



# GEOFENCING MD

*Control & Management of Dangerous Goods  
Transports in Urban Areas*

**UNECE Working Group on telematics**  
Bordeaux – 3-5 June 2014



## Presentation

- ✓ Project acronym: **GEOFENCING MD**
- ✓ Title: **Systemic solution based on telematics for dangerous goods transports monitoring in urban areas**
- ✓ Project proposed by the Think Tank of the LUTB Business Cluster's Transport System Programme
- ✓ Registered at FUI 11
- ✓ Duration: 36 months (2011-2014)
- ✓ 1<sup>st</sup> phase financed by the French Ministry of Ecology and Sustainable Development, in charge of Transports (MEDDE)



## Partners

### ✓ Major corporate groups

- Renault Trucks



### ✓ SMEs

- ERECA – *project leader*
- Geoloc Systems
- AddValentiam



### ✓ Laboratories & Research Institutes

- G-SCOP – INP - Joseph Fourier University
- IRMA
- CEREMA Centre-Est





- ✓ **Develop a tool based on telematics :**
  - Efficient, standard, flexible, scalable
  - Useable by all actors involved in DGT (shippers, carriers, public authorities, emergency services, infrastructure operators, etc...)
  
- ✓ **The Geofencing MD tool should enable :**
  - Real-time tracking and tracing of:
    - All DGT on a given route,
    - Specific vehicle in a targeted area.
  - Dynamic risk analysis in case of accident :
    - On line risk analysis and assessment based on DGT information.



## Context

### ✓ Background on Dangerous Goods Transport :

- Multimode land transport: road, train, waterborne,
- On roads: Hydrocarbons (85 %), Chemicals...
- ~ 5 % of HGVs carrying dangerous goods,
- Identification : Orange plate + Hazmat Labels Pictograms



### ✓ International Regulation - Legal Instruments :

- **UNECE - ADR:** The European Agreement concerning the International Carriage of Dangerous Goods by Road

### ✓ Specific road traffic orders for DGT :

- Tunnels categories,
- Dedicated routes,
- Restricted Access to sensitive areas...





## Local and regional context

### ✓ Rhône-Alps Region

- Highly industrialized,
- Considerable DGT activity (notably due to petrochemical plants)

### ✓ Lyon

- Heavy DG traffic
- Major routes (road, rail, waterways)
- Intermodal hubs

### ✓ The Greater Lyon area

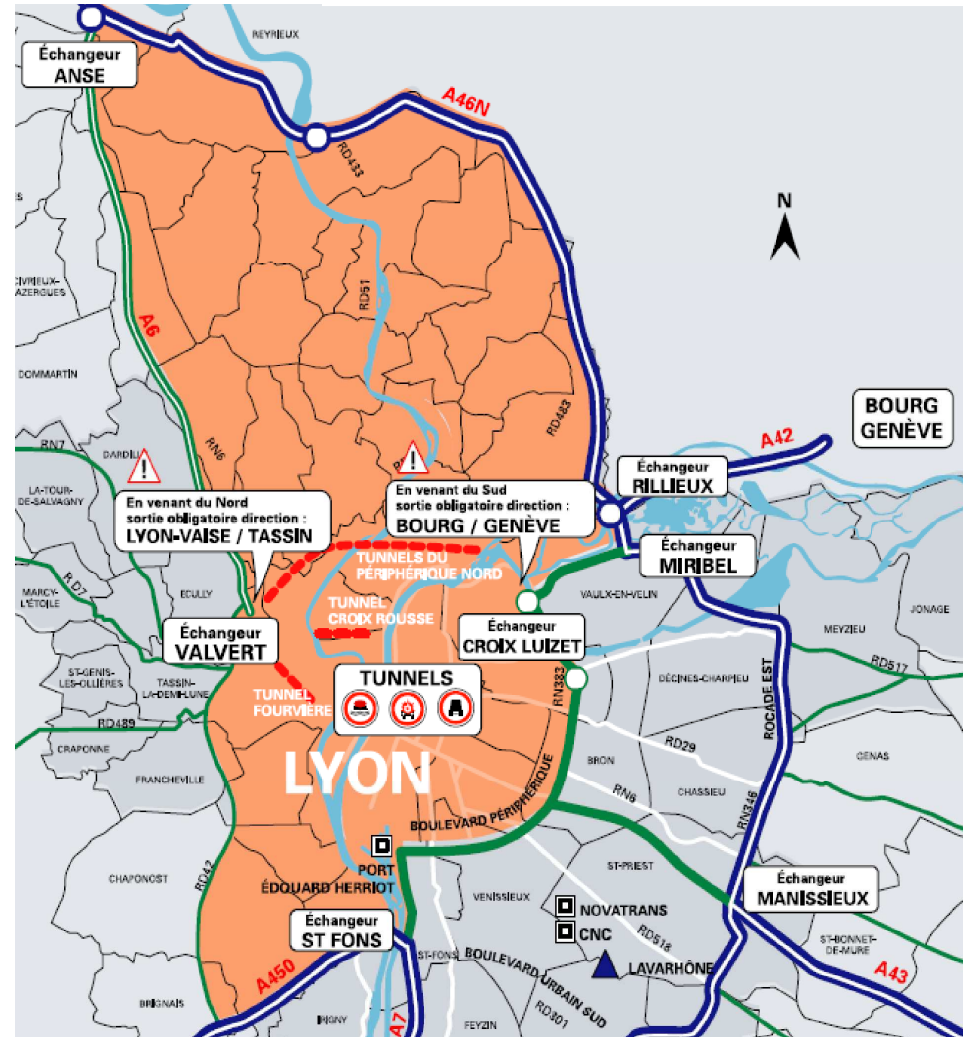
- Ideal experimentation area for demonstrators
- No interactive tool with vehicles currently available.
- DGT traffic scheme: ahead of other European cities





