

# TRANSNATIONAL STRATEGY

## GUIDELINES ON LOW CARBON EMISSION LANDSIDE ACCESSIBILITY TO AIRPORTS



LAirA (Landside Airport Accessibility) is financially supported by the European Union's Interreg Central Europe programme, which is a European cohesion policy programme that encourages cooperation beyond borders. LAirA is a 30-months project (2017-2019), with a total budget of €2.3 million.

LAirA PROJECT 2020 COPYRIGHT



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# Executive Summary

While the major infrastructure for Central European airports will take funding, planning and time to implement, there are many low-investment and high impact changes that can be made to provide ease of use. The LAirA Strategy lays out its findings regarding mobility and information which present mobility alternatives to make eight airports in Central Europe smarter and greener.

Airport passengers and employees should be offered several transport options in order to make an informed choice. As consumers become increasingly concerned with environmental impact, cities and airports that have not modernised transportation may suffer a tourism decline.

## Introduction to LAirA's Transnational Strategy

The magnitude of the growing mobility of European citizens and tourists visiting from abroad has continually increased the trend of air traffic (10% per year in the EU). In order to reduce the carbon footprint associated with air travel, local policy makers and communities need to take action in the area of landside accessibility across Europe.

LAirA (Landside Airport Accessibility) aims to address serious climate concerns precipitating across Central Europe and beyond in relation to travel to and from airports. The LAirA project addresses the mobility integration of airports to be coupled with multimodal solutions to offer smart and low-carbon land transport from major city centres and its commuting zones, referred to as functional urban areas (FUAs).

The 30-month project lasted between May 2017 and October 2019 aimed to reduce the environmental impact of transport activities by changing mobility behaviours of 56 million passengers and 39,000 employees across eight airports in Central Europe, specifically; Budapest, Dubrovnik, Milan, Poznan, Stuttgart, Vienna and Warsaw.

The Transnational Strategy is the third and final phase of the project, focusing on identifying actions for sustainable land transport and access at LAirA airports with the final objective of reducing the CO<sub>2</sub> emissions. In order to achieve this goal, the strategy brings together local and regional authorities and airports to build their capacity and facilitate joint planning and implementation of low carbon mobility solutions. The approach integrates seven key thematic areas including electric mobility, air-rail links, walking and cycling, shared mobility, information technology systems, wayfinding and public transportation.

Airports and authorities are only the first port of call in developing mobility alternatives. Policy makers, communities and individual citizens need to be aware of environmental targets and the critical role each of them plays in reaching those goals, including transportation choices.

# Airports of LAirA

The Transnational Strategy assessed the situation across eight airports situated in different functional urban areas, each with their own unique size, land surface area, inhabitants and airport landside accessibility.

**Budapest** airport provides for basic access by road as well as by bus. While the airport connects to an East/West rail line, there is currently no connection to the city centre. Investments into additional railway access would reduce the carbon footprint of the airport and add more ease of transport for employees and travellers.

**Milan** airports are integrated into a sophisticated road and rail transport system, however, a congestion problem still remains. Investments into updated environmentally-friendly transport as well as cycling infrastructure and increased electric mobility would propel the region forward.

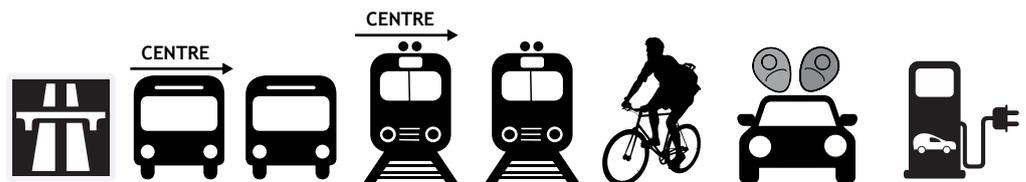
**Poznan** airport is connected to the city by bus but the service leaves a lot to be desired. One of the first steps to improving the accessibility of the airport is to increase the frequency and reliability of the bus service. This would create a more positive image of the bus service, allowing for greater mass use of the service by passengers and employees. This, in turn, would make the airport more environmentally friendly.

**Modlin** airport is only accessible by road. Developments in the region should include an extension of the railway line to the airport and additional investment into regional bus services to increase the direct accessibility of the airport to the city centre.

**Vienna** airport has a clear goal of 100% of passengers utilising rail-bound and eco-friendly transport by 2030. Additional investment needs to be made into electric infrastructure including charging points at the airport and in the city centre. Vienna's approach is forward-thinking and offers a solution to a declining number of passengers paying for parking at the airport.

**Stuttgart** airport has seen an increase in travellers that is predicted to exceed 14 million passengers by 2030. In order to accommodate these growing figures, developments will need to be made across all transport methods. A lack of regular transport service has left employees and travellers with limited options and caused significant motorway congestion.

**Dubrovnik** airport relies heavily on private car service which has left no eco-friendly alternatives. In order to keep pace with the demands of annual tourist number, investments need to be made in alternative transport options including car-sharing, public transport and railway to increase the accessibility of the airport. Greener options should also be considered such as electric mobility and the creation of cycling infrastructure.



Airport	Highway access	Bus access to city centre	Bus Access	Railway access to city centre	Railway access	Smart mobility (Cycling)	Car-Sharing	Electric mobility
Liszt Ferenc, Budapest	x	x	x		x			
Malpensa, Milan	x	x	x	x	x		x	x
Linate, Milan	x	x	x	x	x		x	
Poznań-Ławica, Poznan	x	x	x			x	x	x
Modlin, Warsaw		x	x					
Vienna, Vienna	x	x	x	x	x	x	x	
Stuttgart, Stuttgart	x	x	x	x	x	x	x	
Dubrovnik, Dubrovnik	x	x	x					x

*Modalities of access to and from LAirA airports*

## Transnational Potential

LAirA believes that transnational cooperation represents a catalyst for implementing smart solutions regionally and more broadly across Europe. While the eight airports reviewed in our Transnational Strategy had unique challenges, there were a few recurring issues across all regions to enhance and increase the use of public transport. For example, 50% of the LAirA airports do not have railway access directly to the city centre. There is only one airport, Stuttgart, that provides a garage with charging stations for e-vehicles. All of the airports reviewed lacked soft mobility methods, such as walking and cycling paths connecting the city centre, and services to encourage their employees to share their rides.

**LAirA presents many potential areas for amelioration in its green ambitions:**

**Higher use of public transport:** extending the service lines and frequency of public transport is crucial across all LAirA airports as well as green modernisation and timetable harmonisation.

**Building railway infrastructure:** railway connections to the city centre are a major concern for Milan, Linate, Poznan Lawice, Warsaw, Modlin and Budapest airports, and would serve to greatly increase accessibility while reducing the overall carbon footprint.

**Electric mobility:** landside infrastructure, with a focus on electric mobility, is a potential for every airport. Electric operated cars, taxis and bikes provide a greener solution and can reduce CO<sub>2</sub> emissions. Central European airports should provide charging stations and garages equipped for electric vehicles. Electric car-sharing services could provide new sources of revenue for every partner airport. Development of electric mobility should be emphasised in national and local level strategic documents.

**Soft mobility (walking, cycling):** all of the LAirA partners have expressed a particular interest in soft mobility (pedestrian and cycle facilities and infrastructure). Every LAirA airport has an issue with employees living 1-15km away from the airport, each commuting by car, which makes them a target group for soft mobility modes. The increase of soft mobility would significantly reduce private car traffic with a single passenger, particularly regarding short trips.

**Ride-sharing:** ride-sharing reduces the number of private car trips and can serve as a beneficial solution for airport employees. Many European airports have not invested in ride-sharing services and there is potential for every partner airport to invest in electric vehicle sharing as a future low carbon solution.

Combating environmental concerns is a top priority for Europe. In fact, increased attention on the environment has led many cities to develop specific infrastructure and services dedicated to soft mobility as an eco-friendly solution. LAirA has a unique opportunity to facilitate transnational cooperation between policy makers and communities to make behavioural and structural changes across Europe that will create modern, sustainable and environmentally conscious options which will ease the travel between airports and city centres.

## Transnational Challenges

Transnational cooperation is vital to improving coordination among the existing services of public transport available in Central Europe. The enhancement and upgrade of these services has been deemed critical for the development of regional airports and, as such, requires coordinated strategies, concepts and management tools as a means to overcoming outdated infrastructure and the detachment across borders to create intermodal systems of transport facilities. This, in turn, will enhance the efficiency and reliability of transport in the region as well as reduce the overall carbon emissions in the region. Coordinated strategies in this area will serve as the foundation for future sustainable infrastructure with a clear focus on the effective and eco-friendly transportation of passengers and airport employees to and across Central Europe.

**Traffic congestion:** most of the partners have serious land use and traffic congestion problems on all levels, which continues to increase.

**Noise and air pollution:** the traffic congestion mentioned above has led to increased noise and air pollution, a great concern for the LAirA project. While many forms of transportation contribute to pollution, LAirA sees an opportunity to reduce the carbon pollution produced by private cars as the prime target. This approach, however, may be highly problematic due to the amount of revenue gained by airports. Parking is the number one source of non-aeronautical revenue for airports and the targeting of cars in order to decrease emissions may not be easily accepted.

**The infrequency of public transport:** airport employees and travellers need reliable transport solutions including timetables that are suitable during off-peak hours. This problem has been particularly evident in Stuttgart, Vienna and Warsaw where public transport timetables are often not suited for employees that work in shifts, and has created a serious challenge when convincing employees to switch to sustainable transport.

**Problems in behaviour change:** due to the low quality and often lack of the infrastructure to support pedestrians and cycling connections between the airport and city centre, employees and passengers are left with limited transport options and often choose a vehicle as the most efficient mode of travel. Development of this infrastructure also requires extensive investment and has been an ongoing challenge for almost all partner airports.

**Lack of a clear alternative:** environmental issues are becoming an increasingly important social issue across Europe. LAirA must take into consideration the carbon footprint created from landside transport and work with local and national policy makers to create eco-friendly alternatives.

The challenges referenced above have only continued to grow over time and as tourism and travel to and from Europe continues to flourish, transportation problems will persist. According to an EU fact sheet, in 2017, the number of international tourist arrivals in Europe reached 1.32 billion worldwide of which 51% were in Europe. Finding effective solutions to address transport as it relates to the climate crisis is imperative.

The statistics regarding the consumption and mass use of products relating to carbon emissions in the region show startling trends and have, largely, served as the basis for the enhanced cooperation between LAirA and its multiple partners. This project can serve as the basis for the enhanced cooperation between many airports and experts in Europe, where knowledge and information can be shared to improve development and where views and arguments can be expressed in order to reach compromises where all parties can be satisfied.

## Short-Term Steps to Reach LAirA Objectives

Having previously established the objectives of LAirA's transnational strategy, four short-term actions have been decided upon to ensure straightforward implementation. Our goal is to accomplish the below actions across the regions within one-two years of the project finalisation:

- 1. Applications (Apps) with real-time data on different modes of transport and their schedules for passengers:** Many passengers and employees have access to a smartphone and applications (Apps) that can be leveraged to provide information about transportation alternatives and timetables. Milan airport has piloted an app with some success. The development of a mobile application requires a short-term investment and will meet two of LAirA's objectives: encouraging the use of low carbon mobility and preserving the environment.
- 2. Pre-trip and on-trip information for arriving passengers on low carbon ways of leaving the airport:** Coordination between airlines, public transport operators, taxi companies and local authorities in an effort to provide passengers and employees with transportation options is an easy to implement step that requires minimal investment. Display screens in-flight, located at baggage claim, or posted on airline websites is a low-cost solution to equip passengers and employees with their transportation options. Creating on-trip and arrival information will meet two of LAirA's objectives: offering value to the public sector and preserving the environment.
- 3. Employee awareness-raising on low carbon mobility:** Airport employees may not be aware of the environmental impacts of their daily commute or the available transport options. The creation of educational materials and eco-friendly transport options will raise awareness of the importance of environmental preservation, public health and the local identity around the cities where employees live and work. Awareness-raising concerning local employees will meet two of LAirA's objectives: soft mobility as a way of accessing the airport as well as preserving the environment.
- 4. Shared mobility hubs in the functional area of the airport for passengers and employees:** Shared services as we have seen with UberPool, DriveNow, UberJump and Lime offer eco-friendly ride-sharing, car-sharing and bike-sharing solutions to passengers and employees alike. Cooperation between airports and private operators has the potential to create new partnerships for airport transportation services and would increase awareness of these services. These systems provide low-cost trips for passengers and employees, show an immediate improvement in the air quality at the permanent measuring stations and meet two of LAirA's main objectives: investing in the infrastructure for electric mobility and vehicle sharing systems as well as preserving the environment.

## Medium to Long-Term LAirA Objectives

The following are the medium- and long-term interventions that should be the legacy of the LAirA project in developing green airports in terms of surface access:

**Enhancing public transport:** this step requires continued investment to change airport behaviour and to be able to reduce capacity and bottleneck issues by introducing new and fast direct connections to airports. This is a long-term goal for LAirA, with the timeline set for 2040. Investment in this area will serve to meet one of LAirA's main objectives: improving and investing in the public transport sector to make it more appealing and accessible.

**Strategy for battery management:** the cradle to a grave scenario for lithium-ion batteries is unacceptable. A sustainable plan for reusing and recycling must be implemented before any bigger changes in the ratio between electric and gas/diesel vehicles occur. This new step will serve to meet one of LAirA's main objectives: the preservation of the environment. This step has been given a timeline to be in place by 2040.

**Investments in electric mobility infrastructure:** appropriate charging infrastructure is a must-have for the switch to electric mobility. Investment in this manner is an important move that can be introduced by all airports. LAirA's second objective: investment in the infrastructure for electric mobility and vehicle-sharing systems. This step, when introduced by airports, has the possibility of being in full effect by 2030.

**Investments in soft mobility infrastructure:** appropriate cycling infrastructure is a key step in the move to soft mobility. This should be a move introduced by all partners, at least for the surrounding areas to accommodate employees living in the vicinity. Development in this way would increase the attractiveness of cycling and attract people to make use of the infrastructure available. Currently, cycling is not an attractive method for transport in most areas due to the lack of facilities at airports for cyclists (showers, storage, etc.) Improvement in this area is crucial in order to encourage employees to cycle to work. Such measures could be in place by 2040 and serve to meet the third objective of LAirA: soft mobility as a way of accessing and leaving the airport.

# Recommendations

- Invest in a common approach regarding smart mobility to and from airports.
- Develop personalised strategies, supported by policy makers, authorities and local communities, to promote low carbon mobility to and from cities.
- Provide core funding to build eco-friendly, low carbon modes of transport for all traveling/ commuting through LAirA airports.
- Build an awareness-raising campaign to encourage all passengers to use environmentally friendly modes of transport.
- Ensure behavioural changes concerning transport from travellers and airport employees must work in tandem in order to see the impact.
- Continue to strengthen partnerships across Central European airports.

