

# **Urban Infrastructure Digitalization**

# Ingredients for Liveable, Efficient and Resilient Cities

# City Intelligence Platform







### **City Intelligence Platform (CIP)**

Create value out of urban infrastructure data to:

- analyze and increase efficiency of city infrastructure and urban transport
- propagate sustainable modes of transportation (improve air quality)
- quantify and enhance resilience
- · continuously validate and improve algorithms and services

## **Urban Infrastructure Digitalization** Cross-domain integration and analytics





#### City Intelligence Platform (CIP)

#### Cross-domain integration and analytics, Event- and Incident Handling

Smart Mobility	Smart grid	Smart water	Smart building
Public transport and intelligent traffic solutions	Grid analytics and grid automation	Urban water grid automation	Building energy and power management

#### **Data from Siemens and customer base**

Serving business, the environment, and society Sustainability as a guiding principle

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# **Open Platform** Basis to jointly build an urban IT ecosystem



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# Projects in several European cities

Focus on openness, modularity and extensibility



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# Smart Water Water & energy

### **Demonstrator for Water & Energy**

- Water supply system in Milano, Italy
- Pilot zone (marked in red) from EU-funded research project "ICeWater"
- Data available for Use Case validation:
  - 1362 pipes with total length of 116.27 km
  - 1628 customers
  - Average water demand of ~367 liters per second
  - Fed from 20 local ground water wells



Milan water supply network (blue) with pilot zone (red)

### Smarter Together Objectives and pilot area in Munich

- 1. Living labs for citizen engagement
- 2. District heating and renewable energies for low energy districts
- 3. Holistic refurbishment for low energy districts addressing public and private housing
- 4. Smart Data management platform and smart services for integrated infrastructures
- 5. E-mobility solutions for sustainable mobility



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## Climate Resilient Cities and Infrastructures Project "RESIN" (www.resin-cities.eu)

Climate change, expecting to cause an increase in frequencies and intensities of extreme weather events, stands out as one of the major challenges cities and EU face. Increasing resilience of cities and their infrastructures demands mainstreaming of adaptation measures and developing a coherent and socially equitable approach to disaster risk management policies.

#### **Results:**

- urban typology that will characterise cities based on different variables. Will enhance effectiveness of adaptation and disaster resilience responses by enabling strategies and measures to be targeted to urban characteristics.
- standardised methods for assessing climate change impacts, vulnerabilities, and risks. Will allow for comparing cities and neighbourhoods. Important to stimulate a mutual learning process between cities and to identify priority areas for investment.
- *inventory of potential adaptation measures*, develop *standardised methods for assessing the performance of adaptation measures* in terms of costs, benefits and effectiveness.

City Partners: Paris, Bilbao, Manchester, Bratislava



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### **Smart Energy** Power snapshot analysis

#### Functionality

PowerSnapShot Analysis gives the energy grid provider the ability to check the power grid for anomalies of electrical parameters.



#### **Miscellaneous**

Using the insights from Power Snapshot Analysis, it is easier for the power grid to handle significant amounts of renewable energy generation. Especially wind power and photovoltaic with its fluctuating behavior.



# Smart Energy Anomaly detection

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#### **Functionality**

This application assists municipal utilities to detect anomalies in resource consumption (e.g. energy, water, etc.)

The application identifies profiles that do not fit with the rest of a group of similar users.

#### Source Data / Pilot Deployment

Energy IP Meter Data Management System

Additional events and consumption patterns have been created via simulation

#### **Miscellaneous**

Data has been acquired from real customers.

For privacy reasons, datasets have been anonymized.





## **Data Analytics & Predictions** Shared vehicle availability

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## **STREAM** Public transport prioritization



- Giving priority to public transport at urban intersections enhances its attractiveness and acceptance
- STREAM uses GPS, mobile communication and virtual trigger points to request green at traffic lights
- Online Monitoring shows current positions of busses in the traffic control centre
- CIP provides an additional tool to analyze the system performance





 Giving priority to cyclists at urban intersections with a dedicated App for mobiles and smart watches

# **STREAM** CIP as a tool to prove system performance



STADTBÄUME FÜR BERLIN

# "BikeRider" App in Berlin 3rd party applications based on CIP



- Promotion of cycling as green mode of transportation
- Integration of safety aspects into multimodal routing
- Development and integration of gamifcation elements (competition, community, virtual and real incentives) to promote biking
- Development and integration of mode validation
- Mobile App developed by DFKI (Deutsches Zentrum für Künstliche Intelligenz)
- Concept and backend services by CIP

## **Steadily growing library** Building blocks for new applications

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### Thank you for your attention!

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