LONG FERRY ROAD
CORRIDOR STUDY

ROWAN COUNTY

PROJECT NO.: 30901876
DATE: JUNE 2023

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Adopted by the
Rowan County Commission
on December 4, 2023

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EXECUTIVE SUMMARY

INTRODUCTION

WSP was contracted to perform a corridor plan for future development scenarios along Long Ferry Road from US 29 (Salisbury Avenue) in Spencer, NC to Leonard Rd in Rowan County. The Long Ferry Road corridor is an important east-west transportation corridor connecting Spencer, I-85, and recreational opportunities while consisting primarily of residential, highway corridor commercial and industrial uses, and agricultural land uses. This report summarizes the analysis methodology, assumptions, and findings from the land use development, traffic analysis, roadway concepts, and policy review to support decision making on future infrastructure and transportation network needs.

The objective of this corridor study is to evaluate increases in vehicular and truck traffic and access to several prospective non-residential properties. The corridor plan along this 2.8 mile section of Long Ferry Road will help determine transportation mitigation improvements to support existing conditions, future development, and the overall street network.

This study endeavors to:

— Identify ways to increase traffic safety, mobility, and comfort,
— Identify potential traffic problems, and explore cost-effective solutions,
— Explore traffic calming solutions,
— Identify solutions for accommodating increased truck traffic,
— Provide a recommended cross section(s) that fosters economic development, and
— Develop land use policies to preserve the integrity of the corridor.

STUDY AREA

Based on discussions with Rowan County, the following intersections are included in the study area:

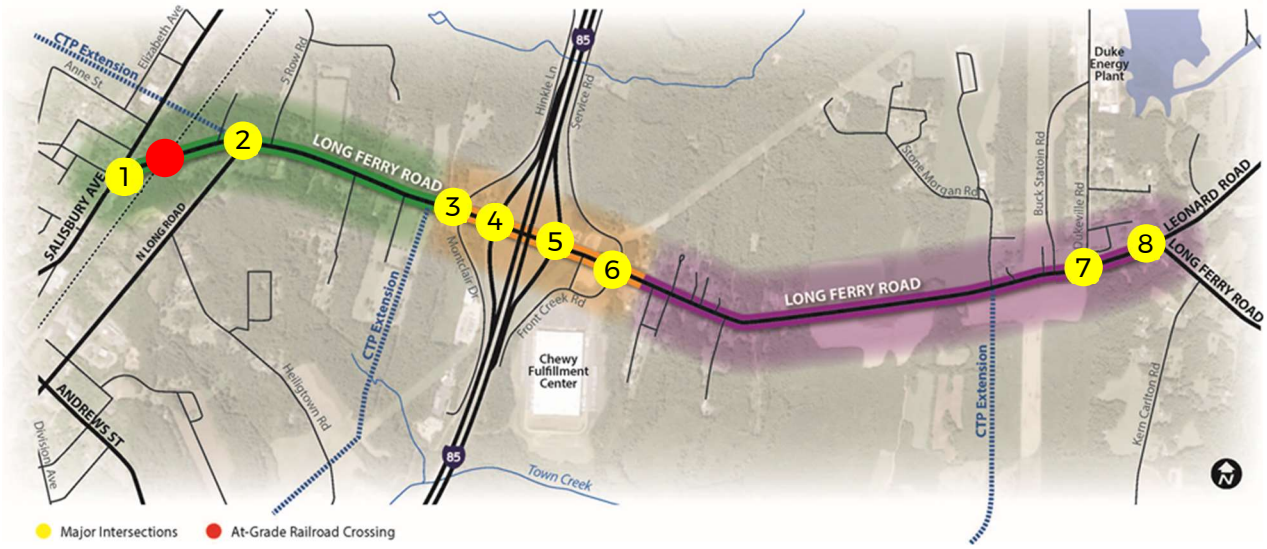
1 Long Ferry Road (SR 2120) / Charles Street & US 29 (Salisbury Avenue)
2 Long Ferry Road (SR 2120) & Long Street (SR 2100)
3 Long Ferry Road (SR 2120) & Hinkle Lane / Montclair Drive
4 Long Ferry Road (SR 2120) & I-85 Southbound Ramps
5 Long Ferry Road (SR 2120) & I-85 Northbound Ramps
6 Long Ferry Road (SR 2120) & Willow Creek Drive / Front Creek Road
7 Long Ferry Road (SR 2120) & Dukeville Road (SR 2175)
8 Long Ferry Road (SR 2120) & Leonard Road (SR 2168)

All study intersections are currently stop-controlled.

The study corridor is the roadway between the first and last study intersection, along Long Ferry Road from US 29 (Salisbury Avenue) to Leonard Road. The study area map is shown in **Figure ES-1.** There are three distinct segments shown on the study area map:

— West of I-85: From US 29 (Salisbury Avenue) to Hinkle Lane / Montclair Drive (Town of Spencer) – shown in green
— I-85 Interchange Area: From Hinkle Lane / Montclair Drive to Willow Creek Drive / Front Creek Road – shown in orange
— East of I-85: From Willow Creek Drive / Front Creek Road to Leonard Road (Rowan County) – shown in purple

Figure ES-1: Study Area Map

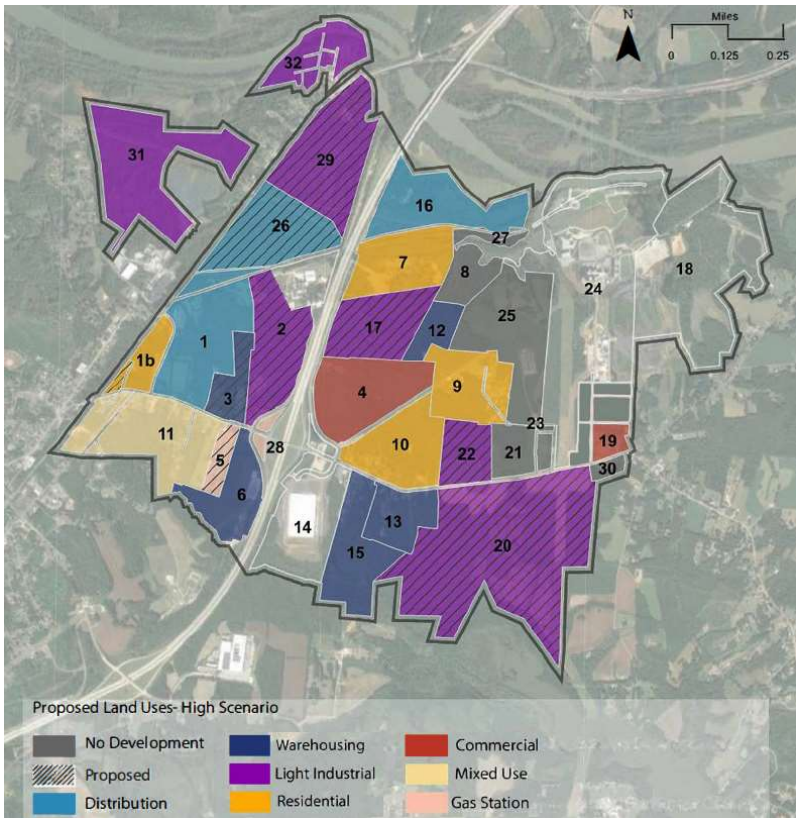


VOLUME DEVELOPMENT

This study was designed to study the impacts of future development scenarios on the Long Ferry Road corridor. To get a more complete picture of the potential development in the area around the corridor, Rowan County and the Town of Spencer combined individual parcels into 32 parcel groups based on proximity, similarity, and development potential. Two estimates of future land uses were provided for each parcel group, which provided a low and high estimate for trip traffic generation. These estimates represented the market build out potential for the land along the Long Ferry Road corridor. These low and high trip generation land uses were then used to prepare an estimate of the daily trips and the trips in both AM and PM peak hours for each parcel group using the ITE Trip Generation Manual. For sites which already have a specific proposed development, the low and high trip generation both match the proposed usage. To develop the 2030 Build traffic volumes, the High-End Development scenario trip generation was used, because studying higher trip values would produce more conservative roadway improvement recommendations. This trip volume was combined with existing counts with background growth of 0.5% to 2030. The resulting volumes were used for analysis. A map which shows the proposed High-End land uses for each parcel group is shown in **Figure ES-2**.

The estimates of the AM and PM peak hour traffic does not include either pass-by or internal capture because not enough detailed information from proposed development plans were available. The resulting volume estimates for the parcel groups along the corridor are conservatively high, which allows the corridor study to provide recommendations for the corridor development which can handle the High-End land uses for all sites.

Figure ES-2: High-End Land Use Scenario Map



SEGMENT CAPACITY ANALYSIS

The capacity analysis for the roadway segments in the study area was performed by calculating the daily volume-to-capacity (V/C) ratios for each segment. V/C ratios provide a reference for how utilized a roadway is, with lower values representing a lower roadway utilizations and higher values representing higher roadway utilization.

Volumes used for this analysis were daily volumes, using the NCDOT 2021 AADT as the base and adding background growth and site trips on top. Capacities for the existing roadway network were based on the CRMPO CTP existing capacity estimates. For the recommended future cross sections, the capacity values used were from the NCDOT Transportation Planning Branch's "Level of Service D Standards for Systems Level Planning".

For the Build and Build with Mitigation scenarios, existing traffic volumes were grown to 2030 and combined with site trips. The Build scenario uses existing cross sections along the corridor, while the Build with Mitigation scenario applied improvements intended to improve corridor operations, safety, and mobility. These improvements included widening the roadway from 2-lanes to 4-lanes from the parcel group 3 area to the parcel group 20 & 22 area.

Based on V/C ratio analysis for the 2030 Build scenario, most of the Long Ferry Road corridor is expected to be at or over capacity. The lowest V/C ratio along the corridor is seen east of Dukeville Road, while rest of the corridor shows volumes over the LOS D capacity threshold.

Based on V/C ratio analysis for the 2030 Build with Mitigation scenario, the V/C ratios along Long Ferry Road corridor are expected to vary. Between US 29 (Salisbury Avenue) and the area of Parcel Group 3, volumes may be higher than capacity for an LOS D due to the constraints of the at-grade railroad crossing preventing roadway widening and the slower speeds within the town limits. At the interchange, volumes are the highest and are

above the capacity for LOS D. The lowest V/C ratios along the corridor are seen between Parcel Group 3 and Hinkle Lane / Montclair Drive and east of Dukeville Road.

Figure ES-3 displays the 2030 Build scenario V/C ratio analysis results and **Figure ES-4** displays the 2030 Build with Mitigation scenario V/C ratio analysis results.

Figure ES-3: 2030 Build Volume-to-Capacity Ratio Map

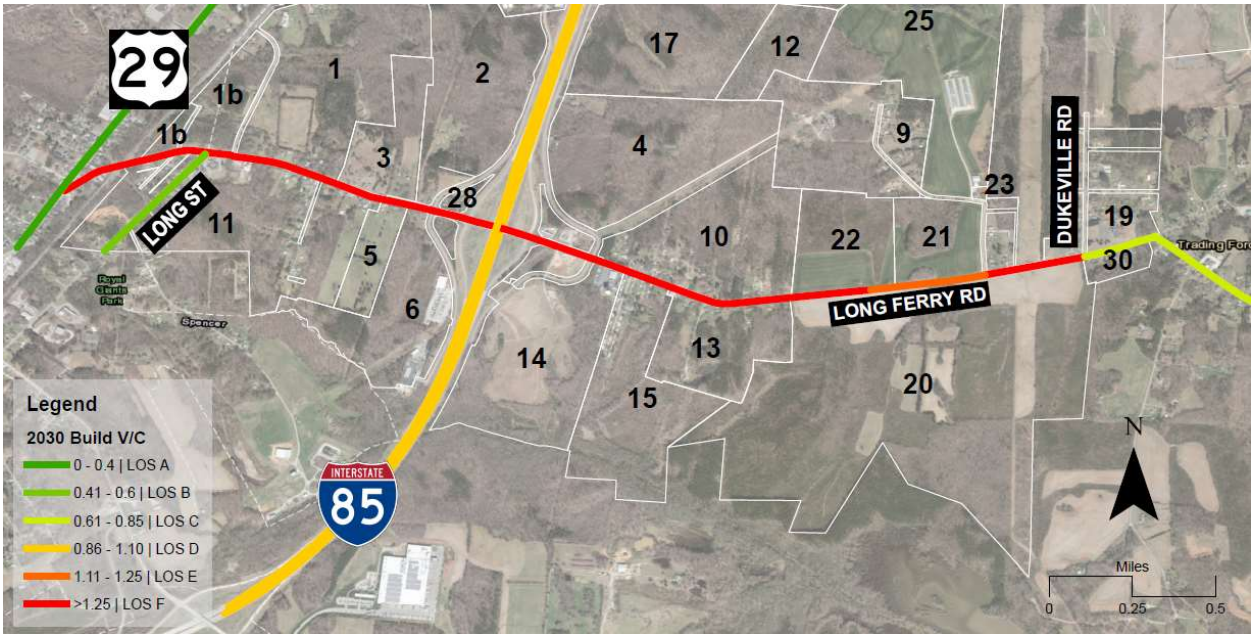


Figure ES-4: 2030 Build with Mitigation Volume-to-Capacity Ratio Map

CROSS-SECTION IMPROVEMENTS

Six types of street sections are recommended to guide the improvement of the Long Ferry Road corridor. These cross-sections are not intended to be prescriptive but rather provide the minimum design standards in accordance with NCDOT design criteria while providing flexibility in access management, roadway capacity, and with future development to meet the transportation, mobility and safety needs along the corridor. All cross-section recommendations are appropriate to use with the existing speed limits along the corridor. These recommendations also consider and are consistent with the CRMPO CTP plans for the long-term vision of the corridor. **Table ES-1** and **Figure ES-5** show an overview of the proposed cross-sections and their locations along the corridor.

To accommodate the increase in truck traffic along the corridor, these cross sections generally include some combination of lane-width increase, shoulder-width increase, or capacity increase. These improvements, combined with access management strategies, which can be more easily implemented in divided cross-sections, should help limit the negative impact that the increase in truck traffic will have on the capacity of the roadway corridor.

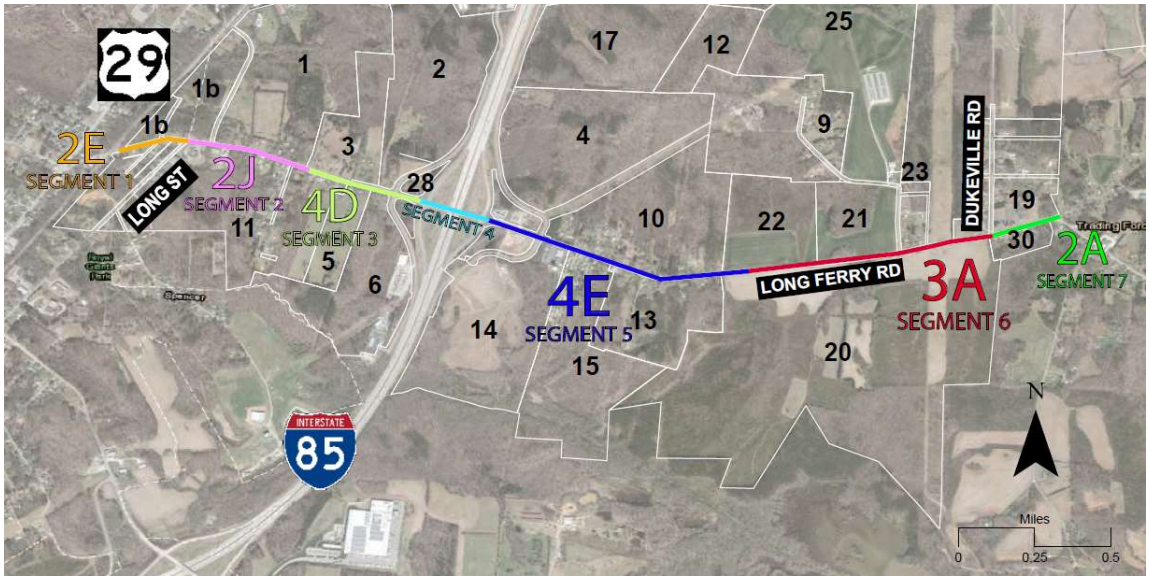
Bicycle and pedestrian accommodations are included west of I-85 for consistency based on town limits and existing land uses.

Concept layouts illustrating all corridor improvements are included in **Appendix ES-A**.

Table ES-1: Cross-Section Improvements Summary

ROADWAY SEGMENT	TYPICAL SECTION ID	RIGHT-OF-WAY WIDTH	TYPICAL SECTION
Segment 1: Long Ferry Road from US 29 (Salisbury Avenue) to Long Street	2E	60’	2 Lane Undivided with Curb & Gutter, Bike Lanes, and Sidewalks
Segment 2: Long Ferry Road from Long Street to Parcel Group 3 Area	2J	90’	2 Lane Divided with Curb & Gutter, Bike Lanes, and Sidewalks
Segment 3: Long Ferry Road from Parcel Group 3 Area to I-85 Southbound Ramps	4D	110’	4 Lane Divided with Curb & Gutter, Bike Lanes, and Sidewalk
Segment 4: Long Ferry Road from I-85 Southbound Ramps to I-85 Northbound Ramps	-	-	6-Lane Bridge with Curb & Gutter and Sidewalk
Segment 5: Long Ferry Road from I-85 Northbound Ramps to Parcel Group 20 & 22 Area	4E	110’	4 Lane Divided with Paved Shoulders
Segment 6: Long Ferry Road from Parcel Group 20 & 22 Area to Dukeville Road	3A	80’	2 Lane with Two Way Left Turn Lane and Paved Shoulders
Segment 7: Long Ferry Road from Dukeville Road to Leonard Road	2A	60’	2 Lane Undivided with Paved Shoulders

Figure ES-5: Recommended Corridor Cross-Sections



INTERSECTION IMPROVEMENTS

Capacity analysis for the intersections in the study area was performed for the AM and PM peak hours. The proposed intersection improvements are intended to complement the cross-section recommendations to enhance intersection operations.

