

State Rail Safety Managers Meeting

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10/21/15



FRA – Office of Railroad Policy and Development

11/4/2015

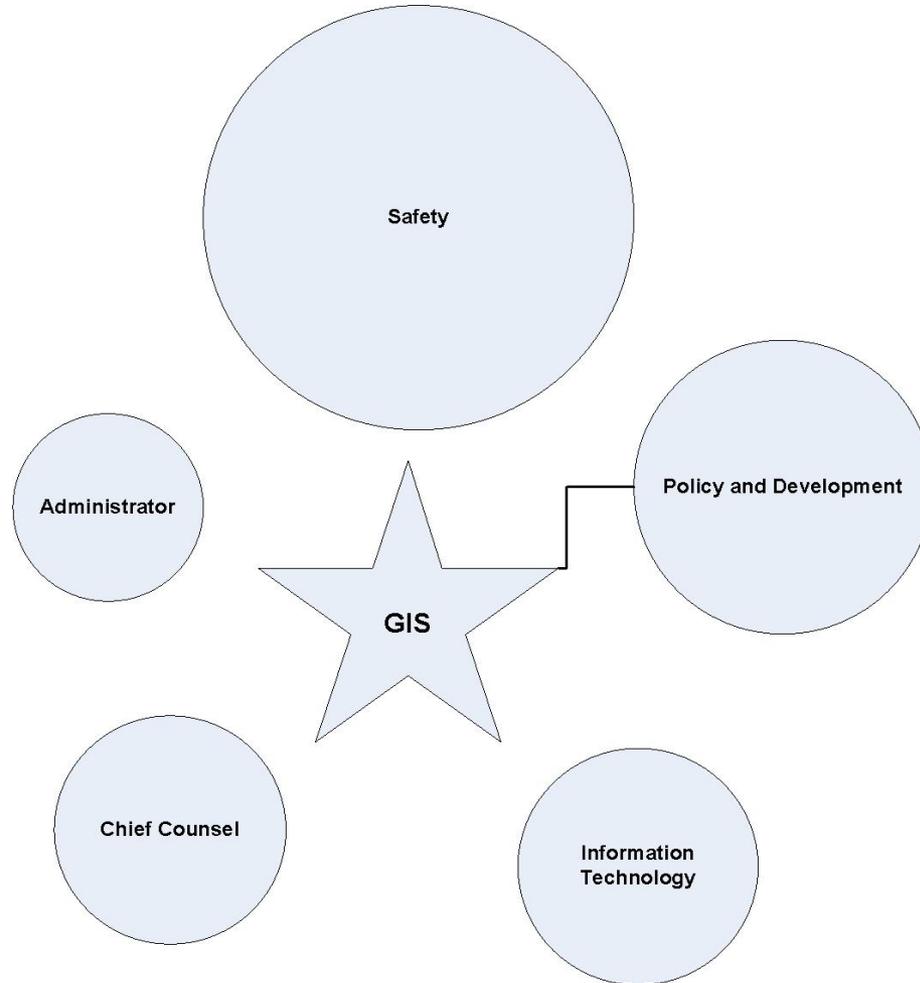


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**Federal Railroad
Administration**

Overview

- GIS Program
- GIS Applications
- GIS Data
- Demo of the Viewer
- Requirements

FRA's GIS Program



FRA's GIS Program

- GIS – Geographical Information Systems
 - GIS Data
 - GIS Applications
 - GIS Analysis



FRA's GIS Data Overview

- Primary
 - Rail network
 - Milepost
 - Freight Stations
 - Highway-rail grade crossings
 - Amtrak passenger stations
- Secondary
 - Yards
 - Subdivisions
 - Accidents
 - FRA Inspections
 - Designated Quiet Zones
 - Bridges
 - Etc.





