

6.0 Benefit/Cost Analysis

6.1 COST TO COMPLETE SUMMARY

This section describes the estimate of the cost-to-complete the Appalachian Development Highway System (ADHS), the scheduling of these capital expenditures and the expected operation and maintenance cost once the road network is completed. In total, the total project calls for the addition of 453.2 miles of highway to the ADHS as shown in Table 6.1.

Table 6.1 Miles to Complete by State

State	Total Miles	Miles Completed until FY 2012	Remaining Miles beyond FY 2012
Alabama	69.9	6.4	63.5
Georgia	31.6	0.0	31.6
Kentucky	22.6	15.8	6.8
Maryland	2.5	0.0	2.5
Mississippi	20.5	16.3	4.2
New York	7.7	6.6	1.1
North Carolina	24.7	1.4	23.3
Ohio	23.3	5.3	18.0
Pennsylvania	125.2	20.6	104.6
South Carolina	4.3	0.0	4.3
Tennessee	26.4	25.0	1.4
Virginia	32.2	1.0	31.2
West Virginia	62.3	29.6	32.7
Total	453.2	128.0	325.2

Source: Cost-to-Complete Study, Appalachian Regional Commission.

The table shows that the State of Pennsylvania is the recipient of the largest portion of infrastructure with 125 miles, approximately one-third of the total. West Virginia and Alabama are projected to receive additions in excess of 60 miles. New York and South Carolina are planned to receive the smallest addition to the ADHS in their respective states. A little less than one-third of the capacity will be added by FY 2012 with the remaining capacity planned to be in construction and completed by FY 2020.

The total capital expenditures are projected to be approximately \$10.5 billion of which \$2.4 billion will become state obligations. The total cost estimate, also broken down by state, is shown in Table 6.2. The allocation of costs among states

mirrors the scheduled capacity additions. By far, Pennsylvania and Alabama are projected to incur the greatest share of cost with expenditures in excess of \$2.5 and \$2.8 billion, respectively. Virginia is projected to incur the third largest cost burden with roughly \$1.2 billion.

Table 6.2 Total Cost to Complete ADHS

Projected ADHS Annual Obligations		
	Total ADHS Completion Cost (Thousands)	Total State Obligations (Thousands)
Alabama	\$2,806,978	\$256,400
Georgia	\$369,339	\$0
Kentucky	\$736,707	\$514,480
Maryland	\$145,036	\$0
Mississippi	\$79,721	\$63,200
New York	\$99,198	\$85,600
North Carolina	\$715,880	\$41,260
Ohio	\$413,253	\$94,000
Pennsylvania	\$2,592,429	\$426,450
South Carolina	\$41,315	\$0
Tennessee	\$577,742	\$546,720
Virginia	\$1,178,875	\$36,800
West Virginia	\$790,461	\$375,840
Total	\$10,546,934	\$2,441

Source: Cost-to-Complete Study, Appalachian Regional Commission.

The project costs are allocated on an annual basis between FY 2007 and FY 2019 based on estimates and construction plans provided by the Appalachian Regional Commission (ARC). According to ARC, 26 percent of the planned capacity additions will be completed by 2012. No detailed construction schedules exist beyond FY 2012. For the purpose of this assumption, it has been assumed that the remaining miles will be evenly allocated over the next seven fiscal years with all construction completed in FY 2020.

Transportation infrastructure needs to be properly maintained in order to maximize its useful life and minimize the life-cycle cost of owning the facilities. Operation and maintenance expenditures as well as repavement costs have been scheduled between FY 2007 and FY 2045 in order to account for the appropriate annual cost that will have to be incurred by individual states. These cost estimates for O&M and repavement have been developed using the Highway Economic Requirement System (HERS). In particular, it has been assumed that each mile scheduled for construction consists of two lanes and that the annual

cost of maintenance per lane mile is \$2,000. Repavement of the road is assumed to occur every 15 years of operation with an expected cost of \$351,500 per lane mile.

The projected ongoing cost estimates result in figures presented in Table 6.3. For instance, in FY 2015, the cost of capacity expansion is equal to \$1.1 billion and annual operations and maintenance costs are equal to \$1.07 million.

