SECTION E
TEXAS 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.

Nearly 22 percent of the mainline LATTS Strategic Highway System (4,917 miles) is located in Texas (Exhibit E-2). The Texas components[1] include the following:

- All of Texas's 3,231 miles of interstate highways, including:
  - I-10, a major east-west interstate linking West Texas with New Orleans, Mobile and Jacksonville
  - I-20, connecting Texas with Wilmington, NC via Jackson, Birmingham, Atlanta, and Columbia, SC
  - I-27 from Amarillo south to Lubbock
  - I-30, connecting Dallas/Ft. Worth and Little Rock
  - I-35, a major north-south interstate freight route linking the Upper Midwest with Laredo
  - I-37, connecting San Antonio to Corpus Christi
  - I-40, a major east-west interstate linking Texas with Little Rock, Memphis, Nashville, Raleigh, and Wilmington
  - I-44, connecting the Midwest to Central Texas via Wichita Falls
  - I-45, linking Dallas/Ft. Worth with Houston/Galveston
  - Numerous urban interstates, including routes I-345, I-410, I-610, I-635, and I-820
- 1,686 miles of non-interstate National Highway System (NHS) facilities

[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

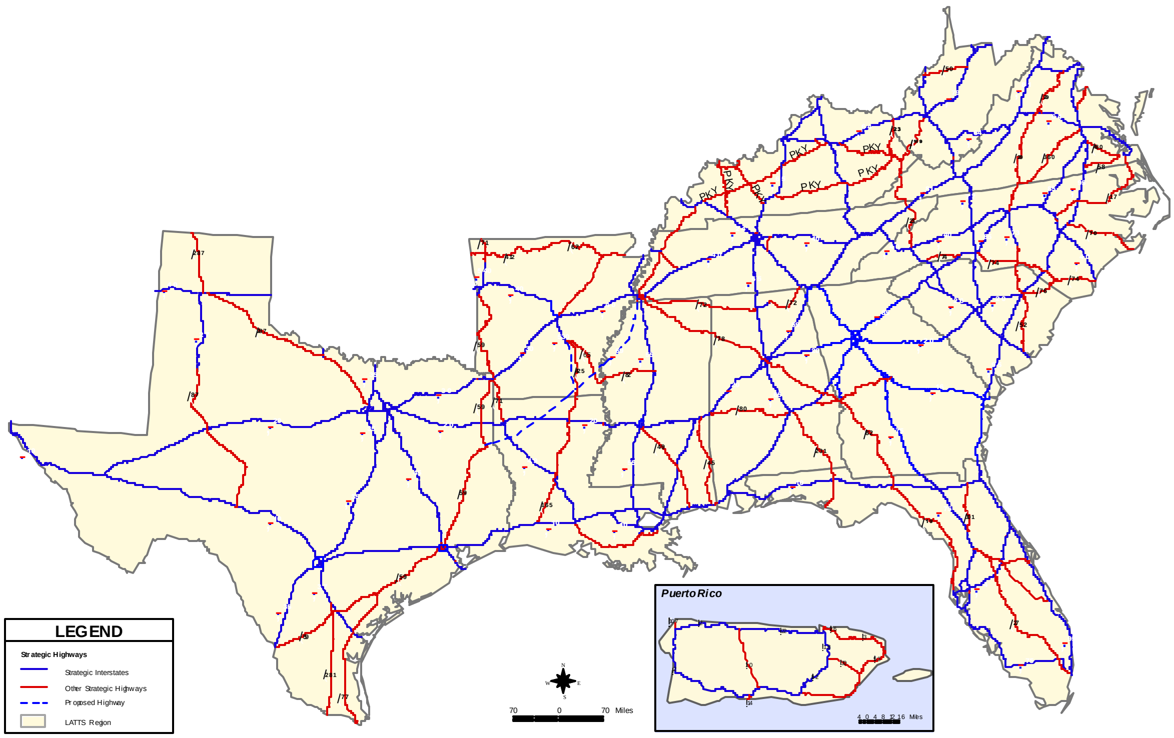
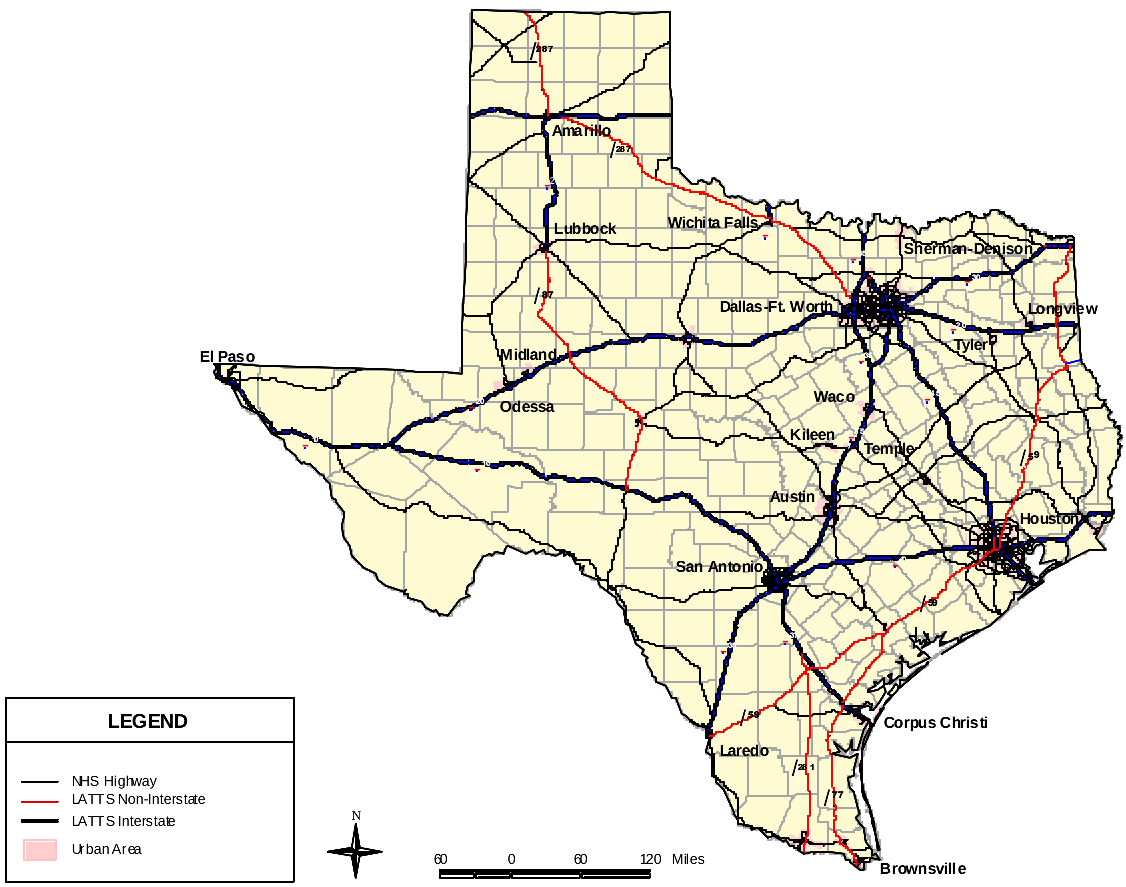