FRA-GIS Applications & Requirements

Purpose & Capabilities

- FRA maintains eight 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

8 GIS Web Applications

Public

1. Main Public Viewer
2. Trespassers
3. Grade Crossing Popup Viewer
4. Multimodal Freight Network

Internal FRA

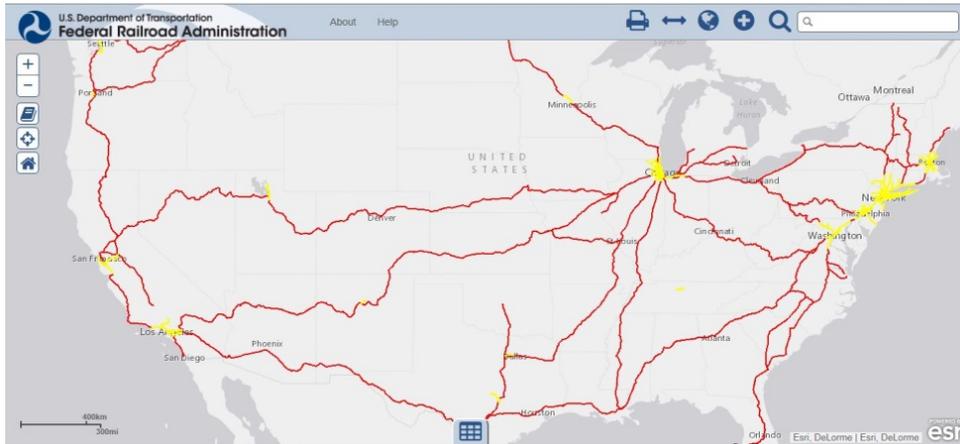
5. Inspection Dashboard
 6. Unsafe Motorist
- * 2 others for internal analysis

System Requirements

- Supported web-browsers: Internet Explorer 9 or higher, Firefox, Chrome
- Internal FRA applications require user be connected to FRA network (in office, VPN, VDI)



Main Public Viewer



Availability

- Public

Capabilities

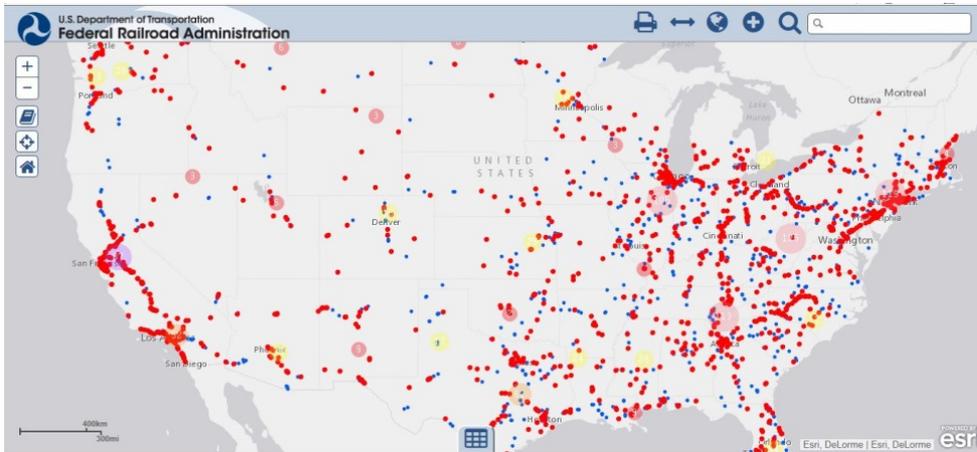
- Provides access to FRA's publicly available GIS layers

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

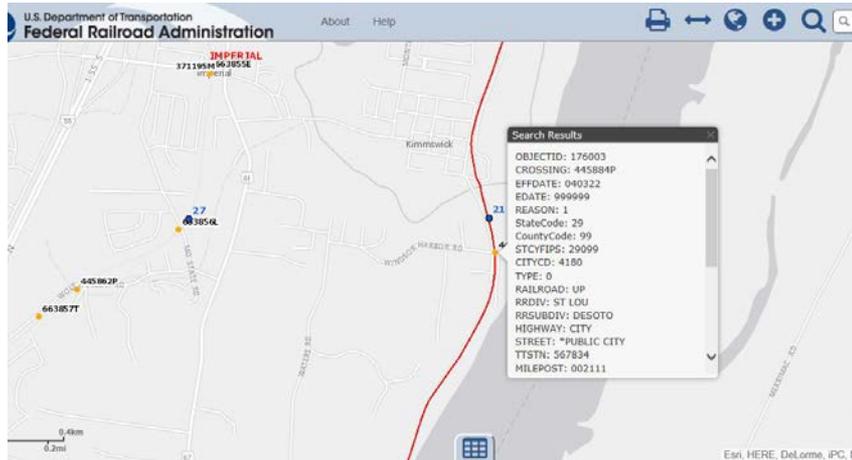
button to produce the Report.

