

a. COST-EFFECTIVENESS ANALYSIS

A Benefit-Cost Analysis (BCA) was prepared for the Grand Parkway project using the *California Life-Cycle Benefit/Cost Analysis Model* (Cal-B/C). The California Department of Transportation developed the Cal-B/C v5.0 Corridor Model as an adaptable tool intended for conducting economic analysis in accordance with US DOT guidance. The publically available spreadsheet model is capable of assessing both highway and transit projects.

The Grand Parkway project is comprised of the following three segments: H, I-1, and I-2. The environmental impacts associated with the segments were studied in two documents, (1) Segment H and I-1 and (2) Segment I-2; therefore the segments are in different phases of project development. Because data was unavailable for segment I-2, the BCA *incorporates the costs associated with all three segments but only incorporates the benefits for two segments: H and I-1*. Project-specific travel demand outputs regarding vehicle miles traveled (VMT) and vehicle hours traveled (VHT) were derived from the Final Environmental Impact Statement (FEIS) for segment H and segment I-1, facilitating use of the Corridor version of the Cal B/C model, in which aggregate vehicle-miles of travel (VMT) and vehicle-hours of travel (VHT) are entered directly as model inputs. Because this version of the model does not calculate accident reduction benefits, no safety benefits are quantified in the BCA. The B/C ratio could improve if the benefits for segment I-2 and/or the accident reduction benefits were included.

The Cal-B/C model uses project-specific input data to calculate life-cycle costs, life-cycle benefits, annual benefits, net present values of costs and benefits, a resulting B/C ratio, and the internal rate of return and payback period. Cal-B/C evaluates benefits in the following three categories: travel time, vehicle operation, and emissions. A summary of the BCA is provided in Section (i) of this appendix. Section (ii) discusses the Cal-B/C inputs used for analysis of the Grand Parkway project, and Section (iii) provides details regarding the BCA results. All monetary values presented in this appendix were adjusted to 2015 dollars, the default value of the “2016 TIGER” version of the Cal B/C model based on the Gross Domestic Product Price Index, unless otherwise stated.

(i) BENEFIT-COST ANALYSIS SUMMARY

The BCA results indicate a **positive B/C ratio of 2.6**, reflecting that the life-cycle benefits of the project exceed the estimated project-related costs. Table 1 provides a summary of the Cal-B/C results.

TABLE 1: CAL B/C RESULTS

Life-Cycle Costs (mil. \$)	\$1,147.3
Life-Cycle Benefits (mil. \$)	\$2,961.2
Net Present Value (mil. \$)	\$1,813.9
Benefit / Cost Ratio:	2.6
Rate of Return on Investment:	14.7%
Payback Period:	8 years

(ii) CAL-B/C MODEL INPUTS

The Cal-B/C model includes a number of default parameters including hourly wage, value of time, fuel price and taxes, accident costs by type of accident, and a maximum volume-to-capacity ratio. Sources for these default values include the Office of Management and Budget (OMB), the Bureau of Labor Statistics (BLS), USDOT Department Guidance, the IDAS model, the American Transportation Research Institute, AAA, the California Department of Transportation, and the California Board of Equalization. Parameters were updated by Caltrans to support 2016 TIGER applications. These default values were used in this BCA unless otherwise stated.¹

Users are also required to input project-specific data into the model. These inputs are discussed in the following subsections. The model identifies project-specific data required to be input by users with green cells.

(a) PROJECT DATA

The Cal-B/C model requires users to select a project location that corresponds to California urban or rural peak traffic and accident parameters. The Grand Parkway project was identified as rural. Tables 2, 3, and 4 below show the data input tables from the Cal B/C model and the project-specific data entered for the Grand Parkway project. Average vehicle occupancy for Texas was based on State Averages for Private Vehicle Occupancy developed by the University of South Florida, based on 2000 Census data.² Truck percent was obtained from the Commercial

¹ California Department of Transportation. 2016. *Cal-B/C v5.0 Corridor Model*. Retrieved on 3/25/2016 from http://www.dot.ca.gov/hq/tpp/offices/eab/LCBC_Analysis_Model.html

² Average vehicle occupancy for Texas based on University of South Florida, State Averages for Private Vehicle Occupancy, Carpool Size and Vehicles Per 100 Workers, analysis based on 2000 Census. Available at <http://www.nctr.usf.edu/clearinghouse/censusavo.htm>

Vehicle share of Total Vehicle Trips in 2019 and 2039 as shown in Final Environmental Impact Statement (FEIS).³

