Chapter 3
HIGHWAY AND TRAFFIC ANALYSIS

This study addresses the question "To what extent have the ADHS corridors that are already built and open to traffic attained their economic objectives? To answer this question, the study identified and documented those ADHS corridors that were principally complete.

This Chapter describes the corridors that are included in the study in terms of location, their physical and operational characteristics before and after the ADHS improvements, and the traffic which uses the ADHS highways. These physical and operational characteristics provide the basis for the economic analyses.

ADHS CORRIDORS INCLUDED IN STUDY

The 26 ADHS corridors are in various stages of completion, ranging from only partially complete to being almost complete. In other words, the study could not simply examine the entire system or those corridors that are complete. At the same time, a process was needed that would not unfairly distort the study results.

Corridor Selection Criteria

To determine which corridors were most appropriate for analysis, one single criterion was selected. That is:

Corridor Selection Criterion

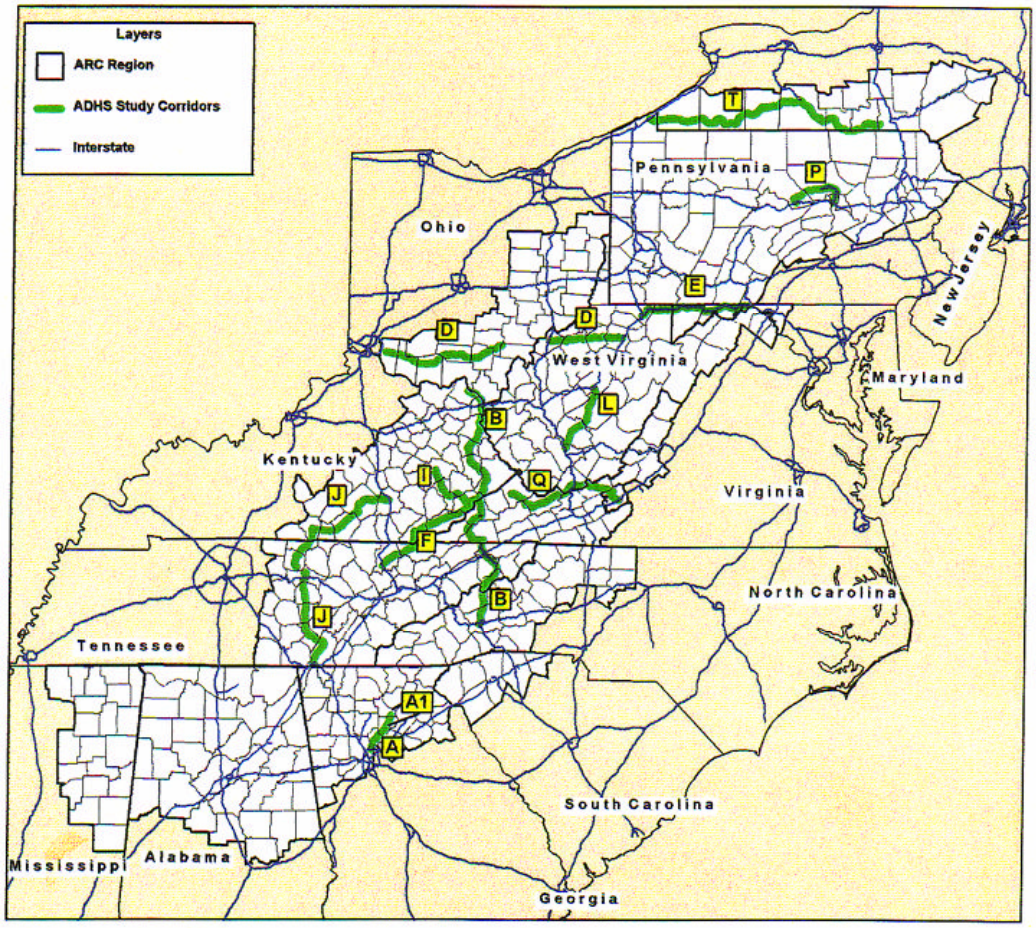
> Each ADHS highway corridor that, end-to-end, was 75% or more complete (in terms of total corridor length) as of January 1, 1995, was selected for inclusion in the study.

Within this criterion it is recognized that each corridor is not 100 percent complete. As a result, the highway sections that were not built prior to 1995 were also excluded from the analysis. In this way only the sections built and open to traffic by January 1, 1995, were included for both cost and economic evaluation purposes.

The Studied ADHS Corridors

Upon examination, it was determined that twelve of the 26 ADHS highway corridors met the 75 percent completion criterion. These are located in 10 of the 13 states in the ARC Region--Georgia, Kentucky, Maryland, New York, North Carolina, Ohio, Pennsylvania, Tennessee, Virginia and West Virginia. The selected twelve ADHS corridors included in the study are shown on **Exhibit 3-1** and are as follows:

Exhibit 3-1
Study Corridors
Appalachian Development Highway Systems



Study Corridors

- A/A-1 in Georgia
- B in North Carolina, Tennessee, Virginia and Kentucky
- D in Ohio and West Virginia
- E in West Virginia and Maryland
- F in Tennessee and Kentucky
- I in Kentucky
- J in Kentucky and Tennessee
- L in West Virginia
- P in Pennsylvania
- Q in Virginia and West Virginia
- T in Pennsylvania and New York

But even these corridors are not completely built. Documentation review determined which sections of which corridors were built prior to 1995. Only these sections are included in the study. The final "Study Corridors" include only those portions of the selected ADHS corridors that were completed and open to traffic before 1995. **Exhibit 3-2** identifies the final Study Corridors in terms of beginning and ending points and mileage. This exhibit indicates that this study focuses on 1,417.8 miles (47%) of the total envisaged ADHS system of 3,025 miles.

Corridor Descriptions

The twelve ADHS corridors are depicted on **Exhibits 33** through **3-13**. Those segments colored green are the segments that are included in the cost and economic impact calculations. Those segments colored orange are in the corridor but were not included in the analysis either because they were not built prior to 1995 or because they were built using other than ARC funds. By making these exclusions, the study was able to focus only in those highway sections that were built prior to 1995 using Appalachian Regional Commission administered funds.

The With and Without ADHS Scenarios

In order to estimate the economic impacts due to the ADHS, it is necessary to compare the "with ADHS" situation to the "without ADHS" situation. In other words, what is quantified and measured in this study is the economic difference between what occurred with the ADHS compared with what would have occurred without the ADHS.

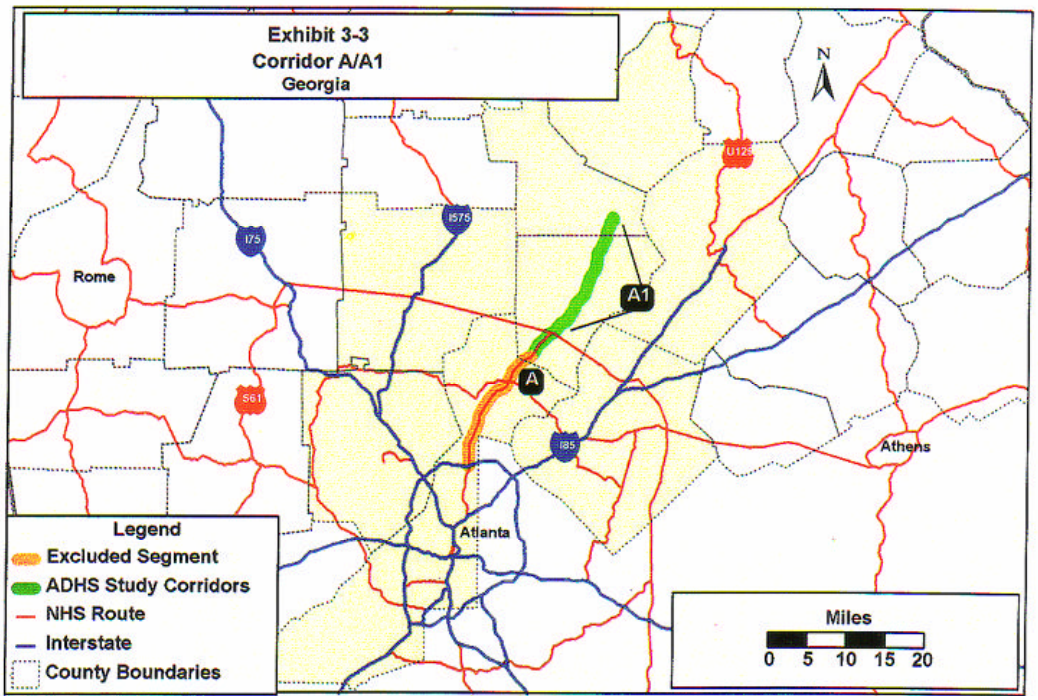
With ADHS Scenario - The highways are already built. Therefore, the "with ADHS" scenario is the 1995 existing highway system and that system's land use and traffic level. The with ADHS scenario includes the highways on **Exhibits 3-3** through **3-13** listed as "With ADHS Improvements."

Exhibit 3-2
ADHS CORRIDORS INCLUDED IN THIS ECONOMIC STUDY

Study Corridors	States	From	To	Miles Studied
A & A-1	Georgia	Forsyth County Line, GA	GA 60, South of Dahlonega, GA	30.4
B	North Carolina, Tennessee, Virginia and Kentucky	I-40, Asheville, NC	Ohio River Crossing South of Portsmouth, OH	249.4
D	Ohio and West Virginia	Batavia, OH	Meigs/Athens Co. Line, OH	189.8
		I-77, Parkersburg, WV	I-79 Clarksburg, WV	
E	West Virginia And Maryland	I-79, Morgantown, WV	I-70, Hancock, MD	109.2
F	Tennessee and Kentucky	I-75, Caryville, TN	Corridor B (US 23) at Jenkins, KY	99.3
I	Kentucky	Corridor F (US 119) at Whitesburg, KY	State Route 30 at Jackson, KY	59.9
J	Tennessee and Kentucky	I-124, Chattanooga, TN	Cookeville, TN Near I-40	214.5
		8 mi. South of Gainsboro, TN	I-75 at London, KY	
L	West Virginia	I-77 at Beckley, WV	I-79 at Sutton, WV	60.5
P	Pennsylvania	I-80, Near Lock Haven, PA	I-80 near Milton, PA	54.7
Q	Virginia and West Virginia	West of Grundy, VA	I-81 at Christiansburg, VA	129.8
T	Pennsylvania and New York	I-90 near Erie, PA	I-81 at Binghamton, NY	220.3
	Total Miles			1,417.8

"Without ADHS Scenario" – The more difficult challenge was to visualize the highway system and traffic levels that would exist today in each corridor region if the ADHS had never been built. This "without ADHS" scenario was deemed to be the existing 1995 regional highway system excluding the ADHS improvement. In other words, the old roads or highways prior to the ADHS, are suitably maintained. These are described on **Exhibits 3-3** through **3-13** as "Without ADHS Improvements." Considerable effort was expended to properly define the "old road" that existed prior to the ADHS.

