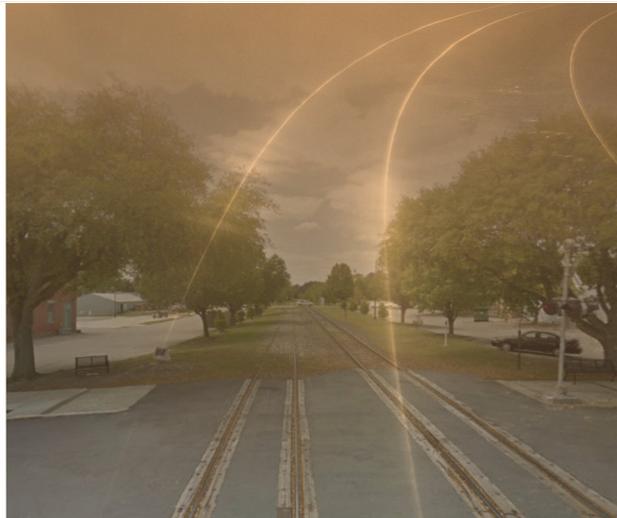
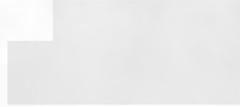
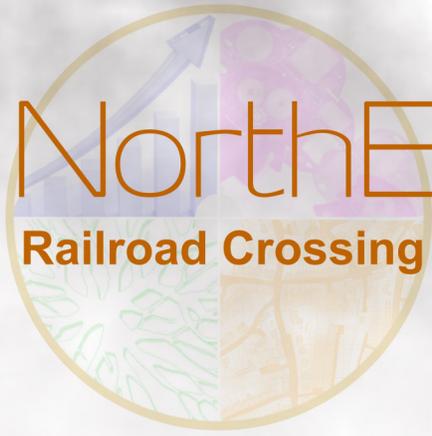


# NorthEast Area Study

**Railroad Crossing Study** | Summary Report | January 2014



A technical report that identifies railroad / roadway crossing issues and suggested treatments in the Knightdale / Wendell / Zebulon railway corridor

**Capital Area Metropolitan Planning Organization**

prepared by Stantec Consulting Services Inc. and AMT Consulting





# CAPITAL AREA METROPOLITAN PLANNING ORGANIZATION NORTHEAST AREA STUDY

## Railroad Crossings Report

September 18, 2013

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- Wakefield Street
- Arendell Avenue (NC 96)
- NC 39

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## RR Crossing Analysis Introduction

AMT, as a subconsultant to Stantec, was hired to evaluate the railroad crossings along the corridor that goes through the Northeast Area Study boundary. This included an evaluation of up to 22 rail crossings for the study area consistent with the Easttrans Study route. The Easttrans Study was performed in 2004 and detailed how commuter rail would be provided through the communities of Knightdale, Wendell, Zebulon, and beyond into Nash and Wilson Counties. The rail crossing evaluations consisted of two parts:

- Phase 1 - accessing and evaluating information collected and provided by the NCDOT Rail Division
- Phase 2 - conduct a more detailed analysis of the top 12 locations through conducting a field examination.

The study team collected information from the NCDOT database for each crossing such as the number of trains and school buses at this location; accidents per year; sight distance factor; and type of protection already in place. The crossings were narrowed down from 22 to 12 by priority based on the exposure index (# of cars/# of trains) for each location. The evaluation also included the crossing's significance to the overall road network. The assessment includes safety and operational issues related to each location.

The field review included photographs to determine causational factors to safety problems and identify design issues. Recommendations for improvements are noted for future study for each location. Safety conditions and remedies may include the typical gates, longer gate arms, four-quadrant gates, signage, and markings to improve visibility. Non-traditional implementation efforts might suggest median dividers (either raised or painted), low-boy audio-visual warning devices, non-traditional "LOOK" signage, channelization fencing for pedestrian crossings, or pedestrian gate arms.

### Railroad Overview

This section of railway is owned by Norfolk Southern (NS) and runs eastward from Raleigh to Wilson via Knightdale, Wendell, and Zebulon within the Northeast Area Study. The line does continue into Eastern North Carolina via Greenville. The railroad is leased by Carolina Coastal Railway (CLNA). They are currently under a 20 year lease with an option for another 20 year lease when the first contract expires. While NS owns the line, since CLNA is leasing the line, all decision making about crossings and work done within the railroad right-of-way is at the discretion of CLNA during the lease.