Exhibit E-2
TEXAS LATTS HIGHWAY SYSTEM

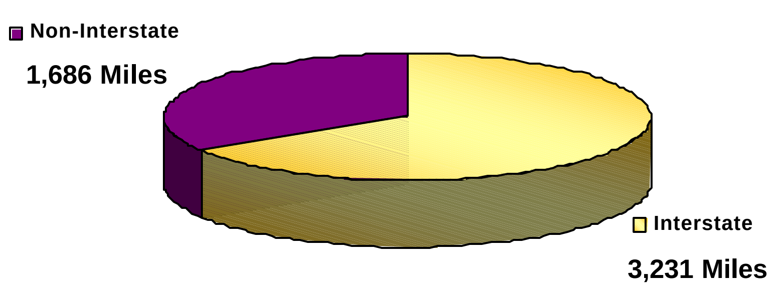


- U.S. 287 from the Oklahoma State Line to Ft. Worth (335 miles), part of Corridor 9 (I-45, U.S. 287) between Amarillo and Galveston. This highway is all multi-laned, with a mix of partial and full access control.
- U.S. 87/277 between Lubbock and I-10, part of Corridor 17 (310 miles). These highways are both two and four lanes, with some control of access on the four-lane sections.
- U.S. 59 from Laredo to I-30 at Texarkana (616 miles) and new location (15 miles) from U.S. 59 to the Louisiana State Line, part of Corridor 18. These highways are also part of Congressional High Priority Corridors 18 (Indianapolis to Laredo) and 20 (Laredo to Texarkana). Existing U.S. 59 is both a two and four-lane highway, with varying levels of access control.
- U.S. 77 from U.S. 59 at Victoria to the Mexico border at Brownsville (238 miles), part of Corridor 18 and Congressional High Priority Corridor 18. This highway is multi-laned, with varying levels of access control.
- U.S. 281 from I-37 to the Mexico border south of McAllen (172 miles), part of LATTS Corridor 18 and Congressional High Priority Corridor 18. This highway is multi-laned, with partial access control.

▶ 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 Texas's portion of the LATTS highways by system.

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



4,917 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 seven LATTS Trade Corridors cross Texas, including:

- Corridor 9 (I-45, U.S. 287) – Amarillo to Galveston
- Corridor 10 (I-35/37) – South Texas to Plains
- Corridor 11 (I-40) – North Texas to Wilmington
- Corridor 13 (I-20, U.S. 76) – El Paso to Wilmington
- Corridor 14 (I-10) – West Texas to Jacksonville
- Corridor 17 (I-27, U.S. 87/277) – Texas to Denver
- Corridor 18 (U.S. 59/51) – Indianapolis to Laredo

HIGHWAY DATABASES

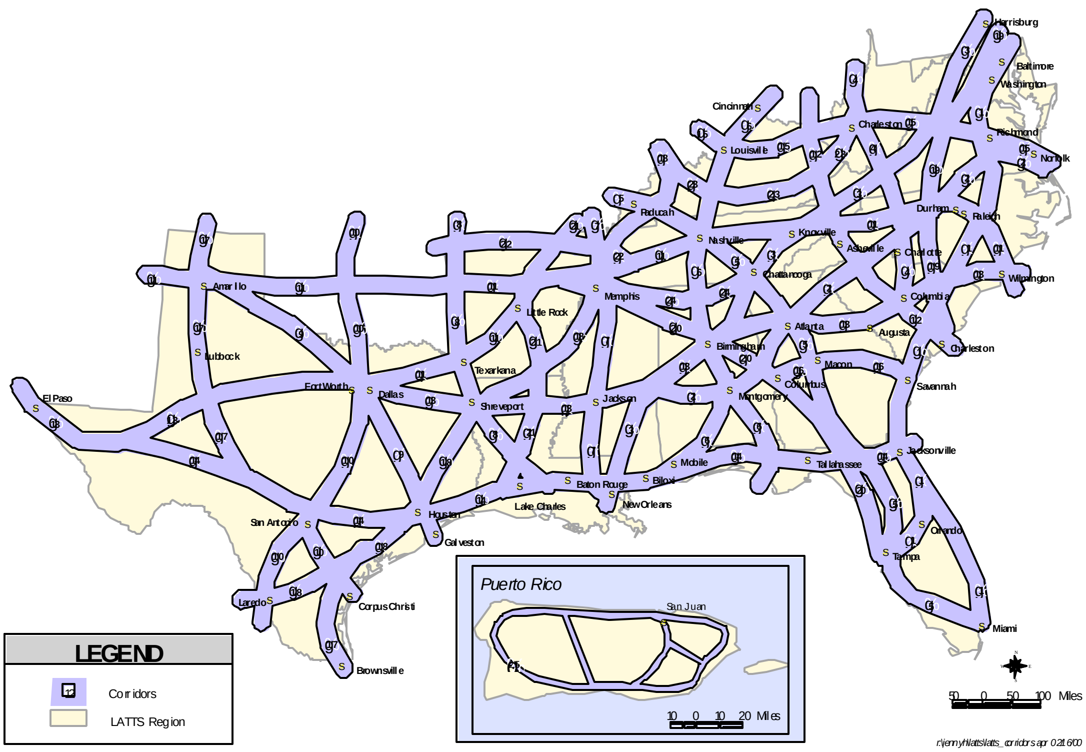
Two main sources of data were used for the analysis of highway investment. The first one, the Highway Performance Monitoring System (HPMS), includes information about the characteristics and conditions of public highways. The second source of data was the LATTS estimates of current and forecasts of future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

For this study, only that portion of the HPMS database corresponding to the selected LATTS Strategic Highway Network was utilized. For Texas, the LATTS HPMS database consisted of 2,588 records describing 4,904 miles of highway on the LATTS Strategic Highway Network.

Exhibit E-4
LATTS TRADE CORRIDORS



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, 3,652 miles of the Strategic Highway Network in Texas were assigned LATTS truck traffic. The majority (85%) of the strategic network not assigned LATTS trucks are U.S. or State highways. Nearly all interstate highways in Texas (96%) were assigned some of the LATTS truck traffic.

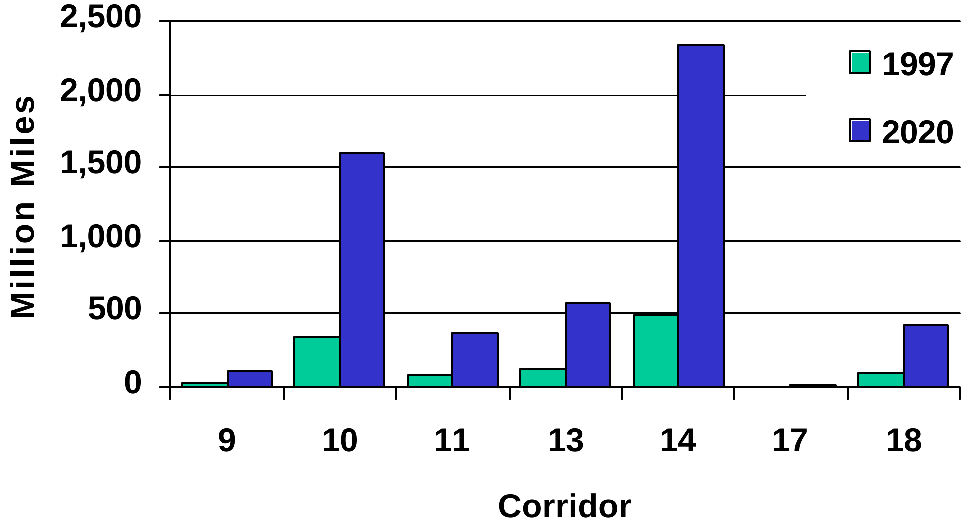
LATTS TRUCK TRAFFIC IN TEXAS

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.

Corridor 14 (I-10 from West Texas to Jacksonville, FL) was assigned 43 percent of all the LATTS truck VMT in the state. By 2020 it will be equivalent to an average annual daily LATTS truck volume of 6,642 or 4.6 trucks every minute. This is the highest volume of LATTS trucks in the Alliance Region.

Another heavily traveled corridor by LATTS trucks is Corridor 10 (I-35/I-37 from South Texas to Plains). By 2020 it will carry 29 percent of LATTS VMT in the state which corresponds to an average annual daily LATTS truck volume of 5,720 or 4 trucks every minute.

Exhibit E-5
LATTS ANNUAL TRUCK VMT IN TEXAS



Corridor 11 (I-40 from North Texas to Wilmington, NC), Corridor 13 (I-20/U.S.76 from El Paso, TX to Wilmington, NC) and Corridor 18 (U.S.59/U.S.51 from Laredo, TX to Indianapolis, IN) together will carry another 25 percent of LATTS VMT in the state with average annual daily LATTS truck volume of 1,154 to 2,543.

