

**Section 404/NEPA Merger Project Team Meeting
Purpose and Need and Proposed Study Area
for SR 3556 (Amboy Road/Meadow Road) Improvements**

SR 3556 (Amboy Road/Meadow Road)
from I-240 to NC 81/SR 3214 (Biltmore Avenue)
with a new bridge over the French Broad River in Asheville
Buncombe County

STIP Project U-4739

North Carolina Department of Transportation



Merger Concurrence Point 1

May 15, 2019

1. Introduction

Project Description

The North Carolina Department of Transportation (NCDOT) proposes to widen SR 3556 (Amboy Road/Meadow Road) to multi-lanes from I-240 to NC 81/SR 3214 (Biltmore Avenue), with a new bridge over the French Broad River, in Asheville, Buncombe County, North Carolina. The project is approximately 2.7 miles long and is identified in the State Transportation Improvement Program (STIP) as Project No. U-4739, WBS No. 39741.1.2, Federal Aid No. STP-3556(2). The project location is shown in attached **Figure 1**.

Merger Screening

In coordination with the US Army Corps of Engineers (USACE), it was determined NCDOT should follow the Section 404/NEPA Merger Process for this project. This decision was made at the Combined External Scoping/Merger Screening meeting held on November 29, 2018.

Purpose of this meeting

The purpose of this Merger Team meeting is to discuss the purpose and need for the project (Concurrence Point No. 1 [CP 1]) and the proposed project study area.

Appendices

Appendix A includes associated figures mentioned throughout this handout. **Appendix B** includes existing and projected travel demand along the corridor, provided in a Traffic Forecast (*U-4739 Traffic Forecast, July 10, 2018*). **Appendix C** provides the Capacity Analyses for the No-Build and Build Scenarios (*SR 3556 (Amboy Road/Meadow Road) Improvements, March 2019*):

- **Appendix A – Figures**
 - Figure 1 – Vicinity Map
 - Figure 2 – Study Area Map
 - Figure 3 – Environmental Features Map
 - Figure 4 – Community Context Map
- **Appendix B – Traffic Forecast**
 - 2018 Base Year No-Build
 - 2040 Future Year No-Build
 - 2040 Future Year Build
- **Appendix C – Capacity Analyses**
 - 2018 Base Year No-Build Conditions
 - 2040 Future Year No-Build
 - Build Alternative 1 – Maintain a two-lane facility and provide signalization and add turn lanes along the corridor as feasible and appropriate
 - Build Alternative 2 – Maintain a two-lane facility and convert each intersection to a roundabout

- Build Alternative 3 – Maintain a two-lane facility and where roundabouts are not appropriate, provide signalization along with turn lanes where feasible and appropriate **(to be included in future submittal)**
- **Appendix D – Concurrence Form**
 - Concurrence Point 1 Form – Purpose and Need and Proposed Study Area

2. Project Status, Background, Schedule, and Cost

The project is included in the current 2018-2027 STIP as project U-4739 and is being managed by NCDOT Project Management Unit. Right-of-way acquisition and construction are scheduled to begin in Fiscal Years 2022 and 2025, respectively.

The project consistently scored well for “safety” and “congestion” in multiple Prioritization processes, from SPOT 2.0 through SPOT 4.0, with SPOT 3.0 and 4.0 also having a high score in the “multimodal” category. Through these quantitative scoring processes, the U-4739 project had the following scores and was added to the STIP:

SPOT Version	Spot ID	Scoring Category		
		Congestion	Safety	Multimodal
2.0	491	57.44	88.71	
3.0	H090491	10	40	10
4.0	H090491	82.28	65.26	72.29

This project, or portions of this project, are included in the following metropolitan or local plans:

- **Living Asheville: A Comprehensive Plan for Our Future (2018)**- The plan recognizes the importance of the French Broad and Swannanoa riverfronts and notes ongoing efforts to enhance multimodal transportation and recreation opportunities along the riverfronts.
- **Blue Ridge Bike Plan, 2013**- The Land of Sky Regional Council was awarded a grant from NCDOT to develop a regional bicycle plan for seven mountain counties including Buncombe County. The plan recommends bike lanes along Amboy Road and Meadow Road within the project study area.
- **Comprehensive Bicycle Plan, 2008**- The City of Asheville’s comprehensive bicycle plan recommends bike lanes along Amboy Road and Meadow Road within the project study area.
- **City of Asheville Pedestrian Thoroughfare Plan, 2005**- The Asheville Sidewalk Needed Linkages with Greenways map identifies Amboy Road and Meadows Road within the project study area as roads in need of linkage to primary Greenways.
- **City of Asheville Greenway Master Plan, 2013**- The plan identifies the existing French Broad River West Bank greenway along Amboy Road within the project area and the planned Swannanoa River Greenway corridor which follows Meadow

Road within the project area as well as the planned French Broad River East Bank greenway which intersects the project at the Meadow Road/Amboy Road intersection.

- **Swannanoa River Greenway Studies (Phase 1 and 2)**- City of Asheville planning and preliminary engineering studies are underway for various portions of Swannanoa River corridor, including the Phase 2 feasibility study for the area along Thompson Road/Swannanoa River Road from Biltmore Ave adjacent to the eastern terminus of this U-4739 project, to US 74 Alt South Tunnel Road.
- **River Arts District Transportation Improvement Project (RADTIP)**- RADTIP is a major construction project that will re-build the roads along the east side of the French Broad River in the River Arts District. The southern project terminus along Lyman Street intersects STIP U-4739 at the Amboy Road intersection with Meadow Road. The 2.2-mile piece of the Wilma Dykeman Riverway includes a continuous multi-use path along the river.
- **Wilma Dykeman RiverWay Master Plan, 2004**- The Riverlink plan provides a conceptual framework for development of the RiverWay, a planned 17-mile transportation and recreational greenway corridor located along the French Broad and Swannanoa rivers. The U-4739 project falls within two of the plan's geographical districts: District 3 French Broad River Recreation Area, and District 4 Meadow Road. Within both districts, the plan recommends these components: multi-use path to the south, planting strip, marked bike lane, travel lane, median, travel lane, marked bike lane, planting strip, and sidewalk.

The project will include the following improvements:

- Several roadway typical section concepts for SR 3556 (Amboy Road/Meadow Road) are currently being considered including:
 - a. 2-lane median divided roadway
 - b. 3-lane undivided roadway

All typical sections will also include bicycle and pedestrian accommodations such as a 5-foot sidewalk on one side of the road and a 10-foot multi-use path on the other side, or sidewalks and bicycle lanes on both sides of the road.

- Intersections within the project corridor that may be improved include:
 - a. Amboy Road and I-240 ramp (unsignalized)
 - b. Amboy Road and Carrier Park Driveway (unsignalized)
 - c. Amboy Road and Short Michigan Avenue (unsignalized)
 - d. Amboy Road and State Street (signalized)
 - e. Amboy Road and Riverview Drive (unsignalized)
 - f. Amboy Road, Meadow Road/Lyman Street (signalized)
 - g. Meadow Road and Victoria Road (signalized)

- h. Meadow Road Short McDowell Street/Habitat for Humanity Driveway (signalized)
- i. Meadow Road and Biltmore Avenue (NC 81/SR 3214) (signalized)

Feasibility Study

NCDOT prepared a Feasibility Study for the widening of SR 3556 (Amboy Road/Meadow Road) from I-240 to NC 81/SR 3214 (Biltmore Avenue) in January 2004 (FS-9913D). The Feasibility Study recommended the typical section on SR 3556 (Amboy Road) to be a four-lane median-divided curb and gutter section with a 23-foot raised grass median, 75-foot wide face to face of curbs with 10-foot berms, on 100 feet of right of way, with a bridge on new alignment over the French Broad River.

Other TIP Projects in the Area

- **STIP Projects U-6046 and U-5832**, combined, propose upgrades to Swannanoa River Road (NC 81) from Biltmore Road to Tunnel Road (US 70).
- **STIP Project U-5019** will construct an interconnected network of pedestrian, bicycle, roadway and streetscape improvements in southwest Asheville including RADTIP Improvements.
- **STIP Project I-2513**, the proposed I-26 Connector project, would construct approximately 7 miles of freeway that would connect I-26 in southwest Asheville to U.S. 19/23/70 in northwest Asheville.

Project Schedule

The tentative project schedule is shown below. Dates are preliminary and subject to change.

- | | |
|---|------------------------|
| • Data Collection (including Traffic) | November 2018 |
| • Initial Project Assessments | Late 2018 - Early 2019 |
| • Open House Public Meeting #1 (concepts) | March 28, 2019 |
| • Open House Public Meeting #2 (designs) | February 2020 |
| • Environmental Document – Type III CE | May 2020 |
| • LEDPA | FY 2020 |
| • Right of Way Plans | FY 2022 |
| • Let to Construction | FY 2025 |

Cost (2018-2027 STIP)

- | | |
|-----------------|---------------------|
| • Right of Way | \$13,200,000 |
| • Construction | \$34,500,000 |
| • Utilities | <u>\$ 1,600,000</u> |
| • Total: | \$49,300,000 |

3. Merger Concurrence Point 1 – PURPOSE AND NEED AND PROPOSED STUDY AREA

Environmental Resources

Environmental resources in the project area are listed below in **Table 1** and shown in attached **Figure 3** (Appendix A). These features have been delineated as part of the Natural Resources Technical Report (NRTR, November 2018).

The study area is part of the French Broad River basin (U.S. Geological Survey [USGS] Hydrologic Unit [HUC] 06010105). There are no water supply watersheds (WS-I or WS-II) within or within 1.0 mile downstream of the study area. There are no primary nursery areas (PNA) or anadromous fish within the study area. Additionally, there are no NCDWR- or North Carolina Wildlife Resources Commission (NCWRC)-designated trout waters within or within 1.0 mile of the study area. The North Carolina 2016 Final 303(d) list of impaired waters identifies no waters within or within 1.0 mile downstream of the study area as impaired.

The project is located along the banks of the French Broad and Swannanoa Rivers in south Asheville, near Mission Hospital and the developing River Arts district to the north, and the popular Biltmore Estate tourist destination across the rivers to the south. Development surrounding Meadow Road is mostly industrial, with the Norfolk Southern freight rail operations having a strong presence. In the western half of the project area, Amboy Road is a two-lane road that parallels a linear collection of riverfront parks: Carrier Park, Amboy Riverfront Park, and French Broad River Park. Development to the north of Amboy Road is comprised primarily of residential neighborhoods. Asheville-Buncombe Technical Community College (AB Tech) lies just north of Meadow Road on Victoria Road, and generates a notable level of traffic on Meadow Road.

Existing Roadway Conditions and Classifications

Amboy Road is a 2-lane undivided roadway with grass shoulders; 2 lanes undivided with 2-foot paved shoulders along Meadow Road from the Amboy Road/Lyman Street intersection to west of the bridge over NS Railroad where it transitions to a 3-lane curb and gutter section to east of the Victoria Street intersection. It then transitions back to a 2-lane undivided shoulder section to the project's eastern terminus at NC 81/SR 3214 (Biltmore Avenue). The posted speed limit is 45 mph along Amboy Road, and 35 mph along Meadow Road.

Existing Amboy Road and Meadow Road are classified as a Minor Arterial in the NCDOT Functional Classification System. I-240 near the western terminus is classified as an Interstate, and Biltmore Avenue near the eastern terminus is classified as a Minor Arterial.

Purpose and Need of Project

NCDOT Division of Highways – Project Management Unit is currently managing the project development, environmental, and engineering studies for the proposed improvements to Amboy Road/Meadow Road in Buncombe County (U-4739). The project is included in the approved 2018-2027 STIP and is scheduled for right-of-way in fiscal year 2022 and construction in 2025. The project will include analysis of widening and associated improvements to this 2.7-mile segment of SR 3556 (Amboy Road/Meadow Road) from I-240 to NC 81/SR 3214 (Biltmore Avenue).

