

2017

FRA Rail Program Delivery

Meeting

FRA's North American Rail Network (NARN)

Raquel Wright

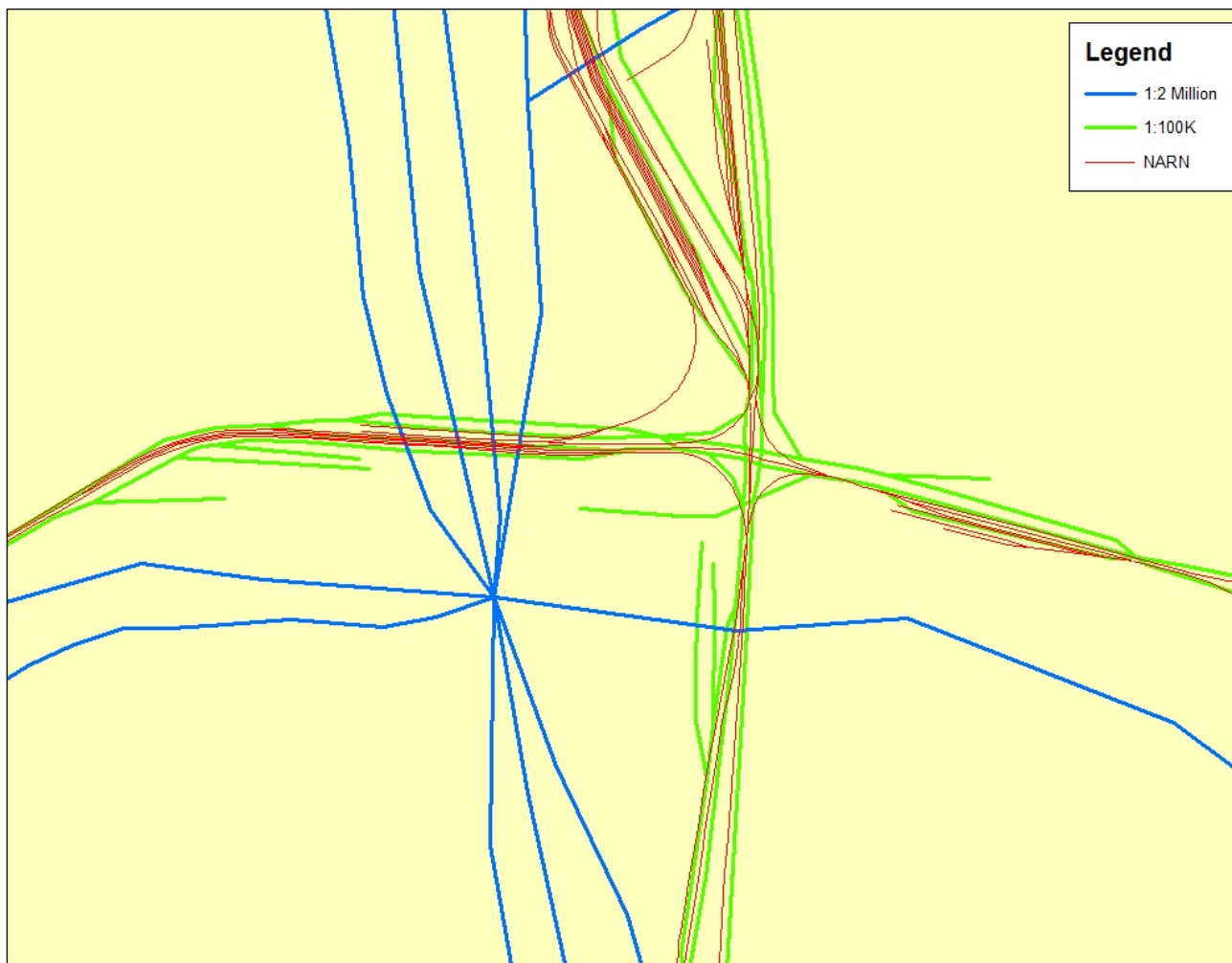
Outline

- ▶ Background - NARN
- ▶ Where we are today
- ▶ How to use the data
- ▶ How to get the data
- ▶ Next Steps

History

- ▶ 1:2 million (USGS): Used for cartographic representation, attributes, and routing
- ▶ 1:100,000 (Census): Had a better spatial representation but lack routability and attributes
- ▶ By 2005, the 1:2 million attributes were conflated to the 1:100,000 network & the 1:100,000 was completely routable

1:2M – 1:100K - NARN



Background

▶ 2015/2016

- ▶ FRA conflated the FRA network with NGA's Rail Network and using 5 years of FRA's Automated Track Inspection Program (ATIP) Data

▶ DOT/FRA Rail Network

- ▶ Represents 185,000 miles of mainline track
- ▶ First created in mid 80s from USGS 1:2million DLGs

▶ NGA Rail Network

- ▶ Includes all lines and sidings
- ▶ In general, more accurate

▶ ATIP Data

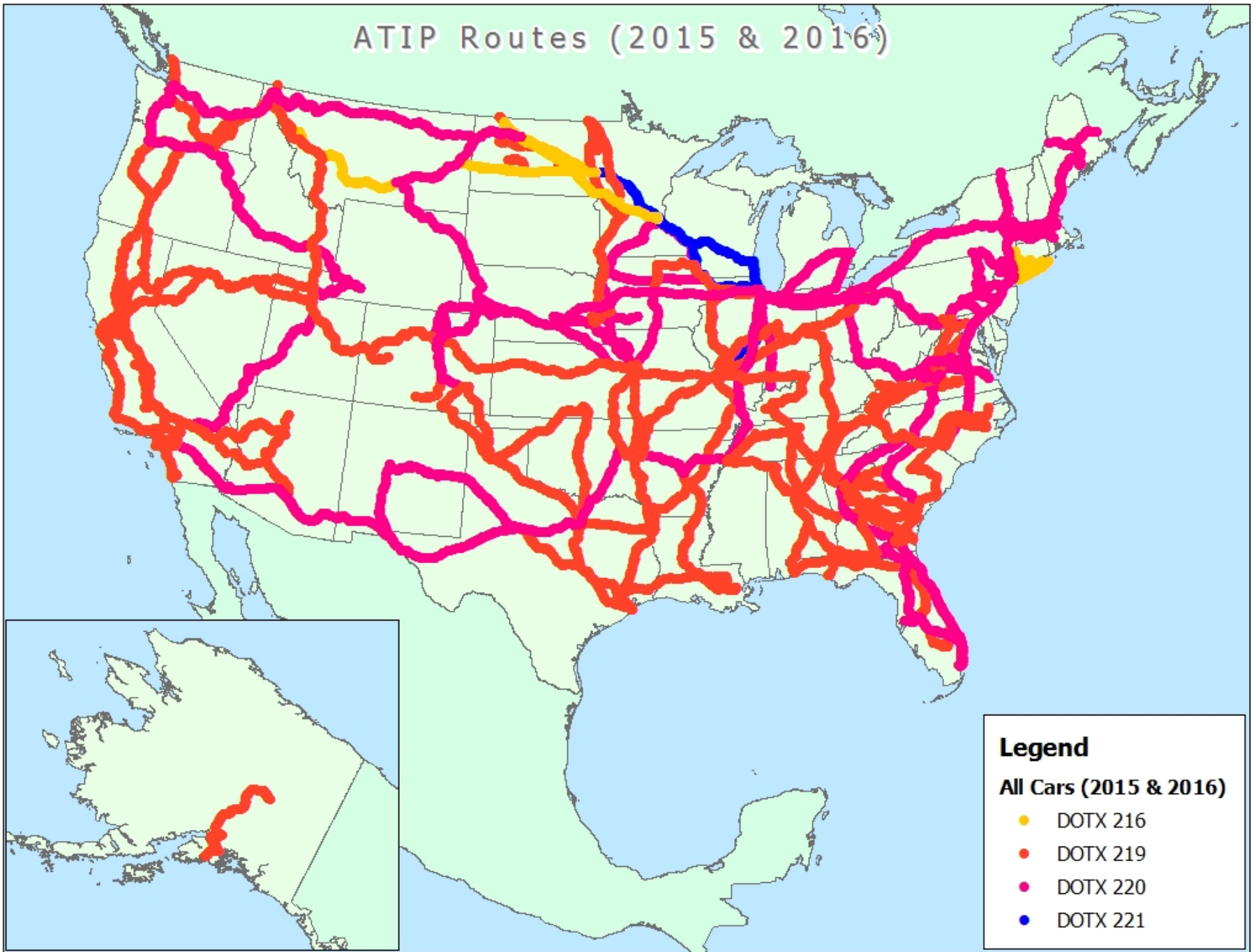
- ▶ Collects long-lat every foot to locate track defects
- ▶ 84,100 miles of main line track collected under ATIP

Automated Track Inspection Program (ATIP) Data

- ▶ The ATIP cars take a latitude and longitude reading every foot.