This study's estimates of economic benefits and economic costs believed attributable to the ADHS represent the benefit and impact differences between the "With ADHS" and "Without ADHS" highway scenarios.

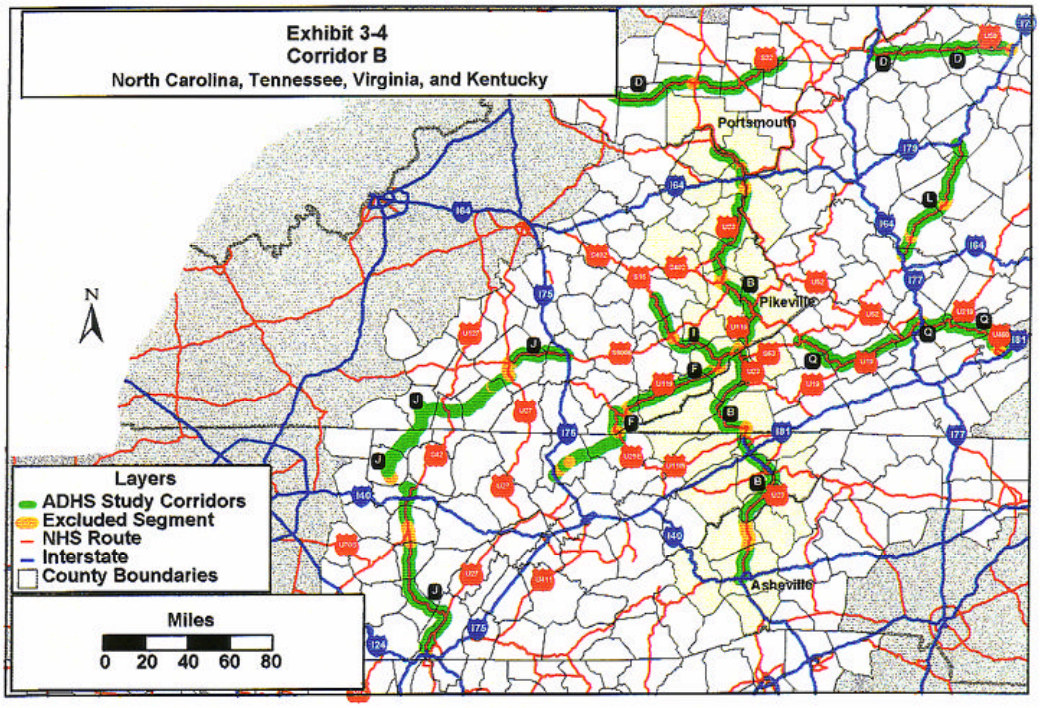


With ADHS Improvements

- Georgia: GA 400 from Forsyth Countyline north to GA 60 south of Dahlonega (includes a section constructed with APL funds as a local access road from GA 53 to GA60).

Without ADHS Improvements

- Georgia: Georgia Route 9 from Forsyth Countyline to Georgia Route 141 (junction with Corridor A1 south of Cumming); Georgia Route 9 from Georgia Route 141 (junction with Corridor A) north to Georgia Route 60.



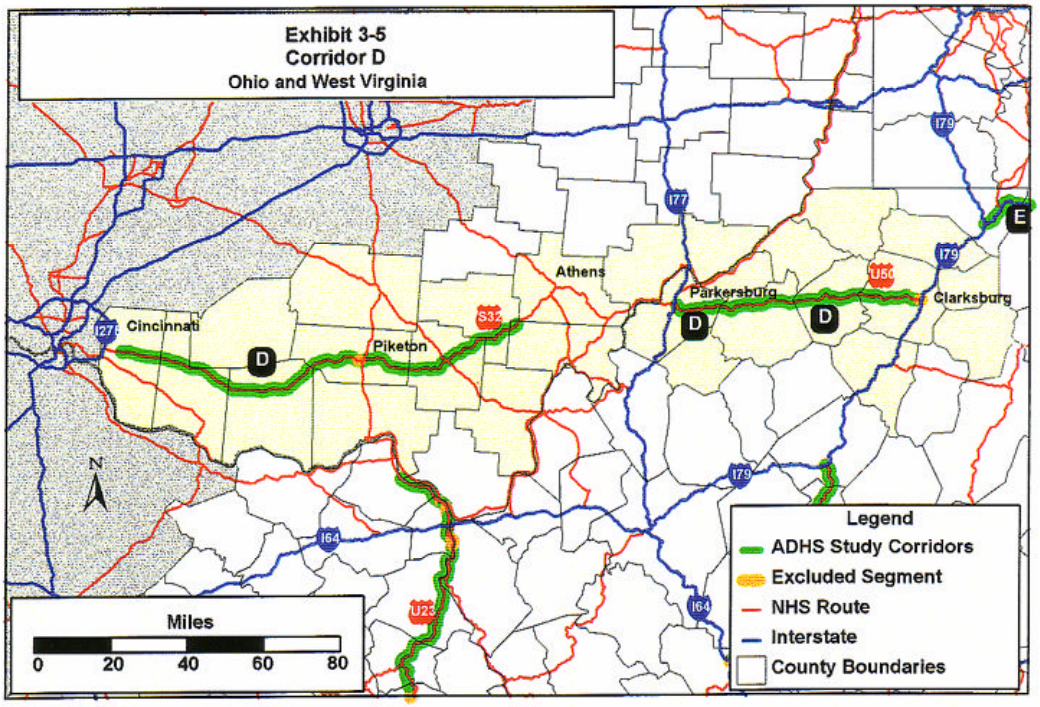
With ADHS Improvements

- North Carolina: US 19/23 From I-40 at Asheville, North Carolina north to Tennessee.
- Tennessee: US23 and I-181 at Johnson City-Kingsport to Virginia
- Virginia: US 23 to Kentucky.
- Kentucky: US23/119 through Pikeville, via KY 80 to Prestonburg, via US 23/460 to Paintsville, and via US 23 to Ohio River Crossing at Portsmouth, Ohio.

Without ADHS Improvements

- North Carolina: Business US 19/23 from I-40 at Asheville north to Mars Hill; US 23 from Mars Hill north to the Tennessee State line at Sam's Gap.
- Tennessee: US 23 from the North Carolina State line at Sam's Gap north to Kingsport at the Virginia State line.
- Virginia: US 23 from the Kingsport at the Tennessee State line north to Pound at the Kentucky State line.
- Kentucky: US 23/US 119 from Jenkins at the Virginia State line to the junction with US460/Ky Route 80 (Corridor Q) at Pikeville; US 460/US119/US23/Ky Route 80 from junction with corridor Q at Pikeville north to junction with US 119 (Corridor G) north of

Pikeville; US 460/US23/Ky Route 80 from Pikeville to junction with Ky. Route 80 at Prestonburg; US 460/US23 from Prestonburg north junction with US 460 at Paintsville; US 460 at Paintsville north to junction with Corridor B1 at Greenup at Ohio State line.



With ADHS Improvements

Study Corridor is divided into two segments: one in Ohio and another in West Virginia which are separated by a 25 mile gap between Athens, Ohio and Parkersburg, West Virginia.

- Ohio: From I-275 at Cincinnati, Ohio via Ohio Route 32 to Piketon then via Ohio Route 32/124 to jct. with US 50 west of Albany, Ohio and via US 50 to intersection with Ohio 56 at eastern limits of Athens, Ohio. (Includes a 6.5 mile section under construction at Piketon from Ohio Route 104 east to Ohio Route 220. Existing Ohio Route 32 provides alternative routing for continuity.

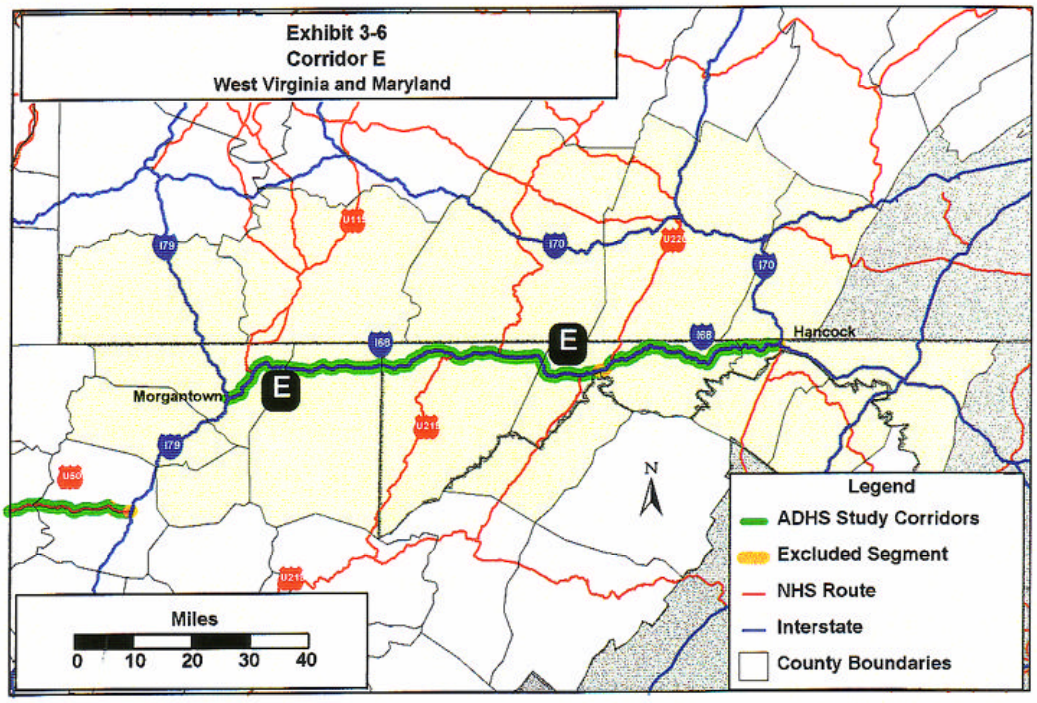
- West Virginia: From I-77 west of Parkersburg, West Virginia via US 50 to I -79 at Clarksburg, West Virginia.

