OASA Electrification Workshop
Engaging Athens: metaCCAZE Use Case for Policy & Practice

National Technical University of Athens: Evi Koliou, Alexandra Vasileiadou, Konstantinos Gkiotsalitis, George Yannis

OASA Telematics: Evi Vasileiou, Efi Paulou

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Table of Contents

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The metaCCAZE project

- **metaCCAZE**:

"Flexibly adapted MetaInnovations, use cases, collaborative business and governance models to accelerate shared Zero Emission mobility for passengers and freight".
metaccaze-project.eu/

- **Partners:**

44 partners from 12 EU countries involving
National Technical University of Athens

- **Duration of the project**:

48 months (January 2024 - December 2027)

- **Framework Program**:

This project has received funding from the Horizon Europe programme under grant agreement No 101139678.

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metaCCAZE Introduction

metaCCAZE aims to revolutionise **mobility in European cities**, serving both **passengers and freight**, with innovative **electric, automated, and connected** solutions designed to make transportation **smarter, net zero, and more efficient for all**.

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Over 70% of EU citizens live in cities which generate 23% of all transport greenhouse gas emissions.

Europe wants to become world's first climate-neutral continent by 2050.

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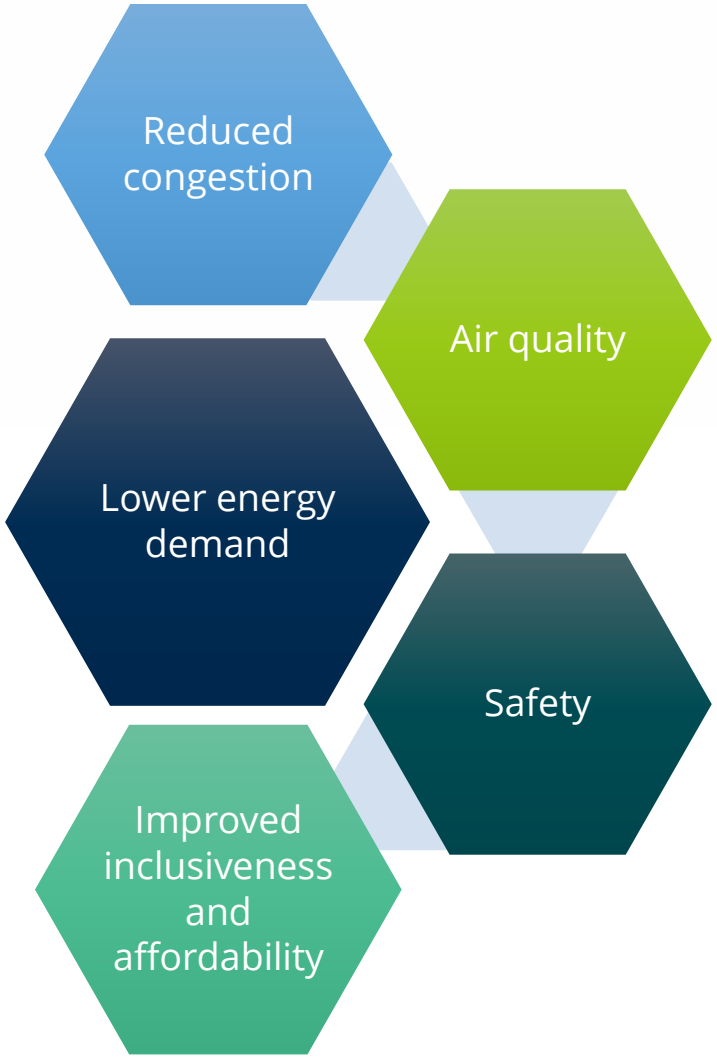
What we aim for

Zero emission shared mobility solutions that combine electrification, automation and connectivity



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What we aim to do

1. Engage professionals and citizens to co-design zero emission shared mobility
2. Develop scalable, resilient technological solutions combining electrification, automation, and connectivity
3. Demonstrate zero emission shared mobility in four trailblazer cities, assessing seasonality effects
4. Transfer solutions to six follower cities, establishing a replicable method
5. Equip markets and stakeholders with skills to adopt zero emission mobility
6. Disseminate results to accelerate metaCCAZE solutions deployment

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metaCCAZE cities

metaCCAZE partners will **test the potential of zero emission shared mobility solutions** in **real** and **diverse urban environments**, in four Trailblazer cities.

