Rating U.S. Roads for Safety

usRAP

UNITED STATES ROAD ASSESSMENT PROGRAM

www.usRAP.us

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The AAA Foundation for Traffic Safety (AAAFTS) has initiated a pilot program to test the technical and political feasibility of instituting a U.S. Road Assessment Program (usRAP) in cooperation with Federal, state and local highway agencies and other stakeholders. usRAP is building on the successful EuroRAP and AusRAP programs already established in Europe and Australia. An International Road Assessment Program (iRAP) has been established to coordinate efforts by usRAP, EuroRAP, and AusRAP and to test the RAP concept in low- and middle-income countries throughout the developing world.

Why usRAP?

Traffic crashes in the United States result in an unacceptably high socioeconomic toll that has been growing due to a general under investment in safety.

The level of safety for motorists on U.S. roads varies widely. Controlled-access freeways, with no at-grade intersections or driveways, provide the highest level of safety among road types. However, highway agencies have limited funds for improving the safety features of roadways; so it is important that their investment decisions are made in a way that provides maximum benefits to motorists and to the public at large.

The primary objectives of usRAP are to:

- Reduce death and serious injury on U.S. roads through a program of systematic assessment of risk that identifies major safety shortcomings, which can be addressed by practical road improvement measures.
- Ensure that assessment of risk lies at the heart of strategic decisions on route improvements, crash protection, and standards of route management.

usRAP provides a new approach to organizing highway safety information to help highway agencies more effectively manage road safety. usRAP will also marshal the support of key stakeholders in the highway community and the general public to make the case for increased investments to bring about a substantial reduction in highway crashes. The initial focus of the usRAP program is rural roads including the state and county highways that carry much of the nation's traffic.

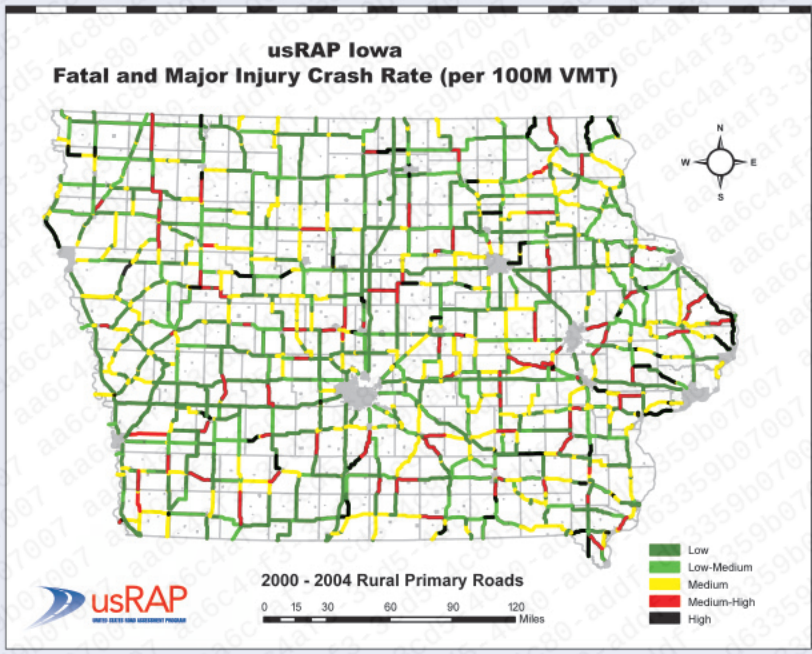
Risk Maps

Risk maps are a key tool used in usRAP to systematically assess risk and to assist in identifying locations for potential safety improvements. A key to understanding the nature of safety on the highway system is to recognize that, while every crash occurs on some road segment, this does *not* imply that the design or operational characteristics of that road segment are necessarily the *cause* of those crashes. While driver and vehicle factors contribute to the causation of many more crashes than road factors, risk maps of the road system can help to identify roadways where there are opportunities to improve safety, or where the public should exercise more care in driving.

