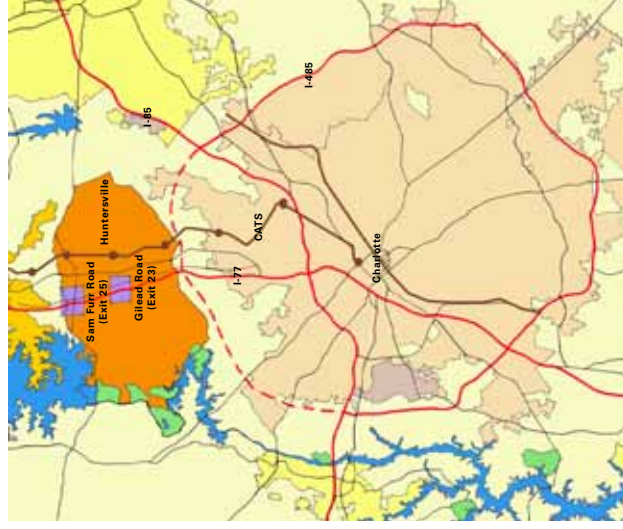


Transportation

IN THE LAST DECADE, rapid development around the Charlotte region has transformed the areas around the Gillead Road (Exit 23) and Sam Furr Road (Exit 25) interchanges from suburban fringes to important commerce centers of the town of Huntersville. This transformation has triggered a need for change in infrastructure form, particularly roadways, to accommodate a more urban density and mixed-use land use pattern. A roadway pattern that was initially laid out to support a few suburban land use parcels and convey traffic as quickly as possible to rural arterial roadways is now reaching its capacity limits. Today, the interchanges and their surrounding roadway networks are expected to support regular regional commuter traffic as well as traffic attracted by Huntersville's two thriving retail centers, new residential neighborhoods, offices and other civic uses.

The major issues, transportation strategies, traffic analysis, and conclusion, presented in this section address both the Sam Furr Road and Gillead Road study areas. While this section addresses both these study areas in general terms, specific applications will vary for each.



REGIONAL LOCATOR: Huntersville is located on the northern edge of the rapidly expanding Charlotte metropolitan area. The US 21/Gillead Road Small Area Plan is intended to complement the NC-73 (Sam Furr Road)/US-21 Small Area Plan.

The Major Issues

Triple Convergence of Traffic

As the main gateways from Huntersville to the rest of the Charlotte region, a number of traffic corridors converge at the Sam Furr Road and Gilead Road interchanges. The roadways passing through both interchange areas carry three converging types of traffic:

- 1 Regular interchanging traffic between the Interstate and the arterial roadways (Sam Furr Road and Gilead Road)
- 2 Regional east-west through traffic (with neither origin nor destination at the interchanges) that does not have options to Gilead or Sam Furr Roads
- 3 Commerce-related local traffic (i.e. residential to shopping) with destinations at the interchange areas.

These three streams of traffic strain the segments of Gilead and Sam Furr Roads between the I-77 ramps and US-21. In both cases, these short roadway segments serve eastbound and westbound traffic, as well as connecting south and northbound interstate traffic.



Triple convergence of traffic at Exit 25 (top) and Exit 23 (bottom)



Network Limitations

Adding to the problem of the converging traffic around Gilead Road and Sam Furr Road is the inherent network limitations of an interchange area. I-77 itself restricts east-west connections across town to a few limited arterials, Gilead Road and Sam Furr Road being two of the most important ones.

Farther east and west from the interchanges, residential subdivisions typical of suburban developments, have developed internal street patterns that are characterized by poor connectivity within and outside these subdivisions. In such cases, all traffic, even local (i.e. home to shopping) trips are forced onto busy arterials. In the Sam Furr area, the Northcross Shopping Center, the North Pointe Executive Park and the residential neighborhoods of Cambridge Grove and Hampton Ridge are all disconnected from the regional roadway system except through a few access points to US-21 and Sam Furr Road. A similar condition exists along Gilead Road, although to a lesser degree.

