



SR
3556 Amboy Road

SR
3556 Meadow Road

SR 3556 (AMBOY ROAD/MEADOW ROAD) IMPROVEMENTS

BUNCOMBE COUNTY

STIP PROJECT NO. U-4739

WBS No. 39741.1.3



TRAFFIC FORECAST REPORT



PREPARED FOR:
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

PREPARED BY:
PATRIOT TRANSPORTATION ENGINEERING, PLLC



JULY 2018

TRAFFIC FORECAST COVER LETTER

July 10, 2018

MEMORANDUM TO: Jennifer Martin, PE
NCDOT Project Management Unit

FROM: Peter Trencansky, PE, PTOE, AICP
Patriot Transportation Engineering, PLLC

SUBJECT: Traffic Forecast for U-4739
Buncombe County
SR 3556 (Amboy Road/Meadow Road) Improvements

Please find attached the 2018 and 2040 traffic forecast for STIP Project U-4739 in Buncombe County. The proposed project would widen SR 3556 (Amboy Road/Meadow Road) to add a median, improve access management and provide multi-modal improvements from I-240 to US 25 (Biltmore Avenue). This forecast was requested for use in the project development activities associated with the project, including the environmental documentation and Preliminary Roadway Design.

This is the first forecast for this project. The project is located within the boundaries of the French Broad River Metropolitan Planning Organization (FBRMPO). The following three scenarios are provided in this forecast:

- 2018 Base Year No-Build (Existing Conditions)
- 2040 Future Year No-Build
- 2040 Future Year Build

The 2018 Base Year No-Build volumes can be used as a proxy for 2018 Base Year Build volumes for analysis purposes.

Anna Henderson (NCDOT Division 13 Traffic Engineer), Daniel Sellars (NCDOT Transportation Planning Branch), Brendan Merithew (NCDOT Division 13 Division Planning Engineer), Michael Clark (NCDOT Division 13 Division Project Engineer), Lyuba Zuyeva (French Broad River MPO Director), and Shannon Capezzali (Buncombe County Planning & Development Planner) were consulted during the development of this forecast.

Fiscal Constraint

The project is located within the FBRMPO boundaries; therefore, the travel demand model and traffic forecast is fiscally constrained to match the assumptions of the corresponding Metropolitan Transportation Plan (MTP).

The *French Broad River Metropolitan Planning Organization 2040 Metropolitan Transportation Plan (2040 MTP)* includes the proposed project in the 2026-2030 timeframe of highway projects and describes it as follows:

- I-25/13A – I-26/I-240, multilane freeway widening, from I-40 to Exit 25 (SR 1781 (Broadway)); BUNC2 a-H

- U-5019C – Lyman Street, multimodal improvements, from Amboy Road to US 70 to SR 1781 (Broadway); BUNC21 a-H
- U-5832 – NC 81, from Biltmore Avenue to US 74 (South Tunnel Road); BUNC21-cH

Travel Demand Model

The French Broad River MPO Travel Demand Model (provided by NCDOT on 03/15/2018) was utilized as a tool in the development of the forecast.

Forecast Methodology

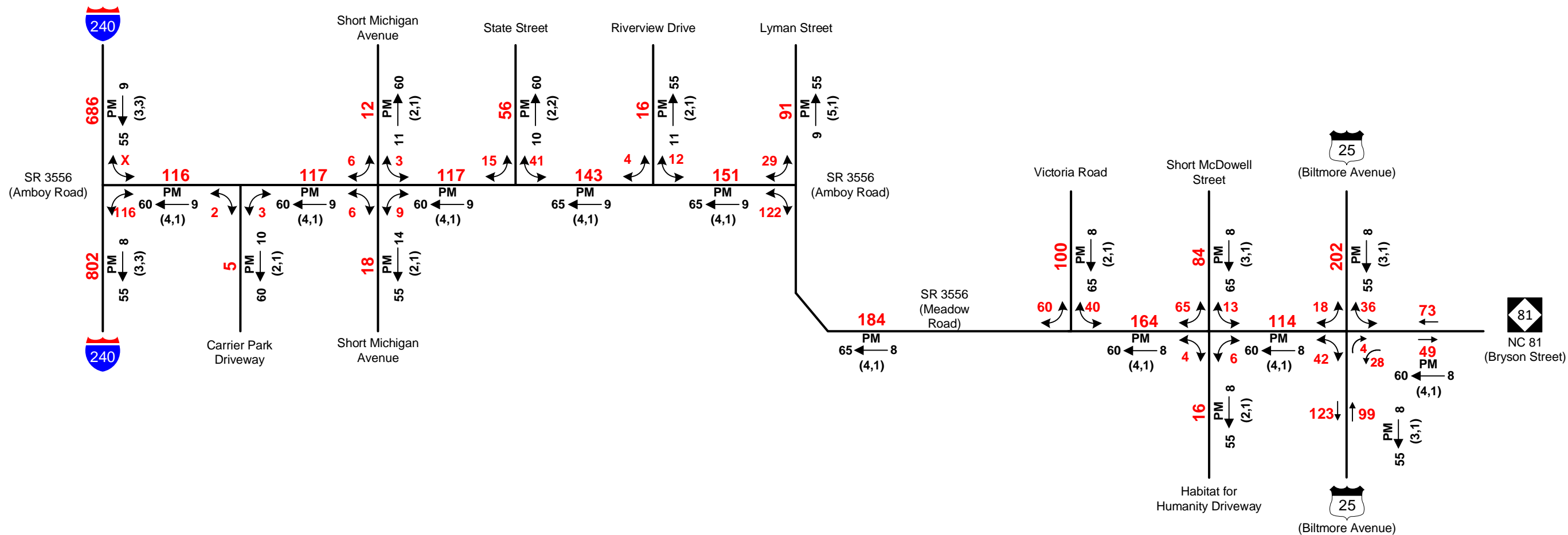
The 2018 Base Year No-Build traffic volumes and design factors were developed based upon current counts and historic AADT trend projections. The 2040 future year no-build traffic volumes generally included the development of compound annual growth rates between two model years, while the 2040 future year build volumes generally included the development of diversion rates between like model years with different scenarios. The compound annual growth rates or diversion rates were then applied to the AADT volumes from another scenario to develop initial volumes for each scenario. Engineering judgment adjustments were applied as needed in finalizing the volumes in order to develop a balanced forecast.

Interpolation/Extrapolation

To estimate AADT volumes between 2018 and 2040, straight line interpolation between the 2018 and the 2040 scenarios is acceptable. 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, please request updated projections at this location.

This forecast has been reviewed and approved by the NCDOT Transportation Planning Division on July 10, 2018.

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Note: The 2018 Base Year No-Build volumes can be used as a proxy for 2018 Base Year Build volumes for analysis purposes.

2018 ANNUAL AVERAGE DAILY TRAFFIC

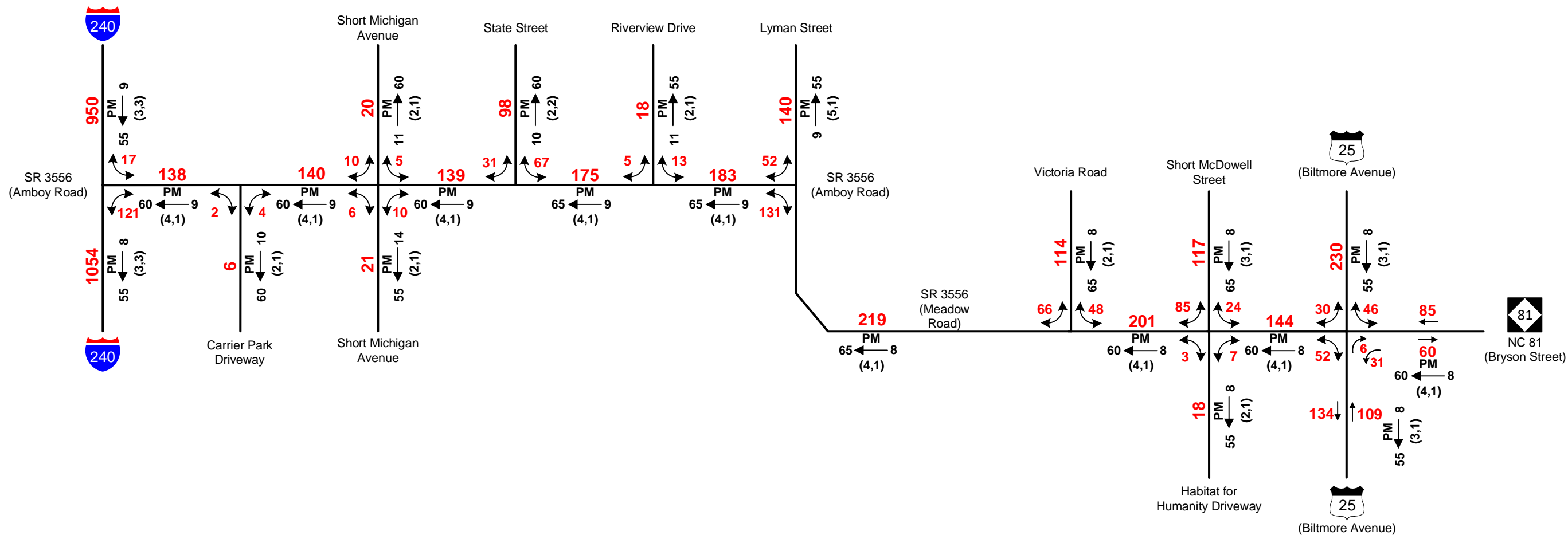
NO-BUILD SCENARIO

SHEET 1 OF 1

LEGEND

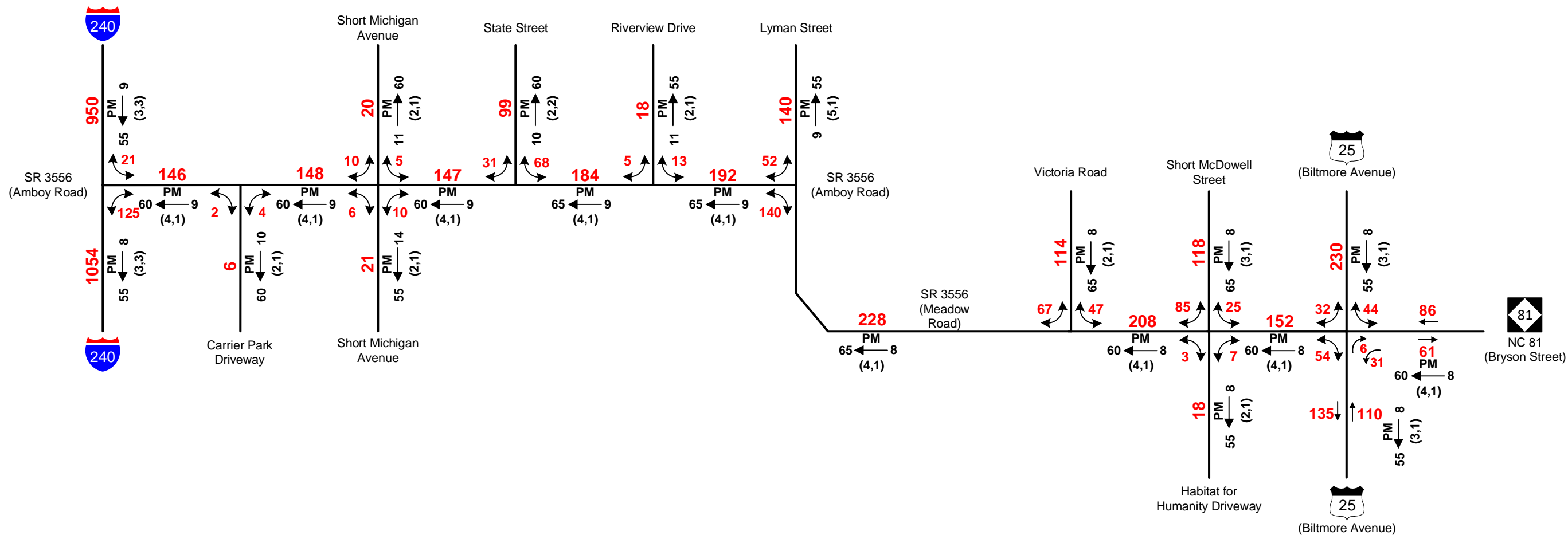
- ### No. of Vehicles Per Day (VPD) in 100s
- 1- Less than 50 VPD
- x Movement Prohibited
- K Design Hour Factor (%)
- PM PM Peak Period
- D Peak Hour Directional Split
- Indicates Direction of D
- (d, t) Duals, TT-STs (%)

TIP: U-4739	WBS: 39741.1.2
COUNTY: Buncombe	DIVISION: 13
DATE: 07-10-2018	
PREPARED BY: Patriot Transportation Engineering, PLLC	
LOCATION: SR 3556 (Amboy Road-Meadow Road) from I-240 to US 25 (Biltmore Avenue)	
PROJECT: Widen SR 3556 (Amboy Road/Meadow Road)	



2040 ANNUAL AVERAGE DAILY TRAFFIC FUTURE YEAR NO-BUILD SCENARIO SHEET 1 OF 1

LEGEND		TIP: U-4739	WBS: 39741.1.2
###	No. of Vehicles Per Day (VPD) in 100s	K	Design Hour Factor (%)
1-	Less than 50 VPD	PM	PM Peak Period
x	Movement Prohibited	D	Peak Hour Directional Split
		→	Indicates Direction of D
		(d, t)	Duals, TT-STs (%)
			DATE: 07-10-2018
			PREPARED BY: Patriot Transportation Engineering, PLLC
			LOCATION: SR 3556 (Amboy Road-Meadow Road) from I-240 to US 25 (Biltmore Avenue)
			PROJECT: Widen SR 3556 (Amboy Road/Meadow Road)



2-lane Divided with Access Management

2040 ANNUAL AVERAGE DAILY TRAFFIC **FUTURE YEAR BUILD SCENARIO**
SHEET 1 OF 1

<p>LEGEND</p> <p>### No. of Vehicles Per Day (VPD) in 100s 1- Less than 50 VPD x Movement Prohibited</p> <p>K Design Hour Factor (%) PM PM Peak Period D Peak Hour Directional Split — Indicates Direction of D (d, t) Duals, TT-STs (%)</p>	<p>TIP: U-4739</p>	<p>WBS: 39741.1.2</p>
	<p>COUNTY: Buncombe</p>	<p>DIVISION: 13</p>
	<p>DATE: 07-10-2018</p>	
	<p>PREPARED BY: Patriot Transportation Engineering, PLLC</p>	
	<p>LOCATION: SR 3556 (Amboy Road-Meadow Road) from I-240 to US 25 (Biltmore Avenue)</p>	
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1. PROJECT BACKGROUND

Patriot Transportation Engineering, PLLC (Patriot) has been contracted by the North Carolina Department of Transportation (NCDOT) to develop base and future year traffic forecasts for NCDOT State Transportation Improvement Program (STIP) Project U-4739 (Amboy Road) improvements in Buncombe County.

1.1 PROJECT REQUEST INFORMATION

The traffic forecast for this project was requested by NCDOT Project Management Unit in support of project development activities, including environmental documentation and Preliminary Design for the project. The scope of work for the traffic forecast was finalized in March 2018.

For the purposes of the environmental document, it was decided through project scoping with NCDOT that Base Year scenarios would use 2018 and Future Year scenarios would use 2040. The 2018 Base Year traffic forecast includes the No-Build scenario. The 2040 Future Year traffic forecast includes No-Build and Build scenarios for one alternative.

1.2 FORECAST HISTORY

This is the first request for a traffic forecast at this location.

1.3 PROJECT DESCRIPTION

NCDOT proposes to improve SR 3556 (Amboy Road/Meadow Road) by adding a median providing improved access management, intersection improvements and additional multi-modal accommodations, from I-240 to US 25 (Biltmore Avenue), a distance of approximately 2.7 miles, in Buncombe County.

1.4 AREA INFORMATION

Buncombe County has an estimated population of 238,300 citizens based on 2010 census data and a projected 2018 population of 264,700 according to the North Carolina Office of State Budget and Management (NCOSBM). The county covers approximately 660 square miles and consists of several cities and towns including; Asheville, Biltmore Forest, Black Mountain, Montreat, Weaverville, and Woodfin. Asheville is the county seat of Buncombe County.

The project area is in Asheville in the central part of Buncombe County, north of I-40 and the French Broad River.

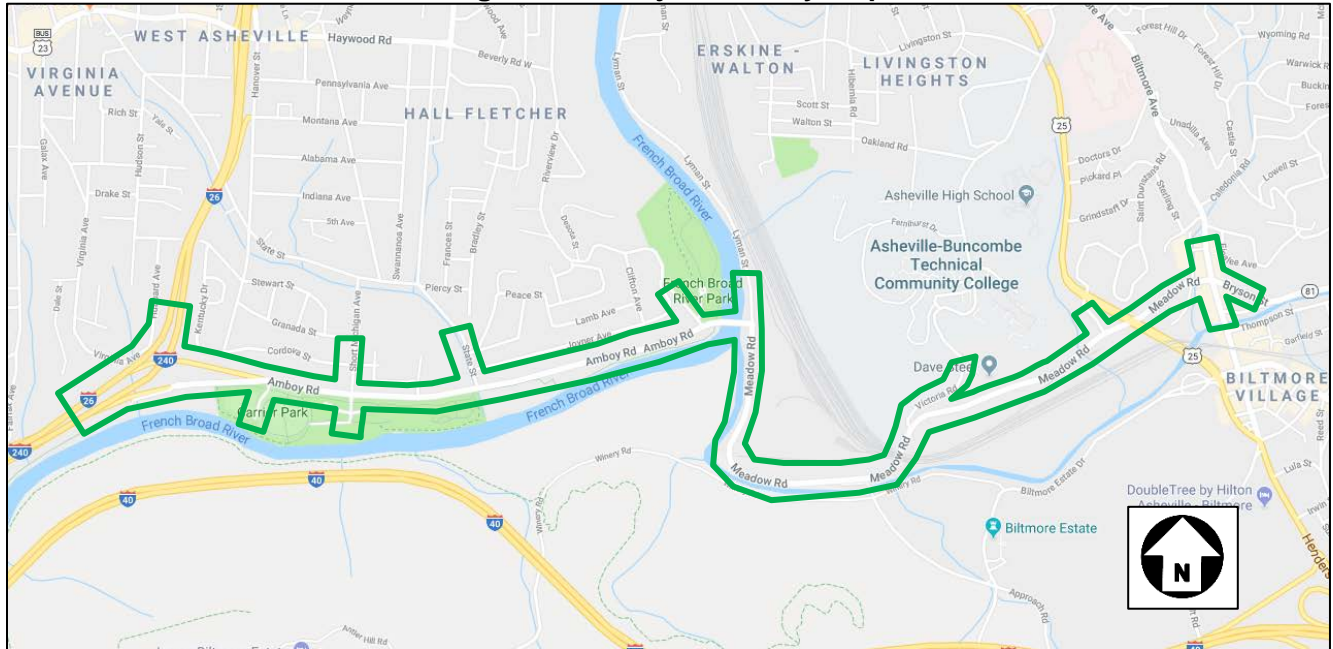
The project location map for the U-4739 forecast is shown on Figure 1-1: Project Vicinity Map.

