NORTHWEST I-75/I-575 CORRIDOR

CHAPTER 1

PURPOSE AND NEED

Table of Contents

List of Tables

List of Figures

1. PURPOSE AND NEED

The Federal Highway Administration (FHWA) and Georgia Department of Transportation (GDOT), in cooperation with the Federal Transit Administration (FTA) and Georgia Regional Transportation Authority (GRTA), propose to make transportation improvements to I-75 and I-575 in the Northwest Corridor in the Atlanta metropolitan area. The improvements are collectively referred to as the Northwest I-75/I-575 Corridor Project and could include the construction of high-occupancy vehicle (HOV) lanes, truck-only lanes, bus rapid transit (BRT) stations, park-and-ride facilities, and improved local and express bus service. The proposed operation of the HOV and truck-only lanes may be tolled to improve effectiveness.

Because federal approvals, permits, and funding assistance are required to construct the improvements, the proposed project is subject to review under the National Environmental Policy Act (NEPA). The preparation of this Alternatives Analysis/Draft Environmental Impact Statement (AA/DEIS) is in compliance with this act. Volume I is the AA/DEIS and technical appendices; and Volume II contains the conceptual engineering plans and environmental constraint maps.

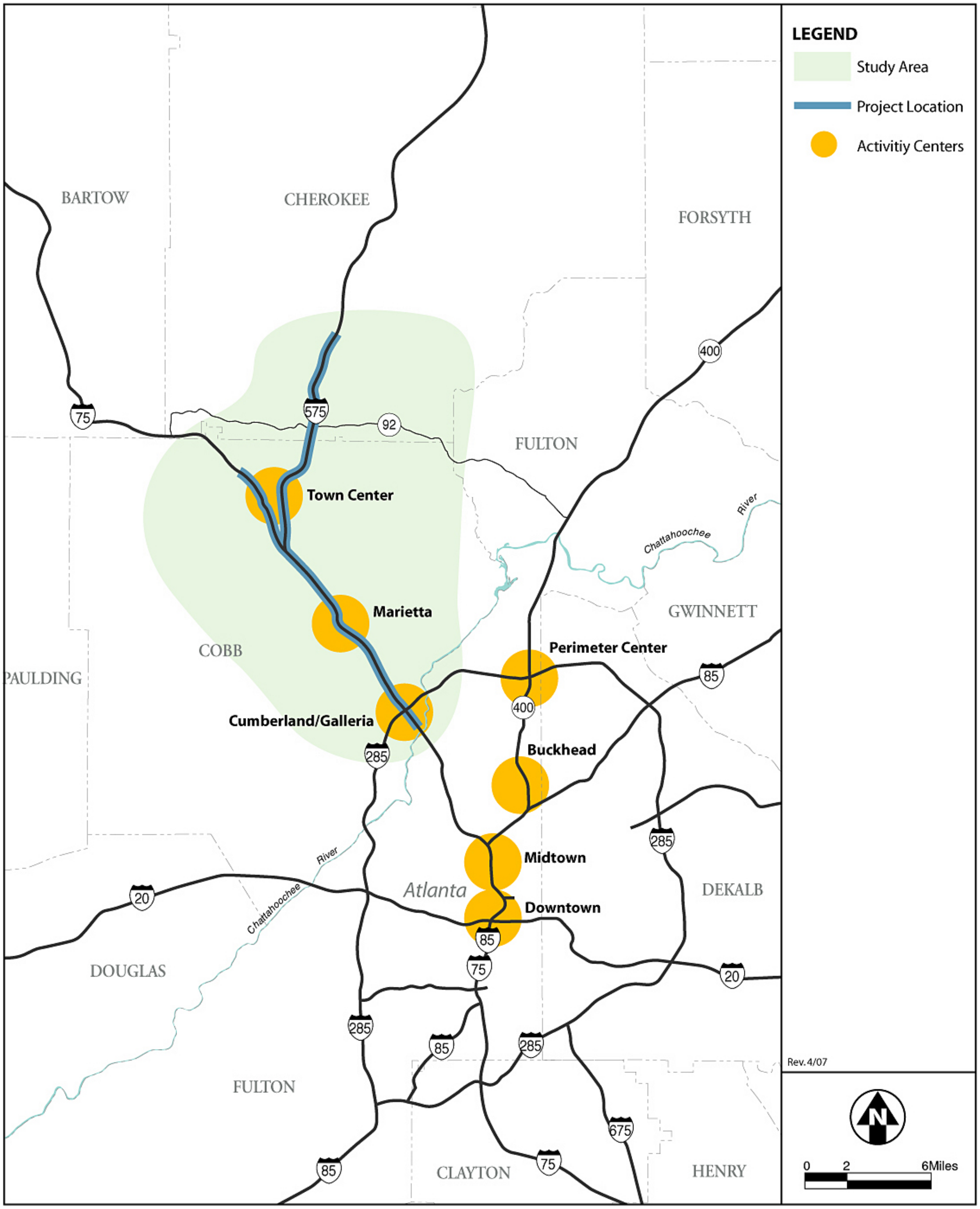
This chapter describes the project area, the purpose and need for the proposed transportation improvements, and the existing and projected future transportation problems for I-75 and I-575 in the Northwest Corridor.

1.1 Project Location

The Northwest I-75/I-575 Corridor Project study area is located northwest of downtown Atlanta, Georgia. I-75 extends to the northwest from downtown Atlanta in Fulton County (see Figure 1-1). Within the study area, I-575 branches from I-75 and extends to the northeast. The highway corridor encompasses the suburban cities of Smyrna, Marietta, Kennesaw, and Acworth and several unincorporated communities in Cobb and Cherokee counties. The area is home to a substantial share of the region's population as well as several business centers, a large regional shopping mall, Dobbins Air Force Base, and numerous major corporations.

The main freeway serving the Northwest Corridor is I-75. It is the primary route for commuters traveling to jobs within the study area as well as in the region, especially to Midtown, downtown Atlanta, Buckhead, and Perimeter Center. As a major north-south route through Georgia, it also serves the transportation needs for regional travel and freight trucking. In downtown Atlanta, I-75 is merged with I-85. Leaving I-85, it proceeds northwesterly as a 10 to 12-lane highway to I-285, which is the beltway around Atlanta. North of I-285, the number of lanes varies from six to 15 lanes. Further to the north in Cobb County, I-75 connects with I-575, which extends northeasterly into Cherokee County. I-575 traverses a more rural area that is experiencing rapid urbanization. This freeway has four general-purpose lanes, two in each direction.

Transit services in the Northwest Corridor are provided by the Cobb Community Transit (CCT), which interconnects to the Metropolitan Atlanta Rapid Transit Authority (MARTA) in urbanized Fulton County located southeast of the study area. The existing transit services within the study area consist of local and express bus services. CCT operates 11 local and six express bus routes along I-75 to Midtown and downtown Atlanta. The CCT express bus routes connect with the MARTA Arts Center Station in Midtown.