## Local DGT traffic scheme

- ✓ Tunnels access prohibited (Dotted red lines)
- ✓ Mandatory transit routes (blue)
- ✓ Restricted area (orange)
- ✓ Time slots for deliveries (6-10am & 4-8pm : prohibited)
- ✓ Dedicated local delivery routes (green)



DGT routes for the Greater Lyon area (Source: SPIRAL)



## Summary of requirements

- ✓ DG identification requirements
  - Identify dangerous goods transported (notably multi-tank vehicles)
  - Access files relating to the safety /dangerousness of goods
  - Supply information in addition to the orange plate
  
- ✓ Organizational requirements
  - Real time tracking and tracing system based on GNSS
  - Electronic documents available via mobile electronic devices
  - Goods delivery status
  - Traffic status information, journey time updates on certain routes and re-routing options





## Summary of requirements

### ✓ Safety requirements

- Plan DGT movements / Pre-trip information
- Geofencing : protect high-risk areas
- Guarantee a high level of safety for users
- Provide safety authorities and emergency services with better information

### ✓ Statistical requirements

- Establish statistics of DG movements
- Knowledge of routes used and statistics for each route

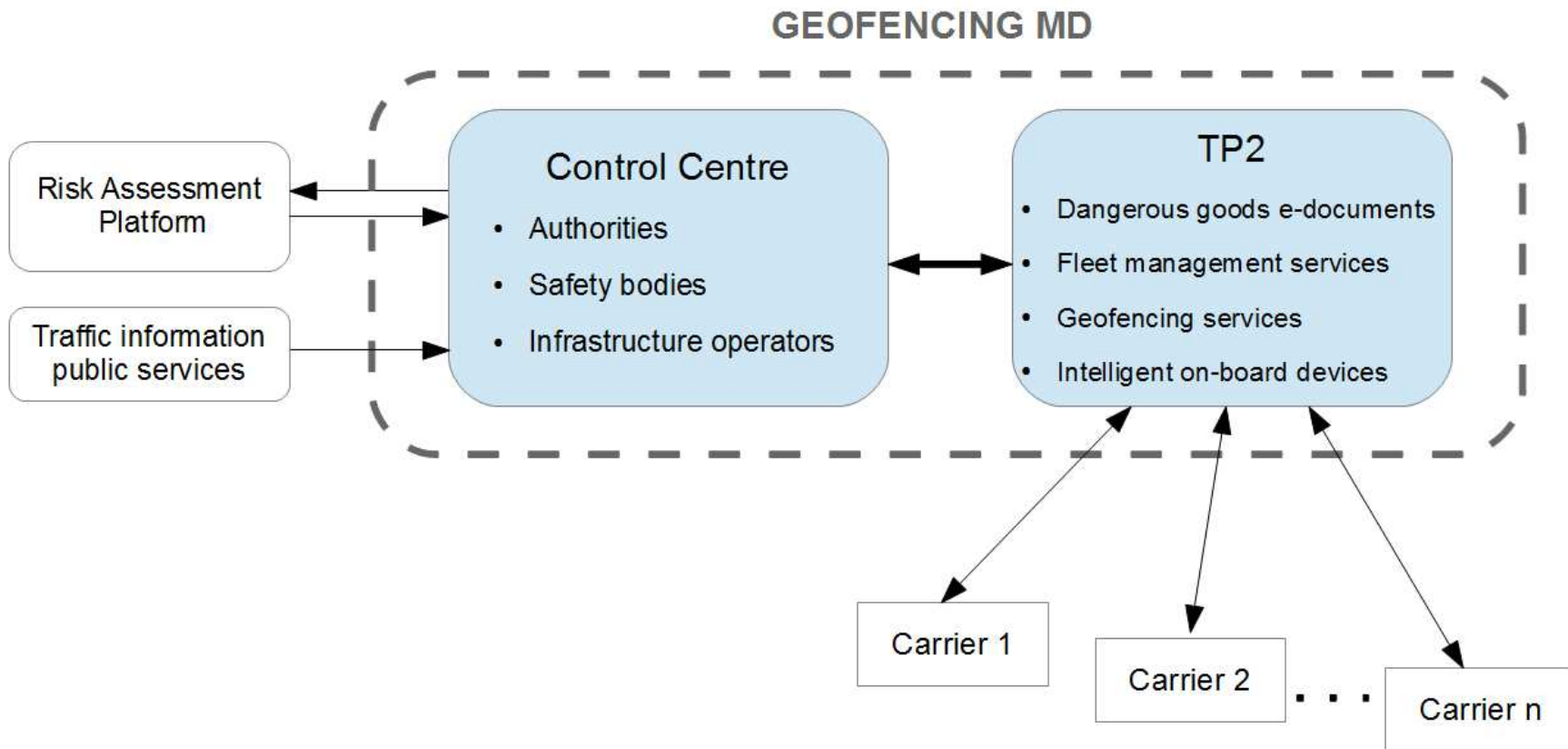


## GEOFENCING MD :

- ✓ **First urban application of the « air traffic control tower » concept**
  - City / Region managed like an airspace
- ✓ **Efficiency**
  - Performance, ergonomics and reliability
- ✓ **Standardisation**
  - inter-modality, international (DATEX II compatible)
- ✓ **Compatibility**
  - Interfacing with other information systems (carriers, loaders....)



# Architecture





## Information on dangerous goods transport

- ✓ Information on tours, missions and deliveries
- ✓ Information on the transport: truck, trailer & driver
- ✓ Dangerous goods packages: name, UN number, volume...

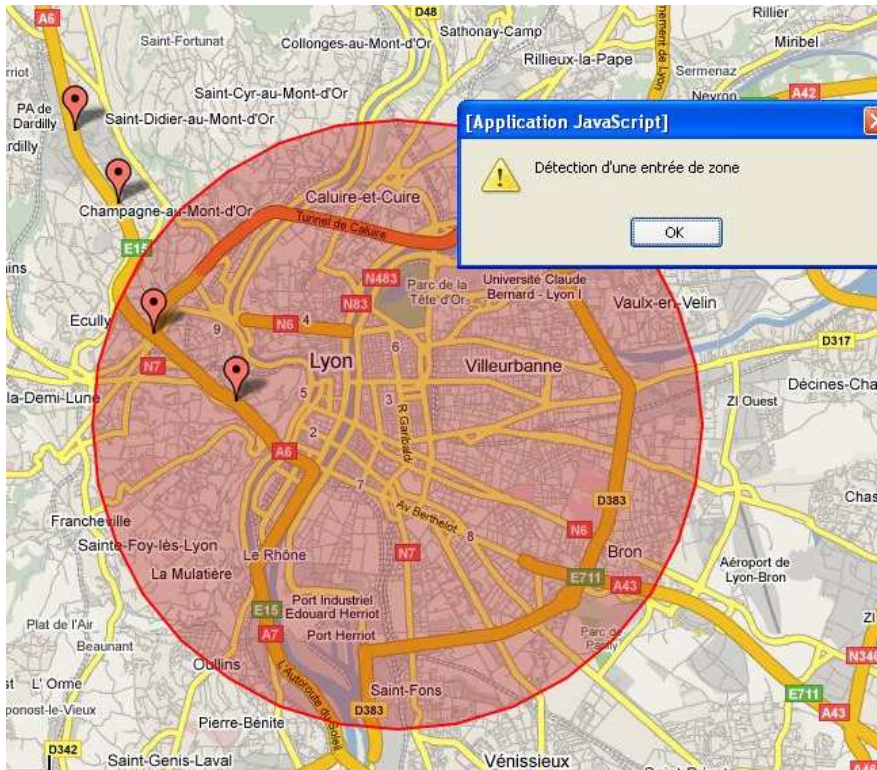
Informations de la tournée		Informations logistiques	
Tournée:	Test_ERECA_2	Véhicule:	AB-123-CF
Commencée le:	16/05/2014 12:00	Remorque:	
Fin prévue le:	16/05/2014 15:00	Chauffeur:	chauffeur_Z chauffeur_Z
<a href="#">Plus d'informations...</a>		<a href="#">Informations capteurs</a>	
Matière dangereuse transportée :		GAZ DE HOUILLE (1023) ACIDE CYANHYDRIQUE (1613)	
Alertes			
TYPE	DATE	INFORMATIONS	
!!!			

