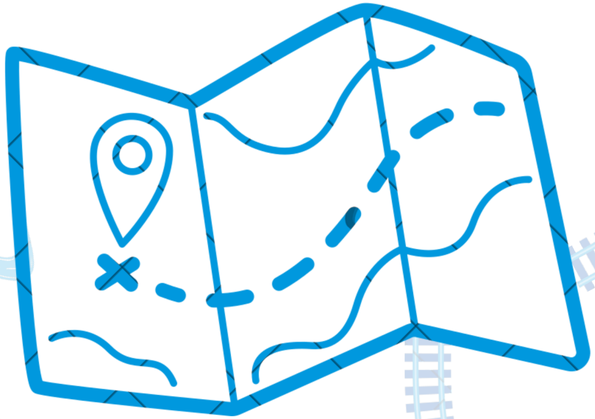
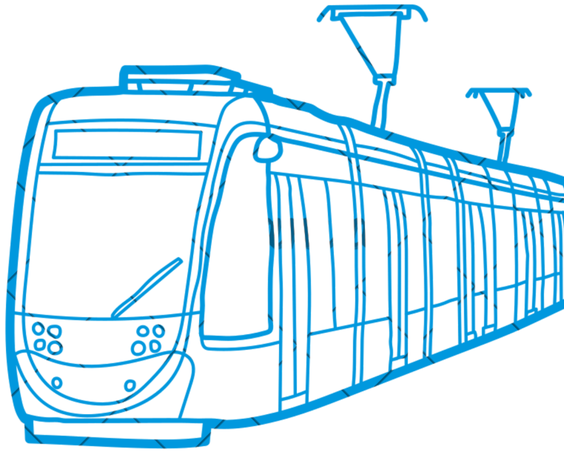
TÉCNICO
UNIVERSIDADE
DE LISBOA

Urban Flow

Smart Occupancy Analytics (SOA)





Group 1

Course: Entrepreneurship Innovation and Technology Transfer

Smart Mobility: Real-Time Occupancy Insights

2º Semester, 2025/2026

Problem

What is the real problem?

Overcrowding is unpredictable. There is no reliable, real-time occupancy information for buses, metros, or trains.

Who is affected?

Millions of public transport passengers and operators who depend on efficient, predictable mobility.

Why it matters?

Stress and uncomfort from crowded trips create a poor experience, affect people for the rest of the day and lowers their performance.

Technology Definition

Smart Occupancy Analytics

Data Acquisition
Real-time data collection
IoT technology

Occupancy Detection
Zone-level occupancy detection
Real-time people analytics

Privacy & Security
Data anonymization
Secure processing (GDPR-compliant)

Visualization & Interaction
Real-time dashboard
Customizable reports

Analytics & Intelligence
Predictive occupancy models
Flow analysis

Scalability & Deployment
Modular architecture
Cloud/edge-ready deployment

Market & Opportunity

Economic Drain

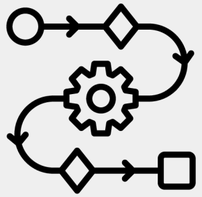
In the EU, inefficient travel networks in urban areas cost Member State economies an estimated 110 billion € each year.

European Court of Auditors
April 2019

SOA Market

Near 2.5B€ market in 2025, reaching 8B€ by 2035.

Average of several reports



Huge Impact

More than 500 billion passenger-kilometres per year across buses, metros, and trams (2023).

