# A Roundabout Feasibility Study for
# SR 400/US 19 at CR 145/Northridge Road Interchange

NH000-0056-01, P.I. No. 751580, Fulton County

Prepared by HNTB Corporation

November 14, 2011

## Introduction

The interchange of SR 400 at Northridge Road is located just 5 miles north of I-285 in the City of Sandy Springs, Fulton County, Georgia. This partial cloverleaf interchange also provides connections to two arterials, Roberts Drive at the northbound (NB) ramps intersection and Dunwoody Place at the southbound (SB) ramps intersection (please see the attached interchange Location Map).

A traffic study was conducted by Kimley-Horn and Associates, Inc. (KHA) in October, 2011 to evaluate the proposed improvements to this interchange. By utilizing the traffic micro-simulation tool VISSIM, this study evaluated existing 2011 operational conditions and future No-Build and Build conditions in 2013 and 2033. Four different Build alternatives were evaluated by KHA's study for capacity and traffic operational improvements to the existing signalized intersections. A preferred option was recommended and was illustrated in the attached KHA's layout for the preferred option.

The purpose of this roundabout feasibility study is to develop and evaluate an additional improvement alternative for this interchange. The additional alternative would convert the two existing signalized intersections at the interchange ramp termini to roundabouts. A conceptual layout was developed for the roundabout alternative. Georgia Department of Transportation's (GDOT's) Roundabout Analysis Tool (version 2.0) was used to analyze the AM and PM peak hours for both the Opening Year (2013) and the Design Year (2033).

## Geometric Issues

Please refer to the attached conceptual roundabout layout for the following discussion on geometric layout.

### Northridge Road at SR 400 SB Ramps/Dunwoody Place

The proposed roundabout at this intersection would be a two-lane roundabout with an inscribed circle diameter of 220 feet. This larger diameter was chosen to provide adequate separation between legs. The circulatory roadway lane widths would be 15 feet for a total circulating width of 30 feet. Each approach entry would have two lanes, one designated as left or left and through and the other through or through and right. In order to provide adequate separation between entering approaches, the inscribed circle would be centered slightly to the north of the current signalized intersection's approximate center. There would be additional right-of-way required in the northwest quadrant of the intersection.

*West Leg* - The eastbound (EB) approach on the west leg would be offset to the left of center to increase the deflection angle and allow for greater spacing between the EB entry and the SB exit. There would be additional right-of-way required to the north of this approach. A right-turn bypass lane would be added from Northridge Road EB to SR 400 SB on-ramp. There would be two westbound exit lanes.

*South Leg* - The NB approach on the south leg would be aligned through the center of the roundabout but shifted left compared to the existing angle of the approach. The amount this leg can be realigned is somewhat limited in order to tie back to the existing ramp alignments. There would be two southbound exit lanes, which then merge into one lane prior to merging with the SR 400 SB mainline.

*East Leg* - The westbound (WB) approach on the east leg would be offset to the left of center of the roundabout due to the roundabout center being to the north. The approach alignment would not vary much from the current alignment. There would be a right-turn bypass lane from Northridge Road WB to Dunwoody Place NB. There would also be an additional separated bypass lane from SR 400 NB off-ramp to Dunwoody Place that would merge into Dunwoody Place north of the intersection. There would be two eastbound exit lanes.

*North Leg* - The SB approach on the north leg would be aligned through the center of the roundabout but angled left compared to the existing alignment. This allows for increased deflection and for greater spacing between the WB entry and the NB exit. The NB exit would be one-lane exit with two bypass merging in north of the intersection.

**Northridge Road at SR 400 SB Ramps/Roberts Drive**

The proposed roundabout at this intersection would be a two-lane roundabout with an inscribed circle diameter of 190 feet. The circulatory roadway lane widths would be 15 feet for a total circulating width of 30 feet. The NB, EB, and SB approaches would have two entry lanes, one designated as left or left and through and the other through or through and right. The WB approach would have one entry lane. The inscribed circle would be centered slightly to the north and west of the current signalized intersection in order to provide adequate separation between entry approaches. Additional right-of-way would be required in the southeast quadrant of the intersection.

*West Leg* – The EB approach would be offset to the right of center. This leg's alignment is relatively fixed so as to have a similar overpass alignment as existing over the SR 400 overpass. There would be a right-turn bypass lane from Northridge Road EB to Roberts Drive. There would be two WB exit lanes.

*South Leg* - The NB approach would be offset to the right of center to allow for greater spacing between the EB entry and the SB exit as well as increase the deflection between the NB entry and EB exit. The existing angle between this leg and the east leg would not provide adequate deflection. Additional right-of-way would be required to the east of this approach. There would be two SB exit lanes.

*East Leg* - The WB would be offset to the left of center of the roundabout due to the roundabout center being to the north, the approach alignment would not vary much from the current alignment. This alignment is restricted from shifting very much to the left to avoid impacts to an existing neighborhood. There would be one EB exit lane.

*North Leg* - The SB approach would be offset to the left of center to increased deflection and allow for greater spacing between the SB entry and the WB exit. There would be a bypass lane from SR 400 NB off ramp to Dunwoody Place. The amount this leg's alignment can shift is relatively fixed in order to tie to the existing ramp alignment. There would be two NB exit lanes.

**Northridge Road at Somerset Court**

A mini-roundabout is proposed for this intersection. This would be similar to the mini-roundabout proposed in the KHA preferred concept.

## Roundabout Analysis

GDOT's Roundabout Analysis Tool was used to determine the operational performance of the proposed roundabouts. The roundabout analysis utilizing the future traffic volumes forecasted by KHA was conducted for both future years 2013 and 2033. Future average daily traffic volumes (ADT) for 2013 and 2033 are summarized in **Table 1**.

According to GDOT's Roundabout Analysis Tool, a roundabout may not operate well when there is too much traffic entering the intersection or if the percentage of traffic on the major road is too high. For a Multi-lane roundabout, the thresholds to determine if a roundabout capacity analysis is justified are an ADT less that 45,000 and percentage on the major road less than 90 percent. As indicated by **Table 1**, the ADT volumes and splits for the SB ramp intersection exceed the suggested entering volume criteria of 45,000 ADT in both 2013 and 2033.

**Table 1 Volume Information**

| | 2013 | | 2033 | |
|---|---|---|---|---|
| | **ADT** | **Split** | **ADT** | **Split** |
| **NB Ramps** | | | | |
| Major Street | 22425 | 60% | 24750 | 60% |
| Minor Street | 14800 | 40% | 16350 | 40% |
| **Total** | **37225** | | **41100** | |
| **SB Ramps** | | | | |
| Major Street | 28475 | 55% | 31450 | 55% |
| Minor Street | 23025 | 45% | 25425 | 45% |
| **Total** | **51500** | | **56875** | |

The information pertaining to the inputs and outputs of the roundabout analysis is included in the attachment. Key measures of effectiveness (MOE) including control delay, Level of Service (LOS), and 95$^{th}$ percentile Queue for each all entry approaches are summarized in **Tables 2** and **3**.

**Table 2 2013 GDOT Multi-lane Roundabout Analysis Summary**

| | Approach Measures of Effectiveness | | | | Approach Measures of Effectiveness | | | |
|---|---|---|---|---|---|---|---|---|
| | SR 400 NB Ramps - AM/PM | | | | SR 400 SB Ramps - AM/PM | | | |
| | North Leg | East Leg | South Leg | West Leg | North Leg | East Leg | South Leg | West Leg |
| **HCM 2010 Model** | | | | | | | | |
| Control Delay, sec/pcu | 16.3/25.2 | 14.9/12.5/ | 26.4/20.1 | 8.7/8.2 | 112.8/97.4 | 11.4/33.9 | 19.5/100.5 | 50.7/15.8 |
| LOS | C/D | B/B | D/C | A/A | F/F | B/D | C/F | F/C |
| 95% Queue (ft) | 137/252 | 20/14 | 213/136 | 48/51 | 561/399 | 110/214 | 86/467 | 239/88 |
| **UK Model** | | | | | | | | |
| Control Delay, sec/pcu | 4.2/4.7 | 3.5/3.1 | 6.7/5.8 | 3.9/4.0 | 11.3/9.8 | 5.0/6.9 | 5.1/9.8 | 7.5/5.0 |
| LOS | A/A | A/A | A/A | A/A | A/A | A/A | A/A | A/A |
| 95% Queue (ft) | 35/47 | 4/4 | 83/63 | 37/39 | 175/118 | 56/83 | 39/146 | 79/45 |

**Table 3 2033 GDOT Multi-lane Roundabout Analysis Summary**

| | Approach Measures of Effectiveness | | | | Approach Measures of Effectiveness | | | |
|---|---|---|---|---|---|---|---|---|
| | SR 400 NB Ramps - AM/PM | | | | SR 400 SB Ramps - AM/PM | | | |
| | North Leg | East Leg | South Leg | West Leg | North Leg | East Leg | South Leg | West Leg |
| **HCM 2010 Model** | | | | | | | | |
| Control Delay, sec/pcu | 22.3/38.4 | 17.5/13.3 | 44.8/29.3 | 9.7/9.0 | 229.2/204.6 | 13.4/100.5 | 27.7/171.8 | 102.8/19.2 |
| LOS | C/E | C/B | E/D | A/A | F/F | B/F | D/F | F/C |
| 95% Queue (ft) | 197/363 | 24/10 | 336/211 | 58/60 | 832/607 | 121/336 | 129/715 | 379/80 |
| **UK Model** | | | | | | | | |
| Control Delay, sec/pcu | 4.6/5.1 | 4.0/3.4 | 8.0/5.8 | 4.2/5.6 | 17.7/14.3 | 5.7/8.4 | 6.0/13.9 | 9.6/5.6 |
| LOS | A/A | A/A | A/A | A/A | C/B | A/A | A/B | A/A |
| 95% Queue (ft) | 42/57 | 4/3 | 112/80 | 43/45 | 299/192 | 69/112 | 50/231 | 114/56 |

The GDOT Roundabout Analysis Tool computes the entry capacity based on the Highway Capacity Manual 2010 (HCM 2010) formula and the UK formula referenced in the 2000 FHWA Roundabout guide. As suggested by the GDOT Roundabout Analysis Tool, the HCM 2010 model yields a conservative capacity and is best applied to the opening year when the driver familiarity is low; while the UK model yields a liberal entry capacity and is best applied for the design year when driver familiarity has increased.

As indicated in **Table 2**, the roundabout at the NB Ramps would operate at acceptable LOS. The longest queue of 252 feet would be expected at the north leg which is the SR 400 NB off ramp. As the layout illustrates, this approach would have adequate storage to accommodate anticipated queuing. However, LOS F would be expected at the roundabout at the SB Ramps in 2013. The HCM model results indicated that all approaches would operate at LOS F. Significant queuing would be expected on both the North and the South legs.

The 2033 results based on using the UK Model indicate that both intersection would operate at acceptable levels of service. Relatively long queues may be expected at the North and South Legs of the SB ramps roundabout but could be accommodated based on the geometric layout.

Recommended improvements from KHA's study include the installation of mini-roundabout at the intersection of Somerset Court. The purpose of the mini-roundabout was to address the complaints that vehicles were using Somerset Court as a turnaround point. If a roundabout is constructed at the NB Ramp intersection, the need to access Somerset Court as a turnaround point would likely go away. A geometric layout was developed to include a mini-roundabout at Somerset Court. No roundabout analysis was conducted at this intersection since very minimal traffic was forecasted for this intersection.

## Conclusions

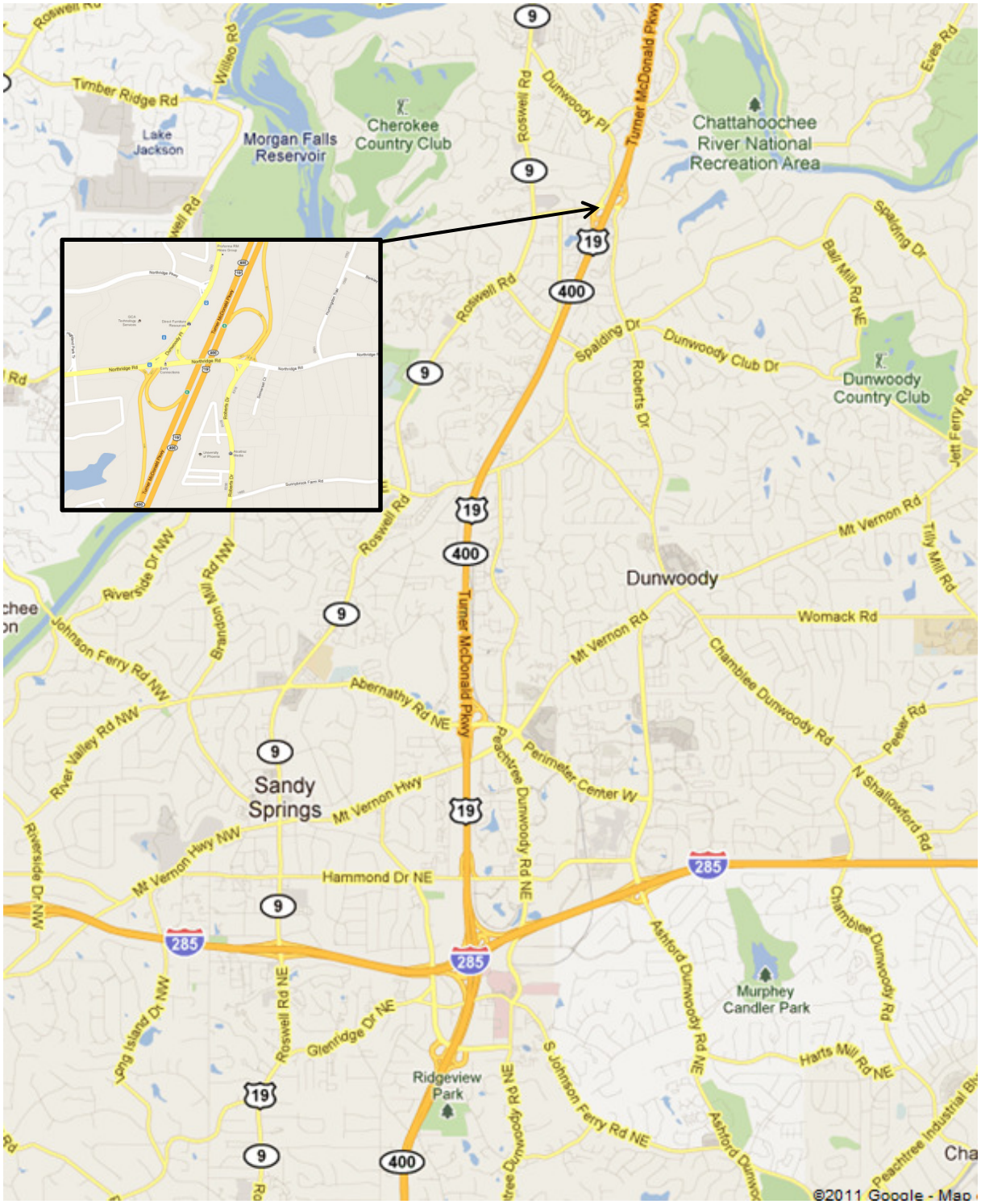
As part of the roundabout feasibility study, a conceptual two-lane roundabout layout was developed for the Northridge Road intersections at SR 400 SB Ramps/Dunwoody Place and SR 400 NB Ramps/Roberts Drive and a mini-roundabout for the intersection of Northridge Road and Somerset Court. Operational analysis utilizing GDOT's Roundabout Analysis Tool was conducted to evaluate the future operational conditions including delay, LOS, and queuing at the proposed two-lane roundabouts. Key observations are summarized below:

- Adjustments to the existing intersection entry approach alignments would be needed to provide adequate separations between entry approaches and proper entry deflection angles. Some new right-of-way would be needed to accommodate those adjustments.

