

**EasyWay**



Annual Forum 2010



**Shortcut to the future.**

Lisbon • November 16<sup>th</sup>-18<sup>th</sup>





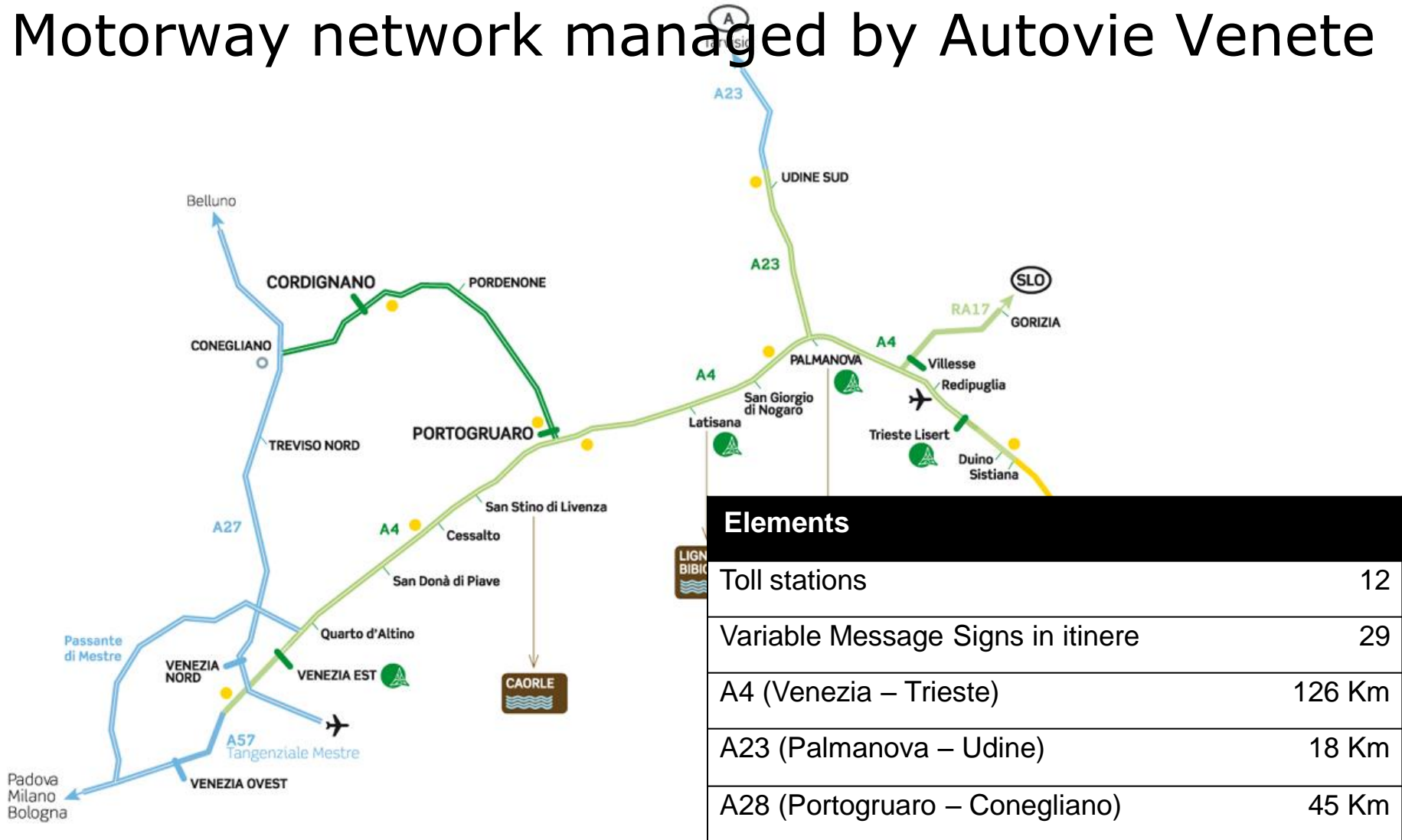
Shortcut to the future.

