WAYFINDING AT AIRPORTS

– a LAirA Project Report -

Interreg
CENTRAL EUROPE
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Development Fund

LAirA

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INTRODUCTION

LAirA project in a nutshell

LAirA (Landside Airport Accessibility) 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 the urban areas situated in Central Europe and important transnational transport gateways for 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 impact 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, Milan, 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 in integrating seven key thematic areas: electric mobility, soft mobility (walking and cycling), air-rail links, ITS (intelligent transport systems), shared mobility (carpooling and car sharing), wayfinding, road-based public transport.

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).

The LAirA project is financially supported by the European Union's Interreg Central Europe Programme that encourages cooperation beyond borders. LAirA received a total budget of €2.3 million.

Executive summary

This report considers the theme of wayfinding at airports. Transporting Cities was commissioned to draw upon its database of global best practice examples to set out how signage and other wayfinding mediums are used to guide passengers through airports. In the context of the LAirA urban areas, these best practices could be used to inform the development of **wayfinding strategies** which would contribute to sustainable mobility objectives.

A particular focus was given to how airports should guide passengers, both explicitly and implicitly towards sustainable surface modes (such as bus, coach or rail services).

A set of guiding inputs, the **principles of wayfinding at airports**, was developed from best practices across the world, which was then used as a guide to interpreting current wayfinding strategies at LAirA airports, informed through a questionnaire circulated to partner airports in November 2018.

Responses from the LAirA airports, together with the evidence drawn from international examples, led to the inclusion of two key recommendations for the development of future wayfinding strategies:

- to establish airport-wide coordination, across departments and zones of responsibility to develop wayfinding strategies;
- to encourage the development of standardised icons for each service available at an airport, which could potentially be adopted within the LAirA urban areas and beyond.

Table 1: Airport user types

Types	Comment
Residents or **Visitors**	Residents from the airport's local area are familiar with the cultural and institutional context of how the airport is planned and operates. Visitors may not have this familiarity meaning they rely on guidance from the airport operator.
Departures or **Arrivals**	Departing passengers' primary concern is catching their flight on time; therefore, they rely on quick, simple and efficient structures allowing them to move swiftly from the airport entrance through to the gate. Passengers arrive on flights within the aviation environment, where they are guided through the Arrivals process. It is only when they emerge from the Arrivals area, into the public area of the terminal where they take full responsibility and must make choices.
Frequent airport travellers or **Occasional airport visitors** or **First time visitors**	The frequency of visits to an airport influences how knowledgeable a passenger would be with the terminal, the airport layout and its connections.
Airport passengers or **People using airport for retail/commercial offering** or **People using airport as surface access hub**	Though airports are primarily used for aviation, their size and variety of facilities means that some visitors may not be accessing the airport to fly somewhere. Whereas passengers catching flights rely on efficient movement through the space, people using the airport as a shopping center may seek an experience that encourages them to dwell in areas of entertainment or activity. Those people using the airport purely to change between two surface modes may simply rely on a weatherproof walking route between the two.
Leisure traveller or Business traveller	Leisure travellers may have more time to spend in the airport environment whereas business travellers may be more time pressed, needing to reach their destination quickly.
Passengers with access to mobile tools or **Passengers without mobile data**	Passengers who have a smartphone, with Wi-Fi or data services, are able to look up information independently, should they need assistance. Many international passengers would not have local mobile data services and would instead rely on information displayed within the airport.
Digital natives or **People who prefer physical navigation**	Similarly, airport users who are more comfortable using their phone to search for live information are unlikely to be reliant upon, nor influenced by information displayed within the airport. This contrasts with those users who prefer to use published information sources.
Meeting a travel agent or **Independent arrivals** or **Being met by friends/family**	Passengers arriving at an airport may be returning home to a familiar region; however, those passengers unfamiliar with the airport may not all need similar levels of assistance. Those met at the Arrivals door may not need onward wayfinding; however, independent travellers would need guidance through the entire Arrivals process, on to a surface transport mode.
Passengers with special access requirements	Not all passengers are able to use routes and services signposted within airports. For those passengers with specific requirements, alternative assistance is required and needs to be accessible.
Non-native speakers or **Native speakers**	Passengers who do not speak the native language of the airport may rely on visual icons, imagery or, in some cases, English translations found commonly in airports.

PART 1: WHAT IS WAYFINDING AT AIRPORTS

1.1 Airport passenger types

Airports cater to a wide variety of users and uses: there is no standard airport passenger and not every type of visitor to an airport uses the space in the same way. Airport operators need to consider the diverse types of passengers in order to help them move through the facility. At a minimum, airports can categorise their passengers as those people from the area and those visiting; however, there are many varieties of each type, including non-passengers. General passenger types are introduced in Table 1.

Despite the variation in users, the aim of wayfinding is to help all people navigate through airports quickly, without the anxiety of their surroundings.

