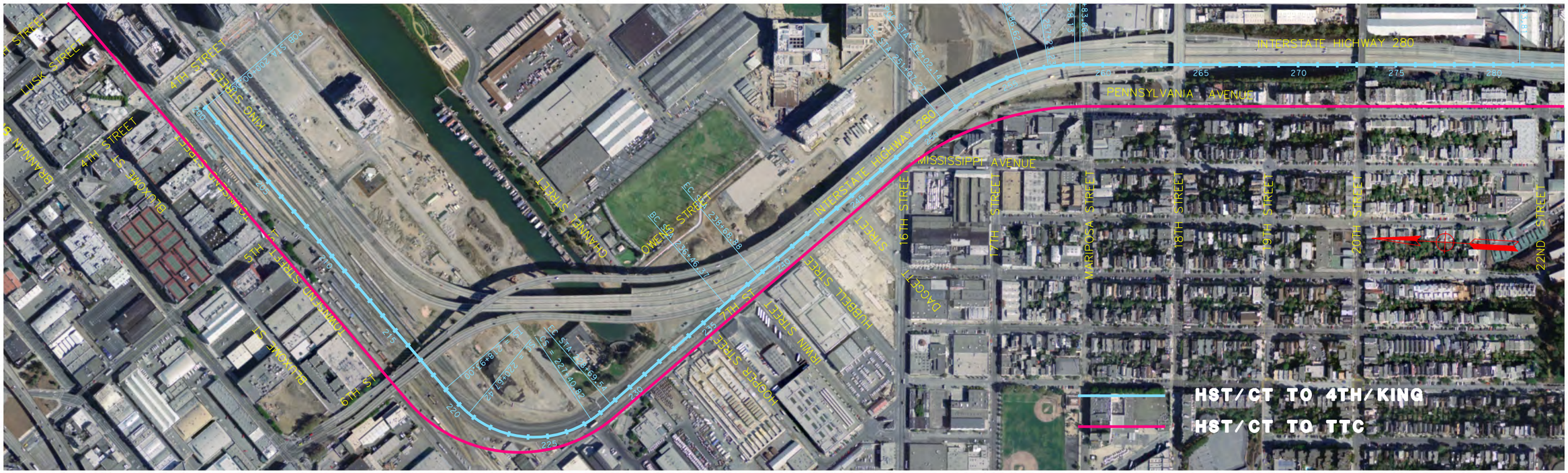
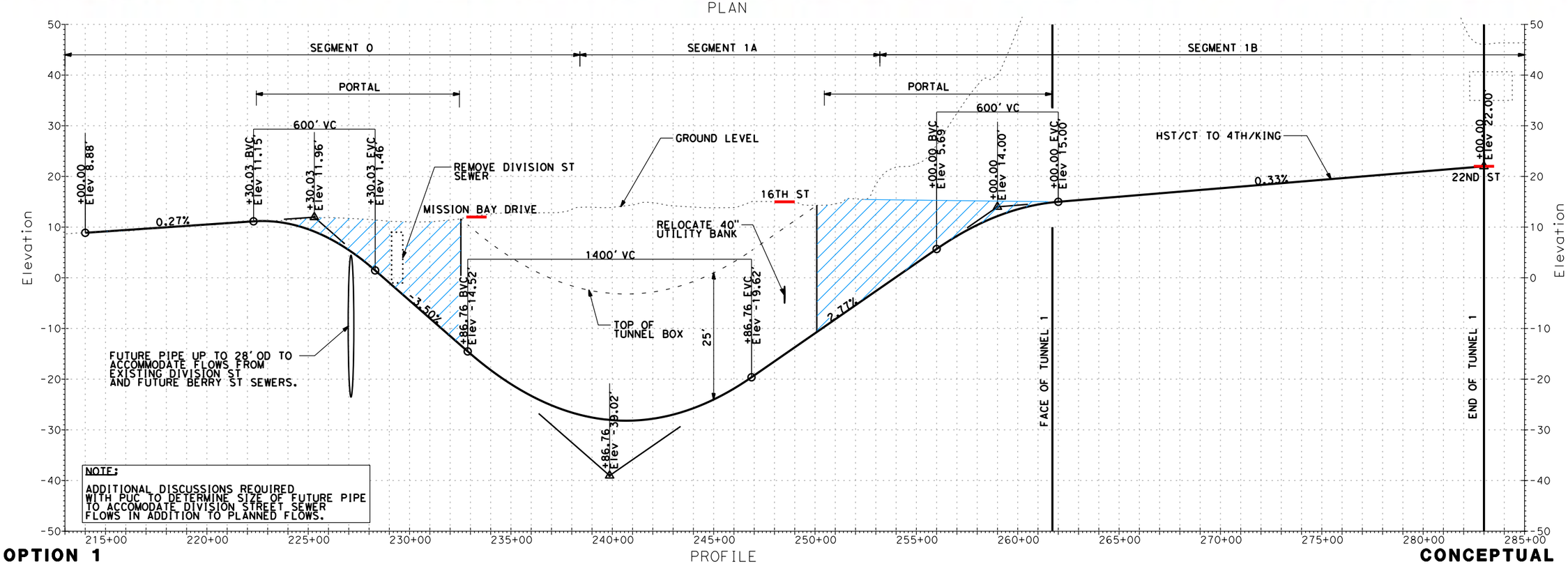
Appendix C: SFTWG Alternative Alignment Options Plan/Profile Drawings

Source: SFTWG



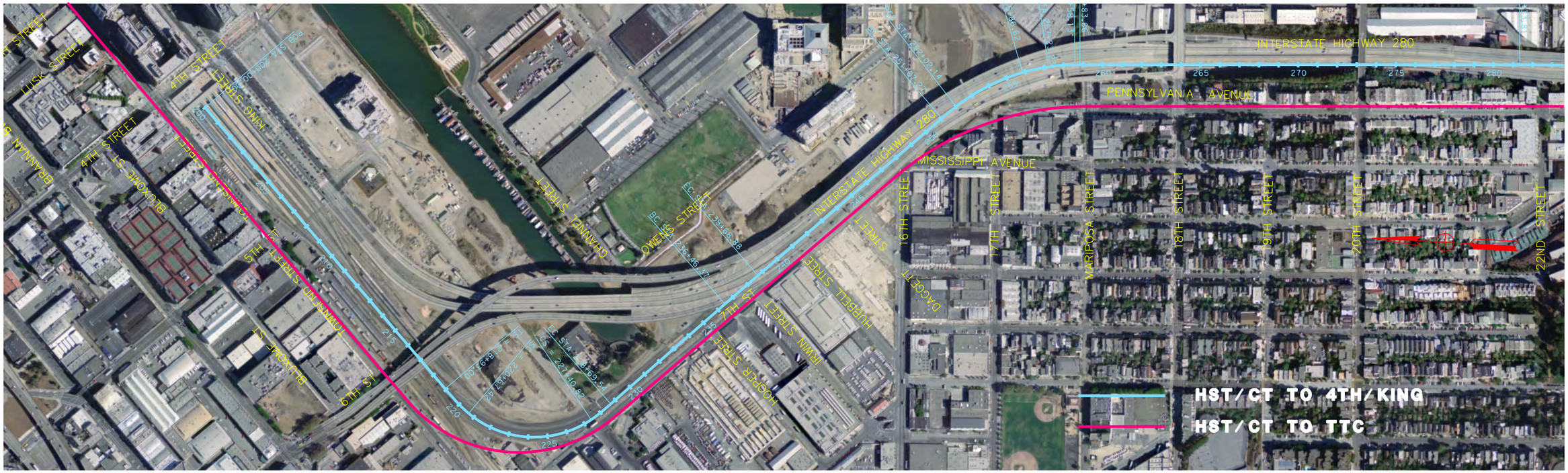
PLAN



OPTION 1

PROFILE

CONCEPTUAL



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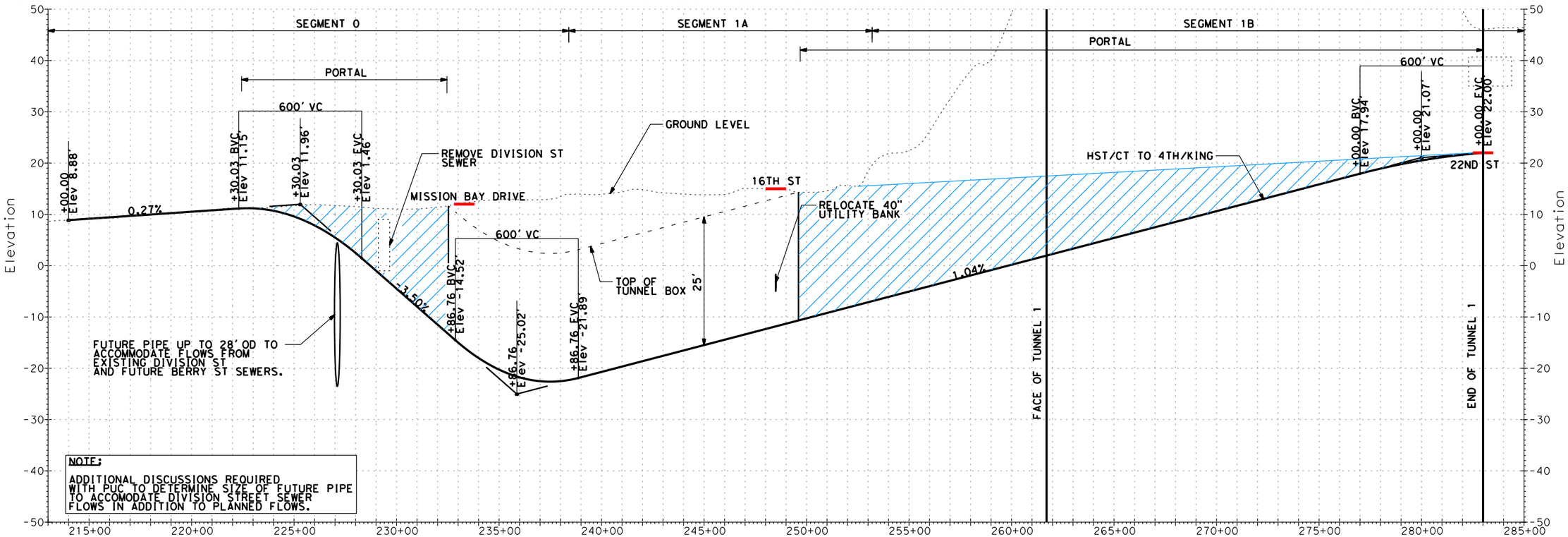
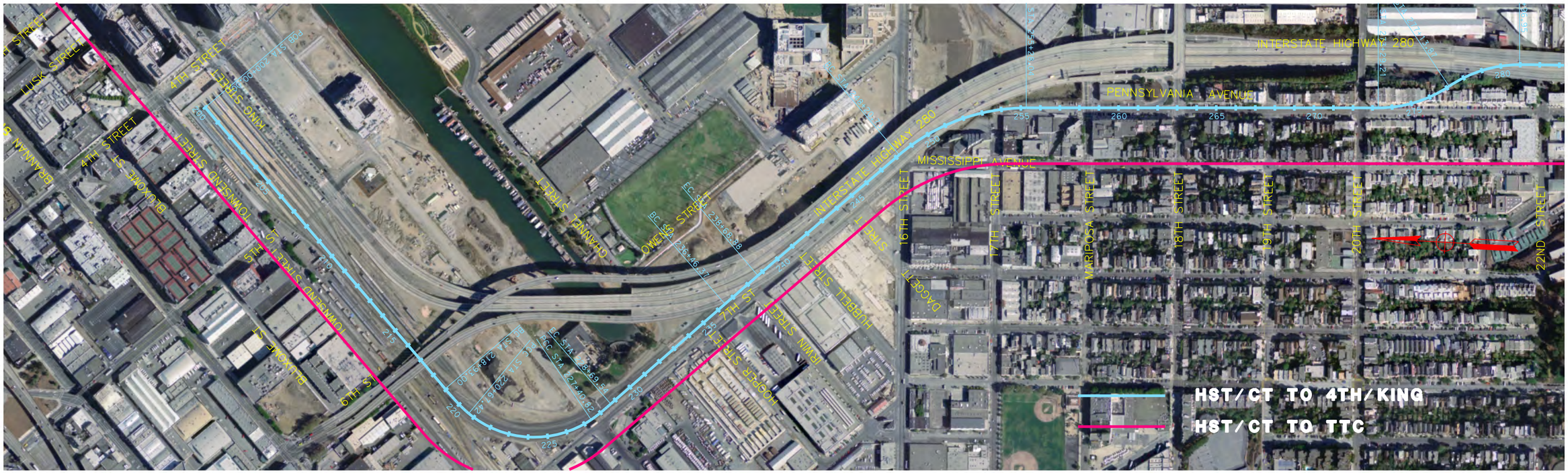


OPTION 2

PROFILE

CONCEPTUAL



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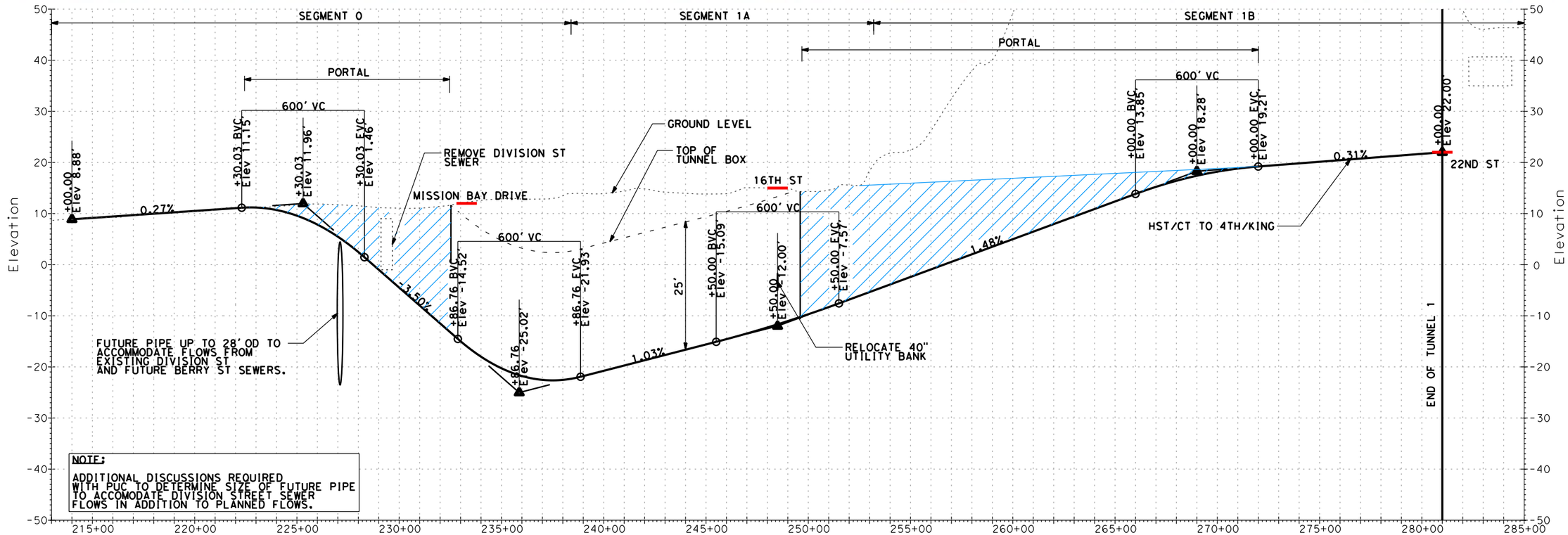
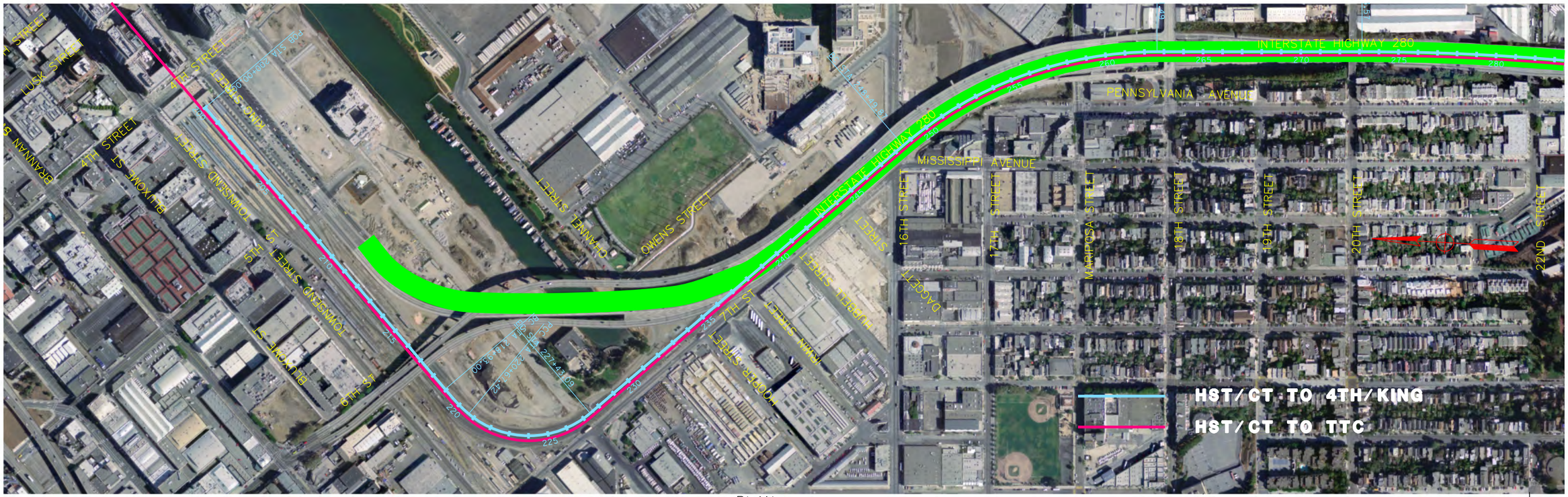


