

## **5. Updated Traffic Modeling for the Managed-Lane Element of the Project**

To move forward with the proposed project, the project team undertook a number of traffic modeling activities using the new ARC 2008 Travel Demand Forecasting Model. In part due to reduced funding available to GDOT for the construction and operation of the proposed project, GDOT re-considered the use of different types of managed lanes. The No-Build Alternative and several managed-lane concepts were evaluated using the same measures of effectiveness as presented in the AA/DEIS. Specific measures of effectiveness include average daily traffic volumes, peak period traffic volumes by directional flow and the flow splits for the directional flows, vehicle and person throughput, miles traveled, and hours traveled. This chapter summarizes the results of the modeling and Attachment C is a complete compendium of the travel demand forecasting results.

The project team made a number of assumptions for the travel demand forecasting. These assumptions include the following:

- The proposed additional general-purpose lane in each direction on I-575 that has been included in the ARC 2008-2013 TIP has been included in the No-Build Alternative. As such, these improvements also have been included for each of the build concepts.
- No improvements to I-285 have been included because they have not been defined.
- Vehicles with three or more occupants would be allowed to use the managed-lanes without paying a toll under each of the build concepts.
- For all of the managed lanes, a fixed tolling rate of \$0.40 per mile was assumed (GTP 2009).

### **5.1 Average Daily Traffic**

The first measure of effectiveness evaluates the average number of vehicles (all modes) that would use the 2035 No-Build Alternative compared to the bi-directional concept and two reversible-lane concepts (see Table 5-1). The evaluation is performed for three points along I-75 and one point along I-575. Both southbound and northbound traffic volumes are combined. The No-Build Alternative forecast traffic volumes along I-75 would increase substantially at the southern portion of the corridor compared to the northern portion in 2035. Specifically, the traffic volumes increase from about 179,000 at the north end to 340,000 at the south end – a near doubling of traffic volume along the corridor. In contrast, traffic volumes in the I-575 corridor are fairly constant at about 115,000 per day.



**Table 5-1. Average Daily Traffic Volumes by Lane Group, 2035**

| Location             | No-Build | Concept A | Concept B1 | Concept B2 | Concept C |
|----------------------|----------|-----------|------------|------------|-----------|
| <b>I-75</b>          |          |           |            |            |           |
| North of I-575       |          |           |            |            |           |
| Managed Lanes        |          | 26,000    | 18,000     | 17,000     | 26,000    |
| GP Lanes             | 179,000  | 174,000   | 173,000    | 173,000    | 174,000   |
| Total: All Lanes     | 179,000  | 200,000   | 191,000    | 189,000    | 200,000   |
| S of Allgood Rd      |          |           |            |            |           |
| Managed Lanes        |          | 49,000    | 30,000     | 31,000     | 45,000    |
| GP Lanes             | 266,000  | 258,000   | 257,000    | 256,000    | 264,000   |
| Total: All Lanes     | 266,000  | 307,000   | 287,000    | 288,000    | 309,000   |
| N of Terrell Mill Rd |          |           |            |            |           |
| Managed Lanes        |          | 60,000    | 36,000     | 36,000     | 50,000    |
| GP Lanes             | 340,000  | 322,000   | 326,000    | 325,000    | 331,000   |
| Total: All Lanes     | 340,000  | 382,000   | 362,000    | 361,000    | 381,000   |
| <b>I-575</b>         |          |           |            |            |           |
| North of I-75        |          |           |            |            |           |
| Managed Lanes        |          | 23,000    | 12,000     | 15,000     | 19,000    |
| GP Lanes             | 115,000  | 109,000   | 110,000    | 110,000    | 117,000   |
| Total: All Lanes     | 115,000  | 133,000   | 123,000    | 124,000    | 135,000   |

Notes:

GP = general-purpose lanes

Comparison of the No-Build Alternative to the bi-directional Concept A shows that this concept with one to two additional managed lanes in each direction on both I-75 and I-575 increases the total average daily traffic volumes by between 12-15 percent on I-75 and about 15 percent on I-575. Up to 60,000 vehicles daily would be using the managed lanes in the southern portion of I-75 and about 23,000 additional vehicles would be using the I-575 managed lanes. Though the number of general-purpose lanes would not change, the traffic volumes have decreased somewhat, thereby slightly lessening traffic congestion in the general-purpose lanes. Note that the number of additional vehicles using the managed-lane system far exceeds the slight decrease in number of vehicles using the general purpose lanes.

Comparison of the bi-directional concept with the two reversible-lane concepts shows that on a daily basis the average number of vehicles using I-75 and I-575 in all cases exceeds the No-Build Alternative. Concept C may be equal to, or slightly exceed, the average daily traffic volumes of the bi-directional concept. Like the bi-directional concept, the reversible-lane concepts result in a reduction in congestion in the general-purpose lanes with substantial numbers of vehicles diverting to the managed lanes.

## 5.2 Peak Period Traffic Volumes

Peak period traffic volumes, as opposed to the average daily traffic volumes discussed above, provide a better understanding of the forecast traffic volumes during the periods when congestion is most severe. Table 5-2 and Table 5-3 below show AM and PM peak period traffic for I-75 and I-575. Traffic volumes are forecast for 12 points along I-75 and 11 points along I-575. The data also shows traffic volumes for southbound and northbound traffic.

Figure 5-1 through Figure 5-5 illustrate the 2035 peak period volumes for the No-Build Alternative and Concepts A through C, including general-purpose and managed-lane volumes, and the peak period directional splits.

For the No-Build Alternative, southbound traffic volumes clearly increase from north to south during the AM peak period, but they do not show continual increases from one point to the next. Rather, there are intermediate locations where congestion is higher, particularly near interchanges serving Marietta. But, because much of the traffic is southbound towards the region's major job centers to the south, traffic volumes southbound are substantially higher than northbound traffic. As expected, PM peak period traffic volumes are substantially higher in the northbound direction compared to the southbound direction of flow. Generally speaking, traffic volumes during the PM peak period are higher for the same locations as southbound traffic during the AM peak period.

The bi-directional system Concept A provides additional capacity to I-75 and I-575 in both directions. And the forecast 2035 traffic volumes for this concept show consistently higher volumes southbound for the AM peak period as well as the northbound traffic volumes for the PM peak period. The segment with the highest traffic volumes is the I-75 segment between Delk Road and Terrell Mill Road. During AM peak periods, southbound traffic volumes increase from about 46,000 to almost 55,000, nearly a 21 percent increase compared to the No-Build Alternative. During the PM peak period, northbound traffic volumes at Delk Road increase from about 54,000 to almost 65,000. In comparison, traffic volumes during AM and PM peak period off-peak directional flows are only slightly increased. At Delk Road, northbound AM peak period traffic volumes are almost 35,000 compared to 33,000 for northbound AM peak period traffic for the No-Build Alternative. Similar patterns are shown for the AM and PM southbound and northbound traffic volumes, respectively.

**Table 5-2. AM Peak Period Traffic Volume by Directional Flow, 2035**

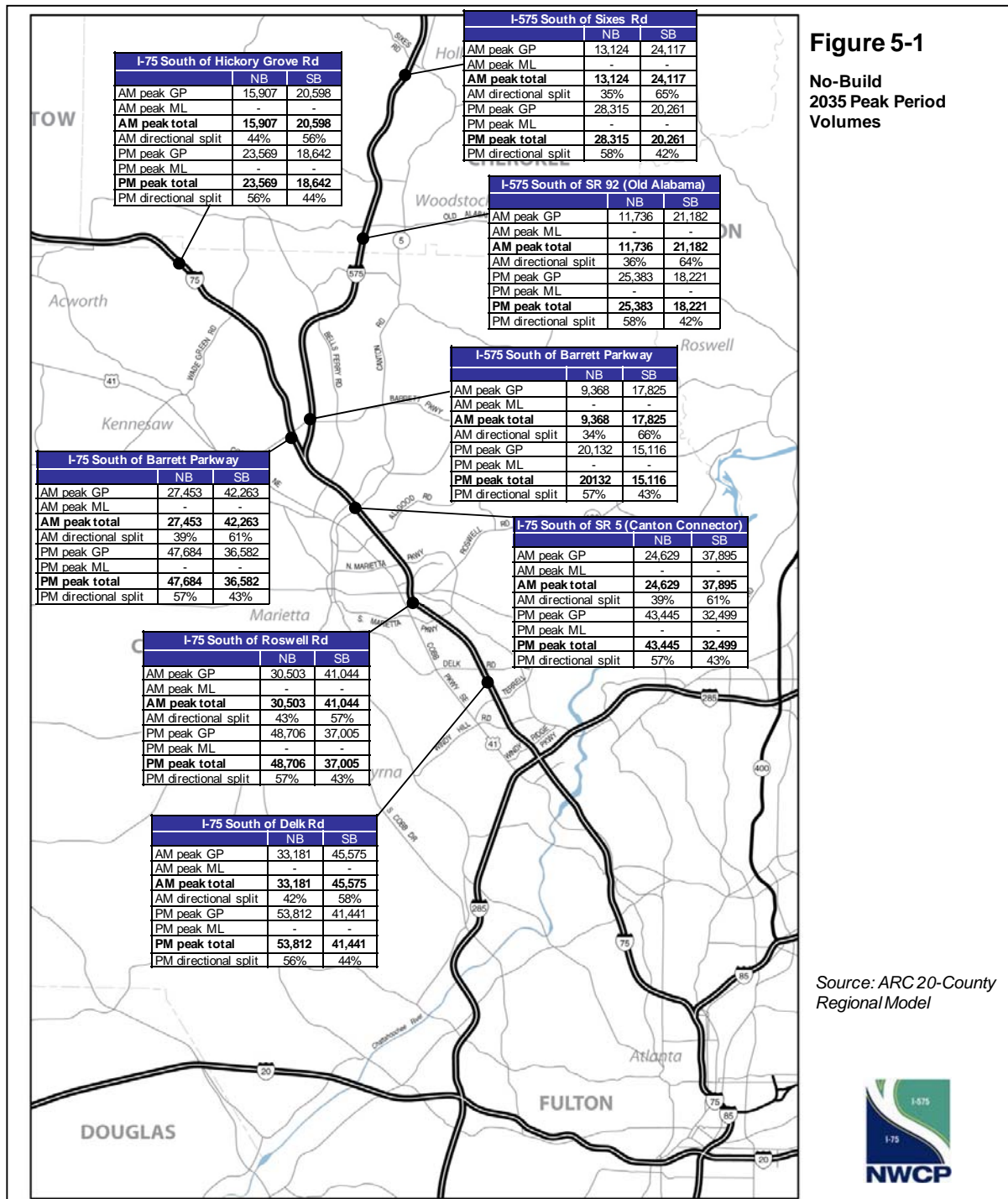
| Location               | No-Build |        | Concept A |        | Concept B1 |        | Concept B2 |        | Concept C |        |
|------------------------|----------|--------|-----------|--------|------------|--------|------------|--------|-----------|--------|
|                        | SB       | NB     | SB        | NB     | SB         | NB     | SB         | NB     | SB        | NB     |
| <b>I-75</b>            |          |        |           |        |            |        |            |        |           |        |
| S of I-75 North Limit  | 21,000   | 16,000 | 22,000    | 16,000 | 22,000     | 16,000 | 22,000     | 16,000 | 22,000    | 16,000 |
| S of Hickory Grove Rd  | 21,000   | 16,000 | 24,000    | 17,000 | 24,000     | 16,000 | 24,000     | 16,000 | 25,000    | 16,000 |
| S of Wade Green Rd     | 21,000   | 16,000 | 25,000    | 16,000 | 24,000     | 16,000 | 24,000     | 16,000 | 25,000    | 16,000 |
| S of Chastain Rd       | 21,000   | 16,000 | 25,000    | 16,000 | 24,000     | 16,000 | 24,000     | 16,000 | 25,000    | 16,000 |
| S of Big Shanty Rd     | 21,000   | 17,000 | 25,000    | 18,000 | 25,000     | 17,000 | 25,000     | 17,000 | 28,000    | 17,000 |
| S of Barrett Pkwy      | 24,000   | 18,000 | 29,000    | 19,000 | 28,000     | 18,000 | 28,000     | 18,000 | 31,000    | 18,000 |
| S of I-75/I-575        | 42,000   | 27,000 | 52,000    | 29,000 | 50,000     | 28,000 | 48,000     | 28,000 | 55,000    | 29,000 |
| S of Canton Rd         | 38,000   | 25,000 | 48,000    | 26,000 | 46,000     | 25,000 | 44,000     | 25,000 | 51,000    | 26,000 |
| S of N Marietta Pkwy   | 32,000   | 25,000 | 43,000    | 26,000 | 42,000     | 25,000 | 40,000     | 25,000 | 46,000    | 25,000 |
| S of Roswell Rd        | 32,000   | 25,000 | 43,000    | 27,000 | 42,000     | 25,000 | 41,000     | 25,000 | 47,000    | 25,000 |
| S of S Marietta Pkwy   | 41,000   | 31,000 | 51,000    | 32,000 | 49,000     | 31,000 | 49,000     | 31,000 | 54,000    | 32,000 |
| S of Dek Rd            | 46,000   | 33,000 | 55,000    | 35,000 | 53,000     | 34,000 | 53,000     | 34,000 | 58,000    | 34,000 |
| <b>I-575</b>           |          |        |           |        |            |        |            |        |           |        |
| S of I-575 North Limit | 17,000   | 10,000 | 19,000    | 10,000 | 18,000     | 10,000 | 18,000     | 10,000 | 20,000    | 11,000 |
| S of Sixes Rd          | 23,000   | 12,000 | 21,000    | 12,000 | 21,000     | 12,000 | 20,000     | 12,000 | 22,000    | 13,000 |
| S of Rope Mill Rd      | 23,000   | 12,000 | 26,000    | 13,000 | 25,000     | 12,000 | 25,000     | 13,000 | 27,000    | 13,000 |
| S of Town Lake Pkwy    | 24,000   | 13,000 | 27,000    | 14,000 | 26,000     | 13,000 | 26,000     | 13,000 | 29,000    | 14,000 |
| S of Dupree Rd         | 24,000   | 13,000 | 27,000    | 14,000 | 26,000     | 13,000 | 28,000     | 13,000 | 29,000    | 14,000 |
| S of SR 92             | 21,000   | 12,000 | 25,000    | 13,000 | 24,000     | 12,000 | 25,000     | 12,000 | 27,000    | 13,000 |
| S of Shallowford Rd    | 21,000   | 12,000 | 25,000    | 13,000 | 24,000     | 12,000 | 23,000     | 12,000 | 27,000    | 13,000 |
| S of Bells Ferry Rd    | 23,000   | 12,000 | 27,000    | 13,000 | 26,000     | 12,000 | 25,000     | 12,000 | 29,000    | 13,000 |
| S of Chastain Rd       | 21,000   | 12,000 | 25,000    | 13,000 | 25,000     | 13,000 | 23,000     | 12,000 | 26,000    | 13,000 |
| S of Big Shanty Rd     | 21,000   | 12,000 | 25,000    | 13,000 | 25,000     | 13,000 | 23,000     | 12,000 | 26,000    | 13,000 |
| S of Barrett Pkwy      | 18,000   | 9,000  | 23,000    | 10,000 | 22,000     | 10,000 | 20,000     | 10,000 | 24,000    | 10,000 |

