Grade Crossing Project Planning Tools

August 9, 2018

U.S. Department of Transportation
Federal Railroad Administration

FRA's Approach to Grade Crossing Safety

2018 Rail Program Delivery Webinar Series
Grade Crossing Project Planning Tools

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Our Focus

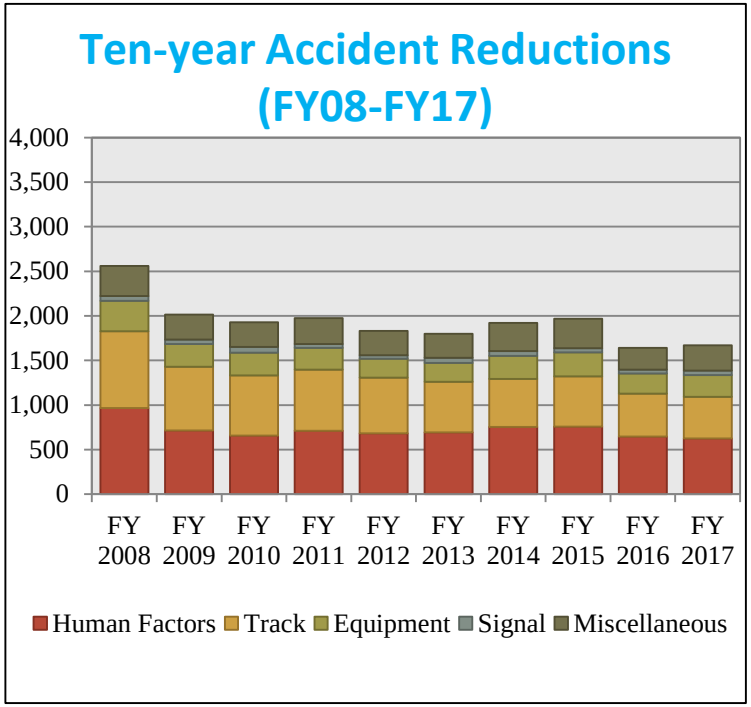
- **The mission of the Federal Railroad Administration (FRA)** is to enable the safe, reliable, and efficient movement of people and goods for a strong America, now and in the future.
  - Safety is our number one priority
  - We are laying a foundation for higher performing rail
  - Promulgating and enforcing rail safety regulations
  - Investing in America's rail corridors
  - Facilitating and conducting research and technology development
- **Vision: RAIL –** *Moving America Forward*

Safety is our number one priority

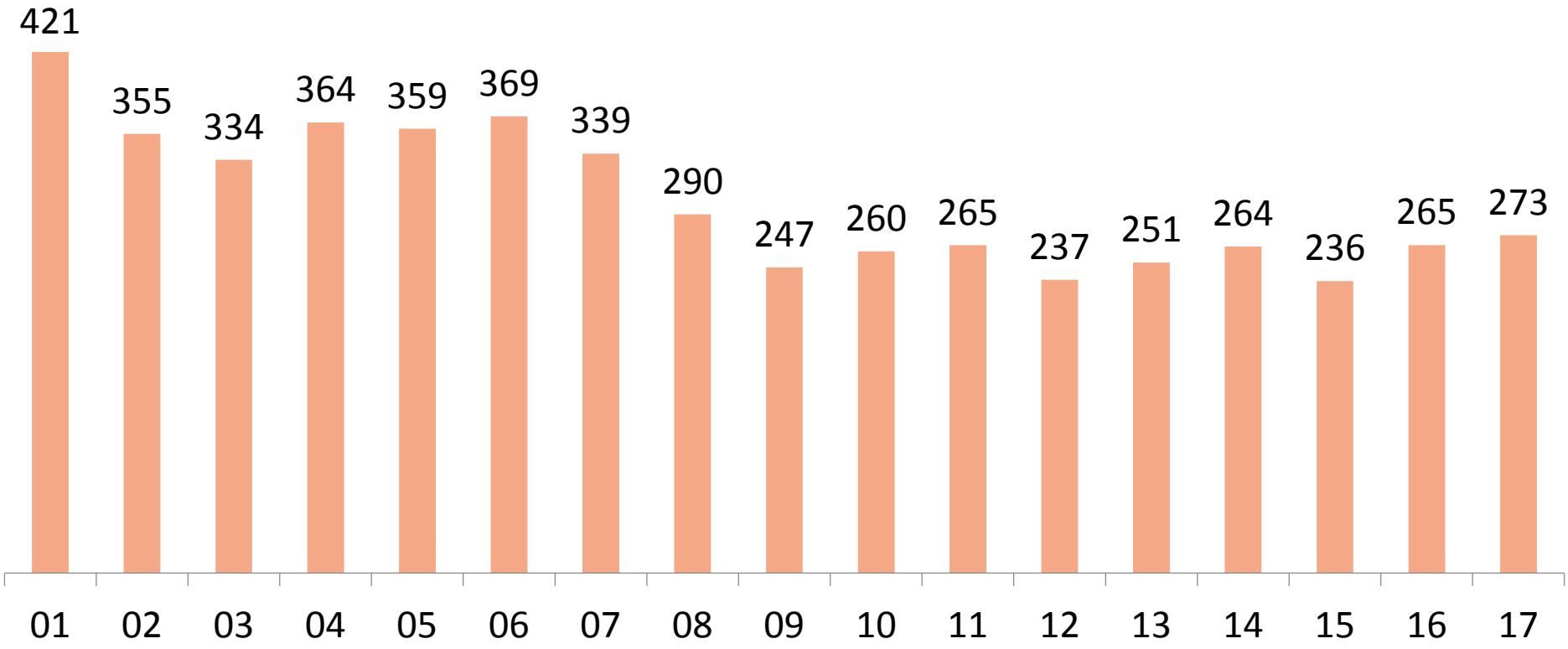
Rail Has Never Been Safer

Every regulation and enforcement action we issue is based on facts and sound research.

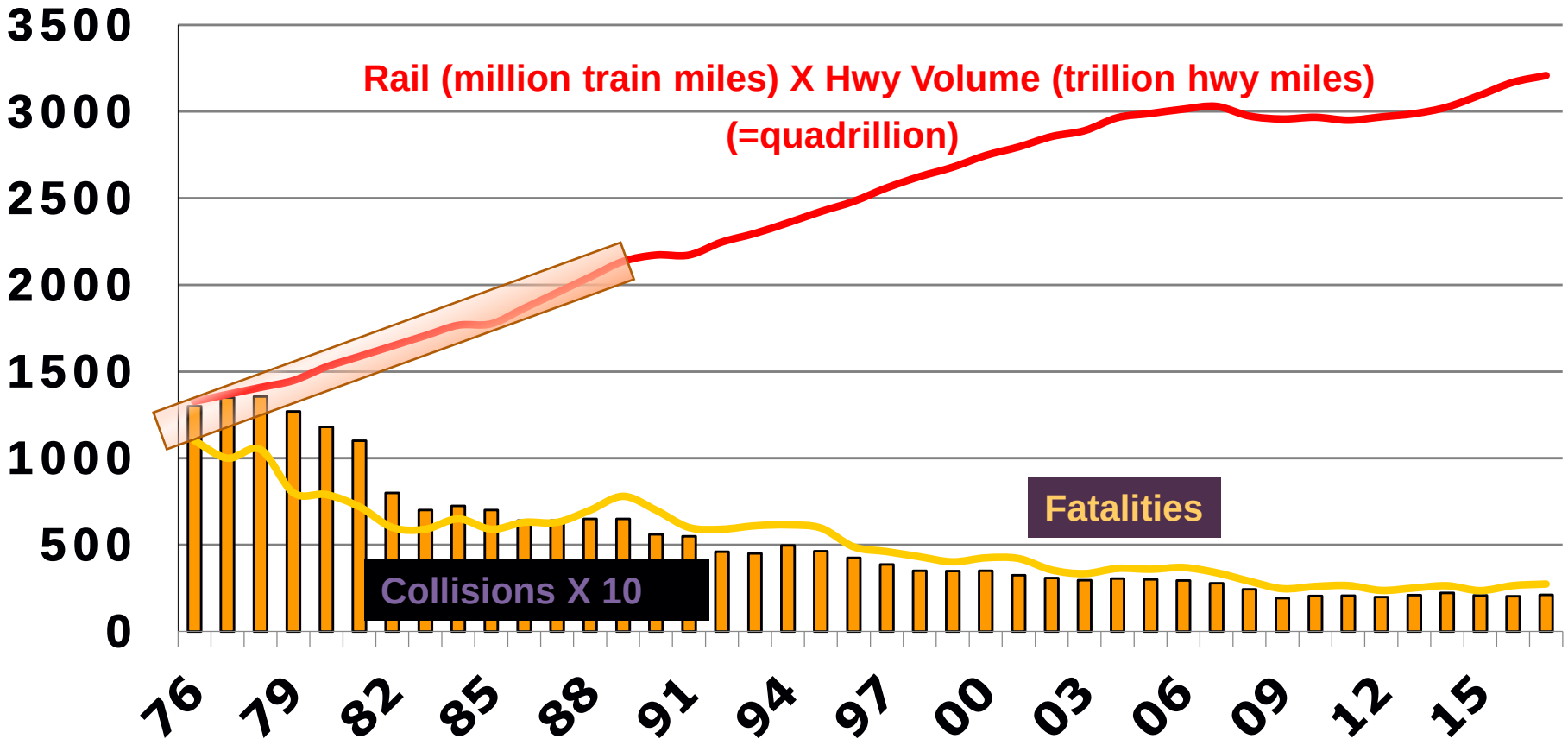
- Over the past decade, train accidents have declined 41 percent
- Highway-rail grade crossing accidents are down 24 percent
- And employee fatalities have been reduced by 50 percent



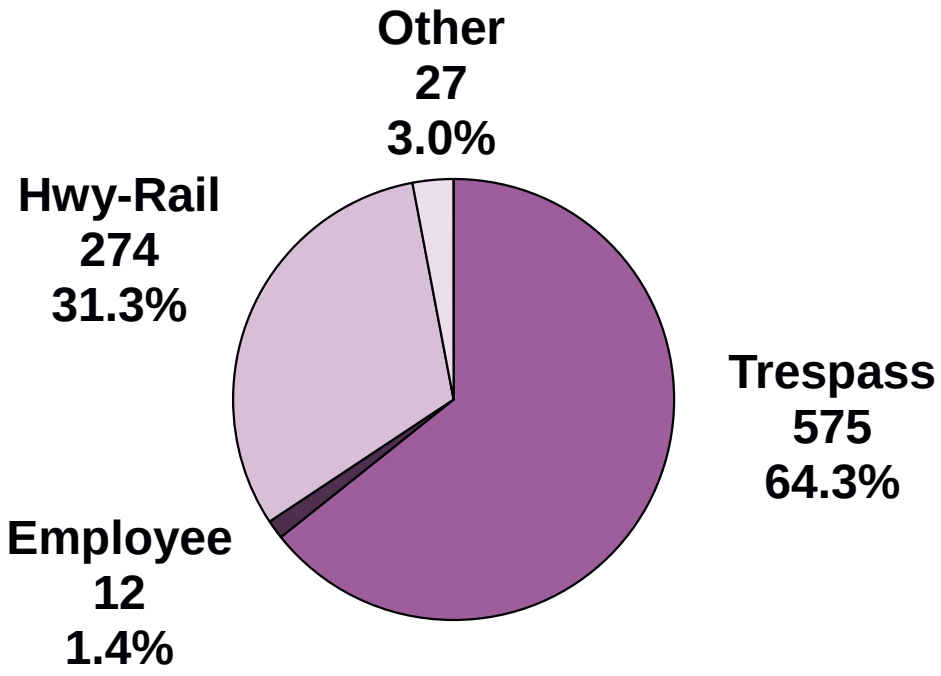
Trends in Fatalities At Grade Crossings, 2000 - 2017



Collisions, Fatalities, and Exposure (1976-2017)



871* Rail-Related Fatalities in 2017



*** Does not include 209 suicide fatalities**

Crossing Collisions 2016 vs. 2017

	2016	2017	% Change
Collisions	2,042	2,106	+ 3.1%
Fatalities	255	273	+ 7.1%
Injuries	845	813	- 3.8%

*** Does not include 209 suicide fatalities**

Number of Crossings
As of March 2017

Crossing Type	How Many	% of Total
Total	249,947	100.0
Public at grade	127,789	51.2
Private at grade	79,084	31.7
Pedestrian at grade	2,927	1.2
Grade Separated (all)	39,672	15.9

Where Collisions Occur 2012 - 2017 (Public GX)

Device	# Collisions	% Collisions	% Xings (2016)
Gates	5811	52.5%	36.9%
Lights	1484	13.9%	14.2%
STOP	1197	10.8%	9.0%
Crossbucks	2174	19.7%	34.8%
Other	351	3.1%	5.2%

Type of Hwy Users in GX Collisions

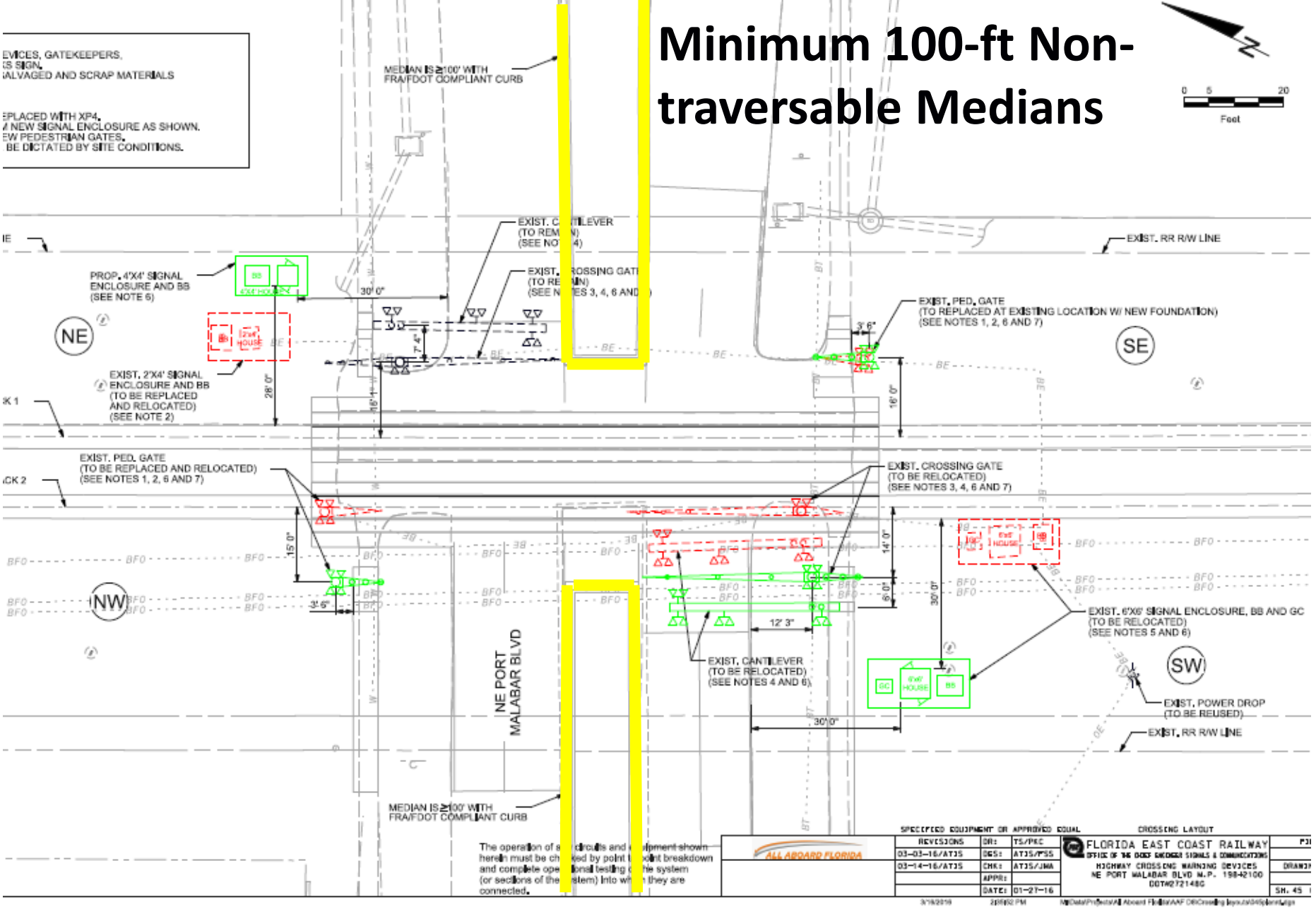
Vehicle Type	2015	2016	2017
Auto	919	901	963
Truck-trailer	326	324	388
Truck	409	370	357
Pedestrian	151	176	172
Other motor vehicle	132	141	155
Van	71	49	63
Other	63	59	49
Bus	4	3	6

Close As Many Grade Crossings As Possible

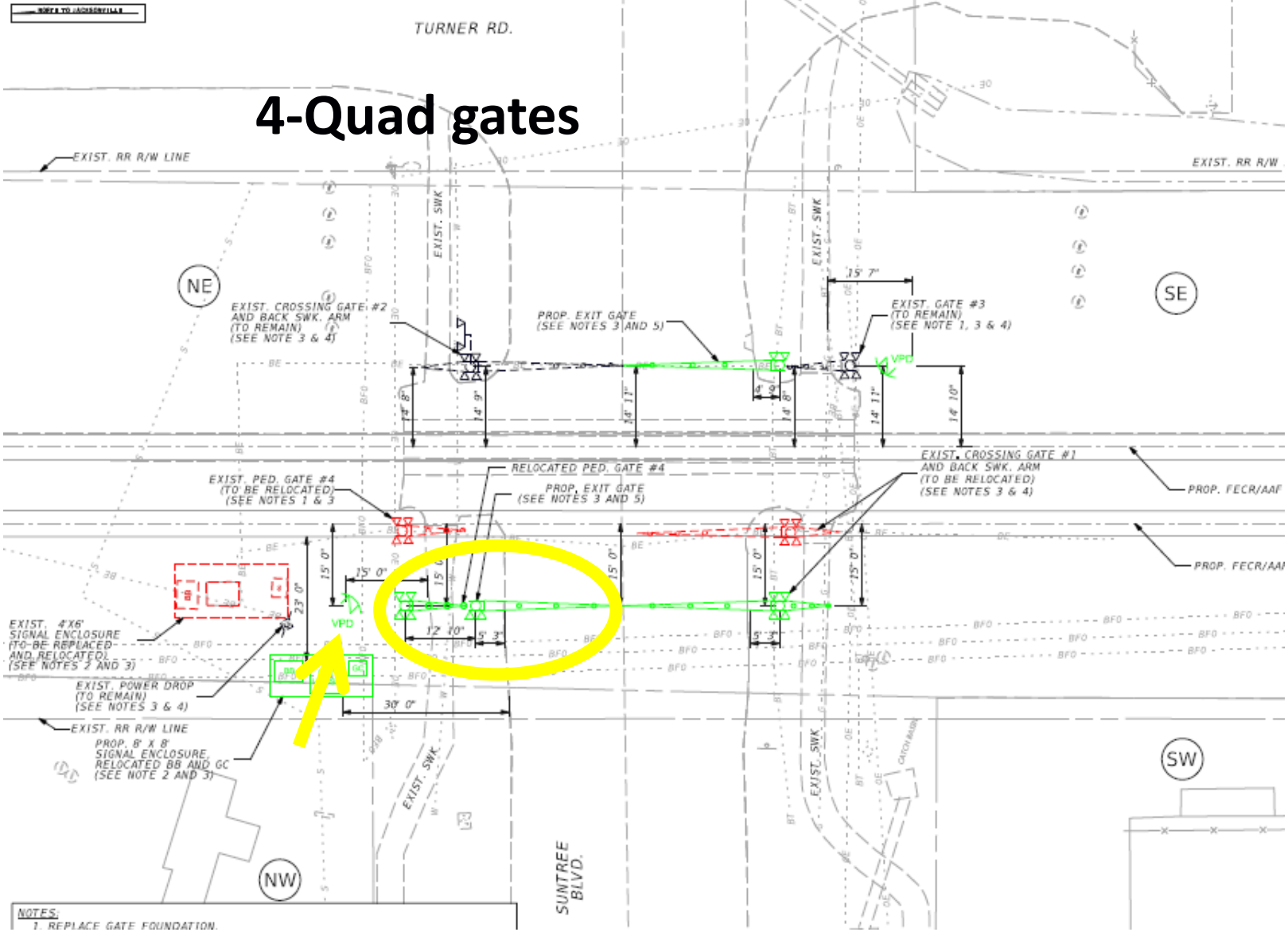
What does the FRA look for in crossing design??

