

HELLENIC INSTITUTE OF
TRANSPORT

AN OVERVIEW OF CRISIS
MANAGEMENT AND EMERGENCY
OPERATIONS RELATED ACTIVITIES
FROM THE PERSPECTIVE OF
TRANSPORT NETWORKS

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WEATHER project Kick-Off meeting – Karlsruhe 16-17/11/2009

Synopsis

Related European activities

National projects

Relevant research topics (in-house)

The MISS project (FP6)

Monitor Integrated Safety System

The MISS project developed an innovative platform to dynamically sense and predict natural and infrastructure conditions, in order to improve safety and efficiency of transport operations in a multi-environmental scenario.

The project aimed to increase citizens and operators safety by enabling a just in time intelligent computation of an open dynamic road surveillance network and streamlining alerting tasks under daily operations.

The MISS platform uses advanced communication technologies for on-line services as well as high capacity storage devices for off-line services and applications, in addition to a new advanced algorithm to simulate risk assessment. The MISS adaptable platform is a mobile system explicitly designed to monitor rough environmental and infrastructure conditions and it can be integrated with any pre-existing system. It will enable intelligent exchange of structured information between the operational fleet vehicles and the Unified Operative Centre where information will be elaborated and actions planned

The MISS project

Monitor Integrated Safety System

We have developed a platform, based on:

- The data fusion, traffic flow estimation and prediction algorithms integrated with the MISS Computing Platform.
 - Roadway geometry, GIS, and traffic control data will be retrieved from existing databases for the test network(s).
 - Traffic flow data will be retrieved from existing databases for the data fusion, traffic flow estimation/prediction algorithms
 - All databases are integrated within the traffic simulator used for this study.
 - The traffic simulator is calibrated based on the traffic flow data from the test network(s).
- The risk assessment algorithm, integrated within the traffic simulator and the MISS computing platform, which takes into account:
 - Accident data, retrieved by existing databases
 - Roadway pavement data, retrieved from existing databases
 - Weather data, retrieved from existing databases
 - Other roadway hazards, retrieved from existing databases.

The MISS project

Monitor Integrated Safety System

The MISS platform has been tested on four case sites with different scenarios.

1. Province of Bologna (IT):
Test of all developed modules together with provincial police
2. City of Saarbrücken (DE):
Test of optimal dispatching of vehicles module for the city's fire brigade.
3. City of Berlin (DE):
Test of image recognition and dedicated bus lanes risk estimation modules for BVG
4. City of Nicosia (CY)
Test of all developed modules together with the Ministry of Public Works in a simulated environment

The RESCUE project (INTERREG)

A catastrophe response and recovery transport and logistics decision support system



Development of an integrated Decision Support and Knowledge Management System that combines expert knowledge and technological solutions to help regions cope with disasters, in order to enable the European Regions to:

1. Share experiences and practices on how to respond to disasters,
2. Develop the necessary transport and logistics tools to further complement knowledge with analytical support.

The RESCUE project

A catastrophe response and recovery transport and logistics decision support system

To meet the above main objective a number of actions have taken place:

- Survey of the existing practices by the regions, the past history of catastrophes and their response actions, document their needs and develop a best practices and lessons learned knowledge base.
- Organization of systematic experience exchange among Regions, so that common successful strategies are identified and methods for their systematic adaptation by the Regions to be achieved
- Assembling and integration of support tools (core logistics and transport methods based on advanced optimization models) that can facilitate mitigation, planning, response and recovery from disasters
- Development of training modules to allow regions to train personnel in simulated environments on rare disasters that other areas experienced.
- Testing of the RESCUE system with the Province of Bologna (IT)

The PROOHF project (INTERREG)

Protection of heritage from fire



Cultural Heritage Monuments (Monasteries, Museums, etc) in European Countries have a large number of invaluable treasures, artifacts, holy icons, very old & attract many visitors from around the world.

Often monuments are located in isolated areas, sometimes inside forests, being in great fire risk with little or no means to respond.

The over-all objective of PROOHF project has been to cope with fire risks in cultural heritage monuments, and their impact on local economies and societies.

The PROOHF project

Protection of heritage from fire

Activities of the project included:

1. Collection, creation of catalogues, documentation, discussions and optimization of already existing emergency plans and procedures for coping with fire risks in heritage monuments.
2. Recording and presentation of fire status of the heritage monuments.
3. Search for possible causes which initiated fires in the past and creating a full record of all relevant conditions.
4. Development of training programs for educating people working /living there, train volunteers and civil protection personnel, as well as other operational people in coping with fires in monuments & taking measures minimizing the economic and social impact.
5. Development of post-fire-rehabilitation plans
6. Development of 3 decision support systems for fire risk analysis (Greece, Italy, Cyprus).

