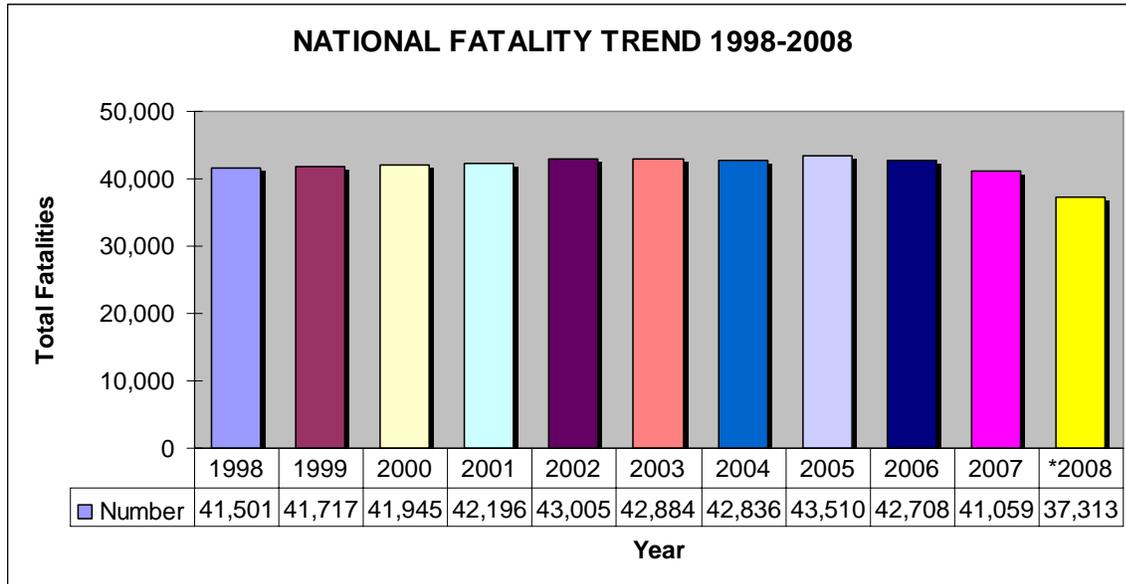


**Recommended Safety Performance Measures for
AASHTO Consideration**
STANDING COMMITTEE ON PERFORMANCE MEASUREMENT

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The current AASHTO Safety goal, established in 2007, is a 50% reduction in annual fatalities within 20 years. This will require an average annual reduction of about 1,000 fatalities each year. Progress towards this goal was made in both 2007 and 2008.



* 2008 preliminary

However, it will be difficult to sustain this progress in future years. There are a number of safety performance measures which states could use to evaluate their highway safety programs, monitor their progress toward the national goal and assist them in programming safety funds to optimize the reduction of both fatalities and major injuries.

Several safety performance measures are discussed in the draft report prepared on performance measures by Cambridge Systematics for AASHTO. Other performance measures are included in the August 2008, USDOT/NHTSA report titled, *Traffic Safety Performance Measures for States and Federal Highway*. Following are the two currently recommended performance measures for State DOTs, as well as two additional safety performance measures.

