

# Traffic Forecast Report

## Division 10 Group 12

### Low Impact Bridge Replacements

*NCDOT Division 10 Bridges*

*Union, Cabarrus, Mecklenburg, and Stanly County, NC*

*WBS No: 17BP.10.R.136, 17BP.10.R.170, 17BP.10.R.171, 17BP.10.R.178,  
17BP.10.R.182, 17BP.10.R.187, 17BP.10.R.189*

**December 2019**

**PREPARED FOR:**

**NORTH CAROLINA DEPARTMENT OF TRANSPORTATION**

**PREPARED BY:**

**STV ENGINEERS, INC. (F-0991)  
900 WEST TRADE STREET, SUITE 715  
CHARLOTTE, NC 28202**





## Traffic Forecast Cover Letter

December 2019

TO: Garland Haywood, PE  
NCDOT Division 10 Bridge Program Manager

FROM: Trent Moody, PE  
STV Engineers, Inc.

SUBJECT: Division 10 Group 12 Low Impact Bridge Replacements,  
Union/Cabarrus/Mecklenburg/Stanly County

***The NCDOT Transportation Planning Division approves the forecasts for 17BP Division 10 Group 12 for delivery as of November 21, 2019.***

Please find attached the 2019/2045 Traffic Forecasts for Division 10 Group 12 Low Impact Bridge Replacements. These projects are located in Union, Cabarrus, Mecklenburg, and Stanly County, NC. Under this project, NCDOT proposes to replace seven bridges in NCDOT Division 10 as listed below:

- R.136 (Union County Bridge 362): SR 1009 (N. Charlotte Avenue) south of SR 1245 (I B Shive Drive), Crossing Bearskin Creek
- R.170 (Cabarrus County Bridge 210): SR 1006 (Mt. Pleasant Road S) north of US 601, Crossing Bost Creek
- R.171 (Mecklenburg County Bridge 109): SR 2138 (McCoy Road) north of Julian Clark Avenue, Crossing Torrence Creek
- R.178 (Mecklenburg County Bridge 60): SR 2822 (Robinson Church Road) west of Atlas Cedar Drive, Crossing Reedy Creek
- R. 182 (Cabarrus County Bridge 141): SR 1114 (Garmon Mill Road) west of Pine Bluff Road, Crossing Rocky River
- R.187 (Mecklenburg County Bridge 361): SR 2373 (Bellhaven Boulevard) north of Cameron Spring Road, Crossing Long Creek
- R.189 (Stanly County Bridge 208): SR 1001 (Love Mill Road) south of Tite Road, Crossing Rocky River

Included in the traffic forecast is the analysis for two scenarios:

- 2019 Base Year No-Build (BY NB)
- 2045 Future Year No-Build/Build (FY NB/B)

The following individuals were consulted during the development of this forecast:

- Tony Tagliaferri, PE - Division Traffic Engineer, NCDOT Division 10
- Marc Morgan, PE - District 1 Engineer (Cabarrus and Stanly), NCDOT Division 10
- Wendy A Taylor, PE - District 2 Engineer (Mecklenburg), NCDOT Division 10
- Lee Ainsworth, III, PE - District 3 Engineer (Anson and Union), NCDOT Division 10



- Stephen Trott, PE - Director of Engineering, Town of Huntersville
- Anna H. Gallup, PE - Manager, Regional Travel Modeling and Analysis Section, Charlotte DOT
- Keith Dixon, NCDOT Transportation Planning Division

Certain assumptions were made in the development of the forecast:

Fiscal Constraint: These bridge projects are a mix of being located inside and outside of an MPO area. For the forecasts outside of an MPO area, they are fiscally constrained to the 2020-2029 State Transportation Improvement Plan (STIP). Projects inside of an MPO area are fiscally constrained by their respective MTPs. Bridges in Mecklenburg and Union County fall within the Charlotte Regional TPO (CRTPO) and bridges within Cabarrus County fall within the Cabarrus-Rowan MPO (CRMPO). Projects that are anticipated to directly affect the proposed projects and are assumed to be complete and open to traffic by 2045, are listed below:

