

PRESENTED BY	DATE
Grace Kagho	20/06/2025

UrbanEcho **ETH** zürich

DEMOCRATIZING URBAN PLANNING WITH AI AND DIGITAL TWINS

Keynote Speaker, KFPE Conference

Imagine spending 2 hours in traffic just to travel 20 km to work...



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\$65 billion annual loss to congestion

70% of the world's population will live in cities 2050

- Cities account for >70% of global carbon emissions
- 90% of urban growth is happening in low- and middle-income countries

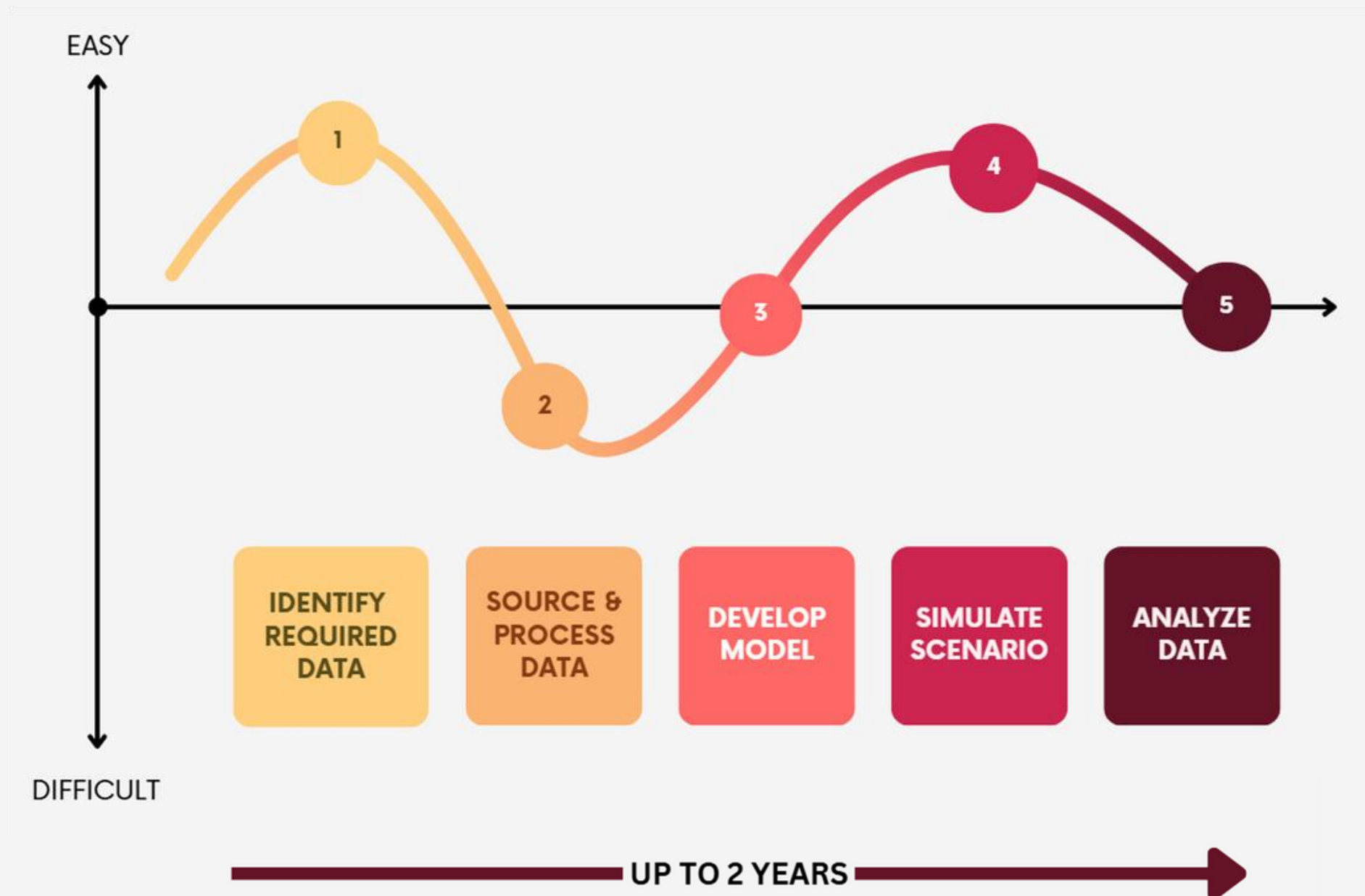
What if we could ask our cities about the future...

