INDUSTRY AND DATA FROM THE INSIDE

Expert Session 1



NFF

Univ.-Prof. Dr.-Ing.
Thomas Vietor
Full Professor & Chairman
MODERATOR



Freenow by Lift

Isabel García Frontera
General Manager
SPEAKER



Volkswagen

Björn Strasdat
Mobility Systems & Powertrain
Solutions Manager
SPEAKER



EURECAT

David Abella
Big Data & Data
Science Researcher
SPEAKER

Industry and Data from the Inside
What can mobility data tell us about how people move?



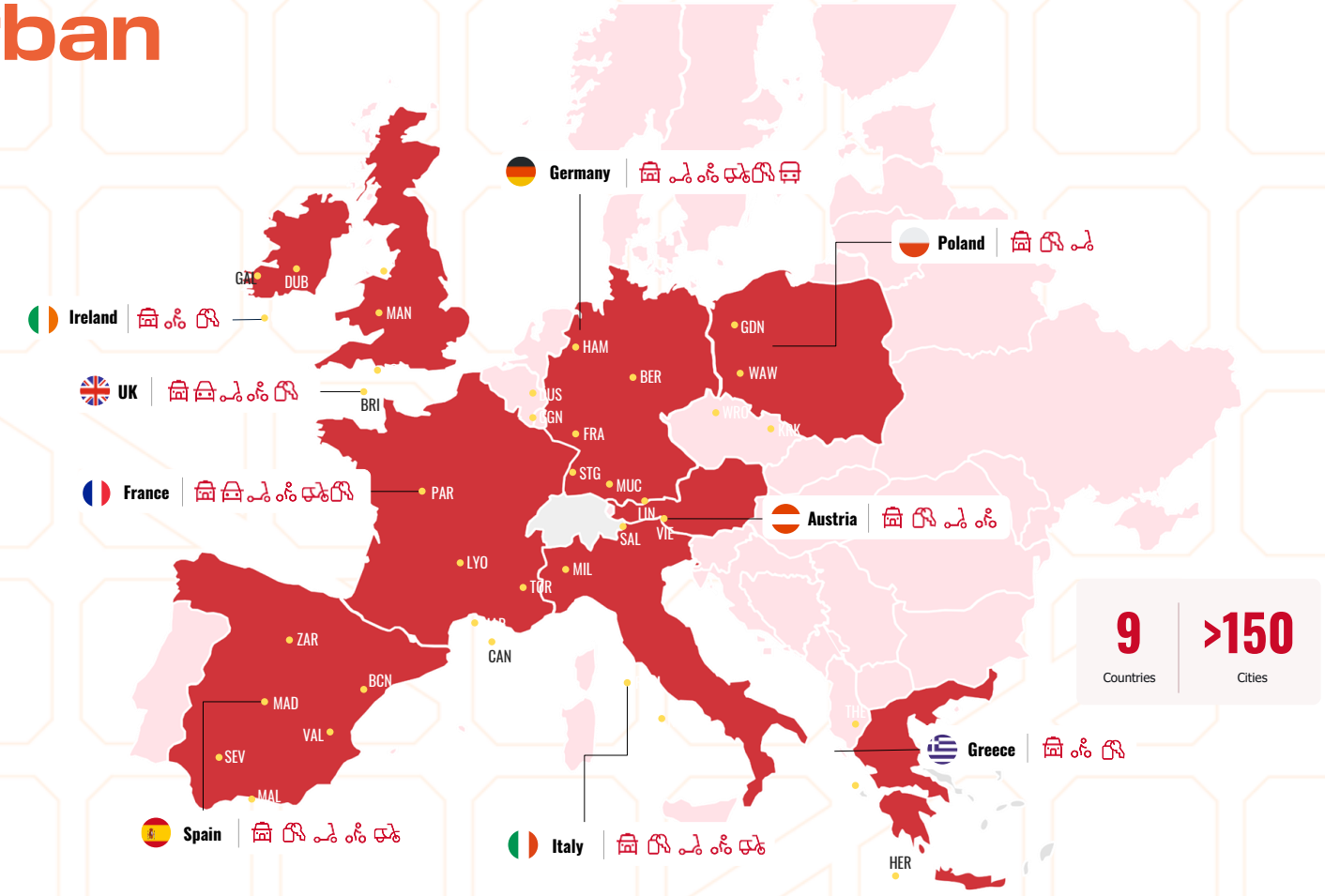
Isabel García Frontera

General Manager at Freenow by Lyft

SPEAKER

Driving the future of urban mobility in Europe

- European tech company
- Founded in 2012 as a taxi hailing app
- Leading multi-mobility app in Europe with taxi at its core
- July 2025, Freenow by Lyft



Scaling impact through collaborations

Partnering with thousands of taxi drivers, fleet owners and multi-mobility providers

150k+	Taxi/PHV drivers
8	Mobility options
20+	Mobility partners

Free2move, emmy, TIER, Europcar, forest, cooltra, SIXT share, ridemovi, voi., voltio BY MUTUA, Traficar, AVIS

How Data contributes to smart mobility

Exploring the value of real-world data from taxis and mobility platforms to understand travel behaviour, demand and urban mobility:

- Building data-driven PR storytelling
- Improving efficiency for taxi drivers and passengers
- Enhancing urban mobility in the cities where we operate

Building data-driven PR storytelling

La ciudad de España que más aumento de peticiones de taxis registró por el eclipse: no es Madrid ni Valencia

El eclipse solar en España ha influido en diferentes áreas, como en el turismo o la movilidad



David Risher · Siguiendo
CEO, Lyft
3 días ·

Today I learned three facts about Lyft and our riders and Oktoberfest:

* Riders traveled to and from the Munich Oktoberfest (a/k/a the Wiesn) so many times that it's the equivalent of circling the Earth 4.5X

* One in five rides happened between 6 and 10 a.m. Yes you read that right.

* The Lyft in the photo is wearing a dirndl.

Enjoy, and Prost!

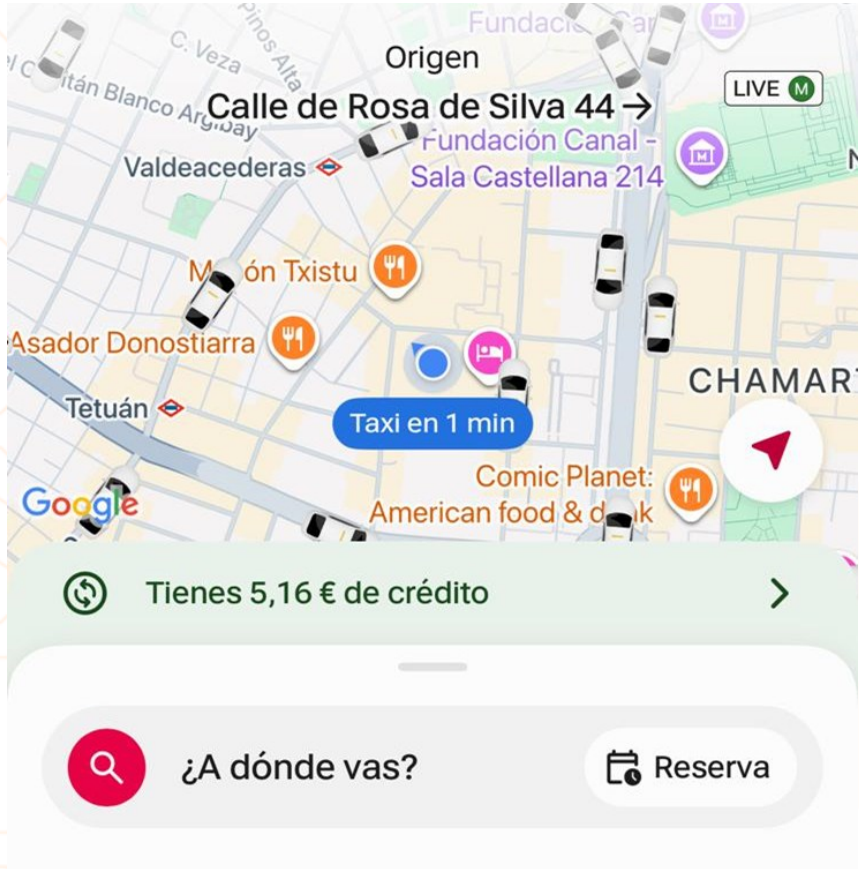
Data and Insights

Nightlife Cities: The 2026 Global Nightlife Index by Lyft & Freenow

Desde un vestido de novia a las cenizas de un familiar: los objetos más curiosos que dejamos olvidados en un taxi

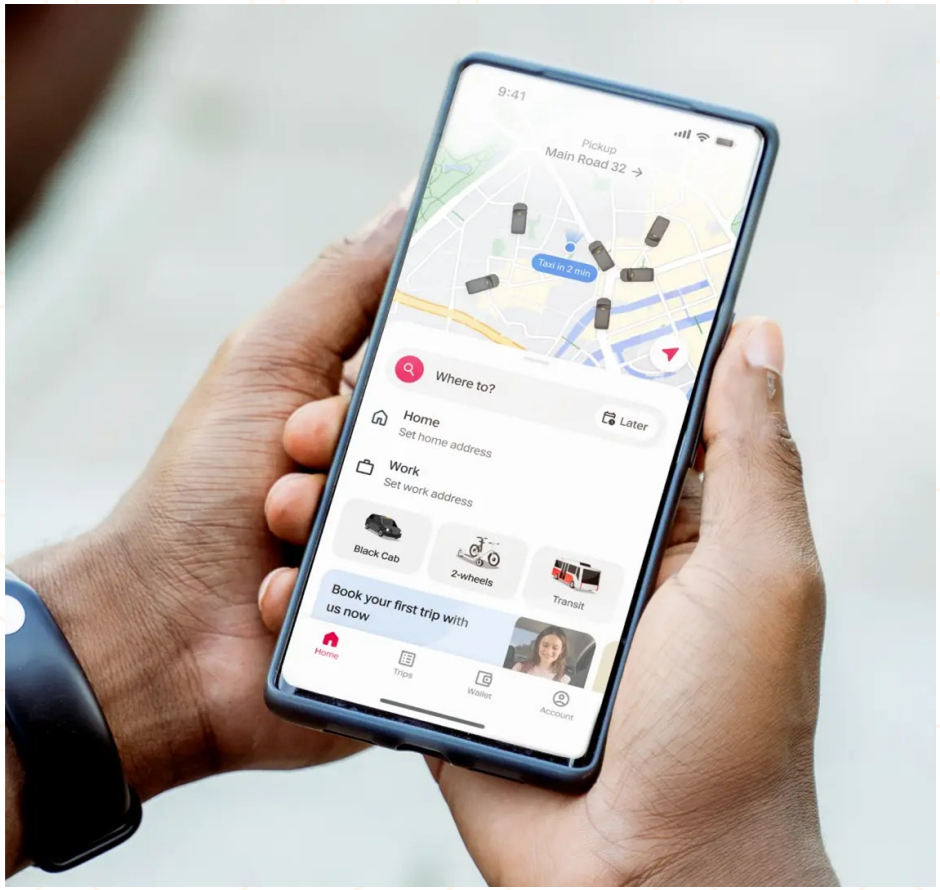
Improving efficiency: smart dispatching and demand prediction

- Tech-driven smart dispatching
- Data-driven demand anticipation
- Guiding supply to high-demand zones
  - Incentives for taxi drivers and passengers



