SECTION E
TENNESSEE HIGHWAYS

As explained in the main Alliance Report, the specific highways determined to comprise the LATTS Strategic Highway System were identified using a series of criteria to help identify a network of highways which had the greatest significance regarding trade with Latin America. The 22,859-mile mainline LATTS Strategic Highway System shown in Exhibit E-1 is the result of this process.

More than 5.5 percent of the mainline LATTS Strategic Highway System (1,269 miles) is located in Tennessee (Exhibit E-2). The Tennessee components[1] include the following:

- All of Tennessee's 1,073 miles of interstate highways, including:
  - I-24 through Nashville and Chattanooga
  - I-40, a major east-west interstate linking Texas with Little Rock, Memphis, Nashville, Knoxville, Raleigh, and Wilmington
  - I-65, a major north-south interstate linking Louisville with Nashville, Birmingham, and Mobile
  - I-75, a major north-south interstate linking Cincinnati with Knoxville, Atlanta, Tampa and Miami
  - I-81, linking east Tennessee with Virginia and Pennsylvania
  - Numerous urban interstates, including routes (I-124, I-40, I-155, I-181, I-240, I-265, I-440, I-540, and I-640.
- 196 miles of non-interstate National Highway System (NHS) facilities.
  - U.S. 23 (I-181) from the Virginia State Line to the North Carolina State Line (11 miles), part of Corridor 12 (I-26, U.S. 23) between Ohio and Charleston, SC. This highway is four-lanes with full access control.
  - S 840 between I-24 and I-40 at Nashville, part of Corridor 6 (8 miles)
  - U.S. 412 from the Missouri State Line to I-40 @ Jackson, TN (42 miles), part of Corridor 13. This highway is all four-laned, with both full and partial access control.

[1] Mileage, number of lanes, pavement condition and other data reported herein were taken from the HPMS Database, as discussed subsequently, and may differ from information in other databases.

Exhibit E-1
LATTS STRATEGIC HIGHWAY SYSTEM

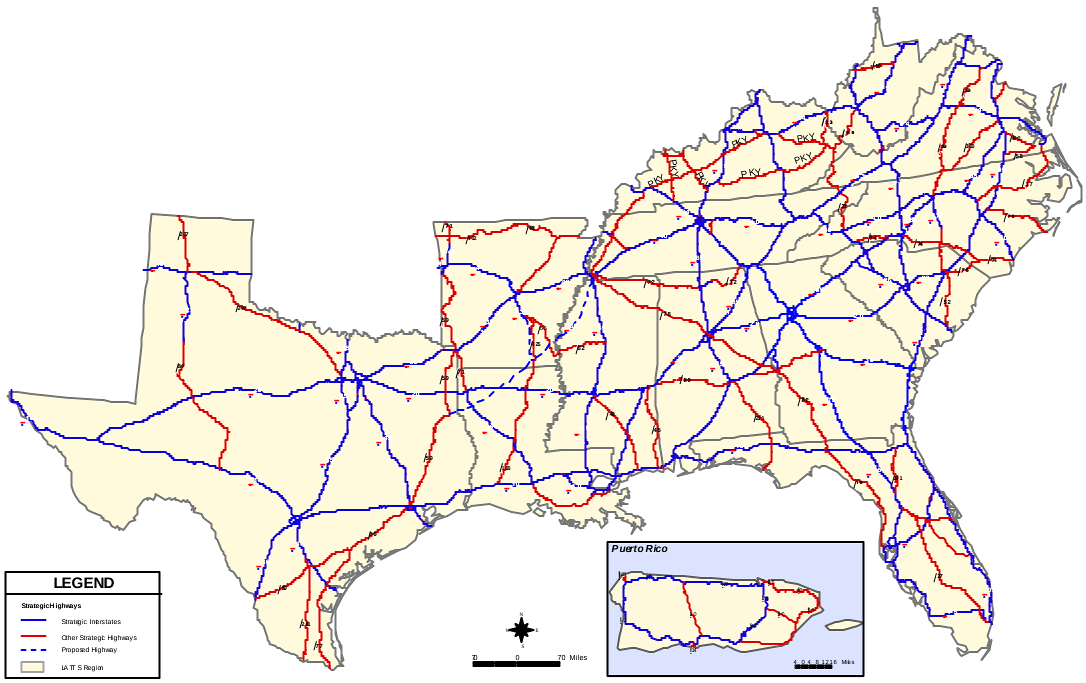
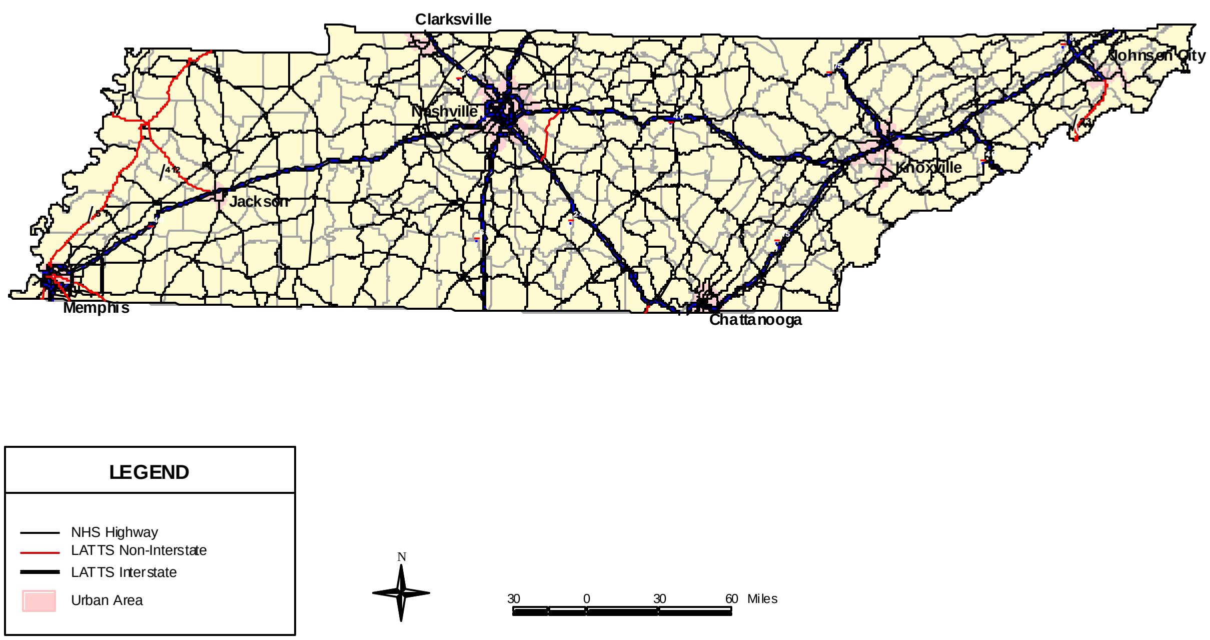


Exhibit E-2
TENNESSEE LATTS HIGHWAY SYSTEM

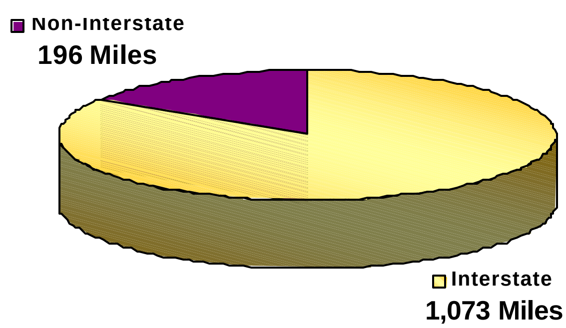


- U.S. 72 from the Mississippi State Line to Memphis (18 miles), part of LATTS Corridor 24. This is a two-lane highway and is also part of Congressional High Priority Corridor 7.
- U.S. 51 from the Kentucky State Line to I-40 at Memphis (112 miles) and new Corridor 18 south of Memphis (5 miles to be located in Tennessee), all part of Corridor 18 and Congressional High priority Corridor 18 (Indianapolis to Laredo).

▶ LATTS connectors linking a LATTS Strategic Highway with a LATTS airport or waterport were included in the Strategic Highway System. However, because of database differences, it was not possible to analyze LATTS connectors in the same manner and to the same level of detail as for mainline highways. LATTS connectors are discussed at the conclusion of Section E.

Exhibit E-3 displays the composition of Tennessee's portion of the LATTS highways by system.