Access limitations along the interstate ramps and adjacent roadways further restrict the few available route choices available to motorists. In some cases, driveway restrictions along both US-21 and Sam Furr Road encourage more traffic to go through the intersections of US-21/Sam Furr and US-21/Gilead, causing increased congestion.



EFFECTIVE STREET NETWORK (LEFT) AND THE EXISTING STREET PATTERN These diagrams show all the effectiveness of a network of streets that contribute to the regional transportation network. The first diagram removes all streets that are cul-de-sac, and streets that do not connect to more than one roadway. Both interchanges show a very sparse network of streets resulting in a few connected links conveying both the regional and local traffic.

Poor Walkability

Both the roadway and land use arrangement in the study areas do not encourage walking and bicycling, therefore forcing all trips including potential short walking and bicycling trips, to become vehicle trips. Roads generally lack sidewalks, have few safe crossings for pedestrians, lack bicycle lanes and have large pavement corner radii at the two most important intersections. Developments have all placed parking (not their buildings) adjacent to streets, thereby degrading the roadways' quality as pedestrian routes. The inherent large blocks (super blocks) also make potential walking and bicycling to and from nearby destinations difficult.



Condition of pedestrian facilities along US-21 near the Northcross Shopping Center.

Major Transportation Strategies

The transportation strategy for NC-73 (Sam Furr Road) and Gilead Road in Huntersville is based on the following major initiatives:

IMPROVE CAPACITY THROUGH NEW LINKS AND BETTER CONNECTIVITY

The capacity needs of both the Sam Furr and Gilead corridors should be accommodated by building or connecting more supporting network throughout these roads' service corridors. Add the new network in four categories.

1. Major East/West Arterial Links Across I-77

Two new links of arterial road, both of them bridging I-77, will accommodate future (2030) travel growth in the region, without widening NC-73 beyond four lanes and Gilead Road beyond its existing two lanes.

One new link connects Bailey Drive across I-77 to the extension of Northcross Drive in the North Pointe Executive Park. This allows for an additional link between Westmoreland Road in Cornelius and Sam Furr Road, providing an alternate route for traffic to and from the North Pointe Business Park and Birkdale Village and the residential neighborhoods on the east side of I-77.

The other new network link is located south of the Sam Furr interchange, halfway between Sam Furr Road and Stumptown Road, and connects Northdowns Lane and Northcross Drive. This new link provide an alternative for local trips between the residential areas on the east side of I-77 and the Birkdale Subdivision and Golf Club and other commercial uses along the south side of NC-73.

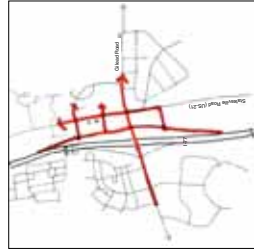
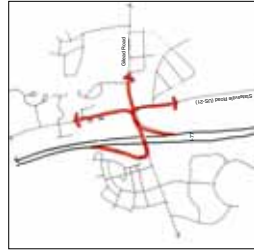
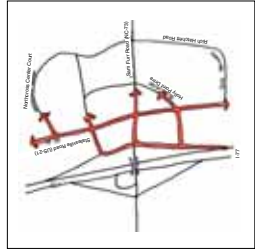
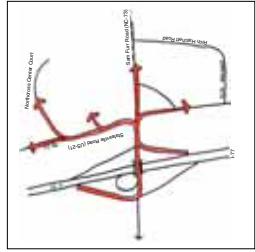


FOUR TYPES OF TRANSPORTATION IMPROVEMENTS

- 1 Major east/west arterial links across I-77
- 2 Improve interchange congestion by adding new network
- 3 New local streets at the Sam Furr/NC-21 and Gilead Road/NC-21 commercial centers
- 4 Local vehicular and pedestrian connections

2. Improve Interchange Congestion by Adding New Network

In both interchange areas, the Plan recommends some minor modification of the I-77 ramps at both Sam Furr and Gilead Roads, that provide more routes for traffic exiting or entering I-77. Specifically the Plan is to provide additional connections to and from the northbound pair of ramp (on and off ramps) that connect to US-21 and to lengthen the ramps north and south of their current location. The additional links offer an opportunity for traffic using the congested segment of NC-73 and Gilead Road between the interchange ramps and US-21 to quickly disperse via a number of route choices.



