cities in motion

POLIS
CITIES AND REGIONS FOR TRANSPORT INNOVATION

SUMMER 2024 | VOLUME IV

PATHWAYS TO PROGRESS

Exclusive interviews with:

Elke Zimmer, Zdeněk Hřib, Krzysztof Matyjaszczyk, Romee Nicolai, Silvio Nocera, Federico Cavallaro

Featuring POLIS members:

Île-de-France Mobilités, Apulia Region, Aarhus, IUAV, Forum Virium Helsinki, Prague, Baden-Württemberg, Częstochowa

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Contributors

EDITOR-IN-CHIEF
ALESSIA GIORGIUTTI

EDITORIAL BOARD
QUAID CEY
CARLOTTA INSERRA
KAREN VANCLUYSEN

MANAGING EDITORS
QUAID CEY
CARLOTTA INSERRA
JONATHAN DE VRIENDT
KAREN VANCLUYSEN

DESIGN
QUAID CEY
ALESSIA GIORGIUTTI
CARLOTTA INSERRA

CONTRIBUTORS
BERNADETTE BERGSMA
CARLO FEDERICO DALL'OMO
CLÁUDIA RIBEIRO
ELKE ZIMMER
FEDERICO CAVALLARO
FRANCESCA ARBORE
FRANÇOISE GUASPARE
GIULIA DI LEO
GEORGE YANNIS
GUSTAV FRIIS
JENNY CARSON
JORGE MANSO GARCIA
KRZYSZTOF MATYJASZCZYK
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SATU REIJONEN
SHRITU SHRESTHA
SILVIO NOCERA
TRACY JAGER
VIRGINIA PETRAKI
WIM DIJKSTRA
ZDENĚK HŘIB
ZSÓFIA JÁKÓI

What is 'Cities in motion'?

'Cities in motion' is **POLIS' magazine** - a place for answers, analysis, and inspiration about the intense and evolving relationship between cities, transport and, essentially, our lives as citizens and mobility actors.

Developed **entirely in-house**, Cities in motion brings together all the inputs on urban mobility that our members have to offer in one convenient place.

For both those who are already vanguard of all things sustainable mobility and those who want to sink their teeth into the world of transport for the first time, 'Cities in motion' quenches a thirst for topic knowledge, and then some.

Do you wish to contribute to the next 'Cities in motion'?

Contact **Alessia Giorgiutti**, POLIS' Communications Coordinator, or **Karen Vancluysen**, Secretary General of POLIS.

FOREWORD

Karen Vancluysen

Secretary General
POLIS

Welcome to the latest edition of Cities in motion, the magazine of POLIS!

In this issue, titled **'Pathways to Progress,'** we explore the transformative power of holistic sustainable urban mobility solutions. Our stories highlight the integration of climate adaptation, technological advancements, community engagement, and collaborative governance into transport planning, showcasing the efforts of various stakeholders working towards the common goal of creating safe, efficient, and sustainable journeys for all.

We see Île-de-France preparing for the 2024 Olympic and Paralympic Games with a truly integrated approach to transport. The region ensures seamless and inclusive travel for millions of spectators, setting the stage for long-term modernisation and connectivity, and providing a model for metropolises worldwide.

Elke Zimmer, Secretary of State of the Ministry of Transport in Baden-Württemberg and host of the upcoming POLIS Conference, stresses the importance of strategic parking solutions. Not only do they promote eco-friendly transport and improve road safety, but they also influence mobility behaviour, reclaim public spaces, and contribute to broader climate targets.

We revisit the theme of influencing mobility behaviour and engaging local communities in urban planning through gamification. The Block by Block and WohnRegion projects successfully use video games like Minecraft to involve citizens in designing public spaces, while the SuperBARRIO game enables inclusive urban planning by allowing users to co-create mobility solutions.

Cycling takes centre stage in several articles, reflecting its ever-growing importance for sustainable urban mobility. The Province of Overijssel shows how it integrates cycling with Intelligent Transport Systems (ITS), enhancing safety, comfort, and convenience.

Amsterdam's newly appointed Bicycle Mayor Romee Nicolai highlights the city's dedication to low-carbon travel and mobility justice. Lastly, tools like Transoft's AutoTURN Pro software exemplify the push for safer and more inclusive cycling networks. These efforts are crucial for integrating bicycles and e-vehicles into urban transport systems effectively.

Other emerging technologies, alongside collaborative governance, are pivotal in modernising urban transport. The SOLUTIONSplus project and the EIT Urban Mobility RAPTOR programme showcase the development of tailored e-mobility solutions and smart city technologies, fostering sustainable urban mobility through innovative approaches and stakeholder collaboration. Innovative solutions come in other shapes and forms, too—sometimes as autonomous delivery vehicles bearing the snowy streets of Helsinki, and sometimes as multimodal transport hubs that integrate rural and urban mobility in North Holland.

As in past issues, we delve into the worlds of safety—this time in micromobility and on rural roads. We also cover Sustainable Urban Mobility Plans (SUMPs), with Czestochowa showcasing the transformative potential of comprehensive urban planning through its SUMP, and National Support Programmes for Sustainable Urban Mobility Planning showing their essential role in standardising and advancing sustainable mobility practices across Europe.

Other topics we have rarely featured finally take front and centre in this issue, with investigations into noise pollution in our cities, discussions on the interconnection between climate adaptation and mobility justice, explorations of Aarhus Municipality's carpooling initiative to reduce CO2 emissions, and examinations of regional programmes and funding allocations with a focus on the Apulia Region.

As we navigate the intricate pathways to progress for a more sustainable future, it becomes evident that the collective efforts of cities and regions across Europe and beyond are paving the way for a more connected and green world. Moreover, it is clear that the pursuit of sustainable urban mobility is not just about addressing present challenges but also about anticipating and adapting to future needs using a whole lot of empirical work and a pinch of bold creativity.

We hope these articles and interviews inspire you—enjoy!

Karen Vancluysen
Secretary General of POLIS Network

ACCESS

The theme of Access serves as an overarching pillar within POLIS, under which the Working Groups on Access and Parking, and the Just Transition Taskforece are organised.

These groups collaborate to address the multifaceted challenges of urban mobility, ensuring that cities and regions can provide accessible, fair, and efficient transport solutions for all citizens.

The **Access Working Group** delves into a wide range of issues, such as access regulations, car use, urban space allocation, pricing, and infrastructure. The Group prioritises managing vehicle access with a focus on fairness and cross-border enforcement, incorporating technologies like geofencing and Intelligent Speed Assistance (ISA). It also works on strengthening public transport as the backbone of a multimodal mobility system, enhancing cooperation between transport and tourism, particularly with coaches in cities, building urban nodes within the TEN-T network, and advancing Urban and Unmanned Air Mobility.

The **Parking Working Group**, in partnership with the European Parking Association, addresses urban parking policies and practices. It coordinates efforts among authorities and professionals to innovate in on-street and off-street parking, public-private partnerships, EV infrastructure, and dynamic curb-space management. The group aims to implement best practices in curb-space management and investigate the integration of parking with energy infrastructure, particularly focusing on EV charging. It also plans to ensure accessible charging infrastructure through ongoing dialogue with the European Disability Forum and develop policies to optimise the vehicle fleet size.

The **Just Transition Taskforce** is dedicated to promoting a fair and sustainable transition to cleaner and more resilient urban mobility systems. It addresses imbalances in the current mobility landscape, promotes inclusive governance, and fosters cross-sector collaboration to find innovative solutions that prioritise equity. Additionally, it engages in global policy and capacity-building activities and promote cross-sector collaboration to create sustainable and equitable mobility solutions.

Find out more about the Access Working Group on our website!

Find out more about the Parking Working Group on our website!

Find out more about the Just Transition Taskforce on our website!

GAMES WIDE OPEN

Discover how **Île-de-France Mobilités** is revolutionising transport for the **Paris 2024 Olympic and Paralympic Games**. With enhanced accessibility, innovative solutions, and strategic planning, getting around the event has never been easier!

WRITTEN BY
FRANÇOISE GUASPARE

Île-de-France Mobilités, the Organising Authority for Mobility (AOM) of the Île-de-France region, is an official partner of the Paris 2024 Olympic and Paralympic Games.

From 26 July to 11 August, France will host the Olympic Games, welcoming over 7 million spectators to 25 competition sites, with 12 in Paris and 13 in the Île-de-France region. Following from 28 August to 8 September, the Paralympic Games will also grace the nation, with 17 competition sites, 10 in Paris and 7 in the Île-de-France region, ready to welcome more than 3 million spectators).

Working alongside the International Olympic Committee and the Mobility Committee for the Paris 2024 Olympic and Paralympic Games, IDFM takes charge of

orchestrating seamless transport for spectators and accredited individuals throughout various events. As the mobility authority, IDFM will enhance the travel experience for Parisians and visitors alike, ensuring effortless journeys between the various Olympic and Paralympic sites.

The first Olympic sites accessible by public transport!

Île-de-France Mobilités has designed new transport plans for reaching each site easily, thus ensuring that the Games are 100% accessible by public transport. The plans will orientate spectators on different lines depending on their number, and will additionally provide complementary solutions in the event of incidents.

Passenger flow management is strategically important for the Olympic Games, as it is vital to cope with crowds. These transport plans include all the lines near the sites as well as lines further away, to ensure the necessary capacity for transporting spectators. IDFM will offer shuttle bus services, too, when the sites are too far from train stations.

Île-de-France Mobilités is overall working to ensure that all sites will be accessible by increasing rail network services for the Paris region, by around 15% on average and up to 25% on the lines most affected by the Games.

The Games experience and accessibility will be further improved by providing additional travel solutions, with automatic metro lines (1, 4, 14) opened all night for the Olympic ceremony, several metro lines and Regional express line (RER C) opened for everyone during the night of the marathon, and increased night buses service (Noctilien) during the Games period.

Moreover, by serving the sites furthest from public transport, such as Golf National de Saint-Quentin en Yvelines and the Stade Nautique de Vaires-sur-Marne, with shuttle buses, but also offering travel solutions to those sites where large crowds are expected, such as Parc des Princes for the football competition and Roland Garros for the tennis competition, Île-de-France Mobilités shows their attention to not leave anything to chance.

A truly enhanced experience

To enhance spectators' experience during the Games, Île-de-France Mobilités is financing and implementing several solutions for all travellers, including:

- A multilingual application for game spectators to select Olympic games sites and integrate specific public transport offers, such as shuttle buses and reinforced transport options. Spectators will also benefit from the 'Paris 2024 Route', which suggests the optimal route based on the number of spectators, ensuring even distribution. Tourists will be able to plan their journeys by downloading the 'Paris 2024 public transport' app and selecting their desired site and date. They will receive a notification the day before the event to plan their journey and will be notified on the day of any disruptions.

- An adapted public transport ticketing system, featuring a single pass granting access to all transport networks in Île-de-France, including airports, and all modes of transport, such as bus, tram, metro, RER, and train. This pass will be available in advance in a paperless version to cut waiting time at ticket offices.

- A coordinated transport communication between Paris 2024 and Île-de-France Mobilités, including signage dedicated to the Games displayed in all stops, trains, and lines serving the Games, as well as in major stations and transfer points. This signage will be complemented by a large number of volunteers, all clad in Games colours, to guide spectators.

And, above all, an inclusive and safe one, too!

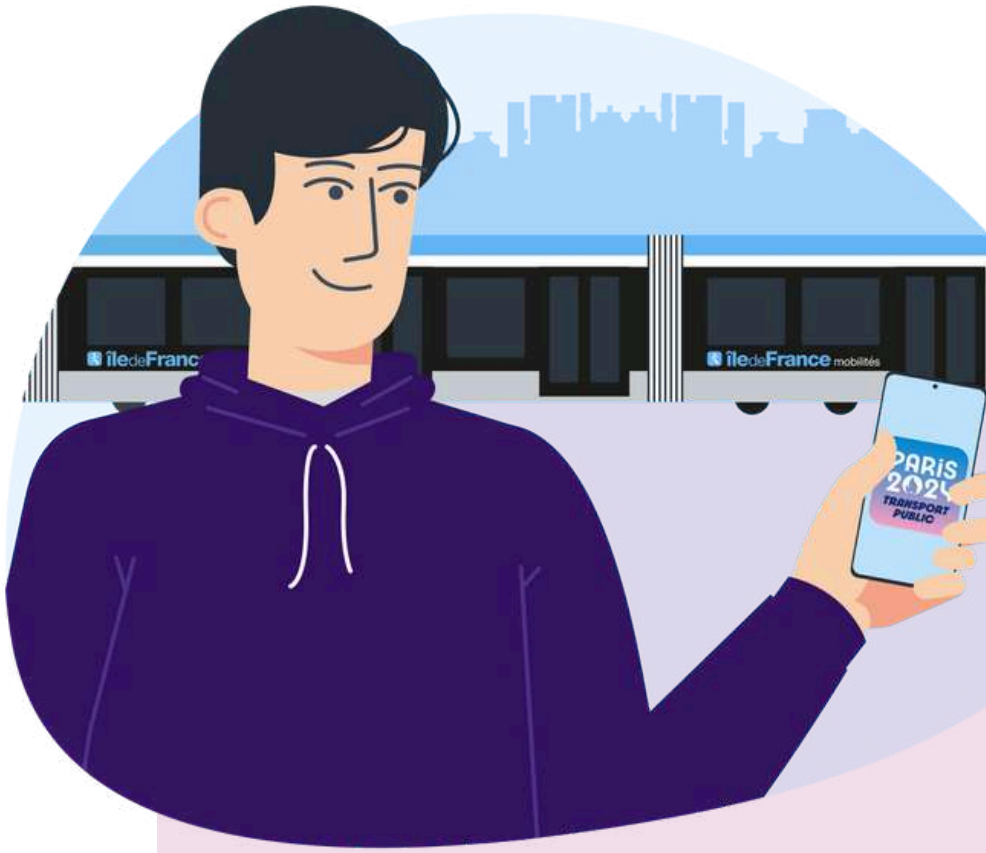
Île-de-France is planning solutions to ensure that everyone can navigate Paris and its surroundings safely. To facilitate travel for people with reduced mobility to get around during the Games and to guarantee everyone's safety, Île-de-France Mobilités has devised dedicated solutions, such as:

- Dedicated shuttles for wheelchair users: For all spectators with 'wheelchair user' tickets, Île-de-France Mobilités has set up a shuttle reservation service to enable them to travel to the Île-de-France sites from 7 Paris stations.

- 240 accessible stations on the Île-de-France Mobilités network, covering 95% of train and RER traffic and 100% of stations near competition sites.

- 100% accessibility of RER A and B stations, as well as the extension of line 14 in June between Saint-Denis and Orly airport.

As Valerie Pecresse, President of the Île-de-France Region and Île-de-France Mobilités, said: 'Organising the Paris 2024 Olympic and Paralympic Games has been a challenge, but the Île-de-France Region, the second-largest funder of the Games after the French government, and Île-de-France Mobilités are ready to host the Games. All the sports facilities were delivered on time, as were all the new transport lines (metro lines 11 and 14, the extension of RER E and tramway T3b). The Games have acted as a tremendous catalyst for projects to create a lasting legacy for the people of the Paris region. In 7 years, we have been able to carry out projects and make the region greener, more connected, more supportive, and more sporty. Without the Games as an accelerator, this implementation would have taken 15 years or even decades.'



Île-de-France Mobilités

Île-de-France Mobilités is an integrated organising authority responsible for all modes of transport in the Île-de-France area. Île-de-France Mobilités designs, organises and finances public transport, new forms of mobility and sustainable mobility for all Ile-de-France residents.

At the heart of the Île-de-France transport network, Île-de-France Mobilités brings together all the stakeholders (passengers, elected representatives, manufacturers, transport operators, infrastructure managers, etc), and invests and innovates to improve the service provided to passengers.

The regional mobility authority conducts an ambitious policy to modernise the network, the operation of which it entrusts to transport operators. Île-de-France Mobilités is composed of the Île-de-France Region and the eight County Councils and therefore has a vision for all transport services in the Île-de-France region (train, RER, metro, tram, T Zen and bus).

SPACE, SAFETY, CLIMATE PROTECTION

Baden-Württemberg's target is to reduce transport-related CO2 emissions by 55% by 2030 compared with 1990 levels and reach climate neutrality by 2040. To this end, **parking** management plays a central role, and for this reason, the State's Ministry of Transport supports local authorities in effectively implementing it.

POLIS: Parking management as a climate protection instrument: what does it mean and how is the region involved?

Elke Zimmer: Parking management contributes to the fulfilment of climate targets in the transport sector in a valuable way — we believe it significantly affects mobility behaviour. Nevertheless, parking management must be implemented in combination with the expansion of climate-friendly modes of transport like cycling, public transport, and car-sharing. In this way, we enable climate-friendly mobility without reducing freedom and flexibility for people.

INTERVIEW WITH
ELKE ZIMMER

ELABORATED BY
ALESSIA GIORGIUTTI

Elke Zimmer

Secretary of State
Ministry of Transport
Baden-Württemberg

When parking is no longer free of charge and parking fees reflect the value of public space, parking management becomes a powerful tool to influence the way people organise their daily mobility.

Implementing cost-covering parking fees can reduce the usage of private cars and encourage the shift towards more climate-friendly modes of transport. In addition to that, parking management can decrease the overall number of private cars, leading to a fairer allocation of space for sustainable mobility, residential, and recreational areas.

Besides the fact that parking management acts as active climate protection, it improves road safety and enhances quality of life by reclaiming public spaces previously occupied by traffic.

Local authorities play a central role in the implementation of climate protection measures — that is also true for parking management. To support these efforts, the State of Baden-Württemberg offers a wide range of programs to help local authorities accelerate climate protection initiatives in mobility at a local level.

POLIS: You mentioned the supporting instruments offered by the State of Baden-Württemberg. Can you give some more details on that?

Elke Zimmer: Our support for local authorities in Baden-Württemberg focuses on three main areas.

Firstly, we established the Kompetenznetz Klima Mobil, comprising fifteen employees who serve as a point of contact and expertise hub for climate protection in mobility across the State. The network advises cities, municipalities, and districts on specific issues related to parking management and integrated traffic planning.

One of the new instruments offered by the Kompetenznetz Klima Mobil is the Park.Raum.Dialog, which allows municipalities to swiftly and strategically adopt a participatory approach to parking management.

In addition, Baden-Württemberg promotes parking space concepts and conducts surveys on parking space use. The State also supports municipalities by funding personnel positions for stationary traffic and data collection management related to parking.

Moreover, Baden-Württemberg empowers local authorities to implement parking management measures with a degree of flexibility. For example, in 2021, Baden-Württemberg was one of the first federal states to grant local authorities the power to determine residential parking fees themselves, considering factors such as real costs of parking.

POLIS: You mentioned the new instrument called Park.Raum.Dialog. What exactly is it and what is the background of the instrument?

Elke Zimmer: The Park.Raum.Dialog brings together stakeholders from public administration, the private sector, politics, and civil society. The aim is to enhance local parking management to make the municipality more attractive. Participating municipalities can swiftly tackle local parking issues and develop targeted measures for integrated and climate-friendly mobility planning by combining different perspectives, needs, and ideas.

The Park.Raum.Dialog builds upon the ParkPAD audit process, which was piloted in fifteen European countries through the Park4SUMP project, an EU-funded project running from September 2018 to March 2022.

The Park.Raum.Dialog in Baden-Württemberg focuses on the involvement of local communities

© *Kompetenznetz Klima Mobil*

In this context, the Kompetenznetz Klima Mobil successfully implemented ParkPAD processes in several municipalities, including Heidelberg and Kehl. Together with local authorities, the instrument was further developed into the state-owned participatory process called Park.Raum.Dialog, which is specially adapted to the needs of local authorities and aligns with the targets for the transformation of the transport sector in Baden-Württemberg.

The initial application phase has concluded, and the launch of Park.Raum.Dialog is scheduled for the second half of this year.

POLIS: How does the process work? What experiences have been made in Baden-Württemberg so far?

Elke Zimmer: The process begins with a survey on the current state of local parking management. Subsequently, two half-day meetings are held in the municipality to brainstorm ideas and devise solutions for parking challenges.

The results are summarised in a report and presented to the municipal council. The report outlines concrete measures to better align parking management with the transformation of the transport sector. Alongside strategic approaches, the immediate implementation of different measures, such as the adjustment of parking fees, plays a key role.

The Park.Raum.Dialog, being a short and intensive process, has garnered positive feedback from municipalities in Baden-Württemberg due to its rapid and participatory approach. Key aspects praised include the structure of the process, the constructive working atmosphere, the open exchange, the willingness to compromise, and the development of innovative and creative ideas. Thanks to its well-founded and discussed ideas, the process serves as a starting point for further decisions on parking management measures and helps streamline municipal processes.

By involving various stakeholders, the Park.Raum.Dialog also contributes to the legitimacy of developed solutions and helps mitigate conflict in parking management.

POLIS: What issues and questions on parking management are local authorities currently facing, and what support is offered on these topics?

Elke Zimmer: Residential parking is a key topic under discussion. Due to various legal inquiries, the Kompetenznetz Klima Mobil offers extensive information on residential parking regulations on its website. Another important issue is parking on pavements, which is generally prohibited due to its impact on traffic safety and walkability, yet often tolerated: an increasing number of municipalities in Baden-Württemberg, like Heidelberg, are enforcing these rules through effective parking control measures.

The Kompetenznetz Klima Mobil supports these efforts by assisting in the implementation of digital parking control systems to ensure the effectiveness of parking management measures and fair space allocation.

Regardless of specific measures, effective communication must be considered in parking management. Some parking management measures, such as raising parking fees or reducing parking spaces in public areas, often spark controversial debates and emotional arguments.

To foster understanding and acceptance of such measures, targeted communication is required. Hence, the Kompententznetz Klima Mobil has developed the communication initiative 'Platzgewinn fürs Klima' — in English, 'Saving space for the climate', which supports local authorities in communicating with citizens. This initiative includes informative charts, templates for press releases, and a communication guide. When communicating parking management, it is important to emphasise the expected positive impacts on individuals, the city, and the climate.

Successful parking space management in Pforzheim and Heidelberg, Baden-Württemberg

© Kompetenznetz Klima Mobil

ENVIRONMENT AND HEALTH

Environment and Health in mobility encompasses themes that POLIS covers in two Working Groups - the Active Travel and Health Working Group and Clean Vehicles and Air Quality Working Group.

Moreover, POLIS has created a Climate-Neutral Cities Mission Taskforce to help its member cities achieve transport decarbonisation.

he Active Travel and Health Working Group promotes walking, wheeling, and cycling as integral parts of urban mobility. It focuses on strategies for equitable public space distribution, emphasizing the health benefits of active travel and ensuring accessibility for all. In 2024, its priorities include urban planning for active mobility, highlighting health benefits, advancing data and ITS for active modes, ensuring inclusivity, and building a culture of active travel.

The Clean Vehicles and Air Quality Working Group tackles air pollution and promotes sustainable transportation. It supports cities in improving air quality through policy frameworks and technologies, focusing on electrification, EV infrastructure, and clean fleets. For 2024, priorities include ensuring EU policies reflect city needs, bridging research and practice for EV infrastructure, continuing stakeholder dialogue, and exploring issues like geofencing and tyre pollution.

The Climate-Neutral Cities Mission Taskforce helps POLIS member cities achieve transport decarbonisation. It focuses on implementing mobility measures in climate plans, sharing knowledge and tools, fostering cooperation, securing funding, and advocating for transport-related issues. In 2024, the Taskforce aims to implement impactful transport measures, promote cooperation, and unify voices on common issues.

Find out more about the Active Travel and Health Working Group on our website!

Find out more about the Clean Vehicles and Air Quality Working Group on our website!

Find out more about the Climate-Neutral Cities Mission Taskforce on our website!

FINDING SOLUTIONS... PLUS

As cities worldwide strive to meet climate goals, the **SOLUTIONSplus** project has emerged as a transformative force, paving the way for innovative **electric mobility** solutions. This initiative, funded under Horizon 2020, co-designed fit-for-purpose e-mobility solutions advancing the sustainable mobility transition in Europe, Asia, Africa, and Latin America.

WRITTEN BY
OLIVER LAH
SHRITU SHRESTHA
CLAUDIA RIBEIRO

At the core of SOLUTIONSplus lies a co-design approach that brings together local stakeholders to develop electric mobility solutions tailored to unique and diverse urban contexts. This inclusive strategy has yielded significant achievements worldwide, ensuring that solutions are not only fit-for-purpose but also adaptable for scalability.

Ampersand provided 24 e-motos to women after completing training
SOLUTIONSplus

The project has delivered added value across several domains:

Building capabilities

Through training programmes and peer-to-peer exchanges, stakeholders in Asia, Latin America, Africa, and Europe have been empowered with the knowledge and skills needed to implement e-mobility initiatives. These efforts have been intrumental in fostering local expertise among various stakeholders and inspiring the adoption of e-mobility innovations.

Supporting start-ups

16 local start-ups were actively involved in Living Labs to test and validate prototypes, operations, and business models. Success stories abound, such as Ampersand in Kigali, which introduced affordable electric motorcycles and battery swapping stations, and Tojo Motors in Pasig, which developed versatile electric vehicles for urban applications.

Strengthening collaboration

Ongoing consultations with local and national authorities have played a crucial role in shaping supportive policies and fostering business collaborations. This collaborative approach ensured the seamless integration of innovative e-mobility solutions into broader urban planning and development frameworks.

Creating reference models

Demonstration actions in multiple cities provided valuable data and insights, establishing reference models for e-mobility innovation. These models have showcased the viability and benefits of electric vehicles, encouraging replication in other regions.

A global e-mobility revolution

SOLUTIONSplus has implemented Living Labs in ten cities worldwide, serving as dynamic hubs for testing and refining innovative e-mobility solutions. These labs fostered collaboration with local companies and stakeholders, driving the development of context-specific electric mobility projects.

Moreover, many of these initiatives are now being propelled by implementation programmes funded by entities such as the Global Environment Facility, the Mitigation Facility, the International Climate Initiative, the Directorate-General for International Partnerships of the European Commission, and many others.

But where are these Living Labs, and what remarkable innovations have they developed?

E-quad developed for the Pasig Living Lab

SOLUTIONSplus

Asia: Hanoi, Pasig City, Kathmandu, and Nanjing

In Hanoi, Vietnam, last-mile connectivity was enhanced through a pilot project linking a BRT station to a mall, demonstrating the effectiveness of shared electric two-wheelers in urban environments.

In Pasig City (Metro Manilla region), Philippines, smart, multi-purpose e-quadricycles and flexible electric vans were introduced by local manufacturer Tojo Motors, that then integrated them into city services through a dedicated booking app.

Retrofitted ICE three-wheeler in Dar es Salaam
SOLUTIONSplus

Meanwhile, the Nepalese city of Kathmandu focused on retrofitting old diesel buses and mini trucks to electric, as well as old e-three-wheelers (Safa Tempos) for passenger and cargo use. The city also developed modular light electric vehicle prototypes, enhancing the flexibility and expanding the application of electric vehicles, such as shuttle vans and waste collectors.

Lastly, Nanjing's Living Lab, China, tested eco-routing solutions for passenger transport, supported by the Chinese government, aiming to optimise routes for environmental sustainability.