A nighttime photograph of a city skyline. Several tall skyscrapers are illuminated with warm orange and yellow lights. The city lights create a bokeh effect in the foreground. The sky is dark with a few stars visible.

...and they could actually answer back?

Src: shutterstock

This is not possible today with the traditional way



Data scarcity

Expensive data acquisition

Specialist software

Expert analysts

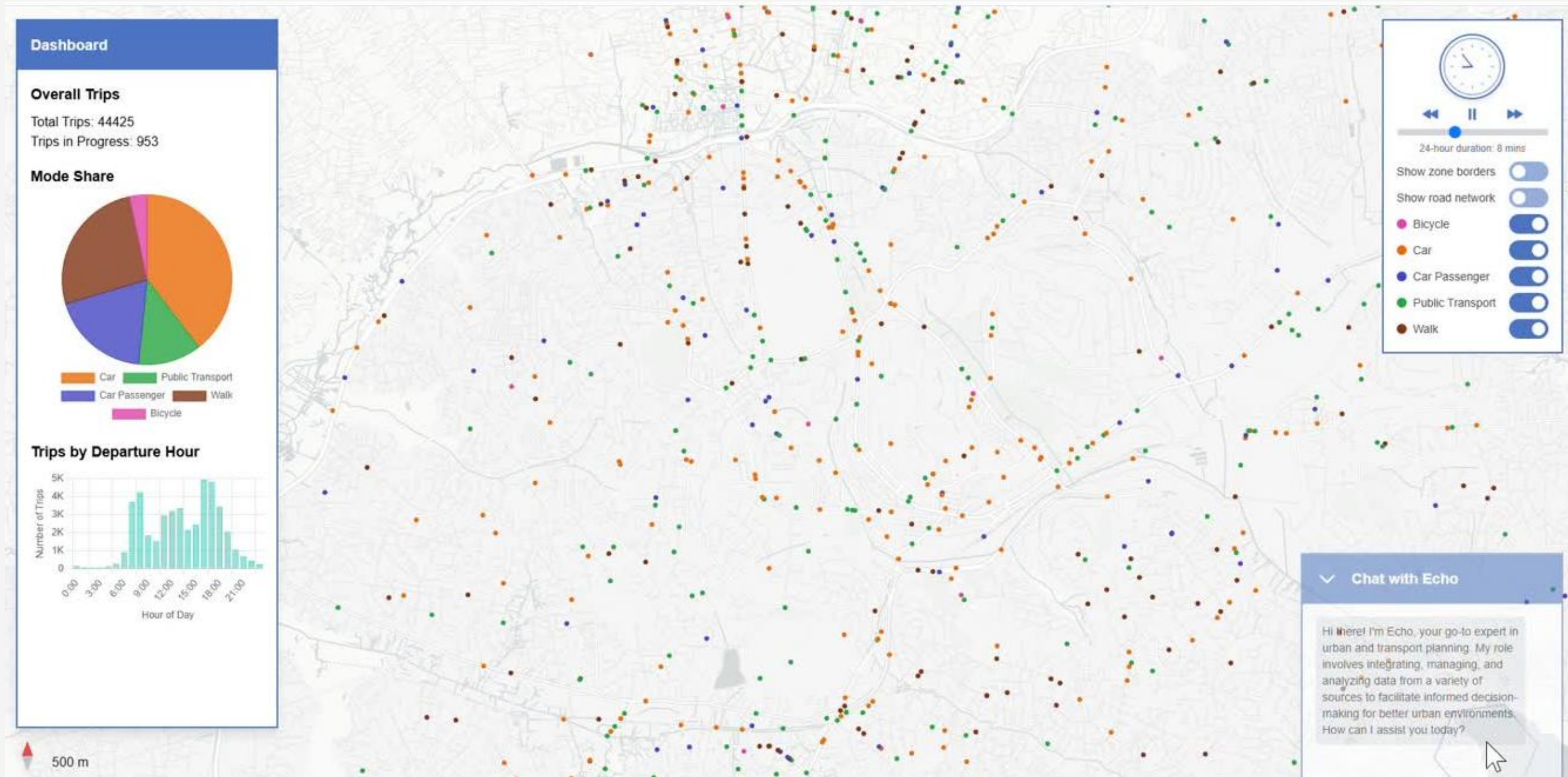
Slow manual analysis

Static, outdated reports

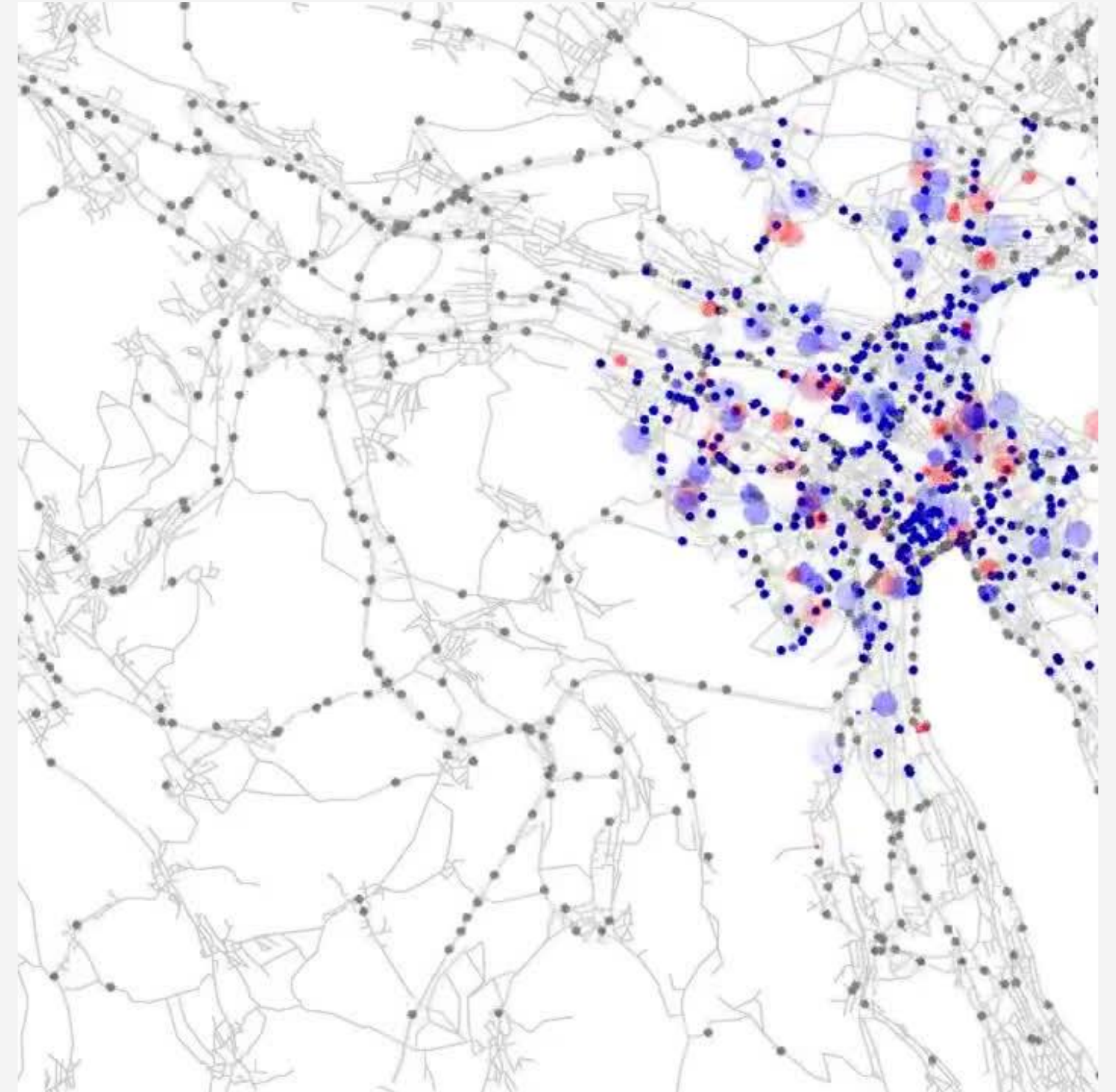
We inherit the mistakes made in the past

