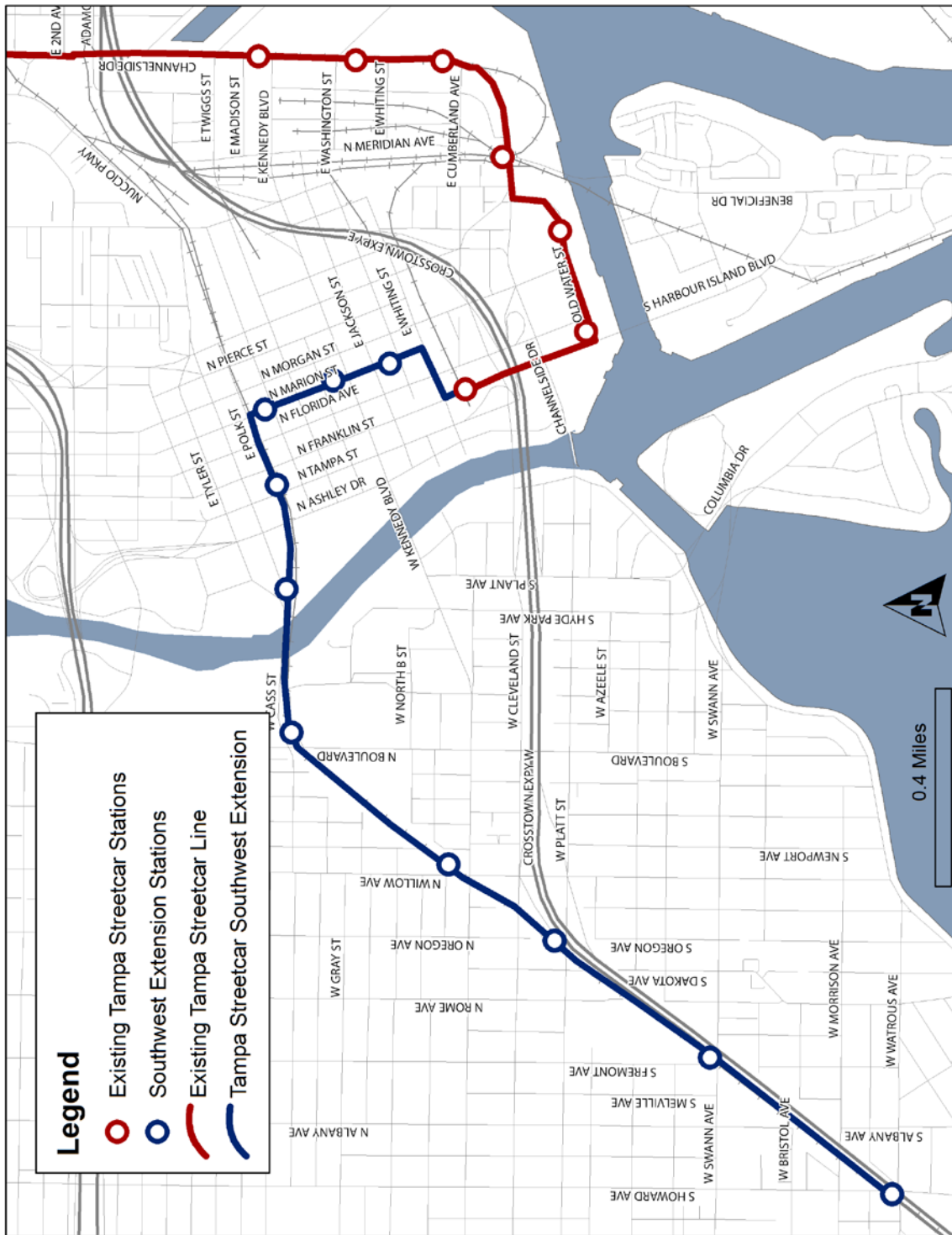
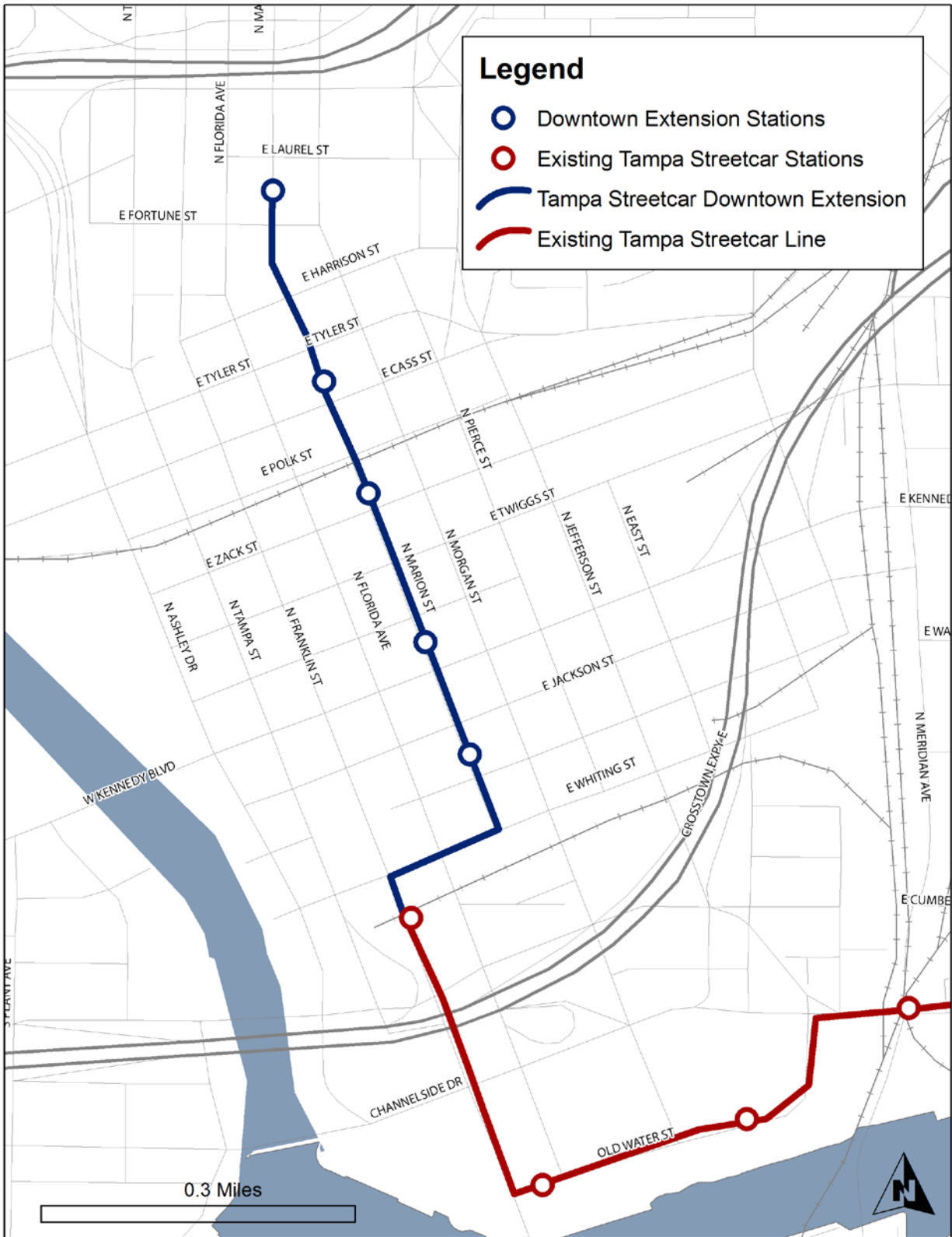


Figure 3: Tampa Streetcar Downtown Extension



## Tampa Streetcar Extensions: Capital and Operating Cost Estimation Methodology

### Capital Cost Estimation Methodology:

The cost to construct extensions to the existing Tampa Streetcar System could vary widely based on the length of the system, the alignment of the extensions, the type of streetcar utilized (i.e., continue the existing historic streetcars or convert to modern streetcars), number of stations, the nature of the right-of-way utilized for the extensions (e.g., existing streets versus new right-of-way), the means of operations (i.e., exclusive right-of-way versus shared), the extent of roadway reconstruction and extent of utility relocation required. Additionally, there may be additional capital costs associated with upgrading the existing alignment (e.g., track and signaling) to accommodate higher levels of streetcar service and the use of modern streetcars versus the existing historic streetcars. Some of these unknown costs may be carried by other improvement projects along the alignments. For the reasons noted above, capital cost estimates will be estimated as a range of possible costs versus one specific cost estimate.

Capital cost estimates can be estimated using capital cost guidelines for three initial planning phases of a project:

- **Order-of-Magnitude Unit Costs** – These general unit cost guidelines are appropriate at the early definition stage of a transit project, such as systems planning studies or long range transportation plans.
- **Conceptual Unit Costs** – These unit cost guidelines are appropriate at the feasibility analysis phase of a transit project.
- **Alternatives Analysis Unit Costs** – These detailed unit cost guidelines are appropriate as the project undergoes FTA's Alternatives Analysis process.

Order-of-magnitude unit costing methodology will be utilized for the purposes of this analysis. As noted above, order-of-magnitude cost estimates are appropriate during the early stages of project definition, such as systems or long range planning.

The methodology used in developing capital cost estimates should be in accordance with Federal Transit Administration (FTA) guidelines. Sources for determining general parametric unit costs are documented at the end of this technical memorandum. **Capital cost components are grouped into eight categories** as defined by the FTA, these include:

- **Guideway Elements** – This asset category includes track foundations, structures, and trackwork along the entire right-of-way. Capital costs for track foundations and structures are segmented by alignment grade. The alignment grades included all elements representing a significant cost impact including at grade-ballasted, at-grade-in-street, elevated structure, elevated fill, underground (subway), and retained cut. Trackwork is segmented into the two main types of track construction for rail transit systems -direct fixation and ballast base.
- **Passenger Stations** - This category includes most costs for completing passenger stations and accompanying structures and systems. Station types are designated by grade (elevated, at-grade

and underground), and by center and side platform locations (i.e., passenger boarding locations). Station costs represent the fixed facilities and amenities. The passenger station cost estimates are based on parametric unit prices developed for each station type which includes at-grade stations, underground and elevated stations (if applicable to the project under study). Site-specific facilities, amenities and site modifications are added on a station-by-station basis. Artwork for stations is included under the Special Conditions category.

- **Yard & Shops** - Fixed guideway operations necessitate a variety of support facilities each requiring a significant capital investment including storage yards, maintenance shops, a control center, and administrative facilities. Five cost elements are included in this category, including: buildings, storage yards, office furniture and equipment, major shops, and central control. The length of the proposed streetcar extensions and the levels of service proposed to operate along the entire alignment will result in a significantly larger fleet of vehicles and the need to construct a new streetcar maintenance facility
- **Systems Elements** - This cost category includes all those electrical systems required for fixed guideway operations. The system costs are clearly defined within six cost elements including: control systems, electrification, communications, central revenue collection, revenue collection-in station, revenue collection-on vehicle.
- **Vehicles** - This cost category is subdivided into revenue and non-revenue vehicles (e.g., maintenance-of-way vehicles, agency trucks and automobiles).
- **Special Conditions** - Development of a fixed guideway system involves some mitigating requirements that may not be directly related to service, but which are required for construction. These project cost elements are included in this special category. The largest cost element within this costs category (as measured by project expenditures) is the relocation of existing utility lines from or within the corridor. Examples of such utilities include: gas, telephone, electric, water, steam, pipeline, railroad, and communications. These special condition category elements include: demolitions, roadway changes, environmental mitigation costs, and landscaping.
- **Right-of-Way** - This category covers all land acquisition and acquisition related costs required to obtain the project right-of-way. The purchase costs for management, appraisal, and relocation expenses are also included in this category.
- **Project Soft Costs** - This category includes all other miscellaneous costs related to the planning, engineering, and project management of major transit systems. These services include: in-house agency staff, government related support staff, and the use of consultants for particular tasks. Project start-up and initiation expenses are also included in this cost category. Project financing

cost and an “other” expense line item, which includes any reconciliations and unaccountable costs; comprise the full range of project development capital costs.

In addition to these eight general capital cost categories, there are two types of contingencies that are used in conceptual capital cost estimates. They are commonly known as:

- **Design Contingencies** – or sometimes simply called Contingency, these are typically a percentage assigned to a unit price to cover uncertainties in the design for details that have not been fully developed, and
- **Construction Contingencies** – also referred to as Project Reserve, these contingencies are designed to cover “unknown-unknowns” that surface during project construction.

