

### **Rural ITS Applications**

In rural areas, safety is the primary potential benefit of ITS; traffic fatalities per 100,000 population are generally much higher in rural states than in urban states. Excessive speeds, aggressive driving, run-off-road crashes, DWI, school bus operations, and highway-rail grade crossings are universally important safety issues. In extremely rural areas, call boxes may be particularly useful. Weather monitoring stations can be useful: for example, fog and dust storms have been known to cause chain reaction crashes involving many vehicles and fatalities. Snow and icing conditions often put drivers at risk, and can effectively shut down highways. Automatic Collision Notification systems can report an accident even if the driver is unconscious. Weigh-In-Motion and roadway condition monitoring technologies help maintain highways cost effectively.

While the application of ITS technologies for congestion mitigation is typically more appropriate in urban areas than in rural areas, the need for more advanced ITS technologies for increased safety is universally acute. As in-vehicle electronics becomes increasingly sophisticated, safety, security, and navigation benefits are beginning to accrue; however, to fully achieve the potential safety benefits of ITS it will be necessary to compliment smarter vehicles with smarter (instrumented) highways (including rural highways). In April of 2001 at the "National Summit to discuss the 10-Year Intelligent Transportation System Program Plan and Research Agenda" in Washington, DC, the general consensus among at least one "Infrastructure and Safety" group was that "using detection for crash avoidance" and "Automated Collision Notification" are top priorities; and a very strong consensus developed in at least one "Infrastructure and Efficiency" group that THE key action item in ITS for the next ten years should be to instrument 100% of U.S. highways, including rural (currently only 15% of urban freeways are instrumented) highways, for vehicle detection.

Inductive Signature Technologies, Inc. is busily developing reliable and cost-effective components necessary for large-scale highway instrumentation. We intend to support rural ITS applications with solar-powered and wireless highway instrumentation systems which are capable of detecting many unsafe traffic conditions, and either alerting drivers (in cooperation with advanced in-vehicle systems) or authorities as appropriate. And we will do this based on highly advanced, yet cost-effective, and anonymous vehicle detection technology.

### **Keys to the Future<sup>1</sup>**

If the fatality rate is not reduced and VMT [vehicle miles traveled] grows at the current rate of 1.96 percent annually, about 60,000 people will be killed on the highways in 2015.

In order to continue the trend of significant yearly reductions in the VMT fatality rate over the next 25 years, greater application of safety management to our nation's roads will be required. It will be necessary to adapt new safety strategies and vehicle technologies to match changing demographics and ever-increasing highway traffic...The USDOT has targeted a 20 percent reduction in highway-related fatalities and injuries by 2008. To achieve this goal, safety strategies and advanced technologies will need to address such issues as:

#### **Major Safety Problems:**

- High levels of alcohol-impaired driving;
- Growing size of vehicles and safety problems due to incompatibility between large and small vehicles;
- Rising incidence of aggressive driving and speed-related crashes;
- Run-off-road crashes;
- Intersection crashes;
- Highway-rail grade crossing fatalities;

#### **Promising Remedies:**

- Drowsy Driver Detection Systems: lanekeeping variation...is a key predictor variable for detecting driver drowsiness.
- Adaptive Cruise Control;
- Rear-End Collision Avoidance Systems;
- Collision Notification Systems;
- Intersection Collision Avoidance Systems;

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<sup>1</sup> Excerpts From: "The Changing Face of Transportation", USDOT (BTS00-007), p. 3-26,27 (please see the original report for the complete text)