- Non-traversable Medians
- 3 or 4 Quadrant Gates
- Gate orientation
- Cantilevers
- Preemption (Advanced or Simultaneous)
- Technologies (VPD, RHM)

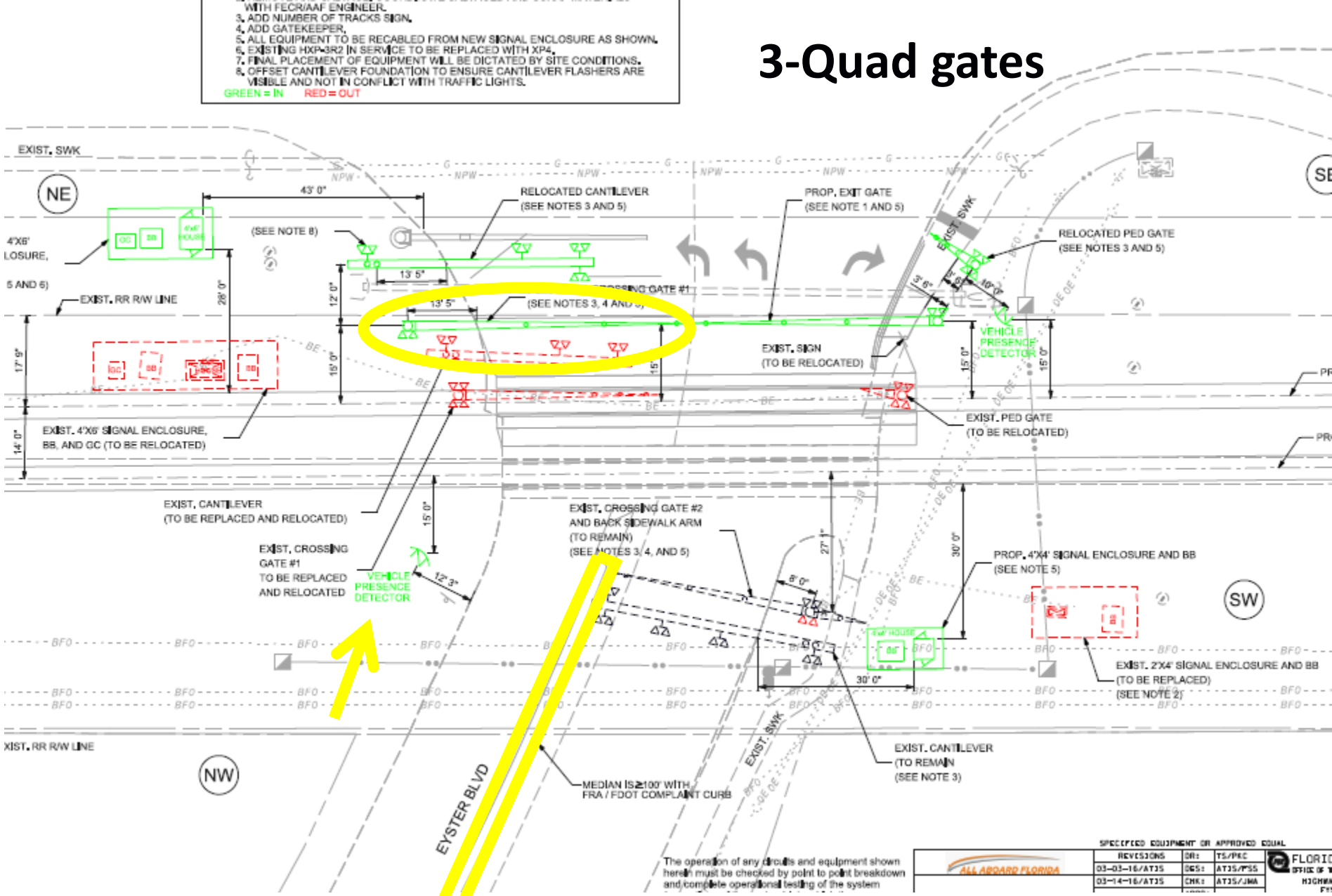
Minimum 100-ft Non-traversable Medians



4-Quad gates


TURNER RD.
EXIST. RR R/W LINE
EXIST. RR R/W
NE
SE
SW
NW
EXIST. CROSSING GATE #2 AND BACK SWK. ARM (TO REMAIN) (SEE NOTE 3 & 4)
PROP. EXIT GATE (SEE NOTES 3 AND 5)
EXIST. GATE #3 (TO REMAIN) (SEE NOTE 1, 3 & 4)
EXIST. SWK.
VPD
EXIST. PED. GATE #4 (TO BE RELOCATED) (SEE NOTES 1 & 3
RELOCATED PED. GATE #4
PROP. EXIT GATE (SEE NOTES 3 AND 5)
EXIST. CROSSING GATE #1 AND BACK SWK. ARM (TO BE RELOCATED) (SEE NOTES 3 & 4)
PROP. FECR/AAF
EXIST. 4'X6' SIGNAL ENCLOSURE (TO BE REPLACED AND RELOCATED) (SEE NOTES 2 AND 3)
EXIST. POWER DROP (TO REMAIN) (SEE NOTES 3 & 4)
PROP. 8' X 8' SIGNAL ENCLOSURE, RELOCATED BB AND GC (SEE NOTE 2 AND 3)
SUNTREE BLVD.
NOTES:
1. REPLACE GATE FOUNDATION.

3-Quad gates


WITH FECR/AAF ENGINEER.
3. ADD NUMBER OF TRACKS SIGN.
4. ADD GATEKEEPER.
5. ALL EQUIPMENT TO BE RECABLED FROM NEW SIGNAL ENCLOSURE AS SHOWN.
6. EXISTING HXP-3R2 IN SERVICE TO BE REPLACED WITH XP4.
7. FINAL PLACEMENT OF EQUIPMENT WILL BE DICTATED BY SITE CONDITIONS.
8. OFFSET CANTILEVER FOUNDATION TO ENSURE CANTILEVER FLASHERS ARE VISIBLE AND NOT IN CONFLICT WITH TRAFFIC LIGHTS.
GREEN = IN RED = OUT
EXIST. SWK
NE
43' 0"
RELOCATED CANTILEVER
(SEE NOTES 3 AND 5)
PROP. EXIT GATE
(SEE NOTE 1 AND 5)
(SEE NOTE 8)
RELOCATED PED GATE
(SEE NOTES 3 AND 5)
EXIST. RR R/W LINE
EXIST. SIGN
(TO BE RELOCATED)
VEHICLE PRESENCE DETECTOR
EXIST. 4'X6' SIGNAL ENCLOSURE, BB, AND GC (TO BE RELOCATED)
EXIST. PED GATE
(TO BE RELOCATED)
EXIST. CANTILEVER
(TO BE REPLACED AND RELOCATED)
EXIST. CROSSING GATE #2
AND BACK SIDEWALK ARM
(TO REMAIN)
(SEE NOTES 3, 4, AND 5)
EXIST. CROSSING GATE #1
TO BE REPLACED AND RELOCATED
VEHICLE PRESENCE DETECTOR
PROP. 4'X4' SIGNAL ENCLOSURE AND BB
(SEE NOTE 5)
SW
EXIST. 2'X4' SIGNAL ENCLOSURE AND BB
(TO BE REPLACED)
(SEE NOTE 2)
EXIST. CANTILEVER
(TO REMAIN
(SEE NOTE 3)
EXIST. SWK
EYSTER BLVD
MEDIAN IS ≥100' WITH FRA / FDOT COMPLAINT CURB
NW
The operation of any circuits and equipment shown hereon must be checked by point to point breakdown and complete operational testing of the system
SPECIFIED EQUIPMENT OR APPROVED EQUAL
ALL ABOARD FLORIDA
REVISIONS
03-03-16/AT3S
03-14-16/AT3S

Pedestrian Treatments

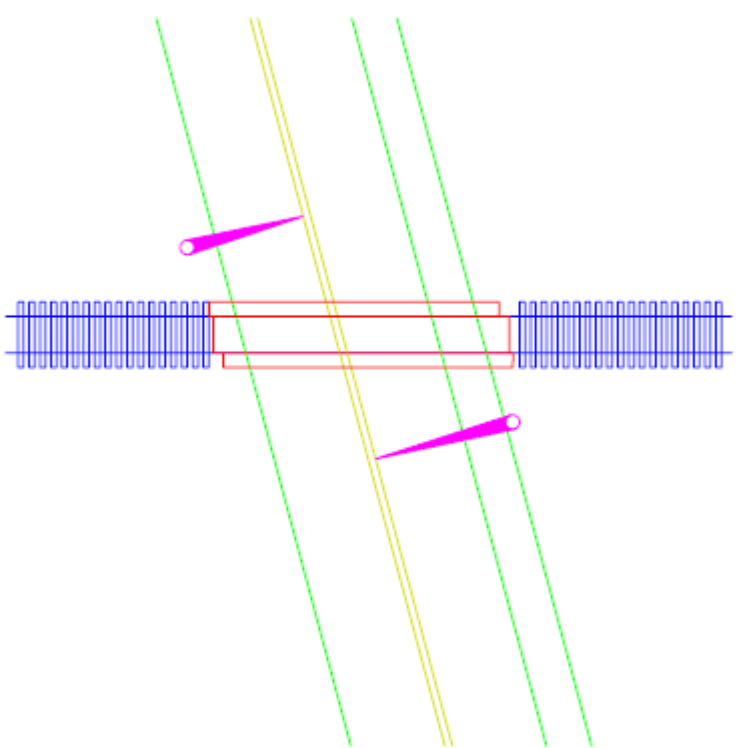
Railroad Preemption

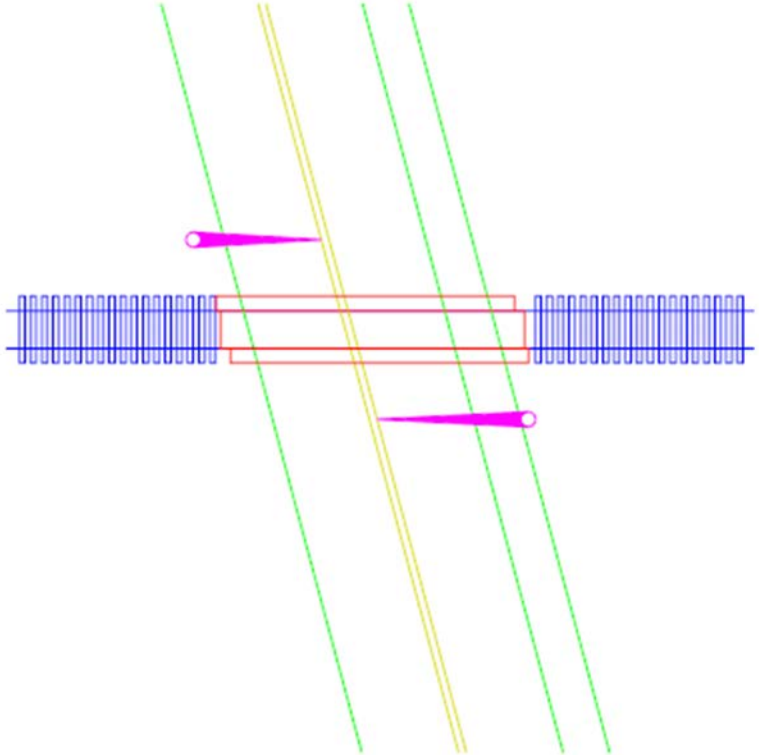
Exit Gate Management System

Cantilevers

Skewed Crossings
Acute Angled

AREMA Part 3.1.36B





The best grade crossings are…

Thank you!

Frank Frey
Frank.frey@dot.gov
202-738-2195

Introduction to *GX Dash!*

Debra Chappell,
Transportation Analyst at FRA

U.S. Department of Transportation
Federal Railroad Administration

Agenda

- Background
- Features of *GX Dash!*
- Next Steps
- Questions

Background

What is *GX Dash!*?

- A different way to view existing data
- Information from the Office of Safety Analysis database
- Provides information for commonly asked questions from media, public inquiries
- Data timeframe: 2008-2018 (partial) – updated monthly
- Tableau software
- Located at https://www.fra.dot.gov/gxdash

Background

What is *GX Dash!*?

- Assists with programming needs
- Provides some supporting data for applications
- Assists with “getting in the weeds” of complex data mining
- Provides a more targeted view
- Assists with outreach efforts
- Answers questions from public, legislative entities, media, etc.

Live Demonstration

https://www.fra.dot.gov/gxdash

Questions?

Thank you!

Debra Chappell
Transportation Analyst
Debra.Chappell@dot.gov
202-493-6018

Extra Slides

In case of Internet failure

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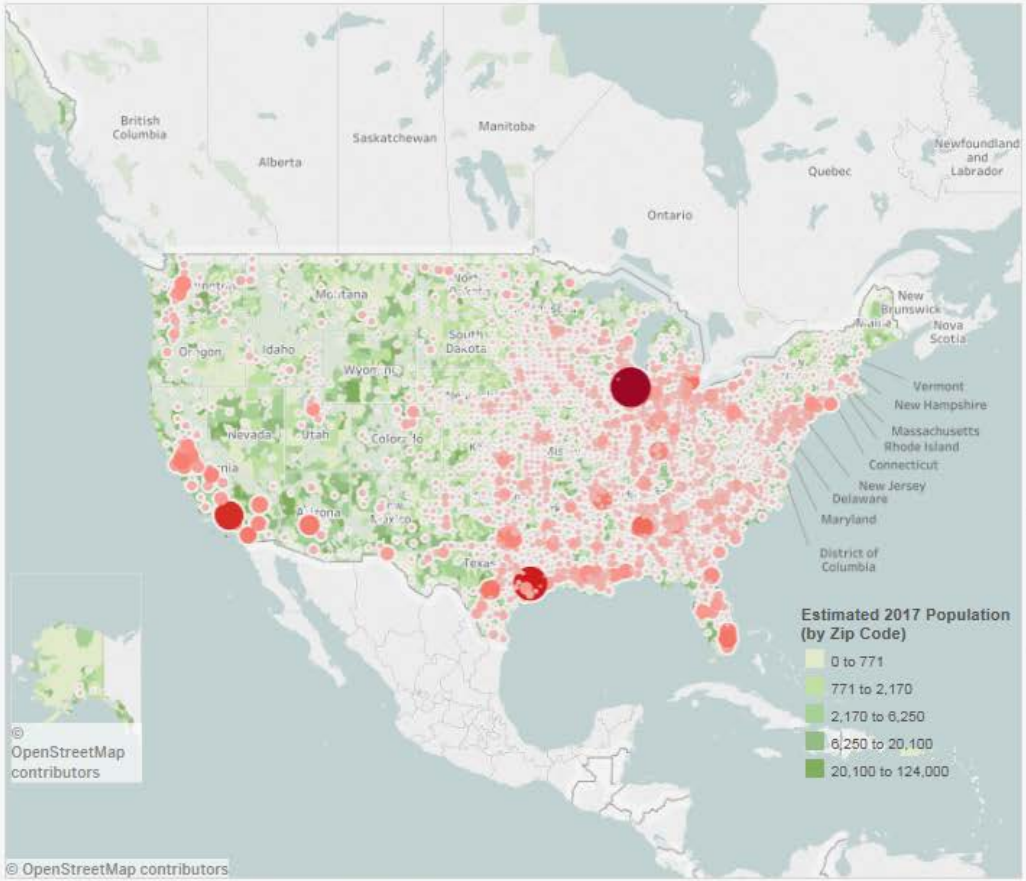
U.S. Department of Transportation
Federal Railroad Administration

Highway-Rail Crossing Collisions 2008-2018 (Partial)

Years Displayed: All
Months Displayed: All
States Displayed: All

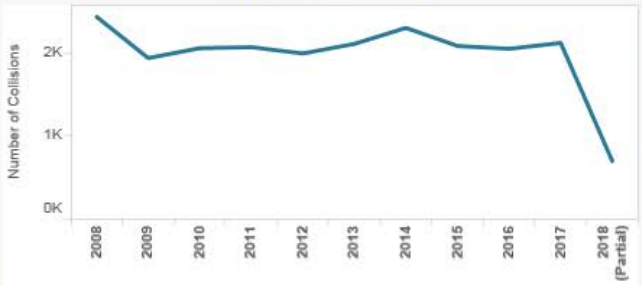
Collisions	Injuries	Fatalities
21,798	9,448	2,609



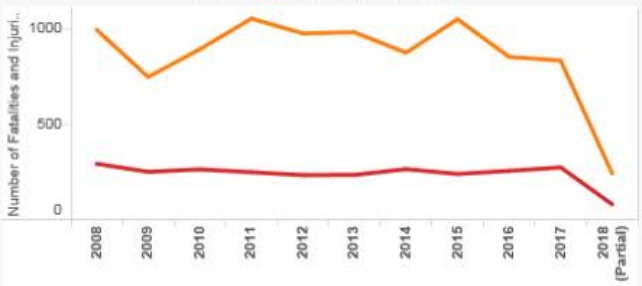
Severity of Collision (based on injuries and fatalities)
1 — 732

Number of Collisions
1 · 100 · 200 · 300 · 400 · 483

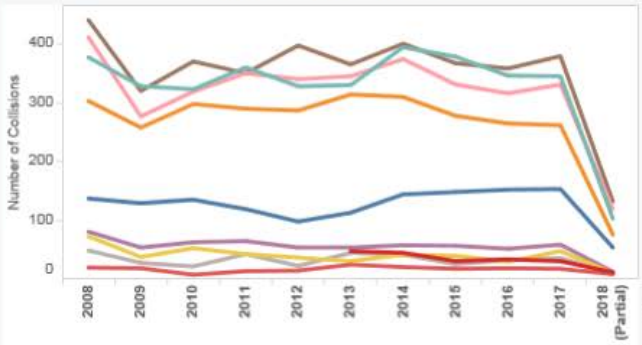
Collisions Over Time



Injuries vs. Fatalities



Collisions by Railroad



Calendar Year: (All)
Month: (All)
State: (All)

Crossing Type
(All)
Private
Public

Fatalities
Injuries

Railroads with the Most Collisions
ATK
BNSF
CP
CRSH
CSX
IC
KCS
NS

All data current through 4/30/2018

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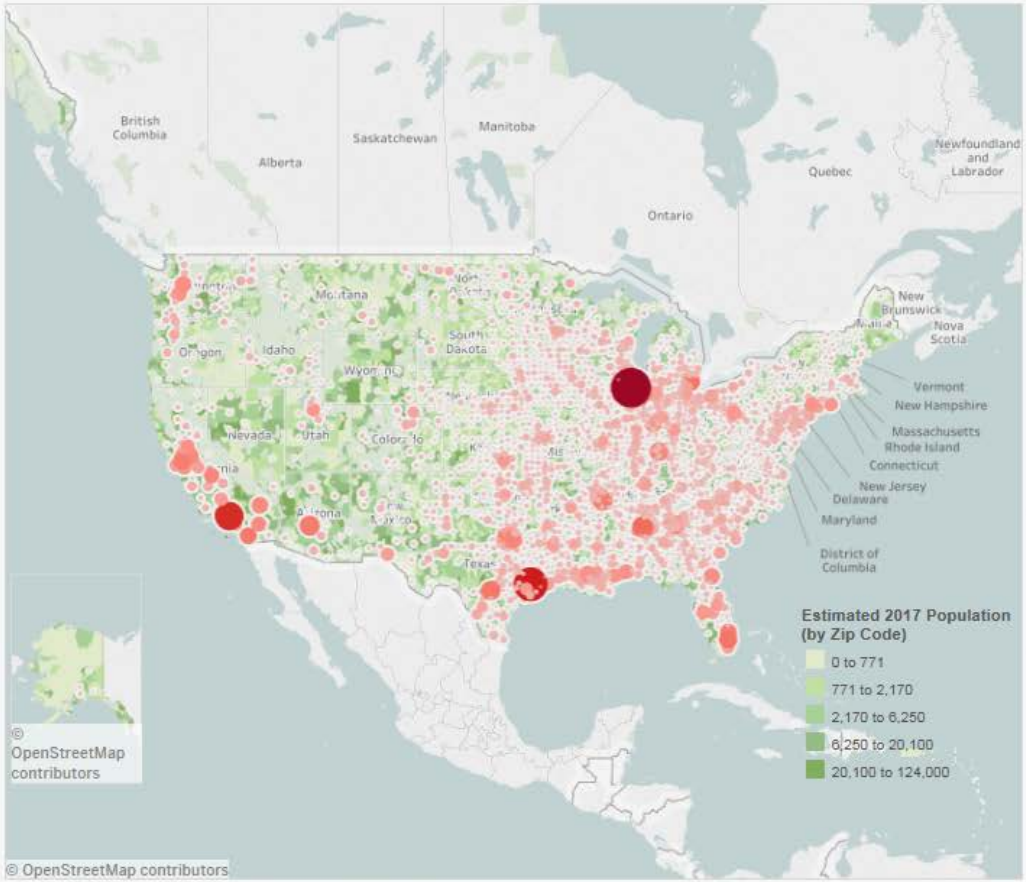

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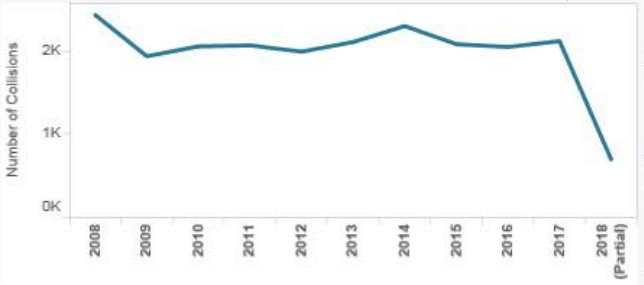
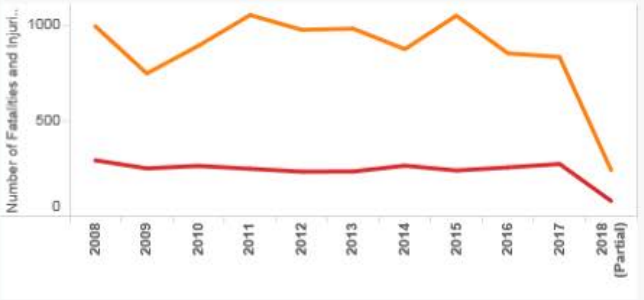


Injuries vs. Fatalities



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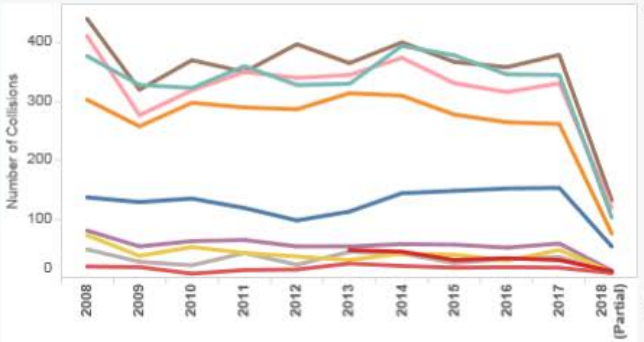

