SECTION E
GEORGIA 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 6 percent of the mainline LATTS Strategic Highway System (1,478 miles) is located in Georgia (Exhibit E-2). The Georgia components[1] include the following:

- NHS and is mostly a two-lane highway with no access control. All of Georgia's 1,233 miles of interstate highways, including:
  - I-20, a major east-west interstate linking central Texas with Jackson, Birmingham, and Atlanta
  - I-75, a major north-south interstate linking Cincinnati, Knoxville, Atlanta, Tampa and Miami
  - I-85, linking Montgomery, Atlanta, Charlotte, and Virginia
  - I-16, connecting Macon and Savannah, which is part of Congressional High Priority Corridor 6 (Meridian, MS to Savannah)
  - Numerous urban interstates, including routes I-185, I-285, I-475, I-516, I-520, I-575, I-675, and I-985
- 245 miles of non-interstate National Highway System (NHS) facilities
  - U.S. 19/280 from the Alabama State Line at Columbus to the Florida State Line (160 miles), part of Corridor 20 (Memphis to Tampa). This section is mostly multi-laned, with varying levels of access control.
  - U.S. 80 from the Alabama State Line at Columbus to Macon (85 miles), part of Corridor 16 and Congressional High Priority Corridor 6. U.S. 80 is not part of the

[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

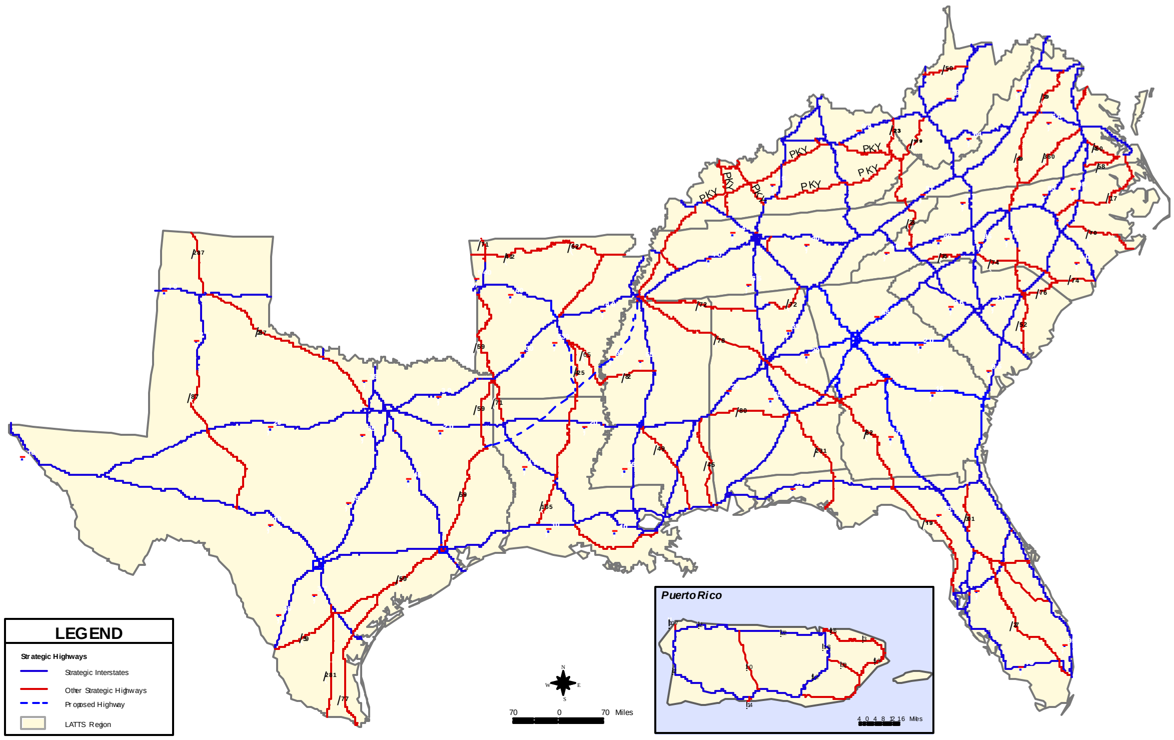
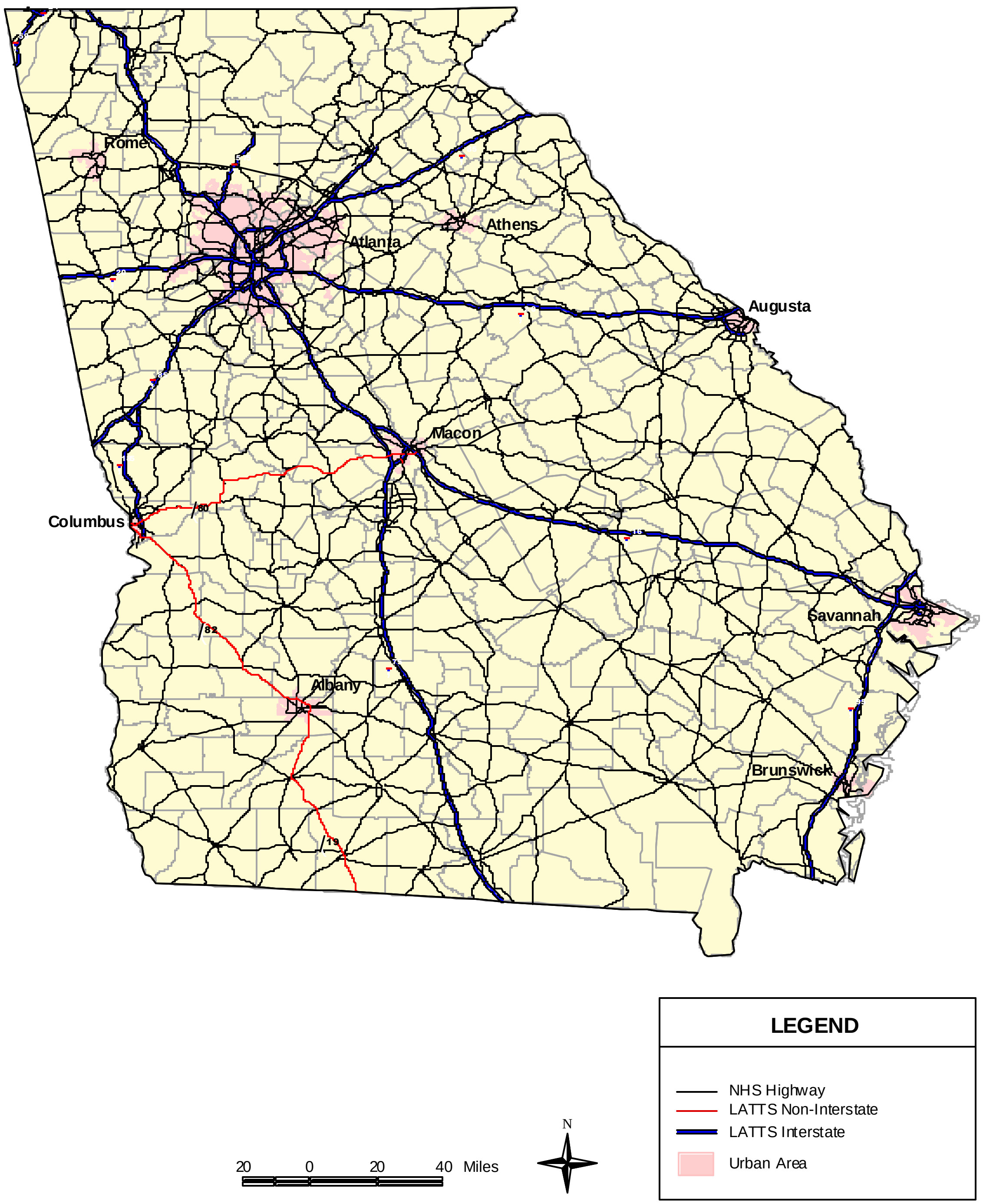