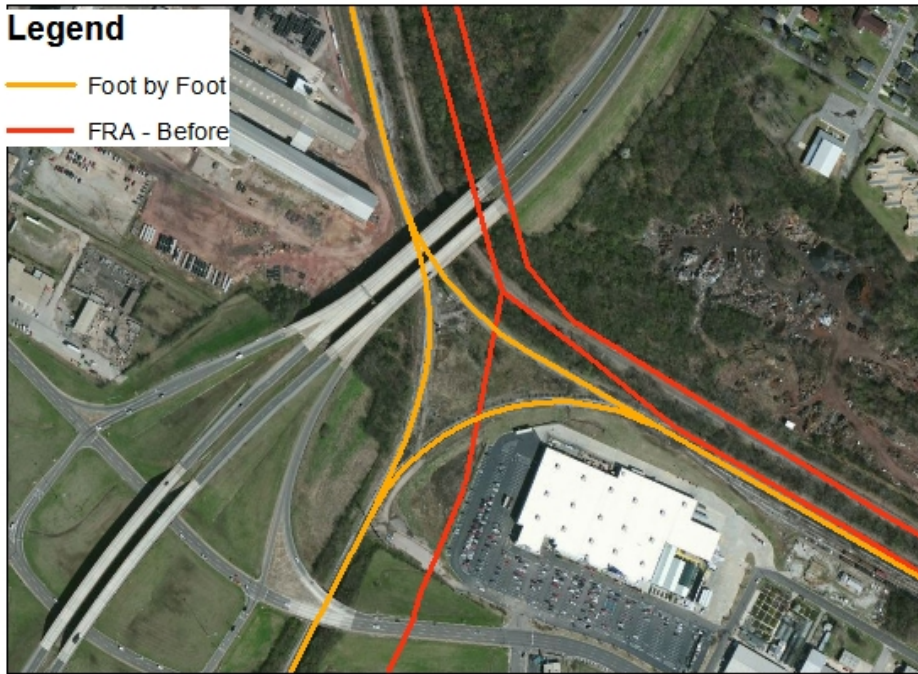


ATIP Routes (2015 & 2016)



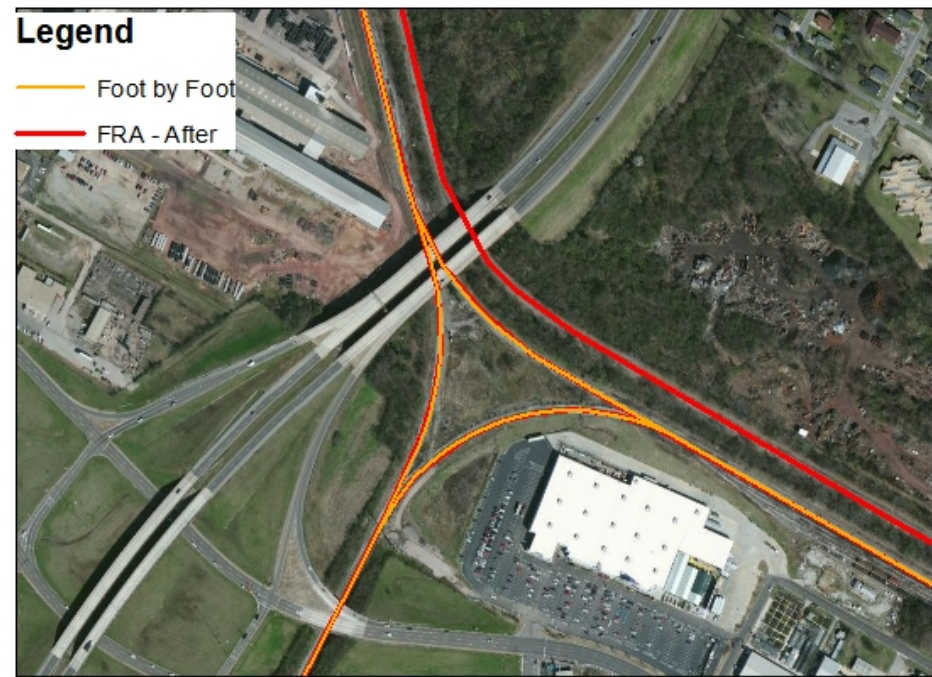
Legend

- Foot by Foot
- FRA - Before

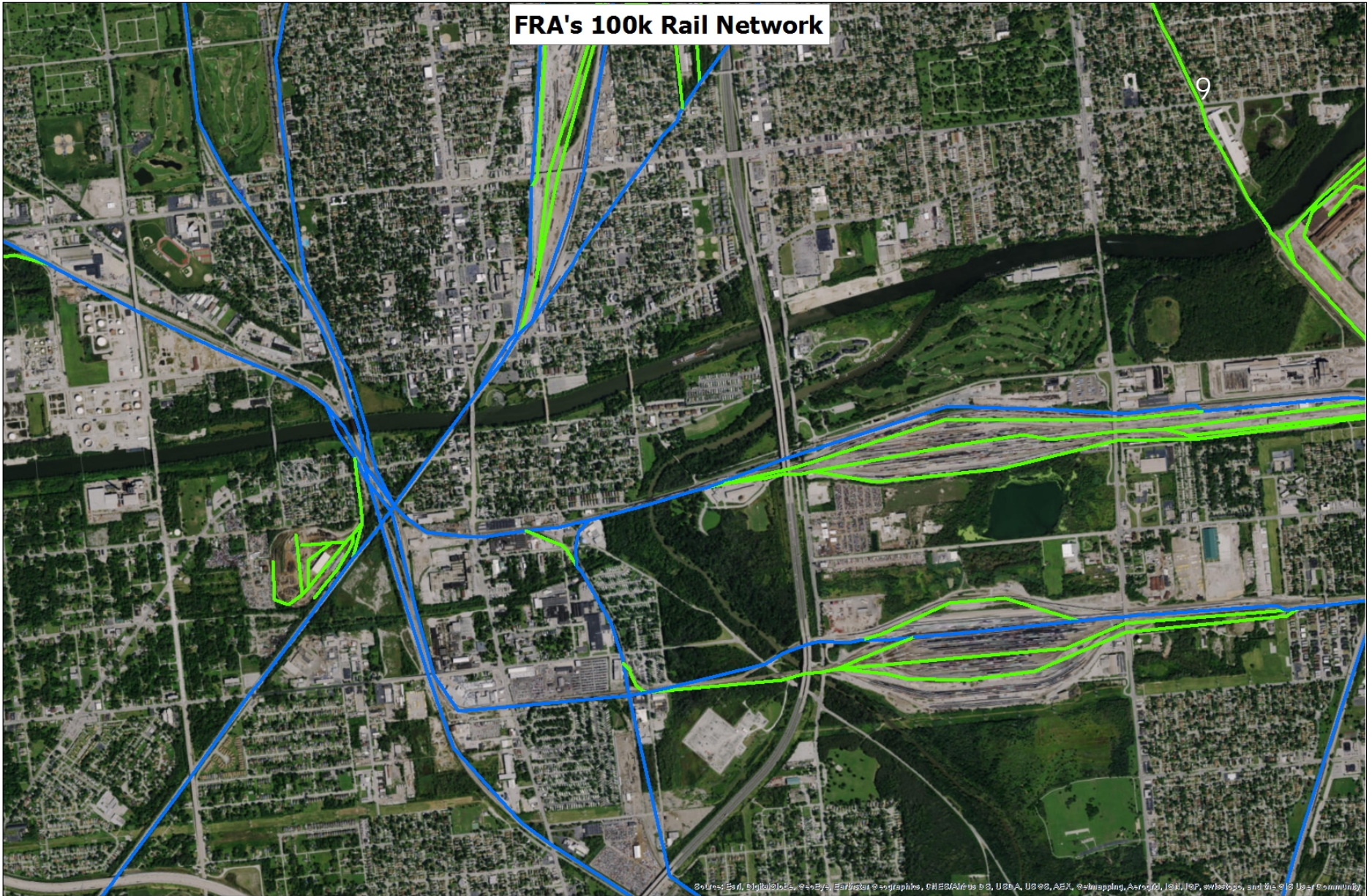


Legend

- Foot by Foot
- FRA - After



FRA's 100k Rail Network



North American Rail Network

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Sources: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroX, eSMapping, AeroGRID, IGN, JSP, swisstopo, and the GIS User Community

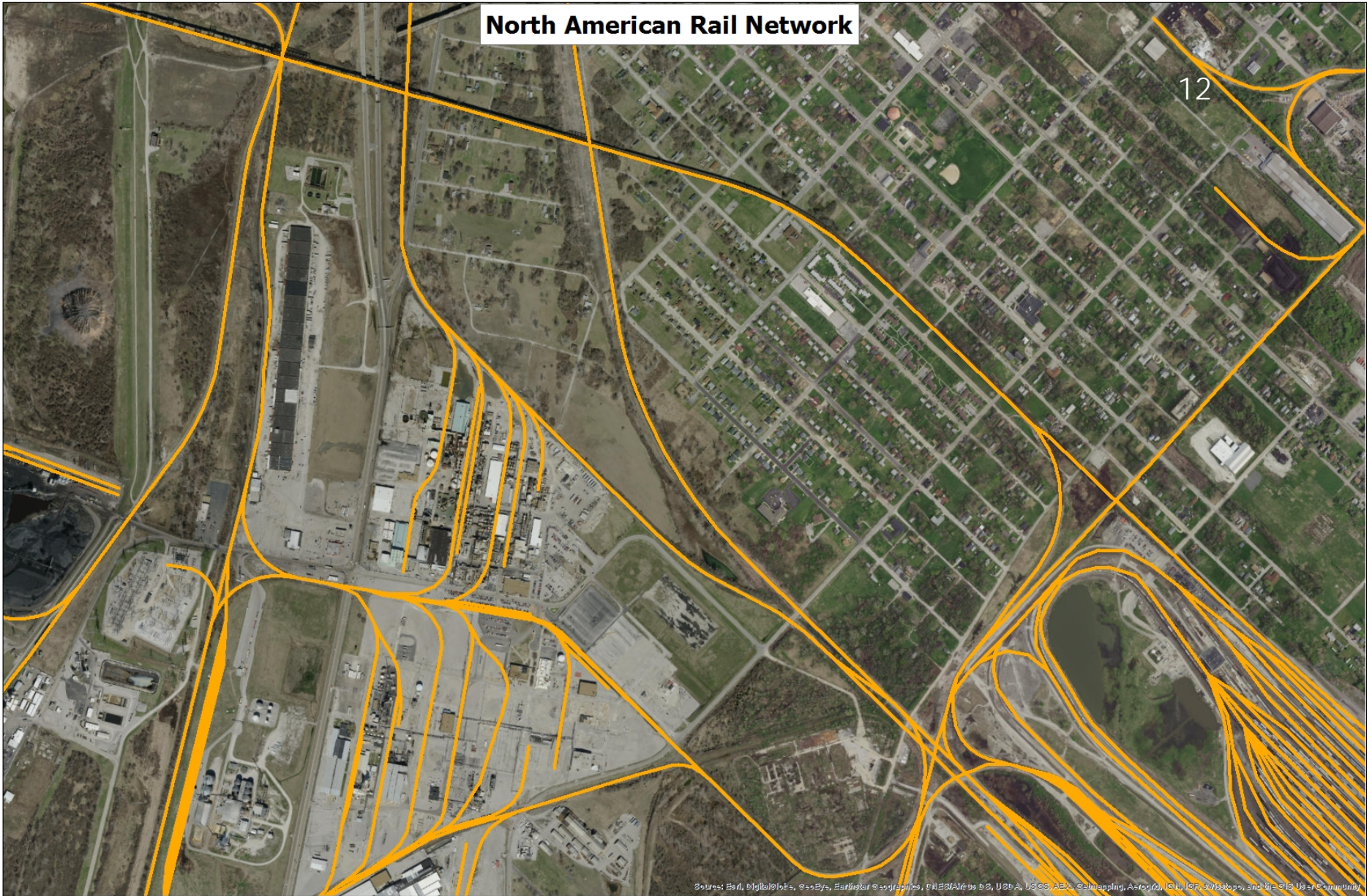
FRA's 100k Rail Network



Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroV, GeoEye, IGN, JP, S, Mapbox, and the GIS User Community