- Information provided by KHA in its Traffic Study was not sufficient to accurately determine the volume from SR 400 NB Off-ramp to NB on Dunwoody Place. This volume would utilize the proposed separate right-turn lane at the interchange from SR 400 NB Off-ramp to Dunwoody Place and would ultimately determine the configuration of the WB approach at the intersection of Northridge Road at SR 400 SB Ramps/Dunwoody Place.
- According to the operational analysis results, the Northridge Road and SR 400 NB Ramps/Roberts Drive would operate at acceptable LOS. The forecasted future entering volumes at the SR 400 SB Ramps/Dunwoody Place would exceed the optimal volumes for a roundabout. In addition, the results based on the HCM model indicate a roundabout at this location would operate at an unacceptable LOS. However, the results based on the UK model indicate favorable operating conditions with a roundabout at this location. It is recommended that a more rigorous analysis be conducted to overcome the shortcomings of a deterministic analysis tool such as GDOT's Roundabout Analysis Tool.
- A roundabout at Somerset Court may not be needed if a roundabout is constructed at the NB Ramp intersection.
- The construction cost to implement the proposed roundabouts could be significantly higher than that of KHA's proposed preferred improvements at this interchange. However, a comprehensive comparative analysis is recommended to facilitate a preferred option selection process. A well calibrated and validated traffic micro-simulation model would be a useful tool for the comparative analysis.

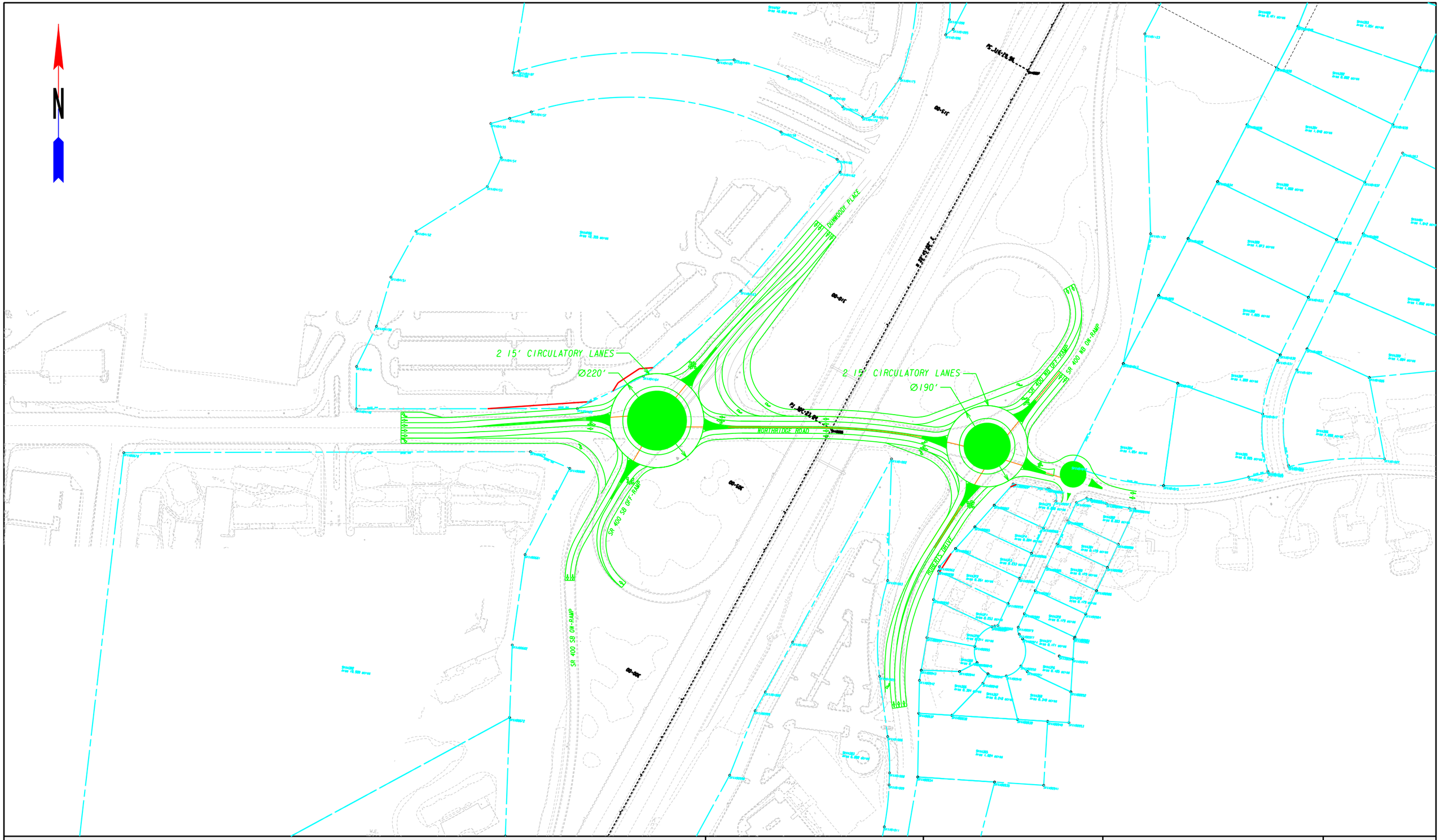
## Attachments

- SR 400 at Northridge Road Interchange Location Map
- Roundabout Geometric Layout
- Preferred Intersection Improvements Recommended by KHA
- Traffic Volumes
- GDOT Roundabout Analysis Tool Printouts




**Location Map**

**SR 400/US 19 at CR 145/Northridge Road Interchange**




NOTES:

**LEGEND**

EDGE OF PAVEMENT

CENTERLINE

ROW

HNTB

3715 NORTHSIDE PARKWAY, NW
200 NORTHCREEK, SUITE 800
ATLANTA, GEORGIA 30327

NORTHRIDGE ROAD
ROUNDABOUT CONCEPT

SCALE IN FEET
0 200 400 800

1 OF 1

N

SCALE IN FEET
0 50 100 200

# SR 400 / US 19 @ CR 145 / NORTHRIDGE ROAD
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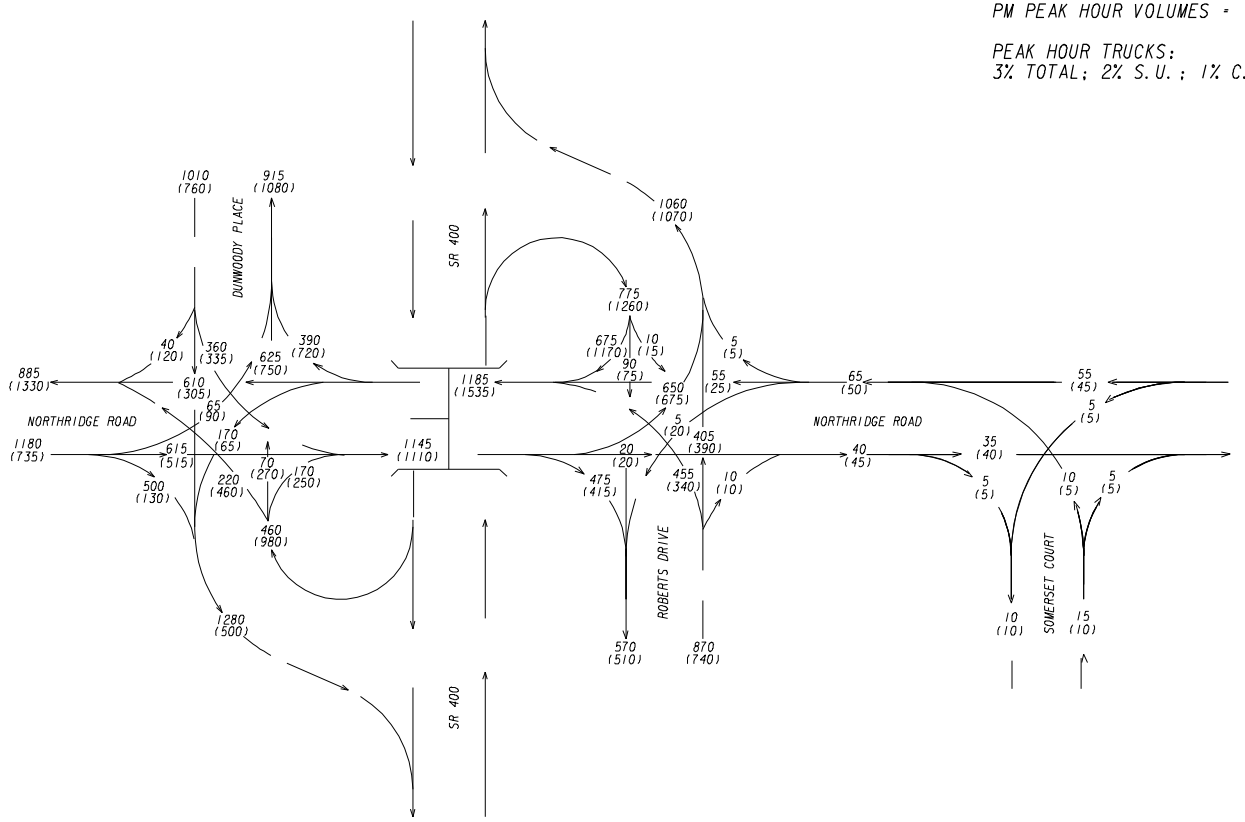
| USER:gary.newton | $$PENTABLE$$ | | GA | 751580 | | |

EXISTING YEAR 2011 DHV
TRAFFIC VOLUMES
AM PEAK HOUR VOLUMES = 000
PM PEAK HOUR VOLUMES = (000)

PEAK HOUR TRUCKS:
3% TOTAL; 2% S.U.; 1% C.U.

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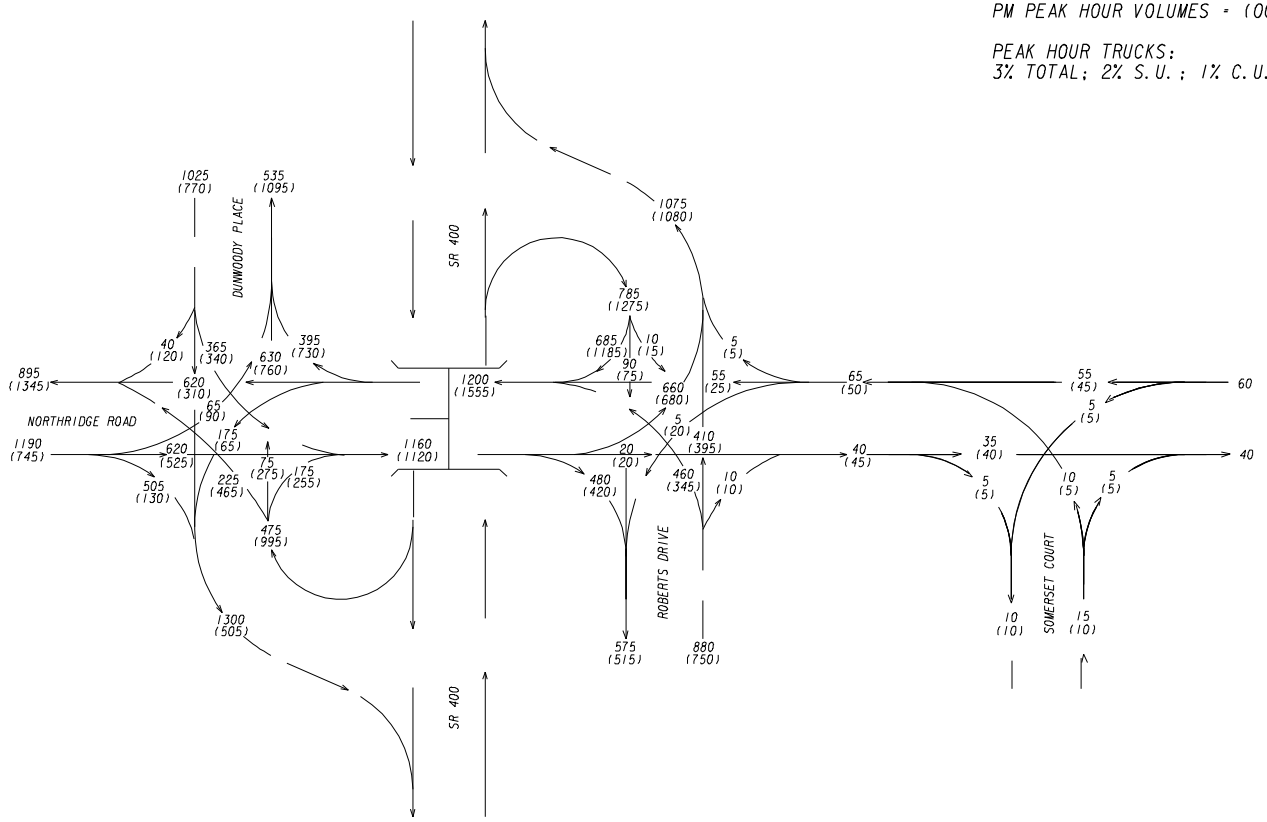
BASE YEAR 2013 DHV
TRAFFIC VOLUMES
AM PEAK HOUR VOLUMES = 000
PM PEAK HOUR VOLUMES = (000)

PEAK HOUR TRUCKS:
3% TOTAL; 2% S.U.; 1% C.U.

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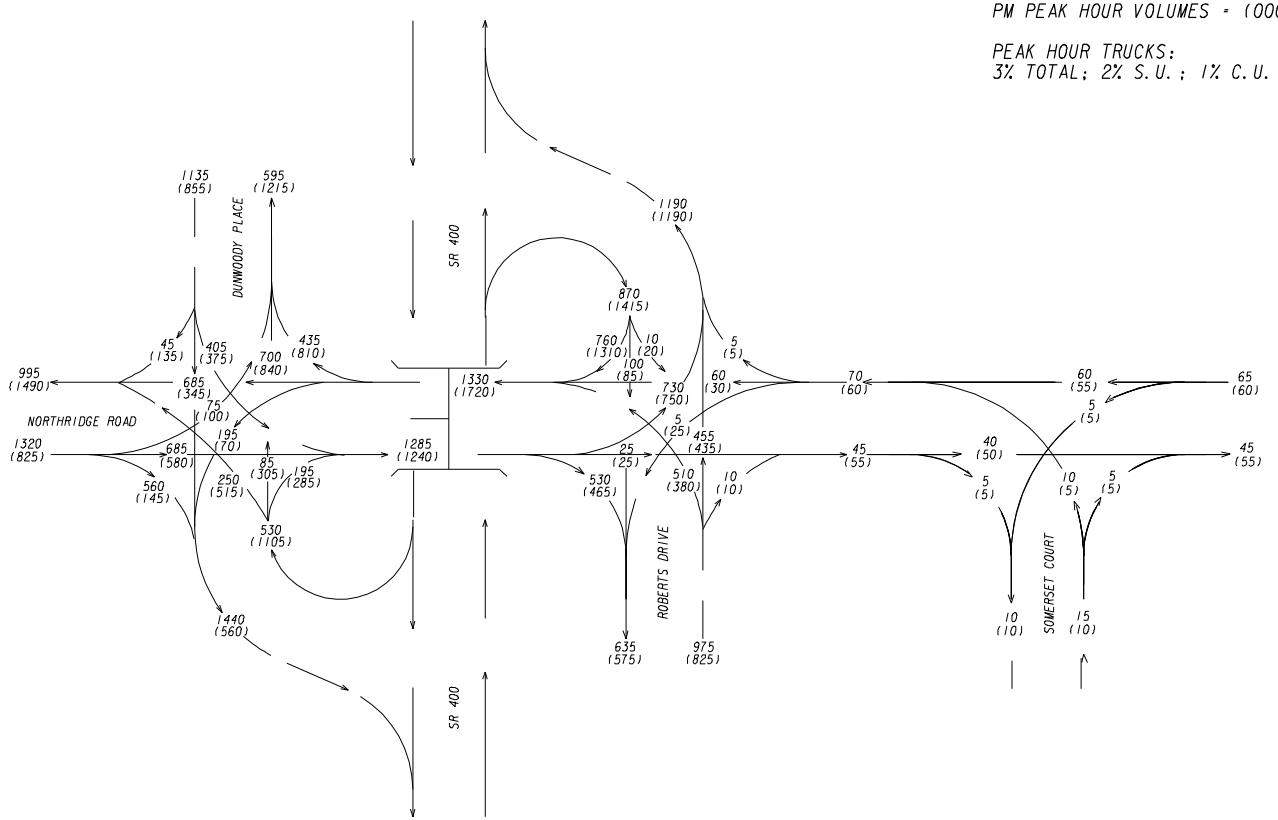
DESIGN YEAR 2033 DHV
TRAFFIC VOLUMES
AM PEAK HOUR VOLUMES = 000
PM PEAK HOUR VOLUMES = (000)

PEAK HOUR TRUCKS:
3% TOTAL; 2% S.U.; 1% C.U.