The majority of LATTS truck traffic in Texas is on the interstate system with 68 percent of total VMT on the rural interstate system and 24 percent on the urban interstate system.

The percentage of LATTS trucks to total trucks is expected to grow from 15 percent in 1997 to 27.5 percent in 2020 on those highways carrying LATTS traffic (from 13 to 24 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 nearly five fold between 1997 and 2020 while overall truck traffic in the state would only double. LATTS truck share of total trucks varies from corridor to corridor. The highest shares in Texas for 2020 are 40 percent on Corridor 14, 32 percent on Corridor 18 and 29 percent on Corridor 10.

Exhibit E-6
TEXAS LATTS TRUCK TRAFFIC

Corridor/ Functional Class	Length (Miles)	1997 Annual Truck VMT (Million Miles) All Trucks Full Network	All Trucks Part. Network(1)	LATTS Trucks Only	LATTS Percent (2)	2020 Annual Truck VMT (Million Miles) All Trucks Full Network	All Trucks Part. Network(1)	LATTS Trucks Only	LATTS Percent (2)
9	**I-45, US 287**		**Amarillo, TX to Galveston, TX**						
R.Interstate	174.17	429.98	427.89	18.35	4.3%	869.28	865.24	78.57	9.1%
R.Other PA	325.16	329.45	-	-	0.0%	545.88	-	-	0.0%
U.Interstate	126.91	420.91	383.50	8.47	2.2%	738.86	672.24	33.84	5.0%
U.Other Fwy.	6.16	8.40	-	-	0.0%	13.85	-	-	0.0%
U.Other PA	4.21	4.63	-	-	0.0%	6.82	-	-	0.0%
TOTAL	636.61	1,193.36	811.39	26.81	3.3%	2,174.69	1,537.48	112.41	7.3%
10	**I-35, I-37**		**South Texas to Plains**						
R.Interstate	428.39	879.65	808.31	219.52	27.2%	2,913.45	2,764.90	1,019.03	36.9%
U.Interstate	340.76	1,265.06	1,182.79	128.69	10.9%	2,987.32	2,839.15	586.88	20.7%
TOTAL	769.15	2,144.71	1,991.10	348.21	17.5%	5,900.78	5,604.04	1,605.91	28.7%
11	**I-40**		**North Texas to Wilmington, NC**						
R.Interstate	284.45	640.82	640.82	58.75	9.2%	1,406.73	1,406.73	262.17	18.6%
U.Interstate	116.39	408.43	378.39	24.71	6.5%	790.09	740.79	109.93	14.8%
TOTAL	400.84	1,049.25	1,019.21	83.46	8.2%	2,196.82	2,147.52	372.10	17.3%
13	**I-20, US 76**		**El Paso, TX to Wilmington, NC**						
R.Interstate	496.25	1,088.50	1,085.64	108.28	10.0%	2,326.63	2,321.75	479.15	20.6%
U.Interstate	175.01	428.15	371.27	22.14	6.0%	903.55	813.23	98.82	12.2%
TOTAL	671.25	1,516.65	1,456.91	130.42	9.0%	3,230.18	3,134.98	577.97	18.4%
14	**I-10**		**West Texas to Jacksonville, FL**						
R.Interstate	723.35	1,157.14	1,134.97	397.79	35.0%	3,988.09	3,941.66	1,881.48	47.7%
U.Interstate	242.72	910.07	824.75	96.58	11.7%	2,085.15	1,935.56	460.74	23.8%
TOTAL	966.07	2,067.21	1,959.72	494.37	25.2%	6,073.24	5,877.22	2,342.22	39.9%
17	**I-27, US 87, US 277**		**Texas to Denver, CO**						
R.Interstate	101.89	70.70	70.70	1.07	1.5%	110.86	110.86	3.60	3.2%
R.Other PA	281.47	100.04	1.97	0.91	46.5%	162.79	6.20	4.41	71.1%
U.Interstate	22.24	28.16	28.16	0.23	0.8%	48.89	48.89	0.79	1.6%
U.Other Fwy.	10.58	9.25	-	-	0.0%	14.03	-	-	0.0%
U.Other PA	17.84	9.54	-	-	0.0%	15.25	-	-	0.0%
TOTAL	434.02	217.70	100.83	2.21	2.2%	351.82	165.94	8.79	5.3%
18	**US 59, US 51**		**Laredo, TX to Indianapolis, IN**						
R.Other PA	792.39	785.09	421.23	77.80	18.5%	1,676.08	1,070.44	357.17	33.4%
U.Other Fwy.	89.41	233.69	74.46	7.41	10.0%	430.18	168.69	34.02	20.2%
U.Other PA	143.89	187.25	41.67	8.85	21.2%	353.57	110.49	40.76	36.9%
TOTAL	1,025.69	1,206.03	537.35	94.07	17.5%	2,459.83	1,349.63	431.94	32.0%
ALL CORRIDORS									
R.Interstate	2,208.50	4,266.79	4,168.33	803.75	19.3%	11,615.03	11,411.13	3,723.99	32.6%
R.Other PA	1,399.02	1,214.58	423.19	78.72	18.6%	2,384.75	1,076.64	361.58	33.6%
U.Interstate	1,024.03	3,460.78	3,168.86	280.81	8.9%	7,553.86	7,049.86	1,291.00	18.3%
U.Other Fwy.	106.15	251.33	74.46	7.41	10.0%	458.06	168.69	34.02	20.2%
U.Other PA	165.93	201.43	41.67	8.85	21.2%	375.64	110.49	40.76	36.9%
TOTAL	4,903.63	9,394.90	7,876.51	1,179.55	15.0%	22,387.35	19,816.80	5,451.34	27.5%

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

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 Texas 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 do not consider any improvements that may have occurred subsequently or any planned improvements.

Detailed results for Texas are presented in Exhibit E-7. The total number of Texas 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.

Based on the HPMS database, these analyses indicate that 415 of the LATTS roadway miles in Texas, or 8.5 percent of the Texas 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.