Inventory
 Accident
 Contact Sheet

445884P

Current
 History

Generate Report Generate Map



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

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

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



Multimodal Freight Network

Availability

- Public

Capabilities

- U.S. DOT is also proposing a draft Multimodal Freight Network (MFN)
- GROW American Act

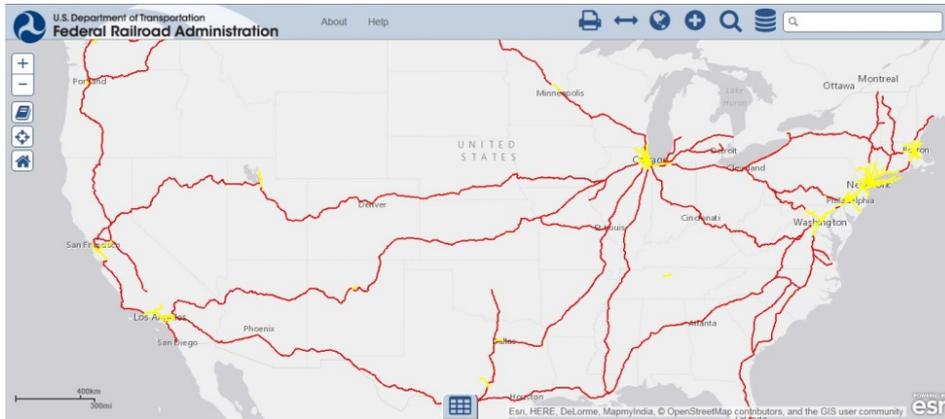
Data Considerations

- MFN Marine
 - MFN Ports
 - MFN Marine Highways
- MFN Border Crossings
- MFN Highways
- MFN Airports
- MFN Rail
 - MFN Rail Connectors
 - MFN Rail



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

Inspection Dashboard



Availability

- Internal FRA

Capabilities

- Provides geographic view for all Track Reports and Defects (with coordinates), Accidents, and ATIP exceptions

Data Considerations

- Track Reports and Defects are updated weekly, but the devices in the field will need to be replaced
- Accidents will be automated by September
- ATIP is processed quarterly

<https://safetydata.fra.dot.gov/SecureSite/default.aspx>

5.09 – GIS Inspection Dashboard

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Unsafe Motorist

Availability

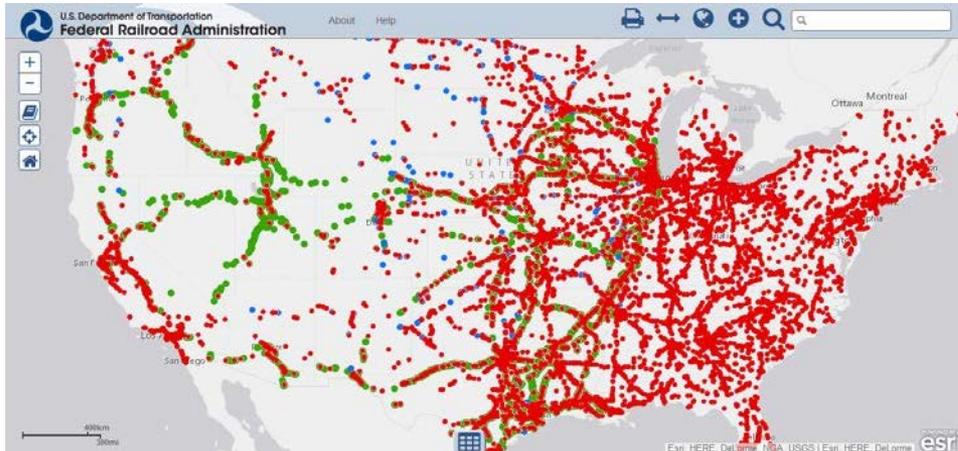
- Internal FRA

Capabilities

- Displays data from UP and BNSF Unsafe Motorist (reports came from train crews reporting of vehicles or pedestrians not obeying the crossing signs)
- Displays all grade crossing accidents

Data Considerations

- Contains Class I network, Amtrak, and commuter rail lines
- All Main line track
- Grade crossing data is updated weekly from RRS systems
- Passenger Rail
- Unsafe Motorist: BNSF & UP
- Mileposts
- STRACNET
- Accidents @ Crossings (Form 57)

