



**UNIONE EUROPEA**  
Fondi Strutturali e di Investimento Europei

# Digital Solutions For Urban Governance

EU Politics Directorate – Structural Funds  
Green Policies – Sport

Catania



## EU Investment Funds (SIE)

Program	Invest. [€]
PON Metro 2014-2020	159M
Agenda Urbana CT-Aci 2014-2020	48M
PNRR	197M
PN Metro 2021-2027	222M
FUA Coalizione Catania 2021-2027	~ 170M
Patto per Catania -> PSC	335M
<b>Total Investment</b>	<b>1,13B</b>

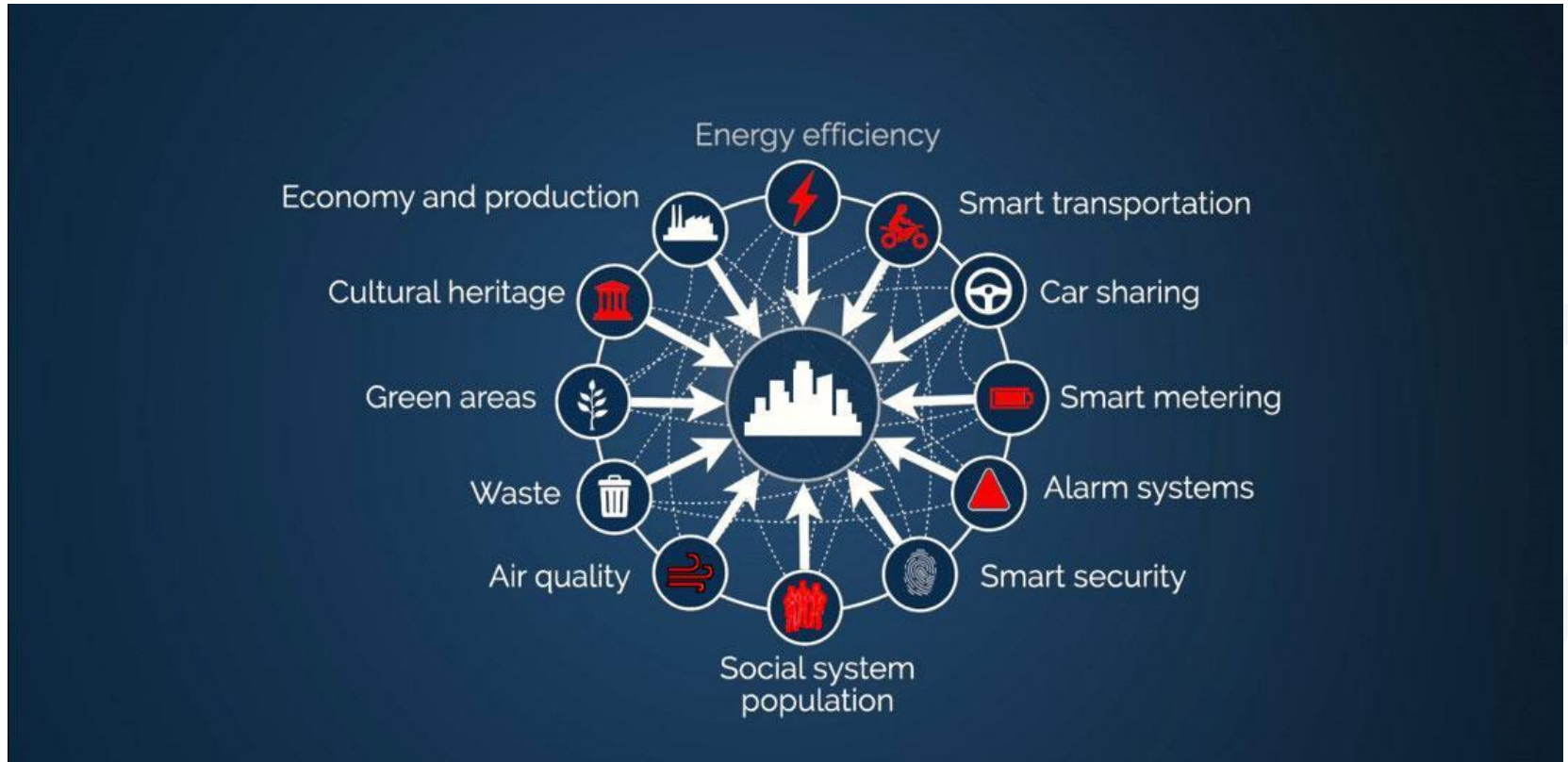
## Digital Agenda

Program	Invest. [€]
<b>PON Metro 2014-2020</b> OP1 - Europa più Intelligente	15,4M
<b>Agenda Urbana CT-Aci 2014-2020</b> Catania Smart – Etna Dati	5,7M
<b>PNRR</b> Cloud Enabling, National Platforms integration, Citizen Experience in Public Services, Cybersecurity	9,3M
<b>PN Metro 2021-2027</b>	22,8M
<b>Digital Agenda Total Investment</b>	<b>53,2M</b>

