



January 18, 2022

MEMORANDUM TO: Mark Eatman, PE  
Central Corridor Development Engineer  
NCDOT Division of Planning & Programming – Corridor Development Unit

FROM: John Burris, PTP  
HNTB North Carolina, PC

SUBJECT: Traffic Forecast for STIP Project U-5832  
NC 81 Widening from Biltmore Avenue to Tunnel Road (US 74A)  
Buncombe County

This traffic forecast was reviewed by the North Carolina Department of Transportation (NCDOT) Transportation Planning Division (TPD) and approved on January 18, 2022.

Please find attached the 2045 Project-Level Traffic Forecast for State Transportation Improvement Program (STIP) Project U-5832. This traffic forecast is an update to a previously completed traffic forecast for this project in December 2015. The main reasons for this current forecast were to update the forecast Future Year from 2040 to 2045 by using the latest version of the French Broad River Metropolitan Planning Organization (FBRMPO) travel demand model (TDM) (which is currently the 2015/2045 FBRMPO TDM v1.1) and to study new project alternatives.

STIP Project U-5832 is proposed to widen existing NC 81 (Swannanoa River Road) from Biltmore Avenue (SR 3214) to S Tunnel Road (US 74A) / Wood Avenue (SR 3276), in Asheville, NC (Buncombe County). STIP Project U-5832 is currently programmed for right-of-way (ROW) to begin in fiscal year 2029, with no set construction date, per the 2020 – 2029 STIP (most current version available at the time of forecast development was from December 21, 2021).

The traffic forecast study area for U-5832 includes a total of 17 existing intersections and 3 proposed intersections (depending on the Build option used). The following Build options are considered in this forecast:

- Option 1
  - Widen NC 81 to add a center turn lane
  - Extend Huntsman Place (west of Biltmore Avenue (SR 3214)) to the current intersection of NC 81 (Biltmore Avenue) and Swannanoa River Road (SR 3389)
- Option 2
  - Construct a new location two-lane roadway (new NC 81) that is north of existing NC 81. This new facility will traverse from the current Biltmore Avenue (SR 3214) intersection at Meadow Road (SR 3556) / NC 81 (Bryson Street) to existing NC 81 west of Haw Creek.
  - Extend Glendale Avenue to the new location roadway
  - Close the Swannanoa River Road and Biltmore Avenue intersection to shopping center access only

### **Fiscal Constraint**

Within an MPO, future year traffic forecasts assume construction of projects listed within an MPO's Metropolitan Transportation Plan (MTP). This traffic forecast is consistent with the FBRMPO 2045 MTP. The FBRMPO 2045 MTP was adopted by their Executive Board on September 24, 2020 and then had Amendment #1 approved by the Board on June 24, 2021 and Amendment #2 approval postponed.

## **Travel Demand Model**

The 2015/2045 FBRMPO TDM v1.1 (adopted on September 24, 2020 and last updated on April 28, 2021) was used in the development of this traffic forecast. This version of the model includes all fiscally-constrained 2045 MTP projects (including MTP amendment projects), as well as socioeconomic data projections. For the purposes of the U-5832 forecast, model runs were completed by modifying the highway network to either include or exclude the subject project (depending on the scenario).

The North Carolina Statewide Model (NCSTM) (Generation 4.5, TransCAD 7 Build 12375) was also used in the development of this traffic forecast. The NCSTM has a Base Year of 2017 and a Future Year of 2045.

## **Interpolation**

To determine any intermediate years, straight-line interpolation may be used. AADT volumes may be extrapolated for up to two years immediately following 2045.

## **Development Activity**

All recent and planned developments were reviewed with local planners and engineers and are assumed to be included in the official Base Year and Future Year 2045 TRM socioeconomic data sets.

## **Forecast Methodology**

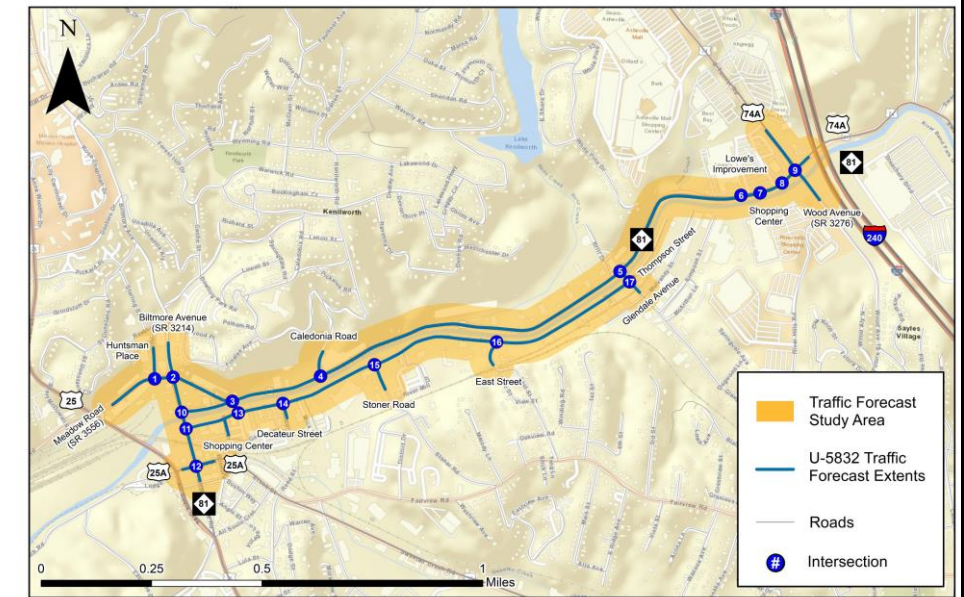
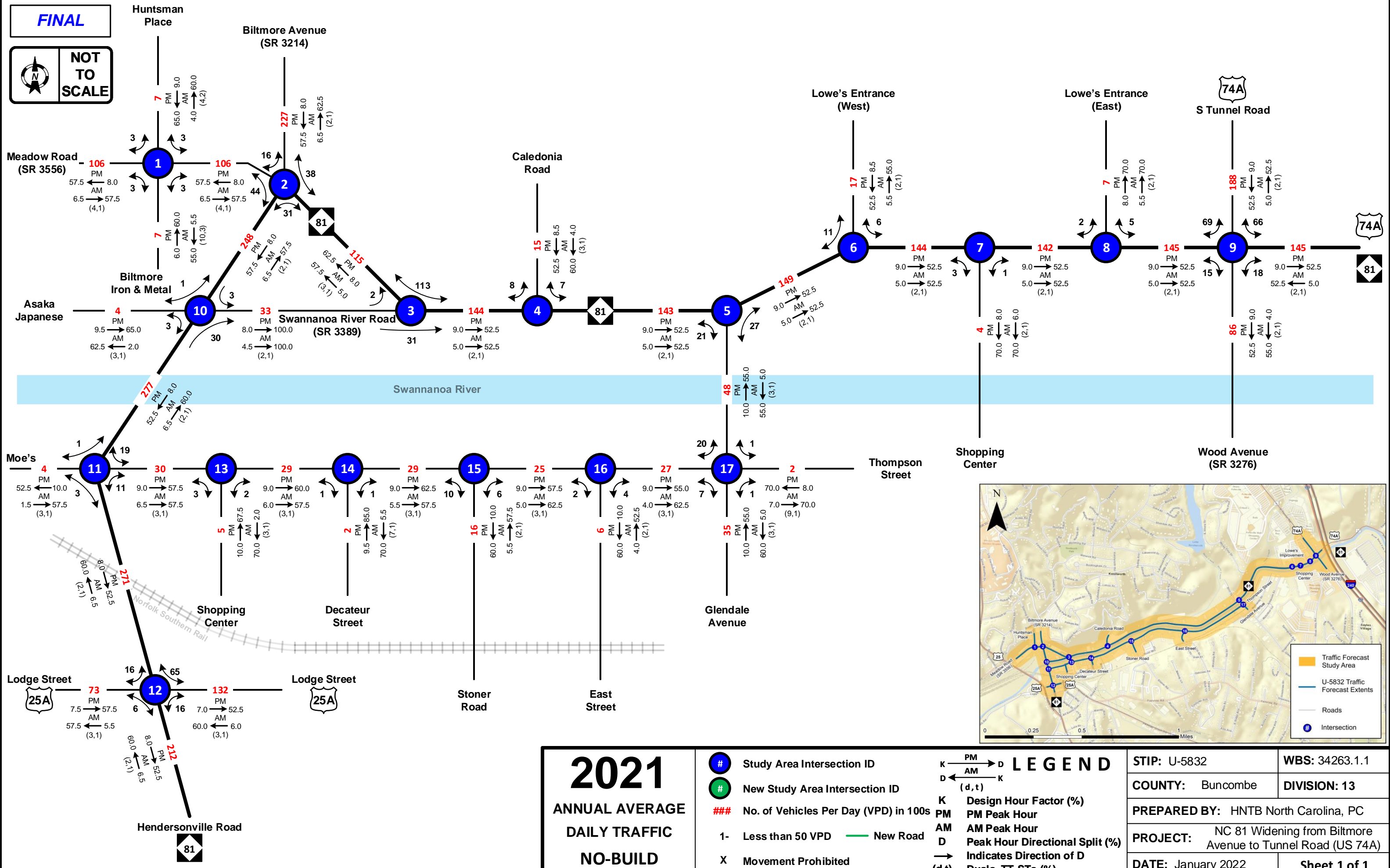
The 2021 BYNB traffic estimate volumes and design factors were developed by considering recent historic AADT, the projection of historic AADT to 2021, project specific count data, and applying engineering judgement. The 2045 FYNB traffic forecast volumes were developed using historic AADT growth rates, extrapolations of historical AADT volumes, and growth percentages calculated from the model.

