

Signal Four Analytics

ILIR BEJLERI

Geoplan Center - University of Florida

FDOT Transportation Data Symposium – October 2014

Overview

- Signal Four Analytics is a statewide interactive, web-based geospatial crash analytical tool
- Developed by and hosted at University of Florida, Geoplan Center
- Main site: <http://s4.geoplan.ufl.edu/>

Target Audience

- Developed for Florida government agencies in:
 - Law Enforcement,
 - Traffic Engineering,
 - Transportation Planning,
 - School Transportation,
 - Injury Prevention,
 - Universities
 - Any organization related to traffic safety
- And private Contractors/Consultants contracted by Florida public agencies

Support & Funding

- Funded by the State of Florida
- Through Florida Traffic Records Coordinating Committee (**TRCC**) (search for Florida TRCC)
- TRCC mission is to improve traffic information systems in the state
- TRCC manages federal funds available for this purpose

Support & Funding – cont.

- TRCC representatives:
 - Department of Transportation
 - Department of Health
 - Department of Highway Safety & Motor Vehicles
 - Agency for Health Care Administration
 - Florida Highway Patrol



Support & Funding – cont.

- To learn more go to TRCC website:
- <http://www.dot.state.fl.us/safety/2A-Programs/Traffic-Crash-Data.shtm>
- An easy way to get to it:
 - Google search for “**Florida TRCC**”

S4 Analytics Focus

- **Accessibility**
 - Makes it easy to get to the data, no special software required
- **Timeliness**
 - Crash data is up to date as reported by law enforcement to DHSMV
- **Utilization**
 - Web-based simple to use intuitive tools, minimal or no training required
- **Geospatial Analytics**
 - Various functions to look at the data spatially

Incident Database

- 3.6 million crash records (2006-present) provided by DHSMV
- 3.5 million citations -FHP only (2011 to present)

GIS Roadway Database

- GIS Streets
 - Uses Navteq Florida unified basemap
- Some Local Data
 - Measured traffic volumes on local roads for selected counties

Update Frequency

- Crash Database Update
 - Daily, twice a day, provided by DHSMV
 - Mapping conducted by
 - University of Florida
 - FDOT shapefiles

Features

- Interface panels
 - Map-centric, resizable query, chart, tabular
- Map Navigation
 - Zoom, pan, drill down, map overview, crash visualization modes, several base maps, street view
 - Tabular Information
 - Colors, crash type, crash reports, data export

Features - cont

- Interface panels
 - Map-centric, resizable query, chart, tabular
- Map Navigation
 - Zoom, pan, drill down, map overview, crash visualization modes, several base maps, street view,
 - Crash point symbology: color and symbol by crash type
- Data export

Features cont

- Bar charts
 - Several attributes
- Query panel
 - Geographic area
 - Crash severity, bike/ped, etc
 - Network (Intersection, Street, Custom, Route)

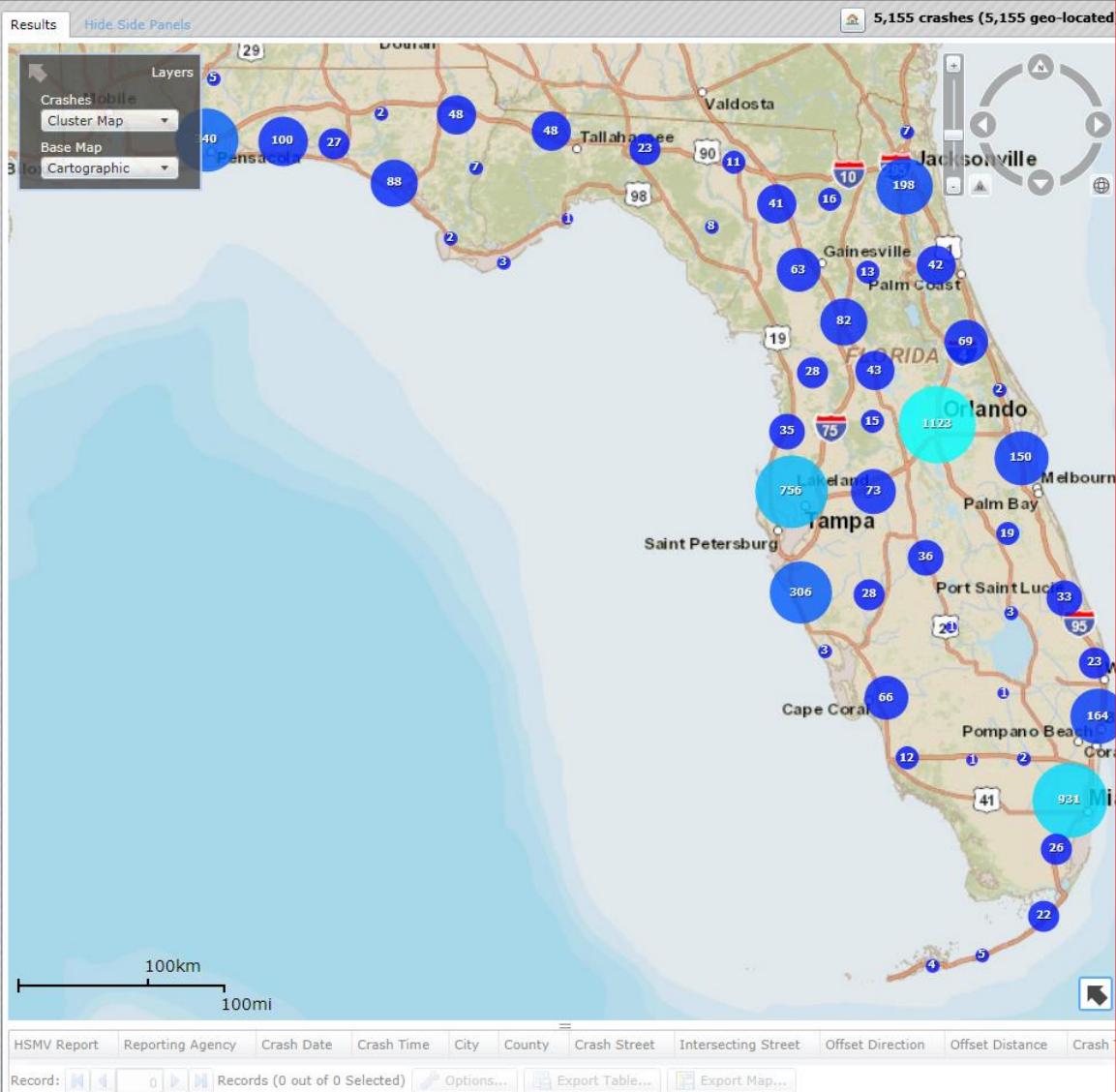
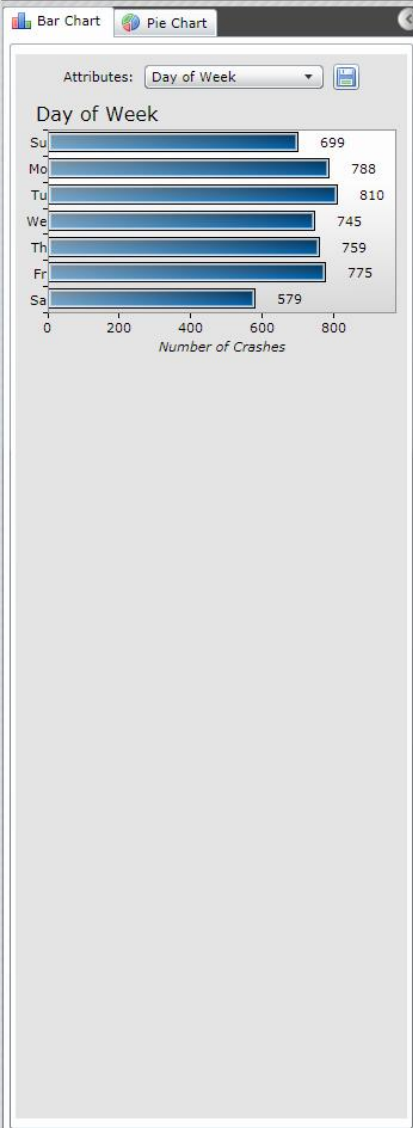
Features cont