TABLE 2: CAL-B/C - DEFINITIONS OF MODEL GROUPS AND YEARS

Model Group	Name	Description	Avg. Vehicle Occupancy (AVO)	Percent Trucks
Model Group 1	Seg H and I-1	Segments H and I-1 from FEIS, Appendix H	1.10	6.7%

TABLE 3: CAL-B/C - AGGREGATE MODEL DATA - YEAR 1 (NO BUILD AND BUILD)

	Number of Trips	Vehicle Miles Traveled (VMT)	Vehicle Hours Traveled (VHT)	Speed	Avg. Vehicle Occupancy (AVO)	Percent Trucks
No Build						
1 Seg H and I-1	17,259,930	138,941,588	3,518,956	39.5	1.10	6.7%
Build						
1 Seg H and I-1	17,259,930	139,138,403	3,518,432	39.5	1.10	6.7%

TABLE 4: CAL-B/C - AGGREGATE MODEL DATA - YEAR 20 (NO BUILD AND BUILD)

	Number of Trips	Vehicle Miles Traveled (VMT)	Vehicle Hours Traveled (VHT)	Speed	Avg. Vehicle Occupancy (AVO)	Percent Trucks
No Build						
1 Seg H and I-1	24,069,539	207,950,748	8,432,909	24.7	1.10	6.7%
Build						
1 Seg H and I-1	24,069,539	208,121,231	8,294,509	25.1	1.10	6.7%

(b) PROJECT COSTS

Estimated project costs and the anticipated length of the construction period were entered into the Cal-B/C model. Project costs were entered under the following categories, as appropriate: Project Support, Right-of-Way (ROW), Construction, Maintenance/Operations, Rehabilitation, or Mitigation. These costs are presented as constant dollars and then discounted using a seven percent (7%) annual rate to reflect their present value.

The initial design and construction costs for the Grand Parkway project are approximately **\$1.23 billion** as described in more detail in Section d: Grant Funds, Sources, and Uses of Project Funds of this application. The construction period is expected to be five years, with annual construction expenditures represented in the model based on detailed cost estimates prepared by the project team. Operations and maintenance (O&M) costs were estimated in the FEIS and adjusted to

³ Truck percent based on Commercial Vehicle share of Total Vehicle Trips in 2019 and 2039 as shown in FEIS Appendix H (Economic Impacts), Exhibit 5 (Travel Demand Model Output, average daily terms), page 757 of Volume II, available at http://www.grandpky.com/downloads/Volume_II.pdf

2015 dollars using the GDP deflator per U.S. Bureau of Economic Analysis.⁴ O&M costs are approximately \$208 million over the first 20 years of the project. Rehabilitation costs were derived from the FEIS replacement cost estimates and adjusted using the same method as described for O&M costs. Rehabilitation costs, or replacement costs, are estimated to equal \$94 million over the first 20 years. The total project costs equal **\$1.15 billion** in present value terms. The breakdown of project costs as reflected in the Cal B/C analysis is indicated in Table 5 below.

TABLE 5: CAL-B/C - PROJECT COSTS

Year	DIRECT PROJECT COSTS									
	INITIAL COSTS						SUBSEQUENT COSTS			
	Project Support	Present Value 7%	R / W	Present Value 7%	Construction	Present Value 7%	Maint./ Op.	Present Value 7%	Rehab.	Present Value 7%
Construction Period										
1	\$11,599,000	\$11,599,000	\$0	\$0	\$0	\$0				
2	\$11,810,000	\$11,037,383	\$0	\$0	\$0	\$0				
3	\$3,615,000	\$3,157,481	\$31,910,000	\$27,871,430	\$0	\$0				
4	\$43,723,000	\$35,690,992	\$135,269,000	\$110,419,798	\$78,265,000	\$63,887,553				
5	\$24,724,000	\$18,861,821	\$94,206,000	\$71,869,306	\$217,425,000	\$165,872,491				
6	\$17,921,000	\$12,777,425	\$62,804,000	\$44,778,384	\$193,344,000	\$137,851,600				
7	\$28,790,000	\$19,183,993	\$0	\$0	\$177,391,000	\$118,203,113				
8	\$5,231,000	\$3,257,604	\$0	\$0	\$89,003,000	\$55,426,595				
Project Open										
1							\$6,886,217	\$4,588,577	\$1,617,218	\$1,077,620
2							\$7,752,211	\$4,827,688	\$1,836,325	\$1,143,571
3							\$8,294,762	\$4,827,627	\$2,869,257	\$1,669,934
4							\$9,505,067	\$5,170,127	\$2,138,901	\$1,163,420
5							\$8,566,037	\$4,354,539	\$2,086,733	\$1,060,789
6							\$9,682,439	\$4,600,057	\$3,130,099	\$1,487,087
7							\$9,985,015	\$4,433,466	\$2,138,901	\$949,698
8							\$10,183,255	\$4,225,689	\$2,170,202	\$900,557
9							\$10,381,494	\$4,026,123	\$2,890,125	\$1,120,840
10							\$10,673,637	\$3,868,617	\$9,473,766	\$3,433,729
11							\$10,245,857	\$3,470,626	\$4,142,164	\$1,403,094
12							\$10,444,096	\$3,306,333	\$4,653,414	\$1,473,152
13							\$10,652,770	\$3,151,770	\$3,641,348	\$1,077,344
14							\$10,882,310	\$3,009,049	\$3,693,517	\$1,021,288
15							\$11,122,285	\$2,874,210	\$7,491,370	\$1,935,912
16							\$12,927,308	\$3,122,114	\$6,051,524	\$1,461,522
17							\$12,416,059	\$2,802,468	\$5,540,275	\$1,250,513
18							\$12,551,696	\$2,647,741	\$6,552,340	\$1,382,196
19							\$12,687,334	\$2,501,265	\$5,592,443	\$1,102,531
20							\$12,833,405	\$2,364,544	\$17,048,605	\$3,141,191
Total		\$115,565,699		\$254,938,918		\$541,241,353	\$208,673,256	\$74,172,631	\$94,758,526	\$29,255,989

