
AWS
re:Invent

MFG202

Simulating city-scale transport behavior with AWS

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Overview

- Arup
- City and country transformation
- From individuals’ behavior to national policy
- Evaluating policy consequences (10-50 years into the future)
- Inside Arup’s agent-based model



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Arup and AWS

Performing analysis. Day in and day out.







Model processing in minutes versus hours

Collaboration across disparate teams

Transformation through cloud technology



Transit and transportation



Citizen engagement



Municipal services



Energy management



Water management



Traffic

Smart models, smart technologies



Internet of things



Artificial intelligence / machine learning



Data lakes



Voice



Augmented reality

Arup’s City Modelling Lab



Gerry Casey



Claire Fram



Michael Fitzmaurice



Kasia Kozlowska



Rory Sedgwick



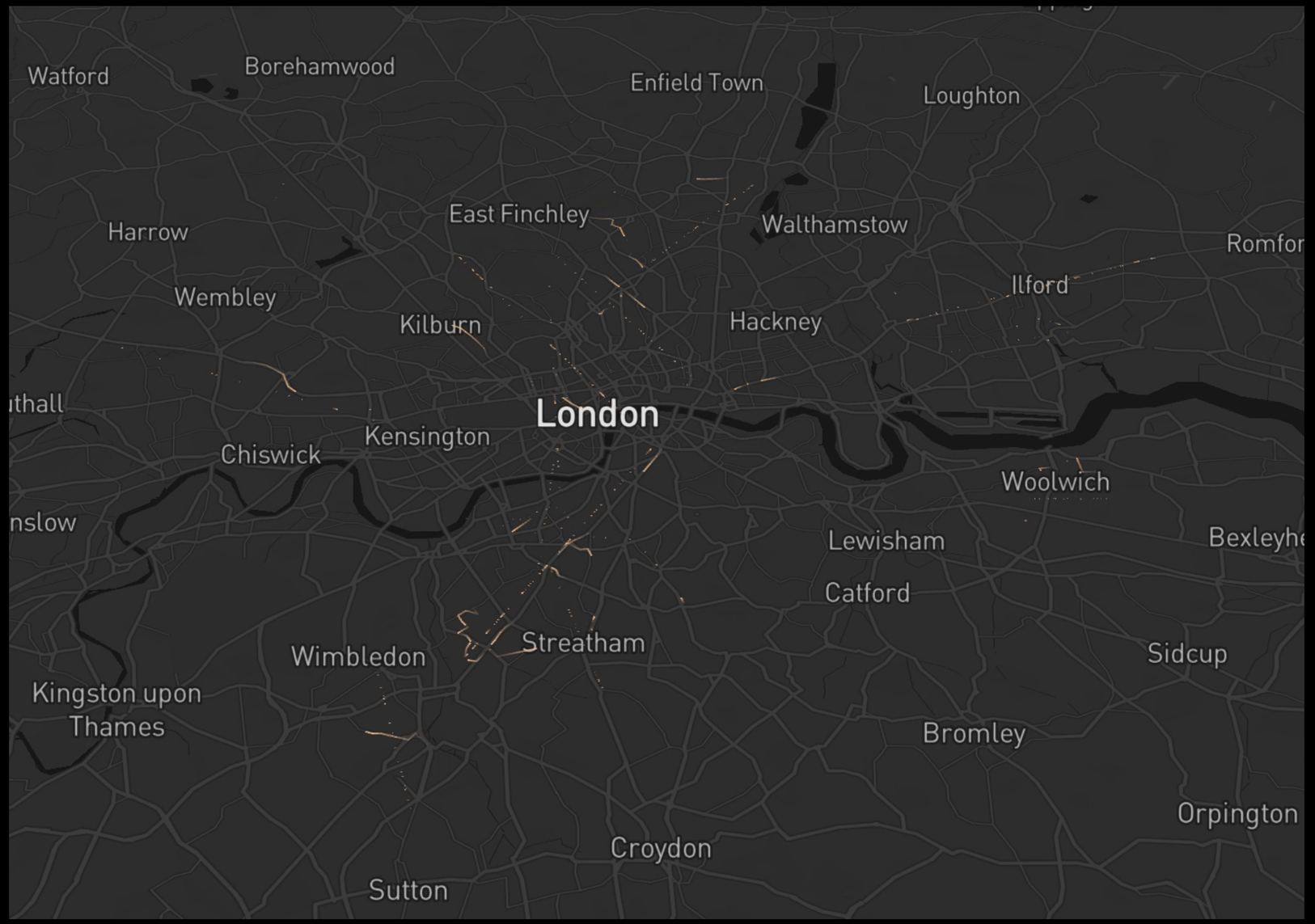
Theodore Chatziioannou



Fred Shone

From individuals' behavior to national policy

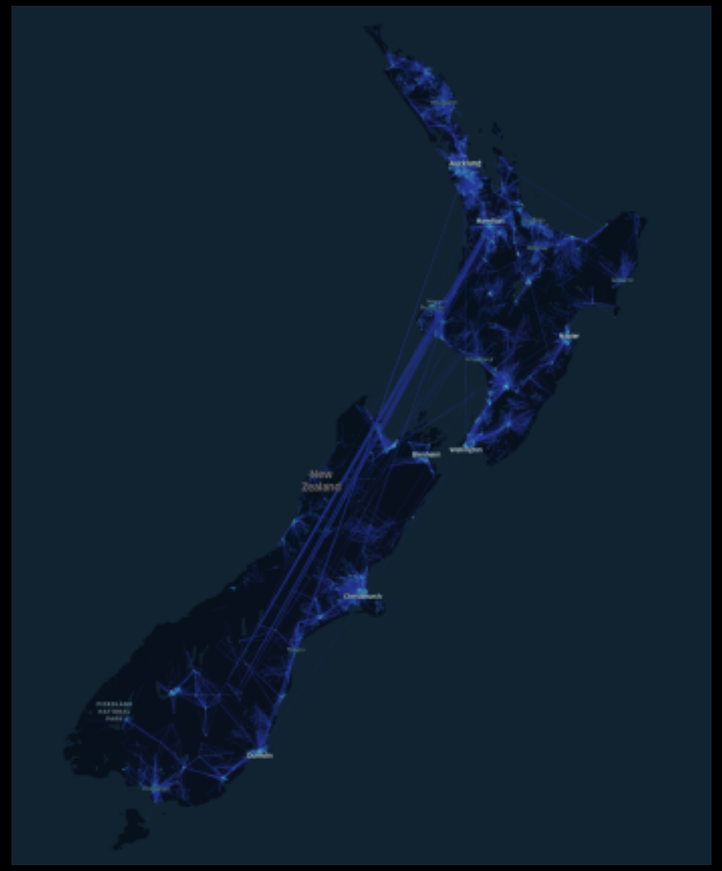
SIMULATING HOW PEOPLE LIVE



London
1 million agents



New Zealand
900,000 agents



Ireland
500,000 agents





“Ultimately it is not a transport model. It a social model.”