- Custom Geographic Area
- Export to GIS
- Network Extent
- 2D Charts & Collision Diagrams
- Selections
- Location and Attribute Editing
- Crash Types

SIGNAL FOUR ANALYTICS

SIGNAL FOUR ANALYTICS

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Crash Profile

Save

Date/Time

Date Range: 4/1/2012 - 4/16/2012

Day of Week: All

Time of Day: All

Geographic Area

Geographic Extent: State of Florida

Participants

Investigating Agency: All

Driver Age: All

Driver Gender: All

Mode of Travel: All

Source of Transport: All

Behavioral Factors: Any

Common Violations: Any

Circumstances

Crash Severity: All

Crash Type: All

CMV Configuration: All

Environmental Circumstances: All

Road Circumstances: All

First Harmful Event: All

Light Condition: All

Road Jurisdiction: All

Road System Identifier: All

Search Clear

Examples of Query Filters

Crash Severity

- All
- Property Damage Only
- Injury - All
- Injury - Not Using Seat Belt
- Injury - Incapacitating
- **Fatality - All**
- **Fatality - Not Using Seat Belt**

Weather Condition

- All
- Clear
- Cloudy
- Rain
- Fog, Smog, Smoke
- Sleet/Hail/Freezing Rain
- Blowing Sand, Soil, Dirt
- Severe Crosswinds
- Other

Crash Type

- All
- **Bicycle**
- **Pedestrian**
- Head On
- Rear End
- Left Entering
- Left Leaving
- Left Rear
- Right Angle
- Right/Left
- Right/Through
- Right/U-Turn
- Opposing Sideswipe
- Same Direction Sideswipe
- Off Road
- Rollover
- Other
- Unknown

Common Violations

- Any
- **Unlawful or Unsafe Speed**
- **Ran Red Light**
- Failed to Yield Right of Way
- Failed to Obey Traffic Control Device
- Careless Driving

Mode of Travel

- All
- Pedestrian
- Bicycle
- Moped
- Motorcycle

Behavioral Factors

- Any
- Aggressive Driving
- Distracted Driving
- **Alcohol Involved**
- **Drugs Involved**

Lane Departure

- All
- Off Road - All
- Off Road - Rollover
- Off Road - Collision Fixed Object
- Crossed into Oncoming Traffic
- Sideswipe

Road Jurisdiction

- All
- DOT
- Other

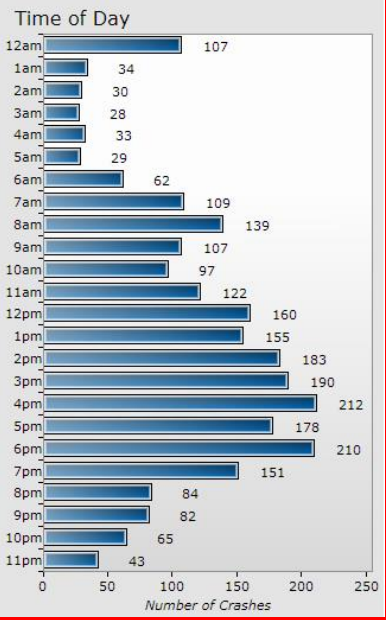
SIGNAL FOUR ANALYTICS

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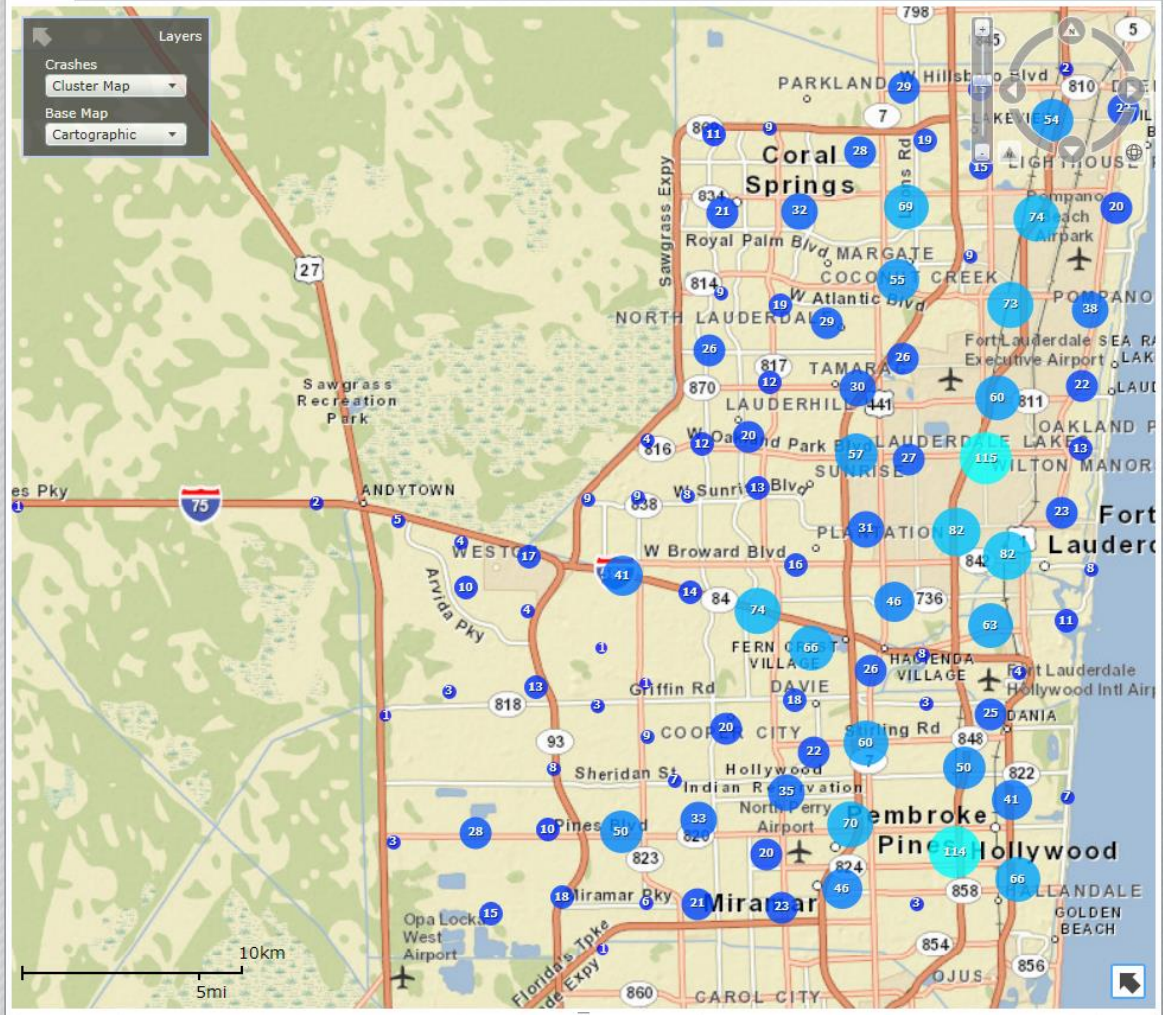
SIGNAL FOUR ANALYTICS

