

## The European Road to increased Safety

Work zones and technologies: management and communication to the users



Introduction 1

Actions on infrastructures 2

Safety Management of Road Maintenance 3

Actions on behaviors 4



## Autostrade's Network

- **3,408** kilometres of motorway (61% of the Italian toll motorway network)
- **About 54 billion** kilometres travelled during 2006 (67% of total kilometres travelled on the national motorway network)
- **288** connection stations between the network and the territory
- **246** service areas

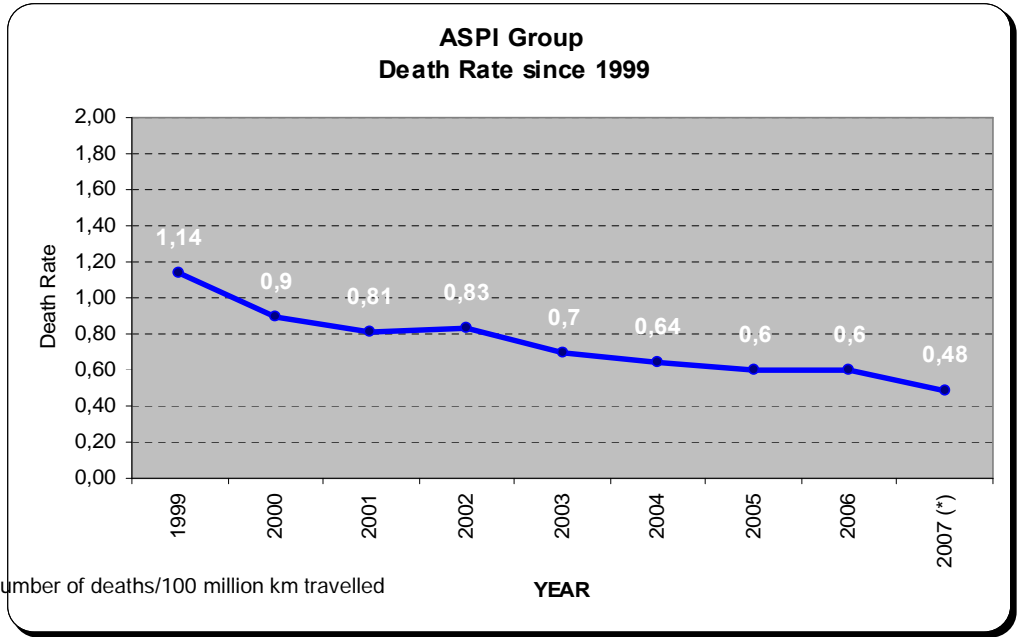
*With about 4 millions travellers per day along the network, equal to the 8% of Italian population, Autostrade may mean a "moving city"*





# Results: safety improvement

## Motorway mortality on the ASPI Group network



From 1999 to 2007, the death rate of the network, run by the ASPI Group, fell by over 50%.

- Specific actions:
- ➔ Infrastructure upgrading
  - ➔ Safety actions on working areas
  - ➔ Solutions for safer driving behaviour

Introduction 1

Actions on infrastructures 2

Safety Management of Road Maintenance 3

Actions on behaviors 4



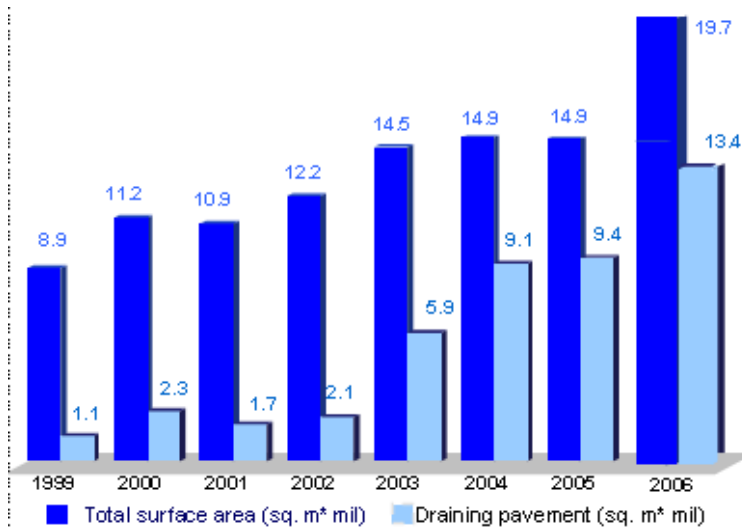
## Actions on infrastructures: Draining Pavement

