

# WINTER MANAGEMENT ALONG THE ITALIAN MOTORWAY NETWORK

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# 1. INTRODUCTION

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In 2005 some heavy snowfalls during the winter season caused mobility breaks along the whole road system

The events of that period showed that the operational approach so far followed was no longer sufficient to ensure the proper management of mobility and infrastructure.

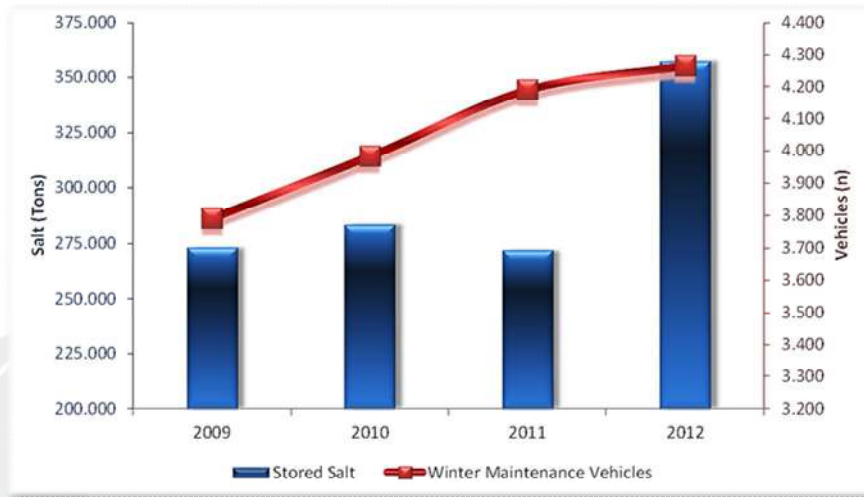
National Institutions and road operators worked together to implement more effective management-operating tools aiming at:

- ✓ strengthening the cooperation among the main actors involved
- ✓ improving coordinated activities (with specific attention to heavy traffic flows)

# 1. INTRODUCTION

Over these last years, the tolled motorways sector has been paying more and more attention and care to winter management activities

Considerable increase of the resources spent (**about 7-10%** of the total ordinary maintenance costs on average for all the concessionaire Companies) and investments for new instruments and technology.



*constant growth of the equipment at disposal of the Italian motorway operators*

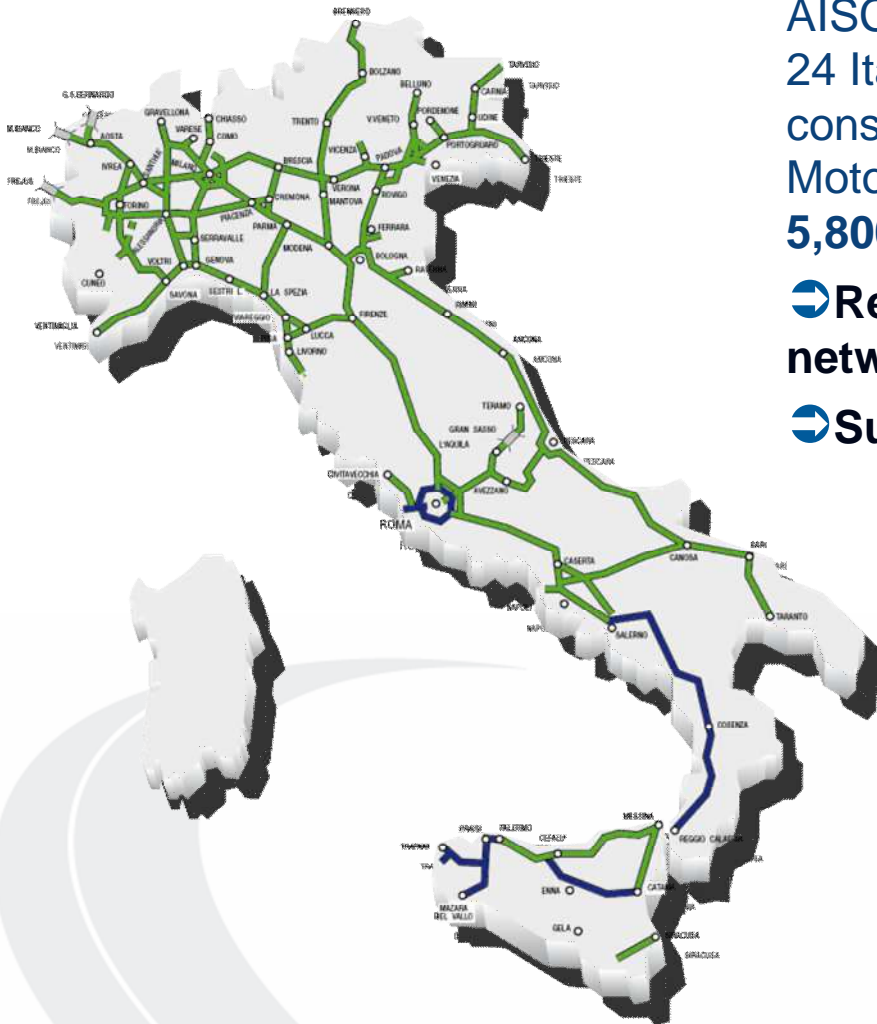
**The motorway system is now ruled by proper emergency procedures and plans**