Bar Chart Pie Chart

Attributes: Time of Day



Results Hide Side Panels 2,610 crashes (2,610 geo-located)



HSMV Report Reporting Agency Crash Date Crash Time City County Crash Street Intersecting Street Offset Direction Offset Distance Crash T

Record: [Navigation icons] 0 Records (0 out of 0 Selected) [Options...] [Export Table...] [Export Map...]

Crash Profile

Save

Date/Time

- Date Range: 1/1/2010 - 2/1/2010
- Day of Week: All
- Time of Day: All

Geographic Area

- Geographic Extent: County
- County: Broward

Participants

- Investigating Agency: All
- Driver Age: All
- Driver Gender: All
- Mode of Travel: All
- Source of Transport: All
- Behavioral Factors: Any
- Common Violations: Any

Circumstances

- Crash Severity: All
- Crash Type: All
- CMV Configuration: All
- Environmental Circumstances: All
- Road Circumstances: All
- First Harmful Event: All
- Light Condition: All
- Road Jurisdiction: All

Search Clear

SIGNAL FOUR ANALYTICS

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Bar Chart Pie Chart

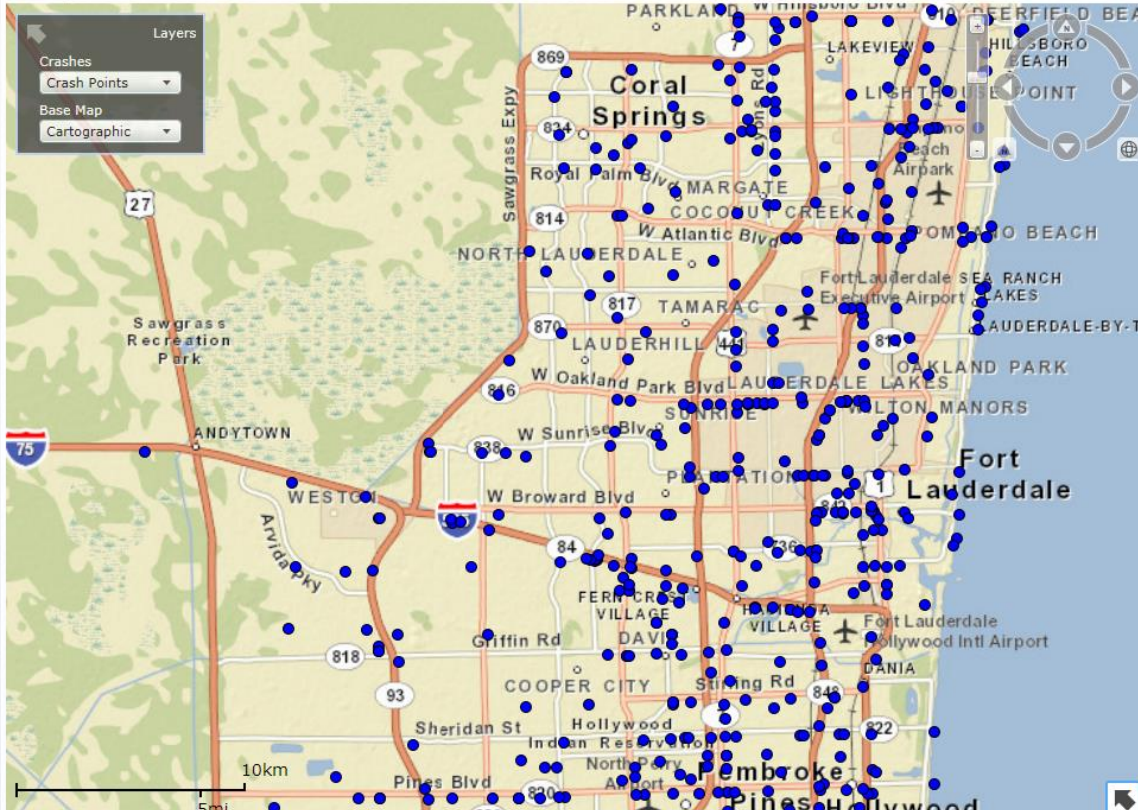
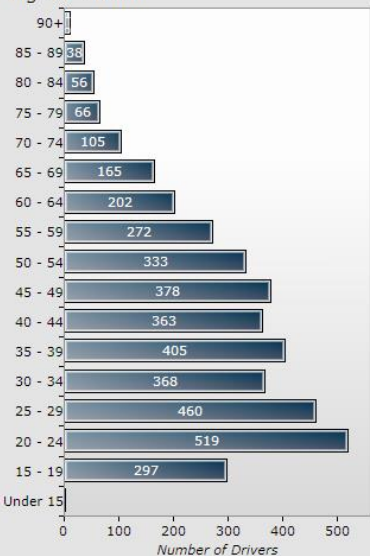
Results Hide Side Panels

2,457 crashes (2,457 geo-located, 1-500 displayed)