Signal control is suggested for installation at the following intersections:

- Long Ferry Road / Charles Street & US 29 (Salisbury Avenue)
- Long Ferry Road & Long Street
- Long Ferry Road & Hinkle Lane / Montclair Drive
- Long Ferry Road & I-85 Southbound Ramps
- Long Ferry Road & I-85 Northbound Ramps
- Long Ferry Road & Willow Creek Drive / Front Creek Road

Long Ferry Road & I-85 Southbound Ramps, Long Ferry Road & I-85 Northbound Ramps, and Long Ferry Road & Willow Creek Drive / Front Creek Road were also recommended for signalization in the RedRock industrial development TIA. An additional signal was recommended at one of the new RedRock industrial access roads.

Cross streets Hinkle Lane and Montclair Drive should be realigned 200 feet to the west to improve access spacing from the intersection with I-85 southbound ramps and to allow room for appropriate turn lanes at both intersections. This relocation is planned based on the proposed local developments.

Intersections are designed to accommodate heavy vehicle turning paths to mitigate the impact of increased truck traffic. Additional turn lanes are also recommended to accommodate heavy turning movements and improve intersection operations.

The potential US 29 (Salisbury Avenue) road diet was generally considered in these recommendations, but the US 29 (Salisbury Avenue) & Long Ferry Road intersection operations and geometry at should be re-evaluated with road diet implementation.

Concept layouts illustrating all intersection improvements are included in **Appendix ES-A**.

PLANNING-LEVEL COST ESTIMATE OF IMPROVEMENTS

Planning-level cost estimates were developed for the recommended roadway improvements using the latest NCDOT P6.0 cost estimates. For planning purposes, these values were increased by 20% to adjust for inflation from 2019 to 2023. The total corridor cost estimate is shown in **Table ES-2**, and a summary by the three corridor Segments A, B and C is shown in **Table ES-3**. Cost will vary over time and the final cost to implement could be substantially more than shown based on construction and material prices at the time of construction.

Table ES-2: Corridor Construction Cost Estimate

COST ESTIMATE AND INPUTS	UNITS
Long Ferry Corridor Length (Miles)	2.8
Proposed Cross-Section Cost	$ 12,343,939
Proposed Cross-Section Cost (Cross Streets)	$ 3,731,061
Proposed Cross-Section Cost (8 additional ramp lanes)	$ 2,000,000
Total Cross-Section Costs	$ 18,075,000
Total Cross-Section Costs (2019 to 2023 Adjustment)	20%
Proposed 2023 Cross-Section Cost	**$ 21,690,000**
Construction - Level Terrain	$ -
Construction - Misc. & Mob. - Structures	$ 5,422,500
Construction - Misc. & Mob. - Roadway	$ 11,929,500
Construction - Misc. & Mob. - Intersection	$ 8,676,000
Construction - Eng. & Constr.	$ 3,253,500
Construction - Project Bridge Length Offset, Widen	$ 2,397,000
Construction - Area Type, Suburban	$ -
Right-of-Way - Parcel, Partial/No Access Control	$ 10,845,000
Utilities - Percentage Of Right Of Way	$ 3,253,500
Construction - ROW - Utilities	**$ 45,777,000**
TOTAL COST ESTIMATE	**$ 67,467,000**

Table ES-3: Corridor Construction Cost Estimate by Segment

SEGMENT A - COST ESTIMATE LONG FERRY ROAD WEST OF I-85 (US 29 TO REALIGNED HINKLE / MONTCLAIR)	UNITS
Proposed 2023 Cross-Section Cost	$ 3,959,091
Construction - ROW - Utilities	$ 7,918,182
Total Cost Estimate	**$ 11,878,000**
SEGMENT B - COST ESTIMATE LONG FERRY ROAD / I-85 INTERCHANGE IMPROVEMENTS (REALIGNED HINKLE / MONTCLAIR TO WILLOW CREEK / FRONT CREEK)	**UNITS**
Proposed 2023 Cross-Section Cost	$ 8,195,455
Construction - ROW - Utilities	$ 18,787,909
Total Cost Estimate	**$ 26,984,000**
SEGMENT C - COST ESTIMATE LONG FERRY ROAD EAST OF I-85 (WILLOW CREEK / FRONT CREEK TO LEONARD)	**UNITS**
Proposed 2023 Cross-Section Cost	$ 9,535,455
Construction - ROW - Utilities	$ 19,070,909
Total Cost Estimate	**$ 28,607,000**

POLICY RECOMMENDATIONS

Various policies are recommended for implementation along the corridor to aid in the management of traffic and right-of-way as development occurs. A summary of these policies is shown in **Table ES-4.**

INCREASED SETBACKS ALONG MAJOR THOROUGHFARES

Require that development occurring along major thoroughfares that have a planned future cross-section that requires right-of-way greater than what is existing along the thoroughfare to institute larger setbacks than those required in the base zoning district to accommodate future additional right-of-way needs.

TRAFFIC IMPACTS ANALYSIS

The local jurisdictions should adopt language that would allow them to request a Preliminary TIA when lower thresholds are met that would provide an idea of what local impacts can occur from the proposed development. Measuring traffic impacts will also be essential to determining what share of the responsibility the developer should reasonably possess for the transportation infrastructure when property is improved. Specific thresholds for traffic generation should be established that would trigger a TIA. Instituting this standard will create clear expectations for new development.

RIGHT-OF-WAY DEDICATION AND IMPROVEMENTS

As the Long Ferry corridor becomes more active with large scale developments, construction of infrastructure improvements and facilitation of new rights-of-way will be essential to ensuring that future improvements can be installed in a cost-effective and practical manner. The applicable jurisdiction should require developers to contribute to these improvements through:

— Reservation or dedication of any additional rights-of-way

— Installation of on- or off-site improvements related to the development's potential impacts

Typically, these improvements have been previously identified in an approved transportation plan from the city, state or MPO. Other on- or off-site improvements specified in a Traffic Impact Analysis can be included as a potential mitigation for the development's impacts either as constructed by the developer or provided in a payment-in-lieu of construction.

OPTION FOR PAYMENT-IN-LIEU OF IMPROVEMENTS

Construction of improvements are not always feasible at the time of property development. This recommendation provides an alternative to construction of the improvements at the time of development and allows the local jurisdiction to recoup a share of the costs.

CROSS-ACCESS, STUB STREETS AND ACCESS MANAGEMENT

Proposed developments should install cross-access roads and/or driveways to accommodate circulation between adjacent parcels. The roads and/or driveways should direct vehicular traffic to consolidated intersections thereby reducing excess curb cuts onto Long Ferry Road and other thoroughfares.

Cross-access can be accomplished through the use of stub streets and/or driveways that will connect a development to the future development of an adjacent property. Where a development is approved adjacent to a site that has a stub street or driveway constructed, the development shall connect into all available stub streets or driveways to create cross access.

Table ES-4: Existing Code Review and Recommendations

	EXISTING CODE		RECOMMENDATIONS
	ROWAN COUNTY	SPENCER, NC	
Traffic Impact Assessment (TIA)	Sec 21-52 (13) (TIA) as requested by Zoning Administrator as site plan requirement	No requirements found	— Preliminary TIA for development with specific thresholds based on potential for significant impacts. — Reviewed by third party consultants chosen by jurisdiction for on-call and verified by staff, or prequalify consultants eligible to perform the TIA
Required ROW reservation	Observation of ROW is required but not dedication	No requirements found	— ROW to be reserved for future road widenings during development review if future improvements have been incorporated into a plan by a city/county/state planning entity. — Where infrastructure upgrade is identified in plans (i.e., sidewalks, road widening, drainage), payment in lieu of construction could be considered.
Cross-access between adjoining parcels	No requirements found	No requirements found	— Property owners must coordinate with local jurisdiction to determine adequate location of shared access for adjacent properties. Where cross access is preserved, developers shall connect sites to existing and/or proposed cross access stub streets and driveways. This should be combined with an effort to reduce the number of curb cuts onto major streets.

CONCLUSION

The Long Ferry Road corridor is an important east-west transportation corridor connecting Spencer, I-85, and recreational opportunities. This corridor consists primarily of residential, highway corridor commercial and industrial uses, and agricultural land uses. This 2.8 mile section of Long Ferry Road has three distinct segments that include west of I-85 in the Town of Spencer, the I-85 interchange area, and east of I-85 in Rowan County. This corridor study evaluated land use development scenarios, associated increases in vehicular and truck traffic, and projected traffic operations in 2030. This evaluation resulted in the development of corridor strategies, transportation mitigations, and policy recommendations in support of the overall study goals.

Corridor improvement strategies generally consist of access management, safety treatments, and capacity enhancements to improve mobility, maintain safety, and provide efficient operations while supporting economic development.

Access management strategies include relocating the Hinkle Lane and Montclair Drive intersection to improve access spacing, consolidating driveways as parcels develop, providing dedicated turn lanes, installing median treatments along sections of the corridor, and preserving right-of-way for future widening along Long Ferry Road.

Safety treatments have the flexibility to be implemented as lower cost, near term treatments or incorporated into higher cost, long term projects. Potential safety treatments along Long Ferry Road include new traffic signals at five (5) locations when warranted, raised medians, dedicated turn lanes, pedestrian and bicycle accommodations west of I-85, grade separation of the existing railroad crossing, roadway lighting, speed limit changes, and interchange reconfiguration. Related to the potentially hazardous location between Barrier Lane and Stoner Morgan Road based on the number of run-off-road crashes, treatments may include lane departure countermeasures, roadside improvements, alignment and superelevation changes, and signing delineation enhancements.

Capacity improvements along the corridor help promote mobility, maintain safety, and provide efficient operations for all users while accommodating the projected increase in truck traffic associated with industrial and commercial development. Roadway improvements include widening the existing two-lane corridor to meet projected daily and peak hour volume demands. This includes transitioning between various cross-sections to match the desired character for the three distinct corridor segments. Intersection improvements include signal control, when warranted and approved by NCDOT, signal timing, turn lanes, and design accommodations. Interchange improvements include upgrading the existing diamond interchange capacity or further evaluating the feasibility of other interchange forms to provide additional capacity, such as a diverging diamond interchange (DDI) or single point interchange.

When applied appropriately, policy changes will help preserve and implement the overall vision for this corridor. Policy recommendations include increased setbacks, traffic impact assessment thresholds, right-of-way reservation requirements, option for payment-in-lieu of improvements, and cross-access connections. Implementation of these policies along the corridor will also aid in the management of traffic and right-of-way as development occurs.

The findings, recommendations, concept designs and cost estimates prepared in this report can support decision making for future land use, infrastructure and transportation network decisions along the Long Ferry Road corridor to foster economic development while preserving the integrity of the corridor.

APPENDIX

APPENDIX ES-A

CONCEPT LAYOUTS

NAD 83/ NSRS 2007

HINKLE LANE

I-85 SB OFF RAMP

I-85 SB

I-85 NB

I-85 NB ON RAMP

WILLOW CREEK DRIVE

LONG FERRY ROAD

TRUCK STOP SITE

MONTCLAIR DRIVE

I-85 SBON RAMP

I-85 NB OFF RAMP

LONG FERRY ROAD

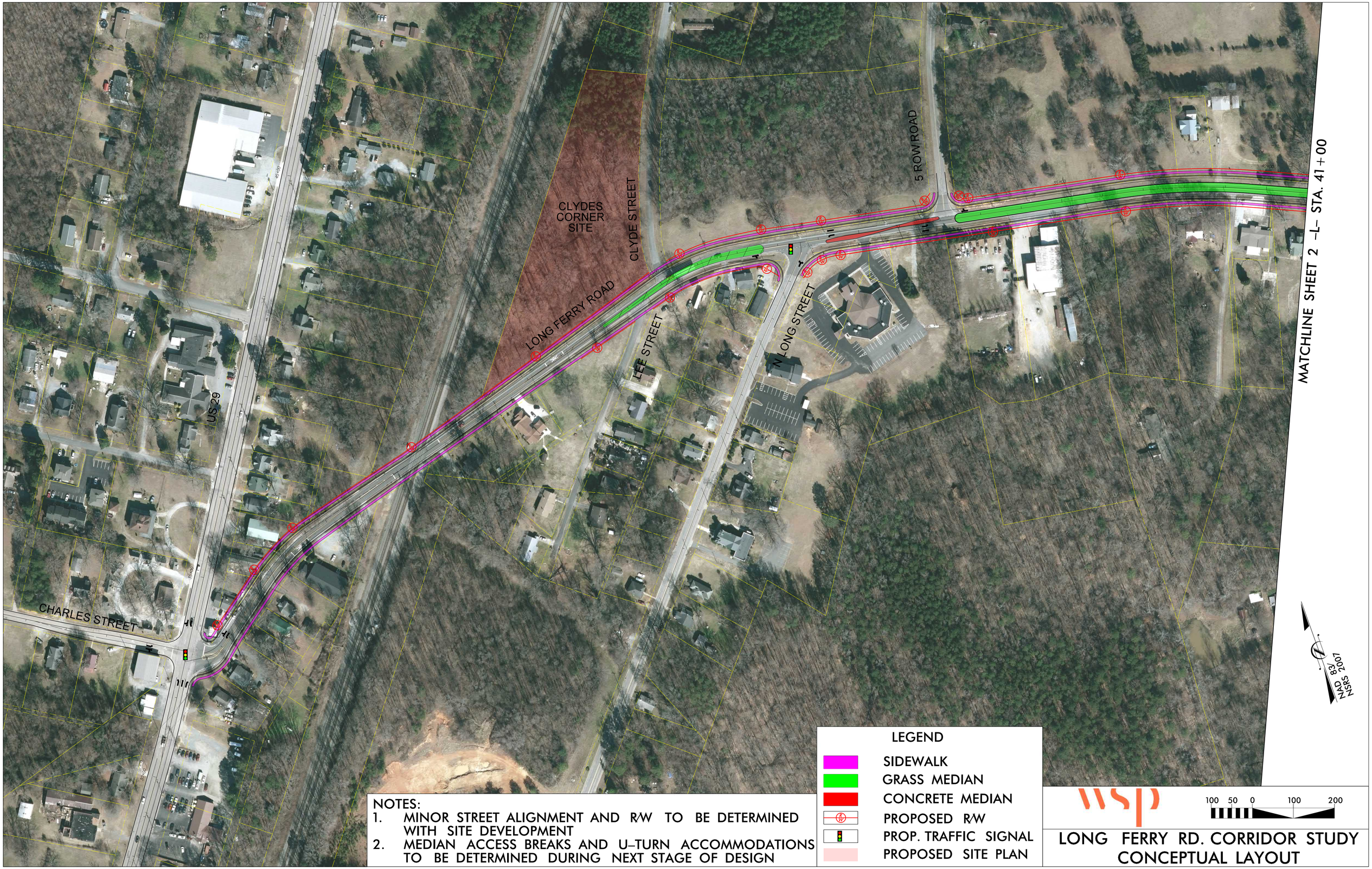
FRONT CREEK ROAD

LEGEND

- SIDEWALK
- GRASS MEDIAN
- CONCRETE MEDIAN
- PROPOSED R/W
- PROP. TRAFFIC SIGNAL
- PROPOSED SITE PLAN

100 50 0 100 200

LONG FERRY RD. CORRIDOR STUDY
CONCEPTUAL LAYOUT



NOTES:
1. MINOR STREET ALIGNMENT AND R/W TO BE DETERMINED WITH SITE DEVELOPMENT
2. MEDIAN ACCESS BREAKS AND U–TURN ACCOMMODATIONS TO BE DETERMINED DURING NEXT STAGE OF DESIGN

LEGEND

- SIDEWALK
- GRASS MEDIAN
- CONCRETE MEDIAN
- PROPOSED R/W
- PROP. TRAFFIC SIGNAL
- PROPOSED SITE PLAN

wsp

100 50 0 100 200

LONG FERRY RD. CORRIDOR STUDY
CONCEPTUAL LAYOUT

NAD 83/2007 NSRS

MATCHLINE SHEET 1 –L– STA. 41+00

MATCHLINE SHEET 3 –L– STA. 70+00

LONG FERRY INDUSTRIAL SITE

HINKLE LANE

I-85 SB OFF RAMP

I-85 SB

I-85 NB

LONG FERRY ROAD

SNIDER STREET

TRUCK STOP SITE

MONTCLAIR DRIVE

I-85 SBON RAMP

LEGEND

- SIDEWALK
- GRASS MEDIAN
- CONCRETE MEDIAN
- PROPOSED R/W
- PROP. TRAFFIC SIGNAL
- PROPOSED SITE PLAN

100 50 0 100 200

LONG FERRY RD. CORRIDOR STUDY CONCEPTUAL LAYOUT

NOTES:

