

Chapter 6 - Evaluation of Alternatives

The two alternatives identified for Strategy D were further investigated by the study through a detailed screening. The following discussion provides a more detailed description of each alternative as well as a comparison of their benefit-cost analyses, travel time savings, safety, cost, operations and accessibility.

6.1 Alternative Definitions

Operationally, the two alternatives would function differently. Alternative 1 would have interchanges on SR 316 that would not provide exclusive access to the HOV lanes. If HOV-eligible vehicles did not use these interchanges to access SR 316, they would not be able to get into the HOV lanes once they were on SR 316. In contrast, Alternative 2 would allow HOV-eligible vehicles to get into the HOV lane after entering SR 316 from any interchange.

To provide the level of detail necessary to study each alternative, specific SR 316 mainline and HOV lane configurations were assumed. This included identifying which existing cross streets would have a future interchange (and access) to SR 316 and which would not. Interchanges were identified based on existing travel demand and minimum interchange spacing thresholds. This study recommends specific interchanges, yet it recognizes that subsequent project-level studies on SR 316, which could include detailed analyses of environmental, design and right-of-way issues, could alter the location of these interchanges.

Both alternatives would include collector-distributor (C-D) roads to serve accessibility, operational and safety needs in Gwinnett County. Preliminary analyses of the horizon year traffic volumes showed that these C-D roads would be needed for operational and safety reasons on SR 316 around the north side of Lawrenceville. Costs for constructing the C-D roads in Gwinnett County are included in the total project cost estimates for Alternative 1 and Alternative 2.

6.1.1 Alternative 1: Four-Lane Freeway With Barrier Separated HOV Lanes

This alternative would involve replacement of the existing, 32-foot grassy median with: (1) HOV-lanes; (2) outside and inside shoulders adjacent to the HOV lanes; and, (3) physical barriers separating general-purpose lanes from concurrent flow HOV lane traffic as well as separation from the HOV lane flowing in the opposite direction. As noted before, this alternative differs from Alternative 2 due to the physical barrier.

Under this alternative, access to and from the HOV lanes would be from designated HOV-only interchanges whose locations are listed in Table 6-1 and shown graphically on Figure 6-1.

**Table 6-1
Alternative 1 - Exclusive HOV Access Locations**

Gwinnett	Herrington	To & From East Only
	Lawrenceville-Suwanee	To & From West Only
	Walther Blvd.	To & From East Only
Barrow	Kilcrease	Full Access
	SR 324/ Carl Bethlehem	Full Access
	Harry McCarty	Full Access
	Harrison Mill	Full Access
	Barber Creek	Full Access
Oconee	Dials Mill	Full Access
	Mars Hill	Full Access

Under Alternative 1, there would be three types of interchanges in the entire corridor: 14 interchanges that would provide access only to the general-purpose lanes, five “hybrid” interchanges providing access to and from the general-purpose lanes and the HOV lanes, and ten “HOV-only” interchanges providing exclusive access to the HOV lanes (listed in Table 6-1).

These existing cross streets would be grade-separated to cross over SR 316, but would not provide access to SR 316 or its HOV lanes:

- Wall Road in Barrow County;
- McNutt Creek Road in Oconee County; and
- Julian Drive in Oconee County.

6.1.2 Alternative 2: Four-Lane Freeway With Non-Barrier Separated HOV Lanes

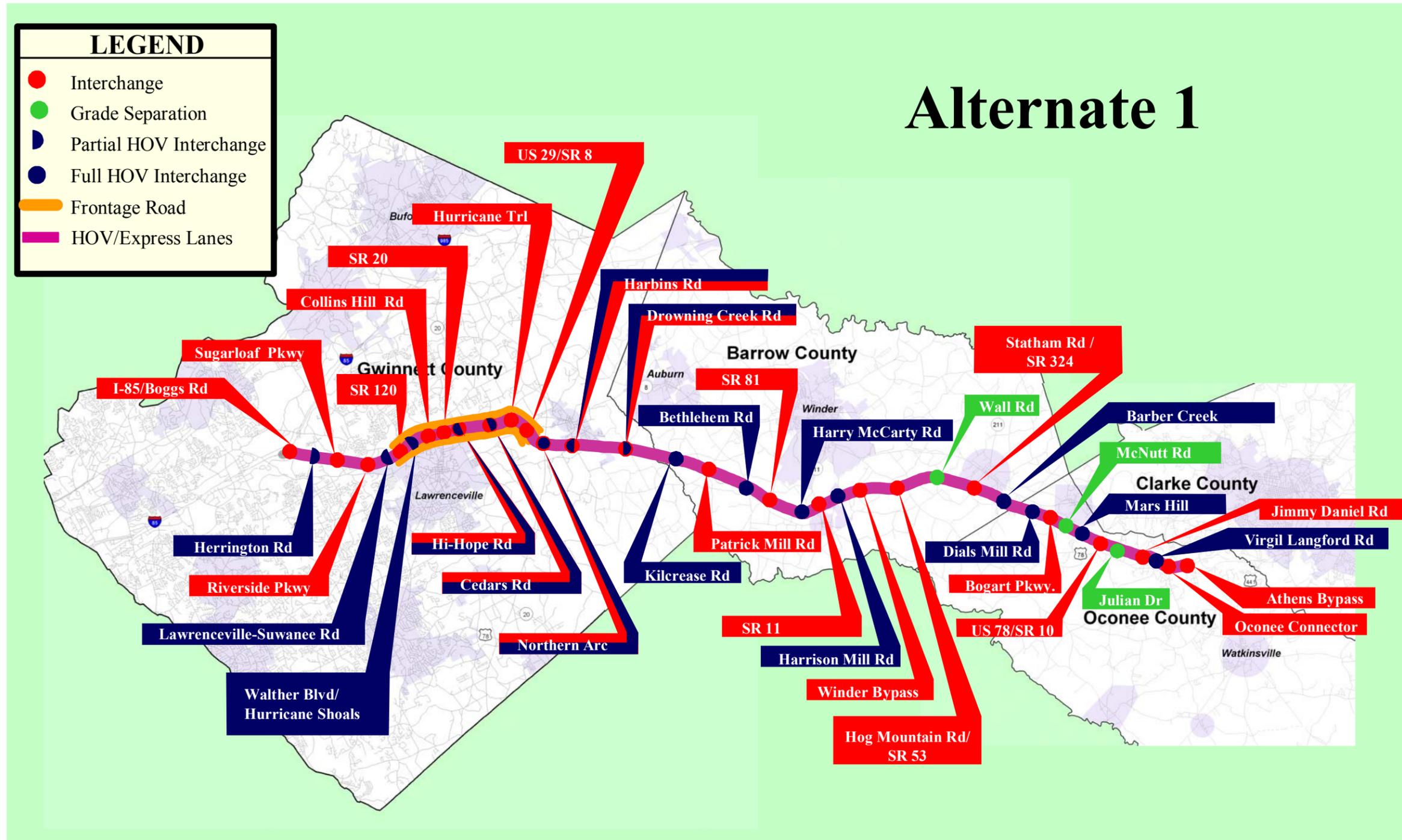
Alternative 2 would not have physical barriers separating its HOV lanes from the adjacent general-purpose lanes. Instead, traffic in the general-purpose lanes would be separated from HOV lane traffic only by pavement markings, similar to the HOV lanes currently operating in the Atlanta region. Therefore, HOV-eligible traffic would enter and leave the HOV-lanes from the general-purpose lanes where pavement markings permit; and, access to the general-purpose lanes would be from any interchange. There would be no HOV-only interchanges under this alternative.