## Ease of Use

Seamless integration between transportation and airports is key. It becomes essential to build efficient modes of transport as passengers will need to feel they are on quick, reliable and convenient transportation in and out of the airport. The proposed mobility options need to be both readily available and easy to use/access to ensure the success of these low-carbon mobility options.

## Communication

Globalisation has brought the world closer through air travel, and the time to amplify investment and communication on important role travel has on the environment is now. Our transnational strategy document has laid a foundation for communication. The document offers solutions to delivering awareness-raising campaigns to employees, passengers, airports, travel companies, tourist boards and cities to encourage eco-friendly transportation options throughout Central Europe.

## Investment in infrastructure and facilities

With the ever-increasing demand for mobility, environmental issues are becoming the major challenges to overcome. The development of infrastructure and facilities, as suggested in this report, play an essential role in stimulating economic growth, sustainability and job creation. Investing in low carbon, interconnected transport and sustainable development around airports will improve environmental performance, making progress towards lower emissions and environmental targets.

## Investment by Europe

The EU has introduced a trillion-euro finance plan to rethink Europe's economy, transport and energy sectors in an effort to become a world leader on clean technologies. The European Commission's funding will include augmented money from the EU's long-term budget, loans from the European Investment Bank and InvestEU. Low carbon transportation options and eco-friendly infrastructure updates to European airports are clearly aligned with the current policy priorities. LAirA has a strategic advantage to have a seat at the table with key stakeholders and policy makers to inform future decisions concerning low carbon transportation solutions.

# Transnational Strategy

Guidelines on Low Carbon Emission Landside Accessibility to Airports



## Introduction

Strategies for airports' low-carbon landside mobility planning in functional urban areas (FUAs) should have the target to reduce the CO<sub>2</sub> emissions produced by access to the airports in functional urban areas. The threats for the environment and the provision of ecological services should be recognised in decision-making procedures in order to make places more eco-friendly. The objective of this strategy is to use the experience and knowledge of the partners to build a common transnational format of strategies which will enhance the integrated environmental management of FUAs regarding mobility.

Central Europe, as identified by the European Commission, is a vast region which involves nine Member States, including all regions from Austria, Croatia, the Czech Republic, Hungary, Poland, Slovakia and Slovenia, as well as eight Länder from Germany and nine regions from North-East Italy. It presents a large number of assets which face numerous challenges in various fields affecting regional development. In this context, transnational cooperation represents a catalyst for implementing smart solutions which answer to regional challenges in different fields, such as innovation, low-carbon economy, environment, culture and transport while building regional capacities following an integrated bottom-up approach involving and coordinating relevant actors from all governance levels.

This strategy brings together European airports and cities in Central Europe that are located in different countries yet are sharing many challenges and opportunities due to their common geography, history, and culture.

The geographic and cultural similarities defining the transnational strategy areas provide an excellent basis for cooperation. Stakeholders from the private and public sectors, universities and civil society organisations are working closely together to advance new or improved solutions designed to meet the most pressing needs of their population.

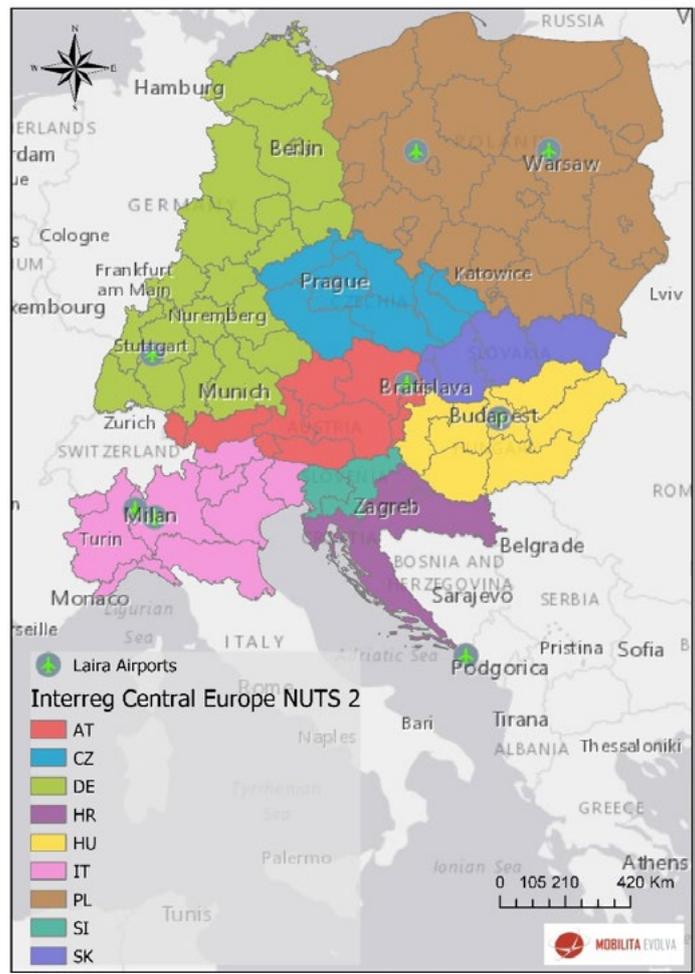


Figure 1. NUTS 2 regions within the Interreg Central Europe scope

Airports are assets and transnational transport gateways for citizens. The magnitude and growing trend of air traffic (10% per year in the EU) requires actions for the landside accessibility of functional urban areas to airports. LAirA (Landside Airport Accessibility) addressed the multimodal, smart and low carbon mobility integration of airports in the mobility systems of functional urban areas. The project aimed to reduce energy use and environmental impacts of transport activities by changing mobility behaviours of airport passengers and employees and by creating novel strategies in low carbon mobility planning for local authorities.

It targeted 56 million passengers and 39 000 employees of the airport systems in Vienna, Budapest, Warsaw, Milan, Stuttgart, Dubrovnik and Poznan. LAirA focused in particular on building capacities of local and regional authorities and airports, to jointly plan and implement low carbon mobility solutions in a transnational and comprehensive approach which integrates seven key thematic areas: electric mobility, air-rail links, walking and cycling, shared mobility, information technology systems, wayfinding and road public transport. LAirA was a 30-months project (May 2017 - October 2019).

**Six different countries and the related FUAs with ten project partners have been brought together for this project:**

1. Municipality of 18th District of Budapest (Hungary)
2. Budapest Airport Ltd. (Hungary)
3. Regional Government of the Mazowieckie Voivodeship (Poland)
4. Stuttgart Region Economic Development Corporation (Germany)
5. Dubrovnik Airport Ltd. (Croatia)
6. City of Dubrovnik Development Agency DURA (Croatia)
7. Airport Regions Council (Belgium)
8. AustriaTech. Ltd. - Federal Agency for Technological Measures (Austria)
9. City of Poznan (Poland)
10. SEA Milan Airports (Italy)

The Transnational Strategy is the result of a bottom-up process which has taken place in the eight LAirA partners airports: Vienna, Budapest, Warsaw, Milano (Linate and Malpensa), Stuttgart, Dubrovnik and Poznan. It was split into three work packages (WP).

**WPT1** (thematic work package) focused on understanding the integration between airports and FUAs mobility system as input to improve the capacities of public entities responsible for low carbon mobility planning. It analysed passengers' and employees' patterns of mobility.

**WPT2** focused on action planning low carbon mobility services and changing behaviour for low carbon airports accessibility in FUAs. It targetted seven key thematic areas: electric mobility, air-rail links, walking and cycling (soft mobility), shared mobility, intelligent transport systems (ITS), wayfinding and road public transport.

**WPT3** built and mainstreamed strategies for airports' low-carbon landside mobility planning in FUAs. It targets the LAirA FUAs and non-partner FUAs with an Enlarged Transfer Programme (ETP). It was related to the third LAirA project specific objective. All partners were involved.

# Strategic Value of Transnational Cooperation

The aim of LAirA Transnational strategy is to develop and to provide policy makers with independent tools to arbitrate conflicts between environmental targets and continuous development of airports. LAirA is meant to support policy makers, local communities to develop their own strategies to mitigate air pollution in airports FUAs as well as offer private investors a frame for investments.

The transnational strategy helps to boost cohesion in the project area. Project partners can learn from each other because each partner is at a different stage of development regarding landside airport accessibility and has different ideas on how to reduce CO<sub>2</sub>. Another achievement that can be approached during LAirA is the initiation of a stakeholder process that brings together local as well as regional and supra-regional actors to gather information on their needs and expectations towards more sustainable mobility options. Especially awareness-raising measures are an approach that is yet underrepresented in various plans and policies. As most of the airports themselves do not have their own mobility concept yet, which is coordinated with other transport-related goals, this project is a good start for shaping future transport in the different regions and the related FUAs of the seven project partners.

By facilitating knowledge exchange, transnational cooperation empowers disadvantaged regions. It builds capacities and enables each territory to learn from the others, tapping into methods and solutions that are developed or applied elsewhere in the region.

The strategy will deliver territorial cohesion - framing issues in a territorial context. The most important results are new knowledge, shared experiences and enhanced capacities while creating and sharing new ideas. Through partnerships that tackle common challenges, regions and cities can join forces instead of reinventing the wheel. Transnational cooperation

plays a key part in knowledge generation and exchange, which allows regions to stay ahead of developments by pooling ideas and resources. This is important when addressing the challenges and opportunities posed by the huge structural changes facing Europe, from disruptive technologies to automation, globalisation, and the ageing workforce.

The strategy will not only look at the relations between the single FUA, the hinterland & the airport but also at the relations with other FUAs parts of the airport catchment area, thus giving mobility answers to the complex mobility patterns of Central European citizens.

The strategy will do it by reducing the gap between peripheral and less accessible regions and the area's well-connected centres.

This strategy facilitates improvements of connections of regions and cities to the European transport networks and strengthens multi-modal environmentally friendly passenger and freight transport. Transnational cooperation will reduce existing disparities of know-how as well as increase the planning and implementation capacity in the field of integrated passenger transport systems where better regional and transnational coordination between stakeholders is considered a key factor. Transnational projects develop new approaches, methodologies, and practices and demonstrate their feasibility. The proven effects often inspire policy-makers to create frameworks that facilitate the upscaling of new solutions. This is one of the key reasons why transnational projects often deliver their full potential only years after a project has ended.

Four types of “added value”<sup>\*</sup> which can derive from transnational cooperation are:

- **Organisational and policy learning:** transnational partnerships explore new terrain and test new approaches to adequately face the challenges and opportunities posed by the huge structural changes in Europe. The first “added value” of territorial cooperation thus emerges from learning and dissemination processes in which stakeholders are enabled to frame common issues in a territorial perspective, learning to work at new scales and in new types of networks. This allows regions to stay ahead of developments, spreading know-how and enhancing competitiveness.
- **Solutions to common problems:** transnational and cross-border cooperation presents a second added value, embodied by the effort of finding solutions to common problems. This encourages the engagement of local and regional actors and it mobilises political participation. Climate changes, pollution or cross border transport systems, for example, pose challenges which are similarly experienced over large territories; these can hardly be tackled by regions separately but necessitate tailored coordination with neighbouring areas.
- **Generating critical mass:** territorial cooperation has the added value of ensuring economies of scale and the achievement of critical mass. The pooling of resources required to create common potential in a specific area is for example of extreme importance in sparsely populated areas.
- **Building transnational structures for future cooperation and further cohesion:** transnational cooperation allows the formation of administrative and institutional structures which define a reference framework for building future cooperation and strengthening the cohesion of a transnational area. These structures facilitate continuity of the lessons learned from previous projects and other cooperation forms. They also bring in the territorial dimension in light of strengthening the cohesion of the area and addressing issues that are territorial in nature.

<sup>\*</sup> According to Hörnström et Al. [Hörnström et Al. 2012]

## LAirA Airports: Context and Future Plans

Functional urban area (FUA) was originally defined for making different metropolitan areas comparable when it comes to their economic, social and environmental performances. In order to ensure the comparability of cities in terms of economic, social and environmental performance in cross-country aspects, a new definition of a city and its commuting zone the so-called functional urban areas was developed by the Organisation for Economic Co-operation and Development (OECD) and the European Commission in 2011. Therefore, this term is used for comparing different airport areas and its FUAs with each other in the LAirA project.

**All eight airports and its FUAs have different sizes and measures in case of areas, inhabitants and airport landside accessibility.**

- The Budapest FUA is considered as a large metropolitan area with almost three million inhabitants.
- The Dubrovnik-Neretva County is considered as the FUA Dubrovnik with approximately 122.000 inhabitants.
- Linate (LIN) and Malpensa (MXP) Airports, located in FUA Milan (LIN) and Varese (MXP) have over ten million inhabitants. In fact, the two FUAs host over 40% of the regional population.
- The Warsaw Modlin Airport is located in the FUA Mazovia, which covers the area of three municipalities: Nowy Dwór Mazowiecki, Zakroczym and Pomiechówek (approximately 46.000 inhabitants).
- FUA Poznan (the city of Poznan and the surrounding municipalities) has over one million residents.
- The FUA of Stuttgart comprises 95 municipalities. The total population of FUA Stuttgart reached 1.965.942 inhabitants in 2014. Besides the FUA Stuttgart there are five other FUAs (Tübingen, Reutlingen, Heilbronn, Pforzheim, Sindelfingen) in the direct catchment area of the Stuttgart Airport.
- The three provinces that belong to the Vienna FUA are Burgenland, Lower Austria and Vienna. The City of Vienna is the main point of attraction within the FUA, with about 1.8 million inhabitants.

Europe NUTS 2 Demographics represents areas of aggregated socioeconomic and demographic information at the NUTS 2 level for Europe. NUTS 2 units have an average population between 800,000 and 3,000,000 people. NUTS (Nomenclature des Unités Territoriales Statistiques) refers to the Nomenclature of Territorial Units for Statistics.