⁴ Average annual expenditure on operations and maintenance as shown in FEIS, Appendix H (Economic Impacts), Exhibit 3 Expenditures Schedule (increments by category, in 2012\$, available at http://www.grandpky.com/downloads/Volume_II.pdf. Adjusted to 2015\$ using GDP deflator per U.S. Bureau of Economic Analysis, Table 1.1.4. Price Indexes for Gross Domestic Product, annual data series. Available at http://www.bea.gov/iTable/index_nipa.cfm

(iii) CAL-B/C MODEL RESULTS

The Cal-B/C model evaluates benefits related to travel time savings, vehicle operating cost savings, accident reduction, and emissions reduction, as described below. Figure 1 and Figure 2 graphically depict the share by category of total project life-cycle costs and total project life-cycle benefits associated with the Grand Parkway project, as discussed in more detail in the following sub-sections.

FIGURE 1: PROJECT COSTS, NET PRESENT VALUE

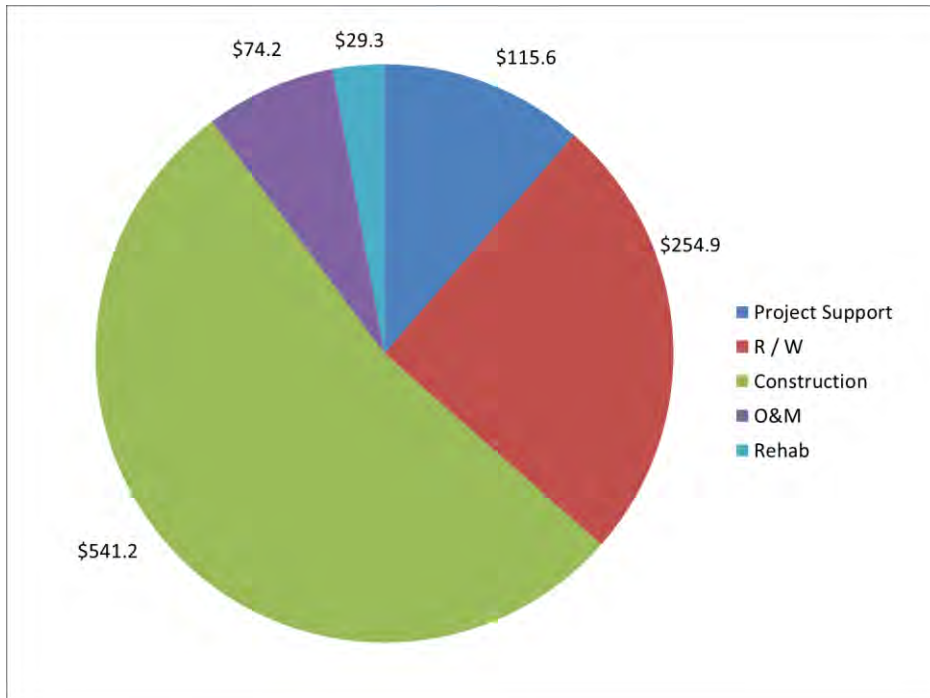
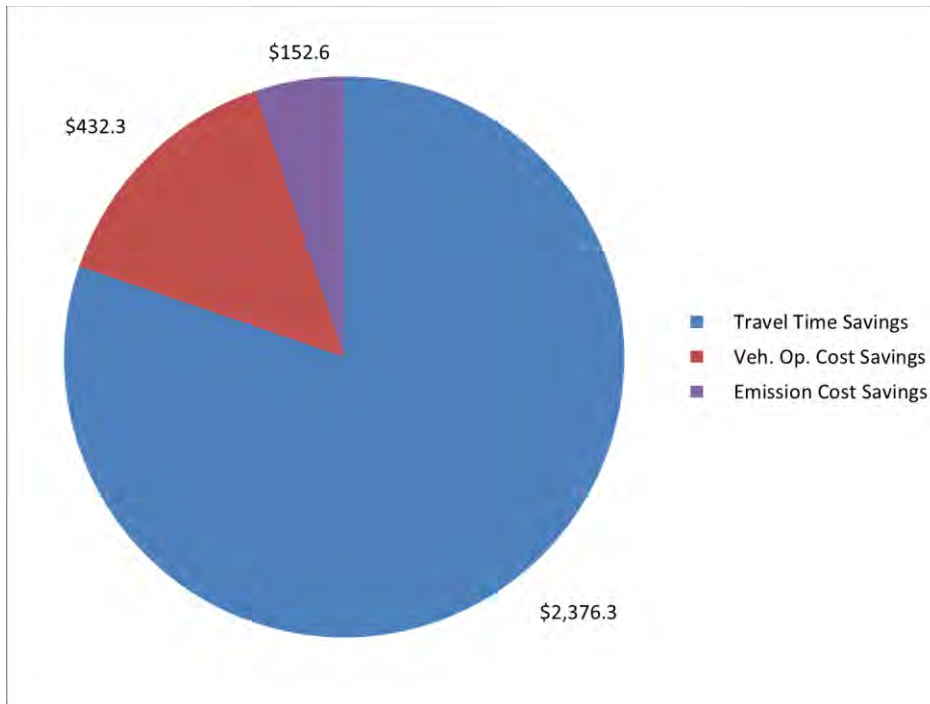


