# APPENDIX

**This Appendix contains detailed information which supports and explains the results contained in the study's report chapters. The three appendices are as follows:**

***Appendix A: Revised Economic Model*** **–** In order to apply the 1995 REMI economic model to both the past (1965-1994) and the future (1996-2025), certain modifications and analyses were necessary. Appendix A describes those economic model changes and analyses.

***Appendix B: Efficiency Benefit/Cost Calculations*** **–** A life cycle 1965-2025 analysis period was used to calculate each corridor's benefit/cost ratio. Appendix B presents each corridor's costs and benefits, by year, over the life cycle period.

***Appendix C: Economic Development Impacts by Year*** **–** In this study the economic development impacts are estimated for all 12 study corridors in total, by impact cause. Appendix C depicts those development impacts, by year, over the life cycle analysis period.

# APPENDIX A
# REVISED ECONOMIC MODEL

To measure the economic impact of the ADHS, a regional economic model specific to the Appalachian Region was needed. After deliberation, it was agreed that the most appropriate available model was the Regional Economic Models, Inc. (REMI) model, which is a private sector model that was configured for the defined Appalachian Region impact area.

## Need to Reconfigure REMI Model

The REMI model has been widely used in many highway corridor feasibility and impact studies throughout the US, and it was used in three of the five "Best Practices" studies referred to by FHWA. However, each of those studies used the "existing REMI model," e.g., 1995 version, which replicates today's economy, and then forecast what might happen to that economy "if a new highway were to be built."

In the ADHS study, however, much of the highways have already been built (between 1965 and 1995). Therefore, the REMI model needed to not only forecast the future (1995-2025) but also to look back in time (1965-1995). To accomplish this, certain changes were needed.

## Traditional Use of REMI Model for Highway Improvements

In general, the REMI model is designed to forecast impacts of future investments and is not designed to evaluate economic impacts from the past. As a result, adjustments to the REMI model were considered, which would estimate the economic impacts in the past instead of the future.

To better understand what adjustments to the REMI model are required for this study, it is useful first to describe the usual means in which REMI is used. The REMI model is a structural economic model which examines an economy from a perspective of cause and effect. Within the REMI model, a relationship between endogenous variables (variables that are determined within the model) and exogenous variables (variables determined outside the model) is established. These relationships between these variables are based upon historical relationships and are represented by parameters. Using historical and estimated values for the exogenous variables, REMI is able to develop a base line forecast for the future. To examine the impact an exogenous change can have in the model, changes in policy variables are made. These changes interact with the endogenous variables within the model and develop an economic forecast for the future. The difference between this forecast and the base line forecast is the economic impact that a change in a policy variable can have on a regional economy. Traditionally, a road improvement will affect the level of expenditures in construction, roadside services, as well as tourism; it will also affect the cost of doing business for major industries within a region. By changing the level of expenditures and cost savings for these different industries, an economic forecast can be obtained. However, this study also needed to be able to examine past changes to the economy. An adjustment to the REMI model was therefore requisite.

## Revision of the REMI Model

The application of the REMI model to past ADHS improvements required a non-traditional application of the REMI model. A number of adjustments were examined to the REMI model in order to gain estimates for historical economic impact from a road improvement. First, the model could not be *developed* to represent a past non-build environment. Rather, the model had to be *manipulated* to approximate the past. Second, the study time period covers 60 years, while the REMI model can only estimate/forecast impacts for a period of 41 years. Therefore, two separate model runs were required, one for years 1-31 (1965-1995), the other for years 31-60 (1996-2024). In addition, a third run was necessary that overlapped the two previous sets of runs in order to merge the data. This third run contained the data from 1986 through 2025. REMI staff were very helpful in helping to understand how to manipulate the REMI model to generate a non-build base case scenario.

Revising the REMI model relied heavily upon the baseline or control forecast REMI model to make economic impact estimates for the historical years. Both the future and historical estimates of impacts were based upon the baseline control model. While deriving the economic impacts for the future years (1996-2024)[1] is straight forward, deriving the economic impacts for the historical years (1965-1995) is not. To derive the economic impacts for the future years (1996-2024), the economic values for increased travel time savings or increased expenditures can be put into the REMI model using standard procedures in the normal way without any alteration to the inputs or the outputs for REMI. However, in order to gain the economic impact for historical years (1965-1995), alterations must occur in either the REMI inputs or outputs.

In order to pursue a method in which the output of the REMI model was altered, the historical levels of output (employment and value added) had to be established for the years 1965-1995. In doing so, the level of output can be altered by a weighted factor. The baseline control forecast of the REMI model, which predicts future economic impacts (1996-2025), can be used to gain an estimate for the economic impact for road improvement made in the past if the output is weighted by the historical levels (1965-1995). An example may be helpful in creating a clearer explanation.

In order to test this methodology, data were utilized from one of the corridors (Corridor B). The initial construction of corridor B began in the mid 1960's and was first open for traffic in 1968, with other sections opening later. With the improved road, an overall gain in travel efficiency was realized for both automobiles and trucks. By improving the travel efficiency along the corridor, the industries within the region experienced a reduction in the cost of doing business. The travel efficiency gains result in cost savings for the industries within the region and the level of impact for the Appalachian Region can be estimated through the REMI model. However, REMI has a maximum period of analysis of 40 years and this corridor has a time frame of 56 (1968-2024) years. Therefore, it was necessary to put the inputs into REMI into two sets. The first set of inputs was for the historical years 1968 through 1995. The second set of inputs consisted of the future years 1996 through 2024. The second set of inputs could be run through REMI in a straight forward fashion. The value of time saved was put into the model as real dollar values for the years 1996 through 2024 and these values are displayed in **Exhibit A2** in Columns **B**

[1] 1996 through 2024 are defined as the future year forecast period because these are the years that REMI can make economic forecasts.

through **E**. The resulting output in terms of employment and value added is displayed in Columns **F** and **G**.

Exhibit A-1 is explained as follows, for the Corridor B example:

- Time Savings and Vehicle Operating Cost (VOC) Savings are both expressed in dollars per year, are calculated outside of the REMI model, and are input into the REMI model. The values are separately calculated for cars and trucks.

- REMI Output comprises some of the data that is produced by the REMI model, with employment (jobs) and Value Added (dollars) shown.

All columns show that both the efficiency gains (time and VOC) and economic development gains (employment and value added) are expected to increase over time.

While deriving results for the second set (1996-2024) of inputs was straight forward, the derivation of results for the first set (1968-1995) of inputs proved to be more difficult. The first set (1968-1995) of cost savings inputs for the competitive advantage impact was placed into the base REMI model as inputs for the years 1998 through 2025. The output for employment and value added (GRP) is displayed in Column **B** and **C** in **Exhibit A-2**. The values of output for these years will be inflated because the analysis used a REMI model that projects economic impacts for the future (1996-2025) while using historical inputs. In the course of the last three decades, a number of economic and demographic changes have occurred. Therefore, these numbers must be deflated to be more representative of the unbuilt case for the years 1968 through 1995. In order to approximate the inflated level of the numbers, a proxy for deflating the values was created and based on the 1968-1995 value added (GRP) and employment levels divided by the 1998-2025 value added (GRP) and employment levels.[2]

For instance, in the impact counties of the Appalachian Region, the employment level in 1968 was 2,347,526 while the 1998 Regional employment level was 3,717,766. To derive the 1998 deflation factor for employment, the 1968 level (2,328,422) is divided by the 1998 level (3,739,573) to gain a factor of .6314. To derive the 1999 deflation factor for employment, the level of employment for 1969 is divided by the employment level of 1999. A similar procedure is employed to derive employment deflation factors for the years 2000 through 2025 and the deflation factor is displayed in Column **D**. For the value added (GRP) output, a deflation factor is based upon the value added for the historical years (1968-1995) divided by the level of value added (GRP) for future years (1998-2025) and is shown in Column **E**. The employment deflation factor (Column **D**) and value added (GRP) deflation factor (Column **E**) are then multiplied by the output for each of the years to adjust the output (Columns **B** and **C**) to the historical years 1966-1995. The new deflated values for employment and value added (GRP) are shown in bold in Columns **F** and **G**.

[2] In the actual use of REMI for the project, all economic indicators were deflated to historical levels.

**Exhibit A-1**
Example Inputs and Outputs – Corridor B

| | Time Savings | | VOC Savings | | REMI Output | |
|---|---|---|---|---|---|---|
| Year | Car millions | Truck millions | Car millions | Truck millions | Employment | Value Added millions |
| Column A | Column B | Column C | Column D | Column E | Column F | Column G |
| 1996 | $13.95 | $19.12 | -$0.77 | $4.16 | 604 | $26.51 |
| 1997 | 14.40 | 19.84 | -0.78 | 4.27 | 782 | 35.93 |
| 1998 | 14.86 | 20.56 | -0.79 | 4.37 | 928 | 43.99 |
| 1999 | 15.31 | 21.28 | -0.80 | 4.48 | 1,047 | 50.82 |
| 2000 | 15.76 | 22.00 | -0.81 | 4.58 | 1,145 | 56.81 |
| 2001 | 16.22 | 22.72 | -0.82 | 4.69 | 1,229 | 62.17 |
| 2002 | 16.67 | 23.44 | -0.83 | 4.79 | 1,304 | 67.18 |
| 2003 | 17.12 | 24.16 | -0.84 | 4.90 | 1,369 | 71.64 |
| 2004 | 17.58 | 24.88 | -0.85 | 5.00 | 1,429 | 75.92 |
| 2005 | 18.03 | 25.60 | -0.86 | 5.11 | 1,484 | 79.88 |
| 2006 | 18.48 | 26.32 | -0.87 | 5.21 | 1,531 | 83.70 |
| 2007 | 18.94 | 27.03 | -0.88 | 5.32 | 1,575 | 87.59 |
| 2008 | 19.39 | 27.75 | -0.89 | 5.43 | 1,616 | 91.22 |
| 2009 | 19.84 | 28.47 | -0.90 | 5.53 | 1,656 | 94.86 |
| 2010 | 20.30 | 29.19 | -0.91 | 5.64 | 1,693 | 98.29 |
| 2011 | 20.75 | 29.91 | -0.92 | 5.74 | 1,728 | 101.68 |
| 2012 | 21.20 | 30.63 | -0.93 | 5.85 | 1,761 | 105.05 |
| 2013 | 21.66 | 31.35 | -0.94 | 5.95 | 1,792 | 108.31 |
| 2014 | 22.11 | 32.07 | -0.95 | 6.06 | 1,846 | 112.96 |
| 2015 | 22.56 | 32.79 | -0.96 | 6.16 | 1,840 | 113.99 |
| 2016 | 23.02 | 33.51 | -0.96 | 6.27 | 1,869 | 107.67 |
| 2017 | 23.47 | 34.23 | -0.97 | 6.37 | 1,898 | 110.80 |
| 2018 | 23.92 | 34.94 | -0.98 | 6.48 | 1,923 | 113.65 |
| 2019 | 24.38 | 35.66 | -0.99 | 6.59 | 1,949 | 116.62 |
| 2020 | 24.83 | 36.38 | -1.00 | 6.69 | 1,971 | 119.40 |
| 2021 | 25.28 | 37.10 | -1.01 | 6.80 | 1,994 | 122.28 |
| 2022 | 25.74 | 37.82 | -1.02 | 6.90 | 2,017 | 125.30 |
| 2023 | 26.19 | 38.54 | -1.03 | 7.01 | 2,043 | 128.43 |
| 2024 | 26.64 | 39.26 | -1.04 | 7.11 | 2,069 | 131.52 |

## Exhibit A-2

Procedure for Deflation

| Column A | Column B | Column C | Column D | Column E | Column F | Column G |
|---|---|---|---|---|---|---|
| Years | REMI Predicted Employment | REMI Predicted Value Added in millions | Employment Deflation Factor | Valued Added Deflation Factor | Deflated Employment Level | Deflated Value Added Level in millions |
| 1966 | 0 | 0 | 0.623 | 0.449 | **0** | **0** |
| 1967 | 0 | 0 | 0.632 | 0.455 | **0** | **0** |
| 1968 | 4 | 0.209 | 0.631 | 0.453 | **3** | **0.095** |
| 1969 | 7 | 0.301 | 0.633 | 0.453 | **4** | **0.137** |
| 1970 | 24 | 1.182 | 0.633 | 0.453 | **15** | **0.536** |
| 1971 | 33 | 1.588 | 0.634 | 0.452 | **21** | **0.718** |
| 1972 | 66 | 3.257 | 0.64 | 0.466 | **42** | **1.518** |
| 1973 | 95 | 4.811 | 0.658 | 0.485 | **62** | **2.333** |
| 1974 | 156 | 7.976 | 0.686 | 0.51 | **107** | **4.068** |
| 1975 | 199 | 10.387 | 0.698 | 0.495 | **139** | **5.142** |
| 1976 | 229 | 12.184 | 0.69 | 0.49 | **158** | **5.97** |
| 1977 | 256 | 14.05 | 0.712 | 0.508 | **182** | **7.137** |
| 1978 | 282 | 15.708 | 0.733 | 0.518 | **207** | **8.137** |
| 1979 | 306 | 17.458 | 0.758 | 0.534 | **232** | **9.323** |
| 1980 | 353 | 20.287 | 0.772 | 0.537 | **273** | **10.894** |
| 1981 | 390 | 22.744 | 0.769 | 0.519 | **300** | **11.804** |
| 1982 | 438 | 25.967 | 0.767 | 0.521 | **336** | **13.529** |
| 1983 | 477 | 28.726 | 0.755 | 0.502 | **360** | **14.421** |
| 1984 | 511 | 31.346 | 0.753 | 0.51 | **385** | **15.987** |
| 1985 | 543 | 33.815 | 0.785 | 0.541 | **426** | **18.294** |
| 1986 | 574 | 36.285 | 0.805 | 0.554 | **462** | **20.102** |
| 1987 | 602 | 38.707 | 0.823 | 0.57 | **496** | **22.063** |
| 1988 | 630 | 40.979 | 0.848 | 0.584 | **534** | **23.932** |
| 1989 | 658 | 43.356 | 0.874 | 0.604 | **575** | **26.187** |
| 1990 | 682 | 45.605 | 0.901 | 0.626 | **614** | **28.549** |
| 1991 | 708 | 47.993 | 0.923 | 0.632 | **653** | **30.332** |
| 1992 | 746 | 51.053 | 0.928 | 0.625 | **692** | **31.908** |
| 1993 | 775 | 53.754 | 0.946 | 0.645 | **734** | **34.672** |
| 1994 | 803 | 56.432 | 0.97 | 0.66 | **779** | **37.245** |
| 1995 | 830 | 59.029 | 0.99 | 0.676 | **822** | **39.904** |

Columns B and C is the output based upon 1996-2025 REMI model using 1966-1995 travel efficiency numbers.

Columns D and E are the deflation factors for employment and value added. These deflation factors are estimated by taking the base years (1966-1995) levels divided by the future years (1996-2025) levels.

Columns F and G are deflated values for the REMI output that represents the economic development impact based upon the 1966-1995 travel efficiency values. The revised values are derived by multiplying Column B and Column C by Columns D and E, respectively.

At this point, a value of output for the years 1998 through 2024 had been calculated. However, upon examination of the output, it was apparent that initial years of the second set of REMI output does not have the accumulated effect of previous economic development. Therefore, this accumulated effect had to be accounted for and estimated.

To merge results of the output, the data set from 1986 -2025 was compiled as a data set that was placed in as a set of inputs into the REMI model for the years 1996-2035. The reason that 1986 was the initial year to this data set was to allow 10 years of accumulation before the 1996 numbers. So the input for 2006 in REMI was actually 1996 and the output for 2006 reflected the output for 1996. Therefore, the output for 2006 through 2010 represented the results for 1996 through 2000 and was used to merge the two sets of output together. Once again, the output values had to be deflated to represent the economic conditions of 1986 through 2025. The results for these years are shown in bold in **Exhibit A-3.**

The above modifications were employed to enable REMI to be used in the study. It required that the historical output from REMI be discounted to historical levels for the time frame of the analysis. The resulting methodology was applied, and the results are summarized in Chapters 5 and 6.

**Exhibit A-3**
**EXAMPLE RESULTS FROM REMI TESTING**
**THESE MODIFICATION PROCEDURES**

| Year | Employment | Value Added in millions |
|---|---|---|
| 1980 | 273 | 10.894 |
| 1981 | 300 | 11.804 |
| 1982 | 336 | 13.529 |
| 1983 | 360 | 14.421 |
| 1984 | 385 | 15.987 |
| 1985 | 426 | 18.294 |
| 1986 | 462 | 20.102 |
| 1987 | 496 | 22.063 |
| 1988 | 534 | 23.932 |
| 1989 | 575 | 26.187 |
| 1990 | 614 | 28.549 |
| 1991 | 653 | 30.332 |

| | | |
|---|---|---|
| 1992 | 692 | 31.908 |
| 1993 | 734 | 34.672 |
| 1994 | 779 | 37.245 |
| 1995 | 822 | 39.904 |
| **1996** | **893** | **44.181** |
| **1997** | **975** | **47.096** |
| **1998** | **1059** | **50.636** |
| **1999** | **1092** | **54.462** |
| **2000** | **1145** | **62.171** |
| 2001 | 1229 | 67.179 |
| 2002 | 1304 | 71.642 |
| 2003 | 1369 | 75.919 |
| 2004 | 1429 | 79.884 |
| 2005 | 1484 | 83.698 |
| 2006 | 1531 | 87.593 |
| 2007 | 1575 | 91.221 |
| 2008 | 1616 | 94.861 |
| 2009 | 1656 | 98.293 |
| 2010 | 1693 | 101.678 |
| 2011 | 1728 | 105.051 |
| 2012 | 1761 | 108.309 |
| 2013 | 1792 | 112.957 |
| 2014 | 1846 | 113.989 |
| 2015 | 1840 | 107.671 |
| 2016 | 1869 | 110.801 |
| 2017 | 1898 | 113.653 |
| 2018 | 1923 | 116.621 |
| 2019 | 1949 | 119.403 |
| 2020 | 1971 | 122.278 |

# APPENDIX B
# EFFICIENCY BENEFIT/COST CALCULATIONS

The results of the travel efficiency benefit and benefit/cost calculations are presented in Chapter 4. In support of those findings, Appendix B presents the actual benefit/cost calculations for each individual corridor on Exhibits B-1 through B-11. Exhibit B-12 then presents the benefit/cost calculations for all twelve corridors combined.

