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Pacific Electric ROW/West Santa Ana Branch Alternatives Analysis

Travel Demand Modeling Report

Final

March 2012

AECOM

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ABBREVIATIONS / ACRONYMS

AA.....Alternatives Analysis
AVTA.....Antelope Valley Transit Authority
BRT .....Bus Rapid Transit
Caltrans .....California Department of Transportation
CEI .....Cost Effectiveness Index
CBD.....Central Business District
CEQA .....California Environmental Quality Act
CRT .....Commuter Rail Transit
EIR .....Environmental Impact Report
EIS.....Environmental Impact Statement
FTA .....Federal Transit Administration
HBO .....Home-Based Other
HBW .....Home-Based Work
HBU .....Home-Based University
HOV .....High-Occupancy Vehicle
KNR.....Kiss-And-Ride
LADOT .....Los Angeles Department of Transportation
LAUS .....Los Angeles Union Station
LAWA.....Los Angeles World Airports
LAX .....Los Angeles International Airport
LRT.....Light Rail Transit
LRTP.....Long Range Transportation Plan
MAX.....Municipal Area Express
Metro .....Los Angeles County Metropolitan Transportation Authority
Mi .....Miles
Min .....Minutes
MPH .....Miles per Hour
NEPA.....National Environmental Policy Act
NHB .....Non-Home Based
OCTA .....Orange County Transportation Authority
O&M.....Operations and Maintenance
OP.....Off-Peak
PK .....Peak
PNR.....Park-And-Ride
ROW .....Right-of-Way
RTC .....Regional Transit Center
SCAG.....Southern California Association of Governments
SOV.....Single Occupancy Vehicle
SPR .....Self-Propelled Railcar
TAZ .....Traffic Analysis Zone
TSM .....Transportation Systems Management

1. INTRODUCTION

This document summarizes the results of the patronage forecasting effort for the Pacific Electric ROW/West Santa Ana Branch (PEROW/WSAB) Alternatives Analysis (AA). These forecasts have been prepared using the most recent version of the Los Angeles County Metro Transportation Authority's Transportation Model validated to corridor conditions.

Several alternatives along the 33 mile PEROW/WSAB corridor were evaluated to study the impact of technology adopted, station locations and alignment on the ridership of the proposed project.

Following this introduction, this report is organized in the following sections:

- Model Validation
- Travel Demand Model Results
- Cost Effectiveness Index
- Summary and Conclusions
- Appendices

2. MODEL VALIDATION

The ridership and mobility benefit forecasts for the Pacific Electric ROW/West Santa Ana Branch (PEROW/WSAB) Alternatives Analysis are based on the latest version of the Metro Transportation Analysis Model. This model is generally consistent with current Federal Transit Authority (FTA) guidance related to transit New Starts forecasting.

The LACMTA model was selected as the preferred model for the AA effort over two other possible choices of model for this study the Southern California Association of Governments (SCAG) regional travel demand model, and the Orange County Transportation Authority (OCTA) Transportation Analysis Model (OCTAM). The LACMTA Model was chosen because it includes the entire study corridor, and is the only one of the three candidate models that has already been reviewed by the FTA for use in Section 5309 New Starts forecasts.

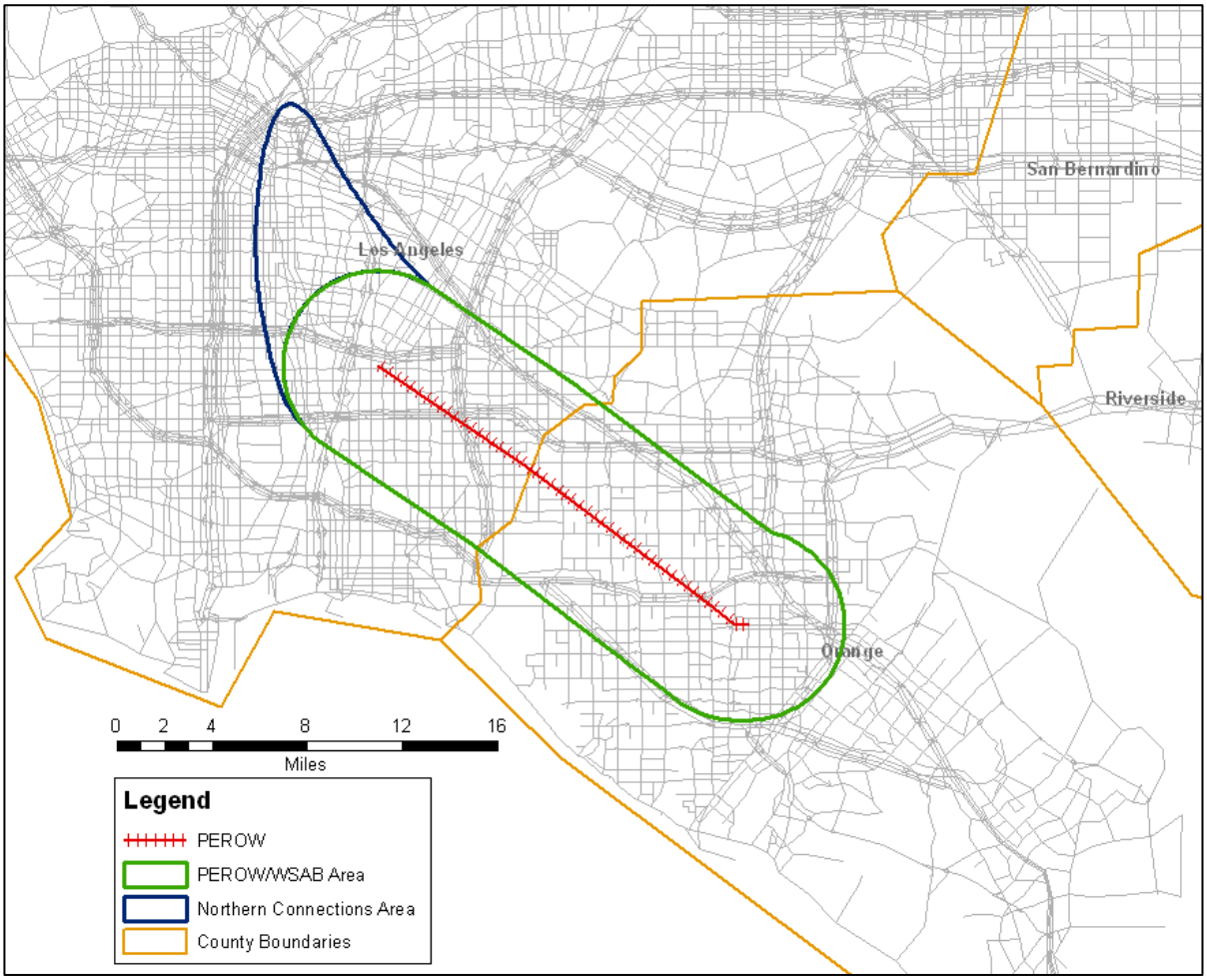
The LACMTA Model is designed to forecast travel demand for highways and transit systems in Los Angeles County, but covers the entire SCAG region from Ventura County in the west to Imperial County in the southeast. It is consistent with SCAG socioeconomic and transportation network data with additional detail in Los Angeles County. It has recently been updated for use in supporting FTA transit New Starts and Measure "R" projects in Los Angeles County. The updated LACMTA model was reviewed by FTA staff in the summer of 2009, and the model structure, calibration, and validation were found to be acceptable. Please note, however, that FTA staff do not formally approve models, they only approve the resulting forecasts.

The performance of the transit model was calibrated and validated by PB Americas by comparing transit boardings from the observed boarding data for the calibration year of 2001 and by comparing district-to-district transit flows to data obtained from the regional on-board survey. The model was also validated to year 2006 conditions to make sure Orange Line Bus Rapid Transit service, opened in 2005, is properly represented.

For the purposes of the PEROW/WSAB AA Study, the LACMTA was re-validated to ensure that it replicates observed travel patterns in the specific markets in the PEROW/WSAB Corridor. The validation involved comparing aspects of the model to available empirical information such as observed transit ridership and transit travel times. The validated model was then used to forecast ridership and user benefits fir various alternatives.

The Corridor is defined as comprising two study areas: the "PEROW/WSAB Area" and a "Northern Connections Area" as shown in Figure 2.1. The PEROW/WSAB Area has a boundary defined as four miles from the PEROW/WSAB right-of-way. The Northern Connections Area extends north from the former railroad right-of-way to incorporate connections to Downtown Los Angeles and Union Station.

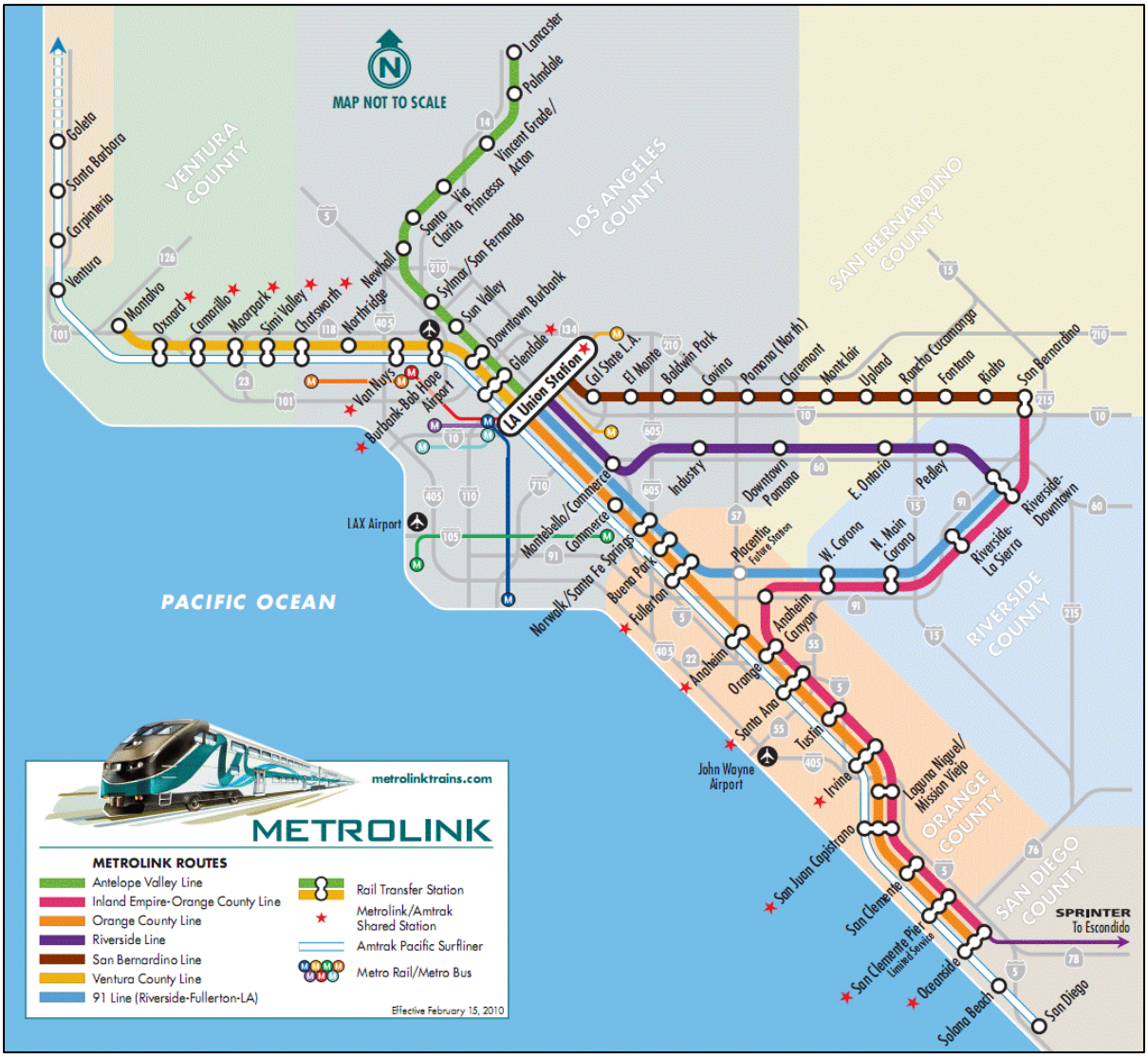
Figure 2.1 – Pacific Electric ROW/West Santa Ana Branch and Northern Connections Areas



2.1. TRANSIT ROUTES SELECTED FOR VALIDATION

In the Corridor Study Area, there are multiple transit operators. LACMTA operates bus and light rail services, mostly in the northwestern part of the study area. OCTA operates buses in Orange County, and various municipal operators and cities run services in and around the study area. Metrolink operates commuter rail services throughout the Los Angeles Metro area and Orange County; and three Metrolink lines run through the study area. These are the Orange County, the Inland Empire-Orange County, and the 91 lines and are shown in the Metrolink service map presented below in Figure 2.2.

Figure 2.2 - Metrolink Service Map



For the travel demand model validation effort, the following data were available:

- 2001 Metro On-Board survey (includes line level daily boardings for bus and rail);
- 2001-2008 System Level Metro Boardings data (includes bus and rail);
- 2007 OCTA line level daily boardings;
- SCAG 2003 Post-Census Regional Household Travel Survey;
- 2008 Metrolink line level daily passenger counts; and
- Bus travel times from 2010 timetables for MTA and OCTA buses.

In order to calculate observed 2006 boardings for Metro bus services, a 2001 to 2006 growth factor was derived from the 2001-2008 system level data and applied to the 2001 line level data. The growth factor was 1.09.

The 2001 Metro and 2007 OCTA data sets include counts for many of the bus routes operating in the Corridor Study Area, but the counts were not split by time period (peak/off-peak). However, the household survey trip data did provide details of time of day and mode of travel. Analysis of this data provided the proportion of trips in the peak and off-peak periods for buses operating in the study area, which is shown in Table 2.1.

Table 2.1 - Proportion of Transit Travel in Peak and Off-Peak Periods

	Entire MTA Model Area		PEROW/WSAB Area	
Time	Transit Trips	Proportion	Transit Trips	Proportion
Peak	573,672	60%	62,851	65%
Off-Peak	386,906	40%	34,059	35%
Total Daily	**960,579**	**100%**	**96,910**	**100%**

Source: SCAG 2003 Post-Census Regional Household Travel Survey

Tables 2.2 and 2.3 show bus services in the PEROW/WSAB and Northern Connections study areas for which reliable count data was available. A service was considered to operate within the study area if approximately 10% or more of the route is within the boundaries shown in Figure 2.1.

Table 2.2 - PEROW/WSAB Area Bus Services Included in Validation

Operator	Route	Description
MTA	60	Downtown LA – Artesia Station via Long Beach Blvd.
MTA	111	Norwalk to LAX City Bus Center via Florence Ave.
MTA	117	LAX City Bus Center - Downey via Century Blvd., 103rd St., Tweedy Blvd. & Imperial
MTA	127	Compton Station - Downey via Compton Blvd. & Somerset Blvd.
MTA	202	Willowbrook - Compton – Wilmington
MTA	265	Pico Rivera - Lakewood Center Mall via Paramount Blvd.
OCTA	21	Fullerton - Huntington Beach via Valley View St./Bolsa Chica Rd.
OCTA	25	Fullerton - Huntington Beach via Knott Ave./Goldenwest St.
OCTA	29	La Habra - Huntington Beach via Beach Blvd.
OCTA	33	Fullerton - Huntington Beach via Magnolia St.
OCTA	35	Fullerton - Huntington Beach via Brookhurst St.
OCTA	37	La Habra - Fountain Valley via Euclid St.
OCTA	43	Fullerton - Costa Mesa via Harbor Blvd.
OCTA	46	Los Alamitos - Orange via Ball Rd./Taft Ave.
OCTA	47	Fullerton - Newport Beach via Anaheim Blvd./Fairview St.
OCTA	50	Long Beach - Orange via Katella Ave.
OCTA	51	Santa Ana - Costa Mesa via Flower St.
OCTA	53	Orange - Irvine via Main St.
OCTA	54	Garden Grove - Orange via Chapman Ave.
OCTA	70	Sunset Beach - Tustin via Edinger Ave.
OCTA	71	Yorba Linda - Balboa via Tustin Ave./Red Hill Ave./Newport Blvd.
OCTA	72	Sunset Beach - Tustin via Warner Ave.
OCTA	76	Huntington Beach - Newport Beach via Talbert Ave./MacArthur Blvd.

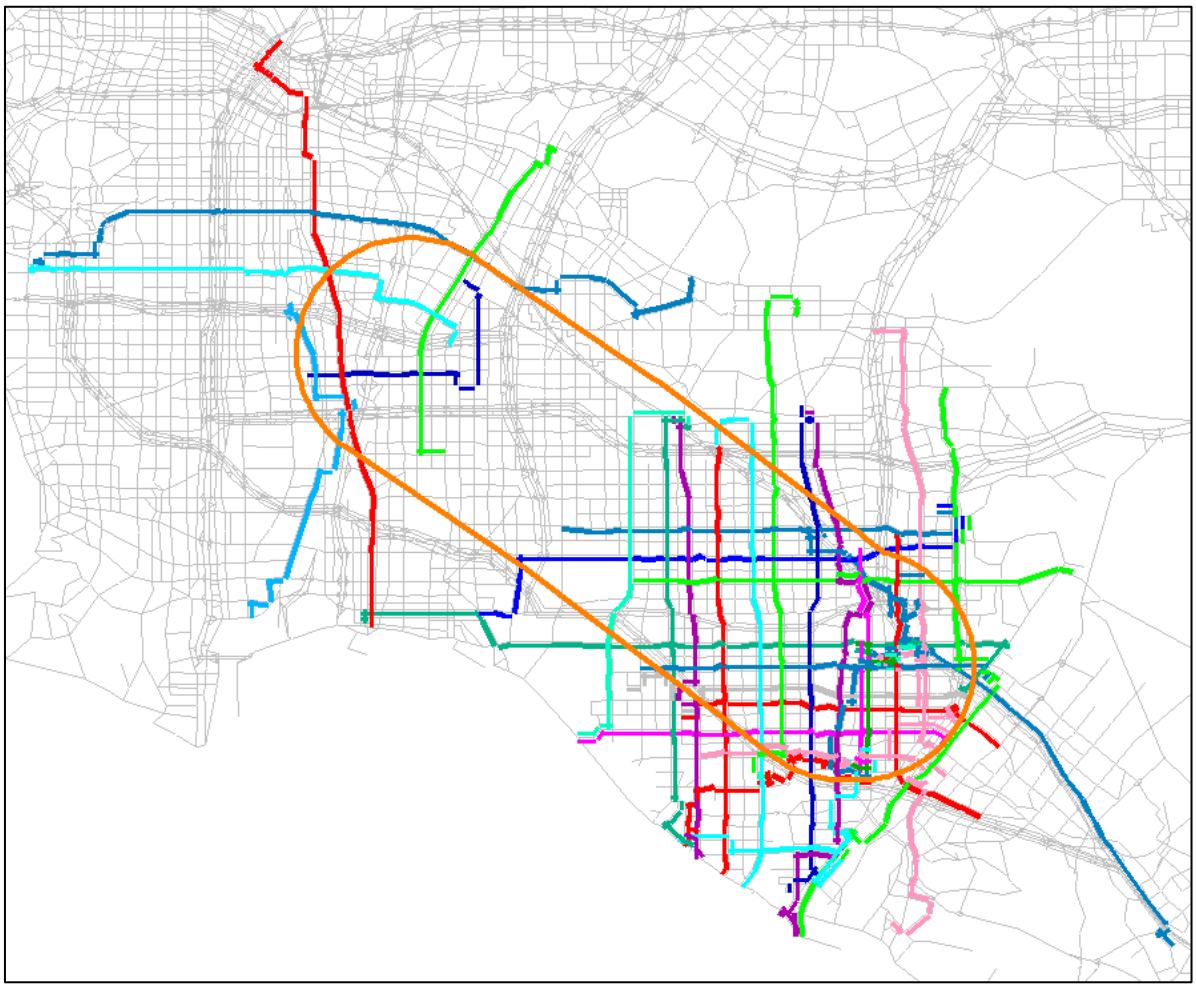
Operator	Route	Description
OCTA	83	Anaheim - Laguna Hills via 5 Fwy/Main St.
OCTA	145	Santa Ana - Costa Mesa via Raitt St./Greenville St./Fairview St.
OCTA	172	Huntington Beach - Costa Mesa via Main St.
OCTA	173	Huntington Beach - Costa Mesa via Atlanta Ave.
OCTA	453	Orange Transportation Center - St. Joseph's Hospital
OCTA	462	The Depot at Santa Ana - Civic Center via Santa Ana Blvd./Civic Center Dr.
OCTA	463	The Depot at Santa Ana - Hutton Centre via Grand Ave.
OCTA	55	Santa Ana - Newport Beach via Standard Ave./Bristol St./Fairview St./ 17th St.
OCTA	56	Garden Grove - Orange via Garden Grove Blvd.
OCTA	57	Brea - Newport Beach via State College Blvd./Bristol St.
OCTA	59	Anaheim - Irvine via Kraemer Blvd./Glassell St./Grand Ave./Von Karman Ave.
OCTA	60	Long Beach - Tustin via Westminster Ave./17th St.
OCTA	64	Huntington Beach - Tustin via Bolsa Ave./1st St.
OCTA	66	Huntington Beach - Irvine via McFadden Ave./Walnut Ave.

Table 2.3 - Northern Connections Area Bus Services Included in Validation

Operator	Route	Description
MTA	42	LAX - Downtown LA via LAX City Bus Center, LaTijera Bl, Stocker St & M.L.King Blvd.
MTA	65	Washington, CSULA
MTA	66	Wilshire Center - Montebello via 8th St & Olympic Blvd.
MTA	70	Los Angeles – El Monte via Marengo St & Garvey Av.
MTA	76	El Monte – Downtown LA via Valley Blvd.
MTA	78	Arcadia - Los Angeles via Huntington Dr & Las Tunas Dr.
MTA	102	Baldwin Village - South Gate via Coliseum St.
MTA	107	Huntington Park – Inglewood
MTA	108	Marina Del Rey to Pico Rivera via Slauson Ave.
MTA	110	Playa Vista - Bell Gardens via Jefferson Blvd. - Gage Ave.
MTA	124	El Segundo – Willowbrook
MTA	250	LAC USC Medical Center - Olympic/Boyle
MTA	251	Cypress Park - Lynwood via Soto St.
MTA	259	El Sereno - South Gate
MTA	305	UCLA - Willowbrook via Sunset, San Vicente & Western
MTA	605	Grande Vista Ave.- Boyle Heights - LA County + USC Medical Center
MTA	620	Boyle Heights via Cesar Chavez Ave & State St.
MTA	111	Norwalk to LAX City Bus Center via Florence Ave.
MTA	720	Santa Monica - Commerce via Wilshire Blvd. & Whittier Blvd.
MTA	760	Downtown LA – Artesia Station via Long Beach Blvd.
MTA	487	El Monte - Downtown LA | Temple City - Downtown LA
MTA	489	El Monte - Downtown LA | Temple City - Downtown LA
MTA	490	Venice/Flower - Diamond Bar

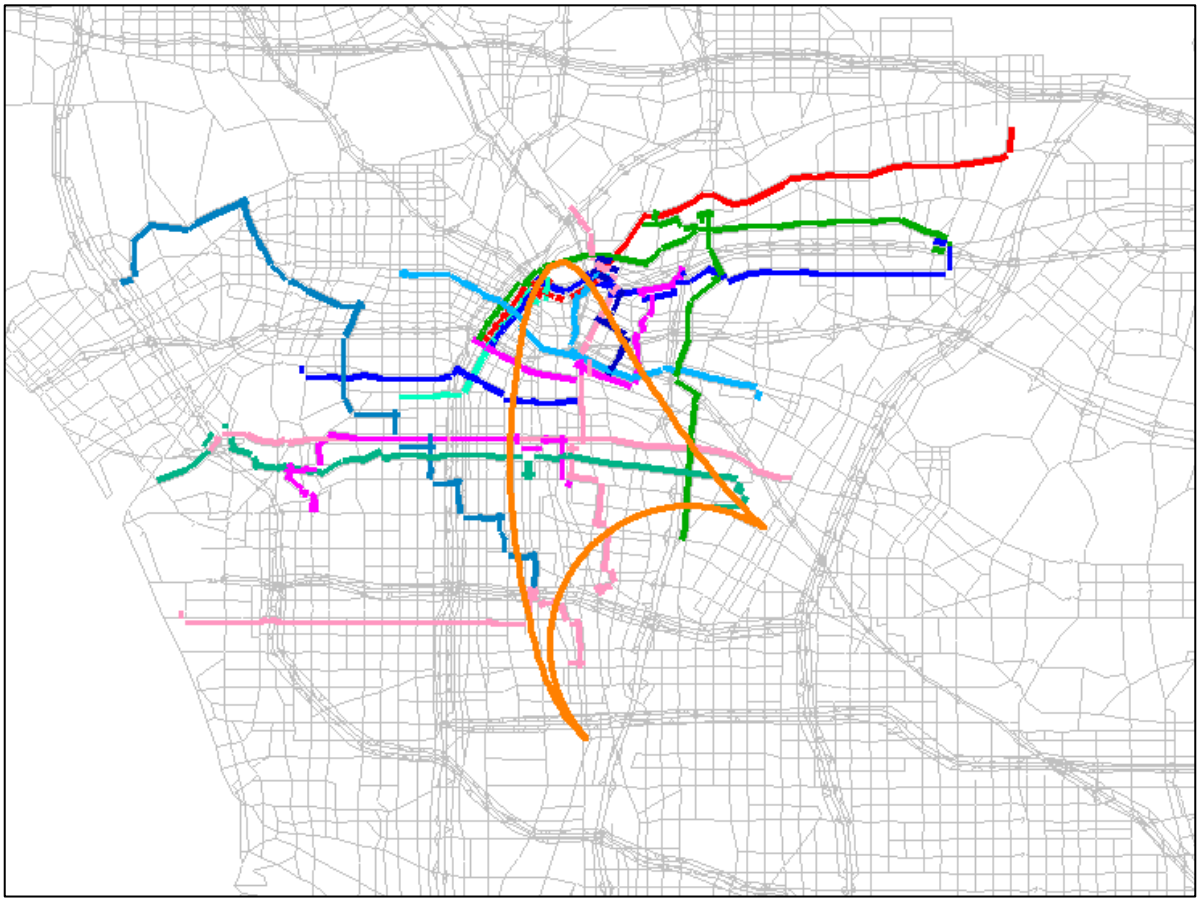
Timetables for bus services operating in the study area were obtained from MTA and OCTA's websites. The timetables provide the expected travel times for services by route and time of day. The timetables used are for 2010 bus services and provide a reasonable indication of travel time in 2006.

Figure 2.3 - PEROW/WSAB Area Validation Bus Routes



PEROW/WSAB area boundary shown in orange

Figure 2.4 - Northern Connections Area Validation Bus Routes



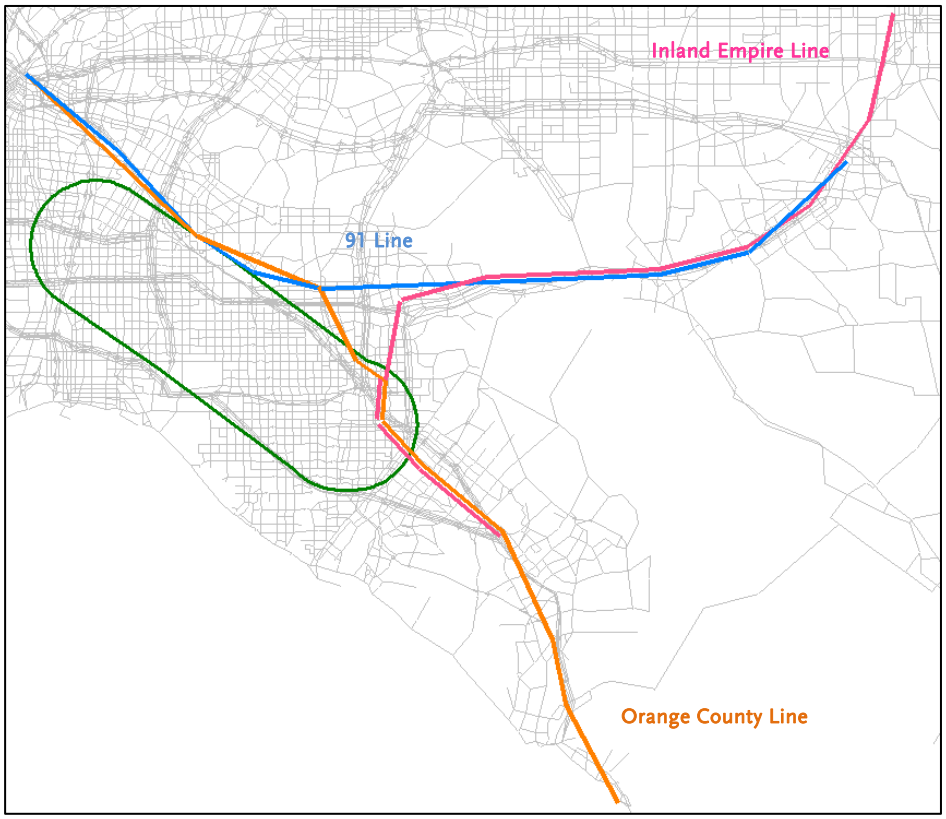
Northern Connection area boundary shown in orange

The Metrolink survey dataset includes passenger counts for trains that operate between Los Angeles County, Orange County and Riverside County. The Metrolink lines included in the model validation are described in Table 2.4 and the location of these lines in relation to the PEROW/WSAB Area is shown in Figure 2.5. The Metrolink survey data records are split by time period.

Table 2.4 - Metrolink Commuter Rail Lines Included in Validation

Operator	Line	Description
Metrolink	Orange County Line	LA Union Station to Oceanside
Metrolink	Inland Empire Line	LA Union Station to Riverside-Downtown
Metrolink	91 Line	San Bernardino to Oceanside

Figure 2.5 - Metrolink Lines Included in Validation

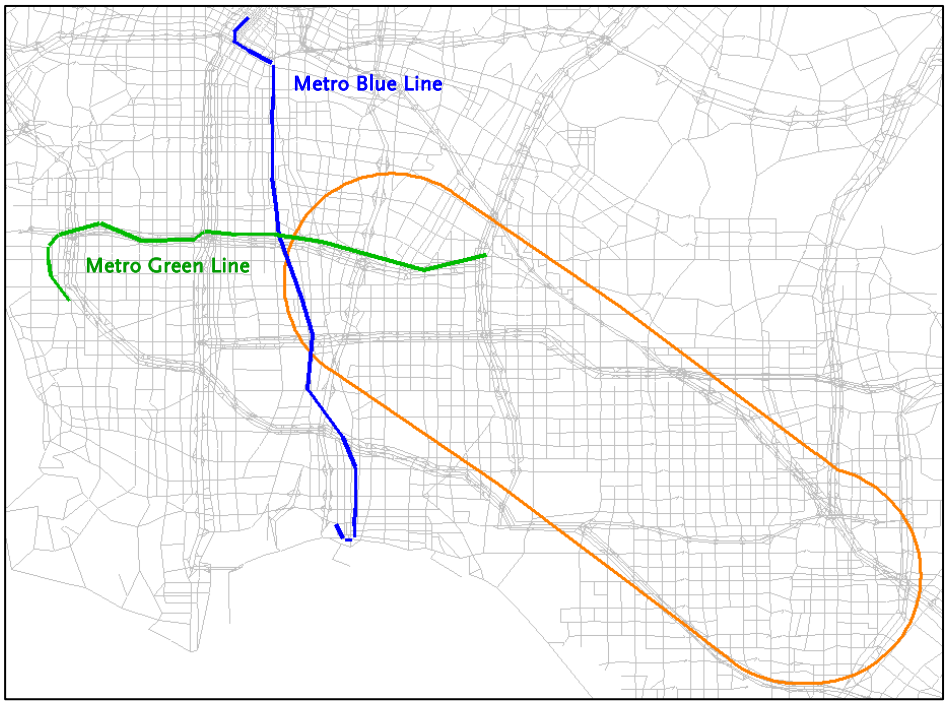


Two Metro Rail lines operate in the primary study area, as described in Table 2.5 and shown in Figure 2.6. Ridership data, by time period, was available for both lines.

Table 2.5 - Metro Rail Lines Included in Validation

Operator	Line	Description
Metro Rail	Green Line	Norwalk to Redondo Beach
Metro Rail	Blue Line	Downtown LA to Long Beach

Figure 2.6 - Metro Rail Lines Included in Validation



PEROW/WSAB area boundary shown in orange

2.2. HIGHWAY NETWORK MODIFICATIONS

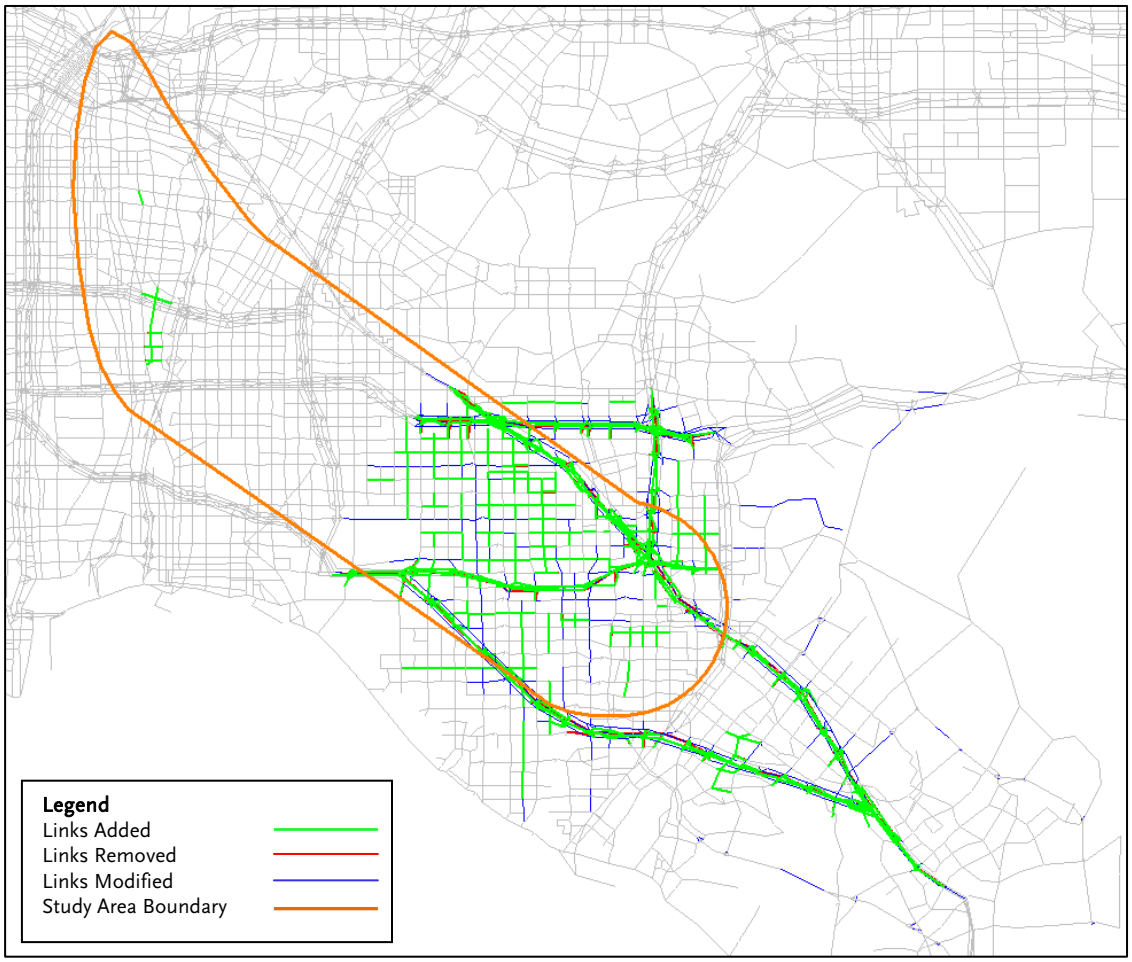
The LACMTA Model includes the entire PEROWWSAB ROW corridor, but the highway network for Orange County was not coded to a high enough level of detail to allow accurate coding of bus routes. The highway network for the Corridor Study Area was reviewed for accuracy, by comparing it with the Orange County Transportation Analysis Model (OCTAM). This analysis showed that several key arterial highway routes were not included in the model network. Insufficient network detail may have a detrimental effect on the model's ability to represent both auto and transit trips in the area. To resolve this issue, the highway network in the study area was enhanced and bus routes re-coded accordingly. Links added, removed and modified are shown in Figure 2.7.

The TAZ system was not modified as the size of TAZs in the study area were deemed suitable for this type of project and reasonable validation results were achieved.

The model process includes initial highway assignments which provide congested travel time and distance skims for mode choice calculations. As described above, the highway network was modified, so it was necessary to update the initial assignments using the new network.

Bus travel times on the new highway network were compared against the equivalent times from the original model to check that the highway network updates had not significantly impacted bus travel times. No significant changes to bus travel times were observed, and the overall change in transit travel time for all lines was approximately 0.1%.

Figure 2.7 - 2006 Base Model Highway Network Modifications



2.3. TRANSIT NETWORK MODIFICATIONS

In addition to the improvements to the highway network, the model's transit network was also updated to better represent the actual system. Approximately 40 bus routes were added, one service was removed, and approximately 30 services were modified, either due to incorrect coding or updates related to the highway network changes. The bus route modifications are listed in Tables 2.6 through 2.8.

Table 2.6 - Bus Route Modifications – PEROW/WSAB Area

Operator	Route	Change
OCTA	83	Added
OCTA	90	Added
OCTA	453	Added
OCTA	472	Added
OCTA	473	Added
OCTA	758	Added
OCTA	794	Added
MTA	127	Made consistent with timetable
MTA	128	Made consistent with timetable
MTA	130	Made consistent with timetable
MTA	251	Made consistent with timetable
MTA	252	Made consistent with timetable
MTA	258	Extended
MTA	715	Added
MTA	760	Added
MTA	762	Added
City of Paramount	Easy Rider	Added
City of Long Beach	52	Added
City of Long Beach	63	Added
City of Long Beach	23	Added
City of Bell Gardens	Fixed Route	Added
Compton Renaissance	COM1	Added
Compton Renaissance	COM2	Added
Compton Renaissance	COM3	Added
Compton Renaissance	COM4	Added
Compton Renaissance	COM5	Added
Downey Link	Northeast Route	Added
Downey Link	Southeast Route	Added
Downey Link	Northwest Route	Added
Downey Link	Southwest Route	Added
City of Norwalk	8	Added (2006)

Source: PEROW- Project Work Task and Network Data Update/Revision Summary Memorandum, Iteris, July 2010

Table 2.7 - Bus Route Modifications – Northern Connections Area

Operator	Route	Change
MTA	26	Extended
MTA	31	Delete
MTA	35	Added
MTA	38	Split from Route 71
MTA	71	Split from Route 38
MTA	207	Extended
MTA	335	Added
MTA	450	Added
MTA	620	Added
MTA	665	Added (2006)
MTA	704	Added (2006); Extended (2035)
MTA	714	Added (2035)
MTA	728	Added (2006)
MTA	730	Made 2-Way
MTA	740	Added (2035)
MTA	753	Added (2006)
MTA	770	Added
City of Montebello	M341	EB Added
Santa Clarita Transit	SC794	Changed to NB in AM, SB in MD
Foothill Transit	FT481	Terminate at El Monte Metro
Foothill Transit	SLVR STRK	Added
Huntington Park	COMBI	Added

Source: PEROW- Project Work Task and Network Data Update/Revision Summary Memorandum, Iteris, July 2010

Table 2.8 - Bus Route Modifications Due to Highway Network Changes

Operator	Route	Change
OCTA	83 NB	Highway network modifications
OCTA	83 SB	Highway network modifications
OCTA	205 SB	Highway network modifications
OCTA	205 NB	Highway network modifications
OCTA	206 SB	Highway network modifications
OCTA	211 EB	Highway network modifications
OCTA	212 NB	Highway network modifications
OCTA	216 NB	Highway network modifications
OCTA	460 SB	Highway network modifications
OCTA	460 NB	Highway network modifications
OCTA	464 SB	Highway network modifications
OCTA	701 NB	Highway network modifications
OCTA	721 SB	Highway network modifications
OCTA	721 NB	Highway network modifications
OCTA	757 SB	Highway network modifications
OCTA	758 NB	Highway network modifications
OCTA	758 SB	Highway network modifications

Source: PEROW- Project Work Task and Network Data Update/Revision Summary Memorandum, Iteris, July 2010

2.4. Initial Model Run

Following the network updates, an initial model run was performed (referred to as the "Run with Network Modifications" for the remainder of this memorandum) to assess the impact of the model updates. Assigned transit boardings were compared with surveys and the bus travel times were compared with current timetables. The run with network modifications was compared with the original LACMTA model 2006 calibration.

Trip table summaries are also provided in this section. The summaries show the total person trips for each of the four modeled trip purposes, followed by a comparison of observed and modeled Home-based Work (HBW) transit trips.

In these summaries, TAZ level production to attraction trips have been aggregated into five districts:

- **LA County Non-PSA** - TAZs in Los Angeles County that are not in the "Project Study Area" (PSA);
- **Orange County Non-PSA** - TAZs in Orange County that are not in the PSA;
- **LA County PSA** - TAZs in Los Angeles County that lie fully or partly within the PSA;
- **Orange County PSA** - TAZs in Orange County that lie fully or partly within the PSA;
- **Other** - All other TAZs in the model (San Bernardino County, Riverside County, etc).

Total person trip summaries are provided in Table 2.9 through Table 2.12. The trip purposes are HBW, Home-based Other (HBO), Non Home-based (NHB), and Home-based University (HBU).

Table 2.9 - 2006 HBW Average Weekday Person Trips

Production\Attraction Area	LA County Non-PSA	Orange County Non-PSA	LA County PSA	Orange County PSA	Other	Total
LA County Non-PSA	4,517,078	105,756	208,629	73,028	132,245	**5,036,736**
Orange County Non-PSA	128,708	755,427	30,588	244,373	21,759	**1,180,854**
LA County PSA	259,270	32,594	144,419	32,890	4,599	**473,771**
Orange County PSA	71,264	256,737	27,005	260,027	8,704	**623,736**
Other	306,119	85,629	19,522	42,353	1,905,089	**2,358,712**
Total	**5,282,439**	**1,236,142**	**430,162**	**652,671**	**2,072,395**	**9,673,809**

Table 2.10 - 2006 HBO Average Weekday Person Trips

Production\Attraction Area	LA County Non-PSA	Orange County Non-PSA	LA County PSA	Orange County PSA	Other	Total
LA County Non-PSA	13,621,831	150,773	387,272	99,324	240,188	**14,499,388**
Orange County Non-PSA	160,751	2,883,015	48,108	470,334	45,817	**3,608,025**
LA County PSA	471,941	43,513	835,140	71,809	4,001	**1,426,404**
Orange County PSA	108,362	366,264	69,235	1,146,428	8,611	**1,698,900**
Other	407,601	64,919	8,719	25,546	6,905,190	**7,411,975**
Total	**14,770,486**	**3,508,484**	**1,348,474**	**1,813,441**	**7,203,807**	**28,644,692**

Table 2.11 - 2006 NHB Average Weekday Person Trips

Production\Attraction Area	LA County Non-PSA	Orange County Non-PSA	LA County PSA	Orange County PSA	Other	Total
LA County Non-PSA	9,194,921	136,004	303,908	102,806	213,413	**9,951,052**
Orange County Non-PSA	154,058	1,732,380	48,731	335,439	41,836	**2,312,444**
LA County PSA	312,612	44,207	377,955	61,580	5,167	**801,521**
Orange County PSA	111,414	328,579	64,543	647,789	14,426	**1,166,751**
Other	249,260	45,758	7,029	17,449	4,340,934	**4,660,430**
Total	**10,022,265**	**2,286,928**	**802,166**	**1,165,063**	**4,615,776**	**18,892,198**

Table 2.12 - 2006 HBU Average Weekday Person Trips

Production\Attraction Area	LA County Non-PSA	Orange County Non-PSA	LA County PSA	Orange County PSA	Other	Total
LA County Non-PSA	895,956	18,308	9,503	2,000	4,307	**930,074**
Orange County Non-PSA	9,619	163,960	491	8,193	64	**182,327**
LA County PSA	58,064	4,820	41,792	3,025	12	**107,713**
Orange County PSA	17,962	62,363	1,856	48,144	13	**130,338**
Other	47,719	24,711	317	862	352,611	**426,220**
Total	**1,029,320**	**274,162**	**53,959**	**62,224**	**357,007**	**1,776,672**

Table 2.13 shows total HBW person trips in the year 2000 US Census Transportation Planning Package (CTPP) travel to work data set, adjusted to match the model 2006 HBW person trips total. Table 2.14 shows the difference between the CTPP HBW person trips and the model run with network modifications.

Table 2.13 - 2000 CTPP HBW Average Weekday Person Trips

Production\Attraction Area	LA County Non-PSA	Orange County Non-PSA	LA County PSA	Orange County PSA	Other	Total
LA County Non-PSA	4,571,784	106,068	211,379	71,917	118,978	**5,080,126**
Orange County Non-PSA	138,004	786,323	35,089	256,197	23,348	**1,238,960**
LA County PSA	262,260	32,282	151,962	31,963	4,871	**483,339**
Orange County PSA	76,309	262,527	30,332	269,531	9,281	**647,980**
Other	307,202	81,472	20,045	41,450	1,773,236	**2,223,405**
Total	**5,355,559**	**1,268,672**	**448,806**	**671,058**	**1,929,714**	**9,673,809**

Table 2.14 - Difference in HBW Average Weekday Person Trips - Run with Network Modifications vs CTPP Observed

Production\Attraction Area	LA County Non-PSA	Orange County Non-PSA	LA County PSA	Orange County PSA	Other	Total
LA County Non-PSA	-54,706	-312	-2,750	1,111	13,267	**-43,390**
Orange County Non-PSA	-9,295	-30,896	-4,501	-11,824	-1,590	**-58,106**
LA County PSA	-2,991	311	-7,543	927	-271	**-9,567**
Orange County PSA	-5,045	-5,790	-3,327	-9,504	-577	**-24,244**
Other	-1,083	4,157	-523	903	131,853	**135,307**
Total	**-73,120**	**-32,530**	**-18,644**	**-18,387**	**142,681**	**0**

Table 2.15 shows the number of daily HBW transit trips according to year 2000 US Census CTPP data. This data has been scaled so that the region-wide trip total is the same as the model. Table 2.16 shows the number of HBW transit trips in the Original LACMTA Model and Table 2.17 shows the number of HBW transit trips after the network modifications described in the previous section were applied.

Table 2.15 - CTPP HBW Average Weekday Transit Trips

Production\Attraction Area	LA County Non-PSA	Orange County Non-PSA	LA County PSA	Orange County PSA	Other	Total
LA County Non-PSA	529,359	348	7,183	185	1,088	**538,163**
Orange County Non-PSA	813	29,602	45	9,544	0	**40,004**
LA County PSA	14,153	101	9,611	510	0	**24,376**
Orange County PSA	1,301	24,634	179	38,641	0	**64,755**
Other	8,591	550	0	662	56,658	**66,460**
Total	**554,217**	**55,234**	**17,019**	**49,542**	**57,746**	**733,758**

Table 2.16 - Original LACMTA Model HBW Average Weekday Transit Trips

Production\Attraction Area	LA County Non-PSA	Orange County Non-PSA	LA County PSA	Orange County PSA	Other	Total
LA County Non-PSA	511,741	4,598	20,909	4,216	5,180	**546,643**
Orange County Non-PSA	6,922	21,883	731	11,400	205	**41,141**
LA County PSA	22,433	1,005	9,056	1,320	137	**33,951**
Orange County PSA	4,553	18,088	1,025	22,876	95	**46,637**
Other	14,920	2,015	501	1,890	24,386	**43,712**
Total	**560,568**	**47,588**	**32,222**	**41,703**	**30,003**	**712,084**

Table 2.17 - Run with Network Modifications HBW Average Weekday Transit Trips

Production\Attraction Area	LA County Non-PSA	Orange County Non-PSA	LA County PSA	Orange County PSA	Other	Total
LA County Non-PSA	520,624	4,550	21,925	4,255	5,287	**556,641**
Orange County Non-PSA	7,898	22,359	742	11,732	226	**42,956**
LA County PSA	23,958	1,068	9,171	1,352	152	**35,701**
Orange County PSA	5,231	18,379	994	22,635	157	**47,396**
Other	19,061	3,218	813	2,906	25,065	**51,064**
Total	**576,772**	**49,573**	**33,645**	**42,880**	**30,888**	**733,758**

A comparison of the Table 2.16 and Table 2.17 trip totals shows that the network modifications have caused an increase in transit trips. This is not unexpected, since numerous bus routes have been added or modified, increasing the attractiveness of transit for some travelers.

The absolute difference between the model run with network modifications and the CTPP trips is shown in Table 2.18. This shows that the model does not replicate the 2000 CTPP trip patterns perfectly, but the scale of trips to/from each area is generally appropriate.

Table 2.18 - Difference in HBW Average Weekday Transit Trips - Run with Network Modifications vs CTPP Observed

Production\Attraction Area	LA County Non-PSA	Orange County Non-PSA	LA County PSA	Orange County PSA	Other	Total
LA County Non-PSA	-8,735	4,202	14,742	4,070	4,200	**18,478**
Orange County Non-PSA	7,085	-7,243	697	2,188	226	**2,952**
LA County PSA	9,805	967	-440	841	152	**11,325**
Orange County PSA	3,930	-6,254	814	-16,006	157	**-17,359**
Other	10,471	2,669	813	2,244	-31,593	**-15,396**
Total	**22,555**	**-5,660**	**16,626**	**-6,663**	**-26,858**	**0**

Summaries of transit boardings and travel time comparisons for the Original LACMTA Model and the Run with Network Modifications are shown in Table 2.19 through Table 2.22.

The key findings from this initial model run were:

- Bus ridership in the Corridor Study Area was higher than observed ridership;
- Metrolink ridership is generally representative of the observed (some percentage differences are large, but absolute differences are generally small);
- Bus travel times were lower than observed (speeds were too fast).

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Table 2.19 - Model Run with Network Modifications and Original LACMTA Model vs Observed - Bus Boardings Summary

Area	Bus Operator	2006/7 Observed			Original LACMTA Model			%Difference (Original LACMTA - Observed)			Run With Network Modifications			%Difference (Network Modifications Run - Observed)		
		Peak	Off-Peak	Daily	Peak	Off-Peak	Daily	Peak	Off-Peak	Daily	Peak	Off-Peak	Daily	Peak	Off-Peak	Daily
PEROW/ WSAB	MTA Bus	45,245	24,363	69,608	48,786	24,515	73,301	8%	1%	5%	51,089	23,323	74,412	13%	-4%	7%
PEROW/ WSAB	OCTA	113,272	60,992	174,264	123,524	65,813	189,337	9%	8%	9%	128,494	66,094	194,588	13%	8%	12%
Northern Connections	MTA Bus	161,068	86,579	247,647	162,229	75,806	238,035	1%	-12%	-4%	167,355	75,108	242,463	6%	-11%	0%
Total		**319,585**	**171,934**	**491,519**	**334,539**	**166,134**	**500,673**	**5%**	**-3%**	**2%**	**346,938**	**164,525**	**511,463**	**9%**	**-3%**	**5%**

Source: Observed boardings from 2001 Metro On-Board Survey (factored to 2006 with 2001-2006 Metro system level data) and 2007 OCTA line level daily boardings

Table 2.20 - Model Run with Network Modifications and Original LACMTA Model vs Observed - Metro Rail Boardings Summary

Metro Rail Line	2006 Observed			Original LACMTA Model			%Difference (Original LACMTA - Observed)			Run With Network Modifications			%Difference (Network Modifications Run - Observed)		
	Peak	Off-Peak	Daily	Peak	Off-Peak	Daily	Peak	Off-Peak	Daily	Peak	Off-Peak	Daily	Peak	Off-Peak	Daily
Metro Rail Blue Line	55,807	22,941	78,748	51,494	20,915	72,409	-8%	-9%	-8%	53,952	20,230	74,182	-3%	-12%	-6%
Metro Rail Green Line	24,707	10,156	34,863	23,309	9,834	33,143	-6%	-3%	-5%	23,635	9,780	33,415	-4%	-4%	-4%
Total	**80,514**	**33,097**	**113,611**	**74,803**	**30,749**	**105,552**	**-7%**	**-7%**	**-7%**	**77,587**	**30,010**	**107,597**	**-4%**	**-9%**	**-5%**

Source: Observed boardings from 2006 Metro system level data

Table 2.21 - Model Run with Network Modifications and Original LACMTA Model vs Observed - Metrolink Boardings Summary

Metrolink Line	2008 Observed			Original LACMTA Model			%Difference (Original LACMTA - Observed)			Run With Network Modifications			%Difference (Network Modifications Run - Observed)		
	Peak	Off Peak	Daily	Peak	Off Peak	Daily	Peak	Off Peak	Daily	Peak	Off Peak	Daily	Peak	Off Peak	Daily
Orange Line	6,155	1,007	7,162	5,667	925	6,592	-8%	-8%	-8%	4,383	919	5,302	-29%	-9%	-26%
Inland Empire	4,428	156	4,584	2,743	587	3,330	-38%	276%	-27%	5,210	624	5,834	18%	300%	27%
91 Line	2,246	107	2,353	1,812	37	1,849	-19%	-65%	-21%	3,252	37	3,289	45%	-65%	40%
Total	**12,829**	**1,270**	**14,100**	**10,222**	**1,549**	**11,771**	**-20%**	**22%**	**-17%**	**12,845**	**1,580**	**14,425**	**0%**	**24%**	**2%**

Table 2.22 - Run With Network Modifications Study Area Total Bus Travel Time Summary

		Observed		Iteris PE ROW Model Run					
		Travel Time (mins)		Travel Time (mins)		Difference (mins)		%Difference	
Type	Route	Peak	Off Peak	Peak	Off Peak	AM Peak	Off Peak	AM Peak	Off Peak
Metro Bus	125	87	93	64	80	-23	-13	-26%	-14%
Metro Bus	127	43	43	32	40	-11	-3	-26%	-6%
Metro Bus	128	55	59	38	47	-17	-13	-32%	-21%
Metro Bus	130	95	103	73	83	-22	-20	-23%	-19%
Metro Bus	202	63	-	42	42	-21	-	-33%	-
Metro Bus	251	77	80	66	63	-10	-17	-13%	-21%
Metro Bus	265	63	64	42	49	-20	-15	-32%	-23%
Metro Bus	266	87	91	76	82	-11	-9	-12%	-10%
Metro Bus	715	61	65	43	49	-18	-16	-30%	-24%
Metro Bus	760	70	73	46	51	-24	-22	-34%	-30%
Metro Bus	762	94	100	78	85	-15	-15	-16%	-15%
OCTA	21	72	-	39	47	-32	-	-45%	-
OCTA	25	84	88	52	54	-32	-33	-39%	-38%
OCTA	29	87	93	64	73	-23	-20	-26%	-22%
OCTA	33	59	61	27	34	-32	-26	-54%	-43%
OCTA	35	84	82	46	44	-38	-37	-45%	-46%
OCTA	37	77	73	66	72	-11	0	-15%	0%
OCTA	43	87	96	52	79	-35	-16	-40%	-17%
OCTA	46	75	66	43	53	-31	-14	-42%	-20%
OCTA	47	99	102	82	93	-17	-8	-17%	-8%
OCTA	50	80	81	31	38	-49	-43	-61%	-53%
OCTA	51	33	33	28	29	-5	-4	-14%	-11%
OCTA	53	66	68	62	64	-4	-3	-6%	-5%
OCTA	54	77	78	50	57	-27	-21	-35%	-27%
OCTA	55	93	98	52	75	-41	-22	-44%	-23%
OCTA	56	60	65	44	48	-17	-17	-28%	-26%
OCTA	57	102	106	57	76	-45	-30	-44%	-28%
OCTA	59	78	78	72	73	-6	-5	-8%	-6%
OCTA	64	62	63	38	44	-24	-19	-38%	-30%
OCTA	66	68	67	58	70	-9	4	-14%	6%
OCTA	70	66	65	72	84	6	19	10%	29%
OCTA	72	60	58	56	66	-4	8	-7%	14%
OCTA	76	77	75	51	61	-25	-14	-33%	-19%
OCTA	145	35	35	27	29	-8	-5	-23%	-16%
OCTA	172	50	51	38	40	-12	-11	-23%	-21%
All Metro		791	769	600	670	-191	-141	**-24%**	**-18%**
All OCTA		1726	1675	1206	1404	-520	-317	**-30%**	**-19%**
Total		2517	2443	1806	2074	-711	-458	**-28%**	**-19%**

2.5. BUS RUN TIMES VALIDATION

The initial model run described above showed that in the Corridor Study Area, the bus ridership was higher than observed and bus travel times were faster than observed. The two trends are linked, so reducing the bus travel speeds in the study area would have the effect of reducing bus ridership, resulting in a model that better represents observed conditions.

In the LACMTA model, bus travel time is determined using "INET" functions that link bus travel time to the highway network travel time, with different functions for peak and off-peak periods, and for different types of bus (local bus, rapid bus, etc). For the Corridor Model, adjustments were made to the bus travel time functions for specific groups of bus lines in the study area so that the model calibration elsewhere was not significantly affected. Separate adjustments were made to buses in the PEROW/WSAB Area (mostly OCTA buses) and the Northern Connections Area (mostly MTA buses).

Several iterations of bus speed adjustments were carried out until the modeled bus ridership in the study area was closer to the observed ridership. Where necessary, a maximum speed cap of 55 mph was applied, which is the maximum speed applied in the original functions. The final bus speed adjustments applied are as shown in Table 2.23.

Table 2.23 - Bus Speed Adjustments Applied

Time Period	PEROW/WSAB Area Bus Speed Adjustments	Northern Connections Area Bus Speed Adjustments
Peak	-17%	13%
Off-Peak	-12%	-12%

The resultant bus travel speed functions that apply to buses in the study area are shown graphically in Figures 2.8 through 2.11. The graphs show the original speed functions for each bus and facility type, with the adjusted functions applied to PEROW/WSAB Area and Northern Connections Area buses.

Figure 2.8 - Bus Speed Functions - Peak Period, Local Bus

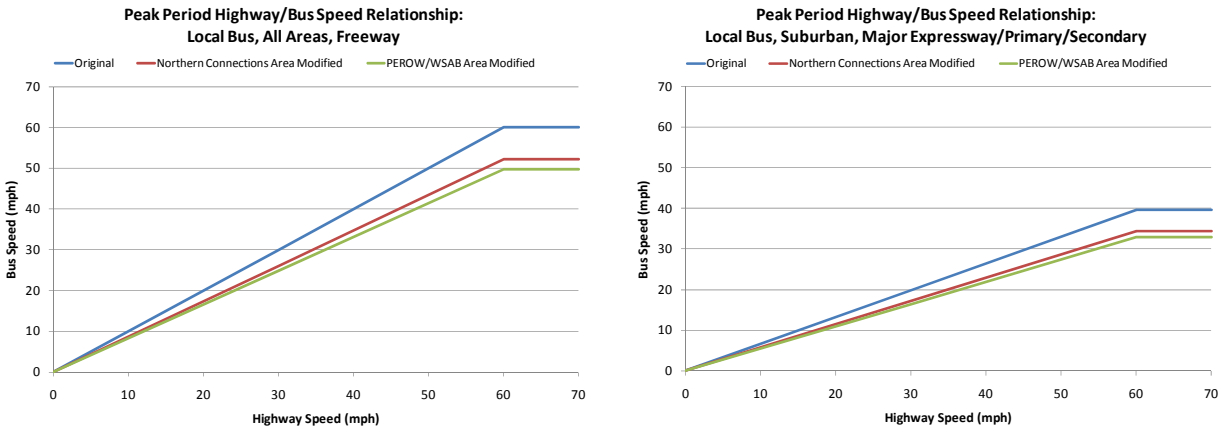
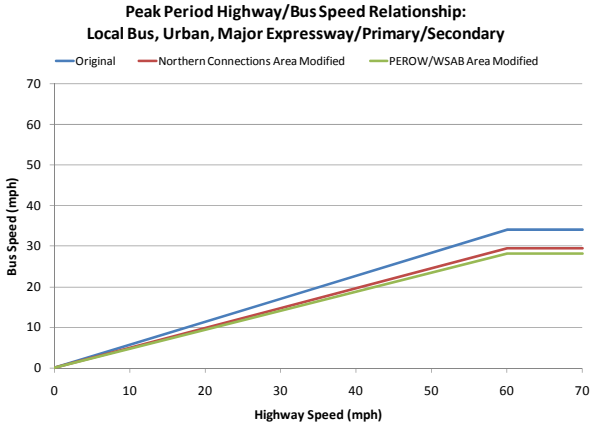


Figure 2.8 (Cont): Bus Speed Functions - Peak Period, Local Bus



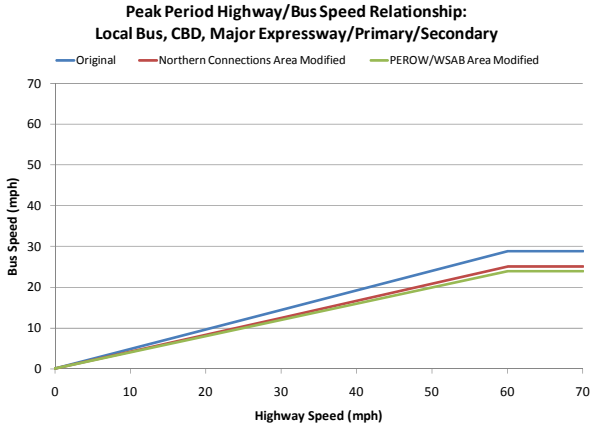
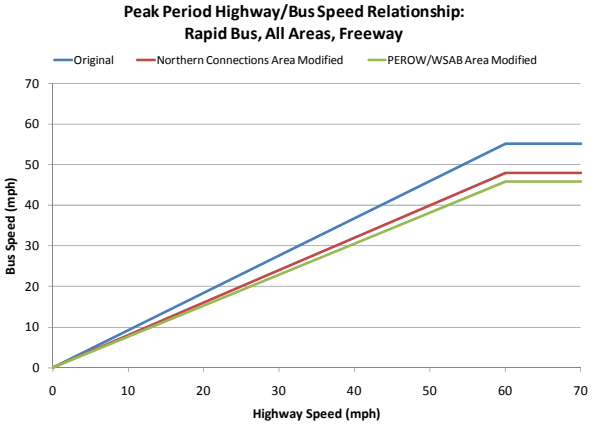
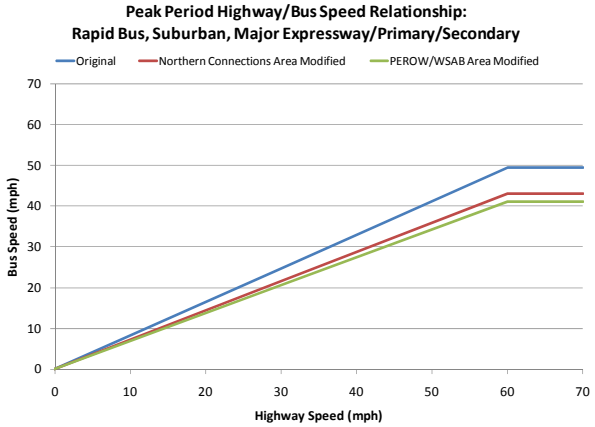
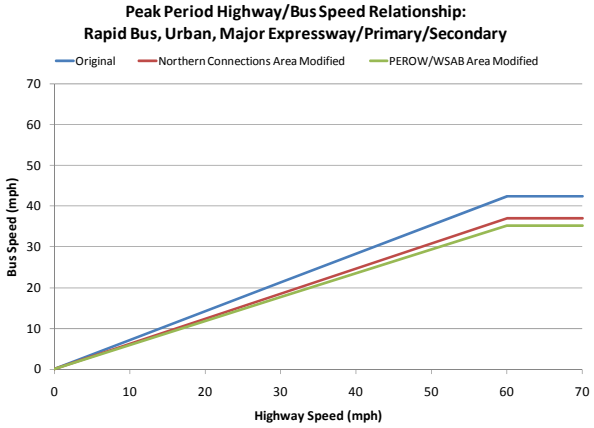


Figure 2.9 - Bus Speed Functions - Peak Period, Rapid Bus







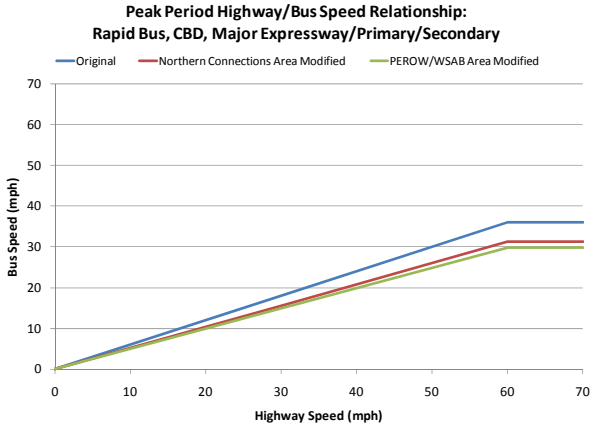
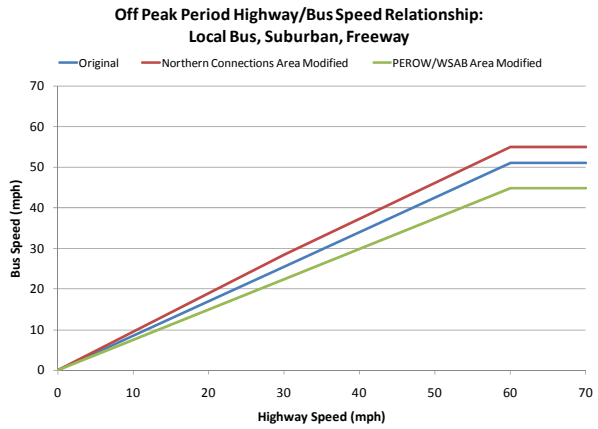
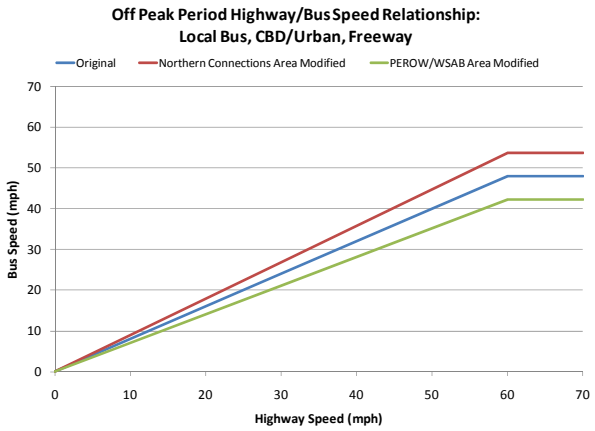
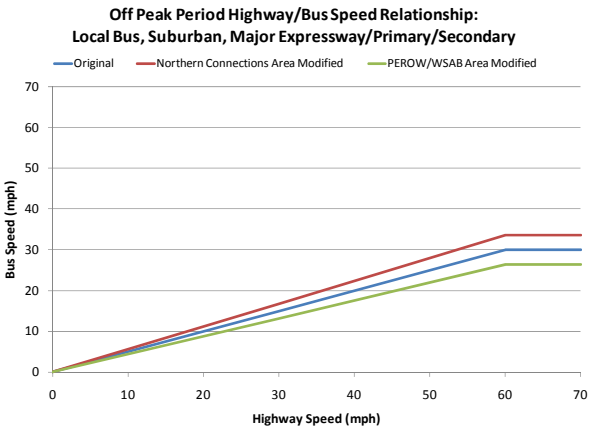
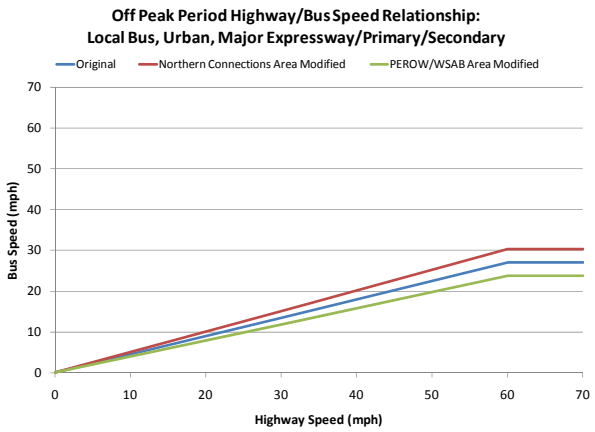


Figure 2.10 - Bus Speed Functions - Off-Peak Period, Local Bus









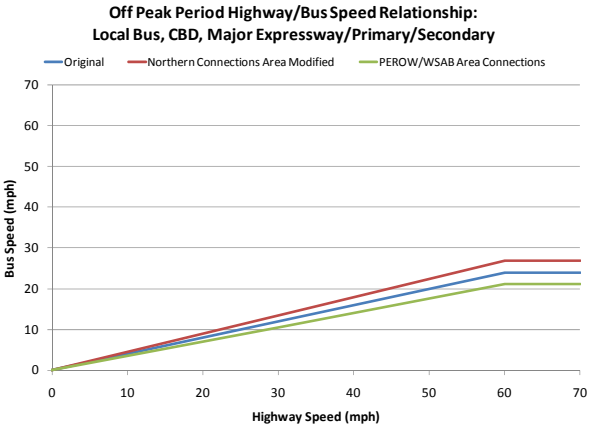
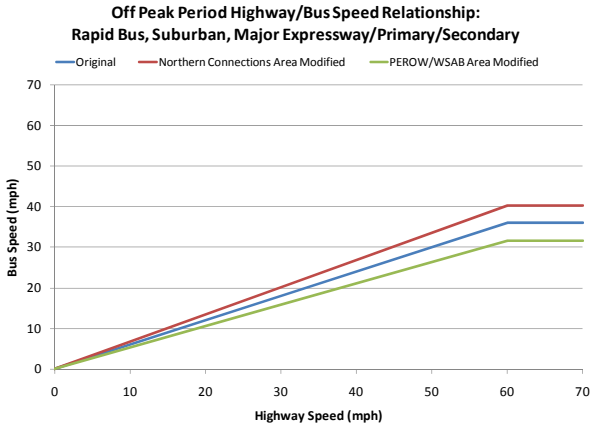
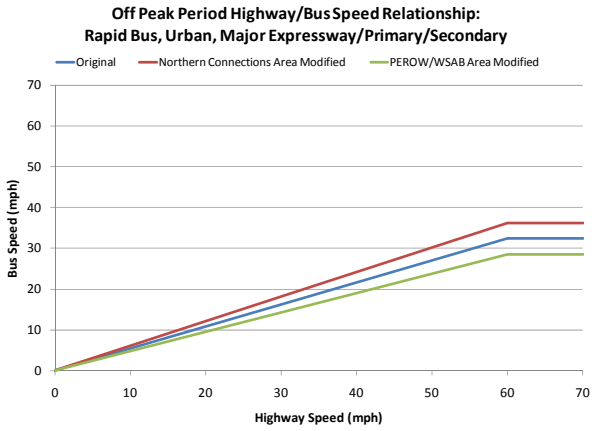
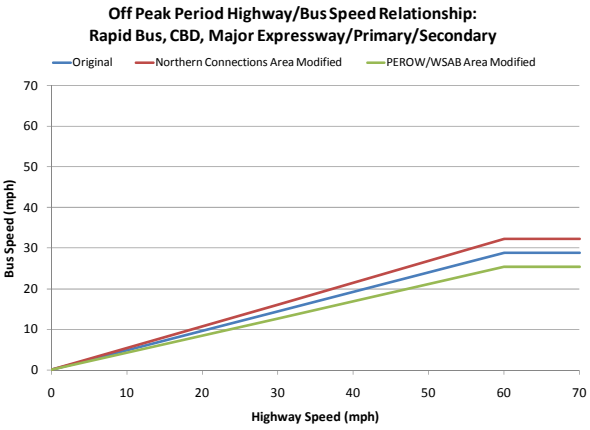


Figure 2.11 - Bus Speed Functions - Off-Peak Period, Rapid Bus







The speed function adjustments were applied to the routes listed in Table 2.24 and Table 2.25. the OCTA and Non-OCTA transit services that were impacted by the bus speed function changes are summarized in Table 2.26 and Table 2.27 respectively.

Table 2.24 - Northern Connections Area MTA Bus Routes Impacted by Bus Speed Function Changes

Metro Route	Description
30	Pico/Rimpau - Dozier/Rowan
42	MLK/Western - Union Station
53	CSU Dominguez Hills - 5th/Beaudry
53	Imperial/Avalon - 5th/Beaudry
53	Central/Slauson - 5th/Beaudry
55	Downtown LA - Imperial/Wilmington Station via Compton Av
58	LA/Alameda-Spring
60	Downtown LA - Artesia Station via Long Beach Blvd
65	Washington/Figueroa - CSU LA
66	Wilshire Center - Montebello via 8th St & Olympic Blvd
68	Washington/La Brea - Atlantic/Chavez
68	WLATC - Atlantic/Chavez

Metro Route	Description
68	WLATC - Rowan/Chavez
70	El Monte - 18th/Main
71	Los Angeles - Cal State LA via Wabash Av & City Terrace Dr
102	Coliseum/La Brea - 37th/Soto
107	Locust/Grace - Florence/Seville
108	Slauson/Paramount - Mesmer
108	Slauson/Paramount - Slauson/Western
110	Playa Vista - Bell Gardens via Jefferson Blvd. - Gage Ave.
111	Norwalk to LAX City Bus Center via Florence Ave.
115	Manchester/Sepulveda - Firestone/Atlantic
115	I105/I605 - Pacific/Culver
115	Norwalk Metro - Manchester/Sepulveda
117	Lakewood Metro - LAX
121	Imperial/Wilmington Station - Whittwood Mall via Imperial Hwy.
124	Compton/Willowbrook - Grand/Main
125	El Segundo - Downey via Rosecrans Ave.
127	Compton Station - Downey via Compton Blvd. & Somerset Blvd.
128	Compton - La Mirada via Alondra Blvd.
130	Redondo Beach - Cerritos via Artesia Blvd.
202	Willowbrook - Compton – Wilmington
205	Imperial/Wilmington Sta. - San Pedro via Wilmington Ave., Vermont Ave. & Western Ave.
250	LAC/USC - Olympic/Boyle
251	Cypress Park - Lynwood via Soto St.
252	Soto/Olympic - Lincoln Park/Broadway
253	8th/Lorena - LAC/USC
254	Boyle Heights - 103rd St. Station via Lorena St. & Boyle Ave.
260	Altadena - Artesia Blue Line Station via Fair Oaks Ave. & Atlantic Blvd.
265	Pico Rivera - Lakewood Center Mall via Paramount Blvd.
266	Lakewood - Pasadena via Rosemead Blvd. & Lakewood Blvd.
275	Beverly/Durfee - Cerritos
315	LAX - Norwalk Metro
315	96th/Sepulveda - Firestone/Atlantic
350	Downtown LA - Avalon Station
361	Artesia Station - Fair Oaks/Loma Alta
362	226th/Norwalk - 5th/Beaudry
605	Grande Vista Ave - Boyle Heights - LA County + USC Medical Center
611	Huntington Park Shuttle
612	South Gate Shuttle
620	Boyle Heights via Cesar Chavez Ave & State St.
665	Cal State LA - City Terrace Shuttle
681	Watts - Huntington Park
715	Metro Rapid (LAX - Downey via Manchester Ave. and Firestone Blvd.)
720	Metro Rapid (Santa Monica - Commerce via Wilshire Blvd. & Whittier Blvd.)
745	Metro Rapid (Downtown Los Angeles - Harbor Freeway Station via Broadway)
753	Metro Rapid (Downtown LA - Imperial/Wilmington Station via Central Ave.)
760	Metro Rapid (Downtown LA - Artesia Station via Long Beach Blvd.)
762	Metro Rapid (Pasadena - Artesia Blue Line Station via Fair Oaks & Atlantic)
770	Metro Rapid (Los Angeles - El Monte via Cesar E. Chavez Ave. & Garvey Ave.)

Table 2.25 - Northern Connections Area Other (Non-MTA) Bus Routes Impacted by Bus Speed Function Changes

Route Number	Description
	Metrolink Shuttle
	Dash - South East
	Dash - Downtown B
	Dash - Downtown D
	Dash - Downtown A
	Dash - Watts
	Dash - Chesterfield Sq
	Dash - City Hall
40	Montebello 40
343	Montebello 343
341	Montebello 341
342	Montebello 342
	Metrolink Shuttle

Table 2.26 - PEROW/WSAB Area OCTA Bus Routes Impacted by Bus Speed Function Changes

OCTA Route	Description
21	Fullerton - Huntington Beach via Valley View St./Bolsa Chica Rd.
25	Fullerton - Huntington Beach via Knott Ave./Goldenwest St.
26	Fullerton - Yorba Linda via Commonwealth Ave./Yorba Linda Blvd.
29	La Habra - Huntington Beach via Beach Blvd.
30	Cerritos - Anaheim via Orangethorpe Ave.
33	Fullerton - Huntington Beach via Magnolia St.
35	Fullerton - Huntington Beach via Brookhurst St.
37	La Habra - Fountain Valley via Euclid St.
38	Lakewood - Anaheim Hills via Del Amo Blvd./La Palma Ave.
42	Seal Beach - Orange via Seal Beach Blvd./Los Alamitos Blvd./Lincoln Ave.
43	Fullerton - Costa Mesa via Harbor Blvd.
46	Los Alamitos - Orange via Ball Rd./Taft Ave.
47	Fullerton - Newport Beach via Anaheim Blvd./Fairview St.
50	Long Beach - Orange via Katella Ave.
51	Santa Ana - Costa Mesa via Flower St.
53	Orange - Irvine via Main St.
54	Garden Grove - Orange via Chapman Ave.
55	Santa Ana - Newport Beach via Standard Ave./Bristol St./Fairview St./ 17th St.
56	Garden Grove - Orange via Garden Grove Blvd.
57	Brea - Newport Beach via State College Blvd./Bristol St.
59	Anaheim - Irvine via Kraemer Blvd./Glassell St./Grand Ave./Von Karman Ave.
60	Long Beach - Tustin via Westminster Ave./17th St.
62	62-Huntng Beach-Santa An
64	Huntington Beach - Tustin via Bolsa Ave./1st St.
66	Huntington Beach - Irvine via McFadden Ave./Walnut Ave.
70	Sunset Beach - Tustin via Edinger Ave.
72	Sunset Beach - Tustin via Warner Ave.
74	Slater - Dyer - Barranca
76	Huntington Beach - Newport Beach via Talbert Ave./MacArthur Blvd.

OCTA Route	Description
83	Anaheim - Laguna Hills via 5 Fwy/Main St.
145	Santa Ana - Costa Mesa via Raitt St./Greenville St./Fairview St.
147	Orange - Brea
164	Seal Beach - Westminster
172	Huntington Beach - Costa Mesa via Main St./Garfield Ave./Ellis Ave./MacArthur Blvd./Sunflower St.
205	Anaheim - Laguna Hills
211	Seal Beach - Irvine Express via 405 Fwy
430	Anaheim Metrolink Station/Amtrak Station - Anaheim Resort Area via
453	Orange Transportation Center - St. Joseph's Hospital via Chapman Ave./Main St./La Veta Ave.
462	The Depot at Santa Ana - Civic Center via Santa Ana Blvd./Civic Center Dr.
463	The Depot at Santa Ana - Hutton Centre via Grand Ave.
464	The Depot at Santa Ana - Costa Mesa via 5 Fwy/55 Fwy/Sunflower Ave.
757	Pomona - Santa Ana Express via 57 Fwy
794	Riverside/Corona - South Coast Metro Express via 91 Fwy/55 Fwy

Table 2.27 - PEROW/WSAB Area Other (Non-OCTA) Bus Routes Impacted by Bus Speed Function Changes

Route Number	Description
1	Norwalk Transit 1
2	Norwalk Transit 2
3	Norwalk Transit 3
4	Norwalk Transit 4
5	Norwalk Transit 5
8	Norwalk Transit 8
7	Long Beach: Orange Ave.
21	Long Beach: Cherry Ave.
22	Long Beach: Downey Ave.
51	Long Beach: Long Beach Blvd. to Artesia Station
61	Long Beach: Atlantic Ave. to Artesia Station
61	Long Beach: Atlantic Ave. to Artesia Station
61	Long Beach: Atlantic Ave. to Artesia Station
63	Long Beach: Atlantic Ave.
91	Long Beach: 7th St. / Bellflower Blvd.
92	Long Beach: 7th St. / Woodruff Ave.
93	Long Beach: 7th St. / Clark Ave.
101	Long Beach: Carson St. / Centralia
102	Long Beach: Willow / Spring
103	Long Beach: Carson St. to Lakewood Mall
112	Long Beach: Broadway / Clark Ave.
172	Long Beach: PCH / Palo Verde to Norwalk Station
173	Long Beach: PCH / Studebaker to Norwalk Station
191	Long Beach: Santa Fe / Del Amo Blvd.
192	Long Beach: Santa Fe / South St.
	Cerritos On Wheels
	Bellflower Green
	Bellflower Orange
	Bellflower Blue

2.6. METROLINK SERVICE ADJUSTMENT

The Metrolink commuter rail service headways for the Orange County Line, Inland Empire Line and the 91 Line were adjusted so that modeled Metrolink ridership on these lines better matched the ridership. 2010 Metrolink timetables were reviewed to ensure that coded headways were generally representative of actual headways.

2.7. TRANSIT VALIDATION SUMMARY

Total daily person trips by trip purpose are shown in Table 2.9 through Table 2.12; these numbers have not changed as a result of the calibration efforts described in the last section. Table 2.28 shows the number of daily HBW transit trips according to year 2000 CTPP data. This data has been scaled so that the region-wide trip total is the same as the model. Table 2.29 shows the number of HBW transit trips in the final validation model run. Comparing Table 2.29 with Table 2.17 shows that the number of HBW transit trips has changed slightly as a result of the bus speed modifications described in the previous section.