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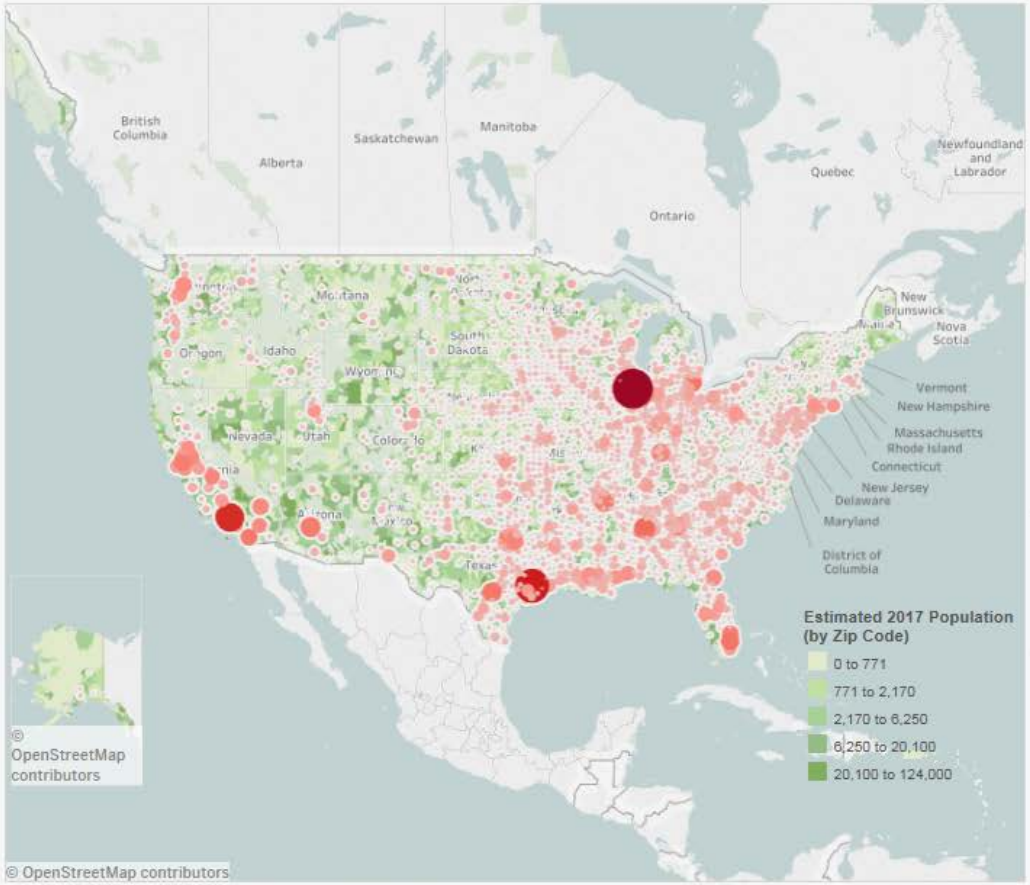

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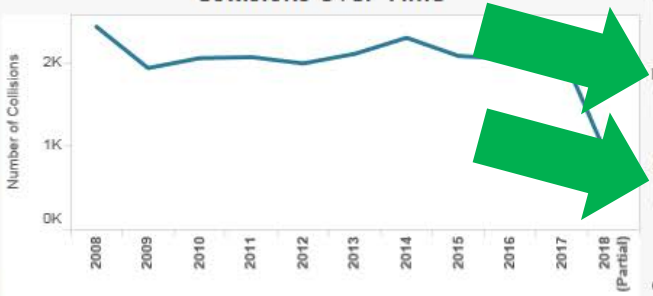

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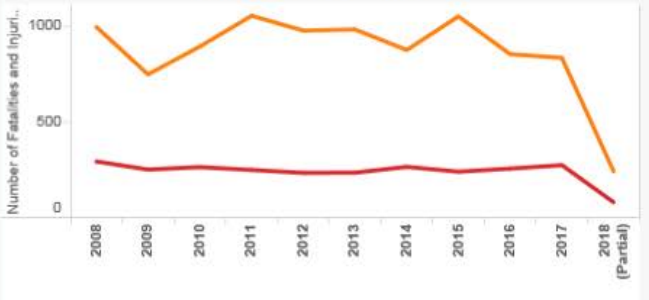

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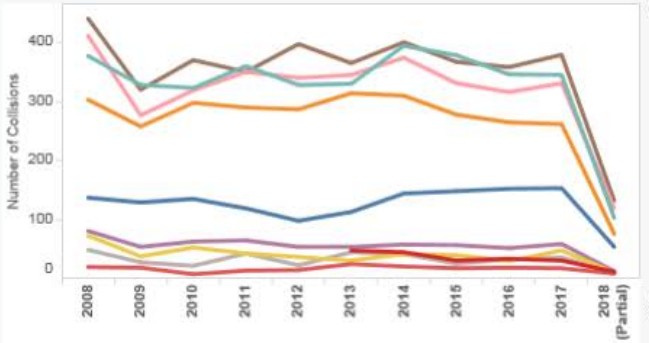

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Crossing Type
(All)
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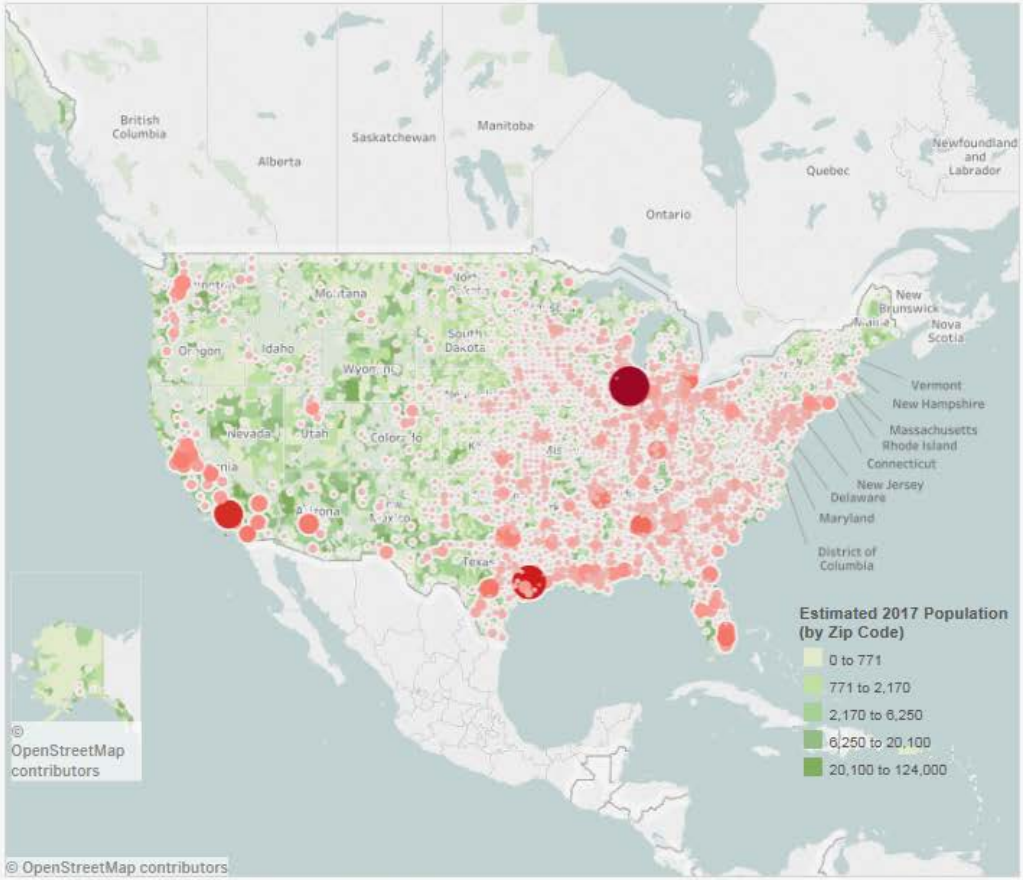


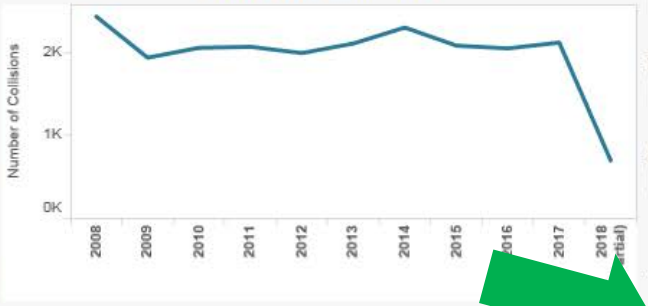
Severity of Collision (based on injuries and fatalities)

1 — 732

Number of Collisions

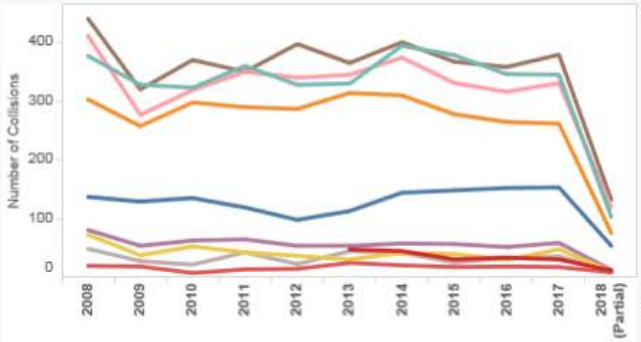
1 | 100 | 200 | 300 | 400 | 483

Collisions Over Time



Injuries vs. Fatalities

Collisions by Railroad



Calendar Year: (All)

Month: (All)

State: (All)

Crossing Type
- (All)
- Private
- Public

Fatalities
Injuries

Railroads with the Most Collisions
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- NS

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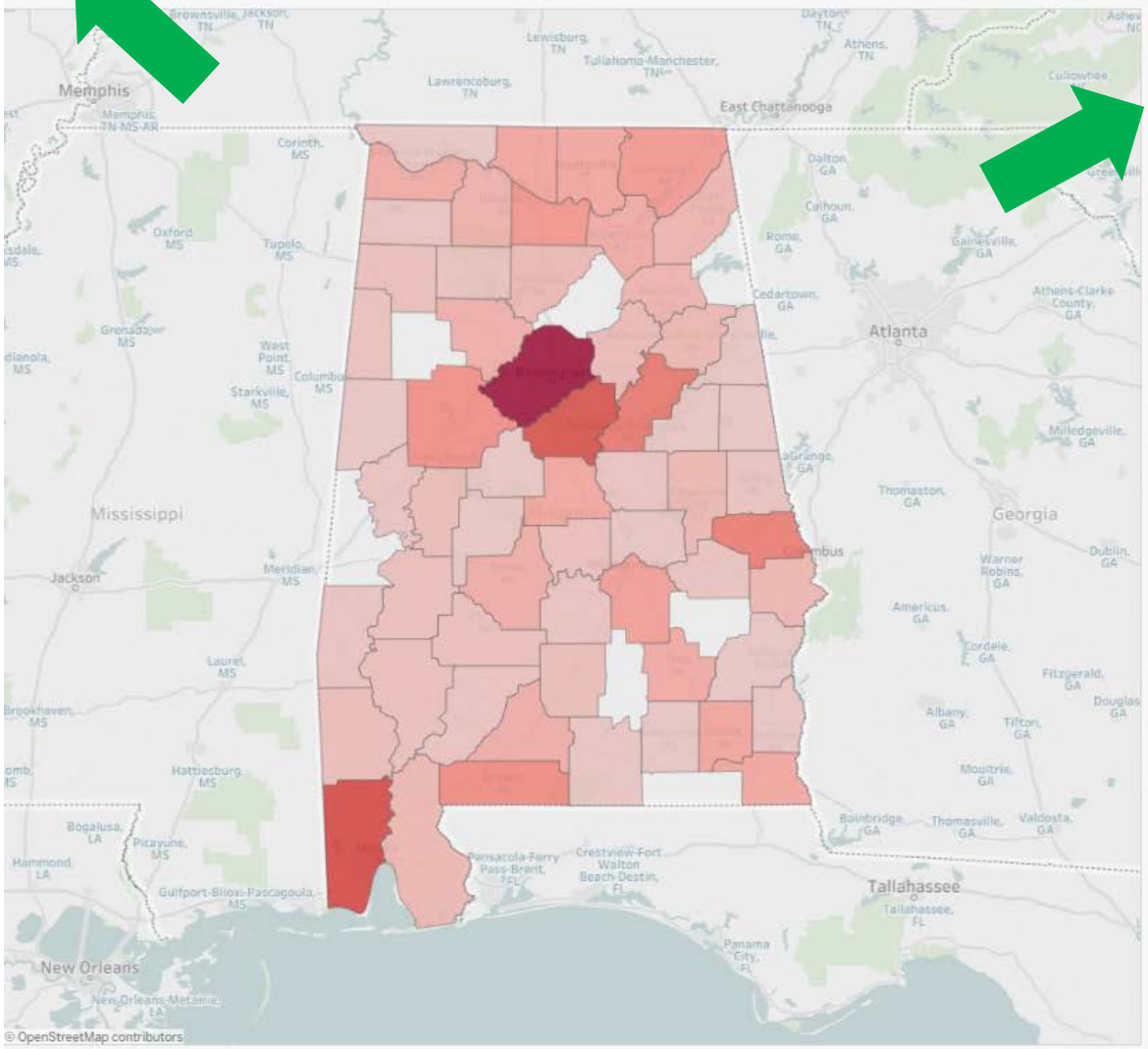
State

Alabama



Number of Collisions in the Past 10 Years

1 — 137

Collisions, Injuries, and Fatalities per Crossing (Ranked by Number of Collisions Over the Past 10 Years)

Crossing ID	Highway	Collisions	Injuries	and Fatalities
351290D	BELLVILLE STREET	10	0	5
351319Y	MILDRED ST/SR15	4	1	0
	MILDRED ST/SR15/S	2	0	0
	MILDRED STREET	1	0	0
725401E	14TH	1	1	0
	14TH ST	3	2	0
	14TH STREET HWY SR 1	1	0	1
	14TH STREET SR 150	1	0	0
	SR 150	1	1	0
352619R	22ND ST	5	5	0
725383J	24TH ST SW & JEFF	1	1	0
	24TH STREET	1	1	0
	24TH STREET SW	1	0	0
	24TH STREET SW/24TH	1	1	0
	: 24TH ST SW & JEFF	1	0	1
725384R	31ST STREET SW	1	0	0
	31ST SW & CLEBURN	1	0	0
	CR - 18/31ST STREET	3	2	0
725393P	32ND	2	1	0
	32ND STREET	3	3	2
727829V	PRIVATE	1	0	0
	SAW MILL ROAD	2	0	0
	SAWMILL RD.	1	0	0
	SAWMILL ROAD	1	0	0
831179A	ANDERSON RD	2	0	0
	ANDERSON ROAD	1		

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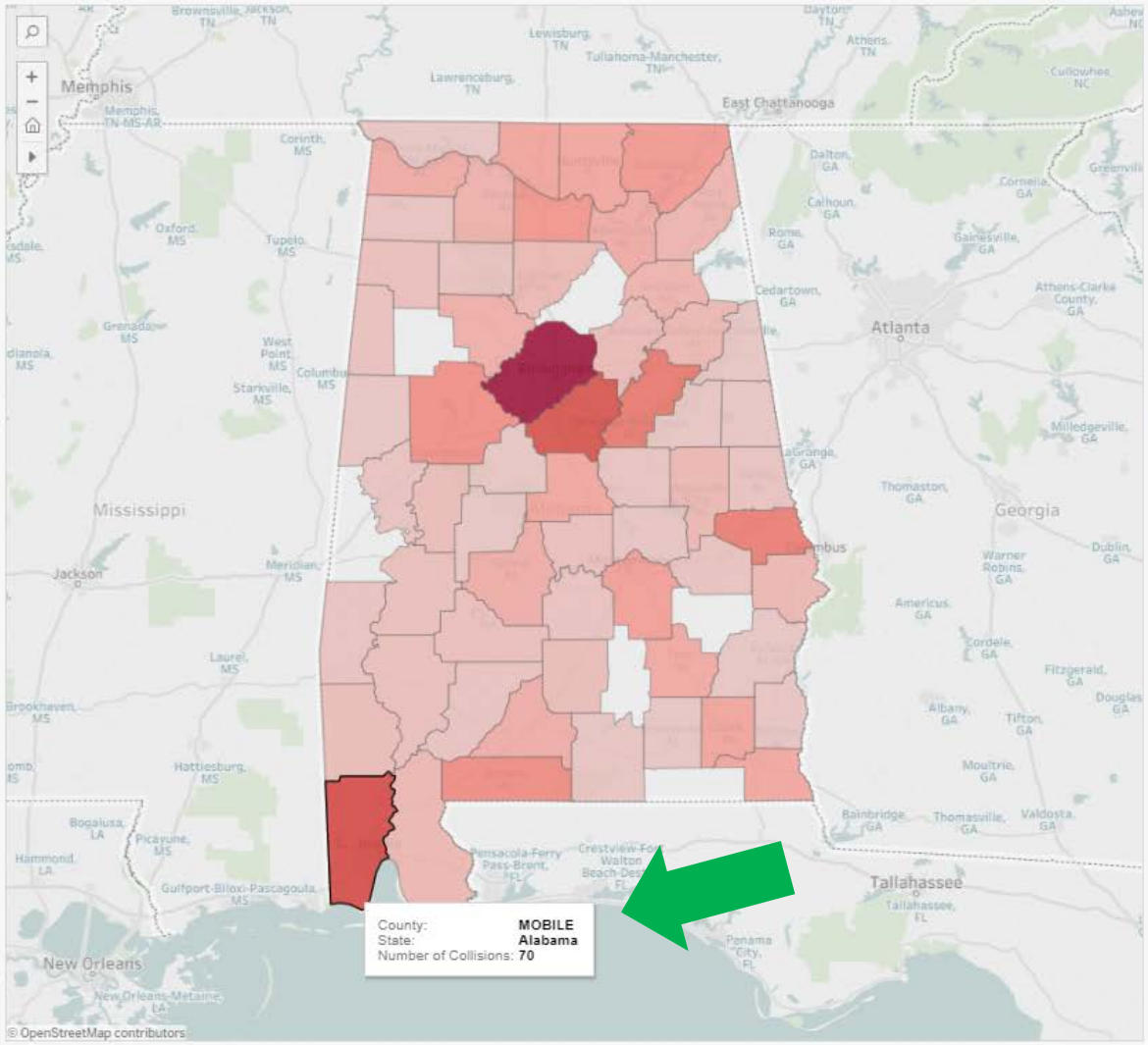
State

Alabama



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(Ranked by Number of Collisions Over the Past 10 Years)

Crossing ID	Highway	Collisions	Injuries	and Fatalities
351250D	BELLVILLE STREET	10	0	5
351319Y	MILDRED ST/SR15	4	1	0
	MILDRED ST/SR15/S	2	0	0
	MILDRED STREET	1	0	0
725401E	14TH	1	1	0
	14TH ST	3	2	0
	14TH STREET HWY SR 1	1	0	1
	14TH STREET SR 150	1	0	0
	SR 150	1	1	0
352619R	22ND ST	5	5	0
725383J	24TH ST SW & JEFF	1	1	0
	24TH STREET	1	1	0
	24TH STREET SW	1	0	0
	24TH STREET SW/24TH	1	1	0
	: 24TH ST SW & JEFF	1	0	1
725384R	31ST STREET SW	1	0	0
	31ST SW & CLEBURN	1	0	0
	CR - 18/31ST STREET	3	2	0
725393P	32ND	2	1	0
	32ND STREET	3	3	2
727829V	PRIVATE	1	0	0
	SAW MILL ROAD	2	0	0
	SAWMILL RD	1	0	0
	SAWMILL ROAD	1	0	0
831179A	ANDERSON RD	2	0	0
	ANDERSON ROAD	1		

Undo | Redo | Revert | Refresh | Pause | Share | Download | Full Screen

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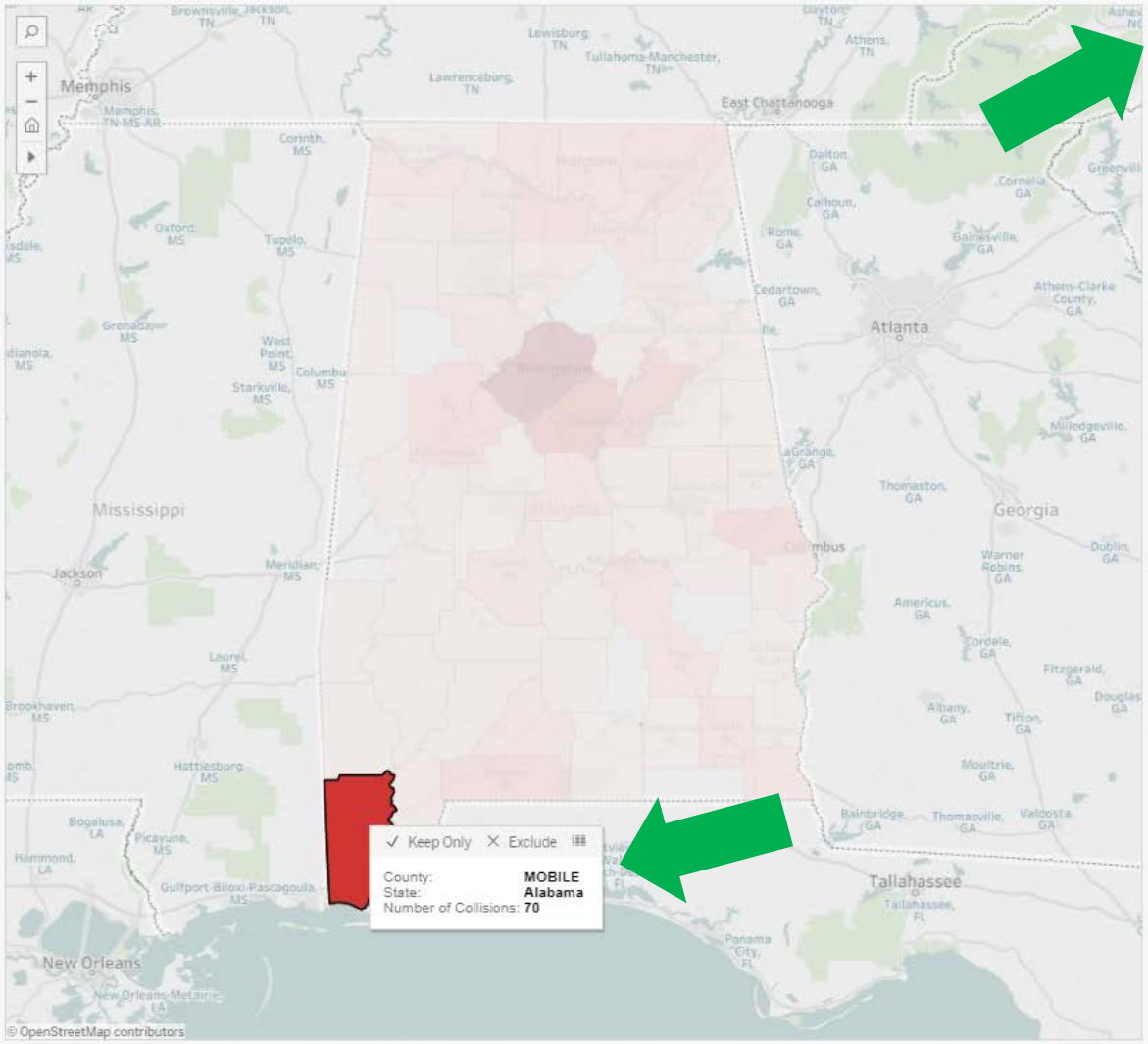
State