1.5 ROUTE INFORMATION

The following roadways within the study area are classified by the Federal Highway Administration (FHWA):

The **SR 3556 (Amboy Road/Meadow Road)** corridor is classified as a *Minor Arterial* and runs from I-26/I-240 in the west to US 25 (Biltmore Avenue) in the east. The roadway alignment continues east of US 25 as NC 81 (Swannanoa River Road) (also as a Minor Arterial). Amboy Road and Meadow Road are two-lane, undivided roadways along the length of the study area. Access to the corridor is provided by intersecting local streets and some direct-access driveways from businesses. The land use along Amboy Road is primarily residential with some commercial and recreational uses. The land use along Meadow Road is mainly commercial and institutional. Asheville High School and AB Tech Community College are both located off of Victoria Road, north of Meadow Road. The speed limit along the corridor varies from 45 mph on the west end (Amboy Road) to 35 mph on the east end (Meadow Road).

Figure 1-1: Project Vicinity Map



I-240 is a four-lane interstate roadway. An interchange provides access to Amboy Road on the west side of the study area. I-240 is a ring facility around Asheville with interchanges with I-40 on the west and east sides of Asheville. The speed limit in the study area is 55 mph.

State Street is designated as a *Minor Collector*. The speed limit along State Street is 30 mph.

Lyman Street is designated as a *Minor Arterial* in the study area. The speed limit along Lyman Street is 30 mph.

Victoria Road is designated as a *Major Collector*. The speed limit along Victoria Road is unposted but has pedestrian area advisory speeds of 20 mph posted near the school areas.

US 25 (Biltmore Avenue) is a *Minor Arterial* in the study area. The speed limit along Biltmore Avenue is posted as 20 mph near the intersection with Meadow Road.

All other roadways included in the project forecast are classified as *Local Roads*.

1.6 FUTURE AREA ROADWAY IMPROVEMENTS – FISCAL CONSTRAINT

The project is located within the French Broad River MPO (FBRMPO) boundaries; therefore, the travel demand model and traffic forecast is fiscally constrained to match the assumptions of the corresponding Metropolitan Transportation Plan (MTP).

The *Metropolitan Transportation Plan 2015-2040* (2040 MTP) includes the following projects in the area which are described as follows:

- I-26/I-240 widening – MTP Project BUNC 2a-H (STIP I-2513A) – multilane freeway widening, from I-40 to Exit 25 (SR 1781 (Broadway))
- Lyman Street improvements – MTP Project BUNC 21a-H (STIP U-5019C) – multimodal improvements, from Amboy Road to US 70 to SR 1781 (Broadway)
- NC 81 upgrades – MTP Project BuNC 21-cH (STIP U-5832) – upgrade roadway from US 25 (Biltmore Avenue) to US 74 (South Tunnel Road)

2. SOURCES OF INFORMATION AND DATA

The following sections describe the various information and data sources used in the development of the traffic forecast.

2.1 RELATED FORECASTS

Past traffic forecasts in the vicinity of the proposed project can potentially be utilized as a tool when preparing the traffic forecast. The following recent forecasts were identified and considered in the development of this forecast:

- I-26 Connector from I-40 to US 19-23 (I-2513)
- NC 81 Improvements from Biltmore Avenue to US 74A (U-5832)

2.2 HISTORIC AADT

Existing traffic count data for study area roadways from 1997 to 2016 was provided by the NCDOT Traffic Survey Group (TSG). Data sources included:

- NCDOT TSG Average Annual Daily Traffic (AADT) history from 1997 to 2016

The locations of the historic traffic data counts are shown in Figure 2-1 . The complete 20-year AADT history for each location is found in Appendix A.

2.3 FIELD DATA COLLECTION

New project-specific counts were taken in March and April 2018 through the NCDOT TSG on-call contract and included nine 13-hour turning movement counts and two 48-hour classification counts. The traffic count locations are listed in Table 2-1 and are displayed in Figure 2-1.

The traffic count locations fall under the following TSG ATR classifications:

- ATR Group 1 (The most dominant group in the State. Mostly rural in nature and is predominantly used for count locations on nonurban primary routes and all rural and most urban secondary roads).
- ATR Group 4 (predominantly found in areas where land use is characterized as urban, with dense, mixed development. Factors from this group are predominantly applied to urban primary routes and higher volume secondary and local routes in large urban areas).
- ATR Group 11 (applies to urban interstate and some rural locations strongly influenced by nearby large urban areas).

The ATR categories for each count were confirmed through correspondence with the NCDOT TSG on 4/3/2018. The classification counts were converted to 24-Hour volumes by dividing the 48-Hour counts by two and then applying the correct seasonal adjustment factors. The turning movement counts (TMCs) were converted to 24-Hour volumes by utilizing the NCDOT Traffic Survey Partial Weekday Count Expansion Factors (November 2015). The count expansion factors were also compared to the count data from the 48-hour volume, speed, classification count and determined to be adequate.

Figure 2-1: Traffic Volume Data Locations

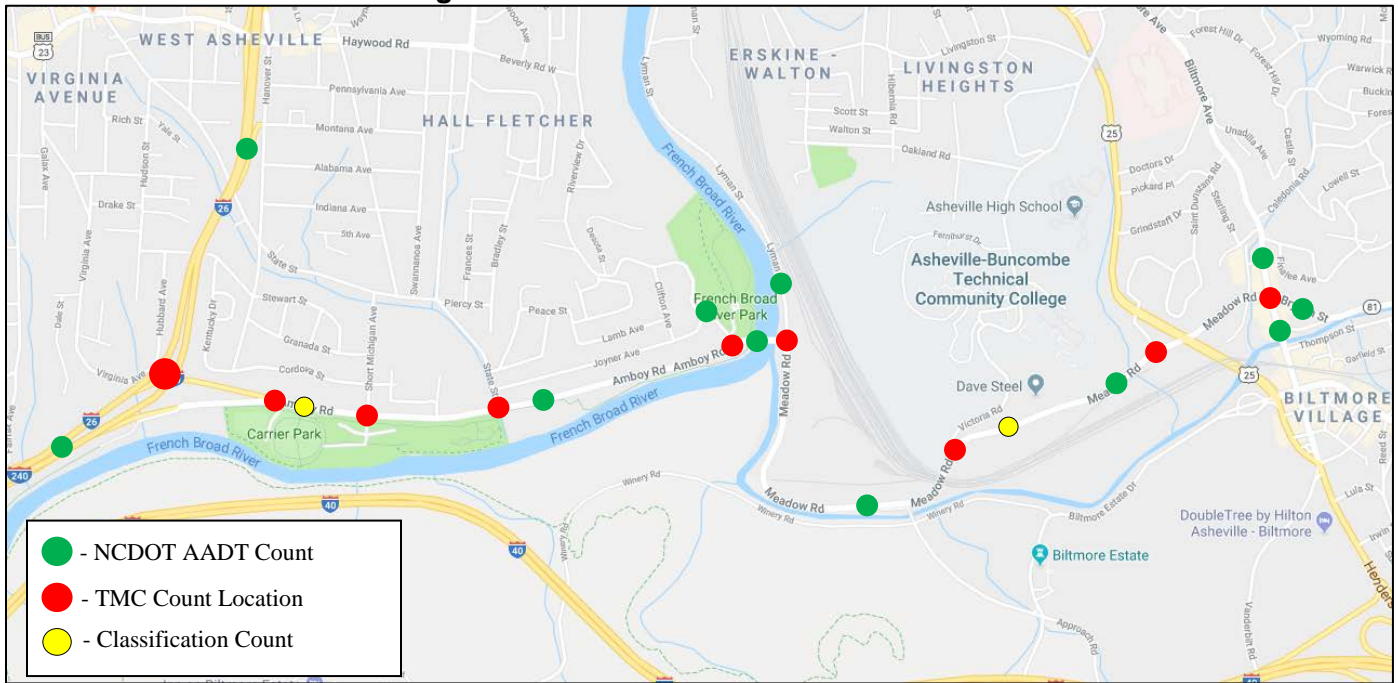


Table 2-1: Collected Traffic Count Locations

Location	Count Type	Date(s)	County	ATR Group	Seasonal Adjustment Factor
SR 3556 (Amboy Rd) at I-240/Future I-26	13-hour TMC*	4/10/18	Buncombe	1/11	0.99/0.97
SR 3556 (Amboy Rd) at Carrier Park Entrance/Old Amboy Rd	13-hour TMC	3/27/18	Buncombe	1	1.05
SR 3556 (Amboy Rd) at Michigan Ave	13-hour TMC	3/28/18	Buncombe	1	1.05
SR 3556 (Amboy Rd) at State St	13-hour TMC	3/28/18	Buncombe	1	1.05
SR 3556 (Amboy Rd) at Riverview Dr	13-hour TMC	3/27/18	Buncombe	1	1.05
SR 3556 (Amboy Rd) at SR 3556 (Meadow Rd)/Lyman St	13-hour TMC	3/27/18	Buncombe	1	1.05
SR 3556 (Meadow Rd) at Victoria Rd	13-hour TMC	3/27/18	Buncombe	1	1.05
SR 3556 (Meadow Rd) at McDowell St	13-hour TMC	3/27/18	Buncombe	1	1.05
SR 3556 (Meadow Rd)/NC 81 (Swannanoa River Rd) at US 25 (Biltmore Ave)	13-hour TMC	3/27/18	Buncombe	1/4	1.05/0.90
SR 3556 (Amboy Rd) east of I-240/Future I-26	48-hour VSC	3/26/18-3/28/18	Buncombe	1	1.05
SR 3556 (Meadow Rd) east of Victoria Rd	48-hour VSC	3/26/18-3/28/18	Buncombe	1	1.05

Note: TMC = turning movement count; VSC = volumes, speed, classification count

* Denotes complex interchange count that includes individual TMC counts at the ramp terminals and a manual classification count on the freeway combined into a single count that is displayed in the same manner as a TMC.

2.4 FIELD INVESTIGATION

An orientation field trip was taken as part of the traffic forecast initiation process. The field trip was taken on June 1st and June 12th:

- There are three parks along Amboy Road between I-26 and Lyman St/Meadow Rd. Carrier Park includes camping and multiple sports fields, Amboy Road River Park provides access to the river for kayaks/canoes and paddle boards, and the French Broad River Park includes a dog park. All three of the parks are connected by the French Broad River Greenway, which continues south connecting to Hominy Creek River Park.
- North of Amboy Road is mostly single family residential, with some industrial between Short Michigan Avenue and State Street.
- Along Meadow Road, there are industrial plants (concrete and steel) and access to the Norfolk Southern rail yard. Closer to Biltmore Avenue, the land use becomes more commercial.
- The PM peak direction is westbound along Meadow and Amboy.
- Victoria Road provides access to Asheville-Buncombe Technical Community College and Asheville High School, as well as Mission Hospital.
- The signalized intersection at Biltmore Avenue queues on every approach in the PM, especially on Meadow Road and Swannanoa River Road.

2.5 INFORMATION FROM LOCAL PLANNERS

Questionnaires were sent to, completed by or discussed with the following individuals to assist in understanding the project and traffic forecast study area:

- Steve Cannon, Division 13, Division Project Development Engineer
- Mike Calloway, NCDOT Division 13 – Division Project Manager
- *Brendan Merithew, NCDOT Division 13 – Division Planning Engineer
- *Anna Henderson, NCDOT Division 13 – Division Traffic Engineer
- *Michael Clark, NCDOT Division 13 – Division Project Engineer
- Troy Wilson, NCDOT Division 13 – District 2 District Supervisor
- *Daniel Sellers, NCDOT Transportation Planning Division
- *Lyuba Zuyeva, French Broad River MPO Director
- *Shannon Capezzali, Buncombe County Planning & Development - Planner II
- Ken Putnam, City of Asheville – Planning Services Director
- Todd Okolichany, City of Asheville – Transportation Department Director
- Shannon Tuch, City of Asheville – Principal Planner
- Stephanie Monson Dahl, City of Asheville – Director of Strategic Development

Individuals who provided a response are denoted with an *. Detailed information from the questionnaires is included in Appendix B.

2.6 OTHER SOURCES

Data sources used that are not listed in Sections 2.1 through 2.5 include:

North Carolina Department of Transportation. *State Transportation Improvement Program*. March 2018. Available: <https://connect.ncdot.gov/projects/planning/STIPDocuments1/NCDOT%20Current%20STIP.pdf>

French Broad River Metropolitan Planning Organization. *Metropolitan Transportation Plan 2015-2040*. Adopted September 24, 2015 and amended on May 24, 2018. Available: <http://www.fbrmpo.org/metropolitan-transportation-plan-mtp/>

NCDOT Functional Classification Maps. Available: <http://ncdot.maps.arcgis.com/home/webmap/viewer.html?layers=029a9a9fe26e43d687d30cd3c08b1792>

3. BASE YEAR 2018 NO-BUILD TRAFFIC FORECAST

3.1 METHODOLOGY

A review of previous traffic forecasts, field-collected traffic counts, area AADT history, and engineering judgment serve as the basis for the 2018 Base Year No-Build traffic forecast. After careful review for reasonableness checks, the 48-Hour classification counts and 13-Hour TMCs were first converted to AADT volumes by using the appropriate NCDOT TSG seasonal adjustment factors based on the month and day of the week the counts were collected.

A variation of the NCDOT Traffic Forecast Utility (TFU) spreadsheet was also a major tool used in the determination of the traffic forecast volumes. The NCDOT TFU spreadsheet includes the calculation of a validation score that considers the approach volumes and design factors for each intersection. The score is utilized as a tool in selecting the appropriate volumes and factors with a score that is less than 2.0 being valid. All scores for the 2018 Base Year forecast were less than 2.0. Ultimately, the approach volumes and factors were selected based on engineering judgment such that the AADTs and turning movements can be converted to peak hour volumes.

The data from the field-collected traffic counts were incorporated into the spreadsheet to replicate volumes as closely as possible for each intersection in the traffic forecast. The traffic forecast volumes in the 2018 Base-Year traffic forecast mimic the observed patterns as closely as possible. Once the traffic forecast volumes were determined, they were compared to historic AADT trends and interpolated model volumes for reasonableness. Table C1 found in Appendix C provides a comparison of historic AADT trends, field collected data, interpolated model volumes, and the selected traffic forecast volumes for all locations within the study area.

3.2 DESIGN FACTORS

Design factors are a very important aspect of traffic forecasting. The truck percentages, peak hour factor (or K-Factor), and directional distribution are all used along with forecasted traffic volumes when designing a roadway. The methodology and chosen values for each of the factors are described below.

3.2.1 TRUCK PERCENTAGES

Truck Percentages were determined using the 48-Hour mainline classification count data and the 13-Hour TMC data. Overall truck percentages were then separated into the two NCDOT standard classifications: Duals (single-unit trucks with at least one dual-tire axle) and TTSTs (multi-unit trucks with single or twin trailers). Attempts were made to maintain consistent truck percentages along a roadway facility unless circumstances warranted a change. Data used to determine the truck percentages and the chosen values are found in Table C2 in Appendix C. A discussion of the truck percentages for the project is also included as follows:

- Truck percentages from the turning movement counts were mostly consistent along SR 3556 (Amboy Rd/Meadow Rd), with one to four percent duals and one to three to percent TTSTs. The forecast utilizes four percent duals and one percent TTSTs on SR 3556 (Amboy Rd/Meadow Rd).
- Truck percentages from the turning movement counts were consistent along I-240, with three percent duals and two percent TTSTs. The previous forecast showed a similar percentage of trucks as the turning movement counts. The forecast utilizes three percent duals and three percent TTSTs.
- Truck percentages from the turning movement counts were consistent along US 25, with two percent duals and one to percent TTSTs. The forecast utilizes three percent duals and one percent TTSTs on US 25.

- Y-lines – Most of the truck percentages collected for the Y-lines showed truck percentages that were similar to SR 3556 (Amboy Rd). The overall percentages ranged from 3 to 6 percent. The forecast utilizes truck percentages that are consistent with the count percentages as much as possible.

3.2.2 DIRECTIONAL DISTRIBUTION

The directional distribution (D) provides information on the direction of traffic flow in the peak period and is a percentage (rounded to the nearest 5 percent) based on the percent of traffic traveling in each direction along the roadway. In addition to the directional distribution percentage, the direction of the peak travel during the PM peak period is selected and included on the forecast figures. For the forecast study area, D was in the 51% to 64% range for SR 3556 (Amboy Rd/Meadow Rd). The D values for the y-lines varied greatly by location and land use. The D values were measured from as low as 50% (I-240 North of SR 3556) to as high as 67% (Victoria Rd North of SR 3556). Table C3 in Appendix C provides the D value information used for this traffic forecast. A discussion of the D values for the project is also included as follows:

- SR 3556 (Amboy Rd/Meadow Rd) – the directional distribution along SR 3556 ranged from 51 to 64 percent in the westbound direction. The directional distribution was determined to be 65 percent with a PM peak in the westbound direction between Riverview Dr and Victoria Rd and 60 percent with a PM peak in the westbound direction for the rest of the corridor.
- I-240 – the directional distribution along I-240 was 50 to 51 percent with a PM peak period direction in the southbound direction. The directional distribution was determined to be 55 percent with a PM peak in the southbound direction.
- US 25 – the directional distribution along US 25 ranged from 51 to 55 percent with a PM peak period direction in the northbound/southbound direction. The directional distribution was determined to be 55 percent with a PM peak in the southbound direction.
- Y-lines along study area – the directional distributions for Y-lines along the study area ranged from 51 to 67 percent. Wherever possible the selected directional distributions were in line with the turning movement count percentages.

3.2.3 PEAK HOUR FACTOR

The peak hour factor (K) is the percentage of AADT that occurs during the peak time period of the day. The K-factor is meant to approximate what percentage of daily traffic would be present during the 30th highest peak hour of a given year, which is commonly referred to as K30. To determine the K-value for the classification counts the highest hourly volume was divided by the daily average of the 48-Hour counts. For turning movement counts the K-factor was developed by dividing the peak hour of the count by the daily volume. The K-factors in this traffic forecast range from 8% to 14%. The K-factor information used for this forecast is found in Table C4 in Appendix C. A discussion of the K values for the project is also included as follows:

- SR 3556 (Amboy Rd/Meadow Rd) – the peak hour factors for SR 3556 was eight to nine percent for all counts. A peak hour factor of nine percent was selected for SR 3556 west of Lyman St and eight percent was selected east of Lyman St.
- I-240 - the peak hour factors for I-240 were between eight and nine percent. A peak hour factor of nine percent was selected north of SR 3556 and a peak hour factor of eight percent was chosen for south of SR 3556.

- US 25 – the peak hour factor for US 25 were eight percent. A peak hour factor of eight percent was selected for US 25.
- Y-lines along the corridor – the peak hour factors for Y-lines along the corridor ranged from eight to fifteen percent and the selected peak hour factors were largely in line with the turning movement count percentages.

3.3 TRAFFIC FORECAST VOLUMES

Based on the methodology described in Section 3.1, traffic forecasts for the 2018 Base Year No-Build Scenario were calculated. Adjusted counts were compared to trend line analyses and the extrapolation of data to 2018 during the process. Utilizing a variation of the NCDOT Traffic Forecast Utility spreadsheet, bidirectional turning movements were also forecasted at intersections to replicate observed daily turning movement volumes as closely as possible. Comparisons of trend line analyses, volume extrapolation, observed counts, and selected forecast volumes are shown in Table C1 in Appendix C.

The forecast includes a non-reciprocal volume on NC 81 (Bryson Street) and on US 25 (Biltmore Avenue) south of the Meadow Road intersection. The non-reciprocal movements are due to the configuration where traffic to and from the south have better access to NC 81 (Bryson Street) via the Swananoa River Road intersection to the south.