Table 2.28 - CTPP HBW Daily Transit Trips

Production\Attraction Area	LA County Non-PSA	Orange County Non-PSA	LA County PSA	Orange County PSA	Other	Total
LA County Non-PSA	526,981	346	7,151	184	1,083	**535,745**
Orange County Non-PSA	809	29,469	45	9,501	0	**39,824**
LA County PSA	14,090	100	9,568	508	0	**24,266**
Orange County PSA	1,295	24,523	179	38,468	0	**64,464**
Other	8,552	547	0	659	56,404	**66,161**
Total	**551,727**	**54,986**	**16,942**	**49,320**	**57,487**	**730,461**

Table 2.29 - Final Validation Model Run HBW Average Weekday Transit Trips

Production\Attraction Area	LA County Non-PSA	Orange County Non-PSA	LA County PSA	Orange County PSA	Other	Total
LA County Non-PSA	527,142	3,928	21,737	3,575	5,368	**561,751**
Orange County Non-PSA	7,503	21,148	645	10,761	220	**40,277**
LA County PSA	23,099	854	8,953	1,165	148	**34,220**
Orange County PSA	4,841	16,878	904	21,646	151	**44,421**
Other	18,929	2,748	753	2,337	25,026	**49,792**
Total	**581,514**	**45,557**	**32,993**	**39,484**	**30,914**	**730,461**

The absolute difference between the Validation Model Run HBW transit trips and the equivalent CTPP trips is shown in Table 2.30. The differences show a slight improvement over the "Run with Network Modifications", shown in Table 2.18.

Table 2.30 - Difference in HBW Average Weekday Transit Trips - Final Validation Model Run vs CTPP Observed

Production\Attraction Area	LA County Non-PSA	Orange County Non-PSA	LA County PSA	Orange County PSA	Other	Total
LA County Non-PSA	161	3,582	14,586	3,391	4,285	**26,006**
Orange County Non-PSA	6,694	-8,321	601	1,260	220	**453**
LA County PSA	9,010	754	-615	657	148	**9,954**
Orange County PSA	3,546	-7,645	726	-16,822	151	**-20,044**
Other	10,376	2,201	753	1,678	-31,377	**-16,370**
Total	**29,787**	**-9,429**	**16,051**	**-9,836**	**-26,573**	**0**

Summaries of the final validation comparison of observed and modeled transit ridership are shown in Table 2.31, Table 2.32 and Table 2.33. Complete tables of bus lines compared are provided in Table 2.35.

The results in Table 2.31 show that the modeled bus boardings in the Corridor Study Area closely match the observed boardings, and the model calibration is significantly improved over the initial run described previously in this memorandum. The modeled total bus boardings for the peak period across the entire study area are within one percent of the observed total. In the off-peak, the modeled bus boardings are only two percent lower than observed.

Table 2.32 shows the boardings for Metro Rail (Blue and Green Lines) which have not changed significantly with the adjustments to bus speeds. Peak period Metro Rail boardings have improved slightly with the bus speed updates, and off-peak boardings have become very slightly worse; a small net improvement over the entire day.

The Metrolink validation results in Table 2.33 show a change from the initial model run, with total daily boardings matching the observed more closely.

Table 2.34 shows the modeled bus travel times compared with timetable travel times. The final model travel times are on average lower than the timetables by between 10 percent and 11 percent. This represents an overall improvement since the initial model run prior to speed adjustments. It should also be noted that full timetables were only available for 2010, while the model was calibrated for 2006 and it is possible that the actual travel times have increased slightly over four years.

Table 2.31 - Validation Run, Model Run with Network Modifications and Original LACMTA Model vs Observed - Bus Boardings Summary

Area	Bus Operator	2006/7 Observed			Original LACMTA Model			%Difference (Original LACMTA - Observed)			Run With Network Modifications			%Difference (Network Modifications Run - Observed)			Validation Run			%Difference (Validation Run - Observed)		
		Peak	Off-Peak	Daily	Peak	Off-Peak	Daily	Peak	Off-Peak	Daily	Peak	Off-Peak	Daily	Peak	Off-Peak	Daily	Peak	Off-Peak	Daily	Peak	Off-Peak	Daily
PEROW/ WSAB	MTA Bus	45,245	24,363	69,608	48,786	24,515	73,301	8%	1%	5%	51,089	23,323	74,412	13%	-4%	7%	43,966	26,168	70,134	-3%	7%	1%
PEROW/ WSAB	OCTA	113,272	60,992	174,264	123,524	65,813	189,337	9%	8%	9%	128,494	66,094	194,588	13%	8%	12%	113,285	60,914	174,199	0%	0%	0%
Northern Connections	MTA Bus	161,068	86,579	247,647	162,229	75,806	238,035	1%	-12%	-4%	167,355	75,108	242,463	6%	-11%	0%	162,802	81,097	243,899	1%	-6%	-2%
Total		**319,585**	**171,934**	**491,519**	**334,539**	**166,134**	**500,673**	**5%**	**-3%**	**2%**	**346,938**	**164,525**	**511,463**	**9%**	**-3%**	**5%**	**320,053**	**168,179**	**488,232**	**0%**	**-2%**	**-1%**

Source: Observed boardings from 2001 Metro On-Board Survey (factored to 2006 with 2001-2006 Metro system level data) and 2007 OCTA line level daily boardings

Table 2.32 - Validation Run, Model Run with Network Modifications and Original LACMTA Model vs Observed - Metro Rail Boardings Summary

Metro Rail Line	2006 Observed			Original LACMTA Model			%Difference (Original LACMTA - Observed)			Run With Network Modifications			%Difference (Network Modifications Run - Observed)			Validation Run			%Difference (Validation Run - Observed)		
	Peak	Off-Peak	Daily	Peak	Off-Peak	Daily	Peak	Off-Peak	Daily	Peak	Off-Peak	Daily	Peak	Off-Peak	Daily	Peak	Off-Peak	Daily	Peak	Off-Peak	Daily
Metro Rail Blue Line	55,807	22,941	78,748	51,494	20,915	72,409	-8%	-9%	-8%	53,952	20,230	74,182	-3%	-12%	-6%	54,080	20,373	74,453	-3%	-11%	-5%
Metro Rail Green Line	24,707	10,156	34,863	23,309	9,834	33,143	-6%	-3%	-5%	23,635	9,780	33,415	-4%	-4%	-4%	24,105	9,677	33,782	-2%	-5%	-3%
Total	**80,514**	**33,097**	**113,611**	**74,803**	**30,749**	**105,552**	**-7%**	**-7%**	**-7%**	**77,587**	**30,010**	**107,597**	**-4%**	**-9%**	**-5%**	**78,185**	**30,050**	**108,235**	**-3%**	**-9%**	**-5%**

Source: Observed boardings from 2006 Metro system level data

Table 2.33 - Validation Run, Model Run with Network Modifications and Original LACMTA Model vs Observed - Metrolink Boardings

Metrolink Line	2008 Observed			Original LACMTA Model			%Difference (Original LACMTA - Observed)			Run With Network Modifications			%Difference (Network Modifications Run - Observed)			Validation Run			%Difference (Validation Run - Observed)		
	Peak	Off Peak	Daily	Peak	Off Peak	Daily	Peak	Off Peak	Daily	Peak	Off Peak	Daily	Peak	Off Peak	Daily	Peak	Off Peak	Daily	Peak	Off Peak	Daily
Orange Line	6,155	1,007	7,162	5,667	925	6,592	-8%	-8%	-8%	4,383	919	5,302	-29%	-9%	-26%	5,458	960	6,418	-11%	-5%	-10%
Inland Empire	4,428	156	4,584	2,743	587	3,330	-38%	276%	-27%	5,210	624	5,834	18%	300%	27%	4,580	102	4,682	3%	-35%	2%
91 Line	2,246	107	2,353	1,812	37	1,849	-19%	-65%	-21%	3,252	37	3,289	45%	-65%	40%	3,042	42	3,084	35%	-61%	31%
Total	**12,829**	**1,270**	**14,100**	**10,222**	**1,549**	**11,771**	**-20%**	**22%**	**-17%**	**12,845**	**1,580**	**14,425**	**0%**	**24%**	**2%**	**13,080**	**1,104**	**14,184**	**2%**	**-13%**	**1%**

Table 2.34 - Validation Run vs Run with Network Modifications vs Observed - Study Area Bus Travel Times Comparison

		Observed		Iteris PE ROW Model Run						AECOM PE ROW Model Run					
		Travel Time (mins)		Travel Time (mins)		Difference (mins)		% Difference		Travel Time (mins)		Difference (mins)		% Difference	
Type	Route	Peak	Off Peak	Peak	Off Peak	AM Peak	Off Peak	AM Peak	Off Peak	Peak	Off Peak	AM Peak	Off Peak	AM Peak	Off Peak
Metro Bus	125	87	93	64	80	-23	-13	-26%	-14%	73	71	-14	-21	-16%	-23%
Metro Bus	127	43	43	32	40	-11	-3	-26%	-6%	36	36	-6	-7	-15%	-16%
Metro Bus	128	55	59	38	47	-17	-13	-32%	-21%	43	41	-12	-18	-22%	-30%
Metro Bus	130	95	103	73	83	-22	-20	-23%	-19%	83	74	-12	-29	-13%	-28%
Metro Bus	202	63	-	42	42	-21	-	-33%	-	48	37	-14	-	-23%	-
Metro Bus	251	77	80	66	63	-10	-17	-13%	-21%	76	56	0	-24	0%	-30%
Metro Bus	265	63	64	42	49	-20	-15	-32%	-23%	49	44	-14	-20	-22%	-31%
Metro Bus	266	87	91	76	82	-11	-9	-12%	-10%	88	73	1	-18	1%	-20%
Metro Bus	715	61	65	43	49	-18	-16	-30%	-24%	49	43	-12	-22	-19%	-33%
Metro Bus	760	70	73	46	51	-24	-22	-34%	-30%	53	45	-17	-27	-25%	-38%
Metro Bus	762	94	100	78	85	-15	-15	-16%	-15%	90	75	-4	-25	-4%	-25%
OCTA	21	72	-	39	47	-32	-	-45%	-	53	59	-19	-	-26%	-
OCTA	25	84	88	52	54	-32	-33	-39%	-38%	63	72	-21	-16	-25%	-18%
OCTA	29	87	93	64	73	-23	-20	-26%	-22%	86	95	-1	2	-1%	2%
OCTA	33	59	61	27	34	-32	-26	-54%	-43%	54	63	-5	2	-8%	3%
OCTA	35	84	82	46	44	-38	-37	-45%	-46%	66	73	-18	-8	-22%	-10%
OCTA	37	77	73	66	72	-11	0	-15%	0%	79	82	2	10	3%	13%
OCTA	43	87	96	52	79	-35	-16	-40%	-17%	89	89	2	-6	2%	-6%
OCTA	46	75	66	43	53	-31	-14	-42%	-20%	52	60	-23	-6	-30%	-10%
OCTA	47	99	102	82	93	-17	-8	-17%	-8%	97	105	-3	3	-3%	3%
OCTA	50	80	81	31	38	-49	-43	-61%	-53%	71	81	-9	0	-11%	0%
OCTA	51	33	33	28	29	-5	-4	-14%	-11%	34	33	1	1	3%	2%
OCTA	53	66	68	62	64	-4	-3	-6%	-5%	74	73	9	6	14%	8%
OCTA	54	77	78	50	57	-27	-21	-35%	-27%	60	65	-17	-13	-23%	-17%
OCTA	55	93	98	52	75	-41	-22	-44%	-23%	76	86	-17	-12	-18%	-12%
OCTA	56	60	65	44	48	-17	-17	-28%	-26%	49	53	-11	-12	-18%	-18%
OCTA	57	102	106	57	76	-45	-30	-44%	-28%	68	86	-34	-20	-33%	-19%
OCTA	59	78	78	72	73	-6	-5	-8%	-6%	86	83	8	5	10%	6%
OCTA	64	62	63	38	44	-24	-19	-38%	-30%	46	50	-16	-12	-25%	-20%
OCTA	66	68	67	58	70	-9	4	-14%	6%	74	83	6	16	9%	25%
OCTA	70	66	65	72	84	6	19	10%	29%	86	95	20	30	30%	46%
OCTA	72	60	58	56	66	-4	8	-7%	14%	54	56	-6	-2	-10%	-3%
OCTA	76	77	75	51	61	-25	-14	-33%	-19%	61	70	-16	-5	-20%	-7%
OCTA	145	35	35	27	29	-8	-5	-23%	-16%	32	33	-2	-1	-7%	-3%
OCTA	172	50	51	38	40	-12	-11	-23%	-21%	46	46	-4	-5	-8%	-10%
All Metro		791	769	600	670	-191	-141	**-24%**	**-18%**	688	595	-103	-211	**-13%**	**-27%**
All OCTA		1726	1675	1206	1404	-520	-317	**-30%**	**-19%**	1555	1688	-171	-45	**-10%**	**-3%**
Total		2517	2443	1806	2074	-711	-458	**-28%**	**-19%**	2243	2283	-274	-255	**-11%**	**-10%**

Table 2.35 - Final Model Validation - Bus Boardings by Line

Operator	Line	Area	2006/7 Observed			2006 Validation Model Run			Difference (Validation Run - Observed)			% Difference (Validation Run - Observed)		
			Peak	Off-Peak	Daily	Peak	Off-Peak	Daily	Peak	Off-Peak	Daily	Peak	Off-Peak	Daily
Metro Bus	60	PEROW / WSAB	19,526	10,514	30,039	21,081	12,625	33,706	1,555	2,111	3,667	8%	20%	12%
Metro Bus	111	PEROW / WSAB	15,689	8,448	24,137	16,115	7,628	23,743	426	-820	-394	3%	-10%	-2%
Metro Bus	117	PEROW / WSAB	6,982	3,760	10,742	6,582	5,370	11,952	-400	1,610	1,210	-6%	43%	11%
Metro Bus	127	PEROW / WSAB	809	436	1,245	31	21	52	-778	-415	-1,193	-96%	-95%	-96%
Metro Bus	202	PEROW / WSAB	1,121	603	1,724	152	435	587	-969	-168	-1,137	-86%	-28%	-66%
Metro Bus	265	PEROW / WSAB	1,118	602	1,720	5	89	94	-1,113	-513	-1,626	-100%	-85%	-95%
OCTA	21	PEROW / WSAB	447	240	687	231	234	465	-216	-6	-222	-48%	-3%	-32%
OCTA	25	PEROW / WSAB	2,157	1,161	3,318	1,337	1,274	2,611	-820	113	-707	-38%	10%	-21%
OCTA	29	PEROW / WSAB	7,093	3,820	10,913	9,457	3,444	12,901	2,364	-376	1,988	33%	-10%	18%
OCTA	33	PEROW / WSAB	1,775	956	2,731	1,571	1,277	2,848	-204	321	117	-12%	34%	4%
OCTA	35	PEROW / WSAB	2,666	1,436	4,102	3,665	1,451	5,116	999	15	1,014	37%	1%	25%
OCTA	37	PEROW / WSAB	3,434	1,849	5,283	4,087	1,662	5,749	653	-187	466	19%	-10%	9%
OCTA	43	PEROW / WSAB	11,146	6,001	17,147	10,141	4,404	14,545	-1,005	-1,597	-2,602	-9%	-27%	-15%
OCTA	46	PEROW / WSAB	2,746	1,479	4,225	1,793	1,000	2,793	-953	-479	-1,432	-35%	-32%	-34%
OCTA	47	PEROW / WSAB	7,433	4,003	11,436	7,174	5,009	12,183	-259	1,006	747	-3%	25%	7%
OCTA	50	PEROW / WSAB	3,894	2,097	5,990	5,527	2,025	7,552	1,634	-72	1,562	42%	-3%	26%
OCTA	51	PEROW / WSAB	895	482	1,377	969	1,027	1,996	74	545	619	8%	113%	45%
OCTA	53	PEROW / WSAB	7,446	4,010	11,456	8,953	7,280	16,233	1,507	3,270	4,777	20%	82%	42%
OCTA	54	PEROW / WSAB	3,844	2,070	5,914	4,400	1,469	5,869	556	-601	-45	14%	-29%	-1%
OCTA	55	PEROW / WSAB	5,218	2,810	8,028	5,676	2,079	7,755	458	-731	-273	9%	-26%	-3%
OCTA	56	PEROW / WSAB	1,724	928	2,652	1,005	1,040	2,045	-719	112	-607	-42%	12%	-23%
OCTA	57	PEROW / WSAB	10,913	5,876	16,789	9,016	7,184	16,200	-1,897	1,308	-589	-17%	22%	-4%
OCTA	59	PEROW / WSAB	3,135	1,688	4,823	6,835	2,025	8,860	3,700	337	4,037	118%	20%	84%
OCTA	60	PEROW / WSAB	9,006	4,849	13,855	9,957	5,002	14,959	951	153	1,104	11%	3%	8%
OCTA	64	PEROW / WSAB	7,220	3,887	11,107	3,527	3,121	6,648	-3,693	-766	-4,459	-51%	-20%	-40%
OCTA	66	PEROW / WSAB	7,319	3,941	11,260	6,629	2,500	9,129	-690	-1,441	-2,131	-9%	-37%	-19%
OCTA	70	PEROW / WSAB	4,466	2,405	6,871	3,886	1,866	5,752	-580	-539	-1,119	-13%	-22%	-16%
OCTA	71	PEROW / WSAB	2,710	1,459	4,169	1,630	1,351	2,981	-1,080	-108	-1,188	-40%	-7%	-28%
OCTA	72	PEROW / WSAB	2,092	1,126	3,218	1,543	909	2,452	-549	-217	-766	-26%	-19%	-24%
OCTA	76	PEROW / WSAB	775	418	1,193	887	191	1,078	112	-227	-115	14%	-54%	-10%
OCTA	83	PEROW / WSAB	2,228	1,199	3,427	1,954	1,293	3,247	-274	94	-180	-12%	8%	-5%
OCTA	145	PEROW / WSAB	632	340	972	365	139	504	-267	-201	-468	-42%	-59%	-48%
OCTA	172	PEROW / WSAB	164	89	253	180	321	501	16	232	248	9%	263%	98%
OCTA	173	PEROW / WSAB	298	161	459	163	218	381	-135	57	-78	-45%	36%	-17%
OCTA	453	PEROW / WSAB	139	75	214	42	119	161	-97	44	-53	-70%	59%	-25%
OCTA	462	PEROW / WSAB	163	88	250	306	0	306	144	-88	56	88%	-100%	22%
OCTA	463	PEROW / WSAB	94	51	145	379	0	379	285	-51	234	302%	-100%	161%
Metro Bus	42	N. Connections	2,892	1,557	4,449	3,587	2,144	5,731	695	587	1,282	24%	38%	29%
Metro Bus	65	N. Connections	1,696	913	2,609	2,200	81	2,281	504	-832	-328	30%	-91%	-13%
Metro Bus	66	N. Connections	18,095	9,744	27,839	11,929	7,680	19,609	-6,166	-2,064	-8,230	-34%	-21%	-30%
Metro Bus	70	N. Connections	11,246	6,056	17,302	14,500	10,454	24,954	3,254	4,398	7,652	29%	73%	44%
Metro Bus	76	N. Connections	7,803	4,202	12,005	10,857	5,157	16,014	3,054	955	4,009	39%	23%	33%
Metro Bus	78	N. Connections	7,427	3,999	11,426	7,247	3,654	10,901	-180	-345	-525	-2%	-9%	-5%
Metro Bus	102	N. Connections	449	242	691	4	7	11	-445	-235	-680	-99%	-97%	-98%
Metro Bus	107	N. Connections	1,476	795	2,271	51	54	105	-1,425	-741	-2,166	-97%	-93%	-95%
Metro Bus	108	N. Connections	11,475	6,179	17,653	17,491	6,480	23,971	6,016	301	6,318	52%	5%	36%
Metro Bus	110	N. Connections	7,547	4,064	11,611	6,535	2,880	9,415	-1,012	-1,184	-2,196	-13%	-29%	-19%
Metro Bus	124	N. Connections	1,196	644	1,840	352	106	458	-844	-538	-1,382	-71%	-84%	-75%
Metro Bus	250	N. Connections	231	124	355	0	79	79	-231	-45	-276	-100%	-37%	-78%
Metro Bus	251	N. Connections	15,019	8,087	23,107	16,309	7,845	24,154	1,290	-242	1,047	9%	-3%	5%
Metro Bus	259	N. Connections	1,437	774	2,210	660	617	1,277	-777	-157	-933	-54%	-20%	-42%
Metro Bus	305	N. Connections	2,669	1,437	4,106	1,343	1,403	2,746	-1,326	-34	-1,360	-50%	-2%	-33%
Metro Bus	605	N. Connections	1,001	389	1,390	227	130	357	-774	-259	-1,033	-77%	-67%	-74%
Metro Bus	620	N. Connections	1,224	659	1,883	33	510	543	-1,191	-149	-1,340	-97%	-23%	-71%
Metro Bus	111	N. Connections	15,689	8,448	24,137	16,115	7,628	23,743	426	-820	-394	3%	-10%	-2%
Metro Bus	720	N. Connections	38,613	20,791	59,404	38,112	16,837	54,949	-501	-3,954	-4,455	-1%	-19%	-7%
Metro Bus	760	N. Connections	5,896	3,175	9,071	4,890	2,725	7,615	-1,006	-450	-1,456	-17%	-14%	-16%
Metro Bus	460	N. Connections	2,857	1,539	4,396	4,660	2,962	7,622	1,803	1,423	3,226	63%	93%	73%
Metro Bus	487	N. Connections	1,918	1,033	2,950	1,661	791	2,452	-257	-242	-498	-13%	-23%	-17%
Metro Bus	489	N. Connections	604	325	929	628	0	628	24	-325	-301	4%	-100%	-32%
Metro Bus	490	N. Connections	2,608	1,404	4,012	3,411	873	4,284	803	-531	272	31%	-38%	7%
		Total	**319,585**	**171,934**	**491,519**	**320,053**	**168,179**	**488,232**	**468**	**-3,755**	**-3,287**	**0%**	**-2%**	**-1%**

3. TRAVEL DEMAND MODEL RESULTS

3.1. RESULTS OVERVIEW

This chapter documents the results of the travel demand forecasting process. Included in this chapter is a description of the types of data used to assess and compare each alternative, followed by detailed model results for each alternative.

An important measure in characterizing the efficiency and utility of a transit alternative is transit ridership. A transit alternative that attracts more new riders will do more to reduce highway and local street congestion and will improve the mobility of both the new and existing transit riders as well as the remaining highway users. Transit ridership covers a broad range of statistics that depict the ability of a project to attract riders and the ability of the bus and rail system to serve the traveling public. Key statistics include:

- Unlinked Transit Trips (Boardings) – Unlinked transit trips (also known as boardings) represent the number of times a traveler boards a new transit vehicle. With this statistic, a commuter driving to a train station and taking the train downtown counts as one unlinked transit trip. A traveler walking from home to a feeder bus who then transfers to another bus or train counts as a two unlinked transit trips. This statistic has the disadvantage that an alternative that adds an extra transfer adds an extra unlinked trip. This effect can result in cases where the inconvenience of the extra transfer can reduce the market share and linked trips while showing an increase in unlinked trips. The advantage of this statistic, however, is that can be measured at the route or station level and provides the most intuitive understanding of whether a project is able to attract ridership.
- Project Boardings – Project boardings are a subset of the unlinked transit trips statistic and represent those boardings making use of a new project. For a stand-alone fixed guideway system (such as PEROW/WSAB project alternative), project boardings are equal to the number of boardings forecast for that service. For projects that are extensions of a pre-existing service (such as the Metro Green Line Extension's Light Rail Alternative for example), boardings are equal to the number of boardings at each new station plus the number of travelers who are on-board the trains as they leave the last existing station and travel towards the first new station
- Station Boardings – Station boardings are the number of boardings occurring at each station and can also show the modes of access and egress (e.g., walk, bus, park-and-ride or kiss-and-ride). This statistic provides information on the locations where the project is forecasted to attract demand. It is also useful in understanding the impacts that each station may have on the surrounding community.
- Transportation System Total User Benefits. Total User Benefits is a system-wide measure of the benefits that are derived by travelers related to the implementation of the project. This statistic is expressed as person-hours of equivalent in-vehicle time savings when the project is compared to the TSM Alternative. Although the key benefit of a new fixed guideway project is expected to be faster running times (i.e., in-vehicle time), fixed guideway projects may also include improved access, egress, frequencies and costs and all of these elements are embedded in the User Benefit measure. User Benefits are a key component of the FTA's Cost Effectiveness Index, which is part of the process that FTA uses to evaluate potential projects for Federal funding.

The remainder of this section documents the projected ridership impacts of each of the modeled alternatives according to these different statistics. All results discussed in this section are for an average weekday in the forecast year (2035).

In case the project one day needs to enter the FTA New Starts program, the analysis and results required by the FTA have been produced for all TSM and Build Alternatives. This analysis is intended for local planning purposes only at this time, and not to support an FTA Section 5309 New Starts application.

3.2. No Build

The Project No Build Alternative is based on the year 2035 Regional "Measure R" No Build. This was rerun with the updated networks and model procedures used in the corridor validation. After a review of the transit service assumptions in this model, Santa Ana Street Car project operating between Harbor Boulevard & Westminster Avenue and SARTC was coded in the networks. System-Wide unlinked transit trips (boardings) and boardings on key Metrolink and Metro Rail services operating close to the project corridor are shown in Table 3.1.

Table 3.1 - Key Ridership Results – Project No Build Alternative

Daily Unlinked Trips (2035)	Project No Build
System-Wide	3,394,001
Metro Green Line	46,763
Metro Blue & Gold Line	161,257
Orange County Line	5,156
Inland Empire	8,285
91 Line	5,452
Santa Ana Streetcar	15,290

3.3. TSM Alternative

Ridership results and user benefits of the TSM Alternative are provided in this section.

The PEROW/WSAB AA is not currently being considered as a Section 5309 New Starts project, so at this stage it is not necessary to define a TSM Alternative for the project that would require FTA approval. However, if the project was to advance forward under the New Starts guidelines, further review and discussion with the FTA would need to take place to select the most suitable TSM Alternative(s) for the projects. Key ridership statistics for this alternative and the Project No Build are shown in Table 3.2.

Table 3.2 - Key Ridership Results – TSM Alternative

Daily Unlinked Trips (2035)	Project No Build	TSM
System-Wide	3,394,001	3,497,587
Metro Green Line	46,763	49,097
Metro Blue & Gold Line	161,257	162,762
Orange County Line	5,156	5,028
Inland Empire	8,285	8,769

Daily Unlinked Trips (2035)	Project No Build	TSM
91 Line	5,452	5,304
Project Boardings	-	85,572
Santa Ana Streetcar	15,290	15,091

The total daily project boardings for this scenario are 85,572. This includes boardings on all new services introduced in the OCTA and MTA regions.

Table 3.3 shows the performance of this scenario in terms of measures used by the FTA to describe and evaluate projects. These measures are calculated against the project No Build alternative and include project boardings and Transportation System User Benefits, and characteristics of the User Benefits such as benefit per customer. User benefits are defined as the weighted travel time savings for all users of each of the project alternatives.

Table 3.3 - User Benefits – TSM Alternative

Statistic	HBW	HBO	NHB	HBU	Total
Daily Project Boardings					85,572
Daily New Riders					35,814
Daily User Benefits (hours)	14,734	8,808	4,505	3,673	31,720
User Benefits per Project Boarding (mins)					22.2
% of benefits that are coverage related	0.0%	0.0%	0.0%	0.0%	0.0%
% of benefits capped prices	-8.4%	-25.9%	-30.3%	-11.0%	-16.7%

Note that the percentages of user benefits that are capped by the FTA Summit program are expected to be high since there is a lot of new service in TSM compared to the No Build.

3.4. BUILD ALTERNATIVES

There are several different operating scenarios for the proposed project, which include LRT, BRT, Maglev and Streetcar. The scenarios differ not just in the technology adopted but also differ in stations and alignment/track used. This section summarizes the ridership and user benefits for all the build alternatives. Unlike TSM, all the FTA evaluation measures for the build alternatives are computed against TSM.

3.4.1. Light Rail Alternative – East Bank Option 1

In this alternative, the project LRT connects to Union Station via the Rail Road ROW on East Bank of Los Angeles River. The project operates with frequency of 5 minutes (peak) and 10 minutes (off-peak).

Key ridership results for this alternative are shown in Table 3.4. Boardings at individual stations and by mode are shown in Appendix A. User Benefits data are shown in Table 3.5.

Table 3.4 - Key Ridership Results – Light Rail Alternative – East Bank Option 1

Daily Unlinked Trips (2035)	Project No Build	LRT East Bank 1
System-Wide	3,394,001	3,497,587
Metro Green Line	46,763	50,188
Metro Blue & Gold Line	161,257	158,570
Orange County Line	5,156	4,059
Inland Empire	8,285	9,519
91 Line	5,452	4,163
Project Boardings	-	84,893
Santa Ana Streetcar	15,290	9,812

Table 3.5 - User Benefits – Light Rail Alternative – East Bank Option 1

Statistic	HBW	HBO	NHB	HBU	Total
Daily Project Boardings					84,893
Daily New Riders					32,727
Daily User Benefits (hours)	16,613	7,704	1,622	841	26,779
User Benefits per Project Boarding (mins)					18.9
% of benefits that are coverage related	0.0%	0.0%	0.0%	0.0%	0.0%
% of benefits capped prices	-19.4%	-42.8%	-46.6%	-9.3%	-27.5%

The Light Rail Alternative is estimated to carry about 85,000 riders per day in 2035. The user benefits per project boarding number is reasonable and in the same range as what was seen for similar projects in the LA region. It should be noted that the percentage of user benefits capped is relatively high than what FTA would normally expect. Such high percentages usually suggest that the TSM alternative is not robust enough to be a replacement for build alternative. But that will not impact the goal of the current study as it is a matter of picking one alternative among many and not FTA New Starts submission.

3.4.2. Light Rail Alternative – West Bank Option 2

In this alternative, the project LRT connects to the Union Station via the Pacific Boulevard and Harbor Subdivision. The project operates with frequency of 5 minutes (peak) and 10 minutes (off-peak).

Key ridership results for this alternative are shown in Table 3.6. Boardings at individual stations and by mode are shown in Appendix A. User Benefit data are shown in Table 3.7.

Table 3.6 - Key Ridership Results – Light Rail Alternative – West Bank Option 2

Daily Unlinked Trips (2035)	Project No Build	LRT West Bank 2
System-Wide	3,394,001	3,562,952
Metro Green Line	46,763	49,758
Metro Blue & Gold Line	161,257	157,964
Orange County Line	5,156	4,049
Inland Empire	8,285	9,503
91 Line	5,452	4,145
Project Boardings	-	82,927
Santa Ana Streetcar	15,290	9,800

Table 3.7 - User Benefits – Light Rail Alternative – West Bank Option 2

Statistic	HBW	HBO	NHB	HBU	Total
Daily Project Boardings					82,927
Daily New Riders					31,197
Daily User Benefits (hours)	15,662	7,560	1,507	808	25,537
User Benefits per Project Boarding (mins)					18.5
% of benefits that are coverage related	0.0%	0.0%	0.0%	0.0%	0.0%
% of benefits capped prices	-19.2%	-40.1%	-45.5%	-9.0%	-26.6%

The user benefits and total boardings for this alternative are similar to those for East Bank Option 1. They are slightly lower mainly because West Bank Option 2 is slightly slower than East Bank Option 1. The same note regarding capping discussed in LRT East Bank Option 1 applies to this alternative.

3.4.3. Light Rail Alternative – West Bank Option 3

In this alternative, the project LRT connects to Union Station via the existing Gold Line Tracks.

Key ridership results for this alternative are shown in Table 3.8. Boardings at individual stations and by mode are shown in Appendix A. User Benefits data are shown in table 3.9.

Table 3.8 - Key Ridership Results – Light Rail Alternative – West Bank Option 3

Daily Unlinked Trips (2035)	Project No Build	LRT West Bank 3
System-Wide	3,394,001	3,565,636
Metro Green Line	46,763	49,819
Metro Blue & Gold Line	161,257	156,466
Orange County Line	5,156	4,104
Inland Empire	8,285	9,564
91 Line	5,452	4,118
Project Boardings	-	87,149
Santa Ana Streetcar	15,290	9,810

Table 3.9 - User Benefits – Light Rail Alternative – West Bank Option 3

Statistic	HBW	HBO	NHB	HBU	Total
Daily Project Boardings					87,149
Daily New Riders					32,867
Daily User Benefits (hours)	16,805	7,811	1,645	815	27,075
User Benefits per Project Boarding (mins)					18.6
% of benefits that are coverage related	0.0%	0.0%	0.0%	0.0%	0.0%
% of benefits capped prices	-18.8%	-38.9%	-44.1%	-8.9%	-25.8%

This alternative had the best end-to-end running time compared to East Bank Option 1 and West Bank Option 2. This is reflected in the overall project boardings and user benefits shown in Table 3.9. Again, the note regarding the capping discussed earlier applied to this alternative.

3.4.4. Maglev Alternative – West Bank Option 3

This alternative differs from the LRT alternative mainly in the technology used to run the proposed project. Low speed Maglev technology is considered in this alternative instead of the Light Rail technology that is common throughout the United States in major cities. In addition, the project is terminated at Harbor Boulevard and it is assumed that all Maglev passengers to SARTC would transfer to the Santa Ana Streetcar system to complete their trip.

Key ridership results for this alternative are shown in Table 3.10. Boardings at individual stations and by mode are shown in Appendix A. User Benefits data are shown in table 3.11.

Table 3.10 - Key Ridership Results – Maglev Alternative – West Bank Option 3

Daily Unlinked Trips (2035)	Project No Build	Maglev West Bank 3
System-Wide	3,394,001	3,563,585
Metro Green Line	46,763	48,901
Metro Blue & Gold Line	161,257	156,051
Orange County Line	5,156	3,873
Inland Empire	8,285	8,690
91 Line	5,452	5,064
Project Boardings	-	75,991
Santa Ana Streetcar	15,290	17,935

Table 3.11 - User Benefits – Maglev Alternative – West Bank Option 3

Statistic	HBW	HBO	NHB	HBU	Total
Daily Project Boardings					75,991
Daily New Riders					28,429
Daily User Benefits (hours)	14,765	6,945	1,451	83	23,994
User Benefits per Project Boarding (mins)					18.9
% of benefits that are coverage related	0.0%	0.0%	0.0%	0.0%	0.0%
% of benefits capped prices	-17.8%	-35.5%	-44.5%	-8.7%	-24.2%

This alternative shows similar results as all the LRT alternatives presented earlier in this section. The overall boardings on the project are lower than LRT alternatives because of the fewer stations but the user benefits per project boarding number is comparable to the LRT alternatives. As expected, there are significant number of transfers from the Maglev line to the Santa Ana Streetcar.

3.4.5. Bus Rapid Transit – HOV Running

This alternative is one of the two Bus Rapid Transit options considered in this study. The segment in the north section of the project between L.A. Downtown and Greenline Metro Rail operates on HOV lanes on I-105 and I-110 Freeways. Note that this alternative terminates at 7th/Metro in downtown and has no easy connection to Union Station unlike most of the alternatives in the study.

Since this alternative operated very similar to the existing Harbor Transitway service and not the Orange Line BRT, the project was coded as transitway in the model. Key ridership results for this alternative are shown in Table 3.12. Boardings at individual stations and by mode are shown in Appendix A. User Benefits data are shown in table 3.13.

Table 3.12 - Key Ridership Results – BRT Alternative – HOV Running

Daily Unlinked Trips (2035)	Project No Build	BRT HOV Running
System-Wide	3,394,001	3,573,523
Metro Green Line	46,763	50,911
Metro Blue & Gold Line	161,257	161,295
Orange County Line	5,156	4,266
Inland Empire	8,285	9,063
91 Line	5,452	4,703
Project Boardings	-	67,208
Santa Ana Streetcar	15,290	14,116

Table 3.13 - User Benefits – BRT Alternative – HOV Running

Statistic	HBW	HBO	NHB	HBU	Total
Daily Project Boardings					67,208
Daily New Riders					24,639
Daily User Benefits (hours)	12,378	4,577	681	-59	17,577
User Benefits per Project Boarding (mins)					15.7
% of benefits that are coverage related	0.0%	0.0%	0.0%	0.0%	0.0%
% of benefits capped prices	-30.6%	-58.0%	-64.4%	-41.8%	-39.3%

This alternative shows about 20 percent fewer boardings and user benefits than the LRT alternatives presented earlier in this section. This can be explained by the slower operating speed and the absence of direct connection to Union Station. Since a significant portion of the alignment operated on HOV lanes on freeways, which are congested in the peak period and also some portion of the off-peak period, the end-to-end runtime is a lot higher than the LRT alternatives. Also, transfers from the Union Station are not possible in this alternative.

The negative user benefits for Home Based University purpose are the result of the TSM specification rather than a modeling issue. Since this alternative doesn't connect to Union Station, some college trips in the corridor do not have the same level of service as that is in TSM to go to colleges/universities west of downtown, e.g., UCLA. Ideally, a separate TSM needs to be developed to evaluate this alternative but for the purpose of this study a generic TSM was used to evaluate all the alternatives.

3.4.6. Bus Rapid Transit – Street Running

This alternative is the second of the two Bus Rapid Transit options considered in this study. The segment in the north section of the project between L.A. Downtown and Green Line Metro Rail operates on arterials. Note that this alternative terminates at Union Station unlike the first BRT alternative.

This alternative is also coded as transitway in the model similar to the first BRT alternative. Key ridership results for this alternative are shown in Table 3.14. Boardings at individual stations and by mode are shown in Appendix A. User Benefits data are shown in table 3.15.

Table 3.14 - Key Ridership Results – BRT Alternative – Street Running

Daily Unlinked Trips (2035)	Project No Build	BRT Street Running
System-Wide	3,394,001	3,556,035
Metro Green Line	46,763	55,939
Metro Blue & Gold Line	161,257	163,918
Orange County Line	5,156	4,826
Inland Empire	8,285	8,980
91 Line	5,452	4,949
Project Boardings	-	57,339
Santa Ana Streetcar	15,290	15,772

Table 3.15 - User Benefits – BRT Alternative – Street Running

Statistic	HBW	HBO	NHB	HBU	Total
Daily Project Boardings					57,339
Daily New Riders					18,121
Daily User Benefits (hours)	10,250	2,856	-444	-57	12,606
User Benefits per Project Boarding (mins)					13.2
% of benefits that are coverage related	0.0%	0.0%	0.0%	0.0%	0.0%
% of benefits capped prices	-27.1%	-32.6%	-2.3%	22.6%	-29.5%

This alternative shows about 30-50 percent fewer boardings and user benefits than the LRT alternatives presented earlier in this section. Since a significant portion of the alignment operated on arterial streets the end-to-end runtime is a lot higher than the LRT alternatives and also higher than the first BRT alternative that operated on HOV lanes on freeways. The negative user benefits again are a result of the TSM specification.

3.5. Sensitivity Runs

This section presents the results from the additional model runs that are based on the LRT and Maglev West Bank Option 3 alternatives. A total of six additional alternatives were modeled to account for differences in mode, alignment, stations and other information. The additional LRT alternatives could be considered potential Minimal Operable Segments (MOS's) if the LRT West Bank 3 alternative is chosen as the Locally Preferred Alternative (LPA).

3.5.1. Streetcar Alternative – West Bank Option 3

This alternative shows the impact of streetcar operations for LRT West Bank Option 3 alignment. In addition to the mode difference, an extra stop at Magnolia was also added to the operating plan. Key ridership results for this alternative are shown in Table 3.16. Boardings at individual stations and by mode are shown in Appendix B. User Benefits data are shown in table 3.17.

Table 3.16 - Key Ridership Results – Streetcar Alternative West Bank Option 3

Daily Unlinked Trips (2035)	Project No Build	Streetcar
System-Wide	3,394,001	3,553,043
Metro Green Line	46,763	49,134
Metro Blue & Gold Line	161,257	156,612
Orange County Line	5,156	3,766
Inland Empire	8,285	9,182
91 Line	5,452	4,927
Project Boardings	-	79,601
Santa Ana Streetcar	15,290	9,876

Table 3.17 - User Benefits – Streetcar Alternative West Bank Option 3

Statistic	HBW	HBO	NHB	HBU	Total
Daily Project Boardings					79,601
Daily New Riders					28,945
Daily User Benefits (hours)	15,124	7,364	1,466	682	24,635
User Benefits per Project Boarding (mins)					18.6
% of benefits that are coverage related	0.0%	0.0%	0.0%	0.0%	0.0%
% of benefits capped prices	-15.1%	-33.4%	-39.4%	-8.3%	-21.8%

The results show that both the boardings and user benefits would reduce by about 10 percent because of the slower operating speed of Streetcar compared to LRT.

3.5.2. Light Rail Alternative – West Bank Option 3 – Completely Grade Separated

This alternative shows the impact of completely grade separating the LRT West Bank Option 3 alignment. Apart from the difference in run time, which reflects the complete grade separation, there is no other difference between this alternative and LRT West Bank Option 3. Key ridership results for this alternative are shown in Table 3.18. Boardings at individual stations and by mode are shown in Appendix B. User Benefits data are shown in table 3.19.

Table 3.18 - Key Ridership Results – LRT West Bank Option 3 – Completely Grade Separated

Daily Unlinked Trips (2035)	Project No Build	LRT West Bank 3, Grade Separated
System-Wide	3,394,001	3,569,397
Metro Green Line	46,763	49,861
Metro Blue & Gold Line	161,257	156,441
Orange County Line	5,156	4,161
Inland Empire	8,285	9,682
91 Line	5,452	4,098

Project Boardings	-	89,561
Santa Ana Streetcar	15,290	9,719

Table 3.19 - User Benefits – LRT West Bank Option 3 – Completely Grade Separated

Statistic	HBW	HBO	NHB	HBU	Total
Daily Project Boardings					89,561
Daily New Riders					34,317
Daily User Benefits (hours)	17,578	7,972	1,744	858	28,151
User Benefits per Project Boarding (mins)					18.9
% of benefits that are coverage related	0.0%	0.0%	0.0%	0.0%	0.0%
% of benefits capped prices	-19.4%	-40.1%	-44.8%	-9.0%	-26.5%

The results show that both the boardings and user benefits would increase slightly because of the minor increase in the operating speed of the LRT due to grade separation.

3.5.3. Maglev Alternative – West Bank Option 3 – With Private Fare

This alternative differs from the Maglev alternative only in the amount of fare charged for passengers. A revised fare assuming private operations was calculated and used in the model instead of the MTA fare. The revised private operations fare ($8.75) is $6.42 in 1999 dollars, which is the year dollars in the travel forecasting model. The MTA fare in comparison was 80 cents in 1999 dollars.

Key ridership results for this alternative are shown in Table 3.20. Boardings at individual stations and by mode are shown in Appendix A. An estimate of user benefits is shown in table 3.21. The user benefits for "private fare Maglev" is estimate using the benefits per rider from the "regular fare" Maglev alternative user because the high fare combined with cost coefficients in the mode choice model generated negative benefits in spite of the travel time savings.

Table 3.20 - Key Ridership Results – Maglev Alternative – West Bank Option 3 with Private Fare

Daily Unlinked Trips (2035)	Project No Build	Maglev West Bank 3 Private Fare
System-Wide	3,394,001	3,410,368
Metro Green Line	46,763	28,162
Metro Blue & Gold Line	161,257	108,338
Orange County Line	5,156	4,034
Inland Empire	8,285	6,703
91 Line	5,452	3,616
Project Boardings	-	8,255
Santa Ana Streetcar	15,290	10,384

Table 3.21 - User Benefits "Estimate" – Maglev Alternative – West Bank Option 3 with Private Fare

Statistic	HBW	HBO	NHB	HBU	Total
Daily Project Boardings					8,255
Daily New Riders					3,088
Daily User Benefits (hours)	1,604	754	158	90	2,606
User Benefits per Project Boarding (mins)					18.9
% of benefits that are coverage related	0.0%	0.0%	0.0%	0.0%	0.0%
% of benefits capped prices	-1.7%	-4.5%	-4.4%	-1.0%	-2.9%

The overall boardings on the project and user benefits are significantly lower than the Maglev alternative because of the extremely high fare. The results show that trips in the corridor found cheaper alternatives to the project in order to avoid paying the high fare.

3.5.4. Light Rail Alternative – West Bank Option 3 – MOS Option 1

This alternative is a segment of LRT West Bank Option 3 operating between LA Union Station and the new station added on the Green Line for the project. Key ridership results for this alternative are shown in Table 3.22. Boardings at individual stations and by mode are shown in Appendix B. User Benefits data are shown in table 3.23.

Table 3.22 - Key Ridership Results – LRT West Bank Option 3 – MOS 1

Daily Unlinked Trips (2035)	Project No Build	LRT MOS 1
System-Wide	3,394,001	3,502,355
Metro Green Line	46,763	48,903
Metro Blue & Gold Line	161,257	157,671
Orange County Line	5,156	5,113
Inland Empire	8,285	8,703
91 Line	5,452	5,457
Project Boardings	-	19,618
Santa Ana Streetcar	15,290	15,102

Table 3.23 - User Benefits – LRT West Bank Option 3 – MOS 1

Statistic	HBW	HBO	NHB	HBU	Total
Daily Project Boardings					19,618
Daily New Riders					1,852
Daily User Benefits (hours)	1,569	1,211	-473	23	2,330
User Benefits per Project Boarding (mins)					7.1
% of benefits that are coverage related	0.0%	0.0%	0.0%	0.0%	0.0%
% of benefits capped prices	-0.8%	-7.4%	-9.6%	-5.8%	-2.4%

The results show that both the boardings are on the low side compared to the full LRT West Bank Option 3, with only about 1,700 boarding per mile. The user benefits also show lower than expected results

because of the TSM specification. The TSM bus from LA Union Station to Los Cerritos College operated parallel to the project LRT and hence was removed from the build alternative. However, the portion along the bus route between the new Green Line Station and Los Cerritos College was not serviced by the build alternative, leading to a lesser level of service in the build alternative. The decrease is evident in the user benefits results of Non-Home Based and Home-Based University purposes.

3.5.5. Light Rail Alternative – West Bank Option 3 – MOS Option 2

This alternative is another segment of LRT West Bank Option 3 operating between the new Green Line Station and Bloomfield station. Key ridership results for this alternative are shown in Table 3.24. Boardings at individual stations and by mode are shown in Appendix B. User Benefits data are shown in table 3.25.

Table 3.24 - Key Ridership Results – LRT West Bank Option 3 – MOS 2

Daily Unlinked Trips (2035)	Project No Build	LRT MOS 2
System-Wide	3,394,001	3,506,996
Metro Green Line	46,763	50,429
Metro Blue & Gold Line	161,257	162,758
Orange County Line	5,156	5,030
Inland Empire	8,285	8,752
91 Line	5,452	5,303
Project Boardings	-	11,059
Santa Ana Streetcar	15,290	14,816

Table 3.25 - User Benefits – LRT West Bank Option 3 – MOS 2

Statistic	HBW	HBO	NHB	HBU	Total
Daily Project Boardings					11,059
Daily New Riders					3,350
Daily User Benefits (hours)	1,490	1,402	-44	508	3,356
User Benefits per Project Boarding (mins)					18.2
% of benefits that are coverage related	0.0%	0.0%	0.0%	0.0%	0.0%
% of benefits capped prices	-3.5%	-1.9%	-94.5%	-0.5%	-0.4%

The boardings per mile are lower than LRT MOS 1 with only about 1,500 boardings per mile. The total length of MOS 2 is only about 7.6 miles and it does not connect to LA downtown. All trips going to downtown from the project corridor will need to transfer to other transit (Green Line or Silver Line for example), therefore, making this alternative less attractive than MOS 1. The user benefits, even though in the expected range, show negative values for NHB purpose. This is again because the same generic TSM was used instead of developing a separate one for this alternative.

3.5.6. Light Rail Alternative – West Bank Option 3 – MOS Option 3

This alternative is the last MOS alternative that was considered during this alternatives analysis. This MOS is a combination of both MOS 1 and MOS 2, operating between Union Station and Bloomfield

station. Key ridership results for this alternative are shown in Table 3.26. Boardings at individual stations and by mode are shown in Appendix B. User Benefits data are shown in table 3.27.

Table 3.26 - Key Ridership Results – LRT West Bank Option 3 – MOS 3

Daily Unlinked Trips (2035)	Project No Build	LRT MOS 3
System-Wide	3,394,001	3,521,244
Metro Green Line	46,763	42,651
Metro Blue & Gold Line	161,257	155,974
Orange County Line	5,156	4,951
Inland Empire	8,285	8,688
91 Line	5,452	5,303
Project Boardings	-	38,788
Santa Ana Streetcar	15,290	14,816

Table 3.27 - User Benefits – LRT West Bank Option 3 – MOS 3

Statistic	HBW	HBO	NHB	HBU	Total
Daily Project Boardings					38,788
Daily New Riders					9,794
Daily User Benefits (hours)	5,719	3,417	236	571	9,943
User Benefits per Project Boarding (mins)					15.4
% of benefits that are coverage related	0.0%	0.0%	0.0%	0.0%	0.0%
% of benefits capped prices	-4.3%	-9.7%	-5.4%	-1.0%	-6.0%

The boardings per mile are higher than those of LRT MOS 1 and MOS 2, with about 1,950 boardings per mile. Since this MOS is a shortened LRT West Bank Option 3 and extended MOS 1, both project boardings and user benefits results fall in between MOS 1 and full LRT West Bank Option 3 results.

4. COST EFFECTIVENESS INDEX

Projects that utilize the FTA New Starts program to obtain federal funding are evaluated in a number of categories, including Cost Effectiveness, Transit Supportive Land Uses, Mobility Improvements, Environmental Benefits, Operating Efficiencies, Economic Development and Local Financial Commitment. An important category (which the ridership modeling process is a key component of) is cost effectiveness. This is a measure of the hours saved by the project compared to its annual cost. The Cost Effectiveness (CEI) is calculated for each Build Alternative by comparing its annual cost (combined annualized capital cost and annual operations and maintenance (O&M) cost) and annual hours saved (user benefits) to the TSM Alternative.

A "provisional" cost effectiveness index has been calculated for each Build Alternative and Operating Scenario when compared to the TSM Alternative. These are shown in Table 4.1 along with other measures of effectiveness (incremental cost per new rider and incremental cost per project boarding). . The LRT alternatives and Streetcar alternative have similar CEIs between $42 and $47. The Maglev alternative has the highest CEI of $76 and that is expected because of the huge capital investment required to build the project. The BRT alternatives have the best CEIs among all the build alternatives, as expected. But it should be noted that the travel time benefits associated with those alternatives are also lower compared to other build alternatives.

These cost effectiveness indices are considered provisional because the current TSM alternative will likely need to be revised to withstand FTA scrutiny if any project alternative from this alternatives analysis is to be considered for FTA New Starts Section 5309 funding. There were significant capped user benefits in all the build alternatives. This can be attributed to the TSM alternative in cases where the level and span of service provided in the TSM does not correspond to the Build alternative. Since this scope of this study was not to determine New Starts feasibility refinement of the TSM alternative was not explored. These refinements could be material and adversely affect the cost effectiveness indices presented in this study.

Table 4.1 – Provisional Cost Effectiveness Indices

	Project No Build	Baseline/ TSM (1)	LRT 1 – East Bank 1	LRT 3 – West Bank 2	LRT 4 - West Bank 3	Street Car Sensitivity Analysis - West Bank 3	Maglev (Metro Fare) - West Bank 3	BRT 1 - HOV-Running Alignment	BRT 2 - Street-Running Alignment
Total Capital Cost (2011$)		$245,849,000	$2,615,258,000	$2,562,405,000	$2,850,558,000	$2,626,214,000	$6,310,102,000	$1,089,740,000	$1,082,573,000
Annualized Capital Cost (2011$)		$25,072,000	$212,748,000	$209,335,000	$228,934,000	$213,145,000	$500,943,000	$92,286,000	$91,288,000
Annual Operating Cost (2011$)		$56,908,495	$232,565,071	$228,794,579	$220,468,489	$233,594,609	$160,562,774	$63,966,505	$54,210,412
Total Annual Cost (2011$)		$81,980,495	$445,313,071	$438,129,579	$449,402,489	$446,739,609	$661,505,774	$156,252,505	$145,498,412
Alternative Used As Comparison	NA	No Build	Baseline	Baseline	Baseline	Baseline	Baseline	Baseline	Baseline
Total Annual Incremental Cost	NA	$81,980,495	$363,332,576	$356,149,084	$367,421,994	$364,759,114	$579,525,279	$74,272,010	$63,517,917
Cost Effectiveness Index (2)									
Average Weekday User Benefits (hours)	NA	31,720	26,779	25,537	27,075	24,635	23,994	17,577	12,606
Average Annual User Benefits (hours)	NA	10,058,412	8,491,621	8,097,783	8,585,483	7,811,759	7,608,497	5,573,667	3,997,363
Cost Effectiveness Index	NA	**$8.15**	**$42.79**	**$43.98**	**$42.80**	**$46.69**	**$76.17**	**$13.33**	**$15.89**
Other Evaluation Measures									
Average Weekday New Riders	NA	NA	32,727	31,197	32,867	28,945	28,429	24,639	18,121
Average Annual New Riders	NA	NA	10,377,732	9,892,569	10,422,126	9,178,460	9,014,836	7,813,027	5,746,169
Incremental Cost Per New Rider	NA	NA	**$35.01**	**$36.00**	**$35.25**	**$39.74**	**$64.29**	**$9.51**	**$11.05**
Average Weekday Project Boardings	NA	NA	84,893	82,927	87,149	79,601	75,991	67,208	57,339
Average Annual Project Boardings	NA	NA	26,919,570	26,296,152	27,634,948	25,241,477	24,096,746	21,311,657	18,182,197
Incremental Cost Per Project Boarding	NA	NA	**$13.50**	**$13.54**	**$13.30**	**$14.45**	**$24.05**	**$3.49**	**$3.49**

(1) Assumes improvements in throughout the greater study area

(2) Transportation system user benefits for the build alternatives show high levels of capping by FTA guidelines. If any of these alternatives are being considered for FTA Section 5309 New Starts funding further refinements of the TSM and possibly the Build alternatives may be required. These refinements could be material and adversely affect the cost effectiveness indicies presented here.

Notes:

- Capital and operating costs prepared and reviewed by others. Capital costs and operating costs are project specific
- Documentation of annualization factor prepared and reviewed by others.

5. SUMMARY AND CONCLUSIONS

The initial ridership modeling activities using the Metro Transportation Analysis Model have yielded key insights into the viability of the TSM and Build Alternatives.

Key findings which arise from this report include the following:

- TSM Alternative – In case the selected project alternative from this alternatives analysis needs to be considered for FTA New Starts Section 5309 funding, the current TSM alternative will likely need to be revised to withstand FTA scrutiny. There were significant capped user benefits in all the build alternatives. This can be attributed to the TSM alternative in cases where the level and span of service provided in the TSM does not correspond to the Build alternative. Since this scope of this study was not to determine New Starts feasibility refinement of the TSM alternative was not explored. These refinements could be material and adversely affect the cost effectiveness indices presented in this study.
- Light Rail Alternatives – The Light Rail Alternatives perform well, projected to carry approximately 85,000 riders per day at their highest level of operations in 2035 depending on the alignment and station locations. The boardings per mile turned out to be around 2,400 boardings per mile. While it appears to be on the high side it is consistent with similar forecast LRT alternatives in the region. The selection of one LRT out of the three modeled alternatives ultimately depends on a combination of factors – cost of building the project and the choice of alignment, i.e., at-grade versus underground. The CEIs for the LRT alternatives reflect the same conclusion.
- Bus Rapid Transit Alternatives – Both the BRT alternatives carry significantly less number of riders than LRT. Due to their slow operating speeds the user benefits derived per project boarding are also significantly less than LRT. The biggest advantage of the BRT alternatives over LRT is the low amount of capital investment required to build the project. That is responsible for the CEIs to relatively low for the two BRT alternatives.
- Maglev Alternative – The ridership on the only Maglev alternative modeled was comparable to that of LRT. The low speed Maglev technology does not offer any significant savings to the end-to-end runtime of the project compared to LRT. Since the cost of building this project is significantly higher than LRT, this alternative may not be viable. As indicated earlier, the CEI for this alternative is the highest among all the build alternatives.
- Streetcar Alternative – Similar to Maglev the ridership for this alternative was comparable to that of LRT. The advantage of this alternative over LRT is additional flexibility in determining the stop spacing depending on the locality, i.e., more stops can be easily added to the alignment in densely populated areas unlike LRT, which requires relatively higher investment to build stations etc. The CEI for this alternative is comparable to the LRT alternatives because of their similar costs and user benefits results.

APPENDIX A. BUILD ALTERNATIVES – BOARDINGS BY STATION AND MODE OF ACCESS

Table A.1 - Station Boardings and Times – LRT East Bank Option 1

Station Name	Southbound (Read Down)		Southbound Boardings			Northbound (Read Up)		Northbound Boardings			Total Boardings		
	Dist (mi)	Time (min)	Peak	Off-Peak	Daily	Dist (mi)	Time (min)	Peak	Off-Peak	Daily	Peak	Off-Peak	Daily
Union Station	3.3	7.7	8,111	2,256	10,367	-	-	5,885	2,224	8,109	13,996	4,479	**18,475**
Soto/Olympic	2.4	3.6	628	168	796	3.3	7.7	569	296	865	1,197	464	**1,661**
Leonis/District	1.4	2.4	940	338	1,278	2.4	3.6	748	363	1,111	1,688	701	**2,389**
Gage	2.3	3.1	943	396	1,339	1.4	2.4	1,032	484	1,515	1,975	880	**2,854**
Firestone	2.5	3.2	1,473	504	1,977	2.3	3.1	1,428	589	2,017	2,901	1,093	**3,994**
Gardendale	0.9	1.8	552	191	743	2.5	3.2	352	199	551	904	390	**1,293**
Green Line (new)	0.7	1.7	2,077	802	2,879	0.9	1.8	1,654	598	2,252	3,731	1,400	**5,131**
Paramount/Rosecrans	2.4	3.2	1,071	509	1,580	0.7	1.7	510	248	758	1,581	757	**2,338**
Bellflower Blvd.	2.4	3.2	1,183	530	1,712	2.4	3.2	642	373	1,015	1,824	903	**2,727**
183Rd St/Gridley Rd.	0.7	1.7	1,241	489	1,729	2.4	3.2	794	426	1,220	2,035	914	**2,949**
Pioneer Blvd.	1.4	2.4	988	364	1,351	0.7	1.7	653	299	951	1,640	662	**2,302**
Bloomfield	2.7	3.5	905	350	1,255	1.4	2.4	607	316	923	1,512	665	**2,177**
Cypress College	1.1	2.0	1,866	683	2,548	2.7	3.5	1,495	620	2,115	3,361	1,303	**4,663**
Knott	1.2	2.1	1,162	506	1,668	1.1	2.0	973	395	1,367	2,135	900	**3,035**
Beach	2.5	3.3	1,570	570	2,140	1.2	2.1	1,564	590	2,154	3,134	1,160	**4,294**
Brookhurst	1.5	2.4	1,338	508	1,846	2.5	3.3	1,139	461	1,600	2,477	969	**3,446**
Euclid	1.3	2.2	992	356	1,347	1.5	2.4	924	323	1,246	1,915	678	**2,593**
Harbor Blvd.	1.0	1.9	2,957	980	3,937	1.3	2.2	1,594	485	2,079	4,551	1,465	**6,015**
Harbor/1St Street	1.0	2.2	320	205	525	1.0	1.9	304	161	464	623	366	**989**
1St Street/Fairview Street	1.2	2.1	547	260	807	1.0	2.2	345	158	503	892	418	**1,309**
1St Street/Bristol Street	2.0	5.9	943	691	1,634	1.2	2.1	440	231	671	1,383	922	**2,305**
SARTC	-	-	3,186	1,140	4,326	2.0	5.9	2,515	1,119	3,634	5,701	2,259	**7,959**
Total	**35.9**	**61.7**	**34,989**	**12,790**	**47,779**	**35.9**	**61.7**	**26,161**	**10,953**	**37,114**	**61,150**	**23,743**	**84,893**

Table A.2 – Station Boardings By Mode of Access – LRT East Bank Option 1

Station Name	By Access						By Egress						Boardings					
	Walk	Bus	PNR	KNR	Rail	Total	Walk	Bus	PNR	KNR	Rail	Total	Walk	Bus	PNR	KNR	Rail	Total
Union Station	370	402	225	71	19,665	20,733	0	4,146	-	-	12,071	16,217	185	2,274	113	36	15,868	18,475
Soto/Olympic	729	122	0	66	0	917	1,587	817	-	-	0	2,404	1,158	470	0	33	0	1,661
Leonis/District	1,563	0	0	73	0	1,636	3,139	2	-	-	0	3,141	2,351	1	0	36	0	2,389
Gage	2,759	380	0	224	0	3,363	1,658	687	-	-	0	2,345	2,208	534	0	112	0	2,854
Firestone	2,405	1,607	968	199	0	5,179	549	2,260	-	-	0	2,809	1,477	1,933	484	100	0	3,994
Gardendale	882	0	0	123	0	1,005	1,581	0	-	-	0	1,581	1,232	0	0	61	0	1,293
Green Line (new)	1,250	0	1,109	229	3,863	6,451	185	29	-	-	3,597	3,810	717	14	554	115	3,730	5,131
Paramount/Rosecrans	1,278	497	0	168	0	1,943	1,089	1,643	-	-	0	2,732	1,184	1,070	0	84	0	2,338
Bellflower Blvd.	2,077	50	1,103	250	0	3,480	1,810	163	-	-	0	1,973	1,944	106	552	125	0	2,727
183Rd St/Gridley Rd.	756	475	733	120	0	2,084	1,755	2,058	-	-	0	3,813	1,255	1,267	366	60	0	2,949
Pioneer Blvd.	867	216	851	182	0	2,116	809	1,679	-	-	0	2,488	838	948	425	91	0	2,302
Bloomfield	1,067	225	1,199	215	0	2,706	695	953	-	-	0	1,648	881	589	599	107	0	2,177
Cypress College	1,080	1,056	1,564	196	0	3,896	2,548	2,882	-	-	0	5,430	1,814	1,969	782	98	0	4,663
Knott	1,768	415	0	247	0	2,430	2,251	1,388	-	-	0	3,639	2,009	902	0	124	0	3,035
Beach	1,476	1,206	1,894	282	0	4,859	1,975	1,754	-	-	0	3,729	1,726	1,480	947	141	0	4,294
Brookhurst	1,160	746	1,626	250	0	3,783	1,678	1,430	-	-	0	3,108	1,419	1,088	813	125	0	3,446
Euclid	976	621	1,385	223	0	3,206	504	1,476	-	-	0	1,980	740	1,049	693	112	0	2,593
Harbor Blvd.	511	1,857	1,564	161	219	4,312	1,174	6,543	-	-	1	7,718	843	4,200	782	81	110	6,015
Harbor/1St Street	556	186	0	196	0	938	862	177	-	-	0	1,039	709	182	0	98	0	989
1St Street/Fairview Street	840	152	0	167	0	1,159	656	803	-	-	0	1,459	748	478	0	84	0	1,309
1St Street/Bristol Street	670	414	0	346	0	1,430	1,190	1,989	-	-	0	3,179	930	1,201	0	173	0	2,305
SARTC	742	1,094	4,911	224	296	7,267	664	7,880	-	-	107	8,651	703	4,487	2,456	112	201	7,959
Total	**25,782**	**11,722**	**19,132**	**4,214**	**24,043**	**84,893**	**28,359**	**40,759**	**-**	**-**	**15,775**	**84,893**	**27,071**	**26,241**	**9,566**	**2,107**	**19,909**	**84,893**

Table A.3 - Station Boardings and Times – LRT West Bank Option 2

Station Name	Southbound (Read Down)		Southbound Boardings			Northbound (Read Up)		Northbound Boardings			Total Boardings		
	Dist (mi)	Time (min)	Peak	Off-Peak	Daily	Dist (mi)	Time (min)	Peak	Off-Peak	Daily	Peak	Off-Peak	Daily
Union Station	4.6	9.0	7,449	2,039	9,488	-	-	5,647	2,121	7,768	13,096	4,160	**17,256**
Pacific/Harbor Sub	1.5	3.2	502	228	730	4.6	9.0	584	283	867	1,086	511	**1,597**
Randolph/Pacific	1.4	2.6	974	378	1,352	1.5	3.2	961	490	1,451	1,935	867	**2,802**
Gage	2.5	3.6	876	512	1,388	1.4	2.6	882	546	1,428	1,758	1,058	**2,816**
Firestone	2.2	3.3	1,415	465	1,880	2.5	3.6	1,376	599	1,975	2,791	1,064	**3,854**
Gardendale	0.7	1.7	549	194	743	2.2	3.3	340	198	538	889	392	**1,281**
Green Line (new)	0.7	1.8	2,000	780	2,780	0.7	1.7	1,525	552	2,077	3,525	1,332	**4,857**
Paramount/Rosecrans	2.4	3.2	1,004	504	1,508	0.7	1.8	490	245	734	1,493	749	**2,242**
Bellflower Blvd.	2.4	3.2	1,175	524	1,699	2.4	3.2	619	371	990	1,794	894	**2,688**
183Rd St/Gridley Rd.	0.7	1.7	1,221	483	1,703	2.4	3.2	776	421	1,197	1,997	904	**2,900**
Pioneer Blvd.	1.4	2.4	965	360	1,324	0.7	1.7	641	299	940	1,606	659	**2,264**
Bloomfield	2.7	3.5	900	344	1,244	1.4	2.4	595	314	909	1,495	658	**2,153**
Cypress College	1.1	2.0	1,847	673	2,520	2.7	3.5	1,480	620	2,100	3,327	1,293	**4,620**
Knott	1.2	2.1	1,149	505	1,654	1.1	2.0	965	397	1,362	2,114	902	**3,015**
Beach	2.5	3.3	1,552	569	2,121	1.2	2.1	1,549	589	2,138	3,101	1,158	**4,259**
Brookhurst	1.5	2.4	1,334	503	1,836	2.5	3.3	1,123	459	1,582	2,457	962	**3,418**
Euclid	1.3	2.2	976	351	1,327	1.5	2.4	917	321	1,238	1,893	672	**2,565**
Harbor Blvd.	1.0	1.9	2,923	971	3,893	1.3	2.2	1,576	487	2,063	4,499	1,457	**5,956**
Harbor/1St Street	1.0	2.2	322	198	520	1.0	1.9	300	161	461	622	359	**981**
1St Street/Fairview Street	1.2	2.1	540	262	801	1.0	2.2	343	156	498	882	417	**1,299**
1St Street/Bristol Street	2.0	5.9	934	678	1,612	1.2	2.1	426	225	650	1,360	902	**2,262**
SARTC	-	-	3,137	1,123	4,260	2.0	5.9	2,473	1,116	3,588	5,610	2,238	**7,848**
Total	**36.0**	**63.4**	**33,740**	**12,638**	**46,378**	**36.0**	**63.4**	**25,586**	**10,963**	**36,549**	**59,326**	**23,601**	**82,927**

Table A.4 - Station Boardings By Mode of Access – LRT West Bank Option 2

Station Name	By Access						By Egress						Boardings					
	Walk	Bus	PNR	KNR	Rail	Total	Walk	Bus	PNR	KNR	Rail	Total	Walk	Bus	PNR	KNR	Rail	Total
Union Station	323	376	222	62	17,993	18,976	0	4,060	-	-	11,475	15,535	162	2,218	111	31	14,734	17,256
Pacific/Harbor Sub	842	223	0	56	0	1,121	1,173	900	-	-	0	2,073	1,007	562	0	28	0	1,597
Randolph/Pacific	1,777	923	0	107	0	2,807	0	2,797	-	-	0	2,797	888	1,860	0	53	0	2,802
Gage	2,462	172	0	185	0	2,819	2,197	615	-	-	0	2,812	2,329	393	0	93	0	2,816
Firestone	2,356	1,537	931	179	0	5,003	516	2,189	-	-	0	2,705	1,436	1,863	465	90	0	3,854
Gardendale	871	0	0	118	0	989	1,572	0	-	-	0	1,572	1,222	0	0	59	0	1,281
Green Line (new)	1,211	0	1,066	222	3,597	6,096	192	31	-	-	3,395	3,618	701	16	533	111	3,496	4,857
Paramount/Rosecrans	1,253	487	0	164	0	1,903	1,086	1,494	-	-	0	2,580	1,170	990	0	82	0	2,242
Bellflower Blvd.	2,050	49	1,072	246	0	3,417	1,802	157	-	-	0	1,959	1,926	103	536	123	0	2,688
183Rd St/Gridley Rd.	748	469	715	118	0	2,050	1,728	2,022	-	-	0	3,750	1,238	1,245	358	59	0	2,900
Pioneer Blvd.	865	211	837	180	0	2,092	797	1,639	-	-	0	2,436	831	925	418	90	0	2,264
Bloomfield	1,064	222	1,181	212	0	2,678	689	938	-	-	0	1,627	876	580	591	106	0	2,153
Cypress College	1,072	1,046	1,550	194	0	3,861	2,525	2,853	-	-	0	5,378	1,798	1,949	775	97	0	4,620
Knott	1,763	411	0	243	0	2,418	2,235	1,377	-	-	0	3,612	1,999	894	0	122	0	3,015
Beach	1,470	1,194	1,880	280	0	4,824	1,957	1,736	-	-	0	3,693	1,714	1,465	940	140	0	4,259
Brookhurst	1,156	743	1,613	248	0	3,760	1,661	1,415	-	-	0	3,076	1,409	1,079	807	124	0	3,418
Euclid	973	616	1,376	222	0	3,188	501	1,440	-	-	0	1,941	737	1,028	688	111	0	2,565
Harbor Blvd.	508	1,844	1,552	160	216	4,280	1,169	6,460	-	-	1	7,631	839	4,152	776	80	108	5,956
Harbor/1St Street	553	186	0	196	0	935	850	176	-	-	0	1,026	701	181	0	98	0	981
1St Street/Fairview Street	838	149	0	172	0	1,159	648	791	-	-	0	1,439	743	470	0	86	0	1,299
1St Street/Bristol Street	673	413	0	289	0	1,375	1,187	1,961	-	-	0	3,148	930	1,187	0	144	0	2,262
SARTC	735	1,079	4,845	228	289	7,176	656	7,763	-	-	100	8,519	695	4,421	2,423	114	194	7,848
Total	**22,944**	**11,203**	**18,840**	**3,918**	**22,094**	**78,999**	**23,968**	**39,118**	**-**	**-**	**14,971**	**78,057**	**23,456**	**25,161**	**9,420**	**1,959**	**18,533**	**82,927**

Table A.5 - Station Boardings and Times – LRT West Bank Option 3

Station Name	Southbound (Read Down)		Southbound Boardings			Northbound (Read Up)		Northbound Boardings			Total Boardings		
	Dist (mi)	Time (min)	Peak	Off-Peak	Daily	Dist (mi)	Time (min)	Peak	Off-Peak	Daily	Peak	Off-Peak	Daily
Union Station	1.3	2.5	8,108	2,149	10,257	-	-	5,518	2,239	7,757	13,626	4,388	**18,014**
7th/Alameda	2.3	3.4	530	143	673	1.3	2.5	1,057	395	1,452	1,587	538	**2,125**
Pacific/Harbor	1.5	2.8	494	215	709	2.3	3.4	637	355	992	1,131	570	**1,701**
Randolph/Pacific	1.2	2.3	991	387	1,378	1.5	2.8	1,052	503	1,554	2,043	889	**2,932**
Gage	2.7	3.8	877	519	1,396	1.2	2.3	966	593	1,558	1,842	1,112	**2,954**
Firestone	2.2	3.3	1,411	466	1,877	2.7	3.8	1,464	631	2,095	2,875	1,097	**3,972**
Gardendale	0.7	1.7	551	197	748	2.2	3.3	354	209	563	905	406	**1,311**
Green Line (new)	0.7	1.8	2,223	796	3,018	0.7	1.7	1,555	576	2,131	3,778	1,371	**5,149**
Paramount/Rosecrans	2.4	3.2	1,010	506	1,516	0.7	1.8	511	251	762	1,521	756	**2,277**
Bellflower Blvd.	2.4	3.2	1,175	528	1,703	2.4	3.2	640	387	1,027	1,815	915	**2,730**
183Rd St/Gridley Rd.	0.7	1.7	1,228	483	1,711	2.4	3.2	802	434	1,236	2,030	916	**2,946**
Pioneer Blvd.	1.4	2.4	968	361	1,328	0.7	1.7	653	308	961	1,621	669	**2,289**
Bloomfield	2.7	3.5	904	352	1,256	1.4	2.4	608	321	929	1,512	673	**2,185**
Cypress College	1.1	2.0	1,853	678	2,531	2.7	3.5	1,506	629	2,135	3,359	1,307	**4,666**
Knott	1.2	2.1	1,153	504	1,656	1.1	2.0	976	399	1,375	2,129	903	**3,031**
Beach	2.5	3.3	1,558	569	2,127	1.2	2.1	1,571	597	2,167	3,129	1,166	**4,294**
Brookhurst	1.5	2.4	1,334	504	1,838	2.5	3.3	1,143	465	1,607	2,477	968	**3,445**
Euclid	1.3	2.2	981	353	1,334	1.5	2.4	926	324	1,250	1,907	676	**2,583**
Harbor Blvd.	1.0	1.9	2,926	973	3,899	1.3	2.2	1,600	489	2,089	4,526	1,462	**5,988**
Harbor/1St Street	1.0	2.2	321	207	528	1.0	1.9	302	161	463	623	368	**991**
1St Street/Fairview Street	1.2	2.1	544	260	804	1.0	2.2	345	158	503	889	418	**1,307**
1St Street/Bristol Street	2.0	5.9	931	684	1,615	1.2	2.1	431	227	657	1,361	911	**2,272**
SARTC	-	-	3,142	1,126	4,267	2.0	5.9	2,557	1,170	3,727	5,699	2,296	**7,994**
Total	**35.0**	**59.8**	**35,209**	**12,954**	**48,163**	**35.0**	**59.8**	**27,171**	**11,815**	**38,986**	**62,380**	**24,769**	**87,149**

Table A.6 - Station Boardings By Mode of Access – LRT West Bank Option 3

Station Name	By Access						By Egress						Boardings					
	Walk	Bus	PNR	KNR	Rail	Total	Walk	Bus	PNR	KNR	Rail	Total	Walk	Bus	PNR	KNR	Rail	Total
Union Station	469	506	267	100	19,171	20,513	0	4,805	-	-	10,709	15,514	235	2,655	133	50	14,940	18,014
7th/Alameda	396	93	0	25	0	514	1,400	2,335	-	-	0	3,735	898	1,214	0	12	0	2,125
Pacific/Harbor	1,000	255	0	73	0	1,328	1,249	825	-	-	0	2,074	1,124	540	0	37	0	1,701
Randolph/Pacific	2,033	1,014	0	123	0	3,170	0	2,693	-	-	0	2,693	1,017	1,853	0	62	0	2,932
Gage	2,668	180	0	203	0	3,051	2,232	624	-	-	0	2,856	2,450	402	0	101	0	2,954
Firestone	2,496	1,628	971	197	0	5,291	530	2,122	-	-	0	2,652	1,513	1,875	485	99	0	3,972
Gardendale	919	0	0	124	0	1,043	1,578	0	-	-	0	1,578	1,248	0	0	62	0	1,311
Green Line (new)	1,260	0	1,090	232	3,658	6,240	217	30	-	-	3,810	4,057	739	15	545	116	3,734	5,149
Paramount/Rosecrans	1,284	496	0	170	0	1,950	1,098	1,506	-	-	0	2,604	1,191	1,001	0	85	0	2,277
Bellflower Blvd.	2,105	51	1,093	254	0	3,503	1,800	156	-	-	0	1,956	1,953	103	547	127	0	2,730
183Rd St/Gridley Rd.	779	479	734	124	0	2,116	1,740	2,036	-	-	0	3,776	1,259	1,258	367	62	0	2,946
Pioneer Blvd.	886	217	848	185	0	2,136	801	1,641	-	-	0	2,442	843	929	424	92	0	2,289
Bloomfield	1,082	226	1,197	217	0	2,722	699	948	-	-	0	1,647	890	587	599	109	0	2,185
Cypress College	1,101	1,065	1,569	201	0	3,936	2,531	2,865	-	-	0	5,396	1,816	1,965	784	100	0	4,666
Knott	1,781	417	0	249	0	2,447	2,236	1,379	-	-	0	3,615	2,008	898	0	124	0	3,031
Beach	1,484	1,214	1,897	284	0	4,879	1,969	1,740	-	-	0	3,709	1,726	1,477	949	142	0	4,294
Brookhurst	1,172	751	1,630	252	0	3,805	1,665	1,419	-	-	0	3,084	1,419	1,085	815	126	0	3,445
Euclid	986	623	1,387	223	0	3,219	503	1,444	-	-	0	1,947	744	1,033	694	112	0	2,583
Harbor Blvd.	513	1,873	1,566	162	221	4,335	1,168	6,470	-	-	1	7,640	841	4,172	783	81	111	5,988
Harbor/1St Street	557	188	0	199	0	943	860	178	-	-	0	1,038	708	183	0	99	0	991
1St Street/Fairview Street	843	151	0	173	0	1,167	650	796	-	-	0	1,446	746	473	0	87	0	1,307
1St Street/Bristol Street	676	417	0	294	0	1,387	1,192	1,964	-	-	0	3,156	934	1,190	0	147	0	2,272
SARTC	764	1,127	5,017	239	307	7,454	659	7,776	-	-	99	8,534	712	4,452	2,509	119	203	7,994
Total	**27,254**	**12,969**	**19,266**	**4,304**	**23,356**	**87,149**	**26,778**	**45,752**	**-**	**-**	**14,619**	**87,149**	**27,016**	**29,360**	**9,633**	**2,152**	**18,988**	**87,149**

Table A.7 - Station Boardings and Times – Maglev West Bank Option 3

Station Name	Southbound (Read Down)		Southbound Boardings			Northbound (Read Up)		Northbound Boardings			Total Boardings		
	Dist (mi)	Time (min)	Peak	Off-Peak	Daily	Dist (mi)	Time (min)	Peak	Off-Peak	Daily	Peak	Off-Peak	Daily
Union Station	1.3	3.5	8,092	2,009	10,101	-	-	5,206	2,098	7,304	13,298	4,107	**17,404**
7th/Alameda	2.2	2.9	523	147	670	1.3	3.5	1,154	421	1,574	1,676	568	**2,244**
Pacific/Harbor	1.0	1.7	488	223	711	2.2	2.9	635	359	993	1,123	581	**1,704**
Randolph/Pacific	1.6	2.4	1,014	388	1,402	1.0	1.7	1,080	515	1,595	2,094	902	**2,996**
Gage	2.4	3.0	907	533	1,440	1.6	2.4	975	608	1,583	1,882	1,141	**3,023**
Firestone	2.4	2.9	1,421	458	1,879	2.4	3.0	1,522	643	2,165	2,943	1,101	**4,044**
Gardendale St	0.7	1.4	494	203	696	2.4	2.9	346	216	562	840	418	**1,258**
Green Line	0.6	2.0	2,137	707	2,844	0.7	1.4	1,439	531	1,970	3,576	1,238	**4,813**
Paramount/Rosecrans	2.1	2.8	1,067	497	1,564	0.6	2.0	507	251	757	1,574	748	**2,321**
Bellflower Blvd	2.4	3.0	1,143	507	1,649	2.1	2.8	674	405	1,079	1,817	911	**2,728**
183Rd St/Gridley Rd	0.7	1.4	1,253	482	1,734	2.4	3.0	796	432	1,228	2,048	914	**2,962**
Pioneer Blvd	1.5	2.1	941	372	1,313	0.7	1.4	702	322	1,024	1,643	694	**2,336**
Bloomfield	2.7	3.2	880	345	1,225	1.5	2.1	652	327	979	1,532	672	**2,204**
Cypress College	2.3	2.7	2,237	816	3,052	2.7	3.2	1,687	693	2,379	3,923	1,508	**5,431**
Beach Blvd	2.5	3.0	1,623	586	2,208	2.3	2.7	1,854	707	2,560	3,476	1,292	**4,768**
Brookhurst St	1.4	2.1	1,337	471	1,807	2.5	3.0	1,141	468	1,609	2,478	938	**3,416**
Euclid St	1.6	2.9	911	289	1,200	1.4	2.1	933	342	1,275	1,844	631	**2,475**
Harbor Blvd	-	-	5,043	1,667	6,710	1.6	2.9	2,248	911	3,159	7,291	2,578	**9,869**
Total	**29.4**	**43.0**	**31,506**	**10,695**	**42,201**	**29.4**	**43.0**	**23,547**	**10,243**	**33,790**	**55,053**	**20,938**	**75,991**

Table A.8 - Station Boardings By Mode of Access – Maglev West Bank Option 3

Station Name	By Access						By Egress						Boardings					
	Walk	Bus	PNR	KNR	Rail	Total	Walk	Bus	PNR	KNR	Rail	Total	Walk	Bus	PNR	KNR	Rail	Total
Union Station	425	342	182	81	19,171	20,201	0	3,745	-	-	10,862	14,607	213	2,043	91	40	15,017	17,404
7th/Alameda	410	80	0	27	0	517	1,751	2,219	-	-	0	3,970	1,081	1,149	0	14	0	2,244
Pacific/Harbor	1,041	189	0	71	0	1,300	1,388	719	-	-	0	2,107	1,214	454	0	35	0	1,704
Randolph/Pacific	2,219	955	0	120	0	3,294	39	2,659	-	-	0	2,698	1,129	1,807	0	60	0	2,996
Gage	2,772	148	0	178	0	3,099	2,530	416	-	-	0	2,946	2,651	282	0	89	0	3,023
Firestone	2,881	1,398	938	194	0	5,411	590	2,087	-	-	0	2,677	1,735	1,743	469	97	0	4,044
Gardendale St	975	3	0	109	0	1,087	1,428	0	-	-	0	1,428	1,202	2	0	54	0	1,258
Green Line	1,176	0	857	176	3,703	5,912	230	17	-	-	3,467	3,714	703	9	428	88	3,585	4,813
Paramount/Rosecrans	1,414	368	0	161	0	1,942	1,614	1,086	-	-	0	2,700	1,514	727	0	80	0	2,321
Bellflower Blvd	2,177	55	1,025	218	0	3,475	1,809	171	-	-	0	1,980	1,993	113	513	109	0	2,728
183Rd St/Gridley Rd	817	477	689	121	0	2,105	1,742	2,076	-	-	0	3,818	1,280	1,276	345	61	0	2,962
Pioneer Blvd	958	222	828	171	0	2,179	869	1,624	-	-	0	2,493	914	923	414	86	0	2,336
Bloomfield	1,188	222	1,123	214	0	2,746	738	923	-	-	0	1,661	963	572	561	107	0	2,204
Cypress College	1,326	1,055	1,577	205	0	4,163	2,849	3,850	-	-	0	6,699	2,087	2,453	788	103	0	5,431
Beach Blvd	2,315	1,076	1,941	308	0	5,640	1,958	1,938	-	-	0	3,896	2,137	1,507	970	154	0	4,768
Brookhurst St	1,198	573	1,558	244	0	3,574	1,793	1,464	-	-	0	3,257	1,496	1,018	779	122	0	3,416
Euclid St	974	475	1,358	221	0	3,029	552	1,368	-	-	0	1,920	763	922	679	111	0	2,475
Harbor Blvd	450	1,393	1,534	162	2,777	6,317	1,081	9,794	-	-	2,545	13,420	766	5,594	767	81	2,661	9,869
Total	**24,718**	**9,030**	**13,610**	**2,981**	**25,651**	**75,991**	**22,962**	**36,155**	**-**	**-**	**16,874**	**75,991**	**23,840**	**22,592**	**6,805**	**1,491**	**21,263**	**75,991**

Table A.9 - Station Boardings and Times – BRT HOV Running

Station Name	Southbound (Read Down)		Southbound Boardings			Northbound (Read Up)		Northbound Boardings			Total Boardings		
	Dist (mi)	Time (min)	Peak	Off-Peak	Daily	Dist (mi)	Time (min)	Peak	Off-Peak	Daily	Peak	Off-Peak	Daily
7th/Metro Center	2.7	15.5	3,555	1,524	5,079	-	-	445	797	1,241	3,555	1,524	**6,320**
Harbor Fwy/Exposition	2.0	3.2	280	286	565	4.5	13.5	2,949	394	3,343	280	286	**3,908**
Harbor Fwy/Slauson	2.5	4.2	234	334	568	1.9	2.7	123	380	502	234	334	**1,070**
Harbor Fwy/Manchester	1.5	2.5	1,348	591	1,938	1.6	2.2	131	301	432	1,348	591	**2,370**
Harbor Fwy/Century Fwy	9.7	11.8	2,275	520	2,794	2.3	3.2	1,165	208	1,372	2,275	520	**4,166**
Green Line Lakewood	2.1	2.3	2,259	740	2,999	9.7	11.8	1,644	426	2,070	2,259	740	**5,069**
Lakewood Blvd	1.2	2.5	946	224	1,170	2.1	2.3	597	130	727	946	224	**1,896**
Bellflower Blvd	2.4	3.8	1,123	281	1,404	1.2	2.5	476	159	635	1,123	281	**2,038**
183Rd St/Gridley Rd	0.7	1.9	803	387	1,190	2.4	3.8	786	280	1,066	803	387	**2,256**
Pioneer Blvd	1.4	2.7	917	288	1,204	0.7	1.9	427	152	579	917	288	**1,783**
Bloomfield	2.7	4.1	1,137	323	1,460	1.4	2.7	519	176	695	1,137	323	**2,154**
Cypress College	1.1	2.4	2,376	772	3,147	2.7	4.1	1,131	414	1,545	2,376	772	**4,692**
Knott Ave	1.2	2.5	1,048	386	1,434	1.1	2.4	1,132	352	1,484	1,048	386	**2,917**
Beach Blvd	1.2	2.5	933	290	1,223	1.2	2.5	1,008	245	1,253	933	290	**2,476**
Magnolia St	1.2	2.5	496	177	673	1.2	2.5	306	131	436	496	177	**1,109**
Brookhurst St	1.5	2.8	725	236	960	1.2	2.5	620	221	841	725	236	**1,801**
Euclid St	1.3	2.6	998	272	1,270	1.5	2.8	399	156	554	998	272	**1,824**
Harbor Blvd	1.0	2.6	2,838	1,017	3,855	1.3	2.6	1,495	538	2,033	2,838	1,017	**5,887**
Harbor/1St Street	1.0	2.7	188	94	282	1.0	2.6	353	102	455	188	94	**737**
1St Street/Fairview St	1.2	2.6	503	237	740	1.0	2.7	124	72	196	503	237	**935**
1St Street/Bristol St	2.0	6.6	2,517	696	3,212	1.2	2.6	188	122	309	2,517	696	**3,521**
SARTC	-	-	5,785	1,217	7,002	2.0	6.6	932	351	1,283	5,785	1,217	**8,284**
Total	**41.6**	**84.3**	**33,279**	**10,884**	**44,163**	**43.2**	**80.5**	**16,944**	**6,101**	**23,045**	**33,279**	**10,884**	**67,208**

Table A.10 - Station Boardings By Mode of Access – BRT HOV Running

Station Name	By Access			By Egress			Boardings		
	Walk/Bus/Rail	Drive	Total	Walk/Bus/Rail	Drive	Total	Walk/Bus/Rail	Drive	Total
7th/Metro Center	2,445	7,712	10,157	2,482	-	2,482	2,463	3,856	6,320
Harbor Fwy/Exposition	117	1,017	1,134	6,681	-	6,681	3,399	508	3,908
Harbor Fwy/Slauson	435	683	1,118	1,022	-	1,022	728	342	1,070
Harbor Fwy/Manchester	1,507	2,537	4,044	695	-	695	1,101	1,268	2,370
Harbor Fwy/Century Fwy	2,846	2,651	5,497	2,835	-	2,835	2,841	1,325	4,166
Green Line Lakewood	4,406	2,425	6,831	3,306	-	3,306	3,856	1,213	5,069
Lakewood Blvd	1,240	600	1,840	1,952	-	1,952	1,596	300	1,896
Bellflower Blvd	1,146	1,904	3,050	1,026	-	1,026	1,086	952	2,038
183Rd St/Gridley Rd	900	1,137	2,037	2,475	-	2,475	1,687	569	2,256
Pioneer Blvd	698	896	1,594	1,971	-	1,971	1,334	448	1,783
Bloomfield	940	1,788	2,728	1,580	-	1,580	1,260	894	2,154
Cypress College	1,624	1,151	2,775	6,608	-	6,608	4,116	575	4,692
Knott Ave	1,142	1,912	3,054	2,780	-	2,780	1,961	956	2,917
Beach Blvd	945	1,626	2,571	2,380	-	2,380	1,662	813	2,476
Magnolia St	637	698	1,335	882	-	882	759	349	1,109
Brookhurst St	1,194	973	2,167	1,435	-	1,435	1,314	487	1,801
Euclid St	793	1,400	2,193	1,454	-	1,454	1,123	700	1,824
Harbor Blvd	2,118	1,285	3,403	8,371	-	8,371	5,244	643	5,887
Harbor/1St Street	255	753	1,008	465	-	465	360	377	737
1St Street/Fairview St	297	630	927	943	-	943	620	315	935
1St Street/Bristol St	441	4,739	5,180	1,862	-	1,862	1,152	2,369	3,521
SARTC	2,178	387	2,565	14,003	-	14,003	8,091	193	8,284
Total	**28,303**	**38,905**	**67,208**	**67,208**	**-**	**67,208**	**47,755**	**19,453**	**67,208**

NOTE: This line is modeled as Transitway. Since the mode choice model currently outputs only station access volumes for transitway mode, the egress data in the above summary were estimated using transit assignment data. Use the egress data with caution.