Exhibit E-3
LATTS MAINLINE STRATEGIC HIGHWAY SYSTEM – TENNESSEE PORTION



1,269 Miles Total **Excludes LATTS Connectors**

LATTS HIGHWAYS VS. LATTS TRADE CORRIDORS

The 22,859 miles of "mainline" LATTS Strategic Highways were grouped into 25 LATTS Trade Corridors (Exhibit E-4). The Trade Corridors were established using logical origins/destinations and assigning each highway to only one corridor. Each corridor was assigned a number (1-25) and was referred to by the primary highway within the corridor (i.e., I-40). Portions of nine LATTS Trade Corridors cross Tennessee, including:

- Corridor 3 (I-59/81/66) – New Orleans to Washington, D.C. and Pennsylvania
- Corridor 5 (I-75/24) – South Florida to Illinois
- Corridor 6 (I-65) – Cincinnati to Mobile
- Corridor 7 (I-55) – St. Louis to New Orleans
- Corridor 11 (I-40) – North Texas to Wilmington
- Corridor 12 (I-26, U.S. 23) – Ohio to Charleston, SC
- Corridor 18 (U.S. 59/51) – Indianapolis to Laredo
- Corridor 22 (U.S. 412) – Tulsa to Nashville
- Corridor 24 (U.S. 72) – Memphis To Chattanooga

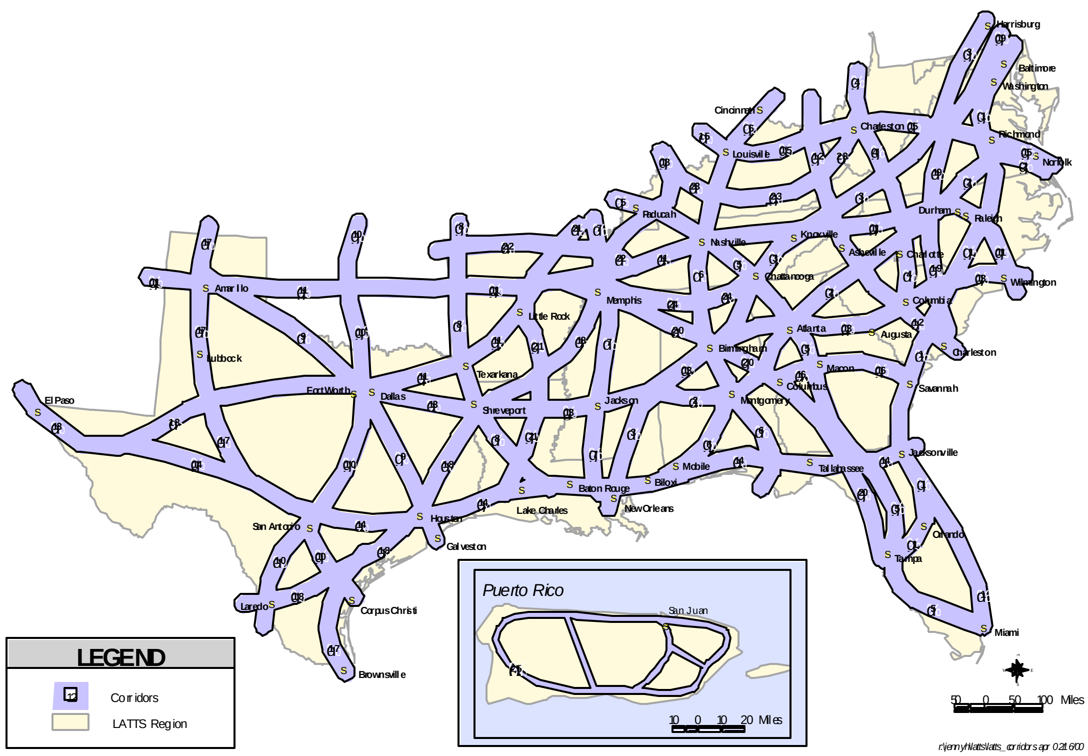
HIGHWAY DATABASES

Two main sources of data were used for the analysis of highway investment. The first one, the Highway Performance Monitoring System (HPMS), includes information about the characteristics and conditions of public highways. The second source of data was the LATTS estimates of current and forecasts of future Latin America trade flows.

HPMS Database

The HPMS database was selected for the LATTS analyses of highway system investment needs because (1) it covered the entire Alliance Region, (2) it employs a consistent format and data definitions and (3) no additional primary data collection was necessary. Nevertheless, it was recognized that (1) the data is time sensitive (i.e., since the latest available information at the time of these analyses was for 1997, it is expected that improvements and additions will have occurred subsequently) (2) the HPMS database may have minor differences relative to other databases that individual Alliance members might use for their own planning and system management purposes and (3) information is not always available for every segment of the LATTS Strategic Highway System.

Exhibit E-4
LATTS TRADE CORRIDORS



For this study, only that portion of the HPMS database corresponding to the selected LATTS Strategic Highway Network was utilized. For Tennessee, the LATTS HPMS database consisted of 1,616 records describing 1,256 miles of highway on the LATTS Strategic Highway Network.

Trade Flows

As explained in the main Alliance report, 1996 and expected 2020 trade volumes with Latin America were estimated and the portion of this trade that would be using highway facilities was translated into truck flows. The truck flows were then assigned to specific highway facilities using GIS generated shortest time paths. The LATTS truck traffic assignment was then merged with the LATTS HPMS database for further analysis.

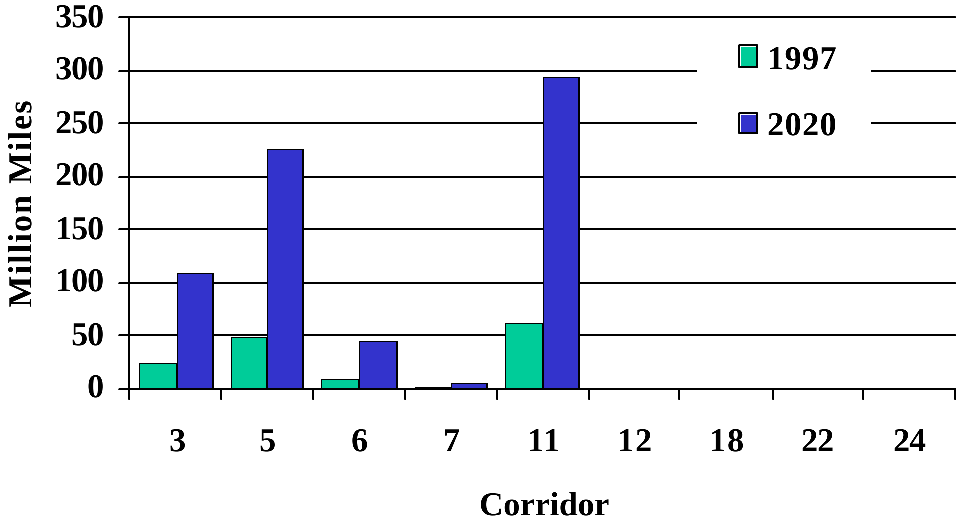
The LATTS procedure for assigning truck flows is appropriate for a macro-scale study such as LATTS. Nevertheless, it should be noted that the procedure produces approximations which may vary slightly from actual conditions. That is, an all-or-nothing assignment on the basis of shortest time paths favors high speed facilities and likely under estimates flows on facilities with lower speeds. In reality, a modest amount of truck flows could choose a lower speed path for a variety of unique reasons. Also, some LATTS trucks undoubtedly will travel on facilities other than those included in the LATTS Strategic Highway System (e.g., a local road to reach a warehouse or plant). Despite these circumstances, the LATTS procedure is deemed to be sufficiently valid for purposes of a regional transportation study.

As a result of this assignment methodology, 1,014 miles of the Strategic Highway Network in Tennessee were shown to carry LATTS truck traffic. All 1,014 miles are interstate highways.

LATTS TRUCK TRAFFIC IN TENNESSEE

The LATTS highway database was used to quantify the LATTS truck traffic in terms of annual Vehicle Miles of Travel (VMT) and to compare LATTS truck traffic to total truck traffic (LATTS and others). Results of this analysis by corridor for 1997 and 2020 are illustrated in Exhibit E-5. More detailed information is presented in Exhibit E-6.

Exhibit E-5
LATTS ANNUAL TRUCK VMT IN TENNESSEE



Of the nine LATTS corridors crossing Tennessee, only five were assigned LATTS truck traffic. Corridor 12 (I-26/U.S. 23 from Charleston, SC to Ohio) was assigned an insignificant amount of LATTS truck traffic. Corridor 18 (U.S.59/U.S.51 from Laredo, TX to Indianapolis, IN), Corridor 22 (U.S.412 from Tulsa, OK to Nashville, TN) and Corridor 24 (U.S.72 from Memphis, TN to Chattanooga, TN) were not assigned any LATTS traffic. These last two corridors were not assigned any truck traffic in any Alliance member. They are comprised mostly of U.S. Routes as opposed to interstates. As for Corridor 18, it currently is comprised of existing facilities only, none of which are an interstate highway. The proposed new Corridor 18 under study in several states would carry more LATTS trucks than the existing roads that comprise Corridor 18. This macro-scale study was limited to existing facilities represented in the HPMS database.