Hazardous Material transportation safety  
and security tracking on motorway in Italy:  
experimental and evaluation phases on A4  
Trieste-Venice

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Autovie Venete



## Motorway network managed by Autovie Venete



Elements	
Toll stations	12
Variable Message Signs in itinere	29
A4 (Venezia – Trieste)	126 Km
A23 (Palmanova – Udine)	18 Km
A28 (Portogruaro – Conegliano)	45 Km



## Outline

- Objective
- Description of the model
- Installation
- Test on field
- Preliminary results
- Conclusions



## Main Objective

- Security and safety on motorway are the main topic for the management of the network in concession, according to the objective of the European Union and mainly to avoid the occurrence of major accidents and risks for people and environment in the neighbourhood of the motorway. On A4 Trieste-Venice, in the frame of EasyWay phase I, the test on the field of complex system to monitoring, tracking and tracing the transportation of hazardous material has been fulfilled and completed.



## Objectives

- Autovie Venete in the past years has registered several accidents involving Hazardous Material transport
- The risks of environmental and social impacts and effects were really high
- Reduce the risks in order to improve the safety and security overall, not only on the motorway
- Develop a Decision Support System based on ITS application for the Handling and Managing of emergency and accidents with HazMat
- Dissemination of the results of the study



## The high risks factor





## Description of the study and model

- Research and Development of tracking and monitoring system of HazMat transportation on the motorway network of Autovie Venete in collaboration with University of Trieste
  - Development of statistical analysis of HazMat transport on the road, within identification of Origin/destination Matrix
  - Deployment of supervisor process and DSS for management of alarms and emergency handling related to HazMat transport
  - Definition of physical and logical architectures of DSS
  - Definition of user requirement
  - Definition of technical requirement
  - Development of the models for the storage and analysis of the alerts and emergency
  - Deployment of the model for evaluation of risks and generation of alerts
  - Deployment of evaluation model of alert situation identified



## Analysis of historical data

- The transportation of HazMat become a huge issue during the last years in the road transport sector because the increasing of accidents involving hazardous products
- Recent study highlighted: 39 % of accidents caused by HazMat are transport related