FIGURE 2: ITEMIZED BENEFITS, NET PRESENT VALUE



(a) TRAVEL TIME SAVINGS

The Cal-B/C model evaluates travel time benefits with four formulas that calculate average annual volume, travel time, travel time savings, and induced travel. Average value of time varies by vehicle type. The Cal-B/C model interpolates traffic volumes and travel speeds between the base year and year 20 of the project. Refer to the formulas provided for more information about each calculation. Table 6 shows the total travel time benefit and the travel time benefit by year for the Grand Parkway project.

$$\text{Average Annual Volume} = \text{Average Daily Traffic} \times \text{Number of Days in Model Year}$$

$$\text{Travel Time} = \text{Average Vehicle Occupancy} \times \text{Average Annual Volume} \times \text{Affected Length} / \text{Speed}$$

$$\text{Travel Time Savings} = \text{Travel Time Reduction} \times \text{Average Value of Time}$$

$$\text{Induced Travel} = \text{Change in Trips} \times \text{Change in Travel Time} \times 0.5$$

TABLE 6: CAL-B/C - TRAVEL TIME SAVINGS BENEFITS

Seg H and I-1

Year	AVERAGE VOLUME (vehicles/yr)		AVERAGE SPEED (mph)		ANNUAL PERSON-TRIPS (trips/yr)		AVERAGE TRAVEL TIME (hours)		PERCENT TRUCKS (%)		TIME BENEFIT (\$/yr)		Constant Dollars	Present Value at 7%
	No Build	Build	No Build	Build	No Build	Build	No Build	Build	No Build	Build	Existing Users	New (Induced)		
1	1,284,418,940	1,284,227,680	1.1	1.1	6,299,874,450	6,299,874,450	0.22	0.22	6.7%	6.7%	\$3,074,632	\$0	\$3,074,632	\$2,048,757
20	3,078,011,785	3,027,495,785	1.1	1.1	8,785,381,735	8,785,381,735	0.38	0.38	6.7%	6.7%	\$812,078,256	\$0	\$812,078,256	\$149,624,751
1	1,284,418,940	1,284,227,680	1	1	6,299,874,450	6,299,874,450	0.22	0.22	6.7%	6.7%	\$3,074,632	\$0	\$3,074,632	\$2,048,757
2	1,378,818,563	1,375,978,633	1	1	6,430,690,623	6,430,690,623	0.23	0.23	6.7%	6.7%	\$45,653,770	\$0	\$45,653,770	\$28,430,873
3	1,473,218,187	1,467,729,586	1	1	6,561,506,796	6,561,506,796	0.25	0.25	6.7%	6.7%	\$88,232,908	\$0	\$88,232,908	\$51,352,356
4	1,567,617,810	1,559,480,539	1	1	6,692,322,969	6,692,322,969	0.26	0.26	6.7%	6.7%	\$130,812,046	\$0	\$130,812,046	\$71,153,086
5	1,662,017,434	1,651,231,492	1	1	6,823,139,142	6,823,139,142	0.27	0.27	6.7%	6.7%	\$173,391,184	\$0	\$173,391,184	\$88,143,286
6	1,756,417,057	1,742,982,444	1	1	6,953,955,314	6,953,955,314	0.28	0.27	6.7%	6.7%	\$215,970,322	\$0	\$215,970,322	\$102,605,944
7	1,850,816,681	1,834,733,397	1	1	7,084,771,487	7,084,771,487	0.29	0.28	6.7%	6.7%	\$258,549,460	\$0	\$258,549,460	\$114,799,052