Exhibit E-6
TENNESSEE LATTS TRUCK TRAFFIC

Corridor/ Functional Class	Length (Miles)	1997 Annual Truck VMT (Million Miles)				2020 Annual Truck VMT (Million Miles)			
		All Trucks Full Network	All Trucks Part. Network(1)	LATTS Trucks Only	LATTS Percent (2)	All Trucks Full Network	All Trucks Part. Network(1)	LATTS Trucks Only	LATTS Percent (2)
3	**I-59, I-81, I-66**		**New Orleans, LA to DC and Pennsylvania**						
R.Interstate	60.44	217.70	217.70	20.05	9.2%	460.85	460.85	86.44	18.8%
U.Interstate	15.22	48.58	48.58	4.94	10.2%	84.75	84.75	21.14	24.9%
TOTAL	75.66	266.28	266.28	24.99	9.4%	545.60	545.60	107.58	19.7%
5	**I-75, I-24**		**South Florida to Illinois**						
R.Interstate	226.26	658.38	658.38	33.30	5.1%	1,421.62	1,421.62	154.89	10.9%
U.Interstate	95.81	418.88	392.88	15.12	3.8%	775.72	733.94	70.17	9.6%
TOTAL	322.07	1,077.26	1,051.26	48.42	4.6%	2,197.35	2,155.56	225.06	10.4%
6	**I-65**		**Mobile, AL to Cincinnati, OH**						
R.Interstate	84.87	293.79	293.79	6.09	2.1%	514.53	514.53	28.11	5.5%
U.Interstate	38.27	187.94	187.94	3.53	1.9%	314.01	314.01	16.88	5.4%
TOTAL	123.14	481.73	481.73	9.62	2.0%	828.53	828.53	44.98	5.4%
7	**I-55**		**New Orleans, LA to St. Louis, MO**						
U.Interstate	12.28	58.30	58.30	1.19	2.0%	104.20	104.20	4.95	4.7%
TOTAL	12.28	58.30	58.30	1.19	2.0%	104.20	104.20	4.95	4.7%
11	**I-40**		**North Texas to Wilmington, NC**						
R.Interstate	349.09	1,273.89	1,233.81	42.27	3.4%	2,242.44	2,169.18	199.33	9.2%
U.Interstate	151.30	718.36	701.57	20.58	2.9%	1,255.91	1,225.54	94.73	7.7%
TOTAL	500.39	1,992.25	1,935.37	62.85	3.2%	3,498.35	3,394.72	294.06	8.7%
12	**I-26, US 23**		**Charleston, SC to Ohio**						
R.Other PA	10.90	5.36	-	-	0.0%	7.93	-	-	0.0%
U.Interstate	23.85	17.33	4.94	0.09	1.9%	31.38	8.98	0.46	5.1%
TOTAL	34.75	22.69	4.94	0.09	1.9%	39.30	8.98	0.46	5.1%
18	**US 59, US 51**		**Laredo, TX to Indianapolis, IN**						
R.Other PA	76.45	49.72	-	-	0.0%	82.75	-	-	0.0%
U.Other Fwy.	0.83	1.04	-	-	0.0%	1.62	-	-	0.0%
U.Other PA	34.64	40.49	-	-	0.0%	71.81	-	-	0.0%
TOTAL	111.92	91.25	-	-	0.0%	156.18	-	-	0.0%
22	**US 412**		**Tulsa, OK to Nashville, TN**						
R.Interstate	15.11	13.60	-	-	0.0%	17.39	-	-	0.0%
R.Other PA	39.39	24.71	-	-	0.0%	47.58	-	-	0.0%
U.Interstate	0.82	0.87	-	-	0.0%	1.10	-	-	0.0%
U.Other Fwy.	0.88	0.54	-	-	0.0%	0.81	-	-	0.0%
U.Other PA	2.08	1.02	-	-	0.0%	1.61	-	-	0.0%
TOTAL	58.28	40.74	-	-	0.0%	68.48	-	-	0.0%
24	**US 72**		**Memphis, TN to Chattanooga, TN**						
R.Other PA	1.90	1.27	-	-	0.0%	2.08	-	-	0.0%
U.Other PA	16.01	10.60	-	-	0.0%	20.62	-	-	0.0%
TOTAL	17.91	11.86	-	-	0.0%	22.70	-	-	0.0%
ALL CORRIDORS									
R.Interstate	735.77	2,457.36	2,403.69	101.71	4.2%	4,656.83	4,566.18	468.77	10.3%
R.Other PA	128.64	81.05	-	-	0.0%	140.34	-	-	0.0%
U.Interstate	337.55	1,450.26	1,394.20	45.44	3.3%	2,567.07	2,471.43	208.32	8.4%
U.Other Fwy.	1.71	1.59	-	-	0.0%	2.42	-	-	0.0%
U.Other PA	52.73	52.11	-	-	0.0%	94.04	-	-	0.0%
TOTAL	1,256.40	4,042.36	3,797.89	147.16	3.9%	7,460.70	7,037.60	677.09	9.6%

Notes: (1) Total truck VMT for highways carrying LATTS traffic only.
(2) Percentage calculated based on Partial Network.

Corridor 11 (I-40 from North Texas to Wilmington, NC) and Corridor 5 (I-75/I-24 from South Florida to Illinois) carry the most LATTS traffic in terms of VMT (294 and 225 million miles respectively in 2020). However, the highest volume of LATTS trucks is found on Corridor 3 (I-59/I-81/I-66 from New Orleans, LA to Washington D.C. and Pennsylvania) with 2020 average annual daily truck volume of 3,896.

Of LATTS truck traffic in Tennessee more than two-thirds is on the rural interstate system and the rest on the urban interstate system.

The percentage of LATTS trucks to total trucks is expected to grow from 4 percent in 1997 to close to 10 percent in 2020 on those highways assigned LATTS traffic (from 4 to 9 percent for the entire LATTS Strategic Network). This growth in LATTS share of total truck traffic is due to the fact that LATTS truck traffic is expected to increase 4.6 fold between 1997 and 2020 while overall truck traffic would increase by 1.7 fold only without LATTS trucks and 1.8 fold with LATTS trucks. The LATTS truck share of total trucks varies from corridor to corridor. The highest shares in Tennessee are 20 percent on Corridor 3 (I-59/I-81/I-66 from New Orleans, LA to Washington D.C. and Pennsylvania) and 10 percent on Corridor 5 (I-75/I-24 from South Florida to Illinois).

IMPACT MEASURES

The purpose of the highway analysis portion of this study was to quantify the LATTS Strategic Network total investment needs and the incremental investment needs that could be attributed to LATTS truck traffic specifically. Because of the macro-scale nature of this study, the investment needs analysis focused on capacity and pavement resurfacing needs.

In order to identify needs due to expected traffic (cars and trucks) other than LATTS and needs specifically attributable to LATTS traffic, two sets of capacity and pavement needs were estimated. First, future needs were estimated based on the "normal" traffic as defined by the HPMS database which includes AADT, truck percentages, and growth rate. Future needs were estimated a second time with the same HPMS traffic plus the "additional" LATTS truck traffic above and beyond the traffic that would be estimated using the "normal" growth. The difference in needs between the two was considered the incremental needs due to growth in LATTS traffic.

Minimum tolerable conditions (MTCs) for both congestion (capacity) and pavement conditions were applied uniformly to all segments of the LATTS Strategic Highway System. These MTCs are described in more detail in the main Alliance report and are summarized below.

- Capacity needs were based on Level of Service (LOS) not exceeding:
  - LOS C for rural highways
  - LOS D for urban highways
- Pavement resurfacing needs were based on the following minimum pavement condition rating:
  - Interstate type facilities: PSR 3.0
  - Other facilities: PSR 2.5

The LATTS minimum tolerable conditions are in no way intended to replicate or replace values that individual members of the Alliance might consider to be more appropriate for their circumstances. The LATTS MTCs were established for this study so as to be consistent for all the Alliance members.

To price the identified capacity or pavement needs, the same unit costs were used consistently throughout the Alliance Region. These unit costs were provided by the FHWA and correspond to 1997 national averages. To maintain consistency throughout the Region, no attempt was made to tailor these unit costs to each state beyond the stratification provided by the FHWA.

CAPACITY NEEDS

A needs analysis model was developed to analyze capacity needs for 1997 and 2020. For the year 2020, capacity needs with and without the “additional” LATTS traffic were estimated. The model was then applied to every one of the HPMS records comprising the Tennessee LATTS highway database and the results were summarized. This model applied the same methodology, outlined in the main Alliance report, and found in the HPMS Analytical Package, to calculate capacity needs. The results reflect the information contained in the HPMS Database and does not consider any improvements that may have occurred subsequently or any planned improvements.

Detailed results for Tennessee are presented in Exhibit E-7. The total number of Tennessee LATTS Strategic Highway Network road miles with capacity deficiencies in 1997 and 2020 are shown in columns 4 through 6. For 2020, the amount of capacity deficiencies with and without the “additional” LATTS traffic is shown.

These analyses indicate that 130 the LATTS roadway miles in Tennessee, or 10.4 percent of the Tennessee portion of the Strategic Network, have existing capacity problems. The analyses also show that the majority of the capacity deficiencies will occur in the next 20 years unless capacity is added.

With the expected “normal” growth (as defined by the HPMS database), a total of 604 road miles or 48 percent of the LATTS network will have congestion problems by 2020. The “additional” LATTS trucks are expected to increase the total to 679 miles or 54 percent of total mileage as noted in Exhibit E-8. In other words, LATTS truck will increase congested miles of roadway by about 12.3 percent and the number of needed lane miles by 13 percent. These percentages are significant but they also indicate that the majority of the congestion problems in Tennessee are not due solely to LATTS traffic but expected overall growth in total traffic. However, unless these capacity needs are met, LATTS truck traffic will be affected by these capacity deficiencies regardless of the source of traffic. As congestion increases, LATTS trucks like other traffic, will experience lower operating speeds, frequent speed changes, lower reliability, and increased operating costs.