Note:  
SB = southbound  
NB = northbound

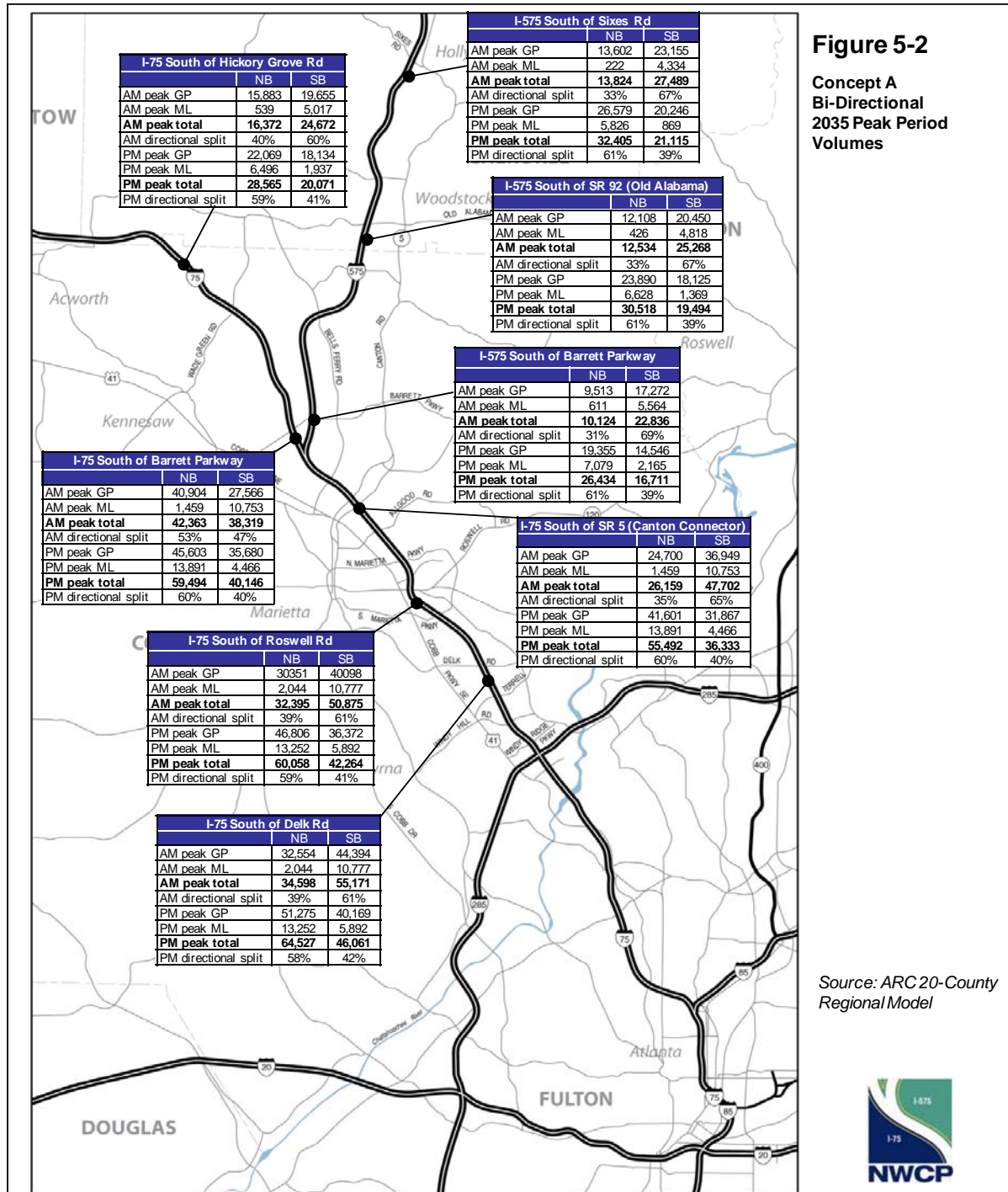
**Table 5-3. PM Peak Period Volume by Directional Flow, 2035**

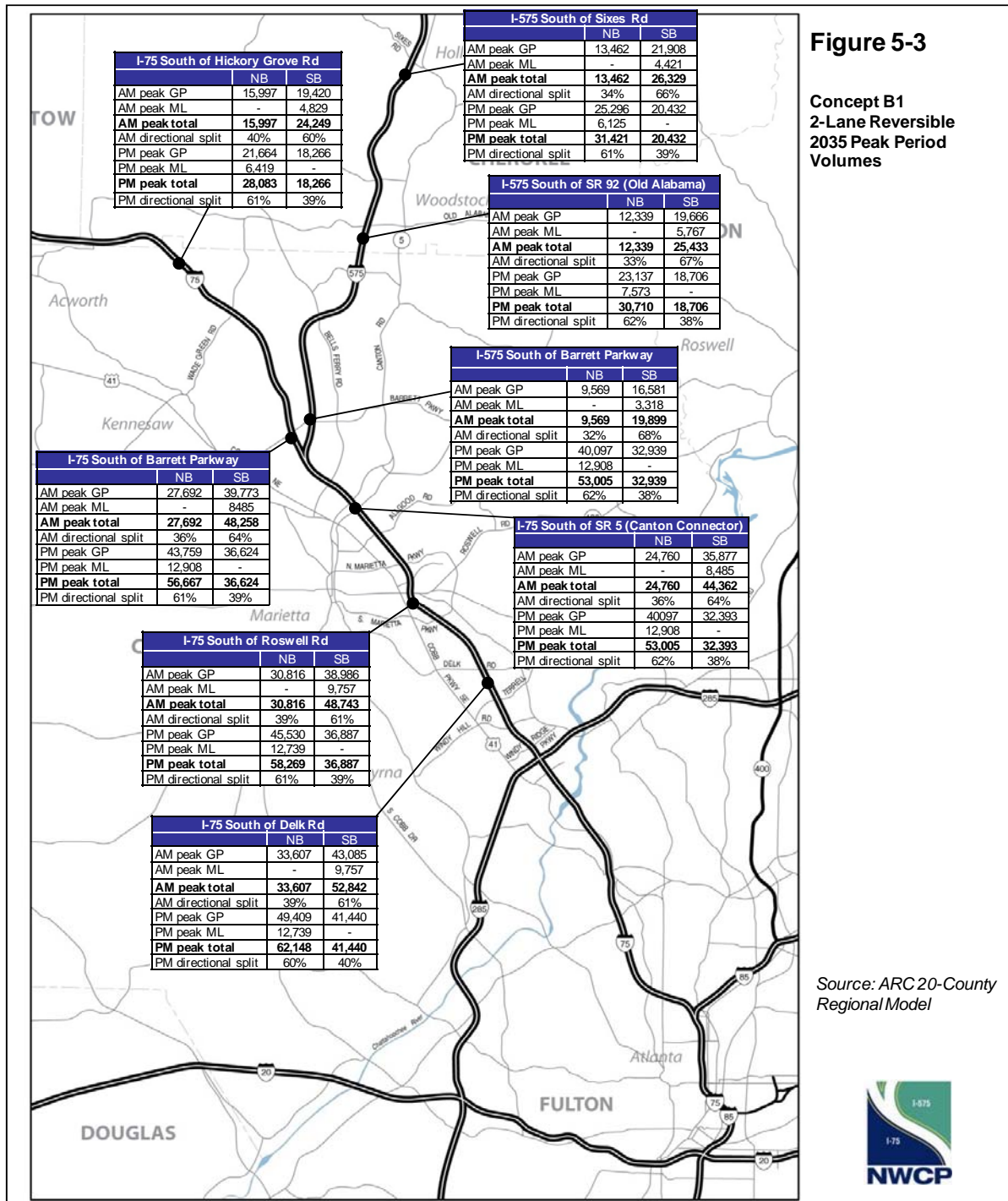
| Location               | No-Build |        | Concept A |        | Concept B1 |        | Concept B2 |        | Concept C |        |
|------------------------|----------|--------|-----------|--------|------------|--------|------------|--------|-----------|--------|
|                        | SB       | NB     | SB        | NB     | SB         | NB     | SB         | NB     | SB        | NB     |
| <b>I-75</b>            |          |        |           |        |            |        |            |        |           |        |
| S of I-75 North Limit  | 19,000   | 26,000 | 20,000    | 27,000 | 19,000     | 27,000 | 19,000     | 27,000 | 19,000    | 28,000 |
| S of Hickory Grove Rd  | 19,000   | 26,000 | 21,000    | 30,000 | 19,000     | 30,000 | 19,000     | 29,000 | 19,000    | 30,000 |
| S of Wade Green Rd     | 19,000   | 24,000 | 20,000    | 29,000 | 19,000     | 28,000 | 18,000     | 28,000 | 19,000    | 29,000 |
| S of Chastain Rd       | 19,000   | 24,000 | 20,000    | 29,000 | 19,000     | 28,000 | 18,000     | 28,000 | 19,000    | 29,000 |
| S of Big Shanty Rd     | 19,000   | 23,000 | 22,000    | 29,000 | 20,000     | 29,000 | 19,000     | 28,000 | 20,000    | 33,000 |
| S of Barrett Pkwy      | 21,000   | 28,000 | 23,000    | 33,000 | 22,000     | 33,000 | 21,000     | 32,000 | 22,000    | 37,000 |
| S of I-75/I-575        | 37,000   | 48,000 | 40,000    | 59,000 | 37,000     | 58,000 | 37,000     | 57,000 | 38,000    | 64,000 |
| S of Canton Rd         | 32,000   | 43,000 | 36,000    | 55,000 | 33,000     | 55,000 | 32,000     | 53,000 | 34,000    | 61,000 |
| S of N Marietta Pkwy   | 29,000   | 37,000 | 33,000    | 50,000 | 29,000     | 50,000 | 29,000     | 48,000 | 30,000    | 56,000 |
| S of Roswell Rd        | 29,000   | 37,000 | 35,000    | 50,000 | 29,000     | 49,000 | 29,000     | 48,000 | 30,000    | 55,000 |
| S of S Marietta Pkwy   | 37,000   | 49,000 | 42,000    | 60,000 | 37,000     | 59,000 | 37,000     | 58,000 | 37,000    | 65,000 |
| S of Delk Rd           | 41,000   | 54,000 | 46,000    | 65,000 | 42,000     | 63,000 | 41,000     | 62,000 | 42,000    | 69,000 |
| <b>I-575</b>           |          |        |           |        |            |        |            |        |           |        |
| S of I-575 North Limit | 16,000   | 20,000 | 16,000    | 21,000 | 16,000     | 21,000 | 16,000     | 21,000 | 16,000    | 22,000 |
| S of Sixes Rd          | 19,000   | 26,000 | 19,000    | 24,000 | 19,000     | 23,000 | 19,000     | 23,000 | 20,000    | 24,000 |
| S of Rope Mill Rd      | 19,000   | 26,000 | 20,000    | 30,000 | 19,000     | 29,000 | 19,000     | 29,000 | 20,000    | 32,000 |
| S of Town Lake Pkwy    | 20,000   | 28,000 | 21,000    | 32,000 | 20,000     | 32,000 | 20,000     | 31,000 | 21,000    | 34,000 |
| S of Dupree Rd         | 20,000   | 28,000 | 21,000    | 32,000 | 20,000     | 32,000 | 20,000     | 33,000 | 21,000    | 34,000 |
| S of SR 92             | 18,000   | 25,000 | 19,000    | 31,000 | 18,000     | 30,000 | 19,000     | 31,000 | 19,000    | 32,000 |
| S of Shallowford Rd    | 18,000   | 25,000 | 19,000    | 31,000 | 18,000     | 30,000 | 19,000     | 30,000 | 19,000    | 32,000 |
| S of Bells Ferry Rd    | 19,000   | 26,000 | 20,000    | 31,000 | 19,000     | 31,000 | 19,000     | 30,000 | 20,000    | 33,000 |
| S of Chastain Rd       | 18,000   | 23,000 | 19,000    | 29,000 | 18,000     | 28,000 | 18,000     | 28,000 | 19,000    | 29,000 |
| S of Big Shanty Rd     | 18,000   | 23,000 | 19,000    | 29,000 | 18,000     | 28,000 | 18,000     | 27,000 | 19,000    | 29,000 |
| S of Barrett Pkwy      | 15,000   | 20,000 | 17,000    | 26,000 | 16,000     | 26,000 | 15,000     | 24,000 | 16,000    | 27,000 |

