

Return on Investment of the SVRT BART Extension

Prepared For:

VTA

Prepared By:



September 2008

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1. Introduction

This memorandum presents the estimation of the return on investment (ROI) of the SVRT BART Extension into Santa Clara County, CA, over 50 years after the opening of the extension in Fiscal Year (FY) 2017.

The Silicon Valley Rapid Transit (SVRT) Project is a 16-mile long extension of the existing Bay Area Rapid Transit (BART) system. It is slated to begin south of the planned Warm Springs BART Station in the City of Fremont in Alameda County (implemented by 2013) and extend, on the former Union Pacific Railroad (UPRR), through the cities of Milpitas, San Jose, and Santa Clara in Santa Clara County.

The numbers used in this analysis, except the operation and maintenance costs of the SVRT BART Extension, come from the *Supplemental Environmental Impact Report* certified in June 2007 by the VTA Board of Directors. The *Supplemental Environmental Impact Report* includes the traffic data and the ridership information that were used to estimate the economic impacts of the SVRT Extension as reported in the *Economic Impact Analysis of the SVRT BART Extension* (September, 2008). The updated operation and maintenance costs used in this analysis correspond to the estimates prepared by AECOM Consult in August 2008.

2. Methodology

The ROI is a performance measure used to evaluate the investment potential by comparing the magnitude and timing of expected gains to the investment costs. The ROI over the life of the SVRT BART Project is estimated as follows:

$$ROI = \frac{\textit{Gain from investment} - \textit{Cost of investment}}{\textit{Cost of investment}}$$

The four categories of expected gains arising from the SVRT BART Extension include:

1. **Travel Efficiencies**, which are the benefits accruing to highway users and potential SVRT BART users upon completion of the extension, as measured in terms of travel-time savings, vehicle-operating cost savings, accident-cost savings, and emission-cost savings.
2. **Construction Impacts**, which are the economic impacts arising from expenditures on local labor and materials used in constructing the SVRT BART Extension.

3. **Operating and Maintenance Impacts**, which are the benefits arising from expenditures on local labor and materials used in operating and maintaining the facility, upon completion.
4. **Strategic Development Impacts**, which are the economic development impacts associated with attracting new land development and retaining business activity due to increased job accessibility and affordable mobility.

As described in the *Economic Impact Analysis of the SVRT BART Extension*, the economic benefits associated with each of the four categories of expected gains arising from the SVRT BART Extension over the analysis period 2016-2030 were estimated utilizing the Regional Economic Models Inc. (REMI). The high and low estimates of the economic benefits were reported as changes in Gross Regional Product (GRP), personal income and employment.

Trend analyses are used to estimate the economic benefits for each of the four categories of expected gains arising from the SVRT BART Extension over the life of the project. The high and low estimates of the economic impacts reported in the *Economic Impact Analysis of the SVRT BART Extension* (September, 2008) are extrapolated to generate values through 2067. The trendlines (i.e., linear or polynomial) that provide the best fit are used to estimate changes in GRP and personal income over the extended analysis period as follows:

- To estimate changes in GRP and personal income through 2067 due to changes in travel efficiency gains accruing to highway users and potential SVRT BART users -attributed to the SVRT BART Extension-, changes in GRP and personal income between 2016 and 2030 estimated by the REMI model were extrapolated using two-order polynomial regressions.¹
- To estimate changes in GRP and personal income through 2067 due to strategic development benefits (i.e., new land development within a one-quarter mile radius of six future SVRT BART Stations, affordable mobility benefits and accessibility benefits) resulting from the SVRT BART Extension, changes in GRP and personal income between 2016 and 2030 estimated by the REMI model were extrapolated using six-order polynomial regressions.²
- To estimate changes in GRP and personal income through 2067 due to construction, operations and maintenance expenditures of the SVRT BART Extension, changes in GRP and personal income between 2017 and 2030 estimated by the REMI model were extrapolated using linear regressions.³

¹ Equations of the form $Y=a+b_1X+b_2X^2$ where X= Year and Y = GRP or Personal Income

² Equations of the form $Y=a+b_1X+b_2X^2+b_3X^3 +b_4X^4 +b_5X^5+b_6X^6$ where X= Year and Y = GRP or Personal Income

³ Equations of the form $Y=a+b_1X$ where X= Year and Y = GRP or Personal Income

The investment costs arising from the SVRT BART Extension include the Project, operations, and maintenance costs. Construction of the SVRT BART Extension is currently scheduled to occur from FY 2008 to FY 2016 and the extension is scheduled to be opened to the public in Fiscal Year 2017.