Exhibit E-7
TEXAS CAPACITY INVESTMENT NEEDS

			Capacity Analysis							
			Deficient Mileage			2020 Needed Lane Miles		2020 Cost in $Million		
Corridor/ Functional Class	Length (Miles)	Existing Lane Miles	1997	2020 W/O LATTS Added Traffic	2020 With LATTS Added Traffic	Base	With LATTS Added Traffic	Base	With LATTS Added Traffic	% Increase Due to LATTS
9	**I-45, US 287**		**Amarillo, TX to Galveston, TX**							
R.Interstate	174.17	725.53	18.22	71.42	92.36	300.53	342.41	212	256	20.7%
R.Other PA	325.16	1,268.40	1.12	12.81	12.81	25.62	25.62	29	29	0.0%
U.Interstate	126.91	741.03	35.02	88.41	90.38	614.97	619.97	2,135	2,152	0.8%
U.Other Fwy.	6.16	24.65	-	-	-	-	-	-	-	0.0%
U.Other PA	4.21	16.83	-	-	-	-	-	-	-	0.0%
TOTAL	636.61	2,776.43	54.36	172.64	195.55	941.12	988.01	2,376	2,437	2.6%
10	**I-35, I-37**		**South Texas to Plains**							
R.Interstate	428.39	1,752.85	48.29	184.18	284.07	656.83	1,010.05	525	796	51.7%
U.Interstate	340.76	1,916.09	91.56	295.61	303.36	1,440.55	1,605.12	5,000	5,571	11.4%
TOTAL	769.15	3,668.93	139.85	479.79	587.44	2,097.38	2,615.17	5,525	6,367	15.2%
11	**I-40**		**North Texas to Wilmington, NC**							
R.Interstate	284.45	1,140.06	2.79	62.22	123.86	136.15	277.55	141	278	97.6%
U.Interstate	116.39	644.61	28.47	77.97	85.89	377.69	410.80	1,311	1,426	8.8%
TOTAL	400.84	1,784.67	31.26	140.19	209.75	513.84	688.35	1,452	1,704	17.4%
13	**I-20, US 76**		**El Paso, TX to Wilmington, NC**							
R.Interstate	496.25	1,999.88	-	106.87	110.17	227.87	235.42	244	252	3.2%
U.Interstate	175.01	970.58	21.49	76.62	79.20	419.76	424.93	1,457	1,475	1.2%
TOTAL	671.25	2,970.46	21.49	183.49	189.37	647.63	660.35	1,701	1,727	1.5%
14	**I-10**		**West Texas to Jacksonville, FL**							
R.Interstate	723.35	2,937.08	23.96	181.49	268.07	474.04	939.06	435	740	70.3%
U.Interstate	242.72	1,453.66	55.50	166.96	178.45	924.29	1,008.70	3,208	3,501	9.1%
TOTAL	966.07	4,390.75	79.46	348.45	446.52	1,398.34	1,947.76	3,643	4,242	16.4%
17	**I-27, US 87, US 277**		**Texas to Denver, CO**							
R.Interstate	101.89	407.55	-	-	-	-	-	-	-	0.0%
R.Other PA	281.47	942.65	-	11.22	20.72	22.44	41.43	17	32	90.7%
U.Interstate	22.24	115.41	-	-	-	-	-	-	-	0.0%
U.Other Fwy.	10.58	44.79	-	-	-	-	-	-	-	0.0%
U.Other PA	17.84	83.30	1.86	3.76	3.76	7.51	7.51	16	16	0.0%
TOTAL	434.02	1,593.71	1.86	14.98	24.47	29.95	48.94	33	48	46.0%
18	**US 59, US 51**		**Laredo, TX to Indianapolis, IN**							
R.Other PA	792.39	2,815.15	59.37	175.56	217.26	414.29	497.66	343	428	24.6%
U.Other Fwy.	89.41	457.52	24.07	73.12	75.12	284.10	292.16	986	1,014	2.8%
U.Other PA	143.89	539.91	3.48	20.71	23.90	41.43	51.21	73	89	21.6%
TOTAL	1,025.69	3,812.58	86.92	269.39	316.28	739.81	841.03	1,403	1,531	9.1%
ALL CORRIDORS										
R.Interstate	2,208.50	8,962.95	93.26	606.18	878.54	1,795.43	2,804.51	1,556	2,321	49.2%
R.Other PA	1,399.02	5,026.20	60.49	199.59	250.79	462.35	564.71	389	489	25.6%
U.Interstate	1,024.03	5,841.38	232.04	705.57	737.29	3,777.26	4,069.52	13,111	14,125	7.7%
U.Other Fwy.	106.15	526.96	24.07	73.12	75.12	284.10	292.16	986	1,014	2.8%
U.Other PA	165.93	640.04	5.34	24.47	27.66	48.94	58.73	90	106	17.7%
TOTAL	4,903.63	20,997.53	415.20	1,608.93	1,969.39	6,368.07	7,789.62	16,132	18,055	11.9%

With the expected "normal" growth (as defined by the HPMS database), a total of 1,609 road miles or 33 percent of the Texas LATTS network will have congestion problems by 2020. The "additional" LATTS trucks are expected to increase the total to 1,969 miles or 40 percent of total mileage as noted in Exhibit E-8. In other words, LATTS truck will increase congested miles of roadway and needed lane miles by about 22 percent. These percentages are significant but they also indicate that the majority of the congestion problems in Texas are not due to LATTS traffic alone but expected overall growth in total traffic. However, unless these capacity needs are met, LATTS truck traffic will be affected by all the capacity deficiencies regardless of the source. As congestion increases, LATTS trucks like other traffic, will experience lower operating speeds, frequent speed changes, lower reliability, and increased operating costs.

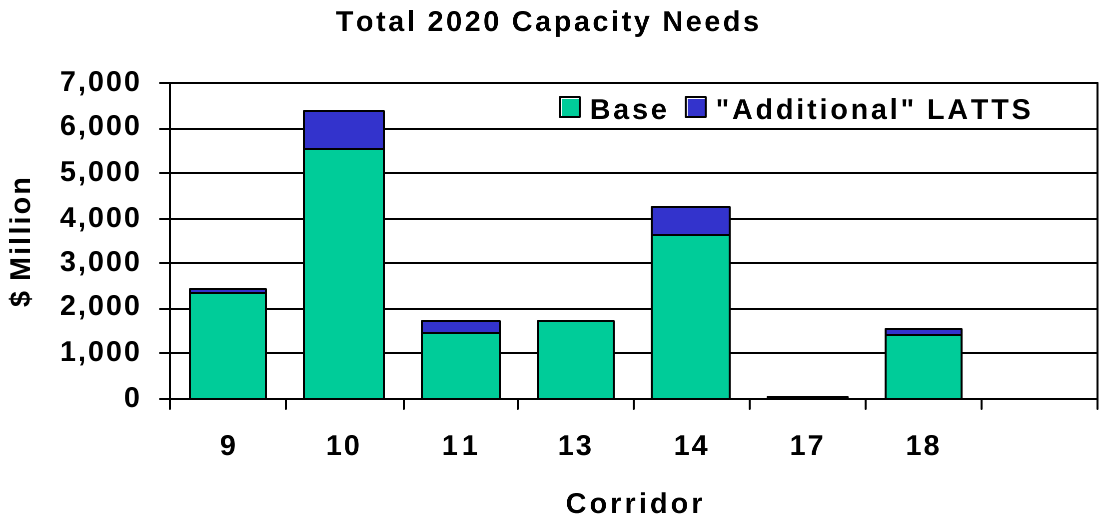
Exhibit E-8
TEXAS 2020 CAPACITY NEEDS
LATTS Strategic Network

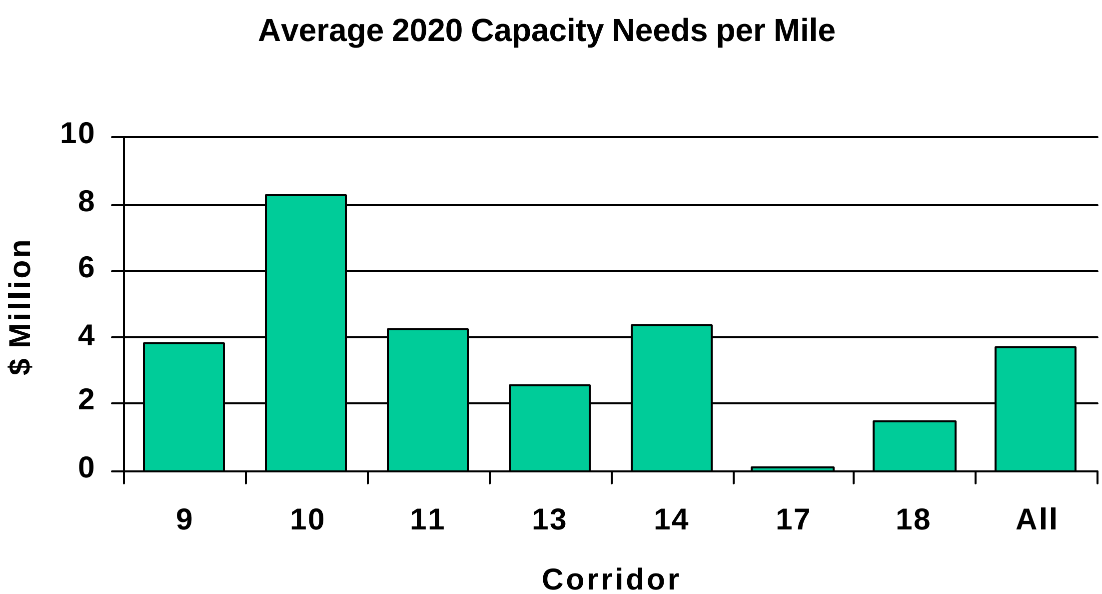
	Deficient Miles	% of Total Miles	Needs (Billion)
"Normal" Growth	1,609	33%	$16.1
"Additional" LATTS Traffic	360	7%	$1.9
Total	1,969	40%	$18.1

Based on the HPMS expected growth in traffic, nearly $16.1 billion will be required in the next 20 years to address congestion problems on the Texas portion of the LATTS Strategic Network. The "additional" LATTS traffic will bring that total to $18.1 billion, a 12 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 related to the total length of the corridor and more specifically the amount of additional lane miles needed: the more lane miles needed, the higher the needs. Corridor 10 (I-35/I-37 from South Texas to Plains) has the highest capacity needs at $ 6.4 billion. Corridor 14 (I-10 from West Texas to Jacksonville, FL) has the next largest capacity needs at $ 4.2 billion. In terms of average capacity needs by roadway mile, Corridor 10 and Corridor 14 have proportionally the highest capacity needs: $ 8.3 and $ 4.4 million per roadway mile versus $ 3.7 million average for the state.

