

Greater Triangle Commuter Rail (GTCR) Phase II Feasibility Study

Client: GoTriangle

STV Project Number: 4020151

CORRIDOR SCREENING REPORT

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Prepared By:



Prepared For:



In Association With:

CES Group
Gannett Fleming
HR&A Advisors, Inc.
OLH, Inc.
Resource Systems Group, Inc.
Simpson Engineers & Associates

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Revision History			
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V1	9/9/2021	Draft for Client Review	M. Barrow
V2	10/29/2021	Revision per Client's comments	M. Barrow
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Executive Summary

This report documents review of the potential Greater Triangle Commuter Rail (GTCR) corridor, shown in **Figure 1** on the following page, from West Durham (MP 52.9) to Clayton (MP 97.9) to identify particular areas that should be considered for engineering analysis in this phase of the feasibility study due to potential risks to project definition, cost, schedule, or general viability. The review considered design criteria compliance, adjacent projects, utilities, encroachments, and at-grade rail crossings.

As a result of the review, the study scope was modified to include additional concept development for the rail alignment through Raleigh Union Station and evaluation through rail network simulation.

Review of grade crossing data (roadway and train volumes; levels of service; crash history) supports the following observations:

- Forty-four (44) of 48 at-grade crossings currently exceed a threshold value that would trigger evaluation of grade separation based on roadway and train volumes. The remaining crossings are projected to exceed the threshold in the future based on project roadway volumes only.
- Eight crossings have volumes or crash history (or both) that further suggest potential for separation or closure (see Table 1). Several have been studied previously without agreement about recommendations. These locations are subject to study with NCDOT and local municipalities during environmental analysis.

Table 1 Grade Crossings with Potential for Separation or Closure due to Traffic Analysis

County	MP	Owner	Intersection	Reason
Durham	54.2	NS	S. Buchanan Boulevard	LOS/Crash History
Durham	55.57	NS	Fayetteville Street	LOS/Crash History
Durham	56.71	NS	S. Driver Street	LOS/Crash History
Durham	57.58	NS	Ellis Road	LOS/Crash History
Wake	68.74	NS	Morrisville-Carpenter Road	LOS/Crash History
Wake	82.05	NS	S. Blount Street	LOS/Crash History
Wake	88.13	NS	Jones Sausage Road	LOS/Crash History
Wake	162.42	CSX	Nowell Road	LOS/Crash History

- Four crossings, listed in **Table 2**, require attention due to proximity to proposed stations or to address existing suboptimal configuration. As indicated in the table, risk associated with two of these crossings will be addressed in conjunction with other tasks. Risk associated with the other two crossings will be addressed with an allowance in the cost estimate.

Table 2 Grade Crossings with Potential for Modification

County	MP	Owner	Intersection	Recommendation
Durham	56.4	NS	Plum St	Address in Durham work
Wake	83.6	NS	Rush St	Address in accessibility work
Wake	85.6	NS	Yeargan Rd	Allowance in cost estimate
Wake	86.5	NS	St. Mary's St	Allowance in cost estimate

Existing conditions and projects of mutual benefit to commuter rail, intercity, and freight service are documented in this report and in a GIS database.

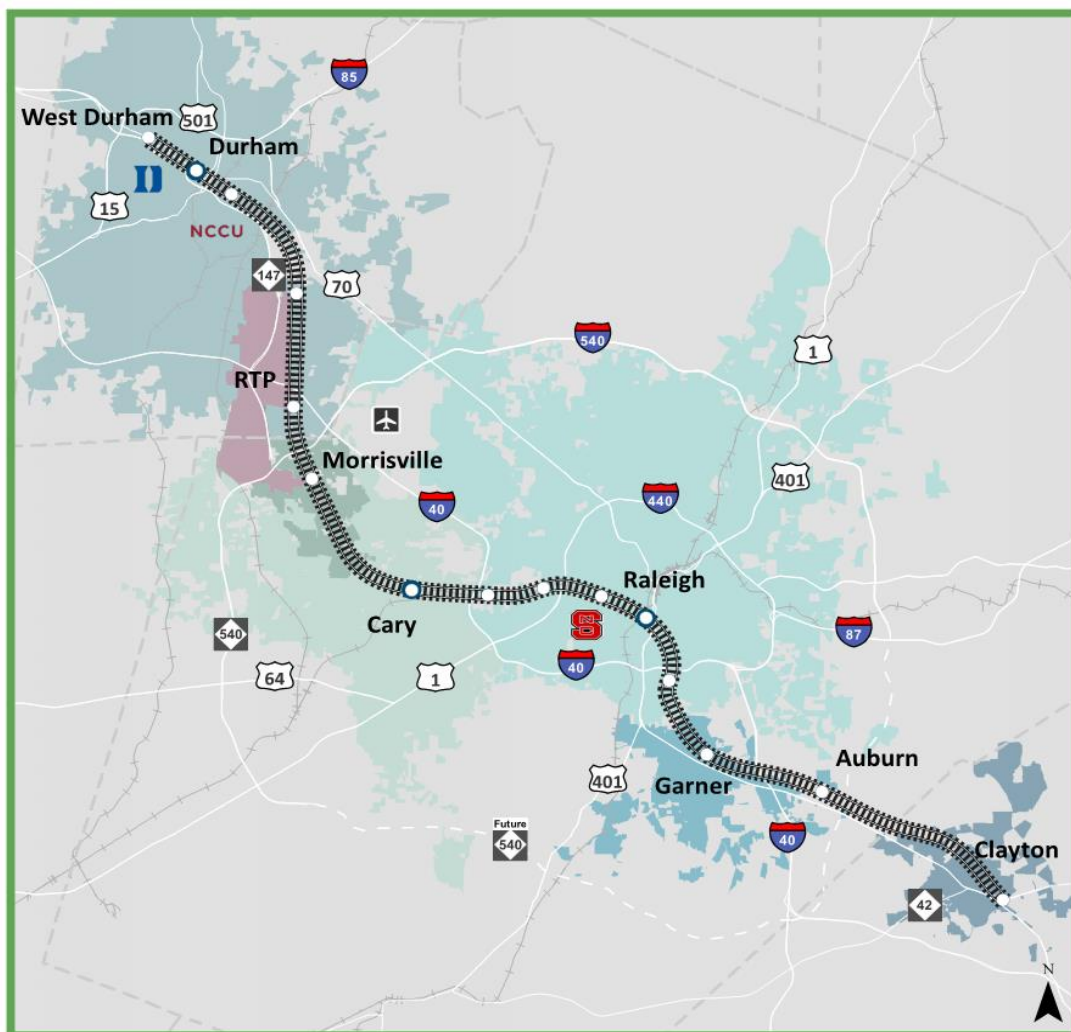


Figure 1 The Greater Triangle Commuter Rail Corridor

Introduction

This technical memorandum summarizes the results of the screening of the GTCR corridor, from West Durham (MP 52.9) to Clayton (MP 97.9), to identify areas of high risk to project definition, cost, schedule, or general viability. This memorandum also provides an overview of the evaluation process, proposes one area (vicinity of Raleigh Union Station) for further study, and suggests potential mutually beneficial projects for project stakeholders.

1 Evaluation Methodology

1.1 High Risk Definition and Risk Evaluation Criteria

This screening was performed to identify areas that warrant special attention in this feasibility study due to potential implications for project viability, project definition, or cost and schedule contingencies. The corridor in general will require complete engineering design if the project moves into project development. The following table summarizes the criteria that supported the assessment of risk.

Table 3 Risk Threshold and Evaluation Criteria

Risk Threshold	Evaluation Criteria
High	Project Viability: <ul style="list-style-type: none"> • Potential impact Cost and Schedule: <ul style="list-style-type: none"> • Likely deviation from Phase I assumptions Further Study: <ul style="list-style-type: none"> • Recommended
Medium	Project Viability: <ul style="list-style-type: none"> • No potential impact Cost and schedule: <ul style="list-style-type: none"> • Potential deviation from Phase I assumptions Further Study: <ul style="list-style-type: none"> • Recommended for priority analysis in project development
Low	Project Viability: <ul style="list-style-type: none"> • No potential impact Cost and schedule: <ul style="list-style-type: none"> • Consistent with Phase I assumptions • Consistent with normal engineering analysis and design Further Study: <ul style="list-style-type: none"> • No further study needed prior to project development, but location is notable

1.2 Additional Evaluation Criteria

In the process of screening for high-risk, the following criteria were also analyzed for their potential risk and impacts to the project's viability, cost estimate, or implementation schedule:

- Design Criteria Compliance
- Sensitive Areas:
 - Adjacent Projects
 - Utilities
 - Encroachments
- Traffic Analysis
- Infrastructure Points of Interest
 - Crossings (At-Grade)
 - Structures

2 Screening Categories

2.1 Design Criteria Compliance

As part of this screening, the corridor was analyzed for potential design criteria deficiencies. Detailed track design for the entire corridor was not performed as part of the Phase II Study. The corridor is currently being operated by both intercity Amtrak and NCDOT-sponsored passenger trains, as well as Norfolk Southern (NS) and CSX-Transportation (CSX) freight rail operators, and therefore the existing corridor track geometry is generally expected to be compatible with commuter rail trains. It is also anticipated that commuter rail would be able to navigate the existing infrastructure at higher rates of speed than the freight operators. There were, however, several locations identified where upgrades to horizontal geometry would be beneficial to the commuter rail operations and to freight and intercity operations. Those locations are listed in **Table 12** in **Section 3.3**.

2.2 Sensitive Areas

2.2.1 Adjacent Projects

Multiple NCDOT State Transportation Improvement Program (STIP) projects could affect the corridor. The impacts of these projects are most commonly creating a grade separation at an existing at-grade crossing (nine projects) or removing the crossing altogether (three projects). See Appendix **Table 13** for a list of NCDOT STIP projects affecting the corridor and **Table 14** for other NCDOT STIP projects within 1000' of the corridor.

2.2.2 Utilities

Existing utility information was provided by NCR, from milepost H-052.2699 (West Durham) to milepost H-097.0000 (Clayton) and shows utilities located in the NCR Right-of-Way via approved encroachment. The utility data was analyzed for critical factors such as the size of the utility or the number and size of utility customers being serviced. These factors help to inform the risks to costs and/or schedule if a utility relocation becomes necessary. If the project progresses, it is recommended that the corridor is analyzed further for potential utility conflicts utilizing industry standards and best practices for sub-surface and aerial utility identification and location.

Table 4 Utility Selection Criteria

Utility	Criteria for Selecting
Cable TV	<ul style="list-style-type: none"> • 875 Gauge • 200 pair cable
Drainage	<ul style="list-style-type: none"> • Pipe size $\geq 24''$
Electrical	<ul style="list-style-type: none"> • $\geq 32KV$ • Buried $\leq 6'$ below ground • Not related to signals • Along a bridge • Conduit size $\geq 30''$
Fiber Optic	<ul style="list-style-type: none"> • ≥ 144 count • Concrete duct bank
Natural Gas	<ul style="list-style-type: none"> • Pipe size $\geq 6''$
Sewer	<ul style="list-style-type: none"> • Pipe size $\geq 24''$
Steam	<ul style="list-style-type: none"> • Encasing Size 48''
Telephone	<ul style="list-style-type: none"> • All were deemed critical
Water	<ul style="list-style-type: none"> • Pipe size $\geq 24''$

Any utility in the dataset not meeting the above criteria was also classified as critical based on the customers they service. While not fully inclusive, some of the customers of note are Duke University, North Carolina State University, North Carolina State Prison Department, and North Carolina State Bureau of Investigation. These are utility customers that could require additional coordination and/or project costs if utilities are impacted.

See **Appendix Table 15 through Table 23** for a full list of utilities meeting the above criteria.

In addition to the data provided by NCR, aerial imagery was utilized to identify major aerial electrical transmission lines. The following seven were identified:

Table 5 Transmission Lines Along Corridor

MP	Existing Track Configuration	Orientation
52.8	One-track	Crossing
61.8	One-track	Crossing
64.9	Two-tracks	Crossing
70.0	One-track	Longitudinal
78.3	Two-tracks	Crossing
89.3	One-track	Crossing
92.3	Two-tracks	Crossing

In review with NCR, it was determined that the longitudinal transmission lines at MP70.0 should not affect the project. The mainline track was relocated in 2016 and was designed and constructed to accommodate a future second track.

2.2.3 Encroachments

Setback Encroachments were identified in the December 2016 NCR Future Track Infrastructure Planning Study. There were found to be no Setback Encroachment changes that would significantly affect the addition of a second track to accommodate the commuter rail project.

2.3 Traffic Analysis

Existing at-grade rail crossings were analyzed to identify operational deficiencies. Each rail crossing was analyzed based on available data and future estimates such as Annual Average Daily Traffic (AADT), crash history, average number of trains per day, and train characteristics. This analysis included an exposure index, delay and Level of Service (LOS), and a summary of hot spot locations with high crash history.

2.3.1 Exposure Index

The Exposure Index (EI), one factor NCDOT may use to determine if a grade-separated crossing is warranted, is calculated by multiplying the number of trains per day by the number of vehicles per day at that specific crossing. Grade separations may be considered in urban areas when the exposure index is 30,000 or more. Further factors in the consideration of grade separations are:

- Accident history
- Topography
- Adjacent land use
- Geometric designs
- Construction impacts
- Costs

Table 24 summarizes the exposure index calculations for each of the study area crossings. Existing and future build (with commuter trains) conditions were analyzed. The future Average Daily Traffic (ADT) growth rate was estimated by county population projections. The average number of trains per day included freight, intercity, and commuter trains.

As shown in **Table 24**, most locations exceed the threshold under both the existing and future year conditions. Four locations (Stirrup Creek Drive, the IBM Driveway, Builders Driveway, and W. Stallings Street) have current conditions under the EI threshold but are expected to exceed the threshold in the future.

2.3.2 Delay Analysis

Level of Service (LOS), expressed as a letter ranging from A (free-flowing) to F (severely congested), is a measure of the operational efficiency of the at-grade crossing (see **Table 6**). It is determined using procedures from the *Highway Capacity Manual*.

Table 6 Average Delay / Vehicle

Level of Service	Average Delay/Vehicle (sec)
A	10.0
B	>10.0 to 15.0
C	>15.0 to 25.0
D	>25.0 to 35.0
E	>35.0 to 50.0
F	>50.0

The delay and LOS calculations are based on the methodology developed for the *Proposed Conrail Acquisition Environmental Impact Statement (EIS)* by the Surface Transportation Board's Section of Environmental Analysis which involved CSX/NS. This methodology was modified as needed for this analysis. Delay and LOS was calculated for each type of train and then added together to derive a total delay for each crossing.

The following values were calculated for each type of train under existing and future conditions.

- Blocked crossing time per train
- Event time
- Average delay per day
- Maximum vehicle queue
- Total stopped vehicle delay per day
- Average delay for all vehicles
- Vehicular level of service (LOS)

Table 25 summarizes the delay and LOS results for the existing and future conditions. The expanded tables per type of train are included as part of **Table 26** through **Table 30**.

2.3.3 Crash Analysis

Crash data was obtained from both the NDCOT Fatal and Serious Injury Crash Locations from 2010-2019 GIS database and the Accident Data as Reported by Railroads from the Federal Railroad Administration (FRA) database. Crashes are tallied using the following classifications:

- Fatality
- Injury
- Property Damage Only (PDO)

At least 20 at-grade crossings along the rail corridor have experienced crashes over the past ten years. Of those locations, four at-grade crossings experienced fatalities. **Table 7** summarizes a total of 36 crashes between 2010-2019.

Table 7 Crashes at NS/CSX Crossings

Crossing No.	MP #	Street Name	Crashes	Fatalities	Injuries	PDO
910594N	53.2	Anderson Street	1	0	0	1
735225L	54.2	S Buchanan Blvd	1	0	0	1
735389C	55.4	S Dillard Street	2	0	0	2
910605Y	55.6	Fayetteville Street	4	0	0	4
630474Y	55.9	Ramseur Street	4	0	0	4
630472K	56.4	S Plum Street	2	0	0	2
630471D	56.7	S Driver Street	1	0	3	0
735236Y	57.6	Ellis Road	1	0	0	1
734736T	59.3	Wrenn Road	1	0	0	1
734742W	62.8	E Cornwallis Road	1	0	0	1
734750N	67.0	McCrimmon Parkway	3	0	0	3
734753J	68.7	Morrisville-Carpenter Road	3	4	0	1
904421K	73.8	NE Maynard Road	1	1	0	0

Crossing No.	MP #	Street Name	Crashes	Fatalities	Injuries	PDO
630654W	75.5	Nowell Road	2	0	1	1
735481C	82.1	S Blount Street	1	1	0	0
735324J	86.0	Vandora Springs Road	2	1	0	1
735328L	87.2	New Rand Road	1	0	1	0
735331U	88.1	Jones Sausage Road	1	0	0	1
735336D	90.3	Auburn Knightdale Road	1	0	1	0
735390W	92.0	Guy Road	1	0	0	1
Total			36	7	6	27

2.3.4 Traffic Conclusions

Utilizing the crash history and LOS data described above, along with NCDOT STIP data, the crossings cited in **Table 8** are candidates for more detailed analysis in an environmental phase of study, should the project move forward. The criteria for inclusion in **Table 8** are as follows: (1) a future build LOS D or worse, (2) a recent history of 20+ crashes total, or (3) a serious/fatal crash involving a train. A more detailed description for each location can be found in **Table 31** in the Appendix.

Table 8 Candidates for Detailed Analysis in Environmental Phase Based on Traffic Analysis

CROSSING INFORMATION			REASON FOR SELECTION		
MP	NS / CSX	STREET NAME	LOS	20+ CRASH HISTORY	SERIOUS / FATAL CRASH
DURHAM COUNTY					
54.2	NS	S. Buchanan Boulevard	X		
55.57	NS	Fayetteville Street		X	
56.71	NS	S. Driver Street			X
57.58	NS	Ellis Road		X	
WAKE COUNTY					
68.74	NS	Morrisville-Carpenter Road		X	X
162.42	CSX	Nowell Road		X	
82.05	NS	S. Blount Street			X
88.13	NS	Jones Sausage Road		X	X

2.4 Other Infrastructure Points of Interest

2.4.1 Railroad Crossings

In addition to analysis of traffic operations and crashes at railroad crossings, consideration was given to potential conflicts between crossing locations and anticipated station configurations. Phase I Risk Register items from municipalities were also reviewed. **Table 9** lists four crossings that warrant evaluation in a future phase. This information will be used to review and adjust, as needed, contingency levels in the capital cost estimate to capture potential risk.

Table 9 Potential Crossing Modifications

MP	Road	Description
56.4	Plum St	Station location could cause conflicts with the current at-grade crossing.
83.6	Rush St	If station tracks and high-level platforms are pursued, the current at-grade crossing could require closure or grade separation.
85.6	Yeargan Rd.	Skewed intersection near existing crossing, additional track may require crossing/intersection modification.
86.5	St. Mary's St.	Garner Station location could affect current grade crossing, requiring closure or grade separation.

2.4.2 Structures

The Phase I study compiled a list of structures along the corridor that require modification to support an additional track. For example, an existing single-track bridge with no capacity to widen for a second track would require a new bridge to provide capacity for two tracks. Overpass roadway bridges were also documented, noting space for double track operations underneath or modifications if required.

Utilizing the Phase I Capital Cost Estimate, aerial imagery, and information from project stakeholders, bridges along the corridor were analyzed for additional high-risk potential in engineering design or constructability. No structures were identified as requiring further consideration at this stage, but the following was noted:

Table 10 Structure Updates from Phase I

MP	Road Name	Structure Type	Description
68.9	Crabtree Creek	UG Ballast Deck Bridge	Construction of new double track ballast bridge was completed by NCRR in 2020

2.5 Risk Screening

In addition to the above detailed analysis of design criteria compliance, sensitive areas, traffic, and infrastructure points of interest, a virtual walkthrough of the corridor was also conducted with project sponsors. The North Carolina Department of Transportation (NCDOT) and the North Carolina Railroad Company (NCR), gave insight into their knowledge of the corridor and railroad operations. After the conclusion of these activities, one location was identified as possessing enough uncertainty and risk to warrant a recommendation for further study. That area is in Downtown Raleigh, within the vicinity of Raleigh Union Station (RUS), and is discussed further in **Section 3.1**.

The high-risk screening of the corridor generated the following results:

Table 11 Risk Area Screening Results

MP	Description	Risk
71.1	Major electrical transmission tower in the area of industry spur.	Medium to Low
72.1	Town of Cary Citizen’s Convenience Center (trash and recycling center) in close proximity to railroad corridor. Downtown Cary is a focus area. Project risk will be captured through that work.	Low
81.0	Multiple uncertainties at Raleigh Union Station including: <ul style="list-style-type: none"> • Single Track Entry for Commuter and Intercity Trains • Signal Design Complexities • Roadway projects in the railroad and platform vicinity 	High
87.0	The addition of a second track from Purvis St to Bagwell St could eliminate ~1300' of on-street parking (~120 spots). If parking is eliminated, it could have implications for Downtown Garner walkability and business access.	Medium to Low
90.0	Auburn Road is parallel to the railroad corridor. An additional track could require realignment of Auburn Road and impacts to adjacent parcel accessibility.	Low
99.3	Overhead industry utility and/or conveyor system.	Low
Various	Due to their close proximity to proposed station and platform infrastructure Plum St, Rush St, and St. Mary’s St are likely candidates for at-grade crossing closure, realignment, or grade separation. Yeorgan Rd is also a candidate due to proximity to a skewed intersection.	Medium

3 Conclusions

3.1 Additional Analysis Recommended in this Phase of Study

The Downtown Raleigh area near Raleigh Union Station (RUS) has several potential risk items and constraints that are located within a small area.