The total estimated cost of the SVRT BART Extension is expected to be approximately \$4.7 billion (in 2005 dollars) spanning the period FY 2002 to FY 2018⁴, with subsequent operations and maintenance costs in the following twenty years (i.e., from FY 2017 to FY 2036) estimated to be approximately \$1.7 billion (in nominal dollars).⁵ The estimated project costs presented in this analysis captures the hard costs (e.g., site preparation activities, structures, earthwork, maintenance facilities, and vehicles), the soft costs (e.g., planning and engineering), and the land and building acquisition costs.

To determine a direct comparison between the expected gains and the costs of the investment, the project, operations and maintenance costs of the SVRT BART Extension and the benefits that accrue over the 50-year period between the years 2017 and 2067 are discounted back to 2005 dollars using a constant discount rate of seven percent as suggested by the U.S. Office of Management and Budget (OMB).⁶

3. Overall Economic Benefits over the Project Life

Table 1A and **Table 1B** present the low and high monetary estimates, respectively, of the overall economic impacts (in millions of 2005 dollars) that the SVRT BART Extension is expected to have on the study region through 2067.

The region analyzed in this study is comprised of Santa Clara, Alameda, Contra Costa, San Francisco, and San Mateo Counties, California. Some benefits of the SVRT BART investment are anticipated to spill over (a positive externality) from the immediately impacted geography of Santa Clara into the adjoining, aforementioned counties. In order to quantify the spillover effect and evaluate as much of the total economic impacts as reasonably possible, Alameda and the remaining aforementioned counties (i.e., Contra Costa, San Francisco, and San Mateo Counties) are considered in the overall study region when modeling the long-term economic impacts of the proposed investment.

⁴ Source: Brain Hughes (VTA, August 2007)

⁵ Source: AECOM Consult (August 2008)

⁶ The OMB directs federal agencies to use a seven percent discount rate in their base-case analysis of proposed investment; this rate is seen as the marginal pre-tax rate of return on an average investment in the private sector un recent years.

Table 1A: Total Gains (in millions of 2005\$) of the SVRT BART Extension through 2067 based on Low Estimates of the Economic Impacts

Period 2016-2067				
Highway User Benefits				
Economic Impact	Santa Clara County	Alameda County	Rest of Bay Area	Study Region
GRP	\$8,247	\$2,099	\$2,504	\$12,850
Personal Income	\$1,481	\$452	\$921	\$2,854
Transit User Benefits				
Economic Impact	Santa Clara County	Alameda County	Rest of Bay Area	Study Region
GRP	\$135	\$9	\$8	\$152
Personal Income	\$32	\$1	\$1	\$34
Construction Expenditure Benefits				
Economic Impact	Santa Clara County	Alameda County	Rest of Bay Area	Study Region
GRP	\$920	\$181	\$439	\$1,540
Personal Income	\$598	\$110	\$331	\$1,039
Operations and Maintenance Expenditure Benefits				
Economic Impact	Santa Clara County	Alameda County	Rest of Bay Area	Study Region
GRP	\$815	\$153	\$304	\$1,272
Personal Income	\$487	\$74	\$224	\$785
Benefits from the Construction Phase of the Influx of Resources from outside Santa Clara County				
Economic Impact	Santa Clara County	Alameda County	Rest of Bay Area	Study Region
GRP	\$144	-	-	\$144
Personal Income	\$91	-	-	\$91
Benefits from the Long-Term Phase of the Influx of Resources from outside Santa Clara County				
Economic Impact	Santa Clara County	Alameda County	Rest of Bay Area	Study Region
GRP	\$218	-	-	\$218
Personal Income	\$80	-	-	\$80
Affordable Mobility Benefits				
Economic Impact	Santa Clara County	Alameda County	Rest of Bay Area	Study Region
GRP	\$129	-	-	\$129
Personal Income	\$72	-	-	\$72
Accessibility Benefits				
Economic Impact	Santa Clara County	Alameda County	Rest of Bay Area	Study Region
GRP	\$4,067	-	-	\$4,067
Personal Income	\$651	-	-	\$651
Total Gains =				\$25,980