North American Rail Network

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Sources: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, JRC, Visiotech, and the GIS User Community

Since the Release of the NARN

- ▶ NARN was released to the public July 2016 as a layer on the National Transportation Atlas Database (NTAD)
- ▶ AAR GIS Committee adopted the NARN as the industry standard
- ▶ Class 1s have validated the Chicago region
- ▶ Network was last versioned October 2017

How to use the data

- ▶ Understanding the attributes, i.e.
 - ▶ Geography (State, County)
 - ▶ Ownership/Trackage rights
 - ▶ Type of track
 - ▶ STRACNET
 - ▶ Passenger

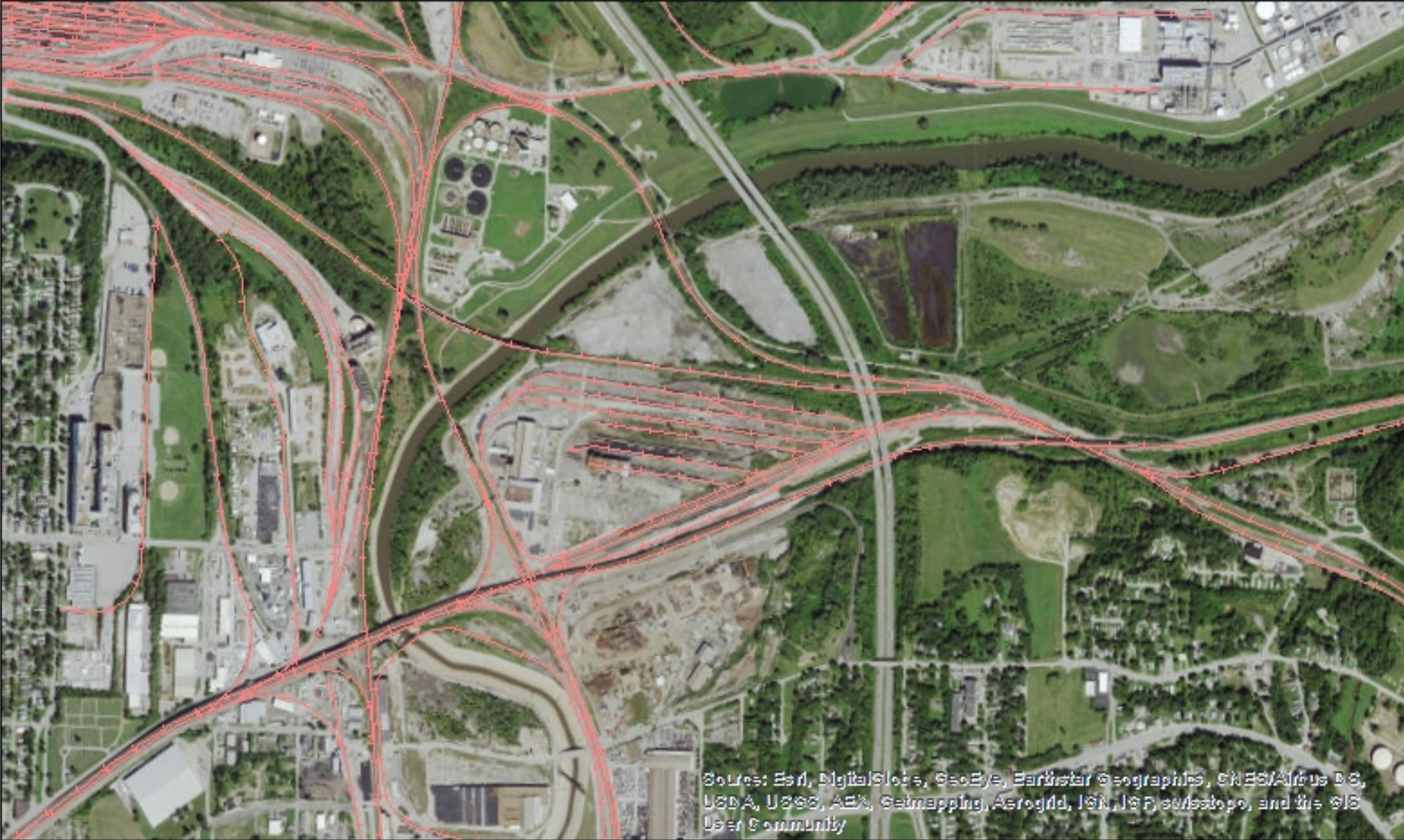
Types of Tracks

NET Column

- ▶ M: Main line
- ▶ I: Major industrial lead
- ▶ O: Other track (minor industrial leads)
- ▶ X: Out of service line
- ▶ S: Passing sidings
- ▶ A: Abandoned rail line
- ▶ R: Abandoned line that has been physically removed
- ▶ Y: Yard tracks
- ▶ F: Rail ferry connection
- ▶ T: Trail on former rail right-of-way

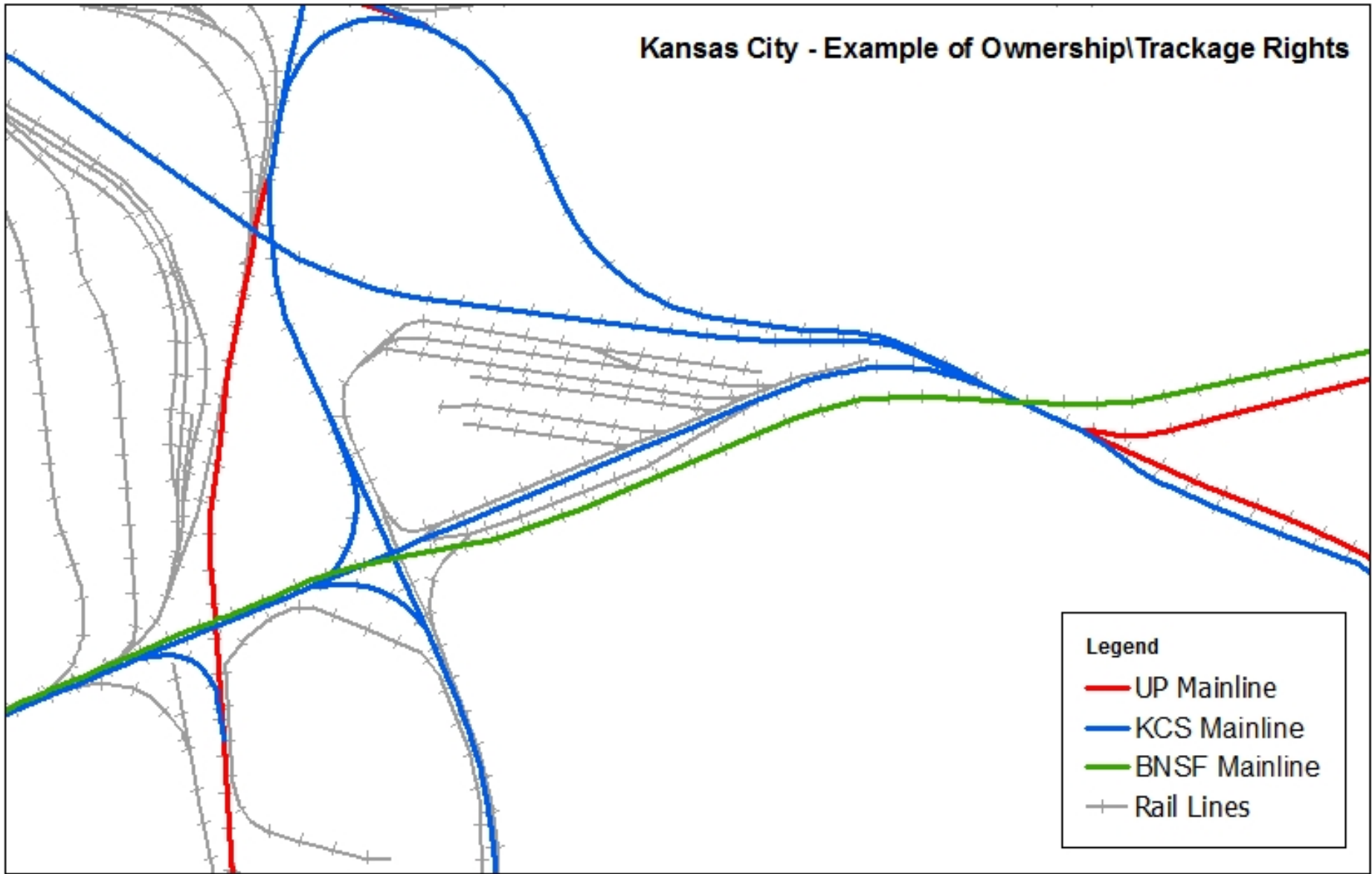
Routing will be on Main and Industrial lead track