1. Single Track Entry – The current RUS Master Plan proposes to construct the commuter rail platform north of the existing intercity station. In order to access the platform, the commuter and intercity trains would both enter and exit their respective platform tracks utilizing a single track. Train breakdowns or schedule variations could lead to a breakdown or delay in service at the RUS commuter and intercity platforms.
2. Platform Heights – There is the potential that the GTCR corridor could utilize low-level platform heights due to physical constraints along the corridor, operating railroad constraints, and rolling stock constraints. The existing intercity platform at RUS is a high-level platform and the commuter platform at RUS is also anticipated to be high-level. Further development of concepts for RUS should be mindful of platform height considerations across the corridor.
3. Signal Design Complexities – Numerous freight and passenger train movements in this area create complex signal design scenarios and a greater need for safety as more passenger traffic is planned at RUS.
4. West Street Extension Project – The City of Raleigh is in the early stages of design on a project to extend West Street under/over the rail corridor and the existing intercity platform. Information should be exchanged between the two projects.

It is recommended that the Raleigh Union Station area be evaluated in further detail to help better understand the risks, schedule and cost implications, and opportunities for improvement at this location. [Note: As a result of the review, the study scope was modified to include additional concept development for the rail alignment through Raleigh Union Station and evaluation through rail network simulation.]

3.2 Confirm Capital Cost Assumptions for Grade Crossings

The Phase I capital cost estimate recognized that grade crossings would be affected by the additional track needed to provide capacity for commuter rail service. When the capital cost estimate is updated to reflect all of the activities that are part of this phase of the feasibility study, assumptions and contingency levels will be checked and modified for consistency with the information about crossings that emerged from this corridor review.

3.3 Mutually Beneficial Projects

The projects listed in **Table 12** have the potential to improve operations for commuter, intercity, and freight operations. GoTriangle, NCRR, and NCDOT will consider the eligibility of these projects for new federal funding programs.

Table 12 Mutually Beneficial Track Projects

Track Curve Corrections		
MP	Description of Curve Correction	Approximate Length
51.3	Flatten existing 3°18' left hand curve to at least 2°40'	1200'
51.8	Flatten existing 3°10' left hand curve across HW 15 to at least 2°25', evaluate bridge replacement/widening	1500'
52.5	Flatten existing 2°56' right hand curve to at least 2°30', evaluate bridge replacement/widening across Hillandale Rd	2100'
54.2	Flatten existing 3°10' right hand curve to at least 2°30'	1050'
54.4	Flatten existing 2°15' left hand curve to at least 1°50'; evaluate Gregson St bridge replacement/widening/profile	1300'
55.3	Flatten existing 1°37' right hand curve to at least 1°40'; evaluate Roxboro St bridge replacement/widening/profile	2300'
55.8	Flatten existing 3°10' left hand curve to at least 2°35'	2000'
83.6	Flatten existing 3°34' left hand curve to at least 3°0'; this curve correction may not be feasible due to environmental justice issues as the realignment may impact a mobile home park	2800'
84.3	Flatten existing 3°58' left hand curve and subsequent two curves to at least 3°15'	2500'
85.3	Flatten existing 4°34' right hand curve and subsequent tangent and left-hand curve to at least 3°30'	3750'
88.3	Flatten existing 3°0' left hand curve and subsequent tangent and right-hand curve to at least 2°30'; evaluate new/widened bridge over I-40	5000'

APPENDIX

Projects

Table 13 NCDOT STIP Projects Affecting Corridor

TIP	MP	Crossing	Relevance to GTCR	Project Route	Description	Category	Mode	Right Of Way Year	Construction Year	Counties
U-3308	56.1	NC 55 (ALSTON AVENUE)	Under Construction. Decreases future bridge maintenance / replacement costs with a newer bridge	NC 55 (ALSTON AVENUE)	NC 147 (DURHAM FREEWAY) TO US 70 BUSINESS / NC 98 (HOLLOWAY STREET) IN DURHAM. WIDEN TO FOUR-LANE DIVIDED FACILITY FROM NC 147 TO MAIN STREET AND REPLACE NORFOLK SOUTHERN RAILROAD BRIDGES. MODERNIZE FROM MAIN STREET TO US 70 BUSINESS / NC 98 (HOLLOWAY ST	TRN	HIGHWAY			DURHAM
U-0071	58.0	East End Connector	A new structure would not affect GTCR project, but requires coordination to ensure adequate clearance from proposed double track	NEW ROUTE	EAST END CONNECTOR, NC 147 (DURHAM FREEWAY) TO NORTH OF NC 98 IN DURHAM. FOUR-LANE DIVIDED FREEWAY WITH AUXILIARY LANES, PART ON NEW LOCATION.	TRN			UNDER CONSTRUCTION	DURHAM
U-0071	58.0	East End Connector	A new structure would not affect GTCR project, but requires coordination to ensure adequate clearance from proposed double track	NEW ROUTE	EAST END CONNECTOR, NC 147 (DURHAM FREEWAY) TO NORTH OF NC 98 IN DURHAM. FOUR-LANE DIVIDED FREEWAY WITH AUXILIARY LANES, PART ON NEW LOCATION.	TRN	HIGHWAY			DURHAM
P-5706	59.1, 59.3, 60.6	Glover Rd., Wrenn Rd., Ellis Rd.	A grade separation can improve rail safety and operations.	NORFOLK SOUTHERN H LINE	EAST DURHAM RAILROAD SAFETY PROJECT. PROJECT WILL STRAIGHTEN EXISTING RAILROAD CURVATURE BETWEEN CP NELSON AND CP EAST DURHAM AND INCLUDES A COMBINATION OF GRADE SEPARATIONS AND CLOSURES AT ELLIS ROAD SOUTH END (734737A), GLOVER ROAD (734735L), AND WRENN	SW	RAIL	2020	2026	DURHAM
P-5717	62.8	Cornwallis Rd (SR-1121)	A grade separation can improve rail safety and operations.	NORFOLK SOUTHERN H LINE	CROSSING 734742W AT SR 1121 (CORNWALLIS ROAD) IN DURHAM. CONSTRUCT GRADE SEPARATION.	REG	RAIL	2020	2021	DURHAM
U-5747B	67.0	McCrimmon Pkwy.	A grade separation can improve rail safety and operations.	NC 54	SR 1635 (MCCRIMMON PARKWAY) IN MORRISVILLE. CONVERT AT-GRADE INTERSECTION TO GRADE SEPARATION, INCLUDING GRADE SEPARATION OF NORTH CAROLINA RAILROAD.	REG	HIGHWAY	2020	2021	WAKE
U-5811	68.7	Morrisville-Carpenter Rd.	Improving at-grade single-track crossing and nearby intersection can improve rail safety and operations	SR 1002 (AVIATION PARKWAY)	NC 54 TO I-40 IN MORRISVILLE. WIDEN TO MULTILANES WITH INTERCHANGE MODIFICATIONS AT I-40.	DIV	HIGHWAY	2024	2028	WAKE
P-4405H	71.1	Private Dr.	A crossing closure can improve rail safety and operations.	Private Dr.	PRIVATE CROSSING SAFETY INITIATIVE TO CLOSE OR ENHANCE PROTECTION AT RAILROAD CROSSINGS BETWEEN RALEIGH AND CHARLOTTE.	TRN				WAKE
P-5708	72.6	N. Harrison Ave. (SR-1652)	A grade separation can improve rail safety and operations.	NORFOLK SOUTHERN H LINE	CONSTRUCT GRADE SEPARATION AT HARRISON AVENUE CROSSING (734755X) IN CARY.	REG	RAIL	2026	2029	WAKE
P-5718	73.8	NE Maynard Rd.	A grade separation can improve rail safety and operations.	CSX	CROSSING 643351A AT SR 1415 (NORTHEAST MAYNARD ROAD) IN CARY. CONSTRUCT GRADE SEPARATION.	REG	RAIL	2022	2024	WAKE
P-5734	74.5	Trinity Rd.	A grade separation can improve rail safety and operations.	NORTH CAROLINA RAILROAD / NORFOLK SOUTHERN H LINE / CSX S LINE	SR 1655 (TRINITY ROAD) IN CARY. CONSTRUCT GRADE SEPARATION AND CLOSE CROSSING 630657S.	SW	RAIL	2022	2024	WAKE

TIP	MP	Crossing	Relevance to GTCR	Project Route	Description	Category	Mode	Right Of Way Year	Construction Year	Counties
U-4437	77.2	Blue Ridge Rd.	A grade separation can improve rail safety and operations.	NC 54 (HILLSBOROUGH STREET)	SR 1664 / SR 3074 (BLUE RIDGE ROAD) IN VICINITY OF NC RAILROAD (CSX CORPORATION AND NORFOLK SOUTHERN) IN RALEIGH. CONSTRUCT GRADE SEPARATIONS AND ACCESS ROAD BETWEEN NC 54 AND SR 1664 / SR 3074.	DIV	HIGHWAY			WAKE
U-2719	77.8	Beltline (I-440)	A new structure would not affect GTCR project, but requires coordination to ensure adequate clearance from proposed double track	I-440/US-1	SOUTH OF SR 1313 (WALNUT STREET) TO NORTH OF SR 1728 (WADE AVENUE) IN RALEIGH. WIDEN FROM FOUR TO SIX LANES, IMPROVE STORAGE AT LAKE BOONE TRAIL INTERCHANGE AND INSTALL RAMP METERS.	SW			UNDER CONSTRUCTION	WAKE
U-2719	77.8	Beltline (I-440)	A new structure would not affect GTCR project, but requires coordination to ensure adequate clearance from proposed double track	I-440/US-1	SOUTH OF SR 1313 (WALNUT STREET) TO NORTH OF SR 1728 (WADE AVENUE) IN RALEIGH. WIDEN FROM FOUR TO SIX LANES, IMPROVE STORAGE AT LAKE BOONE TRAIL INTERCHANGE AND INSTALL RAMP METERS.	SW	HIGHWAY		2020	WAKE
P-5736	78.1	Beryl Rd.	A crossing closure can improve rail safety and operations.	NORTH CAROLINA RAILROAD; NORFOLK SOUTHERN H LINE; CSX S LINE	BERYL ROAD CROSSING IN RALEIGH. EXTEND BERYL ROAD TO ROYAL AVENUE, AND CLOSE CROSSING 630647L.	SW	RAIL	2026	2027	WAKE
P-5500B	80.9	N/A	Track work at RUS would require coordination to ensure it does not conflict with GTCR track designs.	NCRR	STATION SITE WORK	TRN	RAIL			WAKE
P-5500C	80.9	N/A	Station work at RUS would require coordination to ensure it does not conflict with GTCR designs,	NCRR	TRACK IMPROVEMENTS	TRN	RAIL			WAKE
U-5521	81.2	Cabarrus St.	A crossing closure can improve rail safety and operations.	WEST STREET	CABARRUS STREET TO MARTIN STREET IN RALEIGH. EXTEND WEST STREET ON NEW LOCATION, WITH GRADE SEPARATION AT NORTH CAROLINA RAILROAD / NORFOLK SOUTHERN "H" LINE.	DIV				WAKE
P-5738	86	Vandora Springs Rd.	A grade separation can improve rail safety and operations.	NORTH CAROLINA RAILROAD / NORFOLK SOUTHERN H LINE	SR 2713 (VANDORA SPRINGS ROAD) IN GARNER. CONSTRUCT GRADE SEPARATION AND CLOSE CROSSING 735324J.	SW	RAIL	2026	2028	WAKE
R-2829	91.2	NC-540 (proposed)	A new structure would not affect GTCR project, but requires coordination to ensure adequate clearance from proposed double track	NEW ROUTE (FUTURE NC 540)	EASTERN WAKE FREEWAY / TRIANGLE EXPRESSWAY SOUTHEAST EXTENSION (RALEIGH OUTER LOOP), I-40 TO US 64 / US 264 BYPASS. FREEWAY ON NEW LOCATION.	SW	HIGHWAY	2029	2029	WAKE, JOHNSTON
P-5743	94.9	Shotwell Rd. (SR 1553)	A grade separation can improve rail safety and operations.	NS/NCRR H LINE	CONSTRUCT GRADE SEPARATION AT SR 1553 (SHOTWELL ROAD). CLOSE EXISTING AT-GRADE CROSSING IN CLAYTON.	REG	RAIL	2027	2029	JOHNSTON

Table 14 Other STIP Projects within 1000' of corridor

TIP	Project Route	Description	Category	Mode	Right Of Way Year	Construction Year	Counties
R-5718	SR 1003 (BUFFALO ROAD)	US 70 TO SR 1934 (OLD BEULAH ROAD). WIDEN TO THREE LANES.	DIV	HIGHWAY	2022	2025	JOHNSTON
U-6113	US 70 BUSINESS	GREENFIELD PARKWAY TO NC 42. UPGRADE ROADWAY TO SUPERSTREET.	REG	HIGHWAY	2029	POST YEAR	JOHNSTON, WAKE
U-6223	SR 1560 (RANCH ROAD EXTENSION)	US 70 BUS/NC 42 TO SR 1560 (RANCH ROAD) IN CLAYTON. NEW LOCATION EXTENSION OF RANCH ROAD.	DIV	HIGHWAY	2020	2020	JOHNSTON
C-4928	SR 1317 (MORREENE ROAD)	NEAL ROAD TO SR 1320 (ERWIN ROAD) IN DURHAM. CONSTRUCT BIKE LANES AND SIDEWALKS.	DIV	CONGESTION MITIGATION-HWY	2020	2021	DURHAM
C-5572	WEST ELLERBE CREEK GREENWAY	PHASE II, WESTOVER PARK TO STADIUM DRIVE TRAIL IN DURHAM. CONSTRUCT MULTI-USE PATH.	EX	CONGESTION MITIGATION-HWY			DURHAM
EB-5703	LASALLE STREET	KANGAROO DRIVE TO SPRUNT AVENUE IN DURHAM. CONSTRUCT SIDEWALKS ON BOTH SIDES FROM KANGAROO DRIVE TO US 70 BUSINESS (HILLSBOROUGH ROAD) AND ON ONE SIDE FROM HILLSBOROUGH ROAD TO SPRUNT AVENUE.	DIV	BICYCLE AND PEDESTRIAN		2022	DURHAM
EB-5720	BRYANT BRIDGE NORTH / GOOSE CREEK WEST TRAIL	NC 55 TO TO DREW-GRANBY PARK IN DURHAM. CONSTRUCT SHARED-USE PATH AND CONNECTING SIDEWALKS.	DIV	BICYCLE AND PEDESTRIAN	2020	2021	DURHAM
EB-5838	SR 1637 (CHURCH STREET)	SR 3014 (MORRISVILLE-CARPENTER ROAD) TO DURHAM COUNTY LINE IN MORRISVILLE. CONSTRUCT SIDEWALKS TO FILL IN GAPS.	DIV	BICYCLE AND PEDESTRIAN		2022	WAKE
EB-5904	DUKE BELTLINE TRAIL	PETTIGREW STREET TO AVONDALE DRIVE IN DURHAM. CONSTRUCT MULTIUSE TRAIL ON FORMER RAIL CORRIDOR.	DIV	BICYCLE AND PEDESTRIAN		2020	DURHAM
I-5111	I-40	I-440 / US 64 (EXIT 301) TO NC 42 (EXIT 312). ADD 2 GENERAL-PURPOSE LANES IN EACH DIRECTION.		HIGHWAY			WAKE, JOHNSTON
I-5941	I-85	ORANGE COUNTY LINE TO US 15 / US 501 IN DURHAM. PAVEMENT REHABILITATION	SW	HIGHWAY		2025	DURHAM
I-5943	I-40	SR 1728 (WADE AVENUE) TO I-440 / US 1 IN RALEIGH. PAVEMENT AND BRIDGE REHABILITATION.	SW	HIGHWAY		2022	WAKE
I-5995	I-40	EAST OF NC 147 TO SR 3015 (AIRPORT BOULEVARD). PAVEMENT REHABILITATION.	SW	HIGHWAY		2021	DURHAM, WAKE
I-6006	I-40	NC 54 (EXIT 273) TO SR 1728 (WADE AVENUE). CONVERT FACILITY TO A MANAGED FREEWAY WITH RAMP METERING AND OTHER ATM / ITS COMPONENTS.	SW	HIGHWAY	2025	2025	DURHAM, WAKE
P-5005D	VARIOUS	BOYLAN CROSSOVER IN RALEIGH.	TRN	RAIL			WAKE
TD-5264B	CARY TRANSIT / C-TRAN	CONSTRUCT BUS MAINTENANCE FACILITY AT TOWERVIEW COURT IN CARY.	DIV	PUBLIC TRANSIT		2020	WAKE
TD-5269	GO TRIANGLE	UNION STATION IN RALEIGH. CONSTRUCT BUS COMPONENT.	DIV	PUBLIC TRANSIT		2020	WAKE
TO-6166	VARIOUS	BUS RAPID TRANSIT SERVICE, MORRISVILLE TO CLAYTON. CONSTRUCT INFRASTRUCTURE, PURCHASE VEHICLES, AND ESTABLISH SERVICE.	REG	PUBLIC TRANSIT	2025	2028	WAKE, JOHNSTON
U-5618	SR 3014 (MORRISVILLE-CARPENTER ROAD)	SR 1613 (DAVIS DRIVE) TO WEST OF NC 54 IN MORRISVILLE. WIDEN TO 4-LANE DIVIDED FACILITY.	DIV	HIGHWAY			WAKE
U-5750	NC 54	NC 540 TO PERIMETER PARK DRIVE IN MORRISVILLE. ADD LANES.	REG	HIGHWAY	2020	2021	WAKE
U-5937	NC 147 (DURHAM FREEWAY)	SR 1127 (WEST CHAPEL HILL STREET) TO BRIGGS AVENUE IN DURHAM. CONSTRUCT AUXILIARY LANES AND OPERATIONAL IMPROVEMENTS.	SW	HIGHWAY	2023	2027	DURHAM

TIP	Project Route	Description	Category	Mode	Right Of Way Year	Construction Year	Counties
U-6099	SR 5220 (JONES SAUSAGE ROAD)	SR 1004 (EAST GARNER ROAD) TO I-40 IN GARNER. WIDEN ROADWAY FROM SOUTH OF SR 2585 (WILMINGTON ROAD) TO I-40, INCLUDING ACCESS POINT IMPROVEMENTS, AND CONSTRUCT IMPROVEMENTS AT SR 1004 INTERSECTION AND I-40 INTERCHANGE.	DIV	HIGHWAY			WAKE
U-6101	I-40; I-87; I-440; US 1 / US 64	I-40 FROM SR 1728 (WADE AVENUE) TO NC 42, I-440, I-87 FROM I-40 TO I-540, US 1 FROM NC 540 TO I-40. CONVERT FACILITIES TO MANAGED FREEWAYS, TO INCLUDE RAMP METERING.	SW	HIGHWAY	2026	2029	WAKE, JOHNSTON
W-5808H	SR 1004 (GARNER ROAD); TIMBER DRIVE EAST	SR 2539 (YEARGAN ROAD), SR 2564 (CREECH ROAD), AND SHENSTONE BOULEVARD INTERSECTIONS IN GARNER. UPGRADE TRAFFIC SIGNALS	DIV	HIGHWAY SAFETY		2023	WAKE

Utilities

Existing utility information was provided by NCRR, from milepost H-052.2699 (West Durham) to milepost H-097.0000 (Clayton) and shows utilities located in the NCRR Right-of-Way via approved encroachment.