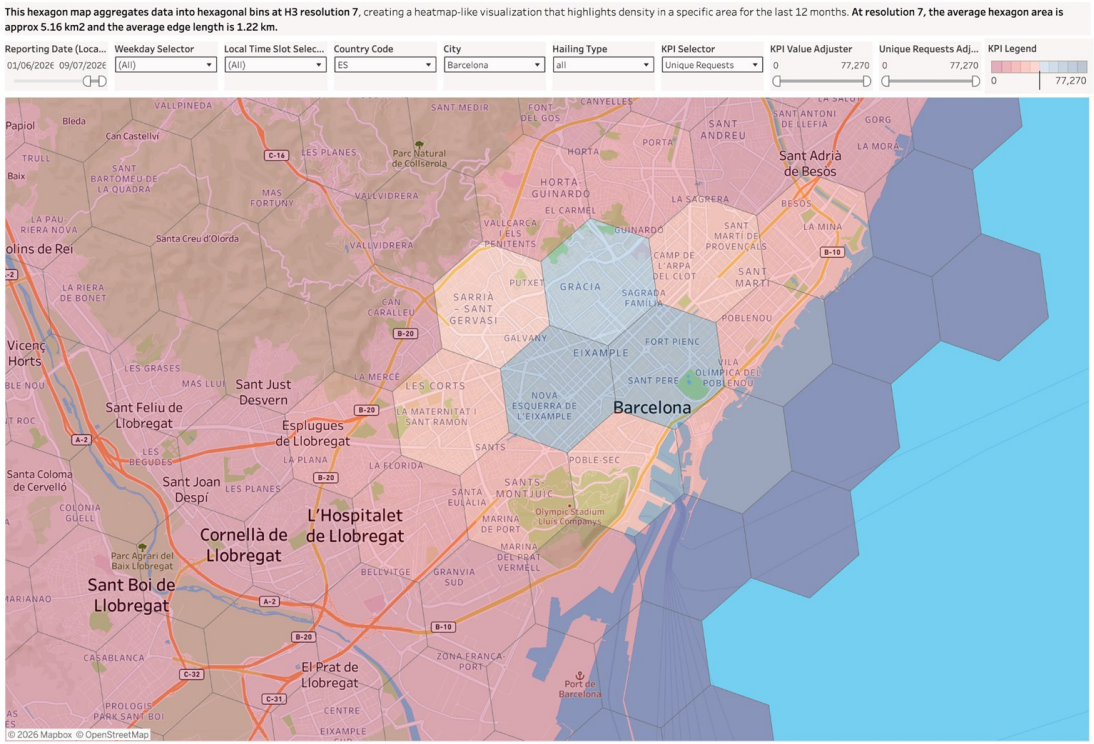
Improving efficiency: smart dispatching and demand prediction

- Win-win for supply
  - Lower operational costs
  - Demand (shorter waiting times)
- Cross-border campaigns based on visitors' country of origin
- Expansion: choosing which cities and countries to launch next.



Enhancing urban mobility in the cities where we operate

- Heatmaps with pick-up rates to spot unmet demand
- Major events calendar to plan extra driver shifts
- Improving service at key hubs: airports and train stations
- Identifying high-demand areas



Enhancing urban mobility in the cities where we operate

Oktoberfest Munich 2026 (12/09 - 4/10) in numbers

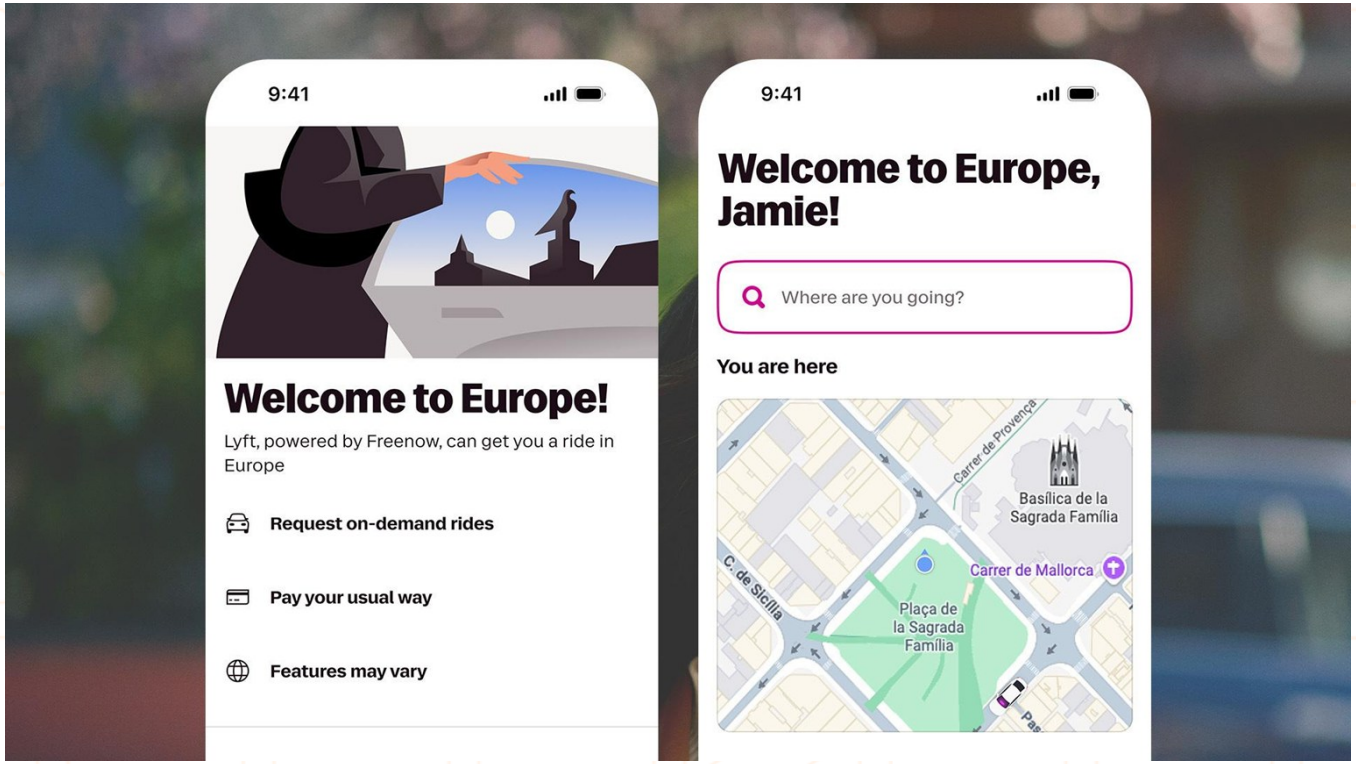
- 1 in 3 rides in Munich went to or from Oktoberfest
- +405% more XL van rides: groups travel together
- 1 in 11 riders were international, led by the UK, Italy and Austria
- 45% of rides ended with a tip
- P1 Club was the most popular last stop of the night
- Friday 25th Sept was the busiest day of the festival



Enhancing urban mobility in the cities where we operate

Mapping Contributor Program:

- Route Overlap, Lyft vs Google
- Taxi Lane Awareness
- Distance, Lyft vs Google



What's next? Autonomous Vehicles

- Talking about the future of mobility means addressing AVs
- Hybrid means coexistence
- Human Drivers Provide invaluable local knowledge and personal connection
- AVs excel in high efficiency in times and areas of low driver supply
- Serving distinct passenger needs





Thank you!

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VOLKSWAGEN GROUP

Mobility and Energy Data: An AI-Based Toolchain to Explore Grid Bottlenecks and Bidirectional Charging Potential

Carnet Symposium 2026 – Data & AI: Unlocking the Future of the Automotive Sector and Urban Mobility

BJÖRN STRASDAT – HEAD OF MOBILITY SYSTEMS & POWERTRAIN SOLUTIONS

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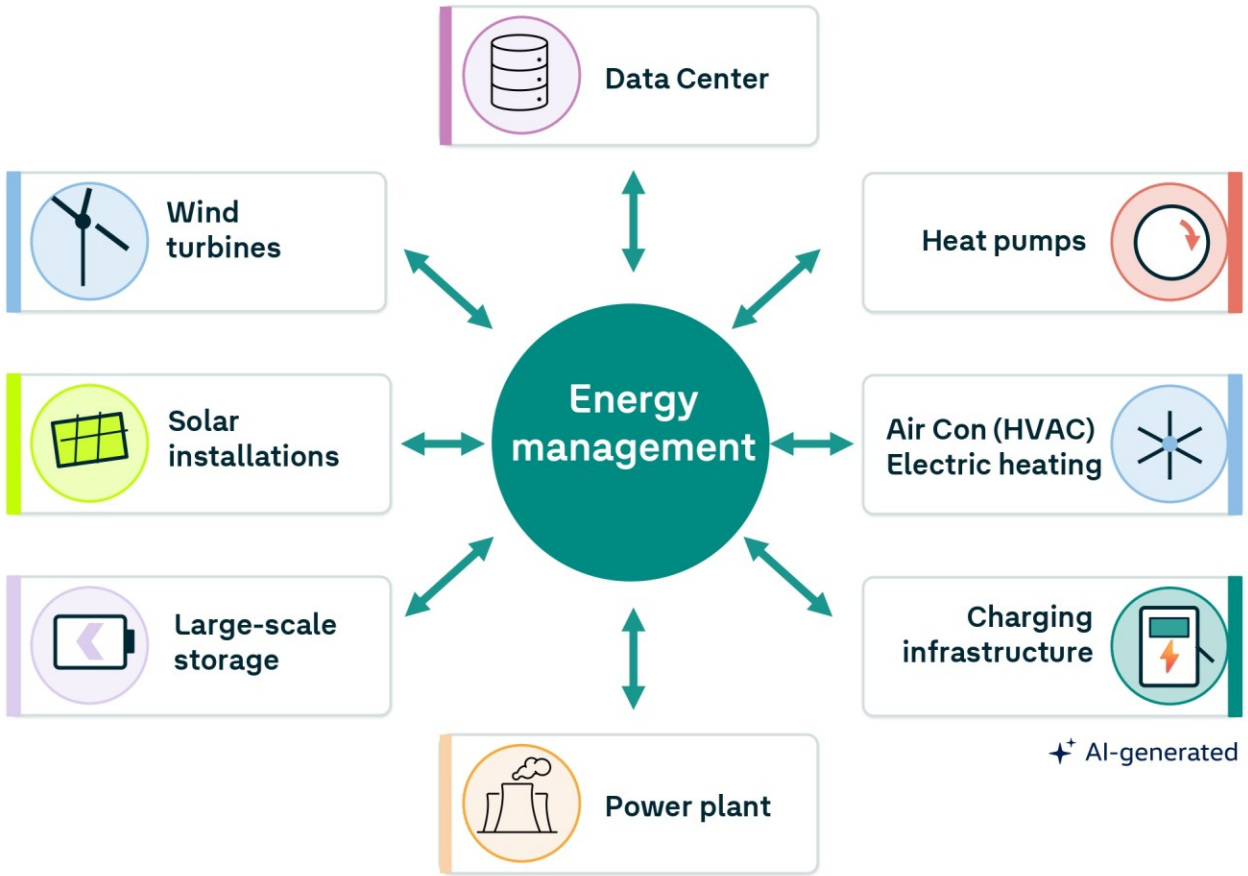
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MobiNexus Collaborating for Innovative Mobility

Energy Management in an Evolving Electricity Market

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Electric vehicles as an integral part of the energy system