4. MODEL DATA

The study area for the forecast is included the French Broad River MPO Travel Demand Model. The study area is located in the central area of the model and has good connectivity, with the model including all of the major roadways (I-240/I-26, US 25, NC 81, and the study roadways, Amboy Road and Meadow Road), and many of the minor y-line roadways. The French Broad River MPO Travel Demand Model (provided by NCDOT on 03/14/2018) was utilized as a tool in the development of the forecast.

The French Broad River MPO Model was developed in TransCAD (version 5.0 Build 2110) and was calibrated based on a base year of 2010, and has models for a future year of 2040.

Table C5 can be found in Appendix C and displays the model performance for the 2010 model against 2010 AADTs, the 2040 model volumes, and an extrapolated volume for 2018 based on the 2010 and 2040 model output. A discussion of the model performance for the project study area corridors is included as follows:

- SR 3556– the 2010 model volumes for SR 3556 were lower than the corresponding AADT (by 3,500 to 7,400 vehicles per day (vpd)). The 2018 interpolated model volumes varied from the extrapolated AADT counts in a similar way.
- I-240 – the 2010 model volumes on I-240 were higher than the corresponding AADT (by 10,600 to 8,400 vehicles per day). The 2018 interpolated model volumes varied from the extrapolated AADT counts in a similar way.
- Lyman Street – the 2010 model volumes for Lyman Street include only 8 vehicles per day while the 2010 AADT volumes in 7,100 AADT. The 2018 interpolated volumes varied by a similar amount with the model producing only 742 vpd compared with a 2016 AADT of 9,100 vpd.

5. BASE YEAR 2018 BUILD TRAFFIC FORECAST

During the scoping process for this forecast, it was determined that a base year 2018 build traffic forecast would not be prepared. The proposed project would not substantially alter the overall roadway network. Therefore, no diversion of traffic is anticipated and a Build forecast would not be required. The 2018 Base Year No-Build volumes can be used as a proxy for 2018 Base Year Build volumes for analysis purposes.

6. FUTURE YEAR 2040 NO-BUILD TRAFFIC FORECAST

6.1 ASSUMPTIONS

A Future Year of 2040 was chosen for the U-4739 traffic volume examination as it is the latest year available in the French Broad River MPO Travel Demand Model and to correspond with the horizon year of the MTP. All 2040 fiscally-constrained projects, with the exception of U-4739, listed in the *French Broad River Metropolitan Planning Organization Metropolitan Transportation Plan 2015-2040* (2040 MTP) were included in the 2040 No-Build alternative model run.

The modeling aspects for the 2040 No-Build scenario include utilizing the French Broad River MPO Travel Demand Model fiscally constrained model. The first step was to review the model and determine if the changes included in the fiscally constrained MTP have been properly included in the model. Based on this review, a number of revisions were made to the future year model network, described below:

- The model network was updated to match the current preferred design alternative for STIP project I-2513. In the vicinity of the study area, this included modifying I-240/I-26, from I-40 to Patton Avenue, to match the preferred alignment and to provide a full-access interchange at Amboy Road (where the existing interchange only offers partial access).
- I-26, from I-240 to US 25, was widened to eight lanes to match the MTP project BUNC3aa-H (STIP A-0010AA)
- NC 81 (Swannanoa River Road), from US 25 (Biltmore Avenue) to S Tunnel Road, was widened to match the MTP project BUNC21c-H (STIP U-5832)
- The MTP project BUNC21a-H (STIP U-5019C) on Lyman Road was modified to reflect the current design concept. Whereas prior there was assumed to be a roadway widening and/or a median separation, the current concept would reflect no widening or median but would instead include complete streets features.
- Amboy Road and Meadow Road, themselves, were also modified to reflect the no-build design and were reverted back to the two-lane undivided roadway included in the Base Year model.

6.2 METHODOLOGY

The French Broad River MPO Travel Demand Model was utilized as a tool in the development of the 2040 Future Year No-Build traffic volumes.

2040 Future Year No-Build model runs were completed without the proposed project in place. The Compound Annual Growth Rate (CAGR) for each traffic volume location was calculated using the following equation:

$$\left(\frac{\text{2040 Model Value}}{\text{2010 Model Value}}\right)^{1/30} - 1$$

Additionally, the raw model volumes were compared to determine the total change in model volume between 2010 and 2040. The CAGR rates and total volume changes were reviewed and adjusted during this phase using engineering judgment where needed. The selected CAGR rates were then determined and applied to the 2018 No-Build traffic volumes and extrapolated to determine the 2040 traffic volumes.

6.3 DESIGN FACTORS

The 2040 model network was reviewed to see if any of the corridors experienced changes in the percent of traffic occurring in the peak hour, direction of peak travel, or directional split. Based on a review of the model data it was determined that all of the 2018 Base Year factors were still adequate and that none of the design factors would change from those included in the 2018 Base Year forecast.

6.4 TRAFFIC FORECAST VOLUMES

Based on the methodology described in Section 6.2, traffic volumes for the 2040 Future Year No-Build Scenario were calculated. Table C6 in Appendix C shows the comparisons of historic growth rates, model output, CAGRs, and selected volumes. Some of the volumes were modified slightly to allow for the development of a balanced network.

A brief summary of the key observations and considerations from the development of the 2040 No-Build volumes are as follows:

- The model CAGRs for SR 3556 (Amboy Rd/Meadow Rd) were all between 1.3 and 2.7%. The FBRMPO Travel Demand Model is not well validated in the area of the proposed project with the model being off by as much as 7,400 vpd on Amboy Road and including 8 vpd on Lyman Street. With existing volumes ranging from 11,400 to 18,400 vpd the existing corridor is at or above the capacity of a two-lane roadway. The 2040 No-Build model volumes range from 10,000 to 17,000 vpd and show that the roadway is approaching its capacity. Therefore, there is limited ability for the existing corridor to grow substantially and the chosen growth rates were reduced from those produced by the model to a range of 0.8 to 1.1 percent per year.
- The model CAGRs for I-240 were approximately 1.3 percent, with the selected growth rates largely matching the model rates.
- The model CAGRs for US 25 were below 0.6 percent, with the selected growth rates largely matching the model rates.
- The Y-lines had growth rates that varied by location. The majority of the y-lines had a selected growth rate that largely matched the model rate with non-modeled roadways having growth rates of approximately 0.5 to 0.8 percent, which is consistent with the land use being mostly developed.

7. FUTURE YEAR 2040 BUILD TRAFFIC FORECAST

7.1 ASSUMPTIONS

The 2040 Build traffic forecast contains all of the assumptions found in the 2040 No-Build traffic volume network discussed in Section 6.1. The U-4739 project was coded into the model by modifying the model to reflect the current preferred design. The future year model network originally included the widening of Amboy Road and Meadow Road from two lanes to four lanes, divided. The future year network was instead modified so that the Build condition for Amboy Road and Meadow Road was changed to add a median but not any additional lanes. (In the 2040 No-Build scenario, Amboy Road and Meadow Road were maintained in the same state as their Base Year configuration.)

7.2 METHODOLOGY

The French Broad River MPO Travel Demand Model and engineering judgment were heavily relied upon in the calculation of the 2040 Future Year Build traffic volumes. Once the travel demand model was run to include U-4739, model volumes were extracted for each location included in the evaluation. Model volumes from the 2040 No-Build and Build Model runs were compared in order to calculate a diversion percentage between the two scenarios. These diversion percentages were then applied to the 2040 No-Build traffic volumes in order to develop 2040 Build Traffic volumes.

7.3 DESIGN FACTORS

The 2040 model network was reviewed to see if any of the corridors experienced changes in the percent of traffic occurring in the peak hour, direction of peak travel, or directional split. The selection of design factors for the 2040 Build scenario was similar to the evaluations discussed in the previous scenarios, with the selected values being the same as those selected for the 2040 No-Build scenario discussed in Section 5.3.

7.4 TRAFFIC FORECAST VOLUMES

Based on the methodology described in Section 7.2, traffic volumes for the 2040 Future Year Build Forecast Scenario were calculated. Table C7 in Appendix C show the comparisons of model output, diversion percentages, volume deltas, and selected volumes.

A brief summary of the key observations and considerations from the development of the 2040 Build volumes are as follows:

- The 2040 Build volumes from the travel demand model show diversion rates on SR 3556 between 3% and 6%. The selected diversion rates were very similar to the model diversion rates and appear to be reasonable based on the minimal capacity change from adding only a median to the roadway.

APPENDIX A:
HISTORIC AADT COUNT DATA

Table A1: NCDOT Historic AADT

Location	2016	2015	2014	2013	2012	2011	2010	2009	2008	2007
SR 3556 E OF STATE ST	13,000				9,900		13,000		13,000	
SR 3556 E OF RIVERVIEW DR	14,000		12,000		11,000		14,000		15,000	
SR 3556 W OF BILTMORE ESTATES DR	17,000		15,000		12,000		17,000		<i>11,000</i>	
SR 3556 W OF US 25 MCDOWELL ST	15,000				15,000		14,000		14,000	
NC 81 W E OF SR 3214	12,000		10,000		11,000		11,000		12,000	
I-240 FROM EXIT 1A TO EXIT 2	62,000	57,000	59,000	58,000	55,000	53,000	53,000	52,000	51,000	52,000
I-240 FROM EXIT 1 TO EXIT 1A	73,000	68,000	69,000	67,000	64,000	63,000	63,000	61,000	60,000	64,000
RIVERVIEW DR N OF SR 3556	920		990		1,100		980		990	
LYMAN ST N OF SR 3556	8,200		6,500		6,100		7,100		7,300	
SR 3214 N OF BRYSON ST	19,000		20,000		20,000				21,000	
NC 81 (BILTMORE AVE) S OF SR 3556 MEADOW RD	22,000		21,000		22,000				25,000	

Location	2006	2005	2004	2003	2002	2001	2000	1999	1998	1997
SR 3556 E OF STATE ST	11,000		13,000		12,000		13,000		11,000	
SR 3556 E OF RIVERVIEW DR	12,000		14,000		14,000		13,000		17,000	
SR 3556 W OF BILTMORE ESTATES DR	15,000		17,000		17,000		16,000		16,000	
SR 3556 W OF US 25 MCDOWELL ST	13,000		15,000		14,000		13,000		12,000	
NC 81 W E OF SR 3214	12,000		12,000		12,000		11,000		9,100	
I-240 FROM EXIT 1A TO EXIT 2	51,000	55,000	52,000	51,000	52,000	50,000	48,000	48,000	45,000	
I-240 FROM EXIT 1 TO EXIT 1A	61,000	65,000	62,000	61,000	61,000	59,000	58,000	57,000	54,000	
RIVERVIEW DR N OF SR 3556	960		1,100		960		790		770	
LYMAN ST N OF SR 3556	6,500		6,900		6,500		6,100		6,900	
SR 3214 N OF BRYSON ST	23,000		23,000		23,000		<i>20,000</i>		25,000	
NC 81 (BILTMORE AVE) S OF SR 3556 MEADOW RD	25,000		23,000		24,000		21,000		27,000	

Note: *Red Italics* denote numbers removed from data set due to being greater than two standard deviations away from the trend line data.

APPENDIX B:
PROJECT CORRESPONDENCE

Lee Klieman

From: contact us admin <noreply@ncdot.gov>
Sent: Tuesday, April 03, 2018 12:27 PM
To: Lee Klieman
Subject: A response to your comment has been posted.

A Subject Matter Expert associated with the 'Traffic Analysis' Unit has responded to the comment you posted. Please do not respond to this email directly. Instead, click on the following link to view the response.
<https://apps.ncdot.gov/ContactUS/Home/CommentDetails?TrackingNum=OH1UD7DCMG&Email=lee@pt-engineering.net>

Comment History

Tracking Number: OH1UD7DCMG

Unit Name: Traffic Analysis

Name/Phone: Lee Klieman / (919)336-9342

Sent By: Lee Klieman

Date/Time: 4/3/2018 11:52:09 AM

Comment:

Hello, I am requesting information on what ATR groups to use at several locations for the purpose of factoring counts. Attached is a file listing the 11 AADT stations and their locations that I am requesting ATR groups for. Thank you, Lee Klieman

Sent By: jlviera

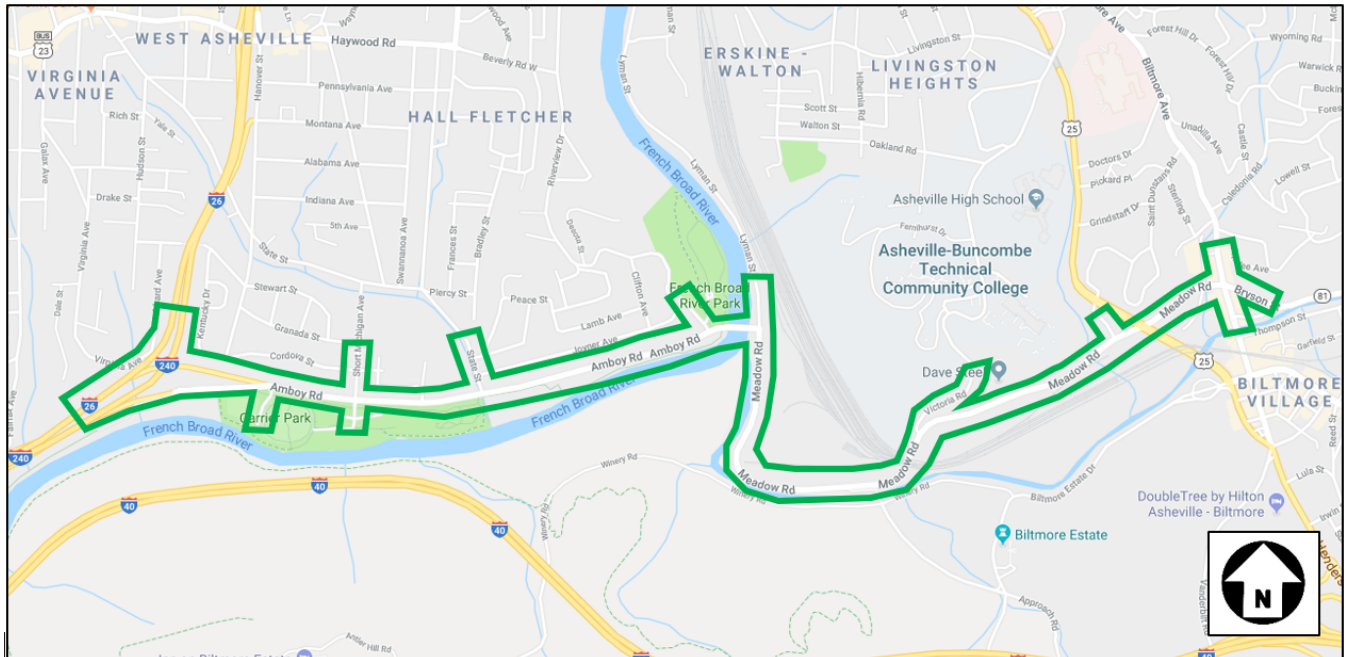
Date/Time: 4/3/2018 12:26:32 PM

Comment:

Good afternoon, Your request has been assigned #0763 as a tracking number. If you have any further questions regarding this particular request, please reference this number in your message. I have reviewed the list of coverage stations that you requested ATR Group numbers for and have attached a spreadsheet with the ATR Group numbers shown. If you have any additional questions, please don't hesitate to ask. Sincerely, Jamie Viera

Study Area Questionnaire Sent to Local Planners

Patriot Transportation Engineering is currently in the process of developing a traffic forecast for NCDOT STIP project U-4739, which includes the widening of SR 3556 (Amboy Road/Meadow Road) from I-240 to US 25 (Biltmore Avenue) in Buncombe County. The forecast includes base year (2018) and design year (2040) forecasts. The forecast study area is shown in the following figure:



We have reviewed the French Broad River Metropolitan Planning Organization (FBRMPO) Metropolitan Transportation Plan (MTP) (adopted September 24, 2015) and the pending MTP Amendments (May 2018) and are seeking input from local planners and engineers who are familiar with the area. We have identified you as a local representative. We have listed a few questions below that will help us in the development of the traffic forecast. We would greatly appreciate your time in answering these questions. Your answers will be used in conjunction with quantitative data sources in order to make fully-informed judgments regarding the forecast. You may answer the questions in text format below and return them to me at: lee@pt-engineering.net.

If you would rather discuss the questions over the phone, we will be following up with a phone call later next week. Thank you in advance for your time and please let me know if you have any questions.

- 1) Current and historical traffic trends indicate that the traffic growth over the last 20 years along Amboy Road and Meadow Road has been slightly negative or positive with growth rates ranging from -1.0% to 1.0% per year within the study area. The 10-year growth rates show more of a decreasing trend for Amboy Road, with growth rates ranging from -1.5% to -0.4% per year. The 10-year growth rates for Meadow Road, show more of an increased trend, with growth rates of approximately 1.0% per year.
 - a. Do you agree that traffic along Amboy Road and Meadow Road has stayed about the same over the last 20 years? If not, what percentage change (increase or decrease) do you anticipate along Amboy Road and Meadow Road over the next 20 years?
 - b. What growth patterns have you noticed?