ATHENS 2004 Olympic Games

Operations & Control Centre for traffic

- For the 2004 Olympic Games in Athens, an Operations & Control “Room” (centre) for traffic has been decided to be created.
- The area covered has been the greater Attica region.
- This centre operated in collaboration with police, anti-terrorism department, civil protection, fire brigade, health emergency department and other “crisis” related organizations (including army).
- Responsible for the final set-up and operations has been the Ministry of Public Works and the Environment together with a private company.

ATHENS 2004 Olympic Games

Emergency Operations & Control Centre

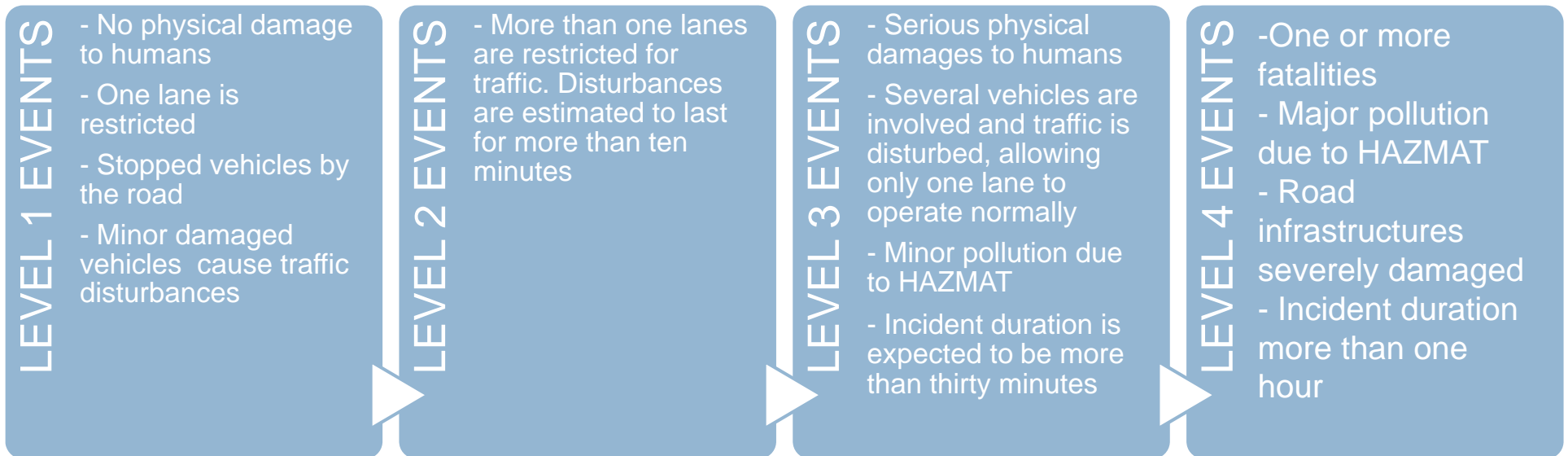
The emergency plans developed for the operations of the control centre during the Olympic Games took into consideration the following parameters:

- Traffic under regular conditions
- Traffic related to Olympic Games related trips
- Traffic in case of emergency situations – including extreme weather events
- Traffic in cases of crisis situations

ATHENS 2004 Olympic Games

Emergency Operations & Control Centre

Four levels of events' emergency have been defined, based on the consequences on the network:



ATHENS 2004 Olympic Games

Emergency Operations & Control Centre

Weather related categorization of events – based on the consequences on traffic - included the following:

Plan code	Definition	Threshold
AY-AKS	Extreme weather conditions in a Motorway	Speed reduction under 60 km/h
OPD-AKS	Extreme weather conditions in a Primary Olympic Artery	Speed reduction under 40 km/h
ODD-AKS	Extreme weather conditions in a Secondary Olympic Artery	Speed reduction under 40 km/h
PA-AKS	Extreme weather conditions in a Primary Artery	Speed reduction under 30 km/h
DA-AKS	Extreme weather conditions in a Secondary Artery	Speed reduction under 30 km/h
OL-AKS	Extreme weather conditions in a Dedicated Olympic Lane	Speed reduction under 40 km/h

ATHENS 2004 Olympic Games

Emergency Operations & Control Centre

Response procedures have been categorized according to the emergency level of the event and included:

- Monitoring, identification and confirmation (Monitoring, Identification and Confirmation, Categorization)
- Information provision to involved entities (Information provision with voice, Storing of event in the system, Information provision through the system and through VMS)
- Mobilization (On-site visit, traffic regulation measures, information to other emergency centres, Newest information provision, Mobilization of emergency vehicles, Additional measures if needed, Press release)
- Restoration (Normal traffic conditions restoration, information provision to the control centre and all involved entities, restoration of VMS messages)

ATHENS 2004 Olympic Games

Emergency Operations & Control Centre

- Nowadays, the operations of the Emergency Operations & Control Centre have stopped, due to Personal Data Protection Laws. The decision has mainly been based on the extensive use of traffic monitoring cameras for the CCTV module of the control system.

