This memo summarizes traffic operations analysis along Arlington Boulevard in the project area performed for 2040 Build Year Conditions.

During the design phase of this project, it was determined that traffic operations analysis would be needed to aid in the determination of the design typical section for Arlington Boulevard. This memo summarizes those traffic operations analysis results.

1.0 Traffic Volume Data

The Project Team received a traffic forecast for the study area from NCDOT dated July 2017, completed by VHB Engineering NC. It should be noted that for the 2040 Build Year Conditions, three sets of volumes were provided: 2040 No Build Scenario, 2040 4-lane widening Build Scenario, and 2040 6-lane widening Build Scenario. An unconstrained build forecast was not provided, however, it is the Project Teams opinion that a 2040 8-lane widening Build Scenario forecast would not see much of an increase in volumes from the 2040 6-lane widening Build Scenario. The forecast was used to generate AM Peak and PM Peak Hour volumes for the 2040 6-lane widening Build Scenario. The resulting traffic volumes were balanced along Arlington Boulevard and used for all of the traffic operations analysis summarized in this memo.

2.0 Capacity Analysis Methodology

The capacity analysis was performed using Synchro (Version 9.1 Build 912 Revision 4) software, and in accordance with the Capacity Analysis Guidelines (NCDOT Congestion Management Section, July 1, 2015). For this analysis, through lanes were added and signal timing was optimized; turn lane improvements were not made. It should be noted that storage bay lengths were not determined with this analysis.

For this memo, three build scenarios were analyzed: 2040 4-lane median divided section (using the 6-lane volumes), 2040 6-lane median divided section (using the 6-lane volumes), and 2040 4-lane superstreet at a few intersections (using the 6-lane volumes).
3.0 Traffic Operations Analysis Results Summary

The capacity analysis indicates that Arlington Boulevard as a 4-lane median divided section would approach or exceed the roadway capacity (Level of Service E or F) in both directions during at least one peak hour of the day. In addition, eight of the sixteen mainline segments would exceed the roadway capacity (Level of Service F), and three of the sixteen mainline segments would approach the roadway capacity (Level of Service E) during at least one peak hour of the day.

The capacity analysis indicates that Arlington Boulevard as a 6-lane median divided section would operate at an acceptable rate of flow (Level of Service D) in both directions during both peak hours of the day. In addition, four of the sixteen mainline segments would exceed the roadway capacity (Level of Service F), and three of the sixteen mainline segments would approach the roadway capacity (Level of Service E) during at least one peak hour of the day.

Mainline capacity analysis for signalized corridors relies heavily on the operations of the signalized intersections. For this analysis, through lanes were added and signal timing was optimized; turn lane improvements were not made. The following six intersections would exceed capacity (Level of Service F) during at least one peak hour as a 6-lane median divided section: SR 1467 (Stantonsburg Rd), US 13 (Dickinson Ave), SR 1702 (S Evans St), US 264 Alt E (Greenville Blvd SE), Red Banks, and SR 1708 (Fire Tower Rd). Dual left-turn lanes and exclusive right-turn lanes would improve level of service at these intersections. A more in depth analysis may provide intersection improvements that could improve the corridor as well. It should be noted that storage bay lengths were not determined with this analysis.

In addition to the above scenarios, there was a desire to analyze the project as a 4-lane superstreet corridor along Arlington Boulevard. At a glance, many of the side streets have substantial volumes that do not appear to make this corridor a good candidate for a 4-lane superstreet corridor. The following intersections are a few that were analyzed that are not expected to function well as superstreet intersections with a 4-lane typical section: SR 1467 (Stantonsburg Rd), NC 11 (Memorial Dr), US 264 Alt E (Greenville Blvd SE), and SR 1708 (Fire Tower Rd). Simulations at these intersections showed traffic locking up and coming to a complete stop because they could not move further. Not all intersections were analyzed as a superstreet, only several intersections with high volumes on the side streets.

