



NCDOT Rail Division Quarterly
Meeting (November 2015)

What is GIS, and how can it help me?

Katie Kyzer and Larry Sanders



What is GIS?

- Acronym for **G**eographic **I**nformation **S**ystems
- System designed to create, analyze, and present spatially related information



How can it help me?

- Visualize data
- Interpret relationships/trends based on location
- Relate multiple datasets based on location (i.e. tracks and crossings)



Who uses GIS?

- Everyone!
- Police departments
- Department Stores
 - Hospitals
- All transportation sectors
- Railroad Operating Companies
 - You name it!



CADD vs. GIS

CADD is a platform for engineering design

MicroStation

Both can display data created in the other format

GIS is a system that relates data based on geography

ArcMap

What has GIS done for Inventory?

- Updated crossing and track GIS layer with SARAH data
- Val Maps
- NCRR Property



Details |
 Basemap |
 Share |
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 Measure |
 Find address or place

Legend

NCDOT North Carolina Rail System

Class 1 - CSX

- CSX Active
- CSX Inactive

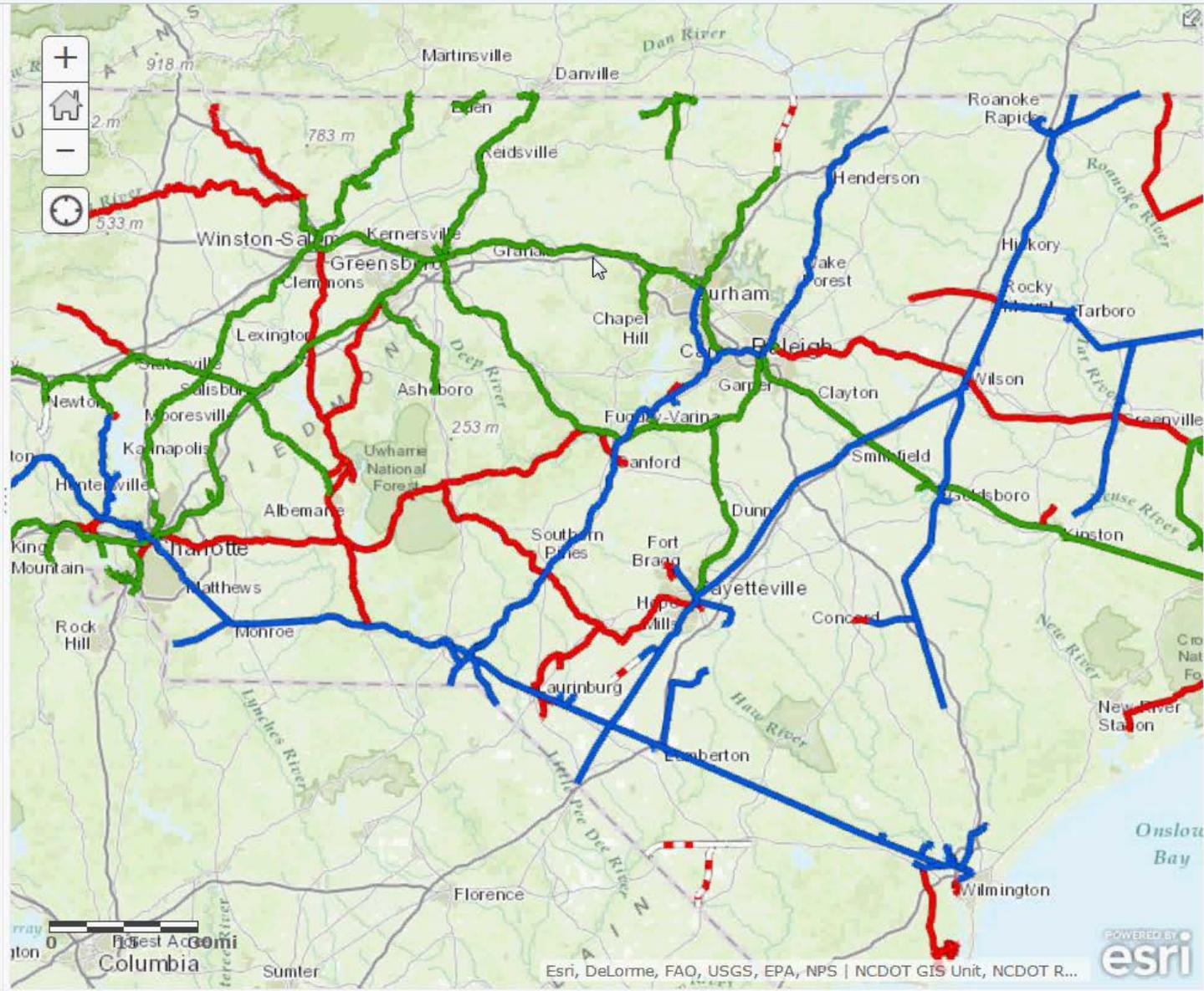
Class 1 - Norfolk Southern

- Norfolk Southern Active
- Norfolk Southern Inactive

Shortline/Other

- Shortline/Other Active
- Shortline/Other Inactive

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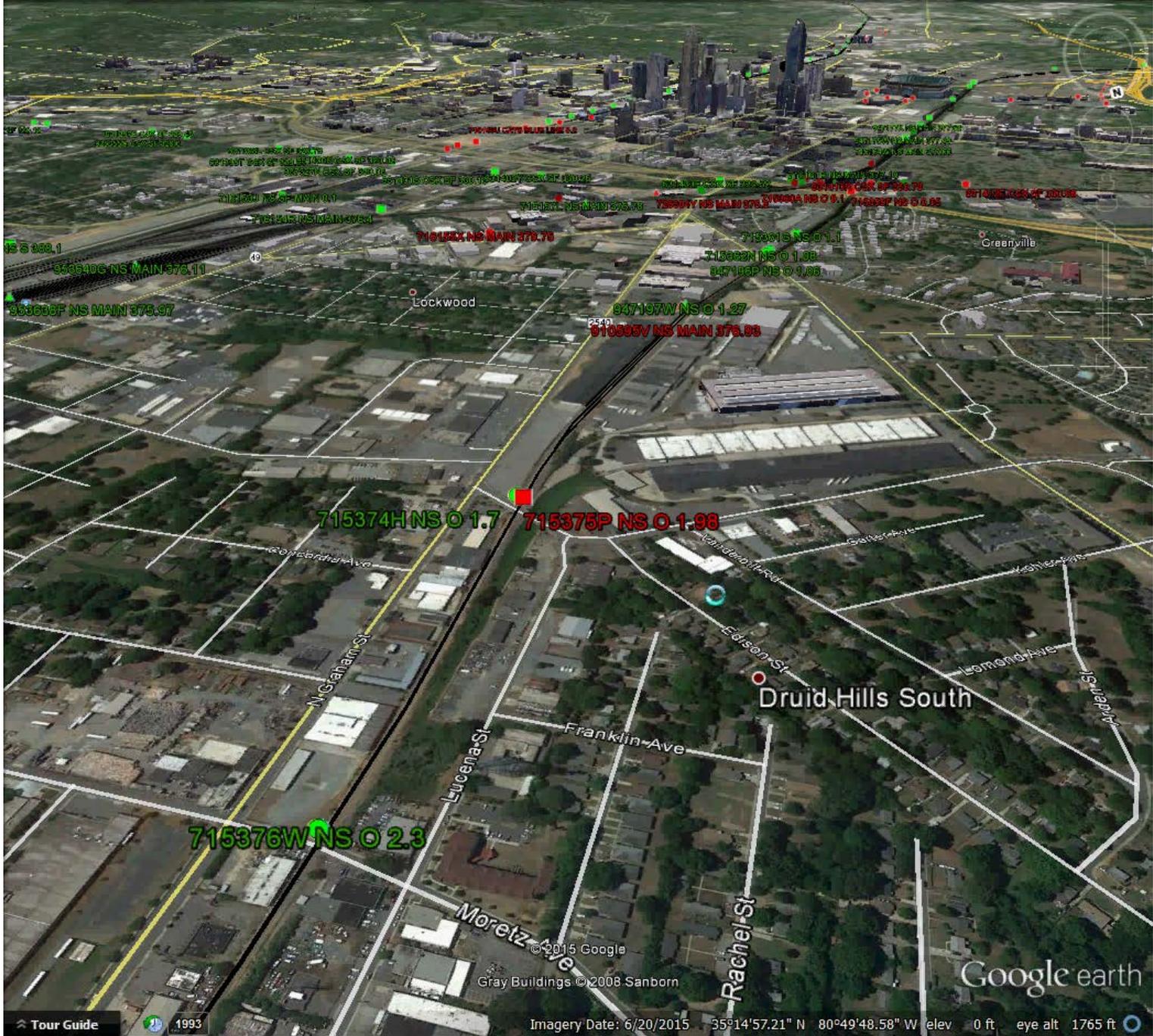


GIS Files on NCDOT Connect Site

To download GIS files for crossings, track, or facilities, visit <https://connect.ncdot.gov/resources/gis/pages/gis-data-layers.aspx>

OR

Google “NCDOT GIS Layers” and select the first link



What can GIS do for me?

