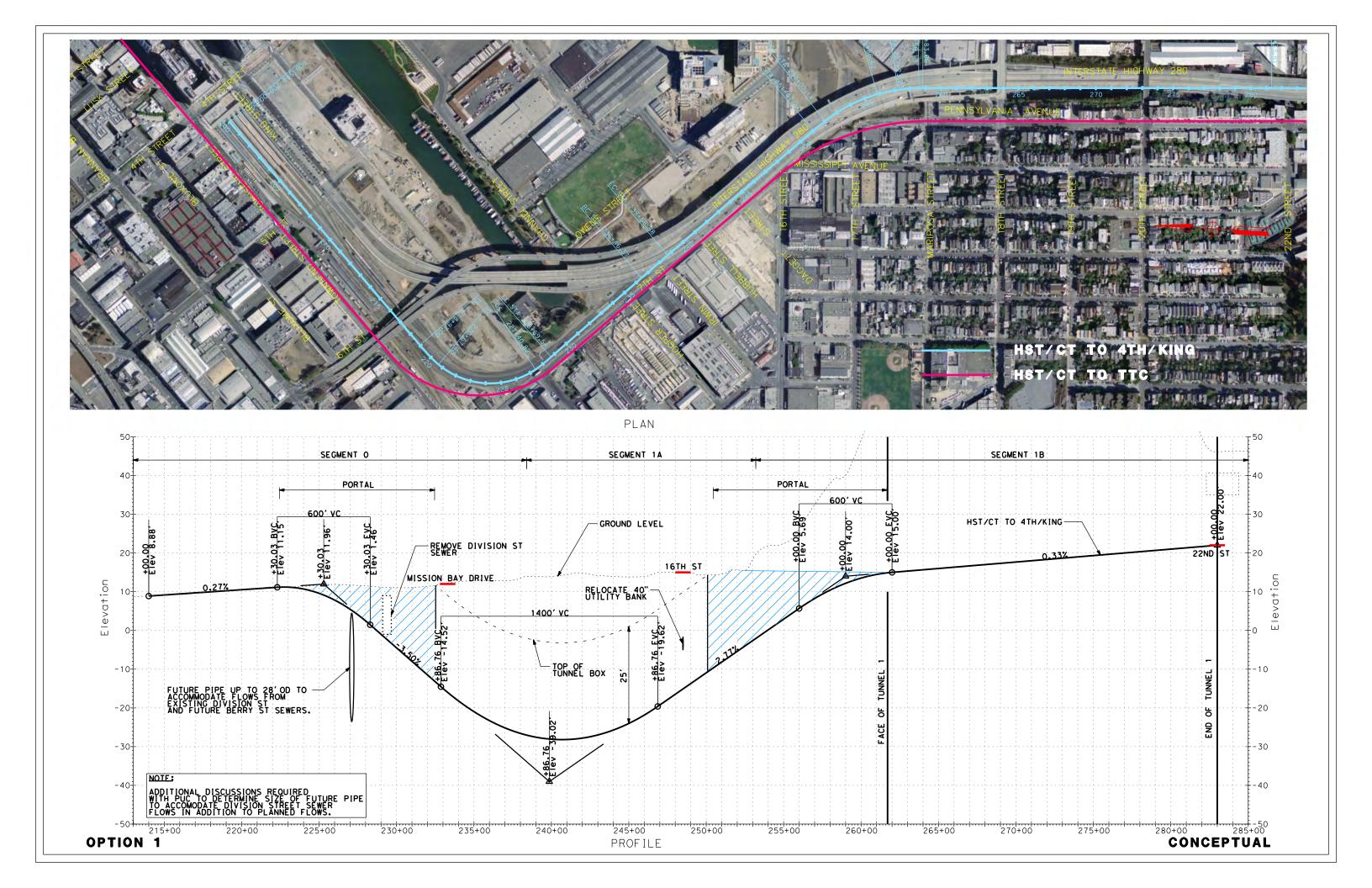
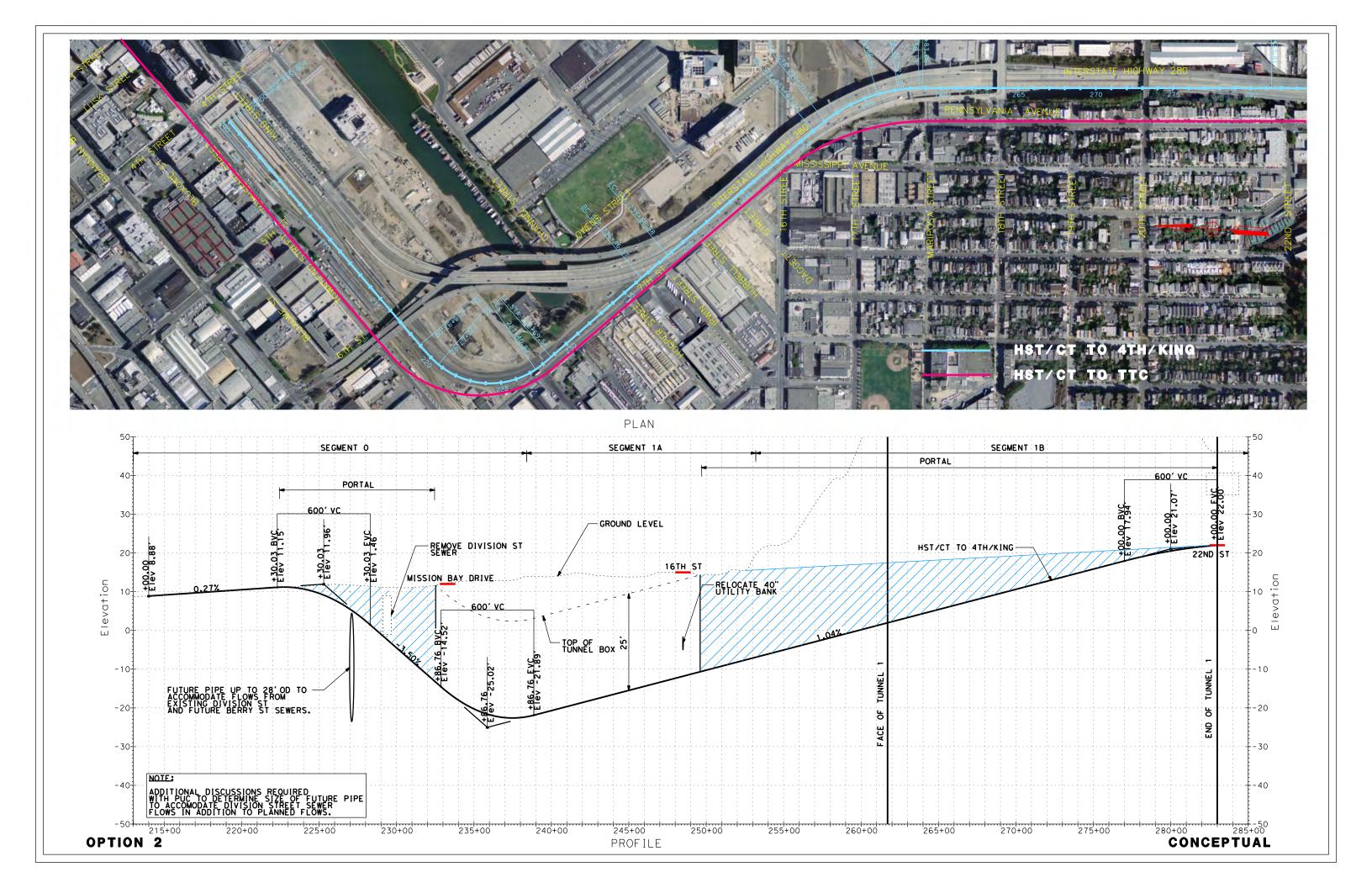
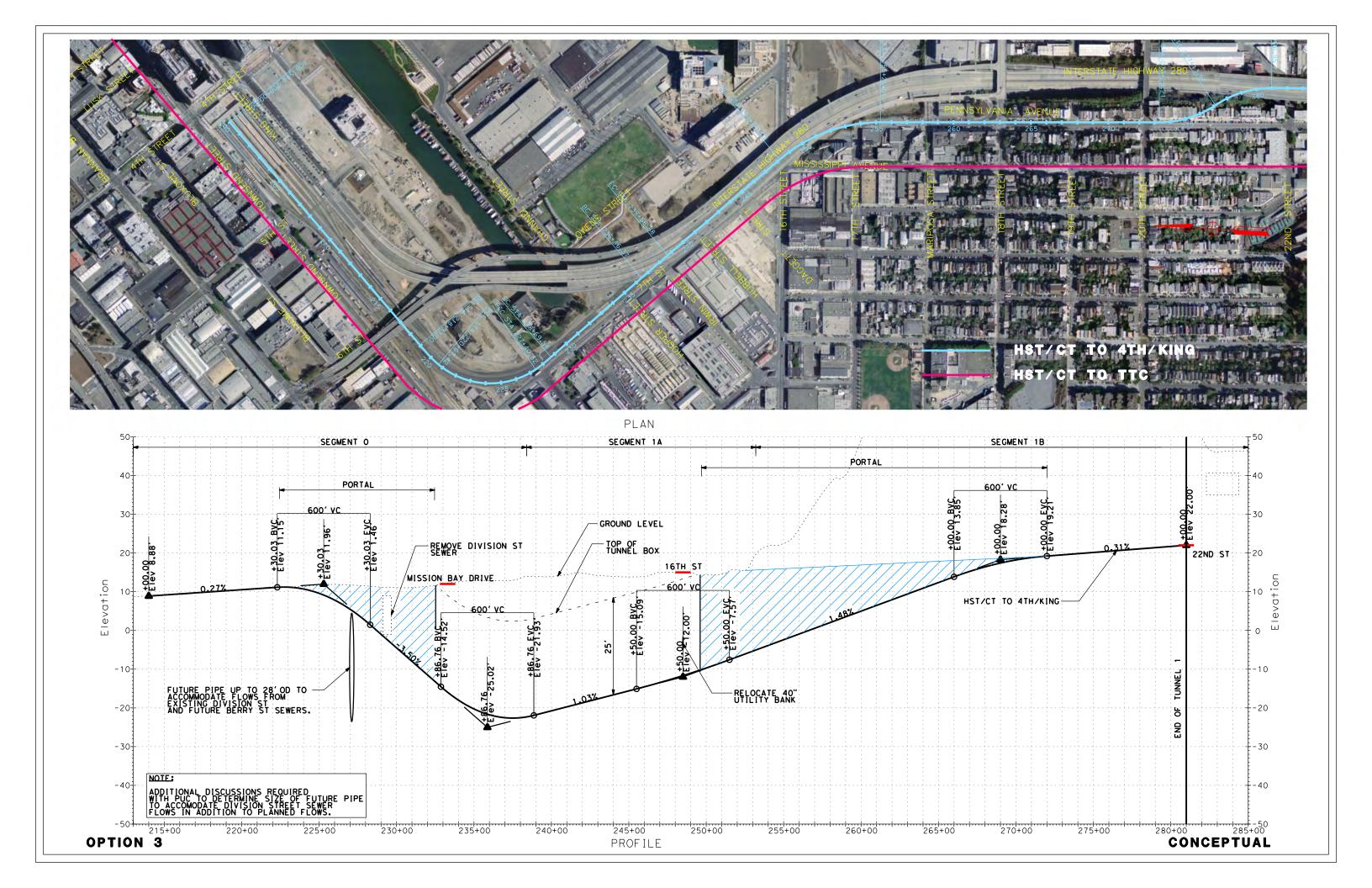
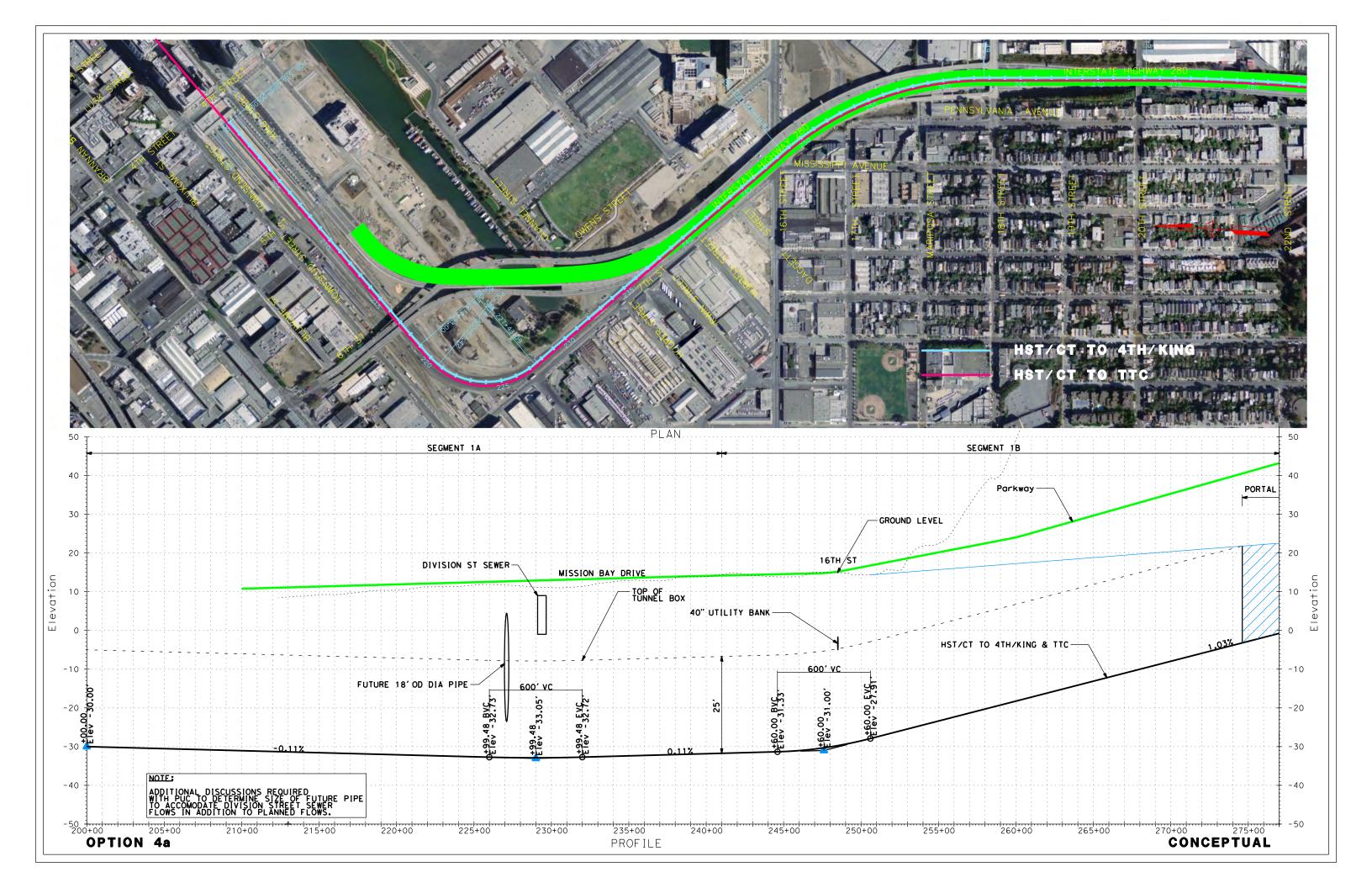
Appendix C: SFTWG Alternative Alignment Options Plan/Profile Drawings

