Hickory Tree Road Widening

NC 150 to US 52

Davidson County

STIP Project No. U-5786

WBS No. 44358.1.1

Traffic Forecast Report

Prepared For:
North Carolina Department of Transportation

Prepared By:
Patriot Transportation Engineering, PLLC

August 2017

TRAFFIC FORECAST COVER LETTER

August 4, 2017

MEMORANDUM TO:	Al Blanton, PE, PLS NCDOT Division 9 Project Engineer
FROM:	Peter Trencansky, PE, PTOE, AICP Patriot Transportation Engineering, PLLC
SUBJECT:	Traffic Forecast for U-5786 Davidson County SR 1508 (Hickory Tree Rd) from NC 150 (Salisbury Rd) to US 52

Please find attached the 2017 and 2040 traffic forecast for STIP Project Number U-5786 in Davidson County. The proposed project will widen SR 1508 (Hickory Tree Rd) from NC 150 (Salisbury Rd) to US 52. SR 1508 (Hickory Tree Rd) is currently two lanes wide for most of its length, and the project would widen the roadway to four lanes wide with a median. This forecast was requested for use in the project development activities associated with the project, including the NEPA documentation and Preliminary Roadway Design.

This is the first forecast for this project. The project is located within the boundaries of the Winston-Salem Urban Area Metropolitan Planning Organization (WSUAMPO). The following three scenarios are provided in this forecast:

- 2017 Base Year No-Build
- 2040 Future Year No-Build
- 2040 Future Year Build

Diane Hampton (NCDOT – Division 9, Division Planning Engineer), J.P. Couch (NCDOT – Division 9, Division Traffic Engineer), Chris Corriher (NCDOT – Division 9 District 1, District Engineer), Margaret Bessette (City of Winston-Salem, City-County Planning Board, Assistant Director), and Scott Leonard (Davidson County, Planner) were consulted during the development of this forecast.

Fiscal Constraint

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

The *Winston-Salem Urban Area Metropolitan Planning Organization 2040 Metropolitan Transportation Plan* (2040 MTP) includes the proposed project in the 2022-2030 timeframe of highway projects and describes it as follows:

- 30-16, STIP U-5786 – Hickory Tree Rd from US 52 to NC 150 – Widen to multilane (3 or more)

There are no other projects that may affect the proposed project included in the 2040 MTP.

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Travel Demand Model

The Piedmont Triad Regional Model v4.2 (provided by Piedmont Area Regional Transit (PART) on 05/04/2017 as authorized by NCDOT) was utilized as a tool in the development of the forecast.

Forecast Methodology

The 2017 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 2017 and 2040, straight line interpolation between the 2017 Base Year No-Build and the 2040 scenarios is acceptable. The 2017 Base Year No-Build volumes may be used as a surrogate for the 2017 Base Year Build volumes for interpolation and extrapolation purposes. 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.

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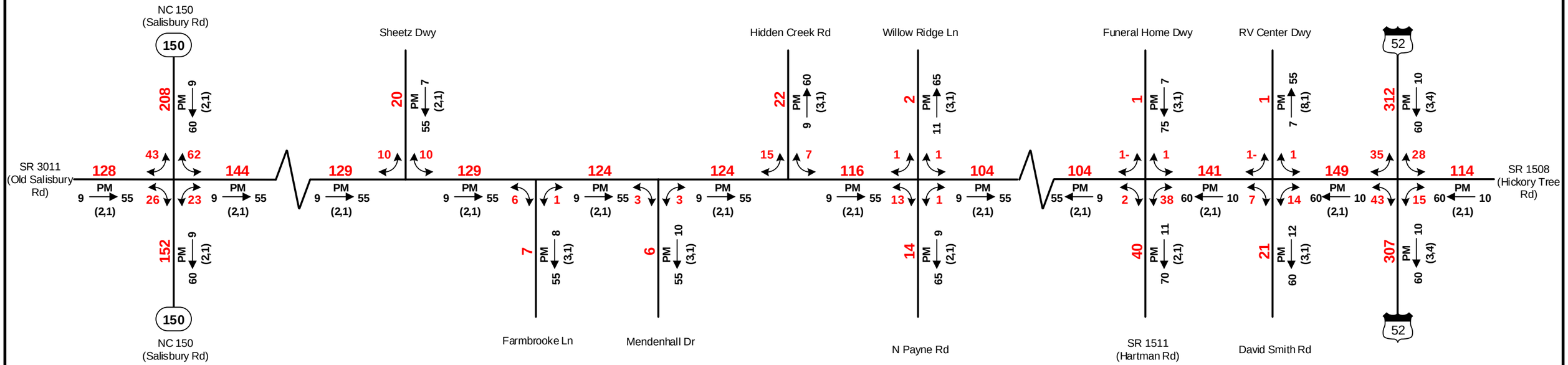


2017

AVERAGE ANNUAL DAILY TRAFFIC

BASE YEAR NO-BUILD & BUILD SCENARIO

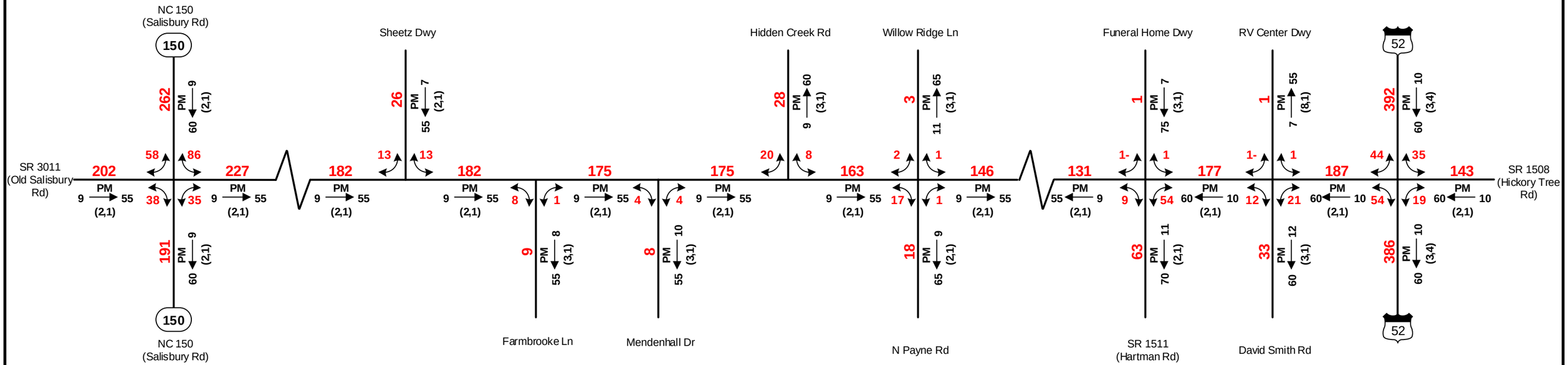
SHEET 1 OF 1

L E G E N D

K ← PM (d, t) → D

###	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
-------	Proposed Roadway	→	Indicates Direction of D
		(d, t)	Duals, TT-STs (%)

TIP: U-5786	**WBS:** 44358.1.1
COUNTY: Davidson	**DIVISION: 9**
DATE: 08-04-2017	
PREPARED BY: Patriot Transportation Engineering, PLLC	
LOCATION: SR 1508 (Hickory Tree Rd), NC 150 (Salisbury Rd) to US 52	
PROJECT: Roadway widening – 4 lanes with median	



2040 AVERAGE ANNUAL DAILY TRAFFIC

FUTURE YEAR NO-BUILD SCENARIO

SHEET 1 OF 1

L E G E N D

K ← PM (d, t) → D

###	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
-------	Proposed Roadway	→	Indicates Direction of D
		(d, t)	Duals, TT-STs (%)

TIP: U-5786 | **WBS:** 44358.1.1

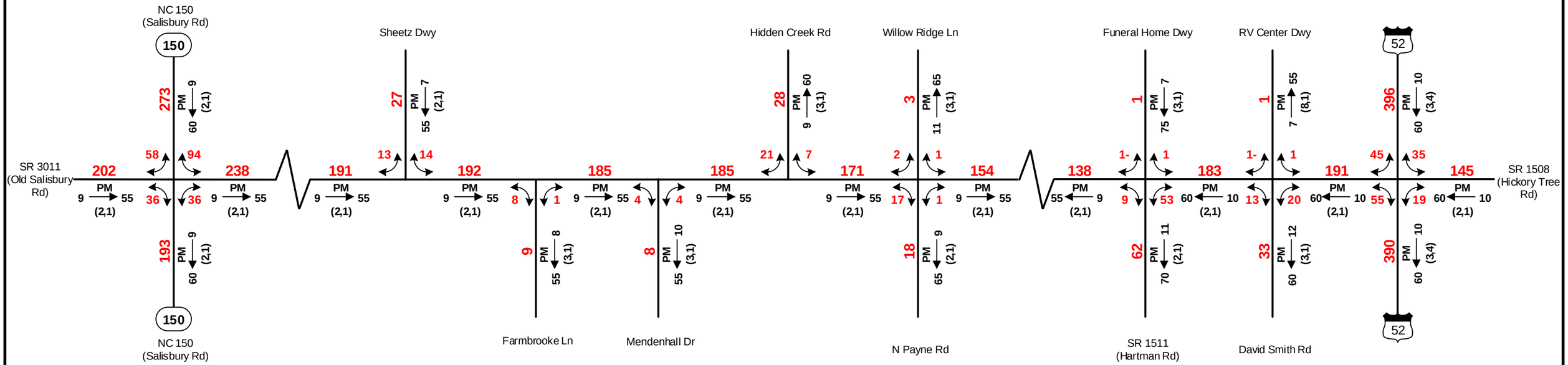
COUNTY: Davidson | **DIVISION: 9**

DATE: 08-04-2017

PREPARED BY: Patriot Transportation Engineering, PLLC

LOCATION: SR 1508 (Hickory Tree Rd), NC 150 (Salisbury Rd) to US 52

PROJECT: Roadway widening – 4 lanes with median



2040 AVERAGE ANNUAL DAILY TRAFFIC

FUTURE YEAR BUILD SCENARIO

SHEET 1 OF 1

L E G E N D

K ← PM (d, t) → D

###	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
-------	Proposed Roadway	→	Indicates Direction of D
		(d, t)	Duals, TT-STs (%)

TIP: U-5786	**WBS:** 44358.1.1
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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 Number U-5786; SR 1508 (Hickory Tree Rd) widening in Davidson County.

1.1 PROJECT REQUEST INFORMATION

The traffic forecast for this project was requested by NCDOT Division 9 in support of project development activities, including National Environmental Policy Act (NEPA) documentation and Preliminary Design for the project. The scope of work for the traffic forecast was finalized in April 2017.

For the purposes of the environmental document, it was decided through project scoping with NCDOT that Base Year scenarios would use 2017 and Future Year scenarios would use 2040. The 2017 Base Year traffic forecast includes only the No-Build scenario. The 2040 Future Year traffic forecast includes Build and No-Build scenarios for a single alternative.

1.2 FORECAST HISTORY

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

1.3 PROJECT DESCRIPTION

NCDOT proposes to widen approximately 2.8 miles of SR 1508 (Hickory Tree Rd) from NC 150 (Salisbury Rd) to US 52 in Davidson County. Hickory Tree Rd is currently two lanes wide for most of its length, and the project would widen the roadway to four lanes wide with a median.

1.4 AREA INFORMATION

Davidson County has an estimated population of 162,900 citizens based on 2010 census data and a 2017 population of 166,800 according to the North Carolina Office of State Budget and Management (NCOSBM). The county covers approximately 567 square miles and consists of several cities and towns including; High Point, Lexington, Thomasville, Denton, Midway, and Wallburg. Lexington is the county seat of Davidson County.

The project area is in the northern end of Davidson County, just south of the Davidson-Forsyth County line. Residential areas in the study area likely act as bedroom communities to Winston-Salem, located in Forsyth County. Forsythe County has an estimated population of 350,700 (2010 census) and a 2017 population of 373,100 (NCOSBM).