8	1,945,216,304	1,926,484,350	1	1	7,215,587,660	7,215,587,660	0.30	0.29	6.7%	6.7%	\$301,128,599	\$0	\$301,128,599	\$124,957,663
9	2,039,615,927	2,018,235,303	1	1	7,346,403,833	7,346,403,833	0.30	0.30	6.7%	6.7%	\$343,707,737	\$0	\$343,707,737	\$133,295,786
10	2,134,015,551	2,109,986,256	1	1	7,477,220,006	7,477,220,006	0.31	0.31	6.7%	6.7%	\$386,286,875	\$0	\$386,286,875	\$140,008,140
11	2,228,415,174	2,201,737,209	1	1	7,608,036,179	7,608,036,179	0.32	0.32	6.7%	6.7%	\$428,866,013	\$0	\$428,866,013	\$145,271,756
12	2,322,814,798	2,293,488,162	1	1	7,738,852,352	7,738,852,352	0.33	0.32	6.7%	6.7%	\$471,445,151	\$0	\$471,445,151	\$149,247,461
13	2,417,214,421	2,385,239,115	1	1	7,869,668,525	7,869,668,525	0.34	0.33	6.7%	6.7%	\$514,024,289	\$0	\$514,024,289	\$152,081,239
14	2,511,614,044	2,476,990,068	1	1	8,000,484,698	8,000,484,698	0.34	0.34	6.7%	6.7%	\$556,603,427	\$0	\$556,603,427	\$153,905,486
15	2,606,013,668	2,568,741,021	1	1	8,131,300,871	8,131,300,871	0.35	0.35	6.7%	6.7%	\$599,182,566	\$0	\$599,182,566	\$154,840,161
16	2,700,413,291	2,660,491,973	1	1	8,262,117,043	8,262,117,043	0.36	0.35	6.7%	6.7%	\$641,761,704	\$0	\$641,761,704	\$154,993,850
17	2,794,812,915	2,752,242,926	1	1	8,392,933,216	8,392,933,216	0.36	0.36	6.7%	6.7%	\$684,340,842	\$0	\$684,340,842	\$154,464,737
18	2,889,212,538	2,843,993,879	1	1	8,523,749,389	8,523,749,389	0.37	0.37	6.7%	6.7%	\$726,919,980	\$0	\$726,919,980	\$153,341,504
19	2,983,612,162	2,935,744,832	1	1	8,654,565,562	8,654,565,562	0.38	0.37	6.7%	6.7%	\$769,499,118	\$0	\$769,499,118	\$151,704,150
20	3,078,011,785	3,027,495,785	1	1	8,785,381,735	8,785,381,735	0.38	0.38	6.7%	6.7%	\$812,078,256	\$0	\$812,078,256	\$149,624,751
Total													\$2,376,270,040	

(b) VEHICLE OPERATING COST SAVINGS

The Cal-B/C model determines the vehicle operating costs benefit by calculating vehicle miles traveled, fuel cost, and non-fuel costs. The model generates calculations for vehicles and trucks based on a Percent Trucks input value. The Percent Trucks was assumed to be 6.7% according to the FEIS.⁵ Refer to the formulas for more information about each calculation. Table 7 provides the total vehicle operating cost benefit and the vehicle operating cost benefit by year for the Grand Parkway project.

$$\text{Vehicles-Miles Traveled} = \text{Affected Length} \times \text{Average Annual Volume}$$

$$\text{Fuel Cost} = \text{Vehicle Miles Traveled} \times \text{Fuel Consumption} \times \text{Fuel Price}$$

$$\text{Non-Fuel Cost} = \text{Vehicle Miles Traveled} \times \text{Cost Per Mile}$$