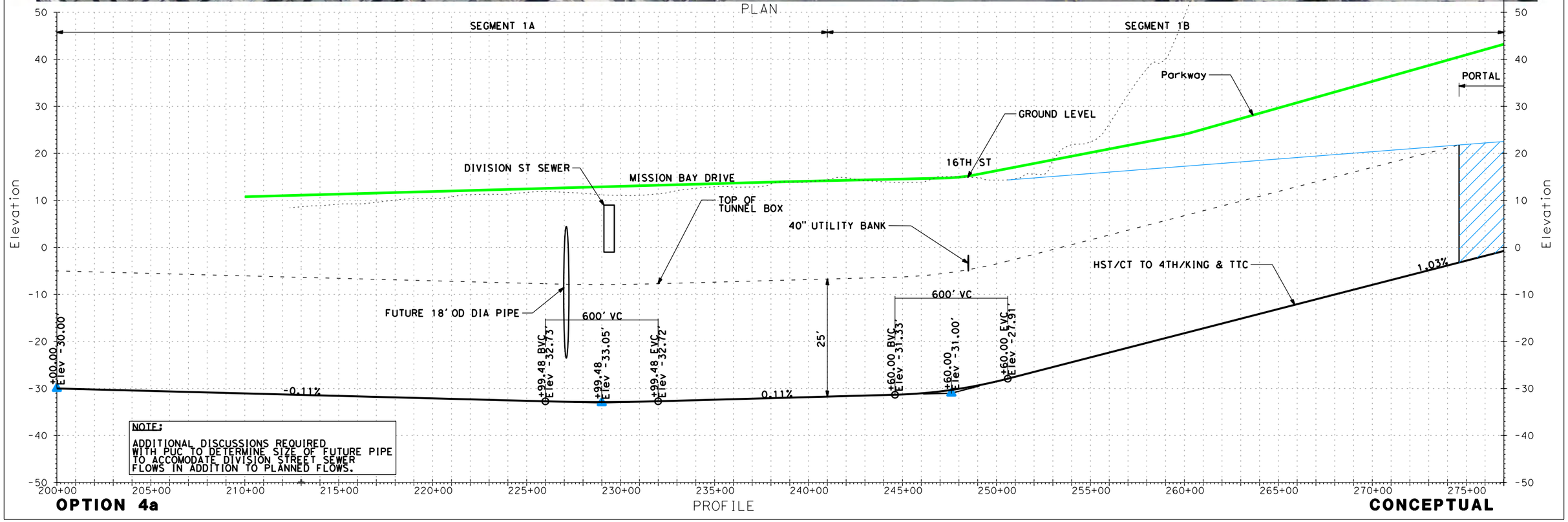
OPTION 3

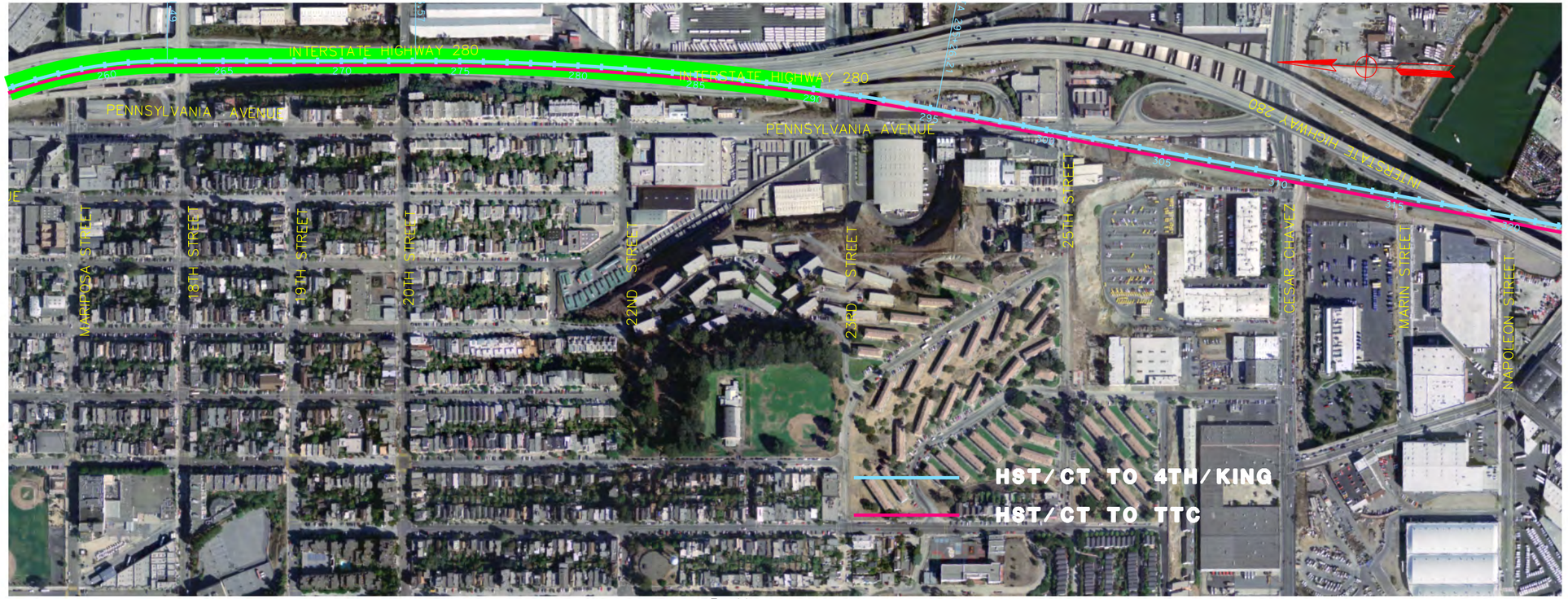
PROFILE

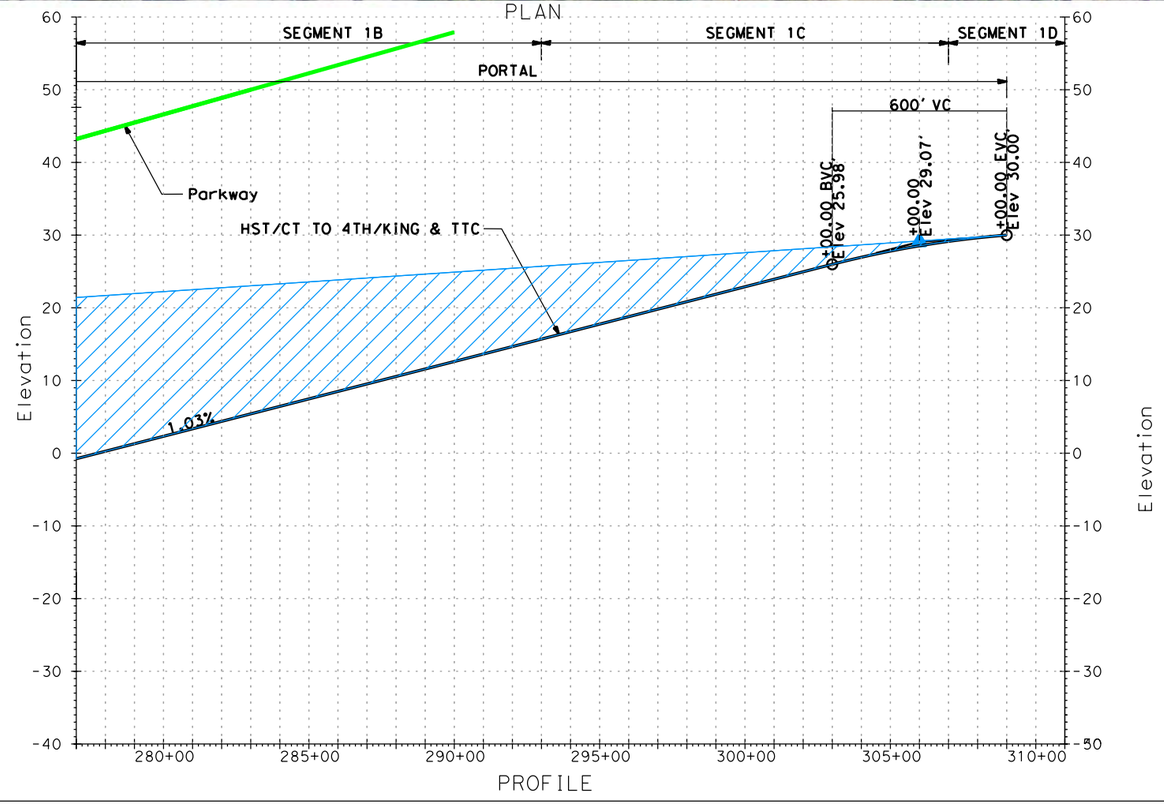
CONCEPTUAL


INTERSTATE HIGHWAY 280
PENNSYLVANIA AVENUE
MISSISSIPPI AVENUE
16TH STREET
17TH STREET
MARIPOSA STREET
18TH STREET
19TH STREET
20TH STREET
22ND STREET
DAGGETT STREET
HOOPER STREET
KING STREET
7TH ST
6TH ST
4TH STREET
BRANNAN ST
LUSK STREET
RALEIGH ST
TOWNSEND STREET
CHANNEL STREET
OWENS STREET
HST/CT TO 4TH/KING
HST/CT TO TTC

PLAN

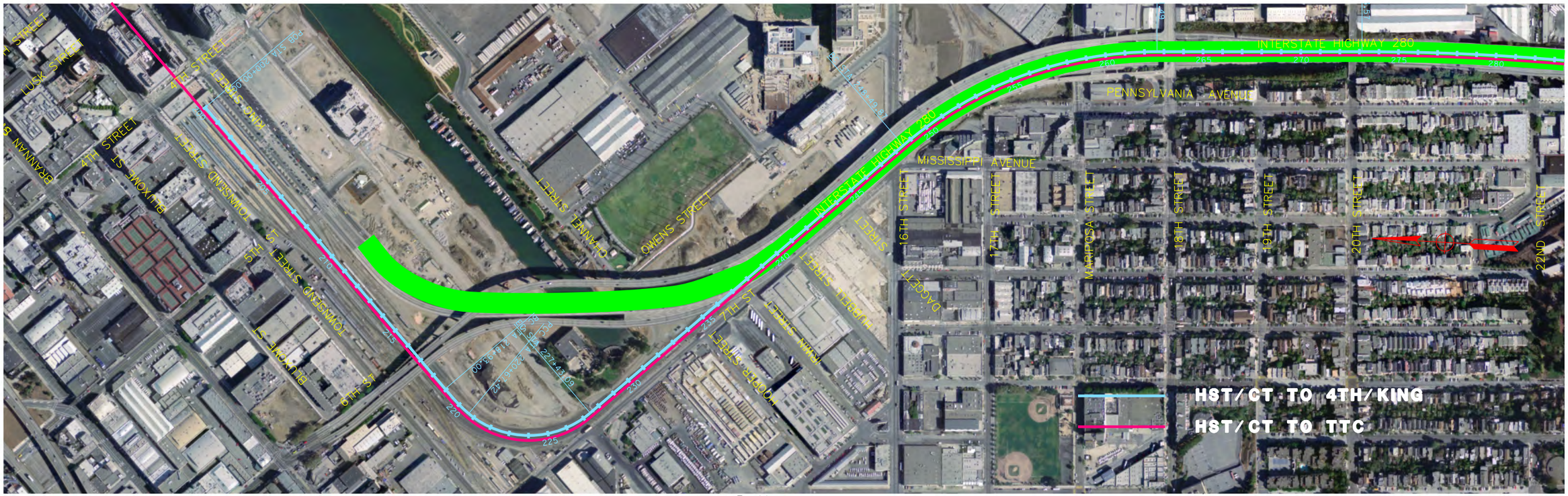

SEGMENT 1A
SEGMENT 1B
Elevation
PROFILE
Parkway
PORTAL
GROUND LEVEL
16TH ST
DIVISION ST SEWER
MISSION BAY DRIVE
TOP OF TUNNEL BOX
40" UTILITY BANK
FUTURE 18' OD DIA PIPE
HST/CT TO 4TH/KING & TTC
600' VC
25'
1.03%
-0.11%
0.11%
0+00.00 Elev -30.00'
0+99.48 BVC Elev -32.73'
0+99.48 Elev -33.05'
0+99.48 EVC Elev -32.72'
0+60.00 BVC Elev -31.33'
0+60.00 Elev -31.00'
0+60.00 EVC Elev -27.91'
NOTE:
ADDITIONAL DISCUSSIONS REQUIRED WITH PUC TO DETERMINE SIZE OF FUTURE PIPE TO ACCOMODATE DIVISION STREET SEWER FLOWS IN ADDITION TO PLANNED FLOWS.
OPTION 4a
CONCEPTUAL