Without ADHS Improvements

- Ohio: Ohio Route 32 from Ohio Route 132 at Batavia to Ohio Route 74 at Andersonville (this is identified as Route 74 on older maps and as Route 32 on more recent maps); Ohio Route 74 (Route 32 ?) From Andersonville eastward to Ohio Route 73 southeast of Locust Grove; Ohio Route 73 from Locust Grove to Ohio Route 772 at Rardon; Ohio Route 772 from Rardon to Ohio Route 112 at Jasper; Ohio Route 112 north to Ohio Route 124 west of Piketon; Ohio Route 124 east to junction with Ohio Route 689 at Wilkesville; Ohio Route 689 north to junction with Ohio Route 143 at Mt. Blanco (recent maps show Route 143 as Route 346); Ohio

Route 143 (Route 346 ?) northeast to junction with US 50 west of Albany; US 50 from Albany to Athens.

- West Virginia: US 50 from WV Route 47 at Parkersburg east to US 19 at Clarksburg.



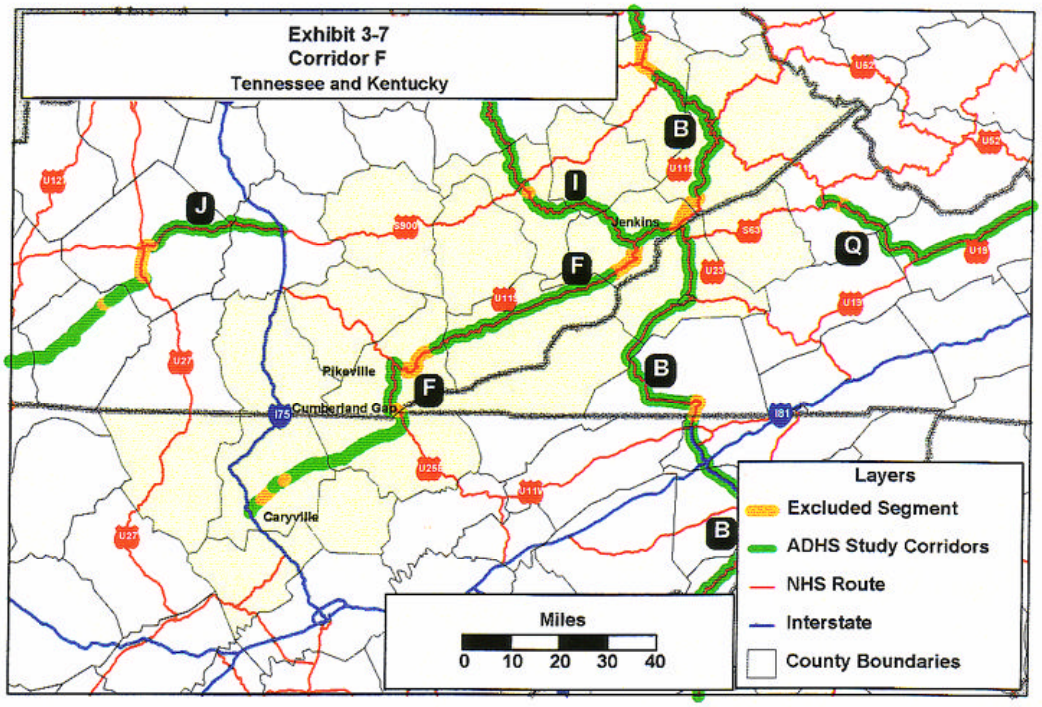
With ADHS Improvements

- West Virginia: From I -79 at Morgantown, West Virginia via I-68 (US 40) to I-70 at Hancock, Maryland.

Without ADHS Improvements

- West Virginia: US 119/ WV Route 73 from WV Route 92 at Morgantown east to junction with US 119 at Easton; WV Route 73 east to junction with WV Route 26 at Bruceton Mills; WV Route 26 north to WV Route 281 at Brandonville; WV Route 281 northeast to junction with US 40 in Pennsylvania; US 40 (in Pennsylvania) into Maryland.

- Maryland: US 40 from Pennsylvania State line east to junction with Maryland Route 522 at Hancock.



With ADHS Improvements

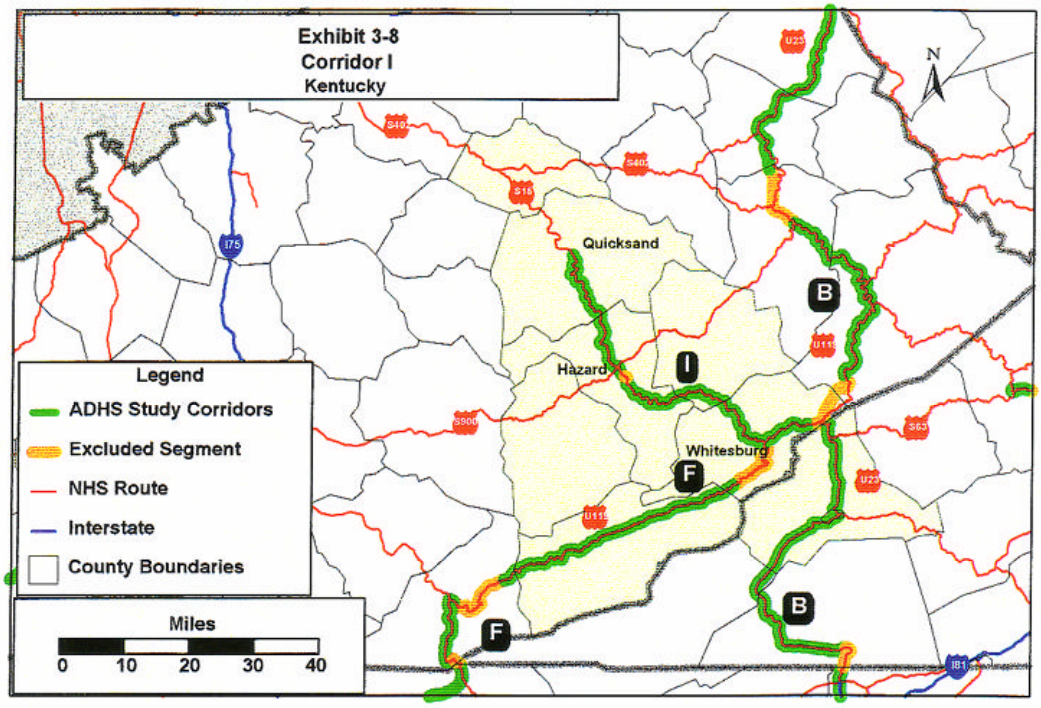
- Tennessee: From I -75 at Caryville, Tennessee via US 25W to Tenn. Route 63 @ LaFollette, via Tenn. Route 63 to Tenn. Route 32/US 25E and then via Tenn. Route 32/US 25E to Cumberland Gap at Kentucky State line. Projects in Tennessee from La Follette east to US 25E, a 30 mile section, have been built to 2 lanes with future widening planned to 4 lanes.

- Kentucky: From Cumberland Gap via US 25E to US 119 at Pineville, Kentucky and then via US 119 to Corridor B (US 23) at Jenkins, Kentucky. An unbuilt section for 14.5 miles from Pine Mountain to Whitesburg in Kentucky is planned for widening of shoulders and additions of climbing lanes along the existing US 119.

Before ADHS Improvements

- Tennessee: US 25 W from junction with Tennessee Route 63 in Caryville eastward to junction with US 25W at LaFollette; Tennessee Route 63 from LaFollette eastward to junction with US 25E at Patterson Crossroads; US 25E north to the Cumberland Gap at the Kentucky State line.

- Kentucky: US 25E from the Cumberland Gap at Middlesboro eastward to junction with US 119 at Pineville; US 119 east from Pineville to US 23 at Jenkins near the Virginia State line.

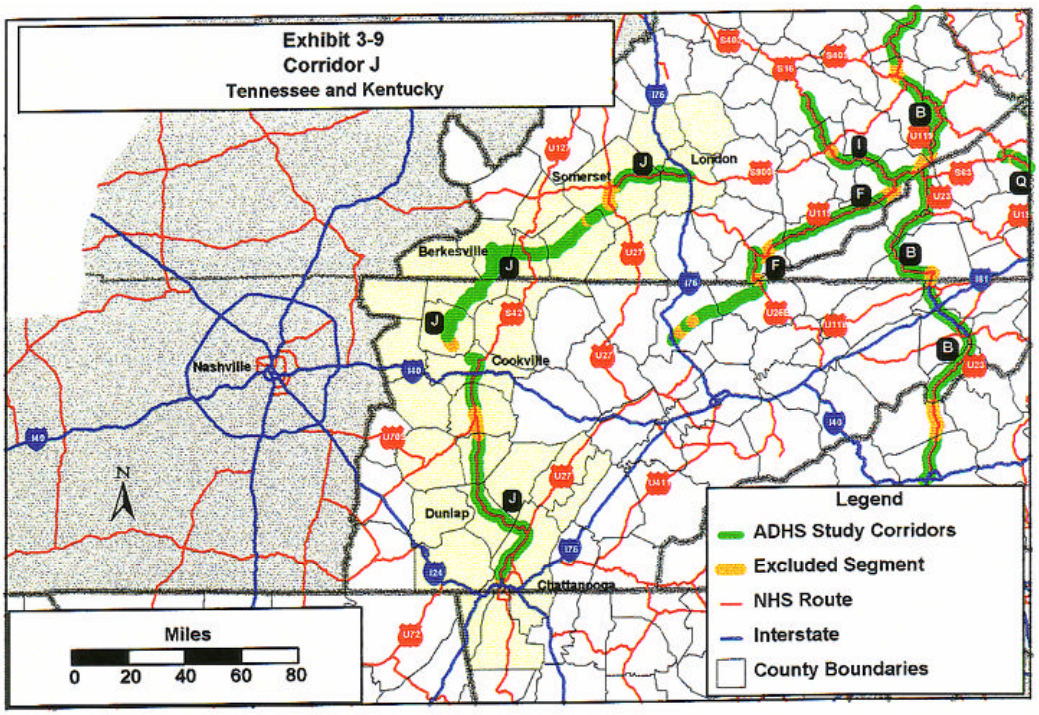


With ADHS Improvements

- Kentucky: From Corridor F (US 119) at Whitesburg, Kentucky via Kentucky Route 15 to Kentucky Route 30 south of Jackson, Kentucky. Length is 60.5 miles. Remainder of Corridor I in Kentucky is an "Adequate" section built with other funds from Jackson to I-64 at Winchester.