On these exhibits all monetary values are at constant 1995 price levels, not discounted (only the "Discounted Total" on the bottom of each column is discounted). The columns on these exhibits are interpreted as follows:

**Construction Costs** – The estimated actual expenditures, by year of authorization at 1995 price levels. For example, in 1965 the ARC spent much less than $608,000 on Corridor A/A1; the $608,000 represents the cost in 1995 prices. No costs are shown after 1995 because 1995 is the last year for which "completed" ADHS segments are included in the study.

**Maintenance Costs** – Annual net increase in costs to each state DOT to administer and maintain the additional lane miles. Annual increases prior to 1995 reflect phasing in of the ADHS highway segments.

**Time Savings** – The constant dollar values of time times the hours saved due to the ADHS. The numbers increase due to increased traffic levels through the years. Time savings are the dominant form of efficiency savings attributable to the ADHS.

**VOC Savings** – Annual savings (or losses) in vehicle operating costs (fuel costs, car maintenance costs, etc.). This value is negative (a disbenefit) when the ADHS causes travel to be slightly more expensive (it generally costs more, in vehicle operating cost, to travel at 65 mph than at 50 mph).

**Accidents Savings** – Annual monetary cost savings due to accident reduction can be a negative value when the trip distance is lengthened due to the ADHS (more vehicle miles of travel), or when induced traffic occurs, and when the change in highway functional classification is slight.

**Net Benefits** – The non-discounted benefits less the costs, by year. The only number in this column that really matters is the "Discounted Total" at the bottom of the column.

At the bottom right of each exhibit are the three indicators of economic feasibility. A "feasible" highway is one which has a positive Net Present Value (NPV), an Internal Rate of Return of 7.0% or greater, and a discounted Benefit/Cost Ratio of 1.0 or greater. These indicators of feasibility are defined as follows:

- **Net Present Value** – All costs and benefits in future years are discounted back to the base year using a seven percent real (constant dollar) discount rate. The future stream of discounted costs is subtracted from the future stream of discounted benefits. When the sum of the discounted benefits is greater than the sum of the discounted costs, the "net present value" is positive and the highway is deemed to be "economically feasible." The net present value is the best indicator of whether or not a corridor is economically feasible.

- **Discounted Benefit/Cost Ratio** – After the future streams of costs and benefits are discounted, the sum of the discounted benefits is divided by the sum of the discounted costs. When the result is 1.0 or greater, the corridor is considered to be "economically feasible."

- **Internal Rate of Return** – This calculation determines that discount rate at which the net present value difference between costs and benefits is zero. If the rate of return, expressed as a percentage, is equal to or greater than seven percent, then the corridor is deemed to be "economically feasible."

On all of these Exhibit B tables, the calculations are based on the Office of Management and Budget discount rate of 7.0% (constant price level discount rate).

## Exhibit B-1
## TRAVEL EFFICIENCIES BENEFIT COST ANALYSIS
## Georgia - corridor A
## Undiscounted 1995 $1,000

| Year | Construction Costs | Maintenance Costs | **TOTAL COSTS** | Time Savings | VOC Savings | Accidents Savings | **TOTAL SAVINCS** | NET BENEFITS |
|---|---|---|---|---|---|---|---|---|
| 1965 | 608 | 0 | **608** | 0 | 0 | 0 | **0** | (608) |
| 1966 | 2,088 | 0 | **2,088** | 0 | 0 | 0 | **0** | (2,088) |
| 1967 | 611 | 0 | **611** | 0 | 0 | 0 | **0** | (611) |
| 1968 | 294 | 0 | **294** | 0 | 0 | 0 | **0** | (294) |
| 1969 | 279 | 0 | **279** | 0 | 0 | 0 | **0** | (279) |
| 1970 | 1,482 | 0 | **1,482** | 0 | 0 | 0 | **0** | (1,482) |
| 1971 | 12,883 | 0 | **12,883** | 0 | 0 | 0 | **0** | (12,883) |
| 1972 | 28,141 | 0 | **28,141** | 0 | 0 | 0 | **0** | (28,141) |
| 1973 | 9,694 | 0 | **9,694** | 0 | 0 | 0 | **0** | (9,694) |
| 1974 | 9,803 | 0 | **9,803** | 0 | 0 | 0 | **0** | (9,803) |
| 1975 | 11,677 | 0 | **11,677** | 0 | 0 | 0 | **0** | (11,677) |
| 1976 | 3,192 | 0 | **3,192** | 0 | 0 | 0 | **0** | (3,192) |
| 1977 | 2,288 | 0 | **2,288** | 0 | 0 | 0 | **0** | (2,288) |
| 1978 | 4,279 | 0 | **4,279** | 0 | 0 | 0 | **0** | (4,279) |
| 1979 | 8,437 | 0 | **8,437** | 0 | 0 | 0 | **0** | (8,437) |
| 1980 | 2,298 | 0 | **2,298** | 0 | 0 | 0 | **0** | (2,298) |
| 1981 | 1,186 | 0 | **1,186** | 0 | 0 | 0 | **0** | (1,186) |
| 1982 | 1,212 | 0 | **1,212** | 0 | 0 | 0 | **0** | (1,212) |
| 1983 | 3 | 0 | **3** | 0 | 0 | 0 | **0** | (3) |
| 1984 | 0 | 309 | **309** | 8,493 | (3,074) | (2,509) | **2,910** | 2,601 |
| 1985 | 0 | 618 | **618** | 10,488 | (3,482) | (2,830) | **4,176** | 3,558 |
| 1986 | 0 | 927 | **927** | 12,483 | (3,890) | (3,150) | **5,442** | 4,515 |
| 1987 | 2,138 | 1,236 | **3,374** | 14,477 | (4,299) | (3,470) | **6,709** | 3,334 |
| 1988 | 7,088 | 1,236 | **8,324** | 16,472 | (4,707) | (3,790) | **7,975** | (349) |
| 1989 | 2,118 | 1,236 | **3,354** | 18,467 | (5,115) | (4,111) | **9,241** | 5,888 |
| 1990 | 1,051 | 1,236 | **2,287** | 20,462 | (5,523) | (4,431) | **10,508** | 8,221 |
| 1991 | 1,061 | 1,236 | **2,297** | 22,457 | (5,931) | (4,751) | **11,774** | 9,477 |
| 1992 | 0 | 1,236 | **1,236** | 24,451 | (6,339) | (5,072) | **13,041** | 11,805 |
| 1993 | 0 | 1,236 | **1,236** | 26,446 | (6,747) | (5,392) | **14,307** | 13,071 |
| 1994 | 0 | 1,236 | **1,236** | 28,441 | (7,156) | (5,712) | **15,573** | 14,337 |
| 1995 | 0 | 1,236 | **1,236** | 30,436 | (7,564) | (6,032) | **16,840** | 15,604 |
| 1996 | 0 | 1,236 | **1,236** | 31,690 | (7,698) | (6,242) | **17,751** | 16,515 |
| 1997 | 0 | 1,236 | **1,236** | 32,945 | (7,832) | (6,452) | **18,661** | 17,425 |
| 1998 | 0 | 1,236 | **1,236** | 34,199 | (7,966) | (6,661) | **19,572** | 18,336 |
| 1999 | 0 | 1,236 | **1,236** | 35,454 | (8,100) | (6,871) | **20,483** | 19,247 |
| 2000 | 0 | 1,236 | **1,236** | 36,708 | (8,234) | (7,081) | **21,394** | 20,158 |
| 2001 | 0 | 1,236 | **1,236** | 37,963 | (8,368) | (7,291) | **22,305** | 21,069 |
| 2002 | 0 | 1,236 | **1,236** | 39,218 | (8,502) | (7,500) | **23,216** | 21,980 |
| 2003 | 0 | 1,236 | **1,236** | 40,472 | (8,636) | (7,710) | **24,127** | 22,891 |
| 2004 | 0 | 1,236 | **1,236** | 41,727 | (8,770) | (7,920) | **25,037** | 23,801 |
| 2005 | 0 | 1,236 | **1,236** | 42,981 | (8,904) | (8,129) | **25,948** | 24,712 |
| 2006 | 0 | 1,236 | **1,236** | 44,236 | (9,038) | (8,339) | **26,859** | 25,623 |
| 2007 | 0 | 1,236 | **1,236** | 45,490 | (9,171) | (8,549) | **27,770** | 26,534 |
| 2008 | 0 | 1,236 | **1,236** | 46,745 | (9,305) | (8,758) | **28,681** | 27,445 |
| 2009 | 0 | 1,236 | **1,236** | 47,999 | (9,439) | (8,968) | **29,592** | 28,356 |
| 2010 | 0 | 1,236 | **1,236** | 49,254 | (9,573) | (9,178) | **30,503** | 29,267 |
| 2011 | 0 | 1,236 | **1,236** | 50,508 | (9,707) | (9,388) | **31,413** | 30,177 |
| 2012 | 0 | 1,236 | **1,236** | 51,763 | (9,841) | (9,597) | **32,324** | 31,088 |
| 2013 | 0 | 1,236 | **1,236** | 53,018 | (9,975) | (9,807) | **33,235** | 31,999 |
| 2014 | 0 | 1,236 | **1,236** | 54,272 | (10,109) | (10,017) | **34,146** | 32,910 |
| 2015 | 0 | 1,236 | **1,236** | 55,527 | (10,243) | (10,226) | **35,057** | 33,821 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 2016 | 0 | 1,236 | **1,236** | 56,781 | (10,377) | (10,436) | **35,968** | 34,732 |
| 2017 | 0 | 1,236 | **1,236** | 58,036 | (10,511) | (10,646) | **36,879** | 35,643 |
| 2018 | 0 | 1,236 | **1,236** | 59,290 | (10,645) | (10,855) | **37,790** | 36,553 |
| 2019 | 0 | 1,236 | **1,236** | 60,545 | (10,779) | (11,065) | **38,700** | 37,464 |
| 2020 | 0 | 1,236 | **1,236** | 61,799 | (10,913) | (11,275) | **39,611** | 38,375 |
| 2021 | 0 | 1,236 | **1,236** | 63,054 | (11,047) | (11,485) | **40,522** | 39,286 |
| 2022 | 0 | 1,236 | **1,236** | 64,308 | (11,181) | (11,694) | **41,433** | 40,197 |
| 2023 | 0 | 1,236 | **1,236** | 65,563 | (11,315) | (11,904) | **42,344** | 41,108 |
| 2024 | 0 | 1,236 | **1,236** | 66,817 | (11,449) | (12,114) | **43,255** | 42,019 |
| 2025 | (23,330) | 0 | **(23,330)** | 0 | 0 | 0 | **0** | 23,330 |
| Total | 90,581 | 48,824 | **139,405** | 1,661,936 | (341,456) | (317,408) | **1,003,072** | 863,668 |
| Discounted Total | 55,318 | 4,119 | **59,437** | 105,069 | (24,497) | (21,244) | **59,328** | (109) |
| | | | | | **Net Present value ($ 1,000):** | | | **(109)** |
| | | | | | **IRR(%):** | | | **7.0** |
| | | | | | **Benefits/Costs Ratio**: | | | **1.00** |

Note: Discount rate is 7%.

## Exhibit B-2
## TRAVEL EFFICIENCIES BENEFIT COST ANALYSIS
## Corridor B - KY, NC, TN, VA
## Undiscounted 1995 $1,000

| Year | Construction Costs | Maintenance Costs | **TOTAL COSTS** | Time Savings | VOC Savings | Accidents Savings | **TOTAL SAVINGS** | NET BENEFITS |
|---|---|---|---|---|---|---|---|---|
| 1965 | 5,984 | 0 | **5,984** | 0 | 0 | 0 | **0** | (5,984) |
| 1966 | 33,033 | 0 | **33,033** | 0 | 0 | 0 | **0** | (33,033) |
| 1967 | 63,167 | 0 | **63,167** | 0 | 0 | 0 | **0** | (63,167) |
| 1968 | 93,052 | (110) | **92,942** | 4,043 | 686 | 370 | **5,099** | (87,844) |
| 1969 | 125,380 | (6) | **125,373** | 4,416 | 693 | 412 | **5,521** | (119,852) |
| 1970 | 86,661 | 47 | **86,705** | 10,919 | (484) | 1,098 | **11,533** | (75,175) |
| 1971 | 133,986 | 450 | **134,436** | 17,563 | 605 | 488 | **18,656** | (115,780) |
| 1972 | 139,398 | 771 | **140,169** | 22,928 | .736 | 2,020 | **25,685** | (114,484) |
| 1973 | 141,786 | 1,212 | **142,998** | 26,351 | 864 | 2,862 | **30,078** | (112,9201 |
| 1974 | 94,710 | 1,410 | **96,120** | 35,379 | 1.767 | 3,384 | **40,530** | (55,590) |
| 1975 | 75,728 | 1,591 | **77,319** | 42,094 | 2,005 | 3,410 | **47,509** | (29,810) |
| 1976 | 64,509 | 1,825 | **66,333** | 44,991 | 2,047 | 3,576 | **50,614** | (15,719) |
| 1977 | 64,854 | 2,021 | **66,874** | 49,149 | 1,343 | 3.712 | **54,203** | (12,671) |
| 1978 | 68,621 | 2,187 | **70,808** | 52,100 | 1,354 | 3,876 | **57,329** | (13,479) |
| 1979 | 63,946 | 2,267 | **66,214** | 56,664 | 1,783 | 4,770 | **63,216** | (2,998) |
| 1980 | 75,310 | 2,258 | **77,569** | 64,120 | 826 | 5.752 | **70,698** | (6,871) |
| 1981 | 45,543 | 2,396 | **47,939** | 68,334 | 1,153 | 6,546 | **76,032** | 28,093 |
| 1982 | 70,822 | 2,561 | **73,383** | 75,170 | 1,041 | 7.718 | **83,929** | 10,546 |
| 1983 | 149,357 | 2,858 | **152,215** | 92,826 | 5,645 | 8,320 | **106,791** | (45,425) |
| 1984 | 59,264 | 3,130 | **62,394** | 103,499 | 7,086 | 9,454 | **120,039** | 57,645 |
| 1985 | 26,260 | 3,422 | **29,681** | 111.711 | 7,271 | 10,702 | **129,684** | 100,002 |
| 1986 | 33,775 | 3,686 | **37,461** | 117,178 | 7,571 | 11,162 | **135,912** | 98,451 |
| 1987 | 34,177 | 3,831 | **38,005** | 129,782 | 10,855 | 14,931 | **155,568** | 117,560 |
| 1988 | 13,964 | 3,917 | **17,881** | 136,034 | 11,427 | 15.714 | **163,175** | 145,294 |
| 1989 | 20,890 | 3,956 | **24,846** | 142,286 | 11,999 | 16,498 | **170,783** | 145,937 |
| 1990 | 10,166 | 3,995 | **14,161** | 148,539 | 12,571 | 17,281 | **178,391** | 164,230 |
| 1991 | 9,803 | 3,995 | **13,798** | 154,791 | 13,143 | 18,064 | **185,998** | 172,200 |
| 1992 | 14,077 | 4,013 | **18,090** | 163,052 | 14,215 | 19,911 | **197,178** | 179,088 |
| 1993 | 3,677 | 4,031 | **7,705** | 169,375 | 14,793 | 20.715 | **204,882** | 197,174 |
| 1994 | 2,000 | 4,049 | **6,049** | 175,698 | 15,371 | 21,518 | **212,587** | 206,538 |
| 1995 | 1,351 | 4,126 | **5,477** | 184,198 | 15,633 | 22,564 | **222,394** | 216,918 |
| 1996 | 0 | 4,184 | **4,184** | 197,036 | 17,326 | 23,270 | **237,632** | 233,448 |
| 1997 | 0 | 4,242 | **4,242** | 209,874 | 19,020 | 23,976 | **252,869** | 248,627 |
| 1998 | 0 | 4,300 | **4,300** | 222,712 | 20,714 | 24,682 | **268,107** | 263,807 |
| 1999 | 0 | 4,300 | **4,300** | 235,550 | 22,407 | 25,388 | **283,344** | 279,044 |
| 2000 | 0 | 4,300 | **4,300** | 248,387 | 24,101 | 26,093 | **298,582** | 294,282 |
| 2001 | 0 | 4,300 | **4,300** | 261,225 | 25,795 | 26,799 | **313,820** | 309,519 |
| 2002 | 0 | 4,300 | **4,300** | 274,063 | 27,488 | 27,505 | **329,057** | 324.757 |
| 2003 | 0 | 4,300 | **4,300** | 286,901 | 29,182 | 28,211 | **344,295** | 339,995 |
| 2004 | 0 | 4,300 | **4,300** | 299,739 | 30,876 | 28,917 | **359,532** | 355,232 |
| 2005 | 0 | 4,300 | **4,300** | 312,577 | 32,570 | 29,623 | **374,770** | 370,470 |
| 2006 | 0 | 4,300 | **4,300** | 325,415 | 34,263 | 30,329 | **390,007** | 385,707 |
| 2007 | 0 | 4,300 | **4,300** | 338,253 | 35,957 | 31,035 | **405,245** | 400,945 |
| 2008 | 0 | 4,300 | **4,300** | 351,091 | 37,651 | 31.741 | **420,482** | 416,182 |
| 2009 | 0 | 4,300 | **4,300** | 363,929 | 39,344 | 32,447 | **435,720** | 431,420 |
| 2010 | 0 | 4,300 | **4,300** | 376.767 | 41,038 | 33,152 | **450,957** | 446,657 |
| 2011 | 0 | 4,300 | **4,300** | 389,605 | 42,732 | 33,858 | **466,195** | 461,895 |
| 2012 | 0 | 4,300 | **4,300** | 402,443 | 44,426 | 34,564 | **481,433** | 477,132 |
| 2013 | 0 | 4,300 | **4,300** | 415,281 | 46,119 | 35,270 | **496,670** | 492,370 |
| 2014 | 0 | 4,300 | **4,300** | 428,119 | 47,813 | 35,976 | **511,908** | 507,608 |
| 2015 | 0 | 4,300 | **4,300** | 440,957 | 49,507 | 36,682 | **527,145** | 522,845 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 2016 | 0 | 4,300 | **4,300** | 453.795 | 51,200 | 37,388 | **542,383** | 538,083 |
| 2017 | 0 | 4,300 | **4,300** | 466,633 | 52,894 | 38,094 | **557,620** | 553,320 |
| 2018 | 0 | 4,300 | **4,300** | 479,470 | 54,588 | 38,800 | **572,858** | 568,558 |
| 2019 | 0 | 4,300 | **4,300** | 492,309 | 56,281 | 39,505 | **588,095** | 583,795 |
| 2020 | 0 | 4,300 | **4,300** | 505,146 | 57,975 | 40,211 | **603,333** | 599,033 |
| 2021 | 0 | 4,300 | **4,300** | 517,984 | 59,669 | 40,917 | **618,570** | 614,270 |
| 2022 | 0 | 4,300 | **4,300** | 530,822 | 61,363 | 41,623 | **633,805** | 629,508 |
| 2023 | 0 | 4,300 | **4,300** | 543,660 | 63,056 | 42,329 | **649,046** | 644.746 |
| 2024 | 0 | 4,300 | **4,300** | 556,498 | 64,750 | 43,035 | **664,283** | 659,983 |
| 2025 | (456,568) | 0 | **(456,568)** | 0 | 0 | 0 | **0** | 456,568 |
| Total | 1,368,683 | 194,415 | **1,563,098** | 13,329,428 | 1,354,104 | 1,218,247 | **15,901,780** | 14,338,682 |
| Discounted | | | | | | | | |
| Total | 879,597 | 23,972 | **903,569** | 1,049,252 | 83,937 | 102,100 | **1,235,290** | 331,721 |
| | | | | | **Net Present value ($1000):** | | | **331,721** |
| | | | | | **IRR (%):** | | | **8.66** |
| | | | | | **Benefits/Costs Ratio:** | | | **1.37** |

Note: Discount rate is 7%.

