

July 16, 2019

MEMORANDUM TO: Nora McCann
Project Manager
NCDOT Project Management Team

FROM: Matthew Quesenberry, PE
HNTB North Carolina, PC

SUBJECT: Final Traffic Forecast for STIP Project I-5719
I-85 Widening to 8-Lane Interstate from US 321 (Exit 17) to NC 273 (Exit 27),
Gaston County

The NCDOT Transportation Planning Division (TPD) has reviewed and approved this traffic forecast for I-5719 for delivery as of July 16, 2019.

Please find attached the 2045 Project-Level Final Traffic Forecast for State Transportation Improvement Program (STIP) I-5719. This traffic forecast is an update to a previously completed traffic forecast for this project on March 8, 2017. STIP Project I-5719 includes the widening of I-85 as an 8-lane interstate from US 321 (Exit 17) to NC 273 (Exit 27) in Gaston County. The traffic forecast for this project was requested by Nora McCann of the NCDOT Project Management Team in February 2019 as part of the 2018 Traffic Forecasting Limited Services Agreement (LSA) to be performed by HNTB.

STIP Project I-5719 is currently programmed for construction to begin in fiscal year 2021, per the 2018 – 2027 STIP, approved by the NCDOT Board of Transportation on August 3, 2017 and most recently revised on June 27, 2019. The Draft 2020 – 2029 STIP was released on January 10, 2019 and displays the construction for STIP Project I-5719 to begin in fiscal year 2023.

The STIP project boundaries for I-5719 include I-85 from US 321 (Exit 17) to NC 273 (Exit 27). The traffic forecast study area for I-5719 extends along I-85 west of US 321 to the NC 274 (Exit 14) interchange, in addition to extending along I-85 east of NC 273 to the I-485 (Exit 30) interchange in Mecklenburg County. The I-5719 traffic forecast includes a total of 12 interchanges and various intersections located near interchange or grade-separated roadways that traverse I-85. The following scenarios are included in this forecast update:

- 2016 Base Year No-Build (BYNB) – No changes from original I-5719 forecast developed on March 8, 2017 and displayed in forecast update report as reference only
- 2045 Future Year No-Build (FYNB)
- 2045 Future Year Build (FYB)

In the development of this forecast update, 2016 and 2017 historic AADT values (not previously available during development of the March 8, 2017 forecast) were reviewed and used to calculate current 10- and 20-year historic AADT linear regression lines. Also, 2016 BYNB AM peak hour design factor data (based on count data from 2016) is summarized in the forecast update report (not previously summarized in March 8, 2017 forecast). This additional data was reviewed and analyzed to provide the most current historic AADT growth rate data in the selection of 2045 FYNB AADT and to develop 2045 FYNB AM peak hour design factors. This additional data does not change the 2016 BYNB traffic estimate developed in the I-5719 forecast completed on March 8, 2017.

Previously completed project-level traffic forecasts that are nearby the I-5719 traffic forecast study area and considered relevant include the previously completed traffic forecast for I-5719 (I-85 Widening) and the nearby forecasts for U-6043 (additional eastbound lane on US 29/US 74), BR-0020 (replacement of US 29/US 74 bridge over the Catawba River), and I-5000 (I-85/US 321 interchange improvements).

Travel Demand Model

The MRM 18v1.1 (effective December 3, 2018) was used in the development of this traffic forecast. The model has a Base Year of 2015 and a Future Year of 2045. Additionally, the North Carolina Statewide Model (NCSTM) Generation 2.3, delivered on February 14, 2018, was used in the development of this traffic forecast. The model has a 2011 Base Year and a 2040 Future Year.

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.

Certain assumptions were made in development of the forecast and include the following items.

Fiscal Constraint

Within a Metropolitan Planning Organization (MPO), future year traffic forecasts assume construction of projects listed within an MPO's Metropolitan Transportation Plan (MTP). This traffic forecast is consistent with both the Gaston Cleveland Lincoln MPO (GCLMPO) 2045 MTP (adopted on March 22, 2018) and the Charlotte Regional Transportation Planning Organization (CRTPO) 2045 MTP (adopted on March 18, 2018).

Development Activity

All recent and planned developments are assumed to be included in the official Base Year and Future Year MRM socioeconomic data sets, with two exceptions. The two exceptions include the proposed CaroMont Hospital at Belmont Abbey College and the recently developed Sonic Automotive EchoPark call center at the S Main Street and Kenworthy Avenue intersection. For these two locations, The *ITE Trip Generation Manual, 10th Edition* was used to estimate trips.

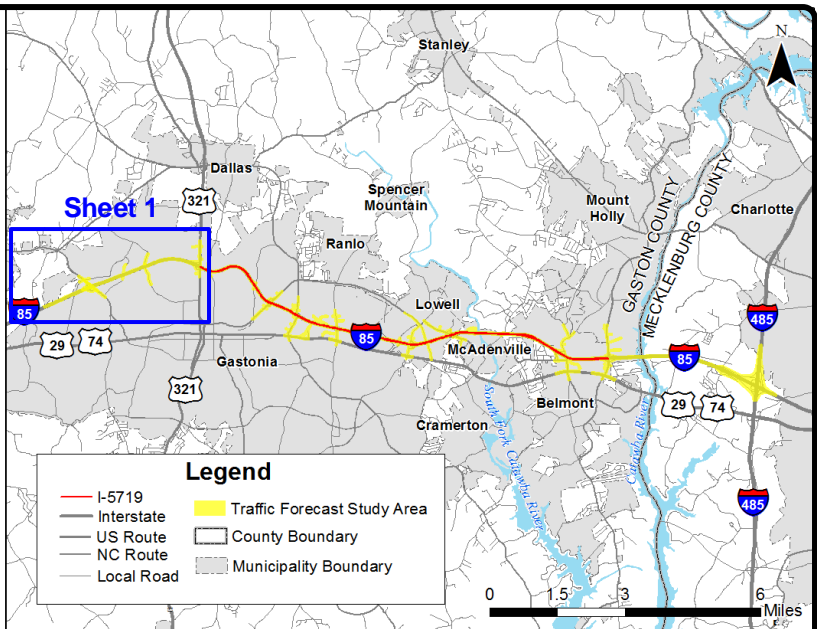
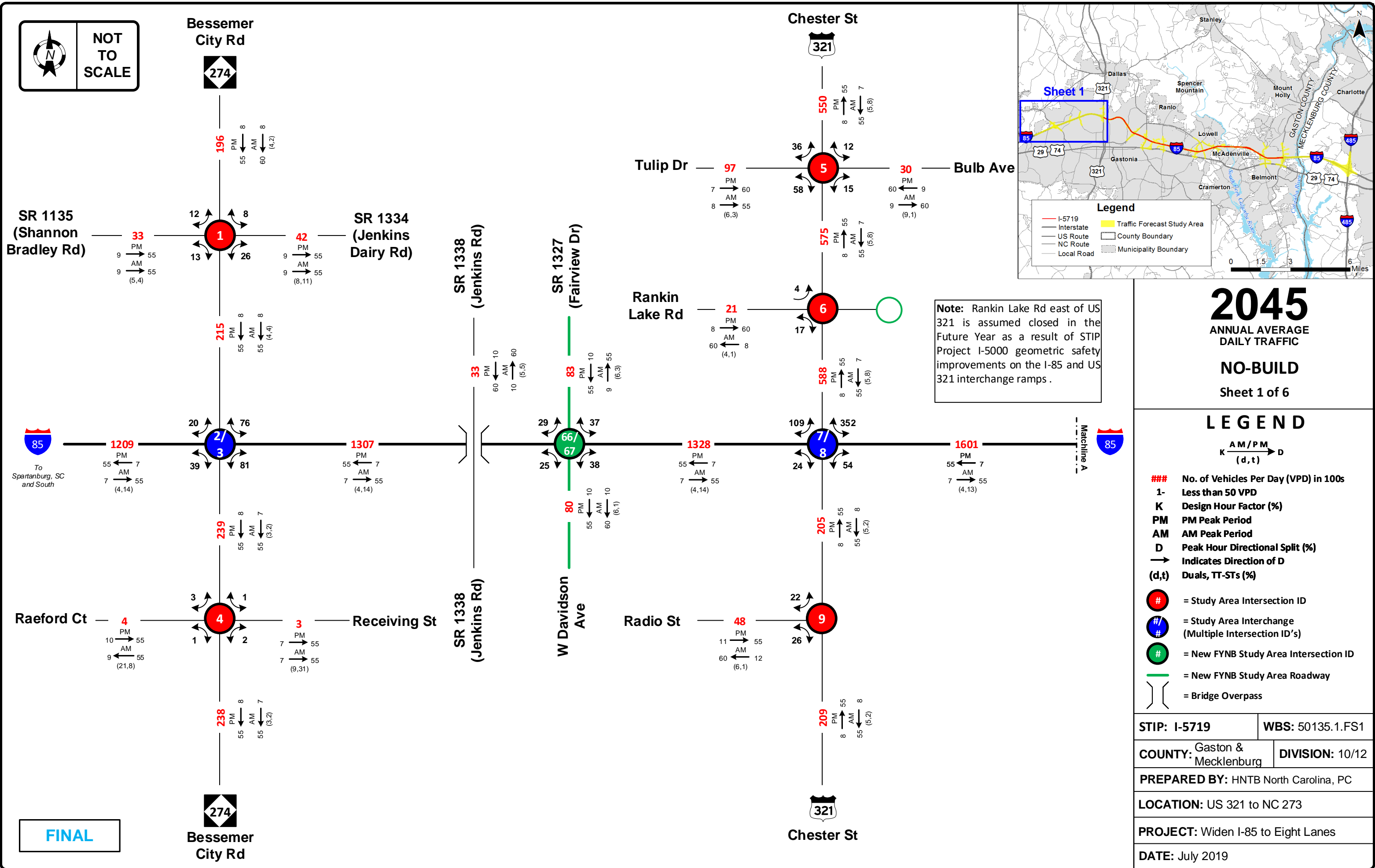
Forecast Methodology