Table 1B: Total Gains (in millions of 2005\$) of the SVRT BART Extension through 2067 based on High Estimates of the Economic Impacts

Period 2016-2067				
Highway user Benefits				
Economic Impact	Santa Clara County	Alameda County	Rest of Bay Area	Study Region
GRP	\$27,126	\$4,675	\$7,097	\$38,898
Personal Income	\$4,066	\$1,108	\$2,922	\$8,096
Transit User Benefits				
Economic Impact	Santa Clara County	Alameda County	Rest of Bay Area	Study Region
GRP	\$135	\$9	\$8	\$152
Personal Income	\$32	\$1	\$1	\$34
Construction Expenditure Benefits				
Economic Impact	Santa Clara County	Alameda County	Rest of Bay Area	Study Region
GRP	\$920	\$181	\$439	\$1,540
Personal Income	\$598	\$110	\$331	\$1,039
Operations and Maintenance Expenditure Benefits				
Economic Impact	Santa Clara County	Alameda County	Rest of Bay Area	Study Region
GRP	\$815	\$153	\$304	\$1,272
Personal Income	\$487	\$74	\$224	\$785
Benefits from the Construction Phase of the Influx of Resources from outside Santa Clara County				
Economic Impact	Santa Clara County	Alameda County	Rest of Bay Area	Study Region
GRP	\$311	-	-	\$311
Personal Income	\$192	-	-	\$192
Benefits from the Long-Term Phase of the Influx of Resources from outside Santa Clara County				
Economic Impact	Santa Clara County	Alameda County	Rest of Bay Area	Study Region
GRP	\$483	-	-	\$483
Personal Income	\$173	-	-	\$173
Affordable Mobility Benefits				
Economic Impact	Santa Clara County	Alameda County	Rest of Bay Area	Study Region
GRP	\$1,004	-	-	\$1,004
Personal Income	\$565	-	-	\$565
Accessibility Benefits				
Economic Impact	Santa Clara County	Alameda County	Rest of Bay Area	Study Region
GRP	\$4,067	-	-	\$4,067
Personal Income	\$651	-	-	\$651
Total Gains =				\$59,262

3. Return on Investment

Table 2 presents the return on investment (ROI) associated with the construction of the SVRT BART Extension and operation and maintenance expenditures over 50 years after the opening of the extension in Fiscal Year (FY) 2017 based on low and high estimates of the economic impacts. **Table 2** also presents the potential ROI associated with VTA investing in joint land use development by shouldering 50% of the construction cost associated with the housing, office, retail and hotel development within a one-quarter mile radius of six future SVRT BART stations in Santa Clara County.

Table 2: Return on Investment (ROI) of the SVRT BART Extension through 2067

Based on Low Estimates of the Economic Impacts	
Assuming no Joint Development Cost by VTA	
Total Gains (from Table 1A) =	\$25,980
Project Costs (millions of 2005\$)	\$4,700
Operations and Maintenance Costs (millions of 2005\$)	\$681
Total Cost =	\$5,381
ROI =	3.83
Assuming 50% Joint Development Cost by VTA	
Total Gains (from Table 1A) =	\$25,980
Project Costs (millions of 2005\$)	\$4,700
Operations and Maintenance Costs (millions of 2005\$)	\$681
Construction Costs from Induced Land Use Development (millions of 2005\$)	\$256
Total Costs =	\$5,637
ROI =	3.61
Based on High Estimates of the Economic Impacts	
Assuming no Joint Development Cost by VTA	
Total Gains (from Table 1B) =	\$59,262
Project Costs (millions of 2005\$)	\$4,700
Operations and Maintenance Costs (millions of 2005\$)	\$681
Total Cost =	\$5,381
ROI =	10.01
Assuming 50% Joint Development Cost by VTA	
Total Gains (from Table 1B) =	\$59,262
Project Costs (millions of 2005\$)	\$4,700
Operations and Maintenance Costs (millions of 2005\$)	\$681
Construction Costs from Induced Land Use Development (millions of 2005\$)	\$256
Total Costs =	\$5,637
ROI =	9.51

According to **Table 2**, the estimated ROI for the SVRT BART Extension, assuming no investment by VTA in construction costs associated with induced land use development, is estimated to be between 3.83 and 10.01. Since the ROI generated a significant positive value, it is expected that the returns will outweigh the costs associated with the constructing the SVRT BART Extension, as well as with the operations and maintenance of the extension over the life of the project.