Repaved road surfaces between 2000 and 2006: + 75%

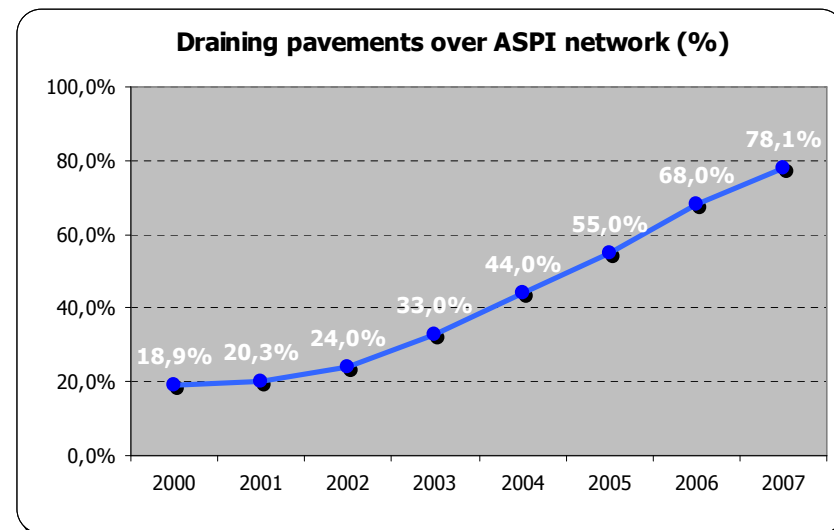
Draining pavement:

- Paved surface area: from 1.1 mil sq. m in 1999 to 13.4 mil sq. m in 2006
- Surface area with open-graded pavements: from 16% of the network in 1999 to 68.6% of network in 2006, with the 78,1 % target planned for 2007

Pavement resurfacing works (sq. m mil)



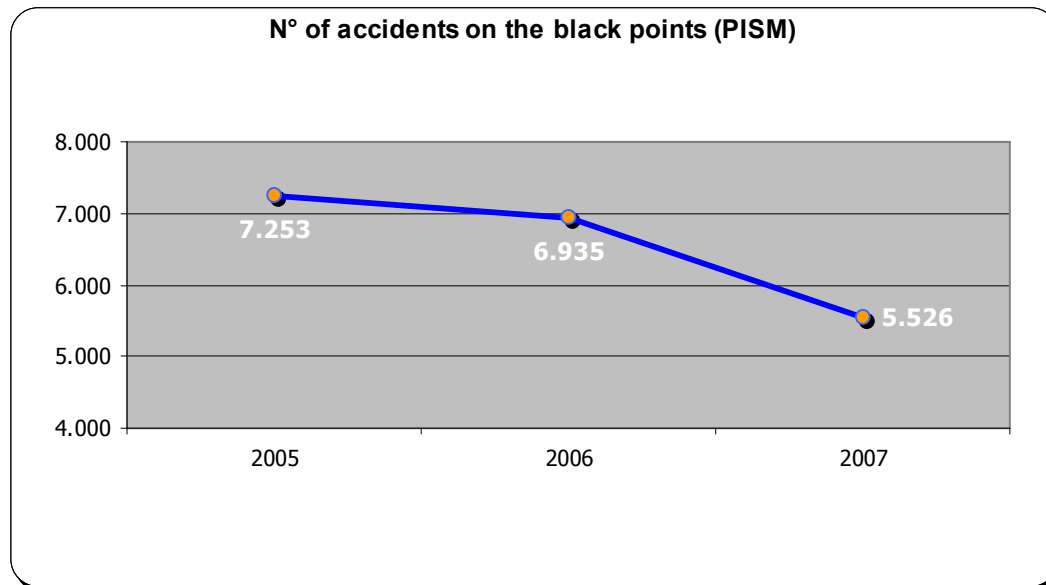
Draining pavements over ASPI network (%)