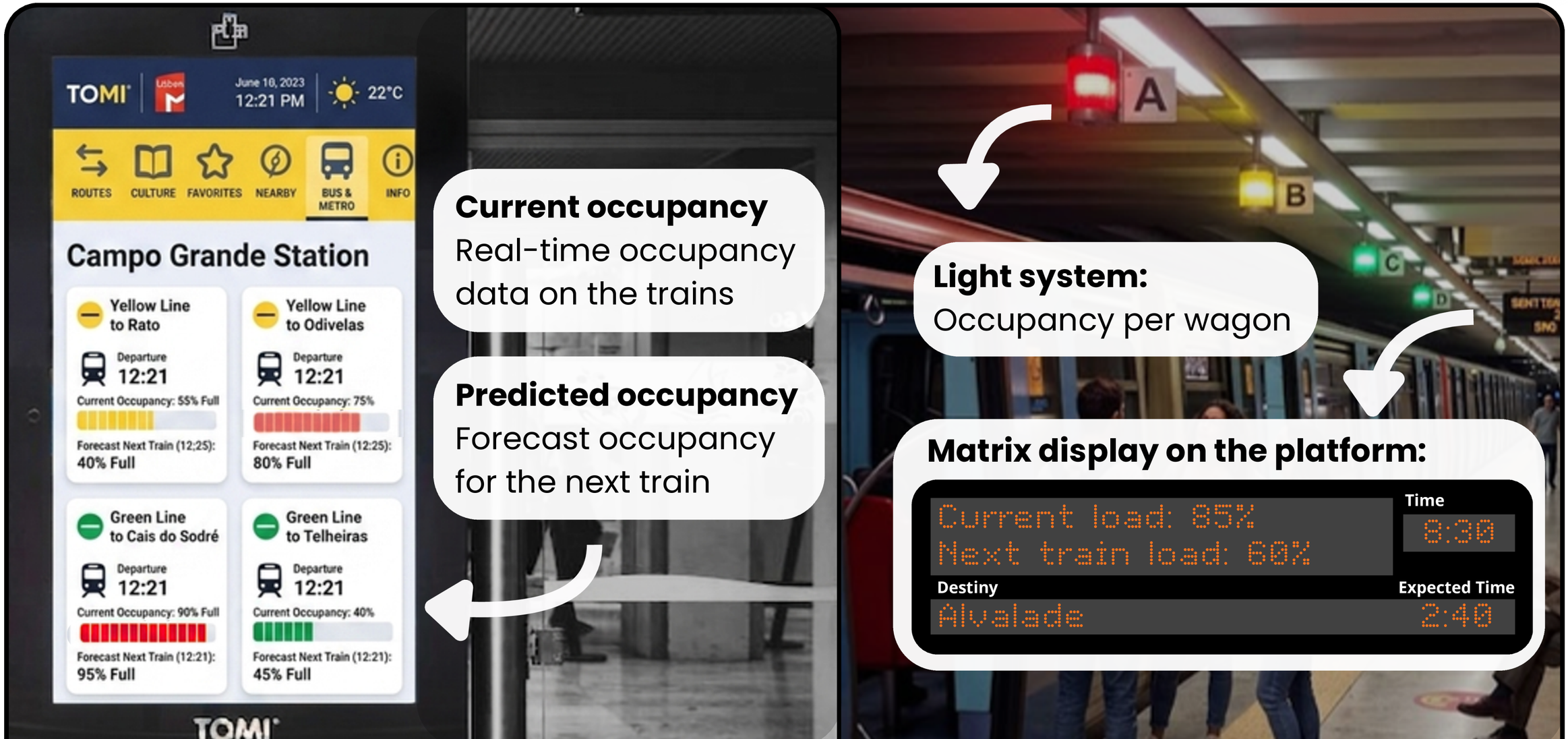
Publications Office of the European Union

EU Funding

163.5 million € available to fund green, smart and resilient transport and mobility research projects.

Horizon Europe
May 2025

Use - At the station



Current occupancy
Real-time occupancy data on the trains

Predicted occupancy
Forecast occupancy for the next train

Light system:
Occupancy per wagon

Matrix display on the platform:

Use - WebApp integration

Real Time Storage

Universal API Gateway

Local Computing

Security & Scalability

Firebase cloud system

- The number of people in the carriage is calculated every 5 seconds.
- The count is sent to the cloud, and the image is deleted.

Carris way

Tomi

Business Model Canvas - BMC

Key Partners

- Transport operators
- Mobility authorities
- Cloud providers
- AI partners
- Hardware suppliers
- Research institutions
- Telecommunications providers

Key Activities

- Occupancy analytic
- Flow prediction
- System monitoring
- Data security
- System integration

Key Resources

- Real-time data
- Secure cloud
- Mobility platforms
- Predictive model
- Expert team

Value Proposition

- Real-time occupancy
- Passenger analytics
- Crowd forecasting
- Multimodal travel
- Decision support
- Operational insights
- Insights and reports for operators

Customer Relationships

- Service updates
- Feedback loop
- Technical support
- Custom insights

Channels

- Passenger webApp
- Station displays
- Operator platforms
- Mobility events

Customer Segments

Paying customers:

- Public transport operators

End users (Non-Paying)

- Daily commuters
- Tourists & occasional travelers

Costs Structure

- Cloud infrastructure
- System integration and deployment
- Costs of Goods Sold - COGS (Hardware)
- Selling, General & Administrative costs - SG&A
- Capex (ex: Furniture, servers, printers and computer)

Revenue Streams

- One-time onboarding fee
- Operator subscription fees, based on package type
- Support, maintenance
- Secondary advertising revenue through the web app

Competition & Differentiation

Companies	Occupancy counting	Flow analysis	Crowd management	Occupancy forecasting	Pre-boarding occupancy info	Multi-Transport Integration	IT systems integration
Urban Flow €	✓	✓	✓	✓	✓	✓	✓
Xovis €€	✓	✓	✓	⊘	✓	⊘	✓
iris-GmbH €€	✓	✓	⊘	⊘	✓	⊘	✓
DILAX Systems €€€	✓	✓	⊘	✓	✓	⊘	✓

Problem & Solution Validation

Interviewed 106 stakeholders to validate the problem and the solution.