The first step in estimating a range capital costs is defining a set of assumptions and facts regarding the extension alignment and length, number and location of stations, existing maintenance facility capacity, existing systems elements and upgrades required, the type of streetcar vehicle to be used, and nature of the alignment right-of-way (i.e., exclusive/shared, in-street/new, etc.). Following is a set of assumptions utilized to estimate the full streetcar line project capital and operating costs.

#### **Project Assumptions:**

- The existing Tampa Streetcar alignment:
  - ✓ 2.6 miles in length
  - ✓ 11 stations
  - ✓ 1 very small vehicle maintenance facility which is at capacity
  - ✓ 10 historic trolley style streetcars, full line assumed to utilize modern streetcars
  - ✓ Only 0.47 miles of the 2.6 mile alignment is double tracked
  - ✓ .08 miles of passing track segments exist (under Selmon Expressway, could be utilized as future double track segment, does not include double track segments)
  - ✓ 5 single side platform stations (would need upgrading for double track operations)
  - ✓ 6 double side platform stations (Stations: Tampa Bay Federal Credit Union, Port Authority Station, York Street Station, Tampa Tribune Station, HSBC Station, Dick Greco Plaza Station could support double track operations)
- Northeast Streetcar Line Extension:
  - ✓ 1.6 miles in length
  - ✓ 6 new stations (6 single side single track station platforms along 21<sup>st</sup> and 22<sup>nd</sup> Streets – 3 each, 3 double side double track platform stations north of 23<sup>rd</sup> Avenue)
  - ✓ Double track alignment along the alignment with the exception of segments along 21<sup>st</sup> Street and 22<sup>nd</sup> Street between 8<sup>th</sup> Avenue and 23<sup>rd</sup> Avenue
  - ✓ Estimated travel time from the Centennial Park Station to the MLK Station: 9:39 minutes
- Southwest Streetcar Line Extension:
  - ✓ 2.65 miles in length

- ✓ 10 new stations (3 existing Marion Street Transitway Stations to be modified to be served by streetcar operations, 7 new double side double track stations)
- ✓ Double track along the entire alignment between the Whiting Station and the South Howard Avenue Station.
- ✓ Estimated travel time from the Whiting Station to the South Howard Avenue Station: 16:33 minutes
- Downtown Extension to Marion Street Transit Center:
  - ✓ 0.78 miles in length
  - ✓ 5 new stations (4 existing Marion Street Transitway Stations to be modified to be served by streetcar operations, 1 new double side double track station at the Marion Street Transit Center)
  - ✓ Double track along the entire alignment between the Whiting Station and the Marion Street Transit Center.
  - ✓ Estimated travel time from Whiting Station to the Marion Street Transit Center: 7:32 minutes
- Full Alignment (Northeast and Southwest only):
  - ✓ Double tracking assumed along the entire alignment, requires single track portions of the existing streetcar line be upgraded to double track alignment
  - ✓ 27 stations along the alignment, use of the Marion Street Transitway in downtown Tampa for three stations
  - ✓ Maximum design speed 35 miles per hour
  - ✓ New bridge required over Hillsborough River
  - ✓ New signal system required
  - ✓ Upgraded communications system required
  - ✓ Historic vehicles retained for special events and peak loading enhancements
  - ✓ New fleet of 24 modern streetcars (e.g., Portland Style Streetcars)
  - ✓ Overall end-to-end travel time approximately 42 minutes
  - ✓ New Hours of service noted above
  - ✓ Service frequencies noted above
  - ✓ Two-car consists operating during peak hours only, one car streetcars at all other times
  - ✓ Annual operating requirements (i.e., car-miles, car-hours, train-hours and peak and fleet vehicles) noted above

### **Capital Cost Estimate**

General capital costs have been developed for the Tampa Streetcar using **Order-of-Magnitude Unit Costs**. These general unit cost guidelines are appropriate at the early definition stage of a transit project, such as systems planning studies or long range transportation plans. To develop order-of-magnitude capital costs the first step is researching capital costs of existing streetcar lines and proposed streetcar lines across the United States. This research focused on systems that exhibit the same or very similar characteristics as proposed for the Tampa Streetcar System (existing plus extensions). While it is very difficult to find an existing or proposed system that looks exactly like the Tampa Streetcar, one very

important criterion is the use of double track alignment. As noted above, the proposed Tampa Streetcar system assumes the use of double tracking in order to accommodate the proposed higher service frequencies. It is important when comparing peer systems (existing and proposed) that costs are articulated in costs per alignment mile versus track mile (which reflect single tracking), and that the alignments reflect the same double tracking per mile (i.e., apples to apples comparisons). It is important to note that some of the peer systems identified have very small portions of single track alignments; however it was felt these did not impact the validity of capital cost estimation at an order-of-magnitude level of analysis. Until further detail is defined for the proposed Tampa Streetcar line expansion, **capital cost estimates will be estimated as a range of possible costs versus one specific cost estimate.**

Capital cost information was collected from several existing and proposed streetcar systems and was screened to those most applicable to this analysis. The following streetcar systems were used:

- Tucson Modern Streetcar Project – TIGER Application
- Madison Streetcar Preliminary Feasibility Study
- Columbia Pike Streetcar Project (Arlington County, Virginia)
- Charlotte Streetcar Project
- Fresno, California – Fresno Street Line Phase 2
- South Lake Union Streetcar – Seattle
- Washington D.C. Streetcar Systems Plan
- Minneapolis Streetcar Project
- Existing Portland Streetcar – Phase I & II
- Tampa Streetcar Project (existing Streetcar System)

Table 4 on the following page identifies peer streetcar systems utilized, their capital cost estimates categorized by the eight categories identified above, the total cost per route mile in 2011 dollars. This peer system comparison reflects a low capital cost per route mile of \$18.63 million (Madison) and a high capital cost per route mile of \$53.57 million. While there appears to be a wide variance in capital costs per route mile, it is explained through the wide variance in project complexities and right-of-way characteristics. The Tampa Streetcar System extensions would appear to reflect a lower level of complexity as well as the use of existing rights-of-way. These two characteristics would suggest capital costs to be on the lower end of the peer system range of capital costs per route mile.

The expanded Tampa Streetcar System consists of four distinct segments: the existing system alignment, the extension to the northeast, the extension to the southwest, and the downtown extension to the Marion Street Transit Center. Capital cost estimates have been developed for three extension alignment segments using the peer capital cost information in Table 4 as a guide. Capital costs have also been estimated for the upgrade of the existing alignment to double track based on a professional assessment of capital cost per route mile.

**Table 4: Peer Streetcar System Capital Cost Estimates (2011\$)**

	Tucson Streetcar	Madison Streetcar Central Loop	Columbia Pike - Arlington	Charlotte Streetcar Vintage	Fresno Line - Ph 2	Seattle South Lake Union	Washington DC Streetcar System	Minneapolis Streetcar	Portland Phase I & II (Original)
miles	3.9	3.7	4.71	1.42	2.3	2.6	34.55	22.0	2.4
stations	18	18	30	6	20	13			
vehicles	7	4	11	3	7	3			7
2011 Dollars	2010 to 2011	2007 to 2011	2005 to 2011	2010 to 2011	2011	2005 to 2011	2009 to 2011	unknown	2001 to 2011
<b>Guideway Elements</b>									
cost per mile	\$ 32.73	\$ 24.08	\$ 35.50	\$ 17.26	\$ 47.60	\$ 14.24			
cost per station	\$ 8.39	\$ 6.51	\$ 7.54	\$ 12.16	\$ 20.70	\$ 5.48			
cost per vehicle	\$ 2.81	\$ 1.46	\$ 9.37	\$ 0.94	\$ 1.50	\$ 0.78			
	\$ 0.16	\$ 0.08	\$ 0.31	\$ 0.16	\$ 0.08	\$ 0.06			
	\$ 14.78	\$ 3.94	\$ 4.92	-	\$ 3.00	\$ 3.43			
	\$ 2.11	\$ 0.98	\$ 0.45	-	\$ 0.43	\$ 1.14			
	\$ 16.89	\$ 6.64	\$ 16.11	\$ 7.99	\$ 9.50	\$ 5.20			
	\$ 4.33	\$ 1.79	\$ 3.42	\$ 5.62	\$ 4.13	\$ 2.00			
	\$ 32.17	\$ 13.51	\$ 39.40	\$ 12.36	\$ 20.00	\$ 10.96			
	\$ 4.60	\$ 3.38	\$ 3.58	\$ 4.12	\$ 2.86	\$ 3.65			
	\$ 20.93	-	\$ 4.59	\$ 0.54	-	\$ 1.72			
	\$ 5.37	-	\$ 0.97	\$ 0.38	-	\$ 0.66			
	\$ 0.84	-	-	\$ 1.40	-	-			
	\$ 0.22	-	-	\$ 0.98	-	-			
	\$ 121.16	\$ 49.63	\$ 109.90	\$ 40.48	\$ 81.60	\$ 36.33			
<b>Project Soft Costs</b>									
cost per mile	\$ 28.05	\$ 13.01	\$ 19.78	\$ 4.93	\$ 29.40	\$ 13.83			
	\$ 7.19	\$ 3.52	\$ 4.20	\$ 3.47	\$ 12.78	\$ 5.32			
<b>Sub-Total</b>	\$ 149.21	\$ 62.64	\$ 129.68	\$ 45.41	\$ 111.00	\$ 50.16			
Contingencies									
% of Sub-Total	\$ 5.36	\$ 6.29	\$ 12.48	\$ 2.89	\$ 12.20	\$ 5.12			
	3.6%	10.0%	9.6%	6.4%	11.0%	10.2%			
<b>Total</b>	\$ 154.56	\$ 68.92	\$ 142.16	\$ 48.30	\$ 123.20	\$ 55.27	\$ 1,590.40	\$ 469.52	\$ 76.47
<b>Cost per Route Mile</b>	\$ 39.63	\$ 18.63	\$ 30.18	\$ 34.02	\$ 53.57	\$ 21.26	\$ 46.03	\$ 21.34	\$ 31.86

**Cost per Route Mile:** Low \$ 18.63  
 Average \$ 32.95  
 High \$ 53.57  
**Existing Streetcar** \$ 15.86 **2002 \$**

Recommended range: \$22 - \$27 million per New Route Mile  
 Recommended range: \$7 - \$10 million per Route Mile for upgrading the existing alignment



Table 5 identifies an estimated range of capital costs to construct double track alignment for the northeast, southwest and downtown streetcar extensions, plus upgrade the existing streetcar line to double track along its entire alignment. As noted in Table 3 above, the recommended range for new streetcar alignment (i.e., northeast and southwest extensions) is \$22 to \$27 million per route mile. Additionally, the recommended range of additional capital costs to upgrade the existing Tampa Streetcar system to double track alignment is \$7 to \$10 million per mile. The estimated total capital costs for the entire system from Martin Luther King Boulevard through Ybor City and downtown Tampa to South Howard Avenue ranges between \$105.4 million to \$131.8 million. The estimated total capital costs for the downtown extension to the Marion Street Transit Center plus the upgrade of the existing alignment ranges between \$29.1 million and \$38.1 million.

**Table 5: Estimated Streetcar Capital Costs (2011\$mil)**

Alignment Segment	Track Miles	Low End Capital Costs	High End Capital Costs
Northeast Extension	1.60	\$35.2	\$43.2
Southwest Extension	2.65	\$58.3	\$71.6
Downtown Extension	0.78	\$17.2	\$21.1
Upgrade Existing Alignment	1.70	\$11.9	\$17.0
<b>Total Estimated Capital Cost Northeast &amp; Southwest Extensions plus Upgrade of Existing Alignment (Range)</b>		<b>\$105.4</b>	<b>\$131.8</b>
<b>Total Estimated Capital Cost Downtown Extension plus Upgrade of Existing Alignment (Range)</b>		<b>\$29.1</b>	<b>\$38.1</b>

Notes: Existing alignment upgrade only reflect segments currently constructed as single track alignment

**Operating Cost Estimation Methodology:**

The existing Tampa Streetcar operations are unique in that it is oriented towards tourist and evening entertainment activities. As noted above, the proposed extensions of the streetcar system and its hours of operation are designed to serve the addition of the work commuter market and additional downtown circulation. Therefore, the operations will reflect a significant expansion in the levels of service (i.e., greater span of service hours and more frequent service), which will require nearly a twenty-four hour operation of service and vehicle and corridor operations and maintenance. This expanded level of operations and maintenance will require a different approach to the calculation of annual operating and maintenance costs than is currently utilized. To develop this modified approach, the consultant team has gathered operating and maintenance (O&M) cost data from the Tacoma and Seattle streetcar systems to develop an approach to calculate the expanded Tampa Streetcar System annual O&M costs.