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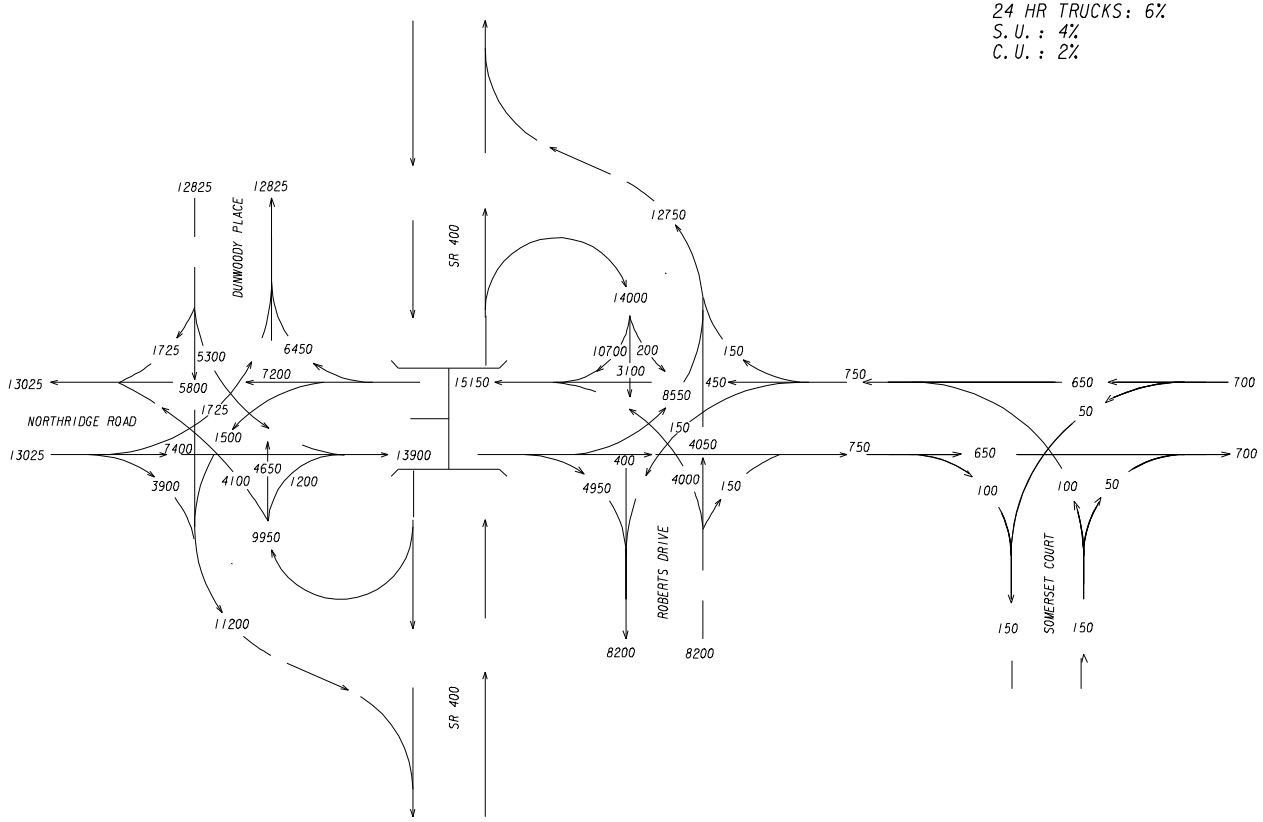
EXISTING YEAR 2011 AADT
TRAFFIC VOLUMES

24 HR TRUCKS: 6%
S.U.: 4%
C.U.: 2%

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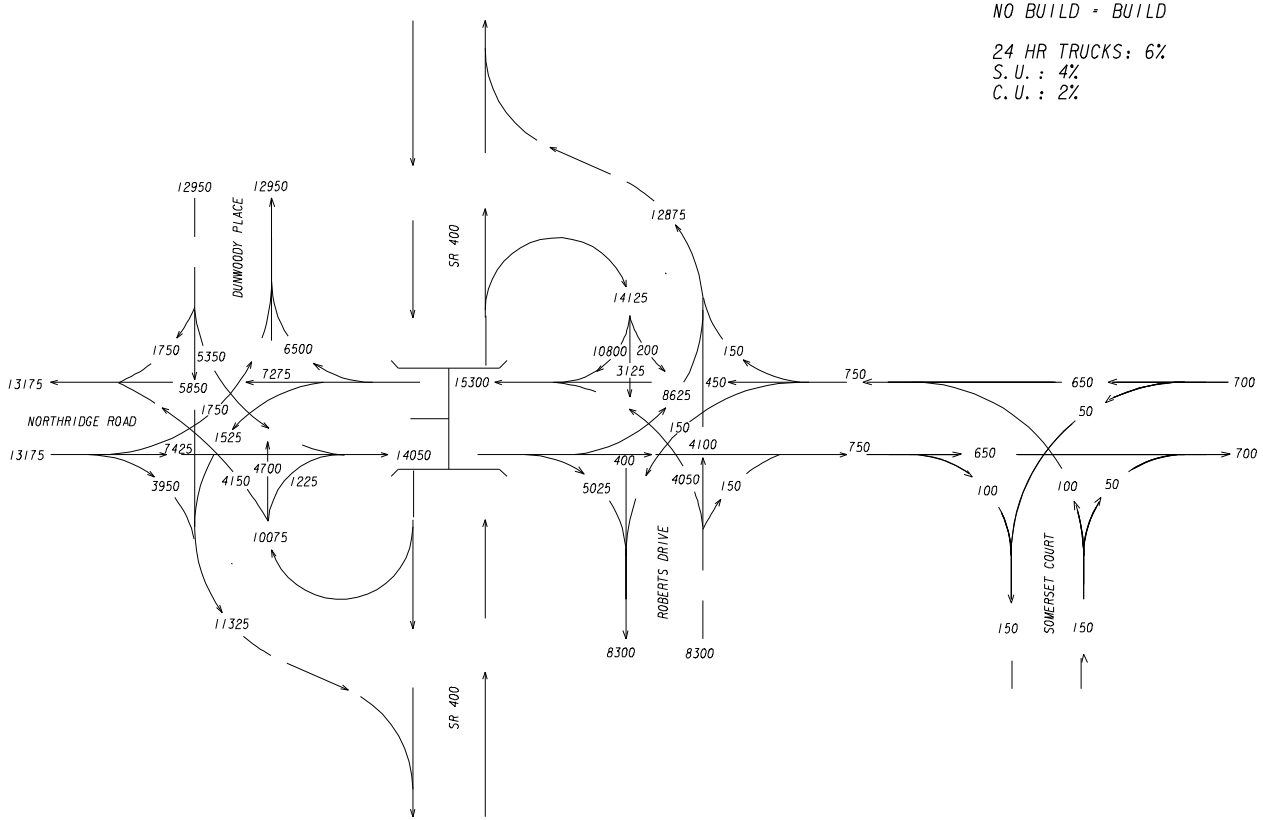
BASE YEAR 2013 AADT
TRAFFIC VOLUMES

NO BUILD - BUILD

24 HR TRUCKS: 6%
S.U.: 4%
C.U.: 2%

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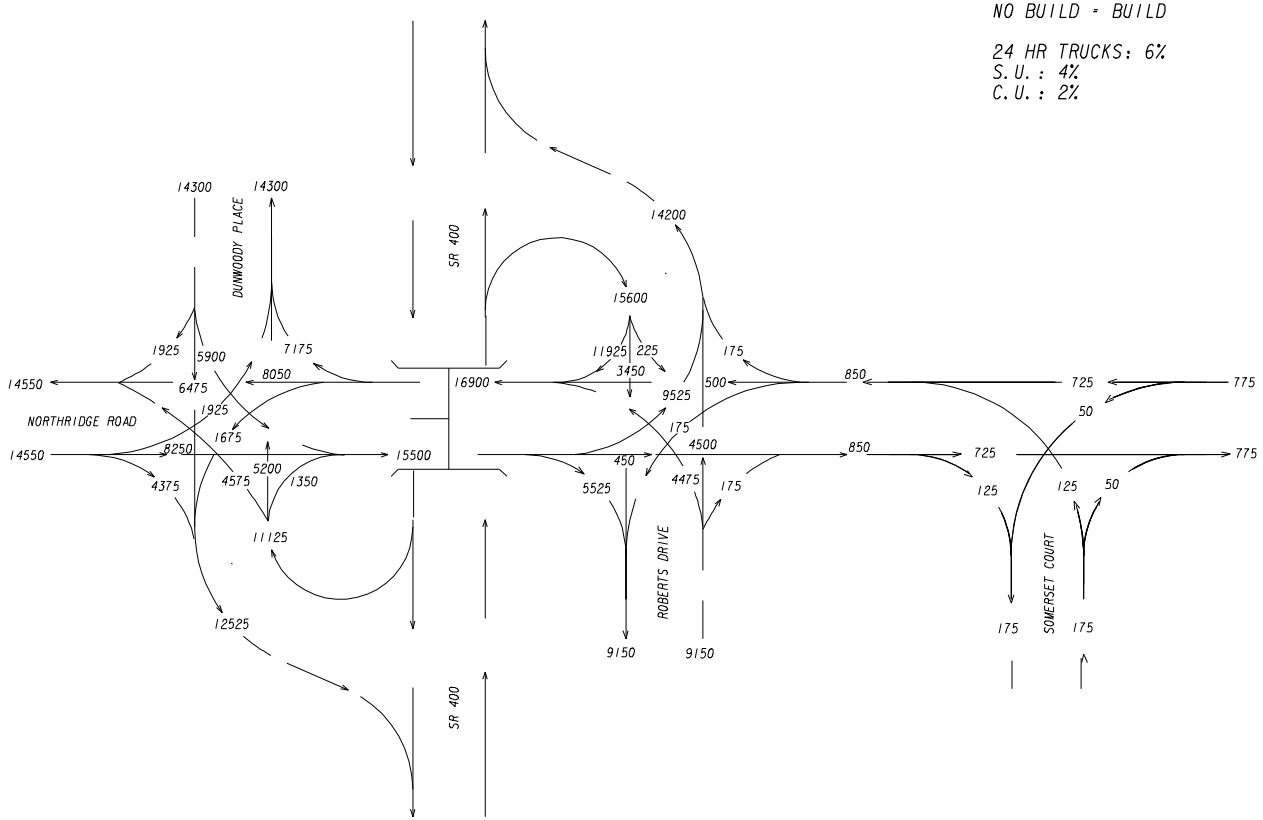
DESIGN YEAR 2033 AADT
TRAFFIC VOLUMES

NO BUILD - BUILD

24 HR TRUCKS: 6%
S.U.: 4%
C.U.: 2%

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SR 400 @ NORTHRIDGE ROAD

DRAWING NO. 10-06

11/5/2009 GPN

## General & Site Information

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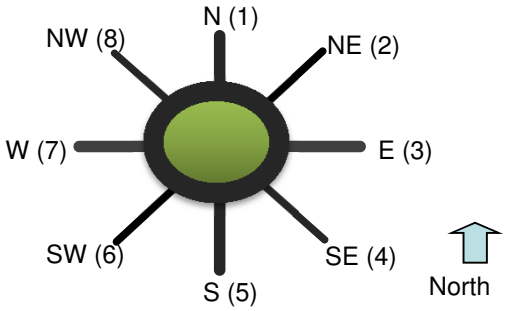
|---|---|
| Analyst: | Keith McCage |
| Agency/Company: | HNTB for GDOT |
| Date: | 11/3/2011 |
| Project Name or PI#: | 751580 |
| Year, Peak Hour: | 2013, AM |
| County/District: | Fulton |
| Intersection: | SR 400 NB at Northridge Road |




## Volumes

| Entry Legs (FROM) | N1 (1) | N2 (1) | NE1 (2) | NE2 (2) | E1 (3) | E2 (3) | SE1 (4) | SE2 (4) |
|---|---|---|---|---|---|---|---|---|
| **Lane Designation** | Left-Thru | Right-Thru | SELECT | SELECT | Lf-Th-Rt | SELECT | SELECT | SELECT |
| N (1), vph | | | | | 5 | | | |
| Exit NE (2), vph | | | | | | | | |
| Legs E (3), vph | 10 | | | | | | | |
| (TO) SE (4), vph | | | | | | | | |
| S (5), vph | 90 | | | | 5 | | | |
| SW (6), vph | | | | | | | | |
| W (7), vph | | 460 | | | 55 | | | |
| NW (8), vph | | | | | | | | |
| Entry Volume, vph | 100 | 460 | 0 | 0 | 65 | 0 | 0 | 0 |

| | S1 (5) | S2 (5) | SW1 (6) | SW2 (6) | W1 (7) | W2 (7) | NW1 (8) | NW2 (8) |
|---|---|---|---|---|---|---|---|---|
| **Lane Designation** | Left-Thru | Right-Thru | SELECT | SELECT | Left-Thru | Right-Thru | SELECT | SELECT |
| N (1), vph | | 410 | | | 360 | 300 | | |
| NE (2), vph | | | | | | | | |
| E (3), vph | | 10 | | | | 20 | | |
| SE (4), vph | | | | | | | | |
| S (5), vph | | | | | | | | |
| SW (6), vph | | | | | | | | |
| W (7), vph | 460 | | | | | | | |
| NW (8), vph | | | | | | | | |
| Entry Volume, vph | 460 | 420 | 0 | 0 | 360 | 320 | 0 | 0 |

| | N | NE | E | SE | S | SW | W | NW |
|---|---|---|---|---|---|---|---|---|
| **# of Entry Flow Lanes** | 2 | 0 | 1 | 0 | 2 | 0 | 2 | 0 |
| **# of Conflict Flow Lanes** | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |

| Volume Characteristics | N | NE | E | SE | S | SW | W | NW |
|---|---|---|---|---|---|---|---|---|
| % Cars | 97% | 100% | 97% | 100% | 97% | 100% | 97% | 100% |
| % Heavy Vehicles | 3% | 0% | 3% | 0% | 3% | 0% | 3% | 0% |
| % Bicycles | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% |
| # of Pedestrians **(ped/hr)** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| *PHF* | *0.92* | *0.92* | *0.92* | *0.92* | *0.92* | *0.92* | *0.92* | *0.92* |
| $F_{hv}$ | 0.971 | 1.000 | 0.971 | 1.000 | 0.971 | 1.000 | 0.971 | 1.000 |
| $F_{ped}$ | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 |

| Entry/Conflicting Flows | N | NE | E | SE | S | SW | W | NW |
|---|---|---|---|---|---|---|---|---|

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Flow to | N (1), pcu/h | 0 | 0 | 6 | 0 | 459 | 0 | 739 | 0 |
| Leg # | NE (2), pcu/h | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | E (3), pcu/h | 11 | 0 | 0 | 0 | 11 | 0 | 22 | 0 |
| | SE (4), pcu/h | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | S (5), pcu/h | 101 | 0 | 6 | 0 | 0 | 0 | 0 | 0 |
| | SW (6), pcu/h | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | W (7), pcu/h | 515 | 0 | 62 | 0 | 515 | 0 | 0 | 0 |
| | NW (8), pcu/h | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Entry flow, pcu/h | 627 | 0 | 73 | 0 | 985 | 0 | 761 | 0 |
| | Entry flow Lane 1, pcu/h | 112 | 0 | 73 | 0 | 515 | 0 | 403 | 0 |
| | Entry flow Lane 2, pcu/h | 515 | 0 | 0 | 0 | 470 | 0 | 358 | 0 |
| | Conflicting flow, pcu/h | 582 | 0 | 1713 | 0 | 773 | 0 | 118 | 0 |