2002

2003

2004

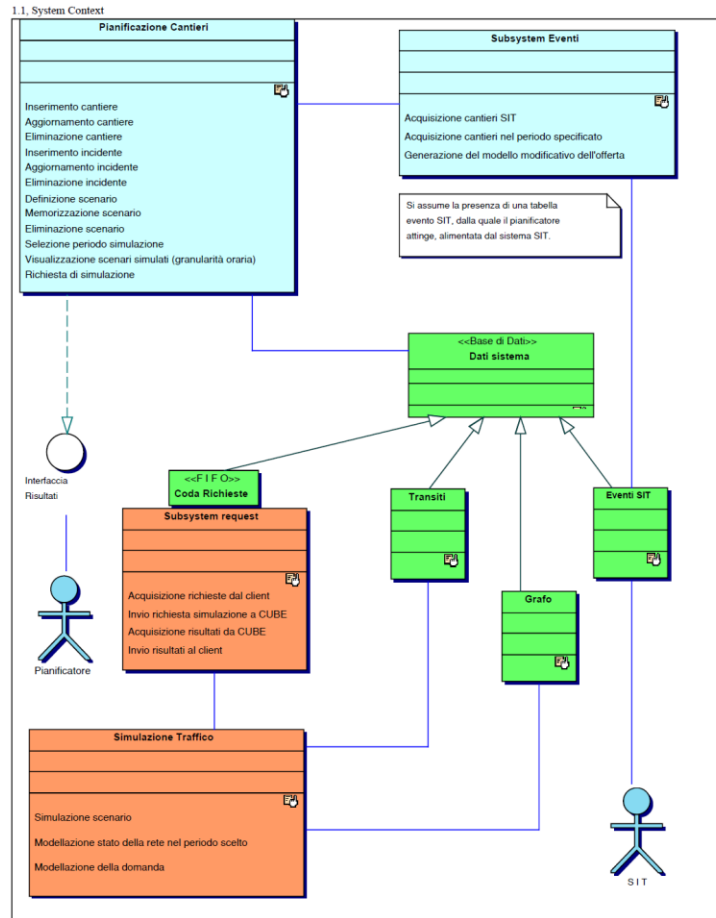
2005

2006

2007

2008

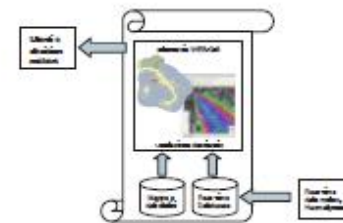
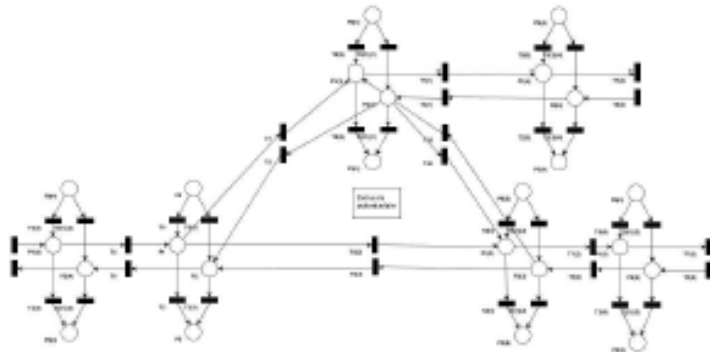
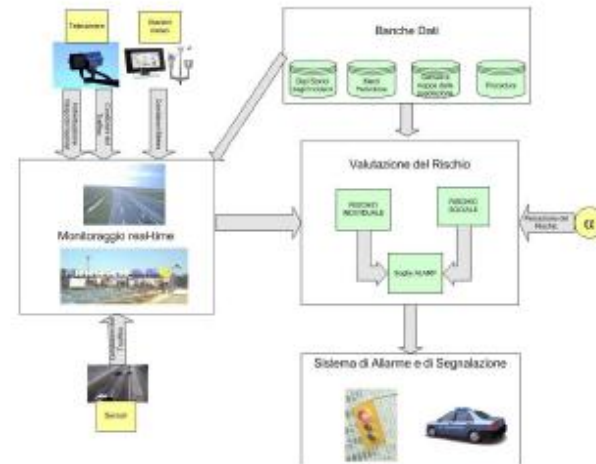
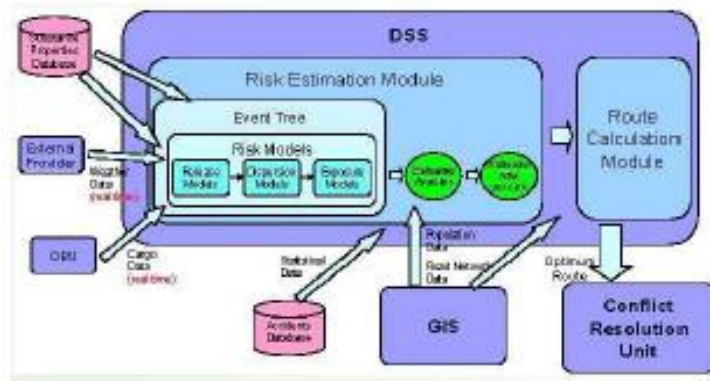
## The system context description



The approach is based on definition of scenario and simulation of the effects caused by an event, the risks for traffic, environment, social impact, and the consequences on the road network, sector by sector



## DSS model for best route calculation, use of Petri network for risk evaluation and system architecture





## The system installed on the road 4 section controlled on A4 in both directions





## Description of the system in use

- The system has a cost of 950 KEuro and consists in 4 sections of motorway (around 30 kms each one) in both directions: east and westbound. It consists in
- sensors and cameras with infrared cameras integrated on each lane, installed on gantries
- telecommunication network with the Traffic Management Centre
- servers and software for the image processing and storage of the data.