The 2021 BYB and 2045 FYB scenarios were developed using diversion rates derived from BYB and FYB model runs relative to BYNB and FYNB model runs, respectively, and engineering judgement where no model data was available. It is assumed in both the 2045 FYNB and 2045 FYB scenarios that all FBRMPO 2045 MTP projects will be constructed.

If it is determined that any of these assumptions have become inconsistent with the project and surrounding area activity, please request updated projections. If you have any questions or I can be of further assistance, please do not hesitate to call me at (919) 424-0483 or e-mail me at [jburris@hntb.com](mailto:jburris@hntb.com).

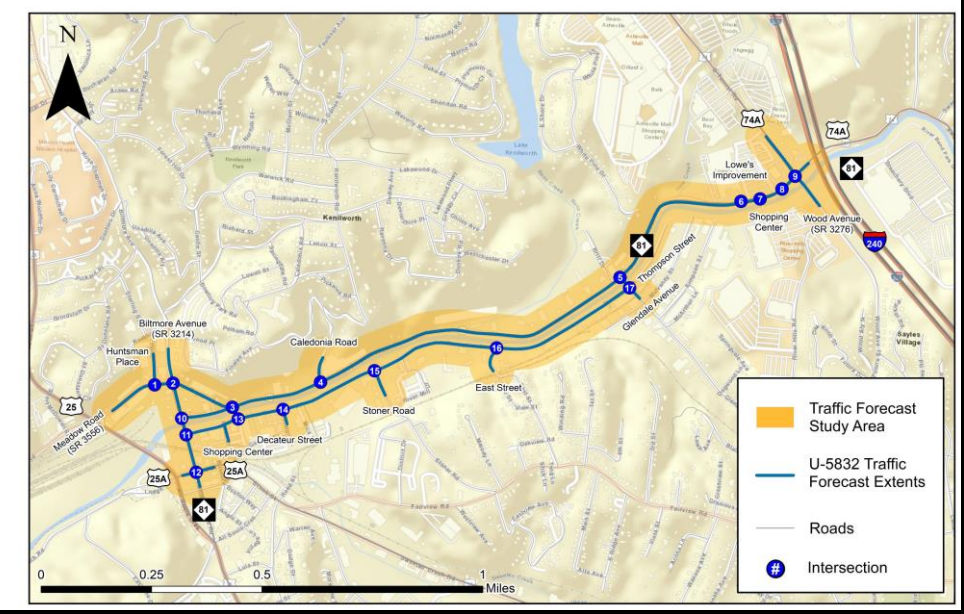
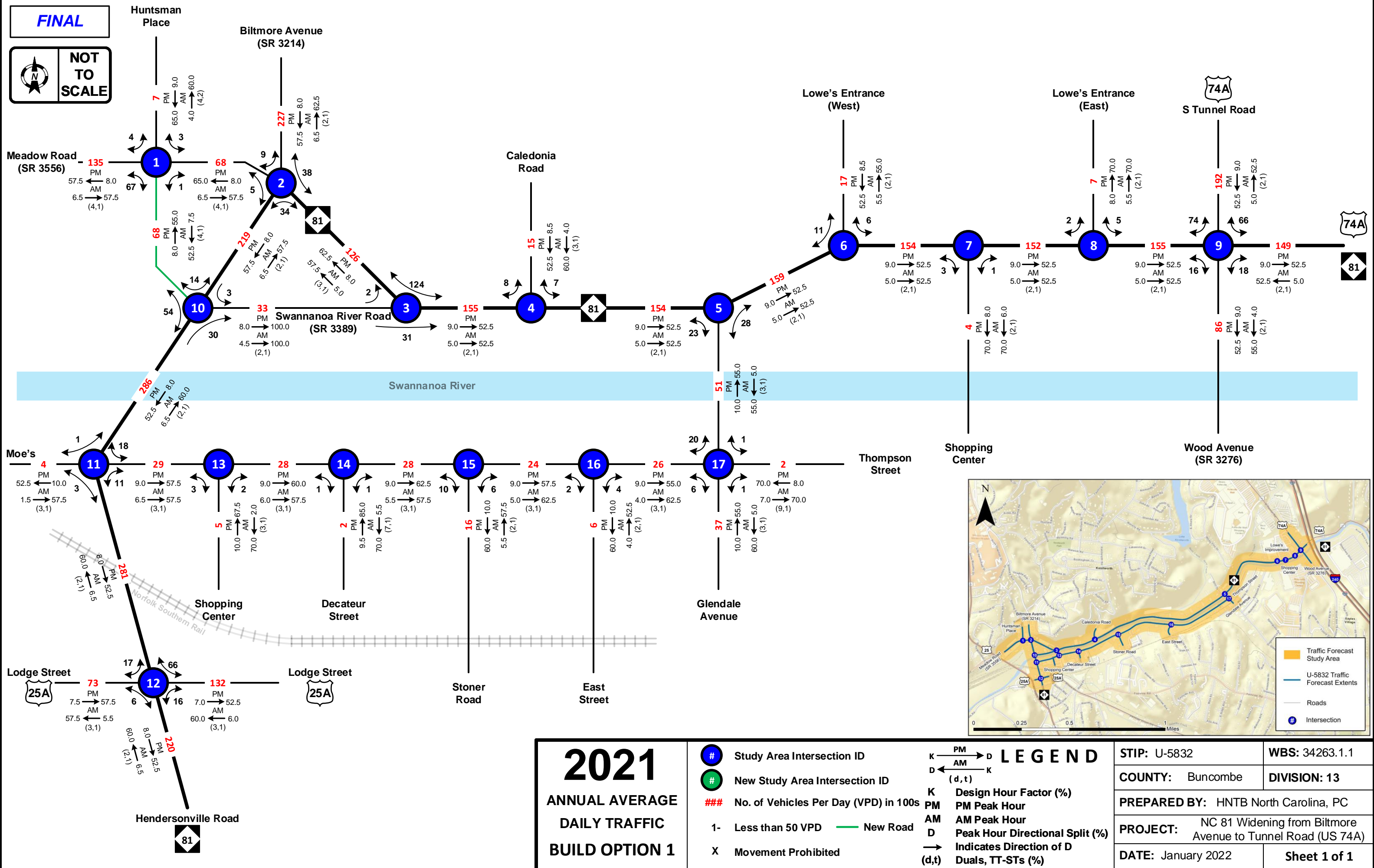
**cc:** Keith Dixon (trafficforecast@ncdot.gov), NCDOT Transportation Planning Division  
NCDOT Traffic Forecasting GIS Support (trafficforecastinggissupport@ncdot.gov)