Wayfinding should point them in the correct direction and ensure that it leads to the destination, whether this is the car park, station or boarding gate: when a passenger reaches a decision point, they must be guided through with wayfinding.

1.2 The context of wayfinding at airports

Airports are large and complex facilities, where operators need to communicate a vast amount of information to users. They need to provide this information in a clear, timely and relevant way to users who are often disorientated, in a hurry or distracted. Airports across the world tend to guide passengers through their facilities in broadly similar ways, see Table 2.

The aim of all these information types is to **provide for a highly efficient, stress-free experience through the airport**. Operators know they need to help users navigate through the airport; however, the challenge is to provide information in a way that will not be misinterpreted by individual users. The physical layout of airports helps to ensure that users are processed, filtered and channelled, thereby restrict a user's ability to make the wrong decision. Additionally, audible announcements and information screens often refer to only one thing, for example, flight departures or security restrictions.

Table 2: Common mediums used to guide passengers through airports

Using the airport as a process	Passengers transition between zones, for example, from check-in, through security, duty-free shopping area, to the gate.
One-way flows	Once they are within the airside of an airport (the secure area), passengers cannot go to a previous part of the process. For example, an arriving passenger cannot return from baggage claim to immigration.
Filtering passenger types	Airports are often laid out so that the Departures part of the airport is physically separate from the Arrivals area. Passengers in either stage of their journey are unlikely to meet until they exit the terminal. In a simplified airport layout, signs for departing passengers face the terminal entrance, whereas those for arriving passengers face the aeroplanes.
Audible announcements	For instructions or important notifications that a passenger *needs* to know, airports use the more active medium of announcements that do not rely on passengers seeking out the message.
Information screens	Visual information is displayed around the airport, specific to the environment that the user is in; for example, flight departure status screens are only shown in the Departures areas.
Wayfinding	Static, physical signage is used throughout the airport to guide passengers through the environment. Using a mixture of text, icons and colours, airports place these signs so that passengers can follow them independently.

It is wayfinding that has the greatest task by needing to show many different types of services and destinations, across a variety of media but constrained by the fact that it is presented on fixed panels that need to be understood by as many users as possible. Wayfinding signs cannot provide a substantial explanation of their meaning, nor can they be positioned to cause an obstruction, so the wayfinding strategy for an airport must assume that passengers will look at the signs installed.

The task is made particularly difficult at airports as, by their nature, they are transit points whose primary users, passengers, can come from long distances and are **using the facility at a time of increased anxiety and formality.** Many people, **especially visitors to the area, rely on wayfinding to locate facilities**. Using the example of the most basic of the facility, the toilet, the challenge of locating this facility is highlighted by the fact that there are many different terms used across the world, such as Toilet, WC, Restroom, Bathroom, and Facilities.

Similarly, in a transport context, Rail, Station, Trains, Airport Express, Metro, Underground and Subway, are all used to refer to the rail service from an airport. Indeed, car park, parking lot, parking stand and parkade reflect a similar variation.

The airport can only function as a transport hub including public transport if users can find their way through the facility: any departure information, onward connections, retail offering or exit information is only effective if it is easy for a passenger to find. **Wayfinding is the structure upon which visual guides are based.**

Taking into account the diversity of users, it is important to note therefore that most **wayfinding is commissioned, developed and designed by operators who are local to the region**. They must be aware that facilities, service concepts and language that is familiar to them may be foreign to the visitor. Not understanding the fact that users are unfamiliar with local systems is a common error in setting up an efficient wayfinding system.

Passengers arriving at an airport, having flown in from another location are particularly reliant upon wayfinding as they may be unaware of the cultural norms within a local airport context. They do not know

who the most appropriate person would be to seek assistance from, and they may not want to admit their unfamiliarity as this may risk their personal safety.

Passengers who are lost in the airport will require additional resources as they will ask members of staff for directions or cause an obstruction as they stop to consider their routes: at the extreme, if a departing passenger cannot find their way through the airport, they may miss their flight. If an arriving passenger will use a taxi to reduce stress, and anxiety, they will then be lost to public transport.

Given this potential risk of miscommunication, it is common to see icons used to refer to facilities and destinations, removing the need to settle language issues. Icons help overcome the anxiety of communicating in a different language and are not reliant upon a visitor understanding the local alphabet and written script.

Figure 1 and Figure 2 show how some airports use clear icon-based symbols as the base of their wayfinding strategies. Figure 1 shows a Terminal Guide at Bangkok's Suvarnabhumi Airport. Due to the language barrier encountered by many passengers, the airport opts to use English translations and recognisable icons for Departures, Arrivals, restaurants and the rail service. A similar theme is evidenced at Edinburgh Airport where each surface access mode is represented by a familiar airport icon.