## Exhibit B-3
## TRAVEL EFFICIENCIES BENEFIT COST ANALYSIS
## Corridor D - OH, WV
## Undiscounted 1995 $1,000

| Year | Construction Costs | Maintenance Costs | **TOTAL COSTS** | Time Savings | VOC Savings | Accidents Savings | **TOTAL SAVINGS** | **NET BENEFITS** |
|---|---|---|---|---|---|---|---|---|
| 1965 | 2,125 | 0 | **2,125** | 0 | 0 | 0 | 0 | (2,125) |
| 1966 | 17,770 | 0 | **17,770** | 0 | 0 | 0 | 0 | (17,770) |
| 1967 | 44,271 | 0 | **44,271** | 0 | 0 | 0 | 0 | (44,271) |
| 1968 | 74,265 | 0 | **74,265** | 0 | 0 | 0 | 0 | (74,265) |
| 1969 | 165,915 | 57 | **165,972** | 449 | (443) | 64 | **69** | (165,902) |
| 1970 | 110,497 | 204 | **110,701** | 2,559 | (795) | 503 | **2,268** | (108,434) |
| 1971 | 93,179 | 565 | **93,743** | 10,159 | (2,491) | 1,478 | **9,146** | (84,598) |
| 1972 | 77,941 | 954 | **78,895** | 11,704 | (2,700) | 1,820 | **10,823** | (68,072) |
| 1973 | 62,094 | 1,367 | **63,461** | 14,323 | (2,955) | 2,496 | **13,864** | (49,597) |
| 1974 | 63,199 | 1,735 | **64,933** | 18,277 | (3,662) | 3,069 | **17,684** | (47,249) |
| 1975 | 21,072 | 1,888 | **22,960** | 19,714 | (3,872) | 3,224 | **19,066** | (3,894) |
| 1976 | 10,335 | 2,013 | **12,348** | 21,151 | (4,082) | 3,380 | **20,448** | 8,100 |
| 1977 | 7,414 | 2,058 | **9,472** | 22,587 | (4,292) | 3,535 | **21,830** | 12,359 |
| 1978 | 10,446 | 2,083 | **12,529** | 27,518 | (4,141) | 4,036 | **27,413** | 14,884 |
| 1979 | 31,484 | 2,107 | **33,591** | 29,598 | (4,303) | 4,227 | **29,522** | (4,068) |
| 1980 | 11,553 | 2,171 | **13,725** | 34,034 | (5,606) | 4,668 | **33,096** | 19,371 |
| 1981 | 6,039 | 2,235 | **8,274** | 36,686 | (5,868) | 4,883 | **35,701** | 27,427 |
| 1982 | 6,664 | 2,275 | **8,939** | 39,337 | (6,131) | 5,098 | **38,305** | 29,367 |
| 1983 | 5,276 | 2,394 | **7,670** | 43,964 | (7,188) | 5,699 | **42,475** | 34,805 |
| 1984 | 3,111 | 2,573 | **5,684** | 49,163 | (7,537) | 6,646 | **48,271** | 42,587 |
| 1985 | 5,945 | 2,751 | **8,696** | 52,236 | (7,879) | 6,928 | **51,285** | 42,589 |
| 1986 | 2,221 | 2,930 | **5,150** | 55,310 | (8,221) | 7,211 | **54,300** | 49,149 |
| 1987 | 821 | 3,028 | **3,849** | 58,384 | (8,563) | 7,493 | **57,314** | 53,464 |
| 1988 | 771 | 3,028 | **3,799** | 61,457 | (8,905) | 7,776 | **60,328** | 56,530 |
| 1989 | 1,395 | 3,028 | **4,423** | 64,531 | (9,247) | 8,058 | **63,342** | 58,919 |
| 1990 | 4,894 | 3,028 | **7,922** | 67,605 | (9,589) | 8,341 | **66,357** | 58,435 |
| 1991 | 1,491 | 3,028 | **4,519** | 70,678 | (9,931) | 8,623 | **69,371** | 64,852 |
| 1992 | 763 | 3,028 | **3,791** | 73,752 | (10,272) | 8,906 | **72,385** | 68,595 |
| 1993 | 740 | 3,028 | **3,768** | 76,826 | (10,614) | 9,188 | **75,400** | 71,632 |
| 1994 | 0 | 3,028 | **3,028** | 79,899 | (10,956) | 9,471 | **78,414** | 75,386 |
| 1995 | 0 | 3,028 | **3,028** | 82,973 | (11,298) | 9,753 | **81,428** | 78,400 |
| 1996 | 0 | 3,028 | **3,028** | 85,318 | (11,484) | 9,945 | **83,779** | 80,751 |
| 1997 | 0 | 3,028 | **3,028** | 87,663 | (11,6701 | 10,136 | **86,129** | 83,101 |
| 1998 | 0 | 3,028 | **3,028** | 90,008 | (11,856) | 10,327 | **88,480** | 85,452 |
| 1999 | 0 | 3,028 | **3,028** | 92,354 | (12,042) | 10,518 | **90,830** | 87,802 |
| 2000 | 0 | 3,028 | **3,028** | 94,699 | (12,228) | 10,710 | **93,181** | 90,153 |
| 2001 | 0 | 3,028 | **3,028** | 97,044 | (12,414) | 10,901 | **95,531** | 92,503 ' |
| 2002 | 0 | 3,028 | **3,028** | 99,389 | (12,600) | 11,092 | **97,882** | 94,854 |
| 2003 | 0 | 3,028 | **3,028** | 101,734 | (12,785) | 11,283 | **100,232** | 97,204 |
| 2004 | 0 | 3,028 | **3,028** | 104,079 | (12,971) | 11,475 | **102,583** | 99,555 |
| 2005 | 0 | 3,028 | **3,028** | 106,425 | (13,157) | 11,666 | **104,933** | 101,905 |
| 2006 | 0 | 3,028 | **3,028** | 108,770 | (13,343) | 11,857 | **107,284** | 104,256 |
| 2007 | 0 | 3,028 | **3,028** | 111,115 | (13,529) | 12,048 | **109,634** | 106,606 |
| 2008 | 0 | 3,028 | **3,028** | 113,460 | (13,715) | 12,240 | **111,985** | 108,957 |
| 2009 | 0 | 3,028 | **3,028** | 115,805 | (13,901) | 12,431 | **114,335** | 111,307 |
| 2010 | 0 | 3,028 | **3,028** | 118,151 | (14,087) | 12,622 | **116,686** | 113,658 |
| 2011 | 0 | 3,028 | **3,028** | 120,496 | (14,273) | 12,813 | **119,036** | 116,008 |
| 2012 | 0 | 3,028 | **3,028** | 122,841 | (14,459) | 13,005 | **121,387** | 118,359 |
| 2013 | 0 | 3,028 | **3,028** | 125,186 | (14,645) | 13,196 | **123,737** | 120,709 |
| 2014 | 0 | 3,028 | **3,028** | 127,531 | (14,831) | 13,387 | **126,088** | 123,060 |
| 2015 | 0 | 3,028 | **3,028** | 129,876 | (15,017) | 13,578 | **128,438** | 125,410 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 2016 | 0 | 3,028 | **3,028** | 132,222 | (15,203) | 13,770 | **130,789** | 127,761 |
| 2017 | 0 | 3,028 | **3,028** | 134,567 | (15,389) | 13,961 | **133,139** | 130,111 |
| 2018 | 0 | 3,028 | **3,028** | 136,912 | (15,575) | 14,152 | **135,490** | 132,462 |
| 2019 | 0 | 3,028 | **3,028** | 139,257 | (15,761) | 14,343 | **137,840** | 134,812 |
| 2020 | 0 | 3,028 | **3,028** | 141,602 | (15,946) | 14,535 | **140,191** | 137,163 |
| 2021 | 0 | 3,028 | **3,028** | 143,948 | (16,132) | 14,726 | **142,541** | 139,513 |
| 2022 | 0 | 3,028 | **3,028** | 146,293 | (16,318) | 14,917 | **144,892** | 141,864 |
| 2023 | 0 | 3,028 | **3,028** | 148,638 | (16,504) | 15,108 | **147,242** | 144,214 |
| 2024 | 0 | 3,028 | **3,028** | 150,983 | (16,690) | 15,300 | **149,593** | 146,565 |
| 2025 | (93,112) | 0 | **(93,112)** | 0 | 0 | 0 | 0 | 93,112 |
| Total | 750,578 | 147,424 | **898,002** | 4,551,239 | (580,066) | 512,618 | **4,483,791** | 3,585,789 |
| Discounted Total | 517,035 | 20,711 | **537,746** | 430,767 | (63,663) | 54,341 | **421,445** | (116,301) |
| | | | | | **Net Present Value ($1000):** | | | **(116,301)** |
| | | | | | **IRR (%):** | | | **5.8** |
| | | | | | **Benefits/Costs Ratio:** | | | **0.78** |

Note: Discount rate is 7%.

## Exhibit B-4
## TRAVEL EFFICIENCIES BENEFIT COST ANALYSIS
## Corridor E. MD, WV
## Undiscounted 1995 $1,000

| Year | Costs | Construction Maintenance Costs | **TOTAL COSTS** | Time Savings | VOC Savings | Accidents Savings | **TOTAL SAVINGS** | NET BENEFITS |
|---|---|---|---|---|---|---|---|---|
| 1965 | 71 | 0 | **71** | 0 | 0 | 0 | **0** | (71) |
| 1966 | 4,365 | 0 | **4,365** | 0 | 0 | 0 | **0** | (4,365) |
| 1967 | 22,420 | 0 | **22,420** | 0 | 0 | 0 | **0** | (22,420) |
| 1968 | 32,284 | 28 | **32,312** | 2,229 | 420 | 38 | **2,687** | (29,625) |
| 1969 | 17,262 | 56 | **17,318** | 2,329 | 434 | 39 | **2,802** | (14,516) |
| 1970 | 44,629 | 83 | **44,712** | 2,429 | 447 | 40 | **2,917** | (41,796) |
| 1971 | 101,950 | 324 | **102,275** | 8,279 | (339) | (169) | **7,771** | (94,504) |
| 1972 | 159,661 | 538 | **160,199** | 8,492 | (343) | (171) | **7,978** | (152,221) |
| 1973 | 129,292 | 751 | **130,043** | 8,705 | (346) | (174) | **8,185** | (121,857) |
| 1974 | 94,863 | 1,247 | **96,110** | 12,934 | (19) | (200) | **12,715** | (83,395) |
| 1975 | 40,287 | 1,617 | **41,904** | 13,279 | (1,252) | (1,030) | **10,997** | (30,908) |
| 1976 | 17,707 | 2,115 | **19,823** | 18,543 | (993) | (1,003) | **16,547** | (3,276) |
| 1977 | 10,737 | 2,613 | **13,350** | 19,720 | (1,122) | (1,088) | **17,511** | 4,161 |
| 1978 | 2,676 | 2,829 | **5,504** | 20,898 | (1,251) | (1,172) | **18,474** | 12,970 |
| 1979 | 1,978 | 3,613 | **5,591** | 27,853 | (554) | (1,515) | **25,784** | 20,193 |
| 1980 | 2,352 | 4,270 | **6,622** | 29,536 | (681) | (1,613) | **27,242** | 20,620 |
| 1981 | 9,973 | 4,927 | **14,900** | 31,219 | (809) | (1,711) | **28,700** | 13,800 |
| 1982 | 35,068 | 5,583 | **40,652** | 32,902 | (936) | (1,809) | **30,158** | (10,494) |
| 1983 | 13,979 | 5,583 | **19,563** | 34,586 | (1,063) | (1,907) | **31,616** | 12,053 |
| 1984 | 11,261 | 5,583 | **16,844** | 36,269 | (1,191) | (2,004) | **33,074** | 16,229 |
| 1985 | 14,436 | 5,583 | **20,020** | 37,952 | (1,318) | (2,102) | **34,531** | 14,512 |
| 1986 | 8,026 | 5,583 | **13,610** | 39,635 | (1,446) | (2,200) | **35,989** | 22,380 |
| 1987 | 13,189 | 5,583 | **18,773** | 41,318 | (1,573) | (2,298) | **37,447** | 18,675 |
| 1988 | 18,527 | 5,583 | **24,110** | 43,002 | (1,701) | (2,396) | **38,905** | 14,795 |
| 1989 | 44,893 | 5,583 | **50,476** | 44,685 | (1,828) | (2,494) | **40,363** | (10,113) |
| 1990 | 17,989 | 5,583 | **23,573** | 46,368 | (1,955) | (2,592) | **41,821** | 18,249 |
| 1991 | 19,212 | 5,583 | **24,795** | 48,051 | (2,083) | (2,689) | **43,279** | 18,484 |
| 1992 | 10,442 | 6,195 | **16,637** | 69,866 | (379) | (3,312) | **66,175** | 49,539 |
| 1993 | 1,869 | 6,812 | **8,681** | 73,092 | (668) | (3,462) | **68,962** | 60,281 |
| 1994 | 1,714 | 7,439 | **9,153** | 75,662 | (824) | (3,579) | **71,259** | 62,106 |
| 1995 | 0 | 8,065 | **8,065** | 78,232 | (979) | (3,697) | **73,556** | 65,490 |
| 1996 | 0 | 8,081 | **8,081** | 81,647 | (1,307) | (3,854) | **76,485** | 68,404 |
| 1997 | 0 | 8,081 | **8,081** | 85,061 | (1,636) | (4,011) | **79,415** | 71,334 |
| 1998 | 0 | 8,081 | **8,081** | 88,476 | (1,964) | (4,168) | **82,344** | 74,263 |
| 1999 | 0 | 8,081 | **8,081** | 91,890 | (2,292) | (4,325) | **85,273** | 77,193 |
| 2000 | 0 | 8,081 | **8,081** | 95,305 | (2,620) | (4,482) | **88,203** | 80,122 |
| 2001 | 0 | 8,081 | **8,081** | 98,719 | (2,948) | (4,639) | **91,132** | 83,051 |
| 2002 | 0 | 8,081 | **8,081** | 102,134 | (3,276) | (4,796) | **94,062** | 85,981 |
| 2003 | 0 | 8,081 | **8,081** | 105,548 | (3,604) | (4,953) | **96,991** | 88,910 |
| 2004 | 0 | 8,081 | **8,081** | 108,963 | (3,932) | (5,110) | **99,921** | 91,840 |
| 2005 | 0 | 8,081 | **8,081** | 112,377 | (4,260) | (5,267) | **102,850** | 94,769 |
| 2006 | 0 | 8,081 | **8,081** | 115,792 | (4,588) | (5,424) | **105,780** | 97,699 |
| 2007 | 0 | 8,081 | **8,081** | 119,207 | (4,916) | (5,581) | **108,709** | 100,628 |
| 2008 | 0 | 8,081 | **8,081** | 122,621 | (5,244) | (5,738) | **111,639** | 103,558 |
| 2009 | 0 | 8,081 | **8,081** | 126,036 | (5,572) | (5,895) | **114,568** | 106,487 |
| 2010 | 0 | 8,081 | **8,081** | 129,450 | (5,900) | (6,052) | **117,498** | 109,417 |
| 2011 | 0 | 8,081 | **8,081** | 132,865 | (6,228) | (6,209) | **120,427** | 112,346 |
| 2012 | 0 | 8,081 | **8,081** | 136,279 | (6,556) | (6,366) | **123,357** | 115,276 |
| 2013 | 0 | 8,081 | **8,081** | 139,694 | (6,884) | (6,524) | **126,286** | 118,205 |
| 2014 | 0 | 8,081 | **8,081** | 143,108 | (7,212) | (6,681) | **129,216** | 121,135 |
| 2015 | 0 | 8,081 | **8,081** | 146,523 | (7,540) | (6,838) | **132,145** | 124,064 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 2016 | 0 | 8,081 | **8,081** | 149,937 | (7,868) | (6,995) | **135,075** | 126,994 |
| 2017 | 0 | 8,081 | **8,081** | 153,352 | (8,196) | (7,152) | **138,004** | 129,923 |
| 2018 | 0 | 8,081 | **8,081** | 156,766 | (8,524) | (7,309) | **140,934** | 132,853 |
| 2019 | 0 | 8,081 | **8,081** | 160,181 | (8,852) | (7,466) | **143,863** | 135,782 |
| 2020 | 0 | 8,081 | **8,081** | 163,596 | (9,180) | (7,623) | **146,793** | 138,712 |
| 2021 | 0 | 8,081 | **8,081** | 167,010 | (9,508) | (7,780) | **149,722** | 141,641 |
| 2022 | 0 | 8,081 | **8,081** | 170,425 | (9,836) | (7,937) | **152,652** | 144,571 |
| 2023 | 0 | 8,081 | **8,081** | 173,839 | (10,164) | (8,094) | **155,581** | 147,500 |
| 2024 | 0 | 8,081 | **8,081** | 177,254 | (10,492) | (8,251) | **158,511** | 150,430 |
| 2025 | (136,080) | 0 | **(136,080)** | 0 | 0 | 0 | **0** | 136,080 |
| Total | 767,034 | 343,704 | **1,110,737** | 4,662,121 | (195,450) | (221,790) | **4,244,881** | 3.134,144 |
| Discounted Total | 444,194 | 38,331 | **482,524** | 387,641 | (12,623) | (18,653) | **356,366** | (126,158) |
| | | | | | **Net Present value ($1000):** | | | **(126,158)** |
| | | | | | **IRR (%):** | | | **5.4** |
| | | | | | **Benefits/Costs Ratio:** | | | **0.74** |

Note: Discount rate is 7%.

