

I-395/Route 9 Transportation Study Environmental Impact Statement

Net Present Value Analysis and Benefit-Cost Ratio of Modeled Transportation Benefits

August 1, 2012

000187

Inputs

0.07 Percent Discount Rate
20 Years Analysis Period

(references: <http://www.fhwa.dot.gov/infrastructure/asstmgmt/primer03.cfm>, http://www.whitehouse.gov/omb/circulars_a094)

| Calendar Year | Project Life | Study Year/ Exponent | Present Value Factor | Construction Costs | | Benefits | |
|---------------|--------------|-------------------------|----------------------|--------------------|---------------|--------------|---------------|
| | | | | Current Year | Present Value | Current Year | Present Value |
| 2015 | | 0 | | \$61,000,000 | \$61,000,000 | 0 | 0 |
| 2016 | 1 | 1 | 1.00000 | 0 | 0 | 4,167,500 | 4,167,500 |
| 2017 | 2 | 2 | 0.87344 | 0 | 0 | 4,386,842 | 3,831,638 |
| 2018 | 3 | 3 | 0.81630 | 0 | 0 | 4,606,184 | 3,760,018 |
| 2019 | 4 | 4 | 0.76290 | 0 | 0 | 4,825,526 | 3,681,371 |
| 2020 | 5 | 5 | 0.71299 | 0 | 0 | 5,044,868 | 3,596,921 |
| 2021 | 6 | 6 | 0.66634 | 0 | 0 | 5,264,211 | 3,507,766 |
| 2022 | 7 | 7 | 0.62275 | 0 | 0 | 5,483,553 | 3,414,881 |
| 2023 | 8 | 8 | 0.58201 | 0 | 0 | 5,702,895 | 3,319,137 |
| 2024 | 9 | 9 | 0.54393 | 0 | 0 | 5,922,237 | 3,221,304 |
| 2025 | 10 | 10 | 0.50835 | 0 | 0 | 6,141,579 | 3,122,067 |
| 2026 | 11 | 11 | 0.47509 | 0 | 0 | 6,360,921 | 3,022,028 |
| 2027 | 12 | 12 | 0.44401 | 0 | 0 | 6,580,263 | 2,921,716 |
| 2028 | 13 | 13 | 0.41496 | 0 | 0 | 6,799,605 | 2,821,594 |
| 2029 | 14 | 14 | 0.38782 | 0 | 0 | 7,018,947 | 2,722,069 |
| 2030 | 15 | 15 | 0.36245 | 0 | 0 | 7,238,289 | 2,623,489 |
| 2031 | 16 | 16 | 0.33873 | 0 | 0 | 7,457,632 | 2,526,158 |
| 2032 | 17 | 17 | 0.31657 | 0 | 0 | 7,676,974 | 2,430,333 |
| 2033 | 18 | 18 | 0.29586 | 0 | 0 | 7,896,316 | 2,336,235 |
| 2034 | 19 | 19 | 0.27651 | 0 | 0 | 8,115,658 | 2,244,047 |
| 2035 | 20 | 20 | 0.25842 | 0 | 0 | 8,335,000 | 2,153,922 |

Benefits and Assumptions

Benefits (2011\$)

\$5,117,000 reduction in crash costs
 \$417,000 reduced vehicle operating costs
 \$2,801,000 travel time savings
\$8,335,000
 \$4,167,500
 \$219,342.11 (half of total benefits, divided by 19 years)

Assumptions:

- \$8,335,000 in benefits would occur as of design year 2035. However, a lower level of annual benefits would begin in year 1 of project life. Because the amount of benefits was not modeled separately for each project year, it was assumed that 1/2 of design year benefits would occur in project year 1, and increase linearly until 2035.
- The salvage value of right-of-way was not subtracted from the total project cost. Subtracting the salvage value would decrease the project cost and increase the positive benefit-cost ratio.

| | Installation | Benefits |
|----------------------------|------------------|------------|
| SUM OF PRESENT VALUES | 61,000,000 | 61,424,195 |
| AVERAGE ANNUAL EQUIVALENTS | 5,381,279 | 5,798,009 |
| BENEFIT-COST RATIO | 1.1 | |
| AVG ANN EQVLNT NET BNFTS | \$416,731 | |

Notes:

- Benefits calculated to design year of 2035, however roadway is expected to exist past 2035 and would continue to provide transportation benefits.
- Other non-transportation benefits, such as employment and related economic development supported by improved mobility and access, are not accounted for and would provide additional benefits for the public.