## 2. GENERAL BACKGROUND

AISCAT is the Association gathering and representing 24 Italian Concessionaires Companies for the construction and the management of tolled Motorways and Tunnels, for a total length of about **5,800 km** which:

➡ Represents 3% of National primary road network

➡ Supports 25% of Country's overall mobility (in 2012 76,4 billion of vehicles-km)



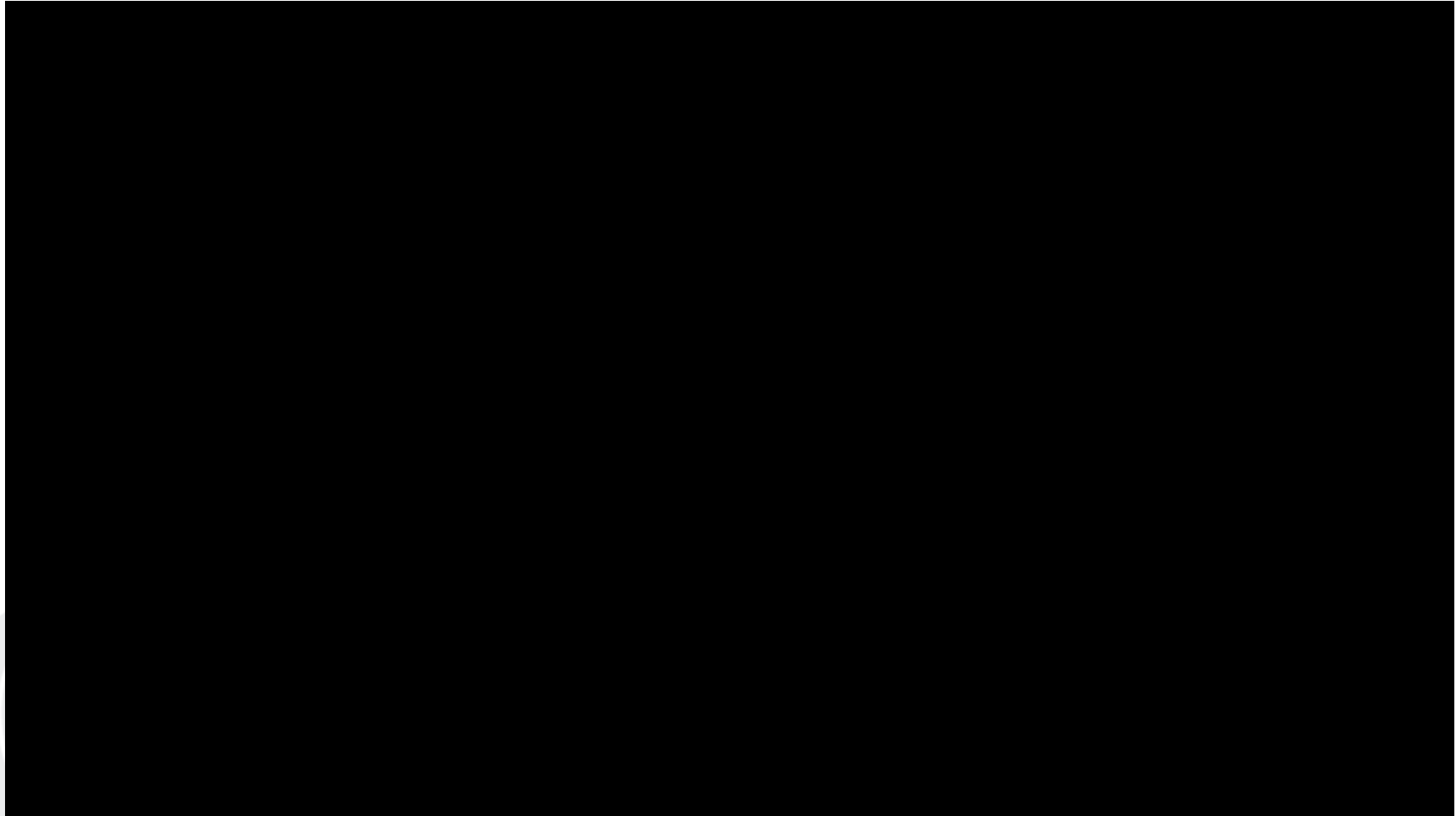
➡ Tolled	Km 5.788,6
➡ Toll free	Km 937,7
<b>Total</b>	<b>Km 6.726,3</b>