Figure 1: Airport guide at Bangkok Suvarnabhumi airport

As long as these icons are clear, and have an accepted meaning, this is a helpful move; however, **there is no global standard for airport iconography**. This is particularly challenging when an airport is directing passengers to a rail service because there may be many types of rail service which cannot be represented easily: for example, does an angular-fronted train refer to a high-speed intercity train or an airport express shuttle service to the city centre; does a rounded train logo refer to an inter-terminal shuttle or a metro service? Referring back to Bangkok Suvarnabhumi Airport, Figure 1 shows that the Airport Rail Link is available from Floor B but it does not convey what the Airport Rail Link is, or what it does. Figure 3, a different sign in a separate location of the same airport does convey that information.

Figure 3: Rail symbol at Bangkok Suvarnabhumi airport

Many of these concepts are known implicitly to regular air passengers; however, in order to present an effective wayfinding strategy, it must be tailored to the most unfamiliar user. It is somehow implicit but in order to have successful wayfinding it must be tailored to the most unfamiliar user, those people who need it the most.

It is not only the transport option that requires careful consideration in an airport context. Traditionally passengers have been guided into a male or female toilet; however, the increasing provision of inclusive toilets (Figure 4) in Europe and North America means this icon may not be understood by visitors from other regions.

Figure 4: Inclusive toilet symbol

In contrast, one icon and sign that is generally understood globally, despite the fact that it is a written word, is the term Taxi. Arriving in any city in the world, most passengers would understand what the word Taxi meant, and understand the concept that it is a car that will take them to their destination for payment (see Figure 5).

Figure 5: Taxi symbol at Milano Malpensa airport

In this context, when airports are investing considerable resources in developing their public transport links in order to reduce congestion and meet environmental/mode shift goals, it is worth considering that one of the most recognisable signs in an airport is Taxi. Further efforts should be undertaken to make public transport options more accessible and as easy to understand.

Broadly speaking, **wayfinding is important to:**

- **Passengers and their greeters** – need to locate facilities in a timely manner as to reach their next transport mode with a minimum of stress. If they cannot find the facilities on their own, they may instead ask airport staff, distracting them from their main duties, increasing staffing requirements and costs.
- **The airport as a transport facility** – the efficient movement of people between transport modes is the main role of an airport. Wayfinding can be used to help move passengers through the facility, reducing congestion and the risk of delays to transport services.
- **The airport as a business** – the commercial sustainability of an airport means meeting the needs of its customers (passengers, airlines and tenants). Wayfinding can help enhance the viability of commercial units but also to contribute to the atmosphere within the airport, which will make it more attractive to each customer type.
- **The airport city** – when the scope of activity at an airport increases to provide the hub of many non-aviation activities, the need to help people navigate through these functions is key. Users need to know when they are in the airport zone, with its greater level of security overlay, versus when they are in the ancillary commercial neighbourhood with its less formal supervision.

1.3 Wayfinding access to public transport around the world

Airports worldwide attempt to increase their commercial business whilst meeting environmental and local policy goals. Significant attention is given to providing and promoting the use of public transport to and from airports. This is set in a context where arriving passengers may be from a more car-dependent culture or may never have even taken a train. Those airports with a rail service may assume that passengers are looking for the rail service; however, in reality, arriving passengers may simply want to escape the airport in the most comfortable way, referring to Part 1, Figure 5, the allure of the taxi may be great! If an airport wants to encourage passenger towards a public transport mode, it can influence a passengers' choices through making the public transport option the obvious option. Wayfinding can be used to lead passengers towards this mode.

1.4 Wayfinding to deliver an exemplary journey through the airport

This section highlights some examples of good practices at international airports. The examples are introduced as seen by an arriving passenger, making their way from the aeroplane to the surface transport mode, passing through the airside terminal area, through to baggage claim and on to the public Arrivals area. There is no one airport whose wayfinding strategy can be used entirely for this example; therefore, this section uses best practice from many different airports to build a continuous journey through this process.

These examples are reflective of global airport practices, as such, they differ in branding and language. In a best practice airport strategy, consistent imagery, concepts, branding, and icons would be used throughout the campus.

This report has opted to focus on wayfinding to rail-based public transport in order to provide a visual guide as to how various airports present this guidance in their own location, the lessons could equally be used to inform a strategy to direct people through a retail area or airport boarding process.

This process takes the form of following an arriving passenger and guiding him/her through a series of steps leading towards successful wayfinding towards public transport.

1.4.1 First step: Orientating the passenger

Location	After the passenger has disembarked from the aeroplane and entered the terminal building.
Role	Telling the passenger where they are in the Arrivals process and what steps will follow on the way through the airport, leading to surface transport connections. The specific transport mode need not be shown here, only the fact that there are public transport options at the end of the process.

At London's Heathrow Airport arriving passengers are introduced to the bright, icon-based wayfinding style upon disembarking from the aeroplane. Passengers are shown how they will pass through the airport, with reference to the surface transport options at the end of the process. Rail is shown as the primary mode in this example, Figure 6.