The attached figures provide details regarding the proposed project footprint and the potential environmental resources present. The attached figures are located in Appendix A and are as follows:

- Figure 1 – Vicinity Map
- Figure 2 – Study Area Map
- Figure 3 – Environmental Features Map
- Figure 4 – Community Context Map

The **NEED** for this study can be described as follows:

Operational and capacity deficiencies exist at the intersections along SR 3556 (Amboy Road/Meadow Road) within the project limits. These intersections are expected to worsen in the future.

Based on the Traffic Forecast Report for U-4739 (July 2018), 2018 annual average daily traffic (AADT) volumes ranged between 11,600 vehicles per day (vpd) along Amboy Road between I-240 and Carrier Park Driveway, and 18,400 vpd along Meadow Road between Amboy Road and Victoria Road (refer to Appendix B). These volumes are forecasted to increase to between approximately 13,800 and 21,900, in these same locations, respectively, in 2040 without construction of the project.

Based on the Capacity Analysis (*SR 3556 (Amboy Road/Meadow Road) Improvements, March 2019*), for the **2018 Base Year No-Build Scenario**:

- During the AM peak period, 3 of 5 signalized intersections are operating at LOS E or F.
- During the PM peak period, 3 of 5 signalized intersections are operating at LOS E or F.
- 46% of the “lane groups”, or one or more lanes of an intersection that accommodate similar traffic movements are operating at LOS E or F in AM peak hour, and 39% are operating at LOS E or F in the PM peak hour.
- One movement of the three unsignalized intersections is operating at LOS E or worse in a peak hour.

With the expected increase in traffic volumes along the corridor in 2040, further operational degradation at the intersections is expected without improvements to the corridor, as shown in the results of the capacity analysis for the **2040 Future Year No Build Scenario**:

- All five signalized intersections operate at LOS E or worse in at least one peak hour.
- During the AM peak period, 4 of 5 signalized intersections are expected to operate at LOS F.
- During the PM peak period, 5 of 5 signalized intersections are expected to operate at LOS E or F.

- 54% of the “lane groups”, or one or more lanes of an intersection that accommodate similar traffic movements are operating at LOS E or F in AM peak hour, and 71% are expected to operate at LOS E or F in the PM peak hour.
- Six movements of the five unsignalized intersections are expected to operate at LOS E or worse in a peak hour.

The bridge over the French Broad River is functionally obsolete and is in need of replacement.

NCDOT Bridge Management Unit records indicate Bridge No. 521 currently has a sufficiency rating of 50.48 out of a possible 100 for a new structure. The bridge, built in 1951, is considered functionally obsolete due to a deck geometry rating of 3 out of 9 according to Federal Highway Administration standards.

There is a lack of parallel east-west connectivity across Asheville.

In response to the Start of Study input request letters that were sent out in August 2018, the French Broad River Metropolitan Planning Organization (FBRMPO) stated that the Amboy/Meadow Road corridor is currently serving the function of being one of the few relatively flat roadways that travel across town and connect major employment centers such as West Asheville, Downtown Asheville, Mission Hospital, Biltmore Village and Asheville Mall.

Existing bicycle, pedestrian and greenway facilities within the project area include a few short-disconnected sections of sidewalk, with pedestrian crosswalks in four locations, as well as the French Broad River Greenway and the signed City of Asheville bike route on Lyman Street. Lyman Street, a municipal road, is a City of Asheville bicycle route with bicycle lanes in each direction.

There are existing safety concerns with pedestrian crossings along Amboy Road.

The project area attracts a high number of bicycle and pedestrian activity due to the nearby parks and walkable neighborhoods. FBRMPO staff reported that pedestrian crossing safety issues have been observed on Amboy Road; even with installed pedestrian crossing signs motorists are traveling at a fast speed and not always observant of pedestrians trying to connect from the West Asheville neighborhoods to Carrier Park. Based on NCDOT bike and pedestrian crash data, three bicycle crashes occurred at Meadow Road intersections and two pedestrian crashes occurred at Amboy Road intersections.

The **PURPOSE** for the proposed action is as follows:

- *Address the operational and capacity deficiencies that exist at the intersections within the project corridor.*

- *Replace Bridge No. 521 over the French Broad River*
- *Improve bicycle and pedestrian accommodations by providing a multimodal corridor that is compatible with the city of Asheville's Wilma Dykeman Riverway Master Plan and other local plans.*

Proposed Project Study Area

The proposed study area developed to address the purpose and need of U-4739 is shown in attached **Figures 1 and 2** (Appendix A). The study area ranges between 300-620 feet wide and begins just east of I-240 and extends approximately 1.12 miles east along Amboy Road to Meadow Road. The study area continues south along Meadow Road for approximately 1.54 miles to the project terminus at Biltmore Avenue. The study area also extends along the following intersecting roads:

- 400 linear feet north along Short Michigan Avenue
- 915 linear feet north along State Street, also extending 330 linear feet east along Lamb Avenue and Joyner Avenue
- 628 linear feet north along Riverview Drive
- 748 linear feet north along Lyman Street
- 1,466 linear feet north along Victoria Road
- 900 linear feet north and south along Biltmore Avenue

The study area does NOT extend into the Biltmore Estate property.

The Concurrence Point 1 concurrence form, which includes the proposed purpose and need and project study area, is attached to this package in Appendix D.

Table 1. – Environmental Resources within the Study Area

Cultural Resources	
Archaeology	<ul style="list-style-type: none"> • Survey Required, August 20, 2018 • Additional deep-trench testing required on Site 31BN185, located on NS property, currently being performed/evaluated for NR Eligibility
Historic Architecture	<ul style="list-style-type: none"> • Survey Required (August 7, 2018) • Several identified and unidentified properties within the Area of Potential Effects including National Register listed, Determined Eligible, and locally landmarked
Human Environment Resources	
Community Resources	1 Community Center - Pisgah View Apartments Community Center
	1 Church – West Asheville House of Prayer
	1 School – Portion of AB Tech Campus located north of Meadow Road on Victoria Road
	1 Health/Rehabilitation Center – Stone Creek Health and Rehabilitation Center
Public Parks	French Broad River Park
	Amboy Riverfront Park
	Carrier Park
	<u>Future</u> Karen Cragolin Park (former USEPA designated brownfield site)
Greenways	French Broad River Greenway
	<u>Future</u> Swannanoa River Greenway
Land and Water Conservation Fund (LWCF) Properties	French Broad River Park - Section 6(f) LWCF used to develop park
High % Special Populations	Yes – Minority and/or Low-Income
Natural Environment Resources	

Table 1. – Environmental Resources within the Study Area

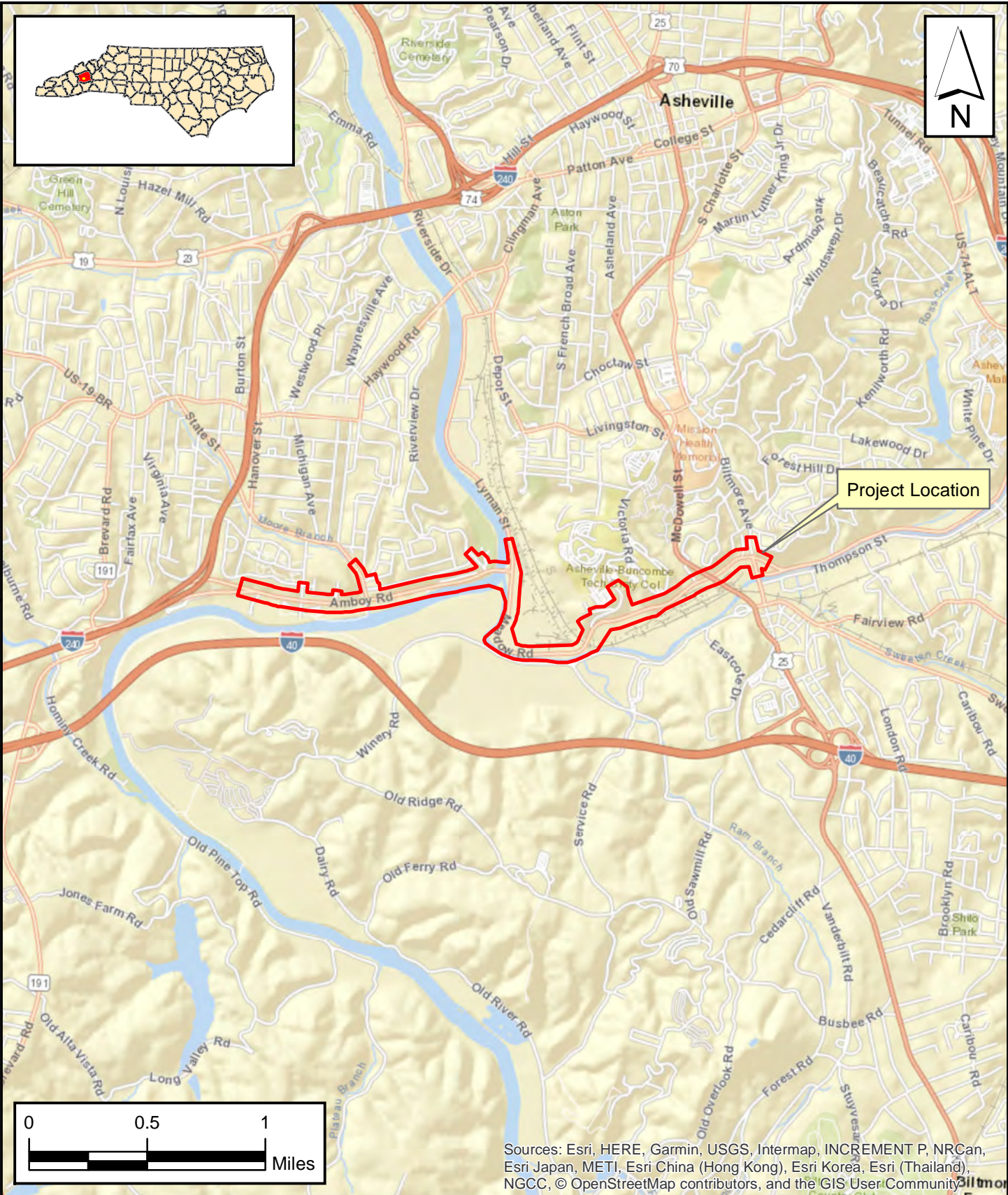
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Streams Delineated as Part of This Project /Number of Crossings	6 potential jurisdictional stream crossings 7,885 linear feet within project study area; Streams include the French Broad River, Moore Branch, Swannanoa River, SA, SB and SC
Wetlands Delineated as Part of This Project	8 potential jurisdictional wetlands totaling 0.59 acres
Water Supply Watershed Critical Areas	No
Navigable Waters	Yes (French Broad River)
Stream Mitigation Sites	Possible on-site at Moore Branch (intersection of State Street and Amboy Road)
Riparian Buffer Rules Apply	No
List of Threatened and Endangered Species and Biological Conclusions	Bog turtle (T[S/A]) – Not Required
	Bald Eagle (BGPA) – No Impact
	Carolina northern flying squirrel (E) – No Effect
	Grey Bat (E) – Unresolved
	Northern long-eared bat (T) – Unresolved
	Spotfin chub (T) – Unresolved
	Appalachian elktoe (E) – Unresolved
	Rusty-patched bumble bee (E) – N/A
	Spruce-fir moss spider (E) – No Effect
	Tan riffleshell (E) – Unresolved
	Blue Ridge goldenrod (T) – No Effect
	Bunched arrowhead (E) – No Effect
	Mountain sweet pitcherplant (E) – No Effect
	Spreading avens (E) – No Effect
Virginia spiraea (T) – No Effect	
Rock gnome lichen (E) – No Effect	