- Operations
- Engineering Coordination and Safety
 - Planning and Environmental
 - Finance and Contracts
 - Design and Construction

What can GIS do for Operations?

- In July 2015, GIS was used to identify the locations of all switches from Raleigh to Charlotte
- Encroachments and Property Management

What can GIS do for Engineering Coordination and Safety?

- TIP, HSIP
- Trespasser and Crash Maps
- Crossing Surface Program
- FRA Inspections
- Analyze crashes and trespasser incidents relative to their locations and the surrounding demographics

What can GIS do for Planning and Environmental?

- See where customers live – are they clustered?
- Associate rail corridor with property owners, land value

Details

+ Add ▾

Basemap

Save ▾

Share



Measure

Bookmarks

Find address or place



Contents

- NCDOT RailSystem - Rail Crossings
- NCDOT RailSystem - Facilities
- NCDOT RailSystem - Shortline/Other
- NCDOT RailSystem - Class 1 - Norfolk Southern
- NCDOT RailSystem - Class 1 - CSX
- NC1Map Parcels - Parcels
- NCDOT County Boundaries
- NCDOT City Boundaries
- Imagery with Labels



What can GIS do for Finance and Contracts?

- SAP
- Contracts

What can GIS do for Design and Construction?

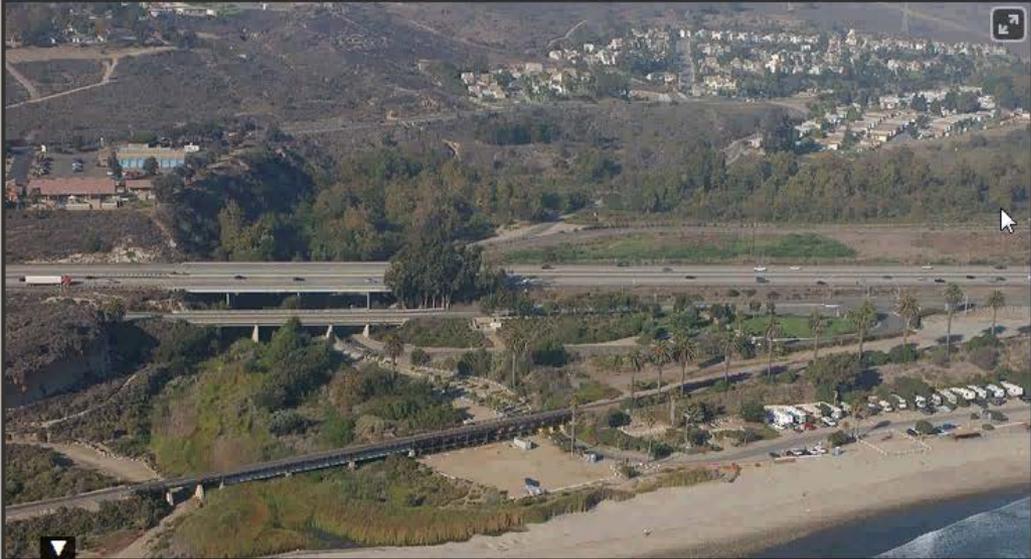
- LOSSAN Rail GIS

<http://lossanmap.sandag.org/>

LOSSAN Coastal Rail Corridor

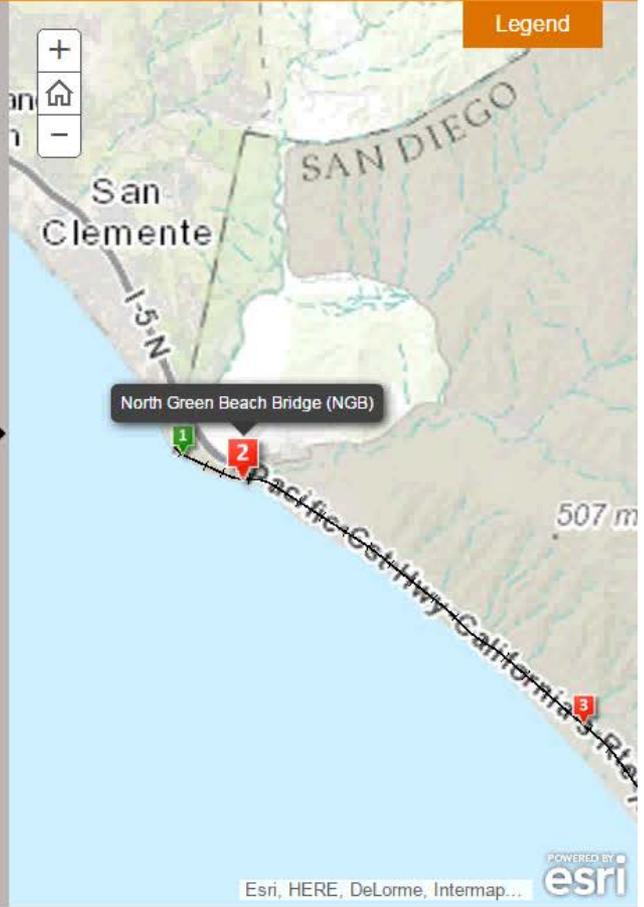
More information about LOSSAN Coastal Rail Corridor Projects [i](#) [t](#) [w](#) [p](#)