Dan Jenkins

New Zealand Ministry of Transport
Arup client

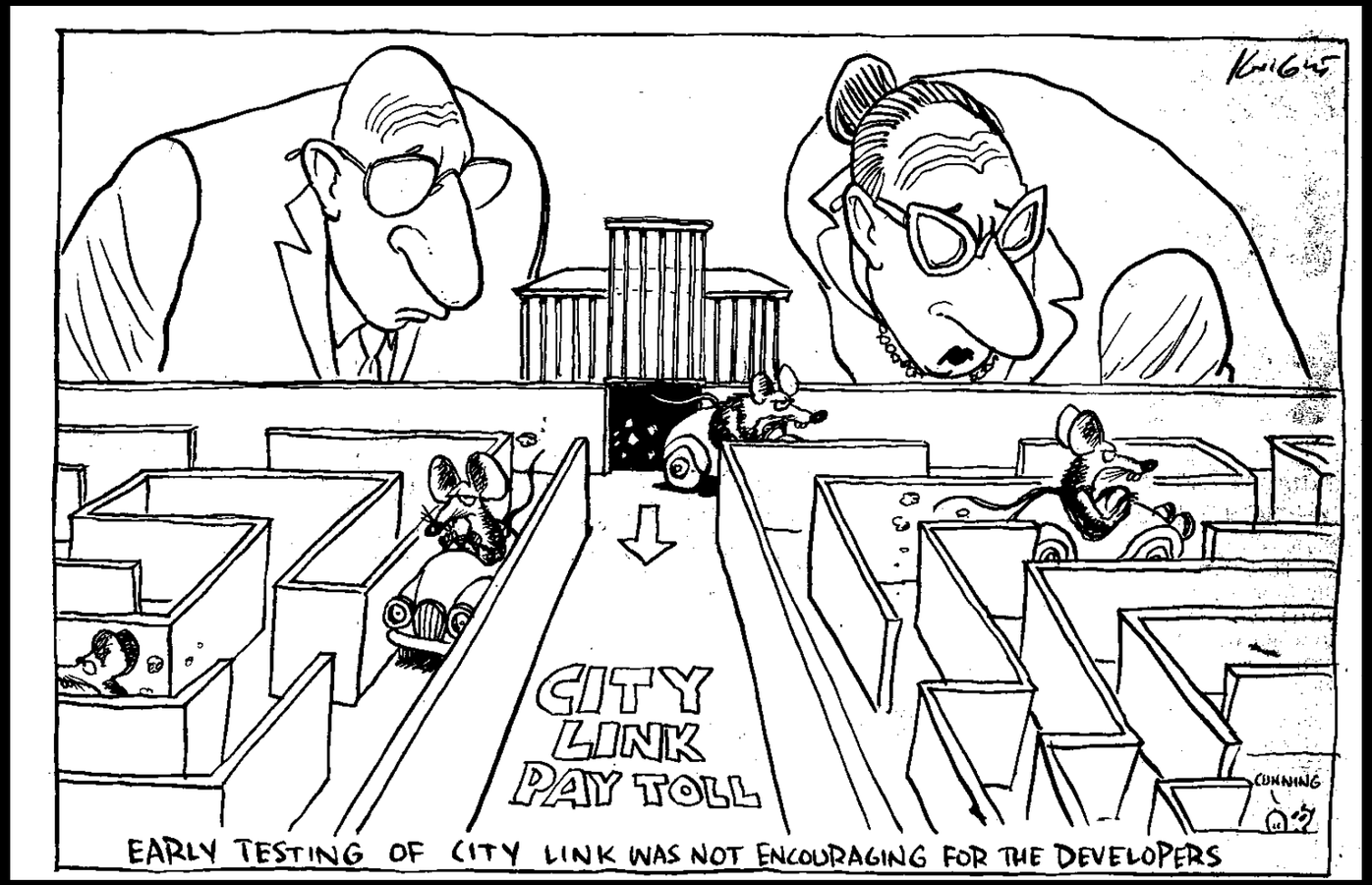
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Evaluating policy consequences

If we changed how road use is priced, who is impacted?

What happens to congestion or carbon emissions?



https://www.transportation-planning.com/quotes.html

Traditional transport models



- Assume consistent, aggregate patterns of behavior across society
- Specific time periods (peak hour surveys)
- High-level travel decisions (commute focus)

What if our future looks different?