Operating and maintenance expenses are typically categorized by operating and cost function. The peer system cost information has been summarized by cost line items under the following operating functions: vehicle operations, vehicle maintenance, facilities maintenance and general administration.

Measures of streetcar productivity and cost effectiveness are assigned under each operating function. Table 6 below identifies the operating cost calculations and averages under each operating functional area for each of the peer systems. While costs under vehicle operations are consistent between the operators, costs under vehicle maintenance, facilities maintenance and general administration vary between the two operators. Because of these variances, like capital costs, operating and maintenance costs have been estimated using a mix of the cost effectiveness factors by operational functional area to provide a range of potential operating costs for the proposed Tampa Streetcar full build out system.

**Table 6: Measures of Cost Effectiveness for Peer Systems**

Measures of Cost Effectiveness	Tacoma, WA	Seattle, WA	Average
Vehicle Operations (VO):			
• Total VO Cost / Train-Hour	\$154	\$151	\$152
Vehicle Maintenance (VM):			
• Total VM Cost / Car-Mile	\$2.16	\$6.44	\$4.30
Facilities Maintenance (FM):			
• Total FM Cost / Dir Route Mile	\$48,089	\$124,180	\$86,134
• Total FM Cost / Station	\$28,853	\$30,481	\$29,667
General Administrative:			
• Total GA Cost / Peak Car	\$425,989	\$112,966	\$269,478
<b>TOTAL COST / TRAIN-HOUR</b>	<b>\$282.18</b>	<b>\$235.39</b>	<b>\$258.78</b>

Table 7 below identifies a low and high operating and maintenance cost estimate for operating the full streetcar line between the Martin Luther King Station through Ybor City and downtown Tampa to the South Howard Avenue Station.

**Table 7: Full Line Tampa Streetcar – Northeast & Southwest  
Annual Operating & Maintenance (O&M) Cost Estimate (2011\$mil)**

Operating Functional Cost Center	Low End O&M Costs	High End O&M Costs
Vehicle Operations	\$6.41	\$6.46
Vehicle Maintenance	\$0.95	\$1.89
Facilities Maintenance	\$1.44	\$1.96
General Administrative	\$2.26	\$2.26
<b>Total O&amp;M Costs</b>	<b>\$11.05</b>	<b>\$12.57</b>
<b>Total Cost / Train-Hour (hundreds)</b>	<b>\$260.84</b>	<b>\$296.57</b>

Table 8 below identifies a low and high operating and maintenance cost estimate for operating the Upgraded existing streetcar line from the Centennial Park Station (Ybor) plus the downtown extension to the Marion Street Transit Center.

**Table 8: Tampa Streetcar – Downtown Extension to Marion Street Transit Center  
Annual Operating & Maintenance (O&M) Cost Estimate (2011\$mil)**

<b>Operating Functional Cost Center</b>	<b>Low End O&amp;M Costs</b>	<b>High End O&amp;M Costs</b>
Vehicle Operations	\$3.09	\$3.09
Vehicle Maintenance	\$0.39	\$0.77
Facilities Maintenance	\$0.79	\$1.04
General Administrative	\$1.35	\$1.35
<b>Total O&amp;M Costs</b>	<b>\$5.62</b>	<b>\$6.25</b>
<b>Total Cost / Train-Hour (hundreds)</b>	<b>\$277.21</b>	<b>\$308.74</b>

Table 9 reflects a low end and high end O&M costs for the existing alignment with service level improvements.

**Table 9: Tampa Streetcar – No Extensions, Proposed Improved Service Hours and Frequencies  
Annual Operating & Maintenance (O&M) Cost Estimate (2011\$mil)**

<b>Operating Functional Cost Center</b>	<b>Low End O&amp;M Costs</b>	<b>High End O&amp;M Costs</b>
Vehicle Operations	\$2.28	\$2.28
Vehicle Maintenance	\$0.26	\$0.52
Facilities Maintenance	\$0.53	\$0.71
General Administrative	\$0.90	\$0.90
<b>Total O&amp;M Costs</b>	<b>\$3.98</b>	<b>\$4.42</b>
<b>Total Cost / Train-Hour (hundreds)</b>	<b>\$266.62</b>	<b>\$295.74</b>

## **Appendix D**

### **Mobility Fee supporting data**

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Revenue calculations are provided on the Background sheet; their supporting data are found in Appendix D. Additionally, Fishkind and Associates' *Technical Review of Hillsborough County's Multimodal Transportation Mobility Fee Study* and Tindale-Oliver's 2009 Technical Study of the Mobility Fee presentation were used as Mobility Fee reference materials.

Projects and their costs were identified through Hillsborough County Public Works and the Unfunded Capital Needs list.

Projected Mobility Fee revenue totals were provided by County Planning and Public Works staff, and are very preliminary. Based on new development estimates, the County can expect to collect up to \$60 million annually. Mobility Fees typically have policy reduction rates associated with them, and those rates will greatly impact the total revenues anticipated. For the purpose of this project and per the recommendation from County staff, a 50-percent discount rate was applied for a grand total of \$30 million annually.

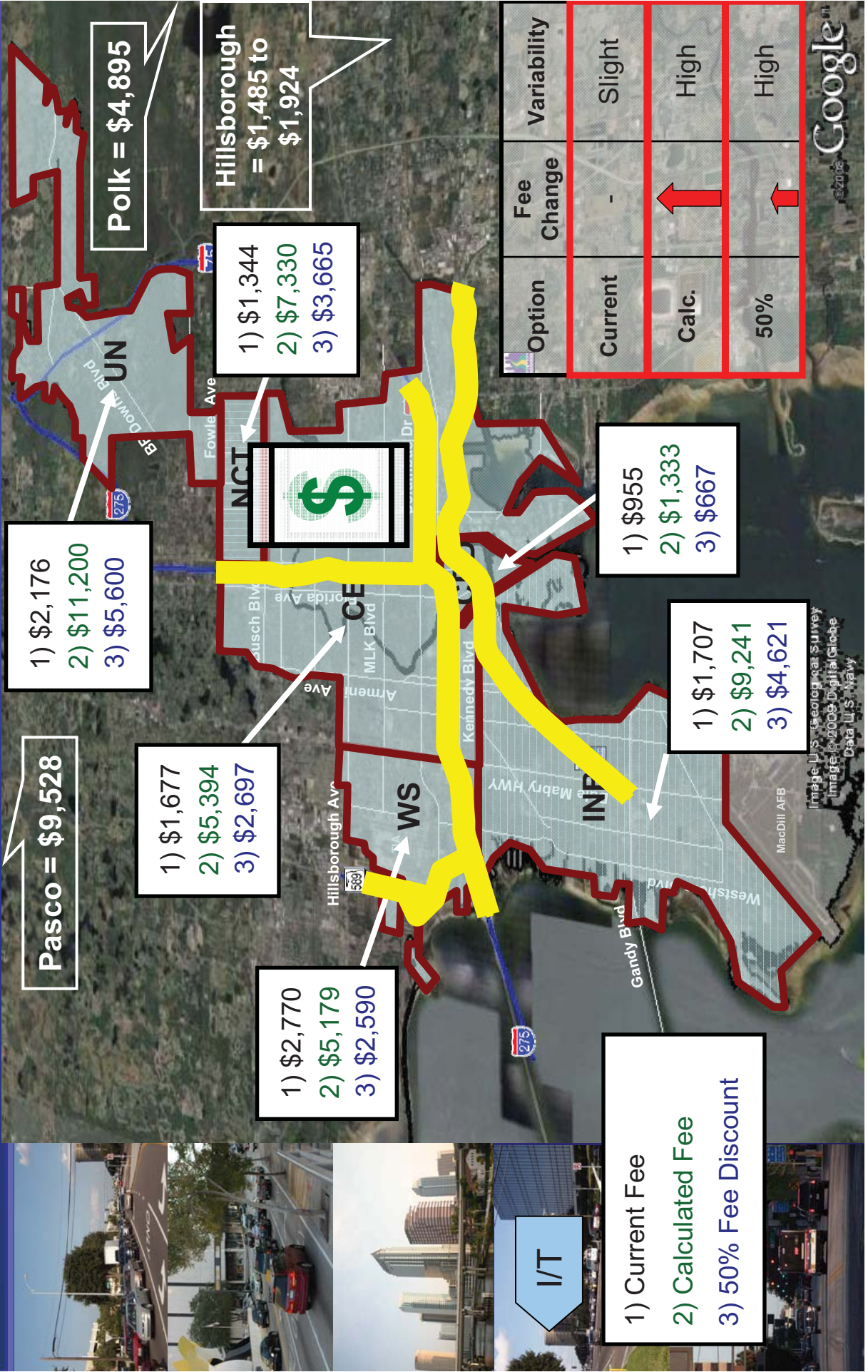
The revenue estimate is for countywide revenues and assumes that the same mobility fee would be adopted in all three cities as well as the unincorporated area.

The following slide is from a 2009 presentation to City Council regarding a technical study of Transportation Impact Fees in Hillsborough County. That study compared the current fee for new construction, a Transportation Impact Fee, to a proposed Mobility Fee. The current fee is listed as the first figure, followed by the proposed Mobility Fee, and last is the calculated Mobility Fee after a policy discount.



# Technical Study Results

## Single Family Residential – Fee Rates



## Appendix E

### Tolled Express Lanes with Bus Rapid Transit supporting data

While basic revenue and cost estimate calculations are provided on the Background sheet, many assumptions were made to this scenario to calculate costs and revenues as the project is not included in existing plans.

New estimates for both revenues and costs were developed based on the tolling mechanism selected: time-of-day pricing, congestion pricing or a flat toll. The revenues, more so than the costs, are also dependent on usage estimates. These variables result in a range of revenue estimates that can be found, along with a range of capital cost estimates, in Appendix E.

FDOT is currently conducting an evaluation of existing managed lanes, and are anticipating studying possible managed lanes for I-275 in the next year. An agency briefing with FDOT District Seven staff was conducted to better understand FDOT's preliminary vision for this project. FDOT staff directed the team to account for special use lanes that connect to the Veteran's Expressway as well as the Howard Frankland Bridge. FDOT provided the typical cross-section for I-275 (Figure 3), as defined in the *Tampa Interstate Study, 1992*. Due to the level of detail included in determining potential costs, the team was asked to ensure costs for the project are used for internal purposes only.



Figure 3. FDOT Proposed Typical I-275 Cross-Section

## Toll Road Cost and Revenue Estimate

### Hypothetical Project: I-275 - Westshore to Tampa CBD

Range: Lower End (2011 dollars)

Scenario 1: Managed Lanes (Congestion Pricing)

Year	Capital Cost		O&M Cost		Revenue		Net Revenue
	Six (6) SULs	Transit	Six (6) SULs	Transit	Toll Revenue	Farebox Collection	
2016	0	0	0	0	0	0	0
2017	0	0	0	0	0	0	0
2018	101,052,500	0	0	0	0	0	-101,052,500
2019	101,052,500	7,534,000	0	0	0	0	-108,586,500
2020	0	0	1,930,000	1,450,000	4,826,000	217,000	1,663,000
2021	0	0	2,208,000	1,465,000	5,520,000	219,000	2,066,000
2022	0	0	2,486,000	1,480,000	6,215,000	221,000	2,470,000
2023	0	0	2,764,000	1,495,000	6,909,000	223,000	2,873,000
2024	0	0	3,041,000	1,510,000	7,603,000	225,000	3,277,000
2025	0	0	3,319,000	1,525,000	8,297,000	227,000	3,680,000
2026	0	0	3,597,000	1,540,000	8,992,000	229,000	4,084,000
2027	0	0	3,874,000	1,555,000	9,686,000	231,000	4,488,000
2028	0	0	4,152,000	1,571,000	10,380,000	233,000	4,890,000
2029	0	0	4,430,000	1,587,000	11,074,000	235,000	5,292,000
2030	0	0	4,708,000	1,603,000	11,769,000	237,000	5,695,000
2031	0	0	4,985,000	1,619,000	12,463,000	239,000	6,098,000
2032	0	0	5,263,000	1,635,000	13,157,000	241,000	6,500,000
2033	0	0	5,540,000	1,651,000	13,851,000	243,000	6,903,000
2034	0	0	5,818,000	1,668,000	14,546,000	245,000	7,305,000
2035	0	0	6,096,000	1,685,000	15,240,000	247,000	7,706,000

