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SPINE

Smart Public transport Initiatives for climate-Neutral cities in Europe

Designing the Future of Low-Energy Public Transport and Shared Mobility Systems

ECTRI webinar

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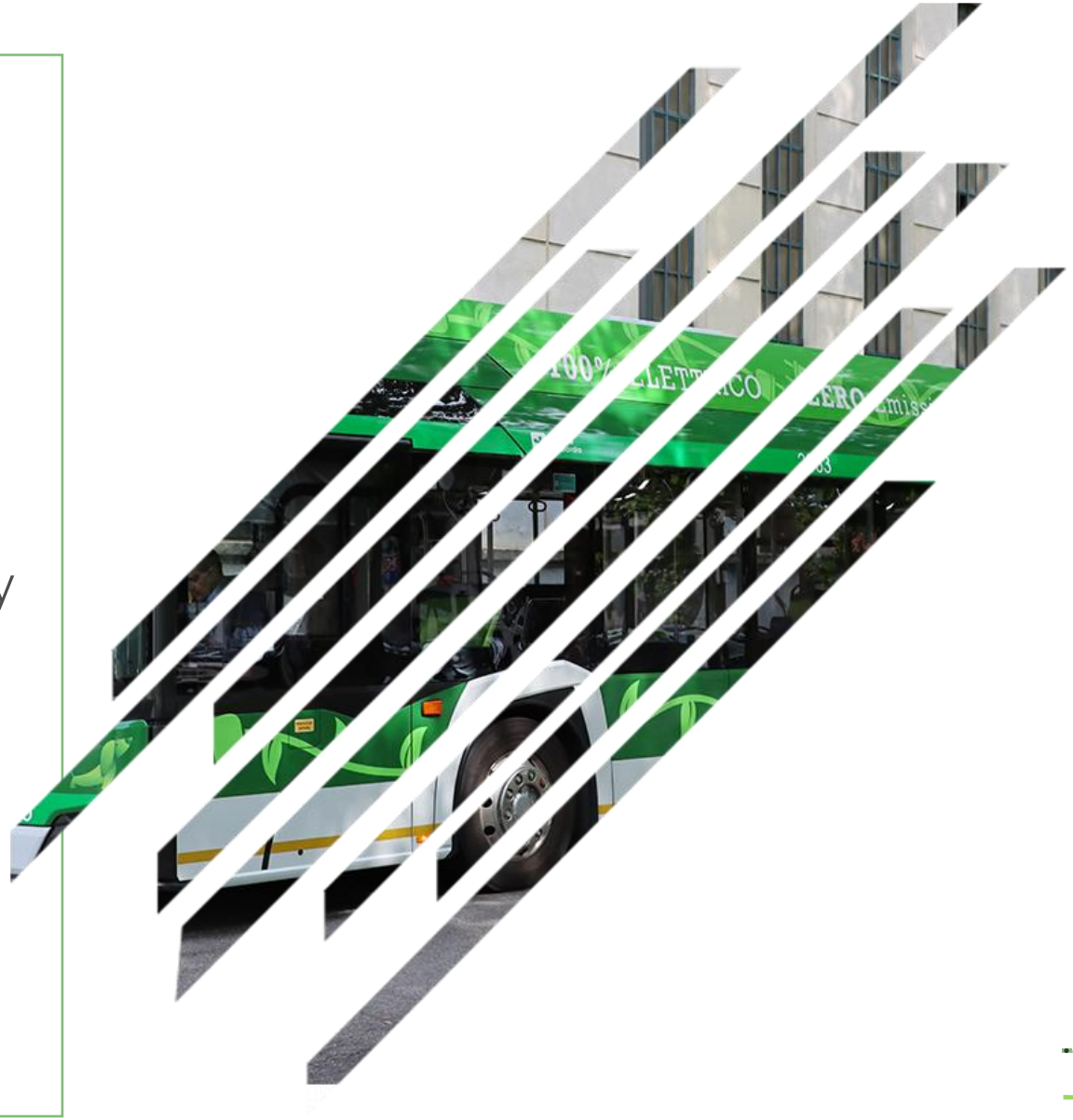
22nd June 2026

Agenda

- SPINE at a glance
- Approach
- Methodology steps in the LLs
- Bologna context
- Bologna approach
  - Multimodal hubs & shared mobility
  - LezGOBO
  - PT prioritization & City30
  - Behavioural change modelling
  - Smart City platform
- Lessons learned