The LOSSAN (Los Angeles-San Diego-San Luis Obispo) rail corridor is the second busiest intercity rail corridor in the nation, playing a critical role in the movement of people and goods within the Southern California region. This story map highlights some of the improvements being made to the LOSSAN rail corridor in San Diego County.



North Green Beach Bridge (NGB)

The North Green Beach Bridge project involves the replacement of three timber spans at the north abutment of the North Green Beach Bridge. This project is necessary to maintain a state of good repair, provide a safe and comfortable ride to our passengers, and to allow freight to use the corridor at normal speeds. Funding status: Fully funded for fill but additional funds need to be identified. Estimated completion date: December 2015.



Legend

San Clemente

1-5-N

North Green Beach Bridge (NGB)

507 m

POWERED BY **esri**

Esri, HERE, DeLorme, Intermap...



San Mateo Creek Bridge Replacement at Trestles



North Green Beach Bridge (NGB)



San Onofre to Pulgas Double Track Stage 1



San Onofre to Pulgas Double Track Stage 2



Santa Margarita River Bridge (SMRB)



North Oceanside Double Track



Oceanside Transit Center Platform Improvement



Oceanside Double Track

Case Study: Trespasser Safety

- In Spring 2015, a GIS Case Study was conducted to analyze trespasser data from the past 5 years