Note:  
SB = southbound  
NB = northbound







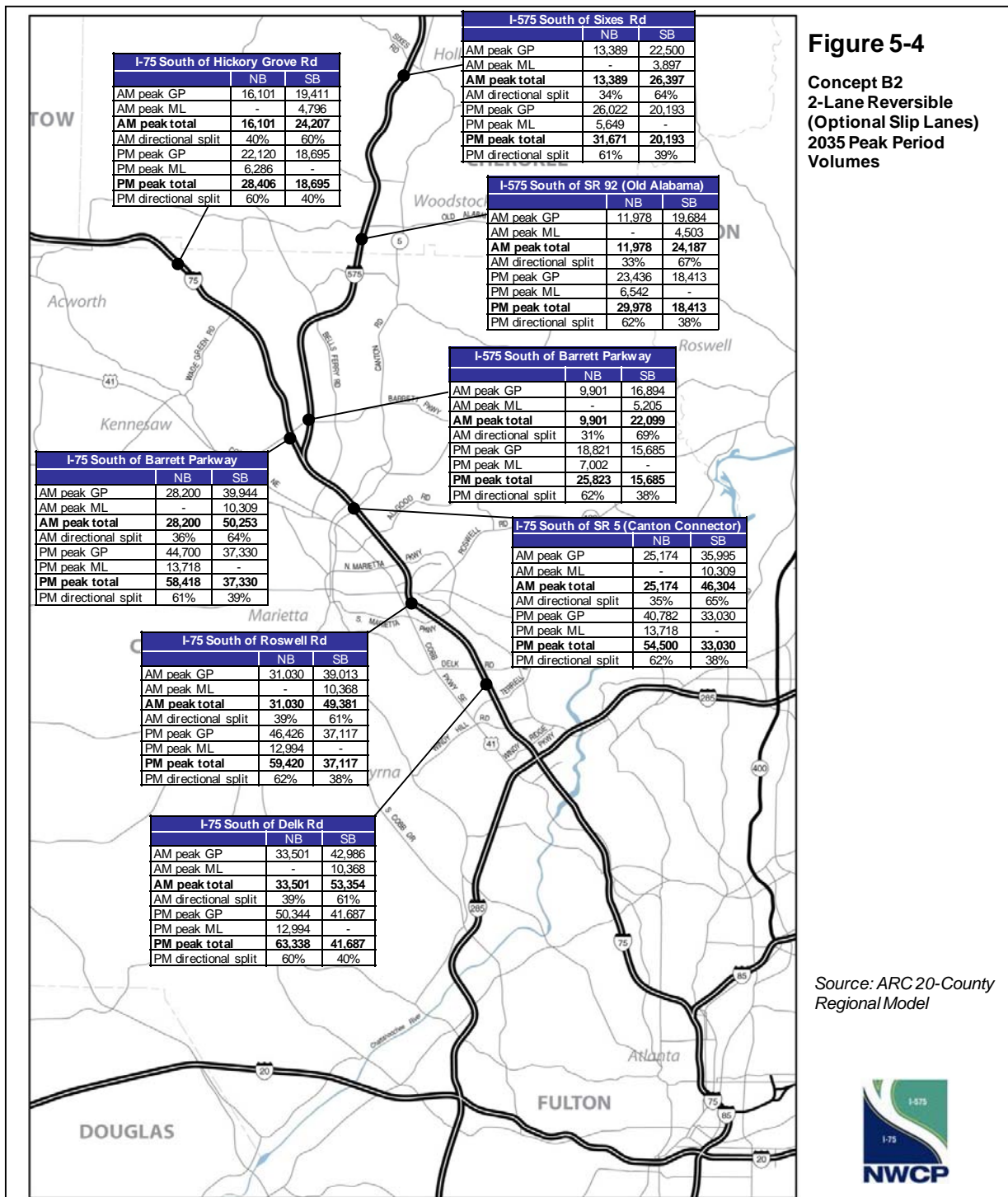


**Figure 5-3**

**Concept B1  
2-Lane Reversible  
2035 Peak Period  
Volumes**

Source: ARC20-County  
Regional Model





**Figure 5-4**

**Concept B2  
2-Lane Reversible  
(Optional Slip Lanes)  
2035 Peak Period  
Volumes**

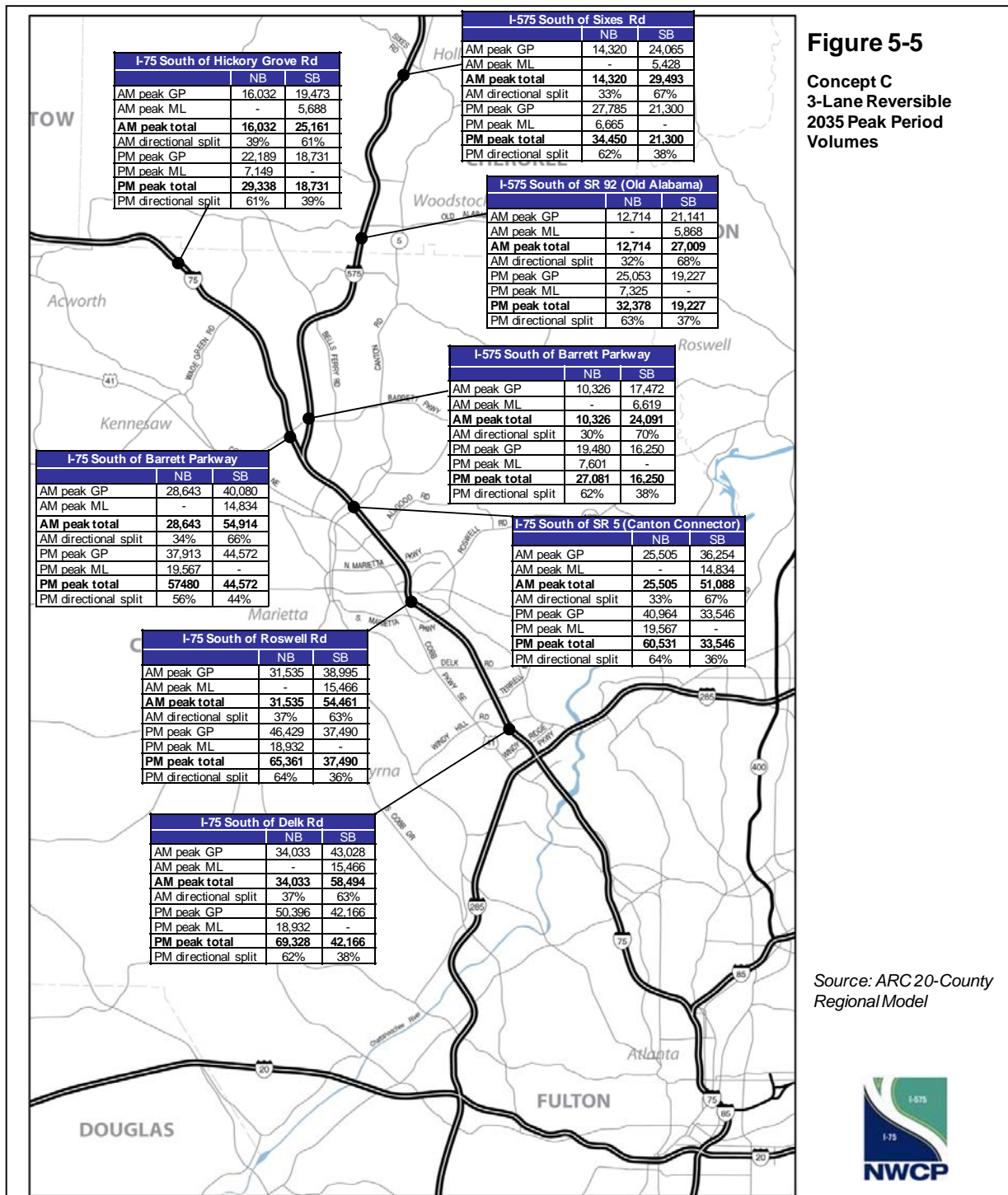
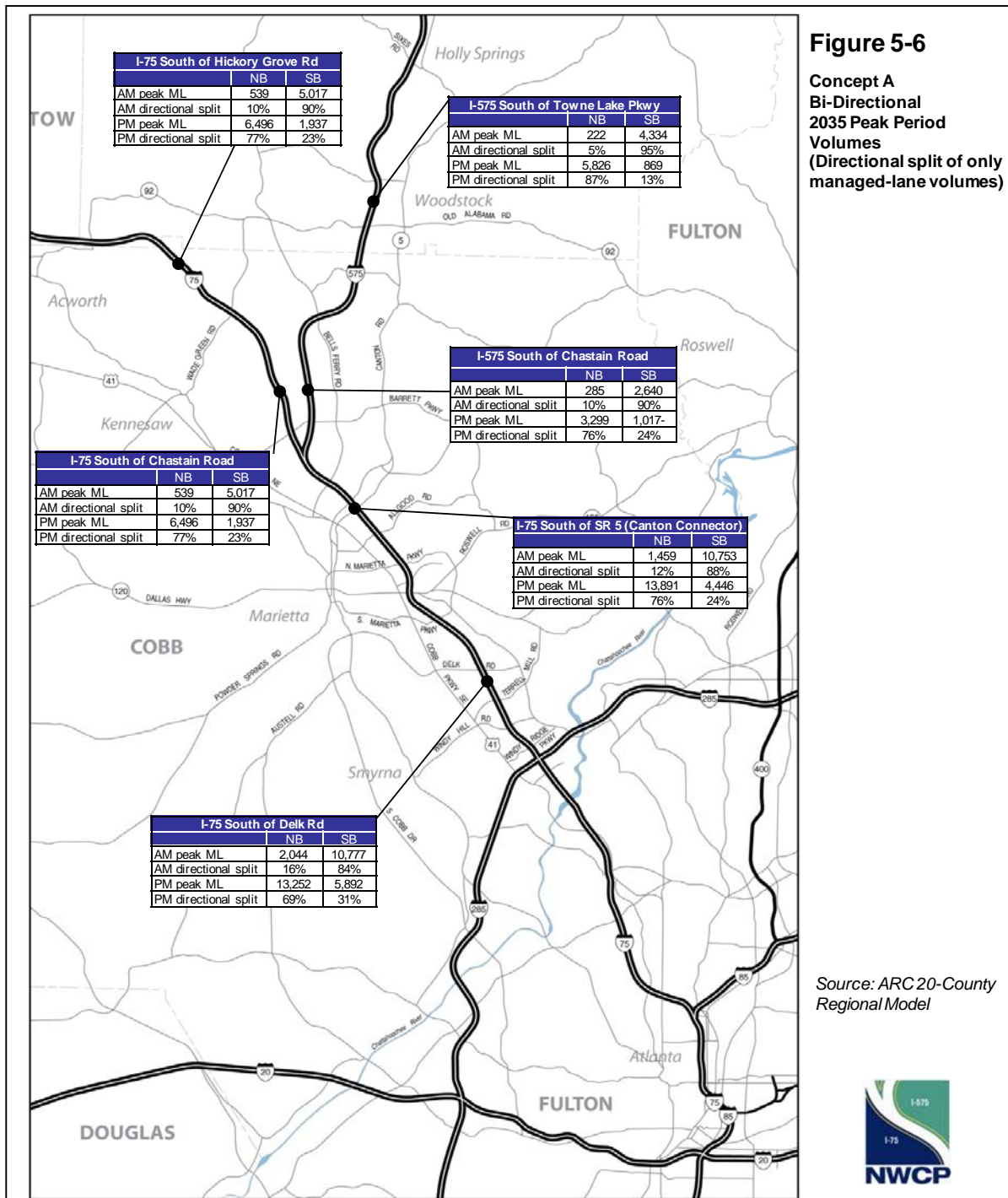


Figure 5-6 was added to illustrate the directional split for Concept A as a function of the managed-lane traffic only. The directional split for the managed lanes is much more pronounced than the directional split for all traffic.

Comparison of the bi-directional concept to the two reversible-lane concepts, however, show equal or higher traffic volumes for both peak periods. During the AM peak period, the southbound traffic on the reversible-lane concepts at Delk Road are between about 53,000 and over 58,000 compared to 55,000 for the bi-directional concept. Without additional lane capacity in the northbound direction during the AM peak period, however, the traffic volumes are less than for the bi-directional concept and are more similar to the traffic volumes of the No-Build Alternative or slightly higher. The higher traffic volumes northbound during the PM peak period for these concepts shows even higher usage than during the AM peak period. This is consistent with the pattern shown for the No-Build Alternative where traffic volumes during the PM peak period typically exceed those of the AM peak period. Again, these trends are also found along I-575 during the AM and PM peak periods.



### 5.3 Peak Period Flow Splits

One of the key measures to assess the effectiveness of managed lanes and the types of managed-lane system that could be effective in a study corridor is peak period directional flow splits. The build alternatives evaluated in the AA/DEIS include HOV lanes as well as a HOT lane operational option. Section 2.3.3.3 discussed reversible lanes and the reasons why this concept was not considered for detailed evaluation in the AA/DEIS. A key reason for eliminating this concept was due to the lack of appropriate peak period flow split data for the horizon year 2030. The ARC 2004 Travel Demand Forecasting Model had indicated flow splits on the I-75 corridor would be 57/43 or less.

As such, it is important to re-examine forecast traffic directional flow splits for the new concepts. “A Policy on Geometric Design of Highways and Streets” (AASHTO 2004) recommends reversible lanes if the peak period directional flow traffic volumes are split 65/35 or greater. This means 65 percent of the total freeway volume in the peak direction and 35 percent in the non-peak direction, or off-peak direction. Table 5-4 and Table 5-5 show the direction flow splits for both AM and PM peak periods for the build concepts. Flow splits that nearly meet or exceed the AASHTO recommended criterion are darkly shaded.

The analysis of the No-Build Alternative indicated that none of the locations along I-75 would come close to meeting the recommended 65/35 flow split during the AM peak period in 2035. Most of the I-575 corridor comes close to meeting the recommended criterion. No locations along either highway are forecast to come close to meeting the criterion in the PM peak period in 2035 for the No-Build Alternative. However, this is largely due to the No-Build model forecasts inability to consider latent demand in the peak direction. The off-peak direction demands are unconstrained yet approaches capacity while the peak-direction is highly constrained and thus the directional split ratios appear to be more evenly split than actual demand would otherwise indicate. This is why the build alternatives, which include increased capacity in the peak direction, show greater directional splits.

Of the managed-lane concepts, all showed directional flow splits coming close to meeting the criteria for most locations along I-575 during the AM peak period. The flow splits for locations along I-75 were weakest for the bi-directional concept and highest for the three-lane reversible concept – Concept C. The two-lane reversible concept is between these other concepts in number of locations meeting the criterion.

During the PM peak period, none of the locations along either I-75 or I-575 came close to meeting the flow split 65/35 criterion for the No-Build Alternative. The Build concepts all showed a substantial number of locations near to or exceeding the criterion. The three-lane reversible concept performed the best. These results clearly reverse a key factor in the rationale for eliminating a reversible-lane concept for detailed evaluation in the AA/DEIS.





**Table 5-4. AM Peak Period Directional Flow Splits, 2035**

| Location               | No-Build | Concept A | Concept B1 | Concept B2 | Concept C |
|------------------------|----------|-----------|------------|------------|-----------|
| <b>I-75</b>            |          |           |            |            |           |
| S of I-75 North Limit  | 56/44    | 58/42     | 57/43      | 58/42      | 58/42     |
| S of Hickory Grove Rd  | 56/44    | 59/41     | 59/41      | 59/41      | 60/40     |
| S of Wade Green Rd     | 56/44    | 60/40     | 60/40      | 60/40      | 61/39     |
| S of Chastain Rd       | 56/44    | 60/40     | 60/40      | 60/40      | 61/39     |
| S of Big Shanty Rd     | 55/45    | 59/41     | 60/40      | 60/40      | 62/38     |
| S of Barrett Pkwy      | 58/42    | 60/40     | 61/39      | 61/39      | 63/37     |
| S of I-75/I-575        | 61/39    | 64/36     | 64/36      | 64/36      | 66/34     |
| S of Canton Rd         | 61/39    | 65/35     | 65/35      | 64/36      | 67/33     |
| S of N Marietta Pkwy   | 57/43    | 62/38     | 63/37      | 61/39      | 65/35     |
| S of Roswell Rd        | 57/43    | 62/38     | 63/37      | 62/38      | 65/35     |
| S of S Marietta Pkwy   | 57/43    | 61/39     | 61/39      | 61/39      | 63/37     |
| S of Delk Rd           | 58/42    | 61/39     | 61/39      | 61/39      | 63/37     |
| <b>I-575</b>           |          |           |            |            |           |
| S of I-575 North Limit | 62/38    | 64/36     | 64/36      | 64/36      | 64/36     |
| S of Sixes Rd          | 65/35    | 63/37     | 63/37      | 62/38      | 62/38     |
| S of Rope Mill Rd      | 65/35    | 67/33     | 67/33      | 66/34      | 67/33     |
| S of Town Lake Pkwy    | 65/35    | 67/33     | 66/34      | 66/34      | 67/33     |
| S of Dupree Rd         | 65/35    | 67/33     | 66/34      | 67/33      | 67/33     |
| S of SR 92             | 64/36    | 67/33     | 67/33      | 67/33      | 68/32     |
| S of Shallowford Rd    | 64/36    | 67/33     | 67/33      | 65/35      | 68/32     |
| S of Bells Ferry Rd    | 66/34    | 68/32     | 68/32      | 67/33      | 69/31     |
| S of Chastain Rd       | 63/37    | 66/34     | 66/34      | 65/35      | 67/33     |
| S of Big Shanty Rd     | 63/37    | 66/34     | 66/34      | 65/35      | 67/33     |
| S of Barrett Pkwy      | 66/34    | 69/31     | 69/31      | 68/32      | 70/30     |

Note: Shaded area shows locations that generally meet transportation guidelines for a split in directional flow of traffic that support consideration of reversible managed lanes. Locations that meet the AASHTO guideline of 65/35 directional flow for reversible lanes are shaded dark grey. Locations with directional splits between 60/40 and 65/35 (and thus reasonably close to the AASHTO and ITE guidelines) are shaded light grey.