1. MINOR STREET ALIGNMENT AND R/W TO BE DETERMINED WITH SITE DEVELOPMENT
2. MEDIAN ACCESS BREAKS AND U–TURN ACCOMMODATIONS TO BE DETERMINED DURING NEXT STAGE OF DESIGN

NAD 1983 2007 NSRS

MATCHLINE SHEET 2 –L– STA. 70+00

MATCHLINE SHEET 4 –L– STA. 99+00

WILLOW CREEK DRIVE

I-85 NB ON RAMP

LONG FERRY ROAD

I-85 NB OFF RAMP

FRONT CREEK ROAD

NOTES:
1. MINOR STREET ALIGNMENT AND R/W TO BE DETERMINED WITH SITE DEVELOPMENT
2. MEDIAN ACCESS BREAKS AND U–TURN ACCOMMODATIONS TO BE DETERMINED DURING NEXT STAGE OF DESIGN

LEGEND

- SIDEWALK
- GRASS MEDIAN
- CONCRETE MEDIAN
- PROPOSED R/W
- PROP. TRAFFIC SIGNAL
- PROPOSED SITE PLAN

100 50 0 100 200

LONG FERRY RD. CORRIDOR STUDY
CONCEPTUAL LAYOUT

NAD 83/ NSRS 2007

MATCHLINE SHEET 3 –L– STA. 99+00

MATCHLINE SHEET 5 –L– STA. 129+00

RED ROCKS SITE

ACCESS A

ACCESS B

ACCESS C

LONG FERRY ROAD

RED ROCKS SITE

NOTES:
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LEGEND

- SIDEWALK
- GRASS MEDIAN
- CONCRETE MEDIAN
- PROPOSED R/W
- PROP. TRAFFIC SIGNAL
- PROPOSED SITE PLAN

wsp

100 50 0 100 200

LONG FERRY RD. CORRIDOR STUDY
CONCEPTUAL LAYOUT

NAD 83/ NSRS 2007

MATCHLINE SHEET 4 –L– STA. 129+00

STONER MORGAN ROAD

BUCK STATION ROAD

DUKEVILLE ROAD

LEONARD ROAD

LONG FERRY ROAD

ACCESS F

ACCESS D

RED ROCKS SITE

130+00

135+00

140+00

145+00

150+00

155+00

NOTES:
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LEGEND

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- PROP. TRAFFIC SIGNAL
- PROPOSED SITE PLAN

100 50 0 100 200

LONG FERRY RD. CORRIDOR STUDY
CONCEPTUAL LAYOUT

1 INTRODUCTION

WSP USA Inc. (hereafter referred to as WSP) was contracted to perform a corridor plan for future development scenarios along Long Ferry Road from US 29 (Salisbury Avenue) in Spencer, NC to Leonard Rd in Rowan County. The Long Ferry Road corridor is an important east-west transportation corridor connecting Spencer, I-85, and recreational opportunities while consisting primarily of residential, highway corridor commercial and industrial uses, and agricultural land uses. This report summarizes the analysis methodology, assumptions, and findings from the land use development, traffic analysis, roadway concepts, and policy review to support decision making on future infrastructure and transportation network needs.

The following scenarios are included in this traffic analysis:

— 2022 Existing
— 2030 No-Build
— 2030 Build
— 2030 Build with Mitigation

The objective of this corridor study is to evaluate increases in vehicular and truck traffic and access to several prospective non-residential properties. The corridor plan along this 2.8 mile section of Long Ferry Road will help determine transportation mitigation improvements to support existing conditions, future development, and the overall street network.

This study endeavors to:

— Identify ways to increase traffic safety, mobility, and comfort,
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2 STUDY AREA

Based on discussions with Rowan County, the following intersections are included in the study area:

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All study intersections are currently stop-controlled.

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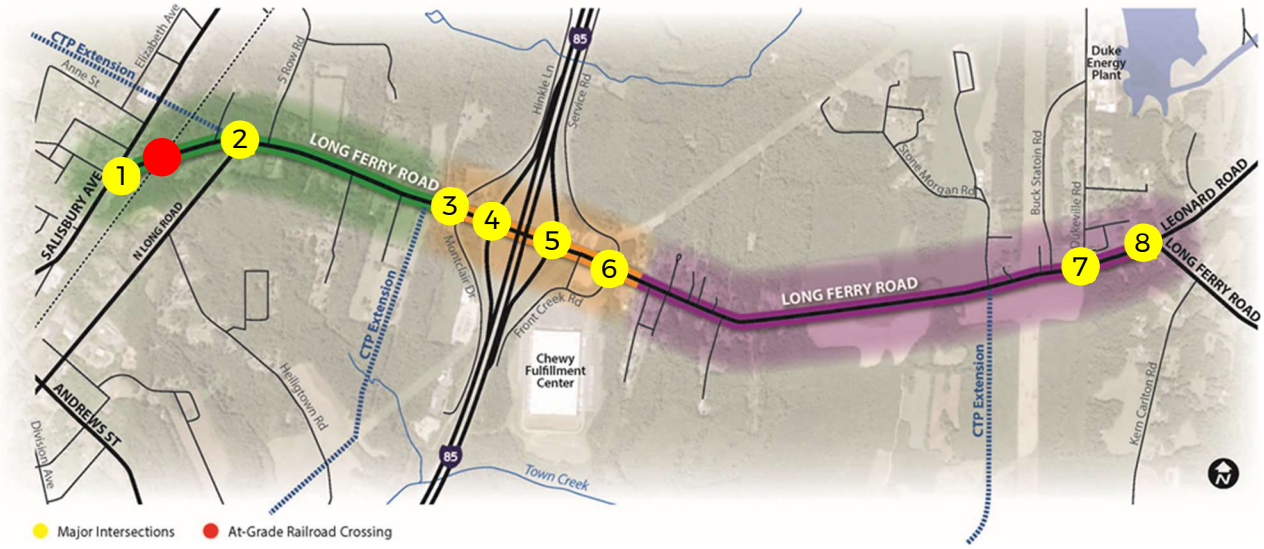
Figure 1: Study Area Map



2.1 DATA COLLECTION

2.1.1 HISTORIC AADT

Historic annual average daily traffic (AADT) trends in the area show a wide variety of growth cases in the area in the last ten years. Compound annual growth rates (CAGR) for this period fall between -2.8% and 3.8%. There has been some development directly on this corridor, as well as general development in the nearby area. The historic growth rates in the study area are shown in **Table 1**.

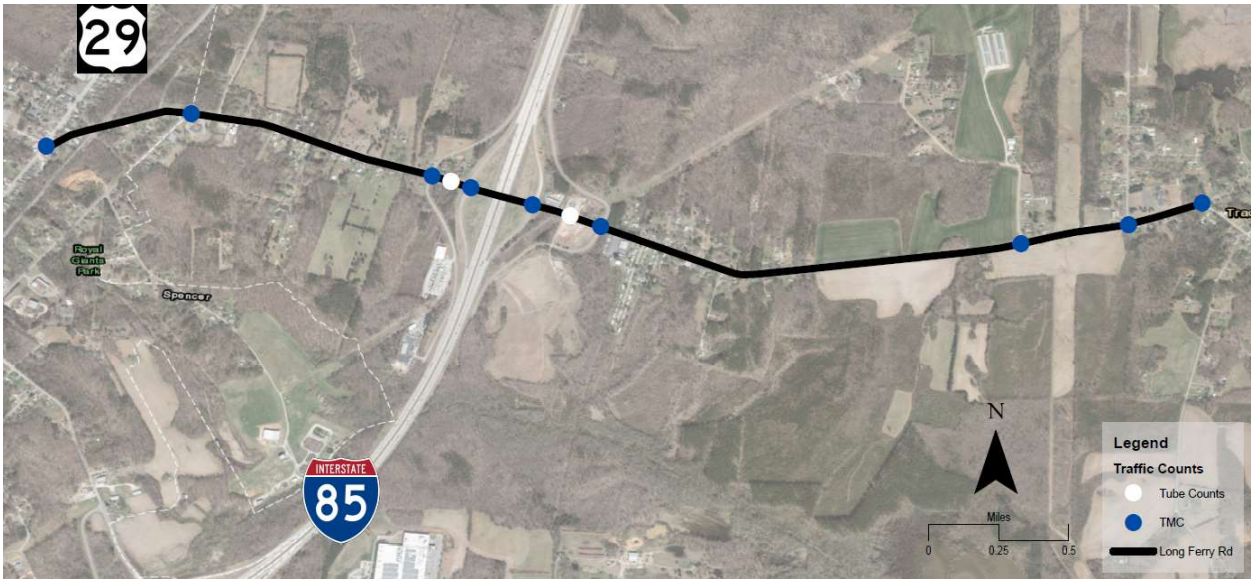
Table 1: Historic AADT in Study Area

ROUTE	LOCATION	AADT										CAGR
		2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	
I-85	Between Exit 81 and Exit 84	64000	63000	72000	72000	75000	80000	79000	83500	72500	75500	1.9%
I-85	Between Exit 79 and Exit 81	65000	63000	72000	73000	76000	81000	80500	84000	73000	76000	1.8%
SR 2120	East of US 29-70 / NC 150	-	3800	-	4300	-	3600	-	4100	-	3700	0.9%
SR 2120	East of SR 2183	5700	-	4200	-	4300	-	4700	-	-	4400	-2.8%
SR 2120	East of I-85	-	4700	-	4700	-	5500	-	6400	-	7400	3.8%
SR 2120	East of SR 2175	-	3600	-	3700	-	4200	-	4100	-	4100	0.0%
SR 2120	East of SR 2168	2900	-	3200	-	3200	-	-	-	-	3200	1.1%
SR 2100	South of SR 2120	-	990	-	1300	-	1100	-	1400	-	1400	0.8%
SR 2175	South of SR 2177	710	-	-	-	550	-	-	-	-	550	-2.6%
SR 2168	North of SR 2120	-	930	-	900	-	1000	-	850	-	850	-1.2%

2.1.2 2022 TRAFFIC COUNTS

Turning movement count (TMC) data was collected for this study on Thursday May 12, 2022, from 7:00-9:00 AM and 4:00-6:00 PM. 48-hour tube counts were collected on Wednesday, May 11 and Thursday, May 12, 2022. The locations of these counts are shown in **Figure 2**. The raw count data can be found in **Appendix A**.

Figure 2: Traffic Count Locations



2.2 LAND USE

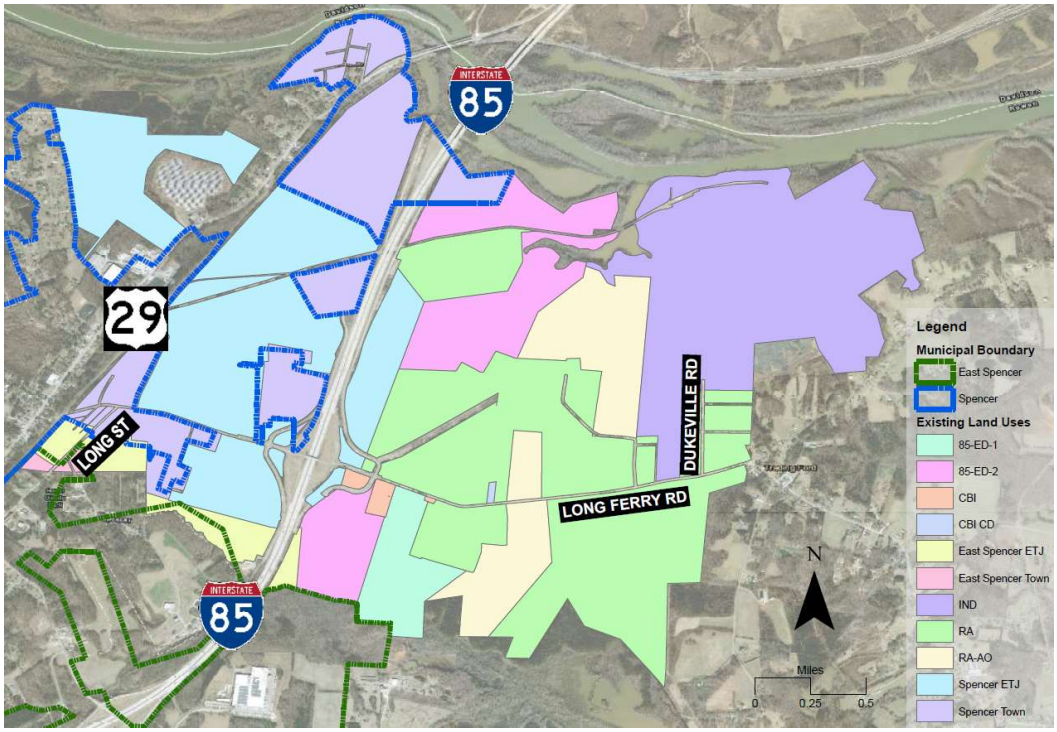
The land surrounding the Long Ferry Road corridor is currently mostly low-density residential, with a few industrial and commercial sites. Notable existing developments are a Chewy distribution facility, an Innospec manufacturing plant, and a Duke Energy power plant.

The existing zoning types in the area around the Long Ferry Road corridor are:

- RA: Rural Agricultural
- RA-AO: Rural Agricultural, Agricultural Overlay
- IND: Industrial
- 85-ED-1: I-85 economic development district focused on high capital investment, high wage, low employment, and clean industries
- 85-ED-2: I-85 economic development district including 85-ED-1 industries as well as distribution and wholesaling operations
- CBI: Commercial, Business, Industrial
- CBI CD: Commercial, Business, Industrial Conditional District
- Spencer Town
- Spencer ETJ: extraterritorial jurisdiction
- East Spencer Town
- East Spencer ETJ: extraterritorial jurisdiction

The location of different zoning types in the study area is shown in **Figure 3**.

Figure 3: Existing Zoning Map



2.3 EXISTING CONDITIONS

A description of the roadways within the study area limits is provided below in **Table 2.** In addition to NCDOT 2021 AADT counts along the corridor, two supplemental 2022 average daily traffic (ADT) counts were collected just east and west of I-85 to confirm truck volumes, hourly volume patterns and potential changes in daily volumes from 2021. The existing lane configuration and traffic control is shown in **Appendix B, Figure 1**.

Table 2: Existing Roadway Conditions

ROAD	LANES	CLASSIFICATION	POSTED SPEED LIMIT	2021 AADT (VEHICLES PER DAY)
Long Ferry Road	Two-Lane Undivided	Minor Arterial west of I-85 Minor Collector east of I-85	35 to 55 mph	3,700 vpd east of US 29 4,400 vpd west of I-85 (2022 tube count west of I-85: 5,405 vpd) 7,400 vpd east of I-85 (2022 tube count east of I-85: 9,736 vpd) 4,100 vpd east of Dukeville Road
I-85	Eight-Lane Divided	Interstate	70 mph	75,500 vpd north of Long Ferry Road 76,000 vpd south of Long Ferry Road
US 29 (Salisbury Avenue)	Four-Lane Undivided	Minor Arterial	35 mph	3,500 vpd north of Long Ferry Road 7,200 vpd south of Long Ferry Road
Long Street	Two-Lane Undivided	Minor Arterial	35 mph	1,400 vpd south of Long Ferry Road
Hinkle Lane	Two-Lane Undivided	Local Road	Not Posted	No Data
Montclair Drive	Two-Lane Undivided	Local Road	Not Posted	No Data
Willow Creek Drive	Two-Lane Undivided	Local Road	Not Posted	No Data
Front Creek Road	Two-Lane Undivided	Local Road	Not Posted	No Data
Dukeville Road	Two-Lane Undivided	Local Road	Not Posted	550 vpd north of Long Ferry Road
Leonard Road	Two-Lane Undivided	Local Road	Not Posted	850 vpd north of Long Ferry Road

2.4 BACKGROUND & LONG-TERM PLANNING PROJECTS

2.4.1 STATE TRANSPORTATION IMPROVEMENT PLAN

There are two NCDOT State Transportation Improvement Plan (STIP) projects in the study area. STIP project U-6237 proposes to construct an eastbound right turn lane on Long Ferry Road at Front Creek Road and turn Front Creek Road into a cul-de-sac, along with additional pavement improvements. Right-of-way and construction year for this project are listed as 2021, and this project is completed and considered part of existing conditions.

The second STIP project in the study area is EB-5861. This project proposed to construct greenway and sidewalk to connect the Third Street Greenway from west of old Mocksville Road near Grants Creek at existing Salisbury Greenway to Fieldcrest Cannon Lane. The impacts in the study area are additional pedestrian and bicycle facilities along US 29 (Salisbury Avenue) through the intersection with Long Ferry Road. The construction year is 2024, and the project is considered to have no direct impact to the roadway network for any corridor analysis scenario.

2.4.2 US 29 (SALISBURY AVENUE) ROAD DIET

The Town of Spencer is currently taking the opportunity afforded by NCDOT work resurfacing US 29 (Salisbury Avenue) to implement a road diet. As a part of NCDOT's periodic resurfacing efforts, the Town studied Salisbury Avenue from 17th Street to Long Ferry Road, looking for opportunities to improve identified traffic problems through the Town of Spencer. The result of that effort was a suggested restriping of the two-mile section of road, reducing traffic lanes to one in each direction with a dedicated center turn lane and bike lanes on either side. This type of road diet has already been implemented from Downtown Salisbury to the south through 17th Street.