Crash Profile Save

Attributes: Age of Driver

Age of Driver



Date/Time

Date Range
+ 1/1/2010 - 1/31/2010

Day of Week
+ All

Time of Day
+ All

Geographic Area

Geographic Extent
+ County

County
+ Broward

Participants

Investigating Agency
+ All

Driver Age
+ All

Driver Gender
+ All

Mode of Travel
+ All

Source of Transport

Source of Transport
+ All

Behavioral Factors
+ None

Common Violations
+ None

Circumstances

Crash Severity
+ All

Crash Type
+ All

CMV Configuration
+ All

Environmental Circumstances
+ All

Road Circumstances
+ All

First Harmful Event
+ All

Light Condition
+ All

Maintenance Jurisdiction
+ All

HSMV Report	Reporting Agency	Crash Date	Crash Time	City	County	Crash Street	Inte
75559265	Wilton Manors Police Department	1/30/2010	12:30 PM	Wilton Manors	Broward	W OAKLAND PK BLVD	N ANDREW
91396231	Ft. Lauderdale Police Department	1/30/2010	12:32 PM	Ft. Lauderdale	Broward	NE 14 TER	NE 52 ST
81544852	Davie Police Department	1/30/2010	12:53 PM	Davie	Broward	TOLEDO CT	UK
81544853	Davie Police Department	1/30/2010	12:56 PM	Davie	Broward	RICK CASE HONDA WAY	WESTON RI
76169634	Hollywood Police Department	1/30/2010	01:03 PM	Hollywood	Broward	STIRLING RD	N 26 AVE
76183933	Broward County Sheriff's Office	1/30/2010	01:10 PM	Deerfield Beach	Broward	NW 9 AV	NW 49 CT

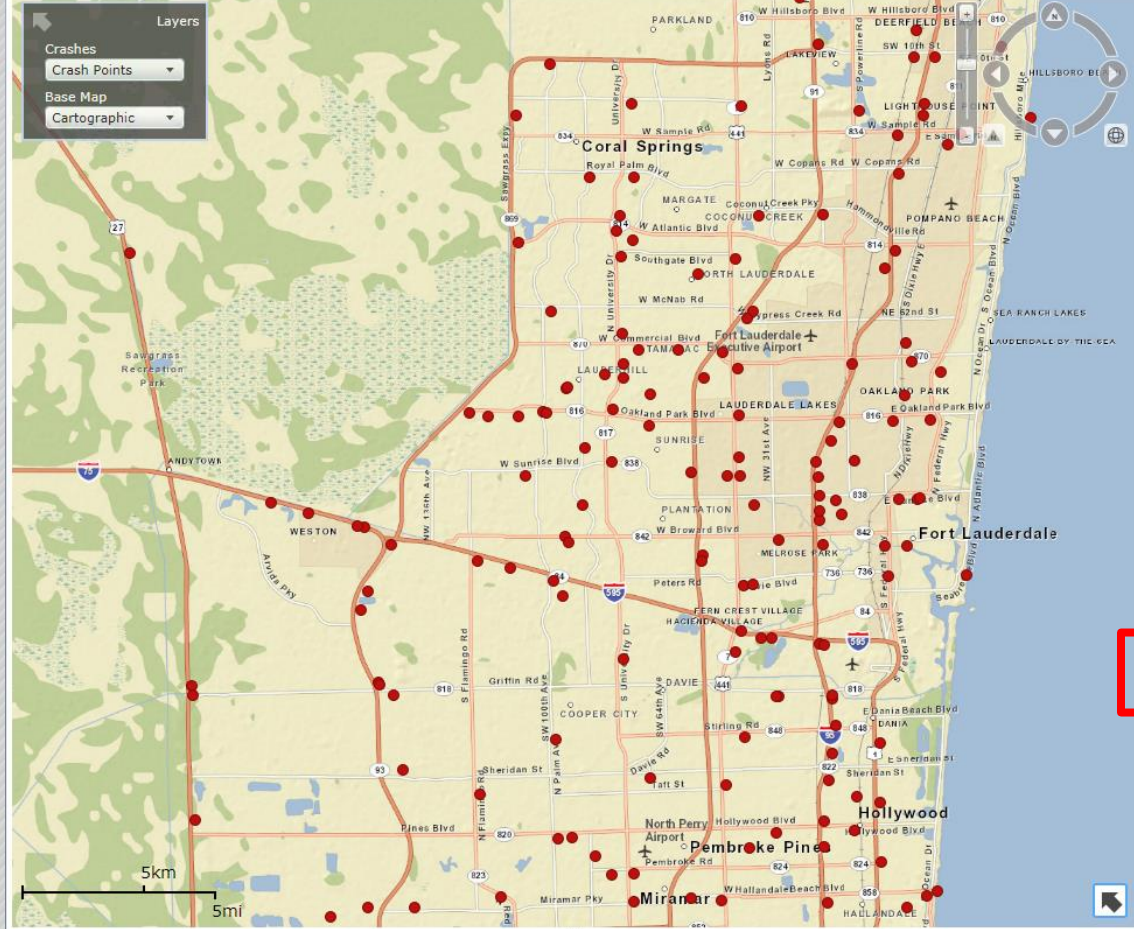
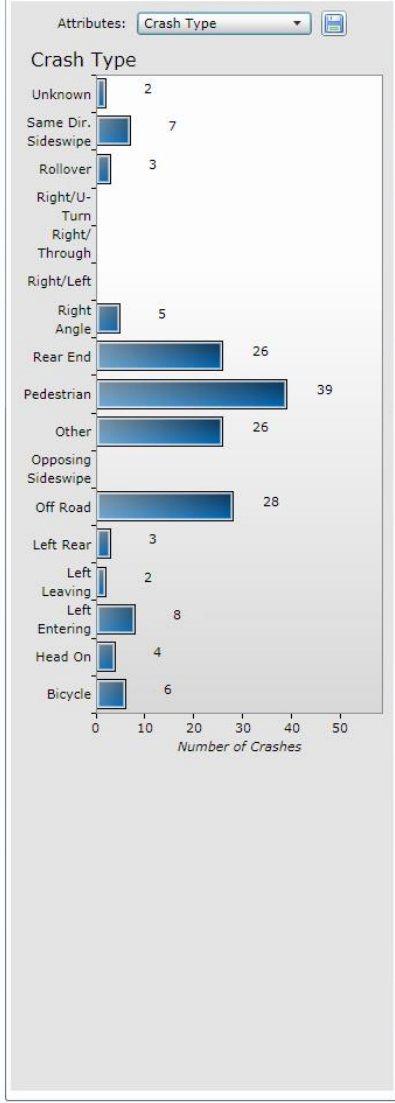
Record: 0 Records (0 out of 500 Selected) Options... Export Table... Export Map...