Source: SFTWG

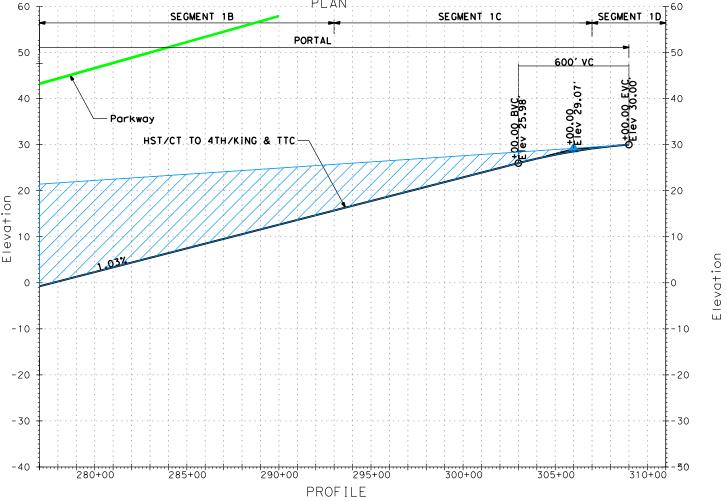


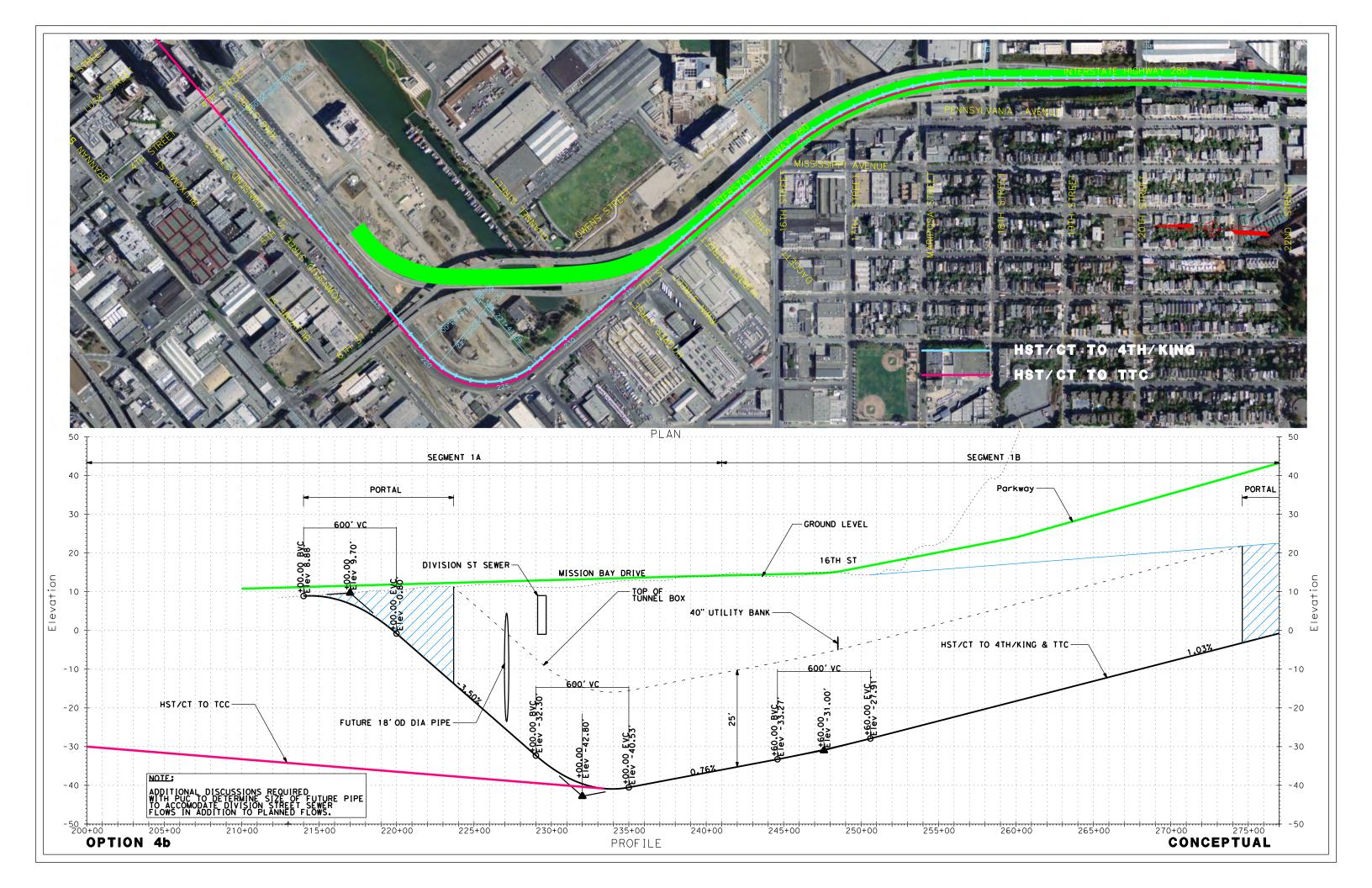


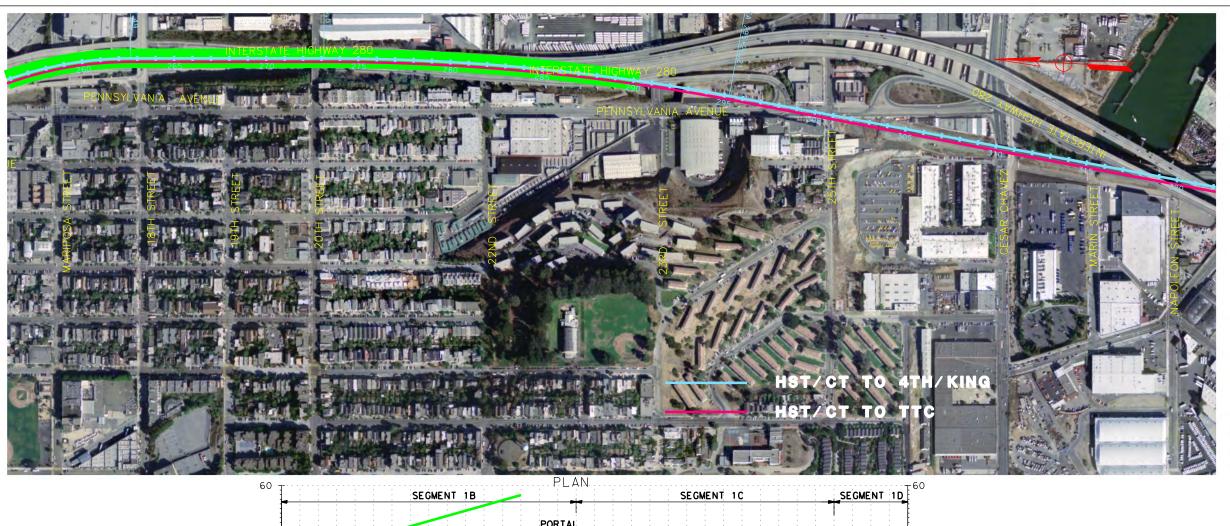


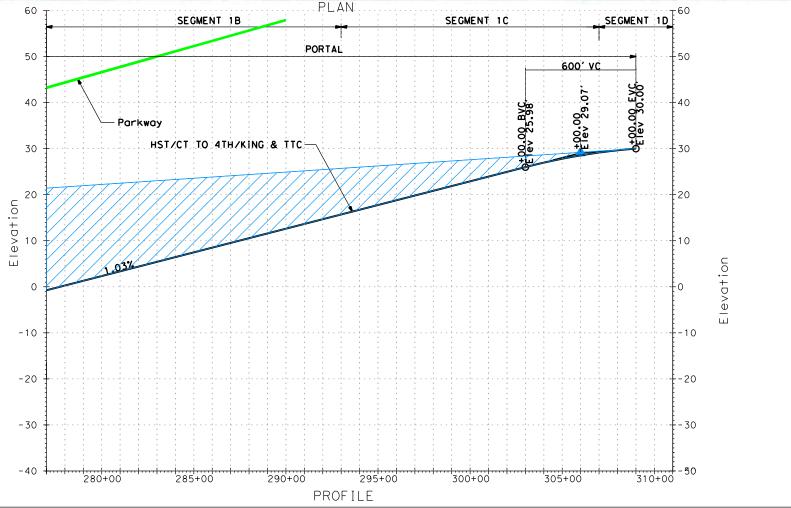






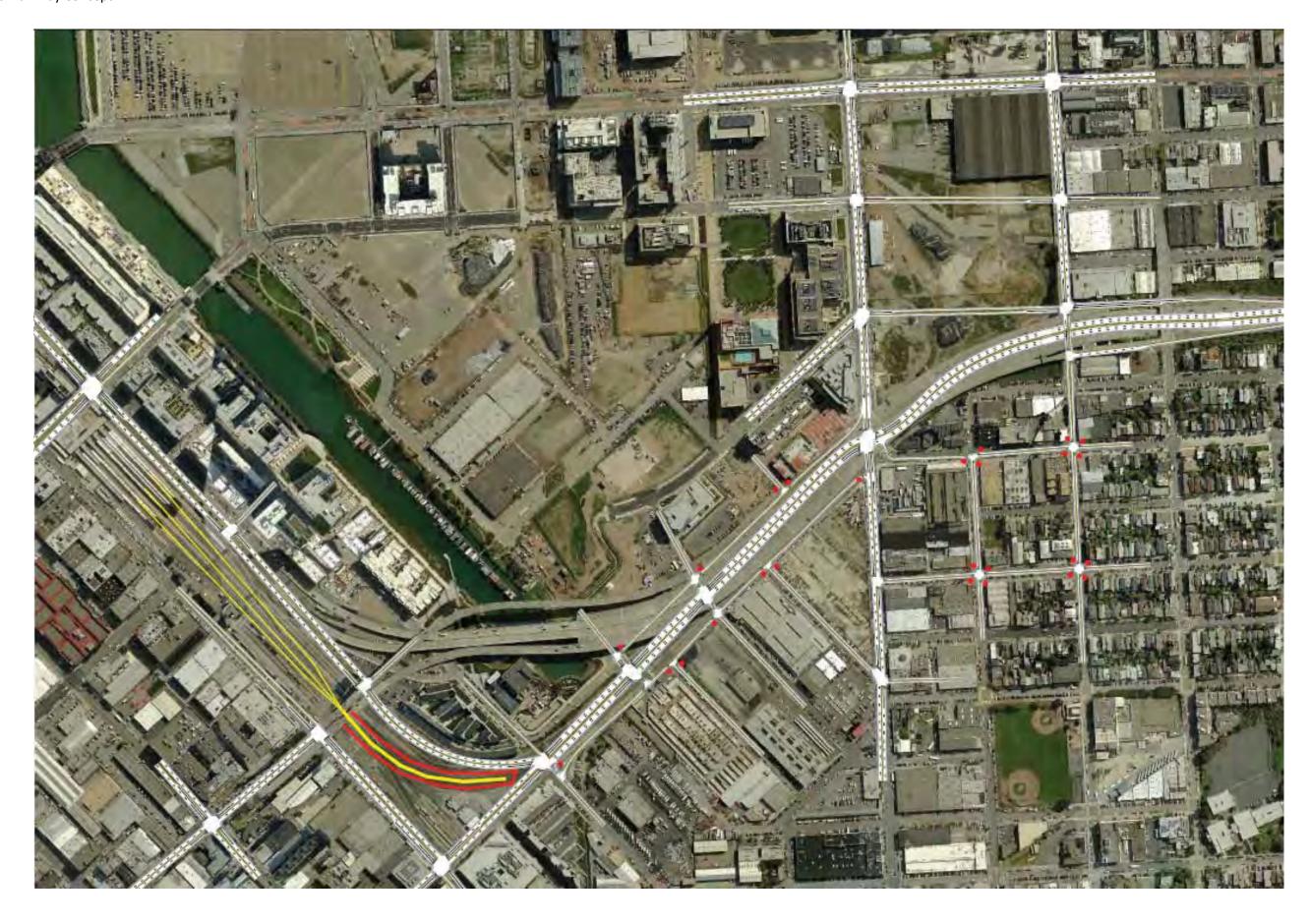


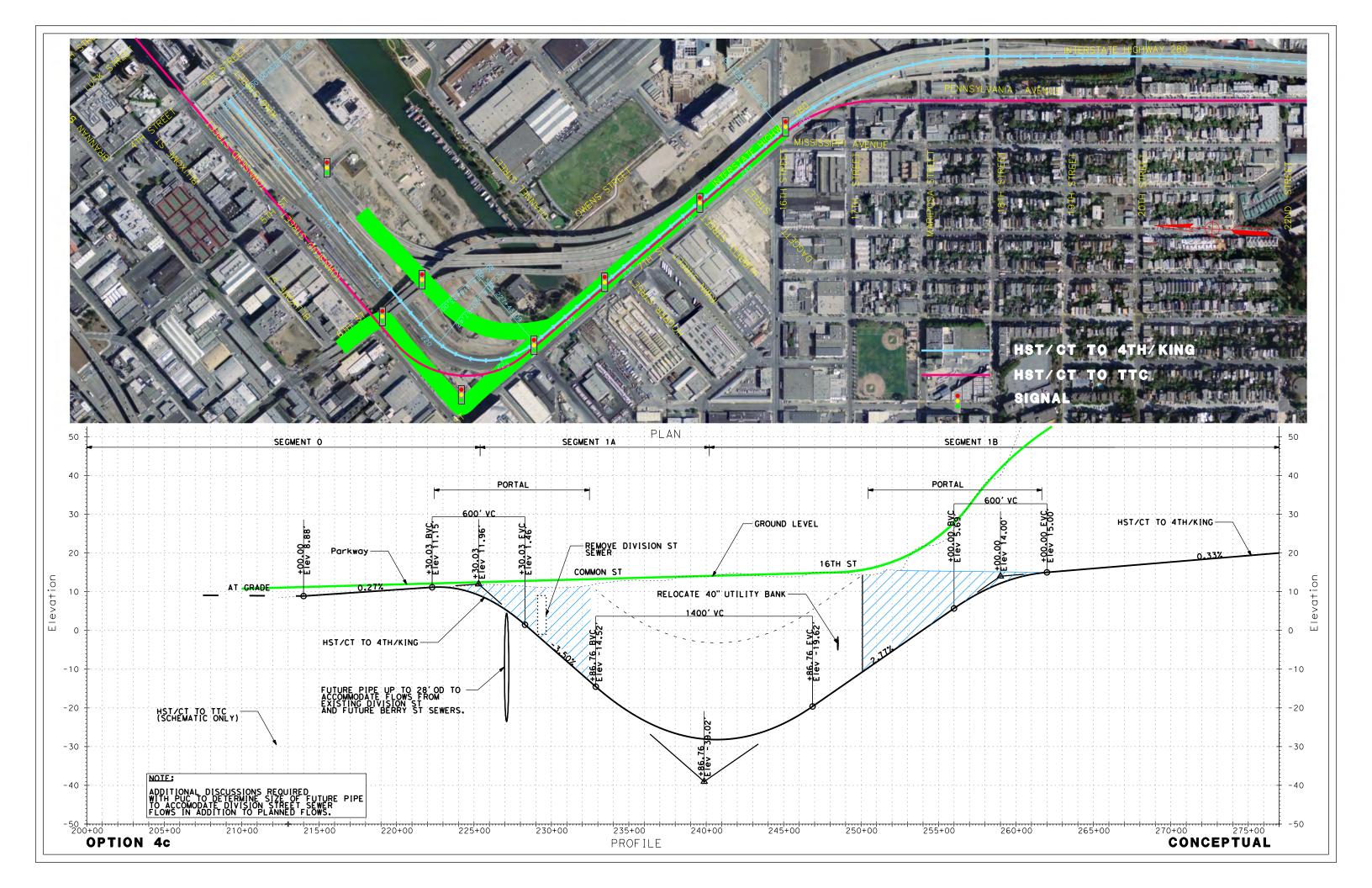




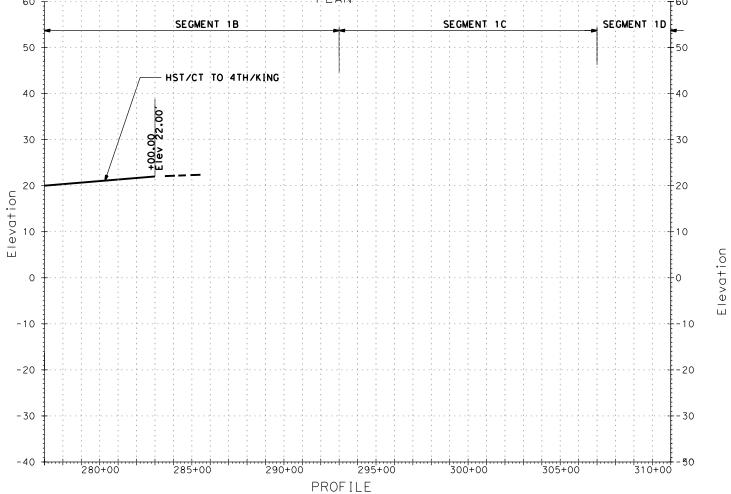
CONCEPTUAL

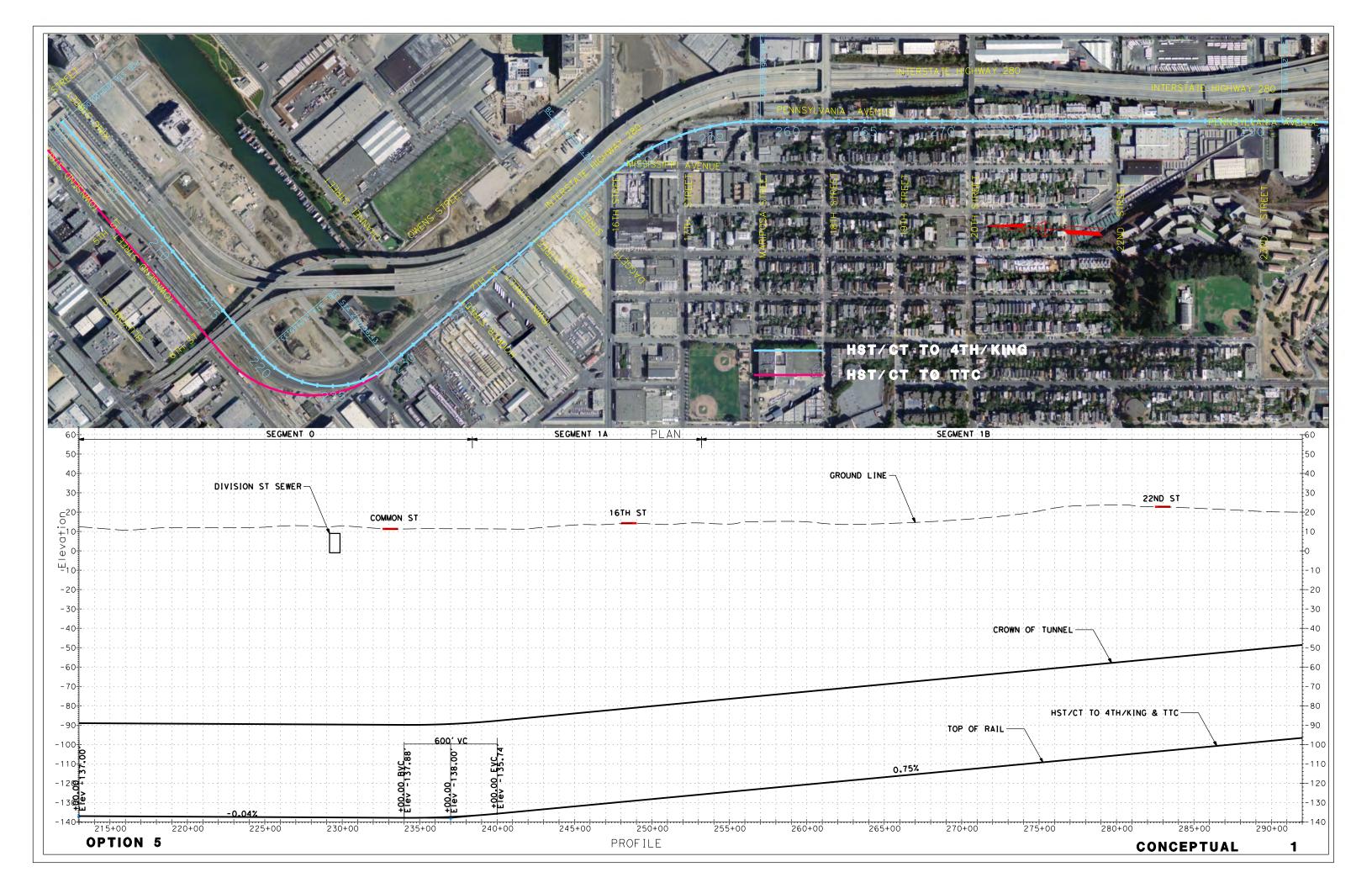
OPTION 4b

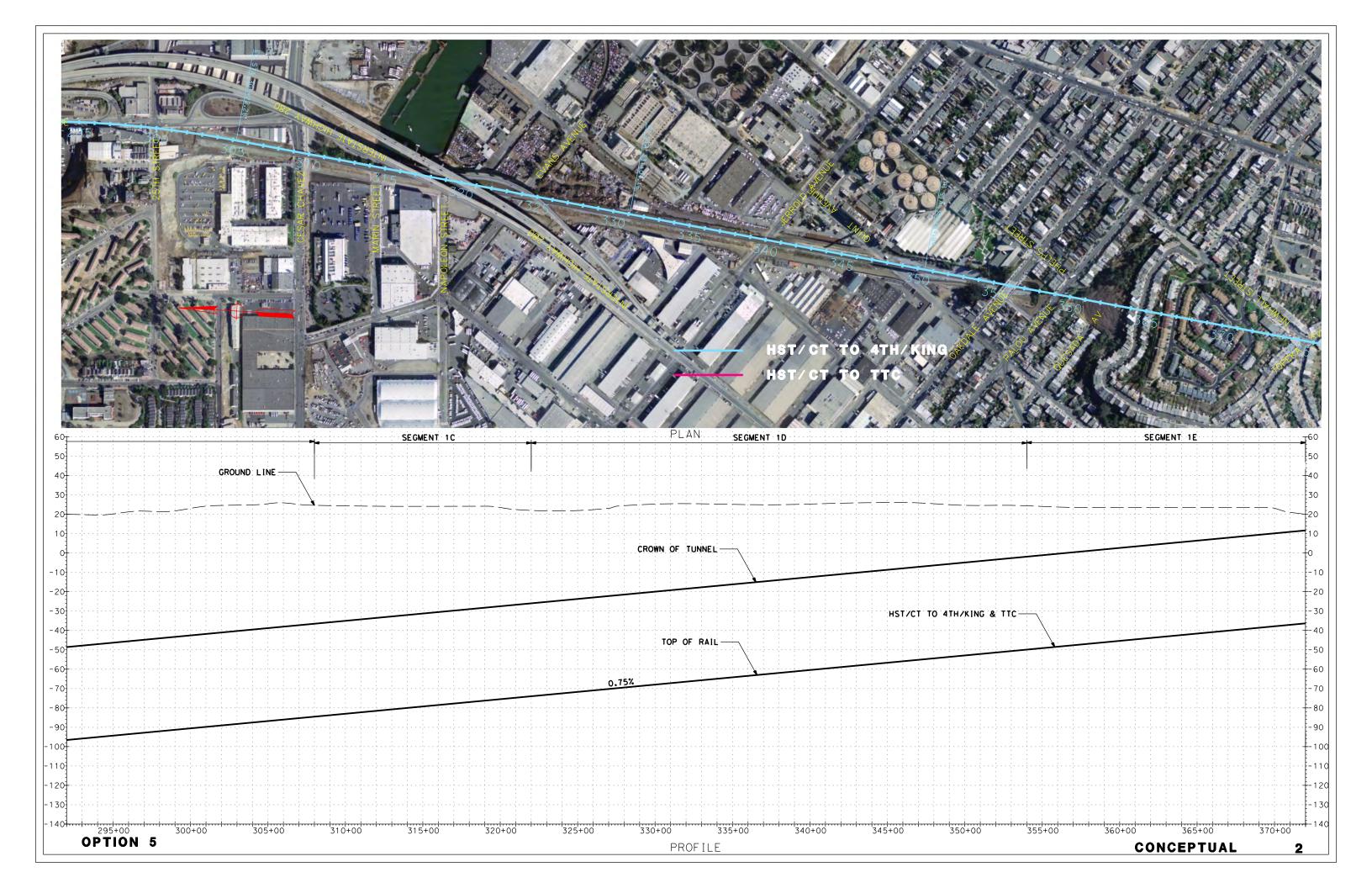


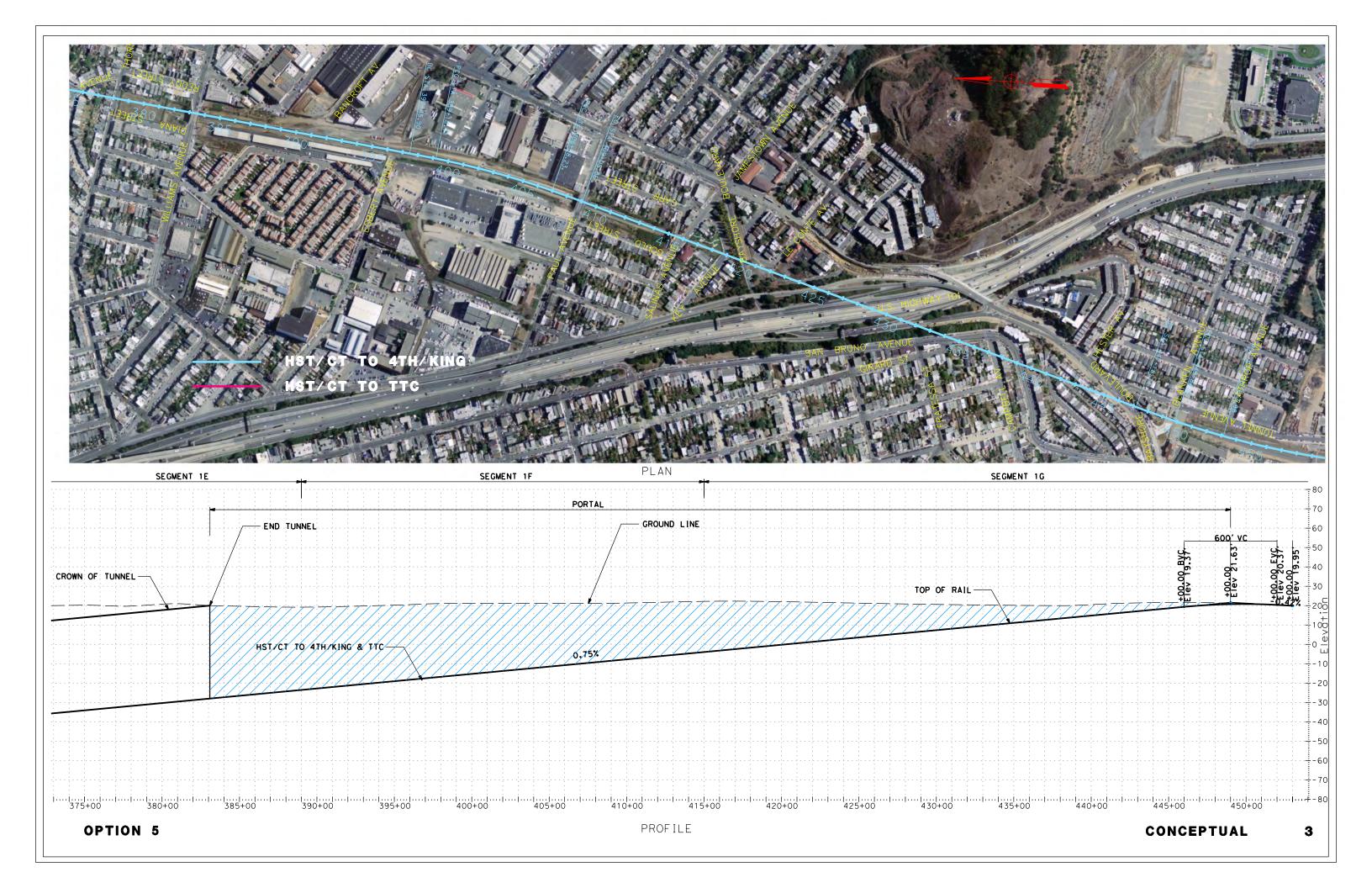






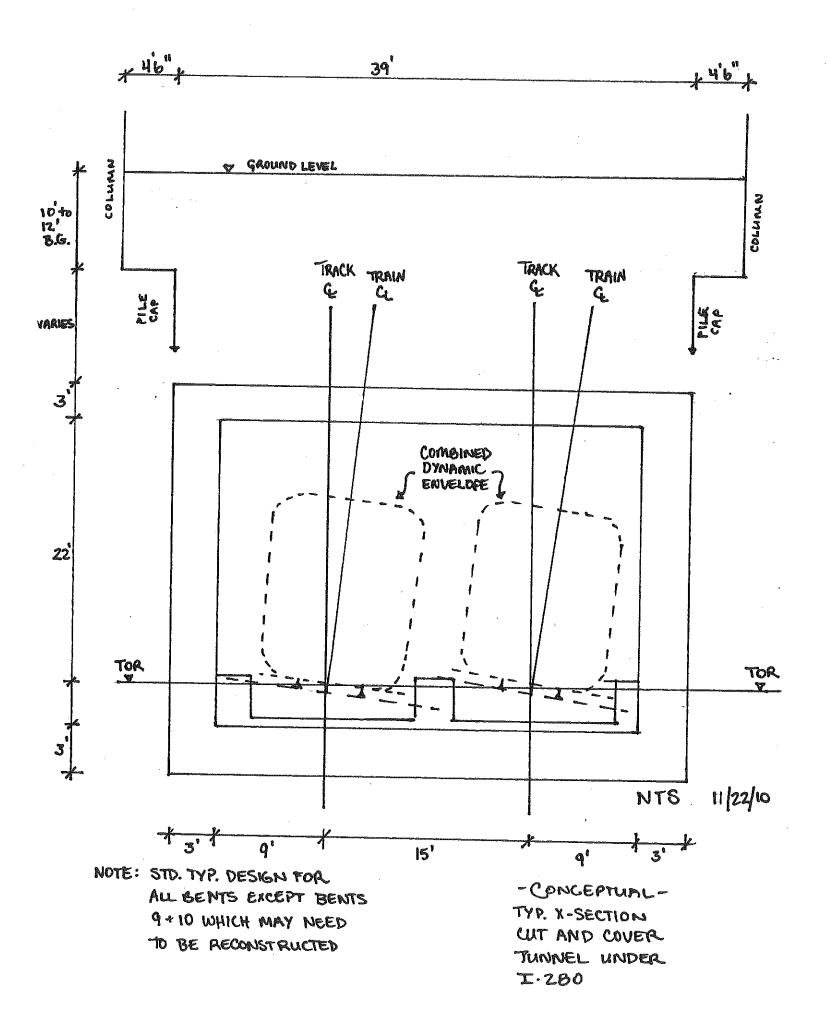


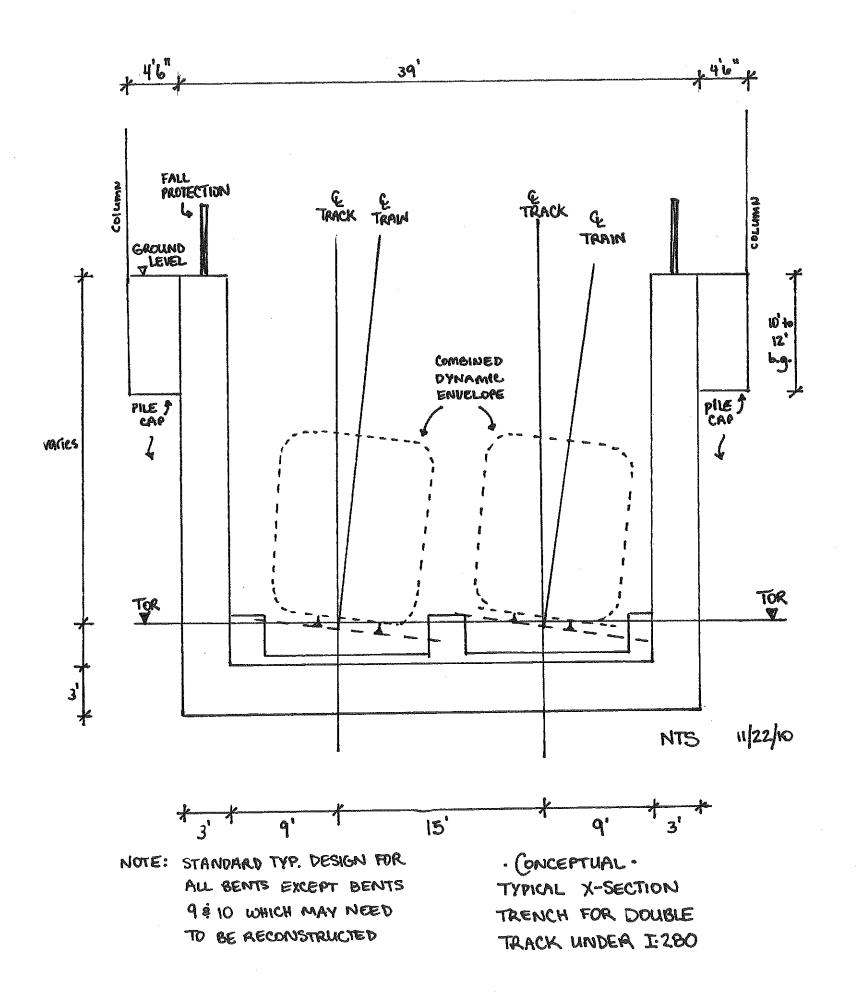


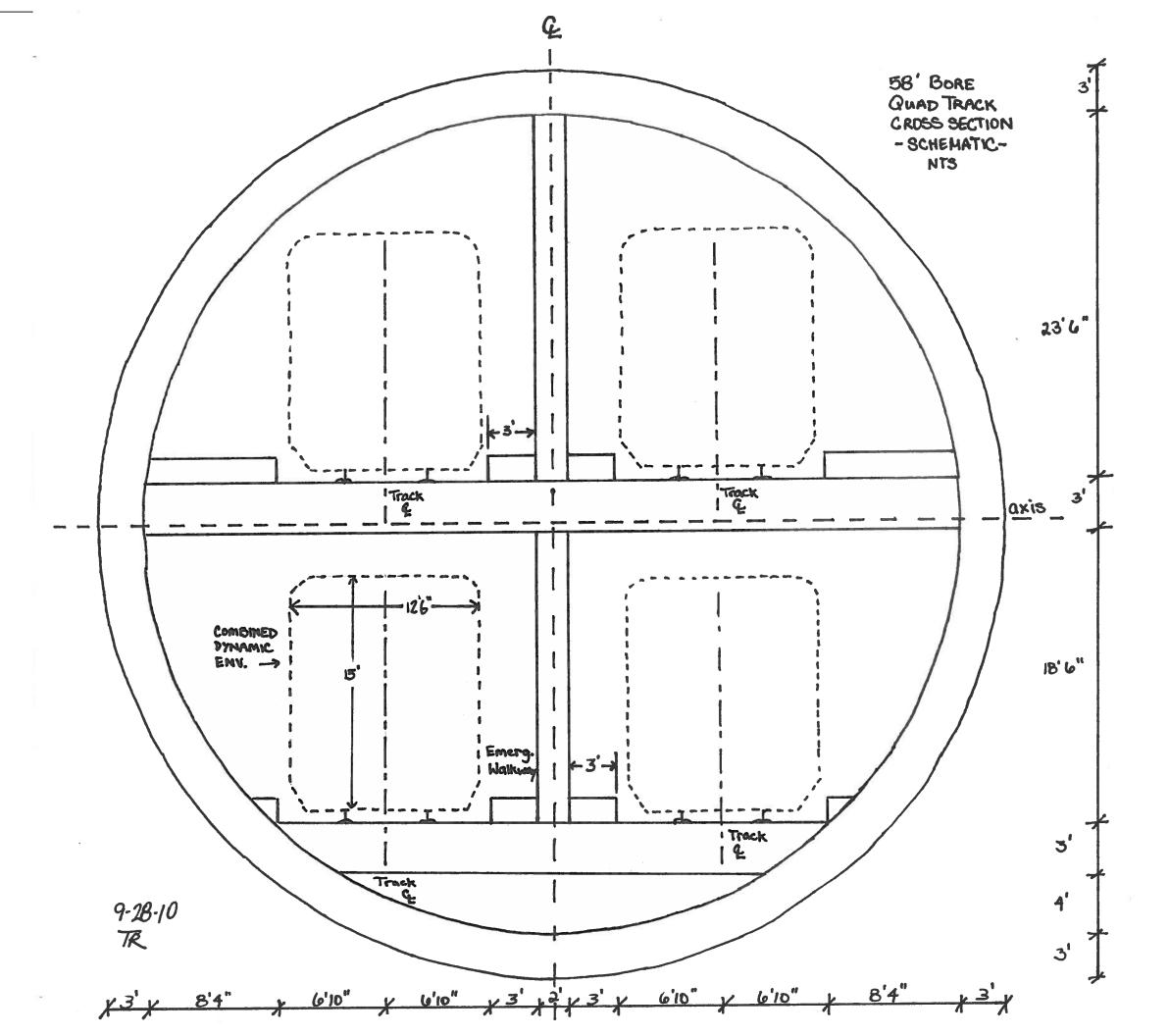


Appendix D: SFTWG Alternative Alignment Options Conceptual Cross-Sections

Source: SFTWG







Appendix E: Appendix L (Cost Estimates) of the CHSRA Supplemental Alternatives Analysis Document

Source: CHSRA Supplemental Alternatives Analysis Report

Appendix L. Conceptual Cost Estimates

Alternatives Analysis Cost Methodology and Assumptions

The construction costs estimates based on the conceptual design presented in this appendix are order-of magnitude cost comparisons of the different design options and do not represent total costs for the project. The conceptual cost estimates are based on the various vertical options shown in Appendix B and the unit prices from the 2009 Business Plan. The cost for ROW is identified qualitatively (high, medium, or low); estimated ROW needs and costs are being developed for options in the 15% engineering design effort.

Basis of Estimate

These estimates have been prepared based on the following:

- Unit costs from 2009 business plan (2009 dollars)
- Preliminary profiles shown on the 500-scale plans included as Appendix B
- Costs broken down by major Subsections 0-9, and then by sub-subsections as depicted on the 500-scale plans
- Costs have been developed for the following options:
 - Aerial Viaduct
 - o Berm (Embankment or MSE mechanically stabilized earth)
 - o At-Grade
 - Open Trench
 - o Covered Trench/Tunnel
 - Deep Tunnel
 - Hybrid
- · ROW costs identified qualitatively as Low, Medium or High
- System wide elements such as Traction Power, Overhead Contact System, Communications, Signaling assumed to be equal for all options
- Costs for reconfiguration of existing Caltrain stations included
- 4-track fully grade separated shared use system assumed
- Costs for HST stations at Millbrae and San Jose included
- Costs for 4th and King HST station not included
- Costs for potential Mid-Peninsula HST station not included
- Maintenance facility not included
- Temporary construction easements (TCE) not included
- Contingency of 25% is included

Definitions/Assumptions

- Aerial Viaduct Elevated structure on columns crossing over existing streets to provide grade separated
- Berm Earthen elevated berm with slopes conforming back to surrounding grade, or mechanically stabilized earth (MSE) walls. Grade separation accomplished by structures spanning the roadways.
- At-Grade Grade separations requiring streets to go either over or under tracks that remain at existing Caltrain grade. ROW impacts account for parcels affected by changes to the roadway profile approaching the grade separation.

- Open Trench Shallow open box bridged at street crossings and drainage channels or streams. These bridged areas would be approximately 10 feet deep in order to accommodate existing utilities.
- Covered Trench/Tunnel Shallow covered box generally constructed from the surface down. Fire and life safety systems required. Top of the box approximately 10 feet below existing street level to minimize impacts to existing underground utilities.
- Deep Tunnel Deep tunnel generally constructed by mining or tunnel boring machine (TBM). Large surface
 areas needed at the tunnel portals to facilitate construction. Fire and life safety systems required. No HST or
 Caltrain stations. Option only considered for 2 HST tracks, therefore to develop total cost must add cost to
 reconstruct Caltrain tracks to achieve the required grade separations. Deep tunnel unit cost is based on
 construction methodology; soil conditions will dictate actual types of construction.
- Hybrid Hybrid configurations consist of either the 2-track open trench over a 2-track covered box or a 2-track open trench over a deep tunnel. The 2-track open trench over a 2-track covered box is constructed from the surface down. Fire and life safety systems are required. Top of the open trench approximately 10 feet deep in order to accommodate existing utilities.

The use of a vertical option in any given sub-section must be coordinated with the adjacent subsection. Transitions between vertical 4-track solutions require approximately 3,000 feet of horizontal distance; transitions between vertical 2-track stacked solutions require approximately 5,000 feet of horizontal distance; the final selected solution must be one that can be "stitched" together without excessive vertical alignment changes. The cost tables are broken down into subsections for options that cover the predominant portion of the subsection. Costs of transitions between vertical options are included within major option types. It is assumed that 4 tracks will be utilized for the entire corridor; to develop total costs for "split" solutions where HST tracks are at one level and Caltrain tracks are at another level requires adding the costs of the options to total 4 tracks. There are notes to that effect in each of the design options where this is a possibility.

These conceptual-level costs are intended to allow a comparative analysis within each subsection between the numerous vertical options that continue to be studied; a more detailed estimate will be developed with the 15% engineering design.



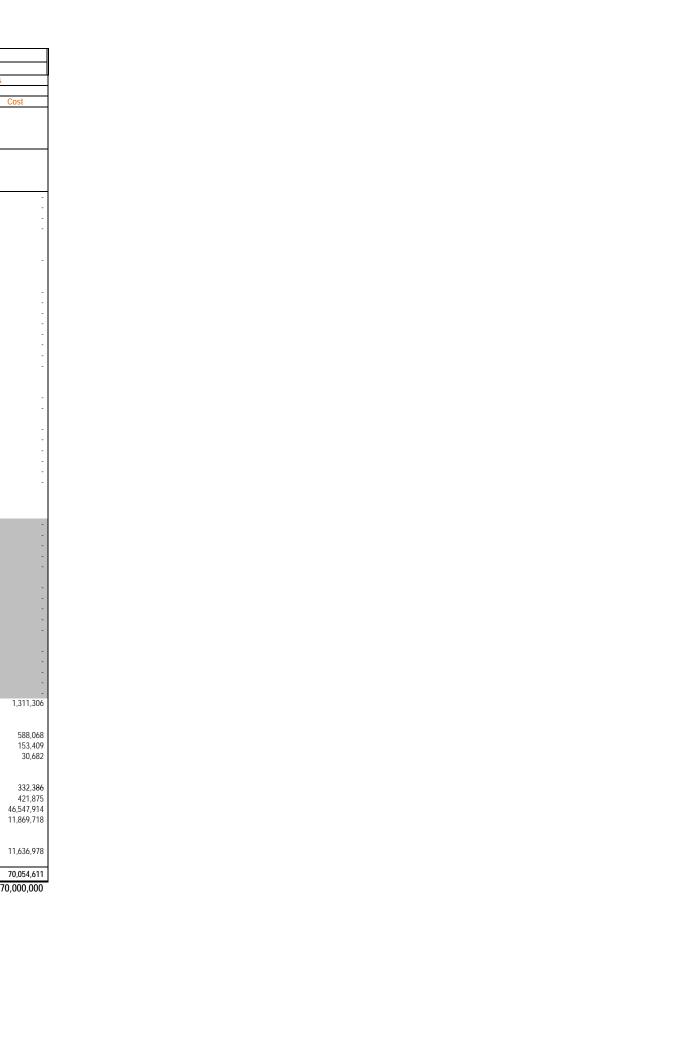
	0A (2.2 miles)	OB (2.2 miles)	OC (1.0 miles)	0D (2.3 miles)
Subsection 0	Covered Trench/ Tunnel	Covered Trench/Tunnel	At Grade	Covered Trench/ Tunnel
Capital Cost (in Millions) does not include ROW	\$3,000 (\$YOE) (Estimate provided by the TJPA, 2010)	\$3,000 (\$YOE) (Estimate provided by the TJPA, 2010)	\$200 (\$YOE)	\$3,000+ (\$YOE)
Acquisition Cost of Permanent ROW	Medium	Medium	Lowest	Highest
Notes:	1. Inclusive of train box and station (in year of expenditure \$) 2. Includes \$100M for reconstruction of 4th & King. 3. Assumed CHSRA contribution of \$1B from CHSRA 2009 Business Plan.	Assumed HST contribution of \$1B towards the total construction costs.	1. Based on MTC SF/Silicon Investment Strategy dated June 2009. 2. Assumed costs to be doubled that of the 2 platform option.	1. Inclusive of train box and station (in year of expenditure \$) 2. Includes \$100M for reconstruction of 4th & King. 3. \$3 billion cost based on TTC estimate for 2.2 mile tunnel and terminal.

	1A (0.3	3 miles)	1B & 1C((1.0 miles)	1D, 1E, 1F &	1G (3.5 miles)
Subsection 1	At Grade	Covered Trench/ Tunnel	At Grade	Covered Trench/ Tunnel	At Grade	Covered Trench/ Tunnel
Capital Cost (\$2009 in Millions) does not include ROW	\$44 (2 tracks)	\$70 (2 tracks)	\$21 (2 tracks)	* / / I / / trackel	\$ 459 (4 tracks) \$71 (2 tracks)	\$955 (2 tracks)
Acquisition Cost of Permanent ROW	Lowest	Medium	Lowest	Lowest	Highest	Lowest
Notes:	2 tracks - 1. Grade separations at Common St and 16th St; 2. ROW take considers the parcels impacted by new grade separations; 3. Two tracks on existing Caltrain alignment for approach to 4th/King station. Must be combined with 2 track covered trench/tunnel option.	2 tracks - 1. Two tracks on new alignment for approach to TTC; Must be combined with 2 track at grade option. 2. Alignment under 7th St.	2 tracks - 1. Two tracks on existing Caltrain alignment for approach to 4th/King station. <i>Must be combined with 2 track covered trench/tunnel option.</i>	2 tracks - 1. Drilled & blast tunneling method; 2. Two tracks on new alignment for approach to TTC. Must be combined with 2 track at grade option.	4 tracks - 1. Two tracks on existing Caltrain alignment for approach to 4th/King station. 2. Two tracks on new alignment for approach to TTC using combination of tunneling and aerial structures. 3. Caltrain Bayshore Station. 2 tracks - 1. Two tracks on existing Caltrain alignment for approach to 4th/King station. <i>Must be combined with 2 track covered trench/tunnel option.</i> 2. Caltrain Bayshore Station.	2 tracks - 1. Drilled & blast tunneling method; 2. Two tracks on new alignment for approach to TTC. Must be combined with 2 track at grade option.

Basic 2009 (Brd Quarter)	Miles	Cost \$
Subsection Details	ant.	Cost \$
Double Track Event (Mile) Start: 0 + 00 Double Event (Mile) Start: 0 + 00 Double Track Event (Mile) Start: 0 + 00 Double Event (Mile) Double Event (Mile	Miles	\$ - \$ - \$ 5
Double Track Trench (Mile)	Miles	\$ 1,335,273 \$ - \$ - \$ - \$ - \$ - \$ -
Double Track Trench (Mile) Start: 0 + 00 0.00 Miles Start: 0 + 00	Miles Miles Miles Miles Miles 0.00 \$ 0.00 \$ 0.28 \$ 0.00 \$	\$ 1,335,273 \$ - \$ - \$ - \$ - \$ - \$ -
Four Track Tunnel (Mile) Start: 0 + 00 0.00 Miles Start: 0 + 00 Start: 0 + 00 Start: 0 + 00 0.00 Miles Start: 0 + 00 Start: 0 +	Miles Miles Miles 0.00 \$ 0.00 \$ 0.28 \$ 0.00 \$ 0.00 \$ 0.0	\$ 1,335,273 \$ - \$ - \$ - \$ - \$ - \$ -
Four Track Trench (Mile) Start: 0 + 00 S	Miles Miles 0.00 \$ 0.00 \$ 0.28 \$ 0.00	\$ 1,335,273 \$ - \$ - \$ - \$ - \$ - \$ -
Double Track Section - Total Double Track Section - Total Double Track Section - On Structure Mile \$ 2,100,224 Double Track Section - On Structure Mile \$ 4,700,160 Double Track Section - In Tunnel or Subway Mile \$ 4,700,160 Double Track Section - In Trench Mile \$ 4,700,160 Double Track Section - In Trench Mile \$ 4,700,160 Double Track Section - In Trench Mile \$ 4,700,160 Double Track Section - In Trench Mile \$ 4,700,160 Double Track Section - Total Source Mile \$ 4,700,160 Double Track Section - On Structure Mile \$ 9,400,320 Double Track Section - In Tunnel or Subway Mile \$ 9,400,320 Double Track Section - In Tunnel or Subway Mile \$ 9,400,320 Double Track Section - In Tunnel or Subway Mile \$ 9,400,320 Double Track Section - In Tunnel or Subway Mile \$ 9,400,320 Double Track Section - In Tunnel or Subway Mile \$ 9,400,320 Double Track Section - In Tunnel or Subway Mile \$ 1,549,312 Double Track Section - In Tunnel or Subway Mile \$ 2,350,080 Double Track Section - In Trench Mile \$ 2,350,080 Double Track Section - In Trench Mile \$ 2,350,080 Double Track Section - In Track Section - In Trench Mile \$ 2,350,080 Double Track Section - In	0.00 \$ 0.00 \$ 0.28 \$ 0.00 \$ 0.00 \$ 0.00 \$ 0.00 \$ 0.00 \$ 0.00 \$ 0.00 \$ 0.00 \$ 0.00 \$ 0.00 \$ 0.00 \$ 0.00 \$	\$ 1,335,273 \$ - \$ - \$ - \$ - \$ - \$ -
1 Double Track Section - At Grade	0.00 \$ 0.28 \$ 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 \$ \$ 0.00 \$ \$ \$ 0.00 \$ \$ 0.00 \$ \$ 0.00 \$ \$ 0.00 \$ \$ 0.00 \$ \$ 0.00 \$ \$ 0.00 \$ \$ 0.00 \$ \$ 0.00 \$ \$ 0.00 \$ \$ 0.00 \$ \$ 0.00 \$ \$ 0.00 \$ \$ 0.00 \$ \$ \$ 0.00 \$ \$ 0.00 \$ \$ 0.00 \$ \$ 0.00 \$ \$ 0.00 \$ \$ 0.00 \$ \$ 0.00 \$ \$ 0.00 \$ \$ 0.00 \$ \$ 0.00 \$ \$ 0.00 \$ \$ 0.00 \$ \$ 0.00 \$ \$ 0.00 \$ \$ \$ 0.00 \$ \$ 0.00 \$ \$ 0.00 \$ \$ 0.00 \$ \$ 0.00 \$ \$ 0.00 \$ \$ 0.00 \$ \$ 0.00 \$ \$ 0.00 \$ \$ 0.00 \$ \$ 0.00 \$ \$ 0.00 \$ \$ 0.00 \$ \$ 0.00 \$ \$ \$ 0.00 \$ \$ 0.00 \$ \$ 0.00 \$ \$ 0.00 \$ \$ 0.00 \$ \$ 0.00 \$ \$ 0.00 \$ \$ 0.00 \$ \$ 0.00 \$ \$ 0.00 \$ \$ 0.00 \$ \$ 0.00 \$ \$ 0.00 \$ \$ 0.00 \$ \$ \$ 0.00 \$ \$ 0.00 \$ \$ 0.00 \$ \$ 0.00 \$ \$ 0.00 \$ \$ 0.00 \$ \$ 0.00 \$ \$ \$ 0.00 \$ \$ 0.00 \$ \$ 0.00 \$ \$ 0.00 \$ \$ 0.00 \$ \$ 0.00 \$ \$ 0.00 \$ \$ 0.00 \$ \$ 0.00 \$ \$ 0.00 \$ \$ 0.00 \$ \$ 0.00 \$ \$ 0.00 \$ \$ 0.00 \$ \$ \$ 0.00 \$ \$ \$ 0.00 \$ \$ 0.00 \$ \$ 0.00 \$ \$ 0.00 \$ \$ 0.00 \$ \$ 0.00 \$ \$ 0.00 \$ \$ \$ 0.00 \$ \$ 0.00 \$ \$ 0.00 \$ \$ 0.00 \$ \$ 0.00 \$ \$ 0.00 \$ \$ 0.00 \$ \$ 0.00 \$ \$ 0.00 \$ \$ 0.00 \$ \$ 0.00 \$ \$ 0.00 \$ \$ 0.00 \$ \$ 0.00 \$ \$ \$ 0.00 \$ \$ \$ 0.00 \$ \$ 0	\$ 1,335,273 \$ - \$ - \$ - \$ - \$ - \$ -
3 Double Track Section - In Tunnel or Subway Mile \$ 4,700,160 0.00 \$ -	0.28 \$ 0.00 \$ 0.	\$ 1,335,273 \$ - \$ - \$ - \$ - \$ - \$ -
A Double Track Section - In Trench	0.00 \$ 0.	\$
Four Track Section - Total	0.00 \$ 0 \$ 0.00 \$ 0.00 \$ 0 \$ 0 \$	\$ \$ \$
Four-track Section - At Grade	0 \$ 0.00	\$ - 5 - 5 - 5 - 5 - 5 - 5 - 5 - 7
Four-track Section - At Grade	0 \$ 0.00	\$ - 5 - 5 - 5 - 5 - 5 - 5 - 5 - 7
Four-track Section - At Grade	0 \$ 0.00	\$ - 5 - 5 - 5 - 5 - 5 - 5 - 5 - 7
Four-track Section - At Grade	0 \$ 0.00	\$ - 5 - 5 - 5 - 5 - 5 - 5 - 5 - 7
Four-track Section - At Grade	0 \$ 0.00	\$ - 5 - 5 - 5 - 5 - 5 - 5 - 5 - 7
Four-Track Section - On Structure	0 \$ 0.00	\$ - 5 - 5 - 5 - 5 - 5 - 5 - 5 - 7
Four-Track Section - In Trench Mile \$ 9,400,320 0.00 \$ -	0.00 \$ 0 \$ 0 \$ 0 \$ 0 \$	\$ - \$ - \$ -
Single Track - Total Mile \$ 1,549,312 0 \$ - 5 Single Track Section - At Grade Mile \$ 2,350,080 0 \$ - 6 Single Track Section - On structure Mile \$ 2,350,080 0 \$ - 7 Single Track Section - In Tunnel or Subway Mile \$ 2,350,080 0 \$ - 8 Single Track Section - In Trench Mile \$ 2,350,080 0 \$ - 9 Freight Double Track - At Grade Mile \$ 2,839,552 0 \$ - 10 Freight Single Track - At Grade Mile \$ 1,549,312 0 \$ -	0 \$ 0 \$ 0 \$	- 5 -
5 Single Track Section - At Grade Mile \$ 1,549,312 0 \$ - 6 Single Track Section - On structure Mile \$ 2,350,080 0 \$ - 7 Single Track Section - In Tunnel or Subway Mile \$ 2,350,080 0 \$ - 8 Single Track Section - In Trench Mile \$ 2,350,080 0 \$ - 9 Freight Double Track - At Grade Mile \$ 2,839,552 0 \$ - 10 Freight Single Track - At Grade Mile \$ 1,549,312 0 \$ -	0 \$ 0 \$ 0 \$	-
6 Single Track Section - On structure Mile Single Track Section - In Tunnel or Subway \$ 2,350,080 Single Track Section - In Tunnel or Subway 0 \$ - Single Track Section - In Tunnel or Subway 8 Single Track Section - In Trench Mile Single Track Section - In Trench 0 \$ - Single Track Section - In Tunnel or Subway 9 Freight Double Track - At Grade Mile Single Track - At Grade 0 \$ - Single Track Section - In Tunnel or Subway 10 Freight Single Track - At Grade Mile Single Track - At Grade 0 \$ - Single Track - At Grade	0 \$ 0 \$ 0 \$	-
8 Single Track Section - In Trench Mile \$ 2,350,080 0 \$ - 9 Freight Double Track - At Grade Mile \$ 2,839,552 0 \$ - 10 Freight Single Track - At Grade Mile \$ 1,549,312 0 \$ -	0 \$	
9 Freight Double Track - At Grade Mile \$ 2,839,552 0 \$ - 10 Freight Single Track - At Grade Mile \$ 1,549,312 0 \$ -		ξ .
10 Freight Single Track - At Grade Mile \$ 1,549,312 0 \$ -		ν -
	0 \$	
Farthwork Itoms	0 \$	
1 Site Preparation - Undeveloped Acre \$ 9,216 3.79 \$ 34,909	3.79 \$	\$ 34,909
	96800.00 \$	
3 Total Fill	38720.00 \$ 0.00 \$	
	58080.00 \$	
6 Landscape erosion Control Acre \$ 6,144 0.09 \$ 553 7 Security Fencing (Both sides of ROW) Mile \$ 144,384 0.00 \$ -	1.20 \$	
8 Special Drainage Facilities 5% Earthwork \$ 1,773	\$	
Structures, Tunnels, Walls		
1 Standard Structure (2 tracks) Mile \$ 34,972,672	0.00 \$	-
Standard Structure (4 tracks) Mile \$ 52,459,008 0.00 \$ -	0.00 \$	
2 High Structure Mile \$ 40,424,448 \$ - 3 Long Span Structure Mile \$ 61,919,232 \$ -	\$	· -
4 Waterway Crossing - Primary Mile \$ 85,342,208 \$ -	\$	-
5 Waterway Crossing - Secondary (Irrigation Canal) Mile \$ 92,049,408	0.00 \$	-
7 Twin Single Track TBM (<6 Miles) Mile \$ 106,637,312 \$ -	\$	-
8 Twin Single Track TBM w/3rd Tube (<6 Miles) Mile \$ 176,720,896 \$ - 9 Double Track Drill & Blast Mile \$ 146,887,680 0.00 \$ -	0.00 \$	· -
10 Double Track Mined (Soft Soil) Mile \$ 79,200,000 \$ -	\$	-
Double Track TBM (<6 Miles) Mile \$ 106,637,312 \$ -	\$	- \$ -
11 Seismic Chamber (Drill & Blast/Mined) ea \$ 126,205,952 \$ \$	\$	-
12 Crossovers ea \$ 442,368 \$ - 13 Cut & Cover Double Track Tunnel Mile \$ 131,246,080 0.00 \$ -	0.28 \$	37,285,818
14 Trench Long (2 tracks) (1000 + ft) Mile \$ 57,524,224 0.00 \$ -	0.00 \$	
Trench Long (4 tracks) (1000 + ft) Mile \$ 86,286,336		
15 Trench Short (2 tracks) (<1000 ft) Mile \$ 78,843,904	\$	-
Trench Short (4 tracks) (<1000 ft) Mile \$ 118,265,856	0.28 \$	3,366,109
17 Retaining Walls Mile \$ 8,613,888 0.00 \$ -	0.00 \$	-
18 Containment Walls Mile \$ 5,907,456 \$ -	\$	*
Four Track Drill & Blast Mile \$ 293,775,360 \$ -	\$	-
Four Track Mined (Soft Soil) Mile \$ 158,400,000	\$	5 - 5 -
Four Track TBM w/3rd Tube (>6 Miles) Mile \$ 353,441,792 \$ -	\$	-
Four Track Cut & Cover Tunnel Mile \$ 262,492,160 0.00 \$ - Double Deck with Double Track Cut and Cover Box Mile \$ 328,521,114	\$	-
Grade Separations 1 Roadway Crossing HSR - 4 Lane Roadway Under 2 Tracks (Urban) ea \$ 13,284,352 2 \$ 26,568,704	\$	
Roadway Crossing HSR - 4 Lane Roadway Under 4 Tracks (Urban) ea \$ 19,926,528 \$ -	\$	-
2 Roadway Crossing HSR - 2 Lane Roadway Under 4 Tracks (Suburban) ea \$ 2,759,680 0 \$ - 3 Roadway Crossing HSR - 2 Lane Roadway Under 2 Tracks (Undeveloped) ea \$ 2,029,568 \$ \$ -	\$	*
4 Roadway Crossing HSR - 4 Lane Roadway Over 4 Tracks (Urban) ea \$ 3,563,520 0 \$	0 \$	-
5 Roadway Crossing HSR - 4 Lane Roadway Over 2 Tracks (Suburban) ea \$ 3,593,216 \$ -	\$	

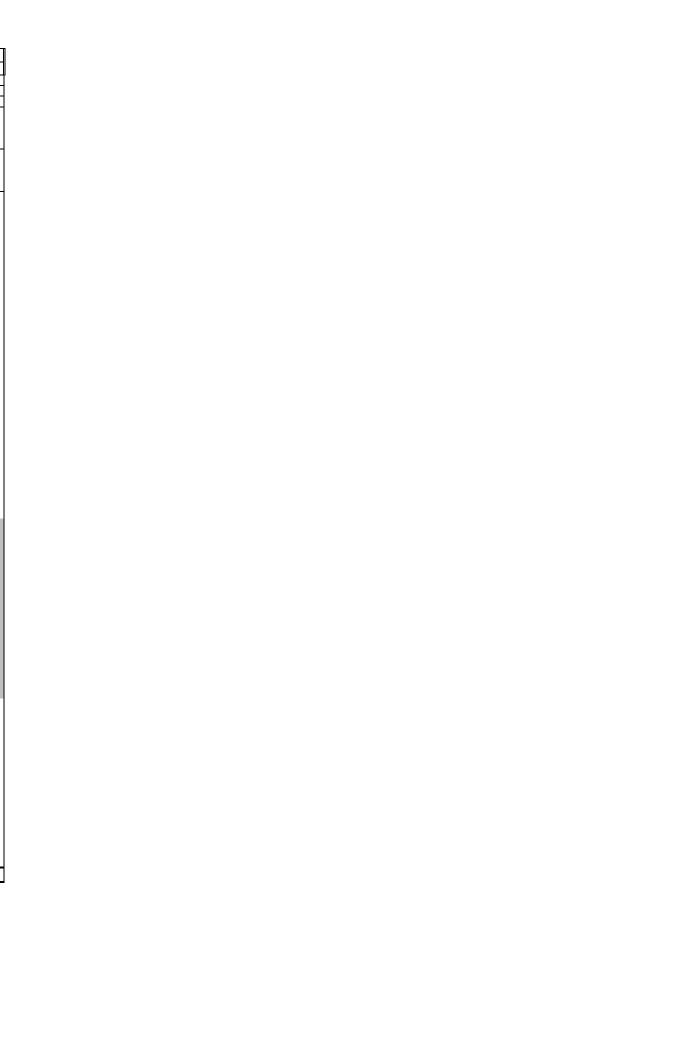
COST ELEMENTS	UNIT	UNIT PRICE		At-Grade	(2 tracks)			Covered Trench	Tunnel (2 tracks)		
Subsection 1		Base: 2009 (3rd	01 1 000 00	E 1 045 00	A			- L 045 00	4		
		Quarter)	Start: 200 + 00	End: 215 + 00	0.28	Miles	Start: 200 + 00	End: 215 + 00	0.28	Miles	
Subsection Details			01 1 000 00	E 1 04E 00	Quant.	Cost	01 1 0 00	- 1 o oo	Quant.	Cost	
Double Track At-Grade (Mile) Double Track Elevated (Mile)			Start: 200 + 00 Start: 0 + 00	End: 215 + 00	0.28 Miles 0.00 Miles		Start: 0 + 00 Start: 0 + 00	End: 0 + 00	0.00 Miles 0.00 Miles		
Double Track Tunnel (Mile)			Start: 0 + 00		0.00 Miles		Start: 200 + 00	End: 215 + 00	0.28 Miles		
Double Track Trench (Mile) Four Track Construction/Reconstruction At-Grade (Mile)			Start: 0 + 00 Start: 0 + 00	End: 0 + 00	0.00 Miles 0.00 Miles		Start: 0 + 00 Start: 0 + 00	End: 0 + 00	0.00 Miles 0.00 Miles		
Four Track Elevated (Mile)			Start: 0 + 00	Liid. 0 1 00	0.00 Miles		Start: 0 + 00		0.00 Miles		
Four Track Tunnel (Mile) Four Track Trench (Mile)			Start: 0 + 00 Start: 0 + 00		0.00 Miles 0.00 Miles		Start: 0 + 00 Start: 0 + 00	End: 0 + 00	0.00 Miles 0.00 Miles		
Roadway Crossing HSR - 2 Lane Roadway Over 4 Tracks (Urban)	ea	\$ 2,850,816	Start. 0 + 00		0.00 Miles	\$ -	Start. 0 + 00			\$	-
6 Roadway Crossing HSR - 2 Lane Roadway Over 2 Tracks (Undeveloped) 7 Street Bridging HSR Trench	ea ea	\$ 3,171,328 \$ 1,398,784				\$ - \$ -				\$ \$	-
8 Minor Crossing Closures	ea	\$ 87,040				\$ -				\$	-
Building Items											
1 Intermediate Passenger Stations	Each	\$ -				\$ -				\$	-
2 Terminal Passenger Stations	Each	\$ -				\$ -				\$	_
Caltrain Passenger Station - At-Grade	Each	\$15,000,000				\$ -				\$	-
Caltrain Passenger Station - On Structure Caltrain Passenger Station - In Tunnel or Subway	Each Each	\$15,000,000 \$15,000,000				\$ - \$ -				\$ \$	-
Caltrain Passenger Station - In Trench	Each	\$15,000,000				\$ -				\$	-
3 Maintenance Facility 4 Parking - Structures	Each	\$ 123,921,884				\$ - \$ -				\$ \$	-
5 Parking - At Grade	space space					\$ -				\$ \$	-
Rail & Utility Relocation											
1 Single Track Relocation (Temporary)	Mile	\$ 2,000,896				\$ -				\$	_
2 Single Track Relocation (Permanent)	Mile	\$ 2,000,896				\$ -				\$	-
3 Single Track Removal	Mile	\$ 130,048				\$ -				\$	_
4 Major Utility Relocations - Dense Urban	Mile	\$ 1,548,288				\$ -				\$	-
Major Utility Relocations - Urban Major Utility Relocations - Dense Suburban	Mile Mile	\$ 1,084,416 \$ 775,168				\$ - \$ -				\$ ¢	-
7 Major Utility Relocations - Suburban	Mile	\$ 464,896				\$ -				\$	-
8 Major Utility Relocations - Undeveloped	Mile	\$ 30,720				\$ -				\$	-
ROW (NOT INCLUDED)											
ROW required for each segment											
1 Dense Urban 2 Urban	Acre Acre	\$ 2,786,321 \$ 1,371,510				\$ - \$				\$ \$	-
3 Dense Suburban	Acre	\$ 908,134				\$ -				\$	-
4 Suburban	Acre	\$ 208,418 \$ 3,642				\$ -				\$	-
5 Undeveloped ROW required for Temp. Construction Easement	Acre	\$ 3,642				-				>	-
1 Dense Urban	Acre					\$ -				\$	-
2 Urban 3 Dense Suburban	Acre Acre					\$ - \$ -				\$ \$	-
4 Suburban	Acre					\$ -				\$	-
5 Undeveloped	Acre					-				\$	-
Right-of-Way Required for Stations, Maintenance & Parking Facilities 6 Dense Urban	Acre	\$ 2,786,321				\$ -				\$	-
7 Urban	Acre	\$ 1,371,510				\$ -				\$	-
8 Dense Suburban 9 Suburban	Acre Acre	\$ 908,134 \$ 208,418				\$ - \$ -				\$	-
10 Undeveloped	Acre	\$ 3,642				\$ -				\$	-
Environmental Mitigation = 3% Line Costs						\$ 816,078				\$ 1,311	,306
System Elements											
1 Signaling (ATC) 2 Communications (w/ Fiber Optic Backbone)	Mile Mile	\$ 2,070,000 \$ 540,000			0.28 0.28				0.28 0.28		,068
3 Wayside Protection System	Mile	\$ 108,000			0.28				0.28		,682
Electrification Items											
Electrification Items 1 Traction Power supply	Mile	\$ 1,170,000			0.28	\$ 332,386			0.28	\$ 332	,386
2 Traction Power Distribution	Mile	\$ 1,485,000			0.28	\$ 421,875			0.28	\$ 421	,875
Subtotal Program Implementation Costs (per screening)						\$ 29,545,092 \$ 7,533,998				\$ 46,547 \$ 11,869	
Program Implementation Costs						- ,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,				- 11,007	,,
Contingencies (per screening) (25%)						\$ 7,386,273				\$ 11,636	978
Somming (Lary)						÷ 1,000,213				Ψ 11,030,	,,,,
Subtotal						\$ 44,465,363				\$ 70,054	
Subtotal Rounded						\$ 44,000,000				\$ 70,000.0	~~~

Subtotal Rounded \$ 44,000,000 \$ 70,000,000



COST ELEMENTS	UNIT	UNIT PRICE		At-C	Grade		Tunnel (2 tracks - Mined)					
Subsection 1		Base: 2009	Obert 045		В	Maria -	Charl Off T		В			
		(3rd Quarter)	Start: 215 + 00	End: 255 + 00	0.76	Miles	Start: 215 + 00	End: 255 + 00	0.76 N	illes		
Subsection Details Double Track At-Grade (Mile)			Start: 215 + 00	End: 255 + 00	Quant. 0.76 Miles	Cost	Start: 0 + 00	End: 0 + 00	Quant. 0.00 Miles	Cost		
Double Track At-Grade (Mile)			Start: 0 + 00	E110: 255 + 00	0.76 Miles		Start: 0 + 00	E110: 0 + 00	0.00 Miles			
Double Track Tunnel (Mile)			Start: 0 + 00		0.00 Miles		Start: 215 + 00	End: 255 + 00	0.76 Miles			
Double Track Trench (Mile) Four Track Construction/Reconstruction At-Grade (Mile)			Start: 0 + 00 Start: 0 + 00	End: 0 + 00	0.00 Miles 0.00 Miles		Start: 0 + 00 Start: 0 + 00	End: 0 + 00	0.00 Miles 0.00 Miles			
Four Track Elevated (Mile)			Start: 0 + 00	End. 0 1 00	0.00 Miles		Start: 0 + 00		0.00 Miles			
Four Track Tunnel (Mile) Four Track Trench (Mile)			Start: 0 + 00 Start: 0 + 00		0.00 Miles 0.00 Miles		Start: 0 + 00 Start: 0 + 00	End: 0 + 00	0.00 Miles 0.00 Miles			
Double Track Section - Total			3tart. 0 + 00		0.00 Miles		3tart. 0 + 00		0.00 Miles			
1 Double Track Section - At Grade	Mile	\$ 2,100,224			0.76				0.00			
2 Double Track Section - On Structure 3 Double Track Section - In Tunnel or Subway	Mile Mile	\$ 4,700,160 \$ 4,700,160			0.00 0.00				0.00 ± 0.76 ±			
4 Double Track Section - In Trench	Mile	\$ 4,700,160			0.00				0.00			
Four Track Section - Total												
Four-track Section - At Grade Four-Track Section - On Structure	Mile Mile	\$ 4,200,448 \$ 9,400,320			0.00	\$ -			0.00			
Four-Track Section - In Tunnel or Subway	Mile	\$ 9,400,320			0	\$ -			0.00	-		
Four-Track Section - In Trench	Mile	\$ 9,400,320			0.00	\$ -			0.00	-		
Single Track - Total	1.											
5 Single Track Section - At Grade 6 Single Track Section - On structure	Mile Mile	\$ 1,549,312 \$ 2,350,080			0	\$ - \$			0.00			
7 Single Track Section - In Tunnel or Subway	Mile	\$ 2,350,080			0	\$ -			0.00	-		
8 Single Track Section - In Trench	Mile	\$ 2,350,080			0	\$ -			0.00	-		
9 Freight Double Track - At Grade 10 Freight Single Track - At Grade	Mile Mile	\$ 2,839,552 \$ 1,549,312			0	\$ - \$ -			0.00			
Earthwork Items		A 0.01/			10.10	A 02.001			10.10	02.001		
1 Site Preparation - Undeveloped 2 Total Cut	Acre CY	\$ 9,216 \$ 6			10.10 0.00				10.10 ± 652666.00 ±			
3 Total Fill	CY	\$ 6			261066.00	\$ 1,642,084			261066.00	1,642,084		
4 Borrow 5 Spoil	CY CY	\$ 13 \$ 13			261066.00 0.00				0.00 : 391600.00 :			
6 Landscape erosion Control	Acre	\$ 6,144			0.00				8.09			
7 Security Fencing (Both sides of ROW)	Mile	\$ 144,384			0.76	\$ 109,382			0.00			
8 Special Drainage Facilities	5% Ear	tnwork 				\$ 256,464			!	546,081		
Structures, Tunnels, Walls												
1 Standard Structure (2 tracks) Standard Structure (4 tracks)	Mile Mile	\$ 34,972,672 \$ 52,459,008			0.00 0.00				0.00			
2 High Structure	Mile	\$ 40,424,448			0.00	\$ -			0.00	-		
3 Long Span Structure	Mile	\$ 61,919,232				\$ -				-		
4 Waterway Crossing - Primary 5 Waterway Crossing - Secondary (Irrigation Canal)	Mile Mile	\$ 85,342,208 \$ 92,049,408			0.00	\$ - \$ -				- I		
6 Twin Single Track Drill&Blast (<6 Miles)	Mile	\$ 142,731,264				\$ -			0.76	108,129,745		
7 Twin Single Track TBM (<6 Miles) 8 Twin Single Track TBM w/3rd Tube (<6 Miles)	Mile Mile	\$ 106,637,312 \$ 176,720,896				\$ - \$ -				-		
9 Double Track Drill & Blast	Mile	\$ 146,887,680			0.00	\$ -				-		
10 Double Track Mined (Soft Soil) Double Track TBM (<6 Miles)	Mile Mile	\$ 79,200,000 \$ 106,637,312				-			[:	-		
Double Track TBM w/3rd Tube (>6 Miles)	Mile	\$ 106,637,312				\$ -						
11 Seismic Chamber (Drill & Blast/Mined)	ea	\$ 126,205,952				\$ -				-		
12 Crossovers 13 Cut & Cover Double Track Tunnel	ea Mile	\$ 442,368 \$ 131,246,080			0.00	\$ -			0.00			
14 Trench Long (2 tracks) (1000 + ft) Trench Long (4 tracks) (1000 + ft)	Mile Mile	\$ 57,524,224 \$ 86,286,336			0.00	\$ -				-		
15 Trench Short (2 tracks) (<1000 ft)	Mile	\$ 78,843,904				\$ -						
Trench Short (4 tracks) (<1000 ft)	Mile	\$ 118,265,856				·						
16 Mechanical & Electrical for Tunnels 17 Retaining Walls	Mile Mile	\$ 11,848,704 \$ 8,613,888			0.00	\$ -			0.76	8,976,291		
18 Containment Walls	Mile	\$ 5,907,456			0.00	\$ -				-		
19 Single Track Cut and Cover Subway	Mile	\$ 131,246,080				\$ -] [:	-		
Four Track Drill & Blast Four Track Mined (Soft Soil)	Mile Mile	\$ 293,775,360 \$ 158,400,000				\$ -]	-		
Four Track TBM (<6 Miles)	Mile	\$ 213,274,624				\$ -						
Four Track TBM w/3rd Tube (>6 Miles) Four Track Cut & Cover Tunnel	Mile Mile	\$ 353,441,792 \$ 262,492,160			0.00	\$ - \$ -						
Double Deck with Double Track Cut and Cover Box	Mile	\$ 328,521,114			0.00	-			ľ	-		
Grade Separations												
1 Roadway Crossing HSR - 4 Lane Roadway Under 2 Tracks (Urban)	ea	\$ 13,284,352				\$ -				-		
Roadway Crossing HSR - 4 Lane Roadway Under 4 Tracks (Urban) 2 Roadway Crossing HSR - 2 Lane Roadway Under 4 Tracks (Suburban)	ea ea	\$ 19,926,528 \$ 2,759,680				\$ -						
3 Roadway Crossing HSR - 2 Lane Roadway Under 2 Tracks (Undeveloped)	ea	\$ 2,029,568				\$ -						
4 Roadway Crossing HSR - 4 Lane Roadway Over 4 Tracks (Urban) 5 Roadway Crossing HSR - 4 Lane Roadway Over 2 Tracks (Suburban)	ea ea	\$ 3,563,520 \$ 3,593,216				\$ - \$ -						
Jinoaaway Grossing risk - 4 Lane Roaaway Over 2 Tracks (Suburban)	Ed	φ 3,373,216		i l		φ -		I	ı li	-		

