



October 28th, 2021

Memorandum To: Dustin Demery
Structures Management Unit
North Carolina Department of Transportation

From: Tim Padgett, PE
Kimley-Horn and Associates, Inc.

Subject: Traffic Forecast for B-5775
Forsyth County
Replace bridge 330275 on Robinhood Road over NC 67

Please find attached the 2021/2045 traffic forecast for B-5775 in Forsyth County. The NCDOT Transportation Planning Division approved this forecast on October 21, 2021.

This forecast represents project No-Build and Build conditions. Replacing bridge 330275 is not expected to substantially affect travel demand along Robinhood Road. Robinhood Road is assumed to have four lanes of travel in 2045.

Certain assumptions were made in the development of the forecast:

Fiscal Constraint. Within the Metropolitan Planning Organization (MPO) area, future forecasts are based on projects included in the State Transportation Improvement Program (STIP) and the Financial Plan for the 2045 Winston Salem Metropolitan Planning Organization Metropolitan Transportation Plan (MTP). No other projects within the STIP and MTP affect travel demand on Robinhood Road within the area of bridge 330275.

Future Conditions and Development Activity. There is no substantial current development under construction or future planned development along Robinhood Road or within the vicinity of the bridge project.

Forecast Methodology. Base year 2021 estimates and Horizon Year 2045 forecasts provided in the attached forecast were developed using a method under which historic traffic data, Forsyth County population projections prepared by the State Demographers office, as well as 2017 and 2045 PTRM (v5.2) model output were considered.

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

If we can be of any further assistance please do not hesitate to contact me at 919-653-2991, or tim.padgett@kimley-horn.com