Table A.11 - Station Boardings and Times – BRT Street Running

Station Name	Southbound (Read Down)		Southbound Boardings			Northbound (Read Up)		Northbound Boardings			Total Boardings		
	Dist (mi)	Time (min)	Peak	Off-Peak	Daily	Dist (mi)	Time (min)	Peak	Off-Peak	Daily	Peak	Off-Peak	Daily
Union Station	2.1	11.1	1,214	78	1,292	-	-	899	128	1,027	2,113	206	**2,319**
Metro Gold Line Soto	0.7	3.5	472	40	511	2.1	11.1	607	50	656	1,078	89	**1,167**
Soto St/Whittier Blvd	0.8	8.4	444	90	533	0.7	3.5	193	53	246	636	143	**779**
Soto St/Olympic Blvd	1.1	9.8	371	31	402	0.8	8.4	186	41	227	557	72	**629**
Soto St/Vernon Ave	1.7	8.3	492	73	565	1.1	9.8	108	46	154	600	119	**718**
Pacific Blvd/Sauson Ave	1.0	3.6	323	106	428	1.7	8.3	613	49	661	935	154	**1,089**
Pacific Blvd/Florence Ave	1.3	4.9	735	192	927	1.0	3.6	275	159	434	1,010	351	**1,361**
Long Beach Blvd/Firestone Blvd	2.1	7.9	967	90	1,057	1.3	4.9	899	97	996	1,866	187	**2,053**
Firestone Blvd/Atlantic	3.6	14.6	513	159	671	2.1	7.9	384	86	470	897	244	**1,141**
Firestone Blvd/Lakewood	2.1	7.8	527	250	776	3.6	14.6	1,066	189	1,255	1,593	438	**2,031**
Green Line Lakewood	2.1	2.3	3,898	1,271	5,168	2.1	7.8	1,334	391	1,725	5,232	1,661	**6,893**
Lakewood Blvd	1.2	2.5	889	188	1,077	2.1	2.3	546	97	643	1,435	285	**1,719**
Bellflower Blvd	2.4	3.8	1,116	250	1,365	1.2	2.5	371	130	500	1,486	379	**1,865**
183Rd St/Gridley Rd	0.7	1.9	676	351	1,027	2.4	3.8	551	315	865	1,226	666	**1,892**
Pioneer Blvd	1.4	2.7	754	194	948	0.7	1.9	297	102	398	1,050	296	**1,346**
Bloomfield	2.7	4.1	1,086	273	1,359	1.4	2.7	306	126	432	1,392	398	**1,790**
Cypress College	1.1	2.4	2,129	561	2,689	2.7	4.1	884	303	1,187	3,013	863	**3,876**
Knott Ave	1.2	2.5	855	305	1,159	1.1	2.4	938	279	1,217	1,793	583	**2,376**
Beach Blvd	1.2	2.5	748	228	975	1.2	2.5	749	206	954	1,496	433	**1,929**
Magnolia St	1.2	2.5	442	136	578	1.2	2.5	238	98	335	680	233	**913**
Brookhurst St	1.5	2.8	615	199	814	1.2	2.5	468	171	639	1,082	370	**1,452**
Euclid St	1.3	2.6	930	238	1,168	1.5	2.8	332	123	454	1,262	360	**1,622**
Harbor Blvd	1.0	2.6	2,317	714	3,031	1.3	2.6	1,168	384	1,552	3,485	1,098	**4,583**
Harbor/1St Street	1.0	2.7	170	75	245	1.0	2.6	338	96	434	508	171	**679**
1St Street/Fairview St	1.2	2.6	511	206	716	1.0	2.7	110	57	167	621	263	**883**
1St Street/Bristol St	2.0	6.6	2,428	533	2,961	1.2	2.6	145	86	230	2,573	618	**3,191**
SARTC	-	-	5,176	916	6,091	2.0	6.6	752	209	961	5,928	1,124	**7,052**
Total	**39.7**	**127.0**	**30,789**	**7,739**	**38,528**	**39.7**	**127.0**	**14,750**	**4,061**	**18,811**	**45,539**	**11,800**	**57,339**

Table A.12 - Station Boardings By Mode of Access – BRT Street Running

Station Name	By Access			By Egress			Boardings		
	Walk/Bus/Rail	Drive	Total	Walk/Bus/Rail	Drive	Total	Walk/Bus/Rail	Drive	Total
Union Station	2,584	0	2,584	2,053	-	2,053	2,319	0	2,319
Metro Gold Line Soto	524	962	1,486	848	-	848	686	481	1,167
Soto St/Whittier Blvd	474	206	680	877	-	877	675	103	779
Soto St/Olympic Blvd	34	514	548	709	-	709	372	257	629
Soto St/Vernon Ave	22	688	710	726	-	726	374	344	718
Pacific Blvd/Sauson Ave	0	624	624	1,554	-	1,554	777	312	1,089
Pacific Blvd/Florence Ave	1,424	555	1,979	742	-	742	1,083	278	1,361
Long Beach Blvd/Firestone Blvd	0	1,858	1,858	2,247	-	2,247	1,124	929	2,053
Firestone Blvd/Atlantic	224	1,128	1,352	929	-	929	576	564	1,141
Firestone Blvd/Lakewood	865	1,557	2,422	1,639	-	1,639	1,252	779	2,031
Green Line Lakewood	9,799	997	10,796	2,989	-	2,989	6,394	498	6,893
Lakewood Blvd	1,003	794	1,797	1,641	-	1,641	1,322	397	1,719
Bellflower Blvd	1,897	1,093	2,990	740	-	740	1,318	547	1,865
183Rd St/Gridley Rd	932	229	1,161	2,622	-	2,622	1,777	115	1,892
Pioneer Blvd	571	757	1,328	1,363	-	1,363	967	379	1,346
Bloomfield	1,366	1,064	2,430	1,150	-	1,150	1,258	532	1,790
Cypress College	1,284	637	1,921	5,830	-	5,830	3,557	319	3,876
Knott Ave	1,454	1,074	2,528	2,223	-	2,223	1,839	537	2,376
Beach Blvd	1,066	898	1,964	1,894	-	1,894	1,480	449	1,929
Magnolia St	810	312	1,122	703	-	703	757	156	913
Brookhurst St	1,244	510	1,754	1,150	-	1,150	1,197	255	1,452
Euclid St	1,105	876	1,981	1,262	-	1,262	1,183	438	1,622
Harbor Blvd	2,093	339	2,432	6,733	-	6,733	4,413	170	4,583
Harbor/1St Street	361	598	959	398	-	398	380	299	679
1St Street/Fairview St	420	511	931	835	-	835	627	256	883
1St Street/Bristol St	3,602	1,479	5,081	1,300	-	1,300	2,451	739	3,191
SARTC	1,071	850	1,921	12,182	-	12,182	6,627	425	7,052
Total	**36,229**	**21,110**	**57,339**	**57,339**	**-**	**57,339**	**46,784**	**10,555**	**57,339**

NOTE: This line is modeled as Transitway. Since the mode choice model currently outputs only station access volumes for transitway mode, the egress data in the above summary were estimated using transit assignment data. Use the egress data with caution.

APPENDIX B. SENSITIVITY RUNS – BOARDINGS BY STATION AND MODE OF ACCESS

Table B.1 - Station Boardings and Times – Streetcar Alternative – West Bank Option 3

Station Name	Southbound (Read Down)		Southbound Boardings			Northbound (Read Up)		Northbound Boardings			Total Boardings		
	Dist (mi)	Time (min)	Peak	Off-Peak	Daily	Dist (mi)	Time (min)	Peak	Off-Peak	Daily	Peak	Off-Peak	Daily
Union Station	1.3	2.6	7,165	1,871	9,036	-	-	4,699	1,940	6,639	11,864	3,811	**15,674**
7th/Alameda	2.3	3.8	523	142	665	1.3	2.6	984	364	1,348	1,507	505	**2,012**
Pacific/Harbor	1.5	2.8	471	204	675	2.3	3.8	604	340	944	1,074	544	**1,618**
Randolph/Pacific	1.2	2.3	965	377	1,341	1.5	2.8	1,018	476	1,494	1,983	852	**2,835**
Gage	2.7	4.3	847	501	1,348	1.2	2.3	948	576	1,524	1,795	1,077	**2,871**
Firestone	2.2	3.7	1,341	431	1,772	2.7	4.3	1,382	598	1,980	2,722	1,029	**3,751**
Gardendale	0.7	1.7	538	195	733	2.2	3.7	338	199	537	876	394	**1,269**
Green Line (new)	0.7	1.9	1,803	698	2,501	0.7	1.7	1,383	520	1,903	3,186	1,218	**4,404**
Paramount/Rosecrans	2.4	3.9	936	482	1,417	0.7	1.9	478	240	718	1,414	721	**2,135**
Bellflower Blvd.	2.4	3.9	1,139	489	1,627	2.4	3.9	601	359	960	1,739	848	**2,587**
183Rd St/Gridley Rd.	0.7	1.7	1,150	440	1,590	2.4	3.9	767	406	1,172	1,917	845	**2,762**
Pioneer Blvd.	1.4	2.7	914	323	1,237	0.7	1.7	610	292	902	1,524	615	**2,139**
Bloomfield	2.7	4.4	849	322	1,170	1.4	2.7	606	296	901	1,454	617	**2,071**
Cypress College	1.1	2.2	1,742	629	2,370	2.7	4.4	1,401	570	1,971	3,142	1,199	**4,341**
Knott	1.2	2.3	967	426	1,393	1.1	2.2	879	360	1,239	1,845	786	**2,631**
Beach	1.2	2.3	1,259	455	1,714	1.2	2.3	1,474	603	2,077	2,733	1,058	**3,791**
Magnolia	1.2	2.4	428	221	649	1.2	2.3	422	193	615	850	414	**1,264**
Brookhurst	1.5	2.7	1,258	451	1,709	1.2	2.4	938	361	1,299	2,196	812	**3,007**
Euclid	1.3	2.5	971	341	1,312	1.5	2.7	793	256	1,049	1,764	597	**2,360**
Harbor Blvd.	1.0	2.4	2,685	880	3,565	1.3	2.5	1,452	438	1,890	4,137	1,318	**5,455**
Harbor/1St Street	1.0	2.3	312	168	479	1.0	2.4	288	146	434	600	314	**913**
1St Street/Fairview Street	1.2	2.3	501	241	741	1.0	2.3	320	139	458	820	379	**1,199**
1St Street/Bristol Street	2.0	6.2	754	589	1,343	1.2	2.3	396	203	598	1,149	792	**1,941**
SARTC	-	-	2,689	989	3,677	2.0	6.2	1,929	970	2,899	4,618	1,959	**6,576**
Total	**34.9**	**67.3**	**32,198**	**11,859**	**44,057**	**34.9**	**67.3**	**24,704**	**10,840**	**35,544**	**56,902**	**22,699**	**79,601**

Table B.2 - Station Boardings By Mode of Access – Streetcar Alternative – West Bank Option 3

Station Name	By Access						By Egress						Boardings					
	Walk	Bus	PNR	KNR	Rail	Total	Walk	Bus	PNR	KNR	Rail	Total	Walk	Bus	PNR	KNR	Rail	Total
Union Station	369	302	165	72	17,163	18,071	0	3,393	-	-	9,884	13,277	185	1,847	83	36	13,524	15,674
7th/Alameda	375	81	0	23	0	479	1,675	1,870	-	-	0	3,545	1,025	976	0	12	0	2,012
Pacific/Harbor	955	248	0	62	0	1,265	1,336	635	-	-	0	1,971	1,145	442	0	31	0	1,618
Randolph/Pacific	2,073	874	0	110	0	3,057	37	2,575	-	-	0	2,612	1,055	1,725	0	55	0	2,835
Gage	2,654	137	0	166	0	2,958	2,407	377	-	-	0	2,784	2,530	257	0	83	0	2,871
Firestone	2,654	1,309	870	173	0	5,005	558	1,939	-	-	0	2,497	1,606	1,624	435	86	0	3,751
Gardendale	898	3	0	95	0	996	1,542	0	-	-	0	1,542	1,220	2	0	48	0	1,269
Green Line (new)	1,096	0	771	160	3,516	5,543	198	12	-	-	3,055	3,265	647	6	386	80	3,285	4,404
Paramount/Rosecrans	1,329	336	0	144	0	1,810	1,567	892	-	-	0	2,459	1,448	614	0	72	0	2,135
Bellflower Blvd.	2,056	52	943	200	0	3,251	1,773	149	-	-	0	1,922	1,915	100	471	100	0	2,587
183Rd St/Gridley Rd.	763	472	645	105	0	1,985	1,636	1,902	-	-	0	3,538	1,199	1,187	323	53	0	2,762
Pioneer Blvd.	909	172	778	157	0	2,015	810	1,452	-	-	0	2,262	859	812	389	78	0	2,139
Bloomfield	1,116	199	1,041	175	0	2,531	687	924	-	-	0	1,611	902	561	520	88	0	2,071
Cypress College	1,151	871	1,479	170	0	3,672	2,560	2,449	-	-	0	5,009	1,856	1,660	740	85	0	4,341
Knott	1,449	295	0	191	0	1,935	2,182	1,145	-	-	0	3,327	1,816	720	0	96	0	2,631
Beach	1,299	765	1,782	216	0	4,061	2,190	1,330	-	-	0	3,520	1,744	1,047	891	108	0	3,791
Magnolia	1,454	287	0	198	0	1,939	300	288	-	-	0	588	877	288	0	99	0	1,264
Brookhurst	985	495	1,481	198	0	3,159	1,774	1,081	-	-	0	2,855	1,379	788	741	99	0	3,007
Euclid	954	473	1,254	187	0	2,867	589	1,264	-	-	0	1,853	771	868	627	93	0	2,360
Harbor Blvd.	575	1,547	1,428	141	296	3,988	1,220	5,700	-	-	1	6,921	897	3,624	714	71	149	5,455
Harbor/1St Street	507	190	0	158	0	854	747	225	-	-	0	972	627	207	0	79	0	913
1St Street/Fairview Street	806	133	0	148	0	1,088	617	693	-	-	0	1,310	711	413	0	74	0	1,199
1St Street/Bristol Street	636	390	0	247	0	1,274	921	1,686	-	-	0	2,607	779	1,038	0	124	0	1,941
SARTC	551	710	4,098	169	270	5,798	1,369	5,859	-	-	126	7,354	960	3,285	2,049	84	198	6,576
Total	**27,613**	**10,343**	**16,735**	**3,666**	**21,245**	**79,601**	**28,696**	**37,839**	**-**	**-**	**13,066**	**79,601**	**28,155**	**24,091**	**8,367**	**1,833**	**17,156**	**79,601**

Table B.3 - Station Boardings and Times – LRT Alternative – West Bank Option 3 - All Grade Separated

Station Name	Southbound (Read Down)		Southbound Boardings			Northbound (Read Up)		Northbound Boardings			Total Boardings		
	Dist (mi)	Time (min)	Peak	Off-Peak	Daily	Dist (mi)	Time (min)	Peak	Off-Peak	Daily	Peak	Off-Peak	Daily
Union Station	1.3	2.4	8,389	2,258	10,647	-	-	5,788	2,374	8,162	14,177	4,632	**18,809**
7th/Alameda	2.3	3.0	539	147	685	1.3	2.4	1,117	407	1,523	1,655	553	**2,208**
Pacific/Harbor	1.5	2.7	508	217	725	2.3	3.0	649	362	1,011	1,157	579	**1,736**
Randolph/Pacific	1.2	2.1	1,011	396	1,407	1.5	2.7	1,067	527	1,594	2,078	923	**3,000**
Gage	2.7	3.5	893	530	1,423	1.2	2.1	993	607	1,600	1,886	1,137	**3,023**
Firestone	2.2	3.1	1,435	477	1,911	2.7	3.5	1,509	652	2,160	2,943	1,128	**4,071**
Gardendale	0.7	1.7	564	201	765	2.2	3.1	367	214	580	931	415	**1,345**
Green Line (new)	0.7	1.9	2,264	791	3,055	0.7	1.7	1,594	585	2,178	3,857	1,376	**5,233**
Paramount/Rosecrans	2.4	3.2	1,024	513	1,537	0.7	1.9	523	257	780	1,546	770	**2,316**
Bellflower Blvd.	2.4	3.2	1,186	529	1,714	2.4	3.2	658	400	1,058	1,844	928	**2,772**
183Rd St/Gridley Rd.	0.7	1.7	1,246	485	1,731	2.4	3.2	811	442	1,253	2,057	927	**2,984**
Pioneer Blvd.	1.4	2.3	981	370	1,351	0.7	1.7	665	311	976	1,646	681	**2,327**
Bloomfield	2.7	3.5	912	352	1,264	1.4	2.3	621	328	949	1,533	680	**2,213**
Cypress College	1.1	2.0	1,875	689	2,564	2.7	3.5	1,524	640	2,164	3,399	1,329	**4,728**
Knott	1.2	2.1	1,166	512	1,678	1.1	2.0	988	404	1,392	2,153	916	**3,069**
Beach	2.5	3.3	1,574	574	2,148	1.2	2.1	1,586	606	2,192	3,160	1,180	**4,340**
Brookhurst	1.5	2.4	1,353	518	1,870	2.5	3.3	1,158	469	1,627	2,511	987	**3,497**
Euclid	1.3	2.2	997	357	1,354	1.5	2.4	935	327	1,262	1,932	683	**2,615**
Harbor Blvd.	1.0	2.3	3,043	944	3,987	1.3	2.2	1,601	487	2,088	4,644	1,431	**6,075**
Harbor/1St Street	1.0	2.3	327	209	536	1.0	2.3	316	162	478	643	371	**1,014**
1St Street/Fairview Street	1.2	2.1	554	267	821	1.0	2.3	345	157	502	899	424	**1,323**
1St Street/Bristol Street	2.0	4.1	784	662	1,445	1.2	2.1	429	235	664	1,213	896	**2,109**
SARTC	-	-	3,435	1,313	4,748	2.0	4.1	2,744	1,268	4,012	6,179	2,581	**8,760**
	35.0	**57.2**	**36,054**	**13,307**	**49,361**	**35.0**	**57.2**	**27,984**	**12,216**	**40,200**	**64,038**	**25,523**	**89,561**

Table B.4 - Station Boardings By Mode of Access – LRT Alternative – West Bank Option 3 - All Grade Separated

Station Name	By Access						By Egress						Boardings					
	Walk	Bus	PNR	KNR	Rail	Total	Walk	Bus	PNR	KNR	Rail	Total	Walk	Bus	PNR	KNR	Rail	Total
Union Station	417	340	186	81	20,270	21,294	0	3,978	-	-	12,345	16,323	209	2,159	93	41	16,308	18,809
7th/Alameda	416	88	0	27	0	531	1,792	2,093	-	-	0	3,885	1,104	1,091	0	14	0	2,208
Pacific/Harbor	1,034	265	0	69	0	1,367	1,397	707	-	-	0	2,104	1,215	486	0	34	0	1,736
Randolph/Pacific	2,207	930	0	118	0	3,255	38	2,707	-	-	0	2,745	1,122	1,819	0	59	0	3,000
Gage	2,799	148	0	178	0	3,124	2,520	402	-	-	0	2,922	2,659	275	0	89	0	3,023
Firestone	2,859	1,419	956	190	0	5,424	599	2,119	-	-	0	2,718	1,729	1,769	478	95	0	4,071
Gardendale	966	4	0	106	0	1,076	1,614	0	-	-	0	1,614	1,290	2	0	53	0	1,345
Green Line (new)	1,181	0	848	173	4,126	6,327	237	15	-	-	3,886	4,138	709	8	424	86	4,006	5,233
Paramount/Rosecrans	1,455	369	0	162	0	1,986	1,633	1,013	-	-	0	2,646	1,544	691	0	81	0	2,316
Bellflower Blvd.	2,234	56	1,060	222	0	3,572	1,808	163	-	-	0	1,971	2,021	110	530	111	0	2,772
183Rd St/Gridley Rd.	819	513	707	114	0	2,154	1,743	2,070	-	-	0	3,813	1,281	1,292	354	57	0	2,984
Pioneer Blvd.	972	202	834	169	0	2,177	865	1,611	-	-	0	2,476	918	906	417	85	0	2,327
Bloomfield	1,203	218	1,144	198	0	2,764	727	935	-	-	0	1,662	965	576	572	99	0	2,213
Cypress College	1,233	958	1,603	198	0	3,992	2,693	2,770	-	-	0	5,463	1,963	1,864	802	99	0	4,728
Knott	1,892	352	0	226	0	2,470	2,375	1,293	-	-	0	3,668	2,133	823	0	113	0	3,069
Beach	1,738	993	1,934	276	0	4,942	2,221	1,517	-	-	0	3,738	1,980	1,255	967	138	0	4,340
Brookhurst	1,359	614	1,647	243	0	3,863	1,914	1,217	-	-	0	3,131	1,636	915	824	121	0	3,497
Euclid	1,146	536	1,366	217	0	3,266	620	1,344	-	-	0	1,964	883	940	683	109	0	2,615
Harbor Blvd.	611	1,714	1,585	163	302	4,375	1,334	6,437	-	-	2	7,774	973	4,076	792	82	152	6,075
Harbor/1St Street	557	215	0	184	0	955	792	280	-	-	0	1,072	675	247	0	92	0	1,014
1St Street/Fairview Street	865	149	0	163	0	1,177	659	809	-	-	0	1,468	762	479	0	81	0	1,323
1St Street/Bristol Street	715	447	0	285	0	1,447	868	1,902	-	-	0	2,770	791	1,174	0	143	0	2,109
SARTC	735	962	5,621	232	474	8,023	1,685	7,636	-	-	176	9,496	1,210	4,299	2,810	116	325	8,760
Total	**29,412**	**11,491**	**19,493**	**3,993**	**25,172**	**89,561**	**30,135**	**43,017**	**-**	**-**	**16,409**	**89,561**	**29,773**	**27,254**	**9,746**	**1,997**	**20,790**	**89,561**

Table B.5 - Station Boardings and Times – Maglev Alternative – West Bank Option 3 with Private Fare

Station Name	Southbound (Read Down)		Southbound Boardings			Northbound (Read Up)		Northbound Boardings			Total Boardings		
	Dist (mi)	Time (min)	Peak	Off-Peak	Daily	Dist (mi)	Time (min)	Peak	Off-Peak	Daily	Peak	Off-Peak	Daily
Union Station	1.3	3.5	858	97	955	-	-	830	356	1,185	1,687	453	**2,140**
7th/Alameda	2.2	2.9	190	4	194	1.3	3.5	169	94	262	358	98	**456**
Pacific/Harbor	1.0	1.7	135	13	147	2.2	2.9	41	15	56	176	28	**203**
Randolph/Pacific	1.6	2.4	161	14	175	1.0	1.7	76	57	132	237	71	**307**
Gage	2.4	3.0	65	12	77	1.6	2.4	30	13	43	95	24	**119**
Firestone	2.4	2.9	146	29	175	2.4	3.0	92	47	139	237	76	**313**
Gardendale St	0.7	1.4	5	6	11	2.4	2.9	11	6	17	16	12	**27**
Green Line	0.6	2.0	62	24	86	0.7	1.4	147	38	184	209	61	**270**
Paramount/Rosecrans	2.1	2.8	69	14	82	0.6	2.0	45	17	62	114	30	**144**
Bellflower Blvd	2.4	3.0	122	34	156	2.1	2.8	29	20	49	151	53	**204**
183Rd St/Gridley Rd	0.7	1.4	102	24	125	2.4	3.0	85	46	131	187	70	**256**
Pioneer Blvd	1.5	2.1	100	27	126	0.7	1.4	73	32	104	172	58	**230**
Bloomfield	2.7	3.2	109	32	141	1.5	2.1	99	52	150	208	84	**291**
Cypress College	2.3	2.7	211	68	279	2.7	3.2	268	109	377	479	177	**656**
Beach Blvd	2.5	3.0	133	45	177	2.3	2.7	332	118	449	464	162	**626**
Brookhurst St	1.4	2.1	122	32	154	2.5	3.0	240	89	329	362	121	**483**
Euclid St	1.6	2.9	109	28	137	1.4	2.1	192	68	260	301	96	**397**
Harbor Blvd	-	-	376	151	527	1.6	2.9	407	203	610	783	354	**1,137**
	29.4	**43.0**	**3,070**	**650**	**3,720**	**29.4**	**43.0**	**3,162**	**1,373**	**4,535**	**6,232**	**2,023**	**8,255**

Table B.6 - Station Boardings By Mode of Access – Maglev Alternative – West Bank Option 3 with Private Fare

Station Name	By Access						By Egress						Boardings					
	Walk	Bus	PNR	KNR	Rail	Total	Walk	Bus	PNR	KNR	Rail	Total	Walk	Bus	PNR	KNR	Rail	Total
Union Station	587	472	252	112	486	1,909	0	1,623	-	-	747	2,370	294	1,047	126	56	617	2,140
7th/Alameda	8	2	0	1	0	10	397	504	-	-	0	901	203	253	0	0	0	456
Pacific/Harbor	23	4	0	2	0	29	248	129	-	-	0	377	136	66	0	1	0	203
Randolph/Pacific	64	28	0	3	0	95	7	512	-	-	0	519	36	270	0	2	0	307
Gage	91	5	0	6	0	102	117	19	-	-	0	136	104	12	0	3	0	119
Firestone	169	82	55	11	0	317	68	241	-	-	0	309	118	161	27	6	0	313
Gardendale St	36	0	0	4	0	40	14	0	-	-	0	14	25	0	0	2	0	27
Green Line	98	0	72	15	5	190	114	8	-	-	226	349	106	4	36	7	116	270
Paramount/Rosecrans	60	16	0	7	0	83	122	82	-	-	0	204	91	49	0	3	0	144
Bellflower Blvd	164	4	77	16	0	261	134	13	-	-	0	147	149	8	39	8	0	204
183Rd St/Gridley Rd	87	51	73	13	0	223	132	157	-	-	0	289	109	104	37	6	0	256
Pioneer Blvd	113	26	98	20	0	257	71	132	-	-	0	203	92	79	49	10	0	230
Bloomfield	186	35	176	34	0	431	67	84	-	-	0	151	127	59	88	17	0	291
Cypress College	248	198	295	38	0	780	226	305	-	-	0	531	237	251	148	19	0	656
Beach Blvd	407	189	341	54	0	992	131	129	-	-	0	260	269	159	171	27	0	626
Brookhurst St	250	120	326	51	0	747	120	98	-	-	0	218	185	109	163	26	0	483
Euclid St	183	89	255	42	0	569	64	160	-	-	0	224	124	124	128	21	0	397
Harbor Blvd	135	418	460	48	159	1,220	104	940	-	-	10	1,053	119	679	230	24	84	1,137
Total	**2,911**	**1,737**	**2,480**	**477**	**650**	**8,255**	**2,137**	**5,135**	**-**	**-**	**983**	**8,255**	**2,524**	**3,436**	**1,240**	**238**	**816**	**8,255**

Table B.7 - Station Boardings and Times – LRT Alternative – MOS 1

Station Name	Southbound (Read Down)		Southbound Boardings			Northbound (Read Up)		Northbound Boardings			Total Boardings		
	Dist (mi)	Time (min)	Peak	Off-Peak	Daily	Dist (mi)	Time (min)	Peak	Off-Peak	Daily	Peak	Off-Peak	Daily
Union Station	1.3	2.5	2,660	401	3,060	-	-	1,759	628	2,387	4,419	1,029	**5,447**
7th/Alameda	2.3	3.4	476	116	592	1.3	2.5	543	270	812	1,018	386	**1,404**
Pacific/Harbor	1.5	2.8	422	176	597	2.3	3.4	519	289	808	940	465	**1,405**
Randolph/Pacific	1.2	2.3	835	314	1,149	1.5	2.8	940	394	1,334	1,775	708	**2,482**
Gage	2.7	3.8	740	438	1,177	1.2	2.3	902	516	1,418	1,642	953	**2,595**
Firestone	2.2	3.3	911	249	1,159	2.7	3.8	1,279	530	1,809	2,190	779	**2,968**
Gardendale	0.7	1.7	486	165	650	2.2	3.3	301	178	479	787	343	**1,129**
Green Line (new)	-	-	886	249	1,135	0.7	1.7	730	325	1,055	1,616	574	**2,190**
Total	**11.9**	**19.8**	**7,413**	**2,105**	**9,518**	**11.9**	**19.8**	**6,971**	**3,129**	**10,100**	**14,384**	**5,234**	**19,618**

Table B.8 - Station Boardings By Mode of Access – LRT Alternative – MOS 1

Station Name	By Access						By Egress						Boardings					
	Walk	Bus	PNR	KNR	Rail	Total	Walk	Bus	PNR	KNR	Rail	Total	Walk	Bus	PNR	KNR	Rail	Total
Union Station	507	413	226	99	4,875	6,120	0	2,653	-	-	2,121	4,774	254	1,533	113	49	3,498	5,447
7th/Alameda	240	51	0	16	0	306	1,154	1,347	-	-	0	2,501	697	699	0	8	0	1,404
Pacific/Harbor	818	209	0	54	0	1,082	1,146	581	-	-	0	1,727	982	395	0	27	0	1,405
Randolph/Pacific	1,806	761	0	96	0	2,663	32	2,269	-	-	0	2,301	919	1,515	0	48	0	2,482
Gage	2,321	123	0	147	0	2,591	2,241	357	-	-	0	2,598	2,281	240	0	74	0	2,595
Firestone	2,028	1,007	678	135	0	3,848	461	1,627	-	-	0	2,088	1,244	1,317	339	67	0	2,968
Gardendale	807	3	0	88	0	899	1,359	0	-	-	0	1,359	1,083	2	0	44	0	1,129
Green Line (new)	926	0	665	135	382	2,109	520	33	-	-	1,717	2,270	723	17	333	68	1,050	2,190
Total	**9,454**	**2,567**	**1,570**	**771**	**5,257**	**19,618**	**6,912**	**8,868**	**-**	**-**	**3,838**	**19,618**	**8,183**	**5,718**	**785**	**385**	**4,547**	**19,618**

Table B.9 - Station Boardings and Times – LRT Alternative – MOS 2

Station Name	Southbound (Read Down)		Southbound Boardings			Northbound (Read Up)		Northbound Boardings			Total Boardings		
	Dist (mi)	Time (min)	Peak	Off-Peak	Daily	Dist (mi)	Time (min)	Peak	Off-Peak	Daily	Peak	Off-Peak	Daily
Green Line (new)	0.7	1.9	1,451	319	1,770	-	-	705	203	908	2,156	522	**2,678**
Paramount/Rosecrans	2.4	3.2	395	250	645	0.7	1.9	221	140	361	616	390	**1,005**
Bellflower Blvd.	2.4	3.2	697	277	973	2.4	3.2	327	169	496	1,024	446	**1,469**
183Rd St/Gridley Rd.	0.7	1.7	729	279	1,007	2.4	3.2	542	240	782	1,271	519	**1,789**
Pioneer Blvd.	1.4	2.3	623	203	825	0.7	1.7	417	180	597	1,039	383	**1,422**
Bloomfield	-	-	1,375	303	1,678	1.4	2.3	778	242	1,020	2,153	545	**2,697**
Total	**7.6**	**12.3**	**5,268**	**1,629**	**6,897**	**7.6**	**12.3**	**2,989**	**1,173**	**4,162**	**8,257**	**2,802**	**11,059**

Table B.10 - Station Boardings By Mode of Access – LRT Alternative – MOS 2

Station Name	By Access						By Egress						Boardings					
	Walk	Bus	PNR	KNR	Rail	Total	Walk	Bus	PNR	KNR	Rail	Total	Walk	Bus	PNR	KNR	Rail	Total
Green Line (new)	868	0	623	127	1,922	3,540	177	11	-	-	1,627	1,815	522	6	312	63	1,775	2,678
Paramount/Rosecrans	696	176	0	78	0	950	654	406	-	-	0	1,060	675	291	0	39	0	1,005
Bellflower Blvd.	1,147	29	544	114	0	1,834	1,013	91	-	-	0	1,104	1,080	60	272	57	0	1,469
183Rd St/Gridley Rd.	492	308	425	69	0	1,294	1,044	1,240	-	-	0	2,284	768	774	212	34	0	1,789
Pioneer Blvd.	626	130	537	109	0	1,402	503	938	-	-	0	1,441	565	534	269	54	0	1,422
Bloomfield	888	161	844	146	0	2,039	1,468	1,887	-	-	0	3,355	1,178	1,024	422	73	0	2,697
Total	**4,717**	**804**	**2,974**	**642**	**1,922**	**11,059**	**4,859**	**4,573**	**-**	**-**	**1,627**	**11,059**	**4,788**	**2,688**	**1,487**	**321**	**1,775**	**11,059**

Table B.11 - Station Boardings and Times – LRT Alternative – MOS 3

Station Name	Southbound (Read Down)		Southbound Boardings			Northbound (Read Up)		Northbound Boardings			Total Boardings		
	Dist (mi)	Time (min)	Peak	Off-Peak	Daily	Dist (mi)	Time (min)	Peak	Off-Peak	Daily	Peak	Off-Peak	Daily
Union Station	1.3	2.5	5,014	1,030	6,043	-	-	3,077	1,143	4,220	8,091	2,173	**10,263**
7th/Alameda	2.3	3.4	505	127	632	1.3	2.5	715	308	1,023	1,220	435	**1,655**
Pacific/Harbor	1.5	2.8	444	192	636	2.3	3.4	569	310	878	1,012	502	**1,514**
Randolph/Pacific	1.2	2.3	927	346	1,273	1.5	2.8	1,012	443	1,455	1,939	789	**2,728**
Gage	2.7	3.8	807	471	1,278	1.2	2.3	916	542	1,457	1,723	1,012	**2,735**
Firestone	2.2	3.3	1,145	352	1,497	2.7	3.8	1,386	593	1,979	2,531	945	**3,476**
Gardendale	0.7	1.7	553	206	758	2.2	3.3	359	202	561	911	408	**1,319**
Green Line (new)	0.7	1.9	342	204	545	0.7	1.7	418	198	615	759	401	**1,160**
Paramount/Rosecrans	2.4	3.2	890	413	1,302	0.7	1.9	452	214	666	1,342	626	**1,968**
Bellflower Blvd.	2.4	3.2	904	361	1,265	2.4	3.2	652	346	998	1,556	707	**2,263**
183Rd St/Gridley Rd.	0.7	1.7	997	414	1,411	2.4	3.2	820	382	1,202	1,817	796	**2,613**
Pioneer Blvd.	1.4	2.3	938	312	1,250	0.7	1.7	632	291	923	1,570	603	**2,173**
Bloomfield	-	-	2,573	729	3,302	1.4	2.3	1,186	439	1,625	3,759	1,168	**4,926**
Total	**19.5**	**32.2**	**16,035**	**5,153**	**21,188**	**19.5**	**32.2**	**12,191**	**5,409**	**17,600**	**28,226**	**10,562**	**38,788**

Table B.12 - Station Boardings By Mode of Access – LRT Alternative – MOS 3

Station Name	By Access						By Egress						Boardings					
	Walk	Bus	PNR	KNR	Rail	Total	Walk	Bus	PNR	KNR	Rail	Total	Walk	Bus	PNR	KNR	Rail	Total
Union Station	414	337	185	81	11,069	12,086	0	3,240	-	-	5,200	8,440	207	1,789	92	40	8,135	10,263
7th/Alameda	301	64	0	20	0	384	1,349	1,576	-	-	0	2,925	825	820	0	10	0	1,655
Pacific/Harbor	886	227	0	59	0	1,171	1,232	624	-	-	0	1,856	1,059	425	0	29	0	1,514
Randolph/Pacific	1,978	833	0	106	0	2,917	35	2,503	-	-	0	2,538	1,006	1,668	0	53	0	2,728
Gage	2,520	133	0	160	0	2,813	2,291	365	-	-	0	2,656	2,405	249	0	80	0	2,735
Firestone	2,413	1,198	807	160	0	4,578	523	1,850	-	-	0	2,373	1,468	1,524	403	80	0	3,476
Gardendale	993	4	0	109	0	1,106	1,531	0	-	-	0	1,531	1,262	2	0	54	0	1,319
Green Line (new)	1,030	0	739	151	0	1,920	376	24	-	-	0	400	703	12	370	75	0	1,160
Paramount/Rosecrans	1,070	271	0	119	0	1,460	1,528	947	-	-	0	2,475	1,299	609	0	60	0	1,968
Bellflower Blvd.	1,822	46	865	181	0	2,914	1,478	133	-	-	0	1,611	1,650	90	432	90	0	2,263
183Rd St/Gridley Rd.	808	506	698	113	0	2,125	1,417	1,683	-	-	0	3,100	1,113	1,095	349	56	0	2,613
Pioneer Blvd.	922	191	791	160	0	2,065	796	1,484	-	-	0	2,280	859	837	396	80	0	2,173
Bloomfield	1,415	256	1,345	233	0	3,249	2,890	3,713	-	-	0	6,603	2,152	1,984	673	117	0	4,926
Total	**16,571**	**4,067**	**5,430**	**1,650**	**11,069**	**38,788**	**15,446**	**18,142**	**0**	**0**	**5,200**	**38,788**	**16,009**	**11,104**	**2,715**	**825**	**8,135**	**38,788**

Appendix C: Air Quality and Climate Change Technical Results

Pacific Electric Right of Way (PEROW) Alternative's Analysis

Air Quality and Climate Change Technical Attachment - Operational Impacts

Attachment 1: Annual Emissions Impacts

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Urbemis 2007 Version 9.2.4

Detail Report for Annual Operational Unmitigated Emissions (Tons/Year)

File Name: C:\Users\sullivans\Documents\Harbor Green Line\060311\Air Quality\Emissions\Appendix B-2 Urbemis Modeling Files\No Build Alt Regional VMT\HGL No Build.urb924

Project Name: PEROW - No Build Alternative

Project Location: South Coast AQMD

On-Road Vehicle Emissions Based on: Version : Emfac2007 V2.3 Nov 1 2006

Off-Road Vehicle Emissions Based on: OFFROAD2007

OPERATIONAL EMISSION ESTIMATES (Annual Tons Per Year, Unmitigated)

Source	ROG	NOX	CO	SO2	PM10	PM25	CO2
Regional VMT	25,634.32	28,158.93	291,874.86	994.96	171,236.69	33,145.18	100,679,564.47
TOTALS (tons/year, unmitigated)	25,634.32	28,158.93	291,874.86	994.96	171,236.69	33,145.18	100,679,564.47

Does not include correction for passby trips

Does not include double counting adjustment for internal trips

Analysis Year: 2035 Season: Annual

Emfac: Version : Emfac2007 V2.3 Nov 1 2006

Summary of Land Uses

Land Use Type	Acreage	Trip Rate	Unit Type	No. Units	Total Trips	Total VMT
Regional VMT		9,910.00	1000 sq ft	5,488.70	54,393,018.94	543,930,189.36
					54,393,018.94	543,930,189.36

Vehicle Fleet Mix

Vehicle Type	Percent Type	Non-Catalyst	Catalyst	Diesel
Light Auto	48.0	0.0	100.0	0.0

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Vehicle Fleet Mix

Vehicle Type	Percent Type	Non-Catalyst	Catalyst	Diesel
Light Truck < 3750 lbs	7.4	0.0	100.0	0.0
Light Truck 3751-5750 lbs	24.4	0.0	100.0	0.0
Med Truck 5751-8500 lbs	11.8	0.0	100.0	0.0
Lite-Heavy Truck 8501-10,000 lbs	1.9	0.0	78.9	21.1
Lite-Heavy Truck 10,001-14,000 lbs	0.6	0.0	66.7	33.3
Med-Heavy Truck 14,001-33,000 lbs	1.0	0.0	20.0	80.0
Heavy-Heavy Truck 33,001-60,000 lbs	0.7	0.0	0.0	100.0
Other Bus	0.1	0.0	0.0	100.0
Urban Bus	0.1	0.0	0.0	100.0
Motorcycle	2.5	32.0	68.0	0.0
School Bus	0.1	0.0	0.0	100.0
Motor Home	1.4	0.0	92.9	7.1

Travel Conditions

	Residential			Commercial		
	Home-Work	Home-Shop	Home-Other	Commute	Non-Work	Customer
Urban Trip Length (miles)	12.7	7.0	9.5	10.0	10.0	10.0
Rural Trip Length (miles)	17.6	12.1	14.9	15.4	9.6	12.6
Trip speeds (mph)	30.0	30.0	30.0	30.0	30.0	30.0
% of Trips - Residential	32.9	18.0	49.1			

% of Trips - Commercial (by land use)

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Travel Conditions

	Residential			Commercial		
	Home-Work	Home-Shop	Home-Other	Commute	Non-Work	Customer
Regional VMT				2.0	1.0	97.0

Operational Changes to Defaults

Commercial-based commute urban trip length changed from 13.3 miles to 10 miles

Commercial-based non-work urban trip length changed from 7.4 miles to 10 miles

Commercial-based customer urban trip length changed from 8.9 miles to 10 miles

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Urbemis 2007 Version 9.2.4

Detail Report for Annual Operational Unmitigated Emissions (Tons/Year)

File Name: C:\Users\sullivans\Documents\PE ROW West Santa Ana Branch Corridor 60180930.6001\URBEMIS Outputs\PEROW_TSM Alt.urb924

Project Name: PEROW - TSM Alternative

Project Location: South Coast AQMD

On-Road Vehicle Emissions Based on: Version : Emfac2007 V2.3 Nov 1 2006

Off-Road Vehicle Emissions Based on: OFFROAD2007

OPERATIONAL EMISSION ESTIMATES (Annual Tons Per Year, Unmitigated)

Source	ROG	NOX	CO	SO2	PM10	PM25	CO2
Regional VMT	25,598.68	28,119.78	291,469.09	993.57	170,998.64	33,099.10	100,539,600.11
TOTALS (tons/year, unmitigated)	25,598.68	28,119.78	291,469.09	993.57	170,998.64	33,099.10	100,539,600.11

Does not include correction for passby trips

Does not include double counting adjustment for internal trips

Analysis Year: 2035 Season: Annual

Emfac: Version : Emfac2007 V2.3 Nov 1 2006

Summary of Land Uses

Land Use Type	Acreage	Trip Rate	Unit Type	No. Units	Total Trips	Total VMT
Regional VMT		9,910.00	1000 sq ft	5,481.07	54,317,401.96	543,174,019.58
					54,317,401.96	543,174,019.58

Vehicle Fleet Mix

Vehicle Type	Percent Type	Non-Catalyst	Catalyst	Diesel
Light Auto	48.0	0.0	100.0	0.0

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Vehicle Fleet Mix

Vehicle Type	Percent Type	Non-Catalyst	Catalyst	Diesel
Light Truck < 3750 lbs	7.4	0.0	100.0	0.0
Light Truck 3751-5750 lbs	24.4	0.0	100.0	0.0
Med Truck 5751-8500 lbs	11.8	0.0	100.0	0.0
Lite-Heavy Truck 8501-10,000 lbs	1.9	0.0	78.9	21.1
Lite-Heavy Truck 10,001-14,000 lbs	0.6	0.0	66.7	33.3
Med-Heavy Truck 14,001-33,000 lbs	1.0	0.0	20.0	80.0
Heavy-Heavy Truck 33,001-60,000 lbs	0.7	0.0	0.0	100.0
Other Bus	0.1	0.0	0.0	100.0
Urban Bus	0.1	0.0	0.0	100.0
Motorcycle	2.5	32.0	68.0	0.0
School Bus	0.1	0.0	0.0	100.0
Motor Home	1.4	0.0	92.9	7.1

Travel Conditions

	Residential			Commercial		
	Home-Work	Home-Shop	Home-Other	Commute	Non-Work	Customer
Urban Trip Length (miles)	12.7	7.0	9.5	10.0	10.0	10.0
Rural Trip Length (miles)	17.6	12.1	14.9	15.4	9.6	12.6
Trip speeds (mph)	30.0	30.0	30.0	30.0	30.0	30.0
% of Trips - Residential	32.9	18.0	49.1			

% of Trips - Commercial (by land use)

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Travel Conditions

	Residential			Commercial		
	Home-Work	Home-Shop	Home-Other	Commute	Non-Work	Customer
Regional VMT				2.0	1.0	97.0

Operational Changes to Defaults

Commercial-based commute urban trip length changed from 13.3 miles to 10 miles

Commercial-based non-work urban trip length changed from 7.4 miles to 10 miles

Commercial-based customer urban trip length changed from 8.9 miles to 10 miles

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Urbemis 2007 Version 9.2.4

Detail Report for Annual Operational Unmitigated Emissions (Tons/Year)

File Name: C:\Users\sullivans\Documents\PE ROW West Santa Ana Branch Corridor 60180930.6001\URBEMIS Outputs\PEROW_BRT HOV.urb924

Project Name: PEROW - BRT HOV

Project Location: South Coast AQMD

On-Road Vehicle Emissions Based on: Version : Emfac2007 V2.3 Nov 1 2006

Off-Road Vehicle Emissions Based on: OFFROAD2007

OPERATIONAL EMISSION ESTIMATES (Annual Tons Per Year, Unmitigated)

Source	ROG	NOX	CO	SO2	PM10	PM25	CO2
Regional VMT	25,561.28	28,078.69	291,043.15	992.12	170,748.75	33,050.73	100,392,676.49
TOTALS (tons/year, unmitigated)	25,561.28	28,078.69	291,043.15	992.12	170,748.75	33,050.73	100,392,676.49

Does not include correction for passby trips

Does not include double counting adjustment for internal trips

Analysis Year: 2035 Season: Annual

Emfac: Version : Emfac2007 V2.3 Nov 1 2006

Summary of Land Uses

Land Use Type	Acreage	Trip Rate	Unit Type	No. Units	Total Trips	Total VMT
Regional VMT		9,910.00	1000 sq ft	5,473.06	54,238,025.18	542,380,251.81
					54,238,025.18	542,380,251.81

Vehicle Fleet Mix

Vehicle Type	Percent Type	Non-Catalyst	Catalyst	Diesel
Light Auto	48.0	0.0	100.0	0.0

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Vehicle Fleet Mix

Vehicle Type	Percent Type	Non-Catalyst	Catalyst	Diesel
Light Truck < 3750 lbs	7.4	0.0	100.0	0.0
Light Truck 3751-5750 lbs	24.4	0.0	100.0	0.0
Med Truck 5751-8500 lbs	11.8	0.0	100.0	0.0
Lite-Heavy Truck 8501-10,000 lbs	1.9	0.0	78.9	21.1
Lite-Heavy Truck 10,001-14,000 lbs	0.6	0.0	66.7	33.3
Med-Heavy Truck 14,001-33,000 lbs	1.0	0.0	20.0	80.0
Heavy-Heavy Truck 33,001-60,000 lbs	0.7	0.0	0.0	100.0
Other Bus	0.1	0.0	0.0	100.0
Urban Bus	0.1	0.0	0.0	100.0
Motorcycle	2.5	32.0	68.0	0.0
School Bus	0.1	0.0	0.0	100.0
Motor Home	1.4	0.0	92.9	7.1

Travel Conditions

	Residential			Commercial		
	Home-Work	Home-Shop	Home-Other	Commute	Non-Work	Customer
Urban Trip Length (miles)	12.7	7.0	9.5	10.0	10.0	10.0
Rural Trip Length (miles)	17.6	12.1	14.9	15.4	9.6	12.6
Trip speeds (mph)	30.0	30.0	30.0	30.0	30.0	30.0
% of Trips - Residential	32.9	18.0	49.1			

% of Trips - Commercial (by land use)

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Travel Conditions

	Residential			Commercial		
	Home-Work	Home-Shop	Home-Other	Commute	Non-Work	Customer
Regional VMT				2.0	1.0	97.0

Operational Changes to Defaults

Commercial-based commute urban trip length changed from 13.3 miles to 10 miles

Commercial-based non-work urban trip length changed from 7.4 miles to 10 miles

Commercial-based customer urban trip length changed from 8.9 miles to 10 miles

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Urbemis 2007 Version 9.2.4

Detail Report for Annual Operational Unmitigated Emissions (Tons/Year)

File Name: C:\Users\sullivans\Documents\PE ROW West Santa Ana Branch Corridor 60180930.6001\URBEMIS Outputs\PEROW_BRT Street.urb924

Project Name: PEROW - BRT Street

Project Location: South Coast AQMD

On-Road Vehicle Emissions Based on: Version : Emfac2007 V2.3 Nov 1 2006

Off-Road Vehicle Emissions Based on: OFFROAD2007

OPERATIONAL EMISSION ESTIMATES (Annual Tons Per Year, Unmitigated)

Source	ROG	NOX	CO	SO2	PM10	PM25	CO2
Regional VMT	25,577.20	28,096.19	291,224.50	992.74	170,855.14	33,071.32	100,455,229.19
TOTALS (tons/year, unmitigated)	25,577.20	28,096.19	291,224.50	992.74	170,855.14	33,071.32	100,455,229.19

Does not include correction for passby trips

Does not include double counting adjustment for internal trips

Analysis Year: 2035 Season: Annual

Emfac: Version : Emfac2007 V2.3 Nov 1 2006

Summary of Land Uses

Land Use Type	Acreage	Trip Rate	Unit Type	No. Units	Total Trips	Total VMT
Regional VMT		9,910.00	1000 sq ft	5,476.47	54,271,819.83	542,718,198.29
					54,271,819.83	542,718,198.29

Vehicle Fleet Mix

Vehicle Type	Percent Type	Non-Catalyst	Catalyst	Diesel
Light Auto	48.0	0.0	100.0	0.0

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Vehicle Fleet Mix

Vehicle Type	Percent Type	Non-Catalyst	Catalyst	Diesel
Light Truck < 3750 lbs	7.4	0.0	100.0	0.0
Light Truck 3751-5750 lbs	24.4	0.0	100.0	0.0
Med Truck 5751-8500 lbs	11.8	0.0	100.0	0.0
Lite-Heavy Truck 8501-10,000 lbs	1.9	0.0	78.9	21.1
Lite-Heavy Truck 10,001-14,000 lbs	0.6	0.0	66.7	33.3
Med-Heavy Truck 14,001-33,000 lbs	1.0	0.0	20.0	80.0
Heavy-Heavy Truck 33,001-60,000 lbs	0.7	0.0	0.0	100.0
Other Bus	0.1	0.0	0.0	100.0
Urban Bus	0.1	0.0	0.0	100.0
Motorcycle	2.5	32.0	68.0	0.0
School Bus	0.1	0.0	0.0	100.0
Motor Home	1.4	0.0	92.9	7.1

Travel Conditions

	Residential			Commercial		
	Home-Work	Home-Shop	Home-Other	Commute	Non-Work	Customer
Urban Trip Length (miles)	12.7	7.0	9.5	10.0	10.0	10.0
Rural Trip Length (miles)	17.6	12.1	14.9	15.4	9.6	12.6
Trip speeds (mph)	30.0	30.0	30.0	30.0	30.0	30.0
% of Trips - Residential	32.9	18.0	49.1			

% of Trips - Commercial (by land use)

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Travel Conditions

	Residential			Commercial		
	Home-Work	Home-Shop	Home-Other	Commute	Non-Work	Customer
Regional VMT				2.0	1.0	97.0

Operational Changes to Defaults

Commercial-based commute urban trip length changed from 13.3 miles to 10 miles

Commercial-based non-work urban trip length changed from 7.4 miles to 10 miles

Commercial-based customer urban trip length changed from 8.9 miles to 10 miles

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Urbemis 2007 Version 9.2.4

Detail Report for Annual Operational Unmitigated Emissions (Tons/Year)

File Name: C:\Users\sullivans\Documents\PE ROW West Santa Ana Branch Corridor 60180930.6001\URBEMIS Outputs\PEROW_LRT East Bank.urb924

Project Name: PEROW - LRT East Bank

Project Location: South Coast AQMD

On-Road Vehicle Emissions Based on: Version : Emfac2007 V2.3 Nov 1 2006

Off-Road Vehicle Emissions Based on: OFFROAD2007

OPERATIONAL EMISSION ESTIMATES (Annual Tons Per Year, Unmitigated)

Source	ROG	NOX	CO	SO2	PM10	PM25	CO2
Regional VMT	25,559.69	28,076.95	291,025.08	992.06	170,738.15	33,048.68	100,386,442.71
TOTALS (tons/year, unmitigated)	25,559.69	28,076.95	291,025.08	992.06	170,738.15	33,048.68	100,386,442.71

Does not include correction for passby trips

Does not include double counting adjustment for internal trips

Analysis Year: 2035 Season: Annual

Emfac: Version : Emfac2007 V2.3 Nov 1 2006

Summary of Land Uses

Land Use Type	Acreage	Trip Rate	Unit Type	No. Units	Total Trips	Total VMT
Regional VMT		9,910.00	1000 sq ft	5,472.72	54,234,657.33	542,346,573.29
					54,234,657.33	542,346,573.29

Vehicle Fleet Mix

Vehicle Type	Percent Type	Non-Catalyst	Catalyst	Diesel
Light Auto	48.0	0.0	100.0	0.0

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Vehicle Fleet Mix

Vehicle Type	Percent Type	Non-Catalyst	Catalyst	Diesel
Light Truck < 3750 lbs	7.4	0.0	100.0	0.0
Light Truck 3751-5750 lbs	24.4	0.0	100.0	0.0
Med Truck 5751-8500 lbs	11.8	0.0	100.0	0.0
Lite-Heavy Truck 8501-10,000 lbs	1.9	0.0	78.9	21.1
Lite-Heavy Truck 10,001-14,000 lbs	0.6	0.0	66.7	33.3
Med-Heavy Truck 14,001-33,000 lbs	1.0	0.0	20.0	80.0
Heavy-Heavy Truck 33,001-60,000 lbs	0.7	0.0	0.0	100.0
Other Bus	0.1	0.0	0.0	100.0
Urban Bus	0.1	0.0	0.0	100.0
Motorcycle	2.5	32.0	68.0	0.0
School Bus	0.1	0.0	0.0	100.0
Motor Home	1.4	0.0	92.9	7.1

Travel Conditions

	Residential			Commercial		
	Home-Work	Home-Shop	Home-Other	Commute	Non-Work	Customer
Urban Trip Length (miles)	12.7	7.0	9.5	10.0	10.0	10.0
Rural Trip Length (miles)	17.6	12.1	14.9	15.4	9.6	12.6
Trip speeds (mph)	30.0	30.0	30.0	30.0	30.0	30.0
% of Trips - Residential	32.9	18.0	49.1			

% of Trips - Commercial (by land use)

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Travel Conditions

	Residential			Commercial		
	Home-Work	Home-Shop	Home-Other	Commute	Non-Work	Customer
Regional VMT				2.0	1.0	97.0

Operational Changes to Defaults

Commercial-based commute urban trip length changed from 13.3 miles to 10 miles

Commercial-based non-work urban trip length changed from 7.4 miles to 10 miles

Commercial-based customer urban trip length changed from 8.9 miles to 10 miles

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Urbemis 2007 Version 9.2.4

Detail Report for Annual Operational Unmitigated Emissions (Tons/Year)

File Name: C:\Users\sullivans\Documents\PE ROW West Santa Ana Branch Corridor 60180930.6001\URBEMIS Outputs\PEROW_LRT West Bank 2.urb924

Project Name: PEROW - LRT West Bank 2

Project Location: South Coast AQMD

On-Road Vehicle Emissions Based on: Version : Emfac2007 V2.3 Nov 1 2006

Off-Road Vehicle Emissions Based on: OFFROAD2007

OPERATIONAL EMISSION ESTIMATES (Annual Tons Per Year, Unmitigated)

Source	ROG	NOX	CO	SO2	PM10	PM25	CO2
Regional VMT	25,562.16	28,079.67	291,053.25	992.16	170,754.68	33,051.87	100,396,160.59
TOTALS (tons/year, unmitigated)	25,562.16	28,079.67	291,053.25	992.16	170,754.68	33,051.87	100,396,160.59

Does not include correction for passby trips

Does not include double counting adjustment for internal trips

Analysis Year: 2035 Season: Annual

Emfac: Version : Emfac2007 V2.3 Nov 1 2006

Summary of Land Uses

Land Use Type	Acreage	Trip Rate	Unit Type	No. Units	Total Trips	Total VMT
Regional VMT		9,910.00	1000 sq ft	5,473.25	54,239,907.50	542,399,075.00
					54,239,907.50	542,399,075.00

Vehicle Fleet Mix

Vehicle Type	Percent Type	Non-Catalyst	Catalyst	Diesel
Light Auto	48.0	0.0	100.0	0.0

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Vehicle Fleet Mix

Vehicle Type	Percent Type	Non-Catalyst	Catalyst	Diesel
Light Truck < 3750 lbs	7.4	0.0	100.0	0.0
Light Truck 3751-5750 lbs	24.4	0.0	100.0	0.0
Med Truck 5751-8500 lbs	11.8	0.0	100.0	0.0
Lite-Heavy Truck 8501-10,000 lbs	1.9	0.0	78.9	21.1
Lite-Heavy Truck 10,001-14,000 lbs	0.6	0.0	66.7	33.3
Med-Heavy Truck 14,001-33,000 lbs	1.0	0.0	20.0	80.0
Heavy-Heavy Truck 33,001-60,000 lbs	0.7	0.0	0.0	100.0
Other Bus	0.1	0.0	0.0	100.0
Urban Bus	0.1	0.0	0.0	100.0
Motorcycle	2.5	32.0	68.0	0.0
School Bus	0.1	0.0	0.0	100.0
Motor Home	1.4	0.0	92.9	7.1

Travel Conditions

	Residential			Commercial		
	Home-Work	Home-Shop	Home-Other	Commute	Non-Work	Customer
Urban Trip Length (miles)	12.7	7.0	9.5	10.0	10.0	10.0
Rural Trip Length (miles)	17.6	12.1	14.9	15.4	9.6	12.6
Trip speeds (mph)	30.0	30.0	30.0	30.0	30.0	30.0
% of Trips - Residential	32.9	18.0	49.1			

% of Trips - Commercial (by land use)

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Travel Conditions

	Residential			Commercial		
	Home-Work	Home-Shop	Home-Other	Commute	Non-Work	Customer
Regional VMT				2.0	1.0	97.0

Operational Changes to Defaults

Commercial-based commute urban trip length changed from 13.3 miles to 10 miles

Commercial-based non-work urban trip length changed from 7.4 miles to 10 miles

Commercial-based customer urban trip length changed from 8.9 miles to 10 miles

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Urbemis 2007 Version 9.2.4

Detail Report for Annual Operational Unmitigated Emissions (Tons/Year)

File Name: C:\Users\sullivans\Documents\PE ROW West Santa Ana Branch Corridor 60180930.6001\URBEMIS Outputs\PEROW_LRT West Bank 3.urb924

Project Name: PEROW - LRT West Bank 3

Project Location: South Coast AQMD

On-Road Vehicle Emissions Based on: Version : Emfac2007 V2.3 Nov 1 2006

Off-Road Vehicle Emissions Based on: OFFROAD2007

OPERATIONAL EMISSION ESTIMATES (Annual Tons Per Year, Unmitigated)

Source	ROG	NOX	CO	SO2	PM10	PM25	CO2
Regional VMT	25,560.30	28,077.61	291,031.99	992.08	170,742.20	33,049.46	100,388,825.16
TOTALS (tons/year, unmitigated)	25,560.30	28,077.61	291,031.99	992.08	170,742.20	33,049.46	100,388,825.16

Does not include correction for passby trips

Does not include double counting adjustment for internal trips

Analysis Year: 2035 Season: Annual

Emfac: Version : Emfac2007 V2.3 Nov 1 2006

Summary of Land Uses

Land Use Type	Acreage	Trip Rate	Unit Type	No. Units	Total Trips	Total VMT
Regional VMT		9,910.00	1000 sq ft	5,472.85	54,235,944.47	542,359,444.68
					54,235,944.47	542,359,444.68

Vehicle Fleet Mix

Vehicle Type	Percent Type	Non-Catalyst	Catalyst	Diesel
Light Auto	48.0	0.0	100.0	0.0

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Vehicle Fleet Mix

Vehicle Type	Percent Type	Non-Catalyst	Catalyst	Diesel
Light Truck < 3750 lbs	7.4	0.0	100.0	0.0
Light Truck 3751-5750 lbs	24.4	0.0	100.0	0.0
Med Truck 5751-8500 lbs	11.8	0.0	100.0	0.0
Lite-Heavy Truck 8501-10,000 lbs	1.9	0.0	78.9	21.1
Lite-Heavy Truck 10,001-14,000 lbs	0.6	0.0	66.7	33.3
Med-Heavy Truck 14,001-33,000 lbs	1.0	0.0	20.0	80.0
Heavy-Heavy Truck 33,001-60,000 lbs	0.7	0.0	0.0	100.0
Other Bus	0.1	0.0	0.0	100.0
Urban Bus	0.1	0.0	0.0	100.0
Motorcycle	2.5	32.0	68.0	0.0
School Bus	0.1	0.0	0.0	100.0
Motor Home	1.4	0.0	92.9	7.1

Travel Conditions

	Residential			Commercial		
	Home-Work	Home-Shop	Home-Other	Commute	Non-Work	Customer
Urban Trip Length (miles)	12.7	7.0	9.5	10.0	10.0	10.0
Rural Trip Length (miles)	17.6	12.1	14.9	15.4	9.6	12.6
Trip speeds (mph)	30.0	30.0	30.0	30.0	30.0	30.0
% of Trips - Residential	32.9	18.0	49.1			

% of Trips - Commercial (by land use)

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Travel Conditions

	Residential			Commercial		
	Home-Work	Home-Shop	Home-Other	Commute	Non-Work	Customer
Regional VMT				2.0	1.0	97.0

Operational Changes to Defaults

Commercial-based commute urban trip length changed from 13.3 miles to 10 miles

Commercial-based non-work urban trip length changed from 7.4 miles to 10 miles

Commercial-based customer urban trip length changed from 8.9 miles to 10 miles

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Urbemis 2007 Version 9.2.4

Detail Report for Annual Operational Unmitigated Emissions (Tons/Year)

File Name: C:\Users\sullivans\Documents\PE ROW West Santa Ana Branch Corridor 60180930.6001\URBEMIS Outputs\PEROW_MagLev.urb924

Project Name: PEROW - MagLev West Bank 3

Project Location: South Coast AQMD

On-Road Vehicle Emissions Based on: Version : Emfac2007 V2.3 Nov 1 2006

Off-Road Vehicle Emissions Based on: OFFROAD2007

OPERATIONAL EMISSION ESTIMATES (Annual Tons Per Year, Unmitigated)

Source	ROG	NOX	CO	SO2	PM10	PM25	CO2
Regional VMT	25,565.06	28,082.85	291,086.23	992.27	170,774.02	33,055.62	100,407,535.44
TOTALS (tons/year, unmitigated)	25,565.06	28,082.85	291,086.23	992.27	170,774.02	33,055.62	100,407,535.44

Does not include correction for passby trips

Does not include double counting adjustment for internal trips

Analysis Year: 2035 Season: Annual

Emfac: Version : Emfac2007 V2.3 Nov 1 2006

Summary of Land Uses

Land Use Type	Acreage	Trip Rate	Unit Type	No. Units	Total Trips	Total VMT
Regional VMT		9,910.00	1000 sq ft	5,473.87	54,246,052.86	542,460,528.61
					54,246,052.86	542,460,528.61

Vehicle Fleet Mix

Vehicle Type	Percent Type	Non-Catalyst	Catalyst	Diesel
Light Auto	48.0	0.0	100.0	0.0

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Vehicle Fleet Mix

Vehicle Type	Percent Type	Non-Catalyst	Catalyst	Diesel
Light Truck < 3750 lbs	7.4	0.0	100.0	0.0
Light Truck 3751-5750 lbs	24.4	0.0	100.0	0.0
Med Truck 5751-8500 lbs	11.8	0.0	100.0	0.0
Lite-Heavy Truck 8501-10,000 lbs	1.9	0.0	78.9	21.1
Lite-Heavy Truck 10,001-14,000 lbs	0.6	0.0	66.7	33.3
Med-Heavy Truck 14,001-33,000 lbs	1.0	0.0	20.0	80.0
Heavy-Heavy Truck 33,001-60,000 lbs	0.7	0.0	0.0	100.0
Other Bus	0.1	0.0	0.0	100.0
Urban Bus	0.1	0.0	0.0	100.0
Motorcycle	2.5	32.0	68.0	0.0
School Bus	0.1	0.0	0.0	100.0
Motor Home	1.4	0.0	92.9	7.1

Travel Conditions

	Residential			Commercial		
	Home-Work	Home-Shop	Home-Other	Commute	Non-Work	Customer
Urban Trip Length (miles)	12.7	7.0	9.5	10.0	10.0	10.0
Rural Trip Length (miles)	17.6	12.1	14.9	15.4	9.6	12.6
Trip speeds (mph)	30.0	30.0	30.0	30.0	30.0	30.0
% of Trips - Residential	32.9	18.0	49.1			

% of Trips - Commercial (by land use)

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Travel Conditions

	Residential			Commercial		
	Home-Work	Home-Shop	Home-Other	Commute	Non-Work	Customer
Regional VMT				2.0	1.0	97.0

Operational Changes to Defaults

Commercial-based commute urban trip length changed from 13.3 miles to 10 miles

Commercial-based non-work urban trip length changed from 7.4 miles to 10 miles

Commercial-based customer urban trip length changed from 8.9 miles to 10 miles

11/7/2011 9:54:44 AM

Urbemis 2007 Version 9.2.4

Detail Report for Annual Operational Unmitigated Emissions (Tons/Year)

File Name: C:\Users\sullivans\Documents\PE ROW West Santa Ana Branch Corridor 60180930.6001\URBEMIS Outputs\PEROW_Street Car.urb924

Project Name: PEROW - Street Car West Bank 3

Project Location: South Coast AQMD

On-Road Vehicle Emissions Based on: Version : Emfac2007 V2.3 Nov 1 2006

Off-Road Vehicle Emissions Based on: OFFROAD2007

OPERATIONAL EMISSION ESTIMATES (Annual Tons Per Year, Unmitigated)

Source	ROG	NOX	CO	SO2	PM10	PM25	CO2
Regional VMT	25,566.55	28,084.49	291,103.24	992.33	170,784.00	33,057.55	100,413,402.00
TOTALS (tons/year, unmitigated)	25,566.55	28,084.49	291,103.24	992.33	170,784.00	33,057.55	100,413,402.00

Does not include correction for passby trips

Does not include double counting adjustment for internal trips

Analysis Year: 2035 Season: Annual

Emfac: Version : Emfac2007 V2.3 Nov 1 2006

Summary of Land Uses

Land Use Type	Acreage	Trip Rate	Unit Type	No. Units	Total Trips	Total VMT
Regional VMT		9,910.00	1000 sq ft	5,474.19	54,249,222.32	542,492,223.19
					54,249,222.32	542,492,223.19

Vehicle Fleet Mix

Vehicle Type	Percent Type	Non-Catalyst	Catalyst	Diesel
Light Auto	48.0	0.0	100.0	0.0

11/7/2011 9:54:44 AM

Vehicle Fleet Mix

Vehicle Type	Percent Type	Non-Catalyst	Catalyst	Diesel
Light Truck < 3750 lbs	7.4	0.0	100.0	0.0
Light Truck 3751-5750 lbs	24.4	0.0	100.0	0.0
Med Truck 5751-8500 lbs	11.8	0.0	100.0	0.0
Lite-Heavy Truck 8501-10,000 lbs	1.9	0.0	78.9	21.1
Lite-Heavy Truck 10,001-14,000 lbs	0.6	0.0	66.7	33.3
Med-Heavy Truck 14,001-33,000 lbs	1.0	0.0	20.0	80.0
Heavy-Heavy Truck 33,001-60,000 lbs	0.7	0.0	0.0	100.0
Other Bus	0.1	0.0	0.0	100.0
Urban Bus	0.1	0.0	0.0	100.0
Motorcycle	2.5	32.0	68.0	0.0
School Bus	0.1	0.0	0.0	100.0
Motor Home	1.4	0.0	92.9	7.1

Travel Conditions

	Residential			Commercial		
	Home-Work	Home-Shop	Home-Other	Commute	Non-Work	Customer
Urban Trip Length (miles)	12.7	7.0	9.5	10.0	10.0	10.0
Rural Trip Length (miles)	17.6	12.1	14.9	15.4	9.6	12.6
Trip speeds (mph)	30.0	30.0	30.0	30.0	30.0	30.0
% of Trips - Residential	32.9	18.0	49.1			

% of Trips - Commercial (by land use)

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Travel Conditions

	Residential			Commercial		
	Home-Work	Home-Shop	Home-Other	Commute	Non-Work	Customer
Regional VMT				2.0	1.0	97.0

Operational Changes to Defaults

Commercial-based commute urban trip length changed from 13.3 miles to 10 miles

Commercial-based non-work urban trip length changed from 7.4 miles to 10 miles

Commercial-based customer urban trip length changed from 8.9 miles to 10 miles

Attachment 2: Daily Emissions Impacts

11/7/2011 9:05:54 AM

Urbemis 2007 Version 9.2.4

Detail Report for Summer Operational Unmitigated Emissions (Pounds/Day)

File Name: C:\Users\sullivans\Documents\Harbor Green Line\060311\Air Quality\Emissions\Appendix B-2 Urbemis Modeling Files\No Build Alt Regional VMT\HGL No Build.urb924

Project Name: PEROW - No Build Alternative

Project Location: South Coast AQMD

On-Road Vehicle Emissions Based on: Version : Emfac2007 V2.3 Nov 1 2006

Off-Road Vehicle Emissions Based on: OFFROAD2007

OPERATIONAL EMISSION ESTIMATES (Summer Pounds Per Day, Unmitigated)

Source	ROG	NOX	CO	SO2	PM10	PM25	CO2
Regional VMT	133,788.75	144,697.65	1,634,870.21	5,770.04	938,283.25	181,617.40	569,880,302.48
TOTALS (lbs/day, unmitigated)	133,788.75	144,697.65	1,634,870.21	5,770.04	938,283.25	181,617.40	569,880,302.48

Does not include correction for passby trips

Does not include double counting adjustment for internal trips

Analysis Year: 2035 Temperature (F): 80 Season: Summer

Emfac: Version : Emfac2007 V2.3 Nov 1 2006

Summary of Land Uses

Land Use Type	Acreage	Trip Rate	Unit Type	No. Units	Total Trips	Total VMT
Regional VMT		9,910.00	1000 sq ft	5,488.70	54,393,018.94	543,930,189.36
					54,393,018.94	543,930,189.36

Vehicle Fleet Mix

Vehicle Type	Percent Type	Non-Catalyst	Catalyst	Diesel
Light Auto	48.0	0.0	100.0	0.0

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Vehicle Fleet Mix

Vehicle Type	Percent Type	Non-Catalyst	Catalyst	Diesel
Light Truck < 3750 lbs	7.4	0.0	100.0	0.0
Light Truck 3751-5750 lbs	24.4	0.0	100.0	0.0
Med Truck 5751-8500 lbs	11.8	0.0	100.0	0.0
Lite-Heavy Truck 8501-10,000 lbs	1.9	0.0	78.9	21.1
Lite-Heavy Truck 10,001-14,000 lbs	0.6	0.0	66.7	33.3
Med-Heavy Truck 14,001-33,000 lbs	1.0	0.0	20.0	80.0
Heavy-Heavy Truck 33,001-60,000 lbs	0.7	0.0	0.0	100.0
Other Bus	0.1	0.0	0.0	100.0
Urban Bus	0.1	0.0	0.0	100.0
Motorcycle	2.5	32.0	68.0	0.0
School Bus	0.1	0.0	0.0	100.0
Motor Home	1.4	0.0	92.9	7.1

Travel Conditions

	Residential			Commercial		
	Home-Work	Home-Shop	Home-Other	Commute	Non-Work	Customer
Urban Trip Length (miles)	12.7	7.0	9.5	10.0	10.0	10.0
Rural Trip Length (miles)	17.6	12.1	14.9	15.4	9.6	12.6
Trip speeds (mph)	30.0	30.0	30.0	30.0	30.0	30.0
% of Trips - Residential	32.9	18.0	49.1			

% of Trips - Commercial (by land use)

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Travel Conditions

	Residential			Commercial		
	Home-Work	Home-Shop	Home-Other	Commute	Non-Work	Customer
Regional VMT				2.0	1.0	97.0

Operational Changes to Defaults

Commercial-based commute urban trip length changed from 13.3 miles to 10 miles

Commercial-based non-work urban trip length changed from 7.4 miles to 10 miles

Commercial-based customer urban trip length changed from 8.9 miles to 10 miles

11/7/2011 9:44:43 AM

Urbemis 2007 Version 9.2.4

Detail Report for Summer Operational Unmitigated Emissions (Pounds/Day)

File Name: C:\Users\sullivans\Documents\PE ROW West Santa Ana Branch Corridor 60180930.6001\URBEMIS Outputs\PEROW_TSM Alt.urb924

Project Name: PEROW - TSM Alternative

Project Location: South Coast AQMD

On-Road Vehicle Emissions Based on: Version : Emfac2007 V2.3 Nov 1 2006

Off-Road Vehicle Emissions Based on: OFFROAD2007

OPERATIONAL EMISSION ESTIMATES (Summer Pounds Per Day, Unmitigated)

Source	ROG	NOX	CO	SO2	PM10	PM25	CO2
Regional VMT	133,602.75	144,496.49	1,632,597.42	5,762.02	936,978.85	181,364.91	569,088,056.96
TOTALS (lbs/day, unmitigated)	133,602.75	144,496.49	1,632,597.42	5,762.02	936,978.85	181,364.91	569,088,056.96

Does not include correction for passby trips

Does not include double counting adjustment for internal trips

Analysis Year: 2035 Temperature (F): 80 Season: Summer

Emfac: Version : Emfac2007 V2.3 Nov 1 2006

Summary of Land Uses

Land Use Type	Acreage	Trip Rate	Unit Type	No. Units	Total Trips	Total VMT
Regional VMT		9,910.00	1000 sq ft	5,481.07	54,317,401.96	543,174,019.58
					54,317,401.96	543,174,019.58

Vehicle Fleet Mix

Vehicle Type	Percent Type	Non-Catalyst	Catalyst	Diesel
Light Auto	48.0	0.0	100.0	0.0
Light Truck < 3750 lbs	7.4	0.0	100.0	0.0

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Vehicle Fleet Mix

Vehicle Type	Percent Type	Non-Catalyst	Catalyst	Diesel
Light Truck 3751-5750 lbs	24.4	0.0	100.0	0.0
Med Truck 5751-8500 lbs	11.8	0.0	100.0	0.0
Lite-Heavy Truck 8501-10,000 lbs	1.9	0.0	78.9	21.1
Lite-Heavy Truck 10,001-14,000 lbs	0.6	0.0	66.7	33.3
Med-Heavy Truck 14,001-33,000 lbs	1.0	0.0	20.0	80.0
Heavy-Heavy Truck 33,001-60,000 lbs	0.7	0.0	0.0	100.0
Other Bus	0.1	0.0	0.0	100.0
Urban Bus	0.1	0.0	0.0	100.0
Motorcycle	2.5	32.0	68.0	0.0
School Bus	0.1	0.0	0.0	100.0
Motor Home	1.4	0.0	92.9	7.1

Travel Conditions

	Residential			Commercial		
	Home-Work	Home-Shop	Home-Other	Commute	Non-Work	Customer
Urban Trip Length (miles)	12.7	7.0	9.5	10.0	10.0	10.0
Rural Trip Length (miles)	17.6	12.1	14.9	15.4	9.6	12.6
Trip speeds (mph)	30.0	30.0	30.0	30.0	30.0	30.0
% of Trips - Residential	32.9	18.0	49.1			
% of Trips - Commercial (by land use)						
Regional VMT				2.0	1.0	97.0

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Operational Changes to Defaults

Commercial-based commute urban trip length changed from 13.3 miles to 10 miles

Commercial-based non-work urban trip length changed from 7.4 miles to 10 miles

Commercial-based customer urban trip length changed from 8.9 miles to 10 miles

11/7/2011 9:46:00 AM

Urbemis 2007 Version 9.2.4

Detail Report for Summer Operational Unmitigated Emissions (Pounds/Day)

File Name: C:\Users\sullivans\Documents\PE ROW West Santa Ana Branch Corridor 60180930.6001\URBEMIS Outputs\PEROW_BRT HOV.urb924

Project Name: PEROW - BRT HOV

Project Location: South Coast AQMD

On-Road Vehicle Emissions Based on: Version : Emfac2007 V2.3 Nov 1 2006

Off-Road Vehicle Emissions Based on: OFFROAD2007

OPERATIONAL EMISSION ESTIMATES (Summer Pounds Per Day, Unmitigated)