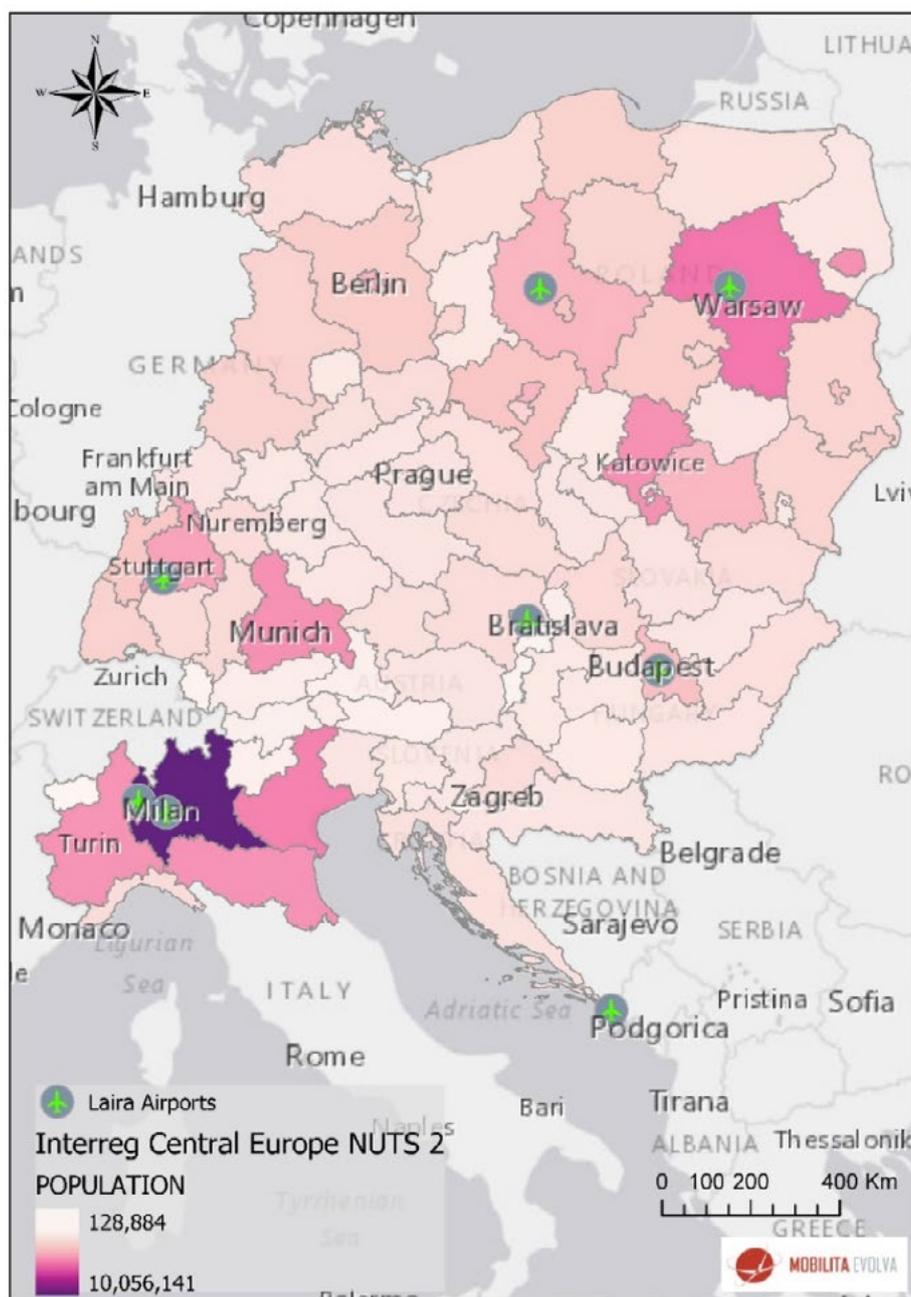


Figure 2. (2016). NUTS 2 population of Central Europe regions

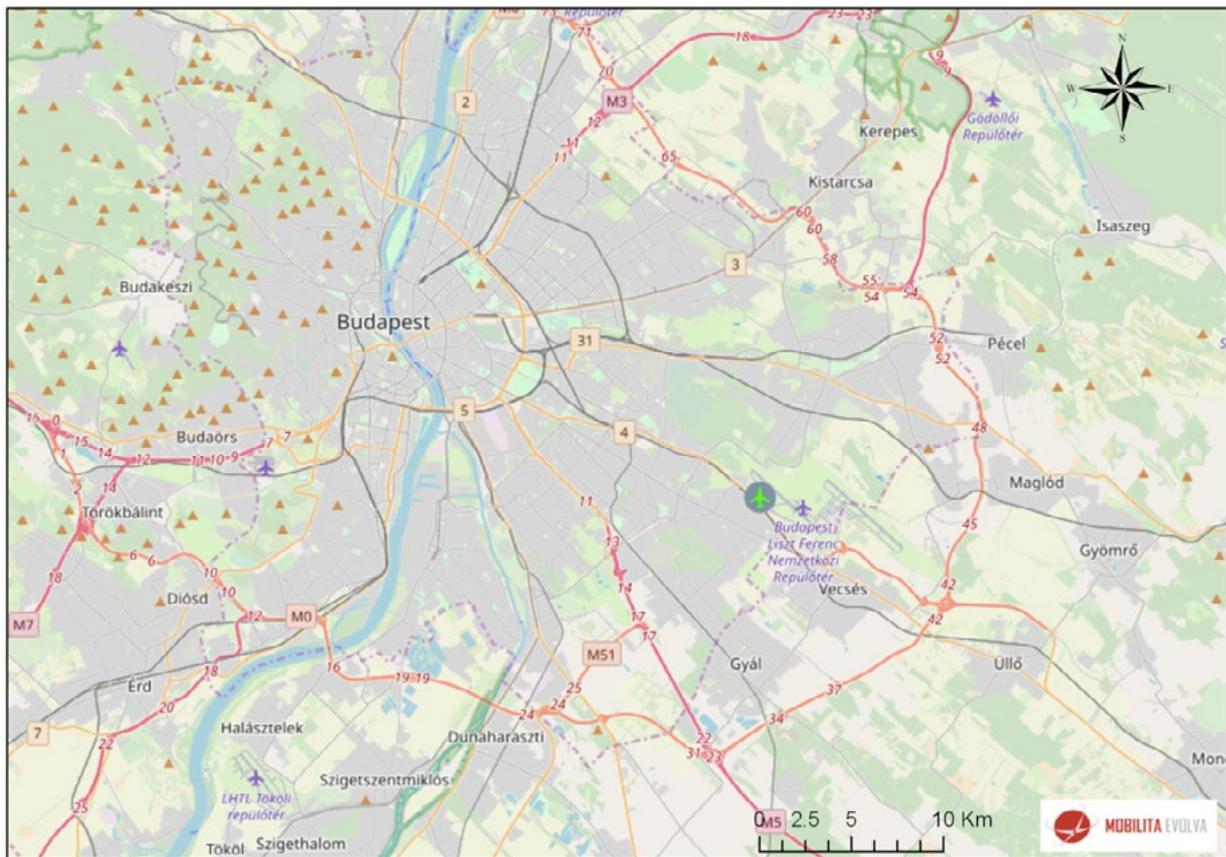


Figure 3. Budapest Airport road access

## Budapest Airport

Budapest Airport is located in four municipalities: District 17 and 18 of Budapest, Vecsés and Ecsér. Terminal 1 and most cargo facilities are located in District 18, as well as part of Terminal 2. Most of the passenger traffic areas are located in Budapest 18 and Vecsés. The majority of the areas of Liszt Ferenc International Airport is found in District 18 and the entrances on the landside are located there too.

According to the FUA definition, the Budapest FUA is considered the largest one in Hungary with nearly three million inhabitants including seven medium-sized and two small urban areas.

The catchment area of Budapest Airport stretches well beyond the FUA. Budapest Airport is located along the M0 motorway that makes it easily accessible from almost the entire Hungary by road transport as well as reaching out to 13 million people within three hours of drive range in the greater region including Austria, Slovakia, Ukraine, Slovenia, Serbia, Romania, Croatia and Slovenia.

District 18 is directly connected to the Hungarian fast-road network and to the downtown of Budapest via Üllői road - Ferihegyi repülőtérre vezető road - main road #4 (M4 highway) axis, but the fast road network is accessible via M0 and M5 highways too.

Budapest Airport is connected to the city centre by two urban public transport bus lines. 100E provides a fast and direct connection to the city centre, whereas the 200E gives a quick connection to the Metro 3 (blue line) to suburban areas.

Budapest Airport has no direct connection to the city railway. Yet, it has two major East-West railway corridors (100a, 120a) that run along its borders.

The Hungarian government has decided to improve the accessibility by building the 100d train corridor with a train station under Budapest Airport Terminal 2. The planning process is underway. The 100d train corridor is shown in the picture on the next page.



A new railway link is planned to connect the existing railway network and the Budapest Airport to provide railway accessibility from East and West Hungary. The key objective of the project is to design a seamless integration between the railway station and the airport terminal, which involves redesigning the airport road network to separate road-road and road-rail connections on different levels. It is expected to be implemented as of 2022-2023.

**Five intervention areas have been set to reach the sustainable urban mobility vision of the Budapest Airport.**

1. Improving accessibility of the District 18 Budapest at the macro- (international, domestic) and at micro-regional level;
2. Mobility development within the capital or beyond the boundary of the district;
3. Improving mobility connections within the district;
4. Strengthening the sustainable mobility solutions of the Liszt Ferenc International Airport;
5. Horizontal priority: awareness-raising and communication.

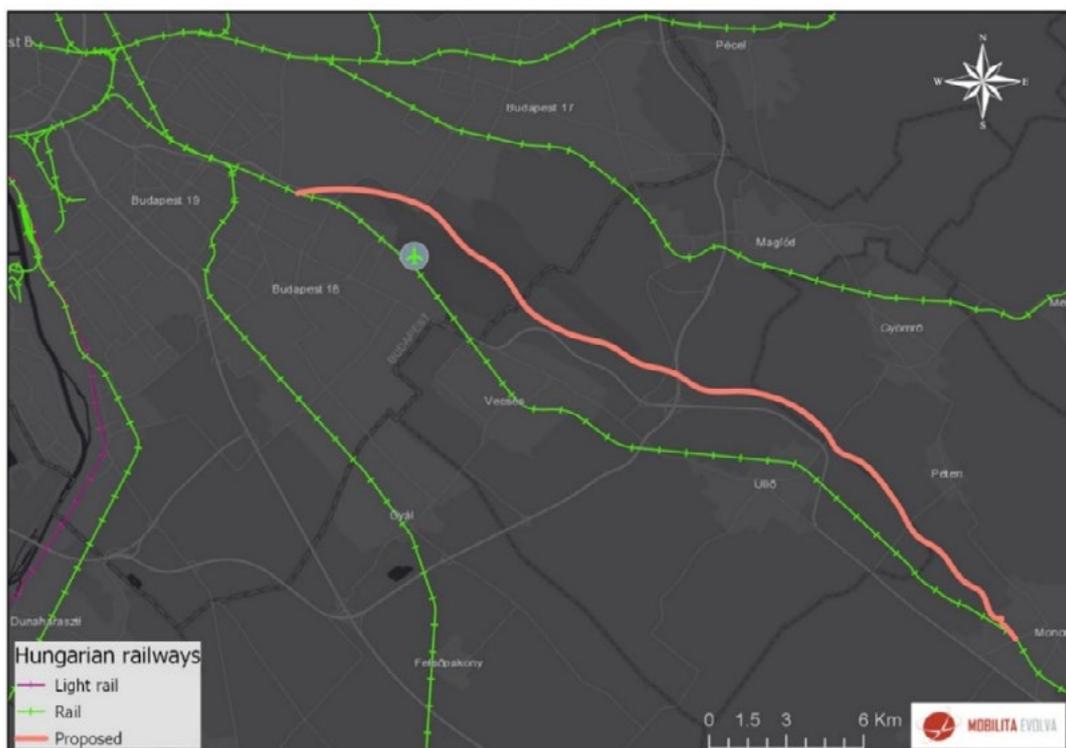


Figure 4. Proposed railway link to Budapest Airport

## SEA Milan Airports

Linate and Malpensa Airports are located in the Lombardy region, which has over ten million inhabitants and which is the leader in the Italian economic system (21.8% of the Italian GDP).

**Linate and Malpensa Airports fall under two Functional Urban Areas (FUA) in the north-west of the Lombardy region:**

- Linate is in Milan FUA (IT002);
- Malpensa is in Varese FUA (IT043).

The two FUAs have a significant share of the regional population (41%, approximately 4.1 million). The core urban area for the two Airports is Milan Metropolitan Area (corresponding to Milan province and Milan FUA). In fact, this is a significant part of the Airports' catchment area in terms of a number of passengers (45.9% for Malpensa and 63.7% for Linate).

In the Figure 5, Linate and Malpensa Airports are integrated within a dense road and rail transport network connecting them to core regional, national and cross-border urban and economic areas.

Concerning mobility services, the analysis shows that both airports have very good accessibility levels thanks to plenty of services (private and public, on-demand and regular).

**In particular, Malpensa Airport has rail, coach and bus connections:**

- Direct rail services operate to/from Milan City centre and Switzerland;
- Coach and bus services operate to/from Milan railway station, Fiera Milano City and Switzerland; additionally, both on-demand and regular services operate to/from major Italian cities, other provincial urban centres, and Linate and Bergamo Orio Al Serio Airports. Moreover, the airport offers car-sharing services: currently there are five parking slots at Terminal 1 and two recharging stations.

Linate Airport has coach and bus services to Milan city centre, Milan railway station, Fiera Milano City and San Raffaele Hospital in Milan urban area, as well as coach services to other regional cities, and to Malpensa and Orio al Serio Airports. On-demand coach services to Switzerland are available.

The car-sharing offer is more developed than at Malpensa Airport and includes four providers. The core project concerning rail accessibility to Linate Airport is the extension of the M4 metro line and its connection to the airport. The line will be active by 2022 and its opening will have an impact on the surface access modal share. It is shown in Figure 7.