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





It should be noted that by 2020, 76 percent of Corridor 10, 52 percent of Corridor 11 (I-40 from North Texas to Wilmington, NC) and 46 percent of Corridor 14 in Texas will require capacity improvements. These three corridors will also experience the highest incremental needs due to LATTS "additional" traffic, 44 percent, 13 percent and 31 percent of the total increase in capacity needs in Texas respectively. This is related to the volumes of LATTS trucks on these three corridors as described in the previous section.

The capacity needs as calculated and described in this study are unlikely to be met in Texas simply by adding more lanes as assumed. The number of additional lanes needed on some highway segments, especially on Corridor 10 (I-35/I-37 in Texas) are too high to be realistic. The projected growth in traffic for both the base case (HPMS database) and for LATTS trucks will be difficult to accommodate in these corridors.

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.

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 Texas 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 Texas pavement needs for the LATTS Strategic Highway Network are presented in Exhibit E-10. Based on the HPMS data, only 3 percent or 145 miles of the Texas portion of the LATTS Strategic Highway Network have existing (1997) pavement deficiencies. With 6.5 percent of its length deficient, Corridor 14 (I-10 from West Texas to Jacksonville, FL) has the highest percentage with existing pavement deficiency.

One would expect that the corridors with the highest concentration of LATTS truck traffic would show the largest impact from LATTS. Exhibit E-10 confirms this expectation to some degree.

- Corridor 14 (I-10 from West Texas to Jacksonville, FL) has the highest LATTS truck VMT and the highest reduction in pavement life from 7.1 years to 5.6 years.
- Corridor 10 (I-35/I-37 from South Texas to Plains) is second in terms of LATTS truck VMT but third only in terms of reduction in 2020 pavement life, from 5.8 years to 5.0 years.

Total resurfacing costs are a function of the average pavement life and the length of the highways. Corridor 10 (I-35/I-37 from South Texas to Plains) has the highest average annual resurfacing needs, nearly $ 134 million with LATTS traffic. With the largest reduction in average pavement life due to LATTS, Corridor 14 (I-10 from West Texas to Jacksonville, FL) has the largest incremental resurfacing needs due to LATTS trucks, $19.8 million annually or 18.1 percent increase.

Future (2020) pavement needs are summarized in Exhibit E-11. Pavement life for the Texas portion of the LATTS Strategic Highway Network will average 7.2 years in 2020 without the “additional” LATTS truck traffic and 6.5 years with it. The annual resurfacing costs for the Texas portion of the LATTS Strategic Highway Network is estimated to exceed $471 million without LATTS “additional” truck traffic and $520 million with it, an increase of 10 percent.

Exhibit E-11
TEXAS 2020 PAVEMENT NEEDS
LATTS Strategic Network

	Pavement Life (Years)	Annual Resurfacing Cost ($Million)
“Normal” Growth	7.2	$471
With “Additional” LATTS Traffic	6.5	$520

Exhibit E-10
TEXAS PAVEMENT RESURFACING INVESTMENT NEEDS

Corridor/ Functional Class	Length (Miles)	Existing Lane Miles	Average 1997 AADT	Pavement Analysis					
				1997 Deficient Mileage	2020 Pavement Life (Years)		2020 Average Annual Cost ($1,000)		
					W/O LATTS Added Traffic	With LATTS Added Traffic	Base	With LATTS Added Traffic	% Increase Due to LATTS
9	**I-45, US 287**			**Amarillo, TX to Galveston, TX**					
R.Interstate	174.17	725.53	30,387	0.36	9.2	9.0	8,634	8,864	2.7%
R.Other PA	325.16	1,268.40	9,781	6.27	11.0	11.0	9,211	9,211	0.0%
U.Interstate	126.91	741.03	86,656	13.60	7.2	7.1	24,807	25,075	1.1%
U.Other Fwy.	6.16	24.65	16,402	-	9.0	9.0	553	553	0.0%
U.Other PA	4.21	16.83	12,817	1.65	5.5	5.5	473	473	0.0%
TOTAL	636.61	2,776.43	30,828	21.87	9.5	9.4	43,678	44,175	1.1%
10	**I-35, I-37**			**South Texas to Plains**					
R.Interstate	428.39	1,752.85	23,068	0.37	7.0	5.6	30,695	38,964	26.9%
U.Interstate	340.76	1,916.09	84,745	20.88	4.7	4.4	89,207	95,008	6.5%
TOTAL	769.15	3,668.93	50,393	21.25	5.8	5.0	119,902	133,973	11.7%
11	**I-40**			**North Texas to Wilmington, NC**					
R.Interstate	284.45	1,140.06	16,280	0.51	7.3	6.6	18,198	20,796	14.3%
U.Interstate	116.39	644.61	71,736	2.56	6.5	6.1	22,156	24,042	8.5%
TOTAL	400.84	1,784.67	32,383	3.08	7.0	6.4	40,354	44,839	11.1%
13	**I-20, US 76**			**El Paso, TX to Wilmington, NC**					
R.Interstate	496.25	1,999.88	16,679	2.13	6.6	5.5	36,306	42,292	16.5%
U.Interstate	175.01	970.58	55,267	3.57	5.3	5.0	43,047	45,095	4.8%
TOTAL	671.25	2,970.46	26,740	5.70	6.2	5.3	79,353	87,388	10.1%
14	**I-10**			**West Texas to Jacksonville, FL**					
R.Interstate	723.35	2,937.08	13,992	38.59	7.9	5.9	46,345	60,656	30.9%
U.Interstate	242.72	1,453.66	93,925	23.81	5.3	4.8	63,006	68,450	8.6%
TOTAL	966.07	4,390.75	34,075	62.40	7.1	5.6	109,351	129,106	18.1%
17	**I-27, US 87, US 277**			**Texas to Denver, CO**					
R.Interstate	101.89	407.55	9,197	-	10.3	10.3	4,320	4,329	0.2%
R.Other PA	281.47	942.65	4,652	-	7.6	7.5	9,521	9,598	0.8%
U.Interstate	22.24	115.41	25,153	-	7.4	7.4	3,462	3,468	0.2%
U.Other Fwy.	10.58	44.79	13,288	-	5.0	5.0	2,039	2,039	0.0%
U.Other PA	17.84	83.30	12,754	0.34	13.1	13.1	991	991	0.0%
TOTAL	434.02	1,593.71	7,313	0.34	8.5	8.4	20,333	20,425	0.5%
18	**US 59, US 51**			**Laredo, TX to Indianapolis, IN**					
R.Other PA	792.39	2,815.15	11,886	11.21	6.7	6.4	32,697	33,783	3.3%
U.Other Fwy.	89.41	457.52	86,359	9.99	6.3	6.2	17,174	17,546	2.2%
U.Other PA	143.89	539.91	17,168	9.35	10.6	9.8	8,560	9,139	6.8%
TOTAL	1,025.69	3,812.58	19,119	30.55	7.2	6.9	58,431	60,468	3.5%
ALL CORRIDORS									
R.Interstate	2,208.50	8,962.95	17,723	41.97	7.6	6.3	144,498	175,902	21.7%
R.Other PA	1,399.02	5,026.20	9,941	17.47	7.9	7.8	51,429	52,592	2.3%
U.Interstate	1,024.03	5,841.38	79,347	64.41	5.6	5.2	245,685	261,139	6.3%
U.Other Fwy.	106.15	526.96	75,016	9.99	6.3	6.2	19,766	20,139	1.9%
U.Other PA	165.93	640.04	16,584	11.34	10.8	10.1	10,024	10,603	5.8%
TOTAL	4,903.63	20,997.53	29,573	145.18	7.2	6.5	471,402	520,375	10.4%

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 Texas portion of the LATTS Strategic Highway Network are presented on Exhibit E-12. In this exhibit, Texas 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.

