

FHWA/AASHTO/NCHRP SCANNING PROGRAM - 2005

**Safety Applications of Intelligent
Transportation Systems**

Countries

- **Japan**



- **Germany**



- **France**



Mission Statement

To find existing ITS applications which could be effective in mitigating safety problems in the U.S. Of particular interest are those applications resulting in measured improvements in highway safety.

Team Members

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- **Mike Freitas, FHWA, Co-Leader, Japan**
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Team Members

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The Team in France



Objectives

- **Focus on safety related ITS applications**
- **Identify technologies that have been or are about to be deployed**
- **Assess effectiveness of deployed technologies through performance measurement**

Key Findings-By Component

- **Driver**
- **Vehicle**
- **Environment**
- **Policy**

Key Findings-Driver

- Provide the driver essential and timely information in the right format
- Technology and the driver's ability to react-must work together
- Information is advisory to the driver versus controlling the vehicle
- It is critical to understand the driver's needs

Key Findings-Driver

- **Standardized traffic enforcement for speed violations leads to greater compliance**
- **The importance of the driver, the vehicle and the environment working harmoniously towards safer travel**

Key Findings-Vehicle

- Accelerated deployment of on-board processing capabilities is key to advancing many other ITS applications
- There is a need to leverage the vehicle a probe that gathers and transmits data

Key Findings-Vehicle

- **Passive safety systems have achieved significant safety benefits**
- **Its time to advance active safety systems such adaptive cruise control, lane keeping, assisted braking, etc.**

Key Findings-Environment

- **Photo enforcement of speed improves safety through greater compliance and speed management**
- **Key ITS applications will advance first in the vehicle and eventually as components of the infrastructure**

Key Findings-Environment

- **More aggressive use of alternate routing will improve congestion management**
- **ITS applications used on toll facilities are deployed to improve customer service**

Key Findings-Policy

- **The EU's Code of Practice is intended to address liability concerns with ITS deployment**
- **Market penetration of technology advances is critical. It doesn't always have to be 100% to be effective**

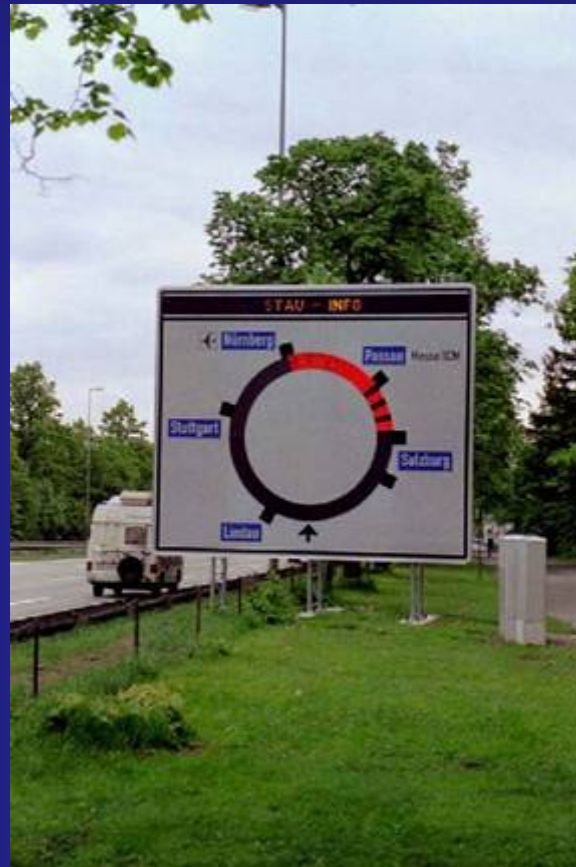
Key Findings-Policy

- **The EU has an aggressive public-private partnership between transportation agencies, private sector companies and the auto manufacturers**
- **Data protocols grow increasingly important as ITS technologies are deployed**

Key Findings-Policy

- **Leadership is the key and must come from both the public and private sectors**
- **Documentation of performance and the warehousing of critical information will result in better tactical and strategic decisions**

Message Sign With Congestion Indication



Message Sign With Congestion Indication



European Union Code of Practice

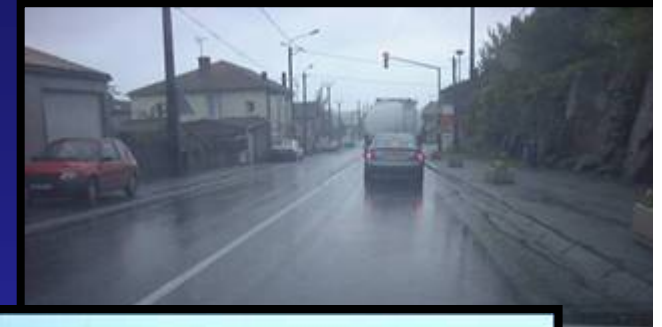


Code of Practice

- Relies on “reasonable safety” and “duty of care”
- Establishes a framework for limitations of liability if followed
- Patterned after other industries (e.g. aviation, pharmaceutical, etc.)
- Japan 1