Latin America: Quito and Montevideo

In Quito, Ecuador, a multimodal e-mobility hub was established, facilitating urban logistics operations with locally manufactured e-cargo bikes, e-quadricycles, and e-mini vans. The hub facilitated the distribution of food supplies and beverages to restaurants and hotels, the collection of recycling materials and the delivery of parcels within the city's historic centre, reducing emissions and congestion.

Uruguay's Montevideo piloted e-cargo bikes for last-mile delivery services, with collaboration between local and European start-ups, the municipality, and the public utility company (UTE) enabling the expansion of road and charging infrastructure for Low-emission vehicles (LEVs), as well as the testing of new logistics models.

Africa: Kigali and Dar es Salaam

In Kigali, Rwanda, locally designed and gender-inclusive e-motos were deployed, empowering women through sustainable mobility solutions — something we detailed in a previous edition of Cities in motion. Moreover, the pilot allowed the launch of a new electric bus fleet using innovative financial mechanisms that tackled the typical barrier of upfront investment costs.

Dar es Salaam, Tanzania, introduced electric tuk-tuks to replace fossil fuels in passenger services, along with pedal-assist electric bicycles for urban deliveries, supported by extensive data collection to inform scaling efforts.

Europe: Hamburg and Madrid

Hamburg, Germany, implemented e-scooter sharing and electrified the taxi fleet, with the latter enabled by the integration of a Low Carbon Mobility Monitoring tool that provided valuable data on the environmental benefits of these initiatives.

Madrid's Living Lab, Spain, focused on e-bus charging infrastructure and the development of a new mobility hub, showcasing significant cost savings and operational efficiencies through its smart charging system for e-buses.

The road ahead

To support the replication of the learnings from the project, SOLUTIONSplus has meticulously crafted a comprehensive toolbox, including training materials, policy papers, and technical guidelines. By disseminating knowledge and best practices, the project ensured that cities and regions worldwide could draw upon its innovations, accelerating the global transition towards sustainable urban mobility.

As SOLUTIONSplus draws to a close, its legacy of collaborative innovation and practical implementation sets a robust foundation for future e-mobility initiatives at a global level. The project's achievements across diverse urban landscapes demonstrate the transformative potential of electric mobility, promising to reshape cities, mitigate emissions, and improve quality of life. With a clear trajectory illuminated by these pioneering solutions, cities are poised to embark on a journey towards more sustainable, efficient, and inclusive urban mobility systems.

EVs: A pillar of tomorrow's mobility landscape

Ather Energy, Unsplash

A MAYOR FOR THE FUTURE

INTERVIEW WITH
ROMEE NICOLAI

ELABORATED BY
QUAID CEY

In March 2024, 25-year-old Romee Nicolai was appointed **Bicycle Mayor** for the **City of Amsterdam**. Over the next two to four years, she aims to bring the 'slow city' concept to the Dutch capital and build a stronger sense of community among local residents, one bike at a time.

Romee Nicolai
© Kick Smeets

In a country where citizens cycle an average of 18.8 kilometres per week, strong cycling policies are a must. Thankfully, the City of Amsterdam is ahead of the game: safe roads, well-maintained bike lanes, and ample parking spaces are just a few of the ways that the Dutch capital is encouraging its citizens to make short-distance trips by bike.

Confronted with a shortage of public space and the looming climate crisis, Amsterdam has made 'conscious mobility behaviour' one of its top future transport priorities. In practice, this means promoting travel modes that occupy as little space as possible and produce the smallest carbon footprint. Few will be surprised to hear that cycling is one of the main ingredients of the city's 'conscious mobility' mix.

But earlier this year, Amsterdam took things one step further: in March, the city appointed 25-year-old Romee Nicolai as its newest Bicycle Mayor. Alongside her ongoing Master of Urban and Regional Planning at the University of Amsterdam (UvA), Nicolai will work with city officials and the international BYCS Network of Bicycle Mayors to enhance Amsterdam's cycling policy. If that weren't enough, she will also continue to serve as Project Leader for the Bike Kitchen UvA, a community space where visitors can learn about bike repair.

Eager to know more, POLIS reached out to Nicolai to find out what plans she has for the next two to four years of her term. Drawing on a life-long love of cycling and a more recently discovered passion for bike repair, she shared insights into Amsterdam's bike culture, explained why human connection is essential to sustainable cycling behaviour, and told us what she thinks the 'slow city' concept means for Amsterdam's future.

POLIS: Being elected Bicycle Mayor for the City of Amsterdam at the age of 25 is quite an achievement. Now that the time has come for you to make your mark, what do you aim to achieve in the next two years?

Romee Nicolai: I feel honoured to fulfil this role as Bicycle Mayor because it feels like an extension of my values and the goals that I want to achieve to make a city like Amsterdam safer and more bike-friendly.

A bicycle mayor is a connector: between people, the city, and bicycles. This can be done by highlighting the benefits of cycling in terms of economy, sustainability, and health. Furthermore, it can be done by exploring the opportunities for collaboration between like-minded businesses, government institution programs, and community groups, to lay the groundwork for a movement of stakeholders that share the same ideas.

During my term as Bicycle Mayor of Amsterdam, I aim to stimulate debate about the meaning of cycling. Additionally, I hope to enhance the human-city-bike connection through self-repair facilities and activities in the city that reshape people's beliefs about cycling.

POLIS: As the new Bicycle Mayor of Amsterdam, you have also joined the BYCS network, which includes more than 200 bicycle mayors worldwide. What do you hope to gain from your participation in this network? What lessons might bicycle mayors from cities across Europe and further afield have to offer Amsterdam?

Romee Nicolai: I am part of an international network of 144 bicycle mayors worldwide: 60 from Europe, the Middle East, and North America, 55 from India, and 29 from Latin America. The role of a bicycle mayor depends on the individual and their background, but it primarily involves representing the interests of cyclists in one's city. It inspires me to see that we all have a common ground and aspire to explore ways to make cycling more accessible and cities more bike-friendly for every group in society.

This made me reflect on the fact that we are spoiled with our Dutch infrastructure and bike facilities, but that accessibility and road safety are still topics for improvement. In Amsterdam, the primary challenge is not how to convince car-owners to switch to bikes, but more to convince bike-users not to behave like car-users with their speed and reckless behaviour.

My goal is to create awareness and dive into the above-mentioned themes by introducing new social norms around cycling. The most powerful way to do this is learning by doing.

POLIS: Alongside your mayoral duties, you are also enrolled in the Master of Urban and Regional Planning at the UvA. How do these two roles feed into each other? In other words, how do your studies inform your work as Bicycle Mayor, and vice versa?

Romee Nicolai: That is right. My bachelor's and master's studies at the UvA have both been in the field of social science, so I

Romee Nicolai

Bicycle Mayor
City of Amsterdam

have an academic background in the field that I am currently working in. In social science, you investigate from an interdisciplinary perspective how decisions in the physical environment can have an impact on the social beliefs and behaviour of people and vice versa. This is exactly what a bicycle mayor does as well.

My study background helps to create a solid knowledge and value base for decision-taking: I have the academic and societal know-how to understand what (side)effects of different mobility-related decisions could have on human well-being and the opportunities for interaction. While it was ambitious and challenging to combine my studies with work, it was possible thanks to my internal drive and persistency to make knowledge more tangible and to transform societies through individual action.

POLIS: Amsterdam is often seen as a haven for cyclists, but you have pointed out that the city's cycling culture lacks an element of 'human connection.' Can you elaborate on this? Moreover, how is this observation linked to your mission at the Bike Kitchen UvA?

Romee Nicolai: Bike-friendly means that the opportunity for bikes is well-provided in Amsterdam. This is true: We have bike lanes everywhere, a lot of (underground) bike parking facilities, well-known Dutch cycling brands, and good-quality bikes.

However, from what I experienced as a born-and-raised Amsterdammer is that the pace of life is based on time: everyone seems to be in a hurry, and everything is based on efficiency. Furthermore, Amsterdam is a fast-growing city and is becoming more crowded.

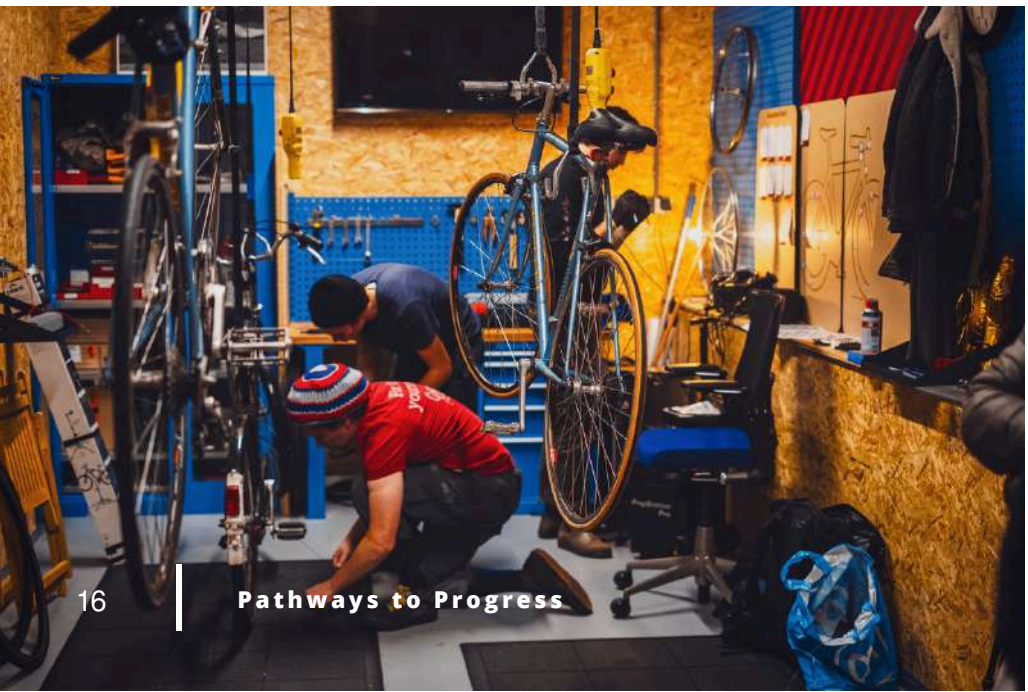
Therefore, it concerns me that people appear to not have time for each other: greeting each other while passing, taking each other into account on the road, or creating a moment of interaction while waiting for a traffic light. It sometimes feels that everyone in traffic seems to be bothered by the time that their journey takes in their daily lives.

This is one of the reasons I started the Bike Kitchen UvA: a do-it-yourself bike repair workshop, where it's all about the journey and repairing by trial and error. It is located on a university campus with over 26,000 students and is known internationally as a testbed for innovative research in different disciplines and themes such as sustainability. As a student, I realised that everyone became almost invisible in the masses and that there was a need for co-creation, interaction, and knowledge exchange.

Therefore, I thought: What is something that everyone has and that can create engagement? Bicycles. My goal is to create awareness about the fact that a bike can be more than only a transport mode; it is also a means of self-expression, freedom, and social interaction. In the bike kitchen, we offer a DIY repair space, but what we actually do is create a living lab and social hub in which different types of knowledge emerge. This started very grassroots- and bottom-up but has proven successful already and has been fully booked since it opened.

Inside the Bike Kitchen UvA

Romee Nicolai



Making space for cyclists (Amsterdam)
Guus Baggermans, Unsplash

POLIS: In a past interview, you said that you are a proponent of the 'slow city' concept and that you hope for Amsterdam to embody this ethos in its cycling policy. In your opinion, how could the slow city concept benefit transport policy in Amsterdam?

Romee Nicolai: I strongly believe that the concept of the slow city allows for the improvement of life quality because slowing transport has benefits for the health of people, the planet, and the economy. This helps to create a more human-centred instead of a transport/product-centred approach in policymaking.

As Jane Jacobs already stated in the 60s, cities should be seen as dynamic, living ecosystems that change over space and time. If transport planning continues to take this aspect into account in decision-making, citizens become the protagonists and mobility is a means to help them move around.

In Amsterdam, the slow city could highlight a more human-oriented approach and accentuate diversity. This provides a counterbalance to the acceleration of society and the conventional goal-oriented approach, in which it seems that there is no space for reflection.

POLIS: If biking is to become a regular feature of daily life and a pillar of sustainable mobility in communities around the world, what do you think must change? What role can bicycle mayors such as yourself play in driving this change?

Romee Nicolai:To begin with, we need to address what is needed to enhance the accessibility of biking worldwide. In saying this, I am aware that I speak from a Western/Global Northern perspective.

Mobility justice is an important aspect to consider here. What must be changed is situation- and location-dependent but can refer to several common characteristics such as good bike infrastructure and facilities, awareness and education about the use and risks of cycling, and access to bikes.

In addressing these points, bicycle mayors could have a role in stimulating debate and supporting initiatives such as cycling lessons for children, ride-outs for local communities, publication of new research about the impact of cycling on citizens' health and personal development, etc.

The fun thing about being a bicycle mayor is that you can give it your personal touch and fill it in with the themes that you believe in. In this way, you help to form communities that share the same mindset. I think that this is a very powerful way to create change.

READY FOR EVS?

The Alternative Fuel Infrastructure Regulation (AFIR) sets legally binding targets for the deployment of **EV recharging stations**. Cities and regions are key enablers of **AFIR** implementation, but they need support from national and supranational levels, including funding and capacity-building. How can the Sustainable Transport Forum help public authorities?

WRITTEN BY
PEDRO GOMES
ZSÓFIA JÁKÓI

The number of electric vehicles (EVs) in Europe is rapidly increasing, with the European Green Deal projecting around 30 million EVs on European roads by 2030. To support this growth and alleviate drivers' range anxiety, a comprehensive network of EV recharging infrastructure is essential. To address the 'chicken and egg' challenge, the EU published Regulation (EU) 2023/1804 in September 2023, known as the Alternative Fuels Infrastructure (AFIR). This regulation sets legally binding national and EU-wide targets for the deployment of alternative fuels infrastructure, including EV recharging stations.

EV charging station in Munich
Marc Heckner

Key targets include:

- Fleet-based targets, with a total power output of at least 1.3 kW for each battery electric car or van and 0.8 kW for each plug-in hybrid;
- Distance-based targets, with the installation of a fast-charging pool every 60 km in each direction of travel by 2025 along the core TEN-T network and by 2030 along the comprehensive TEN-T network.

The role of cities and regions

Cities and regions are pivotal in implementing the AFIR. The deployment of EV recharging infrastructure must indeed align with urban parking, planning, and sustainable mobility strategies to encourage a modal shift from private cars to active travel, public transport, or shared mobility. Within this frame, local and regional authorities will need proper support from national and supranational levels of governance, including funding and capacity-building.

For cities beginning their EV recharging deployment process, several questions arise:

- On ownership and management: Should this network be publicly owned or managed by private operators?
- On tender and procurement processes: How can future-proof tender and procurement processes be structured?
- On revenue sharing: What portion of operational revenue should be shared with public authorities?
- On parking policies: Should cities provide 'free' parking spaces for EVs, and how does this align with car-free zone policies?
- On space management: How can cities avoid creating additional barriers for pedestrians when placing EV chargers, given the scarcity of public space?

STF Plenary

© ACEM

- On permitting procedures: How can permitting procedures and timings be streamlined?
- On funding: Who will finance the deployment of EV recharging infrastructure?

The Sustainable Transport Forum

One of the European Commission's (EC) key initiatives for providing capacity-building tools for public authorities is the Sustainable Transport Forum (STF). This expert group assists the Commission in implementing AFIR through structured dialogue, the exchange of technical knowledge, and cooperation and coordination between Union Member States and relevant public and private stakeholders.

Within the STF, a sub-group focused on public authorities' best practices for supporting the deployment of recharging infrastructure was established in 2021. This sub-group includes POLIS members Barcelona, Rotterdam, Stuttgart, Ljubljana, Lisbon, Gothenburg, Cork, Antwerp, Budapest, Prague, Thessaloniki, Lille Metropole and Baden-Württemberg, as well as other relevant organisations.

Specific Task Forces, proposed by either the Commission or sub-group members, have been set up to develop recommendations and best practice examples to support public authorities in various areas, such as:

- Streamlining permitting and grid connection procedures: This guide identifies maps and assesses the challenges in obtaining environmental permits and grid connections for EV recharging infrastructure;

- Developing common templates, tools, decision trees and standard contracts for public authorities: The objective is to create a standardised set of grounding knowledge to support public authorities and accelerate the rollout of recharging infrastructure;

- Recharging infrastructure for specialised and captive fleets: This is a set of recommendations for deploying recharging infrastructure for fleets with predictable driving and refuelling patterns, such as taxis, ride-hailing services, and urban logistics;

- Updating the SUMP Electrification Topic Guide: This guide will incorporate the latest developments in e-mobility in SUMPs, updating the 2019 ELTIS Guidelines and co-creatively including new important references from both frontrunner and less advanced cities in the process of SUMP electrification.

- Accessibility of recharging stations: These guidelines will ensure EV recharging infrastructure is accessible to all users, including people with disabilities and the elderly, focusing on the design of the EV recharger and the surrounding areas and parking spaces.

- Fire safety of recharging points: This guide addresses fire safety concerns for recharging points in covered parking garages, which is an emerging issue for both EV users and public authorities.

Additionally, the STF is now revising the 2020 STF Handbook, providing updated practical guidelines for public authorities that plan to organise tendering procedures for the deployment or operation of EV recharging infrastructure.

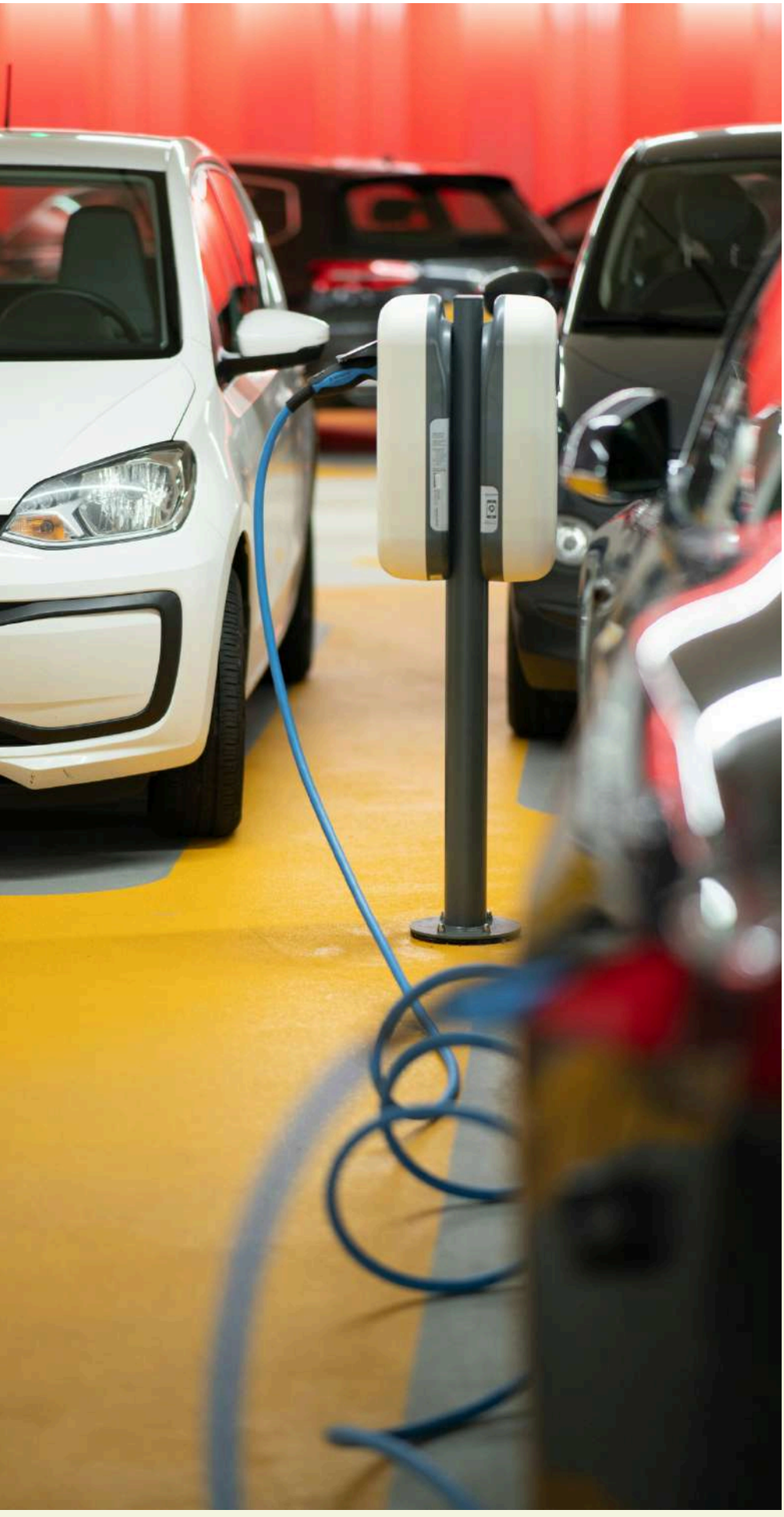
EAFO: The go-to for city practitioners and other policymakers

The guidance and recommendations from the STF sub-group are disseminated and exchanged via a dedicated platform for policymakers on the European Alternative Fuels Observatory (EAFO), which serves as the European Commission's primary reference portal for information on alternative fuel infrastructure and vehicles across Europe. It aims to provide high-quality, easily accessible data to public authorities, consumers, and the EU to support the transition to zero-emission mobility.

While the EAFO document repository is continuously updated with new documents and best practices, there is still progress to be made in ensuring these resources reach their main audience: city practitioners. This was highlighted in a recent POLIS Clean Vehicles & Air Quality Working Group meeting, where POLIS members acknowledged the value of STF Guidelines but also noted areas of improvement, including the need for enhanced dissemination and communication, as well as a reinforced focus on concrete solutions and practical examples for future STF documents.

The way ahead

Established in 2015 following the adoption of Directive 2014/94/EU on the deployment of alternative fuels infrastructure, the Sustainable Transport Forum took a significant step forward by establishing the Public Authorities sub-group. This initiative ensures that the voices of the cities and regions are heard in the planning and



implementation of EV recharging infrastructure in Europe. Over the past few years, this sub-group has been quite active, producing several valuable reports aimed at supporting these authorities through recommendations and knowledge sharing. However, recent policy developments may necessitate future adjustments.

Gabriela Barrera, Project Manager on Electromobility from POLIS member MOBI-VUB, notes, 'Now that AFIR has entered into force, it may be time to consider a more bottom-up approach to reflect and identify the support needed in a fast-changing electric mobility ecosystem.'

Future improvements should also focus on fostering further knowledge-based exchanges with local and regional policymakers. Initiatives such as the EAFO consumer monitor will better support public authorities in identifying current and future needs for EV adoption and creating the enabling conditions for a successful e-mobility transition.

'We know that public authorities play a key role in promoting electric mobility towards BEV 'believers' and BEV 'sceptic' citizens. On the other hand, the EAFO Consumer Monitor provides key information about their challenges and needs. Bringing these two aspects together can translate into more tailored recommendations, and therefore, a wider outreach,' says Gabriela Barrera from MOBI-VUB.

EV charging in the Netherlands
Michael Fousert

SAFE, SHARED, SUSTAINABLE

Bicycles have their own distinctive way of moving and turning, posing unique challenges for **road design**. To address this, **Transoft Solutions** collaborated with Sustrans on the development of an innovative bicycle turning simulation tool that empowers transport planners and engineers to create safe and inclusive road designs.

With the April 2024 signing of the European Declaration on Cycling, the European Union reinforced its commitment to promoting cycling as a sustainable, healthy, and affordable mode of transport. Yet, while some metropolitan areas have long encouraged cycling through policies and planning, others are grappling with how to safely accommodate an influx of cyclists. Growing diversity in bicycle shapes and sizes and increasing numbers of e-bikes and e-scooters further complicate the process of safely integrating cycling into transportation networks.

As the European Cycling Declaration acknowledges, accommodating cyclists requires more than just implementing policies. Properly designed streets and cycling facilities are crucial to ensuring the safe passage of cyclists alongside motor vehicles and vulnerable road users such as pedestrians and those with mobility challenges. Bicycles have their own way of manoeuvring, distinct from motorised vehicles like cars, and creating infrastructure that supports cycling goes beyond simply painting road lines to add a bike path.

WRITTEN BY
TRACY JAGER

Cyclists in Copenhagen, Denmark
Adobe stock (Standard license)

Cyclists on a bike path in Paris, France

Adobe stock (Standard license)

According to Andres Velez, P. Eng., Senior Product Manager, Civil and Transportation at Transoft, 'providing a tool to allow transportation professionals to create designs that facilitate the cyclists' safe passage involved the developing of new algorithms capable of modelling bicycles' distinct manoeuvrability.' Long a leader in developing innovative transportation software, Transoft has included the bicycle simulation tool in its flagship swept path analysis application AutoTURN Pro.

Creating road designs that bikes can safely navigate

Swept path analysis is the act of calculating a vehicle's space requirements, by considering the movement and path of the different parts of the vehicle as it undertakes a turning manoeuvre. For example, a truck towing a trailer requires more room to turn and therefore has a greater swept path, than a compact car.

Since 1991, transport engineers have used Transoft's AutoTURN software to conduct swept path analysis of motorised vehicles, including cars, buses, and trucks with trailers, and ensure these types of vehicles can safely manoeuvre road infrastructure.

But as David Homola, Business Development Manager, Transportation Safety at Transoft, notes, bicycles have different turning characteristics. 'Many bicycles, along with their riders, lean when they turn. So, it is not a straightforward analysis. We must account for how that lean impacts the space requirements of the turn. The angle of lean will also vary depending on the speed.'

Additionally, a cyclist's body becomes an extension of the bicycle, meaning analysis must account for clearance of a rider's head, arms, and legs – what Transoft calls the 'rider box.' AutoTURN Pro's bicycle simulation tool factors in that rider box, the wheelbase, tyre size and number, and the length and height of the bike, the pedals, and handlebars.

Transoft also wanted to account for a range of cycles turning at sustainable speeds, so the tool automatically calculates swept paths of different bicycle types, including those with trailers, cargo bikes, tandem bikes, recumbent bikes, mopeds, and scooters.

Assessing the space requirements of different bikes is especially important in multiple design scenarios such as chicanes, S-shaped curves, or other speed reduction measures being considered.

'A standard bicycle might be able to navigate a zigzag barrier, but when you add a trailer or have a longer bike, it might not make the turns', says Homola.

AutoTURN Pro users can also have access to a wide variety of cycles as per established bicycle guidelines developed in different countries.

'This tool is helpful for those starting who maybe haven't yet established guidelines', says Homola. 'It can give them peace of mind, knowing how a bicycle would navigate, whether it be on a dedicated bike route or alongside vehicles and pedestrians on a marked path. For cities expanding their network, will help them create designs for different neighbourhoods and accommodate the diverse range of cycles we are seeing today. For instance, many cities are looking at ways to facilitate deliveries by cargo bike.'