The 2045 FYNB traffic forecast volumes were developed using historic AADT growth rates, extrapolations of historical AADT volumes, and growth percentages calculated from the Metrolina Regional Model (MRM). The 2045 FYB scenario was developed using diversion rates derived from FYB model runs relative to FYNB model run and engineering judgement where no model data was available.

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) 424-0449 or e-mail me at mquesenberry@hntb.com.

cc:

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Beverly Robinson, NCDOT Project Management Team
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Keith Dixon, NCDOT Transportation Planning Division
John A. (Andy) Bailey, NCDOT Transportation Planning Division
Anil Panicker, NCDOT Division 12
Stuart Basham, NCDOT Division 10
Jim Dunlop, PE, NCDOT Congestion Management Section
Brenda Moore, PE, CPM, NCDOT Roadway Design Unit
Clark Morrison, PhD, PE, NCDOT Pavement Management Unit
Randi Gates, GCLMPO
Robert Cook, CRTPO
NCDOT Traffic Forecasting GIS Support



2045
ANNUAL AVERAGE
DAILY TRAFFIC

NO-BUILD

Sheet 1 of 6

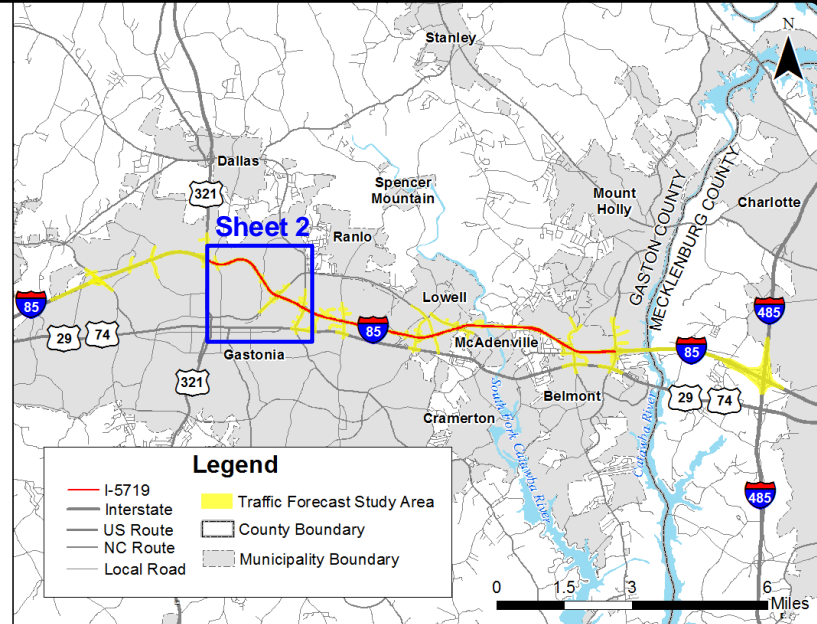
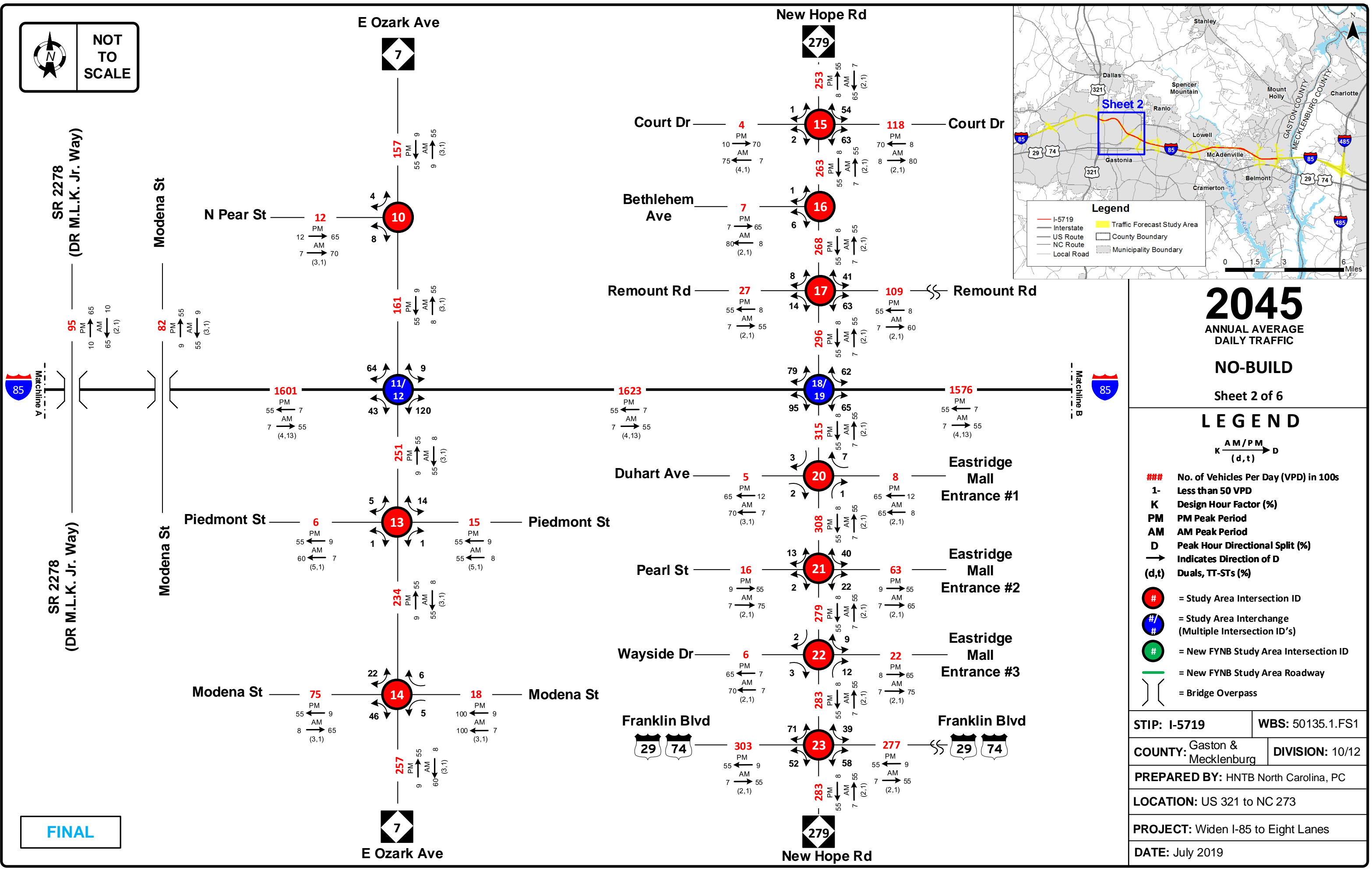
LEGEND