The approved plan includes the proposed restriping from 17th Street to about Jefferson Street, a 1.5 mile section, and retains the four-lane profile but with shared lane arrows added in the last 0.5 mile section from Jefferson Street to Long Ferry Road. NCDOT is scheduled to resurface the remaining section of US 29 (Salisbury Avenue) from Long Ferry Road north to the Yadkin River around 2027.

This road diet helps provide bike lanes and connectivity to local greenways and parks, which is consistent with the goals of STIP project EB-5861 (discussed in **Section 2.4.1** above). It is likely that in the future, this road diet will be applied to the full US 29 segments north and south of Long Ferry Road. For the corridor analysis, this road diet will be included in the intersection analysis for the 2030 Build with Mitigation scenario.

2.4.3 COMPREHENSIVE TRANSPORTATION PLAN

The Cabarrus-Rowan Metropolitan Planning Organization (CRMPO) Comprehensive Transportation Plan (CTP) also includes some future updates to Long Ferry Road. The Jake Alexander Boulevard N Extension will realign Long Ferry Road from US 29 (Salisbury Avenue) to Long Street to move the intersection of Long Ferry Road and US 29 (Salisbury Road) north of the current intersection. This project fixes the undesirable skew of Long Ferry Road at this intersection and includes a railroad grade separation. Per the CRMPO 2050 Metropolitan Transportation Plan (MTP), updated April 2022, the 2045 MTP Horizon Year includes the grade separation as part of the Piedmont High-Speed Rail Corridor project but remains unfunded in the STIP at the present time.

The CTP proposes that Long Ferry Road from US 29 (Salisbury Avenue) to I-85 to be improved to a boulevard with the cross section shown in **Figure 4** below. The CTP also labels the section of Long Ferry Road from I-85 eastbound through existing Stoner Morgan Road as "Needs Improvement" and labels Long Ferry Road from Stoner Morgan Road to Goodman Lake Road as "Existing". Both of these sections are proposed to have the cross section shown in **Figure 5** below. The existing three-leg intersection of Long Ferry Road and Stoner Morgan Road is proposed to become a four-leg intersection with the Jake Alexander Boulevard E Extension. This study did not consider the Jake Alexander Boulevard E Extension as part of the recommendations because of the study horizon year of 2030 and recent and proposed local developments which conflict with its constructability.

Additional details on the CRMPO CTP are included in **Appendix C**.

Figure 4: Typical Section No. 4D – 4 Lane Divided (Raised Median) with Curb & Gutter, Bike Lanes, and Sidewalks

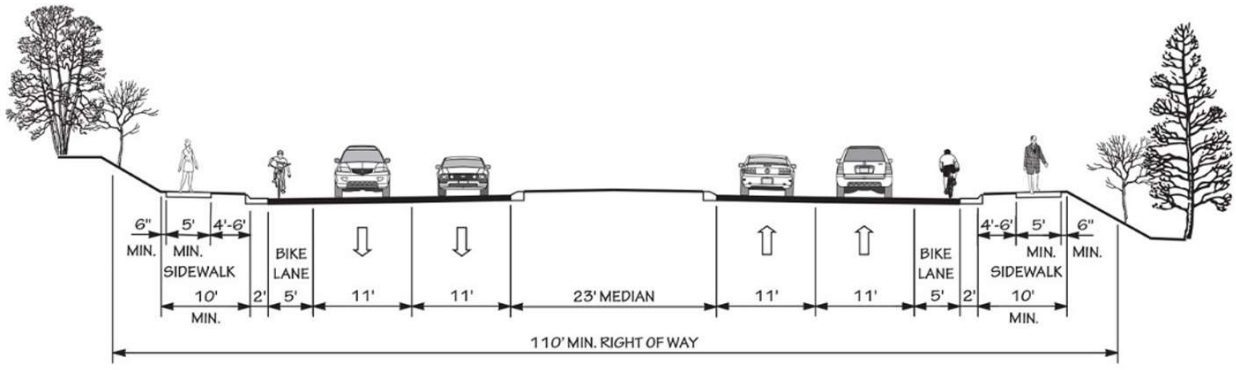
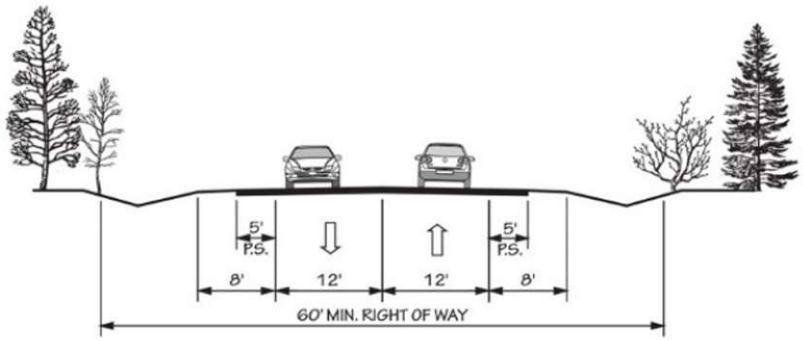


Figure 5: Typical Section No. 2A – 2 Lane Undivided with Paved Shoulders



2.4.4 LOCAL DEVELOPMENT

There are a handful of proposed developments along the Long Ferry Road corridor. These developments are at various stages of development; some have site plans only while others have traffic studies, but for the purposes of this study, all of them were considered as expected to be constructed in the future year Build scenarios but were not included in the future year No Build scenario.

Clyde's Corner is a proposed residential development with seven (7) lots north of Long Ferry Road between the railroad tracks and Clyde Street. This development does conflict with the CTP plan for Jake Alexander Boulevard N Extension which realigns Long Ferry Road.

The Waterford Property and Fisher Lamb Distribution are two developments proposed for north of Hackett Street between the railroad tracks and I-85. The Waterford Property is proposed to have two buildings on approximately 126 acres, one roughly 625,000 square-feet and the other 150,000 square-feet. The Fisher Lamb Distribution site is roughly 98 acres.

Innospec is an existing business in the Long Ferry Road corridor study area and has a future expansion planned for the adjacent parcels. The existing site is approximately 24 acres, and the planned expansion would add an additional 71 acres. Currently located south of Hackett Street between Hinkle Lane and I-85, the expansion would extend the footprint along I-85 to Long Ferry Road.

Johnson Distribution is a roughly 36-acre site north of Long Ferry Road and west of Hinkle Lane with a proposed 349,680 square-foot building.

A truck stop is proposed for south of Long Ferry Road close to Montclair Drive. The truck stop is expected to have seven (7) truck fueling pumps, ten (10) standard fueling pumps, and a convenience store with facilities for truckers.

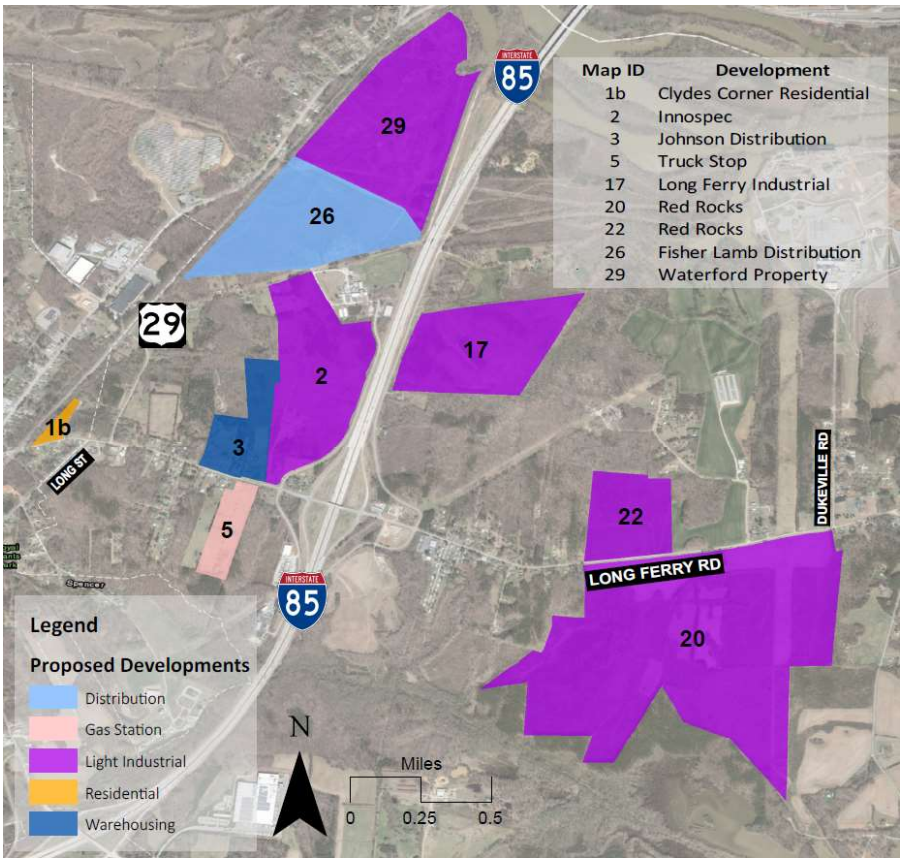
In conjunction with the Waterford Property, Fisher Lamb Distribution, Innospec expansion, Johnson Distribution, and truck stop development, Hinkle Lane and Montclair Drive are proposed to be moved approximately 200 feet west of its currently location. This move will allow the intersection to have acceptable spacing from the I-85 Southbound Ramp intersection and will provide the room for necessary turn lanes to be built along Long Ferry Road in the future to service these sites appropriately.

The Long Ferry Industrial site is roughly 84 acres and Is located north of Long Ferry Road and south of Jacobs Lambe Lane along Willow Creek Drive. The site is proposed to have two buildings, one roughly 312,000 square feet and the other 706,000 square-feet.

The largest proposed development along the Long Ferry Road corridor is the RedRock Industrial development. This development is located on 45 acres north of Long Ferry Road and 335 acres south of Long Ferry Road between Barrier Lane and Dukeville Road. The site north of Long Ferry Road is proposed to have approximately 548,000 square-feet of fulfillment center with two (2) driveways, and the site south of Long Ferry Road has proposed 1,000,000 square-feet of warehousing, 750,000 square feet of light industrial, and 337,000 square-feet of manufacturing with five (5) total driveways onto Long Ferry Road. All proposed driveways are proposed to have an exclusive eastbound turn lane into the site, and the second driveway from the west is proposed to be signalized. Additional improvements to the interchange and service road intersections are also proposed in conjunction with this development based on the traffic impact analysis (TIA) performed for this development.

The locations of these proposed developments are shown in**Figure 6**. All available site plans and additional information are included in **Appendix D**.

Figure 6: Proposed Development Map



3 CRASH ANALYSIS

A strip analysis report from the NCDOT Traffic Engineering Accident Analysis System (TEAAS) was prepared and summarized for the Long Ferry Road corridor within the study area. Based on this report, the most frequent type of crash along the study corridor in the last five years was Fixed Object crashes, which made up 26.4% of the 91 crashes in that period. Fixed Object crashes refer to crashes involving one vehicle striking a permanent fixture along the roadway, such as a tree, guardrail, or sign. Animal crashes were the next most common at 14.3%, followed by Left Turn, Different Roadways (collision of two vehicles traveling on different roadways while one makes a left turn) and Rear End, Slow or Stop (one vehicle rear-ended by another while decelerating), which both made up 12.1% of crashes. There was one pedestrian crash in the past five years along the corridor and no fatal crashes. A summary of the full data set and the TEAAS report can be found in **Appendix E**.

One curved roadway segment on Long Ferry Road between Barrier Lane and Stoner Morgan Road has been designated in both the 2021 and 2022 NCDOT Highway Safety Improvement Program (HSIP) as a potentially hazardous location based on the number of run-off-road crashes in that location.

Compared to similar routes in North Carolina, the Long Ferry Road corridor had higher total, injury, and night crash rates, and lower fatal and wet crash rates. The exact crash rates are shown in **Table 3**.

Table 3: Corridor Crash Rates

ROUTE	CRASHES PER 100 MILLION VEHICLE MILES TRAVELED				
	TOTAL CRASH RATE	FATAL CRASH RATE	NON-FATAL (INJURY) CRASH RATE	NIGHT CRASH RATE	WET CRASH RATE
Long Ferry Road	314.73	0.00	114.13	114.13	41.50
NC Statewide Average – Urban Secondary Routes	303.62	1.10	86.13	71.36	47.79

4 VOLUME DEVELOPMENT

4.1 EXISTING VOLUMES

The raw count data was left unbalanced between study intersections in the peak hours and was used as the 2022 Existing traffic volumes. Unbalanced data means that the volume on a roadway segment is slightly different between intersections. This imbalance accounts for driveways and side streets volumes between study intersections and was considered reasonable for this corridor.

The 2022 Existing peak hour volumes are shown in **Appendix B, Figure 2.**

Daily volumes for the existing scenario are taken from the 2021 NCDOT AADT count stations, which include coverage along the entire study corridor, as shown in **Section 2.3, Table 2**.

4.2 BACKGROUND GROWTH RATE

An annual growth rate of a half percent (0.5%) was used to project ambient growth of traffic on all roadways in the study area. Historical growth rates show that is this area is experiencing growth (see **Section 2.1.1**). Because this study includes the majority of specific development that is possible along this corridor, 0.5% was selected for background growth, which represents all growth that the corridor would experience without any of the specific

developments included in this study. This value is lower than the historical AADT growth rates because those rates include all development along the corridor. 0.5% is a typical value for background growth when the area is growing and the study is including a large amount of specific development that will occur in the area.

This growth rate was applied to the 2021 Daily and 2022 Peak Hour Existing traffic volumes to develop the 2030 No-Build traffic volumes.

No programmed or funded STIP or 2050 CRMPO MTP/CTP projects exist in the study area or vicinity that would affect the traffic volumes. No individual proposed developments were included in the background growth volumes.

The 2030 No-Build peak hour traffic volumes are shown in **Appendix B, Figure 3**.

4.3 METROLINA REGIONAL MODEL

One additional source of data for the volumes along Long Ferry Road was the Metrolina Regional Model (MRM). This model is generally used for long-range planning purposes, with potential development and roadway improvements included in future year models. The AADT and compound annual growth rate (CAGR) data from the MRM in the study area is shown in **Table 4**. This data was not used to develop future year volumes for this study because the future development land use scenarios include site specific development and more intense traffic projections than is included in the MRM.

Inconsistencies were found between NCDOT count station data and 2018 MRM daily volume values. There were also differences between the MRM capacities and the existing capacities shown in the CRMPO CTP. These inconsistencies were another reason that this data was not used for analysis purposes.

Table 4: MRM Volumes

ROUTE	LOCATION	MRM AADT			CAGR	
		2018	2025	2035	2018-2025	2018-2035
I-85	Between Exit 81 and Exit 84	85310	94945	108510	1.5%	3.5%
I-85	Between Exit 79 and Exit 81	76436	85455	97412	1.6%	3.5%
SR 2120	East of US 29-70/NC 150	10543	11215	12612	0.9%	2.6%
SR 2120	East of SR 2183	12316	13325	15157	1.1%	3.0%
SR 2120	East of I-85	5210	5764	6356	1.5%	2.9%
SR 2120	East of SR 2175	5210	5764	6356	1.5%	2.9%
SR 2120	East of SR 2168	5210	5764	6356	1.5%	2.9%
SR 2100	South of SR 2120	712	783	810	1.4%	1.9%

4.4 LAND USE CASE SCENARIOS

This study was designed to study the impacts of future development scenarios on the Long Ferry Road corridor. To get a more complete picture of the potential development in the area around the corridor, Rowan County and the Town of Spencer combined individual parcels into 32 parcel groups based on proximity, similarity, and development potential. Two estimates of future land uses were provided for each parcel group, which provided a low and high estimate for trip traffic generation. These estimates represented the market build out potential for the land along the Long Ferry Road corridor. These low and high trip generation land uses were then used to prepare an estimate of the daily trips and the trips in both AM and PM peak hours for each parcel group using the ITE Trip Generation Manual. For sites which already have a specific proposed development (detailed in **Section 2.4.4**), the low and high trip generation both match the proposed usage. A table of the trip generation for each parcel group is included in **Appendix F**. A summary is shown in **Table 5**.