**Table 5-5. PM Peak Period Directional Flow, 2035**

| Location               | No-Build | Concept A | Concept B1 | Concept B2 | Concept C |
|------------------------|----------|-----------|------------|------------|-----------|
| <b>I-75</b>            |          |           |            |            |           |
| S of I-75 North Limit  | 43/57    | 42/58     | 42/58      | 41/59      | 41/59     |
| S of Hickory Grove Rd  | 43/57    | 41/59     | 40/60      | 39/61      | 39/61     |
| S of Wade Green Rd     | 44/56    | 41/59     | 40/60      | 39/61      | 39/61     |
| S of Chastain Rd       | 44/56    | 41/59     | 40/60      | 39/61      | 39/61     |
| S of Big Shanty Rd     | 46/54    | 43/57     | 41/59      | 40/60      | 37/63     |
| S of Barrett Pkwy      | 44/56    | 41/59     | 40/60      | 40/60      | 37/63     |
| S of I-75/I-575        | 43/57    | 40/60     | 39/61      | 39/61      | 37/63     |
| S of Canton Rd         | 43/57    | 40/60     | 38/62      | 38/62      | 36/64     |
| S of N Marietta Pkwy   | 44/56    | 40/60     | 37/63      | 38/62      | 35/65     |
| S of Roswell Rd        | 44/56    | 41/59     | 38/62      | 38/62      | 35/65     |
| S of S Marietta Pkwy   | 43/57    | 41/59     | 38/62      | 39/61      | 36/64     |
| S of Delk Rd           | 44/56    | 42/58     | 40/60      | 40/60      | 38/62     |
| <b>I-575</b>           |          |           |            |            |           |
| S of I-575 North Limit | 44/56    | 43/57     | 43/57      | 43/57      | 42/58     |
| S of Sixes Rd          | 41/59    | 44/56     | 45/55      | 45/55      | 45/55     |
| S of Rope Mill Rd      | 43/57    | 40/60     | 39/61      | 40/60      | 39/61     |
| S of Town Lake Pkwy    | 42/58    | 39/61     | 39/61      | 39/61      | 38/62     |
| S of Dupree Rd         | 42/58    | 39/61     | 39/61      | 38/62      | 38/62     |
| S of SR 92             | 42/58    | 39/61     | 38/62      | 38/62      | 37/63     |
| S of Shallowford Rd    | 42/58    | 39/61     | 38/62      | 39/61      | 37/63     |
| S of Bells Ferry Rd    | 42/58    | 39/61     | 38/62      | 38/62      | 37/63     |
| S of Chastain Rd       | 44/56    | 40/60     | 39/61      | 39/61      | 39/61     |
| S of Big Shanty Rd     | 44/56    | 40/60     | 39/61      | 40/60      | 39/61     |
| S of Barrett Pkwy      | 43/57    | 39/61     | 38/62      | 39/61      | 38/62     |

Note: Shaded area shows locations that generally meet transportation guidelines for a split in directional flow of traffic that support consideration of reversible managed lanes. Locations that meet the AASHTO guideline of 65/35 directional flow for reversible lanes are shaded dark grey. Locations with directional splits between 60/40 and 65/35 (and thus reasonably close to the AASHTO and ITE guidelines) are shaded light grey.



## 5.4 Peak Period Level of Service

The change in congestion as experienced by motorists is measured by level of service (LOS). Standardized terminology published in the *Highway Capacity Manual 2000* (TRB 2000) use letter designations from A to F to describe the quality of traffic flow. Letter A represents the best operating conditions (free-flow traffic) and LOS F designates the worst operating conditions (stop-and-go conditions, substantially reduced speeds, and difficulty maneuvering). The ARC regional transportation plan 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 at which speeds begin to decline and congestion affects the freedom to maneuver within the traffic stream.

Table 5-6 and Table 5-7 show the forecast 2035 LOS designations for the same highway locations for both the AM and PM peak periods and correspond to the traffic volumes presented in the previous section. On I-75, the southbound traffic conditions during the AM peak period are characterized as mostly LOS F under the No-Build Alternative. Southbound travel on I-575 during the AM peak conditions is only slightly better with LOS D and LOS E in three segments and all of the other locations LOS F. These conditions are expected since no improvements would be made to the general-purpose lanes under this concept. Because of the higher traffic volumes during the PM peak period, congestion is almost uniformly LOS F for both highways. During the AM peak period, traffic operations in the off-peak (northbound) direction are acceptable with mostly LOS C and LOS D conditions. During the PM peak period, traffic operations in the off-peak (southbound) direction are mixed LOS D through LOS F conditions, worse than off-peak direction traffic operations during the AM peak period.

These two tables show the LOS forecast for both directions of travel for the general-purpose lanes as well as the managed lanes for the bi-directional concept as well as the two reversible lane concepts. As described in the AA/DEIS, the managed lanes could be operated without tolls as HOV lanes or with a toll as high-occupancy toll (HOT) lanes (an operational option evaluated in the AA/DEIS). Since the tolling policy has not been addressed at this point for the managed-lane alternatives, the level of service may not be maintained at LOS C for the tabular data presented. The toll rate used in the modeling was fixed at \$0.40 per mile (documentation provided by GDOT). Off-peak tolling rates for midday were set at \$0.25 per mile and nighttime tolling rates were set at \$0.10 per mile. In reality, the toll rate can be adjusted as required to achieve LOS C in the managed lanes.

During the AM peak period, the southbound general purpose lanes on both I-75 and I-575 are generally LOS F on I-75 and LOS E on I-575 under Concept A. The off-peak northbound general purpose lanes are largely LOS C and LOS D, somewhat worse compared to the No-Build Alternative. The level of service for the HOV lanes, however, show markedly improved conditions. Southbound travel in the HOV lanes on I-75 is almost uniformly LOS D and on I-575 conditions are mostly LOS C. Traffic would be free-flowing. No congestion

**Table 5-6. AM Peak Period Level of Service by Directional Flow and Managed Lane, 2035**

| Location               | No-Build |     |    |     | Concept A |     |        |    | Concept B1 |     |     |     | Concept B2 |     |     |     | Concept C |    |       |     |
|------------------------|----------|-----|----|-----|-----------|-----|--------|----|------------|-----|-----|-----|------------|-----|-----|-----|-----------|----|-------|-----|
|                        | GP       |     | GP |     | GP        |     | Bi-Dir |    | GP         |     | Rev |     | GP         |     | Rev |     | GP        |    | 3 Rev |     |
|                        | SB       | NB  | SB | NB  | SB        | NB  | SB     | NB | SB         | NB  | SB  | NB  | SB         | NB  | SB  | NB  | SB        | NB | SB    | SB  |
| <b>I-75</b>            |          |     |    |     |           |     |        |    |            |     |     |     |            |     |     |     |           |    |       |     |
| S of I-75 North Limit  | F        | D   | F  | E   | n/a       | n/a | n/a    | F  | D          | n/a | n/a | n/a | F          | D   | n/a | n/a | F         | D  | n/a   | n/a |
| S of Hickory Grove Rd  | F        | D   | F  | D   | C         | A/B | A/B    | F  | D          | C   | C   | C   | F          | D   | C   | C   | F         | D  | D     | D   |
| S of Wade Green Rd     | F        | D   | F  | E   | D         | A/B | A/B    | E  | E          | C   | C   | C   | F          | E   | C   | C   | F         | E  | D     | D   |
| S of Chastain Rd       | F        | D   | F  | E   | D         | A/B | A/B    | E  | E          | C   | C   | C   | F          | E   | C   | C   | F         | E  | D     | D   |
| S of Big Shanty Rd     | F        | E   | F  | E   | D         | A/B | A/B    | F  | E          | D   | D   | D   | F          | E   | D   | D   | F         | E  | C     | C   |
| S of Barrett Pkwy      | E        | D   | E  | D   | D         | A/B | A/B    | E  | D          | D   | D   | D   | E          | D   | D   | D   | E         | D  | C     | C   |
| S of I-75/I-575        | F        | D   | F  | D   | D         | A/B | A/B    | F  | D          | D   | D   | D   | E          | D   | C   | C   | F         | D  | D     | D   |
| S of Canton Rd         | F        | D   | F  | D   | D         | A/B | A/B    | F  | D          | D   | D   | D   | F          | D   | C   | C   | F         | D  | D     | D   |
| S of N Marietta Pkwy   | F        | D   | F  | D   | D         | A/B | A/B    | F  | D          | D   | D   | D   | F          | D   | C   | C   | F         | D  | D     | D   |
| S of Roswell Rd        | F        | D   | F  | D   | D         | A/B | A/B    | F  | D          | D   | D   | D   | F          | D   | D   | D   | F         | D  | D     | D   |
| S of S Marietta Pkwy   | F        | D   | F  | D   | D         | A/B | A/B    | F  | D          | D   | D   | D   | F          | D   | D   | D   | F         | D  | D     | D   |
| S of Delk Rd           | F        | D   | F  | D   | D         | A/B | A/B    | F  | D          | D   | D   | D   | F          | D   | D   | D   | F         | D  | D     | D   |
| <b>I-575</b>           |          |     |    |     |           |     |        |    |            |     |     |     |            |     |     |     |           |    |       |     |
| S of I-575 North Limit | D        | C   | E  | C   | n/a       | n/a | n/a    | E  | A/B        | n/a | n/a | n/a | E          | A/B | n/a | n/a | E         | C  | n/a   | n/a |
| S of Sixes Rd          | F        | C   | F  | C   | n/a       | n/a | n/a    | E  | C          | n/a | n/a | n/a | E          | C   | n/a | n/a | F         | C  | n/a   | n/a |
| S of Rope Mill Rd      | F        | C   | F  | C   | C         | A/B | A/B    | F  | C          | C   | C   | C   | E          | C   | C   | C   | F         | C  | D     | D   |
| S of Town Lake Pkwy    | F        | C   | F  | D   | C         | A/B | A/B    | F  | D          | C   | C   | C   | F          | D   | C   | C   | F         | D  | D     | D   |
| S of Dupree Rd         | F        | C   | F  | D   | C         | A/B | A/B    | F  | D          | C   | C   | C   | F          | D   | E   | E   | F         | D  | D     | D   |
| S of SR 92             | F        | C   | E  | C   | C         | A/B | A/B    | E  | C          | C   | C   | C   | E          | C   | E   | E   | E         | C  | D     | D   |
| S of Shallowford Rd    | F        | C   | E  | C   | C         | A/B | A/B    | E  | C          | C   | C   | C   | E          | C   | C   | C   | E         | C  | D     | D   |
| S of Bells Ferry Rd    | E        | A/B | E  | A/B | C         | A/B | A/B    | D  | A/B        | C   | C   | C   | D          | A/B | C   | C   | E         | C  | D     | D   |
| S of Chastain Rd       | F        | C   | F  | C   | D         | A/B | A/B    | F  | C          | C   | C   | C   | E          | C   | C   | C   | F         | C  | E     | E   |
| S of Big Shanty Rd     | F        | C   | F  | C   | D         | A/B | A/B    | F  | C          | C   | C   | C   | E          | C   | A/B | A/B | F         | C  | E     | E   |
| S of Barrett Pkwy      | E        | A/B | E  | C   | E         | A/B | A/B    | E  | C          | D   | D   | D   | E          | C   | C   | C   | E         | C  | F     | F   |

Note: SB = southbound directional flow; NB = northbound directional flow; GP = general-purpose lanes; Rev = reversible lane system; Bi-Dir = bi-directional lane system; n/a = conditions not applicable in this segment.



**Table 5-7. PM Peak Period Level of Service by Directional Flow and Managed Lane, 2035**

| Location               | No-Build |    |    |    | Concept A |    |    |     | Concept B1 |    |    |     | Concept B2 |    |    |     | Concept C |    |    |     |
|------------------------|----------|----|----|----|-----------|----|----|-----|------------|----|----|-----|------------|----|----|-----|-----------|----|----|-----|
|                        | GP       |    | NB |    | GP        |    | NB |     | GP         |    | NB |     | GP         |    | NB |     | GP        |    | NB |     |
|                        | SB       | GP | SB | NB | SB        | GP | SB | NB  | SB         | GP | SB | NB  | SB         | GP | SB | NB  | SB        | GP | SB | NB  |
| <b>I-75</b>            |          |    |    |    |           |    |    |     |            |    |    |     |            |    |    |     |           |    |    |     |
| S of I-75 North Limit  | F        | F  | F  | F  | F         | F  | F  | n/a | F          | F  | F  | n/a | F          | F  | F  | n/a | F         | F  | F  | n/a |
| S of Hickory Grove Rd  | F        | F  | F  | F  | F         | F  | F  | A/B | F          | F  | F  | E   | F          | F  | F  | E   | F         | F  | F  | E   |
| S of Wade Green Rd     | E        | F  | E  | E  | F         | F  | E  | A/B | E          | E  | E  | E   | E          | E  | E  | E   | E         | E  | E  | F   |
| S of Chastain Rd       | E        | F  | E  | E  | F         | F  | E  | A/B | E          | E  | E  | E   | E          | E  | E  | E   | E         | E  | E  | F   |
| S of Big Shanty Rd     | F        | F  | F  | F  | F         | F  | F  | A/B | F          | F  | F  | F   | F          | F  | F  | F   | F         | F  | F  | E   |
| S of Barrett Pkwy      | E        | F  | E  | E  | F         | F  | E  | A/B | F          | E  | E  | F   | E          | E  | E  | F   | E         | E  | E  | E   |
| S of I-75/I-5775       | E        | F  | E  | E  | F         | F  | E  | A/B | E          | E  | E  | E   | E          | E  | E  | E   | E         | E  | E  | E   |
| S of Canton Rd         | E        | F  | E  | E  | F         | F  | E  | A/B | E          | F  | F  | E   | E          | E  | E  | E   | F         | F  | F  | E   |
| S of N Marietta Pkwy   | E        | F  | E  | E  | F         | F  | E  | A/B | F          | E  | E  | F   | E          | E  | E  | E   | E         | E  | E  | E   |
| S of Roswell Rd        | E        | F  | E  | E  | F         | F  | E  | A/B | F          | E  | E  | E   | E          | E  | E  | E   | E         | E  | E  | E   |
| S of S Marietta Pkwy   | E        | F  | E  | E  | F         | F  | E  | A/B | F          | E  | E  | E   | E          | E  | E  | E   | F         | F  | F  | E   |
| S of Delk Rd           | E        | F  | E  | E  | F         | F  | E  | A/B | F          | E  | E  | E   | E          | E  | E  | E   | F         | F  | F  | E   |
| <b>I-575</b>           |          |    |    |    |           |    |    |     |            |    |    |     |            |    |    |     |           |    |    |     |
| S of I-575 North Limit | D        | E  | D  | E  | D         | F  | F  | n/a | D          | E  | D  | n/a | D          | E  | D  | n/a | D         | F  | F  | n/a |
| S of Sixes Rd          | E        | F  | E  | E  | E         | F  | F  | n/a | E          | F  | E  | n/a | E          | F  | E  | n/a | E         | F  | F  | n/a |
| S of Rope Mill Rd      | E        | F  | E  | E  | E         | F  | F  | A/B | E          | E  | E  | D   | E          | F  | E  | E   | E         | F  | F  | E   |
| S of Town Lake Pkwy    | F        | F  | F  | F  | F         | F  | F  | A/B | E          | F  | F  | E   | F          | F  | F  | E   | F         | F  | F  | F   |
| S of Dupree Rd         | F        | F  | F  | F  | F         | F  | F  | A/B | E          | F  | F  | E   | F          | F  | F  | F   | F         | F  | F  | F   |
| S of SR 92             | E        | F  | E  | E  | E         | F  | F  | A/B | E          | E  | E  | E   | E          | F  | E  | F   | E         | F  | F  | F   |
| S of Shallowford Rd    | E        | F  | E  | E  | E         | F  | F  | A/B | E          | E  | E  | E   | E          | F  | E  | E   | E         | F  | F  | F   |
| S of Bells Ferry Rd    | D        | F  | D  | E  | D         | E  | E  | A/B | E          | D  | E  | E   | D          | E  | E  | E   | D         | E  | E  | F   |
| S of Chastain Rd       | E        | F  | E  | E  | E         | F  | F  | A/B | F          | E  | E  | F   | E          | F  | E  | E   | E         | F  | F  | F   |
| S of Big Shanty Rd     | E        | F  | E  | E  | E         | F  | F  | A/B | F          | E  | E  | F   | E          | F  | E  | E   | E         | F  | F  | F   |
| S of Barrett Pkwy      | D        | F  | D  | E  | D         | F  | F  | A/B | F          | D  | E  | F   | D          | E  | E  | E   | E         | F  | F  | F   |