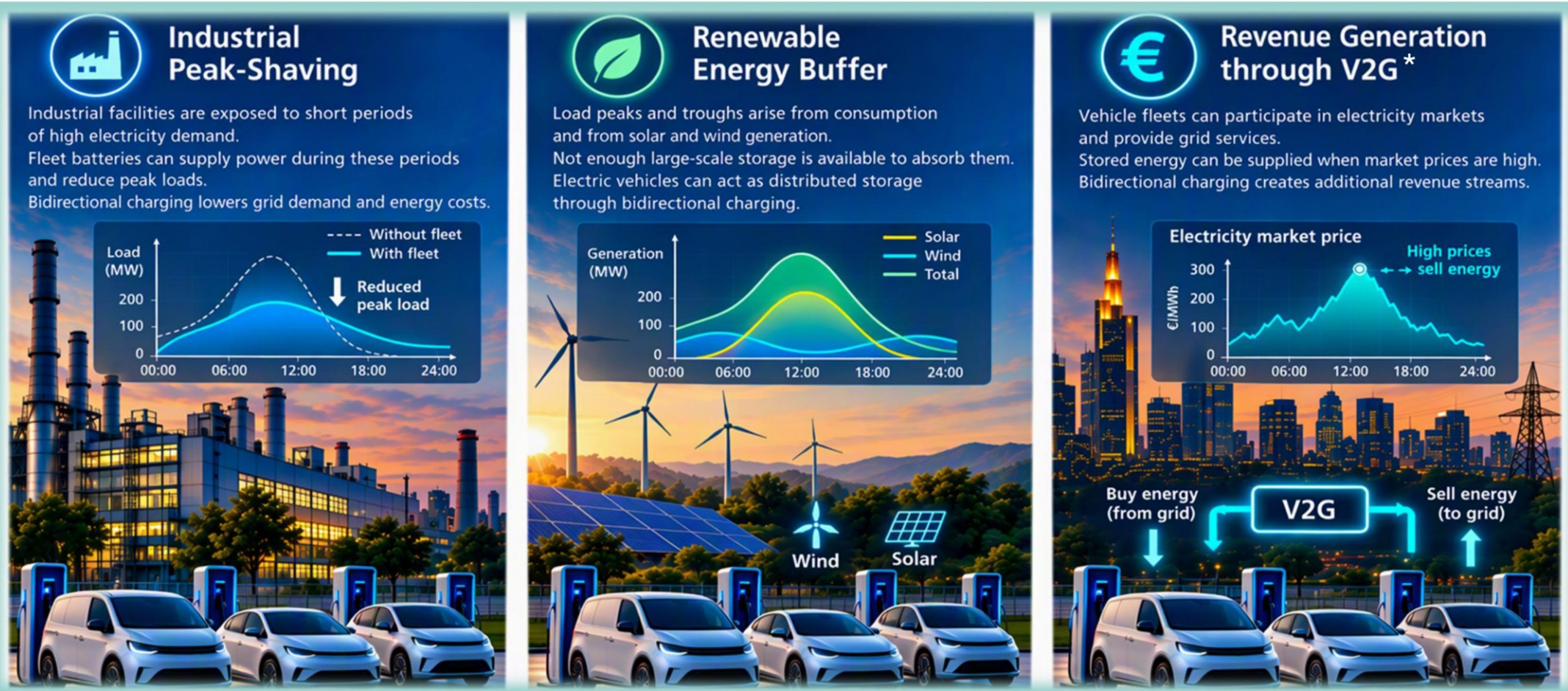
- Continued expansion of wind and solar power
- Growing shift from gas and oil heating to heat pumps
- Expansion of large-scale data centers

- Growing need for electricity storage capacity
- Increasing importance of smart energy management
- **Electric vehicles can provide flexible storage capacity**

Vehicles can be the Grid's Missing Storage

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AI-generated



OPEN QUESTIONS:

- How large is this the Bidirectional Charging Potential within a given region?
- How should the charging infrastructure be designed for a given region?

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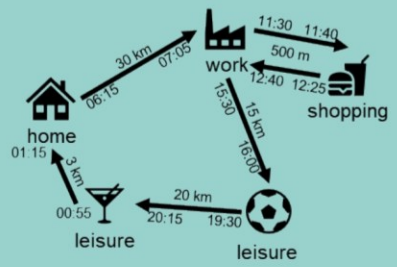
A Digital Twin Makes the Potential Quantifiable

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From data to digital twins to quantitative insights

INPUT DATA

- Mobility data, incl. mobility surveys and customer studies
- Charge-point data: occupancy, power



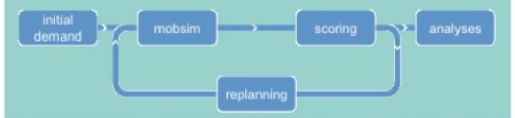


AI-generated

SIMULATION

- Multi-Agent Transport Simulation (MATSim)
- Using an open-source approach
- Enriched by own models and parameters
- Embedded in a common simulation framework

MATSim
Multi-Agent Transport Simulation





Source: matsim.org

SPECIFIC RESULTS

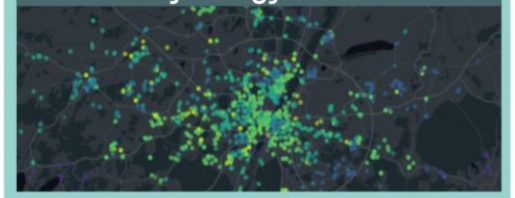
MOBILITY:
experienced car trips



CHARGING:
spatio-temporal power demand

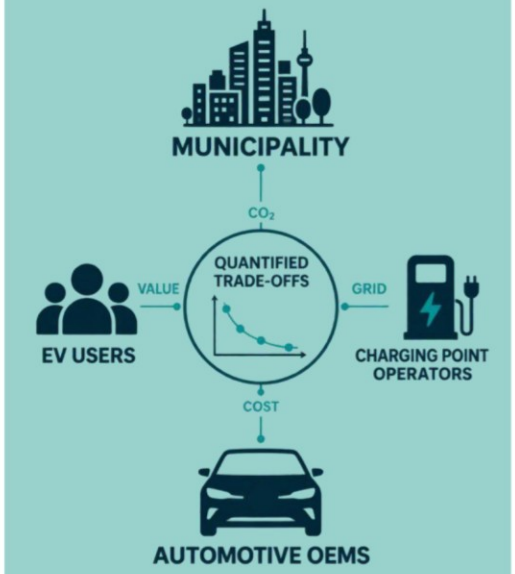


ENERGY GRIDS:
daily energy demand



INSIGHTS

- Quantitative results
- Transparent cause-and-effect relationship
- Multi-dimensional / multi-stakeholder optimization



AI-generated

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MobiNexus — Collaborating for innovative Mobility

Fleet, Public and Electricity Grid Data

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Data sources & challenges

1. Volkswagen Group fleet data

A large European market share gives the VW Group extensive mobility and charging data.



Challenges
- Willingness of customers
- Data access and maintenance

2. Public and operational data

Open maps (OpenStreetMap), public transport timetables, and public and private charge-point occupancy data.



Challenges
- Actuality and completeness
- Licenses for commercial use

3. Grid data

Distribution grid data, with accessibility depending on country and region.



Challenges
- Local, proprietary data
- Sensible infrastructure

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Off-The-Shelf AI is not Trustworthy Enough for Business Decisions

VOLKSWAGEN GROUP

Our response: an in-house multi-agent toolchain built on LLM-based AI assistants

Why we need AI-Tools?

- Very large data volumes
- Scalability and research speed
- Automation of research process
- Cost reduction / Efficiency increase

➢ **AI used for research & structuring of that data**

Limits of existing AI tools: etc.

- Hallucinations and incorrect sources

➢ not trustworthy enough for business decisions

- No tailored data structuring for our use cases
- Limitations regarding heterogeneous sources and formats

In-house built multi-agent toolchain

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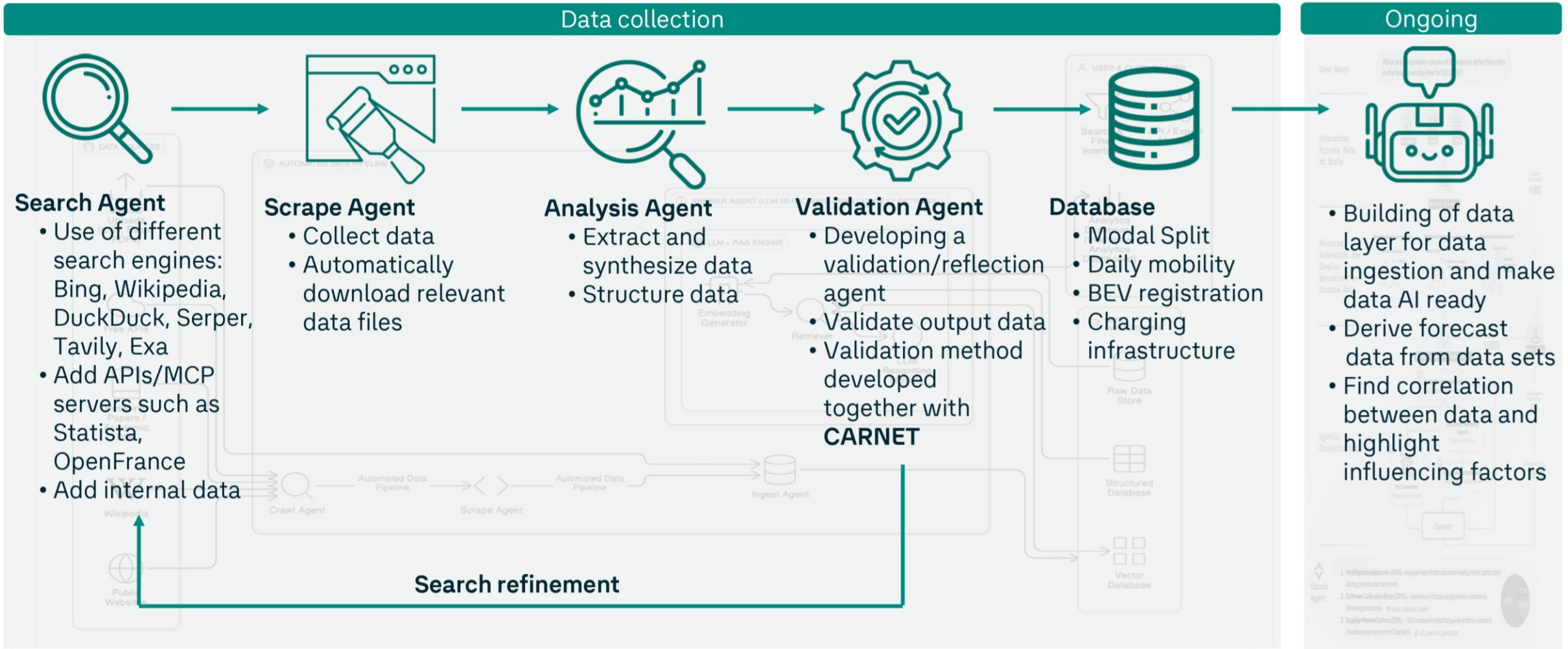
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A Purpose-Built Agent Chain Replaces Generic AI Tooling

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In-house multi-agent toolchain – architecture



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Example Result: Charging Behaviour and Grid Load Analysis

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Visualization with inhouse frontend "MIA"



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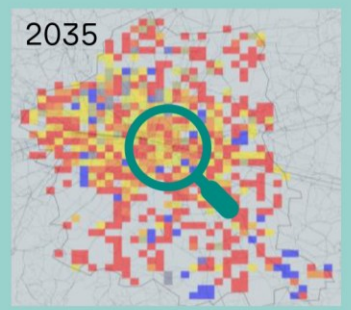
Toolchain Ready – GDPR* & Grid Data are the Bottleneck

VOLKSWAGEN GROUP

Summary and challenges

What the toolchain delivers

- AI-supported data research and preparation
- Mobility charging- and energy-simulation on a digital twin
- Assessment of business models
- Basis for strategic decisions
- Consulting for public authorities and stakeholders
- Consulting for fleet customers



- ➢ Charging infrastructure
- ➢ Powerbottelnecks
- ➢ Bidi-Potential

General challenges

- GDPR*: high effort for data processing; active customer consent is required, EU vs. non-EU differences
- Distribution grid data is only partly available, or unavailable, depending on the region:

France: Enedis operates over 95% of distribution grid

Germany: more than 800 distribution grid operators

Spain: more than 300 operators, five of them large (e.g. Endesa, Iberdrola)

* General Data Protection Regulation

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Leveraging AI to unlock data-driven insights into the interplay between mobility and energy.