Appendix A
Figures



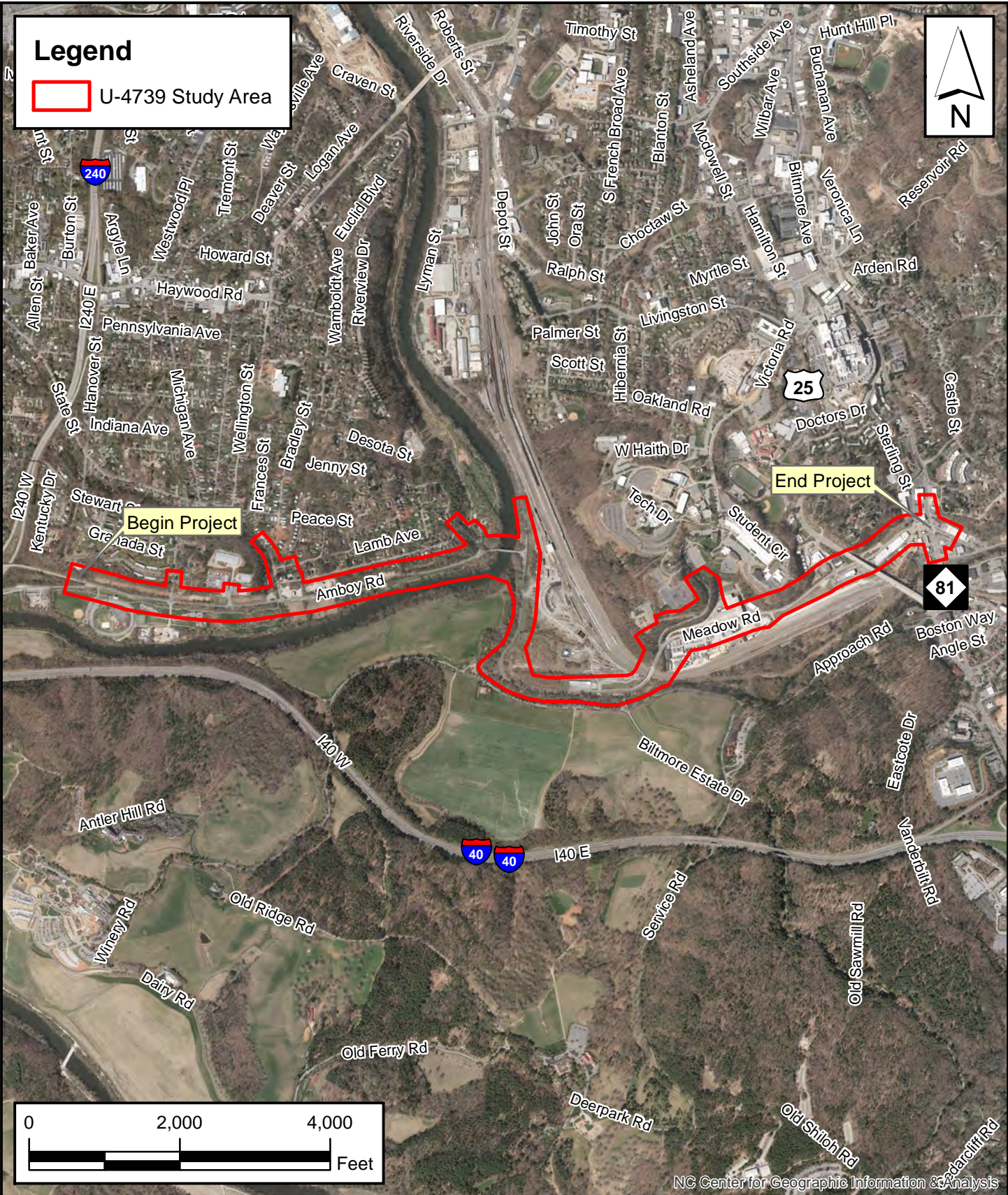
**NORTH CAROLINA
DEPARTMENT
OF TRANSPORTATION
DIVISION OF HIGHWAYS**

**VICINITY MAP
WIDEN SR 3556 (AMBOY RD / MEADOW RD)
TO MULTI-LANES FROM I-240 TO
NC 81 / SR 3214 (BILTMORE AVE)
WITH NEW BRIDGE OVER THE
FRENCH BROAD RIVER**

FA NO. STP-3556(2)

County:	BUNCOMBE
Div:	13 STIP# U-4739
WBS:	39741.1.2
Date:	NOVEMBER 2018

**Figure
1**



NC Center for Geographic Information & Analysis



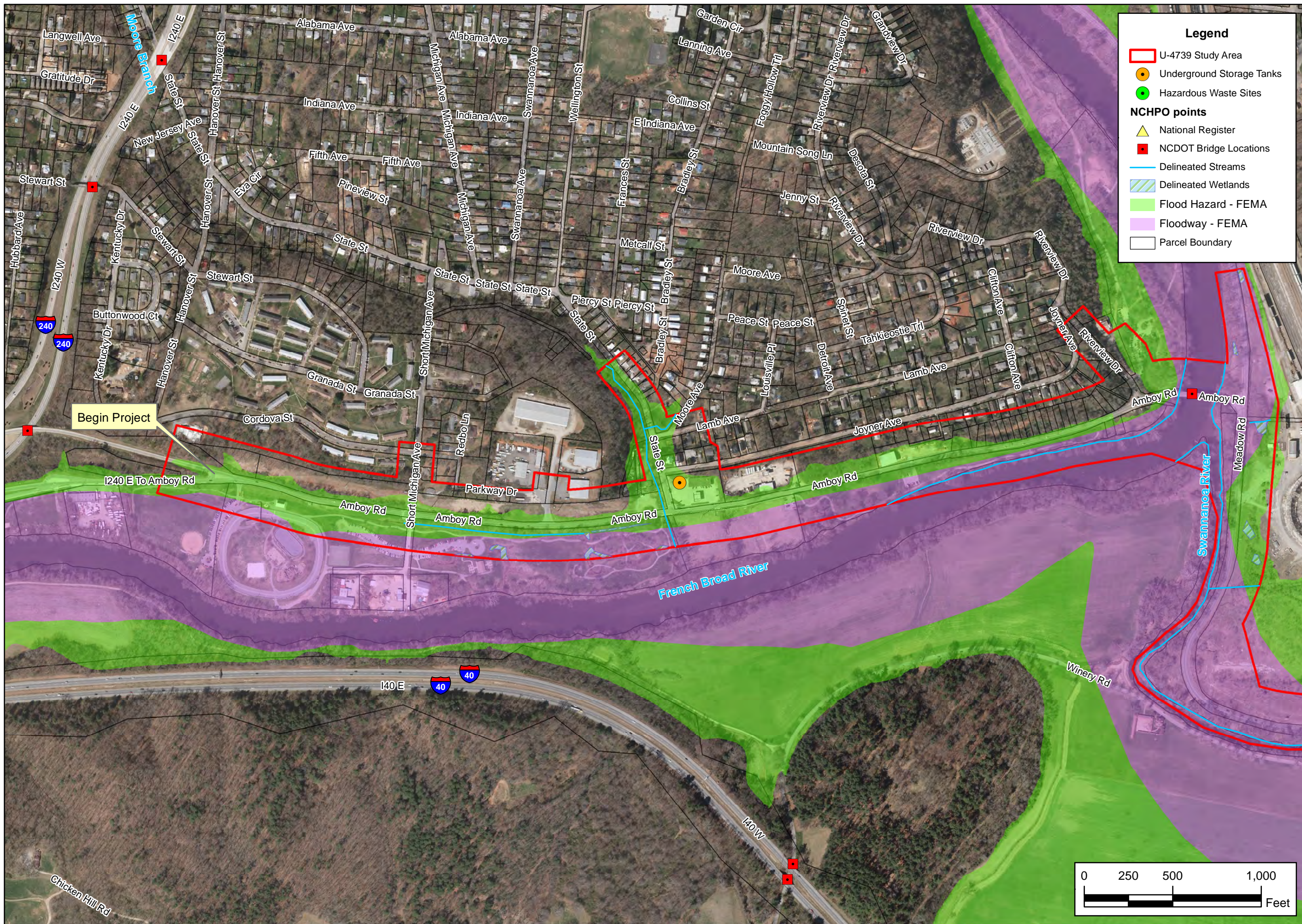
NORTH CAROLINA
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**STUDY AREA MAP
WIDEN SR 3556 (AMBOY RD / MEADOW RD)
TO MULTI-LANES FROM I-240 TO
NC 81 / SR 3214 (BILTMORE AVE)
WITH NEW BRIDGE OVER THE
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**Figure
2**



Legend

- U-4739 Study Area
- Underground Storage Tanks
- Hazardous Waste Sites

NCHPO points

- ▲ National Register
- NCDOT Bridge Locations
- Delineated Streams
- Delineated Wetlands
- Flood Hazard - FEMA
- Floodway - FEMA
- Parcel Boundary



NORTH CAROLINA
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ENVIRONMENTAL FEATURES MAP
WIDEN SR 3556 (AMBOY RD / MEADOW RD)
TO MULTI-LANES FROM I-240 TO
NC 81 / SR 3214 (BILTMORE AVE)
WITH NEW BRIDGE OVER THE
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BUNCOMBE COUNTY
WBS NO. 39741.1.2
FA NO. STP-3556(2)



By:
C ROWELLS

County:
BUNCOMBE

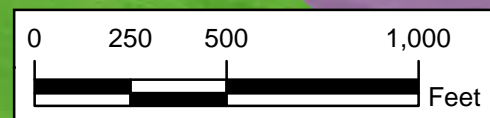
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Date:
NOVEMBER 2018

Figure

3

Sheet 1 of 2





Legend

- U-4739 Study Area
- Underground Storage Tanks
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NORTH CAROLINA
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BUNCOMBE COUNTY
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By:
C ROWELLS

County:
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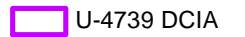
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Date:
NOVEMBER 2018

Figure

3

Sheet 2 of 2

Legend
 U-4739 DCIA

Sheet 1

Sheet 2

Begin Project

End Project



**NORTH CAROLINA
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OF TRANSPORTATION
DIVISION OF HIGHWAYS**

**COMMUNITY CONTEXT MAP
WIDEN SR 3556 (AMBOY RD / MEADOW RD)
TO MULTI-LANES FROM I-240 TO
NC 81 / SR 3214 (BILTMORE AVE)
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**BUNCOMBE COUNTY
WBS NO. 39741.1.2**



