C-ROADS

TRAFFIC VOLUMES MONITORING IN REAL TIME (SPA ARTICULATION) AND 2-HOUR PREDICTION IN THE URBAN NODE OF PORTO

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Outline

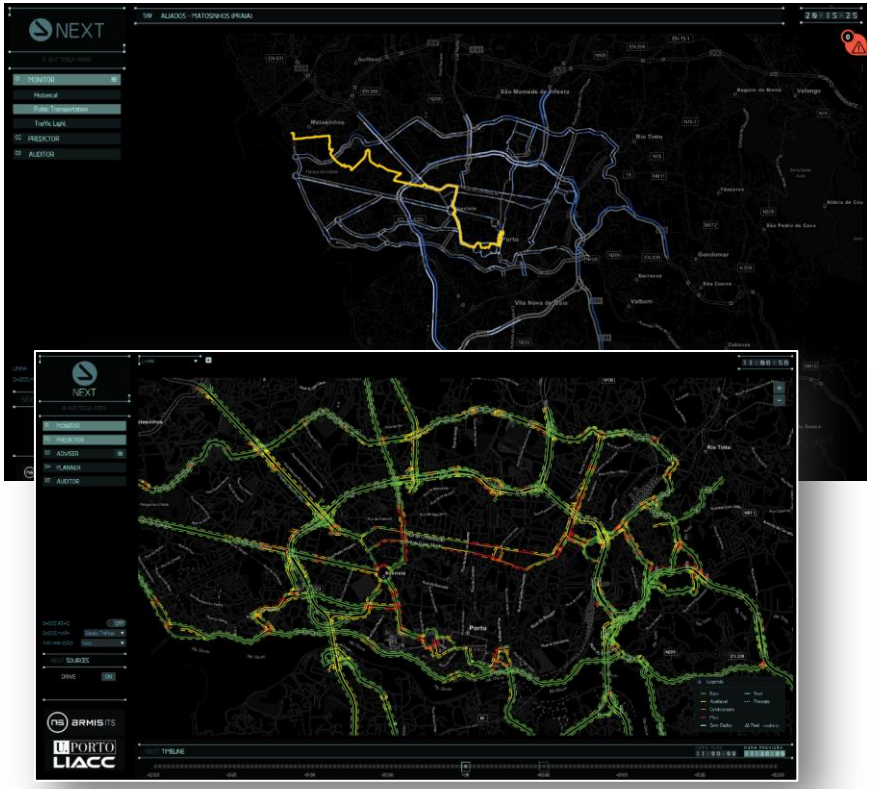
- NEXT
  - Overview;
  - Functionalities;
- Oporto City Implementation
  - System Test Scenarios;
  - Oporto Network;
  - Traffic Data Integration;

NEXT - Overview

- Solution for data analysis, traffic simulation and traffic data forecast.
- **Virtualization** of a **Real** traffic network, allowing to:
  - Edit and perform changes in the network;
  - Integrate online information such as: traffic data, incidents, weather data, and social network's data;
  - Represent the network for traffic data forecast;
  - Test and evaluate dynamic scenarios/contingency plans through traffic simulation;
  - Advise mechanisms and continuous adaptation with Machine-learning algorithms;

NEXT - Functionalities

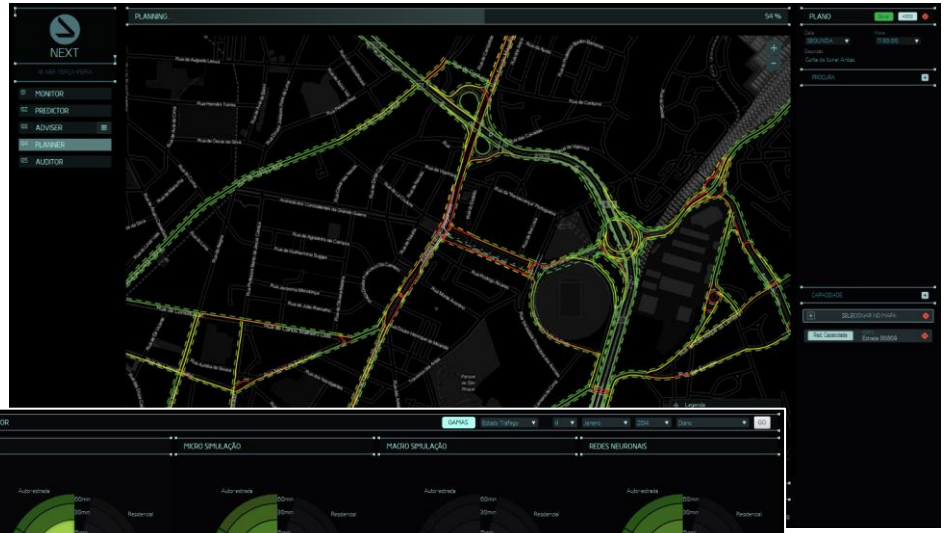
- **Monitor** - Network monitoring and data integration:
  - urban traffic data,
  - interurban traffic data,
  - public transport data;
- **Predictor** - Traffic forecast up to 2 hours;
- **Advisor** - Recommends actions in order to mitigate the impacts based on network virtual representations;



NEXT - Functionalities

- **Planner** - Allows to plan hypothetical events such as dynamic scenarios/contingency plans;

- **Auditor** - Coordinates the interaction between the modules and provides comparative analysis between the real and the forecasted data;



Oporto City Implementation

- The control and supervision of the equipment's network and real-time traffic management are both part of CMP's (Oporto city hall) missions.
- This project aims to install, integrate and parameterize the NEXT traffic forecast system at Traffic Control Centre (TCC) of CMP, in order to gather real-time traffic information for traffic data forecast and decision support algorithms (advices, warnings, …).
- Moreover, the system allows to perform simulations and network planning operations, in an updated ITS system with existent data:
  - Urban Data (traffic data)
  - Interurban Data (traffic data, Incidents)
  - Public Transport Data (static and Dynamic data)

Oporto City Implementation - System
Test Scenarios

- **0th Scenario** - Network parameterization and monitoring;
- **1st Scenario** - Two hour traffic data forecasting;
- **2nd Scenario** - Traffic congestion warnings (incidents);
- **3rd Scenario** - Incident effect propagation appraisal;
- **4th Scenario** - Contingency plans definition, identification and activation:
  - signage plan changing;
  - route planning;
- **5th Scenario** - Test and evaluation of dynamic scenarios/contingency plans for incidents resolution:
  - unmanaged event creation (incident);
  - network capacity and demand variation;

Oporto City Implementation – Oporto Network

- 1st Level: Highways and Main Arteries ~250 Km
- 2nd Level: Secondary Arteries ~200 Km
- 3rd Level: Residential Arteries ~350 Km

- Total: ~800 Km
- **Traffic data Coverage**: ~50%

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Oporto City Implementation – Traffic
Data Integration

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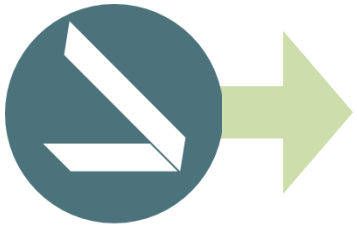
Input Data

- Weather Data

Interurban	Volume Average Velocity Occupancy
Urban	Traffic Light Flow
Public Transport	Instantaneous Velocity Real-Time Positioning From/To stop distance



Output Processed Data

- Traffic Status
- 2h Forecast Data
- Warnings
- Advices
- Travel Times

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THANK YOU!

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