Range: Higher End (2011 dollars)

Scenario 1: Managed Lanes (Congestion Pricing)

Year	Capital Cost		O&M Cost		Revenue		Net Revenue
	Six (6) SULs	Transit	Six (6) SULs	Transit	Toll Revenue	Farebox Collection	
2016	0	0	0	0	0	0	0
2017	0	0	0	0	0	0	0
2018	122,302,000	0	0	0	0	0	-122,302,000
2019	122,302,000	7,534,000	0	0	0	0	-116,141,000
2020	0	0	9,855,000	1,450,000	24,638,000	362,000	13,731,000
2021	0	0	9,896,000	1,479,000	24,740,000	366,000	13,731,000
2022	0	0	9,936,000	1,509,000	24,841,000	370,000	13,766,000
2023	0	0	9,977,000	1,539,000	24,943,000	374,000	13,801,000
2024	0	0	10,018,000	1,570,000	25,044,000	378,000	13,834,000
2025	0	0	10,058,000	1,601,000	25,146,000	382,000	13,869,000
2026	0	0	10,099,000	1,633,000	25,248,000	386,000	13,902,000
2027	0	0	10,140,000	1,666,000	25,349,000	390,000	13,933,000
2028	0	0	10,180,000	1,699,000	25,451,000	394,000	13,966,000
2029	0	0	10,221,000	1,733,000	25,552,000	398,000	13,996,000
2030	0	0	10,262,000	1,768,000	25,654,000	402,000	14,026,000
2031	0	0	10,302,000	1,803,000	25,756,000	406,000	14,057,000
2032	0	0	10,343,000	1,839,000	25,857,000	410,000	14,085,000
2033	0	0	10,384,000	1,876,000	25,959,000	414,000	14,113,000
2034	0	0	10,424,000	1,914,000	26,060,000	418,000	14,140,000
2035	0	0	10,465,000	1,952,000	26,162,000	422,000	14,167,000



Range: Lower End (2011 dollars)

Scenario 2: Time of Day Toll (Peak v/s Off Peak)

Year	Capital Cost		O&M Cost		Revenue		Net Revenue
	Six (6) SULs	Transit	Six (6) SULs	Transit	Toll Revenue	Farebox Collection	
2016	0	0	0	0	0	0	0
2017	0	0	0	0	0	0	0
2018	101,052,500	0	0	0	0	0	-101,052,500
2019	101,052,500	7,534,000	0	0	0	0	-106,771,500
2020	0	0	1,016,000	1,450,000	4,064,000	217,000	2,247,000
2021	0	0	1,164,000	1,465,000	4,657,000	219,000	2,247,000
2022	0	0	1,312,000	1,480,000	5,249,000	221,000	2,678,000
2023	0	0	1,461,000	1,495,000	5,842,000	223,000	3,109,000
2024	0	0	1,609,000	1,510,000	6,435,000	225,000	3,541,000
2025	0	0	1,757,000	1,525,000	7,027,000	227,000	3,972,000
2026	0	0	1,905,000	1,540,000	7,620,000	229,000	4,404,000
2027	0	0	2,053,000	1,555,000	8,213,000	231,000	4,836,000
2028	0	0	2,201,000	1,571,000	8,805,000	233,000	5,266,000
2029	0	0	2,350,000	1,587,000	9,398,000	235,000	5,696,000
2030	0	0	2,498,000	1,603,000	9,991,000	237,000	6,127,000
2031	0	0	2,646,000	1,619,000	10,583,000	239,000	6,557,000
2032	0	0	2,794,000	1,635,000	11,176,000	241,000	6,988,000
2033	0	0	2,942,000	1,651,000	11,769,000	243,000	7,419,000
2034	0	0	3,090,000	1,668,000	12,361,000	245,000	7,848,000
2035	0	0	3,239,000	1,685,000	12,954,000	247,000	8,277,000

Range: Higher End (2011 dollars)

Scenario 2: Time of Day Toll (Peak v/s Off Peak)

Year	Capital Cost		O&M Cost		Revenue		Net Revenue
	Six (6) SULs	Transit	Six (6) SULs	Transit	Toll Revenue	Farebox Collection	
2016	0	0	0	0	0	0	0
2017	0	0	0	0	0	0	0
2018	122,302,000	0	0	0	0	0	-122,302,000
2019	122,302,000	7,534,000	0	0	0	0	-115,303,000
2020	0	0	5,207,000	1,450,000	20,828,000	362,000	14,572,000
2021	0	0	5,228,000	1,479,000	20,913,000	366,000	14,572,000
2022	0	0	5,249,000	1,509,000	20,997,000	370,000	14,609,000
2023	0	0	5,271,000	1,539,000	21,082,000	374,000	14,646,000
2024	0	0	5,292,000	1,570,000	21,167,000	378,000	14,683,000
2025	0	0	5,313,000	1,601,000	21,251,000	382,000	14,719,000
2026	0	0	5,334,000	1,633,000	21,336,000	386,000	14,755,000
2027	0	0	5,355,000	1,666,000	21,421,000	390,000	14,790,000
2028	0	0	5,376,000	1,699,000	21,505,000	394,000	14,824,000
2029	0	0	5,398,000	1,733,000	21,590,000	398,000	14,857,000
2030	0	0	5,419,000	1,768,000	21,675,000	402,000	14,890,000
2031	0	0	5,440,000	1,803,000	21,759,000	406,000	14,922,000
2032	0	0	5,461,000	1,839,000	21,844,000	410,000	14,954,000
2033	0	0	5,482,000	1,876,000	21,929,000	414,000	14,985,000
2034	0	0	5,503,000	1,914,000	22,013,000	418,000	15,014,000
2035	0	0	5,525,000	1,952,000	22,098,000	422,000	15,043,000

Range: Lower End (2011 dollars)

Scenario 3: Flat or Standard Toll

Year	Capital Cost		O&M Cost		Revenue		Net Revenue
	Six (6) SULs	Transit	Six (6) SULs	Transit	Toll Revenue	Farebox Collection	
2016	0	0	0	0	0	0	0
2017	0	0	0	0	0	0	0
2018	101,052,500	0	0	0	0	0	-101,052,500
2019	101,052,500	7,534,000	0	0	0	0	-106,962,500
2020	0	0	953,000	1,450,000	3,810,000	217,000	2,031,000
2021	0	0	1,092,000	1,465,000	4,369,000	219,000	2,031,000
2022	0	0	1,232,000	1,480,000	4,928,000	221,000	2,437,000
2023	0	0	1,372,000	1,495,000	5,486,000	223,000	2,842,000
2024	0	0	1,511,000	1,510,000	6,045,000	225,000	3,249,000
2025	0	0	1,651,000	1,525,000	6,604,000	227,000	3,655,000
2026	0	0	1,791,000	1,540,000	7,163,000	229,000	4,061,000
2027	0	0	1,931,000	1,555,000	7,722,000	231,000	4,467,000
2028	0	0	2,070,000	1,571,000	8,280,000	233,000	4,872,000
2029	0	0	2,210,000	1,587,000	8,839,000	235,000	5,277,000
2030	0	0	2,350,000	1,603,000	9,398,000	237,000	5,682,000
2031	0	0	2,489,000	1,619,000	9,957,000	239,000	6,088,000
2032	0	0	2,629,000	1,635,000	10,516,000	241,000	6,493,000
2033	0	0	2,769,000	1,651,000	11,074,000	243,000	6,897,000
2034	0	0	2,908,000	1,668,000	11,633,000	245,000	7,302,000
2035	0	0	3,048,000	1,685,000	12,192,000	247,000	7,706,000

Range: Higher End (2011 dollars)

Scenario 3: Flat or Standard Toll

Year	Capital Cost		O&M Cost		Revenue		Net Revenue
	Six (6) SULs	Transit	Six (6) SULs	Transit	Toll Revenue	Farebox Collection	
2016	0	0	0	0	0	0	0
2017	0	0	0	0	0	0	0
2018	122,302,000	0	0	0	0	0	-122,302,000
2019	122,302,000	7,534,000	0	0	0	0	-116,065,000
2020	0	0	4,953,000	1,450,000	19,812,000	362,000	13,797,000
2021	0	0	4,970,000	1,479,000	19,880,000	366,000	13,797,000
2022	0	0	4,987,000	1,509,000	19,947,000	370,000	13,821,000
2023	0	0	5,004,000	1,539,000	20,015,000	374,000	13,846,000
2024	0	0	5,021,000	1,570,000	20,083,000	378,000	13,870,000
2025	0	0	5,038,000	1,601,000	20,151,000	382,000	13,894,000
2026	0	0	5,055,000	1,633,000	20,218,000	386,000	13,916,000
2027	0	0	5,072,000	1,666,000	20,286,000	390,000	13,938,000
2028	0	0	5,089,000	1,699,000	20,354,000	394,000	13,960,000
2029	0	0	5,106,000	1,733,000	20,422,000	398,000	13,981,000
2030	0	0	5,122,000	1,768,000	20,489,000	402,000	14,001,000
2031	0	0	5,139,000	1,803,000	20,557,000	406,000	14,021,000
2032	0	0	5,156,000	1,839,000	20,625,000	410,000	14,040,000
2033	0	0	5,173,000	1,876,000	20,693,000	414,000	14,058,000
2034	0	0	5,190,000	1,914,000	20,760,000	418,000	14,074,000
2035	0	0	5,207,000	1,952,000	20,828,000	422,000	14,091,000

Range: Lower End (YOE dollars)

Scenario 1: Managed Lanes (Congestion Pricing)

Year	Capital Cost		O&M Cost		Revenue		Net Revenue
	Six (6) SULs	Transit	Six (6) SULs	Transit	Toll Revenue	Farebox Collection	
2016	0	0	0	0	0	0	0
2017	0	0	0	0	0	0	0
2018	138,441,925	0	0	0	0	0	-138,441,925
2019	138,441,925	9,040,800	0	0	0	0	-147,482,725
2020	0	0	2,645,000	1,987,000	6,612,000	297,000	2,277,000
2021	0	0	3,555,000	2,359,000	8,887,000	353,000	3,326,000
2022	0	0	4,002,000	2,383,000	10,006,000	356,000	3,977,000
2023	0	0	4,449,000	2,407,000	11,123,000	359,000	4,626,000
2024	0	0	4,896,000	2,431,000	12,241,000	362,000	5,276,000
2025	0	0	5,343,000	2,455,000	13,358,000	365,000	5,925,000
2026	0	0	6,798,000	2,911,000	16,995,000	433,000	7,719,000
2027	0	0	7,323,000	2,939,000	18,307,000	437,000	8,482,000
2028	0	0	7,847,000	2,969,000	19,618,000	440,000	9,242,000
2029	0	0	8,372,000	2,999,000	20,930,000	444,000	10,003,000
2030	0	0	8,897,000	3,030,000	22,243,000	448,000	10,764,000
2031	0	0	11,067,000	3,594,000	27,668,000	531,000	13,538,000
2032	0	0	11,684,000	3,630,000	29,209,000	535,000	14,430,000
2033	0	0	12,300,000	3,665,000	30,749,000	539,000	15,323,000
2034	0	0	12,917,000	3,703,000	32,292,000	544,000	16,216,000
2035	0	0	13,533,000	3,741,000	33,833,000	548,000	17,107,000

Range: Higher End (YOE dollars)

Scenario 1: Managed Lanes (Congestion Pricing)

Year	Capital Cost		O&M Cost		Revenue		Net Revenue
	Six (6) SULs	Transit	Six (6) SULs	Transit	Toll Revenue	Farebox Collection	
2016	0	0	0	0	0	0	0
2017	0	0	0	0	0	0	0
2018	167,553,740	0	0	0	0	0	-167,553,740
2019	167,553,740	9,040,800	0	0	0	0	-176,594,540
2020	0	0	13,502,000	1,987,000	33,754,000	496,000	18,761,000
2021	0	0	15,932,000	2,381,000	39,831,000	589,000	22,107,000
2022	0	0	15,998,000	2,429,000	39,994,000	596,000	22,163,000
2023	0	0	16,063,000	2,478,000	40,158,000	602,000	22,219,000
2024	0	0	16,128,000	2,528,000	40,321,000	609,000	22,274,000
2025	0	0	16,194,000	2,578,000	40,485,000	615,000	22,328,000
2026	0	0	19,088,000	3,086,000	47,719,000	730,000	26,275,000
2027	0	0	19,164,000	3,149,000	47,910,000	737,000	26,334,000
2028	0	0	19,241,000	3,211,000	48,102,000	745,000	26,395,000
2029	0	0	19,317,000	3,275,000	48,293,000	752,000	26,453,000
2030	0	0	19,394,000	3,342,000	48,486,000	760,000	26,510,000
2031	0	0	22,871,000	4,003,000	57,178,000	901,000	31,205,000
2032	0	0	22,961,000	4,083,000	57,403,000	910,000	31,269,000
2033	0	0	23,052,000	4,165,000	57,629,000	919,000	31,331,000
2034	0	0	23,141,000	4,249,000	57,853,000	928,000	31,391,000
2035	0	0	23,232,000	4,333,000	58,080,000	937,000	31,452,000