Exhibit E-7
TENNESSEE CAPACITY INVESTMENT NEEDS

Corridor/ Functional Class	Length (Miles)	Existing Lane Miles	Capacity Analysis: Deficient Mileage 1997	2020 W/O LATTS Added Traffic	2020 With LATTS Added Traffic	2020 Needed Lane Miles: Base	With LATTS Added Traffic	2020 Cost in $Million: Base	With LATTS Added Traffic	% Increase Due to LATTS
3	**I-59, I-81, I-66**		**New Orleans, LA to DC and Pennsylvania**							
R.Interstate	60.44	241.76	-	18.87	30.46	37.74	60.92	42	68	61.4%
U.Interstate	15.22	60.88	-	-	-	-	-	-	-	0.0%
TOTAL	75.66	302.64	-	18.87	30.46	37.74	60.92	42	68	61.4%
5	**I-75, I-24**		**South Florida to Illinois**							
R.Interstate	226.26	911.88	15.35	179.35	202.43	397.20	465.28	414	471	13.9%
U.Interstate	95.81	428.84	32.56	73.68	77.92	282.02	309.90	979	1,076	9.9%
TOTAL	322.07	1,340.72	47.91	253.03	280.35	679.22	775.18	1,392	1,547	11.1%
6	**I-65**		**Mobile, AL to Cincinnati, OH**							
R.Interstate	84.87	339.48	12.02	32.52	32.52	68.60	75.28	73	75	3.4%
U.Interstate	38.27	224.48	24.23	37.00	37.34	198.72	204.80	690	711	3.1%
TOTAL	123.14	563.96	36.25	69.52	69.86	267.32	280.08	763	786	3.1%
7	**I-55**		**New Orleans, LA to St. Louis, MO**							
U.Interstate	12.28	57.76	0.63	8.12	8.12	19.00	19.00	66	66	0.0%
TOTAL	12.28	57.76	0.63	8.12	8.12	19.00	19.00	66	66	0.0%
11	**I-40**		**North Texas to Wilmington, NC**							
R.Interstate	349.09	1,441.50	3.61	116.81	149.66	235.14	302.50	275	348	26.5%
U.Interstate	151.30	817.08	39.39	86.10	89.50	374.64	400.20	1,300	1,389	6.8%
TOTAL	500.39	2,258.58	43.00	202.91	239.16	609.78	702.70	1,576	1,737	10.3%
12	**I-26, US 23**		**Charleston, SC to Ohio**							
R.Other PA	10.90	43.49	-	-	-	-	-	-	-	0.0%
U.Interstate	23.85	95.40	-	19.58	18.45	39.16	39.16	136	136	0.0%
TOTAL	34.75	138.89	-	19.58	18.45	39.16	39.16	136	136	0.0%
18	**US 59, US 51**		**Laredo, TX to Indianapolis, IN**							
R.Other PA	76.45	315.18	-	1.61	1.61	3.22	3.22	4	4	0.0%
U.Other Fwy.	0.83	3.32	-	-	-	-	-	-	-	0.0%
U.Other PA	34.64	140.20	0.02	14.30	14.30	29.96	29.96	57	57	0.0%
TOTAL	111.92	458.70	0.02	15.91	15.91	33.18	33.18	61	61	0.0%
22	**US 412**		**Tulsa, OK to Nashville, TN**							
R.Interstate	15.11	60.44	-	-	-	-	-	-	-	0.0%
R.Other PA	39.39	157.56	-	-	-	-	-	-	-	0.0%
U.Interstate	0.82	3.28	-	-	-	-	-	-	-	0.0%
U.Other Fwy.	0.88	3.52	-	-	-	-	-	-	-	0.0%
U.Other PA	2.08	8.32	-	-	-	-	-	-	-	0.0%
TOTAL	58.28	233.12	-	-	-	-	-	-	-	0.0%
24	**US 72**		**Memphis, TN to Chattanooga, TN**							
R.Other PA	1.90	3.80	1.90	1.90	1.90	3.80	3.80	3	3	0.0%
U.Other PA	16.01	63.60	0.61	14.57	14.57	29.42	29.42	49	49	0.0%
TOTAL	17.91	67.40	2.51	16.47	16.47	33.22	33.22	52	52	0.0%
ALL CORRIDORS										
R.Interstate	735.77	2,995.06	30.98	347.55	415.07	738.68	903.98	804	963	19.8%
R.Other PA	128.64	520.03	1.90	3.51	3.51	7.02	7.02	7	7	0.0%
U.Interstate	337.55	1,687.72	96.81	224.48	231.33	913.54	973.06	3,171	3,377	6.5%
U.Other Fwy.	1.71	6.84	-	-	-	-	-	-	-	0.0%
U.Other PA	52.73	212.12	0.63	28.87	28.87	59.38	59.38	106	106	0.0%
TOTAL	1,256.40	5,421.77	130.32	604.41	678.78	1,718.62	1,943.44	4,088	4,453	8.9%

Exhibit E-8
TENNESSEE 2020 CAPACITY NEEDS
LATTS Strategic Network

	Deficient Miles	% of Total Miles	Needs (Billion)
"Normal" Growth	604	48%	$4.1
"Additional" LATTS Traffic	72	6%	$0.4
Total	679	54%	$4.5

Based on the HPMS expected growth in traffic, nearly $4.1.9 billion will be required in the next 20 years to address congestion problems on the Tennessee portion of the LATTS Strategic Network. The "additional" LATTS traffic will bring that total to $4.5 billion, an 8.9 percent increase. The dollar increase in capacity needs due to LATTS traffic is lower than the corresponding increase in terms of needed lane miles because a majority of LATTS truck traffic occurs on rural highways which are less expensive to improve than urban highways.

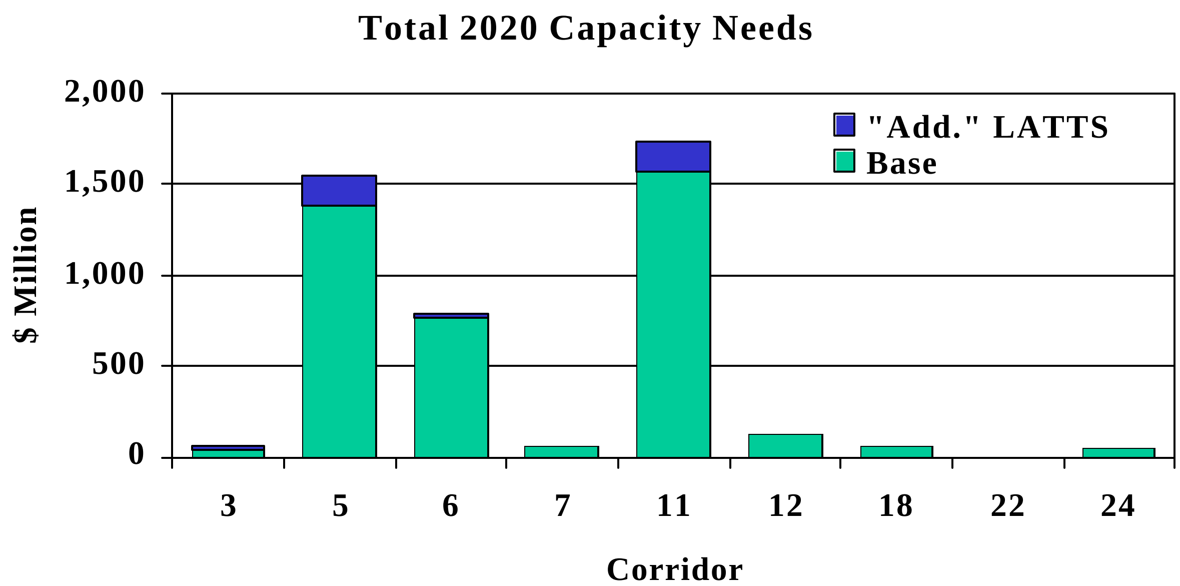
Capacity needs by corridor are illustrated in Exhibit E-9. Total capacity needs by corridor are often related to the total length of the corridor: the longer the corridor, the higher the needs. Corridor 11 (I-40 from North Texas to Wilmington, NC) and Corridor 5 (I-75/I-24 from South Florida to Illinois), which are the longest in Tennessee, have the highest capacity needs ($1.7 and $ 1.5 billion respectively by 2020). However, in terms of average capacity needs per roadway mile, Corridor 6 (I-65 from Mobile, AL to St. Louis, MO) has proportionally the highest capacity needs: $ 6.4 million per roadway mile versus $ 3.5 million average for the state.

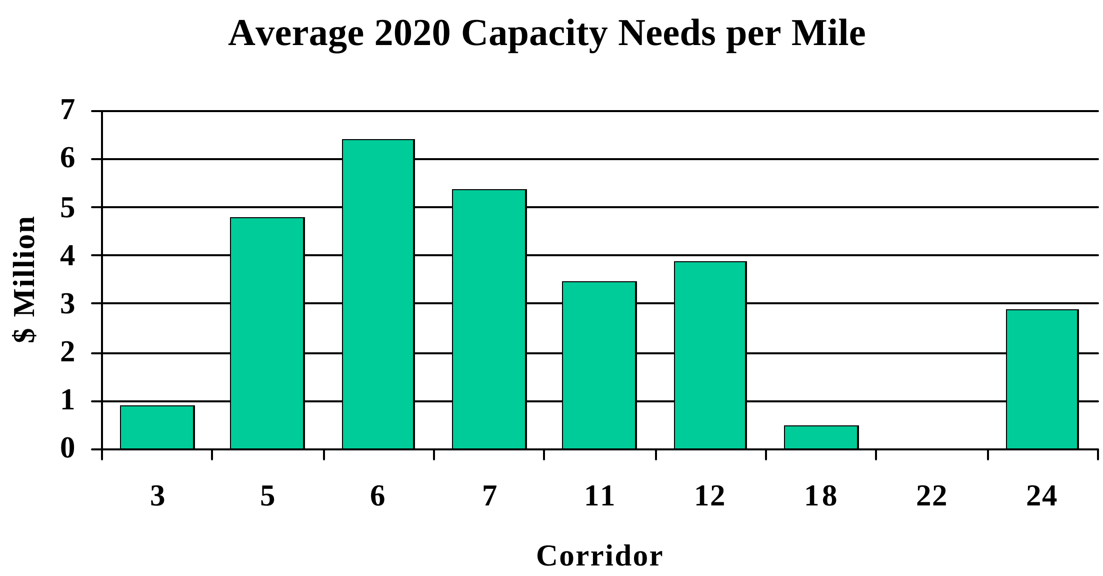
It should be noted that by 2020, 87 percent of Corridor 5 (I-75/I-24 from South Florida to Illinois) in Tennessee will require capacity improvements. Also, Corridor 11 (I-40 from North Texas to Wilmington, NC) will experience the largest incremental needs due to LATTS "additional" traffic, $ 162 million by 2020. This is due in part to the amount of LATTS truck traffic on this corridors as previously discussed.