Table 6.3 Summary of Cost Schedule

Million 2005\$	FY 2007	FY 2010	FY 2015	FY 2020	FY 2025	FY 2030	FY 2040
Capital Expenditures	\$1,008	\$392	\$1,071	\$0	\$0	\$0	\$0
O&M Expenditures	\$0.17	\$0.38	\$1.07	\$2.00	\$2.00	\$2.00	\$2.00
Repavement	\$0	\$0	\$0	\$0	\$12	\$33	\$12
Total Cash Flow	\$1,008	\$392	\$1,072	\$2	\$14	\$35	\$14
Percent of Mileage Completed	0%	18%	49%	100%	100%	100%	100%

Source: Cost-to-Complete Study, Appalachian Regional Commission, and Cambridge Systematics, Inc.

6.2 BENEFIT/COST ANALYSIS RESULTS

This section provides a comparison of the costs, impacts, and benefits of completing the entire ADHS network. The nature of this analysis is discussed in the text that follows.

6.2.1 Costs

Cost-to-complete the remaining ADHS corridor projects are estimated under two different scenarios. The first assumes that the purchasing power of spending in the construction sector will parallel overall inflation, which is assumed to be 3 percent per year. As such, this is the “low-cost” scenario. The second assumes that purchasing power of spending in the construction sector declines relative to other sectors. In this second scenario, we assume that prices in the construction sector rise at 10 percent per year over the period 2007 through 2010, and prices will rise at an average rate of 4.5 percent thereafter.¹⁸ The accelerated price increases over the early period reflects a continuation of recent trends in the construction sector. Table 6.4 shows costs by year for each scenario, including the present value of costs discounted at 5 percent per year.¹⁹

¹⁸The Bureau of Labor Statistics’ bridge and highway construction producer price index (BHWY PPI) grew by 35.3 percent from 2003 to 2006, equivalent to 10.6 percent per year.

¹⁹The application of a discount rate is standard practice within benefit/cost analysis to account for the time value of money (i.e., money today can be invested for a return in the future) and thus prepare costs and benefits in present value terms.

Table 6.4 Total Spending on Proposed Improvements to ADHS System in ARC Region under Two Inflation Scenarios
All Values in Millions Constant 2007 Dollars

Year	Total Outlay (2007 Million Dollars)		Percent of Spending on		
	Low-Cost Scenario	High-Cost Scenario	Capital Expend	Operation and Maintenance	Refurbishment
2007	1,070	1,233	100.0%	0.0%	0.0%
2008	424	525	99.9%	0.1%	0.0%
2009	520	692	99.9%	0.1%	0.0%
2010	416	594	99.9%	0.1%	0.0%
2011	553	801	99.9%	0.1%	0.0%
2012	256	377	99.8%	0.2%	0.0%
2013	1,137	1,695	99.9%	0.1%	0.0%
2014	1,137	1,720	99.9%	0.1%	0.0%
2015	1,137	1,745	99.9%	0.1%	0.0%
2016	1,137	1,771	99.9%	0.1%	0.0%
2017	1,138	1,797	99.9%	0.1%	0.0%
2018	1,138	1,824	99.8%	0.2%	0.0%
2019	1,138	1,851	99.8%	0.2%	0.0%
2020	2	3	0.0%	100.0%	0.0%
2021	2	4	0.0%	100.0%	0.0%
2022	34	57	0.0%	6.3%	93.7%
2023	15	25	0.0%	14.5%	85.5%
2024	17	31	0.0%	12.1%	87.9%
2025	14	26	0.0%	14.7%	85.3%
2026	18	33	0.0%	11.5%	88.5%
2027	10	18	0.0%	21.9%	78.1%
2028	37	68	0.0%	5.8%	94.2%
2029	37	69	0.0%	5.8%	94.2%
2030	37	70	0.0%	5.8%	94.2%
2031	37	71	0.0%	5.8%	94.2%
2032	37	72	0.0%	5.8%	94.2%
2033	37	73	0.0%	5.8%	94.2%
2034	37	74	0.0%	5.8%	94.2%
2035	2	4	0.0%	100.0%	0.0%
2036	2	4	0.0%	100.0%	0.0%
2037	34	71	0.0%	6.3%	93.7%
2038	15	31	0.0%	14.5%	85.5%
2039	17	38	0.0%	12.1%	87.9%
2040	14	32	0.0%	14.7%	85.3%
2041	18	41	0.0%	11.5%	88.5%
2042	10	22	0.0%	21.9%	78.1%
2043	37	85	0.0%	5.8%	94.2%
2044	37	86	0.0%	5.8%	94.2%
PV (5%)	8,283	12,159			
PV (7%)	7,342	10,679			