Range: Lower End (YOE dollars)

Scenario 2: Time of Day Toll (Peak v/s Off Peak)

Year	Capital Cost		O&M Cost		Revenue		Net Revenue
	Six (6) SULs	Transit	Six (6) SULs	Transit	Toll Revenue	Farebox Collection	
2016	0	0	0	0	0	0	0
2017	0	0	0	0	0	0	0
2018	138,441,925	0	0	0	0	0	-138,441,925
2019	138,441,925	9,040,800	0	0	0	0	-147,482,725
2020	0	0	1,392,000	1,987,000	5,568,000	297,000	2,486,000
2021	0	0	1,875,000	2,359,000	7,498,000	353,000	3,617,000
2022	0	0	2,113,000	2,383,000	8,451,000	356,000	4,311,000
2023	0	0	2,352,000	2,407,000	9,406,000	359,000	5,006,000
2024	0	0	2,590,000	2,431,000	10,360,000	362,000	5,701,000
2025	0	0	2,828,000	2,455,000	11,313,000	365,000	6,395,000
2026	0	0	3,601,000	2,911,000	14,402,000	433,000	8,323,000
2027	0	0	3,881,000	2,939,000	15,523,000	437,000	9,140,000
2028	0	0	4,160,000	2,969,000	16,641,000	440,000	9,952,000
2029	0	0	4,441,000	2,999,000	17,762,000	444,000	10,766,000
2030	0	0	4,721,000	3,030,000	18,883,000	448,000	11,580,000
2031	0	0	5,874,000	3,594,000	23,494,000	531,000	14,557,000
2032	0	0	6,203,000	3,630,000	24,811,000	535,000	15,513,000
2033	0	0	6,532,000	3,665,000	26,127,000	539,000	16,469,000
2034	0	0	6,860,000	3,703,000	27,441,000	544,000	17,422,000
2035	0	0	7,190,000	3,741,000	28,758,000	548,000	18,375,000

Range: Higher End (YOE dollars)

Scenario 2: Time of Day Toll (Peak v/s Off Peak)

Year	Capital Cost		O&M Cost		Revenue		Net Revenue
	Six (6) SULs	Transit	Six (6) SULs	Transit	Toll Revenue	Farebox Collection	
2016	0	0	0	0	0	0	0
2017	0	0	0	0	0	0	0
2018	167,553,740	0	0	0	0	0	-167,553,740
2019	167,553,740	9,040,800	0	0	0	0	-176,594,540
2020	0	0	7,134,000	1,987,000	28,534,000	496,000	19,909,000
2021	0	0	8,418,000	2,381,000	33,670,000	589,000	23,460,000
2022	0	0	8,451,000	2,429,000	33,805,000	596,000	23,521,000
2023	0	0	8,486,000	2,478,000	33,942,000	602,000	23,580,000
2024	0	0	8,520,000	2,528,000	34,079,000	609,000	23,640,000
2025	0	0	8,554,000	2,578,000	34,214,000	615,000	23,697,000
2026	0	0	10,081,000	3,086,000	40,325,000	730,000	27,888,000
2027	0	0	10,122,000	3,149,000	40,486,000	737,000	27,952,000
2028	0	0	10,161,000	3,211,000	40,644,000	745,000	28,017,000
2029	0	0	10,201,000	3,275,000	40,805,000	752,000	28,081,000
2030	0	0	10,242,000	3,342,000	40,966,000	760,000	28,142,000
2031	0	0	12,076,000	4,003,000	48,305,000	901,000	33,127,000
2032	0	0	12,124,000	4,083,000	48,494,000	910,000	33,197,000
2033	0	0	12,171,000	4,165,000	48,682,000	919,000	33,265,000
2034	0	0	12,217,000	4,249,000	48,869,000	928,000	33,331,000
2035	0	0	12,265,000	4,333,000	49,058,000	937,000	33,397,000

Range: Lower End (YOE dollars)

Scenario 3: Flat or Standard Toll

Year	Capital Cost		O&M Cost		Revenue		Net Revenue
	Six (6) SULs	Transit	Six (6) SULs	Transit	Toll Revenue	Farebox Collection	
2016	0	0	0	0	0	0	0
2017	0	0	0	0	0	0	0
2018	138,441,925	0	0	0	0	0	-138,441,925
2019	138,441,925	9,040,800	0	0	0	0	-147,482,725
2020	0	0	1,305,000	1,987,000	5,220,000	297,000	2,225,000
2021	0	0	1,759,000	2,359,000	7,034,000	353,000	3,269,000
2022	0	0	1,984,000	2,383,000	7,934,000	356,000	3,923,000
2023	0	0	2,208,000	2,407,000	8,832,000	359,000	4,576,000
2024	0	0	2,433,000	2,431,000	9,732,000	362,000	5,230,000
2025	0	0	2,658,000	2,455,000	10,632,000	365,000	5,884,000
2026	0	0	3,385,000	2,911,000	13,538,000	433,000	7,675,000
2027	0	0	3,649,000	2,939,000	14,595,000	437,000	8,444,000
2028	0	0	3,912,000	2,969,000	15,649,000	440,000	9,208,000
2029	0	0	4,177,000	2,999,000	16,706,000	444,000	9,974,000
2030	0	0	4,441,000	3,030,000	17,762,000	448,000	10,739,000
2031	0	0	5,526,000	3,594,000	22,105,000	531,000	13,516,000
2032	0	0	5,837,000	3,630,000	23,346,000	535,000	14,414,000
2033	0	0	6,146,000	3,665,000	24,584,000	539,000	15,312,000
2034	0	0	6,456,000	3,703,000	25,825,000	544,000	16,210,000
2035	0	0	6,767,000	3,741,000	27,066,000	548,000	17,106,000

Range: Higher End (YOE dollars)

Scenario 3: Flat or Standard Toll

Year	Capital Cost		O&M Cost		Revenue		Net Revenue
	Six (6) SULs	Transit	Six (6) SULs	Transit	Toll Revenue	Farebox Collection	
2016	0	0	0	0	0	0	0
2017	0	0	0	0	0	0	0
2018	167,553,740	0	0	0	0	0	-167,553,740
2019	167,553,740	9,040,800	0	0	0	0	-176,594,540
2020	0	0	6,786,000	1,987,000	27,142,000	496,000	18,865,000
2021	0	0	8,002,000	2,381,000	32,007,000	589,000	22,213,000
2022	0	0	8,029,000	2,429,000	32,115,000	596,000	22,253,000
2023	0	0	8,056,000	2,478,000	32,224,000	602,000	22,292,000
2024	0	0	8,084,000	2,528,000	32,334,000	609,000	22,331,000
2025	0	0	8,111,000	2,578,000	32,443,000	615,000	22,369,000
2026	0	0	9,553,000	3,086,000	38,212,000	730,000	26,303,000
2027	0	0	9,585,000	3,149,000	38,341,000	737,000	26,344,000
2028	0	0	9,617,000	3,211,000	38,469,000	745,000	26,386,000
2029	0	0	9,650,000	3,275,000	38,598,000	752,000	26,425,000
2030	0	0	9,681,000	3,342,000	38,724,000	760,000	26,461,000
2031	0	0	11,409,000	4,003,000	45,637,000	901,000	31,126,000
2032	0	0	11,447,000	4,083,000	45,788,000	910,000	31,168,000
2033	0	0	11,485,000	4,165,000	45,938,000	919,000	31,207,000
2034	0	0	11,522,000	4,249,000	46,087,000	928,000	31,244,000
2035	0	0	11,560,000	4,333,000	46,238,000	937,000	31,282,000

## Capital and O&M Cost Estimate - Express Bus

### Transit - Express Bus on I-275 Special Use Lanes (SULs)

Total Capital Cost <sup>1</sup>	6,934,000
Number of Articulated Buses <sup>2</sup> (60 feet)	7
Annualized Capital Cost <sup>3</sup>	873,000
Annualized O&M Cost <sup>4</sup>	1,450,000
Annual Revenue Hours <sup>5</sup>	15,000
Annual Revenue Miles <sup>6</sup>	358,000
Stations <sup>7</sup>	600,000

Note: All cost are in 2011 dollars

#### Assumptions

<sup>1</sup> Cost per articulated bus (hybrid 60 ft.) is \$950,000

<sup>2</sup> Peak/off-peak hour headway is 7.5/15 minute (includes 20% spare ratio)

<sup>3</sup> Annualized based on 12 years service life and 7% discount rate per FTA guidelines

<sup>4</sup> O&M cost per revenue hour is \$90

<sup>5</sup> Total 14 hours service span; 6 hours during peak and 8 hours during off-peak

<sup>6</sup> Bus speed is 26 mph during peak hour and 28.6 mph (10% higher than peak hour) during off peak hour

<sup>7</sup> Two at-grade bus stations

## **Appendix F**

### **Tolled Intersection Bypass Lanes with Bus Rapid Transit supporting data**

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While basic revenue and cost estimate calculations are provided on the Background sheet, this scenario includes detailed discussion and data due to the many variables and assumptions. Refer to Appendix F for the discussion about Lee County's experience and the Dale Mabry hypothetical scenario; and for detailed revenue and costs calculations.

A two-pronged approach was examined as a means of addressing growing congestion along Dale Mabry Highway, particularly at intersections. First, intersection queue jump toll lanes were identified at the poorest-performing non-grade separated intersections: Ehrlich Road /CR 582; Waters Avenue; Sligh Avenue/SR 598; Dr. Martin Luther King, Jr. Blvd/SR 574, and Columbus Drive. Second, a new MetroRapid Express bus route was assumed to provide improved commuter travel times using the queue jump intersections along Dale Mabry Highway. Bus transit service could be provided between a park-n-ride in the vicinity of Van Dyke Road in the north to a transfer center at Cypress Street in the south. Tolls for free-flow intersection queue jump lanes would be priced by time-of-day due to the predictability of the congestion periods and would be provided as an option to non-tolled signal-controlled lanes. In addition to alleviating congestion, this hypothetical approach is designed to provide a source of revenues for capital development cost for the intersection improvements, transit vehicles and facilities, and ongoing maintenance.

No queue jump toll lanes are currently operating in the U.S. The idea of value-priced queue jump toll facilities was examined for Lee County in 2002 in conjunction with a Federal Highways Administration study. A hypothetical example was based on a study completed in Lee County. Information regarding that study, along with detailed data and revenue estimates, are included in Appendix F.

## **Dale Mabry Tolled Intersection Queue Jump Express – Hypothetical Case Study**

A two-pronged approach was examined as a means of addressing growing congestion along Dale Mabry, particularly at intersections. First, intersection queue jump toll lanes were identified at all non-grade separated intersections. Second, a new MetroRapid Express Route was designed to provide improved commuter travel times using the queue jump intersections along Dale Mabry between a park-n-ride in the vicinity of Van Dyke in the north to a transfer center at Cypress in the south. Tolls for free-flow intersection queue jump lanes would be priced by time-of-day due to the predictability of the congestion periods and would be provided as an option to non-tolled signal-controlled lanes. In addition to alleviating congestion, this hypothetical approach is designed to provide a source of revenues for capital development cost for the intersection improvements, transit vehicles and facilities, and ongoing maintenance.

It should be noted that no queue jump toll lanes have been built in the U.S. The idea of value-priced queue jump toll facilities was examined for Lee County in 2002 in conjunction with a Federal Highways Administration study. Lee County, who participated in that study, has a long history of constructing and managing toll facilities on bridged water crossings. First, let's take a look at Lee County's experience with toll facilities and their review of tolled queue jump lanes and express lanes on Colonial Blvd.

