Implementing resilient mobility

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RESOLUTE meeting

Firenze - December 15, 2015

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Striving for sustainable mobility

Fact: increasing demand for mobility

Constraints: limited physical space and budget to build new physical infrastructures

Challenge: integrating different dimensions – organizational, social, technological

- to enable cooperation among transportation agencies and local governments
- to support users in satisfying their transportation needs in the most efficient and effective manner

Innovation helps

Approach

- optimal **exploitation of existing assets**
- provide a **common synoptic view** of the networks
- share IT solutions to reduce costs

Lower-levels goals

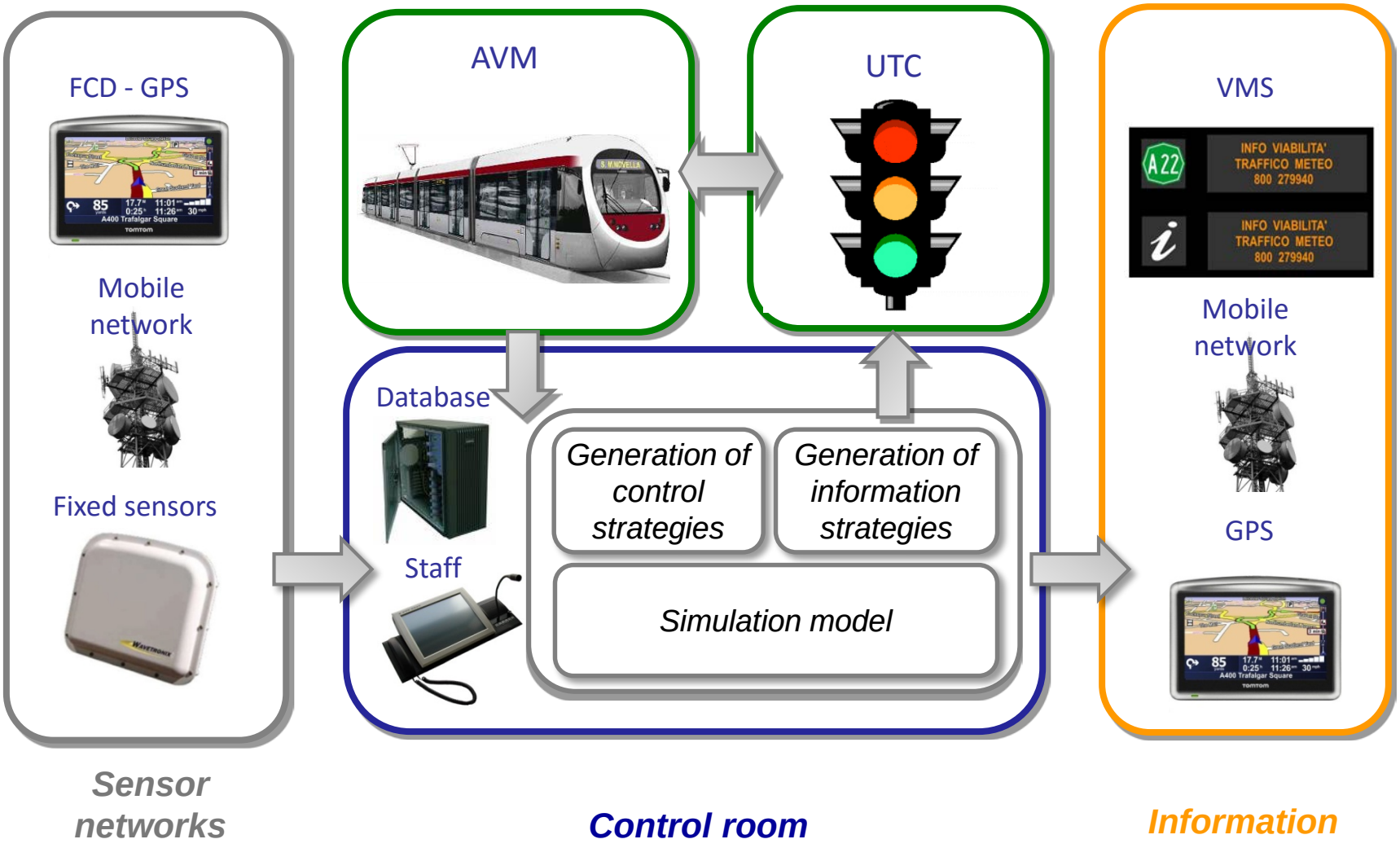
- **enhanced knowledge** of stakeholders and their processes
- **integration and interoperability** of networks and systems, typically operated by different subjects
- support for **collaboration** through widespread usage of ITS