PAVEMENT NEEDS

For purposes of this study, average annual pavement needs in 2020 were estimated. The number of years it would take for the pavement to deteriorate from new in 2020 to a deficient PSR rating (as defined by the minimum tolerable conditions presented earlier) was calculated for each highway segment. As an indicator of the existing condition of the network, pavement deficiencies were identified for 1997.

Exhibit E-9
TENNESSEE STRATEGIC HIGHWAY NETWORK
Capacity Needs by Corridor





Pavements typically are designed to last for a fairly long time. However, as they age and are subjected to traffic loads, they deteriorate. The pavement life measure used in these analyses is dependent on the amount of traffic using the highway and, more specifically, truck traffic (car traffic is a factor in the pavement deterioration rate but it has far less impact). The type of pavement (for example high flexible versus high rigid) is also an important factor affecting pavement deterioration rates. The pavement type on each highway segment, as indicated by the 1997 HPMS database, was used in the estimation of the deterioration rates. The number of lanes indicated for 1997 was used in the calculation of pavement deterioration rate and resurfacing costs. No attempt was made to measure the impact on pavement needs of adding lanes to address the congestion problems identified earlier. Finally, the HPMS-AP methodology for deteriorating pavement was applied in this study. It is based on the concept of 18Kip Equivalent Single Axle Loads. Weather condition or type of subsoil can also influence pavement deterioration rates but, for this study, no other factors beyond traffic and pavement type were used to differentiate pavement deterioration rates between sections.

Each highway segment pavement life was calculated twice. An initial calculation was made using the “base” car and truck traffic from the Tennessee HPMS database. The second calculation was made with the “additional” LATTS traffic added to it. The difference in the two pavement lives is a measure of the impact of LATTS traffic.

Results of Tennessee pavement needs for the LATTS Strategic Highway Network are presented in Exhibit E-10. Based on the HPMS data, existing (1997) pavement deficiencies were found on 28 percent or 357 miles of the Tennessee overall LATTS Strategic Highway Network. Existing pavement deficiencies were concentrated on the interstate system which is heavily used by LATTS trucks. More than 31 percent of the rural interstate system and 30 percent of the urban interstate system had existing pavement deficiencies.

Exhibit E-10
TENNESSEE PAVEMENT RESURFACING INVESTMENT NEEDS

Corridor/ Functional Class	Length (Miles)	Existing Lane Miles	Pavement Analysis: 1997 Deficient Mileage	2020 Pavement Life (Years): W/O LATTS Added Traffic	2020 Pavement Life (Years): With LATTS Added Traffic	2020 Average Annual Cost ($1,000): W/O LATTS Added Traffic	2020 Average Annual Cost ($1,000): With LATTS Added Traffic	2020 Average Annual Cost ($1,000): % Increase Due to LATTS
3	**I-59, I-81, I-66**		**New Orleans, LA to DC and Pennsylvania**					
R.Interstate	60.44	241.76	24.90	9.0	8.5	2,856	3,057	7.0%
U.Interstate	15.22	60.88	4.33	4.3	3.7	2,915	3,316	13.8%
TOTAL	75.66	302.64	29.23	8.1	7.5	5,770	6,373	10.5%
5	**I-75, I-24**		**South Florida to Illinois**					
R.Interstate	226.26	911.88	83.20	9.0	8.8	11,083	11,484	3.6%
U.Interstate	95.81	428.84	38.38	4.5	4.3	20,829	21,564	3.5%
TOTAL	322.07	1,340.72	121.58	7.6	7.3	31,912	33,048	3.6%
6	**I-65**		**Mobile, AL to Cincinnati, OH**					
R.Interstate	84.87	339.48	39.81	9.2	9.1	3,981	4,042	1.5%
U.Interstate	38.27	224.48	12.66	4.6	4.6	10,675	10,797	1.1%
TOTAL	123.14	563.96	52.47	7.4	7.3	14,657	14,838	1.2%
7	**I-55**		**New Orleans, LA to St. Louis, MO**					
U.Interstate	12.28	57.76	6.04	4.7	4.6	2,655	2,706	1.9%
TOTAL	12.28	57.76	6.04	4.7	4.6	2,655	2,706	1.9%
11	**I-40**		**North Texas to Wilmington, NC**					
R.Interstate	349.09	1,441.50	82.60	9.1	8.9	17,289	17,739	2.6%
U.Interstate	151.30	817.08	28.85	6.2	5.9	29,722	30,892	3.9%
TOTAL	500.39	2,258.58	111.45	8.0	7.8	47,010	48,631	3.4%
12	**I-26, US 23**		**Charleston, SC to Ohio**					
R.Other PA	10.90	43.49	-	10.6	10.6	288	288	0.0%
U.Interstate	23.85	95.40	10.18	8.7	8.7	2,508	2,508	0.0%
TOTAL	34.75	138.89	10.18	9.3	9.3	2,796	2,797	0.0%
18	**US 59, US 51**		**Laredo, TX to Indianapolis, IN**					
R.Other PA	76.45	315.18	18.15	12.6	12.6	1,775	1,775	0.0%
U.Other Fwy.	0.83	3.32	0.54	4.5	4.5	155	155	0.0%
U.Other PA	34.64	140.20	1.61	9.7	9.7	2,143	2,143	0.0%
TOTAL	111.92	458.70	20.30	11.7	11.7	4,074	4,074	0.0%
22	**US 412**		**Tulsa, OK to Nashville, TN**					
R.Interstate	15.11	60.44	-	8.8	8.8	778	778	0.0%
R.Other PA	39.39	157.56	-	12.5	12.5	894	894	0.0%
U.Interstate	0.82	3.28	-	5.3	5.3	145	145	0.0%
U.Other Fwy.	0.88	3.52	-	4.1	4.1	172	172	0.0%
U.Other PA	2.08	8.32	0.14	12.2	12.2	104	104	0.0%
TOTAL	58.28	233.12	0.14	11.3	11.3	2,092	2,092	0.0%
24	**US 72**		**Memphis, TN to Chattanooga, TN**					
R.Other PA	1.90	3.80	1.90	13.0	13.0	20	20	0.0%
U.Other PA	16.01	63.60	3.29	12.1	12.1	864	864	0.0%
TOTAL	17.91	67.40	5.19	12.1	12.1	884	884	0.0%
ALL CORRIDORS								
R.Interstate	735.77	2,995.06	230.51	9.1	8.8	35,987	37,100	3.1%
R.Other PA	128.64	520.03	20.05	12.4	12.4	2,978	2,978	0.0%
U.Interstate	337.55	1,687.72	100.44	5.6	5.4	69,449	71,928	3.6%
U.Other Fwy.	1.71	6.84	0.54	4.3	4.3	327	327	0.0%
U.Other PA	52.73	212.12	5.04	10.5	10.5	3,111	3,111	0.0%
TOTAL	1,256.40	5,421.77	356.58	8.3	8.2	111,851	115,445	3.2%

One would expect that the corridors with the highest concentration of LATTS truck traffic would show the largest impact from LATTS traffic. Exhibit E-10 confirms this expectation. Corridor 3 (I-59/I-81/I-66 from New Orleans, LA to Washington, D.C. and Pennsylvania) has the highest concentration of LATTS trucks in terms of daily traffic and the highest reduction in pavement life from 8.1 years to 7.5 years.

Total resurfacing costs are a function of the average pavement life and the length of the highways. Corridor 11 (I-40 from North Texas to Wilmington, NC), the longest corridor in Tennessee, has the highest average annual resurfacing needs, nearly $ 49 million with LATTS traffic. With the largest reduction in average pavement life due to LATTS traffic, Corridor 3 (I-59/I-81/I-66 from New Orleans, LA to Washington, D.C. and Pennsylvania) has proportionally the largest incremental resurfacing needs due to LATTS trucks, 10.5 percent.

Future (2020) pavement needs are summarized in Exhibit E-11. Pavement life for the Tennessee portion of the LATTS Strategic Highway Network will average 8.3 years in 2020 without the "additional" LATTS truck traffic and 8.2 years with it. The annual resurfacing costs for the Tennessee portion of the LATTS Strategic Highway Network is estimated to exceed $112 million without LATTS "additional" truck traffic and $115 million with it, an increase of 3.2 percent.

Exhibit E-11
TENNESSEE 2020 PAVEMENT NEEDS
LATTS Strategic Network

	Pavement Life (Years)	Annual Resurfacing Cost ($Million)
"Normal" Growth	8.3	$112
With "Additional" LATTS Traffic	8.2	$115

OPERATING SPEEDS

Truck operating speed was chosen as a key study performance measure for the LATTS Strategic Highway Network. Truck operating speeds were estimated for each LATTS roadway segment based on the conditions of the roadway, including roadway geometry and alignment, pavement condition, speed limit and traffic volumes. The operating speed calculation for each sample segment or link was based on the methodology of the HPMS Analytical Package used by FHWA to estimate highway needs.

Two types of operating speeds were calculated. One was the average daily operating speed and the other was the peak hour operating speed as defined by the peak hour factor or "K" factor for each road segment. Because it is not known when a truck would travel over a specific highway section during the peak hour, the peak hour operating speed assumed that every section was traveled during peak hour. As a result, the calculated peak hour speed and travel time for an entire corridor is probably somewhat overstated, as it is unlikely that a truck would travel every section during peak hour conditions.

Truck operating speeds were calculated for each LATTS roadway section. Operating speeds over a combination of segments were then calculated by adding travel time and distance for each segment and calculating the new speed.