Thank you for your attention.
I look forward to your questions.

Björn Strasdat

MOIA Stand on Tomorrow
Mobility World Congress

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Science Researcher
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Artificial intelligence applied to the metropolitan bus network

From data to an integrated system

AI 4BUS



David Abella
Big Data & Data Science, Eurecat

SPEAKER

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Eurecat at a glance

2nd largest private RTO in Southern Europe

- Industrial
- Digital
- Biotechnology
- Sustainability
- EU Innovation & Proposal Leadership

R + D + I

+600 large consortium R+D+I projects

+6.000 client companies

+100 H2020 and Horizon Europe projects (2014-2025)

+40 coordinated H2020 and Horizon Europe projects (2014-2025)

+100M€ of return in H2020 and Horizon Europe projects (2014-2025)

+3.400 citations of our scientific publications

Income

69M€ income in 2024

Talent

+350 employees

42% women

58% men

+25% PhDs

+30 nationalities

Internationality

14 Offices

+540 Collaborations worldwide

11 Offices in Catalonia



Madrid

Malaga

Santiago de Chile

Between research and industry

Applied research, technology development and innovation with market impact



TECH PUSH

Universities and research centres create new knowledge.

MARKET PULL

Companies and public bodies need solutions to concrete problems.

Eurecat works where both curves meet: **applied research and technology development** that reach real users

Big Data & Data Science Unit

Computational Social Science group

Urban science | Transport systems | Connected mobility | Active and shared mobility

ONGOING PROJECTS

DeployEMDS

Sharing mobility data



MÈRIDA

Rural transport on demand

AI4BUS

Anticipating bus demand

Diversify-CCAM

Inclusive automated mobility

DynamiCity

Active mobility & health

MOBILITY COLLABORATORS

Barcelona City Council

NEMI

AMB Mobilitat

ATM

L'Hospitalet City Council

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AI 4BUS Project

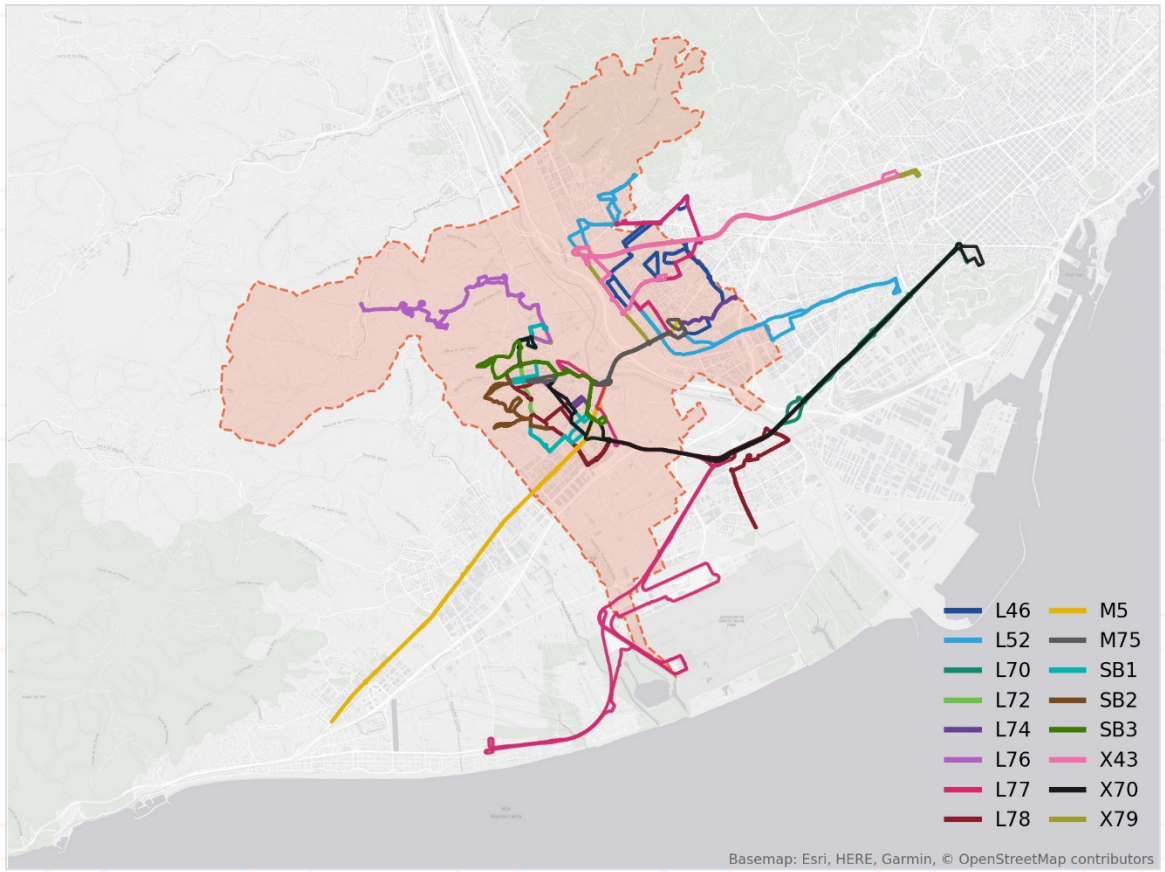
AI applied to the metropolitan bus network

AMB INFORMACIÓ

MINISTERIO DE CIENCIA, INNOVACIÓN Y UNIVERSIDADES

Cofinanciado por la Unión Europea

AGENCIA ESTATAL DE INVESTIGACIÓN



- ❑ Forecast the bus occupancy at each stop, two days ahead, for all the different lines through one model.
- ❑ Explain which factors drive demand, the occupancy.
- ❑ Infer the OD matrices for each bus line.
- ❑ Optimize frequencies within the available fleet.

Region of study: Sant Boi de Llobregat

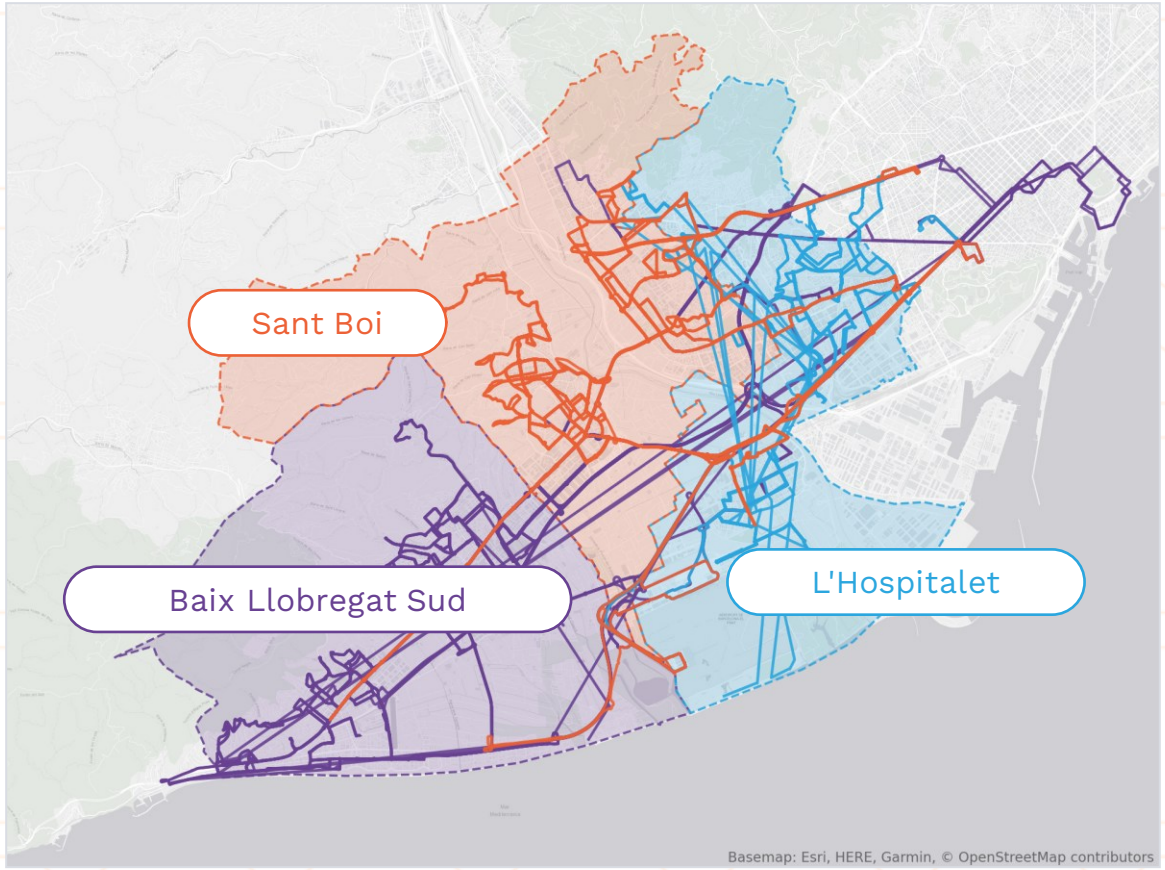
16	143	53k
bus lines	buses	passengers / weekday

AI 4BUS Project

AI applied to the metropolitan bus network

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- ❑ Optimize frequencies within the available fleet.

Extend the framework to other concessions

63	483	155k
bus lines	buses	passengers / weekday

How AI 4BUS works

System architecture

1 Data processing & integration

Cleans the door-sensor counts and joins them with timetables, calendar, events and weather.