Mobility hypervisor in Florence

The traffic hypervisor in the area of Florence paves the way to the adoption of new strategic and operational policies

- Processes data collected from **800+ sensors**
- Identify **network status** in real-time
- **Optimize traffic flows**
- **Enforce traffic control**
- Provide users with **up-to-date information**

Mobility hypervisor in Florence



Interoperable ITS

The hypervisor interoperates with 20+ ITSs

Sensors

- 4x traffic sensors
- 3x meteo/air quality sensors
- 3x TVCC
- 2x AVM
- 2x construction works planning
- 1x parking
- 2x LTZ

Actuators

- 2x UTC
- 3x VMS
- 1x traffic events

Traffic scenarios

Support supervised and unsupervised enforcement of mobility management policies for different situations.

Traffic scenarios comprise

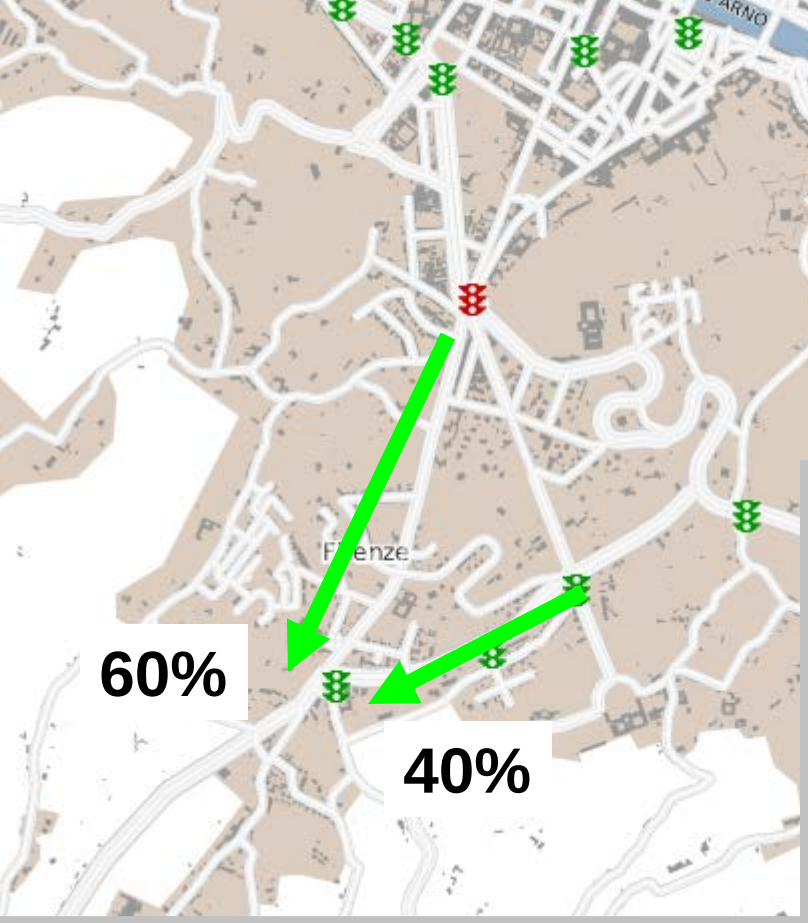
- Triggers

  calendar, changes in offer/demand, traffic events

- Actions

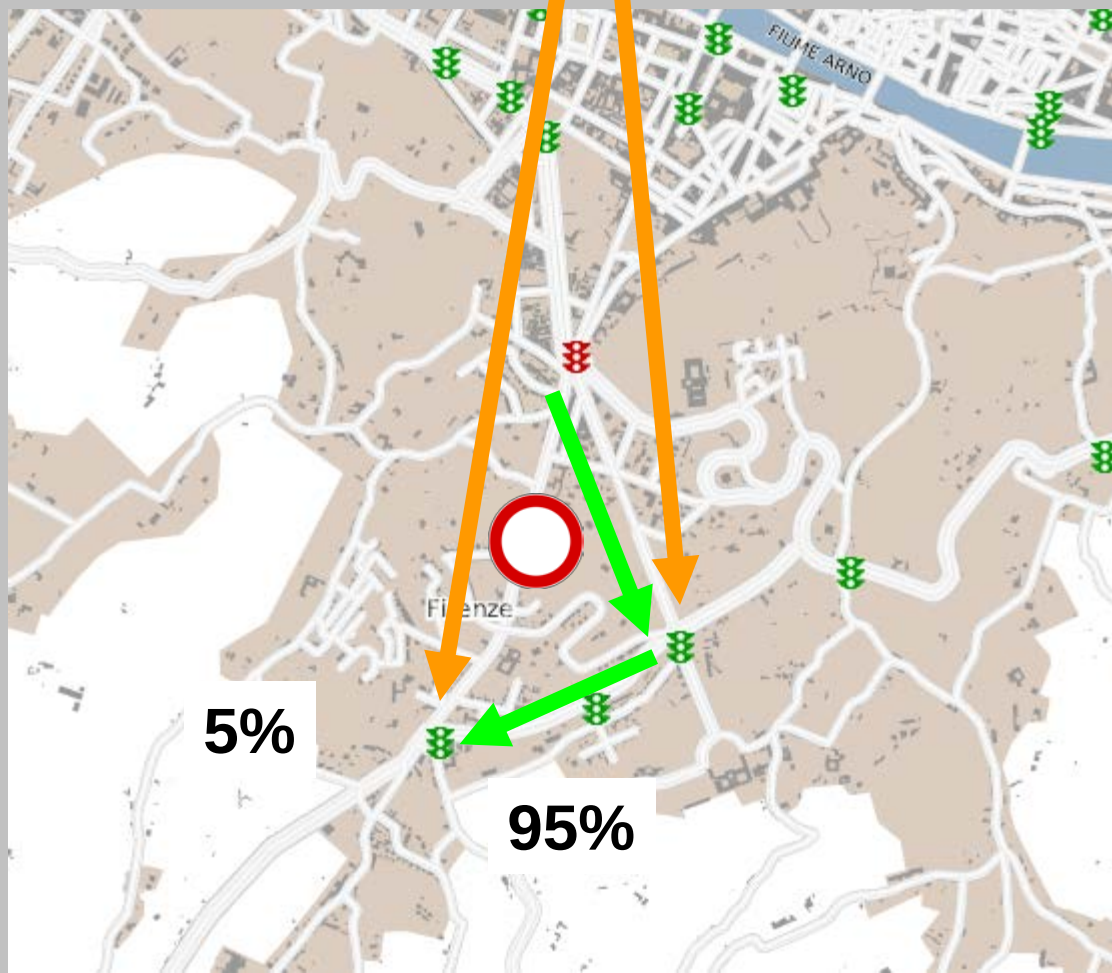
  VMS, UTC, traffic events

- Information to users



Possible triggers
-**Calendar**
-**Traffic event (road closed)**
-**Change in demand (traffic sensor)**