- U-6031: SR 1009 (Charlotte Avenue) from Seymour Street to NC 200, widen to four lanes divided (In vicinity of Union County Bridge 362)
- U-4024: US 601 from existing US 74 to Monroe Bypass, widen to multi-lanes (In vicinity of Union County Bridge 362)
- U-5723: US 74 at US 601 interchange improvements (In vicinity of Union County Bridge 362)
- U-5771: US 21 from SR 2136 (Gilead Road) to Holly Point Drive, widen to multi-lanes (In vicinity of Mecklenburg County Bridge 109)
- I-5714: I-77 at SR 2136 (Gilead Road) update existing interchange (In vicinity of Mecklenburg County Bridge 109)
- U-5807: SR 2136 (Gilead Road) from US 21 to NC 115, widen to multi-lanes (In vicinity of Mecklenburg County Bridge 109)
- U-5114: US 21 at SR 2136 (Gilead Road) intersection improvements (In vicinity of Mecklenburg County Bridge 109)
- U-6106: SR 2136 (Gilead Road) from SR 2120 (McCoy Road) to Wynfield Creek Parkway, widen to 4-lanes divided (In vicinity of Mecklenburg County Bridge 109)
- I-5973: I-485 at NC 16 interchange improvements (In vicinity of Mecklenburg County Bridge 361)
- U-6084: NC 16 (Brookshire Boulevard) at SR 2004 (Mt. Holly-Huntersville Road) intersection improvements (In vicinity of Mecklenburg County Bridge 361)

Development Activity: There are no current approved developments within the forecast area that are expected to have an impact on traffic volumes.

Travel Demand Model: Metrolina Regional Model 18 v1.1 was utilized as a tool in the development of the forecast. The model base and horizon years are 2015 and 2045, respectively.

Forecast Methodology: The 2019 BY NB traffic volumes and design factors were developed based upon 48 hour classification count, 13-hour turning movement count, historic AADT trend projections and the Metrolina Regional Model. The 2045 FY NB/B traffic volumes include the development of compound annual growth rates (CAGRs) utilizing the growth rates between the model base and horizon years. 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 2019 and 2045, 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.

cc (with Attachments):

Keith Dixon, Transportation Planning Division

Andy Bailey, Western Piedmont TPD Group Supervisor

Reuben Crummy, Cabarrus-Rowan MPO and Rocky River RPO TPD Contact

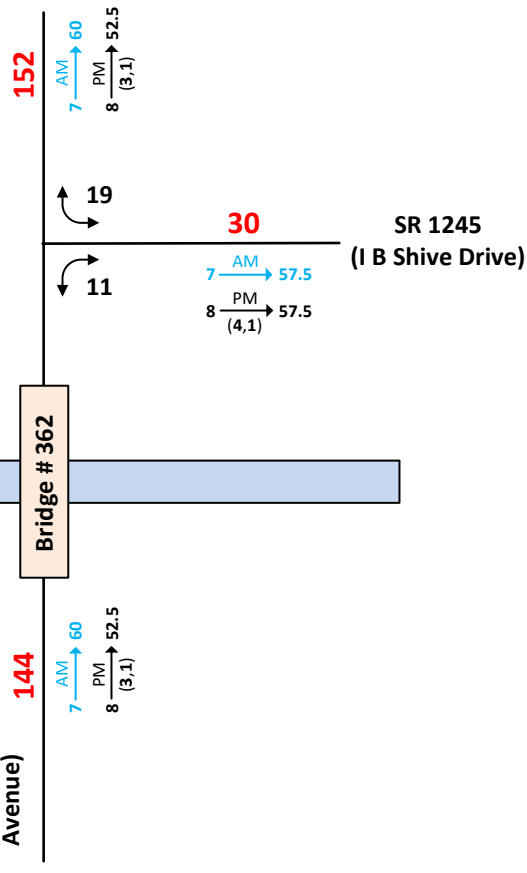
Stuart Basham, PE, NCDOT Division 10 Highway Planning Engineer