EXISTING (LEFT) AND PROPOSED (RIGHT) NETWORKS AT SAM FURR (TOP) AND GILEAD (BOTTOM) Traffic exiting the interchanges currently disperses through a limited network. The proposed network offers multiple routing choices where traffic is processed through multiple intersections.

3. New, well-connected local streets both at the Sam Furr/US-21 and the Gilead Road/US-21 commercial centers

The new network at both interchange areas extends to the east past US-21. Together with the new east-west Interstate ramps, a network of roads conveys the traffic and disperses them through the numerous route choices within the study area.

At the Sam Furr interchange area, two new north-south links are introduced in the Northcross Shopping Center by converting portions of existing private drive aisles to public streets. The new streets intersect with Sam Furr Road, and connect to existing streets (Holly Point Drive and Rich Hatchett Road) at two new signalized intersections. The new intersections facilitate regular "chopping" of queues along Sam Furr Road offering regular opportunities for otherwise frustrated drivers waiting for a gap to turn to and from developments along the congested Sam Furr Road. Instead of relying on the congested Sam Furr/US-21 intersection to handle all turning vehicles to and from US-21 and Sam Furr Road, a coordinated signal system of the three intersections where clearance times are shared, would provide more efficient traffic operations along Sam Furr Road. Similarly, at the Gilead interchange area, the drive aisle in front of Bay Shore Plaza can be converted to a public street and extended to connect Anahova Lane to Hillcrest Drive. This new street will offer an alternative route choice for vehicles coming from the neighborhoods on the south side of Gilead Road and the retail uses along Gilead Road without going on US-21.

At both interchange locations, the new network should form the "bone structure" for redeveloping the existing retail uses into village centers. With a dense framework of narrow, two-lane streets, both areas offer the opportunity to create village center blocks that support

pedestrian-friendly environments. Together with the new roads (explained above), additional minor links that function as drive aisles should be laid out as public streets (with adequate streetscape and sidewalks) to form the framework for shopping center redevelopment. Generally, a desirable pedestrian environment that allows for adequate traffic movement will have functional block perimeters of between 1,500 to 2,100 feet. This guideline can yield walkable block sizes of between 250 feet to 350 feet by 500 feet to 700 feet. With narrower streets and more walkable blocks, the Town should continue encouraging the development of buildings that address the street and have active ground floor uses.

4. Local vehicular and pedestrian connections

Various short roadway links are recommended between areas that generate local trips (i.e. between residential and retail areas, between residential and civic uses). It is also critical to connect roadway pieces that when linked together provide additional capacity to the regional network. In a number of cases, these new links connect to existing roadway stub-outs in the various neighborhoods. In other cases, the additional network can be built when new development comes on board.