Intersections affected by traffic scenario

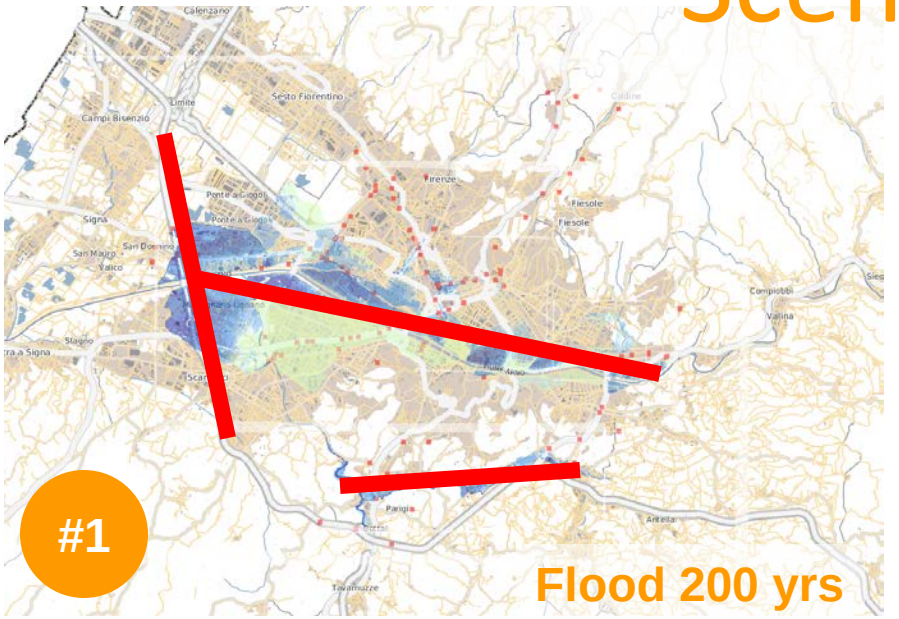


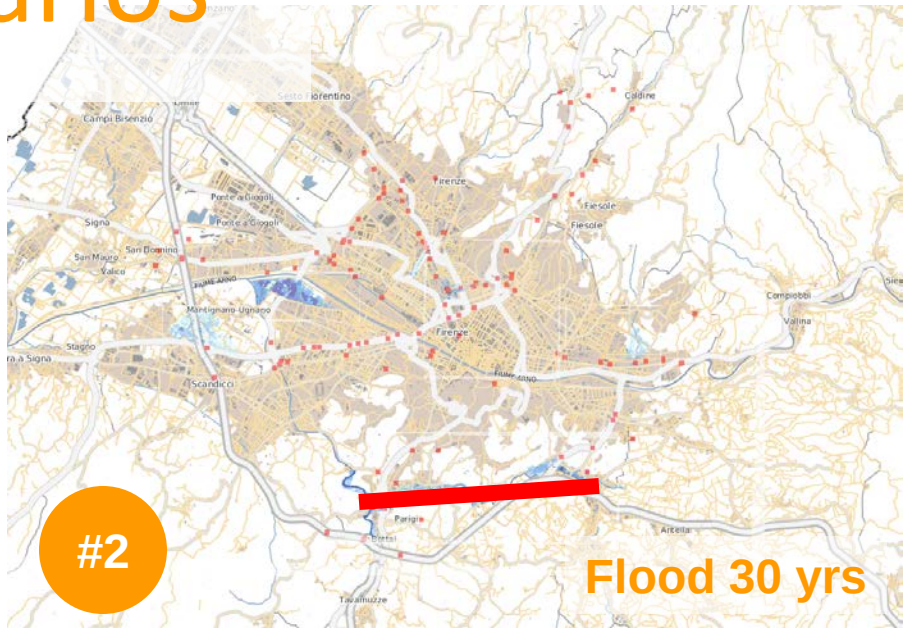
Emergency scenarios

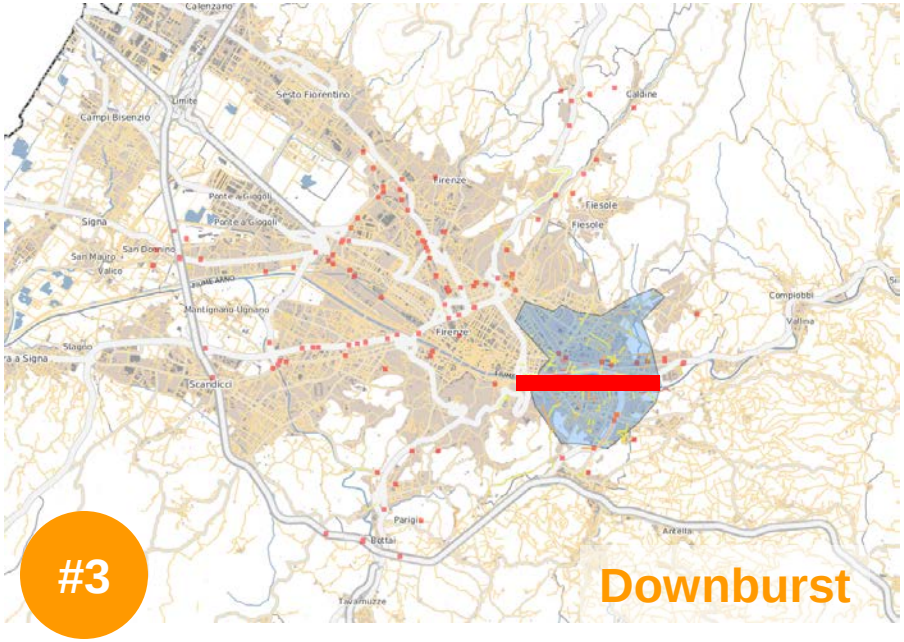
Representative scenarios were identified