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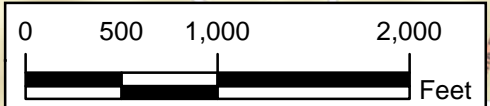
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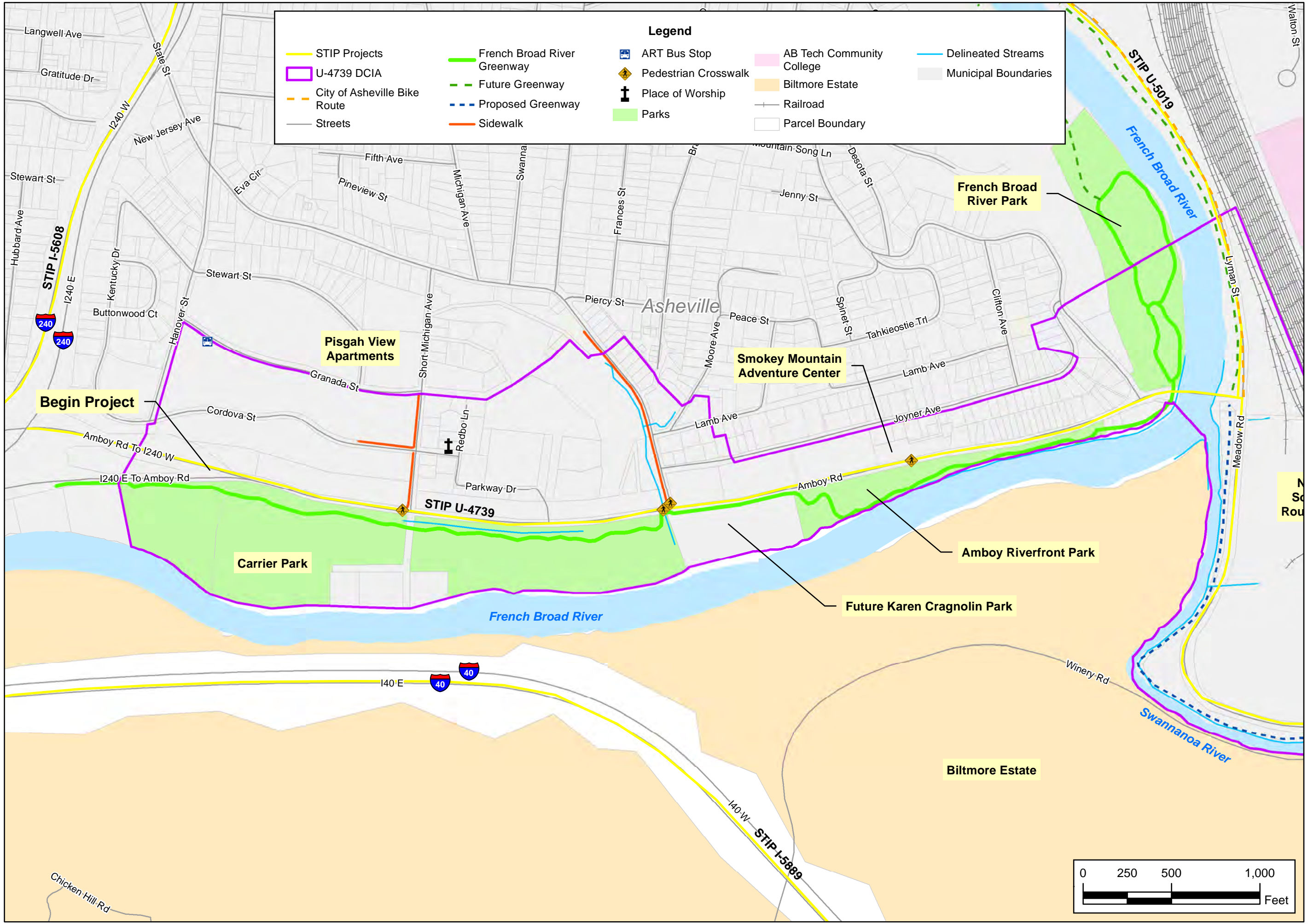
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Figure

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Sheet Index





Legend

STIP Projects	French Broad River Greenway	ART Bus Stop	AB Tech Community College	Delineated Streams
U-4739 DCIA	Future Greenway	Pedestrian Crosswalk	Biltmore Estate	Municipal Boundaries
City of Asheville Bike Route	Proposed Greenway	Place of Worship	Railroad	
Streets	Sidewalk	Parks	Parcel Boundary	



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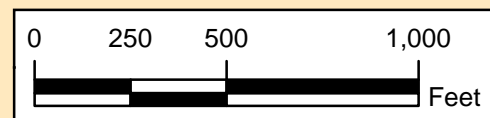
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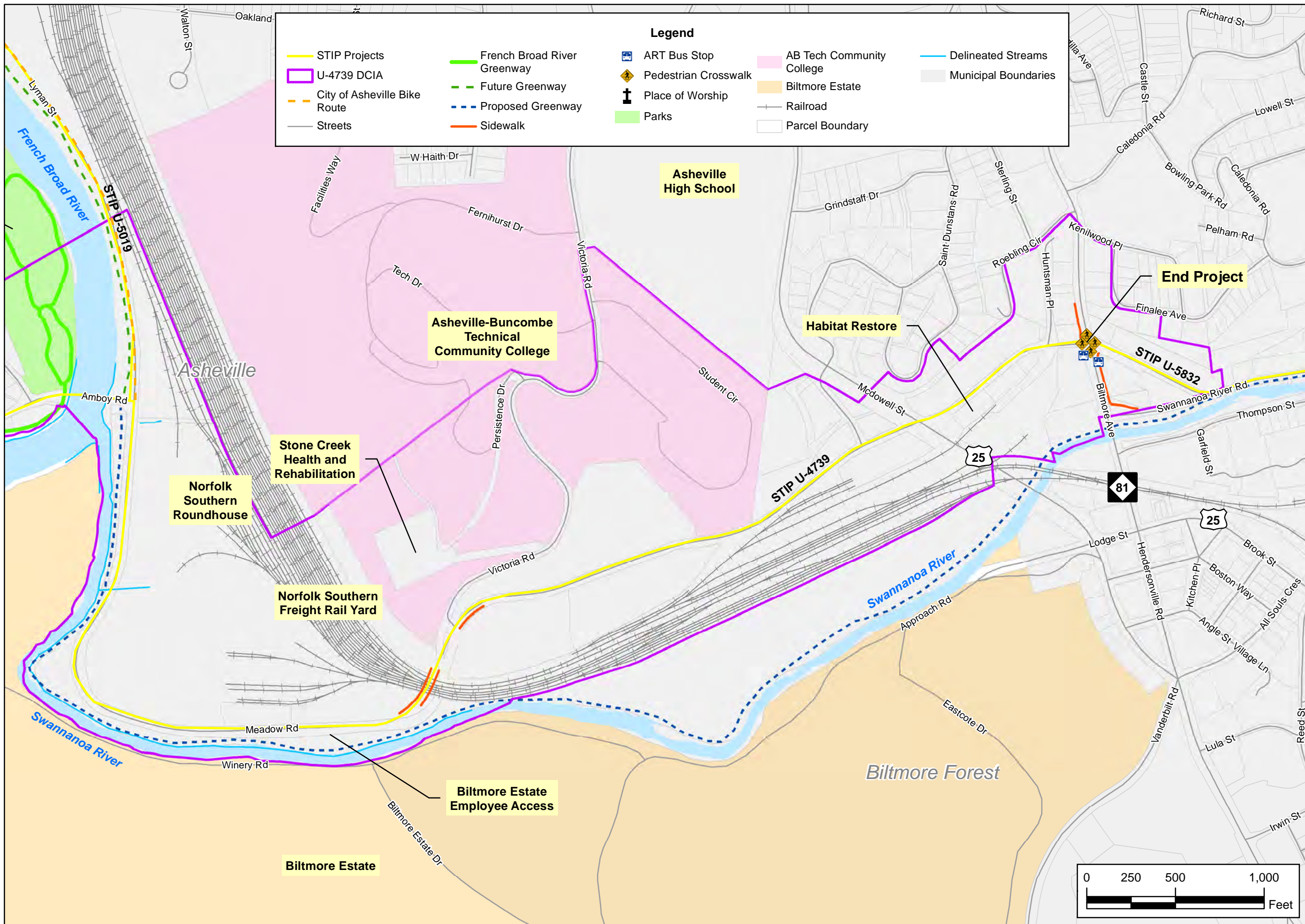
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Figure

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Sheet 1 of 2





NORTH CAROLINA
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NC 81 / SR 3214 (BILTMORE AVE)
WITH NEW BRIDGE OVER THE
FRENCH BROAD RIVER
BUNCOMBE COUNTY
WBS NO. 39741.1.2



By:
C ROWELLS

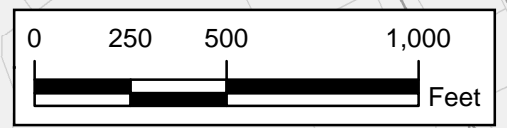
County:
BUNCOMBE

Div: 13	STIP# U-4739
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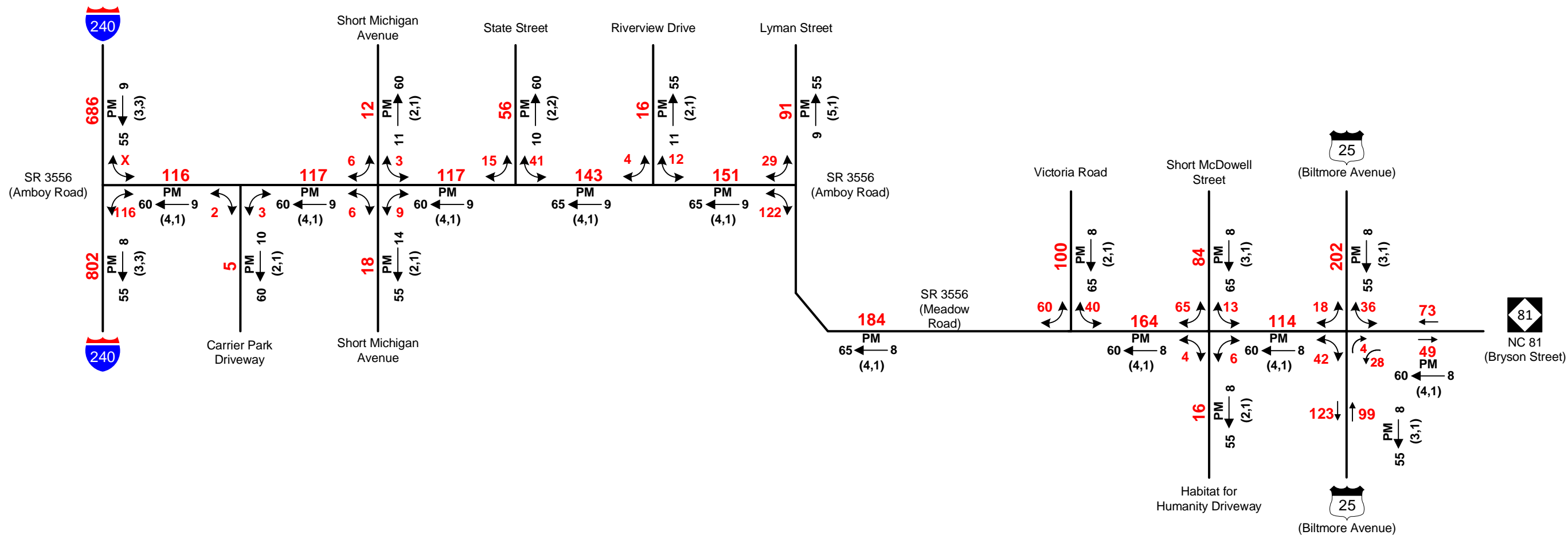
Date:
OCTOBER 2018