Alabama



Number of Collisions in the Past 10 Years

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Collisions, Injuries, and Fatalities per Crossing
(Ranked by Number of Collisions Over the Past 10 Years)

Crossing ID	Highway	Collisions	Injuries	and Fatalities
727829V	PRIVATE	1	0	0
	SAW MILL ROAD	2	0	0
	SAWMILL RD.	1	0	0
	SAWMILL ROAD	1	0	0
727820J	BAYOU AVENUE	1	1	1
	CITY/BAYOU AVE	2	1	0
	HIGHWAY 43	1	0	1
304250E	FORESTDALE DRIVE	2	3	0
	FORESTDALE RD	1	1	0
304256V	SCHILLINGER RD N	3	1	0
351461C	BELLINGRATH RD	2	1	0
	BELLINGRATH RD.	1	0	1
304199J	DAUPHIN ISLAND PK	2	0	0
304233N	MAIN STREET	2	1	0
304257C	FIRE TOWER ROAD	2	1	0
351421E	MADISON ST	1	0	0
	MADISON STREET	1	1	0
351430D	LAWRENCE STREET	2	0	0
727825T	CITY/FERRY AVE	1	4	0
	FERRY AVENUE	1	1	0
727827G	OLD DEPOT STREET	1	0	0
	STATION STREET	1	1	0
727828N	JACINTOPORT BLVD	1	3	0
	JACINTOPORT BLVD.	1	0	0
727836F	CITY/PAPER MILL ROAD	2	0	0
874392S	BERG PIPE	2	0	

Undo | Redo | Revert | Refresh | Pause

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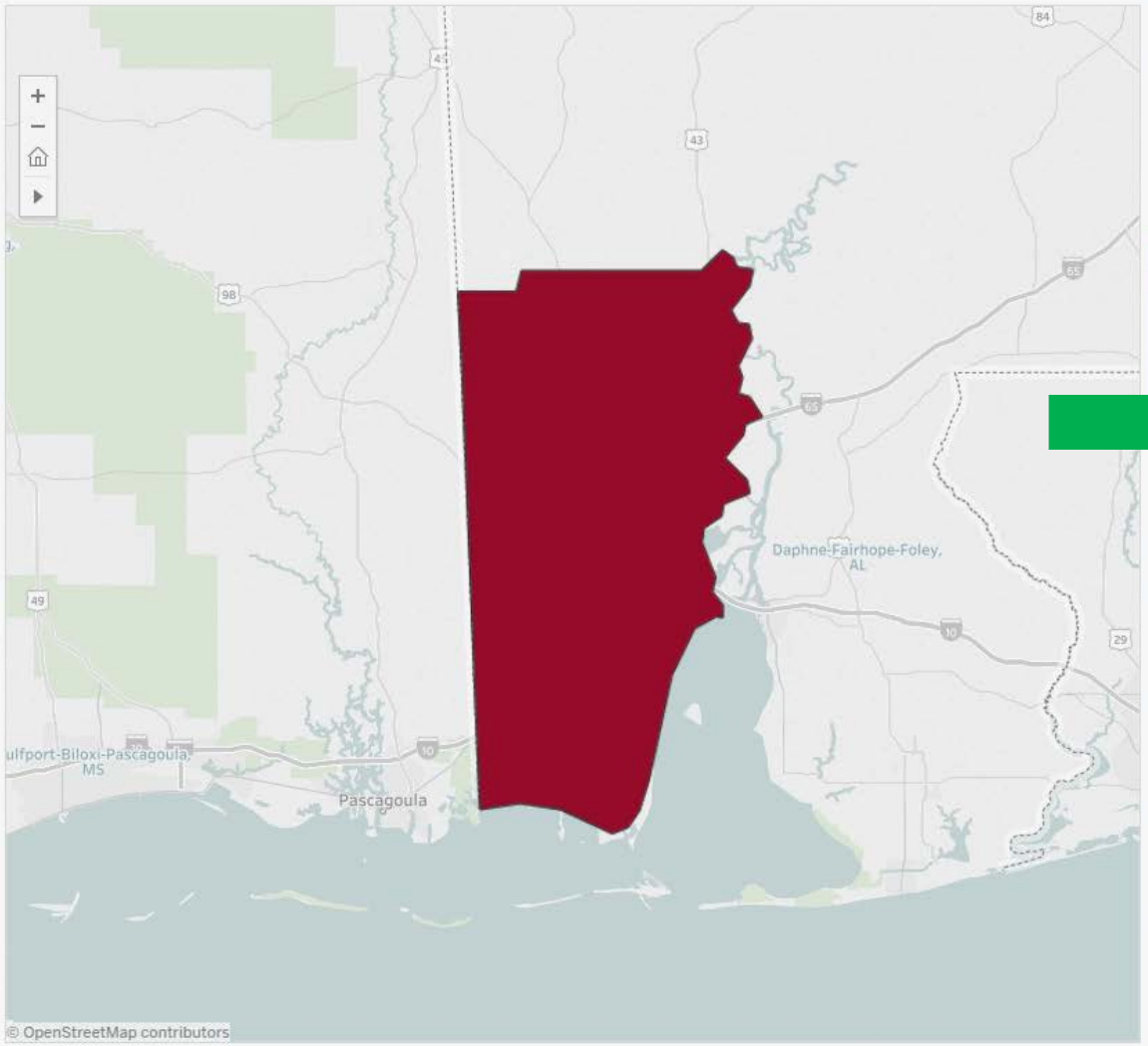
National | Local | Details | Help | Information

State

Alabama



Number of Collisions in the Past 10 Years

4

Collisions, Injuries, and Fatalities per Crossing (Ranked by Number of Collisions Over the Past 10 Years)

Crossing ID	Highway	Collisions	Injuries	and Fatalities
727829V	PRIVATE	1	0	0
	SAW MILL ROAD	2	0	0
	SAWMILL RD.	1	0	0
	SAWMILL ROAD	1	0	0
727820J	BAYOU AVENUE	1	1	1
	FORESTDALE RD	1	1	0
304256V	SCHILLINGER RD N	3	1	0
351461C	BELLINGRATH RD	2	1	0
	BELLINGRATH RD.	1	0	1
304199J	DAUPHIN ISLAND PK	2	0	0
304233N	MAIN STREET	2	1	0
304257C	FIRE TOWER ROAD	2	1	0
351430D	LAWRENCE STREET	2	0	0
727825T	CITY/FERRY AVE	1	4	0
	FERRY AVENUE	1	1	0
727827G	OLD DEPOT STREET	1	0	0
	STATION STREET	1	1	0

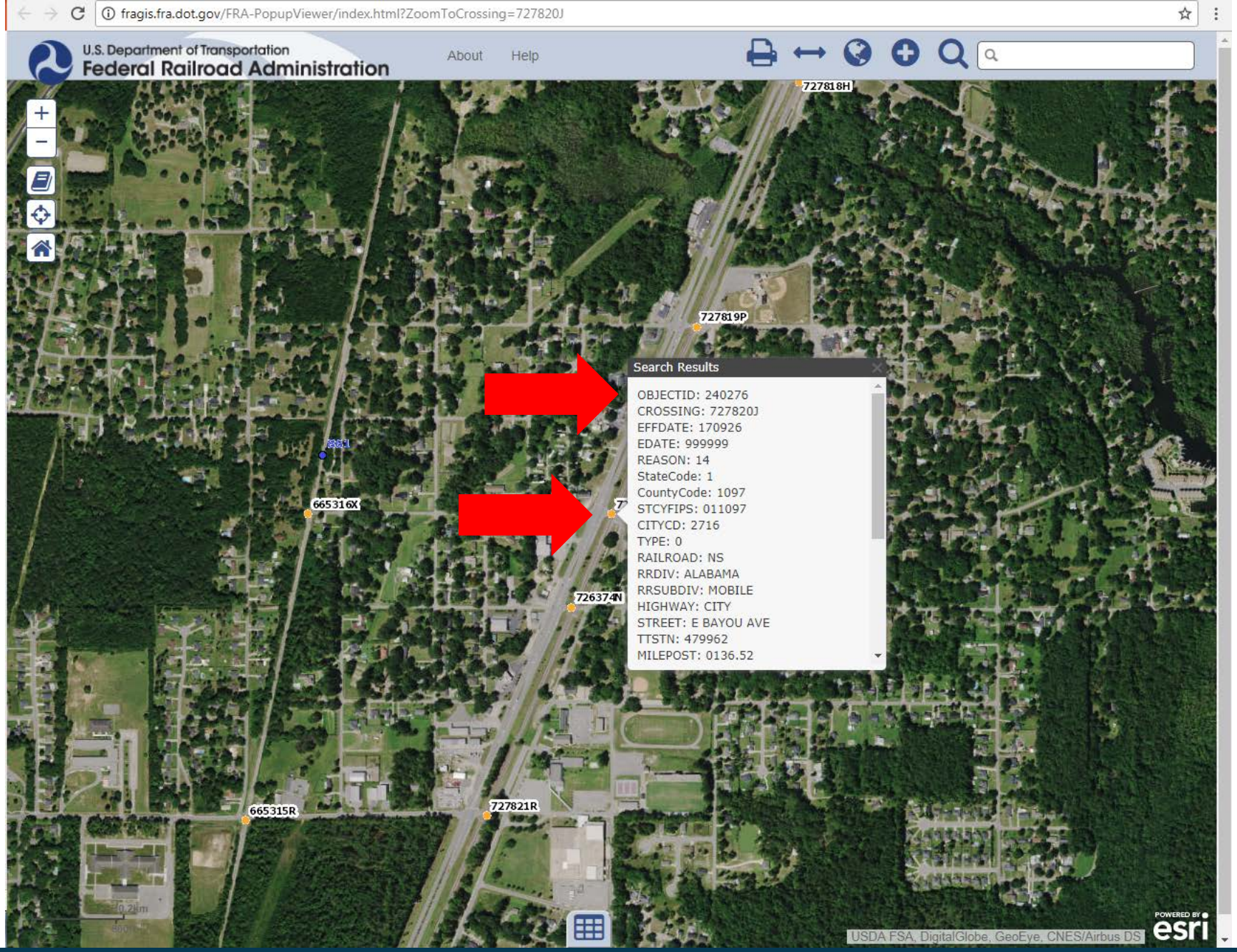
✓ Keep Only ✕ Exclude

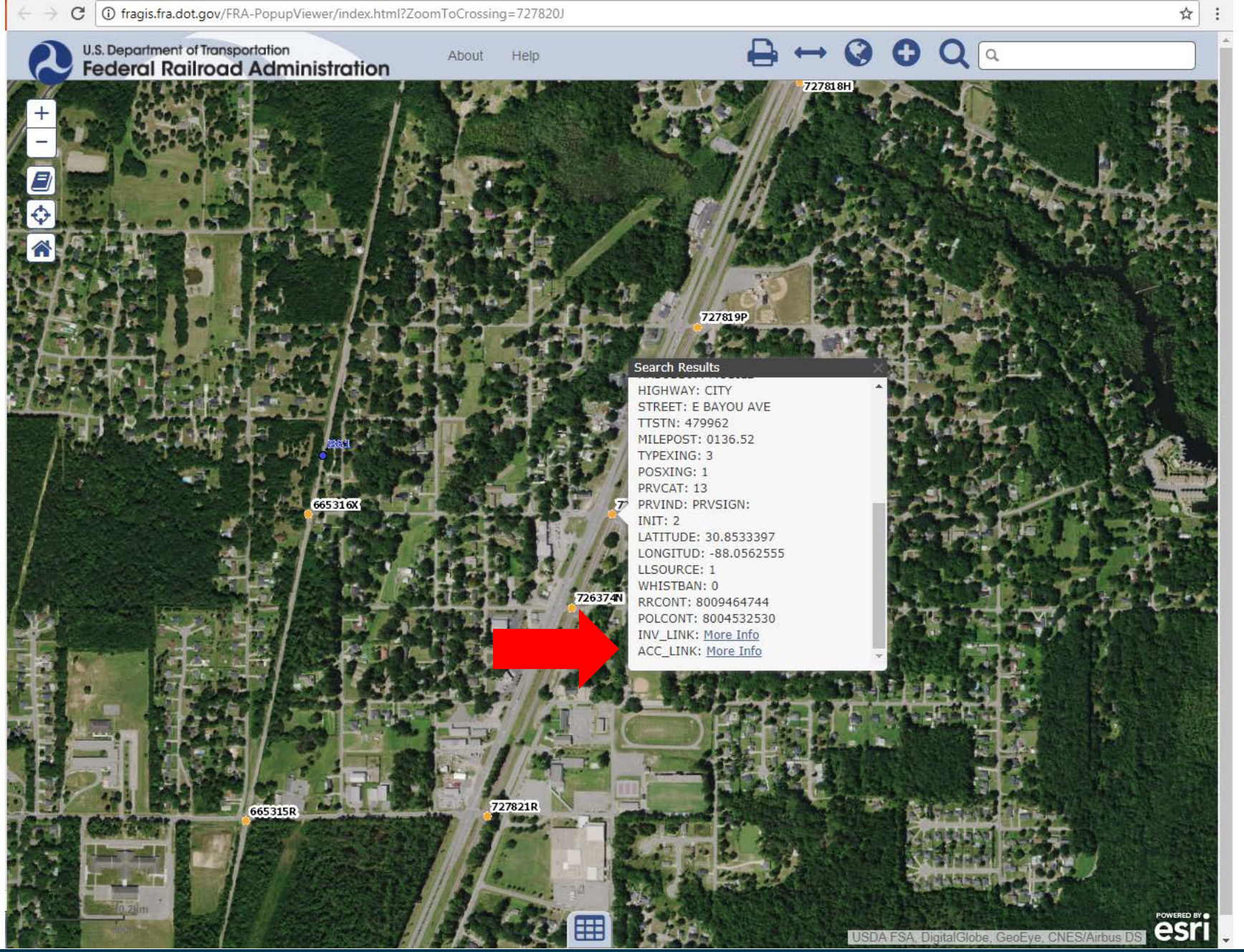
3 items selected · SUM(Number of Records): 4

727820J

Click here to view this crossing!

Undo | Redo | Revert | Refresh | Pause | Share | Download | Full Screen


fragis.fra.dot.gov/FRA-PopupViewer/index.html?ZoomToCrossing=727820J
U.S. Department of Transportation
Federal Railroad Administration
About
Help
727818H
727819P
Search Results
OBJECTID: 240276
CROSSING: 727820J
EFFDATE: 170926
EDATE: 999999
REASON: 14
StateCode: 1
CountyCode: 1097
STCYFIPS: 011097
CITYCD: 2716
TYPE: 0
RAILROAD: NS
RRDIV: ALABAMA
RRSUBDIV: MOBILE
HIGHWAY: CITY
STREET: E BAYOU AVE
TTSTN: 479962
MILEPOST: 0136.52
665316X
726374N
665315R
727821R
USDA FSA, DigitalGlobe, GeoEye, CNES/Airbus DS
POWERED BY esri

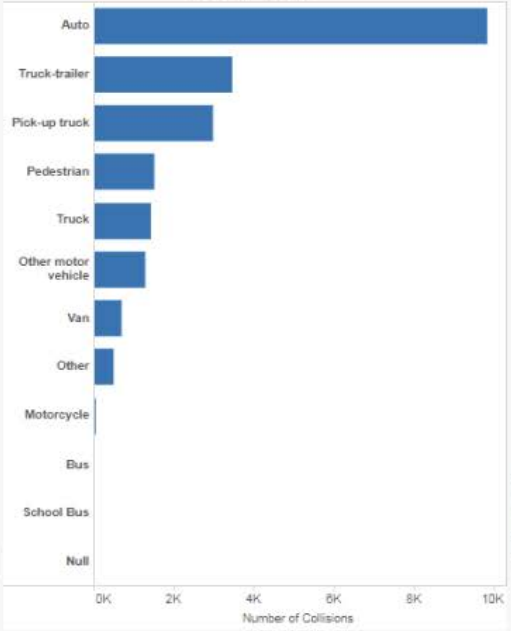

fragis.fra.dot.gov/FRA-PopupViewer/index.html?ZoomToCrossing=727820J
U.S. Department of Transportation
Federal Railroad Administration
About
Help
727818H
727819P
Search Results
HIGHWAY: CITY
STREET: E BAYOU AVE
TTSTN: 479962
MILEPOST: 0136.52
TYPEXING: 3
POSXING: 1
PRVCAT: 13
PRVIND: PRVSIGN:
INIT: 2
LATITUDE: 30.8533397
LONGITUD: -88.0562555
LLSOURCE: 1
WHISTBAN: 0
RRCONT: 8009464744
POLCONT: 8004532530
INV_LINK: More Info
ACC_LINK: More Info
665316X
726374N
665315R
727821R
USDA FSA, DigitalGlobe, GeoEye, CNES/Airbus DS
POWERED BY esri

U.S. Department of Transportation
Federal Railroad Administration

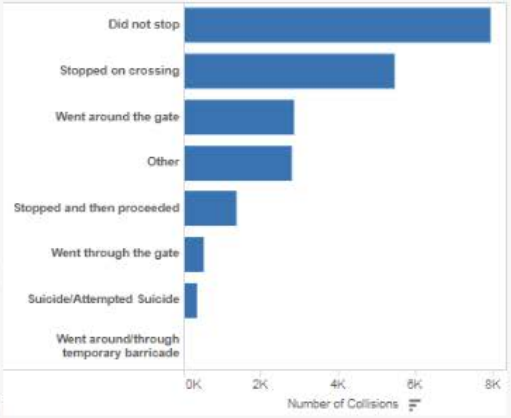
Highway-Rail Crossing Collisions Details

Years Displayed: All
Months Displayed: All
States Displayed: All

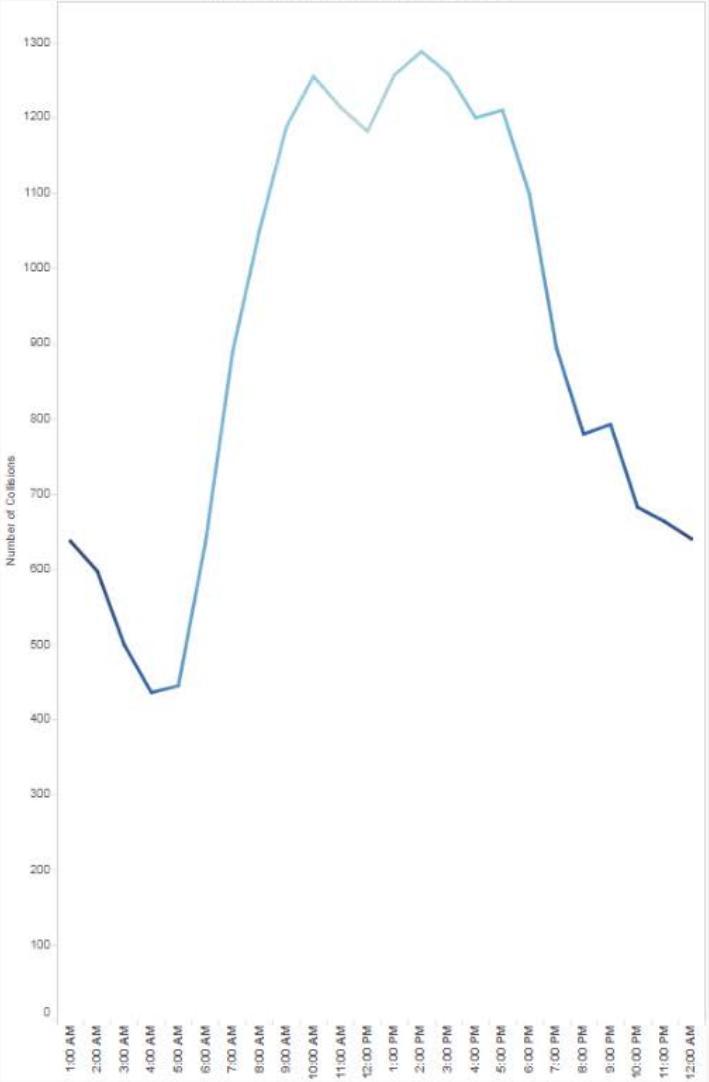
Type of Vehicle



Highway User Action



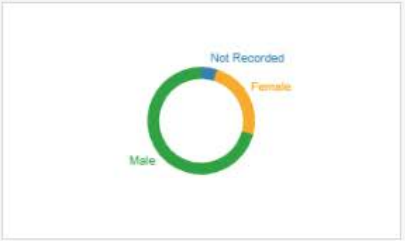
Number of Collisions by Time of Day



Warning Device

Vehicle Position

Driver Gender



Driver Age

Calendar Year
(All)

Month
(All)

State
(All)

Injuries?
(All)
No
Yes

Fatal?
(All)
No
Yes

Crossing Type
(All)
Private
Public

Note: The statistics presented here include both public and private crossings.

*Private crossing are not required to have warning devices and are counted in the "None" category.