SAFEMAP Functions

- 6 assistance features proposed
 - Speed limit assistant
 - Curve warning
 - Intersection warning
 - Overtaking assistant
 - Hazardous area warning
 - Accident spot warning



The logo for Liber-t, featuring the word "Liber-t" in a bold, italicized, orange sans-serif font. The text is set against a white rectangular background that is centered on a dark blue gradient background.

- **Covers the French toll network**
- **Common electronic toll collection**
- **11 different concessionaires operating the whole network**
- **One invoice**
- **More than 1,156,000 subscribers**

Wireless Local Danger Warning within IP PReVENT

Wireless Local Danger Warning-
is based on car to car
communication and supports the
driver in safe driving by
warnings and foresighted
information and provides an
electronic horizon

TPA - Speed Horizon



- A speed horizon is a speed profile ahead based on on-board sensors, inter vehicle communication, and a model based observer. It is the key for:
- predictive driving
- traffic adaptive driving
- damping of stop-and-go waves
- inflow and outflow management in jams
- rapid dissipation of jams



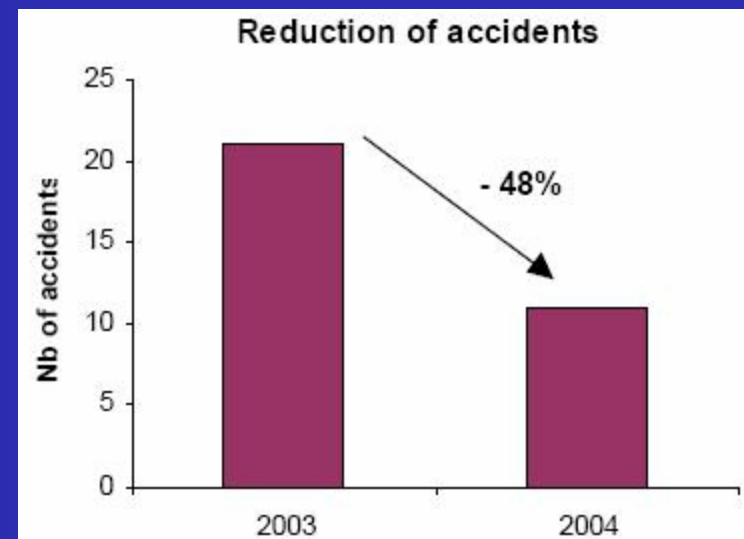
Speed Control on the A7 Motorway

Gain time by driving slower

**Autoroutes
du Sud
de la France**

Preliminary accident results

- Decrease in the total number of accidents by 48 % during the speed control activation
- Decrease of accidental bodily injuries by 77 % during the speed control activation