Figure
4

Sheet 2 of 2



Appendix B
Traffic Forecast



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

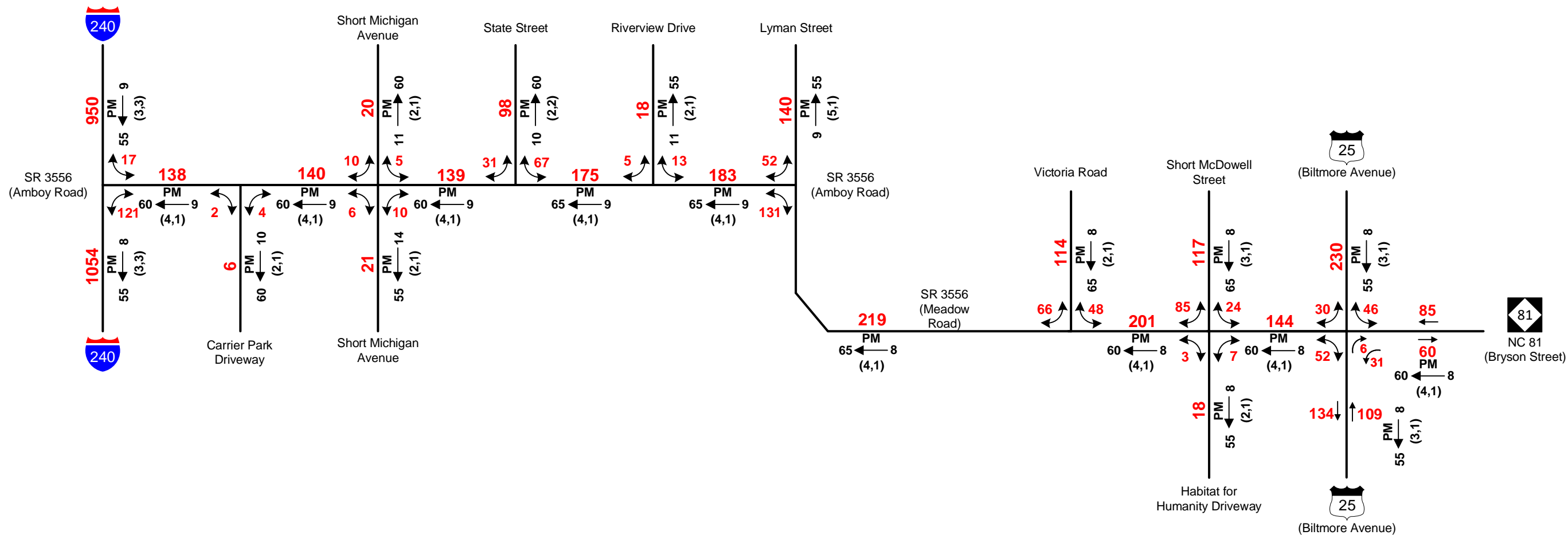
NO-BUILD SCENARIO

SHEET 1 OF 1

LEGEND

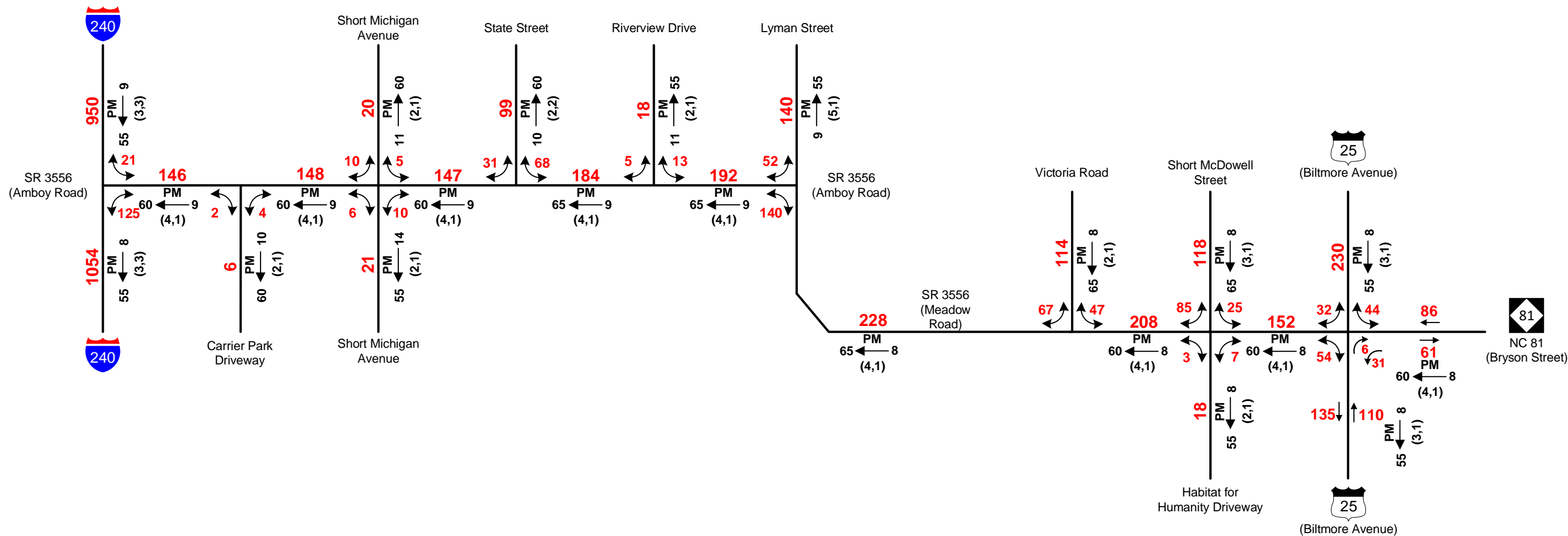
- ### No. of Vehicles Per Day (VPD) in 100s
- 1- Less than 50 VPD
- x Movement Prohibited
- K Design Hour Factor (%)
- PM PM Peak Period
- D Peak Hour Directional Split
- Indicates Direction of D
- (d, t) Duals, TT-STs (%)

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

<h1 style="margin: 0;">2040</h1>	ANNUAL AVERAGE DAILY TRAFFIC	FUTURE YEAR BUILD SCENARIO
		SHEET 1 OF 1
LEGEND		
<p>### No. of Vehicles Per Day (VPD) in 100s</p> <p>1- Less than 50 VPD</p> <p>x Movement Prohibited</p>	<p>K Design Hour Factor (%)</p> <p>PM PM Peak Period</p> <p>D Peak Hour Directional Split</p> <p>→ Indicates Direction of D</p> <p>(d, t) Duals, TT-STs (%)</p>	<p style="text-align: center;">K $\xrightarrow{\text{PM}} \text{D}$ (d, t)</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> <p>PROJECT: Widen SR 3556 (Amboy Road/Meadow Road)</p>

Appendix C
Capacity Analyses

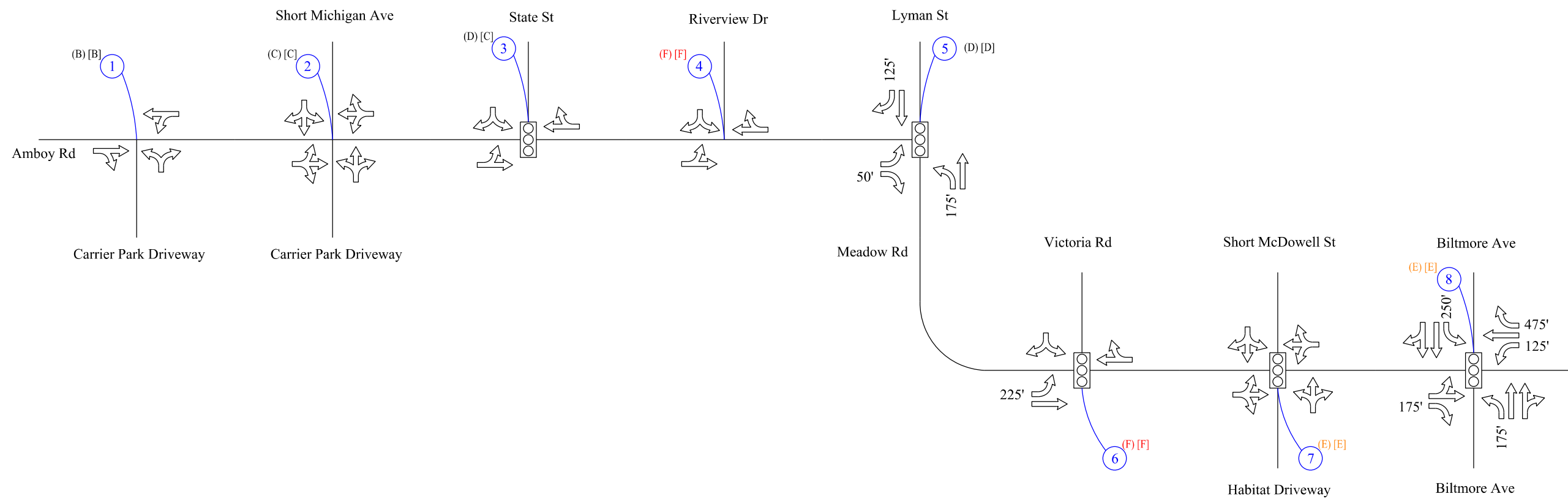
Table 6-1: 2018 Base Year No-Build Intersection Measures of Effectiveness

Signalized Intersections													
Intersection No.	Intersection	Approach	Lane Group	Delay ¹ (s)		Level of Service ²		95th Queue (ft)/Spillback Rate		Maximum Queue Length (ft)			
				AM	PM	AM	PM	AM	PM	AM	PM		
3	Amboy Road & State Street	Overall		36.0	24.2	D	C						
		State St. SB	LR	118.3	50.9	F	D	286.1	0%	77.7	0%	333.2	62.4
		Amboy Road WB	TR	7.2	6.9	A	A	2.5	0%	3.1	0%	30.7	61.7
		Amboy Road EB	LT	18.7	45.9	B	D	47.9	0%	107.0	0%	72.6	117.0
		Overall		43.9	47.2	D	D						
5	Amboy Road & Lyman Street / Meadow Road	Lyman St. SB	T	56.2	38.4	E	D	92.8	0%	38.1	0%	161.4	72.7
			R	61.5	41.9	E	D	48.2	0%	46.1	0%		
		Meadow Road NB	L	57.8	44.2	E	D	90.1	0%	146.4	0%	153.1	217.0
			T	32.5	33.2	C	C	16.4	0%	16.7	0%		
		Amboy Road EB	L	52.2	105.3	D	F	69.8	3%	136.7	6%	220.8	298.9
			R	36.6	74.9	D	E	35.6	1%	47.2	1%		
	Overall		82.0	106.6	F	F							
6	Meadow Road & Victoria Road	Meadow Road SWB	TR	12.3	37.5	B	D	17.9	0%	124.6	0%	46.3	239.3
		Meadow Road NEB	L	12.5	51.7	B	D	31.8	0%	48.6	0%	51.4	56.2
			T	3.7	6.4	A	A	2.1	0%	11.5	0%		
		Victoria Road SEB	LR	574.2	351.1	F	F	876.9	18%	779.8	28%	1181.2	1235.5
	Overall		62.8	59.3	E	E							
7	Meadow Road & Short McDowell Street	Meadow Road SWB	LTR	20.8	30.1	C	C	38.0	0%	69.8	0%	65.3	83.3
		Habitat Driveway NWB	LTR	266.2	377.2	F	F	133.0	0%	119.8	0%	145.8	121.7
		Meadow Road NEB	LTR	18.4	19.9	B	B	46.1	0%	60.4	0%	72.1	126.1
		Short McDowell St. SEB	LTR	232.1	131.1	F	F	353.8	0%	327.5	0%	457.1	333.8
	Overall		62.3	62.2	E	E							
8	US 25 (Biltmore Avenue) & Meadow Road / Bryson Street	Biltmore Ave SB	L	76.4	84.1	E	F	102.2	0%	73.1	0%	136.7	152.4
			T	50.3	56.5	D	E	74.1	0%	97.1	0%		
			TR	50.8	57.6	D	E	81.4	0%	106.2	0%		
		Bryson St. WB	L	87.8	97.1	F	F	79.1	0%	95.7	0%		
			T	79.2	90.5	E	F	62.8	0%	114.6	0%	132.6	205.8
			R	28.1	33.5	C	C	7.9	0%	7.7	0%		
		Biltmore Ave NB	L	128.2	108.8	F	F	146.0	0%	97.3	0%		
			T	52.1	45.1	D	D	100.6	0%	56.8	0%	297.2	162.2
			TR	59.9	52.3	E	D	160.9	0%	85.2	0%		
		Meadow Road EB	LT	65.0	51.5	E	D	141.8	0%	70.6	0%	154.3	86.8
	R	45.0	45.7	D	D	18.4	0%	38.0	0%				