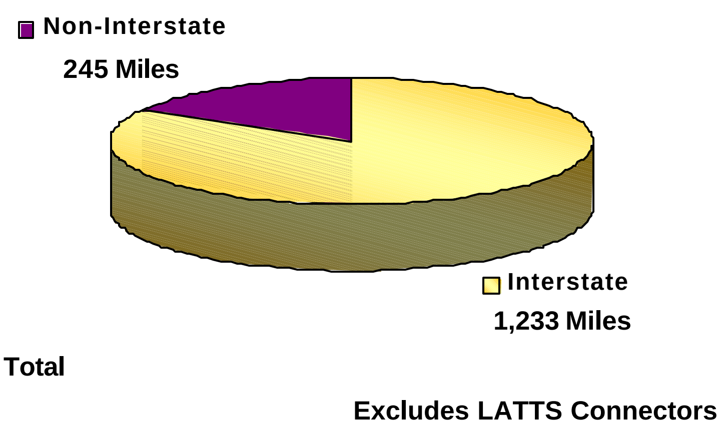
Exhibit E-2
GEORGIA LATTS HIGHWAY SYSTEM



- 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 Georgia's portion of the LATTS highways by system.

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



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 Georgia, including:

- Corridor 1 (I-95) – S. Georgia to Washington
- Corridor 2 (I-85) – West Alabama to Norfolk
- Corridor 3 (I-59/81) – New Orleans to Washington, D.C. and Pennsylvania
- Corridor 5 (I-24/75) – South Georgia to Illinois

- Corridor 13 (I-20) – El Paso to Wilmington, NC
- Corridor 16 (I-16) – Columbus to Savannah
- Corridor 20 (U.S. 19/78/220) – Tampa to Memphis

HIGHWAY DATABASES

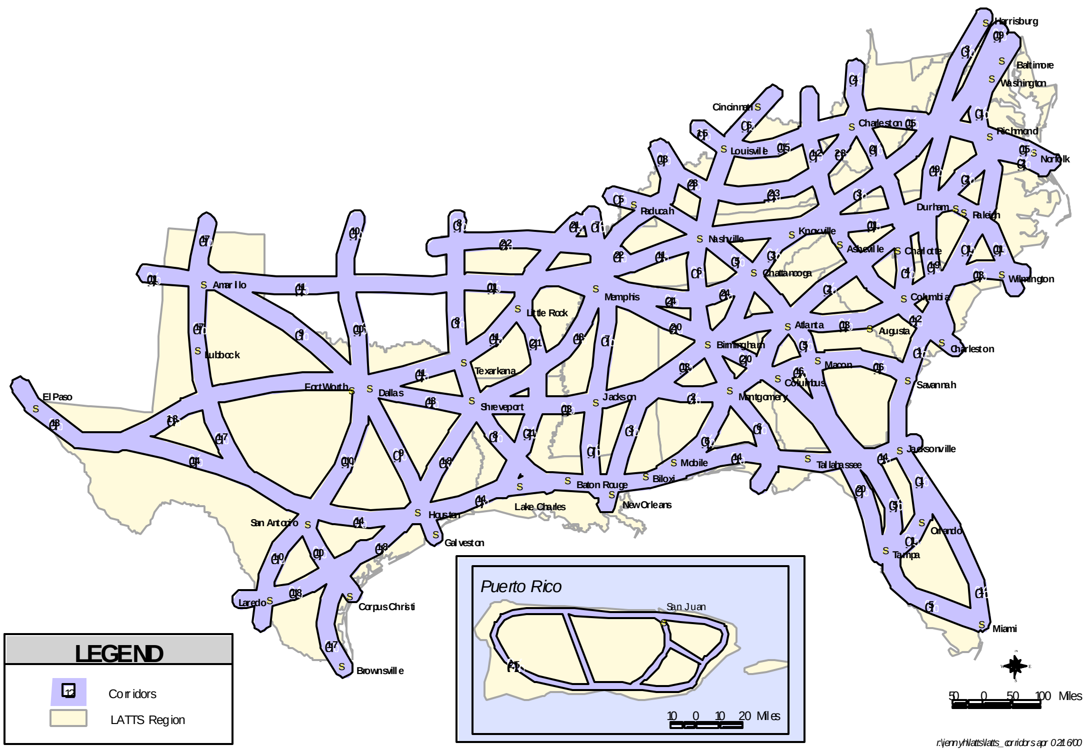
Two main sources of data were used for the analysis of highway investment. The first one, the Highway Performance Monitoring System (HPMS), includes information about the characteristics and conditions of public highways. The second source of data was the LATTS estimates of current and forecasts of future 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 Georgia, the LATTS HPMS database consisted of 2,756 records describing 1,418 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, 1,136 miles of the Strategic Highway Network in Georgia were shown to carry LATTS truck traffic. All 1,136 miles are interstate highways.