## Exhibit B-5
## TRAVEL EFFICIENCIES BENEFIT COST ANALYSIS
## Corridor F - KY, TN
## (1995 $1,000)

| Year | Costs | Construction Maintenance Costs | **TOTAL COSTS** | Time Savings | VOC Savings | Accidents Savings | **TOTAL SAVINGS** | NET BENEFITS |
|---|---|---|---|---|---|---|---|---|
| 1965 | 3,087 | 0 | **3,087** | 0 | 0 | 0 | **0** | (3,087) |
| 1966 | 12,664 | 0 | **12,664** | 0 | 0 | 0 | **0** | (12,664) |
| 1967 | 12,424 | 0 | **12,424** | 0 | 0 | 0 | **0** | (12,424) |
| 1968 | 15,041 | (6) | **15,035** | 263 | (36) | 57 | **284** | (14,750) |
| 1969 | 18,117 | 1 | **18,118** | 306 | (41) | 62 | **327** | (17,790) |
| 1970 | 16,002 | 8 | **16,010** | 349 | (45) | 67 | **370** | (15,640) |
| 1971 | 32,921 | 1 | **32,922** | 497 | (102) | 120 | **515** | (32,407) |
| 1972 | 26,678 | 15 | **26,693** | 585 | (114) | 129 | **600** | (26,092) |
| 1973 | 31,875 | (154) | **31,721** | 4,283 | 234 | 1,003 | **5,520** | (26,200) |
| 1974 | 36,388 | (35) | **36,354** | 4,647 | 223 | 1,048 | **5,919** | (30,435) |
| 1975 | 35,769 | 70 | **35,840** | 5,012 | 212 | 1,093 | **6,317** | (29,523) |
| 1976 | 36,148 | 203 | **36,351** | 6,805 | 5 | 1,300 | **8,110** | (28,241) |
| 1977 | 34,465 | 344 | **34,809** | 9,926 | (246) | 1,643 | **11,323** | (23,486) |
| 1978 | 16,384 | 503 | **16,887** | 10,848 | (451) | 1,756 | **12,153** | (4,734) |
| 1979 | 5,562 | 688 | **6,249** | 11,539 | (493) | 1,824 | **12,870** | 6,621 |
| 1980 | 2,624 | 821 | **3,446** | 12,231 | (535) | 1,893 | **13,588** | 10,143 |
| 1981 | 717 | 834 | **1,551** | 12,922 | (578) | 1,962 | **14,306** | 12,755 |
| 1982 | 644 | 834 | **1,478** | 13,613 | (620) | 2,030 | **15,024** | 13,546 |
| 1983 | 2,299 | 834 | **3,134** | 14,305 | (662) | 2,099 | **15,742** | 12,608 |
| 1984 | 657 | 834 | **1,491** | 14,996 | (704) | 2,168 | **16,460** | 14,969 |
| 1985 | 298 | 834 | **1,132** | 15,688 | (747) | 2,236 | **17,177** | 16,045 |
| 1986 | 301 | 834 | **1,135** | 16,379 | (789) | 2,305 | **17,895** | 16,760 |
| 1987 | 0 | 834 | **834** | 17,070 | (831) | 2,374 | **18,613** | 17,779 |
| 1988 | 0 | 834 | **834** | 17,762 | (873) | 2,443 | **19,331** | 18,497 |
| 1989 | 0 | 834 | **834** | 18,453 | (916) | 2,511 | **20,049** | 19,214 |
| 1990 | 0 | 834 | **834** | 19,144 | (958) | 2,580 | **20,767** | 19,932 |
| 1991 | 1,431 | 834 | **2,265** | 19,836 | (1,000) | 2,649 | **21,484** | 19,219 |
| 1992 | 5,171 | 834 | **6,006** | 20,527 | (1,042) | 2,717 | **22,202** | 16,196 |
| 1993 | 1,515 | 834 | **2,349** | 21,218 | (1,084) | 2,786 | **22,920** | 20,571 |
| 1994 | 695 | 834 | **1,529** | 21,910 | (1,127) | 2,855 | **23,638** | 22,109 |
| 1995 | 684 | 834 | **1,519** | 22,601 | (1,169) | 2,923 | **24,356** | 22,837 |
| 1996 | 0 | 834 | **834** | 23,656 | (1,201) | 3,007 | **25,462** | 24,628 |
| 1997 | 0 | 834 | **834** | 24,712 | (1,234) | 3,090 | **26,568** | 25,734 |
| 1998 | 0 | 834 | **834** | 25,767 | (1,266) | 3,173 | **27,674** | 26,840 |
| 1999 | 0 | 834 | **834** | 26,822 | (1,298) | 3,256 | **28,780** | 27,946 |
| 2000 | 0 | 834 | **834** | 27,877 | (1,330) | 3,340 | **29,886** | 29,052 |
| 2001 | 0 | 834 | **834** | 28,933 | (1,363) | 3,423 | **30,993** | 30,158 |
| 2002 | 0 | 834 | **834** | 29,988 | (1,395) | 3,506 | **32,099** | 31,264 |
| 2003 | 0 | 834 | **834** | 31,043 | (1,427) | 3,589 | **33,205** | 32,371 |
| 2004 | 0 | 834 | **834** | 32,098 | (1,460) | 3,673 | **34,311** | 33,477 |
| 2005 | 0 | 834 | **834** | 33,153 | (1,492) | 3,756 | **35,417** | 34,583 |
| 2006 | 0 | 834 | **834** | 34,209 | (1,524) | 3,839 | **36,523** | 35,689 |
| 2007 | 0 | 834 | **834** | 35,264 | (1,556) | 3,922 | **37,630** | 36,795 |
| 2008 | 0 | 834 | **834** | 36,319 | (1,589) | 4,005 | **38,736** | 37,901 |
| 2009 | 0 | 834 | **834** | 37,374 | (1,621) | 4,089 | **39,842** | 39,007 |
| 2010 | 0 | 834 | **834** | 38,429 | (1,653) | 4,172 | **40,948** | 40,114 |
| 2011 | 0 | 834 | **834** | 39,485 | (1,686) | 4,255 | **42,054** | 41,220 |
| 2012 | 0 | 834 | **834** | 40,540 | (1,718) | 4,338 | **43,160** | 42,326 |
| 2013 | 0 | 834 | **834** | 41,595 | (1,750) | 4,422 | **44,266** | 43,432 |
| 2014 | 0 | 834 | **834** | 42,650 | (1,783) | 4,505 | **45,373** | 44,538 |
| 2015 | 0 | 834 | **834** | 43,706 | (1,815) | 4,588 | **46,479** | 45,644 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 2016 | 0 | 834 | **834** | 44,761 | (1,847) | 4,671 | **47,585** | 46,751 |
| 2017 | 0 | 834 | **834** | 45,816 | (1,879) | 4,754 | **48,691** | 47,857 |
| 2018 | 0 | 834 | **834** | 46,871 | (1,912) | 4,838 | **49,797** | 48,963 |
| 2019 | 0 | 834 | **834** | 47,926 | (1,944) | 4,921 | **50,903** | 50,069 |
| 2020 | 0 | 834 | **834** | 48,982 | (1,976) | 5,004 | **52,009** | 51,175 |
| 2021 | 0 | 834 | **834** | 50,037 | (2,009) | 5,087 | **53,116** | 52,281 |
| 2022 | 0 | 834 | **834** | 51,092 | (2,041) | 5,171 | **54,222** | 53,387 |
| 2023 | 0 | 834 | **834** | 52,147 | (2,073) | 5,254 | **55,328** | 54,494 |
| 2024 | 0 | 834 | **834** | 53,203 | (2,105) | 5,337 | **56,434** | 55,600 |
| 2025 | (67,918) | 0 | **(67,918)** | 0 | 0 | 0 | **0** | 67,918 |
| Total | 282,642 | 39,169 | **321,811** | 1,448,171 | (62,437) | 169,619 | **1,555,353** | 1,233,542 |
| Discounted | | | | | | | | |
| Total | 189,274 | 4,729 | **194,003** | 131,034 | (5,318) | 18,125 | **143,841** | (50,162) |
| | | | | | **Net Present Value ($1000):** | | | **(50,162)** |
| | | | | | **IRR (%):** | | | **5.5** |
| | | | | | **Benefits/Costs Ratio:** | | | **0.74** |

Note: Discount rate is 7%.

## Exhibit B-6
## TRAVEL EFFICIENCIES BENEFIT COST ANALYSIS
## Kentucky. Corridor I
## Undiscounted 1995 $1,000

| Year | Costs | Construction Maintenance Costs | **TOTAL COSTS** | Time Savings | VOC Savings | Accidents Savings | **TOTAL SAVINGS** | NET BENEFITS |
|---|---|---|---|---|---|---|---|---|
| 1965 | 2,139 | 0 | **2,139** | 0 | 0 | 0 | **0** | (2,139) |
| 1966 | 18,009 | 0 | **18,009** | 0 | 0 | 0 | **0** | (18,009) |
| 1967 | 40,224 | 0 | **40,224** | 0 | 0 | 0 | **0** | (40,224) |
| 1968 | 27,683 | (117) | **27,565** | 3,424 | 187 | 245 | **3,857** | (23,709) |
| 1969 | 45,824 | (19) | **45,804** | 3,804 | 205 | 271 | **4,280** | (41,524) |
| 1970 | 24,213 | 32 | **24,244** | 5,423 | 263 | 465 | **6,152** | (18,092) |
| 1971 | 12,928 | 181 | **13,109** | 5,921 | 284 | 504 | **6,709** | (6,399) |
| 1972 | 8,380 | 183 | **8,563** | 6,869 | 234 | 455 | **7,558** | (1,006) |
| 1973 | 3,156 | 262 | **3,418** | 7,393 | 251 | 488 | **8,132** | 4,714 |
| 1974 | 3,939 | 289 | **4,228** | 7,917 | 268 | 521 | **8,706** | 4,478 |
| 1975 | 1,350 | 316 | **1,666** | 8,441 | 285 | 554 | **9,280** | 7,614 |
| 1976 | 1,302 | 316 | **1,618** | 8,965 | 302 | 587 | **9,854** | 8,236 |
| 1977 | 709 | 316 | **1,025** | 9,489 | 319 | 620 | **10,428** | 9,403 |
| 1978 | 11,766 | 316 | **12,083** | 10,013 | 336 | 654 | **11,002** | (1,080) |
| 1979 | 34,180 | 316 | **34,496** | 10,537 | 353 | 687 | **11,577** | (22,920) |
| 1980 | 9,056 | 316 | **9,372** | 11,061 | 370 | 720 | **12,151** | 2,779 |
| 1981 | 4,937 | 316 | **5,253** | 11,585 | 387 | 753 | **12,725** | 7,472 |
| 1982 | 5,969 | 316 | **6,285** | 12,109 | 404 | 786 | **13,299** | 7,013 |
| 1983 | 304 | 316 | **620** | 12,633 | 421 | 819 | **13,873** | 13,253 |
| 1984 | 144 | 316 | **460** | 13,157 | 438 | 853 | **14,447** | 13,987 |
| 1985 | 130 | 316 | **447** | 13,681 | 455 | 886 | **15,021** | 14,575 |
| 1986 | 0 | 316 | **316** | 14,205 | 472 | 919 | **15,596** | 15,279 |
| 1987 | 0 | 316 | **316** | 14,729 | 489 | 952 | **16,170** | 15,853 |
| 1988 | 0 | 316 | **316** | 15,253 | 506 | 985 | **16,744** | 16,428 |
| 1989 | 0 | 316 | **316** | 15,777 | 523 | 1,018 | **17,318** | 17,002 |
| 1990 | 0 | 316 | **316** | 16,301 | 540 | 1,052 | **17,892** | 17,576 |
| 1991 | 0 | 316 | **316** | 16,825 | 557 | 1,085 | **18,466** | 18,150 |
| 1992 | 0 | 316 | **316** | 17,349 | 574 | 1,118 | **19,040** | 18,724 |
| 1993 | 0 | 316 | **316** | 17,873 | 591 | 1,151 | **19,614** | 19,298 |
| 1994 | 0 | 316 | **316** | 18,397 | 608 | 1,184 | **20,189** | 19,872 |
| 1995 | 0 | 316 | **316** | 18,921 | 625 | 1,217 | **20,763** | 20,447 |
| 1996 | 0 | 316 | **316** | 19,454 | 635 | 1,235 | **21,325** | 21,008 |
| 1997 | 0 | 316 | **316** | 19,988 | 646 | 1,253 | **21,886** | 21,570 |
| 1998 | 0 | 316 | **316** | 20,522 | 656 | 1,270 | **22,448** | 22,132 |
| 1999 | 0 | 316 | **316** | 21,056 | 667 | 1,288 | **23,010** | 22,694 |
| 2000 | 0 | 316 | **316** | 21,589 | 677 | 1,305 | **23,572** | 23,255 |
| 2001 | 0 | 316 | **316** | 22,123 | 687 | 1,323 | **24,133** | 23,817 |
| 2002 | 0 | 316 | **316** | 22,657 | 698 | 1,340 | **24,695** | 24,379 |
| 2003 | 0 | 316 | **316** | 23,190 | 708 | 1,358 | **25,257** | 24,941 |
| 2004 | 0 | 316 | **316** | 23,724 | 719 | 1,376 | **25,819** | 25,502 |
| 2005 | 0 | 316 | **316** | 24,258 | 729 | 1,393 | **26,380** | 26,064 |
| 2006 | 0 | 316 | **316** | 24,792 | 740 | 1,411 | **26,942** | 26,626 |
| 2007 | 0 | 316 | **316** | 25,325 | 750 | 1,428 | **27,504** | 27,188 |
| 2008 | 0 | 316 | **316** | 25,859 | 761 | 1,446 | **28,066** | 27,749 |
| 2009 | 0 | 316 | **316** | 26,393 | 771 | 1,463 | **28,627** | 28,311 |
| 2010 | 0 | 316 | **316** | 26,927 | 782 | 1,481 | **29,189** | 28,873 |
| 2011 | 0 | 316 | **316** | 27,460 | 792 | 1,499 | **29,751** | 29,435 |
| 2012 | 0 | 316 | **316** | 27,994 | 803 | 1,516 | **30,313** | 29,996 |
| 2013 | 0 | 316 | **316** | 28,528 | 813 | 1,534 | **30,874** | 30,558 |
| 2014 | 0 | 316 | **316** | 29,061 | 824 | 1,551 | **31,436** | 31,120 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 2015 | 0 | 316 | **316** | 29,595 | 834 | 1,569 | **31,998** | 31,682 |
| 2016 | 0 | 316 | **316** | 30,129 | 844 | 1,586 | **32,560** | 32,243 |
| 2017 | 0 | 316 | **316** | 30,663 | 855 | 1,604 | **33,121** | 32,805 |
| 2018 | 0 | 316 | **316** | 31,196 | 865 | 1,622 | **33,683** | 33,367 |
| 2019 | 0 | 316 | **316** | 31,730 | 876 | 1,639 | **34,245** | 33,929 |
| 2020 | 0 | 316 | **316** | 32,264 | 886 | 1,657 | **34,807** | 34,491 |
| 2021 | 0 | 316 | **316** | 32,797 | 897 | 1,674 | **35,369** | 35,052 |
| 2022 | 0 | 316 | **316** | 33,331 | 907 | 1,692 | **35,930** | 35,614 |
| 2023 | 0 | 316 | **316** | 33,865 | 918 | 1,709 | **36,492** | 36,176 |
| 2024 | 0 | 316 | **316** | 34,399 | 928 | 1,727 | **37,054** | 36,738 |
| 2025 | (37,409) | 0 | **(37,409)** | 0 | 0 | 0 | **0** | 37,409 |
| Total | 218,932 | 16,621 | **235,553** | 1,108,913 | 33,916 | 64,498 | **1,207,327** | 971,773 |
| Discounted Total | 161,546 | 2,645 | **164,191** | 130,097 | 4.440 | 8,353 | **142,891** | (21,300) |
| | | | | | **Net Present Value ($1000):** | | | **132,292** |
| | | | | | **IRR (%):** | | | **8.8** |
| | | | | | **Benefits/Costs Ratio:** | | | **1.50** |

Note: Discount rate is 7%.