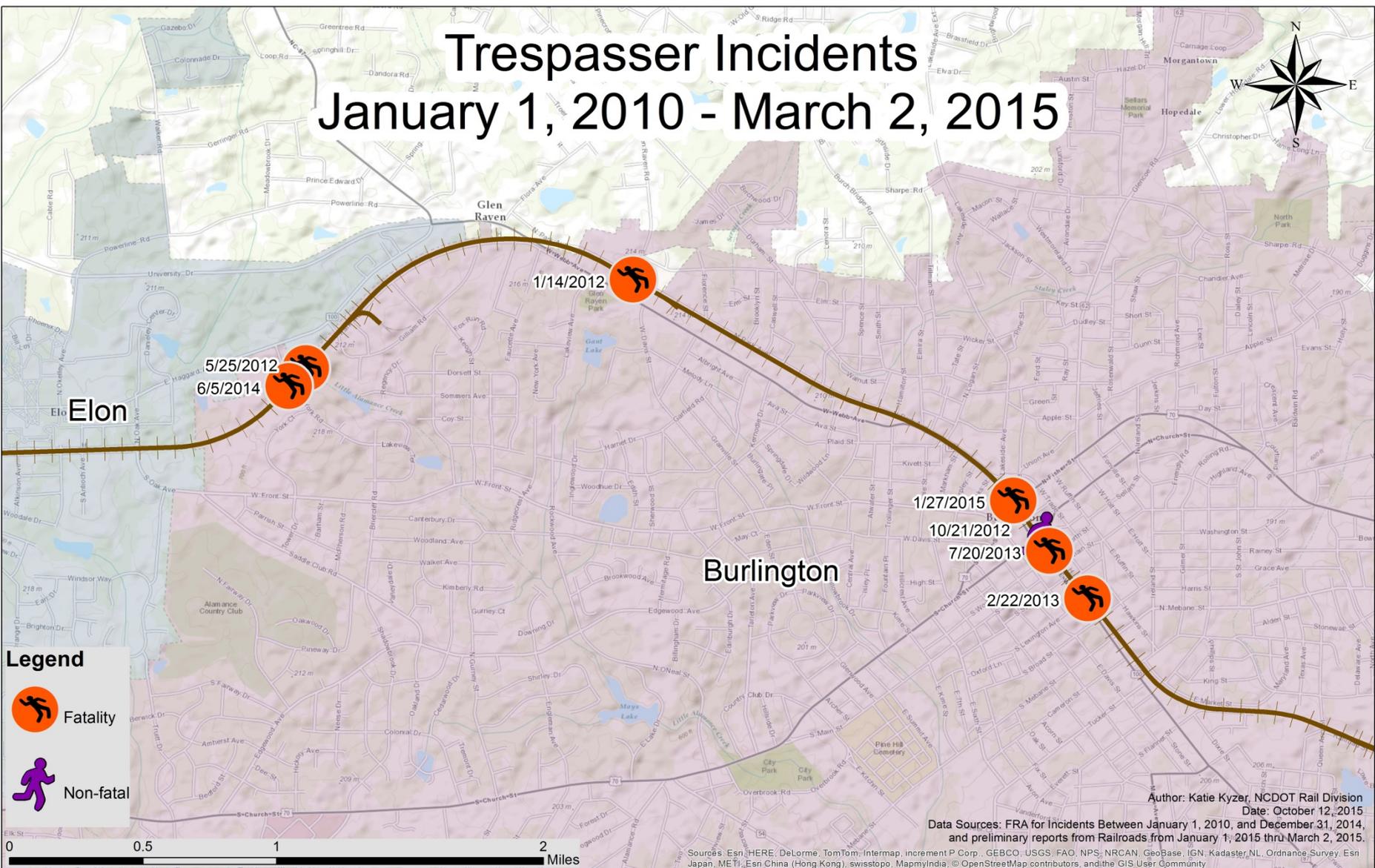
GIS can calculate statistics

- Assuming trespasser incident did not occur at a crossing, the average distance between trespasser incidents and the nearest crossing is **503.507 feet**

GIS Relates Data to Locations

Fatal Incidents	
Charlotte	7
Burlington	6
Durham	6
Greensboro	5
Mebane	2
Asheville	2
Salisbury	2
Thomasville	2
Kannapolis	2
High Point	2