James Dunlop, PE, Congestion Management Section

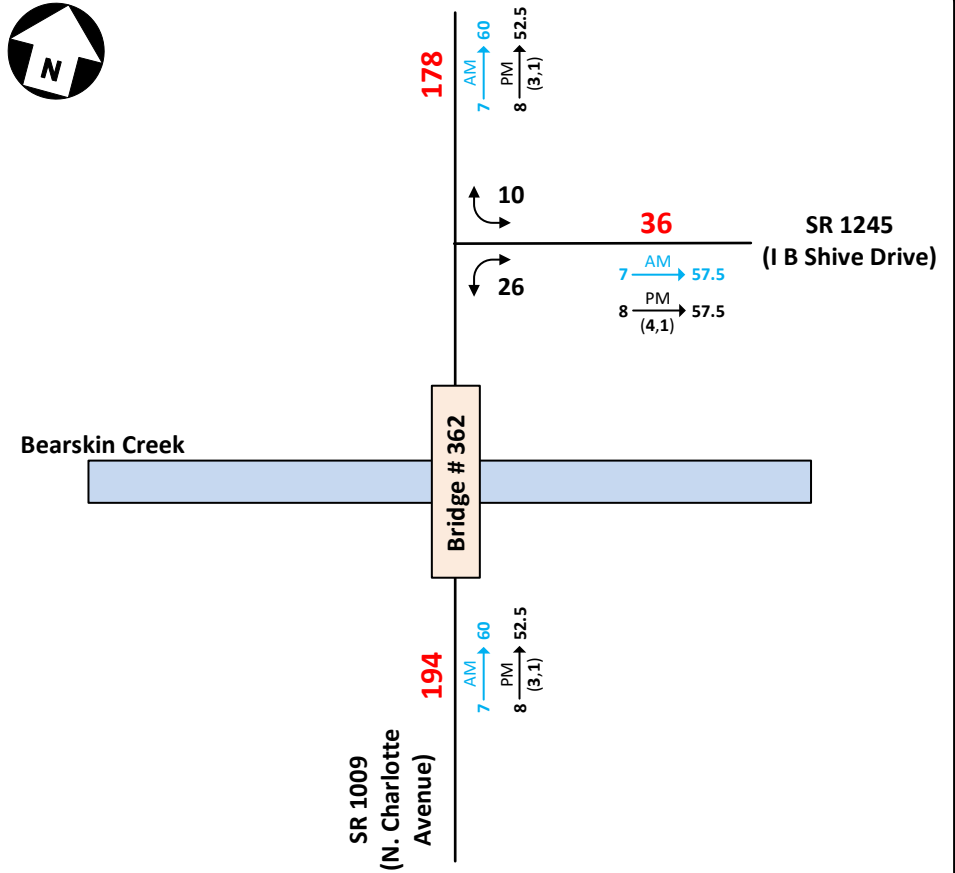
Clark Morrison, PhD, PE, Pavement Management

NCDOT Roadway Design

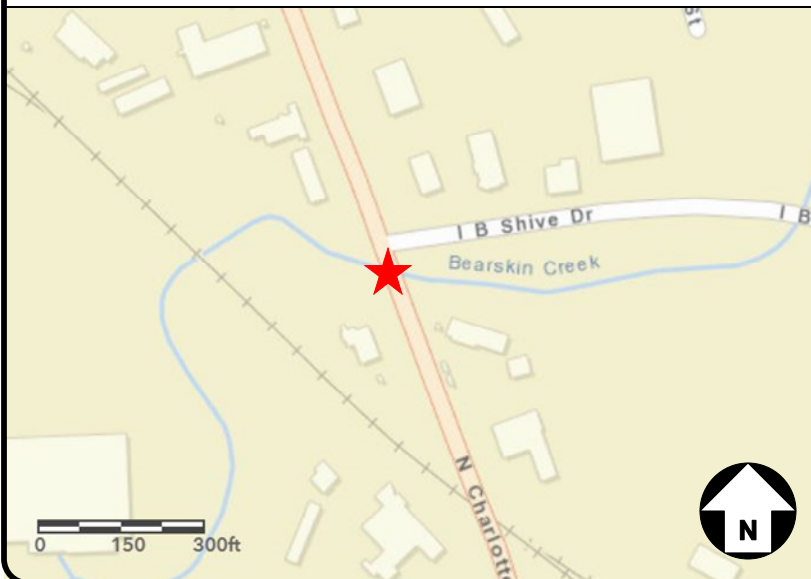
File Copy: Division 10 Group 12 Low Impact Bridge Replacements Union/Cabarrus/Mecklenburg/Stanly County



2019 Base Year No Build



2045 Future Year No Build/Build



2019/2045

AVERAGE ANNUAL DAILY TRAFFIC

SHEET 1 OF 1

LEGEND

- $K \xrightarrow{\text{AM/PM}} D$   
(d, t)
- ### No. of Vehicles Per Day (VPD) in 100s
- 1- Less than 50 VPD
- X Movement Prohibited
- Roadway
- K Design Hour Factor (%)
- AM/PM PM Peak Period
- D Peak Hour Directional Split
- Indicates Direction of D
- (d,t) Duals, TT-STs (%)
- ★ Bridge Location

Division 10 Group 12 Low Impact Bridge Replacements

WBS: 17BP.10.R.136

COUNTY: Union

DIVISION: 10

DATE: December 2019

PREPARED BY: STV Engineers, Inc.

