



# INDIANA DEPARTMENT OF TRANSPORTATION

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DATE: 5/4/2026

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SUBJECT: Changes to Injury Severity Determination Method for Crash Data Analysis

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This memo explains Indiana's transition from officer-reported incapacitating injury classifications to a consistent Suspected Serious Injury (SSI) method aligned with national KABCO standards. To avoid fluctuations in severe injury totals in crash data from year to year, and to better align the state with national best practices, Indiana is changing how injury severity levels are determined. With the upcoming rollout of AASHTOWare Safety for the state, this is an ideal time to make this change while other processes are also evolving.

## **Incapacitating Injury Crashes**

Historically, Indiana has used the following crash severity levels for our analysis: Fatal or Incapacitating Injury, Non-Incapacitating Injury, and Property Damage Only (PDO). The determination of whether an injury was incapacitating or non-incapacitating relied on officers assigning injury severity based on their individual interpretation. This method led to some inconsistencies as officers based the injury severity level on their individual perspectives and as the ARIES definition for incapacitating was altered between software versions. Because officer input changed over time, annual severe-injury totals fluctuated independently of actual safety trends. To mitigate these fluctuations, practitioners had to check each injury crash to verify if the person was transported to a hospital or not. The state is moving away from this method.

## Suspected Serious Injury Crashes (SSI)

Instead of using incapacitating vs non-incapacitating injury, the state will start basing severity determination on Suspected Serious Injuries (SSI). This will be defined by utilizing the individual crash report. In INDOT's copy of the ARIES data, an SSI indicator has been added to the collision level report. For internal INDOT users, this data can be accessed via the Traffic Safety Portal. This data will also be available in AASHTOWare Safety under the field "Crash Severity Level (NEW)."

The Model Minimum Uniform Crash Criteria 6<sup>th</sup> Edition (MMUCC) standards provide injury natures that should be counted as a severe injury. These eight codes align with the MMUCC definition of a Suspected Serious Injury. In the field titled "Nature of Most Severe Injury," if the officer selects one of the following eight options, the injury will count as an SSI:

1. Crush Injury
2. Fracture/Dislocation (See Note)
3. Internal
4. Paralysis
5. Severe Bleeding
6. Severe Burn
7. Severed (See Note)
8. Unconsciousness (See Note)

Note: For Fracture/Dislocation, only fractures or dislocations of extremities should be counted per the MMUCC. Fractures or dislocations of fingers or toes should not be counted. For Unconsciousness, only persons who left the scene unconscious should be counted per the MMUCC. Persons who were briefly unconscious should not be counted. For Severed, only severed limbs/appendages should be counted. Severed fingers and smaller severed body parts should not be counted unless the injury would also fall under one of the seven other categories listed above.

All other injury nature codes will be counted as a B- or C-level injury. Both incapacitating and non-incapacitating injury crashes could be counted as SSI crashes depending on the nature of the most severe injury. Whether someone was transported to the hospital will not be relevant to whether a crash counts as an SSI.

The injury nature code was present in ARIES 5, but not all relevant options were included in the drop-down. Because of this, SSI should only be used for 2022 and subsequent years. In 2022 and 2023, the SSI data will not be complete due to the 15-25% of ARIES 5 reports still being used, but it will be complete enough for preliminary use. For 2024 and future years, all reports will be completed using ARIES 6.

The following table illustrates how SSI counts vary by ARIES version and year, showing how SSI crash totals stabilized by 2024 once ARIES 5 had been completely phased out. Note how 2019 totals (ARIES 5) are unreasonably low and should not be used.

## Suspected Serious Injuries by Year

ARIES Version	2019 SSI Injury Crashes	2022 SSI Injury Crashes	2023 SSI Injury Crashes	2024 SSI Injury Crashes	2025 SSI Injury Crashes
ARIES 5	3,090				
ARIES 5 & 6		3,960	4,130		
ARIES 6				4,095	3,900

## **The KABCO Injury Scale**

Indiana has been performing safety analysis and reporting based on incapacitating injury crashes for many years. The safety tools that are used in the state are built around this use of incapacitating injury. However, Indiana is shifting from incapacitating injury to Suspected Serious Injury (SSI). This change will align Indiana with much of the rest of the United States on the KABCO scale and should stabilize the large fluctuations that have been occurring.