"Operators work on long-term contracts, so a service-based model makes more sense."

Marta Lago Bom - Innovation Department CP

"The more information you have about the system, the better you can plan and optimize the network."

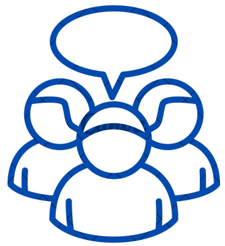
Tiago Farias - Former Ceo Carris, TTSL, ML

"This can give passengers clearer information for smoother daily travel."

Elsa Moniz - Daily User

"If you can ensure it [compliance with the GDPR], the solution could be very attractive for the sector."

Tomé Canas - Head of the Innovation Department ML, Business Mentor



Marketing & Sales Strategy

B2G

1

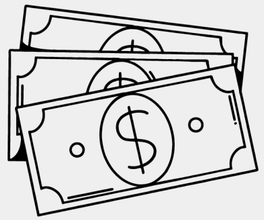
Penetration Pricing

Lower upfront cost removes friction and accelerates operators adoption

2

Trial to Contract

A risk-free trial builds trust and naturally converts into long-term contracts



3

Tiered Pricing

Pricing reflects the measurable operational value delivered to each operator

4

Value-Based Pricing

Costs scale with network size, ensuring fairness and predictable revenue

Pricing Packages & Profit Margins

	Features	Monthly Fee (€)	Profit Margin
UF Monitor * (train or bus)	Real-time occupancy	3 500	35 %
UF Insight **	SOA Monitor + station display & light	4 500	40 %
UF Predict*	SOA Monitor + predictive analytics (TFT)	5 500	40 %
UF Connect **	SOA Insight + flow management	6 500	40 %

TOTAL COST PER WAGON: ~170€

COST PER STATION:
~120€ (6 Wagons)

Others costs:

- Monthly cloud
- API / storage
- Forecasting (TFT)
- Maintenance
- Support

All includes a onboarding fee for initial costs.

* Include 30 wagons ** Include 30 wagons and 10 stations At least 2 years contract.

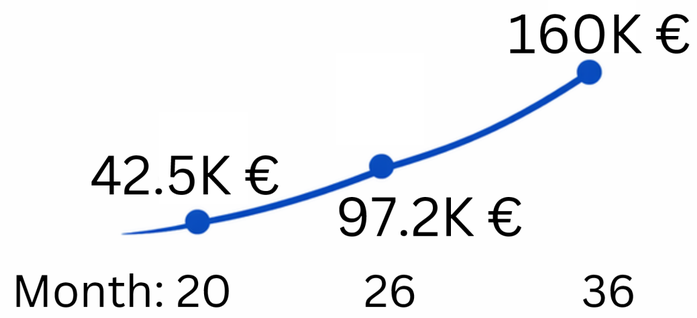
Financials (In 36 months)

Customer Metrics

CAC *	ARPU **	Churn
125 €	360 €	4.49%

LTV > CAC

Revenue Growth



Funding & Ending Cash Balance

Investment	Ending Cash
345K €	Balance 427K €

ECB > Investment

Operating Income

-12.1K € → -10.3K € → 65.2K €

Months: 0, 17 and 36

OI = Revenue - COGS - **SG&A**

* Customer acquisition cost (CAC)
** Average revenue per user (ARPU)

Milestones & Roadmap

0

START

Initial capex deployed

Invest: 60K €

3

MVP READY

Core features validated

11

V1.0 LAUNCH

Full product release

Invest: 85K €

18

GO-TO-MARKET INVESTMENT

Invest: 140K €

First recurring revenue

25

SPAIN EXPANSION

EU Expansion Investment

Service: 5K €

36

3-YEAR CHECKPOINT

Invest < Cash Balance

Established market presence

Why We Are the Ideal Team

Tiago Gonçalves

CTO

Software development internship

Francisco Castanheira

Designer

Introductory course in design

Gonzalo Marques

Marketing

Introductory course in Marketing

Tomás Dias

CFO

Raised in an entrepreneurial family

Gonçalo Ramos

CEO

Project coordination at IEEE STB

Francisco Rodrigues

Engineer

Embedded Systems Engineering Internship

“Without data, you're just another person with an opinion.”

William Edwards Deming

SOA. Turning crowd data into smarter journeys.

Q&A