Trespasser Incidents January 1, 2010 - March 2, 2015

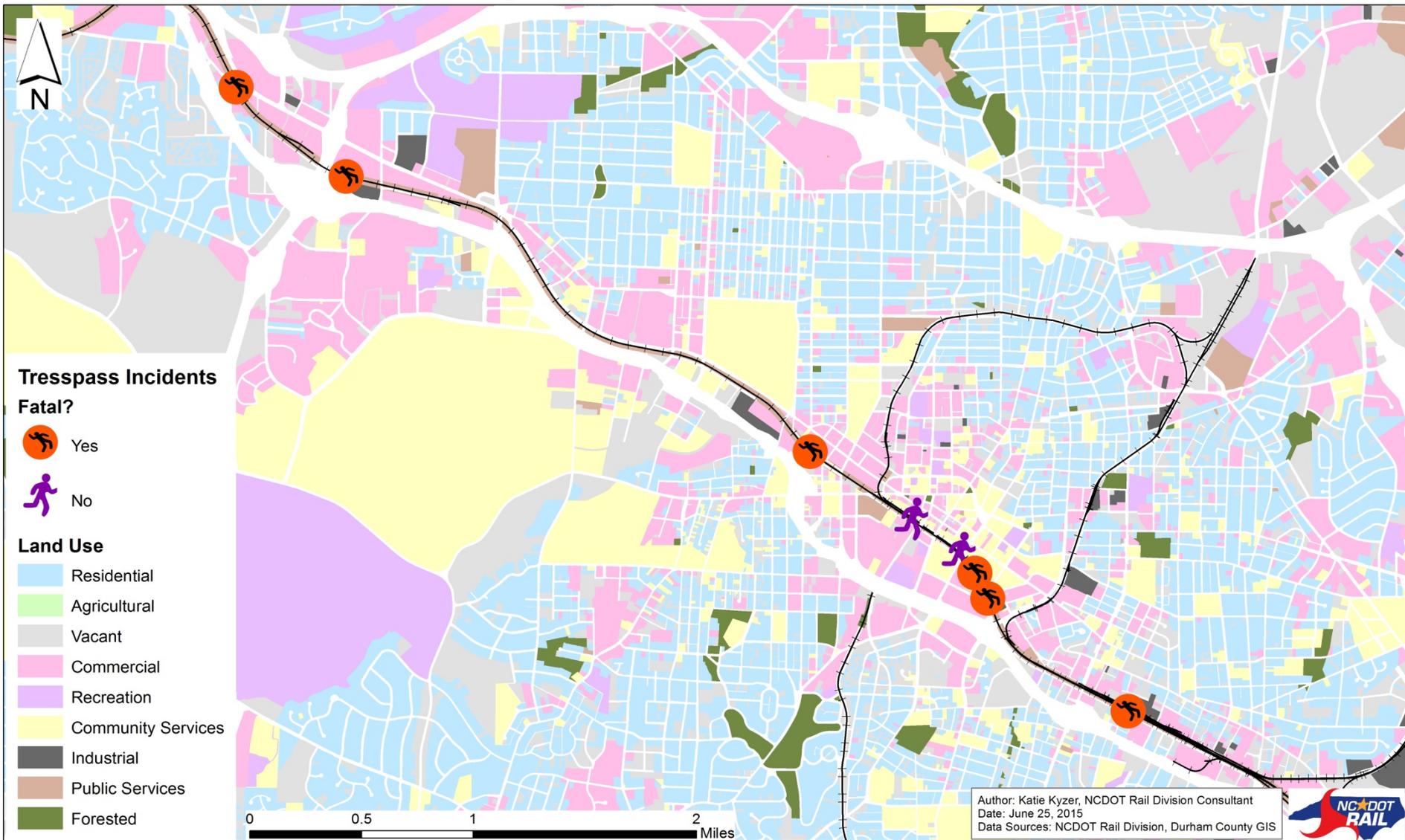


Author: Katie Kyzer, NCDOT Rail Division
Date: October 12, 2015

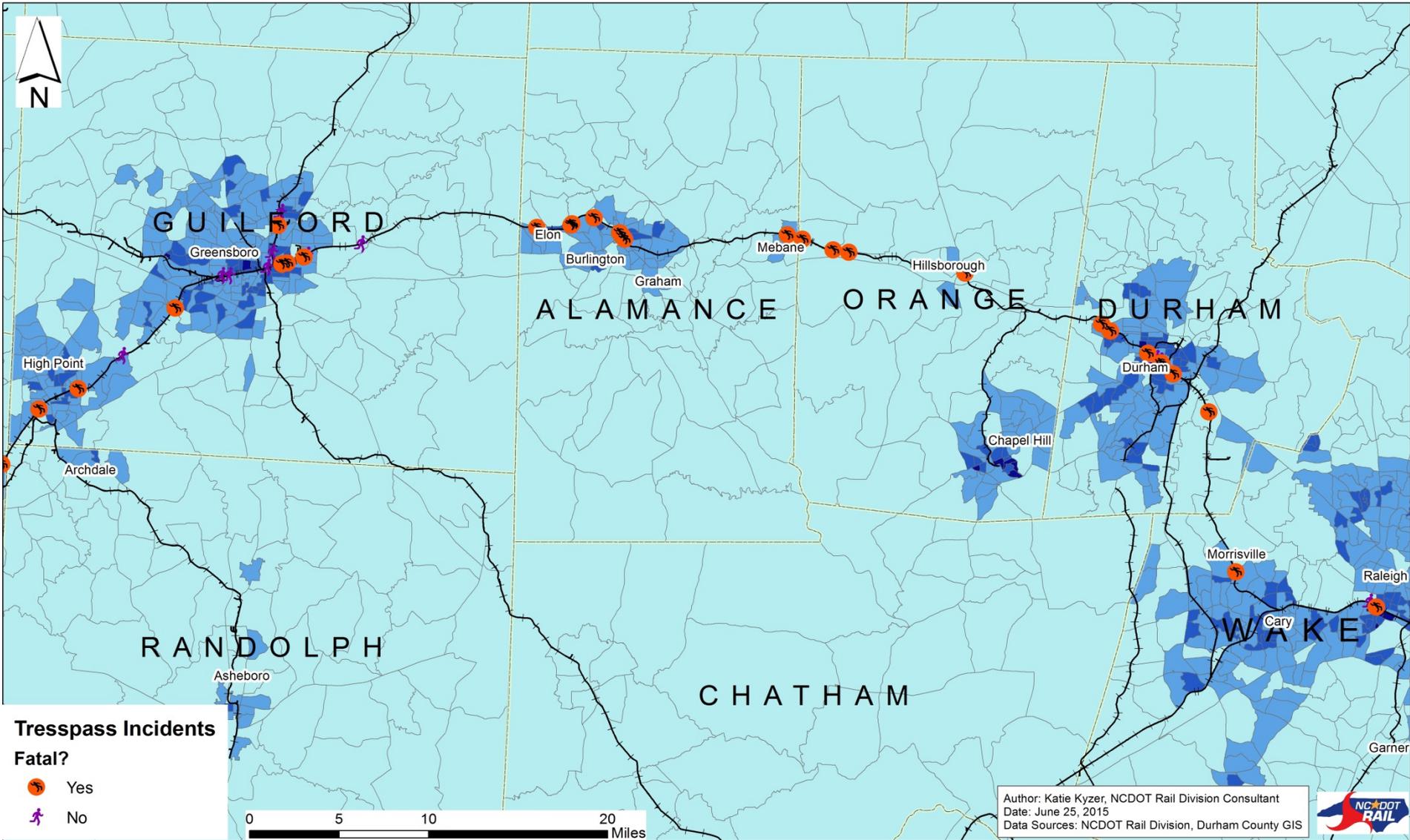
Data Sources: FRA for Incidents Between January 1, 2010, and December 31, 2014, and preliminary reports from Railroads from January 1, 2015 thru March 2, 2015.