# PON Metro CNR – Urban Intelligence Science Hub for City Network – 3,97M€

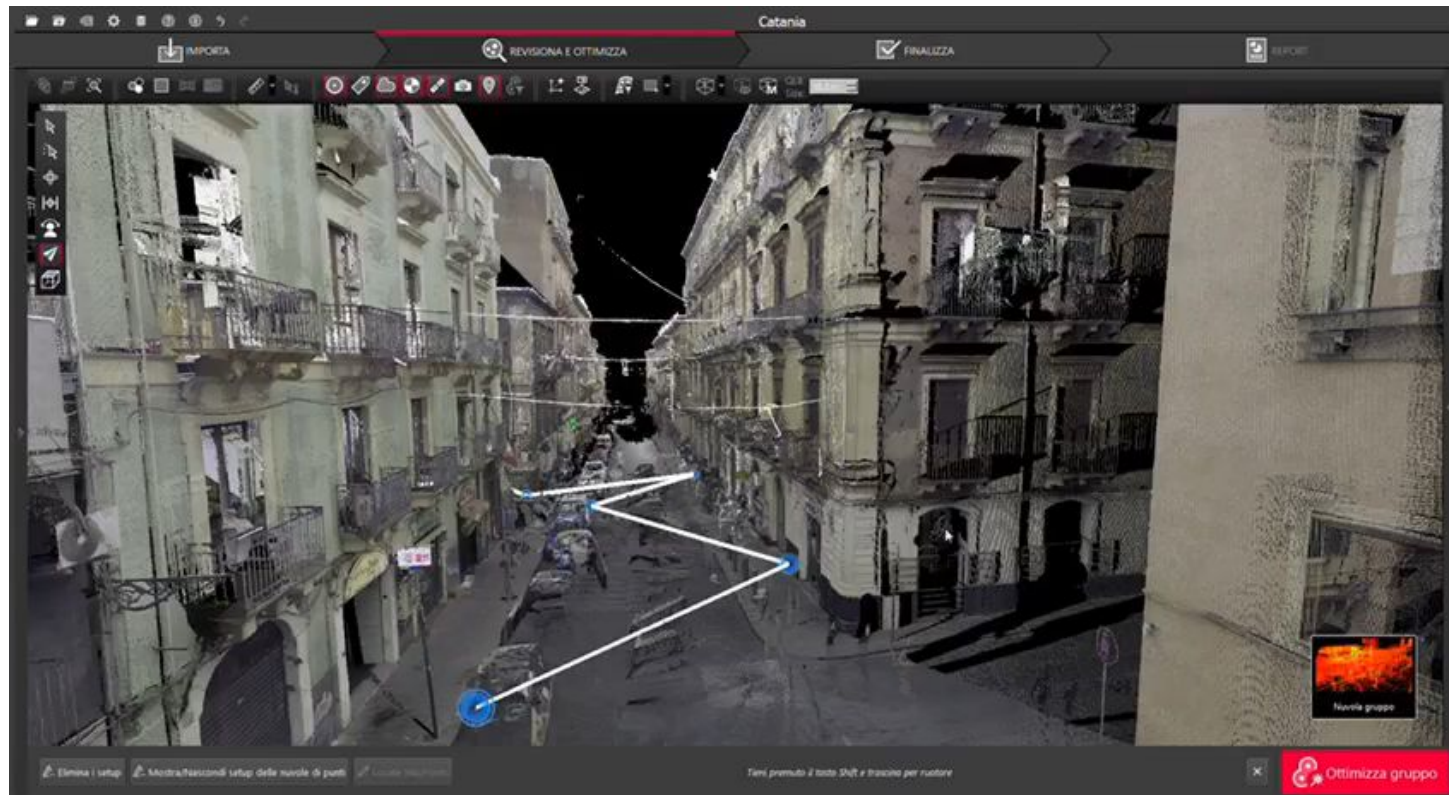
• Pilot Research Project for Innovative Actions. **Digital Twin.**

## Thematic Digital Twins Interactions



# UISH – Urban 3D Model – Catania (Old Town)

Lidar Scanning at road floor (Car, Drone and Backpack)





# UISH – Urban 3D Model – Catania (Old Town)

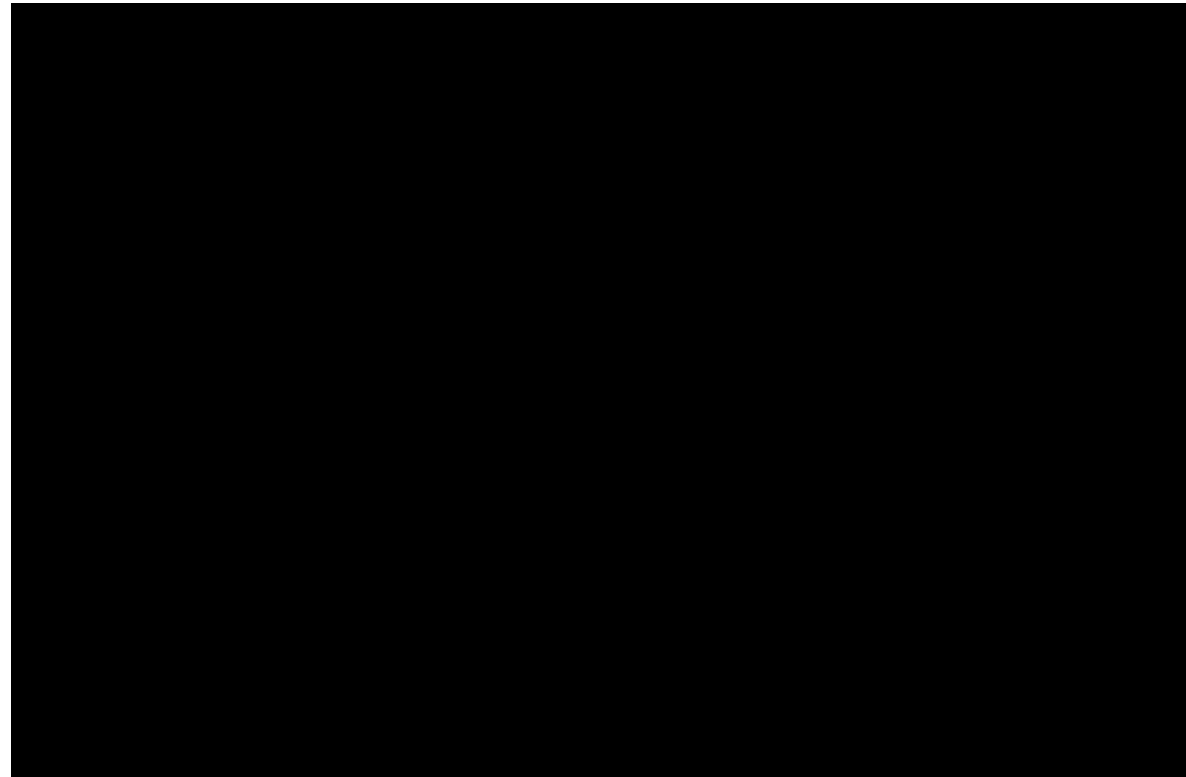
Aerophotogrammetric scanning. Point Clouds Union and 3D Mesh Generation.