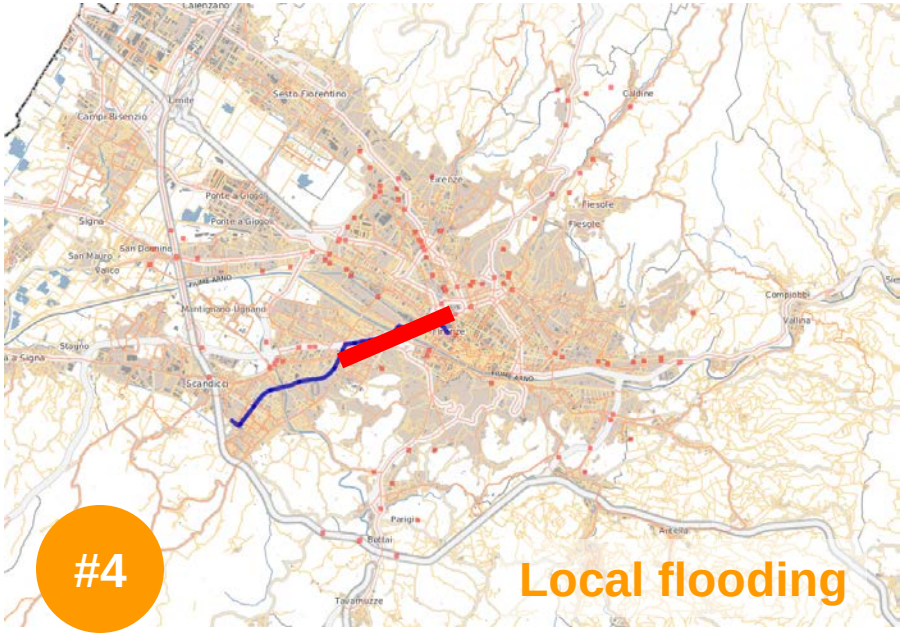
1. Flood - 200 years
2. Flood - 30 years
3. Downburst in the south-east area
4. Local flooding next to Opera theatre