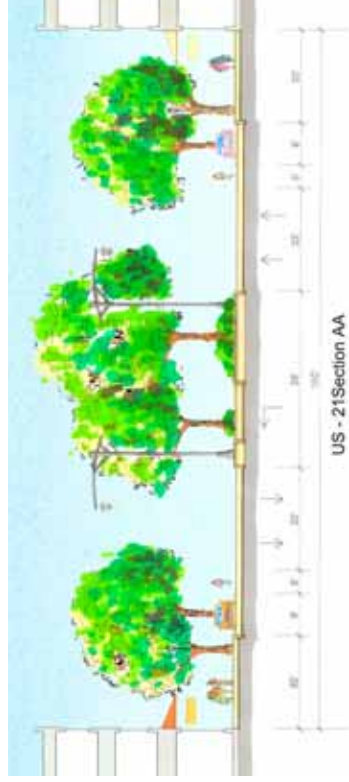
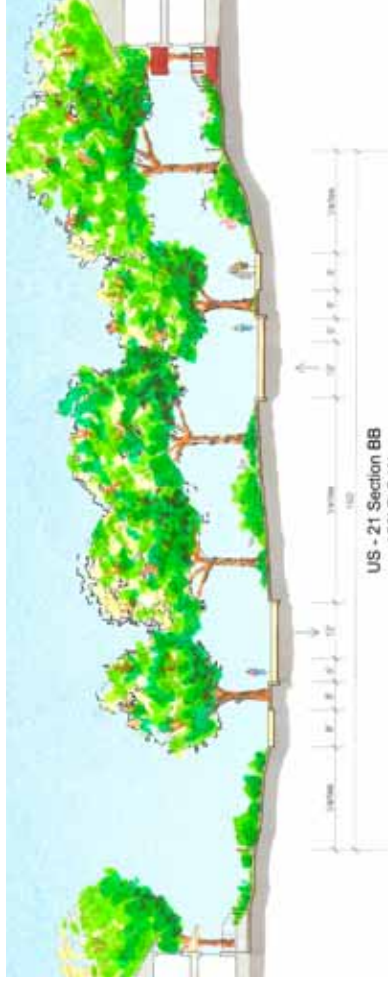
Making connections to existing streets can create concerns (cut-through traffic, safety, congestion) with existing residents. New connections and streets should therefore be designed collaboratively with the neighborhoods and integrate the wide variety of traffic calming and street alignment options available to address neighborhood concerns. In any case, all new local network links should be kept at a neighborhood scale (narrow, low-speed, two-lane roads).

WIDEN US-21 FOR LIMITED SEGMENTS

In addition to the new east-west links connecting the I-77 ramps to US-21, part of the solution for the interchange areas include the widening of US-21 to four lanes in locations essential to the network. Near the Gilead Interchange area, the Plan recommends widening US-21 to four lanes between the new off-ramp to Arabova Lane. At the Sam Furr Interchange area, the Plan recommends widening US-21 to four lanes between Northcross Center Court and Rich Hatchett Road. This limited widening yields a large increase in capacity at the two critical intersections (US-21/Sam Furr and US-21/Gilead). Further, the widening helps accommodate the increase in turning movements to and from US-21 as a result of the interchange modifications (described above) and the expected increase in commercial traffic.

The Plan recommends limiting the size of Sam Furr Road to four lanes, and Gilead Road to two lanes. East of NC-115, Sam Furr Road should remain two-lanes as it goes through a more rural setting. Similarly, south of the new off ramp, between Arabova Lane and Rich Hatchett Road and north of Northcross Center Drive, US-21 should remain two lanes.

Finally, the Plan recommends through street rebuilding measures and development regulations, appropriate streetscape and cross sections are developed for Sam Furr Road and US-21 as it transitions from "town" to "country."



US-21/STATESVILLE ROAD The plan (left) recommends widening Statesville Road (US-21) to four lanes in a limited section between Rich Hatchett Road and Northcross Center Court.

Traffic Analysis and Conclusions

The Proposed Plan Improves Traffic Flow at Interchange Areas

The traffic circulation changes described on the previous page will improve traffic flow at both the I-77/Sam Furr and I-77/Gilead Road interchanges.

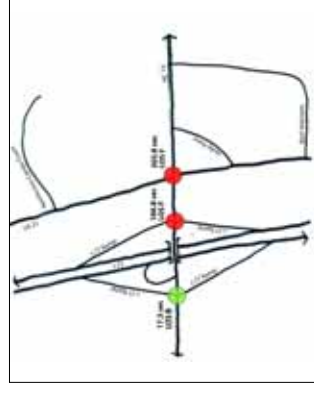
The most often cited measure of traffic performance, the intersection level of service (LOS), is defined by the Highway Capacity Manual. According to the Highway Capacity Manual (HCM 2000, Transportation Research Board), LOS is a measure of the average delay experienced by each vehicle passing through an intersection.

