

Crash Evaluation Methodology Overview

Investigating crash history is an important part of the technical evaluation of a roadway project. Crash history gives an indication on how safe a roadway is currently operating. The number of crashes, where they are occurring, the type of crashes, and severity of those crashes are all primary factors to be considered. Concentration of crash types and/or significant numbers of crashes at certain locations will require treatments (countermeasures) and solutions.

Evaluating crash information occurs in a three-step process: 1) Data Collection, 2) Data Processing, and 3) Data Analysis. The following is a summary of these steps:

Data Collection

The first step in evaluating the crash history is to collect three years of crash records. Typically the number, type, and severity of crashes are similar from year to year. If unusual patterns are identified, then more data may be necessary.

Crash data is obtained and summarized as follows:

- 1) Illinois Department of Transportation (IDOT) Division of Traffic Safety obtains Traffic Crash Reports from local and state police
- 2) Data from reports are coded into the state's accident reporting system
- 3) Various summary reports are obtained from IDOT in addition to the actual Traffic Crash Report:
 - a. S-90 Reports
 - Summarizes crashes by location along the route
 - Provides crash type and injury severity
 - b. Collision Diagram Report
 - Summarizes crashes by location along the route
 - Provides detailed information on crash type, severity of injury, roadway surface condition, lighting conditions, and direction and maneuvers of vehicles
 - c. Intersection Crash Diagram software
 - Draws a diagram of crash data from Collision Diagram Report

A site visit to inventory and observe existing conditions is conducted. Information is collected on possible safety issues such as visibility of traffic signal equipment, location (or lack) of turn lanes, and identification of any fixed objects such as power poles next to the roadway. Observations on traffic flows and maneuvering are recorded.



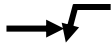




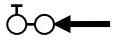

Data Processing

The three most recent year crash data is summarized by various categories: location of crash (intersection or segment), crash type, severity of injury, roadway surface condition, and roadway lighting condition. Information is reviewed for accuracy.

Crash data is divided by location into intersections and segments based on the characteristics of the route:

- 1) Signalized intersections are evaluated by themselves
- 2) Segments can be divided based on:
 - a. Location of signalized and higher volume unsignalized intersections
 - b. Similar roadway type (2-lane versus 4-lane; shoulder versus curb and gutter)

Crash type is an important piece of information. High numbers of certain crash types suggest that a certain problem exists along the roadway. Understanding the reason why these crash types are occurring allows implementation of treatments (countermeasures) to reduce the frequency of these crashes in the future. The main types of crashes include the following:

Crash Type		Description
Right Angle		Vehicles traveling along crossing routes crash at right angle even if one vehicle was making a left or right turn.
Rear End		Both vehicles are traveling in same direction on same route. Lead vehicle may be going straight or turning. Lead vehicle is hit from behind by following vehicle.
Left Turn		Vehicles traveling in opposite directions on same route (approaching each other) with one vehicle turning left to the crossing route or driveway.
Sideswipe, Same Direction		Vehicles traveling in same direction on same route. Usually caused by a lane change or swerving maneuver.
Sideswipe, Opposite Direction		Vehicles traveling in opposite direction on same route (approaching each other). Usually caused by a lane change or swerving maneuver.
Head On		Vehicle traveling in opposite direction on same route (approaching each other) and collide head on.
Pedestrian		Any crash involving a vehicle traveling along the route and a pedestrian.
Bicyclist (Pedal Cyclist)		Any crash involving a vehicle traveling along the route and a bicyclist.
Fixed Object		Vehicle hits a fixed object such as a median or traffic signal / light pole.

Crash severity is key indicator in evaluating the current safety condition of the route. Understanding the severity of injuries will allow the implementation of appropriate countermeasures to reduce the severity of crashes in the future. Crash severity is categorized by IDOT in the following categories:

Severity	Description
Fatal	A traffic crash involving a motor vehicle in which at least one person dies within 30 days of the crash.
Type A (Incapacitating injury)	Any injury, other than fatal, that prevents the injured person from walking, driving, or normally continuing the activities he/she was capable of performing before the injury occurred. Inclusions: severe lacerations, broken/distorted limbs, skull injuries, chest injuries and abdominal injuries.
Type B (Non-incapacitating injury)	Any injury, other than a fatal or incapacitating injury, that is evident to observers at the scene of the crash. Inclusions: lumps on the head, abrasions, bruises, and minor lacerations.
Type C (Reported, injury not evident)	Any injury reported or claimed that is not listed above. Inclusions: momentary unconsciousness, claims of injuries not evident, limping, complaints of pain, nausea.
Property Damage	No injuries or fatalities, but damage is caused either vehicle.

Other considerations in a crash analysis includes the roadway surface condition (dry, wet, snow, ice) and roadway lighting condition (dawn, daylight, dusk, darkness, darkness but lighted roadway). These provide an indication if the roadway and lighting condition are contributing factors to the crashes experienced within the project limits. Depending on the existing situation, appropriate treatments would be studied and implemented.

Data Analysis

Each intersection and segment is evaluated by analyzing crash patterns (number, type, and severity of crashes). Whenever there are significant numbers of a certain crash types, there is likely a common reason(s). Understanding the existing field conditions is also an important part of the analysis. Observations and inventory of existing conditions may explain why certain crashes are occurring. Crash reports (police reports) provide written descriptions of each crash, thus providing valuable insight to the potential cause of each crash. All of the data will be analyzed to understand the probable cause of the crashes.

Once this information is analyzed, potential treatments can be recommended. These recommendations may be required throughout the project study area, or they may be at spot locations where specific treatments are necessary.