### **Lee County Experience**

Lee County currently operates three toll bridges connecting Cape Coral with Fort Myers. Two of these toll facilities – Sanibel Causeway and the Cape Coral Bridge – opened in the early 1960s. From 1974 to 1989, the tolls were removed from the Cape Coral Bridge, but reopened to finance an additional span. In 1997, a third facility, the Midpoint Memorial Bridge, opened in 1997 to address increased traffic demand crossing the Caloosahatchee River. Systemwide gross toll revenues were collected in FY2010 totaling \$27.25 million. This represents a decline of 14.5 percent between 2005 and 2010 and is 26.5 percent lower than the 2005B Bond Official Statement. Estimates for the bond issue were calculated prior to signs of the economic recession. Nonetheless, debt obligations are covered at a ratio of 1.38 for all three facilities. After debt and remittances required by interlocal agreements, a surplus of \$4.4 million was applied to subordinate debt related to the reconstruction of the Sanibel Causeway, and an additional \$2.3 million was deposited into a CIP fund. *[Annual Traffic and Revenue Report, Fiscal Year 2010, Lee County Toll Facilities, Wilbur Smith Associates, April 2011]*

In 2002, Lee County examined the potential for elevated value-priced queue jump lanes to alleviate congestion problems at specific locations. The lanes were proposed to provide a choice for drivers to divert to a queue jump lane for a small toll. Benefits would accrue to drivers on the non-tolled lanes to the extent that demand is reduced. Two intersections were included in the study. Project development cost was estimated for each of the study intersections at \$6.2 million for the Summerlin/San Carlos and \$8.6 million for the Metro/Colonial. Because of the lack of any existing queue jump facilities, Lee County conducted a driver survey to determine potential preferences for use of the queue jump. Based on the survey, and toll elasticity analysis performed during the time of the study, the assumptions used for Lee County queue jump lanes regarding the percentage of the traffic stream that would use the toll lanes, and the time-of-day toll rates are shown in the following table.



Using these assumptions, revenue streams were calculated at \$5.75 and \$2.9 million net bond proceeds for the Metro/Colonial and Summerlin/San Carlos queue jumps, respectively. These revenue calculations were done at a time of higher projected growth that has since been adjusted downward; however, at the

Results of Driver Lee County Survey		
Time of Day	Toll Usage	Toll Rate
Peak Hour	25%	\$0.40
Off-Peak Hours	20%	\$0.25
Shoulder Periods	15%	\$0.15
Weekends	20%	\$0.25

time, it was believed that potential revenues associated with queue jump project could result in financially feasible projects with between 7.0 to 8.75 percent rates of return, assuming a funding source other than bond financing. *[FHWA Value Pricing Pilot Program, Project Development, Design, and Construction Value Priced Queue Jumps, Lee County Department of Transportation, January 3, 2003]*

Subsequent studies of Colonial Blvd. led to development of a value-engineered Express Bus tolled facility from a point directly east of the Midpoint Memorial Bridge which crosses the Caloosahatchee River to a point east of Interstate 75 (I-75). The Project Development & Environmental (PD&E) study led to a lower-cost solution known as the Colonial Express Lanes Initiative which minimized the need for right-of-way acquisition and placed turn lanes below the elevated structure at intersections, and would include a no-cost alternative to the tolled lanes via frontage roads. The resulting \$400 million project for a 2.5 mile facility was proposed to be funded through bonds. Response to the project by the public and elected officials in 2010 was negative based on their concerns for potential negative economic impacts to businesses adjacent to the elevated structures. The project was removed from Lee County’s 2035 LRTP in December 2010. Other at-grade solutions to congestion at intersections are now being developed.

**Hypothetical Analysis of Dale Mabry Tolled Intersection Queue Jump**

It is difficult to assert that the study done for queue jumps in Lee County would be directly applicable to the Hillsborough County intersections. However, for this hypothetical example, we will use some of the assumptions made and draw some general comparisons. Traffic volumes on Dale Mabry as it crosses Waters in peak direction are projected to 2035 at 4,030 and 4,900 vehicles on the north and south side of Waters, respectively. By comparison, in FY2010, peak hour traffic on the Midpoint Memorial Bridge rises above 1,500 vehicles between 2pm and 6pm, topping out at 2,500 vehicles at 5pm. The fact that traffic streams for the Hillsborough County intersection are considerably higher may indicate that volumes would substantiate further review of revenue-generating potential. It should be noted that due to the nature of the bridge crossings over the river, no attractive, timely alternatives exist, whereas in the case of Dale Mabry, a number of alternative routes on local roads, or Veterans Memorial Highway could draw potential traffic from Dale Mabry to avoid congestion, or tolls.

**Project Description:** In this scenario, a total of five queue jump intersections were assumed in conjunction with rapid bus service from a park-n-ride facility in the vicinity of Van Dyke Road at Dale

Mabry to a new transfer facility in the vicinity of Cypress Street at Dale Mabry. Queue jump intersections are proposed for the five through intersections which will effectively grade separate all major intersections in addition to the already grade-separated intersections at Busch Blvd. and Hillsborough Ave. This more extensive approach to address throughput and enhanced transit service on the Dale Mabry corridor includes tolled queue jump intersections at five intersections listed north to south below.

- Ehrlich Road /CR 582
- Waters Avenue
- Sligh Avenue/SR 598
- Dr. Martin Luther King, Jr. Blvd/SR 574
- Columbus Drive

Three General Use Lanes (GUL) would remain at-grade as the no-cost choice to the tolled lanes for the driving public. Supports for the elevated lanes would provide spacing for turn lane(s) below the elevated structure to minimize right-of-way need. It may be necessary to shift the through lanes alignment out to accommodate the elevated structures, but for this cost study, it is assumed that no additional construction of the main lanes would be required. The new elevated toll lane would result in lower volumes on existing through lanes which may allow for optimized signal timing that would reduce delays associated with the traffic signal for east-west Waters traffic in addition to north-south Dale Mabry. Consistent with the Hypothetical I-275 Toll Facility Case Study, an implementation year of 2020 is assumed.

**Toll Usage and Rate Assumptions:** For our hypothetical case, we assumed the traffic stream splits used by Lee County DOT in the 2002 Value Pricing Queue Jump Study shown in the table above. These were based on actual surveys conducted in Lee County at that time. Hillsborough County residents’ willingness will need to be assessed for a relevant projection; however, for this hypothetical case, we applied the Lee County experience and assumed a range of possible toll rates in this early assessment. This is not assumed to be congestion priced, rather, it is a “time-of-day” pricing based on the expectation that traffic volumes are predictable on this corridor.

Time-of-Day Toll Usage and Rate Assumptions				
Time of Day	Toll Usage Peak Direction	Toll Usage Off-peak Direction	Toll Rate (Low)	Toll Rate (High)
Peak Hour	25%	15%	\$0.40	\$0.60
Shoulder Periods	20%	15%	\$0.25	\$0.40
Off-Peak Hours	15%	15%	\$0.15	\$0.25
Weekends	20%	20%	\$0.25	\$0.30

**Transit Service:** Currently, north-south local bus Route 36 deviates eastward from Dale Mabry to Himes at Columbus Drive on the south end, returning to Dale Mabry at Busch Blvd further north. East-west local bus Route 16 on Waters connects with Route 36 at Himes. Today, the Pasco/Lutz Express also provides two trips each in the morning and evening from a stop in Pasco County and a park-and-ride facility in Lutz via Florida Avenue and I-275 to downtown Tampa with daily use below 70 persons per day. In the Hillsborough Area Regional Transit Authorities (HART) 2012 Transportation Development Plan Update, a MetroRapid BRT corridor is identified on Dale Mabry extending from Van Dyke near St.

Joseph’s Hospital in the north to MacDill Air Force Base in the south. HART’s 2021 Vision Plan ridership projection for the new Dale Mabry/Himes Ave BRT route approaches 2,500 persons each day.

For this hypothetical study, a new rapid bus express route is assumed to extend between Van Dyke in the north to a transfer center at Cypress in the south with four southbound trips in the morning and four northbound trips in the evening peak hour. Although this is not consistent with the HART assumptions, it associates the queue jump intersection improvements with the new premium transit service between two logical termini. Local service and limited stop express bus service is assumed to continue and would also benefit from improved travel speeds and use of queue jump intersections on portions of their routes.

**Capital Cost:** The 2002 cost estimated for the Lee County study was \$6.2 to \$8.6 for a similar one-lane, two-direction facility in the median. Clearly, today’s cost would be higher, and the particular site-specific circumstances at the Dale Mabry intersections may be quite different. However, if we assume that on a comparable cost basis that an escalation rate of 2.5 percent per year would be realistic, then a cost of \$7.5 to \$10 million is estimated as of 2011. The 2002 cost estimated for the Lee County study is used as the basis for the cost of all five intersection improvements which gives us a capital cost range of \$37.5 to \$50 million for five one-lane, two-directional queue jump intersections. Rapid bus transit service is operated with four 60-foot articulated bus vehicles purchased at an estimated cost ranging from \$800,000 to \$950,000 each. Cost for a park-and-ride in the north is estimated at \$500,000 and a multi-modal transfer center at Cypress at \$3.6 million based on HART cost for the previously planned Tampa International Airport Transfer Center.

**Operations and Maintenance Cost:** Cost to operate the service is estimated at \$97 per revenue hour per HART’s Transportation Development Plan (2012-2021) and is for peak hour service only. A 20% spare ratio is factored into the analysis and vehicle cost is annualized based on 12 years service life and 7% discount rate per FTA guidelines. Operations and maintenance cost for the structures and transit facilities are estimated at 10%.

**Results:** Based on the above assumptions, revenue streams and capital and operating costs were calculated to develop cash flows for this hypothetical scenario. All 2011 costs and revenues are projected to year-of-expenditure (YOE) dollars using FDOT’s Inflation Factors (FDOT

Hypothetical Case Net Revenues				
(\$millions)	2011 dollars		Year-of-Expenditure	
	Low	High	Low	High
Time Frame				
2020 Start-up Year	\$4.1	\$5.6	\$6.4	\$8.7
2035 Annual	\$4.5	\$10.0	\$6.9	\$15.3
2018-2035 Cumulative	\$23.7	\$69.0	\$54.0	\$120.7

2035 Revenue Forecast Handbook, May 2008). Annual net revenues are shown in the table for 2020 (start-up year), 2035 (planning horizon year), with a cumulative net revenue through 2035. Values are shown in 2011 dollars and YOE dollars. The above results do not represent investment-grade level of analysis, rather they represent simple projections of order of magnitude cost and revenue estimates. Capital cost for vehicles, intersection improvements, and terminal stations ranging from \$45.3 to \$58.5 million in 2011 dollars was converted to YOE 2018-2019 dollars amounting to \$60.8 to \$78.7 million.

## **CONCLUSIONS:**

**Revenue-Generation Potential:** While tolled queue jump intersections reviewed in this hypothetical analysis show potential to generate revenues, it is unclear with this cursory review whether there is potential for bond financing of the multiple queue jump intersection scenario. If bonds could not be issued based on future revenue streams, then a discrete funding source would be required. It is clear that further exploration of the potential to generate revenue would be fruitful.

**Potential Public Concerns:** Even if the public is willing to pay to use queue jump lanes to avoid congestion, there may be objections to the installation of elevated structures at these intersections. Lee County was not successful in implementing their expressway project due to public objections to the elevated lanes and right-of-way takes. The Hillsborough experience may be similar. Communications with affected communities should be included in early planning efforts to better understand the public's willingness to support tolled facilities on an arterial roadway, and adjacent property owner's concerns for elevated structures at major intersections. Two such intersections exist today at Hillsborough Ave. and Busch Blvd.; however, business disruption and limited visibility for businesses at other intersections may pose a major concern that could impact the success of this type of project. In Lee County's experience, public objections led to cancellation of their similar project late in project development, in spite of their ability to ensure funding for the project from net revenues.

**Other Potential User Benefits:** An assessment of congestion management benefits may identify other associated monetary benefits to all users relative to reduced travel time, accidents, emissions, vehicle operations cost, etc. Inclusion of a new rapid bus route and ancillary benefits to ongoing local and limited stop bus routes for a portion of their routes would also increase total user benefits.

**Public Private Partnership Potential:** Given the uncertainty at this time as to whether this hypothetical case is eligible for traditional toll bond financing, an alternative source of funding may be required to construct the queue jump ramps. If a public sector funding stream could be identified, and if further studies confirm the potential for toll revenues, a design-build-operate-maintain-finance arrangement may be attractive to the private sector. The project would be further burdened by additional interest cost for a private entity to provide financing to accelerate a project; however, revenues would be realized earlier than would be possible otherwise. Given the relatively small nature of the project, it may not lend itself to an equity position from the contractor. Advancing the project to an earlier implementation could also result in lower overall capital cost and earlier congestion relieve and introduction of premium transit service choice.

