



# Air-Rail Link

- a LAirA Project Report

LAirA 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.

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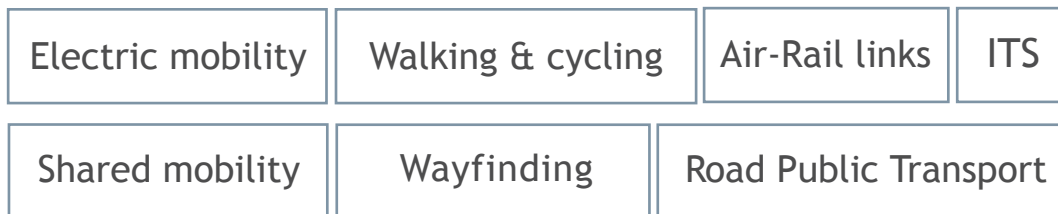
## Project objectives



LAirA addresses the specific and significant challenge of the multimodal, smart and low carbon mobility integration of airports in the mobility systems of Functional Urban Areas (FUAs) of Central Europe (CE). Airports are key assets of CE FUAs and important transnational transport gateways for CE citizens. The magnitude and growing trend of air traffic (on average 10% per year in the EU) requires actions for the improved and sustainable landside accessibility of FUAs to airports.

LAirA's ambition is to reduce the energy use and the negative environmental impacts of transport activities in central-European urban centres and their hinterlands by provoking a change of mobility behaviours of passengers and employees of airports. By building novel strategies that are available for public entities, low carbon mobility planning should be improved. The 56 million passengers and 39,000 employees of the airport systems in the FUAs of Vienna, Budapest, Warsaw, Bologna, Stuttgart, Dubrovnik and Poznan are addressed by the LAirA developments. LAirA shall develop the capacities of public entities - local and regional authorities and airports - that jointly plan and implement low carbon mobility solutions.

A transnational and innovative comprehensive approach is used integrating seven key thematic areas:



LAirA defines in a transnational policy learning dialogue the action plans for low carbon mobility of airport passengers and employees, taking into consideration multiple types of interventions (the seven LAirA thematic areas) not only related to public transport (competence of authorities) but also to further integrate other low carbon mobility solutions (e.g. e-mobility, car sharing).

Strategies for low carbon integration of airports in FUAs are defined in a governance process involving airports, authorities, agencies, transport providers, associations & nodes. WPT2 focuses on action planning low carbon mobility services & changing behaviour for low carbon airports accessibility in FUAs. The expected output is a transnational Action Plan for Multimodal, Smart and Low-carbon Accessibility in Airport FUAs.

## Thematic Focus: Air-Rail Links

## Definition

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Within the LAirA project, the topic of Air-Rail Links covers the city, intercity and international rail connections to the airport. Rail connections can be light rail/tram, metro/subway, commuter/regional rail, dedicated airport express service or high-speed rail connection. The topic does not cover the inter-terminal rail shuttle projects.

In the age of Mobility as a Service (MaaS)<sup>1</sup> airports need to be connected to cities and regions by different transport modes (car sharing, taxi, bus, rail, cycle and other mobility services) to successfully compete and grow business. In 2017, global air traffic passenger demand increased by 8.1 percent on the year before, 2018 traffic is projected to grow another seven percent. With more people travelling to and from airports, road access becomes more congested and car parking space more scarce and expensive. Worrying about road congestion and finding car parking space significantly increases passenger stress level. Airports Council International (ACI) Best Practice Ground Transport report found that passengers that use public transportation tend to be more satisfied than those that use private transportation to access airports. This is true for both business and leisure travellers. Rail and subway get the highest score, whereas car and taxi get the lowest scores on average.

The Advisory Council for Aviation Research and Innovation in Europe (ACARE) has formulated ambitious goals for aviation research in their Flightpath 2050 (European Commission 2011),

one of those ambitions is that 90% of travellers within Europe are able to complete their journey, door-to-door within 4 hrs. Given that the flight time cannot be significantly reduced yet, to achieve this goal most of the attention needs to be given to reduce travel time to/from airports and processing times at airports.

Building rail access to airport can have significant economic and environmental benefits to the airport, the city and region. American Public Transportation Association (APTA) found that hotels in cities with direct rail access from downtown to airport terminals receive nearly 11% more revenue per room than hotels in cities without a rail airport connection (A New Partnership: Rail Transit and Convention Growth).

Improving rail connections can also help with the environmental challenges as a significant proportion of the CO2 emissions at airports are generated by passenger and staff journeys to and from the airport. For example, in 2017 Avinor reported that 23% of total CO2 emissions at Oslo Airport came from surface access.

This thematic report focuses on action plans from project partners to introduce Air-Rail Links as part of the wider LAirA initiative.

## Trends across Europe

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The European Union counts over 400 airports with scheduled flights. Out of about 250 airports serving over 1 million passengers annually in Europe, 68 of them are directly connected by rail.

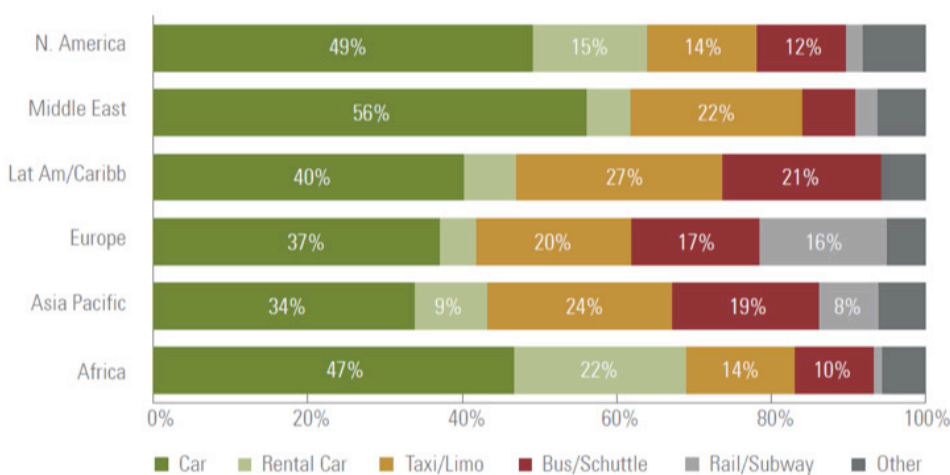
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1. Mobility as a Service, or MaaS is a subscription-based transportation service integrating different forms of mobility services (public transport, car rental, car sharing, taxi, biking, autonomous, flights and other) into a single mobility service accessible on demand and paid for monthly/annually.

According to the Airport Service Quality - Best Practice Report by ACI, European airports have the highest percentage (16% on average) of passengers choosing rail to travel to get to the airport, followed by Asia Pacific region (8% on average). That might be influenced by the fact that getting to the airport by taxi is the most expensive in Europe (EUR 45 on average) and cheapest in Africa/Middle East where it costs EUR 20 on average.

