

MEMORANDUM

June 2018

TO: Tierre Peterson, PE
Structures Management Unit

FROM: Ivo Dernev, PE
AECOM, Technical Services of North Carolina, Inc.

SUBJECT: **B-5985** - Replace Bridge No. 770125 over Lumber River on NC 41/NC 72 and Bridge No. 770175 over the Lumber River on SR 1600 in Robeson County

Please find attached the 2018/2040 Traffic Forecast for the above mentioned project. This forecast was requested by Tierre Peterson, PE of NCDOT Structures Management Unit on May 16, 2018. The forecast was reviewed and approved by the NCDOT Transportation Planning Branch on 07/02/2018.

TIP project B-5985 includes replacement of Bridge No. 770125 over Lumber River on NC 41/NC 72 and Bridge No. 770175 over the Lumber River on SR 1600 in Robeson County. The study area limits for this project cover the bridges and the four adjacent intersections.

The project subject to the forecast analysis is located within the limits of the Lumber River Rural Planning Organization (LRRPO). The Lumberton Travel Demand Model (LTDM) was used as a tool in the development of the forecast.

Included in the traffic forecast is the analysis for two scenarios: one 2018 Base Year and one 2040 Future Year scenarios:

- **Base Year 2018 No-Build/Build** - Existing Conditions
- **Future Year 2040 No-Build/Build** - Existing Conditions

Certain assumptions were made in the development of the forecast:

Fiscal Constraint: NCDOT's 2018-2027 STIP document was reviewed for projects within the study area that might have an effect on future travel patterns. No projects were found that would affect future travel patterns in the project area.

Travel Demand Model: The Lumberton Travel Demand Model (LTDM) was used as a tool in the development of this forecast.

Traffic Forecast Methodology: The 2018 traffic volumes and design factors were developed based upon current counts and historic AADT trend projections. No previous forecasts were available for use to aid in the development of this traffic forecast.

For the calculation of the 2040 traffic volumes, historic growth trends were analyzed and compared to modeled growth rates from the LTDM. Engineering judgement was applied as needed in finalizing the volumes in order to develop a balanced forecast.

If you have any questions or if I can be of further assistance, please do not hesitate to call me at (919) 239-7203, or email me at ivo.dernev@aecom.com.

cc: FILE (Robeson County, TIP Project B-5985)

cc: *(via e-mail as PDF attachments)*
James Dunlop, PE, Congestion Management Section
Brenda Moore, PE, Roadway Design Unit
Clark Morrison, PE, Pavement Management Unit
Darius D. Sturdivant, Division 6 Planning Engineer.
Frank D West, Jr., PE, Highway Division 6 Traffic Engineer
Phil Geary, Lumber River RPO NCDOT Contact
Janet Robertson, Lumber River RPO Contact
Keith Dixon, State Traffic Forecasting Engineer