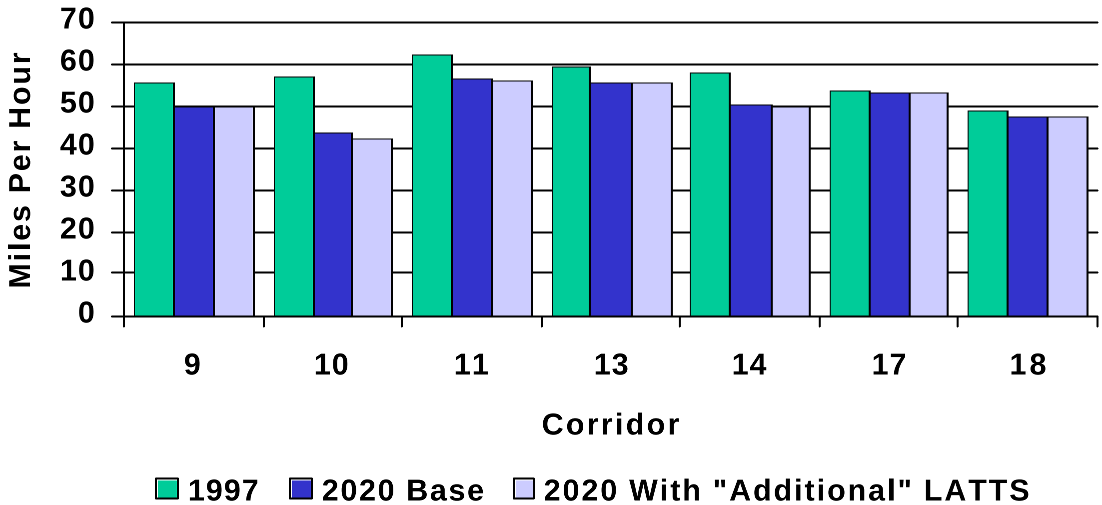
Average daily and peak period speeds/travel times for trucks also are presented for the base year (1997). Further, truck operating speeds are listed twice for year 2020. The first time, truck operating speeds were calculated assuming the base growth rate, i.e. the growth rate indicated by the HPMS database. The second time, truck operating speeds were calculated with the LATTS “additional” traffic. Overall results for the entire corridor within Texas 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.

Average daily operating speeds on Texas LATTS corridors are summarized in Exhibit E-13. All corridors with a majority of interstate facilities (Corridors 9, 10, 11, 13 and 14) have average daily operating speeds above 55 MPH in 1997. Corridors 17 and 18 have lower average daily speeds around 50 MPH because they are comprised of lower type facilities.

Exhibit E-12
TEXAS TRUCK OPERATING SPEEDS

Corridor/ Functional Class	Length (Miles)	Average No. Lane	Speed Limit (MPH)	Average 1997 AADT	1997 Truck Speed (MPH) Daily Average	1997 Truck Speed (MPH) Peak Hour	2020 Truck Speed (MPH) W/O Added LATTS Traffic Daily Average	2020 Truck Speed (MPH) W/O Added LATTS Traffic Peak Hour	2020 Truck Speed (MPH) With Added LATTS Traffic Daily Average	2020 Truck Speed (MPH) With Added LATTS Traffic Peak Hour
9	**I-45, US 287**		**Amarillo, TX to Galveston, TX**							
R.Interstate	174.2	4.2	68.1	30,387	63.3	57.2	59.6	44.6	59.5	44.0
R.Other PA	325.2	3.9	64.6	9,781	53.9	53.6	53.9	53.1	53.9	53.1
U.Interstate	126.9	5.8	61.4	86,656	52.3	26.8	35.9	20.3	35.7	20.2
U.Other Fwy.	6.2	4.0	70.0	16,402	51.6	51.6	51.6	51.6	51.6	51.6
U.Other PA	4.2	4.0	38.2	12,817	25.5	25.5	25.5	24.9	25.5	24.9
TOTAL	**636.6**	**4.4**	**64.6**	**30,828**	**55.4**	**45.1**	**49.8**	**38.4**	**49.7**	**38.2**
Time (HR)					**11.5**	**14.1**	**12.8**	**16.6**	**12.8**	**16.7**
10	**I-35, I-37**		**South Texas to Plains**							
R.Interstate	428.4	4.1	69.3	23,068	60.8	58.3	56.6	43.1	55.5	40.1
U.Interstate	340.8	5.6	63.0	84,745	53.4	25.5	33.9	17.5	32.8	17.1
TOTAL	**769.2**	**4.8**	**66.4**	**50,393**	**57.3**	**37.1**	**43.6**	**26.1**	**42.5**	**25.2**
Time (HR)					**13.4**	**20.7**	**17.6**	**29.4**	**18.1**	**30.6**
11	**I-40**		**North Texas to Wilmington, NC**							
R.Interstate	284.4	4.0	67.4	16,280	63.9	63.7	63.9	55.6	63.9	49.8
U.Interstate	116.4	5.5	62.1	71,736	58.0	27.2	43.7	18.9	43.4	17.4
TOTAL	**400.8**	**4.5**	**65.8**	**32,383**	**62.1**	**45.9**	**56.4**	**35.5**	**56.2**	**32.4**
Time (HR)					**6.5**	**8.7**	**7.1**	**11.3**	**7.1**	**12.4**
13	**I-20, US 76**		**El Paso, TX to Wilmington, NC**							
R.Interstate	496.2	4.0	68.1	16,679	61.1	60.9	60.9	52.8	60.9	52.3
U.Interstate	175.0	5.5	64.8	55,267	56.2	37.1	44.5	25.4	44.4	25.4
TOTAL	**671.3**	**4.4**	**67.2**	**26,740**	**59.7**	**52.2**	**55.6**	**41.2**	**55.5**	**41.0**
Time (HR)					**11.2**	**12.9**	**12.1**	**16.3**	**12.1**	**16.4**
14	**I-10**		**West Texas to Jacksonville, FL**							
R.Interstate	723.4	4.1	69.0	13,992	60.0	59.4	59.7	47.2	59.4	44.6
U.Interstate	242.7	6.0	61.7	93,925	53.7	25.2	34.6	18.5	33.7	17.8
TOTAL	**966.1**	**4.5**	**67.0**	**34,075**	**58.3**	**44.3**	**50.5**	**33.9**	**49.9**	**32.4**
Time (HR)					**16.6**	**21.8**	**19.1**	**28.5**	**19.4**	**29.8**
17	**I-27, US 87, US 277**		**Texas to Denver, CO**							
R.Interstate	101.9	4.0	66.8	9,197	63.3	63.3	63.3	63.2	63.3	63.2
R.Other PA	281.5	3.3	63.8	4,652	53.4	51.4	53.0	51.2	53.0	51.1
U.Interstate	22.2	5.2	58.8	25,153	57.2	56.7	57.1	41.6	57.1	41.6
U.Other Fwy.	10.6	4.2	56.7	13,288	50.2	50.2	50.2	50.2	50.2	50.2
U.Other PA	17.8	4.7	43.2	12,754	30.1	26.0	30.1	23.4	30.1	23.4
TOTAL	**434.0**	**3.7**	**62.8**	**7,313**	**53.7**	**51.8**	**53.5**	**50.3**	**53.5**	**50.3**
Time (HR)					**8.1**	**8.4**	**8.1**	**8.6**	**8.1**	**8.6**
18	**US59, US 51**		**Laredo, TX to Indianapolis, IN**							
R.Other PA	792.4	3.6	60.0	11,886	53.9	51.2	53.1	46.2	52.9	45.6
U.Other Fwy.	89.4	5.1	60.1	86,359	56.3	29.5	42.4	18.3	42.3	18.2
U.Other PA	143.9	3.8	50.0	17,168	31.5	30.8	31.3	25.8	31.3	25.4
TOTAL	**1,025.7**	**3.7**	**58.3**	**19,119**	**49.2**	**44.3**	**47.4**	**37.1**	**47.3**	**36.7**
Time (HR)					**20.9**	**23.2**	**21.6**	**27.6**	**21.7**	**28.0**