Table 15 Utilities - Cable TV

MP	County	Near_City	Comments	Customer	Customer_N	Scope_of_W	Utility_Ty	Utility_Po	Utility_Co	Utility_He	Utility_De	Utility_Ft	Utility_Nu
072 +3103	Wake	Cary	Appears Time Warner transitioned to buried cable. Reference 72 + 2667	522 Charter Communications, Inc. : Spectrum	Time Warner Cable, Morrisville	Annual charge for (1) coax cable @ MP #H72+3103 near N. Harrison St., Cary, NC. Vendor Number 0000020187	Wire	4' Galvanized Steel conduit	Longitudinal		10' below rail, 4' min ROW	323	(1) 875 gauge COAX
074 +0479	Wake	Cary		498 AT&T, Inc. : BellSouth Telecommunications, LLC	BellSouth Telecommunications		Wire	(1) 12-inch steel pipe	Crossing		11' below rail, 4' min row	210	(1) 200 pair copper cable

Table 16 Utilities - Drainage

MP	County	Near_City	Comments	Customer	Customer_N	Scope_of_W	Utility_Ty	Utility_Po	Utility_Co	Utility_He	Utility_De	Utility_Ft	Utility_Nu
068 +3864	Wake	Morrisville		526 Town of Morrisville	Town of Morrisville		Pipe		Crossing		8' below rail, 4.38 min row	130	(1) 36-inch steel storm drainage pipeline
076 +0440	Wake	Raleigh	drainage pipe; mapped based on exhibit, mp and unit given appear incorrect; CSX Assignment	423:1 State of North Carolina-Parent : North Carolina Department of Agriculture	N.C. Dept. of Agriculture		Pipe	(1) 24-inch steel conduit pipe	Crossing		5'-6" below rail, 3' min ROW	200	(1) 12-inch ductile iron carrier pipe w/in a 24-inch steel conduit pipe
079 +0000	Wake	Raleigh		518 State of North Carolina-Parent : North Carolina State University	North Carolina State University at Raleigh	drainage construction and maintenance agreement, a supplement to the agreements of August 5, 1954 and May 1, 1989	Pipe		Longitudinal			200	
079 +1033	Wake	Raleigh		518 State of North Carolina-Parent : North Carolina State University	N.C. State College of Ag. & Eng.	ROW encroachment, license for installation of a 36-inch concrete drainage pipe, extension of 3' x 4' masonry culvert, location of a new manhole, and filling of low area of ROW with earth.	Pipe		Crossing		unknown	70	(1) 36-inch concrete drainage pipe

Table 17 Utilities - Electrical

MP	County	Near_City	Comments	Customer	Customer_N	Scope_of_W	Utility_Ty	Utility_Po	Utility_Co	Utility_He	Utility_De	Utility_Ft	Utility_Nu
054 +3447	Durham	Durham		435 City of Durham	City of Durham		Wire	(1) existing pole & 2-inch steel conduit	Crossing		below track attached to bridge wall	1795	(3) electric power lines
055 +1258	Durham	Durham		435 City of Durham	City of Durham		Wire	(2) 1.0-inch diameter metal conduits	Longitudinal		below track attached to bridge wall	870	(3) electrical wires
058 +0699	Durham	Durham		508 Duke Energy Corporation-Parent : Duke Energy Carolinas, LLC	Duke Energy Carolinas, LLC		Wire	(2) existing poles	Crossing	53' above rail		200	(1) 100kV three phase AC wire
064 +3045	Durham	Durham		508 Duke Energy Corporation-Parent : Duke Energy Carolinas, LLC	Duke Energy Carolinas, LLC		Wire	(1) 36-inch steel conduits	Crossing		32' below rail, 30' min in corridor	432	various electrical line
064 +4233	Durham	Morrisville		508 Duke Energy Corporation-Parent : Duke Energy Carolinas, LLC	Duke Energy Carolinas, LLC		Wire	(1) 30-inch steel casing	Crossing		27.5 below rail, 3' min in corridor	221	various underground electrical wire
071 +2220	Wake	Morrisville	Should be 70 + 3060	509 Duke Energy Corporation-Parent : Duke Energy Progress, LLC	Carolina Power & Light	Information found in 310.05.1028. Agreement scanned and attached. One time fee paid by lessee.	Wire		Crossing		5' below rail; 3' min. depth on r/w	150	23.25" inside diam.; 24" outside diam. carbon steel A106, ASTM Grade B
071 +2782	Wake	Cary		509 Duke Energy Corporation-Parent : Duke Energy Progress, LLC	Progress Energy	Annual charge for (1) 750 MCM aluminum concentric neutral-jacketed electrical wireline @ MP #H71+2782 near Harrison Ave., Cary, NC.	Wire	4" & 6" steel conduit	Crossing		5' below rail, 4' min on ROW	200	(1) 750 MCM aluminum concentric neutral-jacketed
079 +2586	Wake	Raleigh		423:4 State of North Carolina-Parent : State of North Carolina	State of North Carolina		Wire	(1) 36-inch steel casing pipe	Crossing		5'-6" below rail	170	(5) 5-inch and (5) 4-inch electric wirelines in galvanized steel conduits

Table 18 Utilities - Fiber Optic

MP	County	Near_City	Comments	Customer	Customer_N	Scope_of_W	Utility_Ty	Utility_Po	Utility_Co	Utility_He	Utility_De	Utility_Ft	Utility_Nu
052 +2885	Durham	Durham		420:1 Verizon Communications Inc.- Parent : MCI Metro Access Transmission Services Corporation		(1) 432-count fiber optic cable at Milepost h-052 plus 2,885 feet near Hillandale Rd, Durham, NC	Wire	(1) 4.5-inch HDPE pipe	Crossing		15' below rail, 15' min in corridor	243	(1) 432-count fiber optic cable at Milepost h-052 plus 2,885 feet near Hillandale Rd, Durham, NC
053 +0263	Durham	Durham		268 NEXTG Networks of N.Y. DBA NEXTG Networks East	NEXTG Networks of N.Y. d/b/a NEXTG Netwo		Wire	(2) existing poles	Crossing	31'-0" above rail		219	(1) 144 count cable
053 +1008	Durham	Durham		516 State of North Carolina-Parent : North Carolina Department of Transportation		(1) 72-count fiber optic cable, (1) 12-count fiber optic cable, & (1) 72-count fiber optic cable and (1) 12-count fiber optic cable at Milepost h-053 plus 1,008 feet near 15th St, Durham, NC	Wire	(1) 5-inch HDPE pipe, (1) 5-inch HDPE pipe, & (1) 5-inch HDPE pipe	Crossing		15' below rail, 4' min in corridor	212	(1) 72-count fiber optic cable, (1) 12- count fiber optic cable, & (1) 72- count fiber optic cable and (1) 12- count fiber optic cable at Milepost h-053 plus 1,008 feet near 15th St, Durham, NC
053 +1109	Durham	Durham		422:2 Segra : Spirit Communications	South Carolina Telecommunications Group		Wire	(1) 4-inch HDPE casing pipe	Crossing		18' below rail & min in corridor	200	(1) 288 count fiber optic cable
053 +2200	Durham	Durham		510 Duke University	Duke University		Wire	(1) 4-inch HDPE pipe	Longitudinal		6' min in corridor	919	(1) 432-count fiber & (1) 24-count fiber
053 +4062	Durham	Durham		522 Charter Communications, Inc. : Spectrum	Time Warner Cable Southeast, LLC	Annual charge for (1) fiber optic cable @ MP #H053+4062 neare Swift Avenue Durham, NC	Wire	(1) 4-inch steel pipe	Crossing		15' below rail, 5' min in corridor	215	(1) 144-count fiber
053 +4071	Durham	Durham		510 Duke University	Duke University		Wire	(1) 6-inch steel pipe			21' below rail, 15' min in corridor	213	(1) 144 count fiber optic cable
054 +2904	Durham	Durham		457 Fiber Technologies Networks, LLC	Fiber Technologies Networks, LLC		Wire	(1) 4-inch HDPE pipe	Crossing		18' below rail, 18' min in corridor	219	(1) 144-count fiber optic cable
054 +2975	Durham	Durham		420:1 Verizon Communications Inc.- Parent : MCI Metro Access Transmission Services Corporation	MCI Metro Access Transmission Services C		Wire	(1) 4.5-inch HDPE pipe	Crossing		15' below rail, 4' min in corridor	220	(1) 864-count fiber optic cable
054 +3592	Durham	Durham	out of corridor	514 CenturyLink-Parent : Level 3 Communications, LLC	Progress Telecom	Charge for (1) fiber optic cable w/in a 4" steel casing w/ (4) 1.25" innerducts @ MP H-54+3592, near W. Main St., Durham, NC	Wire	(1) 4" steel casing w/ (4) 1.25" innerducts	Crossing		10' below rail, 4' min ROW	200	1
054 +3610	Durham	Durham		516 State of North Carolina-Parent : North Carolina Department of Transportation		(1) 36-count fiber optic cable & (1) 12-count fiber optic cable at Milepost h-054 plus 3,610 feet near Chapel Hill St, Durham, NC	Wire	(1) 5-inch HDPE pipe	Crossing		9.3 below rail & 9.3' min in corridor	230	(1) 36-count fiber optic cable & (1) 12-count fiber optic cable at Milepost h-054 plus 3,610 feet near Chapel Hill St, Durham, NC
054 +5110	Durham	Durham		513 Google Fiber North Carolina, LLC	Google Fiber North Carolina, LLC		Wire	(1) 4-inch HDPE	Crossing		15' below rail, 15' min in corridor	244	(1) 144-count fiber
055 +1170	Durham	Durham		516 State of North Carolina-Parent : North Carolina Department of Transportation		(1) 288-count fiber optic cable & (1) 24-count fiber optic cable at MP H-055+1170 near Roxboro St., Durham, NC	Wire	(1) 2-inch steel pipe	Crossing		10' below rail, 4.5' min in corridor	263	(1) 288-count fiber optic cable & (1) 24-count fiber optic cable at MP H- 055+1170 near Roxboro St., Durham, NC
055 +1170	Durham	Durham		497 AT&T, Inc. : AT&T North Carolina	BellSouth Telecommunications, LLC d/b/a		Wire	(1) 4-inch steel pipe	Crossing		10.8' below rail, 10' min in corridor	207	(1) 864-count fiber
055 +2255	Durham	Durham		420:1 Verizon Communications Inc.- Parent : MCI Metro Access Transmission Services Corporation		(1) 432-count fiber optic cable at MP H-055+2255 near S. Dillard St, Durham , NC	Wire	(1) 4.5-inch HDPE pipe	Crossing		15' below rail, 15' min in corridor	207	(1) 432-count fiber optic cable
055 +3130	Durham	Durham		510 Duke University	Duke University		Wire	(1) 4-inch HDPE pipe	Crossing		15' below rail, 10' min in corridor	164	(1) 432-count fiber optic cable
056 +0692	Durham	Durham		512 Frontier Communications of the Carolinas LLC	Frontier Communications of the Carolinas		Wire	(1) 18-inch steel pipe	Crossing		12'-9" bleow rail, 6'-8" min in corridor	240	(2) 24-count fiber optic cables, (1) 400 pair copper cable, (1) 1200 pair copper cable
056 +2139	Durham	Durham		514 CenturyLink-Parent : Level 3 Communications, LLC	Level 3 Communications, LLC		Wire	(1) 4-inch steel pipe	Crossing		15' below rail and min in corridor	142	(1) 288-count fiber optic

MP	County	Near_City	Comments	Customer	Customer_N	Scope_of_W	Utility_Ty	Utility_Po	Utility_Co	Utility_He	Utility_De	Utility_Ft	Utility_Nu
056 +3906	Durham	Durham		514 CenturyLink-Parent : Level 3 Communications, LLC	Level 3 Communications, LLC		Wire	(1) 6-inch HDPE casing pipe	Longitudinal		15' below rail, 15' min in corridor	1160	(1) 288-count fiber optic cable
058 +5138	Durham	Durham		513 Google Fiber North Carolina, LLC	Google Fiber North Carolina, LLC	Annual charge for (1) fiber optic cable @ MP #H058+5138 near Glover Road Durham, NC - PO #919106474	Wire	(1) 8-inch steel casing pipe	Crossing		11' below rail, 8' min in corridor	208	(1) 288-count fiber
060 +1422	Durham	Durham		522 Charter Communications, Inc. : Spectrum	Time Warner Entertainment - Advance/Newh		Wire	(1) 4-inch steel pipe	Crossing		10' below rail, 5.5' min in corridor	202	(1) 288 count cable
060 +4217	Durham	Durham		514 CenturyLink-Parent : Level 3 Communications, LLC	Level 3 Communications LLC	Annual charge for (1) 192 count fiber optic cable installed in (1) duct encased within a 10 inch conduit at MP #H60+4217 near Ellis Rd., Durham, NC.	Wire	10" steel conduit w/12-1.5" innerducts	Crossing		10' below rail, 4' min ROW	200	(1) 192 count fiber
061 +1257	Durham	Durham		468 MCNC	MCNC		Wire	(1) 4-inch HDPE pipe	Crossing		30.4 below rail, 10' min in corridor	202	(1) 432-count fiber optic cable
061 +1453	Durham	Durham		357 AT&T, Inc. : TCG of the Carolinas, Inc.	TCG of the Carolinas, Inc.	Annual charge for (1) underground fiber optic cable in a 6" steel conduit at MP #H61+1453 near T.W. Alexander Drive, Durham, N.C.	Wire	6" steel conduit	Crossing		10' min entire r/w	200	(1) fiber optic cable
061 +4557	Durham	Durham	underground fiber optic	497 AT&T, Inc. : AT&T North Carolina	AT&T	This agreement supersedes and cancels agreement #714 and 819.	Wire	8" B.S.P. conduit w/ six 1.5" innerducts	Crossing		5.5 below rail, 4' min row	50	(1) 312 count fiber
062 +0391	Durham	Durham		514 CenturyLink-Parent : Level 3 Communications, LLC	tw telecom of north carolina, l.p.		Wire	(1) 4-inch steel pipe	Crossing		10' below rail, 6' min in corridor	252	(1) fiber optic cable w/144 fibers
062 +1041	Durham	Durham		197 International Business Machines Corporation	International Business Machines Corpora	Annual charge for (2) fiber optic cables @ MP #H062+1041 near IBM Access #3, Durham, N.C.	Wire	(1) 16-inch steel pipe	Crossing		10' below rail, 4' min row	200	(2) 288 count fibers and (4) 4-inch diameter PVC conduits
062 +4400	Durham	Durham		500 CenturyLink-Parent : CenturyLink, Inc.	Carolina Telephone & Telegraph Company,		Wire	(1) 4-inch steel casing pipe	Crossing		15' below rail, 10' min in corridor	200	(1) 96-count fiber optic cable
064 +0608	Durham	Durham		510 Duke University		(1) 432-count fiber optic cable located at Milepost h-064 plus 608 feet near NC 54 (Slater Rd), Durham, NC	Wire		Crossing		32' below rail, 32' min in corridor	206	(1) 432-count fiber optic cable located at Milepost h-064 plus 608 feet near NC 54 (Slater Rd), Durham, NC
064 +0622	Durham	Durham		514 CenturyLink-Parent : Level 3 Communications, LLC	Level 3 Communications, Inc.		Wire	(1) 4-inch steel pipe	Crossing		10' below rail and min in corridor	142	(1) 288-count fiber optic cable
064 +0640	Durham	Durham	underground fiber optic	512 Frontier Communications of the Carolinas LLC	Frontier Communications of the Carolinas	1 copper cable, 1 conduit w/ 1 fiber optic cable w/96 fibers & 4 conduits enclosed w/in a 16" by 20" concrete duct bank & manholes as needed for phone service	Wire		Crossing			200	1 coper cable w/3600 conductors, 1 conduit w/1 fiber cable w/96 fibers 4 empy conduits encased w/in 16"x20" concrete duct bank & manholes
064 +0685	Durham	Durham		420:1 Verizon Communications Inc.- Parent : MCI Metro Access Transmission Services Corporation		(1) 864-count fiber optic cable & (1) 288-count fiber optic cable at MP H-064+0685 near NC-56, Durham, NC	Wire	(1) 4.5-inch HDPE pipe	Crossing		48" min in corridor	211	(1) 864-count fiber optic cable & (1) 288-count fiber optic cable
064 +2502	Durham	Durham		420:1 Verizon Communications Inc.- Parent : MCI Metro Access Transmission Services Corporation	Intermedia Communications, Inc.	Charge for (1) 144 count fiber optic cable @ MP H-64+2502, near Hopson Rd., Durham, NC (File #FM0758)	Wire	2 existing poles	Crossing	27'6" above rail		200	(1) 144 count fiber
064 +2800	Durham	Durham		422:2 Segra : Spirit Communications	South Carolina Telecommunications Group		Wire	(1) 4-inch HDPE pipe	Crossing		39' below rail, 18' min in corridor	442	(1) 288-count fiber optic cable
064 +2949	Durham	Durham		522 Charter Communications, Inc. : Spectrum	Time Warner Cable Southeast, LLC	Annual charge for the (1) fiber optic cable @ MP #H064+2949 near Hopson Road Morrisville, NC	Wire	(1) 2-inch HDPE innerduct	Crossing		15' below rail, 5' min in corridor	406	(1) 144-count fiber optic cable
064 +3042	Durham	Durham		359 Teleconnect Long Distance Services & Systems Company	Teleconnect Long Distance Services & Sys		Wire	(1) 2-inch steel pipe	Crossing		15' below rail, 10' min in corridor	432	(1) 144 count fiber & (1) 24 count fiber

MP	County	Near_City	Comments	Customer	Customer_N	Scope_of_W	Utility_Ty	Utility_Po	Utility_Co	Utility_He	Utility_De	Utility_Ft	Utility_Nu
066 +2626	Wake	Morrisville		468 MCNC	MCNC		Wire	(1) 4-inch HDPE pipe	Crossing		12'-9" below rail, 7'-5" min in corridor	255	(1) 432-count fiber optic cable
066 +2626	Wake	Morrisville		513 Google Fiber North Carolina, LLC	Google Fiber North Carolina, LLC	Annual charge for (2) fiber optic cables @ MP #H066+2626 near Barbee Road Morrisville, NC - PO #919106474	Wire	(1) 8-inch steel pipe	Crossing		12'-9" below rail, 6'-3" min in corridor	228	(1) 864 count, (1) 96 count
067 +0087	Wake	Morrisville		422:2 Segra : Spirit Communications	South Carolina Telecommunications Group		Wire	(1) 4-inch HDPE pipe	Crossing		18' below rail & min in corridor	207	(1) 288-count fiber optic cable
067 +0126	Wake	Morrisville		514 CenturyLink-Parent : Level 3 Communications, LLC	Progress Telecom	cable type & capacity(AL-34Q2MT-036)	Wire	(1) 6" steel casing w/ (1) 4" PVC e/w	Crossing		6' below rail, 4' min ROW	200	(1) fiber optic wire w/ (3) 1.25 innerducts
067 +0150	Wake	Morrisville		514 CenturyLink-Parent : Level 3 Communications, LLC	Level 3 Communications, LLC		Wire	(1) 4-inch steel pipe	Crossing		10' below rail, 4' min in corridor	200	(1) 144-count fiber optic cable
068 +3101	Wake	Morrisville		497 AT&T, Inc. : AT&T North Carolina	BellSouth Telecommunications Inc., d/b/a		Wire	(1) HPDE conduit & existing poles	Longitudinal		2.5 ' min in corridor	1461	(1) 864 count cable
068 +3948	Wake	Morrisville		513 Google Fiber North Carolina, LLC	Google Fiber North Carolina, LLC	Annual charge for (4) fiber optic cables @ MP #H068+3948 near Morrisville Carpenter Road Morrisville, NC - PO #919106474	Wire	(1) 8-inch steel casing	Crossing		18'-4" below rail, 6'-1" min in corridor	200	(1) 96, (1) 288, (2) 432 count fibers & (3) spare innerducts
068 +3960	Wake	Morrisville		420:1 Verizon Communications Inc.- Parent : MCI Metro Access Transmission Services Corporation		(1) 432-count fiber optic cable & (1) 864-count fiber optic cable at MP H-068+3960 near Chapel Hill Rd, Morrisville, NC	Wire	(1) 4.5-inch HDPE pipe	Longitudinal		48" min in corridor	540	(1) 432-count fiber optic cable & (1) 864-count fiber optic cable near Chapel Hill Rd, Morrisville, NC
068 +3960	Wake	Morrisville		420:1 Verizon Communications Inc.- Parent : MCI Metro Access Transmission Services Corporation		(1) 864-count fiber optic cable & (1) 432-count fiber optic cable at MP h-068+3960 near Morrisville Carpenter Rd, Morrisville, NC	Wire	(1) 4.5-inch HDPE pipe	Crossing		15' below rail, 15' min in corridor	188	(1) 864-count fiber optic cable & (1) 432-count fiber optic cable near Morrisville Carpenter Rd, Morrisville, NC
068 +4237	Wake	Morrisville		522 Charter Communications, Inc. : Spectrum	Time Warner Entertainment-Advance/Newhou	Annual charge for (1) fiber optic cable w/ (2) coaxial cables and (1) fiber optic cable w/ (1) coaxial cable @ MP #H-68+4237 near NC Hwy 54, Morrisville, NC	Wire	plastic sheathing	Longitudinal		3' min in corridor	904	(1) 24 count fiber optic cable, (1) .875 coax cable, & (1) .5 coax cable
069 +3628	Wake	Morrisville		497 AT&T, Inc. : AT&T North Carolina	BellSouth Telecommunications Inc., d/b/a		Wire	(1) 4.5" steel pipe	Crossing		6' below rail, 4' min in corridor	200	(1) fiber optic cable w/288 fibers
070 +2676	Wake	Cary		510 Duke University	Duke University		Wire	(1) 4-inch HDPE pipe	Crossing		15' below rail, 10' min in corridor	403	(1) 432-count fiber optic cable
071 +2128	Wake	Cary		498 AT&T, Inc. : BellSouth Telecommunications, LLC	Bell South Telecommunications	wireline crossing 54' above rail, fiber optic. File formerly in 310.05.1032. No exec. agree. in file. Exc agmnt in file as of 3/6/2006.	Wire	2 existing poles	Crossing	54' above rail		180	6m gauge wire-5/16"; 36 fiber cable
071 +2720	Wake	Cary		420:1 Verizon Communications Inc.- Parent : MCI Metro Access Transmission Services Corporation	MCI Metro Access Services G		Wire	(1) 4.5-inch HDPE pipe	Crossing		36' below rail, 18 ' min in corridor	211	(1) 864-count fiber optic cable
071 +2773	Wake	Cary		422:2 Segra : Spirit Communications	South Carolina Telecommunications Group		Wire	(1) 4-inch HDPE pipe	Crossing		18' below rail & min in corridor	210	(1) 288-count fiber optic cable
072 +2997	Wake	Cary		513 Google Fiber North Carolina, LLC	Google Fiber North Carolina, LLC	Annual charge for the (1) fiber optic cable @ MP #H072+2997 near Harrison Blvd. Cary, NC - PO #91907263	Wire	(1) 8-inch steel pipe	Crossing		14.6' below track, 13'-3" min in corridor	212	(1) 576-count fiber
072 +3161	Wake	Cary		457 Fiber Technologies Networks, LLC	Fiber Technologies Network, LLC		Wire	(1) 4-inch steel pipe	Crossing		15' below rail, 5' min in corridor	213	(1) 96-count fiber
073 +3935	Wake	Raleigh		422:2 Segra : Spirit Communications	South Carolina Telecommunications Group		Wire	(1) 4-inch HDPE	Crossing		18' below rail, 18' min in corridor	202	(1) 96-count fiber optic cable
073 +3945	Wake	Cary		468 MCNC	MCNC		Wire	(1) 4-inch HDPE pipe	Crossing		15' below rail, 10' min in corridor	202	(1) 432-count fiber optic cable