Scenarios





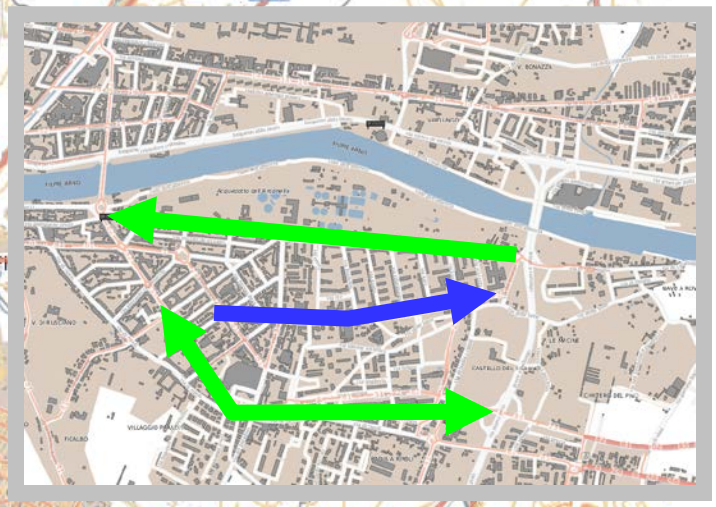




Dealing with emergencies

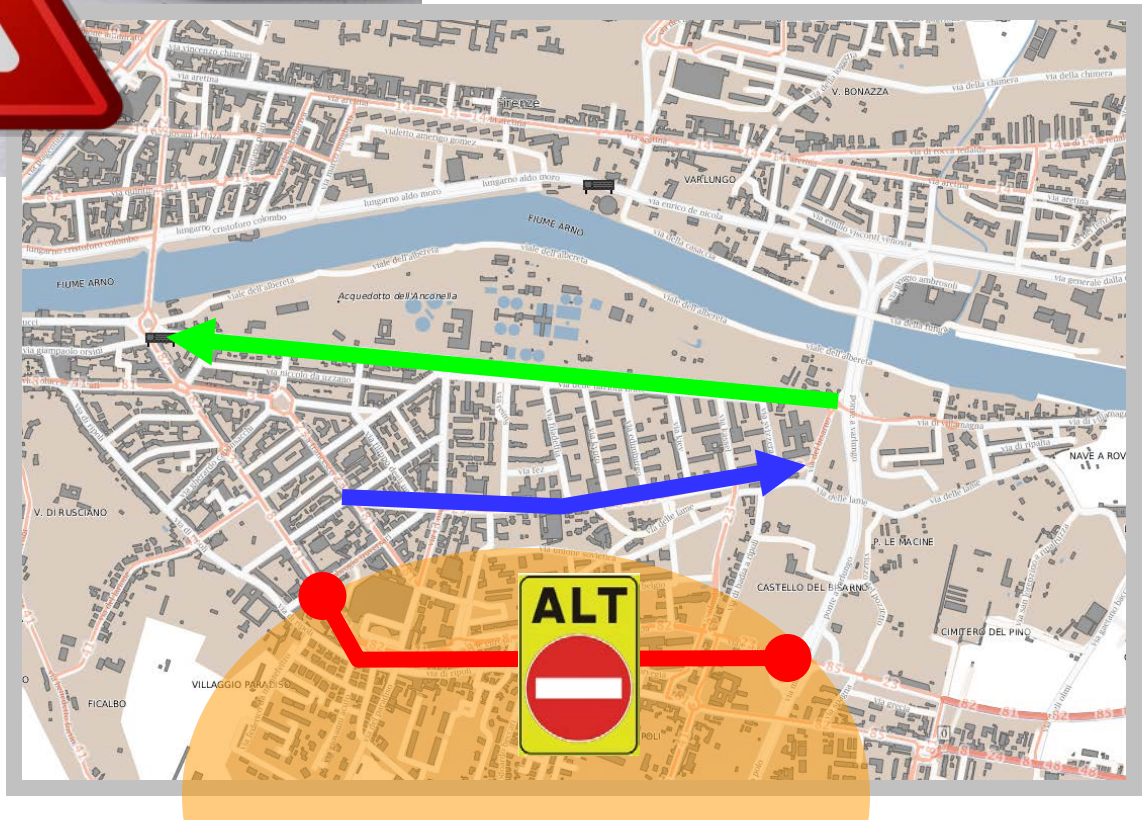
- Constraints of the transportation network
  - limited capacity
  - limited redundancy
- Simulations of emergency scenarios
- Additional actuators
  - loosen limitations
    - limited traffic zones (LTZs)
    - bus lanes
  - redesign transportation network
    - two ways -> one way / change directon
    - remove / add road