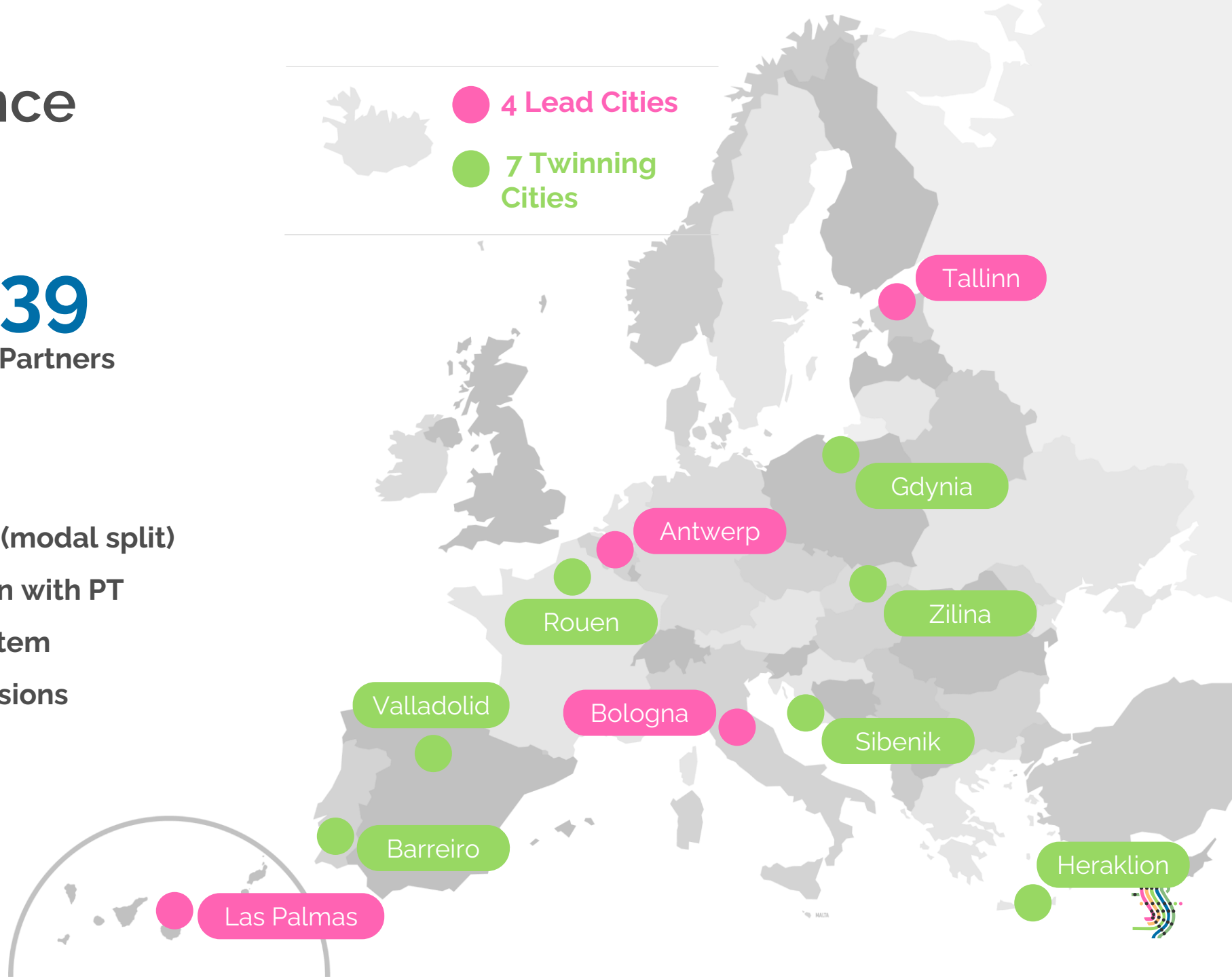
SPINE at a glance

48 Months

17 Millions Euro

39 Partners

- Increase the share of PT (modal split)
- Increase user satisfaction with PT
- A more attractive PT system
- Reduce cars & CO_2 emissions