MP	County	Near_City	Comments	Customer	Customer_N	Scope_of_W	Utility_Ty	Utility_Po	Utility_Co	Utility_He	Utility_De	Utility_Ft	Utility_Nu
073 +3960	Wake	Cary		498 AT&T, Inc. : BellSouth Telecommunications, LLC	Bell South Telecommunications	File was formerly in 310.05.1032. Merged info. into Yardi.	Wire		Crossing		7' below rail; 4' minimum	200	12" GSP; 40' length; 216 Fiber optic cable
074 +0479	Wake	Cary		498 AT&T, Inc. : BellSouth Telecommunications, LLC	BellSouth Telecommunications		Wire	(1) 12-inch steel pipe	Crossing		11' below rail, 4' min row	210	(1) fiber optic cable with 12 fibers
074 +2175	Wake	Raleigh		420:1 Verizon Communications Inc.- Parent : MCI Metro Access Transmission Services Corporation		(2) 864-count fiber optic cable at MP H-074+2175 near Trinity Rd, Cary , NC	Wire	(1) 4.5-inch HDPE pipe	Crossing		15' below rail, 15' min in corridor	200	(2) 864-count fiber optic cables
074 +3691	Wake	Raleigh		516 State of North Carolina-Parent : North Carolina Department of Transportation	N.C. Dept. of Transportation	Annual charge for (1) fiber optic cable @ MP #H074+3691 near I-40 Raleigh, NC	Wire	(1) HPDE conduit	Crossing		30' below rail, 4' min in corridor	210	(1) 144 count fiber optic cable
077 +2487	Wake	Raleigh		518 State of North Carolina-Parent : North Carolina State University	N. C. State University		Wire		Crossing		9.5' below rail, 3' min ROW	200	(1) computer cable wireline
078 +0095	Wake	Raleigh		457 Fiber Technologies Networks, LLC	Fiber Technologies Network, LLC		Wire	(3) wood poles	Crossing	31'10" above rail		348	(1) 96-count fiber
078 +0095	Wake	Raleigh		457 Fiber Technologies Networks, LLC	Fiber Technologies Network, LLC		Wire	(1) 4-inch steel pipe	Crossing		16' below rail, 10' min in corridor	412	(1) 96-count fiber optic cable
078 +0160	Wake	Raleigh		420:1 Verizon Communications Inc.- Parent : MCI Metro Access Transmission Services Corporation	MCI Metro Access Transmission Services C		Wire	(1) 4-inch HDPE pipe	Crossing		15' below rail, 10' min in corridor	221	(1) 864-count fiber optic cable
078 +1235	Raleigh	Wake		420:1 Verizon Communications Inc.- Parent : MCI Metro Access Transmission Services Corporation	MCI Metro Access Transmission Services C		Wire	(1) 4-inch HDPE pipe	Crossing		15' below rail, 10' min in corridor	206	(1) 864-count fiber optic cable
079 +0677	Wake	Raleigh		518 State of North Carolina-Parent : North Carolina State University	North Carolina State University	Annual charge for (1) fiber optic cable & (5) electric cables @ MP #H079+0677 near Dan Allen Drive Raleigh, NC	Wire	concrete	Crossing		16' below rail, 2' min in corridor	187	(1) fiber & (5) electrical cables
079 +2586	Wake	Raleigh		423:4 State of North Carolina-Parent : State of North Carolina	State of North Carolina		Wire	(1) 18-inch x 34-inch concrete box	Longitudinal		5'-6" below rail	164	(8) 4.5-inch fiber optic wirelines w/in (1) 18" x 34" concrete box
079 +3732	Wake	Raleigh		468 MCNC	MCNC		Wire	(1) 4-inch steel pipe	Crossing		15' below rail, 10' min in corridor	201	(1) fiber cable w/144 fiber
080 +3897	Wake	Raleigh		522 Charter Communications, Inc. : Spectrum	Time Warner Cable Southeast, LLC	Annual charge for (2) fiber optic cables and (2) coaxial cables @ MP #H080+3897C near Boylan Avenue Raleigh, NC	Wire	(2) existing poles	Crossing	45.5' above rail		204	(1) 24-count fiber, (1) 150-count fiber, (2) coaxial cables
081 +1014	Wake	Raleigh		457 Fiber Technologies Networks, LLC	Fiber Technologies Network, LLC		Wire	(1) 3-inch steel casing pipe	Crossing		15' below rail, 5' min in corridor	334	(1) 288-count fiber
081 +1553	Wake	Raleigh		468 MCNC	MCNC		Wire	(1) 4-inch HDPE pipe	Crossing		32' below rail, 10' min in corridor	183	(1) 432-count fiber optic cable
082 +0546	Wake	Raleigh		468 MCNC	MCNC		Wire	(1) 4-inch HDPE pipe	Crossing		15' below rail, 10' min in corridor	204	(1) 432-count fiber optic cable
083 +3000	Wake	Raleigh		468 MCNC	MCNC		Wire	(1) 4-inch steel pipe	Crossing		10' below rail, 10' min in corridor	206	(1) 432-count fiber optic cable
083 +3062	Wake	Raleigh		422:2 Segra : Spirit Communications	South Carolina Telecommunications Group		Wire	(2) existing poles	Crossing	31'-10" above rail		206	(1) 288-count fiber
084 +1000	Wake	Raleigh		259 State of North Carolina-Parent : North Carolina State Bureau of Investigation	N.C. State Bureau of Investigation		Wire		Crossing		unknown	200	
084 +2495	Wake	Raleigh		468 MCNC	MCNC		Wire	(2) existing wood poles	Crossing	45' above rail		273	(1) 432-count fiber
085 +4780	Wake	Garner		497 AT&T, Inc. : AT&T North Carolina	BellSouth Telecommunications, LLC dba AT		Wire	(1) 2-inch HDPE conduit	Longitudinal		3' min in corridor	949	(1) 840-count fiber optic cable
085 +4965	Wake	Garner		497 AT&T, Inc. : AT&T North Carolina	BellSouth Telecommunications, Inc. d/b/a		Wire	(1) 12-inch steel pipe	Crossing			200	(1) 864 count fiber optic cable

MP	County	Near_City	Comments	Customer	Customer_N	Scope_of_W	Utility_Ty	Utility_Po	Utility_Co	Utility_He	Utility_De	Utility_Ft	Utility_Nu
085 +5005	Wake	Garner		420:1 Verizon Communications Inc.- Parent : MCI Metro Access Transmission Services Corporation		(1) 864-count fiber optic cable at Milepost h-085 plus 5,005 feet near West Garner Rd, Garner, NC	Wire	(1) 4.5-inch HDPE pipe	Crossing		15' below rail, 15' min in corridor	219	(1) 864-count fiber optic cable at Milepost h-085 plus 5,005 feet near West Garner Rd, Garner, NC
086 +0100	Wake	Garner		420:1 Verizon Communications Inc.- Parent : MCI Metro Access Transmission Services Corporation		(1) 864-count fiber optic cable at MP h-086+0100 near W. Garner Rd, Garner, NC	Wire	(1) 4.5-inch HDPE pipe	Crossing		10' below rail, 10' min in corridor	376	(1) 864-count fiber optic cable at MP h-086+0100 near W. Garner Rd, Garner, NC
086 +2910	Wake	Garner		420:1 Verizon Communications Inc.- Parent : MCI Metro Access Transmission Services Corporation		(1) 864-count fiber optic cable at Milepost h-086 plus 2,910 feet near W. Garner Rd, Garner, NC	Wire	(1) 4.5-inch HDPE pipe	Longitudinal		10' min in corridor	1411	(1) 864-count fiber optic cable at Milepost h-086 plus 2,910 feet near W. Garner Rd, Garner, NC
087 +0450	Wake	Garner		497 AT&T, Inc. : AT&T North Carolina	AT&T	Encroachment is longitudinal for 355 feet; the wireline then crosses the r/w at New Rand Road. The encroachment is 65 feet from C/L until it crosses the tracks. Installation was already in when HNTB reviewed plans.	Wire		Longitudinal		Casing under tracks is approx. 90"	355	5" steel casing; 3" HDPE; 2 1/2" bore
087 +0769	Wake	Garner		447 Conterra Ultra Broadband, LLC	Conterra Ultra Broadband, LLC		Wire	(1) 4-inch HDPE pipe	Crossing		18' below rail, 3.5' min in corridor	205	(1) 144-count fiber optic cable
090 +1510	Wake	Garner		447 Conterra Ultra Broadband, LLC	Conterra Ultra Broadband, LLC		Wire	(1) 4-inch HDPE pipe	Crossing		18' below rail, 3.5' min in corridor	200	(1) 144-count fiber optic cable
092 +0178	Wake	Garner		497 AT&T, Inc. : AT&T North Carolina	BellSouth Telecommunications, Inc dba AT		Wire	(1) 12-inch steel casing pipe	Crossing		8' below rail, 4' min in corridor	282	(1) 864 count fiber
095 +4960	Johnston	Clayton		420:1 Verizon Communications Inc.- Parent : MCI Metro Access Transmission Services Corporation		(1) 432-count fiber optic cable at MP H-095+4960 near North Robertson St, Clayton, NC	Wire	(1) 4.5-inch HDPE pipe	Crossing		15' below rail, 15' min in corridor	200	(1) 432-count fiber optic cable

Table 19 Utilities - Natural Gas

MP	County	Near_City	Comments	Customer	Customer_N	Scope_of_W	Utility_Ty	Utility_Po	Utility_Co	Utility_He	Utility_De	Utility_Ft	Utility_Nu
064 +0619	Durham	Durham		507 Dominion Energy, Inc. : Dominion Energy North Carolina	PSNC Energy		Pipe	n/a	Crossing		30' below rail, 4' min row	210	(1) 8-inch steel pipe
065 +2533	Wake	Morrisville		507 Dominion Energy, Inc. : Dominion Energy North Carolina	Public Service Company of North Carolina		Pipe	n/a	Crossing		15' below rail	200	(1) 6-inch steel natural gas
069 +1080	Wake	Morrisville		507 Dominion Energy, Inc. : Dominion Energy North Carolina	Public Service Company of North Carolina		Pipe		Crossing		10' below rail, 6' min in corridor	211	(1) 6-inch steel pipe
069 +1080	Wake	Morrisville		507 Dominion Energy, Inc. : Dominion Energy North Carolina	Public Service Company of North Carolina		Pipe		Crossing		10' below rail, 4' min in corridor	200	(1) 12-inch natural gas pipe
069 +1454	Wake	Morrisville		507 Dominion Energy, Inc. : Dominion Energy North Carolina	Public Service Company of North Carolina		Pipe		Crossing		17.5' below rail, 6' min in corridor	205	(1) 6-inch steel gas pipeline
073 +0253	Wake	Cary		507 Dominion Energy, Inc. : Dominion Energy North Carolina	Public Service Co. of NC, Inc.		Pipe	(1) 18-inch O.D. casing pipe	Crossing		5'6" below rail, 3' min ROW	64	(1) 12-inch O.D. steel carrier pipe w/in a 18-inch O.D. steel casing pipe
073 +0449	Wake	Cary		507 Dominion Energy, Inc. : Dominion Energy North Carolina	Public Service Co. of NC, Inc.	*not buried, at road level	Pipe	(1) 8-inch casing pipe	Crossing		23' below railroad overpass*	65	(1) 4-inch natural gas pipeline in an 8-inch casing pipe
073 +1305	Wake	Cary		507 Dominion Energy, Inc. : Dominion Energy North Carolina	Public Service Company of North Carolina		Pipe		Crossing		10' below rail, 4' min in corridor	214	(1) 6-inch steel pipe
075 +0946	Wake	Cary	natural gas pipe; exhibit says 1243 east of h075 (map based that); CSX Assignment	507 Dominion Energy, Inc. : Dominion Energy North Carolina	Public Service Co. of NC, Inc.		Pipe	(1) 10-inch steel casing carrier pipe	Crossing		4'-6" below rail	200	(1) 8-inch steel pipe encased in a 10-inch carrier pipe
076 +3061	Wake	Raleigh		507 Dominion Energy, Inc. : Dominion Energy North Carolina	Public Service Co. of N.C., Inc.		Pipe	(1) 16-inch steel casing pipe	Crossing		5'-6" min below ROW	96	(1) 10.75-inch steel pipe w/in a 16-inch steel casing pipe
089 +1553	Wake	Garner		507 Dominion Energy, Inc. : Dominion Energy North Carolina	Public Service Company of North Carolina		Pipe		Crossing		11.6' below rail, 6' min in corridor	200	(1) 8-inch steel gas pipe
091 +2660	Wake	Garner		418:1 Dominion Energy, Inc. : PSNC Energy	Public Service Company of North Carolina		Pipe		Crossing		14' below rail, 6' min in corridor	204	(1) 20-inch steel pipe
094 +4298	Johnston	Clayton		517 Duke Energy Corporation-Parent : North Carolina Natural Gas Corporation	North Carolina Natural Gas		Pipe	n/a	Crossing		12' below rail, 4' min row	200	(1) 6-inch steel pipe

Table 20 Utilities - Sewer

MP	County	Near_City	Comments	Customer	Customer_N	Scope_of_W	Utility_Ty	Utility_Po	Utility_Co	Utility_He	Utility_De	Utility_Ft	Utility_Nu
059 +5387	Durham	Durham		435 City of Durham	City of Durham		Pipe	(1) 24-inch steel pipe	Crossing		36' below rail, 12.5' min in corridor	200	(1) 12-inch ductile iron pipe
064 +3023	Wake	Raleigh		505 County of Durham	County of Durham		Pipe	(1) 30-inch steel casing pipe	Crossing		30.19' below rail, 4' min in corridor	496	(1) 18-inch ductile iron pipe
069 +3336	Wake	Morrisville		516 State of North Carolina-Parent : North Carolina Department of Transportation	N.C. Department of Transportation		Pipe		Longitudinal		3' min in corridor	88	(2) 36-inch welded steel pipes
073 +1067	Wake	Cary		477 Town of Cary	Town of Cary		Pipe	(1) 36-inch steel casing pipe	Crossing		14' below rail, 3' min ROW	100	(1) 20-inch ductile iron pipe w/in a 36-inch steel casing pipe
073 +1577	Wake	Cary		477 Town of Cary	Town of Cary		Pipe	(1) 30-inch steel casing pipe	Crossing		14' below rail, 3' min ROW	100	(1) 18-inch ductile iron sewer pipe w/in a 30-inch steel casing pipe
073 +1677	Wake	Cary	ductile iron sewer pipe; exhibit says 1920 east of h073 (mapped based on that); CSX Assignment	477 Town of Cary	Town of Cary		Pipe	(1) 36-inch steel casing pipe	Crossing		12' below rail, 3' min ROW	767	(1) 20-inch ductile iron sewage pipe w/in a 36-inch steel casing pipe
079 +0585	Wake	Raleigh		518 State of North Carolina-Parent : North Carolina State University	The State of North Carolina for North Ca		Pipe	(1) 72-inch steel pipe	Crossing		19' below rail, 17' min in corridor	200	(1) 60-inch HDPE pipe
079 +1272	Wake	Raleigh		518 State of North Carolina-Parent : North Carolina State University	University of North Carolina		Pipe	(1) 16-inch min. reinforced concrete or metal pipe	Crossing		unknown	200	(1) 10-inch cast iron pipe encased in a 16-inch min. carrier pipe
079 +1836	Wake	Raleigh	sewer pipe; CSX Assignment; may need field inspection-doubt still exists	518 State of North Carolina-Parent : North Carolina State University	N.C. State College of Ag. & Eng.	Drainage sewer--stormwater per CSX assignment spreadsheet	Pipe	unknown	Crossing		unknown	200	(1) 8-inch pipe
080 +3100	Wake	Raleigh		258 State of North Carolina-Parent : North Carolina Department of Corrections	N. C. Dept. Corrections		Pipe		Longitudinal		3.4' min on corridor	285	(1) 12-inch ductile iron waste water pipeline
081 +1523	Wake	Raleigh		504 City of Raleigh	City of Raleigh		Pipe	(1) 30-inch steel casing pipe	Crossing		under railroad tressle, 4' min row	150	(1) 18-inch ductile iron pipe
096 +4851	Johnston	Clayton		506 County of Johnston	County of Johnston		Pipe	(1) 36-inch steel casing pipe	Crossing		8' below rail, 3' min in corridor	200	(1) 20-inch ductile iron pipe

Table 21 Utilities - Steam

MP	County	Near_City	Comments	Customer	Customer_N	Scope_of_W	Utility_Ty	Utility_Po	Utility_Co	Utility_He	Utility_De	Utility_Ft	Utility_Nu
080 +1771	Wake	Raleigh		423:2 State of North Carolina-Parent : North Carolina Prison Department	N.C. Prison Dept./Central Prison		Pipe	(1) 48-inch galvanized steel 12-gauge casing pipe	Crossing		unknown	200	(1) 6.625-inch steel steam pipe w/in (1) 48-inch galvanized steel pipe

Table 22 Utilities - Telephone

MP	County	Near_City	Comments	Customer	Customer_N	Scope_of_W	Utility_Ty	Utility_Po	Utility_Co	Utility_He	Utility_De	Utility_Ft	Utility_Nu
072 +3423	Wake	Cary		498 AT&T, Inc. : BellSouth Telecommunications, LLC	Bell South Telecommunications		Wire	(1) 30-inch steel casing pipe	Crossing		5'-6" below rail	50	(1) 24 gauge telephone cable & 30-inch steel casing pipe
075 +2584	Wake	Raleigh		498 AT&T, Inc. : BellSouth Telecommunications, LLC	Bell South Telecommunications		Wire	(1) 4-inch steel casing pipe	Crossing		5'-6" below rail, 4' min ROW	40	(1) 1-inch telephone wire w/in a 4-inch steel casing pipe
077 +0631	Wake	Raleigh	CSX Assignment; underground wire; inspection may be needed to ensure still exists and exact location	498 AT&T, Inc. : BellSouth Telecommunications, LLC	Bell South Telecommunications		Wire	(1) 25-inch steel casing pipe	Crossing		5' below rail	49	(1) 22-gauge telephone wire w/in a 25-inch steel casing pipe
079 +2231	Wake	Raleigh	CSX Assignment; underground wire; inspection may be needed to ensure still exists and exact location	518 State of North Carolina-Parent : North Carolina State University	N.C. State College		Wire	(1) 2-inch conduit	Crossing		unknown	200	(1) electric telephone wire line encased in 2-inch pipe conduit
080 +3897	Wake	Raleigh		497 AT&T, Inc. : AT&T North Carolina	BellSouth Telecommunicatons, LLC d/b/a		Wire	(1) wood pole	Crossing	43.5' above rail		204	(1) 1200-pair coaxial cable
096 +0798	Johnston	Clayton		500 CenturyLink-Parent : CenturyLink, Inc.	Embarq - Mid Atlantic Telecom	Charge for (1) 24 gauge twisted copper telephone wire @ MP H-96+798, near O'Neil St., Clayton, NC	Wire	2 existing poles	Crossing	27' above rail		200	900 pair 24 gauge ALP-SJ-FSF
096 +4651	Johnston	Clayton	relocated NS 131992	500 CenturyLink-Parent : CenturyLink, Inc.	Carolina Telephone & Telegraph Company		Wire	existing poles	Longitudinal	24' min on corridor		552	(1) 900 pair, (1) 600 pair, & (2) 25 pair copper wires