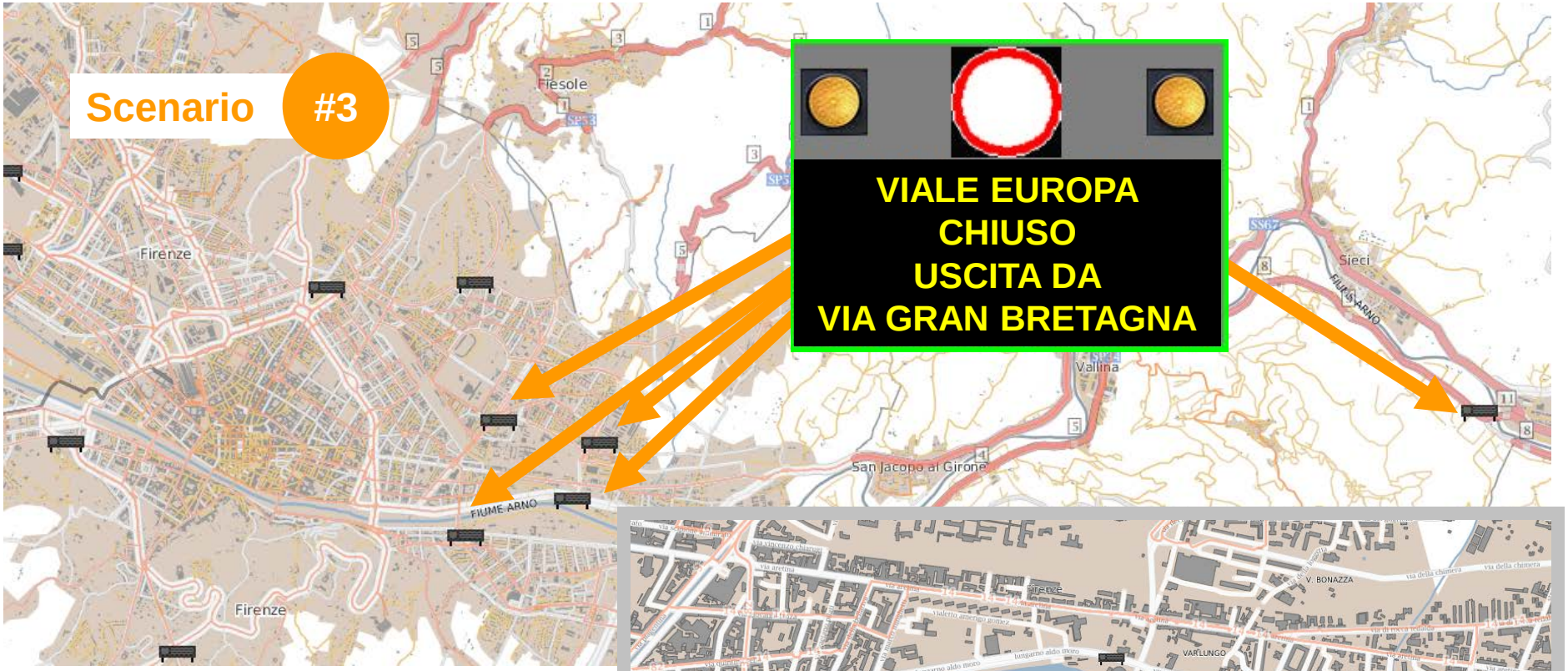
Scenario #3

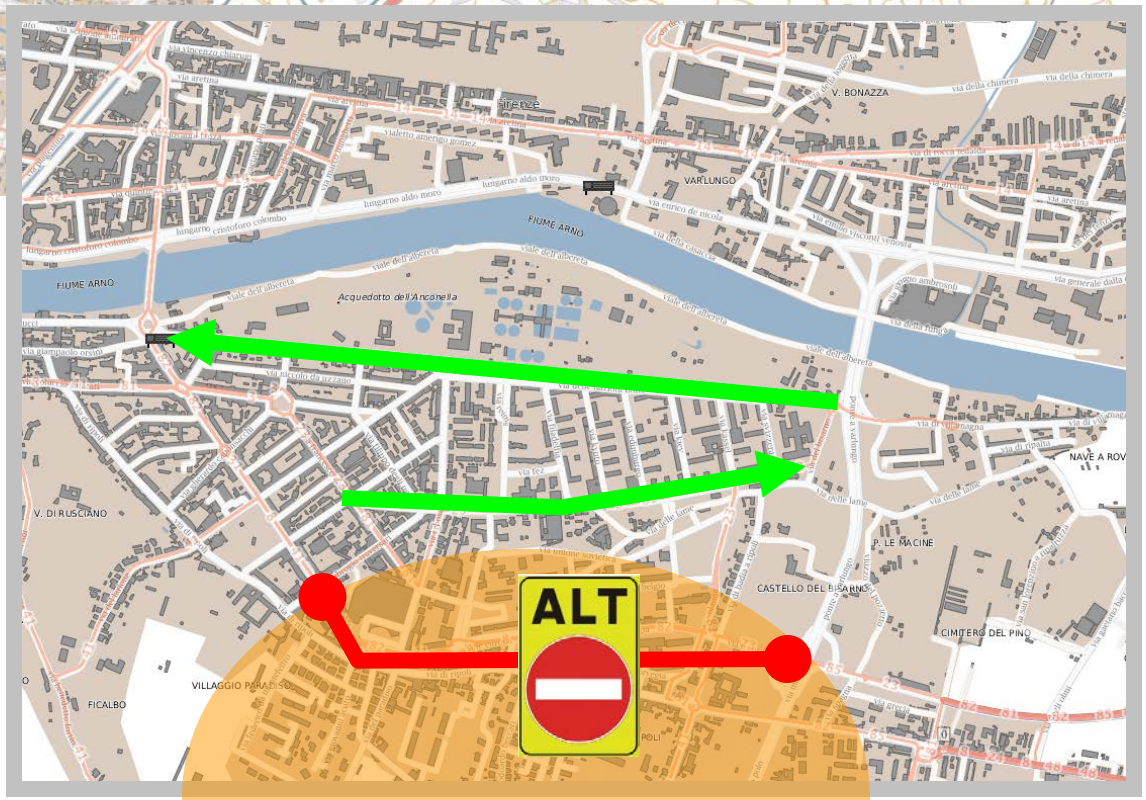


Scenario #3

Given the unpredictable catastrophic event, the standard configuration does not allow outbound private transport to leave the downtown going south-east







Information through VMS

Break the rules!
Reconfigure the network in order to provide a new route out of the city: allow transit through bus lane