Project Level Traffic Forecast Report

TIP PROJECT B-5985

**Bridge No. 770125 on NC 41/NC 72
& Bridge No. 770275 on SR 1600
over Lumber River**

Robeson County

WBS # 47749.1.1

**Prepared by: AECOM
June 2018**

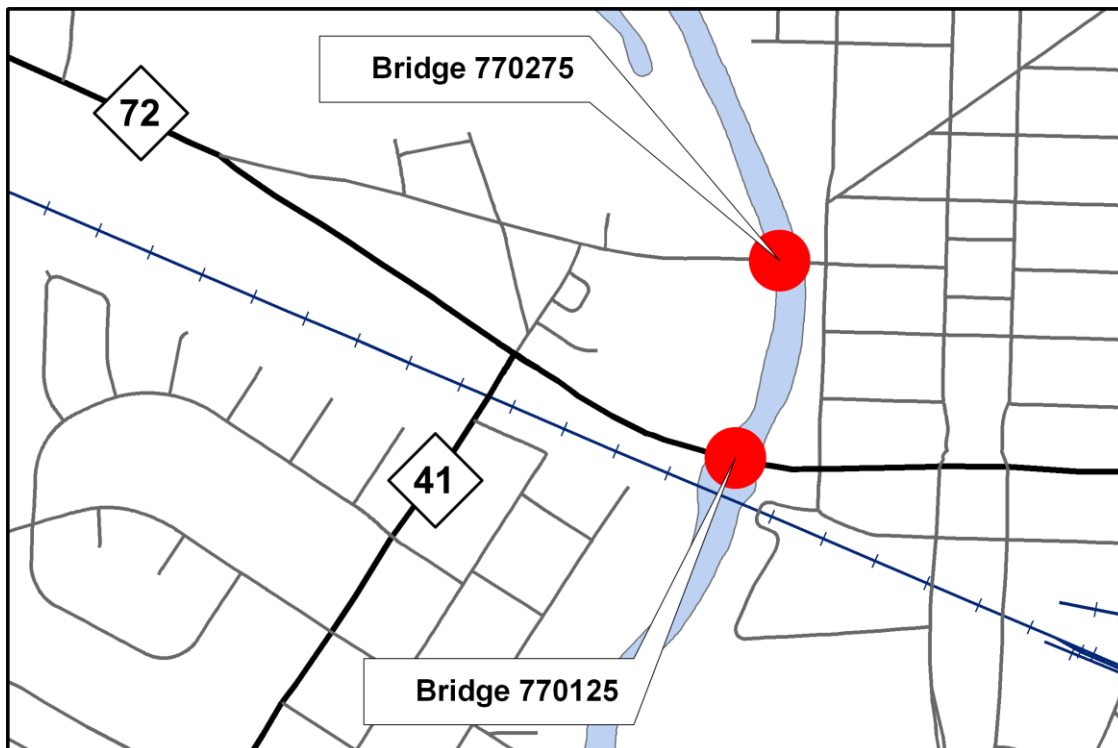
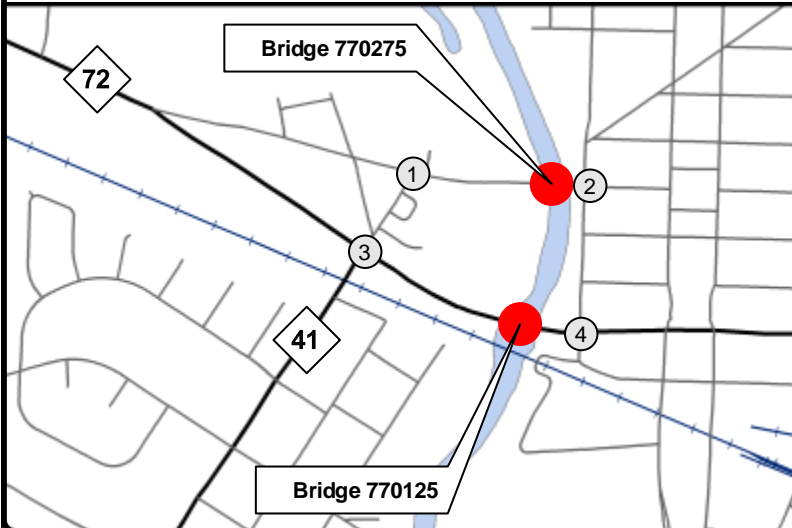
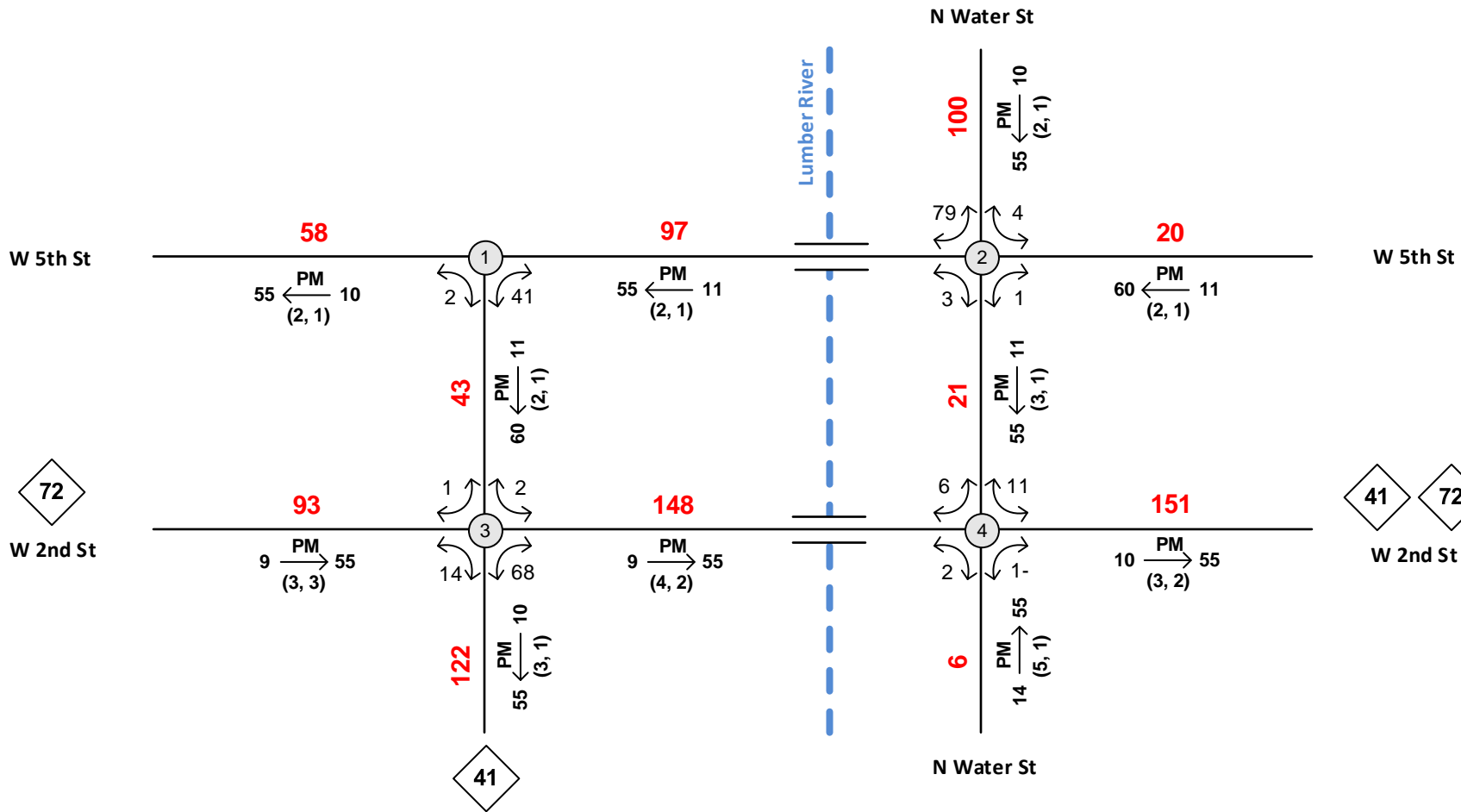


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2018 AVERAGE ANNUAL DAILY TRAFFIC

BASE YEAR NB/B SHEET 1 OF 2

LEGEND

- ### No. of Vehicles Per Day in 100s
- 1- Less than 50 vpd
- X Movement Prohibited
- $K \frac{PM}{(d, t)} \rightarrow D$
- K Design Hour Factor (%)
- PM PM Peak Period
- D Peak Hour Directional Split (%)
- ➔ Indicates Direction of D
- (d, t) Duals, TT-STs (%)