## 2. GENERAL BACKGROUND

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- ✓ Different operators managing the road network
- ✓ High level of daily traffic (**peak value 270,000 – 290,000 vehicles/day on some stretches**)
- ✓ High percentage of heavy vehicles (**average 20-25%, maximum up to 35% on some stretches**)
- ✓ Italy's particular geography (**motorway mountain passes at 1,000 – 1,100 m**)
- ✓ Limited capacity of the ordinary road network

### 3. WINTER EMERGENCY OPERATIONS: THE INTERVENTION MODELS



### 3. WINTER EMERGENCY OPERATIONS: THE INTERVENTION MODELS

#### **Objectives**

- ➔ *traffic management in particular conditions*
- ➔ *specific attention to heavy traffic flows*
- ➔ *maintaining practicability*
- ➔ *coordination among operators*

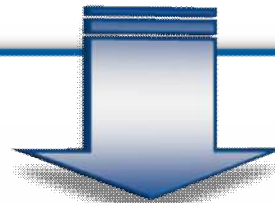




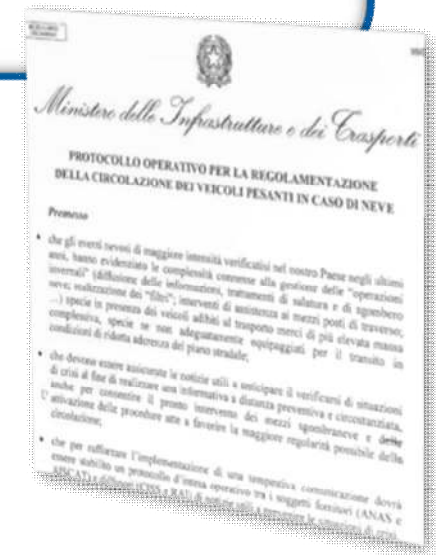
### 3. WINTER EMERGENCY OPERATIONS: THE INTERVENTION MODELS

more effective management-operating tools

- ➔ *new instruments and technology*
- ➔ *new emergency procedures and plans*



- ✓ **Guidelines for Coordinated Management of Emergencies in Wintertime**
- ✓ **Operating Protocol Regulating the Circulation of Heavy Vehicles Under Snowfalls**