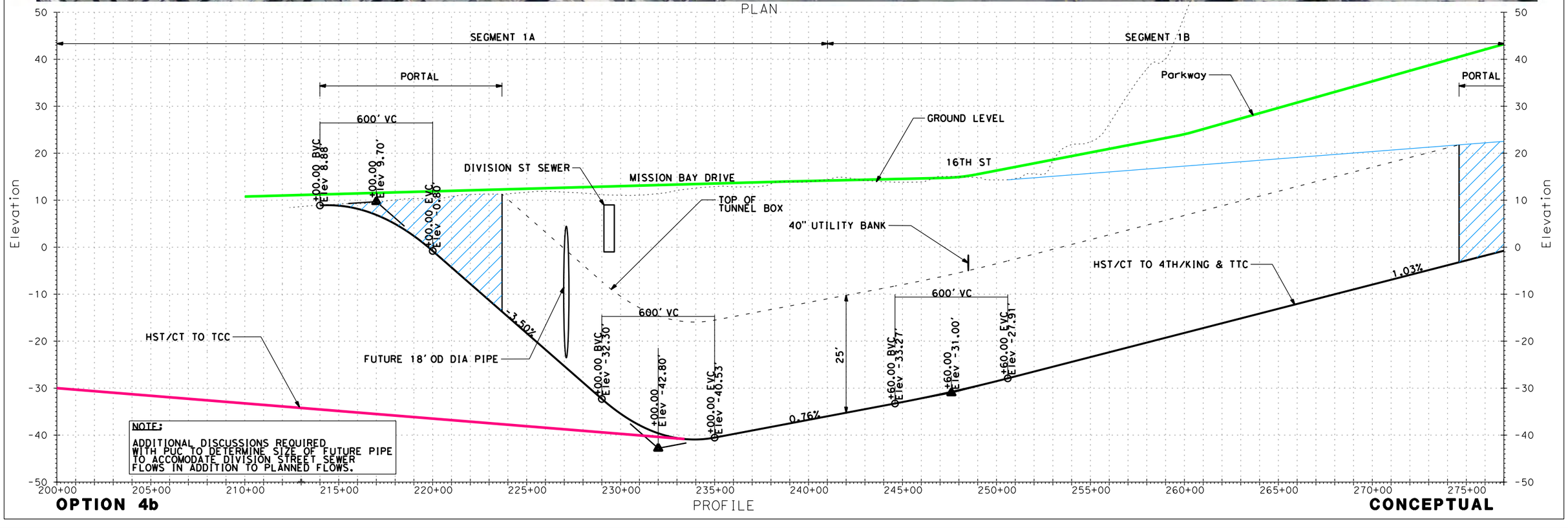


OPTION 4a

CONCEPTUAL



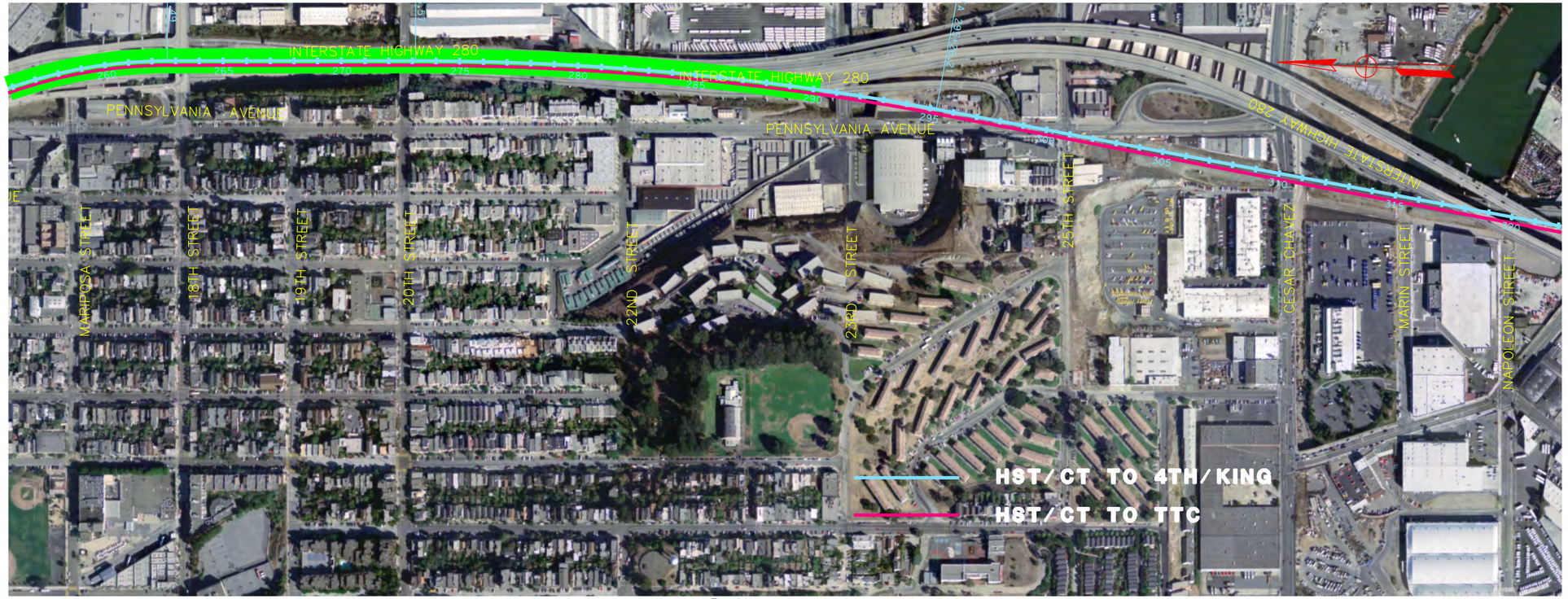
PLAN

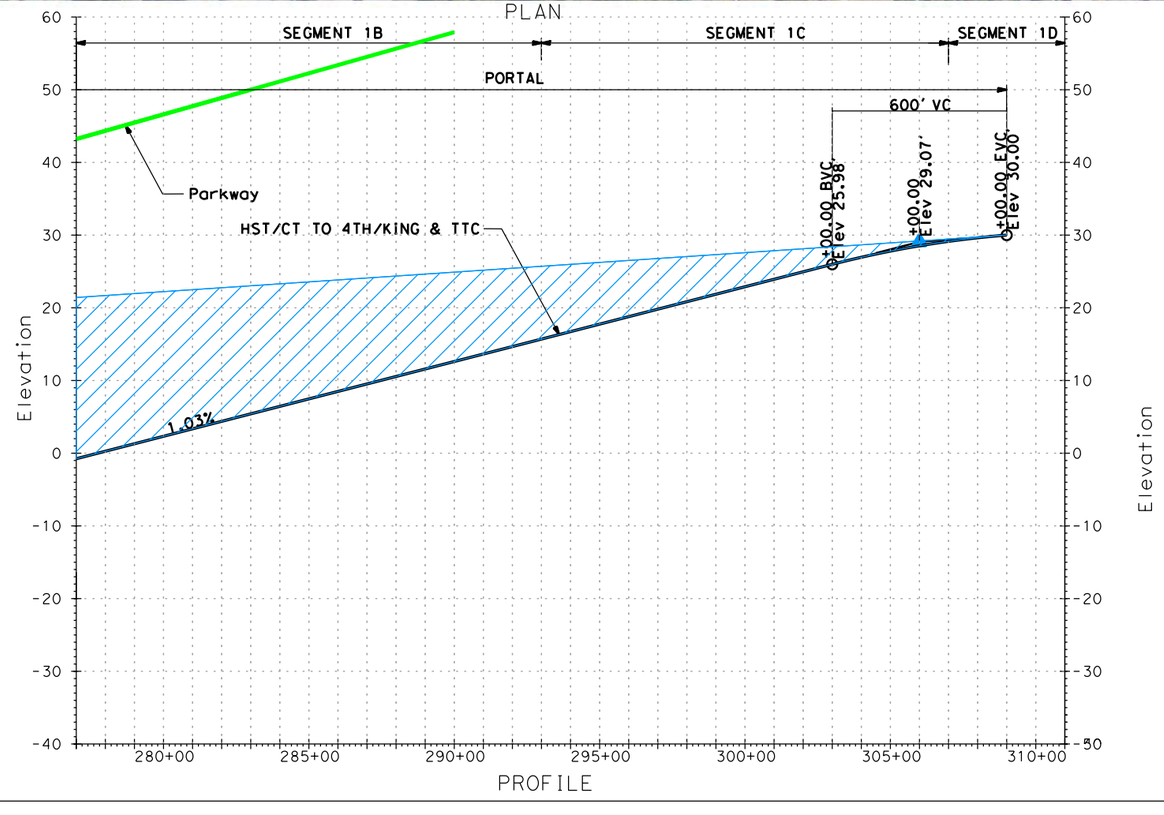


OPTION 4b

PROFILE

CONCEPTUAL

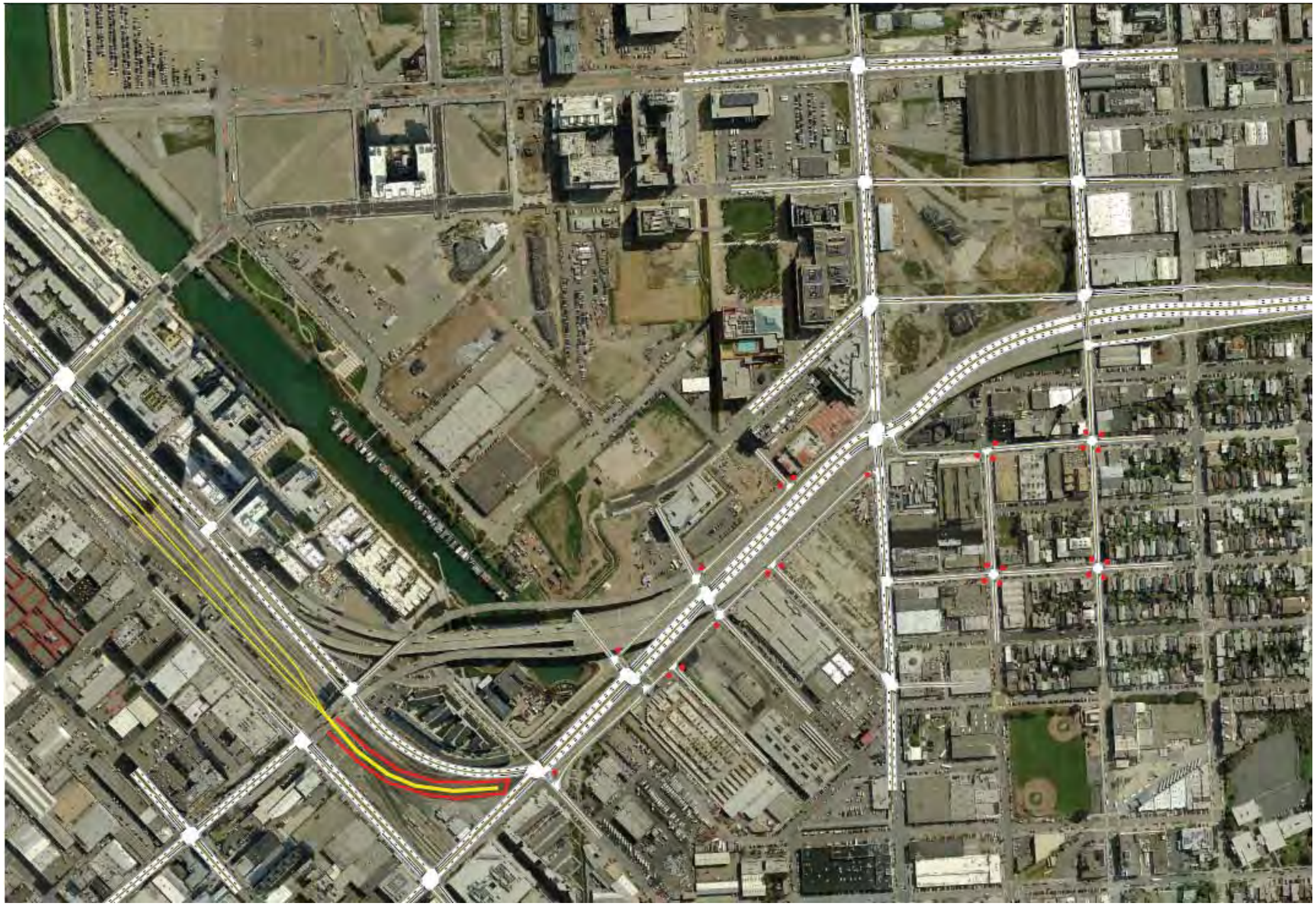


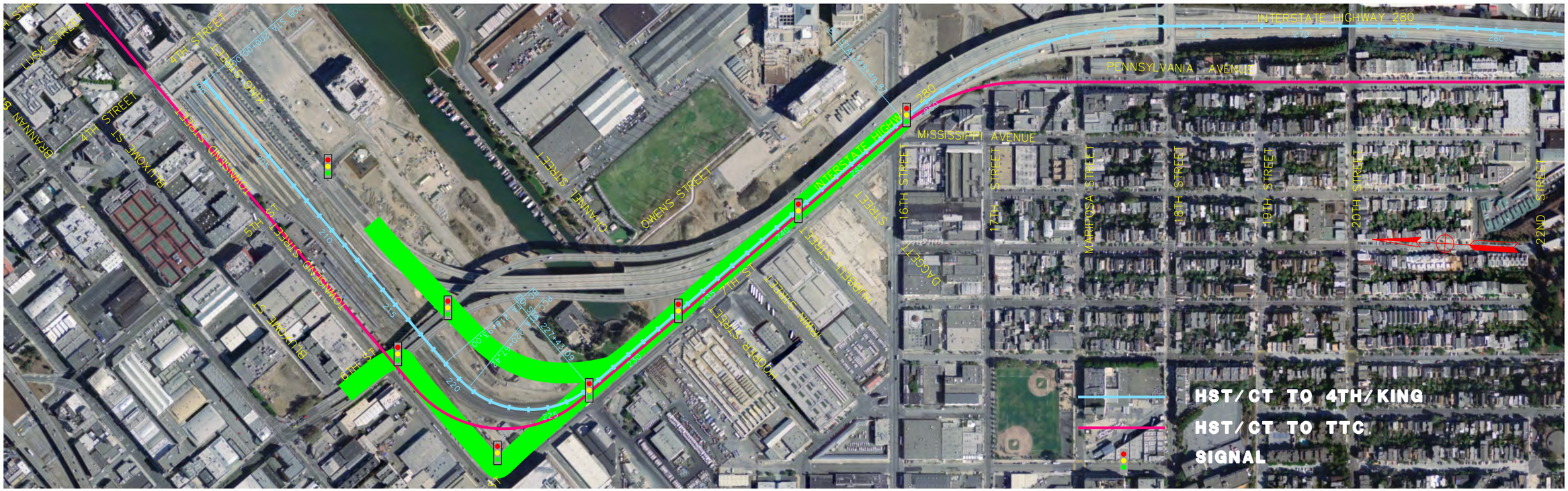


OPTION 4b

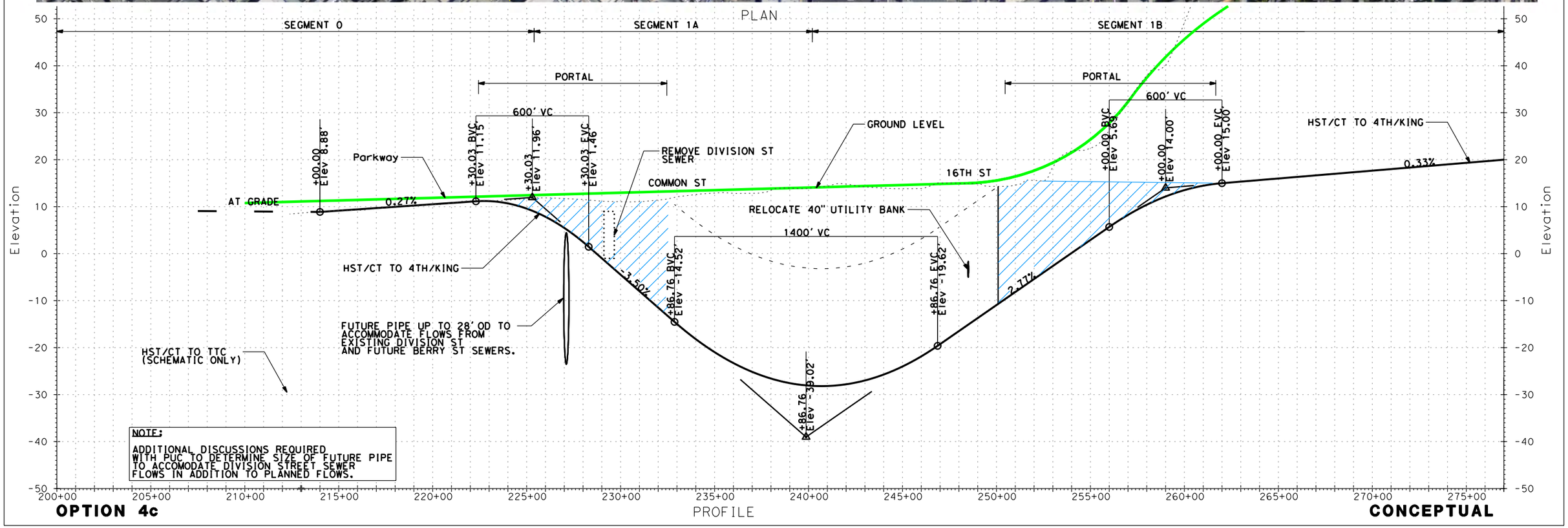
CONCEPTUAL

Option 4c: Parkway Concept





PLAN



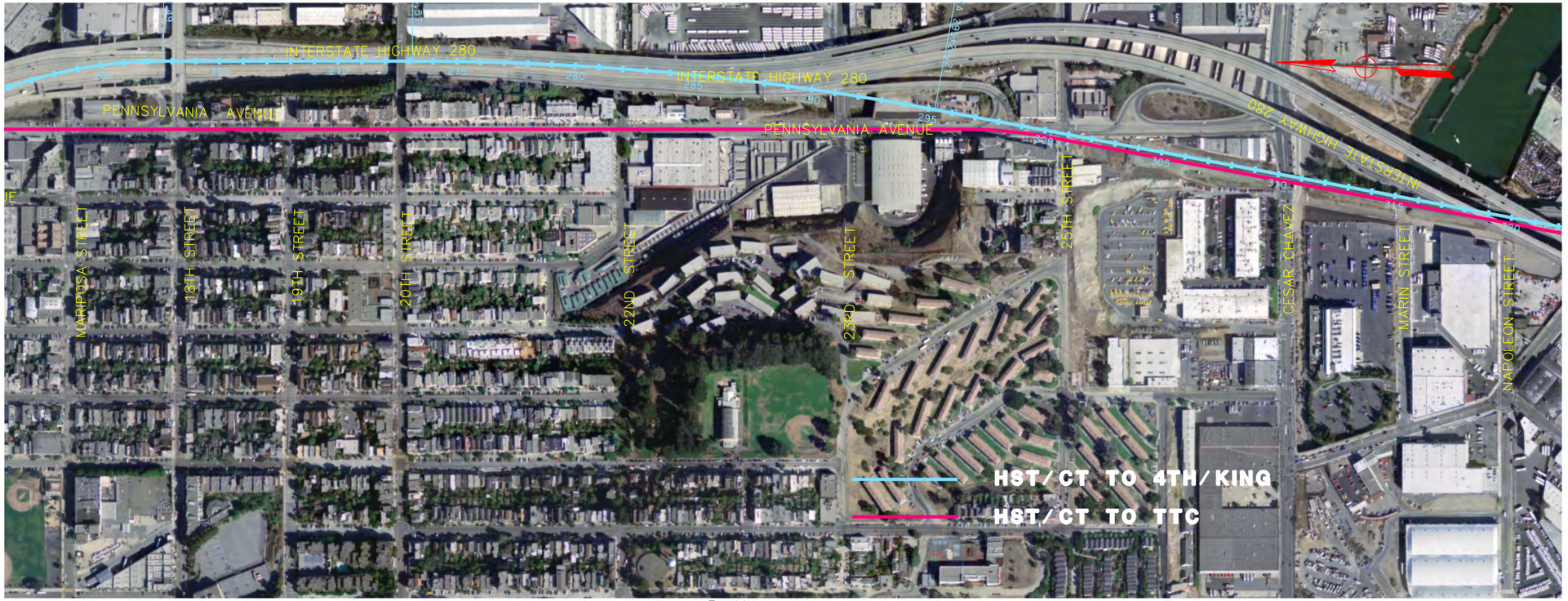
NOTE:

ADDITIONAL DISCUSSIONS REQUIRED WITH PUC TO DETERMINE SIZE OF FUTURE PIPE TO ACCOMODATE DIVISION STREET SEWER FLOWS IN ADDITION TO PLANNED FLOWS.