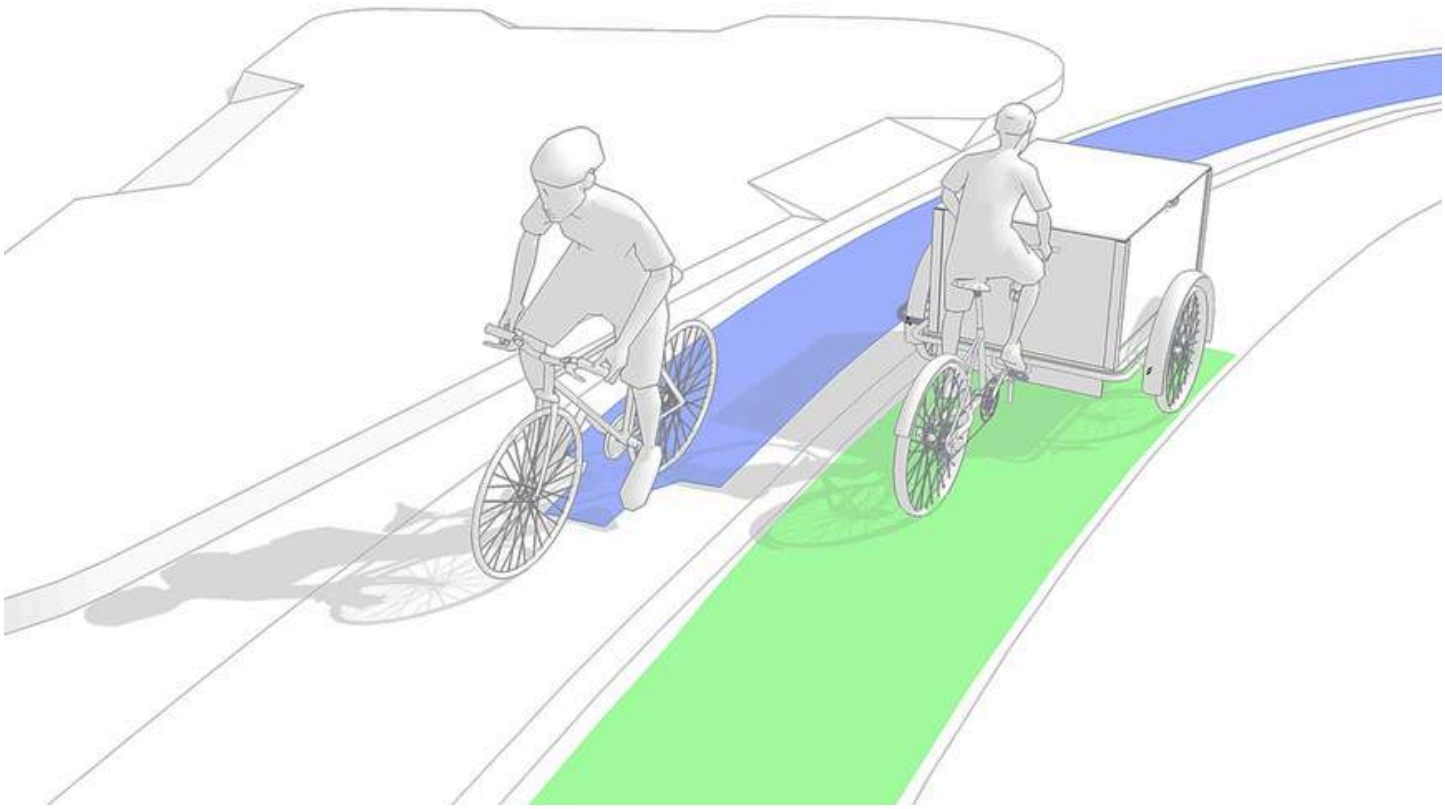
Collaboration with Sustrans sparked tool development

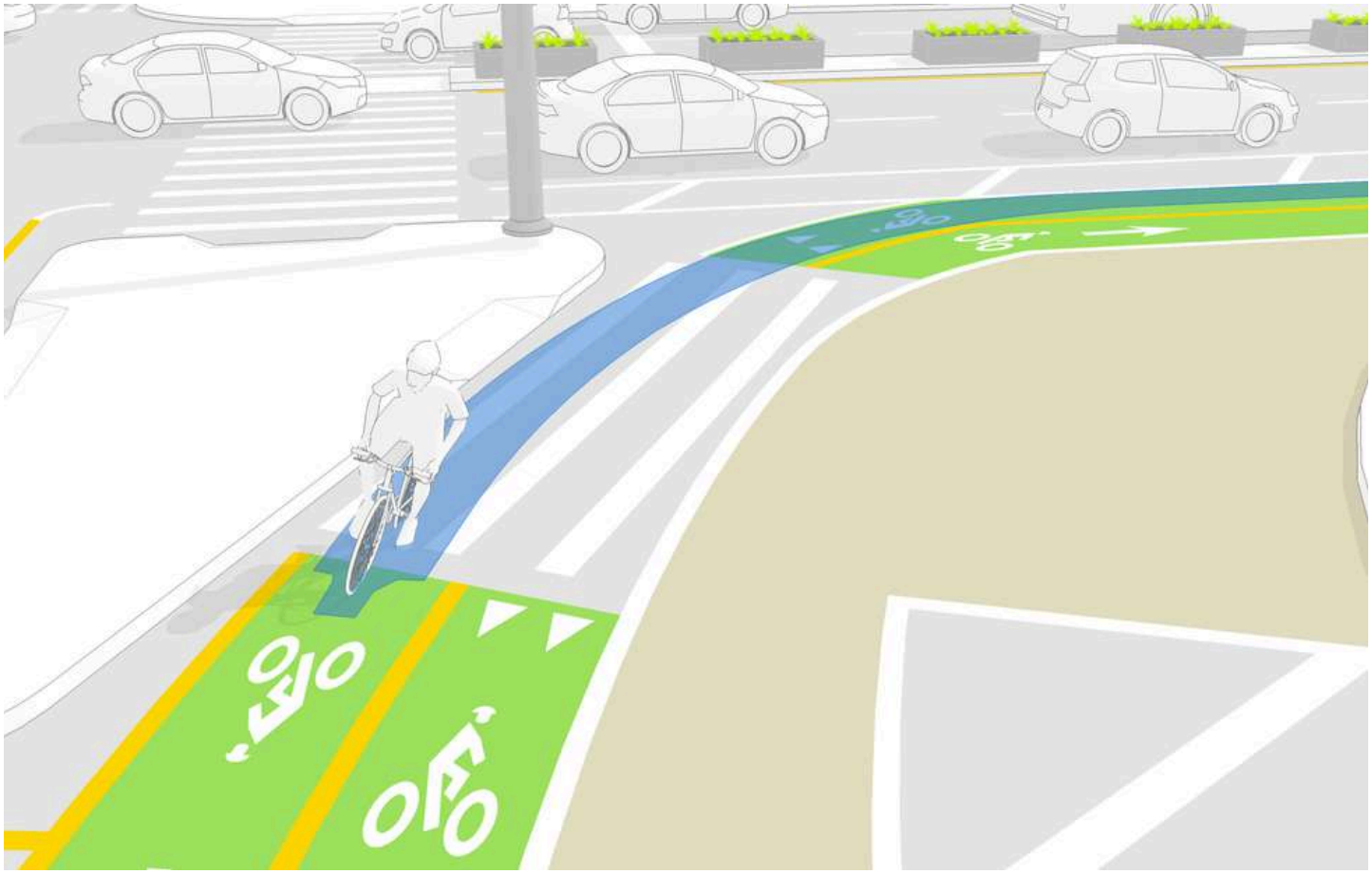
Motivated by current mobility trends emphasising inclusiveness, safety, and sustainability, Transoft embarked on developing a bike simulation tool. This initiative was sparked by a partnership with Sustrans, the custodian of the UK's National Cycle Network. Sustrans reached out to Transoft for help with a design project for a travel route in London's Lambeth Council Borough.

AutoTURN Pro bike simulation*

Transoft Solutions

**This image is a SketchUp rendering for illustration purposes only and does not represent the final product.*





AutoTURN Pro bike simulation*

Transoft Solutions

**This image is a SketchUp rendering for illustration purposes only and does not represent the final product.*

The route runs the northern section of Brockwell Park to Gipsy Hill, connecting the historic Brockwell Park to three schools, two shopping parades, a church, and a playing field. It is alongside Rosendale Road, a wide residential road where vulnerable road users must share space daily with 10,000 vehicles, many of which exceed the 20mph speed limit. Prior to improvements, there were few safe crossing points and no protected space for cycling.

While the Sustrans engineers had UK cycle guidelines to assist with the development, calculating the swept paths was time-consuming and cumbersome. They contacted Transoft about a more efficient and accurate way to analyse the swept paths.

To assist the process, the Sustrans team conducted field tests measuring the turning radii and lean angles of bicycles travelling at different speeds. Transoft incorporated these measurements into the development of bicycle turning templates and the simulation tool.

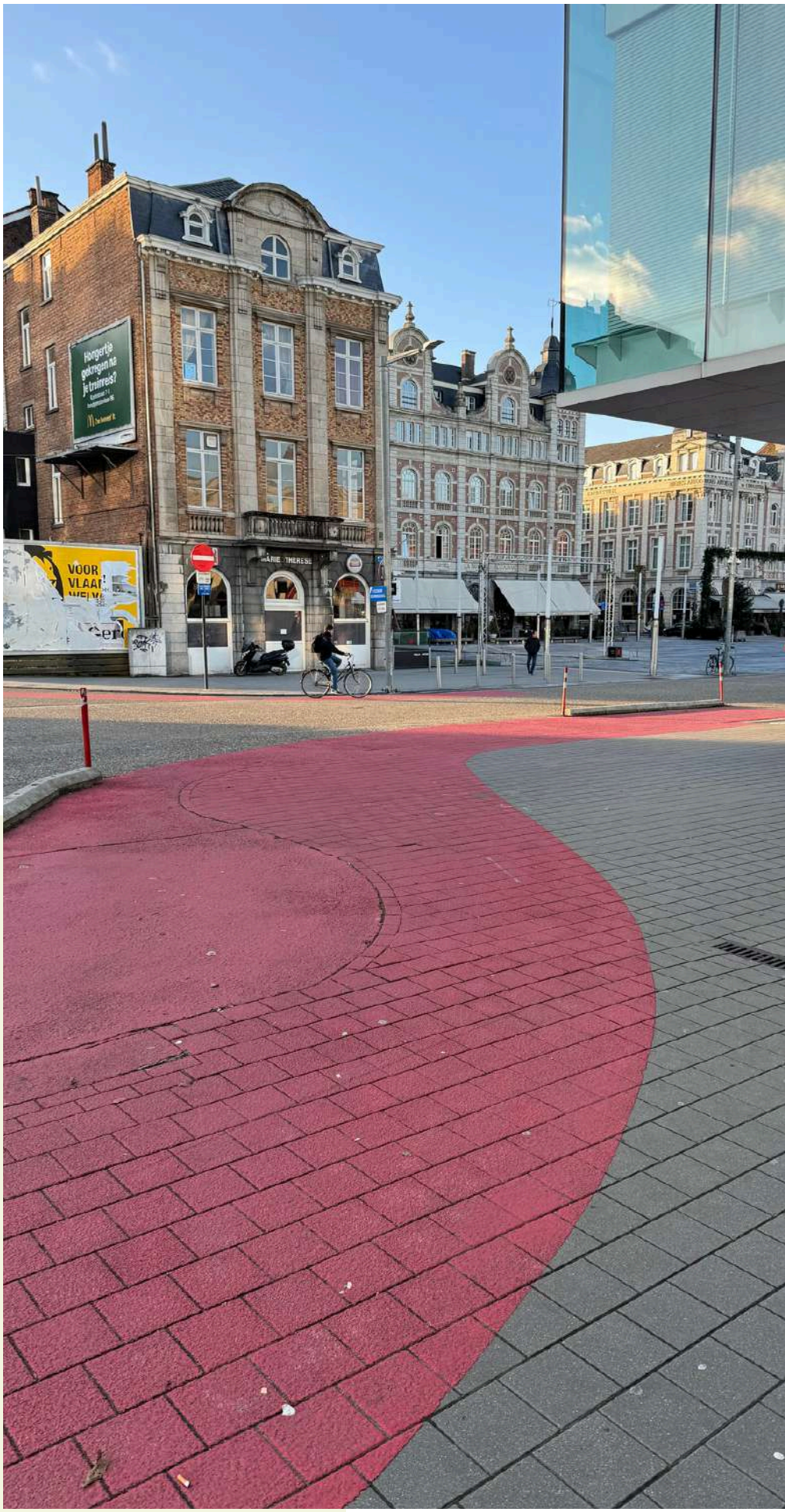
With the tool, Sustrans could run a design simulation for projects like Lambeth Council that demonstrated how bicycles would safely move along the proposed route. The Rosendale Road is currently in progress, and Sustrans has a dedicated page sharing stories of how the segregated bike lane is helping children and adults cycle for work, school, and shopping.

Cities are embracing safe cycling designs

Since that initial project, Sustrans has used the AutoTURN Pro bicycle simulation tool on others, including for Hitchen Road in Luton, north of London, as well as for Brockwell Park Gardens in the south London suburb of Norwood, and Leighton Road in the northeast Kentish Town area.

AutoTURN Pro's bicycle simulation tool is also being used by other European cities, including Lille, France, which will host events for both the 2024 Summer Olympics and the 2025 Tour de France.

Homola says that as cities strive to integrate better bike infrastructure, Transoft is seeing greater interest in the use of the simulation tool. 'A key benefit of using the software is that, when designing routes for bikes, one can easily visualise ahead of time where conflicts might occur, and then create a better design. Understanding how different types of bicycles move also means that cycle paths and networks can be more inclusive.'

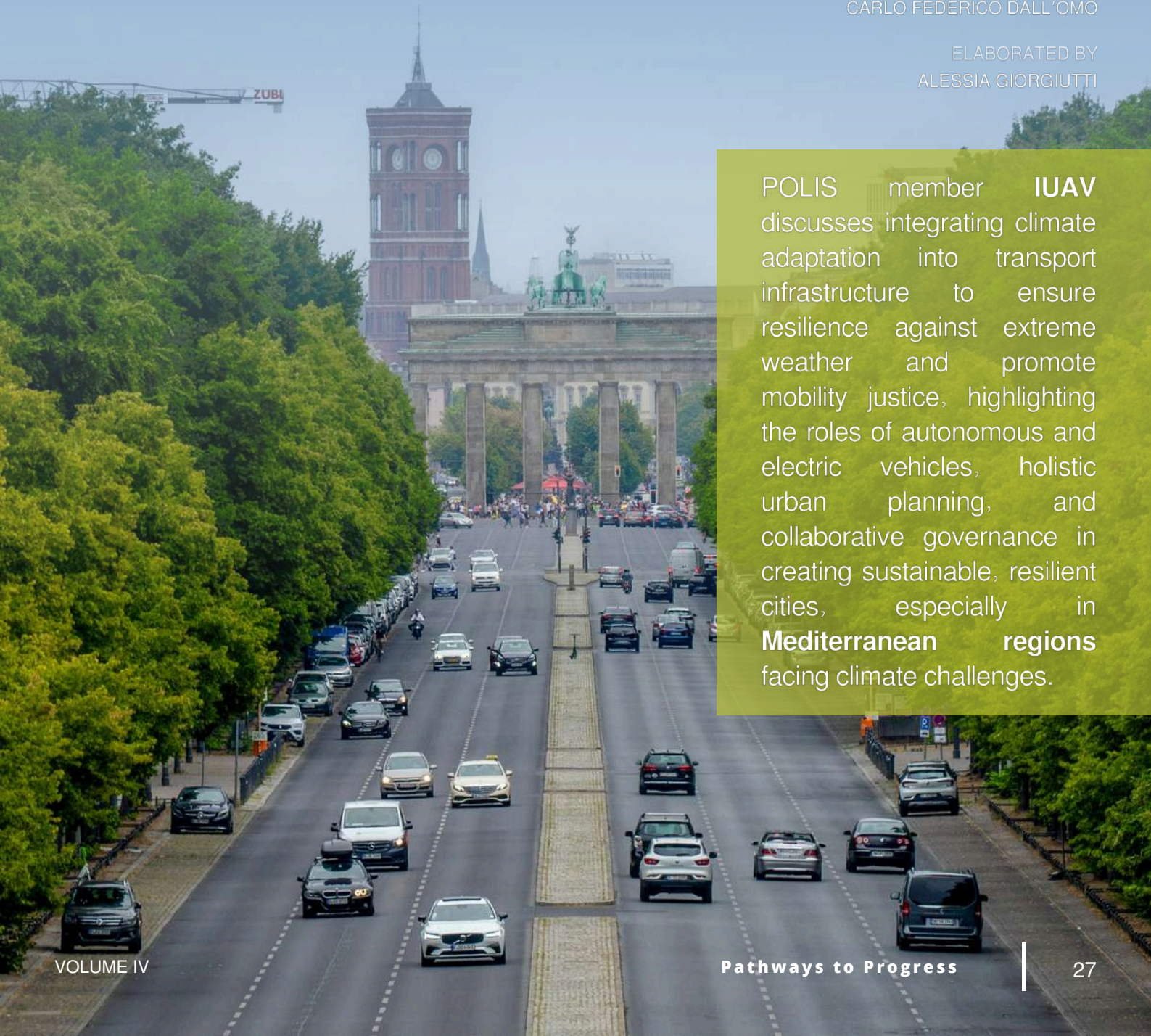


Painted bike path
Steven Chan, Transoft Solutions

RESILIENT URBAN FUTURES

INTERVIEW WITH
SILVIO NOCERA
FEDERICO CAVALLARO
CARLO FEDERICO DALL'OMO

ELABORATED BY
ALESSIA GIORGIUTTI



POLIS member **IUAV** discusses integrating climate adaptation into transport infrastructure to ensure resilience against extreme weather and promote mobility justice, highlighting the roles of autonomous and electric vehicles, holistic urban planning, and collaborative governance in creating sustainable, resilient cities, especially in **Mediterranean regions** facing climate challenges.

POLIS: How can urban planners integrate climate change adaptation measures into existing transport infrastructure to ensure resilience against future extreme weather events, while also incorporating principles of mobility justice to address disparities in climate impacts on vulnerable communities?

IUAV: When addressing the multifaceted impacts of climate change, urban and transport planners often fall back on rigid and compartmentalised approaches. These traditional methods fail to account for the reality that transport and urban planning effects on any given area are deeply intertwined. This interconnectedness becomes even more critical in the face of climate change, where the combination of sudden, extreme weather events and more gradual, long-term shifts requires cohesive, multi-scalar, and temporal strategies.

Climate change introduces a wide range of uncertainties regarding its potential effects, making the adoption of comprehensive and integrated measures to enhance community resilience imperative. Effective planning must incorporate a clear understanding of the short-, medium-, and long-term temporal dimensions of climate impacts. Additionally, the social equity implications of these measures must be considered, ensuring that all community segments are protected and benefited.

Higher education is essential for effectively tackling these complex issues. At IUAV (Istituto Universitario di Architettura di Venezia – IUAV University of Venice), we have developed an educational approach that integrates transport and urban planning disciplines.

Our integrated laboratories provide students with a holistic understanding of these interconnected fields. By merging theoretical knowledge with practical application, we prepare our students to devise and implement strategies that address the diverse challenges of contemporary societies, particularly those related to climate change.

15-minute city: Paris

Urban Design Lab
Creative Commons 4.0 License

POLIS: What innovative roles can emerging technologies like autonomous vehicles and electric mobility solutions play in enhancing urban mobility resilience in the face of climate change challenges, and how can collaborative governance models involving diverse stakeholders facilitate their effective implementation in urban transport planning?

IUAV: Emerging technologies such as autonomous vehicles and electric mobility solutions are pivotal for enhancing urban mobility and resilience under climate change pressures. Autonomous vehicles can optimise traffic management, reduce congestion, and lower emissions through efficient routing and vehicle use. Electric mobility solutions are critical for decreasing urban air pollution and aiding the transition to a decarbonised transport sector.

Silvio Nocera

Full Professor of Transport Engineering and Planning
Università IUAV di Venezia

Federico Cavallaro

Associate Professor of Transport Engineering
Università IUAV di Venezia

Carlo Federico dall'Omo

Associate Professor of Urban and Regional Planning
Università IUAV di Venezia

The effective integration of these technologies into urban transport planning requires a collaborative governance model that involves a diverse array of stakeholders. This model must include local communities, policymakers, industry leaders, and academic researchers to ensure alignment with the socioeconomic and environmental dynamics of each region. Engaging various stakeholders is essential for developing policies that facilitate the adoption of these technologies and address challenges such as infrastructure development, regulatory frameworks, and public acceptance.

Furthermore, collaborative governance supports the co-creation of resilient urban mobility strategies that capitalize on autonomous and electric mobility benefits. Involving stakeholders in decision-making ensures that transport policies are adaptive, inclusive, and sustainable, and are prepared to meet current and future climate-related challenges.

POLIS: Considering the interconnectedness of urban systems, how can holistic approaches to urban planning and design foster synergies between climate change adaptation in mobility and other urban resilience efforts, such as green infrastructure development and affordable housing initiatives, particularly in Mediterranean cities facing accelerated warming?

IUAV: Holistic approaches to urban planning and design are essential for creating synergies between climate change adaptation in mobility and other urban resilience efforts, particularly in Mediterranean cities experiencing increasing disruptive events. By incorporating climate adaptation measures into comprehensive urban planning strategies, cities can effectively tackle multiple challenges at once.

The first benefit of integrating green infrastructure into transport projects concerns urban resilience. Mobility corridors can become part of the green infrastructure, mitigating the heat island effect, managing stormwater runoff and providing shade for pedestrians and cyclists, improving the likelihood of choosing active modes to move in cities.

Linking affordable housing initiatives with public transit corridors can promote equitable access to transportation and reduce dependence on private vehicles. Placing affordable housing near transit hubs enables residents to easily reach jobs, services, and amenities, which in turn lowers transportation-related emissions and alleviates congestion. The dialogue between urban, social and transport policy is crucial for improving urban resilience and pursuing international sustainability goals as well as better quality of life for all social groups.

POLIS: With the Mediterranean Sea experiencing longer and more intense marine heatwaves, how might coastal cities adapt their transport networks to withstand potential disruptions caused by rising sea levels and the increased frequency of extreme weather events, such as storms and flooding, while simultaneously addressing the vulnerability of transport infrastructure to climate hazards like floods and heavy precipitation?

IUAV: Coastal areas are increasingly vulnerable to the impacts of climate change. Adapting transport networks to cope with the extreme and severe events associated with climate change is crucial for maintaining the resilience of these systems. Resilience in this specific context refers to the ability to ensure the continued functionality of transport service even when crucial components of the infrastructure are compromised.

To achieve this, it is imperative to thoroughly understand how transport networks (e.g. road and rail infrastructure) and key nodes (such as stations, ports, airports and intermodal terminals) respond to such extreme events.

Critical questions need to be addressed: Which segments of the network are most susceptible to flooding? Can territorial accessibility be maintained if sections of the road or rail network are temporarily closed?

Gaining a clear understanding of these issues enables the identification of the most appropriate and effective solutions. These solutions should not be viewed as exceptional measures but rather as likely scenarios that may occur in the near future. By embracing this mindset and mastering appropriate tools, planners can design transport networks that are robust and adaptable, especially in vulnerable coastal areas like Venice.

encouraging a shift to cleaner and healthier transport modes, such as active mobility and public transportation. The expansion of public transport and the integration of active mobility and new technologies into urban areas facilitate this shift.

It is therefore imperative that robust infrastructure capable of withstanding climate stress, such as safe cycling paths, pedestrian zones, and reliable public transit systems, be developed. In order to achieve the desired resilience and sustainability, it is necessary to adopt a collaborative approach between local stakeholders and academic research, to enhance infrastructure resilience and align it with broader climate goals.

Water transport in Venice: Navigating challenges in a delicate environment

Francesco Bruzzone

POLIS: Given the significant impact of the transport sector on air pollutant emissions and its susceptibility to climate change impacts, how can holistic urban planning prioritise low-carbon transport modes while also ensuring adaptation to climate-related hazards, particularly in Mediterranean cities facing unique challenges due to their climate change hotspot status?

IUAV: In Mediterranean cities, the implementation of holistic urban planning strategies is of paramount importance to prioritise the use of low-carbon transport modes and to mitigate the risks associated with climate change. Urban planning can facilitate sustainable mobility by designing efficient public transport networks and encouraging shared mobility solutions. To reduce reliance on private vehicles and alleviate congestion, it is essential to consider accessibility, transport interconnection, and urban space utilisation.

The development of compact, dense urban areas oriented towards public transport and the promotion of mixed land use has the effect of reducing the need to travel and

CITIES OF SOUND

WRITTEN BY
QUAID CEY

As the volume of transport noise surges in Europe's cities, the race is on to curb **noise pollution** and protect public health. With partners in ten EU Member States, the **LENS project** is conducting research on an often-overlooked threat : light vehicles.

Visual Generation, Shutterstock

For European city dwellers, sound is ever-present, yet nowhere to be seen. Unlike other forms of pollution, it fades into the background of daily life, often regarded only by a vocal minority as an issue worthy of public attention. The truth of the matter, however, is far more alarming.

Ironic though it may sound, noise pollution has become a silent killer in Europe. After air pollution, it is Europe's second-largest environmental health risk. According to the European Environment Agency (EEA), 20% or more of the urban population in the EU is exposed to sound levels considered detrimental to their health. In some cities, this number creeps closer to 50%. The World Health Organization (WHO) estimates that no fewer than 1 million 'healthy years' are lost in Western Europe each year as a result of environmental noise.

By inducing chronic annoyance and stress, noise pollution leads to many life-impairing – if not life-threatening – health conditions. These range from extreme sleep disturbance, which impacts an estimated 5 million Europeans, to hearing loss, hypertension, poor mental health, and cognitive impairment and decline, all of which were highlighted by the World Health Organization (WHO) in its 2018 Environmental Noise Guidelines for the European Region.

The primary culprit is road traffic noise (RTN). Outcompeting even railways and airports, RTN has a larger negative impact on the overall population than any source of transport noise.

Recent estimates from the EEA show that more than 90 million Europeans are exposed to harmful levels of RTN, causing around 11,000 premature deaths and 40,000 new cases of coronary artery disease. And with urban growth driving up demand for mobility, the toll of RTN is only expected to increase..

Putting an END to noise pollution

The negative impacts of noise pollution have not gone entirely unnoticed. As early as 2002, the European Union passed the Environmental Noise Directive (END; 2002/49/EC), which introduced much-needed limit values for noise: 55 decibels over the day-evening-night period (Lden) and 50 decibels between 11 PM and 7 AM (Lnight).

Quiet spaces: One of Europe's most precious commodities

Marie Bellando Mitjans, Unsplash

To keep sound levels within healthy boundaries, the END requires Member States to map and manage noise pollution at acoustic hotspots, including:

- all cities with 100,000 inhabitants or more;
- roads that receive more than 3 million vehicles or more per year;
- railways travelled by 30,000 train trips or more per year;
- and airports with more than 50,000 take-offs or landings per year.

Based on the results of noise maps, Member States must adopt regularly updated action plans in areas where noise levels exceed Lden and Lnight limits. Additionally, they are obliged to identify and preserve so-called 'quiet areas' – ie areas 'undisturbed by noise from traffic, industry or recreational activities.' Outside of urban areas, only 18% of Europe could be classified as quiet in 2016.

Though promising at first glance, the END has proven difficult to implement, as national authorities are not required to monitor the outcomes of their action plans. A tendency toward underperforming was reflected in the European Commission's 2023 implementation report on the END, which stressed the need to ramp up efforts ahead of 2030, the year by which the EU aims to achieve a 30% reduction in the number of citizens chronically disturbed by transport noise.