### 3. WINTER EMERGENCY OPERATIONS: THE INTERVENTION MODELS

*Guidelines for Coordinated Management of Emergencies in Wintertime*

- ✓ Contents of emergency operating plans under snowfalls
- ✓ Classification codes of the emergency level and related provisions
- ✓ Communication and information procedures (to road users)

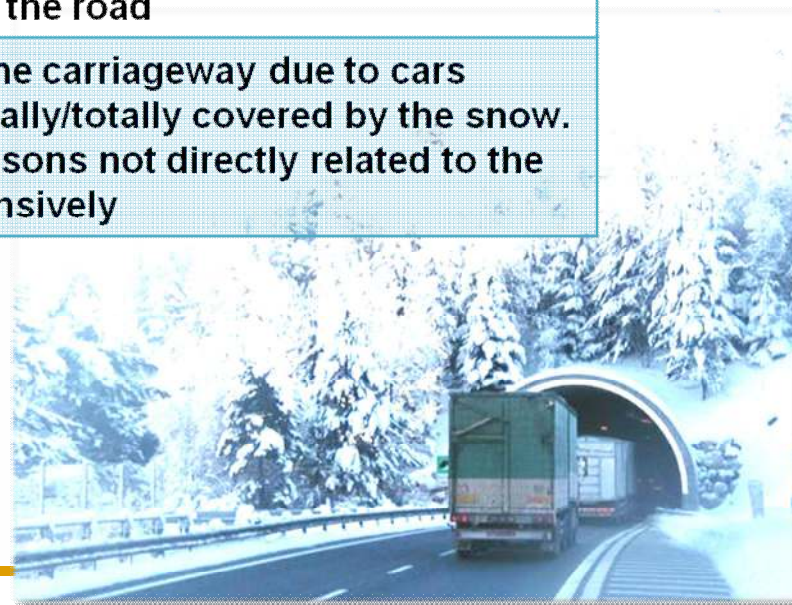
Classificazione delle fasi dell'emergenza		Modelli di informazione al traffico		
codice di allerta neve	stato dell'evento	contenuto dell'informazione (traduzione su PMV) (es.)		
neve codice "zero"	è appena stato emesso un bollettino o un allerta meteo di contenuto tale da rendere necessario un piano di comunicazione preventiva.	"zero"	emesso allerta meteo ad sito impatto	PREVISTA NEVE svincolo inizio svincolo fine
neve codice verde	l'organizzazione del concessionario è pronta ad operare con fondo stradale regolarmente trattato; la precipitazione nevosa non è ancora iniziata.	verde	strutture pronte ad operare; precipitazione non iniziata	
neve codice giallo	la precipitazione nevosa è iniziata. L'intensità non è critica ed è contrastata agevolmente dall'azione dei mezzi operativi; il traffico defluisce senza difficoltà.	giallo	neve in sito con intensità non critica e senza effetti sul deflusso del traffico	NEVE (o NEVE INTENSA o CODE PER NEVE / NEVE INTENSA) svincolo inizio svincolo fine
neve codice rosso	la precipitazione nevosa è intensa e rende necessario, anche su tratti limitati, l'intervento di tutti i mezzi e le attrezzature disponibili; il traffico defluisce in modo rallentato nei punti più critici del tracciato.	Rosso	nevicata intensa gestita in avvicinamento al limite delle potenzialità/possibilità	NEVE INTENSA (o CODE PER NEVE INTENSA) dopo svincolo inizio (fino svincolo fine) POSSIBILI BLOCCHI
neve codice nero	Si è appena verificato un blocco di traffico in una delle carreggiate per intraversamento di uno o più veicoli a causa del fondo stradale parzialmente o totalmente innevato. Il blocco può anche essere avvenuto per cause non direttamente correlabili alla precipitazione in atto che tuttavia continua ad essere molto intensa.	Nero	primi veicoli posti di traverso sulla carreggiata	BLOCCO PER NEVE svincolo inizio svincolo fine
			veicoli posti di traverso in più punti o stima di tempi non brevi per risolvere il primo blocco	CHIUSO PER NEVE (*) svincolo inizio svincolo fine