# UI3H – Urban 3D Model – Palazzo degli Elefanti

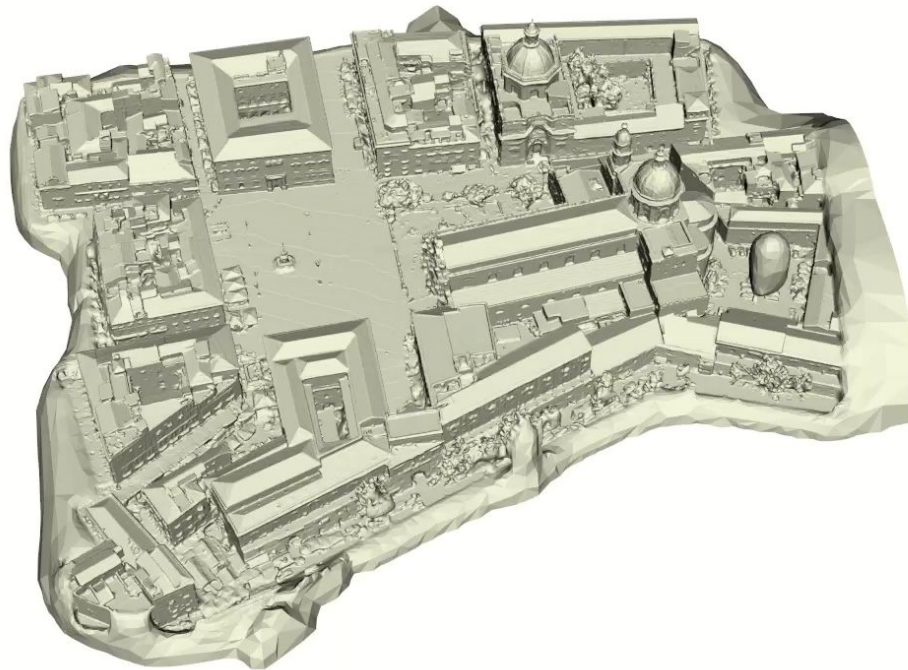
## Automated Semantic Segmentation and Annotation.

- **Point Cloud (500M).**
- 10M points cells subdivision.
- **Classification**  
(RANSAC).
- **Features Extraction**  
(Hough Transformation).
- **Semantic Annotation**  
(Road floor,  
Facades, Roof)



# UIISH – Shading Model

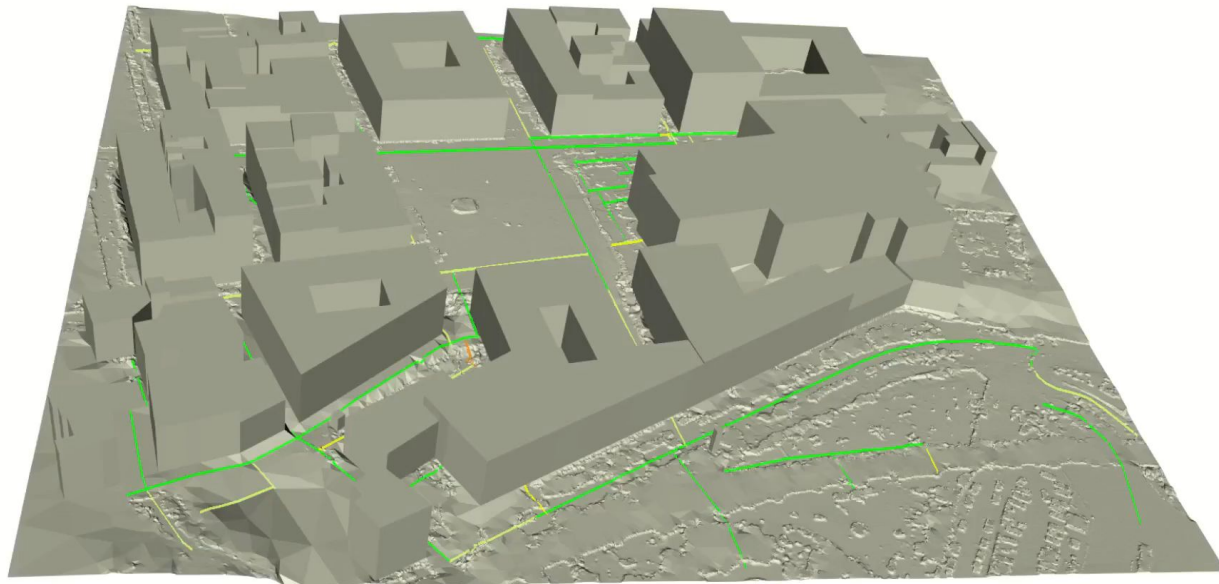
- It contributes to the generation of Heat Maps.
- *E.g. Innovative Digital Service: Best tourist route planning.*