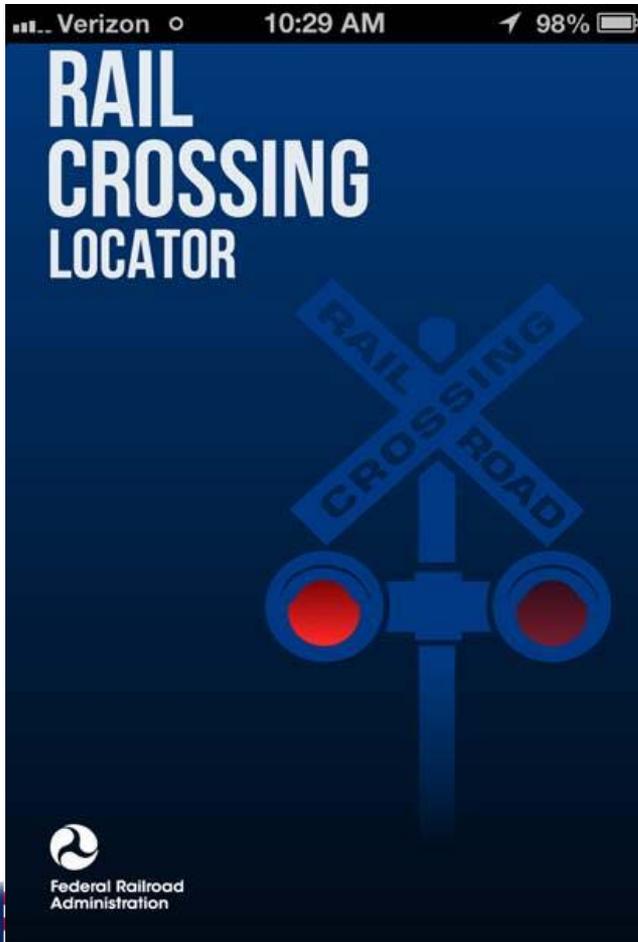


<http://fragis-dev/UnsafeMotorist/>

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FRA's Rail Crossing Locator App



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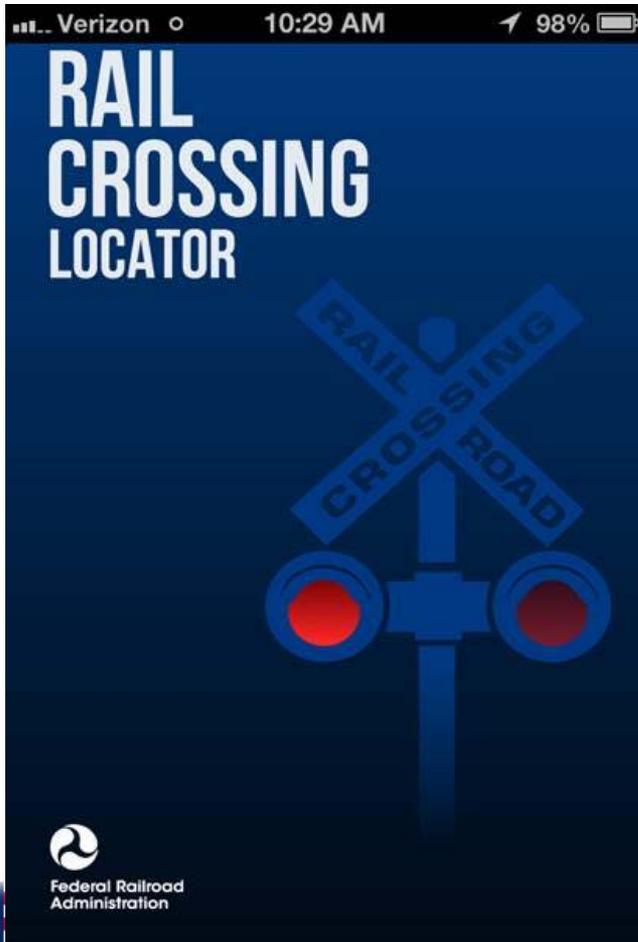
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Federal Railroad Administration