Source	ROG	NOX	CO	SO2	PM10	PM25	CO2
Regional VMT	133,407.51	144,285.33	1,630,211.63	5,753.60	935,609.60	181,099.88	568,256,419.68
TOTALS (lbs/day, unmitigated)	133,407.51	144,285.33	1,630,211.63	5,753.60	935,609.60	181,099.88	568,256,419.68

Does not include correction for passby trips

Does not include double counting adjustment for internal trips

Analysis Year: 2035 Temperature (F): 80 Season: Summer

Emfac: Version : Emfac2007 V2.3 Nov 1 2006

Summary of Land Uses

Land Use Type	Acreage	Trip Rate	Unit Type	No. Units	Total Trips	Total VMT
Regional VMT		9,910.00	1000 sq ft	5,473.06	54,238,025.18	542,380,251.81
					54,238,025.18	542,380,251.81

Vehicle Fleet Mix

Vehicle Type	Percent Type	Non-Catalyst	Catalyst	Diesel
Light Auto	48.0	0.0	100.0	0.0
Light Truck < 3750 lbs	7.4	0.0	100.0	0.0

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Vehicle Fleet Mix

Vehicle Type	Percent Type	Non-Catalyst	Catalyst	Diesel
Light Truck 3751-5750 lbs	24.4	0.0	100.0	0.0
Med Truck 5751-8500 lbs	11.8	0.0	100.0	0.0
Lite-Heavy Truck 8501-10,000 lbs	1.9	0.0	78.9	21.1
Lite-Heavy Truck 10,001-14,000 lbs	0.6	0.0	66.7	33.3
Med-Heavy Truck 14,001-33,000 lbs	1.0	0.0	20.0	80.0
Heavy-Heavy Truck 33,001-60,000 lbs	0.7	0.0	0.0	100.0
Other Bus	0.1	0.0	0.0	100.0
Urban Bus	0.1	0.0	0.0	100.0
Motorcycle	2.5	32.0	68.0	0.0
School Bus	0.1	0.0	0.0	100.0
Motor Home	1.4	0.0	92.9	7.1

Travel Conditions

	Residential			Commercial		
	Home-Work	Home-Shop	Home-Other	Commute	Non-Work	Customer
Urban Trip Length (miles)	12.7	7.0	9.5	10.0	10.0	10.0
Rural Trip Length (miles)	17.6	12.1	14.9	15.4	9.6	12.6
Trip speeds (mph)	30.0	30.0	30.0	30.0	30.0	30.0
% of Trips - Residential	32.9	18.0	49.1			
% of Trips - Commercial (by land use)						
Regional VMT				2.0	1.0	97.0

Operational Changes to Defaults

Commercial-based commute urban trip length changed from 13.3 miles to 10 miles

Commercial-based non-work urban trip length changed from 7.4 miles to 10 miles

Commercial-based customer urban trip length changed from 8.9 miles to 10 miles

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Urbemis 2007 Version 9.2.4

Detail Report for Summer Operational Unmitigated Emissions (Pounds/Day)

File Name: C:\Users\sullivans\Documents\PE ROW West Santa Ana Branch Corridor 60180930.6001\URBEMIS Outputs\PEROW_BRT Street.urb924

Project Name: PEROW - BRT Street

Project Location: South Coast AQMD

On-Road Vehicle Emissions Based on: Version : Emfac2007 V2.3 Nov 1 2006

Off-Road Vehicle Emissions Based on: OFFROAD2007

OPERATIONAL EMISSION ESTIMATES (Summer Pounds Per Day, Unmitigated)

Source	ROG	NOX	CO	SO2	PM10	PM25	CO2
Regional VMT	133,490.64	144,375.23	1,631,227.38	5,757.19	936,192.56	181,212.72	568,610,489.10
TOTALS (lbs/day, unmitigated)	133,490.64	144,375.23	1,631,227.38	5,757.19	936,192.56	181,212.72	568,610,489.10

Does not include correction for passby trips

Does not include double counting adjustment for internal trips

Analysis Year: 2035 Temperature (F): 80 Season: Summer

Emfac: Version : Emfac2007 V2.3 Nov 1 2006

Summary of Land Uses

Land Use Type	Acreage	Trip Rate	Unit Type	No. Units	Total Trips	Total VMT
Regional VMT		9,910.00	1000 sq ft	5,476.47	54,271,819.83	542,718,198.29
					54,271,819.83	542,718,198.29

Vehicle Fleet Mix

Vehicle Type	Percent Type	Non-Catalyst	Catalyst	Diesel
Light Auto	48.0	0.0	100.0	0.0

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Vehicle Fleet Mix

Vehicle Type	Percent Type	Non-Catalyst	Catalyst	Diesel
Light Truck < 3750 lbs	7.4	0.0	100.0	0.0
Light Truck 3751-5750 lbs	24.4	0.0	100.0	0.0
Med Truck 5751-8500 lbs	11.8	0.0	100.0	0.0
Lite-Heavy Truck 8501-10,000 lbs	1.9	0.0	78.9	21.1
Lite-Heavy Truck 10,001-14,000 lbs	0.6	0.0	66.7	33.3
Med-Heavy Truck 14,001-33,000 lbs	1.0	0.0	20.0	80.0
Heavy-Heavy Truck 33,001-60,000 lbs	0.7	0.0	0.0	100.0
Other Bus	0.1	0.0	0.0	100.0
Urban Bus	0.1	0.0	0.0	100.0
Motorcycle	2.5	32.0	68.0	0.0
School Bus	0.1	0.0	0.0	100.0
Motor Home	1.4	0.0	92.9	7.1

Travel Conditions

	Residential			Commercial		
	Home-Work	Home-Shop	Home-Other	Commute	Non-Work	Customer
Urban Trip Length (miles)	12.7	7.0	9.5	10.0	10.0	10.0
Rural Trip Length (miles)	17.6	12.1	14.9	15.4	9.6	12.6
Trip speeds (mph)	30.0	30.0	30.0	30.0	30.0	30.0
% of Trips - Residential	32.9	18.0	49.1			

% of Trips - Commercial (by land use)

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Travel Conditions

	Residential			Commercial		
	Home-Work	Home-Shop	Home-Other	Commute	Non-Work	Customer
Regional VMT				2.0	1.0	97.0

Operational Changes to Defaults

Commercial-based commute urban trip length changed from 13.3 miles to 10 miles

Commercial-based non-work urban trip length changed from 7.4 miles to 10 miles

Commercial-based customer urban trip length changed from 8.9 miles to 10 miles

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Urbemis 2007 Version 9.2.4

Detail Report for Summer Operational Unmitigated Emissions (Pounds/Day)

File Name: C:\Users\sullivans\Documents\PE ROW West Santa Ana Branch Corridor 60180930.6001\URBEMIS Outputs\PEROW_LRT West Bank 2.urb924

Project Name: PEROW - LRT West Bank 2

Project Location: South Coast AQMD

On-Road Vehicle Emissions Based on: Version : Emfac2007 V2.3 Nov 1 2006

Off-Road Vehicle Emissions Based on: OFFROAD2007

OPERATIONAL EMISSION ESTIMATES (Summer Pounds Per Day, Unmitigated)

Source	ROG	NOX	CO	SO2	PM10	PM25	CO2
Regional VMT	133,412.14	144,290.33	1,630,268.20	5,753.80	935,642.07	181,106.16	568,276,140.90
TOTALS (lbs/day, unmitigated)	133,412.14	144,290.33	1,630,268.20	5,753.80	935,642.07	181,106.16	568,276,140.90

Does not include correction for passby trips

Does not include double counting adjustment for internal trips

Analysis Year: 2035 Temperature (F): 80 Season: Summer

Emfac: Version : Emfac2007 V2.3 Nov 1 2006

Summary of Land Uses

Land Use Type	Acreage	Trip Rate	Unit Type	No. Units	Total Trips	Total VMT
Regional VMT		9,910.00	1000 sq ft	5,473.25	54,239,907.50	542,399,075.00
					54,239,907.50	542,399,075.00

Vehicle Fleet Mix

Vehicle Type	Percent Type	Non-Catalyst	Catalyst	Diesel
Light Auto	48.0	0.0	100.0	0.0

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Vehicle Fleet Mix

Vehicle Type	Percent Type	Non-Catalyst	Catalyst	Diesel
Light Truck < 3750 lbs	7.4	0.0	100.0	0.0
Light Truck 3751-5750 lbs	24.4	0.0	100.0	0.0
Med Truck 5751-8500 lbs	11.8	0.0	100.0	0.0
Lite-Heavy Truck 8501-10,000 lbs	1.9	0.0	78.9	21.1
Lite-Heavy Truck 10,001-14,000 lbs	0.6	0.0	66.7	33.3
Med-Heavy Truck 14,001-33,000 lbs	1.0	0.0	20.0	80.0
Heavy-Heavy Truck 33,001-60,000 lbs	0.7	0.0	0.0	100.0
Other Bus	0.1	0.0	0.0	100.0
Urban Bus	0.1	0.0	0.0	100.0
Motorcycle	2.5	32.0	68.0	0.0
School Bus	0.1	0.0	0.0	100.0
Motor Home	1.4	0.0	92.9	7.1

Travel Conditions

	Residential			Commercial		
	Home-Work	Home-Shop	Home-Other	Commute	Non-Work	Customer
Urban Trip Length (miles)	12.7	7.0	9.5	10.0	10.0	10.0
Rural Trip Length (miles)	17.6	12.1	14.9	15.4	9.6	12.6
Trip speeds (mph)	30.0	30.0	30.0	30.0	30.0	30.0
% of Trips - Residential	32.9	18.0	49.1			

% of Trips - Commercial (by land use)

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Travel Conditions

	Residential			Commercial		
	Home-Work	Home-Shop	Home-Other	Commute	Non-Work	Customer
Regional VMT				2.0	1.0	97.0

Operational Changes to Defaults

Commercial-based commute urban trip length changed from 13.3 miles to 10 miles

Commercial-based non-work urban trip length changed from 7.4 miles to 10 miles

Commercial-based customer urban trip length changed from 8.9 miles to 10 miles

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Urbemis 2007 Version 9.2.4

Detail Report for Summer Operational Unmitigated Emissions (Pounds/Day)

File Name: C:\Users\sullivans\Documents\PE ROW West Santa Ana Branch Corridor 60180930.6001\URBEMIS Outputs\PEROW_LRT West Bank 3.urb924

Project Name: PEROW - LRT West Bank 3

Project Location: South Coast AQMD

On-Road Vehicle Emissions Based on: Version : Emfac2007 V2.3 Nov 1 2006

Off-Road Vehicle Emissions Based on: OFFROAD2007

OPERATIONAL EMISSION ESTIMATES (Summer Pounds Per Day, Unmitigated)

Source	ROG	NOX	CO	SO2	PM10	PM25	CO2
Regional VMT	133,402.40	144,279.79	1,630,149.09	5,753.38	935,573.71	181,092.93	568,234,619.88
TOTALS (lbs/day, unmitigated)	133,402.40	144,279.79	1,630,149.09	5,753.38	935,573.71	181,092.93	568,234,619.88

Does not include correction for passby trips

Does not include double counting adjustment for internal trips

Analysis Year: 2035 Temperature (F): 80 Season: Summer

Emfac: Version : Emfac2007 V2.3 Nov 1 2006

Summary of Land Uses

Land Use Type	Acreage	Trip Rate	Unit Type	No. Units	Total Trips	Total VMT
Regional VMT		9,910.00	1000 sq ft	5,472.85	54,235,944.47	542,359,444.68
					54,235,944.47	542,359,444.68

Vehicle Fleet Mix

Vehicle Type	Percent Type	Non-Catalyst	Catalyst	Diesel
Light Auto	48.0	0.0	100.0	0.0

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Vehicle Fleet Mix

Vehicle Type	Percent Type	Non-Catalyst	Catalyst	Diesel
Light Truck < 3750 lbs	7.4	0.0	100.0	0.0
Light Truck 3751-5750 lbs	24.4	0.0	100.0	0.0
Med Truck 5751-8500 lbs	11.8	0.0	100.0	0.0
Lite-Heavy Truck 8501-10,000 lbs	1.9	0.0	78.9	21.1
Lite-Heavy Truck 10,001-14,000 lbs	0.6	0.0	66.7	33.3
Med-Heavy Truck 14,001-33,000 lbs	1.0	0.0	20.0	80.0
Heavy-Heavy Truck 33,001-60,000 lbs	0.7	0.0	0.0	100.0
Other Bus	0.1	0.0	0.0	100.0
Urban Bus	0.1	0.0	0.0	100.0
Motorcycle	2.5	32.0	68.0	0.0
School Bus	0.1	0.0	0.0	100.0
Motor Home	1.4	0.0	92.9	7.1

Travel Conditions

	Residential			Commercial		
	Home-Work	Home-Shop	Home-Other	Commute	Non-Work	Customer
Urban Trip Length (miles)	12.7	7.0	9.5	10.0	10.0	10.0
Rural Trip Length (miles)	17.6	12.1	14.9	15.4	9.6	12.6
Trip speeds (mph)	30.0	30.0	30.0	30.0	30.0	30.0
% of Trips - Residential	32.9	18.0	49.1			

% of Trips - Commercial (by land use)

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Travel Conditions

	Residential			Commercial		
	Home-Work	Home-Shop	Home-Other	Commute	Non-Work	Customer
Regional VMT				2.0	1.0	97.0

Operational Changes to Defaults

Commercial-based commute urban trip length changed from 13.3 miles to 10 miles

Commercial-based non-work urban trip length changed from 7.4 miles to 10 miles

Commercial-based customer urban trip length changed from 8.9 miles to 10 miles

11/7/2011 9:51:00 AM

Urbemis 2007 Version 9.2.4

Detail Report for Summer Operational Unmitigated Emissions (Pounds/Day)

File Name: C:\Users\sullivans\Documents\PE ROW West Santa Ana Branch Corridor 60180930.6001\URBEMIS Outputs\PEROW_LRT East Bank.urb924

Project Name: PEROW - LRT East Bank

Project Location: South Coast AQMD

On-Road Vehicle Emissions Based on: Version : Emfac2007 V2.3 Nov 1 2006

Off-Road Vehicle Emissions Based on: OFFROAD2007

OPERATIONAL EMISSION ESTIMATES (Summer Pounds Per Day, Unmitigated)

Source	ROG	NOX	CO	SO2	PM10	PM25	CO2
Regional VMT	133,399.23	144,276.37	1,630,110.40	5,753.24	935,551.50	181,088.63	568,221,134.41
TOTALS (lbs/day, unmitigated)	133,399.23	144,276.37	1,630,110.40	5,753.24	935,551.50	181,088.63	568,221,134.41

Does not include correction for passby trips

Does not include double counting adjustment for internal trips

Analysis Year: 2035 Temperature (F): 80 Season: Summer

Emfac: Version : Emfac2007 V2.3 Nov 1 2006

Summary of Land Uses

Land Use Type	Acreage	Trip Rate	Unit Type	No. Units	Total Trips	Total VMT
Regional VMT		9,910.00	1000 sq ft	5,472.72	54,234,657.33	542,346,573.29
					54,234,657.33	542,346,573.29

Vehicle Fleet Mix

Vehicle Type	Percent Type	Non-Catalyst	Catalyst	Diesel
Light Auto	48.0	0.0	100.0	0.0

11/7/2011 9:51:00 AM

Vehicle Fleet Mix

Vehicle Type	Percent Type	Non-Catalyst	Catalyst	Diesel
Light Truck < 3750 lbs	7.4	0.0	100.0	0.0
Light Truck 3751-5750 lbs	24.4	0.0	100.0	0.0
Med Truck 5751-8500 lbs	11.8	0.0	100.0	0.0
Lite-Heavy Truck 8501-10,000 lbs	1.9	0.0	78.9	21.1
Lite-Heavy Truck 10,001-14,000 lbs	0.6	0.0	66.7	33.3
Med-Heavy Truck 14,001-33,000 lbs	1.0	0.0	20.0	80.0
Heavy-Heavy Truck 33,001-60,000 lbs	0.7	0.0	0.0	100.0
Other Bus	0.1	0.0	0.0	100.0
Urban Bus	0.1	0.0	0.0	100.0
Motorcycle	2.5	32.0	68.0	0.0
School Bus	0.1	0.0	0.0	100.0
Motor Home	1.4	0.0	92.9	7.1

Travel Conditions

	Residential			Commercial		
	Home-Work	Home-Shop	Home-Other	Commute	Non-Work	Customer
Urban Trip Length (miles)	12.7	7.0	9.5	10.0	10.0	10.0
Rural Trip Length (miles)	17.6	12.1	14.9	15.4	9.6	12.6
Trip speeds (mph)	30.0	30.0	30.0	30.0	30.0	30.0
% of Trips - Residential	32.9	18.0	49.1			

% of Trips - Commercial (by land use)

Travel Conditions

	Residential			Commercial		
	Home-Work	Home-Shop	Home-Other	Commute	Non-Work	Customer
Regional VMT				2.0	1.0	97.0

Operational Changes to Defaults

Commercial-based commute urban trip length changed from 13.3 miles to 10 miles

Commercial-based non-work urban trip length changed from 7.4 miles to 10 miles

Commercial-based customer urban trip length changed from 8.9 miles to 10 miles

11/7/2011 9:53:44 AM

Urbemis 2007 Version 9.2.4

Detail Report for Summer Operational Unmitigated Emissions (Pounds/Day)

File Name: C:\Users\sullivans\Documents\PE ROW West Santa Ana Branch Corridor 60180930.6001\URBEMIS Outputs\PEROW_MagLev.urb924

Project Name: PEROW - MagLev West Bank 3

Project Location: South Coast AQMD

On-Road Vehicle Emissions Based on: Version : Emfac2007 V2.3 Nov 1 2006

Off-Road Vehicle Emissions Based on: OFFROAD2007

OPERATIONAL EMISSION ESTIMATES (Summer Pounds Per Day, Unmitigated)

Source	ROG	NOX	CO	SO2	PM10	PM25	CO2
Regional VMT	133,427.26	144,306.68	1,630,452.91	5,754.45	935,748.08	181,126.68	568,340,526.38
TOTALS (lbs/day, unmitigated)	133,427.26	144,306.68	1,630,452.91	5,754.45	935,748.08	181,126.68	568,340,526.38

Does not include correction for passby trips

Does not include double counting adjustment for internal trips

Analysis Year: 2035 Temperature (F): 80 Season: Summer

Emfac: Version : Emfac2007 V2.3 Nov 1 2006

Summary of Land Uses

Land Use Type	Acreage	Trip Rate	Unit Type	No. Units	Total Trips	Total VMT
Regional VMT		9,910.00	1000 sq ft	5,473.87	54,246,052.86	542,460,528.61
					54,246,052.86	542,460,528.61

Vehicle Fleet Mix

Vehicle Type	Percent Type	Non-Catalyst	Catalyst	Diesel
Light Auto	48.0	0.0	100.0	0.0
Light Truck < 3750 lbs	7.4	0.0	100.0	0.0

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Vehicle Fleet Mix

Vehicle Type	Percent Type	Non-Catalyst	Catalyst	Diesel
Light Truck 3751-5750 lbs	24.4	0.0	100.0	0.0
Med Truck 5751-8500 lbs	11.8	0.0	100.0	0.0
Lite-Heavy Truck 8501-10,000 lbs	1.9	0.0	78.9	21.1
Lite-Heavy Truck 10,001-14,000 lbs	0.6	0.0	66.7	33.3
Med-Heavy Truck 14,001-33,000 lbs	1.0	0.0	20.0	80.0
Heavy-Heavy Truck 33,001-60,000 lbs	0.7	0.0	0.0	100.0
Other Bus	0.1	0.0	0.0	100.0
Urban Bus	0.1	0.0	0.0	100.0
Motorcycle	2.5	32.0	68.0	0.0
School Bus	0.1	0.0	0.0	100.0
Motor Home	1.4	0.0	92.9	7.1

Travel Conditions

	Residential			Commercial		
	Home-Work	Home-Shop	Home-Other	Commute	Non-Work	Customer
Urban Trip Length (miles)	12.7	7.0	9.5	10.0	10.0	10.0
Rural Trip Length (miles)	17.6	12.1	14.9	15.4	9.6	12.6
Trip speeds (mph)	30.0	30.0	30.0	30.0	30.0	30.0
% of Trips - Residential	32.9	18.0	49.1			
% of Trips - Commercial (by land use)						
Regional VMT				2.0	1.0	97.0

Operational Changes to Defaults

Commercial-based commute urban trip length changed from 13.3 miles to 10 miles

Commercial-based non-work urban trip length changed from 7.4 miles to 10 miles

Commercial-based customer urban trip length changed from 8.9 miles to 10 miles

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Urbemis 2007 Version 9.2.4

Detail Report for Summer Operational Unmitigated Emissions (Pounds/Day)

File Name: C:\Users\sullivans\Documents\PE ROW West Santa Ana Branch Corridor 60180930.6001\URBEMIS Outputs\PEROW_Street Car.urb924

Project Name: PEROW - Street Car West Bank 3

Project Location: South Coast AQMD

On-Road Vehicle Emissions Based on: Version : Emfac2007 V2.3 Nov 1 2006

Off-Road Vehicle Emissions Based on: OFFROAD2007

OPERATIONAL EMISSION ESTIMATES (Summer Pounds Per Day, Unmitigated)

Source	ROG	NOX	CO	SO2	PM10	PM25	CO2
Regional VMT	133,435.05	144,315.11	1,630,548.17	5,754.79	935,802.75	181,137.26	568,373,733.06
TOTALS (lbs/day, unmitigated)	133,435.05	144,315.11	1,630,548.17	5,754.79	935,802.75	181,137.26	568,373,733.06

Does not include correction for passby trips

Does not include double counting adjustment for internal trips

Analysis Year: 2035 Temperature (F): 80 Season: Summer

Emfac: Version : Emfac2007 V2.3 Nov 1 2006

Summary of Land Uses

Land Use Type	Acreage	Trip Rate	Unit Type	No. Units	Total Trips	Total VMT
Regional VMT		9,910.00	1000 sq ft	5,474.19	54,249,222.32	542,492,223.19
					54,249,222.32	542,492,223.19

Vehicle Fleet Mix

Vehicle Type	Percent Type	Non-Catalyst	Catalyst	Diesel
Light Auto	48.0	0.0	100.0	0.0
Light Truck < 3750 lbs	7.4	0.0	100.0	0.0

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Vehicle Fleet Mix

Vehicle Type	Percent Type	Non-Catalyst	Catalyst	Diesel
Light Truck 3751-5750 lbs	24.4	0.0	100.0	0.0
Med Truck 5751-8500 lbs	11.8	0.0	100.0	0.0
Lite-Heavy Truck 8501-10,000 lbs	1.9	0.0	78.9	21.1
Lite-Heavy Truck 10,001-14,000 lbs	0.6	0.0	66.7	33.3
Med-Heavy Truck 14,001-33,000 lbs	1.0	0.0	20.0	80.0
Heavy-Heavy Truck 33,001-60,000 lbs	0.7	0.0	0.0	100.0
Other Bus	0.1	0.0	0.0	100.0
Urban Bus	0.1	0.0	0.0	100.0
Motorcycle	2.5	32.0	68.0	0.0
School Bus	0.1	0.0	0.0	100.0
Motor Home	1.4	0.0	92.9	7.1

Travel Conditions

	Residential			Commercial		
	Home-Work	Home-Shop	Home-Other	Commute	Non-Work	Customer
Urban Trip Length (miles)	12.7	7.0	9.5	10.0	10.0	10.0
Rural Trip Length (miles)	17.6	12.1	14.9	15.4	9.6	12.6
Trip speeds (mph)	30.0	30.0	30.0	30.0	30.0	30.0
% of Trips - Residential	32.9	18.0	49.1			
% of Trips - Commercial (by land use)						
Regional VMT				2.0	1.0	97.0

Operational Changes to Defaults

Commercial-based commute urban trip length changed from 13.3 miles to 10 miles

Commercial-based non-work urban trip length changed from 7.4 miles to 10 miles

Commercial-based customer urban trip length changed from 8.9 miles to 10 miles

Appendix D: Capital Cost Analysis

M A I N W O R K S H E E T - B U I L D A L T E R N A T I V E

(Rev.11, May 2, 2008)

PEROW/WSAB CORRIDOR AA

Today's Date **3/16/12**

Yr of Base Year $ 2010

TSM LA Total

Yr of Revenue Ops 2010

	Quantity	Base Year Dollars w/o Contingency (X000)	Base Year Dollars Allocated Contingency (X000)	Base Year Dollars TOTAL (X000)	Base Year Dollars Unit Cost (X000)	Base Year Dollars Percentage of Construction Cost	Base Year Dollars Percentage of Total Project Cost	YOE Dollars Total (X000)
10 GUIDEWAY & TRACK ELEMENTS (route miles)	**0.00**	0	0	**0**		**0%**	**0%**	**0**
10.01 Guideway: At-grade exclusive right-of-way	0.00	0.00	0	0				#DIV/0!
10.02 Guideway: At-grade semi-exclusive (allows cross-traffic)	0.00	0.00	0	0				#DIV/0!
10.03 Guideway: At-grade in mixed traffic	0.00	0.00	0	0				#DIV/0!
10.04 Guideway: Aerial structure	0.00	0.00	0	0				#DIV/0!
10.05 Guideway: Built-up fill	0.00	0.00	0	0				#DIV/0!
10.06 Guideway: Underground cut & cover	0.00	0.00	0	0				#DIV/0!
10.07 Guideway: Underground tunnel	0.00	0.00	0	0				#DIV/0!
10.08 Guideway: Retained cut or fill	0.00	0.00	0	0				#DIV/0!
10.09 Track: Direct fixation		0	0	0				#DIV/0!
10.10 Track: Embedded		0	0	0				#DIV/0!
10.11 Track: Ballasted		0	0	0				#DIV/0!
10.12 Track: Special (switches, turnouts)		0	0	0				#DIV/0!
10.13 Track: Vibration and noise dampening		0	0	0				#DIV/0!
20 STATIONS, STOPS, TERMINALS, INTERMODAL (number)	**0**	0	0	**0**		**0%**	**0%**	**0**
20.01 At-grade station, stop, shelter, mall, terminal, platform	0	0	0	0				#DIV/0!
20.02 Aerial station, stop, shelter, mall, terminal, platform	0	0	0	0				#DIV/0!
20.03 Underground station, stop, shelter, mall, terminal, platform	0	0	0	0				#DIV/0!
20.04 Other stations, landings, terminals: Intermodal, ferry, trolley, etc.	0	0	0	0				#DIV/0!
20.05 Joint development		0	0	0				#DIV/0!
20.06 Automobile parking multi-story structure		0	0	0				#DIV/0!
20.07 Elevators, escalators		0	0	0				#DIV/0!
30 SUPPORT FACILITIES: YARDS, SHOPS, ADMIN. BLDGS	0.00	0	0	**0**		**0%**	**0%**	**0**
30.01 Administration Building: Office, sales, storage, revenue counting				0				#DIV/0!
30.02 Light Maintenance Facility				0				#DIV/0!
30.03 Heavy Maintenance Facility		0	0	0				#DIV/0!
30.04 Storage or Maintenance of Way Building				0				#DIV/0!
30.05 Yard and Yard Track				0				#DIV/0!
40 SITEWORK & SPECIAL CONDITIONS	0.00	11,540	3,462	**15,002**		**100%**	**56%**	**0**
40.01 Demolition, Clearing, Earthwork		0	0	0				0
40.02 Site Utilities, Utility Relocation		0	0	0				0
40.03 Haz. mat'l, contam'd soil removal/mitigation, ground water treatments		0	0	0				0
40.04 Environmental mitigation, e.g. wetlands, historic/archeologic, parks		0	0	0				0
40.05 Site structures including retaining walls, sound walls		0	0	0				0
40.06 Pedestrian / bike access and accommodation, landscaping		0	0	0				0
40.07 Automobile, bus, van accessways including roads, parking lots		11,540	3,462	15,002				0
40.08 Temporary Facilities and other indirect costs during construction				0				0
50 SYSTEMS	0.00	0	0	**0**		**0%**	**0%**	**0**
50.01 Train control and signals		0	0	0				#DIV/0!
50.02 Traffic signals and crossing protection		0	0	0				#DIV/0!
50.03 Traction power supply: substations		0	0	0				#DIV/0!
50.04 Traction power distribution: catenary and third rail		0	0	0				#DIV/0!
50.05 Communications		0	0	0				#DIV/0!
50.06 Fare collection system and equipment		0	0	0				#DIV/0!
50.07 Central Control		0	0	0				#DIV/0!
Construction Subtotal (10 - 50)	0.00	11,540	3,462	**15,002**		**100%**	**56%**	**0**
60 ROW, LAND, EXISTING IMPROVEMENTS	0.00	0	0	**0**			**0%**	**0**
60.01 Purchase or lease of real estate		0	0	0				#DIV/0!
60.02 Relocation of existing households and businesses				0				#DIV/0!
70 VEHICLES (number)	**20**	9,000	450	**9,450**	**$ 473**		**35%**	**0**
70.01 Light Rail	0	0	0	0				0
70.02 Heavy Rail	0	0	0	0				0
70.03 Commuter Rail	0	0	0	0				0
70.04 Bus	20	9,000	450	9,450	$ 473			0
70.05 Other				0				0
70.06 Non-revenue vehicles				0				0
70.07 Spare parts				0				0
80 PROFESSIONAL SERVICES (applies to Cats. 10-50)	0.00	0	0	**0**		**0%**	**0%**	**0**
80.01 Preliminary Engineering				0				#DIV/0!
80.02 Final Design				0				#DIV/0!
80.03 Project Management for Design and Construction				0				#DIV/0!
80.04 Construction Administration & Management				0				#DIV/0!
80.05 Professional Liability and other Non-Construction Insurance				0				#DIV/0!
80.06 Legal; Permits; Review Fees by other agencies, cities, etc.				0				#DIV/0!
80.07 Surveys, Testing, Investigation, Inspection				0				#DIV/0!
80.08 Start up				0				#DIV/0!
Subtotal (10 - 80)	0.00	20,540	3,912	**24,452**			**91%**	**0**
90 UNALLOCATED CONTINGENCY				**2,445**			**9%**	**0**
Subtotal (10 - 90)	0.00			**26,897**			**100%**	**0**
100 FINANCE CHARGES				**0**			**0%**	**0**
Total Project Cost (10 - 100)	0.00			**26,897**			**100%**	**0**
Allocated Contingency as % of Base Yr Dollars w/o Contingency				19.05%				
Unallocated Contingency as % of Base Yr Dollars w/o Contingency				11.90%				
Total Contingency as % of Base Yr Dollars w/o Contingency				30.95%				
Unallocated Contingency as % of Subtotal (10 - 80)				10.00%				
YOE Construction Cost per Mile (X000)								#DIV/0!
YOE Total Project Cost per Mile Not Including Vehicles (X000)								#DIV/0!
YOE Total Project Cost per Mile (X000)								#DIV/0!

MAIN WORKSHEET - BUILD ALTERNATIVE

(Rev.11, May 2, 2008)

PEROW/WSAB CORRIDOR AA

Today's Date **3/16/12**

Yr of Base Year $ 2010

TSM Orange

Yr of Revenue Ops 2010

	Quantity	Base Year Dollars w/o Contingency (X000)	Base Year Dollars Allocated Contingency (X000)	Base Year Dollars TOTAL (X000)	Base Year Dollars Unit Cost (X000)	Base Year Dollars Percentage of Construction Cost	Base Year Dollars Percentage of Total Project Cost	YOE Dollars Total (X000)
10 GUIDEWAY & TRACK ELEMENTS (route miles)	**0.00**	0	0	**0**		**0%**	**0%**	**0**
10.01 Guideway: At-grade exclusive right-of-way	0.00	0.00	0	0				#DIV/0!
10.02 Guideway: At-grade semi-exclusive (allows cross-traffic)	0.00	0.00	0	0				#DIV/0!
10.03 Guideway: At-grade in mixed traffic	0.00	0.00	0	0				#DIV/0!
10.04 Guideway: Aerial structure	0.00	0.00	0	0				#DIV/0!
10.05 Guideway: Built-up fill	0.00	0.00	0	0				#DIV/0!
10.06 Guideway: Underground cut & cover	0.00	0.00	0	0				#DIV/0!
10.07 Guideway: Underground tunnel	0.00	0.00	0	0				#DIV/0!
10.08 Guideway: Retained cut or fill	0.00	0.00	0	0				#DIV/0!
10.09 Track: Direct fixation		0	0	0				#DIV/0!
10.10 Track: Embedded		0	0	0				#DIV/0!
10.11 Track: Ballasted		0	0	0				#DIV/0!
10.12 Track: Special (switches, turnouts)		0	0	0				#DIV/0!
10.13 Track: Vibration and noise dampening		0	0	0				#DIV/0!
20 STATIONS, STOPS, TERMINALS, INTERMODAL (number)	**0**	0	0	**0**		**0%**	**0%**	**0**
20.01 At-grade station, stop, shelter, mall, terminal, platform	0	0	0	0				#DIV/0!
20.02 Aerial station, stop, shelter, mall, terminal, platform	0	0	0	0				#DIV/0!
20.03 Underground station, stop, shelter, mall, terminal, platform	0	0	0	0				#DIV/0!
20.04 Other stations, landings, terminals: Intermodal, ferry, trolley, etc.	0	0	0	0				#DIV/0!
20.05 Joint development		0	0	0				#DIV/0!
20.06 Automobile parking multi-story structure		0	0	0				#DIV/0!
20.07 Elevators, escalators		0	0	0				#DIV/0!
30 SUPPORT FACILITIES: YARDS, SHOPS, ADMIN. BLDGS	0.00	0	0	**0**		**0%**	**0%**	**0**
30.01 Administration Building: Office, sales, storage, revenue counting				0				#DIV/0!
30.02 Light Maintenance Facility				0				#DIV/0!
30.03 Heavy Maintenance Facility		0	0	0				#DIV/0!
30.04 Storage or Maintenance of Way Building				0				#DIV/0!
30.05 Yard and Yard Track				0				#DIV/0!
40 SITEWORK & SPECIAL CONDITIONS	0.00	119,730	35,919	**155,649**		**100%**	**70%**	**0**
40.01 Demolition, Clearing, Earthwork		0	0	0				0
40.02 Site Utilities, Utility Relocation		0	0	0				0
40.03 Haz. mat'l, contam'd soil removal/mitigation, ground water treatments		0	0	0				0
40.04 Environmental mitigation, e.g. wetlands, historic/archeologic, parks		0	0	0				0
40.05 Site structures including retaining walls, sound walls		0	0	0				0
40.06 Pedestrian / bike access and accommodation, landscaping		0	0	0				0
40.07 Automobile, bus, van accessways including roads, parking lots		119,730	35,919	155,649				0
40.08 Temporary Facilities and other indirect costs during construction				0				0
50 SYSTEMS	0.00	0	0	**0**		**0%**	**0%**	**0**
50.01 Train control and signals		0	0	0				#DIV/0!
50.02 Traffic signals and crossing protection		0	0	0				#DIV/0!
50.03 Traction power supply: substations		0	0	0				#DIV/0!
50.04 Traction power distribution: catenary and third rail		0	0	0				#DIV/0!
50.05 Communications		0	0	0				#DIV/0!
50.06 Fare collection system and equipment		0	0	0				#DIV/0!
50.07 Central Control		0	0	0				#DIV/0!
Construction Subtotal (10 - 50)	0.00	119,730	35,919	**155,649**		**100%**	**70%**	**0**
60 ROW, LAND, EXISTING IMPROVEMENTS	0.00	0	0	**0**			**0%**	**0**
60.01 Purchase or lease of real estate		0	0	0				#DIV/0!
60.02 Relocation of existing households and businesses				0				#DIV/0!
70 VEHICLES (number)	**98**	44,100	2,205	**46,305**	$ 473		**21%**	**0**
70.01 Light Rail	0	0	0	0				0
70.02 Heavy Rail	0	0	0	0				0
70.03 Commuter Rail	0	0	0	0				0
70.04 Bus	98	44,100	2,205	46,305	$ 473			0
70.05 Other				0				0
70.06 Non-revenue vehicles				0				0
70.07 Spare parts				0				0
80 PROFESSIONAL SERVICES (applies to Cats. 10-50)	0.00	0	0	**0**		**0%**	**0%**	**0**
80.01 Preliminary Engineering				0				#DIV/0!
80.02 Final Design				0				#DIV/0!
80.03 Project Management for Design and Construction				0				#DIV/0!
80.04 Construction Administration & Management				0				#DIV/0!
80.05 Professional Liability and other Non-Construction Insurance				0				#DIV/0!
80.06 Legal; Permits; Review Fees by other agencies, cities, etc.				0				#DIV/0!
80.07 Surveys, Testing, Investigation, Inspection				0				#DIV/0!
80.08 Start up				0				#DIV/0!
Subtotal (10 - 80)	0.00	163,830	38,124	**201,954**			**91%**	**0**
90 UNALLOCATED CONTINGENCY				**20,195**			**9%**	**0**
Subtotal (10 - 90)	0.00			**222,149**			**100%**	**0**
100 FINANCE CHARGES				**0**			**0%**	**0**
Total Project Cost (10 - 100)	0.00			**222,149**			**100%**	**0**
Allocated Contingency as % of Base Yr Dollars w/o Contingency				23.27%				
Unallocated Contingency as % of Base Yr Dollars w/o Contingency				12.33%				
Total Contingency as % of Base Yr Dollars w/o Contingency				35.60%				
Unallocated Contingency as % of Subtotal (10 - 80)				10.00%				
YOE Construction Cost per Mile (X000)								#DIV/0!
YOE Total Project Cost per Mile Not Including Vehicles (X000)								#DIV/0!
YOE Total Project Cost per Mile (X000)								#DIV/0!

MAIN WORKSHEET - BUILD ALTERNATIVE

(Rev.11, May 2, 2008)

PEROW/WSAB CORRIDOR AA

BRT Alternative

Segment 1 Street Running

Today's Date **3/16/12**

Yr of Base Year $ 2010

Yr of Revenue Ops 2010

	Quantity	Base Year Dollars w/o Contingency (X000)	Base Year Dollars Allocated Contingency (X000)	Base Year Dollars TOTAL (X000)	Base Year Dollars Unit Cost (X000)	Base Year Dollars Percentage of Construction Cost	Base Year Dollars Percentage of Total Project Cost	YOE Dollars Total (X000)
10 GUIDEWAY & TRACK ELEMENTS (route miles)	**0.00**	0	0	**0**		**0%**	**0%**	**0**
10.01 Guideway: At-grade exclusive right-of-way	0.00	0.00	0	0				#DIV/0!
10.02 Guideway: At-grade semi-exclusive (allows cross-traffic)	0.00	0.00	0	0				#DIV/0!
10.03 Guideway: At-grade in mixed traffic	0.00	0.00	0	0				#DIV/0!
10.04 Guideway: Aerial structure	0.00	0.00	0	0				#DIV/0!
10.05 Guideway: Built-up fill	0.00	0.00	0	0				#DIV/0!
10.06 Guideway: Underground cut & cover	0.00	0.00	0	0				#DIV/0!
10.07 Guideway: Underground tunnel	0.00	0.00	0	0				#DIV/0!
10.08 Guideway: Retained cut or fill	0.00	0.00	0	0				#DIV/0!
10.09 Track: Direct fixation		0	0	0				#DIV/0!
10.10 Track: Embedded		0	0	0				#DIV/0!
10.11 Track: Ballasted		0	0	0				#DIV/0!
10.12 Track: Special (switches, turnouts)		0	0	0				#DIV/0!
10.13 Track: Vibration and noise dampening		0	0	0				#DIV/0!
20 STATIONS, STOPS, TERMINALS, INTERMODAL (number)	**0**	0	0	**0**		**0%**	**0%**	**0**
20.01 At-grade station, stop, shelter, mall, terminal, platform	0	0	0	0				#DIV/0!
20.02 Aerial station, stop, shelter, mall, terminal, platform	0	0	0	0				#DIV/0!
20.03 Underground station, stop, shelter, mall, terminal, platform	0	0	0	0				#DIV/0!
20.04 Other stations, landings, terminals: Intermodal, ferry, trolley, etc.	0	0	0	0				#DIV/0!
20.05 Joint development		0	0	0				#DIV/0!
20.06 Automobile parking multi-story structure		0	0	0				#DIV/0!
20.07 Elevators, escalators		0	0	0				#DIV/0!
30 SUPPORT FACILITIES: YARDS, SHOPS, ADMIN. BLDGS	0.00	160,000	24,000	**184,000**		**99%**	**67%**	**0**
30.01 Administration Building: Office, sales, storage, revenue counting				0				0
30.02 Light Maintenance Facility				0				0
30.03 Heavy Maintenance Facility		160,000	24,000	184,000				0
30.04 Storage or Maintenance of Way Building				0				0
30.05 Yard and Yard Track				0				0
40 SITEWORK & SPECIAL CONDITIONS	0.00	1,917	575	**2,492**		**1%**	**1%**	**0**
40.01 Demolition, Clearing, Earthwork		0	0	0				0
40.02 Site Utilities, Utility Relocation		0	0	0				0
40.03 Haz. mat'l, contam'd soil removal/mitigation, ground water treatments		0	0	0				0
40.04 Environmental mitigation, e.g. wetlands, historic/archeologic, parks		0	0	0				0
40.05 Site structures including retaining walls, sound walls		0	0	0				0
40.06 Pedestrian / bike access and accommodation, landscaping		0	0	0				0
40.07 Automobile, bus, van accessways including roads, parking lots		1,917	575	2,492				0
40.08 Temporary Facilities and other indirect costs during construction				0				0
50 SYSTEMS	0.00	0	0	**0**		**0%**	**0%**	**0**
50.01 Train control and signals		0	0	0				#DIV/0!
50.02 Traffic signals and crossing protection		0	0	0				#DIV/0!
50.03 Traction power supply: substations		0	0	0				#DIV/0!
50.04 Traction power distribution: catenary and third rail		0	0	0				#DIV/0!
50.05 Communications		0	0	0				#DIV/0!
50.06 Fare collection system and equipment		0	0	0				#DIV/0!
50.07 Central Control		0	0	0				#DIV/0!
Construction Subtotal (10 - 50)	0.00	161,917	24,575	**186,492**		**100%**	**68%**	**0**
60 ROW, LAND, EXISTING IMPROVEMENTS	0.00	0	0	**0**			**0%**	**0**
60.01 Purchase or lease of real estate		0	0	0				#DIV/0!
60.02 Relocation of existing households and businesses				0				#DIV/0!
70 VEHICLES (number)	**19**	8,550	428	**8,978**	**$ 473**		**3%**	**0**
70.01 Light Rail	0	0	0	0				0
70.02 Heavy Rail	0	0	0	0				0
70.03 Commuter Rail	0	0	0	0				0
70.04 Bus	19	8,550	428	8,978	$ 473			0
70.05 Other				0				0
70.06 Non-revenue vehicles				0				0
70.07 Spare parts				0				0
80 PROFESSIONAL SERVICES (applies to Cats. 10-50)	0.00	48,575	6,784	**55,359**		**30%**	**20%**	**0**
80.01 Preliminary Engineering		4,858	729	5,586				0
80.02 Final Design		11,334	1,700	13,034				0
80.03 Project Management for Design and Construction		16,192	2,429	18,620				0
80.04 Construction Administration & Management		8,096	1,214	9,310				0
80.05 Professional Liability and other Non-Construction Insurance				0				0
80.06 Legal; Permits; Review Fees by other agencies, cities, etc.		1,619	178	1,797				0
80.07 Surveys, Testing, Investigation, Inspection		3,238	486	3,724				0
80.08 Start up		3,238	49	3,287				0
Subtotal (10 - 80)	0.00	219,042	31,787	**250,829**			**91%**	**0**
90 UNALLOCATED CONTINGENCY				**25,083**			**9%**	**0**
Subtotal (10 - 90)	0.00			**275,912**			**100%**	**0**
100 FINANCE CHARGES				**0**			**0%**	**0**
Total Project Cost (10 - 100)	0.00			**275,912**			**100%**	**0**
Allocated Contingency as % of Base Yr Dollars w/o Contingency				14.51%				
Unallocated Contingency as % of Base Yr Dollars w/o Contingency				11.45%				
Total Contingency as % of Base Yr Dollars w/o Contingency				25.96%				
Unallocated Contingency as % of Subtotal (10 - 80)				10.00%				
YOE Construction Cost per Mile (X000)								#DIV/0!
YOE Total Project Cost per Mile Not Including Vehicles (X000)								#DIV/0!
YOE Total Project Cost per Mile (X000)								#DIV/0!

MAIN WORKSHEET-BUILD ALTERNATIVE

(Rev.11, May 2, 2008)

PEROW/WSAB CORRIDOR AA

BRT Alternative

Segment 1 HOV

Today's Date **3/16/12**

Yr of Base Year $ 2010

Yr of Revenue Ops 2010

	Quantity	Base Year Dollars w/o Contingency (X000)	Base Year Dollars Allocated Contingency (X000)	Base Year Dollars TOTAL (X000)	Base Year Dollars Unit Cost (X000)	Base Year Dollars Percentage of Construction Cost	Base Year Dollars Percentage of Total Project Cost	YOE Dollars Total (X000)
10 GUIDEWAY & TRACK ELEMENTS (route miles)	**0.00**	0	0	**0**		**0%**	**0%**	**0**
10.01 Guideway: At-grade exclusive right-of-way	0.00	0.00	0	0				#DIV/0!
10.02 Guideway: At-grade semi-exclusive (allows cross-traffic)	0.00	0.00	0	0				#DIV/0!
10.03 Guideway: At-grade in mixed traffic	0.00	0.00	0	0				#DIV/0!
10.04 Guideway: Aerial structure	0.00	0.00	0	0				#DIV/0!
10.05 Guideway: Built-up fill	0.00	0.00	0	0				#DIV/0!
10.06 Guideway: Underground cut & cover	0.00	0.00	0	0				#DIV/0!
10.07 Guideway: Underground tunnel	0.00	0.00	0	0				#DIV/0!
10.08 Guideway: Retained cut or fill	0.00	0.00	0	0				#DIV/0!
10.09 Track: Direct fixation		0	0	0				#DIV/0!
10.10 Track: Embedded		0	0	0				#DIV/0!
10.11 Track: Ballasted		0	0	0				#DIV/0!
10.12 Track: Special (switches, turnouts)		0	0	0				#DIV/0!
10.13 Track: Vibration and noise dampening		0	0	0				#DIV/0!
20 STATIONS, STOPS, TERMINALS, INTERMODAL (number)	**0**	0	0	**0**		**0%**	**0%**	**0**
20.01 At-grade station, stop, shelter, mall, terminal, platform	0	0	0	0				#DIV/0!
20.02 Aerial station, stop, shelter, mall, terminal, platform	0	0	0	0				#DIV/0!
20.03 Underground station, stop, shelter, mall, terminal, platform	0	0	0	0				#DIV/0!
20.04 Other stations, landings, terminals: Intermodal, ferry, trolley, etc.	0	0	0	0				#DIV/0!
20.05 Joint development		0	0	0				#DIV/0!
20.06 Automobile parking multi-story structure		0	0	0				#DIV/0!
20.07 Elevators, escalators		0	0	0				#DIV/0!
30 SUPPORT FACILITIES: YARDS, SHOPS, ADMIN. BLDGS	0.00	160,000	24,000	**184,000**		**100%**	**65%**	**0**
30.01 Administration Building: Office, sales, storage, revenue counting				0				0
30.02 Light Maintenance Facility				0				0
30.03 Heavy Maintenance Facility		160,000	24,000	184,000				0
30.04 Storage or Maintenance of Way Building				0				0
30.05 Yard and Yard Track				0				0
40 SITEWORK & SPECIAL CONDITIONS	0.00	0	0	**0**		**0%**	**0%**	**0**
40.01 Demolition, Clearing, Earthwork		0	0	0				#DIV/0!
40.02 Site Utilities, Utility Relocation		0	0	0				#DIV/0!
40.03 Haz. mat'l, contam'd soil removal/mitigation, ground water treatments		0	0	0				#DIV/0!
40.04 Environmental mitigation, e.g. wetlands, historic/archeologic, parks		0	0	0				#DIV/0!
40.05 Site structures including retaining walls, sound walls		0	0	0				#DIV/0!
40.06 Pedestrian / bike access and accommodation, landscaping		0	0	0				#DIV/0!
40.07 Automobile, bus, van accessways including roads, parking lots				0				#DIV/0!
40.08 Temporary Facilities and other indirect costs during construction				0				#DIV/0!
50 SYSTEMS	0.00	0	0	**0**		**0%**	**0%**	**0**
50.01 Train control and signals		0	0	0				#DIV/0!
50.02 Traffic signals and crossing protection		0	0	0				#DIV/0!
50.03 Traction power supply: substations		0	0	0				#DIV/0!
50.04 Traction power distribution: catenary and third rail		0	0	0				#DIV/0!
50.05 Communications		0	0	0				#DIV/0!
50.06 Fare collection system and equipment		0	0	0				#DIV/0!
50.07 Central Control		0	0	0				#DIV/0!
Construction Subtotal (10 - 50)	0.00	160,000	24,000	**184,000**		**100%**	**65%**	**0**
60 ROW, LAND, EXISTING IMPROVEMENTS	0.00	0	0	**0**			**0%**	**0**
60.01 Purchase or lease of real estate		0	0	0				#DIV/0!
60.02 Relocation of existing households and businesses				0				#DIV/0!
70 VEHICLES (number)	**38**	17,100	855	**17,955**	$ 473		**6%**	**0**
70.01 Light Rail	0	0	0	0				0
70.02 Heavy Rail	0	0	0	0				0
70.03 Commuter Rail	0	0	0	0				0
70.04 Bus	38	17,100	855	17,955	$ 473			0
70.05 Other				0				0
70.06 Non-revenue vehicles				0				0
70.07 Spare parts				0				0
80 PROFESSIONAL SERVICES (applies to Cats. 10-50)	0.00	48,000	6,704	**54,704**		**30%**	**19%**	**0**
80.01 Preliminary Engineering		4,800	720	5,520				0
80.02 Final Design		11,200	1,680	12,880				0
80.03 Project Management for Design and Construction		16,000	2,400	18,400				0
80.04 Construction Administration & Management		8,000	1,200	9,200				0
80.05 Professional Liability and other Non-Construction Insurance				0				0
80.06 Legal; Permits; Review Fees by other agencies, cities, etc.		1,600	176	1,776				0
80.07 Surveys, Testing, Investigation, Inspection		3,200	480	3,680				0
80.08 Start up		3,200	48	3,248				0
Subtotal (10 - 80)	0.00	225,100	31,559	**256,659**			**91%**	**0**
90 UNALLOCATED CONTINGENCY				**25,666**			**9%**	**0**
Subtotal (10 - 90)	0.00			**282,325**			**100%**	**0**
100 FINANCE CHARGES				**0**			**0%**	**0**
Total Project Cost (10 - 100)	0.00			**282,325**			**100%**	**0**
Allocated Contingency as % of Base Yr Dollars w/o Contingency				14.02%				
Unallocated Contingency as % of Base Yr Dollars w/o Contingency				11.40%				
Total Contingency as % of Base Yr Dollars w/o Contingency				25.42%				
Unallocated Contingency as % of Subtotal (10 - 80)				10.00%				
YOE Construction Cost per Mile (X000)								#DIV/0!
YOE Total Project Cost per Mile Not Including Vehicles (X000)								#DIV/0!
YOE Total Project Cost per Mile (X000)								#DIV/0!

M A I N W O R K S H E E T - B U I L D A L T E R N A T I V E

(Rev.11, May 2, 2008)

PEROW/WSAB CORRIDOR AA — Today's Date **3/16/12**

BRT Alternative — Yr of Base Year $ 2010

Segment 2 Los Angeles County Portion — Yr of Revenue Ops 2010

	Quantity	Base Year Dollars w/o Contingency (X000)	Base Year Dollars Allocated Contingency (X000)	Base Year Dollars TOTAL (X000)	Base Year Dollars Unit Cost (X000)	Base Year Dollars Percentage of Construction Cost	Base Year Dollars Percentage of Total Project Cost	YOE Dollars Total (X000)
10 GUIDEWAY & TRACK ELEMENTS (route miles)	**5.90**	35,472	8,868	**44,340**	**$ 7,515**	**32%**	**23%**	**0**
10.01 Guideway: At-grade exclusive right-of-way	5.56	16871.71	4,218	21,090	$ 3,796			0
10.02 Guideway: At-grade semi-exclusive (allows cross-traffic)	0.00	0.00	0	0				0
10.03 Guideway: At-grade in mixed traffic	0.00	0.00	0	0				0
10.04 Guideway: Aerial structure	0.34	18600.00	4,650	23,250	$ 67,636			0
10.05 Guideway: Built-up fill	0.00	0.00	0	0				0
10.06 Guideway: Underground cut & cover	0.00	0.00	0	0				0
10.07 Guideway: Underground tunnel	0.00	0.00	0	0				0
10.08 Guideway: Retained cut or fill	0.00	0.00	0	0				0
10.09 Track: Direct fixation		0	0	0				0
10.10 Track: Embedded		0	0	0				0
10.11 Track: Ballasted		0	0	0				0
10.12 Track: Special (switches, turnouts)		0	0	0				0
10.13 Track: Vibration and noise dampening		0	0	0				0
20 STATIONS, STOPS, TERMINALS, INTERMODAL (number)	**5**	9,585	2,396	**11,981**	**$ 2,396**	**9%**	**6%**	**0**
20.01 At-grade station, stop, shelter, mall, terminal, platform	5	9585	2,396	11,981	$ 2,396			0
20.02 Aerial station, stop, shelter, mall, terminal, platform	0	0	0	0				0
20.03 Underground station, stop, shelter, mall, terminal, platform	0	0	0	0				0
20.04 Other stations, landings, terminals: Intermodal, ferry, trolley, etc.	0	0	0	0				0
20.05 Joint development		0	0	0				0
20.06 Automobile parking multi-story structure		0	0	0				0
20.07 Elevators, escalators		0	0	0				0
30 SUPPORT FACILITIES: YARDS, SHOPS, ADMIN. BLDGS	5.90	0	0	**0**	**$ -**	**0%**	**0%**	**0**
30.01 Administration Building: Office, sales, storage, revenue counting				0				#DIV/0!
30.02 Light Maintenance Facility				0				#DIV/0!
30.03 Heavy Maintenance Facility		0	0	0				#DIV/0!
30.04 Storage or Maintenance of Way Building				0				#DIV/0!
30.05 Yard and Yard Track				0				#DIV/0!
40 SITEWORK & SPECIAL CONDITIONS	5.90	23,100	6,930	**30,030**	**$ 5,090**	**22%**	**16%**	**0**
40.01 Demolition, Clearing, Earthwork		0	0	0				0
40.02 Site Utilities, Utility Relocation		8,000	2,400	10,400				0
40.03 Haz. mat'l, contam'd soil removal/mitigation, ground water treatments		0	0	0				0
40.04 Environmental mitigation, e.g. wetlands, historic/archeologic, parks		0	0	0				0
40.05 Site structures including retaining walls, sound walls		0	0	0				0
40.06 Pedestrian / bike access and accommodation, landscaping		15,100	4,530	19,630				0
40.07 Automobile, bus, van accessways including roads, parking lots				0				0
40.08 Temporary Facilities and other indirect costs during construction				0				0
50 SYSTEMS	5.90	41,000	12,300	**53,300**	**$ 9,034**	**38%**	**28%**	**0**
50.01 Train control and signals		0	0	0				0
50.02 Traffic signals and crossing protection		7,300	2,190	9,490				0
50.03 Traction power supply: substations		0	0	0				0
50.04 Traction power distribution: catenary and third rail		0	0	0				0
50.05 Communications		22,700	6,810	29,510				0
50.06 Fare collection system and equipment		11,000	3,300	14,300				0
50.07 Central Control		0	0	0				0
Construction Subtotal (10 - 50)	5.90	109,157	30,494	**139,651**	**$ 23,670**	**100%**	**73%**	**0**
60 ROW, LAND, EXISTING IMPROVEMENTS	5.90	0	0	**0**	**$ -**		**0%**	**0**
60.01 Purchase or lease of real estate		0	0	0				#DIV/0!
60.02 Relocation of existing households and businesses				0				#DIV/0!
70 VEHICLES (number)	**0**	0	0	**0**			**0%**	**0**
70.01 Light Rail	0	0	0	0				#DIV/0!
70.02 Heavy Rail	0	0	0	0				#DIV/0!
70.03 Commuter Rail	0	0	0	0				#DIV/0!
70.04 Bus	0	0	0	0				#DIV/0!
70.05 Other				0				#DIV/0!
70.06 Non-revenue vehicles				0				#DIV/0!
70.07 Spare parts				0				#DIV/0!
80 PROFESSIONAL SERVICES (applies to Cats. 10-50)	5.90	29,733	4,153	**33,886**	**$ 5,743**	**24%**	**18%**	**0**
80.01 Preliminary Engineering		2,973	446	3,419				0
80.02 Final Design		6,938	1,041	7,978				0
80.03 Project Management for Design and Construction		9,911	1,487	11,398				0
80.04 Construction Administration & Management		4,955	743	5,699				0
80.05 Professional Liability and other Non-Construction Insurance				0				0
80.06 Legal; Permits; Review Fees by other agencies, cities, etc.		991	109	1,100				0
80.07 Surveys, Testing, Investigation, Inspection		1,982	297	2,280				0
80.08 Start up		1,982	30	2,012				0
Subtotal (10 - 80)	5.90	138,890	34,647	**173,536**	**$ 29,413**		**91%**	**0**
90 UNALLOCATED CONTINGENCY				**17,354**			**9%**	**0**
Subtotal (10 - 90)	5.90			**190,890**	**$ 32,354**		**100%**	**0**
100 FINANCE CHARGES				**0**			**0%**	**0**
Total Project Cost (10 - 100)	5.90			**190,890**	**$ 32,354**		**100%**	**0**
Allocated Contingency as % of Base Yr Dollars w/o Contingency				24.95%				
Unallocated Contingency as % of Base Yr Dollars w/o Contingency				12.49%				
Total Contingency as % of Base Yr Dollars w/o Contingency				37.44%				
Unallocated Contingency as % of Subtotal (10 - 80)				10.00%				
YOE Construction Cost per Mile (X000)								$0
YOE Total Project Cost per Mile Not Including Vehicles (X000)								$0
YOE Total Project Cost per Mile (X000)								$0

MAIN WORKSHEET - BUILD ALTERNATIVE

(Rev.11, May 2, 2008)

PEROW/WSAB CORRIDOR AA

BRT Alternative

Segment 2 Orange County Portion

Today's Date **3/16/12**

Yr of Base Year $ 2010

Yr of Revenue Ops 2010

	Quantity	Base Year Dollars w/o Contingency (X000)	Base Year Dollars Allocated Contingency (X000)	Base Year Dollars TOTAL (X000)	Base Year Dollars Unit Cost (X000)	Base Year Dollars Percentage of Construction Cost	Base Year Dollars Percentage of Total Project Cost	YOE Dollars Total (X000)
10 GUIDEWAY & TRACK ELEMENTS (route miles)	**9.79**	116,252	20,854	**137,106**	**$ 14,002**	**50%**	**35%**	**0**
10.01 Guideway: At-grade exclusive right-of-way	8.84	29818.94	7,455	37,274	$ 4,217			0
10.02 Guideway: At-grade semi-exclusive (allows cross-traffic)	0.00	0.00	0	0				0
10.03 Guideway: At-grade in mixed traffic	0.00	0.00	0	0				0
10.04 Guideway: Aerial structure	0.95	51500.00	12,875	64,375	$ 67,507			0
10.05 Guideway: Built-up fill	0.00	0.00	0	0				0
10.06 Guideway: Underground cut & cover	0.00	0.00	0	0				0
10.07 Guideway: Underground tunnel	0.00	0.00	0	0				0
10.08 Guideway: Retained cut or fill	0.00	0.00	0	0				0
10.09 Track: Direct fixation		0	0	0				0
10.10 Track: Embedded		0	0	0				0
10.11 Track: Ballasted		27,433	412	27,845				0
10.12 Track: Special (switches, turnouts)		7,500	113	7,613				0
10.13 Track: Vibration and noise dampening		0	0	0				0
20 STATIONS, STOPS, TERMINALS, INTERMODAL (number)	**6**	11,502	2,876	**14,378**	**$ 2,396**	**5%**	**4%**	**0**
20.01 At-grade station, stop, shelter, mall, terminal, platform	6	11502	2,876	14,378	$ 2,396			0
20.02 Aerial station, stop, shelter, mall, terminal, platform	0	0	0	0				0
20.03 Underground station, stop, shelter, mall, terminal, platform	0	0	0	0				0
20.04 Other stations, landings, terminals: Intermodal, ferry, trolley, etc.	0	0	0	0				0
20.05 Joint development		0	0	0				0
20.06 Automobile parking multi-story structure		0	0	0				0
20.07 Elevators, escalators		0	0	0				0
30 SUPPORT FACILITIES: YARDS, SHOPS, ADMIN. BLDGS	9.79	0	0	**0**	**$ -**	**0%**	**0%**	**0**
30.01 Administration Building: Office, sales, storage, revenue counting				0				#DIV/0!
30.02 Light Maintenance Facility				0				#DIV/0!
30.03 Heavy Maintenance Facility		0	0	0				#DIV/0!
30.04 Storage or Maintenance of Way Building				0				#DIV/0!
30.05 Yard and Yard Track				0				#DIV/0!
40 SITEWORK & SPECIAL CONDITIONS	9.79	38,300	11,490	**49,790**	**$ 5,085**	**18%**	**13%**	**0**
40.01 Demolition, Clearing, Earthwork		0	0	0				0
40.02 Site Utilities, Utility Relocation		13,200	3,960	17,160				0
40.03 Haz. mat'l, contam'd soil removal/mitigation, ground water treatments		0	0	0				0
40.04 Environmental mitigation, e.g. wetlands, historic/archeologic, parks		0	0	0				0
40.05 Site structures including retaining walls, sound walls		0	0	0				0
40.06 Pedestrian / bike access and accommodation, landscaping		25,100	7,530	32,630				0
40.07 Automobile, bus, van accessways including roads, parking lots				0				0
40.08 Temporary Facilities and other indirect costs during construction				0				0
50 SYSTEMS	9.79	57,000	17,100	**74,100**	**$ 7,568**	**27%**	**19%**	**0**
50.01 Train control and signals		0	0	0				0
50.02 Traffic signals and crossing protection		6,100	1,830	7,930				0
50.03 Traction power supply: substations		0	0	0				0
50.04 Traction power distribution: catenary and third rail		0	0	0				0
50.05 Communications		37,700	11,310	49,010				0
50.06 Fare collection system and equipment		13,200	3,960	17,160				0
50.07 Central Control		0	0	0				0
Construction Subtotal (10 - 50)	9.79	223,054	52,319	**275,374**	**$ 28,123**	**100%**	**70%**	**0**
60 ROW, LAND, EXISTING IMPROVEMENTS	9.79	0	0	**0**	**$ -**		**0%**	**0**
60.01 Purchase or lease of real estate		0	0	0				#DIV/0!
60.02 Relocation of existing households and businesses				0				#DIV/0!
70 VEHICLES (number)	**0**	0	0	**0**			**0%**	**0**
70.01 Light Rail	0	0	0	0				#DIV/0!
70.02 Heavy Rail	0	0	0	0				#DIV/0!
70.03 Commuter Rail	0	0	0	0				#DIV/0!
70.04 Bus	0	0	0	0				#DIV/0!
70.05 Other				0				#DIV/0!
70.06 Non-revenue vehicles				0				#DIV/0!
70.07 Spare parts				0				#DIV/0!
80 PROFESSIONAL SERVICES (applies to Cats. 10-50)	9.79	71,341	9,964	**81,305**	**$ 8,304**	**30%**	**21%**	**0**
80.01 Preliminary Engineering		7,134	1,070	8,204				0
80.02 Final Design		16,646	2,497	19,143				0
80.03 Project Management for Design and Construction		23,780	3,567	27,348				0
80.04 Construction Administration & Management		11,890	1,784	13,674				0
80.05 Professional Liability and other Non-Construction Insurance				0				0
80.06 Legal; Permits; Review Fees by other agencies, cities, etc.		2,378	262	2,640				0
80.07 Surveys, Testing, Investigation, Inspection		4,756	713	5,470				0
80.08 Start up		4,756	71	4,827				0
Subtotal (10 - 80)	9.79	294,396	62,283	**356,679**	**$ 36,427**		**91%**	**0**
90 UNALLOCATED CONTINGENCY				**35,668**			**9%**	**0**
Subtotal (10 - 90)	9.79			**392,347**	**$ 40,069**		**100%**	**0**
100 FINANCE CHARGES				**0**			**0%**	**0**
Total Project Cost (10 - 100)	9.79			**392,347**	**$ 40,069**		**100%**	**0**
Allocated Contingency as % of Base Yr Dollars w/o Contingency				21.16%				
Unallocated Contingency as % of Base Yr Dollars w/o Contingency				12.12%				
Total Contingency as % of Base Yr Dollars w/o Contingency				33.27%				
Unallocated Contingency as % of Subtotal (10 - 80)				10.00%				
YOE Construction Cost per Mile (X000)								$0
YOE Total Project Cost per Mile Not Including Vehicles (X000)								$0
YOE Total Project Cost per Mile (X000)								$0

MAIN WORKSHEET - BUILD ALTERNATIVE

(Rev.11, May 2, 2008)

PEROW/WSAB Corridor AA

BRT Alternative

Segment 3 Option 1 (Harbor/1st/SARTC)

Today's Date **3/16/12**

Yr of Base Year $ 2010

Yr of Revenue Ops 2010

	Quantity	Base Year Dollars w/o Contingency (X000)	Base Year Dollars Allocated Contingency (X000)	Base Year Dollars TOTAL (X000)	Base Year Dollars Unit Cost (X000)	Base Year Dollars Percentage of Construction Cost	Base Year Dollars Percentage of Total Project Cost	YOE Dollars Total (X000)
10 GUIDEWAY & TRACK ELEMENTS (route miles)	**5.11**	48,559	12,140	**60,699**	**$ 11,870**	**39%**	**28%**	**0**
10.01 Guideway: At-grade exclusive right-of-way	4.47	13559.13	3,390	16,949	$ 3,796			0
10.02 Guideway: At-grade semi-exclusive (allows cross-traffic)	0.00	0.00	0	0				0
10.03 Guideway: At-grade in mixed traffic	0.00	0.00	0	0				0
10.04 Guideway: Aerial structure	0.65	35000.00	8,750	43,750	$ 67,495			0
10.05 Guideway: Built-up fill	0.00	0.00	0	0				0
10.06 Guideway: Underground cut & cover	0.00	0.00	0	0				0
10.07 Guideway: Underground tunnel	0.00	0.00	0	0				0
10.08 Guideway: Retained cut or fill	0.00	0.00	0	0				0
10.09 Track: Direct fixation		0	0	0				0
10.10 Track: Embedded		0	0	0				0
10.11 Track: Ballasted		0	0	0				0
10.12 Track: Special (switches, turnouts)		0	0	0				0
10.13 Track: Vibration and noise dampening		0	0	0				0
20 STATIONS, STOPS, TERMINALS, INTERMODAL (number)	**4**	29,434	7,359	**36,793**	**$ 9,198**	**24%**	**17%**	**0**
20.01 At-grade station, stop, shelter, mall, terminal, platform	2	3834	959	4,793	$ 2,396			0
20.02 Aerial station, stop, shelter, mall, terminal, platform	2	25600	6,400	32,000	$ 16,000			0
20.03 Underground station, stop, shelter, mall, terminal, platform	0	0	0	0				0
20.04 Other stations, landings, terminals: Intermodal, ferry, trolley, etc.	0	0	0	0				0
20.05 Joint development		0	0	0				0
20.06 Automobile parking multi-story structure		0	0	0				0
20.07 Elevators, escalators		0	0	0				0
30 SUPPORT FACILITIES: YARDS, SHOPS, ADMIN. BLDGS	5.11	0	0	**0**	**$ -**	**0%**	**0%**	**0**
30.01 Administration Building: Office, sales, storage, revenue counting				0				#DIV/0!
30.02 Light Maintenance Facility				0				#DIV/0!
30.03 Heavy Maintenance Facility		0	0	0				#DIV/0!
30.04 Storage or Maintenance of Way Building				0				#DIV/0!
30.05 Yard and Yard Track				0				#DIV/0!
40 SITEWORK & SPECIAL CONDITIONS	5.11	20,000	6,000	**26,000**	**$ 5,085**	**17%**	**12%**	**0**
40.01 Demolition, Clearing, Earthwork		0	0	0				0
40.02 Site Utilities, Utility Relocation		6,900	2,070	8,970				0
40.03 Haz. mat'l, contam'd soil removal/mitigation, ground water treatments		0	0	0				0
40.04 Environmental mitigation, e.g. wetlands, historic/archeologic, parks		0	0	0				0
40.05 Site structures including retaining walls, sound walls		0	0	0				0
40.06 Pedestrian / bike access and accommodation, landscaping		13,100	3,930	17,030				0
40.07 Automobile, bus, van accessways including roads, parking lots				0				0
40.08 Temporary Facilities and other indirect costs during construction				0				0
50 SYSTEMS	5.11	24,700	7,410	**32,110**	**$ 6,279**	**21%**	**15%**	**0**
50.01 Train control and signals		0	0	0				0
50.02 Traffic signals and crossing protection		2,300	690	2,990				0
50.03 Traction power supply: substations		0	0	0				0
50.04 Traction power distribution: catenary and third rail		0	0	0				0
50.05 Communications		11,400	3,420	14,820				0
50.06 Fare collection system and equipment		11,000	3,300	14,300				0
50.07 Central Control		0	0	0				0
Construction Subtotal (10 - 50)	5.11	122,693	32,908	**155,601**	**$ 30,429**	**100%**	**72%**	**0**
60 ROW, LAND, EXISTING IMPROVEMENTS	5.11	0	0	**0**	**$ -**		**0%**	**0**
60.01 Purchase or lease of real estate		0	0	0				#DIV/0!
60.02 Relocation of existing households and businesses				0				#DIV/0!
70 VEHICLES (number)	**0**	0	0	**0**			**0%**	**0**
70.01 Light Rail	0	0	0	0				#DIV/0!
70.02 Heavy Rail	0	0	0	0				#DIV/0!
70.03 Commuter Rail	0	0	0	0				#DIV/0!
70.04 Bus	0	0	0	0				#DIV/0!
70.05 Other				0				#DIV/0!
70.06 Non-revenue vehicles				0				#DIV/0!
70.07 Spare parts				0				#DIV/0!
80 PROFESSIONAL SERVICES (applies to Cats. 10-50)	5.11	35,791	4,999	**40,790**	**$ 7,977**	**26%**	**19%**	**0**
80.01 Preliminary Engineering		3,579	537	4,116				0
80.02 Final Design		8,351	1,253	9,604				0
80.03 Project Management for Design and Construction		11,930	1,790	13,720				0
80.04 Construction Administration & Management		5,965	895	6,860				0
80.05 Professional Liability and other Non-Construction Insurance				0				0
80.06 Legal; Permits; Review Fees by other agencies, cities, etc.		1,193	131	1,324				0
80.07 Surveys, Testing, Investigation, Inspection		2,386	358	2,744				0
80.08 Start up		2,386	36	2,422				0
Subtotal (10 - 80)	5.11	158,484	37,907	**196,391**	**$ 38,406**		**91%**	**0**
90 UNALLOCATED CONTINGENCY				**19,639**			**9%**	**0**
Subtotal (10 - 90)	5.11			**216,031**	**$ 42,247**		**100%**	**0**
100 FINANCE CHARGES				**0**			**0%**	**0**
Total Project Cost (10 - 100)	5.11			**216,031**	**$ 42,247**		**100%**	**0**
Allocated Contingency as % of Base Yr Dollars w/o Contingency				23.92%				
Unallocated Contingency as % of Base Yr Dollars w/o Contingency				12.39%				
Total Contingency as % of Base Yr Dollars w/o Contingency				36.31%				
Unallocated Contingency as % of Subtotal (10 - 80)				10.00%				
YOE Construction Cost per Mile (X000)								$0
YOE Total Project Cost per Mile Not Including Vehicles (X000)								$0
YOE Total Project Cost per Mile (X000)								$0

MAIN WORKSHEET - BUILD ALTERNATIVE

(Rev.11, May 2, 2008)

PEROW/WSAB Corridor AA

Street Car Alternative

East Bank Option 1

Today's Date **3/16/12**

Yr of Base Year $ 2010

Yr of Revenue Ops 2010

	Quantity	Base Year Dollars w/o Contingency (X000)	Base Year Dollars Allocated Contingency (X000)	Base Year Dollars TOTAL (X000)	Base Year Dollars Unit Cost (X000)	Base Year Dollars Percentage of Construction Cost	Base Year Dollars Percentage of Total Project Cost	YOE Dollars Total (X000)
10 GUIDEWAY & TRACK ELEMENTS (route miles)	**12.53**	194,637	39,138	**233,775**	**$ 18,653**	**35%**	**17%**	**0**
10.01 Guideway: At-grade exclusive right-of-way	9.48	25019.50	6,255	31,274	$ 3,300			0
10.02 Guideway: At-grade semi-exclusive (allows cross-traffic)	0.00	0.00	0	0				0
10.03 Guideway: At-grade in mixed traffic	0.00	0.00	0	0				0
10.04 Guideway: Aerial structure	3.06	129100.00	32,275	161,375	$ 52,812			0
10.05 Guideway: Built-up fill	0.00	0.00	0	0				0
10.06 Guideway: Underground cut & cover	0.00	0.00	0	0				0
10.07 Guideway: Underground tunnel	0.00	0.00	0	0				0
10.08 Guideway: Retained cut or fill	0.00	0.00	0	0				0
10.09 Track: Direct fixation		11,600	174	11,774				0
10.10 Track: Embedded		0	0	0				0
10.11 Track: Ballasted		23,018	345	23,363				0
10.12 Track: Special (switches, turnouts)		5,900	89	5,989				0
10.13 Track: Vibration and noise dampening		0	0	0				0
20 STATIONS, STOPS, TERMINALS, INTERMODAL (number)	**6**	6,000	1,500	**7,500**	**$ 1,250**	**1%**	**1%**	**0**
20.01 At-grade station, stop, shelter, mall, terminal, platform	6	6000	1,500	7,500	$ 1,250			0
20.02 Aerial station, stop, shelter, mall, terminal, platform	0	0	0	0				0
20.03 Underground station, stop, shelter, mall, terminal, platform	0	0	0	0				0
20.04 Other stations, landings, terminals: Intermodal, ferry, trolley, etc.	0	0	0	0				0
20.05 Joint development		0	0	0				0
20.06 Automobile parking multi-story structure		0	0	0				0
20.07 Elevators, escalators		0	0	0				0
30 SUPPORT FACILITIES: YARDS, SHOPS, ADMIN. BLDGS	12.53	160,000	24,000	**184,000**	**$ 14,682**	**27%**	**13%**	**0**
30.01 Administration Building: Office, sales, storage, revenue counting				0				0
30.02 Light Maintenance Facility				0				0
30.03 Heavy Maintenance Facility		160,000	24,000	184,000				0
30.04 Storage or Maintenance of Way Building				0				0
30.05 Yard and Yard Track				0				0
40 SITEWORK & SPECIAL CONDITIONS	12.53	49,000	14,700	**63,700**	**$ 5,083**	**9%**	**5%**	**0**
40.01 Demolition, Clearing, Earthwork		0	0	0				0
40.02 Site Utilities, Utility Relocation		16,900	5,070	21,970				0
40.03 Haz. mat'l, contam'd soil removal/mitigation, ground water treatments		0	0	0				0
40.04 Environmental mitigation, e.g. wetlands, historic/archeologic, parks		0	0	0				0
40.05 Site structures including retaining walls, sound walls		0	0	0				0
40.06 Pedestrian / bike access and accommodation, landscaping		32,100	9,630	41,730				0
40.07 Automobile, bus, van accessways including roads, parking lots				0				0
40.08 Temporary Facilities and other indirect costs during construction				0				0
50 SYSTEMS	12.53	141,200	42,360	**183,560**	**$ 14,646**	**27%**	**13%**	**0**
50.01 Train control and signals		38,100	11,430	49,530				0
50.02 Traffic signals and crossing protection		13,400	4,020	17,420				0
50.03 Traction power supply: substations		8,800	2,640	11,440				0
50.04 Traction power distribution: catenary and third rail		19,500	5,850	25,350				0
50.05 Communications		48,200	14,460	62,660				0
50.06 Fare collection system and equipment		13,200	3,960	17,160				0
50.07 Central Control		0	0	0				0
Construction Subtotal (10 - 50)	12.53	550,837	121,698	**672,535**	**$ 53,662**	**100%**	**48%**	**0**
60 ROW, LAND, EXISTING IMPROVEMENTS	12.53	0	0	**0**	**$ -**		**0%**	**0**
60.01 Purchase or lease of real estate		0	0	0				#DIV/0!
60.02 Relocation of existing households and businesses				0				#DIV/0!
70 VEHICLES (number)	**112**	392,000	19,600	**411,600**	**$ 3,675**		**29%**	**0**
70.01 Light Rail	112	392,000	19,600	411,600	$ 3,675			0
70.02 Heavy Rail	0	0	0	0				0
70.03 Commuter Rail	0	0	0	0				0
70.04 Bus	0	0	0	0				0
70.05 Other				0				0
70.06 Non-revenue vehicles				0				0
70.07 Spare parts				0				0
80 PROFESSIONAL SERVICES (applies to Cats. 10-50)	12.53	163,562	22,844	**186,406**	**$ 14,873**	**28%**	**13%**	**0**
80.01 Preliminary Engineering		16,356	2,453	18,810				0
80.02 Final Design		38,164	5,725	43,889				0
80.03 Project Management for Design and Construction		54,521	8,178	62,699				0
80.04 Construction Administration & Management		27,260	4,089	31,349				0
80.05 Professional Liability and other Non-Construction Insurance				0				0
80.06 Legal; Permits; Review Fees by other agencies, cities, etc.		5,452	600	6,052				0
80.07 Surveys, Testing, Investigation, Inspection		10,904	1,636	12,540				0
80.08 Start up		10,904	164	11,068				0
Subtotal (10 - 80)	12.53	1,106,399	164,142	**1,270,541**	**$ 101,378**		**91%**	**0**
90 UNALLOCATED CONTINGENCY				**127,054**			**9%**	**0**
Subtotal (10 - 90)	12.53			**1,397,595**	**$ 111,515**		**100%**	**0**
100 FINANCE CHARGES				**0**			**0%**	**0**
Total Project Cost (10 - 100)	12.53			**1,397,595**	**$ 111,515**		**100%**	**0**
Allocated Contingency as % of Base Yr Dollars w/o Contingency				14.84%				
Unallocated Contingency as % of Base Yr Dollars w/o Contingency				11.48%				
Total Contingency as % of Base Yr Dollars w/o Contingency				26.32%				
Unallocated Contingency as % of Subtotal (10 - 80)				10.00%				
YOE Construction Cost per Mile (X000)								$0
YOE Total Project Cost per Mile Not Including Vehicles (X000)								$0
YOE Total Project Cost per Mile (X000)								$0

MAIN WORKSHEET - BUILD ALTERNATIVE

(Rev.11, May 2, 2008)

PEROW/WSAB Corridor AA

Street Car Alternative

Segment 1 West Bank Option 1

Today's Date **3/16/12**

Yr of Base Year $ 2010

Yr of Revenue Ops 2010

	Quantity	Base Year Dollars w/o Contingency (X000)	Base Year Dollars Allocated Contingency (X000)	Base Year Dollars TOTAL (X000)	Base Year Dollars Unit Cost (X000)	Base Year Dollars Percentage of Construction Cost	Base Year Dollars Percentage of Total Project Cost	YOE Dollars Total (X000)
10 GUIDEWAY & TRACK ELEMENTS (route miles)	**12.52**	228,287	45,341	**273,629**	**$ 21,852**	**39%**	**19%**	**0**
10.01 Guideway: At-grade exclusive right-of-way	9.83	33170.49	8,293	41,463	$ 4,217			0
10.02 Guideway: At-grade semi-exclusive (allows cross-traffic)	0.00	0.00	0	0				0
10.03 Guideway: At-grade in mixed traffic	0.00	0.00	0	0				0
10.04 Guideway: Aerial structure	2.69	145200.00	36,300	181,500	$ 67,464			0
10.05 Guideway: Built-up fill	0.00	0.00	0	0				0
10.06 Guideway: Underground cut & cover	0.00	0.00	0	0				0
10.07 Guideway: Underground tunnel	0.00	0.00	0	0				0
10.08 Guideway: Retained cut or fill	0.00	0.00	0	0				0
10.09 Track: Direct fixation		13,100	197	13,297				0
10.10 Track: Embedded		0	0	0				0
10.11 Track: Ballasted		30,517	458	30,975				0
10.12 Track: Special (switches, turnouts)		6,300	95	6,395				0
10.13 Track: Vibration and noise dampening		0	0	0				0
20 STATIONS, STOPS, TERMINALS, INTERMODAL (number)	**5**	6,390	1,598	**7,988**	**$ 1,598**	**1%**	**1%**	**0**
20.01 At-grade station, stop, shelter, mall, terminal, platform	5	6390	1,598	7,988	$ 1,598			0
20.02 Aerial station, stop, shelter, mall, terminal, platform	0	0	0	0				0
20.03 Underground station, stop, shelter, mall, terminal, platform	0	0	0	0				0
20.04 Other stations, landings, terminals: Intermodal, ferry, trolley, etc.	0	0	0	0				0
20.05 Joint development		0	0	0				0
20.06 Automobile parking multi-story structure		0	0	0				0
20.07 Elevators, escalators		0	0	0				0
30 SUPPORT FACILITIES: YARDS, SHOPS, ADMIN. BLDGS	12.52	160,000	24,000	**184,000**	**$ 14,694**	**26%**	**13%**	**0**
30.01 Administration Building: Office, sales, storage, revenue counting				0				0
30.02 Light Maintenance Facility				0				0
30.03 Heavy Maintenance Facility		160,000	24,000	184,000				0
30.04 Storage or Maintenance of Way Building				0				0
30.05 Yard and Yard Track				0				0
40 SITEWORK & SPECIAL CONDITIONS	12.52	49,000	14,700	**63,700**	**$ 5,087**	**9%**	**4%**	**0**
40.01 Demolition, Clearing, Earthwork		0	0	0				0
40.02 Site Utilities, Utility Relocation		16,900	5,070	21,970				0
40.03 Haz. mat'l, contam'd soil removal/mitigation, ground water treatments		0	0	0				0
40.04 Environmental mitigation, e.g. wetlands, historic/archeologic, parks		0	0	0				0
40.05 Site structures including retaining walls, sound walls		0	0	0				0
40.06 Pedestrian / bike access and accommodation, landscaping		32,100	9,630	41,730				0
40.07 Automobile, bus, van accessways including roads, parking lots				0				0
40.08 Temporary Facilities and other indirect costs during construction				0				0
50 SYSTEMS	12.52	138,800	41,640	**180,440**	**$ 14,410**	**25%**	**13%**	**0**
50.01 Train control and signals		38,000	11,400	49,400				0
50.02 Traffic signals and crossing protection		13,400	4,020	17,420				0
50.03 Traction power supply: substations		8,800	2,640	11,440				0
50.04 Traction power distribution: catenary and third rail		19,400	5,820	25,220				0
50.05 Communications		48,200	14,460	62,660				0
50.06 Fare collection system and equipment		11,000	3,300	14,300				0
50.07 Central Control		0	0	0				0
Construction Subtotal (10 - 50)	12.52	582,477	127,279	**709,756**	**$ 56,682**	**100%**	**49%**	**0**
60 ROW, LAND, EXISTING IMPROVEMENTS	12.52	0	0	**0**	**$ -**		**0%**	**0**
60.01 Purchase or lease of real estate		0	0	0				#DIV/0!
60.02 Relocation of existing households and businesses				0				#DIV/0!
70 VEHICLES (number)	**108**	378,000	18,900	**396,900**	**$ 3,675**		**28%**	**0**
70.01 Light Rail	108	378,000	18,900	396,900	$ 3,675			0
70.02 Heavy Rail	0	0	0	0				0
70.03 Commuter Rail	0	0	0	0				0
70.04 Bus	0	0	0	0				0
70.05 Other				0				0
70.06 Non-revenue vehicles				0				0
70.07 Spare parts				0				0
80 PROFESSIONAL SERVICES (applies to Cats. 10-50)	12.52	172,742	24,126	**196,868**	**$ 15,722**	**28%**	**14%**	**0**
80.01 Preliminary Engineering		17,274	2,591	19,865				0
80.02 Final Design		40,306	6,046	46,352				0
80.03 Project Management for Design and Construction		57,581	8,637	66,218				0
80.04 Construction Administration & Management		28,790	4,319	33,109				0
80.05 Professional Liability and other Non-Construction Insurance				0				0
80.06 Legal; Permits; Review Fees by other agencies, cities, etc.		5,758	633	6,391				0
80.07 Surveys, Testing, Investigation, Inspection		11,516	1,727	13,244				0
80.08 Start up		11,516	173	11,689				0
Subtotal (10 - 80)	12.52	1,133,219	170,305	**1,303,524**	**$ 104,101**		**91%**	**0**
90 UNALLOCATED CONTINGENCY				**130,352**			**9%**	**0**
Subtotal (10 - 90)	12.52			**1,433,877**	**$ 114,511**		**100%**	**0**
100 FINANCE CHARGES				**0**			**0%**	**0**
Total Project Cost (10 - 100)	12.52			**1,433,877**	**$ 114,511**		**100%**	**0**
Allocated Contingency as % of Base Yr Dollars w/o Contingency				15.03%				
Unallocated Contingency as % of Base Yr Dollars w/o Contingency				11.50%				
Total Contingency as % of Base Yr Dollars w/o Contingency				26.53%				
Unallocated Contingency as % of Subtotal (10 - 80)				10.00%				
YOE Construction Cost per Mile (X000)								$0
YOE Total Project Cost per Mile Not Including Vehicles (X000)								$0
YOE Total Project Cost per Mile (X000)								$0