TIP: B-5985

WBS: 47749.1.1

COUNTY: Robeson

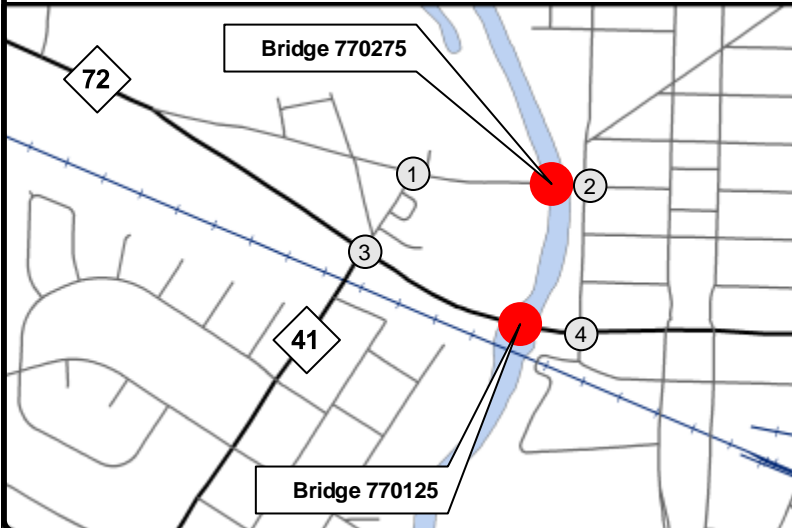
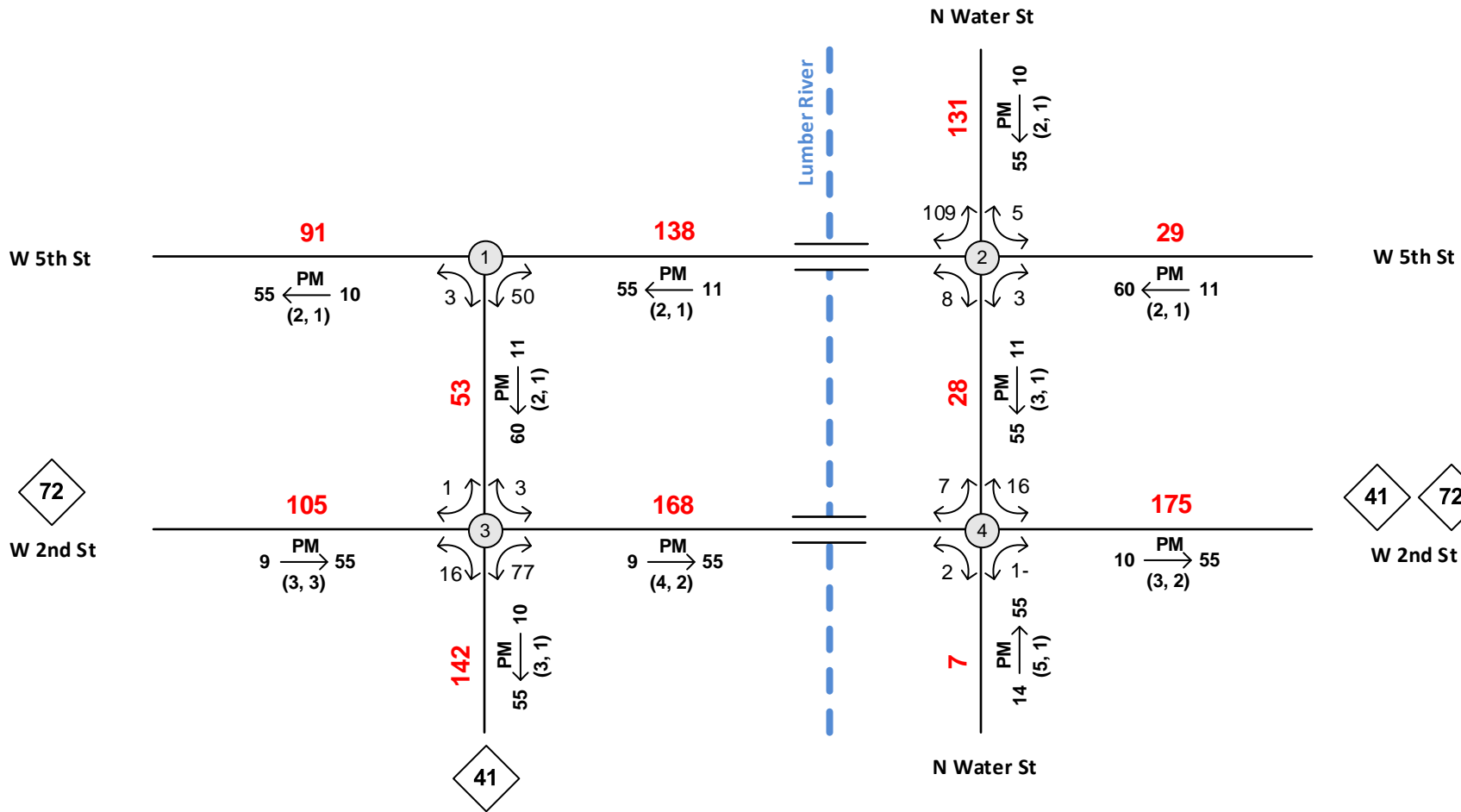
DIVISION: 6

DATE: June 2018

PREPARED BY: AECOM

LOCATION: Bridge No. 770125 on NC 41/NC 72 & Bridge No. 770275 on SR 1600 over Lumber River

PROJECT: Bridge Replacement



2040 AVERAGE ANNUAL DAILY TRAFFIC

FUTURE YEAR NB/B SHEET 2 OF 2

LEGEND

- ### No. of Vehicles Per Day in 100s
- 1- Less than 50 vpd
- X Movement Prohibited
- $K \frac{PM}{(d, t)} \rightarrow D$
- K Design Hour Factor (%)
- PM PM Peak Period
- D Peak Hour Directional Split (%)
- ➔ Indicates Direction of D
- (d, t) Duals, TT-STs (%)

| | |
|---|----------------|
| TIP: B-5985 | WBS: 47749.1.1 |
| COUNTY: Robeson | DIVISION: 6 |
| DATE: June 2018 | |
| PREPARED BY: AECOM | |
| LOCATION: Bridge No. 770125 on NC 41/NC 72 & Bridge No. 770275 on SR 1600 over Lumber River | |
| PROJECT: Bridge Replacement | |

1. Project Background

Project Request Information

This traffic forecast was requested by NCDOT's Structures Management Unit in May, 2018. STIP Project B-5985 is described as replacing Bridge No. 770125 over Lumber River on NC 41/NC 72 (W 2nd St) and Bridge No. 770175 over the Lumber River on SR 1600 (W 5th St) in Robeson County.

Area Information

The project is located in Robeson County within the limits of the Lumber River Rural Planning Organization (LRRPO). The analyzed roadway network is part of Lumberton travel demand model and the model results were used as a tool to aid in the forecast development. Land use within the study area is predominantly urban commercial-use. There is a medium sized, 100-unit residence primarily housing project in the forecast area at 400 Martin Luther King Jr Dr. Robeson County zoning information was reviewed, and no nearby site developments were found that would affect future travel patterns in the project vicinity.

Route Information

NC 41 is a primary state highway in North Carolina. The route travels in a north-south orientation between the South Carolina state line to Lumberton, then takes an east-west direction, connecting the municipalities of Elizabethtown, White Lake, Harrells, Beulaville, and Trenton before terminating at US 70 near Cove City. NC 41 enters the project vicinity from the south as Martin Luther King Jr. Dr. until reaching its junction with NC 72 (W 2nd St.), after which point it runs eastward along W 2nd St in concurrency with NC 72. NC 41 links central Lumberton to I-74 and US 74 to the south of the city. In the project vicinity, NC 41 (Martin Luther King Jr. Dr.) is a four-lane, undivided route south of NC 72 (W 2nd St.). NC 41-72 (W 2nd St.) is a two-lane, undivided route east of NC 41 (Martin Luther King Jr Dr.). South of NC 72 (W 2nd St), it is classified as Minor Arterial in the Federal Highway Classification System. East of NC 41 (Martin Luther King Jr. Dr.), it is classified as Principle Arterial Other in the Federal Highway Classification System. It has a posted speed limit of 35 miles-per-hour within the project vicinity.