Before ADHS Improvements

- Kentucky: Kentucky Route 15 northwest to junction with Kentucky Route 28 at Darfork (north of Hazard); Kentucky Route 28 northwest to junction with Kentucky Route 267 at Clemons; Kentucky Route 267 north to junction with Kentucky Route 15 at Stacy; Kentucky Route 15 northwest to junction with Kentucky Route 30 at Jackson.



With ADHS Improvements

- Tennessee: From I-124 at Chattanooga, Tennessee north via US 27 to Soddy-Daisy, northwest via Tenn. Route 111 to Dunlap, and Tenn. Route 8/111 to Cookville north of I-40 (this segment includes sections with 2 of ultimate 4 lanes complete and open to traffic); From Tenn. Route 56 (north of Jackson County line) via Tenn. Route 56 to Gainsboro and Tenn. Route 53 to the Kentucky State Line. There is 9.7 mile gap on the corridor between north limit at Cookeville to Tenn. Route 56 north of Putnam-Jackson County Line where construction of corridor is planned on new location. This segment includes sections with 2 of ultimate 4 lanes complete and open to traffic.

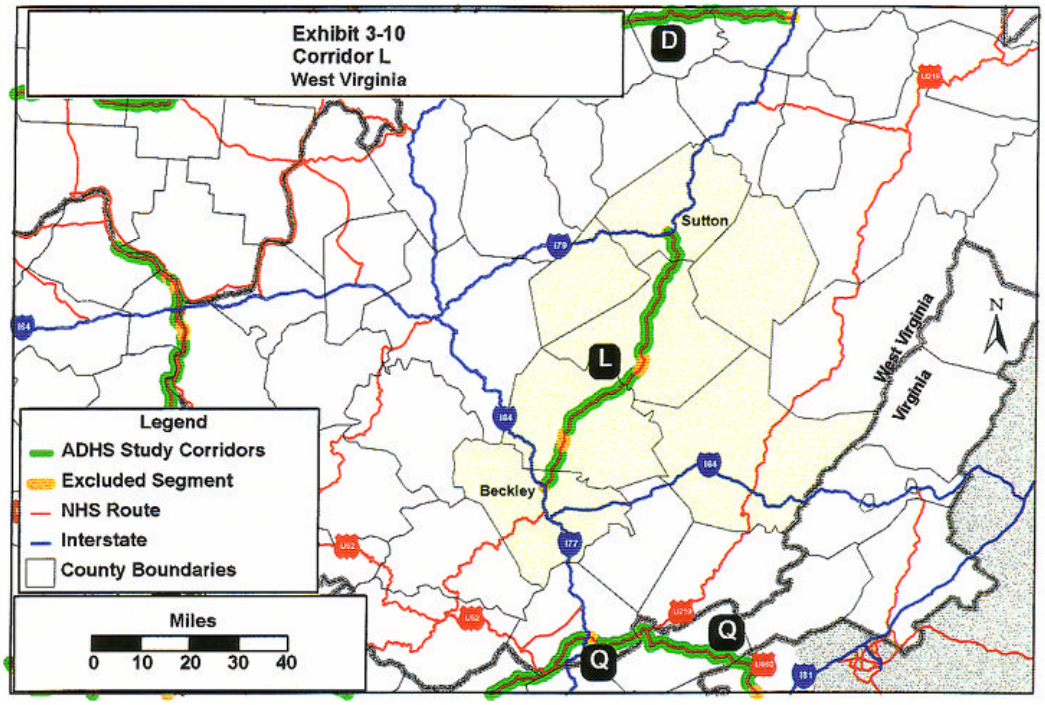
- Kentucky: From Tennessee State line via north Ky. Route 61 to Burkesville, east and north via Ky. Route 90 to Somerset, east via Ky. Route 80 to I-75 at London, Kentucky.

Without ADHS Improvements

- Tennessee (Southern Section): US 127/Tennessee Route 8 from junction with US 27 in Chattanooga north to junction with Tennessee Route 28 near Center Point; Tennessee Route 8/28 north to junction with Tennessee Route 8 north of Dunlap; Tennessee Route 8 north to junction with Tennessee Route 111 at Cagle; Tennessee Route 111 north to junction with Kentucky Route 30 at Spencer; Tennessee Route 111 north to junction with US 70S at Doyle (south of Sparta); US 70S north to Tennessee Route 42 at Sparta; Tennessee Route 42 north to Tennessee Route 136 at Cookeville; Tennessee Route 136 north to junction with Tennessee Route 290; Tennessee Route 290 northwesterly to Tennessee Route 56 (unbuilt section); Tennessee Route 56 north to McCoinsville, south of Gainsboro (unbuilt section).

- Tennessee (Northern Section): Tennessee Route 56 at McCoinsville north to junction with Tennessee Rout 53 at Gainsboro; Tennessee Rout 53 north to the Kentucky State line.

- Kentucky: Kentucky Route 61 north to Kentucky Route 90 at Burkesville; Kentucky Route 90 at Burkesville east to Kentucky Route 55 near Seminary; Kentucky Route 55 to US 127 (shown as Kentucky 35 on older maps) at Ida; US 127 (Kentucky Route 35) to Kentucky Route 90; Kentucky Route 90 to junction with US 27 near Burnside; US 27 north to junction with Kentucky Route 80 at Somerset; Kentucky Route 80 east to junction with US 150 near London.

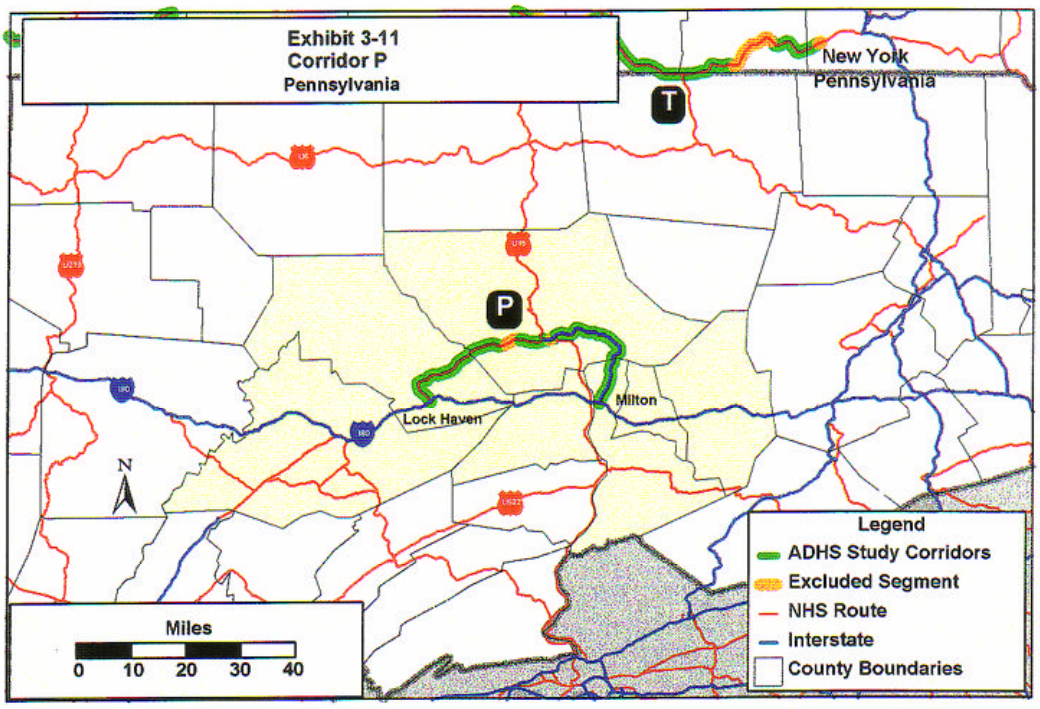


With ADHS Improvements

- West Virginia: From I-77 at Beckley, W. Virginia via US 19 to I-79 at Sutton, W. Virginia. Length - 69.9 miles.

Without ADHS Improvements

- West Virginia: WV Route 16 at Prosperity north to US 21 at Red Star; US 21 north to junction with US 60 at Kanawha River near Cotton Hill; US 60 east to WV Route 41/ US 19 southeast of Lookout; WV Route 41/US 19 north to US 19 at Summerdale; US 19 north to WV Route 4 near Sutton.