LEGEND
Study Area
Project Location
Activitiy Centers
BARTOW
CHEROKEE
FORSYTH
FULTON
GWINNETT
COBB
PAULDING
DOUGLAS
DEKALB
CLAYTON
HENRY
Town Center
Marietta
Cumberland/Galleria
Perimeter Center
Buckhead
Midtown
Downtown
Atlanta
Chattahoochee River
Rev. 4/07
N
0 2 6Miles

1.2 Purpose of the Project

Multimodal transportation improvements are proposed for the Northwest Corridor to meet long-term regional transportation needs. Urban development in Cobb and Cherokee counties over the past decades has substantially increased traffic congestion on both I-75 and I-575. Mobility has increasingly become difficult and time consuming for commuters and interstate travelers using I-75 and I-575 within the Northwest Corridor. The congestion equally affects single-occupancy vehicles (SOVs), HOVs, buses, and commercial vehicles. There are also segments of I-75 and interchanges with design deficiencies that contribute to congestion and safety concerns. In addition, the availability of undeveloped land in the project study area and pressures for continued urbanization are projected to result in substantial increases in both population and employment, which would lead to even worse traffic congestion.

To address these concerns, the purpose of the Northwest I-75/I-575 Corridor Project is to address the following needs:

- Need to reduce congestion
- Need to improve mobility by reducing travel time and increasing reliability
- Need to improve access by improving connectivity between regional activity centers
- Need to improve safety by reducing existing roadway design deficiencies and congestion-related crashes
- Need to reduce vehicle emissions by improving vehicular travel efficiency and increasing the proportion of high-capacity vehicles

Project goals were developed for the Northwest I-75/I-575 Corridor Project. These goals were developed based on the transportation needs of the study area and were used to identify the alternatives in Chapter 2, Alternatives Considered. The goals address project effectiveness, environmental impacts, equity, cost-effectiveness, and financial feasibility. The project goals are listed below.

- Improve transportation effectiveness of I-75 and I-575 to additional travel and to contribute to the improved performance of the regional system
- Provide additional transportation choices or options that increase the capacity of I-75 and I-575
- Improve the quality of life by improving mobility and minimizing effects to both natural resources and the built environment
- Improve transportation equity by providing an equitable distribution of benefits and impacts to all populations
- Provide cost-effective and affordable transportation improvements

A number of measures of effectiveness were used to evaluate how well the alternatives considered meet these project goals. These measures of effectiveness are discussed in Chapter 4, Transportation Impacts and Chapter 5, Environmental Consequences. Specific measures of effectiveness are also used to compare and contrast the alternatives considered in Chapter 7, Evaluation of Alternatives.

1.3 Land Use and Growth Trends

The capacity of the transportation system in the Northwest Corridor is determined by roadway and interchange design, modes of travel, and vehicle occupancy. But, the demand for a transportation system and its ability to accommodate existing and future travel is greatly determined by land use patterns and travel demand. This section briefly describes the land use, activity centers, population, employment, and travel demand characteristics of the Northwest Corridor that contribute to the need for transportation improvements.

1.3.1 Land Use

The Northwest Corridor is diverse in land use and ranges from dense urban land uses to new low-density development. It also is home to several major regional activity centers and business districts, including Cumberland-Galleria and Town Center. Each of these represents a major travel destination within the study area. Downtown Atlanta, Midtown, and Perimeter Center are major destinations for those traveling through the study area. They are the focal point for the regional highway and transit systems.

Suburban single-family residential development characterizes Cobb and Cherokee Counties. High rise office complexes, commercial strip centers, and multi-family housing dominate the immediate area around Cumberland-Galleria and the I-75/I-285 interchange. To the north of I-285, the corridor contains a mix of old and new industrial uses centered around two industrial parks. The Town Center at Cobb Mall is located between I-75 and I-575 and is surrounded by commercial shopping strips. Newer commercial strip development is progressing along Barrett Parkway west of I-75. The area north of Town Center and to the northeast along I-575 is predominately low and moderate density suburban residential development (lots generally less than 1 acre), some agriculture, but substantial open space/undeveloped property.

1.3.2 Population

The Atlanta metropolitan area, and particularly the Northwest Corridor, has experienced tremendous growth in population since 1990 (see Table 1-1). Between 1990 and 2000, the population of the study area increased from approximately 468,000 to over 652,000. This increase accounted for approximately 19 percent of the total regional increase.

Table 1-1. Population and Employment Trends for the Study Area and Region

	Population				Percent Change	
	1990	2000	2005	2030	1990-2000	2005-2030
Study Area Total	468,422	652,292	683,569	975,218	39%	43%
Remaining Region	2,185,082	2,978,268	3,164,355	4,895,806	36%	55%
Total Region	2,653,505	3,630,560	3,847,924	5,871,024	36%	52%
	Employment				Percent Change	
	1990	2000	2005	2030	1990-2000	2005-2030
Study Area Total	194,000	310,933	340,109	535,252	60%	57%
Remaining Region	1,266,871	1,756,067	1,855,406	2,774,651	39%	50%
Total Region	1,460,771	2,067,000	2,195,555	3,309,903	42%	51%

Source: US Census Bureau, 1990 and 2000; ARC, 2004b.

The study area population is projected to increase from about 684,000 to 975,000 between 2005 and 2030. This is an average annual increase of only 1.7 percent, which is approximately half of the average rate of change during the 1990s and less than the projected rate change for the region. In contrast, the population for the entire region is projected to increase from about 3.85 to 5.87 million, which is an average annual increase of more than 2 percent. The region's more rapid rate of growth is because the Northwest I-75/I-575 Corridor project area includes large areas that are already urbanized, especially in the southern portion of the corridor.

1.3.3 Employment

Though population increases have been substantial over the past 10-15 years, employment growth has been more significant. Between 1990 and 2000, employment in the study area increased from 194,000 to almost 311,000, which was an average annual increase of 6 percent (see Table 1-1). By comparison, this increase in employment over-shadowed the increase experienced in the region as a whole. Employment growth in the study area accounted for approximately 24 percent of the regional employment increase in the 1990s.

Employment in the study area is projected to increase from about 340,000 to 535,000, between 2005 and 2030. This is an increase of 57 percent, which exceeds the forecasted 43 percent increase in population. This pattern of employment growth reflects a shift in employment growth to suburban areas, particularly in northern Cobb County.

1.3.4 Travel Demand

Increased travel demand is expected to accompany the projected growth in population and employment. An analysis of existing and projected trip-making patterns, or travel demand, was conducted to determine the major travel patterns and markets for trips with origins/destinations in the study area. The major destinations within the study area are Town Center, the central I-75 corridor, and Cumberland-Galleria. Major destinations for travel outside the study area are Midtown, downtown Atlanta, Buckhead, and Perimeter Center.

Table 1-2 presents the estimated total daily person trips (one-way trips for all modes) for the study area and region in 2005 and 2030. A total of 13.4 million total daily person trips are estimated for the region in 2005, of which 2.72 million or 20 percent are produced in the study area. Of the trips produced within the study area, 79 percent are estimated to have a destination within the study area; some of these trips would use I-75 or I-575. An estimated 21 percent of the trips produced within the study area have a destination outside the study area and most of these trips would use I-75 or I-575.