**Other Possible Solutions:** Desired outcomes for improvements on a given corridor and the degree to which one result is more important than another should guide the type of transportation solution designed. Those desired outcomes may include increased throughput, increased travel times, revenue generation opportunities, or increased travel choice. There may be alternative solutions to increase travel time and reduce congestion on Dale Mabry and other similar corridors. We have reviewed a queue jump solution with the addition of a new rapid express bus route for the Dale Mabry corridor. Further review is needed to identify an optimum solution which may consider other alternatives.

Other technical and operating solutions may include:

- *Traffic signal improvements* – This can be accomplished using Intelligent Traffic System technologies to gain overall traffic congestion reductions.
- *Transit Signal Priority* – Signals are triggered by the presence of a transit vehicle to allow green time for bus through movements thus maximizing transit travel times.
- *Bus Lane with Intermittent Priority (BLIMP)* – Transit preferential treatment through transit signal priority and exclusive lanes during critical time periods (peak hour and special events).

Beyond available technical solutions, a review of the various transit service types, their integration with one another, and extent of that service in terms of route coverage and time of service should be fully considered in light of the travel markets in the Dale Mabry corridor.

## Express Queue Jump Cost and Revenue Estimate

### Hypothetical Project: Dale Mabry Express Queue Jump Toll (Five Intersections)

Range: Lower End (2011 dollars)

All Five Intersections

Year	Capital Cost		O&M Cost		Revenue		Net Revenue
	Intersection Improvement	Transit	Intersection Improvement	Transit	Toll Revenue	Farebox Collection	
2016	0	0	0	0	0	0	0
2017	0	0	0	0	0	0	0
2018	18,750,000	0	0	0	0	0	-18,750,000
2019	18,750,000	7,816,240	0	0	0	0	-26,566,240
2020	0	0	484,000	277,000	4,841,347	42,000	4,122,347
2021	0	0	487,000	280,000	4,873,000	42,000	4,148,000
2022	0	0	491,000	283,000	4,905,000	42,000	4,173,000
2023	0	0	494,000	286,000	4,936,000	42,000	4,198,000
2024	0	0	497,000	289,000	4,968,000	42,000	4,224,000
2025	0	0	500,000	292,000	5,000,000	42,000	4,250,000
2026	0	0	503,000	295,000	5,031,000	42,000	4,275,000
2027	0	0	506,000	298,000	5,063,000	42,000	4,301,000
2028	0	0	509,000	301,000	5,094,000	42,000	4,326,000
2029	0	0	513,000	304,000	5,126,000	42,000	4,351,000
2030	0	0	516,000	307,000	5,158,000	42,000	4,377,000
2031	0	0	519,000	310,000	5,189,000	42,000	4,402,000
2032	0	0	522,000	313,000	5,221,000	42,000	4,428,000
2033	0	0	525,000	316,000	5,253,000	42,000	4,454,000
2034	0	0	528,000	319,000	5,284,000	42,000	4,479,000
2035	0	0	532,000	322,000	5,315,948	42,000	4,503,948

Range: Higher End (2011 dollars)

All Five Intersections

Year	Capital Cost		O&M Cost		Revenue		Net Revenue
	Intersection Improvement	Transit	Intersection Improvement	Transit	Toll Revenue	Farebox Collection	
2016	0	0	0	0	0	0	0
2017	0	0	0	0	0	0	0
2018	25,000,000	0	0	0	0	0	-25,000,000
2019	25,000,000	8,472,240	0	0	0	0	-27,125,359
2020	0	0	728,000	277,000	7,282,881	69,000	6,384,000
2021	0	0	733,000	283,000	7,330,000	70,000	6,384,000
2022	0	0	738,000	289,000	7,378,000	71,000	6,422,000
2023	0	0	743,000	295,000	7,426,000	72,000	6,460,000
2024	0	0	747,000	301,000	7,473,000	73,000	6,498,000
2025	0	0	752,000	307,000	7,521,000	74,000	6,536,000
2026	0	0	757,000	313,000	7,568,000	75,000	6,573,000
2027	0	0	762,000	319,000	7,616,000	76,000	6,611,000
2028	0	0	766,000	325,000	7,663,000	77,000	6,649,000
2029	0	0	771,000	332,000	7,711,000	78,000	6,686,000
2030	0	0	776,000	339,000	7,759,000	79,000	6,723,000
2031	0	0	781,000	346,000	7,806,000	80,000	6,759,000
2032	0	0	785,000	353,000	7,854,000	81,000	6,797,000
2033	0	0	790,000	360,000	7,901,000	82,000	6,833,000
2034	0	0	795,000	367,000	7,949,000	83,000	6,870,000
2035	0	0	800,000	374,000	7,996,374	84,000	6,906,374

Range: Lower End (YOE dollars)

All Five Intersections

Year	Capital Cost		O&M Cost		Revenue		Net Revenue
	Intersection Improvement	Transit	Intersection Improvement	Transit	Toll Revenue	Farebox Collection	
2016	0	0	0	0	0	0	0
2017	0	0	0	0	0	0	0
2018	25,687,500	0	0	0	0	0	-25,687,500
2019	25,687,500	9,379,488	0	0	0	0	-35,066,988
2020	0	0	663,000	379,000	6,633,000	58,000	5,649,000
2021	0	0	785,000	451,000	7,846,000	68,000	6,678,000
2022	0	0	790,000	456,000	7,897,000	68,000	6,719,000
2023	0	0	795,000	460,000	7,947,000	68,000	6,760,000
2024	0	0	800,000	465,000	7,998,000	68,000	6,801,000
2025	0	0	805,000	470,000	8,050,000	68,000	6,843,000
2026	0	0	951,000	558,000	9,509,000	79,000	8,079,000
2027	0	0	957,000	563,000	9,569,000	79,000	8,128,000
2028	0	0	963,000	569,000	9,628,000	79,000	8,175,000
2029	0	0	969,000	575,000	9,688,000	79,000	8,223,000
2030	0	0	975,000	580,000	9,749,000	79,000	8,273,000
2031	0	0	1,152,000	688,000	11,520,000	93,000	9,773,000
2032	0	0	1,159,000	695,000	11,591,000	93,000	9,830,000
2033	0	0	1,166,000	702,000	11,662,000	93,000	9,887,000
2034	0	0	1,173,000	708,000	11,730,000	93,000	9,942,000
2035	0	0	1,180,000	715,000	11,801,000	93,000	9,999,000

Range: Higher End (YOE dollars)

All Five Intersections

Year	Capital Cost		O&M Cost		Revenue		Net Revenue
	Intersection Improvement	Transit	Intersection Improvement	Transit	Toll Revenue	Farebox Collection	
2016	0	0	0	0	0	0	0
2017	0	0	0	0	0	0	0
2018	34,250,000	0	0	0	0	0	-34,250,000
2019	34,250,000	10,166,688	0	0	0	0	-44,416,688
2020	0	0	998,000	379,000	9,978,000	95,000	8,696,000
2021	0	0	1,180,000	456,000	11,801,000	113,000	10,278,000
2022	0	0	1,188,000	465,000	11,879,000	114,000	10,340,000
2023	0	0	1,196,000	475,000	11,956,000	116,000	10,401,000
2024	0	0	1,203,000	485,000	12,032,000	118,000	10,462,000
2025	0	0	1,211,000	494,000	12,109,000	119,000	10,523,000
2026	0	0	1,430,000	592,000	14,304,000	142,000	12,424,000
2027	0	0	1,439,000	603,000	14,394,000	144,000	12,496,000
2028	0	0	1,448,000	614,000	14,483,000	146,000	12,567,000
2029	0	0	1,457,000	627,000	14,574,000	147,000	12,637,000
2030	0	0	1,467,000	641,000	14,665,000	149,000	12,706,000
2031	0	0	1,733,000	768,000	17,329,000	178,000	15,006,000
2032	0	0	1,744,000	784,000	17,436,000	180,000	15,088,000
2033	0	0	1,754,000	799,000	17,540,000	182,000	15,169,000
2034	0	0	1,765,000	815,000	17,647,000	184,000	15,251,000
2035	0	0	1,775,000	830,000	17,752,000	186,000	15,333,000

## Capital and O&M Cost Estimate - Rapid Bus

### Transit - Rapid Bus on Dale Mabry Hwy

Vehicle Capital Cost <sup>1</sup>	3,990,000
Number of Articulated Buses <sup>2</sup> (60 feet)	4
Annualized Capital Cost <sup>3</sup>	502,000
Annualized O&M Cost <sup>4</sup>	517,000
Annual Revenue Hours <sup>5</sup>	5,330
Annual Revenue Miles <sup>6</sup>	119,000
Stations <sup>7</sup>	4,319,000

Note: All cost are in 2011 dollars

#### Assumptions

<sup>1</sup> Cost per articulated bus (hybrid 60 ft.) is \$950,000

<sup>2</sup> Includes 20% spare ratio, peak hour service at 20 minute headway

<sup>3</sup> Annualized based on 12 years service life and 7% discount rate per FTA guidelines

<sup>4</sup> O&M cost per revenue hour is \$97 per HART's TDP (2012-2021)

<sup>5</sup> Peak hour service only

<sup>6</sup> Bus speed is 26 mph during peak hour and 28.6 mph (10% higher than peak hour) during off peak hour

<sup>7</sup> Two terminal stations; Westshore Intermodal Terminal at Northern Terminus station



## Appendix G

### Local Sales Tax supporting data

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Basic revenue calculations and project cost estimates are provided on the Background sheet. Appendix G includes detailed revenue calculations, an alternative revenue calculation methodology, and a summary of peer transit system costs for the Local Sales Tax scenario.

Revenue was calculated for a hypothetical implementation with the City of Tampa as well within all of Hillsborough County. The City of Tampa's revenue was initially based on its current share (derived via default formula as found in the *2010 Local Government Financial Information Handbook*) of the County's local discretionary sales surtax: 23.2109 percent. However, as shown on the Background sheet, revenues were also calculated based on a new methodology that accounts instead for the amount of sales within the City of Tampa.

The rate of growth in revenues is based on an increase in population only; this same methodology was used in the 2035 LRTP, as documented in the "Reasonably Available and New and Additional Projected Revenue Sources in Hillsborough County Technical Memorandum" (2009). This is a conservative approach as it assumes there is no growth in levels of consumption.

Projects and their estimated costs were identified in the Hillsborough County MPO 2035 Long Range Transportation Plan, unless otherwise noted.

#### Demonstration Rail Project

Peer systems were used to develop the capital and operating cost estimates for Diesel Multiple Unit (DMU) rail service between downtown Tampa and the University of South Florida. The peer systems were identified through the Federal Transit Authority's National Transit Database and through local comparisons. The operating characteristics (operating hours, frequency, number of stations, length of service in miles) of DMU service vary greatly, which makes analyzing existing systems and selecting those that are most comparable to the local desired outcome that much more important. When operating characteristics are comparable, Commuter Rail Transit (CRT) projects were used as peer systems.

Systems were grouped by their reported capital costs. Ten completed and in-progress systems reported construction costs, and they averaged \$15.5 million per mile. Five completed and in-progress systems reported construction, right-of-way, and rolling stock costs, and they averaged \$14.5 million per mile. Three completed and in-progress systems reported construction and right-of-way costs, and they averaged \$8.8 million per mile; this average is affected by two projects with very low right-of-way costs. Uniform cost reporting categories would help perform more accurate analysis and comparisons.

Previous, generalized studies identified a range of capital costs for the DMU demonstration project: \$251–306 million. Lower capital costs could be achieved by designing a simple project with few at-grade stations without station parking facilities. Lower capital costs can be achieved by using fewer vehicles and existing ROW where feasible. Austin and Orlando are good examples where lower-cost passenger rail services were achieved using existing freight lines. This required negotiating with the owners of the freight rail lines.

Operating costs were determined by similar research and aided by the proximity of research completed for the ongoing Pinellas Alternatives Analysis. Operating costs are directly tied to service hours and frequencies. The Nashville CRT has very low operating costs (\$112,760 per mile), but it has very limited operating hours limited to peak hours and few stations. Conversely, Miami's Tri-Rail operating costs are about 10 times higher (\$1.13 million per mile). It serves 14,000 passengers a day, while Nashville's CRT line serves 1,200 passengers a day. An average operating cost of \$500,000 per mile is identified in the Pinellas Alternatives Analysis as well as Portland's (OR) Westside Express Service, which is comparable in length and possible assumed service.