COST ELEMENTS	UNIT	UNIT PRICE		Grade	Tunnel (2 tracks - Mined)						
Subsection 1		Base: 2009			В				В		
		(3rd Quarter)	Start: 215 + 00	End: 255 + 00	0.76 N	Miles	Start: 215 + 00	End: 255 + 00	0.76	Miles	
Subsection Details					Quant.	Cost			Quant.		Cost
Double Track At-Grade (Mile)			Start: 215 + 00	End: 255 + 00	0.76 Miles		Start: 0 + 00	End: 0 + 00	0.00 Miles		
Double Track Elevated (Mile)			Start: 0 + 00		0.00 Miles		Start: 0 + 00	E-4-255 - 00	0.00 Miles		
Double Track Tunnel (Mile) Double Track Trench (Mile)			Start: 0 + 00 Start: 0 + 00		0.00 Miles 0.00 Miles		Start: 215 + 00 Start: 0 + 00	End: 255 + 00	0.76 Miles 0.00 Miles		
Four Track Construction/Reconstruction At-Grade (Mile)			Start: 0 + 00	End: 0 + 00	0.00 Miles		Start: 0 + 00	End: 0 + 00	0.00 Miles		
Four Track Elevated (Mile)			Start: 0 + 00		0.00 Miles		Start: 0 + 00		0.00 Miles		
Four Track Tunnel (Mile)			Start: 0 + 00		0.00 Miles		Start: 0 + 00	End: 0 + 00	0.00 Miles		
Four Track Trench (Mile) Roadway Crossing HSR - 2 Lane Roadway Over 4 Tracks (Urban)	ea	\$ 2,850,816	Start: 0 + 00		0.00 Miles 0	¢ .	Start: 0 + 00		0.00 Miles	¢	_
6 Roadway Crossing HSR - 2 Lane Roadway Over 2 Tracks (Undeveloped)	ea	\$ 3,171,328				\$ -				\$	-
7 Street Bridging HSR Trench	ea	\$ 1,398,784				\$ -				\$	-
8 Minor Crossing Closures	ea	\$ 87,040				\$ -				\$	-
Building Items											
1 Intermediate Passenger Stations	Each	\$ -				\$ -				\$	-
, and the second											
	l									_	
2 Terminal Passenger Stations Caltrain Passenger Station - At-Grade	Each Each	\$15,000,000				\$ - \$ -				\$	-
Caltrain Passenger Station - At-Grade Caltrain Passenger Station - On Structure	Each	\$15,000,000				\$ -				\$	-
Caltrain Passenger Station - In Tunnel or Subway	Each	\$15,000,000				\$ -				\$	-
Caltrain Passenger Station - In Trench	Each	\$15,000,000				\$ -				\$	-
3 Maintenance Facility	Each	\$ 123,921,884				\$ -				\$	-
4 Parking - Structures 5 Parking - At Grade	space space	\$ -				\$ - \$ -				\$	-
S. G.	Space	-				•				,	-
Rail & Utility Relocation											
1 Single Track Relocation (Temporary)	Mile	\$ 2,000,896				-				\$	-
2 Single Track Relocation (Permanent)	Mile	\$ 2,000,896				\$ -				\$	-
3 Single Track Removal	Mile	\$ 130,048				\$ -				\$	-
4 Major Utility Relocations - Dense Urban	Mile	\$ 1,548,288				\$ -				\$	-
5 Major Utility Relocations - Urban	Mile	\$ 1,084,416				\$ -				\$	-
6 Major Utility Relocations - Dense Suburban 7 Major Utility Relocations - Suburban	Mile Mile	\$ 775,168 \$ 464,896				\$ - \$ -				\$	-
8 Major Utility Relocations - Suburban	Mile	\$ 404,696				\$ -				\$	-
o major oning resocutions of developed	IVIIIC	Ψ 30,720				*				•	
ROW (NOT INCLUDED)											
ROW required for each segment	١.					•					
1 Dense Urban 2 Urban	Acre Acre	\$ 2,786,321 \$ 1,371,510				\$ -				\$	-
3 Dense Suburban	Acre	\$ 908,134				\$ -				\$	
4 Suburban	Acre	\$ 208,418				\$ -				\$	-
5 Undeveloped	Acre	\$ 3,642				\$ -				\$	-
ROW required for Temp. Construction Easement 1 Dense Urban	Acre					¢				¢	
2 Urban	Acre					\$ -				\$	-
3 Dense Suburban	Acre					\$ -				\$	-
4 Suburban	Acre					\$ -				\$	-
5 Undeveloped Pight of Way Paguired for Stations, Maintenance & Parking Facilities	Acre					\$ -				\$	-
Right-of-Way Required for Stations, Maintenance & Parking Facilities 6 Dense Urban	Acre	\$ 2,786,321				\$ -				\$	
7 Urban	Acre	\$ 1,371,510				\$ -				\$	
8 Dense Suburban	Acre	\$ 908,134				\$ -				\$	-
9 Suburban	Acre	\$ 208,418				\$ -				\$	-
10 Undeveloped Environmental Mitigation = 3% Line Costs	Acre	\$ 3,642				\$ - \$ 209,305				\$	3,964,034
2 Still Grid Miligation - 370 Ellic Goods	1					~ ZU7,JUJ				,	5,707,034
System Elements											
1 Signaling (ATC)	Mile	\$ 2,070,000			0.76				0.76		1,568,182
Communications (w/ Fiber Optic Backbone) Wayside Protection System	Mile Mile	\$ 540,000 \$ 108,000			0.76 0.76				0.76 0.76		409,091 81,818
Sivrayside i rotection system	IVIIIE	φ 100,000			0.76	Ψ 01,018			0.76	,	01,010
Electrification Items											
1 Traction Power supply	Mile	\$ 1,170,000			0.76				0.76		886,364
2 Traction Power Distribution	Mile	\$ 1,485,000			0.76				0.76		1,125,000
Subtotal Program Implementation Costs (per screening)	1					\$ 11,256,580 \$ 2,870,428				\$ \$	140,168,958 35,743,084
Program Implementation Costs (per screening)	1					Ψ 2,010,420				,	30,773,004
										l.	
Contingencies (per screening) (25%)						\$ 2,814,145				\$	35,042,239
Cubtatal						ė 1/041 1T-					210 05 4 222
Subtotal						\$ 16,941,153					210,954,282
Subtotal (Rounded)						\$ 17,000,000				\$ 2	11,000,000



COST ELEMENTS	UNIT	UNIT PRICE		At-G	Grade		Tunnel (2 tracks - Mined)					
Subsection 1		Base: 2009	Olest ore		3	Maria -	Obert OFF		2			
		(3rd Quarter)	Start: 255 + 00	End: 267 + 00	0.23	Miles	Start: 255 + 00	End: 267 + 00	0.23 M	liles		
Subsection Details Double Track At-Grade (Mile)			Start: 255 + 00	End: 267 + 00	Quant. 0.23 Miles	Cost	Starte 0 + 00	End: 0 + 00	Quant. 0.00 Miles	Cost		
Double Track At-Grade (Mile)			Start: 0 + 00	E110: 207 + 00	0.23 Miles		Start: 0 + 00 Start: 0 + 00	E110: 0 + 00	0.00 Miles			
Double Track Tunnel (Mile)			Start: 0 + 00		0.00 Miles		Start: 255 + 00	End: 267 + 00	0.23 Miles			
Double Track Trench (Mile)			Start: 0 + 00		0.00 Miles		Start: 0 + 00		0.00 Miles			
Four Track Construction/Reconstruction At-Grade (Mile) Four Track Elevated (Mile)			Start: 0 + 00 Start: 0 + 00	End: 0 + 00	0.00 Miles 0.00 Miles		Start: 0 + 00 Start: 0 + 00	End: 0 + 00	0.00 Miles 0.00 Miles			
Four Track Tunnel (Mile)			Start: 0 + 00		0.00 Miles		Start: 0 + 00		0.00 Miles			
Four Track Trench (Mile)	1		Start: 0 + 00		0.00 Miles		Start: 0 + 00		0.00 Miles			
Double Track Section - Total 1 Double Track Section - At Grade	Mile	\$ 2,100,224			0.23	\$ 477,324			0.00	\$ -		
2 Double Track Section - On Structure	Mile	\$ 4,700,160			0.00				0.00			
3 Double Track Section - In Tunnel or Subway	Mile	\$ 4,700,160			0.00					\$ 1,068,218		
4 Double Track Section - In Trench	Mile	\$ 4,700,160			0.00	\$ -			0.00	\$ -		
Four Track Section - Total												
Four-track Section - At Grade Four-Track Section - On Structure	Mile Mile	\$ 4,200,448 \$ 9,400,320			0.00	\$ - \$ -			0.00	\$ - \$ -		
Four-Track Section - In Tunnel or Subway	Mile	\$ 9,400,320				\$ -			0.00			
Four-Track Section - In Trench	Mile	\$ 9,400,320			0.00	\$ -			0.00			
5 Single Track Section - At Grade	Mile	\$ 1,549,312			0	\$ -			0.00	\$ -		
6 Single Track Section - On structure	Mile	\$ 2,350,080				\$ -				\$ -		
7 Single Track Section - In Tunnel or Subway 8 Single Track Section - In Trench	Mile Mile	\$ 2,350,080 \$ 2,350,080				\$ - \$ -			0.00			
o Single Hack Section - in Helicit	IVIIIC	Ψ 2,330,000			Ü	V			0.00	•		
9 Freight Double Track - At Grade 10 Freight Single Track - At Grade	Mile Mile	\$ 2,839,552 \$ 1,549,312				\$ - \$ -			0.00			
Earthwork Items	A	¢ 0.21/			2.02	¢ 27.027			2.02	e 27.027		
1 Site Preparation - Undeveloped 2 Total Cut	Acre CY	\$ 9,216 \$ 6			3.03 0.00				3.03 84333.00			
3 Total Fill	CY	\$ 6			33733.00	\$ 212,178			33733.00	\$ 212,178		
4 Borrow	CY	\$ 13			33733.00				0.00			
5 Spoil 6 Landscape erosion Control	CY Acre	\$ 13 \$ 6,144			0.00 0.09				50600.00 1.05			
7 Security Fencing (Both sides of ROW)	Mile	\$ 144,384			0.23					\$ -		
8 Special Drainage Facilities	5% Ear	thwork				\$ 34,891			:	\$ 71,357		
Structures, Tunnels, Walls												
1 Standard Structure (2 tracks)	Mile	\$ 34,972,672			0.00	\$ -			0.00	\$ -		
Standard Structure (4 tracks)	Mile	\$ 52,459,008			0.00					\$ -		
2 High Structure	Mile	\$ 40,424,448				-				\$ -		
3 Long Span Structure 4 Waterway Crossing - Primary	Mile Mile	\$ 61,919,232 \$ 85,342,208				\$ -				\$ - \$ -		
5 Waterway Crossing - Secondary (Irrigation Canal)	Mile	\$ 92,049,408			0.00	*				\$ -		
6 Twin Single Track Drill&Blast (<6 Miles)	Mile	\$ 142,731,264				\$ -			0.23	\$ 32,438,924		
7 Twin Single Track TBM (<6 Miles) 8 Twin Single Track TBM w/3rd Tube (<6 Miles)	Mile Mile	\$ 106,637,312 \$ 176,720,896				\$ - \$ -				\$ - \$ -		
9 Double Track Drill & Blast	Mile	\$ 176,720,696			0.00	\$ -				\$ -		
10 Double Track Mined (Soft Soil)	Mile	\$ 79,200,000				\$ -			:	\$ -		
Double Track TBM (<6 Miles) Double Track TBM w/3rd Tube (>6 Miles)	Mile Mile	\$ 106,637,312 \$ 176,720,896				\$ -						
11 Seismic Chamber (Drill & Blast/Mined)	ea	\$ 176,720,896				\$ -				\$ -		
12 Crossovers	ea	\$ 442,368				\$ -				\$ -		
13 Cut & Cover Double Track Tunnel	Mile	\$ 131,246,080			0.00				0.00	\$ -		
14 Trench Long (2 tracks) (1000 + ft) Trench Long (4 tracks) (1000 + ft)	Mile Mile	\$ 57,524,224 \$ 86,286,336			0.00	-				-		
15 Trench Short (2 tracks) (<1000 ft) Trench Short (4 tracks) (<1000 ft)	Mile Mile	\$ 78,843,904 \$ 118,265,856				\$ -				\$ -		
16 Mechanical & Electrical for Tunnels	Mile	\$ 116,265,656				\$ -			0.23	\$ 2,692,887		
17 Retaining Walls	Mile	\$ 8,613,888			0.00				:	\$ -		
18 Containment Walls 19 Single Track Cut and Cover Subway	Mile Mile	\$ 5,907,456 \$ 131,246,080				\$ -				\$ - \$ -		
Four Track Drill & Blast	Mile	\$ 293,775,360				\$ -				\$ -		
Four Track Mined (Soft Soil)	Mile	\$ 158,400,000				\$ -						
Four Track TBM (<6 Miles)	Mile Mile	\$ 213,274,624				\$ - \$ -						
Four Track TBM w/3rd Tube (>6 Miles) Four Track Cut & Cover Tunnel	Mile	\$ 353,441,792 \$ 262,492,160			0.00					\$ -		
Double Deck with Double Track Cut and Cover Box	Mile	\$ 328,521,114			5.00					•		
Crada Sanarations												
Grade Separations 1 Roadway Crossing HSR - 4 Lane Roadway Under 2 Tracks (Urban)	ea	\$ 13,284,352				\$ -].	\$ -		
Roadway Crossing HSR - 4 Lane Roadway Under 4 Tracks (Urban)	ea	\$ 19,926,528				\$ -				\$ -		
2 Roadway Crossing HSR - 2 Lane Roadway Under 4 Tracks (Suburban)	ea	\$ 2,759,680				\$ -				\$ -		
3 Roadway Crossing HSR - 2 Lane Roadway Under 2 Tracks (Undeveloped) 4 Roadway Crossing HSR - 4 Lane Roadway Over 4 Tracks (Urban)	ea ea	\$ 2,029,568 \$ 3,563,520			0	\$ - \$ -				\$ - \$ -		
5 Roadway Crossing HSR - 4 Lane Roadway Over 2 Tracks (Orban)	ea	\$ 3,563,520				\$ -				\$ -		
	, 50	1 - 0,0,0,210	i	ı			ı	į		•		

COST ELEMENTS	UNIT	UNIT PRICE		At-C	Grade			Tunnel (2 tra	acks - Mined)		
Subsection 1		Base: 2009	Ctant OFF . OO		C	Miles	Chart OFF 100		0.22	Miles	
		(3rd Quarter)	Start: 255 + 00	End: 267 + 00	0.23 [VIIIes	Start: 255 + 00	End: 267 + 00	0.23	Willes	
Subsection Details			01 1 055 00	E 1 0/7 00	Quant.	Cost	0	- Lo 00	Quant.		Cost
Double Track At-Grade (Mile) Double Track Elevated (Mile)			Start: 255 + 00 Start: 0 + 00	End: 267 + 00	0.23 Miles 0.00 Miles		Start: 0 + 00 Start: 0 + 00	End: 0 + 00	0.00 Miles 0.00 Miles		
Double Track Tunnel (Mile)			Start: 0 + 00		0.00 Miles		Start: 255 + 00	End: 267 + 00	0.23 Miles		
Double Track Trench (Mile) Four Track Construction/Reconstruction At Crade (Mile)			Start: 0 + 00	End. 0 . 00	0.00 Miles		Start: 0 + 00	End: 0 : 00	0.00 Miles		
Four Track Construction/Reconstruction At-Grade (Mile) Four Track Elevated (Mile)			Start: 0 + 00 Start: 0 + 00	End: 0 + 00	0.00 Miles 0.00 Miles		Start: 0 + 00 Start: 0 + 00	End: 0 + 00	0.00 Miles 0.00 Miles		
Four Track Tunnel (Mile)			Start: 0 + 00		0.00 Miles		Start: 0 + 00		0.00 Miles		
Four Track Trench (Mile) Roadway Crossing HSR - 2 Lane Roadway Over 4 Tracks (Urban)	00	\$ 2,850,816	Start: 0 + 00		0.00 Miles 0	¢	Start: 0 + 00		0.00 Miles	\$	
6 Roadway Crossing HSR - 2 Lane Roadway Over 2 Tracks (Undeveloped)	ea ea	\$ 2,850,816 \$ 3,171,328			U	\$ -				\$	-
7 Street Bridging HSR Trench	ea	\$ 1,398,784				\$ -				\$	-
8 Minor Crossing Closures	ea	\$ 87,040				\$ -				\$	-
Building Items											
1 Intermediate Passenger Stations	Each	\$ -				\$ -				\$	-
2 Terminal Passenger Stations	Each	\$ -				\$ -				\$	-
Caltrain Passenger Station - At-Grade	Each	\$15,000,000				\$ -				\$	-
Caltrain Passenger Station - On Structure	Each	\$15,000,000				\$ -				\$ \$	-
Caltrain Passenger Station - In Tunnel or Subway Caltrain Passenger Station - In Trench	Each Each	\$15,000,000 \$15,000,000				\$ - \$ -				\$	-
3 Maintenance Facility	Each	\$ 123,921,884				\$ -				\$	-
4 Parking - Structures	space	\$ -				\$ -				\$	-
5 Parking - At Grade	space	\$ -				\$ -				\$	-
Rail & Utility Relocation											
1 Single Track Relocation (Temporary)	Mile	\$ 2,000,896				\$ -				\$	-
2 Single Track Relocation (Permanent)	Mile	\$ 2,000,896				\$ -				\$	-
3 Single Track Removal	Mile	\$ 130,048				\$ -				\$	-
4 Major Utility Relocations - Dense Urban	Mile	\$ 1,548,288				\$ -				\$	-
5 Major Utility Relocations - Urban	Mile	\$ 1,084,416				\$ -				\$	-
Major Utility Relocations - Dense Suburban Major Utility Relocations - Suburban	Mile Mile	\$ 775,168 \$ 464,896				\$ - \$ -				\$	-
8 Major Utility Relocations - Undeveloped	Mile	\$ 30,720				\$ -				\$	-
ROW (NOT INCLUDED) ROW required for each segment											
1 Dense Urban	Acre	\$ 2,786,321				\$ -				\$	-
2 Urban	Acre	\$ 1,371,510				\$ -				\$	-
3 Dense Suburban 4 Suburban	Acre	\$ 908,134 \$ 208,418				\$ -				\$	-
5 Undeveloped	Acre Acre	\$ 208,418 \$ 3,642				\$ -				\$	-
ROW required for Temp. Construction Easement	71010	\$ 0,012				Ť				Ť	
1 Dense Urban	Acre					\$ -				\$	-
2 Urban 3 Dense Suburban	Acre Acre					\$ -				\$	
4 Suburban	Acre					\$ -				\$	-
5 Undeveloped	Acre					\$ -				\$	-
Right-of-Way Required for Stations, Maintenance & Parking Facilities 6 Dense Urban	Acre	\$ 2,786,321				¢				¢	
7 Urban	Acre	\$ 2,766,321				\$ -				\$	
8 Dense Suburban	Acre	\$ 908,134				\$ -				\$	
9 Suburban 10 Undeveloped	Acre Acre	\$ 208,418 \$ 3,642				\$ -				\$ \$	-
Environmental Mitigation = 3% Line Costs	Aue	φ 3,042				\$ - \$ 36,301				\$	1,130,956
System Elements 1 Signaling (ATC)	Mile	\$ 2,070,000			0.23	\$ 470,455			0.23	¢	470,455
2 Communications (w/ Fiber Optic Backbone)	Mile	\$ 2,070,000			0.23				0.23		122,727
3 Wayside Protection System	Mile	\$ 108,000			0.23				0.23		24,545
Electrification Items											
1 Traction Power supply	Mile	\$ 1,170,000			0.23	\$ 265,909			0.23	\$	265,909
2 Traction Power Distribution	Mile	\$ 1,485,000			0.23	\$ 337,500			0.23	\$	337,500
Subtotal						\$ 2,467,481					40,050,624
Program Implementation Costs (per screening) Program Implementation Costs						\$ 629,208				\$	10,212,909
Contingencies (per screening) (25%)						\$ 616,870				\$	10,012,656
Subtotal						¢ 2712 EFA				¢	40 27 <i>6</i> 100
Subtotal Subtotal (Rounded)						\$ 3,713,559 \$ 4,000,000					60,276,189

Subtotal (Rounded) \$ 4,000,000 \$ 60,000,000

t			
-	<u>·</u>		
-			
-			
-			
-			
-	•		
-	•		
-			
-			
-			
-			
-			
-			
-			
-			
-			
-			
- 80,956	0,956		
70,455 22,727 24,545	0,455 22,777		
24,545	4,545		
55,909 37,500 50,624 12,909	5,909 7,500		
12,909	U,624 2,909		
2,656			
76,189	6,189		

COST ELEMENTS	UNIT UNIT F		At-Grade	(2 Tracks)			At-Grad	e (4 Tracks)			Tunnel (2 tr	acks - Mined)	
Subsection 1	Base: (3rd Ou			D				D				D	
			End: 315 + 00	0.91 M	iles	Start: 267 + 00	End: 315 + 00	0.91 Mi	les	Start: 267 + 00	End: 315 + 00	0.91 Mile:	S
Subsection Details Double Track At-Grade (Mile) Double Track Elevated (Mile) Double Track Trench (Mile) Double Track Trench (Mile) Four Track Construction/Reconstruction At-Grade (Mile) Four Track Tunnel (Mile) Four Track Tunnel (Mile) Four Track Trench (Mile) Double Track Section - Total		Start: 267 + 00 Start: 0 + 00	End: 315 + 00 End: 0 + 00	Ouant. 0.91 Miles 0.00 Miles	Cost	Start: 267 + 00 Start: 267 + 00 Start: 0 + 00	End: 315 + 00 End: 315 + 00 End: 0 + 00 End: 0 + 00	Quant. 0.91 Miles 0.91 Miles 0.00 Miles	Cost	Start: 0 + 00 Start: 0 + 00 Start: 267 + 00 Start: 0 + 00	End: 315 + 00 End: 0 + 00	Quant. 0.00 Miles 0.00 Miles 0.91 Miles 0.00 Miles 0.00 Miles 0.00 Miles 0.00 Miles 0.00 Miles 0.00 Miles	Cost
1 Double Track Section - At Grade 2 Double Track Section - On Structure 3 Double Track Section - In Tunnel or Subway 4 Double Track Section - In Trench				0.91 \$ 0.00 \$ 0.00 \$ 0.00 \$; - ; -			0.91 \$ 0.91 \$ 0.00 \$ 0.00 \$	1,909,295 4,272,873 - -			0.00 \$ 0.00 \$ 0.91 \$ 0.00 \$	4,272,873 -
Four Track Section - Total Four-track Section - At Grade Four-Track Section - On Structure Four-Track Section - In Tunnel or Subway Four-Track Section - In Trench	Mile \$ 9,4	0,448 0,320 0,320 0,320		0.00 \$ 0 \$ 0 \$	- -			0.00 \$ 0.00 \$ 0 \$	- - - -			0.00 S 0 S 0 S	
Single Track - Total 5 Single Track Section - At Grade 6 Single Track Section - On structure 7 Single Track Section - In Tunnel or Subway 8 Single Track Section - In Trench				0 \$ 0 \$ 0 \$ 0 \$	- -			0 \$ 0 \$ 0 \$ 0 \$	- - -			0 \$ 0 \$ 0 \$ 0 \$	- - - -
9 Freight Double Track - At Grade 10 Freight Single Track - At Grade		9,552 9,312		0 \$				0 0 \$	-			0 0 \$	-
Earthwork Items 1 Site Preparation - Undeveloped 2 Total Cut 3 Total Fill 4 Borrow 5 Spoil 6 Landscape erosion Control 7 Security Fencing (Both sides of ROW) 8 Special Drainage Facilities	Acre	9,216 6 6 13 13 6,144 4,384		12.12 \$ 0.00 \$ 0.00 \$ 0.00 \$ 0.00 \$ 0.00 \$ 0.85 \$ 0.00 \$	5 - 5 - 5 5,222			12.12 \$ 0.00 \$ 0.00 \$ 0.00 \$ 0.00 \$ 0.00 \$ 0.85 \$ 0.00 \$	111,709 - - - - 5,222 - 5,847			0.00 \$ 916667.00 \$ 366667.00 \$ 0.00 \$ 550000.00 \$ 0.85 \$	5,913,602 2,306,306 - 6,918,912 - 122,726 763,077
Structures, Tunnels, Walls 1 Standard Structure (2 tracks) Standard Structure (4 tracks) 2 High Structure 3 Long Span Structure 4 Waterway Crossing - Primary 5 Waterway Crossing - Secondary (Irrigation Canal) 6 Twin Single Track Drill&Blast (-6 Miles)	Mile \$ 34,9 Mile \$ 52,4 Mile \$ 40,4 Mile \$ 61,9 Mile \$ 85,3 Mile \$ 92,0 Mile \$ 142,7	9,008 4,448 9,232 2,208 9,408		0.00 \$ 0.00 \$ \$ \$	- - - - -			0.91 \$ 0.00 \$ \$ \$ \$	31,793,338 - - - - -			0.00 \$ 0.00 \$ \$ \$ \$ \$	- - - - - 129,755,695
7 Twin Single Track TBM (<6 Miles) 8 Twin Single Track TBM w3rd Tube (<6 Miles) 9 Double Track TBM w3rd Tube (<6 Miles) 10 Double Track Mined (Soft Soil) Double Track TBM (<6 Miles) Double Track TBM w3rd Tube (>6 Miles) 11 Seismic Chamber (Drill & BlastMined)	Mile \$ 106,6 Mile \$ 106,6 Mile \$ 146,8 Mile \$ 146,8 Mile \$ 106,6 Mile \$ 106,6 Mile \$ 176,7 ea \$ 126,2	7,312 0,896 7,680 0,000 7,312 0,896		0.00	-			0.00	-			0.00 \$ 0.00 \$	
12 Crossovers 13 Cut & Cover Double Track Tunnel 14 Trench Long (2 tracks) (1000 + ft) Trench Long (4 tracks) (1000 + ft)		2,368 6,080 4,224		0.00 0.00 \$	-			0.00 \$ 0.00 \$	- - -			\$ \$ \$ \$	-
15 Trench Short (2 tracks) (<1000 ft) Trench Short (4 tracks) (<1000 ft) 16 Mechanical & Electrical for Tunnels 17 Retaining Walls 18 Containment Walls 19 Single Track Cut and Cover Subway Four Track Drill & Blast Four Track Mined (Soft Soil) Four Track TBM (<6 Miles) Four Track TBM w/3rd Tube (<6 Miles) Four Track Cut & Cover Tunnel Double Deck with Double Track Cut and Cover Box	Mile \$ 78.8 Mile \$ 11.8 Mile \$ 11.8 Mile \$ 5.9 Mile \$ 5.9 Mile \$ 293.7 Mile \$ 213.2 Mile \$ 353.4 Mile \$ 323.2	5,856 8,704 3,888 7,456 6,080 5,360 0,000 4,624 1,792 2,160		0.00 \$	- - - -			0.00 \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$	-			0.91 \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$	10,771,549 - - - - - - - - -
Grade Separations 1 Roadway Crossing HSR - 4 Lane Roadway Under 2 Tracks (Urban) Roadway Crossing HSR - 4 Lane Roadway Under 4 Tracks (Urban) 2 Roadway Crossing HSR - 2 Lane Roadway Under 4 Tracks (Suburban) 3 Roadway Crossing HSR - 2 Lane Roadway Under 2 Tracks (Undeveloped) 4 Roadway Crossing HSR - 4 Lane Roadway Over 4 Tracks (Urban)	ea \$ 13,2 ea \$ 19,9 ea \$ 2,7 ea \$ 2,0 ea \$ 3,5	6,528 9,680 9,568		S S S S O S	-			\$ \$ \$ \$ \$	- - - -			\$ \$ \$ \$	- - - -

COST ELEMENTS	UNI	T UNIT PRICE		At-Grade	(2 Tracks)			At-Grad	e (4 Tracks)			Tunnel (2 ti	racks - Mined)	
Subsection 1	'	Base: 2009	D				D						D	
		(3rd Ouarter)	Start: 267 + 00			Miles	Start: 267 + 00	End: 315 + 00		1 Miles	Start: 267 + 00	End: 315 + 00	_	Miles
Subsection Details					Quant.	Cost			Quant.	Cost			Quant.	Cost
Double Track At-Grade (Mile)			Start: 267 + 00	End: 315 + 00	0.91 Miles	0031	Start: 267 + 00		0.91 Miles	0031	Start: 0 + 00		0.00 Miles	COST
Double Track Elevated (Mile) Double Track Tunnel (Mile)			Start: 0 + 00 Start: 0 + 00		0.00 Miles 0.00 Miles		Start: 267 + 00 Start: 0 + 00	End: 315 + 00	0.91 Miles 0.00 Miles		Start: 0 + 00 Start: 267 + 00	End: 215 : 00	0.00 Miles 0.91 Miles	
Double Track Turner (wile) Double Track Trench (Mile)			Start: 0 + 00		0.00 Miles		Start: 0 + 00		0.00 Miles		Start: 0 + 00	End: 315 + 00	0.91 Miles	
Four Track Construction/Reconstruction At-Grade (Mile)			Start: 0 + 00	End: 0 + 00	0.00 Miles		Start: 0 + 00	End: 0 + 00	0.00 Miles		Start: 0 + 00	End: 0 + 00	0.00 Miles	
Four Track Elevated (Mile) Four Track Tunnel (Mile)			Start: 0 + 00 Start: 0 + 00		0.00 Miles 0.00 Miles		Start: 0 + 00 Start: 0 + 00	End: 0 + 00	0.00 Miles 0.00 Miles		Start: 0 + 00 Start: 0 + 00		0.00 Miles 0.00 Miles	
Four Track Trench (Mile)			Start: 0 + 00		0.00 Miles		Start: 0 + 00		0.00 Miles		Start: 0 + 00		0.00 Miles	
5 Roadway Crossing HSR - 4 Lane Roadway Over 2 Tracks (Suburban) Roadway Crossing HSR - 2 Lane Roadway Over 4 Tracks (Urban)	ea ea	\$ 3,593,216 \$ 2,850,816				\$ -				\$ -				\$ -
6 Roadway Crossing HSR - 2 Lane Roadway Over 2 Tracks (Undeveloped)	ea	\$ 3,171,328				\$ -				\$ -				\$ -
7 Street Bridging HSR Trench	ea	\$ 1,398,784				\$ -				\$ -			0	\$ -
8 Minor Crossing Closures	ea	\$ 87,040				\$ -				\$ -			0	\$ -
Building Items														
1 Intermediate Passenger Stations	Eac	h \$ -				\$ -				\$ -				\$ -
2 Terminal Passenger Stations	Eac					\$ -				\$ -				\$ -
Caltrain Passenger Station - At-Grade Caltrain Passenger Station - On Structure	Eac Eac					\$ -				\$ - \$				\$ -
Caltrain Passenger Station - In Tunnel or Subway	Eac	h \$15,000,000				\$ -				\$ -				\$ -
Caltrain Passenger Station - In Trench	Eac					\$ -				\$ -				\$ -
3 Maintenance Facility 4 Parking - Structures	Eac spac					\$ -				\$ - \$				\$ - \$
5 Parking - At Grade	spac					\$ -				\$ -				\$ -
Della Hillia Della callan														
Rail & Utility Relocation 1 Single Track Relocation (Temporary)	Mile	\$ 2,000,896				\$ -				\$ -				\$ -
2 Single Track Relocation (Permanent)	Mile					\$ -				\$ -				\$ -
3 Cinale Teach Democral	Mile	\$ 130.048				.				•				
3 Single Track Removal 4 Major Utility Relocations - Dense Urban	Mile					\$ -				\$ -				\$ -
5 Major Utility Relocations - Urban	Mile	\$ 1,084,416				\$ -				\$ -				\$ -
6 Major Utility Relocations - Dense Suburban	Mile Mile					\$ -				\$ -				\$ \$
7 Major Utility Relocations - Suburban 8 Major Utility Relocations - Undeveloped	Mile					\$ -				\$ -				\$ -
						Ť				•				
ROW (NOT INCLUDED) ROW required for each segment														
1 Dense Urban	Acre	\$ 2,786,321				-				\$ -				\$ -
2 Urban	Acre	\$ 1,371,510				\$ -				\$ -				\$ -
3 Dense Suburban 4 Suburban	Acre					\$ -				-				\$ -
5 Undeveloped	Acre Acre					\$ -				\$ -				\$ -
ROW required for Temp. Construction Easement	Acre	!												\$ -
1 Dense Urban 2 Urban	Acre Acre					\$ -				\$ -				\$ -
3 Dense Suburban	Acre					\$ -				\$ -				\$ -
4 Suburban	Acre	!				\$ -				\$ -				\$ -
5 Undeveloped Right-of-Way Required for Stations, Maintenance & Parking Facilities	Acre	!				-				-				\$ -
6 Dense Urban	Acre	\$ 2,786,321				\$ -				\$ -				\$ -
7 Urban	Acre	\$ 1,371,510				\$ -				\$ -				\$ -
8 Dense Suburban 9 Suburban	Acre Acre					\$ -				\$ -				\$ •
10 Undeveloped	Acre					\$ -				\$ -				\$ -
Environmental Mitigation = 3% Line Costs						\$ 60,962				\$ 1,142,949				\$ 4,824,742
System Elements														
1 Signaling (ATC)	Mile				0.91				0.91				0.91	
2 Communications (w/ Fiber Optic Backbone)	Mile				0.91				0.91				0.91	
3 Wayside Protection System	Mile	\$ 108,000			0.91	\$ 98,182			0.91	\$ 98,182			0.91	\$ 98,182
Electrification Items														
1 Traction Power Supply	Mile Mile				0.91				0.91				0.91	
2 Traction Power Distribution	ubtotal Mile	\$ 1,485,000			0.91	\$ 1,350,000 \$ 6,977,580			0.91	\$ 1,350,000 \$ 44,125,777			0.91	\$ 1,350,000 \$ 170,534,028
Program Implementation Costs (per screening)						\$ 1,779,283				\$ 11,252,073				\$ 43,486,177
Program Implementation Costs														
Contingencies (per screening) (25%)						\$ 1,744,395				\$ 11,031,444				\$ 42,633,507
,g., (E-1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1			<u> </u>							,				
Subtotal						\$ 10,501,258				\$ 66,409,295				\$ 256,653,712
Subtotal (Rounded)						\$ 11,000,000				\$ 66,000,000				\$ 257,000,000

 Subtotal (Rounded)
 \$ 11,000,000
 \$ 66,000,000
 \$ 257,000,000

COST ELEMENTS	UNIT	UNIT PRICE		At-Grade	(2 Tracks)			At-Grad	e (4 Tracks)			Tunnel (2	tracks - Mined)	
Subsection 1		Base: 2009 (3rd Quarter)			F				F			•	F	
		Qual (el)	Start: 315 + 00	End: 350 + 00	0.66	Miles	Start: 315 + 00	End: 350 + 00	0.66 M	iles	Start: 315 + 00	Start: 350 + 00	0.66	Miles
Subsection Details					Quant.	Cost			Quant.	Cost			Quant.	Cost
Double Track At-Grade (Mile) Double Track Elevated (Mile)			Start: 315 + 00 Start: 0 + 00	End: 350 + 00	0.66 Miles 0.00 Miles		Start: 315 + 00 Start: 0 + 00	End: 350 + 00	0.66 Miles 0.00 Miles		Start: 0 + 00 Start: 0 + 00	End: 0 + 00	0.00 Miles 0.00 Miles	
Double Track Tunnel (Mile)			Start: 0 + 00		0.00 Miles		Start: 315 + 00	End: 350 + 00	0.66 Miles		Start: 315 + 00	End: 350 + 00	0.66 Miles	
Double Track Trench (Mile) Four Track Construction/Reconstruction At-Grade (Mile)			Start: 0 + 00 Start: 0 + 00	End: 0 + 00	0.00 Miles 0.00 Miles		Start: 0 + 00 Start: 0 + 00	End: 0 + 00	0.00 Miles 0.00 Miles		Start: 0 + 00 Start: 0 + 00	End: 0 + 00	0.00 Miles 0.00 Miles	
Four Track Elevated (Mile)			Start: 0 + 00	Zilai o i oo	0.00 Miles		Start: 0 + 00	Enai o i oo	0.00 Miles		Start: 0 + 00		0.00 Miles	
four Track Tunnel (Mile) Four Track Trench (Mile)			Start: 0 + 00 Start: 0 + 00		0.00 Miles 0.00 Miles		Start: 0 + 00 Start: 0 + 00		0.00 Miles 0.00 Miles		Start: 0 + 00 Start: 0 + 00	End: 0 + 00 End: 0 + 00	0.00 Miles 0.00 Miles	
Double Track Section - Total 1 Double Track Section - At Grade	Mile	\$ 2,100,224			0.66	\$ 1,392,194			0.66 \$	1,392,194			0.00 \$	_
2 Double Track Section - On Structure	Mile	\$ 4,700,160			0.00	\$ -			0.00 \$	-			0.00 \$	-
3 Double Track Section - In Tunnel or Subway 4 Double Track Section - In Trench	Mile Mile	\$ 4,700,160 \$ 4,700,160			0.00 0.00				0.66 \$ 0.00 \$	3,115,636			0.66 \$ 0.00 \$	
Four Track Section - Total Four-track Section - At Grade Four-Track Section - On Structure Four-Track Section - In Tunnel of Substructure	Mile Mile Mile	\$ 4,200,448 \$ 9,400,320 \$ 9,400,320			0.00	\$ -			0.00 \$ 0 \$ 0 \$	-			0.00 \$	-
Four-Track Section - In Tunnel or Subway Four-Track Section - In Trench	Mile	\$ 9,400,320 \$ 9,400,320			0				0 \$	-			0 \$	
Single Track - Total 5 Single Track Section - At Grade	Mile	\$ 1,549,312			0				0 \$	-			0 \$	-
6 Single Track Section - On structure 7 Single Track Section - In Tunnel or Subway	Mile Mile	\$ 2,350,080 \$ 2,350,080			0				0 \$	-			0 \$	
8 Single Track Section - In Trench	Mile	\$ 2,350,080			0	\$ -			0 \$	-			0 \$	
9 Freight Double Track - At Grade 0 Freight Single Track - At Grade	Mile Mile	\$ 2,839,552 \$ 1,549,312			0				0 \$ 0 \$	-			0 \$	
Earthwork Items 1 Site Preparation - Undeveloped	Acre	\$ 9,216			8.84	\$ 81,469			8.84 \$	81,469			8.84 \$	81,469
2 Total Cut 3 Total Fill	CY CY	\$ 6 \$ 6			0.00 0.00	\$ -			0.00 \$ 0.00 \$				231815.00 \$ 92726.00 \$	1,495,485
4 Borrow	CY	\$ 13			0.00	\$ -			0.00 \$	-			0.00 \$	-
5 Spoil 6 Landscape erosion Control	CY Acre	\$ 13 \$ 6,144			0.00 0.66				0.00 \$ 0.66 \$	4,055			139089.00 \$ 2.87 \$	1,749,717 17,633
7 Security Fencing (Both sides of ROW) 8 Special Drainage Facilities	Mile 5% Earl	\$ 144,384			0.00				0.00 \$	4,276			0.22 \$	31,764 197,965
Structures, Tunnels, Walls	370 Eali	IIWOIK				\$ 4,270			•	4,270			3	197,905
1 Standard Structure (2 tracks)	Mile	\$ 34,972,672			0.00				0.00 \$	-			0.00 \$	
Standard Structure (4 tracks) 2 High Structure	Mile Mile	\$ 52,459,008 \$ 40,424,448			0.00	\$ - \$ -			0.00 \$	-			0.00 \$	-
3 Long Span Structure	Mile	\$ 61,919,232				\$ -			\$	-			\$	-
4 Waterway Crossing - Primary 5 Waterway Crossing - Secondary (Irrigation Canal)	Mile Mile	\$ 85,342,208 \$ 92,049,408				\$ - \$ -			\$	-			\$	-
6 Twin Single Track Drill&Blast (<6 Miles) 7 Twin Single Track TBM (<6 Miles)	Mile Mile	\$ 142,731,264 \$ 106,637,312				\$ - \$ -			\$	-			0.66 \$	
B Twin Single Track TBM w/3rd Tube (<6 Miles)	Mile	\$ 176,720,896			0.00	\$ -			\$				\$	
9 Double Track Drill & Blast 0 Double Track Mined (Soft Soil)	Mile Mile	\$ 146,887,680 \$ 79,200,000			0.00	\$ -			0.66 \$	97,368,727			\$	-
Double Track TBM (<6 Miles) Double Track TBM w/3rd Tube (>6 Miles)	Mile Mile	\$ 106,637,312 \$ 176,720,896												
1 Seismic Chamber (Drill & Blast/Mined)	ea	\$ 126,205,952				\$ -			\$	-			\$	-
12 Crossovers 13 Cut & Cover Double Track Tunnel	ea Mile	\$ 442,368 \$ 131,246,080			0.00				0.00 \$	-			0.00 \$	-
4 Trench Long (2 tracks) (1000 + ft) Trench Long (4 tracks) (1000 + ft)	Mile Mile	\$ 57,524,224 \$ 86,286,336			0.00	\$ -			0.00 \$	-			\$	-
5 Trench Short (2 tracks) (<1000 ft) Trench Short (4 tracks) (<1000 ft)	Mile Mile	\$ 78,843,904 \$ 118,265,856				\$ -			\$	-			\$	-
6 Mechanical & Electrical for Tunnels	Mile Mile	\$ 11,848,704			0.00	\$ -			0.00 \$	-			0.66 \$	7,854,255
7 Retaining Walls 8 Containment Walls	Mile	\$ 5,907,456			0.00	\$ -			\$	-			\$	-
9 Single Track Cut and Cover Subway Four Track Drill & Blast	Mile Mile	\$ 131,246,080 \$ 293,775,360				\$ - \$ -			\$ \$	-			\$	-
Four Track Mined (Soft Soil) Four Track TBM (<6 Miles)	Mile Mile	\$ 158,400,000 \$ 213,274,624				\$ -			\$	-			0.00 \$	
Four Track TBM w/3rd Tube (>6 Miles)	Mile	\$ 353,441,792											\$	-
Four Track Cut & Cover Tunnel Double Deck with Double Track Cut and Cover Box	Mile Mile	\$ 262,492,160 \$ 328,521,114			0.00	\$ -			0.00 \$	-			\$	-
Grade Separations														
1 Roadway Crossing HSR - 4 Lane Roadway Under 2 Tracks (Urban)	ea	\$ 13,284,352 \$ 19,926,528				\$ -			\$	-			\$	
Roadway Crossing HSR - 4 Lane Roadway Under 4 Tracks (Urban) Roadway Crossing HSR - 2 Lane Roadway Under 4 Tracks (Suburban)	ea ea	\$ 2,759,680				\$ -			\$	-			\$	-
3 Roadway Crossing HSR - 2 Lane Roadway Under 2 Tracks (Undeveloped) 4 Roadway Crossing HSR - 4 Lane Roadway Over 4 Tracks (Urban)	ea ea	\$ 2,029,568 \$ 3,563,520			0	\$ - \$ -			0 \$	-			\$	-
	1 00	1 . 0,000,020	ı l	Į.	٥		1	ı	1 914		1			