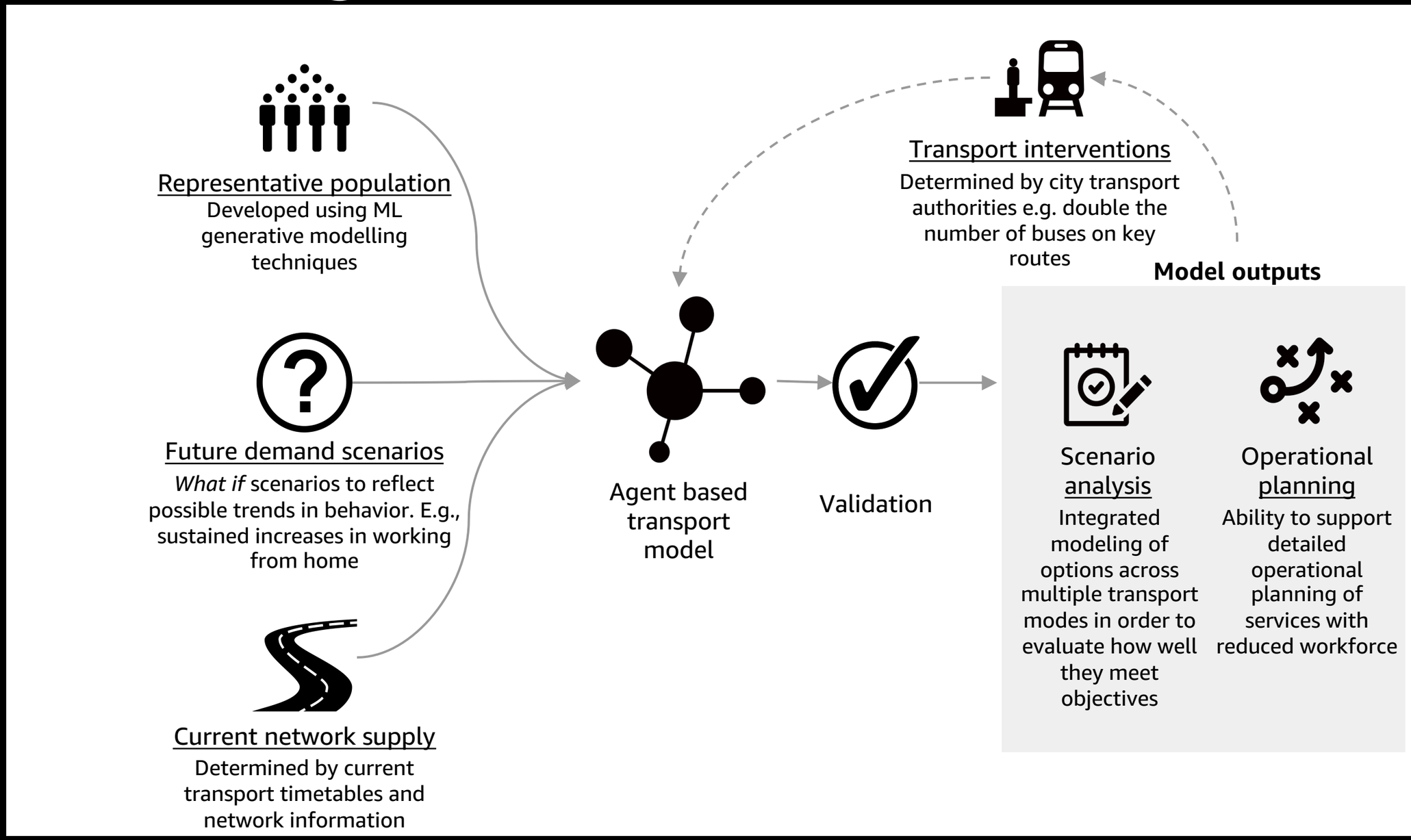


Brooklyn Grange Farm



Before and after: Parklets in Milan. Image: Federica Verona

Inside our agent-based model