Kansas City - Right of Way

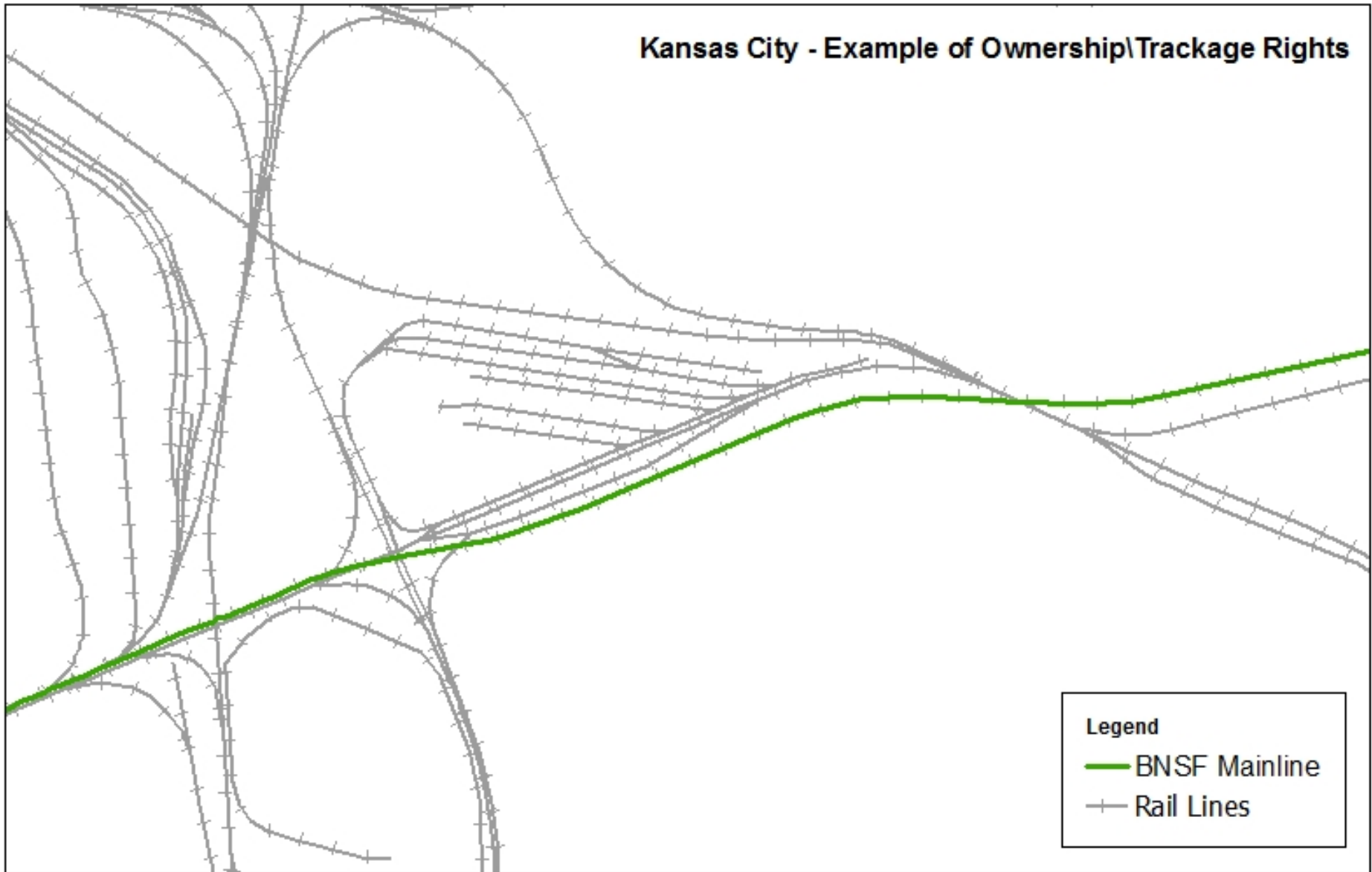


Sources: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

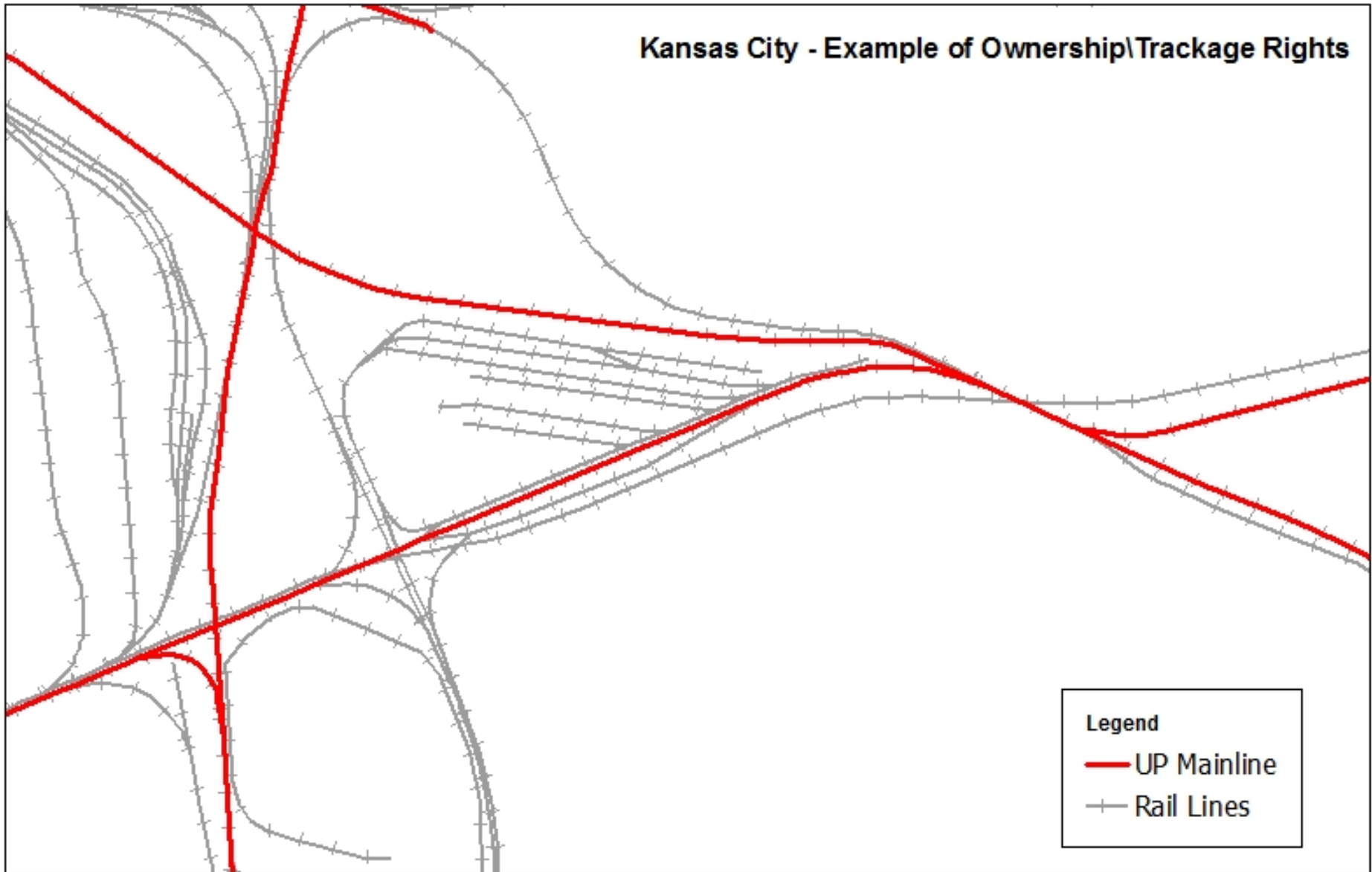
Kansas City - Example of Ownership\Trackage Rights