Study Area Questionnaire Sent to Local Planners

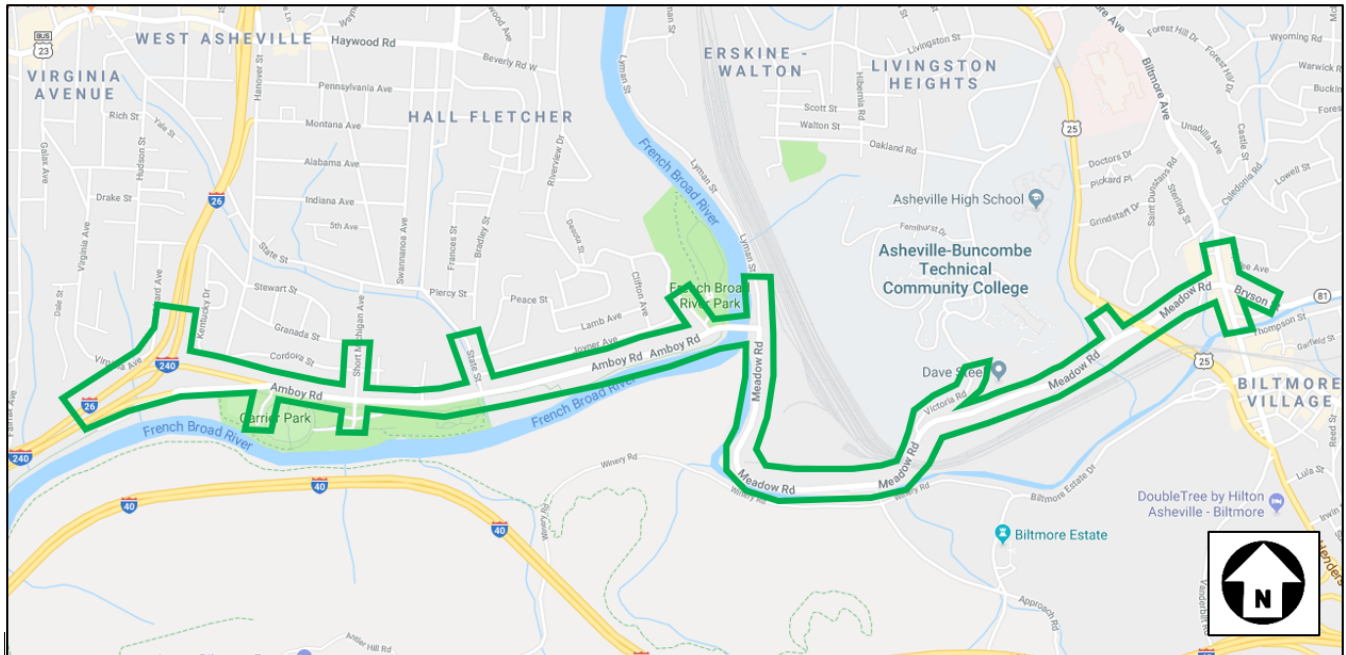
- 2) The historic counts on I-240 indicate that in the last 10 years traffic has grown at a rate of approximately 2.0% per year in the study area. The 20-year growth rate is approximately 1.2%. The FBRMPO Travel Demand Model shows a projected growth rate in the study area of 1.2% between 2010 and 2040.
 - a. Do you agree that the traffic along I-240 has been steadily increasing over the past 10-20 years? If not, what growth rate have you observed?
 - b. Do you agree with the predicted growth rate from the Model on I-240? If not, what growth rate would you expect over the next 20 years?
 - c. What growth patterns have you noticed?
- 3) The traffic forecast will include developing volumes for the average annual daily traffic. Aside from school being in session, are there any noticeable seasonal differences in traffic that you are aware of?
- 4) According to the North Carolina Office of State Budget and Management (OSBM) the population of Buncombe County was approximately 258,400 in 2016 and is projected to grow by 1.0% per year to approximately 324,200 in 2037. This growth rate is similar to the anticipated MPO population growth rate of 1.09% outlined in the MTP.
 - a. Do you think that the 1.09% population growth rate is reasonable for the project study area or do you think it will be higher or lower?
 - b. Do you know of any other population projections for this area that may be helpful as we review the growth in the area?
- 5) The FBRMPO Travel Demand Model data shows that Amboy Road is expected to have a growth rate of roughly 1.5% per year between 2010 and 2040. Meadow Road is expected to have a growth rate of roughly 2.3% per year. These rates are based on a two-lane divided roadway typical section.
 - a. Do you think that these growth rates are reasonable for the project study area or do you think they will be higher or lower?
 - b. Do you think that the volumes will be substantially constrained by the capacity of the roadway if no additional through lanes are provided under this project?
- 6) The project corridor crosses the French Broad River and a substantial amount of railroad infrastructure. Are there noticeable (or historical) differences in the regional development patterns and activity from one side of the river/tracks to the other?
- 7) The multilane freeway widening on I-26/I-240 (STIP ID I-2513, from I-40 to Exit 25 at Broadway (SR 1781) and included in the MTP as BUNC2 a-H) would include the construction of a full-access interchange at Amboy Road to replace the current partial-access interchange. With the construction of this expanded interchange, how much traffic would you foresee accessing Amboy Road from the north on I-26/I-240 (a movement which is currently unavailable)?
- 8) The Metropolitan Transportation Plan (MTP) includes the following projects in the vicinity of the forecast. It is anticipated that these projects may affect the traffic volumes in the traffic forecast study area:
 - I-2513A – I-26/I-240 – multilane freeway widening, from I-40 to Exit 25 (SR 1781 (Broadway)). BUNC2 a-H (MTP Project ID).

Study Area Questionnaire Sent to Local Planners

- U-5019C – Lyman Street, multimodal improvements, from Amboy Road to US 70 to SR 1781 (Broadway Street). BUNC21 a-H (MTP Project ID).
 - U-5823 – NC 81, from US 70 (Tunnel Road) to US 74 (South Tunnel Road). BUNC21 c-H (MTP Project ID).
 - a. Can you please provide your opinion on how each of these may affect traffic volumes in the study area?
 - b. Do you know of any reasonably foreseeable transportation projects that are not identified above that may affect traffic volumes in the traffic forecast study area?
- 9) Are you aware of any previous traffic forecasts that were performed in or near the study area?
- 10) A preliminary review of data on municipal and county websites did not find any current development information:
- a. Do you know of any ongoing or planned developments in the vicinity of the traffic forecast area that may affect our traffic forecast?
- 11) Do you have any additional comments that would be helpful in our development of the traffic forecast?
- 12) This questionnaire is being sent to the following individuals:
- o Steve Cannon, Division 13, Division Project Development Engineer (slcannon@ncdot.gov)
 - o Mike Calloway, Division 13, Division Project Manager (mkcalloway@ncdot.gov)
 - o Anna Henderson, Division 13, Division Traffic Engineer (aghenderson@ncdot.gov)
 - o Troy Wilson, Division 13, District 2 District Supervisor (tswilson@ncdot.gov)
 - o Daniel Sellers, NCDOT Transportation Planning Branch (dcsellers1@ncdot.gov)
 - o Nathan Pennington, Buncombe County Planning Director, (zoningquestions@buncombecounty.org)
 - o Lyuba Zuyeva, French Broad River MPO (lyuba@landofsky.org)
 - o Ken Putnam, City of Asheville, Transportation Department Director (kputnam@ashevillenc.gov)
 - o Todd Okolichany, City of Asheville, Planning Services Director (tokolichany@ashevillenc.gov)
 - o Shannon Tuch, City of Asheville Principal Planner (stuch@ashevillenc.gov)
- a. Are there any other individuals whom you think we should contact to discuss this forecast?

Comments completed by Daniel Sellers via email – 06/07/2018

Patriot Transportation Engineering is currently in the process of developing a traffic forecast for NCDOT STIP project U-4739, which includes the widening of SR 3556 (Amboy Road/Meadow Road) from I-240 to US 25 (Biltmore Avenue) in Buncombe County. The forecast includes base year (2018) and design year (2040) forecasts. The forecast study area is shown in the following figure:



We have reviewed the French Broad River Metropolitan Planning Organization (FBRMPO) Metropolitan Transportation Plan (MTP) (adopted September 24, 2015) and the pending MTP Amendments (May 2018) and are seeking input from local planners and engineers who are familiar with the area. We have identified you as a local representative. We have listed a few questions below that will help us in the development of the traffic forecast. We would greatly appreciate your time in answering these questions. Your answers will be used in conjunction with quantitative data sources in order to make fully-informed judgments regarding the forecast. You may answer the questions in text format below and return them to me at: lee@pt-engineering.net.

If you would rather discuss the questions over the phone, we will be following up with a phone call later next week. Thank you in advance for your time and please let me know if you have any questions.

- 1) Current and historical traffic trends indicate that the traffic growth over the last 20 years along Amboy Road and Meadow Road has been slightly negative or positive with growth rates ranging from -1.0% to 1.0% per year within the study area. The 10-year growth rates show more of a decreasing trend for Amboy Road, with growth rates ranging from -1.5% to -0.4% per year. The 10-year growth rates for Meadow Road, show more of an increased trend, with growth rates of approximately 1.0% per year.
 - a. Do you agree that traffic along Amboy Road and Meadow Road has stayed about the same over the last 20 years? If not, what percentage change (increase or decrease) do you anticipate along Amboy Road and Meadow Road over the next 20 years?
 - b. What growth patterns have you noticed?

Comments completed by Daniel Sellers via email – 06/07/2018

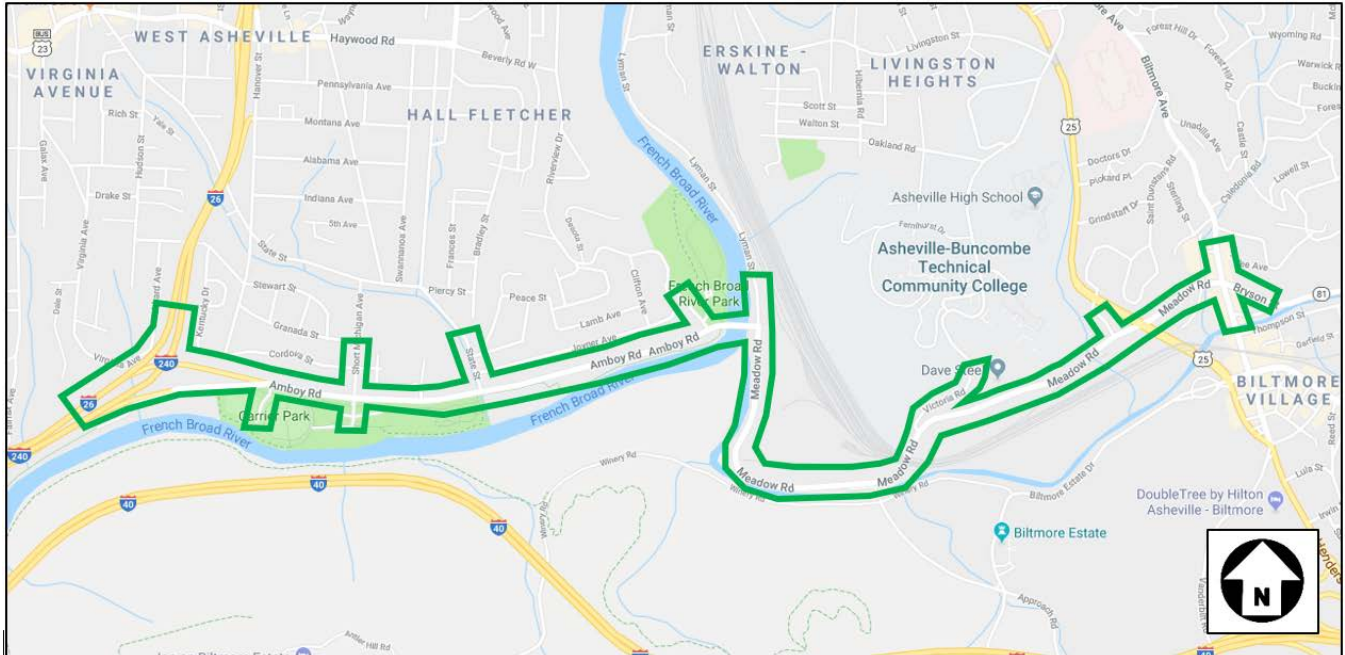
- 2) The historic counts on I-240 indicate that in the last 10 years traffic has grown at a rate of approximately 2.0% per year in the study area. The 20-year growth rate is approximately 1.2%. The FBRMPO Travel Demand Model shows a projected growth rate in the study area of 1.2% between 2010 and 2040.
 - a. Do you agree that the traffic along I-240 has been steadily increasing over the past 10-20 years? If not, what growth rate have you observed?
Seems right
 - b. Do you agree with the predicted growth rate from the Model on I-240? If not, what growth rate would you expect over the next 20 years?
I have no reason to disagree
 - c. What growth patterns have you noticed?
The River Arts district has seen a lot of growth recently. I am not entirely sure if the model is handling that fully.
- 3) The traffic forecast will include developing volumes for the average annual daily traffic. Aside from school being in session, are there any noticeable seasonal differences in traffic that you are aware of?
Yes. The Asheville region is quite heavily touristed. The TDM includes 4 seasonal periods that have differing occupancy ratios for the Hotels, Motels, Cabins, B&Bs, Resorts, and RV parks.
- 4) According to the North Carolina Office of State Budget and Management (OSBM) the population of Buncombe County was approximately 258,400 in 2016 and is projected to grow by 1.0% per year to approximately 324,200 in 2037. This growth rate is similar to the anticipated MPO population growth rate of 1.09% outlined in the MTP.
 - a. Do you think that the 1.09% population growth rate is reasonable for the project study area or do you think it will be higher or lower?
No reason to disagree
 - b. Do you know of any other population projections for this area that may be helpful as we review the growth in the area?
- 5) The FBRMPO Travel Demand Model data shows that Amboy Road is expected to have a growth rate of roughly 1.5% per year between 2010 and 2040. Meadow Road is expected to have a growth rate of roughly 2.3% per year. These rates are based on a two-lane divided roadway typical section.
 - a. Do you think that these growth rates are reasonable for the project study area or do you think they will be higher or lower?
Yes
 - b. Do you think that the volumes will be substantially constrained by the capacity of the roadway if no additional through lanes are provided under this project?
Both roads' AADTs are reasonably close to the capacity of a two lane road. So I would expect growth would be constrained.
- 6) The project corridor crosses the French Broad River and a substantial amount of railroad infrastructure. Are there noticeable (or historical) differences in the regional development patterns and activity from one side of the river/tracks to the other?
- 7) The multilane freeway widening on I-26/I-240 (STIP ID I-2513, from I-40 to Exit 25 at Broadway (SR 1781) and included in the MTP as BUNC2 a-H) would include the construction of a full-access interchange at Amboy Road to replace the current partial-access interchange. With the construction of this expanded interchange, how much traffic would you foresee accessing Amboy Road from the north on I-26/I-240 (a movement which is currently unavailable)?
I would have to consult the model

Comments completed by Daniel Sellers via email – 06/07/2018

- 8) The Metropolitan Transportation Plan (MTP) includes the following projects in the vicinity of the forecast. It is anticipated that these projects may affect the traffic volumes in the traffic forecast study area:
- I-2513A – I-26/I-240 – multilane freeway widening, from I-40 to Exit 25 (SR 1781 (Broadway)). BUNC2 a-H (MTP Project ID).
 - U-5019C – Lyman Street, multimodal improvements, from Amboy Road to US 70 to SR 1781 (Broadway Street). BUNC21 a-H (MTP Project ID).
 - U-5823 – NC 81, from US 70 (Tunnel Road) to US 74 (South Tunnel Road). BUNC21 c-H (MTP Project ID). **I believe this is U-5832 not 23.**
- a. Can you please provide your opinion on how each of these may affect traffic volumes in the study area?
Lyman Street may be the least typical. The RADTIP projects are significantly changing the character of the area
- b. Do you know of any reasonably foreseeable transportation projects that are not identified above that may affect traffic volumes in the traffic forecast study area?
no
- 9) Are you aware of any previous traffic forecasts that were performed in or near the study area?
I am not
- 10) A preliminary review of data on municipal and county websites did not find any current development information:
- a. Do you know of any ongoing or planned developments in the vicinity of the traffic forecast area that may affect our traffic forecast?
River Arts District
- 11) Do you have any additional comments that would be helpful in our development of the traffic forecast?
Seasonality, River Arts District are the big ones. I will also contribute that as we're working on a model update (don't worry nothing in time to affect your forecast) we have been making some changes to the TAZ loading around AB Tech CC, Asheville High school, and Mission Valley Hospital. So as you do the forecast just be aware and careful with nearby intersections.
- 12) This questionnaire is being sent to the following individuals:
- o Steve Cannon, Division 13, Division Project Development Engineer (slcannon@ncdot.gov)
 - o Mike Calloway, Division 13, Division Project Manager (mkcalloway@ncdot.gov)
 - o Anna Henderson, Division 13, Division Traffic Engineer (aghenderson@ncdot.gov)
 - o Troy Wilson, Division 13, District 2 District Supervisor (tswilson@ncdot.gov)
 - o Daniel Sellers, NCDOT Transportation Planning Branch (dcsellers1@ncdot.gov)
 - o Nathan Pennington, Buncombe County Planning Director, (zoningquestions@buncombecounty.org)
 - o Lyuba Zuyeva, French Broad River MPO (lyuba@landofsky.org)
 - o Ken Putnam, City of Asheville, Transportation Department Director (kputnam@ashevillenc.gov)
 - o Todd Okolichany, City of Asheville, Planning Services Director (tokolichany@ashevillenc.gov)
 - o Shannon Tuch, City of Asheville Principal Planner (stuch@ashevillenc.gov)
- a. Are there any other individuals whom you think we should contact to discuss this forecast?
Brandon Merrithew, Div 13 Planning Engineer

Comments completed by Brendan Merithew/Michael Clark via email – 06/27/2018

Patriot Transportation Engineering is currently in the process of developing a traffic forecast for NCDOT STIP project U-4739, which includes the widening of SR 3556 (Amboy Road/Meadow Road) from I-240 to US 25 (Biltmore Avenue) in Buncombe County. The forecast includes base year (2018) and design year (2040) forecasts. The forecast study area is shown in the following figure:



We have reviewed the French Broad River Metropolitan Planning Organization (FBRMPO) Metropolitan Transportation Plan (MTP) (adopted September 24, 2015) and the pending MTP Amendments (May 2018) and are seeking input from local planners and engineers who are familiar with the area. We have identified you as a local representative. We have listed a few questions below that will help us in the development of the traffic forecast. We would greatly appreciate your time in answering these questions. Your answers will be used in conjunction with quantitative data sources in order to make fully-informed judgments regarding the forecast. You may answer the questions in text format below and return them to me at: lee@pt-engineering.net.

If you would rather discuss the questions over the phone, we will be following up with a phone call later next week. Thank you in advance for your time and please let me know if you have any questions.

- 1) Current and historical traffic trends indicate that the traffic growth over the last 20 years along Amboy Road and Meadow Road has been slightly negative or positive with growth rates ranging from -1.0% to 1.0% per year within the study area. The 10-year growth rates show more of a decreasing trend for Amboy Road, with growth rates ranging from -1.5% to -0.4% per year. The 10-year growth rates for Meadow Road, show more of an increased trend, with growth rates of approximately 1.0% per year.
 - a. Do you agree that traffic along Amboy Road and Meadow Road has stayed about the same over the last 20 years? If not, what percentage change (increase or decrease) do you anticipate along Amboy Road and Meadow Road over the next 20 years?
The previous ten-year period saw flat or moderately declining growth in volumes in the region as a whole, most likely due to issues with the economy. I would expect growth in volumes to continue going forward.
 - b. What growth patterns have you noticed?

Comments completed by Brendan Merithew/Michael Clark via email – 06/27/2018

There has been new development, both commercial and residential along Amboy in particular. The parks and greenway have also seen growth in use.

- 2) The historic counts on I-240 indicate that in the last 10 years traffic has grown at a rate of approximately 2.0% per year in the study area. The 20-year growth rate is approximately 1.2%. The FBRMPO Travel Demand Model shows a projected growth rate in the study area of 1.2% between 2010 and 2040.
 - a. Do you agree that the traffic along I-240 has been steadily increasing over the past 10-20 years? If not, what growth rate have you observed? **I would agree that I-240 has seen growth in traffic volume.**
 - b. Do you agree with the predicted growth rate from the Model on I-240? If not, what growth rate would you expect over the next 20 years? **Both the projection from the counts and the model projection seem reasonable.**
 - c. What growth patterns have you noticed?
- 3) The traffic forecast will include developing volumes for the average annual daily traffic. Aside from school being in session, are there any noticeable seasonal differences in traffic that you are aware of? **summer and fall tourist activity may contribute to higher seasonal volumes, particularly on the interstates. Carrier Park on Amboy road is the site of many special events, particularly on the weekends in spring, summer and fall.**
- 4) According to the North Carolina Office of State Budget and Management (OSBM) the population of Buncombe County was approximately 258,400 in 2016 and is projected to grow by 1.0% per year to approximately 324,200 in 2037. This growth rate is similar to the anticipated MPO population growth rate of 1.09% outlined in the MTP.
 - a. Do you think that the 1.09% population growth rate is reasonable for the project study area or do you think it will be higher or lower? **A growth rate for Buncombe County of 1 to 2% appears reasonable. I would expect the Asheville City population to grow at the upper end of that range.**
 - b. Do you know of any other population projections for this area that may be helpful as we review the growth in the area? **It may be worth considering population growth in neighboring counties, particularly Haywood and Madison as it relates to commute patterns into Buncombe and Asheville.**
- 5) The FBRMPO Travel Demand Model data shows that Amboy Road is expected to have a growth rate of roughly 1.5% per year between 2010 and 2040. Meadow Road is expected to have a growth rate of roughly 2.3% per year. These rates are based on a two-lane divided roadway typical section.
 - a. Do you think that these growth rates are reasonable for the project study area or do you think they will be higher or lower? **These projections seem reasonable. Meadow is used as a commute route within the city, and also serves many popular destinations. Amboy Road's access to the parks and greenways, as well as the interstate will likely drive continued growth in volume.**
 - b. Do you think that the volumes will be substantially constrained by the capacity of the roadway if no additional through lanes are provided under this project? **Current AADT**

Comments completed by Brendan Merithew/Michael Clark via email – 06/27/2018

volumes of approximately 14K on Amboy Road and 15-17K on Meadow Road are about at the limit for the facility's capacity, particularly at peak times. Without any improvements, the volumes most likely will be constrained.