2 Demand forecasting

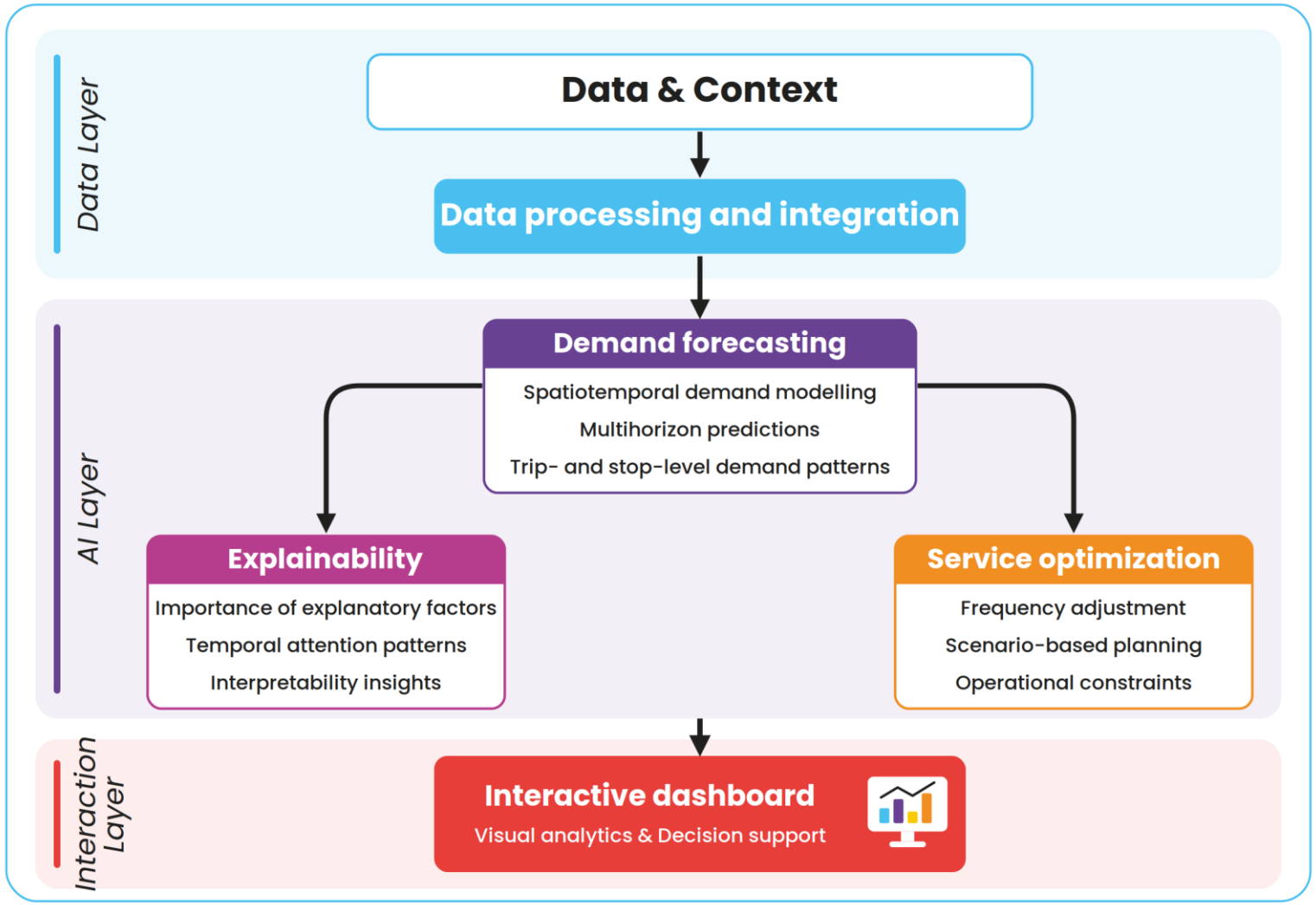
Predicts the occupancy of every trip and every stop, two days ahead.

3 Explainability

Shows which factors drive each forecast and where the model looks.

4 Service Optimisation

Re-allocates frequencies line by line within the available fleet.

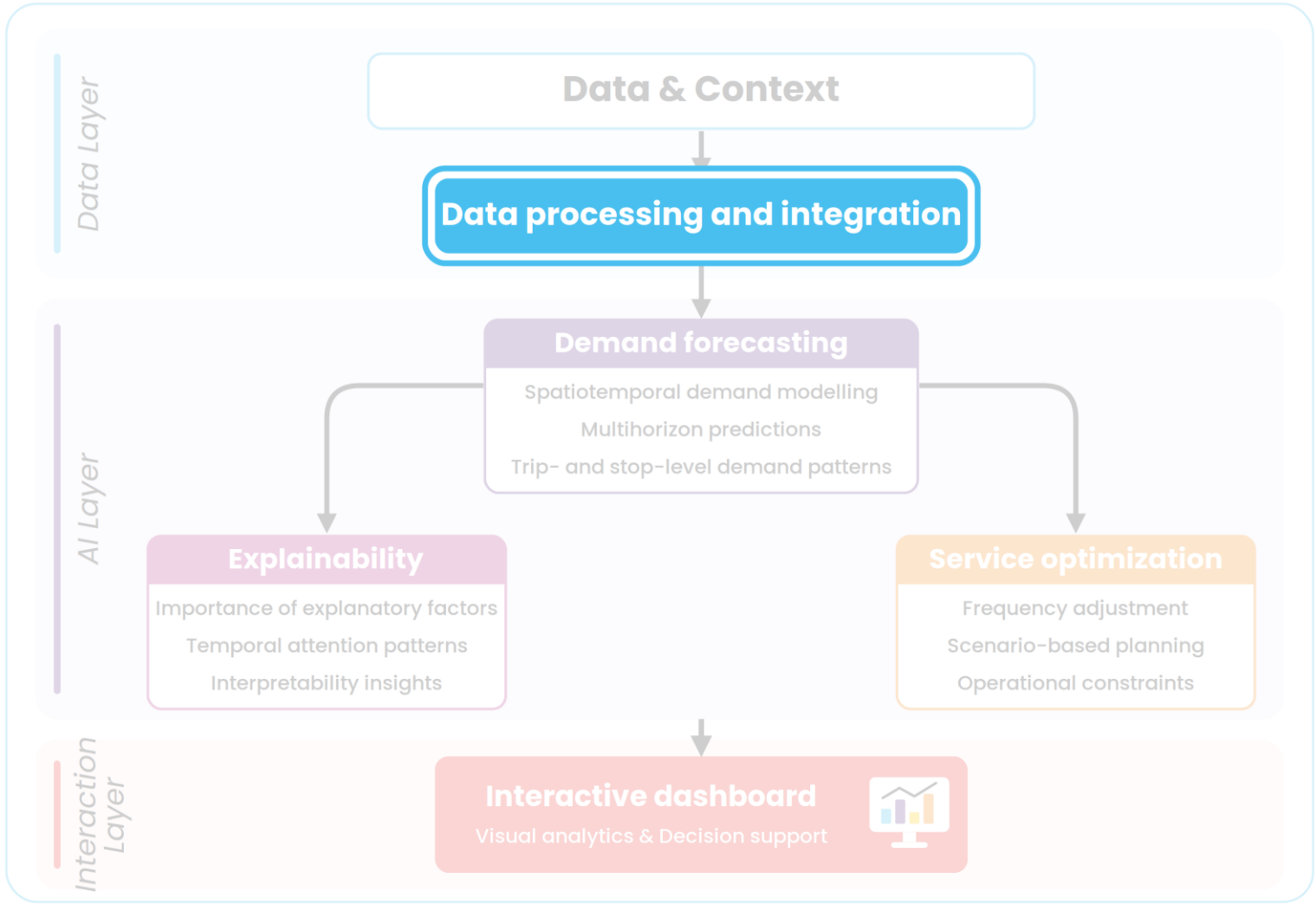


Data processing & integration

Harmonisation of the door-sensor data from different sources

Error detection, correction and imputation

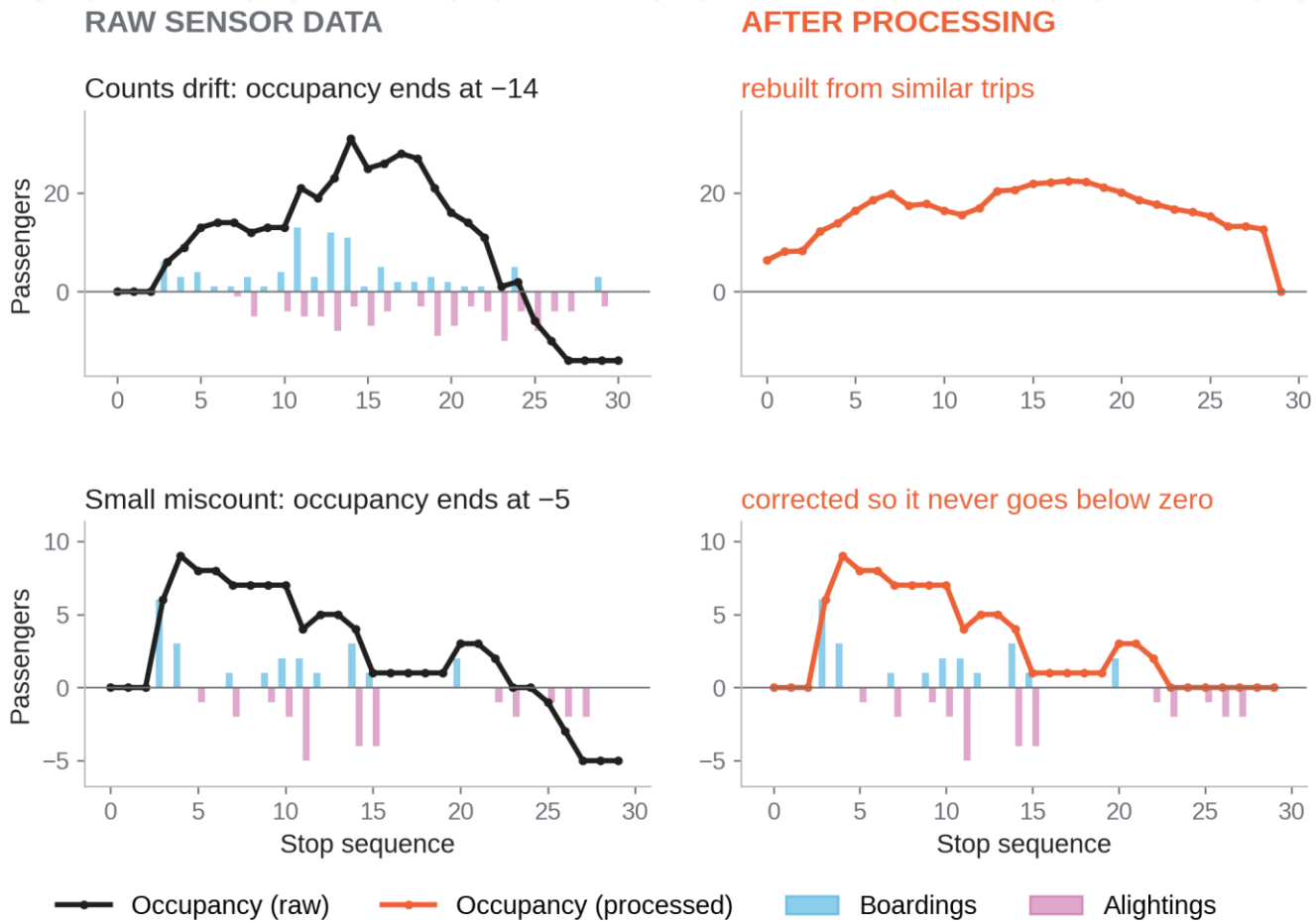
Timetables, calendar, events and weather



Data processing & integration

Constructing the occupancy from boardings and alignments

- Every bus counts boardings and alighting at each door. Across thousands of trips a day, some counters lose connection or drift out of calibration.
- We detect these cases automatically, correct small miscounts and rebuild trips that cannot be repaired from similar trips.
- Repaired data are flagged, so the model learns from them but is only scored on real measurements.