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<h1>2021</h1> <p>ANNUAL AVERAGE DAILY TRAFFIC NO-BUILD</p>	<p><b>#</b> Study Area Intersection ID</p> <p><b>#</b> New Study Area Intersection ID</p> <p><b>###</b> No. of Vehicles Per Day (VPD) in 100s</p> <p>1- Less than 50 VPD</p> <p>X Movement Prohibited</p>	<p><b>LEGEND</b></p> <p>K → PM → D D ← AM ← K (d, t)</p> <p>K Design Hour Factor (%)</p> <p>PM PM Peak Hour</p> <p>AM AM Peak Hour</p> <p>D Peak Hour Directional Split (%)</p> <p>→ Indicates Direction of D</p> <p>(d,t) Duals, TT-STs (%)</p>	<p>STIP: U-5832</p> <p>COUNTY: Buncombe</p> <p>PREPARED BY: HNTB North Carolina, PC</p> <p>PROJECT: NC 81 Widening from Biltmore Avenue to Tunnel Road (US 74A)</p> <p>DATE: January 2022</p>	<p>WBS: 34263.1.1</p> <p>DIVISION: 13</p> <p>Sheet 1 of 1</p>
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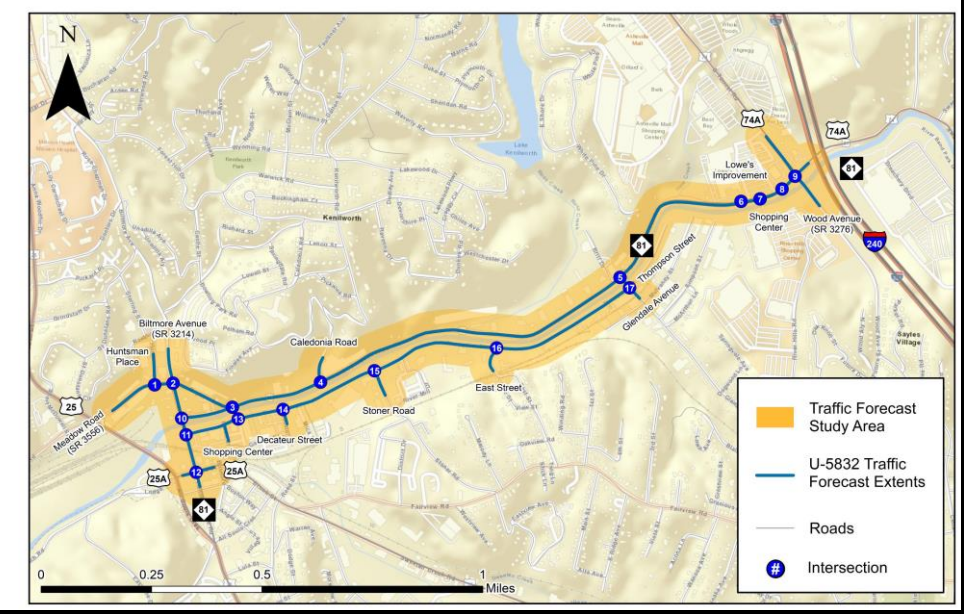
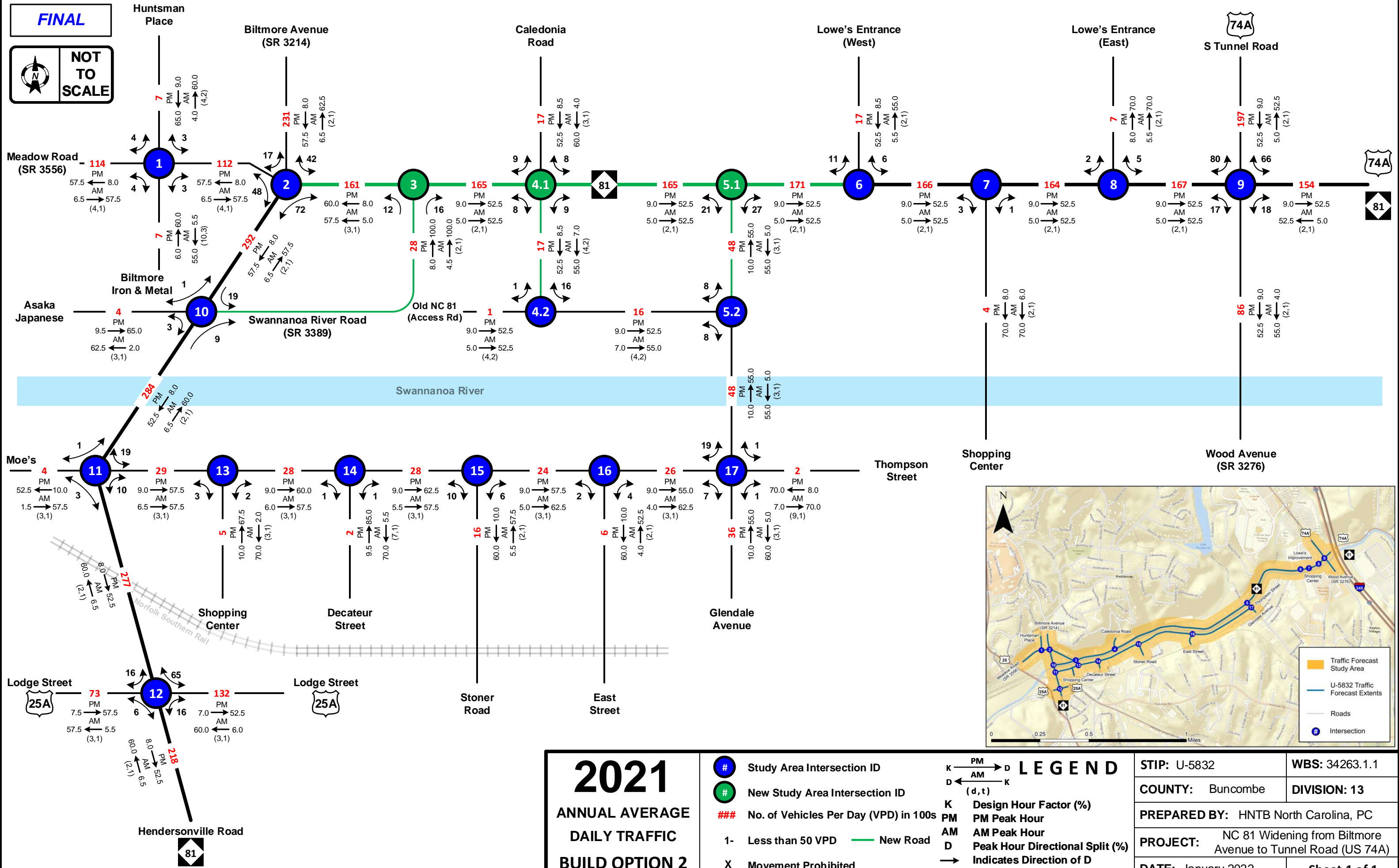