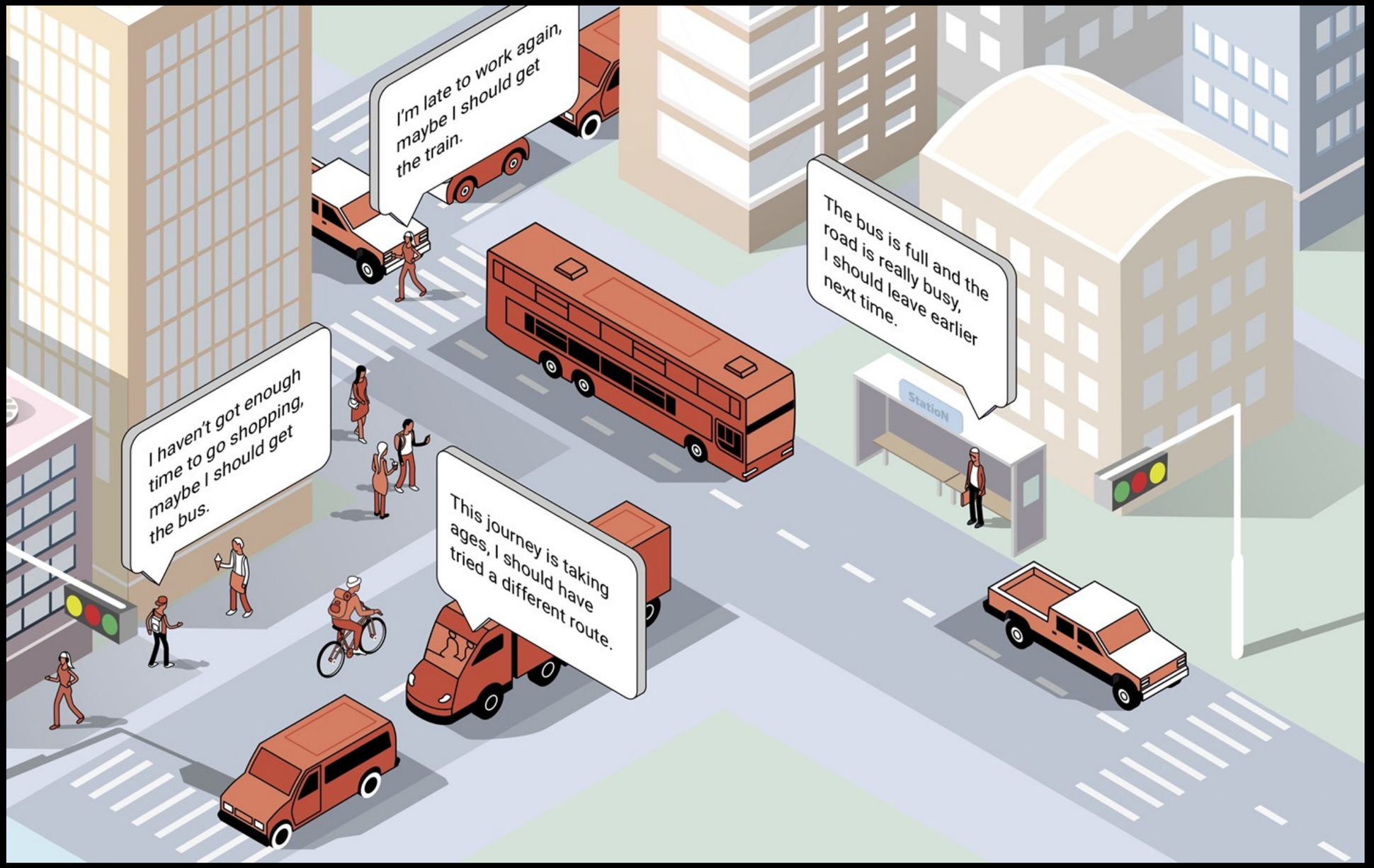
Helping to design the built environment



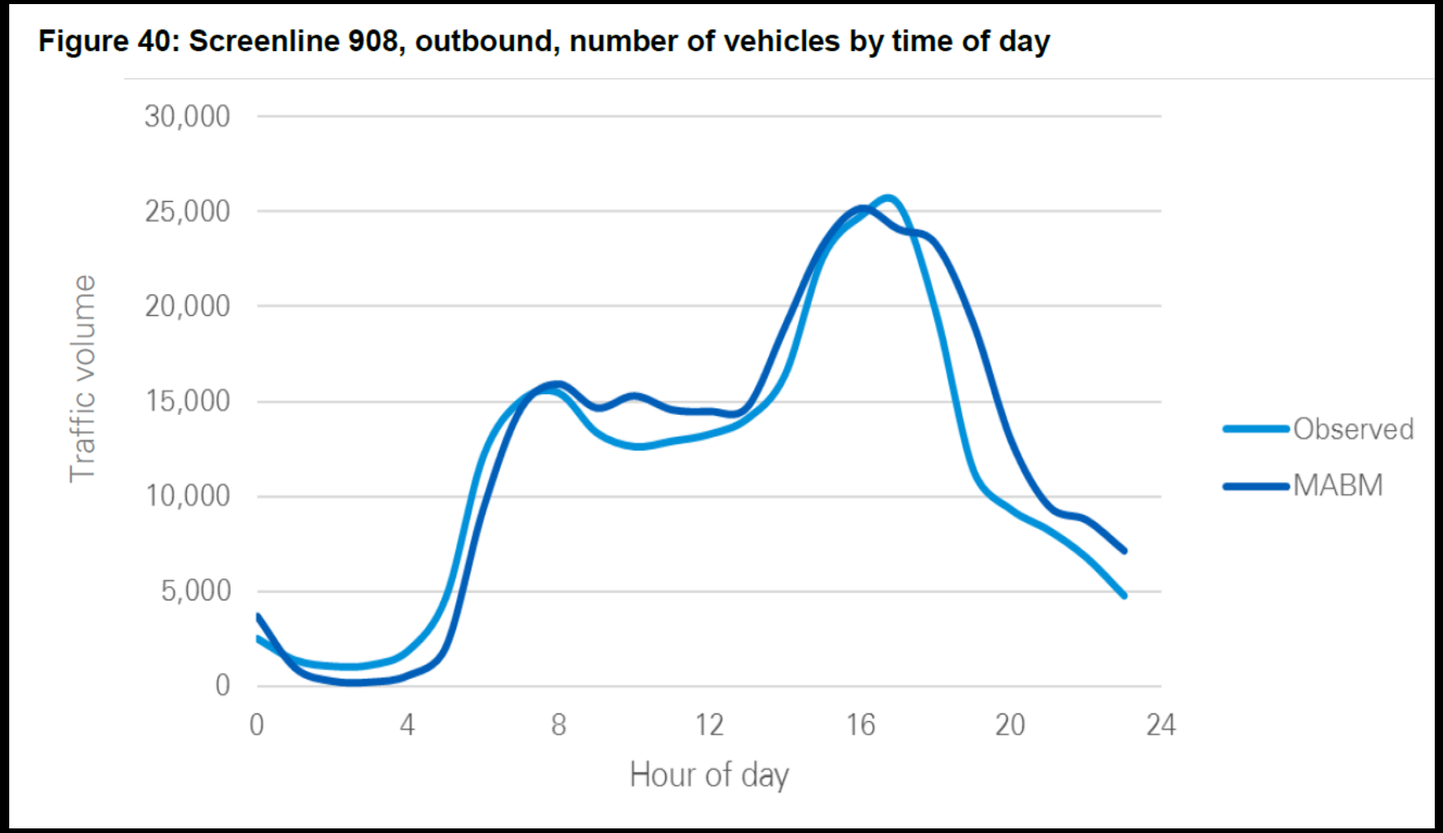