(\*) in anticipo rispetto alla chiusura effettiva

### 3. WINTER EMERGENCY OPERATIONS: THE INTERVENTION MODELS

#### *Classification Codes: Emergency Levels*

<b>Zero code</b>	a weather bulletin or warning has just been issued, the contents of which require a preventive communication plan
<b>Green code</b>	The Concessionaire organisation is ready to operate with the road surface treating: it is not snowing yet
<b>Yellow code</b>	It starts snowing. Its intensity is not critical and it is easily managed by the service vehicles. Traffic flow is smooth
<b>Red code</b>	The snowfall is intense and requires the intervention of all the available vehicles and equipment, even only along certain sections. Traffic moves very slowly on critical points of the road
<b>Black code</b>	Traffic flow has just been blocked on the carriageway due to cars sliding on the road surface that is partially/totally covered by the snow. The block may be also due to other reasons not directly related to the current snowfall, but it is snowing intensively





### 3. WINTER EMERGENCY OPERATIONS: THE INTERVENTION MODELS

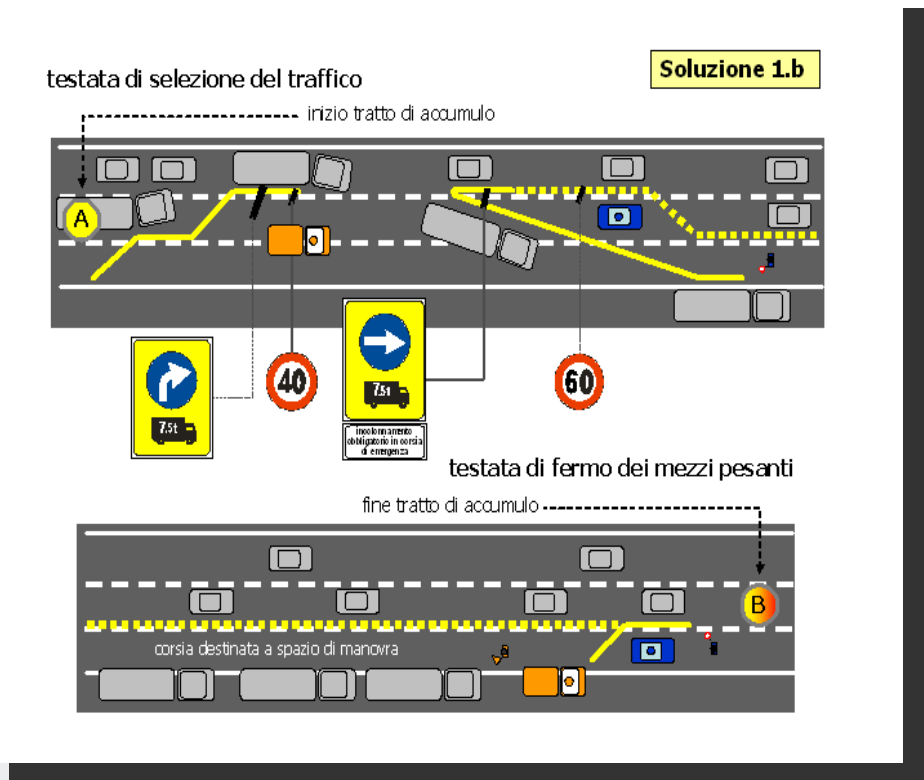
#### *Information Model*

Code	State of the event	Information content (i.e. translation on VMS)
Zero	High impact weather warning issued	<b>EXPECTED SNOW</b> Junction – start Junction - end
Green	All the resources are ready to operate. Snowfall not started yet	
Yellow	Non-critical snowfall without effects on traffic	<b>SNOW (or INTENSE SNOW or QUEUES due to SNOW / INTENSE SNOW)</b> Junction – start Junction - end
Red	Intense snowfall managed at capacity limit	<b>INTENSE SNOW (or QUEUES due to INTENSE SNOW)</b> after junction/start (until junction/end) <b>BLOCKS ARE POSSIBLE</b>
Black	First vehicles positioned crosswise the carriageway	<b>BLOCKS DUE TO SNOW</b> Junction – start Junction – end
	Different vehicles positioned crosswise the carriageway in several points or long-time foreseen to solve the first block	<b>CLOSED DUE TO SNOW *)</b> Junction – start Junction – end

(\*) in advance to real closing section

### 3. WINTER EMERGENCY OPERATIONS: THE INTERVENTION MODELS

*Operating Protocol Regulating the Circulation of HVs along Motorway Network Under Snowfall*