Successful technologies and activities will be transferred to six Follower cities.

To ensure the technologies **meet the needs of citizens** and urban mobility stakeholders, a **series of collaboration activities** will be organised locally in the cities.

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Trailblazer cities

Amsterdam – the Netherlands

Munich – Germany

Tampere – Finland

Limassol – Cyprus

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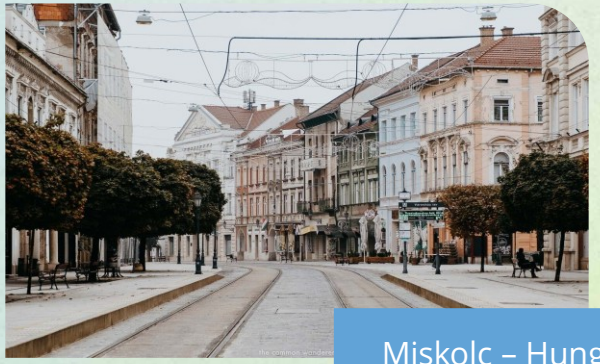
Follower cities

Athens – Greece

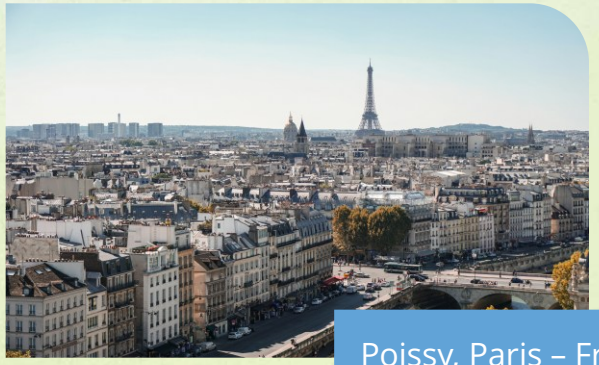
Krakow – Poland

Gozo – Malta

Milan – Italy



Miskolc – Hungary



Poissy, Paris – France

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Athens Current Use Case

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The E-bus rollout in Athens, Greece

- **Bigger picture: ~**1100 buses in daily operation, out of **~**1500 available.
- **Fleet update:** 240 new electric buses to replace old technology buses.
- **70 chargers installed** and **in progress 50 additional chargers** to be installed.
- **Target: 60%-70%** of the active bus fleet transitioning to **electric** or **CNG** by the end of 2025.

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Challenge: Integrating Electric Buses into Daily Operations

While electric buses are now part of the fleet, fully adapting operations remains complex. Key challenges span across strategic and tactical planning:

Strategic planning and Optimization of Charging Station Networks:

- Where to place chargers to minimize bus deadhead time?
- How does traffic stochasticity affect the placement of chargers?
- How do different types of chargers affect the charging station location problem?
- What are the best ways to expand existing charging station networks with current infrastructure?
- Should bus line layout change when considering battery capacity, consumption and re-charging?

Tactical planning and optimization of e-vehicle and driver scheduling and assignment for electric operations:

- How do charging requirements affect vehicle blocks and service schedules?
- How should driver assignments to e-buses adapt in the electric transition?

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Athens Use Cases at metaCCAZE

A. **ATH-UC01: Optimized Scheduling and Route Planning for Electric Bus Integration in Athens**

B. **ATH-UC02: Optimal Planning of Locations of E-Charging Infrastucture for the Athens Electric Bus network**

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ATH-UC01: Optimized Scheduling and Route Planning for Electric Bus Integration in Athens

Summary:

The fleet size for the e-bus deployment has increased from (0 to) 140 to 240 buses.

What metaInnovations will be developed and applied?

Define new vehicle schedules (blocks) and driver schedules (duties) for the electric buses.