MAIN WORKSHEET-BUILD ALTERNATIVE

(Rev.11, May 2, 2008)

PEROW/WSAB Corridor AA

Street Car Alternative

Segment 1 West bank Option 2

Today's Date **3/16/12**

Yr of Base Year $ 2010

Yr of Revenue Ops 2010

	Quantity	Base Year Dollars w/o Contingency (X000)	Base Year Dollars Allocated Contingency (X000)	Base Year Dollars TOTAL (X000)	Base Year Dollars Unit Cost (X000)	Base Year Dollars Percentage of Construction Cost	Base Year Dollars Percentage of Total Project Cost	YOE Dollars Total (X000)
10 GUIDEWAY & TRACK ELEMENTS (route miles)	**12.89**	192,681	36,217	**228,898**	**$ 17,763**	**34%**	**16%**	**0**
10.01 Guideway: At-grade exclusive right-of-way	10.94	36916.95	9,229	46,146	$ 4,217			0
10.02 Guideway: At-grade semi-exclusive (allows cross-traffic)	0.00	0.00	0	0				0
10.03 Guideway: At-grade in mixed traffic	0.00	0.00	0	0				0
10.04 Guideway: Aerial structure	1.94	104900.00	26,225	131,125	$ 67,449			0
10.05 Guideway: Built-up fill	0.00	0.00	0	0				0
10.06 Guideway: Underground cut & cover	0.00	0.00	0	0				0
10.07 Guideway: Underground tunnel	0.00	0.00	0	0				0
10.08 Guideway: Retained cut or fill	0.00	0.00	0	0				0
10.09 Track: Direct fixation		9,400	141	9,541				0
10.10 Track: Embedded		0	0	0				0
10.11 Track: Ballasted		33,964	509	34,473				0
10.12 Track: Special (switches, turnouts)		7,500	113	7,613				0
10.13 Track: Vibration and noise dampening		0	0	0				0
20 STATIONS, STOPS, TERMINALS, INTERMODAL (number)	**6**	7,668	1,917	**9,585**	**$ 1,598**	**1%**	**1%**	**0**
20.01 At-grade station, stop, shelter, mall, terminal, platform	6	7668	1,917	9,585	$ 1,598			0
20.02 Aerial station, stop, shelter, mall, terminal, platform	0	0	0	0				0
20.03 Underground station, stop, shelter, mall, terminal, platform	0	0	0	0				0
20.04 Other stations, landings, terminals: Intermodal, ferry, trolley, etc.	0	0	0	0				0
20.05 Joint development		0	0	0				0
20.06 Automobile parking multi-story structure		0	0	0				0
20.07 Elevators, escalators		0	0	0				0
30 SUPPORT FACILITIES: YARDS, SHOPS, ADMIN. BLDGS	12.89	160,000	24,000	**184,000**	**$ 14,279**	**27%**	**13%**	**0**
30.01 Administration Building: Office, sales, storage, revenue counting				0				0
30.02 Light Maintenance Facility				0				0
30.03 Heavy Maintenance Facility		160,000	24,000	184,000				0
30.04 Storage or Maintenance of Way Building				0				0
30.05 Yard and Yard Track				0				0
40 SITEWORK & SPECIAL CONDITIONS	12.89	50,400	15,120	**65,520**	**$ 5,085**	**10%**	**5%**	**0**
40.01 Demolition, Clearing, Earthwork		0	0	0				0
40.02 Site Utilities, Utility Relocation		17,400	5,220	22,620				0
40.03 Haz. mat'l, contam'd soil removal/mitigation, ground water treatments		0	0	0				0
40.04 Environmental mitigation, e.g. wetlands, historic/archeologic, parks		0	0	0				0
40.05 Site structures including retaining walls, sound walls		0	0	0				0
40.06 Pedestrian / bike access and accommodation, landscaping		33,000	9,900	42,900				0
40.07 Automobile, bus, van accessways including roads, parking lots				0				0
40.08 Temporary Facilities and other indirect costs during construction				0				0
50 SYSTEMS	12.89	144,300	43,290	**187,590**	**$ 14,558**	**28%**	**13%**	**0**
50.01 Train control and signals		39,100	11,730	50,830				0
50.02 Traffic signals and crossing protection		13,400	4,020	17,420				0
50.03 Traction power supply: substations		9,000	2,700	11,700				0
50.04 Traction power distribution: catenary and third rail		20,000	6,000	26,000				0
50.05 Communications		49,600	14,880	64,480				0
50.06 Fare collection system and equipment		13,200	3,960	17,160				0
50.07 Central Control		0	0	0				0
Construction Subtotal (10 - 50)	12.89	555,049	120,544	**675,593**	**$ 52,429**	**100%**	**48%**	**0**
60 ROW, LAND, EXISTING IMPROVEMENTS	12.89	0	0	**0**	**$ -**		**0%**	**0**
60.01 Purchase or lease of real estate		0	0	0				#DIV/0!
60.02 Relocation of existing households and businesses				0				#DIV/0!
70 VEHICLES (number)	**112**	392,000	19,600	**411,600**	**$ 3,675**		**29%**	**0**
70.01 Light Rail	112	392,000	19,600	411,600	$ 3,675			0
70.02 Heavy Rail	0	0	0	0				0
70.03 Commuter Rail	0	0	0	0				0
70.04 Bus	0	0	0	0				0
70.05 Other				0				0
70.06 Non-revenue vehicles				0				0
70.07 Spare parts				0				0
80 PROFESSIONAL SERVICES (applies to Cats. 10-50)	12.89	168,516	23,536	**192,052**	**$ 14,904**	**28%**	**14%**	**0**
80.01 Preliminary Engineering		16,852	2,528	19,379				0
80.02 Final Design		39,320	5,898	45,218				0
80.03 Project Management for Design and Construction		56,172	8,426	64,598				0
80.04 Construction Administration & Management		28,086	4,213	32,299				0
80.05 Professional Liability and other Non-Construction Insurance				0				0
80.06 Legal; Permits; Review Fees by other agencies, cities, etc.		5,617	618	6,235				0
80.07 Surveys, Testing, Investigation, Inspection		11,234	1,685	12,920				0
80.08 Start up		11,234	169	11,403				0
Subtotal (10 - 80)	12.89	1,115,564	163,680	**1,279,244**	**$ 99,274**		**91%**	**0**
90 UNALLOCATED CONTINGENCY				**127,924**			**9%**	**0**
Subtotal (10 - 90)	12.89			**1,407,169**	**$ 109,202**		**100%**	**0**
100 FINANCE CHARGES				**0**			**0%**	**0**
Total Project Cost (10 - 100)	12.89			**1,407,169**	**$ 109,202**		**100%**	**0**
Allocated Contingency as % of Base Yr Dollars w/o Contingency				14.67%				
Unallocated Contingency as % of Base Yr Dollars w/o Contingency				11.47%				
Total Contingency as % of Base Yr Dollars w/o Contingency				26.14%				
Unallocated Contingency as % of Subtotal (10 - 80)				10.00%				
YOE Construction Cost per Mile (X000)								$0
YOE Total Project Cost per Mile Not Including Vehicles (X000)								$0
YOE Total Project Cost per Mile (X000)								$0

MAIN WORKSHEET - BUILD ALTERNATIVE

(Rev.11, May 2, 2008)

PEROW/WSAB Corridor AA

Street Car Alternative

Segment 1 West Bank Option 3

Today's Date **3/16/12**

Yr of Base Year $ 2010

Yr of Revenue Ops 2010

	Quantity	Base Year Dollars w/o Contingency (X000)	Base Year Dollars Allocated Contingency (X000)	Base Year Dollars TOTAL (X000)	Base Year Dollars Unit Cost (X000)	Base Year Dollars Percentage of Construction Cost	Base Year Dollars Percentage of Total Project Cost	YOE Dollars Total (X000)
10 GUIDEWAY & TRACK ELEMENTS (route miles)	**11.81**	426,758	94,078	**520,836**	**$ 44,099**	**56%**	**30%**	**0**
10.01 Guideway: At-grade exclusive right-of-way	7.14	24094.77	6,024	30,118	$ 4,217			0
10.02 Guideway: At-grade semi-exclusive (allows cross-traffic)	0.00	0.00	0	0				0
10.03 Guideway: At-grade in mixed traffic	0.00	0.00	0	0				0
10.04 Guideway: Aerial structure	3.21	173300.00	43,325	216,625	$ 67,494			0
10.05 Guideway: Built-up fill	0.00	0.00	0	0				0
10.06 Guideway: Underground cut & cover	1.46	175696.20	43,924	219,620	$ 150,460			0
10.07 Guideway: Underground tunnel	0.00	0.00	0	0				0
10.08 Guideway: Retained cut or fill	0.00	0.00	0	0				0
10.09 Track: Direct fixation		22,700	341	23,041				0
10.10 Track: Embedded		0	0	0				0
10.11 Track: Ballasted		22,167	333	22,500				0
10.12 Track: Special (switches, turnouts)		8,800	132	8,932				0
10.13 Track: Vibration and noise dampening		0	0	0				0
20 STATIONS, STOPS, TERMINALS, INTERMODAL (number)	**7**	8,946	2,237	**11,183**	**$ 1,598**	**1%**	**1%**	**0**
20.01 At-grade station, stop, shelter, mall, terminal, platform	7	8946	2,237	11,183	$ 1,598			0
20.02 Aerial station, stop, shelter, mall, terminal, platform	0	0	0	0				0
20.03 Underground station, stop, shelter, mall, terminal, platform	0	0	0	0				0
20.04 Other stations, landings, terminals: Intermodal, ferry, trolley, etc.	0	0	0	0				0
20.05 Joint development		0	0	0				0
20.06 Automobile parking multi-story structure		0	0	0				0
20.07 Elevators, escalators		0	0	0				0
30 SUPPORT FACILITIES: YARDS, SHOPS, ADMIN. BLDGS	11.81	160,000	24,000	**184,000**	**$ 15,579**	**20%**	**11%**	**0**
30.01 Administration Building: Office, sales, storage, revenue counting				0				0
30.02 Light Maintenance Facility				0				0
30.03 Heavy Maintenance Facility		160,000	24,000	184,000				0
30.04 Storage or Maintenance of Way Building				0				0
30.05 Yard and Yard Track				0				0
40 SITEWORK & SPECIAL CONDITIONS	11.81	40,500	12,150	**52,650**	**$ 4,458**	**6%**	**3%**	**0**
40.01 Demolition, Clearing, Earthwork		0	0	0				0
40.02 Site Utilities, Utility Relocation		14,000	4,200	18,200				0
40.03 Haz. mat'l, contam'd soil removal/mitigation, ground water treatments		0	0	0				0
40.04 Environmental mitigation, e.g. wetlands, historic/archeologic, parks		0	0	0				0
40.05 Site structures including retaining walls, sound walls		0	0	0				0
40.06 Pedestrian / bike access and accommodation, landscaping		26,500	7,950	34,450				0
40.07 Automobile, bus, van accessways including roads, parking lots				0				0
40.08 Temporary Facilities and other indirect costs during construction				0				0
50 SYSTEMS	11.81	123,400	37,020	**160,420**	**$ 13,583**	**17%**	**9%**	**0**
50.01 Train control and signals		31,400	9,420	40,820				0
50.02 Traffic signals and crossing protection		13,400	4,020	17,420				0
50.03 Traction power supply: substations		7,300	2,190	9,490				0
50.04 Traction power distribution: catenary and third rail		16,100	4,830	20,930				0
50.05 Communications		39,800	11,940	51,740				0
50.06 Fare collection system and equipment		15,400	4,620	20,020				0
50.07 Central Control		0	0	0				0
Construction Subtotal (10 - 50)	11.81	759,604	169,484	**929,088**	**$ 78,665**	**100%**	**53%**	**0**
60 ROW, LAND, EXISTING IMPROVEMENTS	11.81	0	0	**0**	**$ -**		**0%**	**0**
60.01 Purchase or lease of real estate		0	0	0				#DIV/0!
60.02 Relocation of existing households and businesses				0				#DIV/0!
70 VEHICLES (number)	**108**	378,000	18,900	**396,900**	**$ 3,675**		**23%**	**0**
70.01 Light Rail	108	378,000	18,900	396,900	$ 3,675			0
70.02 Heavy Rail	0	0	0	0				0
70.03 Commuter Rail	0	0	0	0				0
70.04 Bus	0	0	0	0				0
70.05 Other				0				0
70.06 Non-revenue vehicles				0				0
70.07 Spare parts				0				0
80 PROFESSIONAL SERVICES (applies to Cats. 10-50)	11.81	225,273	31,463	**256,736**	**$ 21,738**	**28%**	**15%**	**0**
80.01 Preliminary Engineering		22,527	3,379	25,906				0
80.02 Final Design		52,564	7,885	60,448				0
80.03 Project Management for Design and Construction		75,091	11,264	86,355				0
80.04 Construction Administration & Management		37,545	5,632	43,177				0
80.05 Professional Liability and other Non-Construction Insurance				0				0
80.06 Legal; Permits; Review Fees by other agencies, cities, etc.		7,509	826	8,335				0
80.07 Surveys, Testing, Investigation, Inspection		15,018	2,253	17,271				0
80.08 Start up		15,018	225	15,243				0
Subtotal (10 - 80)	11.81	1,362,877	219,847	**1,582,724**	**$ 134,008**		**91%**	**0**
90 UNALLOCATED CONTINGENCY				**158,272**			**9%**	**0**
Subtotal (10 - 90)	11.81			**1,740,997**	**$ 147,409**		**100%**	**0**
100 FINANCE CHARGES				**0**			**0%**	**0**
Total Project Cost (10 - 100)	11.81			**1,740,997**	**$ 147,409**		**100%**	**0**
Allocated Contingency as % of Base Yr Dollars w/o Contingency				16.13%				
Unallocated Contingency as % of Base Yr Dollars w/o Contingency				11.61%				
Total Contingency as % of Base Yr Dollars w/o Contingency				27.74%				
Unallocated Contingency as % of Subtotal (10 - 80)				10.00%				
YOE Construction Cost per Mile (X000)								$0
YOE Total Project Cost per Mile Not Including Vehicles (X000)								$0
YOE Total Project Cost per Mile (X000)								$0

MAIN WORKSHEET - BUILD ALTERNATIVE

(Rev.11, May 2, 2008)

PEROW/WSAB Corridor AA

Street Car

Segment 2 Los Angeles County Portion

Today's Date **3/16/12**

Yr of Base Year $ 2010

Yr of Revenue Ops 2010

	Quantity	Base Year Dollars w/o Contingency (X000)	Base Year Dollars Allocated Contingency (X000)	Base Year Dollars TOTAL (X000)	Base Year Dollars Unit Cost (X000)	Base Year Dollars Percentage of Construction Cost	Base Year Dollars Percentage of Total Project Cost	YOE Dollars Total (X000)
10 GUIDEWAY & TRACK ELEMENTS (route miles)	**7.77**	74,675	11,375	**86,051**	**$ 11,082**	**33%**	**24%**	**0**
10.01 Guideway: At-grade exclusive right-of-way	7.42	25039.22	6,260	31,299	$ 4,217			0
10.02 Guideway: At-grade semi-exclusive (allows cross-traffic)	0.00	0.00	0	0				0
10.03 Guideway: At-grade in mixed traffic	0.00	0.00	0	0				0
10.04 Guideway: Aerial structure	0.34	18600.00	4,650	23,250	$ 67,636			0
10.05 Guideway: Built-up fill	0.00	0.00	0	0				0
10.06 Guideway: Underground cut & cover	0.00	0.00	0	0				0
10.07 Guideway: Underground tunnel	0.00	0.00	0	0				0
10.08 Guideway: Retained cut or fill	0.00	0.00	0	0				0
10.09 Track: Direct fixation		1,700	26	1,726				0
10.10 Track: Embedded		0	0	0				0
10.11 Track: Ballasted		23,036	346	23,382				0
10.12 Track: Special (switches, turnouts)		6,300	95	6,395				0
10.13 Track: Vibration and noise dampening		0	0	0				0
20 STATIONS, STOPS, TERMINALS, INTERMODAL (number)	**5**	12,780	3,195	**15,975**	**$ 3,195**	**6%**	**4%**	**0**
20.01 At-grade station, stop, shelter, mall, terminal, platform	5	12780	3,195	15,975	$ 3,195			0
20.02 Aerial station, stop, shelter, mall, terminal, platform	0	0	0	0				0
20.03 Underground station, stop, shelter, mall, terminal, platform	0	0	0	0				0
20.04 Other stations, landings, terminals: Intermodal, ferry, trolley, etc.	0	0	0	0				0
20.05 Joint development		0	0	0				0
20.06 Automobile parking multi-story structure		0	0	0				0
20.07 Elevators, escalators		0	0	0				0
30 SUPPORT FACILITIES: YARDS, SHOPS, ADMIN. BLDGS	7.77	0	0	**0**	**$ -**	**0%**	**0%**	**0**
30.01 Administration Building: Office, sales, storage, revenue counting				0				#DIV/0!
30.02 Light Maintenance Facility				0				#DIV/0!
30.03 Heavy Maintenance Facility		0	0	0				#DIV/0!
30.04 Storage or Maintenance of Way Building				0				#DIV/0!
30.05 Yard and Yard Track				0				#DIV/0!
40 SITEWORK & SPECIAL CONDITIONS	7.77	30,400	9,120	**39,520**	**$ 5,089**	**15%**	**11%**	**0**
40.01 Demolition, Clearing, Earthwork		0	0	0				0
40.02 Site Utilities, Utility Relocation		10,500	3,150	13,650				0
40.03 Haz. mat'l, contam'd soil removal/mitigation, ground water treatments		0	0	0				0
40.04 Environmental mitigation, e.g. wetlands, historic/archeologic, parks		0	0	0				0
40.05 Site structures including retaining walls, sound walls		0	0	0				0
40.06 Pedestrian / bike access and accommodation, landscaping		19,900	5,970	25,870				0
40.07 Automobile, bus, van accessways including roads, parking lots				0				0
40.08 Temporary Facilities and other indirect costs during construction				0				0
50 SYSTEMS	7.77	91,000	27,300	**118,300**	**$ 15,235**	**46%**	**33%**	**0**
50.01 Train control and signals		23,600	7,080	30,680				0
50.02 Traffic signals and crossing protection		7,300	2,190	9,490				0
50.03 Traction power supply: substations		2,700	810	3,510				0
50.04 Traction power distribution: catenary and third rail		12,100	3,630	15,730				0
50.05 Communications		29,900	8,970	38,870				0
50.06 Fare collection system and equipment		15,400	4,620	20,020				0
50.07 Central Control		0	0	0				0
Construction Subtotal (10 - 50)	7.77	208,855	50,990	**259,846**	**$ 33,463**	**100%**	**72%**	**0**
60 ROW, LAND, EXISTING IMPROVEMENTS	7.77	0	0	**0**	**$ -**		**0%**	**0**
60.01 Purchase or lease of real estate		0	0	0				#DIV/0!
60.02 Relocation of existing households and businesses				0				#DIV/0!
70 VEHICLES (number)	**0**	0	0	**0**			**0%**	**0**
70.01 Light Rail	0	0	0	0				#DIV/0!
70.02 Heavy Rail	0	0	0	0				#DIV/0!
70.03 Commuter Rail	0	0	0	0				#DIV/0!
70.04 Bus	0	0	0	0				#DIV/0!
70.05 Other				0				#DIV/0!
70.06 Non-revenue vehicles				0				#DIV/0!
70.07 Spare parts				0				#DIV/0!
80 PROFESSIONAL SERVICES (applies to Cats. 10-50)	7.77	58,924	8,230	**67,154**	**$ 8,648**	**26%**	**19%**	**0**
80.01 Preliminary Engineering		5,892	884	6,776				0
80.02 Final Design		13,749	2,062	15,811				0
80.03 Project Management for Design and Construction		19,641	2,946	22,587				0
80.04 Construction Administration & Management		9,821	1,473	11,294				0
80.05 Professional Liability and other Non-Construction Insurance				0				0
80.06 Legal; Permits; Review Fees by other agencies, cities, etc.		1,964	216	2,180				0
80.07 Surveys, Testing, Investigation, Inspection		3,928	589	4,517				0
80.08 Start up		3,928	59	3,987				0
Subtotal (10 - 80)	7.77	267,779	59,220	**326,999**	**$ 42,111**		**91%**	**0**
90 UNALLOCATED CONTINGENCY				**32,700**			**9%**	**0**
Subtotal (10 - 90)	7.77			**359,699**	**$ 46,322**		**100%**	**0**
100 FINANCE CHARGES				**0**			**0%**	**0**
Total Project Cost (10 - 100)	7.77			**359,699**	**$ 46,322**		**100%**	**0**
Allocated Contingency as % of Base Yr Dollars w/o Contingency				22.12%				
Unallocated Contingency as % of Base Yr Dollars w/o Contingency				12.21%				
Total Contingency as % of Base Yr Dollars w/o Contingency				34.33%				
Unallocated Contingency as % of Subtotal (10 - 80)				10.00%				
YOE Construction Cost per Mile (X000)								$0
YOE Total Project Cost per Mile Not Including Vehicles (X000)								$0
YOE Total Project Cost per Mile (X000)								$0

MAIN WORKSHEET - BUILD ALTERNATIVE

(Rev.11, May 2, 2008)

PEROW/WSAB Corridor AA

Street Car

Segment 2 Orange County Portion

Today's Date **3/16/12**

Yr of Base Year $ 2010

Yr of Revenue Ops 2010

	Quantity	Base Year Dollars w/o Contingency (X000)	Base Year Dollars Allocated Contingency (X000)	Base Year Dollars TOTAL (X000)	Base Year Dollars Unit Cost (X000)	Base Year Dollars Percentage of Construction Cost	Base Year Dollars Percentage of Total Project Cost	YOE Dollars Total (X000)
10 GUIDEWAY & TRACK ELEMENTS (route miles)	**9.79**	122,152	20,942	**143,095**	**$ 14,614**	**39%**	**28%**	**0**
10.01 Guideway: At-grade exclusive right-of-way	8.84	29818.94	7,455	37,274	$ 4,217			0
10.02 Guideway: At-grade semi-exclusive (allows cross-traffic)	0.00	0.00	0	0				0
10.03 Guideway: At-grade in mixed traffic	0.00	0.00	0	0				0
10.04 Guideway: Aerial structure	0.95	51500.00	12,875	64,375	$ 67,507			0
10.05 Guideway: Built-up fill	0.00	0.00	0	0				0
10.06 Guideway: Underground cut & cover	0.00	0.00	0	0				0
10.07 Guideway: Underground tunnel	0.00	0.00	0	0				0
10.08 Guideway: Retained cut or fill	0.00	0.00	0	0				0
10.09 Track: Direct fixation		4,600	69	4,669				0
10.10 Track: Embedded		0	0	0				0
10.11 Track: Ballasted		27,433	412	27,845				0
10.12 Track: Special (switches, turnouts)		8,800	132	8,932				0
10.13 Track: Vibration and noise dampening		0	0	0				0
20 STATIONS, STOPS, TERMINALS, INTERMODAL (number)	**7**	17,892	4,473	**22,365**	**$ 3,195**	**6%**	**4%**	**0**
20.01 At-grade station, stop, shelter, mall, terminal, platform	7	17892	4,473	22,365	$ 3,195			0
20.02 Aerial station, stop, shelter, mall, terminal, platform	0	0	0	0				0
20.03 Underground station, stop, shelter, mall, terminal, platform	0	0	0	0				0
20.04 Other stations, landings, terminals: Intermodal, ferry, trolley, etc.	0	0	0	0				0
20.05 Joint development		0	0	0				0
20.06 Automobile parking multi-story structure		0	0	0				0
20.07 Elevators, escalators		0	0	0				0
30 SUPPORT FACILITIES: YARDS, SHOPS, ADMIN. BLDGS	9.79	0	0	**0**	**$ -**	**0%**	**0%**	**0**
30.01 Administration Building: Office, sales, storage, revenue counting				0				#DIV/0!
30.02 Light Maintenance Facility				0				#DIV/0!
30.03 Heavy Maintenance Facility		0	0	0				#DIV/0!
30.04 Storage or Maintenance of Way Building				0				#DIV/0!
30.05 Yard and Yard Track				0				#DIV/0!
40 SITEWORK & SPECIAL CONDITIONS	9.79	38,300	11,490	**49,790**	**$ 5,085**	**13%**	**10%**	**0**
40.01 Demolition, Clearing, Earthwork		0	0	0				0
40.02 Site Utilities, Utility Relocation		13,200	3,960	17,160				0
40.03 Haz. mat'l, contam'd soil removal/mitigation, ground water treatments		0	0	0				0
40.04 Environmental mitigation, e.g. wetlands, historic/archeologic, parks		0	0	0				0
40.05 Site structures including retaining walls, sound walls		0	0	0				0
40.06 Pedestrian / bike access and accommodation, landscaping		25,100	7,530	32,630				0
40.07 Automobile, bus, van accessways including roads, parking lots				0				0
40.08 Temporary Facilities and other indirect costs during construction				0				0
50 SYSTEMS	9.79	119,700	35,910	**155,610**	**$ 15,892**	**42%**	**30%**	**0**
50.01 Train control and signals		29,700	8,910	38,610				0
50.02 Traffic signals and crossing protection		7,300	2,190	9,490				0
50.03 Traction power supply: substations		3,400	1,020	4,420				0
50.04 Traction power distribution: catenary and third rail		15,200	4,560	19,760				0
50.05 Communications		37,700	11,310	49,010				0
50.06 Fare collection system and equipment		26,400	7,920	34,320				0
50.07 Central Control		0	0	0				0
Construction Subtotal (10 - 50)	9.79	298,044	72,815	**370,860**	**$ 37,875**	**100%**	**72%**	**0**
60 ROW, LAND, EXISTING IMPROVEMENTS	9.79	0	0	**0**	**$ -**		**0%**	**0**
60.01 Purchase or lease of real estate		0	0	0				#DIV/0!
60.02 Relocation of existing households and businesses				0				#DIV/0!
70 VEHICLES (number)	**0**	0	0	**0**			**0%**	**0**
70.01 Light Rail	0	0	0	0				#DIV/0!
70.02 Heavy Rail	0	0	0	0				#DIV/0!
70.03 Commuter Rail	0	0	0	0				#DIV/0!
70.04 Bus	0	0	0	0				#DIV/0!
70.05 Other				0				#DIV/0!
70.06 Non-revenue vehicles				0				#DIV/0!
70.07 Spare parts				0				#DIV/0!
80 PROFESSIONAL SERVICES (applies to Cats. 10-50)	9.79	84,005	11,733	**95,738**	**$ 9,778**	**26%**	**19%**	**0**
80.01 Preliminary Engineering		8,401	1,260	9,661				0
80.02 Final Design		19,601	2,940	22,541				0
80.03 Project Management for Design and Construction		28,002	4,200	32,202				0
80.04 Construction Administration & Management		14,001	2,100	16,101				0
80.05 Professional Liability and other Non-Construction Insurance				0				0
80.06 Legal; Permits; Review Fees by other agencies, cities, etc.		2,800	308	3,108				0
80.07 Surveys, Testing, Investigation, Inspection		5,600	840	6,440				0
80.08 Start up		5,600	84	5,684				0
Subtotal (10 - 80)	9.79	382,050	84,548	**466,598**	**$ 47,653**		**91%**	**0**
90 UNALLOCATED CONTINGENCY				**46,660**			**9%**	**0**
Subtotal (10 - 90)	9.79			**513,257**	**$ 52,418**		**100%**	**0**
100 FINANCE CHARGES				**0**			**0%**	**0**
Total Project Cost (10 - 100)	9.79			**513,257**	**$ 52,418**		**100%**	**0**
Allocated Contingency as % of Base Yr Dollars w/o Contingency				22.13%				
Unallocated Contingency as % of Base Yr Dollars w/o Contingency				12.21%				
Total Contingency as % of Base Yr Dollars w/o Contingency				34.34%				
Unallocated Contingency as % of Subtotal (10 - 80)				10.00%				
YOE Construction Cost per Mile (X000)								$0
YOE Total Project Cost per Mile Not Including Vehicles (X000)								$0
YOE Total Project Cost per Mile (X000)								$0

MAIN WORKSHEET - BUILD ALTERNATIVE

(Rev.11, May 2, 2008)

PEROW/WSAB Corridor AA

Street Car Alternative

Segment 3 Option (Harbor/1st/SARTC)

Today's Date **3/16/12**

Yr of Base Year $ 2010

Yr of Revenue Ops 2010

	Quantity	Base Year Dollars w/o Contingency (X000)	Base Year Dollars Allocated Contingency (X000)	Base Year Dollars TOTAL (X000)	Base Year Dollars Unit Cost (X000)	Base Year Dollars Percentage of Construction Cost	Base Year Dollars Percentage of Total Project Cost	YOE Dollars Total (X000)
10 GUIDEWAY & TRACK ELEMENTS (route miles)	**5.11**	72,026	12,846	**84,872**	**$ 16,597**	**39%**	**28%**	**0**
10.01 Guideway: At-grade exclusive right-of-way	4.47	15065.70	3,766	18,832	$ 4,217			0
10.02 Guideway: At-grade semi-exclusive (allows cross-traffic)	0.00	0.00	0	0				0
10.03 Guideway: At-grade in mixed traffic	0.00	0.00	0	0				0
10.04 Guideway: Aerial structure	0.65	35000.00	8,750	43,750	$ 67,495			0
10.05 Guideway: Built-up fill	0.00	0.00	0	0				0
10.06 Guideway: Underground cut & cover	0.00	0.00	0	0				0
10.07 Guideway: Underground tunnel	0.00	0.00	0	0				0
10.08 Guideway: Retained cut or fill	0.00	0.00	0	0				0
10.09 Track: Direct fixation		3,100	47	3,147				0
10.10 Track: Embedded		0	0	0				0
10.11 Track: Ballasted		13,860	208	14,068				0
10.12 Track: Special (switches, turnouts)		5,000	75	5,075				0
10.13 Track: Vibration and noise dampening		0	0	0				0
20 STATIONS, STOPS, TERMINALS, INTERMODAL (number)	**6**	23,512	5,878	**29,390**	**$ 4,898**	**13%**	**10%**	**0**
20.01 At-grade station, stop, shelter, mall, terminal, platform	4	5112	1,278	6,390	$ 1,598			0
20.02 Aerial station, stop, shelter, mall, terminal, platform	2	18400	4,600	23,000	$ 11,500			0
20.03 Underground station, stop, shelter, mall, terminal, platform	0	0	0	0				0
20.04 Other stations, landings, terminals: Intermodal, ferry, trolley, etc.	0	0	0	0				0
20.05 Joint development		0	0	0				0
20.06 Automobile parking multi-story structure		0	0	0				0
20.07 Elevators, escalators		0	0	0				0
30 SUPPORT FACILITIES: YARDS, SHOPS, ADMIN. BLDGS	5.11	0	0	**0**	**$ -**	**0%**	**0%**	**0**
30.01 Administration Building: Office, sales, storage, revenue counting				0				#DIV/0!
30.02 Light Maintenance Facility				0				#DIV/0!
30.03 Heavy Maintenance Facility		0	0	0				#DIV/0!
30.04 Storage or Maintenance of Way Building				0				#DIV/0!
30.05 Yard and Yard Track				0				#DIV/0!
40 SITEWORK & SPECIAL CONDITIONS	5.11	20,000	6,000	**26,000**	**$ 5,085**	**12%**	**9%**	**0**
40.01 Demolition, Clearing, Earthwork		0	0	0				0
40.02 Site Utilities, Utility Relocation		6,900	2,070	8,970				0
40.03 Haz. mat'l, contam'd soil removal/mitigation, ground water treatments		0	0	0				0
40.04 Environmental mitigation, e.g. wetlands, historic/archeologic, parks		0	0	0				0
40.05 Site structures including retaining walls, sound walls		0	0	0				0
40.06 Pedestrian / bike access and accommodation, landscaping		13,100	3,930	17,030				0
40.07 Automobile, bus, van accessways including roads, parking lots				0				0
40.08 Temporary Facilities and other indirect costs during construction				0				0
50 SYSTEMS	5.11	60,000	18,000	**78,000**	**$ 15,254**	**36%**	**26%**	**0**
50.01 Train control and signals		15,500	4,650	20,150				0
50.02 Traffic signals and crossing protection		2,300	690	2,990				0
50.03 Traction power supply: substations		3,600	1,080	4,680				0
50.04 Traction power distribution: catenary and third rail		7,900	2,370	10,270				0
50.05 Communications		19,700	5,910	25,610				0
50.06 Fare collection system and equipment		11,000	3,300	14,300				0
50.07 Central Control		0	0	0				0
Construction Subtotal (10 - 50)	5.11	175,538	42,724	**218,262**	**$ 42,683**	**100%**	**72%**	**0**
60 ROW, LAND, EXISTING IMPROVEMENTS	5.11	0	0	**0**	**$ -**		**0%**	**0**
60.01 Purchase or lease of real estate		0	0	0				#DIV/0!
60.02 Relocation of existing households and businesses				0				#DIV/0!
70 VEHICLES (number)	**0**	0	0	**0**			**0%**	**0**
70.01 Light Rail	0	0	0	0				#DIV/0!
70.02 Heavy Rail	0	0	0	0				#DIV/0!
70.03 Commuter Rail	0	0	0	0				#DIV/0!
70.04 Bus	0	0	0	0				#DIV/0!
70.05 Other				0				#DIV/0!
70.06 Non-revenue vehicles				0				#DIV/0!
70.07 Spare parts				0				#DIV/0!
80 PROFESSIONAL SERVICES (applies to Cats. 10-50)	5.11	51,122	7,140	**58,262**	**$ 11,394**	**27%**	**19%**	**0**
80.01 Preliminary Engineering		5,112	767	5,879				0
80.02 Final Design		11,928	1,789	13,718				0
80.03 Project Management for Design and Construction		17,041	2,556	19,597				0
80.04 Construction Administration & Management		8,520	1,278	9,798				0
80.05 Professional Liability and other Non-Construction Insurance				0				0
80.06 Legal; Permits; Review Fees by other agencies, cities, etc.		1,704	187	1,891				0
80.07 Surveys, Testing, Investigation, Inspection		3,408	511	3,919				0
80.08 Start up		3,408	51	3,459				0
Subtotal (10 - 80)	5.11	226,660	49,864	**276,523**	**$ 54,077**		**91%**	**0**
90 UNALLOCATED CONTINGENCY				**27,652**			**9%**	**0**
Subtotal (10 - 90)	5.11			**304,176**	**$ 59,484**		**100%**	**0**
100 FINANCE CHARGES				**0**			**0%**	**0**
Total Project Cost (10 - 100)	5.11			**304,176**	**$ 59,484**		**100%**	**0**
Allocated Contingency as % of Base Yr Dollars w/o Contingency				22.00%				
Unallocated Contingency as % of Base Yr Dollars w/o Contingency				12.20%				
Total Contingency as % of Base Yr Dollars w/o Contingency				34.20%				
Unallocated Contingency as % of Subtotal (10 - 80)				10.00%				
YOE Construction Cost per Mile (X000)								$0
YOE Total Project Cost per Mile Not Including Vehicles (X000)								$0
YOE Total Project Cost per Mile (X000)								$0

MAIN WORKSHEET - BUILD ALTERNATIVE

(Rev.11, May 2, 2008)

PEROW/WSAB Corridor AA

LRT Alternative

Segment 1 East Bank Option

Today's Date **3/16/12**

Yr of Base Year $ 2010

Yr of Revenue Ops 2010

	Quantity	Base Year Dollars w/o Contingency (X000)	Base Year Dollars Allocated Contingency (X000)	Base Year Dollars TOTAL (X000)	Base Year Dollars Unit Cost (X000)	Base Year Dollars Percentage of Construction Cost	Base Year Dollars Percentage of Total Project Cost	YOE Dollars Total (X000)
10 GUIDEWAY & TRACK ELEMENTS (route miles)	**12.53**	248,692	50,019	**298,711**	**$ 23,834**	**36%**	**19%**	**0**
10.01 Guideway: At-grade exclusive right-of-way	9.48	31974.92	7,994	39,969	$ 4,217			0
10.02 Guideway: At-grade semi-exclusive (allows cross-traffic)	0.00	0.00	0	0				0
10.03 Guideway: At-grade in mixed traffic	0.00	0.00	0	0				0
10.04 Guideway: Aerial structure	3.06	165000.00	41,250	206,250	$ 67,497			0
10.05 Guideway: Built-up fill	0.00	0.00	0	0				0
10.06 Guideway: Underground cut & cover	0.00	0.00	0	0				0
10.07 Guideway: Underground tunnel	0.00	0.00	0	0				0
10.08 Guideway: Retained cut or fill	0.00	0.00	0	0				0
10.09 Track: Direct fixation		14,800	222	15,022				0
10.10 Track: Embedded		0	0	0				0
10.11 Track: Ballasted		29,417	441	29,858				0
10.12 Track: Special (switches, turnouts)		7,500	113	7,613				0
10.13 Track: Vibration and noise dampening		0	0	0				0
20 STATIONS, STOPS, TERMINALS, INTERMODAL (number)	**6**	34,506	8,627	**43,133**	**$ 7,189**	**5%**	**3%**	**0**
20.01 At-grade station, stop, shelter, mall, terminal, platform	6	34506	8,627	43,133	$ 7,189			0
20.02 Aerial station, stop, shelter, mall, terminal, platform	0	0	0	0				0
20.03 Underground station, stop, shelter, mall, terminal, platform	0	0	0	0				0
20.04 Other stations, landings, terminals: Intermodal, ferry, trolley, etc.	0	0	0	0				0
20.05 Joint development		0	0	0				0
20.06 Automobile parking multi-story structure		0	0	0				0
20.07 Elevators, escalators		0	0	0				0
30 SUPPORT FACILITIES: YARDS, SHOPS, ADMIN. BLDGS	12.53	160,000	24,000	**184,000**	**$ 14,682**	**22%**	**12%**	**0**
30.01 Administration Building: Office, sales, storage, revenue counting				0				0
30.02 Light Maintenance Facility				0				0
30.03 Heavy Maintenance Facility		160,000	24,000	184,000				0
30.04 Storage or Maintenance of Way Building				0				0
30.05 Yard and Yard Track				0				0
40 SITEWORK & SPECIAL CONDITIONS	12.53	49,000	14,700	**63,700**	**$ 5,083**	**8%**	**4%**	**0**
40.01 Demolition, Clearing, Earthwork		0	0	0				0
40.02 Site Utilities, Utility Relocation		16,900	5,070	21,970				0
40.03 Haz. mat'l, contam'd soil removal/mitigation, ground water treatments		0	0	0				0
40.04 Environmental mitigation, e.g. wetlands, historic/archeologic, parks		0	0	0				0
40.05 Site structures including retaining walls, sound walls		0	0	0				0
40.06 Pedestrian / bike access and accommodation, landscaping		32,100	9,630	41,730				0
40.07 Automobile, bus, van accessways including roads, parking lots				0				0
40.08 Temporary Facilities and other indirect costs during construction				0				0
50 SYSTEMS	12.53	181,500	50,430	**231,930**	**$ 18,506**	**28%**	**15%**	**0**
50.01 Train control and signals		38,100	11,430	49,530				0
50.02 Traffic signals and crossing protection		13,400		13,400				0
50.03 Traction power supply: substations		33,800	10,140	43,940				0
50.04 Traction power distribution: catenary and third rail		34,800	10,440	45,240				0
50.05 Communications		48,200	14,460	62,660				0
50.06 Fare collection system and equipment		13,200	3,960	17,160				0
50.07 Central Control		0	0	0				0
Construction Subtotal (10 - 50)	12.53	673,698	147,776	**821,474**	**$ 65,546**	**100%**	**53%**	**0**
60 ROW, LAND, EXISTING IMPROVEMENTS	12.53	0	0	**0**	**$ -**		**0%**	**0**
60.01 Purchase or lease of real estate		0	0	0				#DIV/0!
60.02 Relocation of existing households and businesses				0				#DIV/0!
70 VEHICLES (number)	**101**	353,500	17,675	**371,175**	**$ 3,675**		**24%**	**0**
70.01 Light Rail	101	353,500	17,675	371,175	$ 3,675			0
70.02 Heavy Rail	0	0	0	0				0
70.03 Commuter Rail	0	0	0	0				0
70.04 Bus	0	0	0	0				0
70.05 Other				0				0
70.06 Non-revenue vehicles				0				0
70.07 Spare parts				0				0
80 PROFESSIONAL SERVICES (applies to Cats. 10-50)	12.53	191,860	26,796	**218,657**	**$ 17,447**	**27%**	**14%**	**0**
80.01 Preliminary Engineering		19,186	2,878	22,064				0
80.02 Final Design		44,767	6,715	51,483				0
80.03 Project Management for Design and Construction		63,953	9,593	73,546				0
80.04 Construction Administration & Management		31,977	4,797	36,773				0
80.05 Professional Liability and other Non-Construction Insurance				0				0
80.06 Legal; Permits; Review Fees by other agencies, cities, etc.		6,395	703	7,099				0
80.07 Surveys, Testing, Investigation, Inspection		12,791	1,919	14,709				0
80.08 Start up		12,791	192	12,983				0
Subtotal (10 - 80)	12.53	1,219,058	192,247	**1,411,306**	**$ 112,609**		**91%**	**0**
90 UNALLOCATED CONTINGENCY				**141,131**			**9%**	**0**
Subtotal (10 - 90)	12.53			**1,552,436**	**$ 123,870**		**100%**	**0**
100 FINANCE CHARGES				**0**			**0%**	**0**
Total Project Cost (10 - 100)	12.53			**1,552,436**	**$ 123,870**		**100%**	**0**
Allocated Contingency as % of Base Yr Dollars w/o Contingency				15.77%				
Unallocated Contingency as % of Base Yr Dollars w/o Contingency				11.58%				
Total Contingency as % of Base Yr Dollars w/o Contingency				27.35%				
Unallocated Contingency as % of Subtotal (10 - 80)				10.00%				
YOE Construction Cost per Mile (X000)								$0
YOE Total Project Cost per Mile Not Including Vehicles (X000)								$0
YOE Total Project Cost per Mile (X000)								$0

MAIN WORKSHEET - BUILD ALTERNATIVE

(Rev.11, May 2, 2008)

PEROW/WSAB Corridor AA

Light Rail Alternative

Segment 1 West Bank Option 1

Today's Date **3/16/12**

Yr of Base Year $ 2010

Yr of Revenue Ops 2010

	Quantity	Base Year Dollars w/o Contingency (X000)	Base Year Dollars Allocated Contingency (X000)	Base Year Dollars TOTAL (X000)	Base Year Dollars Unit Cost (X000)	Base Year Dollars Percentage of Construction Cost	Base Year Dollars Percentage of Total Project Cost	YOE Dollars Total (X000)
10 GUIDEWAY & TRACK ELEMENTS (route miles)	**12.52**	228,287	45,341	**273,629**	**$ 21,852**	**35%**	**18%**	**0**
10.01 Guideway: At-grade exclusive right-of-way	9.83	33170.49	8,293	41,463	$ 4,217			0
10.02 Guideway: At-grade semi-exclusive (allows cross-traffic)	0.00	0.00	0	0				0
10.03 Guideway: At-grade in mixed traffic	0.00	0.00	0	0				0
10.04 Guideway: Aerial structure	2.69	145200.00	36,300	181,500	$ 67,464			0
10.05 Guideway: Built-up fill	0.00	0.00	0	0				0
10.06 Guideway: Underground cut & cover	0.00	0.00	0	0				0
10.07 Guideway: Underground tunnel	0.00	0.00	0	0				0
10.08 Guideway: Retained cut or fill	0.00	0.00	0	0				0
10.09 Track: Direct fixation		13,100	197	13,297				0
10.10 Track: Embedded		0	0	0				0
10.11 Track: Ballasted		30,517	458	30,975				0
10.12 Track: Special (switches, turnouts)		6,300	95	6,395				0
10.13 Track: Vibration and noise dampening		0	0	0				0
20 STATIONS, STOPS, TERMINALS, INTERMODAL (number)	**5**	28,755	7,189	**35,944**	**$ 7,189**	**5%**	**2%**	**0**
20.01 At-grade station, stop, shelter, mall, terminal, platform	5	28755	7,189	35,944	$ 7,189			0
20.02 Aerial station, stop, shelter, mall, terminal, platform	0	0	0	0				0
20.03 Underground station, stop, shelter, mall, terminal, platform	0	0	0	0				0
20.04 Other stations, landings, terminals: Intermodal, ferry, trolley, etc.	0	0	0	0				0
20.05 Joint development		0	0	0				0
20.06 Automobile parking multi-story structure		0	0	0				0
20.07 Elevators, escalators		0	0	0				0
30 SUPPORT FACILITIES: YARDS, SHOPS, ADMIN. BLDGS	12.52	160,000	24,000	**184,000**	**$ 14,694**	**23%**	**12%**	**0**
30.01 Administration Building: Office, sales, storage, revenue counting				0				0
30.02 Light Maintenance Facility				0				0
30.03 Heavy Maintenance Facility		160,000	24,000	184,000				0
30.04 Storage or Maintenance of Way Building				0				0
30.05 Yard and Yard Track				0				0
40 SITEWORK & SPECIAL CONDITIONS	12.52	49,000	14,700	**63,700**	**$ 5,087**	**8%**	**4%**	**0**
40.01 Demolition, Clearing, Earthwork		0	0	0				0
40.02 Site Utilities, Utility Relocation		16,900	5,070	21,970				0
40.03 Haz. mat'l, contam'd soil removal/mitigation, ground water treatments		0	0	0				0
40.04 Environmental mitigation, e.g. wetlands, historic/archeologic, parks		0	0	0				0
40.05 Site structures including retaining walls, sound walls		0	0	0				0
40.06 Pedestrian / bike access and accommodation, landscaping		32,100	9,630	41,730				0
40.07 Automobile, bus, van accessways including roads, parking lots				0				0
40.08 Temporary Facilities and other indirect costs during construction				0				0
50 SYSTEMS	12.52	179,200	53,760	**232,960**	**$ 18,604**	**29%**	**16%**	**0**
50.01 Train control and signals		38,000	11,400	49,400				0
50.02 Traffic signals and crossing protection		13,400	4,020	17,420				0
50.03 Traction power supply: substations		33,800	10,140	43,940				0
50.04 Traction power distribution: catenary and third rail		34,800	10,440	45,240				0
50.05 Communications		48,200	14,460	62,660				0
50.06 Fare collection system and equipment		11,000	3,300	14,300				0
50.07 Central Control		0	0	0				0
Construction Subtotal (10 - 50)	12.52	645,242	144,990	**790,232**	**$ 63,109**	**100%**	**53%**	**0**
60 ROW, LAND, EXISTING IMPROVEMENTS	12.52	0	0	**0**	**$ -**		**0%**	**0**
60.01 Purchase or lease of real estate		0	0	0				#DIV/0!
60.02 Relocation of existing households and businesses				0				#DIV/0!
70 VEHICLES (number)	**97**	339,500	16,975	**356,475**	**$ 3,675**		**24%**	**0**
70.01 Light Rail	97	339,500	16,975	356,475	$ 3,675			0
70.02 Heavy Rail	0	0	0	0				0
70.03 Commuter Rail	0	0	0	0				0
70.04 Bus	0	0	0	0				0
70.05 Other				0				0
70.06 Non-revenue vehicles				0				0
70.07 Spare parts				0				0
80 PROFESSIONAL SERVICES (applies to Cats. 10-50)	12.52	184,869	25,820	**210,689**	**$ 16,826**	**27%**	**14%**	**0**
80.01 Preliminary Engineering		18,487	2,773	21,260				0
80.02 Final Design		43,136	6,470	49,606				0
80.03 Project Management for Design and Construction		61,623	9,243	70,866				0
80.04 Construction Administration & Management		30,811	4,622	35,433				0
80.05 Professional Liability and other Non-Construction Insurance				0				0
80.06 Legal; Permits; Review Fees by other agencies, cities, etc.		6,162	678	6,840				0
80.07 Surveys, Testing, Investigation, Inspection		12,325	1,849	14,173				0
80.08 Start up		12,325	185	12,509				0
Subtotal (10 - 80)	12.52	1,169,611	187,785	**1,357,396**	**$ 108,403**		**91%**	**0**
90 UNALLOCATED CONTINGENCY				**135,740**			**9%**	**0**
Subtotal (10 - 90)	12.52			**1,493,136**	**$ 119,243**		**100%**	**0**
100 FINANCE CHARGES				**0**			**0%**	**0**
Total Project Cost (10 - 100)	12.52			**1,493,136**	**$ 119,243**		**100%**	**0**
Allocated Contingency as % of Base Yr Dollars w/o Contingency				16.06%				
Unallocated Contingency as % of Base Yr Dollars w/o Contingency				11.61%				
Total Contingency as % of Base Yr Dollars w/o Contingency				27.66%				
Unallocated Contingency as % of Subtotal (10 - 80)				10.00%				
YOE Construction Cost per Mile (X000)								$0
YOE Total Project Cost per Mile Not Including Vehicles (X000)								$0
YOE Total Project Cost per Mile (X000)								$0

M A I N W O R K S H E E T - B U I L D A L T E R N A T I V E

(Rev.11, May 2, 2008)

PEROW/WSAB Corridor AA

LRT Alternative

Segment 1 West Bank Option 2

Today's Date **3/16/12**

Yr of Base Year $ 2010

Yr of Revenue Ops 2010

	Quantity	Base Year Dollars w/o Contingency (X000)	Base Year Dollars Allocated Contingency (X000)	Base Year Dollars TOTAL (X000)	Base Year Dollars Unit Cost (X000)	Base Year Dollars Percentage of Construction Cost	Base Year Dollars Percentage of Total Project Cost	YOE Dollars Total (X000)
10 GUIDEWAY & TRACK ELEMENTS (route miles)	**12.89**	192,681	36,217	**228,898**	**$ 17,763**	**30%**	**15%**	**0**
10.01 Guideway: At-grade exclusive right-of-way	10.94	36916.95	9,229	46,146	$ 4,217			0
10.02 Guideway: At-grade semi-exclusive (allows cross-traffic)	0.00	0.00	0	0				0
10.03 Guideway: At-grade in mixed traffic	0.00	0.00	0	0				0
10.04 Guideway: Aerial structure	1.94	104900.00	26,225	131,125	$ 67,449			0
10.05 Guideway: Built-up fill	0.00	0.00	0	0				0
10.06 Guideway: Underground cut & cover	0.00	0.00	0	0				0
10.07 Guideway: Underground tunnel	0.00	0.00	0	0				0
10.08 Guideway: Retained cut or fill	0.00	0.00	0	0				0
10.09 Track: Direct fixation		9,400	141	9,541				0
10.10 Track: Embedded		0	0	0				0
10.11 Track: Ballasted		33,964	509	34,473				0
10.12 Track: Special (switches, turnouts)		7,500	113	7,613				0
10.13 Track: Vibration and noise dampening		0	0	0				0
20 STATIONS, STOPS, TERMINALS, INTERMODAL (number)	**6**	34,506	8,627	**43,133**	**$ 7,189**	**6%**	**3%**	**0**
20.01 At-grade station, stop, shelter, mall, terminal, platform	6	34506	8,627	43,133	$ 7,189			0
20.02 Aerial station, stop, shelter, mall, terminal, platform	0	0	0	0				0
20.03 Underground station, stop, shelter, mall, terminal, platform	0	0	0	0				0
20.04 Other stations, landings, terminals: Intermodal, ferry, trolley, etc.	0	0	0	0				0
20.05 Joint development		0	0	0				0
20.06 Automobile parking multi-story structure		0	0	0				0
20.07 Elevators, escalators		0	0	0				0
30 SUPPORT FACILITIES: YARDS, SHOPS, ADMIN. BLDGS	12.89	160,000	24,000	**184,000**	**$ 14,279**	**24%**	**12%**	**0**
30.01 Administration Building: Office, sales, storage, revenue counting				0				0
30.02 Light Maintenance Facility				0				0
30.03 Heavy Maintenance Facility		160,000	24,000	184,000				0
30.04 Storage or Maintenance of Way Building				0				0
30.05 Yard and Yard Track				0				0
40 SITEWORK & SPECIAL CONDITIONS	12.89	50,400	15,120	**65,520**	**$ 5,085**	**9%**	**4%**	**0**
40.01 Demolition, Clearing, Earthwork		0	0	0				0
40.02 Site Utilities, Utility Relocation		17,400	5,220	22,620				0
40.03 Haz. mat'l, contam'd soil removal/mitigation, ground water treatments		0	0	0				0
40.04 Environmental mitigation, e.g. wetlands, historic/archeologic, parks		0	0	0				0
40.05 Site structures including retaining walls, sound walls		0	0	0				0
40.06 Pedestrian / bike access and accommodation, landscaping		33,000	9,900	42,900				0
40.07 Automobile, bus, van accessways including roads, parking lots				0				0
40.08 Temporary Facilities and other indirect costs during construction				0				0
50 SYSTEMS	12.89	185,900	55,770	**241,670**	**$ 18,755**	**32%**	**16%**	**0**
50.01 Train control and signals		39,100	11,730	50,830				0
50.02 Traffic signals and crossing protection		13,400	4,020	17,420				0
50.03 Traction power supply: substations		34,800	10,440	45,240				0
50.04 Traction power distribution: catenary and third rail		35,800	10,740	46,540				0
50.05 Communications		49,600	14,880	64,480				0
50.06 Fare collection system and equipment		13,200	3,960	17,160				0
50.07 Central Control		0	0	0				0
Construction Subtotal (10 - 50)	12.89	623,487	139,734	**763,220**	**$ 59,229**	**100%**	**52%**	**0**
60 ROW, LAND, EXISTING IMPROVEMENTS	12.89	0	0	**0**	**$ -**		**0%**	**0**
60.01 Purchase or lease of real estate		0	0	0				#DIV/0!
60.02 Relocation of existing households and businesses				0				#DIV/0!
70 VEHICLES (number)	**104**	364,000	18,200	**382,200**	**$ 3,675**		**26%**	**0**
70.01 Light Rail	104	364,000	18,200	382,200	$ 3,675			0
70.02 Heavy Rail	0	0	0	0				0
70.03 Commuter Rail	0	0	0	0				0
70.04 Bus	0	0	0	0				0
70.05 Other				0				0
70.06 Non-revenue vehicles				0				0
70.07 Spare parts				0				0
80 PROFESSIONAL SERVICES (applies to Cats. 10-50)	12.89	176,800	24,693	**201,493**	**$ 15,637**	**26%**	**14%**	**0**
80.01 Preliminary Engineering		17,680	2,652	20,332				0
80.02 Final Design		41,253	6,188	47,441				0
80.03 Project Management for Design and Construction		58,933	8,840	67,773				0
80.04 Construction Administration & Management		29,467	4,420	33,887				0
80.05 Professional Liability and other Non-Construction Insurance				0				0
80.06 Legal; Permits; Review Fees by other agencies, cities, etc.		5,893	648	6,542				0
80.07 Surveys, Testing, Investigation, Inspection		11,787	1,768	13,555				0
80.08 Start up		11,787	177	11,963				0
Subtotal (10 - 80)	12.89	1,164,287	182,627	**1,346,914**	**$ 104,526**		**91%**	**0**
90 UNALLOCATED CONTINGENCY				**134,691**			**9%**	**0**
Subtotal (10 - 90)	12.89			**1,481,605**	**$ 114,978**		**100%**	**0**
100 FINANCE CHARGES				**0**			**0%**	**0**
Total Project Cost (10 - 100)	12.89			**1,481,605**	**$ 114,978**		**100%**	**0**
Allocated Contingency as % of Base Yr Dollars w/o Contingency				15.69%				
Unallocated Contingency as % of Base Yr Dollars w/o Contingency				11.57%				
Total Contingency as % of Base Yr Dollars w/o Contingency				27.25%				
Unallocated Contingency as % of Subtotal (10 - 80)				10.00%				
YOE Construction Cost per Mile (X000)								$0
YOE Total Project Cost per Mile Not Including Vehicles (X000)								$0
YOE Total Project Cost per Mile (X000)								$0

MAIN WORKSHEET - BUILD ALTERNATIVE

(Rev.11, May 2, 2008)

PEROW/WSAB Corridor AA

LRT Alternative

Segment 1 West Bank Option 3

Today's Date **3/16/12**

Yr of Base Year $ 2010

Yr of Revenue Ops 2010

	Quantity	Base Year Dollars w/o Contingency (X000)	Base Year Dollars Allocated Contingency (X000)	Base Year Dollars TOTAL (X000)	Base Year Dollars Unit Cost (X000)	Base Year Dollars Percentage of Construction Cost	Base Year Dollars Percentage of Total Project Cost	YOE Dollars Total (X000)
10 GUIDEWAY & TRACK ELEMENTS (route miles)	**11.81**	426,758	94,078	**520,836**	**$ 44,099**	**51%**	**29%**	**0**
10.01 Guideway: At-grade exclusive right-of-way	7.14	24094.77	6,024	30,118	$ 4,217			0
10.02 Guideway: At-grade semi-exclusive (allows cross-traffic)	0.00	0.00	0	0				0
10.03 Guideway: At-grade in mixed traffic	0.00	0.00	0	0				0
10.04 Guideway: Aerial structure	3.21	173300.00	43,325	216,625	$ 67,494			0
10.05 Guideway: Built-up fill	0.00	0.00	0	0				0
10.06 Guideway: Underground cut & cover	1.46	175696.20	43,924	219,620	$ 150,460			0
10.07 Guideway: Underground tunnel	0.00	0.00	0	0				0
10.08 Guideway: Retained cut or fill	0.00	0.00	0	0				0
10.09 Track: Direct fixation		22,700	341	23,041				0
10.10 Track: Embedded		0	0	0				0
10.11 Track: Ballasted		22,167	333	22,500				0
10.12 Track: Special (switches, turnouts)		8,800	132	8,932				0
10.13 Track: Vibration and noise dampening		0	0	0				0
20 STATIONS, STOPS, TERMINALS, INTERMODAL (number)	**7**	40,257	10,064	**50,321**	**$ 7,189**	**5%**	**3%**	**0**
20.01 At-grade station, stop, shelter, mall, terminal, platform	7	40257	10,064	50,321	$ 7,189			0
20.02 Aerial station, stop, shelter, mall, terminal, platform	0	0	0	0				0
20.03 Underground station, stop, shelter, mall, terminal, platform	0	0	0	0				0
20.04 Other stations, landings, terminals: Intermodal, ferry, trolley, etc.	0	0	0	0				0
20.05 Joint development		0	0	0				0
20.06 Automobile parking multi-story structure		0	0	0				0
20.07 Elevators, escalators		0	0	0				0
30 SUPPORT FACILITIES: YARDS, SHOPS, ADMIN. BLDGS	11.81	160,000	24,000	**184,000**	**$ 15,579**	**18%**	**10%**	**0**
30.01 Administration Building: Office, sales, storage, revenue counting				0				0
30.02 Light Maintenance Facility				0				0
30.03 Heavy Maintenance Facility		160,000	24,000	184,000				0
30.04 Storage or Maintenance of Way Building				0				0
30.05 Yard and Yard Track				0				0
40 SITEWORK & SPECIAL CONDITIONS	11.81	40,500	12,150	**52,650**	**$ 4,458**	**5%**	**3%**	**0**
40.01 Demolition, Clearing, Earthwork		0	0	0				0
40.02 Site Utilities, Utility Relocation		14,000	4,200	18,200				0
40.03 Haz. mat'l, contam'd soil removal/mitigation, ground water treatments		0	0	0				0
40.04 Environmental mitigation, e.g. wetlands, historic/archeologic, parks		0	0	0				0
40.05 Site structures including retaining walls, sound walls		0	0	0				0
40.06 Pedestrian / bike access and accommodation, landscaping		26,500	7,950	34,450				0
40.07 Automobile, bus, van accessways including roads, parking lots				0				0
40.08 Temporary Facilities and other indirect costs during construction				0				0
50 SYSTEMS	11.81	156,700	47,010	**203,710**	**$ 17,248**	**20%**	**11%**	**0**
50.01 Train control and signals		31,400	9,420	40,820				0
50.02 Traffic signals and crossing protection		13,400	4,020	17,420				0
50.03 Traction power supply: substations		27,900	8,370	36,270				0
50.04 Traction power distribution: catenary and third rail		28,800	8,640	37,440				0
50.05 Communications		39,800	11,940	51,740				0
50.06 Fare collection system and equipment		15,400	4,620	20,020				0
50.07 Central Control		0	0	0				0
Construction Subtotal (10 - 50)	11.81	824,215	187,302	**1,011,517**	**$ 85,644**	**100%**	**56%**	**0**
60 ROW, LAND, EXISTING IMPROVEMENTS	11.81	0	0	**0**	**$ -**		**0%**	**0**
60.01 Purchase or lease of real estate		0	0	0				#DIV/0!
60.02 Relocation of existing households and businesses				0				#DIV/0!
70 VEHICLES (number)	**97**	339,500	16,975	**356,475**	**$ 3,675**		**20%**	**0**
70.01 Light Rail	97	339,500	16,975	356,475	$ 3,675			0
70.02 Heavy Rail	0	0	0	0				0
70.03 Commuter Rail	0	0	0	0				0
70.04 Bus	0	0	0	0				0
70.05 Other				0				0
70.06 Non-revenue vehicles				0				0
70.07 Spare parts				0				0
80 PROFESSIONAL SERVICES (applies to Cats. 10-50)	11.81	235,272	32,860	**268,132**	**$ 22,702**	**27%**	**15%**	**0**
80.01 Preliminary Engineering		23,527	3,529	27,056				0
80.02 Final Design		54,897	8,235	63,131				0
80.03 Project Management for Design and Construction		78,424	11,764	90,188				0
80.04 Construction Administration & Management		39,212	5,882	45,094				0
80.05 Professional Liability and other Non-Construction Insurance				0				0
80.06 Legal; Permits; Review Fees by other agencies, cities, etc.		7,842	863	8,705				0
80.07 Surveys, Testing, Investigation, Inspection		15,685	2,353	18,038				0
80.08 Start up		15,685	235	15,920				0
Subtotal (10 - 80)	11.81	1,398,987	237,137	**1,636,124**	**$ 138,529**		**91%**	**0**
90 UNALLOCATED CONTINGENCY				**163,612**			**9%**	**0**
Subtotal (10 - 90)	11.81			**1,799,736**	**$ 152,382**		**100%**	**0**
100 FINANCE CHARGES				**0**			**0%**	**0**
Total Project Cost (10 - 100)	11.81			**1,799,736**	**$ 152,382**		**100%**	**0**
Allocated Contingency as % of Base Yr Dollars w/o Contingency				16.95%				
Unallocated Contingency as % of Base Yr Dollars w/o Contingency				11.70%				
Total Contingency as % of Base Yr Dollars w/o Contingency				28.65%				
Unallocated Contingency as % of Subtotal (10 - 80)				10.00%				
YOE Construction Cost per Mile (X000)								$0
YOE Total Project Cost per Mile Not Including Vehicles (X000)								$0
YOE Total Project Cost per Mile (X000)								$0

MAIN WORKSHEET - BUILD ALTERNATIVE

(Rev.11, May 2, 2008)

PEROW/WSAB Corridor AA

LRT Alternative

Segment 2 LA

Today's Date **3/16/12**

Yr of Base Year $ 2010

Yr of Revenue Ops 2010

	Quantity	Base Year Dollars w/o Contingency (X000)	Base Year Dollars Allocated Contingency (X000)	Base Year Dollars TOTAL (X000)	Base Year Dollars Unit Cost (X000)	Base Year Dollars Percentage of Construction Cost	Base Year Dollars Percentage of Total Project Cost	YOE Dollars Total (X000)
10 GUIDEWAY & TRACK ELEMENTS (route miles)	**7.77**	74,684	11,377	**86,060**	**$ 11,081**	**27%**	**20%**	**0**
10.01 Guideway: At-grade exclusive right-of-way	7.42	25043.69	6,261	31,305	$ 4,217			0
10.02 Guideway: At-grade semi-exclusive (allows cross-traffic)	0.00	0.00	0	0				0
10.03 Guideway: At-grade in mixed traffic	0.00	0.00	0	0				0
10.04 Guideway: Aerial structure	0.34	18600.00	4,650	23,250	$ 67,636			0
10.05 Guideway: Built-up fill	0.00	0.00	0	0				0
10.06 Guideway: Underground cut & cover	0.00	0.00	0	0				0
10.07 Guideway: Underground tunnel	0.00	0.00	0	0				0
10.08 Guideway: Retained cut or fill	0.00	0.00	0	0				0
10.09 Track: Direct fixation		1,700	26	1,726				0
10.10 Track: Embedded		0	0	0				0
10.11 Track: Ballasted		23,040	346	23,386				0
10.12 Track: Special (switches, turnouts)		6,300	95	6,395				0
10.13 Track: Vibration and noise dampening		0	0	0				0
20 STATIONS, STOPS, TERMINALS, INTERMODAL (number)	**5**	28,755	7,189	**35,944**	**$ 7,189**	**11%**	**8%**	**0**
20.01 At-grade station, stop, shelter, mall, terminal, platform	5	28755	7,189	35,944	$ 7,189			0
20.02 Aerial station, stop, shelter, mall, terminal, platform	0	0	0	0				0
20.03 Underground station, stop, shelter, mall, terminal, platform	0	0	0	0				0
20.04 Other stations, landings, terminals: Intermodal, ferry, trolley, etc.	0	0	0	0				0
20.05 Joint development		0	0	0				0
20.06 Automobile parking multi-story structure		0	0	0				0
20.07 Elevators, escalators		0	0	0				0
30 SUPPORT FACILITIES: YARDS, SHOPS, ADMIN. BLDGS	7.77	0	0	**0**	**$ -**	**0%**	**0%**	**0**
30.01 Administration Building: Office, sales, storage, revenue counting				0				#DIV/0!
30.02 Light Maintenance Facility				0				#DIV/0!
30.03 Heavy Maintenance Facility		0	0	0				#DIV/0!
30.04 Storage or Maintenance of Way Building				0				#DIV/0!
30.05 Yard and Yard Track				0				#DIV/0!
40 SITEWORK & SPECIAL CONDITIONS	7.77	30,400	9,120	**39,520**	**$ 5,089**	**13%**	**9%**	**0**
40.01 Demolition, Clearing, Earthwork		0	0	0				0
40.02 Site Utilities, Utility Relocation		10,500	3,150	13,650				0
40.03 Haz. mat'l, contam'd soil removal/mitigation, ground water treatments		0	0	0				0
40.04 Environmental mitigation, e.g. wetlands, historic/archeologic, parks		0	0	0				0
40.05 Site structures including retaining walls, sound walls		0	0	0				0
40.06 Pedestrian / bike access and accommodation, landscaping		19,900	5,970	25,870				0
40.07 Automobile, bus, van accessways including roads, parking lots				0				0
40.08 Temporary Facilities and other indirect costs during construction				0				0
50 SYSTEMS	7.77	118,800	35,640	**154,440**	**$ 19,885**	**49%**	**36%**	**0**
50.01 Train control and signals		23,600	7,080	30,680				0
50.02 Traffic signals and crossing protection		7,300	2,190	9,490				0
50.03 Traction power supply: substations		21,000	6,300	27,300				0
50.04 Traction power distribution: catenary and third rail		21,600	6,480	28,080				0
50.05 Communications		29,900	8,970	38,870				0
50.06 Fare collection system and equipment		15,400	4,620	20,020				0
50.07 Central Control		0	0	0				0
Construction Subtotal (10 - 50)	7.77	252,639	63,325	**315,964**	**$ 40,683**	**100%**	**73%**	**0**
60 ROW, LAND, EXISTING IMPROVEMENTS	7.77	0	0	**0**	**$ -**		**0%**	**0**
60.01 Purchase or lease of real estate		0	0	0				#DIV/0!
60.02 Relocation of existing households and businesses				0				#DIV/0!
70 VEHICLES (number)	**0**	0	0	**0**			**0%**	**0**
70.01 Light Rail	0	0	0	0				#DIV/0!
70.02 Heavy Rail	0	0	0	0				#DIV/0!
70.03 Commuter Rail	0	0	0	0				#DIV/0!
70.04 Bus	0	0	0	0				#DIV/0!
70.05 Other				0				#DIV/0!
70.06 Non-revenue vehicles				0				#DIV/0!
70.07 Spare parts				0				#DIV/0!
80 PROFESSIONAL SERVICES (applies to Cats. 10-50)	7.77	67,269	9,395	**76,664**	**$ 9,871**	**24%**	**18%**	**0**
80.01 Preliminary Engineering		6,727	1,009	7,736				0
80.02 Final Design		15,696	2,354	18,050				0
80.03 Project Management for Design and Construction		22,423	3,363	25,786				0
80.04 Construction Administration & Management		11,211	1,682	12,893				0
80.05 Professional Liability and other Non-Construction Insurance				0				0
80.06 Legal; Permits; Review Fees by other agencies, cities, etc.		2,242	247	2,489				0
80.07 Surveys, Testing, Investigation, Inspection		4,485	673	5,157				0
80.08 Start up		4,485	67	4,552				0
Subtotal (10 - 80)	7.77	319,908	72,720	**392,628**	**$ 50,554**		**91%**	**0**
90 UNALLOCATED CONTINGENCY				**39,263**			**9%**	**0**
Subtotal (10 - 90)	7.77			**431,891**	**$ 55,610**		**100%**	**0**
100 FINANCE CHARGES				**0**			**0%**	**0**
Total Project Cost (10 - 100)	7.77			**431,891**	**$ 55,610**		**100%**	**0**
Allocated Contingency as % of Base Yr Dollars w/o Contingency				22.73%				
Unallocated Contingency as % of Base Yr Dollars w/o Contingency				12.27%				
Total Contingency as % of Base Yr Dollars w/o Contingency				35.00%				
Unallocated Contingency as % of Subtotal (10 - 80)				10.00%				
YOE Construction Cost per Mile (X000)								$0
YOE Total Project Cost per Mile Not Including Vehicles (X000)								$0
YOE Total Project Cost per Mile (X000)								$0

M A I N W O R K S H E E T - B U I L D A L T E R N A T I V E

(Rev.11, May 2, 2008)

PEROW/WSAB Corridor AA — Today's Date **3/16/12**

LRT Alternative — Yr of Base Year $ 2010

Segment 2 Orange — Yr of Revenue Ops 2010

	Quantity	Base Year Dollars w/o Contingency (X000)	Base Year Dollars Allocated Contingency (X000)	Base Year Dollars TOTAL (X000)	Base Year Dollars Unit Cost (X000)	Base Year Dollars Percentage of Construction Cost	Base Year Dollars Percentage of Total Project Cost	YOE Dollars Total (X000)
10 GUIDEWAY & TRACK ELEMENTS (route miles)	**9.79**	122,152	20,942	**143,095**	**$ 14,614**	**32%**	**24%**	**0**
10.01 Guideway: At-grade exclusive right-of-way	8.84	29818.94	7,455	37,274	$ 4,217			0
10.02 Guideway: At-grade semi-exclusive (allows cross-traffic)	0.00	0.00	0	0				0
10.03 Guideway: At-grade in mixed traffic	0.00	0.00	0	0				0
10.04 Guideway: Aerial structure	0.95	51500.00	12,875	64,375	$ 67,507			0
10.05 Guideway: Built-up fill	0.00	0.00	0	0				0
10.06 Guideway: Underground cut & cover	0.00	0.00	0	0				0
10.07 Guideway: Underground tunnel	0.00	0.00	0	0				0
10.08 Guideway: Retained cut or fill	0.00	0.00	0	0				0
10.09 Track: Direct fixation		4,600	69	4,669				0
10.10 Track: Embedded		0	0	0				0
10.11 Track: Ballasted		27,433	412	27,845				0
10.12 Track: Special (switches, turnouts)		8,800	132	8,932				0
10.13 Track: Vibration and noise dampening		0	0	0				0
20 STATIONS, STOPS, TERMINALS, INTERMODAL (number)	**7**	40,257	10,064	**50,321**	**$ 7,189**	**11%**	**8%**	**0**
20.01 At-grade station, stop, shelter, mall, terminal, platform	7	40257	10,064	50,321	$ 7,189			0
20.02 Aerial station, stop, shelter, mall, terminal, platform	0	0	0	0				0
20.03 Underground station, stop, shelter, mall, terminal, platform	0	0	0	0				0
20.04 Other stations, landings, terminals: Intermodal, ferry, trolley, etc.	0	0	0	0				0
20.05 Joint development		0	0	0				0
20.06 Automobile parking multi-story structure		0	0	0				0
20.07 Elevators, escalators		0	0	0				0
30 SUPPORT FACILITIES: YARDS, SHOPS, ADMIN. BLDGS	9.79	0	0	**0**	**$ -**	**0%**	**0%**	**0**
30.01 Administration Building: Office, sales, storage, revenue counting				0				#DIV/0!
30.02 Light Maintenance Facility				0				#DIV/0!
30.03 Heavy Maintenance Facility		0	0	0				#DIV/0!
30.04 Storage or Maintenance of Way Building				0				#DIV/0!
30.05 Yard and Yard Track				0				#DIV/0!
40 SITEWORK & SPECIAL CONDITIONS	9.79	38,300	11,490	**49,790**	**$ 5,085**	**11%**	**8%**	**0**
40.01 Demolition, Clearing, Earthwork		0	0	0				0
40.02 Site Utilities, Utility Relocation		13,200	3,960	17,160				0
40.03 Haz. mat'l, contam'd soil removal/mitigation, ground water treatments		0	0	0				0
40.04 Environmental mitigation, e.g. wetlands, historic/archeologic, parks		0	0	0				0
40.05 Site structures including retaining walls, sound walls		0	0	0				0
40.06 Pedestrian / bike access and accommodation, landscaping		25,100	7,530	32,630				0
40.07 Automobile, bus, van accessways including roads, parking lots				0				0
40.08 Temporary Facilities and other indirect costs during construction				0				0
50 SYSTEMS	9.79	154,700	46,410	**201,110**	**$ 20,539**	**45%**	**33%**	**0**
50.01 Train control and signals		29,700	8,910	38,610				0
50.02 Traffic signals and crossing protection		7,300	2,190	9,490				0
50.03 Traction power supply: substations		26,400	7,920	34,320				0
50.04 Traction power distribution: catenary and third rail		27,200	8,160	35,360				0
50.05 Communications		37,700	11,310	49,010				0
50.06 Fare collection system and equipment		26,400	7,920	34,320				0
50.07 Central Control		0	0	0				0
Construction Subtotal (10 - 50)	9.79	355,409	88,906	**444,316**	**$ 45,377**	**100%**	**73%**	**0**
60 ROW, LAND, EXISTING IMPROVEMENTS	9.79	0	0	**0**	**$ -**		**0%**	**0**
60.01 Purchase or lease of real estate		0	0	0				#DIV/0!
60.02 Relocation of existing households and businesses				0				#DIV/0!
70 VEHICLES (number)	**0**	0	0	**0**			**0%**	**0**
70.01 Light Rail	0	0	0	0				#DIV/0!
70.02 Heavy Rail	0	0	0	0				#DIV/0!
70.03 Commuter Rail	0	0	0	0				#DIV/0!
70.04 Bus	0	0	0	0				#DIV/0!
70.05 Other				0				#DIV/0!
70.06 Non-revenue vehicles				0				#DIV/0!
70.07 Spare parts				0				#DIV/0!
80 PROFESSIONAL SERVICES (applies to Cats. 10-50)	9.79	94,512	13,200	**107,712**	**$ 11,000**	**24%**	**18%**	**0**
80.01 Preliminary Engineering		9,451	1,418	10,869				0
80.02 Final Design		22,053	3,308	25,361				0
80.03 Project Management for Design and Construction		31,504	4,726	36,230				0
80.04 Construction Administration & Management		15,752	2,363	18,115				0
80.05 Professional Liability and other Non-Construction Insurance				0				0
80.06 Legal; Permits; Review Fees by other agencies, cities, etc.		3,150	347	3,497				0
80.07 Surveys, Testing, Investigation, Inspection		6,301	945	7,246				0
80.08 Start up		6,301	95	6,395				0
Subtotal (10 - 80)	9.79	449,921	102,107	**552,028**	**$ 56,377**		**91%**	**0**
90 UNALLOCATED CONTINGENCY				**55,203**			**9%**	**0**
Subtotal (10 - 90)	9.79			**607,231**	**$ 62,015**		**100%**	**0**
100 FINANCE CHARGES				**0**			**0%**	**0**
Total Project Cost (10 - 100)	9.79			**607,231**	**$ 62,015**		**100%**	**0**
Allocated Contingency as % of Base Yr Dollars w/o Contingency				22.69%				
Unallocated Contingency as % of Base Yr Dollars w/o Contingency				12.27%				
Total Contingency as % of Base Yr Dollars w/o Contingency				34.96%				
Unallocated Contingency as % of Subtotal (10 - 80)				10.00%				
YOE Construction Cost per Mile (X000)								$0
YOE Total Project Cost per Mile Not Including Vehicles (X000)								$0
YOE Total Project Cost per Mile (X000)								$0

MAIN WORKSHEET - BUILD ALTERNATIVE

(Rev.11, May 2, 2008)

PEROW/WSAB Corridor AA

LRT Alternative

Segment 3 Option (Harbor/1st/SARTC)