## Actions on infrastructures

- **Crash cushions:** a plan has started to install systems designed and tested by ASPI (130 installed; completion of the plan in 2008)
- **Road signs:** it has been improved visibility on more than 1700 sections where accidents rate was higher than the network average



Introduction 1

Actions on infrastructures 2

Safety Management of Road Maintenance 3

Actions on behaviors 4



## Actions on safety prevention of working areas

Since 2006, Aspi has been introducing a series of integrations to the standard required by the regulations in order to:



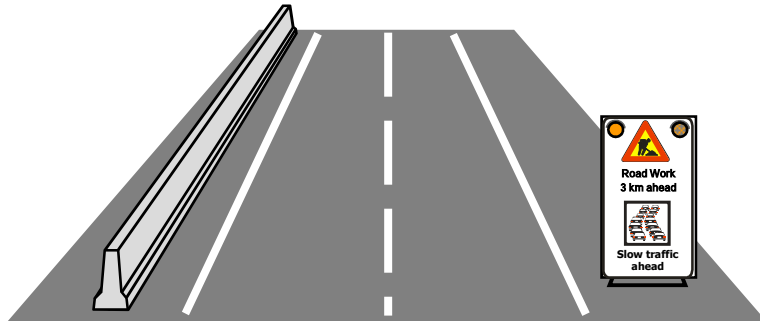
- Improve traffic safety approaching and driving through road works areas ;
- Minimize hazards to the workers.

### Main innovations

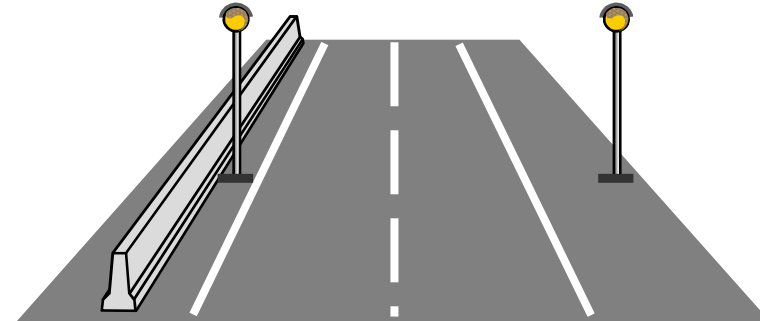
1. Information about road works location are given by *variable message signs* ;
2. *Flashing lights* in advance of the pre-signallization set required by the regulations have been introduced since 2002 and enhanced since 2006;
3. In all detours *flashing arrows* have been provided even in daylight conditions;
4. Types and power of lights and signals *refracting films* effectiveness standards have been redefined;
5. It has been provided *additional protective solutions* in the moving road work zone in presence of operators, and *minimum weight for the trucks* hauling flashing signs;
6. In agreement with the Motorway Police, *speed control* specific operation plane with mobile laser control (autovelox) has been provided.