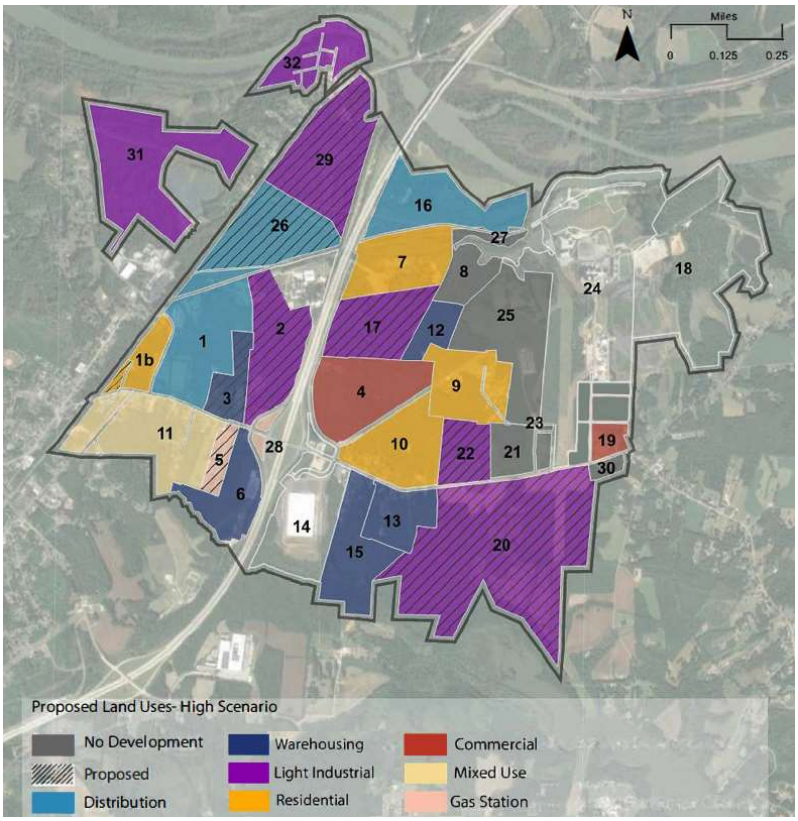
Table 5: Trip Generation Summary

LAND USE	TOTAL DEVELOPMENT LAND USE (SQFT)		TOTAL DEVELOPMENT DAILY TRIPS	
	LOW-END	HIGH-END	LOW-END	HIGH-END
Commercial	221,500	261,500	16,941	18,859
Distribution / Fulfillment	4,621,618	4,621,618	11,115	11,626
Gas Station	10,000	10,000	2,654	2,654
Industrial	5,633,337	3,300,996	18,136	11,608
Manufacturing	336,960	2,669,301	1,225	7,753
Residential	829,961	685,291	4,066	3,222
Truck Stop	12,000	12,000	5,026	5,026
Warehouse	1,995,981	4,340,024	4,102	7,921
Total	**13,631,316**	**15,870,687**	**63,264**	**68,668**

To develop the 2030 Build traffic volumes, the High-End Development scenario trip generation was used, because studying higher trip values would produce more conservative roadway improvement recommendations. A map which shows the proposed High-End land uses for each parcel group is shown in **Figure 7**, and a map of the Low-End scenario is included in **Appendix F**.

The estimates of the AM and PM peak hour traffic does not include either pass-by or internal capture because not enough detailed information from proposed development plans were available. The resulting volume estimates for the parcel groups along the corridor are conservatively high, which allows the corridor study to provide recommendations for the corridor development which can handle the High-End land uses for all sites.

Figure 7: High-End Land Use Scenario Map



4.5 TRIP DISTRIBUTION

Traffic was distributed onto the roadway network for each individual parcel group based on the development type. For industrial development, site trips used the following distribution, which matches the distribution used for the RedRock industrial development Traffic Impact Analysis (TIA):

- 3% to/from the north on US 29 (Salisbury Avenue)
- 6% to/from the south on US 29 (Salisbury Avenue)
- 41% to/from the north on I-85
- 42% to/from the south on I-85
- 8% to/from the east on Long Ferry Road

For residential or commercial developments, the following distribution was used:

- 5% to/from the north on US 29 (Salisbury Avenue)
- 15% to/from the south on US 29 (Salisbury Avenue)
- 5% to/from the south on Long Street
- 30% to/from the north on I-85
- 40% to/from the south on I-85
- 5% to/from the east on Long Ferry Road

The total site trips for High-End developments are shown in **Appendix B, Figure 4** for peak hours and **Appendix B, Figure 5** for daily trips. **Appendix B, Figures 6** shows the 2030 Build peak hour traffic volumes with High-End developments.

5 METHODOLOGY

5.1 LEVEL OF SERVICE CONCEPT

The performance of an intersection is measured by the level of service (LOS) that it provides, as described in the Highway Capacity Manual (HCM), 6th Edition. LOS is a measure that is used to describe the operating conditions of an intersection based on characteristics such as speed, traffic volumes, geometric/lane configuration, and delays. LOS ranges from "A" to "F", with "A" describing smooth, free flow conditions where queues easily clear through each cycle length, and "F" describing heavily congested, over-saturated conditions, where queues are often forced to wait through potentially multiple cycle lengths prior to clearing an intersection, resulting in heavy delays. **Table 6** provides the LOS and delay criteria for signalized and unsignalized intersections provided in the HCM.

Table 6: Level of Service Criteria

LOS	DELAY PER VEHICLE (IN SECONDS)	
	SIGNALIZED INTERSECTION	UNSIGNALIZED APPROACH
A	≤10	≤10
B	>10 and ≤20	>10 and ≤15
C	>20 and ≤35	>15 and ≤25
D	>35 and ≤55	>25 and ≤35
E	>55 and ≤80	>35 and ≤50
F	>80	>50

5.2 INTERSECTION ANALYSIS METHODOLOGY

The capacity analysis for the signalized and stop-controlled intersections in the study area was performed for the AM and PM peak hours using Synchro 11. Synchro is a software for modeling, optimizing, managing, and simulating traffic systems. The existing roadway network was modeled in Synchro to contain existing lane configuration and traffic control.

The traffic analysis was completed in accordance with the latest NCDOT Congestion Management Capacity Analysis Guidelines, and included the following assumptions:

- Peak hour factor set to 0.90
- No right-turn on red movements allowed in future scenarios.
- Used recommended signal timing minimums

Stop-controlled intersection capacity analyses were performed using the HCM 6 report for two-way stop-controlled intersections in Synchro. The inputs for stop-controlled intersections were identical to that of signalized intersections. Additionally, SimTraffic was used to determine network operations and the vehicular queues. SimTraffic performs microsimulation of vehicles through the street network created within Synchro. The results of ten simulation runs in SimTraffic were averaged to determine the maximum queue for each movement. The resulting maximum queue typically provides a more realistic queue length when the 95th percentile queue in Synchro is affected by high volumes and/or adjacent signals unless the network is congested, where upstream intersections heavily meter the amount of traffic that can reach the other intersections. All Synchro and SimTraffic outputs for the analyses performed are included in **Appendix G**.

5.3 SEGMENT CAPACITY ANALYSIS

The capacity analysis for the roadway segments in the study area was performed by calculating the daily volume-to-capacity (V/C) ratios for each segment. V/C ratios provide a reference for how utilized a roadway is, with lower values representing a lower roadway utilizations and higher values representing higher roadway utilization.

Volumes used for this analysis were daily volumes, using the NCDOT 2021 AADT as the base and adding background growth and site trips on top for various scenarios, as described in **Section 4** above.

Capacities for the existing roadway network were based on the CRMPO CTP existing capacity estimates. For the recommended future cross sections, the capacity values used were from the NCDOT Transportation Planning Branch's "Level of Service D Standards for Systems Level Planning". Conversion of V/C ratios to Level of Service values were determined based on methodology shown for peak hours in the CRMPO CTP V/C maps.

6 INTERSECTION CAPACITY ANALYSIS

Capacity analysis was completed for the AM and PM peak hours for the following volume and geometry scenarios:

- 2022 Existing
- 2030 No-Build
- 2030 Build
- 2030 Build with Mitigation

The following sections contain a description of the volumes and geometries used for each of the analysis scenarios as well as the capacity analysis results.

6.1 2022 EXISTING SCENARIO

This section details the analysis results for the existing scenario. The analysis for this scenario is based on the 2022 existing peak hour traffic volumes (see **Section 4.1**) as well as existing lane configuration and traffic control at the intersections in the study area.

Based on Synchro intersection analysis, stop-controlled approaches at one (1) unsignalized intersection operate at LOS E or F in at least one peak hour. This intersection is Long Ferry Road & I-85 Southbound Ramps.

Appendix H, Table 1 summarizes the 2022 Existing scenario capacity analysis results.

6.2 2030 NO-BUILD SCENARIO

This section details the analysis results for the no-build scenario. The analysis for this scenario is based on the 2022 existing peak hour traffic volumes combined with background growth (see **Section 4.2**). It uses existing lane configuration and traffic control at the intersections in the study area.

Based on Synchro intersection analysis, stop-controlled approaches at one (1) unsignalized intersection is projected to operate at LOS E or F in at least one peak hour. This intersection is Long Ferry Road & I-85 Southbound Ramps.

Appendix H, Table 2 summarizes the 2030 No-Build scenario capacity analysis results.

6.3 2030 BUILD SCENARIO

This section details the analysis results for the build scenario. The analysis for this scenario is based on the 2030 no-build traffic volumes combined with high-end land use site trips following the established trip distributions (see **Section 4.4-4.5**). This scenario uses existing lane configuration and traffic control at the intersections in the study area. It does not include improvements proposed by development TIAs which have already been completed.

Based on Synchro intersection analysis for the 2030 Build, six (6) unsignalized intersections of the eight (8) unsignalized intersections in the study area are projected to operate at LOS E or F in at least one peak hour. This poor LOS is mainly due to the heavy turning volumes from both major and minor streets at these intersections.

Appendix H, Table 3 summarizes the 2030 Build scenario capacity analysis results.

6.4 2030 BUILD WITH MITIGATION SCENARIO

This section details the analysis results for the build with mitigation scenario. The analysis for this scenario is based on the 2030 no-build traffic volumes combined with high-end land use site trips following the established trip distributions (see **Section 4.4-4.5**). This scenario also includes geometric improvements intended to improve corridor operations, safety, and mobility at intersections with poor LOS.

The geometric improvements included to help mitigate traffic concerns are signalizing six (6) of the eight (8) study intersections and adding accompanying turn lanes, or additional through lanes, at these signals to accommodate future traffic projections. Three (3) of the six (6) proposed signals were included as recommendations in the RedRock industrial development TIA with accompanying turn lane improvements. These intersections were Long Ferry Road & I-85 Southbound Ramps, Long Ferry Road & I-85 Northbound Ramps, and Long Ferry Road & Willow Creek Drive / Front Creek Road. All turn lane recommendations are equal to or greater than those included in proposed development TIAs. The proposed laneage for the 2030 Build with Mitigation

scenario is shown in **Appendix B, Figure 7** and further explained as intersection recommendations in **Section 10.1**.

Cross streets Hinkle Lane and Montclair Drive are realigned to the west to provide adequate separation from the intersection with I-85 southbound ramps. The potential US 29 (Salisbury Avenue) road diet was generally considered by removing a through lane both northbound and southbound on US 29 (Salisbury Avenue).

Based on Synchro intersection analysis for the 2030 Build with Mitigation, three (3) signalized intersections in the study area are projected to operate at LOS E or F in the PM peak hour. These signals are centered around the I-85 interchange, where the highest traffic volumes are projected. The intersections are Long Ferry Road & I-85 Southbound Ramps, Long Ferry Road & I-85 Northbound Ramps, and Long Ferry Road & Willow Creek Drive / Front Creek Road. This poor LOS is primarily due to the very heavy turning traffic volumes to and from the interstate and service roads conflicting with an increased through traffic volume.

Appendix H, Table 4 summarizes the 2030 Build with Mitigation scenario capacity analysis results.

Table 7 shows the summarized results of the intersection analyses across all scenarios following LOS criteria detailed in **Section 5.1**. None of the scenarios, including the 2030 Build with Mitigation, show all intersections with an overall LOS D or better. Additional interchange improvements to help further mitigate intersection traffic concerns are detailed later in **Section 8**.

Table 7: Capacity Analysis Results

NODE	INTERSECTION	2022 EXISTING				2030 NO BUILD				2030 BUILD HIGH-END				2030 BUILD WITH MITIGATION HIGH-END			
		LOS		DELAY[1]		LOS		DELAY[1]		LOS		DELAY[1]		LOS		DELAY[1]	
		AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM
1	Long Ferry Road / Charles Street & US 29 (Salisbury Avenue)	C	C	16.9	19.5	C	C	17.8	21.2	***F***	***F***	***>300***	***>300***	C	D	28.8	47.7
2	Long Ferry Road & Long Street	A	B	9.3	10.0	A	B	9.3	10.1	***E***	***F***	***44.7***	***>300***	B	D	17.0	53.6
3	Long Ferry Road & Hinkle Lane / Montclair Drive	B	B	11.3	13.2	B	B	11.5	11.7	***F***	C	***>300***	24.38	C	D	22.4	38.1
4	Long Ferry Road & I-85 Southbound Ramps	C	***E***	15.6	***48.6***	C	***F***	16.3	***60.7***	***F***	***F***	***>300***	***>300***	D	***F***	37.5	***117.4***
5	Long Ferry Road & I-85 Northbound Ramps	B	C	13.9	21.7	B	C	14.2	22.9	***F***	***F***	***>300***	***>300***	D	***F***	40.1	***126.5***
6	Long Ferry Road & Willow Creek Drive / Front Creek Road	B	C	12.0	20.4	B	C	12.3	22.0	***F***	***F***	***>300***	***>300***	C	***E***	22.6	***57.8***
7	Long Ferry Road & Dukeville Road	A	B	9.7	10.3	A	B	9.7	10.4	B	B	12.9	14.6	B	B	12.9	14.6
8	Long Ferry Road & Leonard Road	A	A	9.6	9.4	A	A	9.7	9.4	B	B	12.7	11.5	B	B	12.7	11.5

[1]units are seconds per vehicle

BOLD/ITALIC indicates operational deficiency (LOS E or F)

Unsignalized	Signalized

LOS is shown as overall intersection delay for signalized intersections and the worst approach delay for unsignalized intersections.

7 SEGMENT CAPACITY ANALYSIS

Segment capacity for the Long Ferry Road corridor was studied using daily volumes for the following scenarios:

- 2022 Existing
- 2030 No-Build
- 2030 Build
- 2030 Build with Mitigation

The following sections contain the segment capacity analysis results for each of the analysis scenarios.

7.1 2021 EXISTING SCENARIO

This section details the analysis results for the existing scenario. The analysis for this scenario is based on the 2021 existing AADT traffic volumes as well as existing cross sections along the corridor.

Based on V/C ratio analysis for the 2021 Existing scenario, the entire Long Ferry Road corridor is under capacity. The lowest V/C ratio along the corridor is seen between US 29 (Salisbury Avenue) and Long Street, while the highest is seen between I-85 and Dukeville Road.

Figure 8 displays the 2022 Existing scenario V/C ratio analysis results.

Figure 8: 2021 Existing Volume-to-Capacity Ratio Map

7.2 2030 NO-BUILD SCENARIO

This section details the analysis results for the no-build scenario. The analysis for this scenario is based on the 2021 existing AADT traffic volumes combined with background growth. It uses existing cross sections along the corridor.

Based on V/C ratio analysis for the 2030 No Build scenario, the entire Long Ferry Road corridor is expected to be under capacity. The lowest V/C ratio along the corridor is seen between US 29 (Salisbury Avenue) and Long Street, while the highest is seen between I-85 and Dukeville Road.

Figure 9 displays the 2030 No Build scenario V/C ratio analysis results.

Figure 9: 2030 No Build Volume-to-Capacity Ratio Map

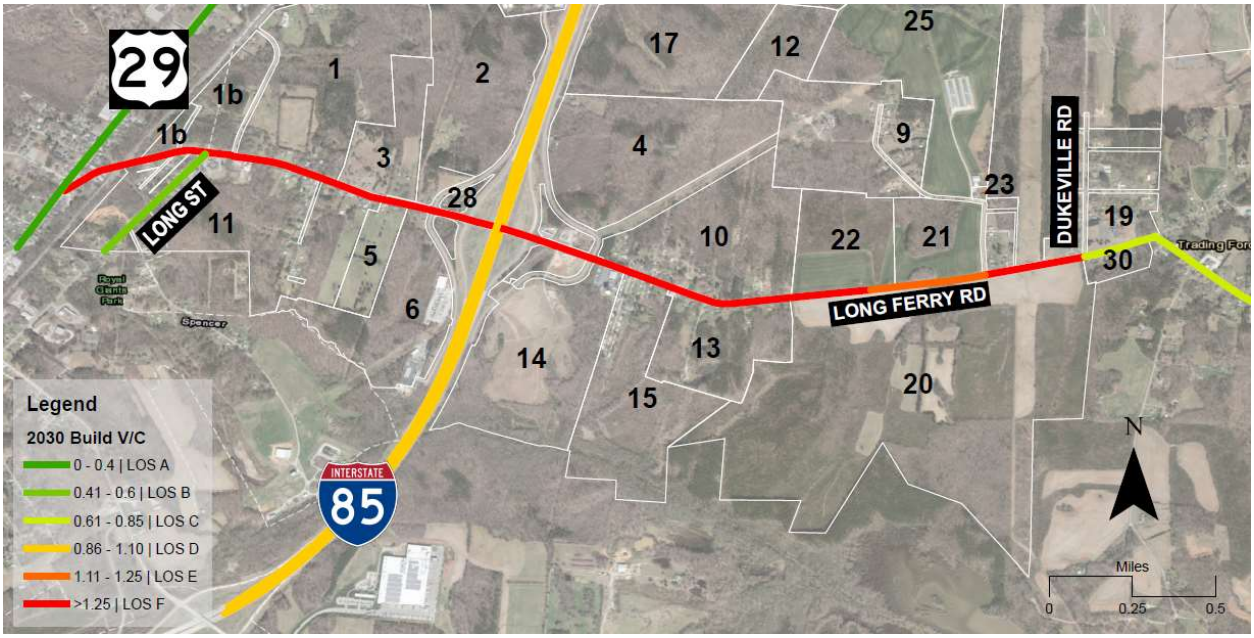
7.3 2030 BUILD SCENARIO

This section details the analysis results for the build scenario. The analysis for this scenario is based on the 2030 no-build traffic volumes combined with site trips. It uses existing cross sections along the corridor.