## Results: Approach Measures of Effectiveness

| **HCM 2010 Model** | **N** | | **E** | | **S** | | **W** | |
|---|---|---|---|---|---|---|---|---|
| *Lane Designations* | *Left-Thru* | *Right-Thru* | *Lf-Th-Rt* | *Lane 2* | *Left-Thru* | *Right-Thru* | *Left-Thru* | *Right-Thru* |
| Entry Capacity, veh/h | 709 | 730 | 331 | NA | 615 | 639 | 1005 | 1010 |
| Entry Flow Rates, veh/h | 109 | 500 | 71 | NA | 500 | 457 | 391 | 348 |
| **V/C ratio** | **0.15** | **0.69** | **0.21** | | **0.81** | **0.71** | **0.39** | **0.34** |
| **Control Delay, s/veh** | **6.8** | **18.4** | **14.9** | | **30.5** | **22.0** | **7.8** | **7.1** |
| LOS | A | C | B | | D | C | A | A |
| **95th % Queue (ft)** | **14** | **137** | **20** | | **213** | **149** | **48** | **39** |
| *Approach Delay* | 16.3 | | 14.9 | | 26.4 | | 8.7 | |
| *Approach LOS* | C | | B | | D | | A | |

| | **NE** | | **SE** | | **SW** | | **NW** | |
|---|---|---|---|---|---|---|---|---|
| *Lane Designations* | *Lane 1* | *Lane 2* | *Lane 1* | *Lane 2* | *Lane 1* | *Lane 2* | *Lane 1* | *Lane 2* |
| Entry Capacity, veh/h | NA | NA | NA | NA | NA | NA | NA | NA |
| Entry Flow Rates, veh/h | NA | NA | NA | NA | NA | NA | NA | NA |
| **V/C ratio** | | | #VALUE! | #VALUE! | | | #VALUE! | #VALUE! |
| **Control Delay, sec/pcu** | | | #VALUE! | #VALUE! | | | #VALUE! | #VALUE! |
| LOS | | | #VALUE! | #VALUE! | | | #VALUE! | #VALUE! |
| **95th % Queue (ft)** | | | #DIV/0! | #VALUE! | | | #DIV/0! | #DIV/0! |
| *Approach Delay* | | | | | | | | |
| *Approach LOS* | | | #N/A | | | | #N/A | |

| **UK Model**** | **N** | **NE** | **E** | **SE** | **S** | **SW** | **W** | **NW** |
|---|---|---|---|---|---|---|---|---|
| Crit. Entry Capacity pcu/h | 2007 | NA | 1198 | NA | 1871 | NA | 2340 | NA |
| Entry Flow pcu/h | 627 | 0 | 73 | 0 | 985 | 0 | 761 | 0 |
| **V/C ratio** | **0.31** | | **0.06** | | **0.53** | | **0.33** | |
| **Control Delay, sec/pcu** | **4.2** | | **3.5** | | **6.7** | | **3.9** | |
| LOS | A | | A | | A | | A | |
| **95th % Queue (ft)** | **35** | | **5** | | **83** | | **37** | |

**Notes:**

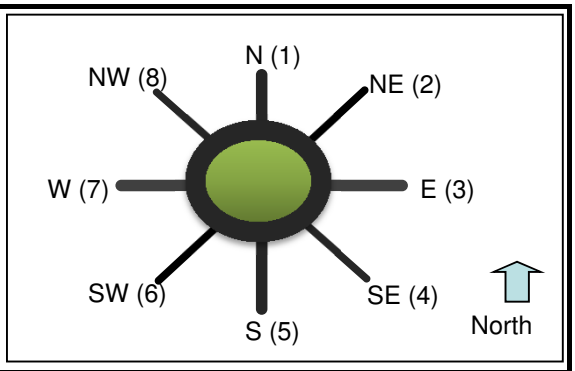
Unit Legend:
vph = vehicles per hour
PHF = peak hour factor
$F_{HV}$ = heavy vehicle factor
pcu = passenger car unit

## *Bypass Lane Merge Point Analysis (if applicable)*

| Bypass Characteristics | Bypass #1 | Bypass #2 | Bypass #3 | Bypass #4 | Bypass #5 | Bypass #6 |
|---|---|---|---|---|---|---|
| Select Entry Leg from Bypass (FROM) | W (7) | | | | | |
| Select Exit Leg for Bypass (TO) | S (5) | | | | | |
| **Does the bypass have a dedicated receiving lane?** | No | | | | | |
| **# of Conflicting Exit Flow Lanes** | 1 | 2 | 2 | 2 | 2 | 2 |
| *Volumes* | | | | | | |
| Entry Leg: Insert Right Turn Volume | 480 | | | | | |
| Exit Leg: ***(Select Input Method)*** | HCM | | | | | |
| *Lane Flow in Exit Leg**** | 107 | | | | | |
| Sum of inner circulatory flow lane to exit leg (leg bypass merges into) | N/A | N/A | N/A | N/A | N/A | N/A |
| Sum of outer circulatory flow lane to exit leg (leg bypass merges into) | N/A | N/A | N/A | N/A | N/A | N/A |
| *Critical Lane Flow (Manual) in Exit Leg**** | | | | | | |
| *Volume Characteristics* | | | | | | |
| PHF (Entry Leg) | 0.92 | | | | | |
| $F_{HV}$ (Entry Leg) | 0.97 | | | | | |
| $F_{ped}$ | 1.00 | | | | | |
| PHF (Exit Leg)*** | N/A | N/A | N/A | N/A | N/A | N/A |
| $F_{HV}$ (Exit Leg)*** | N/A | N/A | N/A | N/A | N/A | N/A |
| ***Volume Characteristics are already taken into account for Default method ONLY. Insert Values above if Manual method.*** | | | | | | |
| *Entry/Conflicting Flows* | | | | | | |
| Entry Flow | 537 | | | | | |
| Conflicting Critical Flow | 107 | 0 | | | | |
| **Bypass Lane Results** | | | | | | |
| Entry Capacity of Bypass, veh/h | 986 | | | | | |
| Flow Rates of Exiting Traffic, veh/h | 522 | | | | | |
| **V/C ratio** | 0.53 | | | | | |
| **Control Delay, sec/pcu** | 10.3 | | | | | |
| LOS | B | | | | | |
| **95th % Queue (ft)** | 82 | | | | | |

## General & Site Information

| | |
|---|---|
| Analyst: | Keith McCage |
| Agency/Company: | HNTB for GDOT |
| Date: | 11/3/2011 |
| Project Name or PI#: | 751580 |
| Year, Peak Hour: | 2013, PM |
| County/District: | Fulton |
| Intersection: | SR 400 NB at Northridge Road |




## Volumes

| Entry Legs (FROM) | N1 (1) | N2 (1) | NE1 (2) | NE2 (2) | E1 (3) | E2 (3) | SE1 (4) | SE2 (4) |
|---|---|---|---|---|---|---|---|---|
| **Lane Designation** | Left-Thru | Right-Thru | SELECT | SELECT | Lf-Th-Rt | SELECT | SELECT | SELECT |
| N (1), vph | | | | | 5 | | | |
| **Exit** NE (2), vph | | | | | | | | |
| **Legs** E (3), vph | 15 | | | | | | | |
| **(TO)** SE (4), vph | | | | | | | | |
| S (5), vph | 75 | | | | 20 | | | |
| SW (6), vph | | | | | | | | |
| W (7), vph | | 630 | | | 25 | | | |
| NW (8), vph | | | | | | | | |
| Entry Volume, vph | 90 | 630 | 0 | 0 | 50 | 0 | 0 | 0 |

| | S1 (5) | S2 (5) | SW1 (6) | SW2 (6) | W1 (7) | W2 (7) | NW1 (8) | NW2 (8) |
|---|---|---|---|---|---|---|---|---|
| **Lane Designation** | Left-Thru | Right-Thru | SELECT | SELECT | Left Only | Left-Thru | SELECT | SELECT |
| N (1), vph | 8 | 387 | | | 371 | 309 | | |
| NE (2), vph | | | | | | | | |
| E (3), vph | | 10 | | | | 20 | | |
| SE (4), vph | | | | | | | | |
| S (5), vph | | | | | | | | |
| SW (6), vph | | | | | | | | |
| W (7), vph | 345 | | | | | | | |
| NW (8), vph | | | | | | | | |
| Entry Volume, vph | 353 | 397 | 0 | 0 | 371 | 329 | 0 | 0 |

| | N | NE | E | SE | S | SW | W | NW |
|---|---|---|---|---|---|---|---|---|
| **# of Entry Flow Lanes** | 2 | 0 | 1 | 0 | 2 | 0 | 2 | 0 |
| **# of Conflict Flow Lanes** | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |

| Volume Characteristics | N | NE | E | SE | S | SW | W | NW |
|---|---|---|---|---|---|---|---|---|
| % Cars | 97% | 100% | 97% | 100% | 97% | 100% | 97% | 100% |
| % Heavy Vehicles | 3% | 0% | 3% | 0% | 3% | 0% | 3% | 0% |
| % Bicycles | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% |
| # of Pedestrians **(ped/hr)** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| *PHF* | *0.92* | *0.92* | *0.92* | *0.92* | *0.92* | *0.92* | *0.92* | *0.92* |
| $F_{hv}$ | 0.971 | 1.000 | 0.971 | 1.000 | 0.971 | 1.000 | 0.971 | 1.000 |
| $F_{ped}$ | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 |

| Entry/Conflicting Flows | N | NE | E | SE | S | SW | W | NW |
|---|---|---|---|---|---|---|---|---|

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Flow to | N (1), pcu/h | 0 | 0 | 6 | 0 | 442 | 0 | 761 | 0 |
| Leg # | NE (2), pcu/h | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | E (3), pcu/h | 17 | 0 | 0 | 0 | 11 | 0 | 22 | 0 |
| | SE (4), pcu/h | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | S (5), pcu/h | 84 | 0 | 22 | 0 | 0 | 0 | 0 | 0 |
| | SW (6), pcu/h | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | W (7), pcu/h | 705 | 0 | 28 | 0 | 386 | 0 | 0 | 0 |
| | NW (8), pcu/h | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Entry flow, pcu/h | 806 | 0 | 56 | 0 | 840 | 0 | 784 | 0 |
| | Entry flow Lane 1, pcu/h | 101 | 0 | 56 | 0 | 395 | 0 | 415 | 0 |
| | Entry flow Lane 2, pcu/h | 705 | 0 | 0 | 0 | 444 | 0 | 368 | 0 |
| | Conflicting flow, pcu/h | 437 | 0 | 1590 | 0 | 800 | 0 | 123 | 0 |

## Results: Approach Measures of Effectiveness

| **HCM 2010 Model** | **N** | | **E** | | **S** | | **W** | |
|---|---|---|---|---|---|---|---|---|
| *Lane Designations* | *Left-Thru* | *Right-Thru* | *Lf-Th-Rt* | *Lane 2* | *Left-Thru* | *Right-Thru* | *Left Only* | *Left-Thru* |
| Entry Capacity, veh/h | 791 | 808 | 361 | NA | 602 | 626 | 1000 | 1006 |
| Entry Flow Rates, veh/h | 98 | 685 | 54 | NA | 384 | 432 | 403 | 358 |
| **V/C ratio** | **0.12** | **0.85** | **0.15** | | **0.64** | **0.69** | **0.40** | **0.36** |
| **Control Delay, s/veh** | **5.8** | **28.0** | **12.5** | | **19.1** | **20.9** | **8.0** | **7.3** |
| LOS | A | D | B | | C | C | A | A |
| **95th % Queue (ft)** | **11** | **252** | **14** | | **117** | **136** | **51** | **41** |
| *Approach Delay* | 25.2 | | 12.5 | | 20.1 | | 8.2 | |
| *Approach LOS* | D | | B | | C | | A | |

| | **NE** | | **SE** | | **SW** | | **NW** | |
|---|---|---|---|---|---|---|---|---|
| *Lane Designations* | *Lane 1* | *Lane 2* | *Lane 1* | *Lane 2* | *Lane 1* | *Lane 2* | *Lane 1* | *Lane 2* |
| Entry Capacity, veh/h | NA | NA | NA | NA | NA | NA | NA | NA |
| Entry Flow Rates, veh/h | NA | NA | NA | NA | NA | NA | NA | NA |
| **V/C ratio** | | | #VALUE! | #VALUE! | | | #VALUE! | #VALUE! |
| **Control Delay, sec/pcu** | | | #VALUE! | #VALUE! | | | #VALUE! | #VALUE! |
| LOS | | | #VALUE! | #VALUE! | | | #VALUE! | #VALUE! |
| **95th % Queue (ft)** | | | #DIV/0! | #VALUE! | | | #DIV/0! | #DIV/0! |
| *Approach Delay* | | | | | | | | |
| *Approach LOS* | | | #N/A | | | | #N/A | |

| **UK Model**** | **N** | **NE** | **E** | **SE** | **S** | **SW** | **W** | **NW** |
|---|---|---|---|---|---|---|---|---|
| Crit. Entry Capacity pcu/h | 2111 | NA | 1286 | NA | 1851 | NA | 2336 | NA |
| Entry Flow pcu/h | 806 | 0 | 56 | 0 | 840 | 0 | 784 | 0 |
| **V/C ratio** | **0.38** | | **0.04** | | **0.45** | | **0.34** | |
| **Control Delay, sec/pcu** | **4.7** | | **3.1** | | **5.8** | | **4.0** | |
| LOS | A | | A | | A | | A | |
| **95th % Queue (ft)** | **47** | | **4** | | **63** | | **39** | |

**Notes:**

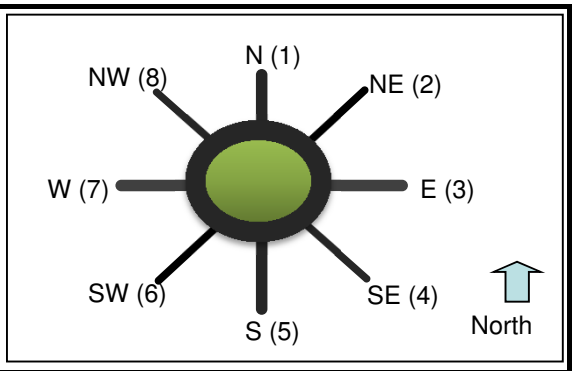
Unit Legend:
vph = vehicles per hour
PHF = peak hour factor
$F_{HV}$ = heavy vehicle factor
pcu = passenger car unit

## *Bypass Lane Merge Point Analysis (if applicable)*

| Bypass Characteristics | Bypass #1 | Bypass #2 | Bypass #3 | Bypass #4 | Bypass #5 | Bypass #6 |
|---|---|---|---|---|---|---|
| Select Entry Leg from Bypass (FROM) | W (7) | | | | | |
| Select Exit Leg for Bypass (TO) | S (5) | | | | | |
| **Does the bypass have a dedicated receiving lane?** | No | | | | | |
| **# of Conflicting Exit Flow Lanes** | 1 | 2 | 2 | 2 | 2 | 2 |
| *Volumes* | | | | | | |
| Entry Leg: Insert Right Turn Volume | 420 | | | | | |
| Exit Leg: ***(Select Input Method)*** | HCM | | | | | |
| *Lane Flow in Exit Leg**** | 107 | | | | | |
| Sum of inner circulatory flow lane to exit leg (leg bypass merges into) | N/A | N/A | N/A | N/A | N/A | N/A |
| Sum of outer circulatory flow lane to exit leg (leg bypass merges into) | N/A | N/A | N/A | N/A | N/A | N/A |
| *Critical Lane Flow (Manual) in Exit Leg**** | | | | | | |
| *Volume Characteristics* | | | | | | |
| PHF (Entry Leg) | 0.92 | | | | | |
| $F_{HV}$ (Entry Leg) | 0.97 | | | | | |
| $F_{ped}$ | 1.00 | | | | | |
| PHF (Exit Leg)*** | N/A | N/A | N/A | N/A | N/A | N/A |
| $F_{HV}$ (Exit Leg)*** | N/A | N/A | N/A | N/A | N/A | N/A |
| ***Volume Characteristics are already taken into account for Default method ONLY. Insert Values above if Manual method.*** | | | | | | |
| *Entry/Conflicting Flows* | | | | | | |
| Entry Flow | 470 | | | | | |
| Conflicting Critical Flow | 107 | 0 | | | | |
| **Bypass Lane Results** | | | | | | |
| Entry Capacity of Bypass, veh/h | 986 | | | | | |
| Flow Rates of Exiting Traffic, veh/h | 457 | | | | | |
| **V/C ratio** | 0.46 | | | | | |
| **Control Delay, sec/pcu** | 9.1 | | | | | |
| LOS | A | | | | | |
| **95th % Queue (ft)** | 64 | | | | | |