Interchange locations identified for Alternative 2 are shown in Figure 6-2. Unlike Alternative 1, HOV lane access is not restricted to specific interchange locations. Therefore, more cross streets are assumed to be grade-separated as a “cross-over” compared to Alternative 1. These locations would be:

- Walther Boulevard./Hurricane Shoals in Gwinnett County;
- Kilcrease Road in Barrow County;
- Carl Bethlehem Road in Barrow County;
- Harry McCarty Road in Barrow County;
- Harrison Mill Road in Barrow County;
- Wall Road in Barrow County;
- Barber Creek Road in Barrow County;
- Dials Mill Road in Oconee County;
- McNutt Creek Road in Oconee County;
- Mars Hill Road in Oconee County; and
- Julian Drive in Oconee County.

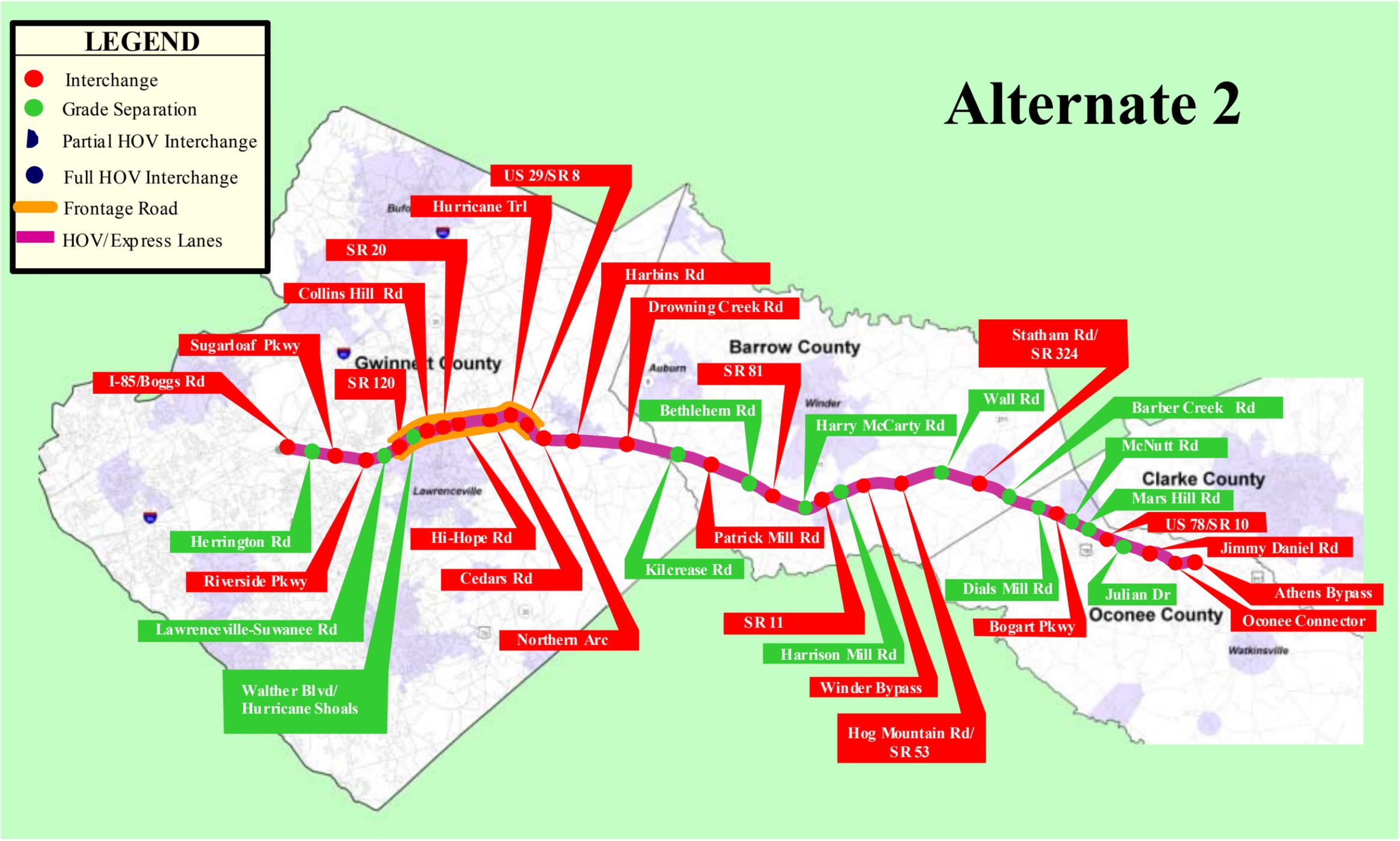
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Figure 6-1
Access Locations - Alternative 1



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Figure 6-2
Access Locations - Alternative 2



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6.2 Benefit-Cost Analysis

A benefit-cost analysis is typically used to indicate the cost-effectiveness of a large public expenditure for public projects. If the computed benefits of a project outweigh its estimated implementation costs, then it is considered a cost-effective investment. Typical factors used in a benefit-cost analysis of transportation projects include: estimated travel time savings of road users; accident reduction estimates; construction cost estimates; and estimates of annual maintenance costs. For this study, the benefit-cost analysis utilized a 20-year benefit-cost stream using a 5% discount rate to adjust future benefits and costs for present worth. The 20-year time frame began in 2005 and ended in 2025 (the horizon year).