Based on V/C ratio analysis for the 2030 Build scenario, most of the Long Ferry Road corridor is expected to be at or over capacity. The lowest V/C ratio along the corridor is seen east of Dukeville Road, while rest of the corridor shows volumes over the LOS D capacity threshold.

Figure 10 displays the 2030 Build scenario V/C ratio analysis results.

Figure 10: 2030 Build Volume-to-Capacity Ratio Map



7.4 2030 BUILD WITH MITIGATION SCENARIO

This section details the analysis results for the build with mitigation scenario. The analysis for this scenario is based on the 2030 build traffic volumes.

Several improvements were applied to the 2030 Build scenario to attempt to improve corridor operations, safety, and mobility. These improvements included widening the roadway from 2-lanes to 4-lanes from the parcel group 3 area to the parcel group 20 & 22 area. The specific cross-section improvements along the entire corridor are further explained as cross-section recommendations in **Section 10.2**.

For portions of the corridor, capacity will be increased past the capacity studied here with medians proposed, so exclusive turn lanes into side streets and driveways can be more easily constructed within the future right-of-way.

Based on V/C ratio analysis for the 2030 Build with Mitigation scenario, the V/C ratios along Long Ferry Road corridor are expected to vary. Between US 29 (Salisbury Avenue) and the area of Parcel Group 3, volumes may be higher than capacity for an LOS D due to the constraints of the at-grade railroad crossing preventing roadway widening and the slower speeds within the town limits. At the interchange, volumes are the highest and are above the capacity for LOS D. The lowest V/C ratios along the corridor are seen between Parcel Group 3 and Hinkle Lane / Montclair Drive and east of Dukeville Road.Figure 11 displays the 2030 Build with Mitigation scenario V/C ratio analysis results.

Figure 11: 2030 Build with Mitigation Volume-to-Capacity Ratio Map

8 CAP-X ANALYSIS

The interchange of Long Ferry Road and I-85 was also analyzed in Cap-X, a tool which provides a planning-level comparison between potential interchange configurations. Cap-X was used to preliminarily study several possible interchange alternatives to help assess what additional improvements can be made at interchange intersections. Analysis showed that the traditional diamond interchange would likely be over capacity in the High-End Build scenario, which confirmed the above Synchro analysis. Three other interchange alternatives were considered: contraflow left interchange, diverging diamond interchange (DDI), and single point interchange. Contraflow left interchange was also likely to be over capacity in the PM peak, so was not considered further. DDI and single point interchanges are projected to be under capacity in both High-End Build scenario peak hours, even with less turn lanes than the traditional diamond interchange.

DDI and single point interchanges both have their own advantages and disadvantages. A DDI crosses arterial traffic to the opposite side of the road to eliminate the need for left turn phases in interchange signals, allowing vehicles to travel with less delay through signals, but they do have capacity issues if the percentage of turning vehicles is too high. Single point interchanges move all interchange traffic to a single intersection, which allows signal phasing to be reduced, but the structure required for this type of intersection can be cost-prohibitive.

The biggest advantage that a DDI has over a single point interchange along Long Ferry Road is constructability. A DDI can be separated onto two bridge structures, one for each direction of travel. This allows traffic to use the existing structure while a new bridge is constructed, and then all traffic can be shifted while the original bridge is replaced, or traffic can be immediately split between bridges if the original structure is acceptable. In contrast, to construct a single point interchange, which has a very large structure footprint, Long Ferry Road would need to be closed while the old bridge is removed and the new bridge is constructed. This is likely a less desirable solution based on local connectivity for alternative routes during construction and the preferences of local jurisdictions.

As development along Long Ferry Road progresses, these potential interchange configurations should be further evaluated for feasibility. The detailed results of the Cap-X analysis can be found in **Appendix I**.

9 TRUCK TRAFFIC

An additional calculation of the truck traffic and percentages was completed to compare the current conditions along Long Ferry Road to the future conditions with the proposed developments. The 2022 tube counts taken as part of the data collection phase of this analysis provide estimates of the current daily truck percentages east and west of the I-85 interchange on Long Ferry Road. Truck site trips for each parcel group along the study corridor were generated and distributed using the same methodology as the total vehicular traffic, as discussed in **Section 4** above. **Table 8** shows the estimated daily truck traffic for the 2022 Existing and 2030 Build scenarios. While the daily percentage of truck traffic may have decreased at some locations, there is a very notable increase in truck traffic at all locations. The increase in number of trucks on these roadways will require that roadway improvements consider truck accommodations, such as increased lane width and paved shoulder width and appropriate turn radii for truck turns.

Table 8: Truck Traffic on Long Ferry Road

LOCATION		2022 EXISTING			2030 BUILD		
		VEHICLE COUNT (VPD)	TRUCK COUNT (VPD)	TRUCK %	VEHICLE COUNT (VPD)	TRUCK COUNT (VPD)	TRUCK %
West of I-85 Southbound Ramps	Eastbound	2,853	143	5%	20,634	2,553	12%
	Westbound	2,552	357	14%	20,172	2,870	14%
	Total	5,405	500	9%	40,806	5,423	13%
East of I-85 Northbound Ramps	Eastbound	4,869	682	14%	27,131	2,917	11%
	Westbound	4,867	681	14%	27,123	2,917	11%
	Total	9,736	1,363	14%	54,254	5,834	11%

10 RECOMMENDED IMPROVEMENTS

10.1 CORRIDOR IMPROVEMENT STRATEGIES

Long Ferry Road corridor improvement strategies generally consisted of access management, safety treatments, and capacity enhancements to improve mobility, maintain safety, provide efficient operations and support economic development.

10.1.1 ACCESS MANAGEMENT

Per FHWA, access management is the proactive management of vehicular access points to land parcels adjacent to all manner of roadways. Implementing access management can provide benefits to the transportation system by increasing roadway capacity, reducing crashes, and shortening travel times. The following access management techniques are recommended along the Long Ferry Road corridor:

- Access spacing – Relocate Hinkle Lane and Montclair Drive intersection approximately 200 feet west of its currently location, away from the I-85 Southbound Ramp intersection, to increase the distance, allow room for turn lanes, and improve traffic flow. This relocation is planned based on the proposed local developments, as discussed in **Section 2.4.4**.
- Driveway spacing – As parcels are developed, consolidate existing driveways to improve driveway spacing and reduce conflict points.
- Turning lanes – Provide dedicated left and right-turn lanes with appropriate full storage and taper at intersections to provide safe turns and keep through traffic flowing.
- Median treatments – Provide non-traversable, raised medians to regulate access and reduce crashes along sections of Long Ferry Road.
- Right-of-Way management – Establish policies and plans to reserve right-of-way along the corridor for future widenings, good sight distance, and access-related issues.

10.1.2 SAFETY TREATMENTS

Safety improvements have the ability to address specific traffic safety concerns. These improvements can reduce the number of traffic crashes, injuries, and fatalities by reducing the potential for and the severity of these incidents on roadways. NCDOT has developed crash reduction factor (CRF) information and safety treatments by categories to represent the expected effect of a countermeasure to improve safety. These treatments have the flexibility to be implemented as lower cost, near term treatments or incorporated into higher cost, long term projects. The following safety treatments by category should be considered along the corridor to address existing concerns or to proactively implement safety measures.

- Traffic signals – Install new traffic signals at intersections when warranted by future development and traffic growth and approved by NCDOT. Additional signal-related safety countermeasures may include improved signal timing and providing flashing yellow arrow (FYA). Traffic signals and crashes should continue to be monitored over time to determine if additional safety treatments are beneficial.
- Reduce conflicts – Provide a raised median along sections of Long Ferry Road per the proposed typical sections and access management near intersections with median channelization.
- Turn lanes and ramps – Install left-turn and right-turns at signal controlled and stop controlled intersections. Install dual left-turns and right-turns at signal controlled intersections, where necessary.

Along US 29 (Salisbury Avenue), consider extending road diet (4 lane to 3 lane conversion with two-way left turn lane (TWLTL)) to Long Ferry Road.

- Roadway improvements – Related to the HSIP between Barrier Lane and Stoner Morgan Road, consider lane departure countermeasures such as centerline rumble strips, shoulder rumble strips, shoulder widening, resurfacing with safety edge, and pavement widening. These improvements could be a modernization project specific to this section or considered corridor wide.
- Roadside improvements – Related to the HSIP between Barrier Lane and Stoner Morgan Road, consider removal of fixed objects and/or flatten side slopes. Neither countermeasure may apply for this section.
- Alignment and sight distance – Related to the HSIP between Barrier Lane and Stoner Morgan Road, review superelevation of horizontal curve and horizontal alignment for potential improvements. Consider reducing intersection skew angle at Long Ferry Road and Leonard Road located in curve. This could include reducing the skew angle or a full intersection realignment.
- Signing delineation and illumination – Related to the HSIP between Barrier Lane and Stoner Morgan Road, consider advance curve warnings signs, chevron signs, and curve warning pavement markings. Consider roadway lighting at key intersections near I-85 and at US 29.
- Pedestrian and bicycle – Provide crosswalks, bike lanes, sidewalks, and countdown pedestrian signals for proposed typical sections west of I-85.
- Railroad crossing – Provide grade separation of the existing railroad crossing associated with future Jake Alexander Boulevard N Extension. This future extension could also realign Long Ferry Road and the undesirable skew at US 29 intersection.
- Interchange configuration – Further evaluate the appropriateness and feasibility of upgrading the interchange configuration to a diverging diamond interchange (DDI). A national study found that installing a DDI reduced overall crashes by 37% and reduced injury and fatal crashes by 54%. Per NCHRP 959 Diverging Diamond Interchange Informational Guide, a DDI generally generates higher capacity per lane for motor vehicles compared to a conventional diamond interchange. Additionally, DDIs have special truck service needs associated with vehicle tracking and the impacts of speeds associated with the crossover design.

10.1.3 CAPACITY IMPROVEMENTS

Roadway and intersection capacity improvements are recommended along the Long Ferry Road corridor and intersection side streets and ramp terminals to address capacity needs associated with future economic development. These capacity improvements promote mobility, maintain safety, and provide efficient operations for all users, including the projected increase in truck traffic associated with industrial and commercial development. Intersection improvements include signal control, when warranted and approved by NCDOT, signal timing, turn lanes, and design accommodations. Roadway improvements generally include NCDOT typical sections that transition along the corridor to meet the projected daily and peak hour volume demands and characteristics of the area. The specifically recommended capacity improvements for intersections and segments along the Long Ferry Road corridor are detailed in **Sections 10.2 and 10.3**, respectively.

10.2 INTERSECTION IMPROVEMENTS

Signal control is suggested for installation at the following intersections:

— Long Ferry Road / Charles Street & US 29 (Salisbury Avenue)
— Long Ferry Road & Long Street
— Long Ferry Road & Hinkle Lane / Montclair Drive
— Long Ferry Road & I-85 Southbound Ramps
— Long Ferry Road & I-85 Northbound Ramps
— Long Ferry Road & Willow Creek Drive / Front Creek Road

Long Ferry Road & I-85 Southbound Ramps, Long Ferry Road & I-85 Northbound Ramps, and Long Ferry Road & Willow Creek Drive / Front Creek Road were also recommended for signalization in the RedRock industrial development TIA. An additional signal was recommended at one of the new RedRock industrial access roads.

Cross streets Hinkle Lane and Montclair Drive should be realigned 200 feet to the west to improve access spacing from the intersection with I-85 southbound ramps and to allow room for appropriate turn lanes at both intersections. This relocation is planned based on the proposed local developments, as discussed in **Section 2.4.4**.

Intersections are designed to accommodate heavy vehicle turning paths to mitigate the impact of increased truck traffic.

The potential US 29 (Salisbury Avenue) road diet was generally considered in these recommendations, but the US 29 (Salisbury Avenue) & Long Ferry Road intersection operations and geometry at should be re-evaluated with road diet implementation.

The recommended laneage at all study intersections is shown in **Table 9**. An additional laneage figure is included in **Appendix B, Figure 7**. Concept layouts illustrating all corridor improvements are also included in **Appendix J**.

Table 9: Intersection Approach Laneage

INTERSECTION	APPROACH	APPROACH LANEAGE
Long Ferry Road / Charles Street & US 29 (Salisbury Avenue)	Eastbound	— 125' exclusive left-turn lane — Shared through / right-turn lane
	Westbound	— 350' exclusive left-turn lane — Shared through / right-turn lane
	Northbound	— 100' exclusive left-turn lane — Through lane — 375' exclusive right-turn lane
	Southbound	— 350' exclusive left-turn lane — Shared through / right-turn lane
Long Ferry Road & Long Street	Eastbound	— Shared through / right-turn lane
	Westbound	— 340' exclusive left-turn lane — Through lane
	Northbound	— Shared left-turn / right-turn lane
Long Ferry Road & Hinkle Lane / Montclair Drive	Eastbound	— 150' exclusive left-turn lane — Through lane — Shared through / right-turn lane
	Westbound	— 350' exclusive left-turn lane — Two through lanes — 200' exclusive right-turn lane
	Northbound	— Shared left-turn / through lane — 300' exclusive right-turn lane
	Southbound	— Two 450' exclusive left-turn lanes — Shared through / right-turn lane
Long Ferry Road & I-85 Southbound Ramps	Eastbound	— Two through lanes — Two 500' exclusive right-turn lanes
	Westbound	— Two 300' exclusive left-turn lanes — Two through lanes
	Southbound	— Two 700' exclusive left-turn lanes — Shared through / right-turn lane — 500' exclusive right-turn lane
Long Ferry Road & I-85 Northbound Ramps	Eastbound	— Two 200' exclusive left-turn lanes — Two through lanes
	Westbound	— Two through lanes — Two 500' exclusive right-turn lanes
	Northbound	— Two 400' exclusive left-turn lanes — Shared through / right-turn lane — 900' exclusive right-turn lane
Long Ferry Road & Willow Creek Drive / Front Creek Road	Eastbound	— Two 400' exclusive left-turn lanes — Two through lanes — 100' exclusive right-turn lane
	Westbound	— 100' exclusive left-turn lane — Two through lanes — 100' exclusive right-turn lane
	Northbound	— 400' exclusive left-turn lane — Shared through / right-turn lane
	Southbound	— Shared left-turn / though lane — Two 700' exclusive right-turn lanes
Long Ferry Road & Dukeville Road	Eastbound	— 150' exclusive left-turn lane — Through lane
	Westbound	— Shared through / right-turn lane
	Southbound	— Shared left-turn / right-turn lane
Long Ferry Road & Leonard Road	Eastbound	— Shared left-turn / through lane
	Westbound	— Shared through / right-turn lane
	Southbound	— Shared left-turn / right-turn lane

10.3 CROSS-SECTION IMPROVEMENTS

Six types of street sections are recommended to guide the improvement of the Long Ferry Road corridor. These cross-sections are not intended to be prescriptive but rather provide the minimum design standards in accordance with NCDOT design criteria while providing flexibility in access management, roadway capacity, and with future development to meet the transportation, mobility and safety needs along the corridor. All cross-section recommendations are appropriate to use with the existing speed limits along the corridor. These recommendations also consider and are consistent with the CRMPO CTP plans for the long-term vision of the corridor. **Table 10** and **Figure 12** show an overview of the proposed cross-sections and their locations along the corridor.

To accommodate the increase in truck traffic along the corridor, these cross sections generally include some combination of lane-width increase, shoulder-width increase, or capacity increase. These improvements, combined with access management strategies, which can be more easily implemented in divided cross-sections, should help limit the negative impact that the increase in truck traffic will have on the capacity of the roadway corridor.

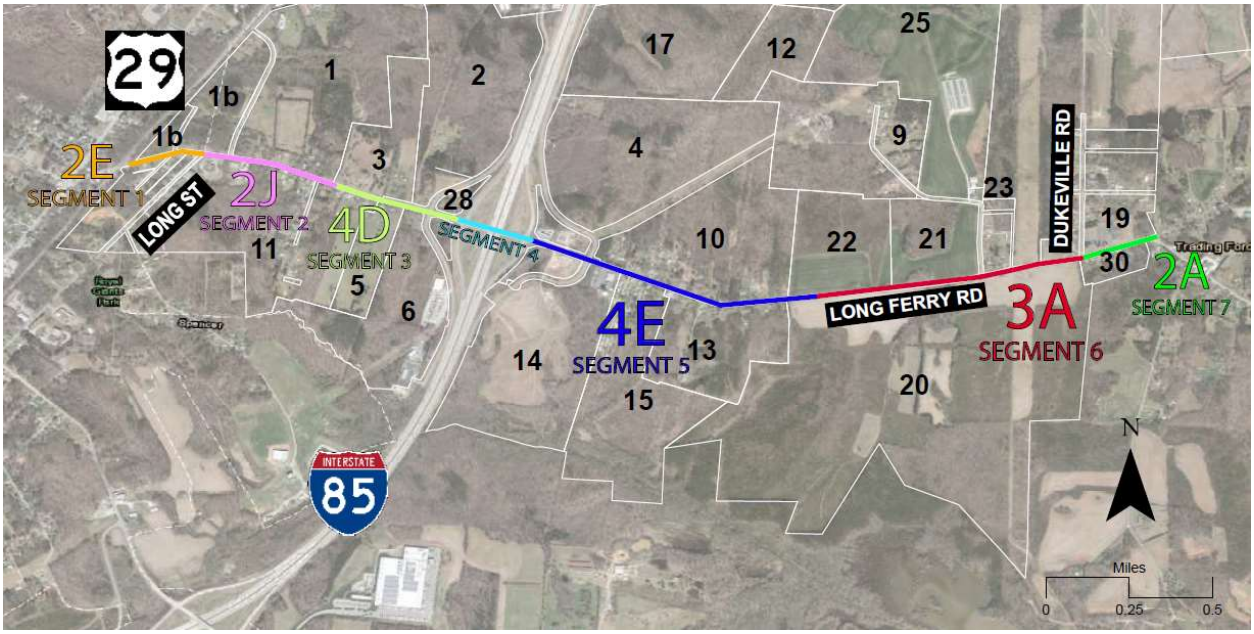
Bicycle and pedestrian accommodations are included west of I-85 for consistency based on town limits and existing land uses.