LOCATION: N. Charlotte Avenue South of I B Shive Drive

PROJECT: Replace Union County Bridge 362



Bost Creek

SR 1006  
(Mt. Pleasant  
Road S)

17  
62.5 ← AM 10  
PM → 65  
10 (14,4)

Bridge # 210

17  
62.5 ← AM 10  
PM → 65  
10 (14,4)

2019 Base Year No Build



Bost Creek

SR 1006  
(Mt. Pleasant  
Road S)

42  
62.5 ← AM 10  
PM → 65  
10 (14,4)

Bridge # 210

42  
62.5 ← AM 10  
PM → 65  
10 (14,4)

2045 Future Year No Build/Build



### 2019/2045

AVERAGE ANNUAL DAILY TRAFFIC

### SHEET 1 OF 1

#### LEGEND

- ### No. of Vehicles Per Day (VPD) in 100s
- 1- Less than 50 VPD
- X Movement Prohibited
- Roadway
- K Design Hour Factor (%)
- AM/PM PM Peak Period
- D Peak Hour Directional Split
- Indicates Direction of D
- (d,t) Duals, TT-STs (%)
- ★ Bridge Location

Division 10 Group 12 Low Impact  
Bridge Replacements

WBS: 17BP.10.R.170

COUNTY: Cabarrus

DIVISION: 10

DATE: December 2019

PREPARED BY: STV Engineers, Inc.

LOCATION: Mt. Pleasant Road North of  
US 601

PROJECT: Replace Cabarrus County  
Bridge 210



Torrence Creek

112

7 AM → 55  
9 PM → 52.5  
(5,1)

Bridge # 109

112

7 AM → 55  
9 PM → 52.5  
(5,1)

SR 2138  
(McCoy Road)

2019 Base Year No Build



Torrence Creek

128

7 AM → 55  
9 PM → 52.5  
(5,1)

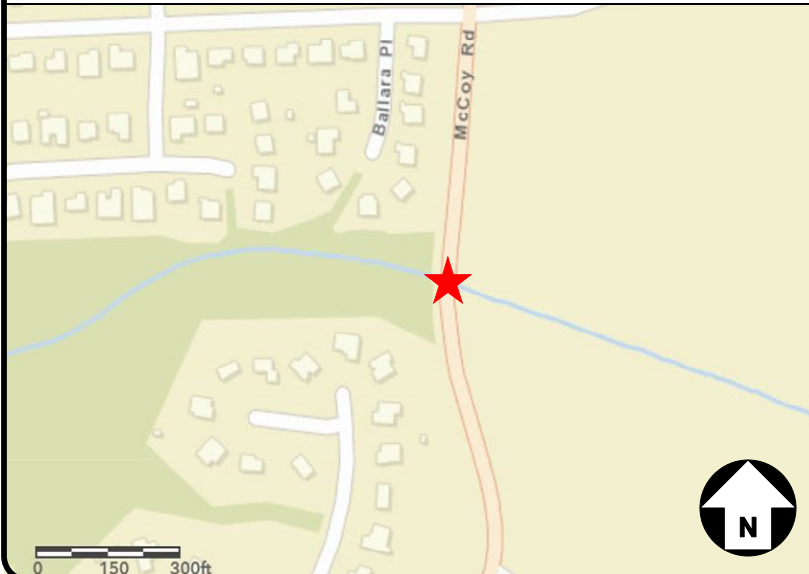
Bridge # 109

128

7 AM → 55  
9 PM → 52.5  
(5,1)

SR 2138  
(McCoy Road)

2045 Future Year No Build/Build



2019/2045

AVERAGE ANNUAL DAILY TRAFFIC

SHEET 1 OF 1

### LEGEND

- $K \xrightarrow{\text{AM/PM}} D$   
(d, t)
- ### No. of Vehicles Per Day (VPD) in 100s
- 1- Less than 50 VPD
- X Movement Prohibited
- Roadway
- K Design Hour Factor (%)
- AM/PM PM Peak Period
- D Peak Hour Directional Split
- Indicates Direction of D
- (d,t) Duals, TT-STs (%)
- ★ Bridge Location