Search Clear

Bar Chart Pie Chart

Results [Hide Side Panels](#) 159 crashes (159 geo-located, 159 displayed)

Crash Profile Save



Crash Profile

Save

Date/Time

Date Range: 1/1/2010 - 12/31/2010

Day of Week: All

Time of Day: All

Geographic Area

Geographic Extent: County

County: Broward

Participants

Investigating Agency: All

Driver Age: All

Driver Gender: All

Mode of Travel: All

Source of Transport: All

Behavioral Factors: Any

Common Violations: Any

Circumstances

Crash Severity: Fatality - All

CMV Configuration: All

Environmental Circumstances: All

Road Circumstances: All

First Harmful Event: All

Light Condition: All

Road Jurisdiction: All

Road System Identifier: All

Search Clear

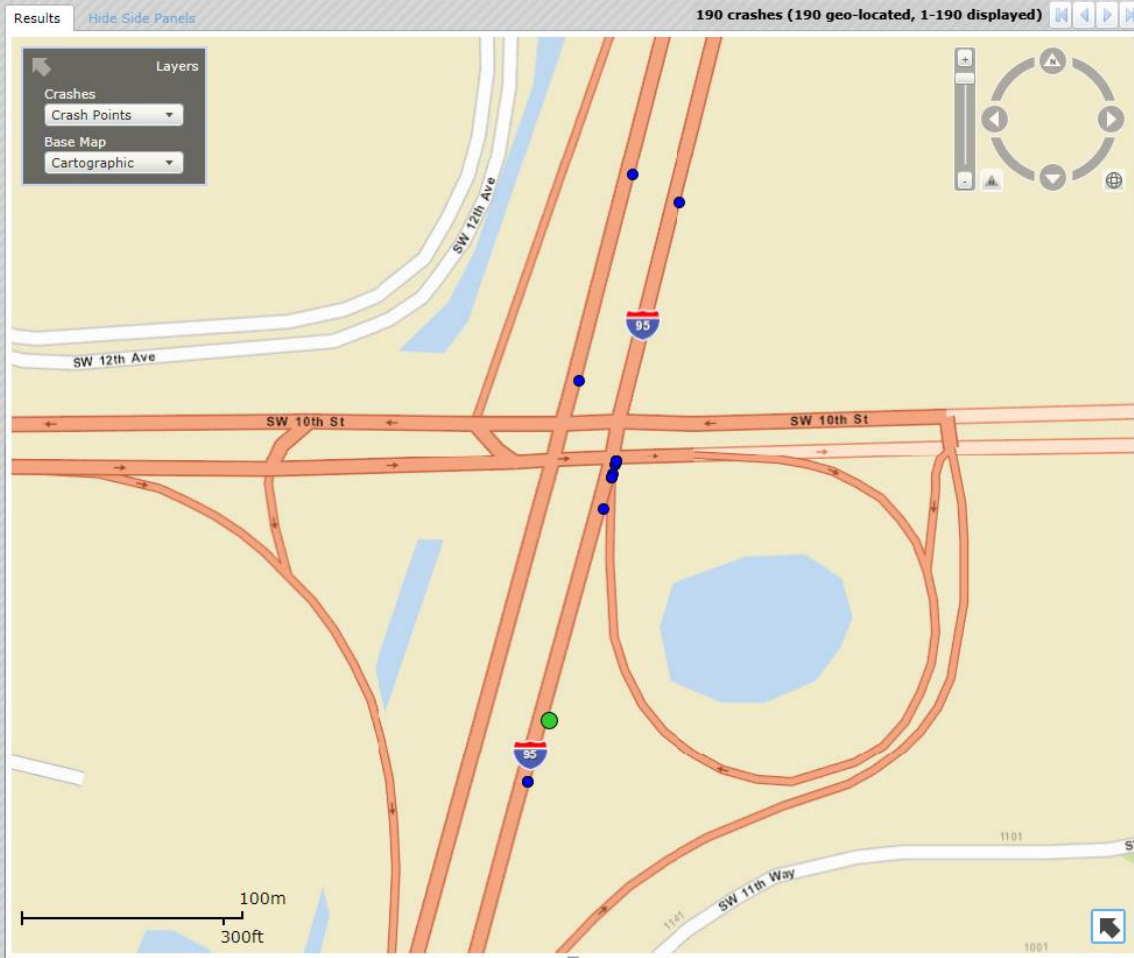
HSMV Report	Reporting Agency	Crash Date	Crash Time	City	County	Crash Street	Intersecting Street	Offset Direc
90306507	Broward County Sheriff's Office	12/23/2010	08:05 PM	Dania Beach	Broward	GRIFFIN RD SR 818	SW 32ND AVE	
91331559	Coral Springs Police Department	12/20/2010	11:31 AM	Coral Springs	Broward	SR 817 UNIVERSITY DR	RAMBLEWOOD DR	South
90628318	Plantation Police Department	12/19/2010	02:20 AM	Plantation	Broward	CENTRAL PARK PLACE	CHELSEA DR	North

Record: 0 Records (0 out of 159 Selected) [Options...](#) [Export Table...](#) [Export Map...](#)

SIGNAL FOUR ANALYTICS

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SIGNAL FOUR ANALYTICS



HSMV Report	Reporting Agency	Crash Date	Crash Time	City	County	Crash Street	In
82886025	Florida Highway Patrol	2/12/2012	09:19 PM	Davie	Broward	INTERSTATE 595 (STATE ROAD 862)	NOB HILL RD
82858543	Florida Highway Patrol	2/13/2012	09:38 AM	Deerfield Beach	Broward	N/B I-95 ENT RAMP	SW 10TH ST
82020791	Florida Highway Patrol	2/14/2012	02:52 PM	Deerfield Beach	Broward	NB INTERSTATE-95 EXIT TO SW 10TH ST	SW 10TH ST

Record: 76 | Records (1 out of 190 Selected) | Options... | Export Table... | Export Map...