Satisfaction with ground transportation is influenced by several factors such as cost, duration and comfort. According to the Best Practice Report, the mode of transport used plays a significant role in passenger satisfaction. Passengers that use public transportation tend to be more satisfied than those that use private transportation. Rail and subway get the highest score whereas car and taxi get the lowest scores on average. It should be noted that passenger satisfaction

### Modal split by region



ASQ Best Practice Report Ground Transportation Modal Split by Region

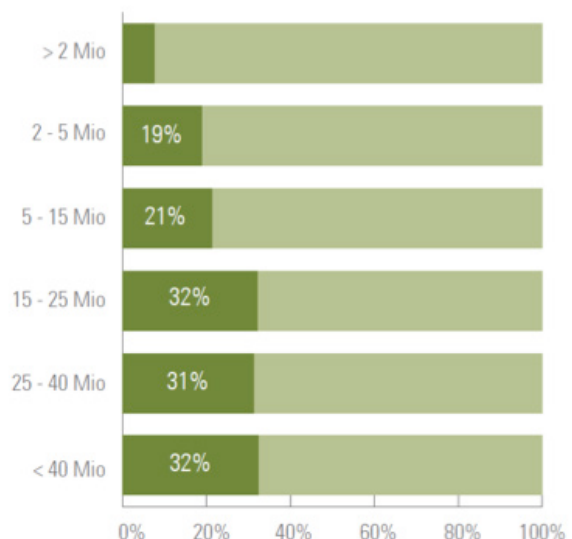
The report also found that there appears to be no correlation between the distance between the airport and the city centre and passenger satisfaction with ground transportation. This is fortunate for airports that are far from downtown as it seems they can still satisfy their passengers by providing an appropriate ground transportation offering. On the other hand, there is a relation between the size of an airport and the score it achieves for ground transportation. Bigger airports tend to offer a wider mix of transportation, which has a positive impact on satisfaction levels.

with a specific mode of transport will also depend on the degree of development of this mode of transport in a region.

Considering the mode share of rail for airport travel, Copenhagen airport is among the leaders in the world as 26% of passengers use the local metro and 34% use the regional

ASQ Best Practice Report Ground Transportation public transport usage at airports

### More passengers use public transport at bigger airports

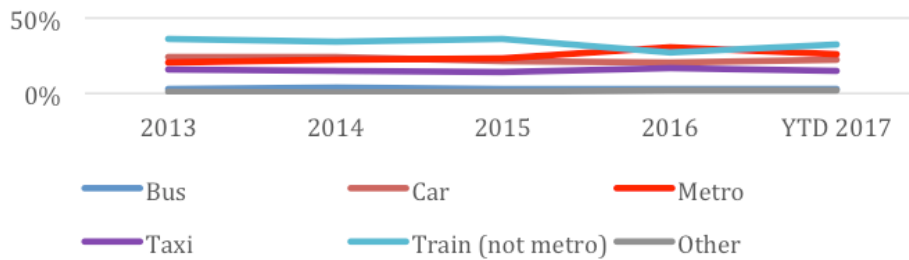




train service to travel to and from the airport. That is a total of 60% of airport passengers using a rail service.

Modal Split at Copenhagen Airport

### Means of transport to CPH (LDPs)



NOTE: The dip in train journeys in 2015 was due to the migrant crisis, many of the Sweden-to-Denmark trains were not stopping at the airport. Passengers lost trust in the commuter rail service and chose to travel by metro instead.

for domestic passengers, location and surface access appear to be the most common reason for their airport choice.

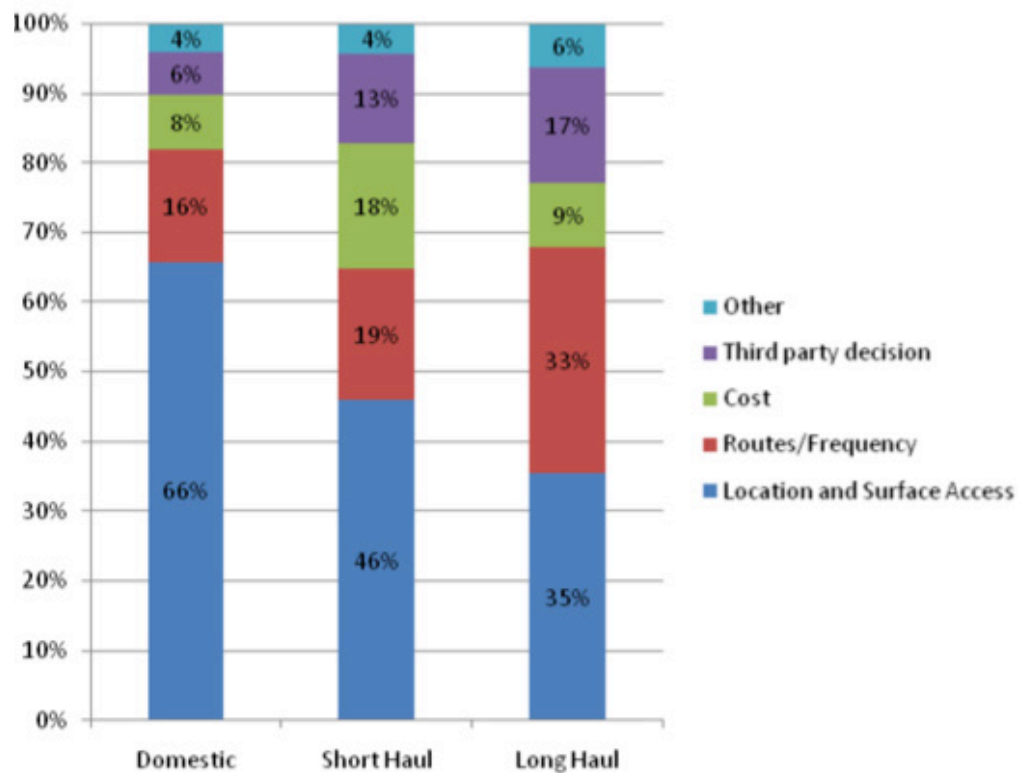
This probably reflects the importance of surface access travel as a proportion of their overall travel time, which

could mean that domestic passengers would choose the nearest or most easily accessible airport to reduce their surface travel time as much as possible.

Location and surface access reasons (46%) are also important to international short-haul passengers, again possibly due to the impact of surface travel time on their overall travel time.