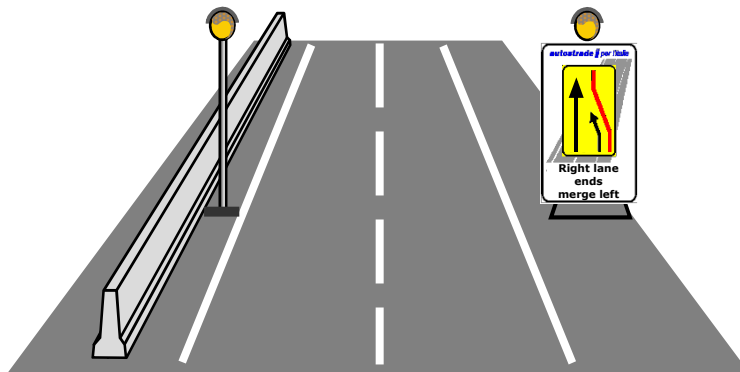
## Signals approaching to the road work zone (examples)



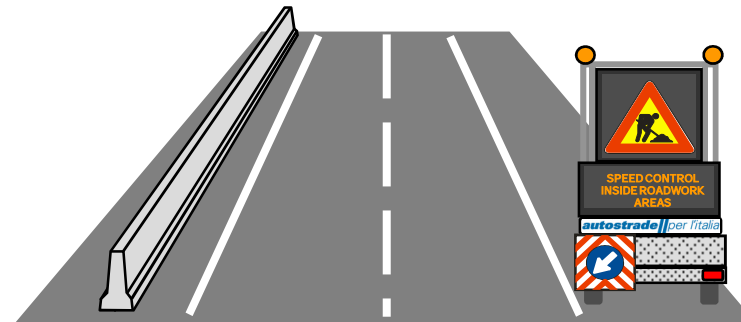
Nearly 2.300 m in advance  
(equivalent to 3 km before the  
narrowing)



1.500 m in advance:  
first couple of flashing lights



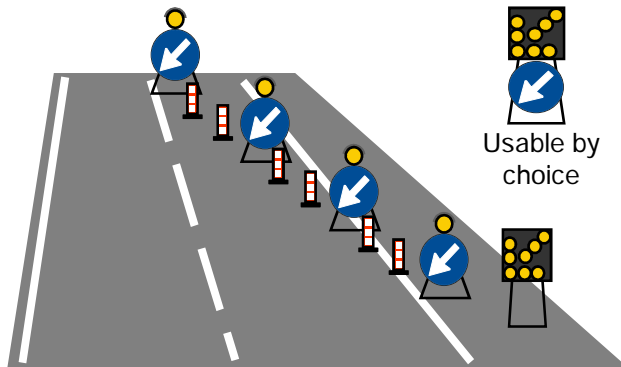
1.000 m in advance: second couple  
of flashing lights, and on the right, the  
advance of closed lane ahead



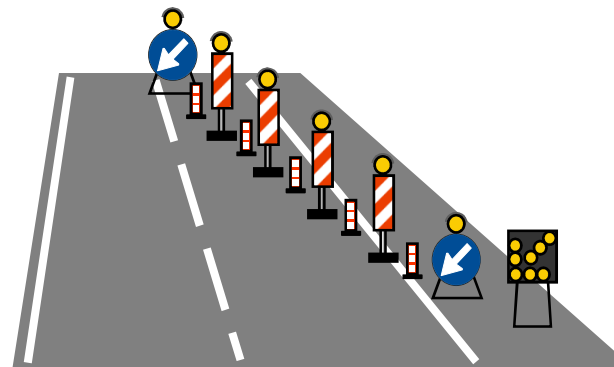
500 m in advance: mobile truck  
(set in the hard shoulder or in a lay-  
bay)