Table 23 Utilities - Water

MP	County	Near_City	Comments	Customer	Customer_N	Scope_of_W	Utility_Ty	Utility_Po	Utility_Co	Utility_He	Utility_De	Utility_Ft	Utility_Nu
053 +1422	Durham	Durham		435 City of Durham	City of Durham		Pipe		Longitudinal		4' min in corridor	1727	(1) 36-inch DI pipe
054 +3659	Durham	Durham		435 City of Durham	City of Durham		Pipe	(1) 24-inch steel pipe	Crossing		3' min in corridor	268	(1) 12-inch ductile iron pipe
055 +5147	Durham	Durham		435 City of Durham	City of Durham		Pipe		Longitudinal		4' min in corridor	132	(1) 24-inch & (1) 6-inch ductile iron pipes
055 +5180	Durham	Durham		435 City of Durham	City of Durham		Pipe		Longitudinal		5' min in corridor	44	(1) 36-inch ductile iron pipe
056 +1122	Durham	Durham		435 City of Durham	City of Durham		Pipe		Longitudinal		4.5' min in corridor	72	(1) 16-inch, (1) 24-inch, & (1) 6-inch ductile iron pipe
056 +3239	Durham	Durham		435 City of Durham	City of Durham		Pipe		Longitudinal		4.5' min in corridor	3223	(1) 36-inch ductile iron pipe
058 +4973	Durham	Durham		435 City of Durham	City of Durham		Pipe	(1) 48-inch steel pipe	Crossing		9.6' below tracks, 6.88 min in corridor	207	(1) 30-inch ductile iron pipe
064 +2916	Wake	Raleigh		435 City of Durham	City of Durham		Pipe	(1) 30-inch steel pipe	Crossing		28.83' below rail, 3' min in corridor	393	(1) 18-inch ductile iron pipe
071 +3232	Wake	Morrisville	Should be 70 + 2232. Mapped and attributed as 71 + 3232	526 Town of Morrisville	Town of Morrisville	Application of T. of Morrisville notes that the encroachment is 700 within the r/w but also crosses the tracks at 90 degrees.	Pipe	(1) 24-inch steel casing	Longitudinal		11ft 9-in below rail, 3ft min in corridor	700	(1) 12-inch ductile iron pipe
072 +2874	Wake	Cary		477 Town of Cary	Town of Cary	Casing pipe is 70 linear feet	Pipe	(1) 30-inch steel casing pipe	Crossing		5'-6" below rail, 3' min ROW	200	(1) 16-inch ductile iron carrier pipe w/in a 30-inch steel casing pipe
072 +2874	Wake	Cary		477 Town of Cary	Town of Cary	Casing pipe is 70 linear feet	Pipe	(1) 30-inch steel casing pipe	Crossing		5'-6" below rail, 3' min ROW	200	(1) 16-inch ductile iron carrier pipe w/in a 30-inch steel casing pipe
072 +2874	Wake	Cary		477 Town of Cary	Town of Cary	Casing pipe is 70 linear feet	Pipe	(1) 30-inch steel casing pipe	Crossing		5'-6" below rail, 3' min ROW	200	(1) 16-inch ductile iron carrier pipe w/in a 30-inch casing pipe
073 +2339	Wake	Cary		477 Town of Cary	Town of Cary		Pipe	(1) 24-inch steel casing pipe	Crossing		6' below rail, 3' min ROW	80	(1) 12-inch ductile iron carrier pipe in a 24-inch steel casing pipe
073 +3716	Wake	Cary	Placed & ID. Identical to 73 + 4096	477 Town of Cary	Town of Cary	Annual charge for (1) 13-inch water line pipe @ MP #H073+3716 near N.E. Maynard Rd., Cary, NC.	Pipe	(1) 24-inch steel casing	Crossing		5'-6" below rail, 3 min row	200	(1) 13-inch DI carrier
076 +1942	Wake	Raleigh		504 City of Raleigh	City of Raleigh		Pipe	(1) 30-inch steel casing pipe	Crossing		18' below rail, 3' min ROW	105	(1) 16-inch ductile iron carrier pipe w/in a 30-inch steel casing pipe
076 +3012	Wake	Raleigh		504 City of Raleigh	City of Raleigh	supplemental agreement extends pipeline by 32'	Pipe	(1) 24-inch corrugated metal 8-guage casing pipe	Crossing		42" min below ground surface to top of pipe	200	(1) 12-inch cast iron water line w/in a 24-inch casing pipe
077 +0648	Wake	Raleigh		504 City of Raleigh	City of Raleigh	2nd pipe is located at S-160+705	Pipe	(2) 36-inch concrete casing pipes	Crossing		5'6" from top of tie to top of the casing pipe	200	(2) 16-inch cast iron water pipes w/in 36-inch concrete casing pipes
077 +0660	Wake	Raleigh		504 City of Raleigh	City of Raleigh	*including (12) fire hydrants, (1) air release valve, (3) 30-inch butterfly valves	Pipe		Longitudinal		4' below rail, 3' min ROW	200	(1) 30-inch ductile iron pipe*
078 +2614	Wake	Raleigh	water pipe;CSX Assignment;may need inspection-doubt still exists; agree. only covers SCL side of ROW	518 State of North Carolina-Parent : North Carolina State University	N.C. State College of Ag. & Eng.		Pipe	(1) 10-inch cast iron or concrete carrier pipe	Crossing		unknown	200	(1) 4-inch cast iron water pipe
079 +1231	Wake	Raleigh		518 State of North Carolina-Parent : North Carolina State University	North Carolina State University		Pipe	60" steel casing	Crossing		13' below rail, 4' min row	200	(2) 17-inch chilled water lines
079 +4521	Wake	Raleigh	water pipe; CSX Assignment; exhibit says h80+260 (mapped based on that)	504 City of Raleigh	City of Raleigh		Pipe	(1) 42-inch concrete casing pipe	Crossing		5'6" from top of tie to top of casing pipe	200	(1) 24-inch concrete water line w/in a 42-inch reinforced concrete casing pipe
080 +1025	Wake	Raleigh	water pipeline; CSX Assignment; may need field inspection-doubtful if still exists	344 State's Prison	State's Prison		Pipe	unknown	Crossing		unknown	200	(1) 8-inch cast iron water pipeline
082 +2679	Wake	Raleigh		504 City of Raleigh	City of Raleigh		Pipe	(1) 36-inch pipe	Crossing		21.83' below rail, 4.37 min in corridor	202	(1) 16-inch ductile iron pipe
086 +3834	Wake	Garner		504 City of Raleigh	City of Raleigh		Pipe		Longitudinal		4.5 min on corridor	6389	(1) 48-inch ductile iron pipe

Traffic

Table 24 Crossing Exposure Index

Highlight indicates location under threshold

RAIL CROSSING INFORMATION - EXPOSURE INDEX										
Crossing #	MP	NS/CSX	Street Name	EXISTING ADT	FUTURE ADT	EXISTING DAILY TRAIN VOLUME	FUTURE DAILY TRAIN VOLUME	EXISTING EXPOSURE INDEX	FUTURE EXPOSURE INDEX	EXPOSURE INDEX THRESHOLD
DURHAM COUNTY										
910594N	53.2	NS	Anderson Street	9,800	12,600	32	72	313600	907226	30000
735223X	53.75	NS	Swift Avenue	19,000	24,429	32	72	608000	1758907	30000
735225L	54.2	NS	S Buchanan Boulevard	23,700	30,472	32	72	758400	2194005	30000
735227A	54.56	NS	S Duke Street	12,000	15,429	32	72	384000	1110889	30000
735229N	54.99	NS	Blackwell Street	4,100	5,272	32	72	131200	379554	30000
735231P	55.07	NS	S Mangum Street	10,000	12,858	32	72	320000	925740	30000
735389C	55.42	NS	S Dillard Street	3,600	4,629	32	72	115200	333267	30000
910605Y	55.8	NS	Fayetteville Street	12,000	15,429	32	72	384000	1110889	30000
470640V	55.57	NS	Ramseur Street	1,900	2,443	32	72	60800	175891	30000
630472K	56.43	NS	S Plum Street	1,300	1,671	32	72	41600	120346	30000
630471D	56.71	NS	S Driver Street	6,100	7,843	32	72	195200	564702	30000
735236Y	57.58	NS	Ellis Road	6,400	8,229	32	72	204800	592474	30000
734735L	59	NS	Glover Road	3,700	4,757	32	72	118400	342524	30000
734736T	59.28	NS	Wrenn Road	1,700	2,186	32	72	54400	157376	30000
734737A	60.28	NS	Ellis Road	12,000	15,429	32	72	384000	1110889	30000
734740H	61.63	NS	Stirrup Creek Drive	610	784	32	72	19520	56470	30000
726293N	62.34	NS	IBM Driveway	350	450	32	72	11200	32401	30000
734742W	62.82	NS	E Cornwallis Road	9,400	12,086	32	72	300800	870196	30000
WAKE COUNTY										
734750N	67.02	NS	McCrimmon Parkway	11,130	15,544	32	72	356160	1119175	30000
734751V	67.76	NS	Builders Driveway	400	559	32	72	12800	40222	30000
734753J	68.74	NS	Morrisville-Carpenter Road	17,000	23,742	32	72	544000	1709431	30000
734755X	72.58	NS	N Harrison Avenue	16,000	22,346	32	72	512000	1608876	30000
734756E	72.7	NS	N Academy Street	5,700	7,961	32	72	182400	573162	30000
904421K	73.76	NS	NE Maynard Road	19,000	26,535	32	72	608000	1910541	30000
630657S	163.43	CSX	Trinity Road	3,400	4,748	32	72	108800	341886	30000
630654W	162.42	CSX	Nowell Road	3,600	5,028	32	72	115200	361997	30000
630650U	161.33	CSX	Powell Drive	3,000	4,190	32	72	96000	301664	30000
633973A	160.77	CSX	Blue Ridge Road	9,100	12,709	32	72	291200	915048	30000
630647L	159.94	CSX	Beryl Road	5,400	7,542	32	72	172800	542996	30000

RAIL CROSSING INFORMATION - EXPOSURE INDEX										
Crossing #	MP	NS/CSX	Street Name	EXISTING ADT	FUTURE ADT	EXISTING DAILY TRAIN VOLUME	FUTURE DAILY TRAIN VOLUME	EXISTING EXPOSURE INDEX	FUTURE EXPOSURE INDEX	EXPOSURE INDEX THRESHOLD
WAKE COUNTY										
630646E	159.73	CSX	Royal Street	700	978	32	72	22400	70388	30000
735488A	81.17	NS	W Cabarrus Street	2,400	3,352	32	72	76800	241331	30000
735481C	82.05	NS	S Blount Street	2,500	3,491	32	72	80000	251387	30000
735480V	83.6	NS	Rush Street	9,200	12,849	32	72	294400	925104	30000
735476F	85.55	NS	Yeargan Road	4,500	6,285	32	72	144000	452497	30000
735324J	85.96	NS	Vandora Springs Road	10,000	13,966	32	72	320000	1005548	30000
735326X	86.46	NS	St. Mary's Street	500	698	32	72	16000	50277	30000
735328L	87.15	NS	New Rand Road	4,900	6,843	32	72	156800	492718	30000
735331U	88.13	NS	Jones Sausage Road	9,600	13,407	32	72	307200	965326	30000
735336D	90.3	NS	Auburn Knightdale Road	5,600	7,821	32	72	179200	563107	30000
735390W	92.02	NS	Guy Road	4,000	5,586	32	72	128000	402219	30000
JOHNSTON COUNTY										
735394Y	94.85	NS	Shotwell Road	15,000	22,925	32	72	480000	1650622	30000
735396M	95.39	NS	W Stallings Street	500	764	32	72	16000	55021	30000
735397U	95.94	NS	N Robertson Street	1,600	2,445	32	72	51200	176066	30000
735398B	96.14	NS	N O'Neil Street	7,600	11,615	32	72	243200	836315	30000
735399H	96.19	NS	N Fayetteville Street	1,100	1,681	32	72	35200	121046	30000
735400A	96.28	NS	N Church Street	1,300	1,987	32	72	41600	143054	30000
735402N	96.84	NS	Central Street	5,000	7,642	32	72	160000	550207	30000
735404C	97.74	NS	NC 42	24,000	36,680	32	72	768000	2640995	30000

Table 25 Crossing Capacity Analysis

RAIL CROSSING INFORMATION - DELAY/LOS SUMMARY												
Crossing #	MP	NS/CSX	STREET NAME	FUTURE ADT	Trains per day	Existing Average Delay Per Vehicle	Existing LOS	Future No Build Average Delay Per Vehicle	FNB LOS	Future Build Average Delay Per Vehicle	FB LOS	Crash Information (for 5 year period) and STIP Information
DURHAM COUNTY												
910594N	53.2	NS	Anderson Street	12,600	72	5.94	B	9.01	B	10.11	C	
735223X	53.75	NS	Swift Avenue	24,429	72	4.09	A	4.80	A	5.38	B	
735225L	54.2	NS	S Buchanan Boulevard	30,472	72	17.61	C	30.63	E	34.35	E	
735227A	54.56	NS	S Duke Street*	15,429	72	3.79	A	4.27	A	4.79	A	
735229N	54.99	NS	Blackwell Street	5,272	72	3.50	A	3.82	A	4.29	A	
735231P	55.07	NS	S Mangum Street*	12,858	72	3.55	A	3.90	A	4.37	A	
735389C	55.42	NS	S Dillard Street	4,629	72	3.64	A	4.04	A	4.53	A	
910605Y	55.57	NS	Fayetteville Street	15,429	72	3.44	A	3.73	A	4.19	A	32 crashes at intersection west of crossing
470640V	55.9	NS	Ramseur Street	2,443	72	3.13	A	3.28	A	3.67	A	
630472K	56.43	NS	S Plum Street	1,671	72	2.98	A	3.07	A	3.44	A	
630471D	56.71	NS	S Driver Street	7,843	72	4.79	A	6.15	B	6.90	B	1 serious injury crash involving train: April 2018
735236Y	57.58	NS	Ellis Road	8,229	72	4.20	A	4.98	A	5.59	B	20 crashes at intersection south of crossing; 22 crashes at intersection north of crossing
734735L	59	NS	Glover Road	4,757	72	3.68	A	4.10	A	4.59	A	Proposed Grade Separation: P-5706
734736T	59.28	NS	Wrenn Road	2,186	72	3.08	A	3.20	A	3.59	A	Crossing Closure: P-5706
734737A	60.28	NS	Ellis Road	15,429	72	8.11	B	18.93	C	21.23	D	Proposed Grade Separation: P-5706
734740H	61.63	NS	Stirrup Creek Drive	784	72	2.83	A	2.86	A	3.21	A	
726293N	62.34	NS	IBM Driveway	450	72	2.77	A	2.79	A	3.13	A	
734742W	62.82	NS	E Cornwallis Road	12,086	72	4.07	A	4.76	A	5.34	B	Proposed Grade Separation: P-5717
WAKE COUNTY												
734750N	67.02	NS	McCrimmon Parkway	15,544	72	4.49	A	6.08	B	6.82	B	Proposed Grade Separation: U-5747B; 73 crashes at intersection east of crossing
734751V	67.76	NS	Builders Driveway	559	72	2.78	A	2.82	A	3.16	A	
734753J	68.74	NS	Morrisville-Carpenter Road	23,742	72	6.88	B	17.78	C	19.94	C	90 crashes at intersection east of crossing; 2 fatality crashes involving train in November 2015 and August 2014
734755X	72.58	NS	N Harrison Avenue	22,346	72	3.79	A	4.50	A	5.05	B	Proposed Grade Separation: P-5708
734756E	72.7	NS	N Academy Street	7,961	72	3.40	A	3.78	A	4.24	A	
904421K	73.76	NS	NE Maynard Road	26,535	72	4.09	A	5.14	B	5.76	B	Proposed Grade Separation: P-5718; 1 fatal crash involving train: January 2014
630657S	163.43	CSX	Trinity Road	4,748	72	3.33	A	3.67	A	4.12	A	Proposed Grade Separation: P-5734; 24 crashes at intersection south of crossing
630654W	162.42	CSX	Nowell Road	5,028	72	3.38	A	3.75	A	4.21	A	51 crashes at intersection south of crossing
630650U	161.33	CSX	Powell Drive	4,190	72	3.44	A	3.86	A	4.33	A	
633973A	160.77	CSX	Blue Ridge Road	12,709	72	3.23	A	3.50	A	3.92	A	Proposed Grade Separation: U-4437; 57 crashes at intersection north of crossing; 25 crashes at intersection south of crossing
630647L	159.94	CSX	Beryl Road	7,542	72	3.35	A	3.70	A	4.15	A	Crossing Closure: P-5736; 40 crashes at intersection north of crossing

RAIL CROSSING INFORMATION - DELAY/LOS SUMMARY												
Crossing #	MP	NS/CSX	STREET NAME	FUTURE ADT	Trains per day	Existing Average Delay Per Vehicle	Existing LOS	Future No Build Average Delay Per Vehicle	FNB LOS	Future Build Average Delay Per Vehicle	FB LOS	Crash Information (for 5 year period) and STIP Information
WAKE COUNTY												
630646E	159.73	CSX	Royal Street	978	72	2.85	A	2.91	A	3.26	A	
735488A	81.17	NS	W Cabarrus Street	3,352	72	3.26	A	3.56	A	3.99	A	
735481C	82.05	NS	S Blount Street	3,491	72	3.29	A	3.60	A	4.04	A	1 fatal crash involving train: February 2013
735480V	83.6	NS	Rush Street	12,849	72	5.53	B	9.45	B	10.60	C	
735476F	85.55	NS	Yeagan Road	6,285	72	3.61	A	4.15	A	4.66	A	
735324J	85.96	NS	Vandora Springs Road	13,966	72	6.08	B	12.07	C	13.53	C	Proposed Grade Separation: P-5738; 46 crashes at intersection north of crossing; 1 fatal crash involving train: February 2013
735326X	86.46	NS	St. Mary's Street	698	72	2.80	A	2.85	A	3.19	A	
735328L	87.15	NS	New Rand Road	6,843	72	3.72	A	4.36	A	4.89	A	
735331U	88.13	NS	Jones Sausage Road	13,407	72	4.12	A	5.19	B	5.82	B	30 crashes at intersection south of crossing
735336D	90.3	NS	Auburn Knightdale Road	7,821	72	3.93	A	4.78	A	5.36	B	
735390W	92.02	NS	Guy Road	5,586	72	3.48	A	3.92	A	4.40	A	
JOHNSTON COUNTY												
735394Y	94.85	NS	Shotwell Road	22,925	72	5.82	B	14.92	C	16.73	C	Proposed Grade Separation: P-5743
735396M	95.39	NS	W Stallings Street	764	72	2.80	A	2.86	A	3.21	A	
735397U	95.94	NS	N Robertson Street	2,445	72	3.05	A	3.28	A	3.67	A	
735398B	96.14	NS	N O'Neil Street	11,615	72	4.68	A	7.62	B	8.55	B	
735399H	96.19	NS	N Fayetteville Street	1,681	72	2.93	A	3.07	A	3.45	A	
735400A	96.28	NS	N Church Street	1,987	72	2.98	A	3.15	A	3.53	A	
735402N	96.84	NS	Central Street	7,642	72	4.21	A	5.95	B	6.68	B	
735404C	97.74	NS	NC 42	36,680	72	4.73	A	7.84	B	8.79	B	

Table 26 Capacity Analysis - Existing Freight

RAIL CROSSING INFORMATION - FREIGHT ONLY IN EXISTING																		
Crossing #	MP	NS/CSX	Street Name	No. Lanes (one-way direction)	ADT (E - Estimated; N - NCDOT Data)	Trains per day	Train Speed (miles/hr)	Train Length (feet)	Blocked Crossing Time (min) D _c	Vehicle Departure Rate S _c	Average Arrival Rate S _a	Average Crossing Delay per Stopped Vehicle D _A	Number of Vehicles Delayed per Day T _D	Average Delay per Vehicle	LOS	Road Classification	Crash/Other Notes	
DURHAM COUNTY																		
910594N	53.2	NS	Anderson Street	1	9,800	N	20	30.00	5280.00	2.50	900	490.00	2.74	340.28	5.72	B	Collector	
735223X	53.75	NS	Swift Avenue	2	19,000	N	20	30.00	5280.00	2.50	1,400	475.00	1.89	659.72	3.94	A	Arterial	
735225L	54.2	NS	S Buchanan Boulevard	1	23,700	E	20	30.00	5280.00	2.50	1,400	1,185.00	8.14	822.92	16.96	C	Arterial	
735227A	54.56	NS	S Duke Street*	3	12,000	N	20	30.00	5280.00	2.50	1,400	400.00	1.75	416.67	3.65	A	Arterial	
735229N	54.99	NS	Blackwell Street	1	4,100	E	20	30.00	5280.00	2.50	900	205.00	1.62	142.36	3.37	A	Collector	
735231P	55.07	NS	S Mangum Street*	3	10,000	N	20	30.00	5280.00	2.50	1,400	333.33	1.64	347.22	3.42	A	Arterial	
735389C	55.42	NS	S Dillard Street	1	3,600	N	20	30.00	5280.00	2.50	700	180.00	1.68	125.00	3.51	A	Local	
910605Y	55.8	NS	Fayetteville Street	2	12,000	N	20	30.00	5280.00	2.50	1,400	300.00	1.59	416.67	3.31	A	Arterial	32 crashes in a 5 year period at Fayetteville/Pettigrew intersection west of rail crossing
470640V	55.57	NS	Ramseur Street	1	1,900		20	30.00	5280.00	2.50	700	95.00	1.45	65.97	3.01	A	Local	
630472K	56.43	NS	S Plum Street	1	1,300		20	30.00	5280.00	2.50	700	65.00	1.38	45.14	2.87	A	Local	
630471D	56.71	NS	S Driver Street	1	6,100	N	20	30.00	5280.00	2.50	700	305.00	2.22	211.81	4.61	A	Local	1 Serious Injury Crash involving train April 2018
735236Y	57.58	NS	Ellis Road	1	6,400	N	20	30.00	5280.00	2.50	900	320.00	1.94	222.22	4.04	A	Collector	20 crashes in a 5 year period at Ellis/Pettigrew south of rail crossing, 22 crashes in a 5 year period at Ellis/Angier north of rail crossing
734735L	59	NS	Glover Road	1	3,700	N	20	30.00	5280.00	2.50	700	185.00	1.70	128.47	3.54	A	Local	Says this will be grade separated from STIP P-5706
734736T	59.28	NS	Wrenn Road	1	1,700	N	20	30.00	5280.00	2.50	700	85.00	1.42	59.03	2.96	A	Local	Crossing may be closed by STIP P-5706
734737A	60.28	NS	Ellis Road	1	12,000	N	20	30.00	5280.00	2.50	900	600.00	3.75	416.67	7.81	B	Collector	Says this will be grade separated from STIP P-5706
734740H	61.63	NS	Stirrup Creek Drive	1	610	E	20	30.00	5280.00	2.50	700	30.50	1.31	21.18	2.72	A	Local	
726293N	62.34	NS	IBM Driveway	1	350	E	20	30.00	5280.00	2.50	700	17.50	1.28	12.15	2.67	A	Local	
734742W	62.82	NS	E Cornwallis Road	1	9,400	N	20	30.00	5280.00	2.50	1,400	470.00	1.88	326.39	3.92	A	Arterial	
WAKE COUNTY																		
734750N	67.02	NS	McCrimmon Parkway	1	11,130	E	20	30.00	5280.00	2.50	1,400	556.50	2.07	386.46	4.32	A	Arterial	73 crashes in a 5 year period at Chapel Hill/McCrimmon east of rail crossing; STIP U-5747B proposes grade separation for 2021 construction
734751V	67.76	NS	Builders Driveway	1	400	E	20	30.00	5280.00	2.50	700	20.00	1.29	13.89	2.68	A	Local	
734753J	68.74	NS	Morrisville-Carpenter Road	1	17,000	N	20	30.00	5280.00	2.50	1,400	850.00	3.18	590.28	6.63	B	Arterial	90 crashes in a 5 year period at Morrisville-Carpenter/Aviation east of rail crossing (2 fatality train involved crashes, one in November 2015 and one in August 2014); Planned U-5811 project to alleviate safety issues
734755X	72.58	NS	N Harrison Avenue	2	16,000	N	20	30.00	5280.00	2.50	1,400	400.00	1.75	555.56	3.65	A	Arterial	