Without proper enforcement measures to back up Member States' action plans, the Commission's warning risks falling on deaf ears. According to Eulalia Peris, an environmental noise expert at the EEA, the lack of follow-up from Member States means that city governments are often left to fight noise pollution on their own.

Sound-proof cities

Some European cities have already risen to the challenge. For example, Paris, which ranks among the noisiest cities in Europe, has introduced so-called 'medusa' devices for noise level monitoring on high-traffic streets. Thanks to multidirectional cameras and a set of eight microphones, these devices can pinpoint the noisiest vehicles and photograph their license plates for follow-up by local police. As of 2023, car drivers and motorcyclists caught exceeding the city's strict noise laws are subject to a fine of €135, a clear sign that Paris has been listening to complaints from residents.

Inside one of Barcelona's superblocks
Marek Lumi, Unsplash

The Paris City Hall was also one of the main partners in the LIFE C-LOW-N ASPHALT project, which developed three innovative, low-noise asphalt mixes to bring down RTN by three decibels at the street level, with the added benefit of reducing road temperatures. By limiting noise from tyre-road interaction, these asphalt mixes have produced significant acoustic advantages, with 63% of residents reporting a noticeable change in RTN volume.

But Paris is not the only city working to keep its streets quiet. Further south, another POLIS member has made a name for itself with its 'superblocks': Barcelona. First introduced in 2016, these pedestrian-first zones re-route nearly all vehicle traffic to their perimeters, creating islands of low environmental noise within bustling Barcelona. Plans to create a 'super-superblock' covering a large portion of the city centre could allow for the more than 20 road intersections to be converted into 'pedestrian plazas,' bringing down local greenhouse gas emissions and curbing noise levels drastically.

Checking for blind spots: LENS takes on LVs

Beyond their work at the local level, Paris and Barcelona have joined fellow POLIS member Leuven as test cities for the LENS project, an EU-funded initiative that targets one of the most overlooked, yet impactful sources of RTN: light vehicles (LVs).

Though their effect on urban noise levels is often underestimated – and, as a result, insufficiently addressed in EU legislation – LVs such as motorbikes produce noise levels comparable to those of medium-duty trucks and even rail freight. This is especially true when their engines have been illegally tampered with (eg by removing silencers). Just like other sources of RTN, they contribute to sleep disturbance, cardiovascular and metabolic disease, cognitive impairment, poor mental health, and premature mortality across the EU.

In collaboration with POLIS and a group of 15 partners from ten EU Member States, LENS is committed to developing the techniques needed to test LV performance under real driving conditions and identify tampered vehicles.

The project's work departs from two unsettling observations: first, that LVs produce levels of air and noise pollution beyond the limits set out in the Euro 5 emissions standards, whether because of typical wear and tear or intentional modifications by drivers; and second, that illegally tampered LVs often pass routine police checks undetected.

The goal of LENS is therefore not only to develop the means to catch noisy LVs once they are already roaming European streets, but also to recommend better test procedures for type approval (TA), which would bring real-world LV performance into the lab.

Leuven takes the lead

As test cities for the LENS project, Leuven, Paris, and Barcelona will pilot the testing equipment needed to monitor noise and air pollution from LVs on the street. The first to take the plunge was Leuven.

LV testing at Tiensestraat (Leuven)
Quaid Cey

Before testing started in the first weeks of May, the City of Leuven brought in the help of the local police force and POLIS member KU Leuven to select adequate sites for monitoring. They considered factors such as LV traffic volume and the presence of non-traffic-related background noise. Based on these criteria, several sites around the city were approved for testing, including one location in the heart of historic Leuven.

At the LENS City Platform and Stakeholder Group Workshop on 15 May 2024, stakeholders from Hungary, Albania, Germany, and the Netherlands visited the testing site in the Leuven city centre after listening to technical presentations from project partners, including LENS project coordinator Leonidas Ntziachristos (Aristotle University Thessaloniki). Amidst the hustle and bustle of cyclists, students, and tourists, workshop attendees had the chance to see for themselves how the LENS project and the Leuven police are working together to test innovative, easy-to-implement noise abatement solutions for LVs.

Following a successful launch, which included the measurement of emissions from more than 160 LVs, LENS' next stop is Paris. With the support of IFPEN, testing will begin this September at two different locations: one rural and one urban. Shortly after, tests will follow in Barcelona before the LENS project presents its findings in mid-2025.

Conclusion

Growing awareness of noise pollution's impact on public health is driving a surge in research on RTN and the development of new techniques to combat transport noise. Essential to these efforts is leadership from projects like LENS, which leverages the technical expertise of research institutes to help cities address one of the unspoken culprits of environmental noise: LVs. Through its niche focus and its emphasis on practical, scalable solutions, the LENS project is helping to enhance understanding of LVs' real-world performance and, as a result, reshape the way these vehicles are regulated and monitored at the regional, national, and local levels. The project's work serves as a reminder that while the symphony of urban sound may be far from over, cities have the power to decide what plays next.

Road traffic, the leading source of urban noise pollution

Geoffroy Hauwen, Unsplash

GOVERNANCE AND INTEGRATION

Governance and Integration revolve around the key challenges faced by local and regional authorities when developing policies and strategies to accelerate the shift to sustainable urban mobility, improve equity and safeguard the public interest, and deal with cutting-edge innovation.

The work of POLIS on the matter is done through the Governance and Integration Working Group, covering a broad range of topics related to shared micromobility services, the future of public transport, Mobility as a Service (MaaS), public/private engagement, gender and labour perspectives in urban mobility, tourism and transport, transition management, leadership of change, and policy nudging for behaviour changes.

This pillar also includes four other Working Groups - the Urban Freight Working Group, the Small and Medium-sized Cities Platform, the Regions Working Group, and the brand-new Capitals Working Group.

The Urban Freight Working Group is engaged in peer-to-peer exchange to share best practice on sustainable urban freight solutions and city logistics, in partnership with technology platform ALICE, which brings the logistics stakeholders around the table.

The Small and Medium-sized Cities Platform (SMC Platform) aims to raise the profile of small and medium-sized cities in the EU as living laboratories for transport innovation.

The Regions Working Group explores leading mobility themes with a focus on regional governance approaches, challenges, and solutions.

The POLIS Capitals Working Group, initiated by Rome in early 2024, addresses the unique transport challenges of capital cities and regions. The Working Group facilitates exchanges between technical experts and political leaders, with practitioners' meetings informing political discussions and vice versa.

Find out more about the Governance and Integration Working Group on our website!

Find out more about the Urban Freight Working Group on our website!

Find out more about the SMC Platform on our website!

Find out more about the Capitals Working Group on our website!

Find out more about the Regions Working Group on our website!

LEADING THE WAY

The 2024 POLIS Leadership Summit, hosted in Prague on 30 May, brought together mobility leaders from the public and private sectors to discuss pressing urban and regional transport issues. POLIS spoke with **Prague**'s Deputy Mayor for Transport and Mobility, **Zdeněk Hřib**, to find out more about his city's ambitious goals.

INTERVIEW WITH
ZDENĚK HŘIB

ELABORATED BY
JONATHAN DE VRIENDT

Hřib opts for active mobility with a cargo bike
City of Prague

POLIS: What does it mean for the City of Prague to take on a leading role in urban mobility by hosting the POLIS Leadership Summit? How does this opportunity allow the city to showcase its initiatives and influence the global discourse on urban mobility?

Zdeněk Hřib: By hosting the POLIS Leadership Summit, the City of Prague took on a significant role in promoting sustainable, safe, and equitable mobility, not only in the Czech Republic but also across Europe. We view this event as a unique opportunity to accelerate positive change by sharing know-how and best practices with international experts, municipalities, and regions, while also increasing public awareness and support for sustainable mobility solutions.

Prague can contribute knowledge and experience in developing its public transport system, which ranks among the best in the world. On the other hand, we seek inspiration from other cities that succeeded in building high-quality and safe cycling infrastructure and turning busy roads into liveable public spaces. This mutual exchange of knowledge in transport innovations is very valuable for all parties involved.

POLIS: In enhancing sustainability and safety in urban transport, what technological solutions is Prague employing, and how does the city ensure accessibility and inclusivity for all population segments, including vulnerable communities?

Zdeněk Hřib: The most visible and tangible new technology we are introducing to our passengers is an automated metro system, currently being procured for the newly constructed D line. The oldest C line will also be retrofitted with driverless technology, with operations expected to start in 2030. Needless to say, both lines and new trains will be fully barrier-free.

Earlier this year, we introduced an upgraded version of our MaaS app 'PID Lítačka', which now offers extended connection searches including active mobility, taxis, or even private car use. Besides intermodal trip planning, users can seamlessly buy tickets or subscriptions and pay for parking through the app.

Prague strives not to leave anyone behind, ensuring that new technologies do not create barriers for those with specific needs or elderly people. We offer heavily discounted fares for low-income individuals, and our seniors over 65 can travel free of charge throughout the city.

POLIS: In the transformation of public spaces into hubs for sustainable mobility, what projects in Prague prioritise pedestrians, cyclists, and public transport users? How does the city involve community feedback and participation in these initiatives?

Zdeněk Hřib: The reconstruction of the Smetanovo riverbank in the historic city centre is a significant project transforming a car-dominated area into a pedestrian- and cyclist-friendly space while also reducing barriers for public transport (trams). The first stage, already completed, includes 17 new trees with sustainable urban drainage systems, widening sidewalks with Prague's signature marble paving, and introducing a unique cycle lane segregated from both motor traffic and pedestrians by curbs, inspired by Copenhagen. This is just the beginning. The second phase of the project covers a larger area and will establish a much-needed connection for bicycle traffic from the north to the south of the city, all within a heritage-protected historical context. This transformation will be completed with strict regulation of through traffic, fulfilling a promise made in 2015 when the tunnel bypass of the city centre was opened.

Zdeněk Hřib

Deputy Mayor for Transport & Mobility
City of Prague

Hřib speaking at the POLIS Leadership Summit in Prague
Pavel Dvorak

Our projects typically involve and benefit from public and stakeholder participation. Pilot projects often require a top-down approach in the initial phases to show what is possible and spark imagination for the next phases. For this project, a wide group of local stakeholders was involved in discussions, and the public was engaged through organised walks before and after the implementation of the first phase. The project has received positive feedback following the first phase, and the public is supportive of the next steps in the city centre.

POLIS: What specific financing models or strategies is Prague considering or already implementing to overcome financial barriers in advancing sustainable urban mobility? How does Prague ensure financial sustainability while balancing the need for investment in infrastructure and service improvements with affordability for residents and businesses?

Zdeněk Hřib: Traditionally, sustainable mobility in Prague has focused on public transport, which facilitates the movement of large numbers of people with minimal impact on quality of life. The main challenge for the city is to establish a sustainable financing model for the operation of public transport, including the expansion of new tram sections, a new metro line, and locally emission-free buses. Currently, we are discussing the increase in fare revenues, which currently cover only 16% of Prague's public transport operating costs, or else we risk having to cut public transport services or slow down development investments in the coming years.

The political leadership is now faced with the difficult task of explaining to the public that increasing the share of costs covered by users is the only way to maintain the high quality of transport in the future. It is crucial that this adjustment does not affect the socially vulnerable. Additionally, to motivate Prague residents to use public transport instead of driving, on-street parking fees will also need to be increased. After all, there are more cars than parking lots in the city centre and an adequate price for on-street parking can also help address this problem.

POLIS: How does Prague engage citizens in shaping urban mobility, and which platforms or initiatives facilitate this involvement? Additionally, how does the city ensure diverse representation and meaningful participation from all societal segments, including marginalised groups?

Zdeněk Hřib: It depends a lot on the scope of the plan. Key and large-scale plans are often discussed with the public by the Prague Institute of Planning and and Development, be it directly through

Hřib making use of Prague's Rekola bike-sharing service
City of Prague

Hřib welcoming in one Prague's newly added tram stations
City of Prague

participatory processes, such as presenting modification proposals to the general public with presentations, discussions, and opportunities for comments, or through thorough consultations with stakeholders, which the public is informed about and invited to make recommendations and suggestions. However, thorough participation can be time-consuming and organisationally demanding. From the city's long-term vision, our Center for Architecture and Metropolitan Planning (CAMP) plays a vital role, hosting ongoing discussions and exhibitions on transport and public space. In the case of smaller projects, the activity is mainly managed by relevant city districts, which can use the methodical support of colleagues from the IPR to increase quality.

The level of public involvement also depends on the willingness of citizens to devote their time and attention to public affairs - and this is not yet a given. In recent years, cooperation with children and youth through the involvement of so-called school parliaments has been increasingly implemented.

POLIS: Regarding pedestrian and cyclist safety in urban mobility plans, what specific measures is Prague implementing, and how does the city collaborate with transport experts, urban planners, and advocacy groups to develop evidence-based safety strategies?

Zdeněk Hřib: There is no doubt that pedestrians are the most vulnerable users of public spaces. Prague is working hard to provide safe, barrier-free opportunities to cross traffic lanes and, where appropriate, to introduce special traffic regimes that clearly prioritise pedestrians. Special attention is paid to the area around schools, as demonstrated by the comprehensive 'Safe Journey to Schools' project and the smaller-scale implementation of school streets.

We are also dedicated to improving conditions for urban cycling. By using the existing road network, we protect cyclists by implementing cycle lanes and dedicated waiting spots at traffic lights, which has significantly increased the city's permeability for cyclists in recent years. We are also developing new lanes separated from cars. Given space limitations, these lanes are often shared between cyclists and pedestrians.

We continuously optimise our methodology for monitoring active mobility. Based on the information obtained, we adapt the built environment and traffic regime to better meet the real needs of users. This may include allowing two-way cycling on one-way streets, legalising pavement use for cyclists, and converting separate pedestrian and cyclist paths into mixed-use lanes.

In the following page:
Snapshots from the Leadership Summit and Political Group in Prague
Pavel Dvorak

More on the
POLIS Leadership Summit

'The vision for Prague as a sustainable transport hub relies on strategic planning, substantial infrastructure investment, and proactive public engagement,' said Zdeněk Hřib, Prague's Deputy Mayor for Transport and Mobility, to the 150 leaders in mobility who gathered in Prague at the CAMP (Center for Architecture and Metropolitan Planning) on 30 May 2024.

Featuring thought-provoking panels, engaging discussions, and concrete collaborations, the POLIS Leadership Summits are the solid ground where brave leadership and decisive action, at both local and global levels, meet and flourish, paving the way towards a more sustainable future of mobility. Our Prague installment followed suit and did not disappoint, delving into four essential topics for advancing urban mobility, each explored by expert panels.

Key discussions focused on:

- Technological Innovation: Developing e-vehicles and integrating digital passenger information and ticketing systems. Europe's goal to establish new charging points by 2030 underscores the need for collaboration among cities, OEMs, and charging point operators. Data sharing was highlighted as crucial for enhancing the mobility ecosystem and tackling urban logistics challenges.
- Reshaping Public Spaces: Emphasizing inclusive green and shared mobility. Utrecht's success in reducing barriers and France's effective communication on mobility constraints were showcased. Engaging younger generations in the green transition through clear communication strategies is seen as vital.
- Optimising Financial Investment: Addressing financial challenges to support public transport, sustainable modes, and low-carbon vehicles. Discussions emphasized the importance of continued funding and planning to overcome past underinvestment and achieve net-zero mobility.
- Ensuring Just and Inclusive Transition: Ensuring all citizens benefit from sustainable mobility. The need for proactive public engagement and reducing barriers to access were key points.

The launch of the "Future of Mobility 5.0" study by Arthur D. Little and POLIS presented ten transformative visions for reimagining transport, highlighting a shift from private cars to shared mobility. However, scaling these solutions remains a challenge.

More on the
POLIS Political Group

On 31 May, the POLIS Political Group—a unique forum to foster peer-to-peer exchange and navigate the complex governance surrounding shifts to more sustainable mobility—brought together political figures from across Europe to discuss urban mobility challenges and innovative strategies. Held at the historic Lord Mayor's Residence in Prague, the meeting emphasised the critical role of political leadership in driving transformative transport projects.

Mayor Bohuslav Svoboda highlighted Prague's plans to invest billions in public transport, cycling, and pedestrian infrastructure. Deputy Mayor Zdeněk Hřib elaborated on integrating public transport into new residential developments.

Experts discussed the growing importance of digital data in transport policy, focusing on vehicle data for planning, management, and compliance with urban mobility systems. The development and implementation of Sustainable Urban Mobility Plans were also a focal point, with leaders sharing insights to meet local and EU-wide mobility objectives.

The message was clear: achieving sustainable, inclusive, and technologically advanced mobility is challenging but possible with determined leadership and collaboration: the summit highlighted progress for the continued transformation of urban mobility across Europe.

SHARING IS CARING

In 2023 and 2024, **Aarhus Municipality** embarked on a groundbreaking collaboration with a **carpooling** platform provider to investigate the thresholds of incentives necessary to make carpooling an attractive option for young students. Over the initial five months of the trial period, some 30,000 rides spanning two kilometres or more have been completed.

Several cities, including Aarhus, have been striving for years to integrate carpooling into their sustainable mobility systems. However, identifying a viable business model that aligns with Denmark's current legislation has proven challenging for municipalities. During a trial period from September 2023 to April 2024, Aarhus Municipality supported carpooling among students attending educational institutions in the city.

Carpool drivers were compensated 15 Danish kroner (approximately €2) per trip through the carpooling platform, while passengers enjoyed the first ten kilometres of the journey for free, equivalent to tenDanish kroner (around €1.35). Consequently, a carpool trip spanning ten kilometres with one passenger receives a subsidy of 25 kroner (approximately €3.35) from the municipality.

The overarching goal behind launching the project was to lay the groundwork for a dialogue about the future framework of carpooling in Aarhus. The aim was to ensure that the municipality's support for carpooling in the future remains equitable, economically viable, and contributes to the green transition of transport in Aarhus.

WRITTEN BY
GUSTAV FRIIS

Public transport is the backbone of a demand-responsive carpooling system
Henrik Sørensen, Colourbox.dk

Does carpooling improve mobility for students in areas underserved by public transport?

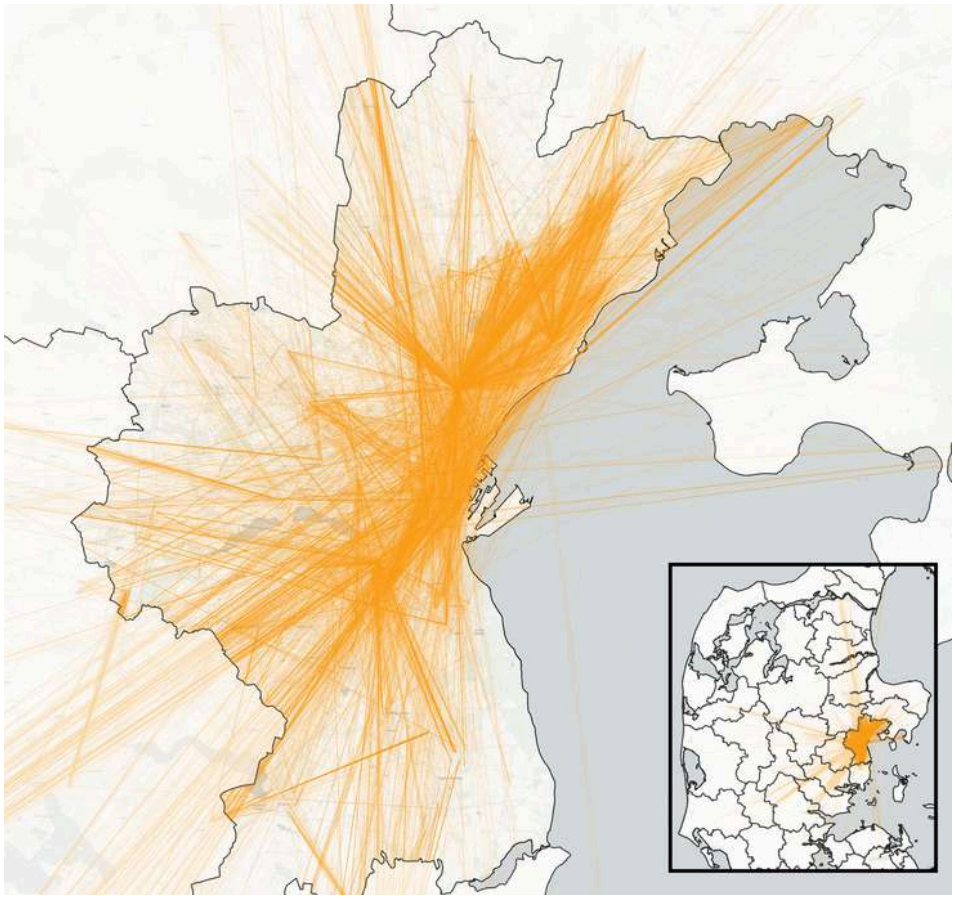
One of the primary motivations behind the carpooling experiment is to address mobility challenges faced by students residing in areas with limited access to traditional public transport. By tracking the usage patterns and destinations of rideshare participants, the municipality of Aarhus aims to determine if carpooling effectively supplements the existing transport infrastructure.

The map provided by the carpooling platform operator displays completed trips within the municipality from January to April 2024. Aarhus' objective is to identify patterns where carpooling trips serve as shortcuts between public transport nodes and originate in areas with limited or no public transport coverage. However, the map exhibits bias, as most trips originate from densely populated areas where public transport accessibility is robust.

In their analysis, the municipality seeks to identify shortcuts, primarily focusing on routes originating from the outskirts of the municipality that do not directly lead to the city centre. Aarhus boasts a semi-radial public transport system, with buses typically travelling into the city centre from one side and exiting from another. Thus, lines trending almost horizontally, both to the south and north of the city, can be interpreted as potential shortcuts.

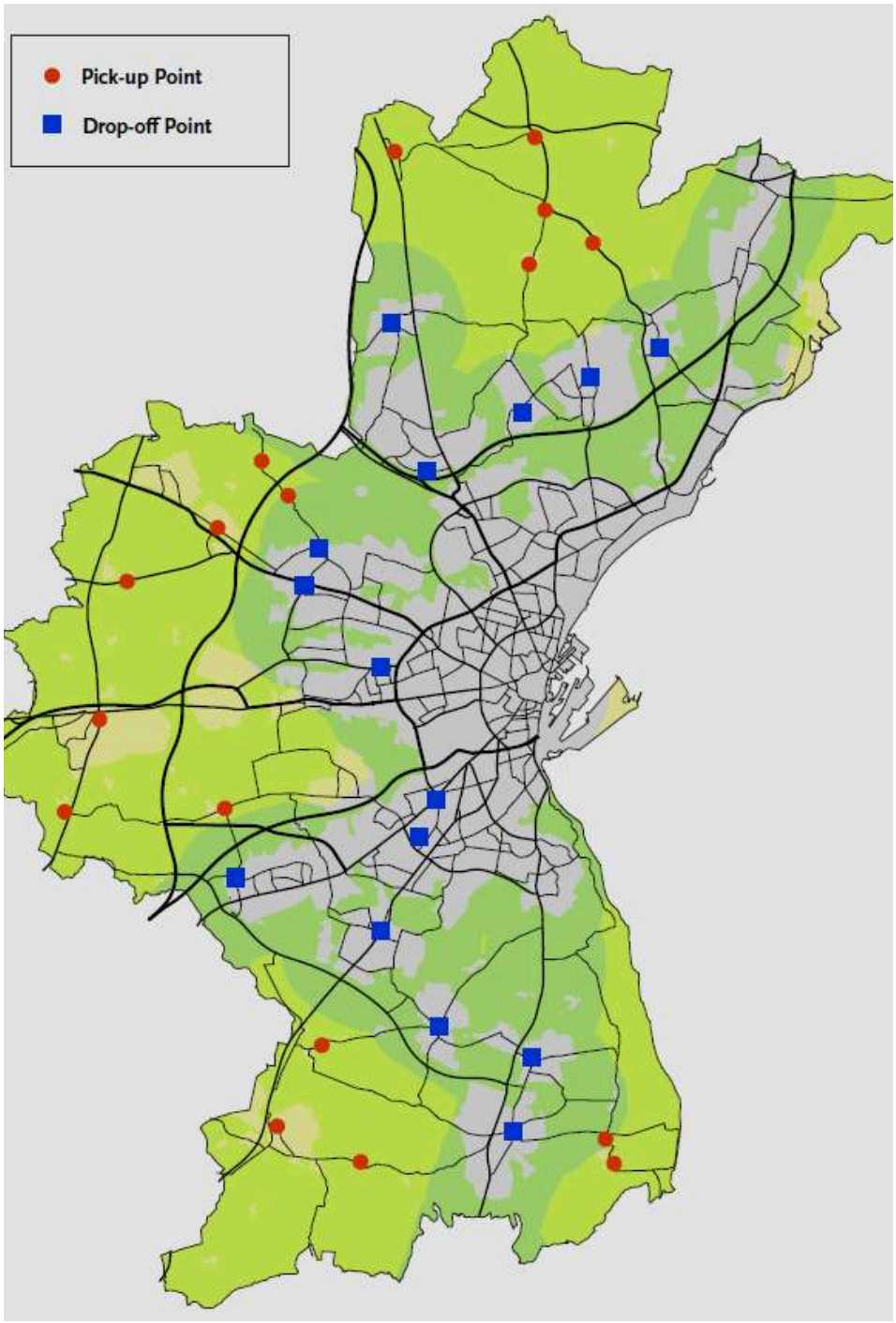
What are the viable models for carpooling services to be offered to citizens?

Aarhus Municipality's initiative rests on the belief that offering monetary incentives can stimulate interest in carpooling among young students.



Completed carpooling trips originating or ending in Aarhus Municipality between January and April 2024

NaboGo



Sketch of a possible carpooling model in Aarhus, where trips starting farthest away from high-frequency public transport (yellow) and ending at a high-frequency hub are subsidised

Gustav Friis

While the project has not undergone a comprehensive evaluation yet, the carpooling platform provider notes a significant surge in platform participation and completed trips due to the incentives. On one hand, it indicated that the incentives are effective. On the other hand, it raises concerns about expanding the model to serve all individuals currently underserved by public transport. The trial was promoted at three educational institutions — just a fraction of the total number of educational institutions in one of Denmark's youngest cities.

Therefore, Aarhus Municipality is actively seeking a sustainable approach to support carpooling — preferably through financial means — yet ensuring it is a model that can also be offered to carpooling platforms without burdening municipal budgets. This requires that the subsidies primarily benefit citizens who have no other options than the private car, or citizens for whom public transport is such a poor alternative that they resort to car usage or avoid travel altogether.

In comparison to neighbouring municipalities, Aarhus Municipality boasts a large student population and a well-established public transport system. Nonetheless, there remain coverage gaps where demand for public transport is so low that it becomes disproportionately expensive to operate. Demand Responsive Transport (DRT) serves as a solution to this challenge in Aarhus; however, carpooling presents a potentially more cost-effective alternative. Hence, in 2024, Aarhus Municipality will explore the prospect of applying the DRT approach to carpooling.

By exploring various pricing structures, technological platforms, and partnership opportunities, the municipality aims to lay a robust foundation for sustainable carpooling initiatives that align with broader urban mobility strategies.

Can carpooling significantly contribute to CO2 reduction in the municipality's transport sector?