FRA's Rail Crossing Locator App

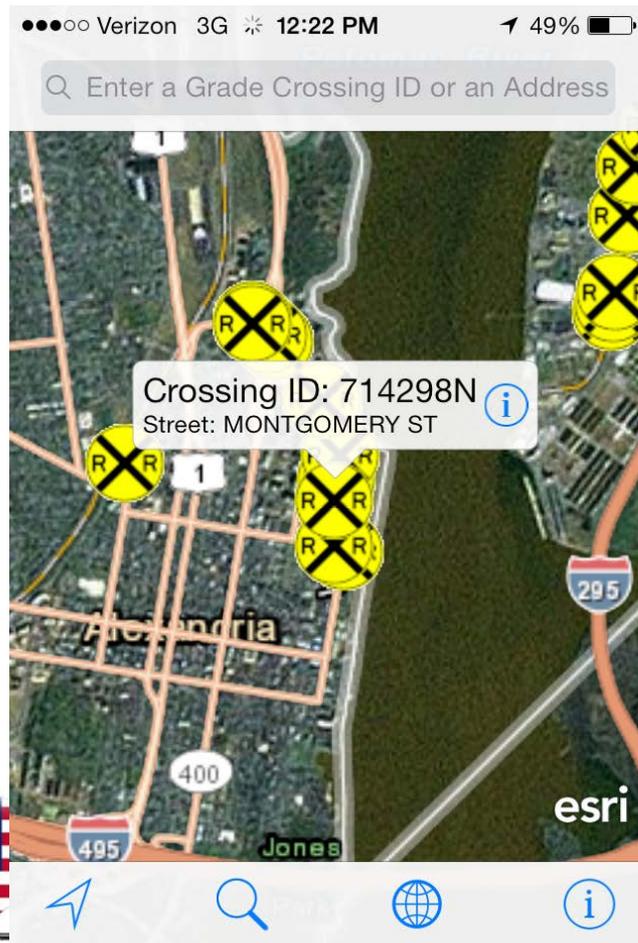


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View Inspection reports, accident records, query data, and view the ENS number



Viewer Demo



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Interface



Tools

- **Default Extent:** Zoom back to the original extent of the map
- **Zoom to Coordinates:** User can put in a latitude and longitude and the map will center on this location
- **Zoom to Region, State, or County:** User can select a FRA region, a State, or a County and the map will zoom to this area
- **Zoom In/Out:** Allow the user to zoom in or out of the map. Note: the user can use their mouse to zoom in or out.
- **Print:** The user can print out the map as a PDF or JPEG and can select to have it landscape, portfolio, or map only.
- **Measure Tool:** The user has the ability to measure an area, measure the length, or determine the coordinates on the map. The user will have the options to toggle between different metrics. FRA GIS Web Map Page 3
- **Map Content:** The user will be able to view the legend, turn on or off layers, and toggle between the basemaps.
- **Add Data:** The user will have the option to search for layers to add to the map, add mapping services, or add their data to the map.
- **Select Content:** The user can query the data based on their attributes or be able to select the data on the map. These queries will display the data at the bottom of the map.
- **Search Locations:** The user can search for specific locations and the map will zoom to that area on the map.

Map Content

- Legend
- Layers
- Basemaps



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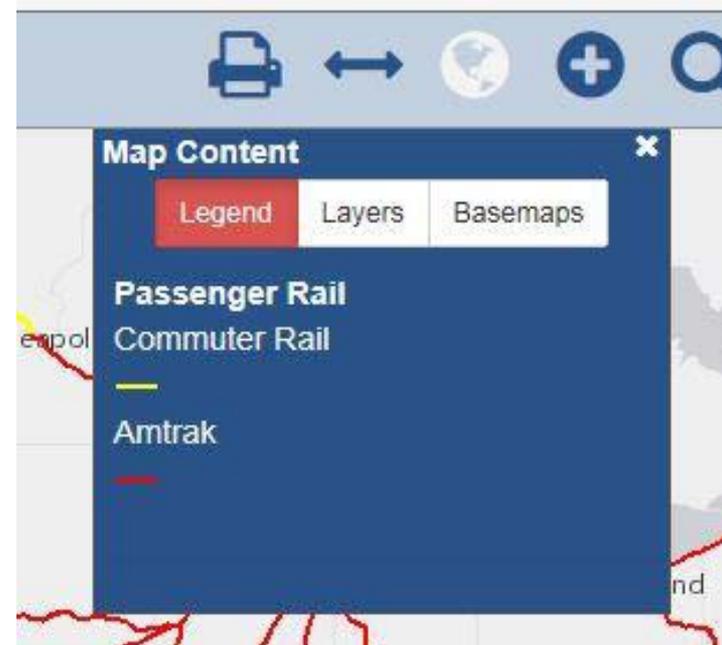
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Legend

- The legend is dynamic, so it will only show the layers that are currently turned on and visible within the map.



Layers

- The user can turn on and off the layers.
- Please note:
 - Some of the layers have sub-layers
 - Some layers will not be visible until the user zooms into the map
 - The user has a tool symbol aligned to the right to allow the user to change the transparency or move the layers up or down.