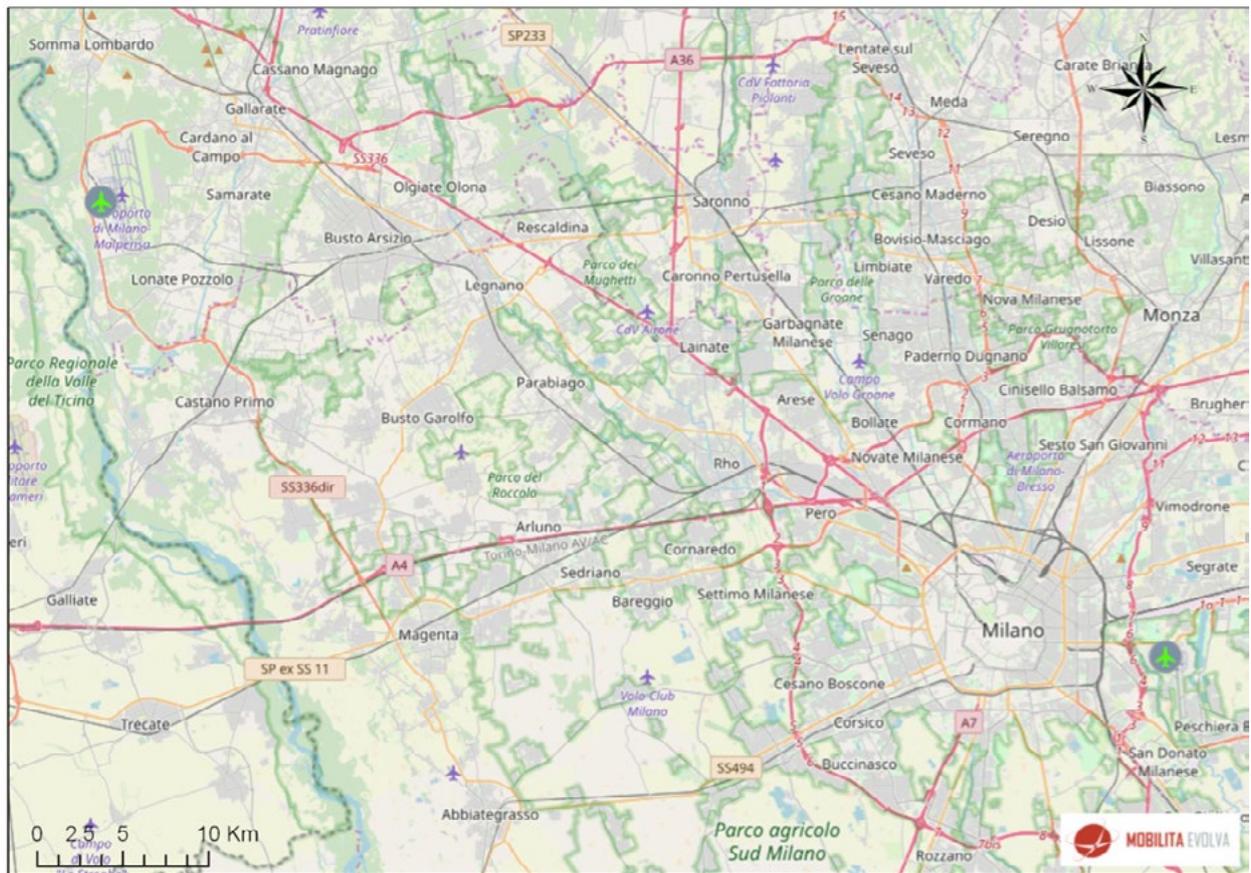


Figure 5. Malpensa and Linate Airport road access

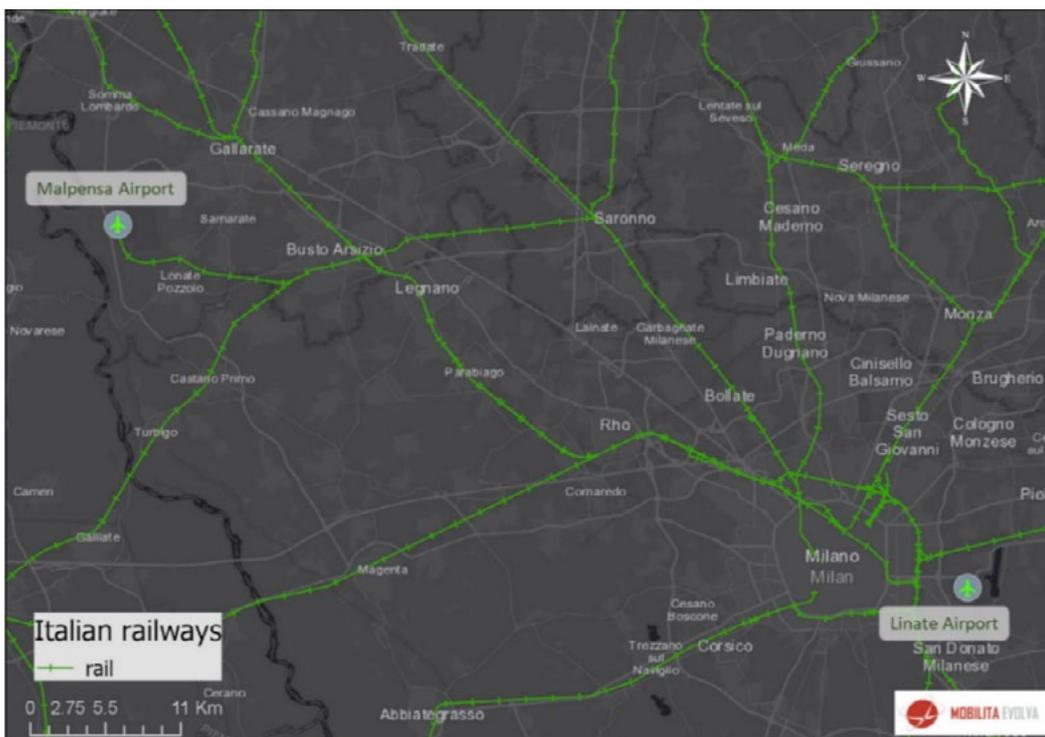


Figure 6. Malpensa and Linate Airport railway access

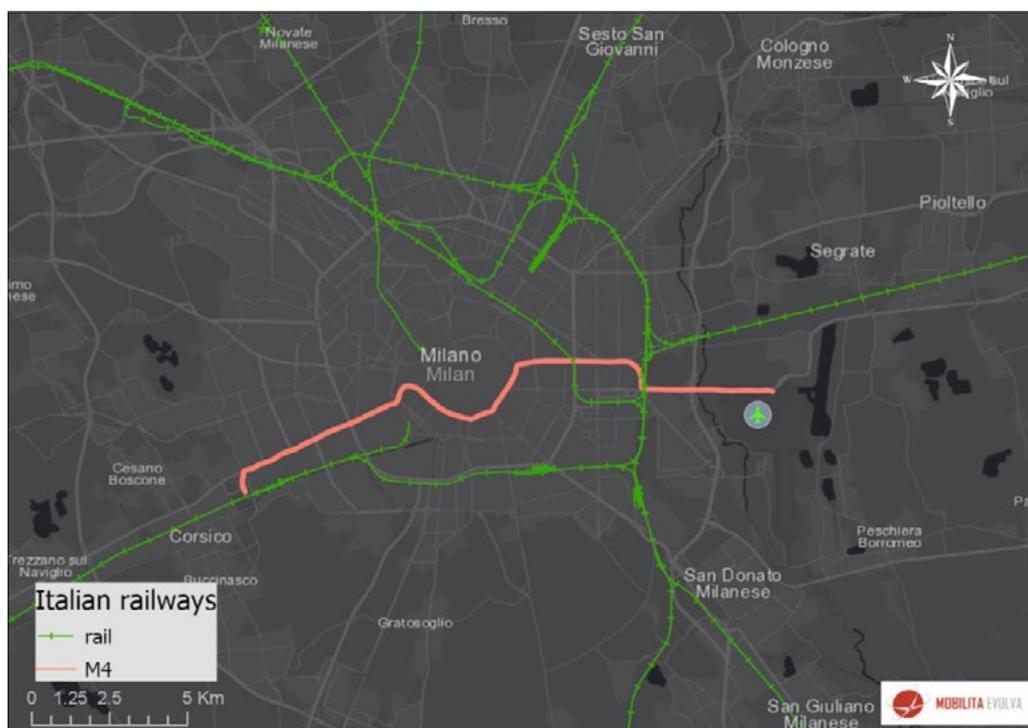


Figure 7. Linate Airport potential M4 metro line

**SEA Milan Airports' vision in landside accessibility is making Malpensa and Linate Airports smart mobility hubs. This means developing the airports to be:**

- the greenest Italian airports in surface access;
- the heart of northern Italy mobility networks;
- equipped with technologies and infrastructure for the best customer mobility services.

**Developing this vision means answering the following strategic challenges:**

1. Reducing traffic congestion on the local road network: passenger traffic increase brings pressure on the airports' surface access systems, both to services and infrastructures; airports need managing increased pressure on service quality standards and engage in cooperation with territorial stakeholders to meet passengers' mobility needs.
2. Adapting the airports' business models to new mobility paradigms: airports need to match enhanced passenger surface access sustainability (and in particular the use of public and shared mobility services) with the related risk of parking revenues decrease; they need generating new revenue streams and identifying business opportunities related to passengers' surface access.
3. Delivering and enhancing the landside airports' infrastructure: physical infrastructures will continue playing a key role in airports' development and airports will need new and enhanced surface access infrastructure to meet passengers' mobility needs in all transport modes.

**SEA Milan Airports have identified three key objectives in landside accessibility to pursue by 2030:**

1. Increasing public transport share to 40%;
2. Delivering new customer services;
3. Investing in landside infrastructure and equipment.

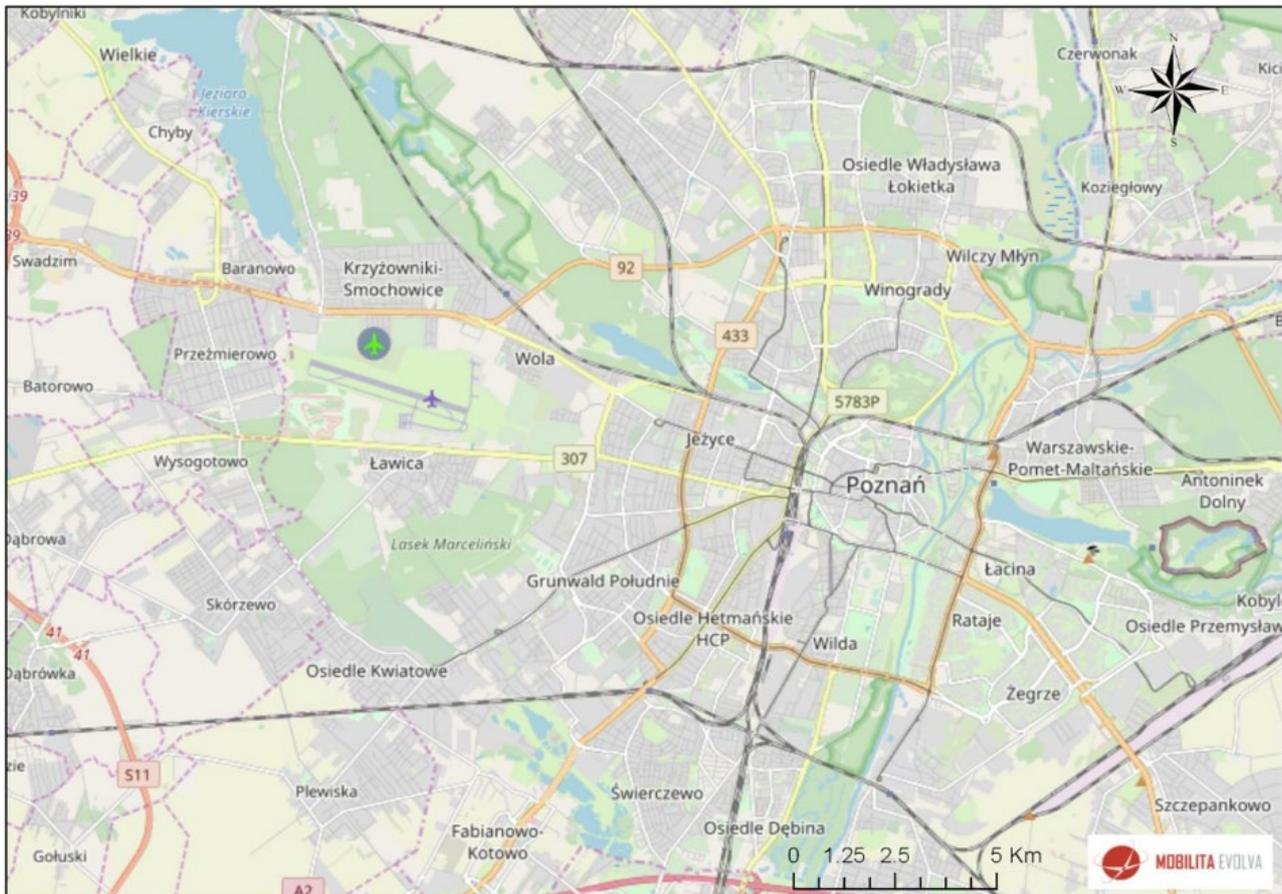


Figure 8. Lawice Poznań Airport road access

## Poznań Airport

The Henryk Wieniawski Poznań-Ławica International Airport is one of the oldest airports in Poland, situated 7km west of the centre of Poznań. In terms of the number of served passengers and the number of air operations, it is the seventh largest Polish airport, after Okęcie in Warsaw, Balice in Krakow, Rębiechowo in Gdańsk, Pyrzowice, Starachowice in Wrocław and Modlin.

The Functional Urban Area of the airport is included in the Poznań Metropolitan Area. The FUA is located in the Wielkopolskie Voivodeship and covers the urbanised area around Poznań with centres having well-developed functional ties in the social and economic areas and developed transport infrastructure.

The functional ties are particularly strong with Poznań - the capital of the region. The FUA is made up of 23 territorial units (Buk, Czerwonak, Dopiewo, Kleszczewo, Komorniki, Kostrzyn, Kórnik, Luboń, Mosina, Murowana Goślina, Oborniki, Pobiedziska, Poznański Powiat, Poznań, Puszczykowo, Rokietnica, Skoki, Stęszew, Suchy

Las, Swarzędz, Szamotuły, Śrem, Tarnowo Podgórne), arranged in two rings surrounding the central city (Poznań). The FUA accounts for 11% of the Wielkopolskie Voivodeship and is inhabited by one million people, i.e. 30% of the population of Wielkopolska.

Poznań-Ławica International Airport is situated in the western part of the administrative territory of the City of Poznań, only 7km from the city centre. The airport connects Poznań with cities in Europe and around the world and serves about 1.5 million passengers a year.

The airport can be accessed only by road (using 307 voivodeship road - Bukowska Street). The airport is in the western part of the city, only 7km away from the centre of Poznań. Its location is shown in Figure 8.

The airport can be accessed easily by car using the modernised Bukowska Street. The most convenient way to get to the airport from the east and south leads through Poznań A2 motorway.



Poznań-Ławica International Airport is connected with the city centre by public transport. There are bus stops right in front of the passenger terminal and in its immediate vicinity. At present, there is only one bus connection between the airport and the city centre - Line 159 - connects the airport with Poznań Główny Railway Station in 22 minutes, and depending on the time of the day - shuttles every 15 - 20 minutes. Equally fast but more comfortable transport services are rendered by taxis.

In order to accelerate travel between the airport and the city centre, special facilities for buses and taxis have been arranged along Bukowska Street, e.g. bus-only lanes and right-of-way at intersections.

At present, Poznań-Ławica Airport is not connected with public rail transport (tram or train).

The airport is accessible also for cyclists. Around the railway station, there is bicycle infrastructure enabling people to get around using bicycles. The city centre is connected with the airport by a bicycle lane with a total length of 6.1km, running mainly along Bukowska Street. When weather and traffic conditions are favourable, the travel time is about 20 minutes.

The city of Poznań has developed a car-sharing concept providing for self-service pay-per-minute car rental. It is assumed that hybrid cars will be deployed first, to be followed by electric ones. Furthermore, thanks to cooperation with Blinkee, the City of Poznań offers electric scooters which can be rented per minute using a mobile application.

Besides sharing cars and scooters, it is possible to rent a private car - the price is to be agreed in an agreement concluded with the private owner operating the sales point in the airport lobby.

So, the problem is how to get to the airport by public transport. Currently, there are too few connections and the hours are not adjusted to the working hours of the employees. An advantage is the bicycle path to the airport, but there is no bicycle station directly next to the airport.