**2021**  
ANNUAL AVERAGE  
DAILY TRAFFIC  
BUILD OPTION 1

#	Study Area Intersection ID	K → PM D ← AM (d, t)	<b>LEGEND</b>
#	New Study Area Intersection ID		
###	No. of Vehicles Per Day (VPD) in 100s	K	Design Hour Factor (%)
1-	Less than 50 VPD	PM	PM Peak Hour
X	Movement Prohibited	AM	AM Peak Hour
		D	Peak Hour Directional Split (%)
		→	Indicates Direction of D
		(d,t)	Duals, TT-STs (%)

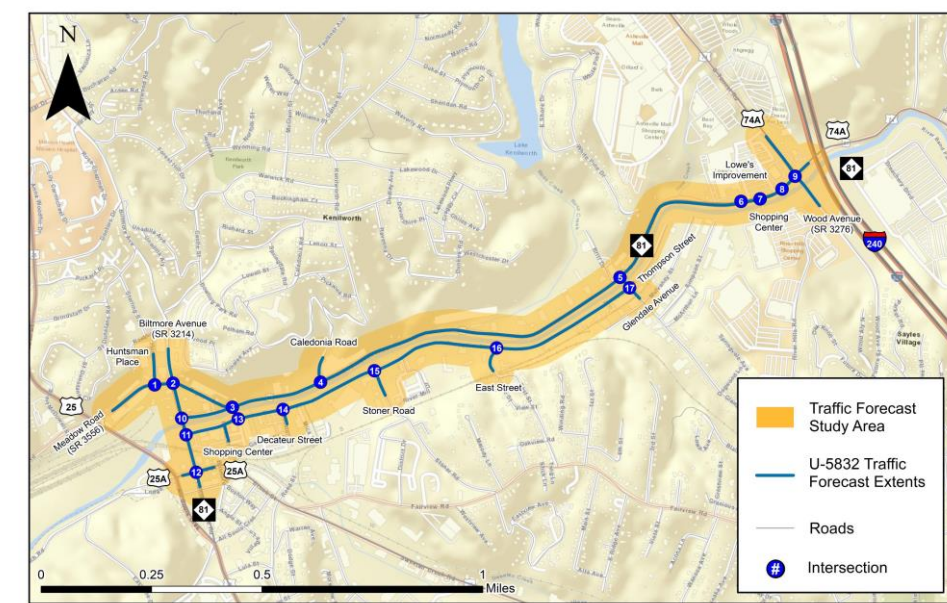
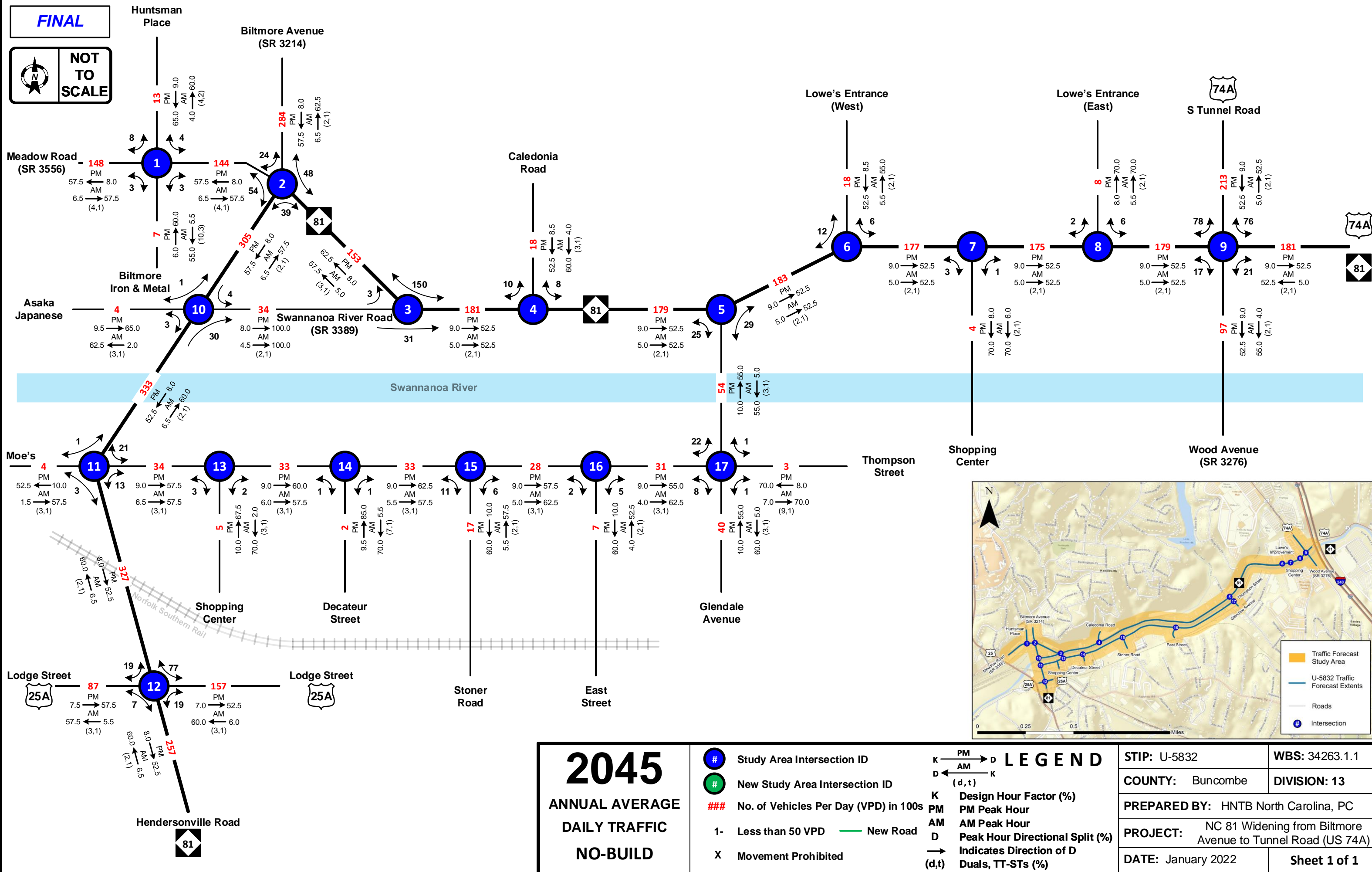
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COUNTY:	Buncombe	DIVISION:	13
PREPARED BY:	HNTB North Carolina, PC		
PROJECT:	NC 81 Widening from Biltmore Avenue to Tunnel Road (US 74A)		
DATE:	January 2022	Sheet	1 of 1