COST ELEMENTS	UNIT	UNIT PRICE		At-Grade	(2 Tracks)			At-Grad	e (4 Tracks)		Tunnel (2 tracks - Mined)				
Subsection 1		Base: 2009 (3rd	F				г		F						
		Quarter)	Start: 315 + 00	End: 350 + 00	0.66 M	iles	Start: 315 + 00	End: 350 + 00	0.66	Miles	Start: 315 + 00	Start: 350 + 00	0.6	6 Miles	
Subsection Details					Quant.	Cost			Quant.	Cost			Quant.	Cost	
Double Track At-Grade (Mile)			Start: 315 + 00	End: 350 + 00	0.66 Miles	CUSI	Start: 315 + 00	End: 350 + 00	0.66 Miles	Cost	Start: 0 + 00	End: 0 + 00	0.00 Miles	Cost	
Double Track Elevated (Mile) Double Track Tunnel (Mile)			Start: 0 + 00 Start: 0 + 00		0.00 Miles 0.00 Miles		Start: 0 + 00 Start: 315 + 00	End: 350 + 00	0.00 Miles 0.66 Miles		Start: 0 + 00 Start: 315 + 00	End: 350 + 00	0.00 Miles 0.66 Miles		
Double Track Trench (Mile)			Start: 0 + 00		0.00 Miles		Start: 0 + 00		0.00 Miles		Start: 0 + 00		0.00 Miles		
Four Track Construction/Reconstruction At-Grade (Mile) Four Track Elevated (Mile)			Start: 0 + 00 Start: 0 + 00	End: 0 + 00	0.00 Miles 0.00 Miles		Start: 0 + 00 Start: 0 + 00	End: 0 + 00	0.00 Miles 0.00 Miles		Start: 0 + 00 Start: 0 + 00	End: 0 + 00	0.00 Miles 0.00 Miles		
Four Track Tunnel (Mile)			Start: 0 + 00		0.00 Miles		Start: 0 + 00		0.00 Miles		Start: 0 + 00	End: 0 + 00	0.00 Miles		
Four Track Trench (Mile) 5 Roadway Crossing HSR - 4 Lane Roadway Over 2 Tracks (Suburban)	ea	\$ 3,593,216	Start: 0 + 00		0.00 Miles		Start: 0 + 00		0.00 Miles	\$ -	Start: 0 + 00	End: 0 + 00	0.00 Miles	\$ -	
Roadway Crossing HSR - 2 Lane Roadway Over 4 Tracks (Urban)	ea	\$ 2,850,816			\$	-				\$ -				\$ -	
		\$ 3,171,328 \$ 1,398,784			\$	-				\$ - \$ -				\$ - \$ -	
		\$ 87,040			\$	-				\$ -			0	\$ -	
Building Items															
1 Intermediate Passenger Stations	Each	\$ -			\$	-				\$ -				\$ -	
2 Terminal Passenger Stations		\$ -			\$	-				\$ -				\$ -	
Caltrain Passenger Station - At-Grade Caltrain Passenger Station - On Structure	Each Each	\$15,000,000 \$15,000,000			\$	-				\$ - \$				\$ - \$	
Caltrain Passenger Station - In Tunnel or Subway	Each	\$15,000,000			\$	-				\$ -				\$ -	
Caltrain Passenger Station - In Trench 3 Maintenance Facility	Each Each	\$15,000,000 \$ 123,921,884			\$					\$ - \$ -				\$ - \$ -	
4 Parking - Structures 5 Parking - At Grade	space	\$ -			\$	-				-				\$ - \$ -	
5 Parking - At Grade	space	\$ -			3	-				-				\$ -	
Rail & Utility Relocation 1 Single Track Relocation (Temporary)	Mile	\$ 2,000,896			•					¢				e	
		\$ 2,000,896			\$	-				\$ -				\$ -	
3 Single Track Removal	Mile	\$ 130,048			•					¢				e	
4 Major Utility Relocations - Dense Urban	Mile	\$ 1,548,288			\$	-				\$ -				\$ -	
	Mile Mile	\$ 1,084,416 \$ 775,168			\$	-				\$ -				\$ -	
7 Major Utility Relocations - Suburban	Mile	\$ 464,896			\$					\$ -				\$ -	
8 Major Utility Relocations - Undeveloped	Mile	\$ 30,720			\$	-				\$ -				\$ -	
ROW (NOT INCLUDED)															
ROW required for each segment 1 Dense Urban	Acre	\$ 2,786,321			\$					\$ -				\$ -	
2 Urban	Acre	\$ 1,371,510			\$	-				\$ -				\$ -	
	Acre Acre	\$ 908,134 \$ 208,418			\$	-				\$ - \$ -				\$ - \$ -	
5 Undeveloped	Acre	\$ 3,642			\$	-				\$ -				\$ -	
	Acre Acre				\$					\$ -				\$ - \$ -	
2 Urban	Acre				\$	-				\$ -				\$ -	
3 Dense Suburban 4 Suburban	Acre Acre				\$	-				\$ - \$ -				\$ - \$ -	
5 Undeveloped	Acre				\$	-				\$ -				\$ -	
Right-of-Way Required for Stations, Maintenance & Parking Facilities 6 Dense Urban	Acre	\$ 2,786,321			\$	-				\$ -				\$ -	
	Acre Acre	\$ 1,371,510 \$ 908,134			\$	-				-				-	
		\$ 208,418			\$					\$ -				\$ -	
10 Undeveloped Environmental Mitigation = 3% Line Costs	Acre	\$ 3,642			\$	44,460				\$ - \$ 3,058,991				\$ - \$ 3,292,221	
					*	11,100				. 5,000,771				- 0,2,2,221	
System Elements 1 Signaling (ATC)	Mile	\$ 2,070,000			0.66 \$	1,372,159			0.66	\$ 1,372,159			0.66	\$ 1,372,159	
2 Communications (w/ Fiber Optic Backbone)	Mile	\$ 540,000			0.66 \$	357,955			0.66	\$ 357,955			0.66	\$ 357,955	
3 Wayside Protection System	Mile	\$ 108,000			0.66 \$	71,591			0.66	\$ 71,591			0.66	\$ 71,591	
Electrification Items	Mile	¢ 1 170 000			0.// *	775 5/0			0.77	¢ 7755'^			0.77	ė 77FF/0	
1 Traction Power supply 2 Traction Power Distribution		\$ 1,170,000 \$ 1,485,000			0.66 \$ 0.66 \$				0.66 0.66	\$ 775,568 \$ 984,375			0.66 0.66		
Subtotal					\$	5,088,102				\$ 108,586,997 \$ 27,689,684				\$ 116,594,561 \$ 29,731,613	
Program Implementation Costs (per screening) Program Implementation Costs					\$	1,277,400				φ 21,089,084				φ <u>27,/31,013</u>	
Contingencies (per screening) (25%)					\$	1,272,026				\$ 27,146,749				\$ 29,148,640	
Subtotal Subtotal (Rounded)					\$	7,657,594 8,000,000				\$ 163,423,430 \$ 163,000,000				\$ 175,474,814 \$ 175,000,000	

COST ELEMENTS	UNIT	UNIT PRICE		At-Grade	(2 Tracks)				At-Grade	(4 Tracks)		Tunnel (2 tracks - Mined)			
Subsection 1		Base: 2009 (3rd Quarter)			F					F		F Ctort, 250 , 00 Ctort, 27/ 00			
			Start: 350 + 00	End: 376 + 00	0.49	Miles		Start: 350 + 00	End: 376 + 00	0.491	Miles	Start: 350 + 00	Start: 376 + 00	0.49	Miles
Subsection Details Double Track At-Grade (Mile) Double Track Elevated (Mile) Double Track Tunnel (Mile) Double Track Trench (Mile) Four Track Construction/Reconstruction At-Grade (Mile) Four Track Elevated (Mile) Four Track Tunnel (Mile) Four Track Tunnel (Mile)			Start: 350 + 00 Start: 0 + 00	End: 376 + 00 End: 0 + 00	Quant. 0.49 Miles 0.00 Miles		Cost	Start: 0 + 00 Start: 0 + 00 Start: 0 + 00 Start: 0 + 00 Start: 350 + 00 Start: 0 + 00 Start: 0 + 00 Start: 0 + 00	End: 0 + 00 End: 376 + 00	Quant. 0.00 Miles	Cost	Start: 0 + 00 Start: 0 + 00 Start: 350 + 00 Start: 0 + 00	End: 0 + 00 End: 376 + 00 End: 0 + 00 End: 0 + 00 End: 0 + 00	Quant. 0.00 Miles 0.00 Miles 0.49 Miles 0.00 Miles 0.00 Miles 0.00 Miles 0.00 Miles 0.00 Miles 0.00 Miles	Cost
Double Track Section - Total 1 Double Track Section - At Grade 2 Double Track Section - On Structure 3 Double Track Section - In Tunnel or Subway 4 Double Track Section - In Trench	Mile Mile Mile Mile	\$ 2,100,224 \$ 4,700,160 \$ 4,700,160 \$ 4,700,160			0.49 0.00 0.00 0.00	\$	1,034,201 - - -			0.00 0.00 0.00 0.00	\$ - \$ -			0.00 0.00 0.49 0.00	\$ - \$ 2,314,473
Four Track Section - Total Four-track Section - At Grade Four-Track Section - On Structure Four-Track Section - In Tunnel or Subway Four-Track Section - In Trench	Mile Mile Mile	\$ 4,200,448 \$ 9,400,320 \$ 9,400,320 \$ 9,400,320				\$	-			0.49 0 0 0				0	\$ -
Single Track - Total 5 Single Track Section - At Grade 6 Single Track Section - On structure 7 Single Track Section - In Tunnel or Subway 8 Single Track Section - In Trench	Mile Mile Mile Mile	\$ 1,549,312 \$ 2,350,080 \$ 2,350,080 \$ 2,350,080			0	\$ \$	- - - -			0 0 0	\$ - \$ - \$ - \$ -			0 0 0	\$ - \$ -
9 Freight Double Track - At Grade 10 Freight Single Track - At Grade	Mile Mile	\$ 2,839,552 \$ 1,549,312				\$	-			0	*			0	
Earthwork Items 1 Site Preparation - Undeveloped 2 Total Cut 3 Total Fill 4 Borrow 5 Spoil 6 Landscape erosion Control 7 Security Fencing (Both sides of ROW) 8 Special Drainage Facilities	Acre CY CY CY CY Acre Mile 5% Eart	\$ 9,216 \$ 6 \$ 6 \$ 13 \$ 13 \$ 6,144 \$ 144,384 hwork			6.57 0.00 0.00 0.00 0.00 0.49 0.00	\$ \$ \$ \$	60,549 - - - - 3,011 - 3,178			6.57 0.00 0.00 0.00 0.00 0.00 0.49 0.49	\$ - \$ - \$ - \$ - \$ 3,011			6.57 529629.00 211851.00 0.00 317778.00 6.57 0.49	\$ 3,416,743 \$ 1,332,526 \$ - \$ 3,997,596 \$ 40,366
Structures, Tunnels, Walls 1 Standard Structure (2 tracks) Standard Structure (4 tracks) 2 High Structure 3 Long Span Structure 4 Waterway Crossing - Primary 5 Waterway Crossing - Secondary (Irrigation Canal)	Mile Mile Mile Mile Mile	\$ 34,972,672 \$ 52,459,008 \$ 40,424,448 \$ 61,919,232 \$ 85,342,208 \$ 92,049,408			0.00 0.00		- - - -			0.00 0.00				0.00 0.00	
6 Twin Single Track Drill&Blast (<6 Miles) 7 Twin Single Track TBM (<6 Miles) 8 Twin Single Track TBM w/3rd Tube (<6 Miles) 9 Double Track Drill & Blast 10 Double Track Mined (Soft Soil) Double Track TBM (<6 Miles) Double Track TBM v/3rd Tube (<6 Miles)	Mile Mile Mile Mile Mile Mile	\$ 142,731,264 \$ 106,637,312 \$ 176,720,896 \$ 146,887,680 \$ 79,200,000 \$ 106,637,312 \$ 176,720,896			0.00	\$ \$ \$	-			0.00	\$ - \$ - \$ - \$ - \$ -			0.49	70,284,335 \$ - \$ - \$ -
11 Seismic Chamber (Drill & Blast/Mined) 12 Crossovers 13 Cut & Cover Double Track Tunnel 14 Trench Long (2 tracks) (1000 + ft) Trench Long (4 tracks) (1000 + ft)	ea ea Mile Mile Mile	\$ 126,205,952 \$ 442,368 \$ 131,246,080 \$ 57,524,224 \$ 86,286,336			0.00 0.00		- - -			0.00 0.00				0.00	\$ - \$ - \$ -
15 Trench Short (2 tracks) (<1000 ft) Trench Short (4 tracks) (<1000 ft) 16 Mechanical & Electrical for Tunnels 17 Retaining Walls 18 Containment Walls 19 Single Track Cut and Cover Subway Four Track Drill & Blast Four Track Mined (Soft Soil) Four Track TBM (<6 Miles) Four Track TBM w/3rd Tube (>6 Miles) Four Track Cut & Cover Tunnel Double Deck with Double Track Cut and Cover Box	Mile Mile Mile Mile Mile Mile Mile Mile	\$ 78,843,904 \$ 118,265,856 \$ 11,848,704 \$ 8,613,888 \$ 5,907,456 \$ 131,246,080 \$ 293,775,360 \$ 158,400,000 \$ 213,274,624 \$ 353,441,792 \$ 262,492,160 \$ 328,521,114			0.00	\$ \$ \$				0.00	\$ - \$ - \$ - \$ \$ - \$ \$ \$ - \$ \$ \$ \$ - \$ \$ \$ \$ \$ - \$				\$ 5,834,589 \$ - \$ - \$ - \$ - \$ - \$ - \$ -
Grade Separations 1 Roadway Crossing HSR - 4 Lane Roadway Under 2 Tracks (Urban) Roadway Crossing HSR - 4 Lane Roadway Under 4 Tracks (Urban) 2 Roadway Crossing HSR - 2 Lane Roadway Under 4 Tracks (Suburban) 3 Roadway Crossing HSR - 2 Lane Roadway Under 2 Tracks (Undeveloped) 4 Roadway Crossing HSR - 4 Lane Roadway Over 4 Tracks (Urban)	ea ea ea ea	\$ 13,284,352 \$ 19,926,528 \$ 2,759,680 \$ 2,029,568 \$ 3,563,520			0	\$ \$ \$ \$	- - - -			0	\$ - \$ - \$ - \$ - \$ -				\$ - \$ - \$ - \$ -

COST ELEMENTS	U	NIT	UNIT PRICE		At-Grade	(2 Tracks)				At-Grade	(4 Tracks)			Tunnel (2 ti	racks - Mined)		
Subsection 1			Base: 2009	F								F					
		((3rd Quarter)	Start: 350 + 00	End: 376 + 00	0.49	Miles		Start: 350 + 00	End: 376 + 00	0.49	Miles	Start: 350 + 00	Start: 376 + 00	0.49	Miles	
Subsection Details Double Track At-Grade (Mile)				Start: 350 + 00	End: 376 + 00	Quant. 0.49 Miles	Co	ost	Start: 0 + 00	End: 0 + 00	Quant. 0.00 Miles	Cost	Start: 0 + 00	End: 0 + 00	Quant. 0.00 Miles	С	Cost
Double Track At-Grade (Wile)				Start: 0 + 00	E110. 370 + 00	0.49 Miles		ŀ	Start: 0 + 00	E110. 0 + 00	0.00 Miles		Start: 0 + 00	E110. 0 + 00	0.00 Miles		
Double Track Tunnel (Mile)				Start: 0 + 00		0.00 Miles			Start: 0 + 00		0.00 Miles		Start: 350 + 00	End: 376 + 00	0.49 Miles		
Double Track Trench (Mile) Four Track Construction/Reconstruction At-Grade (Mile)				Start: 0 + 00	F=d: 0 : 00	0.00 Miles			Start: 0 + 00	F=4: 27/ : 00	0.00 Miles		Start: 0 + 00	Ed-0 - 00	0.00 Miles		
Four Track Construction/Reconstruction At-Grade (Mile)				Start: 0 + 00 Start: 0 + 00	End: 0 + 00	0.00 Miles 0.00 Miles		ŀ	Start: 350 + 00 Start: 0 + 00	End: 376 + 00	0.49 Miles 0.00 Miles		Start: 0 + 00 Start: 0 + 00	End: 0 + 00	0.00 Miles 0.00 Miles		
Four Track Tunnel (Mile)				Start: 0 + 00		0.00 Miles		ŀ	Start: 0 + 00		0.00 Miles		Start: 0 + 00	End: 0 + 00	0.00 Miles		
Four Track Trench (Mile)				Start: 0 + 00		0.00 Miles			Start: 0 + 00		0.00 Miles	•	Start: 0 + 00	End: 0 + 00	0.00 Miles		
5 Roadway Crossing HSR - 4 Lane Roadway Over 2 Tracks (Suburban) Roadway Crossing HSR - 2 Lane Roadway Over 4 Tracks (Urban)	ea ea		3,593,216 2,850,816				\$	-				- •				\$	-
6 Roadway Crossing HSR - 2 Lane Roadway Over 2 Tracks (Undeveloped)	ea		3,171,328				\$	-				\$ -				\$	-
7 Street Bridging HSR Trench	ea	\$	1,398,784				\$	-				\$ -			0	\$	-
8 Minor Crossing Closures	ea	\$	87,040				\$	-				\$ -			0	\$	-
Building Items																	
1 Intermediate Passenger Stations	E	ach \$	-				\$	-				\$ -				\$	-
2 Terminal Passenger Stations	F	ach \$					\$	_				\$				\$	
Caltrain Passenger Station - At-Grade			\$15,000,000				\$	-				\$ -	1			\$	
Caltrain Passenger Station - On Structure	E	ach	\$15,000,000				\$	-				\$ -	1			\$	- [
Caltrain Passenger Station - In Tunnel or Subway Caltrain Passenger Station - In Trench			\$15,000,000 \$15,000,000				\$	-				\$ -	1			\$	- [
3 Maintenance Facility			123,921,884				\$	-				\$ -				\$	-
4 Parking - Structures		ace \$					\$	-				\$ -				\$	-
5 Parking - At Grade	sp	ace \$	-				\$	-				\$ -				\$	-
Rail & Utility Relocation																	
1 Single Track Relocation (Temporary)	Mi	ile \$	2,000,896			0.49	\$	980,439			0.49	\$ 980,439				\$	-
2 Single Track Relocation (Permanent)	Mi	ile \$	2,000,896													\$	-
3 Single Track Removal	Mi	ilo ¢	130,048			0.49	¢	63,724			0.49	\$ 63,724				¢	
4 Major Utility Relocations - Dense Urban	Mi		1,548,288			0.49		758,661			0.49					\$	-
5 Major Utility Relocations - Urban	Mi		1,084,416				\$	-			2	\$ -				\$	-
6 Major Utility Relocations - Dense Suburban	Mi						\$	-				-				\$	-
7 Major Utility Relocations - Suburban 8 Major Utility Relocations - Undeveloped	Mi Mi						\$	-				\$ -				\$	-
Wajor Guing Relocations - Graceveloped	1011	iic y	30,720				Ψ					Ψ				Ψ	
ROW (NOT INCLUDED)																	
ROW required for each segment 1 Dense Urban	٨	cre \$	2,786,321				¢					*				¢	
2 Urban			1,371,510				\$	-				\$ -				\$	-
3 Dense Suburban		cre \$	908,134				\$	-				\$ -				\$	-
4 Suburban		re \$					\$	-				\$ -				\$	-
5 Undeveloped ROW required for Temp. Construction Easement		cre \$	3,642				2	-				-				\$	-
1 Dense Urban		cre					\$	-				\$ -				\$	-
2 Urban	Ac						\$	-				-				\$	-
3 Dense Suburban 4 Suburban		cre cre					\$	-				-				\$	-
5 Undeveloped		re					\$	-				\$ -				\$	-
Right-of-Way Required for Stations, Maintenance & Parking Facilities																	
6 Dense Urban			2,786,321				\$	-				\$ -				\$	-
7 Urban 8 Dense Suburban	Ac		1,371,510 908,134				\$	-				\$ -				\$	-
9 Suburban	Ac		208,418				\$	-				\$ -				\$	-
10 Undeveloped	Ac	cre \$	3,642				\$	- 07.110				\$ -				\$	- 0.422.024
Environmental Mitigation = 3% Line Costs							\$	87,113				\$ 120,379				Þ	2,633,936
System Elements																	
1 Signaling (ATC)	Mi		2,070,000			0.49		,019,318			0.49				0.49		1,019,318
2 Communications (w/ Fiber Optic Backbone) 3 Wayside Protection System	Mi Mi		540,000 108,000			0.49 0.49		265,909 53,182			0.49 0.49				0.49 0.49		265,909 53,182
	IVII		100,000			0.47	*	00,102			0.47	÷ 55,102			0.47	4	55,102
Electrification Items		.					l .					_					
1 Traction Power supply 2 Traction Power Distribution	Mi Mi		1,170,000 1,485,000			0.49 0.49		576,136 731,250			0.49 0.49				0.49 0.49		576,136 731,250
	ubtotal	iic)	1,400,000					,636,671			0.49	\$ 731,250 \$ 6,778,791			0.49		93,077,582
Program Implementation Costs (per screening)								,437,351				\$ 1,728,592					23,734,783
Program Implementation Costs																	
Contingencies (per screening) (25%)							\$ 1.	,409,168				\$ 1,694,698				\$	23,269,395
(-1 -1 -1 -1 -1 -1 -1 -1 -1 -1 -1 -1 -1 -							1,	, , ,				,571,070				•	.,,,0,0
Subtotal								,483,190				\$ 10,202,080					40,081,761
Subtotal (Rounded)							\$ 8,00	000 000				\$ 10,000,000				\$ 1/10	,000,000

Subtotal (Rounded) \$ 8,000,000 \$ 10,000,000 \$ 140,000,000

COST ELEMENTS	UNIT	UNIT PRICE		At-Grade	(2 Tracks)			At-Grade	e (4 Tracks)			Tunnel (2 tr	acks - Mined)	
Subsection 1		Base: 2009 (3rd	G					•		G				
		Quarter)	Start: 376 + 00		G 1.40	Miles	Start: 376 + 00	End: 450 + 00	G 1.40	Miles	Start: 376 + 00	Start: 450 + 00	G 1.40 N	Miles
Subsection Details					Quant.	Cost			Quant.	Cost			Quant.	Cost
Double Track At-Grade (Mile)			Start: 376 + 00	End: 450 + 00	1.40 Miles	0031	Start: 376 + 00	End: 450 + 00	1.40 Miles	0031	Start: 0 + 00	End: 0 + 00	0.00 Miles	5031
Double Track Elevated (Mile) Double Track Tunnel (Mile)			Start: 0 + 00 Start: 0 + 00	End: 0 + 00	0.00 Miles 0.00 Miles		Start: 0 + 00 Start: 0 + 00	End: 0 + 00	0.00 Miles 0.00 Miles		Start: 0 + 00 Start: 376 + 00	End: 450 + 00	0.00 Miles 1.40 Miles	
Double Track Trench (Mile)			Start: 0 + 00	Liid. 0 + 00	0.00 Miles		Start: 0 + 00	Liid. 0 + 00	0.00 Miles		Start: 0 + 00	LIIU. 430 + 00	0.00 Miles	
Four Track Construction/Reconstruction At-Grade (Mile)			Start: 0 + 00	End: 0 + 00	0.00 Miles 0.00 Miles		Start: 0 + 00 Start: 0 + 00	End: 0 + 00	0.00 Miles 0.00 Miles		Start: 0 + 00 Start: 0 + 00	End: 0 + 00	0.00 Miles 0.00 Miles	
Four Track Elevated (Mile) Four Track Tunnel (Mile)			Start: 0 + 00 Start: 0 + 00		0.00 Miles		Start: 0 + 00		0.00 Miles		Start: 0 + 00	End: 0 + 00	0.00 Miles	
Four Track Trench (Mile) Double Track Section - Total		1	Start: 0 + 00		0.00 Miles		Start: 0 + 00		0.00 Miles		Start: 0 + 00	End: 0 + 00	0.00 Miles	
1 Double Track Section - At Grade	Mile	\$ 2,100,224			1.40	\$ 2,943,49	5		0.74	\$ 1,554,166			0.00 \$	-
2 Double Track Section - On Structure	Mile Mile	\$ 4,700,160 \$ 4,700,160			0.00 0.00		-		0.00 0.74				0.00 \$ 1.40 \$	
3 Double Track Section - In Tunnel or Subway 4 Double Track Section - In Trench	Mile	\$ 4,700,160 \$ 4,700,160			0.00		-		0.00				0.00 \$	
Four Track Section - Total Four-track Section - At Grade Four-Track Section - On Structure Four-Track Section - In Tunnel or Subway	Mile Mile Mile	\$ 4,200,448 \$ 9,400,320 \$ 9,400,320			0.00 0 0	\$				\$ 2,772,296 \$ - \$ -			0.00 \$ 0 \$ 0 \$	-
Four-Track Section - In Trench Single Track - Total	Mile	\$ 9,400,320			0	\$	-		0	\$ -			0 \$	-
5 Single Track Section - At Grade 6 Single Track Section - On structure	Mile Mile	\$ 1,549,312 \$ 2,350,080			0 0		:			\$ - \$ -			0 \$	-
7 Single Track Section - In Tunnel or Subway 8 Single Track Section - In Trench	Mile Mile	\$ 2,350,080 \$ 2,350,080 \$ 2,350,080			0	\$	-		0	\$ - \$ -			0 \$	
9 Freight Double Track - At Grade 10 Freight Single Track - At Grade	Mile Mile	\$ 2,839,552 \$ 1,549,312			0 0		-			\$ - \$ -			0 \$	-
Earthwork Items 1 Site Preparation - Undeveloped 2 Total Cut	Acre CY	\$ 9,216 \$ 6			18.69 0.00		3		18.69 0.00				18.69 \$ 72314.81 \$	
3 Total Fill	CY	\$ 6			0.00		-		0.00				28925.93 \$	181,942
4 Borrow 5 Spoil	CY CY	\$ 13 \$ 13			0.00 0.00		- -		0.00 0.00				0.00 \$ 43388.89 \$	545,825
6 Landscape erosion Control	Acre	\$ 6,144			0.74	\$ 4,54	7		0.74	\$ 4,547			0.90 \$	5,508
7 Security Fencing (Both sides of ROW) 8 Special Drainage Facilities	Mile 5% Ear	\$ 144,384 thwork			0.00	\$ \$ 8,83	3		0.00	\$ - \$ 8,838			0.07 \$	9,708 69,086
Structures, Tunnels, Walls 1 Standard Structure (2 tracks) Standard Structure (4 tracks) 2 High Structure 3 Long Span Structure	Mile Mile Mile Mile	\$ 34,972,672 \$ 52,459,008 \$ 40,424,448 \$ 61,919,232			0.00 0.00		-		0.00 0.00				0.00 \$ 0.00 \$ \$	
5 Using Spark actions 4 Waterway Crossing - Primary 5 Waterway Crossing - Secondary (Irrigation Canal) 6 Twin Single Track Drill&Blast (<6 Miles) 7 Twin Single Track TBM (<6 Miles) 8 Twin Single Track TBM w3rd Tube (<6 Miles) 9 Double Track Drill & Blast 10 Double Track Mined (Soft Soil) Double Track TBM (<6 Miles) Double Track TBM w3rd Tube (<6 Miles) 11 Seismic Chamber (Drill & Blast/Mined) 12 Crossovers 13 Cut & Cover Double Track Tunnel	Mile Mile Mile Mile Mile Mile Mile Mile	\$ 85,342,208 \$ 92,049,408 \$ 142,731,264 \$ 106,637,312 \$ 176,720,896 \$ 79,200,000 \$ 106,637,312 \$ 176,720,896 \$ 126,205,952 \$ 442,368 \$ 131,246,080			0.00	\$ \$ \$ \$			0.74				1.40 \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$	-
14 Trench Long (2 tracks) (1000 + ft) Trench Long (4 tracks) (1000 + ft)	Mile Mile	\$ 57,524,224 \$ 86,286,336			0.00	\$	-		0.00	\$ -			\$	-
15 Trench Short (2 tracks) (<1000 ft) Trench Short (4 tracks) (<1000 ft) 16 Mechanical & Electrical for Tunnels 17 Retaining Walls 18 Containment Walls 19 Single Track Cut and Cover Subway Four Track Drill & Blast Four Track Mined (Soft Soil) Four Track TBM (<6 Miles) Four Track TBM w3rd Tube (<6 Miles) Four Track Cut & Cover Tunnel Double Deck with Double Track Cut and Cover Box	Mile Mile Mile Mile Mile Mile Mile Mile	\$ 78,843,904 \$ 118,265,856 \$ 11,848,704 \$ 8,613,888 \$ 5,907,456 \$ 131,246,080 \$ 293,775,360 \$ 158,400,000 \$ 213,274,624 \$ 353,441,792 \$ 262,492,160 \$ 328,521,114			0.00	\$ \$ \$ \$			0.00	\$ - \$ - \$ - \$ -			1.40 \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$	16,606,138 - - - - - -
Grade Separations 1 Roadway Crossing HSR - 4 Lane Roadway Under 2 Tracks (Urban) Roadway Crossing HSR - 4 Lane Roadway Under 4 Tracks (Urban) 2 Roadway Crossing HSR - 2 Lane Roadway Under 4 Tracks (Suburban) 3 Roadway Crossing HSR - 2 Lane Roadway Under 2 Tracks (Undeveloped) 4 Roadway Crossing HSR - 4 Lane Roadway Over 4 Tracks (Urban)	ea ea ea ea	\$ 13,284,352 \$ 19,926,528 \$ 2,759,680 \$ 2,029,568 \$ 3,563,520				\$ \$ \$ \$	-		0	\$ - \$ - \$ - \$ - \$ -			\$ \$ \$ \$ \$ \$ \$ \$ \$ \$	- - - -

Part	COST ELEMENTS	UNIT	UNIT PRICE		At-Grade	(2 Tracks)			At-Grade	e (4 Tracks)			Tunnel (2 t	tracks - Mined)	
Part	Subsection 1	·			,	`				0				0	
Second			Quarter)	Start: 376 + 00			Miles	Start: 376 ± 00			Miles	Start: 376 ± 00	Start: 450 ± 00) Miles
Section Process Proc				otarti 070 i 00	2.10.100100			Starti 676 + 66	21101 100 1 00			Otal ti 070 + 00	Starti 100 + 00		
Column Part				Start: 376 ± 00	End: 450 ± 00		Cost	Start: 376 ± 00	End: 450 ± 00		Cost	Start: 0 ± 00	End: 0 ± 00		Cost
Control Cont					E11a. 430 + 00				Liid. 430 + 00				Liid. 0 + 00		
For This Control Con					End: 0 + 00				End: 0 + 00				End: 450 + 00		
Secretary Secr					End: 0 + 00				End: 0 + 00				End: 0 + 00		
Second Content Seco	Four Track Elevated (Mile)			Start: 0 + 00		0.00 Miles		Start: 0 + 00		0.00 Miles		Start: 0 + 00		0.00 Miles	
Subsection (1987-2) 10m (Parish Age Control (1980) 10m 10m (1980) 10m (19		ea	\$ 3,593,216	Start: 0 + 00		0.00 Miles	\$	Start: 0 + 00		0.00 Miles	\$ -	Start: 0 + 00	E110: 0 + 00	0.00 Miles	\$ -
Special aggregation	Roadway Crossing HSR - 2 Lane Roadway Over 4 Tracks (Urban)	ea	\$ 2,850,816				\$				\$ -				\$ -
Binner Confessor Section Secti							\$				-			0	\$ -
Internation Processor Statement Fig. 1 S S S S S S S S S							\$				\$ -			0	\$ -
Internation Processor Statement Fig. 1 S S S S S S S S S															
Committed Processing Colors		Fach					•				¢ .				
Column Processory States - Account (1999) Column Processory States - Interest (1999) Column Processory States in Fineth (1999) Column Processor States in Fineth (1999) Column Process	I into modulo i docingoi ordiiono	Lacii					*				-				*
Column Processory States - Account (1999) Column Processory States - Interest (1999) Column Processory States in Fineth (1999) Column Processor States in Fineth (1999) Column Process	2 Terminal Descender Stations	F					6				¢				
Contain Princing Studies Each \$1,000,000 \$ \$ \$ \$ \$ \$ \$ \$ \$						1	\$ 15,000,000			1	\$ 15,000,000				\$ - \$
Scheme Street S	Caltrain Passenger Station - On Structure	Each	\$15,000,000				\$]	\$ -				\$ -
Second Content							\$				\$ -			1	\$ 15,000,000
General Successor Space							\$				\$ -				\$ -
Description	4 Parking - Structures	space	- \$				\$				\$ -				\$ -
Symple Marke Security Mile \$ 2,000.05% 9.0 \$ 1,000.025	5 Parking - At Grade	space	- \$				\$				\$ -				\$ -
2 Single Track Residuals of Permisery (1998) Single Track Residuals (1998) Single Track Residuals of Permisery (1998) Single Track Residuals of Permise	Rail & Utility Relocation														
Simple Filters Ferminal 1996 19						0.70	\$ 1,400,62			0.70	\$ 1,400,627				\$ -
4 May Cuttly Reductions: Denne Littlew	2 Single Track Relocation (Permanent)	Mile	\$ 2,000,896			0				0					\$ -
Solve Solv	3 Single Track Removal	Mile	\$ 130,048			0.70	\$ 91,034			0.70	\$ 91,034				\$ -
Alloyer Using Recorders - Desires - Solution						0.74	\$ 1,145,733			0.74	\$ 1,145,733				\$ -
Allage trailly Recordines - Substandan							\$ \$				\$ - \$				\$ - \$
ROW poor INCLIDED) ROW opquired for each segment Acro \$ 2,208.021 \$ 5	7 Major Utility Relocations - Suburban	Mile					\$				\$ -				\$ -
SCON coaper for each segment	8 Major Utility Relocations - Undeveloped	Mile	\$ 30,720				\$				\$ -				\$ -
SCON coaper for each segment	ROW (NOT INCLUDED)														
2 Utdan	ROW required for each segment														
Substitution							\$				-				\$ -
Substead Substant							\$				\$ -				\$ -
ROW required for Temp. Construction Easement Acre							\$				\$ -				\$ -
Dense Urban			\$ 3,642				\$				\$ -			0	\$ - \$ -
Solution							\$				\$ -			J	\$ -
Subtoran							\$				-				-
Subdeveloped Right of Way Required for Sations, Maintenance & Parking Facilities Right of Way Required for Sations, Maintenance & Parking Facilities Right of Way Required for Sations, Maintenance & Parking Facilities Right of Way Required for Sations, Maintenance & Parking Facilities Right of Way Required for Sations, Maintenance & Parking Facilities Right of Way Required for Sations, Maintenance & Parking Facilities Right of Way Required for Sations, Maintenance & Parking Facilities Right of Way Required for Sations, Maintenance & Parking Facilities Right of Way Required for Sations, Maintenance & Parking Facilities Right of Way Required for Sations, Maintenance & Parking Facilities Right of Way Required for Sations, Maintenance & Parking Facilities Right of Way Required for Sations, Maintenance & Parking Facilities Right of Way Required for Sations, Maintenance & Parking Facilities Right of Way Required for Sations, Maintenance & Parking Facilities Right of Way Required for Sations, Maintenance & Parking Facilities Right of Way Required for Sations, Maintenance & Parking Facilities Right of Way Required for Sations, Maintenance & Parking Facilities Right of Way Required for Sations, Way and Parking Facilities Right of Way Required for Sations, Way and Parking Facilities Right of Way Required for Sations, Way and Parking Facilities Right of Way Required for Sations, Way and Parking Facilities Right of Way An							\$				\$ -				\$ - \$ -
Description Acre S 2,786,321 S S S S S S S S S	5 Undeveloped						\$				\$ -				\$ -
Dense Suburban		Acro	\$ 2.796.221				¢				¢				¢
9 Subtorlan							\$				\$ -				\$ -
10 Undeveloped Acre \$ 3,642 \$ \$ - \$ \$ \$ 622,995 \$ \$ \$ \$ \$ 4,029,734 \$ \$ \$ 7,190,530							\$				\$ -				\$ -
Environmental Mitigation = 3% Line Costs \$ 4,029,734 \$ 7,190,530							\$				\$ -				\$ -
1 Signaling (ATC) Mile 2 Communications (W Fiber Optic Backbone) \$ 2,901,136 1.40 \$ 2,901,136 1.40 \$ 756,818 \$ 756,818 \$ 7		71010	Ψ 3,012				7	i			\$ 4,029,734				\$ 7,190,530
1 Signaling (ATC) Mile 2 Communications (W Fiber Optic Backbone) \$ 2,901,136 1.40 \$ 2,901,136 1.40 \$ 756,818 \$ 756,818 \$ 7	System Flaments														
2 Communications (W/ Fiber Optic Backbone) 3 Wayside Protection System Mile \$ 540,000 Mile \$ 108,000 Electrification Items 1 Traction Power supply Traction Power Distribution Program Implementation Costs (per screening) Program Implementation Costs Contingencies (per screening) (25%) Mile \$ 1,40,000 Mile \$ 1,40 \$ 1,639,773		Mile	\$ 2,070,000			1.40	\$ 2,901,136			1.40	\$ 2,901,136			1.40	\$ 2,901,136
Electrification Items Traction Power supply Traction Power Supply Traction Power Distribution Subtotal Forgram Implementation Costs (per screening) (25%) Subtotal															
1 Traction Power supply Mile Traction Power Distribution Mile Mile Mile States 1,170,000 Subtotal Mile Mile States 1,170,000 Subtotal Mile Mile States 1,639,773 States <	3 wayside Protection System	Mile	\$ 108,000			1.40	\$ 151,364			1.40	\$ 151,364			1.40	\$ 151,364
2 Traction Power Distribution Subtotal Program Implementation Costs (per screening) Program Implementation Costs Contingencies (per screening) (25%) Subtotal Mile \$ 1,485,000 Mile \$ 1,485,000 \$ 2,081,250 \$ 28,919,828 \$ 7,374,556 \$ 37,200,556 \$ 37,200,556 \$ 337,200,550 \$ 337,200,556 \$ 337,200,5															
Subtotal Program Implementation Costs (per screening) Program Implementation Costs (per screening) Program Implementation Costs (per screening) (25%) \$ 145,884,535 \$ 254,405,187 \$ 64,873,323 \$ 64,873,															
Program Implementation Costs (per screening) \$ 7,374,556 \$ 37,200,556 \$ 64,873,323 Program Implementation Costs \$ 7,229,957 \$ 36,471,134 \$ 63,601,297 Subtotal \$ 43,524,342 \$ 219,556,225 \$ 382,879,807			\$ 1,485,000			1.40				1.40					
Contingencies (per screening) (25%) \$ 7,229,957 \$ 36,471,134 \$ 63,601,297 Subtotal \$ 43,524,342 \$ 219,556,225 \$ 382,879,807	Program Implementation Costs (per screening)														
Subtotal \$ 43,524,342 \$ 219,556,225 \$ 382,879,807	Program Implementation Costs														
Subtotal \$ 43,524,342 \$ 219,556,225 \$ 382,879,807	Contingencies (per screening) (25%)						\$ 7,229,95				\$ 36,471,134				\$ 63,601,297

Subtotal (Rounded) \$ 44,000,000 \$ 220,000,000 \$ 383,000,000

	2A (4.2 miles)	2B (1.0 miles)	2C1 (1.0 miles)			2C2 (1.3 miles)				2D (1.2 miles)	
Subsection 2	At Grade	Berm	Berm	Aerial Viaduct	Berm	At Grade	Open Trench (HST Only)	Covered Trench/Tunnel (HST Only)	At Grade	Open Trench (HST Only)	Covered Trench (HST Only)
Capital Cost (\$2009 in Millions) does not include ROW	\$74	\$66	\$51 (2 tracks)	\$132 (3 tracks); \$93 (2 tracks)	\$130 (3 tracks); \$105 (2 tracks)	\$28 (3 tracks); \$26 (2 tracks)		•			\$294 (1 track); \$314 (2 tracks)
Acquisition Cost of Permanent ROW	Highest	Medium	Medium	Medium	Medium	Highest	Medium	Lowest	Highest	Medium	Lowest
Notes:	Existing 4 tracks extends from the Caltrain Bayshore Station to just north of the US 101 overpass. Caltrain South San Francisco Station	Linden Ave and Scott St converted to undercrossings.	1. Assume Caltrain 2 track grade separation project completed (includes San Bruno Ave, San Mateo Ave, and Angus Ave converted to undercrossings).	and HST Millbrae station. Must be combined with 1 track open trench or tunnel option. 2 tracks (2 Caltrain)- 1. Two tracks on existing Caltrain alignment for	and HST Millbrae station. <i>Must be combined with 1 track open trench or tunnel option.</i> 2 tracks (2 Caltrain)- 1. Two tracks on	track open trench or tunnel option. 2 tracks (2 Caltrain)- 1. Two tracks on existing Caltrain alignment for approach to Caltrain	Must be combined with 3 track aerial viaduct, berm, or at grade option. 2 tracks - 1. Two tracks on new alignment for approach to HST Millbrae station. Must be combined with 2 track aerial viaduct, berm, or at grade	alignment for approach to HST Millbrae station. Must be combined with 3 track aerial viaduct, berm, or at grade option. 2 tracks - 1. Two tracks on new alignment for approach to HST Millbrae station. Must be combined with 2 track aerial viaduct, berm, or at grade option	Caitrain)- 1. Two tracks on existing Caltrain	alignment for HST Millbrae station. Must be combined with 3 track at grade option. 2. HST Millbrae station (1 platform) 2 tracks - 1. Two tracks on new alignment for HST Millbrae station. Must be combined with 2 track at grade option. 2. HST Millbrae	Must be combined