Safety Performance Measures Recommended for State DOTs

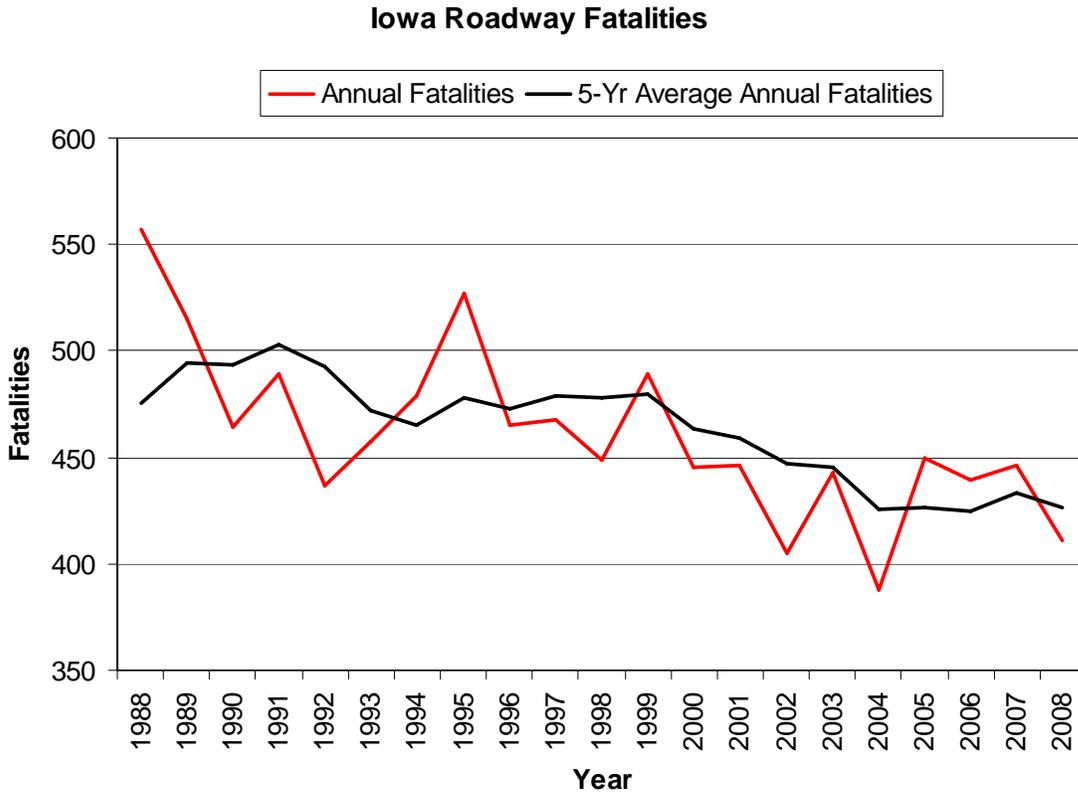
1. Annual Number of Roadway Fatalities

The most obvious roadway safety goal is to save lives, and fatalities per year is easily tracked and understood. Unfortunately, because fatal crashes are such rare events, small fluctuations related to a wide range of factors can lead to wide variations in the number of roadway fatalities over a short time period. This is

especially true for states which have relatively few fatal crashes per year. For this reason, the number of fatalities in a single year is not necessarily the best indicator of an overall increase or decrease in the safety of a roadway system.

2. Three or Five-Year Moving Average of Annual Fatalities

Using the average annual number of fatalities over a three-year or five-year period is still based on readily available roadway fatality data, and it keeps the simple metric of “fatalities per year.” However, it has the added benefit of incorporating more years of data. By looking at the average of multiple years of data, the year-to-year peaks and valleys are smoothed out and an overall trend is easier to identify. The following figure shows the sporadic ups and downs in annual fatalities in Iowa, compared to the general downward trend seen in the plot of the five-year average annual fatalities.



The decision to use three or five-year averages should depend on the exposure level in each state and number of fatalities per year. In general, states with a higher number of highway fatalities would be better served by using a three-year running average. Using fewer years provides more immediate feedback, but is also subject to wider fluctuations which may not be directly related to changes in roadway safety.

Other Excellent Safety Performance Measures

3. Annual Number of Fatalities and Major Injuries

As previously discussed, it is difficult to track the safety performance of a roadway system using fatalities because fatal crashes are such rare events. There are several good reasons to consider including both fatalities and major injuries. First, crashes resulting in major injuries can have a very significant negative impact on the quality of life of the victims. Second, the difference between a fatal crash and a major injury crash can often come down to factors not related to the roadway, such as the individual's prior health, the vehicle type and safety features, or the timing and quality of emergency response. Adding major injuries and fatalities provides more data and a better representation of the safety performance.