Crash Profile

Save

Date/Time

Date Range: 1/1/2012 - 4/16/2012

Day of Week: All

Time of Day: All

Geographic Area

Geographic Extent: County

County: Broward

Participants

Investigating Agency: All

Driver Age: All

Driver Gender: All

Mode of Travel: All

Source of Transport: All

Behavioral Factors: None

Common Violations: None

Circumstances

Crash Severity: All

Crash Type: All

CMV Configuration: All

Environmental Circumstances: All

Road Circumstances: All

First Harmful Event: All

Light Condition: All

Maintenance Jurisdiction: All

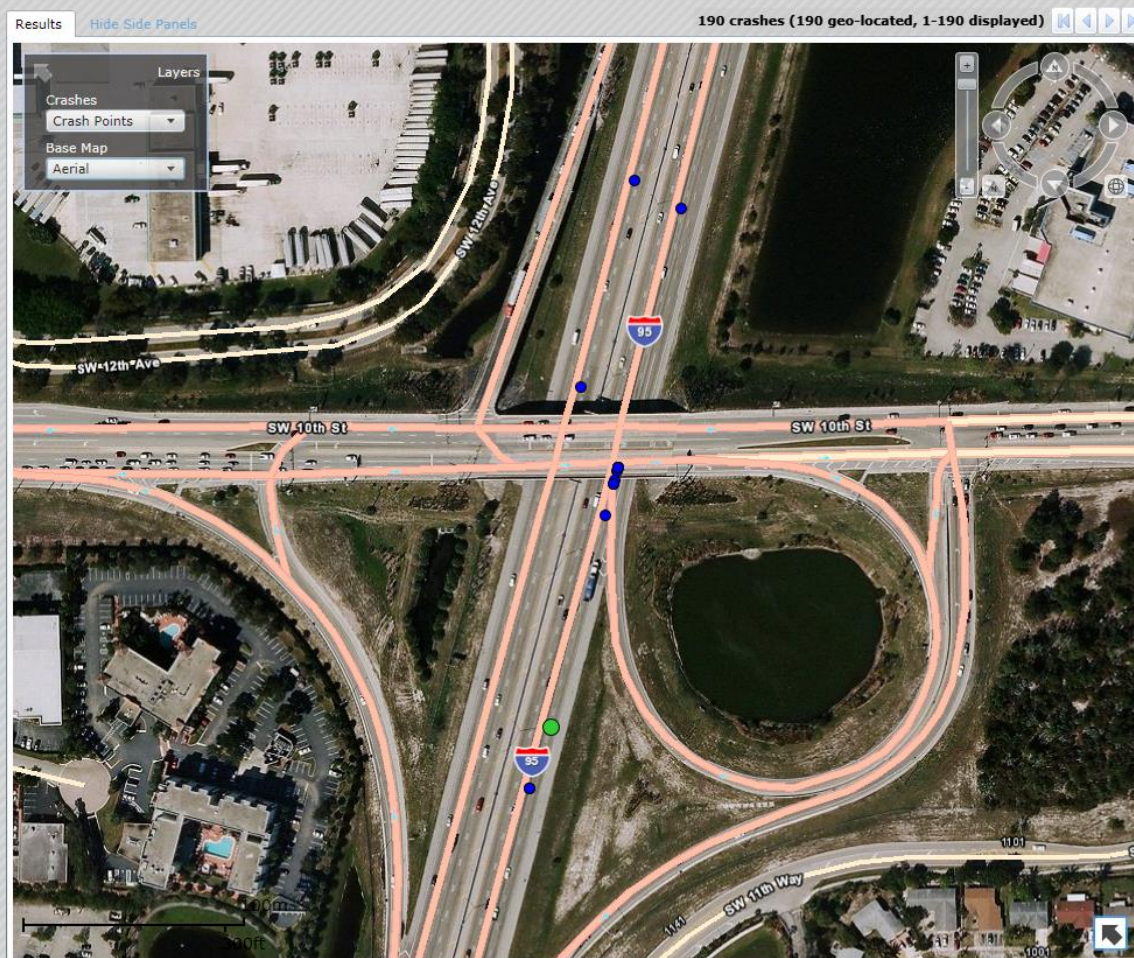
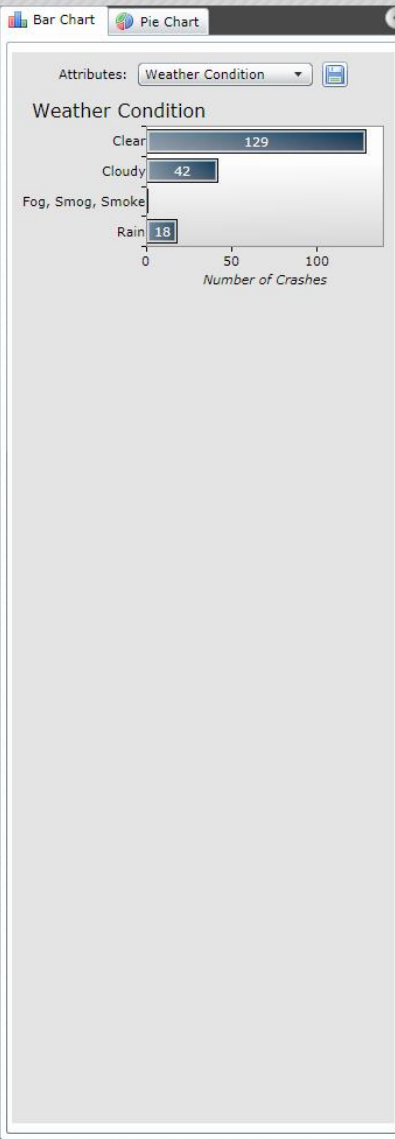
Road System Identifier: ...

Search | Clear

SIGNAL FOUR ANALYTICS

SIGNAL FOUR ANALYTICS

Submit Feedback ilir



HSMV Report	Reporting Agency	Crash Date	Crash Time	City	County	Crash Street	In
82886025	Florida Highway Patrol	2/12/2012	09:19 PM	Davie	Broward	INTERSTATE 595 (STATE ROAD 862)	NOB HILL RD
82858543	Florida Highway Patrol	2/13/2012	09:38 AM	Deerfield Beach	Broward	N/B I-95 ENT RAMP	SW 10TH ST
82920091	Florida Highway Patrol	2/14/2012	02:52 PM	Deerfield Beach	Broward	NB INTERSTATE-95 EXIT TO SW 10TH ST	SW 10TH ST

Record: 76 Records (1 out of 190 Selected) Options... Export Table... Export Map...

Crash Profile

Save

Date/Time

Date Range: 1/1/2012 - 4/16/2012

Day of Week: All

Time of Day: All

Geographic Area

Geographic Extent: County

County: Broward

Participants

Investigating Agency: All

Driver Age: All

Driver Gender: All

Mode of Travel: All

Source of Transport: All

Behavioral Factors: None

Common Violations: None

Circumstances

Crash Severity: All

Crash Type: All

CMV Configuration: All

Environmental Circumstances: All

Road Circumstances: All

First Harmful Event: All

Light Condition: All

Maintenance Jurisdiction: All

Road System Identifier: ...