Typically, there are about 1-2 trains per week that use this section of railroad. During the height of soybean season, which is late fall/early Winter, there may be 4 trains per week using the line running soybean crops from Wilson to downtown Raleigh as 75% of the soybean production in North Carolina is done in the eastern part of the state near this rail line. Beyond the 22 public crossings that were studied in phase 1 of this assessment, there are also numerous private crossings that do not have any treatments. Trains using this track usually travel at approximately 25 miles per hour (mph) due to the high frequency of crossings. According to the At Grade Crossing Investigation Index (from NCDOT Rail, dated 2012), there have only been two (2) crossings in the area where accidents occurred: Fayetteville Street and Robertson Street, both in Knightdale.

Site selection for phase 2 was based on the NCDOT Rail Index, a desktop review of the geometry at each crossing, the daily volumes, and school bus traffic. As part of the phase 2 site investigations, we met in the field with a representative from Carolina Coastal Railway to discuss existing conditions and options for improvements.

The following report has the details of each site visit including site pictures, other noted existing conditions, recommendations for improvements, and any possible affect any changes would have on the roadway network near each crossing. The report also includes some feedback from each municipality in which these crossings are located. Note: these recommendations will be a part of the Northeast Area Study, but must be studied further through the NCDOT process to be able to construct any changes.

The studied crossings are as follows:

#### **In Knightdale:**

- Bethlehem Road/First Street
- Fayetteville Street
- Robertson Avenue
- Marks Creek Road

#### **In Wendell:**

- Eagle Rock Road
- Martin Street
- Buffalo Street
- Main Street
- Hollybrook Road

#### **In Zebulon:**

- Wakefield Street
- Arendell Avenue (NC 96)
- NC 39

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## Municipal Feedback

### Feedback from the Town of Knightdale:

As you are aware, NCDOT has decided to pursue the process of closing the Fayetteville St. RR crossing; however, they have not proceeded with the project to date. I have provided a brief summary of our crossing below for your use with the study:

1. Bethlehem Rd.: Fully automated crossing has been widened in the past two years. Functions fairly well but is situated in a curve.
2. Fayetteville St.: Unsignalized crossing planned to be closed by NCDOT – Very close to intersection with First Avenue.
3. Robertson St.: Fully automated crossing. Near an intersection with First Avenue which affects queing, and is slow moving due to bumps.
4. Marks Creek Rd.: Fully automated crossing. Located near intersection with Robertson St. affects queing

That is the summary of our crossings. One crossing that is greatly needed by the Town of Knightdale is the one between Hodge Rd. and Bethlehem Rd. We have large population areas that are on either side of the railroad/creek corridor and we need to find a way to get a crossing there. Therefore, the Town would like to retain all current crossings in the event that we could ever “trade” an existing crossing for one in that area.

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### Feedback from the Town of Wendell:

- It would be good to have a review of how the crossing on Buffalo Street could change (or might need to change) as traffic volumes increase
    1. The opening of Wendell falls parkway would generate higher traffic volumes along poole rd, which becomes buffalo Street as they follow this road up to Wendell Blvd.
  - It would also be good to have an analysis the future alignment of the railroad crossing at Eagle Rock Road. Eagle rock road is identified for future straitening/realignment, which would change the exact location of the crossing, as well as the angle of the crossing in relation to the road.
  - Attention should be paid to railroad crossings in the heart of our downtown regarding aesthetics, pedestrian access, barriers to economic development, and connections to historically significant areas.
    1. The railroad crossings in the downtown area – pose a stronger risk to injury in the future as it becomes more pedestrian oriented since there are no warning crossings in these locations.
    2. Downtown railroad crossing serves to create additional barriers with “north” main street vs. “south” main street.” Future business will be inhibited by these disconnections.
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### Feedback from the Town of Zebulon:

A major concern for the town is pedestrian crossings at two of our busiest railroad crossings, those being the one at NC 96 and at Wakefield Street. NC 96 is the better of the two crossings in that major improvements were made to the crossing within the past few years. However, when the Town extended sidewalks down Wakefield Street, the sidewalks stopped at the railroad right-of-way and no real pedestrian crossing was provided. This decision was made solely based on the cost to extend a functional pedestrian crossing across the tracks. As you can imagine, this poses great safety concerns for pedestrians getting off a sidewalk to navigate through the tracks to get to the sidewalk on the other side. Wheelchair or scooter access would likely not be able to cross without going onto Wakefield Street, another huge safety concern. Our other crossing (Horton Street, Hwy 39, and Barbee Street) will eventually have these same concerns; however, we have not seen the growth along those corridors as we have at the two mentioned above. Our Mayor continues to push for a greenway trail from Zebulon Community Park down the railroad right-of-way or sewer easement east to Five County Stadium (Mudcats). Should this dream ever become a reality, it is likely a pedestrian only crossing will be needed prior to getting to the Little Creek Wastewater Treatment Plant. In theory, this would allow pedestrians walking down the greenway to cross the tracks at the stadium.

# Town of Knightdale



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# Town of Wendell



# Town of Zebulon



# Town of Knightdale

## Studied Crossings:

### Bethlehem Road/First Street

#### Location:

- West edge of downtown Knightdale
- Between Crosstie Street and Railroad Street
- Main connection to and from the southwest portion of Downtown Knightdale – major connection to Smithfield Road, Poole Road, and points south of Downtown

#### Existing Conditions:

- Bit of a hump - Flat crossing is best for Materials
- Roadway was recently widened with development project north of the track
- Signals/gates/cantilever with signals in both directions
- Both RR and roadway are in curves
- recently worked – panels on crossing (bolt down to 10'tie)
- 25 mph speed zone
- There is existing sidewalk on the west side of the roadway that does lead to the railroad crossing, but there are no existing pedestrian connections across the tracks.
- Raised island in the center of roadway and for the turn onto Railroad Street – painted to be seen
- 2011 ADT: 6,700 vpd, high volume of school bus crossings

#### Recommendations:

- A good example of a safe, high volume crossing
- Needs to have better approach signage and the inclusion of a reduce speed ahead sign in the northbound direction



## Fayetteville Street

### Location:

- Downtown Knightdale
- Between First Avenue and Railroad Street
- Connection to points south of downtown Knightdale as well as a second connection to Knightdale Elementary School

### Existing Conditions:

- Humped with a lot of damage to the crossing
- Crossbucks only
- RR track in curve- sight distance concerns
- 25 mph speed zone
- Larger trucks were seen to have avoided this crossing because of the geometric problems
- 2011 ADT: 1,200 vpd, high volume of school bus crossings (near Elementary School)
- Recent accident (last 10 years): car was hit by train while sitting on tracks at the intersection of Fayetteville and First

### Recommendations:

- This crossing has long been determined as a good crossing to close by both CLNA and NCDOT rail. When the closure was brought to the community, the public was not in agreement.
- Signals and gates should be added to achieve a safer crossing while improving the crossing and signage
- Warning signs with directional arrows on both Railroad Street and First Avenue



## Robertson Ave.

### Location:

- Downtown Knightdale
- Between First Avenue and Hester Street
- Main connection to and from the east of Downtown Knightdale – direct connection to First Avenue to the west and to US 64/264 Bypass and Wendell Falls to the east

### Existing Conditions:

- Humped crossing – especially on the First Ave. side
- Perpendicular crossing – good sight distance
- signals/gates – all signals face directions of traffic
- Dual tracks – no improvements to ties on vehicular crossing
- 25 mph speed zone
- Fire truck passed through without hitting bottom
- 2011 ADT: 1,500 vpd
- Does have an accident history (one incident in last 10 years)

### Recommendations:

- Warning signs with directional arrows on First Avenue



## Marks Creek Road

### Location:

- Eastern Knightdale
- Near intersection of Marks Creek Road, Robertson Street, and Knightdale-Eagle Rock Road: approximately ¾ mile west of the US 64-264/Wendell Falls Blvd. interchange

### Existing Conditions:

- Very close to the intersection
- Flat and perpendicular crossing – good sight distance
- One track - Asphalt on crossing
- Signals/gates – all signals face directions of traffic at intersection
- No speed zone
- 2011 ADT: under 1,000 vpd, high volume of school bus crossings