Note: SB = southbound directional flow; NB = northbound directional flow; GP = general-purpose lanes; Rev = reversible lane system; Bi-Dir = bi-directional lane system; n/a = conditions not applicable in this segment.

would be experienced by motorists using the off-peak direction northbound lane(s) during the AM peak period with LOS A/B conditions. During the PM peak period, the traffic conditions generally remain LOS F for northbound general purpose lanes on both I-75 and I-575 under Concept A. With the higher traffic volumes during PM peak period, the level of service for the HOV lanes is improved compared to the general purpose lanes, but not to the same extent as during the AM peak period. On I-75, the northbound HOV lanes largely operate at LOS E and LOS F and largely LOS E for the No-Build Alternative on I-575. The southbound HOV lanes for both highways during the PM peak period operate at LOS A/B.

Review of these results provided the basis for the evaluation of reversible-lane system concepts for the project corridor. As mentioned above, traffic analysis supporting the AA/DEIS had indicated a substantial latent demand. A substantial portion of the commute traffic was shown to use parallel arterial roadways instead of the highways due to severe congestion levels on the highways. These motorists could reduce their travel time during the peak periods by using the arterial roadways in place of the highways. As a result, level of service analysis of build alternatives in the AA/DEIS continued to show severe congestion levels after substantial highway improvements increased capacity. The LOS A/B designations for the off-peak direction managed lanes for the bi-directional concept during both AM and PM peak periods also provided the basis for evaluation of a reversible-lane system for the project corridor. The LOS A/B represented substantial public expenditure that would be under-used when additional capacity could potentially be used by the primary directional flow of traffic.

In fact, the analysis of the level of service for the reversible concepts did show the construction of only two reversible lanes on I-75 south of I-575 would provide similar transportation services for substantially less public expenditure. The reversible-lane system concept would have primarily LOS C for the managed lanes, similar to congestion levels on the southbound HOV lanes during the AM peak period. On I-575, congestion on the southbound managed lanes would be LOS C, somewhat less congested compared to the southbound HOV lanes on I-575 for the bi-directional concept. Similar congestion patterns were forecast for the PM peak period.

The three-lane reversible lane system, however, showed surprising high usage. During the AM peak period, congestion on I-75 would generally be LOS C and LOS D. Congestion during the PM peak period would be higher resulting in generally LOS E and LOS F, similar congested conditions for the two-lane reversible concept. It appears that adding three lanes to the peak direction results in very little improvement in the LOS of the general purpose lanes. This would validate the assertion that the latent demand of traffic using parallel arterial roadways was sufficiently high to construct a third reversible lane.

The magnitude of these benefits in terms of throughput, vehicle and person miles traveled, and vehicle and person hours of travel is discussed in the following sections. And though no studies have been completed to evaluation changes in congestion levels on the parallel arterial roadways under each of the several concepts evaluated, it would be expected that congestion on these roadways



would substantially improve, especially under the three-lane reversible lane system concept (Concept C).

## **5.5 Vehicle and Person Throughput**

Up until this point in the discussion, all of the analysis has focused on the number of vehicles using the highway travel lanes, including general-purpose, HOV, or reversible lanes. Analysis of vehicle throughput compared to person throughput measures the benefit of highway improvements in terms of people who actually travel on the highway. The vehicle throughput is the assigned projected vehicle trips by use group (drive alone, two-person carpools, three-person carpools, etc.). Person throughput is calculated by multiplying vehicle occupancy rates by the number of vehicles with defined occupancy. The measure of person throughput, however, represents highway person throughput exclusive of transit person throughput. Vehicle and person throughput was forecast for four locations each along I-75 and I-575.

Table 5-8 and Table 5-9 present data on vehicle and person throughput for the AM and PM peak periods. Included is average daily statistics for southbound and northbound traffic on both I-75 and I-575, respectively. The basis of the analysis is the No-Build Alternative. Here, it is important to note that in each case, the total number of persons always exceeds the number of vehicles for all concepts including the No-Build Alternative. This is because some motorists will carpool due to convenience even if there are no designated high-occupancy lanes. This measure emphasizes the benefit per person of public expenditure. Second, the vehicle and person throughput for both directions of travel for each of the build concepts exceeds the No-Build Alternative. The addition of managed lanes would encourage more motorists to carpool. And, the number for vehicle and person throughput for the bi-directional concept and three-lane reversible concept are higher than the two-lane reversible-lane concept for both directions of travel.



**Table 5-8. Vehicle and Person Throughput on I-75, 2035**

| Location                    | Vehicle Throughput |           |            |            |           | Person Throughput |           |            |            |           |
|-----------------------------|--------------------|-----------|------------|------------|-----------|-------------------|-----------|------------|------------|-----------|
|                             | No-Build           | Concept A | Concept B1 | Concept B2 | Concept C | No-Build          | Concept A | Concept B1 | Concept B2 | Concept C |
| <b>Both Directions</b>      |                    |           |            |            |           |                   |           |            |            |           |
| South of Hickory Grove Road |                    |           |            |            |           |                   |           |            |            |           |
| AM Peak Period              | 37,000             | 41,000    | 40,000     | 40,000     | 41,000    | 40,000            | 47,000    | 45,000     | 46,000     | 46,000    |
| PM Peak Period              | 45,000             | 51,000    | 48,000     | 49,000     | 50,000    | 50,000            | 61,000    | 56,000     | 56,000     | 57,000    |
| Total: Daily                | 161,000            | 177,000   | 170,000    | 171,000    | 173,000   | 178,000           | 210,000   | 196,000    | 196,000    | 199,000   |
| South of Chastain Road      |                    |           |            |            |           |                   |           |            |            |           |
| AM Peak Period              | 37,000             | 42,000    | 41,000     | 41,000     | 42,000    | 40,000            | 49,000    | 47,000     | 47,000     | 48,000    |
| PM Peak Period              | 42,000             | 50,000    | 47,000     | 47,000     | 48,000    | 46,000            | 60,000    | 55,000     | 55,000     | 56,000    |
| Total: Daily                | 161,000            | 181,000   | 173,000    | 173,000    | 177,000   | 178,000           | 214,000   | 199,000    | 199,000    | 203,000   |
| South of I-575              |                    |           |            |            |           |                   |           |            |            |           |
| AM Peak Period              | 70,000             | 81,000    | 76,000     | 76,000     | 84,000    | 78,000            | 98,000    | 90,000     | 91,000     | 101,000   |
| PM Peak Period              | 84,000             | 100,000   | 93,000     | 94,000     | 102,000   | 99,000            | 127,000   | 117,000    | 117,000    | 127,000   |
| Total: Daily                | 294,000            | 332,000   | 314,000    | 314,000    | 336,000   | 346,000           | 417,000   | 386,000    | 386,000    | 414,000   |
| South of Delk Road          |                    |           |            |            |           |                   |           |            |            |           |
| AM Peak Period              | 79,000             | 90,000    | 86,000     | 86,000     | 93,000    | 89,000            | 109,000   | 103,000    | 103,000    | 112,000   |
| PM Peak Period              | 95,000             | 111,000   | 104,000    | 104,000    | 111,000   | 113,000           | 142,000   | 129,000    | 129,000    | 139,000   |
| Total: Daily                | 340,000            | 382,000   | 362,000    | 361,000    | 381,000   | 402,000           | 483,000   | 446,000    | 446,000    | 471,000   |
| <b>Southbound Direction</b> |                    |           |            |            |           |                   |           |            |            |           |
| South of Hickory Grove Road |                    |           |            |            |           |                   |           |            |            |           |
| AM Peak Period              | 21,000             | 24,000    | 24,000     | 24,000     | 25,000    | 23,000            | 29,000    | 28,000     | 29,000     | 29,000    |
| PM Peak Period              | 19,000             | 21,000    | 19,000     | 19,000     | 19,000    | 21,000            | 24,000    | 21,000     | 21,000     | 21,000    |
| Total: Daily                | 78,000             | 86,000    | 81,000     | 81,000     | 82,000    | 86,000            | 102,000   | 91,000     | 92,000     | 93,000    |
| South of Chastain Road      |                    |           |            |            |           |                   |           |            |            |           |
| AM Peak Period              | 21,000             | 25,000    | 25,000     | 24,000     | 25,000    | 22,000            | 30,000    | 29,000     | 29,000     | 30,000    |
| PM Peak Period              | 19,000             | 21,000    | 19,000     | 19,000     | 20,000    | 21,000            | 25,000    | 21,000     | 21,000     | 22,000    |
| Total: Daily                | 80,000             | 90,000    | 84,000     | 84,000     | 86,000    | 88,000            | 107,000   | 95,000     | 95,000     | 98,000    |
| South of I-575              |                    |           |            |            |           |                   |           |            |            |           |
| AM Peak Period              | 42,000             | 52,000    | 48,000     | 48,000     | 55,000    | 48,000            | 64,000    | 60,000     | 60,000     | 60,000    |
| PM Peak Period              | 37,000             | 40,000    | 37,000     | 37,000     | 38,000    | 44,000            | 51,000    | 44,000     | 44,000     | 44,000    |
| Total: Daily                | 148,000            | 167,000   | 154,000    | 154,000    | 164,000   | 175,000           | 210,000   | 187,000    | 188,000    | 187,000   |

**NORTHWEST CORRIDOR PROJECT**

**Table 5-8. Vehicle and Person Throughput on I-75, 2035(continued)**

| Location             |                             | Vehicle Throughput |           |            |            |           | Person Throughput |           |            |            |           |
|----------------------|-----------------------------|--------------------|-----------|------------|------------|-----------|-------------------|-----------|------------|------------|-----------|
|                      |                             | No-Build           | Concept A | Concept B1 | Concept B2 | Concept C | No-Build          | Concept A | Concept B1 | Concept B2 | Concept C |
| Northbound Direction | South of Delk Road          |                    |           |            |            |           |                   |           |            |            |           |
|                      | AM Peak Period              | 46,000             | 55,000    | 53,000     | 53,000     | 58,000    | 51,000            | 68,000    | 65,000     | 65,000     | 74,000    |
|                      | PM Peak Period              | 41,000             | 46,000    | 41,000     | 42,000     | 42,000    | 50,000            | 60,000    | 50,000     | 50,000     | 51,000    |
|                      | Total: Daily                | 168,000            | 190,000   | 175,000    | 175,000    | 183,000   | 199,000           | 242,000   | 213,000    | 213,000    | 224,000   |
|                      | South of Hickory Grove Road |                    |           |            |            |           |                   |           |            |            |           |
|                      | AM Peak Period              | 16,000             | 17,000    | 16,000     | 16,000     | 16,000    | 17,000            | 18,000    | 17,000     | 17,000     | 17,000    |
|                      | PM Peak Period              | 26,000             | 30,000    | 29,000     | 29,000     | 30,000    | 29,000            | 36,000    | 35,000     | 35,000     | 36,000    |
|                      | Total: Daily                | 83,000             | 91,000    | 90,000     | 90,000     | 91,000    | 92,000            | 108,000   | 105,000    | 104,000    | 106,000   |
|                      | South of Chastain Road      |                    |           |            |            |           |                   |           |            |            |           |
|                      | AM Peak Period              | 17,000             | 17,000    | 17,000     | 17,000     | 17,000    | 18,000            | 19,000    | 18,000     | 18,000     | 18,000    |
| PM Peak Period       | 23,000                      | 29,000             | 28,000    | 28,000     | 29,000     | 25,000    | 35,000            | 34,000    | 33,000     | 34,000     |           |
| Total: Daily         | 81,000                      | 91,000             | 90,000    | 90,000     | 91,000     | 90,000    | 107,000           | 104,000   | 104,000    | 105,000    |           |
| South of I-575       |                             |                    |           |            |            |           |                   |           |            |            |           |
| AM Peak Period       | 27,000                      | 29,000             | 28,000    | 28,000     | 29,000     | 31,000    | 34,000            | 31,000    | 31,000     | 32,000     |           |
| PM Peak Period       | 48,000                      | 59,000             | 57,000    | 57,000     | 64,000     | 55,000    | 76,000            | 73,000    | 72,000     | 82,000     |           |
| Total: Daily         | 146,000                     | 166,000            | 160,000   | 160,000    | 171,000    | 171,000   | 207,000           | 199,000   | 199,000    | 214,000    |           |
| South of Delk Road   |                             |                    |           |            |            |           |                   |           |            |            |           |
| AM Peak Period       | 33,000                      | 35,000             | 34,000    | 34,000     | 34,000     | 37,000    | 41,000            | 38,000    | 38,000     | 38,000     |           |
| PM Peak Period       | 54,000                      | 65,000             | 62,000    | 62,000     | 69,000     | 63,000    | 82,000            | 79,000    | 79,000     | 89,000     |           |
| Total: Daily         | 172,000                     | 192,000            | 187,000   | 186,000    | 197,000    | 203,000   | 241,000           | 233,000   | 233,000    | 247,000    |           |