Generations after us suffer from our wrong choices

A vision of future urban planning

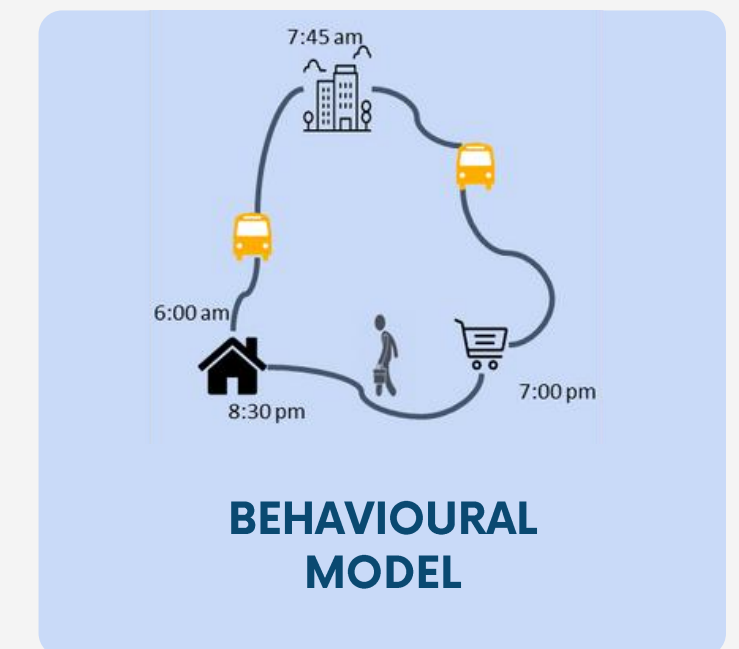
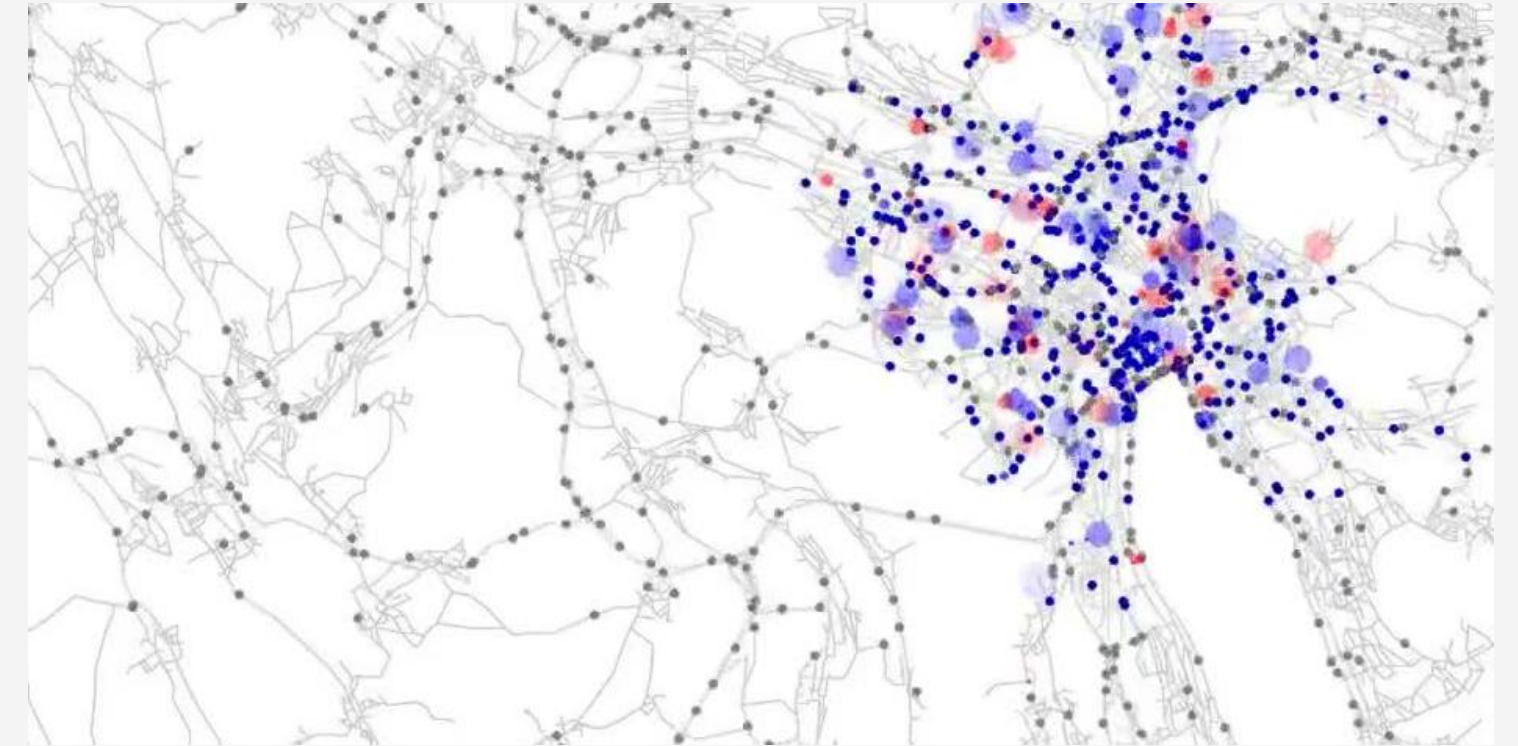