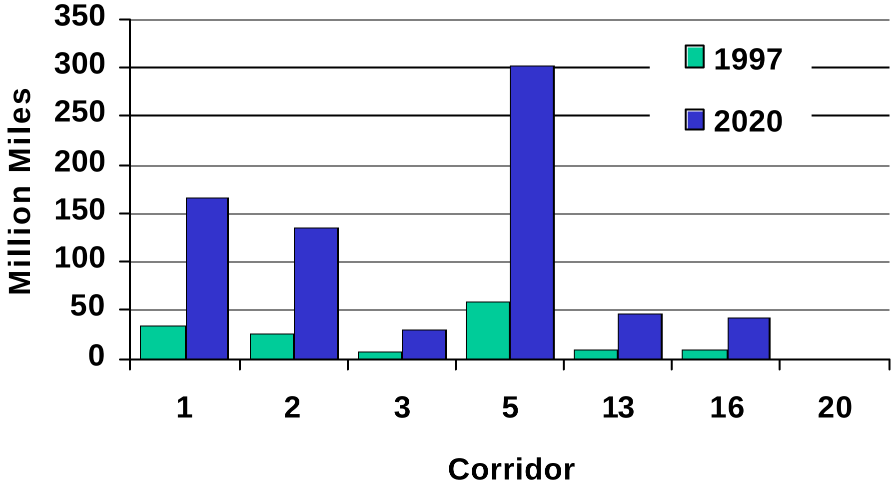
LATTS TRUCK TRAFFIC IN GEORGIA

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.

Of the seven LATTS corridors crossing Georgia, all were assigned LATTS truck traffic except Corridor 20 (U.S.19/U.S.78/U.S.280 from Tampa, FL to Memphis, TN). In fact, based on study procedures, Corridor 20 was not assigned any LATTS traffic in any Alliance member. It is comprised mostly of U.S. Routes as opposed to interstates.

Exhibit E-5

LATTS ANNUAL TRUCK VMT IN GEORGIA



With an annual VMT of 303 million miles, Corridor 5 (I-75/I-24 from South Florida to Illinois) was assigned the most LATTS traffic in terms of VMT. However, the highest volumes of LATTS trucks are found on Corridor 1 (I-95/I-4 from South Florida to Washington D.C.) and 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 4,052 and 3,890 respectively.

Of LATTS truck traffic in Georgia, 72 percent was assigned to the rural interstate system and 28 percent to the urban interstate system. The percentage of LATTS trucks to total trucks is expected to grow from 3 percent in 1997 to 7 percent in 2020 on those highways assigned LATTS traffic. This growth in LATTS share of total truck traffic is due to the fact that LATTS truck traffic is expected to increase 5 fold between 1997 and 2020 while overall truck traffic would increase by 2.1 fold only without LATTS trucks and 2.3 fold with LATTS trucks. LATTS truck share of total trucks varies from corridor to corridor. The highest shares in Georgia are 32 percent on Corridor 3 and 16 percent on Corridor 1.

Exhibit E-6
GEORGIA 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)
1	**I-95, I-4**		**South Florida to Washington, DC**						
R.Interstate	89.46	302.68	302.68	27.16	9.0%	856.82	856.82	131.26	15.3%
U.Interstate	22.54	71.92	71.92	7.20	10.0%	181.32	181.32	34.37	19.0%
TOTAL	112.00	374.59	374.59	34.36	9.2%	1,038.14	1,038.14	165.63	16.0%
2	**I-85**		**West Alabama to Norfolk, VA**						
R.Interstate	162.64	588.52	562.47	16.13	2.9%	1,469.86	1,408.05	87.17	6.2%
U.Interstate	145.37	809.65	499.85	9.22	1.8%	1,550.91	955.03	48.71	5.1%
TOTAL	308.01	1,398.16	1,062.32	25.35	2.4%	3,020.77	2,363.08	135.88	5.7%
3	**I-59, I-81, I-66**		**New Orleans, LA to DC and Pennsylvania**						
R.Interstate	20.67	27.34	27.34	6.82	24.9%	92.48	92.48	29.35	31.7%
TOTAL	20.67	27.34	27.34	6.82	24.9%	92.48	92.48	29.35	31.7%
5	**I-75, I-24**		**South Florida to Illinois**						
R.Interstate	254.11	1,111.72	1,049.12	39.28	3.7%	2,785.38	2,637.77	200.47	7.6%
U.Interstate	162.94	931.73	908.94	19.84	2.2%	1,821.26	1,775.03	102.09	5.8%
TOTAL	417.05	2,043.45	1,958.06	59.12	3.0%	4,606.63	4,412.81	302.56	6.9%
13	**I-20, US 76**		**El Paso, TX to Wilmington, NC**						
R.Interstate	129.37	367.85	367.85	6.30	1.7%	905.98	905.98	31.94	3.5%
U.Interstate	83.58	309.27	309.27	3.00	1.0%	631.03	631.03	15.12	2.4%
TOTAL	212.95	677.12	677.12	9.30	1.4%	1,537.01	1,537.01	47.06	3.1%
16	**I-16**		**Columbus, GA to Savannah, GA**						
R.Interstate	151.80	222.85	222.85	7.82	3.5%	554.14	554.14	38.27	6.9%
R.Other PA	57.58	10.40	-	-	0.0%	16.18	-	-	0.0%
U.Interstate	21.50	24.56	13.94	1.03	7.4%	55.17	33.61	4.71	14.0%
U.Other Fwy.	9.53	4.79	-	-	0.0%	9.18	-	-	0.0%
U.Other PA	17.46	4.12	-	-	0.0%	6.94	-	-	0.0%
TOTAL	257.87	266.73	236.79	8.84	3.7%	641.61	587.75	42.98	7.3%
20	**US 19, US 78, US 280**		**Tampa, FL to Memphis, TN**						
R.Other PA	72.37	32.54	-	-	0.0%	79.40	-	-	0.0%
U.Other Fwy.	0.31	0.09	-	-	0.0%	0.17	-	-	0.0%
U.Other PA	16.61	8.68	-	-	0.0%	14.91	-	-	0.0%
TOTAL	89.29	41.30	-	-	0.0%	94.47	-	-	0.0%
ALL CORRIDORS									
R.Interstate	808.05	2,620.96	2,532.31	103.50	4.1%	6,664.65	6,455.23	518.46	8.0%
R.Other PA	129.95	42.94	-	-	0.0%	95.58	-	-	0.0%
U.Interstate	435.93	2,147.12	1,803.91	40.29	2.2%	4,239.68	3,576.02	205.00	5.7%
U.Other Fwy.	9.84	4.88	-	-	0.0%	9.35	-	-	0.0%
U.Other PA	34.07	12.80	-	-	0.0%	21.85	-	-	0.0%
TOTAL	1,417.84	4,828.69	4,336.22	143.79	3.3%	11,031.11	10,031.25	723.45	7.2%