By 2030, total daily person trips in the region are projected to increase to 20.4 million, an increase of 7.0 million (52 percent) from 2005. A total of 3.94 million of these trips are estimated to be produced within the study area. Trips produced outside the study area with a destination within the study area are estimated to total about 714,000, an increase of 37 percent from the 451,000 produced in 2005.

Similar analysis was conducted for home-based work trips, which usually occur during peak periods. These data showed similar changes as described above for all traffic. The most noteworthy finding was that the number of home-base work trips traveling through the study area with destinations to Midtown/downtown Atlanta and Perimeter Center/Buckhead is expected to decline by approximately one-third by 2030. This documents that the activity centers within the study area are attracting an increasing number of regional trips as well as local trips. Thus, freeway capacity increasingly will

Table 1-2. Total Daily Person Trips, 2005 and 2030

	2005		2030	
	Number	Percent	Number	Percent
Regional Trips				
Total	13,397,000	100%	20,401,000	100%
Trips Produced in Study Area	2,721,000	20%	3,938,000	19%
Trips Produced Outside Study Area	10,676,000	80%	16,463,000	81%
Trips Produced in Study Area				
Destination within Study Area	**2,146,000**	**79**%	**3,257,000**	**83**%
Cumberland-Galleria	202,000	9%	232,000	7%
Central I-75 Corridor	283,000	13%	331,000	10%
Town Center	220,000	10%	267,000	8%
Remainder of Study Area	1,441,000	67%	2,426,000	74%
Destination Outside Study Area	**575,000**	**21**%	**714,000**	**17**%
Midtown/Downtown	57,000	10%	52,000	7%
Perimeter/Buckhead	71,000	12%	67,000	9%
Atlanta	68,000	12%	78,000	11%
Remainder of Region	380,000	66%	484,000	68%
Trips Produced Outside Study Area				
Destination within Study Area	**451,000**	**4**%	**714,000**	**4**%
Cumberland-Galleria	87,000	19%	105,000	15%
Central I-75 Corridor	60,000	13%	70,000	10%
Town Center	22,000	5%	30,000	4%
Remainder of Study Area	282,000	63%	450,000	71%
Destination Outside Study Area	**10,226,000**	**96**%	**15,749,000**	**96**%
Midtown/Downtown	592,000	6%	722,000	5%
Perimeter/Buckhead	609,000	6%	674,000	4%
Atlanta	478,000	5%	621,000	4%
Remainder of Region	8,547,000	83%	13,732,000	87%

Note: Totals may differ from rounding. Percentages calculated before rounding.
Source: ARC, 2004b; Parsons Brinckerhoff Quade & Douglas, 2005.

need to accommodate the high volumes of intra-regional travel, rather than the historically dominant travel patterns between suburban areas and downtown Atlanta.

1.4 Transportation System Performance

An analysis of the performance of the transportation system (freeway and transit) was conducted to evaluate the current (2005) effectiveness of the transportation system in the Northwest Corridor. The analysis for 2030 was conducted assuming no major improvements are made to the transportation system in the corridor. The results of this analysis are presented below.

1.4.1 Highway System Performance

The performance of I-75 and I-575 was analyzed based on traffic volumes, level of service, and travel time. The analysis focused on the inbound direction during the a.m. peak period (i.e., 6:00 a.m. to 10:00 a.m.) and the outbound direction during the p.m. peak period (i.e., 3:00 p.m. to 7:00 p.m.). These directions are considered to represent the peak direction during each peak period.

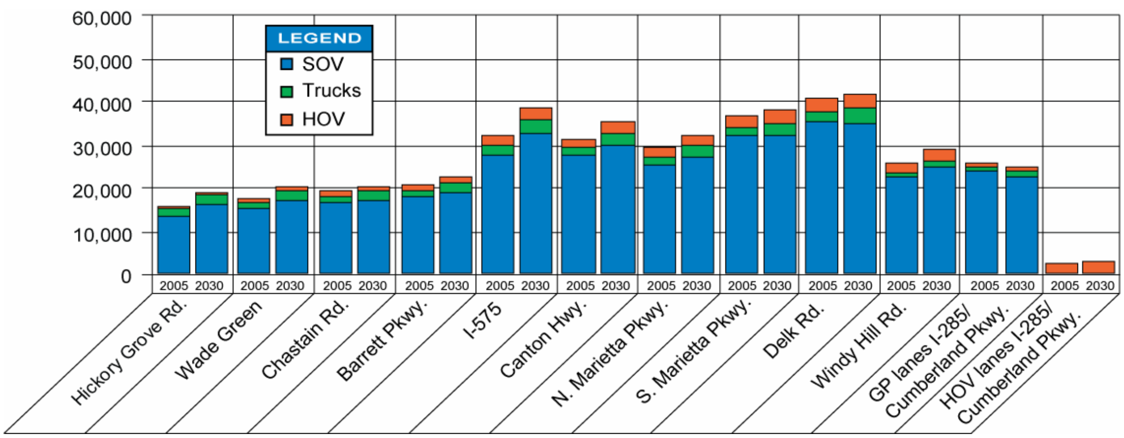
1.4.1.1 Traffic Volumes

An analysis of traffic volumes indicates how much traffic a highway can accommodate. The traffic volumes were broken down by number of vehicles by type. The types of vehicles consist of SOVs, HOVs, and commercial vehicles such as medium and heavy-duty trucks. This analysis provides valuable information on the characteristics of traffic congestion issues and needed improvements.

I-75 Traffic Volumes

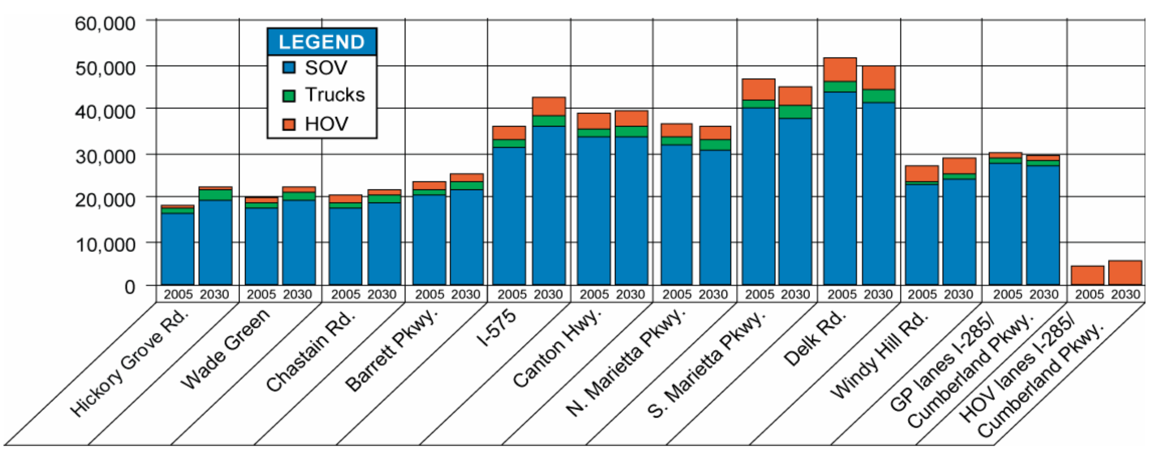
Figure 1-2 presents traffic volume information for I-75 in the a.m. peak period (inbound direction) in 2005 and Figure 1-3 shows p.m. peak period (outbound direction) traffic volumes. The analysis was conducted for I-75 from Hickory Grove Road in northern Cobb County to the Cumberland Parkway near the I-285 interchange. The figures also show the forecasted total 2030 traffic volumes and the proportional breakdown for SOVs, HOVs, and trucks.