Digital Twin: A living, dynamic model of a city



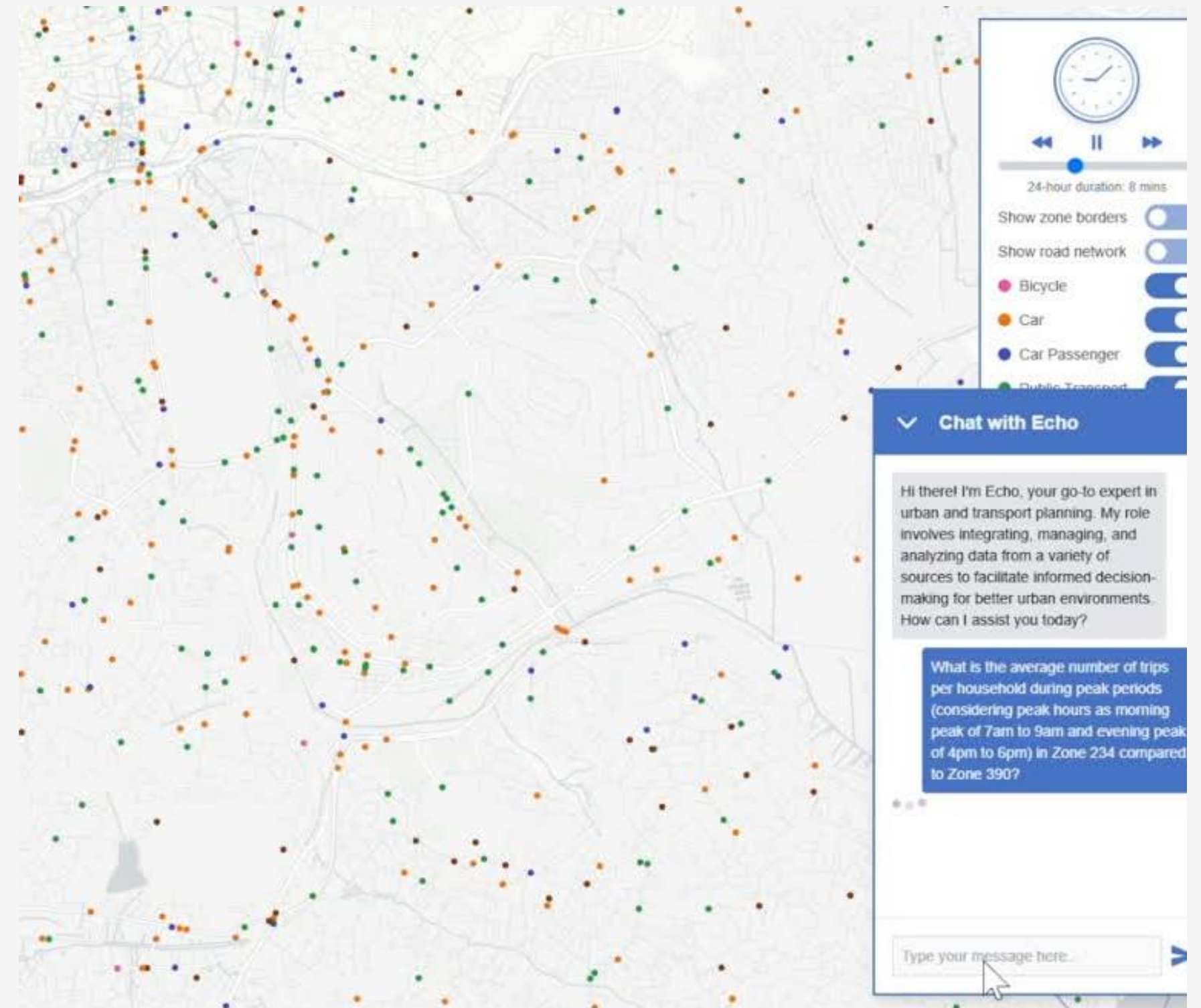
Src:: rexby

Digital Twin: A living, dynamic model of a city



Generative AI gives the Digital Twin a voice

- Agentic and Cognitive architecture
- Selective Retrieval Augmented Generation
- Model Context Protocol
- Reinforcement learning
- Geospatial Foundational Models