## General & Site Information

| | |
|---|---|
| Analyst: | Keith McCage |
| Agency/Company: | HNTB for GDOT |
| Date: | 11/3/2011 |
| Project Name or PI#: | 751580 |
| Year, Peak Hour: | 2033, AM |
| County/District: | Fulton |
| Intersection: | SR 400 NB at Northridge Road |




## Volumes

| Entry Legs (FROM) | N1 (1) | N2 (1) | NE1 (2) | NE2 (2) | E1 (3) | E2 (3) | SE1 (4) | SE2 (4) |
|---|---|---|---|---|---|---|---|---|
| **Lane Designation** | Left-Thru | Right-Thru | SELECT | SELECT | Lf-Th-Rt | SELECT | SELECT | SELECT |
| N (1), vph | | | | | 5 | | | |
| **Exit** NE (2), vph | | | | | | | | |
| **Legs** E (3), vph | 10 | | | | | | | |
| **(TO)** SE (4), vph | | | | | | | | |
| S (5), vph | 100 | | | | | | | |
| SW (6), vph | | | | | | | | |
| W (7), vph | | 510 | | | 60 | | | |
| NW (8), vph | | | | | | | | |
| Entry Volume, vph | 110 | 510 | 0 | 0 | 65 | 0 | 0 | 0 |

| | S1 (5) | S2 (5) | SW1 (6) | SW2 (6) | W1 (7) | W2 (7) | NW1 (8) | NW2 (8) |
|---|---|---|---|---|---|---|---|---|
| **Lane Designation** | Left-Thru | Right-Thru | SELECT | SELECT | Left Only | Lf-Th-Rt | SELECT | SELECT |
| N (1), vph | | 455 | | | 400 | 330 | | |
| NE (2), vph | | | | | | | | |
| E (3), vph | | 10 | | | | 25 | | |
| SE (4), vph | | | | | | | | |
| S (5), vph | | | | | | 0 | | |
| SW (6), vph | | | | | | | | |
| W (7), vph | 510 | | | | | | | |
| NW (8), vph | | | | | | | | |
| Entry Volume, vph | 510 | 465 | 0 | 0 | 400 | 355 | 0 | 0 |

| | N | NE | E | SE | S | SW | W | NW |
|---|---|---|---|---|---|---|---|---|
| **# of Entry Flow Lanes** | 2 | 0 | 1 | 0 | 2 | 0 | 2 | 0 |
| **# of Conflict Flow Lanes** | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |

| Volume Characteristics | N | NE | E | SE | S | SW | W | NW |
|---|---|---|---|---|---|---|---|---|
| % Cars | 97% | 100% | 97% | 100% | 97% | 100% | 97% | 100% |
| % Heavy Vehicles | 3% | 0% | 3% | 0% | 3% | 0% | 3% | 0% |
| % Bicycles | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% |
| # of Pedestrians **(ped/hr)** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| *PHF* | *0.92* | *0.92* | *0.92* | *0.92* | *0.92* | *0.92* | *0.92* | *0.92* |
| $F_{hv}$ | 0.971 | 1.000 | 0.971 | 1.000 | 0.971 | 1.000 | 0.971 | 1.000 |
| $F_{ped}$ | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 |

| Entry/Conflicting Flows | N | NE | E | SE | S | SW | W | NW |
|---|---|---|---|---|---|---|---|---|

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Flow to | N (1), pcu/h | 0 | 0 | 6 | 0 | 509 | 0 | 817 | 0 |
| Leg # | NE (2), pcu/h | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | E (3), pcu/h | 11 | 0 | 0 | 0 | 11 | 0 | 28 | 0 |
| | SE (4), pcu/h | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | S (5), pcu/h | 112 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | SW (6), pcu/h | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | W (7), pcu/h | 571 | 0 | 67 | 0 | 571 | 0 | 0 | 0 |
| | NW (8), pcu/h | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Entry flow, pcu/h | 694 | 0 | 73 | 0 | 1092 | 0 | 845 | 0 |
| | Entry flow Lane 1, pcu/h | 123 | 0 | 73 | 0 | 571 | 0 | 448 | 0 |
| | Entry flow Lane 2, pcu/h | 571 | 0 | 0 | 0 | 521 | 0 | 397 | 0 |
| | Conflicting flow, pcu/h | 638 | 0 | 1898 | 0 | 856 | 0 | 123 | 0 |

## Results: Approach Measures of Effectiveness

| **HCM 2010 Model** | **N** | | **E** | | **S** | | **W** | |
|---|---|---|---|---|---|---|---|---|
| *Lane Designations* | *Left-Thru* | *Right-Thru* | *Lf-Th-Rt* | *Lane 2* | *Left-Thru* | *Right-Thru* | *Left Only* | *Lf-Th-Rt* |
| Entry Capacity, veh/h | 680 | 702 | 291 | NA | 577 | 602 | 1000 | 1006 |
| Entry Flow Rates, veh/h | 120 | 554 | 71 | NA | 554 | 505 | 435 | 386 |
| **V/C ratio** | **0.18** | **0.79** | **0.24** | | **0.96** | **0.84** | **0.43** | **0.38** |
| **Control Delay, s/veh** | **7.3** | **25.5** | **17.5** | | **54.8** | **33.7** | **8.5** | **7.7** |
| LOS | A | D | C | | F | D | A | A |
| **95th % Queue (ft)** | **16** | **197** | **24** | | **336** | **225** | **58** | **46** |
| *Approach Delay* | 22.3 | | 17.5 | | 44.8 | | 9.7 | |
| *Approach LOS* | C | | C | | E | | A | |

| | **NE** | | **SE** | | **SW** | | **NW** | |
|---|---|---|---|---|---|---|---|---|
| *Lane Designations* | *Lane 1* | *Lane 2* | *Lane 1* | *Lane 2* | *Lane 1* | *Lane 2* | *Lane 1* | *Lane 2* |
| Entry Capacity, veh/h | NA | NA | NA | NA | NA | NA | NA | NA |
| Entry Flow Rates, veh/h | NA | NA | NA | NA | NA | NA | NA | NA |
| **V/C ratio** | | | #VALUE! | #VALUE! | | | #VALUE! | #VALUE! |
| **Control Delay, sec/pcu** | | | #VALUE! | #VALUE! | | | #VALUE! | #VALUE! |
| LOS | | | #VALUE! | #VALUE! | | | #VALUE! | #VALUE! |
| **95th % Queue (ft)** | | | #DIV/0! | #VALUE! | | | #DIV/0! | #DIV/0! |
| *Approach Delay* | | | | | | | | |
| *Approach LOS* | | | #N/A | | | | #N/A | |

| **UK Model**** | **N** | **NE** | **E** | **SE** | **S** | **SW** | **W** | **NW** |
|---|---|---|---|---|---|---|---|---|
| Crit. Entry Capacity pcu/h | 1967 | NA | 1065 | NA | 1811 | NA | 2336 | NA |
| Entry Flow pcu/h | 694 | 0 | 73 | 0 | 1092 | 0 | 845 | 0 |
| **V/C ratio** | **0.35** | | **0.07** | | **0.60** | | **0.36** | |
| **Control Delay, sec/pcu** | **4.6** | | **4.0** | | **8.0** | | **4.2** | |
| LOS | A | | A | | A | | A | |
| **95th % Queue (ft)** | **42** | | **6** | | **112** | | **43** | |

**Notes:**

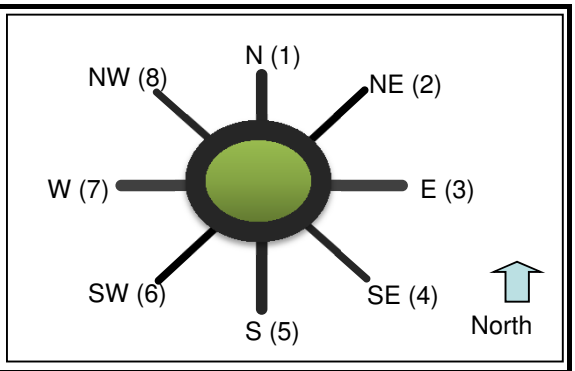
Unit Legend:
vph = vehicles per hour
PHF = peak hour factor
$F_{HV}$ = heavy vehicle factor
pcu = passenger car unit

## *Bypass Lane Merge Point Analysis (if applicable)*

| Bypass Characteristics | Bypass #1 | Bypass #2 | Bypass #3 | Bypass #4 | Bypass #5 | Bypass #6 |
|---|---|---|---|---|---|---|
| Select Entry Leg from Bypass (FROM) | W (7) | | | | | |
| Select Exit Leg for Bypass (TO) | S (5) | | | | | |
| **Does the bypass have a dedicated receiving lane?** | No | | | | | |
| **# of Conflicting Exit Flow Lanes** | 1 | 2 | 2 | 2 | 2 | 2 |
| *Volumes* | | | | | | |
| Entry Leg: Insert Right Turn Volume | 530 | | | | | |
| Exit Leg: ***(Select Input Method)*** | HCM | | | | | |
| *Lane Flow in Exit Leg**** | 118 | | | | | |
| Sum of inner circulatory flow lane to exit leg (leg bypass merges into) | N/A | N/A | N/A | N/A | N/A | N/A |
| Sum of outer circulatory flow lane to exit leg (leg bypass merges into) | N/A | N/A | N/A | N/A | N/A | N/A |
| *Critical Lane Flow (Manual) in Exit Leg**** | | | | | | |
| *Volume Characteristics* | | | | | | |
| PHF (Entry Leg) | 0.92 | | | | | |
| $F_{HV}$ (Entry Leg) | 0.97 | | | | | |
| $F_{ped}$ | 1.00 | | | | | |
| PHF (Exit Leg)*** | N/A | N/A | N/A | N/A | N/A | N/A |
| $F_{HV}$ (Exit Leg)*** | N/A | N/A | N/A | N/A | N/A | N/A |
| ***Volume Characteristics are already taken into account for Default method ONLY. Insert Values above if Manual method.*** | | | | | | |
| *Entry/Conflicting Flows* | | | | | | |
| Entry Flow | 593 | | | | | |
| Conflicting Critical Flow | 118 | 0 | | | | |
| **Bypass Lane Results** | | | | | | |
| Entry Capacity of Bypass, veh/h | 975 | | | | | |
| Flow Rates of Exiting Traffic, veh/h | 576 | | | | | |
| **V/C ratio** | 0.59 | | | | | |
| **Control Delay, sec/pcu** | 11.8 | | | | | |
| LOS | B | | | | | |
| **95th % Queue (ft)** | 103 | | | | | |

## General & Site Information

| | |
|---|---|
| Analyst: | Keith McCage |
| Agency/Company: | HNTB for GDOT |
| Date: | 11/3/2011 |
| Project Name or PI#: | 751580 |
| Year, Peak Hour: | 2033, PM |
| County/District: | Fulton |
| Intersection: | SR 400 NB at Northridge Road |




## Volumes

| Entry Legs (FROM) | N1 (1) | N2 (1) | NE1 (2) | NE2 (2) | E1 (3) | E2 (3) | SE1 (4) | SE2 (4) |
|---|---|---|---|---|---|---|---|---|
| **Lane Designation** | Left-Thru | Right-Thru | SELECT | SELECT | Lf-Th-Rt | SELECT | SELECT | SELECT |
| N (1), vph | | | | | 5 | | | |
| **Exit** NE (2), vph | | | | | | | | |
| **Legs** E (3), vph | 20 | | | | | | | |
| **(TO)** SE (4), vph | | | | | | | | |
| S (5), vph | 85 | | | | 25 | | | |
| SW (6), vph | | | | | | | | |
| W (7), vph | | 695 | | | 30 | | | |
| NW (8), vph | | | | | | | | |
| Entry Volume, vph | 105 | 695 | 0 | 0 | 60 | 0 | 0 | 0 |

| | S1 (5) | S2 (5) | SW1 (6) | SW2 (6) | W1 (7) | W2 (7) | NW1 (8) | NW2 (8) |
|---|---|---|---|---|---|---|---|---|
| **Lane Designation** | Left-Thru | Right-Thru | SELECT | SELECT | Left Only | Left-Thru | SELECT | SELECT |
| N (1), vph | | 435 | | | 410 | 340 | | |
| NE (2), vph | | | | | | | | |
| E (3), vph | | 10 | | | | 25 | | |
| SE (4), vph | | | | | | | | |
| S (5), vph | | | | | | 0 | | |
| SW (6), vph | | | | | | | | |
| W (7), vph | 380 | | | | | | | |
| NW (8), vph | | | | | | | | |
| Entry Volume, vph | 380 | 445 | 0 | 0 | 410 | 365 | 0 | 0 |

| | N | NE | E | SE | S | SW | W | NW |
|---|---|---|---|---|---|---|---|---|
| **# of Entry Flow Lanes** | 2 | 0 | 1 | 0 | 2 | 0 | 2 | 0 |
| **# of Conflict Flow Lanes** | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |

| Volume Characteristics | N | NE | E | SE | S | SW | W | NW |
|---|---|---|---|---|---|---|---|---|
| % Cars | 97% | 100% | 97% | 100% | 97% | 100% | 97% | 100% |
| % Heavy Vehicles | 3% | 0% | 3% | 0% | 3% | 0% | 3% | 0% |
| % Bicycles | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% |
| # of Pedestrians **(ped/hr)** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| *PHF* | *0.92* | *0.92* | *0.92* | *0.92* | *0.92* | *0.92* | *0.92* | *0.92* |
| $F_{hv}$ | 0.971 | 1.000 | 0.971 | 1.000 | 0.971 | 1.000 | 0.971 | 1.000 |
| $F_{ped}$ | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 |

| Entry/Conflicting Flows | N | NE | E | SE | S | SW | W | NW |
|---|---|---|---|---|---|---|---|---|

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Flow to | N (1), pcu/h | 0 | 0 | 6 | 0 | 487 | 0 | 840 | 0 |
| Leg # | NE (2), pcu/h | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | E (3), pcu/h | 22 | 0 | 0 | 0 | 11 | 0 | 28 | 0 |
| | SE (4), pcu/h | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | S (5), pcu/h | 95 | 0 | 28 | 0 | 0 | 0 | 0 | 0 |
| | SW (6), pcu/h | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | W (7), pcu/h | 778 | 0 | 34 | 0 | 425 | 0 | 0 | 0 |
| | NW (8), pcu/h | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Entry flow, pcu/h | 896 | 0 | 67 | 0 | 924 | 0 | 868 | 0 |
| | Entry flow Lane 1, pcu/h | 118 | 0 | 67 | 0 | 425 | 0 | 459 | 0 |
| | Entry flow Lane 2, pcu/h | 778 | 0 | 0 | 0 | 498 | 0 | 409 | 0 |
| | Conflicting flow, pcu/h | 487 | 0 | 1752 | 0 | 890 | 0 | 146 | 0 |

