

US 1/US 1A/FALLS OF NEUSE ROAD INTERSECTION ANALYSIS

PROJECT FEASIBILITY ANALYSIS



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1.0 INTRODUCTION

1.1 Study Purpose

The purpose of this “hot spot” analysis is to build upon the Capital Area Metropolitan Planning Organization’s (CAMPO) US 1 North Corridor Phase I Study, and consider interim and future improvements for the intersection of Capital Boulevard (US 1)/ US 1A/Falls of Neuse Road located in Wake Forest. The adopted Metropolitan Transportation Improvement Program (MTIP) calls for the US 1 Corridor to be upgraded to a freeway facility by 2030 and as part of this conversion, the intersection at US 1/US 1A/Falls of Neuse will be converted from an at-grade intersection to a grade separation interchange. In collaboration with CAMPO and the US 1 Council of Planning, the study team identified three potential future interchanges at the Falls of Neuse/South Main Street (US1A) intersection. The study team also identified and analyzed interim safety and operational improvements to improve the efficiency and extend the life of the existing intersection.

This is the second of three technical memoranda which documents the feasibility of three types of interchange configurations for the US/US 1A/Falls of Neuse Road intersection and draw traffic volumes from the Triangle Regional Demand Model. The baseline future year is 2040, with construction of the future interchange in 2030.

2.0 INTERIM IMPROVEMENTS

2.1 US 1 Widening from US 1A to NC 98 Bypass

NCDOT Division 5 has preliminary plans (Project Number 13097) in development for the widening of US 1 from the US 1A/Falls of Neuse intersection to the interchange with NC 98 Bypass. Preliminary plans have been completed, and finals plans are underway. The widening includes an additional lane in the NB and SB directions as well as right turn lanes. Preliminary plans also call for a signalized intersection at the intersection of US 1 and Caveness Farms (Figure 1) and adding an additional left turn lane in the SB direction at that intersection. The plans also call for the removal of the SB left turns at the shopping center entrance just south of Caveness Farms (See Appendix). According to Division 5, it is anticipated that this interim widening will be constructed by 2017.

2.2 US 1A Capacity Improvements

NCDOT Division 5 Engineers have also reviewed the current lane configuration along US 1A at the intersection with US 1. In its current configuration, Falls of Neuse has 2 westbound lanes, but US 1A only has one westbound through lane. This configuration causes traffic to queue significantly which prevents northbound right turns on red, further compounding the problem. NCDOT recommends a slight widening along the north side US 1A to allow for a second westbound through lane and still provide a right turn lane. The existing shoulder section would be converted to curb and gutter to limit the impacts to the adjacent parcel. This would also require some drainage updates at the current shoulder area. Currently there are no formal plans in place and the improvements are unfunded.

Figure 1: US 1A Capacity Improvements



2.3 US 1A/Falls of Neuse Signal Upgrades

One recommendation as part of this study is signal timing adjustments. Signal timing plans were obtained from the City of Raleigh and reviewed. STV was able to run through a cycle of iterations to optimize the intersection splits and cycle length for the intersection. The City of Raleigh has studied this location to optimize the signal timing and has found that running the signals based on its own demand and timing parameters based on information provided by its detectors (presence of vehicles) was the optimal solution. Their analysis likely did not take into account the additional improvements which have been recommended or currently in plan development. The signal timing adjustments of this study takes into account the additional roadway improvements. The adjustments assume the US 1 Widening from US 1A to NC 98 Bypass improvement plans (Section 2.1) are completed and constructed as shown in the Preliminary Plans. It also assumes the US 1A Capacity Improvements (Section 2.2), which is currently unfunded, will be constructed.

2.4 Safety Improvements

Interim roadway improvements aimed to reduce congestion, and the reduction of driveway access in the close proximity of intersection will improve vehicular safety. Currently US 1A has closely spaced driveways and access points to commercial development. Potential safety improvements could include limiting access points by monolithic islands or delineators which would limit leftovers. Along US 1 there are safety improvements under design as part of NCDOT's preliminary plans between the intersection with US 1 and US 1A/Falls of Neuse to the interchange with NC 98 Bypass (Section 2.1).