4.0 Conclusion

Based on this analysis, a 6-lane median divided section operates at the better level of service.
### SP-1602A: Widening of Arlington Boulevard from NC 43 to Firetower Road

<table>
<thead>
<tr>
<th></th>
<th>4 lane</th>
<th>4 lane with RR Grade separations</th>
<th>6 lane</th>
<th>6 lane with RR Grade Separations</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Alternative 1</strong></td>
<td>$200,000</td>
<td>$200,000</td>
<td>$200,000</td>
<td>$200,000</td>
</tr>
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<td><strong>Alternative 1A</strong></td>
<td>$170,000,000</td>
<td>$200,000,000</td>
<td>$260,000,000</td>
<td>$290,000,000</td>
</tr>
<tr>
<td><strong>Alternative 2</strong></td>
<td>$48,600,000</td>
<td>$61,500,000</td>
<td>$53,500,000</td>
<td>$72,900,000</td>
</tr>
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<td><strong>TOTAL ESTIMATED COST:</strong></td>
<td>$218,800,000</td>
<td>$261,700,000</td>
<td>$313,700,000</td>
<td>$363,100,000</td>
</tr>
</tbody>
</table>
NCDOT State TIP Project No. SP-1602A
Arlington Boulevard Widening from NC 43 (W 5th Street) to SR 2235 (Old Firetower Road)
Greenville, Pitt County
WBS # 34263.1.1
July 14, 2017

MEMORANDUM TO: Lynnise Hawes, PE
Feasibility Studies Engineer
Feasibility Studies Unit, Planning and Programming
NC Department of Transportation

FROM: Taruna Tayal, PMP
VHB Engineering NC, P.C.

SUBJECT: Traffic Forecast for SP-1602A Widening Arlington Boulevard from NC 43 (W 5th Street) to Old Firetower Road (SR 2235), Greenville, Pitt County.

Please find attached the 2016 / 2040 Traffic Forecast for the above-mentioned project. NCDOT Division 2 is proposing STIP No. SP-1602A, which includes widening W. Arlington Boulevard from NC 43 (W 5th Street) to Old Firetower Road (SR 2235). The 5.2-mile project is in Pitt County (NCDOT Division 2) within the City of Greenville and the Greenville Metropolitan Planning Organization.

This forecast has been reviewed and approved by the Transportation Planning Branch on July 10, 2017.

There is no previous traffic forecast for SP-1602A. Two previous traffic forecasts performed for TIP Project No. FS-1002B as listed below were reviewed during the development of this forecast:

- TIP Project No. FS-1002B: Feasibility study for the widening of US 264 (Greenville Blvd.) from NC 11 to NC 33 by NCDOT, April 2012 with base year as 2012 and future year as 2035.
- TIP Project No. FS-1002B: Feasibility study for the widening of US 264 (Greenville Blvd.) from NC 11 to NC 33 by NCDOT, February 2016 with base year as 2015 and future year as 2040.

Daryl Vreeland, AICP the Transportation Planner for Greenville MPO and Reza Jafari, Eastern Planning Unit, Transportation Planning Branch were consulted during the development of this forecast.

The following scenarios are provided in this forecast:

1. Scenario 1 - 2016 Base Year No-Build Scenario
2. Scenario 2 - 2016 Base Year 4-lane widening Build Scenario
3. Scenario 3 - 2016 Base Year 6-lane widening Build Scenario
4. Scenario 4 - 2040 Design Year No-Build Scenario
5. Scenario 5 – 2040 Design Year 4-lane widening Build Scenario
6. Scenario 6 – 2040 Design Year 6-lane widening Build Scenario

**Fiscal Constraint:** Within an MPO, the future year forecasts assume construction of projects as listed within the MPO’s Metropolitan Transportation Plan (MTP, previously called LRTP). This forecast is
consistent with Greenville Urban Area MPO’s current MTP, adopted in December 2013 and amended August 2015. Projects in the MTP which may affect this facility include:

- The Southwest Bypass (NCDOT STIP Project U-2250);
- Fire Tower Road extension to southwest bypass (NCDOT STIP Project U-5006);
- NC 43 South Widening; and
- Widening and Improvements to SR 1700 (Evans Street/Old Tar Road)

**Future Conditions and Development Activity:** No information was available on the specific planned and approved developments in the area. There is moderate growth and development proposed in the study corridor between 2015 and 2040. Based on the household and employment data from the Greenville Travel Demand Model, household growth is expected to be between 40% - 65% between these years and employment growth will be less.