- $\frac{K}{(d,t)} \frac{AM}{PM} \rightarrow D$
- ###** No. of Vehicles Per Day (VPD) in 100s
- 1-** Less than 50 VPD
- K** Design Hour Factor (%)
- PM** PM Peak Period
- AM** AM Peak Period
- D** Peak Hour Directional Split (%)
- \rightarrow Indicates Direction of D
- (d,t)** Duals, TT-STs (%)
- #** = Study Area Intersection ID
- #/#** = Study Area Interchange (Multiple Intersection ID's)
- #** = New FYNB Study Area Intersection ID
- = New FYNB Study Area Roadway
- = Bridge Overpass

Note: Rankin Lake Rd east of US 321 is assumed closed in the Future Year as a result of STIP Project I-5000 geometric safety improvements on the I-85 and US 321 interchange ramps.

STIP: I-5719	WBS: 50135.1.FS1
COUNTY: Gaston & Mecklenburg	DIVISION: 10/12
PREPARED BY: HNTB North Carolina, PC	
LOCATION: US 321 to NC 274	
PROJECT: Widen I-85 to Eight Lanes	
DATE: July 2019	

FINAL



2045
ANNUAL AVERAGE
DAILY TRAFFIC

NO-BUILD

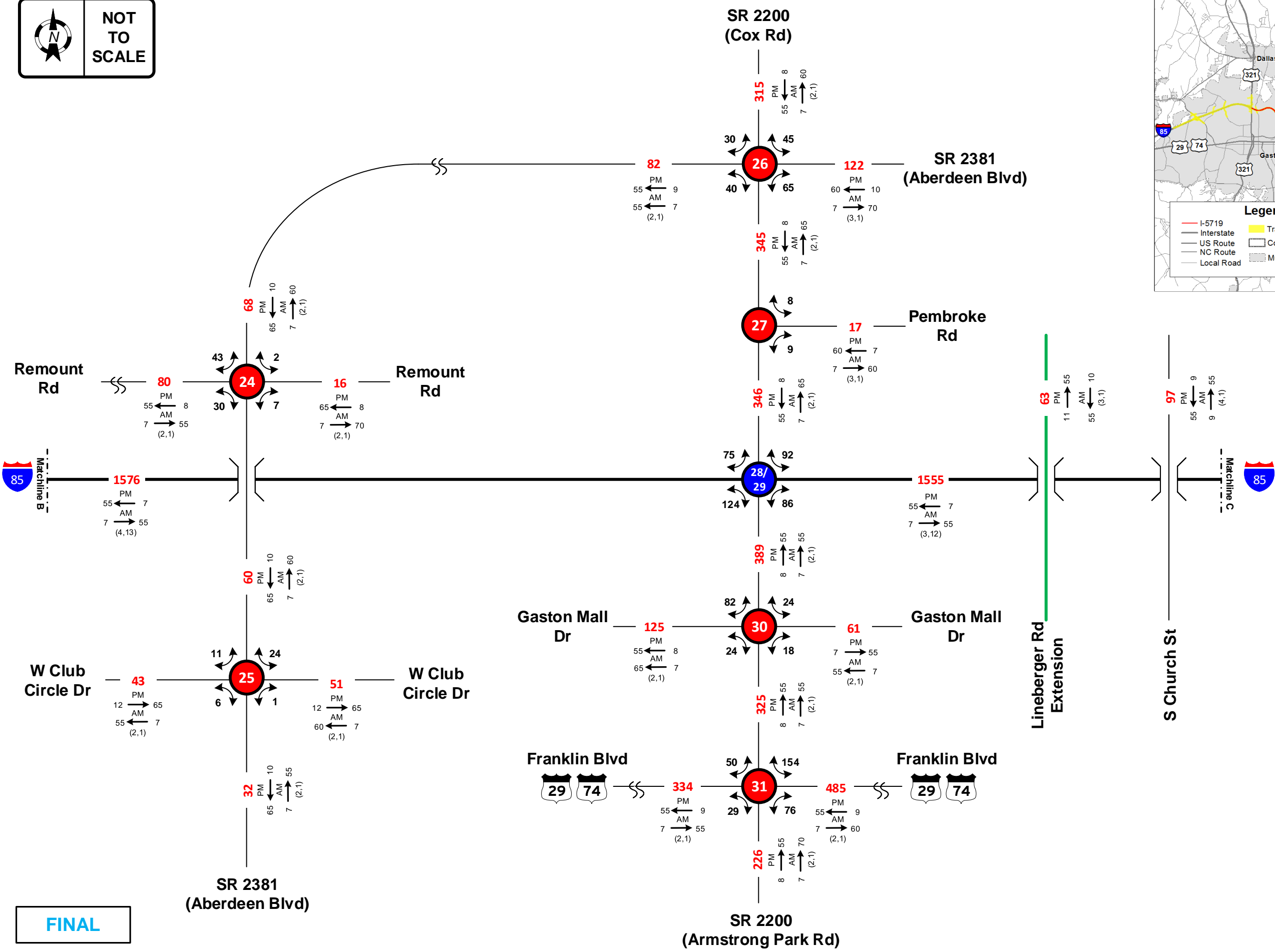
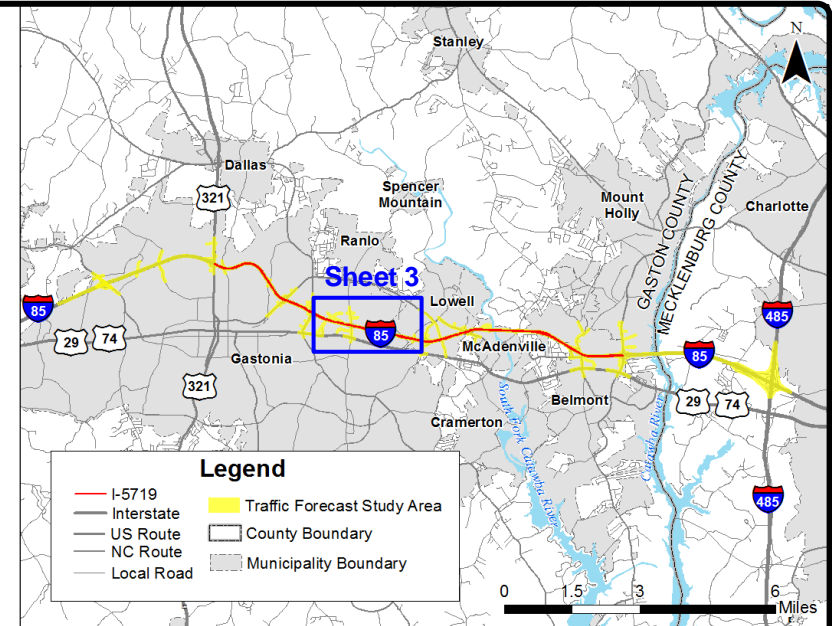
Sheet 2 of 6