Figure 1-2. A.M. Peak Period/Inbound Direction Traffic Volumes on I-75, 2005 and 2030



Source: Parsons Brinckerhoff, 2007f.

Figure 1-3. P.M. Peak Period/Outbound Direction Traffic Volumes on I-75, 2005 and 2030



Source: Parsons Brinckerhoff, 2007f.

In 2005, the a.m. peak period traffic volumes ranged from approximately 15,000 vehicles south of Hickory Grove Road to 41,000 vehicles south of Delk Road. SOVs comprise most of the vehicles during the a.m. peak period – approximately 84 to 88 percent. Truck traffic represents approximately 10 percent of the traffic volume at Hickory Grove Road, but declines to approximately 5 percent south of Delk Road; although the volume remains the same. The HOV traffic represents an estimated 4 to 10 percent of the total traffic volume.

The volume of traffic traveling inbound does not steadily increase from Hickory Grove Road south to I-285 as more and more vehicles enter the freeway. Instead, the volume fluctuates because of short trips using the freeway and traffic exiting the freeway for employment destinations. In particular, there is a decline in traffic volume at the Canton Highway, North Marietta Parkway, Windy Hill Road, and I-285 interchanges. This is primarily because substantial traffic exits the freeway at these interchanges to access Town Center, the City of Marietta, and the Cobb Parkway area (including Southern Polytechnic University, Lockheed Martin Corporation, and Dobbins Air Force Base), respectively.

The a.m. peak period traffic volumes projected for 2030 are similar to existing conditions. This is because the highway is currently operating near capacity and little additional traffic could be accommodated on the existing freeway. For example, south of Chastain Road, the a.m. peak period traffic volumes for both 2005 and 2030 are both approximately 20,000 (see Figure 1-2). Yet, the average annual daily traffic (AADT) for this same highway segment was 320,900 in 2005, but was projected to increase to 474,100 AADT in 2030. This indicates the overall increase in traffic volumes. Considering the substantial share of total traffic that is part of the “commute rush hour” period, the nearly 50-percent increase in total daily traffic volume would mean the “rush hour” would have to extend beyond the current four-hour peak period. This would occur because commuters would try to avoid the peak commute hour, the heaviest periods of commute congestion, queues on particular freeway on-ramps or cross-streets traffic signals, periods when freeway on-ramps are metered (traffic signals controlling vehicles merging into traffic lanes), or other factors that could lengthen their travel duration.

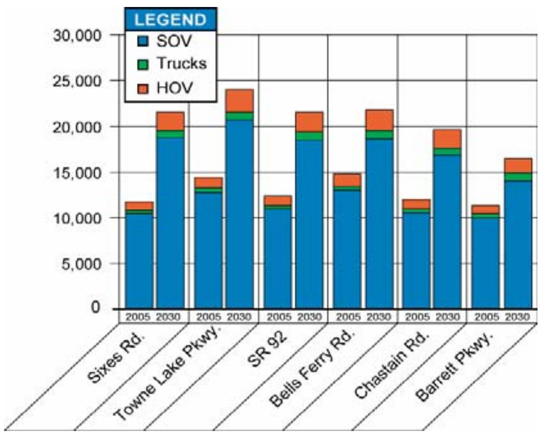
The proportion of vehicles by type, however, is expected to change by 2030. The SOV and HOV traffic volumes are projected to increase slightly, but truck volumes are expected to increase substantially. For example, truck volumes are projected to increase by 27 percent at Hickory Grove Road and up to 53 percent south of Delk Road. These projections, however, likely understate the potential increase in truck traffic based on historical trends and other studies conducted by GDOT and ARC. Findings of these studies indicate that truck traffic on I-75 is expected to double over the next 20 years (i.e., a 3 percent annual growth rate). Despite these increases, truck volumes are projected to remain a relatively small proportion of total vehicular traffic volumes, 6 to 10 percent at Hickory Grove Road and 8 to 11 percent at Delk Road.

The peak period traffic volumes shown in Figure 1-3 for the p.m. outbound direction in 2005 and 2030 are similar to the a.m. peak period in distribution by segment, but higher in volume. In part, this is because the I-75 segment south of Delk Road currently has eight lanes in the northbound direction, but only seven lanes in the southbound direction. The additional northbound lane increases the highway capacity and accounts for the higher traffic volumes during the p.m. peak period. There are only slight differences in the distribution of types of vehicles during the p.m. peak period compared to the a.m. peak period. Similarly, the projected 2030 traffic volumes on I-75 during the p.m. peak period show little growth in traffic volumes between 2005 and 2030 due to existing high levels of congestion.

I-575 Traffic Volumes

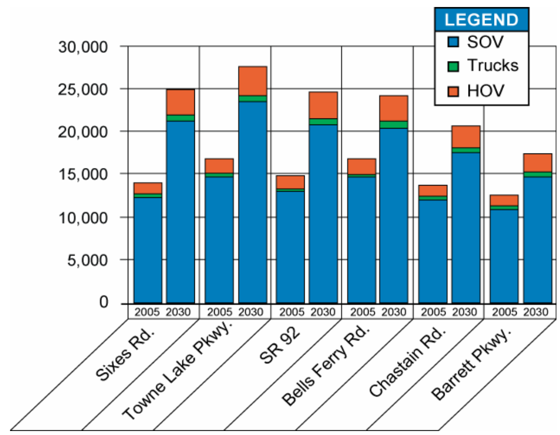
Figure 1-4 and Figure 1-5 present similar information about 2005 and 2030 traffic volumes by type for the a.m. and p.m. peak periods for I-575. In 2005, the a.m. inbound peak period traffic volumes ranged from approximately 11,000 to 17,000 vehicles, which is similar to traffic volumes on I-75 in northern Cobb County. The SOV, HOV, and truck traffic distribution is similar to I-75 with approximately 88 percent, 9 percent, and 3 percent, respectively. In comparison to I-75, however, the projected 2030 a.m. peak period traffic volumes on I-575 are forecast to substantially increase, an estimated 45 to 85 percent, due to urbanization. The mix of traffic by type is expected to change only slightly by 2030.

Figure 1-4. A.M. Peak Period/ Inbound Direction Traffic Volumes on I-575, 2005 and 2030



Source: Parsons Brinckerhoff, 2007f.