- 6) The project corridor crosses the French Broad River and a substantial amount of railroad infrastructure. Are there noticeable (or historical) differences in the regional development patterns and activity from one side of the river/tracks to the other?
- 7) The multilane freeway widening on I-26/I-240 (STIP ID I-2513, from I-40 to Exit 25 at Broadway (SR 1781) and included in the MTP as BUNC2 a-H) would include the construction of a full-access interchange at Amboy Road to replace the current partial-access interchange. With the construction of this expanded interchange, how much traffic would you foresee accessing Amboy Road from the north on I-26/I-240 (a movement which is currently unavailable)? **I would expect an increase in volume due to the enhanced interchange. It might be worth looking at commute patterns from North Buncombe and Madison County to see if the interchange would be appealing to those heading to the area around Meadow and Biltmore Ave.**
- 8) The Metropolitan Transportation Plan (MTP) includes the following projects in the vicinity of the forecast. It is anticipated that these projects may affect the traffic volumes in the traffic forecast study area:
 - I-2513A – I-26/I-240 – multilane freeway widening, from I-40 to Exit 25 (SR 1781 (Broadway)). BUNC2 a-H (MTP Project ID).
 - U-5019C – Lyman Street, multimodal improvements, from Amboy Road to US 70 to SR 1781 (Broadway Street). BUNC21 a-H (MTP Project ID).
 - U-5823 – NC 81, from US 70 (Tunnel Road) to US 74 (South Tunnel Road). BUNC21 c-H (MTP Project ID).
 - a. Can you please provide your opinion on how each of these may affect traffic volumes in the study area? **The I-2513 project, as noted above, will improve interchange access to Amboy Road, and may increase volumes. U-5019 may increase the need for parking in increase bike/ped activity in the area overall. Improvements to NC 81 may add to increased volumes from Amboy, Meadow to Tunnel Road.**
 - b. Do you know of any reasonably foreseeable transportation projects that are not identified above that may affect traffic volumes in the traffic forecast study area?
- 9) Are you aware of any previous traffic forecasts that were performed in or near the study area? **I-2513 has a forecast**
- 10) A preliminary review of data on municipal and county websites did not find any current development information:
 - a. Do you know of any ongoing or planned developments in the vicinity of the traffic forecast area that may affect our traffic forecast? **New Hotel under construction in Meadow Road near Biltmore Ave. The River Arts district in general is experiencing continued growth and development, which may include increases in housing as well as commercial development. Both AB-Tech and Mission Hospital have undergone recent expansions.**
- 11) Do you have any additional comments that would be helpful in our development of the traffic forecast?

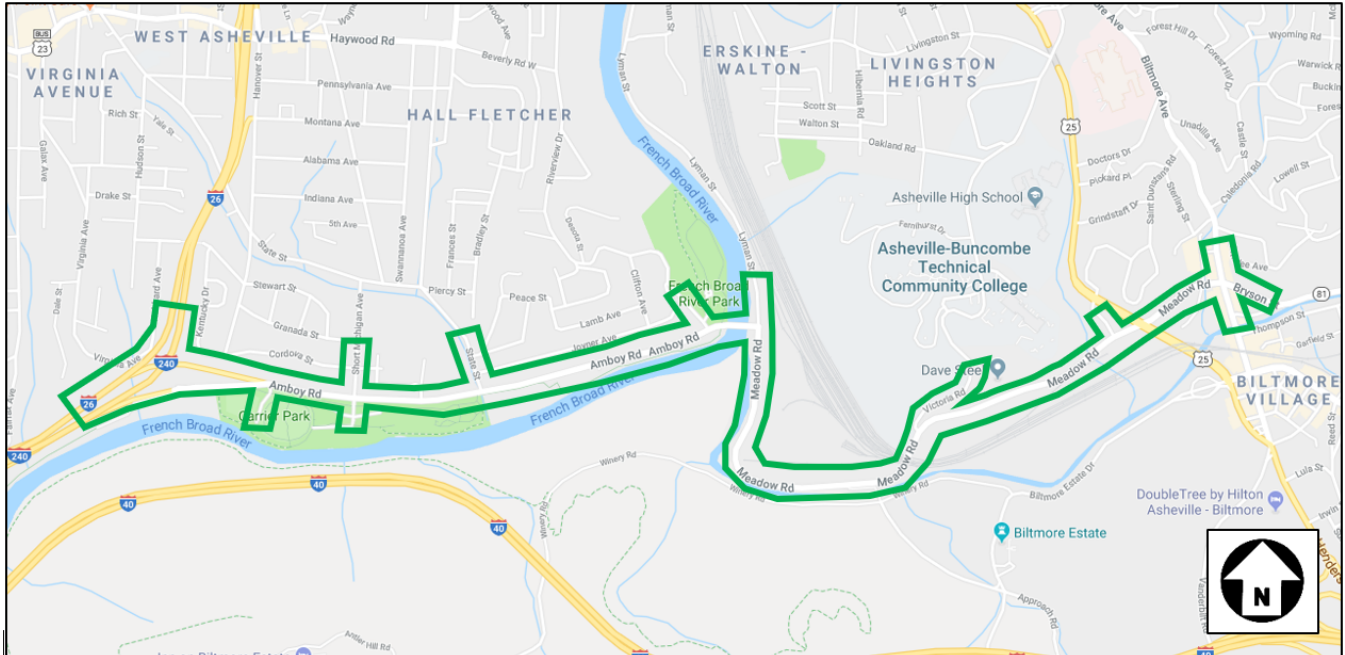
Comments completed by Brendan Merithew/Michael Clark via email – 06/27/2018

12) This questionnaire is being sent to the following individuals:

- o Steve Cannon, Division 13, Division Project Development Engineer (slcannon@ncdot.gov)
 - o Mike Calloway, Division 13, Division Project Manager (mkcalloway@ncdot.gov)
 - o Anna Henderson, Division 13, Division Traffic Engineer (aghenderson@ncdot.gov)
 - o Troy Wilson, Division 13, District 2 District Supervisor (tswilson@ncdot.gov)
 - o Daniel Sellers, NCDOT Transportation Planning Branch (dcsellers1@ncdot.gov)
 - o Nathan Pennington, Buncombe County Planning Director,
(zoningquestions@buncombecounty.org)
 - o Lyuba Zuyeva, French Broad River MPO (lyuba@landofsky.org)
 - o Ken Putnam, City of Asheville, Transportation Department Director
(kputnam@ashevillenc.gov)
 - o Todd Okolichany, City of Asheville, Planning Services Director
(tokolichany@ashevillenc.gov)
 - o Shannon Tuch, City of Asheville Principal Planner (stuch@ashevillenc.gov)
- a. Are there any other individuals whom you think we should contact to discuss this forecast?

Comments completed by FBRMPO (Lyuba Zuyeva) via email – 06/22/2018

Patriot Transportation Engineering is currently in the process of developing a traffic forecast for NCDOT STIP project U-4739, which includes the widening of SR 3556 (Amboy Road/Meadow Road) from I-240 to US 25 (Biltmore Avenue) in Buncombe County. The forecast includes base year (2018) and design year (2040) forecasts. The forecast study area is shown in the following figure:



We have reviewed the French Broad River Metropolitan Planning Organization (FBRMPO) Metropolitan Transportation Plan (MTP) (adopted September 24, 2015) and the pending MTP Amendments (May 2018) and are seeking input from local planners and engineers who are familiar with the area. We have identified you as a local representative. We have listed a few questions below that will help us in the development of the traffic forecast. We would greatly appreciate your time in answering these questions. Your answers will be used in conjunction with quantitative data sources in order to make fully-informed judgments regarding the forecast. You may answer the questions in text format below and return them to me at: lee@pt-engineering.net.

FBRMPO staff responses in blue

If you would rather discuss the questions over the phone, we will be following up with a phone call later next week. Thank you in advance for your time and please let me know if you have any questions.

- 1) Current and historical traffic trends indicate that the traffic growth over the last 20 years along Amboy Road and Meadow Road has been slightly negative or positive with growth rates ranging from -1.0% to 1.0% per year within the study area. The 10-year growth rates show more of a decreasing trend for Amboy Road, with growth rates ranging from -1.5% to -0.4% per year. The 10-year growth rates for Meadow Road, show more of an increased trend, with growth rates of approximately 1.0% per year.
 - a. Do you agree that traffic along Amboy Road and Meadow Road has stayed about the same over the last 20 years? If not, what percentage change (increase or decrease) do you anticipate along Amboy Road and Meadow Road over the next 20 years?
 - b. What growth patterns have you noticed?

Comments completed by FBRMPO (Lyuba Zuyeva) via email – 06/22/2018

MPO staff would agree that there has been a decline in traffic volumes on Amboy and Meadow Road during the recession of 2008-2009 followed by a slow and gradual increase back to pre-recession levels as of 2016; slow and steady increase in traffic is likely to continue over time.

- 2) The historic counts on I-240 indicate that in the last 10 years traffic has grown at a rate of approximately 2.0% per year in the study area. The 20-year growth rate is approximately 1.2%. The FBRMPO Travel Demand Model shows a projected growth rate in the study area of 1.2% between 2010 and 2040.
 - a. Do you agree that the traffic along I-240 has been steadily increasing over the past 10-20 years? If not, what growth rate have you observed?
 - b. Do you agree with the predicted growth rate from the Model on I-240? If not, what growth rate would you expect over the next 20 years?
 - c. What growth patterns have you noticed?

MPO staff would agree that there has been a slow and steady increase of traffic on I-240 including the Jeff Bowen Bridge—on the Jeff Bowen bridge, comparing the traffic count data from 2006 to 2016 it looks like there has been a 5% increase over 10 years. MPO staff agree with the overall traffic growth rate projected by the Travel Demand Model. However, traffic on specific corridors might be over-estimated or under-estimated in the model. Generally we expect the Regional Travel Demand Model to over-estimate the number of travelers choosing to commute via the interstate and to under-estimate the number of travelers who are choosing alternate routes such as Amboy Road and Meadow Road—the local population is likely to self-select to alternate streets and back routes during peak travel times.

- 3) The traffic forecast will include developing volumes for the average annual daily traffic. Aside from school being in session, are there any noticeable seasonal differences in traffic that you are aware of?

Fall tourism peak (especially weekends in October); tourism is likely to be higher from April-early November with a downturn in January; due to school being out in the summer, the months of May and September might be closest to “normal” traffic patterns for Asheville with some tourism but not peak tourism, and schools still in session.

- 4) According to the North Carolina Office of State Budget and Management (OSBM) the population of Buncombe County was approximately 258,400 in 2016 and is projected to grow by 1.0% per year to approximately 324,200 in 2037. This growth rate is similar to the anticipated MPO population growth rate of 1.09% outlined in the MTP.
 - a. Do you think that the 1.09% population growth rate is reasonable for the project study area or do you think it will be higher or lower?
 - b. Do you know of any other population projections for this area that may be helpful as we review the growth in the area?

The City of Asheville has been growing at a faster rate than Buncombe County overall.

- 5) The FBRMPO Travel Demand Model data shows that Amboy Road is expected to have a growth rate of roughly 1.5% per year between 2010 and 2040. Meadow Road is expected to have a growth rate of roughly 2.3% per year. These rates are based on a two-lane divided roadway typical section.

Comments completed by FBRMPO (Lyuba Zuyeva) via email – 06/22/2018

- a. Do you think that these growth rates are reasonable for the project study area or do you think they will be higher or lower?

Meadow Road is connected to several major growing development/employment nodes in the City-- the Biltmore Village (and Biltmore Estate), the Mission Hospital campus, AB Tech Campus and the River Arts District. The City of Asheville population has been growing faster than Buncombe County and the region overall, closer to 1.4% annually. MPO staff expect that the Travel Demand Model growth rates are likely to be reasonable for this area

- b. Do you think that the volumes will be substantially constrained by the capacity of the roadway if no additional through lanes are provided under this project?

The two-lane corridor is generally adequate to serve the existing traffic demand except for key intersections during peak travel times—Meadow Road and Biltmore Avenue, Meadow Road and Victoria Road, Meadow Road and Amboy Road (at the Amboy Road bridge over the French Broad River); fixing capacity at those intersections would contribute to a much smoother traffic flow overall. In the absence of any improvements traffic volumes are expected to continue to grow at a slow rate

- 6) The project corridor crosses the French Broad River and a substantial amount of railroad infrastructure. Are there noticeable (or historical) differences in the regional development patterns and activity from one side of the river/tracks to the other?

Yes, the area off Amboy Road in the west side of the French Broad River (and especially up State Street towards the Haywood Road corridor) is seeing more residential infill development with a few outdoor recreation-oriented businesses (such as the climbing gym) being located on Amboy Road. It will be important to minimize any disruption to the residential neighborhoods and the Carrier Park connections along Amboy Road west of the French Broad River Crossing.

Meadow Road is likely to carry a higher percentage of traffic connecting from one part of town to another-i.e. West Asheville to AB Tech, Mission Hospital, Biltmore Village and the Asheville Mall area off South Tunnel Road. There are fewer destinations directly on Meadow Road and those are primarily industrial/transportation uses (i.e. a concrete plant, Dave Steel Company, Norfolk Southern rail yard) , although there has been some recent development occurring along Meadow Rd between Short McDowell Street and Biltmore avenue-such as a Courtyard by Marriott hotel with 112 guest rooms being developed at 26 Meadow Road (some info at <ftp://ftp.ashevillenc.gov/OED/AARRC/Planning%20and%20Design%20Review%20Committee/DesignReview/Projects/Marriot%20Courtyard%20on%20Meadow/Courtyard%20Asheville%20ProjectNarrative.pdf>).

- 7) The multilane freeway widening on I-26/I-240 (STIP ID I-2513, from I-40 to Exit 25 at Broadway (SR 1781) and included in the MTP as BUNC2 a-H) would include the construction of a full-access interchange at Amboy Road to replace the current partial-access interchange. With the construction of this expanded interchange, how much traffic would you foresee accessing Amboy Road from the north on I-26/I-240 (a movement which is currently unavailable)?

Traffic coming from the north on I-26/I-240 can already access Amboy Road going east by exiting at NC 191/Brevard Road exit and using the I-26 northbound (westbound) on-ramp to continue onto Amboy Road.

One movement that is currently difficult is coming from Amboy Road/Carrier Park and traveling west to connect over to West Asheville at I-26/I-240 NC 191/Brevard Road exit. This is potentially possible but

Comments completed by FBRMPO (Lyuba Zuyeva) via email – 06/22/2018

requires merging across two lanes of interstate traffic in a short span. The improved interchange would make this connection much easier.

MPO staff would expect that the improvements to the Amboy Road (currently partial) interchange might increase some of the local trips that take place between Asheville neighborhoods and Carrier Park/River Arts District, but we do not expect a larger regional shift in travel patterns due to the improved interchange at Amboy Road.

8) The Metropolitan Transportation Plan (MTP) includes the following projects in the vicinity of the forecast. It is anticipated that these projects may affect the traffic volumes in the traffic forecast study area:

- I-2513A – I-26/I-240 – multilane freeway widening, from I-40 to Exit 25 (SR 1781 (Broadway)). BUNC2 a-H (MTP Project ID).
- U-5019C – Lyman Street, multimodal improvements, from Amboy Road to US 70 to SR 1781 (Broadway Street). BUNC21 a-H (MTP Project ID).
- *U-5019C (RADTIP multi-modal transportation improvements) project stops at Hill Street; another project U-5868 picks up on Riverside Drive from Hill Street to Broadway Avenue and is scheduled for 2020—modernization improvements with some complete streets elements*
- U-5823 – NC 81, from US 70 (Tunnel Road) to US 74 (South Tunnel Road). BUNC21 c-H (MTP Project ID). *This description is wrong, from the TIP: U-5832 NC 81 Swannanoa River Road from SR 3214 (BILTMORE AVENUE) TO US 74A (SOUTH TUNNEL ROAD). WIDEN EXISTING ROADWAY.*
- *The City of Asheville is envisioning future transit service on Amboy Road and in the River Arts District as part of Asheville Transit Master Plan (see final draft here)—currently not included in the FBRMPO Travel Demand Model and funding not programmed in the TIP/STIP*

- a. Can you please provide your opinion on how each of these may affect traffic volumes in the study area?

U-5019C (RADTIP multi-modal transportation improvements) and U-5868 Riverside Drive from Hill Street to Broadway Avenue projects are not adding significant vehicular capacity and are unlikely in themselves to induce a growth in vehicular traffic; more pedestrian and bicycle trips might be expected due to new and/or improved facilities

U-5832 NC 81 Swannanoa River Road from SR 3214 (BILTMORE AVENUE) TO US 74A (SOUTH TUNNEL ROAD)—this would likely increase the traffic volumes on Meadow Road west of Biltmore Avenue; however there are significant constraints along this corridor (i.e. the river/slopes/existing businesses) that are going to make a full widening as part of U-5832 project challenging

Transit service when introduced along Amboy Road and in the River Arts District might result in a slight decrease the future traffic volumes on Amboy Road and Lyman Street/Meadow Road.

- b. Do you know of any reasonably foreseeable transportation projects that are not identified above that may affect traffic volumes in the traffic forecast study area?

There is another project in the TIP, U-6046, currently going through STI/SPOT 5 re-prioritization: NC 81 Swannanoa River Road from US 70 (TUNNEL ROAD) TO US 74 (SOUTH TUNNEL ROAD). UPGRADE ROADWAY. Likely construction not till 2025

9) Are you aware of any previous traffic forecasts that were performed in or near the study area?
Traffic forecast for I-26 Connector (I-2513) would overlap with Amboy Road/Meadow Road study area

Comments completed by FBRMPO (Lyuba Zuyeva) via email – 06/22/2018

Courtyard by Marriott Hotel at 26 Meadow Rd might have been required to submit a traffic impact study to the City of Asheville/NCDOT—MPO staff have not seen such a study

10) A preliminary review of data on municipal and county websites did not find any current development information:

- a. Do you know of any ongoing or planned developments in the vicinity of the traffic forecast area that may affect our traffic forecast?
 - *Mission Hospital is expanding its Memorial Campus in Asheville, including Mission Hospital for Advanced Medicine—a 12-story building with 220 patient beds which will replace the aging St. Joseph’s building (see more info here <https://mountainx.com/living/mission-health-undertakes-massive-construction-projects/>)*
 - *Asheville-Buncombe Technical Community College just recently added a new 170,000 square foot Allied Health and Public Service Education building on its Victoria Road campus and a new 650-space parking deck is under construction. An additional 24,000-square-foot multipurpose building is planned. At the same time, AB Tech will be closing/relocating its facilities on Sand Hill Road in the near future.*
 - *There are a number of hotels recently completed or under construction in downtown Asheville and in Biltmore Village. This includes a 120-room AC Hotel at College Street/Broadway, a 136-room Cambria Suites across Page Avenue from the Grove Arcade, a 140-room Hyatt Place on Haywood Street and a 151-room Hilton Garden Inn at the corner of College and South Charlotte streets. Biltmore Village area hotels include a [Home2 Suites at Biltmore Station \(120 rooms\)](#), a Courtyard by Marriott hotel with 112 guest rooms being developed at 26 Meadow Road ([some info here](#)); Holiday Inn & Suites (118 rooms) at 190 Hendersonville Road and Hampton Inn Biltmore (118 rooms) at 117 Hendersonville Road. Generally, tourist traffic is expected to increase during peak periods (May-August, October) and expand into off-peak months.*
 - *Biltmore Village is seeing more breweries such as Burial second location ([more info here](#)) and multi-family residential development such as The District apartments -- 5 stories ,306 units (opened 2017) and River Mill Lofts at Thompson Street and Stoner Road—254 residential units and 4,000 sq ft of commercial space (opened 2017)*
 - *New Belgium Brewery in the River Arts District opened in August of 2016 and is estimated to employ around 140 people; the tasting room with a view of the French Broad River is a big draw for visitors and locals alike*
 - *River Arts District continues to see a lot of development, such as the RAD Lofts expected to add 200 housing units as well as commercial spaces and parking and the renovations at 95 Roberts Street which will become a mixed-use building, to include artists’ studios, retail & restaurant spaces. Stoneyard Apartments is another multi-family residential development planned for Lyman Street. The Foundation cluster of commercial spaces on 13 acres*

Comments completed by FBRMPO (Lyuba Zuyeva) via email – 06/22/2018

including Riverview Station, the Wedge Brewery, 12 Bones restaurant and additional space currently undergoing renovations will potentially house 200,000-250,000 sq ft of retail, restaurants, offices and artists' studios when fully developed ([see an article here](#)).