6.2.2 Impacts and Benefits

There are five categories of ADHS impact that are covered in this study: A) business cost savings; B) household out-of-pocket savings; C) household value of time savings; D) business growth due to improved market access; and E) indirect and induced economic growth (multiplier effects). Traditionally, Categories A-C are considered to be measures of travel efficiency benefit and Categories D-E are considered to be measures of regional economic impact. However, since the ADHS is specifically intended to help address economic distress by improving access in a relatively isolated region, the impacts on economic growth in the ARC region also can be viewed as an indicator of societal benefit and economic return on investment.

The various impacts described in the preceding sections are estimated for the years 2020 and 2035. In order to estimate present values, these impacts are phased in based on: 1) growth rate of underlying traffic volumes from 2020 to 2035; 2) the planned project rollout schedule; 3) empirical research on the timing of market access impacts (see Section 2.5 and Appendix B); and 4) research on the timing of indirect and induced impacts. Tables 6.5 to 6.9 show the annual impacts for each growth scenario, as well as both discounted and undiscounted benefits.

The resulting present values for each impact category are shown in Tables 6.5 and 6.6 using different discount rates.

These tables reaffirm the results of the preceding sections, where within the ARC region, benefits result primarily from industry savings, market access impacts, and secondary economic effects. For the nation as a whole, the latter two impacts are greatly diminished, and benefits flow primarily from industry user savings (travel efficiency and lower costs). Meanwhile, lowering the discount rate to a real 5 percent significantly increases the present value of total benefits as future benefits retain more value.

Table 6.5 Medium-Growth Scenario Benefits to ARC Region from ADHS by Year
Undiscounted (2007 Million Dollars)

Year	Industry User Savings	HH Out-of-Pocket Savings	HH Value of Time Savings	Total Travel Efficiency Benefits	Market Access Growth
2005	0	0	0	0	0
2006	0	0	0	0	0
2007	0	0	0	0	0
2008	30	0	9	40	1
2009	61	1	19	81	2
2010	85	1	27	113	4
2011	110	1	35	146	6
2012	149	1	47	197	9
2013	188	2	60	250	12
2014	245	2	77	325	19
2015	303	3	96	402	27
2016	384	4	121	509	39
2017	467	4	148	619	55
2018	581	6	184	770	78
2019	699	7	221	927	113
2020	851	8	270	1,129	158
2021	1,009	10	319	1,338	226
2022	1,178	11	373	1,562	317
2023	1,354	13	429	1,795	431
2024	1,500	14	475	1,989	576
2025	1,652	16	523	2,191	753
2026	1,756	17	556	2,329	920
2027	1,864	18	591	2,473	1,114
2028	1,937	19	614	2,570	1,282
2029	2,013	19	637	2,669	1,433
2030	2,069	20	655	2,744	1,582
2031	2,127	20	674	2,821	1,683
2032	2,182	21	691	2,894	1,789
2033	2,238	21	709	2,968	1,866
2034	2,283	22	723	3,028	1,938
2035	2,328	22	737	3,088	2,060
2036	2,375	23	752	3,150	2,102
2037	2,422	23	767	3,213	2,144
2038	2,471	24	783	3,277	2,187
2039	2,520	24	798	3,343	2,230
2040	2,571	25	814	3,410	2,275
2041	2,622	25	830	3,478	2,320
2042	2,675	26	847	3,547	2,367
2043	2,728	26	864	3,618	2,414
2044	2,783	27	881	3,691	2,462
2045	2,838	27	899	3,764	2,512

**Table 6.6 Medium-Growth Scenario Benefits to ARC Region
from ADHS by Year**
Discounted at Five Percent (2007 Million Dollars)