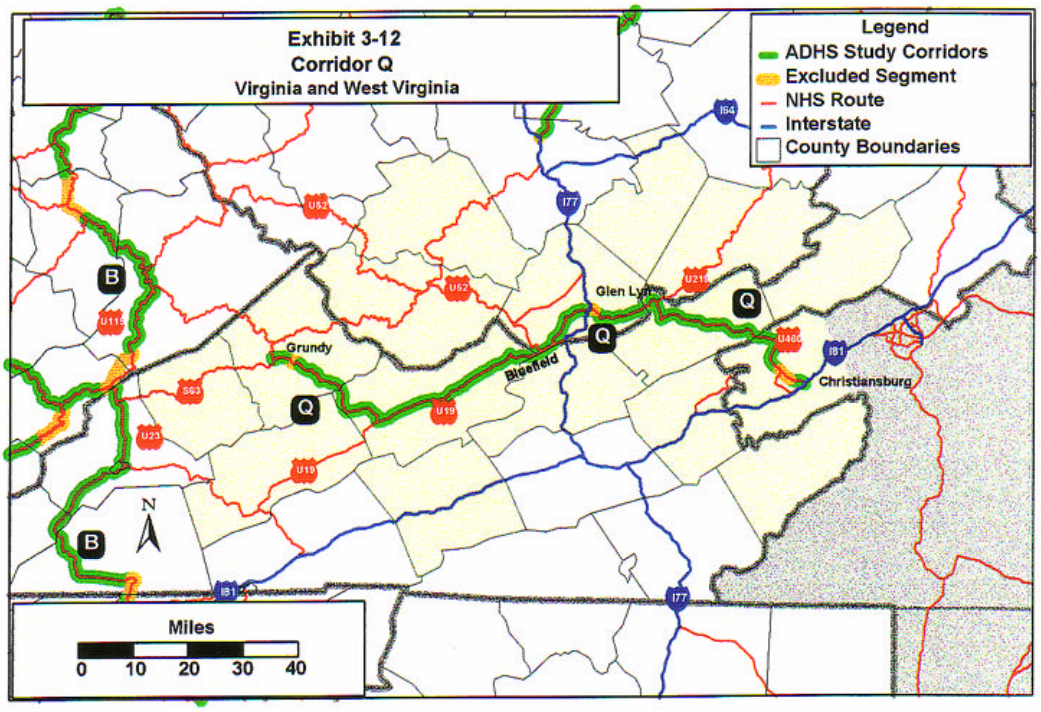


With ADHS Improvement

- Pennsylvania: From I-80 at Lock Haven, Pennsylvania eastward via US 220 and I-180 to I-80 and Milton, Pennsylvania. Length is 60.0 miles.

Without ADHS Improvements

- Pennsylvania: PA Route 880 north to PA Route 64 at Cedar Springs; PA Route 64 north to US 220 at Mill Hall; US 220 east to PA Route 147 at Pennsdale; PA Route 147 south to PA Route 405 near Milton.



With ADHS Improvement

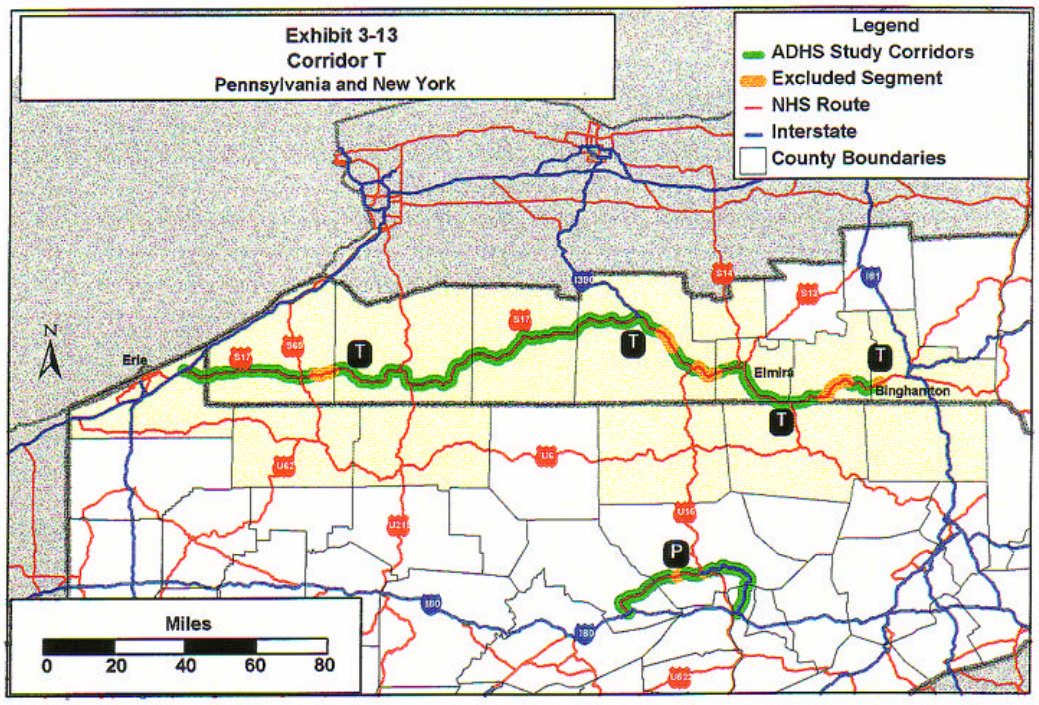
- Virginia: From Grundy, Virginia via US 19/460 to Bluefield at W. Virginia State line. From Glen Lyn at W. Virginia State line east via US 460 to I-81 at Christiansburg, Virginia.

- West Virginia: From Virginia State line at Bluefield via US 460 to Virginia State line at Glen Lyn.

Without ADHS Improvements

- Virginia: US 460 from Christiansburg to the West Virginia State line; US 460/19 from West Virginia State line to junction with US 19 at Claypool Hill; US 460 from Claypool Hill to junction with VA Route 83 at Grundy.

- West Virginia: US 460/WV Route 12 from Glen Lyn at the Virginia State line to junction with US460/219 at Oakvale; WV Route 12 to junction with US 19 (US 21 on old maps) southwest of Princeton; US 19 to Bluefield at the Virginia State line.



With ADHS Improvement

- Pennsylvania: From I-90 east of Erie Pennsylvania via Pa. Route 17 to New York State line (section was recently widened to 4 lanes with other than ADHS funds).

- New York: From Pennsylvania State line via New York Route 17 to I-81 at Binghamton, New York.

Without ADHS Improvements

- Pennsylvania: PA Route 430 to the New York State line.

- New York: NY Route 430 from Pennsylvania State line east to NY 302 at Sherman; NY 302 east to NY Route 94 at Chautauqua Lake; NY Route 94 across Chautauqua Lake to NY Route 17; NY Route 17 east to NY Route 16 at Olean; NY Route 16 to NY Route 408 at Hinsdale; NY Route 408 to NY 20 at Cuba; NY Route 20 to NY Routes 16/2 at Angelica; NY Route 2 to NY Route 70 at Hornell; NY Route 70 to NY Routes 15/415 at Avoca; NY Routes 15/415 to NY Route 17 at Painted Post; NY Route 17 to junction with NY Route 60 at Elmira; NY Routes 17/60 to US 11 at Binghamton.

CORRIDOR ANALYSES

Sources of Information

In order to assess the economic impacts resulting from the completed ADHS improvements, it is necessary to compare the physical and operational characteristics of the Study Corridors with and without the ADHS improvements. Three sources of information were used to develop data for each of the Study Corridors: (1) ARC's 1997 Cost-To-Complete Database and other data provided by ARC; (2) a questionnaire sent to State DOTs requesting before and after data for the Study Corridors; and (3) a travel model developed by Wilbur Smith Associates to estimate traffic and travel data not available from the other sources.

The ARC's 1997 Cost-To-Complete Database includes detailed information regarding the current (1995) status of the entire ADHS and the improvements necessary to complete the system. The ADHS is divided into more than 1,400 sections within the database. This database does provide useful information on the current physical characteristics of those Study Corridor sections that were completed before 1995. However, it contains very little historical information about the Study Corridors before any improvements were made.

To supplement the data available from ARC and, in particular, to obtain more data on the Study Corridors before the ADHS improvements were made, a survey questionnaire **(Exhibit 3-14)** was developed and sent to the State DOTs in the 10 states through which the Study Corridors pass. The State DOTs were very cooperative and responsive. All of the states had good and useful data on the existing (improved) Study Corridors. Most of the State DOTs, however, had little detailed historical data concerning the unimproved Study Corridors (the highways before the ADHS improvements were made). In those cases where detailed historical data was not available, the State DOTs were instructed to use professional judgment in estimating the missing data. Based on the experience of this study, it is recommended that the ARC collect information regarding the existing physical and operational characteristics of those ADHS corridor sections that have not yet been improved (for use in future studies).

Traffic Model

The two data sources described above provided traffic information for two points in time: 1965 and 1995. A travel model was developed by Wilbur Smith Associates to estimate the traffic and travel data required to analyze the economic impacts of the ADHS improvements to the Study Corridors, including:

- Opening year and 30th year auto and truck traffic for each Study Corridor section – the ADHS improvements within each Study Corridor were not all completed at the same time. To realistically compute economic benefits, auto and truck traffic estimates are needed for the year each Study Corridor section was first opened-to-traffic, and for the 30th year thereafter. The ADHS travel model estimates the opening year traffic volumes based on historical traffic counts. Traffic estimates for the 30th year are based on historical traffic growth, forecast future population growth, and forecast changes in vehicle-miles of travel per person.

Exhibit 3-14
Appalachian Development Highway System (ADHS)
Economic Benefit Study Questionnaire

State: **Corridor:** **Section:**
From: **To:**

Part 1: ***Description of the improved ADHS Corridor section in 1995***

(1)Area Type: ☐ Urban ☐ Rural
(2)Road Type: ☐ Freeway ☐ Prin Arterial ☐ Min Arterial ☐ Collector ☐ Local
(3)Access Control: ☐ Full Control ☐ Limited Access ☐ Controlled Access

(4)Length (x.x mi): ____ (5)Speed Limit (mph):
(6)Thru Lanes (#): ____ (7)Climbing Lanes (mi):
(8)Lane Width (ft): ____ (9)Median Width (ft): ____ (10)Shoulder Width (ft):

(11)Curvature (mi): ____ @0-2° ____ @3-6° ____ @7-9° ____ @10-14° ____ @>14°
(12)Grades (mi): ____ @0-5% ____ @6-7% ____ @8-9% ____ @10-11% ____ @>11%
(13)1995 AADT: ____ (14)1995 % Trucks:

(15)In what year was the last major ADHS roadway improvement to this section completed?
(16)Did the ADHS improvements to this section primarily involve: ☐ Improving an existing road, or
☐ Building a new road on new location?