Bringing Digital Twins to Emerging Economies



The Three Roles of AI

FILLS DATA GAPS

Generates realistic synthetic data where none exists

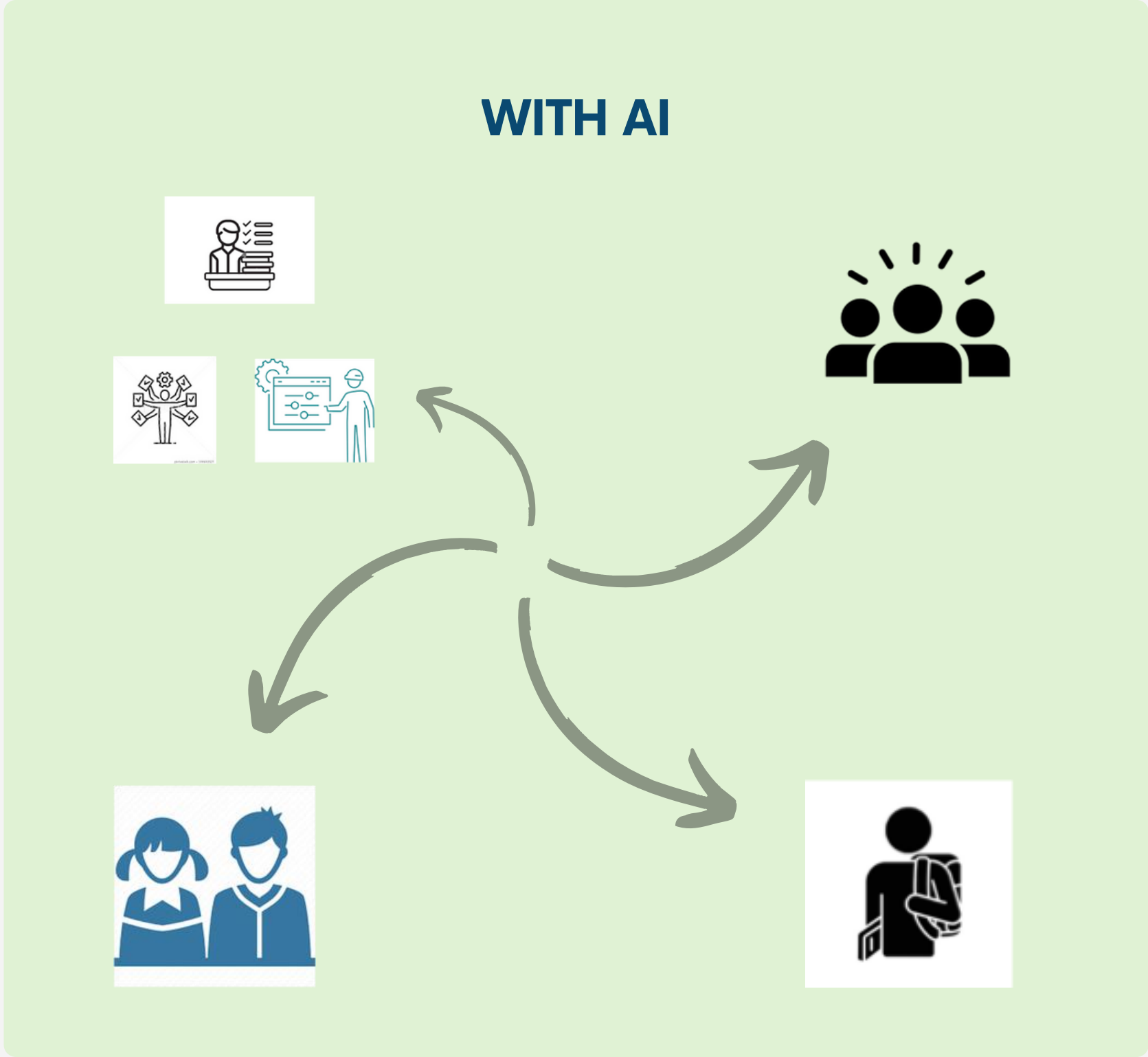
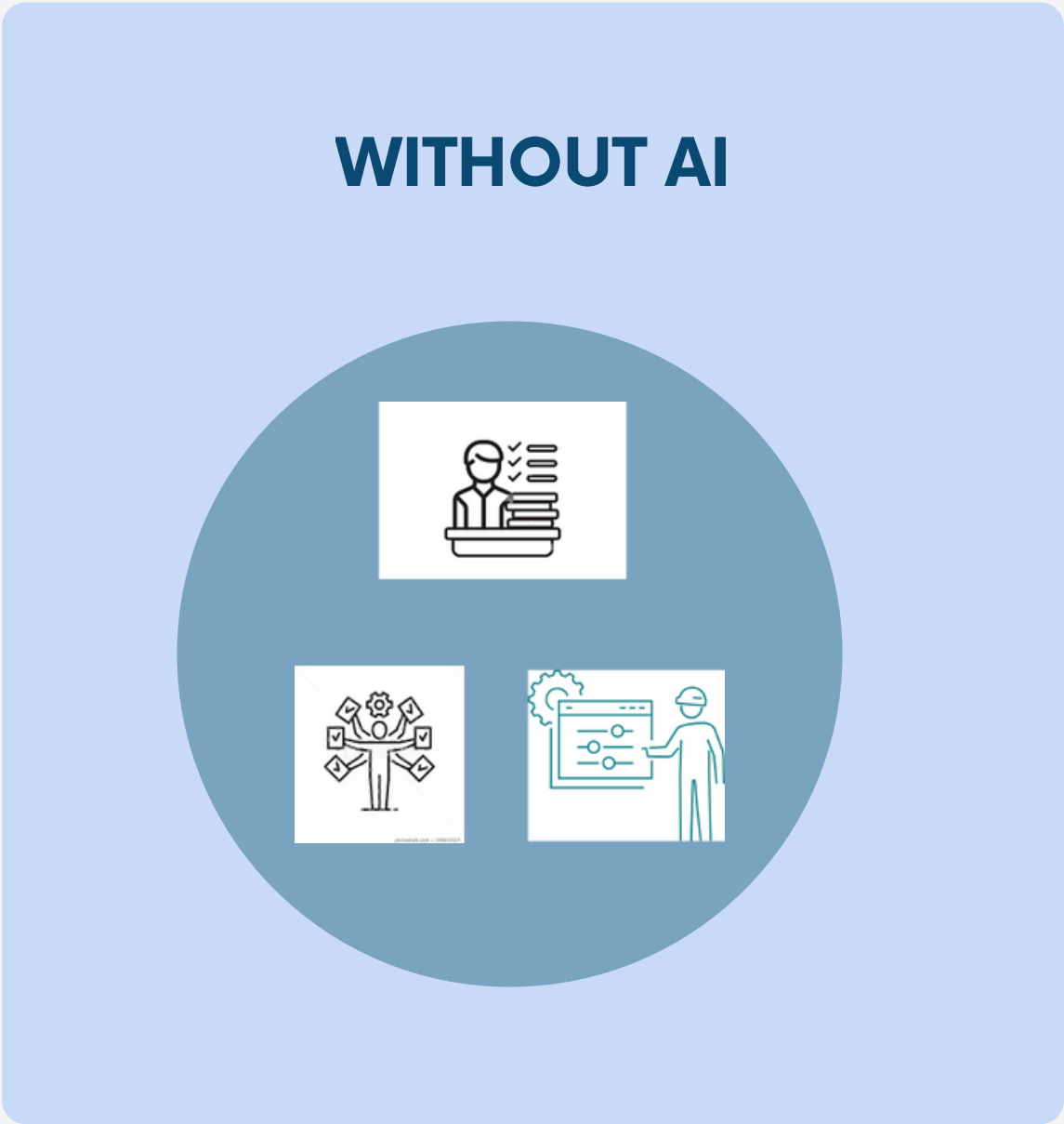
DEMOCRATIZE ACCESS

Translates natural language questions into complex simulations

UNLOCK FORESIGHT

Runs thousand of what-if scenarios to predict future impacts

A New Era of Collaboration



A new era of adapting to global changes locally



Show me the effect of a new public park on local community health

Src:: chatgpt



What is the air quality impact of a new bus line in this neighborhood?