Figure 6: Icon-based arrivals process flow diagram at London Heathrow

In the case of London Heathrow, these signs are repeated through the arrivals process to continually orientate the passenger on their journey through the airport (Figure 7).

Figure 7: Subsequent icon-based flow diagram at London Heathrow airport

1.4.2 Promoting public transport and introducing the iconography

Location	After the passenger has passed through passport control before they reach baggage claim.
Role	Introducing the public transport options, showing departure information and routes available. Note that the separate Train and Bus & Coach icons are introduced at this time so that a passenger can follow those icons through the rest of the journey.

At London Gatwick Airport surface transport wayfinding is introduced after passport control before the passenger reaches the baggage claim area, Figure 8. This digital screen is very visible and creates a point of interest to introduce the Train, Road, and Bus & Coach options.

Figure 8: Public transport information in arrivals at London Gatwick airport - after passport control, before baggage carousels

Whilst the airport may want to promote the use of public transport/rail-based surface access, many passengers prefer to use ridesharing (for example, Uber or Lyft services) due to their convenience and familiarity. Whilst some airports have discouraged their presence at the terminal, this has meant that passengers have been guided by the service providers themselves through the app. In order to maintain a

relationship with the passenger, the airport should seek to guide passengers who may still prefer to use these services. Where they are present at the airport, it is sensible to include them in wayfinding strategies.

Oakland Airport takes an effort to identify Smartphone App Rides on airport signage. A new icon can be seen in this signage style.

Figure 9: Surface transport directions at Oakland airport

Figure 10: Smartphone-based transport location at Minneapolis Saint Paul airport

The icon used at Oakland Airport contrasts with that found at Minneapolis Saint Paul Airport, Figure 10. This icon (a finger pointing to a phone screen) is probably more recognisable as an app-based transport option than the more disconnected one used at Oakland Airport (a car in communication with an object).

1.4.3 Making the association to the transport destination

Location	In baggage claim area.
Role	With the formality of the passport control area having passed, the passenger may have a few moments to dwell in the baggage claim area, waiting for their bags to arrive. At this time, it is more appropriate to introduce the destinations that the public transport mode can offer, so that the passenger, now aware of the options, icons and branding can make an informed, considered choice.

The concept of making rail the obvious place to walk to is shown particularly clearly at Sydney Kingsford Smith Airport, International Terminal, where dominant wayfinding and branding is used across the baggage claim area to embed the concept that the train links to the city, using recognisable imagery of the city to overcome any geographical unfamiliarity. In this example, Figure 11, the Airport Link train service is shown on the baggage carousel, the ceiling, the walls and the structural pillars. Following this dominant identification, a passenger would be familiar with the Airport Link service concept and subsequent signage need only refer to the name Airport Link.

Figure 11: Destination information at Sydney Kingsford Smith airport, international terminal

At London City Airport wayfinding within the baggage claim area uses the city's recognisable buildings to help convey the fact that passengers can reach common city

destinations, such as the exhibition centre, financial districts, government quarter and shopping districts via a Train or Underground, Figure 12.

Figure 12: Icon-themed destination information at London City airport

As mentioned in Section 1.2, it is particularly important to provide clear, prominent wayfinding as passengers emerge into the public area as they will not want to dwell to absorb signage and information provision. Many visitors have been advised to avoid 'looking like a tourist' and so will attempt walk "with purpose" away from this vulnerable location to a more discreet place to understand where they should walk to.

If the airport has not provided the key direction at this point, the passenger may miss the filter point to the preferred mode of onward transport. At Minneapolis Saint Paul Airport, Figure 13, the passenger is immediately informed to proceed ahead for Ground Transport so they can escape this point of vulnerability with confidence. Many global airports overwhelm passengers with information at this point, a situation made more intense by the presence of many people either waiting for friends or soliciting for taxi passengers.

1.4.4 Avoiding the moment of doubt when emerging into the public area

Location	Immediately upon emerging from the Arrivals door.
Role	To ensure that when a passenger emerges from the formal Arrivals area into the public Arrivals waiting area and is confronted with a sea of greeters, name cards and signposts, they can quickly see the direction to the public transport mode and leave this overwhelming area.

Figure 13: Arrivals greeting area at Minneapolis Saint Paul airport

Brisbane Airport is noteworthy for using a unique symbol to identify the rail service from the airport, as shown in Figure 14. Though maybe a proprietary brand it appears similar to other airport icons and forms a recognisable icon to follow from the baggage claim area to the airport's railway station.

1.4.5 Using icons to lead the way through the terminal

Location	Through the public area of the airport
Role	Once a public transport service, destination and icon have been identified and established, using this name and icon in all subsequent wayfinding provides a visual way marker to lead the passenger through to the station.