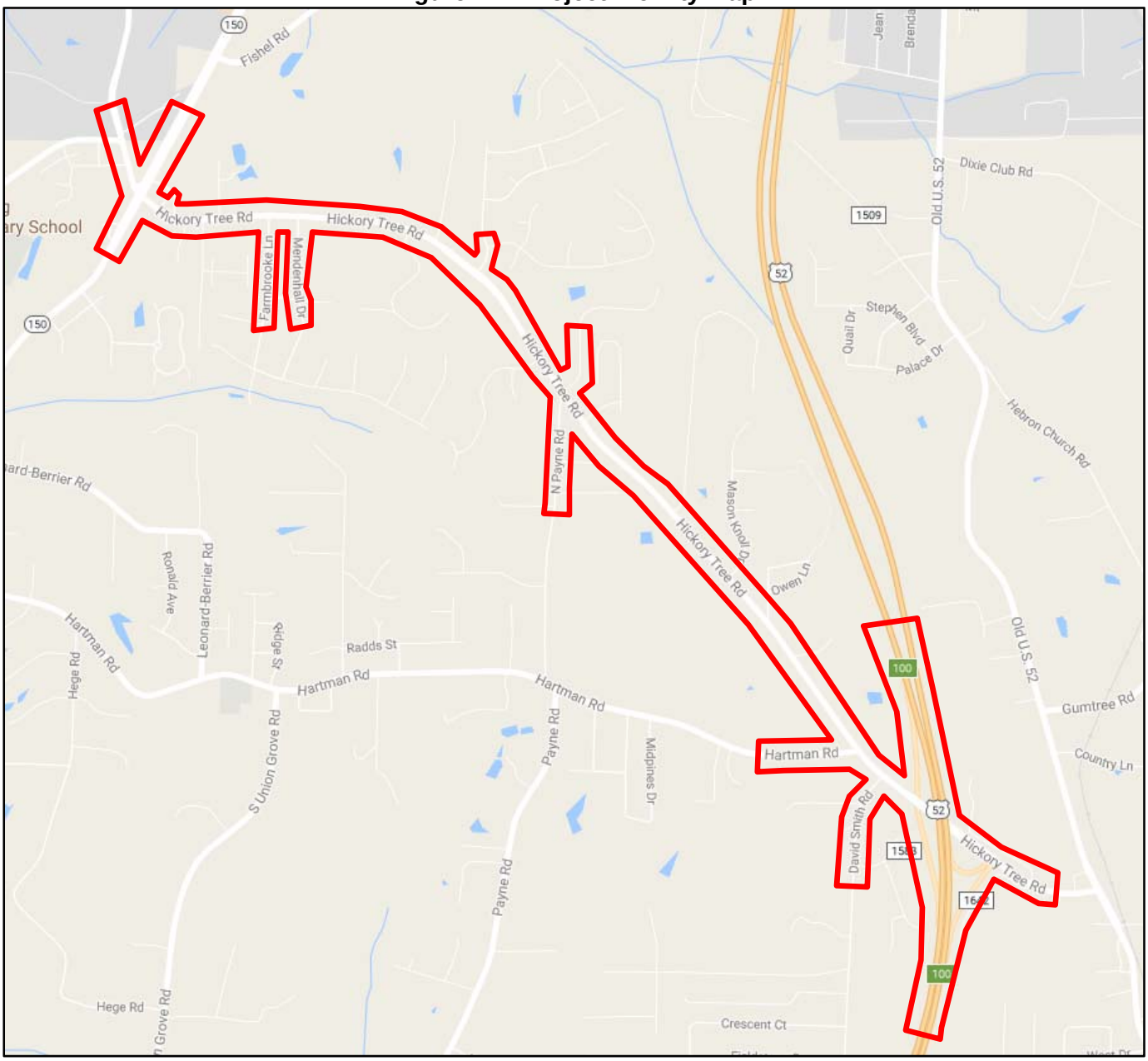
The project location map for the U-5786 forecast is shown on Figure 1-1: Project Vicinity Map.

1.5 ROUTE INFORMATION

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

The **Hickory Tree Rd (SR 1508)** corridor is classified as a *Major Collector* within the traffic forecast study area and primarily serves as a connection between NC 150 to the west and US 52 and Old US 52 (SR 2932) to the east. Hickory Tree Road is a two-lane road along most of its length with no median and sporadic use of left-turn lanes at intersections. East of US 52, Hickory Tree Road is four lanes wide with a two-way left-turn lane (TWLTL) median. There is also a TWLTL (and/or left-turn lanes) between Hartman Road (SR 1511) and the southbound ramps at the US 52 interchange. Access to Hickory Tree Road is provided by intersecting local streets and numerous direct-access driveways from businesses and residences alike.

Figure 1-1: Project Vicinity Map



The land use along the corridor is primarily residential, with some light commercial activities and some agricultural uses, as well. However, there is a large commercial development node at the west end of the study area at the intersection of Hickory Tree Road and NC 150. There is also a smaller commercial development node (with some vacant space) at the east end of the corridor at the US 52 interchange and the intersection with Old US 52. The residential development pattern in the area has been moving from single-lot, direct-access homes to planned-unit developments. Some of the planned-unit developments are newer to the area, with one, Hidden Creek, still in the process of adding homes. There appears to be room for future residential growth along Hickory Tree Road. The speed limit along Hickory Tree Road varies from 45 miles per hour on the western half of the study corridor to 50 miles per hour on the eastern half.

NC 150 is designated as an *Other Principal Arterial* within the study area and provides a connection from Davidson County to I-40 and to Winston-Salem to the north. The speed limit along NC 150 is 55 miles per hour.

US 52 is designated as *Other Freeway* within the study area and provides direct access to I-40 and to Winston-Salem to the north and to I-85 to the south. The speed limit along US 52 is 65 miles per hour.

Old Salisbury Road (SR 3011) is designated as a *Major Collector* within the project study area. The speed limit along Old Salisbury Road is 45 miles per hour.

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

The *Winston-Salem Urban Area Metropolitan Planning Organization 2040 Metropolitan Transportation Plan* (2040 MTP) includes the proposed project in the 2022-2030 timeframe of highway projects and describes it as follows:

- 30-16, STIP U-5786 – Hickory Tree Rd from US 52 to NC 150 – Widen to multilane (3 or more)

It should be noted that, although the MTP describes the Hickory Tree Road widening as "3 or more" lanes, this traffic forecast is being developed under the assumption that Hickory Tree Road will be widened to 4 lanes with a median.

There are no other projects that may affect the proposed project included in the 2040 MTP.

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. However, no past forecasts in the vicinity of the project were identified.

2.2 HISTORIC AADT

Existing traffic count data for study area roadways from 1996 to 2015 was provided by the NCDOT Traffic Survey Group (TSG). Data sources included:

- NCDOT TSG Average Annual Daily Traffic (AADT) history from 1996 to 2015

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 May 2017 through the NCDOT TSG on-call contract and included ten 13-hour turning movement counts and two 48-hour classification counts. (Two of the turning movement counts were for the two ramp intersections of the Hickory Tree Rd/US 52 interchange, but the interchange itself was analyzed as a single location.) 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 classification:

- 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 11 (applies to urban interstate and some rural locations strongly influenced by nearby large urban areas) was considered for US 52 due to the freeway operations being comparable to an Interstate route; however, the turning movement counts at the ramp terminals did not include any through volumes on US 52. Only ramp volumes and through volumes on Hickory Tree Road were counted. Therefore, ATR Group 1 was used for the turning movement counts at the Hickory Tree Rd/US 52 interchange ramp terminals.

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

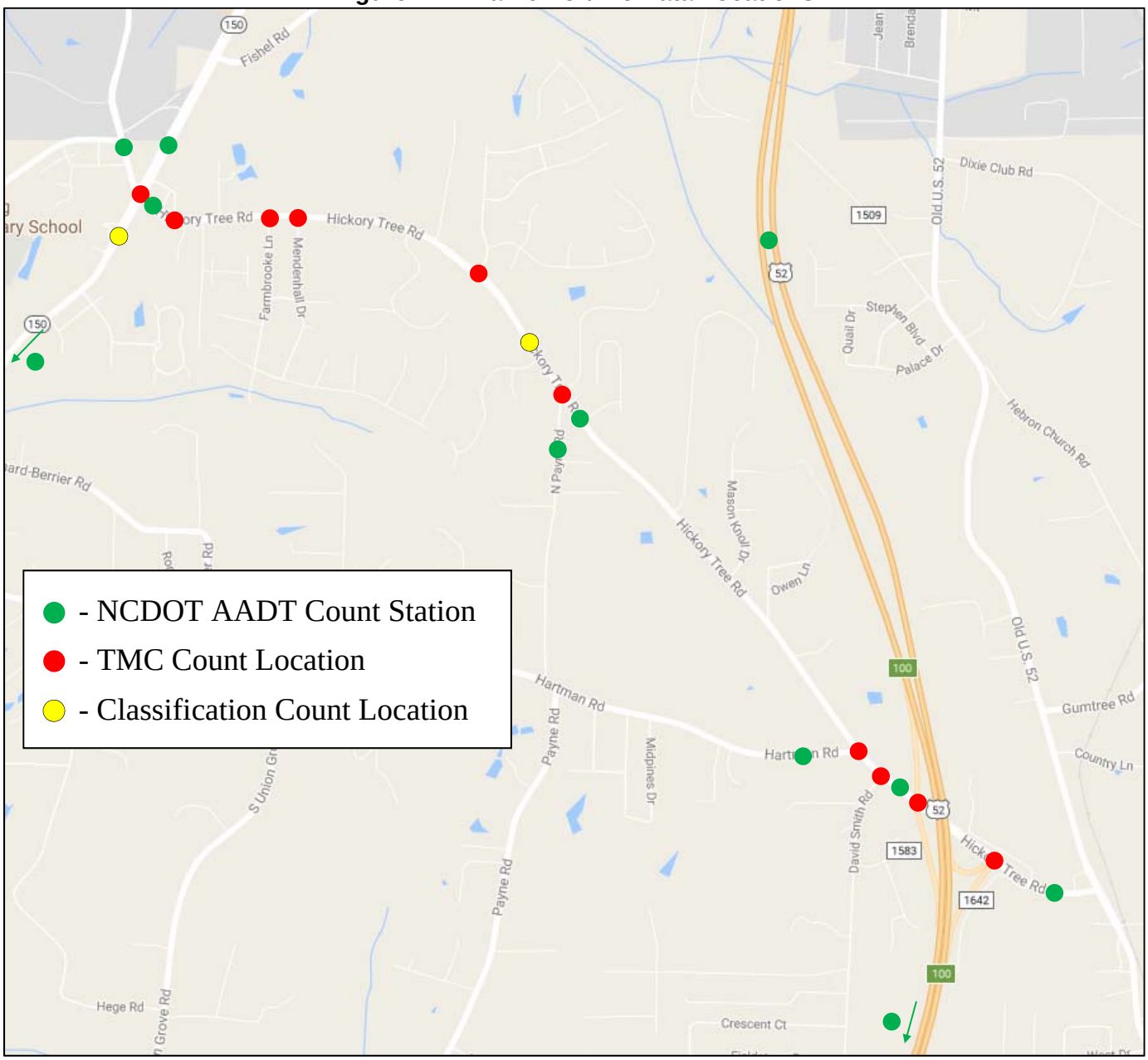


Table 2-1: Collected Traffic Count Locations

Location	Count Type	Date(s)	County	ATR Group	Seasonal Adjustment Factor
Hickory Tree Rd (SR 1508)/Old Salisbury Rd (SR 3011) at NC 150 (Salisbury Rd)	13-hour TMC	05/04/17	Davidson	1	0.93
Hickory Tree Rd (SR 1508) at Sheetz Dwy (full movement)	13-hour TMC	05/04/17	Davidson	1	0.93
Hickory Tree Rd (SR 1508) at Farmbrooke Ln	13-hour TMC	05/04/17	Davidson	1	0.93
Hickory Tree Rd (SR 1508) at Mendenhall Dr	13-hour TMC	05/04/17	Davidson	1	0.93
Hickory Tree Rd (SR 1508) at Hidden Creek Rd	13-hour TMC	05/04/17	Davidson	1	0.93
Hickory Tree Rd (SR 1508) at Willow Ridge Ln/N Payne Rd	13-hour TMC	05/04/17	Davidson	1	0.93
Hickory Tree Rd (SR 1508) at Hartman Rd (SR 1511)	13-hour TMC	05/04/17	Davidson	1	0.93
Hickory Tree Rd (SR 1508) at David Smith Rd	13-hour TMC	05/04/17	Davidson	1	0.93
Hickory Tree Rd (SR 1508) at US 52 SB Ramps	13-hour TMC	05/04/17	Davidson	1	0.93
Hickory Tree Rd (SR 1508) at US 52 NB Ramps	13-hour TMC	05/04/17	Davidson	1	0.93
Hickory Tree Rd (SR 1508) west of Willow Ridge Ln/N Payne Rd	48-hour VSC	05/03/17-05/04/17	Davidson	1	0.95/0.93
NC 150 (Salisbury Rd) south of Hickory Tree Rd (SR 1508)	48-hour VSC	05/03/17-05/04/17	Davidson	1	0.95/0.93

