



SAFETY CRASH DATA GUIDANCE



WHY WAS THIS GUIDE DEVELOPED?

To guide Transportation Professionals in building a complete crash data set using the most recent crash data available for a specific project or location, as required in FDOT's manuals for various safety analyses.

WHO IS THE INTENDED AUDIENCE?

Transportation Planners and Engineers, including FDOT Staff, Partnering Agencies, and Consultants who download and review crash data to perform safety analyses.

WHAT IS THE INTENDED USE OF THE GUIDE?

Apply this process when a safety analysis is needed on any project or location on the State Highway System. The process can also be applied to the off-system roadway network.

WHICH AGENCIES ARE RESPONSIBLE FOR THE RECOMMENDED DATABASES?

- Crash Data:
 - Crash Analysis Reporting System (CAR Online) - State Safety Office, FDOT
 - State Safety Office Geographic Information System (SSOGis) - State Safety Office, FDOT
 - Signal Four Analytics (Signal Four) - GeoPlan Center, University of Florida
- Crash Reports:
 - Electronic Document Management System (EDMS) - FDOT
 - Signal Four Analytics - GeoPlan Center, University of Florida

CRASH DATA PROCESS

1

DOWNLOAD DATA

Obtain access to the Crash Data and Crash Reports

- CAR Online – FDOT Project Manager to request New User Access
- SSOGis– Publicly available
- Signal Four – FDOT Project Manager to request New User Access

When downloading crash data, consider:

- Data years required
- Injury Severity
- On- or Off- State Highway System

2

MERGE DATA

Identify duplicate crashes based on unique crash number

Remove duplicate crashes:

- Original CAR Online and SSOgis records should be retained when removing duplicates

3

CLEAN DATA

Remove crashes based on the following characteristics:

- Occurred outside the project limits
- Occurred in parking lots or outside of the study limits' influence area

Recode "unknown", "none", and "non-traffic fatality" crash severities to "property damage only."

Recode any miscoded / uncoded crash types (e.g., "left-turn", "angle", "head on", "unknown", "other") based upon reviews of crash reports.

5

SAFETY ANALYSIS

Begin safety analysis with clean dataset:
(under construction)

4

SUMMARIZE DATA

Summarize clean dataset in a spreadsheet tool:
(under construction)

CLICK NEXT





GETTING STARTED: AVAILABLE DATA

FIND THE PATH THROUGH THE FOLLOWING QUESTIONS



WHEN TO PULL CRASH DATA?

- When you are performing safety analysis as required by FDOT manuals and guidelines, or otherwise evaluating historical crash patterns and trends to make safety related recommendations.

WHEN TO PULL CRASH REPORTS?

- When verification of crash data attributes and greater understanding of the cause and result of a crash is needed.
- When information from the crash narrative or the collision diagram is needed.

HOW IS ACCESS TO THE CRASH DATABASES OBTAINED?

- Coordinate with your FDOT Project Manager to request access to CAR Online, Signal Four, EDMS, and FDOT VPN through an Automated Access Request Form (AARF) submittal.

WHAT IS THE DIFFERENCE BETWEEN A SHORT AND LONG-FORM CRASH REPORT?

LONG-FORM CRASH REPORT PER F.S.316.066

- Completed by law enforcement when any of the following are met:
 - The crash resulted in death of, personal injury to, or any indication of complaints of pain or discomfort by any of the parties or passengers involved in the crash.
 - A driver leaves the scene of a crash resulting in property damage without providing information and/or rendering aid.
 - An involved road user was under the influence of alcohol or drugs.
 - The crash required an involved vehicle to be removed by a wrecker.
 - The crash involved a commercial motor vehicle.
- Contains a collision diagram and narrative.

SHORT-FORM CRASH REPORT

- Completed by law enforcement for crashes not meeting the long-form conditions.
- A collision diagram and narrative are not required.
- Note that driver exchange information is not included in the crash databases.



WHICH CRASH DATA SOURCES SHOULD BE USED?

- CAR Online, SSOGis, and Signal Four databases should be used to download crash data within the study limits to obtain a complete crash dataset.
- Combining these datasets provides a greater level of completeness when pulling crash data. Further information regarding crash data sources can be found [here](#).