The estimated ROI for the SVRT BART Extension, assuming 50% investment by VTA in construction costs associated with induced land use development, is estimated to be between 3.61 and 9.51. The estimated ROI suggests that the returns will outweigh the costs of construction, operations and maintenance of the SVRT BART Extension and 50% investment by VTA in construction costs associated with induced land use development.

4. Sensitivity Analysis

Sensitivity tests were conducted to gauge the responsiveness of the ROI to changes in the life of the project since shorter or longer analysis periods may produce different ROI figures for the same investment. Subsequently, the life of the SVRT BART Extension was modified and the benefits and costs were estimated using the methodology outlined in **Section 2**.

Table 3A and **Table 3B** presents the low and high monetary estimates, respectively, of the overall economic impacts (in millions of 2005 dollars) that the SVRT BART Extension is expected to have on the study region through 2047 (i.e., over a 30-year period after the opening of the extension in FY 2017).

Table 4A and **Table 4B** presents the low and high monetary estimates, respectively, of the overall economic impacts (in millions of 2005 dollars) that the SVRT BART Extension is expected to have on the study region through 2087 (i.e., over a 70-year period after the opening of the extension in FY 2017).

Table 3A: Total Gains (in millions of 2005\$) of the SVRT BART Extension through 2047 based on Low Estimates of the Economic Impacts

Period 2016-2047				
Highway User Benefits				
Economic Impact	Santa Clara County	Alameda County	Rest of Bay Area	Study Region
GRP	\$4,664	\$1,209	\$1,476	\$7,349
Personal Income	\$878	\$272	\$559	\$1,709
Transit User Benefits				
Economic Impact	Santa Clara County	Alameda County	Rest of Bay Area	Study Region
GRP	\$88	\$6	\$6	\$100
Personal Income	\$25	\$1	\$1	\$28
Construction Expenditure Benefits				
Economic Impact	Santa Clara County	Alameda County	Rest of Bay Area	Study Region
GRP	\$920	\$181	\$439	\$1,540
Personal Income	\$598	\$110	\$331	\$1,039
Operations and Maintenance Expenditure Benefits				
Economic Impact	Santa Clara County	Alameda County	Rest of Bay Area	Study Region
GRP	\$721	\$127	\$260	\$1,108
Personal Income	\$421	\$62	\$192	\$675
Benefits from the Construction Phase of the Influx of Resources from outside Santa Clara County				
Economic Impact	Santa Clara County	Alameda County	Rest of Bay Area	Study Region
GRP	\$144	-	-	\$144
Personal Income	\$91	-	-	\$91
Benefits from the Long-Term Phase of the Influx of Resources from outside Santa Clara County				
Economic Impact	Santa Clara County	Alameda County	Rest of Bay Area	Study Region
GRP	\$207	-	-	\$207
Personal Income	\$78	-	-	\$78
Affordable Mobility Benefits				
Economic Impact	Santa Clara County	Alameda County	Rest of Bay Area	Study Region
GRP	\$82	-	-	\$82
Personal Income	\$46	-	-	\$46
Accessibility Benefits				
Economic Impact	Santa Clara County	Alameda County	Rest of Bay Area	Study Region
GRP	\$3,197	-	-	\$3,197
Personal Income	\$538	-	-	\$538
Total Gains =				\$17,933

Table 3B: Total Gains (in millions of 2005\$) of the SVRT BART Extension through 2047 based on High Estimates of the Economic Impacts