Figure 1-5. P.M. Peak Period/ Outbound Direction Traffic Volumes on I-575, 2005 and 2030



Source: Parsons Brinckerhoff, 2007f.

In 2005, the p.m. peak period traffic volumes on I-575 ranged from approximately 13,000 to 17,000 vehicles, which are higher than the traffic volumes in the a.m. peak period. Like the a.m. peak period, SOVs comprise most of the traffic on I-575, though the percentage of SOV and HOV traffic is higher than during the a.m. peak period. The projected 2030 outbound p.m. traffic volumes show substantial growth with volumes increasing by 40 to 77 percent with only slight changes in the mix of traffic types.

1.4.1.2 Roadway Levels of Service

The severity of roadway congestion is "measured" by a rating system referred to as Level of Service (LOS). LOS describes the quality of traffic flow using national standards published in the *Highway Capacity Manual* (TRB, 2000). LOS is reported using letter designations from A to F. LOS A represents the best operating conditions (free traffic flow) and LOS F designates the worst operating conditions (stop and go conditions, substantially reduced speeds, and difficulty maneuvering). The *Mobility 2030, Volume I: Regional Transportation Plan* (ARC, 2004a) identifies LOS D or better as desirable in the Atlanta metropolitan area, which is consistent with the minimum acceptable LOS for urban areas by the American Association of State Highway and Transportation Officials (AASHTO). LOS D is the level in which speeds begin to decline and congestion affects the freedom to maneuver within the traffic stream. LOS E indicates operations are at capacity, and vehicles are closely spaced with little room to maneuver within the traffic stream.

Both I-75 and I-575 in the Northwest Corridor currently experience congestion as a result of insufficient capacity to accommodate peak period traffic demand. Some of the factors constraining capacity include inadequate number of travel lanes and critical bottlenecks caused by lane drops, merges, diverges, and weaving areas. Under such conditions, LOS for individual locations along the freeways may not reflect actual operating conditions. This is because some segments along the freeway corridor may operate at an improved LOS due to upstream bottlenecks affecting the speeds and queues downstream from the point of heavy congestion. Therefore, the LOS rating for operating conditions along a freeway should be measured based on density rather than traffic volume at a particular point. Traffic density measures effectiveness and is expressed as the average number of vehicles per one-mile segment of traffic lane, or the percentage of available roadway space occupied by vehicles.

Another measure of highway adequacy to meet travel demand is provided by calculating the ratio of traffic volume to highway capacity (i.e., V/C ratios). Ratios above 1.0 indicate the highway is operating above its design capacity. Based on the V/C ratios, LOS ratings can be used to identify capacity constrained segments. This method is referred to as a planning level analysis. Planning LOS is a measure of the adequacy of the number of lanes based on travel demand, not operating conditions based on density of traffic volumes. A planning level analysis was conducted for I-75 and I-575 in the Northwest Corridor. This planning level analysis does not incorporate the effects of weaving and merging of ramps at interchanges.

The calculations of LOS and V/C ratios for the planning level analysis are directly based on output generated by the ARC regional travel forecasting model. The model was developed and validated based on a set of assumptions, such as per lane per hour capacity and proportion of trip making by time period. It is also based on specified parameters, such as trip generation rates. The trip assignment module assumes the capacity of a freeway lane would be between 1,650 vehicles to 1,750 vehicles per hour. This unit of capacity is vehicles (including trucks) and therefore is lower than a traditional capacity figure, which would be in passenger car equivalents as recommended in the *Highway Capacity Manual* (TRB, 2000). The existing and projected LOS and V/C analyses are presented below for I-75 and I-575.

Levels of Service on I-75

Table 1-3 presents 2005 and 2030 V/C ratios and LOS data for I-75 freeway segments for both the a.m. and p.m. peak periods. The analysis for 2005 indicates that traffic demand for all highway segments during the a.m. peak period would generally be at LOS D or LOS E, which is at or below capacity. In 2030, traffic demand is expected to increase with all segments operating at LOS E, or at capacity. In comparison, the 2005 outbound p.m. peak period traffic demand is at LOS E or LOS F for all segments. This indicates that the number of lanes is inadequate in some segments to accommodate the traffic demand. As traffic demand increases between now and 2030, the need for additional capacity is expected to increase.

Volume/capacity ratios are also shown in Table 1-3 and help to quantify how much roadway capacity is used. The 2005 data range from 0.76 to 0.92 during the a.m. inbound peak period in 2005 and are forecasted to increase to 0.85 to 1.00 in 2030. The V/C ratios for the outbound p.m. peak period range from 0.87 to 1.11 in 2005 and are forecast to increase to 0.94 to 1.15 in 2030. Under such circumstances, the projected traffic demand would exceed the practical capacity of the highway. Consequently, traffic must either detour to another route or peak periods would expand in duration, thereby resulting in even longer peak periods.

Table 1-3. Peak Period/Peak Direction Levels of Service on I-75, 2005 and 2030

Segment	Period	Dir	2005				2030			
			Lanes	Demand	V/C	LOS	Lanes	Demand	V/C	LOS
Southbound Peak Direction										
Hickory Grove Rd	AM	SB	3	15,450	0.82	E	3	18,940	0.99	E
South of Wade Green	AM	SB	3	17,490	0.81	E	3	19,960	0.95	E
South of Chastain Rd	AM	SB	3	19,110	0.88	E	3	20,530	0.98	E
South of Barrett Pkwy	AM	SB	4	20,630	0.76	D	4	22,480	0.85	E
South of I-575	AM	SB	6	31,920	0.76	D	6	38,850	0.93	E
South of Canton Hwy	AM	SB	5	31,400	0.90	E	5	35,070	1.00	E
South of N Marietta Pkwy	AM	SB	5	29,180	0.86	E	5	32,390	0.98	E
South of S Marietta Pkwy	AM	SB	6	36,740	0.90	E	6	37,890	0.93	E
South of Delk Rd	AM	SB	7	40,730	0.92	E	7	41,760	0.94	E
South of Windy Hill Rd	AM	SB	5	25,710	0.76	D	5	28,750	0.87	E
Northbound Peak Direction										
Hickory Grove Rd	PM	NB	3	18,230	0.87	E	3	22,100	1.02	F
South of Wade Green	PM	NB	3	19,990	0.93	E	3	22,140	1.05	F
South of Chastain Rd	PM	NB	3	20,470	1.03	F	3	21,920	1.11	F
South of Barrett Pkwy	PM	NB	4	23,760	0.87	E	4	25,150	0.95	E
South of I-575	PM	NB	6	36,350	0.87	E	6	42,720	1.02	F
South of Canton Hwy	PM	NB	5	38,900	1.11	F	5	40,390	1.15	F
South of N Marietta Pkwy	PM	NB	5	37,050	1.09	F	5	36,180	1.10	F
South of S Marietta Pkwy	PM	NB	7	47,020	1.00	F	7	45,230	0.97	E
South of Delk Rd	PM	NB	8	51,690	1.03	F	8	50,240	1.02	F
South of Windy Hill Rd	PM	NB	4	27,060	1.07	F	5	29,280	0.94	E

Note: DIR = Direction
Source: ARC, 2004b; Parsons Brinckerhoff, 2007f.