### Recommendations:

- Warning signs with directional arrows on Robertson/Knightdale-Eagle Rock
- A long term treatment could include converting the WB right turn movement to a free flow movement or reducing the curb radius of the approach (intersection clean-up using curb and gutter for the radii on the Marks Creek approach)



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# Town of Wendell

## Studied Crossings:

### Eagle Rock Road

#### Location:

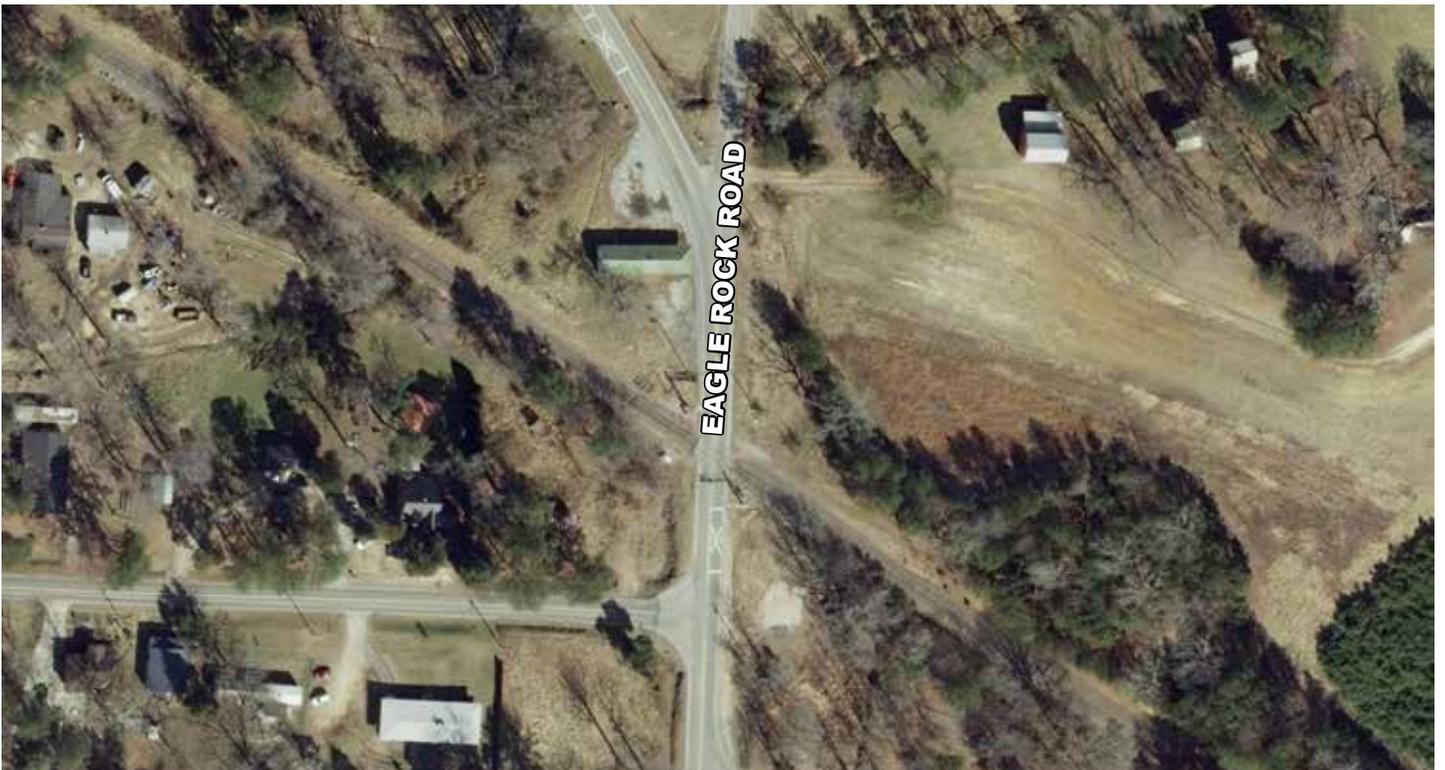
- West edge of Wendell, near Eagle Rock
- Between Martin Pond Road and Old Battle Bridge Road

#### Existing Conditions:

- One track – angled crossing – sight distance concern from the north
- Multiple roadways with multiple intersections near the crossing
- Signals/gates/cantilever with signals in both directions
- 55 mph speed zone
- 2011 ADT: 3,800 vpd

#### Recommendations:

- Better warning signage with directional arrows on both main roadway and on crossing roadways on both sides of the track



## Martin Street

### Location:

- West edge of Downtown Wendell
- Between Cook Street and Third Street

### Existing Conditions:

- Humped crossing
- One track – asphalt covering crossing
- Only has crossbucks
- Used by school buses
- Small residential road with low volumes

### Recommendations:

- No recommendations at this time - Crossing will be monitored into future for usage.