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

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 27 and 28, 2017. The following observations were noted:

- The land use along Hickory Tree Rd is a mix of rural and suburban residential, agriculture, and light commercial. There are many residences that have direct access to Hickory Tree Rd. These residences are a mix of large lot and small lot. There are several residential developments, as well, with some older developments mixed with newer developments.
- One of the newer residential developments is at Hidden Creek, which still has some new home construction on-going.
- There is a major commercial node at the Hickory Tree Rd/NC 150 intersection.
- There is a smaller commercial node at the Hickory Tree Rd /US 52 interchange. Not all of the commercial spaces are currently occupied.
- The right-in/right-out (RIRO) Sheetz driveway on Hickory Tree Rd gets more Sheetz traffic than the full movement driveway. There is also a RIRO driveway that Sheetz and McDonald's share on NC 150 north of Hickory Tree Rd that sees a lot of vehicles.

- The PM peak direction of travel on NC 150 and US 52 is southbound. The PM peak direction of travel on Hickory Tree Rd was harder to judge as it is fairly even, but it appeared that the majority of traffic was traveling eastbound on the west end of the study corridor and westbound on the east end of the corridor.

- The PM traffic peaked at around 5:15 to 5:30. Congestion was not noticeable on Hickory Tree Rd, but there was a steady stream of traffic that could be backed-up on a short term basis by a left-turn vehicle. Some vehicle queuing at the Hartman Rd stop sign was observed.

- The AM traffic peaked at around 7:30 to 7:45. Brief periods of queuing were observed at the Davd Smith Rd and Hartman Rd stop signs.

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:

- *Diane Hampton, NCDOT Division 9 – Division Planning Engineer
- *J.P. Couch, NCDOT Division 9 – Division Traffic Engineer
- *Chris Corriher, NCDOT Division 9 – District 1, District Engineer
- James Upchurch, NCDOT Transportation Planning Branch
- *Margaret Bessette, Winston-Salem City-County Planning Board – Assistant Director
- Byron Brown, Winston-Salem DOT – Principal Planner
- *Scott Leonard, Davidson County – Planner
- Gary Looper, Town of Midway – Town Manager

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.* July 2017. Available: https://connect.ncdot.gov/projects/planning/STIPDocuments1/LIVE_STIP.pdf

Winston-Salem Urban Area Metropolitan Planning Organization. *2040 Metropolitan Transportation Plan.* Adopted September 17, 2015. Available: http://www.cityofws.org/Departments/Transportation/Planning/Plans-and-Studies/2040-Metro-Transportation-Plan

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

3. BASE YEAR 2017 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 2017 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 2017 Base Year forecast were less than 1.0. 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 collection at the Hickory Tree Rd/US 52 interchange ramps did not include any through movements on US 52. In order to estimate the 2017 No-Build traffic volumes on US 52, the NCDOT AADT data for US 52 for 2015 was used as the most recently available data. It was assumed that the NCDOT AADT volumes would be the product of though volumes on US 52 and ramp movements counted at the intersections.

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 2017 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 aforementioned 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 fairly consistent along Hickory Tree Rd, ranging from two to three percent duals and one percent TTSTs. The classification count, however, showed a much higher percentage of trucks (10 percent) than the turning movement counts. Given the consistency of the turning movement data across many locations, the truck percentages from the turning movements were given more weight. The forecast utilizes two percent duals and one percent TTSTs along the entire length of the Hickory Tree Rd corridor.

- The truck percentage data for NC 150 mimicked that of the Hickory Tree Rd data – the turning movement data was consistent at 3 percent across both sides of the intersection with Hickory Tree Rd while the classification count showed a higher 12 percent trucks. The forecast utilizes two percent duals and one percent TTSTs on NC 150.

- The truck percentages for US 52 were based on NCDOT 2015 count data, due to the lack of through volume data on US 52.

- Y-lines – Most of the truck percentages collected for the Y-lines showed truck percentages that were higher than that of Hickory Tree Rd. The overall percentages ranged from 2 to 5 percent (although one count showed 10 percent trucks, see below). The forecast utilizes truck percentages that are consistent with the count percentages as much as possible; but a maximum overall truck percentage of 4 percent was used for the Y-lines (3 percent duals and 1 percent TTSTs), which was deemed appropriate, given the collected traffic data and the nature of the roadways.

- RV sales center driveway – the truck percentage recorded at the RV sales center driveway was fairly high (as might be expected), measuring at 10 percent trucks. That truck percentage was calculated from a count that showed 8 daily Duals out of 83 total vehicles. The forecast uses 8 percent Duals to replicate the counted volume with 100 daily vehicles.

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, generally D was in the 51% to 58% range for Hickory Tree Road. The D values for the y-lines varied greatly by location and land use. The D values were measured from as low as 50% (at the Sheetz driveway) to as high as 100% (at the funeral home driveway). 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:

- Hickory Tree Rd Corridor – the directional distribution along Hickory Tree Rd ranged from 50 to 58 percent with a PM peak period direction in the eastbound direction on the west end of the corridor and a PM peak period direction in the westbound direction on the east end of the corridor. The directional nature of traffic on Hickory Tree Rd differs between the west end and east end of the corridor. For the west end of the corridor, the directional distribution was determined to be 55 percent with a PM peak in the eastbound direction. For the east end of the corridor, the directional distribution was determined to be 60 percent with a PM peak in the westbound direction.

- NC 150 – the directional distribution along NC 150 ranged from 57 to 60 percent in the southbound direction. It was determined that a directional distribution of 60 percent would be the most appropriate distribution with the PM peak direction in the southbound direction.

- US 52 – the directional distribution along US 52 ranged from 52 to 66 percent in the southbound direction. It was determined that a directional distribution of 60 percent would be the most appropriate distribution with the PM peak direction in the southbound direction.

- Y-lines along Hickory Tree Rd – the directional distributions for Y-lines along Hickory Tree Rd ranged from 50 to 100 percent. Wherever possible the selected directional distributions were in line with the turning movement count percentages. Some locations to note:
    - Sheetz driveway – the measured D was 50 percent but a D value of 55 percent was chosen for the forecast
    - Funeral home driveway – the measured D was 100 percent but a D value of 75 percent was chosen for the forecast
    - RV sales driveway – the measured D was 50 percent but a D value of 55 percent was chosen for the forecast

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 6% to 12%. 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:

- Hickory Tree Rd Corridor – the peak hour factor along Hickory Tree Rd ranged from eight to ten percent and had a slightly different nature on each end of the corridor. The peak hour factor for the west end of the corridor was determined to be nine percent, and the east end of the corridor peak hour factor was determined to be ten percent.

- NC 150 – the peak hour factor for NC 150 was nine percent for all counts. A peak hour factor of nine percent was selected for NC 150.

- US 52 – the peak hour factors for US 52 were nine percent and twelve percent. A peak hour factor of ten percent was selected for US 52.

- Y-lines along Hickory Tree Rd – the peak hour factors for Y-lines along Hickory Tree Rd ranged from six to twelve 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 2017 Base Year No-Build Scenario were calculated. Adjusted counts were compared to trend line analyses and the extrapolation of data to 2017 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. A discussion of the traffic forecast volumes is included as follows:

- The traffic forecast includes break lines at two locations on Hickory Tree Rd. One break occurs between NC 150 and the Sheetz driveway where it was determined that the volume between the intersections was affected substantially enough by the intervening Sheetz RIRO driveway a single link volume was not representative of the volume between the two intersections. The other break is between the intersections of

Willow Ridge Ln/N Payne Rd and Hartman Rd. At this location it was determined that the nature of the traffic on Hickory Tree Rd changed (there were differences in both PM peak direction and the peak hour factor).

- As noted previously, the data collection at the Hickory Tree Rd/US 52 interchange ramps did not include any through movements on US 52. In order to estimate the 2017 No-Build traffic volumes on US 52, the NCDOT AADT data for US 52 for 2015 was used as the most recently available data. It was assumed that the NCDOT AADT volumes would be the product of though volumes on US 52 and ramp movements counted at the intersections. Therefore, the ramp movements were subtracted from the NCDOT 2015 AADT to estimate US 52 through movements. Although the NCDOT 2015 AADT is the same on either side of Hickory Tree Rd, the final 2017 No-Build forecast includes volumes on US 52 that slightly higher north of Hickory Tree Rd, which is indicated by the ramp turning movement counts.

4. BASE YEAR 2017 BUILD TRAFFIC FORECAST

During the scoping process for this forecast, it was determined that a base year 2017 build traffic forecast would not be prepared. The proposed project would not alter the overall roadway network. Therefore, no diversion of traffic is anticipated and no build forecast would be required. The 2017 Base Year No-Build volumes can be used as a proxy for 2017 Base Year Build volumes for analysis purposes.

5. MODEL DATA

The study area for the forecast is included the Piedmont Triad Regional Travel Demand Model. The study area is located in the western area of the model and has relatively good connectivity, with the model including all of the major roadways (Hickory Tree Rd (SR 1508), NC 150, US 52, and Hartman Rd (SR 1511)), but none of the minor y-line roadways except for David Smith Road. The Piedmont Triad Regional Model v4.2 (provided by Piedmont Area Regional Transit (PART) on 05/04/2017 as authorized by NCDOT) was utilized as a tool in the development of the forecast to determine the Future year scenarios traffic volumes.

The Piedmont Triad Model was developed in TransCAD (version 5 Build 2110) and was calibrated based on a base year of 2013, and has models for a future year of 2040.

Table C5 can be found in Appendix C and displays the model performance for the 2013 model against 2013 AADTs, the 2040 model volumes, and an extrapolated volume for 2017 based on the 2013 and 2040 model output. A discussion of the model performance for the project study area corridors is included as follows:

- Hickory Tree Road (SR 1508) Corridor – the 2013 model volumes for the corridor were generally lower than the corresponding AADT by 1,800 to 3,000 vehicles per day. However, the middle of the Hickory Tree Rd corridor saw model volumes less than 200 vehicles per day below the AADT. And the 2013 model volume east of US 52 was higher than the corresponding AADT by approximately 1,900 vehicles per day. The 2017 interpolated model volumes varied from the extrapolated AADT counts in a similar way.
- NC 150 (Salisbury Rd) – the 2013 model volumes on NC 150 south of Hickory Tree Rd correspond to the AADT volume fairly well, with the model being approximately 800 vehicles per day greater than the AADT. However, there is greater discrepancy between the model volumes and AADT north of Hickory Tree Rd, where the model is approximately 2,300 vehicles lower than the AADT. The 2016 interpolated model volumes varied from the extrapolated AADT counts in a similar way.
- US 52 – the 2013 model volumes on US 52 were higher than the corresponding AADT (by 2,800 to 4,600 vehicles per day). The 2017 interpolated model volumes grew in discrepancy from the extrapolated AADT because the model predicts greater growth on US 52 than the historic counts have shown.
- Hartman Rd (SR 1511) – the 2013 model volume on Hartman Rd were lower than the corresponding AADT, by approximately 1,900 vehicles per day. The 2017 interpolated model volume was still lower than the extrapolated AADT, but the difference was of a lesser magnitude (approximately 600 vehicles per day).