SPINE Approach

Landscape analysis

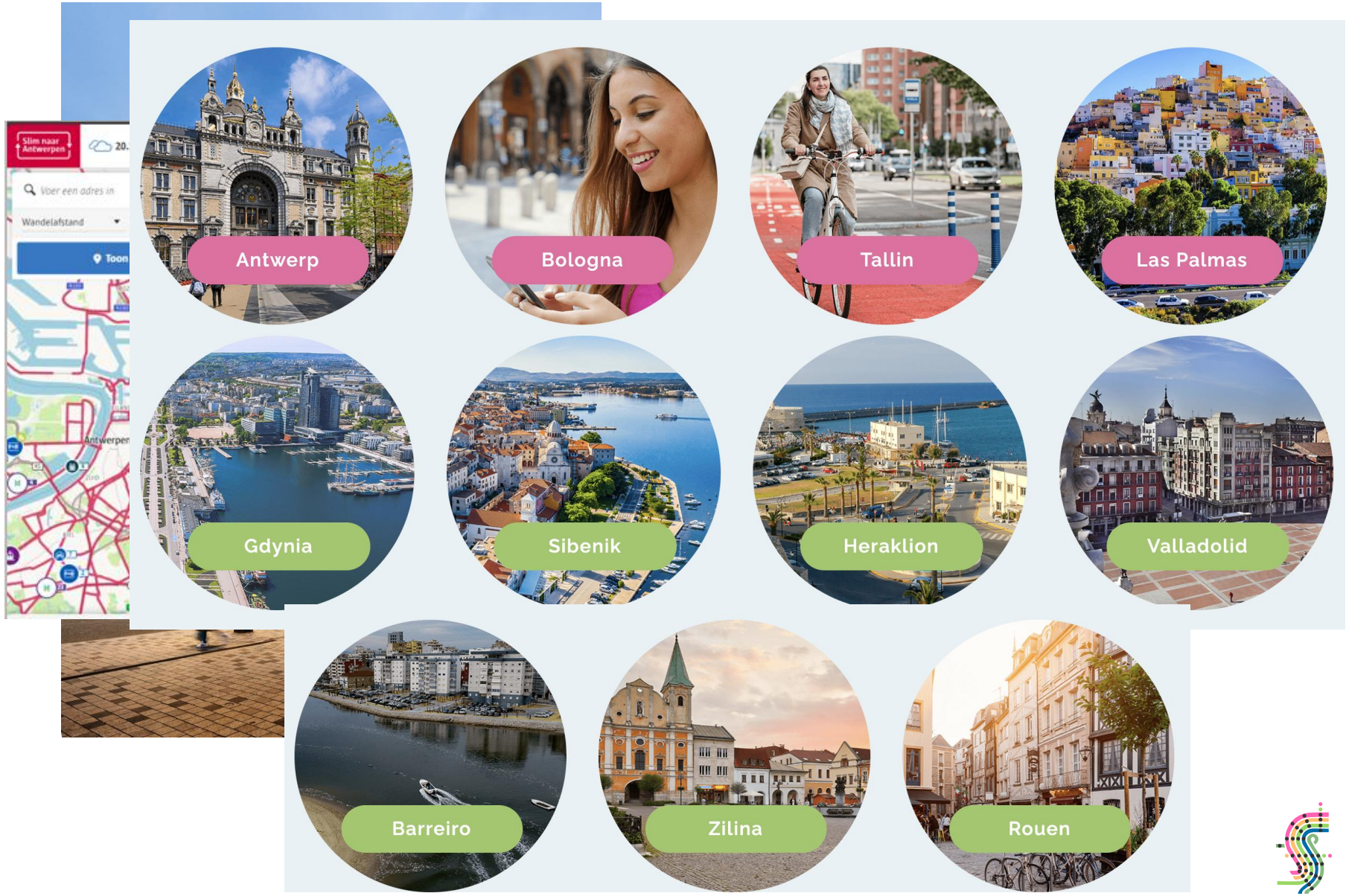
Digital tools

4 lead city living labs

7 twinning cities

Dissemination, transferability, replication, up-scaling

Local policy framework



SPINE Methodology steps in the LLs

Empathise

Explore user needs with initial basket of solutions in the LL

Define

Definition of interventions, indicators and frameworks

Ideate

Barriers and drivers identification, alternatives and new co-created solutions

Prototype

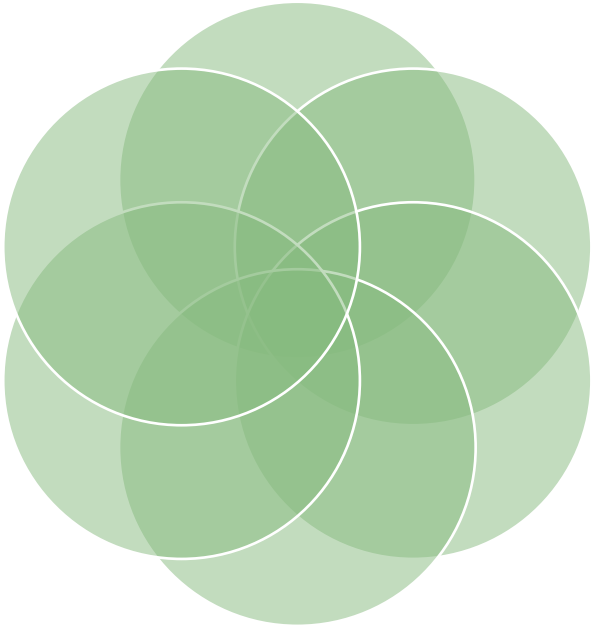
Physical implementation of the selected solutions

Test

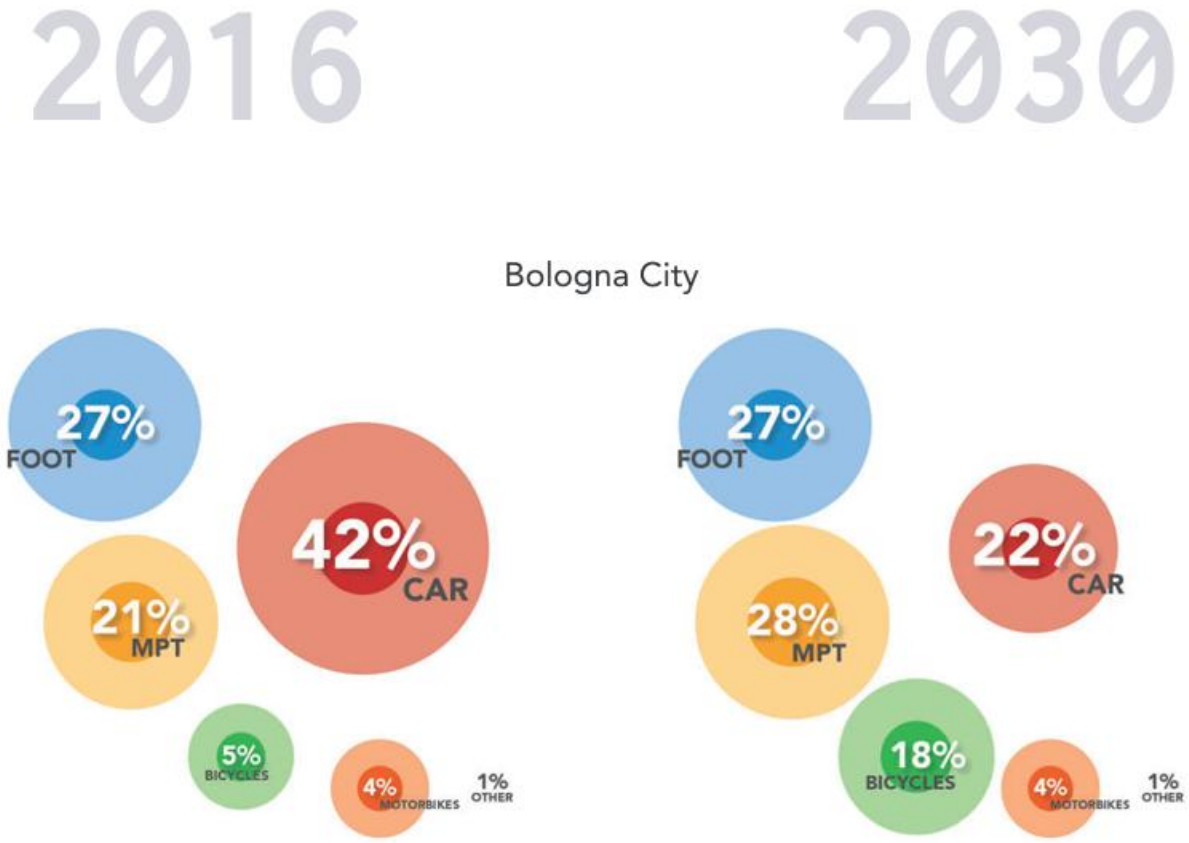
Final evaluation and target impact indicators