## Buffalo Street

### Location:

- West edge of Downtown Wendell
- Between Cook Street and Third Street

### Existing Conditions:

- Two tracks – perpendicular- good sight distance
- Hump in roadway – asphalt filled crossing with wood protecting the rail
- Signals/gates/cantilever with signals in both directions
- 35 mph speed zone
- The sidewalk stops/starts approximately 100 feet on both sides of the tracks
- There is cable and gas located under the crossing
- 2011 ADT: 2,800 vpd, high volume of school bus crossings

### Recommendations:

- Volumes may increase with the opening of Wendell Falls Parkway. The current configuration is safe for higher volumes.
- The sidewalk should be continued through the crossing for a safer pedestrian connection. The sidewalk should be included within the fall of the gates to ensure maximum protection for all users.
- Delineate the edge of the travelway to help separate the vehicular traffic and the pedestrian traffic



## Main Street

### Location:

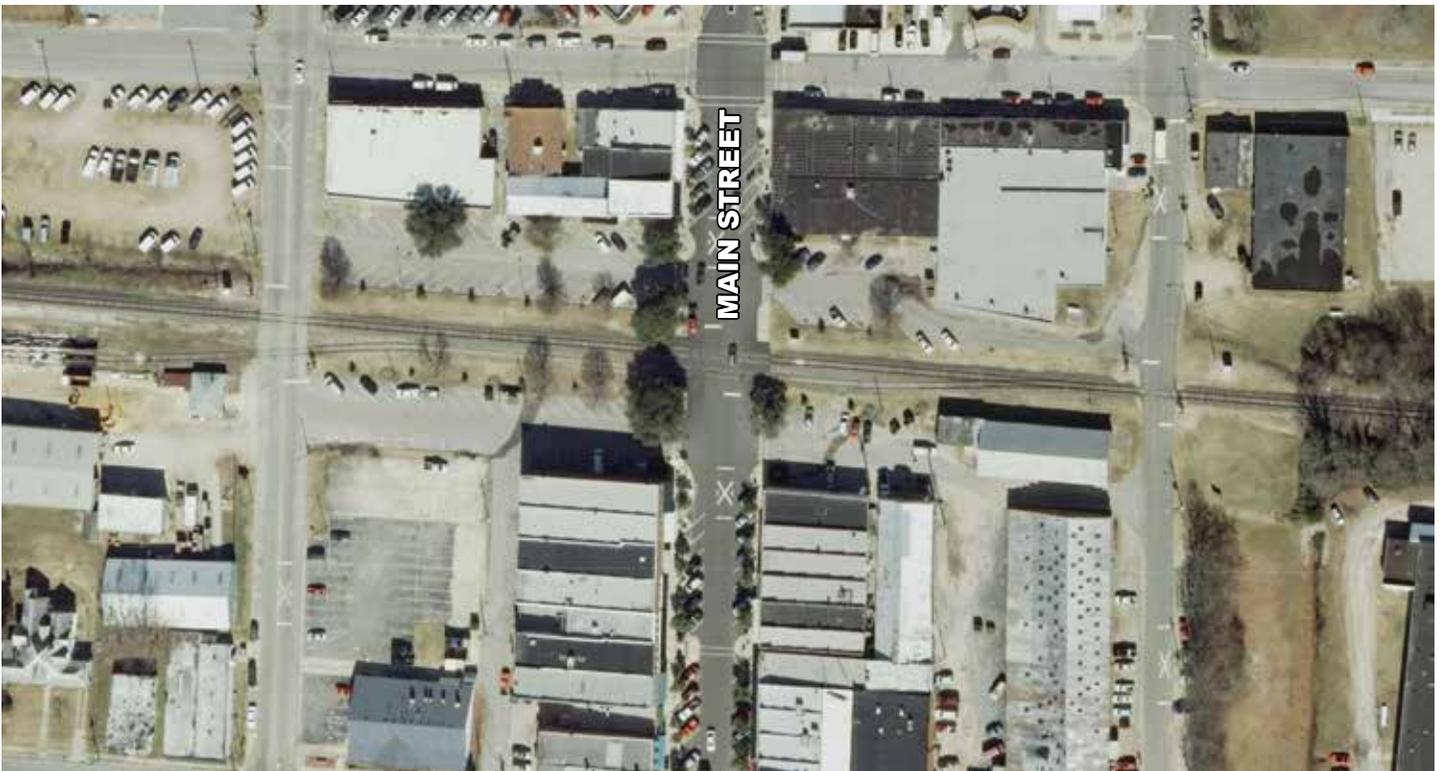
- Downtown Wendell
- Between Depot Street and Campen Street