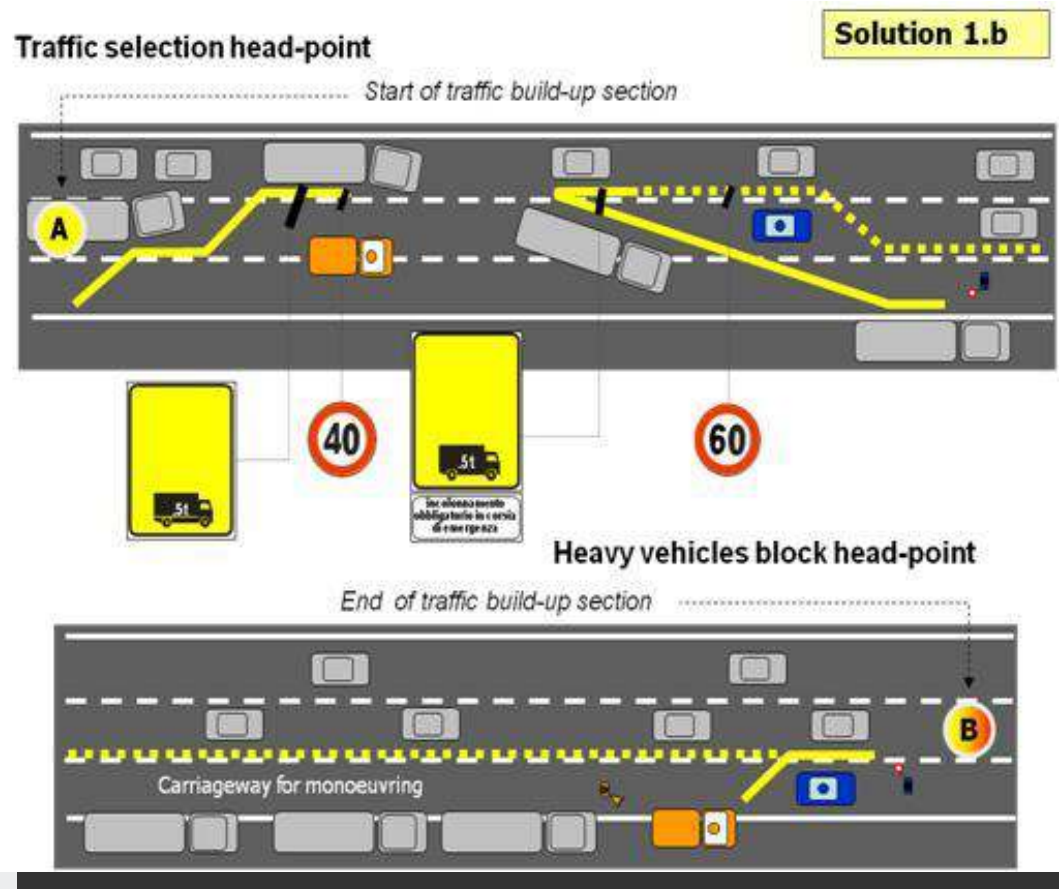


- ✓ Provisions for the “temporary blocking” of HVs (exceeding 7,5 tons) along the carriageway
- ✓ Proper signs schemes

### 3. WINTER EMERGENCY OPERATIONS: THE INTERVENTION MODELS

#### *Signs Schemes: Process for Traffic Storing Section*

Specific signs schemes have been defined to implement the above-mentioned regulating and blocking procedures along the carriageways

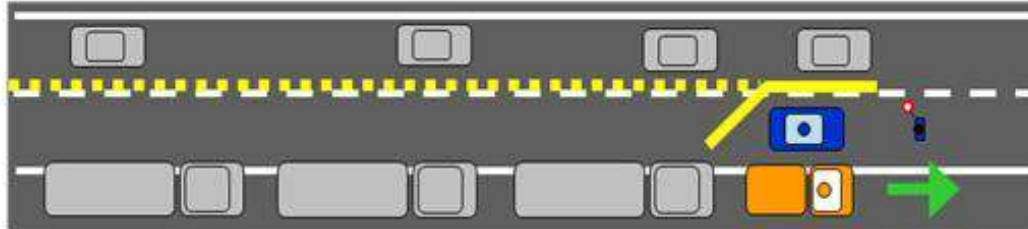


***These schemes also guarantee necessary protection to operators' staff***

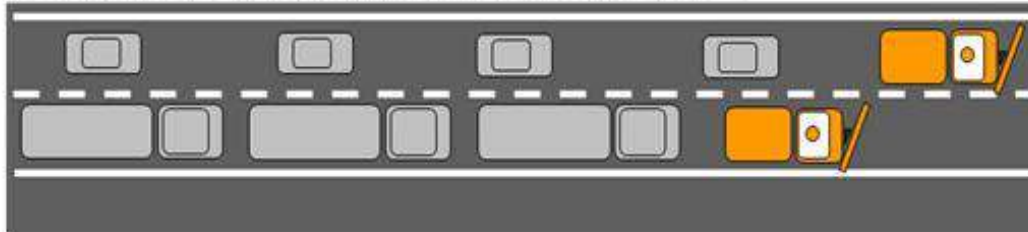
### 3. WINTER EMERGENCY OPERATIONS: THE INTERVENTION MODELS

#### *Signs Schemes: Process for Storage Release*

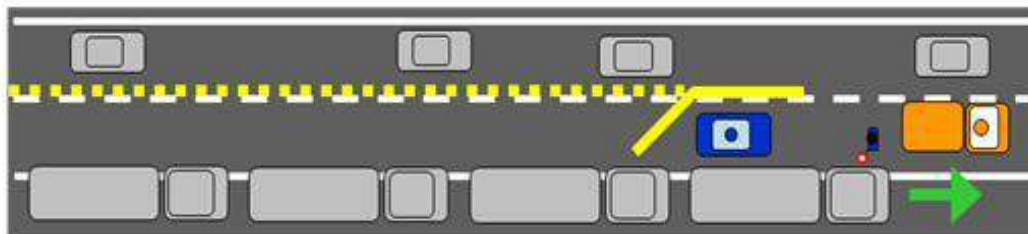
Release of convoys of 50/100 heavy vehicles led by a traffic service vehicle  
*(the convoy is accompanied up to the first junction affected by the snow, where it is handed over to one or more snow-ploughing vehicles that may also act as bulldozers)*



Passing the critical point with snow-ploughing vehicles.