**Forecast Methodology:** The Base Year No-Build traffic forecasts were developed primarily based upon traffic counts taken for this forecast, as well as historic traffic counts and trends. The Design Year 2040 traffic forecasts are developed based upon the modeling results and existing traffic data, as well as the expected traffic pattern change due to the proposed project. The Greenville 2010 Travel Demand Model (adopted in December 2013) was used as a tool in the development of the traffic forecasts.

**Interpolation:** To determine volumes during any intermediate years straight-line interpolation may be used. AADT volumes may be extrapolated for up to two years immediately following 2040. If it is determined that any of these assumptions have become inconsistent with the project and surrounding area activity, request should be made for updated projections at this location.

For future reference this forecast will be saved in Project Store in the LongRangePlanning\Traffic Forecasts folder, under project SP-1602A.

If you have any questions or I can be of further assistance, please do not hesitate to call me at 919.741.5525, or e-mail me at ttayal@vhb.com.

cc: (Final distribution for your records via e-mail as PDF attachments):
- Michael P. Reese, PE, CPM, Congestion Management
- Glen Mumford, PE, Highway Design Branch
- Clark Morrison, PhD, PE, Pavement Management
- Jeff Cabaniss, PE, Division 2 Planning Engineer
- Scott Walston, PE, Transportation Planning Branch
- Ryan Purtle, AICP, Greenville MPO Transportation Planner
- Keith G. Dixon, Transportation Planning Branch

File Copy: SP-1602A, Pitt
No-Build Alternative
(Scenario 1) SHEET 3 OF 4

2016 Average Annual Daily Traffic

LEGEND

- No. of Vehicles per Day (VPD) in 100s
- PM Peak Hour
- PM Peak Hour Directional Split (%)
- Indicates Direction of D
- (d,l) Duals, TSTTs (%)
- K Design Hour Factor (%)
- X Movement Prohibited
- 1- Less than 50 VPD

existing Roadway
No-Build Alternative
(Scenario 1) SHEET 4 OF 4

Average Annual Daily Traffic

2016

LEGEND

### No. of Vehicles per Day (VPD) in 100s

- PM
- D
- PM Peak Hour Directional Split (%)
- (d,t)
- K
- Design Hour Factor (%)
- X
- Movement Prohibited
- Less than 50 VPD

Existing Roadway

PROJECT END
**Legend**

- No. of Vehicles per Day (VPD) in 100s
- PM Peak Hour
- D Peak Hour Directional Split (%)
- Indicates Direction of D (d,t)
- Duals, TSTs (%)
- K Design Hour Factor (%)
- X Movement Prohibited
- 1 Less than 50 VPD

**2016 Average Annual Daily Traffic**

**Project:** Arlington Boulevard Feasibility Study

**Location:** Arlington Blvd from NC 43 (W 5th Street) to SR 2235 (Old Firetower Road)

**Prepared by:** VHB Engineering NC, P.C.

**Date:** 07/10/2017

**County:** Pitt

**Division:** 2

**TIP:** SP-1602A

**WBS:** 34263.1.1

**Build 4 Lanes Alternative**

(Scenario 2) SHEET 2 OF 4
PROJECT: Arlington Boulevard Feasibility Study
LOCATION: Arlington Blvd from NC 43 (W 5th Street) to SR 2235 (Old Firetower Road)
PREPARED BY: VHB Engineering NC, P.C.
DATE: 07/10/2017
COUNTY: Pitt
DIVISION: 2
WBS: 34263.1.1
TIP: SP-1602A