Undo | Redo | Revert | Refresh | Pause | Share | Download | Full Screen

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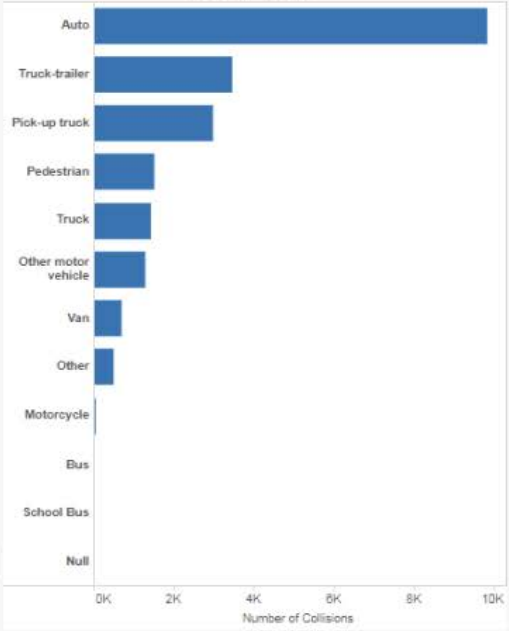
Federal Railroad Administration

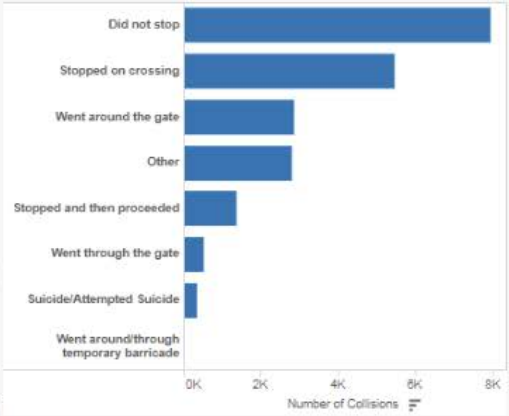
Highway-Rail Crossing Collisions Details

Years Displayed: All
Months Displayed: All
States Displayed: All

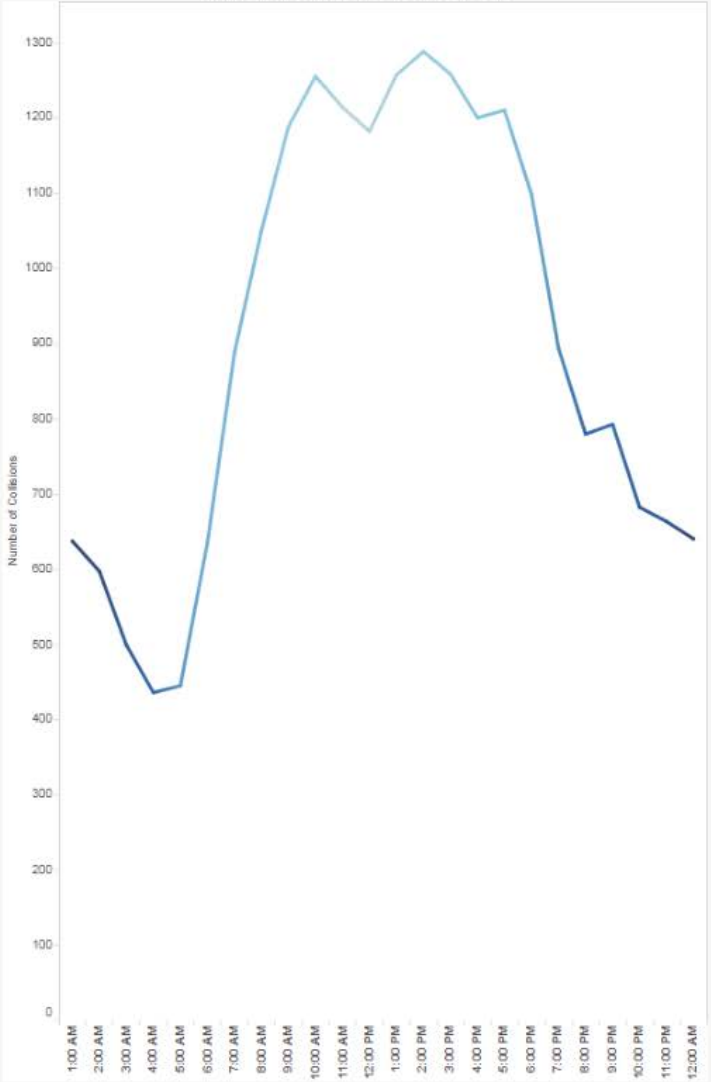
Type of Vehicle



Highway User Action



Number of Collisions by Time of Day



Warning Device

Vehicle Position

Driver Gender

Driver Age

Calendar Year: (All)
Month: (All)
State: (All)

Injuries?
- (All)
- No
- Yes

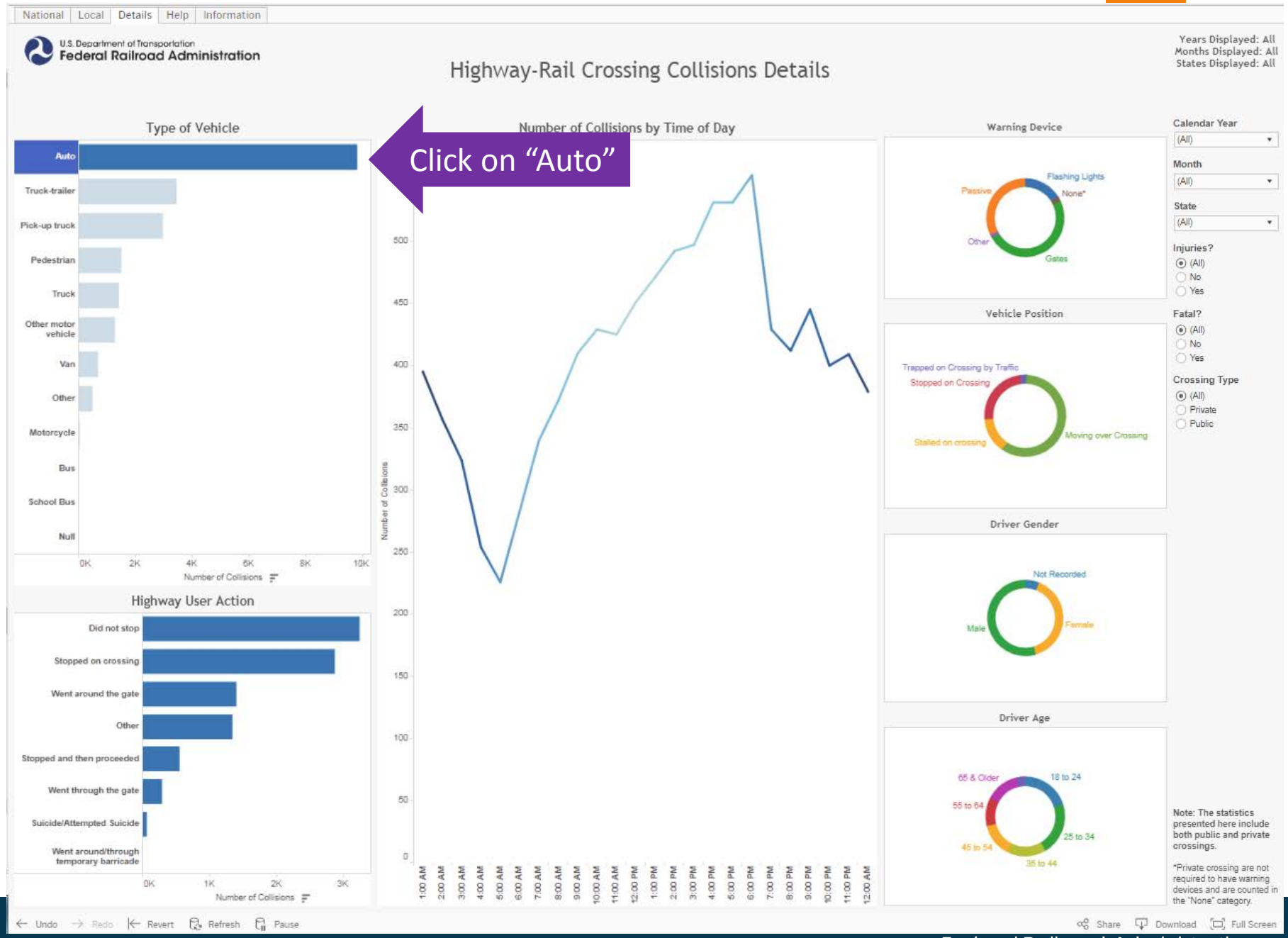
Fatal?
- (All)
- No
- Yes

Crossing Type
- (All)
- Private
- Public

Note: The statistics presented here include both public and private crossings.

*Private crossing are not required to have warning devices and are counted in the "None" category.

Undo | Redo | Revert | Refresh | Pause | Share | Download | Full Screen


National
Local
Details
Help
Information
U.S. Department of Transportation
Federal Railroad Administration
Highway-Rail Crossing Collisions Details
Years Displayed: All
Months Displayed: All
States Displayed: All
Type of Vehicle
Auto
Truck-trailer
Pick-up truck
Pedestrian
Truck
Other motor vehicle
Van
Other
Motorcycle
Bus
School Bus
Null
0K
2K
4K
6K
8K
10K
Number of Collisions
Click on "Auto"
Number of Collisions by Time of Day
Number of Collisions
0
50
100
150
200
250
300
350
400
450
500
1:00 AM
2:00 AM
3:00 AM
4:00 AM
5:00 AM
6:00 AM
7:00 AM
8:00 AM
9:00 AM
10:00 AM
11:00 AM
12:00 PM
1:00 PM
2:00 PM
3:00 PM
4:00 PM
5:00 PM
6:00 PM
7:00 PM
8:00 PM
9:00 PM
10:00 PM
11:00 PM
12:00 AM
Warning Device
Flashing Lights
None*
Gates
Other
Passive
Vehicle Position
Trapped on Crossing by Traffic
Stopped on Crossing
Moving over Crossing
Stalled on crossing
Driver Gender
Not Recorded
Female
Male
Driver Age
18 to 24
25 to 34
35 to 44
45 to 54
55 to 64
65 & Older
Calendar Year
(All)
Month
(All)
State
(All)
Injuries?
(All)
No
Yes
Fatal?
(All)
No
Yes
Crossing Type
(All)
Private
Public
Highway User Action
Did not stop
Stopped on crossing
Went around the gate
Other
Stopped and then proceeded
Went through the gate
Suicide/Attempted Suicide
Went around/through temporary barricade
0K
1K
2K
3K
Number of Collisions
Note: The statistics presented here include both public and private crossings.
*Private crossing are not required to have warning devices and are counted in the "None" category.
Undo
Redo
Revert
Refresh
Pause
Share
Download
Full Screen

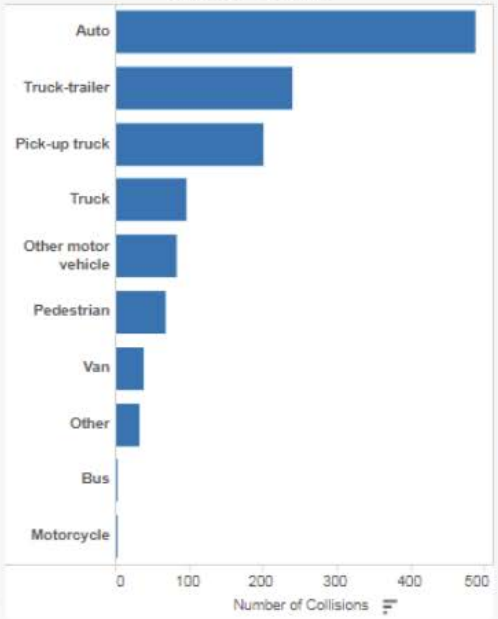
Click on “Stopped on crossing”

U.S. Department of Transportation
Federal Railroad Administration

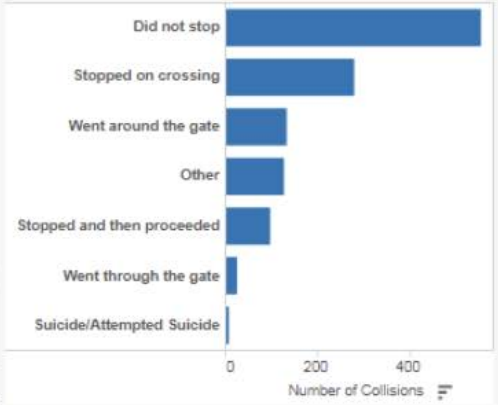
Highway-Rail Crossing Collisions Details

Years Displayed: All
Months Displayed: All
States Displayed: All

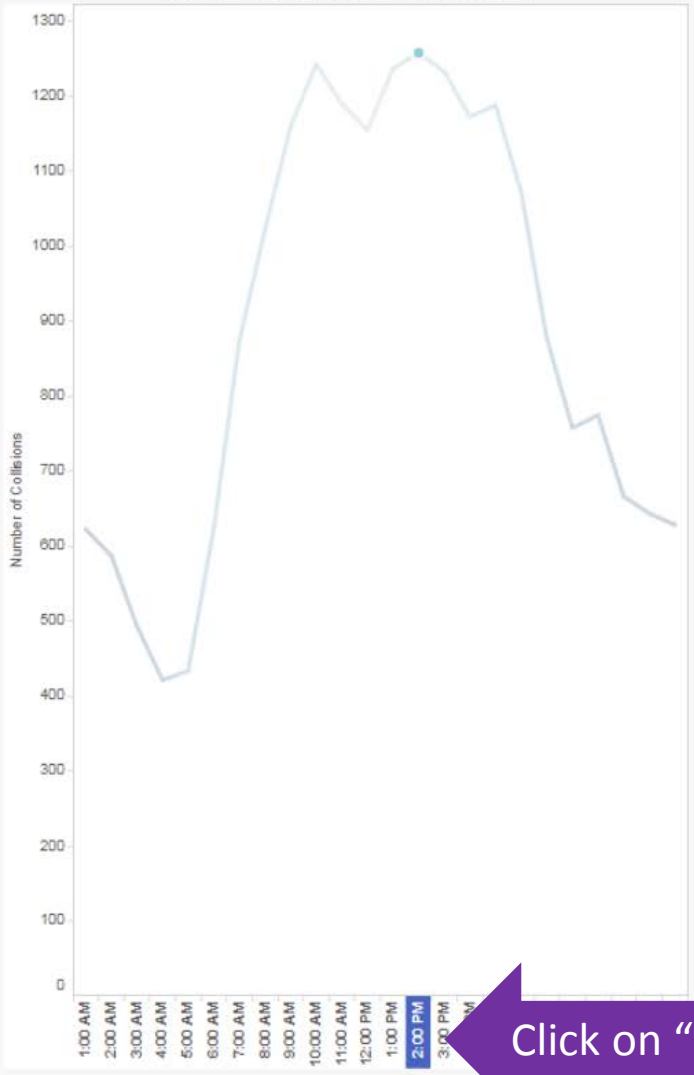
Type of Vehicle



Highway User Action



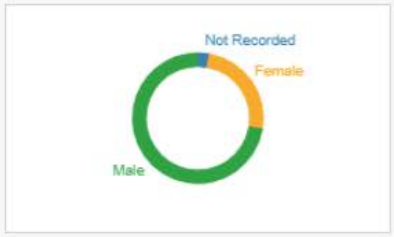
Number of Collisions by Time of Day



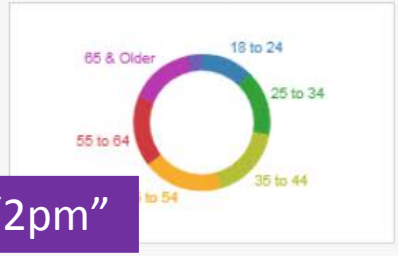
Warning Device

Vehicle Position

Driver Gender



Driver Age



Calendar Year: (All)

Month: (All)

State: (All)

Injuries?
- (All)
- No
- Yes

Fatal?
- (All)
- No
- Yes

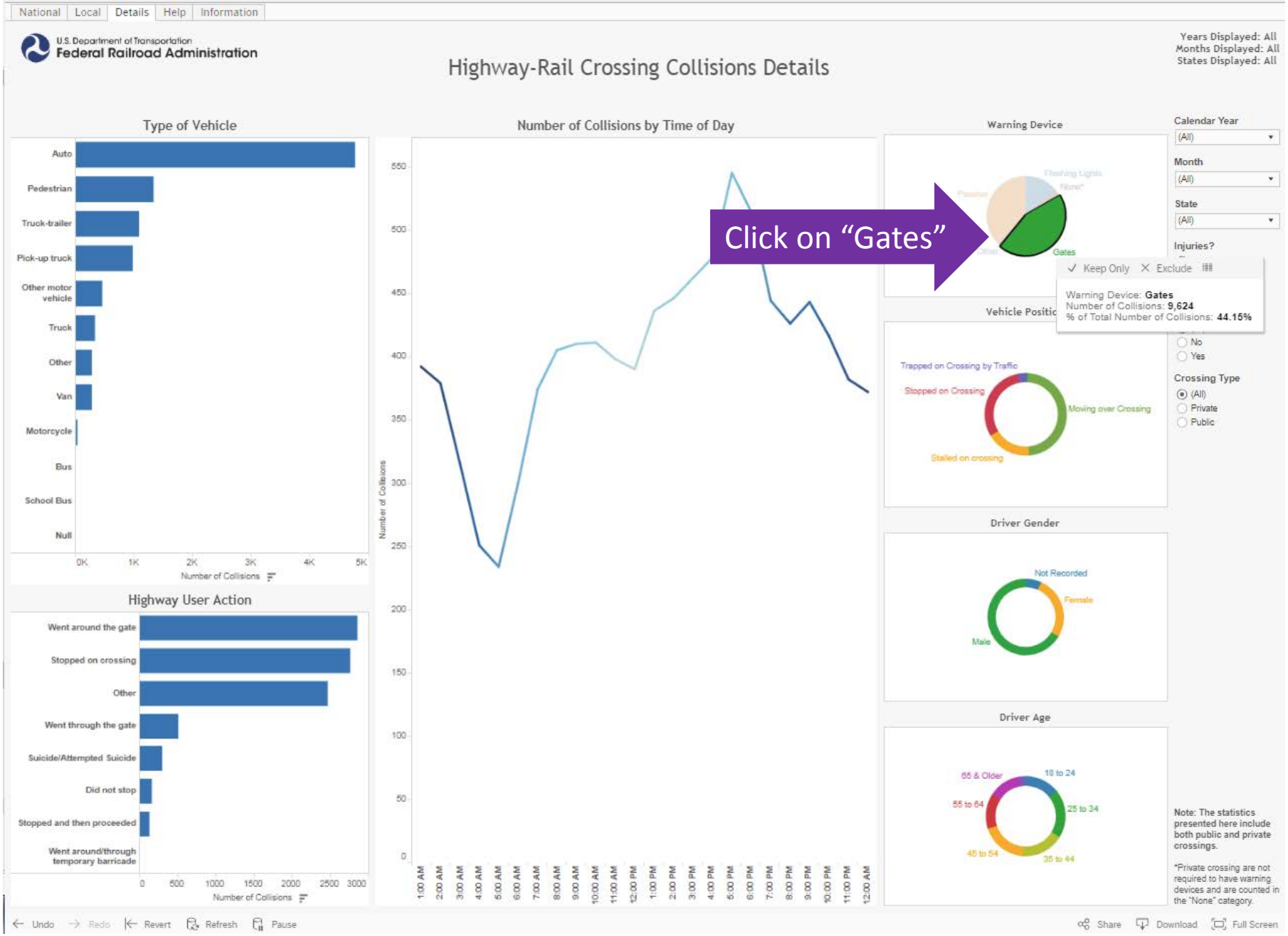
Crossing Type
- (All)
- Private
- Public

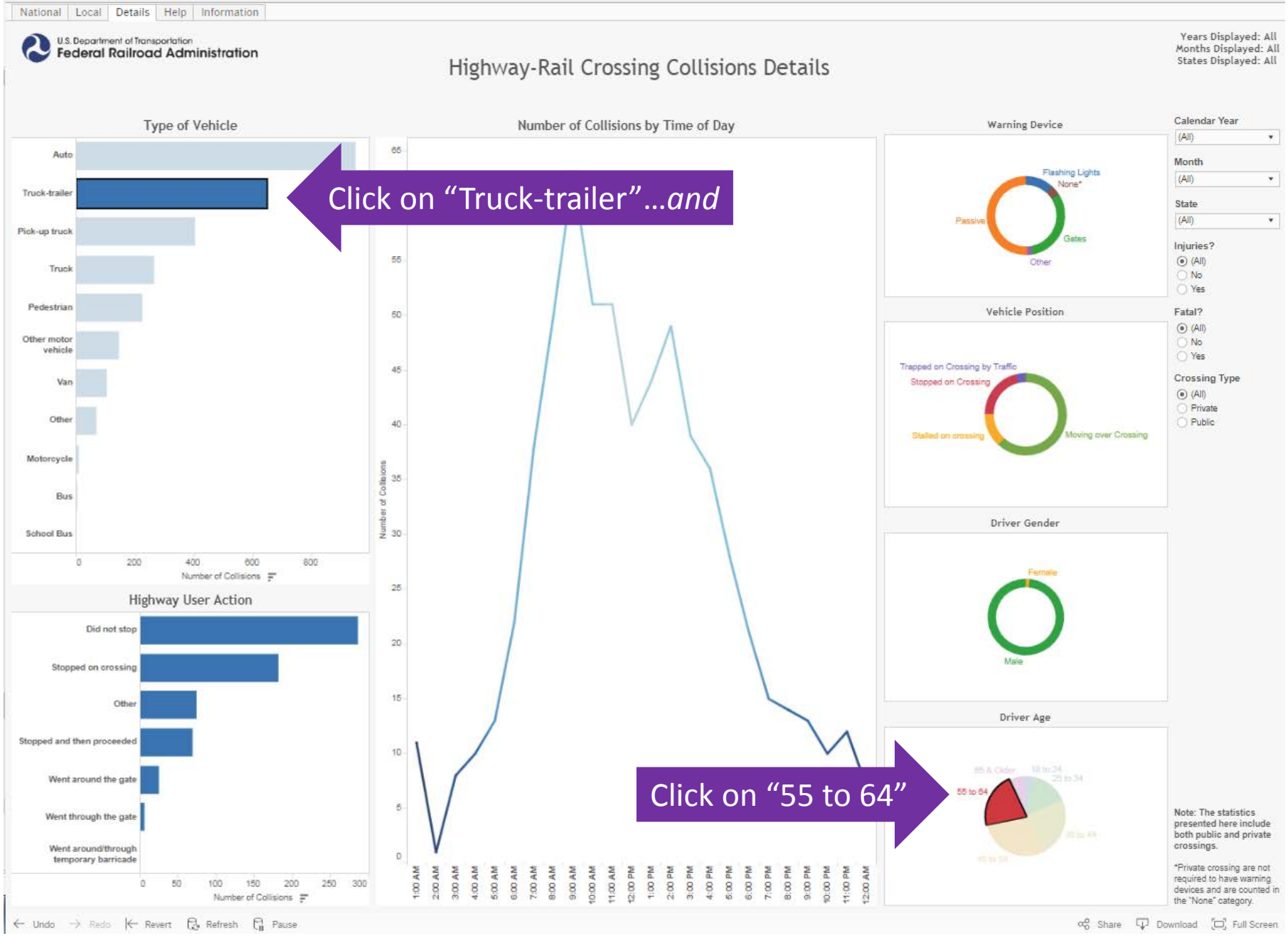
Note: The statistics presented here include both public and private crossings.