A core component of Aarhus Municipality's sustainability agenda is curbing carbon emissions associated with transport. By promoting carpooling as a viable alternative to single-occupancy vehicle trips, the municipality envisions a potential decrease in CO2 emissions. With an ambitious target of achieving carbon neutrality by 2030 and a transport sector that is not transitioning rapidly enough on its own, it is essential to reduce the number of kilometres driven by fossil fuel-powered vehicles. Maximising the use of the countless empty seats traversing our roads every day holds the key to a more sustainable mobility system. However, this requires a collective recognition of carpooling as an integral part of Aarhus' mobility system. Therefore, it is crucial to persist in making carpooling appealing to young people — the future commuters.

Transitioning takes time, and with just five years until 2030, we must strive to make green mobility attractive and the default choice for a much broader demographic than it presently encompasses. While carpooling is just a small piece of the puzzle, it holds promise for advancement through technological innovations, improved legislation, and a heightened willingness to embrace sustainable travel options and practices.

By evaluating the efficacy of incentives and their impact on student mobility and by exploring future service models, the municipality sets a precedent for a data-driven approach to urban mobility planning and policymaking. This approach not only enhances the liveability, sustainability, and inclusivity of Aarhus's transport ecosystem, but also sets a model for cities globally.

Car traffic in Aarhus

Kaiison, Unsplash

REAL SOLUTIONS FOR REAL CITIES

WRITTEN BY
BERNADETTE BERGSMA

European cities struggle with diverse barriers to innovative transport solutions. EIT Urban Mobility's Rapid Applications for Transport (**RAPTOR**) programme brings public administrations and startups together to pilot agile solutions specifically tailored to each city's needs. The programme has seen a promising impact and continues to pilot projects across Europe.

European cities face diverse challenges. Covering 10.53 million square kilometres, from the Arctic Ocean to the Mediterranean Sea, Europe is rich in geographical and cultural diversity. While this diversity is certainly a strength, it also means that a mobility solution that works well in Iceland is unlikely to meet the needs of citizens in Greece.

While tailored solutions are necessary, cities have traditionally been tasked with solving their mobility challenges internally, with lengthy bureaucratic processes slowing the pace and breadth of progress. These sometimes opaque procedures are at the detriment of all, as innovative solutions offered by startups and small and medium-sized enterprises (SMEs) have enormous potential to address niche urban mobility challenges.

This facilitation of connections between public authorities and small, private companies is the guiding force behind EIT Urban Mobility's RAPTOR programme. The challenge-based programme encourages cities to identify a mobility challenge and invites startups and SMEs to propose promising solutions. Winners are then awarded funding to develop and pilot their solution in (and with) the city over a five-month period.

Adriana Diaz, Interim Director of Innovation at EIT Urban Mobility explains: 'The RAPTOR programme was founded to help small, innovative companies bypass the traditional hurdles that come hand-in-hand with administrative contracts. By not only providing funding, but also facilitating partnerships and offering guidance, these SMEs and startups can solve well-defined city challenges while also creating references and opportunities for further scaling the adoption of their solution.'

Since the programme's launch in 2021, 31 pilots have been implemented in 24 cities from 17 countries across Europe. The projects have been varied in scope – focused on addressing the numerous difficulties that cities face in transforming to more sustainable, accessible, and inclusive urban mobility. For example, in 2023 alone, pilots aimed to optimise public transport, micromobility operations, and urban logistics; measure CO2 emissions and bus ridership; and encourage social integration of remote neighbourhoods. The following examples of previous pilots showcase the breadth of innovative solutions tested by RAPTOR programme participants in response to a niche city challenge.

Nudgd'ing for active mobility

In 2023, Helsingborg, Sweden, received the 'Cycling Infrastructure Award' from the European Cyclists' Federation, but at the time, only 11% of all mobility in the city was occurring via bicycle. Thus, the focus of Helsingborg's RAPTOR 2023 challenge was a unique one: develop a bicycle culture in the city.

Sweden-based startup Nudgd, and their behavioural-science-fuelled Smart Nudges Mobility platform, utilised 'nudging' to motivate users to engage in active mobility. Targeting the commuting habits of elementary students and their guardians and staff, the pilot exceeded Nudgd's expectations.

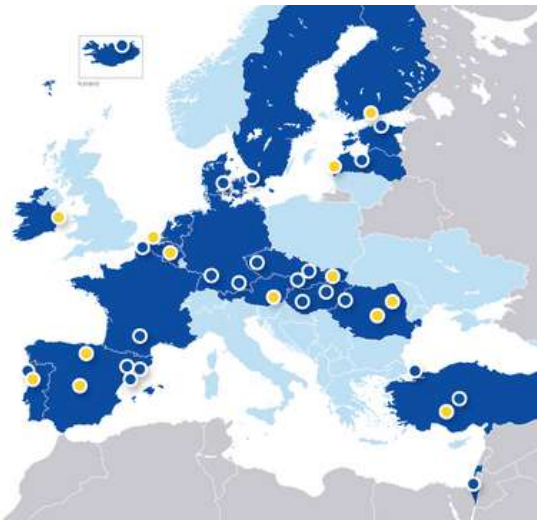
Over 2,400 participants from 25 different schools participated; with 39% of participants reporting that they changed, or planned to change, to a more active mode of transport. Additionally, participants were twice as likely than non-users to switch to active transport. Participants received health benefits from choosing active modes for commuting and Nudgd reasoned that the decreased car traffic would increase safety and air quality near the participating schools.

Instant System for increased ridership

In Akureyri, Iceland, riding the bus is free of charge. However, residents perceive the bus as unreliable and infrequent, preferring private vehicles. The city wanted to change these patterns while also encouraging more active mobility. Thus, Akureyri was paired with Instant System, a Mobility-as-a-Service (MaaS) startup based in France.

Instant System's app-based platform integrates public transport with other mobility options such as cycling, walking, shared mobility, private vehicles for Park & Ride, and on-demand transport for people with disabilities. The app also quantifies each mode's emissions in comparison to a private car, encouraging modal shifts.

After the initial pilot phase, the Municipality of Akureyri opted for a six-month extension, expanding the solution to the whole city and integrating e-scooter availability. Based on the pilot's initial success, Instant System predicts a 10% increase in the shift to public transport, micromobility, or active mobility from private car ridership.

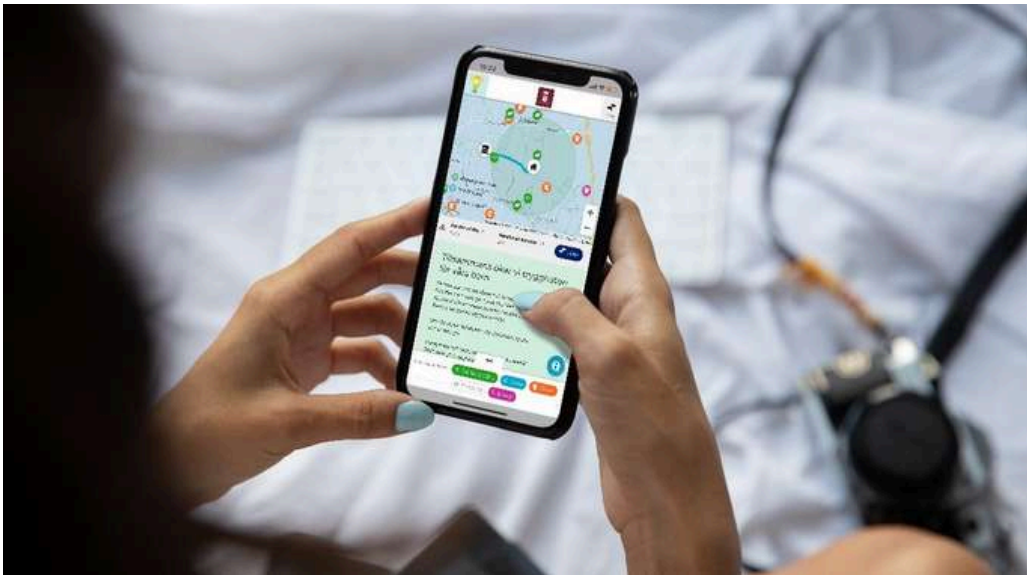


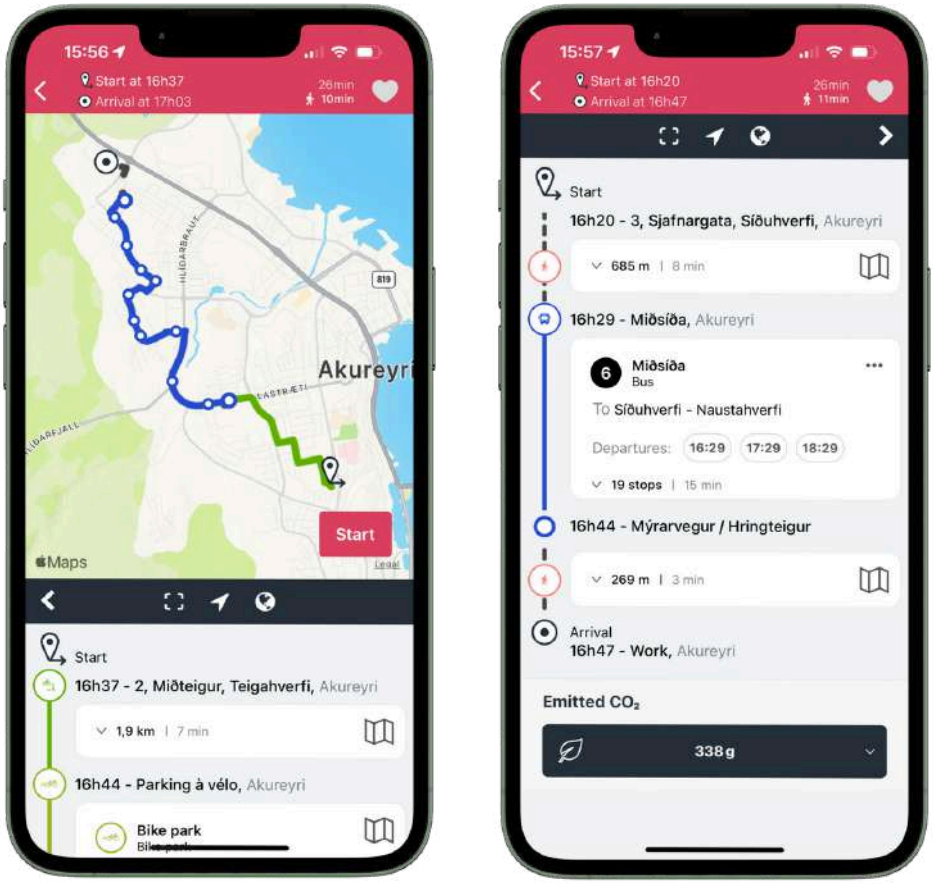
Map of RAPTOR programme pilots (blue pins indicate past projects while yellow pins indicate planned pilots)

EIT Urban Mobility

A parent using the Smart Nudges Platform to select sustainable transport options for their child's school commute

Nudgd AB





Instant System's MaaS platform, showing the CO2 emissions of each journey

Instant System

Getting a consistent Chargeprice

Denmark wants to electrify more than a million vehicles by 2030, and the Capital Region of Denmark offers extensive public and on-street charging infrastructure for electric vehicles (EVs). However, since the price of charging is regulated by the operators themselves, the lack of price transparency can dissuade drivers from making the switch to electric.

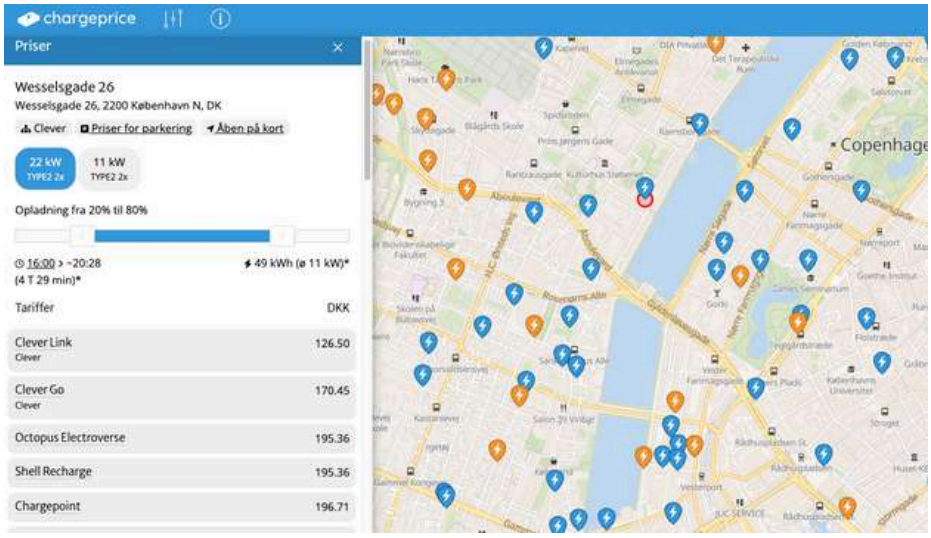
As a participant of RAPTOR 2023, the Capital Region of Denmark wanted to provide drivers with a transparent overview of charging prices across all EV charging operators. Startup Chargeprice, with their app of the same name, was awarded the opportunity to put their product to the test.

By the project's completion, Chargeprice had successfully tailored the app to the Danish market and language and removed the necessity for manual price checks, in favour of twice weekly automated updates. As a result, the startup improved data for over 16,600 charging points in Denmark, 900 of which are in Copenhagen.

Throughout the five-month pilot, over 4,200 Danish EV drivers tested the service which allowed them to search based on compatibility, availability, time of day or night, type, and charging speed. This level of customised search allowed for cost savings for drivers of up to 50%, further encouraging the wider adoption of EVs.

Chargeprice's price transparency solution at work in the Capital Region of Denmark

Chargeprice



RAPTOR in 2024 and beyond

This autumn, the third cohort of the RAPTOR programme will begin their pilots in 13 different cities – from Fingal County in Ireland to Konya, Türkiye, each pilot will tackle a pressing mobility issue. Focused on challenges as wide-ranging as encouraging active mobility for seniors, to optimising urban logistics in low-traffic areas, the programme is anticipated to yield innovative results for years to come.

THE HELSINKI SOLUTION

WRITTEN BY
SATU REIJONEN

Helsinki, the capital of Finland, is leading the way in sustainable urban mobility and **last-mile logistics**. With a target of achieving carbon neutrality by 2030, innovative solutions like autonomous delivery vehicles and parcel locker systems are transforming the city's logistics landscape.

With over 660,000 inhabitants, the Capital of Finland, Helsinki, is targeting carbon neutrality by 2030. Recognised as the most prepared city for the future of urban mobility by the Oliver Wyman Forum, Helsinki leads in innovative urban transport solutions. This success is fuelled by continuous research and development in smart mobility technologies, always prioritising the well-being and happiness of its residents.

However, achieving efficient urban life depends on addressing last-mile logistics, which poses a significant challenge to Helsinki's carbon neutrality goals. The city has implemented numerous solutions to tackle this issue, with parcel locker systems standing out as particularly effective. Innovations like outdoor locker systems, which include features such as audiovisual guidance and the possibility to opt for lower lockers for those with special needs, have notably enhanced service quality for residents.

As e-commerce thrives and parcel locker systems have become the preferred delivery method for many residents, more traditional delivery methods still contribute to congestion, emissions, and safety concerns, indicating that progress is further needed to fully optimise urban logistics and achieve Helsinki's ambitious sustainability targets.

Delivering the 'tools' for change

Forum Virium Helsinki, a non-profit innovation company owned by the city of Helsinki, plays a crucial role in decarbonising conventional last-mile logistics and piloting innovative solutions in the urban environment. Overall, Forum Virium Helsinki is managing a wide range of projects contributing to the shared vision of making Helsinki the most functional city in the world, and as a neutral facilitator, it fosters collaboration between various stakeholders, including residents, businesses, academic institutes, other cities, and the public sector. This collaboration is evident, especially in the URBANE project, funded by the EU Horizon program, which focuses on demonstrating innovative solutions for last-mile deliveries while prioritising sustainability and efficiency.

The URBANE project uses the Helsinki Living Lab as one of its testing grounds, where Forum Virium Helsinki, together with LMAD and DB Schenker, have conducted two successful pilot sprints, each showcasing distinct use cases.

The first sprint focused on B2B deliveries, utilising an autonomous delivery vehicle (ADV) manufactured by TwinswHeel and operated by LMAD, along with a cargo bike provided by DB Schenker. These vehicles delivered tools directly to construction sites from the Würth Center Sörnäinen, an external partner in the first pilot sprint.

This initiative aimed at eliminating unnecessary trips for construction site workers while enhancing tool delivery services — moreover, it became evident that the construction site workers were unwilling to give up their break to pick up the necessary tools themselves instead of having them directly delivered to the site by the ADV.

User-centric innovations ahead

In urban logistics, placing the end user at the centre of operations is crucial for ensuring the success and sustainability of new solutions. Satu Reijonen, the project manager of URBANE's Helsinki operations, highlighted the importance of this in a presentation at the POLIS – ALICE Urban Logistics Webinar #3 on Logistics for Urban Construction Sites.

In particular, Reijonen emphasised the need for transparent feedback loops involving end users, building on top of such insights to then ensure that their needs are met in a way that maximises the value of the service and ensures its financial sustainability in the future. This agile, iterative approach to pilot design — gathering insights during operations and continuously improving based on real-world data — is a hallmark of Helsinki Living Lab's activities.

It comes to no one's surprise that the valuable feedback gathered from the first pilot, including insights from Würth Center Sörnäinen, construction workers, and residents, significantly informed and influenced the design of the second pilot sprint. This phase shifted focus to B2C (business-to-consumer) e-commerce deliveries. Drawing from the previous experiences from Forum Virium Helsinki's mobile locker pilot, a modular parcel locker system was integrated into the ADV, allowing residents to conveniently pick up e-commerce parcels from a predetermined location during a one-hour time slot of their choice.

Seasonal changes in Finland provided an opportunity to test the ADV's functionalities under extreme winter conditions. While cold air and snow piles in random locations posed challenges to both sensors and route optimisation, light snowfall had less impact on the Lidar cameras than anticipated. Moreover, the integrated parcel locker system, featuring a pin-code mechanism for parcel retrieval, received positive feedback from users, and the ADV's design, named HeRo (Helsinki Robot), was praised both locally and in international media for its user-friendly appearance.

Looking at the future

The upcoming third pilot sprint, scheduled for Summer 2024 in the districts of Ruoholahti and Jätkäsaari, will showcase the benefits of consolidating logistics operations within shopping centre premises. This pilot — done in collaboration with the EU Horizon-funded DISCO project, which brings together a wide range of service providers, such as Rolan, A2B, and more — aims to create a neutral platform for various logistics operators to collaborate and optimise last-mile deliveries.

Satu Reijonen at the Autonomy Mobility World Expo in 2024

Renske Martijnse-Hartikka

The pilot's vision is to facilitate e-commerce parcel deliveries using ADVs and cargo bikes from a central location, thereby reducing the need for vans and trucks in the city centre. Additionally, residents will have the opportunity to conveniently drop off parcels for further shipment.

POLIS once again invited Reijonen to discuss the management of last-mile logistics in Helsinki at the Autonomy Mobility World Expo held in Paris in March 2024. Her key message emphasised that the shift towards sustainable last-mile deliveries is inevitable and requires multidisciplinary collaboration. While some regulations are most likely necessary to facilitate this change, they must support rather than hinder innovative solutions. This means that, above all, regulations should support wise land use for sustainable urban logistics and address the responsibilities, safety concerns, and movements of autonomous vehicles in the urban environment.

Additionally, residents play a key role, too: they do so by choosing environmentally friendly logistics services, even if these might be more expensive during the piloting phase. Therefore, achieving a financially sustainable solution requires meeting user needs and delivering value that surpasses existing alternatives, ultimately reshaping consumer behaviour over time.

Leading by example

Raising public awareness about innovative delivery solutions, such as autonomous delivery vehicles, is critical for widespread adoption. Furthermore, the social impact of ADVs, including aspects of safety, inclusivity, accessibility, and public acceptance, should be further measured, monitored, and adjusted using key performance indicators (KPIs) — the first set of KPIs used in URBANE's Helsinki operations was developed in collaboration with students from the Hanken School of Economics during their Corporate Responsibility project course, exemplifying the multidisciplinary collaboration facilitated by Forum Virium Helsinki to ensure that the City of Helsinki continues to be one of the best cities to live in.

Ultimately, Helsinki's commitment to innovation and sustainability positions it as a global leader in urban logistics. By embracing cutting-edge technologies and fostering collaboration across sectors, the city not only aims to decarbonise last-mile delivery, but also to enhance the overall quality of life of its residents. As Helsinki continues to pioneer these advancements, it sets a powerful example for cities worldwide, showcasing how sustainable urban living and efficient logistics can go hand in hand.

HeRo and NeRo robots inside the microhub
Satu Reijonen

FUNDING SUSTAINABLE MOBILITY

Discover how the **Apulia** Regional Programme ERDF-ESF 2021-2027 is driving sustainable urban mobility and inclusive economic growth through strategic investments in zero-emission transport, digital solutions, and enhanced public transport services.

WRITTEN BY
FRANCESCA ARBORE
GIULIA DI LEO

Libero_Monteresi, Shutterstock

As many know, the European Regional Development Fund (ERDF) and the European Social Fund Plus (ESF+) are key components of the European Union's Cohesion Policy — a policy that aims to enhance the economic well-being of regions within the EU and reduce regional disparities.

The ERDF transfers money from wealthier European regions to invest in the infrastructure and services of underdeveloped areas. Meanwhile, the ESF+ supports the creation of more and better jobs across the EU by co-funding national, regional, and local projects that improve employment levels, job quality, and labour market inclusivity in member states and their regions.

Within this framework, the "Apulia Regional Programme ERDF-ESF+ 2021-2027" (CCI 2021IT16FFPR002) was approved.

Bike-friendly electric buses promote low-emission, multimodal transport
Francesca Arbore

The Apulia Regional Programme

The Apulia Regional Programme ERDF-ESF 2021-2027 aligns with key European strategies that focus on ecological and digital transitions and the European Pillar of Social Rights. These strategies are the foundation for inclusive and sustainable economic growth that protects the environment and preserves opportunities for current and future generations.

At the national level, the Apulia Regional Programme embraces the priorities indicated by the Partnership Agreement (PA) 2021-2027 and works in synergy with the National Recovery and Resilience Plan (NRRP) and other national programmes financed by the Cohesion Policy. This coordination ensures maximum complementarity between interventions, prevents overlaps or gaps, fosters collaboration across various institutional levels, and encourages broad participation from potential beneficiaries and territories.

In the area of sustainable urban mobility, the Apulia Regional Programme ERDF-ESF 2021-2027 features Priority Axis III, "Sustainable Urban Mobility" (ERDF). This axis aims to improve air quality, particularly in urban areas, by promoting sustainable and zero-emission mobility forms, including collective, shared, cycling, pedestrian, and intermodal transport.

To achieve this, the specific objective "Promote sustainable multimodal urban mobility as part of the transition towards a net zero carbon economy (SO 2.8)" will be pursued through the following actions:

- 3.1 "Interventions to promote sustainable multimodal urban mobility"
- 3.2 "Infrastructural and technological interventions for traffic management and fare integration"

A multidimensional strategy

The Programme's strategy places a strong emphasis on developing urban mobility. The key actions to be implemented include:

- Upgrading public transport services (in Italian: TPL — Trasporto Pubblico Locale) by replacing vehicles with zero-emission ones in urban, suburban, and metropolitan areas, particularly through Bus Rapid Transit (BRT);
- Promoting soft mobility infrastructure and services, such as urban and suburban cycling and pedestrian paths;
- Expanding Mobility as a Service (MaaS) to better match travel options with demand;
- Modernising interchange nodes between urban and extra-urban mobility using digital solutions (Intelligent Transportation Systems — ITS).

Specifically, the Apulia Region plans to build on the strategy initiated with the previous ERDF 2014-2020 programming. This includes modernising rolling stock and creating networks of cycling and pedestrian paths. Additionally, efforts to enhance intermodal interchange nodes through digitalisation and the expansion of info-mobility services and MaaS will be supported.

As for cycling, the Region will support the extension and completion of cycle routes of regional and national interest within urban, suburban, and contiguous urban areas. It will also facilitate the creation of cycling and pedestrian paths connecting railway

stations and points of interest (e.g., hospitals, universities, schools, public markets).

The promotion and encouragement of using scheduled public transport will be stimulated by introducing an integrated single ticket, making it possible to simply and conveniently plan any type of itinerary.

Lastly, in the context of zero-emission mobility, the Apulia Region also intends to encourage the creation of a public charging network for electric public transport vehicles.

Interventions to come

Within Priority 3 "Sustainable Urban Mobility" of the PR Apulia ERDF 2021/2027, the Apulia Region plans to launch a public call with a financial allocation of €15,620,000.00. This funding is aimed at municipalities within its territory, either individually or in association, to create networks of cycling and pedestrian paths within municipal or inter-municipal areas (neighbouring municipalities).

As for infrastructural and technological interventions for traffic management and fare integration, the Region intends to finance projects that make scheduled public transport more accessible and flexible. These interventions will allow users to know in real-time the various travel alternatives, from the fastest to the most economical, including the most environmentally sustainable options. The financial allocation for these projects is expected to be of approximately 4 million euros.

Additionally, to modernise interchange nodes between urban and extra-urban mobility using digital solutions (ITS) for public transport stops, thereby enhancing the liveability of urban areas and promoting sustainable mobility forms, the Region plans to allocate approximately 4 million euros.

These systems will provide essential support for efficiently managing integrated services for regulation, control, information dissemination, and mobility planning.

The ultimate goal is to create a digital network to better monitor fleets and stops, allowing cities to keep citizens and end-users up-to-date on the timing and availability of public transport.

One of Apulia's newly-added urban bike lanes
Francesca Arbore

GAME ON!

WRITTEN BY
CARLOTTA INSERRA

What is the potential of **gamification** in shaping the cities of tomorrow? Find out how **video games** like Minecraft and SuperBARRIO are revolutionising community engagement and making cities more inclusive and sustainable.

The importance of engaging local communities in the design and development of public spaces has been widely recognised by policymakers and urban planners. Involving citizens in such processes is key to creating truly inclusive, safe, and accessible cities, but to do so effectively has not come without its challenges: balancing the needs of multiple stakeholders, communicating harmoniously between professionals and individuals without any technical knowledge, and engaging with a wide variety of social groups in any community are just some of the barriers to public participation in urban design.

Kids playing Minecraft during one of the WohnRegion project workshops (previous)

© Ben Kilb

This is especially beneficial for specific user groups such as children: youth involvement has long been a significant challenge for public participation in urban design, and integrating the innovative and fun nature of video games into public space design could help bridge this gap, empowering young people to have a say in shaping the cities they will eventually inherit.

So, what does gamification look like in the context of urban planning? How can this participatory method bring together different kinds of users, including children, to create more liveable cities?

Leveraging existing video games: The Minecraft case

Several video game-based urban planning approaches have proven successful and popular with citizens. One of the first was the Block by Block initiative, a collaboration between UN-Habitat and Mojang Studios to integrate the computer game Minecraft into public space planning and get community members more involved. Minecraft is a user-friendly game that helps players visualise three-dimensional environments in a format designed for rapid iteration and idea-sharing.

Through participatory workshops, Block by Block seeks to help neighbourhood residents design the public space that they would like to see. To date, this initiative has sparked dozens of projects in more than 55 countries worldwide.