- *Asheville South Slope area south of downtown is seeing a lot of development, including breweries, restaurants, and some multi-family residential development. For example, The Lofts at South Slope (150 Coxe Avenue) is new residential condos complex with four stories; see an article about [South Slope residential development here](#) While the South Slope area is not directly connected to Amboy-Meadow Road corridor, those developments are likely to have an impact on Biltmore Avenue traffic*
- *Biltmore Estate is adding a new hotel and has some tentative plans to open an additional entrance to visitors off Brevard Road, currently used by employees only*

11) Do you have any additional comments that would be helpful in our development of the traffic forecast?

MPO staff think that for our region's population, the trip purposes are becoming more diverse and less geared towards the nine-to-five work schedule commute patterns. Package deliveries and contractor/small business trips are likely to contribute to the overall trip growth in addition to recreational/personal trips.

The River Arts District continued growth and development is a bit of a wild card for the future traffic growth along Meadow Road—it is likely the bulk of trips generated would be on the weekends/ during the daytime by visiting population; however some commute trips during weekend peaks would likely be generated as well but restaurants and artists' studios might have less-typical hours. Mission Hospital Campus growth and Biltmore Village growth (including multi-family residential development) are certain to add more pressure on Meadow Road corridor.

12) This questionnaire is being sent to the following individuals:

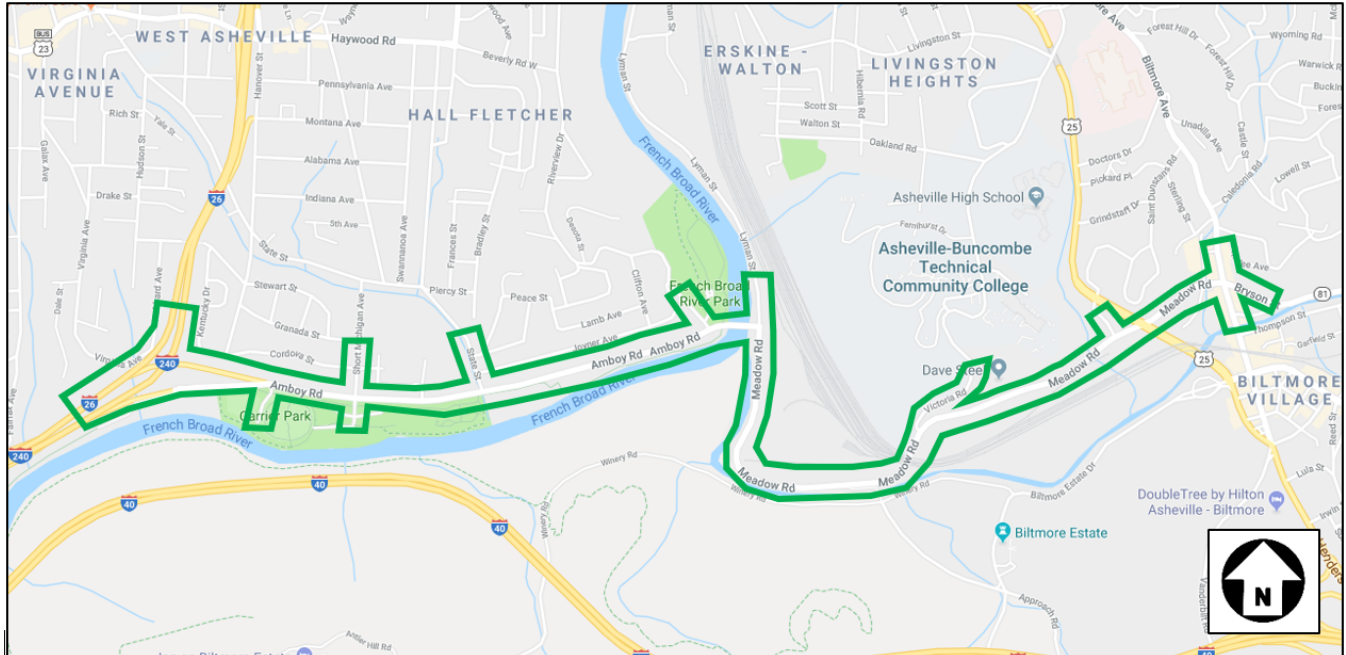
- o Steve Cannon, Division 13, Division Project Development Engineer (slcannon@ncdot.gov)
- o Mike Calloway, Division 13, Division Project Manager (mkcalloway@ncdot.gov)
- o Anna Henderson, Division 13, Division Traffic Engineer (aghenderson@ncdot.gov)
- o Troy Wilson, Division 13, District 2 District Supervisor (tswilson@ncdot.gov)
- o Daniel Sellers, NCDOT Transportation Planning Branch (dcsellers1@ncdot.gov)
- o Nathan Pennington, Buncombe County Planning Director, (zoningquestions@buncombecounty.org)
- o Lyuba Zuyeva, French Broad River MPO (lyuba@landofsky.org)
- o Ken Putnam, City of Asheville, Transportation Department Director (kputnam@ashevillenc.gov)
- o Todd Okolichany, City of Asheville, Planning Services Director (tokolichany@ashevillenc.gov)
- o Shannon Tuch, City of Asheville Principal Planner (stuch@ashevillenc.gov)

a. Are there any other individuals whom you think we should contact to discuss this forecast?

[Stephanie Monson Dahl, City of Asheville Strategic Development Office](mailto:smonson@ashevillenc.gov)

Comments completed by Anna Henderson via email – 06/25/2018

Patriot Transportation Engineering is currently in the process of developing a traffic forecast for NCDOT STIP project U-4739, which includes the widening of SR 3556 (Amboy Road/Meadow Road) from I-240 to US 25 (Biltmore Avenue) in Buncombe County. The forecast includes base year (2018) and design year (2040) forecasts. The forecast study area is shown in the following figure:



We have reviewed the French Broad River Metropolitan Planning Organization (FBRMPO) Metropolitan Transportation Plan (MTP) (adopted September 24, 2015) and the pending MTP Amendments (May 2018) and are seeking input from local planners and engineers who are familiar with the area. We have identified you as a local representative. We have listed a few questions below that will help us in the development of the traffic forecast. We would greatly appreciate your time in answering these questions. Your answers will be used in conjunction with quantitative data sources in order to make fully-informed judgments regarding the forecast. You may answer the questions in text format below and return them to me at: lee@pt-engineering.net.

If you would rather discuss the questions over the phone, we will be following up with a phone call later next week. Thank you in advance for your time and please let me know if you have any questions.

- 1) Current and historical traffic trends indicate that the traffic growth over the last 20 years along Amboy Road and Meadow Road has been slightly negative or positive with growth rates ranging from -1.0% to 1.0% per year within the study area. The 10-year growth rates show more of a decreasing trend for Amboy Road, with growth rates ranging from -1.5% to -0.4% per year. The 10-year growth rates for Meadow Road, show more of an increased trend, with growth rates of approximately 1.0% per year.
 - a. Do you agree that traffic along Amboy Road and Meadow Road has stayed about the same over the last 20 years? If not, what percentage change (increase or decrease) do you anticipate along Amboy Road and Meadow Road over the next 20 years?
I agree.
 - b. What growth patterns have you noticed? There was a decline during the recession, then a steady gradual increase since that will likely continue.

Comments completed by Anna Henderson via email – 06/25/2018

- 2) The historic counts on I-240 indicate that in the last 10 years traffic has grown at a rate of approximately 2.0% per year in the study area. The 20-year growth rate is approximately 1.2%. The FBRMPO Travel Demand Model shows a projected growth rate in the study area of 1.2% between 2010 and 2040.
 - a. Do you agree that the traffic along I-240 has been steadily increasing over the past 10-20 years? If not, what growth rate have you observed? [Definitely.](#)
 - b. Do you agree with the predicted growth rate from the Model on I-240? If not, what growth rate would you expect over the next 20 years? [Yes.](#)
 - c. What growth patterns have you noticed? [AM Peak and PM Peak along I-240 continue to increase. I work 8:00 am to 5:00 pm off of Orange Street just north of downtown. If I am not a work by 7:45 am in the morning, I can expect slow and/or stopped traffic along I-240 between I-40 and Charlotte Street \(travelling eastbound\) until around 8:15 am. If I do not leave the office immediately at 5:00 pm, I can expect slow and/or stopped traffic between Charlotte Street and I-40 \(travelling westbound\) until 5:45 pm or later.](#)
- 3) The traffic forecast will include developing volumes for the average annual daily traffic. Aside from school being in session, are there any noticeable seasonal differences in traffic that you are aware of? [Tourism season runs from May – November.](#)
- 4) According to the North Carolina Office of State Budget and Management (OSBM) the population of Buncombe County was approximately 258,400 in 2016 and is projected to grow by 1.0% per year to approximately 324,200 in 2037. This growth rate is similar to the anticipated MPO population growth rate of 1.09% outlined in the MTP.
 - a. Do you think that the 1.09% population growth rate is reasonable for the project study area or do you think it will be higher or lower? [I do not have any helpful information for this question.](#)
 - b. Do you know of any other population projections for this area that may be helpful as we review the growth in the area? [I do not have any helpful information for this question.](#)
- 5) The FBRMPO Travel Demand Model data shows that Amboy Road is expected to have a growth rate of roughly 1.5% per year between 2010 and 2040. Meadow Road is expected to have a growth rate of roughly 2.3% per year. These rates are based on a two-lane divided roadway typical section.
 - a. Do you think that these growth rates are reasonable for the project study area or do you think they will be higher or lower? [I do not have any information for this question.](#)
 - b. Do you think that the volumes will be substantially constrained by the capacity of the roadway if no additional through lanes are provided under this project? [Possibly. Turn lanes at major intersecting points should be added at a minimum.](#)
- 6) The project corridor crosses the French Broad River and a substantial amount of railroad infrastructure. Are there noticeable (or historical) differences in the regional development patterns and activity from one side of the river/tracks to the other? [I will defer to the City or others for comment.](#)

Comments completed by Anna Henderson via email – 06/25/2018

- 7) The multilane freeway widening on I-26/I-240 (STIP ID I-2513, from I-40 to Exit 25 at Broadway (SR 1781) and included in the MTP as BUNC2 a-H) would include the construction of a full-access interchange at Amboy Road to replace the current partial-access interchange. With the construction of this expanded interchange, how much traffic would you foresee accessing Amboy Road from the north on I-26/I-240 (a movement which is currently unavailable)? [This change will definitely improve access to and from Amboy Road which could increase the traffic volumes.](#)
- 8) The Metropolitan Transportation Plan (MTP) includes the following projects in the vicinity of the forecast. It is anticipated that these projects may affect the traffic volumes in the traffic forecast study area:
- I-2513A – I-26/I-240 – multilane freeway widening, from I-40 to Exit 25 (SR 1781 (Broadway)). BUNC2 a-H (MTP Project ID).
 - U-5019C – Lyman Street, multimodal improvements, from Amboy Road to US 70 to SR 1781 (Broadway Street). BUNC21 a-H (MTP Project ID).
 - U-5823 – NC 81, from US 70 (Tunnel Road) to US 74 (South Tunnel Road). BUNC21 c-H (MTP Project ID).
- a. Can you please provide your opinion on how each of these may affect traffic volumes in the study area? [I do not have an opinion for this question.](#)
- b. Do you know of any reasonably foreseeable transportation projects that are not identified above that may affect traffic volumes in the traffic forecast study area? [No.](#)
- 9) Are you aware of any previous traffic forecasts that were performed in or near the study area? [The I-26 Connector Project Forecast.](#)
- 10) A preliminary review of data on municipal and county websites did not find any current development information:
- a. Do you know of any ongoing or planned developments in the vicinity of the traffic forecast area that may affect our traffic forecast? [I will defer to the COA.](#)
- 11) Do you have any additional comments that would be helpful in our development of the traffic forecast? [No.](#)
- 12) This questionnaire is being sent to the following individuals:
- o Steve Cannon, Division 13, Division Project Development Engineer (slcannon@ncdot.gov)
 - o Mike Calloway, Division 13, Division Project Manager (mkcalloway@ncdot.gov)
 - o Anna Henderson, Division 13, Division Traffic Engineer (aghenderson@ncdot.gov)

Comments completed by Anna Henderson via email – 06/25/2018

- o Troy Wilson, Division 13, District 2 District Supervisor (tswilson@ncdot.gov)
 - o Daniel Sellers, NCDOT Transportation Planning Branch (dcsellers1@ncdot.gov)
 - o Nathan Pennington, Buncombe County Planning Director,
(zoningquestions@buncombecounty.org)
 - o Lyuba Zuyeva, French Broad River MPO (lyuba@landofsky.org)
 - o Ken Putnam, City of Asheville, Transportation Department Director
(kputnam@ashevillenc.gov)
 - o Todd Okolichany, City of Asheville, Planning Services Director
(tokolichany@ashevillenc.gov)
 - o Shannon Tuch, City of Asheville Principal Planner (stuch@ashevillenc.gov)
- a. Are there any other individuals whom you think we should contact to discuss this forecast?

Lee Klieman

From: Shannon T. Capezzali <Shannon.Capezzali@buncombecounty.org> on behalf of zoningquestions <zoningquestions@buncombecounty.org>
Sent: Monday, June 11, 2018 10:30 AM
To: Lee Klieman; zoningquestions
Subject: RE: NCDOT STIP U-4739 Traffic Forecast Questionnaire

Lee,
This area is outside of Buncombe County's jurisdiction. It is located entirely in the City of Asheville limits so they can provide more information.
It is worth noting that many County residents coming from the west utilize the Amboy road exit in order to access the Mission hospital/Hendersonville road, and even east Asheville/Tunnel Road area.

Thank you,
Shannon Capezzali
Planner II
Buncombe County Planning & Development
46 Valley Street
Asheville, NC 28801
(828) 250-4832
Shannon.capezzali@buncombecounty.org

From: Lee Klieman <Lee@pt-engineering.net>
Sent: Tuesday, June 05, 2018 10:59 AM
To: slcannon@ncdot.gov; mkcalloway@ncdot.gov; aghenderson@ncdot.gov; tswilson@ncdot.gov; dcsellers1@ncdot.gov; zoningquestions <zoningquestions@buncombecounty.org>; lyuba@landofsky.org; tokolichany@ashevillenc.gov; stuch@ashevillenc.gov; kputnam@ashevillenc.gov
Cc: Peter Trencansky <peter@pt-engineering.net>
Subject: [EXTERNAL] NCDOT STIP U-4739 Traffic Forecast Questionnaire

CAUTION: External email. Do not click links or open attachments unless verified. Use the "Phish Alert" button to report all suspicious email.

My name is Lee Klieman and my firm, Patriot Transportation Engineering, is in the process of preparing a traffic forecast for NCDOT STIP Project No. U-4739, which would widen Amboy Road and Meadow Road (both SR 3556) to add a median separation in Buncombe County. During the development of the forecast we utilize numerous resources, one of which is to gain a better understanding of the study area through discussing the project with local planners and engineers. I have attached a brief questionnaire that will help us gain a better understanding of the study area as we prepare the forecast. Besides local knowledge (represented by responses to the questionnaire), several other data sources will be consulted in shaping the forecast, so that engineering judgment will sometimes be necessary in determining the traffic forecast submitted to NCDOT.

If you would please review the attached questionnaire, we would greatly appreciate your time in answering these questions. You may answer the questions in text format in the attached file (or simply within an email) and return them

APPENDIX C:
TRAFFIC FORECAST TABLES

Table C1: 2018 Base Year No-Build Traffic Volumes

Forecast Location	NCDOT Historic Count Data							AADT Extrapolated to 2018 (1)	Project Specific Count Data ⁽²⁾		2017 No-Build Traffic Forecast
	2010	2011	2012	2013	2014	2015	2016		TMC	Mainline	
SR 3556 (Amboy Rd) - I-240 to Carrier Park Driveway									11,200 (3) 11,700 (3)		11,600
SR 3556 (Amboy Rd) - Carrier Park Driveway to Short Michigan Avenue									11,700 (3) 12,500 (3)	11,500	11,700
SR 3556 (Amboy Rd) - Short Michigan Avenue to State Street									12,400 (3) 11,800 (3)		11,700
SR 3556 (Amboy Rd) - State Street to Riverview Drive	13,000		9,900				13,000	11,900	14,200 (3) 14,300 (3)		14,300
SR 3556 (Amboy Rd) - Riverview Drive to Lyman Street/ SR 3556 (Meadow Rd)	14,000		11,000		12,000		14,000	12,000	14,900 (3) 15,400 (3)		15,100
SR 3556 (Meadow Rd) - SR 3556 (Amboy Rd) to Victoria Rd	17,000		12,000		15,000		17,000	16,000	18,700 (3) 18,600 (3)		18,400
SR 3556 (Meadow Rd) - Victoria Rd to McDowell Street/ Habitat Driveway	14,000		15,000				15,000	15,400	16,700 (3) 16,700 (3)	13,900	16,400
SR 3556 (Meadow Rd) - Mcdowell Street / Habitat Driveway to US 25 (Biltmore Avenue)									11,500 (3) 11,200 (3)		11,400
NC 81 (Bryson Street) - East of US 25 (Biltmore Avenue)	11,000		11,000		10,000		12,000	10,900	12,300 (3)		12,200
I-240 - North of SR 3556 (Amboy Rd)	53,000	53,000	55,000	58,000	59,000	57,000	62,000	62,400	68,800 (3)		68,600
I-240 - South of SR 3556 (Amboy Rd)	63,000	63,000	64,000	67,000	69,000	68,000	73,000	72,700	80,100 (3)		80,200
Carrier Park Driveway - South of SR 3556 (Amboy Rd)									500 (3)		500
Short Michigan Avenue - North of SR 3556 (Amboy Rd)									1,200 (3)		1,200
Short Michigan Avenue - South of SR 3556 (Amboy Rd)									1,700 (3)		1,800
State Street - North of SR 3556 (Amboy Rd)									5,500 (3)		5,600
Riverview Drive - North of SR 3556 (Amboy Rd)	980		1,100		990		920	1,000	1,600 (3)		1,600
Lyman Street - North of SR 3556 (Amboy Rd)	7,100		6,100		6,500		8,200	7,400	9,000 (3)		9,100
Victoria Road - North of SR 3556 (Meadow Rd)									9,900 (3)		10,000

Table C1: 2018 Base Year No-Build Traffic Volumes

Forecast Location	NCDOT Historic Count Data							AADT Extrapolated to 2018 (1)	Project Specific Count Data ⁽²⁾		2017 No-Build Traffic Forecast
	2010	2011	2012	2013	2014	2015	2016		TMC	Mainline	
McDowell Street - North of SR 3556 (Meadow Rd)									8,400 (3)		8,400
Habitat Driveway - South of SR 3556 (Meadow Rd)									1,500 (3)		1,600
US 25 (Biltmore Avenue) - North of SR 3556 (Meadow Rd)			20,000		20,000		19,000	18,700	20,200 (3)		20,200
US 25 (Biltmore Avenue) - South of SR 3556 (Meadow Rd)			22,000		21,000		22,000	20,100	21,600 (3)		22,200

Notes:

- (1) Data extrapolated to 2018 based on linear regression of 2006-2016 data
- (2) All Project Specific Counts were converted to AADT based on the NCDOT Traffic Survey Unit ATR Seasonal Factors as described in Section 2.3
- (3) 2018 13-hour Turning Movement Count - factored to 24-hour volumes and adjusted to AADT.
- (4) 2018 Project Specific Mainline Count - Adjusted to AADT.