Data CC-BY-SA by OpenStreet



## Applications satellitaires / Geofencing

- ✓ Monitoring of sensitive locations and dense urban areas with geofencing services (Air Traffic Control Tower concept)



Notifications sent either to:

- Authority
- Fleet manager
- Driver



## Applications satellitaires / Geofencing

- ✓ Management of DGT traffic along regulated and transit itineraries
- ✓ Monitoring of dedicated parking areas





# GNSS / Geofencing Applications

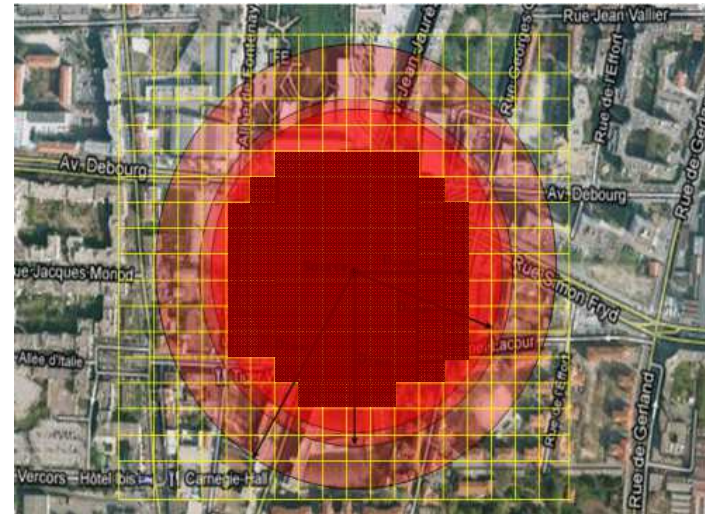
✓ Information sent to drivers to avoid prohibited routes and tunnels :

The image illustrates geofencing applications in urban transport. It features a map of Lyon with a green route and a red route leading to the Fourvière Tunnel. A blue sign on the left indicates 'ACCÈS RÉGLEMENTÉ' with a 4.5m height limit and 'PROCHAINE SORTIE OBLIGATOIRE à 800 m'. A photo on the right shows the interior of a tunnel with various traffic signs, including a 70 km/h speed limit and a 'Rappel' sign.



## Risk analysis related to Dangerous Goods Transportation

- ✓ On line risk assessment of Dangerous Goods Transportation (*G-Scop lab*)
  - Building of maps of dangerous good flows using movement history
  - Determination of dangerous areas around DGT







## Expected benefits

- ✓ **Public actors** (*central government authorities, local authorities, infrastructure managers, safety services...*):
  - ➔ efficient additional mean to ensure safety:
    - Better knowledge & monitoring of DG movements
    - Dynamic management of high-risk areas and transit routes
    - Critical and crisis situation management.
- ✓ **Private actors** (*shippers, carriers, logistics operators*):
  - Improve customer service and competitiveness
  - Maintain and extend their business activities in the urban area
  - Anticipate regulations for long-term compliancy



Thank you for your attention

*GEOFENCING MD Consortium*