**Table 5-9. Vehicle and Person Throughput for I-575, 2035**

| Location               |                             | Vehicle Throughput |           |            |            |           | Person Throughput |           |            |            |           |
|------------------------|-----------------------------|--------------------|-----------|------------|------------|-----------|-------------------|-----------|------------|------------|-----------|
|                        |                             | No-Build           | Concept A | Concept B1 | Concept B2 | Concept C | No-Build          | Concept A | Concept B1 | Concept B2 | Concept C |
| Both Directions        | South of Sixes Road         |                    |           |            |            |           |                   |           |            |            |           |
|                        | AM Peak Period              | 35,000             | 34,000    | 33,000     | 33,000     | 35,000    | 42,000            | 38,000    | 36,000     | 38,000     | 40,000    |
|                        | PM Peak Period              | 45,000             | 42,000    | 41,000     | 41,000     | 44,000    | 57,000            | 51,000    | 49,000     | 51,000     | 53,000    |
|                        | Total: Daily                | 140,000            | 135,000   | 131,000    | 132,000    | 140,000   | 178,000           | 164,000   | 158,000    | 166,000    | 173,000   |
|                        | South of Towne Lake Parkway |                    |           |            |            |           |                   |           |            |            |           |
|                        | AM Peak Period              | 37,000             | 41,000    | 40,000     | 39,000     | 44,000    | 44,000            | 51,000    | 48,000     | 48,000     | 55,000    |
|                        | PM Peak Period              | 49,000             | 54,000    | 52,000     | 51,000     | 56,000    | 62,000            | 70,000    | 67,000     | 66,000     | 72,000    |
|                        | Total: Daily                | 152,000            | 163,000   | 158,000    | 155,000    | 169,000   | 195,000           | 214,000   | 204,000    | 204,000    | 222,000   |
|                        | South of SR-92              |                    |           |            |            |           |                   |           |            |            |           |
|                        | AM Peak Period              | 33,000             | 38,000    | 38,000     | 35,000     | 40,000    | 39,000            | 48,000    | 47,000     | 44,000     | 50,000    |
| PM Peak Period         | 44,000                      | 50,000             | 49,000    | 48,000     | 52,000     | 55,000    | 66,000            | 64,000    | 63,000     | 67,000     |           |
| Total: Daily           | 138,000                     | 153,000            | 151,000   | 145,000    | 157,000    | 175,000   | 203,000           | 199,000   | 192,000    | 206,000    |           |
| South of Chastain Road |                             |                    |           |            |            |           |                   |           |            |            |           |
| AM Peak Period         | 33,000                      | 38,000             | 34,000    | 36,000     | 39,000     | 39,000    | 48,000            | 41,000    | 45,000     | 50,000     |           |
| PM Peak Period         | 40,000                      | 48,000             | 43,000    | 46,000     | 48,000     | 51,000    | 63,000            | 54,000    | 60,000     | 62,000     |           |
| Total: Daily           | 138,000                     | 155,000            | 142,000   | 148,000    | 157,000    | 176,000   | 205,000           | 179,000   | 194,000    | 205,000    |           |
| Southbound Direction   | South of Sixes Road         |                    |           |            |            |           |                   |           |            |            |           |
|                        | AM Peak Period              | 23,000             | 21,000    | 20,000     | 21,000     | 22,000    | 27,000            | 24,000    | 21,000     | 23,000     | 24,000    |
|                        | PM Peak Period              | 19,000             | 19,000    | 19,000     | 19,000     | 20,000    | 24,000            | 23,000    | 25,000     | 25,000     | 25,000    |
|                        | Total: Daily                | 70,000             | 68,000    | 68,000     | 68,000     | 71,000    | 90,000            | 83,000    | 84,000     | 86,000     | 90,000    |
|                        | South of Towne Lake Parkway |                    |           |            |            |           |                   |           |            |            |           |
|                        | AM Peak Period              | 24,000             | 27,000    | 26,000     | 25,000     | 29,000    | 28,000            | 34,000    | 32,000     | 32,000     | 38,000    |
|                        | PM Peak Period              | 20,000             | 21,000    | 20,000     | 20,000     | 21,000    | 27,000            | 28,000    | 27,000     | 27,000     | 28,000    |
|                        | Total: Daily                | 76,000             | 81,000    | 79,000     | 77,000     | 84,000    | 98,000            | 107,000   | 102,000    | 101,000    | 110,000   |
|                        | South of SR-92              |                    |           |            |            |           |                   |           |            |            |           |
|                        | AM Peak Period              | 21,000             | 25,000    | 25,000     | 23,000     | 27,000    | 25,000            | 32,000    | 32,000     | 30,000     | 35,000    |
| PM Peak Period         | 18,000                      | 19,000             | 19,000    | 19,000     | 19,000     | 24,000    | 26,000            | 24,000    | 24,000     | 25,000     |           |
| Total: Daily           | 69,000                      | 76,000             | 74,000    | 71,000     | 77,000     | 88,000    | 102,000           | 97,000    | 94,000     | 101,000    |           |

**NORTHWEST CORRIDOR PROJECT**

**Table 5-9. Vehicle and Person Throughput for I-575, 2035 (continued)**

| Location                    | Vehicle Throughput |           |            |            |           | Person Throughput |           |            |            |           |
|-----------------------------|--------------------|-----------|------------|------------|-----------|-------------------|-----------|------------|------------|-----------|
|                             | No-Build           | Concept A | Concept B1 | Concept B2 | Concept C | No-Build          | Concept A | Concept B1 | Concept B2 | Concept C |
| South of Chastain Road      | AM Peak Period     | 21,000    | 25,000     | 22,000     | 23,000    | 26,000            | 32,000    | 26,000     | 30,000     | 34,000    |
|                             | PM Peak Period     | 18,000    | 19,000     | 18,000     | 18,000    | 19,000            | 26,000    | 24,000     | 24,000     | 24,000    |
|                             | Total: Daily       | 70,000    | 78,000     | 71,000     | 73,000    | 78,000            | 103,000   | 92,000     | 96,000     | 102,000   |
|                             |                    |           |            |            |           |                   |           |            |            |           |
| Northbound Direction        | AM Peak Period     | 12,000    | 12,000     | 12,000     | 12,000    | 13,000            | 15,000    | 15,000     | 15,000     | 16,000    |
|                             | PM Peak Period     | 26,000    | 24,000     | 23,000     | 23,000    | 24,000            | 28,000    | 25,000     | 27,000     | 28,000    |
|                             | Total: Daily       | 69,000    | 67,000     | 64,000     | 65,000    | 69,000            | 81,000    | 73,000     | 80,000     | 83,000    |
|                             |                    |           |            |            |           |                   |           |            |            |           |
| South of Towne Lake Parkway | AM Peak Period     | 13,000    | 14,000     | 13,000     | 13,000    | 14,000            | 16,000    | 16,000     | 16,000     | 17,000    |
|                             | PM Peak Period     | 28,000    | 32,000     | 31,000     | 31,000    | 34,000            | 42,000    | 40,000     | 40,000     | 45,000    |
|                             | Total: Daily       | 75,000    | 81,000     | 79,000     | 78,000    | 85,000            | 107,000   | 102,000    | 103,000    | 112,000   |
|                             |                    |           |            |            |           |                   |           |            |            |           |
| South of SR-92              | AM Peak Period     | 12,000    | 13,000     | 12,000     | 12,000    | 13,000            | 15,000    | 15,000     | 15,000     | 15,000    |
|                             | PM Peak Period     | 25,000    | 31,000     | 31,000     | 29,000    | 32,000            | 40,000    | 40,000     | 39,000     | 43,000    |
|                             | Total: Daily       | 69,000    | 77,000     | 77,000     | 74,000    | 80,000            | 102,000   | 102,000    | 98,000     | 105,000   |
|                             |                    |           |            |            |           |                   |           |            |            |           |
| South of Chastain Road      | AM Peak Period     | 12,000    | 13,000     | 12,000     | 12,000    | 13,000            | 16,000    | 15,000     | 15,000     | 16,000    |
|                             | PM Peak Period     | 23,000    | 29,000     | 25,000     | 28,000    | 29,000            | 38,000    | 30,000     | 36,000     | 38,000    |
|                             | Total: Daily       | 68,000    | 77,000     | 70,000     | 75,000    | 79,000            | 102,000   | 87,000     | 98,000     | 104,000   |
|                             |                    |           |            |            |           |                   |           |            |            |           |

## **5.6 Peak Period Travel Time**

For the average motorist driving in the Northwest Corridor, forecast changes in travel time under the No-Build Alternative compared to the proposed managed-lane concepts are easy to understand. Table 5-10 and Table 5-11 present forecast peak period travel times in minutes for I-75 and I-575. The tables also show a breakdown for travel time by type of lane to allow comparison of travel in the general-purpose lanes to the managed lanes under each of the build concepts.

The key data to review is the total travel time for each highway corridor. For I-75, this would be between Hickory Grove Road south to Akers Mill Road, and from Sixes Road on I-575 to Akers Mill Road on I-75. During the AM peak period, travel time in the I-75 general-purpose lanes would be about 60 minutes for the No-Build Alternative. Implementation of the build concepts would improve travel time to about 54 minutes for Concept A and about 49 minutes for the reversible-lane system concepts. Substantial time savings would occur for motorists traveling in the managed lanes. For these motorists, travel time would be about half of the time required for the general-purpose lanes for each of the managed lane concepts. For the reversible-lane system concepts, travel time would be about 22 or 23 minutes in the reversible lanes instead of over 49 minutes in the general-purpose lanes.

For motorists who travel from Sixes Road to Akers Mill Road, the AM peak period travel time would be about 74 minutes under the No-Build Alternative. Travel in the general-purpose lanes for Concept B would be about 60 minutes and about 67 minutes for Concept A and Concept C. Again, the managed lanes would provide significant time savings. Travel time using the reversible lanes under Concept B would be about 27 minutes or less and about 31 minutes and 34 minutes for Concept A and Concept C, respectively. All of the managed lane concepts reduce travel time for motorists using the managed lanes by more than half. Similar travel time savings would occur during the PM peak period.

**Table 5-10. 2035 AM Peak Period Travel Time in Project Corridor:  
 Southbound Direction**

| Location             |  | No-Build | Concept A | Concept B1 | Concept B2 | Concept C |
|----------------------|--|----------|-----------|------------|------------|-----------|
| Southbound Direction | <b>I-75 Corridor</b>   |          |           |            |            |           |
|                      | <b>Between Northern End of I-75 HOT Lanes (N of Hickory Grove Rd) and Hickory Grove Road</b> |          |           |            |            |           |
|                      | GP Lanes   | 3.4      | 2.3       | 2.3        | 2.3        | 2.2       |
|                      | Managed Lanes  | 0.0      | 0.9       | 0.9        | 0.8        | 0.9       |
|                      | <b>I-75 / I-575 Jct</b>  |          |           |            |            |           |
|                      | GP Lanes   | 23.7     | 20.0      | 18.7       | 19.0       | 18.6      |
|                      | Managed Lanes  | 0.0      | 8.7       | 8.5        | 8.0        | 8.8       |
|                      | <b>N Marietta Pkwy</b>   |          |           |            |            |           |
|                      | GP Lanes   | 35.1     | 30.5      | 28.3       | 28.0       | 28.2      |
|                      | Managed Lanes  | 0.0      | 14.0      | 12.5       | 12.4       | 13.6      |
|                      | <b>S Marietta Pkwy</b>   |          |           |            |            |           |
|                      | GP Lanes   | 42.5     | 37.7      | 34.8       | 34.3       | 34.8      |
|                      | Managed Lanes  | 0.0      | 17.1      | 15.0       | 15.0       | 16.4      |
|                      | <b>Delk Road</b>   |          |           |            |            |           |
|                      | GP Lanes   | 49.1     | 43.8      | 40.3       | 39.5       | 40.2      |
|                      | Managed Lanes  | 0.0      | 19.6      | 17.3       | 17.3       | 18.8      |
|                      | <b>Windy Ridge Road</b>  |          |           |            |            |           |
|                      | GP Lanes   | 57.6     | 51.5      | 47.5       | 46.5       | 47.6      |
|                      | Managed Lanes  | 0.0      | 24.0      | 21.1       | 21.1       | 22.6      |
|                      | <b>Akers Mill Road</b>   |          |           |            |            |           |
|                      | GP Lanes   | 60.0     | 53.8      | 49.5       | 48.3       | 49.6      |
|                      | Managed Lanes  | 0.0      | 25.1      | 21.9       | 21.9       | 23.6      |
|                      | <b>I-75 / I-575 Corridor</b>   |          |           |            |            |           |
|                      | <b>Between Northern End of I-575 HOT Lanes (Sixes Rd) and SR 92</b>                          |          |           |            |            |           |
|                      | GP Lanes   | 16.5     | 14.0      | 11.9       | 12.5       | 15.3      |
|                      | Managed Lanes  | 0.0      | 4.8       | 5.1        | 4.1        | 6.4       |
|                      | <b>I-75 / I-575 Jct</b>  |          |           |            |            |           |
|                      | GP Lanes   | 37.3     | 33.6      | 29.5       | 30.1       | 36.2      |
|                      | Managed Lanes  | 0.0      | 14.4      | 13.8       | 11.8       | 19.1      |
|                      | <b>Windy Ridge Road</b>  |          |           |            |            |           |
|                      | GP Lanes   | 71.2     | 65.1      | 58.3       | 57.6       | 65.2      |
|                      | Managed Lanes  | 0.0      | 29.7      | 26.3       | 24.9       | 32.9      |
|                      | <b>Akers Mill Road</b>   |          |           |            |            |           |
|                      | GP Lanes   | 73.7     | 67.4      | 60.2       | 59.4       | 67.3      |
|                      | Managed Lanes  | 0.0      | 30.8      | 27.2       | 25.7       | 33.8      |

Note:

All travel times are presented in minutes.

GP = general-purpose lane.