## New signals systems examples: closed lane ahead



Between 3 and 7 days

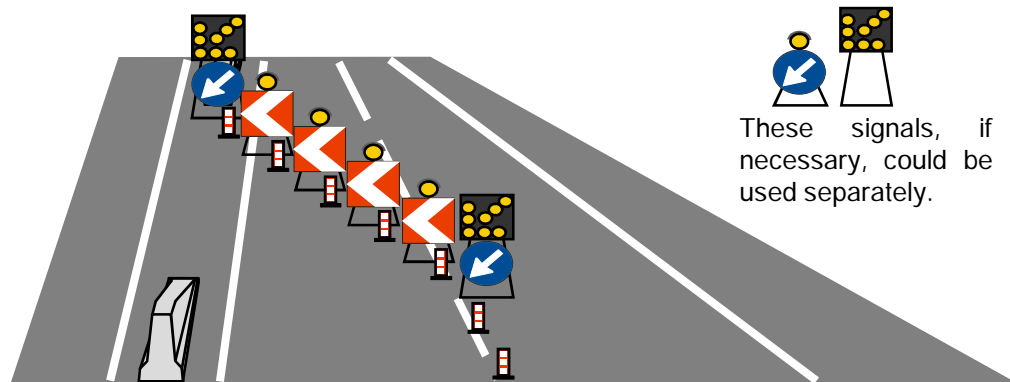


Longer than 7 days

Integration to standards required by the regulations:

- Flashing light arrows
- Reflective fences
- High effectiveness led lights

## New signals systems examples: detour



Integration to standards required by the regulations:

- Flashing light arrows
- High effectiveness led lights

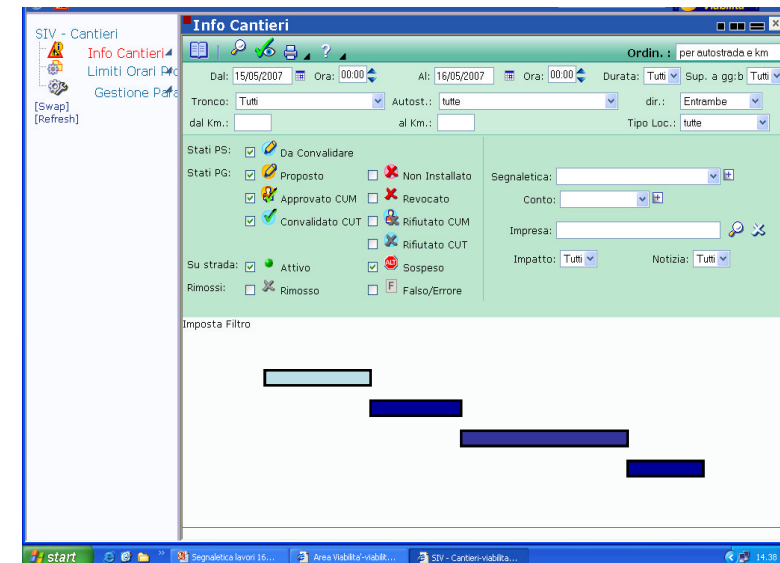


## Actions on safety prevention of working areas: planning

Maintaining the highways network with continuity and with an increasing level of quality requires more frequent interventions. The concessionary needs efficient systems for a short and medium/long term planning

### Main Rules

- Carry out works in periods characterized by lower traffic flow, so to reduce possible discomfort;
- Execute in the same areas and periods compatible operations, in order to reduce works durations;
- Design the road work area in order to minimize the impact on the traffic flows.





## Actions on safety prevention of working areas: control



**Motorway Police** checks traffic signs and, if there are omissions, non-fulfilments, irregularities or any damage in the signalling system, it demands to the responsible of works to restore it quickly.

The **Motorway Police**, through mobile speed control systems, checks the speed limit respect in the road works area.



Mobile speed control box

**The concessionary** monitors traffic and working areas with maintenance people and remoted cameras.

The maintenance companies are obliged to supervised signals and safety of operators and for each inconvenience a referent who is available to solve any trouble in the signalling system quickly.