6. FUTURE YEAR 2040 NO-BUILD TRAFFIC FORECAST

6.1 ASSUMPTIONS

A Future Year of 2040 was chosen for the U-5786 traffic volume examination as it is the latest year available in the Piedmont Triad Regional Travel Demand Model and to correspond with the horizon year of the MTP. All 2040 fiscally-constrained projects, with the exception of U-5786, listed in the *Winston-Salem Urban Area Metropolitan Planning Organization 2040 Metropolitan Transportation Plan* (2040 MTP) were included in the 2040 No-Build alternative model run.

The modeling aspects for the 2040 No-Build scenario include utilizing the Piedmont Triad Regional 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, no revisions were made to the 2040 future year model.

6.2 METHODOLOGY

The Piedmont Triad Regional 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:

((2040 Model Value/2013 Model Value) ^1/27) -1

Additionally, the raw model volumes were compared to determine the total change in model volume between 2013 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 2017 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 2017 Base Year factors were still adequate and that none of the design factors would change from those included in the 2017 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 2040 model volumes along Hickory Tree Rd (SR 1508) average a CAGR of 0.96% per year south of S Church Street (US 25 Business), with the eastern end of the corridor showing slightly more growth than the western end. Discussion with local planners and engineers, however, indicated that the western end of the corridor would be likely to have a higher growth rate than the eastern end of the corridor. Historic growth rates (which are generally higher than the model rates) also reflect this growth pattern. Residential development (and the

corresponding commercial development) has been more concentrated along NC 150, because NC 150 offers direct access to Winston-Salem. The growth rates chosen for the eastern end of the Hickory Tree Road corridor largely resemble the model growth rates and historic growth, but the growth rates chosen for the western end of the corridor (2.0%) are higher than the model rates and more closely resemble the historic growth rates (with the middle part of the corridor showing a transition between the two rates).

- The model CAGRs for NC 150 and US 52 were all below 0.7%. The growth rates chosen for the forecast for both roadways (1.0%) were higher than the model rates, based on discussions with local planners regarding the future growth patterns of the region.

- The model CAGRs for Hartman Rd (SR 1511) and David Smith Rd were both just below 2.0%, with the selected growth rates largely matching the model rates.

- The residential Y-lines had growth rates of approximately 1.0% selected based on overall growth in the area.

- The commercial Y-lines had growth rates that varied by location. The funeral home driveway and RV sales center driveway were assumed to have no growth. However, the growth on the Sheetz driveway was assumed to correspond to the growth on the Hickory Tree Rd Corridor, as the Sheetz (and McDonalds) property represents a strong diverted-trip attractor.

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 5.1. The U-5786 project for was coded into the model by modifying the model to include four lanes along the length the Hickory Tree Road corridor, with a median included. The nature of the median (grass-and-curb versus TWLTL) did not have to be defined in the model network, because the model treats the two medians the same.

7.2 METHODOLOGY

The Piedmont Triad Regional 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-5786, 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 6.2, traffic volumes for the 2040 Future Year Build Forecast Scenario were calculated for both alternatives. Table C7 in Appendix C show the comparisons of model output, diversion percentages, the resulting 2013-2040 CAGR 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 model show diversion rates on Hickory Tree Rd that average 5.05% between NC 150 and Hartman Rd. The diversion rates for Hickory Tree Rd east of Hartman Rd are lower, which is reasonable, considering that there is already a median there and a four-lane width east of US 52. The selected diversion rates were very similar to the model diversion rates.

- The model diversion rates for NC 150 are 0.58% south of Hickory Tree Rd and 3.87% north of Hickory Tree Rd, as more traffic appears to be making use of Hickory Tree Rd to travel to and from Forsythe County. The selected diversion rates were very similar to the model diversion rates, although the selected diversion rate south of Hickory Tree Rd was closer to 1%.

- The model diversion rates for US 52 average 1.28%. The selected diversion rates were very similar to the model diversion rates.

- The model diversion rate for Old Salisbury Rd (west of the corridor) was -1.05% and the diversion rate for David Smith Rd was 2.44%. However, in neither case was the diversion judged to be a reasonable result of

the proposed widening on Hickory Tree Rd. Therefore, both roadways were held steady from the No-Build forecast, with no diversion.

- The 2040 model diversion for Hartman Rd was -2.38%, a reduction of 100 vehicles per day. Both Hartman Rd and Hickory Tree Rd offer east-west connections between US 52 and NC 150, so a diversion to a higher-capacity roadway seems reasonable. The Build forecast featured the same reduction of 100 vehicles that the model estimated, resulting in a diversion rate of -1.59%.

- With the exception of the Sheetz driveway (see below), all other Y-lines had diversion rates of 0%. These are roadways than can only be accessed via Hickory Tree Rd.

- The selected diversion rate for the Sheetz driveway was 3.85%, which represents 100 vehicles per day more than the No-Build forecast. An increase in traffic on Hickory Tree Rd would suggest some increase to this quick-service commercial establishment.

APPENDIX A:

HISTORIC AADT COUNT DATA

Table A1: NCDOT Historic AADT

Location	2015	2014	2013	2012	2011	2010	2009	2008	2007	2006	2005
US 52 - north of Hickory Tree Rd (SR 1508)	31,000	31,000	30,000	28,000	29,000	28,000	29,000	28,000		34,000	*36,000*
US 52 - south of Hickory Tree Rd (SR 1508)	31,000	32,000	30,000	27,000	28,000	28,000	29,000	28,000		32,000	34,000
NC 150 (Salisbury Rd) - north of Hickory Tree Rd (SR 1508)	24,000	20,000	20,000	21,000	22,000	21,000	*23,000*		19,000	18,000	18,000
NC 150 (Salisbury Rd) - south of Hickory Tree Rd (SR 1508)	15,000		14,000	15,000	15,000	14,000	14,000	*15,000*	13,000	13,000	13,000
Hickory Tree Rd (SR 1508) - east of US 52		8,600		10,000		13,000		11,000		10,000	
Hickory Tree Rd (SR 1508) - east of N Payne Rd/Willow Ridge Ln	11,000		8,800		9,300		9,800		8,500		8,700
N Payne Rd - south of Hickory Tree Rd (SR 1508)		1,500		1,600		1,600		1,500		1,400	
Hickory Tree Rd (SR 1508) - east of NC 150 (Salisbury Rd)				12,000		12,000				10,000	
Old Salisbury Rd (SR 3011) - west of NC 150 (Salisbury Rd)	13,000		8,900		9,200		11,000		9,300		9,100
Hartman Rd (SR 1511) - south of Hickory Tree Rd (SR 1508)				3,500		3,400		3,700		3,600	
Hickory Tree Rd (SR 1508) - west of US 52	16,000		13,000		13,000		14,000		15,000		13,000
NC 150 (Salisbury Rd) - north of Hickory Tree Rd (SR 1508) (Forsythe County)	22,000		21,000		23,000		22,000		21,000		19,000

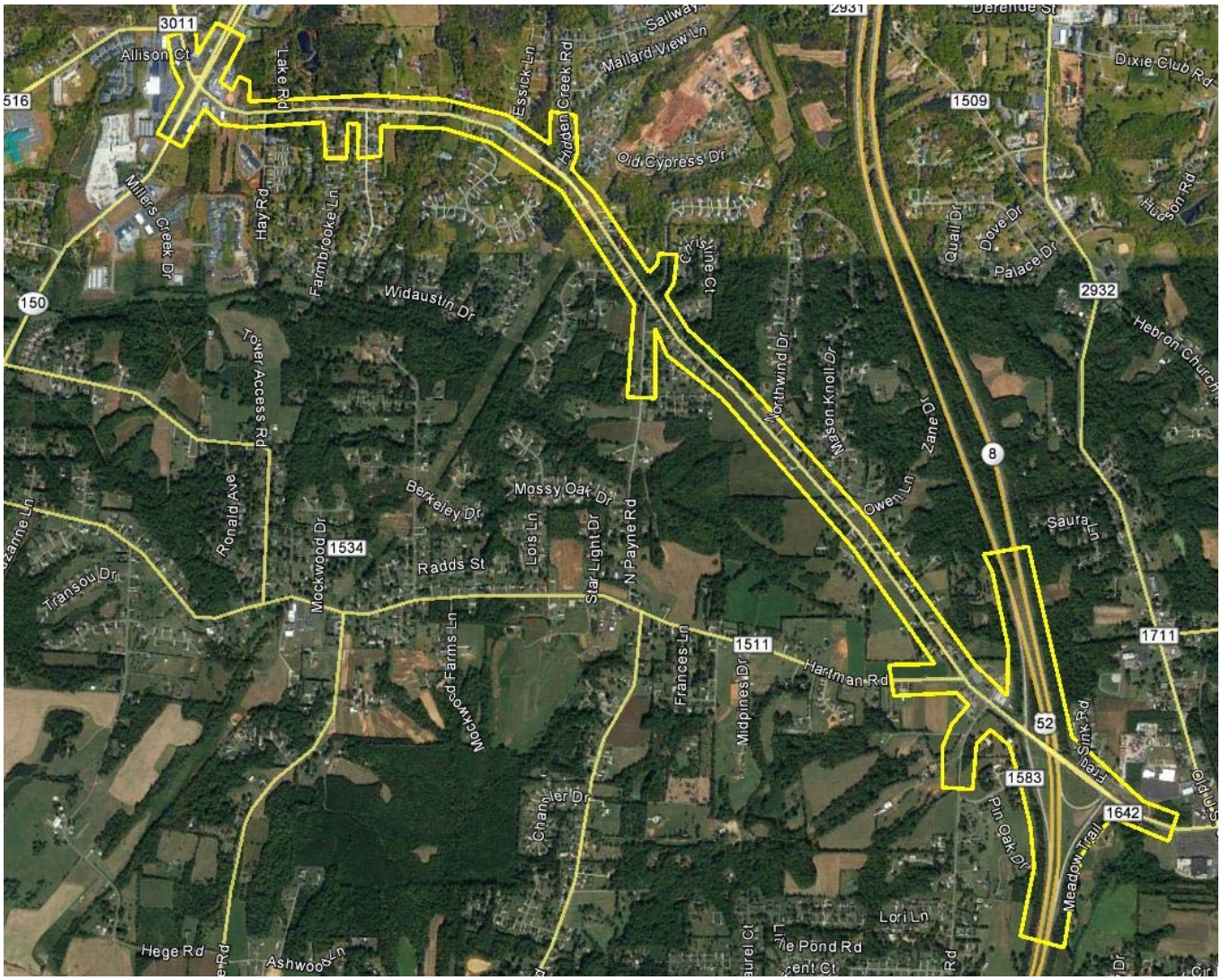
Location	2004	2003	2002	2001	2000	1999	1998	1997	1996
US 52 - north of Hickory Tree Rd (SR 1508)	33,000	33,000		31,000	30,000	28,000	25,000	26,000	23,000
US 52 - south of Hickory Tree Rd (SR 1508)	32,000	32,000	33,000	30,000	27,000	26,000	25,000	23,000	21,000
NC 150 (Salisbury Rd) - north of Hickory Tree Rd (SR 1508)	17,000	15,000			13,000	13,000	12,000	13,000	12,000
NC 150 (Salisbury Rd) - south of Hickory Tree Rd (SR 1508)	13,000	12,000	12,000	12,000	11,000	11,000	11,000	*9,100*	11,000
Hickory Tree Rd (SR 1508) - east of US 52	9,100		11,000	10,000		8,000		7,100	
Hickory Tree Rd (SR 1508) - east of N Payne Rd/Willow Ridge Ln		8,400		7,000		6,300			
N Payne Rd - south of Hickory Tree Rd (SR 1508)	1,200		950	1,100		1,000		650	
Hickory Tree Rd (SR 1508) - east of NC 150 (Salisbury Rd)	10,000		8,900						
Old Salisbury Rd (SR 3011) - west of NC 150 (Salisbury Rd)		8,700							
Hartman Rd (SR 1511) - south of Hickory Tree Rd (SR 1508)	3,500		2,500						
Hickory Tree Rd (SR 1508) - west of US 52		12,000							
NC 150 (Salisbury Rd) - north of Hickory Tree Rd (SR 1508) (Forsythe County)		16,000							