LEGEND

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2045

ANNUAL AVERAGE DAILY TRAFFIC

NO-BUILD

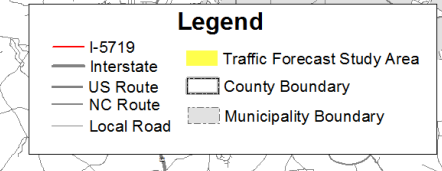
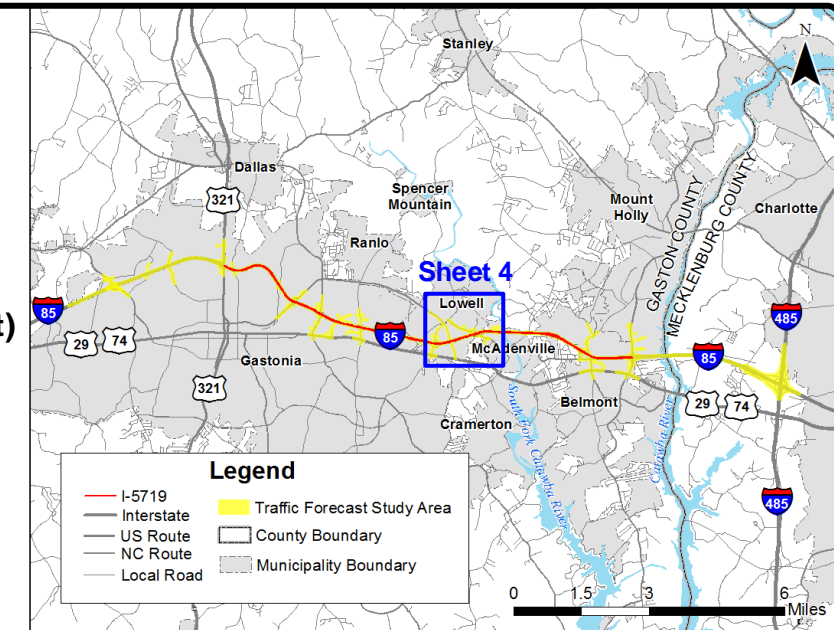
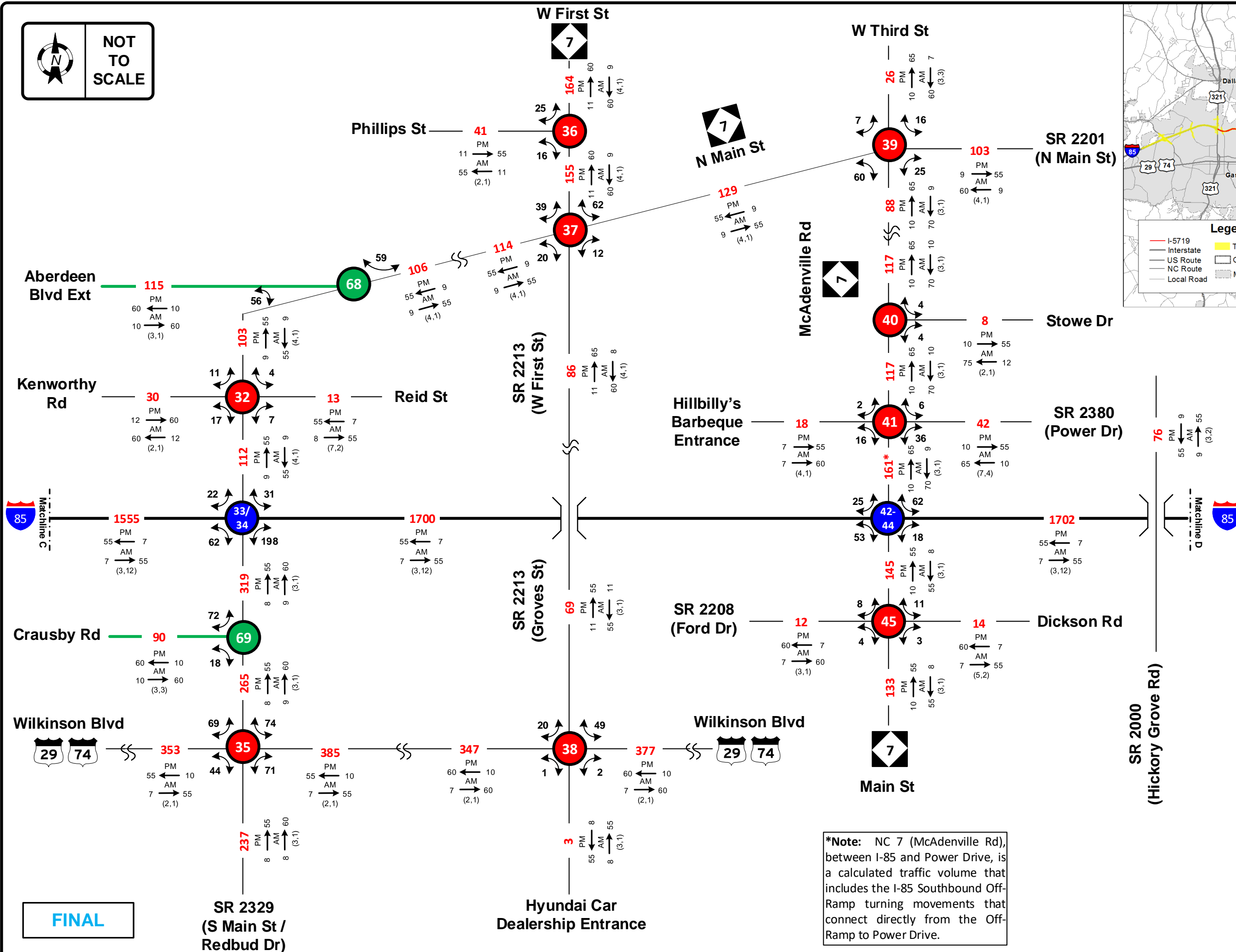
Sheet 3 of 6

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2045
ANNUAL AVERAGE
DAILY TRAFFIC