Part II: ***Description of the road that 1995 traffic on the Corridor section described above would have used in 1995 if no ADHS improvements had been made:***

(17)Area Type: ☐ Urban ☐ Rural
(18)Road Type: ☐ Freeway ☐ Prin Arterial ☐ Min Arterial ☐ Collector ☐ Local
(19)Access Control: ☐ Full Control ☐ Limited Access ☐ Controlled Access
(20)Surface Type: ☐ Unpaved ☐ Paved

(21)Length (x.x mi): ____ (22)Speed Limit (mph):

(23)Thru Lanes (#): ____ (24)Climbing Lanes (mi):
(25)Lane Width (ft): ____ (26)Median Width (ft): ____ (27)Shoulder Width (ft):

(28)Curvature (mi): ____ @0-2° ____ @3-6° ____ @7-9° ____ @10-14° ____ @>14°
(29)Grades (mi): ____ @0-5% ____ @6-7% ____ @8-9% ____ @10-11% ____ @>11%

(30)1965 AADT: ____ (31)1965 % Trucks: ____ <-------- yes, we do want 1965 data here!

If the ADHS improvements for this section involved building a new road in a new location, please provide the following information for the **old road** through this corridor (ie, the road that 1995 section traffic would have used in 1995 if the new road had not been built):

(32)1995 Rte Num: ____ (33)1995 Rte Name:

(34)1995 AADT: ____ (35)1995 % Trucks: ____ Thank you very much for your help.

- Opening year and 30th year travel time/speed for each Study Corridor segment, with and without the ADHS improvements -- travel time/speed was estimated for each Study Corridor segment using the Highway Performance Monitoring System (HPMS) methodology and data developed by the FHWA. This methodology recognizes that travel time, due to congestion-induced speed change cycles, varies according to the level of congestion (expressed in terms of volume/capacity ratios) and varies by type of vehicle (that is to say, it takes longer for a truck to resume original speed).

Corridor Characteristics

The remainder of this chapter summarizes the physical and operating characteristics of the Study Corridors, with and without the ADHS improvements. For data collection and analysis, the Study Corridors were segmented into more than 500 sections. For the purposes of this report the data are summarized by Corridor and State.

Study Corridor Length and Opening Year -- **Exhibit 3-15** summarizes Study Corridor lengths with and without the ADHS improvements. As discussed earlier, these lengths exclude any Study Corridor segments that were not improved with ADHS funds, or were not open to traffic by 1995.

Altogether, the Study Corridors include approximately 1,417 miles of roadway that were constructed or improved using ADHS funds. The comparable roadway mileage in all Study Corridors without the ADHS improvements was about 1,478 miles. The ADHS improvements increased roadway mileage in some corridors and decreased mileage in others. As will be seen later, the major benefits of the ADHS improvements do not come from changes in overall corridor mileage, but from changes in number of lanes and design standards.

Exhibit 3-15 also shows the earliest year, the latest year and the average year that ADHS-improved road sections were opened to traffic within each Study Corridor. The open-to-traffic year is important in this study because it represents the first year that benefits can be generated for an improved roadway section. The earliest year improved sections were opened to traffic was 1967, while the latest were opened in 1995. Corridors F, I and P have been open to traffic the longest. Corridors B, E, L and T include sections that were opened very recently.

Number of Lanes and Lane Miles -- **Exhibit 3-16** shows the minimum, maximum and average number of roadway lanes for each Study Corridor with and without the ADHS improvements. Overall, the ADHS improvements increased the average number of lanes in the Study Corridors from 2.1 to 3.7. Most Study Corridor roadways were 2-lanes before the ADHS improvements, and 4-lanes after the ADHS improvements.

Also shown in Exhibit 3-16 is the mileage of climbing lanes with and without the ADHS improvements. Overall, the ADHS improvements increased the climbing lane mileage in the Study Corridors from 9 to 121 miles. In some cases (for example, Corridors B and P), climbing lanes that existed before the ADHS improvements were eliminated when the roadway section was widened.

Exhibit 3-15. Corridor Length With and Without ADHS Improvements and the Year Open to Traffic

		Studied Length (miles)		Year Open to Traffic		
Corridor	State	With	Without	Earliest	Latest	Average
A/A1	GA	30.4	28.5	1984	1984	1984
B	KY	116.2	129.3	1968	1992	1976
	NC	18.3	18.3	1968	1974	1971
	TN	57.4	55.9	1971	1995	1984
	VA	57.5	69.4	1968	1987	1976
	All of B	**249.4**	**272.8**	**1968**	**1995**	**1977**
D	OH	119.4	128.4	1969	1984	1976
	WV	70.4	75.0	1971	1978	1972
	All of D	**189.8**	**203.4**	**1969**	**1984**	**1975**
E	MD	77.0	77.3	1968	1993	1983
	WV	32.2	30.1	1974	1976	1975
	All of E	**109.2**	**107.4**	**1968**	**1993**	**1981**
F	KY	63.5	68.5	1973	1978	1975
	TN	35.8	36.6	1968	1977	1976
	All of F	**99.3**	**105.1**	**1968**	**1978**	**1975**
I	KY	59.9	63.4	1968	1972	1969
J	KY	93.7	99.4	1970	1984	1977
	TN	120.8	113.5	1973	1991	1983
	All of J	**214.5**	**212.9**	**1970**	**1991**	**1981**
L	WV	60.5	67.3	1971	1995	1980
P	PA	54.7	54.4	1969	1979	1973
Q	VA	103.0	108.8	1967	1986	1976
	WV	26.8	27.6	1967	1978	1975
	All of Q	**129.8**	**136.4**	**1967**	**1986**	**1976**
T	NY	213.5	218.4	1970	1994	1978

	PA	6.8	8.4	1986	1986	1986
	All of T	**220.3**	**226.8**	**1970**	**1994**	**1978**
Total (All Corridors)		**1,417.8**	**1,478.4**	**1967**	**1995**	**1977**

Exhibit 3-16. Number of Lanes and Lane Miles With and Without ADHS Improvements

		Number of Lanes With			Number of Lanes Without			Climbing Lanes (Miles)		Lane Miles	
Corridor	State	Min.	Max.	Avg.	Min.	Max.	Avg.	With	Without	With	Without
A/A1	GA	4	4	4.0	2	4	2.3	0.0	0.0	121.6	66.3
B	KY	2	4	4.0	2	2	2.0	0.0	1.1	463.2	258.5
	NC	4	8	4.2	2	4	3.7	0.0	0.0	76.0	66.9
	TN	4	4	4.0	2	4	2.5	1.9	0.4	229.6	138.7
	VA	4	4	4.0	2	4	2.1	0.0	2.4	230.0	146.8
	All of B	**2**	**8**	**4.0**	**2**	**4**	**2.2**	**1.9**	**3.8**	**998.8**	**610.8**
D	OH	4	4	4.0	2	2	2.0	0.0	0.0	477.6	256.9
	WV	4	4	4.0	2	2	2.0	0.0	0.0	281.6	149.9
	All of D	**4**	**4**	**4.0**	**2**	**2**	**2.0**	**0.0**	**0.0**	**759.2**	**406.8**
E	MD	4	4	4.0	2	2	2.0	51.7	0.0	308.0	154.5
	WV	4	4	4.0	2	2	2.0	10.0	0.0	128.8	60.3
	All of E	**4**	**4**	**4.0**	**2**	**2**	**2.0**	**61.7**	**0.0**	**436.8**	**214.8**
F	KY	2	4	2.4	2	2	2.0	6.0	0.0	155.0	136.9
	TN	4	4	4.0	2	2	2.0	0.0	0.0	143.2	73.3
	All of F	**2**	**4**	**3.0**	**2**	**2**	**2.0**	**6.0**	**0.0**	**298.2**	**210.2**
I	KY	2	4	2.3	2	2	2.0	17.0	0.0	140.4	126.7
J	KY	2	4	2.3	2	2	2.0	15.9	0.0	218.6	198.8
	TN	2	4	3.5	2	2	2.0	14.6	0.0	421.8	227.0
	All of J	**2**	**4**	**3.0**	**2**	**2**	**2.0**	**30.5**	**0.0**	**640.4**	**425.8**
L	WV	4	4	4.0	2	4	2.1	4.1	1.1	242.0	142.0
P	PA	4	4	4.0	2	4	2.1	0.0	4.1	218.8	115.1
Q	VA	4	4	4.0	2	2	2.0	0.0	0.0	412.0	217.6
	WV	4	4	4.0	2	4	2.1	0.0	0.0	107.2	58.9
	All of Q	**4**	**4**	**4.0**	**2**	**4**	**2.0**	**0.0**	**0.0**	**519.2**	**276.6**
T	NY	4	6	4.0	2	4	2.2	0.0	0.0	861.8	488.1
	PA	4	4	4.0	2	2	2.0	0.0	0.0	27.2	16.9
	All of T	**4**	**6**	**4.0**	**2**	**4**	**2.2**	**0.0**	**0.0**	**889.0**	**505.0**
Total (All Corridors)		**2**	**8**	**3.7**	**2**	**4**	**2.1**	**121.2**	**9.0**	**5264**	**3100.2**

The new lanes added by the ADHS improvements significantly increased the roadway lane-miles in the Study Corridors. As shown in Exhibit 3-16, total lane miles increased from 3,100 to 5,264, a 70% increase. The most significant increases occurred in Corridors A/A1, D, E, P and Q.

The ADHS improvements to the Study Corridor roadways are also reflected in the increased width of an average lane (**Exhibit 3-17**). Except for a portion of the Corridor T in New York, all Study Corridor roadways have been upgraded to a standard lane-width of 12 feet.

Roadway Classification -- Approximately 13% of the improved Study Corridor mileage is classified as urban, while 87% is rural. The overall mileage of urban and rural highways does not change much with and without the ADHS improvements. However, as shown in **Exhibit 3-18**, the ADHS improvements increased lane miles in urbanized areas from 478 to 752, or by 57%. Rural lane miles increased from 2,622 to 4,512, or by 72%.