Sources: Esri, HERE, DeLorme, TomTom, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, MEI, Esri China (Hong Kong), swisstopo, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community

Durham Trespasser Incidents, 06/2011-05/2015



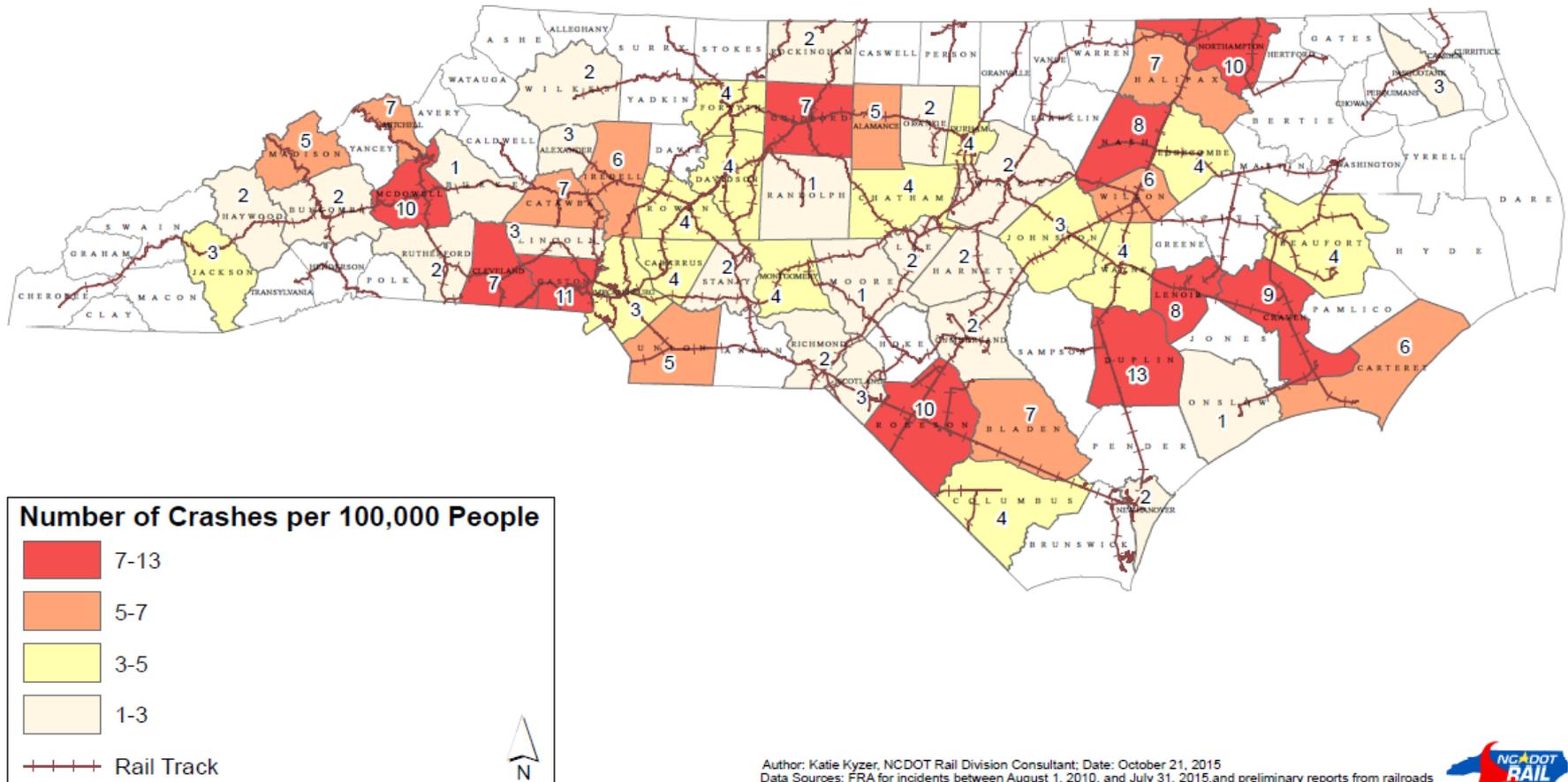
Population Density and Trespasser Incidents, 06/2011-05/2015