**Four proposals for directions to improve the accessibility of Poznań-Ławica Airport were selected:**

- Proposal to create a tram line to Poznań-Ławica Airport, which could be used by passengers, employees and local residents;
- Operation of the bus line by an electric bus and adjustment of its running hours to the shift hours of airport employees. In addition, it is also important to increase the bus frequency from the city centre to the airport;
- Building a city bike station by the airport to encourage employees to use the free ride to work (the first 20 minutes of using the bike is free of charge) - it requires the involvement of ZTM\* and establishing contact with the company Nextibike, which is the operator of the city bike scheme in Poznań;
- The use of electric cars in car-sharing systems and building the charging station at the airport, but this requires the airport's approval and the designation of a suitable location.

An analysis based on the four proposals clearly shows that despite the expected significant impact on the reduction of congestion, launching a tram line is the least preferred solution, followed by car-sharing, which despite the ease of implementation, independence and a significant level of comfort does not solve the important problems of city residents and airport employees. The situation is different in the case of an electric bus and a city bicycle, which has gained favour among the employees of the Poznan airport.

However, the winner was an electric bus, which is a relatively inexpensive solution and does not require any expensive infrastructure (e.g. bus-pass and charging stations) in comparison with a tram.

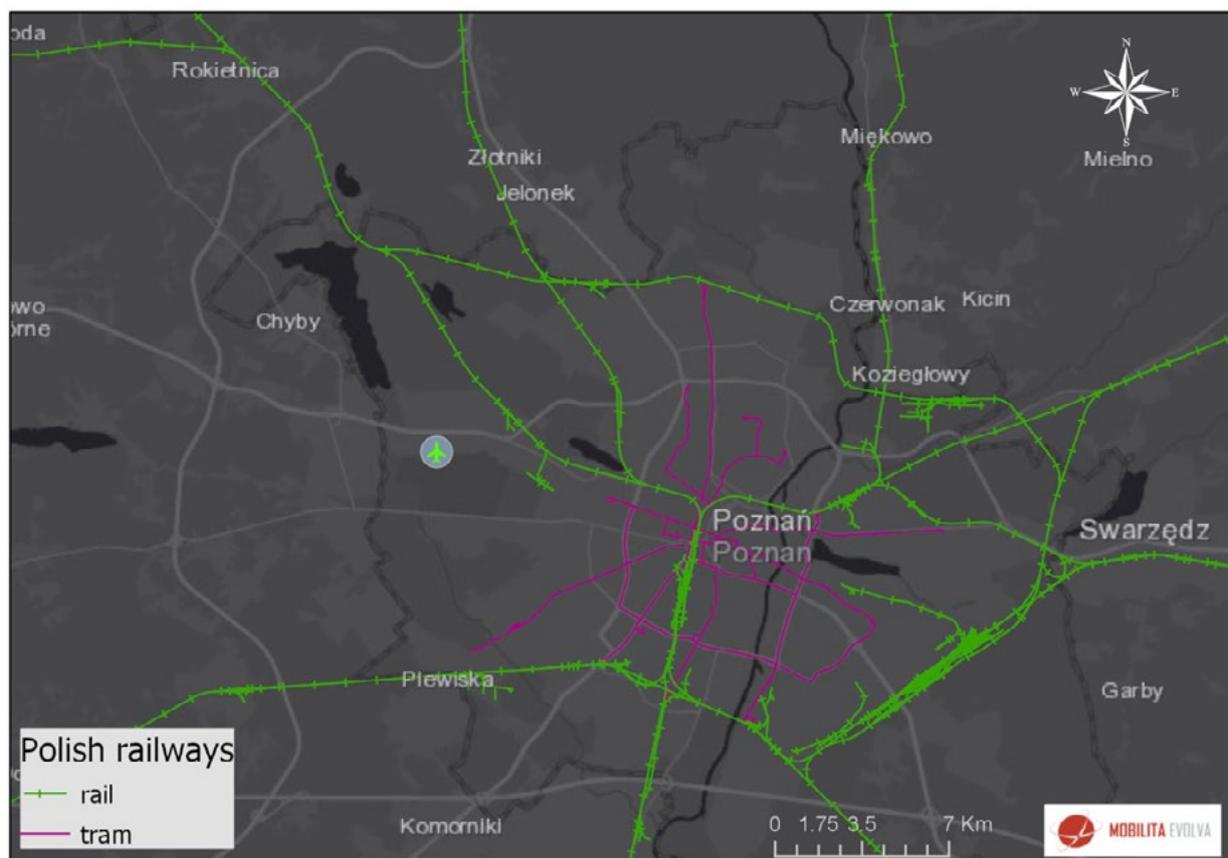


Figure 9. Lawice Poznan Airport railway access

\* Zarząd Transportu Miejskiego w Warszawie is a local authority controlled body managing all means of public transport in Warsaw

## Modlin Airport

The functional area of the Warsaw/Modlin airport covers the area of three municipalities:

- Nowy Dwór Mazowiecki;
- Zakroczym;
- Pomiechówek.

These municipalities directly surround the Warsaw/Modlin airport (which is located administratively within Nowy Dwór Mazowiecki, Mazovia province) which is a justification for establishing such boundaries of the functional area.

Warsaw/Modlin International Airport is a civil airport, servicing scheduled short and medium-range flights of low-cost airlines and charter flights. The airport was opened in 2012. The airport is the second after Chopin Airport, serving the Warsaw metropolitan area. In 2018, the airport served 3.1 million passengers.

Warsaw/Modlin Airport is located 3km to the north-west of the city centre of Nowy Dwór Mazowiecki, near the S7 route connecting Warsaw and Gdansk. It is 39km away from Warsaw.

The airport does not have a railway connection. The nearest station - Modlin - is located 5km away from the airport. A bus service between the station and the airport is available.

Local bus transport service is available in Nowy Dwór Mazowiecki and Pomiechówek.

There are private buses running from Zakroczym to Warsaw, via Nowy Dwór Mazowiecki. The main drawback of this solution is the lack of airport service.

The bus connection between the airport and Warsaw is provided by a single company. Long distance connections (in the direction of Olsztyn, Suwałki, Białystok, Lublin, Łódź, Toruń, Włocławek, Płock) are handled by seven companies. The bus stops at the airport are located at the second passageway from the terminal exit.

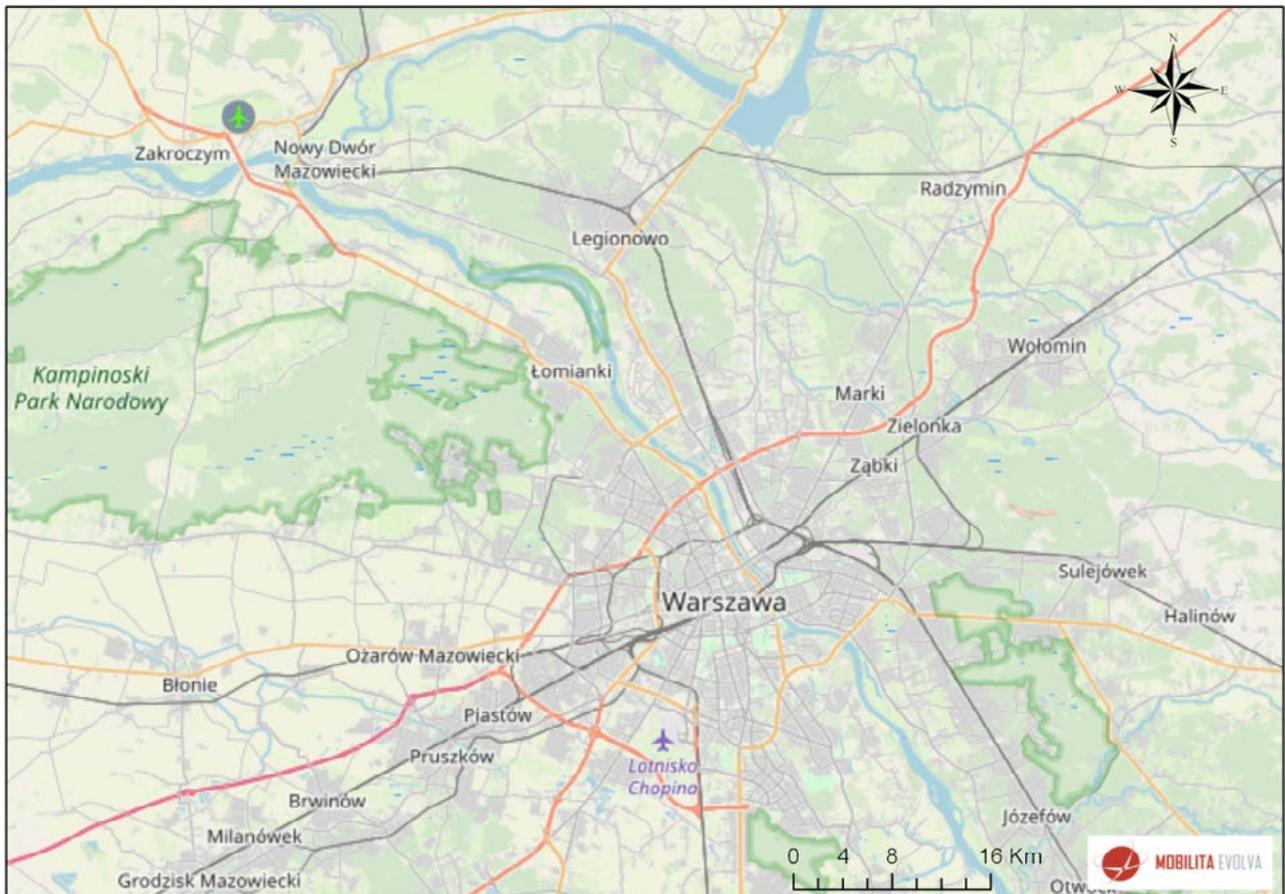


Figure 10. Modlin Warszawa Airport road access

The airport can be reached from Warsaw using the national roads No. 7 and 62 (on the left side of the Vistula River), national road No. 61 and provincial road No. 630 (on the right side of the Vistula River). Travel time ranges from 45 to over 60 minutes. The construction of the S7 expressway between Czosnów and Trasa Armii Krajowej (Home Army route) in Warsaw is a chance to shorten this time. Reaching the airport from the surrounding municipalities does not take much time. The S10 road is planned to be built north of the airport.

The main objective of the Warsaw airport is to promote and support environmentally friendly solutions within the transport system of Mazovia, with particular emphasis on the functional area of the Warsaw/Modlin airport. This is expected to result in a reduction of greenhouse gas emissions, including CO<sub>2</sub>, resulting from journeys to the Warsaw/Modlin airport.

The above is to be achieved mainly through the development of low-carbon mobility infrastructure and through changes in the travel behaviour of passengers and employees. For any change to take place, people’s willingness to participate in it is essential. Therefore, in addition to the development of appropriate infrastructure and services, a specific objective is to build environmental awareness among airport users and staff. High quality transport infrastructure and services combined with a high level of environmental awareness should contribute to achieving objective 3, i.e. to increase the share of passengers and staff travelling to the airport in a more environmentally friendly way.

An important element for the implementation of the main objective is also the cooperation of relevant institutions responsible for transport policy and obtaining stakeholder support for the proposed actions. This is why the fourth specific objective was formulated as strengthening cooperation between Warsaw/Modlin airport stakeholders to achieve low-carbon mobility.

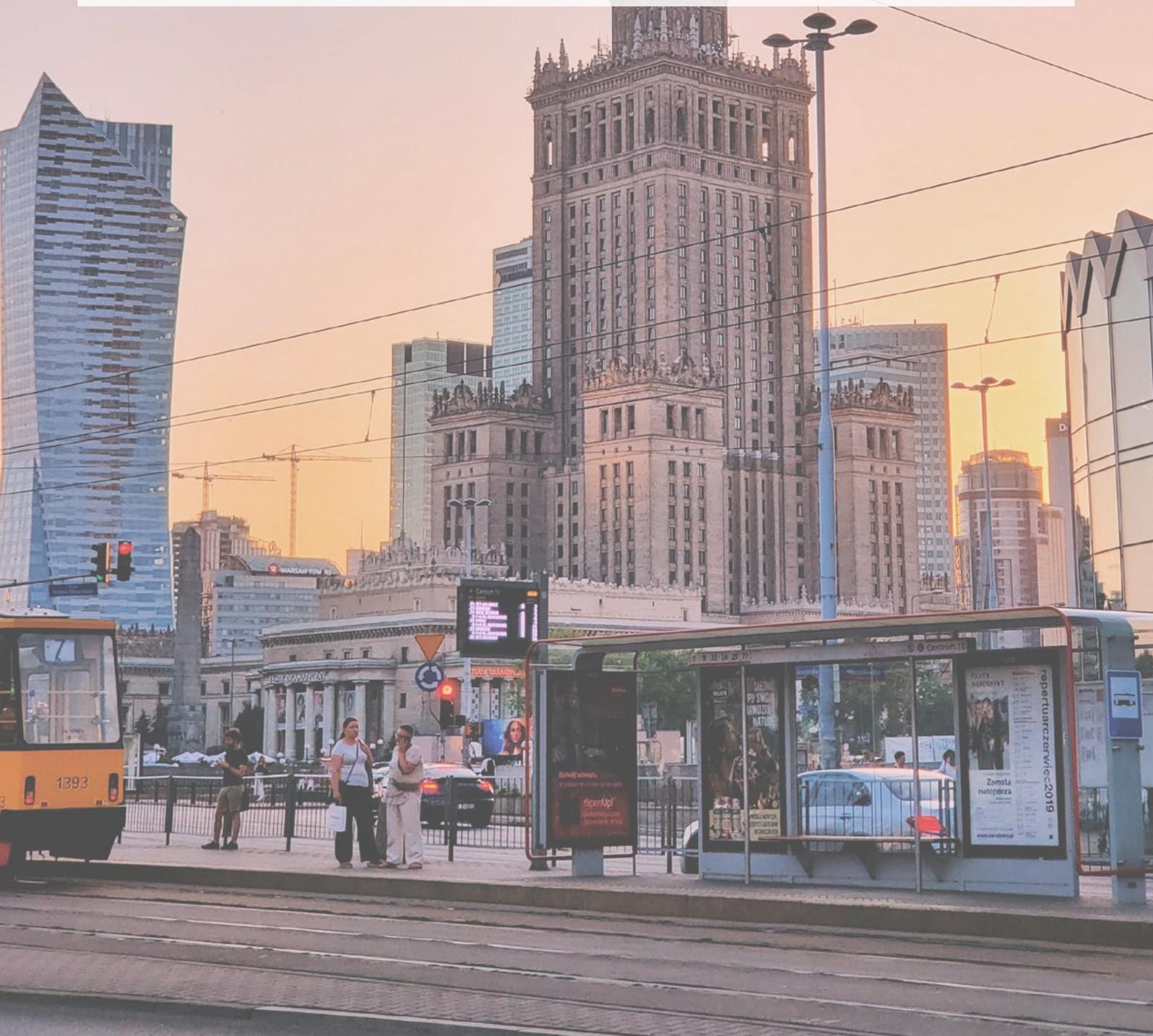


Figure 11. Modlin Warszawa Airport railway access

Taking into account the existing problems and challenges as well as the chances and opportunities, this concept of strategic action focuses on the development of public transport and the improvement of conditions for non-motorised traffic. Expanding the offer of transport services, improving pedestrian and bicycle infrastructure in the functional area of the airport as well as conducting information and motivation activities proved to be most effective. The document does not include any activities dedicated to electromobility. It does not exclude them, however, as together with the implementation of the provisions of this document they may result in synergy.