2.5 Implementation of Recommended Improvements

Table 1 presents the intersections where improvements have been recommended or are already committed to by others.

Table 1: 2014 LOS Analysis with Recommended Improvements

Level of Service																					
Intersection	Type	Intersection		Northbound		Southbound		Eastbound		Westbound											
		AM		PM		AM		PM		AM		PM									
		LOS	DELAY	LOS	DELAY	LOS	DELAY	LOS	DELAY	LOS	DELAY	LOS	DELAY								
2A. Capital Boulevard & Falls of Neuse Road/South Main Street	<i>Signalized</i>	D	37.6	D	47.9	C	29.6	D	50.3	C	30.9	D	41.6	D	53.1	D	52.5	D	53.5	D	48.5
6B. Capital Boulevard and Popes Creek Drive/Wake Pointe	<i>Directional Crossover</i>	D	33.9	F	181.3	A	1.5	A	0.6	A	1.8	A	0.0	D	33.9	C	24.8	C	19.8	F	181.3

A - Improvements include restriping/widening the westbound approach to replace the right turn lane with a combination through/right lane and adjusting the cycle length to 120 second cycle.
 B - Improvements (COMMITTED BY OTHERS, Currently in Design) include widening of US 1 (Capital Boulevard) to 3-lanes in each direction, from the current six-lane section to tie into existing section south of NC 98

With the implementation of the signal timing adjustments at the Capital Boulevard and Falls of Neuse Road/South Main Street intersection and capacity improvements on US 1A (South Main Street), the level of service of the intersection increased from an LOS E in the AM and PM peak hours to an LOS D with a reduction in delay. In addition the LOS improved with a decrease in delay in all intersection approaches.

With the US 1 Widening, the Northbound and Southbound LOS substantially improved to an LOS A for both US 1 Northbound and Southbound as well as a decrease in delay.

3.0 INTERCHANGE CONCEPT DEVELOPMENT

3.1 Screening Criteria

The study team identified criteria which would used to screen alternatives and would identify the locally preferred interchange concept. Criteria included operational efficiency of each interchange, right-of-way (ROW) impacts and overall footprint, the effects on current land use and future development, planning level costs, social and environmental impacts, safety, and constructability.

3.2 Interchange Concepts

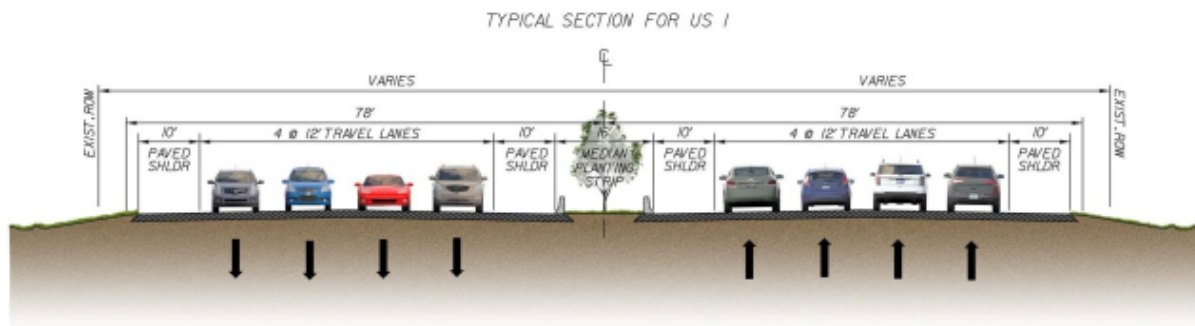
Three concepts were identified through collaboration with CAMPO and the US 1 Council of Planning. The selected concepts were a Single Point Urban Interchange (SPUI), a Diverging Diamond Interchange (DDI), and a Compressed Diamond. The SPUI was listed in the Phase I Report as the recommended interchange and has advantages of reduced ROW as compared to more traditional interchanges. For those primary reasons, the SPUI was selected as an alternative to study. The DDI was selected because of the benefits of the traffic operations and efficiencies. The Compressed Diamond has the benefit of lower construction costs and minimizing footprint.