## Results: Approach Measures of Effectiveness

| **HCM 2010 Model** | **N** | | **E** | | **S** | | **W** | |
|---|---|---|---|---|---|---|---|---|
| *Lane Designations* | *Left-Thru* | *Right-Thru* | *Lf-Th-Rt* | *Lane 2* | *Left-Thru* | *Right-Thru* | *Left Only* | *Left-Thru* |
| Entry Capacity, veh/h | 761 | 780 | 322 | NA | 563 | 588 | 984 | 991 |
| Entry Flow Rates, veh/h | 114 | 755 | 65 | NA | 413 | 484 | 446 | 397 |
| **V/C ratio** | **0.15** | **0.97** | **0.20** | | **0.73** | **0.82** | **0.45** | **0.40** |
| **Control Delay, s/veh** | **6.3** | **47.7** | **15.0** | | **25.7** | **32.4** | **8.9** | **8.0** |
| LOS | A | E | C | | D | D | A | A |
| **95th % Queue (ft)** | **14** | **384** | **19** | | **160** | **211** | **62** | **49** |
| *Approach Delay* | 42.3 | | 15.0 | | 29.3 | | 9.2 | |
| *Approach LOS* | E | | C | | D | | A | |

| | **NE** | | **SE** | | **SW** | | **NW** | |
|---|---|---|---|---|---|---|---|---|
| *Lane Designations* | *Lane 1* | *Lane 2* | *Lane 1* | *Lane 2* | *Lane 1* | *Lane 2* | *Lane 1* | *Lane 2* |
| Entry Capacity, veh/h | NA | NA | NA | NA | NA | NA | NA | NA |
| Entry Flow Rates, veh/h | NA | NA | NA | NA | NA | NA | NA | NA |
| **V/C ratio** | | | #VALUE! | #VALUE! | | | #VALUE! | #VALUE! |
| **Control Delay, sec/pcu** | | | #VALUE! | #VALUE! | | | #VALUE! | #VALUE! |
| LOS | | | #VALUE! | #VALUE! | | | #VALUE! | #VALUE! |
| **95th % Queue (ft)** | | | #DIV/0! | #VALUE! | | | #DIV/0! | #DIV/0! |
| *Approach Delay* | | | | | | | | |
| *Approach LOS* | | | #N/A | | | | #N/A | |

| **UK Model**** | **N** | **NE** | **E** | **SE** | **S** | **SW** | **W** | **NW** |
|---|---|---|---|---|---|---|---|---|
| Crit. Entry Capacity pcu/h | 2075 | NA | 1170 | NA | 1787 | NA | 2320 | NA |
| Entry Flow pcu/h | 896 | 0 | 67 | 0 | 924 | 0 | 868 | 0 |
| **V/C ratio** | **0.43** | | **0.06** | | **0.52** | | **0.37** | |
| **Control Delay, sec/pcu** | **5.2** | | **3.6** | | **6.7** | | **4.3** | |
| LOS | A | | A | | A | | A | |
| **95th % Queue (ft)** | **58** | | **5** | | **80** | | **46** | |

**Notes:**

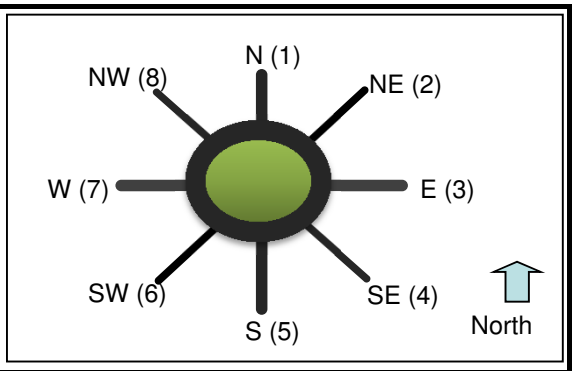
Unit Legend:
vph = vehicles per hour
PHF = peak hour factor
$F_{HV}$ = heavy vehicle factor
pcu = passenger car unit

## *Bypass Lane Merge Point Analysis (if applicable)*

| Bypass Characteristics | Bypass #1 | Bypass #2 | Bypass #3 | Bypass #4 | Bypass #5 | Bypass #6 |
|---|---|---|---|---|---|---|
| Select Entry Leg from Bypass (FROM) | W (7) | | | | | |
| Select Exit Leg for Bypass (TO) | S (5) | | | | | |
| **Does the bypass have a dedicated receiving lane?** | No | | | | | |
| **# of Conflicting Exit Flow Lanes** | 1 | 2 | 2 | 2 | 2 | 2 |
| *Volumes* | | | | | | |
| Entry Leg: Insert Right Turn Volume | 465 | | | | | |
| Exit Leg: ***(Select Input Method)*** | HCM | | | | | |
| *Lane Flow in Exit Leg**** | 123 | | | | | |
| Sum of inner circulatory flow lane to exit leg (leg bypass merges into) | N/A | N/A | N/A | N/A | N/A | N/A |
| Sum of outer circulatory flow lane to exit leg (leg bypass merges into) | N/A | N/A | N/A | N/A | N/A | N/A |
| *Critical Lane Flow (Manual) in Exit Leg**** | | | | | | |
| *Volume Characteristics* | | | | | | |
| PHF (Entry Leg) | 0.92 | | | | | |
| $F_{HV}$ (Entry Leg) | 0.97 | | | | | |
| $F_{ped}$ | 1.00 | | | | | |
| PHF (Exit Leg)*** | N/A | N/A | N/A | N/A | N/A | N/A |
| $F_{HV}$ (Exit Leg)*** | N/A | N/A | N/A | N/A | N/A | N/A |
| ***Volume Characteristics are already taken into account for Default method ONLY. Insert Values above if Manual method.*** | | | | | | |
| *Entry/Conflicting Flows* | | | | | | |
| Entry Flow | 521 | | | | | |
| Conflicting Critical Flow | 123 | 0 | | | | |
| **Bypass Lane Results** | | | | | | |
| Entry Capacity of Bypass, veh/h | 970 | | | | | |
| Flow Rates of Exiting Traffic, veh/h | 505 | | | | | |
| **V/C ratio** | 0.52 | | | | | |
| **Control Delay, sec/pcu** | 10.3 | | | | | |
| LOS | B | | | | | |
| **95th % Queue (ft)** | 80 | | | | | |

## General & Site Information

| | |
|---|---|
| Analyst: | Keith McCage |
| Agency/Company: | HNTB for GDOT |
| Date: | 11/3/2011 |
| Project Name or PI#: | 751580? |
| Year, Peak Hour: | 2013, AM |
| County/District: | Fulton |
| Intersection: | SR 400 SB at Northridge Road |




## Volumes

| Entry Legs (FROM) | N1 (1) | N2 (1) | NE1 (2) | NE2 (2) | E1 (3) | E2 (3) | SE1 (4) | SE2 (4) |
|---|---|---|---|---|---|---|---|---|
| **Lane Designation** | Left-Thru | Right-Thru | SELECT | SELECT | Left-Thru | Right-Thru | SELECT | SELECT |
| N (1), vph | | | | | | | | |
| **Exit** NE (2), vph | | | | | | | | |
| **Legs** E (3), vph | **365** | | | | | | | |
| **(TO)** SE (4), vph | | | | | | | | |
| S (5), vph | **117** | **503** | | | **175** | | | |
| SW (6), vph | | | | | | | | |
| W (7), vph | | **40** | | | **280** | **350** | | |
| NW (8), vph | | | | | | | | |
| Entry Volume, vph | 482 | 543 | 0 | 0 | 455 | 350 | 0 | 0 |

| | S1 (5) | S2 (5) | SW1 (6) | SW2 (6) | W1 (7) | W2 (7) | NW1 (8) | NW2 (8) |
|---|---|---|---|---|---|---|---|---|
| **Lane Designation** | Left Only | Right-Thru | SELECT | SELECT | Left-Thru | Right-Thru | SELECT | SELECT |
| N (1), vph | | **75** | | | **65** | | | |
| NE (2), vph | | | | | | | | |
| E (3), vph | | **175** | | | **257** | **363** | | |
| SE (4), vph | | | | | | | | |
| S (5), vph | | | | | | | | |
| SW (6), vph | | | | | | | | |
| W (7), vph | **225** | | | | | | | |
| NW (8), vph | | | | | | | | |
| Entry Volume, vph | 225 | 250 | 0 | 0 | 322 | 363 | 0 | 0 |

| | N | NE | E | SE | S | SW | W | NW |
|---|---|---|---|---|---|---|---|---|
| **# of Entry Flow Lanes** | 2 | 0 | 2 | 0 | 2 | 0 | 2 | 0 |
| **# of Conflict Flow Lanes** | **2** | **2** | **2** | **2** | **2** | **2** | **2** | **2** |

| **Volume Characteristics** | N | NE | E | SE | S | SW | W | NW |
|---|---|---|---|---|---|---|---|---|
| % Cars | 97% | 100% | 97% | 100% | 97% | 100% | 97% | 100% |
| % Heavy Vehicles | 3% | 0% | 3% | 0% | 3% | 0% | 3% | 0% |
| % Bicycles | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% |
| # of Pedestrians **(ped/hr)** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| *PHF* | *0.92* | *0.92* | *0.92* | *0.92* | *0.92* | *0.92* | *0.92* | *0.92* |
| $F_{hv}$ | 0.971 | 1.000 | 0.971 | 1.000 | 0.971 | 1.000 | 0.971 | 1.000 |
| $F_{ped}$ | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 |

| **Entry/Conflicting Flows** | N | NE | E | SE | S | SW | W | NW |
|---|---|---|---|---|---|---|---|---|

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Flow to | N (1), pcu/h | 0 | 0 | 0 | 0 | 84 | 0 | 73 | 0 |
| Leg # | NE (2), pcu/h | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | E (3), pcu/h | 409 | 0 | 0 | 0 | 196 | 0 | 694 | 0 |
| | SE (4), pcu/h | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | S (5), pcu/h | 694 | 0 | 196 | 0 | 0 | 0 | 0 | 0 |
| | SW (6), pcu/h | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | W (7), pcu/h | 45 | 0 | 705 | 0 | 252 | 0 | 0 | 0 |
| | NW (8), pcu/h | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Entry flow, pcu/h | 1148 | 0 | 901 | 0 | 532 | 0 | 767 | 0 |
| | Entry flow Lane 1, pcu/h | 540 | 0 | 509 | 0 | 252 | 0 | 361 | 0 |
| | Entry flow Lane 2, pcu/h | 608 | 0 | 392 | 0 | 280 | 0 | 406 | 0 |
| | Conflicting flow, pcu/h | 1153 | 0 | 409 | 0 | 1176 | 0 | 1299 | 0 |

## Results: Approach Measures of Effectiveness

| **HCM 2010 Model** | **N** | | **E** | | **S** | | **W** | |
|---|---|---|---|---|---|---|---|---|
| *Lane Designations* | *Left-Thru* | *Right-Thru* | *Left-Thru* | *Right-Thru* | *Left Only* | *Right-Thru* | *Left-Thru* | *Right-Thru* |
| Entry Capacity, veh/h | 462 | 489 | 807 | 824 | 454 | 482 | 414 | 442 |
| Entry Flow Rates, veh/h | 524 | 590 | 495 | 380 | 245 | 272 | 350 | 395 |
| **V/C ratio** | **1.13** | **1.21** | **0.61** | **0.46** | **0.54** | **0.56** | **0.84** | **0.89** |
| **Control Delay, s/veh** | **112.8** | **137.1** | **14.3** | **10.4** | **19.5** | **19.5** | **45.3** | **50.5** |
| LOS | F | F | B | B | C | C | E | F |
| **95th % Queue (ft)** | **474** | **561** | **110** | **62** | **80** | **86** | **209** | **239** |
| *Approach Delay* | 125.7 | | 10.4 | | 19.5 | | 50.7 | |
| *Approach LOS* | F | | B | | C | | F | |

| | **NE** | | **SE** | | **SW** | | **NW** | |
|---|---|---|---|---|---|---|---|---|
| *Lane Designations* | *Lane 1* | *Lane 2* | *Lane 1* | *Lane 2* | *Lane 1* | *Lane 2* | *Lane 1* | *Lane 2* |
| Entry Capacity, veh/h | NA | NA | NA | NA | NA | NA | NA | NA |
| Entry Flow Rates, veh/h | NA | NA | NA | NA | NA | NA | NA | NA |
| **V/C ratio** | | | #VALUE! | #VALUE! | | | #VALUE! | #VALUE! |
| **Control Delay, sec/pcu** | | | #VALUE! | #VALUE! | | | #VALUE! | #VALUE! |
| LOS | | | #VALUE! | #VALUE! | | | #VALUE! | #VALUE! |
| **95th % Queue (ft)** | | | #DIV/0! | #DIV/0! | | | #DIV/0! | #DIV/0! |
| *Approach Delay* | | | | | | | | |
| *Approach LOS* | | | #N/A | | | | #N/A | |

| **UK Model**** | **N** | **NE** | **E** | **SE** | **S** | **SW** | **W** | **NW** |
|---|---|---|---|---|---|---|---|---|
| Crit. Entry Capacity pcu/h | 1598 | NA | 2131 | NA | 1582 | NA | 1494 | NA |
| Entry Flow pcu/h | 1148 | 0 | 901 | 0 | 532 | 0 | 767 | 0 |
| **V/C ratio** | **0.72** | | **0.42** | | **0.34** | | **0.51** | |
| **Control Delay, sec/pcu** | **11.3** | | **5.0** | | **5.1** | | **7.5** | |
| LOS | B | | A | | A | | A | |
| **95th % Queue (ft)** | **175** | | **56** | | **39** | | **79** | |

**Notes:**

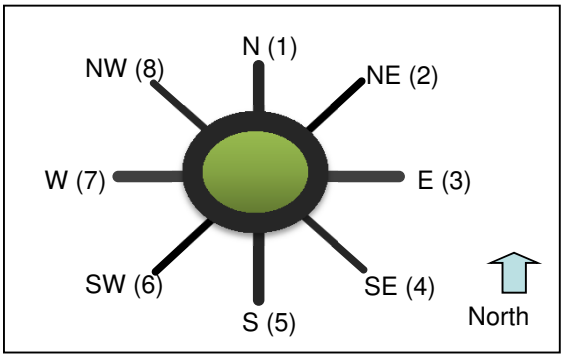
Unit Legend:
vph = vehicles per hour
PHF = peak hour factor
$F_{HV}$ = heavy vehicle factor
pcu = passenger car unit

## *Bypass Lane Merge Point Analysis (if applicable)*

| Bypass Characteristics | Bypass #1 | Bypass #2 | Bypass #3 | Bypass #4 | Bypass #5 | Bypass #6 |
|---|---|---|---|---|---|---|
| Select Entry Leg from Bypass (FROM) | **E (3)** | **W (7)** | | | | |
| Select Exit Leg for Bypass (TO) | **N (1)** | **S (5)** | | | | |
| **Does the bypass have a dedicated receiving lane?** | **Yes** | **No** | | | | |
| **# of Conflicting Exit Flow Lanes** | **1** | **2** | **2** | **2** | **2** | **2** |
| *Volumes* | | | | | | |
| Entry Leg: Insert Right Turn Volume | 170 | 505 | | | | |
| Exit Leg: ***(Select Input Method)*** | HCM | HCM | | | | |
| *Lane Flow in Exit Leg**** | 157 | 890 | | | | |
| Sum of inner circulatory flow lane to exit leg (leg bypass merges into) | N/A | N/A | N/A | N/A | N/A | N/A |
| Sum of outer circulatory flow lane to exit leg (leg bypass merges into) | N/A | N/A | N/A | N/A | N/A | N/A |
| *Critical Lane Flow (Manual) in Exit Leg**** | | | | | | |
| *Volume Characteristics* | | | | | | |
| PHF (Entry Leg) | 0.92 | 0.92 | | | | |
| $F_{HV}$ (Entry Leg) | 0.97 | 0.97 | | | | |
| $F_{ped}$ | 1.00 | 1.00 | | | | |
| PHF (Exit Leg)*** | N/A | N/A | N/A | N/A | N/A | N/A |
| $F_{HV}$ (Exit Leg)*** | N/A | N/A | N/A | N/A | N/A | N/A |
| ***Volume Characteristics are already taken into account for Default method ONLY. Insert Values above if Manual method.*** | | | | | | |
| *Entry/Conflicting Flows* | | | | | | |
| Entry Flow | 190 | 565 | | | | |
| Conflicting Critical Flow | 157 | 890 | | | | |
| **Bypass Lane Results** | | | | | | |
| Entry Capacity of Bypass, veh/h | 1200 | 588 | | | | |
| Flow Rates of Exiting Traffic, veh/h | 185 | 549 | | | | |
| **V/C ratio** | 0.15 | 0.96 | | | | |
| **Control Delay, sec/pcu** | 0.0 | 54.3 | | | | |
| LOS | A | F | | | | |
| **95th % Queue (ft)** | **14** | **340** | | | | |