NC 72 (W 2nd St.) is a primary state highway in North Carolina. The route runs in a southeasterly fashion through Robeson County from the town of Red Springs south to Lumberton before terminating at US 74 near the town of Boardman. NC 72 enters the project area from the west along W 2nd St. The route merges with NC 41 before crossing the Lumber River, then exiting the project area to the west. NC 72 connects downtown Lumberton to I-95 to the west of town. In the project vicinity, NC 72 / W 2nd St. is a four-lane, undivided route west of NC 41 / Martin Luther King Jr. Dr. and a two-lane, undivided route east of NC 41 / Martin Luther King Jr. Dr. It has a posted speed limit of 35 miles-per-hour in the project vicinity. It is classified as Principal Arterial Other in the Federal Highway Classification System.

SR 1600 (W 5th St.) is an east-west route through the city of Lumberton. In the project vicinity, W 5th St. is a two-lane, undivided route. It is classified as Major Collector in the Federal Highway Classification System. It has a posted speed limit of 35 miles-per-hour in the project vicinity.

SR 1536 (N Water St.) is a north-south route through the city of Lumberton. In the project vicinity, SR 1600 (W 5th St.) is a two-lane, undivided route. It has a posted speed limit of 35 miles-per-hour in the project vicinity. It is classified as Minor Arterial in the Federal Highway Classification System.

Martin Luther King Jr. Dr. is a north-south route in the forecast area. Located west of the Lumber River, the four-lane, undivided route is part of NC 41 south of NC 41-72 (W 2nd St.). In

the project vicinity, the route has a posted speed limit of 35 miles-per-hour. South of NC 41-72 (W 2nd St.), where it is signed also as NC 41, the route is classified as Minor Arterial in the Federal Highway Classification System. Between NC 41-72 (W 2nd St.) and SR 1600 (W 5th St.), the route is classified as Local in the Federal Highway Classification System.

2. Sources of Information and Data

Historic AADT

Historic AADTs from the period 1996 through 2016 (shown in Table 1 and Table 2, below) were used in the preparation of the 2018 traffic forecast.

Table 1: Historic AADT (2006-2016)

| Location | Station ID | 2016 | 2015 | 2014 | 2013 | 2012 | 2011 | 2010 | 2009 | 2008 | 2007 | 2006 |
|---|------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| NC 41-72 (W 2nd St) east of SR 1536 (N Water St) | 7700110 | 14,000 | 14,000 | 15,000 | 14,000 | 13,000 | 14,000 | 14,000 | 14,000 | 12,000 | 15,000 | 15,000 |
| NC 41 (Martin Luther King Jr Dr) south of NC 41-72 | 7700111 | 13,000 | 14,000 | - | 14,000 | 12,000 | 14,000 | 13,000 | 14,000 | 13,000 | 15,000 | 15,000 |
| SR 1536 (N Water St) north of SR 1600 (W 5th St) | 7701996 | - | 6,200 | - | 6,400 | - | 5,300 | - | 5,400 | - | 5,700 | - |
| NC 72 west of of SR 1600 (W 5th St) | 7703438 | 18,000 | 17,000 | 13,000 | 15,000 | 14,000 | 16,000 | - | 14,000 | 14,000 | 16,000 | 17,000 |
| SR 1600 (W 5th St) east of SR 1599 (Martin Luther King Jr Dr) | 7709076 | - | 12,000 | - | 11,000 | - | - | - | - | - | - | - |
| SR 1536 (N Water St) between W 2nd St and W 5th St | 7709080 | - | 2,200 | - | 2,200 | - | - | - | - | - | - | - |
| NC 41-72 (W 2nd St) between NC 41 and SR 1536 (N Water St) | 7709400 | 15,000 | 14,000 | - | - | - | 13,600 | - | - | - | - | - |
| NC 72 (W 2nd St) west of NC 41 (Martin Luther King Jr Dr) | 7709404 | 10,000 | 9,700 | - | - | - | 9,600 | - | - | - | - | - |

Table 2: Historic AADT (1996-2005)

| Location | Station ID | 2005 | 2004 | 2003 | 2002 | 2001 | 2000 | 1999 | 1998 | 1997 | 1996 |
|---|------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| NC 41-72 (W 2nd St) east of SR 1536 (N Water St) | 7700110 | 16,000 | 14,000 | 14,000 | 15,000 | 15,000 | 15,000 | 14,000 | 15,000 | 15,000 | 19,000 |
| NC 41 (Martin Luther King Jr Dr) south of NC 41-72 | 7700111 | 15,000 | 13,000 | 13,000 | 13,000 | 14,000 | 15,000 | 14,000 | 15,000 | 15,000 | 15,000 |
| SR 1536 (N Water St) north of SR 1600 (W 5th St) | 7701996 | 7,200 | - | - | - | 7,000 | - | 6,700 | - | 6,500 | - |
| NC 72 west of of SR 1600 (W 5th St) | 7703438 | 21,000 | 15,000 | 16,000 | 15,000 | - | - | - | - | - | - |
| SR 1600 (W 5th St) east of SR 1599 (Martin Luther King Jr Dr) | 7709076 | - | - | - | - | - | - | - | - | - | - |
| SR 1536 (N Water St) between W 2nd St and W 5th St | 7709080 | - | - | - | - | - | - | - | - | - | - |
| NC 41-72 (W 2nd St) between NC 41 and SR 1536 (N Water St) | 7709400 | - | - | - | - | - | - | - | - | - | - |
| NC 72 (W 2nd St) west of NC 41 (Martin Luther King Jr Dr) | 7709404 | - | - | - | - | - | - | - | - | - | - |

Field Data Collection

AECOM collected and reviewed the 13-hour turning movement counts and converted them to 24-hour (daily) traffic estimates. The daily estimates were then converted to AADT volumes. Additionally, a search of the NCDOT Traffic Safety Data Files for available recent data for routes in the project vicinity found two 48-hour volume-speed-classification counts. Collected traffic counts for this project are shown below in Table 3.