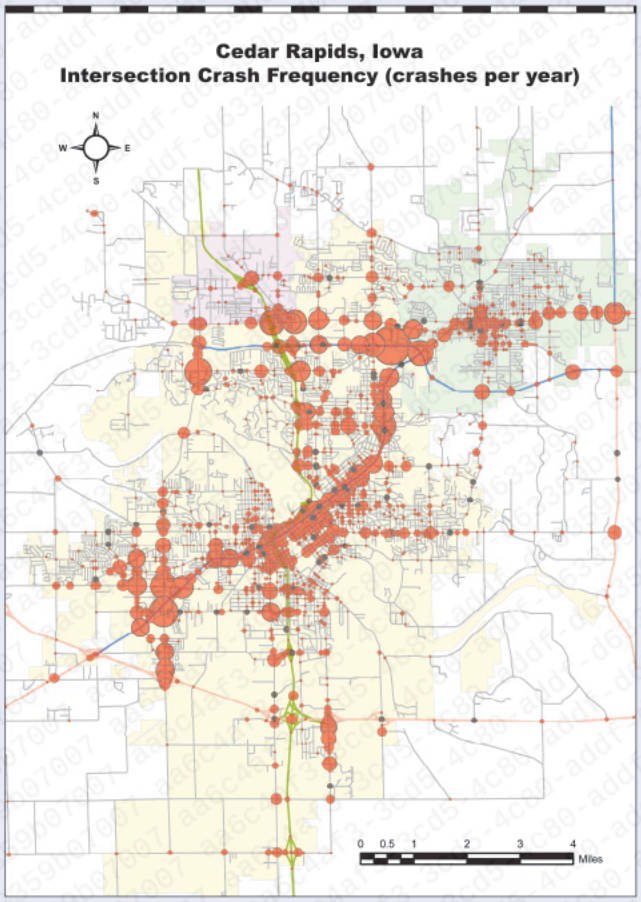
Based on recent crash and traffic flow data, risk maps illustrate the safety performance of the road system by measuring and mapping where people are killed and seriously injured in crashes. In pilot studies conducted in two states (Iowa and Michigan), usRAP has developed several types of risk maps based on:

- Density of crashes per mile of road
- Rate of crashes per 100 million vehicle-miles of travel
- Safety performance of roads relative to the average crash rate for other roads of a similar type
- Potential for crash reduction if the crash rate for a road were reduced to the average crash rate for similar roads

usRAP has also prepared maps representing the cost of crashes on the road and the crash density and rate at urban intersections. All usRAP maps have been produced with five years of crash data. Several examples of maps that have been developed to illustrate the usRAP concept are presented here. It should be noted that the color codes for risk levels of



roads on these maps represent risk only with respect to other roads in the states shown. Preliminary results indicate that the average risk levels for the roads on these maps are below the national average risk level. The full pilot study report is available at www.usrap.us or www.aaafoundation.org.



Who will benefit from usRAP?

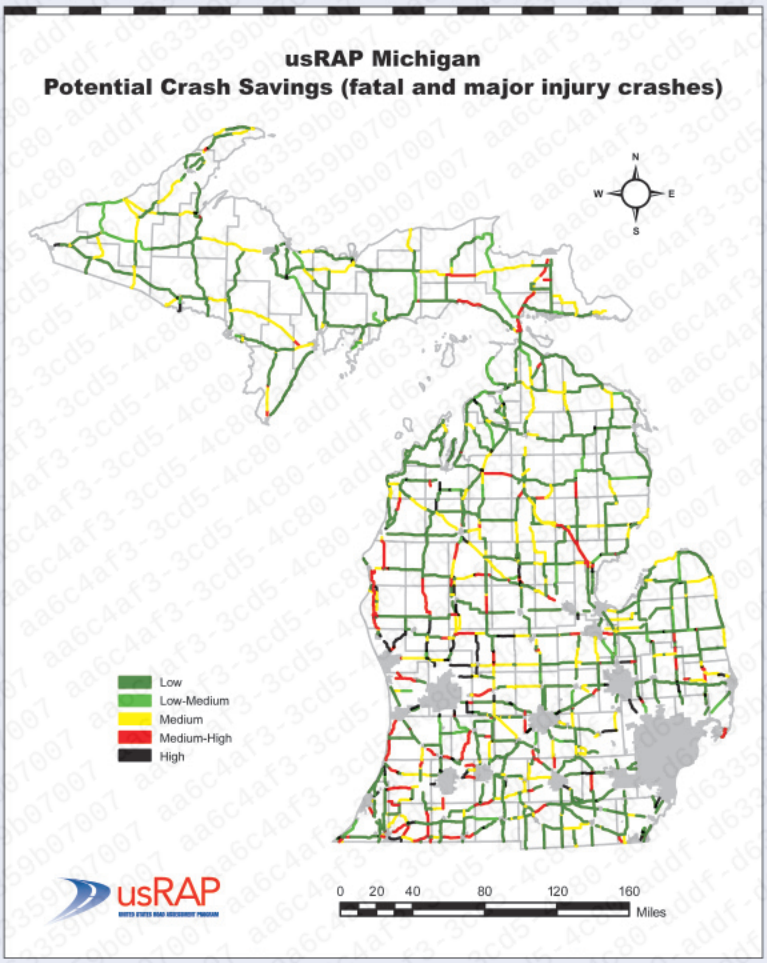
Both highway agencies and individual road users will benefit from information provided by usRAP.