Levels of Service on I-575

Table 1-4 presents the LOS and V/C data for I-575 during a.m. and p.m. peak periods in 2005 and 2030. The analysis indicates that during the 2005 a.m. peak period all but one segment would operate at LOS E, or at capacity in the southbound peak direction. In 2030, traffic demand is expected to increase with all segments operating at LOS E or F. During the p.m. peak period, all segments of I-575 were determined to operate at LOS E or LOS F in both 2005 and 2030. This indicates an inadequate number of lanes in both directions of I-575.

In 2005, the V/C ratios for both peak periods range from 0.78 to 1.20 and would be expected to increase to 0.83 to 1.29. The ranges of both current and forecasted V/C ratios generally exceed those calculated for I-75. Also note, this severe traffic congestion is anticipated despite the construction of additional traffic lanes currently included in *Mobility 2030, Volume I: Regional Transportation Plan* (ARC, 2004a). As on I-75, the congestion would be severe and would cause traffic to divert to other routes or alter travel time to avoid congested periods, which would result in even longer peaks during the a.m. and p.m. peak periods.

Table 1-4. Peak Period/Peak Direction Levels of Service on I-575, 2005 and 2030

Segment	Period	Dir	2005				2030			
			Lanes	Demand	V/C	LOS	Lanes	Demand	V/C	LOS
Southbound Peak Direction										
South of Sixes Rd			2	11,630	0.81	E	3	21,540	1.00	E
South of Towne Lake Pkwy	AM	SB	2	14,300	1.02	F	3	23,920	1.11	F
South of SR-92	AM	SB	2	12,280	0.88	E	3	21,480	0.99	E
South of Bells Ferry Rd	AM	SB	3	14,640	0.78	D	3	21,770	1.16	F
South of Chastain Rd	AM	SB	2	11,910	0.88	E	3	19,510	0.96	E
South of Barrett Pkwy	AM	SB	2	11,260	0.83	E	3	16,360	0.83	E
Northbound Peak Director										
South of Sixes Rd	PM	NB	2	14,060	0.98	E	3	24,950	1.16	F
South of Towne Lake Pkwy	PM	NB	2	16,850	1.20	F	3	27,820	1.29	F
South of SR-92	PM	NB	2	14,870	1.06	F	3	24,750	1.15	F
South of Bells Ferry Rd	PM	NB	3	16,900	0.90	E	3	24,270	1.29	F
South of Chastain Rd	PM	NB	2	13,840	1.02	F	3	20,740	1.02	F
South of Barrett Pkwy	PM	NB	2	12,610	0.93	E	3	17,560	0.89	E

Note: Dir = Direction
Source: ARC, 2004b; Parsons Brinckerhoff, 2007f.

1.4.1.3 Highway Travel Times

The congestion currently on I-75 and I-575 has decreased operating speeds, resulting in increased travel times. An analysis of average travel time by SOV and HOV for representative trips within the study area to the regional activity centers as well as travel to major destinations outside of the study area was conducted using the ARC travel forecasting model. Table 1-5 presents the results of the analysis of travel times to activity centers in 2005 and 2030 by SOV and HOV assuming no transportation improvements are made. A comparison of travel times for 2005 revealed that travel times to activity centers are only slightly higher for SOV than for HOV trips because of the lack of HOV lanes on I-75 north of I-285. Between 2005 and 2030, travel times by SOV are expected to increase by 8 to 18 percent. Travel times by HOV are expected to increase by similar percentages.

Table 1-5. Average Travel Times by SOV and HOV Trips to Local and Regional Activity Centers, 2005 and 2030

Destination	2005 (minutes)		2030 (minutes)		Percent Change	
	SOV	HOV	SOV	HOV	SOV	HOV
Town Center	22	22	26	26	+18%	+18%
Cumberland-Galleria	23	23	25	25	+9%	+9%
Perimeter Center	37	37	41	41	+11%	+11%
Buckhead	40	40	45	44	+13%	+10%
Midtown	35	33	40	35	+14%	+6%
Downtown	37	34	40	36	+8%	+6%

Source: ARC, 2004b; Parsons Brinckerhoff, 2007f.

These projected increases in travel times result from congestion and would affect all vehicle types using both I-75 and I-575, including trucks, transit, and emergency response vehicles. Moreover, without dedicated lanes, the current benefits of HOV are reduced.

1.4.1.4 Trucks and Heavy-Duty Vehicles

Use of freeways by trucks and heavy-duty vehicles is important when evaluating capacity and congestion because these vehicles occupy more space, take longer to speed up and slow down, and affect passenger car driver behavior. These limitations are more noticeable on the long uphill grade of I-75 from I-285 to the northern portion of the study area. Moreover, through-truck traffic is prohibited on I-75 south of I-285, so all through-trucks must use I-285 and circumvent Midtown and downtown Atlanta.

As described above, the percentage of trucks operating on I-75 during peak periods is generally very small, 10 percent or less. But, a review of truck volumes throughout the day found that the highest truck volumes occur midday, not during peak periods. These findings indicate that truckers are choosing not to travel during peak periods because of the heavy congestion.

Information on the percentage of trucks that are through-trucks was also collected. Through-trucks are defined as trucks traveling all the way through the I-75 corridor between Wade Green Road (first interchange south of Hickory Grove Road) and I-285. They do not exit I-75 to access local activity centers. North of Wade Green Road, approximately 95 percent of the trucks in the southbound direction and 97 percent in the northbound direction are through-trucks. At I-285, approximately 85 percent of the trucks in the southbound direction and 90 percent in the northbound direction are through-trucks. It appears that a substantial proportion of the truck traffic is through-trucks serving the needs of businesses outside the Northwest Corridor.

1.4.2 Transit System Performance

The performance of the transit system was analyzed based on transit services provided to major destinations, the transit level of service based on passengers' assessment of its adequacy, and transit travel time.

1.4.2.1 Transit Services

Table 1-6 presents a summary of transit service use in the Northwest Corridor. Statistics used to describe transit use include person trips (daily number of one-way person trips by all modes), transit person trips (total daily number of one-way trips made by transit), and the proportional share of all travel trips made by transit users for major destinations, or travel markets. These major travel markets are described below:

- Market 1 – Travel from within the study area in Cobb and Cherokee counties to activity centers outside the study area (i.e., travel to Midtown, downtown Atlanta, Perimeter Center, and Buckhead using I-75, I-285, and SR-400).
- Market 2 – Travel from study area communities in Cobb and Cherokee counties to one of the activity centers within the study area (i.e., Town Center, Cumberland-Galleria, and the central I-75 corridor).