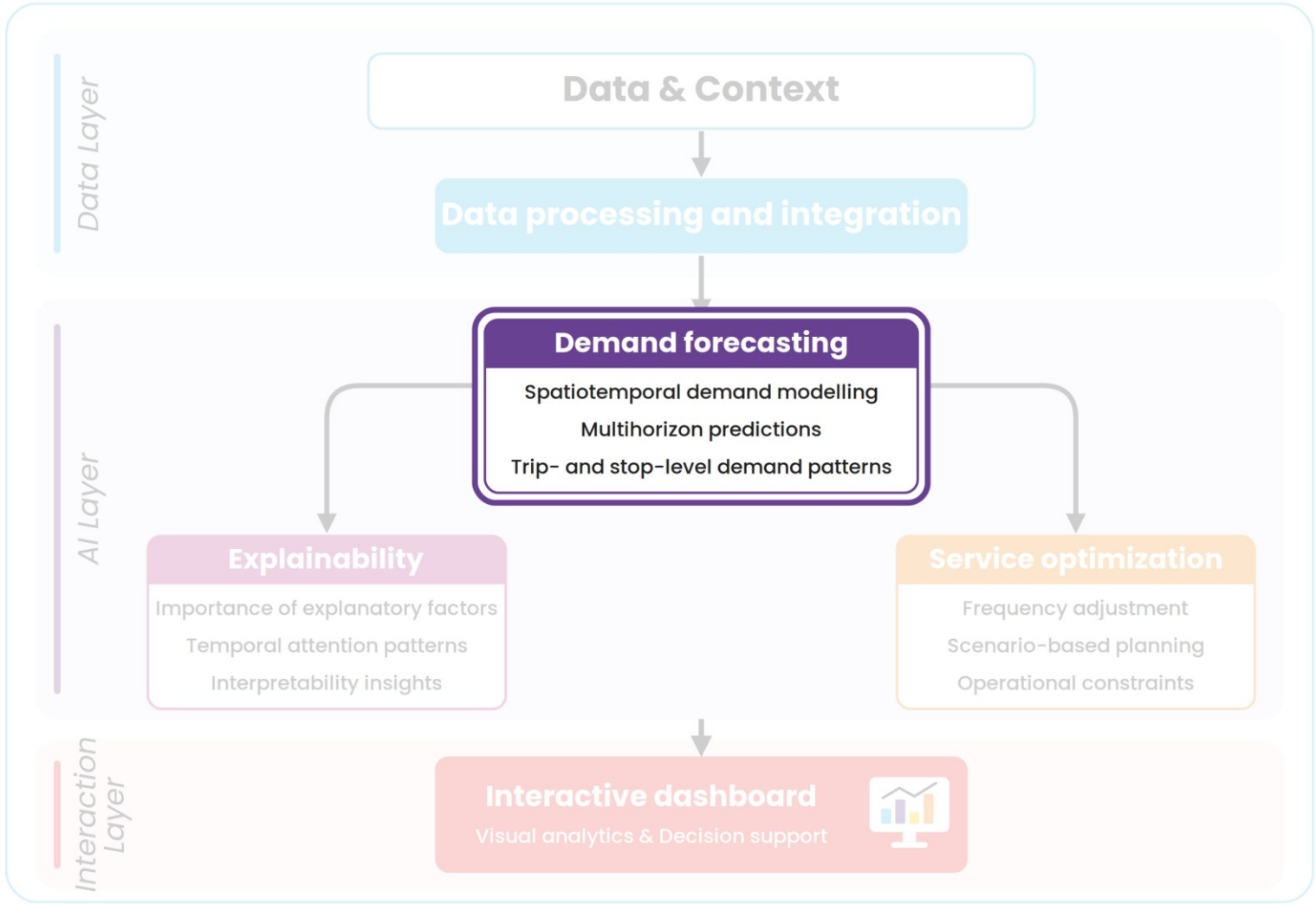


Demand forecasting

Prediction models selected for the occupancy

Model memory and horizon

How the prediction is presented to the user



Deep-learning models for bus occupancy

How many people are on the bus?

Per trip

LSTM Long Short-Term Memory

TFT Temporal Fusion Transformer

Per stop, on a graph of stops

GCN-LSTM Graph Convolutional Network + LSTM

TFT-GNN TFT + Graph Neural Network

Hybrid TFT-GNN + traffic-light classification head

Variants

Probabilistic output (P10–P90 range)

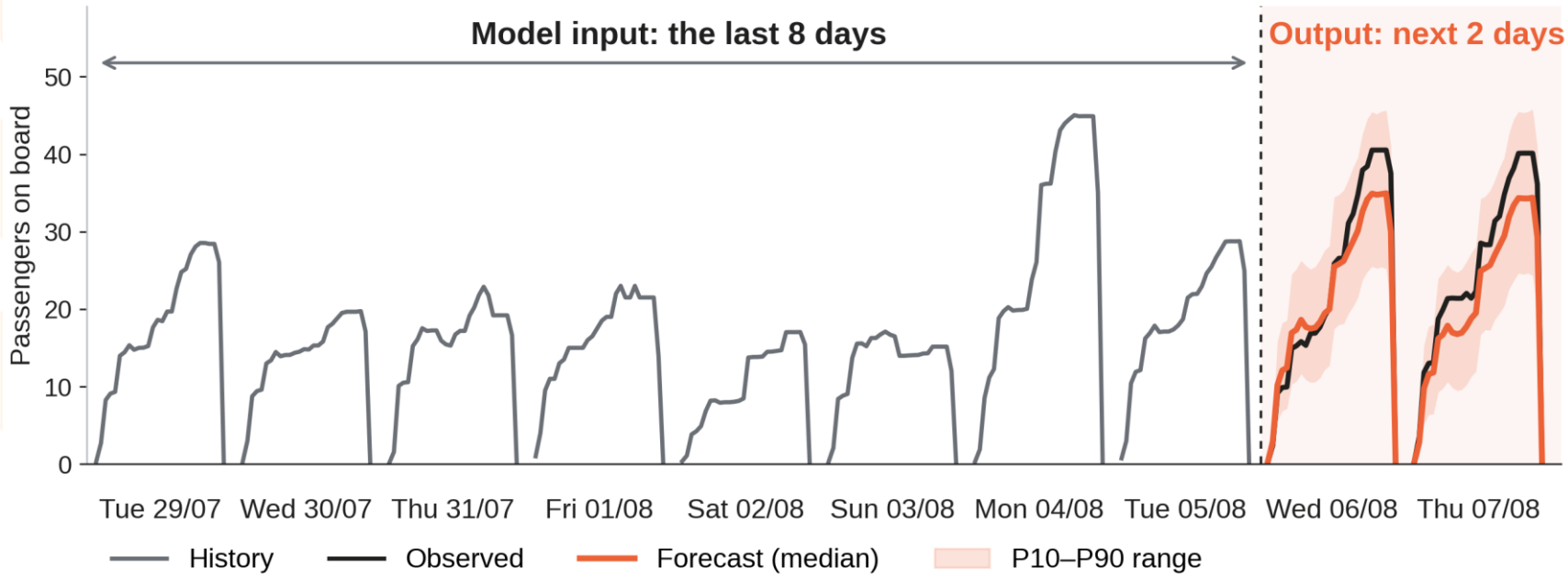
Residual over the historical profile

Foundation models

Chronos-2 Pretrained (Amazon)

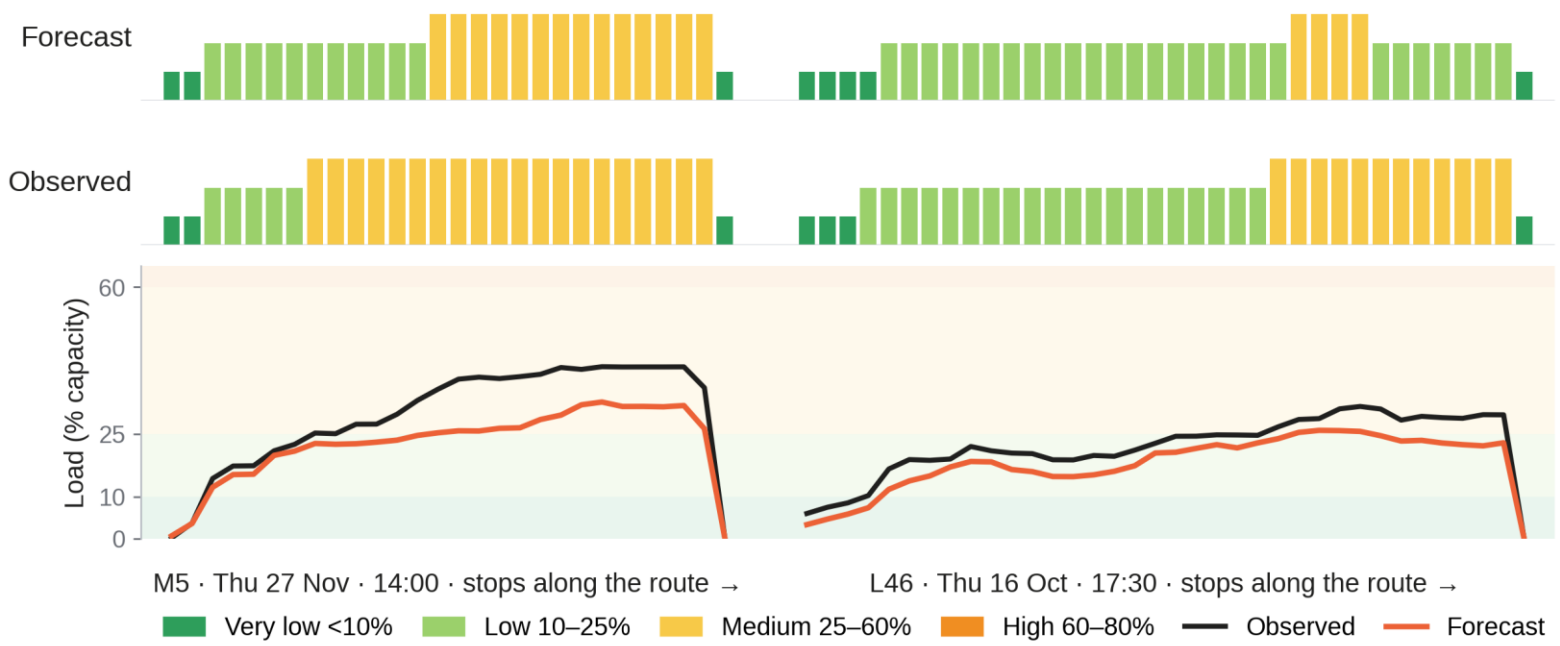
TimesFM Pretrained (Google)

Every model reads the last 8 days and forecasts the next 2.