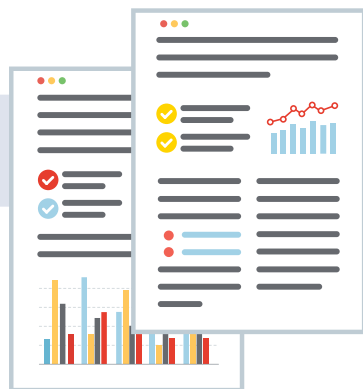
WHY ARE THERE MULTIPLE DATA SOURCES?

- There are multiple data sources because each provides a unique level of access, crash detail, thresholds for inclusion, and interface options. The Florida Highway Safety and Motor Vehicles (FLHSMV) is the official repository of crash records for the State of Florida.
- The CAR Online and Signal Four systems will be integrated into one system by operating from one copy of the FLHSMV crash records. This integrated system is anticipated to be available in late 2022 and will improve the data's processing speed.



WHAT ARE THE DIFFERENCES BETWEEN THE CRASH DATABASES?

- CAR Online, SSOGis, and Signal Four receive the same crash records from the FLHSMV, including short and long-form crash reports on all public roadways. However, the databases have different timeliness, geolocation processes, and data features.
- CAR Online and Signal Four are restricted to authorized users; refer to the [Available Data](#) section of this Guide for more information on obtaining access. SSOGis is publicly available.
- The main benefit of the CAR Online and SSOGis systems compared to Signal Four is the manual systemic geolocation verification process.
- The main benefit of the SSOGis system compared to CAR Online is the geographical user interface; therefore, non-state highway system crashes can be more easily extracted.
- The main benefit of the Signal Four system compared to CAR Online and SSOGis is that crash records are available sooner. Refer to the [Crash Record Processing Timeline](#) for additional details on when to anticipate a crash record to be reflected in each database.



QUESTION/DATABASE	CAR ONLINE	SSOGIS	SIGNAL FOUR
WHICH CRASH RECORDS ARE INCLUDED?	Long-form crashes for all public roadways on and off the State Highway System. Short-form crashes are also included starting in 2018.	Long-form crashes for all public roadways on and off the State Highway System.	Short and long-form crashes for all public roadways on and off the State Highway System.
HOW OFTEN IS THE DATABASE UPDATED?	Nightly	Weekly*	Nightly
HOW LONG DOES IT TAKE FOR A CRASH TO BE AVAILABLE IN THE DATABASE?**	It can take up to 110 days from the date of the crash for fatal and incapacitating injury crashes to be location verified and available in the database. All other crashes are location verified and available in the database within 10 months after annual data is finalized by the FLHSMV.	It can take up to 110 days from the date of the crash for fatal and incapacitating injury crashes to be location verified and available in the database. All other crashes are location verified and available in the database within 10 months after annual data is finalized by the FLHSMV.	All crashes severity levels are available within one day of receipt from the FLHSMV. Therefore, it can take up to 100 days from the date of the crash for fatal and incapacitating injury crashes to be available in the database.
HOW ARE CRASHES GEOLOCATED?	Crashes that do not meet the accepted level of location confidence to be automatically geolocated are manually verified by FDOT SSO staff. Additionally, all fatal and incapacitating injury crashes are manually verified, with these crashes being prioritized over other crash severity levels. Short-form crashes are not geolocated.	Crash locations are taken from CAR Online, but "snapped" to the appropriate side of the roadway as opposed to the centerline.	Using an automated process similar to CAR Online, but without manual location verification, except for in a handful of counties. If a crash location cannot be determined by Signal Four, the coordinates from CAR Online are used when they become available at the completion of a verified year.
IS ROADWAY CHARACTERISTICS INVENTORY (RCI) DATA INCLUDED IN THE DATASET?	Yes	Yes	No
ARE FLAGS FOR THE STRATEGIC HIGHWAY SAFETY PLAN (SHSP) EMPHASIS AREAS INCLUDED IN THE DATASET?	No	Yes	Yes
DATABASE OUTPUTS	Crash data extracts, summary reports, and average crash rates in .csv, .pdf, and .xls formats, respectively	Crash data extracts in .csv and GIS shapefile formats	Crash data extracts in .csv and GIS shapefile formats
DATABASE ACCESS	Restricted to authorized users.	Open to the public.	Restricted to authorized users. ***
OTHER INFORMATION	Includes all crash records received from the FLHSMV including those that are not geolocated.	Does not include non-geolocated crash records received from the FLHSMV.	Does not include crash records received from the FLHSMV that are not geolocated by either Signal Four or CAR Online.