## General & Site Information

| | |
|---|---|
| Analyst: | Keith McCage |
| Agency/Company: | HNTB for GDOT |
| Date: | 11/3/2011 |
| Project Name or PI#: | 751580 |
| Year, Peak Hour: | 2013, PM |
| County/District: | Fulton |
| Intersection: | SR 400 SB at Northridge Road |




## Volumes

| Entry Legs (FROM) | N1 (1) | N2 (1) | NE1 (2) | NE2 (2) | E1 (3) | E2 (3) | SE1 (4) | SE2 (4) |
|---|---|---|---|---|---|---|---|---|
| **Lane Designation** | Left-Thru | Right-Thru | SELECT | SELECT | Left-Thru | Right-Thru | SELECT | SELECT |
| N (1), vph | | | | | | | | |
| **Exit** NE (2), vph | | | | | | | | |
| **Legs** E (3), vph | **340** | | | | | | | |
| **(TO)** SE (4), vph | | | | | | | | |
| S (5), vph | **22** | **288** | | | **65** | | | |
| SW (6), vph | | | | | | | | |
| W (7), vph | | **120** | | | **323** | **437** | | |
| NW (8), vph | | | | | | | | |
| Entry Volume, vph | 362 | 408 | 0 | 0 | 388 | 437 | 0 | 0 |

| | S1 (5) | S2 (5) | SW1 (6) | SW2 (6) | W1 (7) | W2 (7) | NW1 (8) | NW2 (8) |
|---|---|---|---|---|---|---|---|---|
| **Lane Designation** | Lf-Th-Rt | Right-Thru | SELECT | SELECT | Left-Thru | Right-Thru | SELECT | SELECT |
| N (1), vph | 0 | **275** | | | **90** | | | |
| NE (2), vph | | | | | | | | |
| E (3), vph | | **255** | | | **199** | **326** | | |
| SE (4), vph | | | | | | | | |
| S (5), vph | | | | | | | | |
| SW (6), vph | | | | | | | | |
| W (7), vph | **465** | | | | | | | |
| NW (8), vph | | | | | | | | |
| Entry Volume, vph | 465 | 530 | 0 | 0 | 289 | 326 | 0 | 0 |

| | N | NE | E | SE | S | SW | W | NW |
|---|---|---|---|---|---|---|---|---|
| **# of Entry Flow Lanes** | 2 | 0 | 2 | 0 | 2 | 0 | 2 | 0 |
| **# of Conflict Flow Lanes** | **2** | **2** | **2** | **2** | **2** | **2** | **2** | **2** |

| Volume Characteristics | N | NE | E | SE | S | SW | W | NW |
|---|---|---|---|---|---|---|---|---|
| % Cars | 97% | 100% | 97% | 100% | 97% | 100% | 97% | 100% |
| % Heavy Vehicles | 3% | 0% | 3% | 0% | 3% | 0% | 3% | 0% |
| % Bicycles | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% |
| # of Pedestrians **(ped/hr)** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| *PHF* | *0.92* | *0.92* | *0.92* | *0.92* | *0.92* | *0.92* | *0.92* | *0.92* |
| $F_{hv}$ | 0.971 | 1.000 | 0.971 | 1.000 | 0.971 | 1.000 | 0.971 | 1.000 |
| $F_{ped}$ | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 |

| Entry/Conflicting Flows | N | NE | E | SE | S | SW | W | NW |
|---|---|---|---|---|---|---|---|---|

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Flow to | N (1), pcu/h | 0 | 0 | 0 | 0 | 308 | 0 | 101 | 0 |
| Leg # | NE (2), pcu/h | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | E (3), pcu/h | 381 | 0 | 0 | 0 | 285 | 0 | 588 | 0 |
| | SE (4), pcu/h | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | S (5), pcu/h | 347 | 0 | 73 | 0 | 0 | 0 | 0 | 0 |
| | SW (6), pcu/h | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | W (7), pcu/h | 134 | 0 | 851 | 0 | 521 | 0 | 0 | 0 |
| | NW (8), pcu/h | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Entry flow, pcu/h | 862 | 0 | 924 | 0 | 1114 | 0 | 689 | 0 |
| | Entry flow Lane 1, pcu/h | 405 | 0 | 434 | 0 | 521 | 0 | 324 | 0 |
| | Entry flow Lane 2, pcu/h | 457 | 0 | 489 | 0 | 593 | 0 | 365 | 0 |
| | Conflicting flow, pcu/h | 1444 | 0 | 929 | 0 | 1069 | 0 | 800 | 0 |

## Results: Approach Measures of Effectiveness

| **HCM 2010 Model** | **N** | | **E** | | **S** | | **W** | |
|---|---|---|---|---|---|---|---|---|
| *Lane Designations* | *Left-Thru* | *Right-Thru* | *Left-Thru* | *Right-Thru* | *Lf-Th-Rt* | *Right-Thru* | *Left-Thru* | *Right-Thru* |
| Entry Capacity, veh/h | 371 | 399 | 546 | 572 | 492 | 519 | 602 | 626 |
| Entry Flow Rates, veh/h | 393 | 443 | 422 | 475 | 505 | 576 | 314 | 354 |
| **V/C ratio** | **1.06** | **1.11** | **0.77** | **0.83** | **1.03** | **1.11** | **0.52** | **0.57** |
| **Control Delay, s/veh** | **97.4** | **110.6** | **29.3** | **33.9** | **76.9** | **100.5** | **14.9** | **15.8** |
| LOS | F | F | D | D | F | F | B | C |
| **95th % Queue (ft)** | **350** | **399** | **180** | **214** | **377** | **467** | **78** | **88** |
| *Approach Delay* | 104.4 | | 26.2 | | 89.5 | | 14.3 | |
| *Approach LOS* | F | | D | | F | | B | |

| | **NE** | | **SE** | | **SW** | | **NW** | |
|---|---|---|---|---|---|---|---|---|
| *Lane Designations* | *Lane 1* | *Lane 2* | *Lane 1* | *Lane 2* | *Lane 1* | *Lane 2* | *Lane 1* | *Lane 2* |
| Entry Capacity, veh/h | NA | NA | NA | NA | NA | NA | NA | NA |
| Entry Flow Rates, veh/h | NA | NA | NA | NA | NA | NA | NA | NA |
| **V/C ratio** | | | #VALUE! | #VALUE! | | | #VALUE! | #VALUE! |
| **Control Delay, sec/pcu** | | | #VALUE! | #VALUE! | | | #VALUE! | #VALUE! |
| LOS | | | #VALUE! | #VALUE! | | | #VALUE! | #VALUE! |
| **95th % Queue (ft)** | | | #DIV/0! | #DIV/0! | | | #DIV/0! | #DIV/0! |
| *Approach Delay* | | | | | | | | |
| *Approach LOS* | | | #N/A | | | | #N/A | |

| **UK Model**** | **N** | **NE** | **E** | **SE** | **S** | **SW** | **W** | **NW** |
|---|---|---|---|---|---|---|---|---|
| Crit. Entry Capacity pcu/h | 1390 | NA | 1759 | NA | 1659 | NA | 1851 | NA |
| Entry Flow pcu/h | 862 | 0 | 924 | 0 | 1114 | 0 | 689 | 0 |
| **V/C ratio** | **0.62** | | **0.53** | | **0.67** | | **0.37** | |
| **Control Delay, sec/pcu** | **9.8** | | **6.9** | | **9.8** | | **5.0** | |
| LOS | A | | A | | A | | A | |
| **95th % Queue (ft)** | **118** | | **83** | | **146** | | **45** | |

**Notes:**

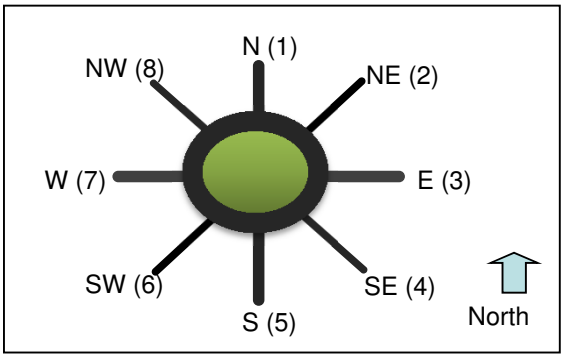
Unit Legend:
vph = vehicles per hour
PHF = peak hour factor
$F_{HV}$ = heavy vehicle factor
pcu = passenger car unit

## *Bypass Lane Merge Point Analysis (if applicable)*

| Bypass Characteristics | Bypass #1 | Bypass #2 | Bypass #3 | Bypass #4 | Bypass #5 | Bypass #6 |
|---|---|---|---|---|---|---|
| Select Entry Leg from Bypass (FROM) | **E (3)** | **W (7)** | | | | |
| Select Exit Leg for Bypass (TO) | **N (1)** | **S (5)** | | | | |
| **Does the bypass have a dedicated receiving lane?** | **Yes** | **No** | | | | |
| **# of Conflicting Exit Flow Lanes** | **1** | **2** | **2** | **2** | **2** | **2** |
| *Volumes* | | | | | | |
| Entry Leg: Insert Right Turn Volume | 175 | 130 | | | | |
| Exit Leg: ***(Select Input Method)*** | Default | HCM | | | | |
| *Lane Flow in Exit Leg**** | 410 | 890 | | | | |
| Sum of inner circulatory flow lane to exit leg (leg bypass merges into) | N/A | N/A | N/A | N/A | N/A | N/A |
| Sum of outer circulatory flow lane to exit leg (leg bypass merges into) | N/A | N/A | N/A | N/A | N/A | N/A |
| *Critical Lane Flow (Manual) in Exit Leg**** | | | | | | |
| *Volume Characteristics* | | | | | | |
| PHF (Entry Leg) | 0.92 | 0.92 | | | | |
| $F_{HV}$ (Entry Leg) | 0.97 | 0.97 | | | | |
| $F_{ped}$ | 1.00 | 1.00 | | | | |
| PHF (Exit Leg)*** | N/A | N/A | N/A | N/A | N/A | N/A |
| $F_{HV}$ (Exit Leg)*** | N/A | N/A | N/A | N/A | N/A | N/A |
| ***Volume Characteristics are already taken into account for Default method ONLY. Insert Values above if Manual method.*** | | | | | | |
| *Entry/Conflicting Flows* | | | | | | |
| Entry Flow | 196 | 146 | | | | |
| Conflicting Critical Flow | 410 | 890 | | | | |
| **Bypass Lane Results** | | | | | | |
| Entry Capacity of Bypass, veh/h | 1200 | 588 | | | | |
| Flow Rates of Exiting Traffic, veh/h | 190 | 141 | | | | |
| **V/C ratio** | 0.16 | 0.25 | | | | |
| **Control Delay, sec/pcu** | 0.0 | 9.4 | | | | |
| LOS | A | A | | | | |
| **95th % Queue (ft)** | **14** | **25** | | | | |

## General & Site Information

| | |
|---|---|
| Analyst: | Keith McCage |
| Agency/Company: | HNTB for GDOT |
| Date: | 11/3/2011 |
| Project Name or PI#: | 751580? |
| Year, Peak Hour: | 2033, AM |
| County/District: | Fulton |
| Intersection: | SR 400 SB at Northridge Road |




## Volumes

| Entry Legs (FROM) | N1 (1) | N2 (1) | NE1 (2) | NE2 (2) | E1 (3) | E2 (3) | SE1 (4) | SE2 (4) |
|---|---|---|---|---|---|---|---|---|
| **Lane Designation** | Left-Thru | Right-Thru | SELECT | SELECT | Left-Thru | Right-Thru | SELECT | SELECT |
| N (1), vph | | | | | | | | |
| **Exit** NE (2), vph | | | | | | | | |
| **Legs** E (3), vph | **405** | | | | | | | |
| **(TO)** SE (4), vph | | | | | | | | |
| S (5), vph | **128** | **557** | | | **195** | | | |
| SW (6), vph | | | | | | | | |
| W (7), vph | | **45** | | | **226** | **474** | | |
| NW (8), vph | | | | | | | | |
| Entry Volume, vph | 533 | 602 | 0 | 0 | 421 | 474 | 0 | 0 |

| | S1 (5) | S2 (5) | SW1 (6) | SW2 (6) | W1 (7) | W2 (7) | NW1 (8) | NW2 (8) |
|---|---|---|---|---|---|---|---|---|
| **Lane Designation** | Left Only | Right-Thru | SELECT | SELECT | Left-Thru | Thru | SELECT | SELECT |
| N (1), vph | | **85** | | | **75** | | | |
| NE (2), vph | | | | | | | | |
| E (3), vph | | **195** | | | **300** | **385** | | |
| SE (4), vph | | | | | | | | |
| S (5), vph | | | | | | | | |
| SW (6), vph | | | | | | | | |
| W (7), vph | **250** | | | | | | | |
| NW (8), vph | | | | | | | | |
| Entry Volume, vph | 250 | 280 | 0 | 0 | 375 | 385 | 0 | 0 |

| | N | NE | E | SE | S | SW | W | NW |
|---|---|---|---|---|---|---|---|---|
| **# of Entry Flow Lanes** | 2 | 0 | 2 | 0 | 2 | 0 | 2 | 0 |
| **# of Conflict Flow Lanes** | **2** | **2** | **2** | **2** | **2** | **2** | **2** | **2** |

| **Volume Characteristics** | N | NE | E | SE | S | SW | W | NW |
|---|---|---|---|---|---|---|---|---|
| % Cars | 97% | 100% | 97% | 100% | 97% | 100% | 97% | 100% |
| % Heavy Vehicles | 3% | 0% | 3% | 0% | 3% | 0% | 3% | 0% |
| % Bicycles | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% |
| # of Pedestrians **(ped/hr)** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| *PHF* | *0.92* | *0.92* | *0.92* | *0.92* | *0.92* | *0.92* | *0.92* | *0.92* |
| $F_{hv}$ | 0.971 | 1.000 | 0.971 | 1.000 | 0.971 | 1.000 | 0.971 | 1.000 |
| $F_{ped}$ | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 |

| **Entry/Conflicting Flows** | N | NE | E | SE | S | SW | W | NW |
|---|---|---|---|---|---|---|---|---|

| Flow to / Leg # | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | N (1), pcu/h | 0 | 0 | 0 | 0 | 95 | 0 | 84 | 0 |
| | NE (2), pcu/h | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | E (3), pcu/h | 453 | 0 | 0 | 0 | 218 | 0 | 767 | 0 |
| | SE (4), pcu/h | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | S (5), pcu/h | 767 | 0 | 218 | 0 | 0 | 0 | 0 | 0 |
| | SW (6), pcu/h | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | W (7), pcu/h | 50 | 0 | 784 | 0 | 280 | 0 | 0 | 0 |
| | NW (8), pcu/h | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Entry flow, pcu/h | 1271 | 0 | 1002 | 0 | 593 | 0 | 851 | 0 |
| | Entry flow Lane 1, pcu/h | 597 | 0 | 471 | 0 | 280 | 0 | 420 | 0 |
| | Entry flow Lane 2, pcu/h | 674 | 0 | 531 | 0 | 313 | 0 | 431 | 0 |
| | Conflicting flow, pcu/h | 1282 | 0 | 459 | 0 | 1304 | 0 | 1439 | 0 |