Occupancy as a traffic light

What the user sees



Traffic-light accuracy

80%

of stops at the exact level

99.9%

at most one level away

Mean error 3.2 pax · NMAE 31%

Mean occupancy: 10.2 pax

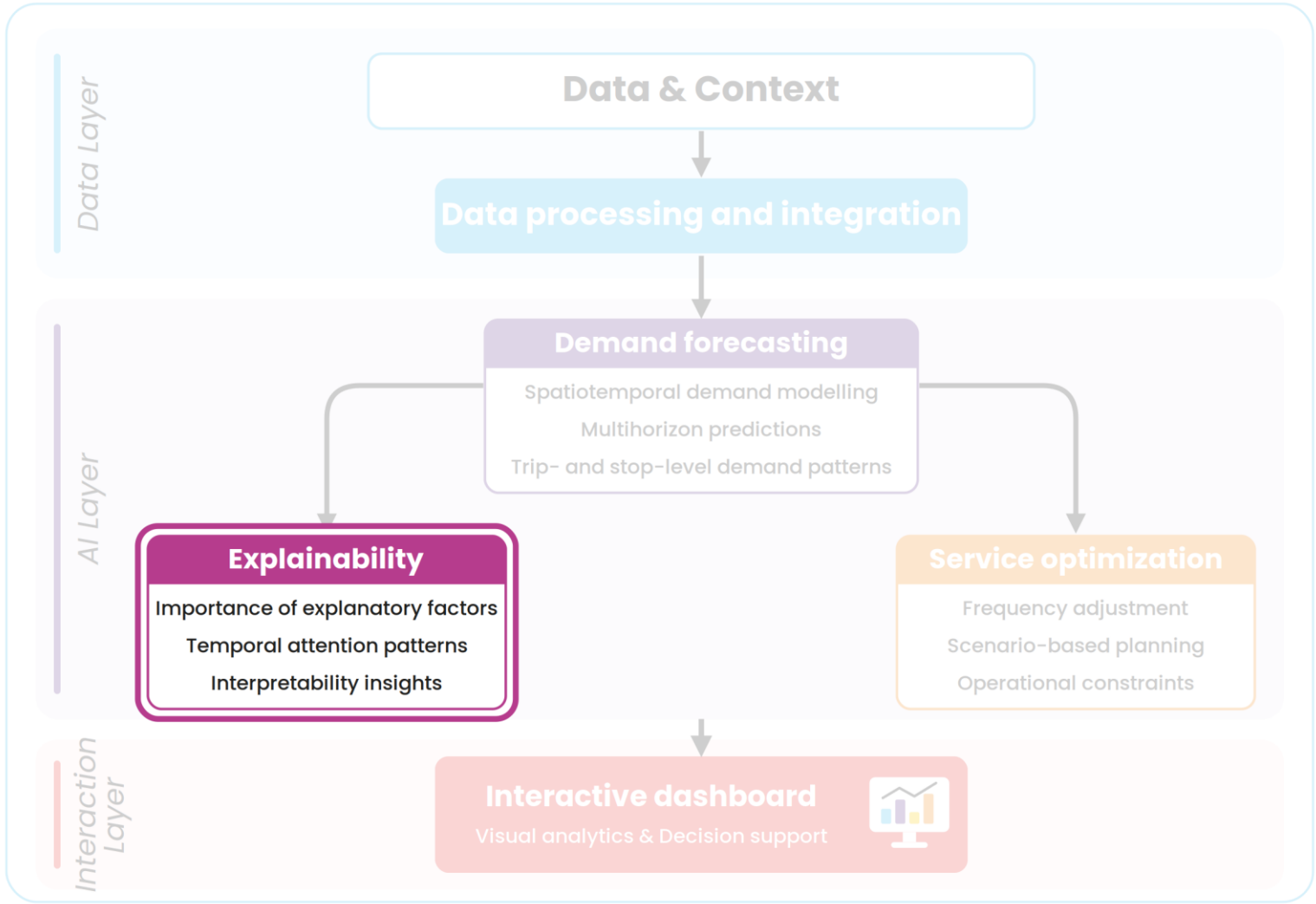
Passengers do not need “23.4 people”: users need to know whether the bus will be quiet or crowded. Each stop gets a level based on the share of bus capacity.

Explainability

Based on what data do the models make their predictions?

Which days in the historical data are most important for the prediction?

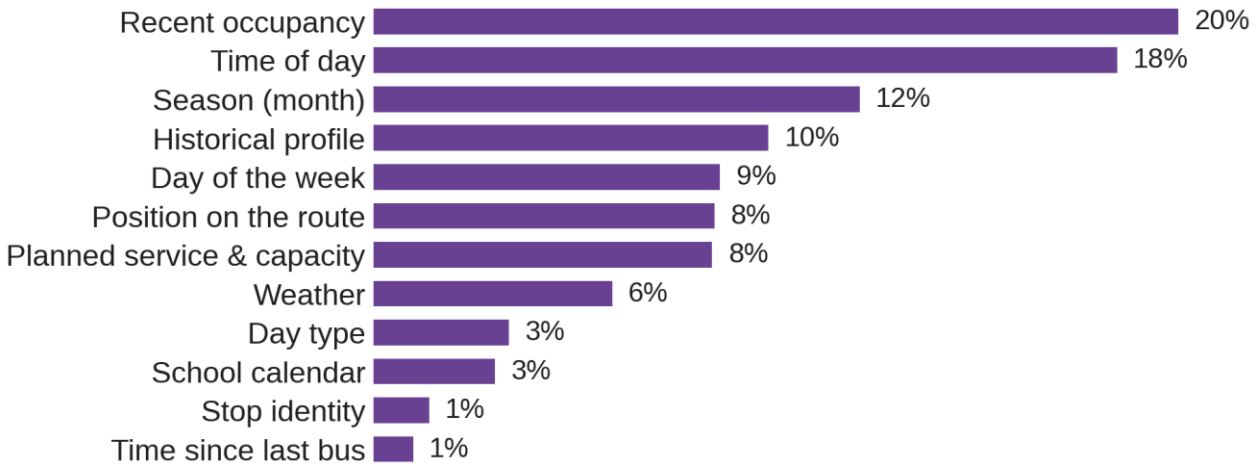
What variables were taken into account when making the prediction?



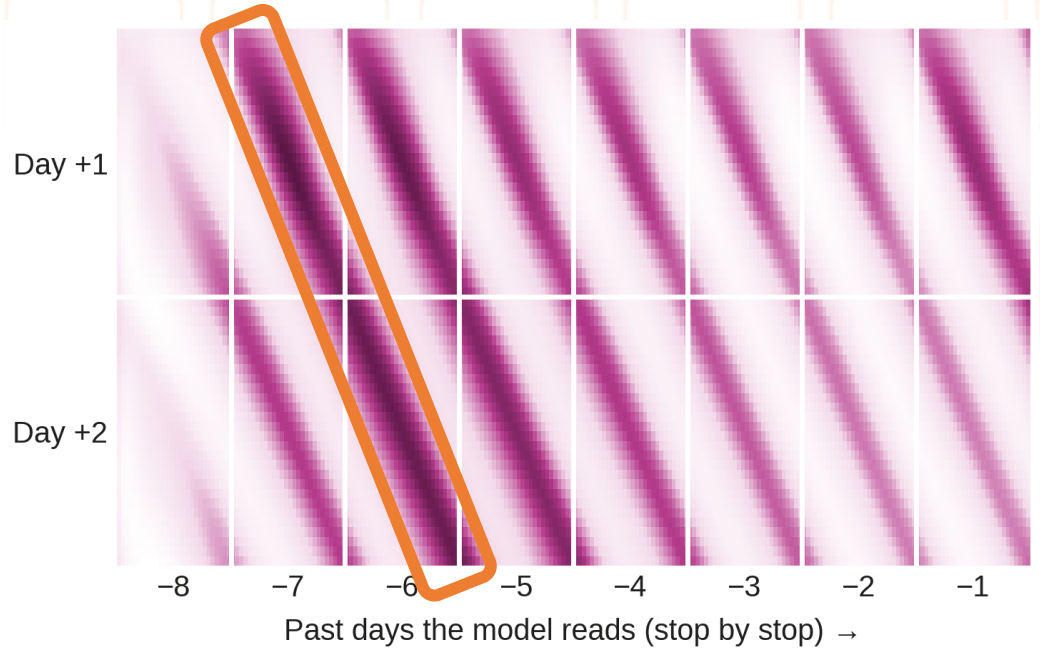
Variable importance and temporal attention

Explainability

Which inputs the model uses



Where it looks in the past



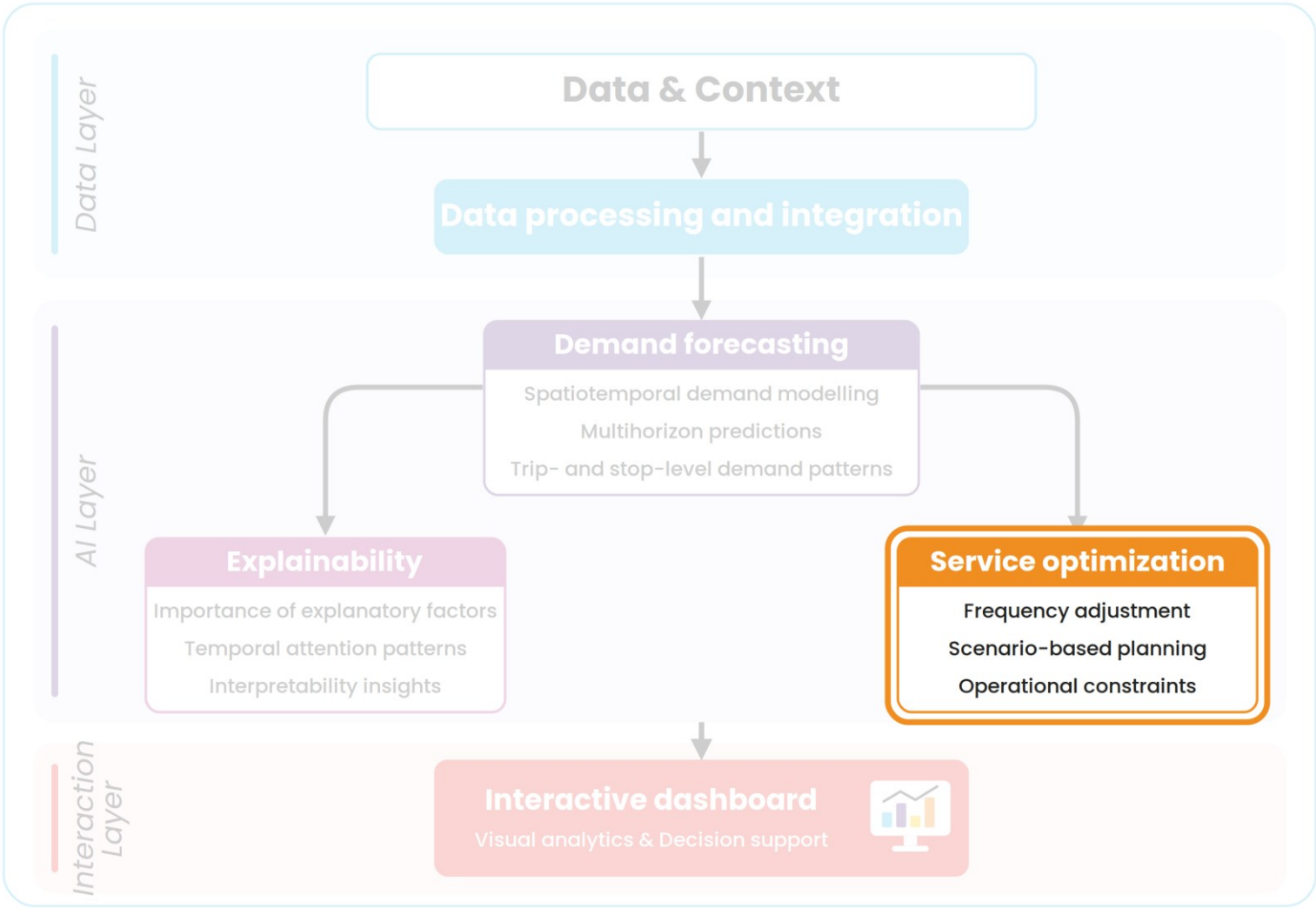
Useful for decisions: the model relies on recent occupancy, time of day, season and the historical profile, and looks at the same stop on previous days, most of all the same weekday one week earlier.