Since then, many others have begun to leverage the potential of Minecraft and apply it to their specific contexts. In 2022, the Deutsches Architekturmuseum (DAM) (German Architecture Museum), together with Minecraft YouTube influencer Josef Heinrich Bogatzki (under the alias TheJoCraft), conducted the 'WohnRegion' project, to test how Minecraft could be used as a tool for urban planning in the Frankfurt Rhein Main region, a POLIS member.

The identified context within the metropolitan area was that public space could no longer be negotiated on a local, small-scale level and that constructive dialogue between different stakeholders, including citizens, was essential to design the region's future in a manner beneficial to all concerned.

The WohnRegion project thus sought to encourage citizens to share their input on urban planning matters, with a specific focus on housing and shared living environments. Together with urban planners from eight districts in Hessen, the project team defined local challenges — some even related to transport, such as

Section of Oberursel district transposed into Minecraft for the WohnRegion project (below)

© TheJoCraft

Digital version of the Kronberg district in the WohnRegion project
© TheJoCraft

pedestrian crossings, parking management, and inclusivity — to be transposed into Minecraft's digital world. Each challenge was based on the unique context of each of the districts, and specific rules were created to reflect the inherent considerations of decision-making processes in planning. Players then had to develop their own solutions to the problem, sharing their vision of what their district should look like.

The project ran from 1 June to 30 September 2022. During this period, public participation was possible, with gamers able to play from home. Additionally, the project organised workshops in each of the districts to include citizens who lacked access to the game and to involve, above all, young children.

The project was a resounding success, with an outpouring of positive feedback from participants and parents alike. The conclusion was that Minecraft could be an excellent tool for engaging diverse age groups in planning processes, as it allows children and young people to critically and playfully address urban planning issues, participating in discussions in a manner that resonates with them. Moreover, because it helps planners and decision-makers understand and adopt the perspectives and language of young people, the project's approach was seen as a driver for inclusive and responsive design.

Designing video games for inclusive urban planning: the SuperBARRIO case

Beyond using existing video games as a participatory method for urban planning, others have resorted to developing brand new options to meet the more specific needs of policymakers and city planners. This is something that the European project ELABORATOR has recently begun working on.

ELABORATOR uses a holistic approach for planning, designing, implementing, and deploying specific innovations and interventions for safe, inclusive, and sustainable urban mobility. The interventions will be demonstrated in several cities across Europe, starting with six Lighthouse cities: Milan (IT), Copenhagen (DK), Helsinki (FI), Issy-les-Moulineaux (FR), Zaragoza (ES), and Trikala (GR). Additionally, six Follower cities will learn and exchange with the Lighthouse cities to plan and implement their own sustainable solutions.

The interventions will be co-designed and co-created specifically with identified 'vulnerable to exclusion' user groups, such

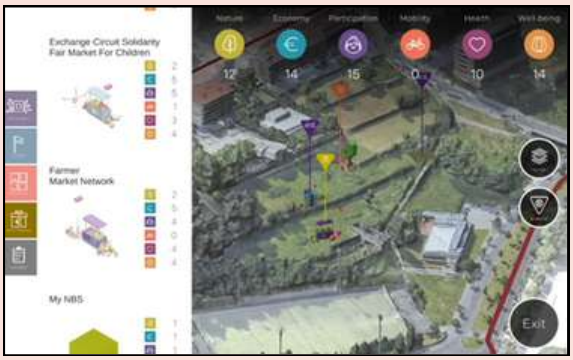
as women, children, older people, and people with physical or mental impairments, among others. Gamification will be used as one of the methodologies to achieve this goal: indeed, the Institute for Advanced Architecture of Catalonia (IAAC), one of the ELABORATOR partners, is currently working on the development of a new version of their video game specifically for the project.

IAAC designed SuperBARRIO as a digital participatory tool that broadens the potential target groups involved in collaborative design, addressing the limitations of more conventional co-creation techniques. Developed as an open-source video game for smartphones and tablets, it allows architects and public entities to engage citizens in the design of public space, collect data about their needs and preferences, and exchange ideas about sustainability and inclusiveness. Initially conceived for the design of Barcelona's Superblock, it was further developed in the URBiNAT H2020 project to focus on co-creating green corridors in deprived areas of three pilot cities (Porto, Nantes, Sofia) using nature-based solutions. Players could download the game as an application and create 3D design strategies for the public space, incorporating proposed solutions from the URBiNAT catalogue. This interactive process helped users see how different solutions would impact important indicators such as well-being, inclusiveness, and resilience.

A new version of the SuperBARRIO game will be developed for ELABORATOR, focusing on the co-design of urban spaces to specifically improve mobility. A 3D model will be created for each target area in the Lighthouse cities of Milan, Trikala, and Zaragoza. Players will navigate these spaces, highlight accessibility barriers and safety risks, and drag and test a diverse range of mobility solutions.

From temporary to permanent infrastructure, the new catalogue of SuperBARRIO for ELABORATOR will include solutions such as bike lanes, green spaces, traffic management measures, and tactical urbanism interventions. The updated game will also feature a new set of specific indicators related to mobility, such as road safety, noise impact, and traffic intensity.

As with the previous version, the goal of the game will be to place the solutions from the catalogue in the target area to understand their impacts. In the process, players will also provide data from the game sessions to support local decision-makers, urbanists, and mobility experts in making publicly informed choices. In the upcoming months, test-play workshops will take place with local partners and relevant target groups in the three Lighthouse cities.



Gameplay of SuperBARRIO (URBiNAT)
© IAAC

SuperBARRIO versions developed for URBiNAT
© IAAC

Conclusion

The use of video games in urban planning offers a promising solution to the challenges of public participation. By creating engaging, accessible, and interactive platforms, urban planners can foster more inclusive dialogue and develop cities that reflect the needs and aspirations of all their inhabitants, including harder-to-reach target groups, such as children. As efforts to address the climate crisis accelerate in the next decades, gamification holds great potential for a future of urban design that is safe, inclusive, and accessible for everyone.

DEVELOPING A HUB STRATEGY

Discover **North Holland**'s pioneering **Hub Strategy**, transforming sustainable transit in urban and rural environments. Delve into how this comprehensive approach integrates diverse mobility needs, enhances connectivity, and fosters collaboration among stakeholders.

North Holland has been at the forefront of integrating multimodal transport hubs into its urban fabric, dedicating substantial efforts to develop a cohesive network of mobility hubs. The pinnacle of these endeavours has been the introduction of its Hub Strategy in November 2023, aimed at enhancing accessibility, sustainability, and liveability in its bustling cities and tranquil municipalities.

In an insightful discussion, Paul Chorus, policy advisor for the Province of North Holland, shed light on the ambitious process of developing the Hub Strategy. This recently unveiled strategy sets the course for the province's future mobility, reflecting its commitment to revitalise the transport landscape.

Through a forward-thinking approach, North Holland has established a network of mobility hubs seamlessly integrating various transport modes. The Hub Strategy delineates the province's pivotal in coordinating and cooperating on hub development and operations, while also supporting municipalities to avoid duplicating efforts and reinventing the wheel.

FROM CONVERSATIONS WITH
PAUL CHORUS

ELABORATED BY
JORGE MANSO GARCIA

North Holland mobility hub
Provincie Noord-Holland (2023)

The genesis of the Hub Strategy

The inception of the Hub Strategy arose from a pressing need to bolster the efficiency and integration of public transport systems serving both the urban centres and the rural areas of North Holland. Informed by the Province's Perspective Mobility document, the strategy underscores the imperative for smart mobility solutions, particularly emphasising active mobility and multimodal transport.

'Mobility hubs are more than mere transit points; they are crucial in promoting social interactions and connectivity,' asserts Chorus. Envisioned as vibrant spaces where public transport options converge with private and shared mobility solutions, these hubs provide residents and commuters with a seamless multimodal experience — one that complements the available mobility system.

In this sense, beyond contributing to increasing accessibility of mobility, hubs wield a profound influence on traveller behaviour, the quality of the living environment and public spaces, as well as the health of users and residents.

Integrating urban and rural mobility

One of the unique challenges addressed by the strategy is the integration of urban and rural mobility in North Holland, a region with diverse geographical needs where densely populated cities like Amsterdam have significantly different mobility demands compared to sparsely populated rural areas. 'Our strategy aims to provide equitable access to mobility solutions that cater to both the dynamic urban environments and the tranquillity of rural settings,' Chorus explains.

In urban areas, hubs focus on reducing car dependency, facilitating a shift towards more sustainable commuting options such as cycling, walking, and public transport. In contrast, rural hubs aim to maintain viable public transport systems that can adapt to lower demand without compromising service quality. 'The approach is about enhancing connectivity in a way that respects and uplifts the local context,' Chorus adds.

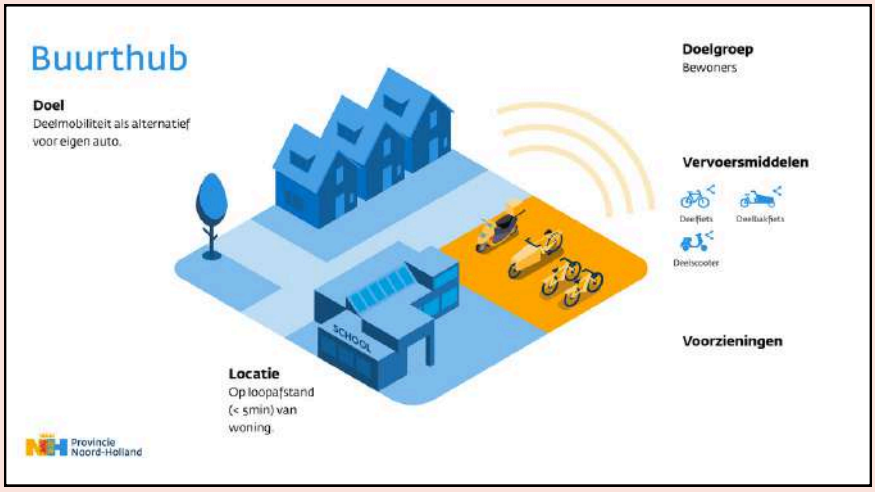
'A comprehensive network of mobility hubs must ensure accessibility across the Province's cities and municipalities. This strategy sets different hubs to cater to various target groups and types of trips. Whether within urban areas, rural areas, or between cities and rural areas, all journeys are aimed to be facilitated,' Chorus emphasises.

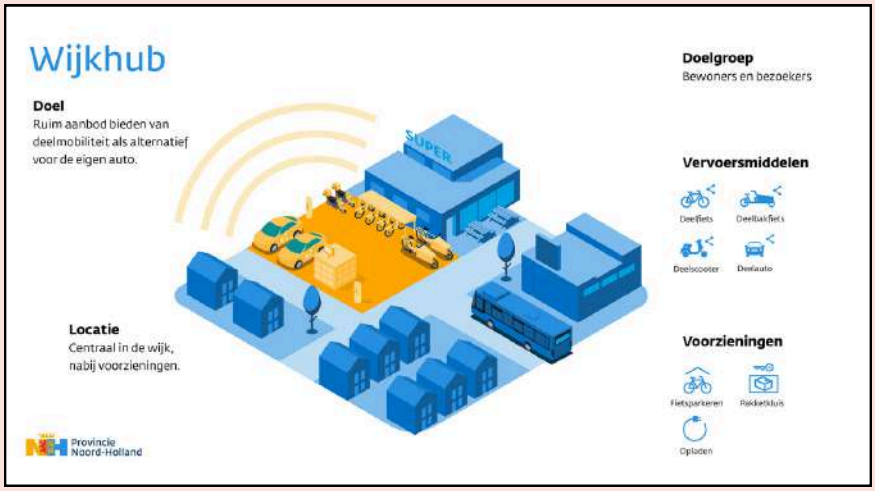
Collaborative efforts and economic challenges

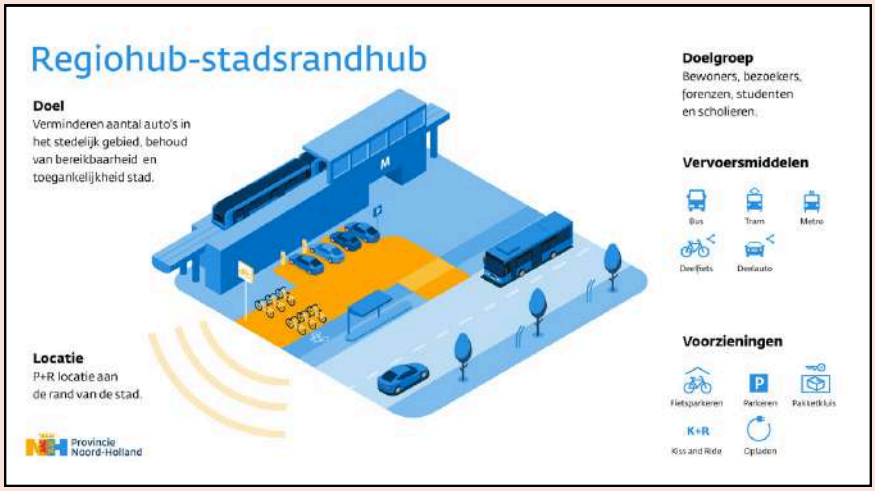
Developing such a comprehensive mobility network requires extensive collaboration with a myriad of stakeholders, including local governments, transport companies, and private operators. 'We have engaged in extensive consultations with municipalities and transport providers to ensure that our visions align and complement each other,' Chorus notes.

Despite these ambitions, the project faces challenges such as funding constraints and the complex task of aligning various stakeholder expectations. The strategy outlines the role of the Province in supporting development, ranging from subsidised co-financing with municipalities to promoting hub development in urban planning, enhancing hub accessibility and exploring innovative funding models like public-private partnerships. planning, enhancing hub accessibility and exploring innovative funding models like public-private partnerships.

North Holland has embarked on several pilot projects to test and refine the hub concept. 'These pilots are crucial. They allow us to gather data, understand user behaviours, and adjust our strategies in real-time,' says Chorus.







Hub strategies for neighbourhoods, districts, and regions

Provincie Noord-Holland (2023)

Learning from these initial implementations helps scale successful practices across the province, adapting strategies to better meet the needs of each area. This systemic scaling up of successful elements not only extends the reach and impact of the hubs but also enhances overall connectivity and accessibility throughout North Holland's urban and rural areas.

Future directions

North Holland's Hub Strategy plays a crucial role in shaping a sustainable and accessible future for its residents. It also proves how provincial governments are finding new ways of spearheading the development of mobility innovations, effectively supporting municipalities and fostering synergies across various transport modes.

By establishing a clear typology and defining specific roles for regional governance, North Holland ensures each phase of the hub strategy aligns with broader transport goals. This clarity helps municipalities understand their role within the larger framework, enhancing cooperative efforts and resource allocation.

'Including a diverse array of stakeholders from the onset is foundational to any strategy, as it reinforces its robustness. Engaging sectors ranging from public transit authorities to private mobility service providers ensures that the hubs developed are not only multifunctional but also inclusive, catering to a wide range of urban and rural mobility needs,' concludes Paul Chorus.

As North Holland continues to expand and refine its network of mobility hubs, the Hub Strategy will serve as a dynamic blueprint for sustainable urban development. It represents a significant step towards integrating and enhancing the province's transport systems, meeting the modern demands of urban and rural living. The success of this strategy will hinge on its adaptability and the continuous commitment to collaborative governance and extensive community involvement.

IT'S ALL ABOUT (REGIONAL) COOPERATION

INTERVIEW WITH
KRZYSZTOF MATYJASZCZYK

ELABORATED BY
MACIEJ HASIK
ALESSIA GIORGIUTTI

In an insightful interview, Mayor Krzysztof Matyjaszczyk shares the challenges and triumphs encountered during the SUMP development for the City of **Czestochowa**, the ambitious goals set for the subregion, and the significant strides made in infrastructure and cooperation.

Matyjaszczyk on site in Czestochowa
Maciej Hasik

Czestochowa, a city with district rights in southern Poland's Silesian Voivodeship, has a population of approximately 200,000 and serves as the central hub for the Northern Subregion of the Silesian Voivodeship, which encompasses three counties and Czestochowa itself, with a total population nearing half a million. As an urban node within the TEN-T network, Czestochowa has emerged as a natural leader in developing a Sustainable Urban Mobility Plan (SUMP) for the entire subregion.

The preparation of the SUMP was a significant undertaking, spanning over two years and involving extensive consultations with the subregion's residents. The work was completed in November 2023, with the adoption process extending until mid-January 2024. The SUMP was developed following the European recommendations for such plans.

Maciej Hasik: What was the biggest challenge during the work on the SUMP?

Krzysztof Matyjaszczyk: Before we started working on the SUMP, the biggest challenge was convincing all the representatives of the municipalities to embrace the idea of creating a joint document aimed at improving the quality of movement for residents across the subregion, beyond political divisions.

Once we achieved consensus on the importance of jointly preparing the SUMP, we devoted a great deal of energy to considering the needs and concerns of as many residents as possible regarding mobility. We used every available means of communication, including online surveys, direct and indirect interviews, telephone interviews, and meetings with residents. This comprehensive approach allowed us to gather over 15,000 responses from the subregion's residents — three times the number typically expected for such a large survey sample.

Hasik: What goals were set for the subregion?

Krzysztof Matyjaszczyk: It was a complicated process, but to summarise — the goals were formulated based on residents' feedback and thorough analyses using the subregion's traffic model, along with environmental considerations. The main goals outlined in the document include:

- Creating an integrated and efficient transport system;
- Reducing the negative impact of transport on the environment, climate, and people;
- Effectively managing sustainable mobility.

To achieve these goals, we developed a scenario for an integrated transport system, seeking to unify the transport network across the subregion. This scenario guides infrastructure planning to improve mobility and safety for residents while respecting environmental concerns.

To put it another way, each local government is now evaluating its investments through the lens of this development scenario, ensuring alignment with the SUMP concept for our region.

Hasik: Have you been able to hand over investments that are part of the SUMP?

Krzysztof Matyjaszczyk: Yes, even before we began developing the SUMP, we were already in the process of carrying out two strategic investments for the City of Czestochowa, and we made sure that their nature was strongly oriented towards the SUMP's goals. These projects are the reconstruction of DK-91 on the north-south axis and the reconstruction of DK-46 on the western side of Czestochowa. These roads aim to divert traffic away from the city centre and enhance mobility between municipalities in the subregion, including improvements for public transport.

I mention these projects to point out that our Subregion needs to keep investing in its road infrastructure. It may be a bit surprising to those in Western Europe, but our country still lacks sufficient infrastructure, and we are working to address it in a sustainable way. The recently developed and adopted SUMP is a significant step forward, which I hope will significantly improve the quality of life for our residents.

Krzysztof Matyjaszczyk

Mayor
City of Czestochowa

Matyjaszczyk on site in Czestochowa
Maciej Hasik

Matyjaszczyk on site in Czestochowa
Maciej Hasik

Hasik: Thanks to these strategic constructions, along with several other local projects, Czestochowa now has over 100 kilometres of bicycle roads available to residents. How do you feel about this achievement?

Krzysztof Matyjaszczyk: A decade ago, the total length of bicycle roads was less than half of what it is now. This makes me all the more pleased that we have now surpassed 100 kilometres — ever more satisfying is that our network of bicycle paths is becoming increasingly cohesive, with fewer gaps across the city. In addition, the City, thanks to these strategic road investments, has benefited from new, safe connections for cycling to neighbouring municipalities.

Hasik: The good news for cyclists does not end there, as the SUMP includes plans for new bicycle connections that will create a cohesive network of routes throughout the subregion. Can you elaborate on this?

Krzysztof Matyjaszczyk: Yes, we are planning three major investments that will enhance cycling across the subregion. The designed bicycle routes will total 230 kilometres in the Northern Subregion and will extend into neighbouring regions, forming a coherent bicycle network.

Hasik: What provisions are in place for transfer centres?

Krzysztof Matyjaszczyk: The SUMP includes a provision for the construction of 15 transfer centres, the construction of which is consistent with the planned bicycle routes and an attractive public transport offer, providing a viable alternative to personal car use.

Hasik: What are your conclusions regarding subregional cooperation?

Krzysztof Matyjaszczyk: At present, each municipality in the subregion considers the SUMP in virtually every investment related to the movement of the population. This approach fosters closer cooperation between municipalities and, hopefully, will soon lead to the establishment of an institution to oversee the consistency of investment plans across the subregion.

NATIONAL SUPPORT FOR SUMPS

In March 2023, the European Commission issued its landmark Recommendation on National Support Programmes for Sustainable Urban Mobility Planning, urging every Member State to put in place a national programme with a dedicated office to assist cities in developing their **sustainable urban mobility plans** (SUMPs).

The National Support Programmes for Sustainable Urban Mobility Planning are designed to provide comprehensive resources, including guidance materials, training programmes, and capacity building. They aim to offer technical expertise alongside financial support to cities, foster networks among cities and towns, and orchestrate targeted communication campaigns. The Recommendation also provides guidance to Member States and cities on preparing for the urban nodes requirements proposed for the Trans-European transport network.

WRITTEN BY
MARKO STANČEC

National SUMP support: A green light for local sustainable mobility
Michele Ursi, Shutterstock

In April 2024, the European Parliament formally adopted a revised regulation of the Trans-European Network for Transport (TEN-T). For the first time, the revised TEN-T objectives and priorities include a recommendation that all Member States should establish a national SUMP support programme aimed at promoting the uptake of SUMPs, improving coordination among regions, cities, and towns, and reinforcing the monitoring and evaluation of SUMP implementation.

ELTIS project in a nutshell

To empower mobility planning authorities across the European Union to adopt the Sustainable Urban Mobility Plan (SUMP) as their standard European-wide strategic planning approach, the ELTIS project underscores the critical role of national and regional levels in supporting SUMP implementation.

In 2023, The European Commission's Expert Group on Urban Mobility and the Directorate-General for Mobility and Transport of the European Commission, with the support of the ELTIS consortium, conducted a comprehensive survey. This survey, contracted by the European Commission, aimed to gain a better understanding of the status and efficiency of National SUMP Support Programmes (NSSP) across Member States (and competent regions). Specifically, the survey sought to:

- Assess the status of national SUMP support programmes in EU member states;
- Evaluate the scope and content of existing programmes;
- Identify key challenges hindering sustainable urban mobility planning in cities, regions, and Member States;
- Determine the needs of local, regional, and national authorities for the development or improvement of national programmes;
- Gauge the state of play and awareness of SUMPs.

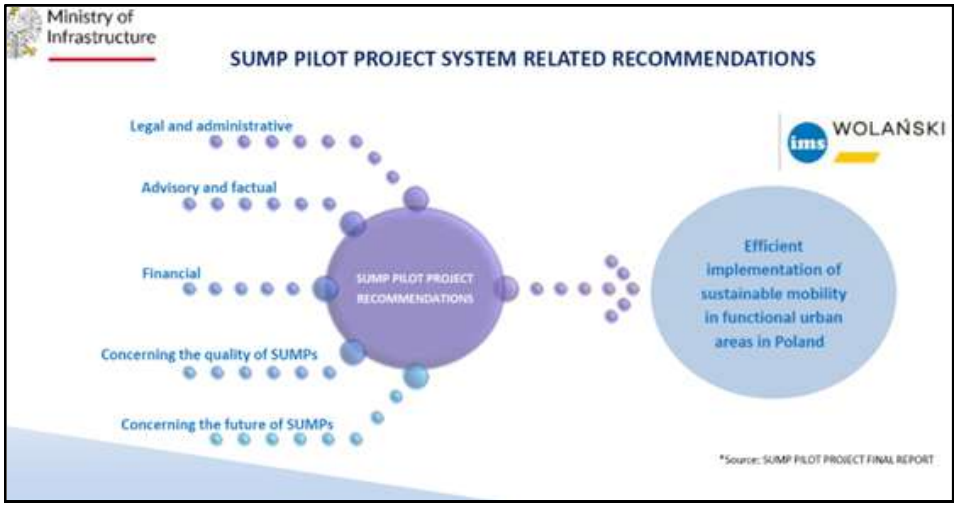
Ministerial insights on NSSP from Poland, Greece, and Slovenia

The survey of Member States representatives reveals that for urban nodes on the TEN-T network and other cities, a comprehensive and integrated approach to sustainable urban transport planning is essential. Developing high-quality SUMPs requires a systematic understanding and targeted support at both the national and local levels. The analysis of the survey and interviews with national SUMP contact points highlighted significant progress in national support programmes in countries like Poland, Greece, and Slovenia.

Poland

Urban mobility in Poland is a key component of the National Urban Policy 2030 adopted by the Government. In 2023, the Minister of Infrastructure established the SUMP Steering Committee, which adopted the Principles of Quality Management of Sustainable Urban Mobility Plans in Poland, particularly within the EU's 2021-2027 perspective. The evaluation process for all SUMPs in Poland is standardised, regardless of the programme used or whether EU funds are involved.

The quality evaluation of SUMPs for all 2021-2027 programmes is conducted by an evaluation team within the Centre for EU Transport Projects (CEUTP), in cooperation with the SUMP Competence Centre within the Ministry of Infrastructure. Additionally, a SUMP plenipotentiary has been appointed at the Ministry of Infrastructure.



SUMP Pilot project final report for Poland

Maria Perkuszewska

To ensure effective communication, knowledge transfer, and dissemination, Poland has established a National SUMP website and the SUMP Competence Centre. Through a technical support instrument project, the following activities are undertaken:

- Verification of existing SUMPs;
- Collaboration with technical universities in Poland;
- Verification of policies that align with SUMP principles;
- Assistance in contract formulation for consultants, including requirement specification, documentation quality, and acceptance support;
- Evaluation and formulation of recommendations during SUMP preparation or updates
- Opportunities for participants to exchange views every six months, at least six times during the duration of the project;
- Organisation of conferences and seminars.

As a result of the NSSP, 45 cities in Poland have adopted or are engaged in the preparation of their SUMPs.

Slovenia

In Slovenia, urban mobility policy is regulated at the national level by the Comprehensive Transport Planning Act, adopted in October 2022, along with the Rules on SUMP in June 2023.

These regulations make it mandatory for 12 city municipalities in Slovenia to develop Sustainable Urban Mobility Plans.

Slovenia's first SUMP support programme was established in 2012 as a national project, providing national guidelines and initiating the first SUMP preparation tender in 2015. Since then, NSSP has been updated regularly in 2018, 2020, and 2023. The NSSP aims to establish a comprehensive approach to SUMP development and implementation, expand SUMPs to the national level, promote intermunicipal collaboration, and monitor and evaluate SUMP quality, results, and impacts.

NSSP is led by the Ministry of the Environment, Climate and Energy and the Ministry of Infrastructure. Key elements of the programme include:

- National/regional funding conditional on having a SUMP
- Coordination and development
- Legislation
- Financial and other incentives
- Guidelines and methodology
- Quality control, monitoring, and evaluation
- Information, education, and promotion

The monitoring and evaluation of SUMP implementation are mandated by law. The legislation defines five common output indicators on modal split and an implementation indicator (share of implemented actions from the action plan). A SUMP quality control tool is in place to improve the document's quality and raise awareness of key content. Regular updates of the SUMP are required every seven years by law. The existing national guidelines are developed within the national planning framework, based on EU guidelines, and adapted to national needs, especially for small- and medium-sized towns and cities. These guidelines cover sub-topics such as parking policy, SULPs, walking, cycling, and public involvement.