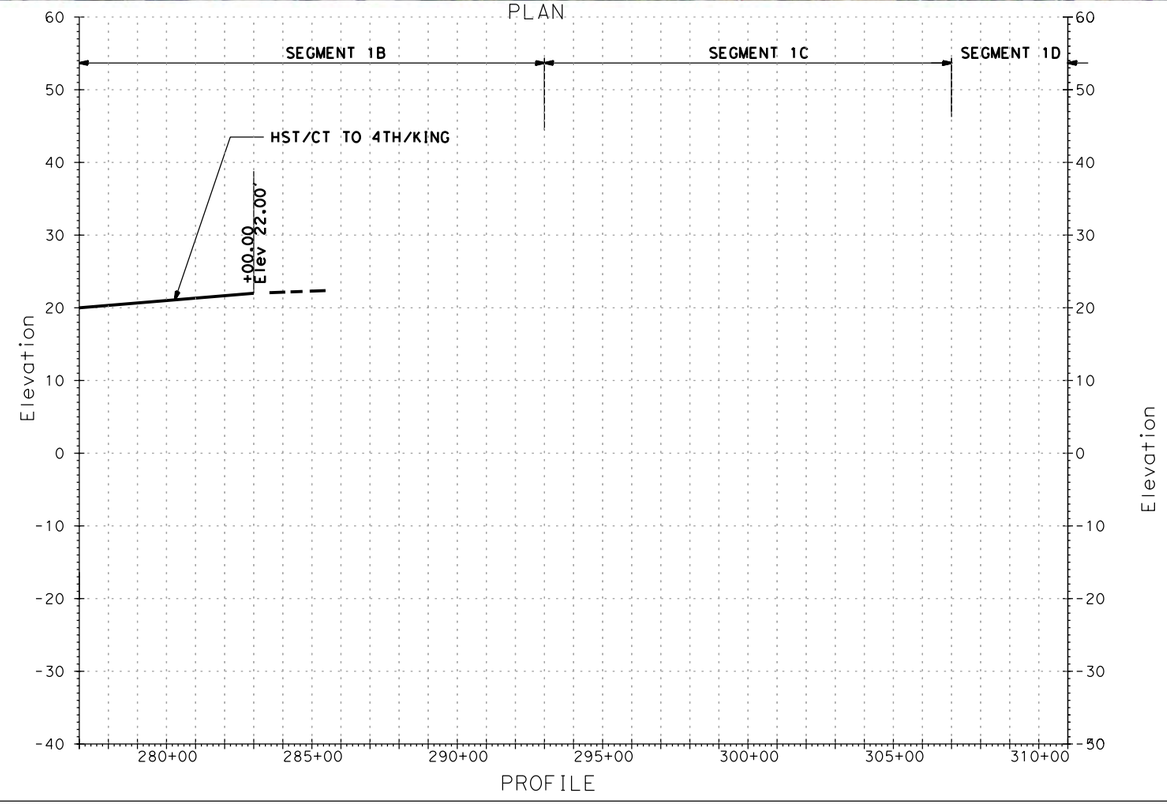
OPTION 4c

PROFILE

CONCEPTUAL



PLAN

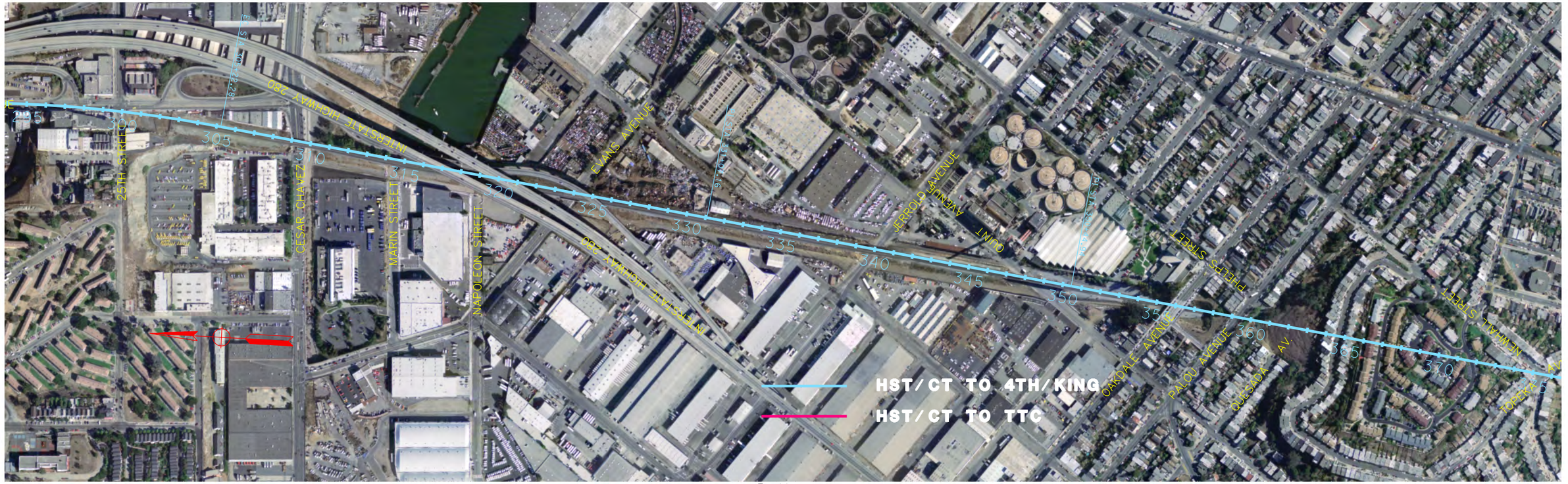


PROFILE

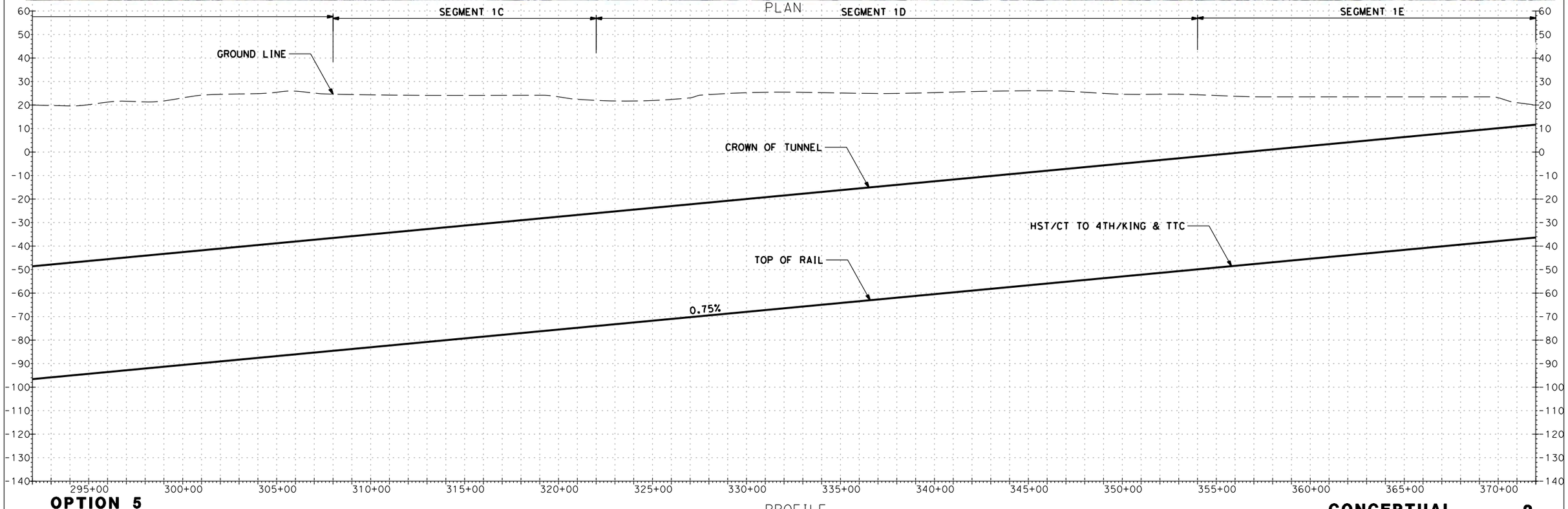
OPTION 4c

CONCEPTUAL


INTERSTATE HIGHWAY 280
PENNSYLVANIA AVENUE
MISSISSIPPI AVENUE
OWENS STREET
CHANNEL STREET
LOWNSDALE STREET
BLUXOME ST
6TH ST
INTERSTATE HIGHWAY 280
16TH STREET
17TH STREET
MARIPOSA STREET
18TH STREET
19TH STREET
20TH STREET
22ND STREET
23RD STREET
DAGGETT STREET
HUBBELL STREET
ILLINOIS STREET
7TH ST
DOGPEAR STREET
HST/CT TO 4TH/KING
HST/CT TO TTC
SEGMENT 0
SEGMENT 1A
PLAN
SEGMENT 1B
DIVISION ST SEWER
COMMON ST
16TH ST
GROUND LINE
22ND ST
CROWN OF TUNNEL
HST/CT TO 4TH/KING & TTC
TOP OF RAIL
600' VC
+00.00 BVC
Elev -137.00
+00.00
Elev -137.88
+00.00
Elev -138.00
+00.00 EVC
Elev -135.74
-0.04%
0.75%
Elevation
215+00
220+00
225+00
230+00
235+00
240+00
245+00
250+00
255+00
260+00
265+00
270+00
275+00
280+00
285+00
290+00
OPTION 5
PROFILE
CONCEPTUAL
1