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traffico limitato

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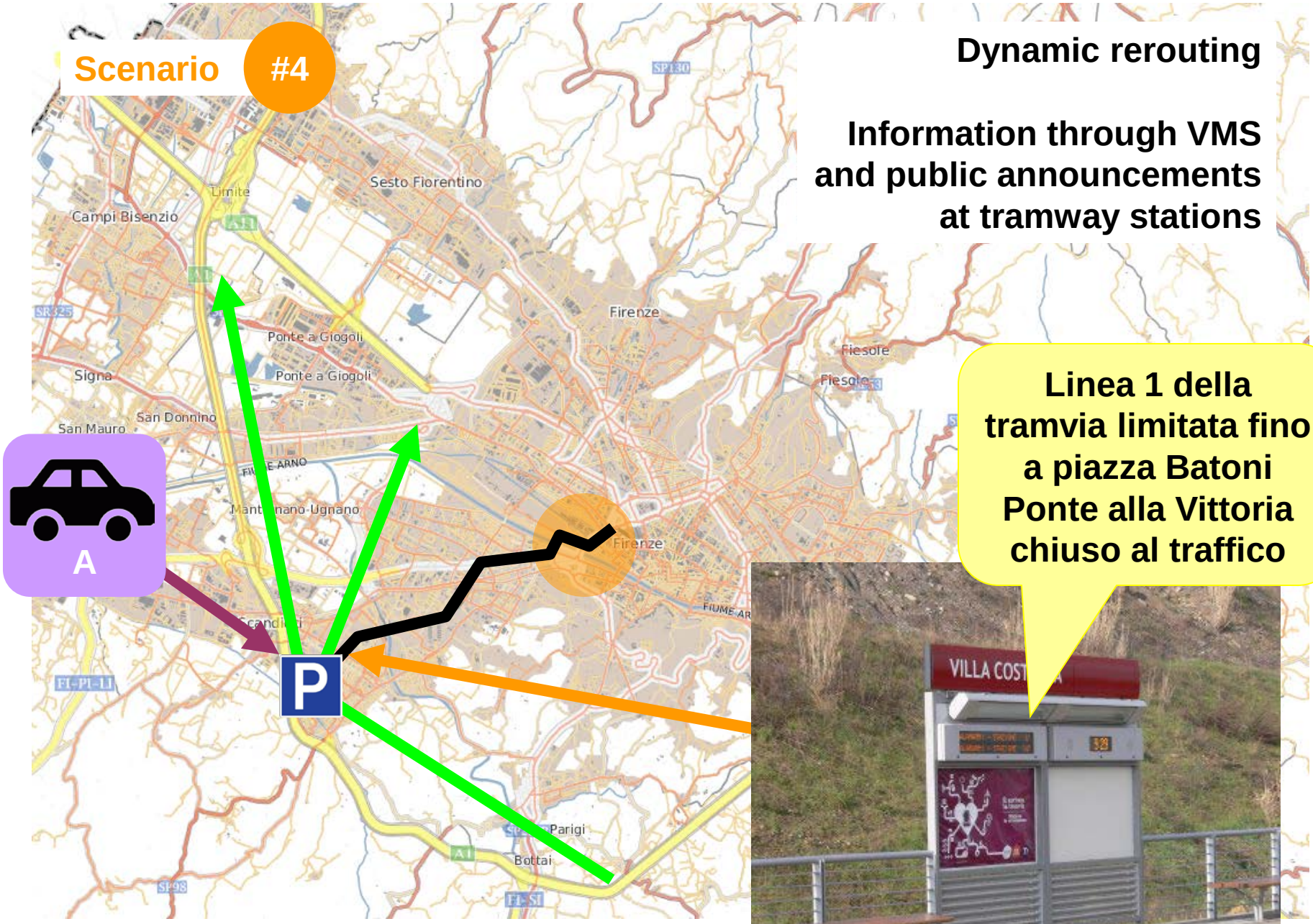
Scenario #4

Dynamic rerouting

Information through VMS and public announcements at tramway stations

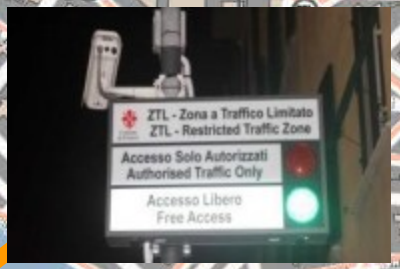


Linea 1 della tramvia limitata fino a piazza Batoni Ponte alla Vittoria chiuso al traffico

Scenario #4

Dynamic rerouting

Allow transit through LTZ



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V. LETIZIA
V. MERCEDE
VILLA DELL'OMBRELLINO
V. PAPINI
TORRE BELLOSGUARDO
GIARDINO DI BOBOLI

Thank you

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