

Climate Change and Road Safety

Consolidated management models and new processes of
Autostrade per l'Italia (ASPI)



AGENDA



01

WINTER ROAD
OPERATIONS

02

NEW PROCESSES FOR
EXTREME WEATHER EVENTS

ASPI OVERVIEW



The Network

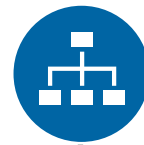
- 3.000 km
- 47% Italian Tollway Network
- 15/20 Italian regions crossed



23%



77%



Organization

- 9 Regional Headquarters
- 2 Central Headquarters
- 10 Traffic Control Centers



Technologies

- 1.922 Highway Message Boards
- 5.000 Traffic Monitoring Cameras
- 1.600 km covered by Tutor System



Resources

- 700 internal operational staff
- 1.500 external operational staff
- 935 operative vehicles



Traffic

- > 49x10⁹ km travelled in 2023
- 2,5x10⁶ daily transits

WINTER ROAD OPERATIONS



WINTER ROAD OPERATIONS

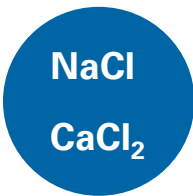
Not just a Winter matter



2.500
Operational
vehicles



5.000
Internal/External
operators



240.000 t
Stocked
Chlorides

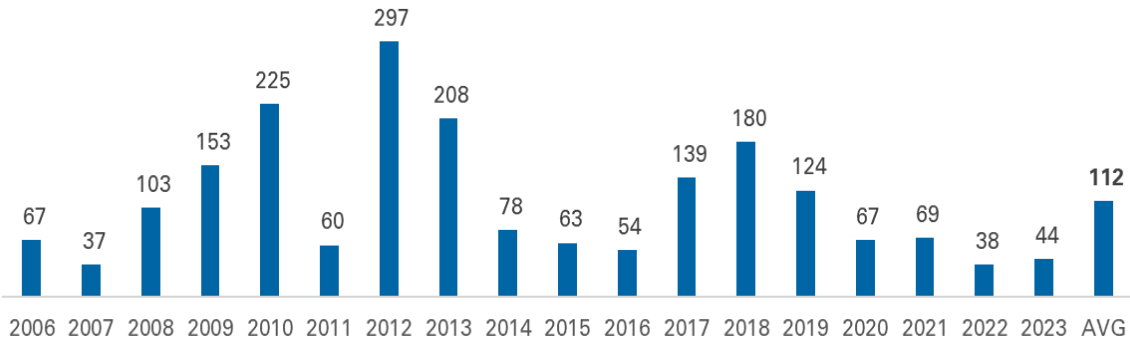


180
Local
Chlorides
Storehouses
(avg cap.900 t)

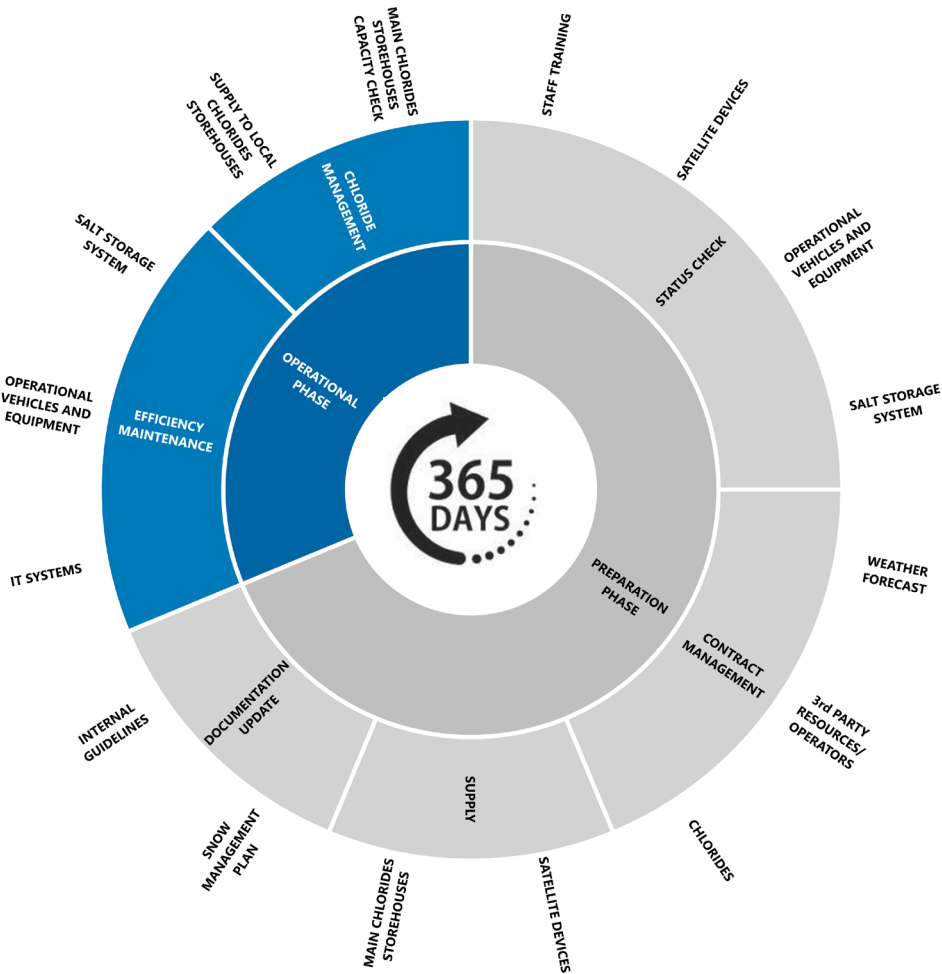


6
HUB - Main
Chlorides
Storehouses
(Tot. cap.
116.000 t)

Snow Index (10³ SnowHours x km)



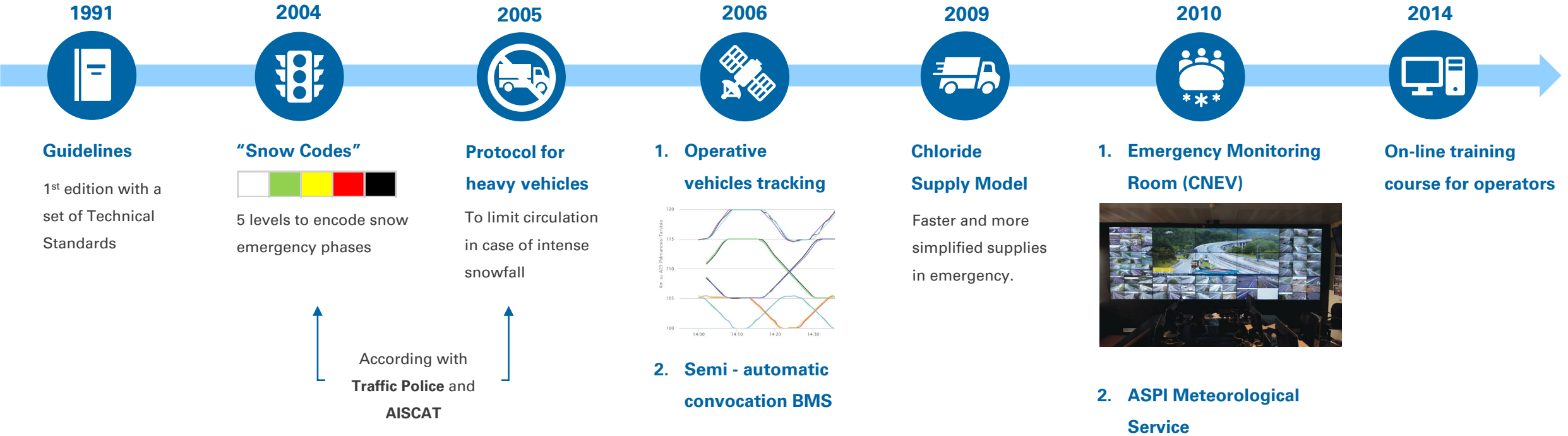
Preparation Phase is crucial: a well-done preparation in off-season period allow to minimize winter-related risks.