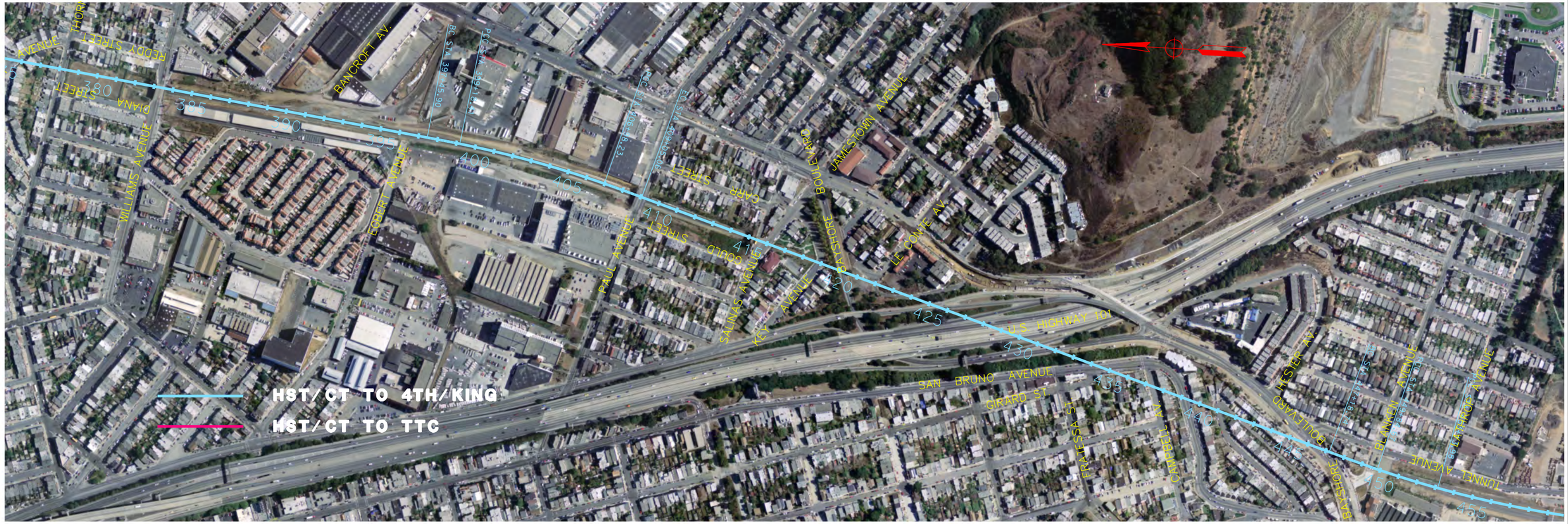
PLAN



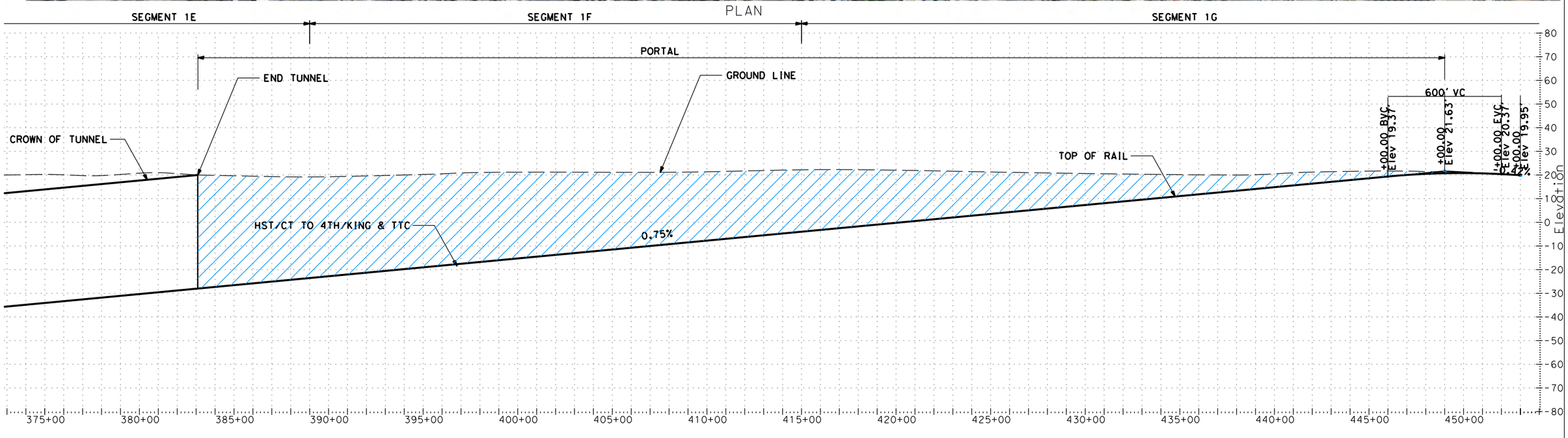
PROFILE

OPTION 5

CONCEPTUAL



PLAN



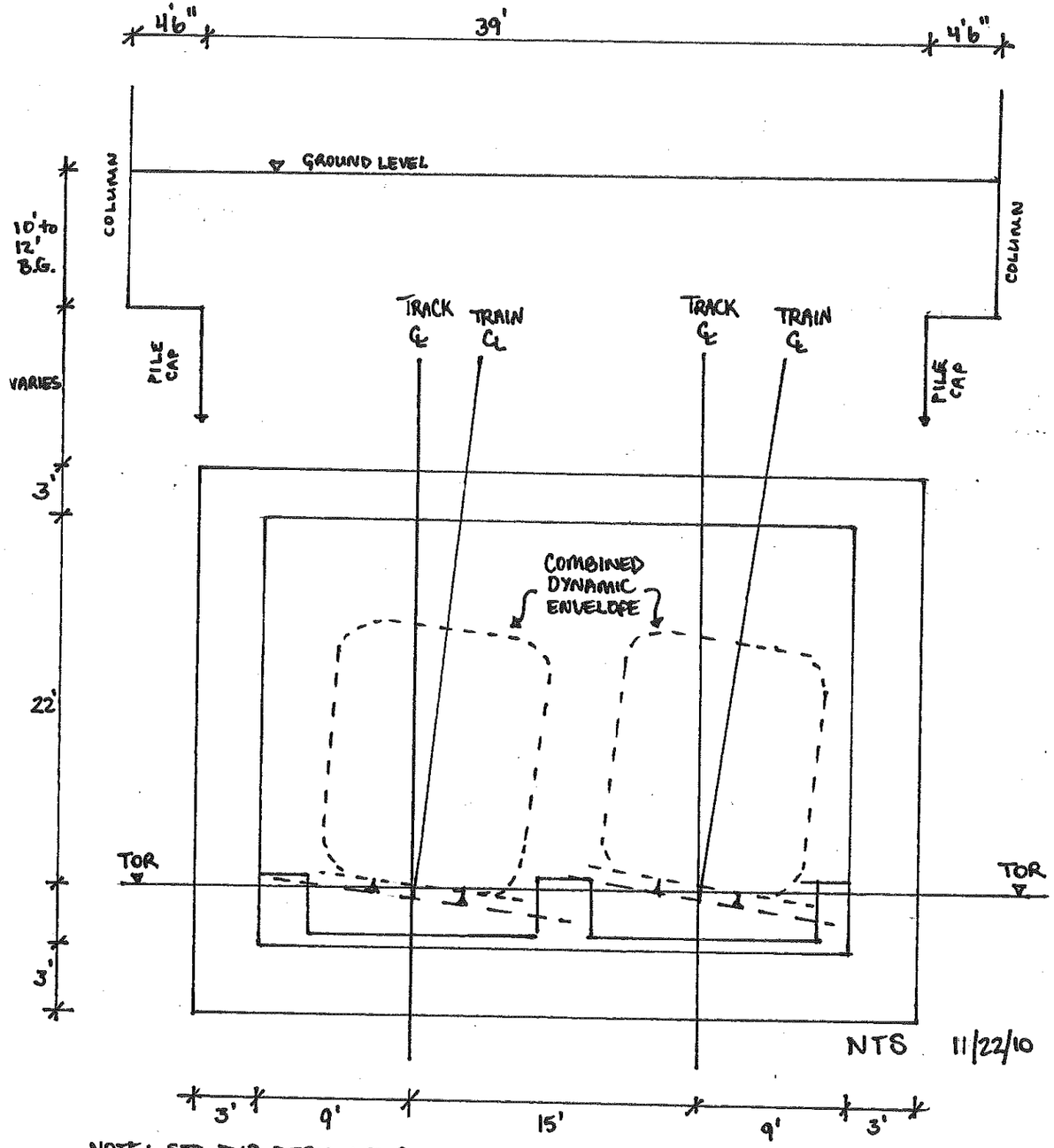
PROFILE

OPTION 5

CONCEPTUAL

Appendix D: SFTWG Alternative Alignment Options Conceptual Cross-Sections

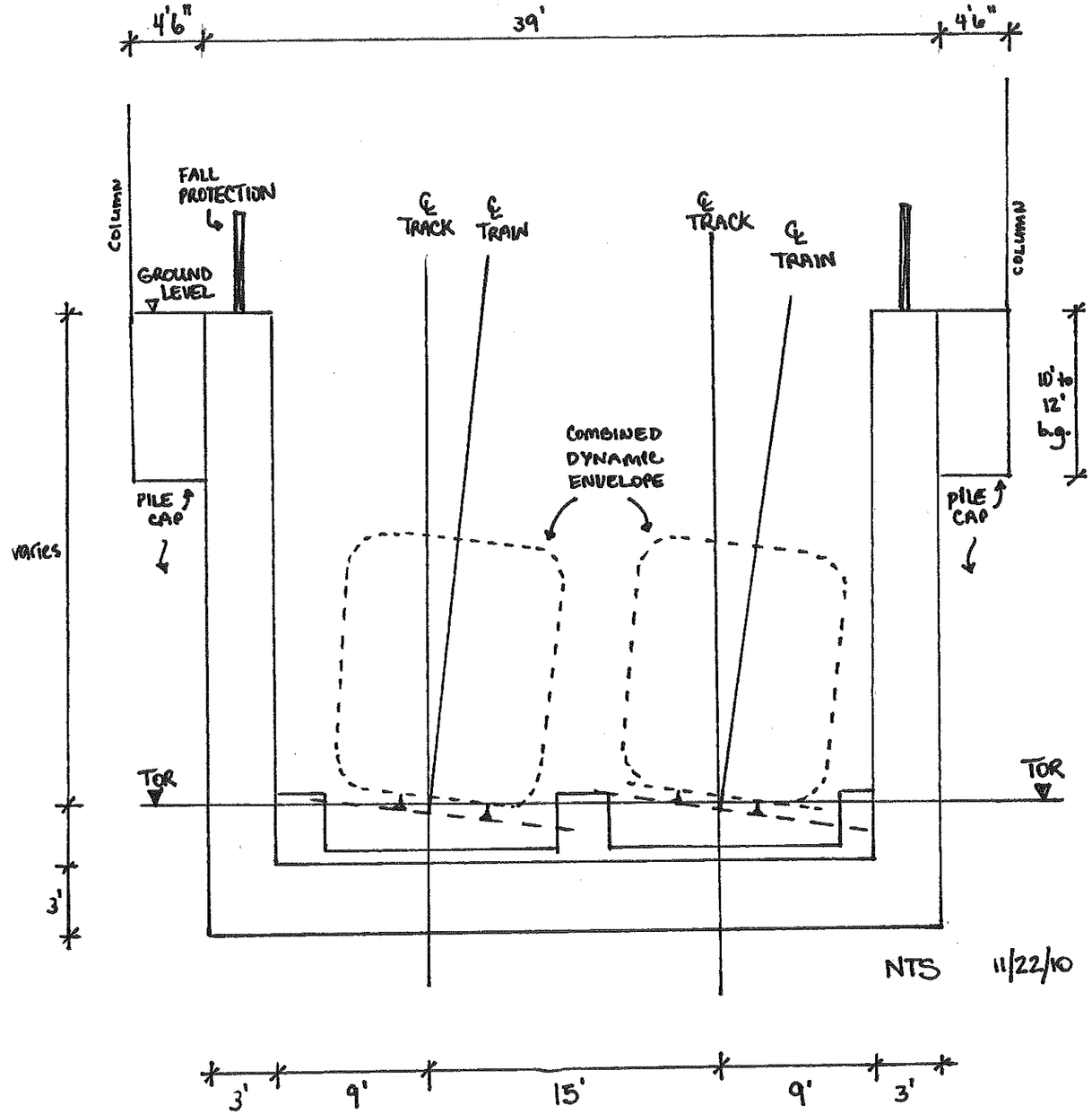
Source: SFTWG



NTS 11/22/10

NOTE: STD. TYP. DESIGN FOR ALL BENTS EXCEPT BENTS 9+10 WHICH MAY NEED TO BE RECONSTRUCTED

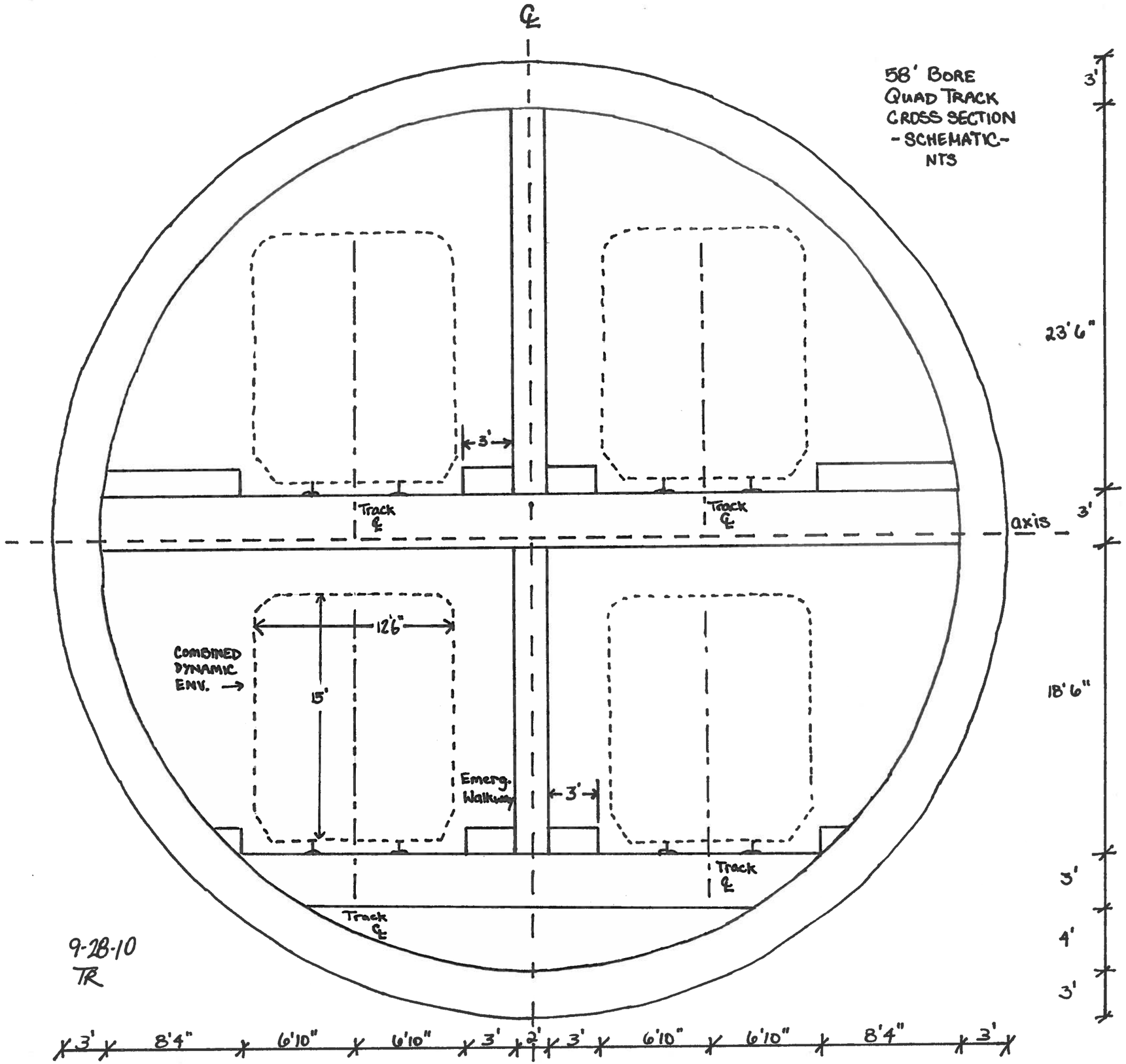
-CONCEPTUAL-
TYP. X-SECTION CUT AND COVER TUNNEL UNDER I-280



NOTE: STANDARD TYP. DESIGN FOR ALL BENTS EXCEPT BENTS 9 & 10 WHICH MAY NEED TO BE RECONSTRUCTED

· CONCEPTUAL ·
TYPICAL X-SECTION TRENCH FOR DOUBLE TRACK UNDER I-280

58' Bore
Quad Track
Cross Section
- Schematic -
NTS



9-28-10
TR

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
    - Berm (Embankment or MSE – mechanically stabilized earth)
    - At-Grade
    - Open Trench
    - 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 access.
- 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.

Subsection 0	0A (2.2 miles) Covered Trench/ Tunnel	0B (2.2 miles) Covered Trench/Tunnel	0C (1.0 miles) At Grade	0D (2.3 miles) 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.	1. 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.

Subsection 1	1A (0.3 miles)		1B & 1C (1.0 miles)		1D, 1E, 1F & 1G (3.5 miles)	
	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)	$271 (2 tracks)	$ 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. *Must be combined with 2 track covered trench/tunnel option.*	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. *Must be combined with 2 track covered trench/tunnel option.* 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.*

	COST ELEMENTS	UNIT	UNIT PRICE	At-Grade (2 tracks)				Covered Trench/Tunnel (2 tracks)			
	Subsection 1		Base: 2009 (3rd Quarter)	A				A			
				Start: 200 + 00	End: 215 + 00	0.28 Miles		Start: 200 + 00	End: 215 + 00	0.28 Miles	
	Subsection Details					Quant.	Cost			Quant.	Cost
	Double Track At-Grade (Mile)			Start: 200 + 00	End: 215 + 00	0.28 Miles		Start: 0 + 00	End: 0 + 00	0.00 Miles	
	Double Track Elevated (Mile)			Start: 0 + 00		0.00 Miles		Start: 0 + 00		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)			Start: 0 + 00		0.00 Miles		Start: 0 + 00		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)			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			0.28	$ 596,655			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	$ -			0.28	$ 1,335,273
4	Double Track Section - In Trench	Mile	$ 4,700,160			0.00	$ -			0.00	$ -
	Four Track Section - Total										
	Four-track Section - At Grade	Mile	$ 4,200,448			0.00	$ -			0.00	$ -
	Four-Track Section - On Structure	Mile	$ 9,400,320			0	$ -			0	$ -
	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										
5	Single Track Section - At Grade	Mile	$ 1,549,312			0	$ -			0	$ -
6	Single Track Section - On structure	Mile	$ 2,350,080			0	$ -			0	$ -
7	Single Track Section - In Tunnel or Subway	Mile	$ 2,350,080			0	$ -			0	$ -
8	Single Track Section - In Trench	Mile	$ 2,350,080			0	$ -			0	$ -
9	Freight Double Track - At Grade	Mile	$ 2,839,552			0	$ -			0	$ -
10	Freight Single Track - At Grade	Mile	$ 1,549,312			0	$ -			0	$ -
	Earthwork Items										
1	Site Preparation - Undeveloped	Acre	$ 9,216			3.79	$ 34,909			3.79	$ 34,909
2	Total Cut	CY	$ 6			0.00	$ -			96800.00	$ 624,476
3	Total Fill	CY	$ 6			0.00	$ -			38720.00	$ 243,546
4	Borrow	CY	$ 13			0.00	$ -			0.00	$ -
5	Spoil	CY	$ 13			0.00	$ -			58080.00	$ 730,637
6	Landscape erosion Control	Acre	$ 6,144			0.09	$ 553			1.20	$ 7,373
7	Security Fencing (Both sides of ROW)	Mile	$ 144,384			0.00	$ -				$ -
8	Special Drainage Facilities	5% Earthwork					$ 1,773				$ 82,047
	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	$ -			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	$ -			0.00	$ -
6	Twin Single Track Drill&Blast (<6 Miles)	Mile	$ 142,731,264				$ -				$ -
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				$ -				$ -
	Double Track TBM w/3rd Tube (>6 Miles)	Mile	$ 176,720,896				$ -				$ -
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								
16	Mechanical & Electrical for Tunnels	Mile	$ 11,848,704				$ -			0.28	$ 3,366,109
17	Retaining Walls	Mile	$ 8,613,888			0.00	$ -			0.00	$ -
18	Containment Walls	Mile	$ 5,907,456				$ -				$ -
19	Single Track Cut and Cover Subway	Mile	$ 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	$ 213,274,624				$ -				$ -
	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 Quarter)	A				A			
				Start: 200 + 00	End: 215 + 00	0.28 Miles		Start: 200 + 00	End: 215 + 00	0.28 Miles	
	Subsection Details					Quant.	Cost			Quant.	Cost
	Double Track At-Grade (Mile)			Start: 200 + 00	End: 215 + 00	0.28 Miles		Start: 0 + 00	End: 0 + 00	0.00 Miles	
	Double Track Elevated (Mile)			Start: 0 + 00		0.00 Miles		Start: 0 + 00		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)			Start: 0 + 00		0.00 Miles		Start: 0 + 00		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)			Start: 0 + 00		0.00 Miles		Start: 0 + 00		0.00 Miles	
	Roadway Crossing HSR - 2 Lane Roadway Over 4 Tracks (Urban)	ea	$ 2,850,816			0	$ -			0	$ -
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	$ -				$ -				$ -
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	Each	$15,000,000				$ -				$ -
	Caltrain Passenger Station - In Trench	Each	$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				$ -				$ -
6	Major Utility Relocations - Dense Suburban	Mile	$ 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				$ -				$ -
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	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	Acre	$ 3,642				$ -				$ -
	Environmental Mitigation = 3% Line Costs						$ 816,078				$ 1,311,306
	System Elements										
1	Signaling (ATC)	Mile	$ 2,070,000			0.28	$ 588,068			0.28	$ 588,068
2	Communications (w/ Fiber Optic Backbone)	Mile	$ 540,000			0.28	$ 153,409			0.28	$ 153,409
3	Wayside Protection System	Mile	$ 108,000			0.28	$ 30,682			0.28	$ 30,682
	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						$ 29,545,092				$ 46,547,914
	Program Implementation Costs (per screening)						$ 7,533,998				$ 11,869,718
	Program Implementation Costs										
	Contingencies (per screening) (25%)						$ 7,386,273				$ 11,636,978
	Subtotal						$ 44,465,363				$ 70,054,611
	Subtotal Rounded						$ 44,000,000				$ 70,000,000

	COST ELEMENTS	UNIT	UNIT PRICE	At-Grade				Tunnel (2 tracks - Mined)			
	Subsection 1		Base: 2009 (3rd Quarter)	B				B			
				Start: 215 + 00	End: 255 + 00	0.76 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		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)			Start: 0 + 00		0.00 Miles		Start: 0 + 00		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)			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			0.76	$ 1,591,079			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	$ -			0.76	$ 3,560,727
4	Double Track Section - In Trench	Mile	$ 4,700,160			0.00	$ -			0.00	$ -
	Four Track Section - Total										
	Four-track Section - At Grade	Mile	$ 4,200,448			0.00	$ -			0.00	$ -
	Four-Track Section - On Structure	Mile	$ 9,400,320			0	$ -			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										
5	Single Track Section - At Grade	Mile	$ 1,549,312			0	$ -			0.00	$ -
6	Single Track Section - On structure	Mile	$ 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	Mile	$ 2,839,552			0	$ -			0.00	$ -
10	Freight Single Track - At Grade	Mile	$ 1,549,312			0	$ -			0.00	$ -
	Earthwork Items										
1	Site Preparation - Undeveloped	Acre	$ 9,216			10.10	$ 93,091			10.10	$ 93,091
2	Total Cut	CY	$ 6			0.00	$ -			652666.00	$ 4,210,479
3	Total Fill	CY	$ 6			261066.00	$ 1,642,084			261066.00	$ 1,642,084
4	Borrow	CY	$ 13			261066.00	$ 3,284,169			0.00	$ -
5	Spoil	CY	$ 13			0.00	$ -			391600.00	$ 4,926,265
6	Landscape erosion Control	Acre	$ 6,144			0.09	$ 553			8.09	$ 49,705
7	Security Fencing (Both sides of ROW)	Mile	$ 144,384			0.76	$ 109,382			0.00	$ -
8	Special Drainage Facilities	5% Earthwork					$ 256,464				$ 546,081
	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	$ -			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	$ -				$ -
6	Twin Single Track Drill&Blast (<6 Miles)	Mile	$ 142,731,264				$ -			0.76	$ 108,129,745
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	$ -				$ -
10	Double Track Mined (Soft Soil)	Mile	$ 79,200,000				$ -				$ -
	Double Track TBM (<6 Miles)	Mile	$ 106,637,312				$ -				
	Double Track TBM w/3rd Tube (>6 Miles)	Mile	$ 176,720,896				$ -				
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	$ -			0.00	$ -
14	Trench Long (2 tracks) (1000 + ft)	Mile	$ 57,524,224			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								
16	Mechanical & Electrical for Tunnels	Mile	$ 11,848,704				$ -			0.76	$ 8,976,291
17	Retaining Walls	Mile	$ 8,613,888			0.00	$ -				$ -
18	Containment Walls	Mile	$ 5,907,456				$ -				$ -
19	Single Track Cut and Cover Subway	Mile	$ 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	$ 213,274,624				$ -				
	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				$ -				$ -
	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)	ea	$ 2,029,568				$ -				$ -
4	Roadway Crossing HSR - 4 Lane Roadway Over 4 Tracks (Urban)	ea	$ 3,563,520			0	$ -				$ -
5	Roadway Crossing HSR - 4 Lane Roadway Over 2 Tracks (Suburban)	ea	$ 3,593,216				$ -				$ -

	COST ELEMENTS	UNIT	UNIT PRICE	At-Grade				Tunnel (2 tracks - Mined)			
	Subsection 1		Base: 2009 (3rd Quarter)	B				B			
				Start: 215 + 00	End: 255 + 00	0.76 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		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)			Start: 0 + 00		0.00 Miles		Start: 0 + 00		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)			Start: 0 + 00		0.00 Miles		Start: 0 + 00		0.00 Miles	
	Roadway Crossing HSR - 2 Lane Roadway Over 4 Tracks (Urban)	ea	$ 2,850,816			0	$ -				$ -
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	$ -				$ -				$ -
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	Each	$15,000,000				$ -				$ -
	Caltrain Passenger Station - In Trench	Each	$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				$ -				$ -
6	Major Utility Relocations - Dense Suburban	Mile	$ 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				$ -				$ -
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	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	Acre	$ 3,642				$ -				$ -
	Environmental Mitigation = 3% Line Costs						$ 209,305				$ 3,964,034
	System Elements										
1	Signaling (ATC)	Mile	$ 2,070,000			0.76	$ 1,568,182			0.76	$ 1,568,182
2	Communications (w/ Fiber Optic Backbone)	Mile	$ 540,000			0.76	$ 409,091			0.76	$ 409,091
3	Wayside Protection System	Mile	$ 108,000			0.76	$ 81,818			0.76	$ 81,818
	Electrification Items										
1	Traction Power supply	Mile	$ 1,170,000			0.76	$ 886,364			0.76	$ 886,364
2	Traction Power Distribution	Mile	$ 1,485,000			0.76	$ 1,125,000			0.76	$ 1,125,000
	Subtotal						$ 11,256,580				$ 140,168,958
	Program Implementation Costs (per screening)						$ 2,870,428				$ 35,743,084
	Program Implementation Costs										
	Contingencies (per screening) (25%)						$ 2,814,145				$ 35,042,239
	Subtotal						$ 16,941,153				$ 210,954,282
	Subtotal (Rounded)						$ 17,000,000				$ 211,000,000

	COST ELEMENTS	UNIT	UNIT PRICE	At-Grade				Tunnel (2 tracks - Mined)			
	Subsection 1		Base: 2009 (3rd Quarter)	C				C			
				Start: 255 + 00	End: 267 + 00	0.23 Miles		Start: 255 + 00	End: 267 + 00	0.23 Miles	
	Subsection Details					Quant.	Cost			Quant.	Cost
	Double Track At-Grade (Mile)			Start: 255 + 00	End: 267 + 00	0.23 Miles		Start: 0 + 00	End: 0 + 00	0.00 Miles	
	Double Track Elevated (Mile)			Start: 0 + 00		0.00 Miles		Start: 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)			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		0.00 Miles	
	Four Track Trench (Mile)			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	$ -			0.23	$ 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	Mile	$ 4,200,448			0.00	$ -			0.00	$ -
	Four-Track Section - On Structure	Mile	$ 9,400,320			0	$ -			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										
5	Single Track Section - At Grade	Mile	$ 1,549,312			0	$ -			0.00	$ -
6	Single Track Section - On structure	Mile	$ 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	Mile	$ 2,839,552			0	$ -			0.00	$ -
10	Freight Single Track - At Grade	Mile	$ 1,549,312			0	$ -			0.00	$ -
	Earthwork Items										
1	Site Preparation - Undeveloped	Acre	$ 9,216			3.03	$ 27,927			3.03	$ 27,927
2	Total Cut	CY	$ 6			0.00	$ -			84333.00	$ 544,049
3	Total Fill	CY	$ 6			33733.00	$ 212,178			33733.00	$ 212,178
4	Borrow	CY	$ 13			33733.00	$ 424,356			0.00	$ -
5	Spoil	CY	$ 13			0.00	$ -			50600.00	$ 636,540
6	Landscape erosion Control	Acre	$ 6,144			0.09	$ 553			1.05	$ 6,451
7	Security Fencing (Both sides of ROW)	Mile	$ 144,384			0.23	$ 32,815			0.00	$ -
8	Special Drainage Facilities	5% Earthwork					$ 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	$ -			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	$ -				$ -
6	Twin Single Track Drill&Blast (<6 Miles)	Mile	$ 142,731,264				$ -			0.23	$ 32,438,924
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	$ -				$ -
10	Double Track Mined (Soft Soil)	Mile	$ 79,200,000				$ -				$ -
	Double Track TBM (<6 Miles)	Mile	$ 106,637,312				$ -				
	Double Track TBM w/3rd Tube (>6 Miles)	Mile	$ 176,720,896				$ -				
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	$ -			0.00	$ -
14	Trench Long (2 tracks) (1000 + ft)	Mile	$ 57,524,224			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								
16	Mechanical & Electrical for Tunnels	Mile	$ 11,848,704				$ -			0.23	$ 2,692,887
17	Retaining Walls	Mile	$ 8,613,888			0.00	$ -				$ -
18	Containment Walls	Mile	$ 5,907,456				$ -				$ -
19	Single Track Cut and Cover Subway	Mile	$ 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	$ 213,274,624				$ -				
	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				$ -				$ -
	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)	ea	$ 2,029,568				$ -				$ -
4	Roadway Crossing HSR - 4 Lane Roadway Over 4 Tracks (Urban)	ea	$ 3,563,520			0	$ -				$ -
5	Roadway Crossing HSR - 4 Lane Roadway Over 2 Tracks (Suburban)	ea	$ 3,593,216				$ -				$ -