Division 10 Group 12 Low Impact Bridge Replacements

WBS: 17BP.10.R.171

COUNTY: Mecklenburg

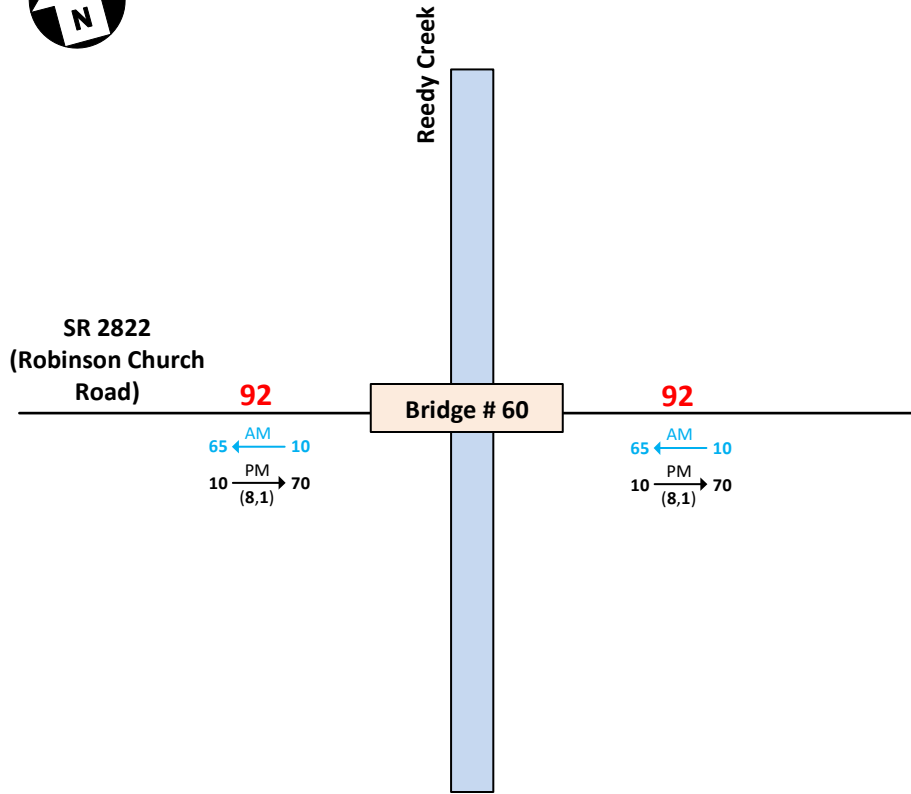
DIVISION: 10

DATE: December 2019

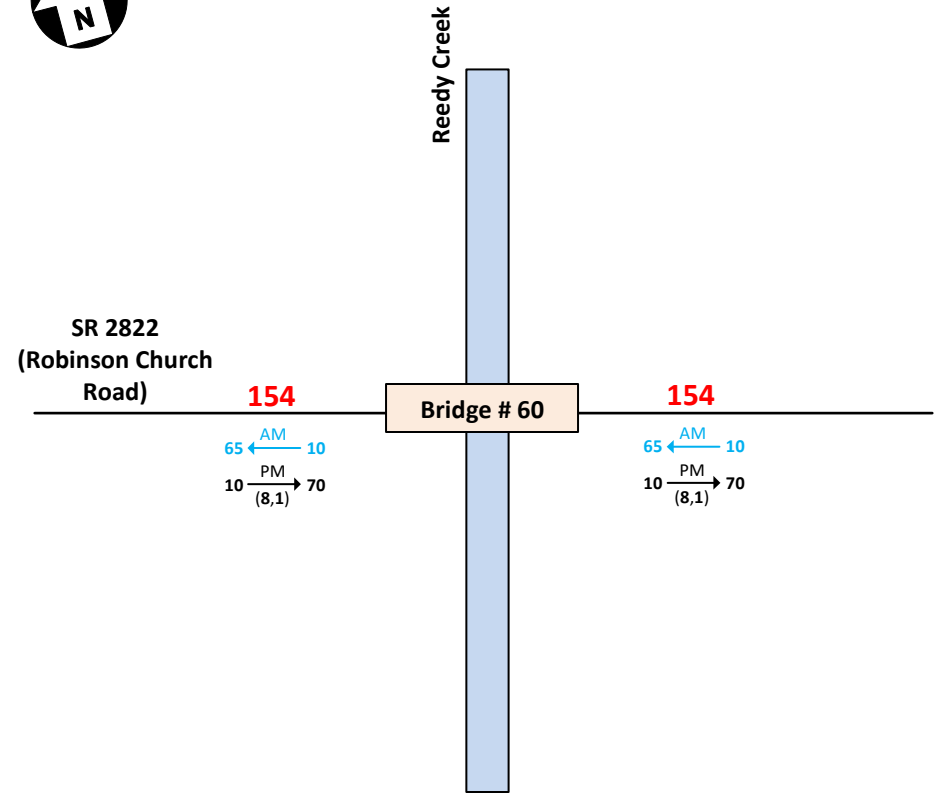
PREPARED BY: STV Engineers, Inc.