To calculate benefits, the baseline condition (also known as Strategy A in Chapter 2), was assumed for analysis purposes to compare travel time and accidents benefits from Alternatives 1 and 2. One of the baseline condition projects depicted in Figure 2-12, the HOV lanes in Gwinnett County, was removed from the baseline condition to eliminate its redundancy in relation to Alternatives 1 and 2.

The computed benefit-cost ratios for Alternatives 1 and 2, both support the significant public investment required for implementation. Specifically, the computed benefit-cost ratio for Alternative 1 is 2.34, while Alternative 2 has a value slightly higher of 2.63.

Travel Time Savings. This user benefit was computed from the study's travel demand model by assigning base year and horizon year trips to the baseline condition, Alternative 1, and Alternative 2 highway networks. The calculated travel time savings were based on traffic volumes and travel times for the entire study area. The primary model output used to calculate travel time savings was person hours of travel (PHT). PHT for each of the network scenarios relied on SOV and MOV trips because the measurement unit was persons instead of vehicles. Year 2005 PHT was computed from a straight-line interpolation of the base year and horizon year model output.

A summary of each alternative's PHT savings compared to the baseline condition is presented in Table 6-2. Under Alternative 1, Year 2005 daily PHT was 15,918 hours less than in the baseline condition. By the horizon year, the computed PHT savings relative to the baseline condition increased to 34,087 hours. PHT savings in Alternative 2 were 15,947 hours and 32,788 hours for 2005 and 2025, respectively, in relation to the baseline condition.

Table 6-2
Daily Person Hours of Travel (2000 and 2025)

Reference Years	Future Baseline Daily PHT ¹	Alternate 1		Alternate 2	
		Daily PHT ¹	Difference From Baseline	Daily PHT ¹	Difference From Baseline
2005	1,363,575	1,347,657	15,918	1,347,628	15,947
2025	2,813,926	2,779,839	34,087	2,781,138	32,788

¹ Person Hours of Travel

In addition to the PHT estimates coming from the study's model, other factors went into calculating travel time savings. First, daily savings in PHT were converted to an annual savings by applying a factor of 300. Second, the value of time used to convert hours to dollars was \$14.35 per hour. This amount was lower than the current average hourly labor rate for all metro Atlanta area workers, as well as the average for truck drivers. Applying these assumed values to the PHT savings produced the total dollar equivalent travel time benefits listed below.

Alternative 1

Year 2005 - \$ 68,524,000
Year 2025 - \$146,744,535

Alternative 2

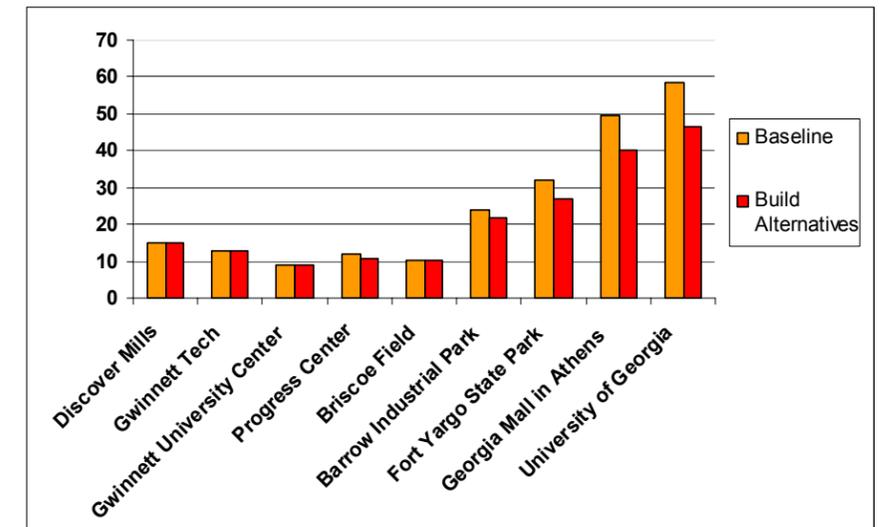
Year 2005 - \$ 68,652,696
Year 2025 - \$141,152,340

Modeled travel time savings from the two alternatives are shown in Figures 6-3 and 6-4. They show that the estimated time savings for both alternatives are essentially the same and are therefore both represented by a single label called "Build Alternatives". Sampled routes represented in these same figures are for motorists traveling from the center of Lawrenceville to selected destinations in the corridor.

Figures 6-3 and 6-4 differ in that they are for the off-peak and peak period times-of-day, respectively. Calculation of the off-peak time-of-day was developed using the free-flow speeds and link distances on the minimum time path between two places. Calculation of peak period travel times reflected the impacts of congestion. It is important to note that in calculating the off-peak and peak travel times, HOV links were not included so that the

reported times reflect travel time of motorist using the general-purpose lanes of SR 316.