This concept is based on the current knowledge, trends and experience gained and analysed within the LAirA project. The vision is also consistent with the policy of the Regional Government of Mazovia.

The vision of Warsaw/Modlin airport to be connected effectively and sustainably with the surrounding area is consistent with both the development policy of the region and with the directions of development of the Warsaw/Modlin airport, of which the regional government is a shareholder.



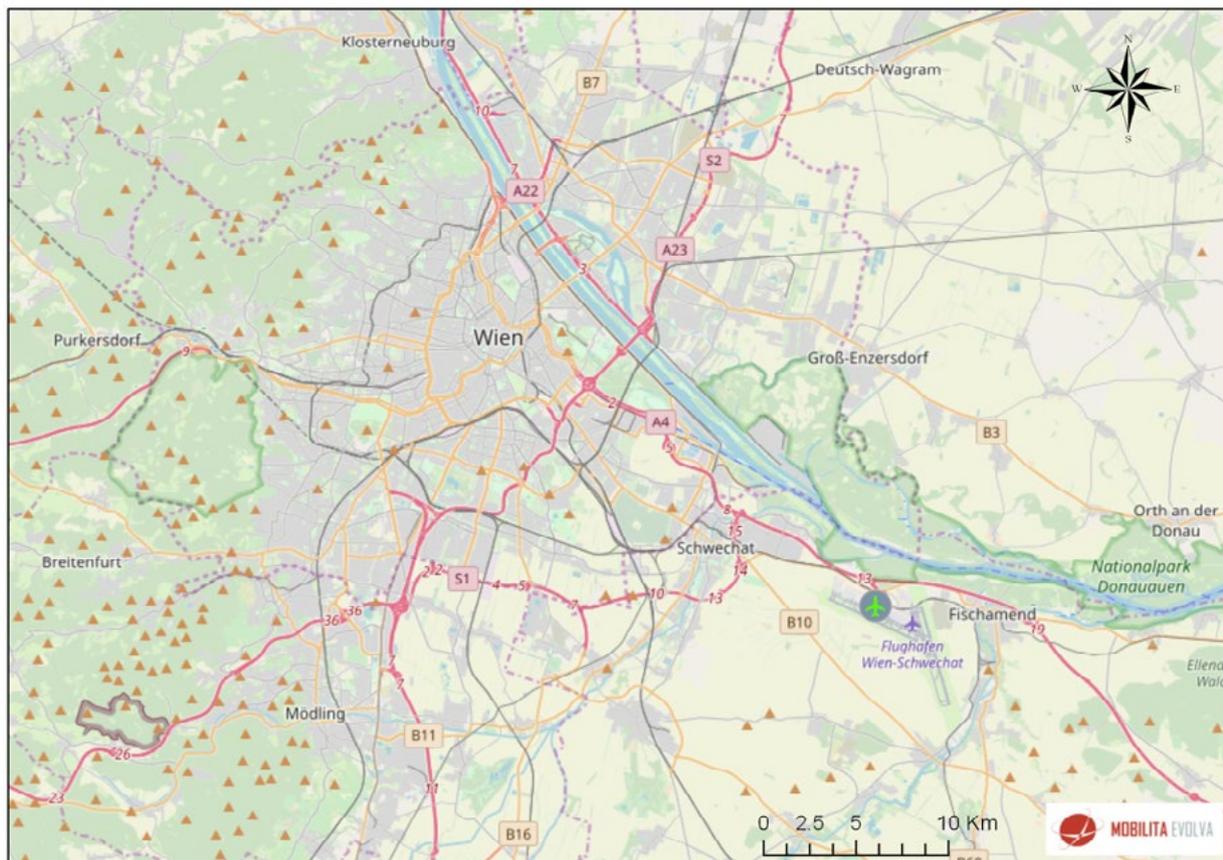


Figure 12. Vienna Airport road access

## Vienna Airport

The FUA of Vienna comprises 313 municipalities in Austria. The total population of the Vienna FUA was 2,793,631 inhabitants in 2014. The City of Vienna has about 1.8 million inhabitants by 2017.

Vienna International Airport is located 20 kilometres of the City of Vienna in the province of Lower Austria. Vienna airport is very well connected by road and rail from Vienna, Linz and Graz. However, the area in the close vicinity to the airport is not well connected to the airport by public transport.

It is possible to access the airport by road and rail with different modes of transport and types of vehicles such as private cars, shared cars, buses, bicycles, taxis or local and long-distance trains.

The airport and its FUA are connected via the motorway “A4” as well as the federal road “B9”. The city centre of Vienna is reachable within 15-20 minutes by car in case of normal traffic volume. At peak times and depending on construction sites along the motorway (which are not unusual), longer travel time must be assumed. The motorway A4 is well connected to the higher-raking transport network and therefore the airport

is also very attractive for passengers coming from the Czech Republic, Hungary and Slovakia.

On a smaller scale, the airport can easily be reached from its immediate surrounding municipalities by country roads and another highway called “S1” which also connects the airport area with the southern and western part of Austria.

Vienna International Airport is serviced by four bus lines (Vienna Airport Line 1-3, AirLiner) directly connecting it with the City of Vienna.

Vienna International Airport is connected to the regional and the long-distance railway network. The railway network (considering the airport connection) is served by trains from the Austrian Federal Railways Association (“Österreichische Bundesbahnen - ÖBB”) and the City Airport Train (CAT).

The most important challenges that Vienna has stated are capacity bottlenecks of rail and road infrastructure to and from the airport and marketing of cycling infrastructure around the airport.

Potentials are enhancing even more the attractiveness and awareness of public transport use, making use of (and improving) the infrastructure for active mobility and taking new opportunities in the field of company-driven mobility management.

Vienna Airport has a vision to increase by half the share of the passengers using rail transport to access the airport by 2030. The other share commutes by eco-friendly road-bound transport modes such as e-/alternative-fuel-taxis, joint rides and eco-friendly busses. At the same time, employees benefit from the mobility management in their FUA home municipalities, which are supported by the airport. An overall programme covering all businesses at the Vienna Airport considers employees' mobility needs and provides a set of alternative transport modes to individual/single rides by fossil-fuel cars.

According to the vision Vienna Airport has set four objectives:

- CO<sub>2</sub> neutrality of the Vienna Airport by 2030;
- Higher share (+50%) of rail-bound transport modes for accessing the airport by 2030;
- A higher share of e-vehicles among taxis that access/leave the airport;
- A higher share of bicycle users among airport commuters.

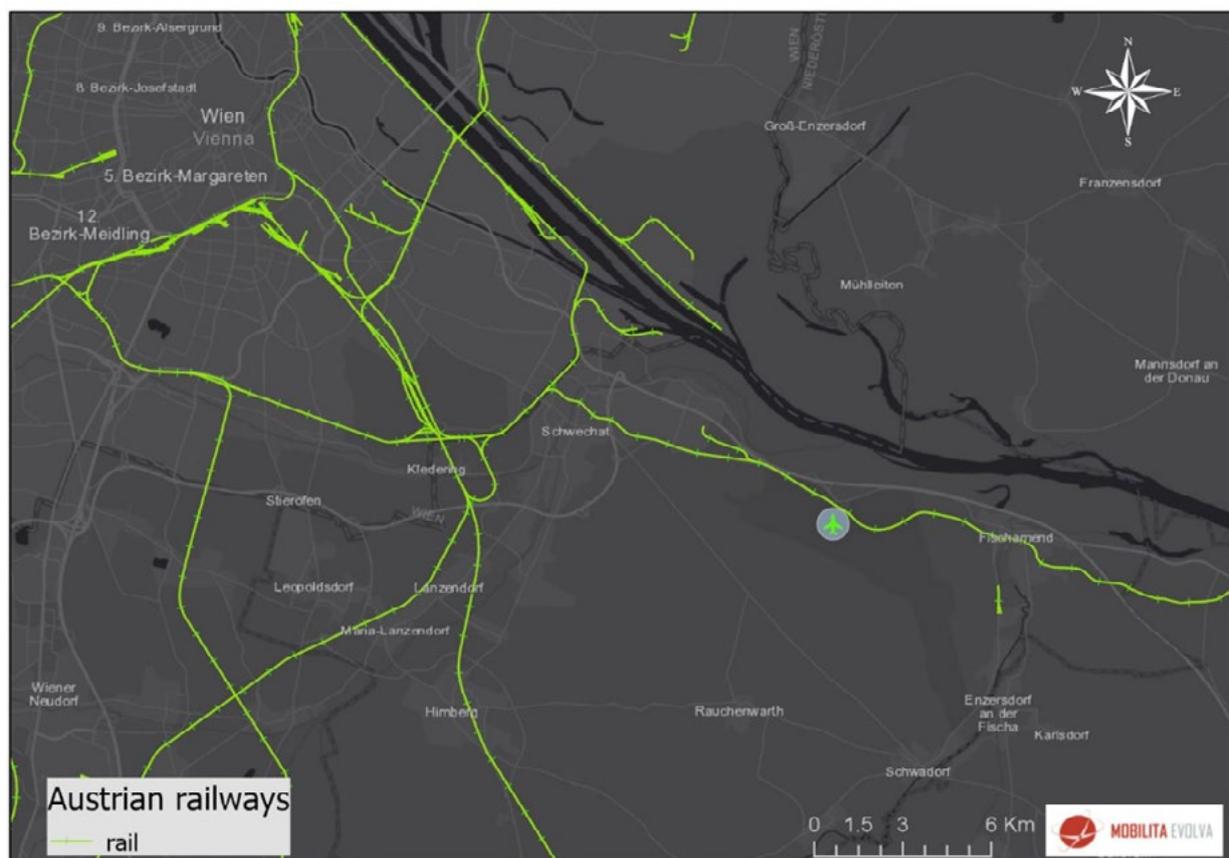


Figure 13. Vienna Airport railway access



## Stuttgart Airport

The functional urban area (FUA) of Stuttgart comprises 95 municipalities. The total population of the Stuttgart FUA (DE007) was 1.965.942 inhabitants in 2014. **Besides the FUA Stuttgart there are other FUAs in the direct catchment area of the Stuttgart Airport:**

- FUA Sindelfingen (DE068) as a medium-sized urban area with 306.122 inhabitants;
- FUA Reutlingen (DE537) as a medium-sized urban area with 235.737 inhabitants;
- FUA Tübingen (DE050) as a small urban area with 189.252 inhabitants;
- FUA Heilbronn (DE529) as a medium-sized urban area with 372.093 inhabitants;
- FUA Pforzheim (DE533) as a medium-sized urban area with 243.262 inhabitants.

All these other FUAs are less than 60 minutes away from the Airport (by car). These five other FUAs combined with the FUA Stuttgart have a population of more than 3.3 million people.

Stuttgart Airport is located about 13 kilometres south of the city of Stuttgart and is on the edge between the nearby municipalities of Leinfelden-Echterdingen, Filderstadt and Stuttgart. Stuttgart is the capital city of the federal state of Baden - Württemberg. Vehicle design and production, as well as engineering in general, are a vital part of the region's economy. Besides its traditional strengths, the Stuttgart Region is also well known for its strong creative industries and its enthusiasm for research and development. The city of Stuttgart had a population of approximately 610.000 inhabitants in 2018.

Stuttgart airport is very well connected to its catchment area via roads and public transport, although a new rail project Stuttgart 21 is planned to enhance the accessibility of the airport and extension of the U6 railway is planned, too.

The airport will experience 41% of growth until 2030. By 2030, 14 million passengers will be expected and an increase of public transport from 23% (2019) to 45% in 2030.