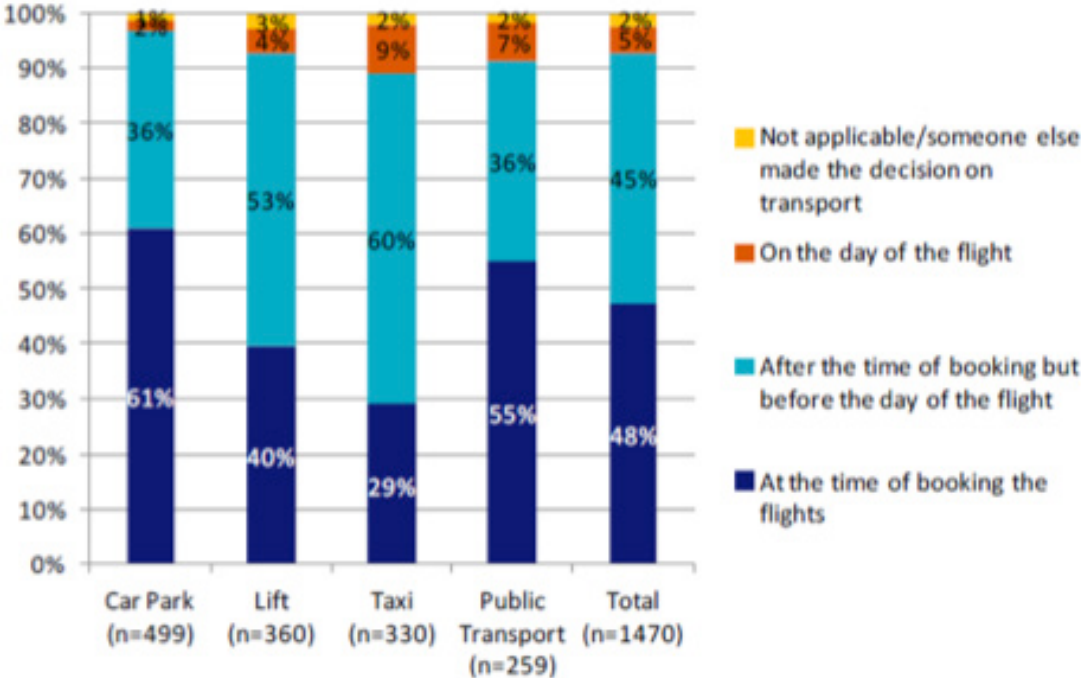
Travel behaviour is different between different demographic groups. Young people chose public transport for their daily travel. Passengers aged between 15 and 29 years made up 32.7% of all travellers at Copenhagen Airport in 2017 and 71.8% of these young passengers accessed the airport by train or metro.

UK CAA Passenger Survey 2011 data shows that ease of surface access is most often why passengers chose their departure airports. The survey also found that



Reason for airport choice according to flight duration at the four major London Airports. CAA Passenger Survey data

Consultation on Issues Affecting Passengers' Access to UK Airports: A Review of Surface Access report also found that most passengers made the decision on transport either at the time of booking (48%), or sometime after the booking but before departure (45%). Very few waited until the day of the flight (5%). The proportions varied by transport mode.



# Relevance of topic for airports

## Policy background

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On 28 March 2011, the European Commission adopted the White Paper entitled “Roadmap to a Single European Transport Area – Towards a competitive and resource efficient transport system” (the “White Paper”). The White Paper aims at reducing the greenhouse gas emissions (GHG) of the transport sector by at least 60% by 2050 compared to 1990. As far as infrastructure is concerned, the White Paper aims at establishing a fully functional and Union-wide multimodal TEN-T core network by 2030. Interoperability could be enhanced by innovative solutions that improve compatibility between the systems involved. The White Paper also aims at optimising the performance of multimodal logistic chains, including by making greater use of more energy-efficient modes. Therefore, it sets the following relevant target for TEN-T policy: by 2050, all core network airports should be connected to the rail network. That means that 37 key airports in Europe will have rail connections into major cities.

National policies on improving access to and from airports and, specifically, pushing for greater take-up of public transport use, differ from country to country. Below are some of the examples of national aviation policy excerpts relating to improving public transport access to national and regional airports.

## United Kingdom

UK Government’s Aviation Policy Framework (2013) states that all airports in England with scheduled services should establish Airport Transport Forums and prepare Airport Surface Access Strategies to feed into Local Transport Plans. The surface access proposals should demonstrate how the airport will ensure easy and reliable access for passengers, increase the use of public transport by passengers to access the airport, and minimise congestion and other local impacts. The general position for existing airports is that developers should pay the costs of upgrading or enhancing road, rail or other transport networks or services where there is a need to cope with additional passengers travelling to and from expanded or growing airports. Where the scheme has a wider range of beneficiaries, the Government will consider, along with other relevant stakeholders, the need for additional public funding on a case-by-case basis.

## France

France’s transport policy aims to reduce greenhouse gas emissions by 20% by 2020 along with the sector’s dependence on hydrocarbons. The Directorate General of Infrastructures, Transport and the Sea (DGITM) promotes modal transfer policy, placing the sustainable development priority at the heart of each decision-making stage. The DGITM was created in 2008 to prepare and

implement the terrestrial and maritime multimodal policy respecting sustainable development principles. It plays a cross-sector role, taking responsibility for all issues relating to terrestrial and maritime transport, but also the planning of airports. The Grenelle 1 Law prioritises public transport and limits the development of road and airport projects (article 11, Grenelle 1). “The development of the use of public passenger transport is a priority. To this end, for inter-urban and peri-urban travel, in terms of infrastructure, priority will be given to rail investments over the development of road or airport projects.”

### Sweden

In 2017 the Swedish Government has adopted a National Aviation Strategy - for Aviation’s Role in the Transport System of Tomorrow. The plan focuses on seven areas: accessibility in Sweden and internationally; strengthening Arlanda Airport as a hub and major airport; reducing the environmental climate impact of aviation; a high level of aviation safety with goal-based regulations; fair conditions and healthy competition; a nation with strong research and an innovative aviation industry; and increased exports of Swedish goods and services. Part of the strategy was the development of the Arlanda Airport Council, whose role is to contribute to the Government’s long-term efforts to develop Arlanda Airport from a multimodal perspective.

### Denmark

Denmark released the new Aviation

Strategy in 2017, focusing on the various elements and presents several initiatives and each of them can help to create the basis for continued improvement in connectivity to, from and within Denmark. One of the focus areas in the strategy is the expansion of the infrastructure to airports - “an airport’s passenger catchment area is an expression of how many potential passengers live within a reasonable distance from the airport. The passenger catchment area for Danish airports can thus be increased by improving the surrounding road and railway connections.”

### Ireland

The National Aviation Policy Action Plan, adopted in 2015, states that “air transport requires a specific level of airport infrastructure, both in terms of quantity and quality, to facilitate the optimum level of air services for Ireland. This includes terminal and runway capacity as well as surface access to airports and is particularly relevant to the development of Dublin Airport as a secondary hub.” One of the action items in the plan is that “access to the airports will be taken into account during the development of surface transport programmes, in line with the Department’s Strategic Framework for Investment in Land Transport which proposed the prioritisation of improved connections to key seaports and airports.”