LOCATION: McCoy Road North of Julian Clark Avenue

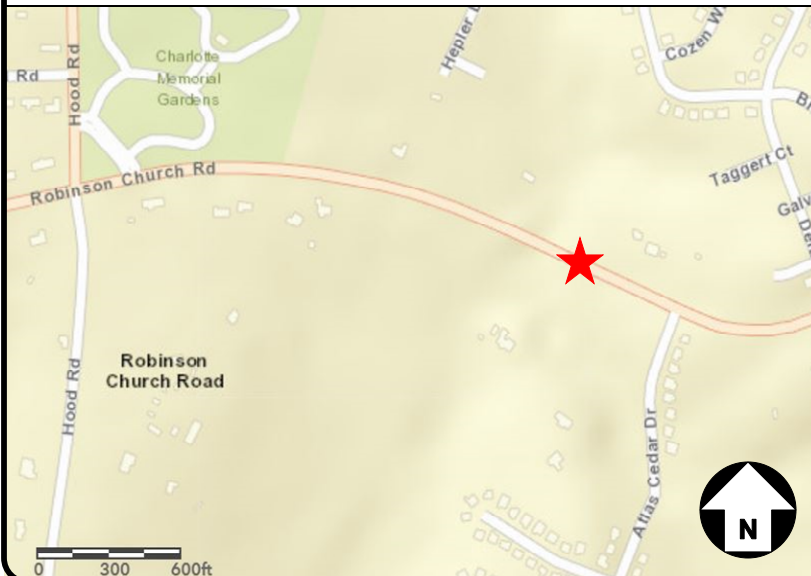
PROJECT: Replace Mecklenburg County Bridge 109



2019 Base Year No Build



2045 Future Year No Build/Build



2019/2045

AVERAGE ANNUAL DAILY TRAFFIC

SHEET 1 OF 1

LEGEND

- ### No. of Vehicles Per Day (VPD) in 100s
- 1- Less than 50 VPD
- X Movement Prohibited
- Roadway
- K Design Hour Factor (%)
- AM/PM PM Peak Period
- D Peak Hour Directional Split
- Indicates Direction of D
- (d,t) Duals, TT-STs (%)
- ★ Bridge Location

Division 10 Group 12 Low Impact Bridge Replacements

WBS: 17BP.10.R.178

COUNTY: Mecklenburg

DIVISION: 10

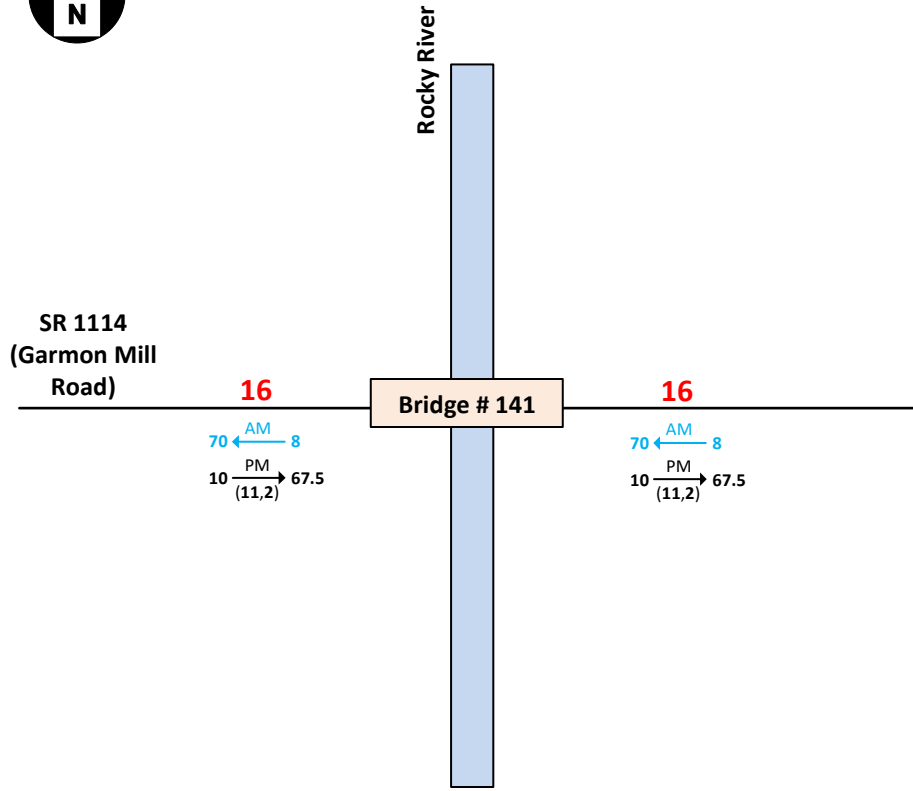
DATE: December 2019

PREPARED BY: STV Engineers, Inc.