Search Clear

SIGNAL FOUR ANALYTICS

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Attributes: Weather Condition

Weather Condition

Clear 129

Cloudy 42

Fog, Smog, Smoke

Rain 18

Number of Crashes

https://s4.geoplan.ufl.edu/analytics/ImageHandler.ashx?hsmv=82858543 - Google Chrome

https://s4.geoplan.ufl.edu/analytics/ImageHandler.ashx?hsmv=82858543

Crash Date	Time of Crash	Date of Report	Reporting Agency Case Number	HSMV Crash Report Number
02/13/2012	09:38 AM	02/13/2012	PHPL120FF028830	82858543

DIAGRAM

Northbound State Road 9
Ent. Ramp from SW 10 Street

Merge Sign

V-1

V-2

Point of Impact

Crash Profile

Date/Time

Date Range: 1/1/2012 - 4/16/2012

Day of Week: All

Time of Day: All

Geographic Area

Geographic Extent: County

County: Broward

Participants

Investigating Agency: All

Driver Age: All

Driver Gender: All

Mode of Travel: All

Source of Transport: All

Behavioral Factors: None

Common Violations: None

Circumstances

Crash Severity: All

Crash Type: All

CMV Configuration: All

Environmental Circumstances: All

Road Circumstances: All

First Harmful Event: All

Light Condition: All

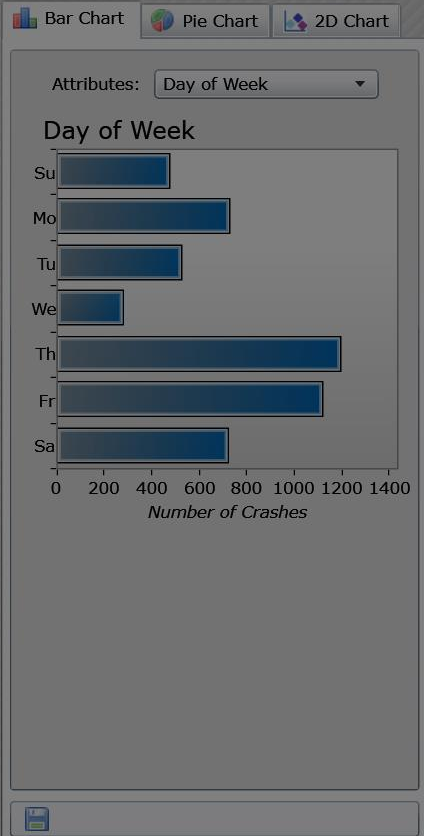
Maintenance Jurisdiction: All

Road System Identifier: ...

HSMV Report	Reporting Agency	Crash Date	Crash Time	City	County	Crash Street	In
82886025	Florida Highway Patrol	2/12/2012	09:19 PM	Davie	Broward	INTERSTATE 595 (STATE ROAD 862)	NOB HILL RD
82858543	Florida Highway Patrol	2/13/2012	09:38 AM	Deerfield Beach	Broward	N/B I-95 ENT RAMP	SW 10TH ST
82880091	Florida Highway Patrol	2/14/2012	02:52 PM	Deerfield Beach	Broward	NB INTERSTATE-95 EXIT TO SW 10TH ST	SW 10TH ST

Record: 75 Records (1 out of 190 Selected) Options... Export Table... Export Map...

Search Clear



All Selected

Crash Data Download

Include the following:

- All Crashes (5046)
- Selected Crashes (3)
- Comma Separated Value (CSV) file
- ArcGIS File Geodatabase (10.1 or higher)
- Crash Report PDF Images

OK Cancel

	HSMV Report #	Agency Report #	Reporting Agency	Form Type	Crash Date	Crash Time	
● ↑	82251405	FHPF14OFF058025	FHP	Short	10/16/2014	2:45 PM	Sarasota
● }	81948012	FHPB14OFF032372	FHP	Long	10/16/2014	6:00 AM	Unincorp
● }	83807773	FHPK14OFF057017	FHP	Long	10/16/2014	2:25 PM	Pompano
● }	84510866	FHPD14OFF092382	FHP	Long	10/16/2014	4:06 PM	Mount D

Showing: All(5046) / Selected(3) Retrieved 5046 (4578 Mapped)

Crash Profile

Database

- Crashes: All Crashes
- Form Type: All
- Reporting Agency: All

Date/Time

- Date Range: 10/16/2014 - 10/23/2014
- Day of Week: All
- Time of Day: All

Geographic Area

- Geographic Extent: State of Florida

Street Network

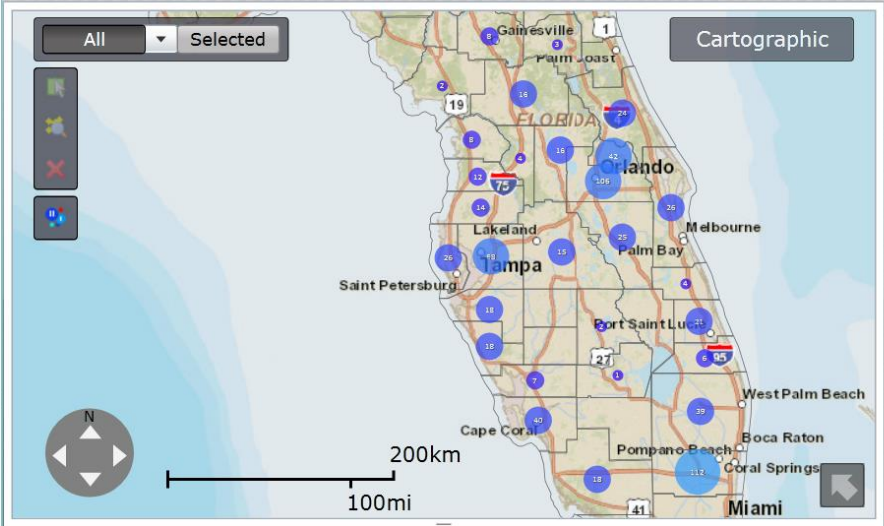
- Network Extent: None

Participants

- Driver Gender: All
- Driver Age: All

Search Clear

SIGNAL FOUR ANALYTICS



	HSMV Report #	Agency Report #	Reporting Agency	Form Type	Crash Date	Crash Time
●	82251405	FHPF14OFF058025	FHP	Short	10/16/2014	2:4
●	81948012	FHPB14OFF032372	FHP	Long	10/16/2014	6:0
●	83807773	FHPK14OFF057017	FHP	Long	10/16/2014	2:2
●	84510866	FHPD14OFF092382	FHP	Long	10/16/2014	4:0