Table 3: Project Traffic Counts

| Count Location | Count Type | Date(s) Collected | County | ATR Group | Seasonal Adjustment Factor ⁽¹⁾ |
|---|------------|-----------------------|---------|-----------|---|
| NC 41-72 (W 2nd St) west of Lumber River ⁽²⁾ | VSC | 3/27/2018 - 3/28/2018 | Robeson | 4 | 0.93 / 0.92 |
| SR 1600 (West 5th St) west of Lumber River ⁽²⁾ | VSC | 3/27/2018 - 3/28/2018 | Robeson | 4 | 0.93 / 0.92 |
| SR 1600 (W 5th St) and Martin Luther King Jr Dr | TMC | 5/24/2018 | Robeson | 1 | 0.93 |
| SR 1600 (W 5th St) and SR 1536 (N Water St) | TMC | 5/24/2018 | Robeson | 1 | 0.93 |
| NC 72 (W 2nd St) and NC 41 (Martin Luther King Jr Dr) | TMC | 5/24/2018 | Robeson | 1 / 4 | 0.93 / 0.98 |
| NC 41-72 (W 2nd St) and SR 1536 (N Water St) | TMC | 5/24/2018 | Robeson | 1 / 4 | 0.93 / 0.98 |

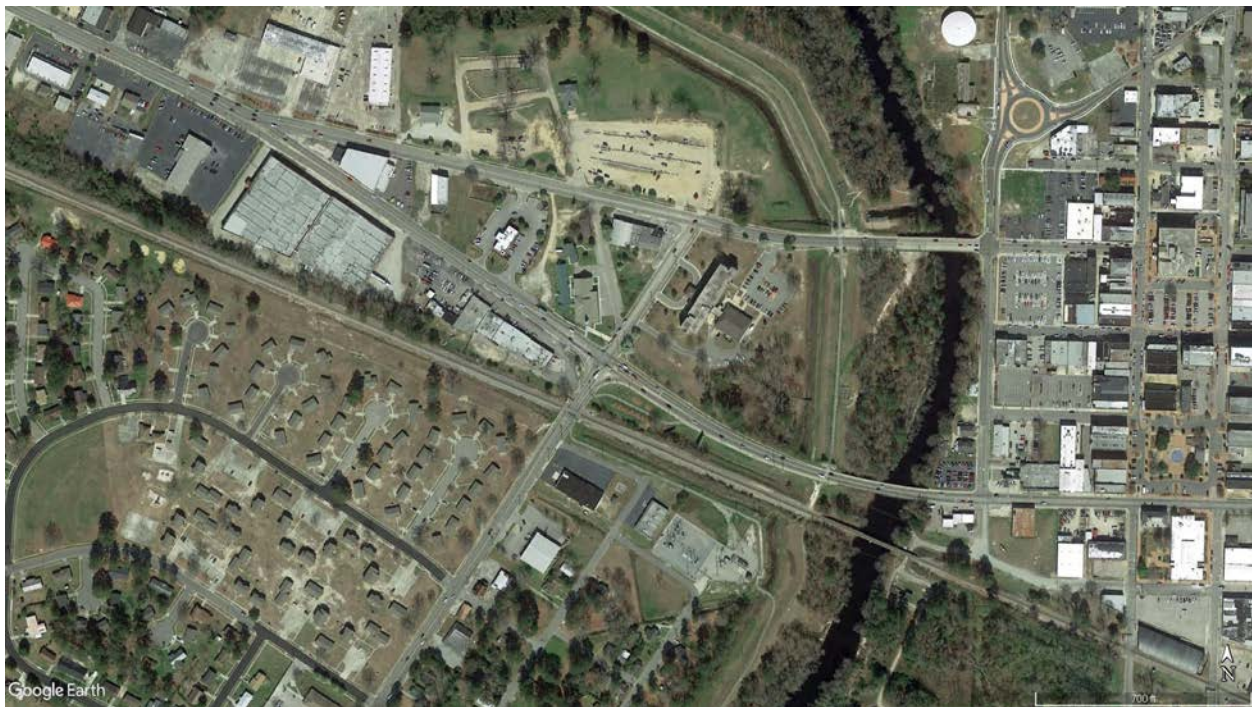
(1) Seasonal Adjustment Factor assigned to the corresponding ATR group based on intersection approach

(2) Count data source: NCDOT Traffic Safety Data Files

Field Investigation

Aerial view satellite imagery of the area was reviewed. The most recent available imagery of the site was taken on March 4th, 2018. An overview image of the project area is seen below in Figure 1.

Figure 1: Project Area Satellite Imagery



Transportation Plans

The project is located in Robeson County within the limits of the Lumber River Rural Planning Organization (LRRPO). Lumberton Comprehensive Transportation Plan (CTP) adopted in August, 2015 was reviewed for any proposed improvements that would possibly influence the future traffic forecast volumes.

County Population Estimates

Robeson County population estimates were obtained from the State Demographics Branch of the Office of Budget and Management, accessed on May 22, 2018. The data shows a projection of negative growth for the county. Results are shown in Table 4. Population and projected growth rate data for the state of North Carolina is shown in Table 5. Additionally, Figure 2 plots the historic and projected population growth rate trends for both North Carolina and Robeson County.

Table 4: County Population Data

| County Population | | | | | Growth Rate | | |
|-------------------|---------|---------|---------|---------|-------------|-----------|-----------|
| 2000 | 2010 | 2020 | 2030 | 2035 | 2000-2010 | 2010-2020 | 2020-2030 |
| 123,339 | 134,461 | 130,109 | 123,740 | 120,557 | 0.9% | -0.3% | -0.5% |

