

TRAFFIC FORECAST REEVALUTION LETTER

May 3, 2021

MEMORANDUM TO: Beverly Robinson, PE
NCDOT Project Management Unit Team Lead – Divisions 11-14

FROM: Peter Trencansky, PE, PTOE, AICP
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SUBJECT: Traffic Forecast Reevaluation for R-2307/I-5717
Catawba and Iredell Counties
NC 150 Improvements from NC 16 to west of US 21 Interchange

A traffic forecast evaluation of the 2016 Traffic Forecast for R-2307/I-5717 was conducted, and it was determined that a traffic forecast update would not likely change any of the design decisions made for R-2307/I-5717 to date. Therefore, it is concluded that the January 2016 forecast can still be relied upon for project-specific decisions, and a new forecast is not necessary at this time.

Please find attached the traffic forecast reevaluation for STIP Project R-2307/I-5717 in Catawba and Iredell Counties. The proposed project would widen NC 150 to a four-lane divided section from the NC 16 Bypass to Perth Road and a six-lane divided section from Perth Road to west of the US 21 interchange. The proposed project also includes upgrading the I-77/NC 150 interchange as STIP Project I-5717. This forecast reevaluation was requested for use in the project development activities associated with the projects, including the approval of the final design plans for the project.

Forecast History

A traffic forecast for the R-2307/I-5717 projects was approved on January 25, 2016 and include forecasts for 2015 Base Year No-Build, 2015 Base Year Build, 2040 Future Year No-Build and 2040 Future Year Build. The forecast was based off the information included in the locally adopted plans at the time of its completion including: *Greater Hickory MPO 2040 Long Range Transportation Plan* and the *Charlotte Regional Transportation Planning Organization (CRTPO) 2040 Metropolitan Transportation Plan*. The forecast utilized the Metrolina Regional Travel Demand Model (MRM 14v1.0) as a tool in the development of the forecast.

Current Status

The scope and design of the proposed project is largely the same as was when the traffic forecast was completed in January 2016. The current locally adopted plans have been updated and include: *Greater Hickory Metropolitan Transportation Plan 2045* (adopted July 2018) and the *CRTPO Metropolitan Transportation Plan 2045* (adopted March 2018). The current travel demand model is the Metrolina Regional Travel Demand Model (MRM 19v1.0).

Review of Study Area and Forecast Assumptions

The study area for the project was reviewed in Google Earth utilizing the historical aerial photography and no substantial developments were noted and no development outside of the anticipated growth along the corridor was observed. The compound annual growth rate (CAGR) for the population of Iredell County is very similar between the 2040 MTP (1.45% per year) and the 2045 MTP (1.47% per year). A review of the committed projects between the 2040 and 2045 MTP documents for the study area found that there were no substantial differences between the two plans.

Project Status

The project is currently in the final design stage and R-2307B (including I-5717) is scheduled for construction in FY 2023 and R-2307A is scheduled for right-of-way acquisition in FY 2025 and construction in FY 2029. The proposed project completed the Environmental Assessment (EA) in February 2016 and the Finding of No Significant Impact (FONSI) in June 2017. The traffic analysis that was developed based on the January 2016 traffic forecast for the project was completed in May 2016 and included in the R-2307 / I-5717 NC 150 Corridor Study Revised FINAL Capacity Analysis Report Addendum. Based on the traffic analysis all signalized intersections are projected to operate at a LOS C or better, except for the intersection of NC 150 at Williamson Rd/Bluefield Rd which is projected to operate at LOS D.

Reevaluation Summary

A traffic forecast evaluation (attached) that reviewed the January 2016 forecast based on the changes in the study area, more recent count data and updated local planning documents was conducted. Due to the methodology and engineering judgment inherent in traffic forecasting it is not possible to determine precisely what the 2045 volume would be; however, based on the reasonableness checks implemented and a comparison of the more recent data a quantitative assessment of the forecast can be determined. Based on the reevaluation of the forecast it is not likely that a traffic forecast update would produce 2045 volumes that would be substantially different than those included for the 2040 Build scenario in the January 2016 forecast. Overall, the 2045 Build volumes would be very comparable to the 2040 Build volumes from the January 2016 forecast. It is not likely that the minor changes in volume would affect design as all segments of the project operate at LOS C or better except for one intersection. This intersection (NC 150 at Williamson Rd/Bluefield Rd) was projected to operate at LOS D in 2040; however, the latest MRM version shows less growth and produces volume slightly lower than the 2040 Build volumes. Therefore, it is not likely that developing an updated traffic forecast would change any of the design decisions made to date, nor are any of the assumptions utilized in the January 2016 forecast no longer true.