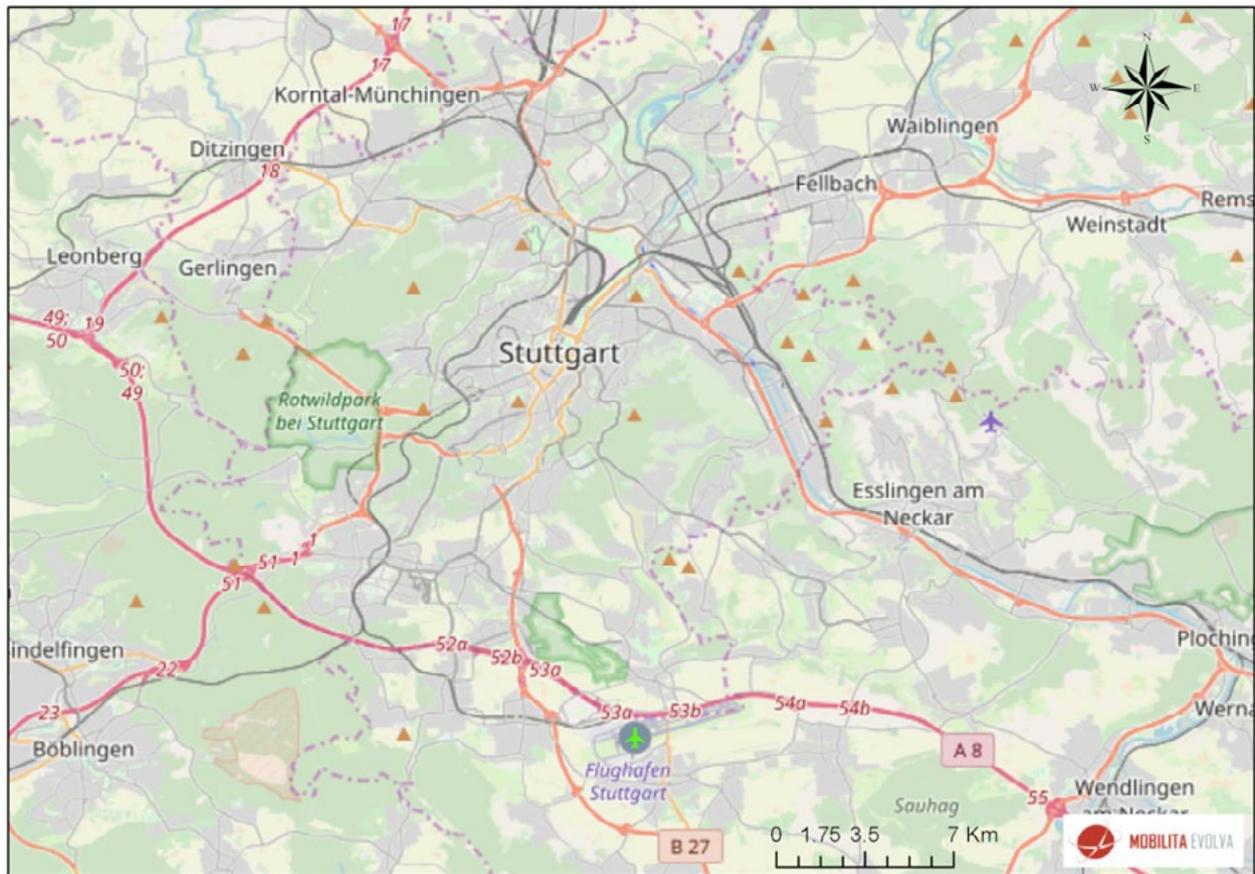


Figure 14. Stuttgart Airport road access

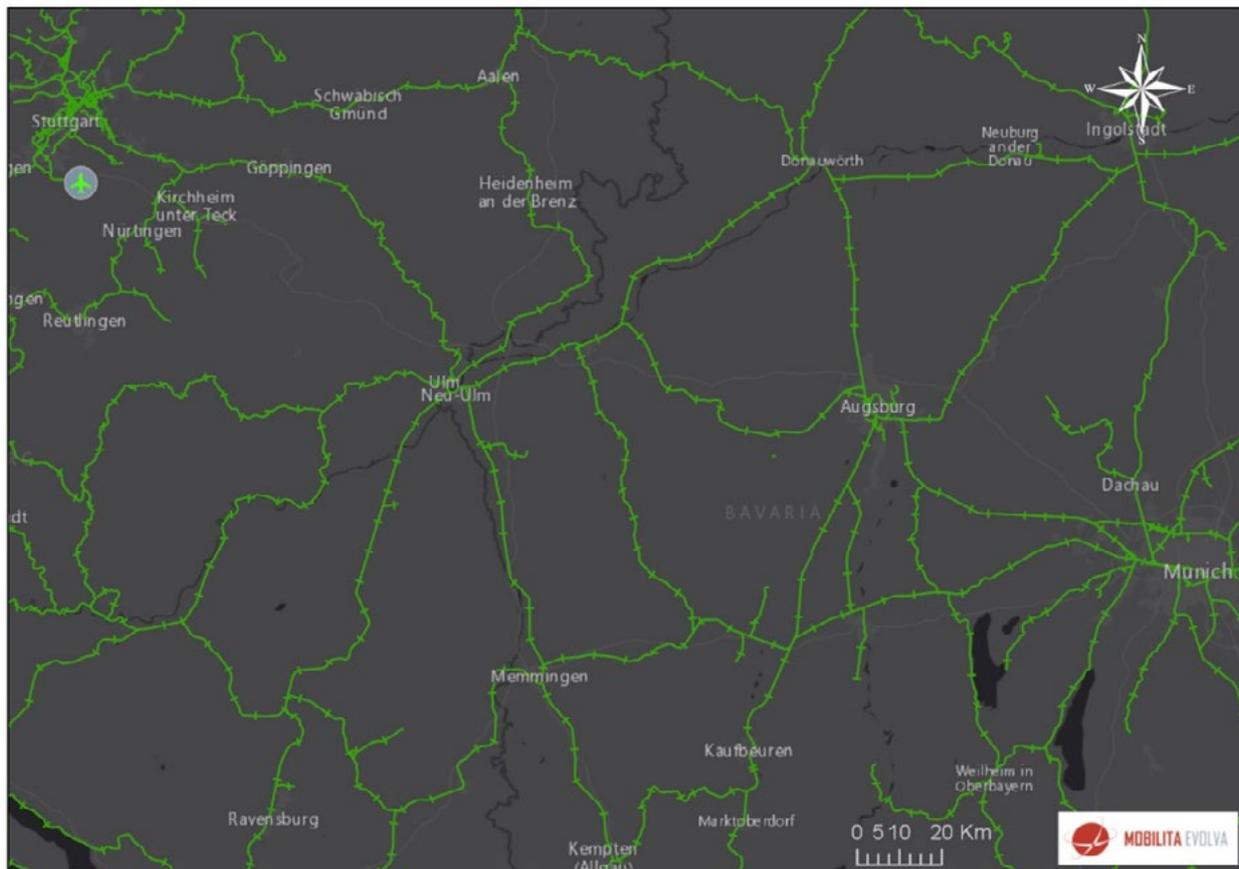


Figure 15. Stuttgart Airport railway access

As a result of the passenger increase, investments in public transport are very much needed, but they have their limitations because of the available land in the surrounding area. Roads are also up for development: B27 and A8 (from three to four lanes).

Cycling infrastructure is well developed to Stuttgart but lacks in the immediate surrounding area. Car-sharing is very developed, with over 200 hubs in the region of Stuttgart.

Stuttgart Airport predicts that passengers and employees will need to change their mobility behaviour. Stuttgart Airport would like to reduce peak hours on individual and public transport which is why they introduced flexible working hours and home office. Employees can choose when and where to work to discharge the transport system. However, Stuttgart Airport has issues with timetables of the public transport system. Shift workers could only use public transport if the operating hours would be better adapted to the requirements of all airport employees.

Stuttgart airport has two aims:

1. Reduction of CO<sub>2</sub> emissions within the Stuttgart Region;

2. Development/improvement of varied sustainable public transport infrastructure from the city centre and surrounding FUAs to the Stuttgart Airport.

**In consideration of the overall aims, the investments and measures are assigned to the following objectives that are more specific:**

**Objective 1:** Improvement of public transport options from surrounding FUAs to the Stuttgart Airport;

**Objective 2:** Improvement of sufficient wayfinding;

**Objective 3:** Rise of rail capacity/shifting from road to rail;

**Objective 4:** Efficiency Improvement of the road network close to Stuttgart Airport;

**Objective 5:** Growth of electrical fleet;

**Objective 6:** Greater frequency and longer operating hours.

## Dubrovnik Airport

The Dubrovnik-Neretva County (DNC) is the southernmost Croatian county, peripherally located and the furthest from the country's capital, Zagreb. The county borders on land and sea with the Split-Dalmatia County and is an integral part of the NUTS 2 region of Adriatic Croatia. According to the 2011 population census, the DNC FUA had 122.568 or 2,86% of the total population of Croatia.

The main characteristic of this region is its transport isolation from the rest of Croatian territory and following that, from the rest of Europe, mostly as a result of physical separation from the rest of the state territory by the Bosnia and Herzegovina access corridor to the Adriatic.

The main road routes pass between the coastline and the Bosnia and Herzegovina state borderline.

The region's economy is mostly based on tourism. Air traffic in Dubrovnik airport is, therefore, mostly international, including various destinations worldwide, especially during the summer season. This is why the catchment area of Dubrovnik airport is much wider, crossing over into the Montenegrin territory and that of Bosnia and Herzegovina. The most significant state road is the D8 state road (Adriatic Highway) with some county and local roads connecting to it, while the A1 motorway runs up to Ploče and the Bosnia and Herzegovina state borderline (Ravča - Ploče L=21km).

Dubrovnik Airport has only one road connecting the main city of Dubrovnik and the airport: D8. Surrounding areas, where employees live are very badly connected with public transport to the airport. Cycling and pedestrian infrastructure around the airport and to Dubrovnik does not exist.

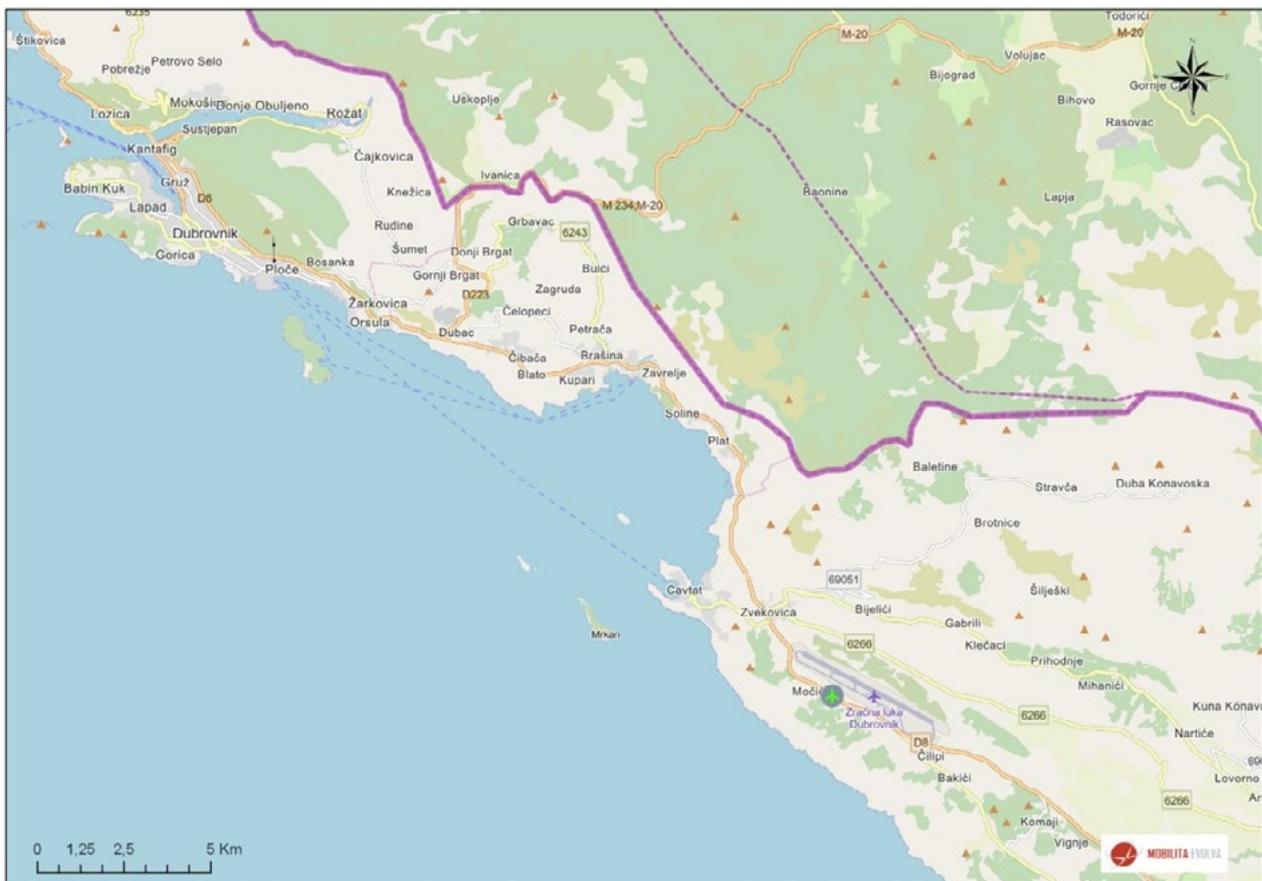


Figure 16. Dubrovnik Airport road access



Dubrovnik Airport is connected to the town of Dubrovnik and the region by public bus. International, long-distance and local bus transport is linked to the Adriatic motorway (D-8), with all bus stops located on the road.

Four bus lines are currently operating on D8. Linkage of the airport with surrounding areas is not a big issue in the off-season, but during the summer season, volumes of cars tend to get 10-12 times higher than off-season. Seasonality is definitely one of the biggest challenges for Dubrovnik airport.

Another difficult challenge is geography. The coastal zone is proportionally narrow, bordered inland by steep mountain slopes. Infrastructural interventions are crucial to change people's mindsets. It does not allow an air-rail connection nor widening of a current D8 road for cycling paths.

Both passengers and employees will choose convenience over sustainability, which is resulting in the use of private car; it is very complex to convince people without a suitable alternative to change their mobility habits.

Based on the analysis of the current situation/ environment, the Airport of Dubrovnik defines the general vision and objectives that represent a statement of what this strategy intends to achieve in coming years: a clear direction of movement and action in the given time period and its realisation will contribute to the achievement of the set vision.

- Vision 1: sustainable transportation to the Airport Dubrovnik - cycling and walking;
- Vision 2: improving ITS technologies to develop sustainable public transport.

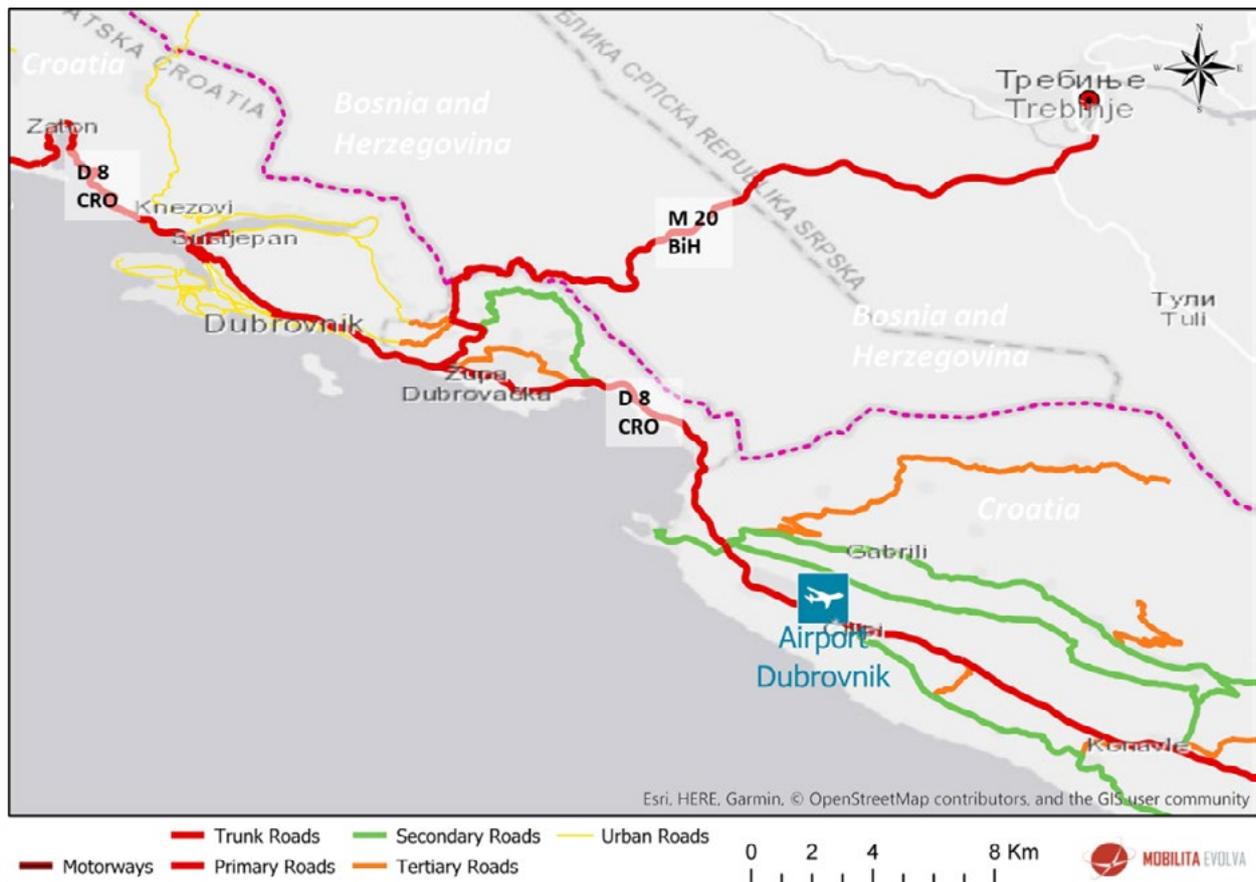


Figure 17. Dubrovnik airport geolocation

**Main objectives stated in the individual strategy for Dubrovnik airport are:**

- Reduction in the proportion of employees travelling alone by car to and from Dubrovnik airport;
- Increase in the use of shared mobility and soft mobility modes;
- Improving the efficiency and sustainability of the transport sector.