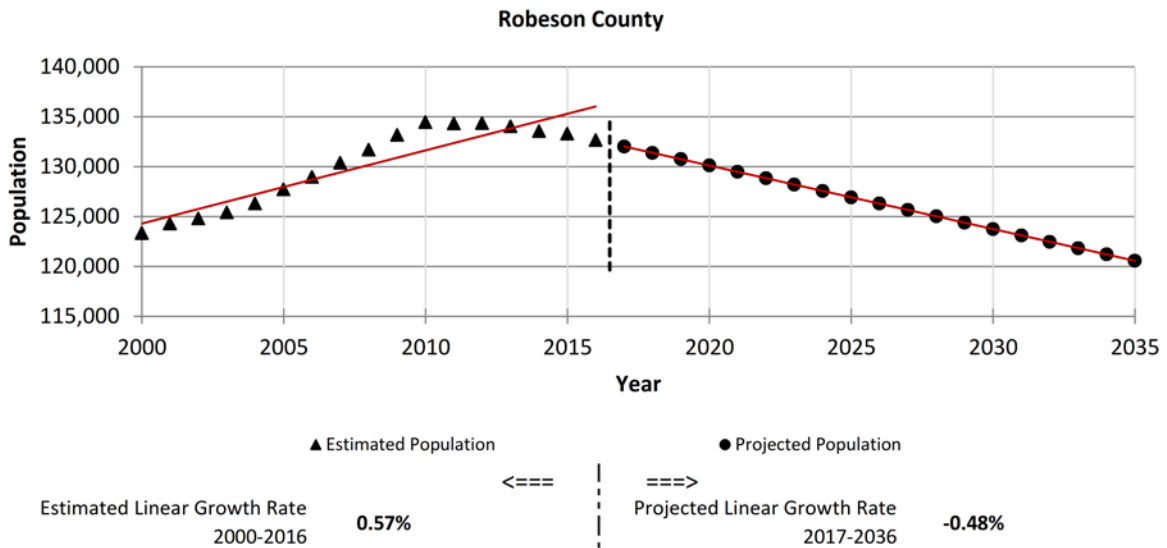
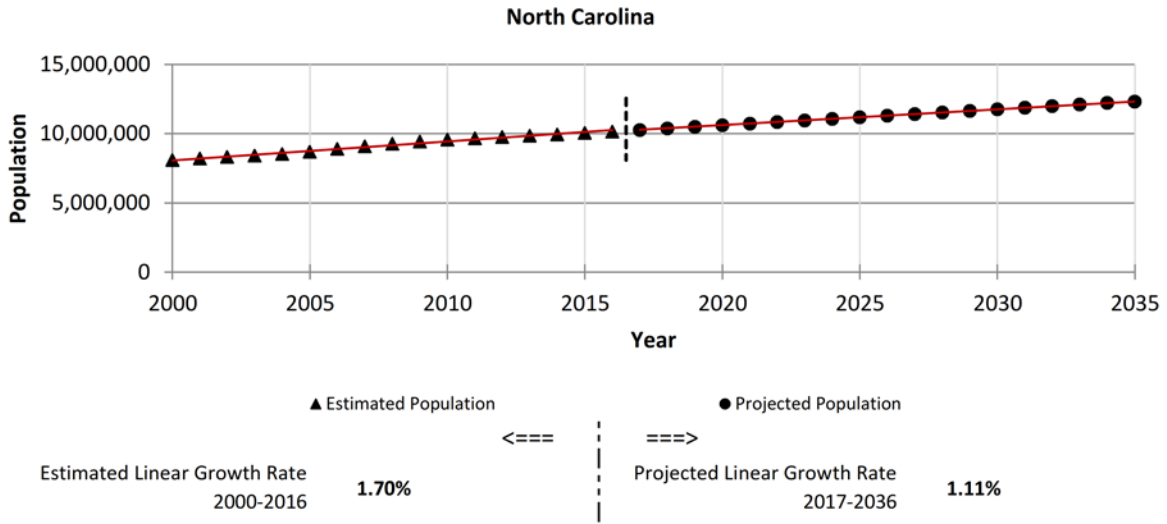
Source: North Carolina Office of State Budget Management (OSBM)

Table 5: State Population Data

| State Population | | | | | Growth Rate | | |
|------------------|-----------|------------|------------|------------|-------------|-----------|-----------|
| 2000 | 2010 | 2020 | 2030 | 2035 | 2000-2010 | 2010-2020 | 2020-2030 |
| 8,081,986 | 9,574,344 | 10,619,432 | 11,759,744 | 12,327,153 | 1.7% | 1.0% | 1.0% |

Source: North Carolina Office of State Budget Management (OSBM)

Figure 2: State and County Population Data



Last Update: October 2017

Data Source: <http://www.osbm.nc.gov/demog/county-projections>

3. Base Year (2018) Forecast

Assumptions

Replacement of the bridges on NC 41-72 (W 2nd St) and SR 1600 (W 5th St) is not expected to have an effect on current travel; therefore 2018 volumes represent both the project’s Base Year No-Build and Build conditions (i.e., travel demand is assumed to be the same).

Methodology

Base Year AADT was determined by comparison of conducted project traffic counts with historical AADT count trends. Outlier data points were eliminated as appropriate when calculating the linear regression growth rates to extrapolate 2018 AADT values. Table 6, below, shows the historic data and selected 2018 forecast volumes.

Table 6: 2018 AADT Calculations

| Forecast Location | Historic AADT | | | | | AADT Extrapolated to 2018 ⁽¹⁾ | Project Specific Count Data | | BY 2018 NB/B Forecast Volume |
|---|---------------|--------|--------|--------|--------|--|-----------------------------|-------------------------|------------------------------|
| | 2008 | 2010 | 2012 | 2014 | 2016 | | TMC ⁽²⁾ | Mainline ⁽³⁾ | |
| NC 72 (W 2nd St) west of NC 41 (Martin Luther King Jr Dr) | - | 9,600 | - | 9,700 | 10,000 | 10,024 | 9,500 | - | 9,300 |
| NC 41-72 (W 2nd St) between NC 41 (Martin Luther King Jr Dr) and SR 1536 (N Water St) | - | 13,600 | - | 14,000 | 15,000 | 15,114 | 14,300 | 12,000 | 14,800 |
| NC 41-72 (W 2nd St) east of SR 1536 (N Water St) | 12,000 | 14,000 | 13,000 | 15,000 | 14,000 | 13,691 | 15,300 | - | 15,100 |
| SR 1600 (W 5th St) west of Martin Luther King Jr Dr | - | - | - | - | - | - | 6,000 | - | 5,800 |
| SR 1600 (W 5th St) between Martin Luther King Jr Dr and SR 1536 (N Water St) | - | - | 11,000 | 12,000 | - | 13,500 | 9,700 | 8,100 | 9,700 |
| SR 1600 (W 5th St) east of SR 1536 (N Water St) | - | - | - | - | - | - | 2,300 | - | 2,000 |
| NC 41 (Martin Luther King Jr Dr) south of NC 41-72 (W 2nd St) | 13,000 | 13,000 | 12,000 | - | 13,000 | 12,759 | 11,800 | - | 12,200 |
| Martin Luther King Jr Dr between NC 41-72 (W 2nd St) and SR 1600 (W 5th St) | - | - | - | - | - | - | 4,400 | - | 4,300 |
| SR 1536 (N Water St) south of NC 41-72 (W 2nd St) | - | - | - | - | - | - | 600 | - | 600 |
| SR 1536 (N Water St) between NC 41-72 (W 2nd St) and SR 1600 (W 5th St) | - | - | 2,200 | 2,200 | 2,200 | 2,200 | 2,100 | - | 2,100 |
| SR 1536 (N Water St) north of SR 1600 (W 5th St) | 5,700 | 5,400 | 5,300 | 6,400 | 6,200 | 6,500 | 9,600 | - | 10,000 |

(1) Historic AADT was extrapolated to 2018 utilizing Average Annual Rate projections from NCDOT Traffic Forecast Utility (from 2006 to 2016)

(2) Count taken on May 24th, 2018

(3) Count taken on March 27th and March 28th, 2018

Determination of Design Factors

Duals, TTSTs, Directional distribution (D), and Peak Hour Factor (K) were determined by analysis of turning movement / class counts obtained for this project. Where truck factors were less than the minimum values used by NCDOT Transportation Planning Division (TPD), a minimum of 2 (two) percent Duals and 1 (one) percent TTSTs was used. Design Factors are shown in the following tables.