*Private crossing are not required to have warning devices and are counted in the "None" category.

Click on "2pm"

Undo | Redo | Revert | Refresh | Pause | Share | Download | Full Screen


National
Local
Details
Help
Information
U.S. Department of Transportation
Federal Railroad Administration
Highway-Rail Crossing Collisions Details
Years Displayed: All
Months Displayed: All
States Displayed: All
Type of Vehicle
Auto
Pedestrian
Truck-trailer
Pick-up truck
Other motor vehicle
Truck
Other
Van
Motorcycle
Bus
School Bus
Null
0K
1K
2K
3K
4K
5K
Number of Collisions
Highway User Action
Went around the gate
Stopped on crossing
Other
Went through the gate
Suicide/Attempted Suicide
Did not stop
Stopped and then proceeded
Went around/through temporary barricade
0
500
1000
1500
2000
2500
3000
Number of Collisions
Number of Collisions by Time of Day
Number of Collisions
1:00 AM
2:00 AM
3:00 AM
4:00 AM
5:00 AM
6:00 AM
7:00 AM
8:00 AM
9:00 AM
10:00 AM
11:00 AM
12:00 PM
1:00 PM
2:00 PM
3:00 PM
4:00 PM
5:00 PM
6:00 PM
7:00 PM
8:00 PM
9:00 PM
10:00 PM
11:00 PM
12:00 AM
Click on “Gates”
Warning Device
Flashing Lights
None*
Gates
Keep Only
Exclude
Warning Device: Gates
Number of Collisions: 9,624
% of Total Number of Collisions: 44.15%
Vehicle Positio
Trapped on Crossing by Traffic
Stopped on Crossing
Moving over Crossing
Stalled on crossing
Driver Gender
Not Recorded
Female
Male
Driver Age
65 & Older
18 to 24
55 to 64
25 to 34
45 to 54
35 to 44
Calendar Year
(All)
Month
(All)
State
(All)
Injuries?
No
Yes
Crossing Type
(All)
Private
Public
Note: The statistics presented here include both public and private crossings.
*Private crossing are not required to have warning devices and are counted in the “None” category.
Undo
Redo
Revert
Refresh
Pause
Share
Download
Full Screen


National
Local
Details
Help
Information
U.S. Department of Transportation
Federal Railroad Administration
Highway-Rail Crossing Collisions Details
Years Displayed: All
Months Displayed: All
States Displayed: All
Type of Vehicle
Auto
Truck-trailer
Pick-up truck
Truck
Pedestrian
Other motor vehicle
Van
Other
Motorcycle
Bus
School Bus
0
200
400
600
800
Number of Collisions
Click on "Truck-trailer"…and
Number of Collisions by Time of Day
Number of Collisions
0
5
10
15
20
25
30
35
40
45
50
55
60
65
1:00 AM
2:00 AM
3:00 AM
4:00 AM
5:00 AM
6:00 AM
7:00 AM
8:00 AM
9:00 AM
10:00 AM
11:00 AM
12:00 PM
1:00 PM
2:00 PM
3:00 PM
4:00 PM
5:00 PM
6:00 PM
7:00 PM
8:00 PM
9:00 PM
10:00 PM
11:00 PM
12:00 AM
Warning Device
Flashing Lights
None*
Passive
Gates
Other
Vehicle Position
Trapped on Crossing by Traffic
Stopped on Crossing
Stalled on crossing
Moving over Crossing
Driver Gender
Female
Male
Driver Age
65 & Older
18 to 24
25 to 34
55 to 64
35 to 44
45 to 54
Calendar Year
(All)
Month
(All)
State
(All)
Injuries?
(All)
No
Yes
Fatal?
(All)
No
Yes
Crossing Type
(All)
Private
Public
Highway User Action
Did not stop
Stopped on crossing
Other
Stopped and then proceeded
Went around the gate
Went through the gate
Went around/through temporary barricade
0
50
100
150
200
250
300
Number of Collisions
Click on "55 to 64"
Note: The statistics presented here include both public and private crossings.
*Private crossing are not required to have warning devices and are counted in the "None" category.
Undo
Redo
Revert
Refresh
Pause
Share
Download
Full Screen

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GX Dash! Tips and Tricks

GX Dash! is a data visualization tool that allows users to interact with FRA's highway-rail grade crossing and inventory data in an intuitive way that drives insights. *GX Dash!* is supported by Tableau Software, which assists with the visualization of data into a format called dashboards. Tableau is designed to be intuitive and user friendly. As you become familiarized with *GX Dash!*, there are a few things that will allow users to get the most out of interacting with the data. The following are the top 8 most helpful things to know in order to successfully navigate through the dashboard.

1. **Filters:** Filtering allows you to tailor visualizations to include only specific criteria. For example, limiting graphics to a geographic area or range of years. Filters apply to every visualization you see on each tab including maps, graphs, and charts.

2. **Tool Tips:** These pop-up text boxes provide additional information when you hover the cursor over an object. Tool tips often pop-up when you hover over areas on a map. You will also find tool tips in line and pie graphs that provide the specific numbers behind the trends.

3. **Undo:** You can undo the last few actions taken while navigating the dashboard by clicking the back arrow button in the bottom left-hand corner of your dashboard. Whether it's a filter, selection, or exclusion, this function will let you back up a few steps.

4. **Interactive Visuals:** When you click on part of a graph or map, the rest of the dashboard filters to include only data relevant to what you selected. Deselect by clicking in the blank space of the visual or clicking the original selection a second time.

5. **Maps Functions:** Use the search function on the top left-hand corner of maps to zoom into a particular state, county, or city. To move the map manually hold "Shift" then click and drag your mouse. You can also double-click to zoom in and "Shift"+ double-click to zoom out.

Pro-tip: To zoom at smaller intervals hold "CTRL" while zooming in/out with your mouse.

6. **Revert to Saved:** Clicking "Revert" in the bottom left-hand corner of your screen will reset the dashboard to the original version of webpage. This function resets all filters, highlights, etc. giving you a fresh start.

7. **"Exclude" and "Keep Only":** Hovering over or selecting any element of a visual will present the option "Keep only" or "Exclude". Excluding your selection will eliminate that set of data from visuals on the entire dashboard, the opposite is true for "Keep only." To retrieve these values back, use the "Undo" function (Tip #4).

8. **Highlighting:** In the top right-hand corner of each legend there is a highlighter symbol, clicking this turns on and off the highlighting function. When this function is on, selecting values in the legend will highlight the corresponding data throughout the rest of the dashboard, where applicable.

For Media Inquiries Contact: frapa@dot.gov
For Technology Inquiries Contact: fraweb@dot.gov

U.S. Department of Transportation
Federal Railroad Administration

When a collision occurs at a highway-rail crossing, also known as a grade crossing, the railroad involved is required to file a detailed report of the incident to the Department of Transportation's Federal Railroad Administration. These reports are recorded through Form FRA F6180.57. Form FRA F6180.57 report data feeds all graphs and visuals in this dashboard. For more information on grade crossing data and statistics please visit the FRA Safety Data website at https://safetydata.fra.dot.gov .

Note.
The data contained within the GX DashI website is being disseminated in the interest of information exchange. This data is generated by the Federal Railroad Administration's Safetydata database, which is located at https://safetydata.fra.dot.gov .This database is updated monthly. Users of this data should anticipate possible variations, based on the updates provided by the railroads and/or States. The United States government assumes no liability for the content or use of the data contained within this website.

Additional Online Data Resources
Federal Railroad Administration: https://www.fra.dot.gov/Page/P0001
Highway-Rail Grade Crossing and Trespass Prevention Division: https://www.fra.dot.gov/Page/P0841
Operation Lifesaver: https://oli.org/

Web-based Accident Prediction System (WBAPS)

What is WBAPS?

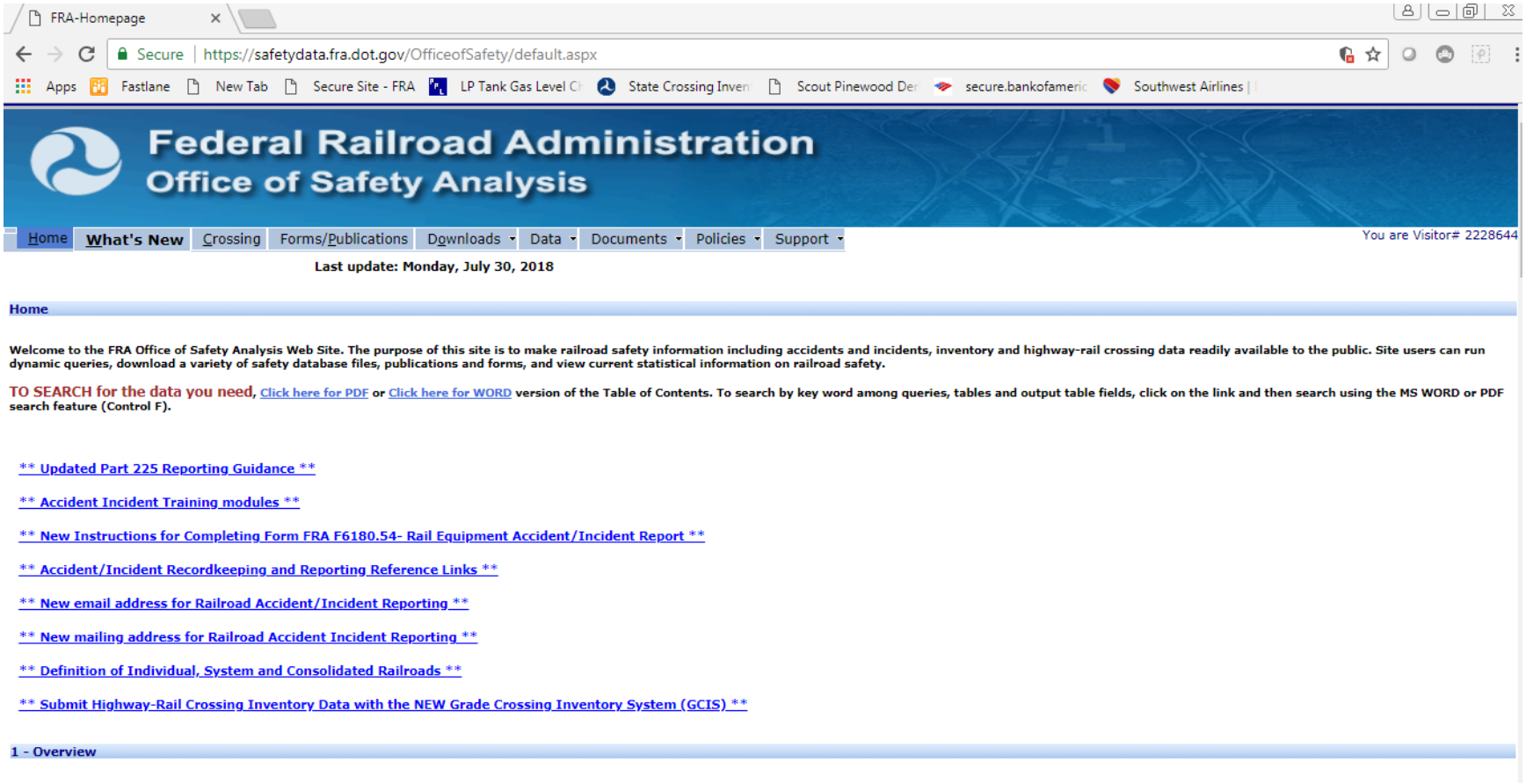
- FRA's Highway-Rail Crossing Web-based Accident Prediction System
- Generates reports listing open, public at-grade highway-rail crossings
- Ranked by predicted accidents per year.
- Used by States and Railroads for Section 130 purposes or for grant applications

Why use WBAPS?

- A tool to identify particular crossings that may be more hazardous than others
- Provides data results of the crossing's physical and operating characteristics, along with the crossing's accident history over the last 5 years
- Assists in the decision-making process in determining which crossing(s) to fund for safety enhancements
- **DOES NOT** rank crossings in terms of most to least dangerous

FRA's Safety Data Homepage

- https://safetydata.fra.dot.gov/OfficeofSafety/default.aspx



Scroll down to 5.03…

3.11 Accident Detail Report
3.16 Summary of Train Accidents With Reportable Damage, Casualties, and Major Causes
3.17 Type Of Territory Vs. Accident Type and Cause
3.18 Accident By State/Railroad

4 - Casualties

4.02 FRA Guide for Preparing Accident/Incident Reports (Published May 2011)
4.03 FRA Guide (PDF) (Effective May 1, 2003)

Query FRA Casualty Data:
4.06 Casualty Detail Report
4.07 Casualty Map with Table
4.08 Casualty Summary Tables
4.09 Worker Safety Report
4.11 Suicide Casualties By State/Railroad
4.12 Casualties By State/Railroad
4.13 Trespasser Incidents by Age, Day of Week, Time of Day
4.14 One Month Casualty Report in Text Format

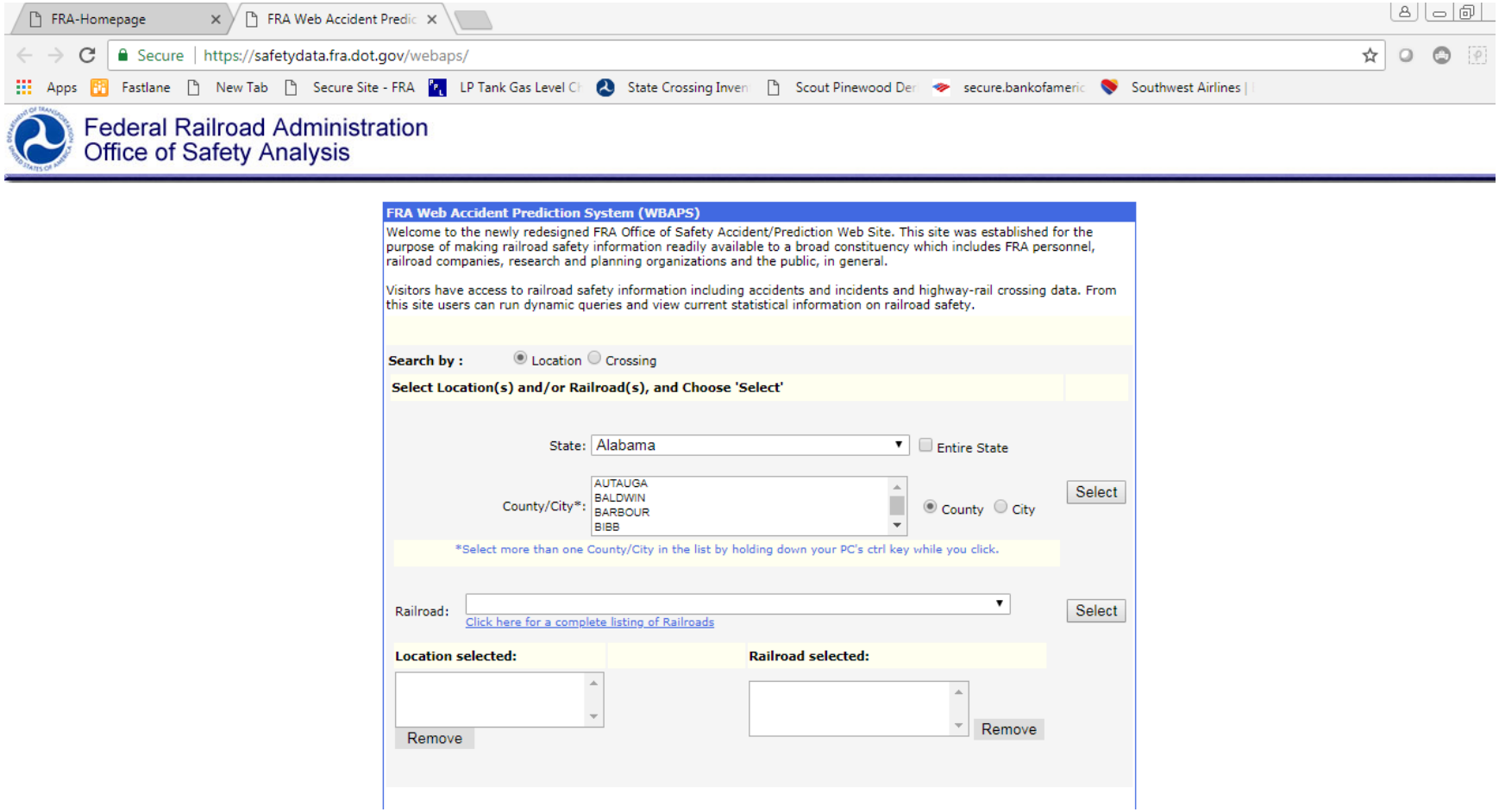
5 - Highway-Rail Crossing Accidents

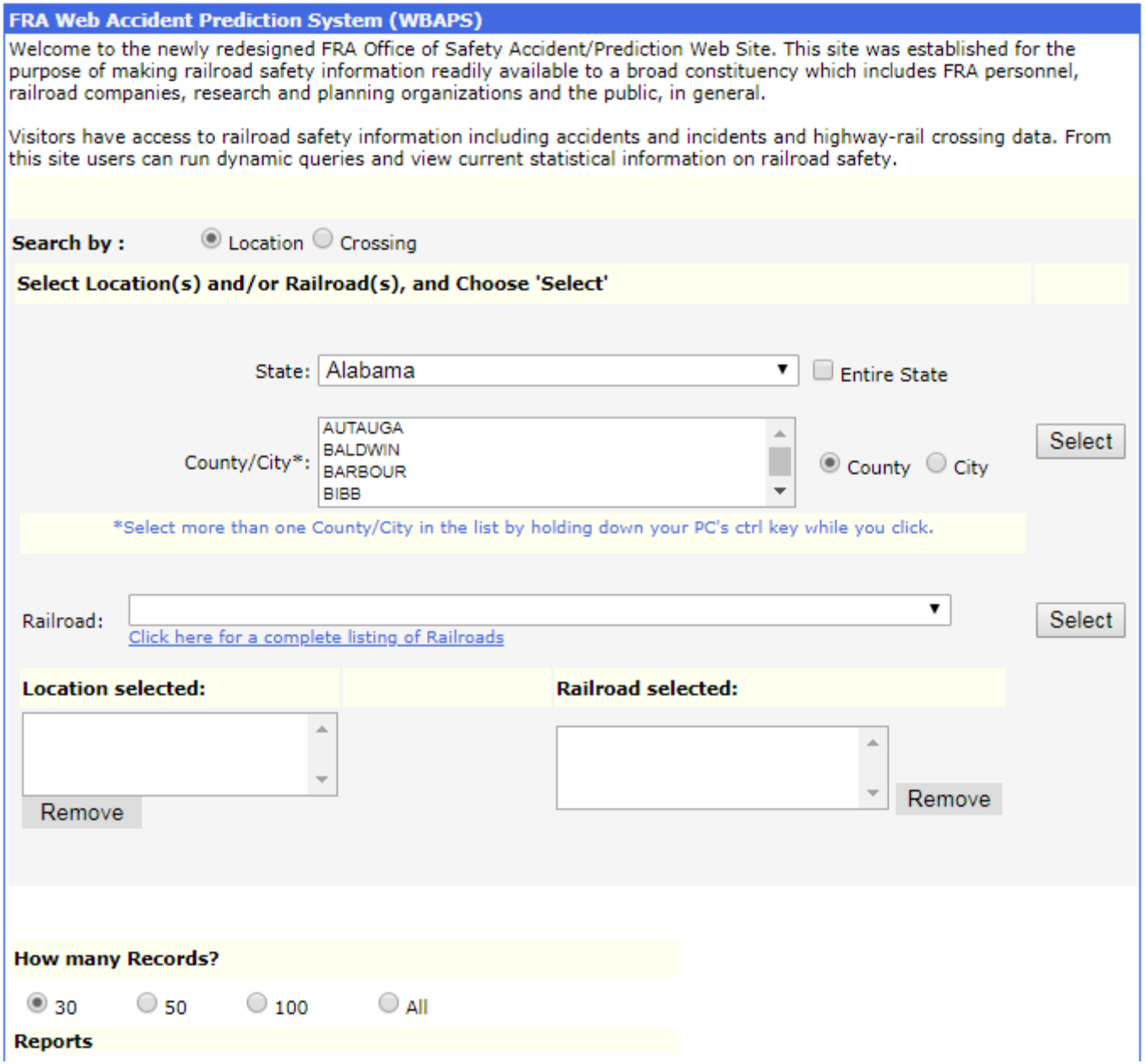
5.01 FRA Guide (PDF) (Effective Ma
5.02 Generate Crossing Inventory dent Reports
5.03 Accident Prediction - WBAPS
5.06 FRA Guide for Preparing Accident/Incident Reports (Published May 2011)

Query FRA Crossing Accident Data:
5.08 Frequency of Crossing Collisions
5.09 Hwy/Rail Detail Report
5.10 Hwy/Rail Map with Table
5.14 Hwy Rail Accident Incident Summary By Railroad
5.15 Consolidated Hwy Rail Accident Incident

WBAPS Homepage

- https://safetydata.fra.dot.gov/webaps/




FRA Web Accident Prediction System (WBAPS)
Welcome to the newly redesigned FRA Office of Safety Accident/Prediction Web Site. This site was established for the purpose of making railroad safety information readily available to a broad constituency which includes FRA personnel, railroad companies, research and planning organizations and the public, in general.
Visitors have access to railroad safety information including accidents and incidents and highway-rail crossing data. From this site users can run dynamic queries and view current statistical information on railroad safety.
Search by :
Location
Crossing
Select Location(s) and/or Railroad(s), and Choose 'Select'
State:
Alabama
Entire State
County/City*:
AUTAUGA
BALDWIN
BARBOUR
BIBB
County
City
Select
*Select more than one County/City in the list by holding down your PC's ctrl key while you click.
Railroad:
Click here for a complete listing of Railroads
Select
Location selected:
Railroad selected:
Remove
Remove
How many Records?
30
50
100
All
Reports

Begin live demonstration

https://safetydata.fra.dot.gov/webaps/

Thank you!