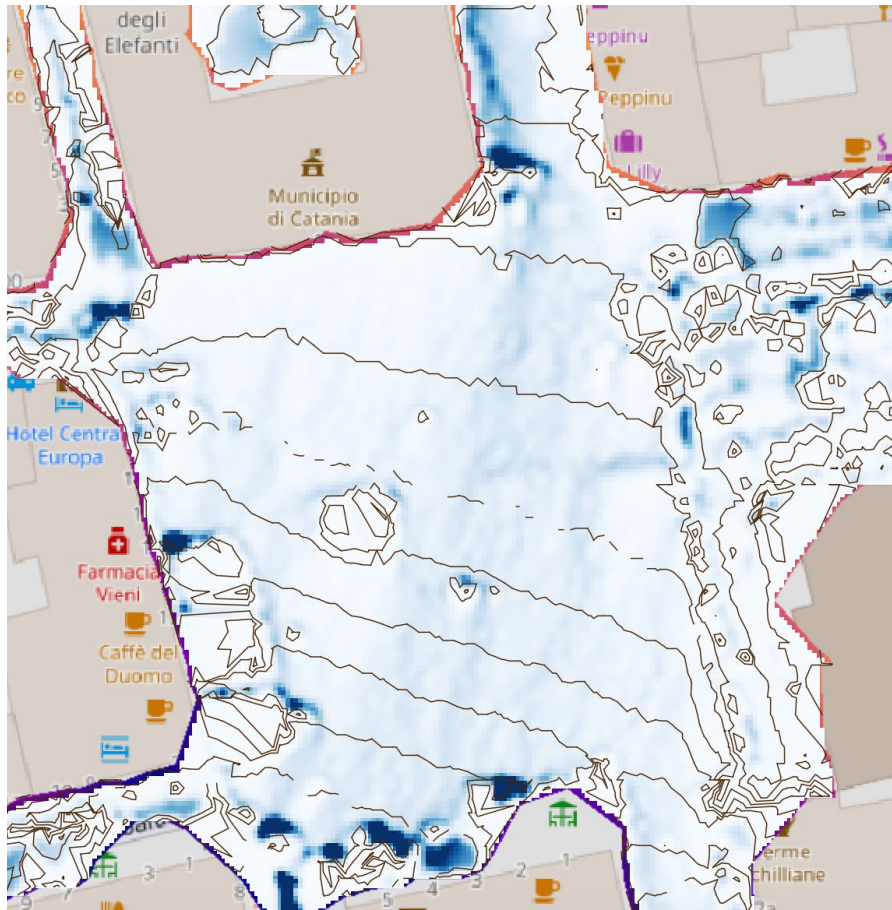
# UI3H – Roads slope calculation.

- A different color is visualized based on the slope gradient.
- Different Levels of Details (LoD) Management.