Conclusion

The January 2016 traffic forecast produced volumes that would not be substantially different than those that would be developed based on current data for a 2045 Build. The assumptions and related planning elements from the January 2016 forecast are still reasonable and valid. There are no design elements that appear to be on the verge of failing or are sensitive to minor changes in volume. Therefore, it is concluded that the January 2016 forecast can still be relied upon for project specific decisions and a new forecast is not necessary at this time. If any of the assumptions included in the original January 2016 forecast change and are determined to be inconsistent with the project and surrounding area activity, please request updated projections at this location.

Project Information

Project ID:	R-2307/I-5717	TF prepared by:	Patriot
TF Delivery Date:	1/25/2016		
Project Description:	NC 150 from NC 16 to west of US 21 Interchange - Widen to 4/6 lanes and improve I-77 Interchange		
TF Evaluation Date:	5/3/2021	Eval prepared by:	Patriot
TF Base Year:	2015		
TF Future Year:	2040		

Verification of Build Assumptions and Project Extents

TF Build Assumptions:	Widen NC 150 to four-lane divided from NC 16 to Perth Rd and six-lane divided to west of US 21 Interchange
Current Build Assumptions:	Same

Build Assumptions Comments/Conclusion

The build assumptions used in the TF are consistent with the current build assumptions being considered.

Verification of BY NB Estimate

Latest TFG AADT Year Currently Available:	2019
Latest TFG AADT Year Available at Time of TF Production:	2013

BY NB Locations	2015 TF NB AADT	2013 TSG AADT Est	2015 TSG AADT Est	2019 TSG AADT Est	TFG AADT Notes
NC 150 - NC 16 Bypass to E. Maiden Rd (SR 1855)	11300	11000	12000	14000	
NC 150 - E. Maiden Rd (SR 1855) to NC 16 Business	13300	12000	13000	15500	
NC 150 - NC 16 Business to Grassy Creek Rd (SR 1853)	12600	11000	12000	13500	
NC 150 - Grassy Creek Rd (SR 1853) to Mt. Pleasant Rd (SR 1849)	13100	12000	13000	14000	
NC 150 - Little Mountain Rd (SR 1815) to Slanting Bridge Rd (SR 1844)	11000	9400	9600	10000 ⁽²⁰¹⁷⁾	
NC 150 - Slanting Bridge Rd (SR 1844) to Sherrills Ford Rd (SR 1848)	14000	12000	13000	15000	
NC 150 - Sherrills Ford Rd (SR 1848) to Kiser Island Rd (SR 1841)/Marshall Steam Station	17800	16000	17000	19000	
NC 150 - East of Greenwood Rd (SR 1840)	17100	12000	16000	18000	TF BY AADT based upon BY counts and turning movements
NC 150 - West of McCrary Rd/Robinson Rd	20900	19000	19000	21500 ⁽²⁰¹⁸⁾	
NC 150 - Mooresville Crossing/Target to Williamson Rd (SR 1109)/Bluefield Rd (SR 1467)	31200	30000	28000	30500 ⁽²⁰¹⁸⁾	
NC 150 - East of Lowes Access/Food Lion Access	37200	40000 ⁽²⁰¹²⁾	36000	36000 ⁽²⁰¹⁸⁾	
NC 150 - East of Norman Station Blvd	35500	34000	33000 ⁽²⁰¹⁶⁾	33500	
NC 150 - West of Macleod Dr	35800	36000 ⁽²⁰¹²⁾	36000	38000 ⁽²⁰¹⁸⁾	
NC 16 Bypass - South of NC 150	16000	16000	22000	28000	
NC 16 Bypass - North of NC 150	9300	7400	9700	12000 ⁽²⁰¹⁷⁾	
E. Maiden Rd (SR 1855) - North of NC 150	2600	2300	2500	3100	
NC 16 Business - South of NC 150	9900	7900	8400	9800	TF BY AADT based upon BY counts and turning movements
NC 16 Business - North of NC 150	6000	4300	4800	4900	TF BY AADT based upon BY counts and turning movements
Grassy Creek Rd (SR 1853) - South of NC 150	1500	1500	1500	1600	
Mt. Pleasant Rd (SR 1849) - North of NC 150	3000	2800	2900	3300	
Little Mountain Rd (SR 1815) - North of NC 150	1700	1600	1600	1700	
Slanting Bridge Rd (SR 1844) - South of NC 150	7500	6600	6900	8800	
Sherrills Ford Rd (SR 1848) - South of NC 150	1200	1000	890	900	
Sherrills Ford Rd (SR 1848) - North of NC 150	5200	5300	5400	5100	
Greenwood Rd (SR 1840) - South of NC 150	700	680	770	800	
McCrary Rd - South of NC 150	1100	800 ⁽²⁰¹²⁾	850	n/a	
Perth Rd (SR 1303) - North of NC 150	10500	n/a	10000	12000	
Williamson Rd (SR 1109) - South of NC 150	18200	23000 ⁽²⁰¹²⁾	20000 ⁽²⁰¹⁶⁾	20000 ⁽²⁰¹⁸⁾	
Bluefield Rd (SR 1467) - North of NC 150	14000	11000	n/a	n/a	
I-77 - South of Exit 35 (Brawley School Rd)	69600	69000	70000	70000	
I-77 - Exit 35 (Brawley School Rd) to Exit 36 (NC 150)	62300	64000	62000	63000	
I-77 - Exit 36 (NC 150) to Exit 42 (US 21/NC 115)	58000	58000	56000	59000	
I-77 - North of Exit 42 (US 21/NC 115)	58500	59000	55000	58500	
Talbert Rd (SR 1116) - North of NC 150	7500	8600 ⁽²⁰¹²⁾	n/a	n/a	
Brawley School Rd (SR 1100) - West of I-77	27000	23000	n/a	26000 ⁽²⁰¹⁷⁾	