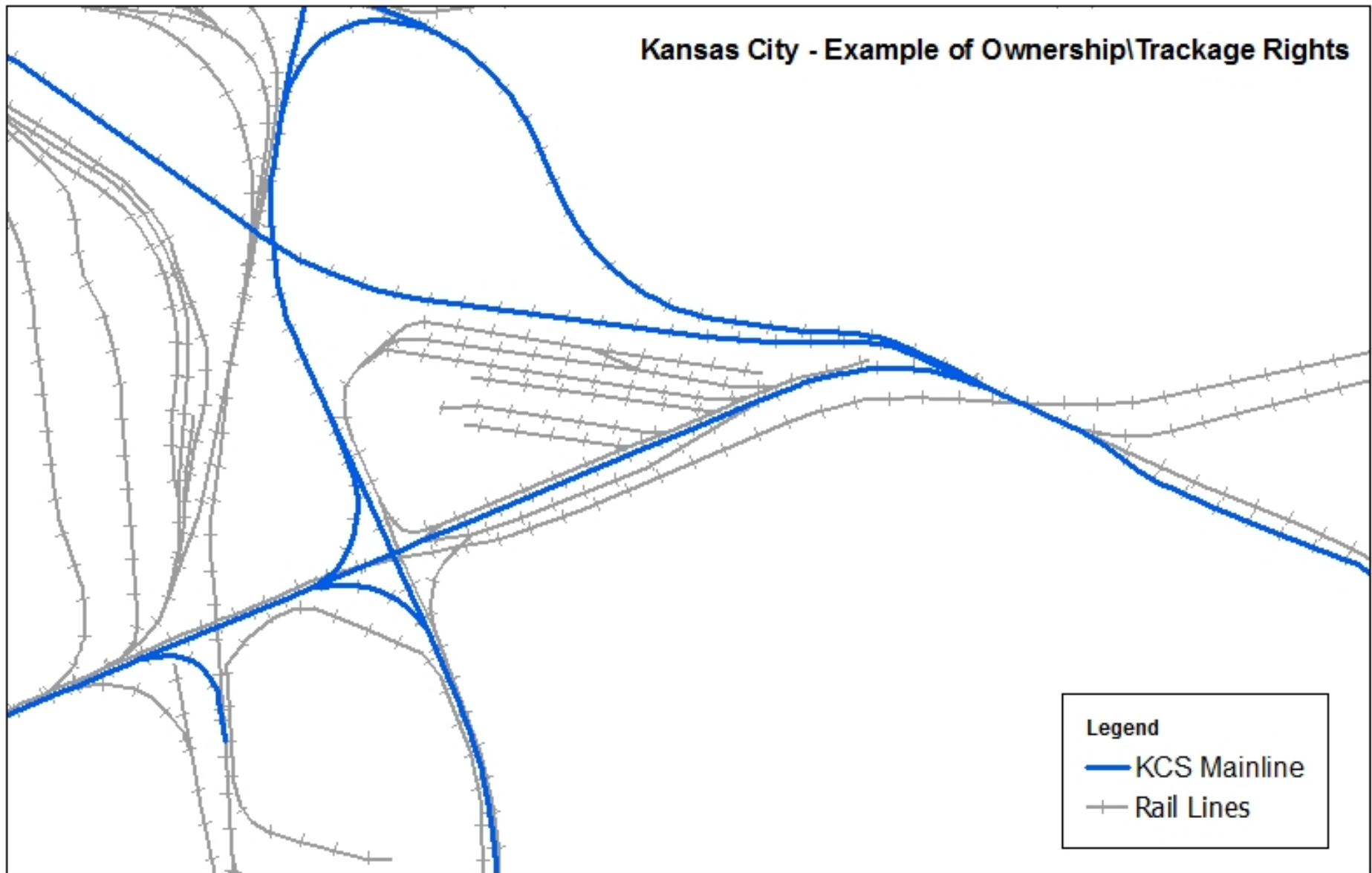
Kansas City - Example of Ownership\Trackage Rights



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Kansas City - Example of Ownership\Trackage Rights