Table 7: Design Factors – Directional Distribution

| Forecast Location | Project Specific Count Data | | Selected 2018 Value | Selected 2040 Value |
|---|-----------------------------|-------------------------|---------------------|---------------------|
| | TMC ⁽¹⁾ | Mainline ⁽²⁾ | | |
| NC 72 (W 2nd St) west of NC 41 (Martin Luther King Jr Dr) | 55 EB | - | 55 EB | 55 EB |
| NC 41-72 (W 2nd St) between NC 41 (Martin Luther King Jr Dr) and SR 1536 (N Water St) | 55 EB | 55 EB | 55 EB | 55 EB |
| NC 41-72 (W 2nd St) east of SR 1536 (N Water St) | 55 EB | - | 55 EB | 55 EB |
| SR 1600 (W 5th St) west of Martin Luther King Jr Dr | 55 EB | - | 55 WB | 55 WB |
| SR 1600 (W 5th St) between Martin Luther King Jr Dr and SR 1536 (N Water St) | 55 WB | 60 EB | 55 WB | 55 WB |
| SR 1600 (W 5th St) east of SR 1536 (N Water St) | 60 WB | - | 60 WB | 60 WB |
| NC 41 (Martin Luther King Jr Dr) south of NC 41-72 (W 2nd St) | 55 NB | - | 55 SB | 55 SB |
| Martin Luther King Jr Dr between NC 41-72 (W 2nd St) and SR 1600 (W 5th St) | 60 SB | - | 60 SB | 60 SB |
| SR 1536 (N Water St) south of NC 41-72 (W 2nd St) | 55 NB | - | 55 NB | 55 NB |
| SR 1536 (N Water St) between NC 41-72 (W 2nd St) and SR 1600 (W 5th St) | 55 SB | - | 55 SB | 55 SB |
| SR 1536 (N Water St) north of SR 1600 (W 5th St) | 55 NB | - | 55 SB | 55 SB |

(1) Count taken on May 24th, 2018

(2) Count taken on March 27th and March 28th, 2018

Table 8: Design Factors – K-Factor

| Forecast Location | Project Specific Count Data | | Selected 2018 Value | Selected 2040 Value |
|---|-----------------------------|-------------------------|---------------------|---------------------|
| | TMC ⁽¹⁾ | Mainline ⁽²⁾ | | |
| NC 72 (W 2nd St) west of NC 41 (Martin Luther King Jr Dr) | 9 | - | 10 | 10 |
| NC 41-72 (W 2nd St) between NC 41 (Martin Luther King Jr Dr) and SR 1536 (N Water St) | 10 | 9 | 9 | 9 |
| NC 41-72 (W 2nd St) east of SR 1536 (N Water St) | 10 | - | 10 | 10 |
| SR 1600 (W 5th St) west of Martin Luther King Jr Dr | 10 | - | 10 | 10 |
| SR 1600 (W 5th St) between Martin Luther King Jr Dr and SR 1536 (N Water St) | 11 / 10 | 10 | 11 | 11 |
| SR 1600 (W 5th St) east of SR 1536 (N Water St) | 11 | - | 11 | 11 |
| NC 41 (Martin Luther King Jr Dr) south of NC 41-72 (W 2nd St) | 12 | - | 10 | 10 |
| Martin Luther King Jr Dr between NC 41-72 (W 2nd St) and SR 1600 (W 5th St) | 11 | - | 11 | 11 |
| SR 1536 (N Water St) south of NC 41-72 (W 2nd St) | 14 | - | 14 | 14 |
| SR 1536 (N Water St) between NC 41-72 (W 2nd St) and SR 1600 (W 5th St) | 11 | - | 11 | 11 |
| SR 1536 (N Water St) north of SR 1600 (W 5th St) | 10 | - | 10 | 10 |

(1) Count taken on May 24th, 2018

(2) Count taken on March 27th and March 28th, 2018

Table 9: Design Factors – Trucks (Duals,TTSTs)

| Forecast Location | Project Specific Count Data | | Selected 2018 Value | Selected 2040 Value |
|---|-----------------------------|-------------------------|---------------------|---------------------|
| | TMC ⁽¹⁾ | Mainline ⁽²⁾ | | |
| NC 72 (W 2nd St) west of NC 41 (Martin Luther King Jr Dr) | 3,3 | - | 3,3 | 3,3 |
| NC 41-72 (W 2nd St) between NC 41 (Martin Luther King Jr Dr) and SR 1536 (N Water St) | 4,2 | 6,2 | 4,2 | 4,2 |
| NC 41-72 (W 2nd St) east of SR 1536 (N Water St) | 3,2 | - | 3,2 | 3,2 |
| SR 1600 (W 5th St) west of Martin Luther King Jr Dr | 2,1 | - | 2,1 | 2,1 |
| SR 1600 (W 5th St) between Martin Luther King Jr Dr and SR 1536 (N Water St) | 2,1 | 3,0 | 2,1 | 2,1 |
| SR 1600 (W 5th St) east of SR 1536 (N Water St) | 2,1 | - | 2,1 | 2,1 |
| NC 41 (Martin Luther King Jr Dr) south of NC 41-72 (W 2nd St) | 3,1 | - | 3,1 | 3,1 |
| Martin Luther King Jr Dr between NC 41-72 (W 2nd St) and SR 1600 (W 5th St) | 2,1 | - | 2,1 | 2,1 |
| SR 1536 (N Water St) south of NC 41-72 (W 2nd St) | 5,1 | - | 5,1 | 5,1 |
| SR 1536 (N Water St) between NC 41-72 (W 2nd St) and SR 1600 (W 5th St) | 3,1 | - | 3,1 | 3,1 |
| SR 1536 (N Water St) north of SR 1600 (W 5th St) | 2,1 | - | 2,1 | 2,1 |

(1) Count taken on May 24th, 2018

(2) Count taken on March 27th and March 28th, 2018

4. Travel Demand Model Data

The routes in the project area are part of the Lumberton Travel Demand Model (LTDM) roadway network. The LTDM was developed with a Base Year 2014 and a horizon Future Year 2040. Two model runs were used during preparation of this forecast – BY 2014 Loaded Network and FY 2040 Loaded Network. The results are shown in Table 10.

