Motorcycle Safety and Intelligent Transportation Systems
Outline

- Motorcycle Safety Problem
- US DOT Actions to Address Problem
- ITS-Related Elements
- Future Needs to Integrate Motorcycles into ITS Programs
Safety Has Been at a Plateau
Highway Fatalities in 2005 Highest Since 1990
2006 & 2007 Show Improvements

* NHTSA FARS data for calendar 2007; released 8/2008
Motorcycle Deaths: Key Facts

Passenger vehicle occupant deaths and motorcyclist deaths, 1975-2007

Thanks to: Insurance Institute for Highway Safety (http://www.iihs.org/research/fatality_facts_2007/motorcycles.html)
Motorcycle Deaths: Key Facts

Motorcyclist deaths by age, 1975-2007

Thanks to: Insurance Institute for Highway Safety (http://www.iihs.org/research/fatality_facts_2007/motorcycles.html)
Motorcycle Deaths: Key Facts

Percentage of motorcycle driver deaths by motorcycle engine size, 1985-2007

Thanks to: Insurance Institute for Highway Safety (http://www.iihs.org/research/fatality_facts_2007/motorcycles.html)
I assume you're aware that 80% of all motorcycle accidents end in death or injury? And that fatalities have increased 89% since 1997?

And that motorcyclists are now 21 times as likely as car occupants to die in a crash — and four times as likely to be injured?

And you just happened to have these facts at your fingertips? Not at all. I've been preparing for this moment your whole life.
Motorcycle Safety
The Bottom Line

- Deaths Have Doubled in Past 10 Years
  - Growing more significant as transportation choice
  - Changing nature of riders & vehicles

- A Significant Element of Our Highway Safety Challenge
  - NTSB Public Forum on Motorcycle Safety, Sept 2006
  - Concerns heightened among government, manufacturers, MC organizations

- Solutions Are Multi-faceted
US DOT Action Plan to Reduce Motorcycle Fatalities

- National Highway Traffic Safety Administration
  - Behavioral Topics
  - Vehicle-Based Improvements

- Federal Highway Administration
  - Motorcyclist Advisory Council (MAC)
  - Better Exposure Measurements
  - Infrastructure Construction, Maintenance, and Operation

- ITS Joint Program Office (RITA)
  - ITS Technologies and Programs
Individual manufacturers have made advances

A comprehensive scanning study of ITS applications for motorcycle safety was published by Monash University in July 2006 (http://www.monash.edu.au/muarc/reports/muarc260.pdf). There is very little else of note in the literature.

Motorcycles have not been significantly represented as a distinct vehicle class within the USDOT ITS Program
Foundational Technology: Smart Helmets or ...

- Wireless audio
- Embedded GPS
- Head Up Display
...Head Down Displays
Integrated Vehicle-Based Safety Systems (IVBSS)

Vehicle Detected

Cautionary Alert Sequence

Flashing Imminent Alert w/ Auditory Crash Alert

IVBSS and Motorcycles

- Purpose is to integrate crash warning systems to assist drivers in avoiding rear-end, run-off-road, and lane change crash warning systems.
- IVBSS explicitly designed to detect even the smallest motorcycles
- Due to size, would be difficult to install IVBSS system on a motorcycle
- Acknowledges motorcyclists as vulnerable and included motorcycle avoidance in verification tests (October 2007)
VII and Motorcycles

- The work plans and cooperative agreements with State and industry partners do not explicitly identify motorcycles, although the technologies are relatively easily adaptable.

- The project recognizes the need to detect “vulnerable road users” but does not explicitly identify motorcycles.

- As much of the work is applicable to all road users, it will support potential motorcycle applications.

- At least one industry partner, Honda, has conducted similar motorcycle-focused R&D in Japan.
Honda Advanced Safety Vehicle Program
Summing It Up

- ITS R&D has focused on automobiles, motor carriers and transit vehicles
- While many ITS efforts are adaptable to motorcycles, they have not historically been specifically included in ITS research.
- As motorcycle fatalities increase, value of ITS technologies should be revisited
- ITS Community should increase engagement with motorcycle organizations and manufacturers
  - Assure migration path for products to MCs
  - Recognize and proactively respond to needs of MCs
  - Specifically include MC user groups in outreach