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

Patriot Transportation Engineering is currently in the process of developing a traffic forecast for NCDOT STIP Project No. U-5786, which would widen SR 1580 (Hickory Tree Rd) from two to four lanes with a median from NC 150 (Salisbury Rd) to US 52 in Davidson County. The forecast includes base year (2017) and design year (2040) forecasts. The forecast study area is shown in the following figure:



We have reviewed the Winston-Salem Urban Area MPO 2040 Metropolitan Transportation Plan (October, 2015) and are seeking input from local planners and engineers who are familiar with the area. We have identified you as a local representative. I have listed a few questions below that will help us in the development in the traffic forecast. We would greatly appreciate your time in answering these questions. 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, I 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 in the last 10 years the traffic growth along SR 1508 (Hickory Tree Rd) has been moderate with rates as high as 3.25% per year. The traffic growth is more prevalent on the western end of the study corridor than on the eastern end (at

US 52) where the traffic growth over the last 10 years is less than 1.0% per year. The traffic along SR 1508 (Hickory Tree Rd) rose steadily through 2009 where it plateaued for several years before increasing again through the present time. The 20-year growth rates are similar to the 10-year rates, although half of the count stations do not have 20 years' worth of data.

Overall, the historic traffic growth on SR 1508 (Hickory Tree Rd) has been approximately 2.0% per year on the western end of the study corridor (at NC 150), with the growth rate gradually decreasing as you move east until it becomes approximately 1.0% at the eastern end of the corridor (at US 52). However, the Piedmont Regional Travel Model projects much more modest growth rates for this roadway, with growth rates consistently at or below 1.0% per year.

a. Do you expect future traffic growth to remain similar to what has been observed, or do you believe the model rates to be a more reasonable estimate for future growth?

b. What growth patterns have you noticed?

c. Would you expect the growth rate to change substantially in the next 20 years?

2) The historic counts on NC 150 (Salisbury Rd) show a 20-year growth rate of 2.0% and 3.6% south and north of Hickory Tree Rd, respectively. The 10-year growth rates are 1.3% and 1.7%. However, the Piedmont Regional Travel Model shows a projected growth rate of 0.3%.

a. Do you expect future traffic growth to remain similar to what has been observed, or do you believe the model rates to be a more reasonable estimate for future growth?

b. What growth patterns have you noticed?

c. Would you expect the growth rate to change substantially in the next 20 years?

3) The historic counts on US 52 show a modest 20-year growth rate of 1.0% and 0.6% south and north of Hickory Tree Rd, respectively. The 10-year growth rates are 0.3% and -0.3%. However, the Piedmont Regional Travel Model shows a projected growth rate of 0.7% north of Hickory Tree Rd and 0.4% south of Hickory Tree Rd. It should be noted that the future model does not include the southern section of the proposed Beltway because it is currently unfunded.

a. Do you expect future traffic growth to remain similar to what has been observed, or do you believe the model rates to be a more reasonable estimate for future growth?

b. What growth patterns have you noticed?

c. Would you expect the growth rate to change substantially in the next 20 years?

4) Aside from school being in session, are there any noticeable seasonal differences in traffic?

5) According to the North Carolina Office of State Budget and Management (OSBM) the current population of Davidson County is approximately 166,800 and is projected to grow by 0.5% per year to 181,800 in 2036; and the current population of Forsyth County is approximately 373,100 and is projected to grow by 1.2% per year to 449,900 in 2036.. The population projections for the entire Winston-Salem Urban Area (county breakdowns were not available) that are contained within the MTP show a projected population growth rate of approximately 1.1% per year to the year 2040.

a. Do you think that the 0.5% to1.2% population growth rate is reasonable for this area? If so, which rate is more likely for the study area?

b. Do you know of any other population projections for this area that may be helpful as we review the growth in the area?

6) The Metropolitan Transportation Plan (MTP) does not include any projects in the vicinity of the forecast that have the potential to affect the traffic volumes in the study area. Do you know of any reasonably foreseeable transportation projects that are not included in the MTP that may affect traffic volumes in the traffic forecast study area?

7) Are you aware of any previous traffic forecasts that were performed in or near the study area?

8) Do you know of developments in the vicinity of the traffic forecast area that may affect our traffic forecast?

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

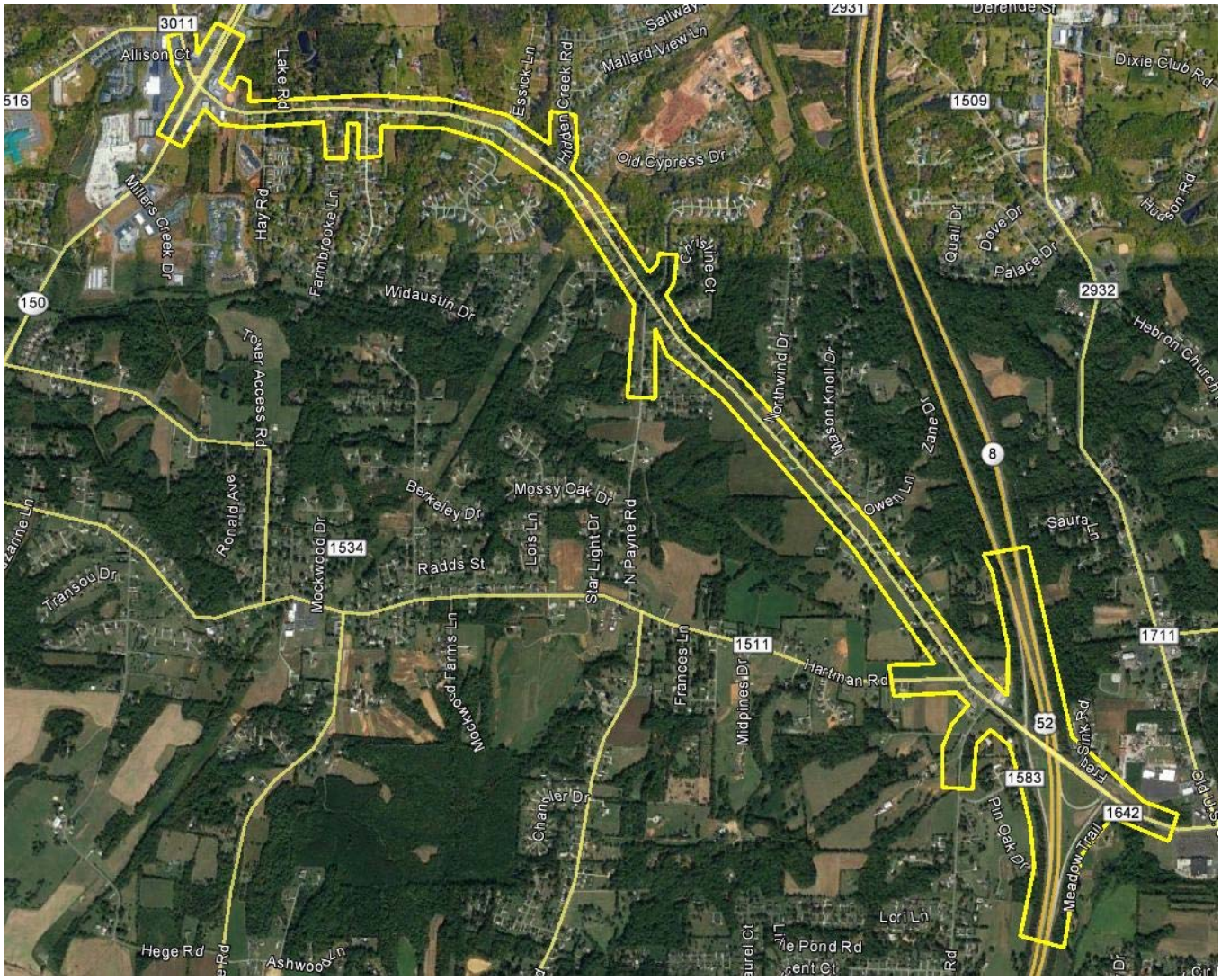
10) This questionnaire is being sent to the following individuals:

i. Diane Hampton, Division 9 Division Planning Engineer
ii. J.P. Couch, Division 9 Division Traffic Engineer
iii. Chris Corriher, Division9, District 1 District Engineer
iv. James Upchurch, NCDOT Transportation Planning Branch
v. Margaret Bessette, City-County Planning Board Assistant Director
vi. Byron Brown, Winston-Salem DOT Principal Planner
vii. Scott Leonard, Davidson County Planner
viii. Gary Looper, Town of Midway Town Manager

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

Comments completed by Scott Leonard via email – 07/06/2017

Patriot Transportation Engineering is currently in the process of developing a traffic forecast for NCDOT STIP Project No. U-5786, which would widen SR 1580 (Hickory Tree Rd) from two to four lanes with a median from NC 150 (Salisbury Rd) to US 52 in Davidson County. The forecast includes base year (2017) and design year (2040) forecasts. The forecast study area is shown in the following figure:



We have reviewed the Winston-Salem Urban Area MPO 2040 Metropolitan Transportation Plan (October, 2015) and are seeking input from local planners and engineers who are familiar with the area. We have identified you as a local representative. I have listed a few questions below that will help us in the development in the traffic forecast. We would greatly appreciate your time in answering these questions. 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, I 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 in the last 10 years the traffic growth along SR 1508 (Hickory Tree Rd) has been moderate with rates as high as 3.25% per year. The traffic growth is more prevalent on the western end of the study corridor than on the eastern end (at

Comments completed by Scott Leonard via email – 07/06/2017

US 52) where the traffic growth over the last 10 years is less than 1.0% per year. The traffic along SR 1508 (Hickory Tree Rd) rose steadily through 2009 where it plateaued for several years before increasing again through the present time. The 20-year growth rates are similar to the 10-year rates, although half of the count stations do not have 20 years' worth of data.

Overall, the historic traffic growth on SR 1508 (Hickory Tree Rd) has been approximately 2.0% per year on the western end of the study corridor (at NC 150), with the growth rate gradually decreasing as you move east until it becomes approximately 1.0% at the eastern end of the corridor (at US 52). However, the Piedmont Regional Travel Model projects much more modest growth rates for this roadway, with growth rates consistently at or below 1.0% per year.

a. Do you expect future traffic growth to remain similar to what has been observed, or do you believe the model rates to be a more reasonable estimate for future growth?
   The County expects traffic growth to increase on both ends of Hickory Tree Road due to an increased interest in the Millers Creek Business Park on the western end of the road and a renewed interest by the Town of Midway to commercially develop the eastern end of the road.
b. What growth patterns have you noticed?
   The commercial development around the western and eastern ends of the road have brought in several new restaurants and places to shop which pulls traffic from both the Arcadia and Midway communities to those commercial attractions. Also, there has recently been an increase in the residential growth in the immediate vicinity, not only the apartment complex known as The Villas at Hickory Tree, but also residential developments within a few miles of Hickory Tree.
c. Would you expect the growth rate to change substantially in the next 20 years?
   We forecast the growth to continue, maybe not substantially due to a limited amount of available land for development, but the commercial growth will continue to increase the traffic flow because the local population is continuing choose the local options rather than traveling into Winston-Salem.