Today's Date	**3/16/12**
Yr of Base Year $	2010
Yr of Revenue Ops	2010

	Quantity	Base Year Dollars w/o Contingency (X000)	Base Year Dollars Allocated Contingency (X000)	Base Year Dollars TOTAL (X000)	Base Year Dollars Unit Cost (X000)	Base Year Dollars Percentage of Construction Cost	Base Year Dollars Percentage of Total Project Cost	YOE Dollars Total (X000)
10 GUIDEWAY & TRACK ELEMENTS (route miles)	**5.11**	72,026	12,846	**84,872**	**$ 16,597**	**31%**	**22%**	**0**
10.01 Guideway: At-grade exclusive right-of-way	4.47	15065.70	3,766	18,832	$ 4,217			0
10.02 Guideway: At-grade semi-exclusive (allows cross-traffic)	0.00	0.00	0	0				0
10.03 Guideway: At-grade in mixed traffic	0.00	0.00	0	0				0
10.04 Guideway: Aerial structure	0.65	35000.00	8,750	43,750	$ 67,495			0
10.05 Guideway: Built-up fill	0.00	0.00	0	0				0
10.06 Guideway: Underground cut & cover	0.00	0.00	0	0				0
10.07 Guideway: Underground tunnel	0.00	0.00	0	0				0
10.08 Guideway: Retained cut or fill	0.00	0.00	0	0				0
10.09 Track: Direct fixation		3,100	47	3,147				0
10.10 Track: Embedded		0	0	0				0
10.11 Track: Ballasted		13,860	208	14,068				0
10.12 Track: Special (switches, turnouts)		5,000	75	5,075				0
10.13 Track: Vibration and noise dampening		0	0	0				0
20 STATIONS, STOPS, TERMINALS, INTERMODAL (number)	**4**	49,802	12,451	**62,253**	**$ 15,563**	**23%**	**16%**	**0**
20.01 At-grade station, stop, shelter, mall, terminal, platform	2	11502	2,876	14,378	$ 7,189			0
20.02 Aerial station, stop, shelter, mall, terminal, platform	2	38300	9,575	47,875	$ 23,938			0
20.03 Underground station, stop, shelter, mall, terminal, platform	0	0	0	0				0
20.04 Other stations, landings, terminals: Intermodal, ferry, trolley, etc.	0	0	0	0				0
20.05 Joint development		0	0	0				0
20.06 Automobile parking multi-story structure		0	0	0				0
20.07 Elevators, escalators		0	0	0				0
30 SUPPORT FACILITIES: YARDS, SHOPS, ADMIN. BLDGS	5.11	0	0	**0**	**$ -**	**0%**	**0%**	**0**
30.01 Administration Building: Office, sales, storage, revenue counting				0				#DIV/0!
30.02 Light Maintenance Facility				0				#DIV/0!
30.03 Heavy Maintenance Facility		0	0	0				#DIV/0!
30.04 Storage or Maintenance of Way Building				0				#DIV/0!
30.05 Yard and Yard Track				0				#DIV/0!
40 SITEWORK & SPECIAL CONDITIONS	5.11	20,000	6,000	**26,000**	**$ 5,085**	**10%**	**7%**	**0**
40.01 Demolition, Clearing, Earthwork		0	0	0				0
40.02 Site Utilities, Utility Relocation		6,900	2,070	8,970				0
40.03 Haz. mat'l, contam'd soil removal/mitigation, ground water treatments		0	0	0				0
40.04 Environmental mitigation, e.g. wetlands, historic/archeologic, parks		0	0	0				0
40.05 Site structures including retaining walls, sound walls		0	0	0				0
40.06 Pedestrian / bike access and accommodation, landscaping		13,100	3,930	17,030				0
40.07 Automobile, bus, van accessways including roads, parking lots				0				0
40.08 Temporary Facilities and other indirect costs during construction				0				0
50 SYSTEMS	5.11	76,500	22,950	**99,450**	**$ 19,448**	**36%**	**26%**	**0**
50.01 Train control and signals		15,500	4,650	20,150				0
50.02 Traffic signals and crossing protection		2,300	690	2,990				0
50.03 Traction power supply: substations		13,800	4,140	17,940				0
50.04 Traction power distribution: catenary and third rail		14,200	4,260	18,460				0
50.05 Communications		19,700	5,910	25,610				0
50.06 Fare collection system and equipment		11,000	3,300	14,300				0
50.07 Central Control		0	0	0				0
Construction Subtotal (10 - 50)	5.11	218,328	54,246	**272,574**	**$ 53,304**	**100%**	**72%**	**0**
60 ROW, LAND, EXISTING IMPROVEMENTS	5.11	0	0	**0**	**$ -**		**0%**	**0**
60.01 Purchase or lease of real estate		0	0	0				#DIV/0!
60.02 Relocation of existing households and businesses				0				#DIV/0!
70 VEHICLES (number)	**0**	0	0	**0**			**0%**	**0**
70.01 Light Rail	0	0	0	0				#DIV/0!
70.02 Heavy Rail	0	0	0	0				#DIV/0!
70.03 Commuter Rail	0	0	0	0				#DIV/0!
70.04 Bus	0	0	0	0				#DIV/0!
70.05 Other				0				#DIV/0!
70.06 Non-revenue vehicles				0				#DIV/0!
70.07 Spare parts				0				#DIV/0!
80 PROFESSIONAL SERVICES (applies to Cats. 10-50)	5.11	62,043	8,665	**70,709**	**$ 13,828**	**26%**	**19%**	**0**
80.01 Preliminary Engineering		6,204	931	7,135				0
80.02 Final Design		14,477	2,172	16,648				0
80.03 Project Management for Design and Construction		20,681	3,102	23,783				0
80.04 Construction Administration & Management		10,341	1,551	11,892				0
80.05 Professional Liability and other Non-Construction Insurance				0				0
80.06 Legal; Permits; Review Fees by other agencies, cities, etc.		2,068	227	2,296				0
80.07 Surveys, Testing, Investigation, Inspection		4,136	620	4,757				0
80.08 Start up		4,136	62	4,198				0
Subtotal (10 - 80)	5.11	280,372	62,912	**343,283**	**$ 67,132**		**91%**	**0**
90 UNALLOCATED CONTINGENCY				**34,328**			**9%**	**0**
Subtotal (10 - 90)	5.11			**377,612**	**$ 73,845**		**100%**	**0**
100 FINANCE CHARGES				**0**			**0%**	**0**
Total Project Cost (10 - 100)	5.11			**377,612**	**$ 73,845**		**100%**	**0**
Allocated Contingency as % of Base Yr Dollars w/o Contingency				22.44%				
Unallocated Contingency as % of Base Yr Dollars w/o Contingency				12.24%				
Total Contingency as % of Base Yr Dollars w/o Contingency				34.68%				
Unallocated Contingency as % of Subtotal (10 - 80)				10.00%				
YOE Construction Cost per Mile (X000)								$0
YOE Total Project Cost per Mile Not Including Vehicles (X000)								$0
YOE Total Project Cost per Mile (X000)								$0

MAIN WORKSHEET - BUILD ALTERNATIVE

(Rev.11, May 2, 2008)

PEROW/WSAB Corridor AA

Low Speed Maglev Alternative

Segment 1 East Bank Option

Today's Date **3/16/12**

Yr of Base Year $ 2010

Yr of Revenue Ops 2010

	Quantity	Base Year Dollars w/o Contingency (X000)	Base Year Dollars Allocated Contingency (X000)	Base Year Dollars TOTAL (X000)	Base Year Dollars Unit Cost (X000)	Base Year Dollars Percentage of Construction Cost	Base Year Dollars Percentage of Total Project Cost	YOE Dollars Total (X000)
10 GUIDEWAY & TRACK ELEMENTS (route miles)	**11.98**	654,400	165,475	**819,875**	**$ 68,419**	**45%**	**29%**	**1,058,932**
10.01 Guideway: At-grade exclusive right-of-way	0.00	0.00	0	0				0
10.02 Guideway: At-grade semi-exclusive (allows cross-traffic)	0.00	0.00	0	0				0
10.03 Guideway: At-grade in mixed traffic	0.00	0.00	0	0				0
10.04 Guideway: Aerial structure	11.98	646900.00	161,725	808,625	$ 67,480			1,044,402
10.05 Guideway: Built-up fill	0.00	0.00	0	0				0
10.06 Guideway: Underground cut & cover	0.00	0.00	0	0				0
10.07 Guideway: Underground tunnel	0.00	0.00	0	0				0
10.08 Guideway: Retained cut or fill	0.00	0.00	0	0				0
10.09 Track: Direct fixation		0	0	0				0
10.10 Track: Embedded		0	0	0				0
10.11 Track: Ballasted		0	0	0				0
10.12 Track: Special (switches, turnouts)		7,500	3,750	11,250				14,530
10.13 Track: Vibration and noise dampening		0	0	0				0
20 STATIONS, STOPS, TERMINALS, INTERMODAL (number)	**6**	120,800	30,200	**151,000**	**$ 25,167**	**8%**	**5%**	**195,028**
20.01 At-grade station, stop, shelter, mall, terminal, platform	0	0	0	0				0
20.02 Aerial station, stop, shelter, mall, terminal, platform	6	115000	28,750	143,750	$ 23,958			185,664
20.03 Underground station, stop, shelter, mall, terminal, platform	0	0	0	0				0
20.04 Other stations, landings, terminals: Intermodal, ferry, trolley, etc.	0	0	0	0				0
20.05 Joint development		0	0	0				0
20.06 Automobile parking multi-story structure		0	0	0				0
20.07 Elevators, escalators		5,800	1,450	7,250				9,364
30 SUPPORT FACILITIES: YARDS, SHOPS, ADMIN. BLDGS	11.98	160,000	24,000	**184,000**	**$ 15,355**	**10%**	**6%**	**237,650**
30.01 Administration Building: Office, sales, storage, revenue counting				0				0
30.02 Light Maintenance Facility				0				0
30.03 Heavy Maintenance Facility		160,000	24,000	184,000				237,650
30.04 Storage or Maintenance of Way Building				0				0
30.05 Yard and Yard Track				0				0
40 SITEWORK & SPECIAL CONDITIONS	11.98	32,400	9,720	**42,120**	**$ 3,515**	**2%**	**1%**	**54,401**
40.01 Demolition, Clearing, Earthwork		0	0	0				0
40.02 Site Utilities, Utility Relocation		16,200	4,860	21,060				27,201
40.03 Haz. mat'l, contam'd soil removal/mitigation, ground water treatments		0	0	0				0
40.04 Environmental mitigation, e.g. wetlands, historic/archeologic, parks		0	0	0				0
40.05 Site structures including retaining walls, sound walls		0	0	0				0
40.06 Pedestrian / bike access and accommodation, landscaping		16,200	4,860	21,060				27,201
40.07 Automobile, bus, van accessways including roads, parking lots				0				0
40.08 Temporary Facilities and other indirect costs during construction				0				0
50 SYSTEMS	11.98	421,500	189,510	**611,010**	**$ 50,989**	**34%**	**21%**	**789,167**
50.01 Train control and signals		46,900	14,070	60,970				78,747
50.02 Traffic signals and crossing protection		0	0	0				0
50.03 Traction power supply: substations		88,900	44,450	133,350				172,232
50.04 Traction power distribution: catenary and third rail		226,400	113,200	339,600				438,620
50.05 Communications		46,100	13,830	59,930				77,404
50.06 Fare collection system and equipment		13,200	3,960	17,160				22,163
50.07 Central Control		0	0	0				0
Construction Subtotal (10 - 50)	11.98	1,389,100	418,905	**1,808,005**	**$ 150,879**	**100%**	**63%**	**2,335,179**
60 ROW, LAND, EXISTING IMPROVEMENTS	11.98	68,900	27,560	**96,460**	**$ 8,050**		**3%**	**124,586**
60.01 Purchase or lease of real estate		68,900	27,560	96,460				124,586
60.02 Relocation of existing households and businesses				0				0
70 VEHICLES (number)	**72**	360,000	180,000	**540,000**	**$ 7,500**		**19%**	**697,452**
70.01 Light Rail	0	0	0	0				0
70.02 Heavy Rail	0	0	0	0				0
70.03 Commuter Rail	0	0	0	0				0
70.04 Bus	0	0	0	0				0
70.05 Other	72	360,000	180,000	540,000	$ 7,500			697,452
70.06 Non-revenue vehicles				0				0
70.07 Spare parts				0				0
80 PROFESSIONAL SERVICES (applies to Cats. 10-50)	11.98	126,740	17,701	**144,442**	**$ 12,054**	**8%**	**5%**	**186,557**
80.01 Preliminary Engineering		12,674	1,901	14,575				18,825
80.02 Final Design		29,573	4,436	34,009				43,925
80.03 Project Management for Design and Construction		42,247	6,337	48,584				62,750
80.04 Construction Administration & Management		21,123	3,169	24,292				31,375
80.05 Professional Liability and other Non-Construction Insurance				0				0
80.06 Legal; Permits; Review Fees by other agencies, cities, etc.		4,225	465	4,689				6,057
80.07 Surveys, Testing, Investigation, Inspection		8,449	1,267	9,717				12,550
80.08 Start up		8,449	127	8,576				11,077
Subtotal (10 - 80)	11.98	1,944,740	644,166	**2,588,907**	**$ 216,046**		**91%**	**3,343,774**
90 UNALLOCATED CONTINGENCY				**258,891**			**9%**	**0**
Subtotal (10 - 90)	11.98			**2,847,797**	**$ 237,650**		**100%**	**3,343,774**
100 FINANCE CHARGES				**0**			**0%**	**0**
Total Project Cost (10 - 100)	11.98			**2,847,797**	**$ 237,650**		**100%**	**3,343,774**
Allocated Contingency as % of Base Yr Dollars w/o Contingency				33.12%				
Unallocated Contingency as % of Base Yr Dollars w/o Contingency				13.31%				
Total Contingency as % of Base Yr Dollars w/o Contingency				46.44%				
Unallocated Contingency as % of Subtotal (10 - 80)				10.00%				
YOE Construction Cost per Mile (X000)								$194,872
YOE Total Project Cost per Mile Not Including Vehicles (X000)								$220,837
YOE Total Project Cost per Mile (X000)								$279,040

MAIN WORKSHEET - BUILD ALTERNATIVE

(Rev.11, May 2, 2008)

PEROW/WSAB Corridor AA

Low Speed Maglev Alternative

Segment 1 West Bank Option 1

Today's Date **3/16/12**

Yr of Base Year $ 2010

Yr of Revenue Ops 2010

	Quantity	Base Year Dollars w/o Contingency (X000)	Base Year Dollars Allocated Contingency (X000)	Base Year Dollars TOTAL (X000)	Base Year Dollars Unit Cost (X000)	Base Year Dollars Percentage of Construction Cost	Base Year Dollars Percentage of Total Project Cost	YOE Dollars Total (X000)
10 GUIDEWAY & TRACK ELEMENTS (route miles)	**11.94**	652,100	164,900	**817,000**	**$ 68,422**	**45%**	**29%**	**1,055,219**
10.01 Guideway: At-grade exclusive right-of-way	0.00	0.00	0	0				0
10.02 Guideway: At-grade semi-exclusive (allows cross-traffic)	0.00	0.00	0	0				0
10.03 Guideway: At-grade in mixed traffic	0.00	0.00	0	0				0
10.04 Guideway: Aerial structure	11.94	644600.00	161,150	805,750	$ 67,480			1,040,689
10.05 Guideway: Built-up fill	0.00	0.00	0	0				0
10.06 Guideway: Underground cut & cover	0.00	0.00	0	0				0
10.07 Guideway: Underground tunnel	0.00	0.00	0	0				0
10.08 Guideway: Retained cut or fill	0.00	0.00	0	0				0
10.09 Track: Direct fixation		0	0	0				0
10.10 Track: Embedded		0	0	0				0
10.11 Track: Ballasted		0	0	0				0
10.12 Track: Special (switches, turnouts)		7,500	3,750	11,250				14,530
10.13 Track: Vibration and noise dampening		0	0	0				0
20 STATIONS, STOPS, TERMINALS, INTERMODAL (number)	**6**	120,800	30,200	**151,000**	**$ 25,167**	**8%**	**5%**	**195,028**
20.01 At-grade station, stop, shelter, mall, terminal, platform	0	0	0	0				0
20.02 Aerial station, stop, shelter, mall, terminal, platform	6	115000	28,750	143,750	$ 23,958			185,664
20.03 Underground station, stop, shelter, mall, terminal, platform	0	0	0	0				0
20.04 Other stations, landings, terminals: Intermodal, ferry, trolley, etc.	0	0	0	0				0
20.05 Joint development		0	0	0				0
20.06 Automobile parking multi-story structure		0	0	0				0
20.07 Elevators, escalators		5,800	1,450	7,250				9,364
30 SUPPORT FACILITIES: YARDS, SHOPS, ADMIN. BLDGS	11.94	160,000	24,000	**184,000**	**$ 15,410**	**10%**	**6%**	**237,650**
30.01 Administration Building: Office, sales, storage, revenue counting				0				0
30.02 Light Maintenance Facility				0				0
30.03 Heavy Maintenance Facility		160,000	24,000	184,000				237,650
30.04 Storage or Maintenance of Way Building				0				0
30.05 Yard and Yard Track				0				0
40 SITEWORK & SPECIAL CONDITIONS	11.94	32,200	9,660	**41,860**	**$ 3,506**	**2%**	**1%**	**54,065**
40.01 Demolition, Clearing, Earthwork		0	0	0				0
40.02 Site Utilities, Utility Relocation		16,100	4,830	20,930				27,033
40.03 Haz. mat'l, contam'd soil removal/mitigation, ground water treatments		0	0	0				0
40.04 Environmental mitigation, e.g. wetlands, historic/archeologic, parks		0	0	0				0
40.05 Site structures including retaining walls, sound walls		0	0	0				0
40.06 Pedestrian / bike access and accommodation, landscaping		16,100	4,830	20,930				27,033
40.07 Automobile, bus, van accessways including roads, parking lots				0				0
40.08 Temporary Facilities and other indirect costs during construction				0				0
50 SYSTEMS	11.94	420,000	188,840	**608,840**	**$ 50,989**	**34%**	**21%**	**786,364**
50.01 Train control and signals		46,700	14,010	60,710				78,412
50.02 Traffic signals and crossing protection		0	0	0				0
50.03 Traction power supply: substations		88,600	44,300	132,900				171,651
50.04 Traction power distribution: catenary and third rail		225,600	112,800	338,400				437,070
50.05 Communications		45,900	13,770	59,670				77,068
50.06 Fare collection system and equipment		13,200	3,960	17,160				22,163
50.07 Central Control		0	0	0				0
Construction Subtotal (10 - 50)	11.94	1,385,100	417,600	**1,802,700**	**$ 150,973**	**100%**	**63%**	**2,328,327**
60 ROW, LAND, EXISTING IMPROVEMENTS	11.94	68,900	27,560	**96,460**	**$ 8,078**		**3%**	**124,586**
60.01 Purchase or lease of real estate		68,900	27,560	96,460				124,586
60.02 Relocation of existing households and businesses				0				0
70 VEHICLES (number)	**72**	360,000	180,000	**540,000**	**$ 7,500**		**19%**	**697,452**
70.01 Light Rail	0	0	0	0				0
70.02 Heavy Rail	0	0	0	0				0
70.03 Commuter Rail	0	0	0	0				0
70.04 Bus	0	0	0	0				0
70.05 Other	72	360,000	180,000	540,000	$ 7,500			697,452
70.06 Non-revenue vehicles				0				0
70.07 Spare parts				0				0
80 PROFESSIONAL SERVICES (applies to Cats. 10-50)	11.94	126,290	17,638	**143,928**	**$ 12,054**	**8%**	**5%**	**185,894**
80.01 Preliminary Engineering		12,629	1,894	14,523				18,758
80.02 Final Design		29,468	4,420	33,888				43,769
80.03 Project Management for Design and Construction		42,097	6,314	48,411				62,527
80.04 Construction Administration & Management		21,048	3,157	24,205				31,263
80.05 Professional Liability and other Non-Construction Insurance				0				0
80.06 Legal; Permits; Review Fees by other agencies, cities, etc.		4,210	463	4,673				6,035
80.07 Surveys, Testing, Investigation, Inspection		8,419	1,263	9,682				12,505
80.08 Start up		8,419	126	8,546				11,037
Subtotal (10 - 80)	11.94	1,940,290	642,798	**2,583,088**	**$ 216,329**		**91%**	**3,336,258**
90 UNALLOCATED CONTINGENCY				**258,309**			**9%**	**0**
Subtotal (10 - 90)	11.94			**2,841,397**	**$ 237,962**		**100%**	**3,336,258**
100 FINANCE CHARGES				**0**			**0%**	**0**
Total Project Cost (10 - 100)	11.94			**2,841,397**	**$ 237,962**		**100%**	**3,336,258**
Allocated Contingency as % of Base Yr Dollars w/o Contingency				33.13%				
Unallocated Contingency as % of Base Yr Dollars w/o Contingency				13.31%				
Total Contingency as % of Base Yr Dollars w/o Contingency				46.44%				
Unallocated Contingency as % of Subtotal (10 - 80)				10.00%				
YOE Construction Cost per Mile (X000)								$194,994
YOE Total Project Cost per Mile Not Including Vehicles (X000)								$220,996
YOE Total Project Cost per Mile (X000)								$279,406

M A I N W O R K S H E E T - B U I L D A L T E R N A T I V E

(Rev.11, May 2, 2008)

PEROW/WSAB Corridor AA

Today's Date **3/16/12**

Yr of Base Year $ 2010

Segment 1 West Bank Option 2

Yr of Revenue Ops 2010

	Quantity	Base Year Dollars w/o Contingency (X000)	Base Year Dollars Allocated Contingency (X000)	Base Year Dollars TOTAL (X000)	Base Year Dollars Unit Cost (X000)	Base Year Dollars Percentage of Construction Cost	Base Year Dollars Percentage of Total Project Cost	YOE Dollars Total (X000)
10 GUIDEWAY & TRACK ELEMENTS (route miles)	**12.23**	669,200	169,500	**838,700**	**$ 68,562**	**45%**	**25%**	**1,083,246**
10.01 Guideway: At-grade exclusive right-of-way	0.00	0.00	0	0				0
10.02 Guideway: At-grade semi-exclusive (allows cross-traffic)	0.00	0.00	0	0				0
10.03 Guideway: At-grade in mixed traffic	0.00	0.00	0	0				0
10.04 Guideway: Aerial structure	12.23	660400.00	165,100	825,500	$ 67,483			1,066,197
10.05 Guideway: Built-up fill	0.00	0.00	0	0				0
10.06 Guideway: Underground cut & cover	0.00	0.00	0	0				0
10.07 Guideway: Underground tunnel	0.00	0.00	0	0				0
10.08 Guideway: Retained cut or fill	0.00	0.00	0	0				0
10.09 Track: Direct fixation		0	0	0				0
10.10 Track: Embedded		0	0	0				0
10.11 Track: Ballasted		0	0	0				0
10.12 Track: Special (switches, turnouts)		8,800	4,400	13,200				17,049
10.13 Track: Vibration and noise dampening		0	0	0				0
20 STATIONS, STOPS, TERMINALS, INTERMODAL (number)	**7**	121,700	30,425	**152,125**	**$ 21,732**	**8%**	**4%**	**196,481**
20.01 At-grade station, stop, shelter, mall, terminal, platform	0	0	0	0				0
20.02 Aerial station, stop, shelter, mall, terminal, platform	7	115000	28,750	143,750	$ 20,536			185,664
20.03 Underground station, stop, shelter, mall, terminal, platform	0	0	0	0				0
20.04 Other stations, landings, terminals: Intermodal, ferry, trolley, etc.	0	0	0	0				0
20.05 Joint development		0	0	0				0
20.06 Automobile parking multi-story structure		0	0	0				0
20.07 Elevators, escalators		6,700	1,675	8,375				10,817
30 SUPPORT FACILITIES: YARDS, SHOPS, ADMIN. BLDGS	12.23	160,000	24,000	**184,000**	**$ 15,042**	**10%**	**5%**	**237,650**
30.01 Administration Building: Office, sales, storage, revenue counting				0				0
30.02 Light Maintenance Facility				0				0
30.03 Heavy Maintenance Facility		160,000	24,000	184,000				237,650
30.04 Storage or Maintenance of Way Building				0				0
30.05 Yard and Yard Track				0				0
40 SITEWORK & SPECIAL CONDITIONS	12.23	33,000	9,900	**42,900**	**$ 3,507**	**2%**	**1%**	**55,409**
40.01 Demolition, Clearing, Earthwork		0	0	0				0
40.02 Site Utilities, Utility Relocation		16,500	4,950	21,450				27,704
40.03 Haz. mat'l, contam'd soil removal/mitigation, ground water treatments		0	0	0				0
40.04 Environmental mitigation, e.g. wetlands, historic/archeologic, parks		0	0	0				0
40.05 Site structures including retaining walls, sound walls		0	0	0				0
40.06 Pedestrian / bike access and accommodation, landscaping		16,500	4,950	21,450				27,704
40.07 Automobile, bus, van accessways including roads, parking lots				0				0
40.08 Temporary Facilities and other indirect costs during construction				0				0
50 SYSTEMS	12.23	435,600	195,060	**630,660**	**$ 51,555**	**34%**	**19%**	**814,546**
50.01 Train control and signals		47,900	14,370	62,270				80,427
50.02 Traffic signals and crossing protection		0	0	0				0
50.03 Traction power supply: substations		90,800	45,400	136,200				175,913
50.04 Traction power distribution: catenary and third rail		231,100	115,550	346,650				447,725
50.05 Communications		47,100	14,130	61,230				79,083
50.06 Fare collection system and equipment		18,700	5,610	24,310				31,398
50.07 Central Control		0	0	0				0
Construction Subtotal (10 - 50)	12.23	1,419,500	428,885	**1,848,385**	**$ 151,101**	**100%**	**54%**	**2,387,333**
60 ROW, LAND, EXISTING IMPROVEMENTS	12.23	382,000	152,800	**534,800**	**$ 43,719**		**16%**	**690,736**
60.01 Purchase or lease of real estate		382,000	152,800	534,800				690,736
60.02 Relocation of existing households and businesses				0				0
70 VEHICLES (number)	**75**	375,000	187,500	**562,500**	**$ 7,500**		**17%**	**726,512**
70.01 Light Rail	0	0	0	0				0
70.02 Heavy Rail	0	0	0	0				0
70.03 Commuter Rail	0	0	0	0				0
70.04 Bus	0	0	0	0				0
70.05 Other	75	375,000	187,500	562,500	$ 7,500			726,512
70.06 Non-revenue vehicles				0				0
70.07 Spare parts				0				0
80 PROFESSIONAL SERVICES (applies to Cats. 10-50)	12.23	130,975	18,293	**149,268**	**$ 12,202**	**8%**	**4%**	**192,791**
80.01 Preliminary Engineering		13,098	1,965	15,062				19,454
80.02 Final Design		30,561	4,584	35,145				45,392
80.03 Project Management for Design and Construction		43,658	6,549	50,207				64,846
80.04 Construction Administration & Management		21,829	3,274	25,104				32,423
80.05 Professional Liability and other Non-Construction Insurance				0				0
80.06 Legal; Permits; Review Fees by other agencies, cities, etc.		4,366	480	4,846				6,259
80.07 Surveys, Testing, Investigation, Inspection		8,732	1,310	10,041				12,969
80.08 Start up		8,732	131	8,863				11,447
Subtotal (10 - 80)	12.23	2,307,475	787,478	**3,094,953**	**$ 253,005**		**91%**	**3,997,372**
90 UNALLOCATED CONTINGENCY				**309,495**			**9%**	**0**
Subtotal (10 - 90)	12.23			**3,404,448**	**$ 278,306**		**100%**	**3,997,372**
100 FINANCE CHARGES				**0**			**0%**	**0**
Total Project Cost (10 - 100)	12.23			**3,404,448**	**$ 278,306**		**100%**	**3,997,372**
Allocated Contingency as % of Base Yr Dollars w/o Contingency				34.13%				
Unallocated Contingency as % of Base Yr Dollars w/o Contingency				13.41%				
Total Contingency as % of Base Yr Dollars w/o Contingency				47.54%				
Unallocated Contingency as % of Subtotal (10 - 80)				10.00%				
YOE Construction Cost per Mile (X000)								$195,159
YOE Total Project Cost per Mile Not Including Vehicles (X000)								$267,385
YOE Total Project Cost per Mile (X000)								$326,776

MAIN WORKSHEET-BUILD ALTERNATIVE

(Rev.11, May 2, 2008)

PEROW/WSAB Corridor AA

Low Speed Maglev Alternative

Segment 1 West Bank Option 3

Today's Date **3/16/12**

Yr of Base Year $ 2010

Yr of Revenue Ops 2010

	Quantity	Base Year Dollars w/o Contingency (X000)	Base Year Dollars Allocated Contingency (X000)	Base Year Dollars TOTAL (X000)	Base Year Dollars Unit Cost (X000)	Base Year Dollars Percentage of Construction Cost	Base Year Dollars Percentage of Total Project Cost	YOE Dollars Total (X000)
10 GUIDEWAY & TRACK ELEMENTS (route miles)	**11.55**	633,700	160,925	**794,625**	**$ 68,781**	**39%**	**21%**	**1,026,320**
10.01 Guideway: At-grade exclusive right-of-way	0.00	0.00	0	0				0
10.02 Guideway: At-grade semi-exclusive (allows cross-traffic)	0.00	0.00	0	0				0
10.03 Guideway: At-grade in mixed traffic	0.00	0.00	0	0				0
10.04 Guideway: Aerial structure	11.55	623700.00	155,925	779,625	$ 67,482			1,006,946
10.05 Guideway: Built-up fill	0.00	0.00	0	0				0
10.06 Guideway: Underground cut & cover	0.00	0.00	0	0				0
10.07 Guideway: Underground tunnel	0.00	0.00	0	0				0
10.08 Guideway: Retained cut or fill	0.00	0.00	0	0				0
10.09 Track: Direct fixation		0	0	0				0
10.10 Track: Embedded		0	0	0				0
10.11 Track: Ballasted		0	0	0				0
10.12 Track: Special (switches, turnouts)		10,000	5,000	15,000				19,374
10.13 Track: Vibration and noise dampening		0	0	0				0
20 STATIONS, STOPS, TERMINALS, INTERMODAL (number)	**8**	167,800	41,950	**209,750**	**$ 26,219**	**10%**	**6%**	**270,908**
20.01 At-grade station, stop, shelter, mall, terminal, platform	0	0	0	0				0
20.02 Aerial station, stop, shelter, mall, terminal, platform	8	153400	38,350	191,750	$ 23,969			247,660
20.03 Underground station, stop, shelter, mall, terminal, platform	0	0	0	0				0
20.04 Other stations, landings, terminals: Intermodal, ferry, trolley, etc.	0	0	0	0				0
20.05 Joint development		0	0	0				0
20.06 Automobile parking multi-story structure		0	0	0				0
20.07 Elevators, escalators		14,400	3,600	18,000				23,248
30 SUPPORT FACILITIES: YARDS, SHOPS, ADMIN. BLDGS	11.55	160,000	24,000	**184,000**	**$ 15,927**	**9%**	**5%**	**237,650**
30.01 Administration Building: Office, sales, storage, revenue counting				0				0
30.02 Light Maintenance Facility				0				0
30.03 Heavy Maintenance Facility		160,000	24,000	184,000				237,650
30.04 Storage or Maintenance of Way Building				0				0
30.05 Yard and Yard Track				0				0
40 SITEWORK & SPECIAL CONDITIONS	11.55	184,600	55,380	**239,980**	**$ 20,772**	**12%**	**6%**	**309,953**
40.01 Demolition, Clearing, Earthwork		0	0	0				0
40.02 Site Utilities, Utility Relocation		169,000	50,700	219,700				283,760
40.03 Haz. mat'l, contam'd soil removal/mitigation, ground water treatments		0	0	0				0
40.04 Environmental mitigation, e.g. wetlands, historic/archeologic, parks		0	0	0				0
40.05 Site structures including retaining walls, sound walls		0	0	0				0
40.06 Pedestrian / bike access and accommodation, landscaping		15,600	4,680	20,280				26,193
40.07 Automobile, bus, van accessways including roads, parking lots				0				0
40.08 Temporary Facilities and other indirect costs during construction				0				0
50 SYSTEMS	11.55	411,300	184,210	**595,510**	**$ 51,546**	**29%**	**16%**	**769,147**
50.01 Train control and signals		45,200	13,560	58,760				75,893
50.02 Traffic signals and crossing protection		0	0	0				0
50.03 Traction power supply: substations		85,800	42,900	128,700				166,226
50.04 Traction power distribution: catenary and third rail		218,300	109,150	327,450				422,927
50.05 Communications		44,400	13,320	57,720				74,550
50.06 Fare collection system and equipment		17,600	5,280	22,880				29,551
50.07 Central Control		0	0	0				0
Construction Subtotal (10 - 50)	11.55	1,557,400	466,465	**2,023,865**	**$ 175,180**	**100%**	**55%**	**2,613,979**
60 ROW, LAND, EXISTING IMPROVEMENTS	11.55	473,000	189,200	**662,200**	**$ 57,318**		**18%**	**855,283**
60.01 Purchase or lease of real estate		473,000	189,200	662,200				855,283
60.02 Relocation of existing households and businesses				0				0
70 VEHICLES (number)	**72**	360,000	180,000	**540,000**	**$ 7,500**		**15%**	**697,452**
70.01 Light Rail	0	0	0	0				0
70.02 Heavy Rail	0	0	0	0				0
70.03 Commuter Rail		0	0	0	#VALUE!			0
70.04 Bus	0	0	0	0				0
70.05 Other	72	360,000	180,000	540,000	$ 7,500			697,452
70.06 Non-revenue vehicles				0				0
70.07 Spare parts				0				0
80 PROFESSIONAL SERVICES (applies to Cats. 10-50)	11.55	123,734	17,282	**141,015**	**$ 12,206**	**7%**	**4%**	**182,132**
80.01 Preliminary Engineering		12,373	1,856	14,229				18,378
80.02 Final Design		28,871	4,331	33,202				42,883
80.03 Project Management for Design and Construction		41,245	6,187	47,431				61,261
80.04 Construction Administration & Management		20,622	3,093	23,716				30,631
80.05 Professional Liability and other Non-Construction Insurance				0				0
80.06 Legal; Permits; Review Fees by other agencies, cities, etc.		4,124	454	4,578				5,913
80.07 Surveys, Testing, Investigation, Inspection		8,249	1,237	9,486				12,252
80.08 Start up		8,249	124	8,373				10,814
Subtotal (10 - 80)	11.55	2,514,134	852,947	**3,367,080**	**$ 291,446**		**91%**	**4,348,845**
90 UNALLOCATED CONTINGENCY				**336,708**			**9%**	**0**
Subtotal (10 - 90)	11.55			**3,703,788**	**$ 320,590**		**100%**	**4,348,845**
100 FINANCE CHARGES				**0**			**0%**	**0**
Total Project Cost (10 - 100)	11.55			**3,703,788**	**$ 320,590**		**100%**	**4,348,845**
Allocated Contingency as % of Base Yr Dollars w/o Contingency				33.93%				
Unallocated Contingency as % of Base Yr Dollars w/o Contingency				13.39%				
Total Contingency as % of Base Yr Dollars w/o Contingency				47.32%				
Unallocated Contingency as % of Subtotal (10 - 80)				10.00%				
YOE Construction Cost per Mile (X000)								$226,259
YOE Total Project Cost per Mile Not Including Vehicles (X000)								$316,055
YOE Total Project Cost per Mile (X000)								$376,425

MAIN WORKSHEET - BUILD ALTERNATIVE

(Rev.11, May 2, 2008)

PEROW/WSAB Corridor AA

Low Speed Maglev Alternative

Segment 2 Los Angeles County Portion

Today's Date **3/16/12**

Yr of Base Year $ 2010

Yr of Revenue Ops 2010

	Quantity	Base Year Dollars w/o Contingency (X000)	Base Year Dollars Allocated Contingency (X000)	Base Year Dollars TOTAL (X000)	Base Year Dollars Unit Cost (X000)	Base Year Dollars Percentage of Construction Cost	Base Year Dollars Percentage of Total Project Cost	YOE Dollars Total (X000)
10 GUIDEWAY & TRACK ELEMENTS (route miles)	**7.77**	793,800	206,395	**1,000,195**	**$ 128,806**	**64%**	**55%**	**1,291,829**
10.01 Guideway: At-grade exclusive right-of-way	0.00	0.00	0	0				0
10.02 Guideway: At-grade semi-exclusive (allows cross-traffic)	0.00	0.00	0	0				0
10.03 Guideway: At-grade in mixed traffic	0.00	0.00	0	0				0
10.04 Guideway: Aerial structure	7.77	749800.00	187,450	937,250	$ 120,700			1,210,531
10.05 Guideway: Built-up fill	0.00	0.00	0	0				0
10.06 Guideway: Underground cut & cover	0.00	0.00	0	0				0
10.07 Guideway: Underground tunnel	0.00	0.00	0	0				0
10.08 Guideway: Retained cut or fill	0.00	0.00	0	0				0
10.09 Track: Direct fixation		37,700	18,850	56,550				73,039
10.10 Track: Embedded		0	0	0				0
10.11 Track: Ballasted		0	0	0				0
10.12 Track: Special (switches, turnouts)		6,300	95	6,395				8,259
10.13 Track: Vibration and noise dampening		0	0	0				0
20 STATIONS, STOPS, TERMINALS, INTERMODAL (number)	**5**	100,700	25,175	**125,875**	**$ 25,175**	**8%**	**7%**	**162,577**
20.01 At-grade station, stop, shelter, mall, terminal, platform	0	0	0	0				0
20.02 Aerial station, stop, shelter, mall, terminal, platform	5	95900	23,975	119,875	$ 23,975			154,828
20.03 Underground station, stop, shelter, mall, terminal, platform	0	0	0	0				0
20.04 Other stations, landings, terminals: Intermodal, ferry, trolley, etc.	0	0	0	0				0
20.05 Joint development		0	0	0				0
20.06 Automobile parking multi-story structure		0	0	0				0
20.07 Elevators, escalators		4,800	1,200	6,000				7,749
30 SUPPORT FACILITIES: YARDS, SHOPS, ADMIN. BLDGS	7.77	0	0	**0**	**$ -**	**0%**	**0%**	**0**
30.01 Administration Building: Office, sales, storage, revenue counting				0				#DIV/0!
30.02 Light Maintenance Facility				0				#DIV/0!
30.03 Heavy Maintenance Facility		0	0	0				#DIV/0!
30.04 Storage or Maintenance of Way Building				0				#DIV/0!
30.05 Yard and Yard Track				0				#DIV/0!
40 SITEWORK & SPECIAL CONDITIONS	7.77	21,000	6,300	**27,300**	**$ 3,516**	**2%**	**2%**	**35,260**
40.01 Demolition, Clearing, Earthwork		0	0	0				0
40.02 Site Utilities, Utility Relocation		10,500	3,150	13,650				17,630
40.03 Haz. mat'l, contam'd soil removal/mitigation, ground water treatments		0	0	0				0
40.04 Environmental mitigation, e.g. wetlands, historic/archeologic, parks		0	0	0				0
40.05 Site structures including retaining walls, sound walls		0	0	0				0
40.06 Pedestrian / bike access and accommodation, landscaping		10,500	3,150	13,650				17,630
40.07 Automobile, bus, van accessways including roads, parking lots				0				0
40.08 Temporary Facilities and other indirect costs during construction				0				0
50 SYSTEMS	7.77	277,100	123,990	**401,090**	**$ 51,653**	**26%**	**22%**	**518,039**
50.01 Train control and signals		30,400	9,120	39,520				51,043
50.02 Traffic signals and crossing protection		1,500	450	1,950				2,519
50.03 Traction power supply: substations		57,600	28,800	86,400				111,592
50.04 Traction power distribution: catenary and third rail		146,700	73,350	220,050				284,212
50.05 Communications		29,900	8,970	38,870				50,204
50.06 Fare collection system and equipment		11,000	3,300	14,300				18,470
50.07 Central Control		0	0	0				0
Construction Subtotal (10 - 50)	7.77	1,192,600	361,860	**1,554,460**	**$ 200,184**	**100%**	**86%**	**2,007,705**
60 ROW, LAND, EXISTING IMPROVEMENTS	7.77	0	0	**0**	**$ -**		**0%**	**0**
60.01 Purchase or lease of real estate		0	0	0				#DIV/0!
60.02 Relocation of existing households and businesses				0				#DIV/0!
70 VEHICLES (number)	**0**	0	0	**0**			**0%**	**0**
70.01 Light Rail	0	0	0	0				#DIV/0!
70.02 Heavy Rail	0	0	0	0				#DIV/0!
70.03 Commuter Rail	0	0	0	0				#DIV/0!
70.04 Bus	0	0	0	0				#DIV/0!
70.05 Other	0	0	0	0				#DIV/0!
70.06 Non-revenue vehicles				0				#DIV/0!
70.07 Spare parts				0				#DIV/0!
80 PROFESSIONAL SERVICES (applies to Cats. 10-50)	7.77	83,405	11,649	**95,054**	**$ 12,241**	**6%**	**5%**	**122,769**
80.01 Preliminary Engineering		8,340	1,251	9,592				12,388
80.02 Final Design		19,461	2,919	22,380				28,906
80.03 Project Management for Design and Construction		27,802	4,170	31,972				41,294
80.04 Construction Administration & Management		13,901	2,085	15,986				20,647
80.05 Professional Liability and other Non-Construction Insurance				0				0
80.06 Legal; Permits; Review Fees by other agencies, cities, etc.		2,780	306	3,086				3,986
80.07 Surveys, Testing, Investigation, Inspection		5,560	834	6,394				8,259
80.08 Start up		5,560	83	5,644				7,289
Subtotal (10 - 80)	7.77	1,276,005	373,508	**1,649,513**	**$ 212,425**		**91%**	**2,130,474**
90 UNALLOCATED CONTINGENCY				**164,951**			**9%**	**0**
Subtotal (10 - 90)	7.77			**1,814,464**	**$ 233,668**		**100%**	**2,130,474**
100 FINANCE CHARGES				**0**			**0%**	**0**
Total Project Cost (10 - 100)	7.77			**1,814,464**	**$ 233,668**		**100%**	**2,130,474**
Allocated Contingency as % of Base Yr Dollars w/o Contingency				29.27%				
Unallocated Contingency as % of Base Yr Dollars w/o Contingency				12.93%				
Total Contingency as % of Base Yr Dollars w/o Contingency				42.20%				
Unallocated Contingency as % of Subtotal (10 - 80)				10.00%				
YOE Construction Cost per Mile (X000)								$258,553
YOE Total Project Cost per Mile Not Including Vehicles (X000)								$274,363
YOE Total Project Cost per Mile (X000)								$274,363

M A I N W O R K S H E E T - B U I L D A L T E R N A T I V E

(Rev.11, May 2, 2008)

PEROW/WSAB Corridor AA — Today's Date **11/11/11**

Low Speed Maglev Alternative — Yr of Base Year $ 2010

Segment 2 Orange County Portion — Yr of Revenue Ops 2010

	Quantity	Base Year Dollars w/o Contingency (X000)	Base Year Dollars Allocated Contingency (X000)	Base Year Dollars TOTAL (X000)	Base Year Dollars Unit Cost (X000)	Base Year Dollars Percentage of Construction Cost	Base Year Dollars Percentage of Total Project Cost	YOE Dollars Total (X000)
10 GUIDEWAY & TRACK ELEMENTS (route miles)	**9.79**	806,200	188,296	**994,496**	**$ 101,566**	**60%**	**51%**	**1,284,469**
10.01 Guideway: At-grade exclusive right-of-way	0.00	0.00	0	0				0
10.02 Guideway: At-grade semi-exclusive (allows cross-traffic)	0.00	0.00	0	0				0
10.03 Guideway: At-grade in mixed traffic	0.00	0.00	0	0				0
10.04 Guideway: Aerial structure	9.79	749800.00	187,450	937,250	$ 95,719			1,210,531
10.05 Guideway: Built-up fill	0.00	0.00	0	0				0
10.06 Guideway: Underground cut & cover	0.00	0.00	0	0				0
10.07 Guideway: Underground tunnel	0.00	0.00	0	0				0
10.08 Guideway: Retained cut or fill	0.00	0.00	0	0				0
10.09 Track: Direct fixation		47,600	714	48,314				62,401
10.10 Track: Embedded		0	0	0				0
10.11 Track: Ballasted		0	0	0				0
10.12 Track: Special (switches, turnouts)		8,800	132	8,932				11,536
10.13 Track: Vibration and noise dampening		0	0	0				0
20 STATIONS, STOPS, TERMINALS, INTERMODAL (number)	**7**	140,900	35,225	**176,125**	**$ 25,161**	**11%**	**9%**	**227,479**
20.01 At-grade station, stop, shelter, mall, terminal, platform	0	0	0	0				0
20.02 Aerial station, stop, shelter, mall, terminal, platform	7	134200	33,550	167,750	$ 23,964			216,662
20.03 Underground station, stop, shelter, mall, terminal, platform	0	0	0	0				0
20.04 Other stations, landings, terminals: Intermodal, ferry, trolley, etc.	0	0	0	0				0
20.05 Joint development		0	0	0				0
20.06 Automobile parking multi-story structure		0	0	0				0
20.07 Elevators, escalators		6,700	1,675	8,375				10,817
30 SUPPORT FACILITIES: YARDS, SHOPS, ADMIN. BLDGS	9.79	0	0	**0**	**$ -**	**0%**	**0%**	**0**
30.01 Administration Building: Office, sales, storage, revenue counting				0				#DIV/0!
30.02 Light Maintenance Facility				0				#DIV/0!
30.03 Heavy Maintenance Facility		0	0	0				#DIV/0!
30.04 Storage or Maintenance of Way Building				0				#DIV/0!
30.05 Yard and Yard Track				0				#DIV/0!
40 SITEWORK & SPECIAL CONDITIONS	9.79	26,400	7,920	**34,320**	**$ 3,505**	**2%**	**2%**	**44,327**
40.01 Demolition, Clearing, Earthwork		0	0	0				0
40.02 Site Utilities, Utility Relocation		13,200	3,960	17,160				22,163
40.03 Haz. mat'l, contam'd soil removal/mitigation, ground water treatments		0	0	0				0
40.04 Environmental mitigation, e.g. wetlands, historic/archeologic, parks		0	0	0				0
40.05 Site structures including retaining walls, sound walls		0	0	0				0
40.06 Pedestrian / bike access and accommodation, landscaping		13,200	3,960	17,160				22,163
40.07 Automobile, bus, van accessways including roads, parking lots				0				0
40.08 Temporary Facilities and other indirect costs during construction				0				0
50 SYSTEMS	9.79	350,300	105,090	**455,390**	**$ 46,508**	**27%**	**23%**	**588,171**
50.01 Train control and signals		38,300	11,490	49,790				64,308
50.02 Traffic signals and crossing protection		1,200	360	1,560				2,015
50.03 Traction power supply: substations		72,700	21,810	94,510				122,067
50.04 Traction power distribution: catenary and third rail		185,000	55,500	240,500				310,624
50.05 Communications		37,700	11,310	49,010				63,300
50.06 Fare collection system and equipment		15,400	4,620	20,020				25,857
50.07 Central Control		0	0	0				0
Construction Subtotal (10 - 50)	9.79	1,323,800	336,531	**1,660,331**	**$ 169,566**	**100%**	**85%**	**2,144,446**
60 ROW, LAND, EXISTING IMPROVEMENTS	9.79	0	0	**0**	**$ -**		**0%**	**0**
60.01 Purchase or lease of real estate		0	0	0				#DIV/0!
60.02 Relocation of existing households and businesses				0				#DIV/0!
70 VEHICLES (number)	**0**	0	0	**0**			**0%**	**0**
70.01 Light Rail	0	0	0	0				#DIV/0!
70.02 Heavy Rail	0	0	0	0				#DIV/0!
70.03 Commuter Rail	0	0	0	0				#DIV/0!
70.04 Bus	0	0	0	0				#DIV/0!
70.05 Other	0	0	0	0				#DIV/0!
70.06 Non-revenue vehicles				0				#DIV/0!
70.07 Spare parts				0				#DIV/0!
80 PROFESSIONAL SERVICES (applies to Cats. 10-50)	9.79	105,382	14,718	**120,100**	**$ 12,266**	**7%**	**6%**	**155,119**
80.01 Preliminary Engineering		10,538	1,581	12,119				15,653
80.02 Final Design		24,589	3,688	28,278				36,523
80.03 Project Management for Design and Construction		35,127	5,269	40,396				52,175
80.04 Construction Administration & Management		17,564	2,635	20,198				26,088
80.05 Professional Liability and other Non-Construction Insurance				0				0
80.06 Legal; Permits; Review Fees by other agencies, cities, etc.		3,513	386	3,899				5,036
80.07 Surveys, Testing, Investigation, Inspection		7,025	1,054	8,079				10,435
80.08 Start up		7,025	105	7,131				9,210
Subtotal (10 - 80)	9.79	1,429,182	351,249	**1,780,431**	**$ 181,831**		**91%**	**2,299,565**
90 UNALLOCATED CONTINGENCY				**178,043**			**9%**	**0**
Subtotal (10 - 90)	9.79			**1,958,474**	**$ 200,014**		**100%**	**2,299,565**
100 FINANCE CHARGES				**0**			**0%**	**0**
Total Project Cost (10 - 100)	9.79			**1,958,474**	**$ 200,014**		**100%**	**2,299,565**
Allocated Contingency as % of Base Yr Dollars w/o Contingency				24.58%				
Unallocated Contingency as % of Base Yr Dollars w/o Contingency				12.46%				
Total Contingency as % of Base Yr Dollars w/o Contingency				37.03%				
Unallocated Contingency as % of Subtotal (10 - 80)				10.00%				
YOE Construction Cost per Mile (X000)								$219,007
YOE Total Project Cost per Mile Not Including Vehicles (X000)								$234,849
YOE Total Project Cost per Mile (X000)								$234,849

Appendix E: Operating and Cost Estimate and Financial Analysis

Southern California Association of Governments

Pacific Electric Right-of-Way / West Santa Ana Branch Corridor Alternatives Analysis

Financial Analysis

Prepared by
AECOM

March 2012

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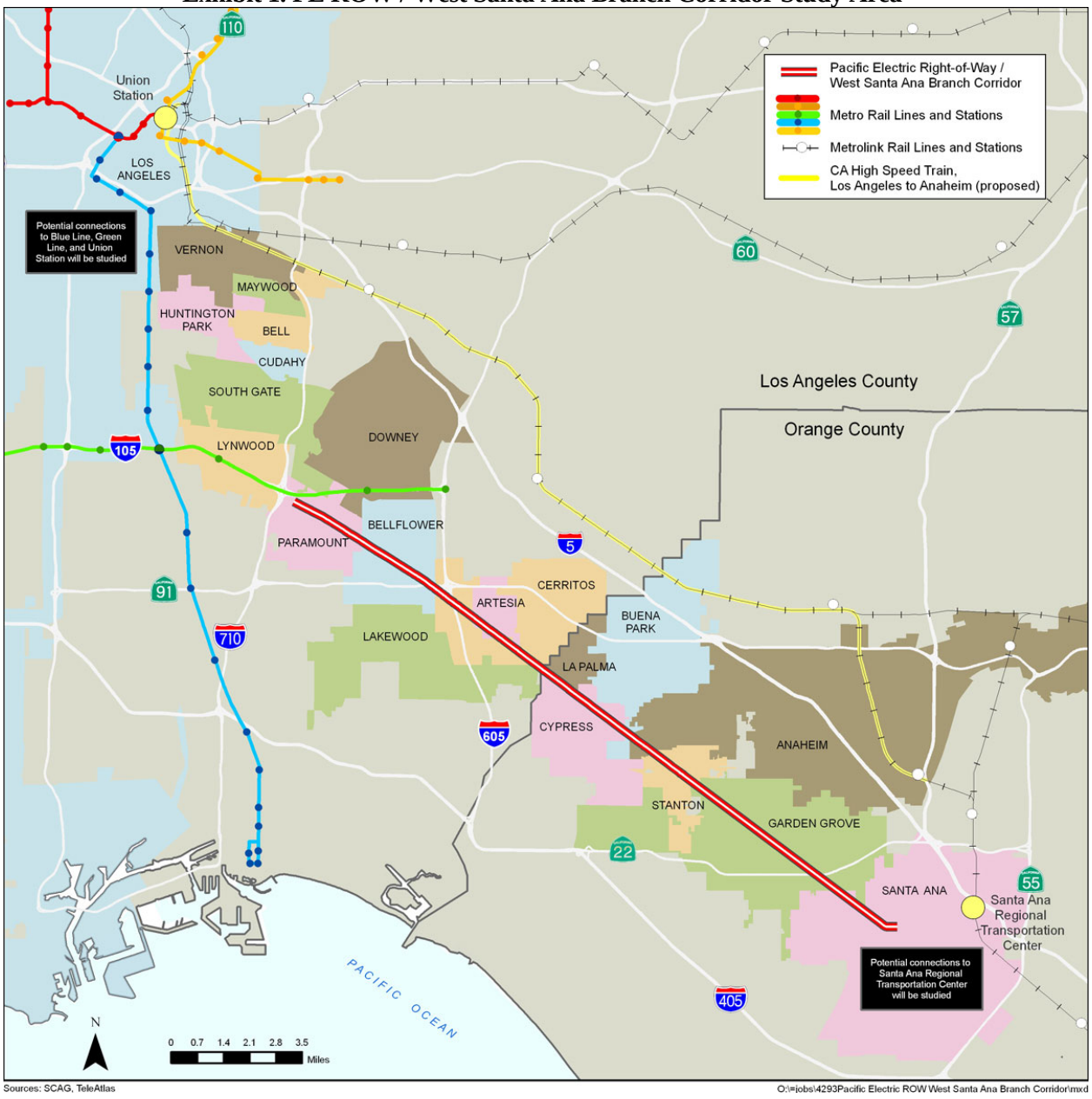
FINANCIAL ANALYSIS

This analysis examines the funding required to construct and operate the Pacific Electric Right-of-Way Project (PE ROW) / West Santa Ana Branch Corridor project. The PE ROW project is a railroad right-of-way that extends for approximately 20 miles between the City of Paramount in Los Angeles County and the City of Santa Ana in Orange County. The railroad corridor was once part of the Pacific Electric Railway, or Red Car, system that provided mass transit service to Southern California from 1901 to 1961. Much of the corridor has been abandoned and is not currently used for mass transit purposes.

The Southern California Association of Governments (SCAG), in coordination with the Los Angeles County Metropolitan Transportation Authority (Metro) and the Orange County Transportation Authority (OCTA), is conducting a transit Alternatives Analysis (AA) for the PE ROW / West Santa Ana Branch. The AA will examine potential transit service along the corridor that can provide additional travel options between Los Angeles and Orange Counties, reduce congestion on nearby streets and freeways, and provide adjacent communities with access to the regional transit network. Exhibit 1 maps PE ROW project study area.

Exhibit 1. PE ROW / West Santa Ana Branch Corridor Study Area



All references to fiscal year (FY) in this analysis refer to the Los Angeles County Metropolitan Transportation Authority and the Orange County Transportation Authority fiscal year, which begins on July 1 and ends on June 30. For example, FY 2011 refers to the period July 1, 2010 through June 30, 2011.

This document begins with a discussion of the sources and uses of fund analysis, which addresses both capital and operating revenues and expenses. The following section addresses funding requirements, including the revenue required to fund the gap between projected sources and uses of funds for project capital and operating and maintenance (O&M) costs. The final section presents the cash flow analysis for selected PE ROW project alternatives.

1. Sources and Uses of Funds Analysis

1.1 Capital Uses of Funds

The construction period of the PE ROW project is from FY2015 to FY2026, with an exception of the TSM component which is assumed to be completed within 5 years from FY2022 to fY2026. **Exhibit 2** summarizes the capital expenses in base year (FY2011) dollars from FY2015 and FY2026 and **Exhibit 3** in year-of-expenditure (inflated) dollars.

Costs estimates were first developed in FY2010 dollars and escalated to FY2011 dollars and then to year-of-expenditure dollars by applying the inflation rate of 3.33% per year, which is the annualized growth rate of the R.S Means Construction Cost index for San Jose, CA from FY2011 to FY2035. This projection was the most detailed and recent projection available; it was prepared for the Santa Clara Valley Transportation Authority by Moody's Economy.com in June 2010. This inflation forecast is summarized in Appendix A.

The financial analysis also projected the costs to rehabilitate, replace, and maintain capital assets in a state of good repair. Rehabilitation and replacement costs are incurred beginning 12 years after the initial costs to construct the PE ROW project, and are based on the useful life of capital assets.

Exhibit 2. PE ROW Construction Costs – FY15-FY26
Millions of Base Year (2011) Dollars

	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	Total
TSM								27.09	36.12	54.18	36.12	27.09	**180.6**
BRT Alternatives													
Street Running	241.69	162.62	238.90	162.62	124.47	7.01	4.75	4.75	6.21	4.75	4.75	3.30	**965.83**
HOV Lane-Running	238.55	160.51	235.80	160.51	122.86	10.85	7.36	7.36	9.62	7.36	7.36	5.11	**973.27**
Street Car Alternatives													
East Bank 1	113.35	76.26	112.04	76.26	58.38	334.44	226.91	226.91	296.45	226.91	226.91	157.38	**2,132.21**
West Bank 1	114.02	76.72	112.71	76.72	58.72	327.36	222.12	222.12	290.18	222.12	222.12	154.05	**2,098.94**
West Bank 2	114.79	77.23	113.46	77.23	59.12	319.61	216.85	216.85	283.30	216.85	216.85	150.40	**2,062.57**
West Bank 3	109.04	73.36	107.78	73.36	56.16	387.59	262.98	262.98	343.56	262.98	262.98	182.40	**2,385.17**
LRT Alternatives													
East Bank 1	126.79	85.31	125.33	85.31	65.30	344.34	233.64	233.64	305.23	233.64	233.64	162.04	**2,234.20**
West Bank 1	128.13	86.21	126.65	86.21	65.99	332.14	225.36	225.36	294.41	225.36	225.36	156.30	**2,177.47**
West Bank 2	128.01	86.13	126.53	86.13	65.93	333.21	226.08	226.08	295.36	226.08	226.08	156.80	**2,182.43**
West Bank 3	121.76	81.93	120.36	81.93	62.71	398.96	270.69	270.69	353.64	270.69	270.69	187.75	**2,491.80**
Maglev Alternatives													
East Bank 1	548.03	368.73	541.70	368.73	282.24	644.36	437.20	437.20	571.17	437.20	437.20	303.23	**5,376.98**
West Bank 1	529.31	356.13	523.20	356.13	272.60	620.90	421.28	421.28	550.37	421.28	421.28	292.19	**5,185.93**
West Bank 2	507.33	341.34	501.47	341.34	261.28	747.86	507.42	507.42	662.91	507.42	507.42	351.93	**5,745.15**
West Bank 3	498.45	335.37	492.69	335.37	256.71	809.51	549.25	549.25	717.56	549.25	549.25	380.95	**6,023.62**

Exhibit 3. PE ROW Construction Costs – FY15-FY26
Millions of Year-of-Expenditure (Inflated) Dollars

	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	Total
TSM								38.84	53.51	82.94	57.14	44.28	**276.72**
BRT Alternatives													
Street Running	275.53	191.56	290.79	204.53	161.77	9.41	6.60	6.82	9.20	7.28	7.52	5.39	**1,176.37**
HOV Lane-Running	271.95	189.07	287.01	201.87	159.67	14.58	10.22	10.56	14.25	11.27	11.65	8.35	**1,190.46**
Street Car Alternatives													
East Bank 1	129.22	89.84	136.37	95.92	75.87	449.11	314.87	325.35	439.20	347.38	358.95	257.25	**3,019.32**
West Bank 1	129.99	90.37	137.18	96.49	76.32	439.61	308.21	318.47	429.91	340.03	351.36	251.81	**2,969.75**
West Bank 2	130.86	90.98	138.11	97.14	76.83	429.20	300.91	310.93	419.73	331.98	343.03	245.84	**2,915.53**
West Bank 3	124.30	86.42	131.19	92.27	72.98	520.49	364.91	377.06	509.01	402.59	416.00	298.13	**3,395.35**
LRT Alternatives													
East Bank 1	144.55	100.49	152.55	107.30	84.87	462.41	324.19	334.99	452.21	357.67	369.58	264.87	**3,155.67**
West Bank 1	146.07	101.55	154.16	108.43	85.76	446.03	312.71	323.12	436.19	345.00	356.49	255.48	**3,070.97**
West Bank 2	145.93	101.46	154.01	108.33	85.68	447.46	313.71	324.16	437.59	346.11	357.63	256.30	**3,078.38**
West Bank 3	138.81	96.51	146.50	103.04	81.50	535.76	375.61	388.12	523.94	414.40	428.20	306.88	**3,539.26**
Maglev Alternatives													
East Bank 1	624.76	434.35	659.36	463.76	366.80	865.30	606.66	626.86	846.21	669.30	691.59	495.64	**7,350.58**
West Bank 1	603.41	419.51	636.83	447.92	354.27	833.79	584.56	604.03	815.40	644.93	666.40	477.59	**7,088.65**
West Bank 2	578.36	402.09	610.39	429.32	339.56	1,004.28	704.10	727.54	982.13	776.80	802.67	575.25	**7,932.49**
West Bank 3	568.23	395.05	599.70	421.80	333.62	1,087.08	762.15	787.52	1,063.10	840.85	868.85	622.68	**8,350.63**

1.2 Operating Uses of Funds

Operating and maintenance (O&M) costs were projected based on level of service and unit costs for each alternative. Project level of service was estimated based on the operating plans prepared for each alternative. **Exhibit 4** summarizes the projected level of service and ridership (ridership was estimated for only some of the build alternative alignments).

Exhibit 4. PE ROW Operating Level of Service and Ridership

Alternatives	Route Miles	Annual Bus- or Train-Hours	Annual Vehicle-Miles	Annual Unlinked Trips	Weekday Unlinked Trips
TSM					
Los Angeles County Segment		55,925	1,617,135	8,413,331	26,331
Orange County Segment		339,915	6,355,110	18,928,796	59,241
BRT Alternatives					
Street-Running	40.5	69,320	2,121,192	18,321,065	57,339
HOV Lane-Running	36.9	124,538	3,910,478	21,474,427	67,208
Street Car Alternatives					
East Bank	35.2	139,780	12,746,715		
West Bank 1	31.8	137,505	12,829,218		
West Bank 2	43.8	139,780	12,706,032		
West Bank 3	42.7	137,505	12,664,210	25,434,261	79,601
LRT Alternatives					
East Bank	35.2	128,415	13,136,856	27,125,171	84,893
West Bank 1	31.8	130,690	12,532,068		
West Bank 2	43.8	119,175	13,251,966	26,496,991	82,927
West Bank 3	42.7	119,695	12,298,860	27,846,012	87,149
Low Speed Maglev	No tracks in SA				
East Bank	29.3	86,665	10,903,846		
West Bank 1	29.7	82,130	11,323,344		
West Bank 2	30	88,940	10,877,823		
West Bank 3	29.7	82,450	10,981,917	24,280,787	75,991

The O&M unit cost estimates were based on existing bus and rail service unit costs from Metro and OCTA as well as from other peer transit operators after adjustment to reflect the operating conditions (i.e., labor costs) in Los Angeles and Orange counties. For each of the alternatives, four sets of O&M unit costs were estimated. The scenarios in the two columns represent the costs if the alternative was to be operated by either Metro or OCTA (and are based on the labor costs for those two agencies). The scenarios in the two rows represent the costs reflecting the low- and high-cost technologies or peer agencies for each mode (e.g., Miami Metromover and TransLink for MagLev); a low-high range was not estimated for the TSM alternative. The detailed O&M methodology is documented in Appendix B. **Exhibit 5** summarizes the O&M unit cost estimates for each mode by agency.

Exhibit 5. PE ROW Operating Unit Costs
Base Year (FY2011) Dollars

Unit Costs (in 2011 dollar)	Route Miles	Bus- or Train-Hours (Annual)	Vehicle-Miles	Annual Ridership
TSM UNIT COSTS				
LA County Cost Structure	$ -	$ 87.23	$ 3.67	$ 0.13
Orange County Cost Structure	$ -	$ 96.74	$ 1.91	$ -
BRT UNIT COSTS				
LA County Cost Structure				
Low	$ 15,133	$ 91.83	$ 3.33	$ -
High	$ 200,526	$ 66.28	$ 2.45	$ 1.30
Orange County Cost Structure				
Low	$ -	$ 96.74	$ 1.91	$ -
High	$ 2,395	$ 86.07	$ 2.82	$ -
STREETCAR AND LRT UNIT COSTS				
LA County Cost Structure				
Low	$ 753,360	$ 115.57	$ 2.92	$ 0.92
High	$ 219,268	$ 540.71	$ 10.60	$ -
Orange County Cost Structure				
Low	$ 37,619	$ 137.43	$ 4.65	$ -
High	$ 34,553	$ 458.31	$ 9.04	$ -
MAG-LEV UNIT COSTS				
LA County Cost Structure				
Low	$ 191,547	$ 244.81	$ 1.47	$ -
High	$ 678,241	$ 355.36	$ 9.56	$ -
Orange County Cost Structure				
Low	$ 30,315	$ 218.89	$ 1.25	$ -
High	$ 107,340	$ 339.62	$ 8.11	$ -

These estimates of unit costs were then applied to the projected design year level of service in Exhibit 5 to project the design year O&M costs. Costs were escalated from FY11 to year-of-expenditure dollars by applying the forecast rate of California San Jose CPI projected by Moody's Economy.com in June 2010 (documented in Appendix A). **Exhibit 6** summarizes O&M costs in base year (FY2011) dollars of TSM, BRT and Street Car alternatives. **Exhibit 7** summarizes O&M costs in base year (FY2011) dollars of LRT and Maglev alternatives. In both of the these exhibits,

Exhibit 6. PE ROW Operating and Maintenance Costs
TSM-BRT-Street Car Alternatives
Base Year (2011) Dollars

Mode	LA County Cost Structure	Orange County Cost Structure
TSM O&M Cost		
Medium	$ 11.89	$ 45.02
BRT O&M Cost		
Street-Running		
Low	$ 13.77	$ 10.76
High	$ 41.65	$ 12.00
HOV Lane-Running		
Low	$ 24.52	$ 19.52
High	$ 53.06	$ 21.76
STREETCAR O&M COSTS		
East Bank 1		
Low	79.87	80.11
High	217.92	193.13
West Bank 1		
Low	77.29	80.05
High	216.83	192.49
West Bank 2		
Low	86.23	80.25
High	219.37	193.06
West Bank 3		
Low	108.43	79.70
High	217.47	191.39

Exhibit 7. PE ROW Operating and Maintenance Costs
LRT and Maglev Alternatives
Base Year (2011) Dollars

Mode	LA County Cost Structure	Orange County Cost Structure
LRT O&M COSTS		
East Bank 1		
Low	$ 104.66	$ 80.34
High	$ 215.95	$ 190.36
West Bank 1		
Low	$ 75.63	$ 77.72
High	$ 210.02	$ 186.05
West Bank 2		
Low	$ 109.83	$ 79.90
High	$ 214.10	$ 186.59
West Bank 3		
Low	$ 107.52	$ 75.51
High	$ 204.03	$ 178.26
MAG-LEV O&M COSTS		
East Bank 1		
Low	42.56	33.44
High	152.28	119.01
West Bank 1		
Low	42.17	32.98
High	155.09	121.02
West Bank 2		
Low	43.21	33.92
High	153.25	119.60
West Bank 3		
Low	41.74	32.63
High	151.93	118.35

For each of the alternatives in Exhibits 6 and 7, four operating scenarios are presented. The scenarios in the two columns represent the costs if the alternative was to be operated by either Metro or OCTA (and are based on the labor costs for those two agencies). The scenarios in the two rows represent the costs reflecting the low- and high-cost technologies or peer agencies for each mode (e.g., Miami Metromover and TransLink for MagLev). The cash flow analyses in Section 3 examined the Metro cost structure/high cost scenario (i.e., the highest O&M cost scenario) for each alternative.

1.3 Capital Sources of Funds

This section describes the funding sources that were assumed available to support construction of the PE ROW project.

Measure R
Measure R is a sales tax initiative approved by Los Angeles County voters in 2008. A half-cent sales tax effective July 1, 2010, ending in 2039, is used for public transportation purposes. $240 million from Measure R bond proceeds is allocated to PE ROW project from FY2020 to FY2025 in the Los Angeles County Metropolitan Transportation Authority (LACMTA) Long Range Transportation Plan.

Prop A 35% Bond
Proposition A is a half-cent sales tax, passed by Los Angeles County voters in 1980, to be used to improve public transit throughout Los Angeles County. 35% of the revenues are dedicated to rail development and operations. $124.4 million from Prop A 35% bond proceeds is allocated to PE ROW project from FY2025 to FY2028 in the LACMTA Long Range Transportation Plan.

Prop C 25%
Proposition C is a half-cent sales tax, passed by Los Angeles County voters in 1990, to be used for public transit purposes in Los Angeles County. 25% of the revenues are dedicated to transit-related highway funds. $500,000 from Prop C 25% program is allocated to PE ROW project in FY2011 and FY2012 in the LACMTA Long Range Transportation Plan.

Local Agency Contribution
The LACMTA Long Range Transportation Plan also identified a total of $19.5 million funding as local agency contribution available to PE ROW project in FY2022 and FY2025.

Section 5309 Fixed Guideway Modernization Grants
These are discretionary Federal funds derived by formula as specified in The Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU) and published in the *Federal Register*. The formula is a function of transit vehicle-revenue miles and route-miles, which are summarized in Exhibit 4. Funds are available seven years after each segment of a new fixed guideway transit project enters revenue service.

1.4 Operating Sources of Funds

This section describes the funding sources that were assumed available to support operation and maintenance of the PE ROW project.

Passenger Revenues
Passenger revenues were based on a projection of average fare paid per rider and projected riders for each alternative. The average fare paid per rider was sized to cover the unmet requirements of operating fund except for the TSM component in the financial analysis. The operating funding requirements of the TSM component of each of the build alternatives was addressed in Section 2 of in the context of the funding requirements of the TSM alternative. Ridership projections were based on the average weekday travel demand forecast prepared for each alternative; an annualization factor of 319.5 average weekdays per year was applied, based on recent Metro and OCTA experience. Growth in ridership from the opening year to the design year takes into consideration the following factors:

- Demographic growth. Ridership was projected to grow between the opening year and the design year based on projected population growth in the PE ROW project study area.

- Fare increases. The average fare per rider was projected to grow with inflation, adjusted every other year. The impacts of these fare increases on projected ridership were taken into account by assuming a fare elasticity of -0.3 percent; that is, for each real fare increase (net of CPI inflation) of one percent ridership would be expected to fall by 0.3 percent. In years that fares do not change, ridership **increases** marginally because fare are declining in real terms.

Advertising Revenues
Advertising revenues were projected based on recent Metro and OCTA revenue per rider and projected ridership. Advertising revenue per rider was derived from Metro and OCTA 2009 National Transportation Database Reports. The ridership projection was based on the travel demand forecast for each alternative. Advertising revenue per rider was projected to grow by the projected rate of California San Jose CPI projected by Moody's Economy.com in June 2010.

Section 5307 Large Urban Cities Grants
These discretionary funds were derived by a formula specified in SAFETEA-LU and published annually in the *Federal Register*. The apportionment of these funds is based primarily on service level and ridership variables. The annual allocation of funds to the Urbanized Area is based on the service operated two years prior. SAFETEA-LU limits the application of these funds to capital expenditures for areas greater than 200,000 population, but preventative maintenance expenses in the operating budget may be considered as "capital." One percent of these funds must be applied to "enhancements," which include the new initiative capital projects.

Incentive tier funding in this grant program (associated with population and population times density) are not assumed available to the PE ROW project, but will be applied to the existing bus operators in the urbanized area. The estimated funding applied in the financial analysis was based on level of service projection of each alternative.

2. Additional Capital and Operating Funding Requirements

2.1 Additional Capital Funding Requirements

The financial analysis revealed that the projected capital revenue sources described in Section 1.3 would not be sufficient to cover PE ROW project capital costs. **Exhibit 8** presents the funding requirement on cash basis by subtracting capital expenditures from the projected funding revenues in year-of-expenditure dollars. The negative numbers are unmet capital funding requirements and positive numbers are funding surplus. TSM capital expenditures were assumed to be shared by the Los Angeles County and the Orange County, therefore no unmet funding requirement of TSM was projected.

The unmet capital funding requirements are addressed in the cash flow analysis in Section 3 through the assumption of an incremental rate of taxation on retail sales in Los Angeles and Orange Counties.

2.2 Additional Operating Funding Requirements

Passenger revenues were assumed to cover the difference between O&M cost and advertising plus 5307 grant funding except for the TSM component. **Exhibit 9** presents the unmet operating funding requirement of TSM component.

Exhibit 8. PE ROW Capital Funding Requirements – FY11 to FY40
Millions of Year-of-Expenditure (Inflated) Dollars

ALTERNATIVES	FY2011-FY2015	FY2016-FY2020	FY2021-FY2025	FY2026-FY2030	FY2031-FY2035	FY2036-FY2040	TOTAL
Bus Rapid Transit							
Street-Running	(275.03)	(850.64)	232.19	39.94	(136.19)	(129.03)	(1,118.76)
HOV Lane-Running	(271.45)	(844.80)	211.64	37.78	(136.03)	(132.10)	(1,134.96)
Street Car							-
East Bank 1	(128.72)	(839.70)	(1,516.15)	(179.22)	(77.95)	(115.29)	(2,857.03)
West Bank 1	(129.49)	(832.57)	(1,478.39)	(173.95)	(76.34)	(109.58)	(2,800.31)
West Bank 2	(130.36)	(824.85)	(1,436.98)	(168.19)	(73.44)	(100.28)	(2,734.09)
West Bank 3	(123.80)	(895.95)	(1,799.97)	(219.01)	(89.99)	(157.03)	(3,285.76)
Light Rail							-
East Bank 1	(144.05)	(900.22)	(1,569.04)	(190.27)	(86.21)	(124.80)	(3,014.58)
West Bank 1	(145.57)	(888.52)	(1,503.90)	(181.22)	(87.73)	(127.16)	(2,934.10)
West Bank 2	(145.43)	(889.54)	(1,509.60)	(182.02)	(81.67)	(110.11)	(2,918.37)
West Bank 3	(138.31)	(955.90)	(1,860.68)	(231.00)	(102.89)	(180.73)	(3,469.50)
Low Speed Maglev							-
East Bank 1	(624.26)	(2,782.17)	(3,171.02)	(528.35)	(431.66)	(671.56)	(8,209.01)
West Bank 1	(602.91)	(2,684.92)	(3,045.73)	(505.53)	(411.42)	(632.77)	(7,883.27)
West Bank 2	(577.86)	(2,778.24)	(3,723.65)	(597.59)	(437.68)	(737.69)	(8,852.71)
West Bank 3	(567.73)	(2,829.85)	(4,052.87)	(642.76)	(449.58)	(784.23)	(9,327.02)

Exhibit 9. PE ROW TSM Operation Funding Requirement FY27 – FY40
Millions of Year-of-Expenditure (Inflated) Dollars

OPERATING SOURCES OF FUNDS	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2011 - 2040
Fare Revenue	$25.26	$26.71	$27.19	$28.71	$29.21	$30.83	$31.36	$33.05	$33.61	$35.39	$35.98	$37.84	$38.45	$40.40	$453.99
FTA Sec 5307 Preventative Maintenance	$0.00	$0.00	$0.02	$0.02	$0.02	$0.02	$0.01	$0.01	$0.01	$0.01	$0.01	$0.01	$0.01	$0.01	$0.17
Advertising Income	$2.16	$2.22	$2.32	$2.39	$2.50	$2.57	$2.68	$2.75	$2.87	$2.95	$3.07	$3.15	$3.28	$3.36	$38.26
TOTAL OPERATING SOURCES OF FUNDS	**$27.42**	**$28.94**	**$29.53**	**$31.12**	**$31.72**	**$33.41**	**$34.05**	**$35.82**	**$36.49**	**$38.35**	**$39.06**	**$41.00**	**$41.74**	**$43.78**	**$492.42**
OPERATING USES OF FUNDS	**2027**	**2028**	**2029**	**2030**	**2031**	**2032**	**2033**	**2034**	**2035**	**2036**	**2037**	**2038**	**2039**	**2040**	**2011 - 2040**
TSM Operating and Maintenance Cost	**$91.03**	**$93.46**	**$95.96**	**$98.48**	**$101.07**	**$103.69**	**$106.37**	**$109.07**	**$111.84**	**$114.62**	**$117.46**	**$120.31**	**$123.21**	**$126.15**	**$1,512.73**
Unmet Funding Requirement	**($63.61)**	**($64.53)**	**($66.43)**	**($67.36)**	**($69.35)**	**($70.28)**	**($72.33)**	**($73.25)**	**($75.35)**	**($76.27)**	**($78.41)**	**($79.31)**	**($81.48)**	**($82.38)**	**($1,020.31)**

3. Cash Flow Analysis

Additional sales tax was assumed in the cash flow analysis to close the gap in capital funding identified in Exhibit 8. The additional sales tax revenues from the Los Angeles County and the Orange County were sized proportionally to the capital costs breakdown between the two counties for each alternative of PE ROW project. The sales tax base amount in each county was provided by the Southern California Government of Association in October 2011.

Bridge financing was applied to address the working capital needs during peak years of construction. The short-term debt was retired after 5 years. The interest and debt management expenses were repaid by sales tax revenue streams. The interest rate applied in this analysis was based on a June 2010 projection of tax-exempt commercial paper interest rates developed by Moody's Economy.com, which is summarized in Appendix A. The bonds were assumed to incorporate the costs of the first year's debt service payment,

the debt issuance expense (equal to 0.6 percent of the gross amount of debt issued). The coverage ratio of the short-term debt was maintained above 2.0 during the entire analysis period.
The average fare paid per rider was adjusted to size the passenger revenue to close the operating funding gap except for TSM component. The Metro High unit costs described in Section 1.2 were applied in calculating the O&M costs of PE ROW alternatives.

The cash flow analysis derived the incremental sales tax rate in each county necessary to generate sufficient sales tax revenues to close capital funding gap of each alternative and maintain sufficiently high debt service coverage. The incremental sales tax was assumed to be implemented in 2015 and continue through 2029 for the BRT alternative and through the end of the 30-year analysis period for the Streetcar, LRT, and mag-lev alternatives. It should be noted that for the Streetcar, LRT, and mag-lev alternatives, further refinement of the cash flow analyses could include lowering the incremental tax rate in the last 5 to 10 years of the 30-year analysis period, thereby avoiding large 2040 year-end cash balances.

Exhibit 10 summarizes the results of selected alternatives (for which ridership projections were prepared).