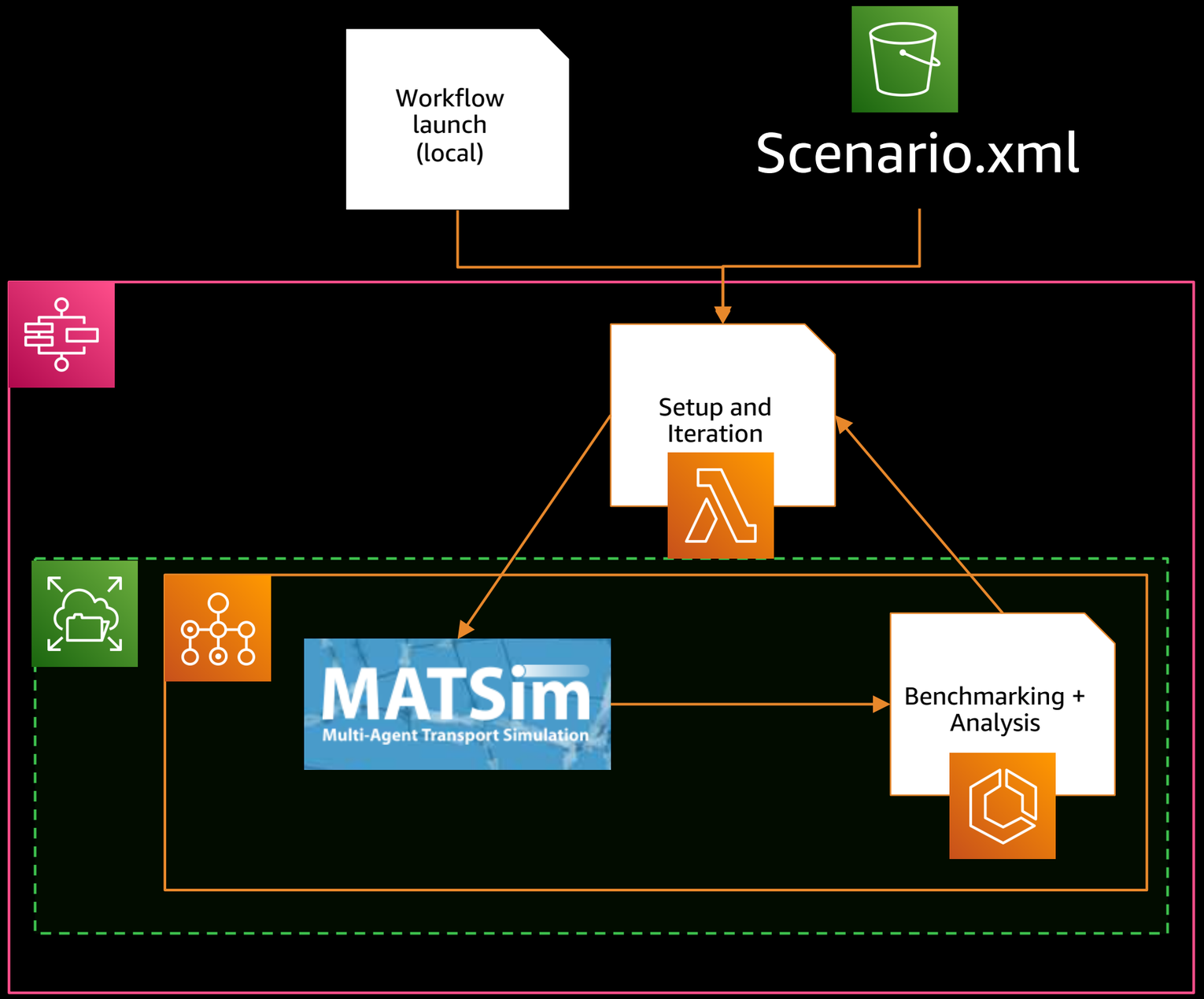
Rules for optimization



Seeing granular results



Traffic volume of a Melbourne screenline: observed vs. agent-based model


Workflow
launch
(local)
Scenario.xml
Setup and
Iteration
MATSim
Multi-Agent Transport Simulation
Benchmarking +
Analysis