Concept layouts illustrating all corridor improvements are included in **Appendix J**.

Table 10: Cross-Section Improvements Summary

ROADWAY SEGMENT	TYPICAL SECTION ID	RIGHT-OF-WAY WIDTH	TYPICAL SECTION
Segment 1: Long Ferry Road from US 29 (Salisbury Avenue) to Long Street	2E	60’	2 Lane Undivided with Curb & Gutter, Bike Lanes, and Sidewalks
Segment 2: Long Ferry Road from Long Street to Parcel Group 3 Area	2J	90’	2 Lane Divided with Curb & Gutter, Bike Lanes, and Sidewalks
Segment 3: Long Ferry Road from Parcel Group 3 Area to I-85 Southbound Ramps	4D	110’	4 Lane Divided with Curb & Gutter, Bike Lanes, and Sidewalks
Segment 4: Long Ferry Road from I-85 Southbound Ramps to I-85 Northbound Ramps	-	-	6-Lane Bridge with Curb & Gutter and Sidewalks
Segment 5: Long Ferry Road from I-85 Northbound Ramps to Parcel Group 20 & 22 Area	4E	110’	4 Lane Divided with Paved Shoulders
Segment 6: Long Ferry Road from Parcel Group 20 & 22 Area to Dukeville Road	3A	80’	2 Lane with Two Way Left Turn Lane and Paved Shoulders
Segment 7: Long Ferry Road from Dukeville Road to Leonard Road	2A	60’	2 Lane Undivided with Paved Shoulders

Figure 12: Recommended Corridor Cross-Sections



10.3.1 SEGMENT 1: LONG FERRY ROAD FROM US 29 (SALISBURY AVENUE) TO LONG STREET

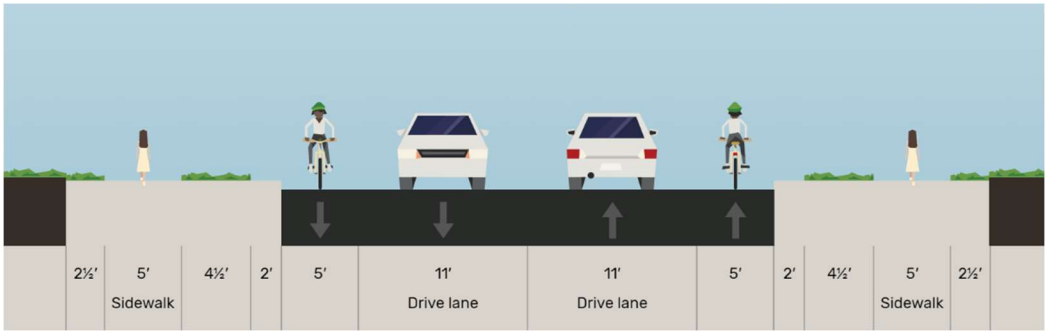
For the section of Long Ferry Road from US 29 (Salisbury Avenue) to Long Street, a typical section 2E is recommended, which includes, at a minimum:

- Two 11'-wide travel lanes going in opposite directions
- Two 5'-wide bike lanes going in opposite directions
- 2' curb and gutter section at edge of travel lanes
- A 4.5'-wide buffer and 5'-wide sidewalk on either side of the roadway
- A minimum of 2.5' from the edges of sidewalk to the edge of right-of-way

This equates to an overall right-of-way of 60 feet. This cross section is illustrated in **Figure 13**. In addition to this cross section, construction of exclusive turn lanes into future developments may be incorporated. This section generally maintains the current cross section, including the at-grade railroad crossing, with the addition of bike lanes and sidewalks. The CRMPO CTP includes realigning this section by moving the intersection of Long Ferry Road and US 29 (Salisbury Avenue) to connect with an extension of Jake Alexander Boulevard and includes a grade-separated railroad crossing. The cross-section should be reevaluated for corridor continuity if and when that roadway project is completed.

The expected LOS D capacity for this cross section is 10,200 vpd.

Figure 13: Typical Section 2E – 2 Lane Undivided with Curb & Gutter, Bike Lanes, and Sidewalks



10.3.2 SEGMENT 2: LONG FERRY ROAD FROM LONG STREET TO PARCEL GROUP 3 AREA

A typical section 2J is recommend for Long Ferry Road from Long Street to the western edge of Parcel Group 3. This typical section includes, at a minimum:

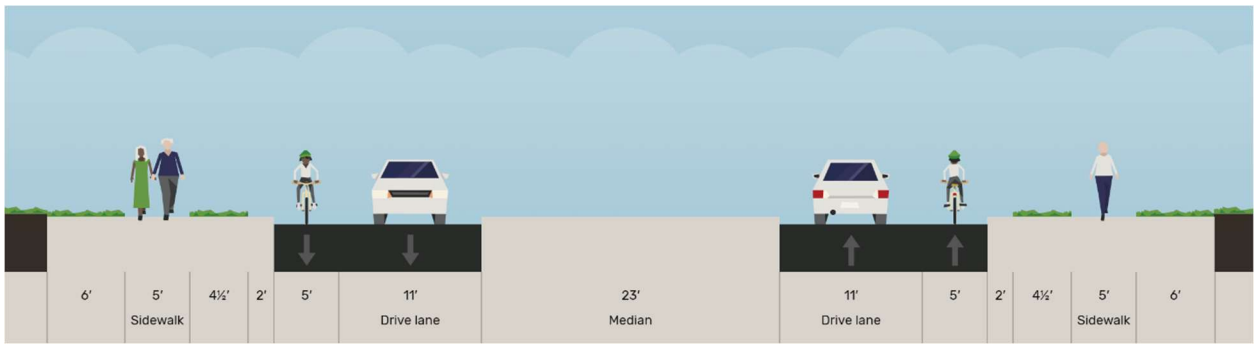
- A 23'-wide center median
- Two 11'-wide travel lanes going in opposite directions
- Two 5'-wide bike lanes going in opposite directions
- 2' curb and gutter section at edge of travel lanes
- A 4.5'-wide buffer and 5'-wide sidewalk on either side of the roadway
- A minimum of 6' from the edges of sidewalk to the edge of right-of-way

This equates to an overall right-of-way of 90 feet. This cross section is illustrated in **Figure 14**. In addition to this cross section, construction of exclusive turn lanes into future developments may be incorporated.

The Town of Spencer intends to use a 60' right-of-way in this segment, using the local ordinance requirement for street trees and sidewalks to provide the additional 30' of the cross section.

The expected LOS D capacity for this cross section is 15,100 vpd.

Figure 14: Typical Section 2J – 2 Lane Divided with Curb & Gutter, Bike Lanes, and Sidewalks



10.3.3 SEGMENT 3: LONG FERRY ROAD FROM PARCEL GROUP 3 AREA TO I-85 SOUTHBOUND RAMPS

A typical section 4D is recommend for Long Ferry Road from the western edge of Parcel Group 3 to the I-85 Southbound Ramps. This typical section includes, at a minimum:

- A 23'-wide center median
- Four 11'-wide travel lanes going in opposite directions
- Two 5'-wide bike lanes going in opposite directions
- 2' curb and gutter section at edge of travel lanes
- A 4.5'-wide buffer and 5'-wide sidewalk on either side of the roadway
- A minimum of 6' from the edges of sidewalk to the edge of right-of-way

This equates to an overall right-of-way of 110 feet. This cross section is illustrated in **Figure 15**. In addition to this cross section, construction of exclusive turn lanes into future developments may be incorporated. This cross section aligns with the overall long-term plans for Long Ferry Road outlined in the CRMPO CTP. Along this section, cross streets Hinkle Lane and Montclair Drive will be realigned to provide adequate separation from the intersection with I-85 southbound ramps.

The expected LOS D capacity for this cross section is 35,400 vpd.

Figure 15: Typical Section 4D – 4 Lane Divided with Curb & Gutter, Bike Lanes, and Sidewalk

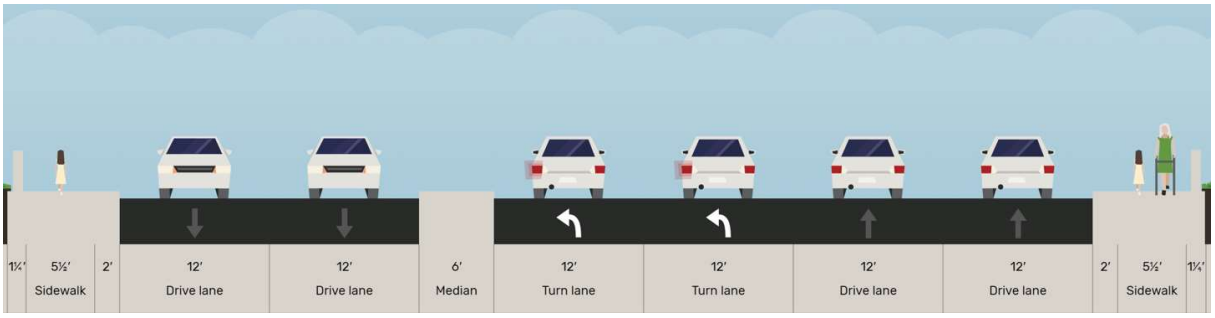
10.3.4 SEGMENT 4: LONG FERRY ROAD FROM I-85 SOUTHBOUND RAMPS TO I-85 NORTHBOUND RAMPS

Between the I-85 ramp terminals on Long Ferry Road, a 6-lane bridge section is recommended. This typical section is comprised of:

- Two 12'-wide travel lanes going in opposite directions
- Two 12'-wide back-to-back left turn lanes
- One 6'-wide median between opposing traffic lanes
- Two 8' 9"-wide shoulders to accommodate 2' gutter, 5' 6" sidewalk, and 1' 3" bridge deck railing

This equates to an overall bridge deck width of 95.5 feet. This cross section is illustrated in **Figure 16**.

Figure 16: Typical 6-Lane Bridge Section



10.3.5 SEGMENT 5: LONG FERRY ROAD FROM I-85 NORTHBOUND RAMPS TO PARCEL GROUP 20 & 22 AREA

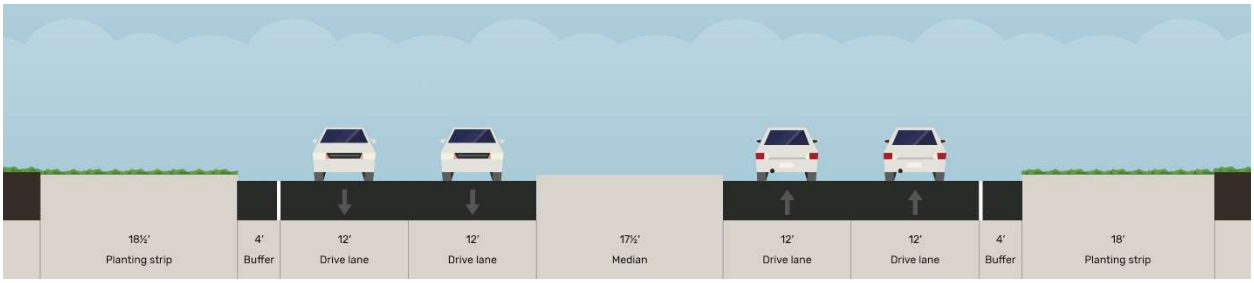
A typical section 4D is recommend for Long Ferry Road from midway through Parcel Groups 1 & 11 to the I-85 Southbound Ramps. This typical section includes, at a minimum:

- A 17.5'-wide center median
- Four 12'-wide travel lanes going in opposite directions
- Two 4'-wide paved shoulders on the far sides of the travel lanes
- A minimum of 18.25' from the edges of pavement (including paved shoulders) to the edge of right-of-way

This equates to an overall right-of-way of 110 feet. This cross section is illustrated in **Figure 17**. In addition to this cross section, construction of exclusive turn lanes into future developments may be incorporated.

The expected LOS D capacity for this cross section is 36,600 vpd.

Figure 17: Typical Section 4E – 4 Lane Divided with Paved Shoulders and Sidewalks



10.3.6 SEGMENT 6: LONG FERRY ROAD FROM PARCEL GROUP 20 & 22 AREA TO DUKEVILLE ROAD

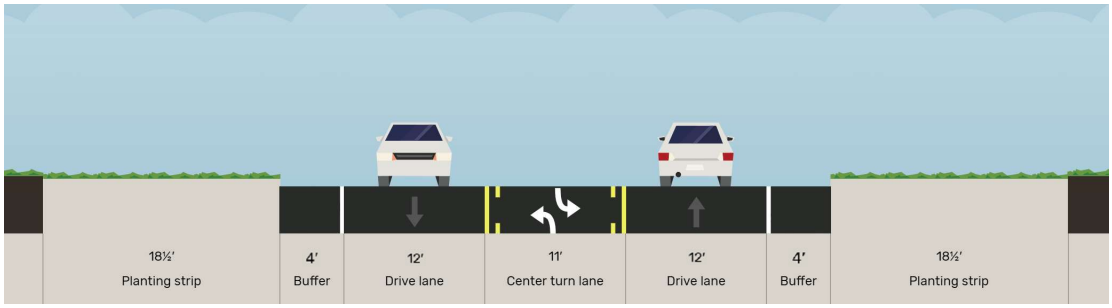
For the section of Long Ferry Road from midway through Parcel Group 20 & 22 (RedRock Industrial Development) to Dukeville Road, a modified typical section 3A is recommended, which includes, at a minimum:

- Two 12'-wide travel lanes going in opposite directions
- One 11'-wide center two-way left-turn lane
- Two 4'-wide paved shoulders on the far sides of the travel lanes
- A minimum of 18.5' from the edges of pavement (including paved shoulders) to the edge of right-of-way

This equates to an overall right-of-way of 80 feet. This cross section is illustrated in **Figure 18**. In addition to this cross section, construction of exclusive turn lanes into future developments may be incorporated. Required right-of-way may vary or increase along RedRock development frontage to accommodate auxiliary turn lanes and site plan requirements.

The expected LOS D capacity for this cross section is 15,900 vpd.

Figure 18: Modified Typical Section 3A – 2 Lane with Two Way Left Turn Lane and Paved Shoulders



10.3.7 SEGMENT 7: LONG FERRY ROAD FROM DUKEVILLE ROAD TO LEONARD ROAD

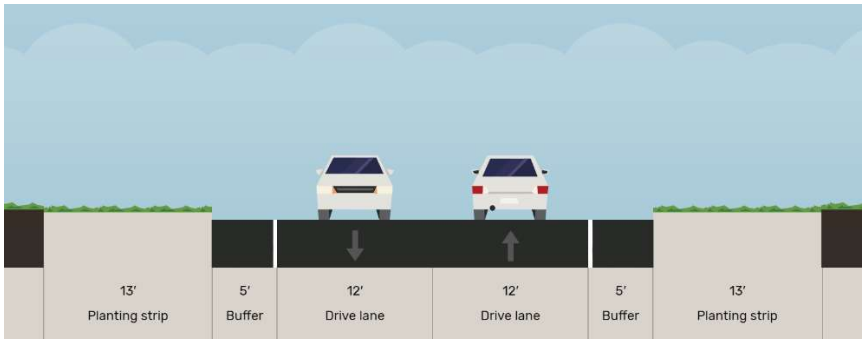
For the section of Long Ferry Road from Dukeville Road to Leonard Road, a typical section 2A is recommended, which includes, at a minimum:

- Two 12'-wide travel lanes going in opposite directions
- Two 5'-wide paved shoulders on the far sides of the travel lanes
- A minimum of 13' from the edges of pavement (including paved shoulders) to the edge of right-of-way

This equates to an overall right-of-way of 60 feet. This cross section is illustrated in **Figure 19**. In addition to this cross section, construction of exclusive turn lanes into future developments may be incorporated. This section generally maintains the current cross section, with widened paved shoulders and clear zones. This may help decrease run-off-the-road crashes that occur through this section.

The expected LOS D capacity for this cross section is 12,200 vpd.

Figure 19: Typical Section 2A – 2 Lane Undivided with Paved Shoulders



10.4 PLANNING-LEVEL COST ESTIMATE OF IMPROVEMENTS

Planning-level cost estimates were developed for the recommended roadway improvements using the latest NCDOT P6.0 cost estimates. For planning purposes, these values were increased by 20% to adjust for inflation from 2019 to 2023. Per-mile construction costs for roadway widening were calculated directly based on recommended cross-section upgrades. Additional contingencies for construction, right-of-way, and utility costs were applied as a percentage of the roadway widening cost estimate, following NCDOT P6.0 methodology. The total corridor cost estimates do not subtract or break out specific roadway improvements and costs that future development may be responsible for contributing. Cost will vary over time and the final cost to implement could be substantially more than shown based on construction and material prices at the time of constructions. The total corridor cost estimate is shown in **Table 11**, and a summary by the three corridor Segments A, B and C is shown in **Table 12**. Cost will vary over time and the final cost to implement could be substantially more than shown based on construction and material prices at the time of construction.