Conceptual designs were developed for the three interchange concepts (See Appendix), based on design criteria developed during the Phase I Report and 2040 traffic volumes pulled from the Triangle Regional Demand Model.

Typical Section

The Phase I Report calls for US 1 to be upgraded to an urban freeway facility in the year 2030. US 1 will have a total of 4 lanes in each direction along with any required auxiliary lanes. For this feasibility study, the interchange entrance/exit ramps each use auxiliary lanes (acceleration/deceleration). US 1 is assumed to go over US 1A/Falls of Neuse Road which is also consistent with the Phase I Report.

Figure 2: US 1 Typical Section



Design Criteria

Along with the facility upgrade, the US 1 design speed is assumed to be 70 MPH. This will require a change in the posted speed from 55 MPH to 65 MPH. Each of the ramps for this interchange was conceptually laid out for a 50 MPH design speed. In the existing conditions Falls of Neuse has a posted speed at 45 MPH (50 MPH design speed) and US 1A is posted at 35 MPH (40 MPH design speed). The future interchange approaches will be posted at 35 MPH and designed for 40 MPH. This will require a reduction of speed along the EB approach on Falls of Neuse Road.

Alignment

The original alignments for US 1, US 1A, and Falls of Neuse Road were set up to be consistent among the three alternatives. There was no vertical element to this study, so there was no distinct advantage for changing the alignments for each. The alignment of US 1 was shifted slightly to the east which, along with leaving US 1 mostly at existing grade, could assist in the construction of the interchange. The recommended alignment along US 1 A was shifted slightly to the south which creates a more desirable alignment for the interchange and could provide the same constructability benefit of the US 1 alignment shift.

4.0 TRAFFIC FORECAST

The Triangle Regional Travel Demand Model was used to develop the traffic forecasts used in the assessment of the improvement alternatives. Alternatives were run using the current “Base Year” models for the 2015, 2030 and 2040 scenarios. The term “Base Year” refers to the

current models used by CAMPO for various scenarios. These models vary between scenarios because of differences in the networks that represent transportation improvement projects that are planned/programmed as part of the federally mandated planning process. Depending on the content of the Base Year models, modifications were made to the model networks to allow for modeling of no-build and improvement alternatives in the 2030 and 2040 scenarios.

4.1 Review of the Model Networks

The model network and associated link data in the vicinity of the study area were reviewed to identify the Base Year conditions in the 2015, 2030 and 2040 scenarios.

In the 2015 Base Year model network, the model network in the vicinity of the study area incorporates an at-grade intersection on Capital Boulevard at New Falls of Neuse Road/South Main Street. In the 2015 model network, centroid connections from traffic analysis zones intersect with Capital Boulevard on the links north and south of the subject intersection, implying that access to properties is permitted and no limitation of access is in place. Capital Boulevard is coded as a pair of one-way links providing 2 lanes in each direction with a posted speed of 55 miles per hour.

Falls of Neuse Road is coded as a series of two-way links west of Capital Boulevard providing 2 lanes in each direction. South Main Street is similarly coded as a series of two-way links, providing two lanes in each direction east of Capital Boulevard to Rogers Road. East of Rogers Road, South Main Street provides one lane in each direction. Falls of Neuse Road and South Main Street are both coded with a posted speed of 45 miles per hour.

In the 2030 and 2040 Base Year model scenarios, the centroid connectors to Capital Boulevard are removed, eliminating access to traffic analysis zones adjacent to the roadway. This indicates a planned conversion of Capital Boulevard to a limited access facility in these model networks. The links for Capital Boulevard also provide three lanes in each direction, representing an increase in capacity over what is shown in the 2015 model network. The coded posted speed limit is also increased from 55 miles per hour to 65 miles per hour.

The at-grade intersection with Falls of Neuse Road/South Main Street that is present in the 2015 model is replaced in the 2030 and 2040 Base Year models by a diamond interchange. The diamond interchange is modeled as one lane ramps with a posted speed limit of 35 miles per hour. There is no change in coding for the Falls of Neuse and South Main Street links compared to the 2015 scenario.

4.2 Model Alternatives

The Base Year models for the three scenarios represent both a no-build condition (2015 scenario) and a diamond interchange “build” condition (2030 and 2040 scenarios) at the intersection of Capital Boulevard and New Falls of Neuse Road/South Main Street.