**FINAL**



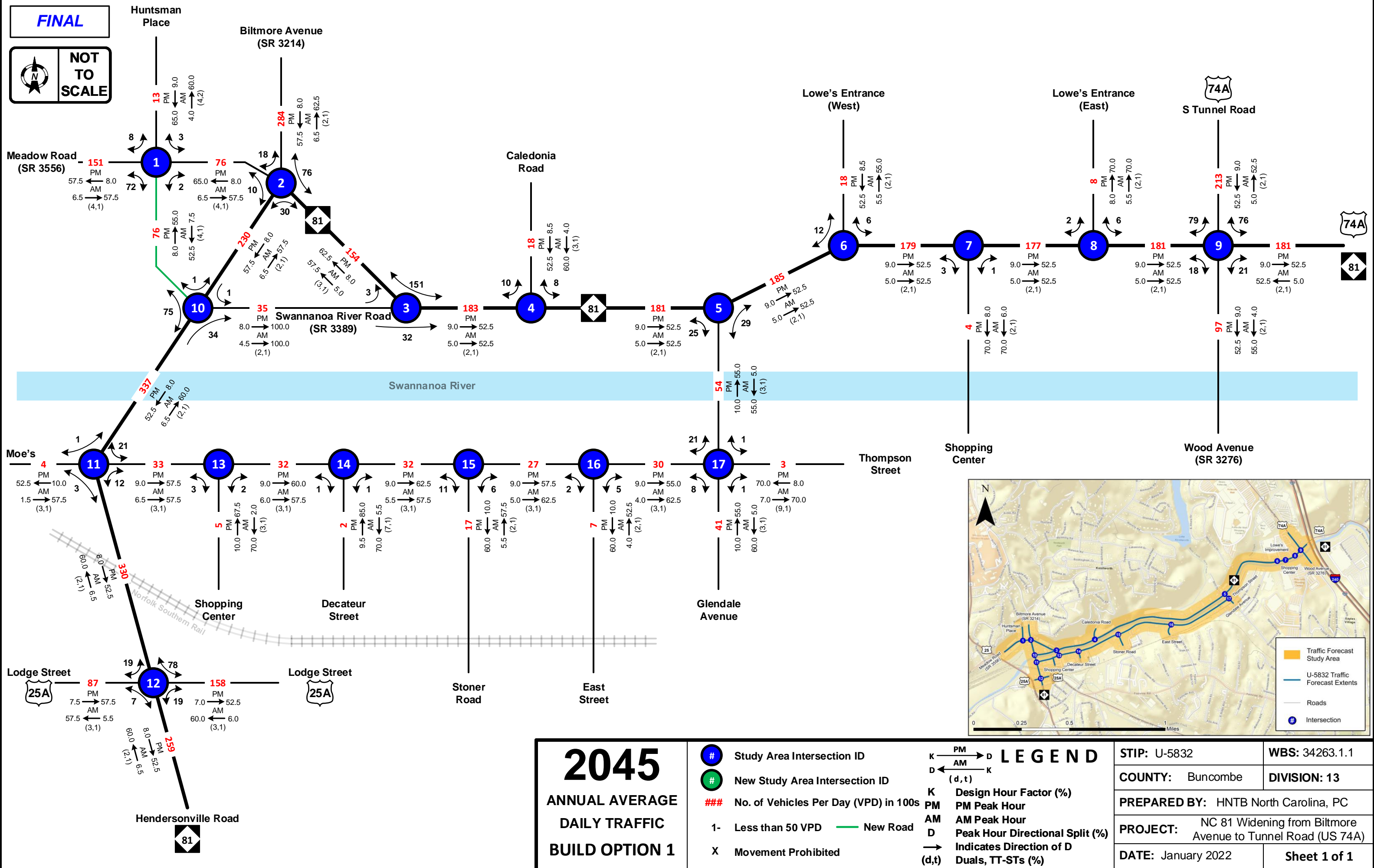
<h1>2021</h1> <p><b>ANNUAL AVERAGE DAILY TRAFFIC BUILD OPTION 2</b></p>	<p><b>#</b> Study Area Intersection ID</p> <p><b>#</b> New Study Area Intersection ID</p> <p><b>###</b> No. of Vehicles Per Day (VPD) in 100s</p> <p>1- Less than 50 VPD</p> <p>X Movement Prohibited</p>	<p><b>LEGEND</b></p> <p>K → PM → D D ← AM ← K (d, t)</p> <p>K Design Hour Factor (%)</p> <p>PM PM Peak Hour</p> <p>AM AM Peak Hour</p> <p>D Peak Hour Directional Split (%)</p> <p>→ Indicates Direction of D</p> <p>(d,t) Duals, TT-STs (%)</p>	<p>STIP: U-5832</p> <p>COUNTY: Buncombe</p> <p>PREPARED BY: HNTB North Carolina, PC</p> <p>PROJECT: NC 81 Widening from Biltmore Avenue to Tunnel Road (US 74A)</p> <p>DATE: January 2022</p>	<p>WBS: 34263.1.1</p> <p>DIVISION: 13</p> <p>Sheet 1 of 1</p>
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<h1>2045</h1> <p>ANNUAL AVERAGE DAILY TRAFFIC NO-BUILD</p>	<p><b>#</b> Study Area Intersection ID</p> <p><b>#</b> New Study Area Intersection ID</p> <p><b>###</b> No. of Vehicles Per Day (VPD) in 100s</p> <p>1- Less than 50 VPD</p> <p>X Movement Prohibited</p>	<p><b>LEGEND</b></p> <p>K → PM → D D ← AM ← K (d, t)</p> <p>K Design Hour Factor (%)</p> <p>PM PM Peak Hour</p> <p>AM AM Peak Hour</p> <p>D Peak Hour Directional Split (%)</p> <p>→ Indicates Direction of D</p> <p>(d,t) Duals, TT-STs (%)</p>	<p>STIP: U-5832</p> <p>COUNTY: Buncombe</p> <p>PREPARED BY: HNTB North Carolina, PC</p> <p>PROJECT: NC 81 Widening from Biltmore Avenue to Tunnel Road (US 74A)</p> <p>DATE: January 2022</p>	<p>WBS: 34263.1.1</p> <p>DIVISION: 13</p> <p>Sheet 1 of 1</p>
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# 2045 ANNUAL AVERAGE DAILY TRAFFIC BUILD OPTION 1