NO-BUILD
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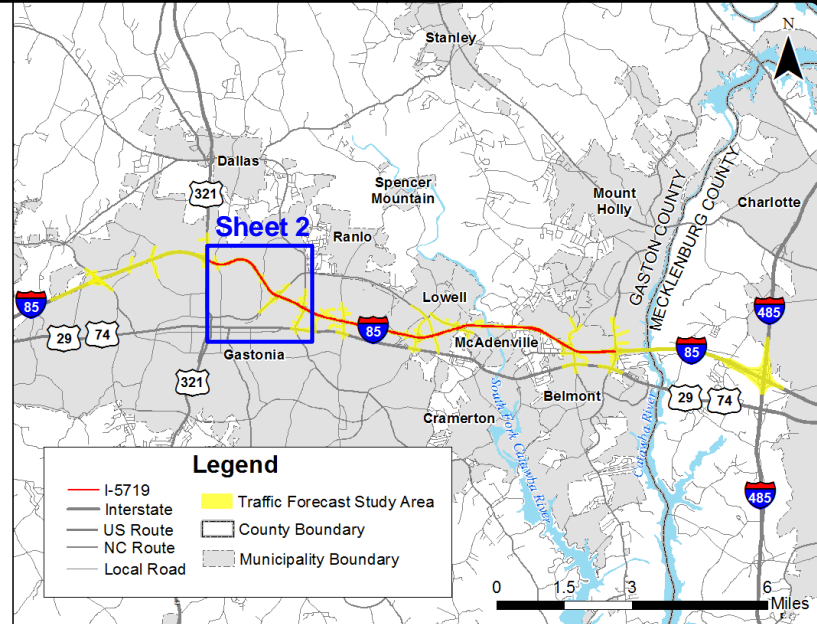
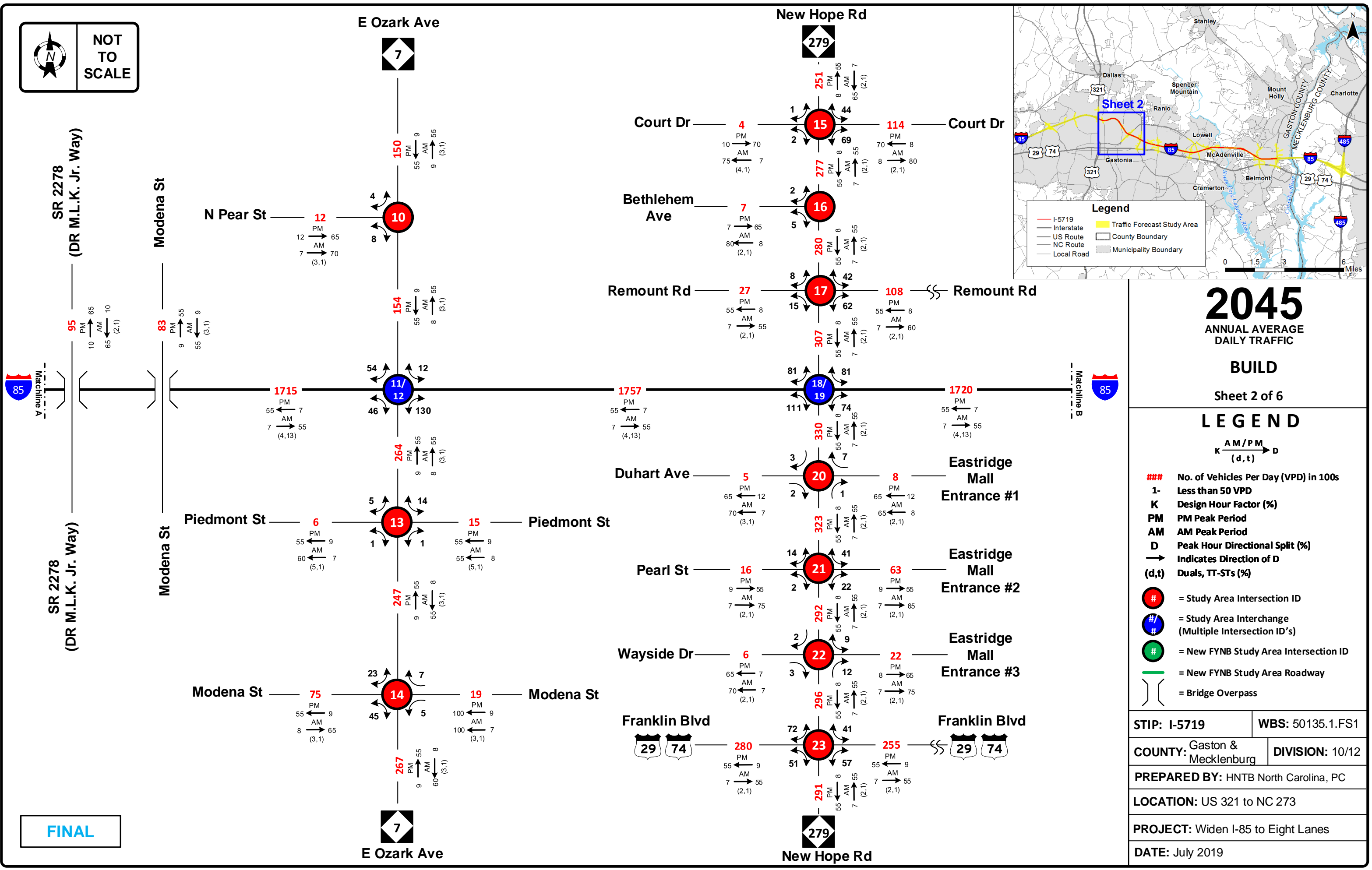
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LOCATION: US 321 to NC 273	
PROJECT: Widen I-85 to Eight Lanes	
DATE: July 2019	

***Note:** NC 7 (McAdenville Rd), between I-85 and Power Drive, is a calculated traffic volume that includes the I-85 Southbound Off-Ramp turning movements that connect directly from the Off-Ramp to Power Drive.

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2045
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DAILY TRAFFIC

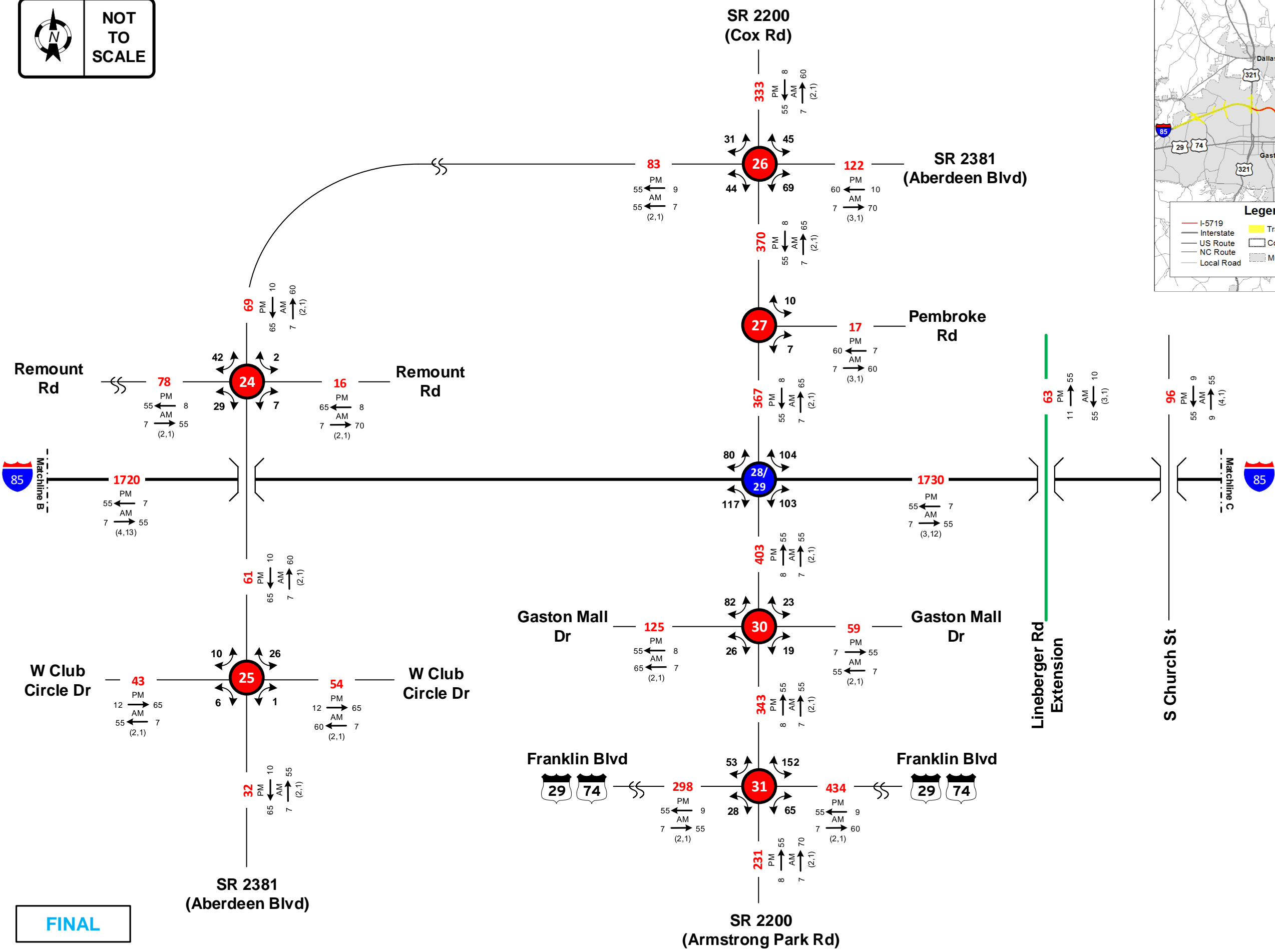
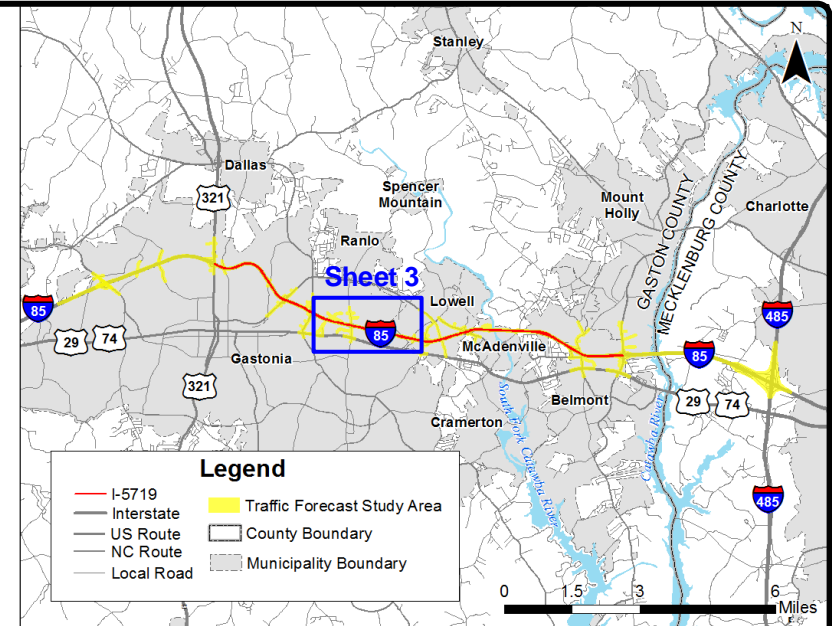
BUILD
Sheet 2 of 6