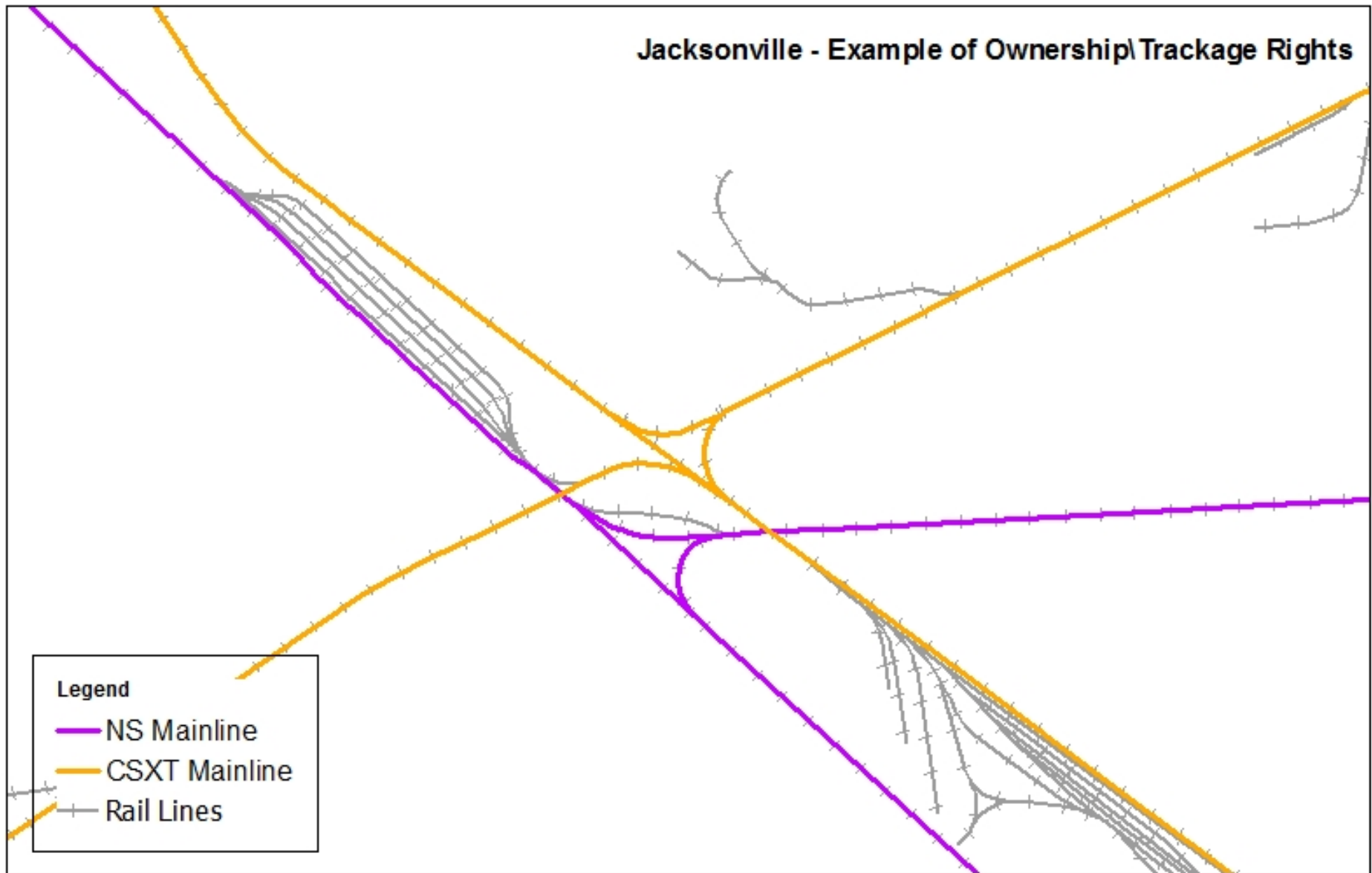


Jacksonville - Right of Way

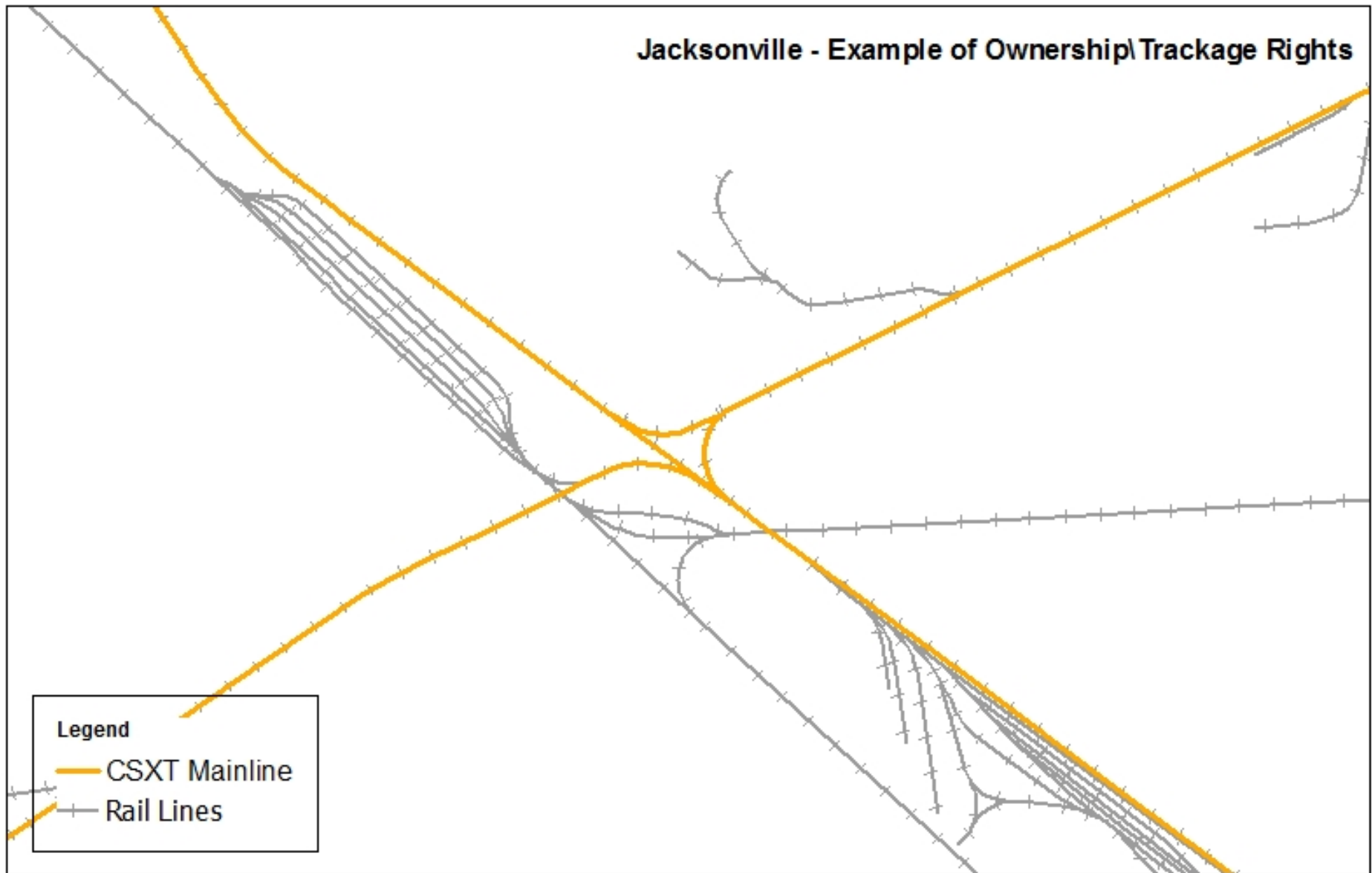


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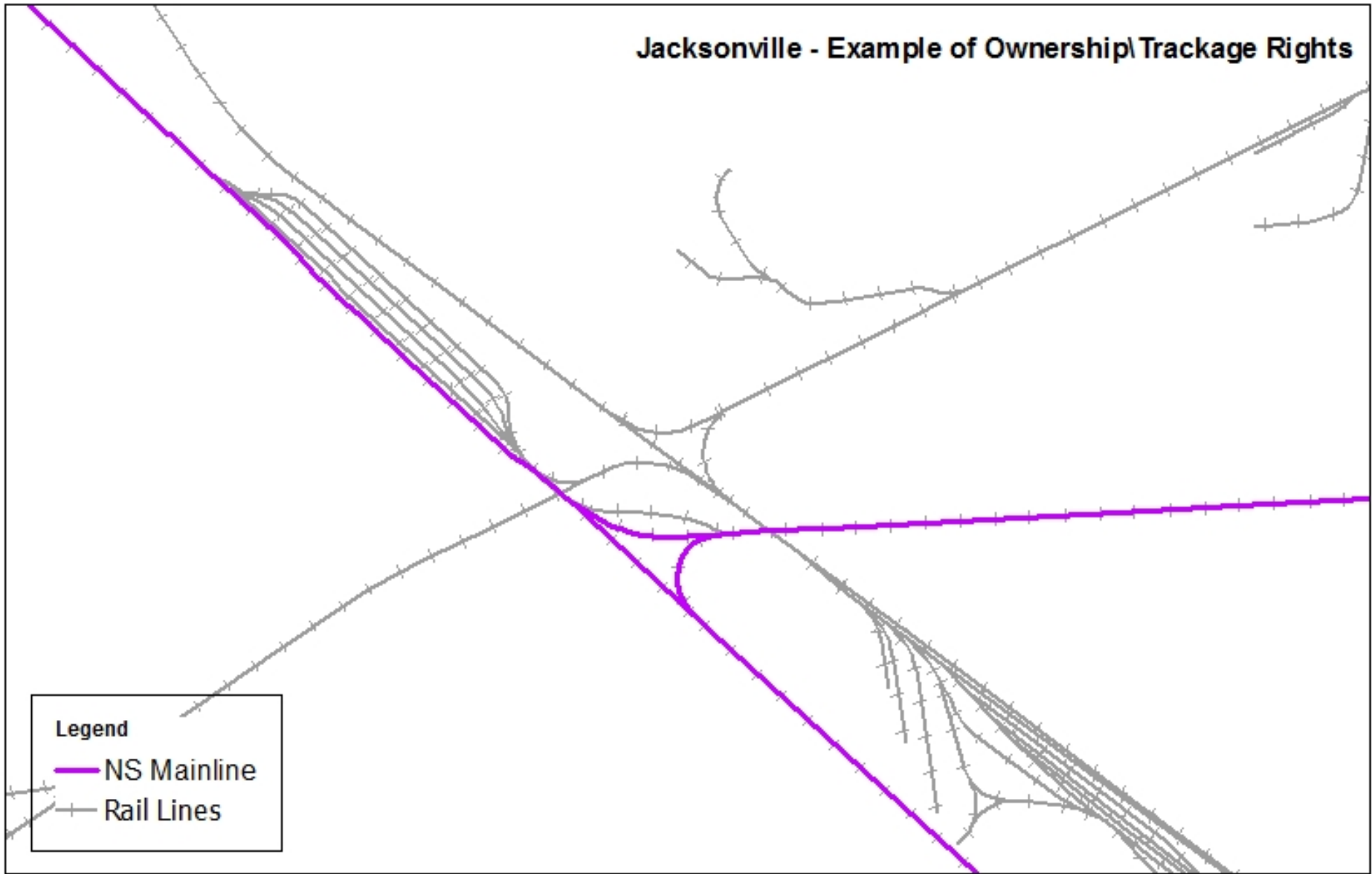
Jacksonville - Example of Ownership \ Trackage Rights



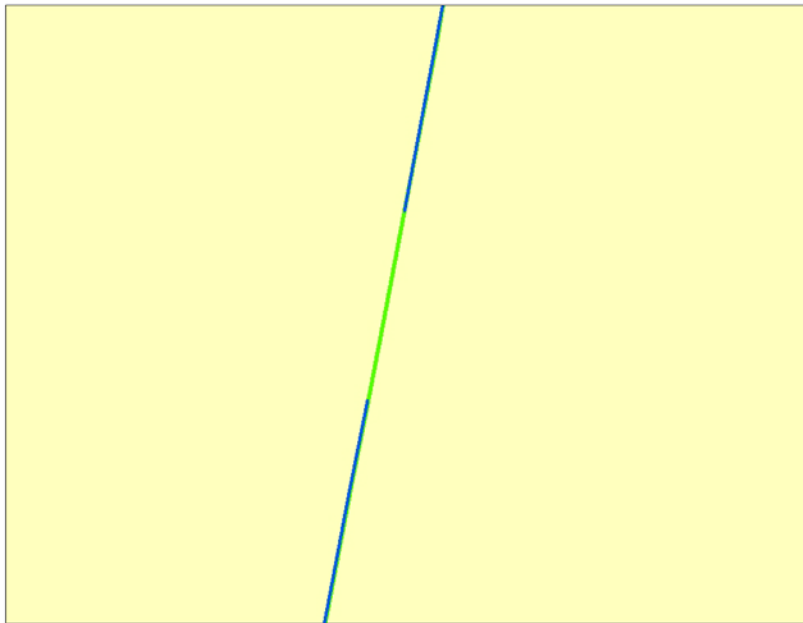
Jacksonville - Example of Ownership \ Trackage Rights



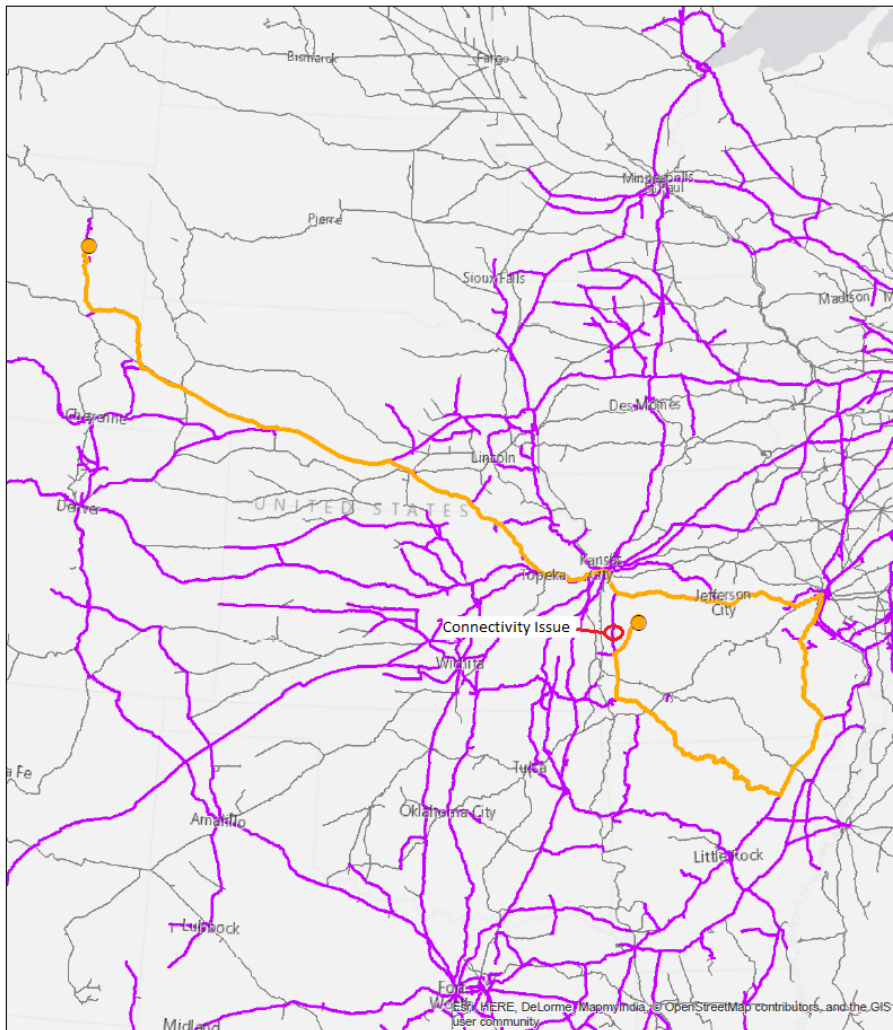
Jacksonville - Example of Ownership \ Trackage Rights



Examples of No Connectivity

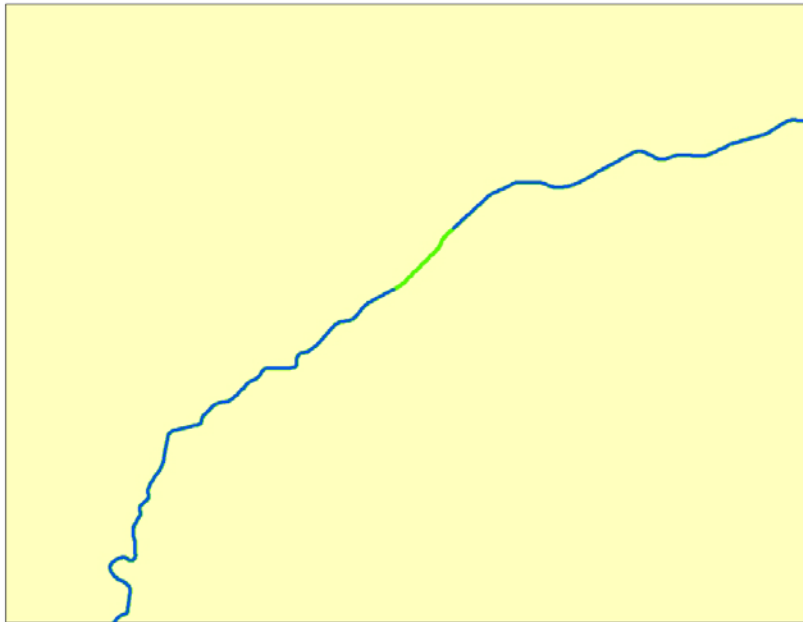


Railroad :	Leg Id: 51749	Leg Use: 32
Waybill Miles : 905.7	Orig :	O_FSAC :
Flowed Miles : 1654.6	Dest :	D_FSAC :