⁵ Truck percent based on Commercial Vehicle share of Total Vehicle Trips in 2019 and 2039 as shown in FEIS Appendix H (Economic Impacts), Exhibit 5 (Travel Demand Model Output, average daily terms), page 757 of Volume II, available at http://www.grandpky.com/downloads/Volume_II.pdf

TABLE 7: CAL-B/C - VEHICLE OPERATING COST SAVINGS BENEFITS

Seg H and I-1

Year	TOTAL VMT (veh-miles/yr)		TOTAL VHT (veh-hours/yr)		AVERAGE SPEED (mph)		PERCENT TRUCKS (%)		BENEFITS (\$/yr)		Constant Dollars	Present Value at 7%
	No Build	Build	No Build	Build	No Build	Build	No Build	Build	Fuel Costs	Non-Fuel Costs		
1	50,713,679,620	50,785,517,095	1,284,418,940	1,284,227,680	39.5	39.5	6.7%	6.7%	(7,823,896.61)	(23,741,493.99)	(31,565,390.60)	(21,033,352.57)
20	75,902,023,020	75,964,249,315	3,078,011,785	3,027,495,785	24.7	25.1	6.7%	6.7%	435,286,765.98	(20,565,104.90)	414,721,661.08	76,412,124.95
1	50,713,679,620	50,785,517,095	1,284,418,940	1,284,227,680	39.5	39.5	6.7%	6.7%	(7,823,896.61)	(23,741,493.99)	(31,565,390.60)	(21,033,352.57)
2	52,039,381,904	52,110,713,528	1,378,818,563	1,375,978,633	37.7	37.9	6.7%	6.7%	(7,996,548.35)	(23,574,315.62)	(31,570,863.97)	(19,660,747.39)
3	53,365,084,188	53,435,909,960	1,473,218,187	1,467,729,586	36.2	36.4	6.7%	6.7%	(8,052,274.40)	(23,407,137.24)	(31,459,411.64)	(18,309,664.00)
4	54,690,786,473	54,761,106,393	1,567,617,810	1,559,480,539	34.9	35.1	6.7%	6.7%	136,593,784.26	(23,239,958.87)	113,353,825.39	61,656,970.48
5	56,016,488,757	56,086,302,826	1,662,017,434	1,651,231,492	33.7	34.0	6.7%	6.7%	139,974,911.08	(23,072,780.50)	116,902,130.58	59,427,115.33
6	57,342,191,041	57,411,499,258	1,756,417,057	1,742,982,444	32.6	32.9	6.7%	6.7%	(8,539,890.86)	(22,905,602.12)	(31,445,492.98)	(14,939,527.20)
7	58,667,893,325	58,736,695,691	1,850,816,681	1,834,733,397	31.7	32.0	6.7%	6.7%	146,745,194.98	(22,738,423.75)	124,006,771.22	55,060,489.45
8	59,993,595,609	60,061,892,123	1,945,216,304	1,926,484,350	30.8	31.2	6.7%	6.7%	150,134,352.05	(22,571,245.38)	127,563,106.67	52,934,154.13
9	61,319,297,894	61,387,088,556	2,039,615,927	2,018,235,303	30.1	30.4	6.7%	6.7%	(8,711,622.95)	(22,404,067.00)	(31,115,689.95)	(12,067,201.03)
10	62,645,000,178	62,712,284,989	2,134,015,551	2,109,986,256	29.4	29.7	6.7%	6.7%	(8,915,446.87)	(22,236,888.63)	(31,152,335.50)	(11,291,040.00)
11	63,970,702,462	64,037,481,421	2,228,415,174	2,201,737,209	28.7	29.1	6.7%	6.7%	245,600,627.85	(22,069,710.26)	223,530,917.59	75,717,655.47
12	65,296,404,746	65,362,677,854	2,322,814,798	2,293,488,162	28.1	28.5	6.7%	6.7%	(9,045,000.12)	(21,902,531.88)	(30,947,532.00)	(9,797,196.08)
13	66,622,107,031	66,687,874,287	2,417,214,421	2,385,239,115	27.6	28.0	6.7%	6.7%	241,359,344.60	(21,735,353.51)	219,623,991.09	64,978,814.12
14	67,947,809,315	68,013,070,719	2,511,614,044	2,476,990,068	27.1	27.5	6.7%	6.7%	(9,152,144.57)	(21,568,175.14)	(30,720,319.71)	(8,494,424.39)
15	69,273,511,599	69,338,267,152	2,606,013,668	2,568,741,021	26.6	27.0	6.7%	6.7%	266,460,228.77	(21,400,996.76)	245,059,232.00	63,327,962.36
16	70,599,213,883	70,663,463,584	2,700,413,291	2,660,491,973	26.1	26.6	6.7%	6.7%	(9,265,823.89)	(21,233,818.39)	(30,499,642.28)	(7,366,062.75)
17	71,924,916,167	71,988,660,017	2,794,812,915	2,752,242,926	25.7	26.2	6.7%	6.7%	278,175,956.12	(21,066,640.02)	257,109,316.10	58,032,957.53
18	73,250,618,452	73,313,856,450	2,889,212,538	2,843,993,879	25.4	25.8	6.7%	6.7%	(9,372,581.40)	(20,899,461.64)	(30,272,043.04)	(6,385,793.13)
19	74,576,320,736	74,639,052,882	2,983,612,162	2,935,744,832	25.0	25.4	6.7%	6.7%	(9,297,608.51)	(20,732,283.27)	(30,029,891.78)	(5,920,291.66)
20	75,902,023,020	75,964,249,315	3,078,011,785	3,027,495,785	24.7	25.1	6.7%	6.7%	435,286,765.98	(20,565,104.90)	414,721,661.08	76,412,124.95