Period 2016-2047				
Highway User Benefits				
Economic Impact	Santa Clara County	Alameda County	Rest of Bay Area	Study Region
GRP	\$13,692	\$2,607	\$20,438	\$36,737
Personal Income	\$2,201	\$632	\$1,757	\$4,590
Transit User Benefits				
Economic Impact	Santa Clara County	Alameda County	Rest of Bay Area	
GRP	\$88	\$6	\$6	\$100
Personal Income	\$25	\$1	\$1	\$28
Construction Expenditure Benefits				
Economic Impact	Santa Clara County	Alameda County	Rest of Bay Area	Study Region
GRP	\$920	\$181	\$439	\$1,540
Personal Income	\$598	\$110	\$331	\$1,039
Operations and Maintenance Expenditure Benefits				
Economic Impact	Santa Clara County	Alameda County	Rest of Bay Area	Study Region
GRP	\$721	\$127	\$260	\$1,108
Personal Income	\$421	\$62	\$192	\$675
Benefits from the Construction Phase of the Influx of Resources from outside Santa Clara County				
Economic Impact	Santa Clara County	Alameda County	Rest of Bay Area	Study Region
GRP	\$311	-	-	\$311
Personal Income	\$192	-	-	\$192
Benefits from the Long-Term Phase of the Influx of Resources from outside Santa Clara County				
Economic Impact	Santa Clara County	Alameda County	Rest of Bay Area	Study Region
GRP	\$459	-	-	\$459
Personal Income	\$168	-	-	\$168
Affordable Mobility Benefits				
Economic Impact	Santa Clara County	Alameda County	Rest of Bay Area	Study Region
GRP	\$641	-	-	\$641
Personal Income	\$356	-	-	\$356
Accessibility Benefits				
Economic Impact	Santa Clara County	Alameda County	Rest of Bay Area	Study Region
GRP	\$3,197	-	-	\$3,197
Personal Income	\$538	-	-	\$538
Total Gains =				\$51,680

Table 4A: Total Gains (in millions of 2005\$) of the SVRT BART Extension through 2087 based on Low Estimates of the Economic Impacts

Total Gains Over the Period 2016-2087				
Highway User Benefits				
Economic Impact	Santa Clara County	Alameda County	Rest of Bay Area	Study Region
GRP	\$10,261	\$2,594	\$3,067	\$15,921
Personal Income	\$1,809	\$549	\$1,113	\$3,472
Transit User Benefits				
Economic Impact	Santa Clara County	Alameda County	Rest of Bay Area	
GRP	\$158	\$10	\$9	\$177
Personal Income	\$33	\$1	\$1	\$36
Construction Expenditure Benefits				
Economic Impact	Santa Clara County	Alameda County	Rest of Bay Area	Study Region
GRP	\$920	\$181	\$439	\$1,540
Personal Income	\$598	\$110	\$331	\$1,039
Operations and Maintenance Expenditure Benefits				
Economic Impact	Santa Clara County	Alameda County	Rest of Bay Area	Study Region
GRP	\$878	\$166	\$328	\$1,373
Personal Income	\$526	\$80	\$241	\$847
Benefits from the Construction Phase of the Influx of Resources from outside Santa Clara County				
Economic Impact	Santa Clara County	Alameda County	Rest of Bay Area	Study Region
GRP	\$144	-	-	\$144
Personal Income	\$91	-	-	\$91
Benefits from the Long-Term Phase of the Influx of Resources from outside Santa Clara County				
Economic Impact	Santa Clara County	Alameda County	Rest of Bay Area	Study Region
GRP	\$221	-	-	\$221
Personal Income	\$81	-	-	\$81
Affordable Mobility Benefits				
Economic Impact	Santa Clara County	Alameda County	Rest of Bay Area	Study Region
GRP	\$148	-	-	\$148
Personal Income	\$84	-	-	\$84
Accessibility Benefits				
Economic Impact	Santa Clara County	Alameda County	Rest of Bay Area	Study Region
GRP	\$4,390	-	-	\$4,390
Personal Income	\$692	-	-	\$692
Total Gains =				\$30,256

Table 4B: Total Gains (in millions of 2005\$) of the SVRT BART Extension through 2087 based on High Estimates of the Economic Impacts