COST ELEMENTS	UNIT	UN	IIT PRICE		At-	Grade				
Subsection 2			ase: 2009 d Quarter)	Start: 450 + 00	End: 671 + 00	A 4.19	Mile	S		
Subsection Details Oouble Track At-Grade (Mile)		(31)	d Quarter)	Start: 450 + 00	End: 671 + 00	Quant. 4.19 Miles		Cost		
Double Track Elevated (Mile) Double Track Tunnel (Mile) Double Track Trench (Mile) Four Track Construction/Reconstruction At-Grade (Mile) Four Track Elevated (Mile) Four Track Tunnel (Mile) Four Track Tunnel (Mile)				Start: 0 + 00 Start: 0 + 00	End: 0 + 00	0.00 Miles				
Double Track Section - Total Double Track Section - At Grade Double Track Section - On Structure Double Track Section - In Tunnel or Subway Double Track Section - In Trench	Mile Mile Mile Mile	\$ \$ \$	2,100,224 4,700,160 4,700,160 4,700,160			4.19 0.00 0.00 0.00	\$	8,790,710 - - -		
Four Track Section - Total Four-track Section - At Grade Four-Track Section - On Structure Four-Track Section - In Tunnel or Subway Four-Track Section - In Trench Single Track - Total	Mile Mile Mile	\$ \$ \$	4,200,448 9,400,320 9,400,320 9,400,320			0.00	\$			
5 Single Track Section - At Grade 6 Single Track Section - On structure 7 Single Track Section - In Tunnel or Subway 8 Single Track Section - In Trench 9 Freight Double Track - At Grade 10 Freight Single Track - At Grade	Mile Mile Mile Mile Mile	\$ \$ \$	1,549,312 2,350,080 2,350,080 2,350,080 2,839,552			0 0 0 0	\$ \$			
Earthwork Items Site Preparation - Undeveloped Total Cut Total Fill Borrow Spoil Landscape erosion Control Security Fencing (Both sides of ROW) Special Drainage Facilities	Acre CY CY CY CY Acre Mile 5% Eart	\$ \$ \$ \$ \$ \$	9,216 6.00 6.00 13.00 13.00 6,144 144,384			32.98 0.00 0.00 0.00 0.00 0.00	\$ \$ \$ \$ \$	303,92 ⁻ 15,196		
Structures, Tunnels, Walls 1 Standard Structure (2 tracks) Standard Structure (4 tracks) 2 High Structure 3 Long Span Structure 4 Waterway Crossing - Primary 5 Waterway Crossing - Secondary (Irrigation Canal) 6 Twin Single Track Drill&Blast (<6 Miles) 7 Twin Single Track TBM (<6 Miles) 8 Twin Single Track TBM w/3rd Tube (<6 Miles) 9 Double Track TBM w/3rd Tube (<6 Miles) 10 Double Track Mined (Soft Soil) Double Track TBM (<6 Miles) 11 Seismic Chamber (Drill & Blast/Mined) 12 Crossovers 13 Cut & Cover Double Track Tunnel 14 Trench Long (2 tracks) (1000 + ft) Trench Long (4 tracks) (1000 + ft)	Mile Mile Mile Mile Mile Mile Mile Mile	\$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$	34,972,672 52,459,008 40,424,448 61,919,232 85,342,208 92,049,408 42,731,264 06,637,312 76,720,896 46,887,680 79,200,000 06,637,312 76,720,896 42,205,952 442,368 31,246,080 57,524,224 86,286,336			0.00 0.02 0.00 0.00 0.00	* * * * * * * * * * * * * * * * * * * *	1,743,360		
15 Trench Short (2 tracks) (<1000 ft) Trench Short (4 tracks) (<1000 ft) 16 Mechanical & Electrical for Tunnels 17 Retaining Walls 18 Containment Walls 19 Single Track Cut and Cover Subway Four Track Drill & Blast Four Track Mined (Soft Soil) Four Track TBM (<6 Miles) Four Track TBM w/3rd Tube (>6 Miles) Four Track Cut & Cover Tunnel Double Deck with Double Track Cut and Cover Box	Mile Mile Mile Mile Mile Mile Mile Mile	\$ 1 \$ \$ 1 \$ 2 \$ 1 \$ 2 \$ 3 \$ 2	78,843,904 18,265,856 11,848,704 8,613,888 5,907,456 31,246,080 93,775,360 58,400,000 13,274,624 53,441,792 62,492,160 28,521,114			0.00	\$ \$ \$ \$ \$ \$ \$			

section 2							_		
			Base: 2009		1	A			
			(3rd Quarter)	Start: 450 + 00	End: 671 + 00	4.19	Miles		
ection Details		l				Quant.		Cost	
le Track At-Grade (Mile)				Start: 450 + 00	End: 671 + 00	4.19 Miles			
ole Track Elevated (Mile) ole Track Tunnel (Mile)				Start: 0 + 00		0.00 Miles 0.00 Miles			
ole Track Tunnel (Mile) ole Track Trench (Mile)				Start: 0 + 00 Start: 0 + 00		0.00 Miles			
Track Construction/Reconstruction At-Grade (Mile)				Start: 0 + 00	End: 0 + 00	0.00 Miles			
Track Elevated (Mile)				Start: 0 + 00		0.00 Miles			
Track Tunnel (Mile) Track Trench (Mile)				Start: 0 + 00 Start: 0 + 00		0.00 Miles 0.00 Miles			
Roadway Crossing HSR - 4 Lane Roadway Under 4 Tracks (Urban)	ea	а	\$ 19,926,528			0.00 Miles	\$	-	
Roadway Crossing HSR - 2 Lane Roadway Under 4 Tracks (Suburban)	ea	a	\$ 2,759,680				\$	-	
Roadway Crossing HSR - 2 Lane Roadway Under 2 Tracks (Undeveloped)	ea		\$ 2,029,568				\$	-	
Roadway Crossing HSR - 4 Lane Roadway Over 4 Tracks (Urban) Roadway Crossing HSR - 4 Lane Roadway Over 2 Tracks (Suburban)	ea ea		\$ 3,563,520 \$ 3,593,216			0	\$ \$	-	
Roadway Crossing HSR - 2 Lane Roadway Over 4 Tracks (Juban)	ea		\$ 2,850,816			0	\$	-	
Roadway Crossing HSR - 2 Lane Roadway Over 2 Tracks (Undeveloped)	ea		\$ 3,171,328				\$	-	
Street Bridging HSR Trench Minor Crossing Closures	ea ea		\$ 1,398,784 \$ 87,040				\$	-	
illior crossing closures	ea	a	\$ 67,040				Ф	-	
Building Items									
ntermediate Passenger Stations	E	Each	\$ -				\$	-	
erminal Passenger Stations	E	Each	\$ -				\$	-	
Caltrain Passenger Station - At-Grade		ach	\$15,000,000			1	\$	15,000,000	
Caltrain Passenger Station - On Structure		ach	\$15,000,000				\$	-	
Caltrain Passenger Station - In Tunnel or Subway Caltrain Passenger Station - In Trench		Each Each	\$15,000,000 \$15,000,000				\$	-	
Maintenance Facility			\$ 123,921,884				\$	-	
Parking - Structures	sp	pace	\$ -				\$	-	
Parking - At Grade	sp	pace	\$				\$	-	
Rail & Utility Relocation									
Single Track Relocation (Temporary)	Mi	lile	\$ 2,000,896				\$	-	
single Track Relocation (Permanent)	Mi	lile	\$ 2,000,896				\$	=	
Single Treek Demovel	N 41	lilo.	¢ 120.040				¢		
ingle Track Removal Major Utility Relocations - Dense Urban			\$ 130,048 \$ 1,548,288				\$ \$	-	
Najor Utility Relocations - Urban			\$ 1,084,416				\$	-	
Najor Utility Relocations - Dense Suburban		lile	\$ 775,168				\$	-	
Major Utility Relocations - Suburban			\$ 464,896				\$	-	
Major Utility Relocations - Undeveloped	IVII	lile	\$ 30,720				\$	-	
ROW (Not Included)									
ROW required for each segment									
Dense Urban			\$ 2,786,321				\$	-	
Jrban Dense Suburban			\$ 1,371,510 \$ 908,134				\$	-	
Suburban			\$ 208,418				\$	-	
Indeveloped	Ac	cre	\$ 3,642				\$	-	
ROW required for Temp. Construction Easement Dense Urban	٨٥	oro					¢		
Irban		cre cre					\$	-	
Dense Suburban		cre					\$	-	
Suburban		cre					\$	-	
Indeveloped	Ac	cre					\$	-	
Right-of-Way Required for Stations, Maintenance & Parking Facilities Dense Urban	Αr	cre	\$ 2,786,321				\$		
Irban			\$ 1,371,510				\$	-	
Dense Suburban		cre	\$ 908,134				\$	-	
Suburban			\$ 208,418 \$ 3,642				\$	-	
Indeveloped Invironmental Mitigation = 3% Line Costs	I AC	cre	\$ 3,642				\$	775,596	
-								-,	
System Elements		191 -	A 0.070.000				.	0 // 1 005	
signaling (ATC) Communications (w/ Fiber Optic Backbone)			\$ 2,070,000 \$ 540,000			4.19 4.19		8,664,205 2,260,227	
Vayside Protection System			\$ 108,000			4.19		452,045	
								,	
Electrification Items			A 470.055				.	4.007.550	
raction Power supply raction Power Distribution			\$ 1,170,000 \$ 1,485,000			4.19 4.19		4,897,159 6,215,625	
	ototal	iii C	ψ 1, 1 00,000			4.19	\$	49,118,044	
Program Implementation Costs (per screening)							\$	12,525,101	
Program Implementation Costs									
Contingencies (per screening) (25%)							\$	12,279,511	
go				<u>L</u>			_	12,217,011	
Subtotal							\$	73,922,656	

Subtotal (Rounded) \$ 74,000,000

Appendix F: Evaluation Matrices for SFTWG Alternative Alignment Options

Source: SFTWG

				San Francisco Technical	Working Group Options	
					from North of Tunnel 1 to 4th/King	
	Evaluation Measure		Portion of O(a)A: HST & Caltrain to 4th/King (Part that connects just west of I-280)	1A: North of Mission Bay Drive to South of 16th Street		1D, 1E, 1F & 1G: North of Cesar Chavez Street to South Portal Tunnel No. 4
			Covered Trench/Tunnel (0.46 miles) to 4th/King	Covered Trench/Tunnel (0.28 miles) to 4th/King	Covered Trench/Tunnel (0.16 miles) + At Grade (0.83 miles) to 4th/King	At-Grade and Covered Trench/Tunnel (3.46 miles) to 4th/King & TTC
	Maximize ridership / revenue	Travel time		More but not significant		Impacts same as CAHSR option
	potential	Route length		More but not significant		Impacts same as CAHSR option
	Maximize connectivity and accessibility	Intermodal connections	Connects with 4 th & King	Not applicable	Not applicable	Connects to Bayshore Station
Design Objectives	Minimize operating and	Operating and Maintenance (O&M) costs (relative costs associated with different options)	Tunnel is more	Tunnel is more	Tunnel is more	Impacts same as CAHSR option
	capital costs	Capital cost, does not include ROW	+ \$114 million	+ \$26 million	+ \$36 million	\$1,026 million
	Acquisition cost of additional ROW				Impacts same as CAHSR option	
Land Use	Development potential for TOD within ½ mile of station location	Development potential for TOD within ½ mile of station location	Yes	Not applicable	Not applicable	Impacts same as CAHSR option
	Consistency with other planning efforts and adopted plans	Qualitative analysis of applicable planning and policy documents	Consistent with adopted plans and policies	Consistent with adopted plans and policies	Consistent with adopted plans and policies	Impacts same as CAHSR option
Company salah ilian	Constructability, access for construction, within existing transportation ROW (does not include station constructability impacts)	Need for temporary construction easements (TCE)	TCE potentially required at tunnel portal locations	Construction would primarily occur within ultimate ROW	Construction would primarily occur within ultimate ROW; TCE required at tunnel portal locations	Impacts same as CAHSR option
Constructability	Disruption to existing railroads	Identify existing freight rail and other rail service connections	Caltrain currently operates on part of this ROW. Construction could impact service.	Caltrain currently operates on this ROW. Construction could impact service.	Caltrain currently operates on part of this ROW. Construction could impact service.	Impacts same as CAHSR option
	Disruption / relocation of utilities	Identify major utilities requiring relocations	Some	None	Some	Impacts same as CAHSR option
	Displacements	Potential impact on properties due to ultimate ROW requirements and grade separations	Low. Possibly some impacts due to vent structures.	Low. Possibly some impacts due to vent structures.	Low. Possibly some impacts due to vent structures.	Impacts same as CAHSR option
	Properties with access affected	Properties with access affected	None	None	None	Impacts same as CAHSR option
Disruption to Communities	Local traffic effects around stations	Increase in traffic congestion	Some	Not applicable	Not applicable	Impacts same as CAHSR option
	Local Traffic effects along alignment and at grade crossings	Identify streets with permanent loss of traffic lanes due to ultimate ROW requirements and identify traffic effects at grade crossings	None	Improved traffic conditions with tracks fully underground in tunnel at Mission Bay Drive and 16th Street	None	Impacts same as CAHSR option

				San Francisco Technical	Working Group Options	
				Option 1: HST/Caltrain under I-280	from North of Tunnel 1 to 4th/King	
	Evaluation Measure		Portion of O(a)A: HST & Caltrain to 4th/King (Part that connects just west of I-280)	1A: North of Mission Bay Drive to South of 16th Street	1B & 1C: South of 16th Street to North of Cesar Chavez Street	1D, 1E, 1F & 1G: North of Cesar Chavez Street to South Portal Tunnel No. 4
			Covered Trench/Tunnel (0.46 miles) to 4th/King	Covered Trench/Tunnel (0.28 miles) to 4th/King	Covered Trench/Tunnel (0.16 miles) + At Grade (0.83 miles) to 4th/King	At-Grade and Covered Trench/Tunnel (3.46 miles) to 4th/King & TTC
		Waterways (acres of waterways within ultimate ROW)	None	None	0.34, may be avoided depending on siting of vent shafts, tunnel portals, and tunnel depth	Impacts same as CAHSR option
■ · · · · · · · · · · · · · · · · · · ·	natural preserves or biologically sensitive habitat areas affected	Critical habitat (presence of waterways providing critical habitat for coastal steelhead, identified as Present or None)	None	None	2	Impacts same as CAHSR option
		Number of historic structures within ultimate ROW	Unknown at this time	None	None	Impacts same as CAHSR option
	Cultural resources	Archeological Sensitivity (identified as present or not)	Present; potential disturbance depends on siting of vent structures, tunnel portals, and tunnel depth	Present	Present	Impacts same as CAHSR option
	Parklands	Acres of parklands within ultimate ROW	None	None	None	Impacts same as CAHSR option
	Agricultural lands	Acres of farmland	Not applicable	Not applicable	Not applicable	Impacts same as CAHSR option
	Noise and Vibration effects on	Noise: Number of residential (R), institutional (I), medical (M), school (S) and park (P) properties within 200' of ultimate ROW	Less than R=101-200; impacts depend on siting of vent structures, tunnel portals, and tunnel depth	R=301-500, I<5, M<5, S<5; impacts depend on siting of vent structures and tunnel portals	Lower impacts than At Grade option depending on siting of vent structures and tunnel portals	Impacts same as CAHSR option
	sensitive receivers	Vibration: Number of residential (R), institutional (I), medical (M), school (S) and park (P) properties within 200' of ultimate ROW	Less than R=101-200; impacts for this option depend on siting of vent structures, tunnel portals, & tunnel depth	R=201-300, I<5, M<5, S<5; impacts depend on siting of vent structures and tunnel portals, and tunnel depth	Lower impacts than At Grade option depending on siting of vent structures, tunnel portals, and tunnel depth	Impacts same as CAHSR option
Environmental Measures	Change in visual/scenic resources	Number of residential (R), institutional (I), and park (P) properties immediately adjacent to the ultimate ROW	Visual setting not affected by below- ground alignment	Visual setting not affected by below- ground alignment	Visual setting not affected by below- ground alignment	Impacts same as CAHSR option
		Number of scenic roadways that cross the ROW	None	Minimal Impacts	Minimal Impacts	Impacts same as CAHSR option
	Iwith aeological and soils	Percent of ultimate ROW susceptible to liquefaction	75%	0%	Minimal Impacts	Impacts same as CAHSR option
M	IWITH HOTENTIAL HAZARANIS	Number of contaminated properties within ultimate ROW / within ¼ mile of ultimate ROW	0/2; impacts depend on siting of vent structures, tunnel portals, and tunnel depth	0/1; impacts depend on siting of vent structures, tunnel portals, and tunnel depth	0/1; impacts depend on siting of vent structures, tunnel portals, and tunnel depth	Impacts same as CAHSR option

				San Francisco Technical	Working Group Options	
				Option 2: HST/Caltrain under I-280	from South of Tunnel 1 to 4th/King	
	Evaluation Measure		Portion of O(a)A: HST & Caltrain to 4th/King (Part that connects just west of I-280)	1A: North of Mission Bay Drive to South of 16th Street		1D, 1E, 1F & 1G: North of Cesar Chavez Street to South Portal Tunnel No. 4
			Covered Trench/Tunnel (0.46 miles) to 4th/King	Covered Trench/Tunnel (0.28 miles) to 4th/King	Covered Trench/Tunnel (0.60 miles) + At Grade (0.44 miles) to 4th/King	At-Grade and Covered Trench/Tunnel (3.46 miles) to 4th/King & TTC
	Maximize ridership / revenue	Travel time		More but not significant		Impacts same as CAHSR option
	•	Route length		More but not significant		Impacts same as CAHSR option
	Maximize connectivity and accessibility	Intermodal connections	Connects with 4 th & King	Not applicable	22nd Street Station	Bayshore Station
Design Objectives	Minimize operating and	Operating and Maintenance (O&M) costs (relative costs associated with different options)	Tunnel is more	Tunnel is more	Tunnel is more	Impacts same as CAHSR option
	capital costs	Capital cost, does not include ROW	+ \$114 million	+ \$26 million	+ \$124 million	\$1,026 million
	Acquisition cost of additional ROW				Impacts same as CAHSR option	
Land Use	Development potential for TOD within ½ mile of station location	Development potential for TOD within ½ mile of station location	Yes	Not applicable	Not applicable	Impacts same as CAHSR option
	Consistency with other planning efforts and adopted plans	Qualitative analysis of applicable planning and policy documents	Consistent with adopted plans and policies	Consistent with adopted plans and policies	Consistent with adopted plans and policies	Impacts same as CAHSR option
Constant to billion	Constructability, access for construction, within existing transportation ROW (does not include station constructability impacts)	Need for temporary construction easements (TCE)	TCE potentially required at tunnel portal locations	Construction would primarily occur within ultimate ROW	Construction would primarily occur within ultimate ROW; TCE required at tunnel portal locations	Impacts same as CAHSR option
Constructability	Disruption to existing railroads	Identify existing freight rail and other rail service connections	Caltrain currently operates on part of this ROW. Construction could impact service.	Caltrain currently operates on this ROW. Construction could impact service.	Caltrain currently operates on part of this ROW. Construction could impact service.	Impacts same as CAHSR option
	Disruption / relocation of utilities	Identify major utilities requiring relocations	Some	None	Some	Impacts same as CAHSR option
	Displacements	Potential impact on properties due to ultimate ROW requirements and grade separations	Low. Possibly some impacts due to vent structures.	Low. Possibly some impacts due to vent structures.	Low. Possibly some impacts due to vent structures.	Impacts same as CAHSR option
	Properties with access affected	Properties with access affected	None	None	None	Impacts same as CAHSR option
Disruption to Communities	Local traffic effects around stations	Increase in traffic congestion	Some	Not applicable	Not applicable	Impacts same as CAHSR option
	Local Traffic effects along alignment and at grade crossings	Identify streets with permanent loss of traffic lanes due to ultimate ROW requirements and identify traffic effects at grade crossings	None	Improved traffic conditions with tracks fully underground in tunnel at Mission Bay Drive and 16th Street	None	Impacts same as CAHSR option

				San Francisco Technical	Working Group Options	
				Option 2: HST/Caltrain under I-280		
	Evaluation Measure		Portion of O(a)A: HST & Caltrain to 4th/King (Part that connects just west of I-280)	1A: North of Mission Bay Drive to South of 16th Street	1B & 1C: South of 16th Street to North of Cesar Chavez Street	1D, 1E, 1F & 1G: North of Cesar Chavez Street to South Portal Tunnel No. 4
			Covered Trench/Tunnel (0.46 miles) to 4th/King	Covered Trench/Tunnel (0.28 miles) to 4th/King	Covered Trench/Tunnel (0.60 miles) + At Grade (0.44 miles) to 4th/King	At-Grade and Covered Trench/Tunnel (3.46 miles) to 4th/King & TTC
	Waterways and wetlands and	Waterways (acres of waterways within ultimate ROW)	None	None	0.34, may be avoided depending on siting of vent shafts, tunnel portals, and tunnel depth	Impacts same as CAHSR option
inatural preserves or biologically sensitive habitat areas affected Environmental Resources		Critical habitat (presence of waterways providing critical habitat for coastal steelhead, identified as Present or None)	None	None	2	Impacts same as CAHSR option
	Number of historic structures within ultimate ROW	Unknown at this time.	None	None	Impacts same as CAHSR option	
	Cultural resources	Archeological Sensitivity (identified as present or not)	Present; potential disturbance depends on siting of vent structures, tunnel portals, and tunnel depth	Present	Present	Impacts same as CAHSR option
Parkle	Parklands	Acres of parklands within ultimate ROW	None	None	None	Impacts same as CAHSR option
	Agricultural lands	Acres of farmland	Not applicable	Not applicable	Not applicable	Impacts same as CAHSR option
	Noise and Vibration effects on	Noise: Number of residential (R), institutional (I), medical (M), school (S) and park (P) properties within 200' of ultimate ROW	Less than R=101-200; impacts depend on siting of vent structures, tunnel portals, and tunnel depth	R=301-500, I<5, M<5, S<5; impacts depend on siting of vent structures and tunnel portals	Lower impacts than At Grade option depending on siting of vent structures and tunnel portals	Impacts same as CAHSR option
	sensitive receivers	Vibration: Number of residential (R), institutional (I), medical (M), school (S) and park (P) properties within 200' of ultimate ROW	Less than R=101-200; impacts for this option depend on siting of vent structures, tunnel portals, & tunnel depth	R=201-300, I<5, M<5, S<5; impacts depend on siting of vent structures and tunnel portals, and tunnel depth	Lower impacts than At Grade option depending on siting of vent structures, tunnel portals, and tunnel depth	Impacts same as CAHSR option
Environmental Measures	Change in visual/scenic resources	Number of residential (R), institutional (I), and park (P) properties immediately adjacent to the ultimate ROW	Visual setting not affected by below- ground alignment	Visual setting not affected by below- ground alignment	Visual setting not affected by below- ground alignment	Impacts same as CAHSR option
		Number of scenic roadways that cross the ROW	None	Minimal Impacts	Minimal Impacts	Impacts same as CAHSR option
	IWITH APOIDAICAI ANA SOIIS	Percent of ultimate ROW susceptible to liquefaction	75%	0%	Minimal Impacts	Impacts same as CAHSR option
	IWITH HOTENTIAL HAZARANIS	Number of contaminated properties within ultimate ROW / within ¼ mile of ultimate ROW	0/2; impacts depend on siting of vent structures, tunnel portals, and tunnel depth	0/1; impacts depend on siting of vent structures, tunnel portals, and tunnel depth	0/1; impacts depend on siting of vent structures, tunnel portals, and tunnel depth	Impacts same as CAHSR option

				San Francisco Technical	Working Group Options	
				Option 3: Pennsylva	ania Ave. Alignment	
	Evaluation Measure		Portion of O(a)A: HST & Caltrain to 4th/King (Part that connects just west of I-280)	1A: North of Mission Bay Drive to		1D, 1E, 1F & 1G: North of Cesar Chavez Street to South Portal Tunnel No. 4
			Covered Trench/Tunnel (0.46 miles) to 4th/King	Covered Trench/Tunnel (0.28 miles) to 4th/King	Mined Tunnel (0.52 miles) + At Grade (0.49 miles) to 4th/King	At-Grade and Covered Trench/Tunnel (3.46 miles) to 4th/King & TTC
	Maximize ridership / revenue	Travel time		More but not significant		Impacts same as CAHSR option
	potential	Route length		More but not significant		Impacts same as CAHSR option
	Maximize connectivity and accessibility	Intermodal connections	Connects with 4 th & King	Not applicable	22nd Street Station	Bayshore Station
Design Objectives Minimize operating and capital costs	Minimize operating and	Operating and Maintenance (O&M) costs (relative costs associated with different options)	Tunnel is more	Tunnel is more	Tunnel is more	Impacts same as CAHSR option
	Capital cost, does not include ROW	+ \$214 million	+ \$26 million	+ \$134 million	\$1,026 million	
	Acquisition cost of additional ROW				Impacts same as CAHSR option	
Land Use	Development potential for TOD within ½ mile of station location	Development potential for TOD within ½ mile of station location	Yes	Not applicable	Not applicable	Impacts same as CAHSR option
Lund Osc	Consistency with other planning efforts and adopted plans	Qualitative analysis of applicable planning and policy documents	Consistent with adopted plans and policies	Consistent with adopted plans and policies	Consistent with adopted plans and policies	Impacts same as CAHSR option
	Constructability, access for construction, within existing transportation ROW (does not include station constructability impacts)	Need for temporary construction easements (TCE)	TCE potentially required at tunnel portal locations	Substantial impacts from cut-and-cover construction in street ROW	Construction would primarily occur within ultimate ROW; TCE required at tunnel portal locations	Impacts same as CAHSR option
Constructability	Disruption to existing railroads	Identify existing freight rail and other rail service connections	Caltrain currently operates on part of this ROW. Construction could impact service.	None	Caltrain currently operates on part of this ROW. Construction could impact service.	Impacts same as CAHSR option
	Disruption / relocation of utilities	Identify major utilities requiring relocations	Some	None	Some	Impacts same as CAHSR option
	Displacements	Potential impact on properties due to ultimate ROW requirements and grade separations	Low. Possibly some impacts due to vent structures.	Low. Possibly some impacts due to vent structures.	Medium. Transition from north end of tunnel 1 to Pennsylvania Avenue alignment would require property acquisitions. Possibly some impacts	Impacts same as CAHSR option
Diamontic - to	Properties with access affected	Properties with access affected	None	None	None	Impacts same as CAHSR option
Disruption to Communities	Local traffic effects around stations	Increase in traffic congestion	Some	Not applicable	Not applicable	Impacts same as CAHSR option
	Local Traffic effects along alignment and at grade crossings	Identify streets with permanent loss of traffic lanes due to ultimate ROW requirements and identify traffic effects at grade crossings	None	Improved traffic conditions with tracks fully underground in tunnel at Mission Bay Drive and 16th Street	None	Impacts same as CAHSR option

				San Francisco Technical		
				Option 3: Pennsylva	nia Ave. Alignment	
	Evaluation Measure		Portion of O(a)A: HST & Caltrain to 4th/King (Part that connects just west of I-280)	1A: North of Mission Bay Drive to South of 16th Street	1B & 1C: South of 16th Street to North of Cesar Chavez Street	1D, 1E, 1F & 1G: North of Cesar Chavez Street to South Portal Tunnel No. 4
			Covered Trench/Tunnel (0.46 miles) to 4th/King	Covered Trench/Tunnel (0.28 miles) to 4th/King	Mined Tunnel (0.52 miles) + At Grade (0.49 miles) to 4th/King	At-Grade and Covered Trench/Tunnel (3.46 miles) to 4th/King & TTC
		Waterways (acres of waterways within ultimate ROW)	None	None	0.34, may be avoided depending on siting of vent shafts, tunnel portals, and tunnel depth	Impacts same as CAHSR option
biologically sensitive habitat areas affected Environmental Resources	natural preserves or biologically sensitive habitat areas affected	Critical habitat (presence of waterways providing critical habitat for coastal steelhead, identified as Present or None)	None	None	2	Impacts same as CAHSR option
	Number of historic structures within ultimate ROW	Unknown at this time.	None	None	Impacts same as CAHSR option	
	Cultural resources	Archeological Sensitivity (identified as present or not)	Present; potential disturbance depends on siting of vent structures, tunnel portals, and tunnel depth	Present	Present	Impacts same as CAHSR option
	Parklands	Acres of parklands within ultimate ROW	None	None	None	Impacts same as CAHSR option
	Agricultural lands	Acres of farmland	Not applicable	Not applicable	Not applicable	Impacts same as CAHSR option
	Noise and Vibration effects on	Noise: Number of residential (R), institutional (I), medical (M), school (S) and park (P) properties within 200' of ultimate ROW	Less than R=101-200; impacts depend on siting of vent structures, tunnel portals, and tunnel depth	R=301-500, I<5, M<5, S<5; impacts depend on siting of vent structures and tunnel portals	Lower impacts than At Grade option depending on siting of vent structures and tunnel portals	Impacts same as CAHSR option
	sensitive receivers	Vibration: Number of residential (R), institutional (I), medical (M), school (S) and park (P) properties within 200' of ultimate ROW	Less than R=101-200; impacts for this option depend on siting of vent structures, tunnel portals, & tunnel depth	R=201-300, I<5, M<5, S<5; impacts depend on siting of vent structures and tunnel portals, and tunnel depth	Lower impacts than At Grade option depending on siting of vent structures, tunnel portals, and tunnel depth	Impacts same as CAHSR option
Environmental Measures	Change in visual/scenic resources	Number of residential (R), institutional (I), and park (P) properties immediately adjacent to the ultimate ROW	Visual setting not affected by below- ground alignment	Visual setting not affected by below- ground alignment	Visual setting not affected by below- ground alignment	Impacts same as CAHSR option
		Number of scenic roadways that cross the ROW	None	Minimal Impacts	Minimal Impacts	Impacts same as CAHSR option
	Maximize avoidance of areas with geological and soils constraints	Percent of ultimate ROW susceptible to liquefaction	75%	0%	Minimal Impacts	Impacts same as CAHSR option
	Maximize avoidance of areas with potential hazardous materials	Number of contaminated properties within ultimate ROW / within ¼ mile of ultimate ROW	0/2; impacts depend on siting of vent structures, tunnel portals, and tunnel depth	0/1; impacts depend on siting of vent structures, tunnel portals, and tunnel depth	0/1; impacts depend on siting of vent structures, tunnel portals, and tunnel depth	Impacts same as CAHSR option

				San Francisco Technical	Working Group Options	
			Option 4A: Replace	I-280 with Parkway over 4-track tunnel l	box, fully underground from Cesar Chave	ez to 4th/King & TTC
	Evaluation Measure		OA: HST & Caltrain to both Transbay and 4th/King	1A: North of Mission Bay Drive to South of 16th Street	1B & 1C: South of 16th Street to North of Cesar Chavez Street	1D, 1E, 1F & 1G: North of Cesar Chavez Street to South Portal Tunnel No. 4
			Tunnel (2.2 miles - 4 track and 2 track) All stations and M&O "underground" + Parkway	4 track Covered Tunnel Box (0.28 miles) + Parkway	4 track Covered Tunnel Box (1.08 miles) + Parkway	4 track At-Grade with Expanded Tunnels (3.46 miles)
	Maximize ridership / revenue	Travel time	1 Falkway	More but not significant		
	potential	Route length		More but not significant		
	Maximize connectivity and accessibility	Intermodal connections	Connects with both Transbay and 4 th & King	Not applicable	22nd Street Station (deep)	Bayshore Station
Design Objectives	Minimize operating and	Operating and Maintenance (O&M) costs (relative costs associated with different options)	Tunnel and Underground Stations and M&O more	Tunnel is more	Tunnel is more	Impacts same as CAHSR option
capital costs	Capital cost, does not include ROW		Total estimated cost is \$6,265 million		\$459 million	
	Acquisition cost of additional ROW					
Land Use	Development potential for TOD within ½ mile of station location	Development potential for TOD within ½ mile of station location	Yes	Not applicable	Not applicable	Not applicable
	Consistency with other planning efforts and adopted plans	Qualitative analysis of applicable planning and policy documents	Consistent with adopted plans and policies	Consistent with adopted plans and policies	Consistent with adopted plans and policies	Consistent with adopted plans and policies
Constants billion	Constructability, access for construction, within existing transportation ROW (does not include station constructability impacts)	Need for temporary construction easements (TCE)	TCE required for demolition of I-280 & construction of Parkway and tunnel.	TCE required for demolition of I-280 & construction of Parkway and tunnel.	TCE required for demolition of I-280 & construction of Parkway and tunnel.	TCE potentially required at portals
Constructability	Disruption to existing railroads	Identify existing freight rail and other rail service connections	Caltrain currently operates on part of this ROW. Construction could impact service.	Caltrain currently operates on this ROW. Construction could impact service.	Caltrain currently operates on this ROW. Construction could impact service.	Caltrain currently operates on this ROW. Construction could impact service.
	Disruption / relocation of utilities	Identify major utilities requiring relocations	Some	None	Some	Some
	Displacements	Potential impact on properties due to ultimate ROW requirements and grade separations	Low-Medium due to ultimate ROW requirements	Low-Medium due to ultimate ROW requirements	Low-Medium due to ultimate ROW requirements	Low-Medium due to ultimate ROW requirements
	Properties with access affected	Properties with access affected	None	None	None	None
Disruption to Communities	Local traffic effects around stations	Increase in traffic congestion	Some	Not applicable	Not applicable	Not applicable
	Local Traffic effects along alignment and at grade crossings	Identify streets with permanent loss of traffic lanes due to ultimate ROW requirements and identify traffic effects at grade crossings	Rails in trench result in no at grade crossings. All lanes on I-280 eliminated; replaced by 4-lane Parkway.	Rails in trench result in no at grade crossings. All lanes on I-280 eliminated; replaced by 4-lane Parkway.	All lanes on I-280 eliminated; replaced by 4-lane Parkway.	Rails in existing ROW, no at grade crossings.

					Working Group Options	
			Option 4A: Replace	l-280 with Parkway over 4-track tunnel l	oox, fully underground from Cesar Chave	ez to 4th/King & TTC
	Evaluation Measure		OA: HST & Caltrain to both Transbay and 4th/King	1A: North of Mission Bay Drive to South of 16th Street	1B & 1C: South of 16th Street to North of Cesar Chavez Street	1D, 1E, 1F & 1G: North of Cesar Chavez Street to South Portal Tunnel No. 4
			Tunnel (2.2 miles - 4 track and 2 track) All stations and M&O "underground" + Parkway	4 track Covered Tunnel Box (0.28 miles) + Parkway	4 track Covered Tunnel Box (1.08 miles) + Parkway	4 track At-Grade with Expanded Tunnels (3.46 miles)
	Waterways and wetlands and	Waterways (acres of waterways within ultimate ROW)	I-280 demolition & Parkway replacement cross channel. Impact?	None	0.34, may be avoided depending on siting of vent shafts, tunnel portals, and tunnel depth	Less than 0.15
	natural preserves or biologically sensitive habitat areas affected	Critical habitat (presence of waterways providing critical habitat for coastal steelhead, identified as Present or None)	None	None	2	2
Environmental Resources Cultural re		Number of historic structures within ultimate ROW	4?	None	None	None
	Cultural resources	Archeological Sensitivity (identified as present or not)	Present; potential disturbance depends on siting of vent structures, tunnel portals, and tunnel depth	Present	Present	Present
	Parklands	Acres of parklands within ultimate ROW	Park located at I-280 crossing channel; potentially impacted.	None	None?	Less than 0.68
	Agricultural lands	Acres of farmland	Not applicable	Not applicable	Not applicable	Not applicable
		Noise: Number of residential (R), institutional (I), medical (M), school (S) and park (P) properties within 200' of ultimate ROW	Less than R=101-200; impacts depend on siting of vent structures, tunnel portals, and tunnel depth	R=301-500, I<5, M<5, S<5; impacts depend on siting of vent structures and tunnel portals	Lower impacts than At Grade option depending on siting of vent structures and tunnel portals	Impacts depend on siting of vent structures and tunnel portal, and tunnel depth
		Vibration: Number of residential (R), institutional (I), medical (M), school (S) and park (P) properties within 200' of ultimate ROW	Less than R=101-200; impacts for this option depend on siting of vent structures, tunnel portals, & tunnel depth	R=201-300, I<5, M<5, S<5; impacts depend on siting of vent structures and tunnel portals, and tunnel depth	Lower impacts than At Grade option depending on siting of vent structures, tunnel portals, and tunnel depth	Impacts depend on siting of vent structures and tunnel portal, and tunnel depth
	Change in visual/scenic resources	Number of residential (R), institutional (I), and park (P) properties immediately adjacent to the ultimate ROW	Visual setting not affected by below- ground alignment	Visual setting not affected by below- ground alignment	Visual setting not affected by below- ground alignment	Minimal impacts
M wi		Number of scenic roadways that cross the ROW	None	Minimal Impacts	Minimal Impacts	Minimal impacts
	WITH APOINAICAL ANA SOLIS	Percent of ultimate ROW susceptible to liquefaction	75%	0%	Minimal Impacts	Minimal impacts
	WITH NOTENTIAL NAZARANIS	Number of contaminated properties within ultimate ROW / within ¼ mile of ultimate ROW	0/2; impacts depend on siting of vent structures, tunnel portals, and tunnel depth	0/1; impacts depend on siting of vent structures, tunnel portals, and tunnel depth	0/1; impacts depend on siting of vent structures, tunnel portals, and tunnel depth	0/6; impacts depend on siting of vent structures, tunnel portals, and tunnel depth

			San Francisco Technical Working Group Options					
			Option 4B: Replace I-	280 with Parkway over 4-track tunnel bo	ox, underground from Cesar Chavez to 1	TC, 4th/King at grade		
	Evaluation Measure		OA: HST & Caltrain to both Transbay and 4th/King	1A: North of Mission Bay Drive to South of 16th Street	1B & 1C: South of 16th Street to North of Cesar Chavez Street	1D, 1E, 1F & 1G: North of Cesar Chavez Street to South Portal Tunnel No. 4		
			Tunnel (2.2 miles - 2 track and 2 track) + Parkway	4 track Covered Tunnel Box (0.28 miles) + Parkway	4 track Covered Tunnel Box (1.08 miles) + Parkway	4 track At-Grade with Expanded Tunnels (3.46 miles)		
	Maximize ridership / revenue	Travel time		More but not significant				
	potential	Route length		More but not significant				
	Maximize connectivity and accessibility	Intermodal connections	Connects with both Transbay and 4 th & King	Not applicable	22nd Street Station (deep)	Bayshore Station		
Design Objectives	Minimize operating and	Operating and Maintenance (O&M) costs (relative costs associated with different options)	Tunnel is more	Tunnel is more	Tunnel is more	Impacts same as CAHSR option		
	capital costs	Capital cost, does not include ROW		Total estimated cost is \$4,441 million		\$459 million		
		Acquisition cost of additional ROW						
Land Use	Development potential for TOD within ½ mile of station location	Development potential for TOD within ½ mile of station location	Yes	Not applicable	Not applicable	Not applicable		
	Consistency with other planning efforts and adopted plans	Qualitative analysis of applicable planning and policy documents	Consistent with adopted plans and policies	Consistent with adopted plans and policies	Consistent with adopted plans and policies	Consistent with adopted plans and policies		
Company salah ilih	Constructability, access for construction, within existing transportation ROW (does not include station constructability impacts)	Need for temporary construction easements (TCE)	TCE required for demolition of I-280 & construction of Parkway and tunnel.	TCE required for demolition of I-280 & construction of Parkway and tunnel.	TCE required for demolition of I-280 & construction of Parkway and tunnel.	TCE potentially required at portals		
Constructability	Disruption to existing railroads	Identify existing freight rail and other rail service connections	Caltrain currently operates on part of this ROW. Construction could impact service.	Caltrain currently operates on this ROW. Construction could impact service.	Caltrain currently operates on this ROW. Construction could impact service.	Caltrain currently operates on this ROW. Construction could impact service.		
		Identify major utilities requiring relocations	Some	None	Some	Some		
	Displacements	Potential impact on properties due to ultimate ROW requirements and grade separations	Low-Medium due to ultimate ROW requirements	Low-Medium due to ultimate ROW requirements	Low-Medium due to ultimate ROW requirements	Low-Medium due to ultimate ROW requirements		
		Properties with access affected	None	None	None	None		
Disruption to Communities	Local traffic effects around stations	Increase in traffic congestion	Some	Not applicable	Not applicable	Not applicable		
	Local Traffic effects along alignment and at grade crossings	Identify streets with permanent loss of traffic lanes due to ultimate ROW requirements and identify traffic effects at grade crossings	Rails in trench result in no at grade crossings. All lanes on I-280 eliminated; replaced by 4-lane Parkway.	Rails in trench result in no at grade crossings. All lanes on I-280 eliminated; replaced by 4-lane Parkway.	All lanes on I-280 eliminated; replaced by 4-lane Parkway.	Rails in existing ROW, no at grade crossings.		

				San Francisco Technical	Working Group Options			
			Option 4B: Replace I-280 with Parkway over 4-track tunnel box, underground from Cesar Chavez to TTC, 4th/King at grade					
	Evaluation Measure		OA: HST & Caltrain to both Transbay and 4th/King	1A: North of Mission Bay Drive to South of 16th Street	1B & 1C: South of 16th Street to North of Cesar Chavez Street	1D, 1E, 1F & 1G: North of Cesar Chavez Street to South Portal Tunnel No. 4		
			Tunnel (2.2 miles - 2 track and 2 track) + Parkway	4 track Covered Tunnel Box (0.28 miles) + Parkway	4 track Covered Tunnel Box (1.08 miles) + Parkway	4 track At-Grade with Expanded Tunnels (3.46 miles)		
	Waterways and wetlands and	Waterways (acres of waterways within ultimate ROW)	I-280 demolition & Parkway replacement cross channel. Impact?	None	0.34, may be avoided depending on siting of vent shafts, tunnel portals, and tunnel depth	Less than 0.15		
	natural preserves or biologically sensitive habitat areas affected	Critical habitat (presence of waterways providing critical habitat for coastal steelhead, identified as Present or None)	None	None	2	2		
Environmental Resources		Number of historic structures within ultimate ROW	4?	None	None	None		
	Cultural resources	Archeological Sensitivity (identified as present or not)	Present; potential disturbance depends on siting of vent structures, tunnel portals, and tunnel depth	Present	Present	Present		
	Parklands	Acres of parklands within ultimate ROW	Park located at I-280 crossing channel; potentially impacted.	None	None?	Less than 0.68		
	Agricultural lands	Acres of farmland	Not applicable	Not applicable	Not applicable	Not applicable		
	Noise and Vibration effects on sensitive receivers	Noise: Number of residential (R), institutional (I), medical (M), school (S) and park (P) properties within 200' of ultimate ROW	Less than R=101-200; impacts depend on siting of vent structures, tunnel portals, and tunnel depth	R=301-500, I<5, M<5, S<5; impacts depend on siting of vent structures and tunnel portals	Lower impacts than At Grade option depending on siting of vent structures and tunnel portals	Impacts depend on siting of vent structures and tunnel portal, and tunnel depth		
		Vibration: Number of residential (R), institutional (I), medical (M), school (S) and park (P) properties within 200' of ultimate ROW	Less than R=101-200; impacts for this option depend on siting of vent structures, tunnel portals, & tunnel depth	R=201-300, I<5, M<5, S<5; impacts depend on siting of vent structures and tunnel portals, and tunnel depth	Lower impacts than At Grade option depending on siting of vent structures, tunnel portals, and tunnel depth	Impacts depend on siting of vent structures and tunnel portal, and tunnel depth		
		Number of residential (R), institutional (I), and park (P) properties immediately adjacent to the ultimate ROW	Visual setting not affected by below- ground alignment	Visual setting not affected by below- ground alignment	Visual setting not affected by below- ground alignment	Minimal impacts		
		Number of scenic roadways that cross the ROW	None	Minimal Impacts	Minimal Impacts	Minimal impacts		
	with aeological and soils	Percent of ultimate ROW susceptible to liquefaction	75%	0%	Minimal Impacts	Minimal impacts		
	with notential hazardous	Number of contaminated properties within ultimate ROW / within ¼ mile of ultimate ROW	0/2; impacts depend on siting of vent structures, tunnel portals, and tunnel depth	0/1; impacts depend on siting of vent structures, tunnel portals, and tunnel depth	0/1; impacts depend on siting of vent structures, tunnel portals, and tunnel depth	0/6; impacts depend on siting of vent structures, tunnel portals, and tunnel depth		

				San Francisco Technical	Working Group Options	
			Option 4C: Replace I	-280 with Parkway over 4-track tunnel b	ox, underground from 16th Street to T	TC, 4th/King at grade
	Evaluation Measure		OA: HST & Caltrain to both Transbay and 4th/King	1A: North of Mission Bay Drive to South of 16th Street	1B & 1C: South of 16th Street to North of Cesar Chavez Street	1D, 1E, 1F & 1G: North of Cesar Chavez Street to South Portal Tunnel No. 4
			Tunnel (2.2 miles - 2 track and 2 track) + Parkway	4 track Covered Tunnel Box (0.28 miles) + Parkway	4 track At-Grade (1.08 miles)	At-Grade and Covered Trench/Tunnel (3.46 miles) to 4th/King & TTC
	Maximize ridership / revenue	Travel time		More but not significant		
		Route length		More but not significant		
	Maximize connectivity and accessibility	Intermodal connections	Connects with both Transbay and 4 th & King	Not applicable	22nd Street Station	Bayshore Station
Design Objectives	Minimize operating and	Operating and Maintenance (O&M) costs (relative costs associated with different options)	Tunnel is more	Tunnel is more	At-Grade is less	Impacts same as CAHSR option
	capital costs	Capital cost, does not include ROW	+ \$176 million	+ \$65 million	+ \$291 million	\$1,026 million
		Acquisition cost of additional ROW				
Land Use	Development potential for TOD within ½ mile of station location	Development potential for TOD within ½ mile of station location	Yes	Not applicable	Not applicable	Not applicable
	Consistency with other planning efforts and adopted plans	Qualitative analysis of applicable planning and policy documents	Consistent with adopted plans and policies	Consistent with adopted plans and policies	Consistent with adopted plans and policies	Consistent with adopted plans and policies
Couration at a letter	Constructability, access for construction, within existing transportation ROW (does not include station constructability impacts)	Need for temporary construction easements (TCE)	TCE required for demolition of I-280 & construction of Parkway and tunnel.	TCE required for demolition of I-280 & construction of Parkway and tunnel.	TCE potentially required at portals	TCE potentially required at portals
Constructability	Disruption to existing railroads	Identify existing freight rail and other rail service connections	Caltrain currently operates on part of this ROW. Construction could impact service.	Caltrain currently operates on this ROW. Construction could impact service.	Caltrain currently operates on this ROW. Construction could impact service.	Caltrain currently operates on this ROW. Construction could impact service.
	Disruption / relocation of utilities	Identify major utilities requiring relocations	Some	None	Some	Some
	Displacements	Potential impact on properties due to ultimate ROW requirements and grade separations	Low-Medium due to ultimate ROW requirements	Low-Medium due to ultimate ROW requirements	Low-Medium due to ultimate ROW requirements	Low-Medium due to ultimate ROW requirements
	Properties with access affected	Properties with access affected	None	None	None	None
Disruption to Communities	Local traffic effects around stations	Increase in traffic congestion	Some	Not applicable	Not applicable	Not applicable
	Local Traffic effects along alignment and at grade crossings	Identify streets with permanent loss of traffic lanes due to ultimate ROW requirements and identify traffic effects at grade crossings	Rails in trench result in no at grade crossings. All lanes on I-280 eliminated; replaced by 4-lane Parkway.	Rails in trench result in no at grade crossings. All lanes on I-280 eliminated; replaced by 4-lane Parkway.	All lanes on I-280 eliminated; replaced by 4-lane Parkway.	Rails in existing ROW, no at grade crossings.