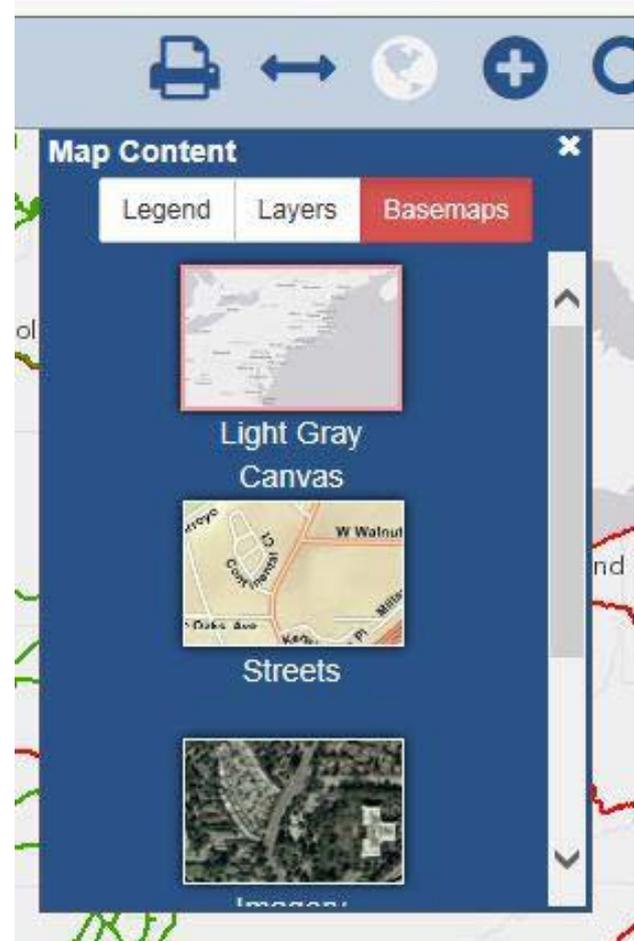
Data Available – Main Viewer

- Passenger Rail
 - Amtrak Rail Stations
 - Commuter
 - Amtrak
 - All Passenger Rail
- Class 1s
 - BNSF
 - UP
 - CN
 - CPRS
 - KCS
 - CSXT
 - NS
- Main Line Rail
- STRACNET
- Freight Stations
- Mileposts
- Grade Crossings

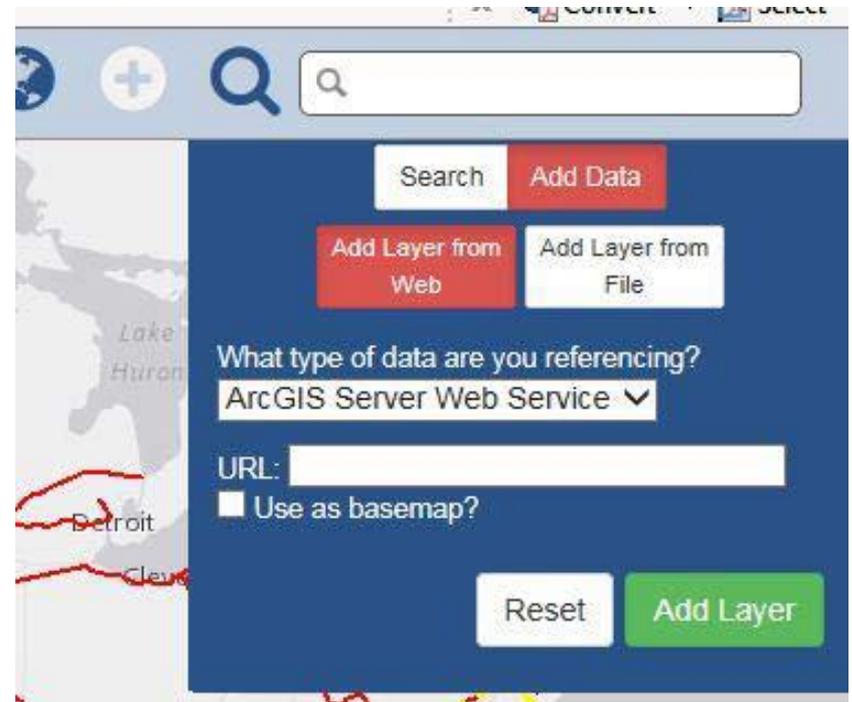
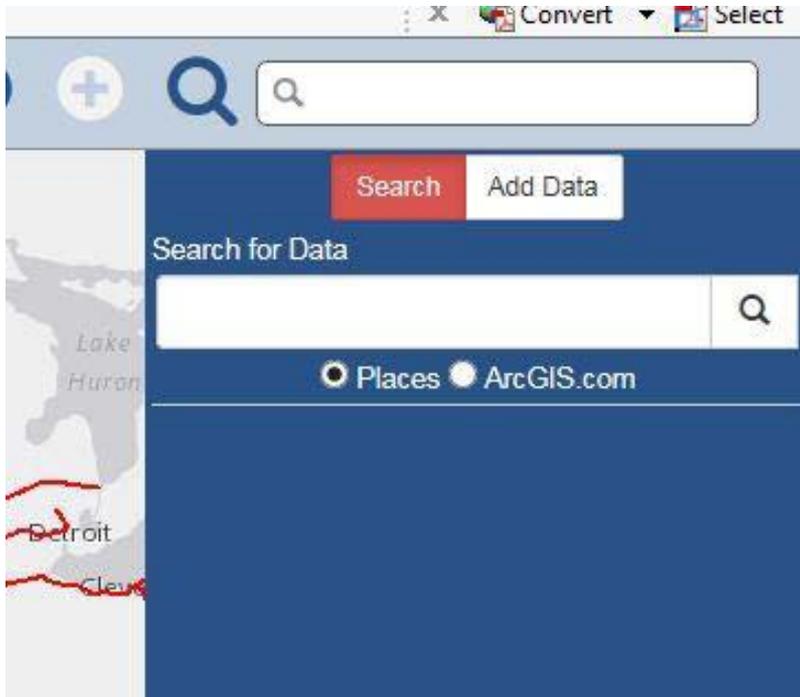