Exhibit 3-19 describes the Study Corridors, with and without the ADHS improvements, in terms of roadway type. Most significant is the increase in freeway lane miles, which increases from 0 to 1,202 miles with the ADHS improvements. Arterial lane miles increased from 2,182 to 4,062, or by 86%.

Speed Limits -- A summary of minimum, maximum and average posted speed limits with and without the ADHS improvements is presented in **Exhibit 3-20**. Overall, the ADHS improvements have increased the average posted speed limit in the Study Corridors by 10 miles per hour, or more than 20%. This increase is the obvious result of the higher design standards used for the ADHS improvements.

Roadway Curvature and Grades -- The higher design standards used for the ADHS improvements also resulted in less severe curves and grades within the Study Corridors. **Exhibit 3-21** shows the percentage of Study Corridor roadway mileage by degree of curvature and the weighted average degree of curvature, with and without the ADHS improvements. Overall, the average degree of curvature for all corridors was reduced from 2.9 to 2.1.

Exhibit 3-22 shows the percentage of Study Corridor roadway mileage by percent grade and the average percent grade, with and without the ADHS improvements. Overall, the average grade for all corridors was reduced from 3.2% to 3.0%. In comparing the curvature and grade data, it appears that the grade problems were not as severe as the curvature problems. Consequently, the ADHS improvements should be expected to have more impact on the curvature problems.

Exhibit 3-21. Roadway Curvature With and Without ADHS Improvements

		Percent Roadway mileage by Curvature (degrees)										AverageCurvature (Degrees)	
		0-2°		3-6°		7-9°		10-14°		Over 14°			
Corridor	State	With	Without	With	Without	With	Without	With	Without	With	Without	With	Without
A/A1	GA	59.8	30.0	11.0	60.8	22.5	5.8	5.7	3.5	1.0	0.0	3.7	3.9
B	KY	91.4	87.3	6.2	6.3	1.5	2.9	1.0	1.8	0.0	1.6	1.4	1.9
	NC	71.1	71.1	28.9	28.9	0.0	0.0	0.0	0.0	0.0	0.0	2.0	2.0
	TN	50.5	55.2	0.5	0.2	9.5	4.0	6.9	1.4	32.4	39.2	7.3	7.3
	VA	82.3	87.7	15.5	3.9	2.3	5.8	0.0	0.0	0.0	2.6	1.7	1.9
	All of B	**78.4**	**79.7**	**8.7**	**6.0**	**3.4**	**3.7**	**2.0**	**1.2**	**7.5**	**9.5**	**2.9**	**3.0**
D	OH	96.1	84.3	3.9	8.7	0.0	1.4	0.0	0.7	0.0	4.9	1.1	2.2
	WV	79.1	58.1	20.7	28.3	0.3	6.7	0.0	4.5	0.0	2.4	1.7	3.3
	All of D	**89.8**	**74.6**	**10.1**	**15.9**	**0.1**	**3.4**	**0.0**	**2.1**	**0.0**	**4.0**	**1.4**	**2.6**
E	MD	52.7	44.9	31.9	31.3	15.4	8.5	0.0	6.1	0.0	9.3	3.2	4.8
	WV	87.2	69.9	12.8	22.0	0.0	3.0	0.0	2.7	0.0	2.3	1.4	2.6
	All of E	**62.9**	**51.9**	**26.3**	**28.7**	**10.9**	**7.0**	**0.0**	**5.2**	**0.0**	**7.3**	**2.7**	**4.2**
F	KY	93.3	89.4	5.3	7.1	1.3	2.0	0.1	0.9	0.0	0.5	1.3	1.6
	TN	64.4	62.5	19.6	8.4	6.5	8.1	4.3	5.4	5.3	15.6	3.4	4.8
	All of F	**82.9**	**80.1**	**10.5**	**7.5**	**3.1**	**4.1**	**1.7**	**2.5**	**1.9**	**5.8**	**2.1**	**2.7**
I	KY	75.9	67.5	14.7	14.2	7.5	10.6	1.3	2.8	0.6	4.8	2.3	3.3
J	KY	97.1	79.7	2.1	5.6	0.8	4.6	0.0	3.1	0.0	7.0	1.1	2.9
	TN	85.0	74.9	13.5	22.5	0.5	1.0	1.0	1.7	0.0	0.0	1.6	2.0
	All of J	**90.3**	**77.1**	**8.5**	**14.6**	**0.6**	**2.6**	**0.6**	**2.4**	**0.0**	**3.3**	**1.4**	**2.4**
L	WV	91.3	70.8	8.7	11.8	0.0	9.8	0.0	4.2	0.0	3.4	1.3	3.1
P	PA	96.3	89.4	3.7	5.3	0.0	3.7	0.0	0.5	0.0	1.0	1.1	1.7
Q	VA	86.3	84.2	11.7	9.4	0.9	3.1	1.1	1.7	0.0	1.7	1.6	2.0

	WV	73.8	84.8	25.5	3.9	0.7	4.6	0.0	4.2	0.0	2.4	1.9	2.3
	All of Q	**83.7**	**84.3**	**14.6**	**8.3**	**0.9**	**3.4**	**0.8**	**2.2**	**0.0**	**1.8**	**1.7**	**2.0**
T	NY	48.4	36.0	44.7	46.3	7.0	17.8	0.0	0.0	0.0	0.0	3.1	3.9
	PA	100.0	94.5	0.0	3.9	0.0	0.4	0.0	0.8	0.0	0.4	1.0	1.3
	All of T	**50.0**	**38.1**	**43.3**	**44.7**	**6.8**	**17.1**	**0.0**	**0.0**	**0.0**	**0.0**	**3.0**	**3.8**
All Corridors		**77.6**	**69.2**	**16.4**	**18.2**	**3.7**	**6.4**	**0.8**	**2.0**	**1.5**	**4.3**	**2.1**	**2.9**

Exhibit 3-22. Roadway Grades With and Without ADHS Improvements

		Percent Roadway Mileage by Grade (percent)										Avg. Grade (percent)	
		0-5%		6-7%		8-9%		10-11%		Over 11%			
Corridor	State	With	Without	With	Without	With	Without	With	Without	With	Without	With	Without
A/A1	GA	90.3	77.5	6.4	22.5	3.3	0.0	0.1	0.0	0.0	0.0	3.0	3.4
B	KY	95.4	95.2	4.6	3.0	0.0	1.8	0.0	0.0	0.0	0.0	2.7	2.7
	NC	96.3	93.2	3.7	6.8	0.0	0.0	0.0	0.0	0.0	0.0	2.6	2.8
	TN	100.0	100.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.5	2.5
	VA	86.6	84.3	10.4	6.2	3.0	9.0	0.0	0.4	0.0	0.0	3.1	3.3
	All of B	**94.5**	**93.3**	**4.8**	**3.5**	**0.7**	**3.1**	**0.0**	**0.1**	**0.0**	**0.0**	**2.7**	**2.8**
D	OH	97.5	85.3	2.5	7.8	0.0	6.0	0.0	0.1	0.0	0.8	2.6	3.3
	WV	100.0	93.2	0.0	6.7	0.0	0.2	0.0	0.0	0.0	0.0	2.5	2.8
	All of D	**98.4**	**88.2**	**1.6**	**7.4**	**0.0**	**3.9**	**0.0**	**0.0**	**0.0**	**0.5**	**2.6**	**3.1**
E	MD	65.7	64.3	21.9	23.6	6.8	7.2	5.6	4.9	0.0	0.0	4.2	4.3
	WV	92.8	70.5	7.2	23.7	0.0	5.7	0.0	0.0	0.0	0.0	2.8	3.8
	All of E	**73.6**	**66.1**	**17.6**	**23.6**	**4.8**	**6.7**	**4.0**	**3.6**	**0.0**	**0.0**	**3.8**	**4.1**
F	KY	88.4	86.5	11.6	11.3	0.0	2.2	0.0	0.0	0.0	0.0	3.0	3.1
	TN	100.0	100.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.5	2.5
	All of F	**92.6**	**91.2**	**7.4**	**7.4**	**0.0**	**1.4**	**0.0**	**0.0**	**0.0**	**0.0**	**2.8**	**2.9**
I	KY	74.9	66.8	16.7	16.1	8.3	13.9	0.0	3.2	0.0	0.0	3.7	4.2
J	KY	81.5	82.3	18.5	6.0	0.0	9.9	0.0	1.8	0.0	0.0	3.2	3.5
	TN	89.7	89.4	10.3	10.6	0.0	0.0	0.0	0.0	0.0	0.0	2.9	2.9
	All of J	**86.1**	**86.0**	**13.9**	**8.5**	**0.0**	**4.6**	**0.0**	**0.8**	**0.0**	**0.0**	**3.1**	**3.2**
L	WV	97.2	84.0	2.8	15.7	0.0	0.1	0.0	0.1	0.0	0.0	2.6	3.1
P	PA	99.8	96.7	0.2	2.8	0.0	0.5	0.0	0.0	0.0	0.0	2.5	2.6

Q	VA	88.8	86.6	10.4	12.3	0.4	0.8	0.0	0.3	0.4	0.0	3.0	3.1
	WV	98.5	98.2	1.5	1.8	0.0	0.0	0.0	0.0	0.0	0.0	2.6	2.6
	All of Q	**90.8**	**88.9**	**8.6**	**10.2**	**0.3**	**0.7**	**0.0**	**0.2**	**0.3**	**0.0**	**2.9**	**3.0**
T	NY	75.4	70.1	24.6	27.6	0.0	2.2	0.0	0.0	0.0	0.0	3.5	3.7
	PA	100.0	99.2	0.0	0.8	0.0	0.0	0.0	0.0	0.0	0.0	2.5	2.5
	All of T	**76.1**	**71.2**	**23.9**	**26.6**	**0.0**	**2.2**	**0.0**	**0.0**	**0.0**	**0.0**	**3.5**	**3.7**
All Corridors		**88.2**	**83.9**	**10.5**	**12.1**	**0.9**	**3.4**	**0.3**	**0.6**	**0.0**	**0.1**	**3.0**	**3.2**

Traffic Analyses

Exhibit 3-23 summarizes the minimum, maximum and average annual daily traffic (AADT) in the Study Corridors for: (1) 1965, before any ADHS improvements were made, (2) the first year each improved Study Corridor segment was open to traffic, and (3) for 1995, after all ADHS improvements were made. In almost every Study Corridor there are very significant differences between the minimum and maximum AADTs. The minimum AADTs typically occur on rural sections of the Study Corridors. The maximum AADTs typically occur on urban sections of the Study Corridors. The average AADT typically falls closer to the minimum because there are many more rural miles in each Study Corridor than there are urban miles.