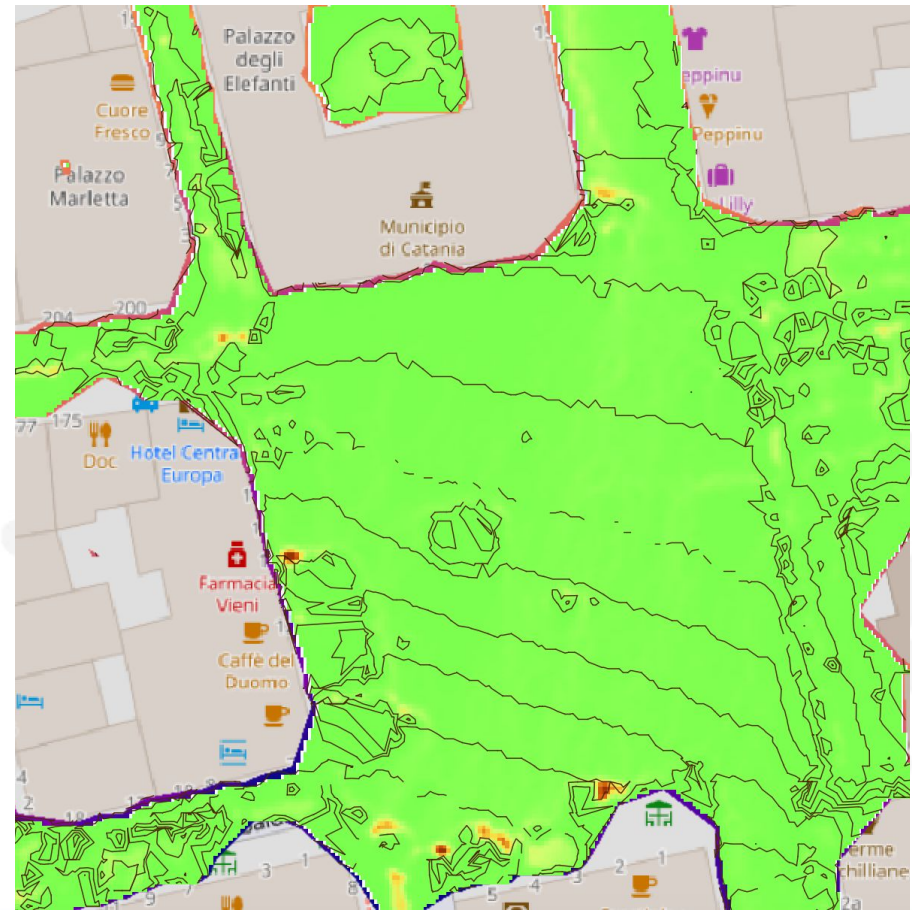


# UISH – Surface water flow model – Piazza Duomo

Flow



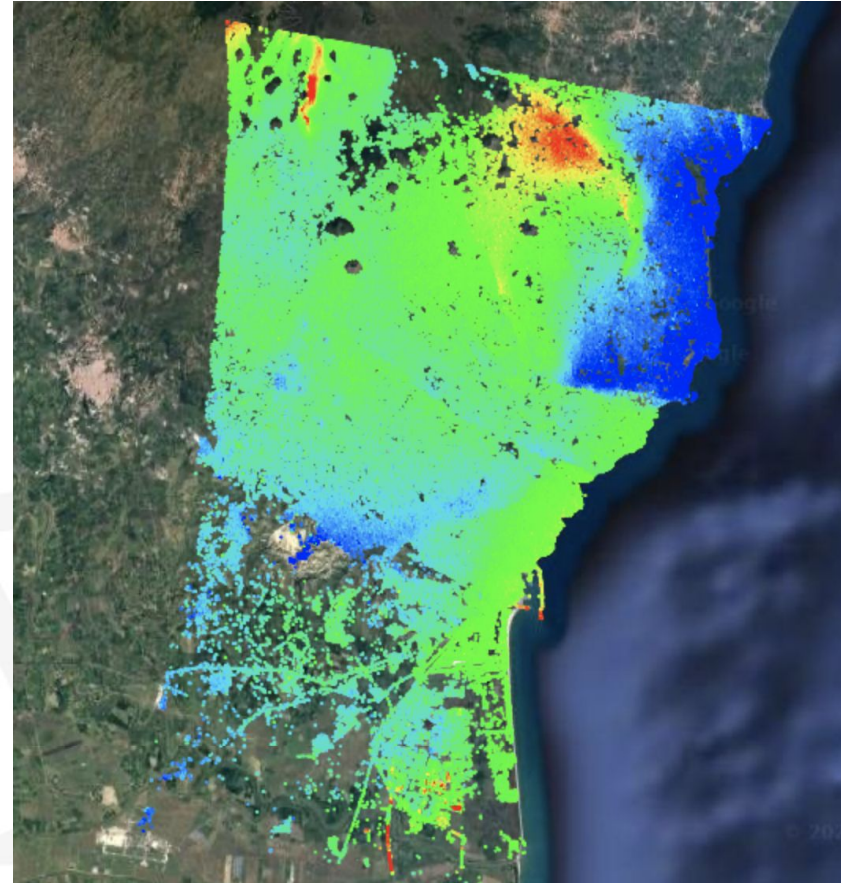
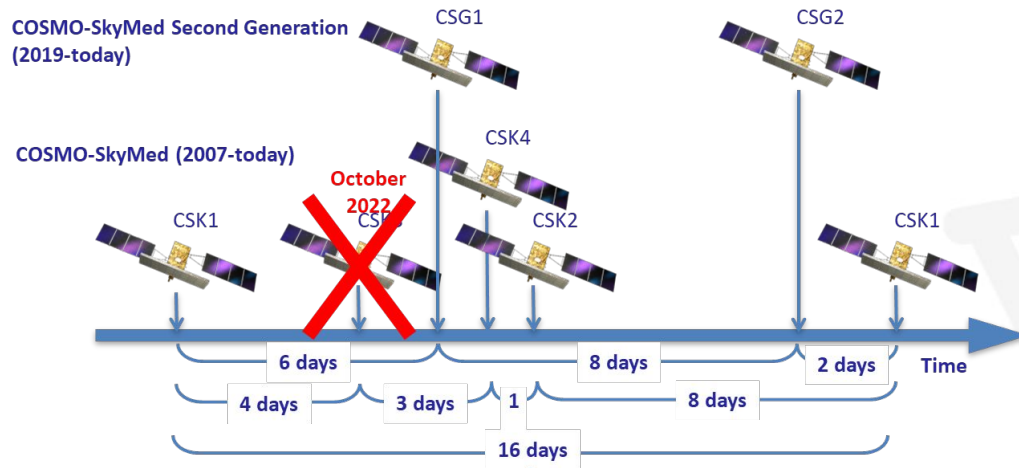
Simulation error





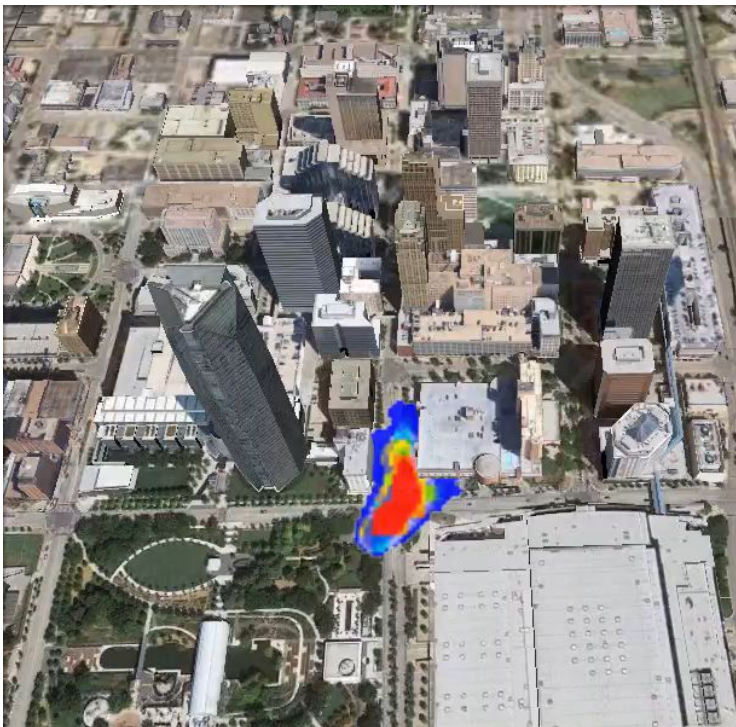
# UI SH – Identification of Earth Movements