Staff Training and **Documentation Update** are essential for a constant performance increase.

WINTER ROAD OPERATIONS

A consolidated process



What about Road Workers Safety?



Specific Winter Operations Training

On-line: new **custom modules** based on effective worker activity kind.
Course is mandatory every 3 years.

1.200 /year

"On the job": practical training to become familiar with equipment, operational routes and procedures.

Road Operator Safety Training

To inform about general behavioral rules to be adopted during road activities.
Course is mandatory.



BEE software

Management system for maintaining of vehicles and equipment. It allow to **certify efficiency with a specific and accurate check-lists**.



Improvement in Worker Rest Area

Rest is crucial for Safety. ASPI is going to improve existing Worker Rest Area to allow a better comfortable relaxation during long winter period.



NEXT

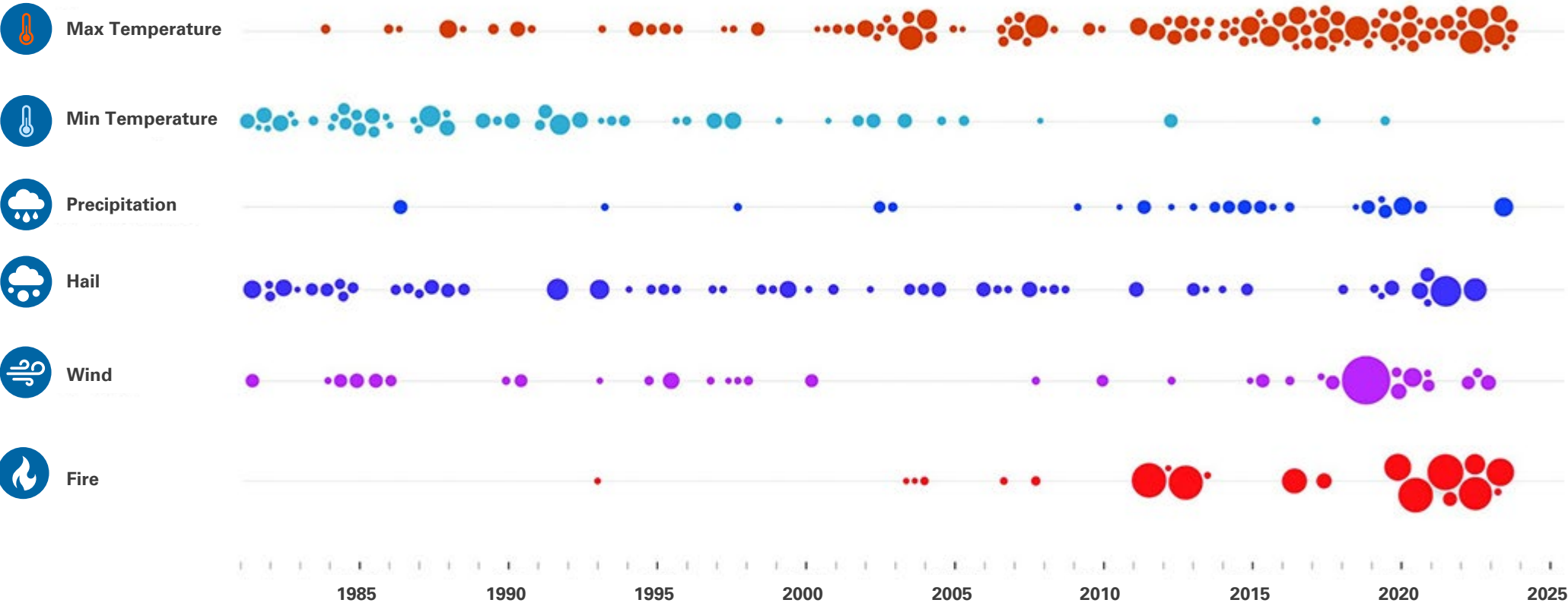
NEW PROCESSES FOR EXTREME WEATHER EVENTS



NEW PROCESSES FOR EXTREME WEATHER EVENTS

The italian climate scenario

Extreme Climate Events The plot show only the extreme climate events (values over 1) recorded in Italy between 1981.1.1 and 2023.09.30