Develop two modeling tools: Electric bus route and charging scheduling (MD-E-VSP) tool, and Line Planning (EV-LPP) tool

Perceived Challenges to overcome:

Regulatory uncertainties, training gaps, procurement delays, and data accuracy issues.

Updates:

- First version of the EV-LPP tools is developed.
- Published papers and submissions concerning the charging scheduling and line planning of e-buses.
- No risks have been reported up to now.

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ATH-UC02: Optimal Planning of Locations of E-Charging Infrastucture for the Athens Electric Bus network

Summary:

Chargers are increasingly being installed.

70 chargers installed up to now, and in progress 50 additional chargers to be installed.

What metaInnovations will be developed and applied?

Develop a Charging Station Location Problem (EB-CSLP) modeling tool to identify the optimal charging infrastructure setup.

Determine quantity, type, and locations of chargers; align with energy grid capabilities; potential re-arrangement of existing bus depots and/or bus stops for this cause.

Perceived Challenges to overcome:

Infrastructure upgrades, lack of regulations, and limited real-time monitoring systems.

Updates:

- Three EB-CSLP tools have been developed.
- All three published peer-reviewed papers and submissions concerning the charging station location of e-buses.
- No risks have been reported up to now.

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Mini-dialogues and continuous communication

The Athens Living Lab stakeholders are engaged in continuous internal and external communication with stakeholders.

Some of the **mini-dialogues** engaged up now:

- NTUA visits at OASA and OSY headquarters and depots,
- Lectures by OASA at NTUA course “Public Transport Planning”,
- Presentation to the International Student Association “BEST”,
- Participation of NTUA and OASA at the “Cyprus Forum Cities 2025” in Limassol, Cyprus,
- Participation at the “heart 2025” Conference at Munich, Germany.
- Other interactions with B.Sc. Levels students working with OASA data on their thesis.

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Business Innovation and Governance Models (BIGMs)

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Culture Map (Governance Canvas)

- **Purpose: Understand how stakeholders behave, what they're trying to achieve, and what helps or hinders them.**

Element	Description
Outcomes	What results stakeholders want (e.g. reliable e-bus system)
Behaviors	What people need to do to reach those outcomes (e.g. share data, use planning tools)
Enablers	What supports those behaviors (e.g. funding, leadership, legislation)
Blockers	What gets in the way (e.g. siloed data, resistance to change, bureaucracy)

Business Model Canvas (BMC)

Purpose: Map out how your Use Case creates, delivers, and captures value in a sustainable way.

Block	Examples for e-mobility
Key Partners	NTUA, OASA, OSY, grid operators
Key Activities	Planning, optimization, maintenance
Value Proposition	Reliable, low-emission transport
Customer Segments	Commuters, drivers, transport agencies
Revenue Streams	EU funding, cost savings
Cost Structure	Hardware, software, operations

Value Proposition Canvas (VPC)

Purpose: Go deeper into your users' needs and how you solve them.

Side	Focus
Customer Profile	What users want, what frustrates them (Jobs, Pains, Gains)
Value Map	What your Use Case offers to solve those problems (Products, Pain Relievers, Gain Creators)

Service-Dominant Strategy Canvas (SDSC)

- **Purpose: Understand your Use Case as a collaborative service system, not just a technical deployment.**

Block	What it describes
Focal Actor	Main coordinator (e.g. NTUA or OASA)
Co-Creators	Others who contribute (OSY, DEDDIE, MoT)
Shared Resources	Data, tools, infrastructure
Institutional Arrangements	Laws, norms, processes
Value-in-Context	How each actor benefits in their own way

Closing Remarks

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Closing Remarks

Electrification is not just a technical shift; it’s a city-wide transformation.

1. Today’s workshop showed how real collaboration works across policy, planning, and operations.
2. We validated Use Cases, identified barriers and enablers, and explored sustainable models.
3. Your input today directly shapes the next project phase (D1.5) and Athens' future mobility planning.
4. This is just the beginning; continued stakeholder engagement will be key.

Together, we're helping Athens lead the way in electric public transport.

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Thank you for Your Participation!

OASA Transport for Athens

NTUA – National Technical University of Athens

https://telematics.oasa.gr/
https://ntua.gr/en/

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