Figure 6-3
Off-Peak Travel Times From Lawrenceville



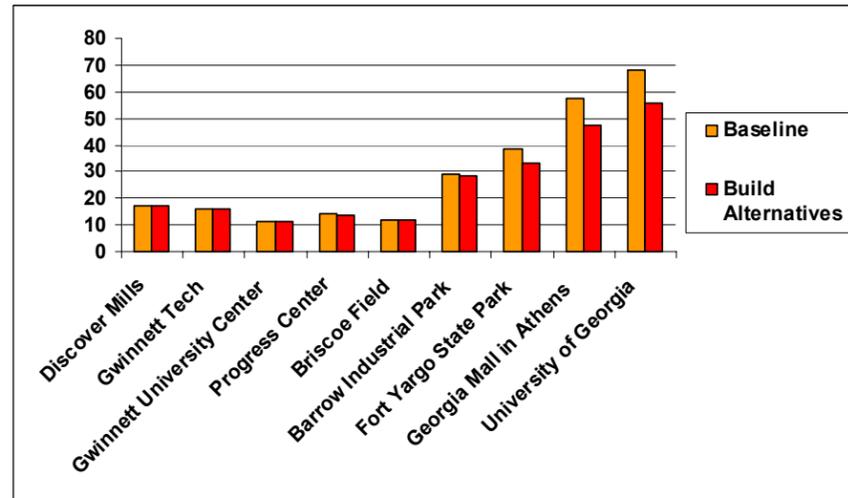
For short distance trips in or near Lawrenceville, the calculations predict there would be little or no savings from the "Build Alternatives" (Alternative 1 or 2) compared to the baseline condition. However, as the trip distances increase, travel time savings also increase. Slightly more than ten minutes would be saved on a trip to the University of Georgia in the "Build Alternatives" compared to the baseline condition for the off-peak and peak periods. The off-peak travel time to the University of Georgia under the baseline condition would take 58 minutes, compared to the 47 minutes for "Build Alternatives". It is important to note that the travel time savings shown in Figures 6-3 and 6-4 are somewhat understated because carpools and buses receive priority treatment in the HOV lanes. If HOV lanes had been used to calculate the minimum travel time, then the "Build Alternatives" would predict an even shorter travel time than those shown in Figure 6-4.

Accident Savings. For the purposes of conducting the benefit-cost analyses, the total accident benefits that would have accumulated as a result of constructing either Alternative 1 or Alternative 2 were deemed roughly equivalent compared to the baseline condition. If the design and operational characteristics were considered in more detail, Alternative 1 could be considered a safer design than Alternative 2. Nevertheless, the design of both alternatives would eliminate the at-grade intersections over the entire length of SR 316 which would significantly reduce the number of injury and

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fatality accidents in the corridor. In contrast, the baseline condition does not include additional grade-separations outside of those already planned.

Figure 6-4
Peak Period Travel Times From Lawrenceville



Average annual accident reductions that could be expected for the base year if the existing at-grade intersections were converted to grade-separated interchanges is shown in Table 6-3. The reductions in injury type accidents and fatal accidents are pronounced; a total of 184 fewer injury accidents and 5 less fatal accidents are estimated to occur on SR 316 under Alternative 1 and Alternative 2 as compared to the baseline condition.

Table 6-3
Estimated Annual Average Accidents By Severity Type (Base Year 2000)

Accident Severity	Without Grade Separation	With Grade Separation	Accident Reduction
Property Damage	296	170	126
Injury	255	71	184
Fatality	7	2	5

Prior to applying average costs to the accident savings calculations, an adjustment was done to account for the likelihood that some of the accidents eliminated from SR 316 could occur at ramp intersections at cross streets. The net result of this adjustment was that more property damage type accidents may occur under Alternative 1 or Alternative 2 than in the baseline condition; approximately half of the injury accident reduction, and all of the fatal accident reduction, would be expected to happen as a result of grade-separating the intersections.

Average dollar cost figures applied to the accident reductions as a result of implementing Alternative 1 or Alternative 2 were taken from the Federal Highway Administration's *Motor Vehicle Accident Costs* Technical Advisory published in 1994. These cost figures were inflated to a year 2005 dollar value for application in the study's benefit-cost analysis. As a result, the estimated net annual dollar savings from Alternative 1 or Alternative 2 for the Year 2005 is \$26,900,000 per year as compared to the baseline condition. The projection of the net annual dollar savings to the horizon year increases the total to approximately \$63,545,000. This figure was based on horizon year traffic volumes and the base year accident rates with, and without, the presence of grade-separated intersections.

Costs. The costs of implementing Alternative 1 and Alternative 2, along with the annual maintenance expenses, were estimated for comparison with the estimated benefits. The total cost estimated for Alternative 1 is shown in Table 6-4 and is subcategorized by its components: preliminary engineering; right-of-way; HOV lane construction; interchange construction; grade-separations; C-D roads; and a contingency amount. The estimated total for Alternative 1 is \$800,000,000.

Table 6-4
Estimated Project Cost - Alternative 1

Category	No. Units	Avg. Cost/Unit	Cost
Preliminary Engineering	-N/A-	-N/A-	\$60,000,000
Right of way	-NA-	-NA-	\$175,000,000
New HOV Retrofit Existing Lanes	40 Miles	\$4,075,000	\$163,000,000
Interchanges ¹	29	\$5,000,000	\$145,000,000
Grade Separations ²	3	\$3,000,000	\$9,000,000
Collector/Distributor	1	\$175,500,000	\$175,500,000
Subtotal	-NA-	-NA-	\$727,500,000
Contingency (10%)	-NA-	-NA-	\$72,750,000
Grand Total	-NA-	-NA-	\$800,250,000

- (1) Not including: I-85, Northern Arc, Winder Bypass, Athens Loop
- (2) Includes Wall Rd., McNutt Creek Rd. and Julian Dr.

Alternative 2 was estimated to cost \$700,000,000, which is less than Alternative 1 because its cross-section span is 10 feet shorter; it has fewer interchanges; does not include physical barriers separating general-purpose lanes from the concurrent flow HOV lane traffic; and it would have lower right-of-way costs. Detailed costs are shown in Table 6-5.