The data collected were presented to Traffic and Safety manager on a cartographic map and highlight warnings and alarms in case of density of certain materials on the road



## Test on field and preliminary results of the analysis of the data collected



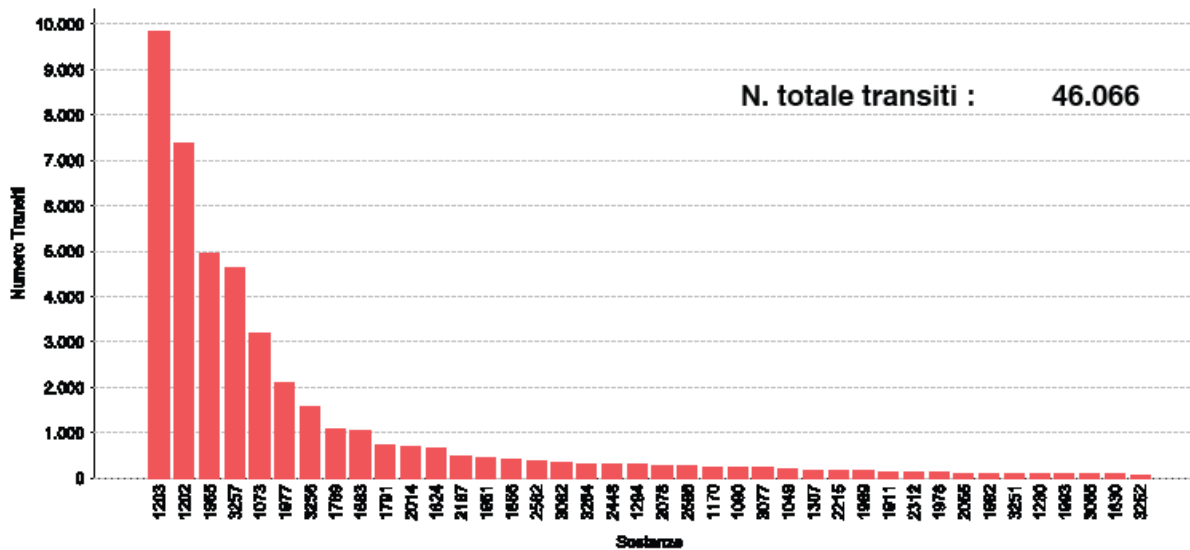
### Analisi Transiti con Merci Pericolose Analisi di Pareto

Numeri ONU: Tutti

Numeri Kemler: Tutti

Varchi: Km 20+400 San Donà-VE EST  
Km 97+800 Villesse-Palmanova  
Km 108+800 Villesse-Redipuglia  
Km 24+400 VE EST-San Donà

Corse: Tutte



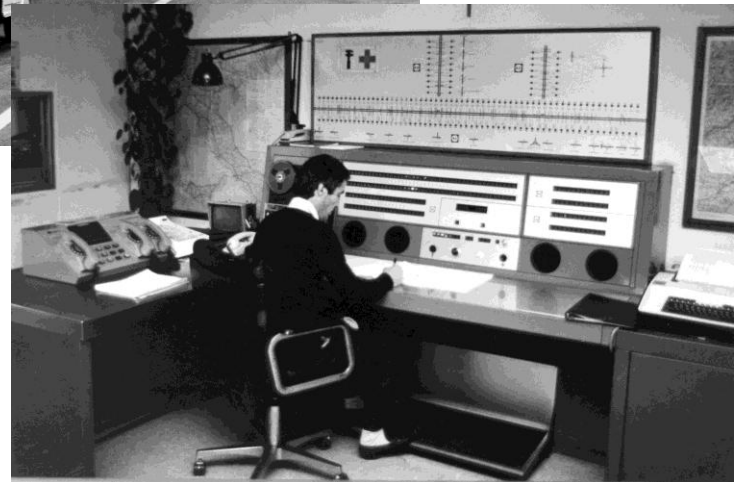


## Conclusions

- The system has been tested during an accident involving transportation of ammonium
- The detection by the system of the truck increases the precision of the information available in the TCC for the emergency and fire brigade patrols
- The system evaluate the risks and suggested to the Police to clear totally the zone
- In less than 20 minutes all actions and measureas has been adopted
- The test continue and the implementation too
- Benefits with ITS deployment on the road network in Europe?



## From here....





...to here now



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Thanks for Your attention

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