Table 1-6. Daily Transit Trips and Mode Share, 2005 and 2030

Market	Travel Market	2005 Person Trips	2005 Transit Person-Trips	2005 Transit Share	2030 Person Trips	2030 Transit Person-Trips	2030 Transit Share
1	Travel to Activity Centers Outside the Study Area	108,000	1,900	2%	105,000	6,900	7%
2	Travel to Activity Centers within the Study Area	371,000	1,500	.04%	439,000	5,600	1%
3	Travel between Activity Centers within the Study Area	306,000	2,200	1%	354,000	11,700	3%
4	Travel from Outside Study Area to Activity Centers within the Study Area	197,000	2,400	1%	245,000	9,700	4%
Total for the Study Area		982,000	8,000	1%	1,143,000	34,000	3%
Total for the Region		13,397,000	292,000	2%	20,386,000	483,000	2%

Note: Totals may differ due to rounding.
Source: ARC, 2004b; Parsons Brinckerhoff, 2007f.

- Market 3 – Travel between activity centers within the study area, e.g., a trip between Town Center and Cumberland-Galleria.
- Market 4 – Travel from outside the study area to one of the activity centers within the study area.

The total number of study area transit person-trips produced by the four major travel markets in 2005 is estimated to be 8,000 daily, or 1 percent of total trips (i.e., transit mode share). Transit person-trips were also projected for each of these major travel markets based on forecasted land use and travel patterns in the Northwest Corridor and the region. By 2030, the number of transit person-trips is projected to increase to 34,000 daily, or a transit mode share of 3 percent. The increase in number of transit trips and mode share are expected because of planned increases in transit service frequency.

1.4.2.2 Transit Level of Service

Transit LOS is a qualitative assessment of transit service from the transit user's point of view. The *Transit Capacity and Quality of Service Manual* (TRB, 2003) provides six designated ranges of values for various service measures. These transit service measures include: headways (frequency), hours of service, service coverage, passenger loads, reliability, and travel time (see Table 1-7). And, like roadway level of service, the transit levels of service are rated from A to F. LOS C is considered desirable for riders who have the option of driving or using transit.

The LOS of existing public transit services within the study area was evaluated (see Table 1-7). For the six service measures, only one was currently evaluated to be above LOS C – service coverage to major destinations during peak periods. Hours of service and coverage of higher density residential areas were rated LOS E. Headways during non-peak period range from LOS D to LOS F. Thus, current transit users feel transit services could generally be improved for most of the service measures rated.

Table 1-7. Transit Level of Service Measures, 2005

Service	Peak Period	Non-Peak Period
Headways – The headways or transit frequency on the existing CCT routes and near-term planned GRTA routes	LOS C – LOS D	LOS D – LOS F
Hours of Service – Hours of service are limited to peak periods, with only limited midday service, for all but one route (CCT route 10 from Marietta to Midtown). The LOS of route 10 is considered to be LOS A because of the night service.	LOS E	Limited
Service Coverage – Service coverage is based on the transit-supportive area served by the transit routes. Household densities are typically about three units per acre and employment density is at least four jobs per acre. • 50% of higher density residential areas served • most major destinations served	 LOS E LOS B	N/A
Passenger Loads – Passenger loads are measures of how full each transit vehicle operates. Under LOS B, passengers can choose where to sit; and under LOS C all passengers can sit.	LOS B – LOS C	N/A
Reliability – Reliability is a measure of on-time performance and schedule adherence. Under LOS C, vehicles are on time 85 to 90 percent of the time and 20 percent of the vehicles are often off their schedules.	LOS C	N/A
Transit/Auto Travel Time Difference – One-way travel times by SOV and transit showed travel time differences of 20 to 42 minutes. A travel time difference of 16 to 30 minutes is considered to be a LOS C and tolerable for riders. A LOS D is considered to be a difference of 31 to 45 minutes.	LOS C – LOS D	N/A

Source: Parsons Brinckerhoff, 2007f.

1.4.2.3 Transit Travel Times

An analysis of average transit travel times for representative trips within the study area and to regional activity centers also was conducted. Table 1-8 presents the results of the analysis for trips in 2005 and 2030; and compares transit trips to SOV trips. (The travel times for transit include wait time, transfer time, and in-vehicle time.) Travel times by transit from the study area to Cumberland-Galleria currently average 61 minutes compared to 23 minutes by SOV. For travel to activity centers outside the study area, transit travel times range from 81 minutes for trips to downtown Atlanta to 94 minutes for trips to Perimeter Center. Trips to Buckhead average 89 minutes. Trips by SOV to these same destinations take less than half of these times. These data show current travel by transit is considerably more time consuming than by SOV.

Projected transit travel times show less change than travel times by SOV due to overall increased traffic congestion. Transit travel times are expected to decrease between 2005 and 2030 due to planned improvements in transit service. In short, the results show that travel times by transit are longer in duration than travel times by SOV, but planned improvements should improve the ability of transit to compete with SOVs in the future by reducing the difference in travel time between the two modes of travel.

Table 1-8. Average Travel Times by Transit and SOV Trips to Local and Regional Activity Centers, 2005 and 2030

Activity Center Destination	2005 (minutes)		2030 (minutes)		Percent Change	
	Transit	SOV	Transit	SOV	Transit	SOV
Town Center	73	22	72	26	-1%	+18%
Cumberland-Galleria	61	23	60	25	-2%	+9%
Perimeter Center	94	37	92	41	-2%	+11%
Buckhead	89	40	85	45	-4%	+13%
Midtown	77	35	71	40	-8%	+14%
Downtown	81	37	76	40	-6%	+8%

Source: ARC, 2004b; Parsons Brinckerhoff, 2007f.

1.4.3 Project Logical Termini

To develop alternatives that address transportation problems and needs on I-75 and I-575 in the Northwest Corridor, a traffic analysis was conducted to define reasonable limits for the proposed transportation improvements in the build alternatives discussed in Chapter 2.

The southern terminus of the project is logical for two reasons. First, there are existing HOV lanes on I-75 just south of the I-75/I-285 interchange. Second, trucks are not permitted to travel on I-75 south of I-285; and through-trucks must use I-285 to circumvent Midtown and downtown Atlanta. Thus, the project improvements need to include extending the existing I-75 HOV lanes to the north of I-285 and developing improved connections to permit through-trucks to travel between I-75 and I-285.

The northern terminus of the project on I-75 was determined based on the results of the planning LOS analysis. The analysis determined there is inadequate capacity on I-75 to accommodate existing and forecast 2030 p.m. peak period traffic demand in the northbound direction in all segments from I-285 north to the freeway segment north to the SR-92 interchange. The analysis of 2030 traffic demand also determined there is inadequate capacity in all segments in the southbound direction during the a.m. peak period. The SR-92 interchange is the next general-purpose interchange north of the Hickory Grove Road crossing. North of the SR-92 interchange, both directions of the freeway are forecast to have adequate capacity to accommodate projected traffic demand at the desired LOS D without improvements. Thus, the construction of HOV and truck-only lanes and the addition of BRT transit service on I-75 between I-285 and Hickory Grove Road south of the SR-92 interchange would increase capacity and reduce travel times for all freeway users including SOVs traveling in the general-purpose lanes.