* Not regularly following the completion of a verified year

**Refer to the [Crash Record Processing Timeline](#) for additional details on when to anticipate a crash record to be reflected in each database.

*** The Florida Traffic Safety Dashboard is available for public access. The download of crash data records is restricted to authorized users.



1 DOWNLOAD DATA



HOW DO YOU PULL CRASH DATA?

CAR Online data is accessed through [CAR Online](#). For a project specific safety analysis, it can be helpful to have the Roadway ID and beginning and ending mileposts in advance. However, the CAR Online platform provides a few alternatives to query the crash data for a specific site. For additional information on the CAR Online tools refer to [CAR Online Help User Guide](#).

SSOGis data is accessed through the [Web Application](#). Users can identify the study limits to download crash data by drawing a geographic boundary or by entering the corresponding State Road Roadway ID and milepost.

Signal Four data is accessed through [Signal Four Analytics](#); users can navigate on the map to the study area and create a boundary around the project limits. An overview of Signal Four Analytics is provided [here](#).

HOW DO YOU PULL CRASH REPORTS?

Use the unique crash numbers to find the related crash reports. The crash reports are obtained from Signal Four by selecting the desired boundary and years of evaluation or from the FDOT Electronic Document Management System ([EDMS](#)).

Refer to the [Merging and Cleaning of Crash Data](#) section of this tutorial for the relevant fields to identify the unique crash reports identifier.

HOW DO YOU DEFINE THE PROJECT LIMITS TO DOWNLOAD CRASH DATA?

For an **intersection** safety study, the recommended minimum length to download crash data is 0.1 miles, with the middle of the intersection at the center of this measurement. Where turn lanes exceed this measure, the distance selected to download crash data should be updated to include the turn lane extent for all approaches.

For a **segment** safety study, the recommended minimum length is 0.2 miles. However, limits should be adapted to the study area and the specific roadway characteristics that need to be evaluated as part of the study.

SHOULD PRACTITIONERS WAIT TO DOWNLOAD CRASH DATA FOR A SAFETY STUDY UNTIL CAR ONLINE ANNUAL CRASH DATA IS VERIFIED?

- For discrete analyses at specific intersection(s) or corridor(s) on any public road (state or local), it is not recommended to wait for the completion of CAR Online verified years of crash data. The use of the recommended crash databases (CAR Online, SSOgis, Signal Four) provides a timely representation of the latest crash trends and patterns.
- For non-discrete areawide analyses (e.g., County, District, Statewide) focused on the State Highway System (SHS), it is recommended to wait for the latest five (5) full calendar years of CAR Online verified crash data.

- It is recommended to pull the last five (5) full calendar years of data as well as the current year up to the day before the crash data is being downloaded. For example, if data is being pulled on 8/16/2021, data should be pulled from 1/1/2016 – 8/15/2021. The current year crash data (1/1/2021-8/15/2021) is typically used by transportation professionals to verify crash trends and patterns.
- When downloading crash data, use at least five (5) full calendar years under consistent site conditions. If five (5) full calendar years of crash data under consistent site conditions are not available, consider using a minimum of three (3) years. Some conditions to consider include recent reconstruction, or major roadway/intersection changes (e.g., 2 to 4 lane widening, signalization) completed within the last five years that may have influenced crash patterns. Five (5) years of crashes are recommended to be obtained in order to apply the Highway Safety Manual, Part C: Predictive Method. The HSM defines 1 to 3 years of crashes as “short-term” and notes that using averages in the predictive method from short-term periods may give misleading estimates and create problems associated with regression-to-the-mean bias. Please refer to guidance provided in the corresponding functional unit’s manual (PD&E, FDM, TEM, etc.).

For additional background on timeliness of crash data, the following two pages provide an overview of the anticipated timeline to process a crash based on its severity. The first timeline covers crashes that did not report a fatality nor a severe injury, and the second timeline describes crashes that did report fatalities and/or severe injuries.