As discussed earlier, the improved Study Corridor sections were opened to traffic at various times between 1967 and 1995. Consequently, the "first year open" AADT presented in Exhibit 3-23 does not represent traffic for a single year. Instead it represents the average of the first year open AADTs for all Study Corridor sections, whenever they were opened to traffic. Between 1965 and 1995, average AADT for all Study Corridors (except Corridor T for which 1965 data were not available) increased from 3,572 to 11,925, or by 233%. The 1995 average AADT for all corridors including Corridor T is about 11,931. Between opening year and 1995, average AADT for all Study Corridors increased from almost 7,000 to almost 12,000, or by 71%.

The AADTs discussed above are one, but not the only, measure of travel on the Study Corridors. Vehicle miles of travel (VMT) and vehicle hours of travel (VHT) are also useful measures because they take into account not only the amount of traffic, but also the distance and time that vehicles travel. VMT on a roadway section is calculated by summing the distance each vehicle on the section travels (for example, 1 vehicle traveling for 1 mile generates 1 vehicle mile of travel). VHT on a roadway section is calculated by summing the time each vehicle takes to travel on the section (for example, 1 vehicle traveling for 1 hour generates one vehicle hour of travel).

Exhibit 3-24 summarizes the estimated 1995 VMT and VHT for cars and trucks in the Study Corridors, with and without the ADHS improvements. The 1995 VMT for the Study Corridors with the ADHS improvements is 14,564,000 for cars and 2,353,000 for trucks. Without the ADHS improvements, the VMT would be about 14,928,000 for cars and 2,425,000 for trucks, or about 2.5-3.0% higher. The reduction in vehicle miles of travel is primarily due to the slight reduction in Study Corridor mileage with the ADHS improvements.

The 1995 VHT for the Study Corridors with the ADHS improvements is 292,000 for cars and 67,000 for trucks. Without the ADHS improvements, the VHT would be about 463,000 (about 60% higher) for cars and 94,000 (about 40% higher) for trucks. The very significant reduction in vehicle hours of travel is primarily due to the higher average travel speeds achieved through the ADHS improvements. In terms of VHT, trucks benefited somewhat less from the ADHS improvements than did cars because they are more affected by the remaining curves and grades on the improved Study Corridors than are cars.

Exhibit 3-23. Average Daily Traffic (AADT) Before and After ADHS Improvements

Average 1st	AADT for 1965			AADT for the 1st Year Open			AADT for 1995		
Yr. Open	Min	Max	Avg	Min	Max	Avg	Min	Max	Avg
1984	1,300	2,300	1,836	4,085	18,679	10,948	16,250	45,000	29,351
1976	2,300	15,600	4,332	2,586	19,225	7,200	5,500	30,600	14,522
1971	3,900	20,200	10,930	5,439	27,841	10,504	10,000	52,400	18,650
1984	900	9,300	5,412	4,000	22,023	10,138	4,000	38,200	19,179
1976	2,000	6,300	3,461	3,656	12,627	5,615	5,910	22,100	10,335
1977	**900**	**20,200**	**4,774**	**2,586**	**27,841**	**7,620**	**4,000**	**52,400**	**14,931**
1976	2,100	4,600	3,400	2,265	12,427	3,985	1,900	30,300	7,274
1972	1,400	5,800	3,406	1,928	16,582	4,821	9,800	47,000	13,935
1975	**1,400**	**5,800**	**3,402**	**1,928**	**16,582**	**4,283**	**1,900**	**47,000**	**9,745**
1983	2,700	19,300	5,886	4,933	18,680	10,180	8,850	32,350	14,238
1975	1,700	1,700	1,700	3,785	8,587	5,481	9,900	27,500	16,029
1981	**1,700**	**19,300**	**4,711**	**3,785**	**18,680**	**8,861**	**8,850**	**32,350**	**14,766**
1975	2,200	5,600	3,011	1,733	10,772	4,756	2,300	21,000	8,037
1976	1,500	4,500	1,854	1,547	12,169	3,877	3,100	25,600	9,156
1975	**1,500**	**5,600**	**2,607**	**1,547**	**12,169**	**4,450**	**2,300**	**25,600**	**8,440**
1969	**1,600**	**2,800**	**2,026**	**2,171**	**4,515**	**2,833**	**6,000**	**13,400**	**8,986**
1977	800	4,600	1,592	619	6,423	2,921	1,600	14,100	5,524
1983	400	4,600	1,416	420	18,961	5,001	1,400	25,600	7,754
1981	**400**	**4,600**	**1,498**	**420**	**18,961**	**4,030**	**1,400**	**25,600**	**6,780**
1980	**2,100**	**5,200**	**2,941**	**2,411**	**14,800**	**6,625**	**7,800**	**23,200**	**13,233**
1973	**2,600**	**10,600**	**6,724**	**5,061**	**22,333**	**10,289**	**4,553**	**42,600**	**15,659**
1976	3,000	8,500	4,503	3,444	14,580	7,698	8,500	25,200	12,647
1975	4,100	6,800	5,177	4,830	10,680	7,351	9,200	24,500	15,351
1976	**3,000**	**8,500**	**4,639**	**3,444**	**14,580**	**7,628**	**8,500**	**25,200**	**13,206**
1978	N/A	N/A	N/A	5,150	39,423	11,377	5,150	39,700	12,185
1986	N/A	N/A	N/A	8,632	8,666	8,645	5,124	5,144	5,134
1978				**5,150**	**39,423**	**11,275**	**5,124**	**39,700**	**11,967**
1977	**400**	**20,200**	**3,572**	**420**	**39,423**	**6,984**	**1,400**	**52,400**	**11,931**

Exhibit 3-24. 1995 Daily Vehicle Miles and Hours of Travel With and Without ADHS Improvements (1,000's)

		Car VMT		Truck VMT		Car VHT		Truck VHT	
Corridor	State	With	Without	With	Without	With	Without	With	Without
A/A1	GA	**831.18**	**757.22**	**61.09**	**54.65**	**16.51**	**24.78**	**1.65**	**2.12**
B	KY	1442.10	1604.61	245.32	270.77	29.87	48.41	7.02	9.18
	NC	317.38	316.48	23.91	23.86	6.18	9.92	0.59	1.06
	TN	978.45	889.84	122.37	111.54	23.61	33.96	3.55	5.50
	VA	527.02	648.91	67.19	85.82	10.15	19.07	2.02	3.19
	Total	**3264.95**	**3459.84**	**458.79**	**491.99**	**69.81**	**111.36**	**13.18**	**18.95**
D	OH	781.73	816.65	86.87	90.75	14.01	20.68	2.32	2.90
	WV	826.13	869.79	154.84	164.81	17.59	30.23	4.50	6.34
	Total	**1607.86**	**1686.44**	**241.71**	**255.56**	**31.60**	**50.91**	**6.82**	**9.24**
E	MD	961.46	964.60	134.82	135.26	16.08	27.08	3.50	5.20
	WV	448.66	395.51	67.48	59.28	7.11	12.85	1.45	2.44
	Total	**1410.12**	**1360.11**	**202.30**	**194.54**	**23.19**	**39.93**	**4.95**	**7.64**
F	KY	450.85	486.82	59.52	65.02	8.77	11.38	1.71	2.05
	TN	288.49	293.48	39.29	40.03	7.19	10.00	1.25	1.51
	Total	**739.34**	**780.30**	**98.81**	**105.05**	**15.97**	**21.38**	**2.96**	**3.56**
I	KY	**463.87**	**495.04**	**74.38**	**79.24**	**9.64**	**13.77**	**2.29**	**2.93**
J	KY	437.26	462.01	80.38	85.09	8.52	12.47	2.35	2.83
	TN	835.36	769.70	101.27	94.11	16.11	25.04	2.64	4.06
	Total	**1272.62**	**1231.71**	**181.65**	**179.20**	**24.63**	**37.51**	**4.99**	**6.89**
L	WV	**695.59**	**766.42**	**105.05**	**114.90**	**12.63**	**22.44**	**2.84**	**4.05**
P	PA	**760.57**	**730.93**	**95.96**	**92.67**	**14.93**	**22.59**	**2.33**	**3.45**
Q	VA	1174.10	1245.60	128.61	135.79	24.31	40.50	3.94	5.57
	WV	367.59	374.16	43.81	45.88	7.47	11.93	1.28	1.72
	Total	**1541.69**	**1619.76**	**172.42**	**181.67**	**31.78**	**52.43**	**5.22**	**7.29**
T	NY	1948.27	2006.28	653.20	665.94	41.12	64.65	19.87	27.80
	PA	27.57	34.24	7.33	9.10	0.44	0.80	0.17	0.26
	Total	**1975.84**	**2040.52**	**660.53**	**675.04**	**41.57**	**65.45**	**20.04**	**28.06**
All Corridors		**14,563.63**	**14,928.29**	**2,352.69**	**2,424.51**	**292.26**	**462.56**	**67.27**	**94.19**

CORRIDOR AND TRAFFIC CONCLUSIONS

Without question, the ADHS improvements have had a significant and positive impact on the physical and operating characteristics of the Study Corridors:

- The average number of lanes has increased from 2.1 to 3.7, or by 76%.
- The total number of lane miles has increased from 3,100 to 5,264, or by 70%.
- The total lane mile of freeways has increased from 0 to 1,202.
- The average speed limit has increased from 47 to 57 miles per hour, or by 21%.
- The average degree of roadway curvature has been reduced from 2.9 to 2.1, or by 38%.
- Vehicle hours of travel for cars and trucks were reduced by 198,000 hours in 1995.

These types of roadway changes make travel more efficient. The economic efficiencies (benefits) that result from these improvements are discussed in the next Chapter.