				San Francisco Technical		
				-280 with Parkway over 4-track tunnel b		
	Evaluation Measure		OA: HST & Caltrain to both Transbay and 4th/King	1A: North of Mission Bay Drive to South of 16th Street	1B & 1C: South of 16th Street to North of Cesar Chavez Street	1D, 1E, 1F & 1G: North of Cesar Chavez Street to South Portal Tunnel No. 4
			Tunnel (2.2 miles - 2 track and 2 track) + Parkway	4 track Covered Tunnel Box (0.28 miles) + Parkway	4 track At-Grade (1.08 miles)	At-Grade and Covered Trench/Tunnel (3.46 miles) to 4th/King & TTC
	Waterways and wetlands and	Waterways (acres of waterways within ultimate ROW)	Potential impact with I-280 demolition & Parkway replacement cross channel.	None	0.34, may be avoided depending on siting of vent shafts, tunnel portals, and tunnel depth	Less than 0.15
	natural preserves or biologically sensitive habitat areas affected	Critical habitat (presence of waterways providing critical habitat for coastal steelhead, identified as Present or None)	None	None	2	2
Environmental Resources		Number of historic structures within ultimate ROW	4?	None	None	None
	Cultural resources	Archeological Sensitivity (identified as present or not)	Present; potential disturbance depends on siting of vent structures, tunnel portals, and tunnel depth	Present	Present	Present
	Parklands	Acres of parklands within ultimate ROW	Park located at I-280 crossing channel; potentially impacted.	None	None	Less than 0.68
	Agricultural lands	Acres of farmland	Not applicable	Not applicable	Not applicable	Not applicable
	Noise and Vibration effects on sensitive receivers	Noise: Number of residential (R), institutional (I), medical (M), school (S) and park (P) properties within 200' of ultimate ROW	Less than R=101-200; impacts depend on siting of vent structures, tunnel portals, and tunnel depth	R=301-500, I<5, M<5, S<5; impacts depend on siting of vent structures and tunnel portals	Lower impacts than At Grade option depending on siting of vent structures and tunnel portals	Impacts depend on siting of vent structures and tunnel portal, and tunnel depth
		Vibration: Number of residential (R), institutional (I), medical (M), school (S) and park (P) properties within 200' of ultimate ROW	Less than R=101-200; impacts for this option depend on siting of vent structures, tunnel portals, & tunnel depth	R=201-300, I<5, M<5, S<5; impacts depend on siting of vent structures and tunnel portals, and tunnel depth	Lower impacts than At Grade option depending on siting of vent structures, tunnel portals, and tunnel depth	Impacts depend on siting of vent structures and tunnel portal, and tunnel depth
Environmental Measures	Change in visual/scenic resources	Number of residential (R), institutional (I), and park (P) properties immediately adjacent to the ultimate ROW	Visual setting not affected by below- ground alignment	Visual setting not affected by below- ground alignment	Visual setting not affected by below- ground alignment	Minimal impacts
		Number of scenic roadways that cross the ROW	None	Minimal Impacts	Minimal Impacts	Minimal impacts
	Maximize avoidance of areas with geological and soils constraints	Percent of ultimate ROW susceptible to liquefaction	75%	0%	Minimal Impacts	Minimal impacts
	Maximize avoidance of areas with potential hazardous materials	Number of contaminated properties within ultimate ROW / within ¼ mile of ultimate ROW	0/2; impacts depend on siting of vent structures, tunnel portals, and tunnel depth	0/1; impacts depend on siting of vent structures, tunnel portals, and tunnel depth	0/1; impacts depend on siting of vent structures, tunnel portals, and tunnel depth	0/6; impacts depend on siting of vent structures, tunnel portals, and tunnel depth

				San Francisco Technical	Working Group Options	
				Option 5: Fully Undergr	ound Mega-Bore Tunnel	
	Evaluation Measure		OA: HST & Caltrain to both Transbay and 4th/King	1A: North of Mission Bay Drive to South of 16th Street	1B & 1C: South of 16th Street to North of Cesar Chavez Street	1D, 1E, 1F & 1G: North of Cesar Chavez Street to South Portal Tunnel No. 4
			Tunnel	Tunnel	Tunnel	Tunnel
	Maximize ridership / revenue	Travel time				
	potential	Route length				
	Maximize connectivity and accessibility	Intermodal connections	Connects with both Transbay and 4 th & King	Not applicable	22nd Street Station (deep)	Bayshore Station
Design Objectives	Minimize operating and	Operating and Maintenance (O&M) costs (relative costs associated with different options)				
	capital costs	Capital cost, does not include ROW		\$8,279	million +	
		Acquisition cost of additional ROW				
Land Use	Development potential for TOD within ½ mile of station location	Development potential for TOD within ½ mile of station location	Yes	Not applicable	Not applicable	Not applicable
Land OSC	Consistency with other planning efforts and adopted plans	Qualitative analysis of applicable planning and policy documents	Consistent with adopted plans and policies	Consistent with adopted plans and policies	Consistent with adopted plans and policies	Consistent with adopted plans and policies
Constantibility	Constructability, access for construction, within existing transportation ROW (does not include station constructability impacts)	Need for temporary construction easements (TCE)	Construction would primarily occur within ultimate ROW	Construction would primarily occur within ultimate ROW	Construction would primarily occur within ultimate ROW	Construction would primarily occur within ultimate ROW; TCE required at tunnel portal locations
Constructability	Disruption to existing railroads	Identify existing freight rail and other rail service connections	Caltrain currently operates on part of this ROW. Construction could impact service.	Caltrain currently operates on this ROW. Construction could impact service.	Caltrain currently operates on this ROW. Construction could impact service.	Caltrain currently operates on this ROW. Construction could impact service.
	Disruption / relocation of utilities	Identify major utilities requiring relocations	None	None	None	Some
	Displacements	Potential impact on properties due to ultimate ROW requirements and grade separations	Low. Possibly some impacts due to vent structures.	Low. Possibly some impacts due to vent structures.	Low. Possibly some impacts due to vent structures.	Low-Medium due to ultimate ROW requirements. Properties may need to be acquired north of Bayshore Station for tunnel portal.
	Properties with access affected	Properties with access affected	None	None	None	None
Disruption to Communities	Local traffic effects around stations	Increase in traffic congestion	Some	None	None	None
	Local Traffic effects along alignment and at grade crossings	Identify streets with permanent loss of traffic lanes due to ultimate ROW requirements and identify traffic effects at grade crossings	None	None	None	None

			San Francisco Technical Working Group Options Option 5: Fully Underground Mega-Bore Tunnel				
	Evaluation Measure		OA: HST & Caltrain to both Transbay and 4th/King	1A: North of Mission Bay Drive to South of 16th Street		1D, 1E, 1F & 1G: North of Cesar Chavez Street to South Portal Tunnel No. 4	
			Tunnel	Tunnel	Tunnel	Tunnel	
		Waterways (acres of waterways within ultimate ROW)	None	None	0.34, may be avoided depending on siting of vent shafts, tunnel portals, and tunnel depth	Less than 0.15	
	natural preserves or biologically sensitive habitat areas affected	Critical habitat (presence of waterways providing critical habitat for coastal steelhead, identified as Present or None)	None	None	2	2	
Environmental Resources		Number of historic structures within ultimate ROW	4	None	None	None	
	Cultural resources	Archeological Sensitivity (identified as present or not)	Present; potential disturbance depends on siting of vent structures, tunnel portals, and tunnel depth	Present	Present	Present	
	Parklands	Acres of parklands within ultimate ROW	None	None	None	Less than 0.68	
	Agricultural lands	Acres of farmland	Not Applicable	Not applicable	Not applicable	Not applicable	
	Noise and Vibration effects on sensitive receivers	Noise: Number of residential (R), institutional (I), medical (M), school (S) and park (P) properties within 200' of ultimate ROW	Less than R=101-200; impacts depend on siting of vent structures, tunnel portals, and tunnel depth	None	R=301-500, I<5, M<5, S<5; impacts depend on siting of vent structures	Impacts depend on siting of vent structures and tunnel portal, and tunnel depth	
		Vibration: Number of residential (R), institutional (I), medical (M), school (S) and park (P) properties within 200' of ultimate ROW	Less than R=101-200; impacts for this option depend on siting of vent structures, tunnel portals, & tunnel depth	None	R=201-300, I<5, M<5, S<5; impacts depend on siting of vent structures and tunnel depth	Impacts depend on siting of vent structures and tunnel portal, and tunnel depth	
Environmental Measures	Change in visual/scenic resources	Number of residential (R), institutional (I), and park (P) properties immediately adjacent to the ultimate ROW	Visual setting not affected by below- ground alignment	None	R=60-100	Minimal impacts	
		Number of scenic roadways that cross the ROW	None	Minimal Impacts	Minimal Impacts	Minimal impacts	
	Maximize avoidance of areas with geological and soils constraints	Percent of ultimate ROW susceptible to liquefaction	75%	0%	Minimal Impacts	Minimal impacts	
	Maximize avoidance of areas with potential hazardous materials	Number of contaminated properties within ultimate ROW / within ¼ mile of ultimate ROW	0/2; impacts depend on siting of vent structures and tunnel depth	0/1; impacts depend on siting of vent structures and tunnel depth	0/1; impacts depend on siting of vent structures and tunnel depth	0/6; impacts depend on siting of vent structures, tunnel portals, and tunnel depth	

Appendix G: Cost Estimates for SFTWG Alternative Alignment Options

Source: SFTWG

	Table 1 - ROM Cost Development Worksheet						
	Cost Elements	Unit	2009 \$, Unit Price	Option	_, Section		
				Quantity	\$		
Track Section	2 track -In Tunnel/Subway/Trench	Per mile	\$4,700,160		\$0		
	2 track - At-grade	Per mile	\$2,100,224		\$0		
	4 track - In Tunnel/Subway/Trench	Per mile	\$9,400,320		\$0		
Earthwork - 2 track	At-grade	Per mile	\$150,000		\$0		
	Covered trench/tunnel	Per mile	\$6,000,000		\$0		
	Mined tunnel	Per mile	\$15,000,000		\$0		
Grade Separations	HSR - 4 lanes under 2 tracks	Each	\$13,284,352		\$0		
	HSR - 4 lanes under 4 tracks	Each	\$19,926,528		\$0		
Structure, Tunnels, Walls	Twin Single Track Drill&Blast (<6 miles)	Per mile	\$142,731,264		\$0		
et acture, rannels, rrans	Cut/Cover Double Track Tunnel	Per mile	\$131,246,080		\$0		
	Double Track TBM (<6 miles)	Per mile	\$106,637,312		\$0		
	Four Track Drill&Blast	Per mile	\$293,775,369		\$0		
	Four Track Cut/Cover Tunnel	Per mile	\$262,492,160		\$0		
Underground Stations	Caltrain - Per Platform	Each	\$150,000,000		\$0		
-	HSR - Per Platform	Each	\$200,000,000		\$0		
Underground M&O Facility	Caltrain	Each	\$400,000,000		\$0		
I-280	Demolition (200' wide)	LF	\$8,000		\$0		
Parkway	4 Lanes with median	LF	\$5,000		\$0		
Ramps		Lump Sum	\$150,000,000		\$0		
System Elements	Signaling, Communications	Per mile	\$2,718,000	0	\$0		
Electrification	Traction Power	Per mile	\$2,655,000	0	\$0		
Mech/Electrical	For Tunnels	Per mile	\$11,848,704	0	\$0		
Environmental Mitigation	Percent of Hard Costs		3%		\$0		
Program Implementatio Costs	Percent of Hard Costs + Env Mit		25.50%		\$0		
Contingencies	Percent of Hard Costs + Env Mit		25.00%		\$0		
Total Cost					\$0		

Page 1 of 51 November 2010

CAHSRA Base Alternative						
	Cost Elements	Unit	2009 \$, Unit Price	Option Base, Section 1A to 4th/King		
				Quantity	\$	
Track Section	2 track -In Tunnel/Subway/Trench	Per mile	\$4,700,160		\$0	
	2 track - At-grade	Per mile	\$2,100,224	0.28	\$588,063	
	4 track - In Tunnel/Subway/Trench	Per mile	\$9,400,320		\$0	
Earthwork - 2 track	At-grade	Per mile	\$150,000	0.28	\$42,000	
	Covered trench/tunnel	Per mile	\$6,000,000		\$0	
	Mined tunnel	Per mile	\$15,000,000		\$0	
Grade Separations	HSR - 4 lanes under 2 tracks	Each	\$13,284,352	2	\$26,568,704	
·	HSR - 4 lanes under 4 tracks	Each	\$19,926,528		\$0	
Structure, Tunnels, Walls	Twin Single Track Drill&Blast (<6 miles)	Per mile	\$142,731,264		\$0	
Structure, runners, vvans	Cut/Cover Double Track Tunnel	Per mile	\$131,246,080		\$0	
	Double Track TBM (<6 miles)	Per mile	\$106,637,312		\$0	
	Four Track Drill&Blast	Per mile	\$293,775,369		\$0	
	Four Track Cut/Cover Tunnel	Per mile	\$262,492,160		\$0	
Underground Stations	Caltrain - Per Platform	Each	\$150,000,000		\$0	
	HSR - Per Platform	Each	\$200,000,000		\$0	
Underground M&O Facility	Caltrain	Each	\$400,000,000		\$0	
I-280	Demolition (200' wide)	LF	\$8,000		\$0	
Parkway	4 Lanes with median	LF	\$5,000		\$0	
Ramps	4 Lanes With Median	Lump Sum	\$150,000,000		\$0 \$0	
System Elements	Signaling, Communications	Per mile	\$2,718,000	0.28	\$761,040	
Electrification	Traction Power	Per mile	\$2,655,000	0.28	\$743,400	
Mech/Electrical	For Tunnels	Per mile	\$11,848,704	0	\$0	
Environmental Mitigation	Percent of Hard Costs		3%		\$861,096	
Program Implementatio Costs	Percent of Hard Costs + Env Mit		25.50%		\$7,538,897	
Contingencies	Percent of Hard Costs + Env Mit		25.00%		\$7,391,076	
Total Cost					\$44,494,276	

Page 2 of 51 November 2010

	CAHSRA Base Alternative						
	Cost Elements	Unit	2009 \$, Unit Price	Option Base, Section 1B to 4th/King			
				Quantity	\$		
Track Section	2 track -In Tunnel/Subway/Trench	Per mile	\$4,700,160		\$0		
	2 track - At-grade	Per mile	\$2,100,224	0.76	\$1,596,170		
	4 track - In Tunnel/Subway/Trench	Per mile	\$9,400,320		\$0		
Earthwork - 2 track	At-grade	Per mile	\$7,100,000	0.76	\$5,396,000		
	Covered trench/tunnel	Per mile	\$6,000,000		\$0		
	Mined tunnel	Per mile	\$15,000,000		\$0		
Grade Separations	HSR - 4 lanes under 2 tracks	Each	\$13,284,352		\$0		
	HSR - 4 lanes under 4 tracks	Each	\$19,926,528		\$0		
Structure, Tunnels, Walls	Twin Single Track Drill&Blast (<6 miles)	Per mile	\$142,731,264		\$0		
	Cut/Cover Double Track Tunnel	Per mile	\$131,246,080		\$0		
	Double Track TBM (<6 miles)	Per mile	\$106,637,312		\$0		
	Four Track Drill&Blast	Per mile	\$293,775,369		\$0		
	Four Track Cut/Cover Tunnel	Per mile	\$262,492,160		\$0		
Underground Stations	Caltrain - Per Platform	Each	\$150,000,000		\$0		
	HSR - Per Platform	Each	\$200,000,000		\$0		
Underground M&O Facility	Caltrain	Each	\$400,000,000		\$0		
I-280	Demolition (200' wide)	LF	\$8,000		\$0		
Parkway	4 Lanes with median	LF	\$5,000		\$0		
Ramps		Lump Sum	\$150,000,000		\$0		
System Elements	Signaling, Communications	Per mile	\$2,718,000	0.76	\$2,065,680		
Electrification	Traction Power	Per mile	\$2,655,000	0.76	\$2,017,800		
Mech/Electrical	For Tunnels	Per mile	\$11,848,704	0	\$0		
Environmental Mitigation	Percent of Hard Costs		3%		\$332,270		
Program Implementatio Costs	Percent of Hard Costs + Env Mit		25.50%		\$2,909,020		
Contingencies	Percent of Hard Costs + Env Mit		25.00%		\$2,851,980		
Total Cost					\$17,168,919		

Page 3 of 51 November 2010

CAHSRA Base Alternative						
	Cost Elements	Unit	2009 \$, Unit Price	Option Base, Section 1C to 4th/King		
				Quantity	\$	
Track Section	2 track -In Tunnel/Subway/Trench	Per mile	\$4,700,160	,	, \$0	
	2 track - At-grade	Per mile	\$2,100,224	0.23	\$483,052	
	4 track - In Tunnel/Subway/Trench	Per mile	\$9,400,320		\$0	
Earthwork - 2 track	At-grade	Per mile	\$3,200,000	0.23	\$736,000	
	Covered trench/tunnel	Per mile	\$6,000,000		\$0	
	Mined tunnel	Per mile	\$15,000,000		\$0	
Grade Separations	HSR - 4 lanes under 2 tracks	Each	\$13,284,352		\$0	
	HSR - 4 lanes under 4 tracks	Each	\$19,926,528		\$0	
Structure, Tunnels, Walls	Twin Single Track Drill&Blast (<6 miles)	Per mile	\$142,731,264		\$0	
	Cut/Cover Double Track Tunnel	Per mile	\$131,246,080		\$0	
	Double Track TBM (<6 miles)	Per mile	\$106,637,312		\$0	
	Four Track Drill&Blast	Per mile	\$293,775,369		\$0	
	Four Track Cut/Cover Tunnel	Per mile	\$262,492,160		\$0	
Underground Stations	Caltrain - Per Platform	Each	\$150,000,000		\$0	
	HSR - Per Platform	Each	\$200,000,000		\$0	
Underground M&O Facility	Caltrain	Each	\$400,000,000		\$0	
I-280	Demolition (200' wide)	LF	\$8,000		\$0	
Parkway	4 Lanes with median	LF	\$5,000		\$0	
Ramps		Lump Sum	\$150,000,000		\$0	
System Elements	Signaling, Communications	Per mile	\$2,718,000	0.23	\$625,140	
Electrification	Traction Power	Per mile	\$2,655,000	0.23	\$610,650	
Mech/Electrical	For Tunnels	Per mile	\$11,848,704	0	\$0	
Environmental Mitigation	Percent of Hard Costs		3%		\$73,645	
Program Implementatio Costs	Percent of Hard Costs + Env Mit		25.50%		\$644,764	
Contingencies	Percent of Hard Costs + Env Mit		25.00%		\$632,122	
Total Cost					\$3,805,373	

Page 4 of 51 November 2010

CAHSRA Base Alternative						
	Cost Elements	Unit	2009 \$, Unit Price	Option Base, Section 1D to 4th/King		
				Quantity	\$	
Track Section	2 track -In Tunnel/Subway/Trench	Per mile	\$4,700,160	·	\$0	
	2 track - At-grade	Per mile	\$2,100,224	0.91	\$1,911,204	
	4 track - In Tunnel/Subway/Trench	Per mile	\$9,400,320		\$0	
Earthwork - 2 track	At-grade	Per mile	\$150,000	0.91	\$136,500	
	Covered trench/tunnel	Per mile	\$6,000,000		\$0	
	Mined tunnel	Per mile	\$15,000,000		\$0	
Grade Separations	HSR - 4 lanes under 2 tracks	Each	\$13,284,352		\$0	
1	HSR - 4 lanes under 4 tracks	Each	\$19,926,528		\$0	
Structure, Tunnels, Walls	Twin Single Track Drill&Blast (<6 miles)	Per mile	\$142,731,264		\$0	
ot. acta. c, rac.s, rras	Cut/Cover Double Track Tunnel	Per mile	\$131,246,080		\$0	
	Double Track TBM (<6 miles)	Per mile	\$106,637,312		\$0	
	Four Track Drill&Blast	Per mile	\$293,775,369		\$0	
	Four Track Cut/Cover Tunnel	Per mile	\$262,492,160		\$0	
Underground Stations	Caltrain - Per Platform	Each	\$150,000,000		\$0	
	HSR - Per Platform	Each	\$200,000,000		\$0	
Underground M&O Facility	Caltrain	Each	\$400,000,000		\$0	
I-280	Demolition (200' wide)	LF	\$8,000		\$0	
Parkway	4 Lanes with median	LF	\$5,000		\$0 \$0	
Ramps	4 Lanes with median	Lump Sum	\$150,000,000		\$0 \$0	
System Elements	Signaling, Communications	Per mile	\$2,718,000	0.91	\$2,473,380	
Electrification	Traction Power	Per mile	\$2,655,000	0.91	\$2,416,050	
Mech/Electrical	For Tunnels	Per mile	\$11,848,704	0	\$0	
Environmental Mitigation	Percent of Hard Costs		3%		\$208,114	
Program Implementatio Costs	Percent of Hard Costs + Env Mit		25.50%		\$1,822,038	
Contingencies	Percent of Hard Costs + Env Mit		25.00%		\$1,786,312	
Total Cost					\$10,753,598	

Page 5 of 51 November 2010

CAHSRA Base Alternative						
	Cost Elements	Unit	2009 \$, Unit Price	Option Base, Section 1E to 4th/King		
				Quantity	\$	
Track Section	2 track -In Tunnel/Subway/Trench	Per mile	\$4,700,160		\$0	
	2 track - At-grade	Per mile	\$2,100,224	0.66	\$1,386,148	
	4 track - In Tunnel/Subway/Trench	Per mile	\$9,400,320		\$0	
Earthwork - 2 track	At-grade	Per mile	\$150,000	0.66	\$99,000	
	Covered trench/tunnel	Per mile	\$6,000,000		\$0	
	Mined tunnel	Per mile	\$15,000,000		\$0	
Grade Separations	HSR - 4 lanes under 2 tracks	Each	\$13,284,352		\$0	
·	HSR - 4 lanes under 4 tracks	Each	\$19,926,528		\$0	
Structure, Tunnels, Walls	Twin Single Track Drill&Blast (<6 miles)	Per mile	\$142,731,264		\$0	
ot. actarc, rames, rrans	Cut/Cover Double Track Tunnel	Per mile	\$131,246,080		\$0	
	Double Track TBM (<6 miles)	Per mile	\$106,637,312		\$0	
	Four Track Drill&Blast	Per mile	\$293,775,369		\$0	
	Four Track Cut/Cover Tunnel	Per mile	\$262,492,160		\$0	
Underground Stations	Caltrain - Per Platform	Each	\$150,000,000		\$0	
	HSR - Per Platform	Each	\$200,000,000		\$0	
Underground M&O Facility	Caltrain	Each	\$400,000,000		\$0	
I-280	Demolition (200' wide)	LF	\$8,000		\$0	
Parkway	4 Lanes with median	LF	\$5,000		\$0	
Ramps	4 Lanes with median	Lump Sum	\$150,000,000		\$0 \$0	
System Elements	Signaling, Communications	Per mile	\$2,718,000	0.66	\$1,793,880	
Electrification	Traction Power	Per mile	\$2,655,000	0.66	\$1,752,300	
Mech/Electrical	For Tunnels	Per mile	\$11,848,704	0	\$0	
Environmental Mitigation	Percent of Hard Costs		3%		\$150,940	
Program Implementatio Costs	Percent of Hard Costs + Env Mit		25.50%		\$1,321,478	
Contingencies	Percent of Hard Costs + Env Mit		25.00%		\$1,295,567	
Total Cost					\$7,799,313	

Page 6 of 51 November 2010

CAHSRA Base Alternative						
Cost Elements		Unit	2009 \$, Unit Price	Option Base, Section 1F to 4th/King		
				Quantity	\$	
Track Section	2 track -In Tunnel/Subway/Trench	Per mile	\$4,700,160		\$0	
	2 track - At-grade	Per mile	\$2,100,224	0.49	\$1,029,110	
	4 track - In Tunnel/Subway/Trench	Per mile	\$9,400,320		\$0	
Earthwork - 2 track	At-grade	Per mile	\$150,000	0.49	\$73,500	
	Covered trench/tunnel	Per mile	\$6,000,000		\$0	
	Mined tunnel	Per mile	\$15,000,000		\$0	
Grade Separations	HSR - 4 lanes under 2 tracks	Each	\$13,284,352		\$0	
	HSR - 4 lanes under 4 tracks	Each	\$19,926,528		\$0	
Structure, Tunnels, Walls	Twin Single Track Drill&Blast (<6 miles)	Per mile	\$142,731,264		\$0	
	Cut/Cover Double Track Tunnel	Per mile	\$131,246,080		\$0	
	Double Track TBM (<6 miles)	Per mile	\$106,637,312		\$0	
	Four Track Drill&Blast	Per mile	\$293,775,369		\$0	
	Four Track Cut/Cover Tunnel	Per mile	\$262,492,160		\$0	
Underground Stations	Caltrain - Per Platform	Each	\$150,000,000		\$0	
3	HSR - Per Platform	Each	\$200,000,000		\$0	
Rail & Utility Relocation		Per mile	\$3,700,000	0.49	\$1,813,000	
I-280	Demolition (200' wide)	LF	\$8,000		\$0	
Parkway	4 Lanes with median	LF	\$5,000		\$0	
Ramps	- Lance Men Meader	Lump Sum	\$150,000,000		\$0	
System Elements	Signaling, Communications	Per mile	\$2,718,000	0.49	\$1,331,820	
Electrification	Traction Power	Per mile	\$2,655,000	0.49	\$1,300,950	
Mech/Electrical	For Tunnels	Per mile	\$11,848,704	0	\$0	
Environmental Mitigation	Percent of Hard Costs		3%		\$166,451	
Program Implementatio Costs	Percent of Hard Costs + Env Mit		25.50%		\$1,457,282	
Contingencies	Percent of Hard Costs + Env Mit		25.00%		\$1,428,708	
Total Cost					\$8,600,821	

Page 7 of 51 November 2010

CAHSRA Base Alternative						
Cost Elements		Unit	2009 \$, Unit Price	Option Base, Section 1G to 4th/King		
				Quantity	\$	
Track Section	2 track -In Tunnel/Subway/Trench	Per mile	\$4,700,160		\$0	
	2 track - At-grade	Per mile	\$2,100,224	1.4	\$2,940,314	
	4 track - In Tunnel/Subway/Trench	Per mile	\$9,400,320		\$0	
Earthwork - 2 track	At-grade	Per mile	\$150,000	1.4	\$210,000	
	Covered trench/tunnel	Per mile	\$6,000,000		\$0	
	Mined tunnel	Per mile	\$15,000,000		\$0	
Grade Separations	HSR - 4 lanes under 2 tracks	Each	\$13,284,352		\$0	
	HSR - 4 lanes under 4 tracks	Each	\$19,926,528		\$0	
Structure, Tunnels, Walls	Twin Single Track Drill&Blast (<6 miles)	Per mile	\$142,731,264		\$0	
	Cut/Cover Double Track Tunnel	Per mile	\$131,246,080		\$0	
	Double Track TBM (<6 miles)	Per mile	\$106,637,312		\$0	
	Four Track Drill&Blast	Per mile	\$293,775,369		\$0	
	Four Track Cut/Cover Tunnel	Per mile	\$262,492,160		\$0	
Underground Stations	Caltrain - Per Platform	Each	\$150,000,000		\$0	
	HSR - Per Platform	Each	\$200,000,000		\$0	
Caltrain Passenger Station	Caltrain	Each	\$15,000,000	1	\$15,000,000	
Rail & Utility Relocation		Per mile	\$3,700,000	0.7	\$2,590,000	
I-280	Demolition (200' wide)	LF	\$8,000		\$0	
Parkway	4 Lanes with median	LF	\$5,000		\$0	
Ramps		Lump Sum	\$150,000,000		\$0	
System Elements	Signaling, Communications	Per mile	\$2,718,000	1.4	\$3,805,200	
Electrification	Traction Power	Per mile	\$2,655,000	1.4	\$3,717,000	
Mech/Electrical	For Tunnels	Per mile	\$11,848,704	0	\$0	
Environmental Mitigation	Percent of Hard Costs		3%		\$847,875	
Program Implementatio Costs	Percent of Hard Costs + Env Mit		25.50%		\$7,423,149	
Contingencies	Percent of Hard Costs + Env Mit		25.00%		\$7,277,597	
Total Cost					\$43,811,135	

Page 8 of 51 November 2010

CAHSRA Base Alternative						
Cost Elements		Unit	2009 \$, Unit Price	•	se, Section 1A to	
				Quantity	\$	
Track Section	2 track -In Tunnel/Subway/Trench	Per mile	\$4,700,160	0.284	\$1,334,845	
	2 track - At-grade	Per mile	\$2,100,224		\$0	
	4 track - In Tunnel/Subway/Trench	Per mile	\$9,400,320		\$0	
Earthwork - 2 track	At-grade	Per mile	\$150,000		\$0	
	Covered trench/tunnel	Per mile	\$6,000,000	0.284	\$1,704,000	
	Mined tunnel	Per mile	\$15,000,000		\$0	
Grade Separations	HSR - 4 lanes under 2 tracks	Each	\$13,284,352		\$0	
	HSR - 4 lanes under 4 tracks	Each	\$19,926,528		\$0	
Structure, Tunnels, Walls	Twin Single Track Drill&Blast (<6 miles)	Per mile	\$142,731,264		\$0	
	Cut/Cover Double Track Tunnel	Per mile	\$131,246,080	0.284	\$37,273,887	
	Double Track TBM (<6 miles)	Per mile	\$106,637,312		\$0	
	Four Track Drill&Blast	Per mile	\$293,775,369		\$0	
	Four Track Cut/Cover Tunnel	Per mile	\$262,492,160		\$0	
Underground Stations	Caltrain - Per Platform	Each	\$150,000,000		\$0	
	HSR - Per Platform	Each	\$200,000,000		\$0	
Underground M&O Facility	Caltrain	Each	\$400,000,000		\$0	
I-280	Demolition (200' wide)	LF	\$8,000		\$0	
Parkway	4 Lanes with median	LF	\$5,000		\$0	
Ramps		Lump Sum	\$150,000,000		\$0	
System Elements	Signaling, Communications	Per mile	\$2,718,000	0.284	\$771,912	
Electrification	Traction Power	Per mile	\$2,655,000	0.284	\$754,020	
Mech/Electrical	For Tunnels	Per mile	\$11,848,704	0.284	\$3,365,032	
Environmental Mitigation	Percent of Hard Costs		3%		\$1,356,111	
Program Implementatio Costs	Percent of Hard Costs + Env Mit		25.50%		\$11,872,751	
Contingencies	Percent of Hard Costs + Env Mit		25.00%		\$11,639,952	
Total Cost					\$70,072,510	

Page 9 of 51 November 2010

CAHSRA Base Alternative						
Cost Elements		Unit	2009 \$, Unit Price	•	e, Section 1B to TTC	
				Quantity	\$	
Track Section	2 track -In Tunnel/Subway/Trench	Per mile	\$4,700,160	0.76	\$3,572,122	
	2 track - At-grade	Per mile	\$2,100,224		\$0	
	4 track - In Tunnel/Subway/Trench	Per mile	\$9,400,320		\$0	
Earthwork - 2 track	At-grade	Per mile	\$150,000		\$0	
	Covered trench/tunnel	Per mile	\$6,000,000		\$0	
	Mined tunnel	Per mile	\$15,000,000	0.76	\$11,400,000	
Grade Separations	HSR - 4 lanes under 2 tracks	Each	\$13,284,352		\$0	
·	HSR - 4 lanes under 4 tracks	Each	\$19,926,528		\$0	
Structure, Tunnels, Walls	Twin Single Track Drill&Blast (<6 miles)	Per mile	\$142,731,264	0.76	\$108,475,761	
	Cut/Cover Double Track Tunnel	Per mile	\$131,246,080		\$0	
	Double Track TBM (<6 miles)	Per mile	\$106,637,312		\$0	
	Four Track Drill&Blast	Per mile	\$293,775,369		\$0	
	Four Track Cut/Cover Tunnel	Per mile	\$262,492,160		\$0	
Underground Stations	Caltrain - Per Platform	Each	\$150,000,000		\$0	
Ţ	HSR - Per Platform	Each	\$200,000,000		\$0	
Underground M&O Facility	Caltrain	Each	\$400,000,000		\$0	
I-280	Demolition (200' wide)	LF	\$8,000		\$0	
Parkway	4 Lanes with median	LF	\$5,000		\$0	
Ramps	Tanco Militara	Lump Sum	\$150,000,000		\$0	
System Elements	Signaling, Communications	Per mile	\$2,718,000	0.76	\$2,065,680	
Electrification	Traction Power	Per mile	\$2,655,000	0.76	\$2,017,800	
Mech/Electrical	For Tunnels	Per mile	\$11,848,704	0.76	\$9,005,015	
Environmental Mitigation	Percent of Hard Costs		3%		\$4,096,091	
Program Implementatio Costs	Percent of Hard Costs + Env Mit		25.50%		\$35,861,279	
Contingencies	Percent of Hard Costs + Env Mit		25.00%		\$35,158,117	
Total Cost					\$211,651,865	

Page 10 of 51 November 2010

CAHSRA Base Alternative						
Cost Elements		Unit	2009 \$, Unit Price	Option Base, Section 1C to TTC		
				Quantity	\$	
Track Section	2 track -In Tunnel/Subway/Trench	Per mile	\$4,700,160	0.23	\$1,081,037	
	2 track - At-grade	Per mile	\$2,100,224		\$0	
	4 track - In Tunnel/Subway/Trench	Per mile	\$9,400,320		\$0	
arthwork - 2 track	At-grade	Per mile	\$150,000		\$0	
	Covered trench/tunnel	Per mile	\$6,000,000	0.23	\$1,380,000	
	Mined tunnel	Per mile	\$15,000,000		\$0	
Grade Separations	HSR - 4 lanes under 2 tracks	Each	\$13,284,352		\$0	
	HSR - 4 lanes under 4 tracks	Each	\$19,926,528		\$0	
Structure, Tunnels, Walls	Twin Single Track Drill&Blast (<6 miles)	Per mile	\$142,731,264	0.23	\$32,828,191	
	Cut/Cover Double Track Tunnel	Per mile	\$131,246,080		\$0	
	Double Track TBM (<6 miles)	Per mile	\$106,637,312		\$0	
	Four Track Drill&Blast	Per mile	\$293,775,369		\$0	
	Four Track Cut/Cover Tunnel	Per mile	\$262,492,160		\$0	
Underground Stations	Caltrain - Per Platform	Each	\$150,000,000		\$0	
	HSR - Per Platform	Each	\$200,000,000		\$0	
Underground M&O Facility	Caltrain	Each	\$400,000,000		\$0	
I-280	Demolition (200' wide)	LF	\$8,000		\$0	
Parkway	4 Lanes with median	LF	\$5,000		\$0	
Ramps		Lump Sum	\$150,000,000		\$0	
System Elements	Signaling, Communications	Per mile	\$2,718,000	0.23	\$625,140	
Electrification	Traction Power	Per mile	\$2,655,000	0.23	\$610,650	
Mech/Electrical	For Tunnels	Per mile	\$11,848,704	0.23	\$2,725,202	
Environmental Mitigation	Percent of Hard Costs		3%		\$1,177,507	
Program Implementatio Costs	Percent of Hard Costs + Env Mit		25.50%		\$10,309,070	
Contingencies	Percent of Hard Costs + Env Mit		25.00%		\$10,106,932	
Total Cost					\$60,843,728	

Page 11 of 51 November 2010

CAHSRA Base Alternative						
Cost Elements		Unit	2009 \$, Unit Price	Option Base, Section 1D to TTC		
				Quantity	\$	
Track Section	2 track -In Tunnel/Subway/Trench	Per mile	\$4,700,160	0.91	\$4,277,146	
	2 track - At-grade	Per mile	\$2,100,224		\$0	
	4 track - In Tunnel/Subway/Trench	Per mile	\$9,400,320		\$0	
Earthwork - 2 track	At-grade	Per mile	\$150,000		\$0	
	Covered trench/tunnel	Per mile	\$6,000,000		\$0	
	Mined tunnel	Per mile	\$17,600,000	0.91	\$16,016,000	
Grade Separations	HSR - 4 lanes under 2 tracks	Each	\$13,284,352		\$0	
	HSR - 4 lanes under 4 tracks	Each	\$19,926,528		\$0	
Structure, Tunnels, Walls	Twin Single Track Drill&Blast (<6 miles)	Per mile	\$142,731,264	0.91	\$129,885,450	
	Cut/Cover Double Track Tunnel	Per mile	\$131,246,080		\$0	
	Double Track TBM (<6 miles)	Per mile	\$106,637,312		\$0	
	Four Track Drill&Blast	Per mile	\$293,775,369		\$0	
	Four Track Cut/Cover Tunnel	Per mile	\$262,492,160		\$0	
Underground Stations	Caltrain - Per Platform	Each	\$150,000,000		\$0	
-	HSR - Per Platform	Each	\$200,000,000		\$0	
Underground M&O Facility	Caltrain	Each	\$400,000,000		\$0	
I-280	Demolition (200' wide)	LF	\$8,000		\$0	
Parkway	4 Lanes with median	LF	\$5,000		\$0	
Ramps		Lump Sum	\$150,000,000		\$0	
System Elements	Signaling, Communications	Per mile	\$2,718,000	0.91	\$2,473,380	
Electrification	Traction Power	Per mile	\$2,655,000	0.91	\$2,416,050	
Mech/Electrical	For Tunnels	Per mile	\$11,848,704	0.91	\$10,782,321	
Environmental Mitigation	Percent of Hard Costs		3%		\$4,975,510	
Program Implementatio Costs	Percent of Hard Costs + Env Mit		25.50%		\$43,560,594	
Contingencies	Percent of Hard Costs + Env Mit		25.00%		\$42,706,464	
Total Cost					\$257,092,915	

Page 12 of 51 November 2010

CAHSRA Base Alternative						
Cost Elements		Unit	2009 \$, Unit Price	Option Base, Section 1E to TTC		
				Quantity	\$	
Track Section	2 track -In Tunnel/Subway/Trench	Per mile	\$4,700,160	0.66	\$3,102,106	
	2 track - At-grade	Per mile	\$2,100,224		\$0	
	4 track - In Tunnel/Subway/Trench	Per mile	\$9,400,320		\$0	
Earthwork - 2 track	At-grade	Per mile	\$150,000		\$0	
	Covered trench/tunnel	Per mile	\$6,000,000		\$0	
	Mined tunnel	Per mile	\$6,300,000	0.66	\$4,158,000	
Grade Separations	HSR - 4 lanes under 2 tracks	Each	\$13,284,352		\$0	
1	HSR - 4 lanes under 4 tracks	Each	\$19,926,528		\$0	
Structure, Tunnels, Walls	Twin Single Track Drill&Blast (<6 miles)	Per mile	\$142,731,264	0.66	\$94,202,634	
ot. acta. c, rac.s, rras	Cut/Cover Double Track Tunnel	Per mile	\$131,246,080	0.00	\$0	
	Double Track TBM (<6 miles)	Per mile	\$106,637,312		\$0	
	Four Track Drill&Blast	Per mile	\$293,775,369		\$0	
	Four Track Cut/Cover Tunnel	Per mile	\$262,492,160		\$0	
Underground Stations	Caltrain - Per Platform	Each	\$150,000,000		\$0	
5	HSR - Per Platform	Each	\$200,000,000		\$0	
Underground M&O Facility	Caltrain	Each	\$400,000,000		\$0	
I-280	Demolition (200' wide)	LF	\$8,000		\$0	
Parkway	4 Lanes with median	LF	\$5,000		\$0	
Ramps	4 Laties with median	Lump Sum	\$150,000,000		\$0	
System Elements	Signaling, Communications	Per mile	\$2,718,000	0.66	\$1,793,880	
Electrification	Traction Power	Per mile	\$2,655,000	0.66	\$1,752,300	
Mech/Electrical	For Tunnels	Per mile	\$11,848,704	0.66	\$7,820,145	
Environmental Mitigation	Percent of Hard Costs		3%		\$3,384,872	
Program Implementatio Costs	Percent of Hard Costs + Env Mit		25.50%		\$29,634,554	
Contingencies	Percent of Hard Costs + Env Mit		25.00%		\$29,053,484	
Total Cost			1		\$174,901,974	

Page 13 of 51 November 2010

CAHSRA Base Alternative						
Cost Elements		Unit	2009 \$, Unit Price	Option Base, Section 1F to TTC		
				Quantity	\$	
Track Section	2 track -In Tunnel/Subway/Trench	Per mile	\$4,700,160	0.49	\$2,303,078	
	2 track - At-grade	Per mile	\$2,100,224		\$0	
	4 track - In Tunnel/Subway/Trench	Per mile	\$9,400,320		\$0	
Earthwork - 2 track	At-grade	Per mile	\$150,000		\$0	
	Covered trench/tunnel	Per mile	\$6,000,000		\$0	
	Mined tunnel	Per mile	\$19,100,000	0.49	\$9,359,000	
Grade Separations	HSR - 4 lanes under 2 tracks	Each	\$13,284,352		\$0	
·	HSR - 4 lanes under 4 tracks	Each	\$19,926,528		\$0	
Structure, Tunnels, Walls	Twin Single Track Drill&Blast (<6 miles)	Per mile	\$142,731,264	0.49	\$69,938,319	
	Cut/Cover Double Track Tunnel	Per mile	\$131,246,080		\$0	
	Double Track TBM (<6 miles)	Per mile	\$106,637,312		\$0	
	Four Track Drill&Blast	Per mile	\$293,775,369		\$0	
	Four Track Cut/Cover Tunnel	Per mile	\$262,492,160		\$0	
Underground Stations	Caltrain - Per Platform	Each	\$150,000,000		\$0	
	HSR - Per Platform	Each	\$200,000,000		\$0	
Underground M&O Facility	Caltrain	Each	\$400,000,000		\$0	
I-280	Demolition (200' wide)	LF	\$8,000		\$0	
Parkway	4 Lanes with median	LF	\$5,000		\$0	
Ramps		Lump Sum	\$150,000,000		\$0	
System Elements	Signaling, Communications	Per mile	\$2,718,000	0.49	\$1,331,820	
Electrification	Traction Power	Per mile	\$2,655,000	0.49	\$1,300,950	
Mech/Electrical	For Tunnels	Per mile	\$11,848,704	0.49	\$5,805,865	
Environmental Mitigation	Percent of Hard Costs		3%		\$2,701,171	
Program Implementatio Costs	Percent of Hard Costs + Env Mit		25.50%		\$23,648,752	
Contingencies	Percent of Hard Costs + Env Mit		25.00%		\$23,185,051	
Total Cost					\$139,574,007	