Table 6-5
Estimated Project Cost - Alternative 2

Category	No. Units	Avg. Cost/Unit	Cost
Preliminary Engineering	-N/A-	-N/A-	\$50,000,000
Right of way	-NA-	-NA-	\$145,000,000
New HOV Retrofit Existing Lanes	40 Miles	\$3,650,000	\$146,000,000
Interchanges ¹	18	\$5,000,000	\$90,000,000
Grade Separations ²	10	\$3,000,000	\$30,000,000
Collector/Distributor	1	\$175,500,000	\$175,500,000
Subtotal	-NA-	-NA-	\$636,500,000
Contingency (10%)	-NA-	-NA-	\$63,650,000
Grand Total	-NA-	-NA-	\$700,150,000

- (1) Not including: I-85, Northern Arc, Winder Bypass, Athens Loop
- (2) Includes Wall Rd., McNutt Creek Rd. and Julian Dr., Walther Blvd., Carl Bethlehem, Kilcrease Rd., Harry McCarty Rd., Harrison Mill Rd., Barber Creek Rd., Dials Mill Rd., Mars Hill Rd.

It is important to note that the cost differential between Alternative 1 and Alternative 2 is based on a preliminary estimate that assumes specific interchange locations, basic interchange designs, and those specific options described earlier about how HOV users would access and leave the HOV lanes. Based on existing development and travel patterns in the SR 316 corridor, the computed cost-effectiveness of the project could be improved by reducing the number of interchanges that were assumed for the benefit-cost analysis done in this study. For example, interchanges providing exclusive HOV access under Alternative 1 could be modified to lower this alternative's estimated implementation costs.

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6.3 Evaluation

Using the following performance criteria, Alternative 1 and Alternative 2 were evaluated against each other as well as against the baseline condition: safety and operations, accessibility differences and ability to address future traffic growth. The relative differences for safety and operations were evaluated utilizing the prior HOV implementation experience in metro Atlanta as well as in other areas in North America. For each alternative, accessibility differences were highlighted by each county and by each cross street. Special attention was paid to cross streets that would not have access to SR 316 (via an interchange) or a crossover (allowing north-south traffic to get from one side of SR 316 to the other). Traffic congestion resulting from future traffic growth was calculated using the SR 316 travel demand model.

The results of this evaluation show that Alternative 1 is preferred under the performance criteria as compared to Alternative 2. This is because the HOV and general-purpose lanes, taken together, would allow traffic on the entire corridor to operate better through the system that would physically separate each HOV lane and have HOV-only interchanges.

Operations and Safety. Because barrier-separated HOV facilities are safer than non-barrier separated HOV facilities, Alternative 1 is preferred. In a study done for the U.S. Federal Highway Administration exploring the safety of different HOV lane treatments¹, the average total accident rate in the HOV lanes for barrier-separated facilities was 1.5 accidents per million vehicle miles of travel in comparison to 6.7 accidents for non-barrier separated concurrent flow HOV lanes. On average, the total accident rate for a barrier-separated HOV lane was more than 3 times safer than a non-barrier separated HOV lane. This data only provides a safety comparison applicable to the HOV lanes themselves. It does not provide a full comparison that considers the entire facility (HOV lanes and general-purpose lanes together).

A barrier-separated HOV System would also improve operating conditions on the HOV lanes throughout the entire corridor. The combination of barrier-separation and exclusive HOV-only interchanges will preserve the future operating performance on the HOV lanes as well as the general-purpose lanes for a significantly longer period during peak periods than in Alternative 2. Under Alternative 1, HOV-eligible vehicles enter and leave the HOV lane directly from an HOV-only interchange. With exclusive HOV access, HOV-eligible vehicles would not have to maneuver across the general-purpose lanes to enter or leave the HOV lanes. In contrast, Alternative 2 would require HOV-eligible vehicles to navigate across the general-purpose lanes to get to the HOV lane. This not only reduces the priority access for HOV

¹ Safety Evaluation of Priority Techniques for High Occupancy Vehicles, Federal Highway Administration, Washington, D.C., 1979

vehicles to easily enter the HOV lane, but also significantly impacts operating conditions for other motorists in the general-purpose lanes.

In addition to the potential conflicts associated with high levels of traffic weaving, abrupt lane changes would be more likely in Alternative 2. SOV and HOV motorists in slow moving or stopped traffic in congested areas of the general-purpose lanes can be tempted to make sudden lane changes into the HOV lane to avoid congestion. This type of maneuver would result in more side-swipe and rear-end accidents that would further deteriorate the level-of-service on SR 316. With barrier-separation, sudden lane changes from the outermost general-purpose lane to the HOV lane would be eliminated.

The superior future operational and safety advantages from Alternative 1 may not be as noticeable on SR 316 in Barrow and Oconee County. However, these advantages would be most obvious on SR 316 in Gwinnett County where current levels of congestion and roadway performance are very sensitive to operational conditions.

Accessibility. This issue addresses the relative changes that each alternative would have on properties adjacent to or near the existing roadway. Under this criterion, there could be some impacts for land development and its relative accessibility to SR. For a large majority of property owners near the SR 316 right-of-way, however, the proposed changes are beneficial in terms of their accessibility to and crossing SR 316.

To facilitate further evaluation, three types of roadway accessibility were considered:

Full Access refers to the types of vehicles allowed to access the roadway at a specific location. It means that single occupant vehicles (SOV), multi-occupant vehicles (MOV), buses and trucks may use the particular intersection or interchange. It does not refer to the directional orientation or configuration of ramps or to allowable turning movements (as in the case of the baseline condition). Some existing cross street intersections, like Virgil Langford Road in Oconee County, currently allow for right-in and right-out turning movements only. In the context of the baseline condition, this is still considered a Full Access intersection because all vehicle types (SOVs and MOVs) can enter or leave SR 316 at that location. Under Alternative 1, Virgil Langford Road would have HOV-only Access to the HOV lanes on SR 316 as well as Crossover Access, but not Full Access because no vehicles could get to the general-purpose lanes of SR 316 at that location. In Alternative 2, all access to SR 316 at Virgil Langford would be terminated; it would not have Full Access or Crossover Access.

HOV Access indicates that only HOV-eligible traffic would be able to get into or leave the HOV lanes via an HOV-only interchange at or near that particular cross street.

Crossover Access refers to a grade-separated structure that allows all north-south traffic to cross over SR 316 without conflicting with motorists driving on the HOV or general-purpose lanes of SR 316.