	COST ELEMENTS	UNIT	UNIT PRICE	At-Grade				Tunnel (2 tracks - Mined)			
	Subsection 1		Base: 2009 (3rd Quarter)	C				C			
				Start: 255 + 00	End: 267 + 00	0.23 Miles		Start: 255 + 00	End: 267 + 00	0.23 Miles	
	Subsection Details					Quant.	Cost			Quant.	Cost
	Double Track At-Grade (Mile)			Start: 255 + 00	End: 267 + 00	0.23 Miles		Start: 0 + 00	End: 0 + 00	0.00 Miles	
	Double Track Elevated (Mile)			Start: 0 + 00		0.00 Miles		Start: 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)			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		0.00 Miles	
	Four Track Trench (Mile)			Start: 0 + 00		0.00 Miles		Start: 0 + 00		0.00 Miles	
	Roadway Crossing HSR - 2 Lane Roadway Over 4 Tracks (Urban)	ea	$ 2,850,816			0	$ -				$ -
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	$ -				$ -				$ -
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	Each	$15,000,000				$ -				$ -
	Caltrain Passenger Station - In Trench	Each	$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				$ -				$ -
6	Major Utility Relocations - Dense Suburban	Mile	$ 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				$ -				$ -
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	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	Acre	$ 3,642				$ -				$ -
	Environmental Mitigation = 3% Line Costs						$ 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	$ 540,000			0.23	$ 122,727			0.23	$ 122,727
3	Wayside Protection System	Mile	$ 108,000			0.23	$ 24,545			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)						$ 629,208				$ 10,212,909
	Program Implementation Costs										
	Contingencies (per screening) (25%)						$ 616,870				$ 10,012,656
	Subtotal						$ 3,713,559				$ 60,276,189
	Subtotal (Rounded)						$ 4,000,000				$ 60,000,000

	COST ELEMENTS	UNIT	UNIT PRICE	At-Grade (2 Tracks)				At-Grade (4 Tracks)				Tunnel (2 tracks - Mined)			
	Subsection 1		Base: 2009 (3rd Quarter)	D				D				D			
				Start: 267 + 00	End: 315 + 00	0.91 Miles		Start: 267 + 00	End: 315 + 00	0.91 Miles		Start: 267 + 00	End: 315 + 00	0.91 Miles	
	Subsection Details					Quant.	Cost			Quant.	Cost			Quant.	Cost
	Double Track At-Grade (Mile)			Start: 267 + 00	End: 315 + 00	0.91 Miles		Start: 267 + 00	End: 315 + 00	0.91 Miles		Start: 0 + 00		0.00 Miles	
	Double Track Elevated (Mile)			Start: 0 + 00		0.00 Miles		Start: 267 + 00	End: 315 + 00	0.91 Miles		Start: 0 + 00		0.00 Miles	
	Double Track Tunnel (Mile)			Start: 0 + 00		0.00 Miles		Start: 0 + 00		0.00 Miles		Start: 267 + 00	End: 315 + 00	0.91 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)			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)			Start: 0 + 00		0.00 Miles		Start: 0 + 00	End: 0 + 00	0.00 Miles		Start: 0 + 00		0.00 Miles	
	Four Track Tunnel (Mile)			Start: 0 + 00		0.00 Miles		Start: 0 + 00		0.00 Miles		Start: 0 + 00		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	
	Double Track Section - Total														
1	Double Track Section - At Grade	Mile	$ 2,100,224			0.91	$ 1,909,295			0.91	$ 1,909,295			0.00	$ -
2	Double Track Section - On Structure	Mile	$ 4,700,160			0.00	$ -			0.91	$ 4,272,873			0.00	$ -
3	Double Track Section - In Tunnel or Subway	Mile	$ 4,700,160			0.00	$ -			0.00	$ -			0.91	$ 4,272,873
4	Double Track Section - In Trench	Mile	$ 4,700,160			0.00	$ -			0.00	$ -			0.00	$ -
	Four Track Section - Total														
	Four-track Section - At Grade	Mile	$ 4,200,448			0.00	$ -			0.00	$ -			0.00	$ -
	Four-Track Section - On Structure	Mile	$ 9,400,320			0	$ -			0.00	$ -			0	$ -
	Four-Track Section - In Tunnel or Subway	Mile	$ 9,400,320			0	$ -			0	$ -			0	$ -
	Four-Track Section - In Trench	Mile	$ 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	Mile	$ 2,350,080			0	$ -			0	$ -			0	$ -
7	Single Track Section - In Tunnel or Subway	Mile	$ 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	Mile	$ 2,839,552			0	$ -			0	$ -			0	$ -
10	Freight Single Track - At Grade	Mile	$ 1,549,312			0	$ -			0	$ -			0	$ -
	Earthwork Items														
1	Site Preparation - Undeveloped	Acre	$ 9,216			12.12	$ 111,709			12.12	$ 111,709			0.00	$ -
2	Total Cut	CY	$ 6			0.00	$ -			0.00	$ -			916667.00	$ 5,913,602
3	Total Fill	CY	$ 6			0.00	$ -			0.00	$ -			366667.00	$ 2,306,306
4	Borrow	CY	$ 13			0.00	$ -			0.00	$ -			0.00	$ -
5	Spoil	CY	$ 13			0.00	$ -			0.00	$ -			550000.00	$ 6,918,912
6	Landscape erosion Control	Acre	$ 6,144			0.85	$ 5,222			0.85	$ 5,222			0.00	$ -
7	Security Fencing (Both sides of ROW)	Mile	$ 144,384			0.00	$ -			0.00	$ -			0.85	$ 122,726
8	Special Drainage Facilities	5% Earthwork					$ 5,847				$ 5,847				$ 763,077
	Structures, Tunnels, Walls														
1	Standard Structure (2 tracks)	Mile	$ 34,972,672			0.00	$ -			0.91	$ 31,793,338			0.00	$ -
	Standard Structure (4 tracks)	Mile	$ 52,459,008			0.00	$ -			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				$ -				$ -				$ -
6	Twin Single Track Drill&Blast (<6 Miles)	Mile	$ 142,731,264				$ -				$ -			0.91	$ 129,755,695
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				$ -				$ -			0.00	$ -
	Double Track TBM (<6 Miles)	Mile	$ 106,637,312											0.00	$ -
	Double Track TBM w/3rd Tube (>6 Miles)	Mile	$ 176,720,896												
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	$ -			0.00	$ -				$ -
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												
16	Mechanical & Electrical for Tunnels	Mile	$ 11,848,704				$ -				$ -			0.91	$ 10,771,549
17	Retaining Walls	Mile	$ 8,613,888			0.00	$ -			0.00	$ -				$ -
18	Containment Walls	Mile	$ 5,907,456				$ -				$ -				$ -
19	Single Track Cut and Cover Subway	Mile	$ 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	$ 213,274,624												$ -
	Four Track TBM w/3rd Tube (>6 Miles)	Mile	$ 353,441,792												$ -
	Four Track Cut & Cover Tunnel	Mile	$ 262,492,160			0.00	$ -			0.00	$ -			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				$ -				$ -				$ -
	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)	ea	$ 2,029,568				$ -				$ -				$ -
4	Roadway Crossing HSR - 4 Lane Roadway Over 4 Tracks (Urban)	ea	$ 3,563,520			0	$ -			0	$ -				$ -

	COST ELEMENTS	UNIT	UNIT PRICE	At-Grade (2 Tracks)				At-Grade (4 Tracks)				Tunnel (2 tracks - Mined)			
	Subsection 1		Base: 2009 (3rd Quarter)	D				D				D			
				Start: 267 + 00	End: 315 + 00	0.91 Miles		Start: 267 + 00	End: 315 + 00	0.91 Miles		Start: 267 + 00	End: 315 + 00	0.91 Miles	
	Subsection Details					Quant.	Cost			Quant.	Cost			Quant.	Cost
	Double Track At-Grade (Mile)			Start: 267 + 00	End: 315 + 00	0.91 Miles		Start: 267 + 00	End: 315 + 00	0.91 Miles		Start: 0 + 00		0.00 Miles	
	Double Track Elevated (Mile)			Start: 0 + 00		0.00 Miles		Start: 267 + 00	End: 315 + 00	0.91 Miles		Start: 0 + 00		0.00 Miles	
	Double Track Tunnel (Mile)			Start: 0 + 00		0.00 Miles		Start: 0 + 00		0.00 Miles		Start: 267 + 00	End: 315 + 00	0.91 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)			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)			Start: 0 + 00		0.00 Miles		Start: 0 + 00	End: 0 + 00	0.00 Miles		Start: 0 + 00		0.00 Miles	
	Four Track Tunnel (Mile)			Start: 0 + 00		0.00 Miles		Start: 0 + 00		0.00 Miles		Start: 0 + 00		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)	ea	$ 3,593,216				$ -				$ -				$ -
	Roadway Crossing HSR - 2 Lane Roadway Over 4 Tracks (Urban)	ea	$ 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	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	Each	$15,000,000				$ -				$ -				$ -
	Caltrain Passenger Station - In Trench	Each	$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				$ -				$ -				$ -
6	Major Utility Relocations - Dense Suburban	Mile	$ 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				$ -				$ -				$ -
3	Dense Suburban	Acre	$ 908,134				$ -				$ -				$ -
4	Suburban	Acre	$ 208,418				$ -				$ -				$ -
5	Undeveloped	Acre	$ 3,642				$ -				$ -				$ -
	ROW required for Temp. Construction Easement	Acre													$ -
1	Dense Urban	Acre					$ -				$ -				$ -
2	Urban	Acre					$ -				$ -				$ -
3	Dense Suburban	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	Acre	$ 908,134				$ -				$ -				$ -
9	Suburban	Acre	$ 208,418				$ -				$ -				$ -
10	Undeveloped	Acre	$ 3,642				$ -				$ -				$ -
	Environmental Mitigation = 3% Line Costs						$ 60,962				$ 1,142,949				$ 4,824,742
	System Elements														
1	Signaling (ATC)	Mile	$ 2,070,000			0.91	$ 1,881,818			0.91	$ 1,881,818			0.91	$ 1,881,818
2	Communications (w/ Fiber Optic Backbone)	Mile	$ 540,000			0.91	$ 490,909			0.91	$ 490,909			0.91	$ 490,909
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	$ 1,170,000			0.91	$ 1,063,636			0.91	$ 1,063,636			0.91	$ 1,063,636
2	Traction Power Distribution	Mile	$ 1,485,000			0.91	$ 1,350,000			0.91	$ 1,350,000			0.91	$ 1,350,000
	Subtotal						$ 6,977,580				$ 44,125,777				$ 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
	Subtotal						$ 10,501,258				$ 66,409,295				$ 256,653,712
	Subtotal (Rounded)						$ 11,000,000				$ 66,000,000				$ 257,000,000

	COST ELEMENTS	UNIT	UNIT PRICE	At-Grade (2 Tracks)				At-Grade (4 Tracks)				Tunnel (2 tracks - Mined)			
	Subsection 1		Base: 2009 (3rd Quarter)	E				E				E			
				Start: 315 + 00	End: 350 + 00	0.66 Miles		Start: 315 + 00	End: 350 + 00	0.66 Miles		Start: 315 + 00	Start: 350 + 00	0.66 Miles	
	Subsection Details					Quant.	Cost			Quant.	Cost			Quant.	Cost
	Double Track At-Grade (Mile)			Start: 315 + 00	End: 350 + 00	0.66 Miles		Start: 315 + 00	End: 350 + 00	0.66 Miles		Start: 0 + 00	End: 0 + 00	0.00 Miles	
	Double Track Elevated (Mile)			Start: 0 + 00		0.00 Miles		Start: 0 + 00		0.00 Miles		Start: 0 + 00		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)			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)			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)			Start: 0 + 00		0.00 Miles		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		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	
	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	Mile	$ 4,700,160			0.00	$ -			0.66	$ 3,115,636			0.66	$ 3,115,636
4	Double Track Section - In Trench	Mile	$ 4,700,160			0.00	$ -			0.00	$ -			0.00	$ -
	Four Track Section - Total														
	Four-track Section - At Grade	Mile	$ 4,200,448			0.00	$ -			0.00	$ -			0.00	$ -
	Four-Track Section - On Structure	Mile	$ 9,400,320			0	$ -			0	$ -			0	$ -
	Four-Track Section - In Tunnel or Subway	Mile	$ 9,400,320			0	$ -			0	$ -			0	$ -
	Four-Track Section - In Trench	Mile	$ 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	Mile	$ 2,350,080			0	$ -			0	$ -			0	$ -
7	Single Track Section - In Tunnel or Subway	Mile	$ 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	Mile	$ 2,839,552			0	$ -			0	$ -			0	$ -
10	Freight Single Track - At Grade	Mile	$ 1,549,312			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	CY	$ 6			0.00	$ -			0.00	$ -			231815.00	$ 1,495,485
3	Total Fill	CY	$ 6			0.00	$ -			0.00	$ -			92726.00	$ 583,239
4	Borrow	CY	$ 13			0.00	$ -			0.00	$ -			0.00	$ -
5	Spoil	CY	$ 13			0.00	$ -			0.00	$ -			139089.00	$ 1,749,717
6	Landscape erosion Control	Acre	$ 6,144			0.66	$ 4,055			0.66	$ 4,055			2.87	$ 17,633
7	Security Fencing (Both sides of ROW)	Mile	$ 144,384			0.00	$ -			0.00	$ -			0.22	$ 31,764
8	Special Drainage Facilities	5% Earthwork					$ 4,276				$ 4,276				$ 197,965
	Structures, Tunnels, Walls														
1	Standard Structure (2 tracks)	Mile	$ 34,972,672			0.00	$ -			0.00	$ -			0.00	$ -
	Standard Structure (4 tracks)	Mile	$ 52,459,008			0.00	$ -			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				$ -				$ -				$ -
6	Twin Single Track Drill&Blast (<6 Miles)	Mile	$ 142,731,264				$ -				$ -			0.66	$ 94,613,527
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	$ -			0.66	$ 97,368,727				$ -
10	Double Track Mined (Soft Soil)	Mile	$ 79,200,000				$ -				$ -				$ -
	Double Track TBM (<6 Miles)	Mile	$ 106,637,312												
	Double Track TBM w/3rd Tube (>6 Miles)	Mile	$ 176,720,896												
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	$ -			0.00	$ -			0.00	$ -
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												
16	Mechanical & Electrical for Tunnels	Mile	$ 11,848,704				$ -				$ -			0.66	$ 7,854,255
17	Retaining Walls	Mile	$ 8,613,888			0.00	$ -			0.00	$ -				$ -
18	Containment Walls	Mile	$ 5,907,456				$ -				$ -				$ -
19	Single Track Cut and Cover Subway	Mile	$ 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	$ 213,274,624											0.00	$ -
	Four Track TBM w/3rd Tube (>6 Miles)	Mile	$ 353,441,792												$ -
	Four Track Cut & Cover Tunnel	Mile	$ 262,492,160			0.00	$ -			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				$ -				$ -				$ -
	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)	ea	$ 2,029,568				$ -				$ -				$ -
4	Roadway Crossing HSR - 4 Lane Roadway Over 4 Tracks (Urban)	ea	$ 3,563,520			0	$ -			0	$ -				$ -