Page 14 of 51 November 2010

CAHSRA Base Alternative						
Cost Elements		Unit	2009 \$, Unit Price	Option Base, Section 1G to TTC		
				Quantity	\$	
Track Section	2 track -In Tunnel/Subway/Trench	Per mile	\$4,700,160	1.4	\$6,580,224	
	2 track - At-grade	Per mile	\$2,100,224		\$0	
	4 track - In Tunnel/Subway/Trench	Per mile	\$9,400,320		\$0	
Earthwork - 2 track	At-grade	Per mile	\$150,000		\$0	
	Covered trench/tunnel	Per mile	\$1,100,000	1.4	\$1,540,000	
	Mined tunnel	Per mile	\$19,100,000		\$0	
Grade Separations	HSR - 4 lanes under 2 tracks	Each	\$13,284,352		\$0	
	HSR - 4 lanes under 4 tracks	Each	\$19,926,528		\$0	
Structure, Tunnels, Walls	Twin Single Track Drill&Blast (<6 miles)	Per mile	\$142,731,264	1.4	\$199,823,770	
,	Cut/Cover Double Track Tunnel	Per mile	\$131,246,080		\$0	
	Double Track TBM (<6 miles)	Per mile	\$106,637,312		\$0	
	Four Track Drill&Blast	Per mile	\$293,775,369		\$0	
	Four Track Cut/Cover Tunnel	Per mile	\$262,492,160		\$0	
Underground Stations	Caltrain - Per Platform	Each	\$150,000,000		\$0	
9	HSR - Per Platform	Each	\$200,000,000		\$0	
Caltrain Passenger Station	Caltrain	Each	\$15,000,000	1	\$15,000,000	
Underground M&O Facility	Caltrain	Each	\$400,000,000		\$0	
I-280	Demolition (200' wide)	LF	\$8,000		\$0	
Parkway	4 Lanes with median	LF	\$5,000		\$0	
Ramps		Lump Sum	\$150,000,000		\$0	
System Elements	Signaling, Communications	Per mile	\$2,718,000	1.4	\$3,805,200	
Electrification	Traction Power	Per mile	\$2,655,000	1.4	\$3,717,000	
Mech/Electrical	For Tunnels	Per mile	\$11,848,704	1.4	\$16,588,186	
Environmental Mitigation	Percent of Hard Costs		3%		\$7,411,631	
Program Implementatio Costs	Percent of Hard Costs + Env Mit		25.50%		\$64,888,833	
Contingencies	Percent of Hard Costs + Env Mit		25.00%		\$63,616,503	
Total Cost					\$382,971,346	

Page 15 of 51 November 2010

CAHSRA Base Alternative (4 -tracks)					
Cost Elements		Unit	2009 \$, Unit Price	CAHSRA Section 1D, 4-Track At-Grade	
				Quantity	\$
Track Section	2 track -In Tunnel/Subway/Trench/Structure	Per mile	\$4,700,160	0.91	\$4,277,146
	2 track - At-grade	Per mile	\$2,100,224	0.91	\$1,911,204
	4 track - In Tunnel/Subway/Trench	Per mile	\$9,400,320		\$0
Earthwork - 2 track	At-grade	Per mile	\$150,000	0.91	\$136,500
	Covered trench/tunnel	Per mile	\$6,000,000		\$0
	Mined tunnel	Per mile	\$17,600,000		\$0
Grade Separations	HSR - 4 lanes under 2 tracks	Each	\$13,284,352		\$0
	HSR - 4 lanes under 4 tracks	Each	\$19,926,528		\$0
Structure, Tunnels, Walls	Twin Single Track Drill&Blast (<6 miles)	Per mile	\$142,731,264		\$0
The second of th	Cut/Cover Double Track Tunnel	Per mile	\$131,246,080		\$0
	Double Track TBM (<6 miles)	Per mile	\$106,637,312		\$0
	Standard Structure (2 tracks)	Per mile	\$34,972,672	0.91	\$31,825,132
	Four Track Cut/Cover Tunnel	Per mile	\$262,492,160		\$0
Underground Stations	Caltrain - Per Platform	Each	\$150,000,000		\$0
Underground Stations	HSR - Per Platform	Each	\$200,000,000		\$0
Underground M&O Facility	Caltrain	Each	\$400,000,000		\$0
I-280	Demolition (200' wide)	LF	\$8,000		\$0
Parkway	4 Lanes with median	LF	\$5,000		\$0
Ramps		Lump Sum	\$150,000,000		\$0
System Elements	Signaling, Communications	Per mile	\$2,718,000	0.91	\$2,473,380
Electrification	Traction Power	Per mile	\$2,655,000	0.91	\$2,416,050
Mech/Electrical	For Tunnels	Per mile	\$11,848,704		\$0
Environmental Mitigation	Percent of Hard Costs		3%		\$1,291,182
Program Implementatio Costs	Percent of Hard Costs + Env Mit		25.50%		\$11,304,301
Contingencies	Percent of Hard Costs + Env Mit		25.00%		\$11,082,648
Total Cost					\$66,717,543

Page 16 of 51 November 2010

	CAHSRA Base Alternative (4 -tracks)					
	Cost Elements	Unit	2009 \$, Unit Price	CAHSRA Section 1E, 4-Track At-Grade		
				Quantity	\$	
Track Section	2 track -In Tunnel/Subway/Trench/Structure	Per mile	\$4,700,160		\$3,102,106	
	2 track - At-grade	Per mile	\$2,100,224	0.66	\$1,386,148	
	4 track - In Tunnel/Subway/Trench	Per mile	\$9,400,320		\$0	
Earthwork - 2 track	At-grade	Per mile	\$150,000	0.91	\$136,500	
	Covered trench/tunnel	Per mile	\$6,000,000		\$0	
	Mined tunnel	Per mile	\$17,600,000		\$0	
Grade Separations	HSR - 4 lanes under 2 tracks	Each	\$13,284,352		\$0	
	HSR - 4 lanes under 4 tracks	Each	\$19,926,528		\$0	
Structure, Tunnels, Walls	Twin Single Track Drill&Blast (<6 miles)	Per mile	\$142,731,264		\$0	
, , , , , , , , , , , , , , , , , , , ,	Cut/Cover Double Track Tunnel	Per mile	\$131,246,080		\$0	
	Double Track TBM (<6 miles)	Per mile	\$106,637,312		\$0	
	Standard Structure (2 tracks)	Per mile	\$34,972,672		\$0	
	Double Track Drill and Blast	Per mile	\$146,887,680	0.66	\$96,945,869	
Underground Stations	Caltrain - Per Platform	Each	\$150,000,000		\$0	
	HSR - Per Platform	Each	\$200,000,000		\$0	
Underground M&O Facility	Caltrain	Each	\$400,000,000		\$0	
1 200	D	1.5	40.000		40	
I-280	Demolition (200' wide)	LF LF	\$8,000		\$0	
Parkway Ramps	4 Lanes with median	LH Lump Sum	\$5,000 \$150,000,000		\$0 \$0	
C			62.740.000	2.55	Ć4 702 000	
System Elements	Signaling, Communications	Per mile	\$2,718,000	0.66	\$1,793,880	
Electrification	Traction Power	Per mile	\$2,655,000	0.66	\$1,752,300	
Mech/Electrical	For Tunnels	Per mile	\$11,848,704		\$0	
Environmental Mitigation	Percent of Hard Costs		3%		\$3,153,504	
Program Implementatio Costs	Percent of Hard Costs + Env Mit		25.50%		\$27,608,928	
Contingencies	Percent of Hard Costs + Env Mit		25.00%		\$27,067,577	
Total Cost					\$162,946,811	

Page 17 of 51 November 2010

CAHSRA Base Alternative (4 -tracks)						
	Cost Elements		2009 \$, Unit Price		ction 1F, 4-Track -Grade	
				Quantity	\$	
Track Section	2 track -In Tunnel/Subway/Trench/Structure	Per mile	\$4,700,160		\$0	
	2 track - At-grade	Per mile	\$2,100,224	0.98	\$2,058,220	
	4 track - In Tunnel/Subway/Trench	Per mile	\$9,400,320		\$0	
Earthwork - 2 track	At-grade	Per mile	\$300,000	0.49	\$147,000	
	Covered trench/tunnel	Per mile	\$6,000,000		\$0	
	Mined tunnel	Per mile	\$17,600,000		\$0	
Grade Separations	HSR - 4 lanes under 2 tracks	Each	\$13,284,352		\$0	
1	HSR - 4 lanes under 4 tracks	Each	\$19,926,528		\$0	
Structure, Tunnels, Walls	Track Relocation and Utilities	Per mile	\$3,679,232	0.49	\$1,802,824	
Structure, runners, wans	Cut/Cover Double Track Tunnel	Per mile	\$131,246,080	0.43	\$1,002,024	
	Double Track TBM (<6 miles)	Per mile	\$106,637,312	+	\$0	
	Standard Structure (2 tracks)	Per mile	\$34,972,672		\$0	
	Double Track Drill and Blast	Per mile	\$146,887,680		\$0	
Underground Stations	Caltrain - Per Platform	Each	\$150,000,000		\$0	
onderground ordinals	HSR - Per Platform	Each	\$200,000,000		\$0	
Underground M&O Facility	Caltrain	Each	\$400,000,000		\$0	
I-280	Demolition (200' wide)	LF	\$8,000		\$0	
Parkway	4 Lanes with median	LF	\$5,000		\$0	
Ramps		Lump Sum	\$150,000,000		\$0	
System Elements	Signaling, Communications	Per mile	\$2,718,000	0.49	\$1,331,820	
Electrification	Traction Power	Per mile	\$2,655,000	0.49	\$1,300,950	
Mech/Electrical	For Tunnels	Per mile	\$11,848,704		\$0	
Environmental Mitigation	Percent of Hard Costs		3%		\$199,224	
Program Implementatio Costs	Percent of Hard Costs + Env Mit		25.50%		\$1,744,210	
Contingencies	Percent of Hard Costs + Env Mit		25.00%		\$1,710,009	
Total Cost					\$10,294,257	

Page 18 of 51 November 2010

CAHSRA Base Alternative (4 -tracks)					
	Cost Elements	Unit	2009 \$, Unit Price	CAHSRA Section 1G, 4-Track At-Grade	
				Quantity	\$
Track Section	2 track -In Tunnel/Subway/Trench/Structure	Per mile	\$4,700,160		\$6,580,224
	2 track - At-grade	Per mile	\$2,100,224	0.7	\$1,470,157
	4 track - In Tunnel/Subway/Trench	Per mile	\$9,400,320		\$0
Earthwork - 2 track	At-grade	Per mile	\$300,000	0.49	\$147,000
	Covered trench/tunnel	Per mile	\$6,000,000		\$0
	Mined tunnel	Per mile	\$17,600,000		\$0
Grade Separations	HSR - 4 lanes under 2 tracks	Each	\$13,284,352		\$0
	HSR - 4 lanes under 4 tracks	Each	\$19,926,528		\$0
Structure, Tunnels, Walls	Track Relocation and Utilities	Per mile	\$3,679,232	0.74	\$2,722,632
Structure, runners, wans	Cut/Cover Double Track Tunnel	Per mile	\$131,246,080	0.7 1	\$0
	Double Track TBM (<6 miles)	Per mile	\$106,637,312		\$0
	Standard Structure (2 tracks)	Per mile	\$34,972,672		\$0
	Double Track Drill and Blast	Per mile	\$146,887,680		\$108,696,883
Underground Stations	Caltrain - At-Grade Station	Each	\$15,000,000	1	\$15,000,000
	HSR - Per Platform	Each	\$200,000,000		\$0
Underground M&O Facility	Caltrain	Each	\$400,000,000		\$0
			4		
I-280	Demolition (200' wide)	LF	\$8,000		\$0
Parkway Ramps	4 Lanes with median	LF Lump Sum	\$5,000 \$150,000,000		\$0 \$0
					•
System Elements	Signaling, Communications	Per mile	\$2,718,000		\$3,805,200
Electrification	Traction Power	Per mile	\$2,655,000	1.4	\$3,717,000
Mech/Electrical	For Tunnels	Per mile	\$11,848,704		\$0
Environmental Mitigation	Percent of Hard Costs		3%		\$4,264,173
Program Implementatio Costs	Percent of Hard Costs + Env Mit		25.50%		\$37,332,833
Contingencies	Percent of Hard Costs + Env Mit		25.00%		\$36,600,817
Total Cost					\$220,336,919

Page 19 of 51 November 2010

SFTWG Option 1							
Cost Elements		Unit	2009 \$, Unit Price		, Section O to h/King		
				Quantity	\$		
Track Section	2 track -In Tunnel/Subway/Trench	Per mile	\$4,700,160	0.46	\$2,162,074		
	2 track - At-grade	Per mile	\$2,100,224		\$0		
	4 track - In Tunnel/Subway/Trench	Per mile	\$9,400,320		\$0		
Earthwork - 2 track	At-grade	Per mile	\$150,000		\$0		
	Covered trench/tunnel	Per mile	\$6,000,000	0.46	\$2,760,000		
	Mined tunnel	Per mile	\$15,000,000		\$0		
Grade Separations	HSR - 4 lanes under 2 tracks	Each	\$13,284,352		\$0		
1	HSR - 4 lanes under 4 tracks	Each	\$19,926,528		\$0		
Structure, Tunnels, Walls	Twin Single Track Drill&Blast (<6 miles)	Per mile	\$142,731,264		\$0		
	Cut/Cover Double Track Tunnel	Per mile	\$131,246,080	0.46	\$60,373,197		
	Double Track TBM (<6 miles)	Per mile	\$106,637,312	01.10	\$0		
	Four Track Drill&Blast	Per mile	\$293,775,369		\$0		
	Four Track Cut/Cover Tunnel	Per mile	\$262,492,160		\$0		
Underground Stations	Caltrain - Per Platform	Each	\$150,000,000		\$0		
5	HSR - Per Platform	Each	\$200,000,000		\$0		
Underground M&O Facility	Caltrain	Each	\$400,000,000		\$0		
I-280	Demolition (200' wide)	LF	\$8,000		\$0		
Parkway	4 Lanes with median	LF	\$5,000		\$0		
Ramps		Lump Sum	\$150,000,000		\$0		
System Elements	Signaling, Communications	Per mile	\$2,718,000	0.46	\$1,250,280		
Electrification	Traction Power	Per mile	\$2,655,000	0.46	\$1,221,300		
Mech/Electrical	For Tunnels	Per mile	\$11,848,704	0.46	\$5,450,404		
Environmental Mitigation	Percent of Hard Costs		3%		\$2,196,518		
Program Implementatio Costs	Percent of Hard Costs + Env Mit		25.50%		\$19,230,512		
Contingencies	Percent of Hard Costs + Env Mit		25.00%		\$18,853,443		
Total Cost					\$113,497,727		

Page 20 of 51 November 2010

SFTWG Option 1							
	Cost Elements	Unit	2009 \$, Unit Price	Option 1, Section 1A to 4th/King			
				Quantity	\$		
Track Section	2 track -In Tunnel/Subway/Trench	Per mile	\$4,700,160	0.284	\$1,334,845		
	2 track - At-grade	Per mile	\$2,100,224		\$0		
	4 track - In Tunnel/Subway/Trench	Per mile	\$9,400,320		\$0		
Earthwork - 2 track	At-grade	Per mile	\$150,000		\$0		
	Covered trench/tunnel	Per mile	\$6,000,000	0.284	\$1,704,000		
	Mined tunnel	Per mile	\$15,000,000		\$0		
Grade Separations	HSR - 4 lanes under 2 tracks	Each	\$13,284,352		\$0		
	HSR - 4 lanes under 4 tracks	Each	\$19,926,528		\$0		
Structure, Tunnels, Walls	Twin Single Track Drill&Blast (<6 miles)	Per mile	\$142,731,264		\$0		
Structure, runners, wans	Cut/Cover Double Track Tunnel	Per mile	\$131,246,080	0.284	\$37,273,887		
	Double Track TBM (<6 miles)	Per mile	\$106,637,312	0.264	\$37,273,887		
	Four Track Drill&Blast	Per mile	\$293,775,369		\$0 \$0		
	Four Track Cut/Cover Tunnel	Per mile	\$262,492,160		\$0 \$0		
Underground Stations	Caltrain - Per Platform	Each	\$150,000,000		\$0		
	HSR - Per Platform	Each	\$200,000,000		\$0		
Underground M&O Facility	Caltrain	Each	\$400,000,000		\$0		
I-280	Demolition (200' wide)	LF	\$8,000		\$0		
Parkway	4 Lanes with median	I F	\$5,000		\$0		
Ramps	T Edites With Median	Lump Sum	\$150,000,000		\$0		
System Elements	Signaling, Communications	Per mile	\$2,718,000	0.284	\$771,912		
Electrification	Traction Power	Per mile	\$2,655,000		\$754,020		
Mech/Electrical	For Tunnels	Per mile	\$11,848,704	0.284	\$3,365,032		
Environmental Mitigation	Percent of Hard Costs		3%		\$1,356,111		
Program Implementatio Costs	Percent of Hard Costs + Env Mit		25.50%		\$11,872,751		
Contingencies	Percent of Hard Costs + Env Mit		25.00%		\$11,639,952		
Total Cost					\$70,072,510		

Page 21 of 51 November 2010

SFTWG Option 1							
	Cost Elements		2009 \$, Unit Price	Option 1, Section 1B, Tunnel to 4th/King			
				Quantity	\$		
Track Section	2 track -In Tunnel/Subway/Trench	Per mile	\$4,700,160		\$752,026		
	2 track - At-grade	Per mile	\$2,100,224		\$0		
	4 track - In Tunnel/Subway/Trench	Per mile	\$9,400,320		\$0		
Earthwork - 2 track	At-grade	Per mile	\$150,000		\$0		
	Covered trench/tunnel	Per mile	\$6,000,000	0.16	\$960,000		
	Mined tunnel	Per mile	\$15,000,000		\$0		
Grade Separations	HSR - 4 lanes under 2 tracks	Each	\$13,284,352		\$0		
	HSR - 4 lanes under 4 tracks	Each	\$19,926,528		\$0		
Structure, Tunnels, Walls	Twin Single Track Drill&Blast (<6 miles)	Per mile	\$142,731,264		\$0		
, , , , , , , , , , , , , , , , , , , ,	Cut/Cover Double Track Tunnel	Per mile	\$131,246,080		\$20,999,373		
	Double Track TBM (<6 miles)	Per mile	\$106,637,312		\$0		
	Four Track Drill&Blast	Per mile	\$293,775,369		\$0		
	Four Track Cut/Cover Tunnel	Per mile	\$262,492,160		\$0		
Underground Stations	Caltrain - Per Platform	Each	\$150,000,000		\$0		
	HSR - Per Platform	Each	\$200,000,000		\$0		
Underground M&O Facility	Caltrain	Each	\$400,000,000		\$0		
I-280	Demolition (200' wide)	LF	\$8,000		\$0		
Parkway	4 Lanes with median	LF	\$5,000		\$0		
Ramps		Lump Sum	\$150,000,000		\$0		
System Elements	Signaling, Communications	Per mile	\$2,718,000	0.16	\$434,880		
Electrification	Traction Power	Per mile	\$2,655,000	0.16	\$424,800		
Mech/Electrical	For Tunnels	Per mile	\$11,848,704	0.16	\$1,895,793		
Environmental Mitigation	Percent of Hard Costs		3%		\$764,006		
Program Implementatio Costs	Percent of Hard Costs + Env Mit		25.50%		\$6,688,874		
Contingencies	Percent of Hard Costs + Env Mit		25.00%		\$6,557,719		
Total Cost					\$39,477,470		

Page 22 of 51 November 2010

SFTWG Option 1							
	Cost Elements		2009 \$, Unit Price	Option 1, Section 1B, At- Grade to 4th/King			
				Quantity	\$		
Track Section	2 track -In Tunnel/Subway/Trench	Per mile	\$4,700,160		\$0		
	2 track - At-grade	Per mile	\$2,100,224	0.6	\$1,260,134		
	4 track - In Tunnel/Subway/Trench	Per mile	\$9,400,320		\$0		
Earthwork - 2 track	At-grade	Per mile	\$7,100,000	0.6	\$4,260,000		
	Covered trench/tunnel	Per mile	\$6,000,000		\$0		
	Mined tunnel	Per mile	\$15,000,000		\$0		
Grade Separations	HSR - 4 lanes under 2 tracks	Each	\$13,284,352		\$0		
·	HSR - 4 lanes under 4 tracks	Each	\$19,926,528		\$0		
Structure, Tunnels, Walls	Twin Single Track Drill&Blast (<6 miles)	Per mile	\$142,731,264		\$0		
	Cut/Cover Double Track Tunnel	Per mile	\$131,246,080		\$0		
	Double Track TBM (<6 miles)	Per mile	\$106,637,312		\$0		
	Four Track Drill&Blast	Per mile	\$293,775,369		\$0		
	Four Track Cut/Cover Tunnel	Per mile	\$262,492,160		\$0		
Underground Stations	Caltrain - Per Platform	Each	\$150,000,000		\$0		
-	HSR - Per Platform	Each	\$200,000,000		\$0		
Underground M&O Facility	Caltrain	Each	\$400,000,000		\$0		
I-280	Demolition (200' wide)	LF	\$8,000		\$0		
Parkway	4 Lanes with median	LF	\$5,000		\$0		
Ramps		Lump Sum	\$150,000,000		\$0		
System Elements	Signaling, Communications	Per mile	\$2,718,000	0.6	\$1,630,800		
Electrification	Traction Power	Per mile	\$2,655,000	0.6	\$1,593,000		
Mech/Electrical	For Tunnels	Per mile	\$11,848,704		\$0		
Environmental Mitigation	Percent of Hard Costs		3%		\$262,318		
Program Implementatio Costs	Percent of Hard Costs + Env Mit		25.50%		\$2,296,594		
Contingencies	Percent of Hard Costs + Env Mit		25.00%		\$2,251,563		
Total Cost					\$13,554,410		

Page 23 of 51 November 2010

SFTWG Option 2							
	Cost Elements	Unit	2009 \$, Unit Price	•	Section O to		
				Quantity	\$		
Track Section	2 track -In Tunnel/Subway/Trench	Per mile	\$4,700,160	0.46	\$2,162,074		
	2 track - At-grade	Per mile	\$2,100,224		\$0		
	4 track - In Tunnel/Subway/Trench	Per mile	\$9,400,320		\$0		
Earthwork - 2 track	At-grade	Per mile	\$150,000		\$0		
	Covered trench/tunnel	Per mile	\$6,000,000	0.46	\$2,760,000		
	Mined tunnel	Per mile	\$15,000,000		\$0		
Grade Separations	HSR - 4 lanes under 2 tracks	Each	\$13,284,352		\$0		
	HSR - 4 lanes under 4 tracks	Each	\$19,926,528		\$0		
Structure, Tunnels, Walls	Twin Single Track Drill&Blast (<6 miles)	Per mile	\$142,731,264		\$0		
	Cut/Cover Double Track Tunnel	Per mile	\$131,246,080	0.46	\$60,373,197		
	Double Track TBM (<6 miles)	Per mile	\$106,637,312		\$0		
	Four Track Drill&Blast	Per mile	\$293,775,369		\$0		
	Four Track Cut/Cover Tunnel	Per mile	\$262,492,160		\$0		
Underground Stations	Caltrain - Per Platform	Each	\$150,000,000		\$0		
	HSR - Per Platform	Each	\$200,000,000		\$0		
Underground M&O Facility	Caltrain	Each	\$400,000,000		\$0		
I-280	Demolition (200' wide)	LF	\$8,000		\$0		
Parkway	4 Lanes with median	LF	\$5,000		\$0		
Ramps		Lump Sum	\$150,000,000		\$0		
System Elements	Signaling, Communications	Per mile	\$2,718,000	0.46	\$1,250,280		
Electrification	Traction Power	Per mile	\$2,655,000	0.46	\$1,221,300		
Mech/Electrical	For Tunnels	Per mile	\$11,848,704	0.46	\$5,450,404		
Environmental Mitigation	Percent of Hard Costs		3%		\$2,196,518		
Program Implementatio Costs	Percent of Hard Costs + Env Mit		25.50%		\$19,230,512		
Contingencies	Percent of Hard Costs + Env Mit		25.00%		\$18,853,443		
Total Cost					\$113,497,727		

Page 24 of 51 November 2010

SFTWG Option 2							
	Cost Elements	Unit	2009 \$, Unit Price	•	Section 1A to King		
				Quantity	\$		
Track Section	2 track -In Tunnel/Subway/Trench	Per mile	\$4,700,160	0.284	\$1,334,845		
	2 track - At-grade	Per mile	\$2,100,224		\$0		
	4 track - In Tunnel/Subway/Trench	Per mile	\$9,400,320		\$0		
Earthwork - 2 track	At-grade	Per mile	\$150,000		\$0		
	Covered trench/tunnel	Per mile	\$6,000,000	0.284	\$1,704,000		
	Mined tunnel	Per mile	\$15,000,000		\$0		
Grade Separations	HSR - 4 lanes under 2 tracks	Each	\$13,284,352		\$0		
	HSR - 4 lanes under 4 tracks	Each	\$19,926,528		\$0		
Structure, Tunnels, Walls	Twin Single Track Drill&Blast (<6 miles)	Per mile	\$142,731,264		\$0		
Structure, runners, wans	Cut/Cover Double Track Tunnel	Per mile	\$131,246,080	0.284	\$37,273,887		
	Double Track TBM (<6 miles)	Per mile	\$106,637,312	0.204	\$0		
	Four Track Drill&Blast	Per mile	\$293,775,369		\$0		
	Four Track Cut/Cover Tunnel	Per mile	\$262,492,160		\$0		
Underground Stations	Caltrain - Per Platform	Each	\$150,000,000		\$0		
	HSR - Per Platform	Each	\$200,000,000		\$0		
Underground M&O Facility	Caltrain	Each	\$400,000,000		\$0		
I-280	Demolition (200' wide)	LF	\$8,000		\$0		
Parkway	4 Lanes with median	LF	\$5,000		\$0		
Ramps		Lump Sum	\$150,000,000		\$0		
System Elements	Signaling, Communications	Per mile	\$2,718,000	0.284	\$771,912		
Electrification	Traction Power	Per mile	\$2,655,000	0.284	\$754,020		
Mech/Electrical	For Tunnels	Per mile	\$11,848,704	0.284	\$3,365,032		
Environmental Mitigation	Percent of Hard Costs		3%		\$1,356,111		
Program Implementatio Costs	Percent of Hard Costs + Env Mit		25.50%		\$11,872,751		
Contingencies	Percent of Hard Costs + Env Mit		25.00%		\$11,639,952		
Total Cost					\$70,072,510		

Page 25 of 51 November 2010

SFTWG Option 2							
	Cost Elements		2009 \$, Unit Price	Option 2, Section 1B, Tunnel to 4th/King			
				Quantity	\$		
Track Section	2 track -In Tunnel/Subway/Trench	Per mile	\$4,700,160		\$2,585,088		
	2 track - At-grade	Per mile	\$2,100,224		\$0		
	4 track - In Tunnel/Subway/Trench	Per mile	\$9,400,320		\$0		
Earthwork - 2 track	At-grade	Per mile	\$150,000		\$0		
	Covered trench/tunnel	Per mile	\$6,000,000	0.55	\$3,300,000		
	Mined tunnel	Per mile	\$15,000,000		\$0		
Grade Separations	HSR - 4 lanes under 2 tracks	Each	\$13,284,352		\$0		
	HSR - 4 lanes under 4 tracks	Each	\$19,926,528		\$0		
Structure, Tunnels, Walls	Twin Single Track Drill&Blast (<6 miles)	Per mile	\$142,731,264		\$0		
	Cut/Cover Double Track Tunnel	Per mile	\$131,246,080	0.55	\$72,185,344		
	Double Track TBM (<6 miles)	Per mile	\$106,637,312		\$0		
	Four Track Drill&Blast	Per mile	\$293,775,369		\$0		
	Four Track Cut/Cover Tunnel	Per mile	\$262,492,160		\$0		
Underground Stations	Caltrain - Per Platform	Each	\$150,000,000		\$0		
	HSR - Per Platform	Each	\$200,000,000		\$0		
Underground M&O Facility	Caltrain	Each	\$400,000,000		\$0		
I-280	Demolition (200' wide)	LF	\$8,000		\$0		
Parkway	4 Lanes with median	LF	\$5,000		\$0		
Ramps		Lump Sum	\$150,000,000		\$0		
System Elements	Signaling, Communications	Per mile	\$2,718,000	0.55	\$1,494,900		
Electrification	Traction Power	Per mile	\$2,655,000	0.55	\$1,460,250		
Mech/Electrical	For Tunnels	Per mile	\$11,848,704	0.55	\$6,516,787		
Environmental Mitigation	Percent of Hard Costs		3%		\$2,626,271		
Program Implementatio Costs	Percent of Hard Costs + Env Mit		25.50%		\$22,993,003		
Contingencies	Percent of Hard Costs + Env Mit		25.00%		\$22,542,160		
Total Cost					\$135,703,804		

Page 26 of 51 November 2010

SFTWG Option 2							
	Cost Elements		2009 \$, Unit Price	•	ection 1B, At- o 4th/King		
				Quantity	\$		
Track Section	2 track -In Tunnel/Subway/Trench	Per mile	\$4,700,160		\$0		
	2 track - At-grade	Per mile	\$2,100,224	0.21	\$441,047		
	4 track - In Tunnel/Subway/Trench	Per mile	\$9,400,320		\$0		
Earthwork - 2 track	At-grade	Per mile	\$7,100,000	0.21	\$1,491,000		
	Covered trench/tunnel	Per mile	\$6,000,000		\$0		
	Mined tunnel	Per mile	\$15,000,000		\$0		
Grade Separations	HSR - 4 lanes under 2 tracks	Each	\$13,284,352		\$0		
·	HSR - 4 lanes under 4 tracks	Each	\$19,926,528		\$0		
Structure, Tunnels, Walls	Twin Single Track Drill&Blast (<6 miles)	Per mile	\$142,731,264		\$0		
	Cut/Cover Double Track Tunnel	Per mile	\$131,246,080		\$0		
	Double Track TBM (<6 miles)	Per mile	\$106,637,312		\$0 \$0		
	Four Track Drill&Blast	Per mile	\$293,775,369		\$0		
	Four Track Cut/Cover Tunnel	Per mile	\$262,492,160		\$0		
Underground Stations	Caltrain - Per Platform	Each	\$150,000,000		\$0		
-	HSR - Per Platform	Each	\$200,000,000		\$0		
Underground M&O Facility	Caltrain	Each	\$400,000,000		\$0		
I-280	Demolition (200' wide)	LF	\$8,000		\$0		
Parkway	4 Lanes with median	LF	\$5,000		\$0		
Ramps	Tanco Milimodali	Lump Sum	\$150,000,000		\$0		
System Elements	Signaling, Communications	Per mile	\$2,718,000	0.21	\$570,780		
Electrification	Traction Power	Per mile	\$2,655,000	0.21	\$557,550		
Mech/Electrical	For Tunnels	Per mile	\$11,848,704		\$0		
Environmental Mitigation	Percent of Hard Costs		3%		\$91,811		
Program Implementatio Costs	Percent of Hard Costs + Env Mit		25.50%		\$803,808		
Contingencies	Percent of Hard Costs + Env Mit		25.00%		\$788,047		
Total Cost					\$4,744,043		

Page 27 of 51 November 2010

SFTWG Option 3							
Cost Elements		Unit	2009 \$, Unit Price	Option 3, Section O to 4th/King and TTC			
				Quantity	\$		
Track Section	2 track -In Tunnel/Subway/Trench	Per mile	\$4,700,160	0.46	\$2,162,074		
	2 track - At-grade	Per mile	\$2,100,224		\$0		
	4 track - In Tunnel/Subway/Trench	Per mile	\$9,400,320		\$0		
Earthwork - 2 track	At-grade	Per mile	\$150,000		\$0		
	Covered trench/tunnel	Per mile	\$6,000,000	0.46	\$2,760,000		
	Mined tunnel	Per mile	\$15,000,000		\$0		
Grade Separations	HSR - 4 lanes under 2 tracks	Each	\$13,284,352		\$0		
	HSR - 4 lanes under 4 tracks	Each	\$19,926,528		\$0		
Structure, Tunnels, Walls	Twin Single Track Drill&Blast (<6 miles)	Per mile	\$142,731,264		\$0		
, ,	Cut/Cover Double Track Tunnel	Per mile	\$131,246,080	0.46	\$60,373,197		
	Double Track TBM (<6 miles)	Per mile	\$106,637,312		\$0		
	Four Track Drill&Blast	Per mile	\$293,775,369		\$0		
	Four Track Cut/Cover Tunnel	Per mile	\$262,492,160		\$0		
Underground Stations	Caltrain - Per Platform	Each	\$150,000,000		\$0		
-	HSR - Per Platform	Each	\$200,000,000		\$0		
Underground M&O Facility	Caltrain	Each	\$400,000,000		\$0		
I-280	Demolition (200' wide)	LF	\$8,000		\$0		
Parkway	4 Lanes with median	LF	\$5,000		\$0		
Ramps		Lump Sum	\$150,000,000		\$0		
System Elements	Signaling, Communications	Per mile	\$2,718,000	0.46	\$1,250,280		
Electrification	Traction Power	Per mile	\$2,655,000	0.46	\$1,221,300		
Mech/Electrical	For Tunnels	Per mile	\$11,848,704	0.46	\$5,450,404		
Environmental Mitigation	Percent of Hard Costs		3%		\$2,196,518		
Program Implementatio Costs	Percent of Hard Costs + Env Mit		25.50%		\$19,230,512		
Contingencies	Percent of Hard Costs + Env Mit		25.00%		\$18,853,443		
Total Cost					\$113,497,727		
Extra cost for taking this segment	on different alignment along 7th to the TTC				\$100,000,000		
Grand Total					\$213,497,727		

Page 28 of 51 November 2010

SFTWG Option 3							
	Cost Elements	Unit	2009 \$, Unit Price	Option 3, Section 1A to 4th/King			
				Quantity	\$		
Track Section	2 track -In Tunnel/Subway/Trench	Per mile	\$4,700,160	0.284	\$1,334,845		
	2 track - At-grade	Per mile	\$2,100,224		\$0		
	4 track - In Tunnel/Subway/Trench	Per mile	\$9,400,320		\$0		
Earthwork - 2 track	At-grade	Per mile	\$150,000		\$0		
	Covered trench/tunnel	Per mile	\$6,000,000	0.284	\$1,704,000		
	Mined tunnel	Per mile	\$15,000,000		\$0		
Grade Separations	HSR - 4 lanes under 2 tracks	Each	\$13,284,352		\$0		
	HSR - 4 lanes under 4 tracks	Each	\$19,926,528		\$0		
Structure, Tunnels, Walls	Twin Single Track Drill&Blast (<6 miles)	Per mile	\$142,731,264		\$0		
	Cut/Cover Double Track Tunnel	Per mile	\$131,246,080	0.284	\$37,273,887		
	Double Track TBM (<6 miles)	Per mile	\$106,637,312		\$0		
	Four Track Drill&Blast	Per mile	\$293,775,369		\$0		
	Four Track Cut/Cover Tunnel	Per mile	\$262,492,160		\$0		
Underground Stations	Caltrain - Per Platform	Each	\$150,000,000		\$0		
	HSR - Per Platform	Each	\$200,000,000		\$0		
Underground M&O Facility	Caltrain	Each	\$400,000,000		\$0		
I-280	Demolition (200' wide)	LF	\$8,000		\$0		
Parkway	4 Lanes with median	LF	\$5,000		\$0		
Ramps		Lump Sum	\$150,000,000		\$0		
System Elements	Signaling, Communications	Per mile	\$2,718,000	0.284	\$771,912		
Electrification	Traction Power	Per mile	\$2,655,000	0.284	\$754,020		
Mech/Electrical	For Tunnels	Per mile	\$11,848,704	0.284	\$3,365,032		
Environmental Mitigation	Percent of Hard Costs		3%		\$1,356,111		
Program Implementatio Costs	Percent of Hard Costs + Env Mit		25.50%		\$11,872,751		
Contingencies	Percent of Hard Costs + Env Mit		25.00%		\$11,639,952		
Total Cost					\$70,072,510		

Page 29 of 51 November 2010

SFTWG Option 3							
	Cost Elements	Unit	2009 \$, Unit Price	Option 3, Section 1B, Tunnel to 4th/King			
				Quantity	\$		
Track Section	2 track -In Tunnel/Subway/Trench	Per mile	\$4,700,160	0.52	\$2,444,083		
	2 track - At-grade	Per mile	\$2,100,224		\$0		
	4 track - In Tunnel/Subway/Trench	Per mile	\$9,400,320		\$0		
Earthwork - 2 track	At-grade	Per mile	\$150,000		\$0		
	Covered trench/tunnel	Per mile	\$6,000,000		\$0		
	Mined tunnel	Per mile	\$15,000,000	0.52	\$7,800,000		
Grade Separations	HSR - 4 lanes under 2 tracks	Each	\$13,284,352		\$0		
•	HSR - 4 lanes under 4 tracks	Each	\$19,926,528		\$0		
Structure, Tunnels, Walls	Twin Single Track Drill&Blast (<6 miles)	Per mile	\$142,731,264	0.52	\$74,220,257		
otractare, rainces, rrain	Cut/Cover Double Track Tunnel	Per mile	\$131,246,080	0.02	\$0		
	Double Track TBM (<6 miles)	Per mile	\$106,637,312		\$0		
	Four Track Drill&Blast	Per mile	\$293,775,369		\$0		
	Four Track Cut/Cover Tunnel	Per mile	\$262,492,160		\$0		
Underground Stations	Caltrain - Per Platform	Each	\$150,000,000		\$0		
J	HSR - Per Platform	Each	\$200,000,000		\$0		
Underground M&O Facility	Caltrain	Each	\$400,000,000		\$0		
I-280	Demolition (200' wide)	LF	\$8,000		\$0		
Parkway	4 Lanes with median	LF	\$5,000		\$0		
Ramps	4 Lanes with median	Lump Sum	\$150,000,000		\$0		
System Elements	Signaling, Communications	Per mile	\$2,718,000	0.52	\$1,413,360		
Electrification	Traction Power	Per mile	\$2,655,000	0.52	\$1,380,600		
Mech/Electrical	For Tunnels	Per mile	\$11,848,704	0.52	\$6,161,326		
Environmental Mitigation	Percent of Hard Costs		3%		\$2,802,589		
Program Implementatio Costs	Percent of Hard Costs + Env Mit		25.50%		\$24,536,665		
Contingencies	Percent of Hard Costs + Env Mit		25.00%		\$24,055,554		
Total Cost					\$144,814,434		

Page 30 of 51 November 2010

SFTWG Option 3						
	Cost Elements	Unit	2009 \$, Unit Price	•	ection 1B, At- o 4th/King	
				Quantity	\$	
Track Section	2 track -In Tunnel/Subway/Trench	Per mile	\$4,700,160		\$0	
	2 track - At-grade	Per mile	\$2,100,224	0.26	\$546,058	
	4 track - In Tunnel/Subway/Trench	Per mile	\$9,400,320		\$0	
Earthwork - 2 track	At-grade	Per mile	\$7,100,000	0.26	\$1,846,000	
	Covered trench/tunnel	Per mile	\$6,000,000		\$0	
	Mined tunnel	Per mile	\$15,000,000		\$0	
Grade Separations	HSR - 4 lanes under 2 tracks	Each	\$13,284,352		\$0	
	HSR - 4 lanes under 4 tracks	Each	\$19,926,528		\$0	
Structure, Tunnels, Walls	Twin Single Track Drill&Blast (<6 miles)	Per mile	\$142,731,264		\$0	
	Cut/Cover Double Track Tunnel	Per mile	\$131,246,080		\$0	
	Double Track TBM (<6 miles)	Per mile	\$106,637,312		\$0 \$0	
	Four Track Drill&Blast	Per mile	\$293,775,369		\$0	
	Four Track Cut/Cover Tunnel	Per mile	\$262,492,160		\$0	
Underground Stations	Caltrain - Per Platform	Each	\$150,000,000		\$0	
5	HSR - Per Platform	Each	\$200,000,000		\$0	
Underground M&O Facility	Caltrain	Each	\$400,000,000		\$0	
I-280	Demolition (200' wide)	LF	\$8,000		\$0	
Parkway	4 Lanes with median	LF	\$5,000		\$0	
Ramps	T Edities Will Median	Lump Sum	\$150,000,000		\$0	
System Elements	Signaling, Communications	Per mile	\$2,718,000	0.26	\$706,680	
Electrification	Traction Power	Per mile	\$2,655,000	0.26	\$690,300	
Mech/Electrical	For Tunnels	Per mile	\$11,848,704		\$0	
Environmental Mitigation	Percent of Hard Costs		3%		\$113,671	
Program Implementatio Costs	Percent of Hard Costs + Env Mit		25.50%		\$995,191	
Contingencies	Percent of Hard Costs + Env Mit		25.00%		\$975,677	
Total Cost					\$5,873,578	

Page 31 of 51 November 2010

SFTWG Option 4a							
	Cost Elements	Unit	2009 \$, Unit Price	Option 4a, Section O to 4th/King Underground			
				Quantity	\$		
Track Section	2 track -In Tunnel/Subway/Trench	Per mile	\$4,700,160		\$0		
	2 track - At-grade	Per mile	\$2,100,224		\$0		
	4 track - In Tunnel/Subway/Trench	Per mile	\$9,400,320		\$0		
Earthwork - 2 track	At-grade	Per mile	\$150,000		\$0		
	Covered trench/tunnel	Per mile	\$6,000,000		\$0		
	Mined tunnel	Per mile	\$15,000,000		\$0		
Grade Separations	HSR - 4 lanes under 2 tracks	Each	\$13,284,352		\$0		
·	HSR - 4 lanes under 4 tracks	Each	\$19,926,528		\$0		
Structure, Tunnels, Walls	Twin Single Track Drill&Blast (<6 miles)	Per mile	\$142,731,264		\$0		
	Cut/Cover Double Track Tunnel	Per mile	\$131,246,080		\$0		
	Double Track TBM (<6 miles)	Per mile	\$106,637,312		\$0 \$0		
	Four Track Drill&Blast	Per mile	\$293,775,369		\$0		
	Four Track Cut/Cover Tunnel	Per mile	\$262,492,160		\$0		
Underground Stations	Caltrain - Per Platform	Each	\$150,000,000	3	\$450,000,000		
	HSR - Per Platform	Each	\$200,000,000	2	\$400,000,000		
Underground M&O Facility	Caltrain	Each	\$400,000,000	1	\$400,000,000		
I-280	Demolition (200' wide)	LF	\$8,000	2900	\$23,200,000		
Parkway	4 Lanes with median	LF	\$5,000	2900	\$14,500,000		
Ramps		Lump Sum	\$150,000,000		\$0		
System Elements	Signaling, Communications	Per mile	\$2,718,000		\$0		
Electrification	Traction Power	Per mile	\$2,655,000		\$0		
Mech/Electrical	For Tunnels	Per mile	\$11,848,704		\$0		
Environmental Mitigation	Percent of Hard Costs		3%		\$38,631,000		
Program Implementatio Costs	Percent of Hard Costs + Env Mit		25.50%		\$338,214,405		
Contingencies	Percent of Hard Costs + Env Mit		25.00%		\$331,582,750		
Total Cost					\$1,996,128,155		

Page 32 of 51 November 2010

SFTWG Option 4a							
	Cost Elements	Unit	2009 \$, Unit Price	•	Section 1A to Underground		
				Quantity	\$		
Track Section	2 track -In Tunnel/Subway/Trench	Per mile	\$4,700,160		\$0		
	2 track - At-grade	Per mile	\$2,100,224		\$0		
	4 track - In Tunnel/Subway/Trench	Per mile	\$9,400,320	0.28	\$2,632,090		
Earthwork - 2 track	At-grade	Per mile	\$150,000		\$0		
	Covered trench/tunnel	Per mile	\$6,000,000	0.56	\$3,360,000		
	Mined tunnel	Per mile	\$15,000,000		\$0		
Grade Separations	HSR - 4 lanes under 2 tracks	Each	\$13,284,352		\$0		
	HSR - 4 lanes under 4 tracks	Each	\$19,926,528		\$0		
Structure, Tunnels, Walls	Twin Single Track Drill&Blast (<6 miles)	Per mile	\$142,731,264		\$0		
	Cut/Cover Double Track Tunnel	Per mile	\$131,246,080		\$0		
	Double Track TBM (<6 miles)	Per mile	\$106,637,312		\$0		
	Four Track Drill&Blast	Per mile	\$293,775,369		\$0		
	Four Track Cut/Cover Tunnel	Per mile	\$262,492,160	0.28	\$73,497,805		
Underground Stations	Caltrain - Per Platform	Each	\$150,000,000		\$0		
	HSR - Per Platform	Each	\$200,000,000		\$0		
Underground M&O Facility	Caltrain	Each	\$400,000,000		\$0		
I-280	Demolition (200' wide)	LF	\$8,000	1500	\$12,000,000		
Parkway	4 Lanes with median	LF	\$5,000	1500	\$7,500,000		
Ramps	Tanco Milimodali	Lump Sum	\$150,000,000	1300	\$0		
System Elements	Signaling, Communications	Per mile	\$2,718,000	0.56	\$1,522,080		
Electrification	Traction Power	Per mile	\$2,655,000	0.56	\$1,486,800		
Mech/Electrical	For Tunnels	Per mile	\$11,848,704	0.56	\$6,635,274		
Environmental Mitigation	Percent of Hard Costs		3%		\$3,259,021		
Program Implementatio Costs	Percent of Hard Costs + Env Mit		25.50%		\$28,532,733		
Contingencies	Percent of Hard Costs + Env Mit		25.00%		\$27,973,268		
Total Cost					\$168,399,070		