For this study, the LOS measured were a composite average value for all vehicles using each intersection. LOS A and B represent insignificant delay and LOS C represents generally acceptable delays. LOS D and E represent an increasing amount of delay and an increasing number of vehicles stopped at an intersection. LOS F means that the intersection is operating with excessive delays.

The following figures summarize the levels of service and the associated vehicular delay for the key intersections at both of the interchange areas.

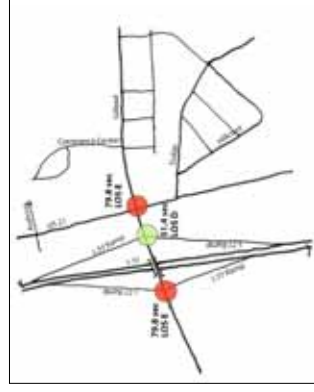
Comparison of the figures show the magnitude of improvement. The I-77/Sam Furr Ramp terminal improves from peak hour Level of Service (LOS) "F," with 167 seconds of delay per vehicle to LOS "B," with 19 seconds of delay. The Sam Furr/US-21 intersection improves from LOS F (266 seconds of delay) to LOS "D" (37 seconds).

The improvement in traffic level of service is likely to be due to two features of the proposed design: 1 The modifications to the I-77 ramps, permitting some of the traffic exiting and entering I-77 to bypass the existing ramp termination at Sam Furr Road and consequently to avoid the "dog leg" movement on the short segment of



SAM FURR INTERCHANGE AREA INTERSECTION DELAY TIME AND LOS (2005 AM PEAK HOUR VOLUMES)
Existing Volumes on Existing Network (top) and Redistributed Volumes on Proposed Network and US 21 widening (bottom)

UNDER CAPACITY
OVER CAPACITY



GILEAD INTERCHANGE AREA INTERSECTION DELAY TIME AND LOS (2005 AM PEAK HOUR VOLUMES)
Existing Volumes on Existing Network (top) and Redistributed Volumes on Proposed Network and US 21 widening (bottom)

Sam Furr Road between the end of the ramp and US-21;² The four-laning of US-21 through the US-21/Sam Furr intersection, thereby significantly increasing its vehicular capacity.

Both of these improvements are based on new network and redistributing the traffic volumes.

A similar level of improvement is likely to be provided for the Gilead/I-77 interchange area for the same reasons noted above for the Sam Furr/I-77 interchange.

Proposed Changes Will Increase Vehicular Capacity

The Critical Lane Volume (CLV), a summation of all the conflicting traffic movements at an intersection, is a reliable and easily understood measure of the extent to which vehicular volumes consume the capacity of an intersection. The CLV analysis for the key intersections in the two interchange areas (Figures C and D) show that the proposed changes will add to the available spare capacity at all four of the key intersections (i.e., the I-77 off ramps at Sam Furr Road and at Gilead Road and the US-21/Sam Furr and US-21/Gilead intersections).

Proposed Network Performs Well as a System

The two measures discussed above - intersection capacity analysis (LOS) and critical lane volume analysis (CLV) - measure the performance of individual intersections, but do not address the interactions between them. Possible interactions of particular concern are backups that could possibly extend from one intersection to the next.

A microsimulation program (the SYNCHRO software) was used to model the entire system of intersections and connecting links at

the Sam Furr/I-77 interchange area, and simulated the travel of every vehicle through the system during the a.m. peak hour of traffic. The microsimulation captured all of the interactions between individual intersections, including the possibility of backups ("spillovers") extending from one intersection to the next. Microsimulation is particularly useful in gauging the impacts of adding closely-spaced intersections along arterial highways, a situation applicable to both the US-21/Sam Furr and the US-21/Gilead areas.