Introduction 1

Actions on infrastructures 2

Safety Management of Road Maintenance 3

Actions on behaviors 4



# Actions on behaviors

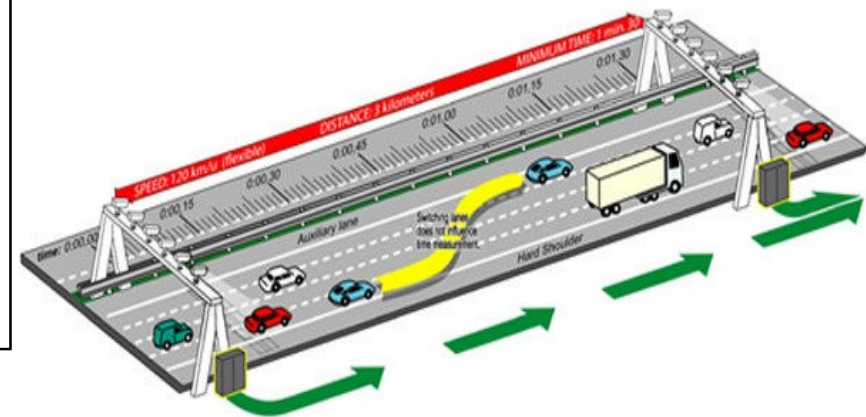
- Press information and advertising;
- Free coffee delivery in the motorway service area in the night time;
- Informative campaign "LA VITA È UN SOFFIO", free delivery of alcohol tests in the motorway service area on Friday and Saturday night;
- Booklet "OBIETTIVO SICUREZZA", a guide to a safer motorway driving;
- Special messages published on the variable message signs, e.g. A14 Bologna Taranto, 43 dead since January, drive safely!
- "METTICI LA TESTA", a television programme in cooperation with RAI Educational about road safety.
- Tutor System.



## Actions on behaviors: Safety TUTOR

Since December 2005 a speed monitoring system fully developed by ASPI has been put in operation. The system measures the average speed of vehicles covering a motorway section, checks the respect of the speed limit and automatically drivers are fined in case of non-observance.

At present time the system is running on more than 1200 km of the Group's network (covering the 16% of ASPI network)



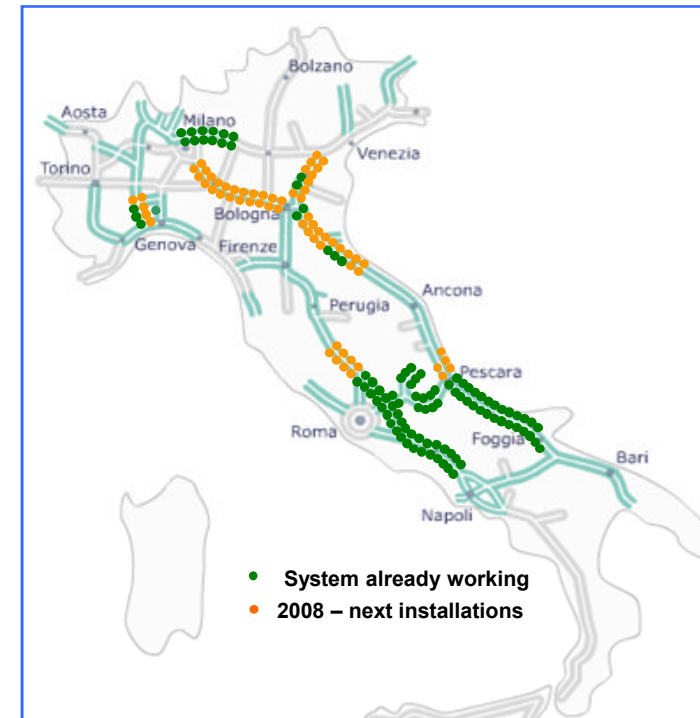


## Actions on behaviors: Safety TUTOR

With the agreement of Motorway Police it is going on the system installation on stretches with high death rate level. The network covered by the Tutor system will arrive by the end of 2007 to:

**1.250 km of carriageway**

- 22% of ASPI network
- 18% of the Group Network



### Objectives achieved

1250 km controlled by Tutor: first 12 months

	September 2005 and August 2006	September 2006 and August 2007	Δ TUTOR covered network	Δ ASPI Network
▶ Accidents rate	50,04	39,03	-22,00 %	-12,74 %
▶ Injured people rate	23,60	15,40	-34,75 %	-11,44 %
▶ Death rate	0,84	0,41	-50,83 %	-6,71 %



**Thank you for your attention !!**