Page 33 of 51 November 2010

SFTWG Option 4a							
	Cost Elements	Unit	2009 \$, Unit Price	•	, Section 1B to Underground		
				Quantity	\$		
Track Section	2 track -In Tunnel/Subway/Trench	Per mile	\$4,700,160		\$0		
	2 track - At-grade	Per mile	\$2,100,224		\$0		
	4 track - In Tunnel/Subway/Trench	Per mile	\$9,400,320	0.76	\$7,144,243		
Earthwork - 2 track	At-grade	Per mile	\$150,000		\$0		
	Covered trench/tunnel	Per mile	\$6,000,000	1.52	\$9,120,000		
	Mined tunnel	Per mile	\$15,000,000		\$0		
Grade Separations	HSR - 4 lanes under 2 tracks	Each	\$13,284,352		\$0		
1	HSR - 4 lanes under 4 tracks	Each	\$19,926,528		\$0		
Structure, Tunnels, Walls	Twin Single Track Drill&Blast (<6 miles)	Per mile	\$142,731,264		\$0		
ot. acta. c, rac.s, rras	Cut/Cover Double Track Tunnel	Per mile	\$131,246,080		\$0		
	Double Track TBM (<6 miles)	Per mile	\$106,637,312		\$0		
	Four Track Drill&Blast	Per mile	\$293,775,369		\$0		
	Four Track Cut/Cover Tunnel	Per mile	\$262,492,160	0.76	\$199,494,042		
Underground Stations	Caltrain - Per Platform	Each	\$150,000,000	1	\$150,000,000		
	HSR - Per Platform	Each	\$200,000,000		\$0		
Underground M&O Facility	Caltrain	Each	\$400,000,000		\$0		
I-280	Demolition (200' wide)	LF	\$8,000	3800	\$30,400,000		
Parkway	4 Lanes with median	LF	\$5,000	3800	\$19,000,000		
Ramps	T Edites With Median	Lump Sum	\$150,000,000	3000	\$0		
System Elements	Signaling, Communications	Per mile	\$2,718,000	1.52	\$4,131,360		
Electrification	Traction Power	Per mile	\$2,655,000	1.52	\$4,035,600		
Mech/Electrical	For Tunnels	Per mile	\$11,848,704	1.52	\$18,010,030		
Environmental Mitigation	Percent of Hard Costs		3%		\$13,240,058		
Program Implementatio Costs	Percent of Hard Costs + Env Mit		25.50%		\$115,916,710		
Contingencies	Percent of Hard Costs + Env Mit		25.00%		\$113,643,833		
Total Cost					\$684,135,876		

Page 34 of 51 November 2010

SFTWG Option 4a						
	Cost Elements	Unit	2009 \$, Unit Price	•	, Section 1C to Underground	
				Quantity	\$	
Track Section	2 track -In Tunnel/Subway/Trench	Per mile	\$4,700,160	,	\$0	
	2 track - At-grade	Per mile	\$2,100,224		\$0	
	4 track - In Tunnel/Subway/Trench	Per mile	\$9,400,320	0.32	\$3,008,102	
Earthwork - 2 track	At-grade	Per mile	\$150,000		\$0	
	Covered trench/tunnel	Per mile	\$6,000,000	0.64	\$3,840,000	
	Mined tunnel	Per mile	\$15,000,000		\$0	
Grade Separations	HSR - 4 lanes under 2 tracks	Each	\$13,284,352		\$0	
·	HSR - 4 lanes under 4 tracks	Each	\$19,926,528		\$0	
Structure, Tunnels, Walls	Twin Single Track Drill&Blast (<6 miles)	Per mile	\$142,731,264		\$0	
Structure, runners, vvans	Cut/Cover Double Track Tunnel	Per mile	\$131,246,080	+	\$0	
	Double Track TBM (<6 miles)	Per mile	\$106,637,312		\$0	
	Four Track Drill&Blast	Per mile	\$293,775,369		\$0	
	Four Track Cut/Cover Tunnel	Per mile	\$262,492,160	0.32	\$83,997,491	
Underground Stations	Caltrain - Per Platform	Each	\$150,000,000		\$0	
	HSR - Per Platform	Each	\$200,000,000		\$0	
Underground M&O Facility	Caltrain	Each	\$400,000,000		\$0	
I-280	Demolition (200' wide)	LF	\$8,000	1300	\$10,400,000	
Parkway	4 Lanes with median	LF	\$5,000	1300	\$6,500,000	
Ramps		Lump Sum	\$150,000,000	1	\$150,000,000	
System Elements	Signaling, Communications	Per mile	\$2,718,000	0.64	\$1,739,520	
Electrification	Traction Power	Per mile	\$2,655,000	0.64	\$1,699,200	
Mech/Electrical	For Tunnels	Per mile	\$11,848,704	0.64	\$7,583,171	
Environmental Mitigation	Percent of Hard Costs		3%		\$8,063,025	
Program Implementatio Costs	Percent of Hard Costs + Env Mit		25.50%		\$70,591,780	
Contingencies	Percent of Hard Costs + Env Mit		25.00%		\$69,207,627	
Total Cost					\$416,629,916	

Page 35 of 51 November 2010

SFTWG Option 4b						
	Cost Elements	Unit	2009 \$, Unit Price	Option 4b, Section O to 4th/King At-Grade		
				Quantity	\$	
Track Section	2 track -In Tunnel/Subway/Trench	Per mile	\$4,700,160	0.46	\$2,162,074	
	2 track - At-grade	Per mile	\$2,100,224		\$0	
	4 track - In Tunnel/Subway/Trench	Per mile	\$9,400,320		\$0	
Earthwork - 2 track	At-grade	Per mile	\$150,000		\$0	
	Covered trench/tunnel	Per mile	\$6,000,000	0.46	\$2,760,000	
	Mined tunnel	Per mile	\$15,000,000		\$0	
Grade Separations	HSR - 4 lanes under 2 tracks	Each	\$13,284,352		\$0	
	HSR - 4 lanes under 4 tracks	Each	\$19,926,528		\$0	
Structure, Tunnels, Walls	Twin Single Track Drill&Blast (<6 miles)	Per mile	\$142,731,264		\$0	
Structure, runners, wans	Cut/Cover Double Track Tunnel	Per mile	\$131,246,080	0.46	\$60,373,197	
	Double Track TBM (<6 miles)	Per mile	\$106,637,312	0.40	\$0	
	Four Track Drill&Blast	Per mile	\$293,775,369		\$0	
	Four Track Cut/Cover Tunnel	Per mile	\$262,492,160		\$0	
Underground Stations	Caltrain - Per Platform	Each	\$150,000,000		\$0	
	HSR - Per Platform	Each	\$200,000,000		\$0	
Underground M&O Facility	Caltrain	Each	\$400,000,000		\$0	
I-280	Demolition (200' wide)	LF	\$8,000	2900	\$23,200,000	
Parkway	4 Lanes with median	I F	\$5,000	2900	\$14,500,000	
Ramps	- I am to the mean and the mean	Lump Sum	\$150,000,000	2300	\$0	
System Elements	Signaling, Communications	Per mile	\$2,718,000	0.46	\$1,250,280	
Electrification	Traction Power	Per mile	\$2,655,000	0.46	\$1,221,300	
Mech/Electrical	For Tunnels	Per mile	\$11,848,704	0.46	\$5,450,404	
Environmental Mitigation	Percent of Hard Costs		3%		\$3,327,518	
Program Implementatio Costs	Percent of Hard Costs + Env Mit		25.50%		\$29,132,417	
Contingencies	Percent of Hard Costs + Env Mit		25.00%		\$28,561,193	
Total Cost					\$171,938,382	

Page 36 of 51 November 2010

SFTWG Option 4b							
	Cost Elements	Unit	2009 \$, Unit Price	•	, Section 1A to g At-Grade		
				Quantity	\$		
Track Section	2 track -In Tunnel/Subway/Trench	Per mile	\$4,700,160		\$0		
	2 track - At-grade	Per mile	\$2,100,224		\$0		
	4 track - In Tunnel/Subway/Trench	Per mile	\$9,400,320	0.28	\$2,632,090		
Earthwork - 2 track	At-grade	Per mile	\$150,000		\$0		
	Covered trench/tunnel	Per mile	\$6,000,000	0.56	\$3,360,000		
	Mined tunnel	Per mile	\$15,000,000		\$0		
Grade Separations	HSR - 4 lanes under 2 tracks	Each	\$13,284,352		\$0		
•	HSR - 4 lanes under 4 tracks	Each	\$19,926,528		\$0		
Structure, Tunnels, Walls	Twin Single Track Drill&Blast (<6 miles)	Per mile	\$142,731,264		\$0		
otractare, rainces, rrain	Cut/Cover Double Track Tunnel	Per mile	\$131,246,080		\$0		
	Double Track TBM (<6 miles)	Per mile	\$106,637,312		\$0		
	Four Track Drill&Blast	Per mile	\$293,775,369		\$0		
	Four Track Cut/Cover Tunnel	Per mile	\$262,492,160	0.28	\$73,497,805		
Underground Stations	Caltrain - Per Platform	Each	\$150,000,000		\$0		
	HSR - Per Platform	Each	\$200,000,000		\$0		
Underground M&O Facility	Caltrain	Each	\$400,000,000		\$0		
I-280	Demolition (200' wide)	LF	\$8,000	1500	\$12,000,000		
Parkway	4 Lanes with median	LF	\$5,000	1500	\$7,500,000		
Ramps	T Edities Will Median	Lump Sum	\$150,000,000	1300	\$0		
System Elements	Signaling, Communications	Per mile	\$2,718,000	0.56	\$1,522,080		
Electrification	Traction Power	Per mile	\$2,655,000	0.56	\$1,486,800		
Mech/Electrical	For Tunnels	Per mile	\$11,848,704	0.56	\$6,635,274		
Environmental Mitigation	Percent of Hard Costs		3%		\$3,259,021		
Program Implementatio Costs	Percent of Hard Costs + Env Mit		25.50%		\$28,532,733		
Contingencies	Percent of Hard Costs + Env Mit		25.00%		\$27,973,268		
Total Cost					\$168,399,070		

Page 37 of 51 November 2010

SFTWG Option 4b							
	Cost Elements	Unit	2009 \$, Unit Price	Option 4b, Section 1B to 4th/King At-Grade			
				Quantity	\$		
Track Section	2 track -In Tunnel/Subway/Trench	Per mile	\$4,700,160		\$0		
	2 track - At-grade	Per mile	\$2,100,224		\$0		
	4 track - In Tunnel/Subway/Trench	Per mile	\$9,400,320	0.76	\$7,144,243		
Earthwork - 2 track	At-grade	Per mile	\$150,000		\$0		
	Covered trench/tunnel	Per mile	\$6,000,000	1.52	\$9,120,000		
	Mined tunnel	Per mile	\$15,000,000		\$0		
Grade Separations	HSR - 4 lanes under 2 tracks	Each	\$13,284,352		\$0		
1	HSR - 4 lanes under 4 tracks	Each	\$19,926,528		\$0		
Structure, Tunnels, Walls	Twin Single Track Drill&Blast (<6 miles)	Per mile	\$142,731,264		\$0		
ot. acta. c, rac.s, rras	Cut/Cover Double Track Tunnel	Per mile	\$131,246,080		\$0		
	Double Track TBM (<6 miles)	Per mile	\$106,637,312		\$0		
	Four Track Drill&Blast	Per mile	\$293,775,369		\$0		
	Four Track Cut/Cover Tunnel	Per mile	\$262,492,160	0.76	\$199,494,042		
Underground Stations	Caltrain - Per Platform	Each	\$150,000,000	1	\$150,000,000		
	HSR - Per Platform	Each	\$200,000,000		\$0		
Underground M&O Facility	Caltrain	Each	\$400,000,000		\$0		
I-280	Demolition (200' wide)	LF	\$8,000	3800	\$30,400,000		
Parkway	4 Lanes with median	LF	\$5,000	3800	\$19,000,000		
Ramps	4 Lattes with median	Lump Sum	\$150,000,000	3800	\$19,000,000		
System Elements	Signaling, Communications	Per mile	\$2,718,000	1.52	\$4,131,360		
Electrification	Traction Power	Per mile	\$2,655,000	1.52	\$4,035,600		
Mech/Electrical	For Tunnels	Per mile	\$11,848,704	1.52	\$18,010,030		
Environmental Mitigation	Percent of Hard Costs		3%		\$13,240,058		
Program Implementatio Costs	Percent of Hard Costs + Env Mit		25.50%		\$115,916,710		
Contingencies	Percent of Hard Costs + Env Mit		25.00%		\$113,643,833		
Total Cost					\$684,135,876		

Page 38 of 51 November 2010

SFTWG Option 4b						
	Cost Elements	Unit	2009 \$, Unit Price	Option 4b, Section 1C to 4th/King At-Grade		
				Quantity	\$	
Track Section	2 track -In Tunnel/Subway/Trench	Per mile	\$4,700,160		\$0	
	2 track - At-grade	Per mile	\$2,100,224		\$0	
	4 track - In Tunnel/Subway/Trench	Per mile	\$9,400,320	0.32	\$3,008,102	
Earthwork - 2 track	At-grade	Per mile	\$150,000		\$0	
	Covered trench/tunnel	Per mile	\$6,000,000	0.64	\$3,840,000	
	Mined tunnel	Per mile	\$15,000,000		\$0	
Grade Separations	HSR - 4 lanes under 2 tracks	Each	\$13,284,352		\$0	
1	HSR - 4 lanes under 4 tracks	Each	\$19,926,528		\$0	
Structure, Tunnels, Walls	Twin Single Track Drill&Blast (<6 miles)	Per mile	\$142,731,264		\$0	
Structure, runners, vvans	Cut/Cover Double Track Tunnel	Per mile	\$131,246,080		\$0	
	Double Track TBM (<6 miles)	Per mile	\$106,637,312		\$0	
	Four Track Drill&Blast	Per mile	\$293,775,369		\$0	
	Four Track Cut/Cover Tunnel	Per mile	\$262,492,160	0.32	\$83,997,491	
Underground Stations	Caltrain - Per Platform	Each	\$150,000,000		\$0	
	HSR - Per Platform	Each	\$200,000,000		\$0	
Underground M&O Facility	Caltrain	Each	\$400,000,000		\$0	
1 200	D-m-liki-m (2001i.d-)	15	¢0.000	1200	¢40,400,000	
I-280	Demolition (200' wide) 4 Lanes with median	LF LF	\$8,000	1300	\$10,400,000	
Parkway Ramps	4 Lanes with median	Lump Sum	\$5,000 \$150,000,000	1300	\$6,500,000 \$150,000,000	
C	Si li G		ć2.740.000	0.64	Ć4 720 F20	
System Elements	Signaling, Communications	Per mile	\$2,718,000	0.64	\$1,739,520	
Electrification	Traction Power	Per mile	\$2,655,000	0.64	\$1,699,200	
Mech/Electrical	For Tunnels	Per mile	\$11,848,704	0.64	\$7,583,171	
Environmental Mitigation	Percent of Hard Costs		3%		\$8,063,025	
Program Implementatio Costs	Percent of Hard Costs + Env Mit		25.50%		\$70,591,780	
Contingencies	Percent of Hard Costs + Env Mit		25.00%		\$69,207,627	
Total Cost					\$416,629,916	

Page 39 of 51 November 2010

SFTWG Option 4c						
	Cost Elements	Unit	2009 \$, Unit Price	•	, Section O to n/King	
				Quantity	\$	
Track Section	2 track -In Tunnel/Subway/Trench	Per mile	\$4,700,160	0.46	\$2,162,074	
	2 track - At-grade	Per mile	\$2,100,224		\$0	
	4 track - In Tunnel/Subway/Trench	Per mile	\$9,400,320		\$0	
Earthwork - 2 track	At-grade	Per mile	\$150,000		\$0	
	Covered trench/tunnel	Per mile	\$6,000,000	0.46	\$2,760,000	
	Mined tunnel	Per mile	\$15,000,000		\$0	
Grade Separations	HSR - 4 lanes under 2 tracks	Each	\$13,284,352		\$0	
	HSR - 4 lanes under 4 tracks	Each	\$19,926,528		\$0	
Structure, Tunnels, Walls	Twin Single Track Drill&Blast (<6 miles)	Per mile	\$142,731,264		\$0	
	Cut/Cover Double Track Tunnel	Per mile	\$131,246,080	0.46	\$60,373,197	
	Double Track TBM (<6 miles)	Per mile	\$106,637,312		\$0	
	Four Track Drill&Blast	Per mile	\$293,775,369		\$0	
	Four Track Cut/Cover Tunnel	Per mile	\$262,492,160		\$0	
Underground Stations	Caltrain - Per Platform	Each	\$150,000,000		\$0	
	HSR - Per Platform	Each	\$200,000,000		\$0	
Underground M&O Facility	Caltrain	Each	\$400,000,000		\$0	
I-280	Demolition (200' wide)	LF	\$8,000	2400	\$19,200,000	
Parkway	4 Lanes with median	LF	\$5,000	2400	\$12,000,000	
Intersections	Improvements	Each	\$3,000,000	3	\$9,000,000	
Ramps		Lump Sum	\$150,000,000		\$0	
System Elements	Signaling, Communications	Per mile	\$2,718,000	0.46	\$1,250,280	
Electrification	Traction Power	Per mile	\$2,655,000	0.46	\$1,221,300	
Mech/Electrical	For Tunnels	Per mile	\$11,848,704	0.46	\$5,450,404	
Environmental Mitigation	Percent of Hard Costs		3%		\$3,402,518	
Program Implementatio Costs	Percent of Hard Costs + Env Mit		25.50%		\$29,789,042	
Contingencies	Percent of Hard Costs + Env Mit		25.00%		\$29,204,943	
Total Cost					\$175,813,757	

Page 40 of 51 November 2010

SFTWG Option 4c					
Cost Elements		Unit	2009 \$, Unit Price	Option 4c, Section 1A to 4th/King	
				Quantity	\$
Track Section	2 track -In Tunnel/Subway/Trench	Per mile	\$4,700,160	0.284	\$1,334,845
	2 track - At-grade	Per mile	\$2,100,224		\$0
	4 track - In Tunnel/Subway/Trench	Per mile	\$9,400,320		\$0
Earthwork - 2 track	At-grade	Per mile	\$150,000		\$0
	Covered trench/tunnel	Per mile	\$6,000,000	0.284	\$1,704,000
	Mined tunnel	Per mile	\$15,000,000		\$0
Grade Separations	HSR - 4 lanes under 2 tracks	Each	\$13,284,352		\$0
	HSR - 4 lanes under 4 tracks	Each	\$19,926,528		\$0
Structure, Tunnels, Walls	Twin Single Track Drill&Blast (<6 miles)	Per mile	\$142,731,264		\$0
Structure, runners, vvans	Cut/Cover Double Track Tunnel	Per mile	\$131,246,080	0.284	\$37,273,887
	Double Track TBM (<6 miles)	Per mile	\$106,637,312	0.204	\$0
	Four Track Drill&Blast	Per mile	\$293,775,369		\$0
	Four Track Cut/Cover Tunnel	Per mile	\$262,492,160		\$0
Underground Stations	Caltrain - Per Platform	Each	\$150,000,000		\$0
	HSR - Per Platform	Each	\$200,000,000		\$0
Underground M&O Facility	Caltrain	Each	\$400,000,000		\$0
I-280	Demolition (200' wide)	LF	\$8,000	1480	\$11,840,000
Parkway	4 Lanes with median	LF	\$5,000	1480	\$7,400,000
Intersections	Improvements	Each	\$3,000,000	2	\$6,000,000
Ramps		Lump Sum	\$150,000,000		\$0
System Elements	Signaling, Communications	Per mile	\$2,718,000	0.284	\$771,912
Electrification	Traction Power	Per mile	\$2,655,000	0.284	\$754,020
Mech/Electrical	For Tunnels	Per mile	\$11,848,704	0.284	\$3,365,032
Environmental Mitigation	Percent of Hard Costs		3%		\$2,113,311
Program Implementatio Costs	Percent of Hard Costs + Env Mit		25.50%		\$18,502,037
Contingencies	Percent of Hard Costs + Env Mit		25.00%		\$18,139,252
Total Cost					\$109,198,296

Page 41 of 51 November 2010

SFTWG Option 4c						
	Cost Elements	Unit	2009 \$, Unit Price		Option 4c, Section 1B Tunnel to 4th/King	
				Quantity	\$	
Track Section	2 track -In Tunnel/Subway/Trench	Per mile	\$4,700,160	0.16	\$752,026	
	2 track - At-grade	Per mile	\$2,100,224		\$0	
	4 track - In Tunnel/Subway/Trench	Per mile	\$9,400,320		\$0	
Earthwork - 2 track	At-grade	Per mile	\$150,000		\$0	
	Covered trench/tunnel	Per mile	\$6,000,000	0.16	\$960,000	
	Mined tunnel	Per mile	\$15,000,000		\$0	
Grade Separations	HSR - 4 lanes under 2 tracks	Each	\$13,284,352		\$0	
	HSR - 4 lanes under 4 tracks	Each	\$19,926,528		\$0	
Structure, Tunnels, Walls	Twin Single Track Drill&Blast (<6 miles)	Per mile	\$142,731,264		\$0	
, , , , , , , , , , , , , , , , , , , ,	Cut/Cover Double Track Tunnel	Per mile	\$131,246,080	0.16	\$20,999,373	
	Double Track TBM (<6 miles)	Per mile	\$106,637,312		\$0	
	Four Track Drill&Blast	Per mile	\$293,775,369		\$0	
	Four Track Cut/Cover Tunnel	Per mile	\$262,492,160		\$0	
Underground Stations	Caltrain - Per Platform	Each	\$150,000,000		\$0	
	HSR - Per Platform	Each	\$200,000,000		\$0	
Underground M&O Facility	Caltrain	Each	\$400,000,000		\$0	
I-280	Demolition (200' wide)	LF	\$8,000	880	\$7,040,000	
Parkway	4 Lanes with median	LF	\$5,000	880	\$4,400,000	
Intersections	Improvements	Each	\$3,000,000	1	\$3,000,000	
Ramps		Lump Sum	\$150,000,000	1	\$150,000,000	
System Elements	Signaling, Communications	Per mile	\$2,718,000	0.16	\$434,880	
Electrification	Traction Power	Per mile	\$2,655,000	0.16	\$424,800	
Mech/Electrical	For Tunnels	Per mile	\$11,848,704	0.16	\$1,895,793	
Environmental Mitigation	Percent of Hard Costs		3%		\$5,697,206	
Program Implementatio Costs	Percent of Hard Costs + Env Mit		25.50%		\$49,879,040	
Contingencies	Percent of Hard Costs + Env Mit		25.00%		\$48,901,019	
Total Cost					\$294,384,136	

Page 42 of 51 November 2010

	SFTWG Option	4c			
	Cost Elements	Unit	2009 \$, Unit Price	Option 4c, Section 1B At- Grade to 4th/King	
				Quantity	\$
Track Section	2 track -In Tunnel/Subway/Trench	Per mile	\$4,700,160		\$0
	2 track - At-grade	Per mile	\$2,100,224	0.6	\$1,260,134
	4 track - In Tunnel/Subway/Trench	Per mile	\$9,400,320		\$0
Earthwork - 2 track	At-grade	Per mile	\$7,100,000	0.6	\$4,260,000
	Covered trench/tunnel	Per mile	\$6,000,000		\$0
	Mined tunnel	Per mile	\$15,000,000		\$0
Grade Separations	HSR - 4 lanes under 2 tracks	Each	\$13,284,352		\$0
	HSR - 4 lanes under 4 tracks	Each	\$19,926,528		\$0
Structure, Tunnels, Walls	Twin Single Track Drill&Blast (<6 miles)	Per mile	\$142,731,264		\$0
	Cut/Cover Double Track Tunnel	Per mile	\$131,246,080		\$0
	Double Track TBM (<6 miles)	Per mile	\$106,637,312		\$0
	Four Track Drill&Blast	Per mile	\$293,775,369		\$0
	Four Track Cut/Cover Tunnel	Per mile	\$262,492,160		\$0
Underground Stations	Caltrain - Per Platform	Each	\$150,000,000		\$0
	HSR - Per Platform	Each	\$200,000,000		\$0
Underground M&O Facility	Caltrain	Each	\$400,000,000		\$0
I-280	Demolition (200' wide)	LF	\$8,000		\$0
Parkway	4 Lanes with median	LF	\$5,000		\$0
Intersections	Improvements	Each	\$3,000,000		\$0
Ramps		Lump Sum	\$150,000,000		\$0
System Elements	Signaling, Communications	Per mile	\$2,718,000	0.6	\$1,630,800
Electrification	Traction Power	Per mile	\$2,655,000	0.6	\$1,593,000
Mech/Electrical	For Tunnels	Per mile	\$11,848,704		\$0
Environmental Mitigation	Percent of Hard Costs		3%		\$262,318
Program Implementatio Costs	Percent of Hard Costs + Env Mit		25.50%		\$2,296,594
Contingencies	Percent of Hard Costs + Env Mit		25.00%		\$2,251,563
Total Cost					\$13,554,410

Page 43 of 51 November 2010

SFTWG Option 5a						
	Cost Elements		2009 \$, Unit Price	Option 5a, Mega-Bore, Bayshore to TTC & 4th/King (Underground), Section O		
				Quantity	\$	
Track Section	2 track -In Tunnel/Subway/Trench	Per mile	\$4,700,160		\$0	
	2 track - At-grade	Per mile	\$2,100,224		\$0	
	4 track - In Tunnel/Subway/Trench	Per mile	\$9,400,320		\$0	
Earthwork - 2 track	At-grade	Per mile	\$150,000		\$0	
	Covered trench/tunnel	Per mile	\$6,000,000		\$0	
	Mined tunnel	Per mile	\$15,000,000		\$0	
Grade Separations	HSR - 4 lanes under 2 tracks	Each	\$13,284,352		\$0	
	HSR - 4 lanes under 4 tracks	Each	\$19,926,528		\$0	
Structure, Tunnels, Walls	Twin Single Track Drill&Blast (<6 miles)	Per mile	\$142,731,264		\$0	
	4-Track Mega Bore	Per mile	\$350,000,000		\$0	
	Cut/Cover Double Track Tunnel	Per mile	\$131,246,080		\$0	
	Double Track TBM (<6 miles)	Per mile	\$106,637,312		\$0	
	Four Track Drill&Blast	Per mile	\$293,775,369		\$0	
	Four Track Cut/Cover Tunnel	Per mile	\$262,492,160		\$0	
Underground Stations	Caltrain - Per Platform	Each	\$150,000,000	3	\$450,000,000	
	HSR - Per Platform	Each	\$200,000,000	2	\$400,000,000	
Underground M&O Facility	Caltrain	Each	\$400,000,000	1	\$400,000,000	
I-280	Demolition (200' wide)	LF	\$8,000		\$0	
Parkway	4 Lanes with median	LF	\$5,000		\$0	
Ramps		Lump Sum	\$150,000,000		\$0	
System Elements	Signaling, Communications	Per mile	\$2,718,000	0	\$0	
Electrification	Traction Power	Per mile	\$2,655,000	0	\$0	
Mech/Electrical	For Tunnels	Per mile	\$11,848,704	0	\$0	
Environmental Mitigation	Percent of Hard Costs		3%		\$37,500,000	
Program Implementatio Costs	Percent of Hard Costs + Env Mit		25.50%		\$328,312,500	
Contingencies	Percent of Hard Costs + Env Mit		25.00%		\$321,875,000	
Total Cost					\$1,937,687,500	

Page 44 of 51 November 2010

SFTWG Option 5a						
	Cost Elements		2009 \$, Unit Price	Option 5a, Mega-Bore, Bayshore to TTC & 4th/King (Underground), Section 1A		
				Quantity	\$	
Track Section	2 track -In Tunnel/Subway/Trench	Per mile	\$4,700,160		\$0	
	2 track - At-grade	Per mile	\$2,100,224		\$0	
	4 track - In Tunnel/Subway/Trench	Per mile	\$9,400,320	0.28	\$2,632,090	
Earthwork - 2 track	At-grade	Per mile	\$150,000		\$0	
	Covered trench/tunnel	Per mile	\$6,000,000		\$0	
	Mined tunnel	Per mile	\$15,000,000	0.56	\$8,400,000	
Grade Separations	HSR - 4 lanes under 2 tracks	Each	\$13,284,352		\$0	
	HSR - 4 lanes under 4 tracks	Each	\$19,926,528		\$0	
Structure, Tunnels, Walls	Twin Single Track Drill&Blast (<6 miles)	Per mile	\$142,731,264		\$0	
Structure, runners, wans	4-Track Mega Bore	Per mile	\$350,000,000	0.28	\$98,000,000	
	Cut/Cover Double Track Tunnel	Per mile	\$131,246,080	0.20	\$38,000,000	
	Double Track TBM (<6 miles)	Per mile	\$106,637,312		\$0	
	Four Track Drill&Blast	Per mile	\$293,775,369		\$0	
	Four Track Cut/Cover Tunnel	Per mile	\$262,492,160		\$0	
Underground Stations	Caltrain - Per Platform	Each	\$150,000,000		\$0	
onderground stations	HSR - Per Platform	Each	\$200,000,000		\$0	
Underground M&O Facility	Caltrain	Each	\$400,000,000		\$0	
I-280	Demolition (200' wide)	LF	\$8,000		\$0	
Parkway	4 Lanes with median	LF	\$5,000		\$0	
Ramps		Lump Sum	\$150,000,000		\$0	
System Elements	Signaling, Communications	Per mile	\$2,718,000	0.56	\$1,522,080	
Electrification	Traction Power	Per mile	\$2,655,000	0.56	\$1,486,800	
Mech/Electrical	For Tunnels	Per mile	\$11,848,704	0.56	\$6,635,274	
Environmental Mitigation	Percent of Hard Costs		3%		\$3,560,287	
Program Implementatio Costs	Percent of Hard Costs + Env Mit		25.50%		\$31,170,315	
Contingencies	Percent of Hard Costs + Env Mit		25.00%		\$30,559,133	
Total Cost					\$183,965,979	

Page 45 of 51 November 2010

SFTWG Option 5a					
	Cost Elements		2009 \$, Unit Price	Option 5a, Mega-Bore, Bayshore to TTC & 4th/King (Underground), Section 1B	
				Quantity	\$
Track Section	2 track -In Tunnel/Subway/Trench	Per mile	\$4,700,160		\$0
	2 track - At-grade	Per mile	\$2,100,224		\$0
	4 track - In Tunnel/Subway/Trench	Per mile	\$9,400,320	0.76	\$7,144,243
Earthwork - 2 track	At-grade	Per mile	\$150,000		\$0
	Covered trench/tunnel	Per mile	\$6,000,000		\$0
	Mined tunnel	Per mile	\$15,000,000	1.52	\$22,800,000
Grade Separations	HSR - 4 lanes under 2 tracks	Each	\$13,284,352		\$0
	HSR - 4 lanes under 4 tracks	Each	\$19,926,528		\$0
Structure, Tunnels, Walls	Twin Single Track Drill&Blast (<6 miles)	Per mile	\$142,731,264		\$0
	4-Track Mega Bore	Per mile	\$350,000,000	0.76	\$266,000,000
	Cut/Cover Double Track Tunnel	Per mile	\$131,246,080		\$0
	Double Track TBM (<6 miles)	Per mile	\$106,637,312		\$0
	Four Track Drill&Blast	Per mile	\$293,775,369		\$0
	Four Track Cut/Cover Tunnel	Per mile	\$262,492,160		\$0
Underground Stations	Caltrain - Per Platform	Each	\$150,000,000	1	\$150,000,000
	HSR - Per Platform	Each	\$200,000,000		\$0
Underground M&O Facility	Caltrain	Each	\$400,000,000		\$0
I-280	Demolition (200' wide)	LF	\$8,000		\$0
Parkway	4 Lanes with median	LF	\$5,000		\$0
Ramps		Lump Sum	\$150,000,000		\$0
System Elements	Signaling, Communications	Per mile	\$2,718,000	1.52	\$4,131,360
Electrification	Traction Power	Per mile	\$2,655,000	1.52	\$4,035,600
Mech/Electrical	For Tunnels	Per mile	\$11,848,704	1.52	\$18,010,030
Environmental Mitigation	Percent of Hard Costs		3%		\$14,163,637
Program Implementatio Costs	Percent of Hard Costs + Env Mit		25.50%		\$124,002,642
Contingencies	Percent of Hard Costs + Env Mit		25.00%		\$121,571,218
Total Cost					\$731,858,730

Page 46 of 51 November 2010

SFTWG Option 5a						
Cost Elements		Unit	2009 \$, Unit Price	Option 5a, Mega-Bore, Bayshore to TTC & 4th/King (Underground), Section 1C		
				Quantity	\$	
Track Section	2 track -In Tunnel/Subway/Trench	Per mile	\$4,700,160		\$0	
	2 track - At-grade	Per mile	\$2,100,224		\$0	
	4 track - In Tunnel/Subway/Trench	Per mile	\$9,400,320	0.23	\$2,162,074	
Earthwork - 2 track	At-grade	Per mile	\$150,000		\$0	
	Covered trench/tunnel	Per mile	\$6,000,000		\$0	
	Mined tunnel	Per mile	\$15,000,000	0.46	\$6,900,000	
Grade Separations	HSR - 4 lanes under 2 tracks	Each	\$13,284,352		\$0	
	HSR - 4 lanes under 4 tracks	Each	\$19,926,528		\$0	
Structure, Tunnels, Walls	Twin Single Track Drill&Blast (<6 miles)	Per mile	\$142,731,264		\$0	
	4-Track Mega Bore	Per mile	\$350,000,000	0.23	\$80,500,000	
	Cut/Cover Double Track Tunnel	Per mile	\$131,246,080		\$0	
	Double Track TBM (<6 miles)	Per mile	\$106,637,312		\$0	
	Four Track Drill&Blast	Per mile	\$293,775,369		\$0	
	Four Track Cut/Cover Tunnel	Per mile	\$262,492,160		\$0	
Underground Stations	Caltrain - Per Platform	Each	\$150,000,000		\$0	
	HSR - Per Platform	Each	\$200,000,000		\$0	
Underground M&O Facility	Caltrain	Each	\$400,000,000		\$0	
I-280	Demolition (200' wide)	LF	\$8,000		\$0	
Parkway	4 Lanes with median	LF	\$5,000		\$0	
Ramps		Lump Sum	\$150,000,000		\$0	
System Elements	Signaling, Communications	Per mile	\$2,718,000	0.46	\$1,250,280	
Electrification	Traction Power	Per mile	\$2,655,000	0.46	\$1,221,300	
Mech/Electrical	For Tunnels	Per mile	\$11,848,704	0.46	\$5,450,404	
Environmental Mitigation	Percent of Hard Costs		3%		\$2,924,522	
Program Implementatio Costs	Percent of Hard Costs + Env Mit		25.50%		\$25,604,188	
Contingencies	Percent of Hard Costs + Env Mit		25.00%		\$25,102,145	
Total Cost					\$151,114,912	

Page 47 of 51 November 2010

SFTWG Option 5a						
Cost Elements		Unit	2009 \$, Unit Price	Option 5a, Mega-Bore, Bayshore to TTC & 4th/King (Underground), Section 1D		
				Quantity	\$	
Track Section	2 track -In Tunnel/Subway/Trench	Per mile	\$4,700,160		\$0	
	2 track - At-grade	Per mile	\$2,100,224		\$0	
	4 track - In Tunnel/Subway/Trench	Per mile	\$9,400,320	0.91	\$8,554,291	
Earthwork - 2 track	At-grade	Per mile	\$150,000		\$0	
	Covered trench/tunnel	Per mile	\$6,000,000		\$0	
	Mined tunnel	Per mile	\$15,000,000	1.82	\$27,300,000	
Grade Separations	HSR - 4 lanes under 2 tracks	Each	\$13,284,352		\$0	
	HSR - 4 lanes under 4 tracks	Each	\$19,926,528		\$0	
Structure, Tunnels, Walls	Twin Single Track Drill&Blast (<6 miles)	Per mile	\$142,731,264		\$0	
	4-Track Mega Bore	Per mile	\$350,000,000		\$318,500,000	
	Cut/Cover Double Track Tunnel	Per mile	\$131,246,080		\$0	
	Double Track TBM (<6 miles)	Per mile	\$106,637,312		\$0	
	Four Track Drill&Blast	Per mile	\$293,775,369		\$0	
	Four Track Cut/Cover Tunnel	Per mile	\$262,492,160		\$0	
Underground Stations	Caltrain - Per Platform	Each	\$150,000,000		\$0	
	HSR - Per Platform	Each	\$200,000,000		\$0	
Underground M&O Facility	Caltrain	Each	\$400,000,000		\$0	
I-280	Demolition (200' wide)	LF	\$8,000		\$0	
Parkway	4 Lanes with median	LF	\$5,000		\$0	
Ramps		Lump Sum	\$150,000,000		\$0	
System Elements	Signaling, Communications	Per mile	\$2,718,000	1.82	\$4,946,760	
Electrification	Traction Power	Per mile	\$2,655,000	1.82	\$4,832,100	
Mech/Electrical	For Tunnels	Per mile	\$11,848,704	1.82	\$21,564,641	
Environmental Mitigation	Percent of Hard Costs		3%		\$11,570,934	
Program Implementatio Costs	Percent of Hard Costs + Env Mit		25.50%		\$101,303,525	
Contingencies	Percent of Hard Costs + Env Mit		25.00%		\$99,317,182	
Total Cost					\$597,889,433	

Page 48 of 51 November 2010

	SFTWG Option	5a			
	Cost Elements		2009 \$, Unit Price	Option 5a, Mega-Bore, Bayshore to TTC & 4th/King (Underground), Section 1E	
				Quantity	\$
Track Section	2 track -In Tunnel/Subway/Trench	Per mile	\$4,700,160		\$0
	2 track - At-grade	Per mile	\$2,100,224		\$0
	4 track - In Tunnel/Subway/Trench	Per mile	\$9,400,320	0.66	\$6,204,211
Earthwork - 2 track	At-grade	Per mile	\$150,000		\$0
	Covered trench/tunnel	Per mile	\$6,000,000		\$0
	Mined tunnel	Per mile	\$15,000,000	1.32	\$19,800,000
Grade Separations	HSR - 4 lanes under 2 tracks	Each	\$13,284,352		\$0
·	HSR - 4 lanes under 4 tracks	Each	\$19,926,528		\$0
Structure, Tunnels, Walls	Twin Single Track Drill&Blast (<6 miles)	Per mile	\$142,731,264		\$0
otractare, rames, rrans	4-Track Mega Bore	Per mile	\$350,000,000	0.66	\$231,000,000
	Cut/Cover Double Track Tunnel	Per mile	\$131,246,080	0.00	\$0
	Double Track TBM (<6 miles)	Per mile	\$106,637,312		\$0
	Four Track Drill&Blast	Per mile	\$293,775,369		\$0
	Four Track Cut/Cover Tunnel	Per mile	\$262,492,160		\$0
Underground Stations	Caltrain - Per Platform	Each	\$150,000,000		\$0
	HSR - Per Platform	Each	\$200,000,000		\$0
Underground M&O Facility	Caltrain	Each	\$400,000,000		\$0
I-280	Demolition (200' wide)	LF	\$8,000		\$0
Parkway	4 Lanes with median	LF	\$5,000		\$0
Ramps		Lump Sum	\$150,000,000		\$0
System Elements	Signaling, Communications	Per mile	\$2,718,000	1.32	\$3,587,760
Electrification	Traction Power	Per mile	\$2,655,000	1.32	\$3,504,600
Mech/Electrical	For Tunnels	Per mile	\$11,848,704	1.32	\$15,640,289
Environmental Mitigation	Percent of Hard Costs		3%		\$8,392,106
Program Implementatio Costs	Percent of Hard Costs + Env Mit		25.50%		\$73,472,886
Contingencies	Percent of Hard Costs + Env Mit		25.00%		\$72,032,242
Total Cost					\$433,634,094

Page 49 of 51 November 2010

SFTWG Option 5a						
	Cost Elements	Unit	2009 \$, Unit Price	Option 5a, Mega-Bore, Bayshore to TTC & 4th/King (Underground), Section 1F		
				Quantity	\$	
Track Section	2 track -In Tunnel/Subway/Trench	Per mile	\$4,700,160		\$0	
	2 track - At-grade	Per mile	\$2,100,224		\$0	
	4 track - In Tunnel/Subway/Trench	Per mile	\$9,400,320	0.49	\$4,606,157	
Earthwork - 2 track	At-grade	Per mile	\$150,000		\$0	
	Covered trench/tunnel	Per mile	\$6,000,000		\$0	
	Mined tunnel	Per mile	\$15,000,000	0.98	\$14,700,000	
Grade Separations	HSR - 4 lanes under 2 tracks	Each	\$13,284,352		\$0	
	HSR - 4 lanes under 4 tracks	Each	\$19,926,528		\$0	
Structure, Tunnels, Walls	Twin Single Track Drill&Blast (<6 miles)	Per mile	\$142,731,264		\$0	
Structure, runners, wans	4-Track Mega Bore	Per mile	\$350,000,000	0.49	\$171,500,000	
	Cut/Cover Double Track Tunnel	Per mile	\$131,246,080	0.15	\$0	
	Double Track TBM (<6 miles)	Per mile	\$106,637,312		\$0	
	Four Track Drill&Blast	Per mile	\$293,775,369		\$0	
	Four Track Cut/Cover Tunnel	Per mile	\$262,492,160		\$0	
Underground Stations	Caltrain - Per Platform	Each	\$150,000,000		\$0	
	HSR - Per Platform	Each	\$200,000,000		\$0	
Underground M&O Facility	Caltrain	Each	\$400,000,000		\$0	
I-280	Demolition (200' wide)	LF	\$8,000		\$0	
Parkway	4 Lanes with median	LF	\$5,000		\$0	
Ramps		Lump Sum	\$150,000,000		\$0	
System Elements	Signaling, Communications	Per mile	\$2,718,000	0.98	\$2,663,640	
Electrification	Traction Power	Per mile	\$2,655,000	0.98	\$2,601,900	
Mech/Electrical	For Tunnels	Per mile	\$11,848,704	0.98	\$11,611,730	
Environmental Mitigation	Percent of Hard Costs		3%		\$6,230,503	
Program Implementatio Costs	Percent of Hard Costs + Env Mit		25.50%		\$54,548,052	
Contingencies	Percent of Hard Costs + Env Mit		25.00%		\$53,478,482	
Total Cost					\$321,940,464	

Page 50 of 51 November 2010

SFTWG Option 5a						
	Cost Elements	Unit	2009 \$, Unit Price	Option 5a, Mega-Bore, Bayshore to TTC & 4th/King (Underground), Section 1G		
				Quantity	\$	
Track Section	2 track -In Tunnel/Subway/Trench	Per mile	\$4,700,160		\$0	
	2 track - At-grade	Per mile	\$2,100,224		\$0	
	4 track - In Tunnel/Subway/Trench	Per mile	\$9,400,320	1.4	\$13,160,448	
Earthwork - 2 track	At-grade	Per mile	\$150,000		\$0	
	Covered trench/tunnel	Per mile	\$6,000,000		\$0	
	Mined tunnel	Per mile	\$15,000,000	2.8	\$42,000,000	
Grade Separations	HSR - 4 lanes under 2 tracks	Each	\$13,284,352		\$0	
	HSR - 4 lanes under 4 tracks	Each	\$19,926,528		\$0	
Structure, Tunnels, Walls	Twin Single Track Drill&Blast (<6 miles)	Per mile	\$142,731,264		\$0	
Structure, runners, wans	4-Track Mega Bore	Per mile	\$350,000,000	1.4	\$490,000,000	
	Cut/Cover Double Track Tunnel	Per mile	\$131,246,080	1.4	\$4,50,000,000	
	Double Track TBM (<6 miles)	Per mile	\$106,637,312		\$0	
	Four Track Drill&Blast	Per mile	\$293,775,369		\$0	
	Four Track Cut/Cover Tunnel	Per mile	\$262,492,160		\$0	
Underground Stations	Caltrain - Per Platform	Each	\$150,000,000		\$0	
	HSR - Per Platform	Each	\$200,000,000		\$0	
Underground M&O Facility	Caltrain	Each	\$400,000,000		\$0	
I-280	Demolition (200' wide)	LF	\$8,000		\$0	
Parkway	4 Lanes with median	LF	\$5,000		\$0	
Ramps		Lump Sum	\$150,000,000		\$0	
System Elements	Signaling, Communications	Per mile	\$2,718,000	2.8	\$7,610,400	
Electrification	Traction Power	Per mile	\$2,655,000	2.8	\$7,434,000	
Mech/Electrical	For Tunnels	Per mile	\$11,848,704	2.8	\$33,176,371	
Environmental Mitigation	Percent of Hard Costs		3%		\$17,801,437	
Program Implementatio Costs	Percent of Hard Costs + Env Mit		25.50%		\$155,851,577	
Contingencies	Percent of Hard Costs + Env Mit		25.00%		\$152,795,664	
Total Cost					\$919,829,897	

Page 51 of 51 November 2010