HOW MANY YEARS OF CRASH DATA SHOULD BE DOWNLOADED?

The same date range should be pulled from each data source (CAR Online, SSOgis, Signal Four).



CRASH DATA PROCESSING TIMELINE

WHAT HAPPENS BETWEEN A CRASH OCCURRENCE AND A DATABASE CRASH RECORD?

CRASH OCCURRENCE – 100 DAYS

- Initial reporting within 10 days
 - Privacy regulations expire 60 days after initial report
- Final reporting within 90 days

FLHSMV PROCESSING – 13 MONTHS

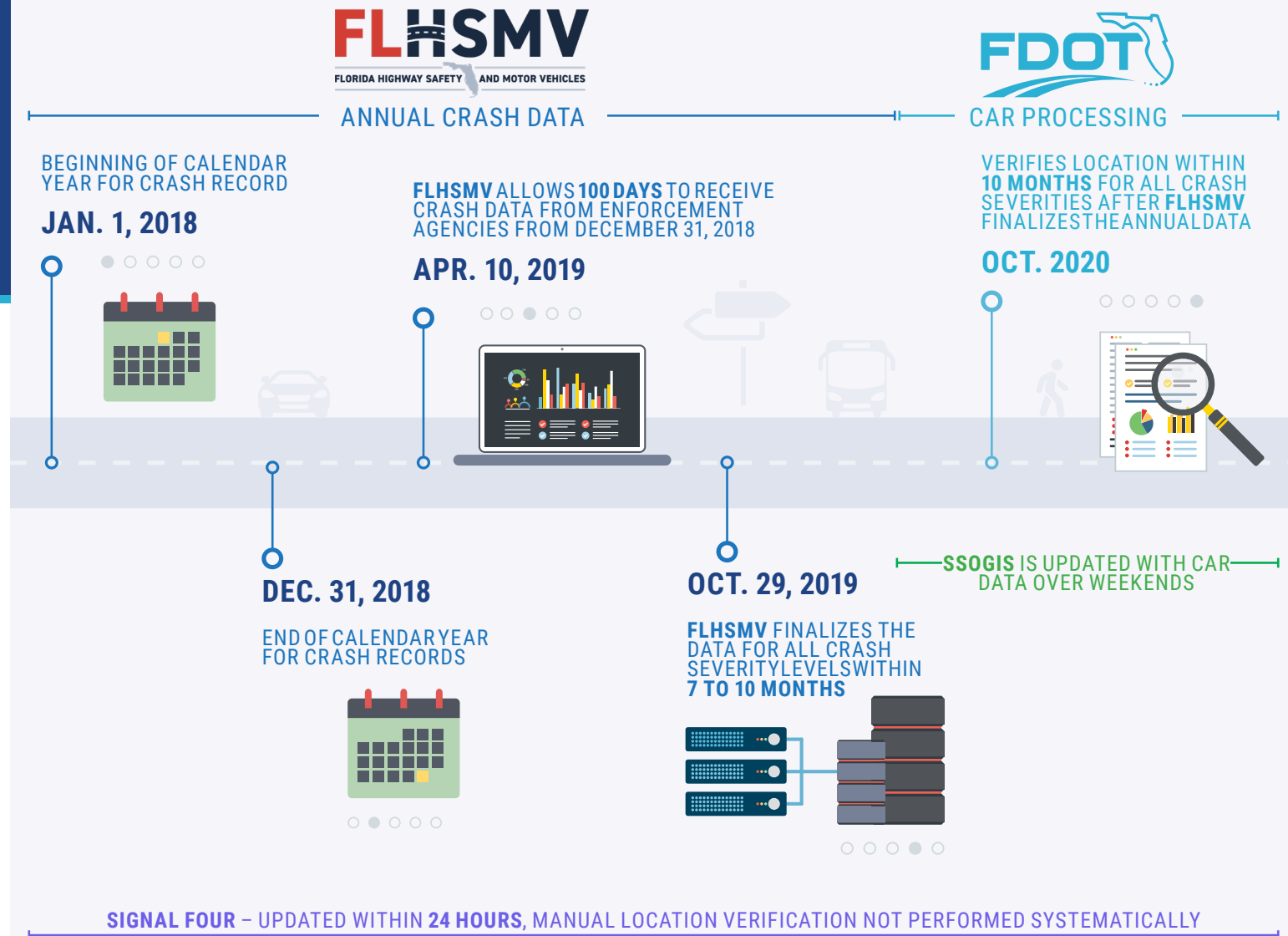
- Annual crash data window – up to 100 days after December 31
- Cleaning of annual crash data – 7 to 10 months