The determination of the northern terminus of the project on I-575 is more complicated by proposed long-range improvement in the RTP to widen I-575 in the next 10-15 years. The analysis of 2005 and 2030 traffic demand for I-575 found that the demand is at or above capacity for all freeway segments between the I-75/I-575 interchange and the I-575/Canton Road interchange. The proposal to increase freeway capacity on I-575 by constructing HOV or HOT lanes extending from the I-75 interchange north to the Sixes Road interchange without the planned freeway widening would improve the V/C ratios, but the traffic demand is still projected to be at or above capacity. However, the projected V/C ratios and LOS for all freeway segments from the I-75 interchange north to the Canton Road interchange including the planned freeway widening north to the Canton Road interchange and the proposed HOV lanes extending north to the Sixes Road interchange would be acceptable (i.e., LOS D). An interim solution, however, may be required if the proposed HOV lanes are constructed and the planned freeway widening does not occur. This interim solution would require extending the existing third northbound lane on the shoulder north (immediately south of the Sixes Road interchange) north to the Sixes Road interchange if the planned I-575 widening does not occur within 10-15 years. Thus, the analysis determined that the northern terminus of the I-575 freeway improvements may extend north to the Sixes Road interchange. This interim solution remains an unresolved issue (see Chapter 7, Evaluation of Alternatives).

A more detailed explanation of the logic of the proposed project termini for both I-75 and I-575 is presented in Chapter 2.

1.5 Highway Safety Concerns

An analysis of crashes and existing highway design of both I-75 and I-575 was conducted and identified a number of safety concerns, which could contribute to reduced capacity and/or additional congestion. Identified safety concerns for both freeways are discussed below in order to highlight issues that should be addressed in the conceptual engineering for the build alternatives.

1.5.1 Crash Analysis

Crashes identify potential highway design problems. The analysis investigated the location of crashes; the total number of crashes, injuries, and fatalities; and crash rates per 100 million vehicles miles of travel. The characteristics of truck crashes were also evaluated as truck acceleration, braking limitations, and larger vehicle size can lead to increased numbers and severity of crashes. Key findings of this analysis are summarized below:

- More than 68 percent of all crashes on I-75 and more than 50 percent on I-575 occur on the freeway or near ramp junctions. More than 23 percent of the crashes on I-75 and more than 48 percent on I-575 occur on freeway ramp cross streets.
- Crash rates on both I-75 and I-575 are generally under statewide averages within the study area. However, the fatal crash rate on I-75 between Windy Hill Road and Delk Road exceeds statewide averages and the fatal crash rate on I-575 between I-75 and Barrett Parkway is over five times greater than the statewide average.
- Rear-end crashes are more than 55 percent of all crashes occurring on both I-75 and I-575, likely due to heavy congestion. Sideswipe crashes are almost twice as prevalent on I-75 as I-575, which likely results during lane changes.
- Truck and heavy-duty vehicles generally are not involved in a disproportionately higher percentage of injury or fatal crashes on either I-75 or I-575 compared with other types of crashes.
- Truck crash rates on I-75 near I-285 and west of the junction with I-575, however, are disproportionate to the number of trucks traveling in traffic at these locations.
- Rear-end crashes are less common for trucks, but sideswipe crashes are between two and three times more common for trucks compared to all crashes. This is likely due to required lane changes as trucks enter and exit I-75 at I-285 (because they are prohibited on I-75 south of I-285).
- When truck crashes occur, they are more likely to involve two or more vehicles. Due to higher volumes of trucks on I-75, the occurrence of crashes involving three vehicles is almost three times as likely on I-75 compared to I-575.

1.5.2 Design Deficiencies

Design deficiencies mean a highway does not meet current AASHTO standards. Over time, acceptable design standards change, so older facilities are more likely to have design deficiencies. The current standards are presented in *A Policy on Geometric Design of Highways and Streets* (AASHTO, 2001). Design deficiencies contribute to congestion and safety concerns that affect highway use by all vehicles including SOVs, HOVs, transit, and trucks. As such, proposed improvements to I-75 and I-575 should consider these issues in the conceptual design of the build alternatives. Deficiencies in I-75 and I-575 are summarized below:

- Vertical clearances are less than the standard 16 feet 6 inches at the Delk Road, South Marietta Parkway, and Dickson Road bridge crossings on I-75.
- Horizontal clearances are less than the standard 16 feet in several segments of I-75 within the study area and total approximately 14.4 miles. Approximately 6.6 miles of northbound and southbound I-75 have median horizontal clearances less than current standards. Right side horizontal clearances are less than standards at several locations and total 0.5 miles on northbound I-75 and 0.75 miles on southbound I-75.
- Shoulder widths are less than the standard 12 feet at several locations on I-75 and total approximately 12.9 miles.
- Lanes are less than the standard 12-foot width on southbound I-75 at Windy Hill Road; and on both northbound and southbound I-75 at Delk Road and at South Marietta Parkway.
- Loop ramp radii are less than the standard 150 feet on the ramp from northbound I-75 to westbound South Marietta Parkway and the ramp from eastbound South Marietta Parkway to northbound I-75.
- Interchange spacing is less than the standard one-mile spacing between the I-75/I-575 split and the Barrett Parkway Interchange on I-75.
- Lane imbalances exist at six locations on northbound I-75 and one location on southbound I-75. As such, the number of one-direction mainline through lanes before an interchange is not the same as the number of mainline lanes after the interchange, i.e., typically a through lane becomes an exit lane.
- On-ramp taper deficiencies exist on the northbound I-75 ramp from South Marietta Parkway. Here, two lanes are only 950 feet long and do not meet the current minimum standards.

As decided by GDOT, these design deficiencies would be corrected by the proposed improvements to I-75 and I-575 where determined to be appropriate.

1.6 Roadway Emissions and Air Quality

The Atlanta metropolitan area currently does not meet all of the National Ambient Air Quality Standards (NAAQS). The area has been designated as a non-attainment area for ground level ozone and fine particulate matter ($PM_{2.5}$) by the US Environmental Protection Agency (USEPA). Ground level ozone (smog) is formed when volatile organic compounds (VOC) and nitrous oxides (NO_x) from vehicle emissions react under sunlight to form ozone (O_3). The combustion of fossil fuels by cars and trucks also accounts for a substantial portion of particulate matter, especially $PM_{2.5}$.

These air quality concerns correlate to the substantial traffic congestion and regional patterns of land development. Though LOS F congestion conditions exist during existing p.m. peak periods on about half of the segments of I-75 and I-575, the 2030 forecast traffic conditions indicate that most of I-75 and I-575 would operate at LOS F. The impacts of worsened traffic congestion will adversely affect air quality in the Atlanta metropolitan area.

As such, to comply with the NAAQS standards, improvements to the freeway system should not further degrade air quality. The addition of general-purpose lanes would tend to support continued use of SOVs – a generally less efficient and relatively more polluting mode of travel. Improvements to the freeway system should be limited to actions that would encourage more efficient transportation modes such as HOVs and transit to accommodate projected traffic demand.

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