Unsignalized Intersections ³													
Intersection No.	Intersection	Approach	Lane Group	Delay ¹ (s)		Level of Service ²		95th Queue (ft)/Spillback Rate		Maximum Queue Length (ft)			
				AM	PM	AM	PM	AM	PM	AM	PM		
1	Amboy Road & Carrier Park Drwy	Amboy Road WB	LT	0.6	0.5	A	A	1.0	0%	0.6	0%	1.1	1.8
		Carrier Park Driveway NB	LTR	12.2	11.3	B	B	1.3	0%	1.0	0%	2.0	1.2
2	Amboy Road & Short Michigan Avenue	Short Michigan Ave. SB	LTR	16.0	19.6	C	C	5.7	0%	5.5	0%	9.1	6.1
		Amboy Road WB	LTR	3.2	2.5	A	A	3.5	0%	3.2	0%	6.5	7.7
		Carrier Park Driveway NB	LTR	17.5	20.7	C	C	11.9	0%	11.9	0%	14.4	15.0
		Amboy Road EB	LTR	0.8	1.6	A	A	2.2	0%	2.5	0%	4.5	3.6
4	Amboy Road & Riverview Drive	Amboy Road NEB	LT	21.6	26.4	C	D	111.8	0%	87.6	0%	206.7	104.3
		Riverview Dr. SEB	LR	219.4	176.0	F	F	134.2	0%	77.2	0%	147.0	80.4

Notes:

- 1 Delay shown is the 95th percentile worst case control delay for the full 60-minute simulation period as derived from the 10 random seed simulations
- 2 Level of Service shown is Simulation based and calculated in a manner that is consistent with the HCM 2010 Methodologies
- 3 Results for unsignalized intersections include only the movements that have conflicting flow and thus have the potential to incur control delay



STIP U-4739
2018 Base Year No-Build
Figure 6-1







-  Existing Laneage
-  Existing Signal
-  Intersection Number
-  (AM) [PM] Intersection LOS
-  (E in Orange)(F in Red)
-  XXXX' Storage Length

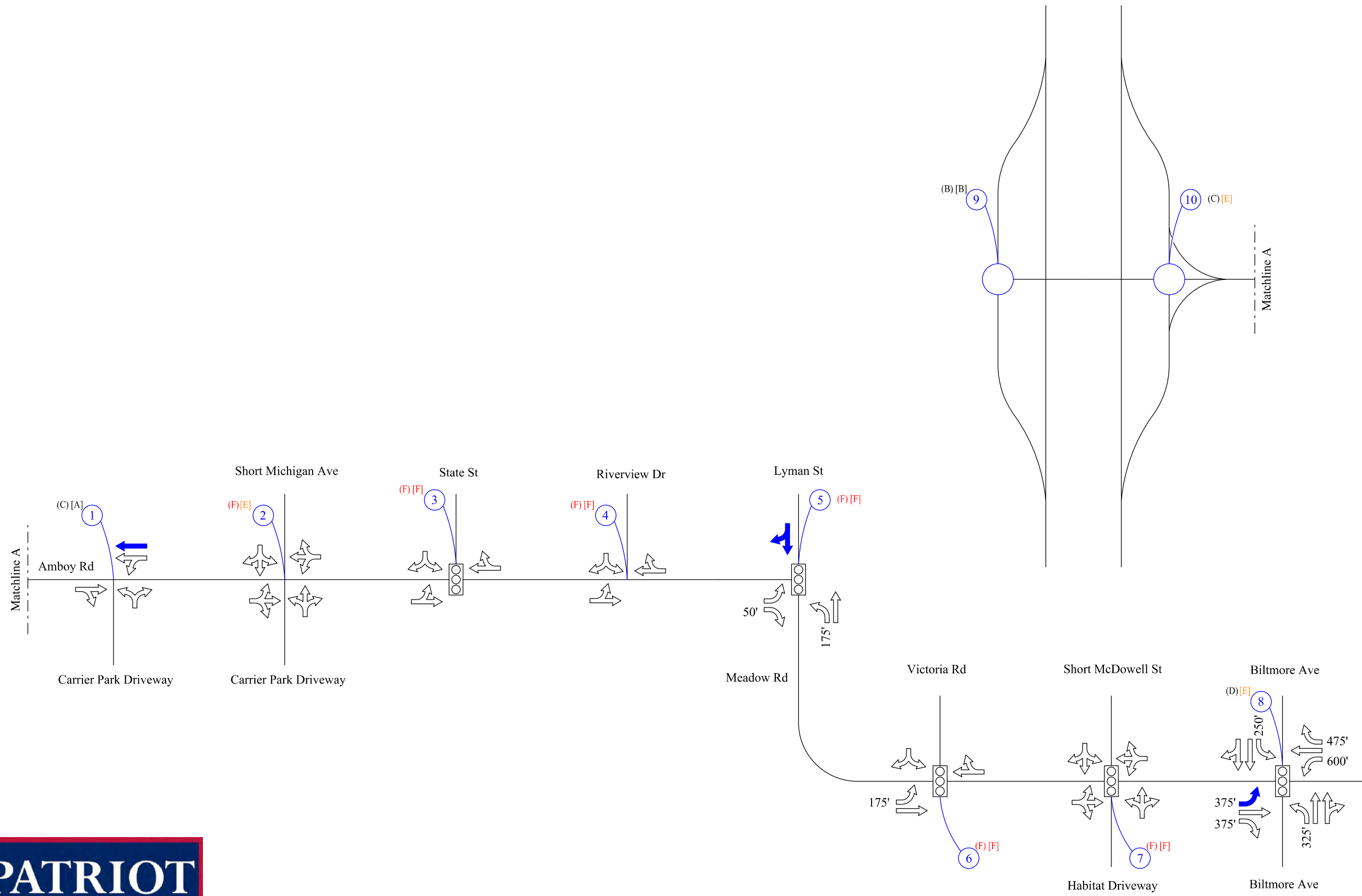


Table 7-1: 2040 Future Year No-Build Intersection Measures of Effectiveness

Signalized Intersections													
Intersection No.	Intersection	Approach	Lane Group	Delay ¹ (s)		Level of Service ²		95th Queue (ft)/Spillback Rate			Maximum Queue Length (ft)		
				AM	PM	AM	PM	AM	PM	AM	PM		
3	Amboy Road & State Street	Overall		152.2	136.2	F	F						
		State St SB	LR	278.8	300.2	F	F	647.9	16%	500.2	0%	1257.0	929.4
		Amboy Road WB	TR	6.6	14.0	A	B	11.2	0%	24.8	0%	13.7	92.4
		Amboy Road EB	LT	167.9	272.1	F	F	459.7	8%	624.5	3%	1447.6	1045.2
5	Amboy Road & Meadow Road / Lyman Street	Overall		129.0	260.3	F	F						
		Lyman St SB	TR	371.2	59.1	F	E	849.7	30%	153.9	0%	1310.8	272.8
		Meadow Road NB	L	141.0	578.4	F	F	271.7	0%	1116.4	1%	339.9	1987.5
		Amboy Road EB	L	47.9	149.8	D	F	100.0	5%	266.1	29%	218.1	1428.5
6	Meadow Road & Victoria Road	Overall		149.0	257.1	F	F						
		Meadow Road SWB	TR	39.6	251.4	D	F	87.5	0%	580.6	4%	157.4	1357.2
		Meadow Road NEB	L	226.7	69.7	F	E	493.0	0%	38.5	0%	701.0	38.5
		Victoria Road SEB	LR	327.7	749.6	F	F	587.1	0%	1169.4	54%	802.4	1487.6
7	Meadow Road & Short McDowell St / Habitat Drwy	Overall		100.4	141.9	F	F						
		Meadow Road SWB	LTR	69.0	125.9	E	F	169.5	0%	357.2	1%	229.9	658.4
		Habitat Driveway NWB	LTR	101.5	110.1	F	F	49.8	0%	35.4	0%	52.3	41.0
		Short McDowell St SEB	LTR	383.5	352.1	F	F	723.9	31%	714.8	44%	906.3	849.5
8	US 25 (Biltmore Ave) & Meadow Road / Bryson St	Overall		42.8	61.5	D	E						
		Biltmore Ave SB	L	56.7	87.0	E	F	74.7	0%	84.9	0%		
		Biltmore Ave SB	T	41.6	57.8	D	E	60.3	0%	117.3	0%	130.8	215.8
		Biltmore Ave SB	TR	41.6	56.4	D	E	68.5	0%	128.5	0%		
		Bryson St WB	L	68.1	84.6	E	F	63.1	0%	114.7	0%		
		Bryson St WB	T	44.3	68.8	D	E	37.3	0%	98.4	0%	80.5	183.8
		Bryson St WB	R	22.3	26.1	C	C	8.0	0%	11.1	0%		
		Biltmore Ave NB	L	62.5	172.6	E	F	73.2	0%	223.1	0%		
		Biltmore Ave NB	T	42.9	44.6	D	D	99.1	0%	63.1	0%	171.5	310.1
		Biltmore Ave NB	TR	44.3	42.8	D	D	101.4	0%	68.3	0%		
		Meadow Road EB	L	76.7	115.3	E	F	39.1	0%	38.5	0%		
		Meadow Road EB	T	37.5	34.1	D	C	53.7	0%	34.9	0%	90.4	58.3
Meadow Road EB	R	21.5	16.1	C	B	16.3	0%	11.0	0%				
Unsignalized Intersections ³													
Intersection No.	Intersection	Approach	Lane Group	Delay ¹ (s)		Level of Service ²		95th Queue (ft)/Spillback Rate			Maximum Queue Length (ft)		
				AM	PM	AM	PM	AM	PM	AM	PM		
1	Amboy Road & Carrier Park Driveway	Amboy Road WB	LT	0.8	0.7	A	A	0.4	0%	0.6	0%	0.4	0.4
		Carrier Park Driveway NB	LR	16.5	9.4	C	A	1.8	0%	0.7	0%	1.8	1.1
2	Amboy Road & Short Michigan Avenue	Short Michigan Ave SB	LTR	118.7	28.6	F	D	105.5	0%	12.4	0%	114.5	17.7
		Amboy Road WB	LTR	4.7	2.3	A	A	6.2	0%	2.7	0%	14.6	7.7
		Carrier Park Driveway NB	LTR	87.8	38.6	F	E	88.3	0%	31.8	0%	93.2	38.0
		Amboy Road EB	LTR	81.0	29.5	F	D	191.1	3%	75.4	0%	590.0	121.3
4	Amboy Road & Riverview Drive	Amboy Road NEB	LT	41.4	375.4	E	F	130.3	0%	953.0	0%	328.7	1760.8
		Riverview Dr SEB	LR	645.2	1201.2	F	F	426.1	2%	703.4	14%	449.6	708.8
Roundabouts													
Intersection No.	Intersection	Approach	Lane Group	Delay ¹ (s)		Level of Service ²		95th Queue (ft)/Spillback Rate			Maximum Queue Length (ft)		
				AM	PM	AM	PM	AM	PM	AM	PM		
9	Amboy Road & I-26EB / I-240WB Ramps	I-26EB / I-240WB Off Ramp SWB	R	11.7	12.6	B	B	12.9	0%	15.1	0%	26.5	37.0
10	Amboy Road & I-26WB / I-240EB Ramps	Amboy Road WB	T	24.0	38.9	C	E	11.0	0%	36.8	0%	21.3	50.3
		I-26WB/I-240EB Off Ramp	R	15.8	15.7	C	C	6.2	0%	7.0	0%	13.3	10.3

Notes:

- 1 Delay shown is the 95th percentile worst case control delay for the full 60-minute simulation period as derived from the 10 random seed simulations
- 2 Level of Service shown is Simulation based and calculated in a manner that is consistent with the HCM 2010 Methodologies
- 3 Results for unsignalized intersections include only the movements that have conflicting flow and thus have the potential to incur control delay



STIP U-4739
2040 Future Year No-Build
Figure 7-1








-  Existing Laneage
-  Laneage changed from Other TIP Projects
-  Existing Signal
-  Roundabout created by Other TIP Projects
-  Intersection Number
-  Intersection LOS
(E in Orange)(F in Red)
-  Storage Length