Exhibit E-13
TEXAS STRATEGIC HIGHWAY NETWORK



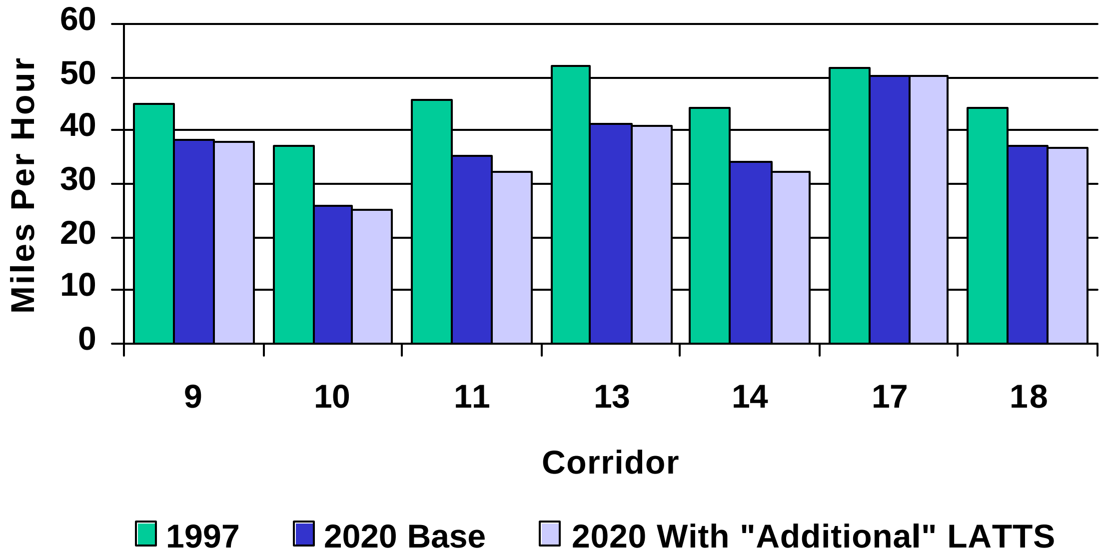
Average Daily Truck Operating Speeds

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 Texas LATTS corridors will be reduced by 5 MPH or more. Corridor 10 (I-35/I-37 from South Texas to Plains) will experience the most deterioration in average daily travel speeds, close to 14 MPH reduction, unless new capacity enhancement measures are undertaken. Corridor 14 (I-10 from West Texas to Jacksonville, FL) could experience a reduction in average travel speed close to 8 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. Even the worse case, Corridor 10, will only experience an additional reduction in average daily speed of 1.1 MPH. 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.

As noted in Exhibit E-14, the expected traffic growth in Texas LATTS corridor will affect “peak hour” speeds more significantly, between 10 and 11 MPH for Corridors 10, 11, 13 and 14.

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



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. As mentioned earlier, these travel speeds are 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.

CONCLUSIONS FOR LATTS MAINLINE HIGHWAYS

(1) LATTS truck traffic in Texas 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 362 percent while all other traffic is expected to increase by 81 percent.

(2) About 40 percent of the LATTS Strategic Highway Network in Texas will require additional capacity by 2020 at an estimated cost of $ 18 billion. More than 91 percent of these capacity needs are for the interstate system (78 percent for the urban interstate system alone). The majority of these needs (89%) are due to expected growth in total traffic and not to LATTS trucks

(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:

- 22.4% more highway miles needing capacity improvements.
- 11.9% additional costs to address these capacity needs.

- 10.4% increase in annual pavement resurfacing costs.

(4) In Texas, Corridor 14 (I-10 from West Texas to Jacksonville, FL) and Corridor 10 (I-35/I-37 from South Texas to Plains) will be 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 Texas 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, information was available in the inventory database for 17 of Texas' 23 connectors. Only five of those 17 connectors have a jurisdictional relationship with the state. The state has full jurisdiction of four connectors and partial jurisdiction of one connector.

The following are the Texas facilities that have connectors for which information was not available in the inventory database:

- Amarillo Intl.; TX2A
- Houston Intercontinental; TX73A
- Lubbock Intl.; TX23A
- Austin-Bergstrom Intl.; TX156A
- Port Arthur; TX154P
- Port of Lavaca

Exhibit E-15
LATTS IN TERMODAL CONNECTORS

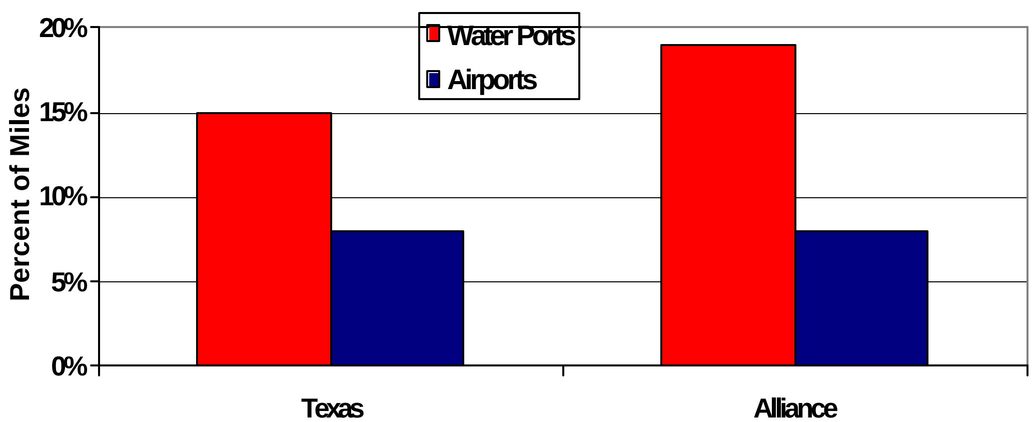
FACILTY ID	FACILITY NAME	LINK MILES	RURAL/URBAN DESIGNATION	OWNERSHIP	AGENCY
TX13P	Port of Corpus Christi #2	0.7	Urbanized (>200k)	County Highway	Corpus Christi MPO
TX14P	Port of Corpus Christi #3	0.5	Urbanized (>200k)	Municipal Highway-County Highway	Corpus Christi MPO
TX154P	Port of Port Arthur	?	Urbanized (50k to 200k)	Municipal Highway	SETRPC
TX15P	Port of Corpus Christi #4	0.7	Urbanized (>200k)	Municipal Highway	Corpus Christi MPO
TX161P	Port of Beaumont	0.9	Urbanized (50k to 200k)	State Highway	SETRPC
TX161P	Port of Beaumont	0.7	Urbanized (50k to 200k)	Municipal Highway-State Highway	SETRPC
TX161P	Port of Beaumont	0.1	Urbanized (50k to 200k)	State Highway	SETRPC
TX16P	Port of Corpus Christi #5	0.5	Urbanized (>200k)	Municipal Highway	Corpus Christi MPO
TX18A	Laredo International Airport	0.9	Urbanized (50k to 200k)	Municipal Highway	City of Laredo
TX29A	Brownsville S Padre Island International Airport	0.8	Urbanized (50k to 200k)	State Highway	Harlingen-San Benito MPO
TX44A	El Paso International Airport	0.9	Urbanized (>200k)	Municipal Highway	El Paso
TX56P	Turning Basin Terminal (S Houston)	0.6	Urbanized (>200k)	County Highway	Houston-Galveston Area Council
TX56P	Bayport Terminal (Houston)	0.6	Urbanized (>200k)	County Highway	Houston-Galveston Area Council
TX57P	Jacintoport Terminal (Houston)	?	Urbanized (>200k)	County Highway	Houston-Galveston Area Council
TX57P	Jacintoport Terminal (Houston)	0.5	Urbanized (>200k)	County Highway	Houston-Galveston Area Council
TX58P	Manchester Terminal Corp. (Houston)	0.7	Urbanized (>200k)	Municipal Highway	Houston-Galveston Area Council
TX77P	Brazosport Turning Basin (Freeport)	0.2	Small Urban (5k to 49k)	State Highway	Houston-Galveston Area Council