Total Gains Over the Period 2016-2087				
Highway User Benefits				
Economic Impact	Santa Clara County	Alameda County	Rest of Bay Area	Study Region
GRP	\$35,195	\$5,852	\$8,728	\$49,775
Personal Income	\$5,147	\$1,375	\$3,547	\$10,069
Transit User Benefits				
Economic Impact	Santa Clara County	Alameda County	Rest of Bay Area	
GRP	\$158	\$10	\$9	\$177
Personal Income	\$33	\$1	\$1	\$36
Construction Expenditure Benefits				
Economic Impact	Santa Clara County	Alameda County	Rest of Bay Area	Study Region
GRP	\$920	\$181	\$439	\$1,540
Personal Income	\$598	\$110	\$331	\$1,039
Operations and Maintenance Expenditure Benefits				
Economic Impact	Santa Clara County	Alameda County	Rest of Bay Area	Study Region
GRP	\$878	\$166	\$328	\$1,373
Personal Income	\$526	\$80	\$241	\$847
Benefits from the Construction Phase of the Influx of Resources from outside Santa Clara County				
Economic Impact	Santa Clara County	Alameda County	Rest of Bay Area	Study Region
GRP	\$311	-	-	\$311
Personal Income	\$192	-	-	\$192
Benefits from the Long-Term Phase of the Influx of Resources from outside Santa Clara County				
Economic Impact	Santa Clara County	Alameda County	Rest of Bay Area	Study Region
GRP	\$489	-	-	\$489
Personal Income	\$174	-	-	\$174
Affordable Mobility Benefits				
Economic Impact	Santa Clara County	Alameda County	Rest of Bay Area	Study Region
GRP	\$1,154	-	-	\$1,154
Personal Income	\$652	-	-	\$652
Accessibility Benefits				
Economic Impact	Santa Clara County	Alameda County	Rest of Bay Area	Study Region
GRP	\$4,390	-	-	\$4,390
Personal Income	\$692	-	-	\$692
Total Gains =				\$72,912

Table 5 presents the ROI associated with the construction of the SVRT BART Extension and operation and maintenance expenditures over 30 years after the opening of the extension in FY 2017 based on low and high estimates of the economic impacts. This table also presents the potential ROI associated with VTA investing in joint land use development by shouldering 50% of the construction cost associated with the housing, office, retail and hotel development within a one-quarter mile radius of six future SVRT BART stations in Santa Clara County.

Table 5: Return on Investment (ROI) of the SVRT BART Extension through 2047

Based on Low Estimates of the Economic Impacts	
Assuming no Joint Development Cost by VTA	
Total Gains (from Table 3A) =	\$17,933
Project Costs (millions of 2005\$)	\$4,700
Operations and Maintenance Costs (millions of 2005\$)	\$546
Total Cost =	\$5,246
ROI =	2.42
Assuming 50% Joint Development Cost by VTA	
Total Gains (from Table 3A) =	\$17,933
Project Costs (millions of 2005\$)	\$4,700
Operations and Maintenance Costs (millions of 2005\$)	\$546
Construction Costs from Induced Land Use Development (millions of 2005\$)	\$256
Total Costs =	\$5,502
ROI =	2.26
Based on High Estimates of the Economic Impacts	
Assuming no Joint Development Cost by VTA	
Total Gains (from Table 3B) =	\$51,680
Project Costs (millions of 2005\$)	\$4,700
Operations and Maintenance Costs (millions of 2005\$)	\$546
Total Cost =	\$5,246
ROI =	8.85
Assuming 50% Joint Development Cost by VTA	
Total Gains (from Table 3B) =	\$51,680
Project Costs (millions of 2005\$)	\$4,700
Operations and Maintenance Costs (millions of 2005\$)	\$546
Construction Costs from Induced Land Use Development (millions of 2005\$)	\$256
Total Costs =	\$5,502
ROI =	8.39

The ROI associated with the construction of the SVRT BART Extension and operation and maintenance expenditures assuming the life of the SVRT BART Extension is 70 years is depicted in **Table 6**. This table also presents the expected ROI associated with VTA investing in joint land use development by shouldering 50% of the construction cost associated with the housing, office, retail and hotel development within a one-quarter mile radius of six future SVRT BART stations in Santa Clara County.