RAIL CROSSING INFORMATION - FREIGHT ONLY IN EXISTING																		
Crossing #	MP	NS/CSX	Street Name	No. Lanes (one-way direction)	ADT (E - Estimated; N - NCDOT Data)	Trains per day	Train Speed (miles/hr)	Train Length (feet)	Blocked Crossing Time (min) D _c	Vehicle Departure Rate S _c	Average Arrival Rate S _q	Average Crossing Delay per Stopped Vehicle D _A	Number of Vehicles Delayed per Day T _D	Average Delay per Vehicle	LOS	Road Classification	Crash/Other Notes	
WAKE COUNTY																		
734756E	72.7	NS	N Academy Street	1	5,700	N	20	30.00	5280.00	2.50	1,400	285.00	1.57	197.92	3.27	A	Arterial	
904421K	73.76	NS	NE Maynard Road	2	19,000	N	20	30.00	5280.00	2.50	1,400	475.00	1.89	659.72	3.94	A	Arterial	Crossing at NCDOT P-5718 which proposes grade separation (1 fatal crash involving train in January 2014)
630657S	163.43	CSX	Trinity Road	1	3,400	N	20	30.00	5280.00	2.50	900	170.00	1.54	118.06	3.21	A	Collector	Crossing at NCDOT P-5718 which proposes grade separation; 24 crashes in a 5 year period at Chatham/Trinity south of rail crossing
630654W	162.42	CSX	Nowell Road	1	3,600	N	20	30.00	5280.00	2.50	900	180.00	1.56	125.00	3.26	A	Collector	51 crashes in a 5 year period at Hillsborough/Nowell south of rail crossing
630650U	161.33	CSX	Powell Drive	1	3,000	N	20	30.00	5280.00	2.50	700	150.00	1.59	104.17	3.31	A	Local	
633973A	160.77	CSX	Blue Ridge Road	2	9,100	N	20	30.00	5280.00	2.50	1,400	227.50	1.49	315.97	3.11	A	Arterial	Crossing at NCDOT U-4437 which proposes grade separation; 57 crashes in a 5 year period at Blue Ridge/Hillsborough north of rail crossing; 25 crashes in a 5 year period at Blue Ridge/Beryl south of rail crossing
630647L	159.94	CSX	Beryl Road	2	5,400	N	20	30.00	5280.00	2.50	700	135.00	1.55	187.50	3.23	A	Local	Crossing at NCDOT P-5736 which proposes closure; 40 crashes in a 5 year period at Hillsborough/Beryl north of rail crossing
630646E	159.73	CSX	Royal Street	1	700		20	30.00	5280.00	2.50	700	35.00	1.32	24.31	2.74	A	Local	
735488A	81.17	NS	W Cabarrus Street	1	2,400		20	30.00	5280.00	2.50	700	120.00	1.51	83.33	3.14	A	Local	Crossing at NCDOT U-5521 may be future grade separation, not clear
735481C	82.05	NS	S Blount Street	1	2,500	N	20	30.00	5280.00	2.50	700	125.00	1.52	86.81	3.17	A	Local	1 fatal crash involving train February 2013
735480V	83.6	NS	Rush Street	1	9,200	N	20	30.00	5280.00	2.50	900	460.00	2.56	319.44	5.33	B	Collector	
735476F	85.55	NS	Yeargan Road	1	4,500	N	20	30.00	5280.00	2.50	900	225.00	1.67	156.25	3.47	A	Collector	
735324J	85.96	NS	Vandora Springs Road	1	10,000	N	20	30.00	5280.00	2.50	900	500.00	2.81	347.22	5.86	B	Collector	Crossing at NCDOT P-5738 which proposes grade separation; 46 crashes in a 5 year period at Vandora Springs/Garner north of rail crossing (1 fatal crash involving train February 2013)
735326X	86.46	NS	St. Mary's Street	1	500		20	30.00	5280.00	2.50	700	25.00	1.30	17.36	2.70	A	Local	
735328L	87.15	NS	New Rand Road	1	4,900	N	20	30.00	5280.00	2.50	900	245.00	1.72	170.14	3.58	A	Collector	
735331U	88.13	NS	Jones Sausage Road	1	9,600	N	20	30.00	5280.00	2.50	1,400	480.00	1.90	333.33	3.96	A	Arterial	30 crashes in a 5 year period at Jones Sausage/Cabela south of rail crossing (most likely far enough from rail to not have an effect)
735336D	90.3	NS	Auburn Knightdale Road	1	5,600	N	20	30.00	5280.00	2.50	900	280.00	1.81	194.44	3.78	A	Collector	
735390W	92.02	NS	Guy Road	1	4,000	N	20	30.00	5280.00	2.50	900	200.00	1.61	138.89	3.35	A	Collector	
JOHNSTON COUNTY																		
735394Y	94.85	NS	Shotwell Road	1	15,000	N	20	30.00	5280.00	2.50	1,400	750.00	2.69	520.83	5.61	B	Arterial	
735396M	95.39	NS	W Stallings Street	1	500		20	30.00	5280.00	2.50	700	25.00	1.30	17.36	2.70	A	Local	
735397U	95.94	NS	N Robertson Street	1	1,600	N	20	30.00	5280.00	2.50	700	80.00	1.41	55.56	2.94	A	Local	
735398B	96.14	NS	N O'Neil Street	1	7,600	N	20	30.00	5280.00	2.50	900	380.00	2.16	263.89	4.51	A	Collector	

RAIL CROSSING INFORMATION - FREIGHT ONLY IN EXISTING																		
Crossing #	MP	NS/CSX	Street Name	No. Lanes (one-way direction)	ADT (E - Estimated; N - NCDOT Data)	Trains per day	Train Speed (miles/hr)	Train Length (feet)	Blocked Crossing Time (min) D _c	Vehicle Departure Rate S _c	Average Arrival Rate S _q	Average Crossing Delay per Stopped Vehicle D _A	Number of Vehicles Delayed per Day T _D	Average Delay per Vehicle	LOS	Road Classification	Crash/Other Notes	
JOHNSTON COUNTY																		
735399H	96.19	NS	N Fayetteville Street	1	1,100		20	30.00	5280.00	2.50	700	55.00	1.36	38.19	2.83	A	Local	
735400A	96.28	NS	N Church Street	1	1,300	E	20	30.00	5280.00	2.50	700	65.00	1.38	45.14	2.87	A	Local	
735402N	96.84	NS	Central Street	1	5,000		20	30.00	5280.00	2.50	700	250.00	1.94	173.61	4.05	A	Local	
735404C	97.74	NS	NC 42	2	24,000	N	20	30.00	5280.00	2.50	1,400	600.00	2.19	833.33	4.56	A	Arterial	
										N/A	N/A	N/A	N/A	N/A	N/A	N/A		
*Data manipulated to represent a one-way street																		

Roadway Classification Determination by STV, all listed as local
 Roadway Classification per NCDOT
 Train Data
 Roadway Data

Table 27 Capacity Analysis - Existing Amtrak

RAIL CROSSING INFORMATION - AMTRAK ONLY IN EXISTING																		
Crossing #	MP	NS/CSX	Street Name	No. Lanes (one-way direction)	ADT (E - Estimated; N - NCDOT Data)	Trains per day	Train Speed (miles/hr)	Train Length (feet)	Blocked Crossing Time (min) D _c	Vehicle Departure Rate S _c	Average Arrival Rate S _a	Average Crossing Delay per Stopped Vehicle D _A	Number of Vehicles Delayed per Day T _D	Average Delay per Vehicle	LOS	Road Classification	Crash/Other Notes	
DURHAM COUNTY																		
910594N	53.2	NS	Anderson Street	1	9,800	N	12	45.00	525.00	0.63	900	490.00	0.69	51.66	0.22	A	Collector	
735223X	53.75	NS	Swift Avenue	2	19,000	N	12	45.00	525.00	0.63	1,400	475.00	0.48	100.16	0.15	A	Arterial	
735225L	54.2	NS	S Buchanan Boulevard	1	23,700	E	12	45.00	525.00	0.63	1,400	1,185.00	2.06	124.93	0.65	A	Arterial	
735227A	54.56	NS	S Duke Street*	3	12,000	N	12	45.00	525.00	0.63	1,400	400.00	0.44	63.26	0.14	A	Arterial	
735229N	54.99	NS	Blackwell Street	1	4,100	E	12	45.00	525.00	0.63	900	205.00	0.41	21.61	0.13	A	Collector	
735231P	55.07	NS	S Mangum Street*	3	10,000	N	12	45.00	525.00	0.63	1,400	333.33	0.42	52.71	0.13	A	Arterial	
735389C	55.42	NS	S Dillard Street	1	3,600	N	12	45.00	525.00	0.63	700	180.00	0.43	18.98	0.13	A	Local	
910605Y	55.8	NS	Fayetteville Street	2	12,000	N	12	45.00	525.00	0.63	1,400	300.00	0.40	63.26	0.13	A	Arterial	32 crashes in a 5 year period at Fayetteville/Pettigrew intersection west of rail crossing
470640V	55.57	NS	Ramseur Street	1	1,900		12	45.00	525.00	0.63	700	95.00	0.37	10.02	0.12	A	Local	
630472K	56.43	NS	S Plum Street	1	1,300		12	45.00	525.00	0.63	700	65.00	0.35	6.85	0.11	A	Local	
630471D	56.71	NS	S Driver Street	1	6,100	N	12	45.00	525.00	0.63	700	305.00	0.56	32.16	0.18	A	Local	1 Serious Injury Crash involving train April 2018
735236Y	57.58	NS	Ellis Road	1	6,400	N	12	45.00	525.00	0.63	900	320.00	0.49	33.74	0.16	A	Collector	20 crashes in a 5 year period at Ellis/Pettigrew south of rail crossing, 22 crashes in a 5 year period at Ellis/Angier north of rail crossing
734735L	59	NS	Glover Road	1	3,700	N	12	45.00	525.00	0.63	700	185.00	0.43	19.50	0.14	A	Local	Says this will be grade separated from STIP P-5706
734736T	59.28	NS	Wrenn Road	1	1,700	N	12	45.00	525.00	0.63	700	85.00	0.36	8.96	0.11	A	Local	Crossing may be closed by STIP P-5706
734737A	60.28	NS	Ellis Road	1	12,000	N	12	45.00	525.00	0.63	900	600.00	0.95	63.26	0.30	A	Collector	Says this will be grade separated from STIP P-5706
734740H	61.63	NS	Stirrup Creek Drive	1	610	E	12	45.00	525.00	0.63	700	30.50	0.33	3.22	0.10	A	Local	
726293N	62.34	NS	IBM Driveway	1	350	E	12	45.00	525.00	0.63	700	17.50	0.32	1.85	0.10	A	Local	
734742W	62.82	NS	E Cornwallis Road	1	9,400	N	12	45.00	525.00	0.63	1,400	470.00	0.48	49.55	0.15	A	Arterial	
WAKE COUNTY																		
734750N	67.02	NS	McCrimmon Parkway	1	11,130	E	12	45.00	525.00	0.63	1,400	556.50	0.52	58.67	0.17	A	Arterial	73 crashes in a 5 year period at Chapel Hill/McCrimmon east of rail crossing; STIP U-5747B proposes grade separation for 2021 construction
734751V	67.76	NS	Builders Driveway	1	400	E	12	45.00	525.00	0.63	700	20.00	0.33	2.11	0.10	A	Local	
734753J	68.74	NS	Morrisville-Carpenter Road	1	17,000	N	12	45.00	525.00	0.63	1,400	850.00	0.81	89.61	0.25	A	Arterial	90 crashes in a 5 year period at Morrisville-Carpenter/Aviation east of rail crossing (2 fatality train involved crashes, one in November 2015 and one in August 2014); Planned U-5811 project to alleviate safety issues
734755X	72.58	NS	N Harrison Avenue	2	16,000	N	12	45.00	525.00	0.63	1,400	400.00	0.44	84.34	0.14	A	Arterial	

RAIL CROSSING INFORMATION - AMTRAK ONLY IN EXISTING																		
Crossing #	MP	NS/CSX	Street Name	No. Lanes (one-way direction)	ADT (E - Estimated; N - NCDOT Data)	Trains per day	Train Speed (miles/hr)	Train Length (feet)	Blocked Crossing Time (min) D _c	Vehicle Departure Rate S _c	Average Arrival Rate S _a	Average Crossing Delay per Stopped Vehicle D _A	Number of Vehicles Delayed per Day T _D	Average Delay per Vehicle	LOS	Road Classification	Crash/Other Notes	
WAKE COUNTY																		
734756E	72.7	NS	N Academy Street	1	5,700	N	12	45.00	525.00	0.63	1,400	285.00	0.40	30.05	0.13	A	Arterial	
904421K	73.76	NS	NE Maynard Road	2	19,000	N	12	45.00	525.00	0.63	1,400	475.00	0.48	100.16	0.15	A	Arterial	Crossing at NCDOT P-5718 which proposes grade separation (1 fatal crash involving train in January 2014)
630657S	163.43	CSX	Trinity Road	1	3,400	N	12	45.00	525.00	0.63	900	170.00	0.39	17.92	0.12	A	Collector	Crossing at NCDOT P-5718 which proposes grade separation; 24 crashes in a 5 year period at Chatham/Trinity south of rail crossing
630654W	162.42	CSX	Nowell Road	1	3,600	N	12	45.00	525.00	0.63	900	180.00	0.40	18.98	0.13	A	Collector	51 crashes in a 5 year period at Hillsborough/Nowell south of rail crossing
630650U	161.33	CSX	Powell Drive	1	3,000	N	12	45.00	525.00	0.63	700	150.00	0.40	15.81	0.13	A	Local	
633973A	160.77	CSX	Blue Ridge Road	2	9,100	N	12	45.00	525.00	0.63	1,400	227.50	0.38	47.97	0.12	A	Arterial	Crossing at NCDOT U-4437 which proposes grade separation; 57 crashes in a 5 year period at Blue Ridge/Hillsborough north of rail crossing; 25 crashes in a 5 year period at Blue Ridge/Beryl south of rail crossing
630647L	159.94	CSX	Beryl Road	2	5,400	N	12	45.00	525.00	0.63	700	135.00	0.39	28.47	0.12	A	Local	Crossing at NCDOT P-5736 which proposes closure; 40 crashes in a 5 year period at Hillsborough/Beryl north of rail crossing
630646E	159.73	CSX	Royal Street	1	700		12	45.00	525.00	0.63	700	35.00	0.33	3.69	0.11	A	Local	
735488A	81.17	NS	W Cabarrus Street	1	2,400		12	45.00	525.00	0.63	700	120.00	0.38	12.65	0.12	A	Local	Crossing at NCDOT U-5521 may be future grade separation, not clear
735481C	82.05	NS	S Blount Street	1	2,500	N	12	45.00	525.00	0.63	700	125.00	0.39	13.18	0.12	A	Local	1 fatal crash involving train February 2013
735480V	83.6	NS	Rush Street	1	9,200	N	12	45.00	525.00	0.63	900	460.00	0.65	48.50	0.20	A	Collector	
735476F	85.55	NS	Yeagan Road	1	4,500	N	12	45.00	525.00	0.63	900	225.00	0.42	23.72	0.13	A	Collector	
735324J	85.96	NS	Vandora Springs Road	1	10,000	N	12	45.00	525.00	0.63	900	500.00	0.71	52.71	0.23	A	Collector	Crossing at NCDOT P-5738 which proposes grade separation; 46 crashes in a 5 year period at Vandora Springs/Garner north of rail crossing (1 fatal crash involving train February 2013)
735326X	86.46	NS	St. Mary's Street	1	500		12	45.00	525.00	0.63	700	25.00	0.33	2.64	0.10	A	Local	
735328L	87.15	NS	New Rand Road	1	4,900	N	12	45.00	525.00	0.63	900	245.00	0.43	25.83	0.14	A	Collector	
735331U	88.13	NS	Jones Sausage Road	1	9,600	N	12	45.00	525.00	0.63	1,400	480.00	0.48	50.61	0.15	A	Arterial	30 crashes in a 5 year period at Jones Sausage/Cabela south of rail crossing (most likely far enough from rail to not have an effect)
735336D	90.3	NS	Auburn Knightdale Road	1	5,600	N	12	45.00	525.00	0.63	900	280.00	0.46	29.52	0.15	A	Collector	
735390W	92.02	NS	Guy Road	1	4,000	N	12	45.00	525.00	0.63	900	200.00	0.41	21.09	0.13	A	Collector	
JOHNSTON COUNTY																		
735394Y	94.85	NS	Shotwell Road	1	15,000	N	12	45.00	525.00	0.63	1,400	750.00	0.68	79.07	0.22	A	Arterial	
735396M	95.39	NS	W Stallings Street	1	500		12	45.00	525.00	0.63	700	25.00	0.33	2.64	0.10	A	Local	
735397U	95.94	NS	N Robertson Street	1	1,600	N	12	45.00	525.00	0.63	700	80.00	0.36	8.43	0.11	A	Local	
735398B	96.14	NS	N O'Neil Street	1	7,600	N	12	45.00	525.00	0.63	900	380.00	0.55	40.06	0.17	A	Collector	

RAIL CROSSING INFORMATION - AMTRAK ONLY IN EXISTING																	
Crossing #	MP	NS/CSX	Street Name	No. Lanes (one-way direction)	ADT (E - Estimated; N - NCDOT Data)	Trains per day	Train Speed (miles/hr)	Train Length (feet)	Blocked Crossing Time (min) D _c	Vehicle Departure Rate S _c	Average Arrival Rate S _a	Average Crossing Delay per Stopped Vehicle D _A	Number of Vehicles Delayed per Day T _D	Average Delay per Vehicle	LOS	Road Classification	Crash/Other Notes
JOHNSTON COUNTY																	
735399H	96.19	NS	N Fayetteville Street	1	1,100		12	45.00	525.00	0.63	700	55.00	0.34	5.80	0.11	A	Local
735400A	96.28	NS	N Church Street	1	1,300	E	12	45.00	525.00	0.63	700	65.00	0.35	6.85	0.11	A	Local
735402N	96.84	NS	Central Street	1	5,000		12	45.00	525.00	0.63	700	250.00	0.49	26.36	0.16	A	Local
735404C	97.74	NS	NC 42	2	24,000	N	12	45.00	525.00	0.63	1,400	600.00	0.55	126.52	0.18	A	Arterial
										N/A	N/A	N/A	N/A	N/A	N/A	N/A	

*Data manipulated to represent a one-way street

Roadway Classification Determination by STV, all listed as local
 Roadway Classification per NCDOT
 Train Data
 Roadway Data