Year	Industry User Savings	HH Out-of-Pocket Savings	HH Value of Time Savings	Total Travel Efficiency Benefits	Market Access Growth
2005	0	0	0	0	0
2006	0	0	0	0	0
2007	0	0	0	0	0
2008	28	0	9	38	1
2009	55	1	18	73	2
2010	74	1	23	98	3
2011	91	1	29	120	5
2012	116	1	37	154	7
2013	141	1	45	186	9
2014	174	2	55	231	13
2015	205	2	65	272	18
2016	247	2	78	328	25
2017	287	3	91	380	34
2018	340	3	108	450	46
2019	389	4	123	516	63
2020	451	4	143	599	84
2021	509	5	161	676	114
2022	567	5	179	751	152
2023	620	6	196	822	198
2024	654	6	207	868	251
2025	686	7	217	910	313
2026	695	7	220	922	364
2027	703	7	223	932	420
2028	695	7	220	922	460
2029	688	7	218	912	490
2030	674	6	213	893	515
2031	659	6	209	875	522
2032	644	6	204	855	528
2033	629	6	199	835	525
2034	611	6	194	811	519
2035	594	6	188	788	526
2036	577	6	183	765	511
2037	561	5	178	743	496
2038	544	5	172	722	482
2039	529	5	168	702	468
2040	514	5	163	681	455
2041	499	5	158	662	442
2042	485	5	154	643	429
2043	471	5	149	625	417
2044	458	4	145	607	405
2045	444	4	141	590	393

**Table 6.7 High-Growth Scenario Benefits to ARC Region
from ADHS by Year**
Undiscounted (2007 Million Dollars)

Year	Industry User Savings	HH Out-of-Pocket Savings	HH Value of Time Savings	Total Travel Efficiency Benefits	Market Access Growth
2005	0	0	0	0	0
2006	0	0	0	0	0
2007	0	0	0	0	0
2008	36	1	13	50	1
2009	74	1	27	103	3
2010	103	2	38	143	4
2011	134	2	50	186	6
2012	180	3	67	250	9
2013	229	3	85	317	13
2014	297	4	110	412	21
2015	368	6	137	510	29
2016	466	7	173	646	43
2017	567	8	210	786	61
2018	705	11	262	978	86
2019	849	13	315	1,177	124
2020	1,034	15	384	1,433	174
2021	1,225	18	455	1,698	249
2022	1,431	21	531	1,983	349
2023	1,644	25	610	2,279	475
2024	1,822	27	676	2,525	635
2025	2,006	30	744	2,780	830
2026	2,133	32	792	2,957	1,014
2027	2,264	34	840	3,139	1,227
2028	2,353	35	873	3,262	1,413
2029	2,444	37	907	3,388	1,578
2030	2,513	38	933	3,483	1,743
2031	2,583	39	959	3,581	1,854
2032	2,650	40	983	3,673	1,971
2033	2,718	41	1,009	3,767	2,056
2034	2,772	41	1,029	3,843	2,135
2035	2,828	42	1,050	3,920	2,270
2036	2,884	43	1,071	3,998	2,315
2037	2,942	44	1,092	4,078	2,361
2038	3,001	45	1,114	4,160	2,409
2039	3,061	46	1,136	4,243	2,457
2040	3,122	47	1,159	4,328	2,506
2041	3,185	48	1,182	4,414	2,556
2042	3,248	49	1,206	4,502	2,607
2043	3,313	50	1,230	4,593	2,659
2044	3,380	51	1,254	4,684	2,712
2045	3,447	52	1,279	4,778	2,767

**Table 6.8 High-Growth Scenario Benefits to ARC Region
from ADHS by Year**
Discounted at Five Percent (2007 Million Dollars)

Year	Industry User Savings	HH out-of-pocket Savings	HH Value of Time Savings	Total Travel Efficiency Benefits	Market Access Growth
2005	0	0	0	0	0
2006	0	0	0	0	0
2007	0	0	0	0	0
2008	35	1	13	48	1
2009	67	1	25	93	2
2010	89	1	33	124	4
2011	110	2	41	153	5
2012	141	2	52	196	7
2013	171	3	63	237	10
2014	211	3	78	293	15
2015	249	4	93	345	20
2016	300	4	111	416	27
2017	348	5	129	483	38
2018	412	6	153	572	50
2019	473	7	175	655	69
2020	548	8	203	760	92
2021	619	9	230	858	126
2022	688	10	255	954	168
2023	753	11	280	1,044	218
2024	795	12	295	1,102	277
2025	834	12	309	1,155	345
2026	844	13	313	1,170	401
2027	853	13	317	1,183	462
2028	845	13	313	1,171	507
2029	836	12	310	1,158	540
2030	818	12	304	1,134	568
2031	801	12	297	1,110	575
2032	782	12	290	1,085	582
2033	764	11	284	1,060	578
2034	743	11	276	1,029	572
2035	721	11	268	1,000	579
2036	701	10	260	971	562
2037	681	10	253	944	546
2038	661	10	245	917	531
2039	642	10	238	890	516
2040	624	9	232	865	501
2041	606	9	225	840	487
2042	589	9	219	816	473
2043	572	9	212	793	459
2044	556	8	206	770	446
2045	540	8	200	748	433