Truck operating speeds on the Tennessee portion of the LATTS Strategic Highway Network are presented on Exhibit E-12. In this exhibit, Tennessee truck operating speeds estimates are presented by functional class. The total lengths of all the segments, which were used in the analysis of the corridor, are listed first. This is followed by items describing the characteristics of the segments, including average number of lanes, speed limit, and AADT. The purpose of listing these items is to facilitate better understanding of the calculated operating speeds. For example, two/three-lane highways have lower operating speeds than equivalent four-lane highways because of passing difficulties. Similarly, low speed limits will result in low operating speeds on facilities no matter what the road conditions are.

Average daily and peak period speeds/travel times for trucks also are presented for the base year (1997). Further, truck operating speeds are listed twice for year 2020. The first time, truck operating speeds were calculated assuming the base growth rate, i.e. the growth rate indicated by the HPMS database. The second time, truck operating speeds were calculated with the LATTS “additional” traffic. Overall results for the entire corridor within Tennessee are then listed, as well as the overall time required to travel the entire corridor. By comparing these speed and travel time values (based on present conditions), it is possible to determine which facilities are most efficient today, which facilities are going to experience deteriorating conditions due to traffic growth regardless of LATTS impact, and finally which facilities are going to be most affected by LATTS traffic.

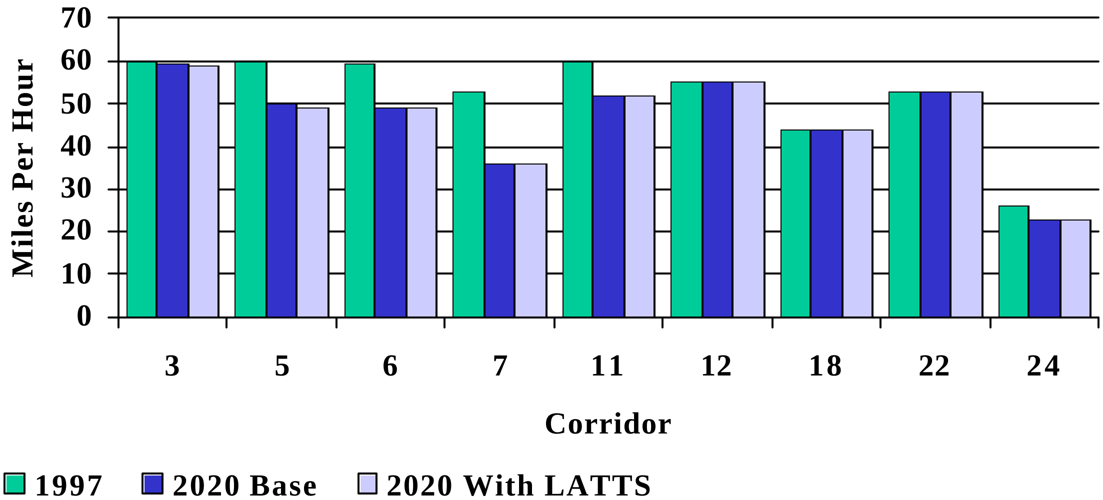
Exhibit E-12
TENNESSEE TRUCK OPERATING SPEEDS

Corridor/ Functional Class	Length (Miles)	Average No. Lane	Speed Limit (MPH)	Average 1997 AADT	1997 Truck Speed (MPH)		2020 Truck Speed (MPH) W/O Added LATTS Traffic		2020 Truck Speed (MPH) With Added LATTS Traffic	
					Daily Average	Peak Hour	Daily Average	Peak Hour	Daily Average	Peak Hour
3	**I-59, I-81, I-66**		**New Orleans, LA to DC and Pennsylvania**							
R.Interstate	60.40	4.0	65.0	24,688	61.4	60.6	60.8	41.8	60.1	35.9
U.Interstate	15.20	4.0	64.0	27,439	54.7	54.7	54.7	54.4	54.7	54.1
TOTAL	**75.70**	**4.0**	**64.8**	**25,241**	**59.9**	**59.3**	**59.5**	**43.9**	**58.9**	**38.5**
Time (HR)					**1.3**	**1.3**	**1.3**	**1.7**	**1.3**	**2.0**
5	**I-75, I-24**		**South Florida to Illinois**							
R.Interstate	226.30	4.0	65.0	33,874	62.2	57.9	55.3	29.8	54.6	29.4
U.Interstate	95.80	4.5	59.9	60,391	55.0	27.1	40.9	18.1	39.7	17.5
TOTAL	**322.10**	**4.2**	**63.4**	**41,762**	**59.9**	**43.2**	**50.0**	**25.0**	**49.1**	**24.5**
Time (HR)					**5.4**	**7.4**	**6.4**	**12.9**	**6.6**	**13.2**
6	**I-65**		**Mobile, AL to Cincinnati, OH**							
R.Interstate	84.90	4.0	65.0	28,974	59.5	53.4	54.4	38.5	54.3	38.5
U.Interstate	38.30	5.9	61.9	88,632	59.4	21.5	40.1	15.9	40.0	15.9
TOTAL	**123.10**	**4.6**	**64.0**	**47,515**	**59.4**	**36.5**	**49.0**	**26.7**	**48.9**	**26.7**
Time (HR)					**2.1**	**3.4**	**2.5**	**4.6**	**2.5**	**4.6**
7	**I-55**		**New Orleans, LA to St. Louis, MO**							
U.Interstate	12.30	4.7	55.0	64,441	52.8	27.3	36.2	16.0	35.9	16.0
TOTAL	**12.30**	**4.7**	**55.0**	**64,441**	**52.8**	**27.3**	**36.2**	**16.0**	**35.9**	**16.0**
Time (HR)					**0.2**	**0.4**	**0.3**	**0.8**	**0.3**	**0.8**
11	**I-40**		**North Texas to Wilmington, NC**							
R.Interstate	349.10	4.1	65.0	31,294	62.7	59.9	60.8	39.1	60.5	38.5
U.Interstate	151.30	5.4	58.4	74,896	54.7	27.8	39.2	19.2	38.9	18.4
TOTAL	**500.40**	**4.5**	**62.8**	**44,478**	**60.0**	**44.4**	**52.1**	**29.8**	**51.8**	**29.0**
Time (HR)					**8.3**	**11.3**	**9.6**	**16.8**	**9.7**	**17.3**
12	**I-26, US 23**		**Charleston, SC to Ohio**							
R.Other PA	10.90	4.0	55.0	8,976	60.2	60.2	60.2	60.2	60.2	60.2
U.Interstate	23.90	4.0	56.0	33,183	53.1	53.1	52.8	20.2	52.8	20.2
TOTAL	**34.80**	**4.0**	**55.7**	**25,590**	**55.1**	**55.1**	**54.9**	**25.5**	**54.9**	**25.5**
Time (HR)					**0.6**	**0.6**	**0.6**	**1.4**	**0.6**	**1.4**
18	**US 59, US 51**		**Laredo, TX to Indianapolis, IN**							
R.Other PA	76.50	4.1	54.9	13,773	54.6	54.6	54.6	53.0	54.6	53.0
U.Other Fwy.	0.80	4.0	50.0	11,475	52.0	52.0	52.0	52.0	52.0	52.0
U.Other PA	34.60	4.0	48.0	18,909	31.1	30.5	31.0	19.1	31.0	19.1
TOTAL	**111.90**	**4.1**	**52.5**	**15,345**	**44.2**	**43.9**	**44.2**	**34.2**	**44.2**	**34.2**
Time (HR)					**2.5**	**2.6**	**2.5**	**3.3**	**2.5**	**3.3**
22	**US 412**		**Tulsa, OK to Nashville, TN**							
R.Interstate	15.10	4.0	65.0	8,501	62.6	62.6	62.6	62.6	62.6	62.6
R.Other PA	39.40	4.0	65.0	8,183	54.4	54.4	54.4	54.4	54.4	54.4
U.Interstate	0.80	4.0	65.0	10,063	56.5	56.5	56.5	56.5	56.5	56.5
U.Other Fwy.	0.90	4.0	55.0	8,050	51.0	51.0	51.0	51.0	51.0	51.0
U.Other PA	2.10	4.0	30.0	14,964	19.4	19.4	19.4	19.4	19.4	19.4
TOTAL	**58.30**	**4.0**	**62.2**	**8,532**	**52.8**	**52.8**	**52.8**	**52.8**	**52.8**	**52.8**
Time (HR)					**1.1**	**1.1**	**1.1**	**1.1**	**1.1**	**1.1**
24	**US 72**		**Memphis, TN to Chattanooga, TN**							
R.Other PA	1.90	2.0	55.0	11,400	41.6	37.5	33.8	21.3	33.8	21.3
U.Other PA	16.00	4.0	42.0	36,265	25.1	22.7	21.8	12.4	21.8	12.4
TOTAL	**17.90**	**3.8**	**43.0**	**33,627**	**26.2**	**23.7**	**22.7**	**12.9**	**22.7**	**12.9**
Time (HR)					**0.7**	**0.8**	**0.8**	**1.4**	**0.8**	**1.4**

Average daily truck operating speeds on Tennessee LATTS corridors are summarized in Exhibit E-13. All corridors with a majority of interstate facilities (Corridors 3, 5, 6, 7, 11, and 12) have average daily truck operating speeds above 50 MPH in 1997. Corridors

18, 22 and 24 have lower average daily truck operating speeds because they are comprised of lower type facilities.