Amplify

C&D, exploitation, knowledge and lessons learned sharing



Contributing to **Bologna's modal shift toward PT and active mobility**, **SPINE** directly supports the objectives of Bologna's **SUMP**, **General Urban Traffic Plan,** and of the **Climate-Neutral and Smart Cities Mission** and applies co-creation methods involving a wide range of stakeholders to **improve PT offer and its attractiveness** in line with users' needs.



Bologna metropolitan SUMP objectives, pumsbologna.it

SPINE GOALS in Bologna:

- **increase PT ridership by 30%**
- **improve PT user satisfaction by more than 25%**
- **reduce n. of most polluting cars in city area by 100%**
- **reduce CO2 emissions more than 20%**

20 YEARS CIVITAS
Sustainable and smart mobility for all

Bologna context

1 million population (metropolitan area)

90,000 university students

1 of the main national and logistic hubs

economy dominated by services, industry, growing tourism

Challenge:
Creating a system of mobility-related measures acting in synergy to enhance **intermodality** and empower citizens to move across the city using more **sustainable modes of transport**, thereby contributing to the reduction of traffic congestion and pollutant emissions.

Bologna approach

Four measures for low-energy urban mobility

Comune di Bologna

SRM RETI E MOBILITÀ

Multimodal hubs & shared mobility

- 3 hubs at Mazzini, Casteldebole & Corticella
- Bike-sharing, car-sharing, EV charging, bike stations
- Real-time digital information, wayfinding
- Co-designed with stakeholders & schools

MaaS journey planner

- Integrated multimodal journey planner
- Combines PT, bike-sharing, micromobility, personal car
- Real-time departures & routing

PT prioritization & City30

- Aimsun microscopic traffic simulation
- 6 key intersections on one Bologna corridor
- City30 vs. 50 km/h + PT signal priority analysis
- Data-driven decision support for city

Smart City Platform & behavioural models

- IBI platform integrating open data & surveys
- PT, sustainability & environmental KPIs
- Mobility of Care behavioural framework
- Scenario analysis for planners

Multimodal hubs & shared mobility

3 Multimodal hubs upgraded: Mazzini, Casteldebole & Corticella railway stations

Integrated PT (bus + train), bike-sharing, car-sharing & EV charging in one intermodal node

Horizontal wayfinding designed with school workshops & accessibility criteria

Co-creation process: Coordinated 9 operators, School labs shaped wayfinding colours for visual accessibility

Per hub:

- 2 interactive kiosks
    - WCAG-compliant & INDIMO inclusive design guidelines applied throughout
- 2 digital screens per hub (real-time arrivals in 4 languages)
- bike sharing parking lots
- car sharing parking lots
- electric vehicle charging station
- bike station (Mazzini and Corticella as a synergy with other projects)
- Possibility to download SPINE LezGOBO app

Mazzini example

Wayfinding





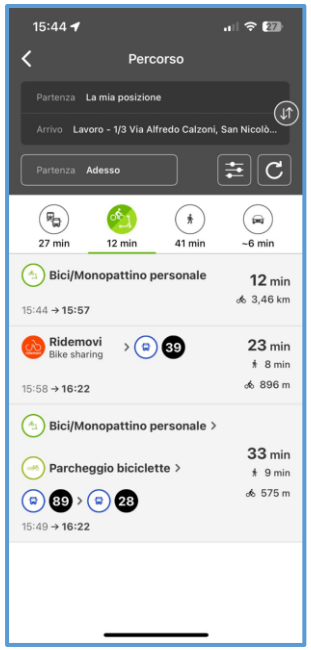




MaaS journey planner: LezGOBO

LezGOBO delivers:

- Integrated multimodal journey planner: PT, bike-sharing, micromobility, personal car, walking & active modes combined
- Real-time departure information & multi-modal routing across the metropolitan area
- MaaS scheduler: plan and compare mobility options in one unified interface
- White-label platform developed by INSY, customised for Bologna under the LezGOBO brand
- Accessible and inclusive design, aligns with Bologna's SUMP and smart city strategy