### Switzerland

The Report on the Aviation Policy of Switzerland 2016 states that within the scope of its planning expertise, the Federal

Council ensures the implementation of the coordinated traffic and spatial development of airports. “Different modes of transport should be linked in such a way that reliable, comfortable and efficient transfer connections are ensured. National airports should be connected to high performance roads and integrated into the regional public transport network, national railway networks and, if possible, European high-speed rail network. Regional airports should also, as far as it is economically possible, be accessible by good public transport links.”

## Best practices in/around airports

Success of the airport rail links depend on many factors and local circumstances but there are some key elements that need to be considered when planning for a new air-rail service. According to the Global AirRail Alliance, an international membership organisation promoting rail access to airports, a best practice airport rail connection, should consider the following:

- Location
- Frequency and journey time
- Price
- Ticket integration
- In-town check-in

- Location

Positioning the railway station at the airport is one of the first and key elements to consider when planning a successful airport rail link. Passengers arriving at an unfamiliar airport might feel disoriented and stressed. In most

cases the easiest option for them is to take out their phone and call a friend, ride sharing service or hail a taxi from outside the arrivals door.

Southampton Airport’s railway station is located just few steps away from the terminal. Passengers do not need to guess how to find the railway station as the wayfinding clearly directs them reassuring along the way. 16% of Southampton Airport passengers used rail service to access the airport in 2014.

Southampton Airport



Other airports integrate the railway station within the terminal, for example, Flytoget railway station was part of the original airport design and is located directly under the arrivals hall.

- Frequency and journey time

After finding the railway station the next question always is “how long will I have to wait for the next train?”. Turn-up-and-go services will always be more attractive to passengers than trains running every half hour and communicating that message in a clear and simple way

ensures passengers will choose rail over taxi. Rhonexpress light rail service to and from Lyon Airport advertises the frequency and travel time at the baggage collection area and as soon as passengers enter the arrivals area after the customs. 12% of passengers used rail to travel to/from Lyon Airport in 2014.



Rhonexpress signage at Lyon Airport

- Price

Airport Express Rail services historically were competing with private cars and taxis, focusing on high quality service, branding and a “premium” feel of the journey. These operators were targeting the business travellers that value speed and reliability and therefore were setting their fares to compete with car parking fees and taxi tariffs and were usually more expensive than a traditional commuter rail or metro services. The arrival of ride sharing companies created a cheaper option for travelling to and from the airport by car and forced the airport express rail operators to re-evaluate their fares and look at expanding their markets to different travel groups, such as families, backpackers and young entrepreneurs that are looking for good travel deals and are prepared to book in advance of travel.

Heathrow Express offers “buy early and save up to 75%” discounted fares for advanced bookings made between three

and six months in advance. The Express Saver single fare is £25 if travelling during the peak times (06:30 - 09:30 or 16:00 - 19:00 Monday - Friday) or £22 if travelling during off-peak times. Returns are £37. The advance tickets start from £5.50 one way. Kids aged 15 years and under travel free in Express Class when accompanied by a paying adult.

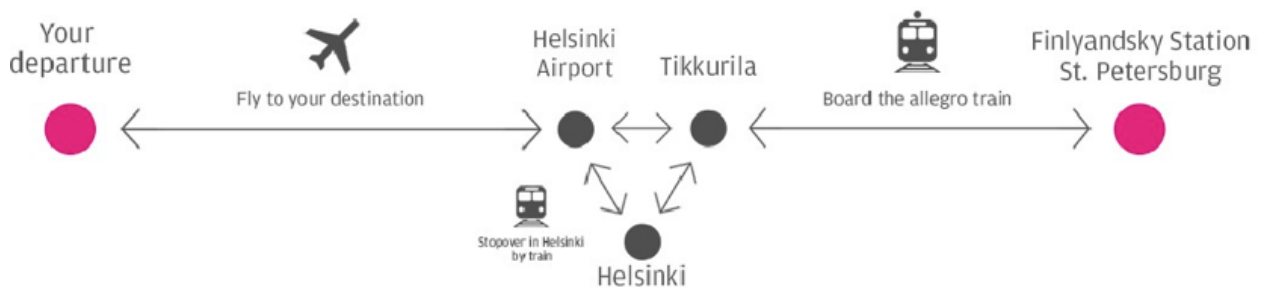
Stansted Express offers advance one-way tickets from just £7 when booking online. A standard class single ticket costs £32.40. Stansted Express and Gatwick Express offer a Web-Duo type ticket, where two people can travel on a discounted single ticket.

- Airline-railway ticketing integration

There are number of airline-ground transport partnerships around the world, encouraging passengers to book a combined airline and ground transport ticket for their travel to/from the airport.

For example, partnership between Finnair and Finnish railway company VR, enables air passengers to connect between Helsinki Airport and Saint Petersburg on a single intermodal ticket. The intermodal ticket also includes the transfer between Helsinki Airport and Helsinki Central or Tikkurila high-speed rail station, from where passengers can catch the high-speed Allegro train. The Allegro service, run by Finland’s state-owned VR Group, started at the end of 2010 and saw its biggest passenger numbers in 2013, when VR sold about half a million tickets. In 2014, Allegro served a total of about 400,000 passengers.

Although the potential market size for surface-to-air integrated ticketing is large, the demand is still low, mainly due



to commercial, technological and policy barriers. This is even the case for the most successful and widely known airline-railway partnership, Rail&Fly between Deutsche Bahn (DB) and various airlines. DB sells around 500,000 Rail&Fly tickets annually. With over 200 million air passengers per year in Germany and at an assumed average rail mode share of 25% (passengers travelling to/from airports by rail), this represents just 1% of actual air passengers accessing airports by rail that are using integrated tickets.

- In-town check-in

There are only a small number of airport rail operators that offer an in-town check-in service for passengers to drop off their luggage before the flight at the city centre railway station. Those are:

- A'REX, Seoul
- City Airport Train, Vienna
- Delhi Airport Metro Express, Delhi
- Airport Express Line, Hong Kong
- KLIA Ekspres, Kuala Lumpur
- Narita Express, Tokyo
- SBB, Switzerland

About half of the airport customers use the in-town check-in services in Hong Kong (54.3% data recorded in 2011) and Vienna (50%, data recorded in 2012).

However, there is some new-found

interest in releasing passengers off their luggage before the flight. In March 2017, PostNL introduced the PostNL Baggage Service for travellers traveling from Schiphol and Eindhoven airport. This service has two variants - luggage is picked up from home and checked-in for the traveller, or luggage is collected at home and delivered at the airport, where travellers can then check-in the suitcases at the airport themselves.

easyJet has also launched a partnership with home bag-drop service AirPortr, giving passengers travelling from London Gatwick the option to check-in their luggage online and then have it collected from their doorstep by AirPortr drivers and taken directly to the airport.

**Best Practice Example - Zurich Airport**

With around 350 rail connections and over 700 bus and 400 tram departures a day, Zurich Airport is considered to be one of the best-connected airports in Europe. With some 70,000 public transport users daily, Zurich Airport has become a key transport hub in the greater Zurich area in terms of passenger frequency.