Modifications were made to the Base Year networks for the 2030 and 2040 scenarios to model a No-Build condition that maintains the at-grade intersection in the 2015 scenario while maintaining the other Base Year network improvements along Capital Boulevard (elimination of centroid connectors, increasing capacity from two to three lanes, and increasing the speed from 55 to 65 miles per hour. The portion of the at-grade intersection was coded in the 2030 and

2040 No-Build scenarios consistent with the link data for that portion of the intersection in the 2015 Base Year scenario.

Modifications were also made to the Base Year networks for the 2030 and 2040 scenarios to model a build condition alternative to the diamond interchange coded in these Base Year models. In each of these scenarios, the coded diamond interchange was modified to represent a Single Point Urban Interchange (SPUI). The SPUI in the model was coded with single lane ramps connecting to Capital Boulevard and carrying right turn traffic to and from Falls of Neuse Road/South Main Street. The short portions of the ramps carrying left turn traffic to and from Falls of Neuse Road/South Main Street were coded with two lanes, consistent with the conceptual design of the SPUI. All the ramp segments were coded with posted speed limits of 35 miles per hour.

In addition to the diamond and SPUI interchanges, a third improvement alternative, a diverging diamond interchange (DDI) was considered for evaluation. For travel demand modeling purposes, the coding of a DDI into the networks is only a slight variation on the coding of a SPUI and would likely result in similar, if not nearly identical, traffic assignments. Consequently, it was judged that the traffic assignments obtained for the SPUI alternative should be sufficiently representative of the traffic assignments for the DDI alternative for use in evaluating the two concepts.

The travel demand model projections were generated after completing traffic assignments for the no-build and build alternatives for the 2030 and 2040 scenarios and for the 2015 Base Year scenario. These projections were then used to develop the morning and afternoon peak hour traffic volumes for use in the more detailed traffic analysis of the operation of the no-build conditions and the proposed improvement alternatives.

4.3 Turning Movement Volumes

The turning movement data for the interchange was utilized as the source for development of the remaining intersections in the study area. Link growth rates were determined from the TransCAD model and were found to be 3% along the US 1A/Falls of Neuse Road/South Main Street corridor and closer to 4% along the US 1/Capital Boulevard corridor. The through volumes for each of the corridors were carried throughout the mainline and the growth rates were applied to the turning movements at each of the study intersections to balance the network for the future year 2040 conditions.

4.4 2040 Traffic Volumes

Tables 2 and 3 show the AADTs of the Diamond, SPUI, and No-Build Alternatives respectively. Table 4 shows the average of each of the alternatives. As mentioned above, the AADT for the Diverging Diamond Interchange was not modeled therefore there was no AADT data for that alternate; however the results would be similar to the AADT from the SPUI alternative.

	North of Intersection	South of Intersection
US 1 NB	49,590 vpd	53,510 vpd
US 1 SB	49,208 vpd	55,011 vpd
Combined NB/SB	98,798 vpd	108,521 vpd
Falls of Neuse	43,370 vpd	
US 1A (Main Street)	50,647 vpd	

	North of Intersection	South of Intersection
US 1 NB	48,860 vpd	53,015 vpd
US 1 SB	49,721 vpd	55,328 vpd
Combined NB/SB	98,581 vpd	108,343 vpd
Falls of Neuse	43,273 vpd	
US 1A (Main Street)	52,946 vpd	

	North of Intersection	South of Intersection
US 1 NB	49,167 vpd	53,745 vpd
US 1 SB	49,680 vpd	55,338 vpd
Combined NB/SB	98,847 vpd	109,083 vpd
Falls of Neuse	43,322 vpd	
US 1A (Main Street)	51,797 vpd	

5.0 FUTURE TRAFFIC CONDITIONS

Projected analyses for the future build year of 2040 were modeled in accordance with the Transportation Research Board’s 2010 Highway Capacity Manual (HCM). The HCM utilizes a term “level of service” to measure how traffic operates in intersections and on roadway segments. There are currently six levels of service (LOS). The LOS is an important measure of roadway congestion. The LOS is determined by calculating the delay for the intersection and converting it to a letter grade. The LOS ranges from A (no congestion) to F (severe congestion).