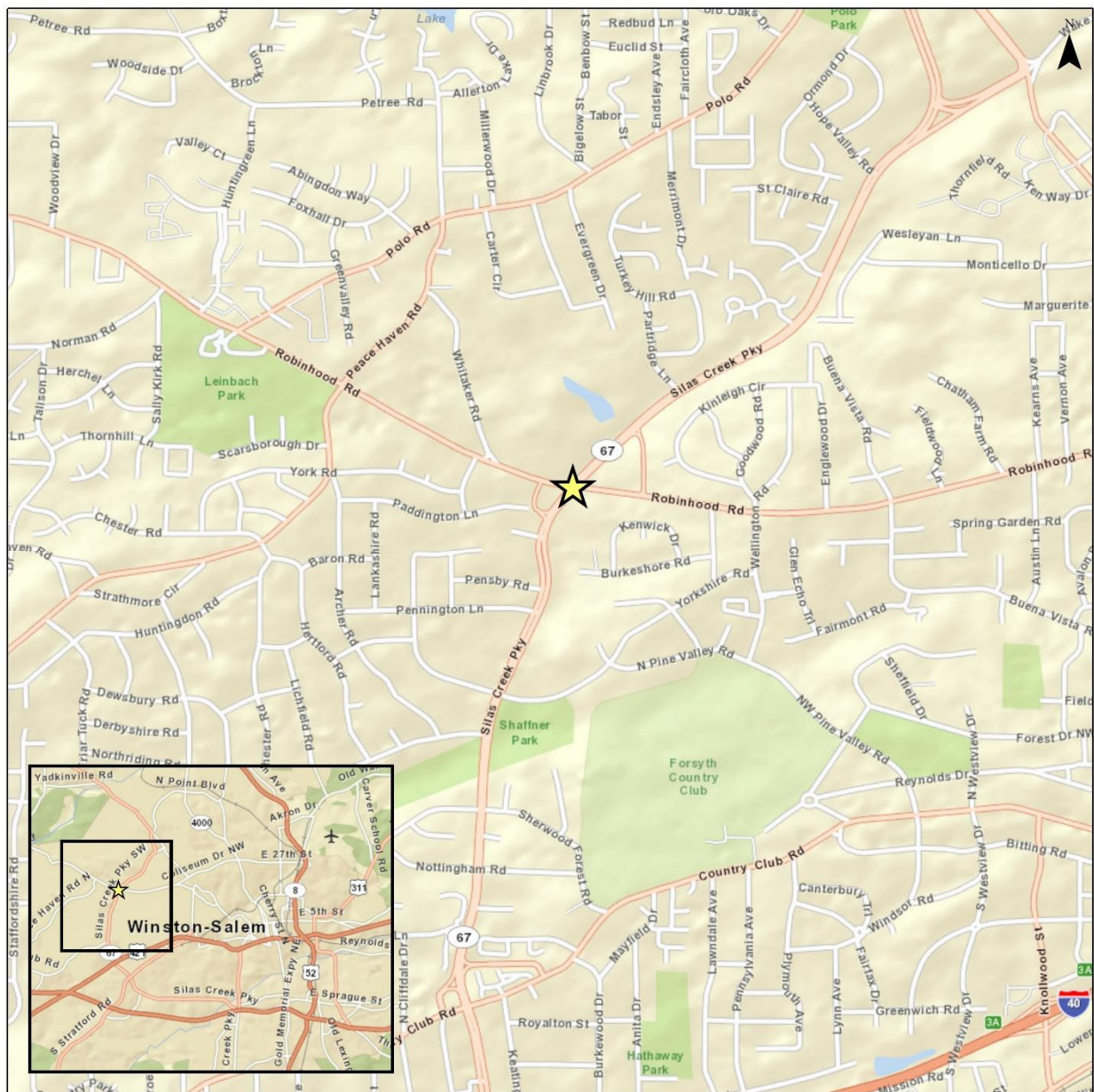
Cc: TrafficForecast@ncdot.gov

Project B-5775 Traffic Forecast

Forsyth County bridge 330275 replacement – Robinhood Road over NC 67

October 28, 2021

Year	Lanes Robinhood Road	AADT	D		K		Duals	TTSTs
			AM	PM	AM	PM		
2021	4	21,000	55% EB	55% WB	8%	9%	2%	1%
2045	4	25,100	55% EB	55% WB	8%	9%	2%	1%



Project Level Traffic Forecast Report
Replace Forsyth County bridge 330275 on Robinhood Road over
NC 67
October 28, 2021

STIP Project #	B-5775
Project description	Replace bridge no. 330275 over NC 67, Forsyth County
MPO or RPO	Winston Salem Metropolitan Planning Organization
Previous forecasts	None

1. Project Background

Related Forecasts: No related forecasts have been completed in the last five years.

Related Projects: There are no projects in the 2020-2029 STIP which would substantially affect traffic on Robinhood Road.

Route Information: Robinhood Road is functionally classified as a Major Collector and is not an NC Strategic Transportation Corridor. NC 67 is classified as a Freeway.

Contacts:

The following people were contacted for information during the development of this forecast:

- Fred Haith, Division 9 Planning Engineer, NCDOT
- Amy Crum, Winston-Salem Planning Department
- Daryl Vreeland, Winston-Salem MPO Coordinator, NCDOT

There were no known projects or developments that would impact B-5775.

Metropolitan Transportation Plan (MTP): The 2045 Winston Salem Metropolitan Planning Organization Metropolitan Transportation Plan (MTP) adopted January 2021 was reviewed for information relating to projects near B-5775. No projects were found that would influence travel demand along Robinhood Road.

Forsyth County Population Table

2010	2040	CAGR 2010-2040
350,638	445,036	0.80%

Piedmont Triad Regional Model (PTRM 5.2):

Robinhood Road is located within the Piedmont Triad Regional Model boundary.

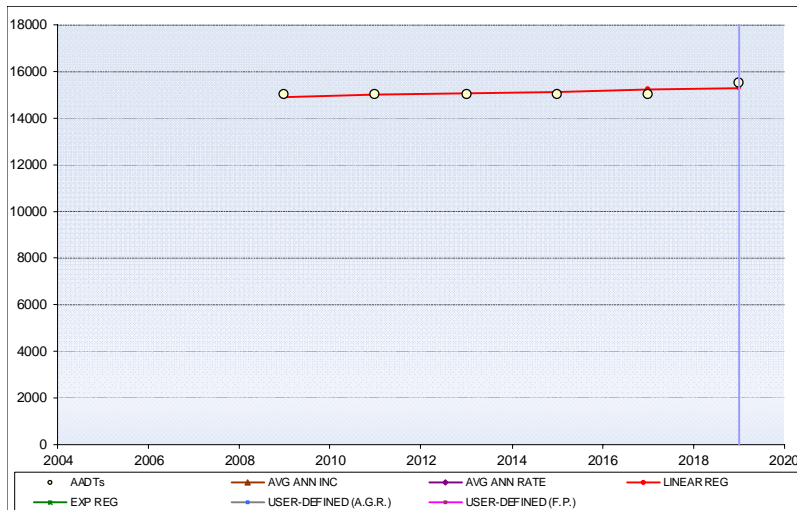
Model Volume Table

Location	BY 2017 Volume	FY 2045 Volume	CAGR 2017-2045
Robinhood Road at NC 67	9,207	11,659	0.85%