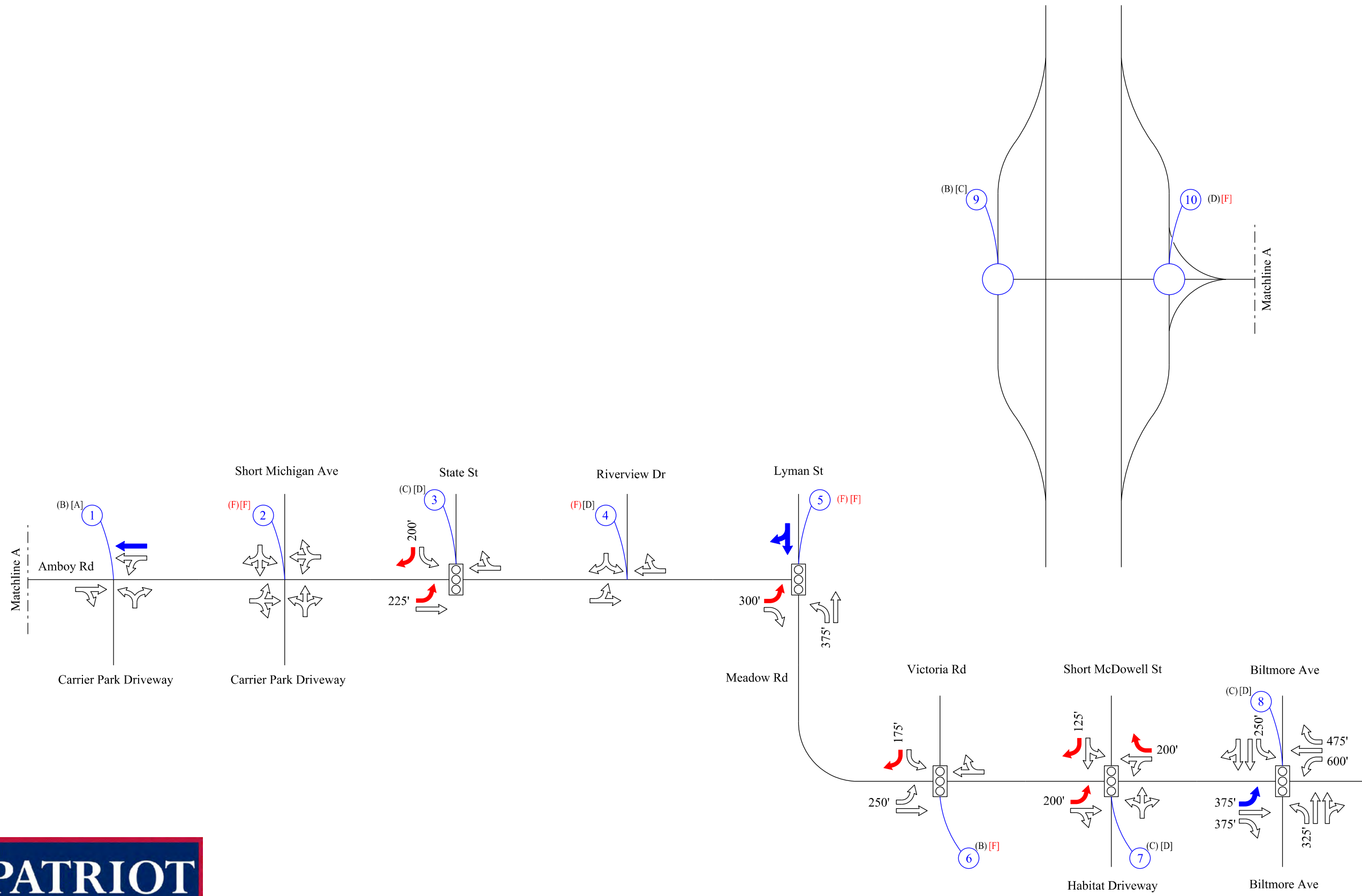


Table 8-1: 2040 Future Year Build Alternative 1 Intersection Measures of Effectiveness

Signalized Intersections													
Intersection No.	Intersection	Approach	Lane Group	Delay ¹ (s)		Level of Service ²		95th Queue (ft)/Spillback Rate		Maximum Queue Length (ft)			
				AM	PM	AM	PM	AM	PM	AM	PM		
3	Amboy Road & State Street	Overall		21.3	39.8	C	D						
		State St SB	L	33.8	38.8	C	D	57.4	0%	33.3	0%	95.7	61.7
		Amboy Road WB	TR	20.8	5.2	C	A	65.2	0%	0.8	0%	78.4	29.3
		Amboy Road EB	L	43.1	190.1	D	F	29.1	0%	262.1	0%	58.5	276.5
		Amboy Road EB	T	10.7	65.7	B	E	11.2	0%	2.0	0%		
5	Amboy Road & Meadow Road / Lyman Street	Overall		91.1	159.6	F	F						
		Lyman St SB	TR	130.7	175.6	F	F	260.9	0%	307.8	0%	431.0	428.2
		Meadow Road NB	L	262.7	290.1	F	F	587.5	0%	239.0	0%	756.9	710.2
		Meadow Road NB	T	141.1	245.7	F	F	14.3	0%	2.9	0%		
		Amboy Road EB	L	28.6	50.9	C	D	29.2	0%	58.0	0%	64.6	83.9
6	Meadow Road & Victoria Road	Overall		17.0	112.6	B	F						
		Meadow Road SWB	TR	13.5	129.9	B	F	22.4	0%	156.2	0%	61.6	462.8
		Meadow Road NEB	L	41.0	55.3	D	E	71.8	0%	56.7	0%	119.1	45.5
		Meadow Road NEB	T	7.9	2.8	A	A	2.8	0%	6.2	0%		
		Victoria Road SEB	L	40.0	207.5	D	F	28.3	0%	62.9	0%	39.7	439.6
7	Meadow Road & Short McDowell St / Habitat Drwy	Overall		20.0	43.4	C	D						
		Meadow Road SWB	LT	15.9	68.2	B	E	38.3	0%	163.6	0%	23.2	213.7
		Meadow Road SWB	R	13.1	55.1	B	E	7.9	0%	8.1	0%		
		Habitat Driveway NWB	LTR	43.2	38.1	D	D	20.4	0%	11.9	0%	22.3	13.9
		Meadow Road NEB	L	26.1	37.1	C	D	57.1	0%	39.5	0%	62.9	73.4
8	US 25 (Biltmore Ave) & Meadow Road / Bryson St	Overall		31.4	38.0	C	D						
		Biltmore Ave SB	L	37.5	37.6	D	D	47.5	0%	46.1	0%		
		Biltmore Ave SB	T	31.2	35.2	C	D	56.5	0%	42.5	0%	71.7	101.9
		Biltmore Ave SB	TR	33.0	37.7	C	D	66.7	0%	54.8	0%		
		Bryson St WB	L	47.6	42.4	D	D	56.0	0%	35.9	0%		
Unsignalized Intersections ³	Amboy Road & Carrier Park Driveway	Overall		0.8	0.6	A	A						
		Amboy Road WB	LT	0.8	0.6	A	A	0.1	0%	0.0	0%	0.2	0.0
		Carrier Park Driveway NB	LR	12.2	9.6	B	A	1.7	0%	0.8	0%	2.0	0.8
		Short Michigan Ave SB	LTR	41.5	34.3	E	D	30.3	0%	17.5	0%	34.4	17.3
		Carrier Park Driveway NB	LTR	3.8	2.7	A	A	6.1	0%	4.1	0%	16.0	6.8
Amboy Road & Short Michigan Avenue	Overall		74.9	73.7	F	F							
	Carrier Park Driveway NB	LTR	74.9	73.7	F	F	70.3	0%	59.9	0%	79.5	69.7	
	Amboy Road EB	LTR	1.6	3.5	A	A	2.1	0%	7.1	0%	8.0	11.3	
	Amboy Road NEB	LT	2.1	2.1	A	A	2.0	0%	4.8	0%	7.5	7.6	
	Riverview Dr SEB	LR	68.4	32.2	F	D	41.3	0%	13.5	0%	42.5	17.5	
Roundabouts	Amboy Road & I-26EB / I-240WB Ramps	Overall		12.6	15.4	B	C						
		I-26EB / I-240WB Off Ramp SWB	R	12.6	15.4	B	C	15.6	0%	24.8	0%	30.5	44.8
		Amboy Road WB	T	26.0	52.7	D	F	15.6	0%	59.4	0%	25.0	73.1
		I-26WB/I-240EB Off Ramp	R	15.8	16.4	C	C	6.2	0%	8.7	0%	18.9	17.9

Notes:

- 1 Delay shown is the 95th percentile worst case control delay for the full 60-minute simulation period as derived from the 10 random seed simulations
- 2 Level of Service shown is Simulation based and calculated in a manner that is consistent with the HCM 2010 Methodologies
- 3 Results for unsignalized intersections include only the movements that have conflicting flow and thus have the potential to incur control delay



STIP U-4739
2040 Future Year Build Alt 1
Figure 8-1

- Existing Laneage
- Laneage changed from Other TIP Projects
- Laneage created by U-4739
- Existing Signal
- Roundabout created by Other TIP Projects
- Intersection Number
- Intersection LOS
(E in Orange)(F in Red)
- XXX' Storage Length

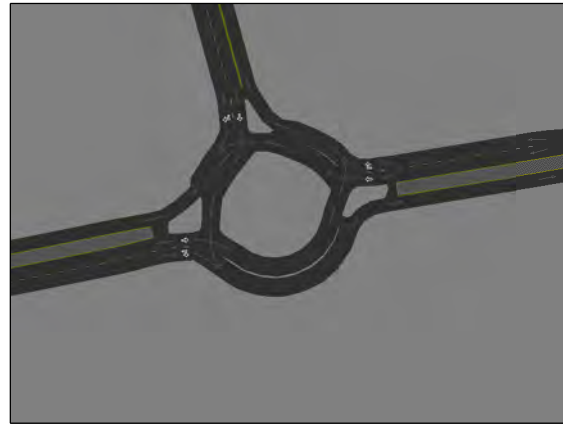


Table 8-2: 2040 Future Year Build Alternative 2 Intersection Measures of Effectiveness