Turning movement data was obtained from the TransCAD model for the main intersection of US 1/US 1A. Growth rates of 3.0-4.0% were determined from the model and were applied to the side street volumes. The through volumes from the US 1/US 1A intersection were then distributed throughout the US 1/Capital Boulevard and US 1A/Falls of Neuse Road/South Main Street corridors. These traffic volumes were input into the Synchro models and the following models were developed:

- 2040 No Build (Existing Conditions with Improvements)
- 2040 Build – CDI (Existing Conditions with Improvements, with US 1/US 1A Diamond Interchange)
- 2040 Build – SPUI (Existing Conditions with Improvements, with US 1/US 1A SPUI Interchange)
- 2040 Build – DDI (Existing Conditions with Improvements, with US 1/US 1A DDI Interchange)

Again, Synchro/SimTraffic 8.0 was used to analyze the intersections in the study area and obtain a LOS and delay per vehicle for the unsignalized and signalized intersections. SimTraffic was again used to simulate the traffic during each peak hour and observe how each of the interchange models affected the intersections in the project vicinity.

5.1 2040 No Build Conditions

The results of the 2040 No Build Conditions Level of Service analysis indicate each of the intersections during the PM peak hour; operate at a failing LOS F. Four of these intersections operate at a LOS F during the AM peak hour. The key study intersection, US 1 (Capital Boulevard) and US 1A (Falls of Neuse Road/South Main Street), operates at a LOS F during both the AM and PM peak hours, with all four of the approaches operating deficiently during both of the morning and afternoon commute. Observations made during the simulation, are that the eastbound and westbound directions during both peak hours, are backed up along the corridor outside the project vicinity. Along US 1, in the AM peak hour, the NB lefts spillback into the inside through lane and in the southbound direction, the through volume backs up beyond the Popes Creek Drive/Wake Point intersection, blocking the turn lanes at each of the intersections. In the PM peak hour, there were no northbound issues noted, and the southbound approach was similar to the AM observations.

Table 5 below presents the 2040 No Build Conditions Level of Service and Delay for each of the intersections.

Table 5: 2040 No Build Conditions LOS

		Level of Service																			
Intersection	Type	Intersection				Northbound				Southbound				Eastbound				Westbound			
		AM		PM		AM		PM		AM		PM		AM		PM		AM		PM	
		LOS	DELAY	LOS	DELAY	LOS	DELAY	LOS	DELAY	LOS	DELAY	LOS	DELAY	LOS	DELAY	LOS	DELAY	LOS	DELAY	LOS	DELAY
1. Falls of Neuse Road and Wakefield Commons	Directional Crossover	D	26.2	F	359.2	D	26.2	F	359.2	-	-	-	-	A	0.0	A	0.0	C	24.1	F	52.5
2A. Capital Boulevard & Falls of Neuse Road/South Main Street	Signalized	F	376.4	F	494.6	F	200.4	F	590.4	F	424.2	F	365.3	F	303.6	F	410.5	F	582.3	F	574.5
3. South Main Street and Star Road	Unsignalized	C	16.6	F	131.6	C	16.6	F	131.6	-	-	-	-	A	0.0	A	0.0	A	0.0	A	0.0
4. South Main Street and Wake Drive	Unsignalized	F	***	F	***	F	***	F	***	B	14.6	F	***	F	354.3	E	35.6	C	16.0	F	214.8
5. South Main Street and WalMart Driveway	Signalized	F	178.1	F	245.0	D	54.4	D	43.2	F	196.6	F	198.5	C	22.4	F	246.7	F	255.3	F	265.9
6B. Capital Boulevard and Popes Creek Drive/Wake Pointe	Directional Crossover	F	2057.7	F	***	F	249.3	F	110.7	F	164.7	F	***	F	2057.7	F	1590.8	F	1566.0	F	***

*** - Volume greatly exceeds capacity and delay cannot be computed.

A - Existing Conditions Improvements include restriping/widening the westbound approach to replace the right turn lane with a combination through/right lane and adjusting the cycle length to 120 second cycle.