**Analysis of over 170 Historical satellite images 2011-2022**  
*(Synthetic Aperture Radar - SAR)*

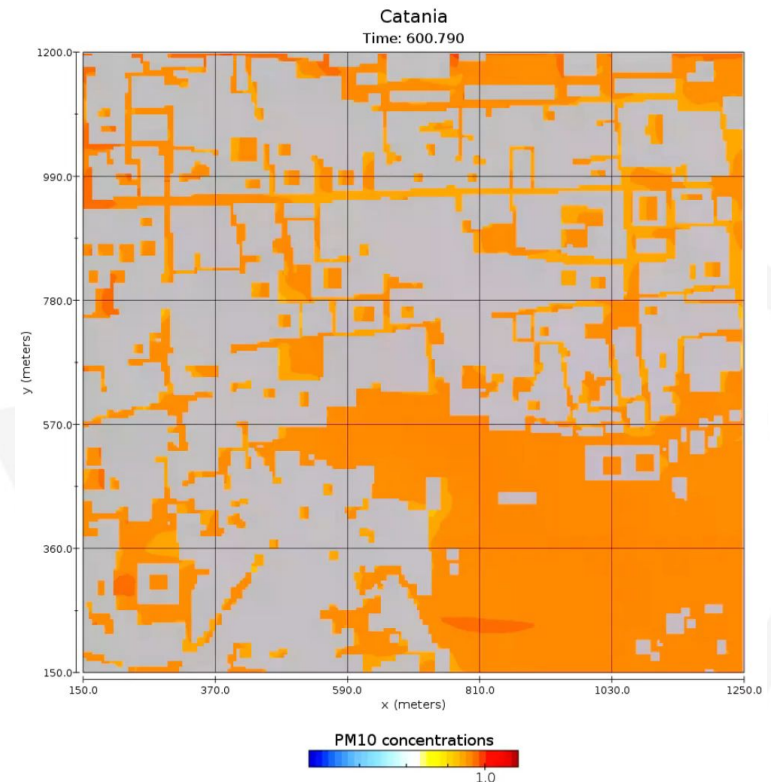


# UIH – Air Quality Model

Pollution spread 3D  
Simulation

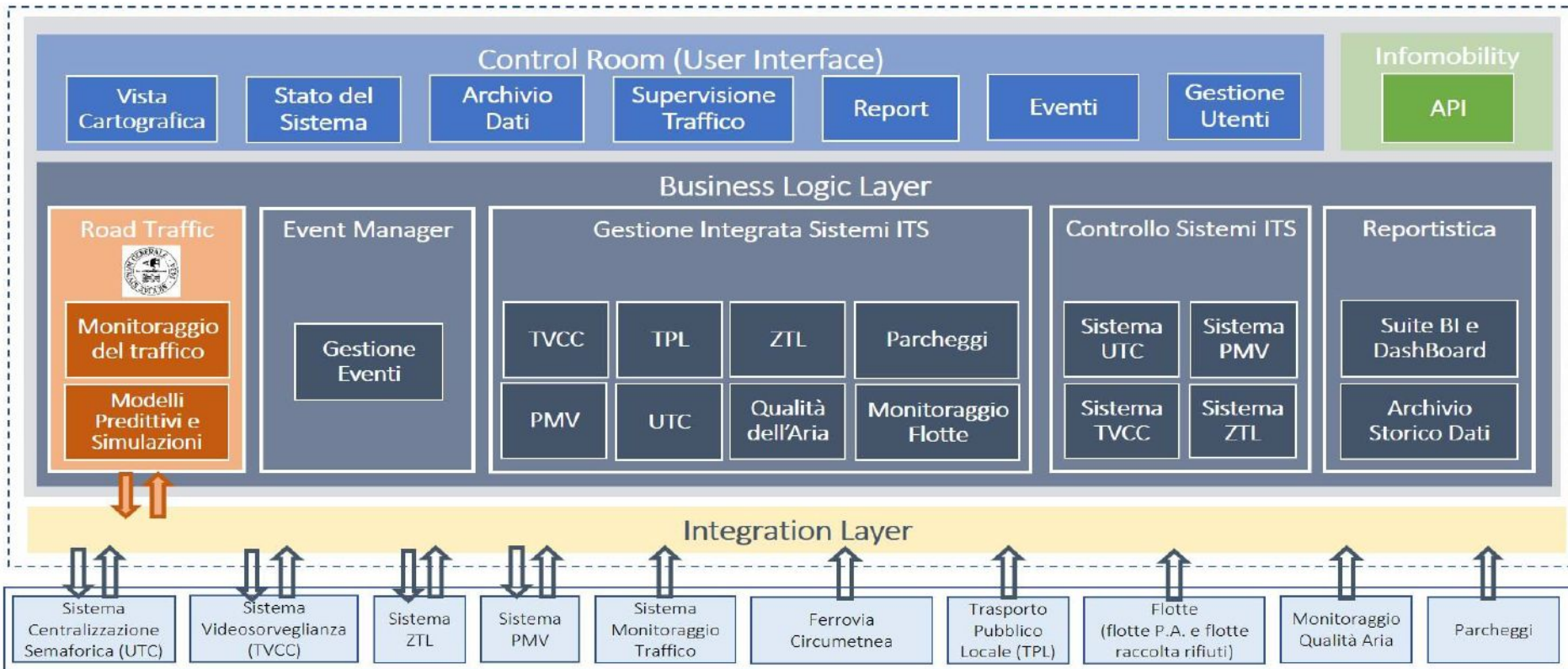


PM10 concentration for traffic emissions.  
24h simulation starting at 06:00am 02/05/2023.