Src:: chatgpt

Looking Forward



Building with unbiased data



Protective privacy



Ensuring explainable AI



Building the future of cities, together



Grace Kagho
Computational
Scientist



Miguel Cardenas
Software Dev.



Janody Pougala
Travel behaviour
models



Nora Havel
Project
Management



Dr. Fritz Bugger
Business Strategy
advisory



Prof. Francesco Corman
Transport Systems



Caroline Kokocinski
Innosuisse Business
Coach



Kweku Adams
Software dev
advisory



Prof. Prateek Bansal
Data Fusion models



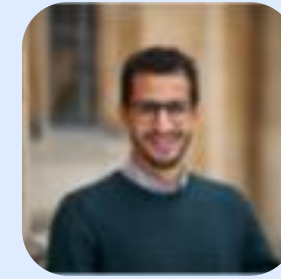
Dr. Milos Balac
Agent-based
Simulations



Owen Mwuara
Informal mobility
networks



Tarek Chouaki
Modeller



Hussein Mahfouz
Data scientist
Modeller



Dr. Vivek Sakhrani
Market Strategy
advisory

Supported by:



Innosuisse Initial
Coaching

Building sustainable cities together



Shifting from reactive to proactive planning

Project Partners
(in discussions):

Transport
for Cairo

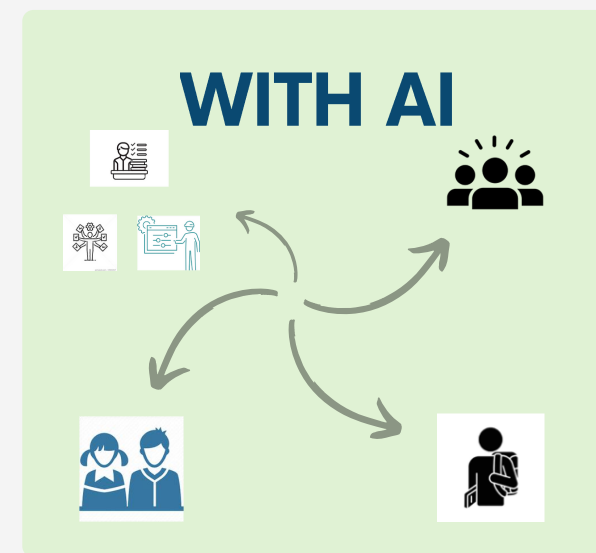
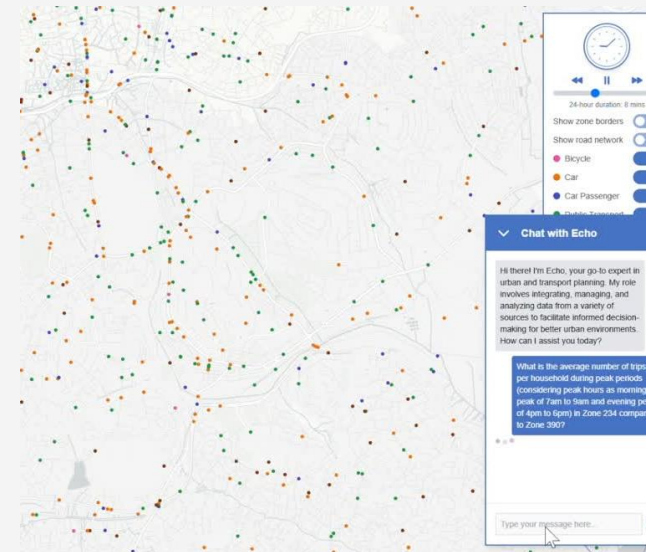


مواصلات
للخاهرة



Schweizerische Eidgenossenschaft
Confédération suisse
Confederazione Svizzera
Confederaziun svizra

Thank You!



Contact Me:

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