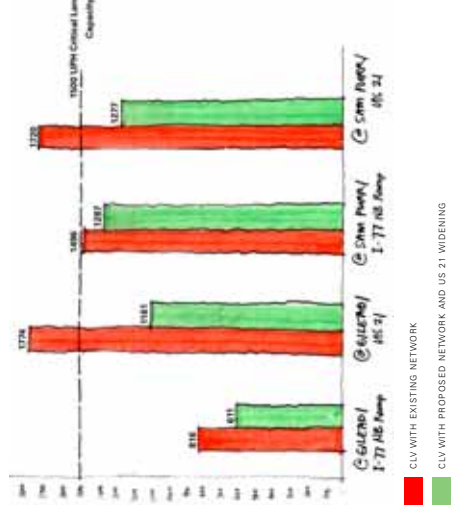
The SYNCHRO microsimulation model demonstrated conclusively that, under the current traffic volumes for the AM Peak Hour (7 to 8 a.m.) the proposed street configuration at the Sam Furr interchange area, with its added streets, intersections and traffic signals, will operate efficiently as a system, with no risk of backups impairing the overall operation. During the entire peak hour modeled, there were no instances of a queue extending from one intersection to the next upstream intersection.

Furthermore, with the addition of network improvements proposed around the Sam Furr interchange, it is expected that this interchange area will continue to operate efficiently in the design year 2030. It is also reasonable to conclude that the proposed network configuration will produce similarly beneficial results during other time periods, as the a.m. peak volumes represent the current worst-case traffic volumes for the Sam Furr interchange.

Typically, the queues on the critical road (Sam Furr Road) extended only to mid-block and occasionally to three-quarters of the block. This pattern of queue lengths well short of the block length is particularly significant for the block of Sam Furr Road between US-



LEVEL OF SERVICE (LOS) The following graphic summarizes the different LOS measures.



Critical Lane Volumes (2005 AM Peak Hour)

21 and Holly Point Drive. The short length of this proposed block and the resulting short traffic signal spacing raised concerns that westbound traffic would back up from the Sam Furr/US-21 intersection, thereby preventing traffic from entering Sam Furr Road from Holly Point Drive. The microsimulation shows conclusively that this concern is unfounded.

The short block and resulting short signalized spacing in the proposed plan simply "chops" the long queues now seen at the Sam Furr/US-21 intersection into several smaller queues, scattered among the entire series of intersections along Sam Furr Road. As a result of this fragmentation of the queue, there are no long queues blocking intersections, and the proposed network of small block and closely spaced intersections can function smoothly.

While no separate microsimulation modeling was done for the Gillead Road interchange area, we believe that the Sam Furr modeling is illustrative of the benefits of additional network for this area, given the similarity between the two interchange areas and that traffic volumes for the Sam Furr interchange area are much higher than those present at the Gillead area.

The only problems associated with queues revealed by the traffic simulation run (see graphic) were two instances of queues in left turn auxiliary lanes at the US-21/ Sam Furr intersection (one in the southbound left turn and another in the west bound left turn) extending into the through lanes. In the first instance, only single a vehicle "overflowed" the left turn lane, causing only a 3.6 seconds of

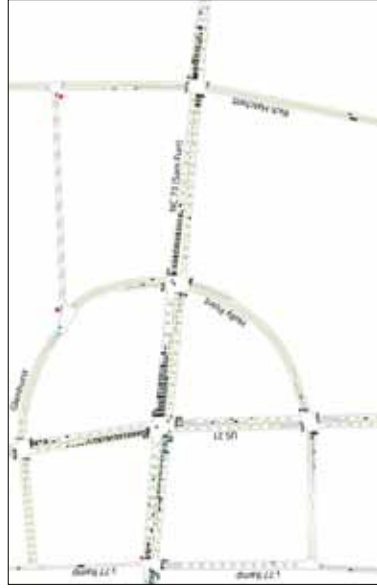
delay to through traffic. In the second instance, two vehicles overflowed the left turn lane, resulting on a delay of 7.2 seconds to through traffic.

With Proposed Network Sam Furr Road Can Remain a Four-Lane Road

With the existing road system, and the traffic growth projected for the year 2030, Sam Furr Road will require between six and eight through lanes in between the I-77 and US-21 link and six lanes between US-21 and NC-115. With the auxiliary lanes (left turn, possibly dual left turns and right turn deceleration) likely to be needed, the cross section of Sam Furr Road at intersections is likely to be 8-10 lanes, a width of pavement irreconcilably at odds with the intended character of the area.