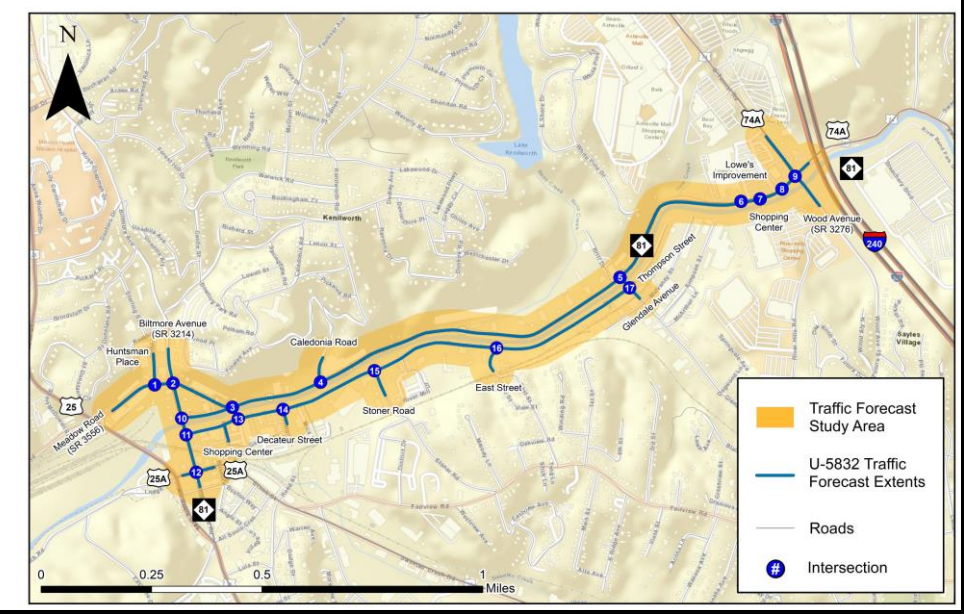
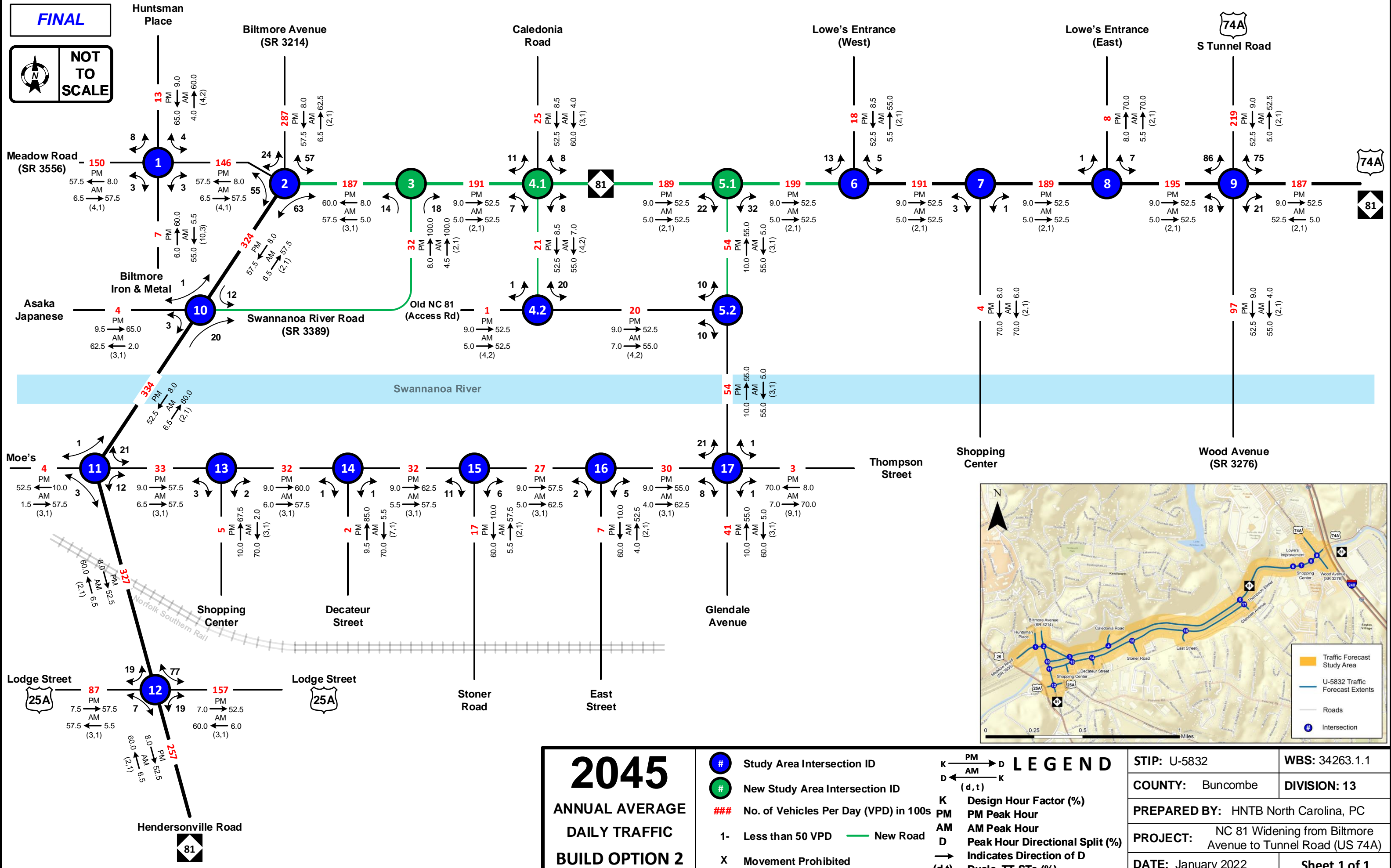
- #** Study Area Intersection ID
- #** New Study Area Intersection ID
- ###** No. of Vehicles Per Day (VPD) in 100s
- 1-** Less than 50 VPD
- X** Movement Prohibited

**LEGEND**

- K** PM → D
- D** ← AM
- (d, t)**
- K** Design Hour Factor (%)
- PM** PM Peak Hour
- AM** AM Peak Hour
- D** Peak Hour Directional Split (%)
- Indicates Direction of D
- (d,t)** Duals, TT-STs (%)

STIP: U-5832	WBS: 34263.1.1
COUNTY: Buncombe	DIVISION: 13
PREPARED BY: HNTB North Carolina, PC	
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DATE: January 2022	Sheet 1 of 1