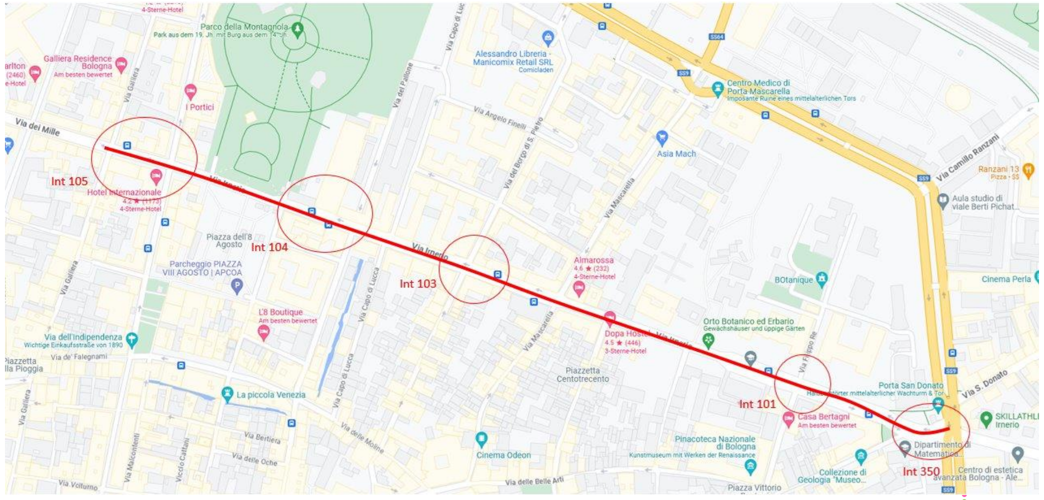
PT prioritization & City30 simulation

Aimsun microscopic traffic model:
Via Irnerio – Via Mascarella corridor, Bologna
6 signalised intersections, 5 PT bus lines
~21,400 car trips at afternoon peak (16:00–21:00)

Four scenarios tested:

- 30km/h with and no PT priority
- 50km/h with and no PT priority

Bus priority improves bus performance at 30 and 50 km/h
Car performance deteriorates slightly and consistently across both speed limits.
Bus delays and travel times decrease with priority at both limits (-9% / -5% at 30 km/h and -11% / -8% at 50 km/h).
Cars experience similar increases in delays/travel times at both limits (+15% / +9%).
Bus speed increases more strongly at 50 km/h (+8%) than at 30 km/h (+5%).



Behavioural change modelling

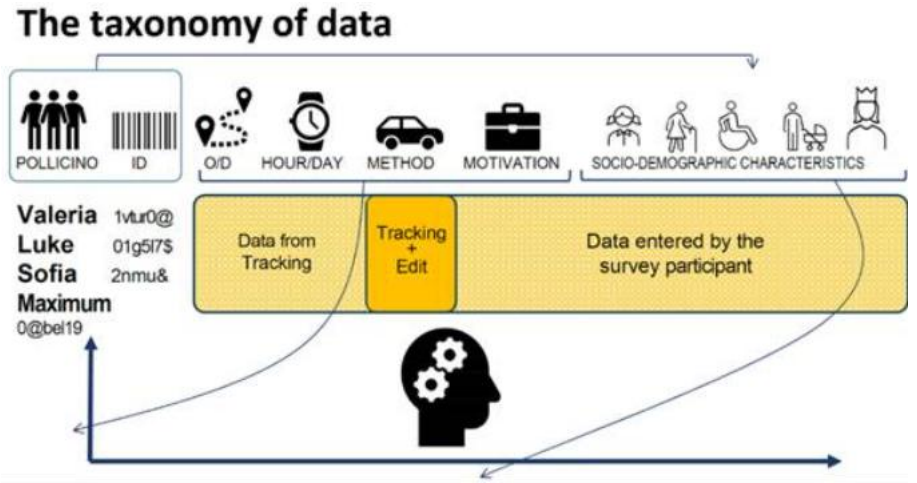
Goal: Understand what drives mode choice in Bologna

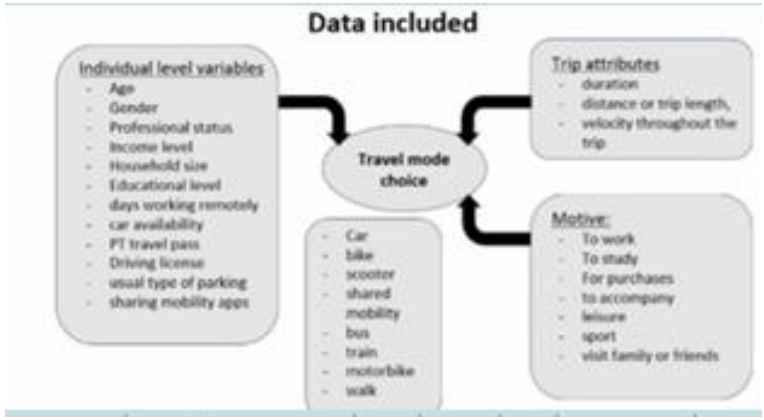
Data collection and analysis:
- 750 participants through Pollicino app
- Daily mobility behaviour recorded car, PT, cycling, walking
- Age, gender, income, household size, car access, PT subscriptions, trip purpose
- Multinomial Logit Model used to analyse the mode choice

Findings:
Low-energy mobility depends on habits, socio-demographics and economic factors, not only infrastructure.