2) The historic counts on NC 150 (Salisbury Rd) show a 20-year growth rate of 2.0% and 3.6% south and north of Hickory Tree Rd, respectively. The 10-year growth rates are 1.3% and 1.7%. However, the Piedmont Regional Travel Model shows a projected growth rate of 0.3%.

a. Do you expect future traffic growth to remain similar to what has been observed, or do you believe the model rates to be a more reasonable estimate for future growth?
   We disagree with the model rates. The traffic growth north and south along Highway 150 will increase due to the overall development coming to the Arcadia community.
b. What growth patterns have you noticed?
   The Arcadia community has been targeted by developers who build apartment complexes for senior adults under the tax credit program from the Federal Government. Also, Arcadia continues to have large available tracts of undisturbed land that could attract developers.
c. Would you expect the growth rate to change substantially in the next 20 years?
   We do <u>not</u> expect the growth rate to change substantially, however we do expect it to increase.

3) The historic counts on US 52 show a modest 20-year growth rate of 1.0% and 0.6% south and north of Hickory Tree Rd, respectively. The 10-year growth rates are 0.3% and -0.3%. However, the Piedmont Regional Travel Model shows a projected growth rate of 0.7% north of Hickory Tree Rd and 0.4% south of Hickory Tree Rd. It should be noted that the future model does not include the southern section of the proposed Beltway because it is currently unfunded.

Comments completed by Scott Leonard via email – 07/06/2017

a. Do you expect future traffic growth to remain similar to what has been observed, or do you believe the model rates to be a more reasonable estimate for future growth?
We believe the growth rate will at least continue at its historic 20-year pace, however, the Town of Midway has begun a push for more commercial development and has hired consulting engineers to study the existing traffic patterns and make improvements to attract more growth.
b. What growth patterns have you noticed?
We have not noticed a growth pattern.
c. Would you expect the growth rate to change substantially in the next 20 years?
We predict it will grow but slight and not substantially.

4) Aside from school being in session, are there any noticeable seasonal differences in traffic?
No.

5) According to the North Carolina Office of State Budget and Management (OSBM) the current population of Davidson County is approximately 166,800 and is projected to grow by 0.5% per year to 181,800 in 2036; and the current population of Forsyth County is approximately 373,100 and is projected to grow by 1.2% per year to 449,900 in 2036.. The population projections for the entire Winston-Salem Urban Area (county breakdowns were not available) that are contained within the MTP show a projected population growth rate of approximately 1.1% per year to the year 2040.
   a. Do you think that the 0.5% to1.2% population growth rate is reasonable for this area? If so, which rate is more likely for the study area? We do believe that range is reasonable and would lean more towards the 1.2%.

   b. Do you know of any other population projections for this area that may be helpful as we review the growth in the area? No.

6) The Metropolitan Transportation Plan (MTP) does not include any projects in the vicinity of the forecast that have the potential to affect the traffic volumes in the study area. Do you know of any reasonably foreseeable transportation projects that are not included in the MTP that may affect traffic volumes in the traffic forecast study area? The only foreseeable change that may impact the traffic volumes is not a construction project but rather the declaration of State Highway 52 to Interstate status as I-285. We predict this declaration will attract traffic simply due to the mindset of travelers who choose Interstates automatically when finding routes to their destination. This will impact the eastern end of the study area around the Town of Midway.

7) Are you aware of any previous traffic forecasts that were performed in or near the study area?
Kimley-Horn & Associates produced a Community Transportation Evaluation for the Town of Midway back in 2013. This evaluation not only did an analysis of what the current traffic issues in the town were, but also gave direction on potential improvements and changes to Hickory Tree Road in particular its connection with the new Highway 52. Such improvements included possible roundabouts at both sides of the Highway at the on/off ramps, and even the possibility of re-routing Hickory Tree Road as it approaches its current terminus at Old Highway 52.

8) Do you know of developments in the vicinity of the traffic forecast area that may affect our traffic forecast? There are two small developments currently in the planning process that lie within the immediate area. Neither are large enough to make a difference in the traffic forecast. However, there is one new large apartment complex that is attempting to receive the governmental funding for development. If approved in August of this year, it will have an impact on the forecast. It does not lie on Hickory Tree Road but will impact the traffic volume.

Comments completed by Scott Leonard via email – 07/06/2017

9) Do you have any additional comments that would be helpful in our development of the traffic forecast? We believe the current widening project involving Hickory Tree Road has a three-lane facility rather than four. If four is the proposal for this analysis, it would probably be better to go through the MPO since it would take more existing houses along Hickory Tree Road than currently expected and would need political support.

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

i. Diane Hampton, Division 9 Division Planning Engineer
ii. J.P. Couch, Division 9 Division Traffic Engineer
iii. Chris Corriher, Division9, District 1 District Engineer
iv. John A. Bailey, NCDOT Transportation Planning Branch
v. Margaret Bessette, City-County Planning Board Assistant Director
vi. Byron Brown, Winston-Salem DOT Principal Planner
vii. Scott Leonard, Davidson County Planner
viii. Kassie Watts, Town of Midway Town Planner

a. Are there any other individuals whom you think we should contact to discuss this forecast? Kassis Watts is no longer the Town Planner for Midway. The County has taken over that role, therefore the only other person that would need to be involved is the Town Manager, Gary Looper. His contact information is glooper@midway-nc.gov .

NOTES OF CONVERSATION WITH DIANE HAMPTON, 07/05/2017

That area (northern Davidson County) will continue to develop. They have water and good schools in that area.

NOTES OF CONVERSATION WITH J.P. COUCH, 07/05/2017

Question 1 – The west end of the corridor is becoming more developed. NC 150 is a direct link to Winston-Salem. However, there is more land available on the east end of the corridor. The historic growth rates are accurate and will probably continue.

Question 2 – NC 150 is where all the growth is taking place. Neighborhoods are being developed down NC 150. That will have a higher growth rate than the model is showing.

Question 3 – The growth on US 52 is anybody's guess. In the future it will be designated as I-285, and they're applying for some design exceptions now to make that happen. Doesn't know if the interstate designation will bring more traffic (or more development) or not. The model growth of 0.7%-1.0% sounds okay.

Question 4 – No.

Question 5 – Don't know.

Question 6 – The Town of Midway wants to connect a road to Hickory Tree Road opposite of the US 52 northbound ramps, to provide better access to some industrial areas. It's still in planning mode and is only a possibility at this point.

Question 7 – No.

Question 8 – Don't know.

NOTES OF CONVERSATION WITH CHRIS CORRIHER, 07/05/2017

There are no new developments lately. There is some talk of Midway connecting to the US 52 northbound ramps intersection.

Development along Hickory Tree Road took off during the housing boom in the early 2000s, and after the slow down we didn't see a whole lot of new building out there.

NOTES OF CONVERSATION WITH SCOTT LEONARD, 07/05/2017

The commercial nodes at either end of the corridor have sewer and so does Hidden Creek (from the north side of the development), but everything else is septic.

The widening project was originally conceived as a 3-lane roadway. A project for 5-lanes should go through the MPO in order to get political support, because the right-of-way may not be available for 5 lanes and might require taking people's houses.

NOTES OF CONVERSATION WITH MARGARET BESSETTE, 07/05/2017

The best people to talk to would be Byron Brown or Scott Leonard.

They did the socio-economic data forecast for the MTP. Didn't have a lot of growth in Davidson County. The northern end of the county has seen some suburban style development.

APPENDIX C:

TRAFFIC FORECAST TABLES

Table C1: 2016 Base Year No-Build Traffic Volumes

Forecast Location	NCDOT Historic Count Data							AADT Exptrapolated to 2017[1]	Project Specific Count Data[2]		2017 No-Build Traffic Forecast
	2009	2010	2011	2012	2013	2014	2015		TMC	Mainline	
Old Salisbury Rd (SR 3011) - west of NC 150 (Salisbury Rd)	11,000		9,200		8,900		13,000	11,900	12,800 (3)		**12,800**
Hickory Tree Rd (SR 1508) - east of NC 150 (Salisbury Rd)		12,000		12,000				14,100	14,400 (3)		**14,400**
Hickory Tree Rd (SR 1508) - west of Sheetz Dwy									12,900 (3)		**12,900**
Hickory Tree Rd (SR 1508) - Sheetz Dwy to Farmbrooke Ln									13,100 (3) 12,700 (3)		**12,900**
Hickory Tree Rd (SR 1508) - Farmbrooke Ln to Mendenhall Dr									12,300 (3) 12,400 (3)		**12,400**
Hickory Tree Rd (SR 1508) - Mendenhall Dr to Hidden Creek Rd									12,300 (3) 12,200 (3)		**12,400**
Hickory Tree Rd (SR 1508) - Hidden Creek Rd to N Payne Rd/Willow Ridge Ln									11,600 (3) 11,600 (3)	11,600 (5)	**11,600**
Hickory Tree Rd (SR 1508) - east of N Payne Rd/Willow Ridge Ln	9,800		9,300		8,800		11,000	10,700	10,300 (3)		**10,400**
Hickory Tree Rd (SR 1508) - west of Hartman Rd (SR 1511)									10,400 (3)		**10,400**
Hickory Tree Rd (SR 1508) - Hartman Rd (SR 1511) to David Smith Rd									14,100 (3) 14,100 (3)		**14,100**
Hickory Tree Rd (SR 1508) - David Smith Rd to US 52	14,000		13,000		13,000		16,000	14,500	14,800 (3) 14,900 (3)		**14,900**
Hickory Tree Rd (SR 1508) - east of US 52		13,000		10,000		8,600		9,200	11,400 (3)		**11,400**
NC 150 (Salisbury Rd) - south of Old Salisbury Rd (SR 3011)/Hickory Tree Rd (SR 1508)	14,000	14,000	15,000	15,000	14,000		15,000	15,500	15,200 (3)	37,100 (5)	**15,200**
NC 150 (Salisbury Rd) - north of Old Salisbury Rd (SR 3011)/Hickory Tree Rd (SR 1508)		21,000	22,000	21,000	20,000	20,000	24,000	23,000	20,800 (3)		**20,800**
Sheetz Dwy - north of Hickory Tree Rd (SR 1508)									2,000 (3)		**2,000**
Farmbrooke Ln - south of Hickory Tree Rd (SR 1508)									700 (3)		**700**
Mendenhall Dr - south of Hickory Tree Rd (SR 1508)									600 (3)		**600**
Hidden Creek Rd - north of Hickory Tree Rd (SR 1508)									2,100 (3)		**2,200**
N Payne Rd - south of Hickory Tree Rd (SR 1508)		1,600		1,600		1,500		1,600	1,500 (3)		**1,400**
Willow Ridge Ln - north of Hickory Tree Rd (SR 1508)									200 (3)		**200**

Table C1: 2016 Base Year No-Build Traffic Volumes

Forecast Location	NCDOT Historic Count Data							AADT Exptrapolated to 2017[1]	Project Specific Count Data[2]		2017 No-Build Traffic Forecast
	2009	2010	2011	2012	2013	2014	2015		TMC	Mainline	
Hartman Rd (SR 1511) - south of Hickory Tree Rd (SR 1508)		3,400		3,500				3,300	4,000 (3)		**4,000**
Funeral Home Dwy - north of Hickory Tree Rd (SR 1508)									100 (3)		**100**
David Smith Rd - south of Hickory Tree Rd (SR 1508)									2,000 (3)		**2,100**
RV Sales Dwy - north of Hickory Tree Rd (SR 1508)									100 (3)		**100**
US 52 - south of Hickory Tree Rd (SR 1508)	29,000	28,000	28,000	27,000	30,000	32,000	31,000	30,000	5,900 (4)		**30,700**
US 52 - north of Hickory Tree Rd (SR 1508)	29,000	28,000	29,000	28,000	30,000	31,000	31,000	29,000	6,400 (4)		**31,200**

Notes:

(1) Data extrapolated to 2017 based on linear regression of 2006-2015 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) 2017 13-hour Turning Movement Count - factored to 24-hour volumes and adjusted to AADT.