Table C2: 2018 Base Year No-Build Design Data – Truck Percentages

Forecast Location	Previous Forecast		Project Specific Count Data		Selected 2017 BY NB Value
	Truck Percentage	STIP Project	TMC	Mainline	
SR 3556 (Amboy Rd) - I-240 to Carrier Park Driveway	4 , 3	I-2513	4 , 1 (1) 3 , 1 (1)		4 , 1
SR 3556 (Amboy Rd) - Carrier Park Driveway to Short Michigan Avenue			3 , 1 (1) 3 , 1 (1)	(6 , 1) (2)	4 , 1
SR 3556 (Amboy Rd) - Short Michigan Avenue to State Street			3 , 1 (1) 1 , 3 (1)		4 , 1
SR 3556 (Amboy Rd) - State Street to Riverview Drive			1 , 3 (1) 1 , 1 (1)		4 , 1
SR 3556 (Amboy Rd) - Riverview Drive to Lyman Street/ SR 3556 (Meadow Rd)			1 , 1 (1) 3 , 1 (1)		4 , 1
SR 3556 (Meadow Rd) - SR 3556 (Amboy Rd) to Victoria Road			3 , 1 (1) 3 , 1 (1)		4 , 1
SR 3556 (Meadow Rd) - Victoria Road to Mcdowell Street/ Habitat Driveway			4 , 1 (1) 3 , 1 (1)	(8 , 1) (2)	4 , 1
SR 3556 (Meadow Rd) - Mcdowell Street/ Habitat Driveway to US 25 (Biltmore Avenue)	6 , 1	U-5832	3 , 1 (1) 3 , 1 (1)		4 , 1
NC 81 (Bryson Street) - East of US 25 (Biltmore Avenue)	5 , 1	U-5832	2 , 1 (1)		4 , 1
I-240 - North of SR 3556 (Amboy Rd)	3 , 3	I-2513	3 , 2 (1)		3 , 3
I-240 - South of SR 3556 (Amboy Rd)	3 , 3	I-2513	3 , 2 (1)		3 , 3
Carrier Park Driveway - South of SR 3556 (Amboy Rd)			2 , 0 (1)		2 , 1
Short Michigan Avenue - North of SR 3556 (Amboy Rd)			3 , 0 (1)		2 , 1
Short Michigan Avenue - South of SR 3556 (Amboy Rd)			2 , 1 (1)		2 , 1
State Street - North of SR 3556 (Amboy Rd)			1 , 2 (1)		2 , 2
Riverview Drive - North of SR 3556 (Amboy Rd)			1 , 0 (1)		2 , 1
Lyman Street - North of SR 3556 (Amboy Rd)			5 , 1 (1)		5 , 1
Victoria Road - North of SR 3556 (Meadow Rd)			1 , 1 (1)		2 , 1

Table C2: 2018 Base Year No-Build Design Data – Truck Percentages

Forecast Location	Previous Forecast		Project Specific Count Data		Selected 2017 BY NB Value
	Truck Percentage	STIP Project	TMC	Mainline	
McDowell Street - North of SR 3556 (Meadow Rd)			3 , 1 (1)		3 , 1
Habitat Driveway - South of SR 3556 (Meadow Rd)			2 , 0 (1)		2 , 1
US 25 (Biltmore Avenue) - North of SR 3556 (Meadow Rd)	4 , 1	U-5832	2 , 1 (1)		3 , 1
US 25 (Biltmore Avenue) - South of SR 3556 (Meadow Rd)	4 , 1	U-5832	2 , 1 (1)		3 , 1

Notes:

- (1) 2018 13-hour Turning Movement Count
- (2) 2018 Volume, Speed, Class Mainline Count

Table C3: 2018 Base Year No-Build Design Data – Directional Distribution

Forecast Location	Previous Forecast		Project Specific Count Data		Selected 2017 BY NB Value
	Directional Distribution	STIP Project	TMC	Mainline	
SR 3556 (Amboy Rd) - I-240 to Carrier Park Driveway	55 WB	I-2513	60 WB (1) 59 WB (1)		60 WB
SR 3556 (Amboy Rd) - Carrier Park Driveway to Short Michigan Avenue			59 WB (1) 57 WB (1)	84 WB (2)	60 WB
SR 3556 (Amboy Rd) - East of Short Michigan Avenue			59 WB (1) 59 WB (1)		60 WB
SR 3556 (Amboy Rd) - State Street to Riverview Drive			62 WB (1) 63 WB (1)		65 WB
SR 3556 (Amboy Rd) - Riverview Drive to Lyman Street/ SR 3556 (Meadow Rd)			63 WB (1) 63 WB (1)		65 WB
SR 3556 (Meadow Rd) - SR 3556 (Amboy Rd) to Victoria Road			64 NB (1) 63 WB (1)		65 NB
SR 3556 (Meadow Rd) - Victoria Road to Mcdowell Street/ Habitat Driveway			54 WB (1) 62 WB (1)	57 WB (2)	60 WB
SR 3556 (Meadow Rd) - Mcdowell Street/ Habitat Driveway to US 25 (Biltmore Avenue)	55 EB	U-5832	55 WB (1) 51 WB (1)		60 WB
NC 81 (Bryson Street) - East of US 25 (Biltmore Avenue)	55 EB	U-5832	63 WB (1)		60 WB
I-240 - North of SR 3556 (Amboy Rd)	55 SB	I-2513	50 SB (1)		55 SB
I-240 - South of SR 3556 (Amboy Rd)	55 SB	I-2513	51 SB (1)		55 SB
Carrier Park Driveway - South of SR 3556 (Amboy Rd)			58 SB (1)		60 SB
Short Michigan Avenue - North of SR 3556 (Amboy Rd)			61 NB (1)		60 NB
Short Michigan Avenue - South of SR 3556 (Amboy Rd)			51 SB (1)		55 SB
State Street - North of SR 3556 (Amboy Rd)			60 NB (1)		60 NB
Riverview Drive - North of SR 3556 (Amboy Rd)			53 NB (1)		55 NB
Lyman Street - North of SR 3556 (Amboy Rd)			55 NB (1)		55 NB
Victoria Road - North of SR 3556 (Meadow Rd)			67 SB (1)		65 SB

Table C3: 2018 Base Year No-Build Design Data – Directional Distribution

Forecast Location	Previous Forecast		Project Specific Count Data		Selected 2017 BY NB Value
	Directional Distribution	STIP Project	TMC	Mainline	
McDowell Street - North of SR 3556 (Meadow Rd)			66 SB (1)		65 SB
Habitat Driveway - South of SR 3556 (Meadow Rd)			52 SB (1)		55 SB
US 25 (Biltmore Avenue) - North of SR 3556 (Meadow Rd)	55 SB	U-5832	51 NB (1)		55 SB
US 25 (Biltmore Avenue) - South of SR 3556 (Meadow Rd)	55 SB	U-5832	55 SB (1)		55 SB

Notes:

- (1) 2018 13-hour Turning Movement Count
- (2) 2018 Volume, Speed, Class Mainline Count

Table C4: 2018 Base Year No-Build Design Data – Peak Hour Factor

Forecast Location	Previous Forecast		Project Specific Count Data		Selected 2018 BY NB Value
	Peak Hour Factor	STIP Project	TMC	Mainline	
SR 3556 (Amboy Rd) - I-240 to Carrier Park Driveway	10	I-2513	8 (1) 8 (1)		9
SR 3556 (Amboy Rd) - Carrier Park Driveway to Short Michigan Avenue			9 (1) 9 (1)	10 (2)	9
SR 3556 (Amboy Rd) - Short Michigan Avenue to State Street			9 (1) 9 (1)		9
SR 3556 (Amboy Rd) - State Street to Riverview Drive			9 (1) 9 (1)		9
SR 3556 (Amboy Rd) - Riverview Drive to Lyman Street/ SR 3556 (Meadow Rd)			9 (1) 8 (1)		9
SR 3556 (Meadow Rd) - SR 3556 (Amboy Rd) to Victoria Road			8 (1) 8 (1)		8
SR 3556 (Meadow Rd) - Victoria Road to Mcdowell Street/ Habitat Driveway			8 (1) 8 (1)	9 (2)	8
SR 3556 (Meadow Rd) - Mcdowell Street/ Habitat Driveway to US 25 (Biltmore Avenue)	9	U-5832	8 (1) 8 (1)		8
NC 81 (Bryson Street) - East of US 25 (Biltmore Avenue)	8	U-5832	8 (1)		8
I-240 - North of SR 3556 (Amboy Rd)	9	I-2513	9 (1)		9
I-240 - South of SR 3556 (Amboy Rd)	9	I-2513	8 (1)		8
Carrier Park Driveway - South of SR 3556 (Amboy Rd)			10 (1)		10
Short Michigan Avenue - North of SR 3556 (Amboy Rd)			11 (1)		11
Short Michigan Avenue - South of SR 3556 (Amboy Rd)			15 (1)		14
State Street - North of SR 3556 (Amboy Rd)			10 (1)		10
Riverview Drive - North of SR 3556 (Amboy Rd)			11 (1)		11
Lyman Street - North of SR 3556 (Amboy Rd)			9 (1)		9
Victoria Road - North of SR 3556 (Meadow Rd)			8 (1)		8

Table C4: 2018 Base Year No-Build Design Data – Peak Hour Factor

Forecast Location	Previous Forecast		Project Specific Count Data		Selected 2018 BY NB Value
	Peak Hour Factor	STIP Project	TMC	Mainline	
McDowell Street - North of SR 3556 (Meadow Rd)			8 (1)		8
Habitat Driveway - South of SR 3556 (Meadow Rd)			8 (1)		8
US 25 (Biltmore Avenue) - North of SR 3556 (Meadow Rd)	8	U-5832	8 (1)		8
US 25 (Biltmore Avenue) - South of SR 3556 (Meadow Rd)	8	U-5832	8 (1)		8

Notes:

- (1) 2018 13-hour Turning Movement Count
- (2) 2018 Volume, Speed, Class Mainline Count

Table C5: Model Validation

Forecast Location	Model 2010		2018 No-Build		FY No-Build Volumes	
	Model Volume	AADT	Interpolated Model ⁽¹⁾	Forecast Volume	2040 Model	2040 Forecast
SR 3556 (Amboy Rd) - I-240 to Carrier Park Driveway	7,779		8,800	11,600	11,473	13,800
SR 3556 (Amboy Rd) - Carrier Park Driveway to Short Michigan Avenue	7,779		8,800	11,700	11,473	14,000
SR 3556 (Amboy Rd) - Short Michigan Avenue to State Street	6,595		7,500	11,700	9,982	13,900
SR 3556 (Amboy Rd) - East of State Street	9,530	13,000	11,200	14,300	15,906	17,500
SR 3556 (Amboy Rd) - Riverview Drive to Lyman Street/ SR 3556 (Meadow Rd)	9,530	14,000	11,200	15,100	15,906	18,300
SR 3556 (Meadow Rd) - SR 3556 (Amboy Rd) to Victoria Road	9,537	17,000	11,400	18,400	16,647	21,900
SR 3556 (Meadow Rd) - Victoria Road to Mcdowell Street/ Habitat Driveway	8,515	14,000	10,800	16,400	16,999	20,100
SR 3556 (Meadow Rd) - Mcdowell Street/ Habitat Driveway to US 25 (Biltmore Avenue)	5,507 6,710		7,300	11,400	12,103 13,543	14,400
NC 81 (Bryson Street) - East of US 25 (Biltmore Avenue)	7,442	11,000	9,200	12,200	13,939	14,500
I-240 - North of SR 3556 (Amboy Rd)	63,640	53,000	71,800	68,600	94,325	95,000
I-240 - South of SR 3556 (Amboy Rd)	71,419	63,000	80,300	80,200	104,543	105,400
Short Michigan Avenue - North of SR 3556 (Amboy Rd)	3,613		3,900	1,200	4,799	2,000
State Street - North of SR 3556 (Amboy Rd)	4,747		6,000	5,600	9,370	9,800
Lyman Street - North of SR 3556 (Amboy Rd)	8	7,100	200	9,100	742	14,000
Victoria Road - North of SR 3556 (Meadow Rd)	10,062		10,500	10,000	11,563	11,400
McDowell Street - North of SR 3556 (Meadow Rd)	4,199		4,900	8,400	6,966	11,700
US 25 (Biltmore Avenue) - North of SR 3556 (Meadow Rd)	26,436		27,800	20,200	31,473	23,000
US 25 (Biltmore Avenue) - South of SR 3556 (Meadow Rd)	24,236		24,900	22,200	26,622	24,300

Notes: (1) Interpolated volume between 2010 and 2040 model data

Table C6: 2040 No-Build Traffic Volumes

Forecast Location	Forecast 2018 Base Year NB	Historic Growth Rate		Model Growth Rate ⁽¹⁾	Chosen Growth Rate ⁽¹⁾	Model Volume Delta ⁽²⁾	Chosen Volume Delta ⁽²⁾	Future Year No-Build Volumes	
	AADT	2007-2016	1997-2016	2010-2040	2018-2040	2010-2040	2018-2040	2040 Model	2040 Forecast
SR 3556 (Amboy Rd) - I-240 to Carrier Park Driveway	11,600			1.30%	0.79%	3,694	2,200	11,473	13,800
SR 3556 (Amboy Rd) - Carrier Park Driveway to Short Michigan Avenue	11,700			1.30%	0.82%	3,694	2,300	11,473	14,000
SR 3556 (Amboy Rd) - Short Michigan Avenue to State Street	11,700			1.39%	0.79%	3,387	2,200	9,982	13,900
SR 3556 (Amboy Rd) - State Street to Riverview Drive	14,300	-0.36%	0.10%	1.72%	0.92%	6,376	3,200	15,906	17,500
SR 3556 (Amboy Rd) - Riverview Drive to Lyman Street/ SR 3556 (Meadow Rd)	15,100	-1.51%	-1.02%	1.72%	0.88%	6,376	3,200	15,906	18,300
SR 3556 (Meadow Rd) - SR 3556 (Amboy Rd) to Victoria Road	18,400	0.99%	-0.43%	1.87%	0.79%	7,110	3,500	16,647	21,900
SR 3556 (Meadow Rd) - Victoria Road to Mcdowell Street/ Habitat Driveway	16,400	0.99%	0.95%	2.33%	0.93%	8,484	3,700	16,999	20,100
SR 3556 (Meadow Rd) - Mcdowell Street/ Habitat Driveway to US 25 (Biltmore Avenue)	11,400			2.66% 2.37%	1.07%	6,596 6,833	3,000	12,103 13,543	14,400
NC 81 (Bryson Street) - East of US 25 (Biltmore Avenue)	12,200	-0.45%	0.30%	2.11%	0.79%	6,497	2,300	13,939	14,500
I-240 - North of SR 3556 (Amboy Rd)	68,600	2.05%	1.24%	1.32%	1.49%	30,685	26,400	94,325	95,000
I-240 - South of SR 3556 (Amboy Rd)	80,200	1.79%	1.13%	1.28%	1.25%	33,124	25,200	104,543	105,400
Carrier Park Driveway - South of SR 3556 (Amboy Rd)	500				0.83%		100		600
Short Michigan Avenue - North of SR 3556 (Amboy Rd)	1,200			0.95%	2.35% ⁽³⁾	1,186	800 ⁽³⁾	4,799	2,000
Short Michigan Avenue - South of SR 3556 (Amboy Rd)	1,800				0.70%		300		2,100
State Street - North of SR 3556 (Amboy Rd)	5,600			2.29%	2.58%	4,623	4,200	9,370	9,800
Riverview Drive - North of SR 3556 (Amboy Rd)	1,600	-0.65%	1.00%		0.54%		200		1,800
Lyman Street - North of SR 3556 (Amboy Rd)	9,100	0.86%	0.62%	n/a	1.98%	734	4,900	742	14,000
Victoria Road - North of SR 3556 (Meadow Rd)	10,000			0.46%	0.60%	1,501	1,400	11,563	11,400
McDowell Street - North of SR 3556 (Meadow Rd)	8,400			1.70%	1.52%	2,767	3,300	6,966	11,700
Habitat Driveway - South of SR 3556 (Meadow Rd)	1,600				0.54%		200		1,800
US 25 (Biltmore Avenue) - North of SR 3556 (Meadow Rd)	20,200	-1.13%	-1.47%	0.58%	0.59%	5,037	2,800	31,473	23,000
US 25 (Biltmore Avenue) - South of SR 3556 (Meadow Rd)	22,200	-1.87%	-0.72%	0.31%	0.41%	2,386	2,100	26,622	24,300

Notes:

(1) Growth rate shown is the Compound Annual Growth Rate (CAGR).