LEGEND
- No. of Vehicles per Day (VPD) in 100s
- Existing Roadway
- PM Peak Hour
- D Peak Hour Directional Split (%)
- Indicates Direction of D
- Duals, TITS (%)
- K Design Hour Factor (%)
- X Movement Prohibited
- 1- Less than 50 VPD

2016 Average Annual Daily Traffic

Build 4 Lanes Alternative
(Scenario 2) SHEET 3 OF 4

US 264 Alt E (Greenville Blvd)
SR 1702 (S Evans Street)
West Arlington Boulevard
Marvin Jarman Road
Hooker Road
East Arlington Boulevard

318 8 PM (L1) 55
305 8 PM (L1) 55
277 8 PM (L1) 55
224 8 PM (L1) 55
289 8 PM (L1) 55
274 8 PM (L1) 55
222 8 PM (L1) 55
267 8 PM (L1) 55
276 8 PM (L1) 55
277 8 PM (L1) 55
289 8 PM (L1) 55
2016 Average Annual Daily Traffic
Build 4 Lanes Alternative
(Scenario 2) SHEET 4 OF 4

---

PROJECT END

TIP: SP-1602A
WBS: 34263.1.1
DIVISION: 2
COUNTY: Pitt
DATE: 07/10/2017
PREPARED BY: VHB Engineering NC, P.C.
LOCATION: Arlington Blvd from NC 43 (W 5th Street) to SR 2235 (Old Firetower Road)
PROJECT: Arlington Boulevard Feasibility Study

---

**Legend**
- **No. of Vehicles per Day (VPD)** in 100s
- **PM** PM Peak Hour (PM 55)
- **D** PM Peak Hour Directional Split (%)
- **(d.l)** Indicates Direction of D (duals, TTSTs)
- **K** Design Hour Factor (%)
- **X** Movement Prohibited
- **1-** Less than 50 VPD

---

**Existing Roadway**

---

**Build 4 Lanes Alternative**

---

**Average Annual Daily Traffic**

---

**Legend**
- **No. of Vehicles per Day (VPD)** in 100s
- **PM** PM Peak Hour (PM 55)
- **D** PM Peak Hour Directional Split (%)
- **(d.l)** Indicates Direction of D (duals, TTSTs)
- **K** Design Hour Factor (%)
- **X** Movement Prohibited
- **1-** Less than 50 VPD
2016 Average Annual Daily Traffic
(Scenario 3) SHEET 4 OF 4

Legend

No. of Vehicles per Day (VPD) in 100s

PM Peak Hour

Peak Hour Directional Split (%)

(D.I) Indicates Direction of D

K Design Hour Factor (%)

X Movement Prohibited

1- Less than 50 VPD

Build 6 Lanes Alternative

PROJECT: Arlington Boulevard Feasibility Study

LOCATION: Arlington Blvd from NC 43 (W 5th Street) to SR 2235 (Old Firetower Road)

TIP: SP-1602A

WBS: 34263.1.1

DIVISION: 2

COUNTY: Pitt

DATE: 07/10/2017

PREPARED BY: VHB Engineering NC, P.C.
### No-Build Alternative

#### (Scenario 4) SHEET 1 OF 4

**PROJECT:** Arlington Boulevard Feasibility Study

**LOCATION:** Arlington Blvd from NC 43 (W 5th Street) to SR 2235 (Old Firetower Road)

**PREPARED BY:** VHB Engineering NC, P.C.

**DATE:** 07/10/2017

**COUNTY:** Pitt

**DIVISION:** 2

**TIP:** SP-1602A

**WBS:** 34263.1.1

**TIP:** SP-1602A

**WBS:** 34263.1.1

**X Movement Prohibited:

---

**LEGEND**

- **No. of Vehicles per Day (VPD) in 100s**
- **Existing Roadway**
- **PM (d,t) Peak Hour**
- **PM Peak Hour Directional Split (%)**
- **Indicates Direction of D**
- **Duals, TTSTs (%)**
- **K Design Hour Factor (%)**
- **X Movement Prohibited**
- **1- Less than 50 VPD**