- **Density of modes:** the airport is served by several modes-national and regional trains, buses and trams.
- **Travel time:** Zurich city centre is just ten minutes away by public transport.
- **Density of schedule:** there is a public transport departure every 37 seconds at peak hours. This allows for real flexibility and seamless travel.
- **Ticketing:** a single ticket system for all modes.
- **Luggage check-in:** SBB offers Flight Luggage service where passengers can either check-in their bags at one of the selected SBB rail stations or order their bags to be collected directly from home and back again.
- **Intermodality:** public transport facilities are no more than 5 minutes' walk from public transport to the airport.

# Limitations and Potentials

## Limitations

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Building an airport rail link is expensive and involves many stakeholders that have different agendas. Furthermore, car parking revenue makes up a significant proportion of airport's operational revenue and introducing a new rail connection to the airport might be perceived as a threat to that revenue source.

There are no studies done to determine what critical conditions need to be met at the airport (number of passengers served annually, road congestion, car parking capacity, distance from the city, different modes available and other factors) to make introducing a new railway service a valid option. It has been discussed in the industry that an airport express rail service (a non-stop, dedicated airport rail link between the airport and the city centre) can be considered for airports that serve more than 10 million passengers annually. But the viability of an airport rail link service still needs to be determined on a case by case basis.

## Potential

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Demand for air travel is growing and it is important that airports ensure their infrastructure is ready to efficiently serve the passengers. Improving ground transport access allows airports to welcome more passengers from wider catchment areas and more passengers means more flights. An efficient and fast public transport network to and from the airport opens commercial and real-estate opportunities around the airport region.

Introduction of the Ring Rail Line to Helsinki Airport allowed the development of Aviapolis, offering housing to 20,000 residents and over 40,000 new jobs.

When Canada Line started operating between Vancouver Airport and the city centre in 2009, it spurred an intense development along the route. Translink (the operator of the line) originally projected the break-even ridership to occur by 2014 at 100,000 passengers per day. However, by late 2010 the line had reached this projected ridership, three years early. In addition to greater than expected ridership, the Canada Line has driven increased densification around the route stations. In 2011 the Vancouver City Council approved density changes that add as many as 14,000 people along the corridor in the next 30 years.



## Project Partner Insights

### Budapest Airport

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Seamless transportation and transferability of passengers is key when designing air-rail links. Train terminals directly and closely connected to the Airport Terminals is a great benefit. For example, at Stuttgart Airport the train terminal is located directly under the Airport Terminal and the trains are accessible by escalators and elevators placed between the underground train station and the terminal.

The consideration for Budapest is to decide if a new train line between the airport and the city centre or an extension from the existing train lines connecting the airport terminals and the national rail networks needs to be built. In the first case the airport needs to have enough passenger traffic to sustain a dedicated airport rail line or a regular financial support from the state to sustain such line. An extension from national rail network has the benefit of integration with other rail lines which would enhance the general accessibility of the airport FUA. This also seems more financially feasible.

In any case the road, pedestrian and train crossings should be designed to be on different ground levels, so the train line is separated from the other traffic. This reduces travel time for both the train and road journeys.

In the ideal case, Airports are already cooperating with their neighbours, including local municipalities, aviation authorities, transportation authorities,

mobility planners, NGOs, and other business partners to form a common strategy and development roadmap for enhancing mobility and transportation developments. Airport rail connection would be one of the possible airport related transportation solutions and, arguably, the most significant mobility development in terms of passenger capacity, cost and needed territory for the investment (train lines, stations, construction areas). The key role of an airport could be to find and establish the common interest group of the local and national stakeholders to try to facilitate a complex development inside and outside the airport land.

Air-rail link development in Budapest Airport FUA is a national importance project. This brings both, challenges and opportunities, as such projects can have significant investment costs and the public perception might be that it will only benefit an isolated area. Therefore, it is important to involve all stakeholders early in the project development stage to agree the benefits to the wider reach of potential users by creating connections to new areas and enhancing the accessibility of the airport. Various environmental and aviation safety issues should also be evaluated before planning and the appropriate solutions should be incorporated into the basic design plans.

# Key objectives from airport's perspective for future developments

## Short Term

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### Stakeholder engagement

Gaining public and political support for the project is a key step for an airport rail link project success. An airport rail link project Gautrain to connect Johannesburg O.R.Tambo Airport with the city centre and the wider region (started operations in 2010) credits its success to a comprehensive stakeholder engagement and communication strategy. Before the strategy implementation the coverage about the Gautrain's project in the media was only 5% positive and 57% negative (February 2006). In August 2007 the balance shifted with 43% positive news stories and only 16% negative coverage. The Media relations focused on a strong drive to educate the public about Gautrain and continuously communicate socio-economic success stories.

### Planning for multimodality

Design future airport rail link projects that seamlessly integrate with other transport modes (infrastructure and digital).

### Planning for construction

Ensuring that the construction of the airport rail link does not affect airport operations or other transport modes at the airport.

## Long Term

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### Service Quality

Sustaining and growing the quality of service.

### Wider connectivity

Planning for extensions of the train network and connections to the wider region.

## Actions

### **Budapest: Air-rail link between Budapest Airport and East/West Hungary Action**

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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.

In addition to the redevelopment of the railway track, the plans include the development of a two-platform railway station near the Terminal 2, and the redevelopment of the train station at Kőbánya-Kispest.

Feasibility studies and design plans have already been created, evaluating several rail route options and the train station concepts at Budapest (starting point of the connection), at the Airport Terminal and at the town of Monor (end station of connection and connection point towards the national train network).