Next steps for agent-based models

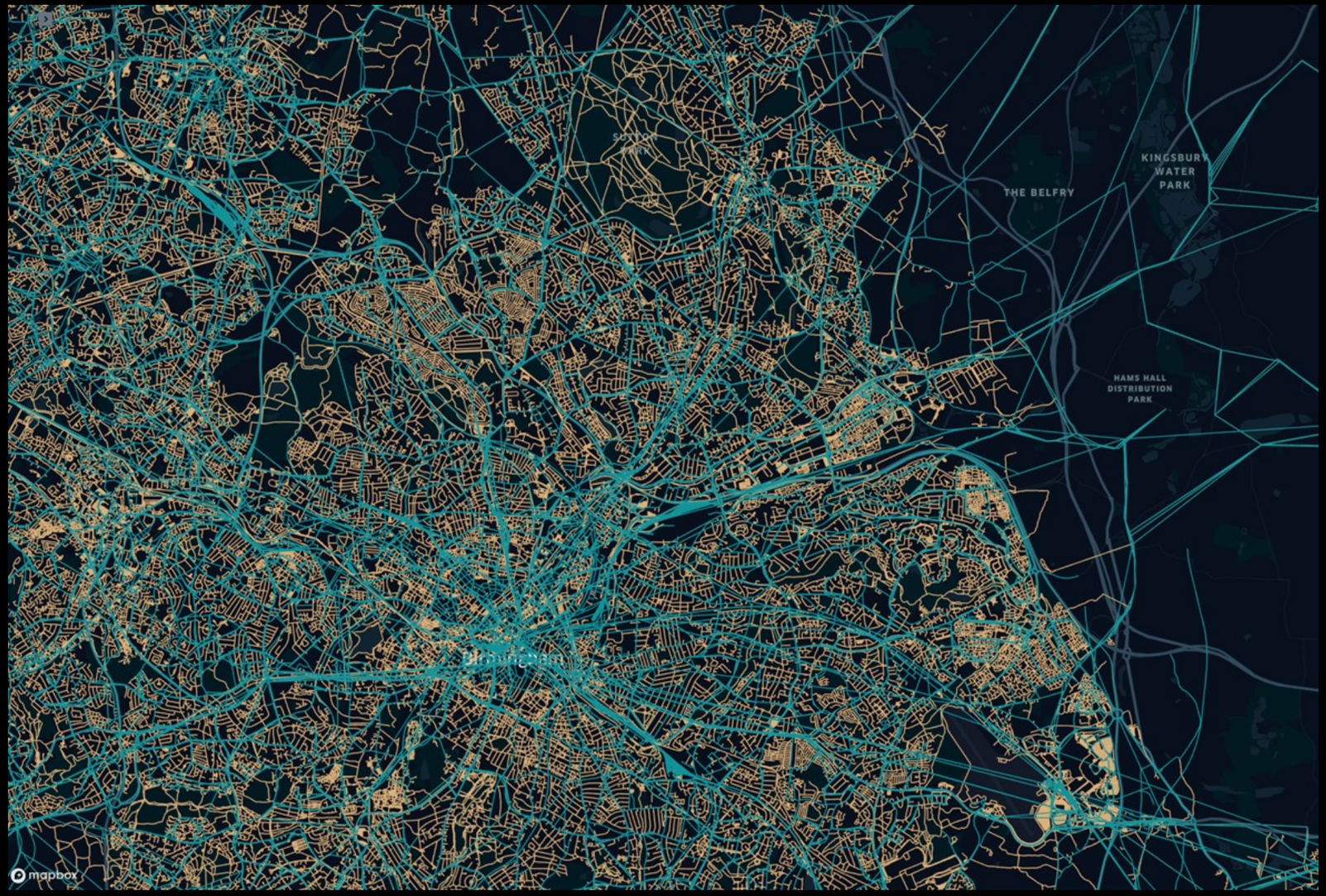






Learn more

medium.com/arupcitymodelling



Thank you!

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