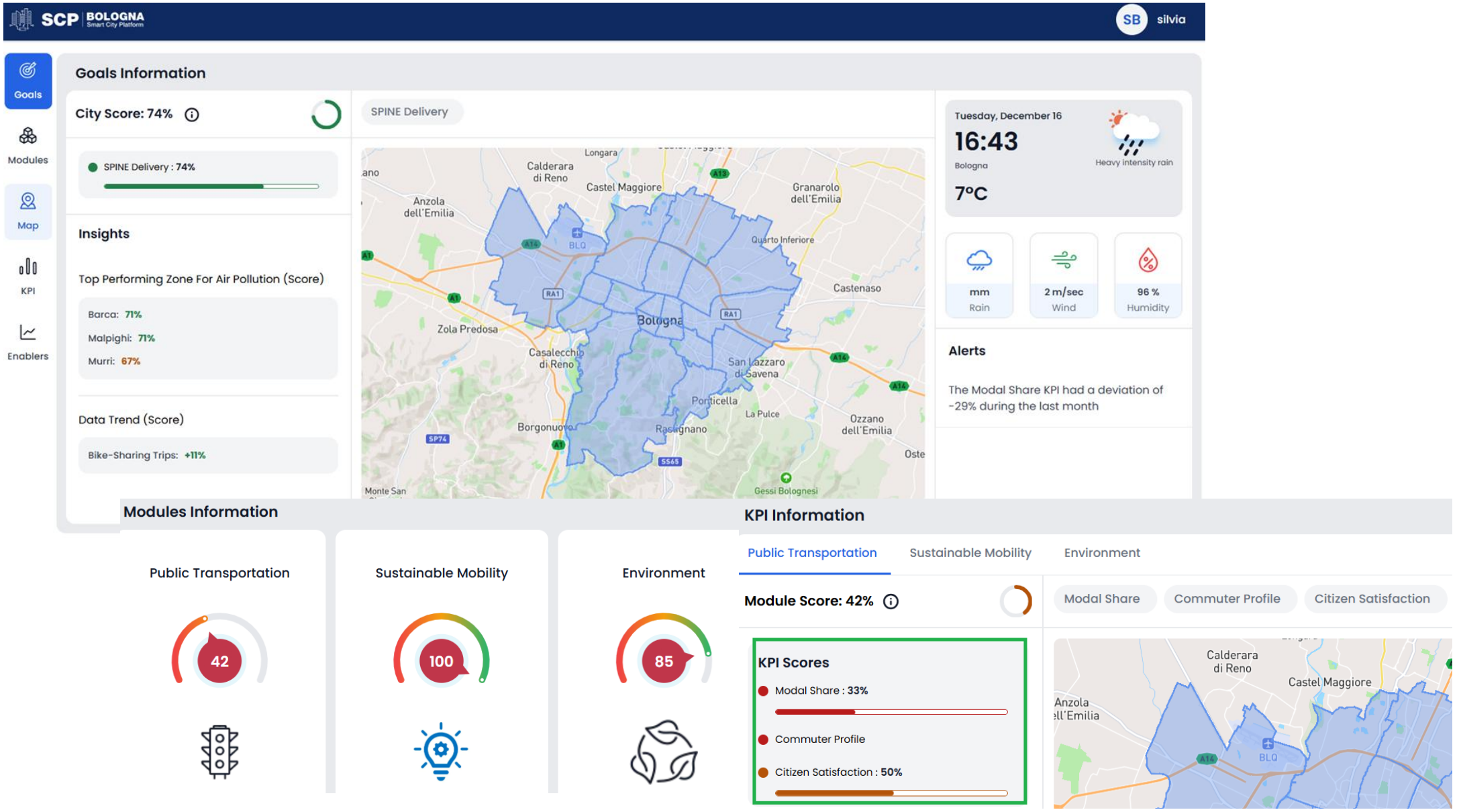
work trips -> higher car and motorcycle use
leisure and shopping -> more walking and cycling
leisure activities -> shared mobility

Women more likely to use active modes and PT for care-related trips





Smart City platform



Smart City platform

Integration of diverse data sources
Scenario support

- Public Transport KPIs

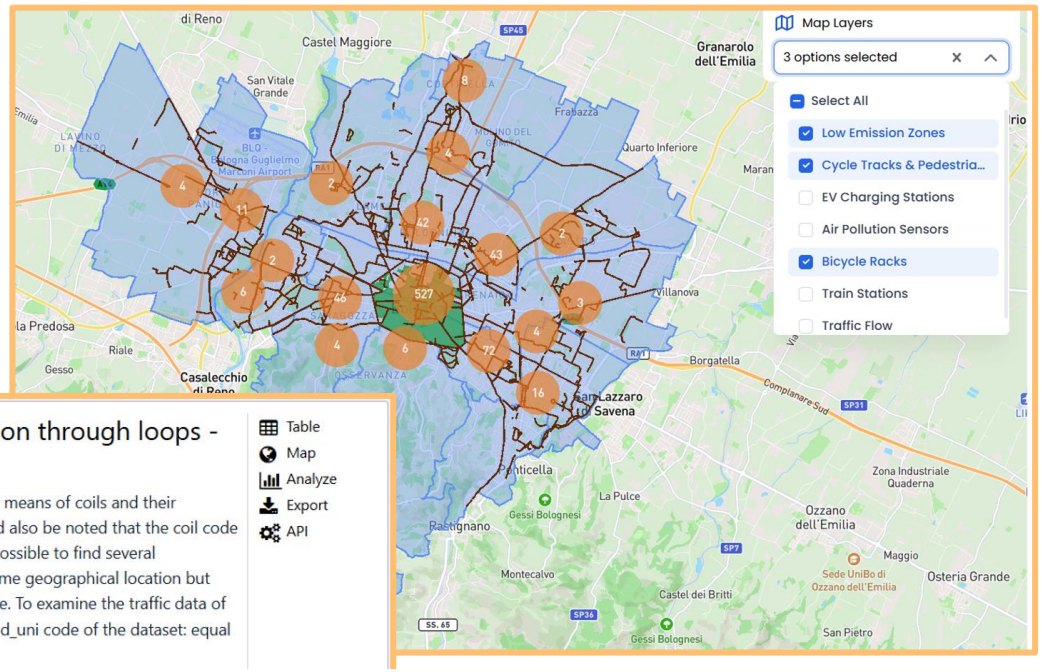
Modal share, Commuter profile, Citizen satisfaction