Basemaps

- The user can toggle between the basemaps, which are reference layers that are standard geographic maps.

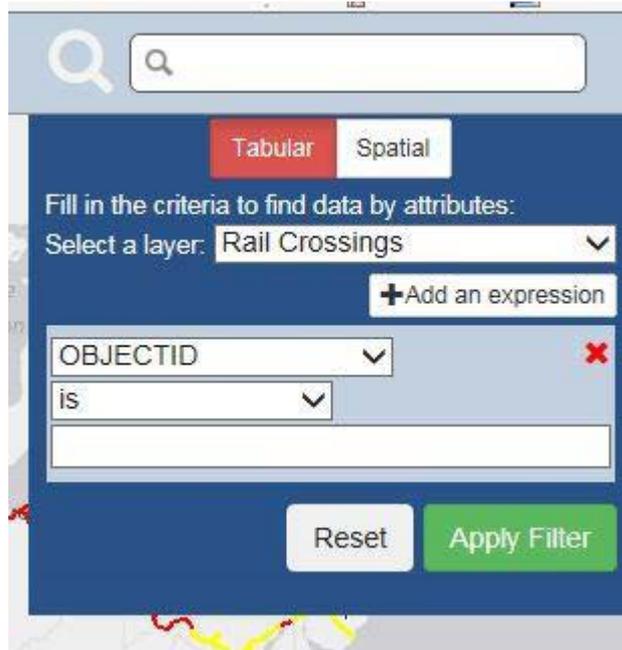


Add Data

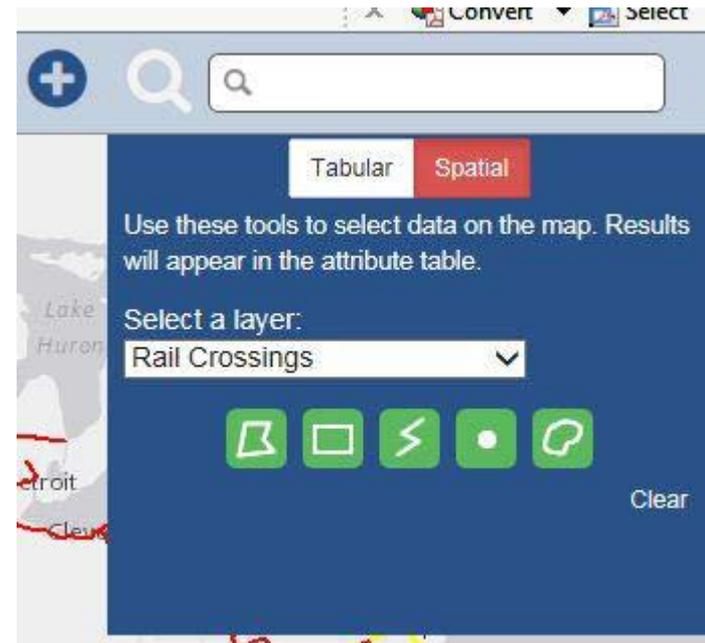


Selecting Data

Users can select a specific layer and query specific attributes of that layer. The user also has the ability to add additional queries for more specific information.