### Existing Conditions:

- Two tracks – perpendicular- good sight distance
- Hump in roadway – asphalt filled crossing with wood protecting the rail – paved recently
- Signals/crossbucks in both directions
- Road is very wide
- 20 mph speed zone
- Sidewalk on both sides of the roadway stops/starts at crossing on both sides of the tracks
- Both parallel streets (Pine and Cypress) have gates (narrower crossings)
- 2011 ADT: 2,700 vpd, low volume of school bus crossings

### Recommendations:

- Pedestrian movements are extremely important through this crossing. Gates not only need to be installed to make the vehicular crossing safer, they should be added for the pedestrian movements as well.
- The roadway may need to be narrowed to make the installation of the gates more cost effective
- Crossing also needs better warning signage – difficult to place on a wide street
- Consider the installation of Quad Gates that will control the crossing for both the vehicular traffic and pedestrian traffic



## Hollybrook Road

### Location:

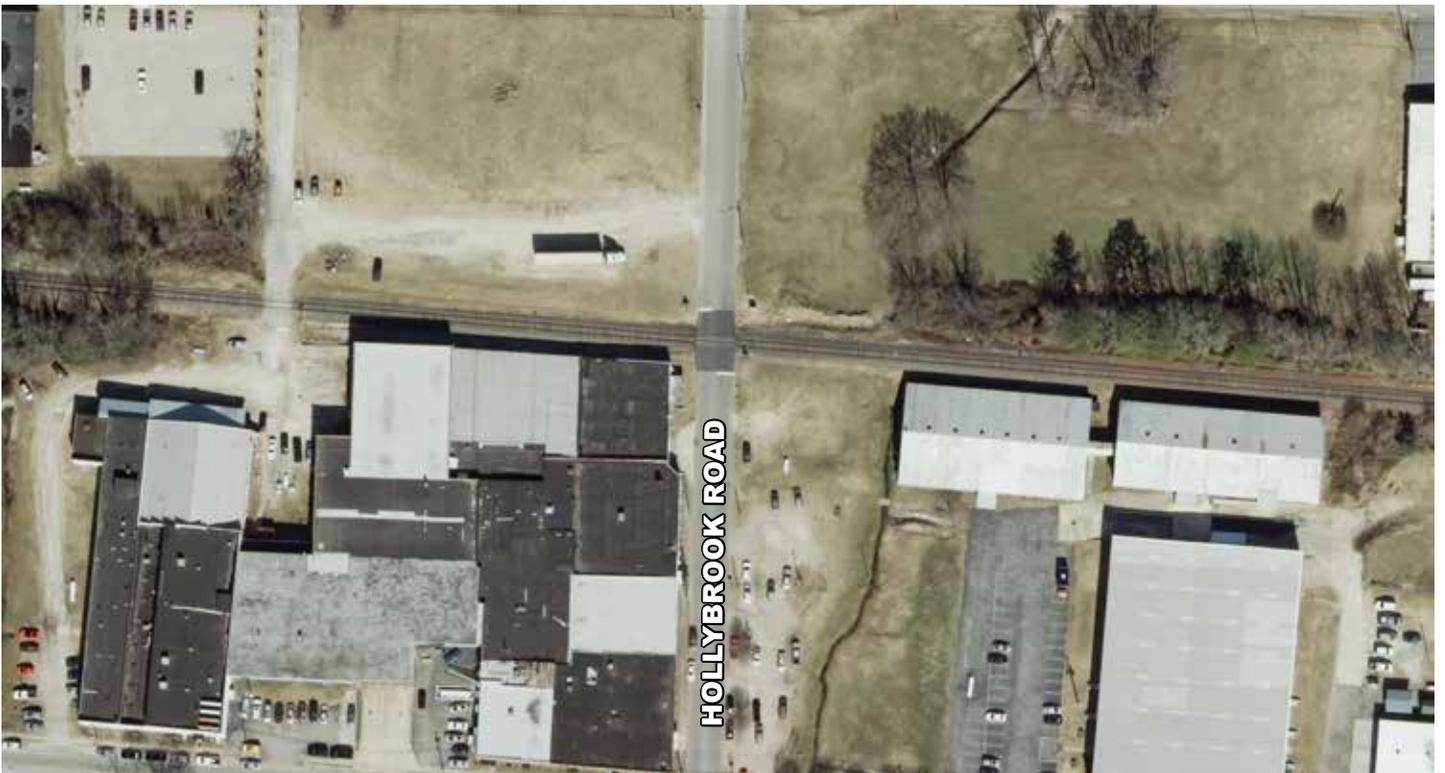
- East section of Downtown Wendell
- Between Third Street and Fourth Street