## Exhibit B-7
## TRAVEL EFFICIENCIES BENEFIT COST ANALYSIS
## Corridor J - KY, TN
## (1995 $1,000)

| Year | Construction Costs | Maintenance Costs | **TOTAL COSTS** | Time Savings | VOC Savings | Accidents Savings | **TOTAL SAVINGS** | NET BENEFITS |
|---|---|---|---|---|---|---|---|---|
| 1965 | 758 | 0 | **758** | 0 | 0 | 0 | **0** | (758) |
| 1966 | 4,673 | 0 | **4,673** | 0 | 0 | 0 | **0** | (4,673) |
| 1967 | 8,478 | 0 | **8,478** | 0 | 0 | 0 | **0** | (8,478) |
| 1968 | 7,114 | 0 | **7,114** | 0 | 0 | 0 | **0** | (7,114) |
| 1969 | 11,419 | 0 | **11,419** | 0 | 0 | 0 | **0** | (11,419) |
| 1970 | 16,599 | (30) | **16,569** | 174 | (14) | (46) | **114** | (16,456) |
| 1971 | 37,119 | (20) | **37,100** | 182 | (15) | (48) | **119** | (36,981) |
| 1972 | 24,212 | (10) | **24,202** | 190 | (16) | (50) | **124** | (24,078) |
| 1973 | 46,960 | 21 | **46,981** | 74 | (219) | (168) | **(314)** | (47,295) |
| 1974 | 57,803 | 5 | **57,808** | 2,424 | (376) | 141 | **2,189** | (55,619) |
| 1975 | 31,028 | 1 | **31,029** | 4,366 | (415) | 143 | **4,095** | (26,934) |
| 1976 | 30,929 | 208 | **31,137** | 6,215 | (429) | 239 | **6,025** | (25,112) |
| 1977 | 29,762 | 438 | **30,200** | 8,270 | 27 | 229 | **8,526** | (21,674) |
| 1978 | 35,152 | 601 | **35,753** | 8,802 | 58 | 235 | **9,094** | (26,658) |
| 1979 | 36,853 | 789 | **37,642** | 16,157 | 945 | 51 | **17,153** | (20,488) |
| 1980 | 25,775 | 968 | **26,743** | 17,500 | 669 | 124 | **18,293** | (8,450) |
| 1981 | 27,519 | 1,265 | **28,784** | 20,652 | 929 | (6) | **21,576** | (1,208) |
| 1982 | 19,086 | 1,562 | **20,647** | 21,856 | 981 | (9) | **22,828** | 2,181 |
| 1983 | 14,353 | 1,760 | **16,113** | 23,060 | 1,032 | (12) | **24,080** | 7,966 |
| 1984 | 10,847 | 1,857 | **12,704** | 25,608 | 1,175 | 189 | **26,971** | 14,267 |
| 1985 | 12,771 | 1,886 | **14,657** | 26,883 | 1,230 | 195 | **28,308** | 13,650 |
| 1986 | 12,749 | 1,916 | **14,665** | 28,158 | 1,286 | 201 | **29,645** | 14,980 |
| 1987 | 19,405 | 1,945 | **21,350** | 29,433 | 1,342 | 207 | **30,982** | 9,632 |
| 1988 | 12,611 | 2,036 | **14,647** | 39,881 | 2,709 | (237) | **42,353** | 27,706 |
| 1989 | 13,793 | 2,127 | **15,920** | 41,362 | 2,792 | (238) | **43,915** | 27,995 |
| 1990 | 11,904 | 2,271 | **14,175** | 48,829 | 1,482 | (821) | **49,490** | 35,315 |
| 1991 | 26,254 | 2,552 | **28,806** | 50,798 | 911 | (1,134) | **50,574** | 21,768 |
| 1992 | 27,668 | 2,743 | **30,410** | 52,678 | 914 | (1,165) | **52,428** | 22,017 |
| 1993 | 8,887 | 2,933 | **11,821** | 54,558 | 918 | (1,195) | **54,282** | 42,461 |
| 1994 | 5,241 | 2,964 | **8,205** | 56,439 | 922 | (1,226) | **56,135** | 47,931 |
| 1995 | 2,693 | 2,964 | **5,657** | 58,319 | 926 | (1,256) | **57,989** | 52,332 |
| 1996 | 0 | 2,964 | **2,964** | 68,803 | 1,697 | (1,649) | **68,851** | 65,887 |
| 1997 | 0 | 2,964 | **2,964** | 79,287 | 2,468 | (2,042) | **79,713** | 76,749 |
| 1998 | 0 | 2,964 | **2,964** | 89,770 | 3,239 | (2,435) | **90,574** | 87,611 |
| 1999 | 0 | 2,964 | **2,964** | 100,254 | 4,010 | (2,828) | **101,436** | 98,472 |
| 2000 | 0 | 2,964 | **2,964** | 110,738 | 4,780 | (3,220) | **112,298** | 109,334 |
| 2001 | 0 | 2,964 | **2,964** | 121,222 | 5,551 | (3,613) | **123,160** | 120,196 |
| 2002 | 0 | 2,964 | **2,964** | 131,705 | 6,322 | (4,006) | **134,021** | 131,058 |
| 2003 | 0 | 2,964 | **2,964** | 142,189 | 7,093 | (4,399) | **144,883** | 141,919 |
| 2004 | 0 | 2,964 | **2,964** | 152,673 | 7,864 | (4,792) | **155,745** | 152,781 |
| 2005 | 0 | 2,964 | **2,964** | 163,156 | 8,635 | (5,184) | **166,607** | 163,643 |
| 2006 | 0 | 2,964 | **2,964** | 173,640 | 9,405 | (5,577) | **177,468** | 174,504 |
| 2007 | 0 | 2,964 | **2,964** | 184,124 | 10,176 | (5,970) | **188,330** | 185,366 |
| 2008 | 0 | 2,964 | **2,964** | 194,608 | 10,947 | (6,363) | **199,192** | 196,228 |
| 2009 | 0 | 2,964 | **2,964** | 205,091 | 11,718 | (6,756) | **210,054** | 207,090 |
| 2010 | 0 | 2,964 | **2,964** | 215,575 | 12,489 | (7,148) | **220,915** | 217,951 |
| 2011 | 0 | 2,964 | **2,964** | 226,059 | 13,260 | (7,541) | **231,777** | 228,813 |
| 2012 | 0 | 2,964 | **2,964** | 236,542 | 14,030 | 11,934) | **242,639** | 239,675 |
| 2013 | 0 | 2,964 | **2,964** | 247,026 | 14,801 | (8,327) | **253,501** | 250,537 |
| 2014 | 0 | 2,964 | **2,964** | 257,510 | 15,572 | (8,720) | **264,362** | 261,398 |
| 2015 | 0 | 2,964 | **2,964** | 267,994 | 16,343 | (9,112) | **275,224** | 272,260 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 2016 | 0 | 2,964 | **2,964** | 278,477 | 17,114 | (9,505) | **286,086** | 283,122 |
| 2017 | 0 | 2,964 | **2,964** | 288,961 | 17,885 | (9,898) | **296,948** | 293,984 |
| 2018 | 0 | 2,964 | **2,964** | 299,445 | 18,655 | (10,291) | **307,809** | 304,845 |
| 2019 | 0 | 2,964 | **2,964** | 309,928 | 19,426 | (10,684) | **318,671** | 315,707 |
| 2020 | 0 | 2,964 | **2,964** | 320,412 | 20,197 | (11,077) | **329,533** | 326,569 |
| 2021 | 0 | 2,964 | **2,964** | 330,896 | 20,968 | (11,469) | **340,395** | 337,431 |
| 2022 | 0 | 2,964 | **2,964** | 341,380 | 21,739 | (11,862) | **351,256** | 348,292 |
| 2023 | 0 | 2,964 | **2,964** | 351,863 | 22,510 | (12,255) | **362,118** | 359,154 |
| 2024 | 0 | 2,964 | **2,964** | 362,347 | 23,281 | (12,648) | **372,980** | 370,016 |
| 2025 | (150,216) | 0 | **(150,216)** | 0 | 0 | 0 | **0** | 150,216 |
| Total | 480,198 | 121,704 | **601,902** | 6,894,540 | 381,940 | (212,964) | **7,063,517** | 6,461,615 |
| Discounted Total | 251,514 | 11,865 | **263,380** | 386,875 | 17,518 | (8,721) | **395,672** | 132,292 |
| | | | | | **Net Present Value ($1000):** | | | **132,292** |
| | | | | | **IRR (%):** | | | **8.8** |
| | | | | | **Benefits/Costs Ratio:** | | | **1.50** |

Note: Discount rate is 7%.

## Exhibit B-8
## TRAVEL EFFICIENCIES BENEFIT COST ANALYSIS
## West Virginia – Corridor L
## Undiscounted 1995 $1,000

| Year | Construction Costs | Maintenance Costs | **TOTAL COSTS** | Time Savings | VOC Savings | Accidents Savings | **TOTAL SAVINGS** | NET BENEFITS |
|---|---|---|---|---|---|---|---|---|
| 1965 | 0 | 0 | **0** | 0 | 0 | 0 | **0** | 0 |
| 1966 | 726 | 0 | **726** | 0 | 0 | 0 | **0** | (726) |
| 1967 | 3,240 | 0 | **3,240** | 0 | 0 | 0 | **0** | (3,240) |
| 1968 | 7,776 | 0 | **7,776** | 0 | 0 | 0 | **0** | (7,776) |
| 1969 | 27,285 | 0 | **27,285** | 0 | 0 | 0 | **0** | (27,285) |
| 1970 | 63,388 | 0 | **63,388** | 0 | 0 | 0 | **0** | (63,388) |
| 1971 | 94,615 | 24 | **94,639** | 2,224 | (121) | 567 | **2,669** | (91,970) |
| 1972 | 69,595 | 76 | **69,672** | 4,444 | 266 | 1,248 | **5,958** | (63,713) |
| 1973 | 63,422 | 129 | **63,550** | 4,993 | 287 | 1,356 | **6,636** | (56,914) |
| 1974 | 66,779 | 269 | **67,047** | 6,625 | (487) | 1,289 | **7,426** | (59,621) |
| 1975 | 21,448 | 384 | **21,833** | 7,402 | (561) | 1,381 | **8,222** | (13,610) |
| 1976 | 11,115 | 472 | **11,588** | 8,179 | (635) | 1,474 | **9,018** | (2,569) |
| 1977 | 13,225 | 579 | **13,804** | 9,169 | (1,603) | 1,080 | **8,646** | (5,157) |
| 1978 | 10,158 | 614 | **10,772** | 10,960 | (1,798) | 1,372 | **10,535** | (238) |
| 1979 | 2,708 | 649 | **3,357** | 12,013 | (1,955) | 1,458 | **11,516** | 8,159 |
| 1980 | 1,318 | 698 | **2,017** | 13,658 | (2,113) | 1,652 | **13,197** | 11,180 |
| 1981 | 1,106 | 729 | **1,834** | 14,746 | (2,266) | 1,745 | **14,226** | 12,391 |
| 1982 | 26 | 743 | **769** | 15,834 | (2,418) | 1,839 | **15,254** | 14,486 |
| 1983 | 9 | 756 | **766** | 16,922 | (2,571) | 1,932 | **16,283** | 15,517 |
| 1984 | 3 | 756 | **759** | 18,010 | (2,724) | 2,025 | **17,312** | 16,553 |
| 1985 | 1 | 756 | **758** | 19,098 | (2,876) | 2,119 | **18,341** | 17,583 |
| 1986 | 0 | 756 | **756** | 20,186 | (3,029) | 2,212 | **19,370** | 18,613 |
| 1987 | 0 | 756 | **756** | 21,275 | (3,182) | 2,305 | **20,398** | 19,642 |
| 1988 | 0 | 756 | **756** | 22,363 | (3,334) | 2,399 | **21,427** | 20,671 |
| 1989 | 0 | 756 | **756** | 23,451 | (3,487) | 2,492 | **22,456** | 21,699 |
| 1990 | 0 | 756 | **756** | 24,539 | (3,640) | 2,585 | **23,485** | 22,728 |
| 1991 | 0 | 756 | **756** | 25,627 | (3,792) | 2,679 | **24,513** | 23,757 |
| 1992 | 0 | 756 | **756** | 26,715 | (3,945) | 2,772 | **25,542** | 24,786 |
| 1993 | 0 | 756 | **756** | 27,803 | (4,097) | 2,865 | **26,571** | 25,815 |
| 1994 | 0 | 756 | **756** | 28,891 | (4,250) | 2,959 | **27,600** | 26,843 |
| 1995 | 0 | 824 | **824** | 41,980 | (4,270) | 6,235 | **43,946** | 43,122 |
| 1996 | 0 | 891 | **891** | 45,696 | (4,364) | 6,599 | **47,931** | 47,040 |
| 1997 | 0 | 958 | **958** | 49,412 | (4,458) | 6,962 | **51,916** | 50,958 |
| 1998 | 0 | 1,025 | **1,025** | 53,128 | (4,552) | 7,326 | **55,901** | 54,876 |
| 1999 | 0 | 1,025 | **1,025** | 56,843 | (4,646) | 7,689 | **59,887** | 58,861 |
| 2000 | 0 | 1,025 | **1,025** | 60,559 | (4,740) | 8,052 | **63,872** | 62,847 |
| 2001 | 0 | 1,025 | **1,025** | 64,275 | (4,834) | 8,416 | **67,857** | 66,832 |
| 2002 | 0 | 1,025 | **1,025** | 67,991 | (4,928) | 8,779 | **71,842** | 70,817 |
| 2003 | 0 | 1,025 | **1,025** | 71,707 | (5,022) | 9,143 | **75,828** | 74,802 |
| 2004 | 0 | 1,025 | **1,025** | 75,423 | (5,116) | 9,506 | **79,813** | 78,788 |
| 2005 | 0 | 1,025 | **1,025** | 79,139 | (5,210) | 9,869 | **83,798** | 82,773 |
| 2006 | 0 | 1,025 | **1,025** | 82,854 | (5,304) | 10,233 | **87,784** | 86,758 |
| 2007 | 0 | 1,025 | **1,025** | 86,570 | (5,398) | 10,596 | **91,769** | 90,743 |
| 2008 | 0 | 1,025 | **1,025** | 90,286 | (5,492) | 10,960 | **95,754** | 94,729 |
| 2009 | 0 | 1,025 | **1,025** | 94,002 | (5,586) | 11,323 | **99,739** | 98,714 |
| 2010 | 0 | 1,025 | **1,025** | 97,718 | (5,680) | 11,686 | **103,725** | 102,699 |
| 2011 | 0 | 1,025 | **1,025** | 101,434 | (5,774) | 12,050 | **107,710** | 106,684 |
| 2012 | 0 | 1,025 | **1,025** | 105,150 | (5,868) | 12,413 | **111,695** | 110,670 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 2013 | 0 | 1,025 | **1,025** | 108,865 | (5,962) | 12,777 | **115,680** | 114,655 |
| 2014 | 0 | 1,025 | **1,025** | 112,581 | (6,056) | 13,140 | **119,666** | 118,640 |
| 2015 | 0 | 1,025 | **1,025** | 116,297 | (6,150) | 13,503 | **123,651** | 122,626 |
| 2016 | 0 | 1,025 | **1,025** | 120,013 | (6,244) | 13,867 | **127,636** | 126,611 |
| 2017 | 0 | 1,025 | **1,025** | 123,729 | (6,337) | 14,230 | **131,621** | 130,596 |
| 2018 | 0 | 1,025 | **1,025** | 127,445 | (6,431) | 14,594 | **135,607** | 134,581 |
| 2019 | 0 | 1,025 | **1,025** | 131,161 | (6,525) | 14,957 | **139,592** | 138,567 |
| 2020 | 0 | 1,025 | **1,025** | 134,876 | (6,619) | 15,320 | **143,577** | 142,552 |
| 2021 | 0 | 1,025 | **1,025** | 138,592 | (6,713) | 15,684 | **147,562** | 146,537 |
| 2022 | 0 | 1,025 | **1,025** | 142,308 | (6,807) | 16,047 | **151,548** | 150,522 |
| 2023 | 0 | 1,025 | **1,025** | 146,024 | (6,901) | 16,411 | **155,533** | 154,508 |
| 2024 | 0 | 1,025 | **1,025** | 149,740 | (6,995) | 16,774 | **159,518** | 158,493 |
| 2025 | (32,105) | 0 | **(32,105)** | 0 | 0 | 0 | **0** | 32,105 |
| Total | 425,841 | 44,799 | **470,640** | 3,260,925 | (223,309) | 390,945 | **3,428,561** | 2,957,921 |
| Discounted Total | 264,599 | 5,460 | **270,059** | 222,867 | (20,963) | 28,459 | **230,363** | (39,696) |

| | |
|---|---|
| **Net Present Value ($1000):** | (39,696) |
| **IRR (%):** | 6.3 |
| **Benefits/Costs Ratio:** | 0.85 |

Note: Discount rate is 7%.