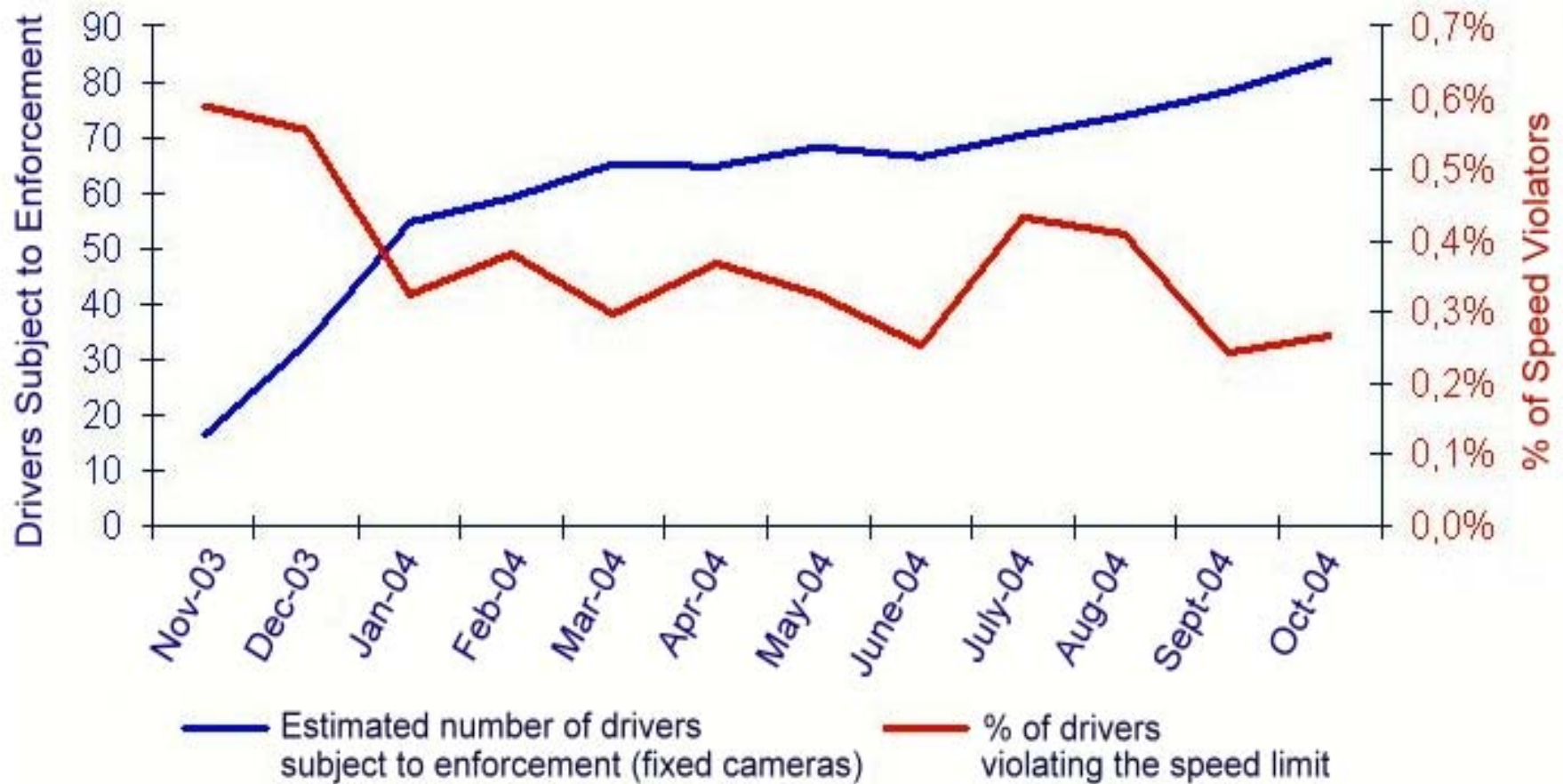


Speed Enforcement on French Motorways



A7 Speed Management

Drivers Subject to Camera Enforcement and Violators (Fixed Cameras)



Automated Traffic Enforcement

- **Ministre de Transport**
- **Photo enforcement of speed limits**
- **Uses fixed and mobile cameras**
- **All sites are clearly identified**
- **Goal is to achieve more uniform speed characteristics and reduced crashes**
- **Preliminary outcomes include an 86% reduction in crashes**

Recommendations-Driver

- 1. Identify stakeholders and interest groups and advance their collaborative efforts in raising the awareness of the driver's needs*
- 2. Advance the use of technology, driver education, insurance incentives, and other means to promote greater speed compliance and management*

Recommendations-Vehicle

- 3. Promote the aggressive implementation of low cost, on-board processing devices in US automobiles that will communicate with infrastructure features and receive information from other sources*
- 4. Promote and collaborate in the development of technology focused on driver assistance (e.g., adaptive cruise control, lanekeeping, assisted braking, etc.)*

Recommendations- Environment

- 5. Promote the additional testing and implementation of photo enforcement of speed. Implement a program of photo speed radar with a non-citation strategy to help curb aggressive driving on our nation's roads and highways*
- 6. Promote the accelerated development and deployment of systems that facilitate communication between the infrastructure and the vehicle*

Recommendations- Environment

- 7. Promote the further use of changeable/dynamic graphical signs (International standards)*
- 8. Integrate/certify/maintain detailed location codes, speed limits, and other critical infrastructure features into digital maps. Then, further integrate this information with on-board vehicle technology.*

Recommendations- Environment

9. *Develop and deploy technology that utilizes existing information gathered to provide “real time” notice of incidents. Utilize data collected in traffic - operations centers to react to emergencies*
10. *Promote the use of operations data in planning for future improvements to the infrastructure*

Recommendations-Policy

- 11. Create a national highway safety program leadership initiative focusing on safety applications of ITS technologies*
- 12. Create a warehouse for standardizing, gathering, managing and analyzing before-and-after performance data relating to safety applications of ITS technologies*

Scan Technology Implementation Program

- **Two early focus areas**
 - **Vehicle based**
 - **Infrastructure based**
- **Integration with state projects**
- **Integration with current VII efforts**
- **Technical presentations**

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