LEGEND

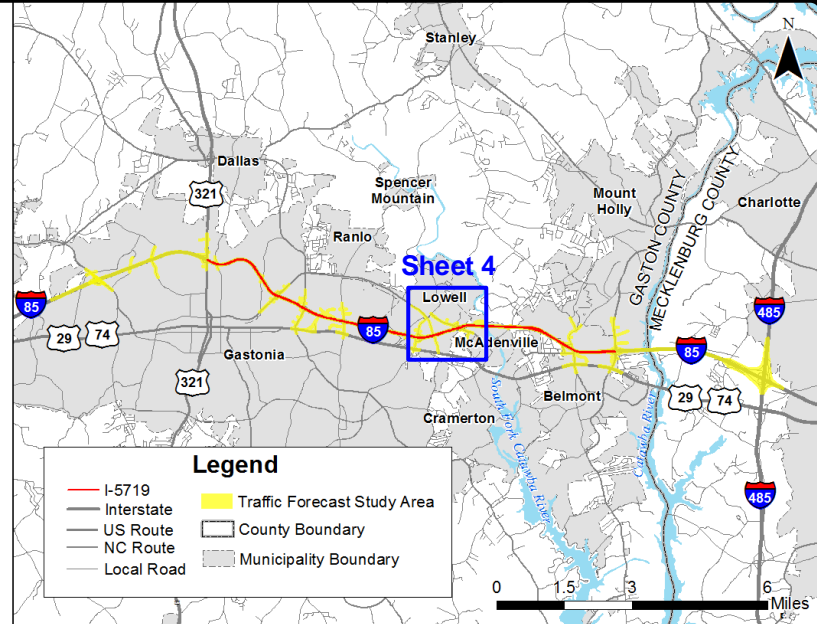
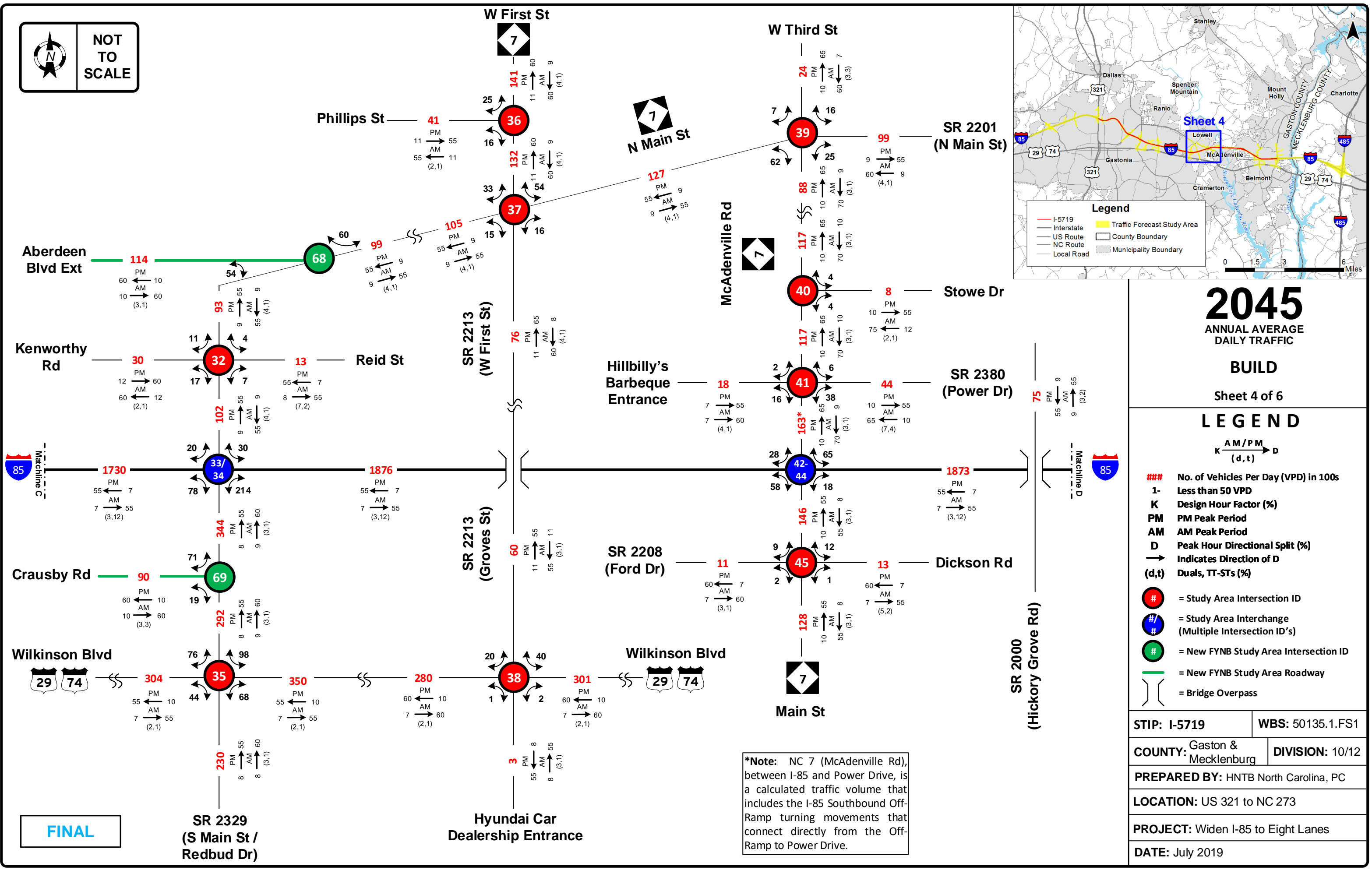
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2045
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BUILD
Sheet 4 of 6