Frank Frey
Frank.frey@dot.gov
202-738-2195

GradeDec.Net

FRA Web-Based Benefit Analysis Tool

U.S. Department of Transportation
Federal Railroad Administration

What is GradeDec.Net?

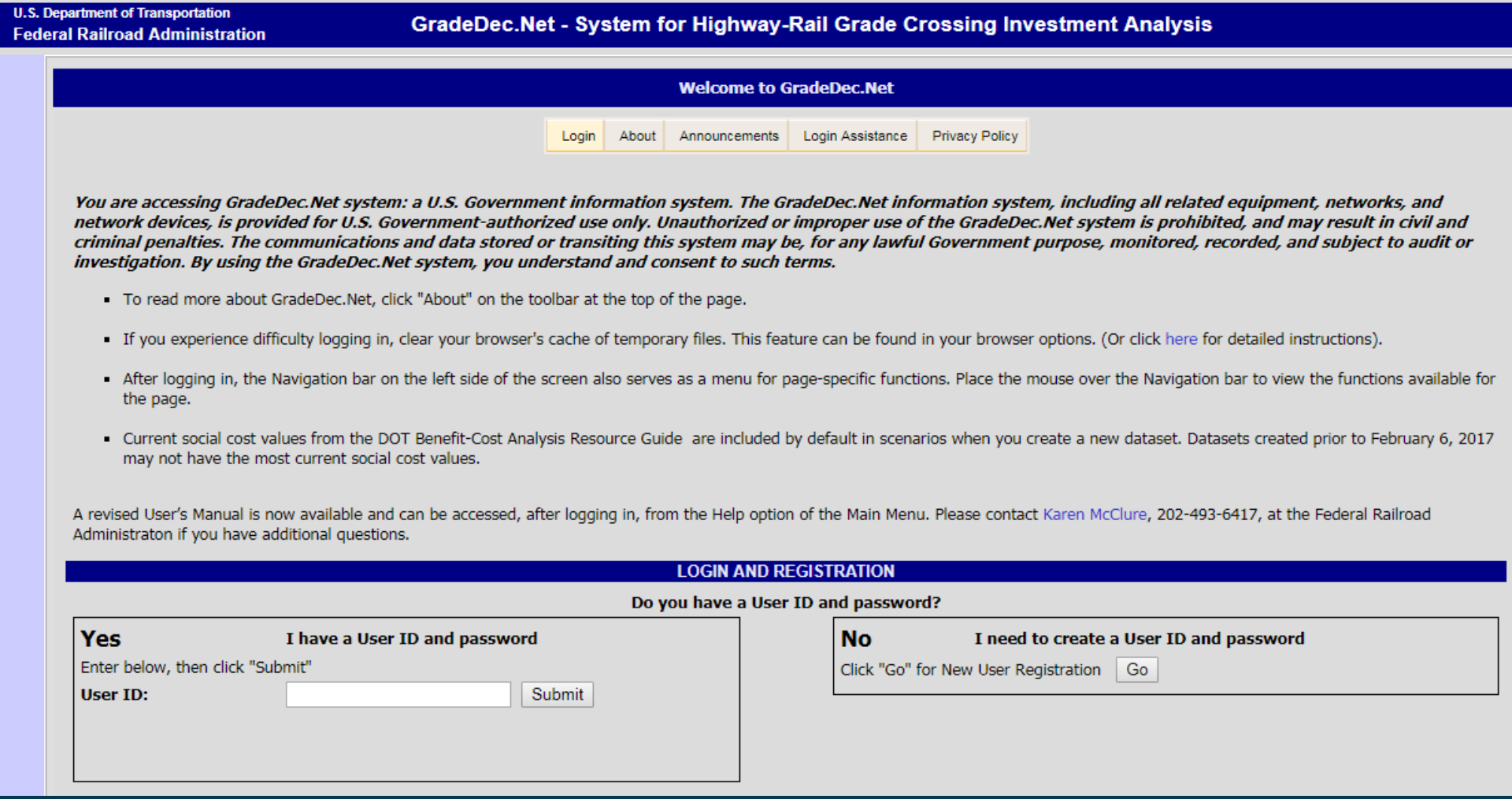
- Web-Based Highway-Rail Grade Crossing Benefit Cost Analysis Tool
  - Evaluates crossing upgrades, closures, and separations
  - Compares grade crossing investment benefits of improved safety and reduced travel time, environmental impacts, and highway vehicle fuel costs to capital and maintenance costs
  - Benefits and costs are discounted to allow decision-makers to inspect future benefits in terms of present day values
  - Meets all criteria outlined in the US DOT Benefit-Cots Analysis Guidance for Discretionary Grant Programs
  - The model is completely transparent. Users can adjust model parameters to more accurately reflect local circumstances.

What is GradeDec.Net?

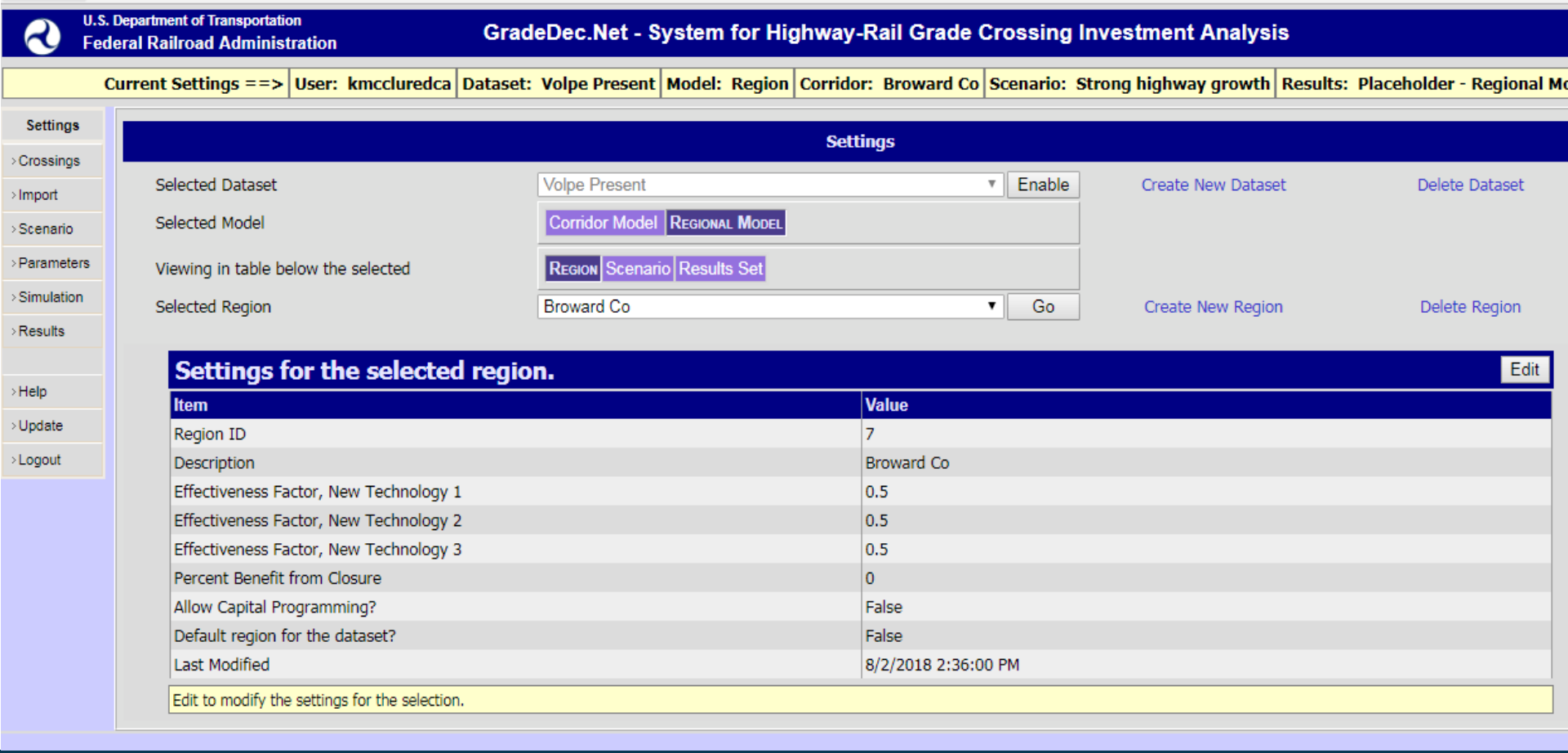
- Easy access to FRA National Grade Crossing Inventory Database and FRA Accident Data
- Evaluate crossings within a region or along a rail corridor
  - Region: Rank crossings within a county, group of counties, or state
  - Measure the effects of grade crossing closure and separation on adjacent crossings
  - Corridor: Input train and highway vehicle time-of-day arrival rates to estimate probability that trains and vehicles arrive at crossings simultaneously.
- Measures the length of queue behind closed gates to so planners anticipate 'spillback' to the next roadway intersection

LoginGradeDec.Net

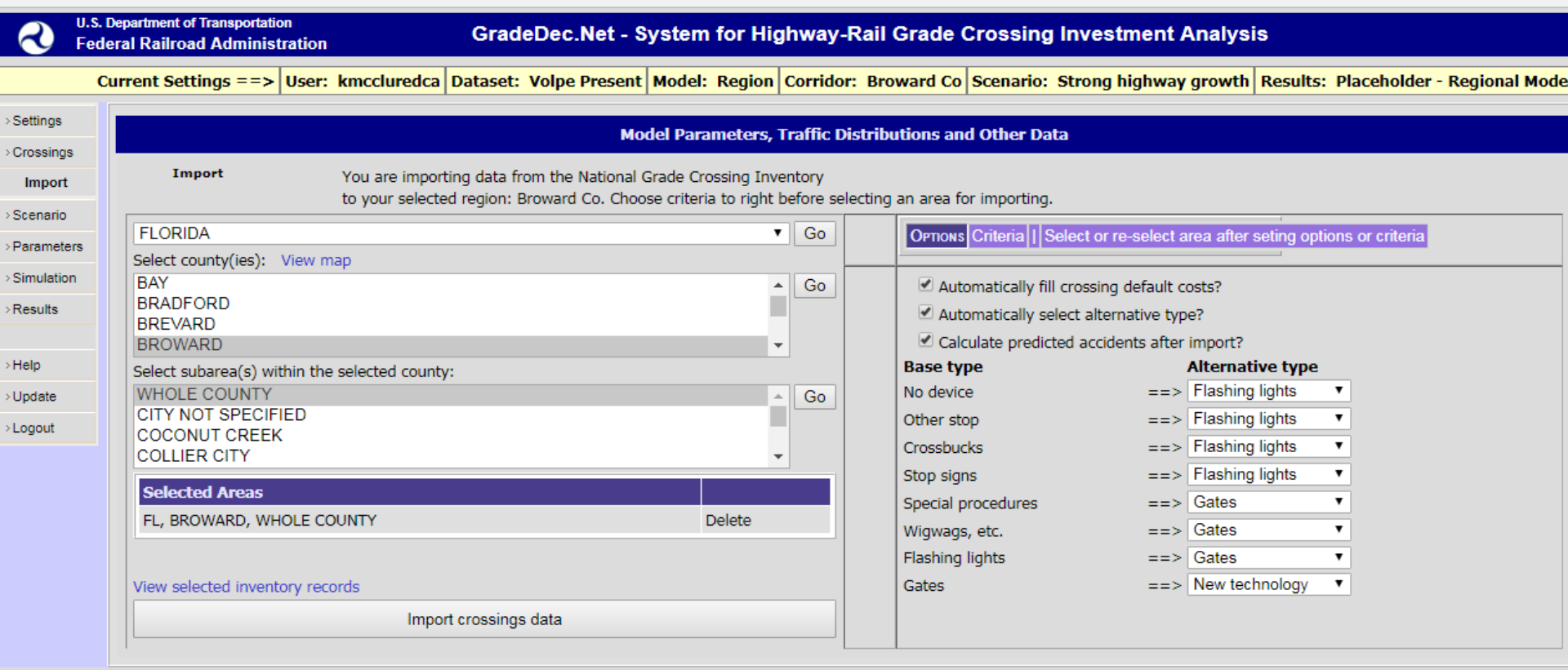
https://gradedec.fra.dot.gov/



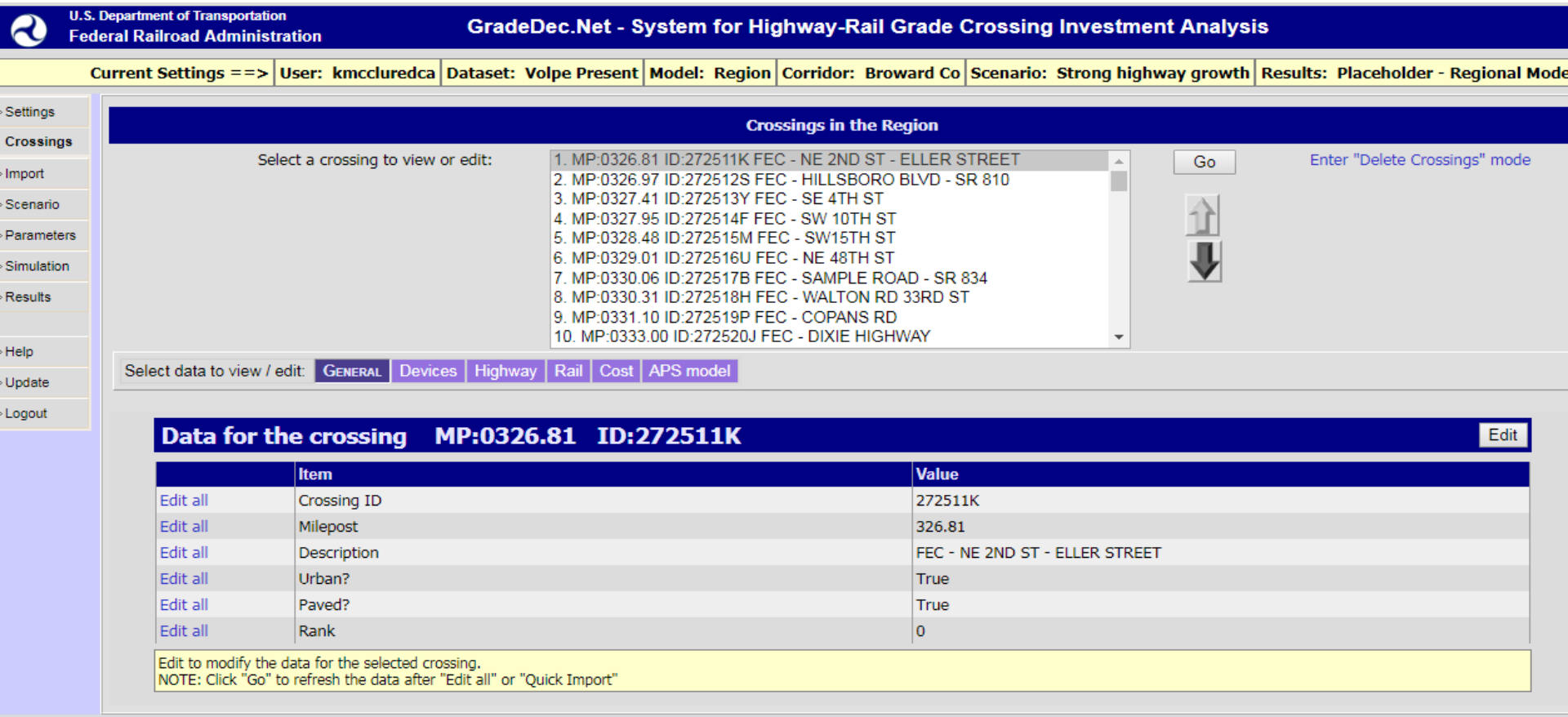
Select Regional Model and Import All Crossings In County



Upgrade all crossing while importing

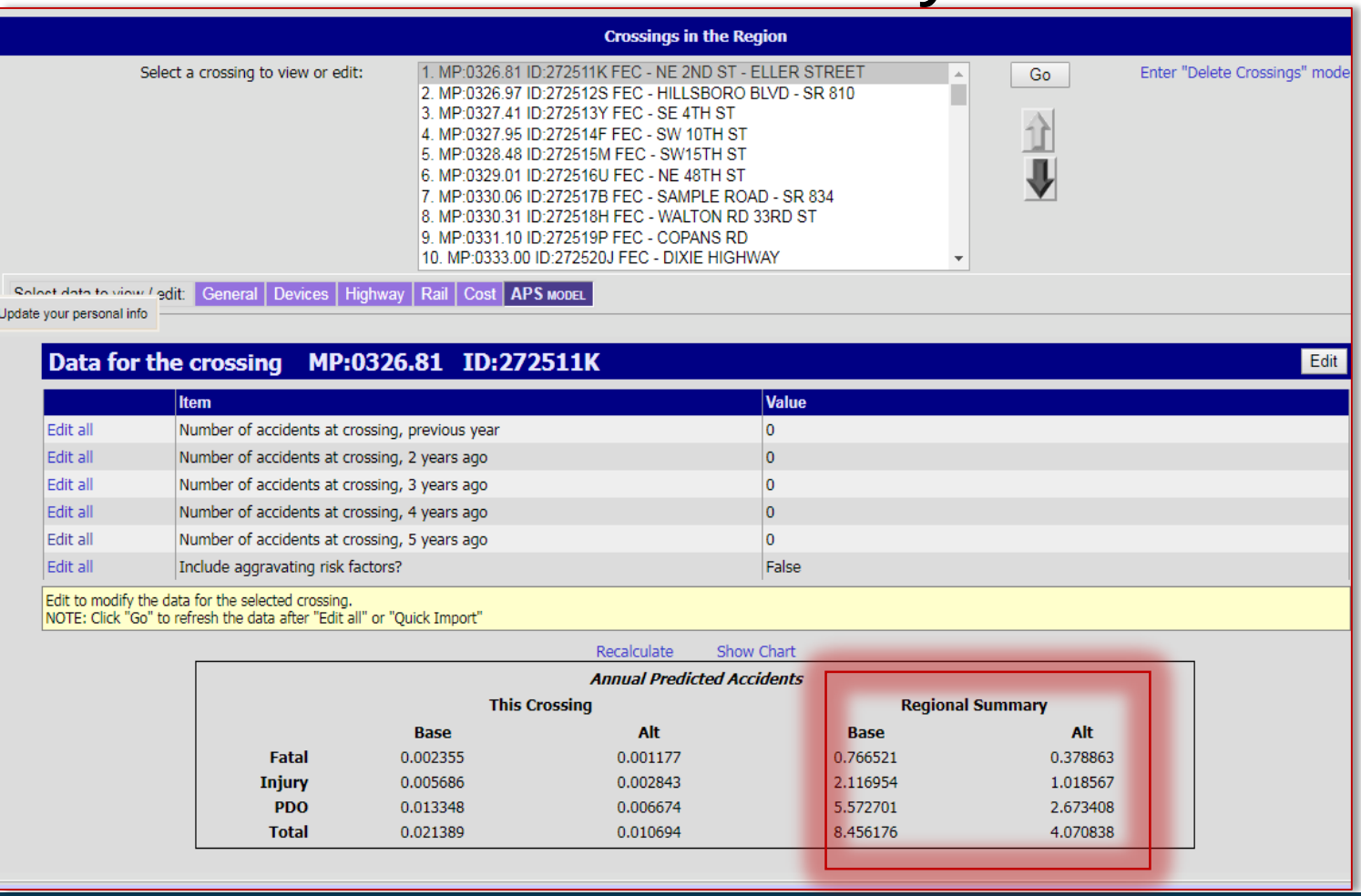


Go to Crossings page to verify all imported data

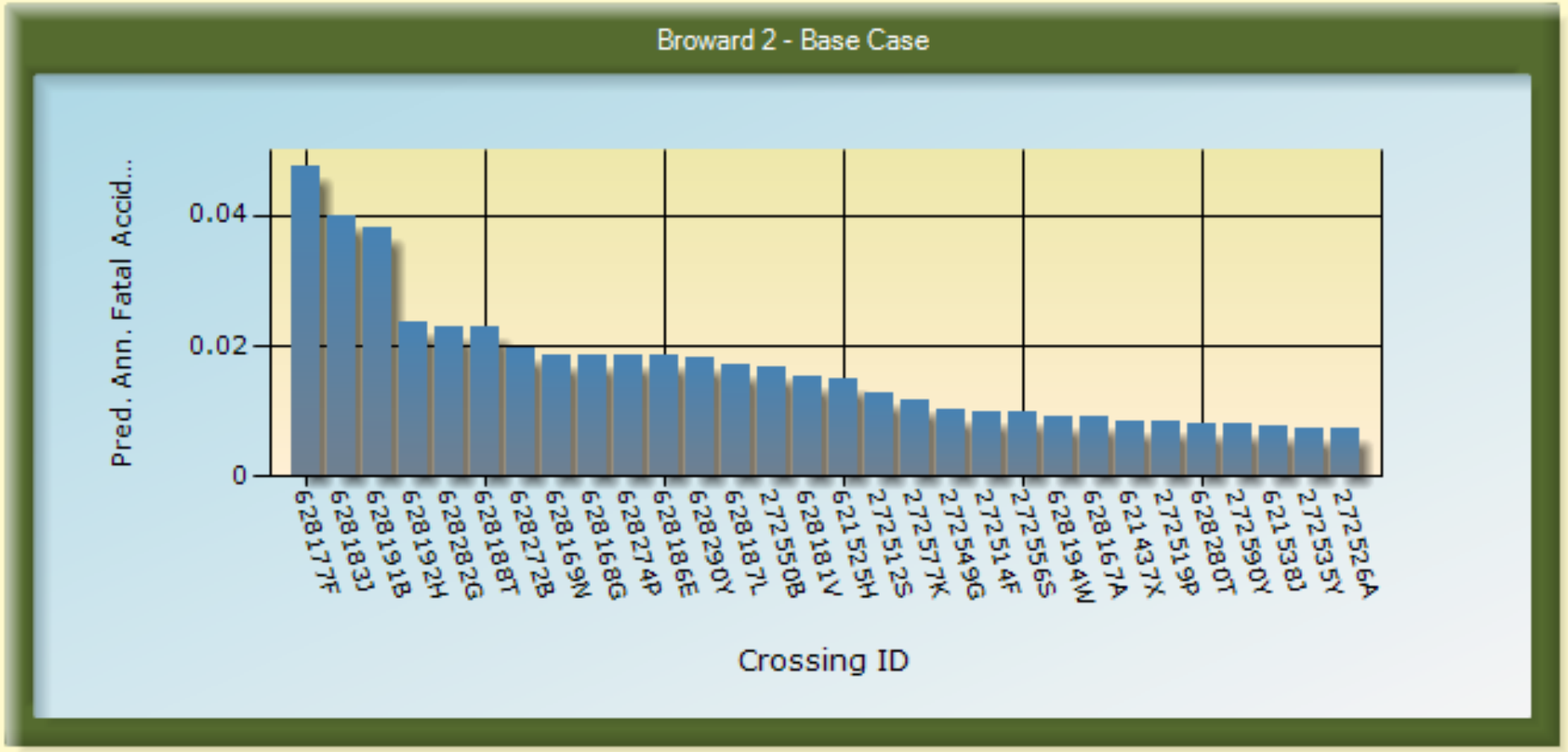


All 140 Broward County crossings are imported.