**Table 5-11. 2035 PM Peak Period Travel Time in Project Corridor:  
Northbound Direction**

| Location             |   | No-Build | Concept A | Concept B1 | Concept B2 | Concept C |
|----------------------|---|----------|-----------|------------|------------|-----------|
| Northbound Direction | <b>I-75 Corridor</b>  |          |           |            |            |           |
|                      | <b>Between Akers Mill Road and Windy Ridge Road</b>           |          |           |            |            |           |
|                      | GP Lanes  | 3.5      | 3.3       | 3.0        | 2.9        | 2.9       |
|                      | Managed Lanes   | 0.0      | 1.2       | 1.0        | 1.0        | 0.8       |
|                      | <b>Delk Road</b>  |          |           |            |            |           |
|                      | GP Lanes  | 11.0     | 9.9       | 9.2        | 9.0        | 8.8       |
|                      | Managed Lanes   | 0.0      | 6.2       | 5.5        | 5.2        | 4.6       |
|                      | <b>S Marietta Pkwy</b>  |          |           |            |            |           |
|                      | GP Lanes  | 19.2     | 17.0      | 15.6       | 15.4       | 15.7      |
|                      | Managed Lanes   | 0.0      | 10.6      | 9.3        | 8.9        | 8.2       |
|                      | <b>N Marietta Pkwy</b>  |          |           |            |            |           |
|                      | GP Lanes  | 27.0     | 24.1      | 21.9       | 21.5       | 22.6      |
|                      | Managed Lanes   | 0.0      | 13.6      | 11.8       | 11.5       | 10.8      |
|                      | <b>I-75 / I-575 Jct</b>                                       |          |           |            |            |           |
|                      | GP Lanes  | 46.9     | 41.6      | 37.3       | 36.5       | 39.0      |
|                      | Managed Lanes   | 0.0      | 22.4      | 18.6       | 18.9       | 17.8      |
|                      | <b>Hickory Grove Road</b>                                     |          |           |            |            |           |
|                      | GP Lanes  | 70.3     | 61.1      | 55.3       | 54.6       | 57.4      |
|                      | Managed Lanes   | 0.0      | 33.1      | 29.0       | 28.7       | 29.1      |
|                      | <b>Northern End of I-75 HOT Lanes (N of Hickory Grove Rd)</b> |          |           |            |            |           |
|                      | GP Lanes  | 73.9     | 63.7      | 57.8       | 57.1       | 59.9      |
|                      | Managed Lanes   | 0.0      | 33.9      | 29.9       | 29.5       | 30.0      |
|                      | <b>I-75 / I-575 Corridor</b>                                  |          |           |            |            |           |
|                      | <b>Between Akers Mill Road and Windy Ridge Road</b>           |          |           |            |            |           |
|                      | GP Lanes  | 3.5      | 3.3       | 3.0        | 2.9        | 2.9       |
|                      | Managed Lanes   | 0.0      | 1.2       | 1.0        | 1.0        | 0.8       |
|                      | <b>I-75 / I-575 Jct</b>                                       |          |           |            |            |           |
|                      | GP Lanes  | 46.9     | 41.6      | 37.3       | 36.5       | 39.0      |
|                      | Managed Lanes   | 0.0      | 22.4      | 18.6       | 18.9       | 17.8      |
|                      | <b>SR-92</b>  |          |           |            |            |           |
|                      | GP Lanes  | 72.1     | 63.0      | 56.4       | 55.1       | 62.7      |
|                      | Managed Lanes   | 0.0      | 35.6      | 30.5       | 30.0       | 36.1      |
|                      | <b>Northern End of I-575 HOT Lanes (Sixes Road)</b>           |          |           |            |            |           |
|                      | GP Lanes  | 96.0     | 82.4      | 73.4       | 72.3       | 84.4      |
|                      | Managed Lanes   | 0.0      | 42.0      | 39.4       | 35.5       | 45.5      |

Note:

All travel times are presented in minutes.

GP = general-purpose lane.



## 5.7 Person Miles and Hours of Travel

Another measure of increased mobility in the corridor can be presented by evaluating person miles of travel and person hours of travel. Both of these forecast values are outputs from the ARC 2008 Travel Demand Forecasting Model.

Table 5-12 presents these statistics for I-75. Looking at both directions of travel, all of the build concepts result in substantially increased person miles traveled for both directions of travel for the AM and PM peak periods as well as daily. On a daily basis, the two two-lane reversible concept is better than the No-Build Alternative, and the bi-directional and three-lane reversible-lane concepts are even better for increased person miles of travel for both directions of travel. The three-lane reversible concept provides the highest person miles traveled for the AM peak period for both directions of travel and the bi-directional concept provides the best person miles traveled for both directions of travel for the PM peak period. However, during the most congested periods, the AM and PM peak periods, the number of person miles traveled for the three-lane reversible concept substantially exceeds the benefits provided for the bi-directional concept. During the AM peak period, southbound person miles traveled for the three-lane reversible is forecast to be more than 834,000 compared to 774,000 for the bi-directional concept. During the PM peak period, the most congested period of the day, person miles traveled for the northbound three-lane reversible-lane concept would be an estimated more than 445,000 compared to about 423,000 for the bi-directional concept.

The data for the person hours of travel show a different trend. Here, the build concepts are generally the same or less than the No-Build Alternative. This is desirable as the transportation improvements are intended to reduce travel time for motorists. For highway use, the person hours of travel data is lowest for the two two-lane reversible concepts. But, person hours of travel for the bi-directional concept is increased over the No-Build Alternative. The best performing concept is the three-lane reversible concept considering travel time is generally reduced for a larger number of vehicles and highway users.

On I-575, measures of person miles of travel and person hours of travel show mixed mixed benefits over the No-Build Alternative (see Note:

PMT = person miles of travel

PHT = person hours of travel

Table 5-13). All of the build concepts show improvements over the No-Build Alternative for increased person miles of travel during both the AM and PM peak periods. The three-lane reversible concept shows the most substantial increase. However, this concept provides additional improvements to the I-575 corridor through the addition of managed lanes, but results in substantial increased person hours of travel compared to the No-Build Alternative. The bi-directional concept and the two two-lane reversible concepts would provide reduced person hours of travel.

**Table 5-12. Person Miles and Hours of Travel on I-75, 2035**

| Location             |                         | No-Build  | Concept A | Concept B1 | Concept B2 | Concept C |
|----------------------|-------------------------|-----------|-----------|------------|------------|-----------|
| Both Directions      | Person Miles of Travel  |           |           |            |            |           |
|                      | AM Peak Period          | 956,000   | 1,206,000 | 1,123,000  | 1,129,000  | 1,232,000 |
|                      | PM Peak Period          | 1,183,000 | 1,551,000 | 1,400,000  | 1,400,000  | 1,520,000 |
|                      | Total: Daily            | 4,276,000 | 5,280,000 | 4,839,000  | 4,843,000  | 5,144,000 |
|                      | Daily PMT Per Lane Mile | 27,000    | 25,000    | 23,000     | 23,000     | 22,000    |
|                      | Person Hours of Travel  |           |           |            |            |           |
|                      | AM Peak Period          | 45,000    | 46,000    | 41,000     | 40,000     | 44,000    |
|                      | PM Peak Period          | 69,000    | 68,000    | 62,000     | 62,000     | 68,000    |
|                      | Total: Daily            | 173,000   | 173,000   | 161,000    | 160,000    | 175,000   |
|                      | Daily PHT Per Lane Mile | 1,000     | 1,000     | 1,000      | 1,000      | 1,000     |
| Southbound Direction | Person Miles of Travel  |           |           |            |            |           |
|                      | AM Peak Period          | 568,000   | 774,000   | 732,000    | 737,000    | 834,000   |
|                      | PM Peak Period          | 542,000   | 659,000   | 541,000    | 544,000    | 551,000   |
|                      | Total: Daily            | 2,184,000 | 2,689,000 | 2,348,000  | 2,354,000  | 2,491,000 |
|                      | Daily PMT Per Lane Mile | 28,000    | 26,000    | 23,000     | 23,000     | 22,000    |
|                      | Person Hours of Travel  |           |           |            |            |           |
|                      | AM Peak Period          | 34,000    | 34,000    | 29,000     | 29,000     | 32,000    |
|                      | PM Peak Period          | 20,000    | 19,000    | 20,000     | 20,000     | 22,000    |
|                      | Total: Daily            | 84,000    | 84,000    | 79,000     | 79,000     | 87,000    |
|                      | Daily PHT Per Lane Mile | 1,000     | 1,000     | 1,000      | 1,000      | 1,000     |
| Northbound Direction | Person Miles of Travel  |           |           |            |            |           |
|                      | AM Peak Period          | 388,000   | 433,000   | 391,000    | 392,000    | 398,000   |
|                      | PM Peak Period          | 641,000   | 892,000   | 859,000    | 857,000    | 969,000   |
|                      | Total: Daily            | 2,092,000 | 2,591,000 | 2,491,000  | 2,489,000  | 2,654,000 |
|                      | Daily PMT Per Lane Mile | 27,000    | 25,000    | 24,000     | 24,000     | 23,000    |
|                      | Person Hours of Travel  |           |           |            |            |           |
|                      | AM Peak Period          | 11,000    | 12,000    | 11,000     | 11,000     | 12,000    |
|                      | PM Peak Period          | 49,000    | 49,000    | 42,000     | 41,000     | 46,000    |
|                      | Total: Daily            | 89,000    | 90,000    | 82,000     | 81,000     | 88,000    |
|                      | Daily PHT Per Lane Mile | 1,000     | 1,000     | 1,000      | 1,000      | 1,000     |

Note:

PMT = person miles of travel

PHT = person hours of travel



**Table 5-13. Person Miles and Hours of Travel on I-575, 2035**

| Location             |                         | No-Build  | Concept A | Concept B1 | Concept B2 | Concept C |
|----------------------|-------------------------|-----------|-----------|------------|------------|-----------|
| Both Directions      | Person Miles of Travel  |           |           |            |            |           |
|                      | AM Peak Period          | 442,000   | 524,000   | 501,000    | 492,000    | 559,000   |
|                      | PM Peak Period          | 601,000   | 711,000   | 687,000    | 676,000    | 728,000   |
|                      | Total: Daily            | 1,954,000 | 2,201,000 | 2,123,000  | 2,098,000  | 2,266,000 |
|                      | Daily PMT Per Lane Mile | 27,000    | 24,000    | 23,000     | 22,000     | 24,000    |
|                      | Person Hours of Travel  |           |           |            |            |           |
|                      | AM Peak Period          | 19,000    | 18,000    | 16,000     | 16,000     | 21,000    |
|                      | PM Peak Period          | 32,000    | 30,000    | 27,000     | 26,000     | 36,000    |
|                      | Total: Daily            | 70,000    | 67,000    | 61,000     | 61,000     | 77,000    |
|                      | Daily PHT Per Lane Mile | 1,000     | 1,000     | 1,000      | 1,000      | 1,000     |
| Southbound Direction | Person Miles of Travel  |           |           |            |            |           |
|                      | AM Peak Period          | 287,000   | 360,000   | 342,000    | 333,000    | 392,000   |
|                      | PM Peak Period          | 270,000   | 289,000   | 274,000    | 273,000    | 283,000   |
|                      | Total: Daily            | 1,010,000 | 1,124,000 | 1,070,000  | 1,060,000  | 1,146,000 |
|                      | Daily PMT Per Lane Mile | 28,000    | 24,000    | 23,000     | 22,000     | 24,000    |
|                      | Person Hours of Travel  |           |           |            |            |           |
|                      | AM Peak Period          | 15,000    | 15,000    | 12,000     | 12,000     | 17,000    |
|                      | PM Peak Period          | 8,000     | 8,000     | 8,000      | 8,000      | 9,000     |
|                      | Total: Daily            | 33,000    | 32,000    | 30,000     | 30,000     | 37,000    |
|                      | Daily PHT Per Lane Mile | 1,000     | 1,000     | 1,000      | 1,000      | 1,000     |
| Northbound Direction | Person Miles of Travel  |           |           |            |            |           |
|                      | AM Peak Period          | 154,000   | 164,000   | 159,000    | 159,000    | 167,000   |
|                      | PM Peak Period          | 331,000   | 423,000   | 413,000    | 403,000    | 445,000   |
|                      | Total: Daily            | 944,000   | 1,078,000 | 1,053,000  | 1,038,000  | 1,120,000 |
|                      | Daily PMT Per Lane Mile | 27,000    | 23,000    | 23,000     | 23,000     | 24,000    |
|                      | Person Hours of Travel  |           |           |            |            |           |
|                      | AM Peak Period          | 3,000     | 3,000     | 3,000      | 3,000      | 4,000     |
|                      | PM Peak Period          | 25,000    | 22,000    | 19,000     | 18,000     | 27,000    |
|                      | Total: Daily            | 37,000    | 35,000    | 31,000     | 31,000     | 41,000    |
|                      | Daily PHT Per Lane Mile | 1,000     | 1,000     | 1,000      | 1,000      | 1,000     |

Note:

PMT = person miles of travel

PHT = person hours of travel

## 5.8 Vehicle Miles and Hours Traveled

A true measure of overall transportation effectiveness is vehicle miles of travel and vehicle hours of travel (see Table 5-14 and Table 5-15). The overall effectiveness of a project can be identified through analysis of changes in the number of vehicular trips and the corresponding changes in total vehicle miles of travel (VMT) using the different types of lanes – general-purpose, bi-directional, or reversible lanes. For each highway segment, VMT is calculated as the number of vehicles multiplied by length of the segment. VHT is computed as the number of vehicles multiplied by the time it takes to traverse the segment. For each of the concepts, the VMT and VHT are presented for projected 2035 AM and PM peak period and daily and for both directions and separately for the southbound and northbound directions. Generally, a higher value of VMT per lane mile indicates an overall higher density, thus a higher usage and overall effectiveness of the highway facility. A lower value of VHT per lane mile indicates a lower usage of the facility. Density is also an indicator of the level of congestion.

The data in the tables indicates Concept A and Concept C have higher total daily VMT (i.e. higher usage) than Concept B or the No-Build Alternative on I-75. This is logical as these two concepts simply have more lanes. What is interesting is that Concept C usage is nearly as high as Concept A despite one fewer lane on I-75 between I-285 and I-575. The daily VMT per lane mile, however, indicates congestion under Concept A would be more than under Concept B. Concept C, however, would be the least congested.

Analysis of the peak period shows more differences between the build concepts. During the AM peak period, southbound VMT for Concept C is 668,000, which is substantially higher than Concept A at 628,000. The southbound VMT for Concept B is even less at about 596,000. This shows that though Concept A has overall higher VMT on a daily basis, this concept is less able to meet travel demand during the congested southbound AM peak period compared to Concept C. This also shows the relative small portion of traffic in the off-peak direction flow during peak periods and the ability of the three-lane reversible concept to serve more vehicles due to the strength of the latent demand currently using the parallel arterials in the region due to high congestion on I-75. Similar results are shown for the PM peak period for northbound travel.

Because the proposal at this time is to add managed lanes to the Northwest Corridor, it is particularly helpful to analyze VMT for only the proposed new managed lanes. Review of the VMT for the managed lanes alone by time period (i.e., AM and PM peak period) for the bi-directional and reversible-lane concepts determined that the reversible-lane concepts have more VMT than the bi-directional concept for both time periods. Though not in the tables below, the VMT for the managed lanes alone during the AM peak period was reported to be about 114,000 for Concept B, 153,000 for Concept A, and 181,000 for Concept C. The differences between Concept A and Concept C for total VMT for the PM peak period is less pronounced with VMTs for the managed lanes reported as about 158,000 for Concept B, about 228,000 for Concept A, and 233,000 for Concept C.