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 Georgia 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 Georgia are presented in Exhibit E-7. The total number of Georgia 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 only 22 of the LATTS roadway miles in Georgia, or less than two percent of the Georgia 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
GEORGIA CAPACITY INVESTMENT NEEDS

Corridor/ Functional Class	Length (Miles)	Existing Lane Miles	Capacity Analysis							
			Deficient Mileage			2020 Needed Lane Miles		2020 Cost in $Million		
			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
1	**I-95, I-4**		**South Florida to Washington, DC**							
R.Interstate	89.46	366.28	-	67.42	81.08	138.76	167.12	144	173	20.1%
U.Interstate	22.54	98.82	-	0.43	0.52	0.86	1.04	3	4	20.7%
TOTAL	112.00	465.10	-	67.85	81.60	139.62	168.16	147	177	20.1%
2	**I-85**		**West Alabama to Norfolk, VA**							
R.Interstate	162.64	684.27	8.22	114.80	114.80	279.19	292.59	293	298	1.7%
U.Interstate	145.37	1,079.54	4.68	84.78	86.34	361.73	368.31	1,256	1,278	1.8%
TOTAL	308.01	1,763.81	12.90	199.58	201.14	640.92	660.90	1,549	1,577	1.8%
3	**I-59, I-81, I-66**		**New Orleans, LA to DC and Pennsylvania**							
R.Interstate	20.67	83.24	-	0.20	8.21	0.40	16.42	1	24	4000.0%
TOTAL	20.67	83.24	-	0.20	8.21	0.40	16.42	1	24	4000.0%
5	**I-75, I-24**		**South Florida to Illinois**							
R.Interstate	254.11	1,331.04	4.80	170.24	170.75	392.35	433.07	476	495	3.9%
U.Interstate	162.94	1,068.66	3.94	62.82	67.50	283.41	302.92	984	1,051	6.9%
TOTAL	417.05	2,399.70	8.74	233.06	238.25	675.76	735.99	1,460	1,546	5.9%
13	**I-20, US 76**		**El Paso, TX to Wilmington, NC**							
R.Interstate	129.37	537.22	-	79.62	82.12	159.24	164.24	185	191	3.0%
U.Interstate	83.58	496.73	0.64	52.53	52.53	163.64	164.94	568	573	0.8%
TOTAL	212.95	1,033.95	0.64	132.15	134.65	322.88	329.18	753	763	1.3%
16	**I-16**		**Columbus, GA to Savannah, GA**							
R.Interstate	151.80	607.20	-	-	-	-	-	-	-	0.0%
R.Other PA	57.58	116.65	-	8.22	8.22	16.44	16.44	12	12	0.0%
U.Interstate	21.50	89.56	-	2.79	2.79	6.53	6.53	23	23	0.0%
U.Other Fwy.	9.53	38.76	-	0.85	0.85	1.70	1.70	6	6	0.0%
U.Other PA	17.46	67.09	-	-	-	-	-	-	-	0.0%
TOTAL	257.87	919.26	-	11.86	11.86	24.67	24.67	40	40	0.0%
20	**US 19, US 78, US 28**		**Tampa, FL to Memphis, TN**							
R.Other PA	72.37	269.80	-	-	-	-	-	-	-	0.0%
U.Other Fwy.	0.31	1.24	-	-	-	-	-	-	-	0.0%
U.Other PA	16.61	66.44	-	-	-	-	-	-	-	0.0%
TOTAL	89.29	337.48	-	-	-	-	-	-	-	0.0%
ALL CORRIDORS										
R.Interstate	808.05	3,609.25	13.02	432.28	456.96	969.94	1,073.44	1,099	1,181	7.4%
R.Other PA	129.95	386.45	-	8.22	8.22	16.44	16.44	12	12	0.0%
U.Interstate	435.93	2,833.31	9.26	203.35	209.68	816.17	843.74	2,833	2,929	3.4%
U.Other Fwy.	9.84	40.00	-	0.85	0.85	1.70	1.70	6	6	0.0%
U.Other PA	34.07	133.53	-	-	-	-	-	-	-	0.0%
TOTAL	1,417.84	7,002.54	22.28	644.70	675.71	1,804.25	1,935.32	3,950	4,128	4.5%

With the expected "normal" growth (as defined by the HPMS database), a total of 645 road miles or 45 percent of the LATTS network will have congestion problems by 2020. The "additional" LATTS trucks are expected to increase the total to 676 miles or 48 percent of total mileage as noted in Exhibit E-8. In other words, LATTS truck will increase congested miles of roadway by about 4.8 percent and the number of needed lane miles by 7.3 percent. These percentages are significant but they also indicate that the majority of the congestion problems in Georgia 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.

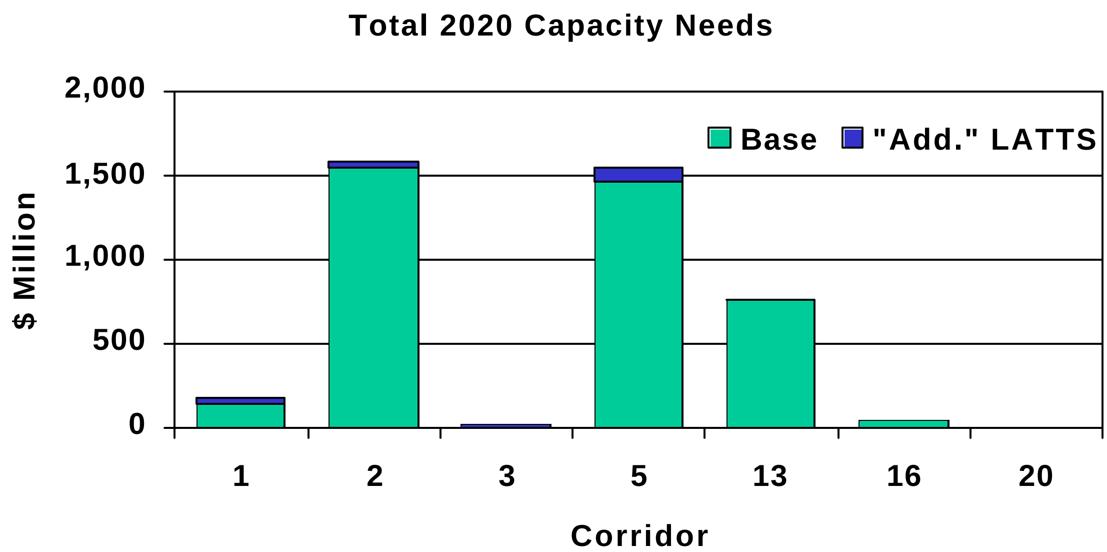
Exhibit E-8
GEORGIA 2020 CAPACITY NEEDS
LATTS Strategic Network