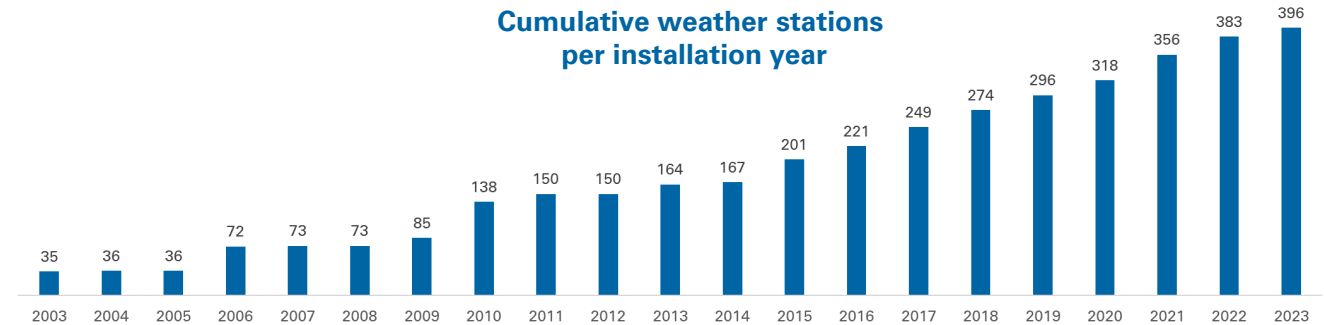


NEW PROCESSES FOR EXTREME WEATHER EVENTS

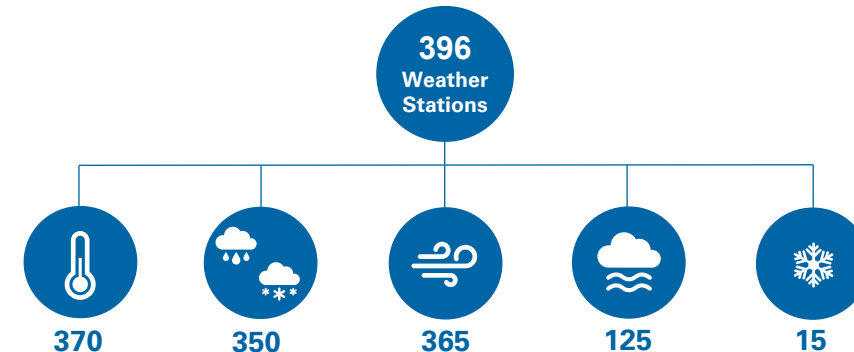
The ASPI meteorological network for data driven decision-making



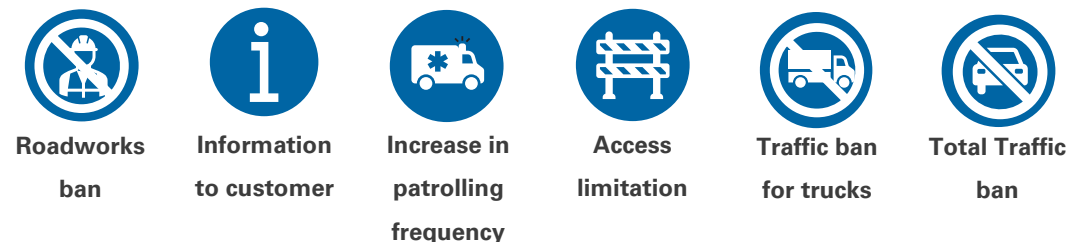
Cumulative weather stations
per installation year



Extreme events generally have a higher forecast uncertainty degree compared to normal weather phenomena. **Greater the number of measurements, faster the response in case of unpredicted events.**



Data alone are not enough. Right decisions to limit weather-related risks needs a **Management Plan** to define roles, actions and timing. Measures to be taken has been summarized in ASPI's Internal Guidelines.