AADT coverage counts: Two stations on Robinhood Road (ID-340000935 and ID-340000936) were analyzed for this forecast and presented in the chart below. Station 340000935 is located approximately 1,100 feet east of BR-5775, just east of the northbound NC 67 ramps, while Station 340000936 is located approximately 500 feet west of BR-5775, just west of the southbound NC 67 ramps. The general trend shows close to zero growth at both stations. Both stations show very stable volumes from 2009 to 2019.

AADT TREND ANALYSIS

#0340000935 - ROBINHOOD RD E OF NC 67 SILAS CREEK PKWY



HISTORIC DATA		STATISTICAL RESULTS	
Year	AADT	LINEAR REG:	35.7
2009	15000	LINEAR %:	0.24%
2011	15000	EXPONENTIAL REG:	0.23%
2013	15000		
2015	15000		
2017	15000	R-SQUARED	
2019	15500	LINEAR:	0.4286
		EXPONENTIAL:	0.4286

NUMBER OF DATA POINTS:

6

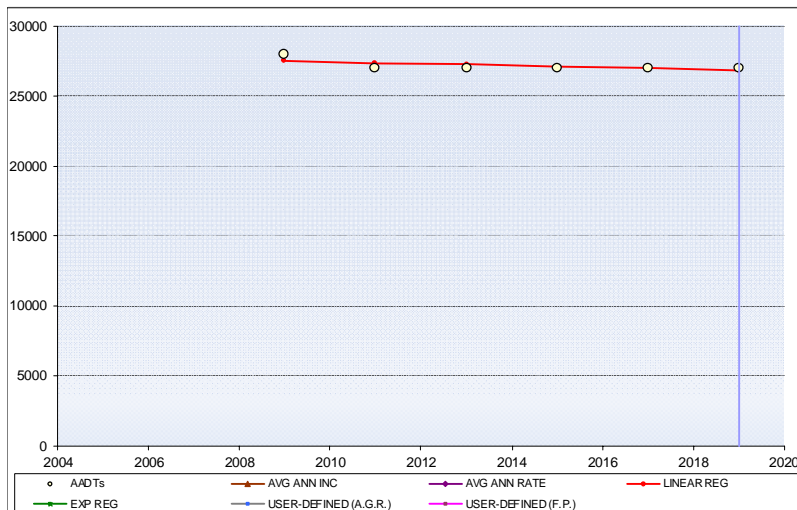
SHOW HISTORIC DATA:	SHOW FUTURE DATA:	SHOW STATION #:
<input checked="" type="checkbox"/> LINEAR REGRESSION	<input type="checkbox"/> LINEAR REGRESSION	0340000935 - ROBINHOOD RD E OF NC 67
<input type="checkbox"/> EXPONENTIAL REGRESSION	<input type="checkbox"/> EXPONENTIAL REGRESSION	FUT YRS: 2019
<input type="checkbox"/> HISTORIC DATA	<input type="checkbox"/> USER-DEFINED (FUT PROJ)	#1 2021
	<input type="checkbox"/> USER-DEFINED (A.G.R.)	#2 2025
		#3 2035
		#4 2040
		#5 2045

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION/ TRANSP. PLANNING BRANC

FUTURE PROJECTIONS:				
Avg Ann Inc	Avg Ann Rate	Linear Reg	Exp Reg	
15500	15500	15262	15260	
15600	15602	15333	15332	
15800	15808	15476	15476	
16300	16335	15833	15843	
16550	16605	16012	16029	
16800	16879	16190	16218	

AADT TREND ANALYSIS

#0340000936 - ROBINHOOD RD W OF NC 67 SILAS CREEK PKWY



HISTORIC DATA		STATISTICAL RESULTS	
Year	AADT	LINEAR REG:	-71.4
2009	28000	LINEAR %:	-0.26%
2011	27000	EXPONENTIAL REG:	-0.26%
2013	27000		
2015	27000		
2017	27000	R-SQUARED	
2019	27000	LINEAR:	0.4286
		EXPONENTIAL:	0.4286

NUMBER OF DATA POINTS:

6

SHOW HISTORIC DATA:	SHOW FUTURE DATA:	SHOW STATION #:
<input checked="" type="checkbox"/> LINEAR REGRESSION	<input type="checkbox"/> LINEAR REGRESSION	0340000936 - ROBINHOOD RD W OF NC 67
<input type="checkbox"/> EXPONENTIAL REGRESSION	<input type="checkbox"/> EXPONENTIAL REGRESSION	FUT YRS: 2019
<input type="checkbox"/> HISTORIC DATA	<input type="checkbox"/> USER-DEFINED (FUT PROJ)	#1 2021
	<input type="checkbox"/> USER-DEFINED (A.G.R.)	#2 2025
		#3 2035
		#4 2040
		#5 2045

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION/ TRANSP. PLANNING BRANC

FUTURE PROJECTIONS:				
Avg Ann Inc	Avg Ann Rate	Linear Reg	Exp Reg	
27000	27000	26810	26814	
26800	26804	26667	26675	
26400	26417	26381	26399	
25400	25474	25667	25722	
24900	25015	25310	25390	
24400	24564	24952	25062	

Turning Movement Count information: No nearby turning movement count information was available on Robinhood Road.

2. 2021 Estimate

Assumptions:

- No substantial development is presently under construction which affects base year traffic.
- Historic traffic counts provide a reasonable estimation of current traffic volume.

Methodology: Historic AADT information was grown to 2021 at each of the coverage count locations. B-5775 is located between these two count locations and between the NC 67/Robinhood Road NB/SB ramps which affect the actual volume crossing the bridge. To account for this, the western count location was used in conjunction with the ramp counts on the SB NC 67 ramps along with the eastern count location to estimate a 2021 volume for Robinhood Road at B-5775.

Determination of Base Year Design Factors: Design factors were estimated based on existing land use and facility type information, along with information from preliminary 2021 NCDOT AADT Count Station data for counts ID-340000935, and ID-340000936, including AADT and peak hour information provided in the tables below.

2021 AADT Determination

Location	Historic Data projected to 2021	2021 NCDOT AADT Count Sta (Prelim)	2021 AADT Estimate
Robinhood Road west of NC 67 SB ramps	26,800	25,500	25,500
Robinhood Road east of NC 67 NB ramps	15,600	12,800	15,000
Robinhood Road at B-5775	21,000	NA	21,000

Design Factors (in Percent)

Location	D – Directional Distribution			K – Peak Hour Factor		
	Source	AM Value	PM Value	Source	AM Value	PM Value
Robinhood Road west of NC 67 SB ramps	NA	NA	NA	2021 NCDOT Count Sta	7%	9%
Robinhood Road east of NC 67 NB ramps	NA	NA	NA	2021 NCDOT Count Sta	8%	9%
Robinhood Road at B-5775	Estimate	55% EB	55% WB	Estimate	8%	9%

Truck Factors (in Percent)

Location	Single Unit (dual)		Multi-Unit (ttst)	
	Source	Value	Source	Value
Robinhood Road at B-5775	Estimate	2%	Estimate	1%

3. 2045 Forecast

Assumptions:

- Land use and population: No substantial change to land use in the area served by Robinhood Road is anticipated before 2045.
- Fiscal constraint: All projects planned within the 2045 Winston-Salem MTP are anticipated to be open to traffic by 2045. None of the planned highway projects should significantly affect travel demand on Robinhood Road at this project.
- Model: The Piedmont Triad Regional Model (PTRM 5.2) shows 2017 (BY) and 2045 (FY) volumes on Robinhood Road at the project site. Assumptions about future development activity and changes in the distribution of population and employment in the forecast study area are implicit in the model.

Methodology: 2045 AADT was calculated by selecting an appropriate growth rate from historic trends, OSBM county population projections, and travel demand model growth on the project link.

Determination of Future Year Design Factors: 2021 design factors are used for 2045 since no substantial change in the function or character of traffic on Robinhood Road is expected.

Growth Rate Comparison and Determination of 2045 AADT

Location	2021 AADT Estimate	Population Growth 2010-2040 CAGR (%)	AADT Historic Growth CAGR (%)	Model Growth 2013-2040 CAGR (%)	Applied Growth CAGR (%)	2045 Forecast AADT
Robinhood Road at B-5775	21,000	0.8%	-0.3 – 0.3%	0.85%	0.75%	25,100

* range of growth from two AADT stations located east and west of the project