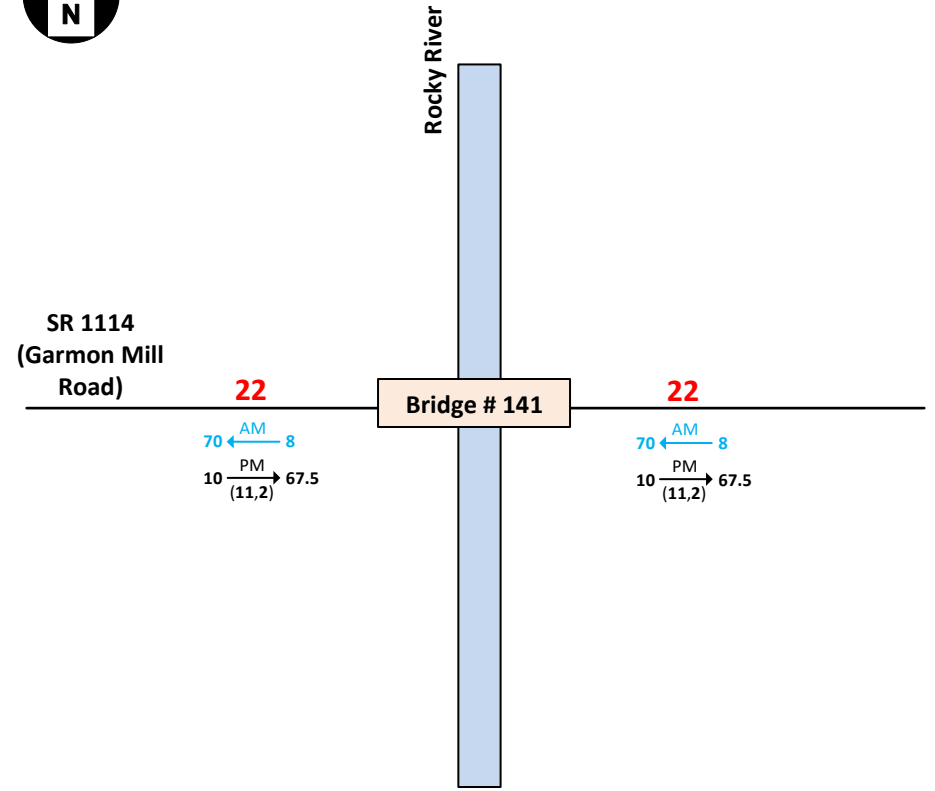
LOCATION: Robinson Church Road West of Atlas Cedar Drive

PROJECT: Replace Mecklenburg County Bridge 60





2019 Base Year No Build



2045 Future Year No Build/Build



2019/2045

AVERAGE ANNUAL DAILY TRAFFIC

SHEET 1 OF 1

LEGEND

- $K \xrightarrow{\text{AM/PM}} D$   
(d, t)
- ### No. of Vehicles Per Day (VPD) in 100s
- 1- Less than 50 VPD
- X Movement Prohibited
- Roadway
- K Design Hour Factor (%)
- AM/PM PM Peak Period
- D Peak Hour Directional Split
- $\rightarrow$  Indicates Direction of D
- (d,t) Duals, TT-STs (%)
- ★ Bridge Location

Division 10 Group 12 Low Impact Bridge Replacements

WBS: 17BP.10.R.182

COUNTY: Cabarrus

DIVISION: 10

DATE: December 2019

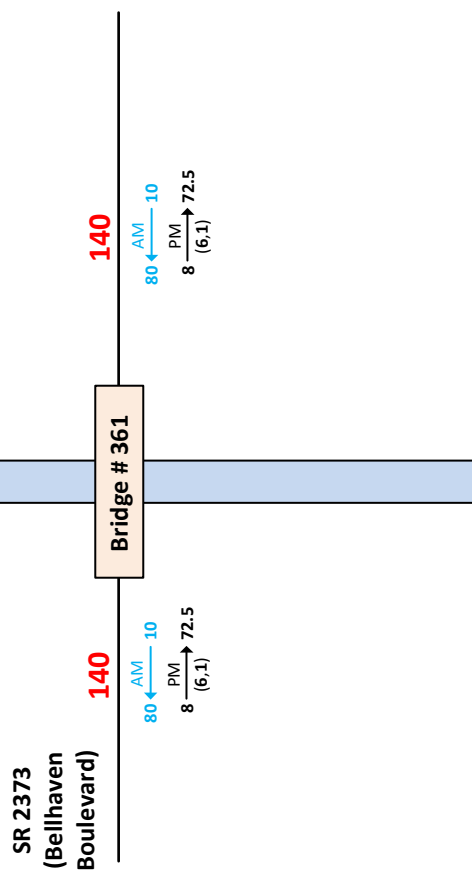
PREPARED BY: STV Engineers, Inc.