Table 28 Capacity Analysis - Build Freight

RAIL CROSSING INFORMATION - FREIGHT ONLY IN BUILD																		
Crossing #	MP	NS/CSX	Street Name	No. Lanes (one-way direction)	FUTURE ADT (E - Estimated; N - NCDOT Data)	Trains per day	Train Speed (miles/hr)	Train Length (feet)	Blocked Crossing Time (min) D _c	Vehicle Departure Rate S _c	Average Arrival Rate S _a	Average Crossing Delay per Stopped Vehicle D _A	Number of Vehicles Delayed per Day T _D	Average Delay per Vehicle	LOS	Road Classification	Crash/Other Notes	
DURHAM COUNTY																		
910594N	53.2	NS	Anderson Street	1	12,600	N	20	30.00	5280.00	2.50	900	630.02	4.17	437.51	8.68	B	Collector	
735223X	53.75	NS	Swift Avenue	2	24,429	N	20	30.00	5280.00	2.50	1,400	610.73	2.22	848.24	4.62	A	Arterial	
735225L	54.2	NS	S Buchanan Boulevard	1	30,472	E	20	30.00	5280.00	2.50	1,400	1,523.61	14.16	1,058.07	29.49	D	Arterial	
735227A	54.56	NS	S Duke Street*	3	15,429	N	20	30.00	5280.00	2.50	1,400	514.30	1.98	535.73	4.12	A	Arterial	
735229N	54.99	NS	Blackwell Street	1	5,272	E	20	30.00	5280.00	2.50	900	263.58	1.77	183.04	3.68	A	Collector	
735231P	55.07	NS	S Mangum Street*	3	12,858	N	20	30.00	5280.00	2.50	1,400	428.58	1.80	446.44	3.75	A	Arterial	
735389C	55.42	NS	S Dillard Street	1	4,629	N	20	30.00	5280.00	2.50	700	231.44	1.87	160.72	3.89	A	Local	
910605Y	55.57	NS	Fayetteville Street	2	15,429	N	20	30.00	5280.00	2.50	1,400	385.73	1.73	535.73	3.59	A	Arterial	32 crashes in a 5 year period at Fayetteville/Pettigrew intersection west of rail crossing
470640V	55.9	NS	Ramseur Street	1	2,443		20	30.00	5280.00	2.50	700	122.15	1.51	84.82	3.15	A	Local	
630472K	56.43	NS	S Plum Street	1	1,671		20	30.00	5280.00	2.50	700	83.57	1.42	58.04	2.96	A	Local	
630471D	56.71	NS	S Driver Street	1	7,843	N	20	30.00	5280.00	2.50	700	392.15	2.84	272.33	5.92	B	Local	1 Serious Injury Crash involving train April 2018
735236Y	57.58	NS	Ellis Road	1	8,229	N	20	30.00	5280.00	2.50	900	411.44	2.30	285.72	4.80	A	Collector	20 crashes in a 5 year period at Ellis/Pettigrew south of rail crossing, 22 crashes in a 5 year period at Ellis/Angier north of rail crossing
734735L	59	NS	Glover Road	1	4,757	N	20	30.00	5280.00	2.50	700	237.86	1.89	165.18	3.94	A	Local	Says this will be grade separated from STIP P-5706
734736T	59.28	NS	Wrenn Road	1	2,186	N	20	30.00	5280.00	2.50	700	109.29	1.48	75.90	3.09	A	Local	Crossing may be closed by STIP P-5706
734737A	60.28	NS	Ellis Road	1	15,429	N	20	30.00	5280.00	2.50	900	771.45	8.75	535.73	18.23	C	Collector	Says this will be grade separated from STIP P-5706
734740H	61.63	NS	Stirrup Creek Drive	1	784	E	20	30.00	5280.00	2.50	700	39.22	1.32	27.23	2.76	A	Local	
726293N	62.34	NS	IBM Driveway	1	450	E	20	30.00	5280.00	2.50	700	22.50	1.29	15.63	2.69	A	Local	
734742W	62.82	NS	E Cornwallis Road	1	12,086	N	20	30.00	5280.00	2.50	1,400	604.30	2.20	419.65	4.58	A	Arterial	
WAKE COUNTY																		
734750N	67.02	NS	McCrimmon Parkway	1	15,544	E	20	30.00	5280.00	2.50	1,400	777.20	2.81	539.73	5.85	B	Arterial	73 crashes in a 5 year period at Chapel Hill/McCrimmon east of rail crossing; STIP U-5747B proposes grade separation for 2021 construction
734751V	67.76	NS	Builders Driveway	1	559	E	20	30.00	5280.00	2.50	700	27.93	1.30	19.40	2.71	A	Local	
734753J	68.74	NS	Morrisville-Carpenter Road	1	23,742	N	20	30.00	5280.00	2.50	1,400	1,187.11	8.22	824.38	17.13	C	Arterial	90 crashes in a 5 year period at Morrisville-Carpenter/Aviation east of rail crossing (2 fatality train involved crashes, one in November 2015 and one in August 2014); Planned U-5811 project to alleviate safety issues
734755X	72.58	NS	N Harrison Avenue	2	22,346	N	20	30.00	5280.00	2.50	1,400	558.64	2.08	775.89	4.33	A	Arterial	
734756E	72.7	NS	N Academy Street	1	7,961	N	20	30.00	5280.00	2.50	1,400	398.03	1.75	276.41	3.64	A	Arterial	

RAIL CROSSING INFORMATION - FREIGHT ONLY IN BUILD																		
Crossing #	MP	NS/CSX	Street Name	No. Lanes (one-way direction)	FUTURE ADT (E - Estimated; N - NCDOT Data)	Trains per day	Train Speed (miles/hr)	Train Length (feet)	Blocked Crossing Time (min) D _c	Vehicle Departure Rate S _c	Average Arrival Rate S _q	Average Crossing Delay per Stopped Vehicle D _A	Number of Vehicles Delayed per Day T _D	Average Delay per Vehicle	LOS	Road Classification	Crash/Other Notes	
WAKE COUNTY																		
904421K	73.76	NS	NE Maynard Road	2	26,535	N	20	30.00	5280.00	2.50	1,400	663.38	2.38	921.36	4.95	A	Arterial	Crossing at NCDOT P-5718 which proposes grade separation (1 fatal crash involving train in January 2014)
630657S	163.43	CSX	Trinity Road	1	4,748	N	20	30.00	5280.00	2.50	900	237.42	1.70	164.88	3.54	A	Collector	Crossing at NCDOT P-5718 which proposes grade separation; 24 crashes in a 5 year period at Chatham/Trinity south of rail crossing
630654W	162.42	CSX	Nowell Road	1	5,028	N	20	30.00	5280.00	2.50	900	251.39	1.73	174.57	3.61	A	Collector	51 crashes in a 5 year period at Hillsborough/Nowell south of rail crossing
630650U	161.33	CSX	Powell Drive	1	4,190	N	20	30.00	5280.00	2.50	700	209.49	1.78	145.48	3.72	A	Local	
633973A	160.77	CSX	Blue Ridge Road	2	12,709	N	20	30.00	5280.00	2.50	1,400	317.73	1.62	441.28	3.37	A	Arterial	Crossing at NCDOT U-4437 which proposes grade separation; 57 crashes in a 5 year period at Blue Ridge/Hillsborough north of rail crossing; 25 crashes in a 5 year period at Blue Ridge/Beryl south of rail crossing
630647L	159.94	CSX	Beryl Road	2	7,542	N	20	30.00	5280.00	2.50	700	188.54	1.71	261.86	3.56	A	Local	Crossing at NCDOT P-5736 which proposes closure; 40 crashes in a 5 year period at Hillsborough/Beryl north of rail crossing
630646E	159.73	CSX	Royal Street	1	978		20	30.00	5280.00	2.50	700	48.88	1.34	33.94	2.80	A	Local	
735488A	81.17	NS	W Cabarrus Street	1	3,352		20	30.00	5280.00	2.50	700	167.59	1.64	116.38	3.42	A	Local	Crossing at NCDOT U-5521 may be future grade separation, not clear
735481C	82.05	NS	S Blount Street	1	3,491	N	20	30.00	5280.00	2.50	700	174.57	1.67	121.23	3.47	A	Local	1 fatal crash involving train February 2013
735480V	83.6	NS	Rush Street	1	12,849	N	20	30.00	5280.00	2.50	900	642.43	4.37	446.13	9.10	B	Collector	
735476F	85.55	NS	Yeargan Road	1	6,285	N	20	30.00	5280.00	2.50	900	314.23	1.92	218.22	4.00	A	Collector	
735324J	85.96	NS	Vandora Springs Road	1	13,966	N	20	30.00	5280.00	2.50	900	698.30	5.58	484.93	11.62	C	Collector	Crossing at NCDOT P-5738 which proposes grade separation; 46 crashes in a 5 year period at Vandora Springs/Garner north of rail crossing (1 fatal crash involving train February 2013)
735326X	86.46	NS	St. Mary's Street	1	698		20	30.00	5280.00	2.50	700	34.91	1.32	24.25	2.74	A	Local	
735328L	87.15	NS	New Rand Road	1	6,843	N	20	30.00	5280.00	2.50	900	342.17	2.02	237.61	4.20	A	Collector	
735331U	88.13	NS	Jones Sausage Road	1	13,407	N	20	30.00	5280.00	2.50	1,400	670.37	2.40	465.53	5.00	A	Arterial	30 crashes in a 5 year period at Jones Sausage/Cabela south of rail crossing (most likely far enough from rail to not have an effect)
735336D	90.3	NS	Auburn Knightdale Road	1	7,821	N	20	30.00	5280.00	2.50	900	391.05	2.21	271.56	4.61	A	Collector	
735390W	92.02	NS	Guy Road	1	5,586	N	20	30.00	5280.00	2.50	900	279.32	1.81	193.97	3.78	A	Collector	
JOHNSTON COUNTY																		
735394Y	94.85	NS	Shotwell Road	1	22,925	N	20	30.00	5280.00	2.50	1,400	1,146.27	6.90	796.02	14.37	C	Arterial	
735396M	95.39	NS	W Stallings Street	1	764		20	30.00	5280.00	2.50	700	38.21	1.32	26.53	2.75	A	Local	
735397U	95.94	NS	N Robertson Street	1	2,445	N	20	30.00	5280.00	2.50	700	122.27	1.51	84.91	3.16	A	Local	
735398B	96.14	NS	N O'Neil Street	1	11,615	N	20	30.00	5280.00	2.50	900	580.77	3.52	403.32	7.34	B	Collector	
735399H	96.19	NS	N Fayetteville Street	1	1,681		20	30.00	5280.00	2.50	700	84.06	1.42	58.37	2.96	A	Local	
735400A	96.28	NS	N Church Street	1	1,987	E	20	30.00	5280.00	2.50	700	99.34	1.46	68.99	3.03	A	Local	

RAIL CROSSING INFORMATION - FREIGHT ONLY IN BUILD																	
Crossing #	MP	NS/CSX	Street Name	No. Lanes (one-way direction)	FUTURE ADT (E - Estimated; N - NCDOT Data)	Trains per day	Train Speed (miles/hr)	Train Length (feet)	Blocked Crossing Time (min) D _c	Vehicle Departure Rate S _c	Average Arrival Rate S _a	Average Crossing Delay per Stopped Vehicle D _A	Number of Vehicles Delayed per Day T _D	Average Delay per Vehicle	LOS	Road Classification	Crash/Other Notes
JOHNSTON COUNTY																	
735402N	96.84	NS	Central Street	1	7,642	20	30.00	5280.00	2.50	700	382.09	2.75	265.34	5.73	B	Local	
735404C	97.74	NS	NC 42	2	36,680	20	30.00	5280.00	2.50	1,400	917.01	3.62	1,273.63	7.55	B	Arterial	
									N/A	N/A	N/A	N/A	N/A	N/A	N/A		

*Data manipulated to represent a one-way street

Roadway Classification Determination by STV, all listed as local
 Roadway Classification per NCDOT
 Train Data
 Roadway Data

Table 29 Capacity Analysis - Build Amtrak

RAIL CROSSING INFORMATION - AMTRAK ONLY IN BUILD																		
Crossing #	MP	NS/CSX	Street Name	No. Lanes (one-way direction)	FUTURE ADT (E - Estimated; N - NCDOT Data)	Trains per day	Train Speed (miles/hr)	Train Length (feet)	Blocked Crossing Time (min) D _c	Vehicle Departure Rate S _c	Average Arrival Rate S _a	Average Crossing Delay per Stopped Vehicle D _A	Number of Vehicles Delayed per Day T _D	Average Delay per Vehicle	LOS	Road Classification	Crash/Other Notes	
DURHAM COUNTY																		
910594N	53.2	NS	Anderson Street	1	12,600	N	12	45.00	525.00	0.63	900	630.02	1.05	66.42	0.33	A	Collector	
735223X	53.75	NS	Swift Avenue	2	24,429	N	12	45.00	525.00	0.63	1,400	610.73	0.56	128.78	0.18	A	Arterial	
735225L	54.2	NS	S Buchanan Boulevard	1	30,472	E	12	45.00	525.00	0.63	1,400	1,523.61	3.58	160.63	1.13	A	Arterial	
735227A	54.56	NS	S Duke Street*	3	15,429	N	12	45.00	525.00	0.63	1,400	514.30	0.50	81.33	0.16	A	Arterial	
735229N	54.99	NS	Blackwell Street	1	5,272	E	12	45.00	525.00	0.63	900	263.58	0.45	27.79	0.14	A	Collector	
735231P	55.07	NS	S Mangum Street*	3	12,858	N	12	45.00	525.00	0.63	1,400	428.58	0.46	67.78	0.14	A	Arterial	
735389C	55.42	NS	S Dillard Street	1	4,629	N	12	45.00	525.00	0.63	700	231.44	0.47	24.40	0.15	A	Local	
910605Y	55.57	NS	Fayetteville Street	2	15,429	N	12	45.00	525.00	0.63	1,400	385.73	0.44	81.33	0.14	A	Arterial	32 crashes in a 5 year period at Fayetteville/Pettigrew intersection west of rail crossing
470640V	55.9	NS	Ramseur Street	1	2,443		12	45.00	525.00	0.63	700	122.15	0.38	12.88	0.12	A	Local	
630472K	56.43	NS	S Plum Street	1	1,671		12	45.00	525.00	0.63	700	83.57	0.36	8.81	0.11	A	Local	
630471D	56.71	NS	S Driver Street	1	7,843	N	12	45.00	525.00	0.63	700	392.15	0.72	41.34	0.23	A	Local	1 Serious Injury Crash involving train April 2018
735236Y	57.58	NS	Ellis Road	1	8,229	N	12	45.00	525.00	0.63	900	411.44	0.58	43.38	0.18	A	Collector	20 crashes in a 5 year period at Ellis/Pettigrew south of rail crossing, 22 crashes in a 5 year period at Ellis/Angier north of rail crossing
734735L	59	NS	Glover Road	1	4,757	N	12	45.00	525.00	0.63	700	237.86	0.48	25.08	0.15	A	Local	Says this will be grade separated from STIP P-5706
734736T	59.28	NS	Wrenn Road	1	2,186	N	12	45.00	525.00	0.63	700	109.29	0.37	11.52	0.12	A	Local	Crossing may be closed by STIP P-5706
734737A	60.28	NS	Ellis Road	1	15,429	N	12	45.00	525.00	0.63	900	771.45	2.21	81.33	0.70	A	Collector	Says this will be grade separated from STIP P-5706
734740H	61.63	NS	Stirrup Creek Drive	1	784	E	12	45.00	525.00	0.63	700	39.22	0.34	4.13	0.11	A	Local	
726293N	62.34	NS	IBM Driveway	1	450	E	12	45.00	525.00	0.63	700	22.50	0.33	2.37	0.10	A	Local	
734742W	62.82	NS	E Cornwallis Road	1	12,086	N	12	45.00	525.00	0.63	1,400	604.30	0.56	63.71	0.18	A	Arterial	
WAKE COUNTY																		
734750N	67.02	NS	McCrimmon Parkway	1	15,544	E	12	45.00	525.00	0.63	1,400	777.20	0.71	81.94	0.22	A	Arterial	73 crashes in a 5 year period at Chapel Hill/McCrimmon east of rail crossing; STIP U-5747B proposes grade separation for 2021 construction
734751V	67.76	NS	Builders Driveway	1	559	E	12	45.00	525.00	0.63	700	27.93	0.33	2.94	0.10	A	Local	
734753J	68.74	NS	Morrisville-Carpenter Road	1	23,742	N	12	45.00	525.00	0.63	1,400	1,187.11	2.08	125.16	0.66	A	Arterial	90 crashes in a 5 year period at Morrisville-Carpenter/Aviation east of rail crossing (2 fatality train involved crashes, one in November 2015 and one in August 2014); Planned U-5811 project to alleviate safety issues
734755X	72.58	NS	N Harrison Avenue	2	22,346	N	12	45.00	525.00	0.63	1,400	558.64	0.53	117.79	0.17	A	Arterial	
734756E	72.7	NS	N Academy Street	1	7,961	N	12	45.00	525.00	0.63	1,400	398.03	0.44	41.96	0.14	A	Arterial	

RAIL CROSSING INFORMATION - AMTRAK ONLY IN BUILD																		
Crossing #	MP	NS/CSX	Street Name	No. Lanes (one-way direction)	FUTURE ADT (E - Estimated; N - NCDOT Data)	Trains per day	Train Speed (miles/hr)	Train Length (feet)	Blocked Crossing Time (min) D _c	Vehicle Departure Rate S _c	Average Arrival Rate S _q	Average Crossing Delay per Stopped Vehicle D _A	Number of Vehicles Delayed per Day T _D	Average Delay per Vehicle	LOS	Road Classification	Crash/Other Notes	
WAKE COUNTY																		
904421K	73.76	NS	NE Maynard Road	2	26,535	N	12	45.00	525.00	0.63	1,400	663.38	0.60	139.88	0.19	A	Arterial	Crossing at NCDOT P-5718 which proposes grade separation (1 fatal crash involving train in January 2014)
630657S	163.43	CSX	Trinity Road	1	4,748	N	12	45.00	525.00	0.63	900	237.42	0.43	25.03	0.14	A	Collector	Crossing at NCDOT P-5718 which proposes grade separation; 24 crashes in a 5 year period at Chatham/Trinity south of rail crossing
630654W	162.42	CSX	Nowell Road	1	5,028	N	12	45.00	525.00	0.63	900	251.39	0.44	26.50	0.14	A	Collector	51 crashes in a 5 year period at Hillsborough/Nowell south of rail crossing
630650U	161.33	CSX	Powell Drive	1	4,190	N	12	45.00	525.00	0.63	700	209.49	0.45	22.09	0.14	A	Local	
633973A	160.77	CSX	Blue Ridge Road	2	12,709	N	12	45.00	525.00	0.63	1,400	317.73	0.41	67.00	0.13	A	Arterial	Crossing at NCDOT U-4437 which proposes grade separation; 57 crashes in a 5 year period at Blue Ridge/Hillsborough north of rail crossing; 25 crashes in a 5 year period at Blue Ridge/Beryl south of rail crossing
630647L	159.94	CSX	Beryl Road	2	7,542	N	12	45.00	525.00	0.63	700	188.54	0.43	39.76	0.14	A	Local	Crossing at NCDOT P-5736 which proposes closure; 40 crashes in a 5 year period at Hillsborough/Beryl north of rail crossing
630646E	159.73	CSX	Royal Street	1	978		12	45.00	525.00	0.63	700	48.88	0.34	5.15	0.11	A	Local	
735488A	81.17	NS	W Cabarrus Street	1	3,352		12	45.00	525.00	0.63	700	167.59	0.42	17.67	0.13	A	Local	Crossing at NCDOT U-5521 may be future grade separation, not clear
735481C	82.05	NS	S Blount Street	1	3,491	N	12	45.00	525.00	0.63	700	174.57	0.42	18.41	0.13	A	Local	1 fatal crash involving train February 2013
735480V	83.6	NS	Rush Street	1	12,849	N	12	45.00	525.00	0.63	900	642.43	1.11	67.73	0.35	A	Collector	
735476F	85.55	NS	Yeargan Road	1	6,285	N	12	45.00	525.00	0.63	900	314.23	0.49	33.13	0.15	A	Collector	
735324J	85.96	NS	Vandora Springs Road	1	13,966	N	12	45.00	525.00	0.63	900	698.30	1.41	73.62	0.45	A	Collector	Crossing at NCDOT P-5738 which proposes grade separation; 46 crashes in a 5 year period at Vandora Springs/Garner north of rail crossing (1 fatal crash involving train February 2013)
735326X	86.46	NS	St. Mary's Street	1	698		12	45.00	525.00	0.63	700	34.91	0.33	3.68	0.11	A	Local	
735328L	87.15	NS	New Rand Road	1	6,843	N	12	45.00	525.00	0.63	900	342.17	0.51	36.07	0.16	A	Collector	
735331U	88.13	NS	Jones Sausage Road	1	13,407	N	12	45.00	525.00	0.63	1,400	670.37	0.61	70.68	0.19	A	Arterial	30 crashes in a 5 year period at Jones Sausage/Cabela south of rail crossing (most likely far enough from rail to not have an effect)
735336D	90.3	NS	Auburn Knightdale Road	1	7,821	N	12	45.00	525.00	0.63	900	391.05	0.56	41.23	0.18	A	Collector	
735390W	92.02	NS	Guy Road	1	5,586	N	12	45.00	525.00	0.63	900	279.32	0.46	29.45	0.15	A	Collector	
JOHNSTON COUNTY																		
735394Y	94.85	NS	Shotwell Road	1	22,925	N	12	45.00	525.00	0.63	1,400	1,146.27	1.75	120.85	0.55	A	Arterial	
735396M	95.39	NS	W Stallings Street	1	764		12	45.00	525.00	0.63	700	38.21	0.33	4.03	0.11	A	Local	
735397U	95.94	NS	N Robertson Street	1	2,445	N	12	45.00	525.00	0.63	700	122.27	0.38	12.89	0.12	A	Local	
735398B	96.14	NS	N O'Neil Street	1	11,615	N	12	45.00	525.00	0.63	900	580.77	0.89	61.23	0.28	A	Collector	
735399H	96.19	NS	N Fayetteville Street	1	1,681		12	45.00	525.00	0.63	700	84.06	0.36	8.86	0.11	A	Local	