221,758 people in census tracts that border the NS H line

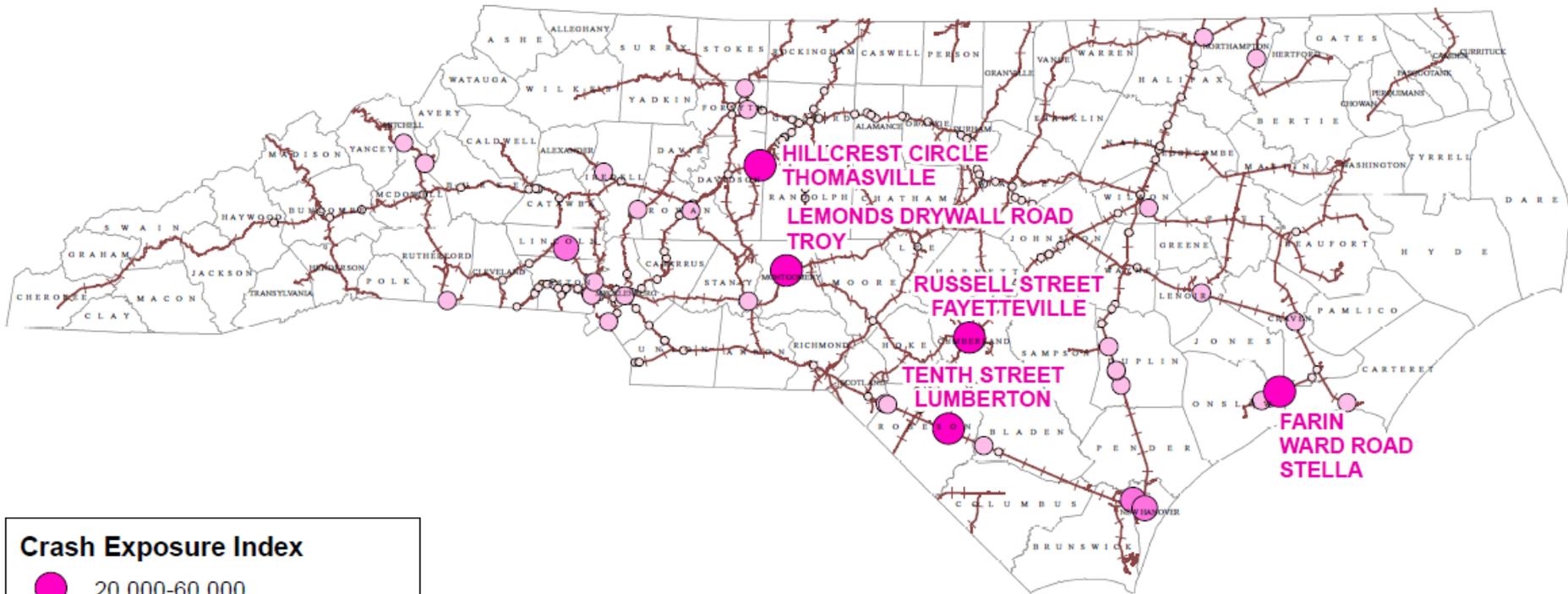
So GIS is just maps?

Rail Grade Crossing Crashes per 100,000 People August 1, 2010 - October 19, 2015



Rail Grade Crossing Crash Exposure Index

August 1, 2010 - October 19, 2015



Crash Exposure Index

- 20,000-60,000
- 10,000-20,000
- 2,000-10,000
- 0-2,000

++++ Rail Track



Author: Katie Kyzer, NCDOT Rail Division Consultant; Date: October 21, 2015
 Data Sources: FRA for incidents between August 1, 2010, and July 31, 2015, and preliminary reports from railroads for incidents from August 1, 2015 thru October 19, 2015



What is GIS?

- **Geographic Information Systems**
- System designed to
 - visualize data
 - generate spatial statistics
 - analyze relationships between spatially related things (crossings, track, trespasser events, property)

How can GIS help me?

- Access information more quickly
- Relate data more efficiently
- Gain resources to promote safety

Questions



Katie Kyzer – kkyzer1@ncdot.gov
Larry Sanders – ldsanders1@ncdot.gov
NCDOT Rail Division
862 Capital Blvd Raleigh, NC 27603



Trespasser Incidents June 2011-July 2015