## Exhibit B-9
## TRAVEL EFFICIENCIES BENEFIT COST ANALYSIS
## Pennsylvania - Corridor P
## Undiscounted 1995 $1,000

| Year | Costs | Construction Maintenance Costs | **TOTAL COSTS** | Time Savings | VEC Savings | Accidents Savings | **TOTAL SAVINGS** | NET BENEFITS |
|---|---|---|---|---|---|---|---|---|
| 1965 | 0 | 0 | **0** | 0 | 0 | 0 | **0** | 0 |
| 1966 | 2,632 | 0 | **2,632** | 0 | 0 | 0 | **0** | (2,632) |
| 1967 | 9,616 | 0 | **9,616** | 0 | 0 | 0 | **0** | (9,616) |
| 1968 | 7,640 | 0 | **7,640** | 0 | 0 | 0 | **0** | (7,640) |
| 1969 | 19,592 | 33 | **19,625** | 13 | (1,247) | (663) | **(1,898)** | (21,523) |
| 1970 | 33,780 | 66 | **33,847** | (5) | (1,268) | (680) | **(1,953)** | (35,800) |
| 1971 | 25,699 | 233 | **25,932** | 4,839 | (239) | (553) | **4,048** | (21,885) |
| 1972 | 39,707 | 471 | **40,178** | 8,887 | (459) | (1,122) | **7,306** | (32,872) |
| 1973 | 77,208 | 794 | **78,002** | 13,578 | (1,191) | (1,841) | **10,547** | (67,456) |
| 1974 | 69,977 | 1,117 | **71,094** | 14,292 | (1,166) | (1,864) | **11,262** | (59,832) |
| 1975 | 72,899 | 1,295 | **74,194** | 15,005 | (1,142) | (1,886) | **11,977** | (62,217) |
| 1976 | 33,022 | 1,429 | **34,451** | 16,950 | (1,223) | (1,563) | **14,164** | (20,287) |
| 1977 | 24,388 | 1,444 | **25,832** | 17,669 | (1,199) | (1,584) | **14,886** | (10,945) |
| 1978 | 9,694 | 1,459 | **11,153** | 18,389 | (1,175) | (1,605) | **15,609** | 4,455 |
| 1979 | 7,082 | 1,516 | **8,598** | 23,138 | (1,137) | (405) | **21,596** | 12,998 |
| 1980 | 19,017 | 1,558 | **20,575** | 23,857 | (1,113) | (427) | **22,318** | 1,743 |
| 1981 | 5,723 | 1,600 | **7,323** | 24,577 | (1,089) | (448) | **23,040** | 15,717 |
| 1982 | 3,238 | 1,642 | **4,880** | 25,296 | (1,065) | (469) | **23,762** | 18,882 |
| 1983 | 3,095 | 1,642 | **4,737** | 26,016 | (1,041) | (4901 | **24,485** | 19,747 |
| 1984 | 36 | 1,642 | **1,678** | 26,735 | (1,017) | (511) | **25,207** | 23,529 |
| 1985 | 33 | 1,642 | **1,675** | 27,454 | (993) | (532) | **25,929** | 24,254 |
| 1986 | 1,210 | 1,642 | **2,853** | 28,174 | (969) | (553) | **26,651** | 23,799 |
| 1987 | 4,324 | 1,642 | **5,966** | 28,893 | (945) | (574) | **27,374** | 21,408 |
| 1988 | 1,224 | 1,642 | **2,867** | 29,613 | (921) | (595) | **28,096** | 25,229 |
| 1989 | 606 | 1,642 | **2,248** | 30,332 | (897) | (616) | **28,818** | 26,570 |
| 1990 | 602 | 1,642 | **2,244** | 31,051 | (873) | (637) | **29,541** | 27,297 |
| 1991 | 0 | 1,642 | **1,642** | 31,771 | (849) | (658) | **30,263** | 28,621 |
| 1992 | 0 | 1,642 | **1,642** | 32,490 | (826) | (680) | **30,985** | 29,343 |
| 1993 | 0 | 1,642 | **1,642** | 33,210 | (802) | (701) | **31,707** | 30,065 |
| 1994 | 0 | 1,642 | **1,642** | 33,929 | (778) | (722) | **32,430** | 30,788 |
| 1995 | 0 | 1,642 | **1,642** | 34,648 | (754) | (743) | **33,152** | 31,510 |
| 1996 | 0 | 1,642 | **1,642** | 37,931 | (761) | (771) | **36,398** | 34,756 |
| 1997 | 0 | 1,642 | **1,642** | 41,213 | (769) | (799) | **39,645** | 38,003 |
| 1998 | 0 | 1,642 | **1,642** | 44,495 | (777) | (827) | **42,891** | 41,249 |
| 1999 | 0 | 1,642 | **1,642** | 47,778 | (784) | (855) | **46,138** | 44,496 |
| 2000 | 0 | 1,642 | **1,642** | 51,060 | (792) | (883) | **49,384** | 47,742 |
| 2001 | 0 | 1,642 | **1,642** | 54,342 | (800) | (911) | **52,631** | 50,989 |
| 2002 | 0 | 1,642 | **1,642** | 57,624 | (808) | (940) | **55,877** | 54,235 |
| 2003 | 0 | 1,642 | **1,642** | 60,907 | (815) | (968) | **59,124** | 57,482 |
| 2004 | 0 | 1,642 | **1,642** | 64,189 | (823) | (996) | **62,370** | 60,728 |
| 2005 | 0 | 1,642 | **1,642** | 67,471 | (831) | (1,024) | **65,617** | 63,975 |
| 2006 | 0 | 1,642 | **1,642** | 70,754 | (838) | (1,052) | **68,863** | 67,221 |
| 2007 | 0 | 1,642 | **1,642** | 74,036 | (846) | (1,080) | **72,110** | 70,468 |
| 2008 | 0 | 1,642 | **1,642** | 77,318 | (854) | (1,108) | **75,356** | 73,714 |
| 2009 | 0 | 1,642 | **1,642** | 80,601 | (861) | (1,136) | **78,603** | 76,961 |
| 2010 | 0 | 1,642 | **1,642** | 83,883 | (869) | (1,165) | **81,849** | 80,207 |
| 2011 | 0 | 1,642 | **1,642** | 87,165 | (877) | (1,193) | **85,096** | 83,454 |
| 2012 | 0 | 1,642 | **1,642** | 90,447 | (885) | (1,221) | **88,342** | 86,700 |
| 2013 | 0 | 1,642 | **1,642** | 93,730 | (892) | (1,249) | **91,589** | 89,947 |
| 2014 | 0 | 1,642 | **1,642** | 97,012 | (900) | (1,277) | **94,835** | 93,193 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 2015 | 0 | 1,642 | **1,642** | 100,294 | (908) | (1,305) | **98,082** | 96,440 |
| 2016 | 0 | 1,642 | **1,642** | 103,577 | (915) | (1,333) | **101,328** | 99,686 |
| 2017 | 0 | 1,642 | **1,642** | 106,859 | (923) | (1,361) | **104,575** | 102,932 |
| 2018 | 0 | 1,642 | **1,642** | 110,141 | (931) | (1,389) | **107,821** | 106,179 |
| 2019 | 0 | 1,642 | **1,642** | 113,424 | (938) | (1,418) | **111,068** | 109,425 |
| 2020 | 0 | 1,642 | **1,642** | 116,706 | (946) | (1,446) | **114,314** | 112,672 |
| 2021 | 0 | 1,642 | **1,642** | 119,988 | (954) | (1,474) | **117,560** | 115,918 |
| 2022 | 0 | 1,642 | **1,642** | 123,271 | (962) | (1,502) | **120,807** | 119,165 |
| 2023 | 0 | 1,642 | **1,642** | 126,553 | (969) | (1,530) | **124,053** | 122,411 |
| 2024 | 0 | 1,642 | **1,642** | 129,835 | (977) | (1,558) | **127,300** | 125,658 |
| 2025 | (73,473) | 0 | **(73,473)** | 0 | | 0 | **0** | 73,473 |
| Total | 398,573 | 83,626 | **482,199** | 3,033,405 | (51,586) | (56,891) | **2,924,929** | 2,442,730 |
| Discounted | | | | | | | | |
| Total | 245,423 | 12,507 | **257,930** | 261,422 | (10,412) | (10,354) | **240,656** | (17,274) |
| | | | | | **Net present Value ($1000):** | | | **(17,274)** |
| | | | | | **IRR (%):** | | | **6.6** |
| | | | | | **Benefits/costs Ratio:** | | | **0.93** |

Note: Discount rate is 7%.

## Exhibit 8-10
## TRAVEL EFFICIENCIES BENEFIT COST ANALYSIS
## Corridor Q - VA, WV
## Undiscounted 1995 $1,000

| Year | Construction Costs | Maintenance Costs | **TOTAL COSTS** | Time Savings | VOC Savings | Accidents Savings | **TOTAL SAVINGS** | NET BENEFITS |
|---|---|---|---|---|---|---|---|---|
| 1965 | 5,138 | 0 | **5,138** | 0 | 0 | 0 | **0** | (5,138) |
| 1966 | 21,578 | 0 | **21,578** | 0 | 0 | 0 | **0** | (21,578) |
| 1967 | 23,586 | (30) | **23,557** | 1,029 | (434) | (271) | **324** | (23,232) |
| 1968 | 25,223 | (40) | **25,182** | 2,405 | (411) | 306 | **2,300** | (22,882) |
| 1969 | 20,106 | 26 | **20,132** | 7,099 | (31) | 646 | **7,715** | (12,418) |
| 1970 | 33,820 | 129 | **33,949** | 7,474 | (46) | 663 | **8,091** | (25,858) |
| 1971 | 63,749 | 205 | **63,954** | 7,850 | (61) | 679 | **8,468** | (55,487) |
| 1972 | 80,618 | 183 | **80,801** | 9,259 | (250) | 1,169 | **10,178** | (70,623) |
| 1973 | 87,915 | 246 | **88,161** | 14,839 | (599) | 1,636 | **15,876** | (72,285) |
| 1974 | 39,982 | 342 | **40,324** | 15,925 | (636) | 1,696 | **16,984** | (23,340) |
| 1975 | 30,090 | 364 | **30,454** | 20,091 | (1,323) | 2,436 | **21,204** | (9,250) |
| 1976 | 44,213 | 490 | **44,703** | 21,327 | (1,3891 | 2,528 | **22,465** | (22,238) |
| 1977 | 36,077 | 593 | **36,670** | 24,989 | (1,773) | 2,788 | **26,003** | (10,666) |
| 1978 | 14,021 | 554 | **14,575** | 40,445 | (2,826) | 4,924 | **42,543** | 27,968 |
| 1979 | 11,188 | 755 | **11,943** | 42,522 | (2,956) | 5,098 | **44,664** | 32,721 |
| 1980 | 10,645 | 956 | **11,601** | 44,599 | (3,087) | 5,273 | **46,785** | 35,184 |
| 1981 | 3,067 | 1,118 | **4,185** | 46,676 | (3,218) | 5,447 | **48,906** | 44,721 |
| 1982 | 1,671 | 1,118 | **2,789** | 48,753 | (3,349) | 5,622 | **51,027** | 48,237 |
| 1983 | 1,857 | 1,118 | **2,975** | 50,831 | (3,480) | 5,796 | **53,147** | 50,172 |
| 1984 | 3,173 | 1,118 | **4,291** | 52,908 | (3,610) | 5,971 | **55,268** | 50,977 |
| 1985 | 3,929 | 1,118 | **5,048** | 54,985 | (3,741) | 6,145 | **57,389** | 52,341 |
| 1986 | 1,410 | 1,039 | **2,450** | 65,154 | (4,252) | 8,005 | **68,907** | 66,457 |
| 1987 | 1,418 | 1,105 | **2,523** | 67,231 | (4,383) | 8,179 | **71,028** | 68,505 |
| 1988 | 2,410 | 1,171 | **3,580** | 69,308 | (4,513) | 8,354 | **73,149** | 69,569 |
| 1989 | 2,333 | 1,236 | **3,569** | 71,386 | (4,644) | 8,528 | **75,269** | 71,701 |
| 1990 | 6,406 | 1,236 | **7,642** | 73,463 | (4,775) | 8,703 | **77,390** | 69,749 |
| 1991 | 2,152 | 1,236 | **3,388** | 75,540 | (4,906) | 8,877 | **79,511** | 76,123 |
| 1992 | 954 | 1,236 | **2,190** | 77,617 | (5,036) | 9,052 | **81,632** | 79,442 |
| 1993 | 926 | 1,236 | **2,162** | 79,694 | (5,167) | 9,226 | **83,753** | 81,591 |
| 1994 | 0 | 1,236 | **1,236** | 81,771 | (5,298) | 9,401 | **85,873** | 84,637 |
| 1995 | 0 | 1,236 | **1,236** | 83,848 | (5,429) | 9,575 | **87,994** | 86,758 |
| 1996 | 0 | 1,236 | **1,236** | 87,972 | (5,676) | 9,903 | **92,198** | 90,962 |
| 1997 | 0 | 1,236 | **1,236** | 92,096 | (5,923) | 10,230 | **96,403** | 95,167 |
| 1998 | 0 | 1,236 | **1,236** | 96,220 | (6,171) | 10,558 | **100,607** | 99,371 |
| 1999 | 0 | 1,236 | **1,236** | 100,344 | (6,418) | 10,886 | **104,812** | 103,576 |
| 2000 | 0 | 1,236 | **1,236** | 104,468 | (6,665) | 11,213 | **109,016** | 107,780 |
| 2001 | 0 | 1,236 | **1,236** | 108,592 | (6,912) | 11,541 | **113,220** | 111,984 |
| 2002 | 0 | 1,236 | **1,236** | 112,716 | (7,160) | 11,869 | **117,425** | 116,189 |
| 2003 | 0 | 1,236 | **1,236** | 116,840 | (7,407) | 12,196 | **121,629** | 120,393 |
| 2004 | 0 | 1,236 | **1,236** | 120,964 | (7,654) | 12,524 | **125,834** | 124,598 |
| 2005 | 0 | 1,236 | **1,236** | 125,088 | (7,902) | 12,852 | **130,038** | 128,802 |
| 2006 | 0 | 1,236 | **1,236** | 129,212 | (8,149) | 13,179 | **134,243** | 133,006 |
| 2007 | 0 | 1,236 | **1,236** | 133,336 | (8,396) | 13,507 | **138,447** | 137,211 |
| 2008 | 0 | 1,236 | **1,236** | 137,460 | (8,643) | 13,835 | **142,651** | 141,415 |
| 2009 | 0 | 1,236 | **1,236** | 141,584 | (8,891) | 14,162 | **146,856** | 145,620 |
| 2010 | 0 | 1,236 | **1,236** | 145,708 | (9,138) | 14,490 | **151,060** | 149,824 |
| 2011 | 0 | 1,236 | **1,236** | 149,832 | (9,385) | 14,818 | **155,265** | 154,028 |
| 2012 | 0 | 1,236 | **1,236** | 153,956 | (9,632) | 15,145 | **159,469** | 158,233 |
| 2013 | 0 | 1,236 | **1,236** | 158,080 | (9,880) | 15,473 | **163,673** | 162,437 |
| 2014 | 0 | 1,236 | **1,236** | 162,204 | (10,127) | 15,801 | **167,878** | 166,642 |
| 2015 | 0 | 1,236 | **1,236** | 166,328 | (10,374) | 16,128 | **172,082** | 170,846 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 2016 | 0 | 1,236 | **1,236** | 170,452 | (10,622) | 16,456 | **176,287** | 175,051 |
| 2017 | 0 | 1,236 | **1,236** | 174,576 | (10,869) | 16,784 | **180,491** | 179,255 |
| 2018 | 0 | 1,236 | **1,236** | 178,700 | (11,116) | 17,111 | **184,695** | 183,459 |
| 2019 | 0 | 1,236 | **1,236** | 182,824 | (11,363) | 17,439 | **188,900** | 187,664 |
| 2020 | 0 | 1,236 | **1,236** | 186,948 | (11,611) | 17,767 | **193,104** | 191,868 |
| 2021 | 0 | 1,236 | **1,236** | 191,072 | (11,858) | 18,094 | **197,309** | 196,073 |
| 2022 | 0 | 1,236 | **1,236** | 195,196 | (12,105) | 18,422 | **201,513** | 200,277 |
| 2023 | 0 | 1,236 | **1,236** | 199,320 | (12,353) | 18,750 | **205,718** | 204,481 |
| 2024 | 0 | 1,236 | **1,236** | 203,444 | (12,600) | 19,077 | **209,922** | 208,686 |
| 2025 | (128,686) | 0 | **(128,686)** | 0 | 0 | 0 | **0** | 128,686 |
| Total | 450,970 | 58,179 | **509,149** | 5,484,552 | (346,622) | 566,660 | **5,704,590** | 5,195,441 |
| Discounted Total | 320,695 | 7,468 | **328,163** | 501,308 | (31,755) | 55,153 | **524,706** | 196,543 |
| | | | | | **Net Present Value ($1000):** | | | **196,543** |
| | | | | | **IRR (%):** | | | **9.8** |
| | | | | | **Benefits/Costs Ratio:** | | | **1.60** |

Note: Discount rate is 7%.

## Exhibit 8-11
## TRAVEL EFFICIENCIES BENEFIT COST ANALYSIS
## Corridor T - NY, PA
## Undiscounted 1995 $1,000

| Year | Construction Costs | Maintenance Costs | **TOTAL COSTS** | Time Savings | VOC Savings | Accidents Savings | **TOTAL SAVINGS** | NET BENEFITS |
|---|---|---|---|---|---|---|---|---|
| 1965 | 0 | 0 | **0** | 0 | 0 | 0 | **0** | 0 |
| 1966 | 0 | 0 | **0** | 0 | 0 | 0 | **0** | 0 |
| 1967 | 7,685 | 0 | **7,685** | 0 | 0 | 0 | **0** | (7,685) |
| 1968 | 44,957 | 0 | **44,957** | 0 | 0 | 0 | **0** | (44,957) |
| 1969 | 88,510 | 0 | **88,510** | 0 | 0 | 0 | **0** | (88,510) |
| 1970 | 120,097 | 29 | **120,126** | 754 | 90 | (551) | **294** | (119,832) |
| 1971 | 166,109 | 58 | **166,167** | 754 | 90 | (551) | **294** | (165,873) |
| 1972 | 121,071 | 86 | **121,157** | 755 | 90 | (551) | **294** | (120,863) |
| 1973 | 194,892 | 115 | **195,007** | 755 | 90 | (551) | **294** | (194,713) |
| 1974 | 121,338 | 485 | **121,823** | 43,113 | (2,562) | 719 | **41,270** | (80,553) |
| 1975 | 50,879 | 1,068 | **51,947** | 71,727 | (4,794) | 1,526 | **68,459** | 16,512 |
| 1976 | 35,605 | 1,867 | **37,471** | 84,886 | (71) | 3,510 | **88,325** | 50,854 |
| 1977 | 15,859 | 2,665 | **18,525** | 85,671 | (129) | 3,530 | **89,072** | 70,547 |
| 1978 | 15,505 | 3,094 | **18,600** | 86,456 | (188) | 3,550 | **89,818** | 71,218 |
| 1979 | 28,979 | 3,346 | **32,326** | 91,018 | 807 | 4,341 | **96,166** | 63,841 |
| 1980 | 20,967 | 3,466 | **24,434** | 104,179 | 1,445 | 5,047 | **110,671** | 86,237 |
| 1981 | 31,479 | 3,679 | **35,159** | 109,039 | 2,711 | 5,055 | **116,805** | 81,646 |
| 1982 | 30,458 | 3,892 | **34,351** | 109,893 | 2,661 | 5,077 | **117,632** | 83,281 |
| 1983 | 27,055 | 4,149 | **31,205** | 116,094 | 1,376 | 5,709 | **123,179** | 91,975 |
| 1984 | 22,769 | 4,323 | **27,091** | 116,913 | 1,331 | 5,729 | **123,974** | 96,882 |
| 1985 | 23,552 | 4,403 | **27,955** | 117,732 | 1,286 | 5,750 | **124,768** | 96,813 |
| 1986 | 17,381 | 4,536 | **21,917** | 122,530 | 1,993 | 6,642 | **131,165** | 109,248 |
| 1987 | 24,039 | 4,589 | **28,629** | 123,134 | 1,918 | 6,623 | **131,675** | 103,047 |
| 1988 | 17,453 | 4,643 | **22,096** | 123,739 | 1,843 | 6,604 | **132,186** | 110,090 |
| 1989 | 8,356 | 4,845 | **13,202** | 128,439 | 3,006 | 6,372 | **137,818** | 124,616 |
| 1990 | 12,343 | 4,995 | **17,338** | 129,044 | 2,931 | 6,354 | **138,328** | 120,990 |
| 1991 | 4,456 | 5,145 | **9,601** | 129,648 | 2,856 | 6,335 | **138,839** | 129,238 |
| 1992 | 2,563 | 5,295 | **7,858** | 130,253 | 2,781 | 6,316 | **139,349** | 131,491 |
| 1993 | 1,664 | 5,295 | **6,959** | 130,857 | 2,706 | 6,297 | **139,860** | 132,901 |
| 1994 | 163 | 5,339 | **5,502** | 148,459 | 3,153 | 6,922 | **158,534** | 153,031 |
| 1995 | 161 | 5,384 | **5,544** | 149,656 | 3,101 | 6,909 | **159,666** | 154,121 |
| 1996 | 0 | 5,428 | **5,428** | 164,487 | 4,507 | 7,138 | **176,132** | 170,704 |
| 1997 | 0 | 5,472 | **5,472** | 179,319 | 5,914 | 7,366 | **192,599** | 187,127 |
| 1998 | 0 | 5,472 | **5,472** | 194,150 | 7,321 | 7,595 | **209,066** | 203,594 |
| 1999 | 0 | 5,472 | **5,472** | 208,982 | 8,727 | 7,824 | **225,533** | 220,060 |
| 2000 | 0 | 5,472 | **5,472** | 223,813 | 10,134 | 8,052 | **242,000** | 236,527 |
| 2001 | 0 | 5,472 | **5,472** | 238,645 | 11,540 | 8,281 | **258,466** | 252,994 |
| 2002 | 0 | 5,472 | **5,472** | 253,476 | 12,947 | 8,510 | **274,933** | 269,460 |
| 2003 | 0 | 5,472 | **5,472** | 268,308 | 14,353 | 8,738 | **291,400** | 285,927 |
| 2004 | 0 | 5,472 | **5,472** | 283,139 | 15,760 | 8,967 | **307,866** | 302,394 |
| 2005 | 0 | 5,472 | **5,472** | 297,971 | 17,167 | 9,196 | **324,333** | 318,861 |
| 2006 | 0 | 5,472 | **5,472** | 312,802 | 18,573 | 9,424 | **340,800** | 335,327 |
| 2007 | 0 | 5,472 | **5,472** | 327,634 | 19,980 | 9,653 | **357,267** | 351,794 |
| 2008 | 0 | 5,472 | **5,472** | 342,465 | 21,386 | 9,882 | **373,733** | 368,261 |
| 2009 | 0 | 5,472 | **5,472** | 357,297 | 22,793 | 10,110 | **390,200** | 384,728 |
| 2010 | 0 | 5,472 | **5,472** | 372,128 | 24,199 | 10,339 | **406,667** | 401,194 |
| 2011 | 0 | 5,472 | **5,472** | 386,960 | 25,606 | 10,568 | **423,134** | 417,661 |
| 2012 | 0 | 5,472 | **5,472** | 401,791 | 27,013 | 10,796 | **439,600** | 434,128 |
| 2013 | 0 | 5,472 | **5,472** | 416,623 | 28,419 | 11,025 | **456,067** | 450,595 |
| 2014 | 0 | 5,472 | **5,472** | 431,454 | 29,826 | 11,254 | **472,534** | 467,061 |
| 2015 | 0 | 5,472 | **5,472** | 446,286 | 31,232 | 11,482 | **489,001** | 483,528 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 2016 | 0 | 5,472 | **5,472** | 461,117 | 32,639 | 11,711 | **505,467** | 499,995 |
| 2017 | 0 | 5,472 | **5,472** | 475,949 | 34,046 | 11,940 | **521,934** | 516,462 |
| 2018 | 0 | 5,472 | **5,472** | 490,780 | 35,452 | 12,168 | **538,401** | 532,928 |
| 2019 | 0 | 5,472 | **5,472** | 505,612 | 36,859 | 12,397 | **554,868** | 549,395 |
| 2020 | 0 | 5,472 | **5,472** | 520,443 | 38,265 | 12,626 | **571,334** | 565,862 |
| 2021 | ' 0 | 5,472 | **5,472** | 535,275 | 39,672 | 12,854 | **587,801** | 582,329 |
| 2022 | 0 | 5,472 | **5,472** | 550,106 | 41,078 | 13,083 | **604,268** | 598,795 |
| 2023 | 0 | 5,472 | **5,472** | 564,938 | 42,485 | 13,312 | **620,734** | 615,262 |
| 2024 | 0 | 5,472 | **5,472** | 579,769 | 43,892 | 13,540 | **637,201** | 631,729 |
| 2025 | (118,900) | 0 | **(118,900)** | 0 | 0 | 0 | **0** | 118,900 |
| Total | 1,137,449 | 245,448 | **1,382,898** | 13,247,222 | 732,306 | **412,545** | **14,392,073** | 13,009,176 |
| Discounted Total | 649,074 | 28,723 | **677,797** | 1,072,564 | 31,299 | 40,120 | **1,143,984** | 466,187 |
| | | | | | **Net Present Value ($1000):** | | | **466,187** |
| | | | | | **IRR (%):** | | | **10.1** |
| | | | | | **Benefits/Costs Ratio:** | | | **1.69** |