Table 6: Return on Investment (ROI) of the SVRT BART Extension through 2087

Based on Low Estimates of the Economic Impacts	
Assuming no Joint Development Cost by VTA	
Total Gains (from Table 4A) =	\$30,256
Project Costs (millions of 2005\$)	\$4,700
Operations and Maintenance Costs (millions of 2005\$)	\$734
Total Cost =	\$5,434
ROI =	4.57
Assuming 50% Joint Development Cost by VTA	
Total Gains (from Table 4A) =	\$30,256
Project Costs (millions of 2005\$)	\$4,700
Operations and Maintenance Costs (millions of 2005\$)	\$734
Construction Costs from Induced Land Use Development (millions of 2005\$)	\$256
Total Costs =	\$5,690
ROI =	4.32
Based on High Estimates of the Economic Impacts	
Assuming no Joint Development Cost by VTA	
Total Gains (from Table 4B) =	\$72,912
Project Costs (millions of 2005\$)	\$4,700
Operations and Maintenance Costs (millions of 2005\$)	\$734
Total Cost =	\$5,434
ROI =	12.42
Assuming 50% Joint Development Cost by VTA	
Total Gains (from Table 4B) =	\$72,912
Project Costs (millions of 2005\$)	\$4,700
Operations and Maintenance Costs (millions of 2005\$)	\$734
Construction Costs from Induced Land Use Development (millions of 2005\$)	\$256
Total Costs =	\$5,690
ROI =	11.81

In summary, the anticipated ROIs assuming the life of the SVRT BART Extension is 30 and 70 years also generated positive values. These estimates suggest that the gains resulting from increases in GRP and personal income in the study region will outweigh the costs associated with the construction, operations and maintenance of the SVRT BART Extension over the life of the project.

Table 7 summarizes the ROIs of the SVRT BART Extension based on the low and high estimates of the economic benefits attributed to the SVRT BART investment over the periods 2016-2047, 2016-2067 and 2016-2087. These estimates suggest that the gains generated by the low estimates represent between 35% and 45% the gains generated by the high estimates. In all cases, the gains resulting from increases in GRP and personal income in the study region will outweigh the costs associated with the construction, operations and maintenance of the SVRT BART Extension. Therefore, the SVRT BART investment is deemed to be economically feasible.

Table 7: Return on Investment (ROI) of the SVRT BART Extension (based on Low and High Estimates of the Economic Impacts)

Source	Total Gains Over Period 2016-2047 (in millions of 2005\$)		Total Gains Over Period 2016-2067 (in millions of 2005\$)		Total Gains Over Period 2016-2087 (in millions of 2005\$)	
	Low Estimates	High Estimates	Low Estimates	High Estimates	Low Estimates	High Estimates
Highway User Benefits	\$9,058	\$41,327	\$15,704	\$46,994	\$19,393	\$59,844
Transit User Benefits	\$128	\$128	\$185	\$185	\$213	\$213
Construction Expenditure Benefits	\$2,581	\$2,581	\$2,581	\$2,581	\$2,581	\$2,581
Operations and Maintenance Expenditure Benefits	\$1,784	\$1,784	\$2,057	\$2,057	\$2,220	\$2,220
Benefits from the Construction Phase of the Influx of Resources (Land-Use Development) from outside Santa Clara County	\$235	\$502	\$235	\$502	\$235	\$502
Benefits from the Long-Term Phase of the Influx of Resources (Land-Use Development) from outside Santa Clara County	\$285	\$626	\$298	\$656	\$301	\$664
Affordable Mobility Benefits	\$128	\$997	\$201	\$1,568	\$232	\$1,807
Accessibility Benefits	\$3,735	\$3,735	\$4,718	\$4,718	\$5,082	\$5,082
Total Gains =	\$17,933	\$51,680	\$25,980	\$59,262	\$30,256	\$67,830
ROI Assuming no Joint Development Cost by VTA	2.42	8.85	3.83	10.01	4.57	12.42
ROI Assuming 50% Joint Development Cost by VTA	2.26	8.39	3.61	9.51	4.32	11.81

REFERENCES

1. *OMB Circular A-94*. The U.S. Office of Management and Budget. .
2. *Supplemental Environmental Impact Report* certified in June 2007 by the VTA Board of Directors.
3. *The Economic Impact Analysis of the SVRT BART Extension* (September, 2008).