

Evaluation of Injury Severity Updates in California Collision Data

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Background

- Fatal or injury collisions in California are reported to the California Highway Patrol (CHP) for inclusion in the Statewide Integrated Traffic Records System (SWITRS).
- Records are made publicly accessible in I-SWITRS site and provisional until they have been frozen to updates by CHP, which could be one or more years later.
- Users may retain localized versions from their extraction date regardless if still provisional.
- CHP collision investigation manual outlines key traffic collision report submission requirements:
 - Within ten working days from the date of the collision.
 - Reports that cannot be completed due to unusual circumstances may be retained at the local level for a maximum of 15 days.
- Submission requirements naturally lead to situations where updates to records may be necessary.
- There is a lack of reporting metrics regarding report submissions into SWITRS, so exact submission counts and timelines are unknown.

Crash Costs

- Safety improvement projects must prove positive economic benefit costs of any proposed plan.

<California HSIP Application Crash Costs>

Severity	Location Type	Crash Unit Cost (2018 Dollars)
Combined Fatal and Severe Injury (K + A)	Roadway	\$2,000,000
	Non Signalized Int.	\$2,310,000
	Signalized Int.	\$1,460,000
Evident Injury – Other Visible (B)		\$126,500
Possible Injury – Complaint of Pain (C)		\$71,900
Property Damage Only (O)		\$11,800

Safety Performance Management

- The FHWA Safety Performance Management Final Rule established the following five performance measures based on five-year rolling averages:
 - Number of Fatalities
 - Rate of Fatalities per 100 million Vehicle Miles Traveled (VMT)
 - Number of Serious Injuries
 - Rate of Serious Injuries per 100 million VMT
 - Number of Non-motorized Fatalities and Non-motorized Serious Injuries
- States are now required to set specific annual targets based on these five performance measures as a part of HSIP.

Objective

- Evaluate and quantify injury severity updates for data retrieved from I-SWITRS for fatal and severe injury collisions.

Methods

- SWITRS data for fatal and severe injury collisions that occurred in 2016 were retrieved from I-SWITRS.
- A baseline dataset was retrieved on Mar 1st, 2017 that contained 97% of the total records available in the final retrieved dataset. The retrieval dates and record counts were as follows:
 - March 1, 2017 (193,567 collisions)
 - June 12, 2017 (196,998 collisions)
 - November 1, 2017 (197,525 collisions)
 - June 22, 2018 (198,886 collisions)
- Collisions were imported into ArcGIS Pro and joined via their unique ID to the baseline dataset to compare any differences in injury severity.

Results and Discussion

- 94 injury collisions were changed to fatal collisions (2.653%) and 2 fatal collisions were changed to severe injury collisions (0.056%) out of 3,543 total fatal collisions.

<Summary of Changes in 2016 SWITRS Data>

Extraction Date	Tot. # of Records	Tot. # of Records Diff	Cum. # Records Diff	# of Injury Severity Changes	Cum. # of Injury Severity Changes
Mar 2017	193,567	n/a	0	n/a	0
Jun 2017	196,998	+3,431	+3,431	70	70
Nov 2017	197,525	+527	+3,958	17	87
Jun 2018	198,886	+1,361	+5,319	10	96

- If a victim passed away after the initial collision but within the classified timeframe, that would serve as a catalyst for the record to be investigated and updated to a fatality.
- The two fatal collisions that were downgraded to severe injury collisions were possibly initially misclassified or the victims were determined to have passed away from natural causes before the actual collision occurred.

<Injury Severity Changes from Mar 2017 to June 2018>

Original Inj. Severity	Updated Inj. Severity	# of Records
Complaint of Pain	Fatal	8
Other Visible Injury	Fatal	17
Severe Injury	Fatal	69
Fatal	Severe Injury	2

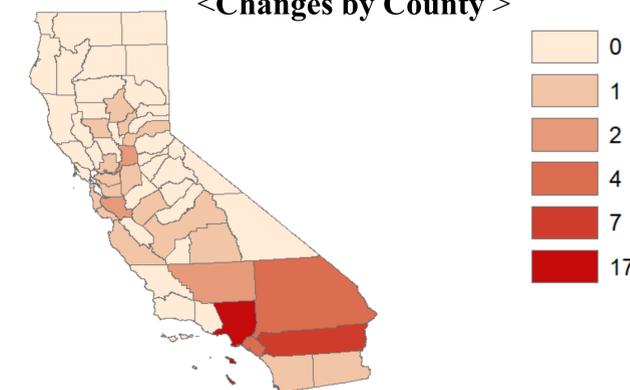
- The City of Los Angeles had the highest number of changes (20 records).
- The rate of changes based on the total reported collisions was highest (0.405%) in Compton in Los Angeles County.

<Number of Records with Changes by Location >

County	City	Tot. Records	Records w. Changes	Rate of Changes
Los Angeles	Los Angeles	29,732	20	0.067%
Fresno	Unincorporated	1,558	4	0.257%
Los Angeles	Unincorporated	6,613	4	0.060%
San Diego	San Diego	6,938	4	0.058%
Tulare	Unincorporated	968	3	0.310%
Los Angeles	Lancaster	1,034	3	0.290%
Riverside	Unincorporated	2,064	3	0.145%
Sacramento	Unincorporated	3,811	3	0.079%
Los Angeles	Compton	494	2	0.405%
Los Angeles	Palmdale	803	2	0.249%
Riverside	Riverside	2,109	2	0.095%
Los Angeles	Long Beach	2,302	2	0.087%
Santa Clara	San Jose	3,954	2	0.051%

➤ NOTE: Table includes only locations with 2 or more records with changes. There were 42 locations with 1 record with changes.

<Changes by County >



Conclusion

- Nearly 3 percent of all fatal collisions were updated; a significant amount given its importance to current safety PM targets in California.
- Agencies accessing data from I-SWITRS should have a process in place to retroactively compare local data with finalized SWITRS.