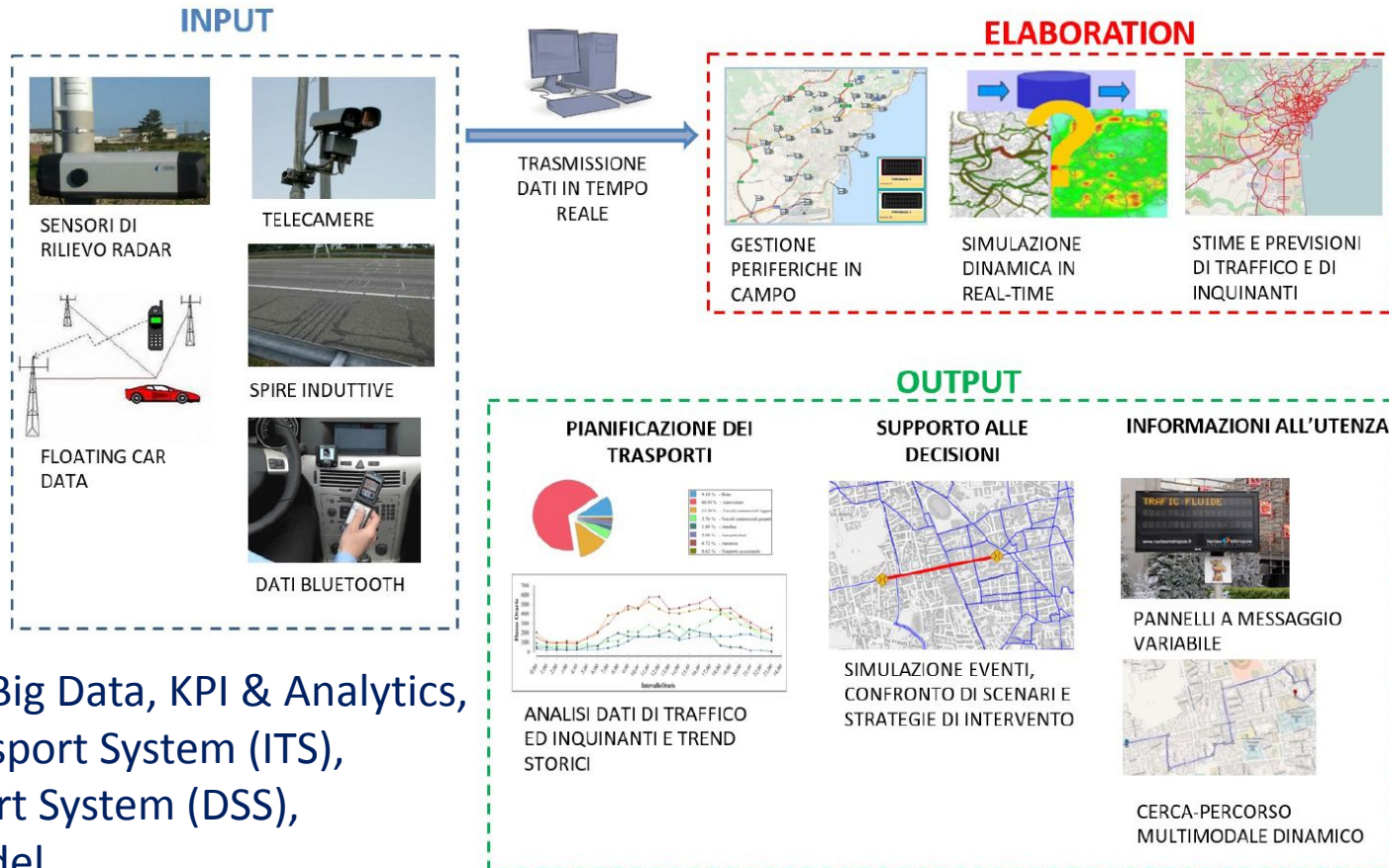


# Mobility Control Room - Integration



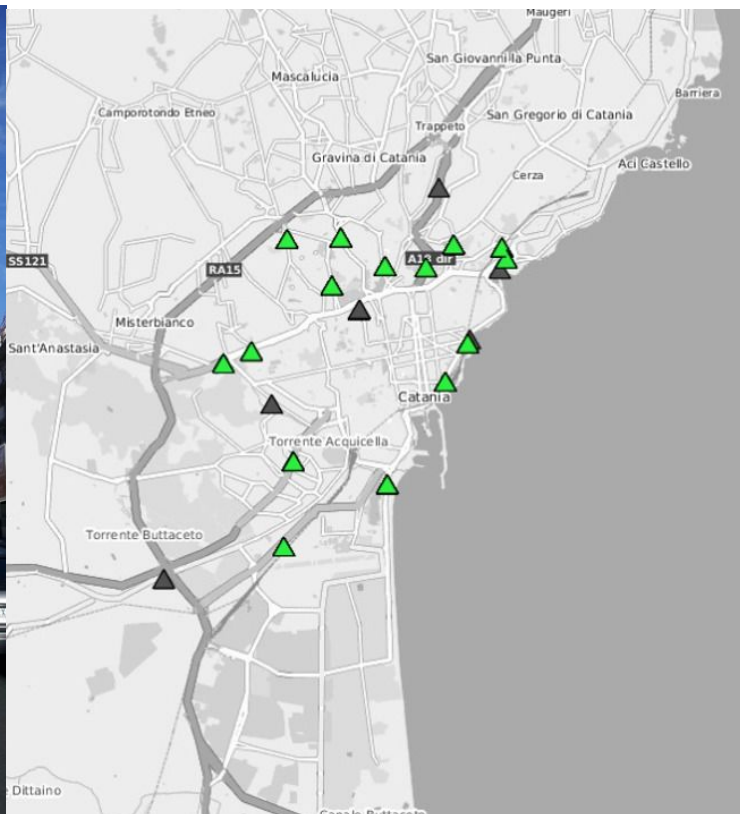


# Mobility Control Room - ITS



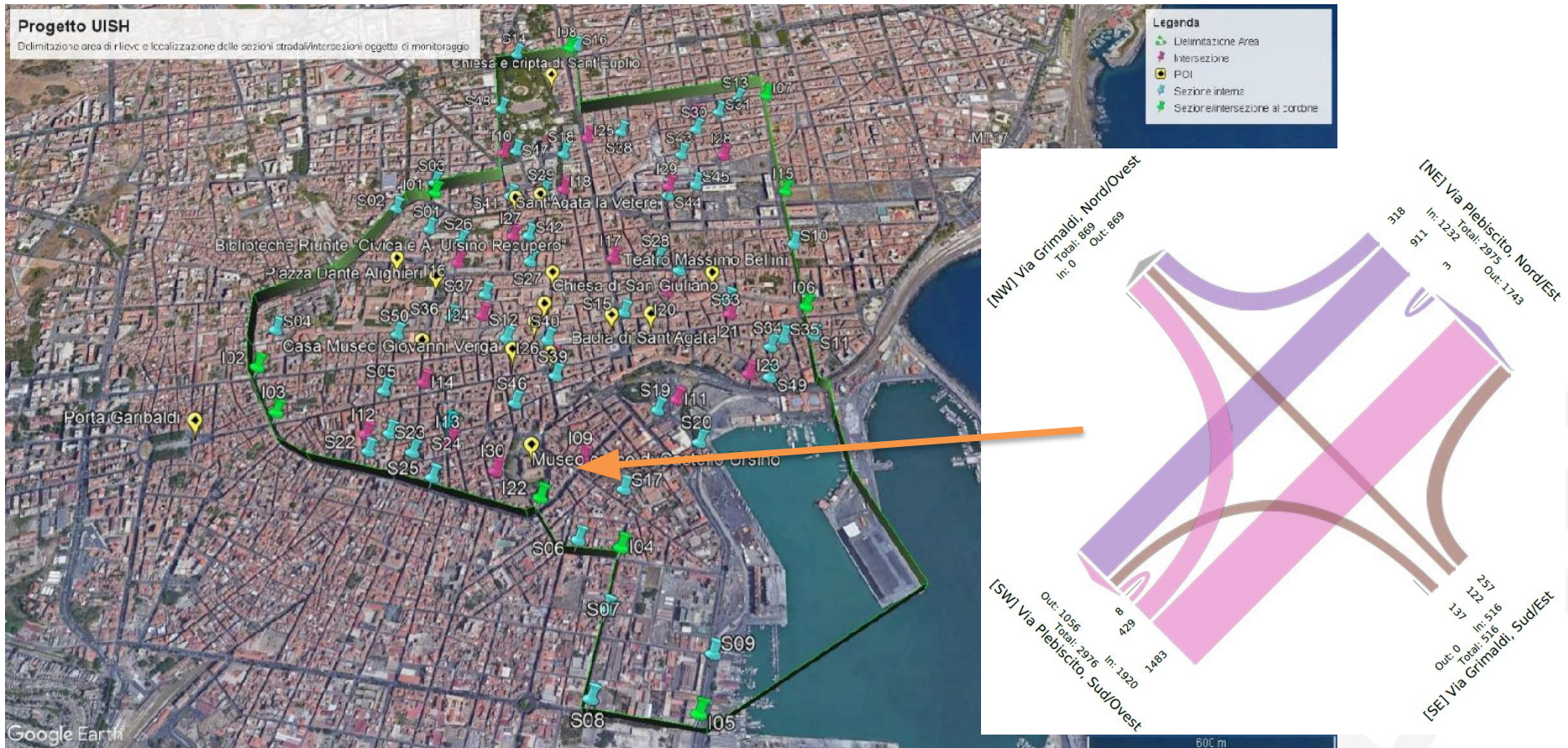
IoT, Data Lake, Big Data, KPI & Analytics,  
Intelligent Transport System (ITS),  
Decision Support System (DSS),  
Previsional Model.

# Mobility Control Room – Sensors Network





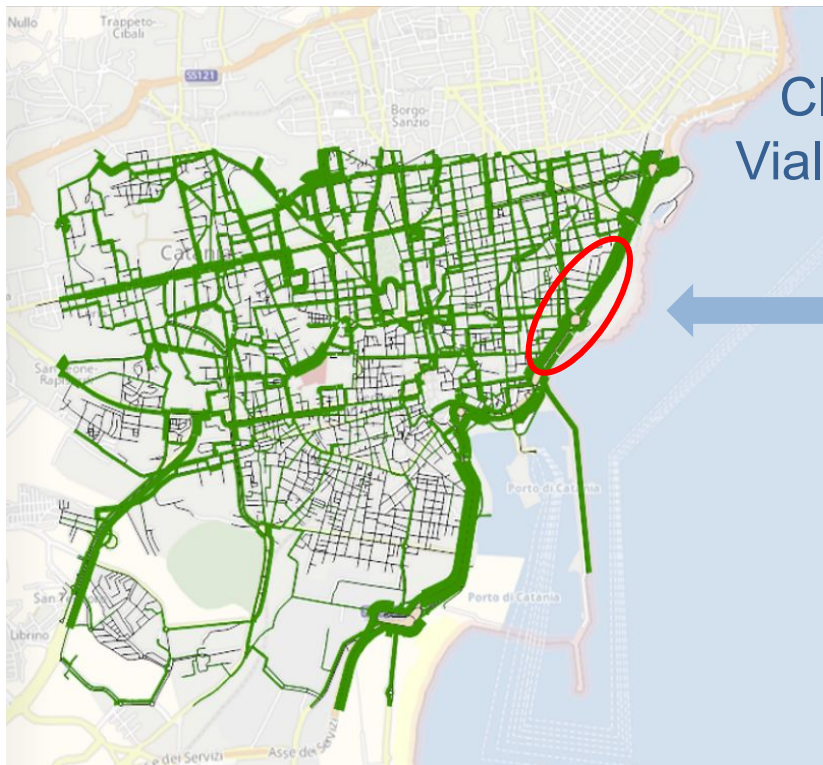
# UIISH – Vehicle flow monitoring campaign



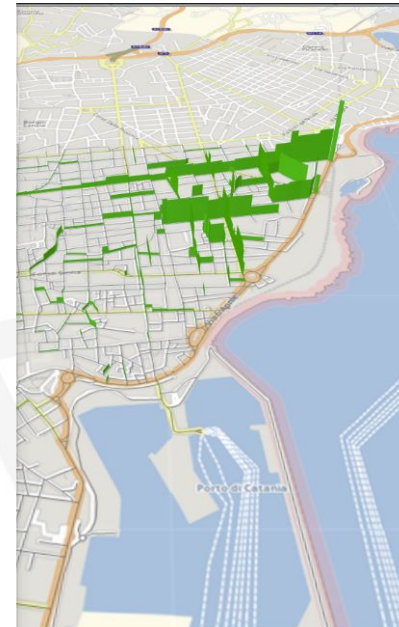
50 roads sections and 30 intersections for 24 hours

# UISH – Urban Traffic Model

## Events Simulation. «What if» Analysis.



Closing  
Viale Africa



Traffic variations  
due to the closing.





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**Thx!**

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**Catania**