Accessibility differences under each alternative in Gwinnett County are highlighted in Table 6-6. Because the baseline condition does not include the Gwinnett County HOV-lanes or the eastward expansion of the freeway type design to Drowning Creek Road, there are significant accessibility differences.

**Table 6-6
Accessibility By Vehicle Type - Gwinnett County**

Cross Street	Future Baseline			Alternative 1			Alternative 2		
	Full Access ¹	HOV Access ²	Crossover Access ³	Full Access ¹	HOV Access ²	Crossover Access ³	Full Access ¹	HOV Access ²	Crossover Access ³
I-85	✓		✓	✓	✓	✓	✓	✓	✓
Boggs	✓		✓	✓		✓	✓	✓	✓
Herrington			✓		✓	✓			✓
Sugarloaf Pkwy.	✓		✓	✓		✓	✓	✓	✓
Riverside Pkwy.	✓		✓	✓		✓	✓	✓	✓
Lawrenceville-Suwanee			✓		✓	✓			✓
SR 120/Duluth Hwy.	✓		✓	✓		✓	✓	✓	✓
Walther Blvd.	✓				✓	✓			
Collins Ind. Way	✓					✓			
Collins Hill	✓			✓		✓	✓	✓	✓
SR 20/Buford Dr.	✓			✓		✓	✓	✓	✓
Hi-Hope	✓			✓	✓	✓	✓	✓	✓
Progress Center	✓					✓			
Cedars	✓			✓	✓	✓	✓	✓	✓
Hurricane Tr.	✓			✓			✓	✓	
Fence	✓								
US 29/Winder Hwy.	✓			✓		✓	✓	✓	✓
Northern Arc	✓			✓	✓		✓	✓	
Harbins	✓			✓	✓	✓	✓	✓	✓
Williams Farm	✓						✓	✓	
Drowning Ck.	✓			✓	✓	✓	✓	✓	✓

- ✓ Type access available
 - ☐ Type access not available
- (1) Access to general purpose lanes for all vehicle types
May only serve traffic in one direction
- (2) Access to high occupancy vehicle lanes for HOV-eligible vehicles
- (3) Grade separation connecting both sides of SR 316

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With Alternative 1 or 2, the following Gwinnett County cross streets would no longer have direct access to general-purpose lanes on SR 316 or the ability to cross over SR 316:

- Collins Industrial Way
- Progress Center/Airport Road;
- Fence Road; and
- Williams Farm Road.

Under both build alternatives, the existing direct access at Walther Boulevard/Hurricane Trail, Collins Industrial Way, and other individual properties west of Hi-Hope Road would be eliminated or modified. If C-D or frontage roads were to be constructed as part of Alternatives 1 or 2, the accessibility impacts on these areas would be significantly lessened.

The accessibility differences between Alternative 1 and Alternative 2 pertain to where multi-occupant vehicles are permitted to enter or leave the HOV lanes. For example, there would be crossover access at Walther Blvd./Hurricane Shoals in Alternative 1 that would not be provided in Alternative 2. In Alternative 1, access for multi-occupant vehicles to the HOV lanes would only be at HOV-only interchanges identified earlier in this chapter and are also noted in Table 6-6. In Alternative 2, HOV eligible vehicles would be permitted to access HOV lanes at any of the proposed interchanges by entering SR 316 and maneuvering across the general-purpose lanes. Five of the grade-separated interchanges providing full access in Gwinnett County are proposed to serve the HOV-lanes, see Figure 6-6. These include Hi-Hope Road, Cedars Road, the proposed Northern Arc, Harbins Road and Drowning Creek Road.

Accessibility differences in Barrow County are highlighted in Table 6-7. The baseline condition assumed that existing access will remain for purposes of this analysis, although GDOT could implement turning movement restrictions at some locations if future accident experience warrants access management changes. Based upon that assumption, there is full access at all 17 cross streets under the baseline condition. Both Alternative 1 and Alternative 2 would scale back access on SR 316 to the six.

Under Alternative 1 or 2, the existing cross streets would no longer have access to the general-purpose lanes on SR 316: Kilcrease Road, Carl Bethlehem Road, Harry McCarty Road, Harrison Mill Road, Smith Cemetary Road, Jackson Trail Road, Cosby Road, Wall Road, McCarty Road, Barber Creek Road and Craft Road. Crossover access, however, would be provided at: Kilcrease Road, Carl Bethlehem, Harry McCarty Road, Harrison Mill, Wall Road and Barber Creek Road. Locations that have access currently but where access is completely eliminated under Alternative 1 and Alternative 2 are listed below:

- Smith Cemetary between Winder and Bethlehem;
- Jackson Trail outside Winder;
- Cosby Road between Winder and Statham;
- McCarty Road outside Statham; and
- Craft Road outside Statham.

If frontage roads were to be constructed along SR 316 in Barrow County, the accessibility impact from Alternatives 1 or 2 would be lessened.

**Table 6-7
Accessibility By Vehicle Type - Barrow County**

Cross Street	Future Baseline			Alternative 1			Alternative 2		
	Full Access ¹	HOV Access ²	Crossover Access ³	Full Access ¹	HOV Access ²	Crossover Access ³	Full Access ¹	HOV Access ²	Crossover Access ³
Kilcrease	✓	✓	✓	✓	✓	✓	✓	✓	✓
Patrick Mill	✓	✓	✓	✓	✓	✓	✓	✓	✓
SR 324/Carl Bethlehem	✓	✓	✓	✓	✓	✓	✓	✓	✓
SR 81/Charles Floyd	✓	✓	✓	✓	✓	✓	✓	✓	✓
Harry McCarty	✓	✓	✓	✓	✓	✓	✓	✓	✓
SR 11/Monroe Hwy.	✓	✓	✓	✓	✓	✓	✓	✓	✓
Harrison Mill	✓	✓	✓	✓	✓	✓	✓	✓	✓
Winder Bypass	✓	✓	✓	✓	✓	✓	✓	✓	✓
Smith Cemetary	✓	✓	✓	✓	✓	✓	✓	✓	✓
Jackson Trail	✓	✓	✓	✓	✓	✓	✓	✓	✓
SR 53/Hog Mountain	✓	✓	✓	✓	✓	✓	✓	✓	✓
Cosby	✓	✓	✓	✓	✓	✓	✓	✓	✓
Wall	✓	✓	✓	✓	✓	✓	✓	✓	✓
McCarty	✓	✓	✓	✓	✓	✓	✓	✓	✓
SR 324/Statham	✓	✓	✓	✓	✓	✓	✓	✓	✓
Barber Creek	✓	✓	✓	✓	✓	✓	✓	✓	✓
Craft	✓	✓	✓	✓	✓	✓	✓	✓	✓