BY NB Comments/Conclusion

Overall, the balanced BY NB AADT estimate looks reasonable.

Travel Demand Model Information

TDM Area?	Yes				
Current TDM Name/Version	MRM19v1.0	BY:	2015	FY:	2045
TF TDM Name/Version	MRM14v1.0	BY:	2010/2015 ⁽¹⁾	FY:	2040

(1) Model was calibrated to 2010; however TF used 2015 interim model due to construction of NC 150/NC 16 Bypass and I-77/Brawley School Rd interchanges that opened between 2010 and 2015.

TDM Comments/Conclusion

The MRM19v1.0 and MRM14v1.0 FY loaded networks both show the project as a four-lane divided from NC 16 Bypass to Perth Road and six-lane divided from Perth Road to US 421. No substantial differences were found around the TF area between the MRM14v1.0 and MRM19v1.0 networks or the TAZ structure.

Growth Comparisons

TDM Growth Comparison	TF BYNB to FYB Growth			MRM19v1.0 BYNB to FYB Growth			MRM14v1.0		
	2015 TF NB AADT	2040 TF Build AADT	CAGR*	2015 TDM No Build Trips	2045 TDM Build Trips	CAGR	2015 No Build Trips	2040 Build Trips	CAGR
NC 150 - NC 16 Bypass to E. Maiden Rd (SR 1855)	11300	20900	2.5%	12600	19800	1.5%	10500	19400	2.5%
NC 150 - E. Maiden Rd (SR 1855) to NC 16 Business	13300	24500	2.5%	12600	19800	1.5%	10500	19400	2.5%
NC 150 - NC 16 Business to Grassy Creek Rd (SR 1853)	12600	22800	2.4%	15300	30200	2.3%	16200	28500	2.3%
NC 150 - Grassy Creek Rd (SR 1853) to Mt. Pleasant Rd (SR 1849)	13100	23800	2.4%	14500	29400	2.4%	14800	27100	2.4%
NC 150 - Little Mountain Rd (SR 1815) to Slanting Bridge Rd (SR 1844)	11000	22400	2.9%	13700	29800	2.6%	13800	28300	2.9%
NC 150 - Slanting Bridge Rd (SR 1844) to Sherrills Ford Rd (SR 1848)	14000	25800	2.5%	19700	36900	2.1%	19800	33200	2.1%
NC 150 - Sherrills Ford Rd (SR 1848) to Kiser Island Rd (SR 1841)/Marshall Steam Station	17800	32000	2.4%	18400	38700	2.5%	18500	36400	2.7%
NC 150 - East of Greenwood Rd (SR 1840)	17100	33100	2.7%	20600	42900	2.5%	21400	41800	2.7%
NC 150 - West of McCrary Rd/Robinson Rd	20900	37200	2.3%	27700	51000	2.1%	28200	50900	2.4%
NC 150 - Mooresville Crossing/Target to Williamson Rd (SR 1109)/Bluefield Rd (SR 1467)	31200	46800	1.6%	20700	46400	2.7%	15900	38900	3.6%
NC 150 - East of Lowes Access/Food Lion Access	37200	50800	1.3%	36100	46000	0.8%	35100	47600	1.2%
NC 150 - East of Norman Station Blvd	35500	48700	1.3%	27700	33000	0.6%	34400	47100	1.3%