NEW PROCESSES FOR EXTREME WEATHER EVENTS

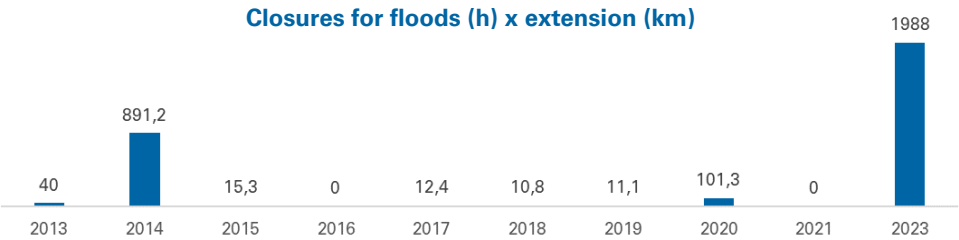


A14 - Emilia-Romagna, 16-17.05.2023



A11 - Tuscany, 02.11.2023

2023 represented a turning point in ASPI: **2 major flood events** caused extensive damage to the highway and posed significant risks to road traffic safety.



Needs to define a **new process** to regulate the timing and procedures for the adoption of traffic measures and an **early-warning system** to pre-alert the resources necessary to manage the associated risk.

NEW PROCESSES FOR EXTREME WEATHER EVENTS

1. Forecast of criticality



Italian Civil Protection produce a daily **Bulletin of national hydrogeological and hydraulic criticalities.**

- High:** huge and persistent dangerous phenomena
- Moderate:** widespread and persistent phenomena
- Ordinary:** occasional dangerous phenomena

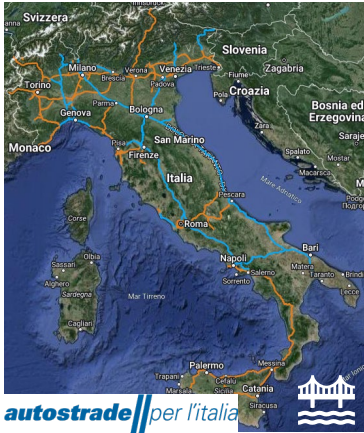
2. Flood Risk Map



Institute for Environmental Protection has realized a **mosaic of flood hazard zones.**

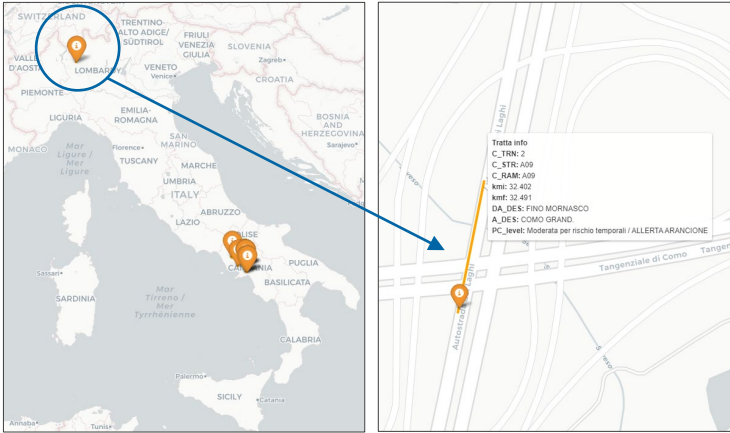
- High prob. scenario:** return period 20–50 y
- Medium prob. scenario:** r.p. 100–200 y
- Low prob. or extreme event scenario**

3. Bridges and Viaducts classification



ASPI has categorized bridges and viaducts in **5 levels** based on the **risk of overtopping** in case of significant river floods.

4. ASPI Flood Risk Bulletin



A dedicated internal software combines the 3 layers to produce a summary map with the highest flood risk sectors.

1. Alert Phase



- Roadworks ban
- Increase in patrolling frequency
- Resources pre-convocation
- Specific information on Highway Message Boards

2. Action Phase



- Increase in patrolling frequency
- 1° level resources convocation
- 1° level traffic reduction measures
- Specific information on Highway Message Boards

3. Emergency Phase



- 2° level resources convocation
- 2° level traffic reduction measures
- Specific information on Highway Message Boards

Thank You For Your Attention