Service optimisation

Frequencies per line and time block

Redistribution of the same fleet

Scenario-based planning



Frequency optimisation

Service optimization based on occupancy

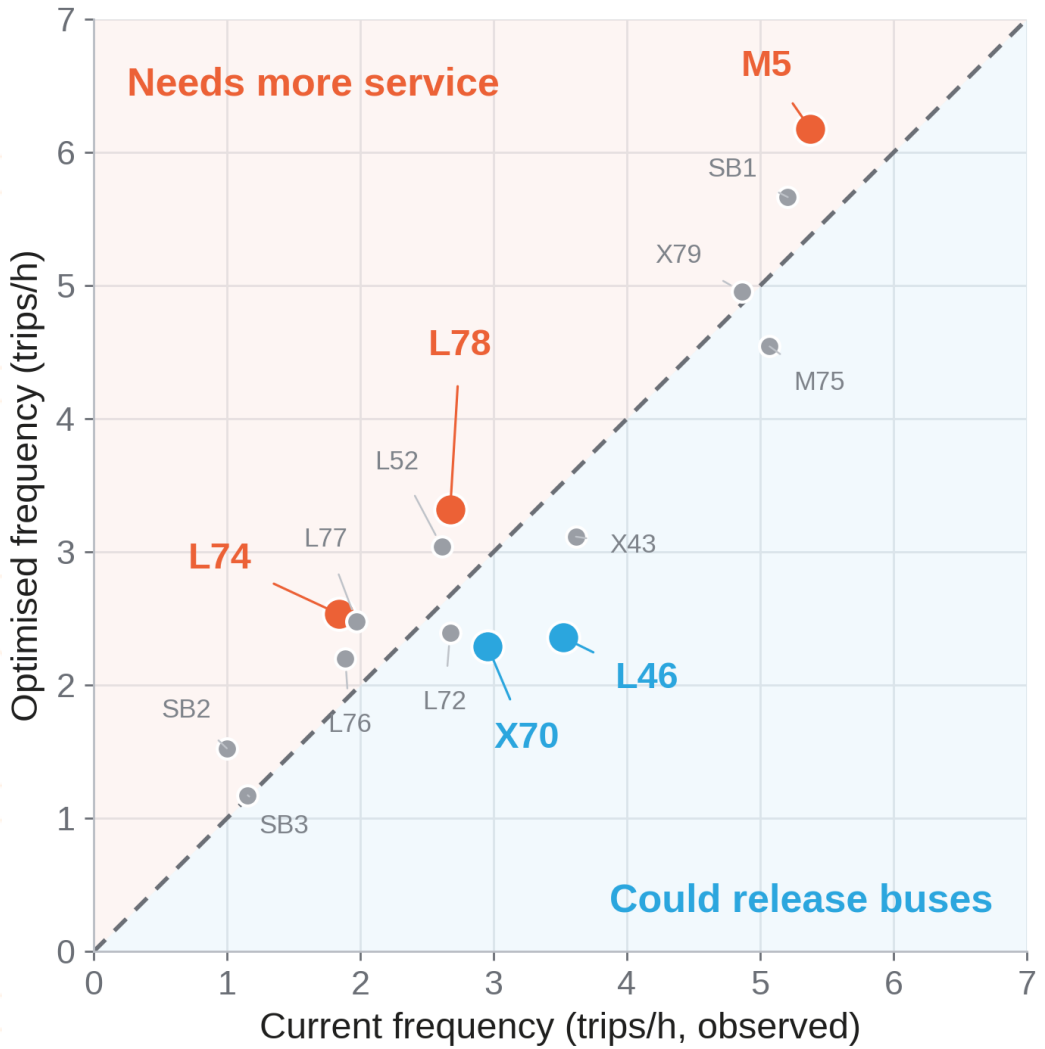
Re-allocate trips optimizing occupancy, across the 16 Sant Boi lines, keeping the number of buses unchanged

Historical demand	Predicted demand
Used today	Not viable

Two inputs were considered. Re-planning day-to-day from forecasts was not of interest for AMB, whose timetables are set for stable periods, so the optimiser works on historical demand.

Today's timetable already tracks demand well (r = 0.92). The exceptions stand out:

- ✓ Busier lines, such as M5, L74 and L78, would need more trips
- ✓ Lighter lines, such as L46 and X70, could release buses.

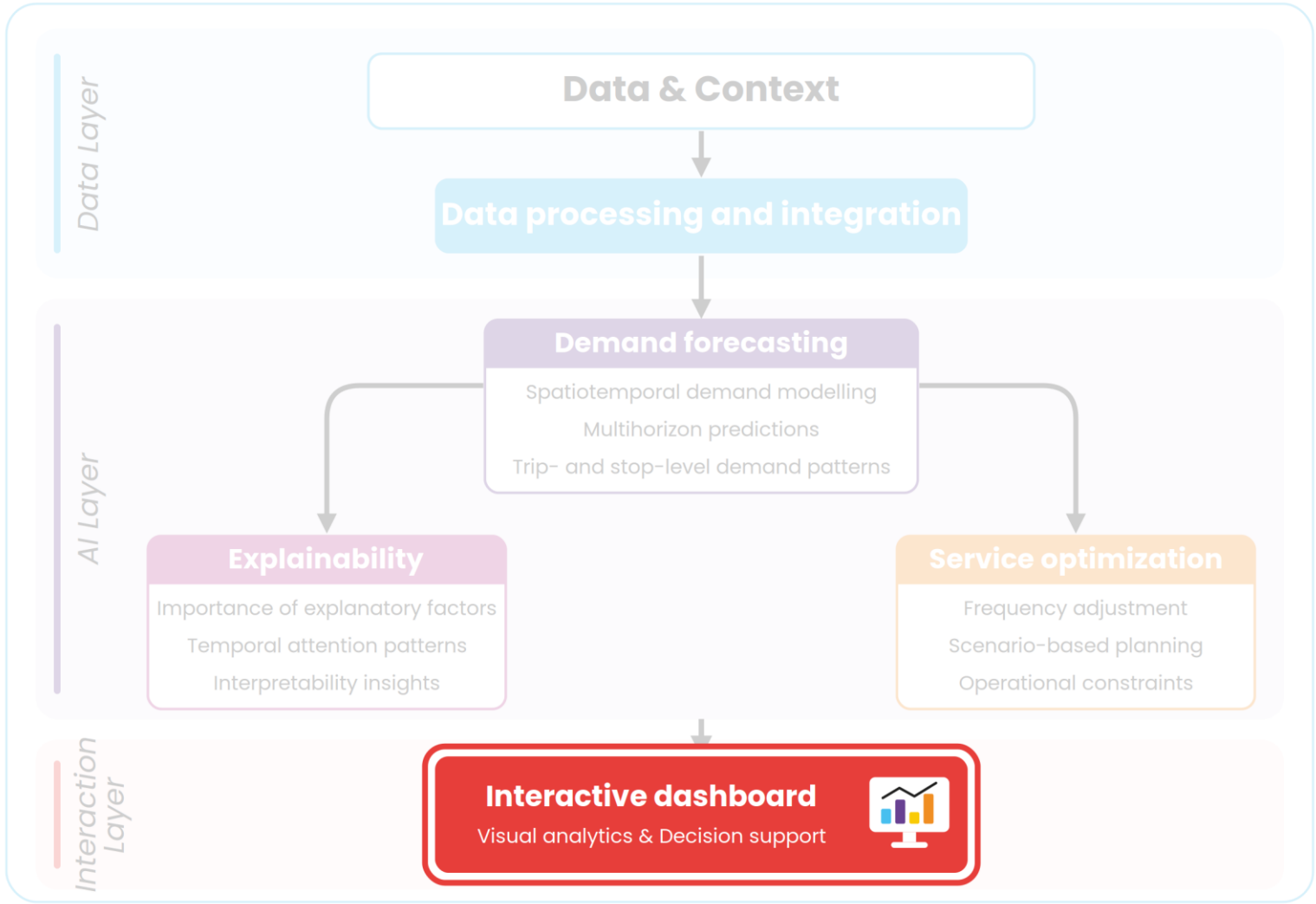


Visualisation

Dashboards inside AMB's own systems

Traffic light in the AMB Mobilitat app

Observed vs forecast vs optimised



Integration into AMB's current tools

Visualisation

1 Adapted to AMB's visualization systems

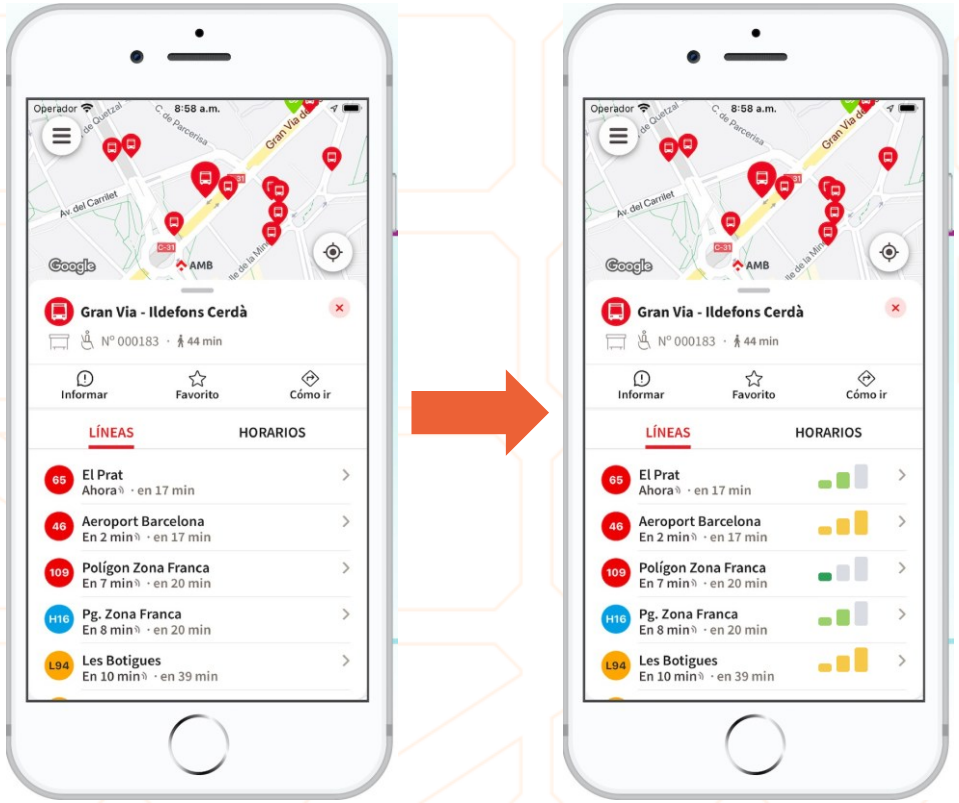
Model outputs are standardized to AMB's own data schema and explored through their internal visualization tools: by line, stop, day type and time band.

2 Adapted to AMB Mobilitat

The traffic-light level is converted to the data format of AMB's passenger app, so it can be shown next to each real-time arrival and passengers can pick a less crowded bus.

Today

With AI4BUS (concept)



Take-home message

Adapt, adapt, adapt

Lessons learned from our experience in AI4BUS, taking a model from the lab to real data and a real operator:

1

Adapt to the data

Real sensor data are imperfect: clean, repair and flag them before learning.

2

Adapt to the user

Turn forecasts into a traffic light planners and passengers can read at a glance.

3

Adapt to operations

Explain the model and optimize within the fleet and planning limits that exist today.

AI 4BUS



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INDUSTRY AND DATA FROM THE INSIDE

Expert Session 1



NFF

Univ.-Prof. Dr.-Ing.
Thomas Vietor
Full Professor & Chairman
MODERATOR



Freenow by Lift

Isabel García Frontera
General Manager
SPEAKER



Volkswagen

Björn Strasdat
Mobility Systems & Powertrain
Solutions Manager
SPEAKER



EURECAT

David Abella
Big Data & Data
Science Researcher
SPEAKER