RAIL CROSSING INFORMATION - AMTRAK ONLY IN BUILD																		
Crossing #	MP	NS/CSX	Street Name	No. Lanes (one-way direction)	FUTURE ADT (E - Estimated; N - NCDOT Data)	Trains per day	Train Speed (miles/hr)	Train Length (feet)	Blocked Crossing Time (min) D _c	Vehicle Departure Rate S _c	Average Arrival Rate S _q	Average Crossing Delay per Stopped Vehicle D _A	Number of Vehicles Delayed per Day T _D	Average Delay per Vehicle	LOS	Road Classification	Crash/Other Notes	
JOHNSTON COUNTY																		
735400A	96.28	NS	N Church Street	1	1,987	E	12	45.00	525.00	0.63	700	99.34	0.37	10.47	0.12	A	Local	
735402N	96.84	NS	Central Street	1	7,642		12	45.00	525.00	0.63	700	382.09	0.70	40.28	0.22	A	Local	
735404C	97.74	NS	NC 42	2	36,680	N	12	45.00	525.00	0.63	1,400	917.01	0.92	193.36	0.29	A	Arterial	
										N/A	N/A	N/A	N/A	N/A	N/A	N/A		

*Data manipulated to represent a one-way street

Roadway Classification Determination by STV, all listed as local
 Roadway Classification per NCDOT
 Train Data
 Roadway Data

Table 30 Capacity Analysis - Build Commuter

RAIL CROSSING INFORMATION - COMMUTER ONLY IN BUILD																		
Crossing #	MP	NS/CSX	Street Name	No. Lanes (one-way direction)	FUTURE ADT (E - Estimated; N - NCDOT Data)	Trains per day	Train Speed (miles/hr)	Train Length (feet)	Blocked Crossing Time (min) D _c	Vehicle Departure Rate S _c	Average Arrival Rate S _a	Average Crossing Delay per Stopped Vehicle D _A	Number of Vehicles Delayed per Day T _D	Average Delay per Vehicle	LOS	Road Classification	Crash/Other Notes	
DURHAM COUNTY																		
910594N	53.2	NS	Anderson Street	1	12,600	N	40	40.00	450.00	0.63	900	630.02	1.05	219.75	1.10	A	Collector	
735223X	53.75	NS	Swift Avenue	2	24,429	N	40	40.00	450.00	0.63	1,400	610.73	0.56	426.05	0.58	A	Arterial	
735225L	54.2	NS	S Buchanan Boulevard	1	30,472	E	40	40.00	450.00	0.63	1,400	1,523.61	3.56	531.44	3.72	A	Arterial	
735227A	54.56	NS	S Duke Street*	3	15,429	N	40	40.00	450.00	0.63	1,400	514.30	0.50	269.08	0.52	A	Arterial	
735229N	54.99	NS	Blackwell Street	1	5,272	E	40	40.00	450.00	0.63	900	263.58	0.44	91.94	0.46	A	Collector	
735231P	55.07	NS	S Mangum Street*	3	12,858	N	40	40.00	450.00	0.63	1,400	428.58	0.45	224.24	0.47	A	Arterial	
735389C	55.42	NS	S Dillard Street	1	4,629	N	40	40.00	450.00	0.63	700	231.44	0.47	80.72	0.49	A	Local	
910605Y	55.57	NS	Fayetteville Street	2	15,429	N	40	40.00	450.00	0.63	1,400	385.73	0.43	269.08	0.45	A	Arterial	32 crashes in a 5 year period at Fayetteville/Pettigrew intersection west of rail crossing
470640V	55.9	NS	Ramseur Street	1	2,443		40	40.00	450.00	0.63	700	122.15	0.38	42.60	0.40	A	Local	
630472K	56.43	NS	S Plum Street	1	1,671		40	40.00	450.00	0.63	700	83.57	0.36	29.15	0.37	A	Local	
630471D	56.71	NS	S Driver Street	1	7,843	N	40	40.00	450.00	0.63	700	392.15	0.71	136.78	0.75	A	Local	1 Serious Injury Crash involving train April 2018
735236Y	57.58	NS	Ellis Road	1	8,229	N	40	40.00	450.00	0.63	900	411.44	0.58	143.51	0.61	A	Collector	20 crashes in a 5 year period at Ellis/Pettigrew south of rail crossing, 22 crashes in a 5 year period at Ellis/Angier north of rail crossing
734735L	59.0	NS	Glover Road	1	4,757	N	40	40.00	450.00	0.63	700	237.86	0.48	82.97	0.50	A	Local	Says this will be grade separated from STIP P-5706
734736T	59.28	NS	Wrenn Road	1	2,186	N	40	40.00	450.00	0.63	700	109.29	0.37	38.12	0.39	A	Local	Crossing may be closed by STIP P-5706
734737A	60.28	NS	Ellis Road	1	15,429	N	40	40.00	450.00	0.63	900	771.45	2.20	269.08	2.30	A	Collector	Says this will be grade separated from STIP P-5706
734740H	61.63	NS	Stirrup Creek Drive	1	784	E	40	40.00	450.00	0.63	700	39.22	0.33	13.68	0.35	A	Local	
726293N	62.34	NS	IBM Driveway	1	450	E	40	40.00	450.00	0.63	700	22.50	0.32	7.85	0.34	A	Local	
734742W	62.82	NS	E Cornwallis Road	1	12,086	N	40	40.00	450.00	0.63	1,400	604.30	0.55	210.78	0.58	A	Arterial	
WAKE COUNTY																		
734750N	67.02	NS	McCrimmon Parkway	1	15,544	E	40	40.00	450.00	0.63	1,400	777.20	0.71	271.09	0.74	A	Arterial	73 crashes in a 5 year period at Chapel Hill/McCrimmon east of rail crossing; STIP U-5747B proposes grade separation for 2021 construction
734751V	67.76	NS	Builders Driveway	1	559	E	40	40.00	450.00	0.63	700	27.93	0.33	9.74	0.34	A	Local	
734753J	68.74	NS	Morrisville-Carpenter Road	1	23,742	N	40	40.00	450.00	0.63	1,400	1,187.11	2.06	414.06	2.16	A	Arterial	90 crashes in a 5 year period at Morrisville-Carpenter/Aviation east of rail crossing (2 fatality train involved crashes, one in November 2015 and one in August 2014); Planned U-5811 project to alleviate safety issues
734755X	72.58	NS	N Harrison Avenue	2	22,346	N	40	40.00	450.00	0.63	1,400	558.64	0.52	389.71	0.55	A	Arterial	

RAIL CROSSING INFORMATION - COMMUTER ONLY IN BUILD																	
Crossing #	MP	NS/CSX	Street Name	No. Lanes (one-way direction)	FUTURE ADT (E - Estimated; N - NCDOT Data)	Trains per day	Train Speed (miles/hr)	Train Length (feet)	Blocked Crossing Time (min) D _c	Vehicle Departure Rate S _c	Average Arrival Rate S _q	Average Crossing Delay per Stopped Vehicle D _A	Number of Vehicles Delayed per Day T _D	Average Delay per Vehicle	LOS	Road Classification	Crash/Other Notes
WAKE COUNTY																	
734756E	72.7	NS	N Academy Street	1	7,961	N	40	40.00	450.00	0.63	1,400	398.03	0.44	138.83	0.46	A	Arterial
904421K	73.76	NS	NE Maynard Road	2	26,535	N	40	40.00	450.00	0.63	1,400	663.38	0.60	462.78	0.62	A	Arterial
630657S	163.43	CSX	Trinity Road	1	4,748	N	40	40.00	450.00	0.63	900	237.42	0.43	82.81	0.45	A	Collector
630654W	162.42	CSX	Nowell Road	1	5,028	N	40	40.00	450.00	0.63	900	251.39	0.44	87.68	0.46	A	Collector
630650U	161.33	CSX	Powell Drive	1	4,190	N	40	40.00	450.00	0.63	700	209.49	0.45	73.07	0.47	A	Local
633973A	160.77	CSX	Blue Ridge Road	2	12,709	N	40	40.00	450.00	0.63	1,400	317.73	0.41	221.65	0.42	A	Arterial
630647L	159.94	CSX	Beryl Road	2	7,542	N	40	40.00	450.00	0.63	700	188.54	0.43	131.53	0.45	A	Local
630646E	159.73	CSX	Royal Street	1	978		40	40.00	450.00	0.63	700	48.88	0.34	17.05	0.35	A	Local
735488A	81.17	NS	W Cabarrus Street	1	3,352		40	40.00	450.00	0.63	700	167.59	0.41	58.46	0.43	A	Local
735481C	82.05	NS	S Blount Street	1	3,491	N	40	40.00	450.00	0.63	700	174.57	0.42	60.89	0.44	A	Local
735480V	83.6	NS	Rush Street	1	12,849	N	40	40.00	450.00	0.63	900	642.43	1.10	224.08	1.15	A	Collector
735476F	85.55	NS	Yeagan Road	1	6,285	N	40	40.00	450.00	0.63	900	314.23	0.48	109.60	0.50	A	Collector
735324J	85.96	NS	Vandora Springs Road	1	13,966	N	40	40.00	450.00	0.63	900	698.30	1.40	243.57	1.47	A	Collector
735326X	86.46	NS	St. Mary's Street	1	698		40	40.00	450.00	0.63	700	34.91	0.33	12.18	0.35	A	Local
735328L	87.15	NS	New Rand Road	1	6,843	N	40	40.00	450.00	0.63	900	342.17	0.51	119.35	0.53	A	Collector
735331U	88.13	NS	Jones Sausage Road	1	13,407	N	40	40.00	450.00	0.63	1,400	670.37	0.60	233.82	0.63	A	Arterial
735336D	90.3	NS	Auburn Knightdale Road	1	7,821	N	40	40.00	450.00	0.63	900	391.05	0.56	136.40	0.58	A	Collector
735390W	92.02	NS	Guy Road	1	5,586	N	40	40.00	450.00	0.63	900	279.32	0.46	97.43	0.48	A	Collector
JOHNSTON COUNTY																	
735394Y	94.85	NS	Shotwell Road	1	22,925	N	40	40.00	450.00	0.63	1,400	1,146.27	1.73	399.82	1.81	A	Arterial
735396M	95.39	NS	W Stallings Street	1	764		40	40.00	450.00	0.63	700	38.21	0.33	13.33	0.35	A	Local
735397U	95.94	NS	N Robertson Street	1	2,445	N	40	40.00	450.00	0.63	700	122.27	0.38	42.65	0.40	A	Local
735398B	96.14	NS	N O'Neil Street	1	11,615	N	40	40.00	450.00	0.63	900	580.77	0.89	202.57	0.93	A	Collector

RAIL CROSSING INFORMATION - COMMUTER ONLY IN BUILD																		
Crossing #	MP	NS/CSX	Street Name	No. Lanes (one-way direction)	FUTURE ADT (E - Estimated; N - NCDOT Data)		Trains per day	Train Speed (miles/hr)	Train Length (feet)	Blocked Crossing Time (min) D _c	Vehicle Departure Rate S _c	Average Arrival Rate S _q	Average Crossing Delay per Stopped Vehicle D _A	Number of Vehicles Delayed per Day T _D	Average Delay per Vehicle	LOS	Road Classification	Crash/Other Notes
JOHNSTON COUNTY																		
735399H	96.19	NS	N Fayetteville Street	1	1,681		40	40.00	450.00	0.63	700	84.06	0.36	29.32	0.37	A	Local	
735400A	96.28	NS	N Church Street	1	1,987	E	40	40.00	450.00	0.63	700	99.34	0.37	34.65	0.38	A	Local	
735402N	96.84	NS	Central Street	1	7,642		40	40.00	450.00	0.63	700	382.09	0.69	133.27	0.72	A	Local	
735404C	97.74	NS	NC 42	2	36,680	N	40	40.00	450.00	0.63	1,400	917.01	0.91	639.71	0.95	A	Arterial	
										N/A	N/A	N/A	N/A	N/A	N/A	N/A		

*Data manipulated to represent a one-way street

Roadway Classification Determination by STV, all listed as local
 Roadway Classification per NCDOT
 Train Data
 Roadway Data

Table 31 Crossings Flagged from Traffic Analysis

TRAIN CROSSING INFORMATION - DELAY/LOS SUMMARY							
MP	NS/CSX	STREET NAME	FYB LOS	FYB LOS	Crash Information (20 crashes or greater for 5 year period, 2015 - 2019)	Crash Information (Fatal and Serious Injury crashes for 10 year period, 2010 - 2019)	Notes
DURHAM COUNTY							
54.2	NS	S Buchanan Boulevard	E	E			
55.57	NS	Fayetteville Street	A	A	32 crashes at intersection west of crossing		
56.71	NS	S Driver Street	B	B		1 serious injury crash involving train: April 2018	
57.58	NS	Ellis Road	A	B	20 crashes at intersection south of crossing; 22 crashes at intersection north of crossing		Phase I Risk Register comment: "Ellis Road in Durham likely warrants grade separation but would be impactful to surrounding development."
WAKE COUNTY							
67.02	NS	McCrimmon Parkway	B	B	73 crashes at intersection east of crossing		Proposed Grade Separation: U-5747B
68.74	NS	Morrisville-Carpenter Road	C	C	90 crashes at intersection east of crossing	2 fatality crashes involving train in November 2015 and August 2014	
73.76	NS	NE Maynard Road	B	B		1 fatal crash involving train: January 2014	Proposed Grade Separation: P-5718
163.43	CSX	Trinity Road	A	A	24 crashes at intersection south of crossing		Proposed Grade Separation: P-5734
162.42	CSX	Nowell Road	A	A	51 crashes at intersection south of crossing		
160.77	CSX	Blue Ridge Road	A	A	57 crashes at intersection north of crossing; 25 crashes at intersection south of crossing		Proposed Grade Separation: U-4437
159.94	CSX	Beryl Road	A	A	40 crashes at intersection north of crossing		Proposed Crossing Closure: P-5736
82.05	NS	S Blount Street	A	A		1 fatal crash involving train: February 2013	
85.96	NS	Vandora Springs Road	C	C	46 crashes at intersection north of crossing	1 fatal crash involving train: February 2013	Proposed Grade Separation: P-5738
88.13	NS	Jones Sausage Road	B	B	30 crashes at intersection south of crossing		

TABLE LEGEND

- Potential for Further Study (if no current project planned)
- Project Related to Crossing

Table 32 Phase I Risk Register Comments Concerning Crossings

Road	City	Comment	Source
Anderson Street.	Durham	Old West Durham neighborhood may be concerned about additional rail traffic at grade crossings at Anderson Street.	Input from Duke University
LaSalle St	Durham	LaSalle Street crossing in Durham is not flat; concern that this would need to be separated.	Input from City of Durham
Swift Ave.	Durham	Swift Avenue in Durham is an issue. Likely needs to be grade separated for traffic reasons.	Input from City of Durham
Gregson St	Durham	Gregson Street in Durham is an existing low clearance bridge that would need to be replaced. Providing adequate clearance would have significant implications for adjacent crossings. Might be fair to say it is not possible.	Input from City of Durham
Ellis Road	Durham	Ellis Road in Durham likely warrants grade separation but would be impactful to surrounding development.	Input from City of Durham
Glover, Wrenn, Ellis	Durham	Current projects to separate Glover, close Wrenn, and separate Ellis (southern crossing) in Durham.	Input from City of Durham
Cornwallis Road	Durham	Cornwallis Road grade separation is in the pipeline.	Input from City of Durham
Harrison Ave	Cary	Harrison Avenue grade separation in Cary - no public acceptance, has been deferred for a number of years.	Input from Town of Cary
Maynard, Trinity	Cary	Maynard and Trinity grade separation in Cary - mildly more acceptable than Harrison, in particular Trinity.	Input from Town of Cary
Jones Sausage Road	Garner	Jones Sausage Road wants to be grade separated, project being entered in SPOT, may be funded through LAPP.	Input from Town of Garner
Shotwell Rd.	Clayton	Shotwell Road in Clayton may warrant grade separation.	Input from Town of Clayton
Powhatan	Clayton	Novo Nordisk in Clayton is considering a closure at Powhatan.	Input from Town of Clayton
NC 142	Clayton	NC 42 in Clayton is complicated; likely warrants grade separation but would not be straightforward to accomplish.	Input from Town of Clayton
Various	Clayton	Prior study of grade crossing closures and pedestrian tunnels in downtown Clayton was not well-received.	Input from Town of Clayton

Table 33 Current At-Grade Crossing Master List

CURRENT AT-GRADE CROSSING MASTER LIST				
Crossing #	MP	NS/CSX	Street Name	Recommendation
DURHAM COUNTY				
910594N	53.2	NS	Anderson Street	No change
735223X	53.75	NS	Swift Avenue	No change
735225L	54.2	NS	S Buchanan Boulevard	Flagged by Traffic - Future Year (Build & No-Build) LOS E
735227A	54.56	NS	S Duke Street	No change
735229N	54.99	NS	Blackwell Street	No change
735231P	55.07	NS	S Mangum Street	No change
735389C	55.42	NS	S Dillard Street	No change
910605Y	55.57	NS	Fayetteville Street	Flagged by Traffic - Existing Crash History (20+ Crashes)
470640V	55.9	NS	Ramseur Street	No change
630472K	56.43	NS	S Plum Street	Station location could cause conflicts with the current at-grade crossing. To be informed by design at E Durham Station
630471D	56.71	NS	S Driver Street	Flagged by Traffic - Existing Crash History (Serious/Fatal)
735236Y	57.58	NS	Ellis Road	Flagged by Traffic - Existing Crash History (20+ Crashes)
734735L	59	NS	Glover Road	Proposed separation/Closure by NCDOT - Glover Rd separated by P-5706
734736T	59.28	NS	Wrenn Road	Proposed separation/Closure by NCDOT - Wrenn Rd crossing closure associated with P-5706
734737A	60.28	NS	Ellis Road	Proposed separation/Closure by NCDOT - Ellis Rd grade separated with P-5702
734740H	61.63	NS	Stirrup Creek Drive	No change
726293N	62.34	NS	IBM Driveway	No change
734742W	62.82	NS	E Cornwallis Road	Proposed separation/Closure by NCDOT - P-5717- grade separation of Cornwallis Road- partially funded by NS- construction 2021
WAKE COUNTY				
734750N	67.02	NS	McCrimmon Parkway	Proposed separation/Closure by NCDOT - U-5747B- grade separation of McCrimmon Pkwy- construction 2021
734751V	67.76	NS	Builders Driveway	No change
734753J	68.74	NS	Morrisville-Carpenter Road	Flagged by Traffic - Existing Crash History (20+ Crashes & Serious/Fatal)
734755X	72.58	NS	N Harrison Avenue	Proposed separation/Closure by NCDOT - P-5708 Proposed grade separation- construction in 2029
734756E	72.7	NS	N Academy Street	No change
904421K	73.76	NS	NE Maynard Road	Proposed separation/Closure by NCDOT - P-5718 Proposed grade separation- construction in 2024
630657S	163.43	CSX	Trinity Road	Proposed separation/Closure by NCDOT - P-5734 Proposed grade separation- construction 2024
630654W	162.42	CSX	Nowell Road	Flagged by Traffic - Existing Crash History (20+ crashes)
630650U	161.33	CSX	Powell Drive	No change
633973A	160.77	CSX	Blue Ridge Road	Proposed separation/Closure by NCDOT - U-4437- proposed grade separation - under construction with DB project U-2719
630647L	159.94	CSX	Beryl Road	Proposed separation/Closure by NCDOT - P-5736- crossing closure- partially funded by NS- construction 2027
630646E	159.73	CSX	Royal Street	No change
735488A	81.17	NS	W Cabarrus Street	Proposed separation/Closure by NCDOT - U-5521- Project may involve closure of existing crossing
735481C	82.05	NS	S Blount Street	Flagged by Traffic - Existing Crash History (Serious/Fatal)
735480V	83.6	NS	Rush Street	If station tracks and high-level platforms are pursued, the current at-grade crossing could require closure or grade separation.
735476F	85.55	NS	Yeorgan Road	Skewed intersection near existing crossing; additional track may require crossing/intersection modification
735324J	85.96	NS	Vandora Springs Road	Proposed separation/Closure by NCDOT - P-5738- grade separation- partially funded by NS- construction 2028
735326X	86.46	NS	St. Mary's Street	Garner Station location could affect current grade crossing, requiring closure or grade separation
735328L	87.15	NS	New Rand Road	No change
735331U	88.13	NS	Jones Sausage Road	Flagged by Traffic - Existing Crash History (20+ Crashes & Serious/Fatal)
735336D	90.3	NS	Auburn Knightdale Road	No change
735390W	92.02	NS	Guy Road	No change
JOHNSTON COUNTY				
735394Y	94.85	NS	Shotwell Road	Proposed separation/Closure by NCDOT - P-5743- grade separation- partially funded by NS- construction 2029
735396M	95.39	NS	W Stallings Street	No change
735397U	95.94	NS	N Robertson Street	No change
735398B	96.14	NS	N O'Neil Street	No change
735399H	96.19	NS	N Fayetteville Street	No change
735400A	96.28	NS	N Church Street	No change
735402N	96.84	NS	Central Street	No change
735404C	97.74	NS	NC 42	No change