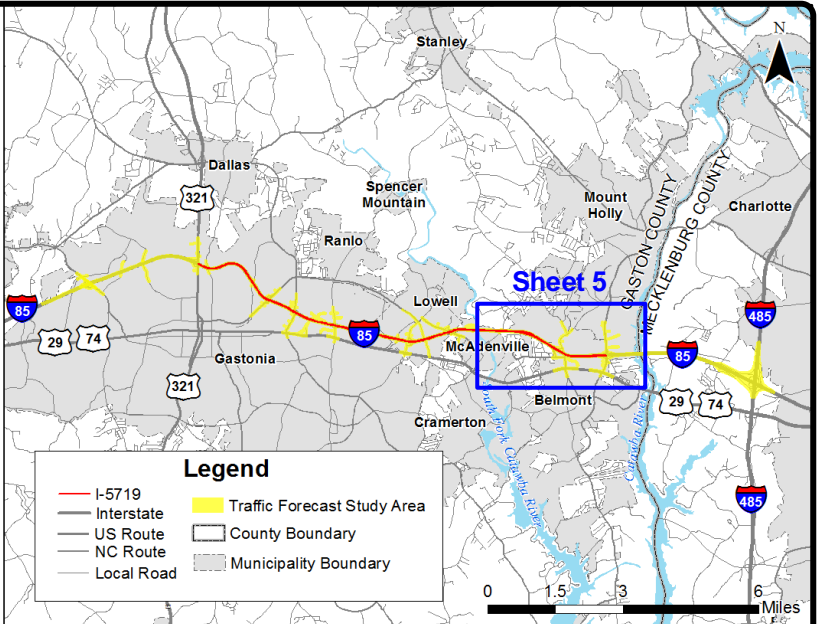
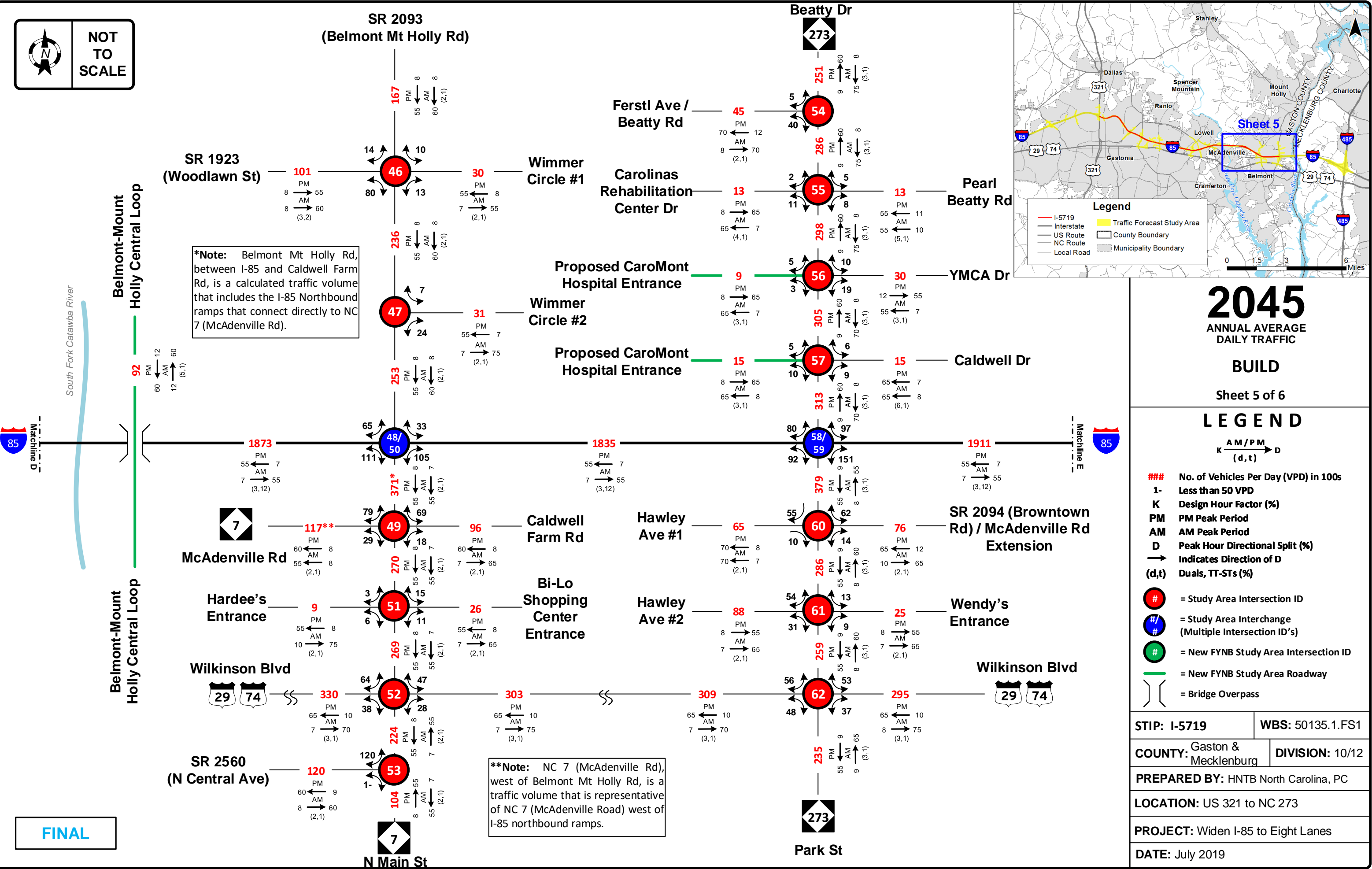
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Double Line = Bridge Overpass

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2045
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BUILD