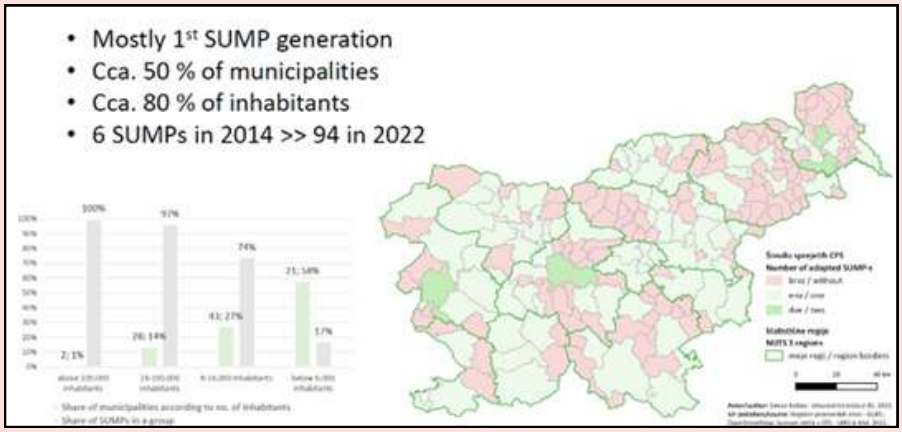
To ensure effective communication and knowledge transfer, the National Task Force (NTF) for SUMPs includes stakeholders from all government levels and academic support.

The National Platform for Sustainable Mobility features an official website, newsletters, national research programmes, targeted research programmes, andnational guidelines. It also organises annual national conferences with educational programmes.

Future plans for Slovenia include the introduction of regional SUMPs with pilot SUMPs and guidelines under preparation, as well as the development of the second generation of local municipal SUMPs.

As a result of the NSSP, 96 municipalities in Slovenia have adopted SUMPs.

Meeting of the national task force (above)
Urban Planning Institute of the Republic of Slovenia (UIRS)



SUMP development status in Slovenia (below)
Simon Koblar, UIRS

Greece

In 2016, the Ministry of Infrastructure and Transport (MoIT) established a Working Group for SUMPs to assess the needs and capacities of local authorities. This group developed guidelines for SUMPs and established an Administration Unit to support their implementation, drawing on EU guidelines and best practices. The following year, the MoIT established a Dedicated Unit for SUMPs, which focused on creating a, legal framework for SUMPs, monitoring their development, facilitating capacity building for local authorities, and developing a strategic plan to promote sustainable urban mobility. SUMP funding was also secured through the 'Green Fund,' managed by the Ministry of Environment and Energy.

SUMPs were formally defined in national law in 2019, and in 2021, local authorities were mandated to prepare SUMPs, outlining the SUMP cycle, objectives, and procedures.

Currently, legislation for SUMPs (Law 4784/2021 & Article 93 Law 5039/2023) requires all municipalities with over 30,000 inhabitants and regional authorities to develop SUMPs. Proposed SUMP measures that align with Law 4784/2021 and fall within the areas of responsibility of the Ministry of Infrastructure and Transport will be reviewed by the Minister and may be prioritised for inclusion in the annual Public Investment Program.

An online National SUMP platform has been established to monitor SUMP implementation. This platform facilitates the submission of step-by-step 'SUMP Cycle Reports,' and mandates regular SUMP updates of the SUMP. SUMPs must be revised based on periodic progress reports or new data or needs at any time after five years, and no later than ten years from the issuance of the ministerial decision that designates the mobility plan as a SUMP.

As a result of the NSSP, 95 municipalities and regional authorities have adopted or are in the process of developing SUMPs.

SAFETY AND SECURITY

How can we make urban mobility networks safe for all users? Our work on Safety and Security, done by the Safety and Security Working Group, answers this question and many more.

The Working Group addresses street and road safety, with a particular focus on protecting those who walk, cycle, or use public transport or shared micromobility vehicles. It also addresses the security of urban mobility networks, focusing on protecting users of transport infrastructure from gender-based sexual harassment, violent crime, and terrorist acts.

The topics being discussed in the Safety and Security Working Group go from the New Paradigm for Safe City Streets to the Safe System and the Vision Zero approaches, from speed management and traffic calming principles, methods, strategies, and solutions; to improvements in vehicle design (eg direct vision for trucks) and performance (eg Intelligent Speed Assistance Systems and Autonomous Vehicles).

The Working Group also investigates Crime Prevention Through Environmental Design (CPTED), applied to public transport stops, stations, and connecting hubs and pedestrian paths, gender-based sexual violence in public transport and public spaces, and risk Management principles and methods.

Find out more about the Safety and Security Working Group on our website!

SAVING LIVES ON RURAL ROADS

WRITTEN BY
JENNY CARSON
MARIA MEINERO

Half of all **road deaths** in the European Union happen on rural roads. What are governments doing to address this toll? Jenny Carson and Maria Meinero, authors of a recent report published by the **European Transport Safety Council**, explain why the dream of the open road doesn't have to turn into a nightmare.

In 2022, some 10,000 people died on the rural roads of Europe – more than half of all road deaths. Rural roads can be dangerous, compared to other road types. They often lack central and side barriers and allow for large speed and weight differentials between the vehicles that use them, from lorries to vulnerable cyclists and pedestrians. Single-vehicle crashes, where a fatigued driver misjudges a turn and runs off the road, are common. Head-on collisions frequently occur, and are often lethal.

By following the principles of the Safe System, countries and regions across Europe are making substantial improvements. In a recent report, the European Transport Safety Council (ETSC) examined progress in reducing deaths on rural roads across Europe over the last decade. And with help from our panel of experts, we looked at some remarkable interventions that are saving lives. France, Spain and the Belgian region of Flanders have reduced the speed limit across the entirety of their rural road networks. Sweden has invested heavily in '2+1' roads, which introduce a central barrier and a safety-first design. In Scotland, experiments with special road markings for motorcyclists to guide them through sharp turns have achieved remarkable results. In the West Pomerania region of Poland, 800 km of high-quality cycle routes have been built in five years.

So, with political leadership and the appropriate investment of time and resources, even small changes can make a big difference.

What the data show

In the last decade, the number of rural road deaths in the EU decreased by 25%. The number of deaths on other road types decreased more slowly, by 18% over the same period.

These reductions leave us far from the EU target, inspired by Vision Zero, of a 50% reduction in road deaths by 2030 compared to 2019, as well as the EU aspiration of zero road deaths by 2050.

On rural non-motorway roads with speed limits between 70km/h and 80km/h, between 53% and 82% of car and van speed observations in free-flowing traffic were within the speed limit in 2022.

On rural roads with speed limits between 90km/h and 110km/h, between 43% and 88% of cars and vans speed observations in free-flowing traffic were within the speed limit in 2022.

On average across the EU27, 56% of people killed on rural roads are car passengers or drivers, 20% are motorcycle riders or passengers, 9% are pedestrians and 8% are cyclists. The three most common collision scenarios on rural roads are collisions where the main opponent is a car, a (light or heavy) goods vehicle, or where no other vehicle is involved. Single-vehicle collisions tend to be underreported compared to multiple-vehicle collisions. Single bicycle collisions are particularly prone to underreporting in police records.

A rural road in Northern Germany
AustralianCamera, Shutterstock

Rural road infrastructure

Shortcomings in infrastructure are a contributory factor in many collisions on rural roads. Some of the most common unsafe features of rural road infrastructure include a lack of separation between the different directions of traffic and between motorised traffic and pedestrians or cyclists, obstacles in the roadside area, as well as inappropriate curve design.

The EU Road Infrastructure Safety Management (RISM) Directive requires governments to carry out regular road safety audits, identify high-risk sites and prioritise safety when building new roads. The revised directive which came into force in 2019 has extended the scope of the original legislation to include all motorways, primary roads and roads outside urban areas that have received EU funding.

In addition, a new network-wide road safety assessment has been introduced and the requirements to protect vulnerable road users have been strengthened.

A well-designed rural road should have separate lanes or paths for slow traffic meaning interaction between cars and trucks etc. and slow traffic only occurs at intersections. Self-explaining and self-enforcing roads aim to prevent road users from driving at inappropriate speeds. They also seek to prevent driving errors and aim to prevent motorists from committing traffic offences across the whole road network.

A matter of speed

Exceeding the speed limit is by far the most recorded road traffic offence and speeding remains a problem on rural roads. Most countries with a significantly lower road mortality rate than the EU average apply 70 km/h or 80 km/h standard speed limits on rural roads.

According to the Safe System approach, safe speed limits on rural roads without a median barrier should not be higher than 70 km/h and not higher than 100 km/h on roads with median and side barriers. The design of these roads should also match a credible speed limit.

A combination of mobile roadside police checks together with automated enforcement, including mobile and fixed cameras, as well as time-over-distance cameras, has proved to be an effective tool in addressing speeding, also on rural roads.

Road cycling in rural Ireland
Darrin Laing, Shutterstock

Walking and cycling

Walking and cycling are valuable modes of transport in rural areas but are also leisure and tourism activities. Obstacles to bicycle use in rural areas include a lack of safe cycling routes, longer distances and uphill stretches. The impact on rural road safety of the rise in the use of electric bicycles should also be considered given that cyclists on electric bicycles tend to travel further and faster than those on traditional bicycles. It is important to design infrastructure that more effectively separates cyclists from faster-moving traffic and also to reduce the relative speed between the different road users.

Pavements tend to be lacking in villages in rural areas. In addition, risks are highest on rural roads where there are few pedestrians and no separation or protection from fast-moving traffic. And yet, research has shown that rural citizens still walk for at least 19% of their trips. The provision of quality rural pedestrian infrastructure, including pavements separated from the road, can and should address these issues.

Safe routes to school

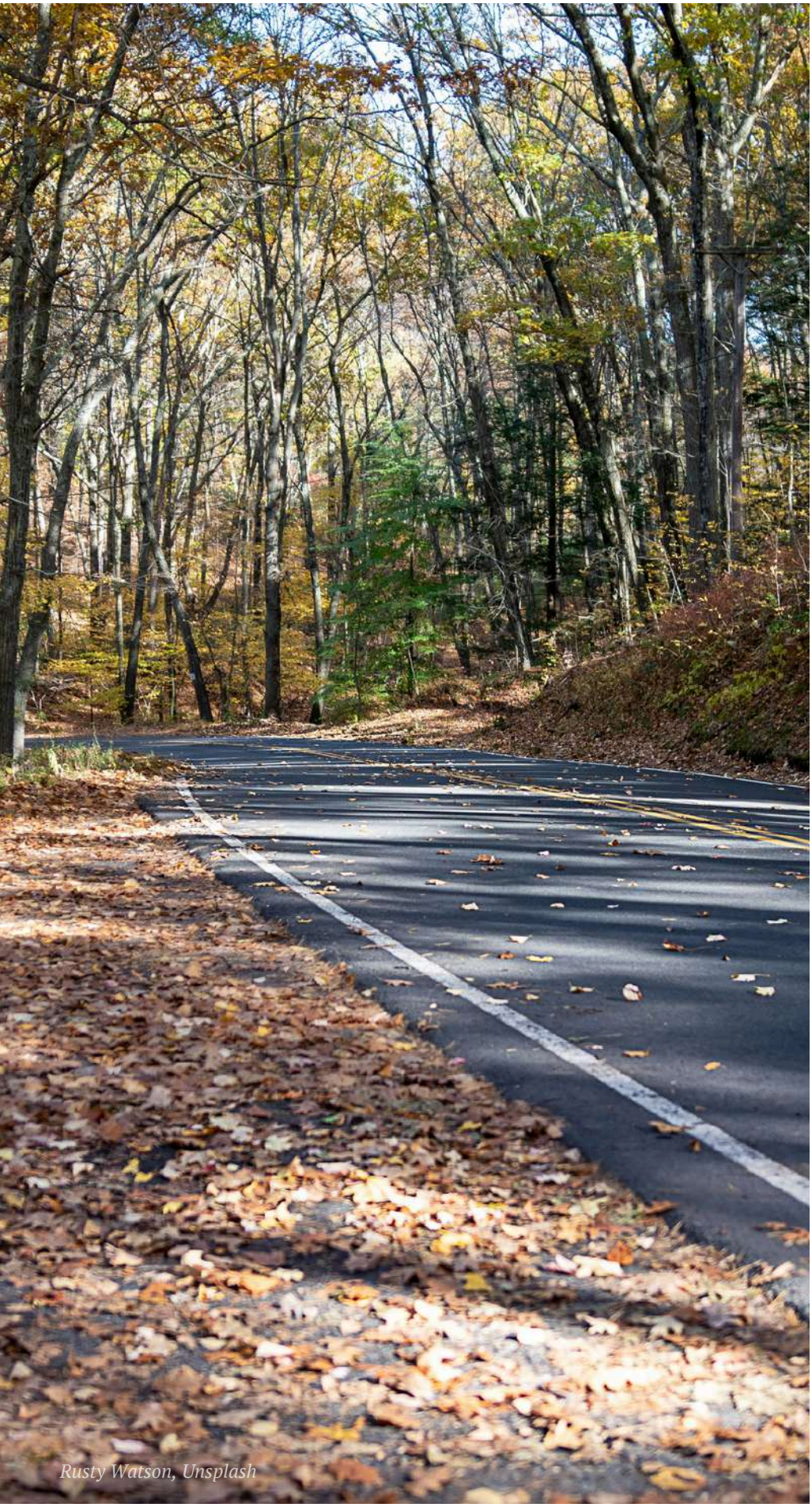
Informing pupils of safe routes to school and developing a school mobility plan is a measure schools can adopt to make travelling to school safer, including in a rural context.

Safer cars, vans, and lorries

From July 2024, technologies such as automated emergency braking (AEB) and intelligent speed assistance (ISA) will be mandatory on all new vehicles sold in the EU and will help improve road safety on all road types. Governments and speed data providers should ensure that speed limit maps are comprehensive and regularly updated.

Mandatory automated emergency calling systems known as eCall are especially useful in a rural context where an unconscious driver may not be seen by others who can raise the alarm. Legislation for the fitment of eCall on motorcycles should also be prioritised.

Painted road sign outside of a village school in Pinet, France
Pierre Jean Durieu, Shutterstock



Rusty Watson, Unsplash

Conclusion

Rural roads can and are being made safer with interventions that do not need to be costly. Road safety audits, analysis and subsequent treatment of high-risk sites, setting and enforcing appropriate speed limits, creating separated paths for cyclists and walkers, and removing obstacles at the roadside; are just a few examples of what can and should be done. With increasing focus on urban road safety, it is critically important that policymakers do not forget rural roads where half of road deaths occur.

SAFER MICROMOBILITY

WRITTEN BY
VIRGINIA PETRAKI
GEORGE YANNIS
PHILIPPE CRIST

Micromobility provides viable options for car-free travel and improves connectivity to public transport, but it must be safe. The uptake of **micromobility**, boosted by the arrival of privately owned and shared e-scooters and e-bikes, benefits people and cities, but also raises **challenges for safety** within busy city spaces.

Safer micromobility: Paris
Philippe Crist

Micromobility is becoming safer, but an increase in severe injuries from e-scooter crashes is cause for concern. Overall, shared e-scooter casualty risk is on the decline in Europe, with usage increasing faster than reported injuries.

While incident data provides valuable insights into the frequency and severity of crashes, understanding micromobility safety requires an understanding of crash or injury risk. This means understanding how many crashes occur and relating this number to how much travel occurs. Outside of shared micromobility, we generally have fewer data on the overall number of bicycle, e-bike, and e-scooter trips taking place just as we see a significant under-reporting of crashes and injuries – especially non-severe injuries.

Assessing crash risk will require better data collection on trip numbers and crashes, as well as their severity for privately owned micromobility vehicles.

Micromobility crashes

Up to 70% of total reported casualties are minor. Severe injuries comprise a small portion of total reported casualties, and a relatively small percentage of reported micromobility crashes lead to fatal injuries (up to 1% of total reported casualties), with no clear difference between e-scooters, e-bikes, and conventional bikes.

Crash mechanisms vary based on the type of vehicle and road user involved. Most micromobility-related crashes involve only

the rider and no other road users. These incidents are primarily attributed to falls, accounting for up to 93% of all reported e-scooter-related casualties. Collisions involving larger motor vehicles tend to result in more severe injuries, with as many as one in ten reported motor vehicle crashes involving e-scooters or bikes leading to severe injury or death of the rider involved. Motor vehicles are the greatest source of danger with respect to micromobility (and pedestrians) on urban streets.

E-scooter riders presented to hospitals with a greater share of head, face, and neck injuries than cyclists, which may partly be explained by significantly lower helmet use among e-scooter riders. E-scooter face injury profiles point to the need to explore e-scooter-specific helmet designs. Injuries to lower extremities are more prevalent among e-scooter riders than cyclists – possibly reflecting injuries sustained as e-scooter riders hop off their e-scooter just before or at the moment of losing control. Most injury categories are not mutually exclusive, and numerous patients presented with more than one injury type or location.

Safe infrastructure and vehicle design matter

Key risk factors associated with micromobility shed light on the multifaceted challenges that must be addressed to ensure the safe integration of micromobility options into urban landscapes.

An underlying risk factor for severe injuries and death of micromobility riders is the driving behaviour, speed, and mass of cars, vans, and trucks. Micromobility-focused risk factors are related to rider behaviour, infrastructure, and vehicle design.

Rider-related safety factors differ significantly between bicycles and e-scooters, notably concerning night-time riding, alcohol intake, and helmet usage. Prominent causes of e-scooter riders' injuries are riding under the influence of alcohol or drugs, low levels of helmet use

Safer micromobility: Barcelona
Philippe Crist

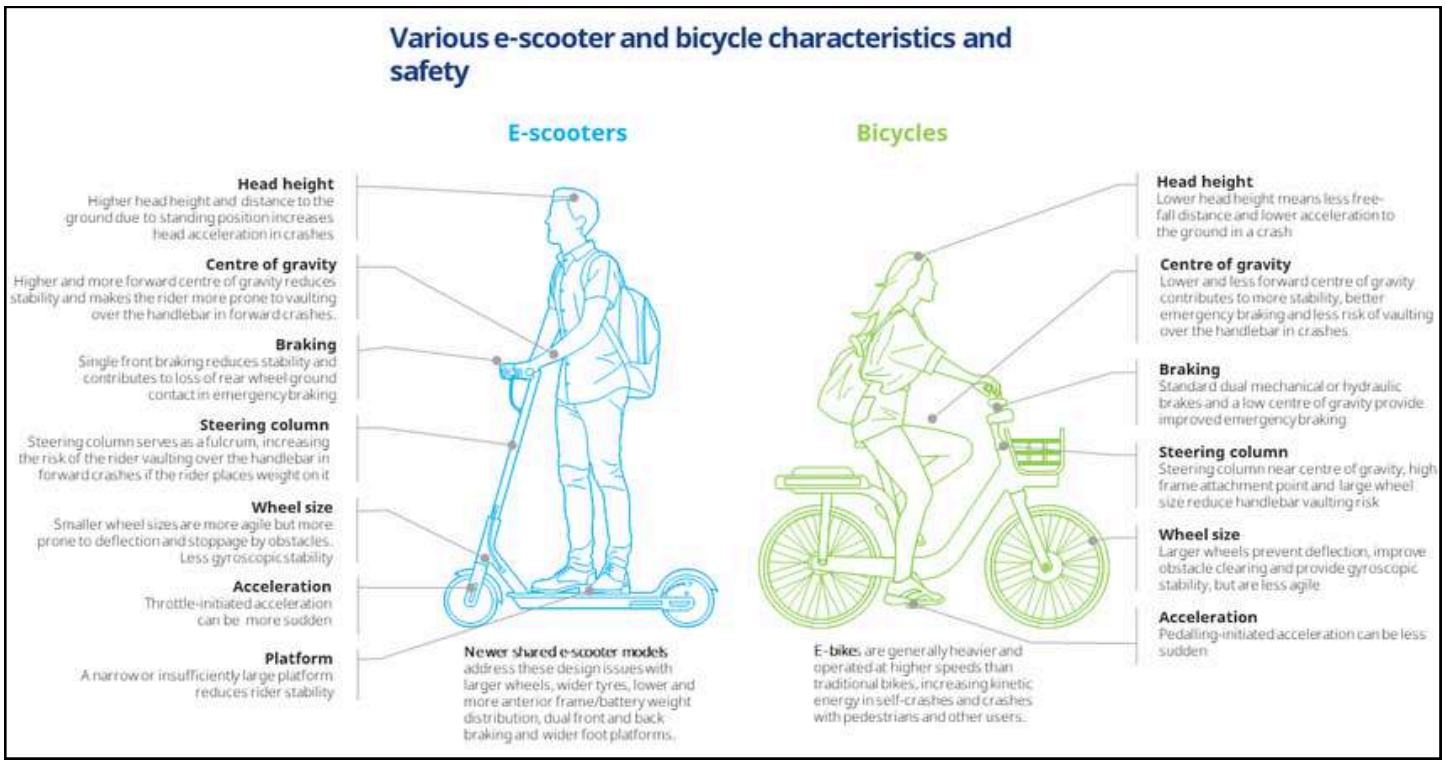
and riding during night-time. Inexperienced riders, whether due to limited riding experience or unfamiliarity with local conditions, face heightened crash risks, with first-time riders particularly vulnerable. Speeding emerges as a significant concern, as excessive travel speed of micromobility modes and other motor vehicles has been identified as a key risk factor. This is especially the case for high-speed e-scooters and e-bikes (e.g. that can travel up to 45km/h). Addressing these rider-related factors is crucial for enhancing micromobility safety.

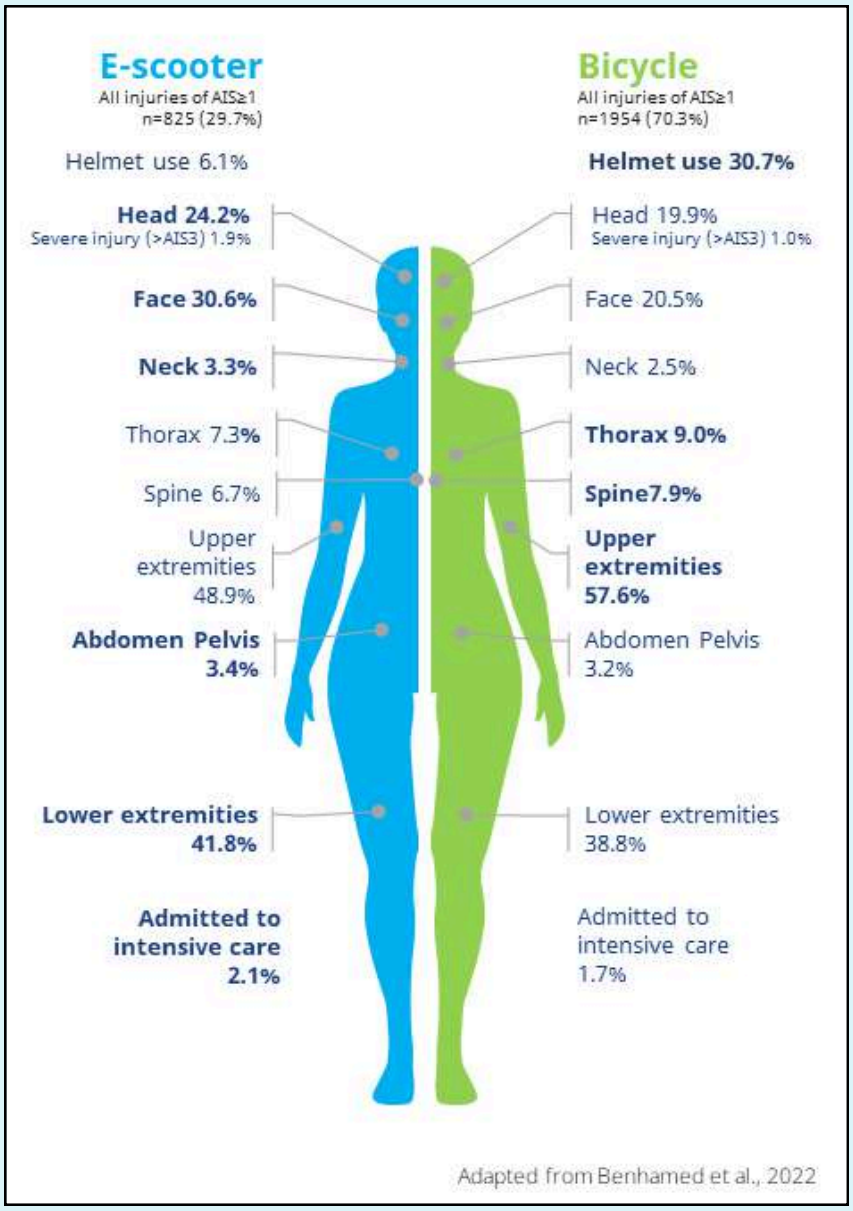
The growing popularity of micromobility, particularly of e-scooters, raises safety concerns related to their design.Unlike bikes, e-scooters entail a standing riding position, making riders vulnerable to falls, especially during abrupt manoeuvres. Reducing maximum design speed can significantly mitigate head-ground impact velocities during e-scooter falls. Wheel size and braking systems are critical factors affecting stability and crash outcomes, with larger wheels and effective braking systems enhancing safety. E-scooters differ from both e-bikes and traditional bicycles concerning their centre of gravity, acceleration profiles, and visibility features, influencing manoeuvrability and risk levels. Shared e-scooter fleets prioritise safety through design enhancements (dynamic geofenced speed controls, larger wheels, wider tyres, lower and more anterior frame/battery weight distribution, dual front and back braking, and wider foot platforms) and regular inspections, unlike privately-owned counterparts.

Poorly maintained or unpaved surfaces contribute to rider loss of control and falls and are linked to heightened crash risk, particularly for e-scooters. Poor surfaces contribute to 30-40% of e-scooter crashes thus emphasising the critical need for smooth, comfortable, and well-maintained infrastructure to ensure rider safety. Riding location can also influence crash probability, with intersections and sidewalks the least safe locations due to high conflict rates. In the United States and Europe, the prevalence of micromobility infrastructure usage significantly affects safety outcomes, with separated infrastructure from car traffic proving the safest. Inappropriate parking of micromobility vehicles on sidewalks or pavements is a source of conflict and falls for pedestrians.

A focus on rider behaviour and safety equipment must be complemented by better infrastructure and improved vehicle design – especially for e-scooters.