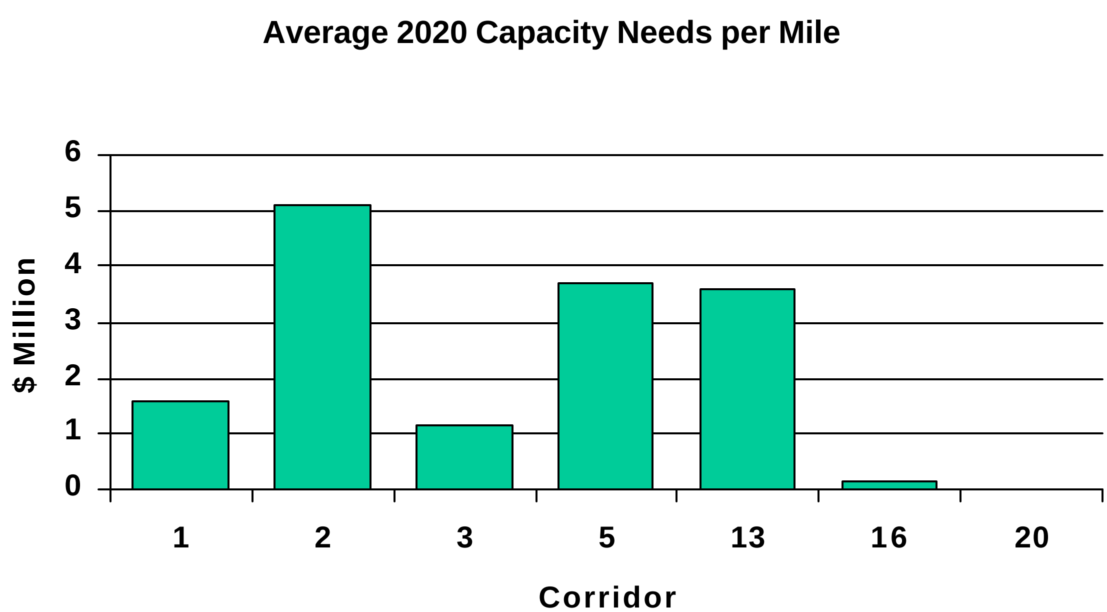
	Deficient Miles	% of Total Miles	Needs (Billion)
"Normal" Growth	645	45%	$3.9
"Additional" LATTS Traffic	31	2%	$0.2
Total	676	48%	$4.1

Based on the HPMS expected growth in traffic, nearly $3.9 billion will be required in the next 20 years to address congestion problems on the Georgia portion of the LATTS Strategic Network. The "additional" LATTS traffic will bring that total to $4.1 billion, a 4.5 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 the degree of congestion. Corridor 2 (I-85 from West Alabama to Norfolk, VA) and Corridor 5 (I-75/I-24 from South Florida to Illinois), which are the longest in Georgia, have the highest capacity needs, $1.6 billion and $1.5 billion respectively by 2020. They also have the highest average capacity needs per roadway mile, but the shorter Corridor 13 (I-20/U.S.76 from El Paso, TX to Wilmington, NC) has average capacity needs per mile nearly equal to those of Corridor 5, about $ 3.7 million per roadway mile.

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





It should be noted that by 2020, 73 percent of Corridor 1 (I-95/I-4 from South Florida to Washington D.C.) and 65 percent of Corridor 2 in Georgia will require capacity improvements. Proportionally, Corridor 1 is also expected to have the highest incremental needs due to LATTS “additional” traffic, 20.1 percent.

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 Georgia 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 Georgia pavement needs for the LATTS Strategic Highway Network are presented in Exhibit E-10. Based on the HPMS data, Georgia did not have any existing pavement deficiencies on the LATTS Strategic Highway System

Exhibit E-10
GEORGIA 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	% Increase Due to LATTS
1	**I-95, I-4**		**South Florida to Washington, DC**					
R.Interstate	89.46	366.28	-	3.6	3.6	10,970	11,026	0.5%
U.Interstate	22.54	98.82	-	3.6	3.5	5,500	5,640	2.5%
TOTAL	112.00	465.10	-	3.6	3.6	16,470	16,666	1.2%
2	**I-85**		**West Alabama to Norfolk, VA**					
R.Interstate	162.64	684.27	-	4.2	4.1	18,664	18,737	0.4%
U.Interstate	145.37	1,079.54	-	3.6	3.6	60,594	60,926	0.5%
TOTAL	308.01	1,763.81	-	3.8	3.8	79,259	79,663	0.5%
3	**I-59, I-81, I-66**		**New Orleans, LA to DC and Pennsylvania**					
R.Interstate	20.67	83.24	-	4.1	3.9	2,827	2,915	3.1%
TOTAL	20.67	83.24	-	4.1	3.9	2,827	2,915	3.1%
5	**I-75, I-24**		**South Florida to Illinois**					
R.Interstate	254.11	1,331.04	-	3.8	3.8	39,575	39,763	0.5%
U.Interstate	162.94	1,068.66	-	3.6	3.6	60,320	60,622	0.5%
TOTAL	417.05	2,399.70	-	3.7	3.7	99,895	100,385	0.5%
13	**I-20, US 76**		**El Paso, TX to Wilmington, NC**					
R.Interstate	129.37	537.22	-	3.8	3.8	15,019	15,228	1.4%
U.Interstate	83.58	496.73	-	3.7	3.7	27,792	27,804	0.0%
TOTAL	212.95	1,033.95	-	3.7	3.7	42,812	43,032	0.5%
16	**I-16**		**Columbus, GA to Savannah, GA**					
R.Interstate	151.80	607.20	-	6.0	5.8	11,449	11,898	3.9%
R.Other PA	57.58	116.65	-	14.8	14.8	555	555	0.0%
U.Interstate	21.50	89.56	-	6.7	6.4	3,274	3,440	5.1%
U.Other Fwy.	9.53	38.76	-	7.1	7.1	1,173	1,173	0.0%
U.Other PA	17.46	67.09	-	15.2	15.2	603	603	0.0%
TOTAL	257.87	919.26	-	7.9	7.7	17,054	17,669	3.6%
20	**US 19, US 78, US 28(**		**Tampa, FL to Memphis, TN**					
R.Other PA	72.37	269.80	-	10.2	10.2	1,984	1,984	0.0%
U.Other Fwy.	0.31	1.24	-	10.9	10.9	23	23	0.0%
U.Other PA	16.61	66.44	-	13.6	13.6	683	683	0.0%
TOTAL	89.29	337.48	-	10.8	10.8	2,690	2,690	0.0%
ALL CORRIDORS								
R.Interstate	808.05	3,609.25	-	4.2	4.2	98,505	99,567	1.1%
R.Other PA	129.95	386.45	-	11.6	11.6	2,539	2,539	0.0%
U.Interstate	435.93	2,833.31	-	3.7	3.7	157,480	158,432	0.6%
U.Other Fwy.	9.84	40.00	-	7.2	7.2	1,196	1,196	0.0%
U.Other PA	34.07	133.53	-	14.4	14.4	1,285	1,285	0.0%
TOTAL	1,417.84	7,002.54	-	4.7	4.6	261,006	263,020	0.8%