- ✓ Type access available
 - Type access not available
- (1) Access to general purpose lanes for all vehicle types
May only serve traffic in one direction
(2) Access to high occupancy vehicle lanes for HOV-eligible vehicles
(3) Grade separation connecting both sides of SR 316

The accessibility differences between Alternative 1 and Alternative 2 in Barrow County focus on how multi-occupant vehicles would be permitted to enter or leave the HOV lanes. None of the Full Access interchanges in Barrow County were proposed to serve the barrier separated HOV-lanes proposed in Alternative 1. Therefore, access for multi-occupant vehicles to the HOV-lanes would occur at different interchanges in Alternative 1 than in Alternative 2.

Accessibility differences in Oconee County are highlighted in Table 6-8. In the baseline condition it is assumed, for the purpose of this analysis, that existing access will remain, although GDOT could implement turning movement restrictions at some locations if future accident experience warrants access management changes. Based upon that assumption, there is full access at all 11 cross streets under the baseline condition. As defined for evaluation purposes, both Alternative 1 and Alternative 2 would reduce access to SR 316 to the five locations indicated in Table 6-8. Existing access to the general-purpose lanes would be eliminated under Alternative 1 or Alternative 2 at: Dials Mill Extension, Dials Mill Road, McNutt Creek, Mars Hill, Julian Drive and Virgil Langford. Crossover access would be provided at several locations: Dials Mill Road, McNutt Creek Road, Mars Hill and Julian Drive. The only location with current direct access to SR 316 that would be eliminated and not have the ability to cross over SR 316 under Alternative 1 and Alternative 2 is the Dials Mill Extension outside Bogart.

**Table 6-8
Accessibility By Vehicle Type - Oconee County**

Cross Street	Future Baseline			Alternative 1			Alternative 2		
	Full Access ¹	HOV Access ²	Crossover Access ³	Full Access ¹	HOV Access ²	Crossover Access ³	Full Access ¹	HOV Access ²	Crossover Access ³
Dials Mill Ext.	✓	✓	✓	✓	✓	✓	✓	✓	✓
Dials Mill	✓	✓	✓	✓	✓	✓	✓	✓	✓
Bogart Pkwy.	✓	✓	✓	✓	✓	✓	✓	✓	✓
McNutt Creek	✓	✓	✓	✓	✓	✓	✓	✓	✓
Mars Hill	✓	✓	✓	✓	✓	✓	✓	✓	✓
US 78/M. Moina Hwy.	✓	✓	✓	✓	✓	✓	✓	✓	✓
Julian Dr.	✓	✓	✓	✓	✓	✓	✓	✓	✓
Jimmy Daniel	✓	✓	✓	✓	✓	✓	✓	✓	✓
Virgil Langford	✓	✓	✓	✓	✓	✓	✓	✓	✓
Oconee Connector	✓	✓	✓	✓	✓	✓	✓	✓	✓
SR 10/Athens Loop	✓	✓	✓	✓	✓	✓	✓	✓	✓

- ✓ Type access available
 - Type access not available
- (1) Access to general purpose lanes for all vehicle types
May only serve traffic in one direction
(2) Access to high occupancy vehicle lanes for HOV-eligible vehicles
(3) Grade separation connecting both sides of SR 316

Consistent with the expectation in Barrow and Gwinnett counties, if frontage roads were to be constructed along SR 316 in Oconee County, the impact on accessibility would be significantly reduced.

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Accessibility differences between Alternative 1 and Alternative 2 in Oconee County focus on how multi-occupant vehicles enter or leave the HOV lanes. None of the full access interchanges in Oconee County were proposed to serve the barrier separated HOV-lanes proposed in Alternative 1. Therefore, access for multi-occupant vehicles to the HOV-lanes would occur at different interchanges in Alternative 1 than in Alternative 2. These differences are highlighted in Table 6-8.

Traffic Congestion. A comparative profile of horizon year traffic congestion is displayed in Figure 6-5 for the baseline condition, Alternative 1, and Alternative 2. The illustration shows the relationship between future travel demand on SR 316 and the vehicle capacity of SR 316. Where the shaded areas rise above the red line, (which represents a LOS D service volume) congestion is likely. The LOS D service volume is not the threshold associated with bottleneck conditions, but nearing it. On portions where the shaded area greatly exceeds the service volume line, there is more congestion than on those segments where the shaded area narrowly crosses the red line.

Because no significant increases to SR 316's capacity are included in the baseline condition, traffic on substantial portions of the roadway will be congested, and for longer periods of time, in the horizon year. In fact, the study predicts that by the horizon year, travel demand and roadway congestion could extend along the entire corridor. The threshold for this future congestion under the baseline condition is predicted to be the same as under the corridor's existing conditions: varying from 76,000 vehicles per day west of SR 120 and 50,000 daily vehicles east of SR 120. Existing travel demand capacity on SR 316 in Gwinnett County already exceeds the LOS D service volume. The worst congestion in the horizon year is expected to occur at the western end, between I-85 and Drowning Creek Road, just as it currently does. Alternate 1 and Alternate 2 would not likely do away with all future year congestion on SR 316; however, these two alternates would eliminate congestion from most of the corridor and dramatically reduce it in Gwinnett County, resulting in significantly improved traffic flow through the horizon year.