FDOT (CAR ONLINE & SSGIS) – 10 MONTHS

- Location verification is completed within 10 months after FLHSMV finalizes annual crash data

KABCO SCALE		FLORIDA TRAFFIC CRASH REPORT (FTCR) INJURY LEVEL
K	FATAL	FATAL
A	SEVERE INJURY	INCAPACITATING
B	MODERATE INJURY	NON-INCAPACITATING
C	MINOR INJURY	POSSIBLE
O	PROPERTY DAMAGE ONLY	NONE

CRASH DATA PROCESSING TIMELINE





FATAL AND SEVERE INJURY CRASHES REPORTING TIMELINE

WHAT HAPPENS BETWEEN A **FATAL** OR A **SEVERE INJURY** CRASH OCCURRENCE AND A DATABASE CRASH RECORD?

CRASH OCCURRENCE – 100 DAYS

- Initial reporting within 10 days
 - Privacy regulations expire 60 days after initial report
- Final reporting within 90 days

FLHSMV PROCESSING – 100 DAYS

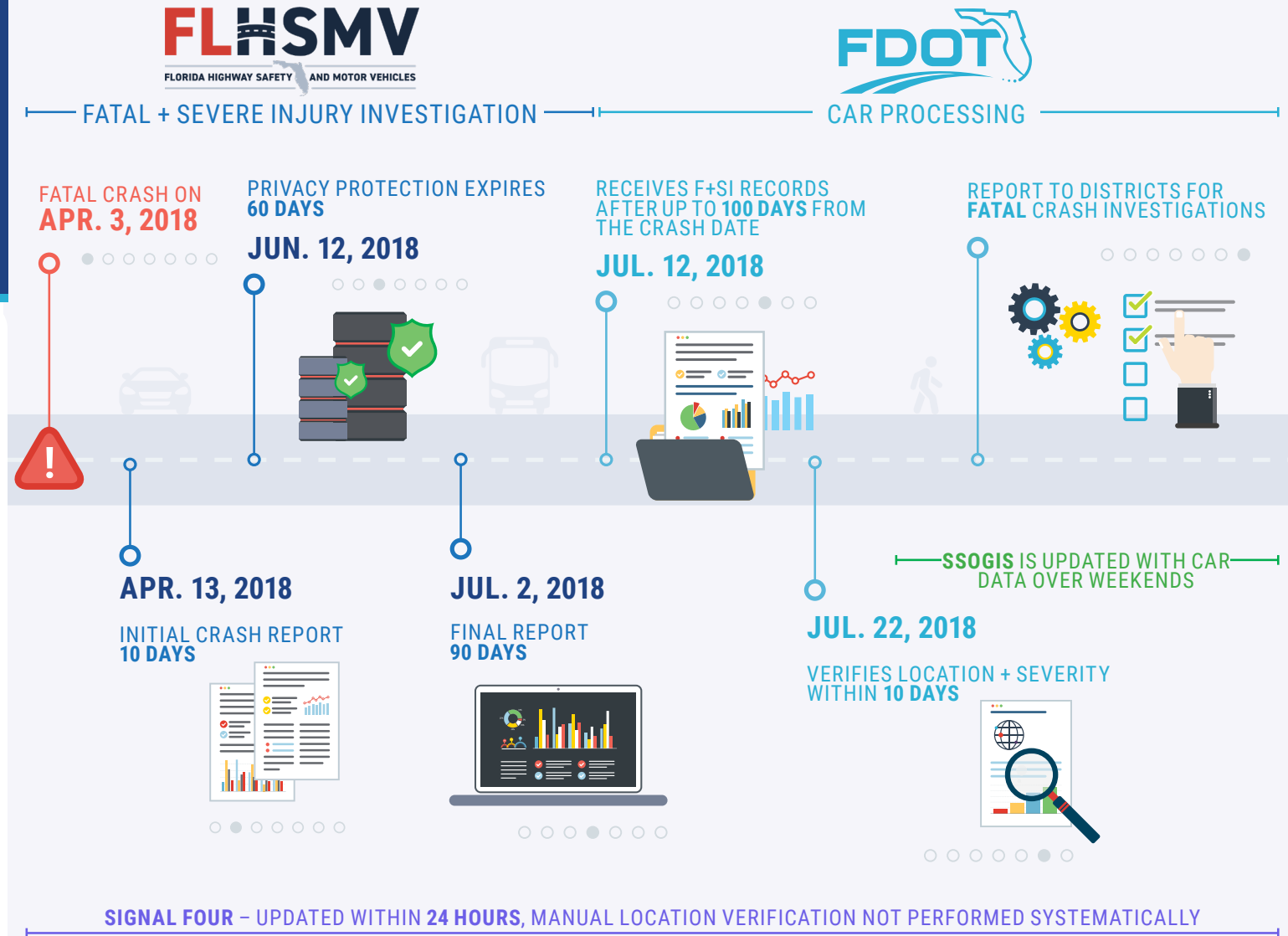
- Same as crash occurrence timeline

FDOT (CAR ONLINE & SSOGIS) – 110 DAYS

- Receives crash records from FLHSMV – 100 days
- SSO Location + severity verification – 10 days

	KABCO SCALE	FLORIDA TRAFFIC CRASH REPORT (FTCR) INJURY LEVEL
K	FATAL	FATAL
A	SEVERE INJURY	INCAPACITATING
B	MODERATE INJURY	NON-INCAPACITATING
C	MINOR INJURY	POSSIBLE
O	PROPERTY DAMAGE ONLY	NONE

FATAL AND SEVERE INJURY CRASHES REPORTING TIMELINE



2 MERGE DATA

IF USING DATA FROM MULTIPLE DATASETS, WILL THERE BE DUPLICATE CRASHES?

- Yes, CAR Online, SSOGis, and Signal Four datasets will include duplicate crash data. To use all three datasets, remove duplicate crashes from the non-primary dataset. Duplicate crashes can be identified by their unique crash numbers.
- When comparing datasets for de-duplication, maintain data for the primary dataset by removing the duplicated crash data from the secondary and tertiary datasets.