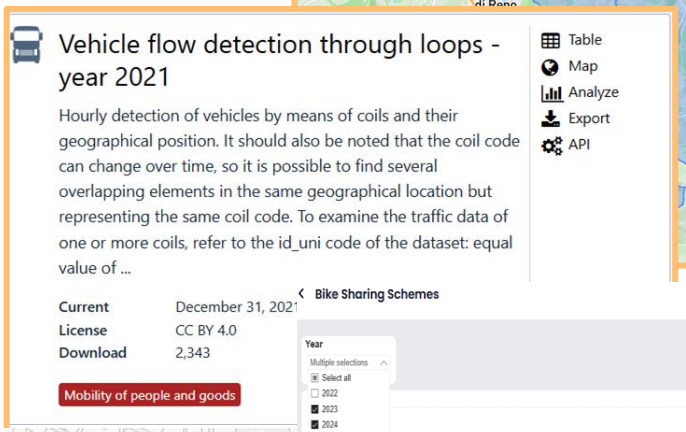
- Sustainable Mobility KPIs

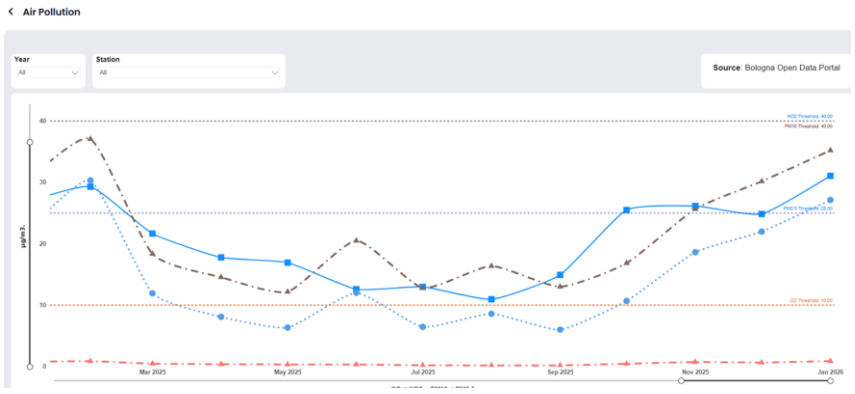
Bike sharing utilization, Active mobility participation