(2) Volume Delta is the raw change in volume between either the model volumes or the forecast volumes

(3) Growth rate and model volumes shown are for a centroid connector that was determined to be representative of the change in volume for the subject roadway

Table C7: 2040 Build Traffic Volumes

Forecast Location	2040 Model Volumes, Daily		Model Diversion Percent	Chosen Diversion Percent	Model Volume Delta	Chosen Volume Delta	2040 Forecast Volumes	
	No-Build	Build					No-Build	Build
SR 3556 (Amboy Rd) - I-240 to Carrier Park Driveway	11,473	11,961	4.25%	5.80%	488	800	13,800	14,600
SR 3556 (Amboy Rd) - Carrier Park Driveway to Short Michigan Avenue	11,473	11,961	4.25%	5.71%	488	800	14,000	14,800
SR 3556 (Amboy Rd) - Short Michigan Avenue to State Street	9,982	10,501	5.20%	5.76%	519	800	13,900	14,700
SR 3556 (Amboy Rd) - State Street to Riverview Drive	15,906	16,528	3.91%	5.14%	622	900	17,500	18,400
SR 3556 (Amboy Rd) - Riverview Drive to Lyman Street/ SR 3556 (Meadow Rd)	15,906	16,528	3.91%	4.92%	622	900	18,300	19,200
SR 3556 (Meadow Rd) - SR 3556 (Amboy Rd) to Victoria Road	16,647	17,290	3.86%	4.11%	643	900	21,900	22,800
SR 3556 (Meadow Rd) - Victoria Road to Mcdowell Street/ Habitat Driveway	16,999	17,648	3.82%	3.48%	649	700	20,100	20,800
SR 3556 (Meadow Rd) - Mcdowell Street/ Habitat Driveway to US 25 (Biltmore Avenue)	12,103	12,832	6.02%	5.56%	729	800	14,400	15,200
NC 81 (Bryson Street) - East of US 25 (Biltmore Avenue)	13,939	14,101	1.16%	1.38%	162	200	14,500	14,700
I-240 - North of SR 3556 (Amboy Rd)	94,325	94,498	0.18%	0.00%	173	0	95,000	95,000
I-240 - South of SR 3556 (Amboy Rd)	104,543	104,807	0.25%	0.00%	264	0	105,400	105,400
Carrier Park Driveway - South of SR 3556 (Amboy Rd)				0.00%		0	600	600
Short Michigan Avenue - North of SR 3556 (Amboy Rd)	4,799	4,800	0.02%	0.00% (1)	1	0 (1)	2,000	2,000
Short Michigan Avenue - South of SR 3556 (Amboy Rd)				0.00%		0	2,100	2,100
State Street - North of SR 3556 (Amboy Rd)	9,370	9,472	1.09%	1.02%	102	100	9,800	9,900
Riverview Drive - North of SR 3556 (Amboy Rd)				0.00%		0	1,800	1,800
Lyman Street - North of SR 3556 (Amboy Rd)	742	763	2.83%	0.00%	21	0	14,000	14,000
Victoria Road - North of SR 3556 (Meadow Rd)	11,563	11,588	0.22%	0.00%	25	0	11,400	11,400
McDowell Street - North of SR 3556 (Meadow Rd)	6,966	6,860	-1.52%	0.85%	-106	100	11,700	11,800
Habitat Driveway - South of SR 3556 (Meadow Rd)				0.00%		0	1,800	1,800
US 25 (Biltmore Avenue) - North of SR 3556 (Meadow Rd)	31,473	31,431	-0.13%	0.00%	-42	0	23,000	23,000
US 25 (Biltmore Avenue) - South of SR 3556 (Meadow Rd)	26,622	26,734	0.42%	0.82%	112	200	24,300	24,500

Notes:

(1) Diversion rate and model volumes shown are for a centroid connector that was determined to be representative of the change in volume for the subject roadway

APPENDIX D:

FRENCH BROAD RIVER MPO TRAVEL MODEL REVISIONS

The study area for the forecast is included the French Broad River MPO Travel Demand Model. The study area is located in the central area of the model and has good connectivity, with the model including all of the major roadways (I-240/I-26, US 25, NC 81, and the study roadways, Amboy Road and Meadow Road), and many of the minor y-line roadways. The French Broad River MPO Travel Demand Model (provided by NCDOT on 03/14/2018) was utilized as a tool in the development of the forecast.

The French Broad River MPO Model was developed in TransCAD (version 5.0 Build 2110) and was calibrated based on a base year of 2010, and has models for a future year of 2040.

No revisions were made to the calibrated 2010 Base Year Model.

A review was made of the 2040 Future Year Model, based on the French Broad River MPO (FBRMPO) *Metropolitan Transportation Plan 2015-2040* (2040 MTP) (adopted September 24, 2015 and amended on May 24, 2018). The review revealed the need to modify the existing Future Year Model network around the study corridor. The modifications are described below (all described modifications are in reference to the current 2040 Future Year Model network, as delivered).

- 2040 No-Build Scenario (All 2040 MTP projects included, except for U-4739)
 - I-2513 network modifications
 - The model network was updated to match the current preferred design alternative for STIP project I-2513. In the vicinity of the study area, this included modifying I-240/I-26, from I-40 to Patton Avenue, to match the preferred alignment and to provide a full-access interchange at Amboy Road (where the existing interchange only offers partial access).
 - The original future year network is shown in Figure D-1.
 - The updated future year network is shown in Figure D-2.
 - I-26, from I-240 to US 25
 - Widened from six lanes to eight lanes to match the MTP project BUNC3aa-H (STIP A-0010AA)
 - The model network area that includes the revisions is shown in Figure D-3.
 - NC 81 (Swannanoa River Road), from US 25 (Biltmore Avenue) to S Tunnel Road
 - Widened from 2 lanes (divided) to 4 lanes (undivided) to match the MTP project BUNC21c-H (STIP U-5832)
 - The model network area that includes the revisions is shown in Figure D-4 (with link IDs labeled).
 - Lyman Road, from Amboy Road to Hill Street
 - Future network attributes modified from 4 lanes to 2 lanes to reflect the current design concept, which would include complete streets features but no roadway widening.
 - The model network area that includes the revisions is shown in Figure D-5 (with link IDs labeled).
 - Amboy Road and Meadow Road
 - The future year network was modified for the No-Build scenario so that Amboy Road and Meadow Road were maintained in the same state as their Base Year configuration (2 lanes, undivided).
 - The model network area that includes the revisions is shown in Figure D-6 (with link IDs labeled).

- 2040 Build Scenario (All 2040 MTP projects included, including U-4739)
 - The network modifications for I-2513, I-26, NC 81, and Lyman Road made for the 2040 No-Build scenario were kept for the 2040 Build scenario
 - Amboy Road and Meadow Road
 - The future year network was modified for the Build scenario so that Amboy Road and Meadow Road were changed from 4 lanes, divided to 2 lanes, divided.
 - The model network area that includes the revisions is shown in Figure D-6.

Figure D-1: FBRMPO 2040 Network, I-2513 Revision Area, Original



Figure D-2: FBRMPO 2040 Network, I-2513 Revision Area, Revised



Figure D-3: FBRMPO 2040 Network, I-26 Revision Area

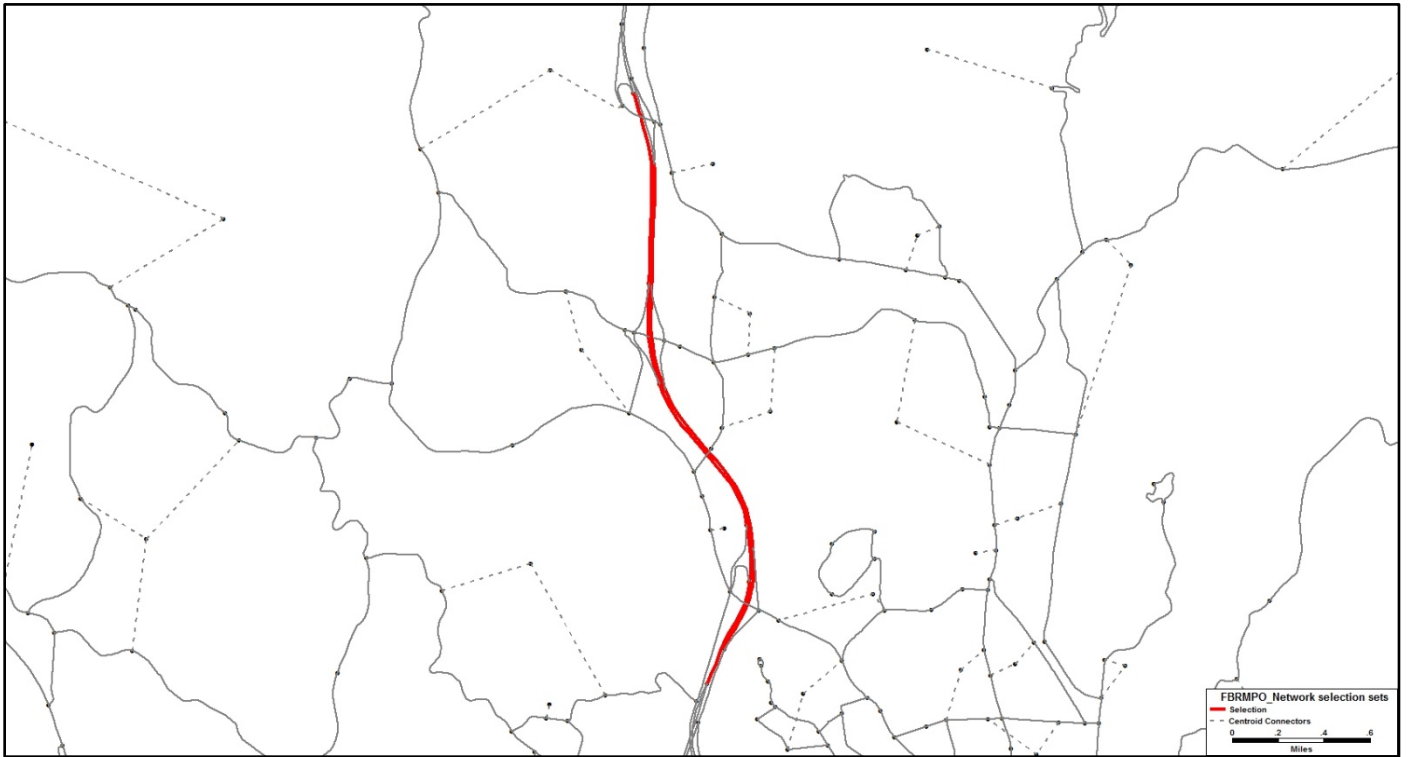


Figure D-4: FBRMPO 2040 Network, NC 81 Revision Area

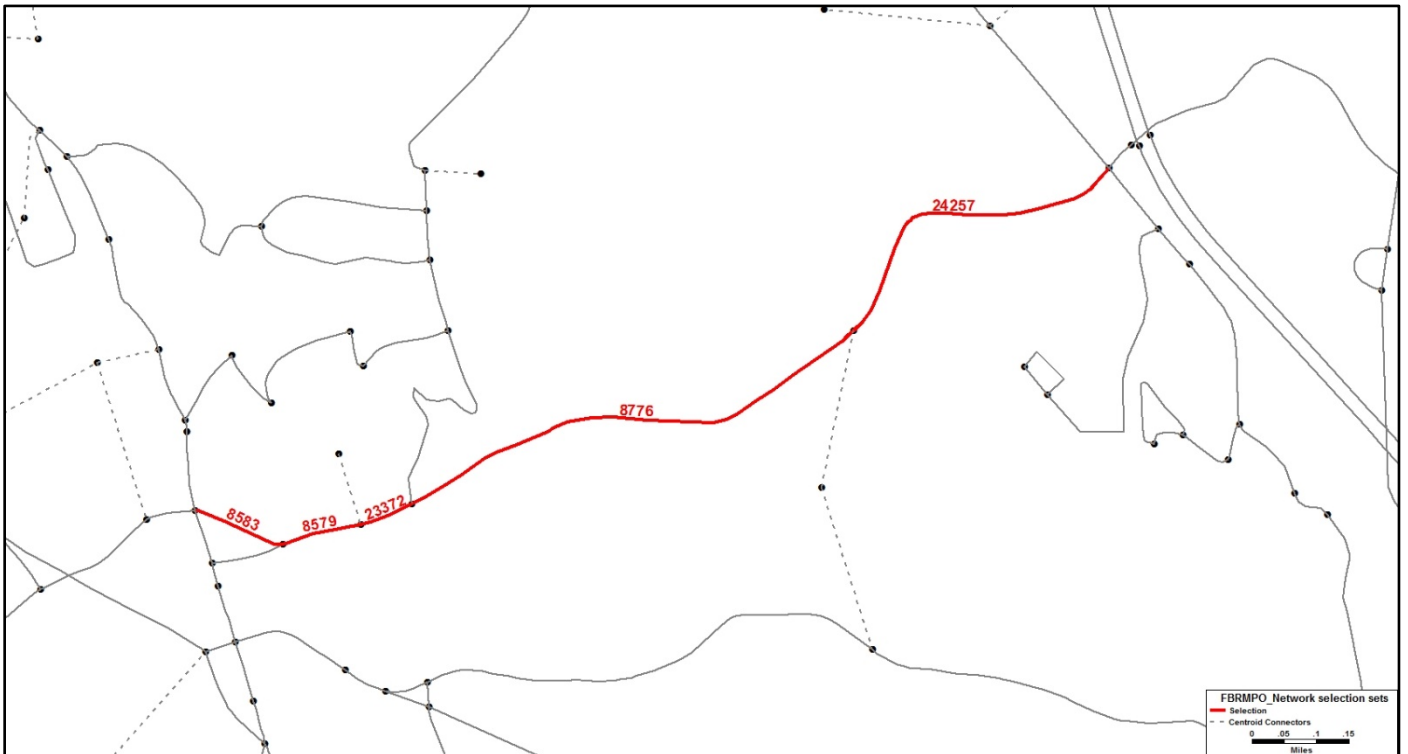


Figure D-5: FBRMPO 2040 Network, Lyman Rd Revision Area

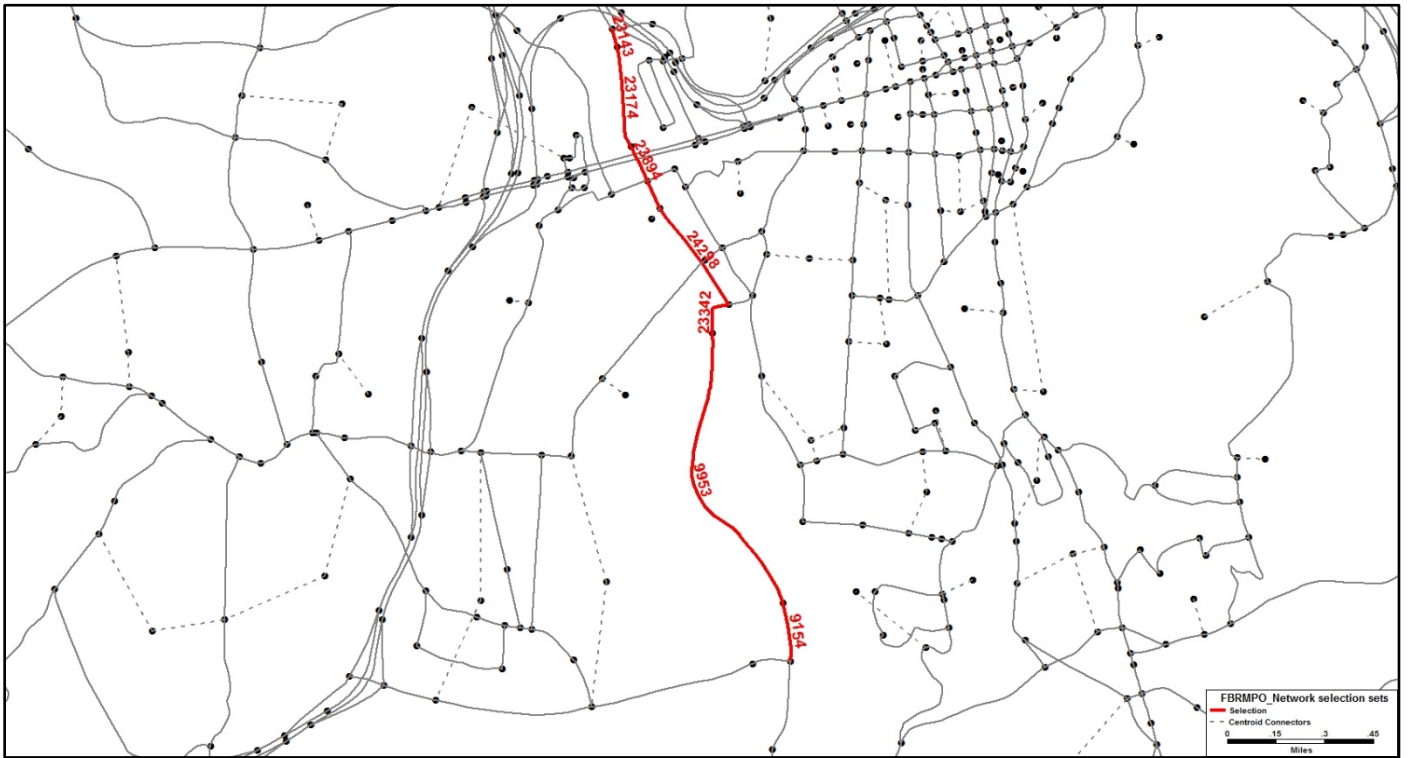
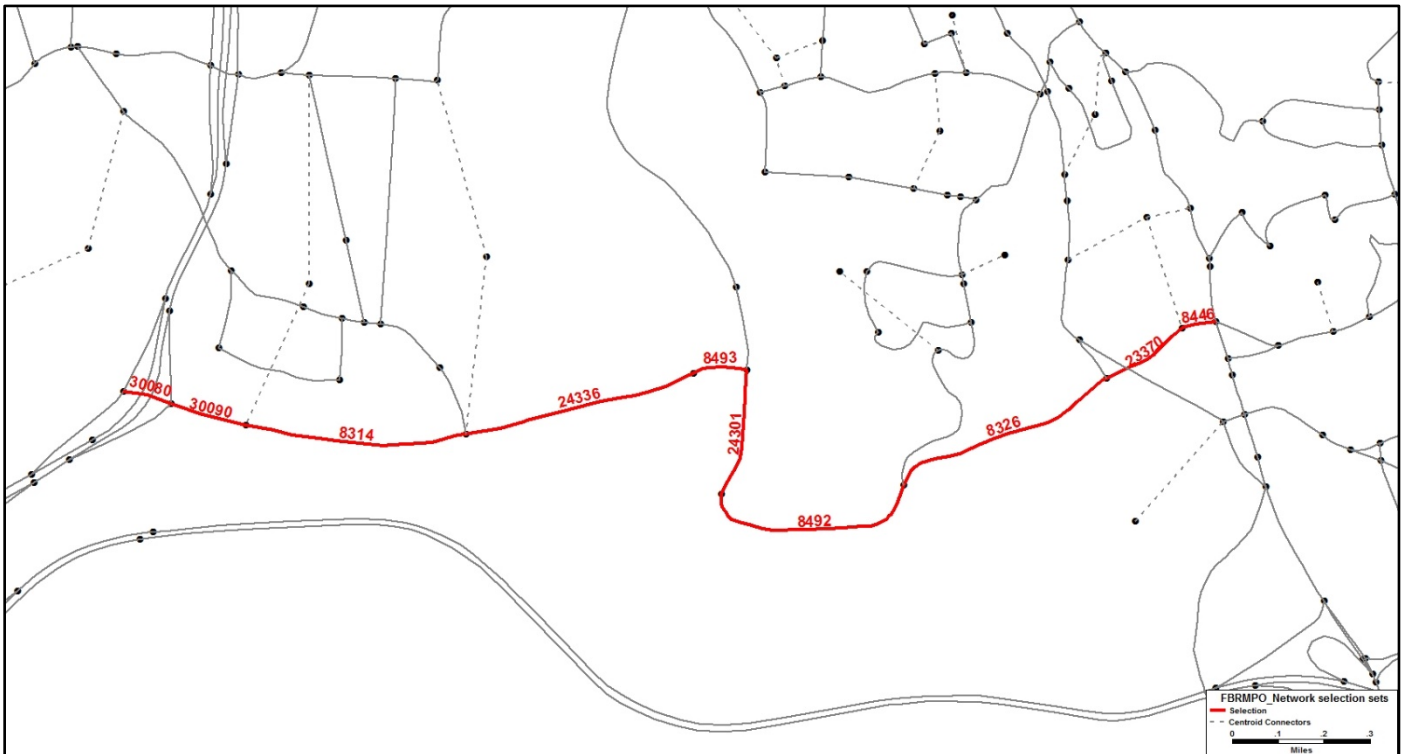


Figure D-6: FBRMPO 2040 Network, Amboy Rd/Meadow Rd Revision Area





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