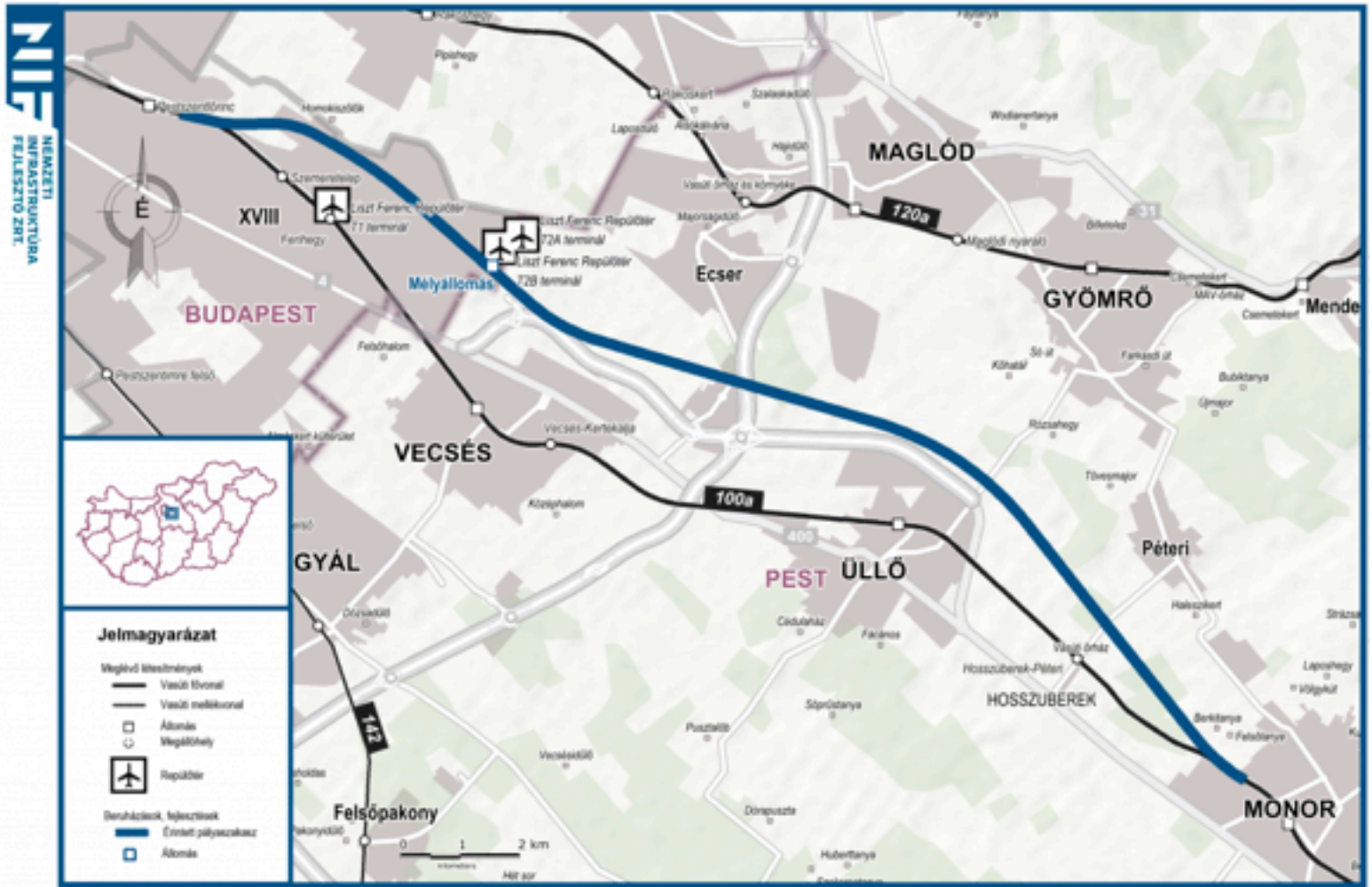
The first step is to carry out the authorization and legislative tasks related to the development, then the tender documentation and the public procurement tender itself, as well as a possible grant application based on transport development concepts.

One of the considerations for the Budapest Airport rail link development is the route positioning in the city and the airport. The train could approach the airport terminal between the two runways, but this solution would have to be either in a tunnel or levelled to the ground in a trench, as there are number of aviation safety issues that need to be considered.

The next step is to carry out an environmental impact study and incorporate the appropriate solutions into the basic design plans.

Stakeholder engagement and public awareness is also a significant issue to consider. The new railway line could offer an alternative transport option to access the airport, reducing road congestion and emissions from vehicles.

The proposed path of the new air-rail connection at Budapest Airport, connecting the airport to the national railway network



One of the alternative design plans for the location of the Train terminal near the Airport terminal. (Railway line is red).

## Overview on measures

Action	Actors involved (Target groups and agents of change and their role)	Barriers	Timeline	Proposed changes/improvements in general addressing airports and their FUA
Air-Rail link between Budapest Airport and East/West Hungary	<p>Municipality of 18th District of Budapest</p> <p>Budapest Airport Ltd</p> <p>Nemzeti Infrastruktúra Fejlesztő Zrt.</p> <p>Budapesti Közlekedési Központ</p> <p>MÁV (Magyar Államvasutak) - Hungarian National Train Company</p> <p>Major's Office Budapest</p> <p>Transportation planning departments of Ministries</p> <p>Mobility groups</p>	<p>Time of construction</p> <p>Location of the station</p> <p>Collecting financial support</p> <p>Administrative and political support</p> <p>Public support</p> <p>Preferred Route</p> <p>Differences in local development and land use plans of the neighboring municipalities</p> <p>Availability of the areas for new tracks, related ownership procedures</p>	<p>Planned timeline only, no governmental decision has been made yet about the development.</p> <p>Feasibility Study - end of 2018</p> <p>Project implementation - 2022-2023</p>	<p>Construction of a 22 km rail link from Kőbánya-Kispest metro station to Vecsés-Monor via the airport's Terminal 2</p> <p>Building a two-platform railway station at Terminal 2 near the passenger terminal</p> <p>Redevelopment of the train station at Kőbánya-Kispest.</p> <p>Separate level crossings</p> <p>Include the existing and airport related train line (100) to the developments</p> <p>Reduced road traffic and emissions</p> <p>Public awareness</p>

## Sustainability Potential and Impact

Dynamic annual increase of passengers should be the basis of air-rail link developments - Budapest Airport passenger numbers are growing above the 10% rate during the last 5 years. Passenger growth was 11.1% in 2016, 14,1% in 2017, and 17% in Q1 2018. Besides the existing mobility options, the new train connection would create the possibilities of serving the increasing passenger and cargo volumes and would attract more passengers from outside the Airport FUA increasing the airport's catchment area.

The new train connection would increase accessibility from East and West Hungary and its closest catchment area from Line 100, Budapest Nyugati and Kelenföld train stations. This would greatly enhance work related commuting by train.

Budapest Airport is a Carbon Neutral Airport (ACI Europe 04 2018) and it welcomes the train connection as one of the least polluting and safe passenger transportation methods. Most of BUD Airport passengers arrive to the airport by car. The train connection could shift the mode share, reducing emissions from road traffic.

In some specific cases air cargo can be transported by train but this opportunity is usually limited.

A train connection could also serve as a separate and an additional transportation method in case of disruption on roads.

## Risk Mitigation Measures

If the final decision will support a dedicated direct train connection between the airport and city centre the

catchment area for the airport will not increase, the ticket prices might be too high, it might also mean high operation and maintenance costs compared to possible passenger volume. To mitigate this risk, a strong local and regional cooperation is needed to ensure an optimal solution for the region.

The public opinion might not be in favour of the development and the political support might change. Budapest Airport is constantly looking for cooperation opportunities with the local communities and municipalities through noise reduction, various environmental and mobility related projects, and provides its support for counter measures. As the train connection would benefit the entire region, development partnerships are formed and sustained. An advanced communication strategy with local communities and municipalities is needed to ensure a continues support.

Choosing the right location of the station at the airport: A direct connection between the train and and terminals needs to be secured so the advantage of the fast train connection will not be lost by difficult and long transfer to/from the terminal.