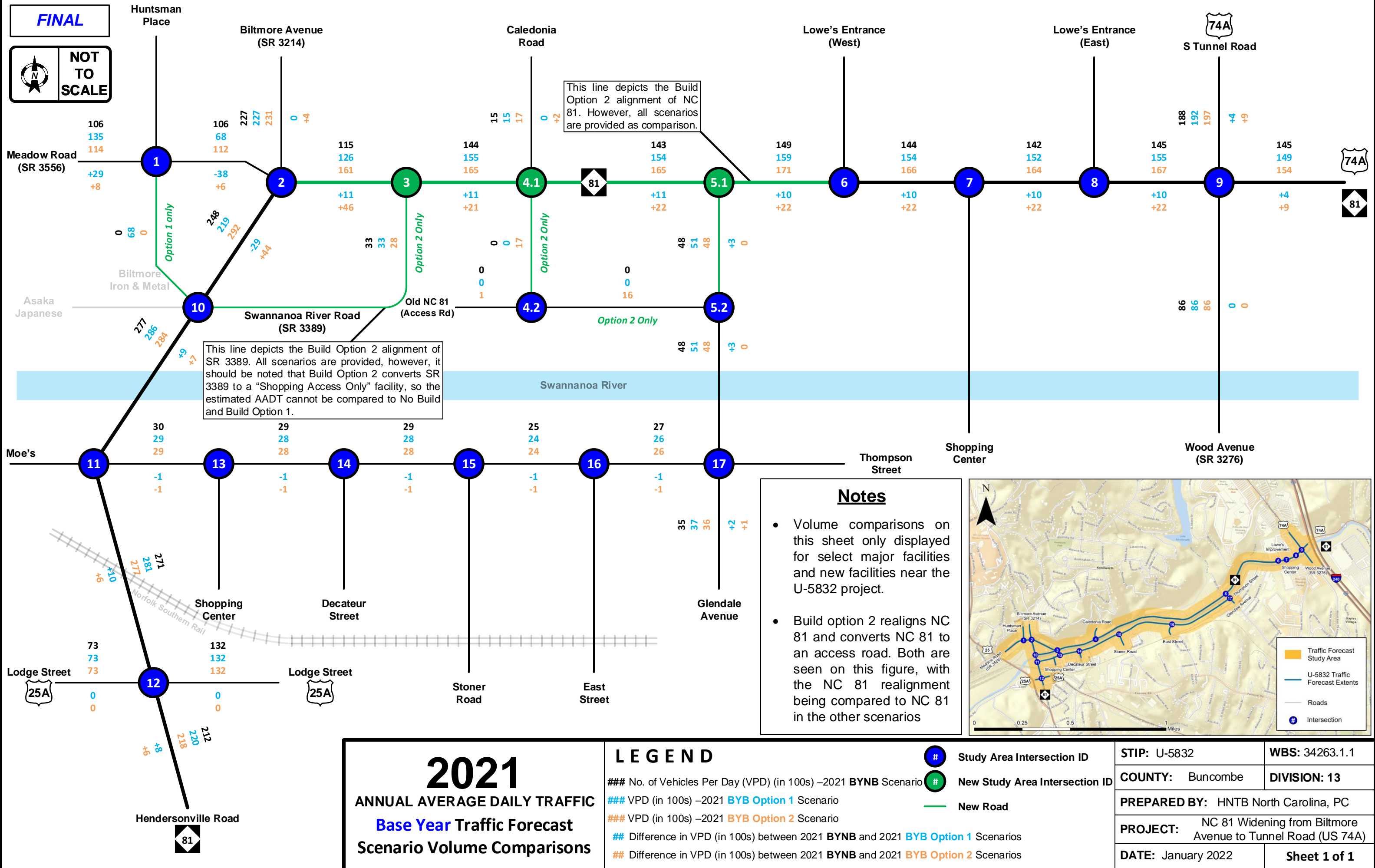
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<h1>2045</h1> <p>ANNUAL AVERAGE DAILY TRAFFIC BUILD OPTION 2</p>	<p><b>#</b> Study Area Intersection ID</p> <p><b>#</b> New Study Area Intersection ID</p> <p><b>###</b> No. of Vehicles Per Day (VPD) in 100s</p> <p>1- Less than 50 VPD</p> <p>X Movement Prohibited</p>	<p><b>LEGEND</b></p> <p>K → PM → D D ← AM ← K (d, t)</p> <p>K Design Hour Factor (%)</p> <p>PM PM Peak Hour</p> <p>AM AM Peak Hour</p> <p>D Peak Hour Directional Split (%)</p> <p>→ Indicates Direction of D</p> <p>(d,t) Duals, TT-STs (%)</p>	<p>STIP: U-5832</p> <p>COUNTY: Buncombe</p> <p>PREPARED BY: HNTB North Carolina, PC</p> <p>PROJECT: NC 81 Widening from Biltmore Avenue to Tunnel Road (US 74A)</p> <p>DATE: January 2022</p>	<p>WBS: 34263.1.1</p> <p>DIVISION: 13</p> <p>SHEET: 1 of 1</p>
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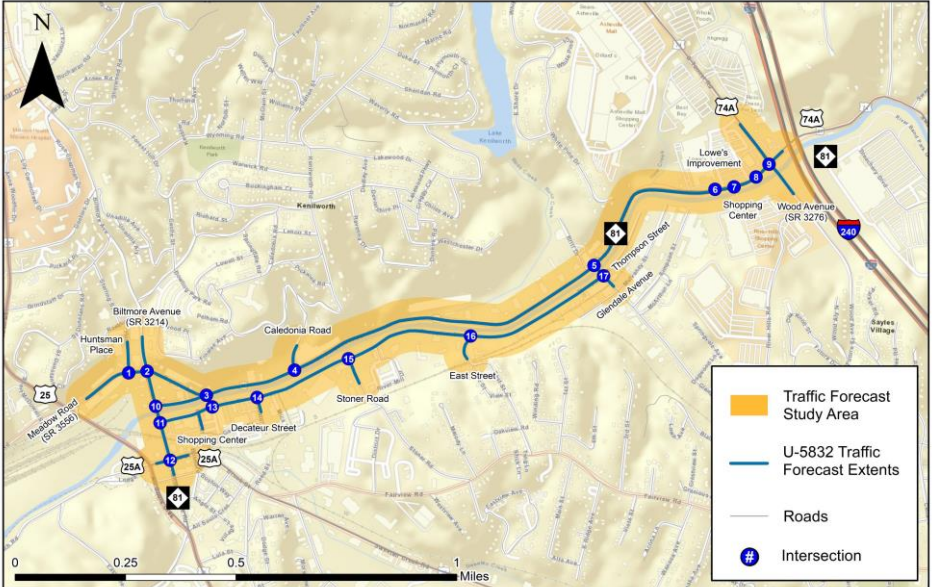


This line depicts the Build Option 2 alignment of NC 81. However, all scenarios are provided as comparison.

This line depicts the Build Option 2 alignment of SR 3389. All scenarios are provided, however, it should be noted that Build Option 2 converts SR 3389 to a "Shopping Access Only" facility, so the estimated AADT cannot be compared to No Build and Build Option 1.

**Notes**

- Volume comparisons on this sheet only displayed for select major facilities and new facilities near the U-5832 project.
- Build option 2 realigns NC 81 and converts NC 81 to an access road. Both are seen on this figure, with the NC 81 realignment being compared to NC 81 in the other scenarios