## Results: Approach Measures of Effectiveness

| HCM 2010 Model | N | | E | | S | | W | |
|---|---|---|---|---|---|---|---|---|
| *Lane Designations* | *Left-Thru* | *Right-Thru* | *Left-Thru* | *Right-Thru* | *Left Only* | *Right-Thru* | *Left-Thru* | *Thru* |
| Entry Capacity, veh/h | 419 | 447 | 778 | 796 | 412 | 440 | 373 | 401 |
| Entry Flow Rates, veh/h | 579 | 654 | 458 | 515 | 272 | 304 | 408 | 418 |
| **V/C ratio** | **1.38** | **1.46** | **0.59** | **0.65** | **0.66** | **0.69** | **1.09** | **1.04** |
| **Control Delay, s/veh** | **212.0** | **244.4** | **14.0** | **15.7** | **27.3** | **28.0** | **107.6** | **89.7** |
| LOS | F | F | B | C | D | D | F | F |
| **95th % Queue (ft)** | **716** | **832** | **101** | **121** | **118** | **129** | **379** | **342** |
| *Approach Delay* | 229.2 | | 12.3 | | 27.7 | | 102.8 | |
| *Approach LOS* | F | | B | | D | | F | |

| | NE | | SE | | SW | | NW | |
|---|---|---|---|---|---|---|---|---|
| *Lane Designations* | *Lane 1* | *Lane 2* | *Lane 1* | *Lane 2* | *Lane 1* | *Lane 2* | *Lane 1* | *Lane 2* |
| Entry Capacity, veh/h | NA | NA | NA | NA | NA | NA | NA | NA |
| Entry Flow Rates, veh/h | NA | NA | NA | NA | NA | NA | NA | NA |
| **V/C ratio** | | | #VALUE! | #VALUE! | | | #VALUE! | #VALUE! |
| **Control Delay, sec/pcu** | | | #VALUE! | #VALUE! | | | #VALUE! | #VALUE! |
| LOS | | | #VALUE! | #VALUE! | | | #VALUE! | #VALUE! |
| **95th % Queue (ft)** | | | #DIV/0! | #DIV/0! | | | #DIV/0! | #DIV/0! |
| *Approach Delay* | | | | | | | | |
| *Approach LOS* | | | #N/A | | | | #N/A | |

| UK Model** | N | NE | E | SE | S | SW | W | NW |
|---|---|---|---|---|---|---|---|---|
| Crit. Entry Capacity pcu/h | 1506 | NA | 2095 | NA | 1490 | NA | 1394 | NA |
| Entry Flow pcu/h | 1271 | 0 | 1002 | 0 | 593 | 0 | 851 | 0 |
| **V/C ratio** | **0.84** | | **0.48** | | **0.40** | | **0.61** | |
| **Control Delay, sec/pcu** | **17.7** | | **5.7** | | **6.0** | | **9.6** | |
| LOS | C | | A | | A | | A | |
| **95th % Queue (ft)** | **299** | | **69** | | **50** | | **114** | |

**Notes:**

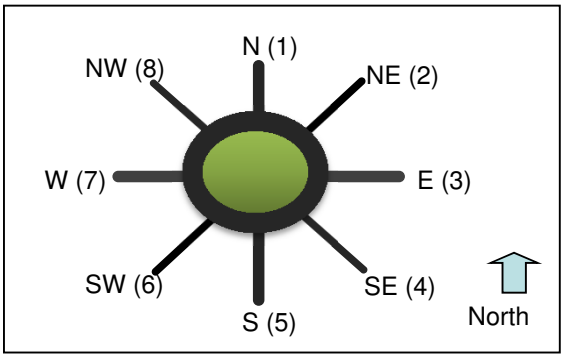
Unit Legend:
vph = vehicles per hour
PHF = peak hour factor
$F_{HV}$ = heavy vehicle factor
pcu = passenger car unit

## *Bypass Lane Merge Point Analysis (if applicable)*

| Bypass Characteristics | Bypass #1 | Bypass #2 | Bypass #3 | Bypass #4 | Bypass #5 | Bypass #6 |
|---|---|---|---|---|---|---|
| Select Entry Leg from Bypass (FROM) | **E (3)** | **W (7)** | | | | |
| Select Exit Leg for Bypass (TO) | **N (1)** | **S (5)** | | | | |
| **Does the bypass have a dedicated receiving lane?** | **Yes** | **No** | | | | |
| **# of Conflicting Exit Flow Lanes** | **1** | **2** | **2** | **2** | **2** | **2** |
| *Volumes* | | | | | | |
| Entry Leg: Insert Right Turn Volume | 185 | 560 | | | | |
| Exit Leg: ***(Select Input Method)*** | HCM | HCM | | | | |
| *Lane Flow in Exit Leg**** | 179 | 985 | | | | |
| Sum of inner circulatory flow lane to exit leg (leg bypass merges into) | N/A | N/A | N/A | N/A | N/A | N/A |
| Sum of outer circulatory flow lane to exit leg (leg bypass merges into) | N/A | N/A | N/A | N/A | N/A | N/A |
| *Critical Lane Flow (Manual) in Exit Leg**** | | | | | | |
| *Volume Characteristics* | | | | | | |
| PHF (Entry Leg) | 0.92 | 0.92 | | | | |
| $F_{HV}$ (Entry Leg) | 0.97 | 0.97 | | | | |
| $F_{ped}$ | 1.00 | 1.00 | | | | |
| PHF (Exit Leg)*** | N/A | N/A | N/A | N/A | N/A | N/A |
| $F_{HV}$ (Exit Leg)*** | N/A | N/A | N/A | N/A | N/A | N/A |
| ***Volume Characteristics are already taken into account for Default method ONLY. Insert Values above if Manual method.*** | | | | | | |
| *Entry/Conflicting Flows* | | | | | | |
| Entry Flow | 207 | 627 | | | | |
| Conflicting Critical Flow | 179 | 985 | | | | |
| **Bypass Lane Results** | | | | | | |
| Entry Capacity of Bypass, veh/h | 1200 | 550 | | | | |
| Flow Rates of Exiting Traffic, veh/h | 201 | 609 | | | | |
| **V/C ratio** | 0.17 | 1.14 | | | | |
| **Control Delay, sec/pcu** | 0.0 | 108.6 | | | | |
| LOS | A | F | | | | |
| **95th % Queue (ft)** | **15** | **537** | | | | |

## General & Site Information

| | |
|---|---|
| Analyst: | Keith McCage |
| Agency/Company: | HNTB for GDOT |
| Date: | 11/3/2011 |
| Project Name or PI#: | 751580? |
| Year, Peak Hour: | 2033, PM |
| County/District: | Fulton |
| Intersection: | SR 400 SB at Northridge Road |




## Volumes

| Entry Legs (FROM) | N1 (1) | N2 (1) | NE1 (2) | NE2 (2) | E1 (3) | E2 (3) | SE1 (4) | SE2 (4) |
|---|---|---|---|---|---|---|---|---|
| **Lane Designation** | Left-Thru | Right-Thru | SELECT | SELECT | Left-Thru | Right-Thru | SELECT | SELECT |
| N (1), vph | | | | | | | | |
| **Exit** NE (2), vph | | | | | | | | |
| **Legs** E (3), vph | **375** | | | | | | | |
| **(TO)** SE (4), vph | | | | | | | | |
| S (5), vph | **27** | **318** | | | **70** | | | |
| SW (6), vph | | | | | | | | |
| W (7), vph | | **135** | | | **358** | **482** | | |
| NW (8), vph | | | | | | | | |
| Entry Volume, vph | 402 | 453 | 0 | 0 | 428 | 482 | 0 | 0 |

| | S1 (5) | S2 (5) | SW1 (6) | SW2 (6) | W1 (7) | W2 (7) | NW1 (8) | NW2 (8) |
|---|---|---|---|---|---|---|---|---|
| **Lane Designation** | Left-Thru | Right-Thru | SELECT | SELECT | Left-Thru | Right-Thru | SELECT | SELECT |
| N (1), vph | | **305** | | | **100** | | | |
| NE (2), vph | | | | | | | | |
| E (3), vph | | **285** | | | **288** | **292** | | |
| SE (4), vph | | | | | | | | |
| S (5), vph | | | | | | | | |
| SW (6), vph | | | | | | | | |
| W (7), vph | **515** | | | | | | | |
| NW (8), vph | | | | | | | | |
| Entry Volume, vph | 515 | 590 | 0 | 0 | 388 | 292 | 0 | 0 |

| | N | NE | E | SE | S | SW | W | NW |
|---|---|---|---|---|---|---|---|---|
| **# of Entry Flow Lanes** | 2 | 0 | 2 | 0 | 2 | 0 | 2 | 0 |
| **# of Conflict Flow Lanes** | **2** | **2** | **2** | **2** | **2** | **2** | **2** | **2** |

| **Volume Characteristics** | N | NE | E | SE | S | SW | W | NW |
|---|---|---|---|---|---|---|---|---|
| % Cars | 97% | 100% | 97% | 100% | 97% | 100% | 97% | 100% |
| % Heavy Vehicles | 3% | 0% | 3% | 0% | 3% | 0% | 3% | 0% |
| % Bicycles | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% |
| # of Pedestrians **(ped/hr)** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| *PHF* | *0.92* | *0.92* | *0.92* | *0.92* | *0.92* | *0.92* | *0.92* | *0.92* |
| $F_{hv}$ | 0.971 | 1.000 | 0.971 | 1.000 | 0.971 | 1.000 | 0.971 | 1.000 |
| $F_{ped}$ | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 |

| **Entry/Conflicting Flows** | N | NE | E | SE | S | SW | W | NW |
|---|---|---|---|---|---|---|---|---|

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Flow to | N (1), pcu/h | 0 | 0 | 0 | 0 | 341 | 0 | 112 | 0 |
| Leg # | NE (2), pcu/h | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | E (3), pcu/h | 420 | 0 | 0 | 0 | 319 | 0 | 649 | 0 |
| | SE (4), pcu/h | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | S (5), pcu/h | 386 | 0 | 78 | 0 | 0 | 0 | 0 | 0 |
| | SW (6), pcu/h | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | W (7), pcu/h | 151 | 0 | 940 | 0 | 577 | 0 | 0 | 0 |
| | NW (8), pcu/h | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Entry flow, pcu/h | 957 | 0 | 1019 | 0 | 1237 | 0 | 761 | 0 |
| | Entry flow Lane 1, pcu/h | 450 | 0 | 479 | 0 | 577 | 0 | 434 | 0 |
| | Entry flow Lane 2, pcu/h | 507 | 0 | 540 | 0 | 661 | 0 | 327 | 0 |
| | Conflicting flow, pcu/h | 1595 | 0 | 1030 | 0 | 1181 | 0 | 884 | 0 |

## Results: Approach Measures of Effectiveness

| HCM 2010 Model | N | | E | | S | | W | |
|---|---|---|---|---|---|---|---|---|
| *Lane Designations* | *Left-Thru* | *Right-Thru* | *Left-Thru* | *Right-Thru* | *Left-Thru* | *Right-Thru* | *Left-Thru* | *Right-Thru* |
| Entry Capacity, veh/h | 332 | 359 | 507 | 533 | 452 | 480 | 565 | 591 |
| Entry Flow Rates, veh/h | 437 | 492 | 465 | 524 | 560 | 641 | 422 | 317 |
| **V/C ratio** | **1.32** | **1.37** | **0.92** | **0.98** | **1.24** | **1.34** | **0.75** | **0.54** |
| **Control Delay, s/veh** | **194.8** | **213.2** | **50.5** | **62.4** | **151.7** | **189.3** | **26.5** | **15.6** |
| LOS | F | F | F | F | F | F | D | C |
| **95th % Queue (ft)** | **540** | **607** | **280** | **336** | **584** | **715** | **167** | **80** |
| *Approach Delay* | 204.6 | | 30.0 | | 171.8 | | 19.2 | |
| *Approach LOS* | F | | D | | F | | C | |

| | NE | | SE | | SW | | NW | |
|---|---|---|---|---|---|---|---|---|
| *Lane Designations* | *Lane 1* | *Lane 2* | *Lane 1* | *Lane 2* | *Lane 1* | *Lane 2* | *Lane 1* | *Lane 2* |
| Entry Capacity, veh/h | NA | NA | NA | NA | NA | NA | NA | NA |
| Entry Flow Rates, veh/h | NA | NA | NA | NA | NA | NA | NA | NA |
| **V/C ratio** | | | #VALUE! | #VALUE! | | | #VALUE! | #VALUE! |
| **Control Delay, sec/pcu** | | | #VALUE! | #VALUE! | | | #VALUE! | #VALUE! |
| LOS | | | #VALUE! | #VALUE! | | | #VALUE! | #VALUE! |
| **95th % Queue (ft)** | | | #DIV/0! | #DIV/0! | | | #DIV/0! | #DIV/0! |
| *Approach Delay* | | | | | | | | |
| *Approach LOS* | | | #N/A | | | | #N/A | |

| UK Model** | N | NE | E | SE | S | SW | W | NW |
|---|---|---|---|---|---|---|---|---|
| Crit. Entry Capacity pcu/h | 1282 | NA | 1687 | NA | 1578 | NA | 1791 | NA |
| Entry Flow pcu/h | 957 | 0 | 1019 | 0 | 1237 | 0 | 761 | 0 |
| **V/C ratio** | **0.75** | | **0.60** | | **0.78** | | **0.43** | |
| **Control Delay, sec/pcu** | **14.3** | | **8.4** | | **13.9** | | **5.6** | |
| LOS | B | | A | | B | | A | |
| **95th % Queue (ft)** | **192** | | **112** | | **231** | | **56** | |

**Notes:**

Unit Legend:
vph = vehicles per hour
PHF = peak hour factor
$F_{HV}$ = heavy vehicle factor
pcu = passenger car unit

## *Bypass Lane Merge Point Analysis (if applicable)*

| Bypass Characteristics | Bypass #1 | Bypass #2 | Bypass #3 | Bypass #4 | Bypass #5 | Bypass #6 |
|---|---|---|---|---|---|---|
| Select Entry Leg from Bypass (FROM) | **E (3)** | **W (7)** | | | | |
| Select Exit Leg for Bypass (TO) | **N (1)** | **S (5)** | | | | |
| **Does the bypass have a dedicated receiving lane?** | **Yes** | **No** | | | | |
| **# of Conflicting Exit Flow Lanes** | **1** | **2** | **2** | **2** | **2** | **2** |
| *Volumes* | | | | | | |
| Entry Leg: Insert Right Turn Volume | 810 | 145 | | | | |
| Exit Leg: ***(Select Input Method)*** | HCM | HCM | | | | |
| *Lane Flow in Exit Leg**** | 453 | 465 | | | | |
| Sum of inner circulatory flow lane to exit leg (leg bypass merges into) | N/A | N/A | N/A | N/A | N/A | N/A |
| Sum of outer circulatory flow lane to exit leg (leg bypass merges into) | N/A | N/A | N/A | N/A | N/A | N/A |
| *Critical Lane Flow (Manual) in Exit Leg**** | | | | | | |
| *Volume Characteristics* | | | | | | |
| PHF (Entry Leg) | 0.92 | 0.92 | | | | |
| $F_{HV}$ (Entry Leg) | 0.97 | 0.97 | | | | |
| $F_{ped}$ | 1.00 | 1.00 | | | | |
| PHF (Exit Leg)*** | N/A | N/A | N/A | N/A | N/A | N/A |
| $F_{HV}$ (Exit Leg)*** | N/A | N/A | N/A | N/A | N/A | N/A |
| ***Volume Characteristics are already taken into account for Default method ONLY. Insert Values above if Manual method.*** | | | | | | |
| *Entry/Conflicting Flows* | | | | | | |
| Entry Flow | 907 | 162 | | | | |
| Conflicting Critical Flow | 453 | 465 | | | | |
| **Bypass Lane Results** | | | | | | |
| Entry Capacity of Bypass, veh/h | 1200 | 792 | | | | |
| Flow Rates of Exiting Traffic, veh/h | 880 | 158 | | | | |
| **V/C ratio** | 0.73 | 0.20 | | | | |
| **Control Delay, sec/pcu** | 0.0 | 6.7 | | | | |
| LOS | A | A | | | | |
| **95th % Queue (ft)** | **181** | **20** | | | | |