Total resurfacing costs are a function of the average pavement life and the length of the highways. Corridor 5 (I-75/I-24 from South Florida to Illinois), the longest corridor in Georgia, has the highest average annual resurfacing needs, more than $ 100 million with LATTS traffic.

With the largest reduction in average pavement life due to LATTS, Corridor 3 (I-59/I-81/I-66 from New Orleans, LA to Washington, D.C. and Pennsylvania) and Corridor 16 (I-16 from Columbus, GA to Savannah, GA) have proportionally the largest incremental resurfacing needs due to LATTS trucks, 3.1 percent and 3.6 percent.

Future (2020) pavement needs are summarized in Exhibit E-11. Pavement life for the Georgia portion of the LATTS Strategic Highway Network will average 4.7 years in 2020 without the "additional" LATTS truck traffic and 4.6 years with it. The annual resurfacing costs for the Georgia portion of the LATTS Strategic Highway Network is estimated to exceed $261 million without LATTS "additional" truck traffic and $263 million with it, an increase which is less than 1 percent.

Exhibit E-11
GEORGIA 2020 PAVEMENT NEEDS
LATTS Strategic Network

	Pavement Life (Years)	Annual Resurfacing Cost ($Million)
"Normal" Growth	4.7	$261
With "Additional" LATTS Traffic	4.6	$263

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

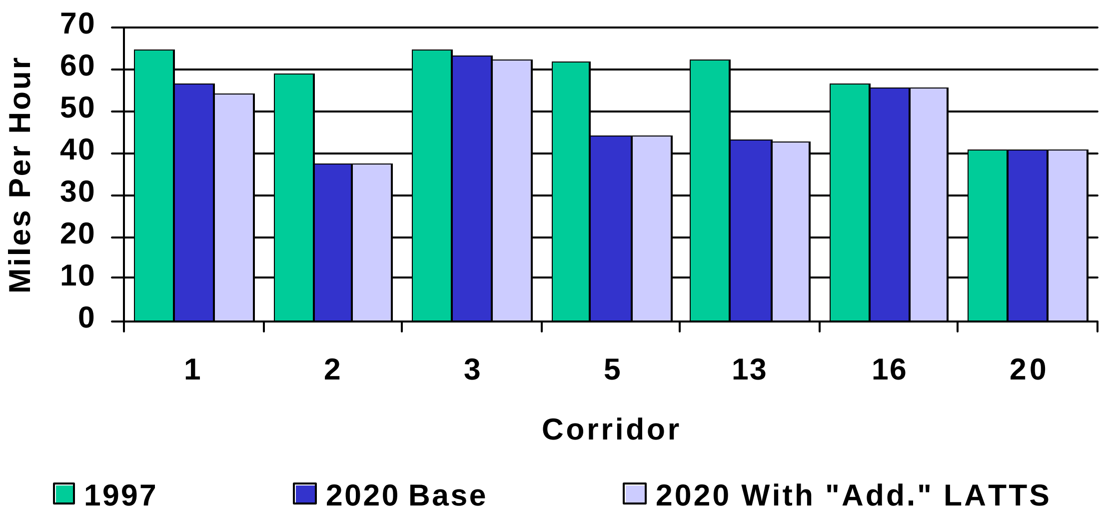
Average daily and peak period speeds/travel times for trucks also are presented for the base year (1997). Further, truck operating speeds are listed twice for year 2020. The first time, truck operating speeds were calculated assuming the base growth rate, i.e. the growth rate indicated by the HPMS database. The second time, truck operating speeds were calculated with the LATTS "additional" traffic. Overall results for the entire corridor within Georgia 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
GEORGIA 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
1	**I-95, I-4**		**South Florida to Washington, DC**							
R.Interstate	89.50	4.1	64.9	35,891	65.3	63.2	56.0	26.8	53.4	26.7
R.Other PA	-	0.0	0.0	0	0.0	0.0	0.0	0.0	0.0	0.0
U.Interstate	22.50	4.4	61.0	36,939	63.7	62.0	59.6	17.6	58.1	17.5
U.Other Fwy.	-	0.0	0.0	0	0.0	0.0	0.0	0.0	0.0	0.0
U.Other PA	-	0.0	0.0	0	0.0	0.0	0.0	0.0	0.0	0.0
TOTAL	**112.00**	**4.2**	**64.1**	**36,102**	**65.0**	**62.9**	**56.7**	**24.3**	**54.3**	**24.2**
Time (HR)					**1.7**	**1.8**	**2.0**	**4.6**	**2.1**	**4.6**
2	**I-85**		**West Alabama to Norfolk, VA**							
R.Interstate	162.60	4.2	64.4	35,389	63.9	52.3	44.9	29.9	44.3	29.2
U.Interstate	145.40	7.4	57.2	122,369	54.5	24.0	31.8	17.2	31.6	17.2
TOTAL	**308.00**	**5.7**	**60.8**	**76,441**	**59.1**	**33.6**	**37.6**	**22.2**	**37.3**	**22.0**
Time (HR)					**5.2**	**9.2**	**8.2**	**13.9**	**8.3**	**14.0**
3	**I-59, I-81, I-66**		**New Orleans, LA to DC and Pennsylvania**							
R.Interstate	20.70	4.0	65.0	13,648	65.1	64.9	63.7	39.3	62.4	36.5
R.Other PA	-	0.0	0.0	0	0.0	0.0	0.0	0.0	0.0	0.0
U.Interstate	-	0.0	0.0	0	0.0	0.0	0.0	0.0	0.0	0.0
U.Other PA	-	0.0	0.0	0	0.0	0.0	0.0	0.0	0.0	0.0
TOTAL	**20.70**	**4.0**	**65.0**	**13,648**	**65.1**	**64.9**	**63.7**	**39.3**	**62.4**	**36.5**
Time (HR)					**0.3**	**0.3**	**0.3**	**0.5**	**0.3**	**0.6**
5	**I-75, I-24**		**South Florida to Illinois**							
R.Interstate	254.10	5.2	65.0	44,811	65.0	55.3	49.6	28.8	49.0	28.5
U.Interstate	162.90	6.6	60.2	95,790	57.9	32.4	38.1	17.5	37.9	17.4
TOTAL	**417.00**	**5.8**	**63.0**	**64,728**	**62.0**	**43.3**	**44.4**	**23.0**	**44.0**	**22.8**
Time (HR)					**6.7**	**9.6**	**9.4**	**18.1**	**9.5**	**18.3**
13	**I-20, US 76**		**El Paso, TX to Wilmington, NC**							
R.Interstate	129.40	4.2	65.0	28,065	65.3	63.0	54.9	28.2	54.2	27.8
U.Interstate	83.60	5.9	58.6	83,698	57.9	27.6	33.0	16.4	32.8	16.4
TOTAL	**213.00**	**4.9**	**62.3**	**49,900**	**62.2**	**41.9**	**43.5**	**22.0**	**43.1**	**21.8**
Time (HR)					**3.4**	**5.1**	**4.9**	**9.7**	**4.9**	**9.8**
16	**I-16**		**Columbus, GA to Savannah, GA**							
R.Other PA	57.60	2.0	52.0	3,300	50.2	45.6	49.6	44.6	49.6	44.6
U.Other PA	17.50	3.8	48.9	13,180	30.6	30.4	30.5	29.7	30.5	29.7
TOTAL	**257.90**	**3.6**	**59.4**	**14,454**	**56.5**	**54.9**	**55.7**	**45.8**	**55.7**	**45.7**
Time (HR)					**4.6**	**4.7**	**4.6**	**5.6**	**4.6**	**5.6**
20	**US 19, US 78, US 280**		**Tampa, FL to Memphis, TN**							
R.Interstate	-	0.0	0.0	0	0.0	0.0	0.0	0.0	0.0	0.0
R.Other PA	72.40	3.7	50.6	8,212	44.3	43.5	44.0	42.4	44.0	42.4
U.Interstate	-	0.0	0.0	0	0.0	0.0	0.0	0.0	0.0	0.0
U.Other PA	16.60	4.0	53.0	14,237	30.5	30.5	30.5	30.4	30.5	30.4
TOTAL	**89.30**	**3.8**	**51.0**	**9,358**	**40.9**	**40.4**	**40.7**	**39.6**	**40.7**	**39.6**
Time (HR)					**2.2**	**2.2**	**2.2**	**2.3**	**2.2**	**2.3**