**Table 5-14. Vehicle Miles and Hours of Travel on I-75, 2035**

|                      | Location                | No-Build  | Concept A | Concept B1 | Concept B2 | Concept C |
|----------------------|-------------------------|-----------|-----------|------------|------------|-----------|
| Both Directions      | Vehicle Miles of Travel |           |           |            |            |           |
|                      | AM Peak Period          | 866,000   | 1,002,000 | 954,000    | 953,000    | 1,032,000 |
|                      | PM Peak Period          | 1,025,000 | 1,216,000 | 1,135,000  | 1,136,000  | 1,229,000 |
|                      | Total: Daily            | 3,718,000 | 4,240,000 | 3,993,000  | 3,994,000  | 4,223,000 |
|                      | Daily VMT Per Lane Mile | 24,000    | 20,000    | 19,000     | 19,000     | 18,000    |
|                      | Vehicle Hours of Travel |           |           |            |            |           |
|                      | AM Peak Period          | 41,000    | 41,000    | 37,000     | 36,000     | 39,000    |
|                      | PM Peak Period          | 60,000    | 58,000    | 53,000     | 53,000     | 58,000    |
|                      | Total: Daily            | 151,000   | 149,000   | 139,000    | 138,000    | 151,000   |
|                      | Daily VHT Per Lane Mile | 1,000     | 1,000     | 1,000      | 1,000      | 1,000     |
| Southbound Direction | Vehicle Miles of Travel |           |           |            |            |           |
|                      | AM Peak Period          | 511,000   | 628,000   | 597,000    | 595,000    | 668,000   |
|                      | PM Peak Period          | 465,000   | 519,000   | 462,000    | 465,000    | 473,000   |
|                      | Total: Daily            | 1,896,000 | 2,161,000 | 1,977,000  | 1,979,000  | 2,083,000 |
|                      | Daily VMT Per Lane Mile | 24,000    | 21,000    | 19,000     | 19,000     | 18,000    |
|                      | Vehicle Hours of Travel |           |           |            |            |           |
|                      | AM Peak Period          | 30,000    | 30,000    | 26,000     | 25,000     | 28,000    |
|                      | PM Peak Period          | 17,000    | 17,000    | 17,000     | 17,000     | 19,000    |
|                      | Total: Daily            | 73,000    | 73,000    | 69,000     | 68,000     | 75,000    |
|                      | Daily VHT Per Lane Mile | 1,000     | 1,000     | 1,000      | 1,000      | 1,000     |
| Northbound Direction | Vehicle Miles of Travel |           |           |            |            |           |
|                      | AM Peak Period          | 355,000   | 375,000   | 357,000    | 357,000    | 364,000   |
|                      | PM Peak Period          | 561,000   | 697,000   | 673,000    | 672,000    | 756,000   |
|                      | Total: Daily            | 1,822,000 | 2,079,000 | 2,017,000  | 2,015,000  | 2,139,000 |
|                      | Daily VMT Per Lane Mile | 23,000    | 20,000    | 19,000     | 19,000     | 18,000    |
|                      | Vehicle Hours of Travel |           |           |            |            |           |
|                      | AM Peak Period          | 10,000    | 11,000    | 10,000     | 10,000     | 11,000    |
|                      | PM Peak Period          | 43,000    | 41,000    | 36,000     | 35,000     | 40,000    |
|                      | Total: Daily            | 78,000    | 77,000    | 70,000     | 69,000     | 76,000    |
|                      | Daily VHT Per Lane Mile | 1,000     | 1,000     | 1,000      | 1,000      | 1,000     |

Note:

VMT = vehicle miles of travel

VHT = vehicle hours of travel



**Table 5-15. Vehicle Miles and Hours of Travel on I-575, 2035**

| Location             | No-Build                | Concept A | Concept B1 | Concept B2 | Concept C |
|----------------------|-------------------------|-----------|------------|------------|-----------|
| Both Directions      | Vehicle Miles of Travel |           |            |            |           |
|                      | AM Peak Period          | 373,000   | 422,000    | 403,000    | 446,000   |
|                      | PM Peak Period          | 477,000   | 544,000    | 524,000    | 561,000   |
|                      | Total: Daily            | 1,533,000 | 1,680,000  | 1,623,000  | 1,736,000 |
|                      | Daily VMT Per Lane Mile | 22,000    | 18,000     | 17,000     | 19,000    |
|                      | Vehicle Hours of Travel |           |            |            |           |
|                      | AM Peak Period          | 16,000    | 15,000     | 13,000     | 18,000    |
|                      | PM Peak Period          | 26,000    | 24,000     | 22,000     | 29,000    |
|                      | Total: Daily            | 56,000    | 54,000     | 49,000     | 61,000    |
|                      | Daily VHT Per Lane Mile | 1,000     | 1,000      | 1,000      | 1,000     |
| Southbound Direction | Vehicle Miles of Travel |           |            |            |           |
|                      | AM Peak Period          | 245,000   | 287,000    | 271,000    | 307,000   |
|                      | PM Peak Period          | 206,000   | 218,000    | 209,000    | 218,000   |
|                      | Total: Daily            | 791,000   | 857,000    | 821,000    | 879,000   |
|                      | Daily VMT Per Lane Mile | 22,000    | 18,000     | 17,000     | 19,000    |
|                      | Vehicle Hours of Travel |           |            |            |           |
|                      | AM Peak Period          | 13,000    | 12,000     | 10,000     | 15,000    |
|                      | PM Peak Period          | 6,000     | 6,000      | 6,000      | 7,000     |
|                      | Total: Daily            | 26,000    | 26,000     | 24,000     | 29,000    |
|                      | Daily VHT Per Lane Mile | 1,000     | 1,000      | 1,000      | 1,000     |
| Northbound Direction | Vehicle Miles of Travel |           |            |            |           |
|                      | AM Peak Period          | 128,000   | 136,000    | 132,000    | 139,000   |
|                      | PM Peak Period          | 271,000   | 326,000    | 315,000    | 343,000   |
|                      | Total: Daily            | 742,000   | 823,000    | 803,000    | 857,000   |
|                      | Daily VMT Per Lane Mile | 21,000    | 18,000     | 17,000     | 19,000    |
|                      | Vehicle Hours of Travel |           |            |            |           |
|                      | AM Peak Period          | 3,000     | 3,000      | 3,000      | 3,000     |
|                      | PM Peak Period          | 20,000    | 18,000     | 16,000     | 21,000    |
|                      | Total: Daily            | 30,000    | 28,000     | 25,000     | 32,000    |
|                      | Daily VHT Per Lane Mile | 1,000     | 1,000      | 1,000      | 1,000     |

Note:

VMT = vehicle miles of travel

VHT = vehicle hours of travel

But again, the bi-directional system, Concept A, includes some off-peak traffic, so an examination of the same data for peak directional traffic is insightful. For AM peak period southbound traffic, the managed lanes VMT is reported to be about 114,000 for Concept B, 130,000 for Concept A, and over 180,000 for Concept C. And for northbound managed lane traffic in the PM peak period, the VMT is reported to be about 157,000 for Concept B, a total of 164,000 for Concept A, and over 233,000 for Concept C. Thus, Concept C shows an increased utilization of about 38 percent for the AM peak period and about 42 percent for the PM peak period over Concept A and even higher utilization over Concept B.



And lastly, specific analysis of the managed lanes for the tolled groups (SOV, HOV2, and commercial trucks) provides an indicator of potential toll revenues for the build concepts in 2035. Examination of tolled groups during the peak periods shows that the VMT of Concept C is over 86 percent higher than Concept B during the AM peak period and 66 percent higher than Concept B for the PM peak period. Moreover, the sum of the AM and PM peak period VMT for the tolled groups for Concept C comprise about 50 percent of total daily managed-lane VMT. In comparison, the tolled groups comprise about 41 percent of total daily managed-lane VMT for concept B, and only about 31 percent for Concept A. But the absolute number for peak period tolled groups VMT for Concept C (289,000) is over 70 percent greater than the peak period tolled groups VMT for Concept B (167,000). As such, Concept C has significantly greater toll revenue capacity than Concept B in 2035.

Thus, from an overall effectiveness standpoint, the three-lane reversible system, Concept C, would appear to be the most effective of the new build concepts for the Northwest Corridor Project. This analysis, however, is based only on 2035 traffic forecast data and analysis of year of opening traffic data could provide a different view of which of the concepts would be most effective. As such, from a financial feasibility standpoint, it is the toll revenue collection over the life of the project, from opening year to horizon year, in light of construction and operation costs that provide the best information on the financial feasibility of either Concept B or Concept C. For this reason, GDOT's selection of a preferred alternative must consider the results of upcoming financial analysis.

## **5.9 Preliminary Benefit-Cost Analysis**

Using forecast traffic data as well as very conceptual cost estimates, the project team also conducted a preliminary benefit-cost analysis. The Georgia Department of Transportation's Benefit/Cost Analysis Worksheet (dated November 13, 2007) was used to calculate congestion benefit-cost (B/C) ratios for each of the alternatives. The detailed calculation results of the analysis are contained in Attachment D.

A congestion B/C ratio greater than 1.0 indicates that the calculated dollar value of congestion benefits exceeds the estimated dollar cost of the project. Higher B/C ratios are better than lower B/C ratios. The B/C ratio can be used to help determine whether a project should or should not proceed. It can also be used to compare alternatives.

Assumptions used in the calculations for the build concepts included the following:

- The congestion benefit equals to the total of the time benefit (Tb), the commercial benefit (CMb), and the fuel benefit (Fb).
- The total project cost equals the total of the preliminary engineering costs, the right-of-way costs, and the construction costs.
- The congestion B/C ratio is the congestion benefit divided by the project cost.

For the Northwest Corridor Project, one modification to the GDOT spreadsheet was made. Since the proposed managed lanes would have different daily traffic volumes, different truck percentages, and different travel time savings than the general purpose lanes, congestion benefits for the managed lanes were calculated separately from the general purpose lanes congestion benefits. These values were then added together before dividing by the project cost.

The results for the four build concepts under consideration at this time are listed below. A more detailed discussion of these results is found in the paragraphs that follow.

- Concept A = 2.67
- Concept B1 = 5.64
- Concept B2 = 6.70
- Concept C = 4.65

For Concept A, the average daily traffic (ADT) in the general-purpose lanes in 2035 is projected to be 322,000. Trucks are projected to make up about 9.6 percent of the total vehicles. With the construction of this concept the travel time through the corridor in the general purpose lanes would be reduced by about 10 minutes in the PM peak period compared to the No-Build Alternative. In 2035, the managed lanes would have an ADT of 60,000. Trucks would be prohibited from the managed lanes. Travel time would be reduced by about 40 minutes in the PM peak period. Concept A was estimated to cost about \$2billion. These values yield a congestion B/C ratio of 2.67.

For Concept B1, the ADT in the general-purpose lanes in 2035 is projected to be 326,000. Trucks are projected to comprise about 9.40 percent of total traffic. With the construction of this concept, the travel time through the corridor in the general-purpose lanes would be reduced by about 16 minutes in the PM peak period compared to the No-Build Alternative. In 2035, the managed lanes would have an ADT of 36,000. Trucks would be prohibited from the managed lanes. Travel time will be reduced by about 44 minutes in the PM peak period. Concept B1 was estimated to cost about \$1.2 billion. These values yielded a congestion B/C ratio of 5.64.

For Concept B2, the ADT in the general-purpose lanes in 2035 is projected to be 325,000, slightly less than for Concept B1. Trucks would comprise about 9.4 percent of total vehicles. After construction, travel time through the corridor in the general-purpose lanes would be reduced by about 17 minutes in the PM peak period compared to the No-Build Alternative. In 2035, the managed lanes would have an ADT of 36,000. Trucks would again be prohibited from the managed lanes. Travel time would be reduced by about 44 minutes in the PM peak period. Concept B2 is estimated to cost about \$1.1 billion. These values yield a congestion B/C ratio of 6.70.

And lastly for Concept C, the 2035 ADT in the general-purpose lanes is projected to be 331,000 and trucks would comprise about 9 percent of total traffic.



Following construction, travel time through the corridor in the general-purpose lanes would be reduced by about 14 minutes in the PM peak period compared to the No-Build Alternative. In 2035, the managed lanes would have an ADT of 50,000 and again trucks would be prohibited from using the managed lanes. Travel time would be reduced by about 44 minutes in the PM peak period. Concept C is estimated to cost about \$1.4 billion. These values yield a congestion B/C ratio of 4.65.

## **5.10 Conclusions**

The purpose of the traffic modeling analysis was to assess transportation measures of effectiveness for the bi-directional concept compared to the No-Build Alternative and to assess whether or not a reversible lane concept could provide substantial improvements over the bi-directional concept. Based on this analysis, the results demonstrate all of the build concepts meet the project purpose and need for the project. The basis for this conclusion is as follows:

### Need to Reduce Congestion

- 1) All of the concepts provide similar level of service compared to the No-Build Alternative for the general purpose lanes.
- 2) The level of service for the managed lanes for each of the build concepts (managed and reversible-lane concepts) is substantially improved over the highly congested conditions of the general purpose lanes of the No-Build Alternative.
- 3) The off-peak direction lanes during peak periods of the bi-directional concept are generally LOS A/B and indicate unused capacity.

### Need to Improve Mobility (by reducing travel time and increasing reliability)

- 1) Measures of vehicle hours of travel and person hours of travel for the bi-directional and two-lane reversible concepts is generally less than the No-Build Alternative.
- 2) The vehicle and person hours of travel for the three-lane reversible concept are generally increased over the No-Build Alternative.

### Need to Improve Access (by improving connectivity between regional activity centers)

- 1) Measures of vehicle and person miles of travel for each of the build concepts is substantially increased over the No-Build Alternative.
- 2) The two two-lane reversible lane concepts provide the least improvement, whereas the three-lane reversible lane concept show improvements over the bi-directional concept.

### Need to Improve Safety (by reducing existing roadway design deficiencies and congestion-related crashes)

- 1) To reduce overall project costs, none of the build concepts would reduce roadway design deficiencies as none would include re-construction of existing interchanges.

- 2) A higher proportion of all vehicles using highway and potentially parallel arterial roadways under all of the build concepts, particularly the three-lane reversible concept, would experience reduced congestion and reduced-congestion-related crashes compared to the No-Build Alternative.

Need to Reduce Vehicle Emissions (by improving vehicular travel efficiency and increasing the proportion of high-capacity vehicles)

- 1) Measures of vehicle miles and hours of travel indicate the bi-directional and two two-lane reversible lane concepts all are reduced values compared to the No-Build Alternative.
- 2) The three-lane reversible concept values for vehicle miles and hours of travel are generally higher than the No-Build Alternative.
- 3) All of the build concepts show substantial increased proportion of high-occupancy vehicles compared to the No-Build Alternative with the highest proportion attributed to the three-lane reversible concept.

Moreover, the two two-lane reversible lane concepts often provide improvements over the bi-directional concept. And, in a number of cases, the benefits provided by the three-lane reversible concept often provide the greatest benefits as shown in these transportation measures of effectiveness compared to the other build concepts. At this stage of the project study, a reversible lane concept appears to be superior to the bi-directional concept based on the transportation measures of effectiveness.



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