The PRITS project

Peripheral Road of Thessaloniki ITS

Definition of emergency management procedures and respective VMS messages for the Peripheral Road of Thessaloniki (including weather related aspects).

Short Info:

- The peripheral road of Thessaloniki is a 22,5 km long, 3-lanes per direction motorway, with more than 100.000 trips served through it during the day.
- The new ITS project includes the installation of 17 cameras for the CCTV module, 5 VMS panels and a new central control platform.
- All functions are integrated under the NETWORKS platform
- 3 levels of emergency are defined
- 4 weather event categories are included in the decision process: Fog, Rain, Wind, Snow

The PRITS project

Peripheral Road of Thessaloniki ITS

Level 1:

- Event, one lane is closed, queue formation of up to 500 meters
- Event, two lanes are closed, queue formation of up to 500 meters
- Event, three lanes are closed, queue formation of up to 500 meters
- Obstacles on the road and formation of queue up to 500 meters
- Road side works and formation of queue up to 500 meters
- Increased traffic, congestion and formation of queue up to 500 meters
- Heavy vehicles movements and formation of queue up to 500 meters
- Reduced light conditions
- Planned construction works

The PRITS project

Peripheral Road of Thessaloniki ITS

Level 2:

- Event, one lane is closed, queue formation of up to 3 kilometers
- Event, two lanes are closed, queue formation of up to 3 kilometers
- Event, three lanes are closed, queue formation of up to 3 kilometers
- Obstacles on the road and formation of queue up to 3 kilometers
- Road side works and formation of queue up to 3 kilometers
- Increased traffic, congestion and formation of queue up to 3 kilometers
- Heavy vehicles movements and formation of queue up to 3 kilometers
- Movement of pedestrians
- Slides

The PRITS project

Peripheral Road of Thessaloniki ITS

Level 3:

- Event, one lane is closed, queue formation larger than 3 kilometers
- Event, two lanes are closed, queue formation larger than 3 kilometers
- Event, three lanes are closed, queue formation larger than 3 kilometers
- Obstacles on the road and formation of queue larger than 3 kilometers
- Road side works and formation of queue up to 3 kilometers
- Increased traffic, congestion and formation of queue larger than 3 kilometers
- Heavy vehicles movements and formation of queue larger than 3 kilometers
- Close on-ramp or off-ramp
- Extreme weather conditions

Thessaloniki's new urban ITS

The new Intelligent mobility management and traffic control system of Thessaloniki

A new ITS project – starting now - for the central area of Thessaloniki's city.

Integration of environmental, weather related and traffic related information for:

- Provision of pre-trip and en-route multimodal routing services to the citizens of Thessaloniki
- Data fusion of environmental, weather and traffic data for the computation of optimal signal settings based on dynamic traffic assignment and simulation models in order to combine optimal traffic management and reduction of environmental pollution.
- Integration of weather data for the definition of traffic management strategies (both extreme events and “normal” conditions)

In-house relevant research questions/topics

- Integration issues of geographically spread TMCs information for better handling of emergency operations
- Identification of critical infrastructure
- Computation of network components importance (eg links importance ranking)
- Identification of major intersecting traffic flows-paths
- Uncertainty issues in both the demand and the supply part of transportation modeling
- Dynamic supplies and demands
- Dynamic capacities
- Dynamic traffic assignment models to better capture traffic dynamics and time-dependent characteristics (eg due to an event) while respecting dynamic user equilibrium principles

In-house relevant research questions/topics



Definition of various types of disasters

- Natural
 - ▣ Earthquakes, hurricanes, floods, fires, tsunamis etc
- Non-natural (man-made)
 - ▣ Accidental
 - Industrial or chemical
 - Nuclear
 - HAZMAT
 - ▣ Intentional
 - Terrorism related

In-house relevant research questions/topics



- Pre disaster, During disaster and Post Disaster issues related to transportation
- Determination of network clearance time
- Determination of evacuation procedures and strategies (including contraflow & zone scheduling)



Thank you for your attention

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For further information please visit <http://www.imet.gr>