Exhibit 10. Summary of Cash Flow Analysis Results

		Incremental Sales Tax			
		Tax Rate		Implementation Period	
	Avg Fare per Unlinked Trip	Los Angeles County	Orange County	Los Angeles County	Orange County
BRT Alternatives					
Street Running	$2.42	0.006%	0.032%	2015	2029
HOV Lane-Running	$2.64	0.006%	0.032%	2015	2029
Street Car Alternatives					
East Bank 1					
West Bank 1					
West Bank 2					
West Bank 3	$9.60	0.038%	0.036%	2015	2040
LRT Alternatives					
East Bank 1	$8.93	0.034%	0.041%	2015	2040
West Bank 1					
West Bank 2	$9.06	0.033%	0.040%	2015	2040
West Bank 3	$8.23	0.039%	0.041%	2015	2040
Low Speed Maglev Alternatives					
East Bank 1					
West Bank 1					
West Bank 2					
West Bank 3	$7.12	0.101%	0.110%	2015	2040

Exhibits 11 – 17 summarize capital and operating sources and uses of funds with debt financing for the following alternatives (for which travel demand forecasts were prepared):

1. BRT Street-Running Alternative
2. BRT HOV Lane-Running Alternative
3. Street Car West Bank 3 Alternative

4. LRT East Bank 1 Alternative
5. LRT West Bank 2 Alternative
6. LRT West Bank 3 Alternative
7. Maglev West Bank 3 Alternative

Exhibit 11. Capital and Operating Sources and Uses of Funds
BRT Street-Running Alternative
Year-of-Expenditure Dollars in Millions

Southern California Association of Government / Pacific Electric Right-of-Way Alternative Analysis
Scenario: BRT Street Running Alternative
11/14/2011

CAPITAL SOURCES OF FUNDS

(Year of Expenditure Dollars in Millions) Fiscal Year	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	Total 2011 - 2040
Transfer from Operation	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.19***	***$2.04***	***$1.63***	***$3.56***	***$2.32***	***$4.38***	***$3.09***	***$5.28***	***$3.94***	***$6.26***	***$4.89***	***$7.33***	***$5.92***	***$8.49***	***$59.33***
Capital Funds																															
Measure R	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$7.40	$11.80	$125.10	$80.10	$1.40	$14.20	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$240.00
Section 5309 Rail & Fixed Guideway Modernization Grants	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$3.12	$3.22	$3.32	$3.42	$3.53	$3.64	$3.64	$23.90
Prop A 35% Bond	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$17.50	$28.60	$66.60	$11.70	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$124.40
Prop C 25%	$0.10	$0.40	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.50
Local Agency Contribution	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$11.60	$0.00	$0.00	$7.90	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$19.50
Interest on Capital Reserve Allocated to Capital Funds	$0.00	$0.00	$0.02	$0.02	$0.02	$1.56	$1.09	$1.66	$1.17	$0.93	$0.01	$0.00	$0.00	$0.00	$0.03	$0.00	$1.62	$4.93	$8.80	$11.11	$12.41	$11.96	$11.56	$11.11	$10.84	$10.52	$10.27	$9.98	$9.81	$9.42	$140.85
TSM Los Angeles County Share	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$6.21	$8.56	$13.27	$9.14	$7.08	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.16	$0.37	$0.70	$0.93	$1.11	$1.11	$1.11	$49.75
TSM Orange County Share	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$32.63	$44.95	$69.67	$48.00	$37.20	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.82	$1.94	$3.68	$4.88	$5.81	$5.81	$5.81	$261.19
Additional Sales Tax from Los Angeles County	$0.00	$0.00	$0.00	$0.00	$22.52	$23.92	$25.26	$26.64	$28.10	$29.62	$31.23	$32.93	$34.66	$36.39	$38.13	$39.90	$41.70	$43.59	$45.55	$47.58	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$547.71
Additional Sales Tax from Orange County	$0.00	$0.00	$0.00	$0.00	$38.35	$40.73	$43.01	$45.36	$47.85	$50.43	$53.18	$56.06	$59.02	$61.96	$64.92	$67.93	$71.00	$74.21	$77.55	$81.02	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$932.59
Subtotal Capital Funds	***$0.10***	***$0.40***	***$0.02***	***$0.02***	***$60.90***	***$66.21***	***$69.35***	***$73.66***	***$77.12***	***$88.37***	***$96.22***	***$264.53***	***$227.29***	***$182.70***	***$199.82***	***$180.71***	***$180.91***	***$134.43***	***$131.90***	***$139.72***	***$12.41***	***$11.96***	***$11.56***	***$15.21***	***$16.36***	***$18.22***	***$19.50***	***$20.43***	***$20.37***	***$19.98***	***$2,340.40***
Financing Program																															
Construction Bridge Financing	$0.00	$0.00	$0.00	$0.00	$267.37	$130.32	$265.85	$154.66	$120.67	$205.88	$76.16	$75.47	$11.84	$47.51	$83.59	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$1,439.32
Subtotal Financing Program	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$267.37***	***$130.32***	***$265.85***	***$154.66***	***$120.67***	***$205.88***	***$76.16***	***$75.47***	***$11.84***	***$47.51***	***$83.59***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$1,439.32***
TOTAL CAPITAL SOURCES OF FUNDS	**$0.10**	**$0.40**	**$0.02**	**$0.02**	**$328.27**	**$196.54**	**$335.20**	**$228.32**	**$197.79**	**$294.25**	**$172.39**	**$340.00**	**$239.13**	**$230.21**	**$283.41**	**$180.71**	**$181.10**	**$136.47**	**$133.54**	**$143.28**	**$14.73**	**$16.34**	**$14.65**	**$20.49**	**$20.31**	**$24.49**	**$24.39**	**$27.76**	**$26.29**	**$28.47**	**$3,839.05**

CAPITAL USES OF FUNDS

(Year of Expenditure Dollars in Millions) Fiscal Year	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	Total 2011 - 2040
Project Expenses																															
BRT Street Running Alternative	$0.00	$0.00	$0.00	$0.00	$275.53	$191.56	$290.79	$204.53	$161.77	$9.41	$6.60	$6.82	$9.20	$7.28	$7.52	$5.39	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$1,176.37
Rehabilitation & Replacement	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$6.89	$11.68	$18.95	$24.06	$28.10	$28.34	$28.50	$28.67	$28.90	$29.09	$29.27	$29.41	$29.41	$29.41	$350.69
TSM	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$38.84	$53.51	$82.94	$57.14	$44.28	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$276.72
TSM Rehabilitation & Replacement	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.97	$2.31	$4.38	$5.81	$6.92	$6.92	$6.92	$34.23
Financing Program																															
Retired Bridge Financing Debt	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$267.37	$130.32	$265.85	$154.66	$120.67	$205.88	$76.16	$75.47	$11.84	$47.51	$83.59	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$1,439.32
Interest	$0.00	$0.00	$0.00	$0.00	$10.35	$15.19	$25.55	$31.83	$36.80	$34.57	$30.05	$23.10	$17.89	$15.22	$10.75	$7.99	$5.25	$4.82	$3.08	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$272.43
Debt Management Expenses	$0.00	$0.00	$0.00	$0.00	$1.60	$2.39	$3.98	$4.91	$5.63	$6.87	$5.72	$5.39	$3.87	$3.23	$3.00	$1.77	$1.31	$0.86	$0.79	$0.50	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$51.82
TOTAL CAPITAL USES OF FUNDS	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$287.48**	**$209.13**	**$320.31**	**$241.26**	**$204.20**	**$318.22**	**$172.69**	**$340.00**	**$239.13**	**$229.33**	**$284.29**	**$135.59**	**$88.91**	**$29.20**	**$70.33**	**$108.16**	**$28.10**	**$28.34**	**$28.50**	**$29.65**	**$31.21**	**$33.47**	**$35.09**	**$36.33**	**$36.33**	**$36.33**	**$3,601.57**
NET CAPITAL CASH FLOW	**$0.10**	**$0.40**	**$0.02**	**$0.02**	**$40.79**	**($12.60)**	**$14.88**	**($12.94)**	**($6.41)**	**($23.96)**	**($0.30)**	**$0.00**	**$0.00**	**$0.88**	**($0.88)**	**$45.12**	**$92.19**	**$107.27**	**$63.21**	**$35.12**	**($13.37)**	**($12.00)**	**($13.86)**	**($9.16)**	**($10.91)**	**($8.98)**	**($10.70)**	**($8.57)**	**($10.04)**	**($7.85)**	**$237.48**

OPERATING SOURCES OF FUNDS

(Year of Expenditure Dollars in Millions) Fiscal Year	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	Total 2011 - 2040
Fare Revenue	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$63.09***	***$66.71***	***$67.90***	***$71.71***	***$72.96***	***$76.99***	***$78.31***	***$82.55***	***$83.94***	***$88.39***	***$89.85***	***$94.50***	***$96.02***	***$100.90***	***$1,133.79***
FTA Sec 5307 Preventative Maintenance	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.76***	***$0.73***	***$0.71***	***$0.69***	***$0.67***	***$0.64***	***$0.62***	***$0.60***	***$0.59***	***$0.57***	***$0.55***	***$0.53***	***$7.66***
Advertising Income	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$1.45***	***$1.49***	***$1.56***	***$1.60***	***$1.67***	***$1.72***	***$1.79***	***$1.84***	***$1.92***	***$1.97***	***$2.06***	***$2.11***	***$2.20***	***$2.25***	***$25.64***
TOTAL OPERATING SOURCES OF FUNDS	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$64.53**	**$68.20**	**$70.21**	**$74.04**	**$75.34**	**$79.40**	**$80.77**	**$85.04**	**$86.48**	**$90.97**	**$92.49**	**$97.18**	**$98.76**	**$103.68**	**$1,167.09**

OPERATING USES OF FUNDS

(Year of Expenditure Dollars in Millions) Fiscal Year	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	Total 2011 - 2040
Bus Rapid Transit	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$64.35	$66.16	$68.58	$70.48	$73.02	$75.02	$77.68	$79.76	$82.54	$84.71	$87.60	$89.84	$92.84	$95.19	$1,107.76
Regional Rail	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
TOTAL OPERATING USES OF FUNDS	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$64.35**	**$66.16**	**$68.58**	**$70.48**	**$73.02**	**$75.02**	**$77.68**	**$79.76**	**$82.54**	**$84.71**	**$87.60**	**$89.84**	**$92.84**	**$95.19**	**$1,107.76**
NET OPERATING CASH FLOW	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.19**	**$2.04**	**$1.63**	**$3.56**	**$2.32**	**$4.38**	**$3.09**	**$5.28**	**$3.94**	**$6.26**	**$4.89**	**$7.33**	**$5.92**	**$8.49**	**$59.33**

CASH BALANCES

(Year of Expenditure Dollars in Millions) Fiscal Year	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	Total 2011 - 2040
Enterprise Debt Reduction Fund and Capital Carryover Fund Bal.																															
Beginning Cash Balance	$0.00	$0.10	$0.50	$0.52	$0.54	$41.33	$28.73	$43.62	$30.68	$24.26	$0.30	($0.00)	($0.00)	($0.00)	$0.88	($0.00)	$45.12	$137.30	$244.57	$307.78	$342.90	$329.53	$317.54	$303.68	$294.52	$283.61	$274.63	$263.94	$255.37	$245.33	
Additions (Deletions) to Cash	$0.10	$0.40	$0.02	$0.02	$40.79	($12.60)	$14.88	($12.94)	($6.41)	($23.96)	($0.30)	$0.00	$0.00	$0.88	($0.88)	$45.12	$92.19	$107.27	$63.21	$35.12	($13.37)	($12.00)	($13.86)	($9.16)	($10.91)	($8.98)	($10.70)	($8.57)	($10.04)	($7.85)	$237.48
Ending Cash Balance	**$0.10**	**$0.50**	**$0.52**	**$0.54**	**$41.33**	**$28.73**	**$43.62**	**$30.68**	**$24.26**	**$0.30**	**($0.00)**	**($0.00)**	**($0.00)**	**$0.88**	**($0.00)**	**$45.12**	**$137.30**	**$244.57**	**$307.78**	**$342.90**	**$329.53**	**$317.54**	**$303.68**	**$294.52**	**$283.61**	**$274.63**	**$263.94**	**$255.37**	**$245.33**	**$237.48**	

DEBT SERVICE COVERAGE RATIOS Fiscal Year	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	
All Dedicated Revenues / All Debt Issues																															
Gross Coverage (Dedicated Tax Revenues / Debt Service)					5.88	4.26	2.67	2.26	2.06	2.32	2.81	3.85	5.24	6.46	9.58	13.49	21.48	24.42	39.91												
Net Coverage ((Ded. Tax Revenues - Operating Exp.) / Debt Svc.)					5.88	4.26	2.67	2.26	2.06	2.32	2.81	3.85	5.24	6.46	9.58	13.49	21.52	24.84	40.44												

REVENUE HOURS OF SERVICE (in millions)																															
Bus/BRT Hours	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	
Street Car Hours	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Light Rail Hours	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Maglev Hours	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	

Exhibit 12. Capital and Operating Sources and Uses of Funds
BRT HOV Lane-Running Alternative
Year-of-Expenditure Dollars in Millions

Southern California Association of Government / Pacific Electric Right-of-Way Alternative Analysis
Scenario: BRT HOV Lane-Running Alternative
11/14/2011

CAPITAL SOURCES OF FUNDS

(Year of Expenditure Dollars in Millions) Fiscal Year	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	Total 2011 - 2040
Transfer from Operation	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.15***	***$2.53***	***$1.80***	***$4.29***	***$2.78***	***$5.43***	***$3.87***	***$6.69***	***$5.08***	***$8.07***	***$6.41***	***$9.56***	***$7.86***	***$11.18***	***$75.70***
Capital Funds																															
Measure R	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$7.40	$11.80	$125.10	$80.10	$1.40	$14.20	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$240.00
Section 5309 Rail & Fixed Guideway Modernization Grants	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$2.84	$2.93	$3.02	$3.12	$3.22	$3.32	$3.32	$21.77
Prop A 35% Bond	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$17.50	$28.60	$66.60	$11.70	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$124.40
Prop C 25%	$0.10	$0.40	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.50
Local Agency Contribution	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$11.60	$0.00	$0.00	$7.90	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$19.50
Interest on Capital Reserve Allocated to Capital Funds	$0.00	$0.00	$0.02	$0.02	$0.02	$1.54	$1.07	$1.64	$1.16	$0.92	$0.04	$0.00	$0.00	$0.00	$0.05	$0.00	$1.50	$4.84	$8.65	$10.89	$12.03	$11.59	$11.22	$10.79	$10.55	$10.25	$10.03	$9.76	$9.64	$9.30	$137.52
TSM Los Angeles County Share	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$6.21	$8.56	$13.27	$9.14	$7.08	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.16	$0.37	$0.70	$0.93	$1.11	$1.11	$1.11	$49.75
TSM Orange County Share	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$32.63	$44.95	$69.67	$48.00	$37.20	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.82	$1.94	$3.68	$4.88	$5.81	$5.81	$5.81	$261.19
Additional Sales Tax from Los Angeles County	$0.00	$0.00	$0.00	$0.00	$22.52	$23.92	$25.26	$26.64	$28.10	$29.62	$31.23	$32.93	$34.66	$36.39	$38.13	$39.90	$41.70	$43.59	$45.55	$47.58	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$547.71
Additional Sales Tax from Orange County	$0.00	$0.00	$0.00	$0.00	$38.35	$40.73	$43.01	$45.36	$47.85	$50.43	$53.18	$56.06	$59.02	$61.96	$64.92	$67.93	$71.00	$74.21	$77.55	$81.02	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$932.59
Subtotal Capital Funds	***$0.10***	***$0.40***	***$0.02***	***$0.02***	***$60.90***	***$66.19***	***$69.34***	***$73.64***	***$77.11***	***$88.36***	***$96.25***	***$264.53***	***$227.29***	***$182.70***	***$199.84***	***$180.71***	***$180.80***	***$134.34***	***$131.75***	***$139.49***	***$12.03***	***$11.59***	***$11.22***	***$14.61***	***$15.79***	***$17.65***	***$18.96***	***$19.90***	***$19.88***	***$19.54***	***$2,334.94***
Financing Program																															
Construction Bridge Financing	$0.00	$0.00	$0.00	$0.00	$263.07	$127.71	$261.39	$151.54	$117.89	$207.29	$75.97	$74.48	$13.73	$49.49	$88.86	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$1,431.43
Subtotal Financing Program	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$263.07***	***$127.71***	***$261.39***	***$151.54***	***$117.89***	***$207.29***	***$75.97***	***$74.48***	***$13.73***	***$49.49***	***$88.86***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$1,431.43***
TOTAL CAPITAL SOURCES OF FUNDS	**$0.10**	**$0.40**	**$0.02**	**$0.02**	**$323.96**	**$193.91**	**$330.73**	**$225.19**	**$194.99**	**$295.66**	**$172.22**	**$339.01**	**$241.02**	**$232.18**	**$288.70**	**$180.71**	**$180.95**	**$136.87**	**$133.55**	**$143.78**	**$14.81**	**$17.02**	**$15.09**	**$21.30**	**$20.87**	**$25.72**	**$25.37**	**$29.46**	**$27.74**	**$30.72**	**$3,842.07**

CAPITAL USES OF FUNDS

(Year of Expenditure Dollars in Millions) Fiscal Year	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	Total 2011 - 2040
Project Expenses																															
BRT HOV Lane-Running Alternative	$0.00	$0.00	$0.00	$0.00	$271.95	$189.07	$287.01	$201.87	$159.67	$14.58	$10.22	$10.56	$14.25	$11.27	$11.65	$8.35	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$1,190.46
Rehabilitation & Replacement	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$6.80	$11.53	$18.70	$23.75	$27.74	$28.10	$28.36	$28.62	$28.98	$29.26	$29.55	$29.76	$29.76	$29.76	$350.68
TSM	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$38.84	$53.51	$82.94	$57.14	$44.28	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$276.72
TSM Rehabilitation & Replacement	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.97	$2.31	$4.38	$5.81	$6.92	$6.92	$6.92	$34.23
Financing Program																															
Retired Bridge Financing Debt	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$263.07	$127.71	$261.39	$151.54	$117.89	$207.29	$75.97	$74.48	$13.73	$49.49	$88.86	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$1,431.43
Interest	$0.00	$0.00	$0.00	$0.00	$10.18	$14.93	$25.11	$31.26	$36.13	$34.11	$29.71	$22.89	$17.86	$15.37	$11.04	$8.29	$5.58	$5.09	$3.28	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$270.84
Debt Management Expenses	$0.00	$0.00	$0.00	$0.00	$1.58	$2.34	$3.91	$4.82	$5.53	$6.77	$5.65	$5.33	$3.85	$3.23	$3.06	$1.82	$1.36	$0.91	$0.83	$0.53	($0.00)	($0.00)	($0.00)	($0.00)	($0.00)	($0.00)	($0.00)	($0.00)	($0.00)	($0.00)	$51.53
TOTAL CAPITAL USES OF FUNDS	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$283.71**	**$206.34**	**$316.03**	**$237.96**	**$201.32**	**$318.53**	**$173.30**	**$339.01**	**$241.02**	**$230.70**	**$290.18**	**$138.71**	**$88.22**	**$31.26**	**$72.30**	**$113.15**	**$27.74**	**$28.10**	**$28.36**	**$29.59**	**$31.29**	**$33.64**	**$35.36**	**$36.68**	**$36.68**	**$36.68**	**$3,605.88**
NET CAPITAL CASH FLOW	**$0.10**	**$0.40**	**$0.02**	**$0.02**	**$40.25**	**($12.43)**	**$14.69**	**($12.77)**	**($6.33)**	**($22.87)**	**($1.08)**	**$0.00**	**$0.00**	**$1.48**	**($1.48)**	**$42.00**	**$92.73**	**$105.61**	**$61.26**	**$30.63**	**($12.93)**	**($11.08)**	**($13.27)**	**($8.29)**	**($10.42)**	**($7.92)**	**($9.99)**	**($7.22)**	**($8.94)**	**($5.96)**	**$236.19**

OPERATING SOURCES OF FUNDS

(Year of Expenditure Dollars in Millions) Fiscal Year	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	Total 2011 - 2040
Fare Revenue	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$80.67***	***$85.30***	***$86.82***	***$91.69***	***$93.29***	***$98.44***	***$100.13***	***$105.55***	***$107.33***	***$113.02***	***$114.88***	***$120.83***	***$122.78***	***$129.01***	***$1,449.75***
FTA Sec 5307 Preventative Maintenance	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.70***	***$0.67***	***$0.65***	***$0.63***	***$0.61***	***$0.59***	***$0.57***	***$0.55***	***$0.54***	***$0.52***	***$0.50***	***$0.49***	***$7.02***
Advertising Income	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$1.70***	***$1.75***	***$1.82***	***$1.88***	***$1.96***	***$2.02***	***$2.10***	***$2.16***	***$2.25***	***$2.31***	***$2.41***	***$2.47***	***$2.57***	***$2.64***	***$30.05***
TOTAL OPERATING SOURCES OF FUNDS	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$82.36**	**$87.05**	**$89.34**	**$94.24**	**$95.90**	**$101.09**	**$102.84**	**$108.31**	**$110.15**	**$115.89**	**$117.83**	**$123.83**	**$125.85**	**$132.14**	**$1,486.82**

OPERATING USES OF FUNDS

(Year of Expenditure Dollars in Millions) Fiscal Year	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	Total 2011 - 2040
Bus Rapid Transit	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$82.21	$84.52	$87.54	$89.95	$93.12	$95.66	$98.97	$101.61	$105.08	$107.82	$111.42	$114.26	$117.99	$120.96	$1,411.12
Regional Rail	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
TOTAL OPERATING USES OF FUNDS	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$82.21**	**$84.52**	**$87.54**	**$89.95**	**$93.12**	**$95.66**	**$98.97**	**$101.61**	**$105.08**	**$107.82**	**$111.42**	**$114.26**	**$117.99**	**$120.96**	**$1,411.12**
NET OPERATING CASH FLOW	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.15**	**$2.53**	**$1.80**	**$4.29**	**$2.78**	**$5.43**	**$3.87**	**$6.69**	**$5.08**	**$8.07**	**$6.41**	**$9.56**	**$7.86**	**$11.18**	**$75.70**

CASH BALANCES

(Year of Expenditure Dollars in Millions) Fiscal Year	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	Total 2011 - 2040
Enterprise Debt Reduction Fund and Capital Carryover Fund Bal.																															
Beginning Cash Balance	$0.00	$0.10	$0.50	$0.52	$0.54	$40.79	$28.36	$43.05	$30.28	$23.95	$1.08	($0.00)	($0.00)	($0.00)	$1.48	($0.00)	$42.00	$134.73	$240.34	$301.59	$332.23	$319.29	$308.21	$294.94	$286.65	$276.23	$268.30	$258.31	$251.09	$242.15	
Additions (Deletions) to Cash	$0.10	$0.40	$0.02	$0.02	$40.25	($12.43)	$14.69	($12.77)	($6.33)	($22.87)	($1.08)	$0.00	$0.00	$1.48	($1.48)	$42.00	$92.73	$105.61	$61.26	$30.63	($12.93)	($11.08)	($13.27)	($8.29)	($10.42)	($7.92)	($9.99)	($7.22)	($8.94)	($5.96)	$236.19
Ending Cash Balance	**$0.10**	**$0.50**	**$0.52**	**$0.54**	**$40.79**	**$28.36**	**$43.05**	**$30.28**	**$23.95**	**$1.08**	**($0.00)**	**($0.00)**	**($0.00)**	**$1.48**	**($0.00)**	**$42.00**	**$134.73**	**$240.34**	**$301.59**	**$332.23**	**$319.29**	**$308.21**	**$294.94**	**$286.65**	**$276.23**	**$268.30**	**$258.31**	**$251.09**	**$242.15**	**$236.19**	

DEBT SERVICE COVERAGE RATIOS Fiscal Year	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	
All Dedicated Revenues / All Debt Issues																															
Gross Coverage (Dedicated Tax Revenues / Debt Service)					5.98	4.33	2.72	2.30	2.10	2.35	2.84	3.89	5.24	6.40	9.33	13.00	20.19	23.14	37.54												
Net Coverage ((Ded. Tax Revenues - Operating Exp.) / Debt Svc.)					5.98	4.33	2.72	2.30	2.10	2.35	2.84	3.89	5.24	6.40	9.33	13.00	20.22	23.63	38.09												

REVENUE HOURS OF SERVICE (in millions)																															
Bus/BRT Hours	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	
Street Car Hours	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Light Rail Hours	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Maglev Hours	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	

Exhibit 13. Capital and Operating Sources and Uses of Funds
Street Car West Bank 3 Alternative
Year-of-Expenditure Dollars in Millions

Southern California Association of Government / Pacific Electric Right-of-Way Alternative Analysis
Scenario: Street Car West Bank 3 Alternative
11/13/2011

CAPITAL SOURCES OF FUNDS

(Year of Expenditure Dollars in Millions) Fiscal Year	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	Total 2011 - 2040
Transfer from Operation	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.36***	***$11.06***	***$14.23***	***$25.50***	***$22.53***	***$34.65***	***$31.73***	***$44.72***	***$41.88***	***$55.74***	***$53.00***	***$67.72***	***$65.13***	***$80.73***	***$548.99***
Capital Funds																															
Measure R	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$7.40	$11.80	$125.10	$80.10	$1.40	$14.20	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$240.00
Section 5309 Rail & Fixed Guideway Modernization Grants	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$41.33	$43.06	$44.87	$46.77	$48.76	$50.84	$50.84	$326.48
Prop A 35% Bond	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$17.50	$28.60	$66.60	$11.70	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$124.40
Prop C 25%	$0.10	$0.40	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.50
Local Agency Contribution	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$11.60	$0.00	$0.00	$7.90	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$19.50
Interest on Capital Reserve Allocated to Capital Funds	$0.00	$0.00	$0.02	$0.02	$0.02	$0.70	$0.86	$0.75	$1.03	$2.27	$2.75	$1.89	$1.29	$2.30	$2.15	$2.02	$1.45	$1.54	$1.90	$2.04	$2.11	$2.18	$6.53	$2.43	$2.33	$2.46	$2.59	$11.97	$22.39	$33.79	$113.77
TSM Los Angeles County Share	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$6.21	$8.56	$13.27	$9.14	$7.08	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.16	$0.37	$0.70	$0.93	$1.11	$1.11	$1.11	$49.75
TSM Orange County Share	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$32.63	$44.95	$69.67	$48.00	$37.20	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.82	$1.94	$3.68	$4.88	$5.81	$5.81	$5.81	$261.19
Additional Sales Tax from Los Angeles County	$0.00	$0.00	$0.00	$0.00	$66.09	$70.19	$74.12	$78.18	$82.46	$86.90	$91.65	$96.62	$101.71	$106.79	$111.88	$117.07	$122.36	$127.90	$133.65	$139.63	$145.68	$151.80	$158.24	$164.99	$172.00	$179.38	$187.16	$195.25	$203.40	$159.29	$3,324.39
Additional Sales Tax from Orange County	$0.00	$0.00	$0.00	$0.00	$20.87	$22.17	$23.40	$24.69	$26.04	$27.44	$28.94	$30.51	$32.12	$33.72	$35.33	$36.97	$38.64	$40.39	$42.21	$44.09	$46.00	$47.94	$49.97	$52.10	$54.32	$56.64	$59.10	$61.66	$64.23	$50.30	$1,049.81
Subtotal Capital Funds	***$0.10***	***$0.40***	***$0.02***	***$0.02***	***$86.99***	***$93.07***	***$98.38***	***$103.62***	***$109.53***	***$124.02***	***$135.14***	***$304.56***	***$268.72***	***$227.15***	***$246.10***	***$228.94***	***$229.04***	***$181.52***	***$177.76***	***$185.76***	***$193.79***	***$201.92***	***$214.74***	***$261.83***	***$274.02***	***$287.74***	***$301.43***	***$324.56***	***$347.78***	***$301.15***	***$5,509.78***
Financing Program																															
Construction Bridge Financing	$0.00	$0.00	$0.00	$0.00	$58.01	$0.00	$33.85	$0.00	$0.00	$496.58	$238.45	$166.81	$376.40	$322.25	$803.96	$426.62	$27.48	$280.96	$219.87	$680.49	$292.12	$0.00	$10.49	$0.00	$464.87	$48.04	$0.00	$0.00	$0.00	$0.00	$4,947.26
Subtotal Financing Program	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$58.01***	***$0.00***	***$33.85***	***$0.00***	***$0.00***	***$496.58***	***$238.45***	***$166.81***	***$376.40***	***$322.25***	***$803.96***	***$426.62***	***$27.48***	***$280.96***	***$219.87***	***$680.49***	***$292.12***	***$0.00***	***$10.49***	***$0.00***	***$464.87***	***$48.04***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$4,947.26***
TOTAL CAPITAL SOURCES OF FUNDS	**$0.10**	**$0.40**	**$0.02**	**$0.02**	**$145.00**	**$93.07**	**$132.23**	**$103.62**	**$109.53**	**$620.60**	**$373.59**	**$471.37**	**$645.13**	**$549.40**	**$1,050.06**	**$655.56**	**$256.88**	**$473.55**	**$411.86**	**$891.75**	**$508.44**	**$236.57**	**$256.97**	**$306.55**	**$780.76**	**$391.51**	**$354.42**	**$392.29**	**$412.91**	**$381.88**	**$11,006.03**

CAPITAL USES OF FUNDS

(Year of Expenditure Dollars in Millions) Fiscal Year	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	Total 2011 - 2040
Project Expenses																															
Street Car West Bank 3 Alternative	$0.00	$0.00	$0.00	$0.00	$124.30	$86.42	$131.19	$92.27	$72.98	$520.49	$364.91	$377.06	$509.01	$402.59	$416.00	$298.13	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$3,395.35
Rehabilitation & Replacement	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$3.11	$5.27	$8.55	$10.85	$12.68	$25.69	$34.81	$44.24	$56.97	$67.03	$77.43	$84.88	$84.88	$84.88	$601.28
TSM	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$38.84	$53.51	$82.94	$57.14	$44.28	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$276.72
TSM Rehabilitation & Replacement	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.97	$2.31	$4.38	$5.81	$6.92	$6.92	$6.92	$34.23
Financing Program																															
Retired Brige Financing Debt	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$58.01	$0.00	$33.85	$0.00	$0.00	$496.58	$238.45	$166.81	$376.40	$322.25	$803.96	$426.62	$27.48	$280.96	$219.87	$680.49	$292.12	$0.00	$10.49	$0.00	$464.87	$4,899.22
Interest	$0.00	$0.00	$0.00	$0.00	$2.25	$2.22	$3.54	$3.57	$3.60	$20.90	$28.06	$32.92	$46.66	$58.42	$69.64	$76.72	$71.81	$68.49	$64.90	$60.51	$55.83	$55.11	$45.23	$37.26	$29.32	$20.26	$20.52	$20.52	$20.98	$1.96	$921.18
Debt Management Expenses	$0.00	$0.00	$0.00	$0.00	$0.35	$0.35	$0.55	$0.55	$0.55	$3.53	$4.61	$5.61	$7.67	$9.60	$14.43	$14.01	$12.74	$13.43	$12.49	$14.64	$11.57	$9.01	$8.90	$7.22	$8.69	$4.89	$3.14	$3.14	$3.08	$3.08	$177.81
TOTAL CAPITAL USES OF FUNDS	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$126.90**	**$88.98**	**$135.28**	**$96.40**	**$77.13**	**$602.93**	**$397.59**	**$488.28**	**$616.85**	**$553.56**	**$1,053.78**	**$671.59**	**$254.47**	**$463.59**	**$408.19**	**$889.96**	**$506.69**	**$117.28**	**$369.91**	**$309.56**	**$777.77**	**$388.68**	**$106.90**	**$125.95**	**$115.86**	**$561.71**	**$10,305.79**
NET CAPITAL CASH FLOW	**$0.10**	**$0.40**	**$0.02**	**$0.02**	**$18.10**	**$4.08**	**($3.05)**	**$7.22**	**$32.40**	**$17.67**	**($24.00)**	**($16.91)**	**$28.28**	**($4.16)**	**($3.72)**	**($16.03)**	**$2.41**	**$9.96**	**$3.67**	**$1.79**	**$1.75**	**$119.29**	**($112.95)**	**($3.01)**	**$2.99**	**$2.83**	**$247.52**	**$266.34**	**$297.05**	**($179.83)**	**$700.24**

OPERATING SOURCES OF FUNDS

(Year of Expenditure Dollars in Millions) Fiscal Year	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	Total 2011 - 2040
Fare Revenue	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$347.42***	***$367.40***	***$373.93***	***$394.89***	***$401.78***	***$423.98***	***$431.24***	***$454.61***	***$462.25***	***$486.78***	***$494.79***	***$520.42***	***$528.79***	***$555.65***	***$6,243.93***
FTA Sec 5307 Preventative Maintenance	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$6.01***	***$5.87***	***$5.73***	***$5.60***	***$5.47***	***$5.34***	***$5.22***	***$5.10***	***$4.98***	***$4.87***	***$4.75***	***$4.64***	***$63.58***
Advertising Income	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$2.01***	***$2.07***	***$2.16***	***$2.22***	***$2.32***	***$2.39***	***$2.49***	***$2.56***	***$2.67***	***$2.74***	***$2.85***	***$2.93***	***$3.05***	***$3.13***	***$35.59***
TOTAL OPERATING SOURCES OF FUNDS	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$349.43**	**$369.47**	**$382.09**	**$402.98**	**$409.84**	**$431.97**	**$439.20**	**$462.51**	**$470.13**	**$494.62**	**$502.62**	**$528.21**	**$536.59**	**$563.42**	**$6,343.11**

OPERATING USES OF FUNDS

(Year of Expenditure Dollars in Millions) Fiscal Year	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	Total 2011 - 2040
Bus Rapid Transit	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
Regional Rail	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$349.07	$358.40	$367.86	$377.49	$387.30	$397.32	$407.47	$417.79	$428.26	$438.88	$449.63	$460.49	$471.46	$482.69	$5,794.12
TOTAL OPERATING USES OF FUNDS	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$349.07**	**$358.40**	**$367.86**	**$377.49**	**$387.30**	**$397.32**	**$407.47**	**$417.79**	**$428.26**	**$438.88**	**$449.63**	**$460.49**	**$471.46**	**$482.69**	**$5,794.12**
NET OPERATING CASH FLOW	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.36**	**$11.06**	**$14.23**	**$25.50**	**$22.53**	**$34.65**	**$31.73**	**$44.72**	**$41.88**	**$55.74**	**$53.00**	**$67.72**	**$65.13**	**$80.73**	**$548.99**

CASH BALANCES

(Year of Expenditure Dollars in Millions) Fiscal Year	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	Total 2011 - 2040
Enterprise Debt Reduction Fund and Capital Carryover Fund Bal.																															
Beginning Cash Balance	$0.00	$0.10	$0.50	$0.52	$0.54	$18.65	$22.73	$19.68	$26.90	$59.29	$76.96	$52.97	$36.05	$64.34	$60.18	$56.46	$40.43	$42.84	$52.80	$56.46	$58.25	$60.00	$179.29	$66.34	$63.34	$66.32	$69.16	$316.68	$583.02	$880.07	
Additions (Deletions) to Cash	$0.10	$0.40	$0.02	$0.02	$18.10	$4.08	($3.05)	$7.22	$32.40	$17.67	($24.00)	($16.91)	$28.28	($4.16)	($3.72)	($16.03)	$2.41	$9.96	$3.67	$1.79	$1.75	$119.29	($112.95)	($3.01)	$2.99	$2.83	$247.52	$266.34	$297.05	($179.83)	$700.24
Ending Cash Balance	**$0.10**	**$0.50**	**$0.52**	**$0.54**	**$18.65**	**$22.73**	**$19.68**	**$26.90**	**$59.29**	**$76.96**	**$52.97**	**$36.05**	**$64.34**	**$60.18**	**$56.46**	**$40.43**	**$42.84**	**$52.80**	**$56.46**	**$58.25**	**$60.00**	**$179.29**	**$66.34**	**$63.34**	**$66.32**	**$69.16**	**$316.68**	**$583.02**	**$880.07**	**$700.24**	

DEBT SERVICE COVERAGE RATIOS Fiscal Year	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
All Dedicated Revenues / All Debt Issues																														
Gross Coverage (Dedicated Tax Revenues / Debt Service)					38.74	41.68	27.57	28.79	30.13	5.47	4.30	3.86	2.87	2.41	2.11	2.01	2.24	2.46	2.71	3.04	3.43	3.62	4.60	5.83	7.72	11.65	12.00	12.52	12.76	106.68
Net Coverage ((Ded. Tax Revenues - Operating Exp.) / Debt Svc.)					38.74	41.68	27.57	28.79	30.13	5.47	4.30	3.86	2.87	2.41	2.11	2.01	2.25	2.62	2.93	3.46	3.84	4.25	5.30	7.03	9.15	14.40	14.59	15.82	15.86	147.77

REVENUE HOURS OF SERVICE (in millions)																															
Bus/BRT Hours	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Street Car Hours	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	
Light Rail Hours	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Maglev Hours	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	

Exhibit 14. Capital and Operating Sources and Uses of Funds
LRT East Bank 1 Alternative
Year-of-Expenditure Dollars in Millions
*

Southern California Association of Government / Pacific Electric Right-of-Way Alternative Analysis
Scenario: LRT East Bank 1 Alternative
11/13/2011

CAPITAL SOURCES OF FUNDS

(Year of Expenditure Dollars in Millions) Fiscal Year	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	Total 2011 - 2040
Transfer from Operation	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.21***	***$10.83***	***$14.08***	***$25.25***	***$22.31***	***$34.32***	***$31.42***	***$44.30***	***$41.48***	***$55.22***	***$52.50***	***$67.11***	***$64.54***	***$80.01***	***$543.58***
Capital Funds																															
Measure R	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$7.40	$11.80	$125.10	$80.10	$1.40	$14.20	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$240.00
Section 5309 Rail & Fixed Guideway Modernization Grants	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$42.18	$43.95	$45.80	$47.75	$49.78	$51.92	$51.92	$333.30
Prop A 35% Bond	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$17.50	$28.60	$66.60	$11.70	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$124.40
Prop C 25%	$0.10	$0.40	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.50
Local Agency Contribution	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$11.60	$0.00	$0.00	$7.90	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$19.50
Interest on Capital Reserve Allocated to Capital Funds	$0.00	$0.00	$0.02	$0.02	$0.02	$0.82	$0.57	$0.87	$0.61	$1.02	$2.44	$1.67	$1.06	$1.99	$1.91	$1.77	$1.27	$1.53	$1.89	$2.03	$2.10	$2.17	$5.94	$2.80	$3.88	$2.42	$2.54	$11.90	$22.69	$34.07	$112.05
TSM Los Angeles County Share	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$6.21	$8.56	$13.27	$9.14	$7.08	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.16	$0.37	$0.70	$0.93	$1.11	$1.11	$1.11	$49.75
TSM Orange County Share	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$32.63	$44.95	$69.67	$48.00	$37.20	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.82	$1.94	$3.68	$4.88	$5.81	$5.81	$5.81	$261.19
Additional Sales Tax from Los Angeles County	$0.00	$0.00	$0.00	$0.00	$58.66	$62.30	$65.78	$69.38	$73.18	$77.13	$81.34	$85.75	$90.26	$94.77	$99.29	$103.90	$108.59	$113.51	$118.62	$123.92	$129.29	$134.73	$140.44	$146.43	$152.65	$159.20	$166.10	$173.29	$180.52	$141.37	$2,950.39
Additional Sales Tax from Orange County	$0.00	$0.00	$0.00	$0.00	$23.96	$25.45	$26.87	$28.34	$29.89	$31.50	$33.22	$35.02	$36.87	$38.71	$40.56	$42.44	$44.35	$46.36	$48.45	$50.62	$52.81	$55.03	$57.36	$59.81	$62.35	$65.02	$67.84	$70.78	$73.73	$57.74	$1,205.09
Subtotal Capital Funds	***$0.10***	***$0.40***	***$0.02***	***$0.02***	***$82.64***	***$88.56***	***$93.21***	***$98.59***	***$103.69***	***$117.05***	***$128.80***	***$297.99***	***$261.81***	***$219.82***	***$238.50***	***$220.99***	***$220.81***	***$173.10***	***$168.96***	***$176.57***	***$184.20***	***$191.93***	***$203.74***	***$252.19***	***$265.14***	***$276.83***	***$290.05***	***$312.67***	***$335.78***	***$292.02***	***$5,296.17***
Financing Program																															
Construction Bridge Financing	$0.00	$0.00	$0.00	$0.00	$86.93	$9.59	$74.77	$10.06	$0.00	$501.39	$217.82	$172.26	$332.11	$282.42	$763.83	$375.27	$39.55	$239.07	$183.45	$644.79	$245.98	$0.00	$0.00	$0.00	$386.14	$2.85	$0.00	$0.00	$0.00	$0.00	$4,568.30
Subtotal Financing Program	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$86.93***	***$9.59***	***$74.77***	***$10.06***	***$0.00***	***$501.39***	***$217.82***	***$172.26***	***$332.11***	***$282.42***	***$763.83***	***$375.27***	***$39.55***	***$239.07***	***$183.45***	***$644.79***	***$245.98***	***$0.00***	***$0.00***	***$0.00***	***$386.14***	***$2.85***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$4,568.30***
TOTAL CAPITAL SOURCES OF FUNDS	**$0.10**	**$0.40**	**$0.02**	**$0.02**	**$169.57**	**$98.15**	**$167.98**	**$108.65**	**$103.69**	**$618.44**	**$346.62**	**$470.25**	**$593.92**	**$502.24**	**$1,002.33**	**$596.26**	**$260.58**	**$423.00**	**$366.49**	**$846.60**	**$452.49**	**$226.25**	**$235.17**	**$296.49**	**$692.76**	**$334.90**	**$342.55**	**$379.78**	**$400.32**	**$372.03**	**$10,408.06**

CAPITAL USES OF FUNDS

(Year of Expenditure Dollars in Millions) Fiscal Year	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	Total 2011 - 2040
Project Expenses																															
LRT East Bank 1 Alternative	$0.00	$0.00	$0.00	$0.00	$144.55	$100.49	$152.55	$107.30	$84.87	$462.41	$324.19	$334.99	$452.21	$357.67	$369.58	$264.87	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$3,155.67
Rehabilitation & Replacement	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$3.61	$6.13	$9.94	$12.62	$14.74	$26.30	$34.41	$42.78	$54.09	$63.03	$72.27	$78.89	$78.89	$78.89	$576.61
TSM	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$38.84	$53.51	$82.94	$57.14	$44.28	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$276.72
TSM Rehabilitation & Replacement	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.97	$2.31	$4.38	$5.81	$6.92	$6.92	$6.92	$34.23
Financing Program																															
Retired Brige Financing Debt	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$86.93	$9.59	$74.77	$10.06	$0.00	$501.39	$217.82	$172.26	$332.11	$282.42	$763.83	$375.27	$39.55	$239.07	$183.45	$644.79	$245.98	$0.00	$0.00	$0.00	$386.14	$4,565.45
Interest	$0.00	$0.00	$0.00	$0.00	$3.36	$3.69	$6.59	$7.05	$7.11	$23.47	$29.35	$32.91	$44.66	$54.97	$64.55	$70.49	$65.81	$62.57	$59.08	$54.84	$50.33	$49.12	$40.39	$33.76	$24.15	$15.05	$15.25	$15.56	$15.91	$0.12	$850.13
Debt Management Expenses	$0.00	$0.00	$0.00	$0.00	$0.52	$0.58	$1.03	$1.09	$1.09	$4.10	$4.88	$5.86	$7.40	$9.04	$13.62	$12.86	$11.79	$12.19	$11.30	$13.48	$10.37	$8.12	$7.88	$6.45	$7.66	$3.81	$2.33	$2.33	$2.33	$2.33	$164.44
TOTAL CAPITAL USES OF FUNDS	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$148.43**	**$104.76**	**$160.17**	**$115.44**	**$93.06**	**$576.92**	**$368.01**	**$487.36**	**$567.85**	**$504.62**	**$1,006.27**	**$610.32**	**$253.48**	**$413.00**	**$362.75**	**$844.77**	**$450.71**	**$123.09**	**$321.75**	**$267.42**	**$733.00**	**$332.26**	**$95.66**	**$103.70**	**$104.05**	**$474.40**	**$9,623.25**
NET CAPITAL CASH FLOW	**$0.10**	**$0.40**	**$0.02**	**$0.02**	**$21.14**	**($6.61)**	**$7.81**	**($6.79)**	**$10.63**	**$41.53**	**($21.39)**	**($17.12)**	**$26.07**	**($2.38)**	**($3.94)**	**($14.06)**	**$7.10**	**$10.00**	**$3.74**	**$1.84**	**$1.78**	**$103.16**	**($86.59)**	**$29.08**	**($40.24)**	**$2.65**	**$246.89**	**$276.08**	**$296.26**	**($102.37)**	**$784.81**

OPERATING SOURCES OF FUNDS

(Year of Expenditure Dollars in Millions) Fiscal Year	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	Total 2011 - 2040
Fare Revenue	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$344.66***	***$364.48***	***$370.95***	***$391.75***	***$398.59***	***$420.61***	***$427.82***	***$451.00***	***$458.57***	***$482.91***	***$490.86***	***$516.28***	***$524.59***	***$551.23***	***$6,194.30***
FTA Sec 5307 Preventative Maintenance	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$6.07***	***$5.93***	***$5.79***	***$5.66***	***$5.53***	***$5.40***	***$5.28***	***$5.16***	***$5.04***	***$4.92***	***$4.81***	***$4.70***	***$64.29***
Advertising Income	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$2.14***	***$2.21***	***$2.30***	***$2.37***	***$2.48***	***$2.55***	***$2.66***	***$2.73***	***$2.85***	***$2.92***	***$3.04***	***$3.13***	***$3.25***	***$3.34***	***$37.96***
TOTAL OPERATING SOURCES OF FUNDS	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$346.80**	**$366.68**	**$379.32**	**$400.05**	**$406.86**	**$428.82**	**$436.00**	**$459.13**	**$466.70**	**$490.99**	**$498.94**	**$524.33**	**$532.65**	**$559.27**	**$6,296.54**

OPERATING USES OF FUNDS

(Year of Expenditure Dollars in Millions) Fiscal Year	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	Total 2011 - 2040
Bus Rapid Transit	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
Regional Rail	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$346.59	$355.86	$365.25	$374.81	$384.55	$394.49	$404.58	$414.83	$425.22	$435.77	$446.43	$457.22	$468.11	$479.26	$5,752.96
TOTAL OPERATING USES OF FUNDS	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$346.59**	**$355.86**	**$365.25**	**$374.81**	**$384.55**	**$394.49**	**$404.58**	**$414.83**	**$425.22**	**$435.77**	**$446.43**	**$457.22**	**$468.11**	**$479.26**	**$5,752.96**
NET OPERATING CASH FLOW	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.21**	**$10.83**	**$14.08**	**$25.25**	**$22.31**	**$34.32**	**$31.42**	**$44.30**	**$41.48**	**$55.22**	**$52.50**	**$67.11**	**$64.54**	**$80.01**	**$543.58**

CASH BALANCES

(Year of Expenditure Dollars in Millions) Fiscal Year	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	Total 2011 - 2040
Enterprise Debt Reduction Fund and Capital Carryover Fund Bal.																															
Beginning Cash Balance	$0.00	$0.10	$0.50	$0.52	$0.54	$21.68	$15.07	$22.88	$16.09	$26.72	$68.25	$46.86	$29.74	$55.82	$53.44	$49.50	$35.44	$42.54	$52.54	$56.28	$58.11	$59.89	$163.05	$76.47	$105.54	$65.30	$67.95	$314.84	$590.92	$887.18	
Additions (Deletions) to Cash	$0.10	$0.40	$0.02	$0.02	$21.14	($6.61)	$7.81	($6.79)	$10.63	$41.53	($21.39)	($17.12)	$26.07	($2.38)	($3.94)	($14.06)	$7.10	$10.00	$3.74	$1.84	$1.78	$103.16	($86.59)	$29.08	($40.24)	$2.65	$246.89	$276.08	$296.26	($102.37)	$784.81
Ending Cash Balance	**$0.10**	**$0.50**	**$0.52**	**$0.54**	**$21.68**	**$15.07**	**$22.88**	**$16.09**	**$26.72**	**$68.25**	**$46.86**	**$29.74**	**$55.82**	**$53.44**	**$49.50**	**$35.44**	**$42.54**	**$52.54**	**$56.28**	**$58.11**	**$59.89**	**$163.05**	**$76.47**	**$105.54**	**$65.30**	**$67.95**	**$314.84**	**$590.92**	**$887.18**	**$784.81**	

DEBT SERVICE COVERAGE RATIOS Fiscal Year	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	
All Dedicated Revenues / All Debt Issues																															
Gross Coverage (Dedicated Tax Revenues / Debt Service)					24.56	23.80	14.05	13.85	14.50	4.63	3.90	3.67	2.85	2.43	2.17	2.08	2.32	2.56	2.83	3.18	3.62	3.86	4.90	6.11	8.90	14.89	15.34	15.69	15.98	1,707.12	
Net Coverage ((Ded. Tax Revenues - Operating Exp.) / Debt Svc.)					24.56	23.80	14.05	13.85	14.50	4.63	3.90	3.67	2.85	2.43	2.17	2.08	2.33	2.73	3.07	3.64	4.06	4.56	5.68	7.42	10.62	18.56	18.79	20.00	20.04	2,393.07	

REVENUE HOURS OF SERVICE (in millions)																															
Bus/BRT Hours	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Street Car Hours	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Light Rail Hours	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13
Maglev Hours	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Exhibit 15. Capital and Operating Sources and Uses of Funds
LRT West Bank 2 Alternative
Year-of-Expenditure Dollars in Millions

Southern California Association of Government / Pacific Electric Right-of-Way Alternative Analysis
Scenario: LRT West Bank 2 Alternative
11/13/2011

CAPITAL SOURCES OF FUNDS

(Year of Expenditure Dollars in Millions) Fiscal Year	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	Total 2011 - 2040
Transfer from Operation	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.11***	***$10.63***	***$14.10***	***$25.16***	***$22.24***	***$34.14***	***$31.25***	***$44.01***	***$41.20***	***$54.81***	***$52.11***	***$66.57***	***$64.02***	***$79.34***	***$539.67***
Capital Funds																															
Measure R	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$7.40	$11.80	$125.10	$80.10	$1.40	$14.20	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$240.00
Section 5309 Rail & Fixed Guideway Modernization Grants	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$43.18	$44.99	$46.88	$48.87	$50.94	$53.12	$53.12	$341.11
Prop A 35% Bond	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$124.40
Prop C 25%	$0.10	$0.40	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.50
Local Agency Contribution	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$11.60	$0.00	$0.00	$7.90	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$19.50
Interest on Capital Reserve Allocated to Capital Funds	$0.00	$0.00	$0.02	$0.02	$0.02	$0.83	$0.58	$0.88	$0.62	$0.87	$2.36	$1.62	$1.00	$1.91	$1.85	$1.71	$1.22	$1.51	$1.88	$2.01	$2.09	$2.16	$5.79	$2.72	$3.90	$2.39	$2.51	$11.75	$22.40	$33.64	$110.25
TSM Los Angeles County Share	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$6.21	$8.56	$13.27	$9.14	$7.08	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.16	$0.37	$0.70	$0.93	$1.11	$1.11	$1.11	$49.75
TSM Orange County Share	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$32.63	$44.95	$69.67	$48.00	$37.20	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.82	$1.94	$3.68	$4.88	$5.81	$5.81	$5.81	$261.19
Additional Sales Tax from Los Angeles County	$0.00	$0.00	$0.00	$0.00	$57.12	$60.66	$64.05	$67.56	$71.26	$75.10	$79.20	$83.49	$87.89	$92.28	$96.68	$101.17	$105.73	$110.52	$115.49	$120.66	$125.89	$131.18	$136.75	$142.58	$148.63	$155.01	$161.73	$168.73	$175.77	$137.65	$2,872.75
Additional Sales Tax from Orange County	$0.00	$0.00	$0.00	$0.00	$23.33	$24.78	$26.16	$27.59	$29.11	$30.67	$32.35	$34.10	$35.90	$37.69	$39.49	$41.32	$43.19	$45.14	$47.17	$49.28	$51.42	$53.58	$55.85	$58.24	$60.71	$63.31	$66.06	$68.92	$71.79	$56.22	$1,173.38
Subtotal Capital Funds	***$0.10***	***$0.40***	***$0.02***	***$0.02***	***$80.46***	***$86.26***	***$90.78***	***$96.03***	***$100.98***	***$114.04***	***$125.70***	***$294.75***	***$258.40***	***$216.23***	***$234.76***	***$217.08***	***$216.74***	***$168.88***	***$164.54***	***$171.96***	***$179.39***	***$186.92***	***$198.39***	***$247.69***	***$260.54***	***$271.97***	***$284.97***	***$307.25***	***$330.00***	***$287.55***	***$5,192.83***
Financing Program																															
Construction Bridge Financing	$0.00	$0.00	$0.00	$0.00	$90.88	$13.12	$79.27	$14.31	$0.00	$495.58	$214.65	$168.80	$323.72	$273.65	$748.04	$365.99	$39.30	$233.41	$177.52	$632.26	$240.36	$0.00	$0.00	$0.00	$375.11	$0.38	$0.00	$0.00	$0.00	$0.00	$4,486.36
Subtotal Financing Program	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$90.88***	***$13.12***	***$79.27***	***$14.31***	***$0.00***	***$495.58***	***$214.65***	***$168.80***	***$323.72***	***$273.65***	***$748.04***	***$365.99***	***$39.30***	***$233.41***	***$177.52***	***$632.26***	***$240.36***	***$0.00***	***$0.00***	***$0.00***	***$375.11***	***$0.38***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$4,486.36***
TOTAL CAPITAL SOURCES OF FUNDS	**$0.10**	**$0.40**	**$0.02**	**$0.02**	**$171.34**	**$99.38**	**$170.05**	**$110.34**	**$100.98**	**$609.62**	**$340.35**	**$463.55**	**$582.13**	**$489.88**	**$982.80**	**$583.07**	**$256.15**	**$412.91**	**$356.17**	**$829.38**	**$441.99**	**$221.05**	**$229.65**	**$291.70**	**$676.85**	**$327.17**	**$337.08**	**$373.83**	**$394.02**	**$366.89**	**$10,218.85**

CAPITAL USES OF FUNDS

(Year of Expenditure Dollars in Millions) Fiscal Year	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	Total 2011 - 2040
Project Expenses																															
LRT West Bank 2 Alternative	$0.00	$0.00	$0.00	$0.00	$145.93	$101.46	$154.01	$108.33	$85.68	$447.46	$313.71	$324.16	$437.59	$346.11	$357.63	$256.30	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$3,078.38
Rehabilitation & Replacement	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$3.65	$6.18	$10.04	$12.74	$14.89	$26.07	$33.91	$42.02	$52.96	$61.61	$70.55	$76.96	$76.96	$76.96	$565.50
TSM	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$38.84	$53.51	$82.94	$57.14	$44.28	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$276.72
TSM Rehabilitation & Replacement	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.97	$2.31	$4.38	$5.81	$6.92	$6.92	$6.92	$34.23
Financing Program																															
Retired Brige Financing Debt	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$90.88	$13.12	$79.27	$14.31	$0.00	$495.58	$214.65	$168.80	$323.72	$273.65	$748.04	$365.99	$39.30	$233.41	$177.52	$632.26	$240.36	$0.00	$0.00	$0.00	$375.11	$4,485.98
Interest	$0.00	$0.00	$0.00	$0.00	$3.52	$3.97	$7.06	$7.69	$7.75	$23.73	$29.34	$32.61	$43.90	$53.89	$63.10	$68.82	$64.25	$61.10	$57.72	$53.59	$49.21	$48.01	$39.49	$33.07	$23.51	$14.53	$14.72	$15.02	$15.36	$0.02	$834.96
Debt Management Expenses	$0.00	$0.00	$0.00	$0.00	$0.55	$0.62	$1.10	$1.19	$1.19	$4.16	$4.90	$5.84	$7.30	$8.86	$13.35	$12.57	$11.52	$11.90	$11.03	$13.18	$10.13	$7.94	$7.70	$6.30	$7.49	$3.70	$2.25	$2.25	$2.25	$2.25	$161.51
TOTAL CAPITAL USES OF FUNDS	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$149.99**	**$106.05**	**$162.17**	**$117.20**	**$94.61**	**$566.23**	**$361.07**	**$480.71**	**$556.62**	**$491.80**	**$986.80**	**$596.62**	**$248.21**	**$402.92**	**$352.44**	**$827.55**	**$440.22**	**$121.31**	**$314.51**	**$259.89**	**$718.53**	**$324.58**	**$93.33**	**$101.15**	**$101.49**	**$461.25**	**$9,437.26**
NET CAPITAL CASH FLOW	**$0.10**	**$0.40**	**$0.02**	**$0.02**	**$21.35**	**($6.67)**	**$7.88**	**($6.85)**	**$6.37**	**$43.39**	**($20.72)**	**($17.17)**	**$25.51**	**($1.92)**	**($4.00)**	**($13.55)**	**$7.94**	**$9.99**	**$3.73**	**$1.83**	**$1.77**	**$99.74**	**($84.86)**	**$31.81**	**($41.68)**	**$2.58**	**$243.75**	**$272.68**	**$292.53**	**($94.36)**	**$781.59**

OPERATING SOURCES OF FUNDS

(Year of Expenditure Dollars in Millions) Fiscal Year	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	Total 2011 - 2040
Fare Revenue	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$341.58***	***$361.22***	***$367.64***	***$388.25***	***$395.03***	***$416.85***	***$423.99***	***$446.97***	***$454.47***	***$478.59***	***$486.47***	***$511.66***	***$519.90***	***$546.31***	***$6,138.93***
FTA Sec 5307 Preventative Maintenance	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$6.27***	***$6.13***	***$5.98***	***$5.84***	***$5.71***	***$5.58***	***$5.45***	***$5.32***	***$5.20***	***$5.08***	***$4.96***	***$4.85***	***$66.37***
Advertising Income	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$2.09***	***$2.16***	***$2.25***	***$2.32***	***$2.42***	***$2.49***	***$2.59***	***$2.67***	***$2.78***	***$2.86***	***$2.97***	***$3.05***	***$3.18***	***$3.26***	***$37.08***
TOTAL OPERATING SOURCES OF FUNDS	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$343.67**	**$363.37**	**$376.16**	**$396.69**	**$403.43**	**$425.18**	**$432.30**	**$455.21**	**$462.70**	**$486.77**	**$494.64**	**$519.80**	**$528.04**	**$554.42**	**$6,242.38**

OPERATING USES OF FUNDS

(Year of Expenditure Dollars in Millions) Fiscal Year	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	Total 2011 - 2040
Bus Rapid Transit	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
Regional Rail	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$343.56	$352.75	$362.06	$371.53	$381.19	$391.05	$401.04	$411.20	$421.50	$431.96	$442.54	$453.22	$464.02	$475.08	$5,702.72
TOTAL OPERATING USES OF FUNDS	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$343.56**	**$352.75**	**$362.06**	**$371.53**	**$381.19**	**$391.05**	**$401.04**	**$411.20**	**$421.50**	**$431.96**	**$442.54**	**$453.22**	**$464.02**	**$475.08**	**$5,702.72**
NET OPERATING CASH FLOW	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.11**	**$10.63**	**$14.10**	**$25.16**	**$22.24**	**$34.14**	**$31.25**	**$44.01**	**$41.20**	**$54.81**	**$52.11**	**$66.57**	**$64.02**	**$79.34**	**$539.67**

CASH BALANCES

(Year of Expenditure Dollars in Millions) Fiscal Year	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	Total 2011 - 2040
Enterprise Debt Reduction Fund and Capital Carryover Fund Bal.																															
Beginning Cash Balance	$0.00	$0.10	$0.50	$0.52	$0.54	$21.89	$15.22	$23.10	$16.25	$22.62	$66.01	$45.29	$28.12	$53.62	$51.71	$47.70	$34.16	$42.09	$52.08	$55.81	$57.64	$59.41	$159.15	$74.29	$106.10	$64.42	$67.00	$310.75	$583.43	$875.95	
Additions (Deletions) to Cash	$0.10	$0.40	$0.02	$0.02	$21.35	($6.67)	$7.88	($6.85)	$6.37	$43.39	($20.72)	($17.17)	$25.51	($1.92)	($4.00)	($13.55)	$7.94	$9.99	$3.73	$1.83	$1.77	$99.74	($84.86)	$31.81	($41.68)	$2.58	$243.75	$272.68	$292.53	($94.36)	$781.59
Ending Cash Balance	**$0.10**	**$0.50**	**$0.52**	**$0.54**	**$21.89**	**$15.22**	**$23.10**	**$16.25**	**$22.62**	**$66.01**	**$45.29**	**$28.12**	**$53.62**	**$51.71**	**$47.70**	**$34.16**	**$42.09**	**$52.08**	**$55.81**	**$57.64**	**$59.41**	**$159.15**	**$74.29**	**$106.10**	**$64.42**	**$67.00**	**$310.75**	**$583.43**	**$875.95**	**$781.59**	

DEBT SERVICE COVERAGE RATIOS Fiscal Year	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
All Dedicated Revenues / All Debt Issues																														
Gross Coverage (Dedicated Tax Revenues / Debt Service)					22.87	21.50	12.78	12.38	12.96	4.46	3.80	3.61	2.82	2.41	2.16	2.07	2.32	2.55	2.82	3.17	3.60	3.85	4.88	6.07	8.90	15.02	15.48	15.82	16.12	12,477.71
Net Coverage ((Ded. Tax Revenues - Operating Exp.) / Debt Svc.)					22.87	21.50	12.78	12.38	12.96	4.46	3.80	3.61	2.82	2.41	2.16	2.07	2.32	2.72	3.06	3.64	4.05	4.56	5.67	7.40	10.66	18.80	19.02	20.26	20.29	17,583.72

REVENUE HOURS OF SERVICE (in millions)																															
Bus/BRT Hours	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Street Car Hours	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Light Rail Hours	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	
Maglev Hours	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	

Exhibit 16. Capital and Operating Sources and Uses of Funds
LRT West Bank 3 Alternative
Year-of-Expenditure Dollars in Millions

Southern California Association of Government / Pacific Electric Right-of-Way Alternative Analysis
Scenario: LRT West Bank 3 Alternative
11/13/2011

CAPITAL SOURCES OF FUNDS

(Year of Expenditure Dollars in Millions) Fiscal Year	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	Total 2011 - 2040
Transfer from Operation	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.84***	***$10.90***	***$14.11***	***$24.69***	***$21.93***	***$33.31***	***$30.59***	***$42.79***	***$40.14***	***$53.16***	***$50.61***	***$64.44***	***$62.03***	***$76.69***	***$526.21***
Capital Funds																															
Measure R	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$7.40	$11.80	$125.10	$80.10	$1.40	$14.20	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$240.00
Section 5309 Rail & Fixed Guideway Modernization Grants	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$40.24	$41.92	$43.68	$45.53	$47.46	$49.48	$49.48	$317.79
Prop A 35% Bond	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$17.50	$28.60	$66.60	$11.70	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$124.40
Prop C 25%	$0.10	$0.40	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.50
Local Agency Contribution	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$11.60	$0.00	$0.00	$7.90	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$19.50
Interest on Capital Reserve Allocated to Capital Funds	$0.00	$0.00	$0.02	$0.02	$0.02	$0.79	$0.72	$0.84	$0.85	$1.91	$2.83	$1.95	$1.35	$2.38	$2.22	$2.09	$1.49	$1.42	$1.78	$1.92	$1.99	$2.06	$5.91	$2.30	$2.20	$2.33	$2.46	$11.92	$21.70	$33.12	$110.59
TSM Los Angeles County Share	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$6.21	$8.56	$13.27	$9.14	$7.08	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.16	$0.37	$0.70	$0.93	$1.11	$1.11	$1.11	$49.75
TSM Orange County Share	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$32.63	$44.95	$69.67	$48.00	$37.20	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.82	$1.94	$3.68	$4.88	$5.81	$5.81	$5.81	$261.19
Additional Sales Tax from Los Angeles County	$0.00	$0.00	$0.00	$0.00	$67.57	$71.76	$75.77	$79.93	$84.31	$88.85	$93.70	$98.78	$103.98	$109.17	$114.38	$119.69	$125.09	$130.76	$136.64	$142.75	$148.94	$155.20	$161.78	$168.68	$175.85	$183.39	$191.34	$199.62	$207.95	$162.86	$3,398.75
Additional Sales Tax from Orange County	$0.00	$0.00	$0.00	$0.00	$23.74	$25.21	$26.62	$28.08	$29.62	$31.22	$32.92	$34.71	$36.53	$38.36	$40.19	$42.05	$43.95	$45.94	$48.01	$50.16	$52.33	$54.53	$56.84	$59.27	$61.78	$64.43	$67.23	$70.14	$73.06	$57.22	$1,194.15
Subtotal Capital Funds	***$0.10***	***$0.40***	***$0.02***	***$0.02***	***$91.34***	***$97.77***	***$103.11***	***$108.85***	***$114.78***	***$129.38***	***$141.25***	***$310.97***	***$275.47***	***$234.25***	***$253.52***	***$236.71***	***$237.14***	***$189.82***	***$186.43***	***$194.83***	***$203.25***	***$211.78***	***$224.54***	***$271.46***	***$284.05***	***$298.22***	***$312.37***	***$336.06***	***$359.12***	***$309.60***	***$5,716.62***
Financing Program																															
Construction Bridge Financing	$0.00	$0.00	$0.00	$0.00	$70.93	$0.00	$51.88	$0.00	$0.00	$533.56	$244.98	$192.60	$388.63	$330.29	$850.20	$438.06	$44.77	$289.62	$224.14	$723.62	$299.69	$0.00	$29.30	$2.03	$506.00	$53.80	$0.00	$0.00	$0.00	$0.00	$5,274.09
Subtotal Financing Program	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$70.93***	***$0.00***	***$51.88***	***$0.00***	***$0.00***	***$533.56***	***$244.98***	***$192.60***	***$388.63***	***$330.29***	***$850.20***	***$438.06***	***$44.77***	***$289.62***	***$224.14***	***$723.62***	***$299.69***	***$0.00***	***$29.30***	***$2.03***	***$506.00***	***$53.80***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$5,274.09***
TOTAL CAPITAL SOURCES OF FUNDS	**$0.10**	**$0.40**	**$0.02**	**$0.02**	**$162.26**	**$97.77**	**$154.99**	**$108.85**	**$114.78**	**$662.95**	**$386.23**	**$503.57**	**$664.10**	**$564.55**	**$1,103.73**	**$674.77**	**$282.75**	**$490.34**	**$424.68**	**$943.14**	**$524.87**	**$245.10**	**$284.43**	**$316.27**	**$830.19**	**$405.18**	**$362.97**	**$400.50**	**$421.15**	**$386.29**	**$11,516.92**

CAPITAL USES OF FUNDS

(Year of Expenditure Dollars in Millions) Fiscal Year	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	Total 2011 - 2040
Project Expenses																															
LRT West Bank 3 Alternative	$0.00	$0.00	$0.00	$0.00	$138.81	$96.51	$146.50	$103.04	$81.50	$535.76	$375.61	$388.12	$523.94	$414.40	$428.20	$306.88	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$3,539.26
Rehabilitation & Replacement	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$3.47	$5.88	$9.55	$12.12	$14.16	$27.55	$36.94	$46.65	$59.74	$70.10	$80.81	$88.48	$88.48	$88.48	$632.42
TSM	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$38.84	$53.51	$82.94	$57.14	$44.28	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$276.72
TSM Rehabilitation & Replacement	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.97	$2.31	$4.38	$5.81	$6.92	$6.92	$6.92	$34.23
Financing Program																															
Retired Brige Financing Debt	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$70.93	$0.00	$51.88	$0.00	$0.00	$533.56	$244.98	$192.60	$388.63	$330.29	$850.20	$438.06	$44.77	$289.62	$224.14	$723.62	$299.69	$0.00	$29.30	$2.03	$506.00	$5,220.29
Interest	$0.00	$0.00	$0.00	$0.00	$2.74	$2.71	$4.73	$4.78	$4.81	$23.07	$30.31	$35.45	$49.63	$61.69	$73.24	$80.51	$75.31	$71.87	$68.15	$63.65	$58.84	$57.49	$48.01	$39.97	$31.97	$22.88	$23.17	$22.47	$22.90	$2.20	$982.54
Debt Management Expenses	$0.00	$0.00	$0.00	$0.00	$0.43	$0.43	$0.74	$0.74	$0.74	$3.94	$4.98	$6.14	$8.16	$10.14	$15.24	$14.67	$13.47	$14.05	$13.06	$15.42	$12.12	$9.49	$9.40	$7.67	$9.36	$5.34	$3.55	$3.55	$3.37	$3.36	$189.54
TOTAL CAPITAL USES OF FUNDS	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$141.98**	**$99.64**	**$151.96**	**$108.55**	**$87.05**	**$633.69**	**$410.91**	**$520.43**	**$635.24**	**$569.17**	**$1,107.39**	**$691.32**	**$284.84**	**$480.43**	**$421.05**	**$941.40**	**$523.18**	**$139.30**	**$383.96**	**$319.40**	**$827.01**	**$402.39**	**$113.34**	**$150.72**	**$123.69**	**$606.96**	**$10,875.00**
NET CAPITAL CASH FLOW	**$0.10**	**$0.40**	**$0.02**	**$0.02**	**$20.28**	**($1.87)**	**$3.03**	**$0.29**	**$27.73**	**$29.26**	**($24.68)**	**($16.86)**	**$28.86**	**($4.63)**	**($3.66)**	**($16.55)**	**($2.09)**	**$9.91**	**$3.64**	**$1.74**	**$1.69**	**$105.79**	**($99.54)**	**($3.13)**	**$3.19**	**$2.78**	**$249.63**	**$249.78**	**$297.46**	**($220.67)**	**$641.92**

OPERATING SOURCES OF FUNDS

(Year of Expenditure Dollars in Millions) Fiscal Year	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	Total 2011 - 2040
Fare Revenue	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$326.08***	***$344.83***	***$350.96***	***$370.64***	***$377.11***	***$397.94***	***$404.76***	***$426.69***	***$433.86***	***$456.88***	***$464.40***	***$488.45***	***$496.31***	***$521.53***	***$5,860.45***
FTA Sec 5307 Preventative Maintenance	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$5.86***	***$5.72***	***$5.59***	***$5.46***	***$5.33***	***$5.21***	***$5.09***	***$4.97***	***$4.85***	***$4.74***	***$4.63***	***$4.53***	***$61.98***
Advertising Income	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$2.20***	***$2.26***	***$2.37***	***$2.43***	***$2.54***	***$2.61***	***$2.73***	***$2.80***	***$2.92***	***$3.00***	***$3.12***	***$3.21***	***$3.34***	***$3.43***	***$38.97***
TOTAL OPERATING SOURCES OF FUNDS	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$328.28**	**$347.10**	**$359.18**	**$378.80**	**$385.24**	**$406.01**	**$412.82**	**$434.70**	**$441.87**	**$464.85**	**$472.38**	**$496.40**	**$504.28**	**$529.48**	**$5,961.39**

OPERATING USES OF FUNDS

(Year of Expenditure Dollars in Millions) Fiscal Year	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	Total 2011 - 2040
Bus Rapid Transit	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
Regional Rail	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$327.45	$336.20	$345.07	$354.10	$363.31	$372.70	$382.23	$391.91	$401.73	$411.69	$421.77	$431.96	$442.25	$452.79	$5,435.18
TOTAL OPERATING USES OF FUNDS	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$327.45**	**$336.20**	**$345.07**	**$354.10**	**$363.31**	**$372.70**	**$382.23**	**$391.91**	**$401.73**	**$411.69**	**$421.77**	**$431.96**	**$442.25**	**$452.79**	**$5,435.18**
NET OPERATING CASH FLOW	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.84**	**$10.90**	**$14.11**	**$24.69**	**$21.93**	**$33.31**	**$30.59**	**$42.79**	**$40.14**	**$53.16**	**$50.61**	**$64.44**	**$62.03**	**$76.69**	**$526.21**

CASH BALANCES

(Year of Expenditure Dollars in Millions) Fiscal Year	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	Total 2011 - 2040
Enterprise Debt Reduction Fund and Capital Carryover Fund Bal.																															
Beginning Cash Balance	$0.00	$0.10	$0.50	$0.52	$0.54	$20.82	$18.95	$21.97	$22.27	$49.99	$79.25	$54.57	$37.71	$66.58	$61.95	$58.29	$41.74	$39.65	$49.56	$53.19	$54.93	$56.62	$162.41	$62.88	$59.75	$62.93	$65.72	$315.35	$565.13	$862.59	
Additions (Deletions) to Cash	$0.10	$0.40	$0.02	$0.02	$20.28	($1.87)	$3.03	$0.29	$27.73	$29.26	($24.68)	($16.86)	$28.86	($4.63)	($3.66)	($16.55)	($2.09)	$9.91	$3.64	$1.74	$1.69	$105.79	($99.54)	($3.13)	$3.19	$2.78	$249.63	$249.78	$297.46	($220.67)	$641.92
Ending Cash Balance	**$0.10**	**$0.50**	**$0.52**	**$0.54**	**$20.82**	**$18.95**	**$21.97**	**$22.27**	**$49.99**	**$79.25**	**$54.57**	**$37.71**	**$66.58**	**$61.95**	**$58.29**	**$41.74**	**$39.65**	**$49.56**	**$53.19**	**$54.93**	**$56.62**	**$162.41**	**$62.88**	**$59.75**	**$62.93**	**$65.72**	**$315.35**	**$565.13**	**$862.59**	**$641.92**	

DEBT SERVICE COVERAGE RATIOS Fiscal Year	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
All Dedicated Revenues / All Debt Issues																														
Gross Coverage (Dedicated Tax Revenues / Debt Service)					33.27	35.79	21.66	22.61	23.67	5.21	4.18	3.77	2.83	2.39	2.11	2.01	2.24	2.46	2.71	3.03	3.42	3.65	4.55	5.70	7.43	10.83	11.16	12.00	12.27	100.01
Net Coverage ((Ded. Tax Revenues - Operating Exp.) / Debt Svc.)					33.27	35.79	21.66	22.61	23.67	5.21	4.18	3.77	2.83	2.39	2.11	2.01	2.26	2.61	2.92	3.42	3.79	4.23	5.19	6.77	8.69	13.16	13.34	14.87	14.98	134.86

REVENUE HOURS OF SERVICE (in millions)																															
Bus/BRT Hours	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Street Car Hours	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Light Rail Hours	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	
Maglev Hours	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	

Exhibit 17. Capital and Operating Sources and Uses of Funds
Maglev West Bank 3 Alternative
Year-of-Expenditure Dollars in Millions

Southern California Association of Government / Pacific Electric Right-of-Way Alternative Analysis
Scenario: Maglev West Bank 3 Alternative
11/13/2011

CAPITAL SOURCES OF FUNDS

(Year of Expenditure Dollars in Millions) Fiscal Year	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	Total 2011 - 2040
Transfer from Operation	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.63***	***$8.22***	***$11.30***	***$19.27***	***$17.18***	***$25.75***	***$23.69***	***$32.88***	***$30.88***	***$40.69***	***$38.76***	***$49.18***	***$47.36***	***$58.41***	***$404.20***
Capital Funds																															
Measure R	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$7.40	$11.80	$125.10	$80.10	$1.40	$14.20	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$240.00
Section 5309 Rail & Fixed Guideway Modernization Grants	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$35.28	$36.76	$38.31	$39.94	$41.64	$43.43	$43.43	$278.79
Prop A 35% Bond	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$17.50	$28.60	$66.60	$11.70	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$124.40
Prop C 25%	$0.10	$0.40	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.50
Local Agency Contribution	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$11.60	$0.00	$0.00	$7.90	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$19.50
Interest on Capital Reserve Allocated to Capital Funds	$0.00	$0.00	$0.02	$0.02	$0.02	$3.22	$2.24	$3.42	$2.42	$1.92	$5.78	$4.02	$3.49	$5.26	$4.51	$4.45	$3.19	$1.05	$1.44	$1.62	$1.72	$1.81	$2.00	$2.16	$2.12	$2.32	$2.49	$13.83	$17.80	$37.65	$131.99
TSM Los Angeles County Share	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$6.21	$8.56	$13.27	$9.14	$7.08	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.16	$0.37	$0.70	$0.93	$1.11	$1.11	$1.11	$49.75
TSM Orange County Share	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$32.63	$44.95	$69.67	$48.00	$37.20	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.82	$1.94	$3.68	$4.88	$5.81	$5.81	$5.81	$261.19
Additional Sales Tax from Los Angeles County	$0.00	$0.00	$0.00	$0.00	$174.59	$185.41	$195.77	$206.51	$217.82	$229.55	$242.08	$255.21	$268.65	$282.07	$295.52	$309.24	$323.20	$337.84	$353.03	$368.82	$384.80	$400.98	$418.00	$435.82	$454.32	$473.81	$494.37	$515.76	$537.27	$420.77	$8,781.19
Additional Sales Tax from Orange County	$0.00	$0.00	$0.00	$0.00	$64.57	$68.58	$72.41	$76.38	$80.56	$84.90	$89.54	$94.39	$99.36	$104.33	$109.30	$114.38	$119.54	$124.95	$130.57	$136.41	$142.32	$148.31	$154.60	$161.19	$168.04	$175.24	$182.85	$190.76	$198.72	$155.63	$3,247.84
Subtotal Capital Funds	***$0.10***	***$0.40***	***$0.02***	***$0.02***	***$239.18***	***$257.21***	***$270.42***	***$286.30***	***$300.79***	***$323.77***	***$349.20***	***$529.16***	***$505.11***	***$476.00***	***$506.07***	***$500.95***	***$512.52***	***$475.54***	***$485.04***	***$506.86***	***$528.84***	***$551.10***	***$574.60***	***$635.42***	***$663.55***	***$694.07***	***$725.45***	***$768.90***	***$804.13***	***$664.39***	***$13,135.15***
Financing Program																															
Construction Bridge Financing	$0.00	$0.00	$0.00	$0.00	$433.11	$137.06	$403.30	$159.69	$74.17	$1,410.09	$614.55	$818.78	$987.97	$693.16	$2,056.71	$985.05	$487.35	$758.09	$448.21	$1,787.17	$685.16	$170.76	$425.82	$42.80	$1,380.68	$235.23	$0.00	$0.00	$0.00	$0.00	$15,194.89
Subtotal Financing Program	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$433.11***	***$137.06***	***$403.30***	***$159.69***	***$74.17***	***$1,410.09***	***$614.55***	***$818.78***	***$987.97***	***$693.16***	***$2,056.71***	***$985.05***	***$487.35***	***$758.09***	***$448.21***	***$1,787.17***	***$685.16***	***$170.76***	***$425.82***	***$42.80***	***$1,380.68***	***$235.23***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$15,194.89***
TOTAL CAPITAL SOURCES OF FUNDS	**$0.10**	**$0.40**	**$0.02**	**$0.02**	**$672.29**	**$394.28**	**$673.72**	**$445.99**	**$374.96**	**$1,733.86**	**$963.76**	**$1,347.94**	**$1,493.08**	**$1,169.16**	**$2,562.78**	**$1,486.00**	**$1,000.50**	**$1,241.84**	**$944.55**	**$2,313.30**	**$1,231.18**	**$747.61**	**$1,024.11**	**$711.11**	**$2,075.11**	**$969.99**	**$764.21**	**$818.09**	**$851.49**	**$722.79**	**$28,734.23**

CAPITAL USES OF FUNDS

(Year of Expenditure Dollars in Millions) Fiscal Year	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	Total 2011 - 2040
Project Expenses																															
Maglev West Bank 3 Alternative	$0.00	$0.00	$0.00	$0.00	$568.23	$395.05	$599.70	$421.80	$333.62	$1,087.08	$762.15	$787.52	$1,063.10	$840.85	$868.85	$622.68	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$8,350.63
Rehabilitation & Replacement	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$14.21	$24.08	$39.07	$49.62	$57.96	$85.14	$104.19	$123.88	$150.46	$171.48	$193.20	$208.77	$208.77	$208.77	$1,639.58
TSM	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$38.84	$53.51	$82.94	$57.14	$44.28	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$276.72
TSM Rehabilitation & Replacement	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.97	$2.31	$4.38	$5.81	$6.92	$6.92	$6.92	$34.23
Financing Program																															
Retired Brige Financing Debt	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$433.11	$137.06	$403.30	$159.69	$74.17	$1,410.09	$614.55	$818.78	$987.97	$693.16	$2,056.71	$985.05	$487.35	$758.09	$448.21	$1,787.17	$685.16	$170.76	$425.82	$42.80	$1,380.68	$14,959.66
Interest	$0.00	$0.00	$0.00	$0.00	$16.76	$21.78	$37.48	$44.08	$47.33	$86.06	$97.16	$112.32	$142.55	$165.15	$188.75	$202.82	$191.22	$183.28	$174.74	$165.24	$154.97	$143.97	$132.24	$117.93	$103.34	$87.28	$81.71	$66.35	$66.09	$9.62	$2,840.21
Debt Management Expenses	$0.00	$0.00	$0.00	$0.00	$2.60	$3.42	$5.84	$6.80	$7.24	$15.70	$16.79	$20.88	$24.39	$27.59	$39.49	$36.94	$36.17	$35.81	$32.57	$39.14	$30.91	$26.02	$25.65	$21.36	$26.95	$17.64	$13.53	$12.51	$9.95	$9.70	$545.60
TOTAL CAPITAL USES OF FUNDS	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$587.59**	**$420.25**	**$643.02**	**$472.68**	**$388.19**	**$1,621.95**	**$1,013.16**	**$1,362.87**	**$1,443.25**	**$1,190.70**	**$2,564.31**	**$1,521.27**	**$1,060.38**	**$1,231.14**	**$939.54**	**$2,310.70**	**$1,228.89**	**$742.47**	**$1,020.17**	**$712.35**	**$2,070.23**	**$965.94**	**$465.02**	**$720.36**	**$334.53**	**$1,615.68**	**$28,646.63**
NET CAPITAL CASH FLOW	**$0.10**	**$0.40**	**$0.02**	**$0.02**	**$84.69**	**($25.98)**	**$30.70**	**($26.68)**	**($13.23)**	**$111.91**	**($49.40)**	**($14.93)**	**$49.83**	**($21.53)**	**($1.53)**	**($35.28)**	**($59.88)**	**$10.71**	**$5.01**	**$2.60**	**$2.29**	**$5.14**	**$3.94**	**($1.24)**	**$4.88**	**$4.05**	**$299.20**	**$97.73**	**$516.96**	**($892.89)**	**$87.61**

OPERATING SOURCES OF FUNDS

(Year of Expenditure Dollars in Millions) Fiscal Year	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	Total 2011 - 2040
Fare Revenue	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$245.99***	***$260.13***	***$264.75***	***$279.60***	***$284.48***	***$300.19***	***$305.33***	***$321.88***	***$327.29***	***$344.66***	***$350.33***	***$368.47***	***$374.40***	***$393.42***	***$4,420.90***
FTA Sec 5307 Preventative Maintenance	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$5.08***	***$4.96***	***$4.85***	***$4.73***	***$4.63***	***$4.52***	***$4.42***	***$4.32***	***$4.22***	***$4.12***	***$4.03***	***$3.93***	***$53.79***
Advertising Income	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$0.00***	***$1.92***	***$1.97***	***$2.06***	***$2.12***	***$2.22***	***$2.28***	***$2.38***	***$2.44***	***$2.55***	***$2.62***	***$2.72***	***$2.80***	***$2.91***	***$2.99***	***$33.98***
TOTAL OPERATING SOURCES OF FUNDS	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$247.90**	**$262.10**	**$271.89**	**$286.68**	**$291.54**	**$307.21**	**$312.34**	**$328.84**	**$334.25**	**$351.59**	**$357.27**	**$375.39**	**$381.34**	**$400.34**	**$4,508.67**

OPERATING USES OF FUNDS

(Year of Expenditure Dollars in Millions) Fiscal Year	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	Total 2011 - 2040
Bus Rapid Transit	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
Regional Rail	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$247.28	$253.89	$260.59	$267.41	$274.36	$281.45	$288.65	$295.96	$303.37	$310.90	$318.51	$326.20	$333.98	$341.93	$4,104.47
TOTAL OPERATING USES OF FUNDS	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$247.28**	**$253.89**	**$260.59**	**$267.41**	**$274.36**	**$281.45**	**$288.65**	**$295.96**	**$303.37**	**$310.90**	**$318.51**	**$326.20**	**$333.98**	**$341.93**	**$4,104.47**
NET OPERATING CASH FLOW	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.63**	**$8.22**	**$11.30**	**$19.27**	**$17.18**	**$25.75**	**$23.69**	**$32.88**	**$30.88**	**$40.69**	**$38.76**	**$49.18**	**$47.36**	**$58.41**	**$404.20**

CASH BALANCES

(Year of Expenditure Dollars in Millions) Fiscal Year	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	Total 2011 - 2040
Enterprise Debt Reduction Fund and Capital Carryover Fund Bal.																															
Beginning Cash Balance	$0.00	$0.10	$0.50	$0.52	$0.54	$85.23	$59.26	$89.96	$63.27	$50.04	$161.95	$112.55	$97.62	$147.45	$125.92	$124.39	$89.11	$29.23	$39.94	$44.95	$47.55	$49.85	$54.99	$58.93	$57.68	$62.56	$66.61	$365.80	$463.53	$980.49	
Additions (Deletions) to Cash	$0.10	$0.40	$0.02	$0.02	$84.69	($25.98)	$30.70	($26.68)	($13.23)	$111.91	($49.40)	($14.93)	$49.83	($21.53)	($1.53)	($35.28)	($59.88)	$10.71	$5.01	$2.60	$2.29	$5.14	$3.94	($1.24)	$4.88	$4.05	$299.20	$97.73	$516.96	($892.89)	$87.61
Ending Cash Balance	**$0.10**	**$0.50**	**$0.52**	**$0.54**	**$85.23**	**$59.26**	**$89.96**	**$63.27**	**$50.04**	**$161.95**	**$112.55**	**$97.62**	**$147.45**	**$125.92**	**$124.39**	**$89.11**	**$29.23**	**$39.94**	**$44.95**	**$47.55**	**$49.85**	**$54.99**	**$58.93**	**$57.68**	**$62.56**	**$66.61**	**$365.80**	**$463.53**	**$980.49**	**$87.61**	

DEBT SERVICE COVERAGE RATIOS Fiscal Year	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
All Dedicated Revenues / All Debt Issues																														
Gross Coverage (Dedicated Tax Revenues / Debt Service)					14.27	11.66	7.16	6.42	6.30	3.65	3.41	3.11	2.58	2.34	2.14	2.09	2.32	2.53	2.77	3.06	3.40	3.82	4.33	5.06	6.02	7.44	8.29	10.65	11.14	59.91	
Net Coverage ((Ded. Tax Revenues - Operating Exp.) / Debt Svc.)					14.27	11.66	7.16	6.42	6.30	3.65	3.41	3.11	2.58	2.34	2.14	2.09	2.32	2.57	2.83	3.17	3.51	3.99	4.51	5.34	6.32	7.90	8.76	11.39	11.85	65.98	

REVENUE HOURS OF SERVICE (in millions)																															
Bus/BRT Hours	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Street Car Hours	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Light Rail Hours	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Maglev Hours	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	

Appendix A: Inflation and Interest Rate Projections

This appendix summarizes the inflation and interest rate projections applied in the financial plan. The projection is prepared for the Santa Clara Valley Transportation Authority by the Moody's Economy.com in June 2010. The forecast includes 30 years of annual projections (through 2040) of San Jose inflation and national interest rates; the San Jose inflation was assumed applicable for this project. Table A.1 lists the inflation and interest rates applied in this financial plan:

Inflation and Income

- San Jose CA CPI: Urban Consumer - All Items, (Index 1982-84=100, SA)
- San Jose RS Means Construction Cost Index (Jan 1993=100)
- Interest Rates: Nonfinancial Commercial Paper - 1 Month, (%)
- U.S. 3-month Treasury- Bill, (%)

The Economy.com projections included baseline, optimistic and pessimistic forecasts. The baseline forecasts were based on assumptions regarding the most likely set of economic outcomes over the next 30 years. The range between the high and low forecasts was assumed to capture between 80% and 85% of likely economic outcomes. The baseline forecast was applied in the financial analysis. The high and low forecasts may be considered as ranges in a financial plan risk analysis.

Model Structure

The Economy.com projections were developed using the Economy.com's proprietary state-of-the-art integrated economic forecast model. The model applied a comprehensive database of historic socioeconomic variables which is regularly updated in real-time as new data is released. The model forecasted economic trends using a two-tier structure in which macroeconomic assumptions drove a national forecast, which in turn was applied to develop forecasts of regional economic trends. These regional forecasts varied based on economic trends particular to each metropolitan area. The assumptions and methodological approaches employed to develop these forecasts were informed by the professional judgment of Economy.com's team of macro and regional economists and commodity and industry specialists, who have a depth of expertise on the particulars of individual economic trends.

Forecast Summary

Figure A.1 presents the San Jose CA Consumer Price Index/All Urban Consumers inflation projections. The left line graph summarizes the baseline (or most likely), optimistic, and pessimistic projections of inflation in the San Jose Consumer Price Index prepared by Economy.com. The right graph summarizes the annual and average variance between the Economy.com baseline and optimistic projection and between the Economy.com baseline and pessimistic projections. The baseline inflation projection is applied to escalate O&M costs, fare revenues and advertising revenues.