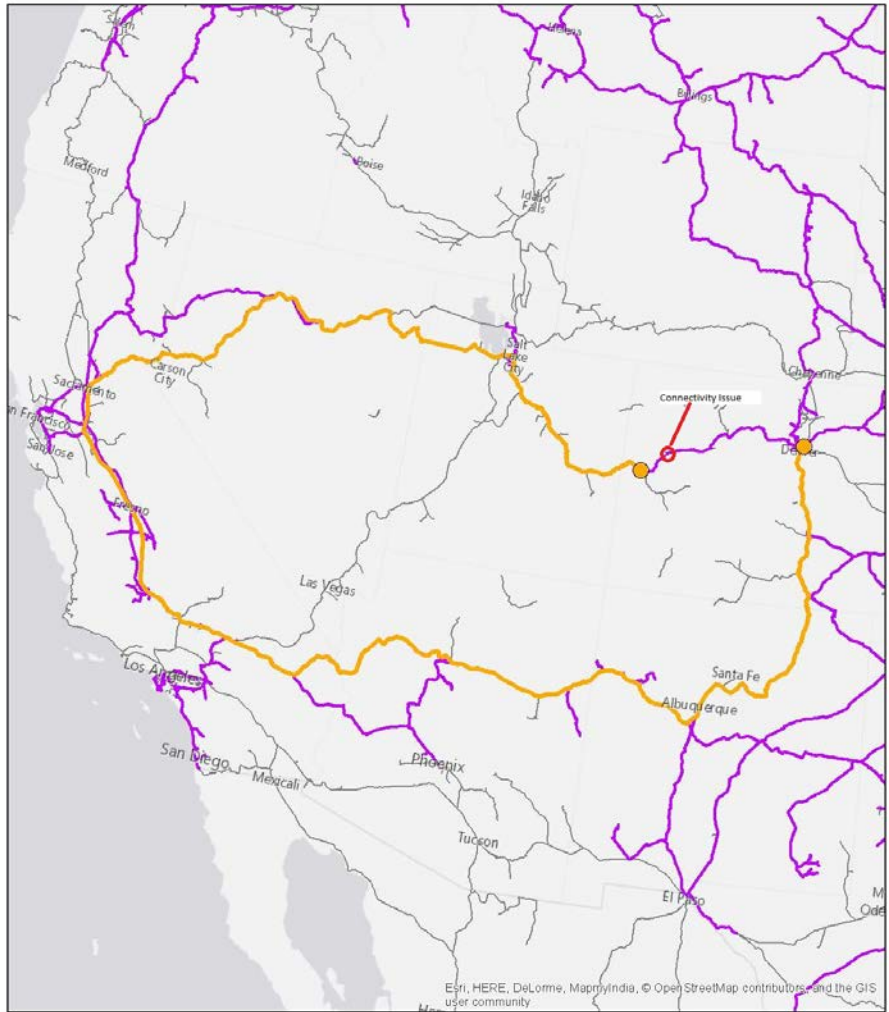


● Station — Selected Route — RR Mainline — All Mainline

Examples of No Connectivity

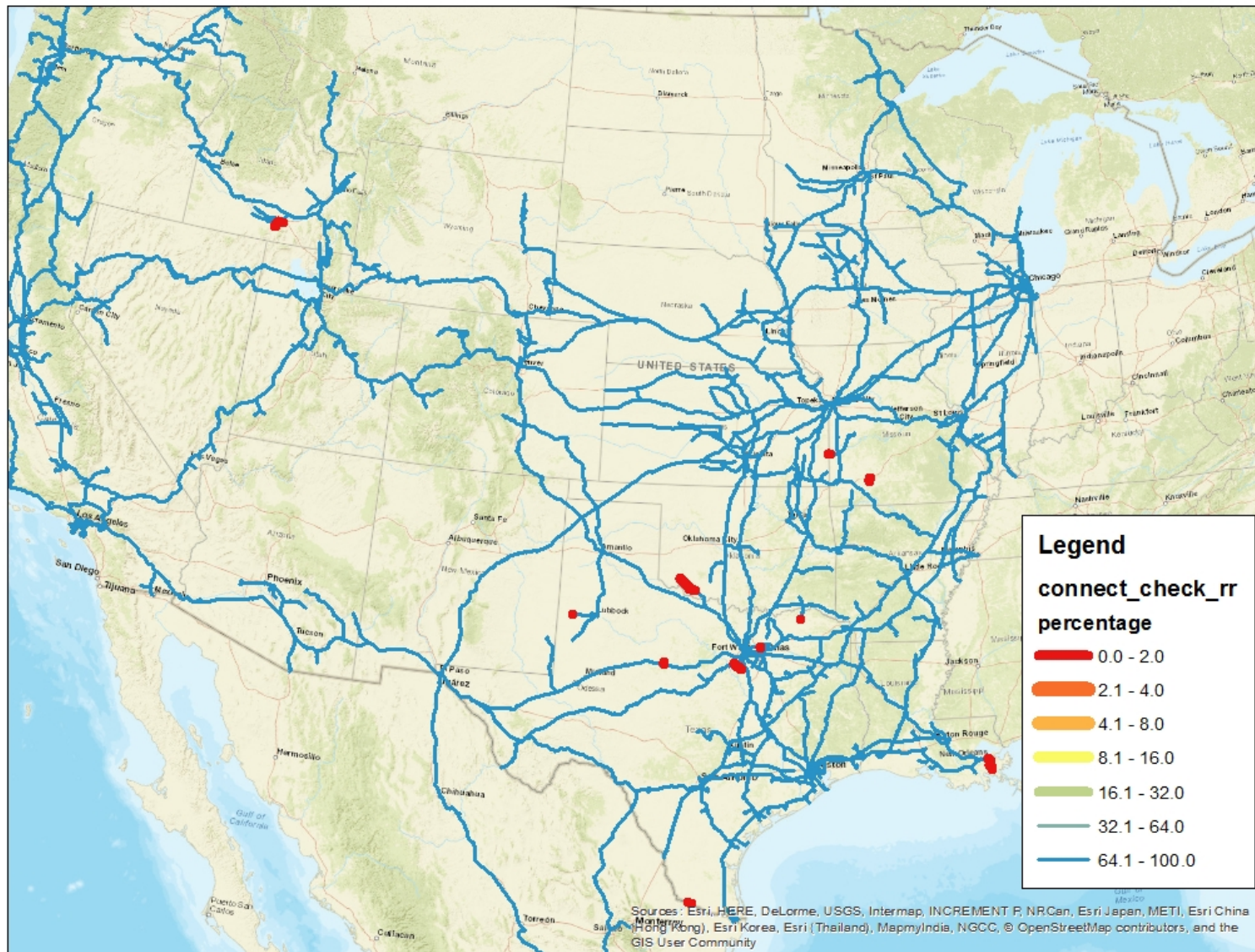


Railroad : Leg Id: 9122 Leg Use: 59
Waybill Miles : 279.2 Orig : O_FSAC :
Flowed Miles : 2645.1 Dest : D_FSAC :



● Station — Selected Route — RR Mainline — All Mainline

Examples of No Connectivity



Updates within the North American Rail Network

- ▶ 5000 updates of Records since July
 - ▶ Ownership
 - ▶ Trackage rights
 - ▶ Type of Track: Main Line, siding, etc.
- ▶ Several dozen Spatial Updates

How to get the data

- ▶ National Transportation Atlas Database (NTAD)
- ▶ FRA GIS Viewer

SEARCH WITHIN MAP

My Activity

This is a big dataset. We're generating a new visualization, check back shortly.



- + Q

Esri, HERE, DeLorme, MapmyIndia, © OpenStreetMap contributors, and the GIS user community | Acknowledgment of the Federal Railroad Administration | MAP | SATELLITE

< Railroad Lines

Open In ArcGIS Comments (0) Share

Download Dataset APLs

Details Table Charts

Description

The Railroad Network is a comprehensive database of the nation's railway system at 1:24,000 to 1:100,000 scale. The data set covers all 50 States plus the District of Columbia.