Average daily truck operating speeds on Georgia LATTS corridors are summarized in Exhibit E-13. All corridors with a majority of interstate facilities (Corridors 1, 2, 3, 5, 13 and 16) have average daily operating speeds above 55 MPH in 1997. Corridor 20 has lower average daily speeds around 40 MPH because it is comprised of lower type facilities.

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

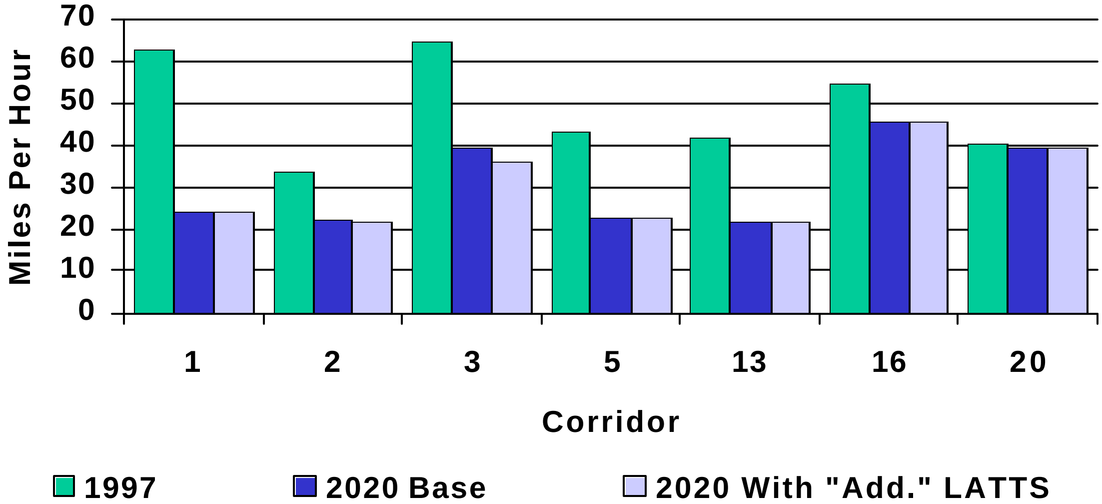


The projected growth in traffic between 1997 and 2020 will affect this measure of performance significantly. Unless additional capacity is provided, the average daily speed in many of Georgia LATTS corridors will be reduced by 15 MPH or more on several corridors. Corridor 2 (I-85 from West Alabama to Norfolk, VA) is projected to have the most deterioration in average daily travel speeds, more than a 21 MPH reduction, unless new capacity enhancement measures are undertaken. Corridor 13 (I-20/U.S.76 from El Paso, TX to Wilmington, NC) and Corridor 5 (I-75/I-24 from South Florida to Illinois) could experience a reduction in average travel speed close to 18 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 1 (I-95/I-4 from South Florida to Washington D.C.), will only experience an additional reduction in average daily speed of 2.4 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 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 Georgia LATTS corridor will affect "peak hour" speeds even more significantly than it will average daily speed. A reduction up to 38 MPH for Corridor 1 (I-95/I-4 from South Florida to Washington D.C.) was estimated. The impact of LATTS "additional traffic" is insignificant compared to the impact of overall growth in total traffic.