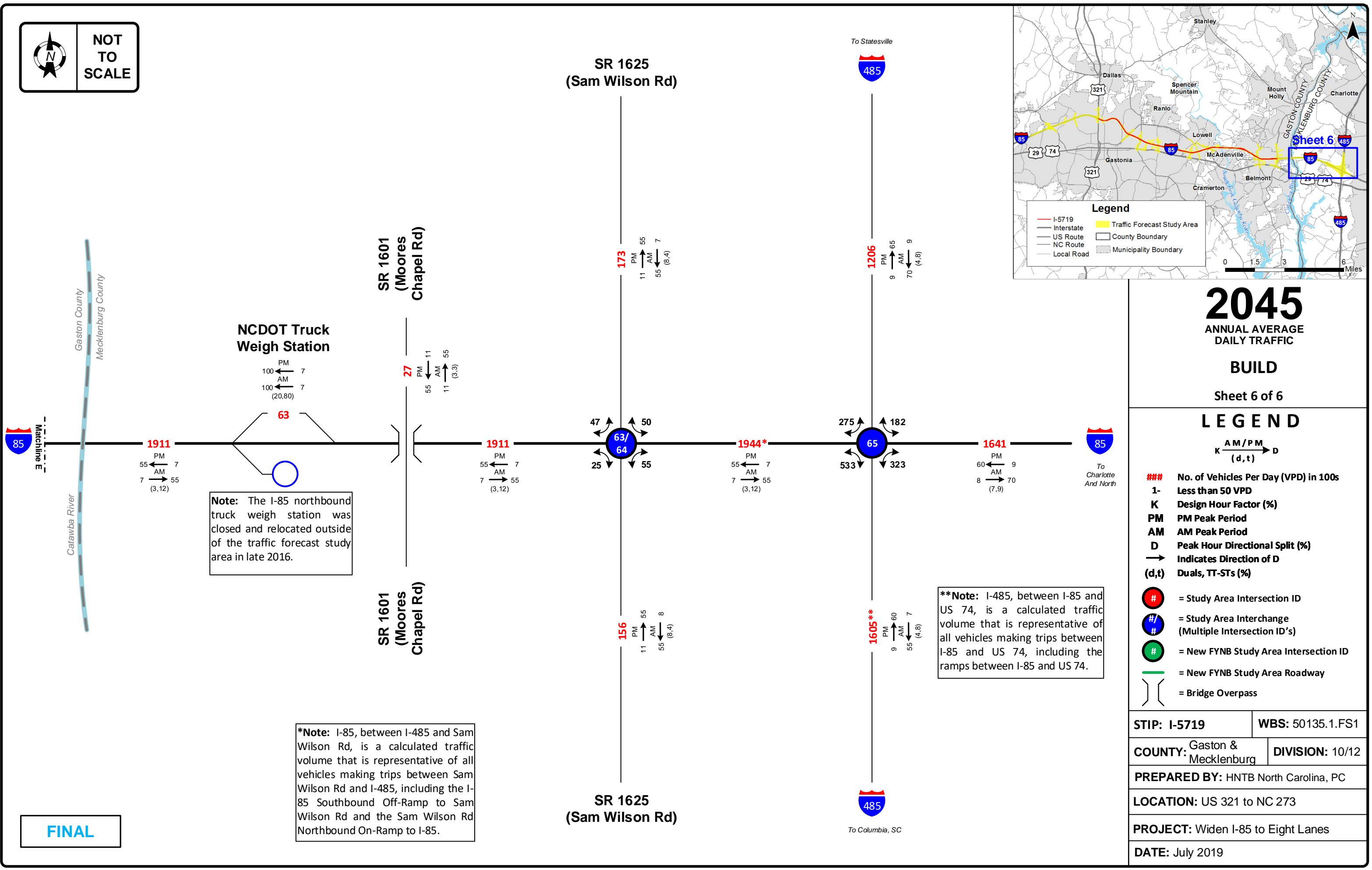
Sheet 5 of 6

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NCDOT Truck Weigh Station

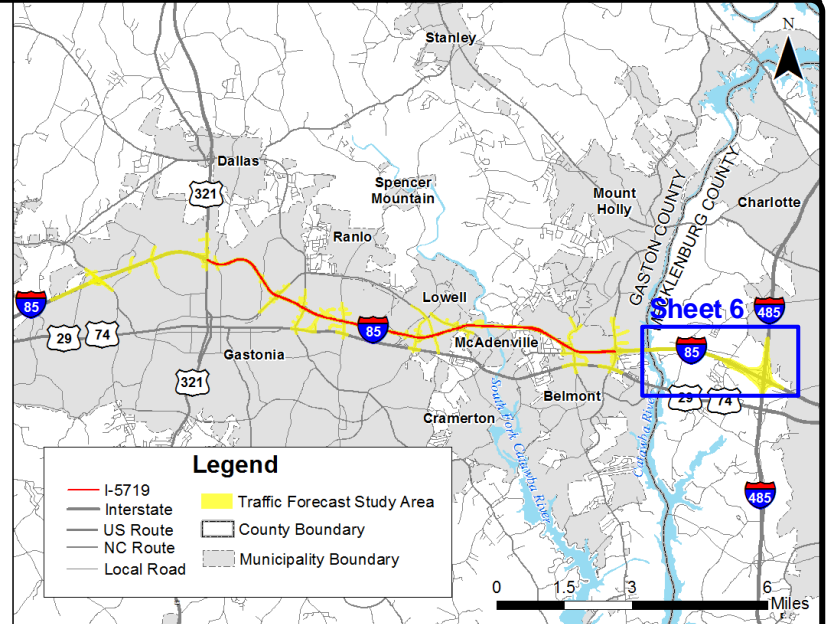
PM 100 ← 7
AM 100 ← 7
(20,80)

63

Note: The I-85 northbound truck weigh station was closed and relocated outside of the traffic forecast study area in late 2016.

***Note:** I-85, between I-485 and Sam Wilson Rd, is a calculated traffic volume that is representative of all vehicles making trips between Sam Wilson Rd and I-485, including the I-85 Southbound Off-Ramp to Sam Wilson Rd and the Sam Wilson Rd Northbound On-Ramp to I-85.

****Note:** I-485, between I-85 and US 74, is a calculated traffic volume that is representative of all vehicles making trips between I-85 and US 74, including the ramps between I-85 and US 74.



2045
ANNUAL AVERAGE DAILY TRAFFIC

BUILD

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LEGEND

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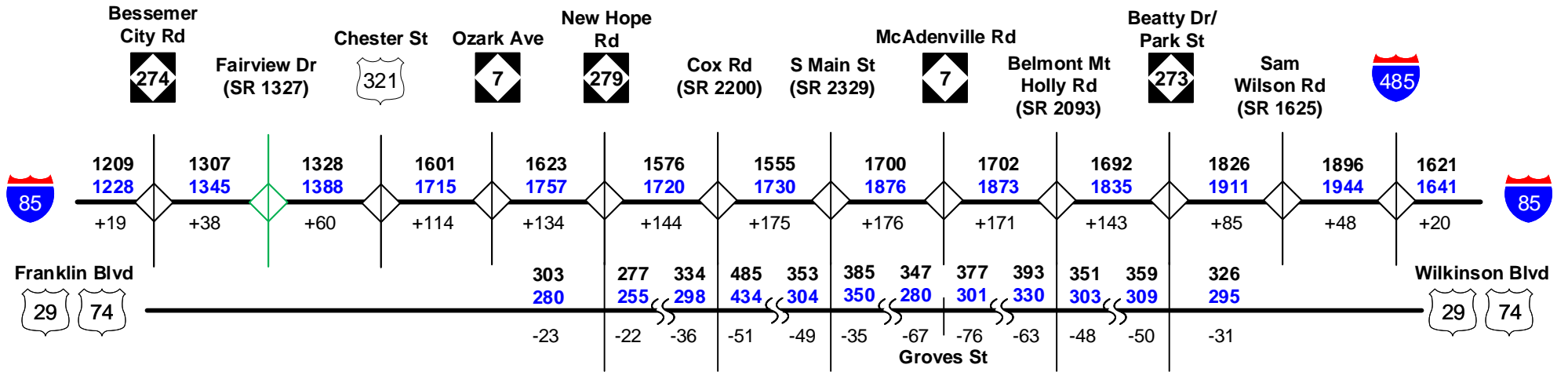
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2045 Future Year No-Build to **Build** Scenario Comparison



STIP Project I-5719

I-85 & US 29/US 74 Comparison between No-Build and Build Scenarios

LEGEND

- ### No. of Vehicles Per Day (VPD) in 100s – 2045 FYNB Scenario
- ### No. of VPD in 100s – 2045 FYB Scenario
- ## Difference in No. of VPD in 100s between the 2 scenarios

STIP: I-5719

COUNTY: Gaston & Mecklenburg DIVISION: 10/12

PREPARED BY: HNTB North Carolina, PC

PROJECT: Widen I-85 to 8-Lane Interstate from US 321 to NC 273

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