Dataset Attributes

About

Open Data

By USDOT_BTS

Updated:

Data available to the open data portal

<https://osav.usdot.opendata.arcgis.com/datasets?keyword=Rail>

FRA-GIS Applications & Requirements

Purpose & Capabilities

- FRA maintains 4 GIS web mapping applications that provide geographic information and spatial analysis for railroad and related transportation data
- RPD manages the underlying database representing the route structure of the North American railroad system
- RRS and RPD provide geo-coded data that support FRA's safety and rail development missions
- All of FRA's GIS applications allow for querying data, toggling among available visual layers, and importing custom geo-coded data layers from outside sources

4 GIS Web Applications

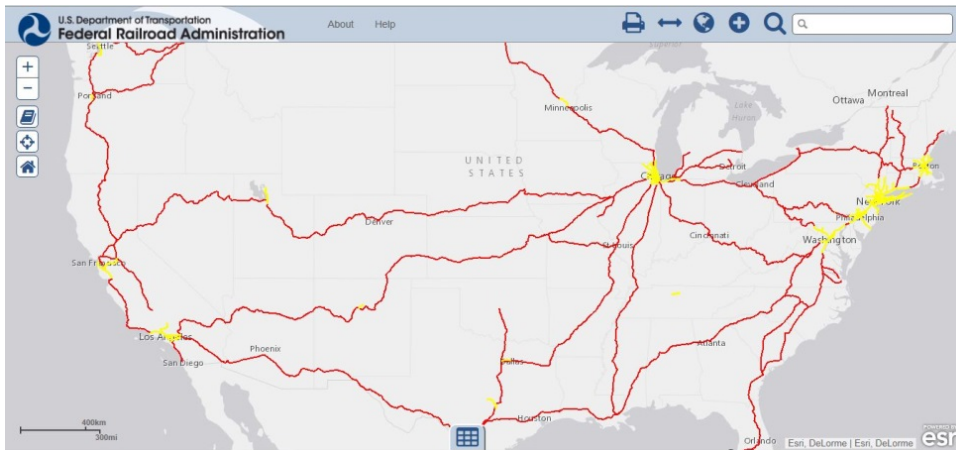
Public

1. Main Public Viewer
2. Trespassers
3. Grade Crossing Popup Viewer
4. Grade Crossing Mobile App

System Requirements

- Supported web-browsers: Internet Explorer 9 or higher, Firefox, Chrome

Main Public Viewer



Availability

- Public

Capabilities

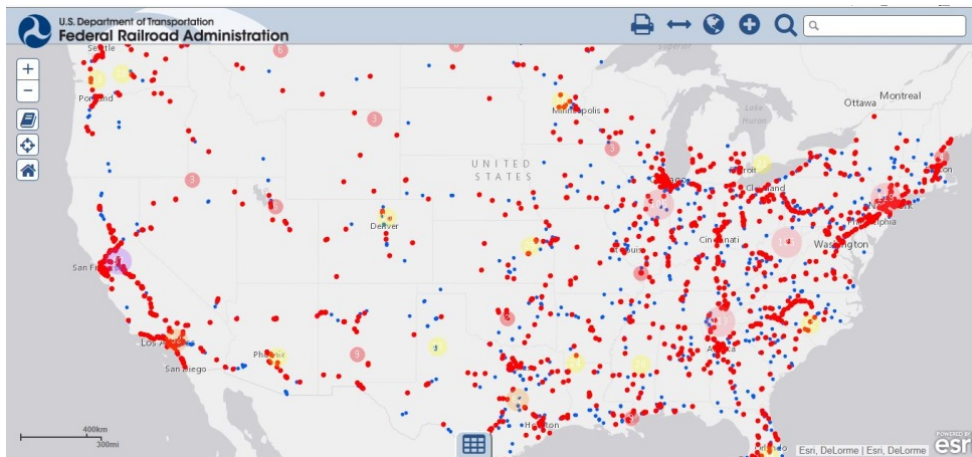
- Provides access to FRA's publicly available GIS layers

Data Considerations

- Contains Class I network, Amtrak, and commuter rail lines
- All Main line track
- Grade crossing data is updated weekly from RRS systems

<http://fragis.fra.dot.gov/GISFRASafety/>

Trespassers



Availability

- Public

Capabilities

- Displays all railroad trespasser-related injuries and fatalities dating back to June 2011
- Intended to increase education, enforcement, and engineering efforts to reduce trespassing on railroad property

Data Considerations

- Trespassers are updated as needed
- Contains Class I network
- All Main line track

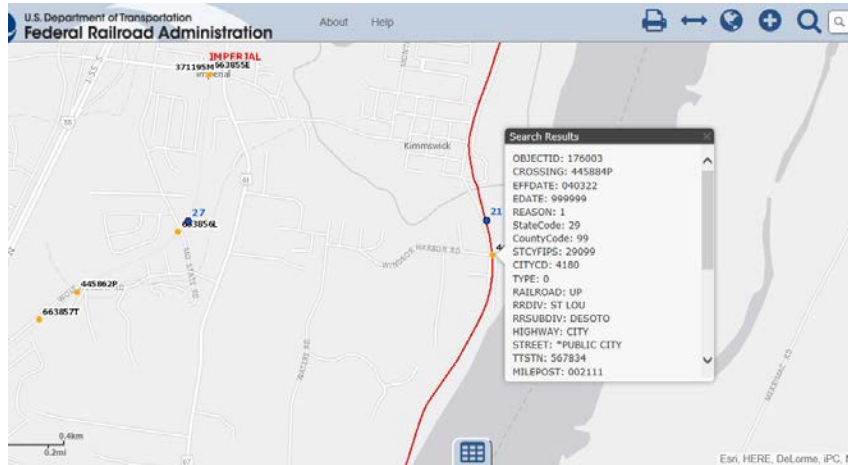
<http://fragis.fra.dot.gov/Trespassers/>

Grade Crossing Popup Viewer

button to produce the Report.

Inventory Accident Contact Sheet

Current History



<http://safetydata.fra.dot.gov/OfficeofSafety/PublicSite/Crossing/Crossing.aspx>

<http://fragis.fra.dot.gov/FRA-PopupViewer/index.html?ZoomToCrossing=294553H>

Availability

- Public


Capabilities

- Links from FRA's public Office of Safety Analysis website to provide visual / geographic views of grade crossings
- Viewer provides links to FRA grade crossing inventory and accident reports

Data Considerations

- Contains Class I network, Amtrak, and commuter rail lines
- All Main line track
- Grade crossing data is updated weekly from RRS systems

Popup Viewer

 Federal Railroad Administration
Office of Safety Analysis

Home Crossing Forms/Publications Downloads Data Documents Policies Support

5.02 - Generate Crossing Inventory and Accident Reports

Please click on one of the links below or enter a crossing number, pick the report type and click on the **Generate Report** button to produce the Report.

Report Type: Inventory Accident Contact Sheet

Crossing#:

Inventory: Current History

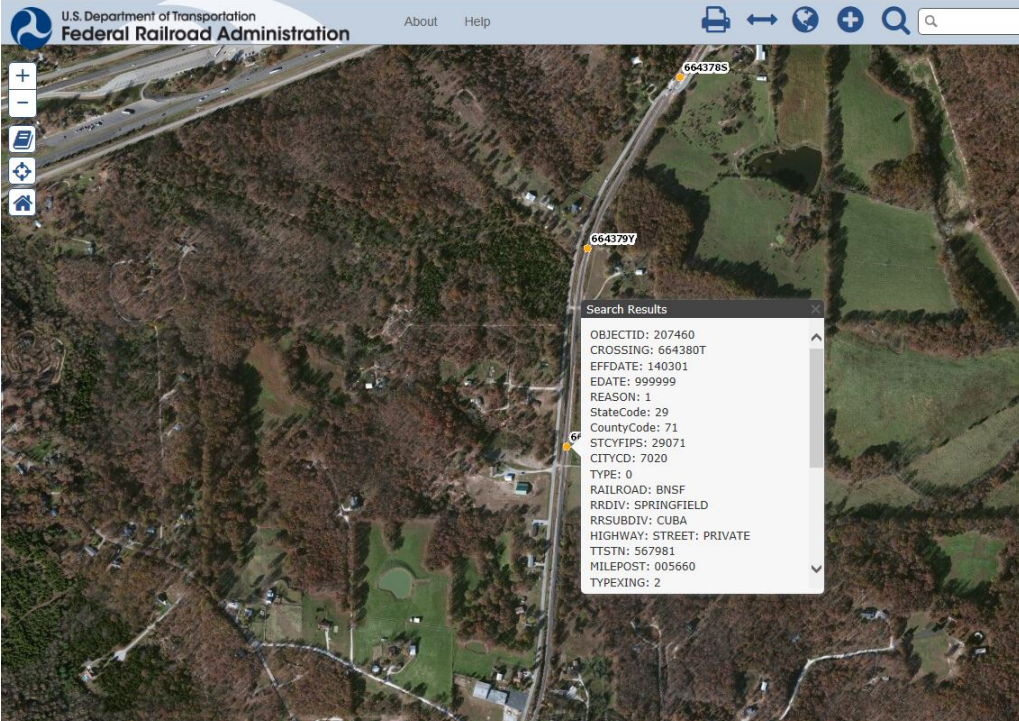
Additional Links

[Query by Location \ Railroad](#)
[Query by Crossing](#)
[Accident Prediction \(WBAPS\)](#)
[Crossing Inventory Data File Reconciliation \(CIR\)](#)
[DOT Crossing Inventory Information](#)
[Crossing Data help](#)
[Maps](#)
[Notice](#)
[Using this Site](#)

Crossing Inventory File (hard-copy submissions) as of: 4/30/2012
Crossing Inventory File (electronic submissions) as of: 2/29/2012
Accident file as of: 3/31/2012

U.S. Department of Transportation
Federal Railroad Administration

About Help



Search Results

OBJECTID:	207460
CROSSING:	664380T
EFFDATE:	140301
EDATE:	999999
REASON:	1
StateCode:	29
CountyCode:	71
STCYFIPS:	29071
CITYCD:	7020
TYPE:	0
RAILROAD:	BNSF
RRDIV:	SPRINGFIELD
RRSUBDIV:	CUBA
HIGHWAY:	STREET: PRIVATE
TTSTN:	567981
MILEPOST:	005660
TYPEXING:	2

Rail Crossing Locator mobile app - Overview

- ▶ **Android** and **Apple** devices
- ▶ **Locate** crossings, **view** FRA Safety data and reports, **contact** FRA, and **report emergencies** via ENS
- ▶ **Empowers public**, (including transportation, emergency, and safety organizations) to **join FRA's** effort to further **improve grade crossing safety**
- ▶ **ESRI Mobile SDK**



Next Steps

- ▶ Keeping the Network Updated
- ▶ Short lines
 - ▶ Developing a Strategic Plan for incorporating the short lines
- ▶ Validating Routes
- ▶ Routes by Commodity
- ▶ Change Management with the Railroads

2017

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Meeting

Thank you!

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