LOCATION: Garmon Mill Road West of Pine Bluff Road

PROJECT: Replace Cabarrus County Bridge 141



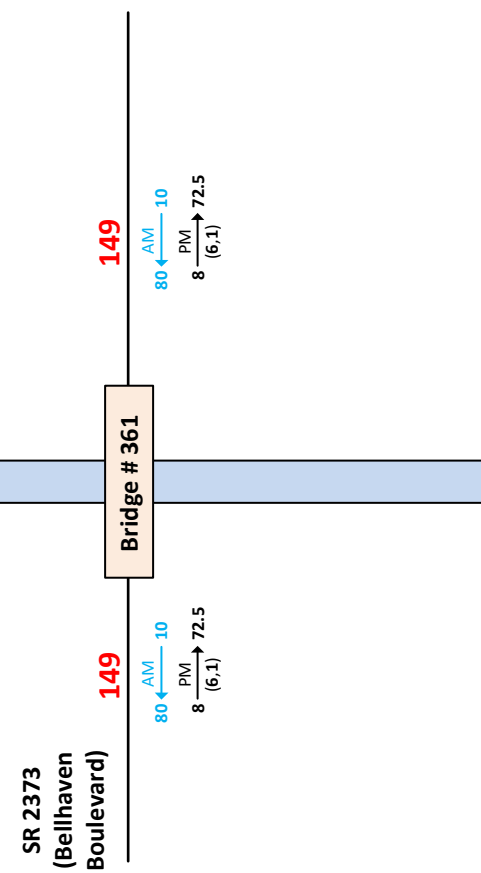
Long Creek



2019 Base Year No Build



Long Creek



2045 Future Year No Build/Build



2019/2045

AVERAGE ANNUAL DAILY TRAFFIC

SHEET 1 OF 1

### LEGEND

- $K \frac{AM/PM}{(d,t)} \rightarrow D$
- ### No. of Vehicles Per Day (VPD) in 100s
- 1- Less than 50 VPD
- X Movement Prohibited
- Roadway
- K Design Hour Factor (%)
- AM/PM PM Peak Period
- D Peak Hour Directional Split
- Indicates Direction of D
- (d,t) Duals, TT-STs (%)
- ★ Bridge Location

Division 10 Group 12 Low Impact  
Bridge Replacements

WBS: 17BP.10.R.187

COUNTY: Mecklenburg

DIVISION: 10

DATE: December 2019

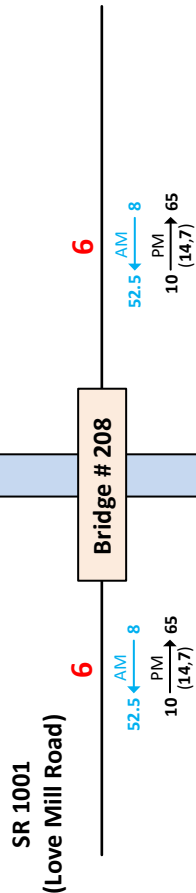
PREPARED BY: STV Engineers, Inc.

LOCATION: Bellhaven Boulevard North  
of Cameron Spring Road

PROJECT: Replace Mecklenburg County  
Bridge 361



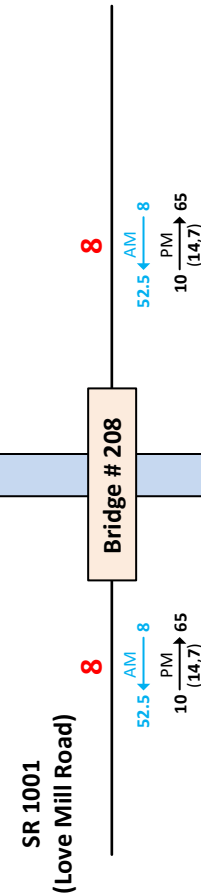
Rocky River



2019 Base Year No Build



Rocky River



2045 Future Year No Build/Build



2019/2045

AVERAGE ANNUAL DAILY TRAFFIC

SHEET 1 OF 1

### LEGEND

- ### No. of Vehicles Per Day (VPD) in 100s
- 1- Less than 50 VPD
- X Movement Prohibited
- Roadway
- K Design Hour Factor (%)
- AM/PM PM Peak Period
- D Peak Hour Directional Split
- Indicates Direction of D
- (d,t) Duals, TT-STs (%)
- ★ Bridge Location

Division 10 Group 12 Low Impact Bridge Replacements

WBS: 17BP.10.R.189

COUNTY: Stanly

DIVISION: 10

DATE: December 2019

PREPARED BY: STV Engineers, Inc.

LOCATION: Love Mill Road South of Tite Road

PROJECT: Replace Stanly County Bridge 208