**PROJECT START**

- **West Arlington Boulevard**
- **SR 1202 (MacGregor Downs Road)**
- **Beasley Drive**
- **Heart Drive**
- **SR 1467 (Stantonsburg Road)**
- **Hemby Lane**

**2040 Average Annual Daily Traffic**

<table>
<thead>
<tr>
<th>No. of Vehicles per Day (VPD) in 100s</th>
<th>Average Annual Daily Traffic</th>
</tr>
</thead>
<tbody>
<tr>
<td>E. W T C H L I N E</td>
<td>2040</td>
</tr>
<tr>
<td>West Arlington Boulevard</td>
<td>241</td>
</tr>
<tr>
<td>SR 1202 (MacGregor Downs Road)</td>
<td>24</td>
</tr>
<tr>
<td>Beasley Drive</td>
<td>8</td>
</tr>
<tr>
<td>Heart Drive</td>
<td>85</td>
</tr>
<tr>
<td>SR 1467 (Stantonsburg Road)</td>
<td>454</td>
</tr>
<tr>
<td>Hemby Lane</td>
<td>317</td>
</tr>
<tr>
<td>Driveway</td>
<td>295</td>
</tr>
</tbody>
</table>

---

**Matchline:**

- Arlington Boulevard

---

**Matchline:**

- Arlington Boulevard

---

**Matchline:**

- Arlington Boulevard
2040 Average Annual Daily Traffic

LEGEND

- No. of Vehicles per Day (VPD) in 100s
- PM Peak Hour
- PM Peak Hour Directional Split (%)
- Indicates Direction of D (d,t)
- Duals, TTSTs (%)
- K Design Hour Factor (%)
- X Movement Prohibited
- 1- Less than 50 VPD

PROJECT: Arlington Boulevard Feasibility Study
LOCATION: Arlington Blvd from NC 43 (W 5th Street) to SR 2235 (Old Firetower Road)
PREPARED BY: VHB Engineering NC, P.C.
DATE: 07/10/2017
COUNTY: Pitt
DIVISION: 2
WBS: 34263.1.1
TIP: SP-1602A
SHEET 2 OF 4

No-Build Alternative
(Scenario 4)
### Legend

- **No. of Vehicles per Day (VPD) in 100s**
- **PM Peak Hour**
- **PM Peak Hour Directional Split (%)**
- **Indicates Direction of D (d,t) Duals, TTBTs (%)**
- **K Design Hour Factor (%)**
- **X Movement Prohibited**
- **1- Less than 50 VPD**

---

#### Average Annual Daily Traffic

<table>
<thead>
<tr>
<th>Road</th>
<th>East Arlington Boulevard</th>
<th>Hooker Road</th>
<th>West Arlington Boulevard</th>
</tr>
</thead>
<tbody>
<tr>
<td>US 264 Alt E (Greenville Blvd SE)</td>
<td>55</td>
<td>55</td>
<td>55</td>
</tr>
<tr>
<td>Hooker Road</td>
<td>55</td>
<td>55</td>
<td>55</td>
</tr>
<tr>
<td>Marvin Jarman Road</td>
<td>55</td>
<td>55</td>
<td>55</td>
</tr>
<tr>
<td>SR 1702 (S Evans Street)</td>
<td>55</td>
<td>55</td>
<td>55</td>
</tr>
</tbody>
</table>

---

#### No-Build Alternative

**Scenario 4**

- **2040 Average Annual Daily Traffic**

- **TIP:** SP-1602A
- **WBS:** 34263.1.1
- **DIVISION:** 2
- **COUNTY:** Pitt
- **DATE:** 07/10/2017
- **PREPARED BY:** VHB Engineering NC, P.C.
- **LOCATION:** Arlington Blvd from NC 43 (W 5th Street) to SR 2235 (Old Firetower Road)
- **PROJECT:** Arlington Boulevard Feasibility Study
LEGEND