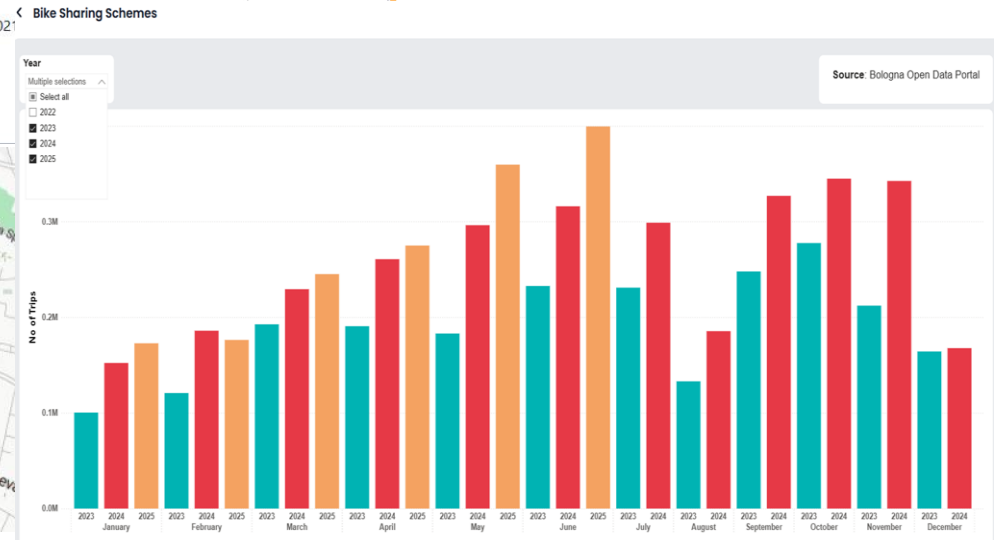
- Environmental KPIs

Air pollution, EV charging stations









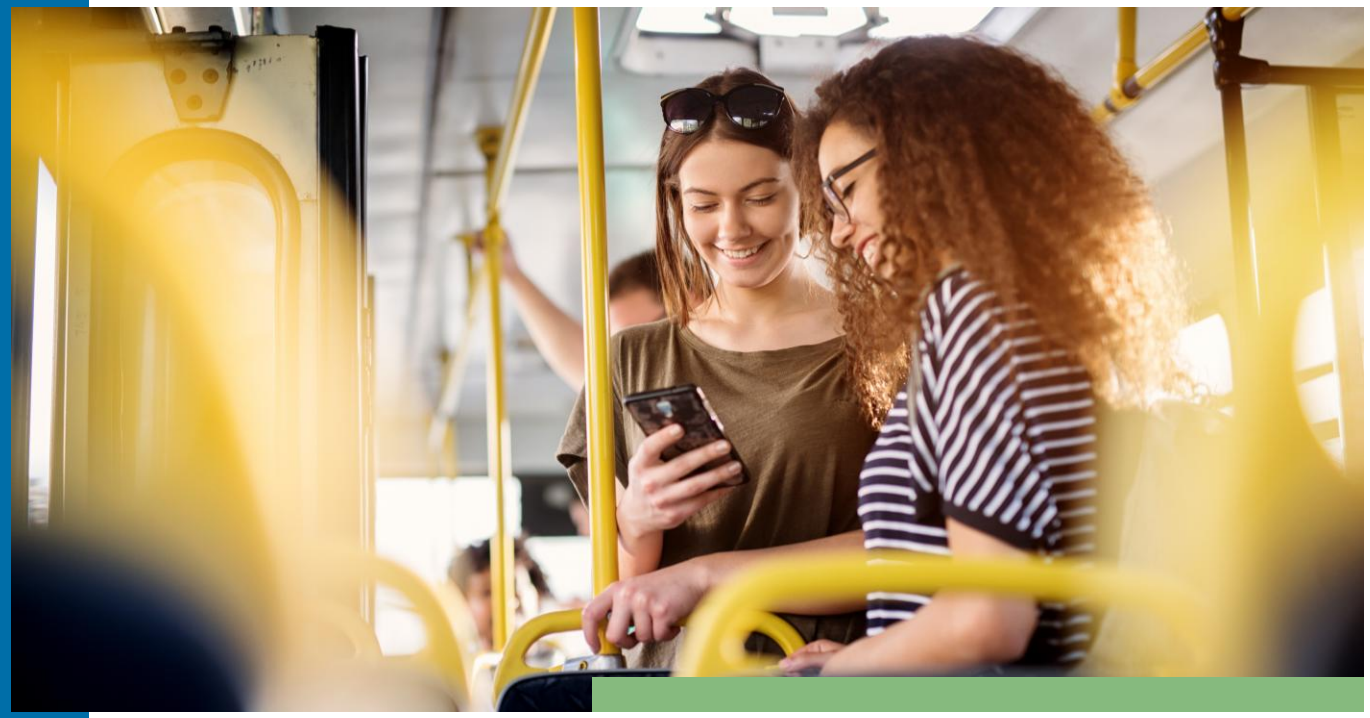
LESSONS LEARNED

Multimodal hubs most immediately replicable and support the shift from private car to sustainable mobility

Simulation as a planning tool and political evidence to defend low-speed, low-energy policies and improve PT reliability

Behavioural modelling: trip purpose is the key variable

No single measure is enough
Low-energy mobility requires removing car trips at scale through an integrated package



Bologna has been selected as a mentor city for Civitas Replication Programme (October)

THANK YOU!!

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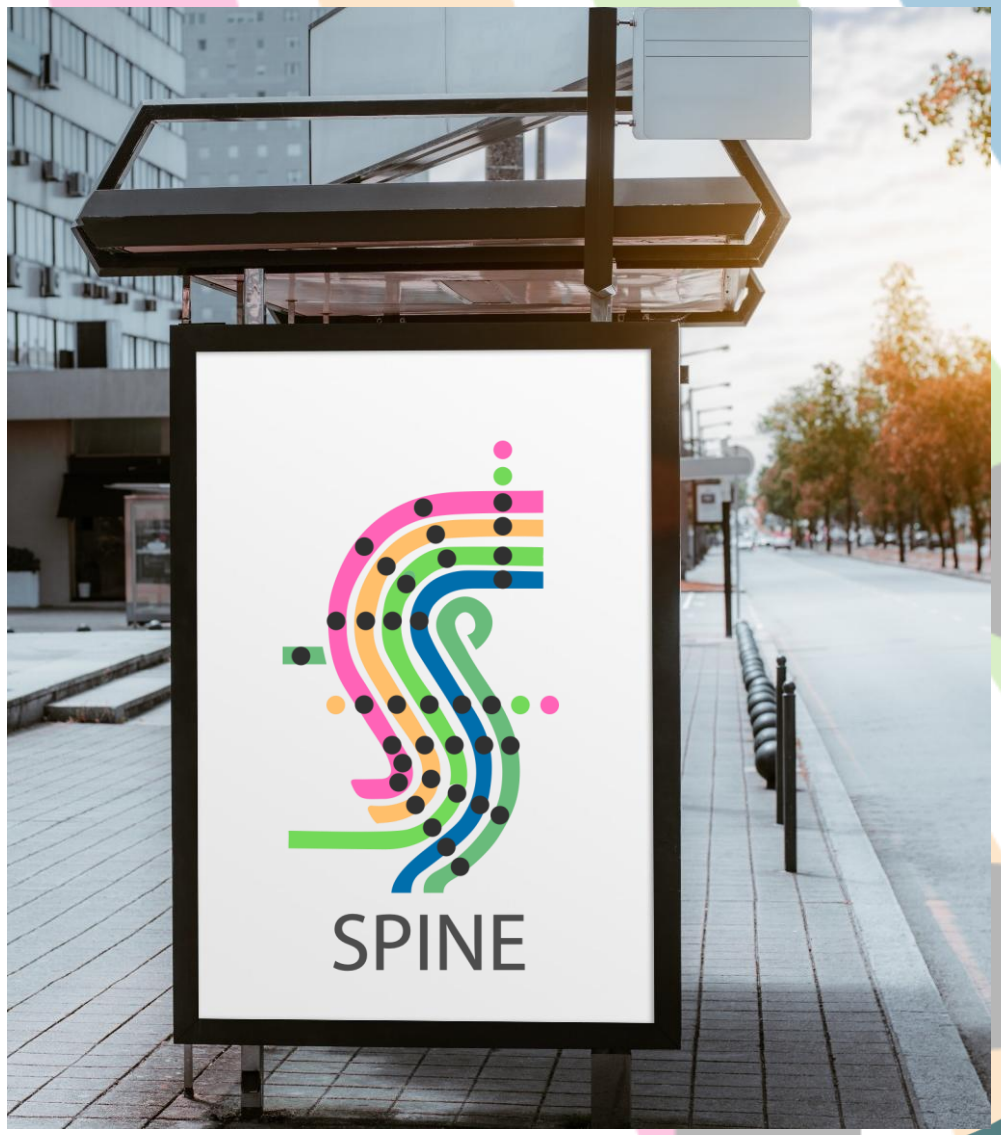
SCAN ME



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