#### Impact on other modes

The upgrade and redevelopment of the major road linking Budapest and the airport is crucial as nearly all airport journeys today are made by road, through public buses, private cars, buses and taxis. The existing road consists of a four to six lane highway with the two inside lanes separated from the outside ones by metal barriers. The road suffers

from congestion in both directions, specifically at most junctions leading to and from the airport and there are no escape roads from the two inner lanes in case the traffic gets blocked. This could result in the entire traffic coming to a halt for several hours, in some cases making the airport inaccessible. The train connection could offer a separate service and reduce the load on the road traffic.

### Vienna: Rail connection to the East from Vienna International Airport

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An expansion of the rail connection to the East (direction Slovenia, Hungary) from the Vienna International Airport is planned for 2033-35. One of the key goals is to increase rail mode share for arriving and departing passengers. Currently about 43.4% of air passengers travel to and from Vienna International Airport by rail (City Airport Train 8.8%, rapid transit train 25.4%, Railjet 9.2%).

Vienna Airport Region works with the airport, local municipalities and other stakeholder partners to develop the airport region focusing on improving transport facilities, commercial and logistics infrastructure.

Action	Actors involved (Target groups and agents of change and their role)	Barriers	Timeline
Rail connection to the East from Vienna International Airport	Austriatech Ltd - Federal Agency for Technological Measures  Vienna International Airport	Administrative and political support  Simplification and standardization of the ticketing process  Project communication with Stakeholders	2033-35

Modal split at Vienna Airport<sup>3</sup>

Basis: departing local passengers		2015	2016	2017
Means of transport to the airport	Private/company car	25.60%	25.00%	24.0%
	Car sharing <sup>1</sup>	-	-	0.7%
	Rental car (e.g. Sixt, Avis, Europcar)	2.60%	2.40%	1.7%
	Taxi and chauffeured rental car	20.80%	22.0%	19.3%
	Public bus (e.g. Vienna Airport Lines, Blaguss)	9.50%	8.50%	8.3%
	Coach	2.60%	3.50%	2.5%
	Rapid transit train	23.60%	20.90%	25.4%
	CAT - City Airport Train	10.90%	9.50%	8.8%
	ÖBB long-distance transport (e.g. from Salzburg, Linz, St. Pölten, Meidling, Vienna Hauptbahnhof)	4.30%	7.80%	9.2%
	Other	0.10%	0.10%	0.10%

## Milan: Linate and Malpensa Airports: rail strategic initiatives

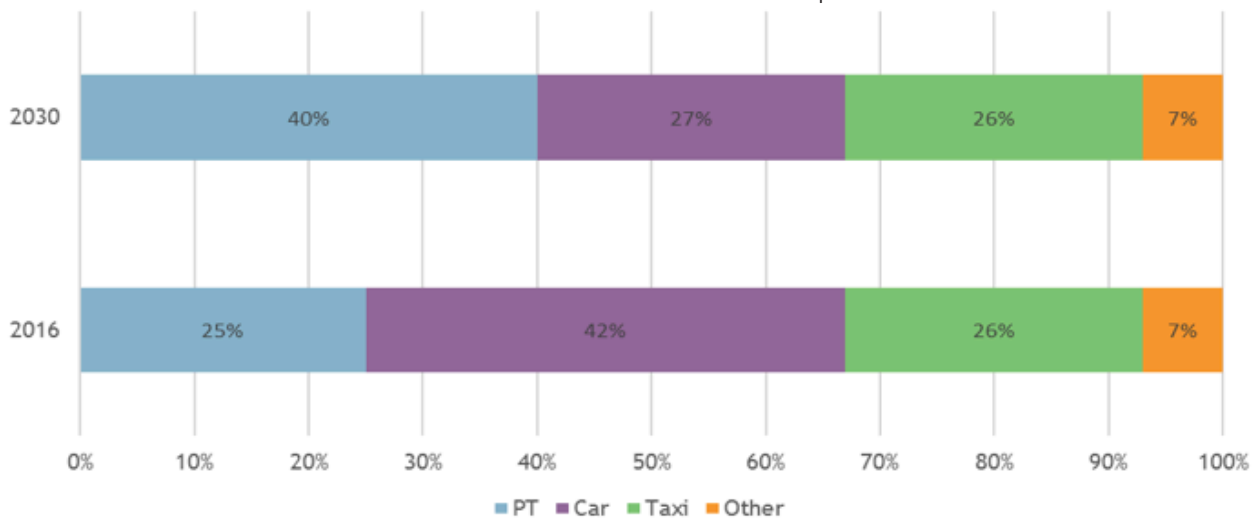
### Linate Airport

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 impact on the surface access modal share.

The picture shows the mode share of landside access in 2016 and the forecasts by 2030. The mode share forecasts, and in particular the public transport (PT) share increase, reflect both the M4 metro line extension to Linate Airport and other the surface access planned actions. Nevertheless, M4 extension will play a fundamental role in the public transport share increase.

2. Source SEA Milan Airports

3. Flughafen Wien AG Sustainability Report 2017

Linate Airport landside access mode share<sup>4</sup>

## Malpensa Airport

The current rail mode share at Malpensa Airport is 14% and it refers to the Malpensa Express air-rail link<sup>5</sup>. Different actions aim at improving Malpensa Airport's rail accessibility and includes both rail infrastructure and services:

- Regional and suburban rail services extension to Malpensa Airport to increase the Airport's accessibility from its closest catchment area (lines S5/S15 and S9).
- Long-distance rail service enhancement, specifically the service extensions to Malpensa Airport as the next stop after Milano Centrale, and substitution of some Malpensa Express rides (while considering the Malpensa Express schedule, the economic impact of the substitutions for the Malpensa Express operator and the related tariffs).
- Cross-border railway service extension, specifically S50 and RE50 rail services to directly connect Malpensa Airport to the most part of the Swiss Canton Ticino and increase the number of rail services to Switzerland to attract Swiss passengers using Zurich Airport.
- Malpensa Express service enhancement, specifically:
  - a direct service to Milano Centrale;
  - increased service frequency;
  - reduced travel time;
  - a platform dedicated to Malpensa Express at Milano Centrale;
  - improved wayfinding; and
  - airport passengers dedicated rail cars with adequate luggage facilities, wi-fi, beverages and snacks selling.
- Development of railway connections to other Milan railway nodes, as Rogoredo and Lambrate train stations.
- MXP North rail access project, concerning the rail infrastructure link between Malpensa Terminal 1 and the Simplon rail infrastructure, which connects Lombardy to the Swiss alpine routes. This is a 2-phase greenfield EU-funded project connecting the two Airport terminals (Phase I) and extending north from Terminal 2 (Phase II). Phase 1 was completed in December 2016 and Phase 2 is in the design phase<sup>6</sup>. Concerning the Airport's accessibility from its catchment area, the project covers the entire north of Italy and part of Switzerland.