# 2021 ANNUAL AVERAGE DAILY TRAFFIC Base Year Traffic Forecast Scenario Volume Comparisons

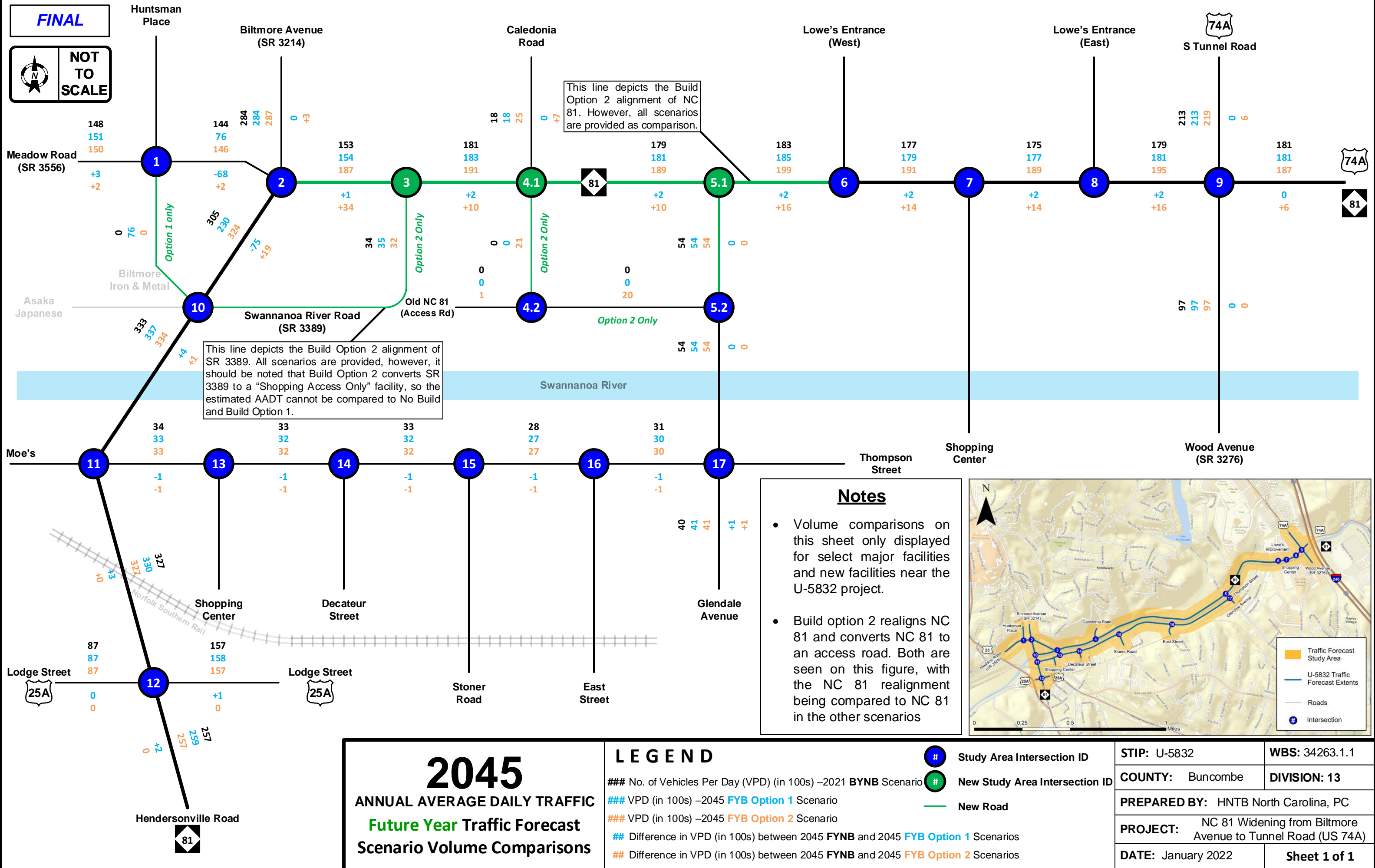
## LEGEND

- ### No. of Vehicles Per Day (VPD) (in 100s) –2021 BYNB Scenario
- ### VPD (in 100s) –2021 BYB Option 1 Scenario
- ### VPD (in 100s) –2021 BYB Option 2 Scenario
- ## Difference in VPD (in 100s) between 2021 BYNB and 2021 BYB Option 1 Scenarios
- ## Difference in VPD (in 100s) between 2021 BYNB and 2021 BYB Option 2 Scenarios

- # Study Area Intersection ID
- # New Study Area Intersection ID
- New Road

STIP: U-5832	WBS: 34263.1.1
COUNTY: Buncombe	DIVISION: 13
PREPARED BY: HNTB North Carolina, PC	
PROJECT: NC 81 Widening from Biltmore Avenue to Tunnel Road (US 74A)	
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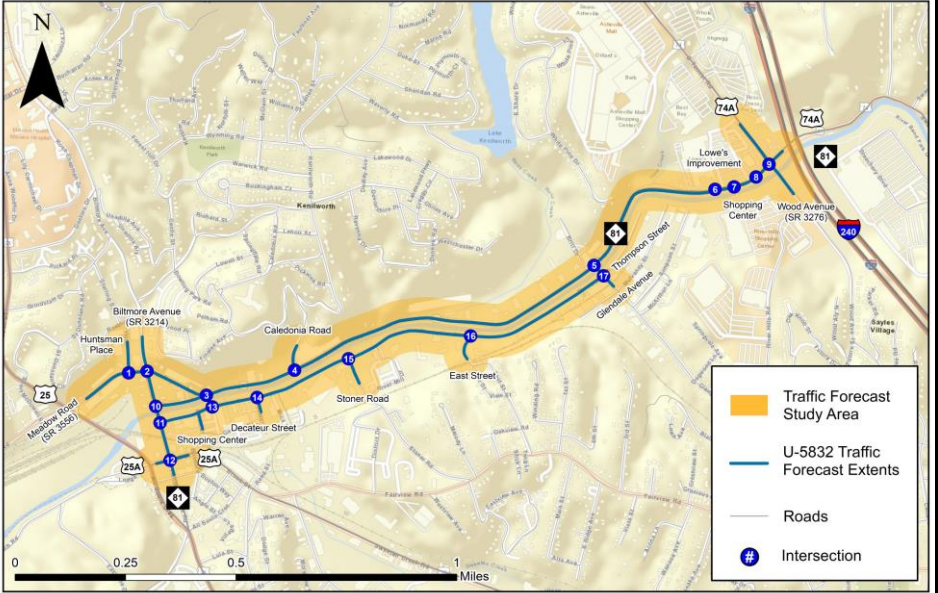


This line depicts the Build Option 2 alignment of NC 81. However, all scenarios are provided as comparison.

This line depicts the Build Option 2 alignment of SR 3389. All scenarios are provided, however, it should be noted that Build Option 2 converts SR 3389 to a "Shopping Access Only" facility, so the estimated AADT cannot be compared to No Build and Build Option 1.

**Notes**

- Volume comparisons on this sheet only displayed for select major facilities and new facilities near the U-5832 project.
- Build option 2 realigns NC 81 and converts NC 81 to an access road. Both are seen on this figure, with the NC 81 realignment being compared to NC 81 in the other scenarios



# 2045 ANNUAL AVERAGE DAILY TRAFFIC Future Year Traffic Forecast Scenario Volume Comparisons

## LEGEND

- ### No. of Vehicles Per Day (VPD) (in 100s) –2021 BYNB Scenario
- ### VPD (in 100s) –2045 FYB Option 1 Scenario
- ### VPD (in 100s) –2045 FYB Option 2 Scenario
- ## Difference in VPD (in 100s) between 2045 FYNB and 2045 FYB Option 1 Scenarios
- ## Difference in VPD (in 100s) between 2045 FYNB and 2045 FYB Option 2 Scenarios

- # Study Area Intersection ID
- # New Study Area Intersection ID
- New Road

STIP: U-5832	WBS: 34263.1.1
COUNTY: Buncombe	DIVISION: 13
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PROJECT: NC 81 Widening from Biltmore Avenue to Tunnel Road (US 74A)	
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