Figure 14: Airtrain Icon at Brisbane airport

It is surprising that neither this icon, nor a similar one, combining the rail and airport theme has not been used elsewhere across the world as the icon could easily be translated to different airport contexts. The train and aeroplane symbols on the icon would be easily recognisable as a train that leads to an airport if this image was more widely used.

The icon can be seen in position at various points through the airport terminal, Figure 15 and Figure 16, appearing as part of the overall wayfinding strategy, and reinforces the principle of using standard icons at every airport.

Figure 15: Airrail symbol at Brisbane airport

Figure 16: Airrail icon at Brisbane airport Forecourt

At San Francisco Airport, train imagery is used to convey what a sign is referring to (Figure 17), in this case directing a passenger to use the AirTrain to reach the destinations on the sign. It should be noted that this sign assumes a visitor knows that BART is the local name for what international visitors would know to be a subway/metro service. The AirTrain icon may be more useful to visitors in this situation.

At Sydney Kingsford Smith Airport, Domestic Terminal, Trains is used in a central, prominent location to direct passengers down into the station, Figure 18. This sign is positioned so that arriving passengers can see it whilst approaching the concourse along the Arrivals channel.

Figure 17: Icon-themed airport wayfinding at San Francisco airport

Figure 18: Airport terminal wayfinding at Sydney Kingsford Smith airport
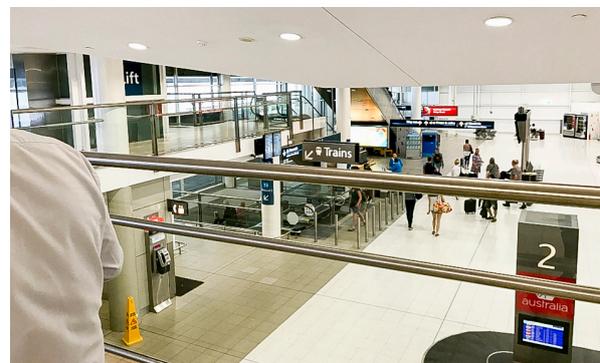
Though both the examples from Sydney and San Francisco show the benefit of using the actual mode, a train, in the icon, little meaning is given to what type of train icon is used: an airport shuttle, mainline railway or metro-type service.

At Lisbon Airport, Figure 19, passengers are directed to the Metro station through the terminal building with prominent yellow signs, with the contrasting red Metro symbol.

Figure 19: Repeating signage at Lisbon airport

1.4.6 Providing reassurance along the way

Location	Where there is a walking route between the airport terminal and the public transport station.
Role	To reassure the passenger that they are walking in the right direction and that they have not left the pathway to the transport mode of choice.

Taking into consideration the size and layout of large airport complexes, it's necessary to guide passengers to their chosen destination. Continuous, repetitive wayfinding is key to reassuring a passenger that they are walking in the correct direction. At Southampton Airport, Figure 20, passengers are led from the terminal building to the nearby station along a covered walkway with regular signs counting down the steps to the station.

Figure 20: Repeating signage from Southampton airport terminal to railway station

1.4.7 Identifying the transport destination

Location	At the entrance to the station.
Role	To welcome and confirm to the passenger that they have arrived at the public transport station. This reassurance removes any anxiety about whether a passenger has walked the right way.

Having guided a passenger through the airport, it is key to reassuring a passenger that they have reached their destination. This should be done using clear, inviting wayfinding styles. At Helsinki Airport, Figure 21, dominant lighting is used to highlight the entrance to the station with large icons leading into the station. This helps to provide the confirmation that would not be provided by the very small icons used on overhead signage in the same location.

Figure 21: Station identification at Helsinki airport

At London Southend Airport the station is identified with clear, exaggerated identification that a passenger can see from the airport terminal, Figure 22. In this way, wayfinding is not required as the passenger can see the station from afar.

Figure 22: Train station identification at London Southend airport

At Birmingham Airport, heavily branded wayfinding signage is used to welcome passengers onto the rail service, Figure 23. It would be difficult not to feel assured at this point!

Figure 23: Railway station concourse signage at Birmingham airport

1.4.8 Draw a picture for complicated transport connections

Location	At the entrance to the public transport station.
Role	To convey the next steps in the transport service. If a passenger must take a short shuttle to reach a remote railway station, they can be easily understood with a simple diagram.

Where the passenger has arrived at a station, airports and rail operators often convey how local area shuttles will connect to the wider surface access network. This is particularly common in North America where modern urban rail networks have been developed but do not connect directly into the airport terminal. These airports require that passenger boards a short shuttle ride to reach the main interchange point to the wider rail service. Rather than attempt to explain this procedure, they use diagrams to show the connection.

At Oakland Airport, Figure 24, the short shuttle connects to a nearby BART (metro/subway) station. This is shown in an illustration.

Figure 24: Rail access diagram at Oakland airport

At Minneapolis Saint Paul Airport, Figure 25, the terminal map includes an illustration of how a short shuttle ride, Tram, is used to reach the Light Rail service.