Table 10: Model Output Data

| Forecast Location | Model Calibration BY 2018 | | | | 2040 AADT Extrapolated | | FY 2040 Model |
|---|---------------------------|---------------|-------------------------|---------------|------------------------|-----------|---------------|
| | 2018 AADT ⁽¹⁾ | BY 2014 Model | 2018 Model Interpolated | 2018 Forecast | 1996-2016 | 2006-2016 | |
| NC 72 (W 2nd St) west of NC 41 (Martin Luther King Jr Dr) | 10,024 | 7,900 | 8,100 | 9,300 | - | 11,585 | 9,100 |
| NC 41-72 (W 2nd St) between NC 41 (Martin Luther King Jr Dr) and SR 1536 (N Water St) | 15,114 | 13,300 | 13,500 | 14,800 | - | 21,617 | 14,900 |
| NC 41-72 (W 2nd St) east of SR 1536 (N Water St) | 13,691 | 14,700 | 15,000 | 15,100 | 12,808 | 12,180 | 16,500 |
| SR 1600 (W 5th St) west of Martin Luther King Jr Dr | - | 1,000 | 1,100 | 5,800 | - | - | 1,800 |
| SR 1600 (W 5th St) between Martin Luther King Jr Dr and SR 1536 (N Water St) | 13,500 | 10,200 | 10,700 | 9,700 | - | 35,182 | 13,700 |
| SR 1600 (W 5th St) east of SR 1536 (N Water St) | - | 4,200 | 4,400 | 2,000 | - | - | 5,500 |
| NC 41 (Martin Luther King Jr Dr) south of NC 41-72 (W 2nd St) | 12,759 | 15,900 | 16,400 | 12,200 | 11,588 | 10,365 | 18,900 |
| Martin Luther King Jr Dr between NC 41-72 (W 2nd St) and SR 1600 (W 5th St) | - | 8,800 | 9,200 | 4,300 | - | - | 11,300 |
| SR 1536 (N Water St) south of NC 41-72 (W 2nd St) | - | - | - | - | - | - | - |
| SR 1536 (N Water St) between NC 41-72 (W 2nd St) and SR 1600 (W 5th St) | 2,200 | 1,700 | 1,700 | 2,100 | - | 2,200 | 1,800 |
| SR 1536 (N Water St) north of SR 1600 (W 5th St) | 6,500 | 7,900 | 8,300 | 10,000 | 4,657 | 9,500 | 10,600 |

5. Future Year Build (2040) Forecast

Assumptions

Replacement of the bridges on NC 41-72 (W 2nd St) and SR 1600 (W 5th St) is not expected to have an effect on current travel; therefore 2018 volumes represent both the project’s Base Year No-Build and Build conditions (i.e., travel demand is assumed to be the same).

Fiscal Constraint

NCDOT’s 2018-2027 STIP document was reviewed for projects within the study area that might have an effect on future travel patterns. No projects were found that would affect future travel patterns in the project area.

Methodology

Analysis of compiled historic AADT counts and model runs revealed past and projected growth rates. Table 11 shows the comparisons of AADT growth rates, the selected forecast growth rate, and selected volumes. No noticeable site development plans were found that would affect future travel patterns in the project area. Engineering judgment adjustments were applied as needed in finalizing the volumes in order to develop a balanced forecast.

Table 11: Growth Rate Comparison and Determination of 2040 AADT

| Forecast Location | Historic AADT Growth Rate | | BY 2018 NB/B Forecast Volumes | FY 2040 NB/B | | | |
|---|---------------------------|-----------|-------------------------------|-------------------|--------------------|-----------|-----------|
| | 1996-2016 | 2006-2016 | | Model Growth Rate | Chosen Growth Rate | Volumes | |
| | | | | | | 2014-2040 | 2018-2040 |
| NC 72 (W 2nd St) west of NC 41 (Martin Luther King Jr Dr) | - | 0.7% | 9,300 | 0.5% | 0.6% | 9,100 | 10,500 |
| NC 41-72 (W 2nd St) between NC 41 (Martin Luther King Jr Dr) and SR 1536 (N Water St) | - | 1.6% | 14,800 | 0.4% | 0.6% | 14,900 | 16,800 |
| NC 41-72 (W 2nd St) east of SR 1536 (N Water St) | -0.4% | -0.5% | 15,100 | 0.4% | 0.7% | 16,500 | 17,500 |
| SR 1600 (W 5th St) west of Martin Luther King Jr Dr | - | - | 5,800 | 2.3% | 2.1% | 1,800 | 9,100 |
| SR 1600 (W 5th St) between Martin Luther King Jr Dr and SR 1536 (N Water St) | - | 4.5% | 9,700 | 1.1% | 1.6% | 13,700 | 13,800 |
| SR 1600 (W 5th St) east of SR 1536 (N Water St) | - | - | 2,000 | 1.0% | 1.7% | 5,500 | 2,900 |
| NC 41 (Martin Luther King Jr Dr) south of NC 41-72 (W 2nd St) | -0.5% | -0.9% | 12,200 | 0.7% | 0.7% | 18,900 | 14,200 |
| Martin Luther King Jr Dr between NC 41-72 (W 2nd St) and SR 1600 (W 5th St) | - | - | 4,300 | 1.0% | 1.0% | 11,300 | 5,300 |
| SR 1536 (N Water St) south of NC 41-72 (W 2nd St) | - | - | 600 | - | 0.7% | - | 700 |
| SR 1536 (N Water St) between NC 41-72 (W 2nd St) and SR 1600 (W 5th St) | - | 0.0% | 2,100 | 0.2% | 1.3% | 1,800 | 2,800 |
| SR 1536 (N Water St) north of SR 1600 (W 5th St) | -0.9% | 1.7% | 10,000 | 1.1% | 1.2% | 10,600 | 13,100 |

Determination of Design Factors

Since no substantial change in the function or character of traffic the roadways within the traffic forecast study area is expected, Base Year 2018 design factors were used for Future Year 2040.