B - Existing Conditions Improvements (COMMITTED BY OTHERS, Currently in Design) include widening of US 1 (Capital Boulevard) to 3-lanes in each direction, from the current six-lane section to tie into existing section south of NC 98

5.2 2040 CDI Level of Service

For the 2040 Build Conditions, three interchange scenarios were modeled as mentioned above, Diamond, SPUI and DDI. The Diamond Interchange scenario resulted in a LOS F operation at the main intersection of US 1/US 1A. The westbound-to-southbound US 1 left turn volume in the morning peak hour is projected to be more than 900 vehicles with over 300 vehicles making the eastbound-to-northbound US 1 maneuver. With this type of left turn volume, there is not enough storage along the bridge deck to accommodate the volume without constructing multiple turn and through lanes under a non-compressed design. The simulation for this model indicated a

free flowing US 1/Capital Boulevard; however, there was major congestion on both the east/westbound directions due to the spillback of the left turn lanes into the through lanes.

Table 6 below presents the 2040 Build Conditions Level of Service and Delay for each of the intersections under the Diamond Interchange configuration.

Table 6: 2040 Build – Diamond Interchange Conditions LOS

Level of Service																					
Intersection	Type	Intersection				Northbound				Southbound				Eastbound				Westbound			
		AM		PM		AM		PM		AM		PM		AM		PM		AM		PM	
		LOS	DELAY	LOS	DELAY	LOS	DELAY	LOS	DELAY	LOS	DELAY	LOS	DELAY	LOS	DELAY	LOS	DELAY	LOS	DELAY	LOS	DELAY
1. Falls of Neuse Road and Wakefield Commons	Directional Crossover	D	25.8	F	455.6	D	25.8	F	424.0	-	-	-	-	A	0.0	A	0.0	C	23.7	F	455.6
2C. Capital Boulevard & Falls of Neuse Road/South Main Street - SB	Diamond Interchange	F	115.4	F	219.0	-	-	-	-	F	277.5	F	177.7	F	147.9	F	372.6	C	34.7	C	26.4
2C. Capital Boulevard & Falls of Neuse Road/South Main Street - NB		F	212.0	F	325.7	E	61.5	F	591.8	-	-	-	-	D	42.1	C	29.2	F	352.5	F	363.9
3. South Main Street and Star Road	Unsignalized	B	11.4	C	21.3	B	11.4	C	21.3	-	-	-	-	A	0.0	A	0.0	A	0.0	A	0.0
4. South Main Street and Wake Drive	Unsignalized	F	***	F	***	F	***	F	***	F	57.6	F	***	F	59.7	D	32.6	C	15.7	F	129.4
5. South Main Street and WalMart Driveway	Signalized	F	191.2	F	262.7	D	54.4	D	35.6	F	199.4	F	191.2	B	19.1	F	249.3	F	273.0	F	313.6

*** - Volume greatly exceeds capacity and delay cannot be computed.

B - Improvements (COMMITTED BY OTHERS, Currently in Design) include widening of US 1 (Capital Boulevard) to 3-lanes in each direction, from the current six-lane section to tie into existing section south of NC 98

C - Intersection converted to a Compressed Diamond Interchange

5.3 2040 SPUI Level of Service

The SPUI Interchange scenario resulted in an acceptable LOS operation at the main intersection of US 1/US 1A during both of the peak periods. Both the AM and PM peak hours resulted in a LOS C under the SPUI configuration. In the AM peak hour, all approaches to the intersection with the exception of the NB leg operate acceptably as well; the NB leg operates at a LOS E during both peak hours. The simulation for this model indicated a free flowing US 1/Capital Boulevard and smooth progression along US 1A. The PM peak hour simulation showed similar results along the US 1 corridor; however there was some EB congestion due to the signal at WalMart but nothing that caused backups along the ramps onto US 1.

Table 7 below presents the 2040 Build Conditions Level of Service and Delay for each of the intersections under the SPUI Interchange configuration.