Figure 25: Rail access diagram at Minneapolis Saint Paul airport

PART 2: PRINCIPLES OF WAYFINDING

2.1 The ideal journey to public transport

We have seen that there is an "ideal" journey towards the public (and green) transport:

- Orientating the passenger as early as possible upon arrival, as soon as they are inside the terminal.
- Promoting public transport and introducing iconography. Making their options known.
- Making the association with the transport destination.
- Avoiding any risk of doubt and stress that would lead to "losing" the passenger.
- Using icons to lead the way through the terminal.
- Providing reassurance along the whole way.
- Identifying the transport destination, letting the passenger know that they have reached the transport hub.
- Draw a picture of complicated transport connections.

This ideal journey abides by a number of principles of wayfinding.

2.2 Identifying the principles of wayfinding

Part 1 of this report considered common stages and means in which information is given in wayfinding. On the example journey, information is given out progressively along the journey through the airport. Drawing upon these examples, there are some key themes that are necessary to include in airport wayfinding. These are set out in Table 3 as the Principles of Wayfinding at Airports.

In order to develop a wayfinding strategy that contributes to these principles, **airport operators need to develop their plans in coordination with other stakeholders so that they provide a holistic, airport-wide signage design guide**. Where an airport has a railway station, standardised visual information should be provided up to the point where the passenger leaves the airport campus (by boarding a train). Where an airport is integrated into a shopping or exhibition centre, the wayfinding plan and signage design should encompass the entire estate. It is preferable in these situations to have one overall body responsible for ensuring that wayfinding is standardised, fit for all user types.

It is particularly important that this responsible body learns from and seeks out best practice from other airports. They should not develop their icons and terminology in isolation. Only this way will a passenger understand what a message means at either end of their flight.

Failure to coordinate wayfinding across the estate can lead to unexpected passenger behaviours or indeed, losing passengers to competing modes, such as the taxi or private cars.

The risks associated with poor wayfinding are diverse. When a local designer plans an airport wayfinding strategy, they may not fully realise the anxiety and uncertainty faced by new visitors. This can have an impact or confusing the airport experience reducing passenger experience. It might also reduce the efficient and profitable operation of an airport if passengers are missing boarding times while lost in a terminal.

Table 3: The principles of wayfinding at airports

Principle 1	Begin the wayfinding where the passenger relies on airport information, before they leave the Arrivals area.
Principle 2	Provide simple information, targeted at people who are unfamiliar with the airport.
Principle 3	Use standardised, visual way markers.
Principle 4	Provide a consistent wayfinding style throughout airport campus.
Principle 5	Show the way - lead the passenger the whole way.
Principle 6	Confirm to the passenger that they have reached their destination.

Another example is that passengers may not even be aware of their surface access choices. If, for example, rail service is available from an airport, it is unlikely to be used if it is not advertised. Where an airport is trying to meet environmental goals, this can have a detrimental effect in that the airport may have a lightly used rail service as most passengers continue to use road-based transport as they are unaware of the rail service. A clear example where wayfinding and signage are not effective is at Geneva Airport where each arriving passenger is provided with a free rail ticket into the local urban area. Unfortunately, this service is no advertised along the Arrivals journey. Passengers must claim this free ticket at a specific machine in the baggage claim area, which is only visible to passengers who happen to approach it, see Figure 26 and Figure 27.

Figure 26: View from baggage claim area at Geneva Airport, towards the exit to the terminal, showing rail ticket machine on the left.


Figure 27: Rail ticket machine in the baggage claim area at Geneva airport, showing free ticket redemption machine to the right.

For those who prefer navigating with traditional signs, they will seek out human advice if they are uncertain of where to go. This occupies resources that could be better directed to smoothing passenger flow and making the airport operation more efficient. Equally, cultural bias assumes that all travellers are alike – they are not. While some passengers may seek advice from members of airport personnel, some passengers may be intimidated or dissuaded from engaging with officials in uniform and therefore never find their way to their chosen destination.

Airports are transport points for people from other areas, as shown in Table 1 (Airport User Types), the people who rely on it most are not necessarily from the area so it is needed to really consider how you are showing information and messaging to people from a different culture; language, car-based societies; and people with various values of time. Airports are unusual as they cater for people who might otherwise rely on their phone to navigate (using Google Maps, their ride-sharing provider or City Mapper-type services); however, arriving in a new, unfamiliar place passenger may be more aware of physical signage as they may not have local data services or be connected to airport Wi-Fi. For users of these services, an **airport has a short window before the passenger seeks out their own, potentially competing, information on their phone, which may not be consistent with the airport operator's preferred routing based on their policy ambitions**, Figure 28.