Pavement Problems

Texas' connectors followed Alliance averages in this category as illustrated in Exhibit E-16. Among those connectors for which poor pavement conditions were reported are:

- Houston's Manchester terminal connector, TX58P-100% deficient
- Port of Corpus Christi #2, TX13P-50% deficient
- El Paso Intl., TX44A –50% deficient

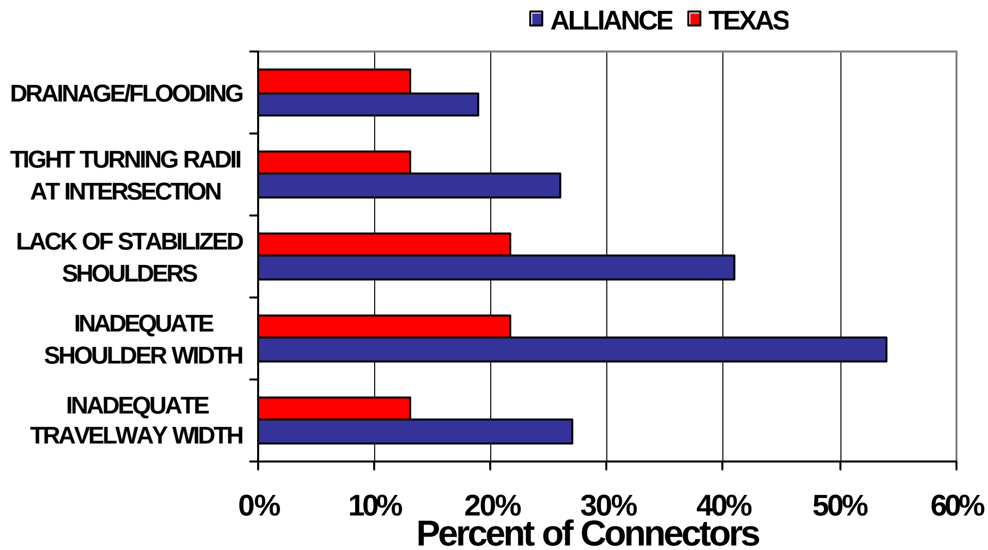
Exhibit E-16
CONNECTORS WITH PAVEMENT PROBLEMS
Texas vs. Alliance



Geometric/Physical Problems

Where deficiencies in the geometric/physical areas were reported, the number of deficiencies were below Alliance averages as noted in Exhibit E-17. Two connectors account for the majority of deficiencies: TX18A serving Laredo Intl. and TX15P were reported to have problems with travelway width, roadway shoulders, and drainage.

Exhibit E-17
GEOMETRIC/PHYSICAL PROBLEMS
Texas vs. Alliance



At-Grade Railroad Crossing Problems

Only two of Texas' 23 connectors were reported to have significant deficiencies regarding rail crossings. Those connectors are:

- TX14P; Port of Corpus Christi #3
- TX16P; Port of Corpus Christi #5

These connectors each have reported problems with congestion, delays, devices, and lack of alternate routes.

Traffic Operations and Safety Problems

Texas reported very minor deficiencies in this category. Only two connectors had more than two reported deficiencies. Laredo's TX18A and El Paso's TX44A each had problems with heavy traffic, long delays at signals, and difficult turns.

State Summary

Texas had more connectors in the NHS inventory database than all other LATTS states. Based upon the available information, the levels of deficiencies were below the Alliance averages in all categories. Of those connectors in the inventory database which are under state jurisdiction, none had any significant deficiency. All of the connectors with significant deficiencies were under municipal of county jurisdiction.

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.

Texas ITS/CVO Plan

Texas recently completed the *Texas ITS/CVO Business Plan* in January 2001. The Business Plan was developed to maximize highway safety and increase government and industry productivity through the application of Intelligent Transportation System/Commercial Vehicle Operations (ITS/CVO) technologies to support regulatory and enforcement functions[2].

The Business Plan was developed as a joint effort between the Texas Department of Transportation, Texas Department of Public Safety, Texas Office of the Comptroller, and the office of the Governor, in collaboration with the Texas Motor Transport Association, Texas Bus Association, the Federal Highway Administration and the Federal Motor Carrier Safety Administration.

The Business Plan focuses on the four main goals as set forth by the national ITS/CVO program. The Texas goals are as follows: 1) improve highway safety by applying

[2] *Texas ITS/CVO Business Plan*, Texas Department of Transportation, January 2001

enforcement and other resources to Commercial Operations where safety risks are more likely to exist, 2) streamline credentials and tax administration, 3) improve the screening and selection of vehicles for roadside enforcement operations, and 4) organize and manage the implementation of Texas' ITS/CVO Business Plan so that it is an integral part of normal activities[3].

Each of the projects as set forth by the Business Plan encompasses at least one of the four national programs areas. Exhibit E-18 shows the projects with applicable lead agencies and anticipated schedule. The projects listed within the Business Plan are outlined as follows:

- ITS/CVO Champion - An individual will be assigned to work with all state agencies, the motor carrier industry, and the legislature, to maintain the momentum of the ITS/CVO plan.
- CVO Data Sharing - Data will be shared among the various agencies, especially the regulatory and enforcement agencies. It is anticipated that this project will take two years to develop and implement.
- Credentials Interface - This project will allow for streamlining of the credentialing process. The motor carriers will be able to transfer all necessary information electronically and only enter information once rather than multiple times.
- Roadside Infrastructure - Existing weigh stations will be upgraded and modernized to include WIM. This will allow congestion reduction and an overall safety improvement.
- Motor Carrier Incentives - A program will be developed and implemented that will allow incentives to be established for carriers that participate in increased safety, regulatory compliance, and program participation.
- Uniform Number System - All state and federal agencies will establish a single numbering system that will be used by the motor carriers. This will allow for information to be exchanged easier.
- Audit Coordination - Coordination between TxDOT/VTR (Vehicles Title and Registration Division) and the State Comptrollers' office will be facilitated. This will allow for the State's resources to be applied effectively and for the motor carriers to be treated fairly.

[3] *Texas ITS/CVO Business Plan*, Texas Department of Transportation, January 2001

Exhibit E-18
TEXAS ITS PROJECT INFORMATION AND SCHEDULE[1]

Projects	Lead Agency	Schedule
1. ITS/CVO Champion	Not yet determined	Steering Committee to make decision by February 2001
2. CVO Data Sharing	TxDOT	Cooperation MOAs, development, implementation, and maintenance, uniform numbering system Completed in 2 years
3. Credentials Interface	TxDOT	07/01 Link existing web sites to Texas One-Stop Web Site 07/01 Survey industry/users for needs/expectations 07/01 Investigate best practices in other states jurisdictions 07/02 Design, develop and test prototype 10/02 Implement, deploy, evaluate 12/00 - 12/02 Marketing
4. Roadside Infrastructure	DPS with aid from with TxDOT	8 border crossings completed and operational NLT 2004 25 sites constructed over next 25 years
5. Motor Carrier Incentives	To be determined	Identification of incentives that can be implemented by various agencies Use Pinnacle Movers' Program as prototype to determine appropriateness and potential incentives No specific timetable at this time
6. Uniform Number System	TxDOT	Determine responsibilities within TxDOT Project completion prior to implementation of data link within/between State agencies
7. Audit Coordination	Joint effort between TxDOT VTR and Comptrollers Office	Understand existing processes Develop new processes Develop task force Completion: 1 year

[1] *Texas ITS/CVO Business Plan*, Texas Department of Transportation, January 2001.