### Existing Conditions:

- One track – perpendicular- good sight distance
- Hump in roadway – asphalt filled crossing with wood protecting the rail (wood is broken in multiple places)
- Signals/crossbucks in both directions
- Low volume road with curb on both sides – no gutter
- No posted speed limit – assume 35 mph speed zone
- No sidewalks
- Regular warning signs
- 2011 ADT: 2,900 vpd, high volume of school bus crossings

### Recommendations:

- Consider installation of gates with high number of school bus crossings and volume



# Town of Zebulon

## Studied Crossings:

### Wakefield Street

#### Location:

- Edge of Western Downtown Zebulon
- RR crossing is between Vance Street and Barbee Street

#### Existing Conditions:

- 1 track
- Signal, Crossbucks
- No Gates
- Low point in roadway – possible flooding
- Asphalt from RR fills the roadway and extends to sidewalk
- Sidewalk connection dies at RR crossing
- Panels are extra wide for bikes, pedestrians
- 35 mph speed limit
- Regular warning signs – standard round signs
- 2011 ADT: 3,300 vpd, high volume of school bus crossings

#### Recommendations:

- Crossing is substantial enough to warrant gates
- Pedestrian connections are extremely important, connect sidewalk through track area, protect movements with separate gate facilities – NCLA RR has dictated that pedestrian movements need to be protected equally with vehicular movements
- Future study for flooding – determine how to remove flooding condition



**Arendell Ave. - NC 96****Location:**

- Downtown Zebulon
- RR crossing is between Vance Street and Barbee Street

**Existing Conditions:**

- 2 tracks
- Cantilevers, Overhead Signal, Bucks
- Gate Signals
- Panel in road over hump
- Sidewalks on both sides stop at tracks
- Panels are extra wide for bikes, pedestrians
- 20mph speed limit
- Warning signs – standard round signs
- 2011 ADT: 5,000 vpd, high volume of school bus crossings

**Recommendations:**

- Pedestrian connections are extremely important, connect sidewalks through track area, protect movements with separate gate facilities – NCLA RR has dictated that pedestrian movements need to be protected equally with vehicular movements
- In the short term, delineate the edge of the travelway to clearly differentiate vehicular traffic from pedestrian traffic
- Install appropriate pavement markings



## NC 39

**Location:** South of Five County Stadium and US 264

- US Foods Entrance to North
- Entrance to Little Creek Waste Water Plant just to South

### **Existing Conditions:**

- Stream Next to Tracks
- Gates, Lights, Crossbucks
- Guardrail protection both directions
- Warning Signs
- No Speed limit posted – 55mph
- Asphalt to Rail / some cracking, conditions ok
- rubberized curbing protecting rail
- 2011 ADT: 4,700 vpd

### **Recommendations:**

- Improve warning signs - replace with high intensity signage per MUTCD
- Lower speed of vehicles – possible speed limit decrease to 45 mph
- Install rumble strips on NC 39 to alert drivers and lower speeds
- Install warning flashers to be activated for advanced warning of an approaching train