 - CAR Online should be the primary dataset when comparing datasets, with SSOGis being the secondary and Signal Four being the tertiary dataset.
- CAR Online and SSOGis crash numbers consist of nine digits. Occasionally, a leading zero will be omitted when displayed in a spreadsheet, yielding an eight digit crash number. Signal Four crash numbers consist of eight digits.
 - To compare crash numbers across datasets for deduplication, multiply each Signal Four crash number by ten.
 - The following data column headers can be used to identify the crash numbers for each dataset:
 - CAR Online: "CRSH_NUM"
 - SSOGis: "FDOT Crash Number"
 - Signal Four: "Report_Number"
- It is recommended to move the duplicate SSOGis and Signal Four crash data into a separate tab in the spreadsheet to maintain a record of de-duplicated crashes.

HOW IS DATA CLEANED FOLLOWING DEDUPLICATION?

Remove crashes that occurred outside of the project limits. For safety analysis purposes, the project limits are based on the influence area of the intersection or segment, as discussed in the [Download Section](#) of this guide.

- Utilize GIS and/or the crash-specific roadway ID and milepost to determine if a crash occurred outside the influence area.
- Remove crashes that occurred in parking lots or outside of the study limits' influence area.
- Re-code crash severities of "unknown", "none", and "non-traffic fatality" to Property Damage Only (PDO).

WHY DOES CRASH SEVERITY NEED TO BE RECODED?

A crash severity level is coded as a zero when person-level injury data was not reported. A crash severity level is coded as a non-traffic fatality when the only injury reported in the crash is a fatal not related to traffic (e.g., heart attack).

WHEN ARE CRASH REPORTS REVIEW NEEDED?