Note: Discount rate is 7%.

## Exhibit 8-12
## TRAVEL EFFICIENCIES BENEFIT COST ANALYSIS
## All Corridors
## Undiscounted 1995 $1,000

| Year | Costs | Construction Maintenance Costs | **TOTAL COSTS** | Time Savings | VOC Savings | Accidents Savings | **TOTAL SAVINCS** | NET BENEFITS |
|---|---|---|---|---|---|---|---|---|
| 1965 | 19,909 | 0 | **19,909** | 0 | 0 | 0 | **0** | (19,909) |
| 1966 | 117,538 | 0 | **117,538** | 0 | 0 | 0 | **0** | (117,538) |
| 1967 | 235,723 | (30) | **235,693** | 1,029 | (434) | (271) | **324** | (235,369) |
| 1968 | 335,329 | (246) | **335,083** | 12,364 | 845 | 1,017 | **14,227** | (320,856) |
| 1969 | 539,690 | 146 | **539,836** | 18,415 | (4301 | 831 | **18,817** | (521,020) |
| 1970 | 551,169 | 569 | **551,738** | 30,077 | (1,851) | 1,560 | **29,786** | (521,952) |
| 1971 | 775,138 | 2,022 | **777,160** | 58,268 | (2,389) | 2,516 | **58,395** | (718,765) |
| 1972 | 775,403 | 3,267 | **778,670** | 74,114 | (2,555) | 4,946 | **76,505** | (702,165) |
| 1973 | 848,293 | 4,742 | **853,036** | 95,295 | (3,585) | 7,108 | **98,818** | (754,218) |
| 1974 | 658,782 | 6,863 | **665,645** | 161,532 | (6,650) | 9,804 | **164,686** | (500,959) |
| 1975 | 392,228 | 8,596 | **400,823** | 207,129 | (10,855) | 10,853 | **207,127** | (193,696) |
| 1976 | 288,078 | 10,938 | **299,016** | 238,010 | (6,467) | 14,028 | **245,572** | (53,445) |
| 1977 | 239,777 | 13,071 | **252,848** | 256,640 | (8,676) | 14,465 | **262,429** | 9,581 |
| 1978 | 198,702 | 14,240 | **212,942** | 286,429 | (10,083) | 17,624 | **293,970** | 81,028 |
| 1979 | 232,396 | 16,047 | **248,443** | 321,040 | (7,511) | 20,535 | **334,064** | 85,621 |
| 1980 | 180,917 | 17,483 | **198,400** | 354,774 | (9,826) | 23,089 | **368,037** | 169,637 |
| 1981 | 137,289 | 19,100 | **156,388** | 376,435 | (8,647) | 24,227 | **392,015** | 235,627 |
| 1982 | 174,859 | 20,527 | **195,386** | 394,764 | (9,432) | 25,885 | **411,217** | 215,831 |
| 1983 | 217,589 | 21,413 | **239,002** | 431,235 | (7,531) | 27,966 | **451,670** | 212,668 |
| 1984 | 111,262 | 22,443 | **133,705** | 465,750 | (9,828) | 28,010 | **483,932** | 350,227 |
| 1985 | 87,356 | 23,331 | **110,687** | 487,907 | (10,795) | 29,497 | **506,609** | 395,923 |
| 1986 | 77,073 | 24,166 | **101,239** | 519,392 | (11,274) | 32,753 | **540,871** | 439,632 |
| 1987 | 99,512 | 24,867 | **124,379** | 545,727 | (9,172) | 36,722 | **573,278** | 448,899 |
| 1988 | 74,047 | 25,163 | **99,210** | 574,883 | (8,4701 | 37,256 | **603,669** | 504,460 |
| 1989 | 94,385 | 25,561 | **119,945** | 599,168 | (7,814) | 38,020 | **629,373** | 509,428 |
| 1990 | 65,355 | 25,893 | **91,248** | 625,344 | (9,789) | 38,414 | **653,969** | 562,721 |
| 1991 | 65,859 | 26,324 | **92,184** | 646,020 | (11,025) | 39,078 | **674,073** | 581,889 |
| 1992 | 61,638 | 27,294 | **88,932** | 688,749 | (9,356) | 40,564 | **719,958** | 631,026 |
| 1993 | 19,279 | 28,120 | **47,399** | 710,951 | (10,172) | 41,479 | **742,258** | 694,859 |
| 1994 | 9,813 | 28,840 | **38,653** | 749,495 | (10,334) | 43,070 | **782,231** | 743,578 |
| 1995 | 4,889 | 29,655 | **34,544** | 785,812 | (11,178) | 47,449 | **822,083** | 787,539 |
| 1996 | 0 | 29,840 | **29,840** | 843,690 | (8,325) | 48,579 | **883,944** | 854,103 |
| 1997 | 0 | 30,010 | **30,010** | 901,569 | (5,473) | 49,709 | **945,805** | 915,795 |
| 1998 | 0 | 30,136 | **30,136** | 959,447 | (2,621) | 50,839 | **1,007,666** | 977,530 |
| 1999 | 0 | 30,136 | **30,136** | 1,017,326 | 232 | 51,969 | **1,069,527** | 1,039,391 |
| 2000 | 0 | 30,136 | **30,136** | 1,075,204 | 3,084 | 53,099 | **1,131,388** | 1,101,252 |
| 2001 | 0 | 30,136 | **30,136** | 1,133,083 | 5,936 | 54,229 | **1,193,248** | 1,163,113 |
| 2002 | 0 | 30,136 | **30,136** | 1,190,961 | 8,789 | 55,359 | **1,255,109** | 1,224,974 |
| 2003 | 0 | 30,136 | **30,136** | 1,248,840 | 11,641 | 56,489 | **1,316,970** | 1,286,835 |
| 2004 | 0 | 30,136 | **30,136** | 1,306,719 | 14,493 | 57,619 | **1,378,831** | 1,348,696 |
| 2005 | 0 | 30,136 | **30,136** | 1,364,597 | 17,346 | 58,749 | **1,440,692** | 1,410,557 |
| 2006 | 0 | 30,136 | **30,136** | 1,422,475 | 20,198 | 59,879 | **1,502,553** | 1,472,418 |
| 2007 | 0 | 30,136 | **30,136** | 1,480,354 | 23,051 | 61,009 | **1,564,414** | 1,534,279 |
| 2008 | 0 | 30,136 | **30,136** | 1,538,233 | 25,903 | 62,139 | **1,626,275** | 1,596,140 |
| 2009 | 0 | 30,136 | **30,136** | 1,596,111 | 28,755 | 63,269 | **1,688,136** | 1,658,001 |
| 2010 | 0 | 30,136 | **30,136** | 1,653,990 | 31,608 | 64,400 | **1,749,997** | 1,719,861 |
| 2011 | 0 | 30,136 | **30,136** | 1,711,868 | 34,460 | 65,530 | **1,811,858** | 1,781,722 |
| 2012 | 0 | 30,136 | **30,136** | 1,769,747 | 37,312 | 66,660 | **1,873,719** | 1,843,583 |
| 2013 | 0 | 30,136 | **30,136** | 1,827,625 | 40,165 | 67,790 | **1,935,580** | 1,905,444 |
| 2014 | 0 | 30,136 | **30,136** | 1,885,504 | 43,017 | 68,920 | **1,997,441** | 1,967,305 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 2015 | 0 | 30,136 | **30,136** | 1,943,382 | 45,869 | 70,050 | **2,059,302** | 2,029,166 |
| 2016 | 0 | 30,136 | **30,136** | 2,001,261 | 48,722 | 71,180 | **2,121,163** | 2,091,027 |
| 2017 | 0 | 30,136 | **30,136** | 2,059,140 | 51,574 | 72,310 | **2,183,024** | 2,152,888 |
| 2018 | 0 | 30,136 | **30,136** | 2,117,018 | 54,427 | 73,440 | **2,244,884** | 2,214,749 |
| 2019 | 0 | 30,136 | **30,136** | 2,174,897 | 57,279 | 74,570 | **2,306,745** | 2,276,610 |
| 2020 | 0 | 30,136 | **30,136** | 2,232,775 | 60,131 | 75,700 | **2,368,606** | 2,338,471 |
| 2021 | 0 | 30,136 | **30,136** | 2,290,654 | 62,984 | 76,830 | **2,430,467** | 2,400,332 |
| 2022 | 0 | 30,136 | **30,136** | 2,348,532 | 65,836 | 77,960 | **2,492,328** | 2,462,193 |
| 2023 | 0 | 30,136 | **30,136** | 2,406,411 | 68,688 | 79,090 | **2,554,189** | 2,524,054 |
| 2024 | 0 | 30,136 | **30,136** | 2,464,289 | 71,541 | 80,220 | **2,616,050** | 2,585,914 |
| 2025 | (1,317,797) | 0 | **(1,317,797)** | 0 | 0 | 0 | **0** | 1,317,797 |
| Total | 6,371,480 | 1,343,913 | **7,715,393** | 58,682,453 | 701,340 | **2,526,080** | **61,909,873** | 54,194,480 |
| Discounted | | | | | | | | |
| Total | 3,978,268 | 160,530 | **4,138,798** | 4,678,898 | (32,037) | 247,680 | **4,894,541** | 755,743 |
| | | | | | **Net Present value ($1000):** | | | **755,743** |
| | | | | | **IRR (%):** | | | **7.9** |
| | | | | | **Benefits/Costs Ratio:** | | | **1.18** |

Note: Discount rate is 7%.

## APPENDIX C
## ECONOMIC DEVELOPMENT IMPACTS BY YEAR

One of the advantages afforded by the REMI model is its ability to track economic development impacts over time in a dynamic way. Reasons why the impacts increase over time are because traffic increases, and because population increases, and because the number of ADHS completed highway sections continue to increase; another important reason is that the impacts tend to build on themselves. For example, the study shows that the Appalachian Region number of people and employees increased in part due to the ADHS.

Contained in Appendix C are tables which show how the various economic development impacts are estimated to change over time. As shown, all impact types (employment, population, wages and value added) increase through the entire 1965-2024 analysis period. This is because of the dynamic nature of the economic development process, and because of the dynamic nature of the REMI model.

**Exhibits C-1 through C-4** show the impacts by cause (competitive advantage, roadside services, tourism, and construction), and **Exhibit C-5** presents the total economic development impacts for all eleven studied ADHS corridors.

Each exhibit follows a consistent format in which the first column (Column **A**) is the year, second column (Column **B**) displays the number of new permanent jobs created, the third column (Column **C**) is the additional population created, the fourth column (Column **D**) is the total increase in wages, and the fifth and final column (Column **E**) is the valued added created.

For each of the economic indicators and for each year, the additional jobs, the additional population, the increase in wages, and the increase in value added is determined by the difference between the values of the economic indicators for the control forecast and the values for the economic indicators for the new forecast. The control forecast represents the economic values if none of the ADHS highways were ever built. The values for any year, e.g., 2015, represent the additional jobs, the increase in population, the increase in the value of wages paid out, and the additional value added relative to the control forecast. The values displayed for wages and value added are in millions of dollars.

**Exhibit C-1**
Competitive Advantage Impacts

| A<br>year | B<br>employment | C<br>population | D<br>wages | E<br>value added |
|---|---|---|---|---|
| | | | millions | |
| 1966 | 0 | 0 | 0.00 | 0.00 |
| 1967 | 3 | 2 | 0.02 | 0.10 |
| 1968 | 75 | 43 | 0.38 | 2.18 |
| 1969 | 119 | 110 | 0.59 | 3.43 |
| 1970 | 198 | 202 | 1.09 | 5.74 |
| 1971 | 392 | 399 | 2.42 | 11.69 |
| 1972 | 556 | 660 | 3.63 | 17.16 |
| 1973 | 776 | 977 | 5.51 | 24.48 |

| | | | | |
|---|---|---|---|---|
| 1974 | 1330 | 1534 | 10.34 | 40.24 |
| 1975 | 1792 | 2317 | 15.56 | 54.84 |
| 1976 | 2269 | 3202 | 21.42 | 71.09 |
| 1977 | 2655 | 4102 | 27.61 | 83.79 |
| 1978 | 3111 | 5012 | 35.53 | 99.30 |
| 1979 | 3618 | 6026 | 44.30 | 115.24 |
| 1980 | 4029 | 7087 | 54.03 | 126.11 |
| 1981 | 4380 | 8134 | 61.21 | 139.69 |
| 1982 | 4615 | 9134 | 67.17 | 145.87 |
| 1983 | 5008 | 10175 | 81.92 | 162.67 |
| 1984 | 5628 | 11224 | 95.14 | 188.36 |
| 1985 | 6087 | 12238 | 106.49 | 205.32 |
| 1986 | 6586 | 13229 | 121.75 | 225.78 |
| 1987 | 7162 | 14245 | 139.80 | 246.79 |
| 1988 | 7780 | 15240 | 157.62 | 271.25 |
| 1989 | 8401 | 16239 | 177.46 | 297.69 |
| 1990 | 8970 | 17250 | 193.79 | 316.48 |
| 1991 | 9334 | 18302 | 217.89 | 327.18 |
| 1992 | 10046 | 19434 | 245.01 | 359.16 |
| 1993 | 10692 | 20578 | 271.55 | 385.61 |
| 1994 | 11438 | 21710 | 307.28 | 417.98 |
| 1995 | 12195 | 22747 | 324.80 | 444.83 |
| 1996 | 14755 | 24833 | 341.60 | 502.79 |
| 1997 | 15835 | 26995 | 360.12 | 549.74 |
| 1998 | 16870 | 29111 | 380.33 | 605.81 |
| 1999 | 17931 | 31346 | 402.12 | 667.59 |
| 2000 | 18957 | 33795 | 425.53 | 713.12 |
| 2001 | 19989 | 36330 | 450.48 | 744.52 |
| 2002 | 21006 | 38906 | 477.03 | 810.21 |
| 2003 | 21958 | 41486 | 505.21 | 873.94 |
| 2004 | 22882 | 44100 | 534.99 | 944.24 |
| 2005 | 24067 | 46140 | 544.13 | 1059.20 |
| 2006 | 25319 | 47839 | 582.35 | 1129.92 |
| 2007 | 26625 | 49423 | 622.86 | 1202.03 |
| 2008 | 27874 | 52887 | 663.64 | 1272.24 |
| 2009 | 29096 | 56234 | 706.38 | 1342.31 |
| 2010 | 30274 | 59464 | 749.96 | 1411.40 |
| 2011 | 31441 | 62577 | 795.63 | 1480.74 |
| 2012 | 32579 | 65571 | 843.28 | 1549.81 |
| 2013 | 33674 | 68448 | 892.44 | 1617.19 |
| 2014 | 34769 | 71222 | 946.67 | 1686.02 |
| 2015 | 35796 | 73904 | 1001.05 | 1752.25 |
| 2016 | 36780 | 76487 | 1056.68 | 1817.36 |
| 2017 | 37800 | 78999 | 1117.34 | 1885.71 |

| | | | | |
|---|---|---|---|---|
| 2018 | 38753 | 81428 | 1178.38 | 1951.27 |
| 2019 | 39693 | 83795 | 1242.82 | 2017.21 |
| 2020 | 40597 | 86099 | 1309.07 | 2082.25 |
| 2021 | 41517 | 88363 | 1379.52 | 2148.83 |
| 2022 | 42496 | 90636 | 1455.99 | 2220.06 |
| 2023 | 43483 | 92906 | 1537.63 | 2292.76 |
| 2024 | 44475 | 95169 | 1625.14 | 2366.39 |