NC 150 - West of Macleod Dr	35800	51900	1.5%	27500	37300	1.0%	25100	36400	1.5%
NC 16 Bypass - South of NC 150	16000	21900	1.3%	7600	13500	1.9%	14400	19700	1.3%
NC 16 Bypass - North of NC 150	9300	11000	0.7%	5300	10500	2.3%	12800	15300	0.7%
E. Maiden Rd (SR 1855) - North of NC 150	2600	4200	1.9%	<i>3900</i>	<i>8500</i>	2.6%	<i>10000</i>	<i>13800</i>	1.3%
NC 16 Business - South of NC 150	9900	14700	1.6%	3600	8100	2.7%	3900	5800	1.6%
NC 16 Business - North of NC 150	6000	9800	2.0%	3200	8200	3.2%	5500	9000	2.0%
Grassy Creek Rd (SR 1853) - South of NC 150	1500	2200	1.5%	<i>6800</i>	<i>9500</i>	1.1%	<i>10200</i>	<i>15400</i>	1.7%
Mt. Pleasant Rd (SR 1849) - North of NC 150	3000	4900	2.0%	<i>4500</i>	<i>5000</i>	0.4%	<i>4800</i>	<i>7800</i>	2.0%
Little Mountain Rd (SR 1815) - North of NC 150	1700	2700	1.9%	<i>5100</i>	<i>8700</i>	1.8%	<i>5200</i>	<i>8300</i>	1.9%
Slanting Bridge Rd (SR 1844) - South of NC 150	7500	8000	0.3%	<i>6800</i>	<i>9500</i>	1.1%	<i>7500</i>	<i>7500</i>	0.0%
Sherrills Ford Rd (SR 1848) - South of NC 150	1200	1900	1.9%	<i>5000</i>	<i>10300</i>	2.4%	<i>4500</i>	<i>7200</i>	1.9%
Sherrills Ford Rd (SR 1848) - North of NC 150	5200	7100	1.3%	7300	10400	1.2%	7300	10000	1.3%
Greenwood Rd (SR 1840) - South of NC 150	700	1100	1.8%	<i>5000</i>	<i>10300</i>	2.4%	<i>4500</i>	<i>7200</i>	1.9%
McCrary Rd - South of NC 150	1100	1600	1.5%	<i>7600</i>	<i>9100</i>	0.6%	<i>11700</i>	<i>16700</i>	1.4%
Perth Rd (SR 1303) - North of NC 150	10500	13300	1.0%	10600	12100	0.4%	10400	13700	1.1%
Williamson Rd (SR 1109) - South of NC 150	18200	33500	2.5%	16800	25100	1.3%	15800	29100	2.5%
Bluefield Rd (SR 1467) - North of NC 150	14000	16000	0.5%	20100	22500	0.4%	19200	21600	0.5%
I-77 - South of Exit 35 (Brawley School Rd)	69600	97100	1.3%	78500	104400	1.0%	78000	97700	0.9%
I-77 - Exit 35 (Brawley School Rd) to Exit 36 (NC 150)	62300	83300	1.2%	73500	96600	0.9%	72600	85800	0.7%
I-77 - Exit 36 (NC 150) to Exit 42 (US 21/NC 115)	58000	76000	1.1%	69500	92400	1.0%	68400	78300	0.5%
I-77 - North of Exit 42 (US 21/NC 115)	58500	75000	1.0%	69500	99100	1.2%	68400	89100	1.1%
Talbert Rd (SR 1116) - North of NC 150	7500	9000	0.7%	8300	8200	0.0%	10300	12300	0.7%
Brawley School Rd (SR 1100) - West of I-77	27000	27400	0.1%	29000	30700	0.2%	28000	28400	0.1%

Volumes shown in grey italics are for centroid connectors that roughly represent the roadway included in the forecast.