The following chart provides an example of why fatalities alone can be misleading as the sole safety performance measure. Both 2007 and 2008 had a higher number of fatalities than in 2002. However, both years had substantially fewer *total* fatalities and major injuries.

State of Iowa Fatalities and Major Injuries

Year	2002	2003	2004	2005	2006	2007	2008*
Fatal	405	443	388	450	439	446	411
Major Injury	2232	2051	2173	2090	1889	1976	1829
Totals	2637	2494	2561	2540	2328	2422	2240

* 2008 preliminary

At this time, many states are unable to collect reliable crash data for major injury crashes on all roadways. In addition, inconsistency exists with what is considered a major injury.

4. Performance Measures to Optimize State Highway Safety Program Investments

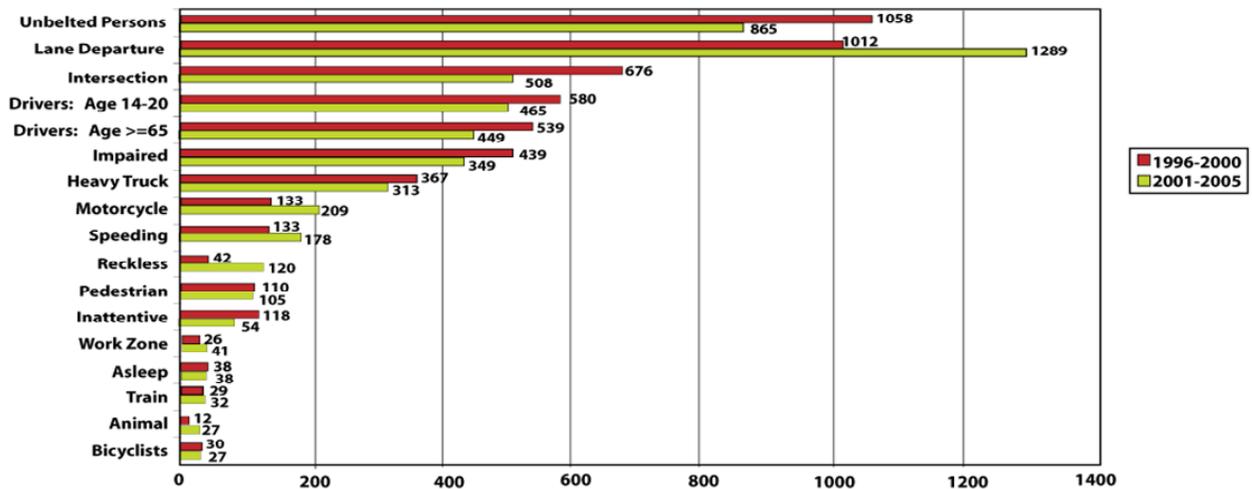
Highway fatality and major injury trends are directly impacted by a state's safety program investments. Tracking the number of fatalities (and major injuries if possible) for each emphasis area of a state's Strategic Highway Safety Plan can

help that state target their limited safety funds to the areas where they are needed most.

As an example, the following chart was developed in 2006, when Iowa was developing its Safety Plan. The chart showed a high number and increasing trend in run-off-the-road crashes. As a result, Iowa placed more focus on reducing lane departure crashes with strategies such as paved shoulders, shoulder and centerline rumble strips, median cable, low cost improvements at high crash curves, etc.

Iowa Crash Deaths Associated with Key Emphasis Areas

(produced by Iowa Department of Transportation - Office of Traffic and Safety on April 19, 2006)
 (note that 2005 data remains preliminary due to submission, entry, and edit lag)



Please note that these categories are not necessarily mutually exclusive.
 Typical yearly fatality totals for Iowa range from 400-450 deaths.

A similar format can also be used to compare the most recent annual data in each emphasis area to both the previous year and previous five-year average time period.

Iowa Fatalities and Major Injuries Associated with Key Emphases

(by Iowa Dept. of Transportation - Office of Traffic and Safety on January 30, 2009)

(*note that 2008 data remain preliminary*)