Figure A.1. California San Jose Consumer Price Index Inflation Projections – All Urban Consumers

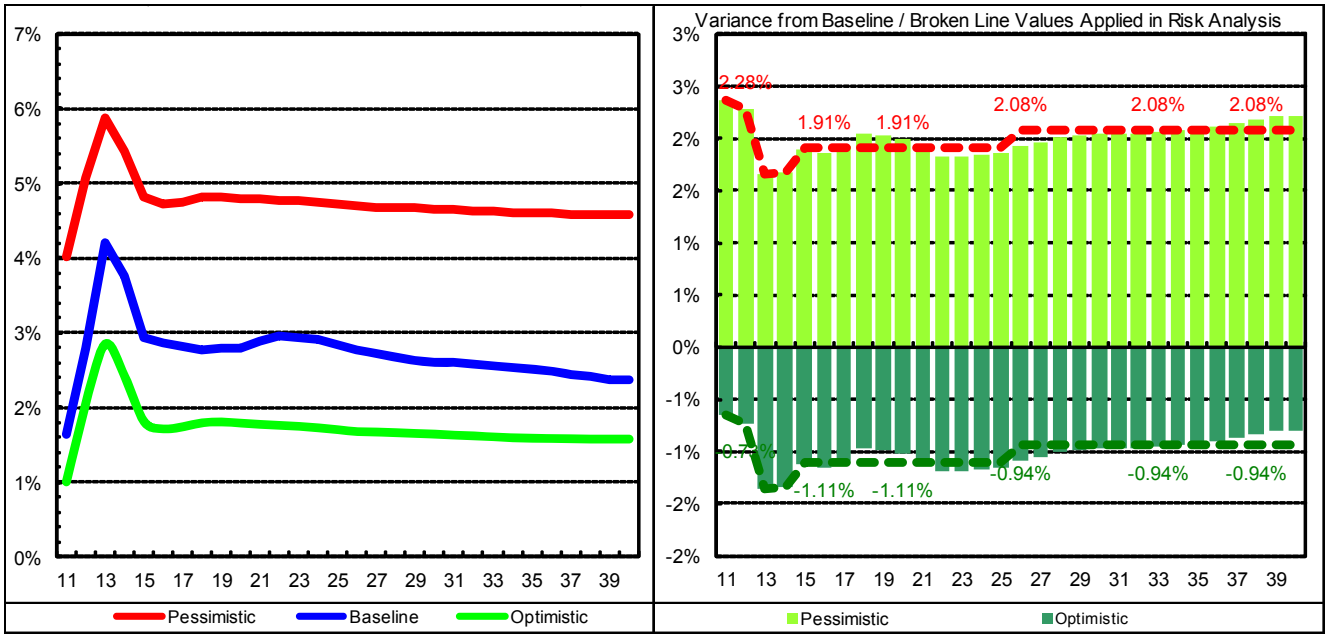


Figure A.2 shows construction cost inflation projections: The left line graph summarizes the baseline, optimistic, and pessimistic projections of inflation in the San Jose RS Means Construction Cost Index (solid lines) compared to U.S. CPI (dotted lines). The right graph summarizes the annual and average variance between the Economy.com baseline and optimistic projections and between the Economy.com baseline and pessimistic projections of the RS Means Construction Cost Index. The baseline annualized growth rate 3.33% was applied to escalate capital costs.

Figure A.2. California San Jose RS Means Construction Cost Index Inflation Projections

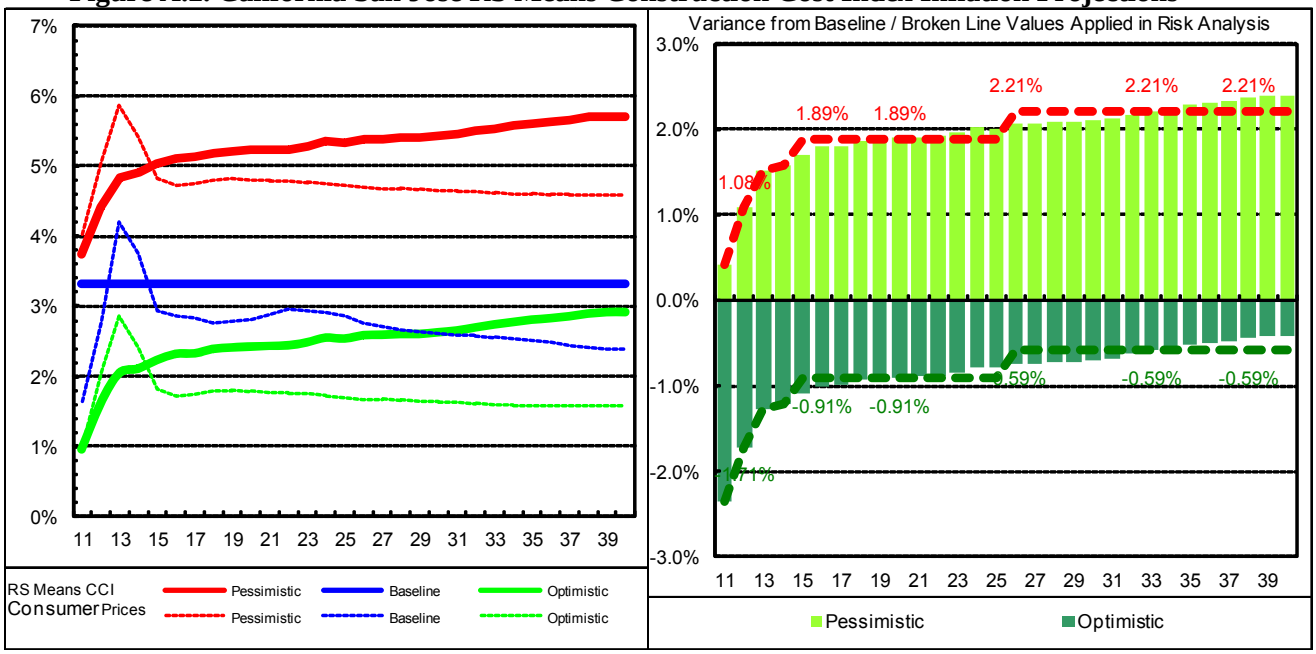


Figure A.3 summarizes nonfinancial commercial paper interest rate projections. The left line graph summarizes the baseline, optimistic, and pessimistic projections of nonfinancial commercial paper interest rates prepared by Economy.com. The right graph summarizes the annual and average variance between the Economy.com baseline and optimistic projections and between the Economy.com baseline and pessimistic projections. The baseline index was applied as the short-term interest rate in the bridge financing computations.

Figure A.3. Nonfinancial Commercial Paper Interest Rate Projections

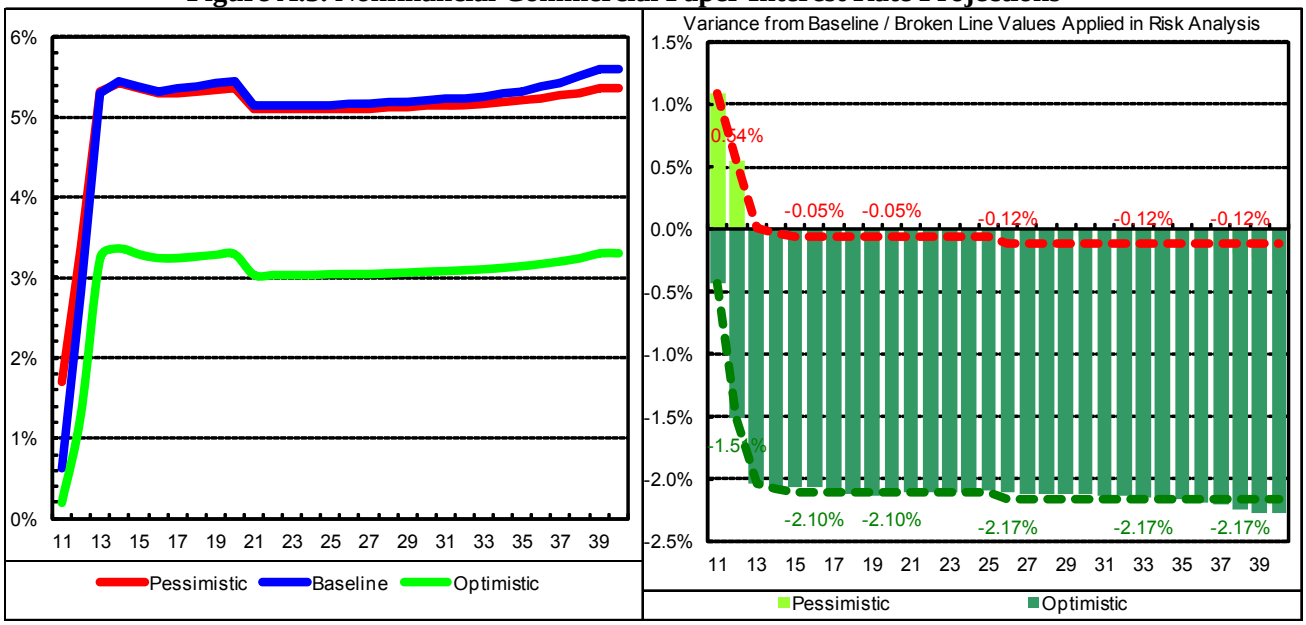
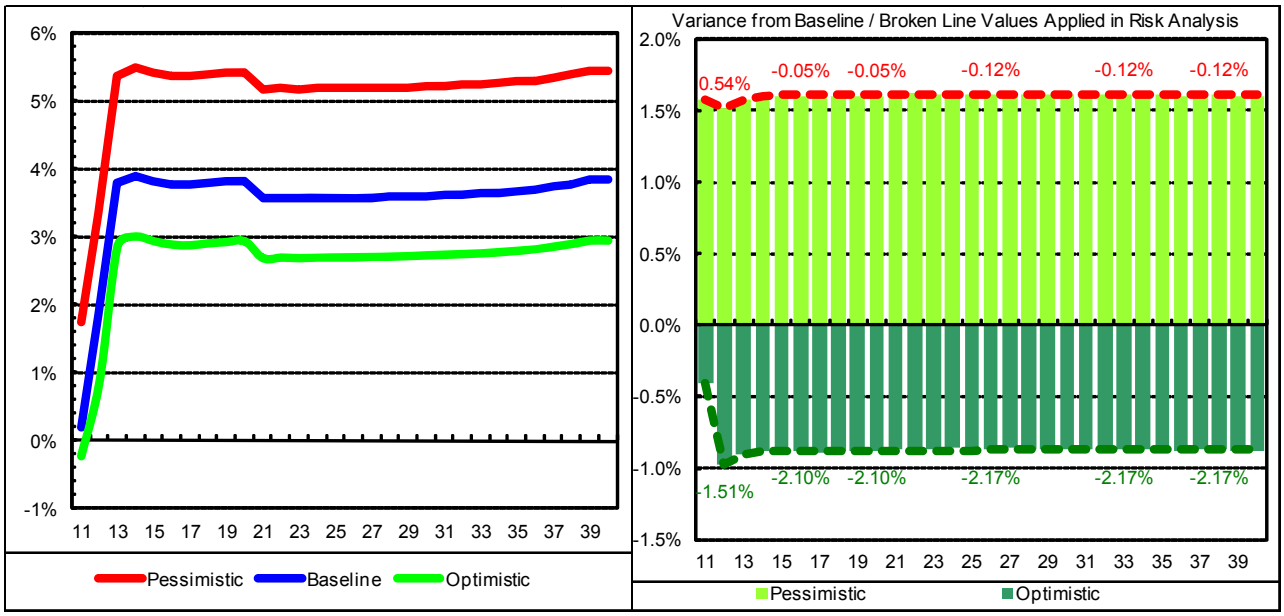


Figure A.4 displays US treasury 3-month interest rate projections. The left line graph summarizes the baseline, optimistic, and pessimistic projections of US treasury 3-month interest rates prepared by Economy.com. The right graph summarizes the annual and average variance between the Economy.com baseline and optimistic projections and between the Economy.com baseline and pessimistic projections. The baseline index was applied as the interest rate in the cash balance interest computations.

Figure A.4. Nonfinancial Commercial Paper Interest Rate Projections



Appendix B: Pacific Electric Right-of-Way / West Santa Ana Branch Operations and Maintenance Cost Methodology

1. Introduction

This appendix describes the methodology used to calculate the low and high operations and maintenance (O&M) cost estimates for each alternative technology. The O&M costs are, to the extent possible, based on existing cost models for Metro and OCTA, with the assumption that these primary operators would be responsible for operations in their respective counties for bus-related alternatives. For rail-related alternatives, O&M costs are based on cost models for peer transit operators after adjustment to reflect the operating conditions in Los Angeles and Orange counties.

The memorandum is organized by alternative technology. Sections 3 through 6 summarize the methodology and sources of information used to calculate the O&M unit cost estimates for each transit alternative. The final high and low O&M unit cost estimates, applied in the financial plan, are listed in Section 7. Section 8 calculates the projected total O&M costs for the design year operating statistics for each alternative, representing the costs of operation if operated by Metro or OCTA. Finally, an appendix is included at the end of this memorandum. It lists a series of tables showing the detailed calculation used to derive the O&M unit cost estimates.

2. Transportation Systems Management Alternative

TSM bus services are assumed to be operated by Metro for routes operating in Los Angeles County and OCTA for routes operating in Orange County. O&M unit costs for Metro were derived from the local and rapid bus cost model documented in the Metro Fiscal Year 2012 Proposed Budget. The unit costs for OCTA were derived from the agency's local bus cost model.

The Metro cost model is an activity-based model which identifies costs by function and then develops aggregate costs per revenue service hour for the following modes: Orange Line, Silver Line, local and rapid bus, all bus, light rail, heavy rail and total rail. The FY2011 approved budget model was used for this exercise, primarily because it represented costs in 2011 dollars. This meant that no inflation adjustment was required for application in the financial plan. The model aggregates costs by major activity (or function) and by major object class. For each object class, one of four cost drivers was assigned: vehicle-hours, vehicle-miles, route miles, and passengers. For each mode, operating expenses assigned to each cost driver were then totaled and divided by FY2011 units of service to derive O&M unit costs. For the TSM alternative, Metro's local and rapid bus cost model was used to derive the O&M unit costs.

Similar to the Metro cost model, OCTA's model is an activity-based one which addresses costs by function and then develops aggregate costs per revenue service hour and aggregate costs per revenue service mile. The OCTA "Local Directly Operated Large Bus" (LDL) mode was identified as the most representative of vehicle operations for the TSM alternative. Again, the FY2011 approved budget model was used, and the O&M unit costs were derived for vehicle-hour and vehicle-mile cost drivers by totaling the expenses for each driver and dividing them by the respective FY2011 units of service.

The resulting O&M unit costs in 2011 dollars were applied in the financial plan.

3. Bus Rapid Transit Alternatives

The Metro Orange Line represents a dedicated BRT design similar to the BRT project alternatives considered for this study. As such, O&M unit costs for Metro BRT were derived from the FY2011 approved budget model for the Orange Line. OCTA does not operate exclusive bus fixed guideway, so there was no OCTA O&M cost model to use for BRT alternatives. The LDL mode was identified by OCTA as the most representative of vehicle operations for this mode, and O&M unit costs for OCTA BRT were thus derived from the LDL's FY2011 approved budget model. The O&M unit costs for OCTA for BRT alternatives are the same as those for the TSM alternative.

A second set of O&M unit costs was also derived for each agency based on operating costs of directly operated motor bus experiences reported by Metro and OCTA to the National Transit Database (NTD) for FY2009. NTD costs are summarized by function (Vehicle Operations, Vehicle Maintenance, Non-Vehicle Maintenance, and General Administration) and by object class (Operators' Salaries/Wages, Other Salaries/Wages, Fringe Benefits, Services, Fuel/Lube, Tires/Tubes, Other Materials/Supplies, Utilities, Casualty/Liability Costs, Taxes, Directly Operated Services, Miscellaneous Expenses, and Expense Transfers).

Costs in each function and object class line item were assigned to one of three main cost drivers: vehicle revenue hours (costs for Vehicle Operations), vehicle revenue miles (costs for Vehicle Maintenance, fuel and propulsion electricity), and directional route miles (costs for non-vehicle maintenance). General administrative costs were treated as either a function of total operating cost or were derived as a cost per vehicle revenue hour. Costs were then aggregated by cost driver and divided by the corresponding units of service for each driver, as documented in NTD for FY2009, to derive the O&M unit costs. These were then inflated from 2009 to 2011 dollars for application in the financial plan by applying a Consumer Price Index (CPI) adjustment rate for the Los Angeles – Riverside – Orange County area.

4. Streetcar and Light Rail Transit Alternatives

The Metro Light Rail cost model addresses the combined operations of the Metro Blue, Green, and Gold Lines and represents a design similar to the LRT project alternatives considered for this study. O&M unit costs for Metro Streetcar and LRT were thus derived from the Metro FY2011 approved budget model for the Light Rail Line.

A second set of O&M unit costs was also derived from the well-documented operating costs for light rail, reported by Metro to NTD for FY2009. The process for deriving these costs is identical to that described in the previous section. The LRT O&M unit costs, derived from NTD, were also inflated from 2009 to 2011 dollars for application in the financial plan by applying the CPI-based adjustment factor.

OCTA does not operate a streetcar or light rail transit mode, so there was no OCTA O&M cost model to use for deriving unit costs for these alternatives. Instead, the operating experiences of several peer transit systems offering LRT service in North America were identified. These agencies included: Tri-County Metropolitan Transportation District of Oregon, Metropolitan Transit Authority of Harris County, Dallas Area Rapid Transit, Utah Transit Authority, Denver Regional Transportation District (RTD), Santa Clara Valley Transportation Authority, Sacramento Regional Transit District, San Diego Metropolitan Transit System, and Metro[1]. These systems were selected because they represent the "new" LRT operations in the

[1] Other North American agencies offering LRT service were excluded from this analysis. These agencies were either too old, too small, operated on the East Coast, or provided seasonal operations only.

United States and (except for UTA and RTD) do not have winter operations. LRT costs for each agency were well-documented in the NTD for FY2009. The O&M unit costs for each agency were calculated for three cost drivers: vehicle revenue hours, vehicle revenue miles and directional route miles. General administrative costs were also calculated as a function of total operating cost or as a cost per vehicle revenue hour.

Metro and RTD were identified as having the highest and lowest[2] total O&M cost per vehicle revenue hour. Application of both agencies' operating experience for Orange County operations required conversion of the labor-related costs to reflect the impact of different wage and fringe benefit costs in Orange County. This was accomplished by comparing the FY2009 O&M experience reported by OCTA to NTD for directly operated motor bus operations with the same experiences reported by Metro and RTD. The ratio of OCTA to Metro and OCTA to RTD motor bus costs was derived for each cost driver. These ratios were then applied to the Metro and RTD LRT experiences and the resulting OCTA O&M unit costs for LRT were calculated, one set based on the Metro LRT experience and the second set based on the RTD LRT experience. The O&M unit costs were then inflated from 2009 to 2011 dollars for application in the financial plan by applying the CPI-based adjustment factor.

5. Slow-Speed MagLev Alternatives

Neither Metro nor OCTA (nor any other North American transit agency) operates a slow-speed mag-lev system. In the absence of a suitable experience for such operations, the well-documented experiences of three new technology transit systems in North America were identified. These included:

- Vancouver SkyTrain system: SkyTrain uses linear induction motors that are similar to the slow-speed MagLev technology in that propulsion is achieved with no moving parts. To this extent, SkyTrain was considered a good analog to the slow-speed MagLev concept, particularly with respect to vehicle maintenance. SkyTrain differs from slow-speed MagLev in that the vehicle moves on a relatively conventional steel-wheel-on-steel-wheel guideway.

- Miami Dade Transit (MDT) Metromover: Metromover is an automated technology, similar to SkyTrain, but relies on rotating electric motors and rubber tire propulsion. It provided a useful comparison. O&M costs were well documented in the NTD.

- Jacksonville Transit Authority (JTA) People Mover: The People Mover is similar to Metromover in that it is automated and relies on rotating electric motors and rubber tire propulsion. O&M costs were also well-documented in the NTD.

SkyTrain O&M unit costs were derived from a cost model developed by TransLink, the regional transit planning and funding agency in the Vancouver region for SkyTrain and motor bus operations. These unit costs were then converted to costs representative of Los Angeles and Orange County experiences by adjusting for labor costs. This was accomplished by comparing the FY2009 O&M unit costs for motor bus operations at TransLink with the FY2009 O&M unit costs for motor bus operations at each of Metro and OCTA, as reported to the NTD. The ratio of Metro to TransLink and OCTA to TransLink motor bus costs was derived for costs related to vehicle revenue hours, vehicle revenue miles, directional route miles

[2] Metropolitan Transit Authority of Harris County has the lowest total O&M cost per vehicle revenue hour. On the other hand, Dallas Area Rapid Transit has one of the highest. Given that both agencies operate within close proximity in the same State, the operating experiences should be comparable. Due to this discrepancy, both agencies were not considered in subsequent analysis.

and general administration. These ratios were then applied to the SkyTrain experience to obtain the Metro and OCTA O&M unit costs for MagLev.

Similar labor adjustments were carried out for the MDT and JTA Metromover and People Mover experiences, respectively. The O&M unit costs for these experiences were well-documented in the NTD for FY2009. The ratio of Metro to MDT and JTA motor bus costs and OCTA to MDT and JTA motor bus costs was first calculated for each cost driver based on costs reported to the NTD. These ratios were then applied to the MDT and JTA automated transit experiences to calculate the Metro and OCTA O&M unit costs for MagLev. The JTA People Mover experience had a very high total O&M cost per vehicle revenue hour relative to Metromover and was not considered in subsequent analysis.

The SkyTrain and Metromover are both fully automated systems. The Metro Board requires a driver on all the transit service offerings of the agency, whether automated or not. For that reason, an additional cost component was added to the Metro and OCTA O&M unit costs per vehicle revenue hour for MagLev to account for labor. For Metro, this cost was composed of unit costs per vehicle revenue hour for the following three object classes for its LRT operations reported to the NTD: Vehicle Operations Operators' Salaries/Wages, Other Salaries/Wages and Fringe Benefits. For OCTA, the cost component was composed of unit costs per vehicle revenue hour for the same three object classes. However, since OCTA does not operate a LRT system, the unit cost values calculated for OCTA LRT operations based on the Metro experience were used instead(refer to *Section 3*).

The two sets of O&M unit costs for each of Metro and OCTA MagLev, calculated based on the SkyTrain and Metromover experiences, were then inflated from 2009 to 2011 dollars for application in the financial plan by applying the CPI-based adjustment factor.

6. Determining Low and High O&M Unit Cost Estimates

With the exception of the TSM alternative, all other transit alternatives had two sets of O&M unit costs (high and low), representing the costs of operation if operated by Metro and OCTA. These unit costs were applied to operating statistics to calculate total cost estimates by agency by mode and to establish the O&M unit cost sets associated with the low and high cost estimates for each agency/mode grouping. Table 1 summarizes the high and low O&M unit cost estimates for each mode by agency.

7. Projected Total O&M Costs

The projected design year operating statistics generated for each alternative are summarized in table 2 by cost driver. The high and low O&M unit cost estimates are then applied to these operating statistics to project the total O&M costs for each alternative. Table 3 summarizes the high and low total O&M costs for each alternative, representing the costs of operation if operated by Metro and OCTA.

Table 1. Summary of 2011 O&M Unit Costs

Mode	Route Miles	Bus- or Train-Hours	Vehicle-Miles	Annual Ridership
TSM				
LA County Cost Structure	$ -	$ 87.23	$ 3.67	$ 0.13
Orange County Cost Structure	$ -	$ 96.74	$ 1.91	$ -
BRT				
LA County Cost Structure				
Low	$ 15,133	$ 87.99	$ 3.33	$ -
High	$ 200,526	$ 66.28	$ 2.45	$ 1.30
Orange County Cost Structure				
Low	$ -	$ 96.74	$ 1.91	$ -
High	$ 2,395	$ 85.39	$ 2.82	$ -
Streetcar and LRT				
LA County Cost Structure				
Low	$ 753,360	$ 115.57	$ 2.92	$ 0.92
High	$ 219,268	$ 536.98	$ 10.60	$ -
Orange County Cost Structure				
Low	$ 37,619	$ 139.84	$ 4.65	$ -
High	$ 34,702	$ 552.44	$ 9.00	$ -
MagLev				
LA County Cost Structure				
Low	$ 191,547	$ 240.97	$ 1.47	$ -
High	$ 678,241	$ 325.25	$ 9.56	$ -
Orange County Cost Structure				
Low	$ 30,315	$ 218.21	$ 1.25	$ -
High	$ 107,340	$ 316.40	$ 8.11	$ -

Table 2. Projected Design Year Operating Statistics

Alternative	Route Miles	Annual Bus- or Train-Hours	Annual Vehicle-Miles	Annual Ridership
TSM				
LA County Segment		55,925	1,617,135	8,413,331
Orange County Segment		339,915	6,355,110	18,928,796
BRT				
Street-Running	40.5	69,320	2,121,192	18,321,065
HOV Lane-Running	36.9	124,538	3,910,478	21,474,427
Streetcar				
East Bank	35.2	139,780	12,746,715	
West Bank 1	31.8	137,505	12,829,218	
West Bank 2	43.8	139,780	12,706,032	
West Bank 3	42.7	137,505	12,664,210	25,434,261
LRT				
East Bank	35.2	128,415	13,136,856	27,125,171
West Bank 1	31.8	130,690	12,532,068	
West Bank 2	43.8	119,175	13,251,966	26,496,991
West Bank 3	42.7	119,695	12,298,860	27,846,012
MagLev				
East Bank	29.3	86,665	10,903,846	
West Bank 1	29.7	82,130	11,323,344	
West Bank 2	30.0	88,940	10,877,823	
West Bank 3	29.7	82,450	10,981,917	24,280,787

Table 3. Projected Total O&M Costs

Alternative	Route Miles	Annual Bus- or Train-Hours	Annual Vehicle-Miles	Annual Ridership	Total O&M Cost
TSM					
LA County Cost Structure	$ -	$ 4,878,111	$ 5,927,382	$ 1,081,131	**$ 11,886,625**
Orange County Cost Structure	$ -	$ 32,881,939	$ 12,139,931	$ -	**$ 45,021,870**
BRT					
Street-Running					
LA County Cost Structure					
Low	$ 612,872	$ 6,099,330	$ 7,054,355	$ -	**$ 13,766,557**
High	$ 8,121,323	$ 4,594,184	$ 5,198,724	$ 23,734,790	**$ 41,649,021**
Orange County Cost Structure					
Low	$ -	$ 6,705,724	$ 4,052,034	$ -	**$ 10,757,758**
High	$ 96,994	$ 5,919,060	$ 5,986,506	$ -	**$ 12,002,560**
HOV Lane-Running					
LA County Cost Structure					
Low	$ 558,395	$ 10,957,854	$ 13,004,904	$ -	**$ 24,521,152**
High	$ 7,399,427	$ 8,253,758	$ 9,583,995	$ 27,819,945	**$ 53,057,126**
Orange County Cost Structure					
Low	$ -	$ 12,047,279	$ 7,470,041	$ -	**$ 19,517,320**
High	$ 88,373	$ 10,633,986	$ 11,036,294	$ -	**$ 21,758,653**
Streetcar					
East Bank					
LA County Cost Structure					
Low	$ 26,518,266	$ 16,153,706	$ 37,196,653	$ -	**$ 79,868,625**
High	$ 7,718,236	$ 75,059,726	$ 135,140,242	$ -	**$ 217,918,204**
Orange County Cost Structure					
Low	$ 1,324,172	$ 19,546,317	$ 59,243,990	$ -	**$ 80,114,479**
High	$ 1,221,505	$ 77,220,641	$ 114,683,463	$ -	**$ 193,125,609**
West Bank 1					
LA County Cost Structure					
Low	$ 23,956,842	$ 15,890,795	$ 37,437,408	$ -	**$ 77,285,045**
High	$ 6,972,724	$ 73,838,086	$ 136,014,936	$ -	**$ 216,825,746**
Orange County Cost Structure					
Low	$ 1,196,269	$ 19,228,189	$ 59,627,446	$ -	**$ 80,051,904**
High	$ 1,103,519	$ 75,963,831	$ 115,425,751	$ -	**$ 192,493,100**
West Bank 2					
LA County Cost Structure					
Low	$ 32,997,160	$ 16,153,706	$ 37,077,934	$ -	**$ 86,228,800**
High	$ 9,603,941	$ 75,059,726	$ 134,708,922	$ -	**$ 219,372,590**
Orange County Cost Structure					
Low	$ 1,647,691	$ 19,546,317	$ 59,054,904	$ -	**$ 80,248,912**
High	$ 1,519,941	$ 77,220,641	$ 114,317,434	$ -	**$ 193,058,016**
West Bank 3					
LA County Cost Structure					
Low	$ 32,168,464	$ 15,890,795	$ 36,955,892	$ 23,411,640	**$ 108,426,791**

Alternative	Route Miles	Annual Bus- or Train-Hours	Annual Vehicle-Miles	Annual Ridership	Total O&M Cost
High	$ 9,362,746	$ 73,838,086	$ 134,265,527	$ -	**$ 217,466,359**
Orange County Cost Structure					
Low	$ 1,606,310	$ 19,228,189	$ 58,860,525	$ -	**$ 79,695,024**
High	$ 1,481,769	$ 75,963,831	$ 113,941,157	$ -	**$ 191,386,757**
LRT					
East Bank LA County Cost Structure					
Low	$ 26,518,266	$ 14,840,307	$ 38,335,138	$ 24,968,083	**$ 104,661,793**
High	$ 7,718,236	$ 68,956,895	$ 139,276,504	$ -	**$ 215,951,634**
Orange County Cost Structure					
Low	$ 1,324,172	$ 17,957,077	$ 61,057,282	$ -	**$ 80,338,531**
High	$ 1,221,505	$ 70,942,114	$ 118,193,601	$ -	**$ 190,357,219**
West Bank 1 LA County Cost Structure					
Low	$ 23,956,842	$ 15,103,218	$ 36,570,284	$ -	**$ 75,630,344**
High	$ 6,972,724	$ 70,178,535	$ 132,864,562	$ -	**$ 210,015,821**
Orange County Cost Structure					
Low	$ 1,196,269	$ 18,275,205	$ 58,246,357	$ -	**$ 77,717,831**
High	$ 1,103,519	$ 72,198,924	$ 112,752,263	$ -	**$ 186,054,705**
West Bank 2 LA County Cost Structure					
Low	$ 32,997,160	$ 13,772,485	$ 38,671,044	$ 24,389,858	**$ 109,830,547**
High	$ 9,603,941	$ 63,995,156	$ 140,496,896	$ -	**$ 214,095,993**
Orange County Cost Structure					
Low	$ 1,647,691	$ 16,664,990	$ 61,592,288	$ -	**$ 79,904,969**
High	$ 1,519,941	$ 65,837,530	$ 119,229,257	$ -	**$ 186,586,727**
West Bank 3 LA County Cost Structure					
Low	$ 32,168,464	$ 13,832,579	$ 35,889,751	$ 25,631,600	**$ 107,522,394**
High	$ 9,362,746	$ 64,274,388	$ 130,392,099	$ -	**$ 204,029,232**
Orange County Cost Structure					
Low	$ 1,606,310	$ 16,737,705	$ 57,162,457	$ -	**$ 75,506,472**
High	$ 1,481,769	$ 66,124,801	$ 110,654,067	$ -	**$ 178,260,637**

MagLev					
East Bank					
LA County Cost Structure					
Low	$ 5,612,340	$ 20,883,856	$ 16,068,386	$ -	**$ 42,564,582**
High	$ 19,872,451	$ 28,188,160	$ 104,223,181	$ -	**$ 152,283,792**
Orange County Cost Structure					
Low	$ 888,221	$ 18,911,145	$ 13,636,043	$ -	**$ 33,435,410**
High	$ 3,145,058	$ 27,420,828	$ 88,446,455	$ -	**$ 119,012,340**
West Bank 1					
LA County Cost Structure					
Low	$ 5,688,959	$ 19,791,047	$ 16,686,577	$ -	**$ 42,166,583**
High	$ 20,143,747	$ 26,713,132	$ 108,232,906	$ -	**$ 155,089,784**
Orange County Cost Structure					
Low	$ 900,347	$ 17,921,564	$ 14,160,656	$ -	**$ 32,982,567**
High	$ 3,187,994	$ 25,985,952	$ 91,849,210	$ -	**$ 121,023,156**
West Bank 2					
LA County Cost Structure					
Low	$ 5,746,423	$ 21,432,068	$ 16,030,038	$ -	**$ 43,208,529**
High	$ 20,347,219	$ 28,928,113	$ 103,974,444	$ -	**$ 153,249,776**
Orange County Cost Structure					
Low	$ 909,442	$ 19,407,572	$ 13,603,500	$ -	**$ 33,920,514**
High	$ 3,220,195	$ 28,140,638	$ 88,235,370	$ -	**$ 119,596,203**
West Bank 3					
LA County Cost Structure					
Low	$ 5,688,959	$ 19,868,158	$ 16,183,435	$ -	**$ 41,740,552**
High	$ 20,143,747	$ 26,817,213	$ 104,969,414	$ -	**$ 151,930,374**
Orange County Cost Structure					
Low	$ 900,347	$ 17,991,391	$ 13,733,677	$ -	**$ 32,625,415**
High	$ 3,187,994	$ 26,087,200	$ 89,079,728	$ -	**$ 118,354,922**

Appendix F: Outreach Meeting Record

Pacific Electric ROW/West Santa Ana Branch Corridor Alternatives Analysis Meeting Record
Reporting Period: April 2009 - June 2012

TYPE	STAKEHOLDERS	CONTACT NAME	PURPOSE	MEETING DATE & TIME	LOCATION
Conceptual Screening					
ELECTED OFFICIALS AND STAKEHOLDER BRIEFINGS					
City	La Palma	City Manager Dominic Lazzaretto and Public Works Director Jeff Moneda	Interview	Mon., April 26, 2011	La Palma City Hall
City	Paramount	Public Works Director Christopher Cash	Interview	Fri., April 30, 2011	Paramount City Yard
County of Los Angeles	Los Angeles Supervisor Don Knabe's Office	Planning Deputy Julie Moore	Interview	Thurs., May 6, 2011	Kenneth Hahn Hall of Administration
City	Bellflower	Councilmember Scott Larsen, City Manager Michael Egan, Public Works Director Deborah Chankin	Interview	Mon., May 10, 2010	Larsen Gangloff & Larsen, 16600 Woodruff Avenue, Bellflower, CA
City	Cerritos	Councilmember Bruce Barrows, City Manager Art Gallucci, Public Works Director Hal Arbogast	Interview	Mon., May 10, 2010	Cerritos City Hall
City	Cudahy	Mayor Frank Gurule, City Manager George Perez	Interview	Mon., May 10, 2010	Cudahy City Hall
City	Lynwood	Public Works Director Dan Ojeda	Interview	Mon., May 10, 2010	Lynwood City Hall
City	South Gate	City Manager Ron Bates	Interview	Mon.,May 10, 2010	South Gate City Hall
City	City of Cypress	Councilmember Phil Luebben, City Engineer Kamren Dadbeh, Public Works Director Doug Dancs	Interview	Wed., May 12, 2010	Cypress City Hall
Agency	Metro and Gateway Cities Council of Government	Metro Director Diane DuBois, Transportation Deputy Karen Heit	Interview	Wed., May 12, 2010	Gateway Cities Council of Government Office
City	La Palma	Mayor Pro-tem Ralph Rodriguez, Orange County Council of Governments Representative/Council-member Mark Waldman	Interview	Wed., May 12, 2010	Central Park, Conference Room, La Palma, CA

City	Anaheim	Public Works Director Danny Wu	Interview	Wed., May 12, 2010	OCTA Headquarters, 600 S. Main St., Orange, CA
City	Garden Grove	Mayor William Dalton, Public Works Director Keith Jones	Interview	Thurs., May 13, 2011	Garden Grove City Hall
City	Santa Ana	Councilmember Michelle Martine, Public Works Executive Director Raul Godinez	Interview	Fri., May 14, 2010	OCTA Headquarters, 600 S. Main St., Orange, CA
County of Orange	County of Orange, Supervisor Janet Nguyen's Office	Supervisor Nguyen, Chief of Staff Nick Lecong, Executive Aide Nate Mitchell	Interview	Wed., May 19, 2010	Orange County Hall of Administration
City	Stanton	Councilmember Carol Warren, Public Works Director Nick Guilliams, Community Development Director Omar Dadahoy	Interview	Wed., May 19, 2010	Stanton City Hall
City	South Gate	Vice Mayor Maria Davila, Councilmember Gil Hurtado	Interview	Wed., May 19, 2010	South Gate City Hall
City	Vernon	Mayor Pro Tem Michael McCormick, Director of Community Services Keith Wilson	Interview	Thurs., May 20, 2010	Vernon City Hall
City	Downey	Special Projects Coordinator Shannon DeLong, Planning Assistant Jessica Halak	Interview	Thurs., June 3, 2010	Downey City Hall
City	Bell	Mayor Oscar Hernandez, Councilmember George Mirabel, City Manager Robert Rizzo, Public Works Director Luis Ramirez	Interview	Thurs., June 3, 2010	Bell City Hall
City	Huntington Park	Councilmember Elba Guerrero, Public Works Director Patrick Fu, City Engineer Wes Lind	Interview	Fri., June 4, 2010	Huntington Park City Hall
City	Los Angeles	Planning Deputy Edel Vizcarra, Councilmember Jose Huizar's Office	Interview	Mon., June 7, 2010	Los Angeles City Hall
City	Los Angeles	Deputy Mayor of Transportation Jaime de la Vega, Associate Director Borja Leon	Interview	Wed. , June 30, 2010	Los Angeles City Hall

Agency	Central Cities East Association	Executive Director Estela Lopez, Transportation Consultant Mike Kodama, Planning Deputy Edel Vizcarra	Interview	Wed., June 30, 2010	Los Angeles City Hall
Agency	Union Pacific Railroad	Director of Public Affairs Lupe Valdez	Interview	Tues., June 22, 2010	Union Pacific RR Office, City of Industry
Community-Based Organization (CBO)	Bellflower Kingdom Causes	Chrissy Padilla, Operations Director	Bi-lingual presentation, encourage participation at community meetings	Thurs., Oct. 28, 2010	16429 Bellflower Bl., Bellflower, CA
CBO	Women's Club	Yvonne Correa, Chair	Bi-lingual presentation, encourage participation at community meetings	Tues., Nov 9, 2010	Clubhouse, Salt Lake Park, Huntington Park
CBO	Kiwanis Club	Bill St. Marie, Programs Chair	Presentation, encourage participation at community meetings	Friday, Nov 12, 2010	9302 Laurel St., Bellflower, CA
Educational Institution	Cypress College Associated Student Body	Dr. Kasler, President	Presentation, encourage participation at community meetings	Wed., Dec 1, 2010	Cypress College, Cypress, CA
Bus. Organization	South Gate Chamber of Commerce	Catalina Hernandez, Executive Director	Presentation, encourage participation at community meetings	Tues., May 24, 2011	3350 Tweedy Bl., South Gate, CA
City Commission	South Gate Planning Commission	Alvie Betancourt, City Planner	Presentation, encourage participation at community meetings	Wed. May 25, 2011	South Gate City Hall

Initial Screening					
BRIEFINGS, COUNCIL PRESENTATIONS, ANNOUNCEMENTS AT COUNCIL MEETINGS					
Agency	Metro and Gateway Cities Council of Governments (COG)	Metro Director Diane DuBois	Present AA Scoping Results and Next Steps. Invite Participation in Community Meetings.	Wed., Nov. 3, 2010	Gateway Cities COG Office
Agency	Gateway Cities Council of Governments (COG)	COG Chair/South Gate Councilmember Gil Hurtado	Present AA Scoping Results and Next Steps. Invite Participation in Community Meetings.	Wed., Nov. 3, 2010	Gateway Cities COG Office
City	Santa Ana	Councilmember Michelle Martinez	Present AA Scoping Results and Next Steps. Invite Participation in Community Meetings.	Thurs., Nov. 4, 2010	SCAG Office, 818 W. 7th St., Los Angeles, CA
City	Bellflower	Councilmember Scott Larsen	Present AA Scoping Results and Next Steps. Invite Participation in Community Meetings.	Thurs., Nov. 4, 2010	Bellflower City Hall
City	Cerritos	Councilmembers Bruce Barrow and Laura Chen	Present AA Scoping Results and Next Steps. Invite Participation in Community Meetings.	Thurs., Nov. 4, 2010	Cerritos City Hall
City	Los Angeles	Planning Deputy Edel Vizcarra, Councilmember Jose Huizar';s office	Present AA Scoping Results and Next Steps. Invite Participation in Community Meetings.	Mon., Nov. 8, 201o	Los Angeles City Hall
City	Huntington Park	Councilmember Elba Guerrero	Present AA Scoping Results and Next Steps. Invite Participation in Community Meetings.	Tues., Nov. 9, 2010	O Restaurant, Los Angeles, CA
County	County of Los Angeles, Supervisor Don Knabe's Office	Planning Deputy Julie Moore	Provided Project Update	Mon., Jan. 10, 2011	Kenneth Hahn Hall of Administration
City	Los Angeles	Planning Deputy Paul Habib, Office of Councilmember Jose Huizar	Provided Project Update	Thurs., Jan. 13, 2011	Los Angeles City Hall
City	South Gate	Mayor Maria Davila	Provided Project Update	Tues., Feb. 1, 2011	South Gate City Hall
City	Buena Park	Councilmember Miller Oh	Provided Project Update	Thurs., Feb. 3, 2011	Buena Park City Hall
City	Maywood	Mayor Ed Varela, City Manager Lilian Myers	Provided Project Update	Fri., Feb. 11, 2011	Maywood City Hall
City	Bell	Councilmember Ana Maria Quintana	Provided Project Update	Friday, July 15, 2011	Bell City Hall

City	Buena Park	Council Presentation	Present AA Scoping Results and Next Steps. Invite Participation in Community Meetings.	Tues., Nov. 9, 2011	Buena Park City Hall
City	Los Angeles	Councilmember Jan Perry's Planning Team, Staff Members	Present AA Scoping Results and Next Steps. Invite Participation in Community Meetings.	Wed., Dec. 1, 2010	Los Angeles City Hall
City	Downey	Council Members	Made announcement at Council Meeting to invite participation in community meetings.	Tues.,Oct. 26, 2010	Downey City Hall
City	Lynwood	Council Members	Made announcement at Council Meeting to invite participation in community meetings.	Tues., Nov. 2, 2010	Lynwood City Hall
City	Cudahy	Council Members	Made announcement at Council Meeting to invite participation in community meetings.	Tues., Nov. 2, 2010	Cudahy City Hall
City	Maywood	Council Members	Made announcement at Council Meeting to invite participation in community meetings.	Wed. Nov. 10, 2010	Maywood City Hall
City	Garden Grove	Council Members	Made announcement at Council Meeting to invite participation in community meetings.	Tues., Nov. 9, 2011	Garden Grove City Hall
City	Santa Ana	Council Members	Made announcement at Council Meeting to invite participation in community meetings.	Mon., Nov. 15, 2010	Santa Ana City Hall
City	Vernon	Council Members	Made announcement at Council Meeting to invite participation in community meetings.	Mon., Nov. 15, 2010	Vernon City Hall
City	Anaheim	Council Members	Made announcement at Council Meeting to invite participation in community meetings.	Tues., Nov. 16, 2010	Anaheim City Hall
City	Cypress	Council Members	Made announcement at Council Meeting to invite participation in community meetings.	Mon.,Nov. 22, 2010	Cypress City Hall

City	Stanton	Council Members	Made announcement at Council Meeting to invite participation in community meetings.	Tues., Nov. 23, 2010	Stanton City Hall
Final Screening					
BRIEFINGS, COUNCIL PRESENTATIONS, ANNOUNCEMENTS AT COUNCIL MEETINGS					
Agency	FTA	Mary Nguyen, Environmental Protection Specialist	Review of Preliminary Draft AA Report Comments	Thurs., Jan 12, 2012	FTA Offices
Agency	Orange County Transportation Authority	Ed Alegre, Senior Transportation Analyst	Review of Preliminary Draft AA Report Comments	Wed., Jan 25, 2012	OCTA Headquarters, 600 S. Main St., Orange, CA
Agency	Los Angeles Metropolitan Transportation Authority	Fanny Pan	Review of Preliminary Draft AA Report Comments	Thurs., March 1, 2012	Metro Headquarters, One Gateway Plaza, Los Angeles, CA 90012
Elected Officials	Cerritos	Councilmember Bruce Barrows	Provided Project Update	Tues., April 10, 2012	Cerritos City Hall
Elected Officials	Santa Ana	Councilmember Michelle Martinez, Public Works Director Raul Godinez	Provided Project Update	Wed., April 11, 2012	Santa Ana City Hall
Elected Officials/Agency	Orange County Transportation Authority	Carol Cavecche, Boardmember	Provided Project Update	Wed., April 11, 2012	OCTA Headquarters, 600 S. Main St., Orange, CA
City Staff	Huntington Park	Jack Wong, Planning Director	City tour of alignment and stations	Tues., April 17, 2012	Huntington Park City Hall
Elected Officials	Metro	Diane DuBois, Boardmember	Provided Project Update	Thurs., April 19, 2012	Metro Headquarters, One Gateway Plaza, Los Angeles, CA 90012
Elected Officials	Huntington Park	Huntington Park City Council	Meeting to discuss recommendations/ alignment and stations	Mon., May 7, 2012	Huntington Park City Hall
Agency	OLDA	OLDA Board	Presentation/comments	Wed., May 9, 2012	SCAG offices, Paramount
Elected Officials/Agency	Metro	Diane DuBois, Boardmember	Provided Project Update	Mon., June 18, 2012	Conference Call

BRIEFINGS, COUNCIL PRESENTATIONS, ANNOUNCEMENTS AT COUNCIL MEETINGS					
City Technical Staff	TAC Meeting #1	TAC members represent all cities involved in the AA, and Metro and OCTA.	Project Overview, input on mobility problem and needs	Tues., May 25, 2010, 1:30 - 3 pm	SCAG Main Office, Los Angeles, CA
City Technical Staff	TAC Meeting #2	TAC members represent all cities involved in the AA, and Metro and OCTA.	Results of Community Meetings and Initial Set of Alternatives	Tues., July 13, 2010, 1:30 - 3 pm	City of Buena Park, Police Dept. Community Room
City Technical Staff	TAC Meeting #3	TAC members represent all cities involved in the AA, and Metro and OCTA.	Results of Screening of Initial Set of Alternatives	Tues., Oct. 26, 2010, 1:30 - 3 pm	LA County Metro Headquarters
City Technical Staff	TAC Meeting #4	TAC members represent all cities involved in the AA, and Metro and OCTA.	Results of Final Screening of Alternatives	Tues., Jan. 18. 2011, 1:30 - 3 pm	Bellflower City Hall
City Technical Staff	TAC Meeting #5	TAC members represent all cities involved in the AA, and Metro and OCTA.	Refinement of Final Alternatives	Tues., Feb. 15, 2011,1:30 - 3:30 pm	City of Buena Park, Walter D. Ehlers Community Center
City Technical Staff	TAC Meeting #6	TAC members represent all cities involved in the AA, and Metro and OCTA.	Additional Refinement of Final Alternatives	Tues., Mar. 15, 2011, 1:30 - 3:30 pm	Bellflower City Hall
City Technical Staff	TAC Meeting #7	TAC members represent all cities involved in the AA, and Metro and OCTA.	Additional Refinement of Final Alternatives	Tues., April 19, 2011, 1:30 - 3:30 pm	Buena Park City Hall
City Technical Staff	TAC Meeting #8	TAC members represent all cities involved in the AA, and Metro and OCTA.	Additional Refinement of Final Alternatives	Tues., July 19, 2011, 1:30 - 3:30 pm	Bellflower City Hall
City Technical Staff	TAC Meeting #9	TAC members represent all cities involved in the AA, and Metro and OCTA.	Additional Refinement of Final Alternatives	Mon., March 19, 2012 1:30 - 3:30 pm	Cerritos Sheriffs Station
City Technical Staff	TAC Meeting #10	TAC members represent all cities involved in the AA, and Metro and OCTA.	Additional Refinement of Final Alternatives	Tues., April 17, 2012 1:30 - 3:30 pm	Buena Park City Hall
City Technical Staff	TAC Meeting #11	TAC members represent all cities involved in the AA, and Metro and OCTA.	Results of Final Screening of Alternatives	Tues., May 8, 2012 1:30 - 3:30 pm	Buena Park City Hall
City Technical Staff	TAC Meeting #12	TAC members represent all cities involved in the AA, and Metro and OCTA.	Results of Final Screening of Alternatives	Tues., June 12, 2012 1:30 - 3:30 pm	Cerritos Sheriffs Station
STEERING COMMITTEE					
Elected Officials	Meeting #1	Steering Committee members represent all cities involved in the AA, and Metro and OCTA.	Project Overview, input on mobility problem and needs	Wed., May 26, 2010, 1:30 - 3 pm	SCAG Main Office, Los Angeles, CA

Elected Officials	Meeting #2	Steering Committee members represent all cities involved in the AA, and Metro and OCTA.	Results of Community Meetings and Initial Set of Alternatives	Wed., July 21, 2010, 1:30 - 3:00 pm	City of Buena Park, Walter D. Ehlers Community Center
Elected Officials	Meeting #3	Steering Committee members represent all cities involved in the AA, and Metro and OCTA.	Results of Screening of Initial Set of Alternatives	Wed., Nov. 10, 2010, 1:30 - 3 pm	LA County Metro Headquarters
Elected Officials	Meeting #4	Steering Committee members represent all cities involved in the AA, and Metro and OCTA.	Results of Final Screening of Alternatives	Friday, Feb. 25, 2011, 3 - 4:30 pm	South Gate Civic Center-Main Hall
Elected Officials	Meeting #5	Steering Committee members represent all cities involved in the AA, and Metro and OCTA.	Refinement of Final Alternatives	Wed. Apr. 27, 2011, 1:30 - 3:30 pm	City of Buena Park, Walter D. Ehlers Community Center
Elected Officials	Meeting #6	Steering Committee members represent all cities involved in the AA, and Metro and OCTA.	Refinement of Final Alternatives	Wed., April 25, 2012, 3:00 pm	City of Bellflower City Hall
Elected Officials	Meeting #7	Steering Committee members represent all cities involved in the AA, and Metro and OCTA.	Results of Final Screening of Alternatives	Wed., June 20, 2012, 3:00 pm	Metro Headquarters

COMMUNITY MEETINGS AND OPEN HOUSES					
Conducted during Conceptual Screening					
	Host City	**Purpose**	**Date and Time**	**Location**	
Public Meeting	City of Garden Grove	Introduce project, elicit community input	Tues., June 15, 2010, 6:30 - 8:30 pm	Garden Grove Community Center	
Public Meeting	City of Huntington Park	Introduce project, elicit community input	Wed., June 16, 2010, 6:30 - 8:30 pm	Huntington Park Community Center	
Public Meeting	City of Cypress	Introduce project, elicit community input	Thurs., June 17, 2010, 6:30 - 8:30 pm	Cypress Community Center	
Public Meeting	City of Cerritos	Introduce project, elicit community input	Sat., June 19, 2010, 1 -3 pm	Cerritos Park East Community Center	
Public Meeting	City of Paramount	Introduce project, elicit community input	Tues., June 22, 2010, 6:30 - 8:30 pm	Progress Park Plaza West Auditorium	
Public Meeting	City of Stanton	Introduce project, elicit community input	Wed., June 23, 2010, 6:30 - 8:30 pm	Stanton City Council Chambers	
Conducted during Initial Screening					
Public Meeting	City of Paramount	Present Preliminary Alternatives, solicit feedback	Tues., Nov. 16, 2010, 6:30-8:30 pm	Progress Park Plaza West Auditorium	
Public Meeting	City of Cerritos	Present Preliminary Alternatives, solicit feedback	Tues., Nov. 23, 2010, 6:30 - 8:30 pm	Cerritos Park East Community Center	
Public Meeting	City of Huntington Park	Present Preliminary Alternatives, solicit feedback	Wed., Dec. 1, 2010, 6:30 - 8:30 pm	Huntington Park Community Center	
Public Meeting	City of Garden Grove	Present Preliminary Alternatives, solicit feedback	Thurs., Dec. 2, 2010, 6:30 - 8:30pm	The Courtyard Center, Garden Grove	
Public Meeting	City of Cypress	Present Preliminary Alternatives, solicit feedback	Tues., Dec. 7, 2010, 6:30 - 8:30 pm	Cypress College	
Public Meeting	City of Stanton	Present Preliminary Alternatives, solicit feedback	Sat., Dec. 11, 2010, 1- 3 pm	Stanton Community Center	
Public Meeting	City of South Gate	Provide Project Update	Mon., June 27, 2011, 5:30 - 7:30 pm	South Gate Civic Center, Main Hall	
Public Meeting	City of Garden Grove	Provide Project Update	Tues., June 28, 2011, 5:30 - 7:30 pm	The Courtyard Center, Garden Grove	

Focus Groups					
City staff	Focus Group #1	Cities represented: Bell, Cudahy, Downey, Huntington Park, Lynwood, Maywood, South Gate	Initial station location discussion	Thurs., Sept. 9, 2010	South Gate City Hall
City staff	Focus Group #2	Cities represented: Buena Park, Cypress, Stanton. OCTA staff also attended.	Initial station location discussion	Thurs., Sept. 16, 2010	Stanton City Yard\
City staff	Focus Group #3	Cities represented: Anaheim, Garden Grove, Santa Ana	Initial station location discussion	Tues., Sept. 21, 2010	Santa Ana City Hall
City staff	Focus Group #4	Cities represented: Bellflower, Cerritos, Artesia	Initial station location discussion	Wed., Sept. 29, 2010	Bellflower City Hall
Conducted during Final Screening					
Public Meeting	City of Santa Ana	Final Screening Results	Tues., May 15, 2012, 5:30 - 7:30 pm	Santa Ana City Hall	
Public Meeting	City of Garden Grove	Final Screening Results	Wed., May 16, 2012, 5:30 - 7:30 pm	Garden Grove Community Center	
Public Meeting	Buena Park	Final Screening Results	Sat., May 19, 2012, 5:30 - 7:30 pm	Buena Park Community Center	
Public Meeting	Little Tokyo	Final Screening Results	Tues., May 22, 20212, 5:30 - 7:30 pm	Japanese American Museum	
Public Meeting	Bellflower	Final Screening Results	Wed., May 23, 2012, 5:30 - 7:30 pm	Bellflower Community Center	
Public Meeting	South Gate	Final Screening Results	Thurs., May 24, 2012, 5:30 - 7:30 pm	South Gate Community Center	

Additional Organizations and Media Contacted

CITY OF BELLFLOWER

City of Bellflower: Public Affairs Department
Bellflower Chamber of Commerce
City of Bellflower Public Safety Commission
City of Bellflower Parks and Recreation Commission
City of Bellflower Planning Commission
Kingdom Causes
Bellflower Noon Lions Club
Kiwanis Club of Bellflower
Rotary Club of Bellflower
Elks Lodge of Bellflower/Long Beach
Soroptimist Club of Bellflower

CITY OF LYNWOOD

Director of Neighborhood Services
Block Watch
City of Lynwood Planning Commission
City of Lynwood Public Safety Commission
City of Lynwood Traffic and Parking Commission
City of Lynwood Chamber of Commerce
Rotary Club of Lynwood
Press Telegram
Los Angeles Wave/Lynwood Press

CITY OF PARAMOUNT

City of Paramount Quarterly newsletter
City's Website Calendar
Paramount Petroleum Refinery
Paramount Unified School District
Neighborhood Watch Program
Chamber of Commerce
City Managers Executive Secretary
Emmanuel Reform Church
Our Lady of the Rosary Parish
Paramount Journal

CITY OF LAKEWOOD

City Public Info Officer
The Lakewood Living Magazine
School District Superintendents Office
Rotary Club of Lakewood
Gateway Cities COG

CITY OF DOWNEY

City of Downey Steering Committee Members
Downey Chamber of Commerce

CITY OF CERRITOS

Public Information Officer
City Website
Cerritos TV3
Los Cerritos Community News
Cerritos Regional Chamber of Commerce
The China Press
Chinese Daily News
India Journal
International Daily News
Korea Daily
Nguoi Viet
Rafu Shimpo
Sing Tao Newspapers Los Angeles Ltd.
Taiwan Daily
United Times
Viet Bao Daily News
Viet Tide
Cerritos College Radio WPMD

CITY OF BUENA PARK

City Public Information Officer
Holder Elementary School near ROW
Chamber of Commerce
City of Buena Park Planning Commission
City of Buena Park Traffic and Transportation Commission

CITY OF BUENA PARK
Orange County Register
Buena Park Independent

CITY OF ARTESIA
City Public Information Officer
Planning Commission
Parks and Recreation Commission

SUPERVISOR DON KNABE
Field Deputy
Communications Director

CITY OF HUNTINGTON PARK
City Planning Commission
City Community Development Commission
Women's Club
Chamber of Commerce

CITY OF SOUTH GATE
Assistant to City Manager
City Community Action Committee
Chamber of Commerce
Mobile Home Park

CITY OF CUDAHY
City Manager

CITY OF BELL

Director of Community Services
The following environmental justice organizations:
East Yard Communities for Environmental Justice
Urban and Environmental Policy Program, Occidental College
USC
Coalition For A Safe Environment
Natural Resources Defense Council
The Cunningham Report
Community Action and Environmental Justice
Coalition for Clean Air
Long Beach Alliance for Children with Asthma
Environmental and Health Coordinator Physicians for Social Responsibility
Communities for a Better Environment
Los Angeles Board of Harbor Commissioners
California Transportation and Air Initiative
UCLA Pub Hlth-COEH

CITY OF BELL

Legal Aid Foundation of Los Angeles
Move LA
Bus Riders Union

CITY OF MAYWOOD

City Steering Committee

CITY OF VERNON

Director of Community Services and Water
Chamber of Commerce
Rotary Club of Vernon
Vernon Sun Newspaper

CITY OF GARDEN GROVE

Community Services Director
Main Street Commission
Planning Commission
Traffic Commission
Neighborhood Improvement and Conservation Commission
Garden Grove Chamber of Commerce
Salvation Army Family Services
Seventh Day Adventist Church
St Callistus Christian Services
St. Columban's Catholic Church
Asian American Senior Services Center
H. Louis Lake Senior Center
Orange County Korean-American Center
St. Anselm's Cross-Cultural Community Center
Garden Grove Journal

CITY OF ANAHEIM

Public Information Officer
Community Services
Director

CITY OF SANTA ANA

Public Information Officer
Deputy City Manager
Neighborhood Services Director
ComLink
OCTA

CITY OF SANTA ANA

Trails4All
Orange County Wheelman
Latino Health Access
Greater Santa Ana Business Alliance
Downtown Anaheim
Orange County Congregation Community Organization
Santa Ana Collaborative for Responsible Development Community Coalition (SACRED)
Chief of Staff for JANET NGUYEN

CITY OF SANTA ANA

Miniondas
Excelsior
Rumores

County Community Services Center
Templo Calvario
Salvation Army Family Services
Seventh-Day Adventist Church
St. Barbaras Catholic Church
Trinity Cristo Rey Lutheran Church
Abrazar Senior Center
Asian American Senior Center
H. Louis Lake Senior Center
Midway City Community Center (also a FRC)
Santa Ana Senior Center
Southern California Indian Center
Southwest Senior Center
Vietnamese Community Center
Westminster Senior Center (also a FRC)
Santa Ana Vietnamese Hope Community Center
Boat People SOS
Cambodian Family
Casa de la Familia

CITY OF CYPRESS

Mayor's Office
City Manager's Office
Economic Development Manager
Cypress Chamber of Commerce
Kiwanis
Cypress College

CITY OF LA PALMA

City Manager's Office
News Enterprise
Orange County Wheelmen
Trails4All

CITY OF STANTON

Community Development Director
Public Information Officer
City Clerk
Orange County News
OC Register

Appendix G: Public Comment Log

Comments From Public Meetings

ID	Name/ Info.	Date	Submission Method	Type of Commenter	City	Comments	
						Purpose & Need	Alternatives
1	Robert Allen	6/10/2010	Email	Public	Not Stated	Few bike lanes that run North/South and no bike lanes East/West	Bike Pathway
2	Greg Laemmle	6/10/2010	Email	Public	Not Stated	Supports the project. Would like to see a bikeway and/or multi-use pedestrian path	Multi-modal commuting
3	Constance Condit	6/10/2010	Email	Public	Not Stated	Supports the project. Would like to see multi-use path to encourage people to get out of their cars and increase exercise.	Multi-use path
4	Elliot Gordon	6/10/2010	Email	Public	Irvine, CA	Supports the Project. Would like to see multi-use path in place that would connect rivers, trails and other rec areas. Wants to increase physical activity	Multi-use path
5	Charles C. Mack (Legislative Representative of Local 1422)	6/10/2010	Email	Public (The United Transportation Union)	Not Stated	Fully supports project. Best ever public transit solutions to reduce traffic congestion in Southern California	"Rail to Trail" conversion
6	Ron McGill	6/10/2010	Email	Public	Pasadena, CA	wholeheartedly supports the plan	
7	Phil Willems	6/10/2010	Email	Public	Not Stated	Supports the project. Would like to see a bikeway proposed in the plans. States that a multi-use path can enhance the corridor by attracting transit riders and improving access to the transit stations.	Multi-use path
8	Dr Robert C Hirst	6/10/2010	Email	Public	Laguna Niguel, CA	Supports the project. Request that a multi-use path be included in the plans for the 20 mile Pacific Electric Corridor	multi-use path
9	Jill Bailey	6/10/2010	Email	Public	Los Angeles County resident	Supports the project. Request that a multi-use path be included in the plans for the 20 mile Pacific Electric Corridor	multi-use path

Comments From Public Meetings

ID	Name/ Info.	Date	Submission Method	Type of Commenter	City	Comments	
						Purpose & Need	Alternatives
10	Felicia Bander	6/10/2010	Email	Public	Not Stated	Supports the project. Request that a multi-use path be included in the plans for the 20 mile Pacific Electric Corridor	multi-use path
11	Mike and Bonnie LeLesch	6/10/2010	Email	Public	Not Stated	Supports the project. Request that a multi-use path be included in the plans for the 20 mile Pacific Electric Corridor	multi-use path
12	Steve Grove	6/10/2010	Email	Public	Not Stated	Supports the project. Request that a multi-use path be included in the plans for the 20 mile Pacific Electric Corridor	multi-use path
13	David Erickson	6/14/2010	Email	Public	Lancaster, CA	Supports the project. Request that a multi-use path be included in the plans for the 20 mile Pacific Electric Corridor	multi-use path
14	V. & B. Jones	6/14/2010	Email	Public	Not Stated	Supports the project. Request that a multi-use path be included in the plans for the 20 mile Pacific Electric Corridor	multi-use path
15	Alicia Kern	6/10/2010	Email	Public	Palos Verdes, CA	Supports the project. Request that a multi-use path be included in the plans for the 20 mile Pacific Electric Corridor	multi-use path
16	Dick Roether	6/10/2010	Email	Public	Pasadena, CA	Supports the project. Request that a multi-use path be included in the plans for the 20 mile Pacific Electric Corridor	multi-use path
17	Dan Hazard	6/10/2010	Email	Public	Huntington Beach, CA	Supports the project	multi-use path

Comments From Public Meetings

ID	Name/ Info.	Date	Submission Method	Type of Commenter	City	Comments	
						Purpose & Need	Alternatives
18	Bryan Meek	6/10/2010	Email	Public	Not Stated	Supports the project. Request that a multi-use path be included in the plans for the 20 mile Pacific Electric Corridor. Would appreciate a separation between cycling and motor vehicles.	multi-use path
19	Harvey L Kale	6/10/2010	Email	Public	Not Stated	Supports the project. Request that a multi-use path be included in the plans for the 20 mile Pacific Electric Corridor	multi-use path
20	Shirley Otis-Green	6/10/2010	Email	Public	Duarte, CA	Supports the project. Urges the adoption of development plans that take into account the promotion of an integrated trail system throughout Southern California	multi-use path
21	Wesley Reutimann	6/21/2010	Email	Public	Not Stated	Supports the project. Request that a multi-use path be included in the plans for the 20 mile Pacific Electric Corridor	multi-use path

Comments From Public Meetings

ID	Name/ Info.	Date	Submission Method	Type of Commenter	City	Comments	
						Purpose & Need	Alternatives
22	Carl R. Nelson	6/23/2010	Email	Public (retired Orange County Director of Public Works)	Statonto, CA	Supports the project. Would like to see transit linkages across Orange and LA county through an expanded light rail system.	Light Rail system
23	George Ridenour	6/23/2010	Email	Public	Not Stated	Supports the project. Believes that an elevated Mag-Lev train system would is the best option for the 20 mile PE RoW	Elevated Magnetic Levitation Train
24	Melissa V Rentchler	6/10/2010	email	Public	Longbeach, CA	Supports the project. Request that a multi-use path be included in the plans for the 20 mile Pacific Electric Corridor	multi-use path
25	Allison Mannos	6/10/2010	email	Public	Los Angeles, CA	Supports the project. Request that a multi-use path be included in the plans for the 20 mile Pacific Electric Corridor	multi-use path
26	Michael Gimbel		email	Public	San Morino, CA		
27	Colin Liu		email	Public	Cypress, CA		
28	M Pelayo		email	Public	Artesia, CA		
29	Lloyd Gonzales		email	Public	Buena Park, CA		
30	James Suazo		email	Public	Santa Ana, Ca		
31	Chad Druten		email	Public	Paramount, CA		
32	Herb Sutherland		email	Public	Cypress, CA		

Comments From Public Meetings

ID	Name/ Info.	Date	Submission Method	Type of Commenter	City	Comments	
						Purpose & Need	Alternatives
33	Michael E. Bailey		email	Public	Mission Viejo, CA	This line would be perfect for a light rail system or a Metrolink type system. It should have connections to the Santa Ana Transportation Center (Metrolink Station) and a connection to La Union Station. Buses could be used to connect people to this line from where they live and work. This is also a great way to releave conjestion and help reduce air pollution. People will use the system as a less expensive alternative to cars. If we are going to make the Clean Air Act work, we need investments like this one and in bus transit. This line is also a perfect vehicle to build an integrated public transportation system of rail, buses, bicycles, and walkability. Thank you.	Light Rail system
34	John Chamberlain		email	Public	Garden Grove, CA		
35	Nancy Chamberlain		email	Public	Garden Grove, CA	Very disconcerting for our family. We live with that rail road right away in our back yard.	Opposed to project
36	Marlon Regisford		email	Public	Irvine, CA		
37	William Walker		email	Public	Los Angeles, CA		
38	Lawrence Kato		email	Public	La Palma, CA		
39	Richard A. Rosich		email	Public	Alhambra, CA		
40	Richard A. Rosich		email	Public	Alhambra, CA	Is there a path that would lead it throught the city of Whittier. This city is in need of mass transit. The city is also limited in its ability to connect with the regions freeways.	Connect line to Whittier

Comments From Public Meetings

ID	Name/ Info.	Date	Submission Method	Type of Commenter	City	Comments	
						Purpose & Need	Alternatives
41	John Chamberlain		email	Public	Garden Grove, CA	I attended the June 15th meeting at the G.G. meeting regarding our transportation needs. I found the meeting: (1) very friendly, (2) well organized, (3) very informative. I especially thought the table by table setup was nice and then the table by table opinions presended by an individual at each table. I do think the cookies could have been a little sweeter. I did not realize that an official/representative of SCAG was setting at our table. I think that should have been made knowed so it was apparent to everyone he would probably be presenting SCAG position. I want you to know, if in fact, the person was a SCAG representative he was very cordial and informative. I would not have know the proposal tracks were 10-20 feet. I [my family] live adjacent to the tracks. Our back yard faces the track. I understand the need to evaulate our transportation needs. Thank you much. John C.	
42	Jim Hamlin		email	Public	Cypress, CA		
43	Steve Donaldson		email	Public	San Carlos, CA		
44	Konstantin Akhrem		email	Public	Huntington Beach, CA		
45	Bob Bengford		email	Public	Not Stated		
46	Steven Chan		email	Public	Orange, CA		
47	Al Jones		email	Public	City of Industry, CA	This could be a big help if connected to the Amtrack/Metrolink line at the Santa Ana station and run to Union Station. It could relieve a lot of congestion; in addition, construction would be cheaper since it would not have to deal with the existing traffic	Connect to Amtrak

Comments From Public Meetings

ID	Name/ Info.	Date	Submission Method	Type of Commenter	City	Comments	
						Purpose & Need	Alternatives
48	eric marshall		email	Public	Buena Park, CA		
49	Emil Ali		email	Public	Cerritos, CA		
50	Quintin Sumabat		email	Public	Cerritos, CA		
51	ROY RICHY		email	Public	Westminster, CA	WE LIVE IN WESTMINSTER AN IN FAVOR OF IT	
52	unantiege		email	Public	Not Stated	Very Good site, thank yo mister, it's help's me!	
53	Keith McCarthy		email	Public	Downey, CA	A great amount of work has been invested by the Orange Line Development Authority; proposing to use MagLev technology along this corridor. I was among those who helped assemble this agency, and continue to support this proposal.	MagLev
54	Wesley Reutimann		email	Public	Pasadena, CA		
55	Wallace Phelps		email	Public	Long Beach, CA	This right of way coupled with the present "green line" would connect Orange County with a direct route to the traffic plagued LA International Airport. This would provide a rapid link to the Harbor, South Bay, and LA Westside. Together with the present Blue, Red, Purple, Gold Line, and soon to be completed Agua (Exposition Blvd.) would connect Orange County to the Southern California transportation system. The currently underutilized Green Line would become and invaluable artery. Please keep in mind that these old right of ways were laid out before any development in the most optimum manner. At the same time it would provide the people of L.A. County with easy access to the many O.C. attractions.	Connect project to existing lines
56	Andrew		email	Public	Downey, CA		
57	Matthew Stafford		email	Public	Downey, CA		

Comments From Public Meetings

ID	Name/ Info.	Date	Submission Method	Type of Commenter	City	Comments	
						Purpose & Need	Alternatives
58	Paul Ayala		email	Public	Garden Grove, CA		
59	Dennis Lytton		email	Public	Los Angeles, CA		
60	Eric Tooley		Email	Public	Los Angeles, CA	I believe that this corridor is important and should be put to better use as a rapid transit line. It should be built as light rail so that it can connect to the rapidly expanding Los Angeles Metro system . I do not think BRT would be a good investment over time. Commuter rail is possible, but light rail is preferred by me. The corridor should include a bike path that is separate from traffic as much as is possible. I frequently ride the Green line in Los Angeles and would be thrilled to be able to head into other cities and counties with such a system with as few transfers as possible.	Connect project to existing lines. Use light rail system and bike paths

Comments From Public Meetings

ID	Name/ Info.	Date	Submission Method	Type of Commenter	City	Comments	
						Purpose & Need	Alternatives
61	Theresa M. SHERRIN	10/11/2010	Email	Public	Cypress, CA	I have been responding to this cause for years. You need to look at what is good for the people and not what the current politician wants. When I was young married with small children in the late 50's we use the old P.E. Street Car to get around. It went from L.A. to Santa Ana and moved people out to the country. Orange Co. was country at that time. The Street Car should NEVER have been discontinued. No one seems to care if it works only will it please a group. A good example of this is the train that goes along the 105 Freeway. It should have gone into LAX so those of us out here in Orange County could have taken it to the Airport. When you go to other Countries you can take their trains right to the Airport. You don't need someone to take you. All of this would have less cars on the road or at the airports. I know the CAR DEALERS don't want that. Taxi/ shuttles, car rentals don't want this but just WHO are you suppose to be working for. If the OLD RED CAR /P. E. Street Car was back in business it would increase business at areas near the stops. People could get to school at Cypress College without all of the parking and traffic congestion we now have at Valley View and Lincoln. This would be true all along the route.	Connect line to LAX/Cypress college

Comments From Public Meetings

ID	Name/ Info.	Date	Submission Method	Type of Commenter	City	Comments	
						Purpose & Need	Alternatives
62	Michael Alvarez	10/20/2010	email	Public	Paramount, CA	I want to express my gratitude on the process of the Santa Ana ROW. I've been waiting for this sort of development for the past decade or so. We need jobs and an adequate mass transit system in this town. But I do strongly feel that a light rail line would serve this ROW best. We need a line that allows us to bring both counties together intimately without the limitations that we will receive with Metrolink or High Speed Rail. I am not saying that Metrolink and High Speed Rail are a waste of funds, what I am saying is that they won't serve the Santa Ana Corridor the way a light rail line would.	Light Rail system
63	Chrissy Padilla	11/1/2010	Email	Public	Belflower, CA	Thanks again for last Thursday. I was so encouraged! Not only did you do a fabulous job educating my neighbors about possibilities for the PE-ROW, but you also ignited a conversation about long-term sustainability for our, mostly rental, neighborhood. I love that the neighbors are thinking about these questions. My hope is that we are able to help them organize and connect with the city about their fears. Because the proposed project is still quite a bit away, it gives us time to make changes within our own community to protect the vulnerable so that all come out winners.	
64	Douglas Dumhart	11/30/2010	Mail	Public	La Palma, CA	Opposes PE-ROW project due to quality of life concerns to the residents of La Palma. Urges project managers to explore alternative to using the PE-ROW.	

Comments From Public Meetings

ID	Name/ Info.	Date	Submission Method	Type of Commenter	City	Comments	
						Purpose & Need	Alternatives
65	Matt Card	5/31/2011	Email	Public	Fullerton, CA	Good day- I am a founding, but not active member, of NOCBAC- I am currently cycle touring on the east coast of the USA-I am writing you about the potential improvements along the existing Pacific Electric Right-of-Ways- I noticed that the proposed transit methods consist only of major mass transit improvement options- I noticed that there are no mentions of bicycle/recreation path improvements along the route-Considering the current budgets and economically trying times a lower cost alternatively beneficail use might be feasible- As a way to start the ball rolling and gain citizen awareness, and as is done in many places in the USA and worldwide, graded bike paths might be a way to extend the use of existing funds to provide the maximum length of paths along the existing rights-of way-	Bike Pathway
66	Michael E. Bailey	5/30/2011	Email	Public	Mission Viejo, CA	Supports both a street car or light rail system but thinks a street car option would be esier to sell to folks in Santa Ana and Garden Grove. Has concerns regarding diabled riders. What can be done to bridge the gap between the boarding platforms and the streetcar or light rail car floors? Another issue is that the current Metrolink automated ticketing machines are hard for some members of the disability community to use.	Street Car system

Comments From Public Meetings

ID	Name/ Info.	Date	Submission Method	Type of Commenter	City	Comments	
						Purpose & Need	Alternatives
67	Alan Jones	6/21/2011	Email	Public	Not Stated	I am unable to attend these meetings due to conflicts with my employment. I would, however, urge you to retain this right of way for rail traffic either now or in the future. If you look at what has happened in Europe you would understand how important this is.	Light Rail system
68	Mark Johnston	7/11/2011	Written response	Public	Chino, CA	Supports DMU but would also support light rail system. Stress the need to make system connect to existing systems cush as the blue line, LAX, Disneyland monorail, ect. Blue line should beused to connect Orange County to downtown LA/Union Station. "Please consider all my suggestions. I have a lot more ideas. Strangely, I go to meetings all over southern California and have never been contacted, so I wonder how much of peoples comments are ever even read Thank you for your time" (sent in three pages of suggestions).	Diesel Multiple Units

Comments From Public Meetings							
ID	Name/ Info.	Date	Submission Method	Type of Commenter	City	Comments	
						Purpose & Need	Alternatives
69	Nels Nelson	8/1/2011	Email	Public	Belflower, CA	Supports use of PE ROW for public transit but wishes to see a biketrail included at least through from Bellflower to Paramount, and hopefully beyond.This 2.3 mile addition would allow bike riders to ride a 30 mile circuit along the Pacific Electric Corridor, down one of the river beds, then along the Pacific Coast Highway and up another river bed to complete the circuit. "We understand that this corridor is also being looked at as a possible public transportation route. We support that initiative, but if this corridor is to be transformed into a public bus route, or some other form of public transportation method, we would like to see it also include a bike path. Ultimately we would like to see the entire corridor converted to a bike path, regardless of the status of a public transportation route."	Bike Pathway
Comments From Project Website							
70	N/A		Email	Public		FIRE YOUR CONSULTANTS!! I am a transit professional with 30+ years experience. Based on the press reports and my quick review of the total number of peak LRT vehicles (~80) needed that your studies indicate for an LA County-Orange County, projected operating costs are overstated at least twice the likely number. Consider this: 78 peak vehicles X 12 hours per day X 300 days per year equals a maximum of 281,000 hours per year. According to NTD, LAMTA's LRT operating costs in FY 2010 was about $168 million for 429,000 annual vehicle revenue hours, or about $391.00 per RVH. Applying this to this estimate to the PE ROW, I get an estimate of $110-$120 million annually, including an allowance for inflation between 2010 and 2012 of +/- 10%.	

Comments From Public Meetings

ID	Name/ Info.	Date	Submission Method	Type of Commenter	City	Comments	
						Purpose & Need	Alternatives
71	N/A		Email	Public		Concerning Project Scope, Please make sure that project is well integrated with existing rail networks. Thus the following should be requirements in your alternatives screening: - end points in SARC and Union Station - direct connection to Metro Green Line in Norwalk - direction connection to Metrolink and light rail / subway line inside SARC and Union Station Further, provide a fast and safe ride. Thus the following should be requirements: - one seat ride between Union Station and SARC (no transfers) - grade separations	
72	Mark B.		Email	Public		I attended the session in Bellflower today and appreciate the info. From the comments around me I'd recommend adjusting the presentation by 1. Clarify Acronyms from the start, like "TSM is a way of saying xxxxxxxxxxxxxx and AA study means YYYYYYYYYYY", just the language we speak that may seem foreign to you at the moment. As a retired engineer it's easy to get into the presentation and leave some of the attendees behind from the start. 2. Consider (Maybe you have and determined not to) Q&A (that's Questions & Answers) after the presentation is completed and go back thru the slides for more clarity of understanding and address individuals that want to "drill down" in sessions like you have at the storyboards. Thank you,	

Comments From Public Meetings

ID	Name/ Info.	Date	Submission Method	Type of Commenter	City	Comments	
						Purpose & Need	Alternatives
73	N/A		Email	Public		I read about the May 19, 2012 meeting after it happened. I am sorry that I missed the meeting, but have requested to be placed on a email notification site. I am very in favor of alternative communting alternatives. Since the sixties, we have relayed more & more on the automobile. The track is too far for me to walk to, but on the occassion that I would like to go to LA to explore, I would rather do it that way.	
74	N/A		Email	Public		Would bus service be workable? The bus could access the corridor and leave it for other destinations.	
75	N/A		Email	Public		I assume all who are making the study are reidents of the two cities. The best reason to make a study is to find out who would use that line. Te best way to do that is with a 2 part survey. Part 1: Mail to each residence in each city involved in the line. 2. Door to door survey. If you do not do these things you are wasting money now and if the project is approve you will waste money in the furture.	

Comments From Public Meetings

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						Purpose & Need	Alternatives
76	N/A		Email	Public		Read the updated alternative analysis and west bank version #3 is best. It is almost the same idea i had proposed earlier. I had the line connecting at LIttle Tokio station also for access into LAUS. You need to get with the downtown connector team ASAP and make sure the connection can be made at this location. They either need to build a knock out panel for you or better yet, have you contribute to the junction now and build it as the same time as the connector. Just leave it closed off with tail tracks until you can connected it later. I was thinking your route could head south from Little Tokio at grade on Central ave for at least 4-6 blocks (saving $) before having to tunnel to get south of the 10 freeway. The rest of the route as far south towards the Green Line looks pretty good. From Green to Santa Ana also like the station spacing. I just have problems with the Santa Ana end- it must be light rail right to the Santa Ana Amtrak and Metrolink station If mSanta Ana w ants a street car, they can build that (and Garden Grove for that matter) as circulators that feed the light rail. Can't wait for the spring public hearings Thank you.	
77	N/A		Email	Public		the bikeway could be put in before any other project as it is badly needed for cross-town commutes.	

Comments From Public Meetings

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						Purpose & Need	Alternatives
78	N/A		Email	Public		This project should be Light rail so that it fits in with the LA Metro system. A maglev train will cause operational confusion at the Union Station terminus, creating more unnecessary modes. Light rail can be operated by LA Metro, with subsidies from OCTA to account for the Orange County portion. The light rail should connect to the northbound Gold Line just north of Little Tokyo to proceed into Union Station on the Gold Line tracks. This would also technically allow the trains to continue running all the way to Pasadena or to a future northbound extension into Glendale. There is no reason to add a different transportation mode to the system in LA County, Light Rail makes the most sense.	
79	N/A		Email	Public		That old railway roadbed has been waiting patiently for far too long, as the tiny towns along it have now mushroomed into teeming cities. Garden Grove and all of the other communities can surely make good use of an alternate rail connection to Los Angeles and Santa Ana, and perhaps SCRRA will allow existing Metrolink trainsets to be utilized by having them run from Union Station to Santa Ana on the San Diegan Line, then return on the Pacific Electric route (and vice versa). If some businesses along the way are willing to ship by rail again due to the high environmental and financial costs of trucking, maybe Union Pacific would be willing to help cover the cost of laying down new track. Only a few miles of single track are missing, as the lines is still in place and active in the City of Stanton, but a signalling system will probably need to be installed - unless crews can safely separate trains by radio or GPS.	

Comments From Public Meetings

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80	N/A		Email	Public		regarding the PE/Santa Ana Branch planning. However, I've reviewed the information on the web site. I currently reside in Orange County. I have some experience using transit systems to get to work, as for a while I commuted to the LAX area, which necessitated a drive to Norwalk and then a trip on the Green Line, in addition to bus connections near LAX. Every day I wished that the transit systems were better and mourned the lack of a connection between the Green Line and the Norwalk Metrolink station (the bus connection was so inefficient that I drove to Norwalk). I'm very happy to see study of the PE ROW through Santa Ana. If this had existed while I was employed near LAX, my commute would have been so much better. Having commuted daily on the Green Line light rail system, I can say I would very much favor light rail as an alternative for this corridor. It was a fast and efficient system and rarely broke down. When the PE ROW is figured in with the Green Line you have something that we've been missing: a transit alternative to the 405 (I wish we had Metrolink down the middle of the 405). The PE ROW + Green Line corridor roughly parallels the 405, albeit inland a bit. However, it heads to West LA, which is a horrible place to be in a car. With the additional rail development taking place, this line becomes a great connection to a high concentration of jobs in West LA. Furthermore, the presentation indicates that light rail would run 18 hours a day, which is much more than Metrolink. I really like Metrolink, but the problem is if I go to downtown LA in the evening, there's no way to get back. If such a light rail alternative existed, I could get back in the late evenings and stay out of my car. i'm excited to see that the study includes another way to get to Union Station besides taking the Green Line to the Blue Line. I recommend the transit	