Exhibit E-13
TENNESSEE STRATEGIC HIGHWAY NETWORK
Average Daily Truck Operating Speeds

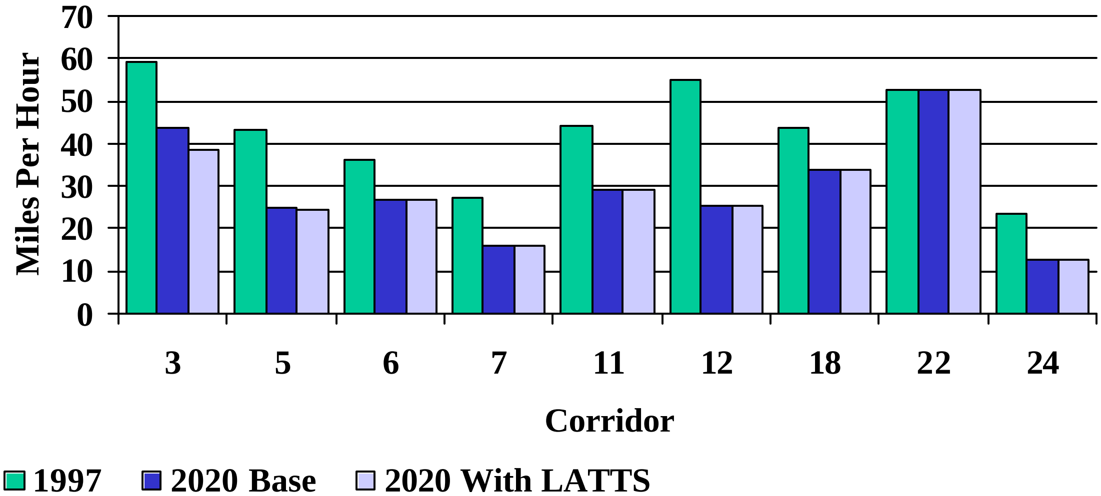


The projected growth in traffic between 1997 and 2020 will affect this measure of performance significantly. Unless additional capacity is provided, the average daily speed in many of Tennessee LATTS corridors will be reduced by 5 MPH or more. Corridor 7 (I-55 from New Orleans, LA to St. Louis, MO), a very short corridor in Tennessee will experience the most deterioration in average daily travel speeds, close to 17 MPH reduction, unless new capacity enhancement measures are undertaken. Corridor 5 (I-75/I-24 from South Florida to Illinois), Corridor 6 (I-65 from Mobile, AL to Cincinnati, OH) and Corridor 11 (I-40 from North Texas to Wilmington, NC) could experience a reduction in average travel speed close to 10 MPH.

Compared to the impact of the expected traffic growth between 1997 and 2020, the impact of the "additional" LATTS traffic on average daily truck travel speed appears minor, less than 1 MPH in all corridors. One may wonder why there would be such an apparent small impact on average speeds when the impact of LATTS traffic on capacity appeared much more significant. The reason is due to the selected minimum tolerable standards used to identify capacity needs. The capacity needs are based on not exceeding LOS C on rural highways and LOS D on urban highways during peak hour. However, traveling speeds are most affected (change rapidly) when the LOS reaches E and F. In other words, capacity needs are based on explicit standards that are higher than those used implicitly in the LATTS speed calculation.

The expected traffic growth in Tennessee LATTS corridor will affect "peak hour" speeds more significantly, up to 30 MPH for Corridor 12 (I-26/U.S.23 from Charleston, SC to Ohio) as illustrated in Exhibit E-14.

Exhibit E-14
TENNESSEE STRATEGIC HIGHWAY NETWORK
"Peak-Hour" Truck Operating Speeds



As mentioned earlier, these travel speeds were estimated assuming no change in capacity on any section of the LATTS highway network and traffic peaking patterns the same as they are today. This is unlikely given the severity of the estimated resulting congestion on some highways.

The impact of LATTS "additional traffic" is slightly more pronounced on "peak hour" speeds than on average daily speeds but still very mild compared to the impact of overall growth in total traffic.

CONCLUSIONS FOR LATTS MAINLINE HIGHWAYS

(1) LATTS truck traffic in Tennessee is expected to grow at a much higher rate than the rest of the traffic in the state. From 1997 to 2020, LATTS truck traffic will increase by 360 percent while all other traffic is expected to increase by 69 percent.

(2) About 54 percent of the LATTS Strategic Highway Network in Tennessee will require additional capacity by 2020 at a cost of $ 4.5 billion. More than 97 percent of these capacity needs are for the interstate system (76 percent for the urban interstate system alone). The majority of these needs are due to expected growth in total traffic and not to LATTS trucks only.

(3) However, LATTS truck traffic will have an increasing impact on the state highway investment needs for the Strategic Highway Network. By 2020, LATTS "additional" truck traffic will have resulted in:

- 12.3% more highway miles needing capacity improvements.
- 8.9% additional costs to address these capacity needs.
- 3.2% increase in annual pavement resurfacing costs.

(4) In Tennessee, Corridor 3 (I-59/I-81/I-66 from New Orleans, LA to Washington D.C. and Pennsylvania), Corridor 5 (I-75/I-24 from South Florida to Illinois) and Corridor 11 (I-40 from North Texas to Wilmington, NC) will be proportionally most affected by LATTS trucks because of the higher volume of LATTS trucks using these corridors.

(5) If these investment needs are not met, the Tennessee portion of the LATTS Strategic Highway Network will experience significant deterioration in operating speeds, especially during "peak hour."

WATERPORT AND AIRPORT INTERMODAL CONNECTORS

The focus of the highway analysis was, appropriately, on the mainline portion of the LATTS Strategic Highway System. This is the portion of the highway network carrying the vast majority of truck travel (vehicle miles) and has "needs" that could be quantified using existing databases. Additionally, the portion of the highway system connecting the LATTS mainline system with the LATTS waterports and airports also were assessed. While these highway intermodal connectors sometimes are overlooked, their deficiencies can significantly impact the efficient movement of vehicles, especially large trucks.

LATTS intermodal connectors are the highways that link the mainline LATTS Strategic System with LATTS intermodal facilities (waterports and airports). To avoid costly new data collection activities, a recently compiled database was used to conduct the connectors analysis. This database, the *NHS Connectors*, was populated by the state DOTs and compiled by the Federal Highway Administration. It includes a high quality sample of the LATTS intermodal connectors. However, it does not contain information for every LATTS intermodal connector. These analyses utilized information for those LATTS intermodal connectors for which information was available in the NHS connectors database at the time the analyzes were performed.

As noted in Exhibit E-15, Tennessee has three connectors for which information was available in the *NHS Inventory Database*. All three of these connectors are under municipal jurisdiction.

Exhibit E-15
LATTS INTERMODAL CONNECTORS

FACILTY ID	FACILITY NAME	LINK MILES	RURAL/URBAN DESIGNATION	OWNERSHIP	AGENCY
TN14P	President's Island - Memphis	5.3	Urbanized (>200k)	Municipal Highway	Memphis MPO
TN15A	Memphis International Airport	2	Urbanized (>200k)	Municipal Highway	Memphis MPO
TN15A	Memphis International Airport	2.4	Urbanized (>200k)	Municipal Highway	Memphis MPO

Information for the Nashville International Airport connector was not contained in the inventory database.

Pavement Problems

Based upon the available information, Tennessee's connectors have very minor pavement condition deficiencies. Only 1% of the two-mile TN15A connector has pavement problems, whereas 39% of the other locally-owned and maintained airport connectors in the Alliance Region have pavement condition deficiencies.

Geometric/Physical Problems

Tennessee's connectors were reported to have only three geometric/physical deficiencies. The two-mile TN15A reported two shoulder problems, while the Memphis BEA connector, TN14P, was reported to have travelway problems.

At-Grade Railroad Crossing Problems

Connector TN14P accounted for all at-grade railroad crossing related deficiencies. Problems with delays, devices, and lack of alternate routes were reported on TN14P.

Traffic Operations and Safety Problems

The Memphis connector was reported to have two deficiencies, inadequate turning radii and frequent accidents. There were no other significant problems.

State Summary

TN14P accounted for the majority of deficiencies in the survey. Based upon the available information, Tennessee fared well with all other connectors.

INTELLIGENT TRANSPORTATION SYSTEMS (ITS)

While it is clear that improvements in highway infrastructure are required to achieve an economically efficient transportation system, truck operations also can be improved by the implementation of ITS. Transportation technologies help freight transport become more productive and more responsive to the needs of business enterprises, including those which are engaged in Latin American trade. Fortunately, a large portion of current work in the ITS arena is with commercial vehicle operations (CVO). Of significant relevance to LATTS is the Commercial Vehicle Information Systems and Networks (CVISN) that embodies a collection of information systems and communications networks that provide support to CVO.

The national ITS/CVO program encompasses numerous projects undertaken by the individual states. The national program is designed to encourage the development and implementation of technology to enhance the safe movement of commercial vehicles across the United States. There are four main areas within the national program and each of the individual states are striving to meet these goals:

- Safety Assurance – Programs and projects that are designed to assure the safety of commercial drivers, vehicles, and cargo.
- Credentials Administration – Programs and projects that are designed to improve the procedures and systems for managing motor carrier regulation.
- Electronic Screening – Programs and projects that are designed to facilitate the verification of size, weight, safety, and credentials information.
- Carrier Operations – Programs and projects that are designed to reduce congestion and manage the flow of commercial vehicle traffic.

Most of the Alliance member states have completed some type of ITS/CVO Business Plan. Many of these documents are living documents and are continually being updated and revised. Since state's ITS/CVO plans are changing frequently, the information contained below is only a snapshot of ITS information available in early 2001.

Tennessee ITS/CVO Plan

Tennessee started the ITS/CVO business planning process during 1997 with the completion of the *Tennessee Triad Initiative.* This document serves as the basis for all ITS/CVO projects within the state. The *Tennessee Triad Initiative* is a joint public/private partnership intended to develop and execute a statewide, public/private ITS/CVO initiative that drastically improves the way the Tennessee's state agencies and the motor carrier industry do business with one another[2].