Revenues generated from varying levels of additional Local Sales Tax

Municipality/Agency	0.25% Sales Tax			
	2012	2013	2014	2015
Hillsborough County	23,412,924	23,759,435	24,111,075	24,467,919
Tampa	5,434,350	5,514,779	5,596,398	5,679,224
Hillsborough County Total	23,412,924	47,172,359	71,283,434	95,751,353
Tampa Total	5,434,350	10,949,129	16,545,527	22,224,751

Municipality/Agency	0.5% Sales Tax			
	2012	2013	2014	2015
Hillsborough County	46,825,848	47,518,871	48,222,150	48,935,838
Tampa	10,868,701	11,029,558	11,192,795	11,358,448
Hillsborough County Total	46,825,848	94,344,719	142,566,869	191,502,707
Tampa Total	10,868,701	21,898,259	33,091,054	44,449,502

Municipality/Agency	0.75% Sales Tax			
	2012	2013	2014	2015
Hillsborough County	70,238,773	71,278,306	72,333,225	73,403,757
Tampa	16,303,051	16,544,336	16,789,193	17,037,673
Hillsborough County Total	70,238,773	141,517,079	213,850,304	287,254,061
Tampa Total	16,303,051	32,847,387	49,636,580	66,674,253

Municipality/Agency	1.00% Sales Tax			
	2012	2013	2014	2015
Hillsborough County	93,651,697	95,037,742	96,444,301	97,871,676
Tampa	21,737,402	22,059,115	22,385,590	22,716,897
Hillsborough County Total	93,651,697	188,689,439	285,133,740	383,005,416
Tampa Total	21,737,402	43,796,517	66,182,107	88,899,004

Revenue Generated									
2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
24,830,044	25,197,529	25,570,452	25,948,895	26,332,939	26,722,666	27,118,162	27,519,510	27,926,799	28,340,116
5,763,277	5,848,573	5,935,132	6,022,972	6,112,112	6,202,571	6,294,369	6,387,526	6,482,061	6,577,996
120,581,397	145,778,926	171,349,378	197,298,273	223,631,212	250,353,878	277,472,040	304,991,550	332,918,349	361,258,465
27,988,028	33,836,601	39,771,733	45,794,705	51,906,817	58,109,388	64,403,757	70,791,283	77,273,344	83,851,340

Revenue Generated									
2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
49,660,088	50,395,058	51,140,905	51,897,790	52,665,877	53,445,332	54,236,323	55,039,021	55,853,598	56,680,232
11,526,553	11,697,146	11,870,264	12,045,944	12,224,224	12,405,143	12,588,739	12,775,052	12,964,123	13,155,992
241,162,795	291,557,853	342,698,758	394,596,548	447,262,425	500,707,757	554,944,080	609,983,101	665,836,699	722,516,931
55,976,055	67,673,201	79,543,465	91,589,409	103,813,633	116,218,776	128,807,515	141,582,567	154,546,690	167,702,682

Revenue Generated									
2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
74,490,133	75,592,587	76,711,357	77,846,685	78,998,816	80,167,998	81,354,485	82,558,531	83,780,397	85,020,347
17,289,830	17,545,720	17,805,396	18,068,916	18,336,336	18,607,714	18,883,108	19,162,578	19,446,184	19,733,988
361,744,194	437,336,781	514,048,138	591,894,823	670,893,639	751,061,637	832,416,122	914,974,653	998,755,050	1,083,775,397
83,964,083	101,509,803	119,315,199	137,384,115	155,720,451	174,328,165	193,211,273	212,373,851	231,820,035	251,554,023

Revenue Generated									
2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
99,320,177	100,790,116	102,281,809	103,795,580	105,331,755	106,890,665	108,472,646	110,078,042	111,707,197	113,360,463
23,053,107	23,394,293	23,740,528	24,091,888	24,448,448	24,810,285	25,177,477	25,550,104	25,928,246	26,311,984
482,325,593	583,115,709	685,397,518	789,193,098	894,524,853	1,001,415,518	1,109,888,164	1,219,966,206	1,331,673,403	1,445,033,866
111,952,111	135,346,404	159,086,932	183,178,820	207,627,268	232,437,553	257,615,030	283,165,134	309,093,380	335,405,364

2026	2027	2028	2029	2030	2031	2032	2033	2034	2035
28,654,691	28,972,758	29,294,356	29,619,523	29,948,300	30,280,726	30,616,842	30,956,689	31,300,308	31,647,742
6,675,350	6,774,145	6,874,403	6,976,144	7,079,391	7,184,166	7,290,492	7,398,391	7,507,887	7,619,004
389,913,156	418,885,914	448,180,270	477,799,793	507,748,093	538,028,819	568,645,661	599,602,350	630,902,658	662,550,400
90,526,690	97,300,835	104,175,238	111,151,382	118,230,773	125,414,939	132,705,431	140,103,822	147,611,709	155,230,713

2026	2027	2028	2029	2030	2031	2032	2033	2034	2035
57,309,382	57,945,516	58,588,712	59,239,046	59,896,600	60,561,452	61,233,684	61,913,378	62,600,616	63,295,483
13,350,701	13,548,291	13,748,806	13,952,288	14,158,782	14,368,332	14,580,983	14,796,782	15,015,774	15,238,007
779,826,313	837,771,829	896,360,541	955,599,587	1,015,496,187	1,076,057,639	1,137,291,323	1,199,204,701	1,261,805,317	1,325,100,800
181,053,383	194,601,674	208,350,480	222,302,768	236,461,550	250,829,882	265,410,865	280,207,647	295,223,421	310,461,428

2026	2027	2028	2029	2030	2031	2032	2033	2034	2035
85,964,073	86,918,274	87,883,067	88,858,569	89,844,899	90,842,178	91,850,526	92,870,067	93,900,925	94,943,225
20,026,051	20,322,436	20,623,208	20,928,432	21,238,173	21,552,498	21,871,475	22,195,172	22,523,661	22,857,011
1,169,739,470	1,256,657,744	1,344,540,811	1,433,399,380	1,523,244,279	1,614,086,457	1,705,936,983	1,798,807,050	1,892,707,975	1,987,651,200
271,580,074	291,902,510	312,525,718	333,454,150	354,692,323	376,244,821	398,116,296	420,311,468	442,835,129	465,692,140

2026	2027	2028	2029	2030	2031	2032	2033	2034	2035
114,618,764	115,891,033	117,177,423	118,478,092	119,793,199	121,122,904	122,467,368	123,826,756	125,201,233	126,590,966
26,701,401	27,096,582	27,497,611	27,904,576	28,317,564	28,736,664	29,161,966	29,593,563	30,031,548	30,476,015
1,559,652,630	1,675,543,663	1,792,721,086	1,911,199,178	2,030,992,377	2,152,115,281	2,274,582,649	2,398,409,405	2,523,610,638	2,650,201,604
362,106,765	389,203,347	416,700,958	444,605,534	472,923,098	501,659,762	530,821,728	560,415,291	590,446,839	620,922,854

## Alternate methodologies for calculating the value of a one-cent municipal sales tax based on sales tax receipts rather than on the default formula

Courtesy of the MPO Advisory Council Revenue Study 2012 conducted by the Center for Urban Transportation Research.

Description from Brady Sneath:

*Initially I used the 2011 Local Government Handbook estimate for County Local Option Sales Surtax and prorated by population to obtain the values for individual cities. Under this approach, the City of Tampa's estimated value was calculated to be \$53.8 million for LFY 2013.  $(\$183.1 / 1,229,226 \times 335,709) * 1.076 = \$53.8$ . (The 2011 Local Government Handbook forecasts a 7.6% increase in sales tax collections for 2013.)*

*This approach was problematic as it did not reflect different rates in sales tax collections for municipalities compared to their respective counties, particularly for cities such as Orlando, where County collections are significantly higher (Disney, Universal, etc.).*

*As a result, I used 2002 retail sales for Cities > 50,000, Counties and States from the US Census Bureau as a starting point. I first calculated the City of Tampa's 2002 share of State retail sales (2.68%) and then adjusted this data to reflect changes in population to 2010. Since between 2002 and 2010, the City of Tampa grew 6% more slowly than the State, the percentage of State retail sales attributable to the City of Tampa was adjusted downward 6% to 2.52%. I then applied this percentage to the 2011 Local Government Handbook Statewide Total for Local Option Sales Surtax estimate (\$2,703.6 million) and then increased this amount by 7.6% to generate a LFY 2013 estimate.*

*$(\$2,703.6 * .00252) * 1.076 = \$73.3$  million*

*Since the time of my analysis, the US Census Bureau has updated their files to reflect 2007 retail sales. In 2007, City of Tampa's sales were 2.51% of Florida's total.*

*I hope this explains the methodology used to estimate the value of the municipal sales tax option. I understand the revised methodology does not adjust for relative changes in retail sales between the city and county that may have occurred other than due to population or for relative changes in retail sales per capita for Tampa compared to the State. It appeared to be the most reasonable methodology that could be applied statewide to develop approximate estimates.*

<b>Methodology calculations for Hillsborough County</b>				
	<b>2010 Population</b>	<b>Population % Share</b>	<b>Default Formula Shares*</b>	<b>Difference</b>
Unincorporated Area	834,255	67.9%	73.5%	5.7%
Incorporated Areas	394,971	32.1%		
Tampa	335,709	27.3%	22.5%	-4.8%
Plant City	34,721	2.8%	2.3%	-0.5%
Temple Terrace	24,541	2.0%	1.6%	-0.4%
Total	1,229,226	100.0%	100.0%	0.0%
County + 2/3 Incorporated	1,492,540			

\* Based on Default Formula (Section 218.62, F.S.)

218.62 Distribution formulas.—

- (1) Each participating county and municipal government shall receive a proportion of moneys earmarked for distribution within that county.
- (2) The proportion for each county government shall be computed by dividing the sum of the unincorporated area population plus two-thirds of the incorporated area population by the sum of the total county population plus two-thirds of the incorporated area population.
- (3) The proportion for each municipal government shall be computed by dividing the population of that municipality by the sum of the total county population plus two-thirds of the incorporated area population.
- (4) Effective October 1, 2000, the apportionment factors shall, except in the case of error in the population certified pursuant to s. 186.901, remain in effect for the fiscal year. Adjustments to distributions to correct errors shall be made subsequent to receipt of a corrected population certified pursuant to s. 186.901.

History.—s. 10, ch. 82-154; s. 1, ch. 2003-33.

Peer Diesel Multiple Unit (DMU) and Commuter Rail Transit (CRT) Systems Cost Summary

Project	State	Mode	Status	Cap Cost			Miles	Constr. Cost/Mile (\$M)	Cost Date
				Const	ROW*	Rolling Stock			
Sonoma-Marina Area Rail Transit (SMART)	CA	DMU						\$10.0	2011
Sunrail	FL	CRT	FFGA**	\$ 615.0			61.5	\$10.0	2007
Sunrail initial operating segment	FL	CRT	FFGA	\$ 357.2			32	\$11.2	2008
Austin Red Line	TX	DMU	Completed	\$ 140.0			32	\$4.4	2010
Weber County to Salt Lake City	UT	CRT	FFGA	\$ 611.7			44	\$13.9	2008
Denver Gold Line	CO	EMU		\$ 840.3			10.8	\$77.8	2009
Eagle Commuter Rail (Denver)	CO	EMU	Final Design	\$ 2,043.1			30.2	\$67.7	2010
Denton to North Carrollton A-Train (Dallas)	TX	DMU	In Constr.	\$ 239.5	\$ 31.0	\$ 78.0	21	\$11.4	2011
Northstar (Big Lake to Minneapolis)	MN	CRT	Completed	\$ 151.0	\$ 100.0	\$ 66.0	40	\$3.8	2009?
Westside Express Service (Portland)	OR	DMU	Completed	\$146.0		\$ 15.0	14.7	\$9.9	2008
eBART (East Contra Costa to Oakland)	CA	DMU			\$523		10	\$52.3	2011
Tri-Rail Double Track (W. Palm to Miami)	FL	CRT	Completed	\$ 333.9			44.3	\$7.5	2005
Wilsonville to Beaverton Commuter Rail	OR	DMU	Final Design		\$104.10		14.7	\$7.1	2006
Lebanon to Nashville Commuter Rail	TN	CRT	Completed	\$ 39.0			32	\$1.2	2005

\* Or track rights

\*\* FFGA - Full Funding Grant Agreement