	COST ELEMENTS	UNIT	UNIT PRICE	At-Grade (2 Tracks)				At-Grade (4 Tracks)				Tunnel (2 tracks - Mined)			
	Subsection 1		Base: 2009 (3rd Quarter)	E				E				E			
				Start: 315 + 00	End: 350 + 00	0.66 Miles		Start: 315 + 00	End: 350 + 00	0.66 Miles		Start: 315 + 00	Start: 350 + 00	0.66 Miles	
	Subsection Details					Quant.	Cost			Quant.	Cost			Quant.	Cost
	Double Track At-Grade (Mile)			Start: 315 + 00	End: 350 + 00	0.66 Miles		Start: 315 + 00	End: 350 + 00	0.66 Miles		Start: 0 + 00	End: 0 + 00	0.00 Miles	
	Double Track Elevated (Mile)			Start: 0 + 00		0.00 Miles		Start: 0 + 00		0.00 Miles		Start: 0 + 00		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)			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)			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)			Start: 0 + 00		0.00 Miles		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		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)	ea	$ 3,593,216				$ -				$ -				$ -
	Roadway Crossing HSR - 2 Lane Roadway Over 4 Tracks (Urban)	ea	$ 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	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	Each	$15,000,000				$ -				$ -				$ -
	Caltrain Passenger Station - In Trench	Each	$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				$ -				$ -				$ -
6	Major Utility Relocations - Dense Suburban	Mile	$ 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				$ -				$ -				$ -
3	Dense Suburban	Acre	$ 908,134				$ -				$ -				$ -
4	Suburban	Acre	$ 208,418				$ -				$ -				$ -
5	Undeveloped	Acre	$ 3,642				$ -				$ -				$ -
	ROW required for Temp. Construction Easement	Acre													$ -
1	Dense Urban	Acre					$ -				$ -				$ -
2	Urban	Acre					$ -				$ -				$ -
3	Dense Suburban	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	Acre	$ 908,134				$ -				$ -				$ -
9	Suburban	Acre	$ 208,418				$ -				$ -				$ -
10	Undeveloped	Acre	$ 3,642				$ -				$ -				$ -
	Environmental Mitigation = 3% Line Costs						$ 44,460				$ 3,058,991				$ 3,292,221
	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														
1	Traction Power supply	Mile	$ 1,170,000			0.66	$ 775,568			0.66	$ 775,568			0.66	$ 775,568
2	Traction Power Distribution	Mile	$ 1,485,000			0.66	$ 984,375			0.66	$ 984,375			0.66	$ 984,375
	Subtotal						$ 5,088,102				$ 108,586,997				$ 116,594,561
	Program Implementation Costs (per screening)						$ 1,297,466				$ 27,689,684				$ 29,731,613
	Program Implementation Costs														
	Contingencies (per screening) (25%)						$ 1,272,026				$ 27,146,749				$ 29,148,640
	Subtotal						$ 7,657,594				$ 163,423,430				$ 175,474,814
	Subtotal (Rounded)						$ 8,000,000				$ 163,000,000				$ 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			
				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					Quant.	Cost			Quant.	Cost			Quant.	Cost
	Double Track At-Grade (Mile)			Start: 350 + 00	End: 376 + 00	0.49 Miles		Start: 0 + 00	End: 0 + 00	0.00 Miles		Start: 0 + 00	End: 0 + 00	0.00 Miles	
	Double Track Elevated (Mile)			Start: 0 + 00		0.00 Miles		Start: 0 + 00		0.00 Miles		Start: 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)			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)			Start: 0 + 00	End: 0 + 00	0.00 Miles		Start: 350 + 00	End: 376 + 00	0.49 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		Start: 0 + 00		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)			Start: 0 + 00		0.00 Miles		Start: 0 + 00		0.00 Miles		Start: 0 + 00	End: 0 + 00	0.00 Miles	
	Double Track Section - Total														
1	Double Track Section - At Grade	Mile	$ 2,100,224			0.49	$ 1,034,201			0.00	$ -			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	Mile	$ 4,700,160			0.00	$ -			0.00	$ -			0.49	$ 2,314,473
4	Double Track Section - In Trench	Mile	$ 4,700,160			0.00	$ -			0.00	$ -			0.00	$ -
	Four Track Section - Total														
	Four-track Section - At Grade	Mile	$ 4,200,448			0.00	$ -			0.49	$ 2,068,402			0.00	$ -
	Four-Track Section - On Structure	Mile	$ 9,400,320			0	$ -			0	$ -			0	$ -
	Four-Track Section - In Tunnel or Subway	Mile	$ 9,400,320			0	$ -			0	$ -			0	$ -
	Four-Track Section - In Trench	Mile	$ 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	Mile	$ 2,350,080			0	$ -			0	$ -			0	$ -
7	Single Track Section - In Tunnel or Subway	Mile	$ 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	Mile	$ 2,839,552			0	$ -			0	$ -			0	$ -
10	Freight Single Track - At Grade	Mile	$ 1,549,312			0	$ -			0	$ -			0	$ -
	Earthwork Items														
1	Site Preparation - Undeveloped	Acre	$ 9,216			6.57	$ 60,549			6.57	$ 60,549			6.57	$ 60,549
2	Total Cut	CY	$ 6			0.00	$ -			0.00	$ -			529629.00	$ 3,416,743
3	Total Fill	CY	$ 6			0.00	$ -			0.00	$ -			211851.00	$ 1,332,526
4	Borrow	CY	$ 13			0.00	$ -			0.00	$ -			0.00	$ -
5	Spoil	CY	$ 13			0.00	$ -			0.00	$ -			317778.00	$ 3,997,596
6	Landscape erosion Control	Acre	$ 6,144			0.49	$ 3,011			0.49	$ 3,011			6.57	$ 40,366
7	Security Fencing (Both sides of ROW)	Mile	$ 144,384			0.00	$ -			0.49	$ 71,098			0.49	$ 70,748
8	Special Drainage Facilities	5% Earthwork					$ 3,178				$ 6,733				$ 445,926
	Structures, Tunnels, Walls														
1	Standard Structure (2 tracks)	Mile	$ 34,972,672			0.00	$ -			0.00	$ -			0.00	$ -
	Standard Structure (4 tracks)	Mile	$ 52,459,008			0.00	$ -			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				$ -				$ -				$ -
6	Twin Single Track Drill&Blast (<6 Miles)	Mile	$ 142,731,264				$ -				$ -			0.49	$ 70,284,335
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												
	Double Track TBM w/3rd Tube (>6 Miles)	Mile	$ 176,720,896												
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	$ -			0.00	$ -			0.00	$ -
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												
16	Mechanical & Electrical for Tunnels	Mile	$ 11,848,704				$ -				$ -			0.49	$ 5,834,589
17	Retaining Walls	Mile	$ 8,613,888			0.00	$ -			0.00	$ -				$ -
18	Containment Walls	Mile	$ 5,907,456				$ -				$ -				$ -
19	Single Track Cut and Cover Subway	Mile	$ 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	$ 213,274,624											0.00	$ -
	Four Track TBM w/3rd Tube (>6 Miles)	Mile	$ 353,441,792												$ -
	Four Track Cut & Cover Tunnel	Mile	$ 262,492,160			0.00	$ -			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				$ -				$ -				$ -
	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)	ea	$ 2,029,568				$ -				$ -				$ -
4	Roadway Crossing HSR - 4 Lane Roadway Over 4 Tracks (Urban)	ea	$ 3,563,520			0	$ -			0	$ -				$ -

	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			
				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					Quant.	Cost			Quant.	Cost			Quant.	Cost
	Double Track At-Grade (Mile)			Start: 350 + 00	End: 376 + 00	0.49 Miles		Start: 0 + 00	End: 0 + 00	0.00 Miles		Start: 0 + 00	End: 0 + 00	0.00 Miles	
	Double Track Elevated (Mile)			Start: 0 + 00		0.00 Miles		Start: 0 + 00		0.00 Miles		Start: 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)			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)			Start: 0 + 00	End: 0 + 00	0.00 Miles		Start: 350 + 00	End: 376 + 00	0.49 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		Start: 0 + 00		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)			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)	ea	$ 3,593,216				$ -				$ -				$ -
	Roadway Crossing HSR - 2 Lane Roadway Over 4 Tracks (Urban)	ea	$ 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	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	Each	$15,000,000				$ -				$ -				$ -
	Caltrain Passenger Station - In Trench	Each	$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			0.49	$ 980,439			0.49	$ 980,439				$ -
2	Single Track Relocation (Permanent)	Mile	$ 2,000,896												$ -
3	Single Track Removal	Mile	$ 130,048			0.49	$ 63,724			0.49	$ 63,724				$ -
4	Major Utility Relocations - Dense Urban	Mile	$ 1,548,288			0.49	$ 758,661			0.49	$ 758,661				$ -
5	Major Utility Relocations - Urban	Mile	$ 1,084,416				$ -				$ -				$ -
6	Major Utility Relocations - Dense Suburban	Mile	$ 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				$ -				$ -				$ -
3	Dense Suburban	Acre	$ 908,134				$ -				$ -				$ -
4	Suburban	Acre	$ 208,418				$ -				$ -				$ -
5	Undeveloped	Acre	$ 3,642				$ -				$ -				$ -
	ROW required for Temp. Construction Easement	Acre													$ -
1	Dense Urban	Acre					$ -				$ -				$ -
2	Urban	Acre					$ -				$ -				$ -
3	Dense Suburban	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	Acre	$ 908,134				$ -				$ -				$ -
9	Suburban	Acre	$ 208,418				$ -				$ -				$ -
10	Undeveloped	Acre	$ 3,642				$ -				$ -				$ -
	Environmental Mitigation = 3% Line Costs						$ 87,113				$ 120,379				$ 2,633,936
	System Elements														
1	Signaling (ATC)	Mile	$ 2,070,000			0.49	$ 1,019,318			0.49	$ 1,019,318			0.49	$ 1,019,318
2	Communications (w/ Fiber Optic Backbone)	Mile	$ 540,000			0.49	$ 265,909			0.49	$ 265,909			0.49	$ 265,909
3	Wayside Protection System	Mile	$ 108,000			0.49	$ 53,182			0.49	$ 53,182			0.49	$ 53,182
	Electrification Items														
1	Traction Power supply	Mile	$ 1,170,000			0.49	$ 576,136			0.49	$ 576,136			0.49	$ 576,136
2	Traction Power Distribution	Mile	$ 1,485,000			0.49	$ 731,250			0.49	$ 731,250			0.49	$ 731,250
	Subtotal						$ 5,636,671				$ 6,778,791				$ 93,077,582
	Program Implementation Costs (per screening)						$ 1,437,351				$ 1,728,592				$ 23,734,783
	Program Implementation Costs														
	Contingencies (per screening) (25%)						$ 1,409,168				$ 1,694,698				$ 23,269,395
	Subtotal						$ 8,483,190				$ 10,202,080				$ 140,081,761
	Subtotal (Rounded)						$ 8,000,000				$ 10,000,000				$ 140,000,000

	COST ELEMENTS	UNIT	UNIT PRICE	At-Grade (2 Tracks)				At-Grade (4 Tracks)				Tunnel (2 tracks - Mined)			
	Subsection 1		Base: 2009 (3rd Quarter)	G				G				G			
				Start: 376 + 00	End: 450 + 00	1.40 Miles		Start: 376 + 00	End: 450 + 00	1.40 Miles		Start: 376 + 00	Start: 450 + 00	1.40 Miles	
	Subsection Details					Quant.	Cost			Quant.	Cost			Quant.	Cost
	Double Track At-Grade (Mile)			Start: 376 + 00	End: 450 + 00	1.40 Miles		Start: 376 + 00	End: 450 + 00	1.40 Miles		Start: 0 + 00	End: 0 + 00	0.00 Miles	
	Double Track Elevated (Mile)			Start: 0 + 00		0.00 Miles		Start: 0 + 00		0.00 Miles		Start: 0 + 00		0.00 Miles	
	Double Track Tunnel (Mile)			Start: 0 + 00	End: 0 + 00	0.00 Miles		Start: 0 + 00	End: 0 + 00	0.00 Miles		Start: 376 + 00	End: 450 + 00	1.40 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)			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)			Start: 0 + 00		0.00 Miles		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		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	
	Double Track Section - Total														
1	Double Track Section - At Grade	Mile	$ 2,100,224			1.40	$ 2,943,496			0.74	$ 1,554,166			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	Mile	$ 4,700,160			0.00	$ -			0.74	$ 3,478,118			1.40	$ 6,587,345
4	Double Track Section - In Trench	Mile	$ 4,700,160			0.00	$ -			0.00	$ -			0.00	$ -
	Four Track Section - Total														
	Four-track Section - At Grade	Mile	$ 4,200,448			0.00	$ -			0.66	$ 2,772,296			0.00	$ -
	Four-Track Section - On Structure	Mile	$ 9,400,320			0	$ -			0	$ -			0	$ -
	Four-Track Section - In Tunnel or Subway	Mile	$ 9,400,320			0	$ -			0	$ -			0	$ -
	Four-Track Section - In Trench	Mile	$ 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	Mile	$ 2,350,080			0	$ -			0	$ -			0	$ -
7	Single Track Section - In Tunnel or Subway	Mile	$ 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	Mile	$ 2,839,552			0	$ -			0	$ -			0	$ -
10	Freight Single Track - At Grade	Mile	$ 1,549,312			0	$ -			0	$ -			0	$ -
	Earthwork Items														
1	Site Preparation - Undeveloped	Acre	$ 9,216			18.69	$ 172,218			18.69	$ 172,218			18.69	$ 172,218
2	Total Cut	CY	$ 6			0.00	$ -			0.00	$ -			72314.81	$ 466,517
3	Total Fill	CY	$ 6			0.00	$ -			0.00	$ -			28925.93	$ 181,942
4	Borrow	CY	$ 13			0.00	$ -			0.00	$ -			0.00	$ -
5	Spoil	CY	$ 13			0.00	$ -			0.00	$ -			43388.89	$ 545,825
6	Landscape erosion Control	Acre	$ 6,144			0.74	$ 4,547			0.74	$ 4,547			0.90	$ 5,508
7	Security Fencing (Both sides of ROW)	Mile	$ 144,384			0.00	$ -			0.00	$ -			0.07	$ 9,708
8	Special Drainage Facilities	5% Earthwork					$ 8,838				$ 8,838				$ 69,086
	Structures, Tunnels, Walls														
1	Standard Structure (2 tracks)	Mile	$ 34,972,672			0.00	$ -			0.00	$ -			0.00	$ -
	Standard Structure (4 tracks)	Mile	$ 52,459,008			0.00	$ -			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				$ -				$ -				$ -
6	Twin Single Track Drill&Blast (<6 Miles)	Mile	$ 142,731,264				$ -				$ -			1.40	$ 200,040,029
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	$ -			0.74	$ 108,696,883				$ -
10	Double Track Mined (Soft Soil)	Mile	$ 79,200,000				$ -				$ -				$ -
	Double Track TBM (<6 Miles)	Mile	$ 106,637,312												
	Double Track TBM w/3rd Tube (>6 Miles)	Mile	$ 176,720,896												
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	$ -			0.00	$ -			0.00	$ -
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												
16	Mechanical & Electrical for Tunnels	Mile	$ 11,848,704				$ -				$ -			1.40	$ 16,606,138
17	Retaining Walls	Mile	$ 8,613,888			0.00	$ -			0.00	$ -				$ -
18	Containment Walls	Mile	$ 5,907,456				$ -				$ -				$ -
19	Single Track Cut and Cover Subway	Mile	$ 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	$ 213,274,624												$ -
	Four Track TBM w/3rd Tube (>6 Miles)	Mile	$ 353,441,792												$ -
	Four Track Cut & Cover Tunnel	Mile	$ 262,492,160			0.00	$ -			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				$ -				$ -				$ -
	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)	ea	$ 2,029,568				$ -				$ -				$ -
4	Roadway Crossing HSR - 4 Lane Roadway Over 4 Tracks (Urban)	ea	$ 3,563,520			0	$ -			0	$ -				$ -

	COST ELEMENTS	UNIT	UNIT PRICE	At-Grade (2 Tracks)				At-Grade (4 Tracks)				Tunnel (2 tracks - Mined)			
	Subsection 1		Base: 2009 (3rd Quarter)	G				G				G			
				Start: 376 + 00	End: 450 + 00	1.40 Miles		Start: 376 + 00	End: 450 + 00	1.40 Miles		Start: 376 + 00	Start: 450 + 00	1.40 Miles	
	Subsection Details					Quant.	Cost			Quant.	Cost			Quant.	Cost
	Double Track At-Grade (Mile)			Start: 376 + 00	End: 450 + 00	1.40 Miles		Start: 376 + 00	End: 450 + 00	1.40 Miles		Start: 0 + 00	End: 0 + 00	0.00 Miles	
	Double Track Elevated (Mile)			Start: 0 + 00		0.00 Miles		Start: 0 + 00		0.00 Miles		Start: 0 + 00		0.00 Miles	
	Double Track Tunnel (Mile)			Start: 0 + 00	End: 0 + 00	0.00 Miles		Start: 0 + 00	End: 0 + 00	0.00 Miles		Start: 376 + 00	End: 450 + 00	1.40 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)			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)			Start: 0 + 00		0.00 Miles		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		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)	ea	$ 3,593,216				$ -				$ -				$ -
	Roadway Crossing HSR - 2 Lane Roadway Over 4 Tracks (Urban)	ea	$ 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	Each	$ -				$ -				$ -				$ -
2	Terminal Passenger Stations	Each	$ -				$ -				$ -				$ -
	Caltrain Passenger Station - At-Grade	Each	$15,000,000			1	$ 15,000,000			1	$ 15,000,000				$ -
	Caltrain Passenger Station - On Structure	Each	$15,000,000				$ -				$ -				$ -
	Caltrain Passenger Station - In Tunnel or Subway	Each	$15,000,000				$ -				$ -			1	$ 15,000,000
	Caltrain Passenger Station - In Trench	Each	$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			0.70	$ 1,400,627			0.70	$ 1,400,627				$ -
2	Single Track Relocation (Permanent)	Mile	$ 2,000,896			0				0					$ -
3	Single Track Removal	Mile	$ 130,048			0.70	$ 91,034			0.70	$ 91,034				$ -
4	Major Utility Relocations - Dense Urban	Mile	$ 1,548,288			0.74	$ 1,145,733			0.74	$ 1,145,733				$ -
5	Major Utility Relocations - Urban	Mile	$ 1,084,416				$ -				$ -				$ -
6	Major Utility Relocations - Dense Suburban	Mile	$ 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				$ -				$ -				$ -
3	Dense Suburban	Acre	$ 908,134				$ -				$ -				$ -
4	Suburban	Acre	$ 208,418				$ -				$ -				$ -
5	Undeveloped	Acre	$ 3,642				$ -				$ -				$ -
	ROW required for Temp. Construction Easement	Acre												0	$ -
1	Dense Urban	Acre					$ -				$ -				$ -
2	Urban	Acre					$ -				$ -				$ -
3	Dense Suburban	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	Acre	$ 908,134				$ -				$ -				$ -
9	Suburban	Acre	$ 208,418				$ -				$ -				$ -
10	Undeveloped	Acre	$ 3,642				$ -				$ -				$ -
	Environmental Mitigation = 3% Line Costs						$ 622,995				$ 4,029,734				$ 7,190,530
	System Elements														
1	Signaling (ATC)	Mile	$ 2,070,000			1.40	$ 2,901,136			1.40	$ 2,901,136			1.40	$ 2,901,136
2	Communications (w/ Fiber Optic Backbone)	Mile	$ 540,000			1.40	$ 756,818			1.40	$ 756,818			1.40	$ 756,818
3	Wayside Protection System	Mile	$ 108,000			1.40	$ 151,364			1.40	$ 151,364			1.40	$ 151,364
	Electrification Items														
1	Traction Power supply	Mile	$ 1,170,000			1.40	$ 1,639,773			1.40	$ 1,639,773			1.40	$ 1,639,773
2	Traction Power Distribution	Mile	$ 1,485,000			1.40	$ 2,081,250			1.40	$ 2,081,250			1.40	$ 2,081,250
	Subtotal						$ 28,919,828				$ 145,884,535				$ 254,405,187
	Program Implementation Costs (per screening)						$ 7,374,556				$ 37,200,556				$ 64,873,323
	Program Implementation Costs														
	Contingencies (per screening) (25%)						$ 7,229,957				$ 36,471,134				$ 63,601,297
	Subtotal						$ 43,524,342				$ 219,556,225				$ 382,879,807
	Subtotal (Rounded)						$ 44,000,000				$ 220,000,000				$ 383,000,000