(4) TMC count available only for ramps at US 52 interchange.

Table C2: 2016 Base Year No-Build Design Data – Truck Percentages

Forecast Location	Project Specific Count Data		Selected 2017 BY NB Value
	TMC	Mainline	
Old Salisbury Rd (SR 3011) - west of NC 150 (Salisbury Rd)	2 , 1 (1)		**2 , 1**
Hickory Tree Rd (SR 1508) - east of NC 150 (Salisbury Rd)	2 , 1 (1)		**2 , 1**
Hickory Tree Rd (SR 1508) - west of Sheetz Dwy	2 , 1 (1)		**2 , 1**
Hickory Tree Rd (SR 1508) - Sheetz Dwy to Farmbrooke Ln	2 , 1 (1) 2 , 1 (1)		**2 , 1**
Hickory Tree Rd (SR 1508) - Farmbrooke Ln to Mendenhall Dr	2 , 1 (1) 2 , 1 (1)		**2 , 1**
Hickory Tree Rd (SR 1508) - Mendenhall Dr to Hidden Creek Rd	2 , 1 (1) 2 , 1 (1)		**2 , 1**
Hickory Tree Rd (SR 1508) - Hidden Creek Rd to N Payne Rd/Willow Ridge Ln	2 , 1 (1) 2 , 1 (1)	9 , 1 (3)	**2 , 1**
Hickory Tree Rd (SR 1508) - east of N Payne Rd/Willow Ridge Ln	3 , 1 (1)		**2 , 1**
Hickory Tree Rd (SR 1508) - west of Hartman Rd (SR 1511)	2 , 1 (1)		**2 , 1**
Hickory Tree Rd (SR 1508) - Hartman Rd (SR 1511) to David Smith Rd	2 , 1 (1) 2 , 1 (1)		**2 , 1**
Hickory Tree Rd (SR 1508) - David Smith Rd to US 52	2 , 1 (1) 2 , 1 (1)		**2 , 1**
Hickory Tree Rd (SR 1508) - east of US 52	3 , 1 (1)		**2 , 1**
NC 150 (Salisbury Rd) - south of Old Salisbury Rd (SR 3011)/Hickory Tree Rd (SR 1508)	2 , 1 (1)	3 , 9 (3)	**2 , 1**
NC 150 (Salisbury Rd) - north of Old Salisbury Rd (SR 3011)/Hickory Tree Rd (SR 1508)	2 , 1 (1)		**2 , 1**
Sheetz Dwy - north of Hickory Tree Rd (SR 1508)	2 , 1 (1)		**2 , 1**
Farmbrooke Ln - south of Hickory Tree Rd (SR 1508)	5 , 0 (1)		**3 , 1**
Mendenhall Dr - south of Hickory Tree Rd (SR 1508)	5 , 0 (1)		**3 , 1**
Hidden Creek Rd - north of Hickory Tree Rd (SR 1508)	4 , 1 (1)		**3 , 1**
N Payne Rd - south of Hickory Tree Rd (SR 1508)	2 , 0 (1)		**2 , 1**
Willow Ridge Ln - north of Hickory Tree Rd (SR 1508)	5 , 0 (1)		**3 , 1**
Hartman Rd (SR 1511) - south of Hickory Tree Rd (SR 1508)	2 , 1 (1)		**2 , 1**
Funeral Home Dwy - north of Hickory Tree Rd (SR 1508)	5 , 0 (1)		**3 , 1**
David Smith Rd - south of Hickory Tree Rd (SR 1508)	3 , 1 (1)		**3 , 1**

Table C2: 2016 Base Year No-Build Design Data – Truck Percentages

Forecast Location	Project Specific Count Data		Selected 2017 BY NB Value
	TMC	Mainline	
RV Sales Dwy - north of Hickory Tree Rd (SR 1508)	10 , 0 (1)		**8 , 1**
US 52 - south of Hickory Tree Rd (SR 1508)	3 , 4 (2)		**3 , 4**
US 52 - north of Hickory Tree Rd (SR 1508)	3 , 4 (2)		**3 , 4**

Notes:

(1) 2017 13-hour Turning Movement Count

(2) Truck percentages based on NCDOT 2015 count data

(3) 2017 Volume, Speed, Class Mainline Count

Table C2: 2016 Base Year No-Build Design Data – Truck Percentages

Forecast Location	Project Specific Count Data		Selected 2017 BY NB Value
	TMC	Mainline	
Old Salisbury Rd (SR 3011) - west of NC 150 (Salisbury Rd)	56 EB (1)		**55 EB**
Hickory Tree Rd (SR 1508) - east of NC 150 (Salisbury Rd)	55 EB (1)		**55 EB**
Hickory Tree Rd (SR 1508) - west of Sheetz Dwy	55 EB (1)		**55 EB**
Hickory Tree Rd (SR 1508) - Sheetz Dwy to Farmbrooke Ln	55 EB (1) 55 EB (1)		**55 EB**
Hickory Tree Rd (SR 1508) - Farmbrooke Ln to Mendenhall Dr	55 EB (1) 55 EB (1)		**55 EB**
Hickory Tree Rd (SR 1508) - Mendenhall Dr to Hidden Creek Rd	54 EB (1) 54 EB (1)		**55 EB**
Hickory Tree Rd (SR 1508) - Hidden Creek Rd to N Payne Rd/Willow Ridge Ln	53 EB (1) 52 EB (1)	54 EB (3)	**55 EB**
Hickory Tree Rd (SR 1508) - east of N Payne Rd/Willow Ridge Ln	50 EB (1)		**55 EB**
Hickory Tree Rd (SR 1508) - west of Hartman Rd (SR 1511)	53 WB (1)		**55 WB**
Hickory Tree Rd (SR 1508) - Hartman Rd (SR 1511) to David Smith Rd	58 WB (1) 58 WB (1)		**60 WB**
Hickory Tree Rd (SR 1508) - David Smith Rd to US 52	59 WB (1) 58 WB (1)		**60 WB**
Hickory Tree Rd (SR 1508) - east of US 52	51 WB (1)		**60 WB**
NC 150 (Salisbury Rd) - south of Old Salisbury Rd (SR 3011)/Hickory Tree Rd (SR 1508)	60 SB (1)	57 SB (3)	**60 SB**
NC 150 (Salisbury Rd) - north of Old Salisbury Rd (SR 3011)/Hickory Tree Rd (SR 1508)	57 SB (1)		**60 SB**
Sheetz Dwy - north of Hickory Tree Rd (SR 1508)	50 SB (1)		**55 SB**
Farmbrooke Ln - south of Hickory Tree Rd (SR 1508)	51 SB (1)		**55 SB**
Mendenhall Dr - south of Hickory Tree Rd (SR 1508)	56 SB (1)		**55 SB**
Hidden Creek Rd - north of Hickory Tree Rd (SR 1508)	59 NB (1)		**60 NB**
N Payne Rd - south of Hickory Tree Rd (SR 1508)	63 SB (1)		**65 SB**
Willow Ridge Ln - north of Hickory Tree Rd (SR 1508)	65 NB (1)		**65 NB**
Hartman Rd (SR 1511) - south of Hickory Tree Rd (SR 1508)	70 SB (1)		**70 SB**
Funeral Home Dwy - north of Hickory Tree Rd (SR 1508)	100 SB (1)		**75 SB**
David Smith Rd - south of Hickory Tree Rd (SR 1508)	60 SB (1)		**60 SB**

Table C2: 2016 Base Year No-Build Design Data – Truck Percentages

Forecast Location	Project Specific Count Data		Selected 2017 BY NB Value
	TMC	Mainline	
RV Sales Dwy - north of Hickory Tree Rd (SR 1508)	50 NB (1)		**55 NB**
US 52 - south of Hickory Tree Rd (SR 1508)	52 SB (2)		**60 SB**
US 52 - north of Hickory Tree Rd (SR 1508)	66 SB (2)		**60 SB**

Notes:

(1) 2017 13-hour Turning Movement Count

(2) 2017 13-hour Turning Movement Count on US 52 ramps

(3) 2017 Volume, Speed, Class Mainline Count

Table C2: 2016 Base Year No-Build Design Data – Truck Percentages

Forecast Location	Project Specific Count Data		Selected 2017 BY NB Value
	TMC	Mainline	
Old Salisbury Rd (SR 3011) - west of NC 150 (Salisbury Rd)	8 (1)		**9**
Hickory Tree Rd (SR 1508) - east of NC 150 (Salisbury Rd)	9 (1)		**9**
Hickory Tree Rd (SR 1508) - west of Sheetz Dwy	9 (1)		**9**
Hickory Tree Rd (SR 1508) - Sheetz Dwy to Farmbrooke Ln	9 (1) 10 (1)		**9**
Hickory Tree Rd (SR 1508) - Farmbrooke Ln to Mendenhall Dr	9 (1) 9 (1)		**9**
Hickory Tree Rd (SR 1508) - Mendenhall Dr to Hidden Creek Rd	9 (1) 9 (1)		**9**
Hickory Tree Rd (SR 1508) - Hidden Creek Rd to N Payne Rd/Willow Ridge Ln	9 (1) 9 (1)	10 (3)	**9**
Hickory Tree Rd (SR 1508) - east of N Payne Rd/Willow Ridge Ln	9 (1)		**9**
Hickory Tree Rd (SR 1508) - west of Hartman Rd (SR 1511)	9 (1)		**9**
Hickory Tree Rd (SR 1508) - Hartman Rd (SR 1511) to David Smith Rd	10 (1) 10 (1)		**10**
Hickory Tree Rd (SR 1508) - David Smith Rd to US 52	10 (1) 10 (1)		**10**
Hickory Tree Rd (SR 1508) - east of US 52	10 (1)		**10**
NC 150 (Salisbury Rd) - south of Old Salisbury Rd (SR 3011)/Hickory Tree Rd (SR 1508)	9 (1)	9 (3)	**9**
NC 150 (Salisbury Rd) - north of Old Salisbury Rd (SR 3011)/Hickory Tree Rd (SR 1508)	9 (1)		**9**
Sheetz Dwy - north of Hickory Tree Rd (SR 1508)	7 (1)		**7**
Farmbrooke Ln - south of Hickory Tree Rd (SR 1508)	8 (1)		**8**
Mendenhall Dr - south of Hickory Tree Rd (SR 1508)	10 (1)		**10**
Hidden Creek Rd - north of Hickory Tree Rd (SR 1508)	9 (1)		**9**
N Payne Rd - south of Hickory Tree Rd (SR 1508)	9 (1)		**9**
Willow Ridge Ln - north of Hickory Tree Rd (SR 1508)	11 (1)		**11**
Hartman Rd (SR 1511) - south of Hickory Tree Rd (SR 1508)	11 (1)		**11**
Funeral Home Dwy - north of Hickory Tree Rd (SR 1508)	2 (1)		**7**
David Smith Rd - south of Hickory Tree Rd (SR 1508)	12 (1)		**12**

Table C2: 2016 Base Year No-Build Design Data – Truck Percentages

Forecast Location	Project Specific Count Data		Selected 2017 BY NB Value
	TMC	Mainline	
RV Sales Dwy - north of Hickory Tree Rd (SR 1508)	6 (1)		**7**
US 52 - south of Hickory Tree Rd (SR 1508)	9 (2)		**10**
US 52 - north of Hickory Tree Rd (SR 1508)	12 (2)		**10**

Notes:

(1) 2017 13-hour Turning Movement Count

(2) 2017 13-hour Turning Movement Count on US 52 ramps

(3) 2017 Volume, Speed, Class Mainline Count

Table C5: Model Validation

Forecast Location	Model Calibration 2013		Interpolated Model (1)	Forecast Volume	FY NB Volumes	
	Model	AADT	2017	2017 NB	2040 Model	2040 Forecast
Old Salisbury Rd (SR 3011) - west of NC 150 (Salisbury Rd)	6,964	8,800	7,300	12,800	9,500	20,200
Hickory Tree Rd (SR 1508) - east of NC 150 (Salisbury Rd)	8,849	12,000	9,200	14,400	11,500	22,700
Hickory Tree Rd (SR 1508) - west of Sheetz Dwy	8,849	12,000	9,200	12,900	11,500	18,200
Hickory Tree Rd (SR 1508) - Sheetz Dwy to Farmbrooke Ln	8,849	12,000	9,200	12,900	11,500	18,200
Hickory Tree Rd (SR 1508) - Farmbrooke Ln to Mendenhall Dr	8,849	12,000	9,200	12,400	11,500	17,500
Hickory Tree Rd (SR 1508) - Mendenhall Dr to Hidden Creek Rd	8,849	12,000	9,200	12,400	11,500	17,500
Hickory Tree Rd (SR 1508) - Hidden Creek Rd to N Payne Rd/Willow Ridge Ln	8,517		8,800	11,600	10,500	16,300
Hickory Tree Rd (SR 1508) - east of N Payne Rd/Willow Ridge Ln	8,517	8,700	8,800	10,400	10,500	14,600
Hickory Tree Rd (SR 1508) - west of Hartman Rd (SR 1511)	8,517		8,800	10,400	10,500	13,100
Hickory Tree Rd (SR 1508) - Hartman Rd (SR 1511) to David Smith Rd	10,914		11,500	14,100	14,600	17,700
Hickory Tree Rd (SR 1508) - David Smith Rd to US 52	10,674	13,000	11,200	14,900	14,400	18,700
Hickory Tree Rd (SR 1508) - east of US 52	11,906	10,000	12,400	11,400	15,200	14,300
NC 150 (Salisbury Rd) - south of Old Salisbury Rd (SR 3011)/Hickory Tree Rd (SR 1508)	15,833	15,000	16,000	15,200	17,200	19,100
NC 150 (Salisbury Rd) - north of Old Salisbury Rd (SR 3011)/Hickory Tree Rd (SR 1508)	16,636	19,000	16,900	20,800	18,100	26,200
Sheetz Dwy - north of Hickory Tree Rd (SR 1508)	n/a		n/a	2,000	n/a	2,600
Farmbrooke Ln - south of Hickory Tree Rd (SR 1508)	n/a		n/a	700	n/a	900
Mendenhall Dr - south of Hickory Tree Rd (SR 1508)	n/a		n/a	600	n/a	800
Hidden Creek Rd - north of Hickory Tree Rd (SR 1508)	*2,876*		*2,900*	2,200	*3,300*	2,800
N Payne Rd - south of Hickory Tree Rd (SR 1508)	n/a		n/a	1,400	n/a	1,800
Willow Ridge Ln - north of Hickory Tree Rd (SR 1508)	n/a		n/a	200	n/a	300
Hartman Rd (SR 1511) - south of Hickory Tree Rd (SR 1508)	2,486	3,400	2,700	4,000	4,200	6,300
Funeral Home Dwy - north of Hickory Tree Rd (SR 1508)	n/a		n/a	100	n/a	100
David Smith Rd - south of Hickory Tree Rd (SR 1508)	2,483		2,700	2,100	4,100	3,300
RV Sales Dwy - north of Hickory Tree Rd (SR 1508)	n/a		n/a	100	n/a	100
US 52 - south of Hickory Tree Rd (SR 1508)	34,664		35,300	30,700	38,900	38,600
US 52 - north of Hickory Tree Rd (SR 1508)	32,807		33,800	31,200	39,300	39,200

Notes:

(1) Interpolated volume between 2010 and 2040 model data

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

Table C6: 2040 No-Build Traffic Volumes

Forecast Location	Forecast 2017 Base Year NB	Historic Growth Rate		Model Growth Rate [1]	Chosen Growth Rate [1]	Future Year No-Build Volumes	
	AADT	2006-2015	1996-2015	2013-2040	2017-2040	2040 Model	2040 Forecast
Old Salisbury Rd (SR 3011) - west of NC 150 (Salisbury Rd)	12,800	2.62%	2.28%	1.16%	2.00%	9,500	**20,200**
Hickory Tree Rd (SR 1508) - east of NC 150 (Salisbury Rd)	14,400	3.25%	3.08%	0.98%	2.00%	11,500	**22,700**
Hickory Tree Rd (SR 1508) - west of Sheetz Dwy	12,900			0.98%	1.51%	11,500	**18,200**
Hickory Tree Rd (SR 1508) - Sheetz Dwy to Farmbrooke Ln	12,900			0.98%	1.51%	11,500	**18,200**
Hickory Tree Rd (SR 1508) - Farmbrooke Ln to Mendenhall Dr	12,400			0.98%	1.51%	11,500	**17,500**
Hickory Tree Rd (SR 1508) - Mendenhall Dr to Hidden Creek Rd	12,400			0.98%	1.51%	11,500	**17,500**
Hickory Tree Rd (SR 1508) - Hidden Creek Rd to N Payne Rd/Willow Ridge Ln	11,600			0.78%	1.49%	10,500	**16,300**
Hickory Tree Rd (SR 1508) - east of N Payne Rd/Willow Ridge Ln	10,400	2.14%	2.69%	0.78%	1.49%	10,500	**14,600**
Hickory Tree Rd (SR 1508) - west of Hartman Rd (SR 1511)	10,400			0.78%	1.01%	10,500	**13,100**
Hickory Tree Rd (SR 1508) - Hartman Rd (SR 1511) to David Smith Rd	14,100			1.07%	0.99%	14,600	**17,700**
Hickory Tree Rd (SR 1508) - David Smith Rd to US 52	14,900	0.35%	1.31%	1.11%	0.99%	14,400	**18,700**
Hickory Tree Rd (SR 1508) - east of US 52	11,400	-1.79%	1.39%	0.90%	0.99%	15,200	**14,300**
NC 150 (Salisbury Rd) - south of Old Salisbury Rd (SR 3011)/Hickory Tree Rd (SR 1508)	15,200	1.31%	1.95%	0.31%	1.00%	17,200	**19,100**
NC 150 (Salisbury Rd) - north of Old Salisbury Rd (SR 3011)/Hickory Tree Rd (SR 1508)	20,800	1.66%	3.58%	0.31%	1.01%	18,100	**26,200**
Sheetz Dwy - north of Hickory Tree Rd (SR 1508)	2,000			n/a	1.15%	n/a	**2,600**
Farmbrooke Ln - south of Hickory Tree Rd (SR 1508)	700			n/a	1.10%	n/a	**900**
Mendenhall Dr - south of Hickory Tree Rd (SR 1508)	600			n/a	1.26%	n/a	**800**
Hidden Creek Rd - north of Hickory Tree Rd (SR 1508)	2,200			*0.46%*	1.05% (2)	*3,300*	**2,800**
N Payne Rd - south of Hickory Tree Rd (SR 1508)	1,400	0.99%	4.44%	n/a	1.10%	n/a	**1,800**
Willow Ridge Ln - north of Hickory Tree Rd (SR 1508)	200			n/a	1.78%	n/a	**300**
Hartman Rd (SR 1511) - south of Hickory Tree Rd (SR 1508)	4,000	-0.84%	2.06%	1.92%	1.99%	4,200	**6,300**
Funeral Home Dwy - north of Hickory Tree Rd (SR 1508)	100			n/a	0.00%	n/a	**100**
David Smith Rd - south of Hickory Tree Rd (SR 1508)	2,100			1.88%	1.98%	4,100	**3,300**
RV Sales Dwy - north of Hickory Tree Rd (SR 1508)	100			n/a	0.00%	n/a	**100**
US 52 - south of Hickory Tree Rd (SR 1508)	30,700	0.32%	0.96%	0.43%	1.00%	38,900	**38,600**
US 52 - north of Hickory Tree Rd (SR 1508)	31,200	-0.25%	0.64%	0.67%	1.00%	39,300	**39,200**

Notes:

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

(2) 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	2040 Forecast Volumes	
	No-Build	Build			No-Build	Build
Old Salisbury Rd (SR 3011) - west of NC 150 (Salisbury Rd)	9,500	9,400	-1.05%	0.00%	20,200	**20,200**
Hickory Tree Rd (SR 1508) - east of NC 150 (Salisbury Rd)	11,500	12,100	5.22%	4.85%	22,700	**23,800**
Hickory Tree Rd (SR 1508) - west of Sheetz Dwy	11,500	12,100	5.22%	4.95%	18,200	**19,100**
Hickory Tree Rd (SR 1508) - Sheetz Dwy to Farmbrooke Ln	11,500	12,100	5.22%	5.49%	18,200	**19,200**
Hickory Tree Rd (SR 1508) - Farmbrooke Ln to Mendenhall Dr	11,500	12,100	5.22%	5.71%	17,500	**18,500**
Hickory Tree Rd (SR 1508) - Mendenhall Dr to Hidden Creek Rd	11,500	12,100	5.22%	5.71%	17,500	**18,500**
Hickory Tree Rd (SR 1508) - Hidden Creek Rd to N Payne Rd/Willow Ridge Ln	10,500	11,000	4.76%	4.91%	16,300	**17,100**
Hickory Tree Rd (SR 1508) - east of N Payne Rd/Willow Ridge Ln	10,500	11,000	4.76%	5.48%	14,600	**15,400**
Hickory Tree Rd (SR 1508) - west of Hartman Rd (SR 1511)	10,500	11,000	4.76%	5.34%	13,100	**13,800**
Hickory Tree Rd (SR 1508) - Hartman Rd (SR 1511) to David Smith Rd	14,600	15,000	2.74%	3.39%	17,700	**18,300**
Hickory Tree Rd (SR 1508) - David Smith Rd to US 52	14,400	14,700	2.08%	2.14%	18,700	**19,100**
Hickory Tree Rd (SR 1508) - east of US 52	15,200	15,300	0.66%	1.40%	14,300	**14,500**
NC 150 (Salisbury Rd) - south of Old Salisbury Rd (SR 3011)/Hickory Tree Rd (SR 1508)	17,200	17,300	0.58%	1.05%	19,100	**19,300**
NC 150 (Salisbury Rd) - north of Old Salisbury Rd (SR 3011)/Hickory Tree Rd (SR 1508)	18,100	18,800	3.87%	4.20%	26,200	**27,300**
Sheetz Dwy - north of Hickory Tree Rd (SR 1508)	n/a	n/a	n/a	3.85%	2,600	**2,700**
Farmbrooke Ln - south of Hickory Tree Rd (SR 1508)	n/a	n/a	n/a	0.00%	900	**900**
Mendenhall Dr - south of Hickory Tree Rd (SR 1508)	n/a	n/a	n/a	0.00%	800	**800**
Hidden Creek Rd - north of Hickory Tree Rd (SR 1508)	*3,300*	*3,300*	*0.00%*	0.00% (1)	2,800	**2,800**
N Payne Rd - south of Hickory Tree Rd (SR 1508)	n/a	n/a	n/a	0.00%	1,800	**1,800**
Willow Ridge Ln - north of Hickory Tree Rd (SR 1508)	n/a	n/a	n/a	0.00%	300	**300**
Hartman Rd (SR 1511) - south of Hickory Tree Rd (SR 1508)	4,200	4,100	-2.38%	-1.59%	6,300	**6,200**
Funeral Home Dwy - north of Hickory Tree Rd (SR 1508)	n/a	n/a	n/a	0.00%	100	**100**
David Smith Rd - south of Hickory Tree Rd (SR 1508)	4,100	4,200	2.44%	0.00%	3,300	**3,300**
RV Sales Dwy - north of Hickory Tree Rd (SR 1508)	n/a	n/a	n/a	0.00%	100	**100**
US 52 - south of Hickory Tree Rd (SR 1508)	38,900	39,300	1.03%	1.04%	38,600	**39,000**
US 52 - north of Hickory Tree Rd (SR 1508)	39,300	39,900	1.53%	1.02%	39,200	**39,600**

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

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

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