Table 6.9 Present Value of Impact Streams from ARC Highway Investments, Discounted at Seven Percent per Year
All Figures Shown in Million 2007 Dollars

Impact Type	Medium Growth		High Growth	
	ARC	National	ARC	National
A. Industry User Savings	11,388	18,781	13,831	21,793
B. HH Out-of-Pocket Savings	109	113	207	215
C. HH Value of Time Savings	3,607	3,754	5,133	5,343
D. Market Access Growth ^a	6,514	1,261	7,176	1,390
E. Indirect and Induced Growth ^a	5,541	N/A	6,302	N/A
Total Impacts	27,159	23,909	32,649	28,741

^a Value Added.

Table 6.10 Present Value of Impact Streams from ARC Highway Investments, Discounted at Five Percent per Year
All Figures Shown in Million 2007 Dollars

Benefit Description	Medium Growth		High Growth	
	ARC	National	ARC	National
A. Industry User Savings	17,310	29,114	21,023	33,737
B. HH Out-of-Pocket Savings	165	173	314	328
C. HH Value of Time Savings	5,482	5,718	7,803	8,137
D. Market Access Growth ^a	10,684	2,069	11,769	2,280
E. Indirect and Induced Growth ^a	9,551	N/A	10,862	N/A
Total Impacts	43,192	37,074	51,771	44,482

^a Value Added.

Although the magnitudes are somewhat higher for the Woods & Poole growth scenario, the patterns are very similar. Within the ARC region, direct travel savings account for roughly half of overall impacts (with industry receiving a disproportionate share), while market access impacts and secondary economic growth account for the other half. Moving to the National perspective, most of the market access impacts are lost (by accounting for “reshuffling” of the location of existing businesses and jobs), but direct travel savings are greatly increased by including benefits of “through” traffic.²⁰ These larger impacts arise because a

²⁰“Secondary” indirect and induced impacts are not considered at the national level due to constraints on labor mobility into and out of the United States.

large number of firms utilize the improved infrastructure, but are located outside the ARC region.

6.2.3 Benefit/Cost Ratios

Total impact results are summarized in Table 6.11. They are shown both as: 1) *travel efficiency benefits* (reflecting industry savings, household out-of-pocket savings and household time savings); and as 2) *total economic benefits* (reflecting the combined impacts of direct travel-cost savings, market access improvements and indirect and induced growth). All values are expressed in terms of the present value of future benefit and cost streams over 30 years, expressed in constant 2007 dollars.

The comparison of benefits and costs are shown as *net present values* (representing benefits minus costs) and as *benefit/cost ratios* (representing benefits divided by costs). They are shown as ranges, reflecting varying assumptions about future construction cost increases and future baseline growth forecasts:

The lower bound of the ranges reflect the high-cost scenario (accelerated cost increases in the construction sector above the general rate of inflation), along with Global Insight's medium baseline growth scenario.

The upper bound of the ranges reflect the low-cost scenario (construction costs following the general rate of inflation), along with the higher baseline growth scenario from Woods and Poole.

Finally, all results are displayed using both a 7 percent real discount rate and a 5 percent real discount rate. While Office of Management and Budget (OMB) guidelines had in the past recommended a 7 percent discount rate for program evaluation, most economists today recognize a 5 percent real discount rate as a more reasonable measure of the opportunity cost of capital. (It represents the private sector cost of borrowing, over-and-above the rate of inflation. While government bonds have a lower cost of borrowing, they come at the cost of displacing private sector borrowing.)

Economic return on investment also was calculated from two perspectives: 1) the ARC region; and 2) the entire United States. While costs are assumed to be the same from either perspective, benefits vary in two important ways:

Travel efficiency benefits are significant for the ARC region but even higher from a national perspective. That is because a significant share of the affected trips are long-distance freight shipments that have a high value and extend to origins and destinations beyond the ARC region.

On the other hand, *total economic benefits* are high for the ARC region but lower from a national perspective. That is because benefits of increased market access, including induced economic growth and development, accrue largely to the ARC region via regional economic impacts, although there are also productivity and export gains for the rest of the United States in addition to direct travel efficiency benefits.