In the updated KABCO scale for Indiana, the following definitions will apply:

- K will be Killed - someone was killed in the crash,
- A will be Suspected Serious Injury (SSI) - the nature of the most severe injury resides within the SSI parameters (Crush, Fracture/Dislocation, Paralysis, Severe Bleeding, etc.),
- B will be Non-Suspected Serious Injury (Non-SSI or NSSI) - the most severe injury is visible or evident to observers at the scene of the crash (abrasions, bruises, minor lacerations, lumps on the head, etc.),
- C will be Minor Injury - the injury is not visible or evident to observers at the scene of the crash (complaint of pain, limping, nausea, hysteria, reported momentary unconsciousness, whiplash, etc.), and
- O will be Property Damage Only (PDO) – no person was killed or injured in the crash.

The most severe injury in the crash determines the level of severity for the whole crash. The Indiana safety tools will initially categorize crash severity according to the following logic:

- K – Someone was killed in the crash,
- A – Not a K crash and someone had a severity level of SSI in the crash,
- B – Not a K or A crash and someone was marked as either incapacitating or non-incapacitating in the crash,
- C – Not a K, A, or B crash and someone was marked as Possible, Refused, Not Reported, or Unknown,
- O – No person was injured or killed in the crash.

## **Timeline**

The change from incapacitating to SSI will go into effect in Indiana on October 1<sup>st</sup>, 2026. All work done for traffic safety analysis on the state or local network, all reporting, and all research must be done using the updated method after that date. The 2032 call for projects on the state system should be done using SSI methodology.

Note: The local safety call that typically takes place in November 2026 will still allow analysis using the old methodology. Every subsequent local call for projects will utilize SSI methodology.

The various tools such as the INDOT TSAM scoresheet and RoadHAT will be updated or retired to account for this change.

## **How to Handle Errors**

Crash narratives will still be an important part of a safety analysis to verify accuracy of severity level and crash type. Since crash reports are entered by individual police officers, there will be cases where the severity level listed on the report is not accurate. In such cases, modifications should be made to accurately reflect the true severity level. Any change made by the analysis should be documented in project scoping documents and scoresheets. Examples of changes that could be made are:

- An SSI crash with injury nature of “fracture/dislocation” has been clarified as a minor broken nose with no other injury in the narrative. The practitioner should modify this record to a Non-SSI crash and document the change in their analysis.
- A Non-SSI crash with injury nature of “minor bruise” notes in the narrative that someone was found unconscious after the crash. The practitioner should modify this record to an SSI crash and document the change in their analysis.
- A Minor Injury crash with injury nature of “complaint of pain” has been clarified in the narrative as minor lacerations. The practitioner should modify this record to a Non-SSI crash and document the change in their analysis.
- A PDO crash may show no injuries, but the narrative may describe an injured person or other error. The practitioner should modify this record appropriately and document the change in their analysis.

In most cases, unless there has been an obvious mistake, the practitioner should default to the officer’s injury selection on the report.

## **Crash Costs**

To calculate benefit cost ratios, to perform statistical analysis for network screening and scoring, and for statewide research, crashes of different severities must be converted to dollars or equivalent property damage crashes (EPDO). For most work in Indiana, a conversion to dollars is used but the calculations will work with either method and produce identical results.

The estimated cost of a crash is based on the nature of the most severe injury in the crash. If multiple people are injured or killed, the crash cost will still be based on the severity level for the crash as a whole and not on a sum of the individual injuries. The following costs should be used for projects in Indiana (in 2025 dollars):

- K = \$857,956
- A = \$857,956
- B = \$212,262
- C = \$125,600
- O = \$15,587

These costs were selected after a review of the current methodology and a survey of what other states have been using. K crashes have the same estimated cost as A crashes because the inflated cost of a fatal crash (as much as \$20M by some estimations) causes too much of an impact on the selection of safety projects. Fatal crashes are very random and are unlikely to reoccur in the same spot twice within a few years. By overweighting fatal crashes, safety projects are programmed to locations that had one severe crash and may not actually have a pattern of severe crashes.

## **Number Of Years Used in Analysis**

Since severe crashes are rare, if too few years are used, a pattern of crashes may not be apparent. However, too many years may result in the inclusion of crashes that took place when conditions were significantly different than they are today. Historically, Indiana has used 3 years of crash data to evaluate a location for a safety improvement. Going forward, 5 years of data will be used. Five years of data will allow for a more robust crash pattern to become apparent and should allow the practitioner to select the best-fitting countermeasure for the location.

For locations that may have experienced a major change in the past few years such as a new development, roadway project, or work zone, an exception to allow a shorter crash history may be approved.

Note: For the INDOT state 2032 call for projects, only 4 years of SSI data are available. Therefore, only 2022-2025 will be used for analysis. For the 2033 call for projects, 5 years will be utilized (2022-2026). Every subsequent year will use the 5 preceding years of data.