Figure 28: Screenshot of mapping apps
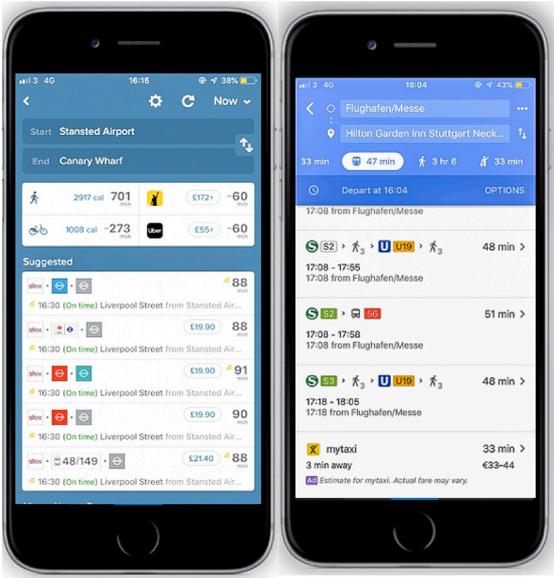
When a passenger looks at their phone to navigate from the airport, they may use their preferred mapping app. Figure 28 shows two examples from European airports: London Stansted Airport to a central business district; and Stuttgart Airport to a city centre hotel. In these two examples, the app shows without prompt that there is an alternative, quicker route to the city via a ride-sharing or taxi service. This is one example of how new competitors are entering the airport access market.

It is noteworthy that many airports are developing proprietary apps which irregular passengers are unlikely to use; whereas they have yet to engage with mapping and journey planning companies such as Google to ensure that their public transport services are listed in the transit database.

PART 3: WAYFINDING IN LAIRA REGIONS OR FUNCTIONAL URBAN AREAS

3.1 LAirA partners and the principles of wayfinding

As set out in Part 2, there are particular principles of wayfinding that contribute to a holistic, effective wayfinding strategy. This section sets out to assess LAirA airports against these principles.

3.2 Partner questionnaire

In order to understand how LAirA partner airports structure their wayfinding delivery, a questionnaire was circulated to partner airports in November 2018 to capture airport procedures. This questionnaire referred to how the airport liaised with other authorities focussing on the theme of public transport.

Each partner airport was asked the questions set out in Table 4.

This questionnaire was distributed to the LAirA partners in November 2018. By the time of writing, responses had been received from three partners: Milan Malpensa/Linate, Stuttgart and Warsaw/Modlin. These airports' responses are also shown in Table 4.

3.3 Analysis of questionnaire responses

Statistical analysis cannot be undertaken on three responses, so a detailed commentary can be undertaken instead in order to draw some themes from the responses.

It is noticeable in Milan's response that the person responsible for wayfinding is in charge of real estate and airports accessibility planning. Warsaw/Modlin Airport suggested that guiding passengers was within the responsibility of passenger facilities.

Again, Warsaw/Modlin suggested that the responsibility for wayfinding beyond the terminal was with the same person. This would mean that priorities for airport wayfinding may be different outside of the terminals at both Milan Malpensa and Stuttgart. Referring back to the principles of wayfinding at airports, Table 3, it would be important to ensure that Principle 4 - "Provide a consistent wayfinding style throughout

airport campus" – was embedded across departments.

Milan Malpensa and Warsaw/Modlin responded that their wayfinding was planned and designed by an internal team, though only Warsaw/Modlin uses a wayfinding standard to guide this internal work. Stuttgart also references a wayfinding standard. It would be difficult for an internal team to understand the challenges faced by international visitors to the airport without a guiding standard or guide, as suggested by Principle 2 - "Provide simple information, targeted at people who are unfamiliar with the airport"; however, the existence of a strategy at all means that using "standardised, visual way markers", as set out in Principle 3, could be adopted quickly, if not already present.

All respondents stated that their wayfinding stretched out beyond the airport terminal. As Milan states in Question 2 that the person in charge of wayfinding is not responsible for wayfinding beyond the terminal, there may be some variance with how this wayfinding is interpreted by each person responsible across the airport campus.

Interestingly, Milan states that they coordinate wayfinding with local police. There also appears to be continuous coordination with other transport operators. At Stuttgart, the respondent states that they do coordinate with others.

None of the airports seeks to collect feedback on their wayfinding. This would be an opportunity to understand whether passengers were sufficiently informed by the wayfinding and could inform future improvements. Milan, though not Stuttgart or Warsaw/Modlin, state that they do refer to other airports to inform their designs.

It is not possible to draw a general conclusion from these three respondents, only to refer to their responses; however, **there are key areas where the principles of wayfinding could improve the effectiveness of the wayfinding**. Referring back to the six Principles, it is possible to suggest that the lack of airport-wide structures to deliver consistent wayfinding would restrict the partner airports' from effectively delivering the principles of wayfinding.