Total												\$432,282,944
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(c) EMISSIONS REDUCTION

The Cal-B/C model determines an emissions reduction benefit by calculating vehicles-miles traveled and highway emissions costs. Emissions costs are calculated by emissions type. Refer to the formulas for more information about each calculation. Table 8 provides the total emissions benefit and the emissions benefit by year for the Grand Parkway project.

$$\textit{Vehicle-Miles Traveled} = \textit{Affected Length} \times \textit{Average Annual Volume}$$

$$\textit{Highway Emissions Cost} = \textit{Vehicle-Miles Traveled} \times \textit{Rate} \times \textit{Cost / Mile}$$

TABLE 8: CAL-B/C - EMISSIONS REDUCTION BENEFITS

Year	TOTAL VMT (veh-miles/yr)		TOTAL VHT (veh-hours/yr)		AVERAGE SPEED (mph)		PERCENT TRUCKS (%)		AVERAGE VOLUME (vehicles/yr)		RUNNING EMISSIONS (\$/yr)		STARTING EMISSIONS (\$/yr)		Constant Dollars	Present Value at 7%
	No Build	Build	No Build	Build	No Build	Build	No Build	Build	No Build	Build	No Build	Build	No Build	Build		
1	50,713,679,620	50,785,517,095	1,284,418,940	1,284,227,680	39.5	39.5	6.7%	6.7%	5,750,174,973	5,750,174,973	\$2,101,831,747	\$2,104,809,056	\$65,281,346	\$65,281,346	(\$2,977,309)	(\$1,983,907)
20	75,902,023,020	75,964,249,315	3,078,011,785	3,027,495,785	24.7	25.1	6.7%	6.7%	8,018,807,769	8,018,807,769	\$5,153,356,779	\$5,008,956,926	\$88,050,302	\$88,050,302	\$144,399,853	\$26,605,554
1	50,713,679,620	50,785,517,095	1,284,418,940	1,284,227,680	39.5	39.5	6.7%	6.7%	5,750,174,973	5,750,174,973	\$2,101,831,747	\$2,104,809,056	\$65,281,346	\$65,281,346	(\$2,977,309)	(\$1,983,907)
2	52,039,381,904	52,110,713,528	1,378,818,563	1,375,978,633	37.7	37.9	6.7%	6.7%	5,869,576,699	5,869,576,699	\$2,220,431,084	\$2,223,474,682	\$67,399,479	\$67,399,479	(\$3,043,598)	(\$1,895,400)
3	53,365,084,188	53,435,909,960	1,473,218,187	1,467,729,586	36.2	36.4	6.7%	6.7%	5,988,978,425	5,988,978,425	\$2,327,909,725	\$2,330,999,310	\$69,571,981	\$69,571,981	(\$3,089,586)	(\$1,798,167)
4	54,690,786,473	54,761,106,393	1,567,617,810	1,559,480,539	34.9	35.1	6.7%	6.7%	6,108,380,151	6,108,380,151	\$2,471,466,906	\$2,442,628,200	\$71,800,960	\$71,800,960	\$28,838,706	\$15,686,345
5	56,016,488,757	56,086,302,826	1,662,017,434	1,651,231,492	33.7	34.0	6.7%	6.7%	6,227,781,877	6,227,781,877	\$2,602,165,212	\$2,571,602,129	\$74,088,606	\$74,088,606	\$30,563,083	\$15,536,722
6	57,342,191,041	57,411,499,258	1,756,417,057	1,742,982,444	32.6	32.9	6.7%	6.7%	6,347,183,604	6,347,183,604	\$2,741,136,012	\$2,744,449,162	\$76,437,187	\$76,437,187	(\$3,313,149)	(\$1,574,053)