If relevant, to verify crash types are coded correctly, review crash reports for all or specific crash types. It may be relevant to review crash reports when:

- The scope of the study includes a review of crash reports.
- The scope of the study includes a collision diagram, and crash location is key to develop these diagrams.
- The study focuses on specific crash types; a review of crash reports will verify those crash types are coded correctly.
- A review of the crash reports will add value to understand crash patterns.

3 CLEAN DATA

OUTSIDE OF PROJECT LIMITS/NON-PUBLIC ROADWAYS

DATASET COLUMN HEADER		REMOVE CRASHES WITH VALUES
CAR ONLINE	DHSRDSYS	7, 8, or 9. This removes forest road, private roadway, and parking lot crashes.
SSOGIS	DHSMV ROAD SYSTEM ID	"07 FOREST ROAD", "08 PRIVATE ROADWAY", and "09 PARKING LOT"
SIGNAL FOUR	ROAD SYSTEM IDENTIFIER	"Forest road", "Private Roadway", and "Parking Lot"

PROPERTY DAMAGE ONLY (PDO) CRASH

DATASET COLUMN HEADER		RE-CODE FROM	RE-CODE TO
CAR ONLINE	ACCISEV	blank, 0, or 6	1
SSOGIS	HIGHEST INJURY IN CRASH	UNKNOWN/NOT CODED, "6 NON-TRAFFIC FATALITY"	"1 NO INJURY"
SIGNAL FOUR	S4 CRASH SEVERITY DETAIL	"blank" or "Non-Traffic Fatality"	"No Injury"

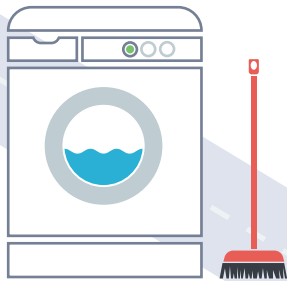
If crash types need to be updated following a review of crash reports, use the following data column headers to recode crash types:

CAR ONLINE frst_harm_evnt_cd impct_typ_cd v1_vhcl_move_cd tot_of_pedst_num totof_pedcycl_num	SSOGIS Crash Harmful Event Manner of Collision Pedestrian Related Bicyclist Related	SIGNAL FOUR s4_crash_type_simplified s4_crash_type type_of_impact s4_is_pedestrian_involved s4_is_bicyclist_involved
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3 CLEAN DATA (continued)

WHEN AND HOW TO RECODE CRASH TYPES IN THE MERGED DATASET?

- Recode any miscoded / uncoded crash types (e.g., "left-turn", "angle", "head on", "unknown", other) based upon reviews of crash reports



COMING SPRING 2022

4 SUMMARIZE DATA

5 SAFETY ANALYSIS

This section will detail the analysis dependent on the unit's safety analysis guidelines.

The DOT manuals to be further referenced into the Phase II of this guide include:

- Access Management Guidebook
- FDOT Traffic Engineering Manual
- Florida HSIP Guidelines Manual
- FDOT Design Manual
- IAR User's Guide Safety Analysis Guidance
- ICE Manual
- Lane Repurposing Guidebook
- MUTS
- PD&E Manual
- PD&E Safety Analysis Guidebook

To learn about traffic safety coalitions supporting the reduction of specific crash types, refer to the Traffic Safety Coalitions referenced in the following page. Visit <https://www.fdot.gov/Safety/safety-coalitions/coalitionsresources.shtm> for up to date information and links.





TRAFFIC SAFETY COALITIONS

Want to help Florida achieve our target of zero fatalities and serious injuries?
Please see our [Strategic Highway Safety Plan](#)

The following traffic safety coalitions are resources to support the implementation of this plan, and could also help in the reduction of identified crash types through different safety analysis.

OCCUPANT PROTECTION SAFETY



floccupantprotection.com

MOTORCYCLE SAFETY



ridesmartflorida.com

TEEN DRIVER SAFETY



fteensafedriver.org

TRAFFIC RECORDS



ftrafficrecords.com

IMPAIRED DRIVING SAFETY



fimpaireddriving.com

PEDESTRIAN & BICYCLE SAFETY



alerttodayflorida.com

AGING ROAD USER SAFETY



safemobilityfl.com



SAFETY CRASH DATA GUIDANCE

Please visit [FDOT Safety Coalitions](#) for up to date information and links.