Users can select a specific layer and use spatial tools to select the map display.



Working with Layers

- Once the user queries the data or selects the data, the data table will display on the bottom of the map. The user will have the ability to create multiple queries

The screenshot displays the U.S. Department of Transportation Federal Railroad Administration web application. The main interface features a map of the United States with rail lines and crossings highlighted in green and red. A search and query panel on the right side allows users to filter data by attributes. The panel includes a search bar, a dropdown menu for 'Rail Crossings', and a query builder with a dropdown for 'RAILROAD' and a text input field containing 'is AA'. Below the query panel are 'Reset' and 'Apply Filter' buttons. At the bottom of the map, a data table titled 'Rail Crossings 1' is displayed, showing a list of rail crossing records with columns for OBJECTID, CROSSING, EFFDATE, EDATE, REASON, StateCode, and CountyCode.

OBJECTID	CROSSING	EFFDATE	EDATE	REASON	StateCode	CountyCode
177209	000116B	880103	999999	1	26	115
177210	000117H	000325	999999	1	26	115
177212	000131D	000325	999999	1	26	115
177213	000137U	000325	999999	1	26	115
177214	000141J	000325	999999	1	26	115

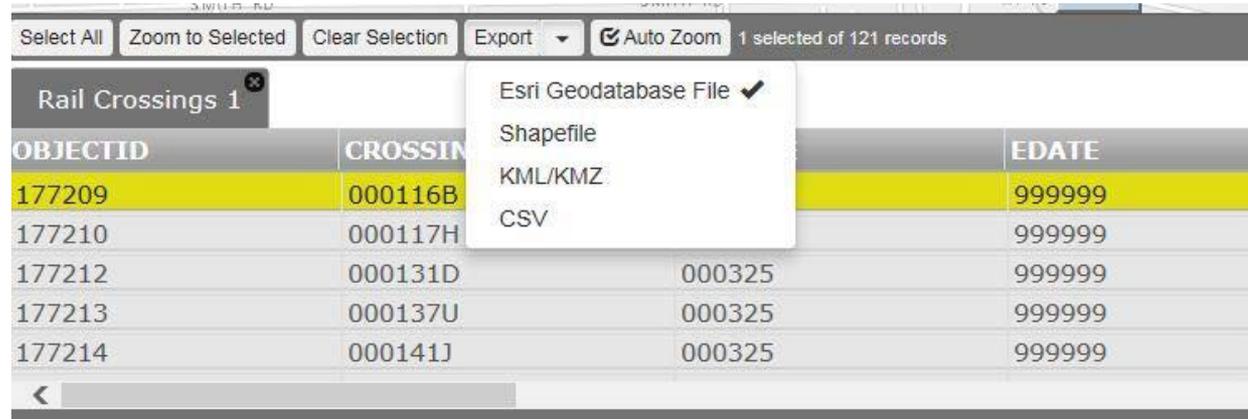
Options with the Data

- The user has several options to work with the data.
 - Select All
 - Zoom to Selected
 - Clear Selection
 - Export
 - Auto Zoom

OBJECTID	CROSSING	EFFDATE	EDATE	REASON	StateCode	CountyCode
177209	000116B	880103	999999	1	26	115
177210	000117H	000325	999999	1	26	115
177212	000131D	000325	999999	1	26	115
177213	000137U	000325	999999	1	26	115
177214	000141J	000325	999999	1	26	115

Exporting Data

- The user has the option to export the data as a Geodatabase, a Shapefile, a KML/KMZ, or as a CSV.
- *Please note that the Freight Stations and the Mileposts are not downloadable for copyright reasons.*



The screenshot shows a software interface with a table of rail crossings. The table has columns for OBJECTID, CROSSING, and EDATE. The first row is highlighted in yellow. An 'Export' menu is open, showing options: Esri Geodatabase File (checked), Shapefile, KML/KMZ, and CSV. The interface also includes buttons for 'Select All', 'Zoom to Selected', 'Clear Selection', and 'Auto Zoom'. A status bar indicates '1 selected of 121 records'.

OBJECTID	CROSSING	EDATE	
177209	000116B	999999	
177210	000117H	999999	
177212	000131D	000325	999999
177213	000137U	000325	999999
177214	000141J	000325	999999

Requirements

- Headquarters
- Regional Inspectors
- Public

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