Safer Micromobility (2020)
International Transport Forum





Safer Micromobility (2020)

International Transport Forum

Table 5. Risk factors related to users associated with micromobility safety

Risk factor	Vehicle type	Effect	Source
Nighttime (% of fatal crashes)	es	82%	Karpinski et al., 2022b
	eb	48%	
	cb	57%	
	es	43%	Yang et al., 2020
Nighttime & Reduced lighting (% of casualties)	es	30-44%	Weidemann et al., 2022; Kleinertz et al., 2021; Kleinertz et al., 2023; Laverdet et al., 2023
	cb	14-28%	
	eb	18%	
Nighttime crash risk	es	4.8 crashes per 100,000 trips vs 2.2 for daytime crashes	Shah & Cherry, 2022
Helmet use (% of casualties)	es	0-7%	Harbrecht et al., 2021; Cicchino et al., 2021b; Grill et al., 2022; English et al., 2020; Bloom et al., 2022; Stray et al., 2022; Meyer et al., 2022; Laverdet et al., 2023; Clough et al., 2023; Leyendecker et al., 2023
	cb	16-64%	
	eb	53%	
Alcohol	es	Fatalities: 41%	Karpinski et al. 2022b
	es	Casualties: 7-53%	Weidemann et al., 2022; Puzio et al., 2020; Grill et al., 2022; Bekhit et al., 2020; Harbrecht et al., 2021; Kleinertz et al., 2021; Neuroth et al., 2022; Leyendecker et al., 2023
	cb	Casualties: 6-13%	
Double riding (% of casualties)	es	14-17%: >one riders/ vehicle	Weidemann et al., 2022 Hennoq et al. 2020
Experience	es	24-37% of injured riders were injured during their 1st ride	Austin Public Health, 2019; Cicchino et al., 2021; Williams et al., 2022; Sexton et al., 2023
	es	78% of crashes involved riders with low riding rates	DfT, 2022

*es: e-scooters, eb: e-bikes, cb: conventional bikes
*Casualties: persons injured and fatalities

Collisions		Vehicle type	%
Involved road users (% of casualties)	Single road user	es	93%
	Multiple road users	es	7%
Falls	% of total crashes	es	79-90%
	% of total casualties	es	64-85%
		cb	75%
With objects	% of total casualties	es	1-39%
With motor vehicles	% of total casualties	es	8-19%
		cb	10%
	% of total fatalities	es	>86% (24% hit-and-run)
		cb	93-96%
With pedestrians	Involved pedestrians (% of total crashes)	es	4-17%
	Injured pedestrians (% of total casualties)	es	1-10%
	tripped over (of non-rider casualties)	es	30%
	Struck (of non-rider casualties)	es	59%

es=electric scooter, eb=electric bike, cb=conventional bike
Casualties: persons injured and fatalities.
All sources are detailed in the accompanying technical report.

Micromobility safety recommendations

A holistic approach that combines improved infrastructure, safe riding behaviour, vehicle design standards, and safety and exposure data collection is essential to improve micromobility safety. Subsequently, the following key recommendations based on the Safe System Approach for both Authorities and shared micromobility operators can contribute to further enhance micromobility safety.

Safe infrastructure

- Proactively maintain micromobility infrastructure (authorities)
- Establish a dedicated and well-connected micromobility network (authorities)
- Establish a micromobility parking policy and designate parking areas where needed (authorities)
- Establish collaborative partnerships with authorities for infrastructure condition reporting (operators)
- Onboard parking zones in shared micromobility apps and deploy smart docking in high-traffic areas (operators)

Safe riders

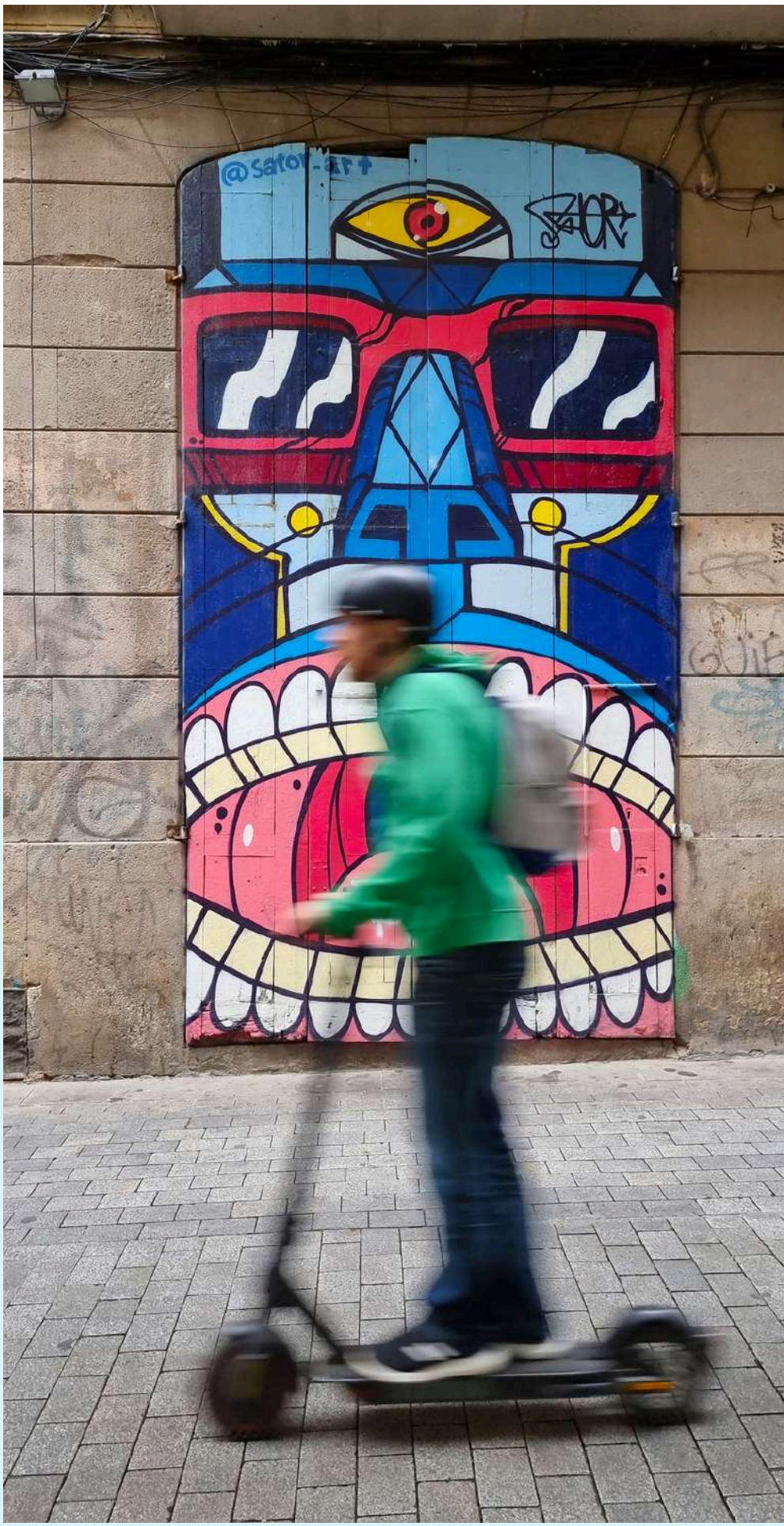
- Implement a 30km/h (or lower) speed limit in areas with high micromobility use (authorities)
- Establish low-speed limits for micromobility vehicles in pedestrian or shared zones (authorities)
- Take enforcement action against risky micromobility (authorities)
- Promote the use of appropriate helmets (authorities)
- Introduce rider education in secondary schools (authorities)
- Enable real-time safety interventions via telematics (operators)
- Provide post-trip feedback via telematics data (operators)
- Provide economic incentives for safe riding (operators)
- Implement mandatory initial rider training (operators)
- Verify the age to start riding (operators)

Safe vehicles

- Set universal technical requirements for e-scooter design (authorities)
- Adopt riding support systems in micromobility vehicles (authorities)
- Ensure systematic maintenance of micromobility fleets (operators)
- Provide post-trip feedback via telematics data (operators)
- Enable context-dependent maximum speed control using geofencing (operators)
- Restrict e-scooter access if tandem riding and/or alcohol use is detected (operators)
- Implement riding support systems in shared e-scooters (operators)

Safe management

- Establish and collect data on distinct micromobility categories in safety statistics (authorities)
- Enable in-vehicle or in-app crash detection technology (operators)



Safer micromobility: Barcelona

Philippe Crist

TRAFFIC EFFICIENCY

The Traffic Efficiency Working Group addresses the broad subject of multimodal network management from both a strategic and technical perspective.

The Traffic Efficiency Working Group's main purpose is to enable knowledge sharing and reflection about current transport practice, new developments and evolving European policy related to network management, Intelligent Transport Systems (ITS) and data.

Working Group meetings have mainly drawn upon POLIS' experience and knowledge in ITS, which has been at the heart of POLIS activities since the creation of the network. The Working Group has focused in the recent past on issues such as multi-modal network management, data and digitalisation, automation, C-ITS, MaaS and European ITS/data policy.

Through the Working Group, POLIS partners with the EU's CCAM platform, CCAM research partnership, POLIS-ACEA CCAM infrastructure dialogue, and NAPCORE communities of interest.

The topics being discussed in this Working Group are:

- Network management strategies and technology to improve the flow of sustainable modes;
- Policy-responsive network management to improve road safety and reduce emissions;
- Harnessing the potential of data for transport planning, performance assessment and operations;
- Digitalisation and digital services in transport;
- Planning and infrastructure aspects of vehicle automation and C-ITS;
- Artificial intelligence in transport;
- Demystifying EU policy on data and ITS.

Find out more about the Traffic Efficiency Working Group on our website!

CYCLING: MAKE IT SMART!

Bike-sharing at the touch of a button
© Deelfiets Nederland

WRITTEN BY
WIM DIJKSTRA

Behavioural change is needed to make bicycles a pillar of the Europe's sustainable mobility mix, and technological innovations may hold some of the answers. With **smart cycling** not yet fully integrated into mobility policies, the Dutch **Province of Overjissel** is determined to make a difference.

Cycling is widely recognised as a sustainable and healthy mode of transport. While private efforts have primarily focused on improving bicycles, with a shift from 'analogue', traditional models to e-bikes, speed pedelecs, and cargo bikes, governments have concentrated on developing various types of bicycle infrastructure, ranging from simple bike lanes to more sophisticated cycle highways.

Recently, there has been an increased focus on encouraging more people to cycle by promoting behavioural changes. Concurrently, the transition towards smart cities and smart mobility aims to leverage technological solutions to meet societal goals. However, smart cycling has not yet been integrated into the concept of smart mobility, though the Province if Overjissel believes it should be.

Rope light in Aarhus (Denmark)
© Michael Bloksgaard

All about BITS and MegaBITS

As the Netherlands leads in cycling and cycling policy, the Province of Overijssel decided in 2019 to pioneer smart cycling by launching the Interreg NSR project BITS (Bike and Intelligent Transport Systems).

The goal was to raise awareness about smart cycling. The BITS project demonstrated the significant added value of combining cycling with Intelligent Transport Systems (ITS). Working with the project partners, the Province implemented over 30 cycling ITS solutions and began improving cycling data collection — an effort that will continue with the MegaBITS project (2023-2026).

Following the initial BITS experimentation, it is now crucial to prioritise smart cycling in policies at all government levels and within the private smart mobility sector. MegaBITS aims to advance the digital transition in the cycling sector by initiating five ITS cycling flagships across seven cities/regions. This will accelerate the deployment of ITS technologies, improving rider safety, speed, comfort, and convenience, thereby making cycling a more attractive mode of transport.

Additionally, the project plays a pivotal role in bringing together the various public and private stakeholders within the smart cycling ecosystem. By coordinating efforts and initiatives, MegaBITS aims to integrate smart cycling into Europe's sustainable mobility policies.

Addressing the cycling data gap

Smart mobility begins with data and digitalisation, essential for ITS solutions. However, the data requirements for bicycles differ from those for cars. For instance, while data for automated driving is useful for cars, it is not applicable to bicycles. Despite this, much information about bicycles is still lacking because, unlike cars, most bicycles are not equipped with sensors that provide comprehensive data on origin, destination, routing, and speed.

To address this gap, considerable effort is being invested in combining different data sources to obtain useful cycling information. ITS solutions such as camera-based counting, smart traffic lights, and cycling apps are becoming more prevalent, offering more insights than traditional manual counting methods. However, this

patchwork approach does not provide a complete picture, partly because data is often owned by private companies.

The necessity of complete and/or real-time data for bicycles remains a topic for analysis and organisation — a role that the MegaBITS project aims to fulfil. Additionally, the European NAPCORE project seeks to coordinate data accessibility, including cycling data, through National Access Points, and to propose standards for key cycling data categories, thus integrating cycling data into the European Mobility Data Space and ensuring its proper place within the broader mobility ecosystem.

ITS solutions in cycling are needed... but where?

ITS solutions benefit not only cycling and mobility policy but also cyclists themselves, though this is sometimes overlooked. These solutions can enhance safe cycling conditions, prioritise cycling at intersections, facilitate access to shared bicycles, and more. Smart cycling thus becomes an additional tool to promote cycling, complementing good infrastructure, quality bikes, and efficient bike parking facilities.

But which ITS solutions are needed where? To be answered, this question requires us to differentiate between different target groups and understand their needs and incentives. Indeed, cycling can be categorised into utility cycling, recreational cycling, and logistic cycling, each with distinct requirements. Additionally, cyclists have varying needs based on their experience, age, and purpose — whether they are novices, elderly, students, and so on.

For policy implementers, having access to a comprehensive toolbox of smart cycling applications is crucial. Scaling up successful projects is equally important. The BITS directory serves as a knowledge hub for smart cycling applications, offering local and regional authorities a wealth of smart cycling solutions and best practices.

Smart cycling ecosystem

The MegaBITS project focuses on implementing smart cycling solutions and collecting cycling data at local and regional levels, particularly in the North Sea Region. However, the project's ambitions extend to fostering broader cooperation with other smart cycling initiatives and public and private stakeholders working on the topic also at a European level. This collaboration is essential for advancing the development of smart cycling applications and cycling data.

Overall, this ecosystem of smart cycling actors and projects should work on a roadmap to enhance smart cycling in Europe, covering data topics such as collecting (floating) bike data, organising data standards, providing open cycling data, and ensuring data quality — additionally, it should raise awareness about the benefits of smart cycling applications.

Smart bike parking at Utrecht Central Station (Netherlands)

Ronald Jorna

To support these efforts, studies should be initiated to assess the costs and benefits of smart cycling implementations, including investment and operating costs, benefits for cyclists, and socio-economic advantages like improved safety, traffic flow, environmental impact, and health. Of course, governance would also be an important issue to tackle: it is indeed crucial to define the roles of public and private partnerships and the four government layers (Europe, national, regional, and local), especially if we truly want smart cycling to become a significant element in the follow-up to the recently issued European Declaration on Cycling.

Only with continued collaboration and strategic investments, smart cycling can become an integral part of Europe's sustainable mobility framework, driving forward — and beyond — the goals outlined in the Declaration.

Smart lights for bikes
© See.Sense

Editors

Alessia Giorgiutti

Communications & Membership Lead & Co-Coordinator Just Transition

Alessia coordinates POLIS' corporate communications and magazine and has been involved in several EU-funded projects as a Communications Manager. She currently supports other managers and officers on tasks related to content production and communication for their projects. Her work focuses on making accessible and inclusive content about transport, as well as highlighting the experiences of marginalised users.

Contributed articles:
'Space, Safety, Climate Protection'
'Resilient Urban Futures'
'It's All About (Regional) Cooperation'

Jonathan de Vriendt

Membership & Communications Manager

Jonathan ensures that all POLIS members stay happy, heard, and well-informed. He helps new members find their way in the POLIS Network, with its unique resources, networking opportunities, and support for European projects. Jonathan oversees all membership actions with specific attention to the needs of cities and regions.

Contributed articles:
'Leading the Way'

Carlotta Inserra

Project & Communications Officer

Carlotta works on POLIS' corporate communications and magazine (Cities in motion) and is involved in sustainable urban mobility projects, focusing on inclusive transport and accessible shared mobility services (ELABORATOR, SMALL), greener living spaces in the Mediterranean (Green Living Areas), and sustainable urban logistics (DISCO). Additionally, she provides support to the Active Travel & Health Working Group.

Contributed articles:
'Game ON!'

Quaid Cey

Communications Assistant

As part of the communications team, Quaid produces news and social media content, promotes POLIS events and campaigns, and contributes to the publication of Cities in motion. He has a BA in Liberal Arts & Sciences from the University of Maastricht (UM) and an MA in Communication Studies from the Vrije Universiteit Brussel (VUB).

Karen Vancluysen

Secretary General

Karen was appointed as Secretary General of POLIS in September 2014, after having been the network's Research Director for 8 years. Since 1998, she has been involved in urban mobility networking, innovation, and policy activities as well as a wide range of European urban transport research projects.

Contributed articles:
'A Mayor for the Future'
'Cities of Sound'

Contributors

In alphabetical order:

Bernadette Bergsma

Director of Communications and EU Affairs, EIT Urban Mobility

Bernadette has been involved with EIT Urban Mobility since its establishment in 2019. Before joining the organisation, she held various roles in marketing, communications, and EU relations. From 2010 to 2020, she serve as the City of Eindhoven's EU Strategic Advisor.

Contributed articles:
'Real Solutions for Real Cities'

Carlo Federico Dall'Omo

Research Manager
Università IUAV di Venezia

Carlo is a Research Manager at the Università IUAV di Venezia, where he earned a PhD in Architecture, City, and Design and currently teaches Planning and Urban Design. His research focuses on built environment managemnet and climate change adaptation. He co-coordinates the UNESCO Chair in Heritage & Urban Regeneration and is a Climate Ambassador for the European Climate Pact.

Contributed articles:
'Resilient Urban Futures'

Cláudia Ribeiro

Projects & Proposals Lead & SMC Platform Coordinator, POLIS Network

With a master's degree in Political Science from Universitat Pompeu Fabra and the University of Konstanz, Cláudia has managed mobility projects since 2016. Currently, she manages multiple EU-funded projects on a diversity of topics, including urban freight, e-mobility, and sustainable mobility, as well as developing bids for project funding.

Contributed articles:
'Finding Solutions...Plus'

Elke Zimmer

Secretary of State, Ministry of Transport Baden-Württemberg

Elke was a district councillor in the Neckarau district of Mannheim for nine years before she was elected to the Mannheim municipal council in 2014. Since 2016, she has been a member of the state parliament of Baden-Württemberg. She has served as State Secretary in the Baden-Württemberg Ministry of Transport since May 2021.

Contributed articles:
'Space, Safety, Climate Protection'

Federico Cavallaro

Associate Professor of Transport Engineering, Università IUAV di Venezia

Federico is an Associate Professor in Transport Engineering at Università Iuav di Venezia. In the past, he was a senior researcher at Eurac Research and a national expert for the Alpine Convention. His research interests include transport planning, economics, public and freight transport performance, external costs, and mobility planning.

Contributed articles:
'Resilient Urban Futures'

Francesca Arbore

Manager of Sustainable Mobility and Public Transport Services, Apulia Region

Francesca graduated with highest distinction from both the University of Bari, where she studied jurisprudence, and from the University of Torvergata, Rome, where she studies economics. She has been a manager in the Region of Apulia's public administration since 2001, and began her work as Manager of Sustainable Mobility and Public Transport Services in 2022.

Contributed articles:
'Funding Sustainable Mobility'

Françoise Guaspare

Senior Policy Advisor,
Île-de-France Europe

Françoise contributes to improving urban mobility by facilitating the dialogue between public authorities, industries, and research centres. She is involved in the European Commission's Expert Group on Urban Mobility as well as the chair of POLIS/ERRIN Transport Working Groups, ERTRAC (European Road Transport Research Advisory Council), and the CCAM European partnership. She is member of the Cities Mission board.

Contributed articles:
'Games Wide Open'

Giulia Di Leo

Supervisor MaaS, Inter- and extra-urban mobility ITS, Apulia Region

Giulia has been working for the Region of Apulia's public administration and has supervised various core tasks related to Sustainable Mobility and Public Transport Services since 2006.

Contributed articles:
'Financing Sustainable Mobility'

George Yannis

Professor,
National Technical University of Athens

George is a Professor of Traffic Safety and Management at the National Technical University of Athens (NTUA), as well as the Director of the Department of Transport Planning and Engineering at the NTUA's School of Civil Engineering. Within the field of traffic safety and mangement, George specialises in data science.

Contributed articles:
'Safer Micromobility'

Gustav Friis

Project Manager
City of Aarhus

Gustav holds a master's degree in Urban Planning. Prior to joining the City of Aarhus as Project Manager in 2014, he worked on mobility for the City of Aalborg and POLIS. In Aarhus, he works on smart mobility projects aimed at changing travel behaviour and reducing congestion and carbon emissions.

Contributed articles:
'Sharing is Caring'

Jenny Carson

Project Manager,
European Transport Safety Council

Jenny joined the European Transport Safety Council (ETSC) in 2020 and works on both the PIN and PANACEA projects. She has worked on EU policy since 2000 and previously worked at the East of England Brussels Office.

Contributed articles:
'Saving Lives on Rural Roads'

Jorge Manso Garcia

Project Officer,
POLIS Network

At POLIS, Jorge focuses on European projects in the area of shared mobility, such as SMAPE, ShareDiMobiHub, and SUM. Furthermore, he contributes his expertise to the HL4EU Project (Healthy Lifestyles for Europe) and supports the Safety and Security Working Group.

Contributed articles:
'Developing a Hub Strategy'

Krzysztof Matyjaszczyk

Mayor,
City of Częstochowa

Krzysztof has served as the Mayor of Czestochowa since 2010. He is activist of local government and the leader of the northern Subregion of Silesian Voivodeship. During his time as Mayor, Krzysztof has focused on the development of road and communications infrastructure, as well attracting new investors to the city to create well-paying jobs for local and regional residents.

Contributed articles:
'It's All About (Regional) Cooperation'

Maciej Hasik

Press Officer, Czestochowa Municipal Road Administration

Maciej has served as a Press Officer of the Czestochowa Municipal Road Administration since 2015. His main duties are to represent the Municipal Road Administration in the media, create social media profiles, and cooperate in making promotional articles, photos, and videos.

Contributed articles:
'It's All About (Regional) Cooperation'

Maria Meinero

Policy & Data Analyst
European Transport Safety Council

Maria joined the European Transport Safety Council (ETSC) in 2021 and works on the PIN project. She has previously worked at the European Commission and Insurance Europe.

Contributed articles:
'Saving Lives on Rural Roads'

Marko Stančec

Project Coordinator & Climate-Neutral Cities Mission Taskforce Coordinator, POLIS Network

Marko coordinates the Climate Neutral Cities Mission Taskforce, focused on the transport component of climate plans. He has extensive experience in city networks and policy in mobility, SUMPs, urban space management, transport data analysis and management, and multimodal urban nodes.

Contributed articles:
'Unlocking National SUMPS'

Oliver Lah

Coordinator,
Urban Living Lab Center

Oliver is the head of the Urban Living Lab Center, a UN-Habitat Collaborating Center co-hosted by the Technical University of Berlin, the Wuppertal Institute for Climate Environment and Energy, and the Massachusetts Institute of Technology. He coordinates the Urban Electric Mobility Initiative and the SOLUTIONSplus flagship project.

Contributed articles:
'Finding Solutions...Plus'

Paul Chorus

Policy Advisor,
Province of North Holland

Paul is a Senior Policy Officer for mobility and a project leader in the field of sustainable area development within North Holland's Smart Mobility Programme. He was responsible for drafting the province's Hub Strategy, which was approved by regional ministers in 2023. Currently, he collaborares with local municipalities on the implementation of various mobility hubs.

Contributed articles:
'Developing a Hub Strategy'

Pedro Gomes

Cluster Lead Clean Vehicles & Air Quality, POLIS Network

Pedro leads POLIS' Clean Vehicles & Air Quality Working Group and manages several EU-funded projects, including eCharge4Drivers and EAFO. Pedro is also POLIS' contact point in the European Commission's Sustainable Transport Forum. He holds an MSc in Environmental Management Systems and has experience researching topics in the fields of energy efficiency, GHG emission mitigation, and sustainable mobility.

Contributed articles:
'Ready for EVs?'

Philippe Crist

Senior Advisor for Innovation and Foresight, International Transport Forum

Philippe is a Senior Advisor for Innovation and Foresight at the International Transport Forum (ITF). He has over 30 years of experience in policy-focused transport research related to urban transport, active travel, sustainability, new mobility, digitalisation, data governance, foresight, and resilience planning.

Contributed articles:
'Safer Micromobility'

Romee Nicolai

Bicycle Mayor,
City of Amsterdam

Romee is Amsterdam's Bicycle Mayor, the leader of the Bike Kitchen at the University of Amsterdam (UvA), and a student of the UvA Master in Urban Regional Planning. In 2023, she was nominated UvA Talent and UvA Impactmaker. In 2024, she will speak at the VeloCity and EuroBike conferences. Through her work, she aims to strengthen the human-mobility relationship and stimulate transdisciplinary learning.

Contributed articles:
'A Mayor for the Future'

Satu Reijonen

Project Manager,
Forum Virium Helsinki

Satu works at Forum Virium Helsinki as a Project Manager for the URBANE project's Helsinki operations. She is enthusiastic about decarbonising the future by demonstrating innovative solutions in the urban environment. Her multidisciplinary background drives the collaboration between a variety of stakeholders in Helsinki Living Lab.

Contributed articles:
'The Helsinki Solution'

Shritu Shrestha

Senior Researcher,
Urban Living Lab Center

Since 2022, Shritu has been a Senior Researcher at the Wuppertal Institute. She holds a doctorate from Berlin University of Technology and the Wuppertal Institute, and specialises in sustainable transport, urban planning, climate actions, and building energy efficiency. Shritu has also worked with UN-Habitat and the Stockholm Environment Institute.

Contributed articles:
'Finding Solutions...Plus'

Silvio Nocera

Full Professor of Transport Engineering and Planning, Università IUAV di Venezia

Silvio specialises in transport planning, focusing on externalities and global warming. He has widely published in major journals and, since 2020, is among the top 2% cited authors in Logistics & Transportation (Elsevier-Stanford University world surveys). An Associate Editor of the journal Research in Transportation Business and Management, he coordinates the IUAV Master's Degree in Spatial Planning.

Contributed articles:
'Resilient Urban Futures'

Tracy Jager

Strategic Communications Consultant,
Transoft Solutions

Tracy is a strategic communications consultant and writer based in Vancouver. With a diverse background serving various sectors, including but not limited to engineering and software development, Tracy is adept at translating complex topics into compelling narratives. Her expertise spans strategic communications planning, branding, project management, and content creation.

Contributed articles:
'Safe, Shared, Sustainable'

Virginia Petraki

Research Associate,
National Technical University of Athens

Virginia is a transport engineer and PhD Candidate in the Department of Transport Planning and Engineering of the School of Civil Engineering at the National Technical University of Athens (NTUA). Her specialisation areas are road safety, transport economics, road user behaviour, and data science.

Contributed articles:
'Safer Micromobility'

Wim Dijkstra

Strategic Advisor on Mobility Policy,
Province of Overijssel

As a Strategic Advisor on Mobility Policy for the Dutch Province of Overijssel, Wim is on the constant lookout for new topics in mobility development and the mobility transition that need support and (political) attention. In an effort to promote smart cycling, Wim has helped his province take the lead on the Interreg NS project BITS, as well as its successor, MegaBITS.

Contributed articles:
'Cycling: Make It Smart!'

Zdeněk Hřib

Deputy Mayor for Transport & Mobility,
City of Prague

Zdeněk is Prague's current Deputy Mayor for Transport and Mobility. As a leading figure in governance, particularly in urban mobility, he directs initiatives aimed at enhancing transport infrastructure and accessibility. Prior to his current position, Zdeněk served as Mayor of Prague from November 2018 to February 2023.

Contributed articles:
'Leading the Way'

Zsófia Jákói

Project Officer,
POLIS Network

Zsofia supports the POLIS Clean Vehicles and Air Quality Working Group. As a political science graduate with policy research experience, she contributes to numerous urban logistics projects, supporting the enhancement of sustainable mobility solutions.

Contributed articles:
'Ready for EVs?'

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