**Exhibit C-2**
Roadside Services Impact

| A | B | C | D | E |
|---|---|---|---|---|
| **year** | **employment** | **population** | **wages** | **value added** |
| | | | | millions |
| 1966 | 0 | 0 | 0 | 0 |
| 1967 | 2 | 1 | 0.01 | 0.05 |
| 1968 | 24 | 5 | 0.12 | 0.61 |
| 1969 | 34 | 14 | 0.17 | 0.86 |
| 1970 | 65 | 30 | 0.36 | 1.64 |
| 1971 | 113 | 59 | 0.68 | 2.80 |
| 1972 | 145 | 96 | 0.99 | 3.65 |
| 1973 | 191 | 142 | 1.45 | 4.86 |
| 1974 | 269 | 201 | 2.26 | 7.07 |
| 1975 | 316 | 274 | 2.97 | 8.19 |
| 1976 | 364 | 354 | 3.90 | 9.13 |
| 1977 | 405 | 440 | 4.65 | 10.34 |
| 1978 | 457 | 524 | 5.55 | 11.54 |
| 1979 | 514 | 613 | 6.84 | 13.29 |
| 1980 | 562 | 707 | 8.29 | 14.79 |
| 1981 | 584 | 799 | 9.18 | 14.97 |
| 1982 | 594 | 883 | 10.09 | 15.65 |
| 1983 | 639 | 968 | 11.12 | 16.45 |
| 1984 | 719 | 1058 | 12.17 | 18.22 |
| 1985 | 765 | 1144 | 13.83 | 21.55 |
| 1986 | 823 | 1228 | 15.32 | 24.88 |
| 1987 | 875 | 1310 | 16.46 | 28.21 |
| 1988 | 938 | 1388 | 18.24 | 31.55 |
| 1989 | 1000 | 1467 | 20.19 | 34.88 |
| 1990 | 1067 | 1545 | 22.14 | 38.21 |
| 1991 | 1103 | 1623 | 24.00 | 41.54 |
| 1992 | 1183 | 1712 | 26.09 | 44.88 |
| 1993 | 1242 | 1801 | 28.36 | 48.21 |
| 1994 | 1311 | 1892 | 30.63 | 51.54 |
| 1995 | 1390 | 1980 | 33.22 | 54.87 |

| | | | | |
|---|---|---|---|---|
| 1996 | 1485 | 2079 | 34.62 | 58.20 |
| 1997 | 1578 | 2189 | 38.60 | 60.27 |
| 1998 | 1668 | 2298 | 40.86 | 61.79 |
| 1999 | 1757 | 2403 | 42.29 | 63.32 |
| 2000 | 1843 | 2516 | 43.36 | 64.91 |
| 2001 | 1928 | 2644 | 44.42 | 66.77 |
| 2002 | 2011 | 2776 | 45.61 | 68.98 |
| 2003 | 2093 | 2908 | 46.99 | 71.89 |
| 2004 | 2174 | 3037 | 48.71 | 75.69 |
| 2005 | 2253 | 3170 | 50.64 | 79.90 |
| 2006 | 2346 | 3351 | 52.65 | 85.19 |
| 2007 | 2412 | 3548 | 54.92 | 88.59 |
| 2008 | 2480 | 3729 | 57.39 | 92.14 |
| 2009 | 2552 | 3903 | 60.24 | 95.84 |
| 2010 | 2622 | 4070 | 63.24 | 99.56 |
| 2011 | 2693 | 4229 | 66.49 | 103.29 |
| 2012 | 2761 | 4381 | 69.82 | 107.00 |
| 2013 | 2831 | 4525 | 73.50 | 110.79 |
| 2014 | 2898 | 4662 | 77.38 | 114.60 |
| 2015 | 2964 | 4794 | 81.50 | 118.41 |
| 2016 | 3031 | 1352 | 78.90 | 110.43 |
| 2017 | 3096 | 1447 | 83.08 | 113.93 |
| 2018 | 3161 | 1535 | 87.56 | 117.46 |
| 2019 | 3224 | 1624 | 92.19 | 121.03 |
| 2020 | 3286 | 1712 | 97.03 | 124.49 |
| 2021 | 3348 | 1795 | 102.08 | 127.91 |
| 2022 | 3407 | 1880 | 107.45 | 131.45 |
| 2023 | 3465 | 1962 | 112.92 | 134.91 |
| 2024 | 3523 | 2046 | 118.58 | 138.34 |

## Exhibit C-3
Tourism Impact

| A<br>year | B<br>employment | C<br>population | D<br>wages | E<br>value added |
|---|---|---|---|---|
| | | | | millions |
| 1966 | 0 | 0 | 0 | 0 |
| 1967 | 3 | 1 | 0.01 | 0.05 |
| 1968 | 13 | 3 | 0.06 | 0.22 |
| 1969 | 34 | 11 | 0.16 | 0.79 |
| 1970 | 66 | 29 | 0.34 | 1.48 |
| 1971 | 115 | 59 | 0.63 | 2.55 |
| 1972 | 147 | 97 | 0.88 | 3.3 |
| 1973 | 191 | 145 | 1.24 | 4.38 |
| 1974 | 267 | 205 | 1.91 | 6.37 |

| | | | | |
|---|---|---|---|---|
| 1975 | 312 | 281 | 2.43 | 7.35 |
| 1976 | 359 | 363 | 3.07 | 8.2 |
| 1977 | 399 | 451 | 3.7 | 9.29 |
| 1978 | 447 | 535 | 4.54 | 10.39 |
| 1979 | 502 | 627 | 5.63 | 11.95 |
| 1980 | 547 | 720 | 6.66 | 13.29 |
| 1981 | 567 | 812 | 7.53 | 13.46 |
| 1982 | 574 | 896 | 8.02 | 14.1 |
| 1983 | 616 | 982 | 8.86 | 14.85 |
| 1984 | 691 | 1070 | 10.65 | 16.42 |
| 1985 | 733 | 1154 | 11.81 | 18.24 |
| 1986 | 786 | 1232 | 13.15 | 21.71 |
| 1987 | 832 | 1313 | 14.65 | 25.17 |
| 1988 | 890 | 1386 | 16.56 | 28.63 |
| 1989 | 945 | 1460 | 18.27 | 32.09 |
| 1990 | 1005 | 1533 | 20.42 | 35.55 |
| 1991 | 1035 | 1608 | 21.88 | 39.01 |
| 1992 | 1106 | 1689 | 24.97 | 42.47 |
| 1993 | 1157 | 1773 | 27.07 | 45.93 |
| 1994 | 1218 | 1854 | 30 | 49.39 |
| 1995 | 1287 | 1933 | 33.44 | 52.85 |
| 1996 | 1386 | 2069 | 36.67 | 56.31 |
| 1997 | 1480 | 2204 | 38.61 | 58.38 |
| 1998 | 1571 | 2340 | 40.76 | 59.86 |
| 1999 | 1659 | 2475 | 42.05 | 61.27 |
| 2000 | 1745 | 2611 | 42.83 | 62.82 |
| 2001 | 1828 | 2747 | 43.62 | 64.55 |
| 2002 | 1909 | 2882 | 44.48 | 66.67 |
| 2003 | 1988 | 3018 | 45.57 | 69.1 |
| 2004 | 2064 | 3107 | 46.93 | 71.79 |
| 2005 | 2330 | 3289 | 48.48 | 74.39 |
| 2006 | 2388 | 3495 | 50.13 | 77.35 |
| 2007 | 2451 | 3690 | 52.03 | 80.56 |
| 2008 | 2514 | 3870 | 54.21 | 83.82 |
| 2009 | 2576 | 4040 | 56.67 | 87.25 |
| 2010 | 2638 | 4200 | 59.34 | 90.74 |
| 2011 | 2697 | 4352 | 62.16 | 94.19 |
| 2012 | 2756 | 4493 | 65.07 | 97.65 |
| 2013 | 2813 | 4628 | 68.3 | 101.08 |
| 2014 | 2869 | 4756 | 71.63 | 104.56 |
| 2015 | 2924 | 4876 | 75.25 | 108.11 |
| 2016 | 2977 | 1357 | 79.01 | 111.62 |
| 2017 | 3030 | 1450 | 82.97 | 115.16 |
| 2018 | 3081 | 1533 | 87.11 | 118.61 |

| | | | | |
|---|---|---|---|---|
| 2019 | 3129 | 1617 | 91.45 | 122.07 |
| 2020 | 3177 | 1698 | 95.93 | 125.52 |
| 2021 | 3222 | 1778 | 100.69 | 128.96 |
| 2022 | 3265 | 1854 | 105.61 | 132.37 |
| 2023 | 3309 | 1931 | 110.59 | 135.73 |
| 2024 | 3334 | 2005 | 115.85 | 139.14 |

## Exhibit C-4
Construction Impacts

| A | B | C | D | E |
|---|---|---|---|---|
| year | employment | population | wages | value added |
| | | | millions | |
| 1965 | 200 | 49 | 1.19 | 6.69 |
| 1966 | 1266 | 371 | 7.79 | 41.52 |
| 1967 | 2532 | 1065 | 16.42 | 82.20 |
| 1968 | 3473 | 2007 | 21.75 | 112.43 |
| 1969 | 6046 | 3492 | 41.17 | 189.97 |
| 1970 | 5856 | 5025 | 44.55 | 183.56 |
| 1971 | 8217 | 6947 | 67.94 | 263.63 |
| 1972 | 8358 | 8899 | 76.84 | 271.04 |
| 1973 | 9249 | 10675 | 92.60 | 302.38 |
| 1974 | 7093 | 11802 | 76.84 | 219.06 |
| 1975 | 3679 | 11819 | 47.11 | 109.90 |
| 1976 | 2549 | 11329 | 34.02 | 73.92 |
| 1977 | 2141 | 10736 | 27.94 | 59.89 |
| 1978 | 2016 | 10107 | 25.08 | 55.96 |
| 1979 | 2774 | 9707 | 37.01 | 80.38 |
| 1980 | 2157 | 9242 | 28.82 | 59.50 |
| 1981 | 1728 | 8619 | 21.07 | 47.15 |
| 1982 | 2412 | 8176 | 35.78 | 68.72 |
| 1983 | 3105 | 8000 | 57.43 | 93.32 |
| 1984 | 1860 | 7552 | 30.19 | 54.44 |
| 1985 | 1724 | 6950 | 27.09 | 50.43 |
| 1986 | 1708 | 6402 | 27.92 | 50.95 |
| 1987 | 2219 | 5996 | 44.45 | 68.55 |
| 1988 | 1972 | 5604 | 39.77 | 60.94 |
| 1989 | 2400 | 5287 | 56.08 | 76.61 |
| 1990 | 1973 | 4967 | 45.21 | 61.58 |
| 1991 | 2108 | 4693 | 55.23 | 65.83 |
| 1992 | 2139 | 4492 | 60.76 | 68.24 |
| 1993 | 1524 | 4207 | 41.24 | 47.40 |
| 1994 | 1462 | 3909 | 41.86 | 46.01 |
| 1995 | 1392 | 3760 | 34.62 | 58.20 |
| 1996 | 602 | 3490 | 14.27 | 26.18 |

| | | | | |
|---|---|---|---|---|
| 1997 | 600 | 3221 | 15.70 | 25.96 |
| 1998 | 578 | 2951 | 16.10 | 25.18 |
| 1999 | 557 | 2682 | 16.06 | 24.25 |
| 2000 | 538 | 2413 | 15.93 | 23.38 |
| 2001 | 524 | 2143 | 15.78 | 22.71 |
| 2002 | 513 | 1874 | 15.65 | 22.26 |
| 2003 | 477 | 1604 | 12.91 | 20.06 |
| 2004 | 510 | 1335 | 15.70 | 22.17 |
| 2005 | 504 | 1065 | 16.07 | 21.89 |
| 2006 | 501 | 796 | 16.24 | 21.80 |
| 2007 | 498 | 823 | 16.40 | 21.77 |
| 2008 | 497 | 840 | 16.62 | 21.77 |
| 2009 | 497 | 859 | 16.93 | 21.80 |
| 2010 | 498 | 872 | 17.30 | 22.01 |
| 2011 | 501 | 885 | 17.74 | 22.14 |
| 2012 | 501 | 894 | 18.19 | 22.27 |
| 2013 | 505 | 902 | 18.76 | 22.54 |
| 2014 | 506 | 904 | 19.28 | 22.71 |
| 2015 | 509 | 909 | 19.96 | 22.99 |
| 2016 | 512 | 911 | 20.66 | 23.21 |
| 2017 | 514 | 918 | 21.37 | 23.46 |
| 2018 | 515 | 917 | 22.11 | 23.57 |
| 2019 | 518 | 920 | 22.89 | 23.81 |
| 2020 | 519 | 919 | 23.72 | 24.01 |
| 2021 | 521 | 923 | 24.58 | 24.20 |
| 2022 | 522 | 925 | 25.49 | 24.38 |
| 2023 | 522 | 928 | 26.44 | 24.55 |
| 2024 | 523 | 930 | 25.15 | 24.02 |

## Exhibit C-5

Total Economic Development Impacts

| A<br>year | B<br>employment | C<br>population | D<br>wages | E<br>value added |
|---|---|---|---|---|
| | | | millions | |
| 1965 | 200 | 49 | 1.19 | 6.69 |
| 1966 | 1266 | 371 | 7.79 | 41.52 |
| 1967 | 2540 | 1068 | 16.46 | 82.4 |
| 1968 | 3584 | 2058 | 22.31 | 115.44 |
| 1969 | 6233 | 3626 | 42.09 | 195.06 |
| 1970 | 6184 | 5286 | 46.33 | 192.43 |
| 1971 | 8837 | 7464 | 71.69 | 280.66 |
| 1972 | 9205 | 9751 | 82.35 | 295.15 |
| 1973 | 10409 | 11939 | 100.8 | 336.1 |

| | | | | |
|---|---|---|---|---|
| 1974 | 8959 | 13741 | 91.35 | 272.75 |
| 1975 | 6099 | 14691 | 68.07 | 180.28 |
| 1976 | 5541 | 15248 | 62.41 | 162.35 |
| 1977 | 5600 | 15728 | 63.9 | 163.31 |
| 1978 | 6031 | 16178 | 70.71 | 177.2 |
| 1979 | 7408 | 16972 | 93.78 | 220.87 |
| 1980 | 7295 | 17757 | 97.8 | 213.69 |
| 1981 | 7259 | 18364 | 98.99 | 215.28 |
| 1982 | 8194 | 19090 | 121.06 | 244.34 |
| 1983 | 9368 | 20125 | 159.34 | 287.29 |
| 1984 | 8897 | 20904 | 148.15 | 277.44 |
| 1985 | 9309 | 21486 | 159.21 | 295.54 |
| 1986 | 9903 | 22092 | 178.14 | 323.31 |
| 1987 | 11088 | 22864 | 215.36 | 368.72 |
| 1988 | 11580 | 23618 | 232.19 | 392.36 |
| 1989 | 12747 | 24453 | 272 | 441.27 |
| 1990 | 13015 | 25295 | 281.56 | 451.82 |
| 1991 | 13580 | 26226 | 319 | 473.55 |
| 1992 | 14475 | 27327 | 356.84 | 514.74 |
| 1993 | 14614 | 28359 | 368.22 | 527.15 |
| 1994 | 15428 | 29366 | 409.77 | 564.92 |
| 1995 | 16264 | 30419 | 426.08 | 610.75 |
| 1996 | 18229 | 32471 | 427.16 | 643.49 |
| 1997 | 19494 | 34609 | 453.03 | 694.35 |
| 1998 | 20687 | 36700 | 478.05 | 752.63 |
| 1999 | 21904 | 38907 | 502.52 | 816.44 |
| 2000 | 23083 | 41335 | 527.64 | 864.24 |
| 2001 | 24269 | 43864 | 554.31 | 898.55 |
| 2002 | 25439 | 46437 | 582.78 | 968.12 |
| 2003 | 26516 | 49016 | 610.68 | 1034.99 |
| 2004 | 27631 | 51579 | 646.33 | 1113.89 |
| 2005 | 29154 | 53664 | 659.32 | 1235.38 |
| 2006 | 30554 | 55481 | 701.37 | 1314.27 |
| 2007 | 31986 | 57484 | 746.21 | 1392.95 |
| 2008 | 33365 | 61326 | 791.86 | 1469.97 |
| 2009 | 34721 | 65036 | 840.22 | 1547.2 |
| 2010 | 36032 | 68606 | 889.83 | 1623.71 |
| 2011 | 37332 | 72043 | 942.02 | 1700.36 |
| 2012 | 38597 | 75339 | 996.36 | 1776.73 |
| 2013 | 39823 | 78503 | 1052.99 | 1851.61 |
| 2014 | 41042 | 81544 | 1114.96 | 1927.89 |
| 2015 | 42193 | 84483 | 1177.77 | 2001.76 |
| 2016 | 43300 | 80107 | 1235.24 | 2062.62 |
| 2017 | 44440 | 82814 | 1304.76 | 2138.26 |

| | | | | |
|---|---|---|---|---|
| 2018 | 45510 | 85413 | 1375.15 | 2210.9 |
| 2019 | 46564 | 87956 | 1449.35 | 2284.11 |
| 2020 | 47579 | 90428 | 1525.75 | 2356.28 |
| 2021 | 48608 | 92859 | 1606.87 | 2429.9 |
| 2022 | 49690 | 95295 | 1694.54 | 2508.26 |
| 2023 | 50779 | 97727 | 1787.58 | 2587.95 |
| 2024 | 51855 | 100150 | 1884.72 | 2667.89 |