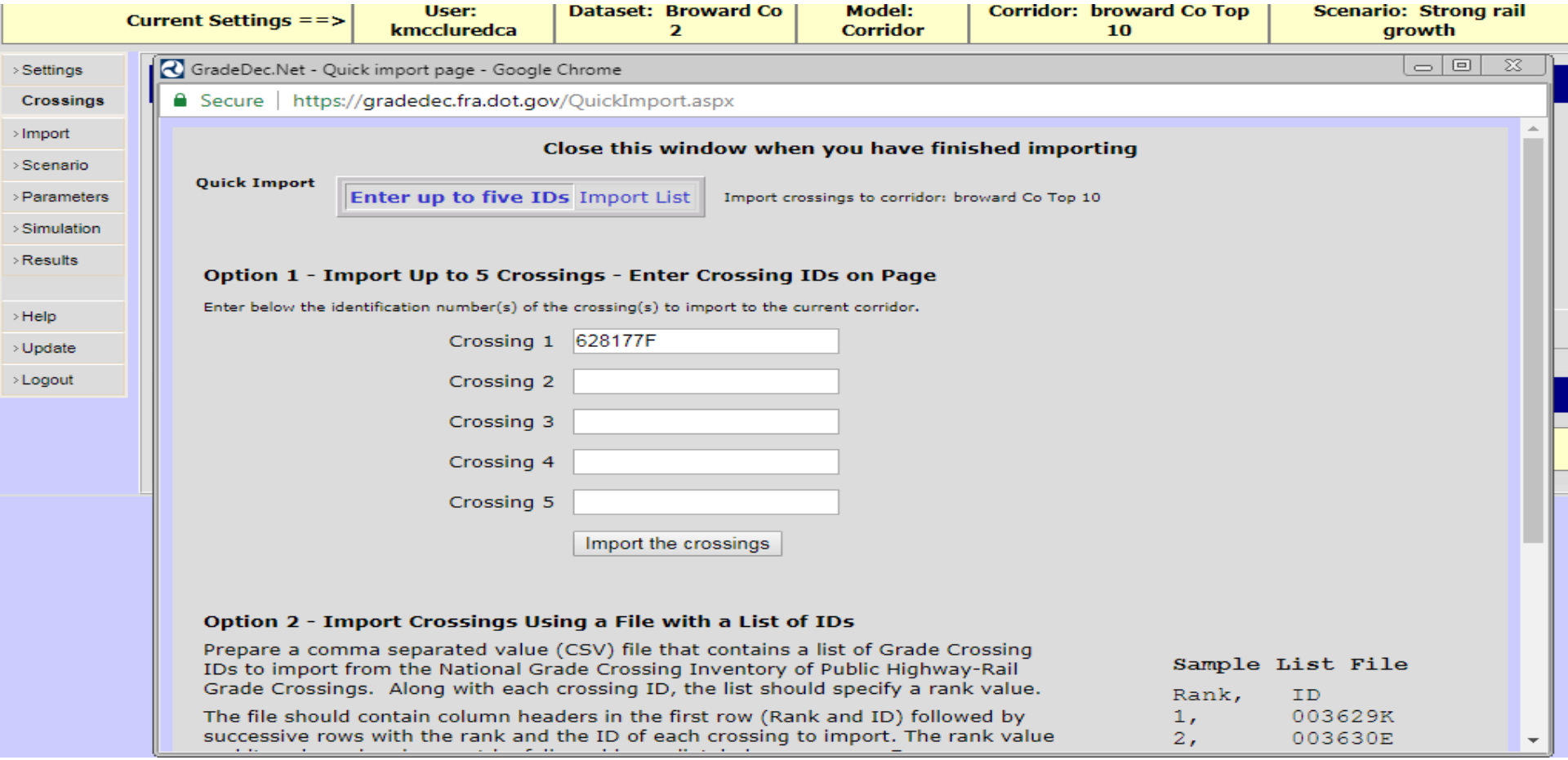
Use US DOT APS Model to estimate risk for each crossing and the entire county



Select the 10 most dangerous crossing IDs in the county



Switch to Corridor Model, Use Quick Import to select top 10 high risk crossings



Calculate the Maximum Queue Length Behind Each Crossing

Results: Placeholder - Corridor Model

Selected results data group: Max Queue Length, last year, by GCX ▾ Go Show summary chart

	Variable	Mean Value	Standard Deviation
No view	Max queue length, last year, GCX 1, PCE, MP 1001.29	71.067	NaN
No view	Max queue length, last year, GCX 2, PCE, MP 1002.3	42.604	NaN
No view	Max queue length, last year, GCX 3, PCE, MP 1004.34	29.929	NaN
No view	Max queue length, last year, GCX 4, PCE, MP 1006.31	18.160	NaN
No view	Max queue length, last year, GCX 5, PCE, MP 1007.88	7.801	NaN
No view	Max queue length, last year, GCX 6, PCE, MP 1009.01	36.414	NaN
No view	Max queue length, last year, GCX 7, PCE, MP 1010.08	10.771	NaN
No view	Max queue length, last year, GCX 8, PCE, MP 1016.2	28.747	NaN
No view	Max queue length, last year, GCX 9, PCE, MP 1017.3	24.567	NaN
No view	Max queue length, last year, GCX 10, PCE, MP 1020.85	28.144	NaN

Go to the Simulation Page, click run, then select Max Queue, last year, by GCX. Identify crossings most suitable for separation

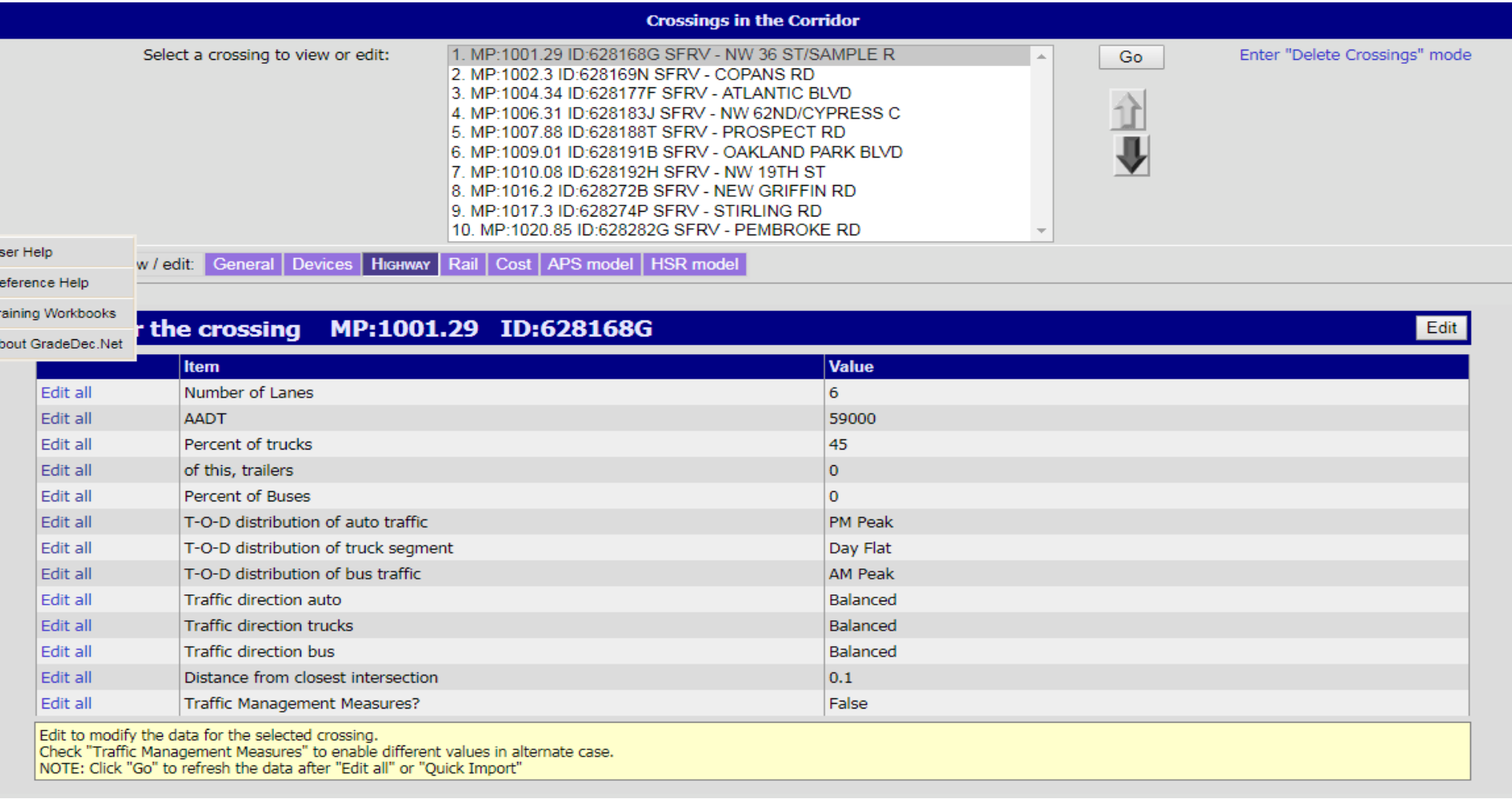
Return to the Crossings page, Click the Devices tab, click “Edit All’ alternative devices, then separate the top two crossings.

Data for all crossings in the corridor

Edit

No.	Crossing ID	Milepost	Description	Alternate Case Device
1	628168G	1001.29	SFRV - NW 36 ST/SAMPLE R	Grade Separation
2	628169N	1002.3	SFRV - COPANS RD	Grade Separation
3	628177F	1004.34	SFRV - ATLANTIC BLVD	New Technology 1
4	628183J	1006.31	SFRV - NW 62ND/CYPRESS C	New Technology 1
5	628188T	1007.88	SFRV - PROSPECT RD	New Technology 1
6	628191B	1009.01	SFRV - OAKLAND PARK BLVD	New Technology 1
7	628192H	1010.08	SFRV - NW 19TH ST	New Technology 1
8	628272B	1016.2	SFRV - NEW GRIFFIN RD	New Technology 1
9	628274P	1017.3	SFRV - STIRLING RD	New Technology 1
10	628282G	1020.85	SFRV - PEMBROKE RD	New Technology 1

Adjust Highway Traffic Time of Day Arrival Rate



Use “Edit All” for all auto traffic distributed to PM peak

Data for all crossings in the corridor

Cancel | Update

No.	Crossing ID	Milepost	Description	T-O-D distribution of auto traffic
1	628168G	1001.29	SFRV - NW 36 ST/SAMPLE R	PM Peak
2	628169N	1002.3	SFRV - COPANS RD	PM Peak
3	628177F	1004.34	SFRV - ATLANTIC BLVD	PM Peak
4	628183J	1006.31	SFRV - NW 62ND/CYPRESS C	PM Peak
5	628188T	1007.88	SFRV - PROSPECT RD	PM Peak
6	628191B	1009.01	SFRV - OAKLAND PARK BLVD	PM Peak
7	628192H	1010.08	SFRV - NW 19TH ST	PM Peak
8	628272B	1016.2	SFRV - NEW GRIFFIN RD	PM Peak
9	628274P	1017.3	SFRV - STIRLING RD	PM Peak
10	628282G	1020.85	SFRV - PEMBROKE RD	PM Peak

Be sure to click “Update” to save your changes.

Benefit Cost Results at the 7 percent discount rate

Results: Placeholder - Corridor Model

Selected results data group: Benefits and Benefit-Cost Summary ▾ Go Show summary chart

	Variable	Mean Value
No view	Safety benefits, thous $ PV	28156.590
No view	Travel time savings, thous $ PV	37618.070
No view	Environmental benefits, thous $ PV	4151.333
No view	Veh operating cost benefit, thous $ PV	11513.290
No view	Network benefits, thous $ PV	70.713
	Total benefits, thous $ PV	82717.030
	of this, benefits from induced trips, thous $ PV	29.829
	of this, disbenefits from induced trips, thous $ PV	-80.621
	of this, investment salvage value, thous $ PV	1257.826
	Total costs, thous $ PV	23000.700
No view	Net benefits, thous $ PV	59716.330
No view	Benefit-cost ratio	3.596
No view	Rate of return (constant dollars), %	19.143
No view	Local benefits (not included in summary), thous $ PV	8271.703

Help
rence Help
ning Workbooks
ut GradeDec.Net

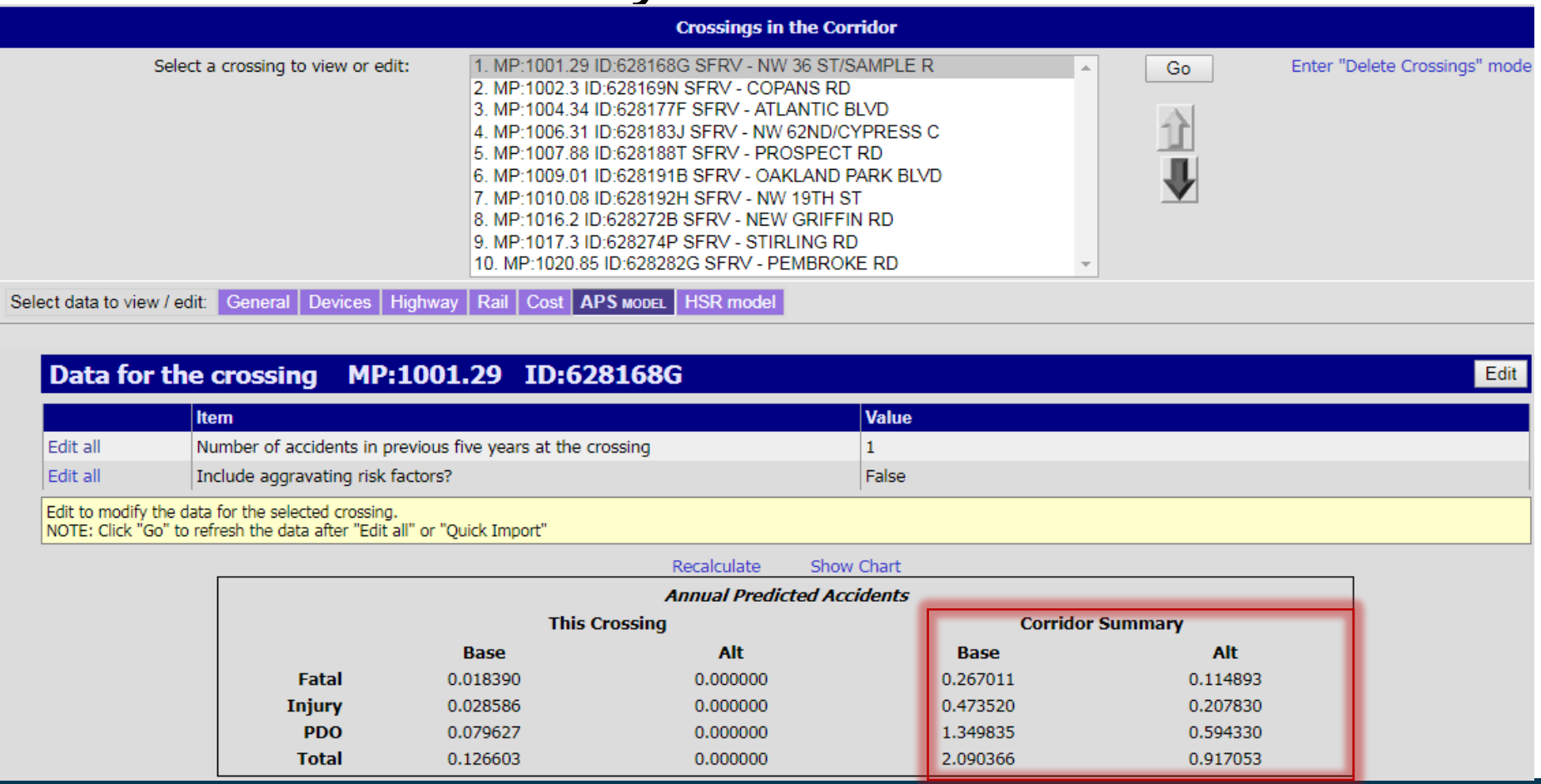
Intermediate Values: Maximum Queue Length

Results: Placeholder - Regional Model

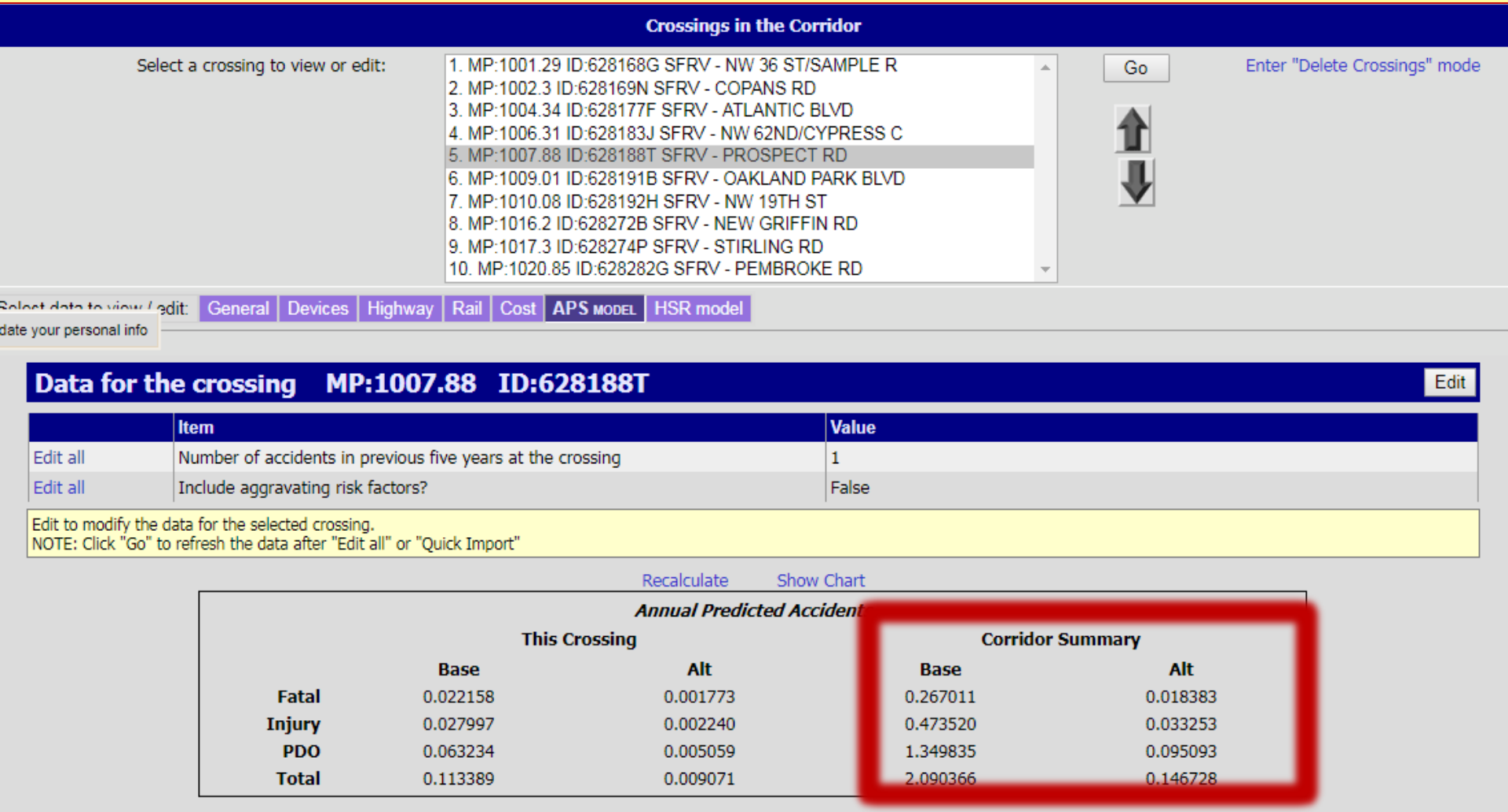
Selected results data group: Max Queue Length, last year, by GCX ▼ Go Show summary chart

Variable	Mean Value	St
Max queue length, last year, GCX 1, PCE, ID 272511K	5.890	
Max queue length, last year, GCX 2, PCE, ID 272512S	425.665	
Max queue length, last year, GCX 3, PCE, ID 272513Y	5.084	
Max queue length, last year, GCX 4, PCE, ID 272514F	95.014	
Max queue length, last year, GCX 5, PCE, ID 272515M	12.342	
Max queue length, last year, GCX 6, PCE, ID 272516U	17.157	
Max queue length, last year, GCX 7, PCE, ID 272517B	425.665	
Max queue length, last year, GCX 8, PCE, ID 272518H	15.630	
Max queue length, last year, GCX 9, PCE, ID 272519P	397.776	
Max queue length, last year, GCX 10, PCE, ID 272520J	2851.942	

Targeting the two most dangerous crossing of the 10 selected for the analysis reduced accident risk by 50%.



Add 4 quad gates with 60’ median barriers to the other 8 crossings



Questions?

Thank you!

Karen McClure
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karen.mcclure@dot.gov
202-493-6417