Table 7: 2040 Build – SPUI Interchange Conditions LOS

Level of Service																					
Intersection	Type	Intersection				Northbound				Southbound				Eastbound				Westbound			
		AM		PM		AM		PM		AM		PM		AM		PM		AM		PM	
		LOS	DELAY	LOS	DELAY	LOS	DELAY	LOS	DELAY	LOS	DELAY	LOS	DELAY	LOS	DELAY	LOS	DELAY	LOS	DELAY	LOS	DELAY
1F. Falls of Neuse Road and Wakefield Commons	Directional Crossover	B	14.3	F	86.6	E	56.7	F	186.6	-	-	-	-	C	26.9	F	126.5	A	4.2	C	25.0
2D. Capital Boulevard & Falls of Neuse Road/South Main Street	SPUI Interchange	C	27.0	C	28.0	E	58.7	E	61.9	D	46.9	D	49.2	C	31.4	C	22.6	B	14.6	B	17.4
3. South Main Street and Star Road	Unsignalized	A	9.2	B	10.6	A	9.2	B	10.6	-	-	-	-	A	0.0	A	0.0	A	0.0	A	0.0
4. South Main Street and Wake Drive	Unsignalized	F	***	F	***	F	***	F	***	B	13.8	F	***	F	527.6	E	44.9	C	16.3	F	445.1
5. South Main Street and WalMart Driveway	Signalized	F	217.3	F	257.7	D	54.4	D	37.2	F	197.8	F	217.0	A	8.4	F	236.4	F	324.8	F	306.1

*** - Volume greatly exceeds capacity and delay cannot be computed.

B - Improvements (COMMITTED BY OTHERS, Currently in Design) include widening of US 1 (Capital Boulevard) to 3-lanes in each direction, from the current six-lane section to tie into existing section south of NC 98

D - Intersection converted to a Single Point Urban Interchange

F - Intersection includes signal installation for EB left turn movement only

5.4 2040 DDI Level of Service

The DDI Interchange scenario resulted in an acceptable LOS operation at the main intersection of US 1/US 1A during the AM and PM peak hours at both interchange ramps. The simulation model was very similar to the conditions under the SPUI configuration.

Table 8 below presents the 2040 Build Conditions Level of Service and Delay for each of the intersections under the DDI Interchange configuration.

Table 8: 2040 Build – DDI Interchange Conditions LOS

Level of Service																					
Intersection	Type	Intersection				Northbound				Southbound				Eastbound				Westbound			
		AM		PM		AM		PM		AM		PM		AM		PM		AM		PM	
		LOS	DELAY	LOS	DELAY	LOS	DELAY	LOS	DELAY	LOS	DELAY	LOS	DELAY	LOS	DELAY	LOS	DELAY	LOS	DELAY	LOS	DELAY
1. Falls of Neuse Road and Wakefield Commons	Directional Crossover	B	15.1	F	87.2	E	56.7	F	186.6	-	-	-	-	C	26.9	F	119.3	A	5.4	C	30.2
2E. Capital Boulevard & Falls of Neuse Road/South Main Street - SB RAMP	DDI Interchange	C	29.1	C	22.7	-	-	-	-	B	14.8	C	31.8	C	35.6	B	11.2	C	34.1	D	54.0
2E. Capital Boulevard & Falls of Neuse Road/South Main Street - NB RAMP		D	47.4	C	26.2	D	41.1	D	36.5	-	-	-	-	D	44.7	F	212.1	E	76.1	A	8.7
3. South Main Street and Star Road	Unsignalized	C	21.1	F	263.1	C	22.3	F	282.4	-	-	-	-	A	0.0	A	0.0	A	0.0	A	0.0
4. South Main Street and Wake Drive	Unsignalized	F	***	F	***	F	***	F	***	B	13.8	F	***	F	527.6	E	44.9	C	16.9	F	144.0
5. South Main Street and WalMart Driveway	Signalized	F	217.6	F	248.6	D	54.4	D	37.2	F	197.8	F	218.0	A	9.4	F	245.0	F	324.8	F	272.8

*** - Volume greatly exceeds capacity and delay cannot be computed.

B - Improvements (COMMITTED BY OTHERS, Currently in Design) include widening of US 1 (Capital Boulevard) to 3-lanes in each direction, from the current six-lane section to tie into existing section south of NC 98

E - Intersection converted to a Diverging Diamond Interchange