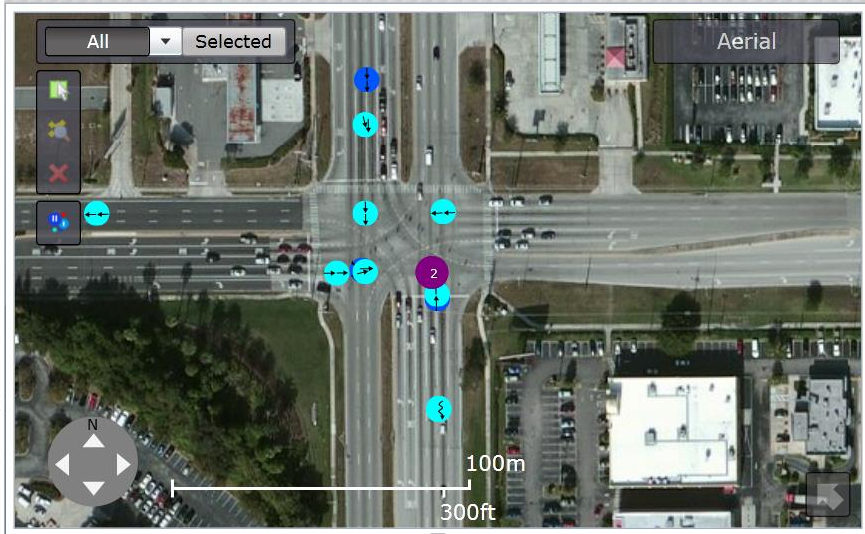
Showing: All(1124) / Selected(0) Retrieved 1124 (1011 Mapped)

Crash Profile

Database

- Crashes
 - All Crashes
- Form Type
 - All
- Reporting Agency
 - All
- Date/Time
 - Date Range
 - 10/16/2014 - 10/16/2014
 - Day of Week
 - All
 - Time of Day
 - All
- Geographic Area
 - Geographic Extent
 - State of Florida
- Street Network
 - Network Extent
 - None
- Participants
 - Driver Gender
 - All
 - Driver Age

Search Clear



	HSMV Report #	Agency Report #	Reporting Agency	Form Type	Crash Date
●	84495784	FHPD14OFF072639	FHP	Long	8/17/2014
●	84477141	FHPD14OFF072957	FHP	Long	8/18/2014
●	84486413	FHPD14OFF073815	FHP	Long	8/20/2014
●	84729708	2014-00347824	Orlando PD	Long	8/20/2014

Showing: All(7853) / Selected(0) | Retrieved 7853 (7565 Mapped)

Crash Profile

Reporting Agency: All

Date/Time: Date Range (8/16/2014 - 10/16/2014), Day of Week (All), Time of Day (All)

Geographic Area: County (Orange - All)

Street Network: Network Extent (None)

Participants: Driver Gender (All), Driver Age (All), Pedestrian Age (All)

Search | Clear

SIGNAL FOUR ANALYTICS

Esri - GIS Mapping Software | Signal Four Analytics

https://s4.geoplan.ufl.edu/analytics/#/Views/CrashAnalysisMainPage.xaml

Apps | IIR | IT | Maps | Events | Crash | Elderly | Analysis | Byreku | Programming | Electronics | Leisure | UF | Rural | MetroP | CrashFacts | Tmodel | Web

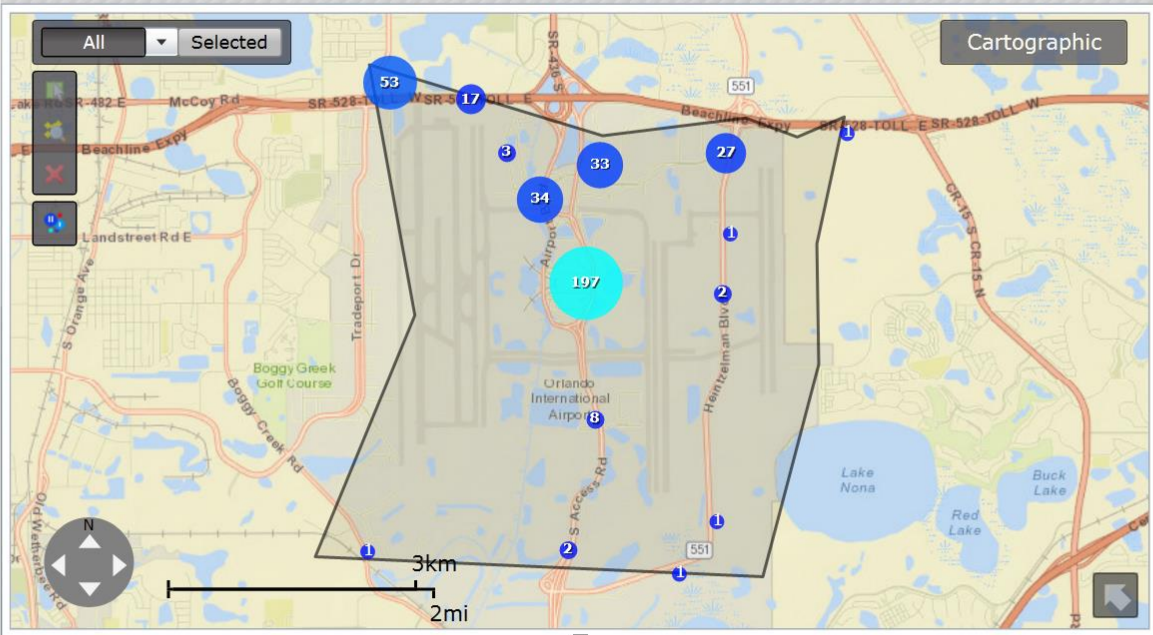
SIGNAL FOUR ANALYTICS | Crash Analysis | Network Analysis (Beta) | Submit Feedback | ilir

Bar Chart | Pie Chart | 2D Chart

Attribute 1: Crash Type

Injury

- Angle: 2
- Animal: 0
- Bicycle: 3
- Head On: 1
- Left Turn: 4
- Off Road: 26
- Other: 13
- Pedestrian: 13
- Rear End: 35
- Right Turn: 1
- Sideswipe: 4
- Unknown: 3



	HSMV Report #	Agency Report #	Reporting Agency	Form Type	Crash Date	Crash Time	City
?	8089491	FHPD09OFF039391	FHP	Short	5/5/2009	4:45 PM	Unincorporated
?	10582206	2000200040	Orlando PD	Long	8/10/2000	4:20 PM	Orlando

Showing: All(381) / Selected(0) Retrieved 381 (381 Mapped)

Crash Profile

Airport-year2 | Save

Geographic Extent: Custom Area

Saved Areas: Mall, Orlando Intl Airport, UF, UF Circle

Street Network: Network Extent: None

Participants: Driver Gender: All, Driver Age: All, Pedestrian Age: All, Cyclist Age: All, Mode of Travel: All

Search | Clear

Users Summary

- Over 1500 users
- Over 230 agencies

Utilization: Quarterly Statistics

- 10,000 unique logins
- 25,000 queries issued
- 50,000 crash reports reviewed/downloaded

Road Ahead

- Update GIS database to 2014 unified basemap
- Complete citations query interface
- Finalize Network Analysis
- Enhanced analytics and usability
- Inclusion of location of traffic signals, red light running camera locations, schools etc.

Access

- Access is **free** – the state support it
- To get access: go to <http://s4.geoplan.ufl.edu/> and select **Request Access** link
- Access is typically provided within 24-48 hours
- Accept User Agreement regarding access to personal information



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