4. Source: PwC for SEA, Piano Strategico dell'Accessibilità Terrestre degli Aeroporti di Milano Linate e Milano Malpensa (February 2018)

5. Source SEA Milan Airports

6. European Commission, TEN-T Days 2018, Ljubljana ([www.tentdays.eu/2018/WEB\\_TENTdays2018\\_exhibitionguide\\_FINAL2.pdf](http://www.tentdays.eu/2018/WEB_TENTdays2018_exhibitionguide_FINAL2.pdf) page 62)



## Overview on measures

Action	Actors involved (Target groups and agents of change and their role)	Barriers	Proposed changes/improvements in general addressing airports and their FUA
<p>Improve rail connections to Milan Malpensa Airport</p> <p>Develop new rail links to Milan Linate Airport</p>	SEA Milan Airports	<p>Rail network constrains around Milan Malpensa Airport</p> <p>Agreements with service provider</p> <p>Develop direct connections from Linate Airport to intermodal hubs (Centrale, Rogoredo)</p>	<p>Increase rail mode share at Milan Malpensa Airport</p> <p>Strengthen long-distance rail connections and connections with rail hubs</p> <p>Improve Malpensa Express service level</p> <p>Develop the new Metro Line 4 connection</p> <p>Carry out a feasibility study for a high-speed rail link to Milan Linate Airport</p>

## Modlin: Improving public transport connections at Modlin Airport

Expansion of a railway link from the Modlin railway station to the Airport and the construction of a train/bus station at the airport. In the second phase of the project it is expected to extend the railway connection to Plock. Currently Koleje Mazowieckie provides railway connections between Warsaw (including Warsaw Chopin Airport) and Modlin, where shuttle buses connect the station with the airport terminal.

The Rail Transport Development in Mazovia and the Mazovian Civil Aviation Infrastructure Development Program states that the Warsaw Metropolitan Area should be promoted as an attractive location for offices of international organizations and foreign companies

active on a global scale. Creating an area of economic activity around the Modlin airport should also contribute to the region's internationalization.

Currently the Polish Government is considering building Poland's new central airport. The investment could have important impact on the development of Modlin Airport.

## Overview on measures

Action	Actors involved (Target groups and agents of change and their role)	Timeline	Proposed changes/improvements in general addressing airports and their FUA
Improving public transport connections to Modlin Airport	Regional Government of the Mazowieckie Voivodeship  MPL Warszawa - Modlin Sp.z.o.o.  PKP PLK SA  Koleje Mazowieckie	2030	Expansion of a railway link from the Modlin railway station to the Airport  Construction of a train/bus station at the airport  Extend the railway connection to Plock

### Sustainability Potential and Impacts

The implementation of this project would help reduce CO2 emissions as more passengers and airport employees would use rail to travel to/from the airport, reducing the congestion on roads. Furthermore, after building railway to the airport, change from train to bus won't be necessary, so the airport will be more available for persons with reduced mobility. After implementation of the second phase of the project (building railway link from Modlin Airport to Plock) accessibility of public transport in the region will increase.

### Risk Mitigation Measures

The impact of reducing revenues from car parking on the Modlin Airport and local companies should be monitored. Moreover, the development of Poland's new central airport could have significant effect on number of passengers using new railway link to Modlin Airport.

### Impact on other modes

Implementation of the second part of the project will result in urbanisation of areas located along the railway.

### Poznan: Identifying potential future public transport connections to Ławica Airport

Currently there is no tram or railway connection between the city centre and Poznań Ławica Airport. However, the City of Poznań has reserved an area for the implementation of an airport rail connection in its spatial development conditions and direction study and planning documents.

Poznań is part of the TEN-T network and one of the objectives of the programme is to provide fast connections between the city centre and the airports by 2050. Among the options considered for the

potential airport rail route in Poznań are the extension of the tram line or construction of a new railway line. The cost effectiveness of those options will be examined by experts and the results will be the subject of further meetings during which final decisions will be made. Currently there is no research being conducted on this subject.

## Sustainability Potential and Impacts

Every year Poznań Ławica Airport handles an increasing number of passengers. It is estimated that in 2018 passenger numbers will reach 2 million. Introducing rail access to the airport will provide a very competitive transport alternative for people living in Poznań and its regions. A fast, direct rail connection between the city centre and the airport could be the fastest transport option for passengers and employees, which could result in the reduction of car journeys to and from the airport.

Action	Actors involved (Target groups and agents of change and their role)	Barriers	Timeline	Proposed changes/improvements in general addressing airports and their FUA
Identifying potential future public transport connections to Ławica Airport	City of Poznań Marshal's Office the Wielkopolskie Voivodship in Poznań Metropolitan association of Poznań Polish Railways	Total cost of the investment Agreement between parties Public perception and opinion about the project	2021 - 2025 (according to strategic documents)	Ensuring availability of rail transport to Poznan Ławica Airport Development of a direct connection between Poznan Główny - Poznań Ławica stations (estimated time 12 minutes) Feasibility study for this investment to be carried out

## Stuttgart: High speed rail link to Stuttgart Airport

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A high-speed rail connection is planned to link Stuttgart Airport to Ulm and Munich. Recently Deutsche Bahn has awarded a contract to build a new rail section between Stuttgart Airport and the city of Wendlingen in the South-East. The contract comes under Stuttgart 21, a railway and urban development project. A total of 60 km of new railway

line and three new stations - Stuttgart Main Station, Flughafen/Messe for the airport and trade fair grounds, and Mitnachtstraße rapid transit station in the new Rosenstein district - are planned.

There are also plans to integrate the regional rail connections from the South, improving public transport access to cities like Tübingen, Reutlingen and Friedrichshafen.

### Overview on measures

Action	Actors involved (Target groups and agents of change and their role)	Barriers	Timeline
High speed rail link to Stuttgart Airport	Deutsche Bahn	Only 4 ICE high-speed trains an hour are planned to stop at the airport	2025-2026

# Conclusions

Airport rail link projects, whether it is a new connection or a modernisation project, involve many stakeholders and are capital heavy. Building strong and sustainable relations with the many stakeholders is key in ensuring the success of the project. LAirA project partners highlight the political and local support as one of the main challenges in delivering airport rail link projects. The political support can be strengthened if the local community is behind the project and is actively advocating for it. Naturally, some of the projects will be more favoured by residents than others. A dedicated airport-city centre rail link might not appeal to local communities as it will bypass their settlements, but it could help ease the road congestion in the area and reduce emissions from cars. A clear, open and reliable communication strategy is recommended to engage the stakeholders from the very start of the project development to secure their support.

One of the key barriers for airport rail link development is the lack of global best practice studies available for airports and airport regions to support their own projects. Beyond that, the data available might not be comparable as there is no global standard for airports to analyse public/private transport mode share changes and how different infrastructure projects affect passenger behaviour.

However, the overall trend is to consider rail connection as an environmentally friendly, reliable, frequent, fast and affordable public transport option for a growing airport. All LAirA project partners agree that an airport rail link connection will help reduce road congestion, increase airport's catchment area, provide an alternative transportation mode for local communities and support airport's growth.

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