7	58,667,893,325	58,736,695,691	1,850,816,681	1,834,733,397	31.7	32.0	6.7%	6.7%	6,466,585,330	6,466,585,330	\$2,884,260,284	\$2,850,885,291	\$78,849,054	\$78,849,054	\$33,374,993	\$14,818,896
8	59,993,595,609	60,061,892,123	1,945,216,304	1,926,484,350	30.8	31.2	6.7%	6.7%	6,585,987,056	6,585,987,056	\$2,863,014,782	\$2,828,265,990	\$57,237,880	\$57,237,880	\$34,748,792	\$14,419,513
9	61,319,297,894	61,387,088,556	2,039,615,927	2,018,235,303	30.1	30.4	6.7%	6.7%	6,705,388,782	6,705,388,782	\$2,976,485,648	\$2,979,776,259	\$59,357,371	\$59,357,371	(\$3,290,611)	(\$1,276,156)
10	62,645,000,178	62,712,284,989	2,134,015,551	2,109,986,256	29.4	29.7	6.7%	6.7%	6,824,790,508	6,824,790,508	\$3,155,721,689	\$3,159,111,140	\$61,548,419	\$61,548,419	(\$3,389,451)	(\$1,228,493)
11	63,970,702,462	64,037,481,421	2,228,415,174	2,201,737,209	28.7	29.1	6.7%	6.7%	6,944,192,234	6,944,192,234	\$3,345,153,841	\$3,283,276,180	\$63,813,768	\$63,813,768	\$61,877,662	\$20,960,105
12	65,296,404,746	65,362,677,854	2,322,814,798	2,293,488,162	28.1	28.5	6.7%	6.7%	7,063,593,960	7,063,593,960	\$3,476,644,915	\$3,480,173,563	\$66,156,258	\$66,156,258	(\$3,528,649)	(\$1,117,080)
13	66,622,107,031	66,687,874,287	2,417,214,421	2,385,239,115	27.6	28.0	6.7%	6.7%	7,182,995,686	7,182,995,686	\$3,684,300,482	\$3,616,129,441	\$68,578,837	\$68,578,837	\$68,171,041	\$20,169,351
14	67,947,809,315	68,013,070,719	2,511,614,044	2,476,990,068	27.1	27.5	6.7%	6.7%	7,302,397,412	7,302,397,412	\$3,828,314,282	\$3,831,991,239	\$71,084,556	\$71,084,556	(\$3,676,957)	(\$1,016,709)
15	69,273,511,599	69,338,267,152	2,606,013,668	2,568,741,021	26.6	27.0	6.7%	6.7%	7,421,799,138	7,421,799,138	\$4,058,729,186	\$3,980,967,154	\$73,676,580	\$73,676,580	\$77,762,032	\$20,095,187
16	70,599,213,883	70,663,463,584	2,700,413,291	2,660,491,973	26.1	26.6	6.7%	6.7%	7,541,200,864	7,541,200,864	\$4,216,615,557	\$4,220,452,941	\$76,358,188	\$76,358,188	(\$3,837,384)	(\$926,778)
17	71,924,916,167	71,988,660,017	2,794,812,915	2,752,242,926	25.7	26.2	6.7%	6.7%	7,660,602,590	7,660,602,590	\$4,467,020,813	\$4,383,847,771	\$79,132,778	\$79,132,778	\$83,173,041	\$18,773,250
18	73,250,618,452	73,313,856,450	2,889,212,538	2,843,993,879	25.4	25.8	6.7%	6.7%	7,780,004,317	7,780,004,317	\$4,640,160,702	\$4,644,166,600	\$82,003,873	\$82,003,873	(\$4,005,898)	(\$845,032)
19	74,576,320,736	74,639,052,882	2,983,612,162	2,935,744,832	25.0	25.4	6.7%	6.7%	7,899,406,043	7,899,406,043	\$4,819,360,844	\$4,823,414,797	\$84,975,120	\$84,975,120	(\$4,053,952)	(\$799,223)
20	75,902,023,020	75,964,249,315	3,078,011,785	3,027,495,785	24.7	25.1	6.7%	6.7%	8,018,807,769	8,018,807,769	\$5,153,356,779	\$5,008,956,926	\$88,050,302	\$88,050,302	\$144,399,853	\$26,605,554
Total																\$152,603,926