Table 11: Corridor Construction Cost Estimate

COST ESTIMATE AND INPUTS	UNITS
Long Ferry Corridor Length (Miles)	2.8
Proposed Cross-Section Cost	$ 12,343,939
Proposed Cross-Section Cost (Cross Streets)	$ 3,731,061
Proposed Cross-Section Cost (8 additional ramp lanes)	$ 2,000,000
Total Cross-Section Costs	$ 18,075,000
Total Cross-Section Costs (2019 to 2023 Adjustment)	20%
Proposed 2023 Cross-Section Cost	**$ 21,690,000**
Construction-- Level Terrain	$ -
Construction-- Misc. & Mob.-- Structures	$ 5,422,500
Construction-- Misc. & Mob.-- Roadway	$ 11,929,500
Construction-- Misc. & Mob.-- Intersection	$ 8,676,000
Construction-- Eng. & Constr.	$ 3,253,500
Construction-- Project Bridge Length Offset, Widen	$ 2,397,000
Construction-- Area Type, Suburban	$ -
Right-of-Way-- Parcel, Partial/No Access Control	$ 10,845,000
Utilities-- Percentage Of Right Of Way	$ 3,253,500
Construction-- ROW-- Utilities	**$ 45,777,000**
TOTAL COST ESTIMATE	**$ 67,467,000**

Table 12: Corridor Construction Cost Estimate by Segment

SEGMENT A-- COST ESTIMATE LONG FERRY ROAD WEST OF I-85 (US 29 TO REALIGNED HINKLE / MONTCLAIR)	UNITS
Proposed 2023 Cross-Section Cost	$ 3,959,091
Construction-- ROW-- Utilities	$ 7,918,182
Total Cost Estimate	**$ 11,878,000**
SEGMENT B-- COST ESTIMATE LONG FERRY ROAD / I-85 INTERCHANGE IMPROVEMENTS (REALIGNED HINKLE / MONTCLAIR TO WILLOW CREEK / FRONT CREEK)	**UNITS**
Proposed 2023 Cross-Section Cost	$ 8,195,455
Construction-- ROW-- Utilities	$ 18,787,909
Total Cost Estimate	**$ 26,984,000**
SEGMENT C-- COST ESTIMATE LONG FERRY ROAD EAST OF I-85 (WILLOW CREEK / FRONT CREEK TO LEONARD)	**UNITS**
Proposed 2023 Cross-Section Cost	$ 9,535,455
Construction-- ROW-- Utilities	$ 19,070,909
Total Cost Estimate	**$ 28,607,000**

10.5 POLICY RECOMMENDATIONS

10.5.1 INCREASED SETBACKS ALONG MAJOR THOROUGHFARES

Require that development occurring along major thoroughfares that have a planned future cross-section that requires right-of-way greater than what is existing along the thoroughfare to institute larger setbacks than those required in the base zoning district to accommodate future additional right-of-way needs. Using a centerline setback establishes a balanced setback along the entire roadway, whereas using a setback from a future right-of-way allows a setback line to better follow a planned future cross-section if the future right-of-way is unbalanced to one side or the other of an existing centerline.

SAMPLE LANGUAGE

Where property that is subject to a development application is located adjacent to a thoroughfare, existing or proposed, that has a planned future cross-section that requires new right-of-way or right-of-way greater than what is existing as identified in a Comprehensive Transportation Plan or other thoroughfare plan, building setbacks shall be measured from the future right-of-way as identified in the adopted plan or build-to lines established as measured from the centerline of the existing or future roadway.

This setback can be established through a setback table for certain major thoroughfares as measured from either the centerline of the roadway or a proposed future right-of-way line rather than a setback from existing right-of-way line, as required in the base zoning district.

10.5.2 TRAFFIC IMPACTS ANALYSIS

NCDOT requires that Traffic Impact Assessments (TIAs) be conducted for developments forecast to generate 3,000 or greater vehicle trips per day. Rowan County and the Town of Spencer do not require a TIA in their land development codes beyond this threshold. The local jurisdictions should adopt language that would allow them to request a Preliminary TIA when lower thresholds are met that would provide an idea of what local impacts can occur from the proposed development. Thresholds can also be established for particular roadways so that potential impacts of more sensitive roadways can be considered. Measuring traffic impacts will also be essential to determining what share of the responsibility the developer should reasonably possess for the transportation infrastructure when property is improved. Specific thresholds for traffic generation should be established that would trigger a TIA. Instituting this standard will create clear expectations for new development.

Suggested threshold is developments that exceed the High-End land use scenario traffic volumes may be required to provide a TIA at the discretion of the local jurisdiction.

The process can include a preliminary TIA review utilizing specific development characteristics of the proposal to determine what level of detail will be required from the TIA. Some jurisdictions divide this into Tier 1 and Tier 2 analyses. A Tier 1 analysis would be completed when development is anticipated to meet or minimally exceed the predetermined threshold for a study. A Tier 2 analysis typically involves more systemic interventions. This approach allows a right sizing of the analysis that considers the existing infrastructure, context and use intensity.

SAMPLE LANGUAGE

An applicant seeking a development approval shall submit a Preliminary TIA. The municipal staff will review the Preliminary TIA and determine the appropriate traffic impact analysis to be performed. Depending on the anticipated impact to the transportation network:

1. The applicant may not be required to perform further study. In this instance, the Preliminary TIA shall be accepted;
2. The applicant may be required to conduct a Tier 1 TIA; or
3. The applicant may be required to conduct a Tier 2 TIA.

Thresholds for TIA Tiers specifies the type of traffic impact analysis that shall be performed based on the anticipated ADT and/or peak hour trips.

A Tier 1 TIA can be utilized for proposed development or redevelopment (new, expansion of an existing use, or redevelopment of an existing use with a different use) anticipated to generate between 500 – 1,000 additional average daily traffic and/or 50 – 100 additional peak hour trips based on the ITE Trip Generation Manual, latest addition.

A Tier 2 TIA is comprehensive in scope and can be utilized for proposed development (new, expansion of existing use, or redevelopment of an existing use with a higher intensity use) that is (1) anticipated to generate more than 1,000 additional average daily traffic and/or 100 or more additional peak hour trips or (2) located in proximity to other development generating a significant number of average daily trips and/or peak hour trips, has potential to cause detrimental cumulative impacts to the overall transportation network, and/or or creates a public safety concern.

10.5.3 RIGHT-OF-WAY DEDICATION AND IMPROVEMENTS

As the Long Ferry corridor becomes more active with large scale developments, construction of infrastructure improvements and facilitation of new rights-of-way will be essential to ensuring that future improvements can be installed in a cost-effective and practical manner. The applicable jurisdiction should require developers to contribute to these improvements through:

— Reservation or dedication of any additional rights-of-way
— Installation of on- or off-site improvements related to the development's potential impacts

Typically, these improvements have been previously identified in an approved transportation plan from the city, state or MPO. Other on- or off-site improvements specified in a Traffic Impact Analysis can be included as a potential mitigation for the development's impacts either as constructed by the developer or provided in a payment-in-lieu of construction.

SAMPLE LANGUAGE

Where a proposed development is adjacent to a road designated for widening or improvement on an adopted transportation plan and insufficient right-of-way exists to provide for the designated improvement, such additional right-of-way, as specified for the future road cross-section in the adopted plan, shall be dedicated to the appropriate public entry by the developer as a requirement of final plat approval. Such dedication shall be limited to the length of the road immediately along the subject property lines.

10.5.4 OPTION FOR PAYMENT-IN-LIEU OF IMPROVEMENTS

Construction of improvements are not always feasible at the time of property development. This recommendation provides an alternative to construction of the improvements at the time of development and allows the local jurisdiction to recoup a share of the costs.

SAMPLE LANGUAGE

In instances where a local jurisdiction or Department of Transportation deems that an improvement be scheduled for construction at a later date, the Developer may make a payment-in-lieu of construction equal to the pro-rata share of the costs of construction. The local jurisdiction will have to create a public improvement fund to collect this payment and the fund must be compartmentalized based on each roadway so that payments-in-lieu of construction are dedicated to respective roadway improvements where they are collected.

10.5.5 CROSS-ACCESS, STUB STREETS AND ACCESS MANAGEMENT

Proposed developments should install cross-access roads and/or driveways to accommodate circulation between adjacent parcels. Access management is presented as a congestion management strategy in the 2050 Metropolitan Transportation Plan for Cabarrus Rowan MPO. It states“"...well-spaced driveways and connectivity between adjacent developments”" are key to reducing congestion and improving capacity. The roads and/or driveways should direct vehicular traffic to consolidated intersections thereby reducing excess curb cuts onto Long Ferry Road and other thoroughfares. The reduction in curb cuts reduces points of conflict when turning onto the road. When there are few alternative routes near a corridor, cross-access becomes even more critical to ensuring safety

and adequate traffic flow. The lack of cross-access coupled with a drastic increase in freight traffic will be a challenge for Long Ferry Road as it develops into an industrial corridor.

Cross-access can be accomplished through the use of stub streets and/or driveways that will connect a development to the future development of an adjacent property. Where a development is approved adjacent to a site that has a stub street or driveway constructed, the development shall connect into all available stub streets or driveways to create cross access.

For example, the proposed RedRock industrial development will have multiple curb cuts onto Long Ferry, which will likely increase left turning movements onto the road drastically. Adjacent industrial and warehousing uses already exist or are planned. Since the properties in the corridor are not part of a cohesive industrial campus, it will be up to the local jurisdictions to collectively collaborate with developers to determine the most favorable locations and methods for cross access and shared maintenance.

Some municipalities have gone as far as developing a formula to calculate how many cross-access street or driveway points would be required on all sides of the development based on either a potential traffic impact, size of the parcel, or length of frontage.

SAMPLE LANGUAGE

All development shall be designed to allow for vehicular cross-access to adjacent properties to encourage shared access points on public streets. Cross-access shall be installed to the shared property line of an adjoining property. In the event a temporary construction easement or similar easement is required for the cross-access to be constructed to the shared property line and the adjoining owner is unwilling to enter into such an easement, then the cross-access shall be constructed to a point as close as feasible to the property line and the unwilling property owner shall be responsible for completing the cross-access when their property is developed.

The requirement for cross-access to an adjacent property line may be considered for exemption if the Planning Department and/or the Engineering Department deem a connection not feasible due to:

- Topographical constraints;
- Environmental constraints, including without limitation the presence of stream buffers or other natural features;
- Public safety;
- Sufficient cross-access already exists on or to the subject property;
- The principal use of the subject property is incompatible with an existing use or use classification of an adjoining property. For purposes of evaluating incompatibility, the following shall apply:
    - Adjacent property classified as a residential use shall be deemed incompatible with property classified as Heavy Industrial or Light Industrial.
    - Adjacent property classified as Civic & Institutional shall be deemed incompatible with property classified as Heavy Industrial or Light Industrial.
    - Existing or proposed industrial uses shall be deemed incompatible with all other uses.

Table 13: Existing Code Review and Recommendations

	EXISTING CODE		RECOMMENDATIONS
	ROWAN COUNTY	SPENCER, NC	
Traffic Impact Assessment (TIA)	Sec 21-52 (13) (TIA) as requested by Zoning Administrator as site plan requirement	No requirements found	— Preliminary TIA for development with specific thresholds based on potential for significant impacts. — Reviewed by third party consultants chosen by jurisdiction for on-call and verified by staff, or prequalify consultants eligible to perform the TIA
Required ROW reservation	Observation of ROW is required but not dedication	No requirements found	— ROW to be reserved for future road widenings during development review if future improvements have been incorporated into a plan by a city/county/state planning entity. — Where infrastructure upgrade is identified in plans (i.e., sidewalks, road widening, drainage), payment in lieu of construction could be considered.
Cross-access between adjoining parcels	No requirements found	No requirements found	— Property owners must coordinate with local jurisdiction to determine adequate location of shared access for adjacent properties. Where cross access is preserved, developers shall connect sites to existing and/or proposed cross access stub streets and driveways. This should be combined with an effort to reduce the number of curb cuts onto major streets.

11 CONCLUSION

The Long Ferry Road corridor is an important east-west transportation corridor connecting Spencer, I-85, and recreational opportunities. This corridor consists primarily of residential, highway corridor commercial and industrial uses, and agricultural land uses. This 2.8 mile section of Long Ferry Road has three distinct segments that include west of I-85 in the Town of Spencer, the I-85 interchange area, and east of I-85 in Rowan County. This corridor study evaluated land use development scenarios, associated increases in vehicular and truck traffic, and projected traffic operations in 2030. This evaluation resulted in the development of corridor strategies, transportation mitigations, and policy recommendations in support of the overall study goals.

Corridor improvement strategies generally consist of access management, safety treatments, and capacity enhancements to improve mobility, maintain safety, and provide efficient operations while supporting economic development.

Access management strategies include relocating the Hinkle Lane and Montclair Drive intersection to improve access spacing, consolidating driveways as parcels develop, providing dedicated turn lanes, installing median treatments along sections of the corridor, and preserving right-of-way for future widening along Long Ferry Road.

Safety treatments have the flexibility to be implemented as lower cost, near term treatments or incorporated into higher cost, long term projects. Potential safety treatments along Long Ferry Road include new traffic signals at five (5) locations when warranted, raised medians, dedicated turn lanes, pedestrian and bicycle accommodations west of I-85, grade separation of the existing railroad crossing, roadway lighting, speed limit changes, and interchange reconfiguration. Related to the potentially hazardous location between Barrier Lane and Stoner Morgan Road based on the number of run-off-road crashes, treatments may include lane departure countermeasures, roadside improvements, alignment and superelevation changes, and signing delineation enhancements.

Capacity improvements along the corridor help promote mobility, maintain safety, and provide efficient operations for all users while accommodating the projected increase in truck traffic associated with industrial and commercial development. Roadway improvements include widening the existing two-lane corridor to meet projected daily and peak hour volume demands. This includes transitioning between various cross-sections to match the desired character for the three distinct corridor segments. Intersection improvements include signal control, when warranted and approved by NCDOT, signal timing, turn lanes, and design accommodations. Interchange improvements include upgrading the existing diamond interchange capacity or further evaluating the feasibility of other interchange forms to provide additional capacity, such as a diverging diamond interchange (DDI) or single point interchange.

When applied appropriately, policy changes will help preserve and implement the overall vision for this corridor. Policy recommendations include increased setbacks, traffic impact assessment thresholds, right-of-way reservation requirements, option for payment-in-lieu of improvements, and cross-access connections. Implementation of these policies along the corridor will also aid in the management of traffic and right-of-way as development occurs.

The findings, recommendations, concept designs and cost estimates prepared in this report can support decision making for future land use, infrastructure and transportation network decisions along the Long Ferry Road corridor to foster economic development while preserving the integrity of the corridor.

Long Ferry Road Corridor Study

Community Input Meeting

A community meeting was held on Thursday, September 21, 2023, from 4:00 – 7:00 pm at the Spencer Town Hall. Over 81 notices were mailed to corridor property owners in the County's jurisdiction promoting the event as an opportunity to comment and ask questions of County and Town Staff regarding the study and its recommendations.

Comments from the Community Meeting

9/5/2023 via email - Exit 81 LF has been my home for almost 30 years. I have a lot of sweet memories with my family, as do many of my neighbors. Before Chewy, the most traffic we saw was the lake traffic and that only ramped up on the weekends. Now, trees are being torn down, industrial sites built, surveyors on the side of the road, not to mention the TWO gas stations! 30 years ago there was (1) 2 pump gas station on a dirt plot, right where BP is. This was still the time when you could pump gas before paying and the convenience store was a SHACK. I still remember this little gas station like it was yesterday. Please look up in RowCo archives. I understand the need for safety. What I don't understand is encouraging an increase in traffic flow. PLEASE don't gentrify my small town. PLEASE let us keep our PEACE and privacy.

9/21/2023 at meeting – Keep me posted on any conversations related to grade separation. We'd like to maintain a realistic JAB (*Jake Alexander Boulevard*) North corridor.

9/21/2023 at meeting – Concern on proposal; 1-curve in LF (*Long Ferry*) Rd above Red Rock Development should be straightened; 2-speed limit of road should be reduced.

9/22/2023 via email - I am Vice President and co-owner of Sampson-Bladen Oil Co., Inc. Sampson-Bladen's owners also own an LLC named Clark Stores LLC. This LLC owns 1190 Long Ferry Rd in Salisbury, NC. Sampson-Bladen operates a convenience store at that address called Han-Dee Hugo's #221. This location is a very busy location because of its proximity to Interstate 85. The Long Ferry Road Corridor Study as it is currently proposed would prevent drivers on I-85 that are exiting onto East Long Ferry Rd. from having access to our driveway because the proposal creates a grass median where a left turn lane now exists. We believe that the current left turn lane could easily be extended within this project to continue to allow safe access to our location. I attended the drop-in public meeting on this subject on 09/21/23 because I was notified by Rowan County of this meeting. Thoughtful discussion was had by all, and Rowan County was well represented by knowledgeable folks. We request that we continue to be communicated with as this project moves forward so that we may have the input that we feel like we are entitled to.