No. of Vehicles per Day (VPD) in 100s

PM Peak Hour Percentage
PM Peak Hour Directional Split (%)
(d,l) Indicates Direction of D Indicators
K Duals, TTSTs (%) Design Hour Factor (%)
X Movement Prohibited
1- Less than 50 VPD

PROJECT:
Arlington Boulevard Feasibility Study

LOCATION:
Arlington Blvd from NC 43 (W 5th Street) to SR 2235 (Old Firetower Road)

PREPARED BY:
VHB Engineering NC, P.C.

DATE:
07/10/2017

COUNTY:
Pitt

DIVISION:
2

WBS:
34263.1.1

TIP:
SP-1602A

No-Build Alternative
(Scenario 4) SHEET 4 OF 4

2040 Average Annual Daily Traffic

Mulberry Lane

Wimbledon Drive

SR 1708 (E Fire Tower Road)

SR 1725 (East Arlington Boulevard)

SR 2235 (Old Firetower Road)

PROJECT END
**2040 Average Annual Daily Traffic**

**Legend**
- No. of Vehicles per Day (VPD) in 100s
- PM Peak Hour
- PM Peak Hour Directional Split (%)
- D Indicates Direction of D
- D Free Flow Speed
- (d,t) Duals, TTSTs (%)
- K Design Hour Factor (%)
- X Movement Prohibited
- 1- Less than 50 VPD

**PROJECT:** Arlington Boulevard Feasibility Study

**LOCATION:** Arlington Blvd from NC 43 (W 5th Street) to SR 2235 (Old Firetower Road)

**PREPARED BY:** VHB Engineering NC, P.C.

**COUNTY:** Pitt

**DIVISION:** 2

**TIP:** SP-1602A

**DATE:** 07/10/2017

**WB/:** 34263.1.1

**WBS:** 34263.1.1.1
2040 Average Annual Daily Traffic

Build 4 Lanes Alternative
(Scenario 5) SHEET 4 OF 4
2040 Average Annual Daily Traffic

PROJECT: Arlington Boulevard Feasibility Study
LOCATION: Arlington Blvd from NC 43 (W 5th Street) to SR 2235 (Old Firetower Road)
PREPARED BY: VHB Engineering NC, P.C.
DATE: 07/10/2017
COUNTY: Pitt
DIVISION: 2
WBS: 34263.1.1
TIP: SP-1602A

LEGEND

- No. of Vehicles per Day (VPD) in 100s
- Existing Roadway
- PM Peak Hour
- D Peak Hour Directional Split (%)
- Indicates Direction of D
- Indicates % of D
- PM Peak Hour Directional Split (%)
- Indicates Direction of D
- Indicates % of D
- Design Hour Factor (%)
- Movement Prohibited
- Less than 50 VPD

PROJECT: Build 6 Lanes Alternative
(Scenario 6) SHEET 2 OF 4
**LEGEND**

- **K(d,t)**: Indicates Direction of D (duals, TSTs) (%)
- **PM Peak Hour (D, TSTs) (%)**: Indicates Direction of D
- **Design Hour Factor (%)**: Indicates Direction of D
- **Movement Prohibited**: Indicates Direction of D
- **1- Less than 50 VPD**: Indicates Direction of D

**PROJECT:** Arlington Boulevard Feasibility Study

**LOCATION:** Arlington Blvd from NC 43 (W 5th Street) to SR 2235 (Old Firetower Road)

**PREPARED BY:** VHB Engineering NC, P.C.

**DATE:** 07/10/2017

**COUNTY:** Pitt

**DIVISION:** 2

**WBS:** 34263.1.1

**TIP:** SP-1602A

**SHEET 3 OF 4**

**2040 Average Annual Daily Traffic**

**Build 6 Lanes Alternative**

(Scenario 6)
STUDY AREA VICINITY
SP-1602A Arlington Boulevard Widening

May 2017