Measured release of heavy vehicles under the control of the Police  
*(this is possible when the intensity of snowfalls on the subsequent section of the motorway is not critical and enables heavy vehicles to transit without the need of a snow-ploughing vehicle)*



***These schemes also guarantee necessary protection to operators' staff***



## 4. THE NATIONAL MOBILITY COORDINATION CENTRE “VIABILITÀ ITALIA”

- ✓ **Coordinating structure** within the Ministry of Internal Affairs – Road Police Service
- ✓ Dealing with **emergency road conditions and mobility crisis at National level**
- ✓ **Members:** Road Police, Ministry of Internal Affairs, Fire Brigades, Civil Protection, Ministry of Infrastructure and Transport, *Carabinieri* Service, National Railways, ANAS and AISCAT
- ✓ **Tasks:** National mobility planning in case of critical events (i.e. bad weather conditions, mass departures for holidays, etc.), emergency coordination, communication to road users and media





# 4. THE NATIONAL MOBILITY COORDINATION CENTRE “VIABILITÀ ITALIA”

Management Plan for mobility emergencies due to bad weather conditions in wintertime

- Specification of**
- **Motorway critical nodes, stretches and areas**
  - **Motorway sections for temporary storage of HVs**
  - **Activities of all the resources involved in the emergency management**



## 5. THE ACTIVITIES OF MOTORWAY OPERATORS

**The Italian motorway Concessionaires adopt**

- **specific and complex maintenance procedures**
- **operational manuals and plans**

These plans define activities and responsibilities, as well as setting out the chain of interventions:

- **Collection of meteorological data and weather forecasts**
- **Identification of the most critical junctions and areas (through an analysis of historical series of recorded traffic, especially HVs traffic, and snowfalls)**
- **Identification of the areas and junctions that may require temporary blocking of HVs**
- **Identification of the motorway sections where carrying out temporary storage of HVs**
- **Implementation of road operating measures according to classification codes: definition of interventions, timeline, duties, type and quantity of vehicles/equipment to be activated, etc.**
- **Supply of vehicles and equipment**
- **Staff training**
- **Communication to road users**

# 5. THE ACTIVITIES OF MOTORWAY OPERATORS

## The Resources Employed



Tecnologia e Informazione  
Technology and Information

Centri controllo traffico Traffic Control Centres		35
Telecamere su strada Video Cameras		4.882
Pannelli Messaggio Variabile Variable Message Signs		2.415
Centraline Meteo Weather Stations		507
Rilevatori Ghiaccio Ice Detectors		311
Rilevatori Nebbia Fog Detectors		168
Colonnine S.O.S. SOS Posts		7.110
Terza corsia dinamica Third Dynamic Lane		20 km

	1.874
Addetti alla Viabilità Mobility Staff	
	4.266
Mezzi manutenzione invernale Winter Maintenance Vehicles	
	357.395t
Sale Stoccato Stored Salt	
	149
Posti di manutenzione Maintenance Sites	

### POLIZIA STRADALE | Road Police

	58
Caseme* Road Police Units	
	12
C.O.A. Centro Operativo Autostradale Highway operations center	
	3.584
Risorse Umane* Human resources	
	633
Automezzi* Vehicles	

Gestione della Viabilità  
Mobility Management



Data at 31-12-2012

## 6. THE FUTURE

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- ➔ **Intervention time reduction** (anticipating operational actions)
- ➔ **Weather forecasts improvement**
- ➔ **New technologies implementation**
- ➔ **Road users involvement** (influencing their behaviour/  
preventive information: “STAY AT HOME!!!”)
- ➔ **Public opinion change** “circulation on Motorway network should always be guaranteed, even during extraordinary snowfalls”

**Thank you for your attention!**

**[www.aiscat.it](http://www.aiscat.it)**

**Alessandro Musmeci – AISCAT**