Dubrovnik airport stresses the importance of infrastructure for soft mobility and a switch to shared mobility. Residential roads in the vicinity of the airport could be designed for cyclists. Those would serve employees living within the cycling distance of the airport (<10km). Since the territory is steep, EV bikes would be very convenient for this area.

Almost 50% of departing passengers arrive by private car could easily be replaced with public transport and shuttle bus. Integration of the route planning application is one of the actions, according to the individual strategy, is needed for Dubrovnik Airport to reach its objectives. Electric mobility, with improvements in electric mobility infrastructure, is one of the actions that Dubrovnik Airport wants to develop, with shared public and individual mobility.

# Transnational Potential and Challenges of LAirA Partner Airports

Transnational cooperation will improve coordination among existing services, provided by different modes of transport, creating intermodal systems of existing transport facilities, overcoming discontinuity across borders and the lack of infrastructure. Coordinated strategies, concepts and management tools will contribute to improving the multimodality of environmentally friendly transport. This will enhance the efficiency, reliability and quality of greener transport modes and services.

## Transnational Potential

Higher use of public transport is one of the common potentials for every LAirA airport. Extending the service lines and frequency of public transport is crucial, as well as modernization and timetable harmonization.

Building the railway infrastructure that runs directly to the airport from the city centre is a major concern for: Milano Linate, Poznan Lawice, Warsaw/Modlin and Budapest airports. This calls for in-depth cooperation between different political and administrative levels to achieve common objectives of liveability regarding infrastructure but also awareness-raising among users.

A switch to electric mobility is a potential for every LAirA airport to reduce CO<sub>2</sub>: cars, taxis, bikes.

Landside infrastructure should be developed in order to accomplish this - charging stations for e-vehicles, with garages with charging spots as at Stuttgart airport. Electric vehicle car-sharing is also a huge potential for every partner airport -

Such a coordinated approach will pave the way for designing future infrastructure in a sustainable manner and more effective transportation of passengers and airport employees to and across central European regions.

After analysing individual partners strategies, common potentials and problems can be distinguished.

either having car-sharing system at the moment or if planning to introduce it in the future.

All the LAirA partners have highlighted one particular potential: soft mobility. Every LAirA airport has an issue with employees living 1-15km away from the airport commuting alone by car. That makes them target a group for soft mobility modes.

Generally, soft mobility and its promotion in urban policies has been linked to the problem of emissions generated by vehicular traffic.

The increase of soft mobility would definitely reduce private car traffic with one passenger, particularly regarding short trips. Ride-sharing is a way to reduce private car trips with only one person per car, too, especially for the employees.

The emerging attention to environmental concerns has been leading many cities towards the development of specific infrastructures and services dedicated to soft mobility. This should be adopted by LAirA partners as well.

## Transnational Challenges

Most of the LAirA partners have serious land use and traffic congestion problems on all levels, which are increasing. Air pollution and noise problems are serious issues that need to be tackled.

When talking about sustainable access to the airport, the main objective is to reduce carbon pollution produced by private cars. That leads to one challenge that airports and local governments cannot easily accept because of high revenues from parking. Parking is the number one source of non-aeronautical income and accounts for up to a quarter of total operating revenue. As fewer and fewer people will pay to park or rent a car at the airport, airport authorities need to rethink how they monetise ground access.

One of the challenges of switching to public transport is the congestion of public transport vehicles stressed by Stuttgart, Vienna and Warsaw. Public transport timetables often are not suited for employees that work in shifts which is a big issue when convincing employees to switch to sustainable transport.

A big challenge when changing the employees' way of ground access is also their behaviour which is very hard to adapt. Every airport has underlined this problem.

Low quality of pedestrian and cycling infrastructure is a big challenge for almost every partner airport and demands huge investments.

In the swing of all the awareness-raising protests and articles about environmental pollution in 2019, we must take into consideration pollution from the batteries from E-vehicles: unethical and fossil-fuel intensive methods when produced and pollution from the end of life batteries (recycling or landfill disposal).

**Finding effective solutions to the climate crisis is an absolute imperative and before urging people to use electric vehicles, a sustainable strategy and plan in every country must be created in order to make electric vehicles truly sustainable.**

# Transnational Objectives of LAirA Partner Airports

When talking about green mobility, common grounds can be detected.

The question is: how to transfer the knowledge gathered by the LAirA partners beyond the project consortium?

Within the transnational context, the development of coordinated concepts for smart regional mobility and services is foreseen, fostering improved service standards and interoperability. Particular attention is put on mobility services in the public interest.

## The European Commission has proposed a new cohesion policy 2021-2027

**Objective 1** - Improving and investing in the public transport sector - making it attractive and accessible.

**Objective 2** - Investing in the infrastructure for electric mobility and vehicle sharing systems.

**Objective 3** - Soft mobility as a way of accessing and leaving the airport.

**Objective 4** - Preservation of the environment.

**Regional development investments will strongly focus on objectives 1 and 2:** smarter Europe and greener, carbon-free Europe. 65% to 85% of European Regional Development Fund (ERDF) and Cohesion Fund resources will be allocated to these priorities, depending on Member States' relative wealth. This means that local authorities from LAirA partners and entrepreneurs willing to invest in the airports' transport system will have a strong co-financial support.

The established time perspective for the measurements of the strategy is divided into established, short term (until 2025), medium-term (until 2030) and long term (until 2050) partly because the pursuit of sustainable development thus requires, and partly because the attainment of the objectives set needs persistent efforts.

## Common principles for every partner are:

1. Green airports: protection of the natural environment while enhancing the transport system;
2. Maintaining and establishing a smart, safe and attractive transport system.

## Short-Term Actions: First Steps to Reach the Objectives

After the main objectives of the transnational strategy have been determined, the first easy to implement steps, are presented.

Five short term actions (1-2 years after finalisation of the project) are proposed below for the whole project region. These resulted from common potentials and challenges across the region in terms of green mobility.

### 1. Application with real-time data with information on different modes of transport, their schedules and itineraries for passengers

Enhanced passenger digital experience with reference to real-time information is the main feature of Milan Airports travel planning application. The application was introduced to LAirA partners at the meeting in Dubrovnik, April 2019. It is part of the pilot project for improving Milan Airports digital channels for land access.

**Investment:** short term investment from airports and private investors.

#### Objectives:

- Objective 1 - improving and investing in the public transport sector - making it attractive and accessible.
- Objective 4 - preservation of the environment.



Figure 18. Real-time data application

## 2. Pre-trip and on-trip information for arriving passengers on low carbon ways of leaving the airport

This action will help to reach Objective 2. It is an easy action that any partner can introduce with cooperation between airline operators and public transport operators on the ground, taxi companies and local authorities.

Information could also be uploaded on the airline operator’s website, too.

**Investment:** short term investment from airports, flight operators and private investors.

**Objectives:**

Objective 1 - improving and investing in the public transport sector - making it attractive and accessible.

Objective 4 - preservation of the environment.



*Figure 19. On-trip information on public transport at the destination airport*

### 3. Awareness-raising on low carbon emission mobility among employees

Awareness-raising on low carbon emission mobility among employees would be an easy step for every airport in the Central Europe region and beyond. A set of guidelines should be presented to employees to raise awareness of the importance of environmental preservation.

Positive contributions to public health, the environment and local identity (with public bicycles as part of the urban landscape) are additional benefits of the awareness-raising strategy.

Changing peoples' minds through marketing and campaigns is a crucial step. Educational programmes help to communicate the benefits of cycling and to create respect between the transport modes to improve road safety.

**Investment:** short term investment airports and local authorities.

#### **Objectives:**

Objective 3 - soft mobility as a way of accessing and leaving the airport.

Objective 4 - preservation of the environment.

#### 4. Shared mobility hubs in the main city of the airport for passengers and surrounding cities for employees and at the airport: car-sharing and bike-sharing if possible

**Bike-sharing systems** provide access to bicycles for short trips at a low-cost and eliminate the barriers to owning and maintaining or travelling on a personal bike. A person rents a bike at the airport and rides with it to his/her destination. An acceptable distance to bike is 10km and the optimal distance is 5km. Bike share is designed to provide a cost-effective, environmentally friendly and convenient travel option for many short trips.

Bike-sharing would be an excellent way for employees living in the area 10km from the airport to access the airport.

Appropriate auxiliary infrastructure at the workplace is crucial for the promotion of bike sharing among employees.

**Investment:** short term investment that all partners can introduce to their airports if they already have a satisfying cycling infrastructure.

##### Objectives:

Objective 2 - investing in the infrastructure for electric mobility and vehicle sharing systems.

Objective 4 - preservation of the environment.

**Car-sharing** would allow passengers to reach the city centre or the airport in an easy, non-stressful way. A person picks up a car at the city centre hub and drops it off at the airport hub.

Car-sharing differs from the traditional car rental model by offering more locations to pick up vehicles and eliminating the hassle of having to go into a branch office to pick up and drop off a vehicle. It is basically an on-demand service on short time basis.

**Investment:** short term investment from private operators, airports can lease the right for having a hub at the airport to operators (alternative source of revenues).

Electric vehicles are very convenient for these short types of drives (city centre - airport).

##### Objectives:

Objective 2 - investing in the infrastructure for electric mobility and vehicle sharing systems.



Figure 20. Bike-sharing system in Oslo



Figure 21. Electric car-sharing system

## 5. Measuring and monitoring of the air quality at permanent measuring stations

Reports on measuring and monitoring the air quality after the LAirA project could register the improvements in the air quality.

**Investment:** short term investment that all partners and interested airports can introduce to their FUAs.

**Objectives:**

Objective 4 - preservation of the environment.

# Medium and Long-Term Interventions and Investments

This is a list of medium and long-term interventions that should be a legacy of LAirA project. These interventions are the grounds for developing green airports in terms of surface access.

## 1. Enhancing public transport

**New public transport lines**, connecting surrounding areas for employees and more harmonized system to the city centre.

Timeline: long term, until 2040.

**Investment:** long term investment that all partners and other interested airports and stakeholders should introduce to their airports, which will help reduce capacity and bottleneck issues. New and fast direct connections to airports.

**Direct air - rail links** for the airports that do not have it yet and have suitable relief for it and/or planned space for it in advance from the urban plans.

**Objectives:**

Objective 1 - improving and investing in the public transport sector - making it attractive and accessible.

## 2. Strategy for battery management (reusing and recycling)

This is a key step if we want the electric mobility to be sustainable.

Timeline: long term, until 2040.

**Investment:** cradle to grave scenario for lithium ion batteries is not acceptable. A sustainable plan of reusing and recycling must be implemented before any bigger changes in ratio between electric and petrol/diesel vehicles occurs.

**Objectives:**

Objective 4 - preservation of the environment.

### 3. Investments in electric mobility infrastructure

Appropriate charging infrastructure is a key enabler for the switch to electric mobility.

Timeline: medium term, until 2030.

**Investment:** medium term investment that all partners can introduce to their airports.

#### Objectives:

Objective 2 - investing in the infrastructure for electric mobility and vehicle sharing systems.

### 4. Investments in soft mobility infrastructure

**Appropriate cycling infrastructure** is a key enabler for the switch to soft mobility.

Timeline: long term, until 2040.

**Investment:** long term investment that all partners and their local authorities should introduce to their airports, at least for the surrounding areas for employees.

**Development and modernization of cycling routes** will attract people to use them.

Due to the lack of facilities for cyclists at airport offices (e.g. secure storage, showers), commuting by bike is not attractive to employees. Auxiliary infrastructure is crucial in order to attract employees to cycle to work, at least in warmer seasons.

Auxiliary infrastructure: bike parking, lockers, showers, changing rooms at the workplace will definitely enhance the probability of switching to soft mobility.

#### Objectives:

Objective 3 - soft mobility as a way of accessing and leaving the airport.

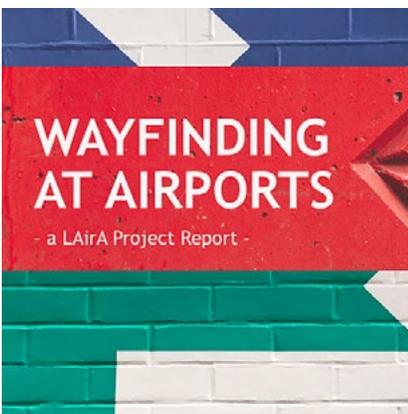
## LAirA Project Action Plans



Air-Rail Link - LAirA project report (2018)



Landside Accessibility to Airports: International best practice report (2019)



Wayfinding at Airports - LAirA project report (2019)



Multimodal and Sustainable Low Carbon Mobility Integration of Airports and their Catchment Areas (2019)



Electric Mobility Action Plan (2020)

All LAirA publications can be found on the official project website:

<https://www.interreg-central.eu/Content.Node/LAirA.html>

# Project Partners

## Project partners

Municipality of 18th District of Budapest, Lead Partner, Hungary

SEA Milan Airports, Italy

Stuttgart Region Economic Development Corporation, Germany

City of Dubrovnik Development Agency, Croatia

Austriatech LTD - Federal Agency for Technological Measures, Austria

Budapest Airport LTD, Hungary

Regional Government of the Mazowieckie Voivodeship, Poland

Dubrovnik Airport LTD, Croatia

Airport Regions Council, Communication Partner, Belgium

City of Poznan, Poland

## Associated partners

Stuttgart Region, Germany

Flughafen Wien AG, Austria

BKK Centre For Budapest Transport, Hungary

Warsaw/Modlin Airport, Poland

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## Sources

Figure 18 - <https://i.pinimg.com/originals/f0/c0/d3/f0c0d36953aece29444edd2570bf97d3.jpg>

Figure 19 - <https://i.ytimg.com/vi/YcWjtq33EN4/maxresdefault.jpg>

Figure 20 - <https://media.newmindmedia.com/TellUs/image/?file=B7971F40A7506E376504F9A87C43DB5C4D41F2B8.jpg&dh=533&dw=800>

Figure 21 - <https://www.euractiv.com/wp-content/uploads/sites/2/2017/06/Autolib-800x450.jpg>









# Landside Airport Accessibility

<https://www.interreg-central.eu/Content.Node/LAirA.html>