Table 6.11 Net Present Value and Benefit/Cost Ratio Ranges for ARC Highway Investments

		Net Present Value (Million Dollars)	Benefit/Cost Ratio
<i>Using a Five Percent Discount Rate</i>			
Travel Efficiency Benefits ^a (A+B+C)	ARC	10,797-20,857	1.9-3.5
	National	22,845-33,919	2.9-5.1
Total Economic Benefits ^a (A through E)	ARC	31,032-43,488	3.6-6.3
	National	24,914-36,199	3.1-5.4
<i>Using a Seven Percent Discount Rate</i>			
Travel Efficiency Benefits ^a (A+B+C)	ARC	4,425-11,829	1.4-2.6
	National	11,969-20,009	2.1-3.7
Total Economic Benefits ^a (A through E)	ARC	16,480-25,307	2.5-4.5
	National	13,230-21,399	2.2-3.9

Source: Economic Development Research Group and HDR Decision Economics.

^a Lower-range value reflects high-cost and medium-growth (Global Insight) scenarios; upper-range value reflects low-cost and high-growth (Woods & Poole) scenarios.

As shown in Table 6.11, the key findings are as follows:

No matter the scenario, the perspective, the assumptions, or the inclusion of more narrow or expansive measures of economic benefit, completing and maintaining the remaining ADHS corridor segments is expected to generate benefits in excess of costs.

Travel Efficiency (U.S.) – The present value of travel efficiency benefits at the national level is estimated to be at least 2.9 times the cost (using a 5 percent discount rate). With alternative assumptions regarding the discount rate, construction costs and growth forecasts, that value may range from 2.1 to 5.1. This represents the traditional measure of travel efficiency and even the most conservative assumptions produce a national economic return of over \$2 for every \$1 of cost.

Travel Efficiency (ARC Region) – Regardless of the assumptions made, travel-cost savings accruing to people and businesses within the ARC region amount to approximately two-thirds of the national value and thus a benefit/ratio in excess of 1.0.

Total Economic Benefits (ARC Region) – The present value of total estimated economic benefits for the ARC region is at least 3.6 times the estimated cost (using a 5 percent discount rate). With alternative assumptions regarding the discount rate, construction costs and growth forecasts, that value may range from 2.5 to 6.3. This represents the increase in total economic effects,

including value added due to increased business activity, as well as travel-cost savings. Since a goal of the ADHS is to promote economic growth in the region by reducing isolation, these total economic impacts are indicative of how completing the ADHS can help achieve that goal.

Total Economic Benefits (U.S.) – At the U.S. level, the estimated total economic benefit impact is 3.1 times the estimated cost (using a 5 percent discount rate). With alternative assumptions regarding the discount rate, construction costs and growth forecasts, that value may range from 2.2 to 5.4. This impact represents the modest additional increase in value added due to productivity and export gains from travel-cost savings and access/connectivity improvements. The value is lower than the economic impact for the ARC region since business location shifts are assumed to cancel out at the national level. However, the value is higher than the national-level travel efficiency impact shown above, due to the inclusion of effects beyond pure travel-cost savings.

6.2.4 Conclusions

The analysis reported here indicates that completion of the ADHS will result in significant benefits in excess of costs, under all scenarios and assumptions regarding costs, growth, and discount rates. The benefit/cost ratios associated with ADHS completion are within the range usually found for individual highway projects that are funded, which tend to be between 1.2 and 3.5²¹ and also within the range of coordinated transportation investment programs. The benefit/cost ratios of ADHS completion actually tend towards the upper end of the range for the ratios found for rural corridors in the United States. There are several reasons for this result:

The remaining ADHS highway projects complete important linkages in a long-distance network, rather than just serving connections between individual communities;

Many of these projects open up access for isolated, mountainous areas, rather than merely expanding system capacity;

Benefits of the remaining segments leverage benefits of already-completed parts of the system; and

These highway segments are projected to serve a mix of trips with a high portion of long-distance truck travel, which has a particularly high value of time savings.

The importance of these network-related factors is amplified by the growing national and global nature of industries and markets. These findings underscore the role that a completed ADHS can make to the future economic competitiveness of the ARC region and the United States.

²¹This range is based on results of highway benefit/cost studies conducted in Wisconsin, Indiana, Oregon, California, Montana, New York State, and Canada.