However, with a proper network of supporting roads, Sam Furr Road through and east of the I-77 interchange area can remain a four-lane road, even with the assumptions of 25-year traffic growth. The ability to maintain a four-lane section stems from the three major network improvements incorporated into this plan and described above:

- 1 The two proposed new arterial crossings of I-77 (Bailey Road and Northdowns) will remove some 9,000-11,200 daily vehicles from Sam Furr Road in the year 2030. These two new crossings will serve important origin/destination pairs within the Huntersville/Cornelius communities, such as Cornelius-Birkdale, northeast Huntersville-Birkdale, southeast Huntersville-Birkdale, and northwest Huntersville-Northcross



TRAFFIC SIMULATION The following figures are snap shots from a traffic simulation run demonstrating the "queue chopping" phenomenon. Long queues along Sam Furr Road were "chopped" along the four signals at I-77 Ramps, at US-21, at Holly Point Drive, and at Rich Hatchett Road. None of the queues extended past the downstream intersection.

- 2 The proposed new local street connections will remove some 3,700 daily vehicles from Sam Furr between I-77 and US-21, and 3,000 daily vehicles from Sam Furr Road between US-21 and NC 115. Most of this reduction is attributable to short trips between origins/destinations adjacent or nearly adjacent to Sam Furr Road; for example, between Northcross shopping center and its immediately adjacent neighbors; between residences south of Sam Furr Road and shopping and employment destinations north of it.
- 3 The proposed modifications to the I-77 ramps will remove 3,800 daily vehicles from Sam Furr Road between the I-77 ramp and US-21. Much of this reduction is due to the elimination of "dog-leg" movements between the I-77 off ramp and US-21 northbound. These volume reductions are found in Table 1 on page 32 of this report.
- The combined impact of these traffic reductions due to the proposed network will allow Sam Furr Road to carry year 2030 traffic, at acceptable levels of service, while maintaining a four-lane cross section. Maintaining this four-lane road width is critical for the efficient functioning of the NC-73 and US-21 arterials for both vehicular and pedestrian traffic.
- A four lane road width is also critical for accommodating pedestrian crossings at minor intersections (such as the Sam Furr/Holly Point intersection proposed for signalization). With wide cross sections on Sam Furr Road (six or more lanes), the pedestrian crossing time greatly exceeds the needed cross street green time at signals, resulting in both reduced traffic capacity and minimal pedestrian crossing time.
- With a four-lane Sam Furr Road, simple two-phase signal operation can be maintained at minor intersections being proposed for signalization. Two-phase control (no protected left-turn phase) maximizes traffic capacity, permits more generous pedestrian crossing times, and is a retail friendly measure.
- Important urban design features (framing the street with street trees, enclosing the street with fronting buildings, attractive usable sidewalks), possible with a four-lane street, become unachievable with a six-lane road and its inevitable auxiliary lanes.

TABLE 1

PROJECTED VOLUME, YEAR 2030 (ADT)	YEAR 2030 DAILY TRIPS, SAM FURR ROAD	
	I-77 TO US 21	US 21 TO NC 115
Model ¹	32,600	33,200
Adjusted ²	34,600	40,500
THROUGH LANES NEEDED ON SAM FURR ROAD (EXISTING NETWORK) ³	6 lanes	6 lanes
REDUCTIONS IN VOLUME, YEAR 2030, DUE TO PROPOSED NETWORK		
Two New I-77 Crossings ⁴	11,200	9,000
Local Connections ⁵	3,700	3,000
I-77 Interchange Modifications ⁶	3,800	nil
Total Reduction in Traffic on Sam Furr Road	18,700	12,000
YEAR 2030 VOLUME, ADJUSTED FOR PROPOSED NETWORK ⁷	15,900	28,500
THROUGH LANES NEEDED ON SAM FURR ROAD (PROPOSED NETWORK) ¹	4 lanes	4 lanes