Comparison of AADT Projection between the TF and new TDM

Locations	2040 TF Build AADT	MRM19v1.0 2045 AADT Est. 1	MRM19v1.0 2045 AADT Est. 2	Substantial Difference?	Traffic Forecaster AADT Comments
NC 150 - NC 16 Bypass to E. Maiden Rd (SR 1855)	20900	17800	20700	No	
NC 150 - E. Maiden Rd (SR 1855) to NC 16 Business	24500	20900	22900	No	
NC 150 - NC 16 Business to Grassy Creek Rd (SR 1853)	22800	24900	24300	No	
NC 150 - Grassy Creek Rd (SR 1853) to Mt. Pleasant Rd (SR 1849)	23800	26600	25800	No	
NC 150 - Little Mountain Rd (SR 1815) to Slanting Bridge Rd (SR 1844)	22400	23900	20400	No	
NC 150 - Slanting Bridge Rd (SR 1844) to Sherrills Ford Rd (SR 1848)	25800	26200	25800	No	
NC 150 - Sherrills Ford Rd (SR 1848) to Kiser Island Rd (SR 1841)/Marshall Steam Station	32000	37400	36200	Higher	BY AADT based on counts was higher and growth rate is affected by centroid loading location. Not likely to be a major concern or affect design decisions.
NC 150 - East of Greenwood Rd (SR 1840)	33100	35600	34000	No	
NC 150 - West of McCrary Rd/Robinson Rd	37200	38500	37200	No	
NC 150 - Mooresville Crossing/Target to Williamson Rd (SR 1109)/Bluefield Rd (SR 1467)	46800	69900	62600	Higher	MRM growth rate is much higher due to centroid connector loading location and was reduced in the original forecast. This volume will be much lower than those shown and should not be a major concern.
NC 150 - East of Lowes Access/Food Lion Access	50800	47400	45300	No	
NC 150 - East of Norman Station Blvd	48700	42300	39000	Lower	MRM v19.1.0 shows lower growth rates on NC 150 east of I-77. The magnitude of change in volumes is not likely to affect design decisions.
NC 150 - West of Macleod Dr	51900	48600	50400	No	
NC 16 Bypass - South of NC 150	21900	28400	46100	Higher	The MRM v 19.1.0 shows higher growth rates on NC 16 Bypass and NC 16 Business but they have substantially lower volumes than in the MRM v14.1.0. Traffic on the Bypass has increased more rapidly than projected; however, the overall volume is well below capacity for a freeway facility. This location is at the edge of the project and the changes should not affect the design of the project.
NC 16 Bypass - North of NC 150	11000	18400	22600	Higher	
E. Maiden Rd (SR 1855) - North of NC 150	4200	5700	6100	No	
NC 16 Business - South of NC 150	14700	22300	19800	Higher	
NC 16 Business - North of NC 150	9800	15400	11100	Higher	
Grassy Creek Rd (SR 1853) - South of NC 150	2200	2100	2100	No	
Mt. Pleasant Rd (SR 1849) - North of NC 150	4900	3300	3600	Lower	This is a minor difference in volume on a low volume roadway and is not likely to affect design decisions.
Little Mountain Rd (SR 1815) - North of NC 150	2700	2900	2700	No	
Slanting Bridge Rd (SR 1844) - South of NC 150	8000	10500	11800	Higher	The MRM v19.1.0 shows higher growth, but the overall magnitude of the increase is relatively minor and is not likely to affect the design of the project
Sherrills Ford Rd (SR 1848) - South of NC 150	1900	2500	1700	No	
Sherrills Ford Rd (SR 1848) - North of NC 150	7100	7400	6900	No	
Greenwood Rd (SR 1840) - South of NC 150	1100	1400	1500	No	
McCrary Rd - South of NC 150	1600	1300	n/a	No	
Perth Rd (SR 1303) - North of NC 150	13300	12000	13500	No	
Williamson Rd (SR 1109) - South of NC 150	33500	27200	28900	Lower	MRM v19.1.0 shows lower growth rates on Williamson Rd. The magnitude of change in volumes is not likely to affect design decisions.
Bluefield Rd (SR 1467) - North of NC 150	16000	15700	n/a	No	
I-77 - South of Exit 35 (Brawley School Rd)	97100	92600	89600	No	
I-77 - Exit 35 (Brawley School Rd) to Exit 36 (NC 150)	83300	81900	79800	No	
I-77 - Exit 36 (NC 150) to Exit 42 (US 21/NC 115)	76000	77100	75500	No	
I-77 - North of Exit 42 (US 21/NC 115)	75000	83400	79600	No	
Talbert Rd (SR 1116) - North of NC 150	9000	7400	n/a	No	
Brawley School Rd (SR 1100) - West of I-77	27400	28600	28400	No	

2045 AADT Est. 1 includes utilizing the TF 2015 BY AADT and applying MRM v19.1.0 growth rates to determine 2045 FY B AADT

2045 AADT Est. 2 includes utilizing the 2019 (or growth adjusted volume from prior year) AADT count and applying the MRM v19.1.0 growth rates to determine 2045 FY B AADT

Growth Comparisons Comments/Conclusion*

The traffic forecast uses the diversion between the No Build and Build model runs to determine the FY Build volumes. Thus a direct comparison of BY NB to FY B growth rates is not fully compatible with acceptable traffic forecasting methodology.

It looks like a TF update for R-2307/I-5717 with the new MRM19v1.0 would likely result in very similar volumes in 2045.