Currently there are three agencies responsible for motor carrier activities within the State of Tennessee: Department of Transportation (TnDOT), Department of Safety (TnDOS), and Department of Revenue (TnDOR). Together these three assure that all motor carriers operating within the state are in compliance with all of the regulatory functions.

The Tennessee Department of Transportation operates the Permitting Office and they own and operate nine weigh stations located throughout the state. The Permitting Office, within the DOT, issues all over-sized / over-weight vehicle permits.

The Tennessee Department of Safety has a special division, the Commercial Vehicle Enforcement Division (CVE), that is responsible for insuring the safety of and enforcing the regulations of all commercial vehicles operating on Tennessee roadways.

The Department of Revenue is responsible for all commercial vehicle taxing within the state. This includes the administration of both IFTA and IRP. Currently these programs are not handled electronically.

The Business Plan was originally under the guidance of a core working group that consisted of representatives from the Tennessee Departments of Revenue, Transportation and Safety and the Tennessee Trucking Association. Since its inception the working group has grown to include representatives from the Tennessee Department of Economic and Community Development, various cities and municipalities, The University of Tennessee and Vanderbilt University, The Department of Energy's Oak Ridge National Laboratory and several state-based trucking companies of varying sizes.

[2] *Tennessee TRIAD Initiative*, Tennessee Department of Transportation, December 1997

Together this group provides Tennessee with a broad view of where the state is headed in the ITS/CVO planning process.

The goals that are set forth within this initiative are aligned with the national ITS/CVO goals. There are three main strategic goals and then underlying goals describing the outcome the team would like to see. The strategic goals are to measurably improve the public safety, private profitability, and mutual efficiency through:

- Continuous improvement of roadside operations,
- Continuous improvement of statewide motor carrier vehicle/driver operation, and
- Continuous improvement of statewide ITS/CVO operations[3].

Each of these strategic goals has underlying goals associated with it. These underlying goals identify the projects that will be undertaken in order to reach the strategic goals.

The projects proposed by the *Tennessee Triad* are divided into three categories: Roadside Operations, Office Operations, and Vehicle/Driver Operations. Within these categories are projects that will help achieve the goals as identified within the *Tennessee Triad,* as follows:

- Office Operations Projects
  - Tennessee Electronic Credentialing System (TnECS) – This system will allow credential applications, verifications, invoicing, and deliveries to the motor carrier industry to be processed in a timely and efficient manner using new electronic technologies.
  - Satellite CATS Facilities - CATS access terminals will be provided at all weigh stations and other appropriate locations.
  - Public/Private TnECS Training and Outreach – This initiative will increase public and private sector proficiency with Tennessee's Electronic Credentialing System (TnECS) through the development of a training and outreach program.
  - Triad Initiative Web-Page Development – This initiative involves the development of a web-page that will electronically provide information concerning commercial vehicle operations within the state.
  - Safety and Compliance EDI - Using CVIEW, enforcement officers and state based carriers will be provided with safety information, highway patrol actions, and information on particular vehicles and drivers.
- Roadside Operations Projects
  - Electronic Clearance Programs – These programs will continue to use and improve the technologies that allow those carriers that are properly credentialed to by-pass the weigh stations.
  - Weight Station Upgrades – All weight stations, statewide, will be upgraded to include electronic clearance programs, Safety and Compliance EDI, Electronic Screening with AVI and Automated Inspection Selection, and ASISt. A portion of this project has been completed. At the time of this report, there were a total of nine stations equipped with PrePass. Two of these stations also have WIM abilities.

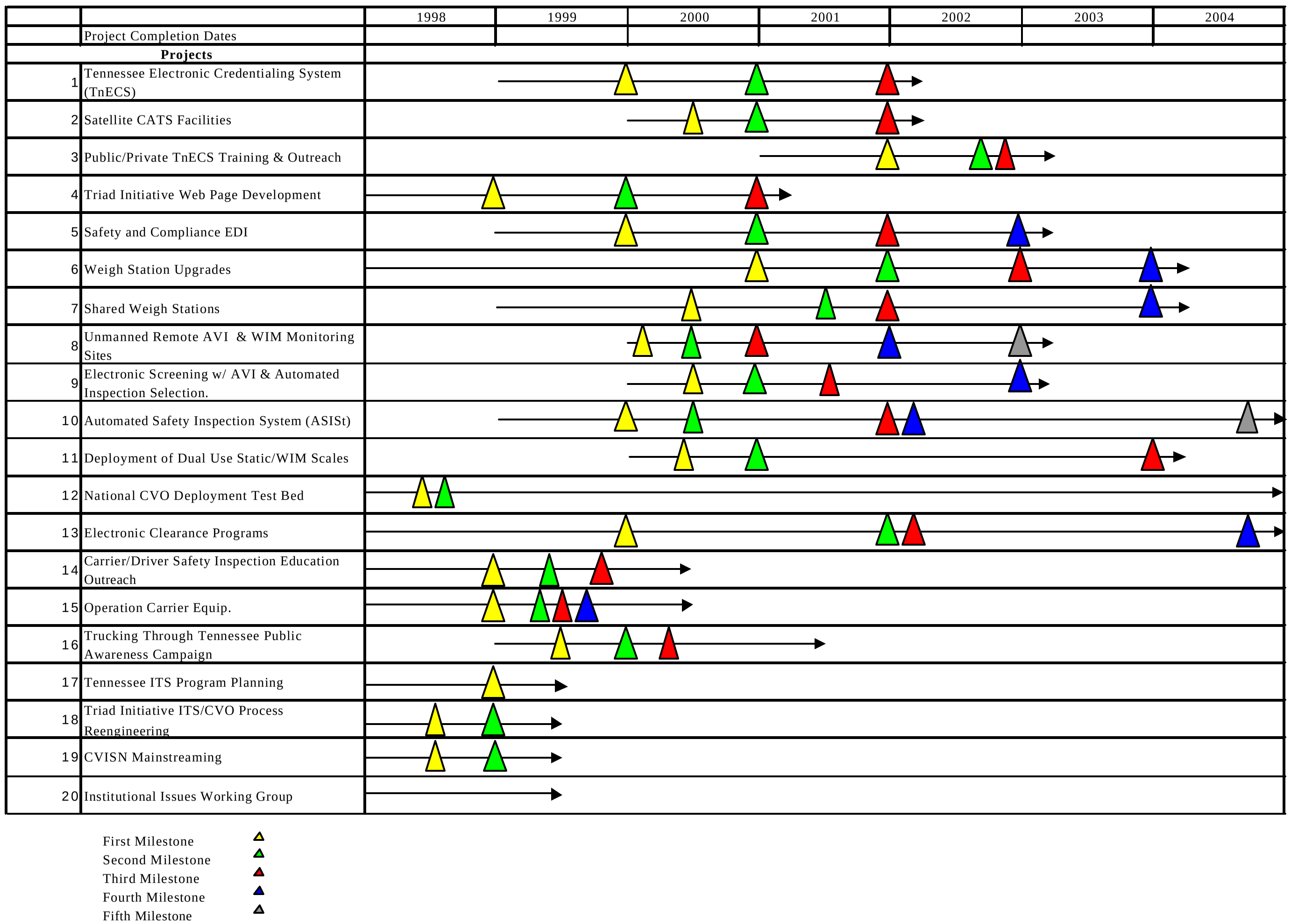
[3] *Tennessee TRIAD Initiative*, Tennessee Department of Transportation, December 1997

  - Carrier/Driver Safety Inspection Education and Outreach – Statewide outreach programs will be accelerated and expanded to educate carriers and drivers on inspections and the uses of the various ITS/CVO technologies.
  - Safety and Compliance EDI
  - Operations Carrier Equip – Educational programs will be development for carriers and drivers that encourage the use of the various in-vehicle and in-office technologies to improve safety and productivity.
  - "Shared" Weigh Stations – This program will enable Tennessee to team with adjoining states to construct weight stations that both states can utilize. This will reduce the staffing and construction burden placed on each individual state.
  - Unmanned, Remote AVI and WIM Monitoring Sites - Unmanned AVI and WIM stations that are quickly accessible by highway patrol and enforcement officers will be completed.
  - Electronic Screening with AVI and Automated Inspection Selection - Existing electronic clearance systems at weigh stations will be upgraded to include remote AVI and automated inspection selection systems. A portion of this has been accomplished with the completion of nine stations equipped with PrePass.
  - Automated Safety Inspection System (ASISt) - Portions of the inspection process will be automated to include the checking of the vehicle safety attributes and skid-pad brake testers.
  - Deployment of Dual-Use Static/WIM Scales - Existing static weigh scales will be converted into ultra-high accuracy, ultra-low cost, and medium speed WIM scales.
  - National CVO Deployment Test Bed - This program will develop a weigh station based on the National CVO Deployment Test Bed that tests, evaluates, and validates advanced weigh-in-motion systems, AVI technology, automated safety inspections, and other CVO technologies.
- Vehicle/Driver Operations Projects
  - Electronic Clearance Programs
  - Carrier/Driver Safety Inspection Education and Outreach
  - "Trucking through Tennessee" Public Awareness Campaign - Develop statewide public education program that emphasizes the value and role of trucking industry, difficulty of driving a commercial vehicle, and safe driving practices to use within the vicinity of commercial vehicles.
  - Operation Carrier Equip

Exhibit E-16 shows the project timeline with milestones highlighted.

Exhibit E-16

SCHEDULE OF ITS/CVO EVENTS FOR THE STATE OF TENNESSEE[1]



1 *Tennessee TRIAD Initiative*, Tennessee Department of Transportation, December 1997