Highway Agencies

Agencies responsible for road safety can use usRAP maps to see how well their road system is performing. usRAP maps can serve as a tool to identify the potential need for safety improvements on the highway system which can then be more thoroughly investigated in site-specific engineering studies. No single map is sufficient by itself to identify safety improvement locations. Multiple usRAP maps may be used in combination, and highway agencies should consider many factors beyond those depicted on the usRAP maps in determining safety improvement priorities. However, the usRAP maps provide a new tool that can assist highway agencies in the safety improvement process and that can be used, over time, to show the public the successes achieved through highway safety improvements.

Road Users

usRAP maps can help individual road users understand the risks involved in traveling on roads of different types and the safety performance of the specific roads that they travel. For example, usRAP maps clearly illustrate that freeway travel involves less risk than travel on other parts of the road system. Thus, selection of freeway routes, where practical, can reduce the overall risk to motorists in specific trips. Risk-aware road users will be more likely to adapt their driving behavior to reduce their risk of crash. Informed road-users will also



be better able to understand and respect the reasons for traffic laws, including speed limits, that reflect the risk of being killed or seriously injured in a crash.

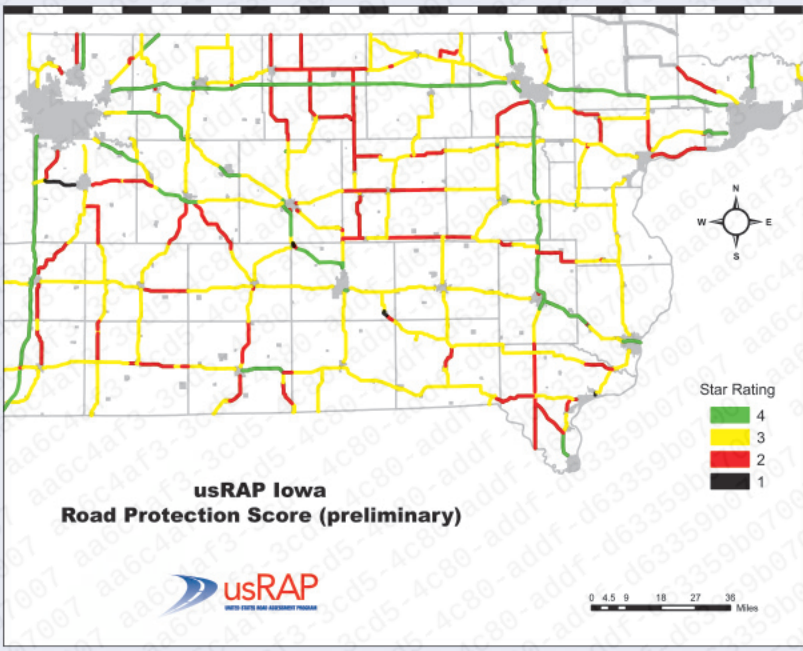
What's next for usRAP?

Star Ratings Based On Road Protection Score

Europe and Australia have developed concepts based on a road protection score for assigning *star ratings* to roads based on their safety features, with four (or five) stars assigned to roads with the most proven safety features and one star to roads with the fewest safety features. This concept is potentially valuable because data are not always available to produce risk maps based on crash history. usRAP has begun to explore the development of maps based on inventories of road safety features that can be made either directly during road inspections, or subsequently from video of the road, at reasonable cost. While potentially promising, the methodology used to score roads and assign star ratings to roads requires further research and testing.

Additional Pilot Studies

usRAP will continue work in Iowa and Michigan to test the concept of *performance tracking* to document safety improvement over time. In addition, pilot studies have begun during 2006 in other states. It is expected that the initial usRAP concepts will evolve significantly as a result of the ongoing work.



The primary objective of usRAP is to reduce death and serious injury on U.S. roads through a program of systematic assessment of risk that identifies major safety shortcomings, which can be addressed by practical road improvement measures.

The Pilot Program Technical Advisory Panel included Representatives from:

- AAA Clubs
- American Highway Users Alliance
- Federal Highway Administration
- American Association of State Highway and Transportation Officials
- National Association of County Engineers
- Institute of Transportation Engineers
- American Traffic Safety Services Association
- Participating state and local highway agencies

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