¹ CDOT Year 2030 Projections
² Adjustment by Huntersville staff, 6/30/05, to calibrate base year (2000) model results to ground counts. Average of unadjusted and fully adjusted projections.
³ Based on 32,400 ADT capacity for 4-lane road and 48,600 for 6-lane road. Capacities based on Level of Service "E," saturation flow of 1,700 vehicles per lane per hour, 42% green time for major flow, 55/45% east/west directional split, and "K" factor of .08. "K" factor represents the proportion of the average annual daily traffic (AADT) expected to occur in the design hour. The "K" factor is also known as the design hour factor.
⁴ Based on daily trip generation of 30,000 trips at Birkdale Village's retail area, 20,000 trips for Birkdale Village's residential area, 4,400 for North Pointe Executive Park, and 10,000 for Northcross Shopping Center. For these trip generators, fractions ranging from 5 to 20 percent (based on location) would have options to the use of Sam Furr Road, with reductions in travel time, if the two new bridges across I-77 were in place. Assuming that 60-75 percent of trips with these new options (depending on origin/destination pair) would choose the shortest path, a total of 11,200 trips would be diverted from Sam Furr Road to the west of I-77. To the east, the estimate is scaled down by 20 percent, yielding 9,000 trips.
⁵ Based on total travel generated by 5 clusters of trip generators along Sam Furr Road. Of the total travel generated by these clusters, portions ranging from 6 to 10 percent were estimated to benefit from improved travel time due to local network connections. Local network connections were assumed to be used by 50-75 percent of those motorists who would benefit from their use. A total of 3,700 trips diverted to local network use were computed, by this methodology, for areas to the west of I-77, to the east of I-77, 80 percent of this amount, or 3,000 daily trips, was assumed.
⁶ From Capacity Analysis, Gilead and Sam Furr interchanges.
⁷ "Adjusted" projected volume year 2030 (line 2) less "total reduction in traffic on Sam Furr Road" (line 7).

NOTE ON FUTURE YEAR TRAFFIC PROJECTIONS

Currently available traffic projections (Average Daily Traffic or ADT) for the year 2030 of 32,600 vehicles west of I-77 and 33,200 vehicles to the east of I-77 are subject to a wide range of interpretation. The "base year" (year 2000) traffic predicted by the model underestimates the existing travel. If a reasonable "correction factor", bringing base year estimates into conformity with actual counts, is applied to the year 2030 forecasts, the year 2030 ADT increases to 34,600 to the west of I-77 and 40,500 to the east.

The uncertainty associated with travel demand forecasts underscores again the importance of Huntersville planning roads on the basis of vision for the Town, rather than on traffic forecasts. In the face of uncertain traffic forecasts, the best approach to accommodate future travel demand in the study areas is the development of a full and well connected road network, rather than widening a single arterial road (i.e., Sam Furr Road) to 7-lane or 9-lane cross sections, which is incompatible with the Town's long term transportation vision.

Implementation and Preliminary Cost Estimates

The proposed transportation solutions for Sam Furr and Gillead interchanges can be “packaged” into different improvement projects. The following lists rank these project packages based on the potential benefits they would provide to the study areas (1 being the most beneficial). The list provides a preliminary prioritization of projects as well as an understanding of the project’s relative cost impacts.

Gillead Interchange Area Improvements

Key	Project	Construction Cost*	ROW Cost	Total Cost	Timing
1	New ramps New ramps to Gillead Road New ramps to US 21	2,800,000	2,700,000	5,500,000	Short to Medium Term
		1,600,000	900,000	2,500,000	
2	US 21 widening	3,200,000	0	3,200,000	Short to Medium Term
3	Network around retail center	4,500,000	2,600,000	7,100,000	Short to Medium Term
4	Neighborhood connections Construction and ROW Cost Preliminary Engineering and Construction Engineering Inspection Estimated Project Cost	5,900,000	1,000,000	6,900,000	Short to Long Term
				25,200,000	
				34,020,000	

*Figures exclude costs for intersections, traffic signals, design and construction inspection. Figures include estimated landscaping costs.