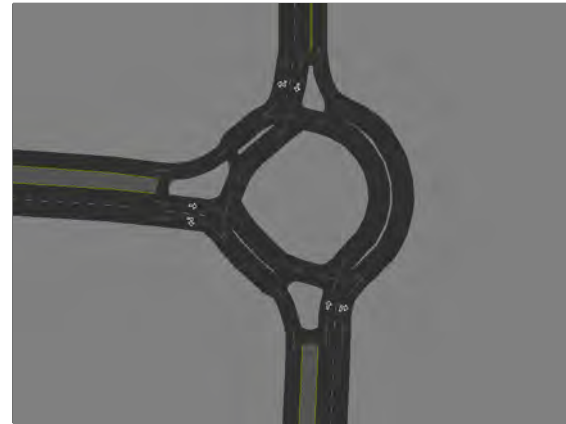
Signalized Intersections														
Intersection No.	Intersection	Approach	Lane Group	Delay ¹ (s)		Level of Service ²		95th Queue (ft)/Spillback Rate			Maximum Queue Length (ft)			
				AM	PM	AM	PM	AM	PM	AM	PM			
8	US 25 (Biltmore Ave) & Meadow Road / Bryson St	Overall		44.1	56.1	D	E							
			Biltmore Ave SB	L	42.1	56.7	D	E	76.5	0%	84.2	0%	133.5	150.7
			Biltmore Ave SB	TR	42.8	56.4	D	E	74.5	0%	127.9	0%		
			Bryson St WB	L	68.0	78.7	E	E	64.1	0%	111.1	0%	81.9	161.3
			Bryson St WB	T	42.1	50.1	D	D	33.8	0%	73.7	0%		
			Bryson St WB	R	22.4	27.6	C	C	8.8	0%	11.3	0%		
			Biltmore Ave NB	L	61.4	84.1	E	F	75.5	0%	102.5	0%	164.0	154.6
			Biltmore Ave NB	T	42.5	43.0	D	D	95.5	0%	61.9	0%		
			Biltmore Ave NB	TR	43.2	44.5	D	D	101.4	0%	69.2	0%		
			Meadow Road EB	L	66.0	93.4	E	F	40.9	0%	41.7	0%	127.1	103.9
			Meadow Road EB	T	47.6	59.6	D	E	93.7	0%	83.8	0%		
			Meadow Road EB	R	25.9	39.2	C	D	28.3	0%	41.8	0%		
Roundabouts														
Intersection No.	Intersection	Approach	Lane Group	Delay ¹ (s)		Level of Service ²		95th Queue (ft)/Spillback Rate			Maximum Queue Length (ft)			
				AM	PM	AM	PM	AM	PM	AM	PM			
1	Amboy Road & Carrier Park Driveway	Amboy Road WB	LT	13.0	13.7	B	B	0.8	0%	0.9	0%	0.2	0.7	
		Carrier Park Driveway NB	LR	404.3	12.5	F	B	77.8	0%	0.2	0%	71.8	0.5	
		Amboy Road EB	LT	79.3	12.7	F	B	128.1	1%	1.2	0%	108.8	3.2	
2	Amboy Road & Short Michigan Ave	Short Michigan Ave SB	LTR	12.3	17.4	B	C	3.9	0%	5.6	0%	4.0	6.6	
		Amboy Road WB	LTR	14.9	17.0	B	C	2.9	0%	6.5	0%	3.7	5.2	
		Carrier Park Driveway NB	LTR	462.4	9.5	F	A	380.1	37%	1.5	0%	373.6	2.1	
		Amboy Road EB	LTR	82.9	13.6	F	B	152.1	3%	2.4	0%	233.2	3.2	
3	Amboy Road & State St	State St SB	L	14.8	20.4	B	C	10.7	0%	12.5	0%	10.0	14.0	
		State St SB	R	11.5	13.5	B	B	2.1	0%	4.3	0%			
		Amboy Road WB	T	15.4	17.3	C	C	1.9	0%	4.8	0%	1.9	7.0	
		Amboy Road WB	R	14.6	16.0	B	C	1.2	0%	1.4	0%			
		Amboy Road EB	T	152.7	15.8	F	C	4.1	0%	1.5	0%	256.9	5.8	
		Amboy Road EB	R	182.5	16.6	F	C	241.4	1%	5.6	0%			
4	Amboy Road & Riverview Dr	Amboy Road WB	TR	10.4	17.9	B	C	0.6	0%	2.6	0%	0.7	3.7	
		Amboy Road NEB	LT	17.4	15.1	C	C	8.3	0%	1.9	0%	8.6	2.3	
		Riverview Dr SEB	LR	11.2	42.0	B	E	2.2	0%	17.1	0%	2.5	16.0	
5	Amboy Rd & Lyman St / Meadow Rd	Lyman St SB	T	14.7	32.3	B	D	12.0	0%	36.3	0%	9.9	38.6	
		Lyman St SB	R	12.7	25.4	B	D	2.6	0%	25.3	0%			
		Meadow Road NB	L	18.2	41.0	C	E	9.1	0%	37.5	0%	10.9	36.9	
		Meadow Road NB	T	15.4	35.4	C	E	3.8	0%	6.0	0%			
6	Meadow Road & Victoria Road	Amboy Road EB	L	13.3	11.2	B	B	5.8	0%	2.4	0%	15.0	3.7	
		Amboy Road EB	R	13.5	10.3	B	B	14.1	0%	2.7	0%			
		Victoria Road SB	L	14.3	37.8	B	E	3.9	0%	20.3	0%	7.3	68.0	
		Victoria Road SB	R	13.3	52.0	B	F	2.3	0%	78.5	0%			
7	Meadow Road & Short McDowell St / Habitat Drwy	Meadow Road SWB	T	16.1	17.0	C	C	10.5	0%	9.5	0%	10.7	9.9	
		Meadow Road SWB	R	13.5	14.0	B	B	2.2	0%	1.0	0%			
		Meadow Road NEB	L	19.4	15.2	C	C	3.8	0%	2.4	0%	10.9	6.4	
		Meadow Road NEB	T	21.1	15.1	C	C	12.9	0%	6.1	0%			
9	Amboy Road & I-26EB / I-240WB Ramps	Short McDowell St SB	LTR	12.1	35.2	B	E	8.8	0%	72.6	0%	8.3	79.2	
		Meadow Road SWB	LTR	21.7	23.1	C	C	21.4	0%	20.0	0%	23.3	44.0	
		Habitat Driveway NWB	LTR	28.3	18.1	D	C	9.1	0%	2.2	0%	10.3	3.2	
		Meadow Road NEB	LTR	19.7	16.5	C	C	9.6	0%	5.5	0%	11.1	5.5	
10	Amboy Road & I-26WB / I-240 EB Off Ramp	I-26WB / I-240WB Off Ramp SWB	LT	13.4	17.3	B	C	18.9	0%	30.2	0%	37.4	56.5	
		Amboy Road NWB	TR	24.8	89.4	C	F	16.3	0%	138.8	0%	25.5	142.9	
		I-26WB / I-240 EB Off Ramp NEB	TR	15.8	15.9	C	C	6.5	0%	7.6	0%	15.5	16.5	

Notes:

- 1 Delay shown is the 95th percentile worst case control delay for the full 60-minute simulation period as derived from the 10 random seed simulations
- 2 Level of Service shown is Simulation based and calculated in a manner that is consistent with the HCM 2010 Methodologies
- 3 Results for unsignalized intersections include only the movements that have conflicting flow and thus have the potential to incur control delay



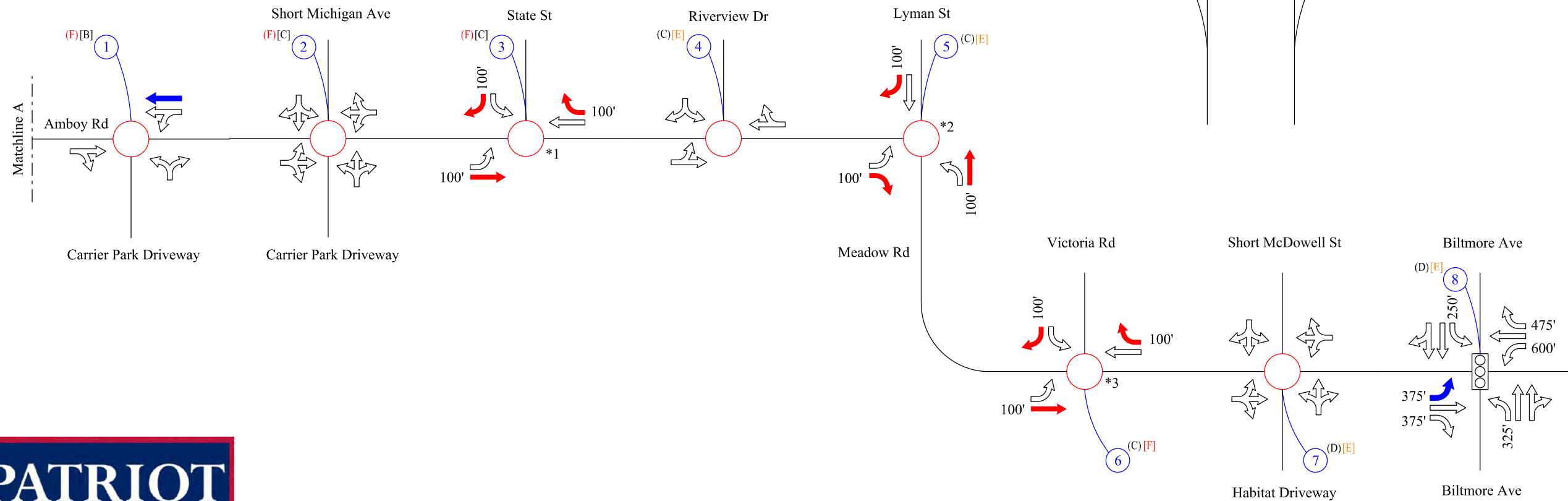
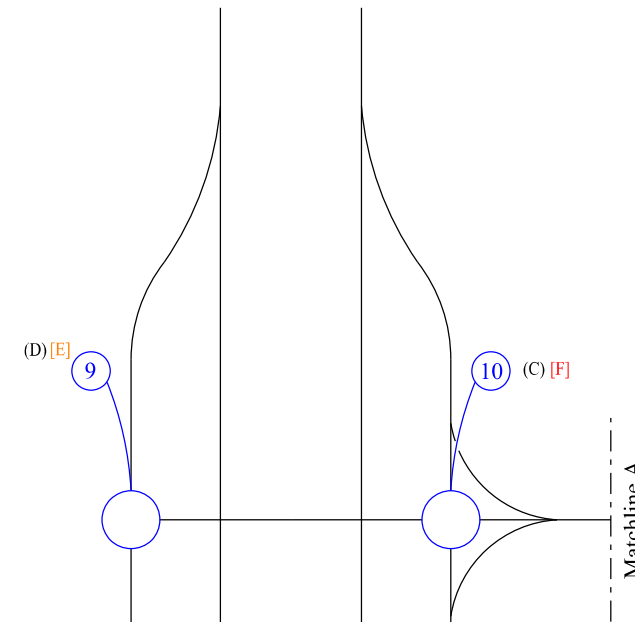
1 - Amboy Rd at State Rd Turbo Roundabout



2 - Amboy Rd at Lyman St/Meadow Rd Turbo Roundabout



3 - Meadow Rd at Victoria Rd Turbo Roundabout



STIP U-4739
2040 Future Year Build Alt 2
Figure 8-2

- Existing Laneage
- Laneage changed from Other TIP Projects
- Laneage created by U-4739
- Existing Signal
- Roundabout created by Other TIP Projects
- Roundabout created by U-4739
- Intersection Number
- Intersection LOS
(E in Orange)(F in Red)
- Storage Length

Appendix D
Concurrence Form

Section 404/NEPA Merger Team Meeting Agreement

Concurrence Point No. 1: Project Purpose & Need and Proposed Study Area

Project Name/Description: Widen SR 3556 (Amboy Road/Meadow Road) to multi-lanes from I-240 to NC 81/SR 3214 (Biltmore Avenue), with a new bridge over the French Broad River, in Asheville, Buncombe County, North Carolina, WBS No. 39741.1.2, **State Transportation Improvement Program (STIP) Project No. U-4739.**

Purpose and Need of Proposed Project

The **NEEDS** to be addressed by this project can be summarized as follows:

- *Operational and capacity deficiencies exist at the intersections along SR 3556 (Amboy Road/Meadow Road) within the project limits. These intersections are expected to worsen in the future.*
- *The bridge over the French Broad River is functionally obsolete and is in need of replacement.*
- *There are existing safety concerns with pedestrian crossings along Amboy Road.*

The **PURPOSE** of the proposed project is to:

address the operational and capacity deficiencies that exist at the intersections within the project corridor and to improve bicycle and pedestrian accommodations while providing a multimodal corridor that is compatible with the city of Asheville's Wilma Dykeman Riverway Master Plan and other local plans.

Project Study Area

The proposed project study area was developed to address the above-stated purpose and need for U-4739. The project study area boundaries are fully depicted on Figures 1 and 2 of the Merger Packet.

The Project Team members have concurred, on this date of May 15, 2019, on the project purpose and need as stated above and the project study area fully depicted in Figures 1 and 2 of the Merger packet.

Federal Highway Administration	_____	
	Donnie Brew	DATE
US Army Corps of Engineers	_____	
	Lori Beckwith	DATE
US Fish & Wildlife Service	_____	
	Claire Ellwanger	DATE
NC Division of Water Resources	_____	
	Kevin Barnett	DATE
NC Wildlife Resources Commission	_____	
	Marla Chambers	DATE
US Environmental Protection Agency	_____	
	Amanetta Somerville	DATE
NC Department of Transportation	_____	
	Beverly Robinson	DATE
NC State Historic Preservation Office	_____	
	Renee Gledhill-Earley	DATE