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



CONCLUSIONS FOR LATTS MAINLINE HIGHWAYS

(1) LATTS truck traffic in Georgia 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 403 percent while all other traffic is expected to increase by 115 percent.

(2) About 48 percent of the LATTS Strategic Highway Network in Georgia will require additional capacity by 2020 at a cost of $ 4.1 billion. The majority of these needs are due to expected growth in the state and not to LATTS trucks only.

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

- 4.8% more highway miles needing capacity improvements.
- 4.5% additional costs to address these capacity needs.

- 0.8% increase in annual pavement resurfacing costs.

(4) If these investment needs are not met, regardless of the source of traffic, the Georgia 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, three different port facilities account for six connectors in Georgia for which information was available in the NHS Connectors Inventory Database. The State has jurisdiction over Savannah’s Garden Terminal connectors.

Exhibit E-15
LATTS INTERMODAL CONNECTORS

FACILITY ID	FACILITY NAME	LINK MILES	RURAL/URBAN DESIGNATION	OWNERSHIP	AGENCY
GA24P	Garden Terminal, Savannah	1.6	Urbanized (>200k)	State Highway	Chatham County - Savannah Metro Planning Comm.
GA24P	Garden Terminal, Savannah	2.7	Urbanized (>200k)	State Highway	Chatham County - Savannah Metro Planning Comm.
GA25P	Ocean Terminal, Savannah	0.8	Urbanized (>200k)	County Highway-Town or Township Highway	Chatham County - Savannah Metro Planning Comm.
GA2A	Hartsfield Intl. Airport, Atlanta	1.7	Urbanized (>200k)	County Highway-Town or Township Highway	ARC
GA2A	Hartsfield Intl. Airport, Atlanta	1.6	Urbanized (>200k)	County Highway	ARC
GA2A	Hartsfield Intl. Airport, Atlanta	1.5	Urbanized (>200k)	County Highway-Town or Township Highway	ARC

Pavement Problems

Georgia reported no pavement deficiencies in this category.

Geometric/Physical Problems

For three connectors, geometric/physical deficiencies were reported. One of the Garden Terminal connectors (GA24P) reports roadway shoulder problems, the Savannah Ocean Terminal (GA25P) connector reported travel way restrictions and shoulder deficiencies, while Hartsfield International (GA2A) reported a deficiency with roadway shoulders on one of its two connectors.

At-Grade Railroad Crossing Problems

GA24P has four railroad crossings and GA25P has one railroad crossing. For both, rough railroad crossings were reported, but no other deficiencies were reported in this category.

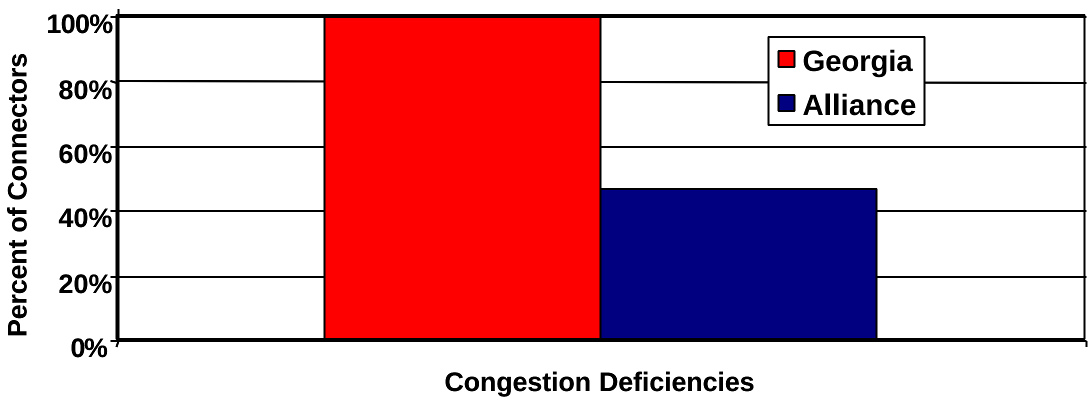
Traffic Operations and Safety Problems

Exhibit E-16 compares the percent of connectors with congestion problems for Georgia and the entire LATTS Alliance. Georgia averages over six traffic/safety problems per connector, compared with just over four deficiencies per connector Alliance-wide. Problems with signals and turning were reported on the waterport connectors. The waterport facilities had the most deficiencies, and many of these are associated with the connector's junction with the NHS mainline. Congestion was the most common deficiency cited.

State Summary

While only a few deficiencies were reported for most of the categories, congestion is a problem on most of Georgia's LATTS connectors, based upon the information that was available.

Exhibit E-16
CONNECTORS WITH PAVEMENT PROBLEMS
Georgia vs. Alliance Local/Other



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.

Georgia ITS/CVO Plan

Georgia completed its ITS/CVO Strategic & Business Plan for the State of Georgia during December of 1997. At the time of this report, Georgia had very little in the area of ITS/CVO technology implemented. Interfaces were being developed to facilitate the implementation of both the IRP and IFTA Clearinghouses and the state is planning on allowing carriers to utilize TAXCONNECT to electronically file Fuel Tax Returns. However, the state is starting to realize the importance of this technology and is working toward applying it. As of January 2001, many of the goals set forth within the planning document had already been completed, but there are still many goals that the state is working toward.

The majority of Georgia's planned activities fall into the credential administration category. This is necessary to set the preliminary groundwork for implementation of a state ITS/CVO CVISN system. The various activities are as follows:

- Development of a Carrier Automated Transactions System (CATS) – This allows electronic interaction among Georgia's CVA (Commercial Vehicle Administration) agencies and carriers with their own PC systems.
- Development of an office system that allows a "walk-in carrier" the same agency access as those carriers with their own systems.
- Provision of necessary hardware and software to support all electronic interaction between agencies, carriers, agents, and local credentialing offices.

In addition to the extensive ongoing activities in the administration category, there are limited activities planned for the credential administration and electronic screening categories. These activities rely on implementation of the above listed administration activities. In electronic screening, activities are planned for development of weigh stations and mobile weigh scales that include Electronic Screening systems. These stations would facilitate electronic communication of activity reports, citations, etc. CVISN concepts for these various roadside facilities include integration of a Roadside Operations Computer (ROC) and the ASPEN software being developed.

In the category of credential administration, activities are underway to develop a single Credentialing Interface (CI) that would interconnect all carriers, agencies, and local credentialing offices with the central credentialing office and computer systems. The CI would support all electronic interchanges between these offices.