Subsection 2	2A (4.2 miles)	2B (1.0 miles)	2C1 (1.0 miles)	2C2 (1.3 miles)					2D (1.2 miles)		
	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)	$107 (1 track); $146 (2 tracks)	$312 (1 track); $317 (2 tracks)	$37 (3 tracks); $14 (2 tracks)	$113 (1 track) $159 (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:	1. Existing 4 tracks extends from the Caltrain Bayshore Station to just north of the US 101 overpass. 2. Caltrain South San Francisco Station	1. 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).	3 tracks (2 Caltrain-1 HST) - 1. Three tracks on existing Caltrain alignment for approach to Caltrain 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 approach to Caltrain Millbrae station. *Must be combined with 2 track open trench or tunnel option.*	3 tracks (2 Caltrain-1 HST) - 1. Three tracks on existing Caltrain alignment for approach to Caltrain 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 approach to Caltrain Millbrae station. *Must be combined with 2 track open trench or tunnel option.*	3 tracks (2 Caltrain-1 HST) - 1. Three tracks on existing Caltrain alignment for approach to Caltrain 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 approach to Caltrain Millbrae station. 3. Center St and Santa Paula (Pedestrian) converted to an overcrossings. *Must be combined with 2 track open trench or tunnel option.*	1 track - 1. One track on new 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.*	1 track - 1. One track on new 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.*	3 tracks (2 Caltrain-1 HST) - 1. Three tracks on existing Caltrain alignment for Caltrain and HST Millbrae station. *Must be combined with 1 track open trench or tunnel option.* 2. Caltrain Millbrae Station. 3. HST Millbrae Station (1 platform) 2 tracks (2 Caltrain)- 1. Two tracks on existing Caltrain alignment for Caltrain Millbrae station. *Must be combined with 2 track open trench or tunnel option.*	1 track - 1. One track on new 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 station (2 platforms)	1 track - 1. One track on new 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 station (2 platforms)

	COST ELEMENTS	UNIT	UNIT PRICE	At-Grade			
	Subsection 2		Base: 2009 (3rd Quarter)	A			
				Start: 450 + 00	End: 671 + 00	4.19 Miles	
	Subsection Details					Quant.	Cost
	Double Track At-Grade (Mile)			Start: 450 + 00	End: 671 + 00	4.19 Miles	
	Double Track Elevated (Mile)			Start: 0 + 00		0.00 Miles	
	Double Track Tunnel (Mile)			Start: 0 + 00		0.00 Miles	
	Double Track Trench (Mile)			Start: 0 + 00		0.00 Miles	
	Four Track Construction/Reconstruction At-Grade (Mile)			Start: 0 + 00	End: 0 + 00	0.00 Miles	
	Four Track Elevated (Mile)			Start: 0 + 00		0.00 Miles	
	Four Track Tunnel (Mile)			Start: 0 + 00		0.00 Miles	
	Four Track Trench (Mile)			Start: 0 + 00		0.00 Miles	
	Double Track Section - Total						
1	Double Track Section - At Grade	Mile	$ 2,100,224			4.19	$ 8,790,710
2	Double Track Section - On Structure	Mile	$ 4,700,160			0.00	$ -
3	Double Track Section - In Tunnel or Subway	Mile	$ 4,700,160			0.00	$ -
4	Double Track Section - In Trench	Mile	$ 4,700,160			0.00	$ -
	Four Track Section - Total						
	Four-track Section - At Grade	Mile	$ 4,200,448			0.00	$ -
	Four-Track Section - On Structure	Mile	$ 9,400,320			0	$ -
	Four-Track Section - In Tunnel or Subway	Mile	$ 9,400,320			0	$ -
	Four-Track Section - In Trench	Mile	$ 9,400,320			0.00	$ -
	Single Track - Total						
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	$ -
	Earthwork Items						
1	Site Preparation - Undeveloped	Acre	$ 9,216			32.98	$ 303,921
2	Total Cut	CY	$ 6.00			0.00	$ -
3	Total Fill	CY	$ 6.00			0.00	$ -
4	Borrow	CY	$ 13.00			0.00	$ -
5	Spoil	CY	$ 13.00			0.00	$ -
6	Landscape erosion Control	Acre	$ 6,144			0.00	$ -
7	Security Fencing (Both sides of ROW)	Mile	$ 144,384			0.00	$ -
8	Special Drainage Facilities	5% Earthwork					$ 15,196
	Structures, Tunnels, Walls						
1	Standard Structure (2 tracks)	Mile	$ 34,972,672			0.00	$ -
	Standard Structure (4 tracks)	Mile	$ 52,459,008				
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			0.02	$ 1,743,360
6	Twin Single Track Drill&Blast (<6 Miles)	Mile	$ 142,731,264				$ -
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	$ -
10	Double Track Mined (Soft Soil)	Mile	$ 79,200,000				$ -
	Double Track TBM (<6 Miles)	Mile	$ 106,637,312				$ -
	Double Track TBM w/3rd Tube (>6 Miles)	Mile	$ 176,720,896				$ -
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	$ -
14	Trench Long (2 tracks) (1000 + ft)	Mile	$ 57,524,224			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				
16	Mechanical & Electrical for Tunnels	Mile	$ 11,848,704				$ -
17	Retaining Walls	Mile	$ 8,613,888			0.00	$ -
18	Containment Walls	Mile	$ 5,907,456				$ -
19	Single Track Cut and Cover Subway	Mile	$ 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	$ 213,274,624				$ -
	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				$ -

	COST ELEMENTS	UNIT	UNIT PRICE	At-Grade			
	Subsection 2		Base: 2009 (3rd Quarter)	A			
				Start: 450 + 00	End: 671 + 00	4.19 Miles	
	Subsection Details					Quant.	Cost
	Double Track At-Grade (Mile)			Start: 450 + 00	End: 671 + 00	4.19 Miles	
	Double Track Elevated (Mile)			Start: 0 + 00		0.00 Miles	
	Double Track Tunnel (Mile)			Start: 0 + 00		0.00 Miles	
	Double Track Trench (Mile)			Start: 0 + 00		0.00 Miles	
	Four Track Construction/Reconstruction At-Grade (Mile)			Start: 0 + 00	End: 0 + 00	0.00 Miles	
	Four Track Elevated (Mile)			Start: 0 + 00		0.00 Miles	
	Four Track Tunnel (Mile)			Start: 0 + 00		0.00 Miles	
	Four Track Trench (Mile)			Start: 0 + 00		0.00 Miles	
	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)	ea	$ 2,029,568				$ -
4	Roadway Crossing HSR - 4 Lane Roadway Over 4 Tracks (Urban)	ea	$ 3,563,520			0	$ -
5	Roadway Crossing HSR - 4 Lane Roadway Over 2 Tracks (Suburban)	ea	$ 3,593,216				$ -
	Roadway Crossing HSR - 2 Lane Roadway Over 4 Tracks (Urban)	ea	$ 2,850,816			0	$ -
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	$ -				$ -
2	Terminal Passenger Stations	Each	$ -				$ -
	Caltrain Passenger Station - At-Grade	Each	$15,000,000			1	$ 15,000,000
	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	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				$ -
6	Major Utility Relocations - Dense Suburban	Mile	$ 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				$ -
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	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	Acre	$ 3,642				$ -
	Environmental Mitigation = 3% Line Costs						$ 775,596
	System Elements						
1	Signaling (ATC)	Mile	$ 2,070,000			4.19	$ 8,664,205
2	Communications (w/ Fiber Optic Backbone)	Mile	$ 540,000			4.19	$ 2,260,227
3	Wayside Protection System	Mile	$ 108,000			4.19	$ 452,045
	Electrification Items						
1	Traction Power supply	Mile	$ 1,170,000			4.19	$ 4,897,159
2	Traction Power Distribution	Mile	$ 1,485,000			4.19	$ 6,215,625
	Subtotal						$ 49,118,044
	Program Implementation Costs (per screening)						$ 12,525,101
	Program Implementation Costs						
	Contingencies (per screening) (25%)						$ 12,279,511
	Subtotal						$ 73,922,656
	Subtotal (Rounded)						$ 74,000,000

Appendix F: Evaluation Matrices for SFTWG Alternative Alignment Options

Source: SFTWG

Evaluation Measure			San Francisco Technical Working Group Options			
			Option 1: HST/Caltrain under I-280 from North of Tunnel 1 to 4th/King			
			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
Design Objectives	*Maximize ridership / revenue potential*	*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 4th & King	Not applicable	Not applicable	Connects to Bayshore Station
	Minimize operating and capital costs	*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	+ $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
Constructability	*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
	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
Disruption to Communities	*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
	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

Evaluation Measure			San Francisco Technical Working Group Options			
			Option 1: HST/Caltrain under I-280 from North of Tunnel 1 to 4th/King			
			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
Environmental Resources	*Waterways and wetlands and natural preserves or biologically sensitive habitat areas affected*	*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
		Critical habitat (presence of waterways providing critical habitat for coastal steelhead, identified as Present or None)	None	None	2	Impacts same as CAHSR option
	Cultural resources	*Number of historic structures within ultimate ROW*	Unknown at this time	None	None	Impacts same as CAHSR option
		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
Environmental Measures	*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 same as CAHSR option
		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
	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

Evaluation Measure			San Francisco Technical Working Group Options			
			Option 2: HST/Caltrain under I-280 from South of Tunnel 1 to 4th/King			
			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
Design Objectives	*Maximize ridership / revenue potential*	*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 4th & King	Not applicable	22nd Street Station	Bayshore Station
	Minimize operating and capital costs	*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	+ $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
Constructability	*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
	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
Disruption to Communities	*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
	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

Evaluation Measure			San Francisco Technical Working Group Options			
			Option 2: HST/Caltrain under I-280 from South of Tunnel 1 to 4th/King			
			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
Environmental Resources	*Waterways and wetlands and natural preserves or biologically sensitive habitat areas affected*	*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
		Critical habitat (presence of waterways providing critical habitat for coastal steelhead, identified as Present or None)	None	None	2	Impacts same as CAHSR option
	Cultural resources	*Number of historic structures within ultimate ROW*	Unknown at this time.	None	None	Impacts same as CAHSR option
		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
Environmental Measures	*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 same as CAHSR option
		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
	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

Evaluation Measure			San Francisco Technical Working Group Options			
			Option 3: Pennsylvania Ave. Alignment			
			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
Design Objectives	*Maximize ridership / revenue potential*	*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 4th & King	Not applicable	22nd Street Station	Bayshore Station
	Minimize operating and capital costs	*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
	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	*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
	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
Disruption to Communities	*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 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
	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

Evaluation Measure			San Francisco Technical Working Group Options			
			Option 3: Pennsylvania Ave. Alignment			
			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
Environmental Resources	*Waterways and wetlands and natural preserves or biologically sensitive habitat areas affected*	*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
		Critical habitat (presence of waterways providing critical habitat for coastal steelhead, identified as Present or None)	None	None	2	Impacts same as CAHSR option
	Cultural resources	*Number of historic structures within ultimate ROW*	Unknown at this time.	None	None	Impacts same as CAHSR option
		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
Environmental Measures	*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 same as CAHSR option
		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
	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

Evaluation Measure			San Francisco Technical Working Group Options			
			Option 4A: Replace I-280 with Parkway over 4-track tunnel box, fully underground from Cesar Chavez to 4th/King & TTC			
			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)
Design Objectives	*Maximize ridership / revenue potential*	*Travel time*	More but not significant			
		Route length	More but not significant			
	Maximize connectivity and accessibility	*Intermodal connections*	Connects with both Transbay and 4th & King	Not applicable	22nd Street Station (deep)	Bayshore Station
	Minimize operating and capital costs	*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 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
Constructability	*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
	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
Disruption to Communities	*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
	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.

Evaluation Measure			San Francisco Technical Working Group Options			
			Option 4A: Replace I-280 with Parkway over 4-track tunnel box, fully underground from Cesar Chavez to 4th/King & TTC			
			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)
Environmental Resources	*Waterways and wetlands and natural preserves or biologically sensitive habitat areas affected*	*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
		Critical habitat (presence of waterways providing critical habitat for coastal steelhead, identified as Present or None)	None	None	2	2
	Cultural resources	*Number of historic structures within ultimate ROW*	4?	None	None	None
		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
Environmental Measures	*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
	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

Evaluation Measure			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			
			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)
Design Objectives	*Maximize ridership / revenue potential*	*Travel time*	More but not significant			
		Route length	More but not significant			
	Maximize connectivity and accessibility	*Intermodal connections*	Connects with both Transbay and 4th & King	Not applicable	22nd Street Station (deep)	Bayshore Station
	Minimize operating and capital costs	*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	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
Constructability	*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
	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
Disruption to Communities	*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
	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.

Evaluation Measure			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			
			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)
Environmental Resources	*Waterways and wetlands and natural preserves or biologically sensitive habitat areas affected*	*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
		Critical habitat (presence of waterways providing critical habitat for coastal steelhead, identified as Present or None)	None	None	2	2
	Cultural resources	*Number of historic structures within ultimate ROW*	4?	None	None	None
		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
Environmental Measures	*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
	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

Evaluation Measure			San Francisco Technical Working Group Options			
			Option 4C: Replace I-280 with Parkway over 4-track tunnel box, underground from 16th Street to TTC, 4th/King at grade			
			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
Design Objectives	*Maximize ridership / revenue potential*	*Travel time*	More but not significant			
		Route length	More but not significant			
	Maximize connectivity and accessibility	*Intermodal connections*	Connects with both Transbay and 4th & King	Not applicable	22nd Street Station	Bayshore Station
	Minimize operating and capital costs	*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 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
Constructability	*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
	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
Disruption to Communities	*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
	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.

Evaluation Measure			San Francisco Technical Working Group Options			
			Option 4C: Replace I-280 with Parkway over 4-track tunnel box, underground from 16th Street to TTC, 4th/King at grade			
			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
Environmental Resources	*Waterways and wetlands and natural preserves or biologically sensitive habitat areas affected*	*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
		Critical habitat (presence of waterways providing critical habitat for coastal steelhead, identified as Present or None)	None	None	2	2
	Cultural resources	*Number of historic structures within ultimate ROW*	4?	None	None	None
		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
Environmental Measures	*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
	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

Evaluation Measure			San Francisco Technical Working Group Options Option 5: Fully Underground Mega-Bore Tunnel			
			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
Design Objectives	*Maximize ridership / revenue potential*	*Travel time*				
		Route length				
	Maximize connectivity and accessibility	*Intermodal connections*	Connects with both Transbay and 4th & King	Not applicable	22nd Street Station (deep)	Bayshore Station
	Minimize operating and capital costs	*Operating and Maintenance (O&M) costs (relative costs associated with different options)*				
		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
	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
Constructability	*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
	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
Disruption to Communities	*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
	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

Evaluation Measure			San Francisco Technical Working Group Options Option 5: Fully Underground Mega-Bore Tunnel OA: HST & Caltrain to both Transbay and 4th/King Tunnel	1A: North of Mission Bay Drive to South of 16th Street Tunnel	1B & 1C: South of 16th Street to North of Cesar Chavez Street Tunnel	1D, 1E, 1F & 1G: North of Cesar Chavez Street to South Portal Tunnel No. 4 Tunnel
Environmental Resources	*Waterways and wetlands and natural preserves or biologically sensitive habitat areas affected*	*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
		Critical habitat (presence of waterways providing critical habitat for coastal steelhead, identified as Present or None)	None	None	2	2
	Cultural resources	*Number of historic structures within ultimate ROW*	4	None	None	None
		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
Environmental Measures	*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
	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
	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

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
	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	0.28	$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

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

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

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
	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	0.91	$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

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
	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	0.66	$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

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
	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		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

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

CAHSRA Base Alternative					
Cost Elements		**Unit**	**2009 $, Unit Price**	**Option Base, Section 1A to TTC**	
				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

CAHSRA Base Alternative					
Cost Elements		**Unit**	**2009 $, Unit Price**	**Option Base, 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
	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	0.76	$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

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
Earthwork - 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

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

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
	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
	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	0.66	$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					$174,901,974

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

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
	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

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
	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
	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

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	0.66	$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
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	0.66	$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

CAHSRA Base Alternative (4 -tracks)					
Cost Elements		**Unit**	**2009 $, Unit Price**	**CAHSRA Section 1F, 4-Track At-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
	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
	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
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
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

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	1.4	$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
	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	0.74	$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
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
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

SFTWG Option 1					
Cost Elements		**Unit**	**2009 $, Unit Price**	**Option 1, Section O to 4th/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		$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

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
	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

SFTWG Option 1					
Cost Elements		**Unit**	**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	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		$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

SFTWG Option 1					
Cost Elements		**Unit**	**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

SFTWG Option 2					
Cost Elements		**Unit**	**2009 $, Unit Price**	**Option 2, Section O to 4th/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		$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

SFTWG Option 2					
Cost Elements		**Unit**	**2009 $, Unit Price**	**Option 2, 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

SFTWG Option 2					
Cost Elements		**Unit**	**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	0.55	$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

SFTWG Option 2					
Cost Elements		**Unit**	**2009 $, Unit Price**	**Option 2, 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	0.21	$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
	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	0.21	$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

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

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

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
	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	0.52	$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

SFTWG Option 3					
Cost Elements		**Unit**	**2009 $, Unit Price**	**Option 3, 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	0.26	$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
	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	0.26	$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

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
	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

SFTWG Option 4a					
Cost Elements		**Unit**	**2009 $, Unit Price**	**Option 4a, Section 1A 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	0.28	$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		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%		$3,259,021
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

SFTWG Option 4a					
Cost Elements		**Unit**	**2009 $, Unit Price**	**Option 4a, Section 1B 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	0.76	$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
	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	0.76	$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		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%		$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

SFTWG Option 4a					
Cost Elements		**Unit**	**2009 $, Unit Price**	**Option 4a, Section 1C 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	0.32	$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
	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

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
	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	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	0.46	$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

SFTWG Option 4b					
Cost Elements		**Unit**	**2009 $, Unit Price**	**Option 4b, Section 1A 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	0.28	$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		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%		$3,259,021
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

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
	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	0.76	$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		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%		$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

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
	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	0.32	$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

SFTWG Option 4c					
Cost Elements		**Unit**	**2009 $, Unit Price**	**Option 4c, Section O to 4th/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

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
	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	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

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

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

SFTWG Option 5a					
Cost Elements		**Unit**	**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

SFTWG Option 5a					
Cost Elements		**Unit**	**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
	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
	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	0.56	$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

SFTWG Option 5a					
Cost Elements		**Unit**	**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

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

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	0.91	$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

SFTWG Option 5a					
Cost Elements		**Unit**	**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
	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
	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

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
	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
	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

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
	4-Track Mega Bore	Per mile	$350,000,000	1.4	$490,000,000
	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		$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