The design of both alternatives includes: (1) a new HOV lane in each direction for the entire length of the corridor; (2) new auxiliary lanes between I-85 and SR 120 in Gwinnett County; and, (3) a new collector-distributor roadway system between SR 120 and Winder Highway/SR 8 in Gwinnett County. These improvements substantially increase SR 316's ability to move traffic efficiently -- especially in Gwinnett County. Under Alternate 1 and Alternate 2 the daily LOS D service volume increases to 130,000 vehicles per day from Winder Highway/SR 8 to I-85. It expands to 98,000 vehicles per day east of Winder Highway/SR 8.

The study's analysis of horizon year congestion under both alternates predicts there could be varying degrees of congestion from I-85 to Drowning Creek Road. In comparison with the baseline condition, however, there would be significantly less congestion throughout the corridor under either alternative. This congestion level is indicated by the narrower amount of shaded area above the red line in Figure 6-5 on all portions of SR 316.

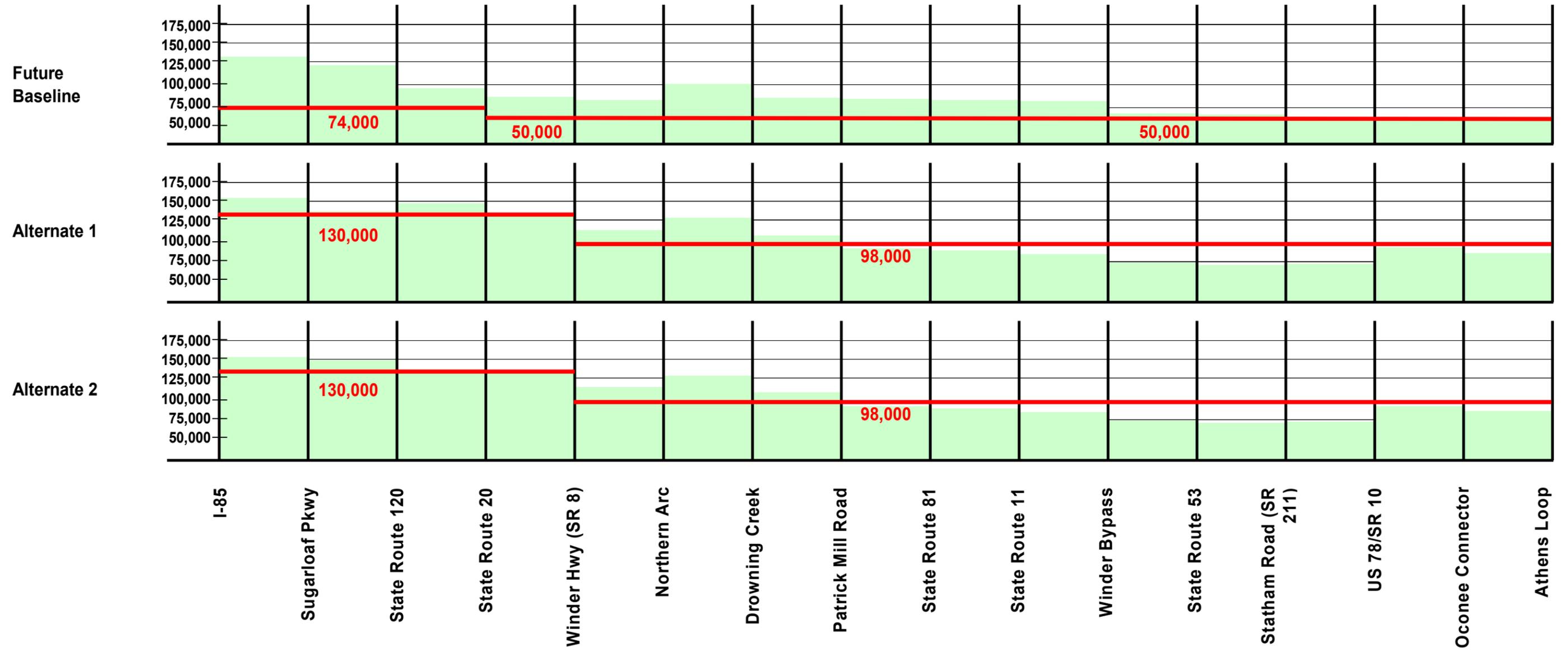
With only 20,000 to 30,000 vehicles per day above LOS D service volume on SR 316 in the horizon year between I-85 and Drowning Creek Road, Alternatives 1 and 2 will distribute traffic through the corridor roadway network much better than under the baseline condition (40,000 to 50,000 vehicles per day above LOS D service volume). Under the baseline condition, much of this additional traffic would most likely have to be absorbed by the local street system, i.e., more motorists on the local streets seeking a secondary route to complete their trip. This diversion of traffic from SR 316 could happen because these secondary roadways would appear to be as good, or better, routes to use than the primary system of roads. This situation would lead to an undesirable mix of motorists on local streets: those making local trips would be mixing with an increasing number of time sensitive, longer distance trips in the vicinity of subdivisions, schools and other community facilities. The result would be longer travel times and greater congestion for all motorists on the secondary roadways.

An important feature of both Alternate 1 and Alternate 2 is that with the HOV lanes proposed in these alternatives there will be a significant increase in the capacity to move people as opposed to just moving vehicles. HOV facilities intrinsically carry more people by offering better traffic flow to the multi-occupant vehicles. In terms of "person-movements" and "person capacity", as opposed to the movement of vehicles and vehicle capacity, Alternatives 1 and 2 will effectively offer substantially more capacity because there will be more carpools, vanpools, and users of public transportation.

Even under Alternate 1 and Alternate 2, forecasted travel demand exceeds the LOS D vehicle capacity of SR 316 in Gwinnett County and a portion of western Barrow. In order to address this increasing demand, the implementation of express bus and commuter rail service (as specifically included in the baseline condition) that would complement this study's recommendations for SR 316, will likely be needed to provide adequate commuting options within the corridor.

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**Figure 6-5
Future Year 2025 Traffic Congestion**



LEGEND

50,000 Estimated service volume (vehicles per day) for LOS D

 Estimated 2025 Daily Traffic Volume from SR 316 travel demand model