Table 4: Partner airport questionnaire and responses	Milano Malpensa/Linate	Stuttgart Airport	Warsaw/Modlin
1	**Who is responsible for wayfinding at the airport? What is their role?**	Real estate and airports accessibility planning	N/A	Infrastructure and passenger facilities
2	**Is it the same person responsible for wayfinding beyond the airport terminals?**	No	No	Infrastructure and Parking Department
3	**Who planned & designed the wayfinding?**	Internal	N/A	Internal Infrastructure Department
4	**Do you have a wayfinding standard or design guide?**	No	Yes	Yes
5	**Does the wayfinding strategy cover the area outside the airport terminal? How far does it cover?**	Yes, it covers the road access landside area within the airport	Yes, airport and parking facilities	Within the airport property
6	**Do you coordinate wayfinding with local transport operators/local municipalities?**	Yes, with the local police	Yes	No
7	**Have you received any feedback from passengers on the signs? Are you collecting feedback?**	No	No	No
8	**Do you use other airport signs to influence your wayfinding designs?**	Yes, we try to learn from other airports	No	No

PART 4: CONCLUSION

Part 2 and Part 3 discussed how the structure of responsibilities within airports can enable or restrict the effective delivery of wayfinding that meets the Six Principles of Wayfinding set out in Table 3. A disjointed, confused wayfinding plan will lead to a disjointed, confused passenger journey.

4.1 Capitalising on transport investment

Wayfinding is not just about showing people around the system to where they want to go, **wayfinding has a role in directing passengers to where the operator wants/needs them to go**. Depending on the airport's priority, this may be to direct passengers into a retail area, or it may be to direct a passenger to the correct area to pass through airport security. This means that wayfinding is key to realising an airport's business and commercial objectives.

Referring to the public transport case study, many recent investments have been made into rail or other public transport links to airports across Europe. These are predicated upon meeting financial and environmental policy goals which would have been used to justify the link's funding.

If passengers cannot see or do not know about the public transport link, then they will not use it. This is particularly important in the context of modern mobility services (Mobility as a Service, ride sharing etc) as the passenger will revert back to the comfortable, familiar way of navigating if they cannot rely on using airport wayfinding, as highlighted in Figure 25.

4.2 Wayfinding and access to airports

Wayfinding needs to be considered across the airport site if a passenger is to be guided according to the airport's own ambitions. The growing use of app-based transport services will only serve to provide a larger competitor to traditional transport services.

As airports control the physical space within which a passenger moves, wayfinding is the means that the airport can put emphasis on their own strategy.

Within the LAirA study area, from the evidence collected in the questionnaire, it is the structure under which wayfinding is planned and implemented which

has the greatest influence on successful strategies. As policy goals move to actively promote sustainable modes, wayfinding will become a key means by which passengers are informed and guided onto these modes, so as to ensure these goals are met.

Wayfinding at airports is a challenging issue. Whether it is a language difference, cultural diversity or geographical origin, each user of an airport will have a different interpretation of information presented to them. Wayfinding is one of a suite of information sources at airports but is the only one that relies purely on visual information. How an airport presents this information is key to ensuring that the airport operates efficiently and provides for user experience.

Evidence suggests that wayfinding is more than simply pointing a passenger to a shop or to a taxi, that in fact, wayfinding can help airports to influence passenger behaviour through nudging them towards a preferred destination, whether this is a sustainable mode of surface transport or a commercial enterprise. An airport must introduce destination options early, lead the passenger through the airport, and reassure them that they have arrived.

Examples from around the world suggest that the effectiveness of this concept is limited as wayfinding is provided in a different way in each location. There does not appear to be a common principle of terminology or visual keys that would be essential to meet the needs of an international user-group.

In addition, the provision of universally understood wayfinding information can only be successfully done at a local level by having the structures in place to ensure that each airport has a holistic wayfinding strategy that makes sense. An overall body responsible for planning and developing this strategy across the entire airport campus may be a way to achieve this.

None of the LAirA partner airports who responded to the questionnaire appeared to have these structures arranged. Neither did they have means by which to review and improve their wayfinding strategy using external best insight: it is only by having external, non-native, input into the wayfinding strategy that an airport can judge how its information provision is interpreted.

There is no perfect airport Wayfinding strategy, as no strategy has been tested by all passengers. It's the role of industry organisations to promote the actions that airports can take to embrace best practice recommendations.

4.3 Conclusion and recommendation

The report has highlighted that Principles of Wayfinding at Airports can be identified from global best practice, these principles are:

Principle 1	Begin the wayfinding where the passenger relies on airport information, before they leave the Arrivals area.
Principle 2	Provide simple information, targeted at people who are unfamiliar with the airport.
Principle 3	Use standardised, visual way markers.
Principle 4	Provide a consistent wayfinding style throughout airport campus.
Principle 5	Show the way - lead the passenger the whole way.
Principle 6	Confirm to the passenger that they have reached their destination.

In order to create Wayfinding Strategies that embrace these principles, two important notions are evident: that airports should use simple, obvious visual guidance across the whole airport area, and that to deliver this common signage, structures must be in place to ensure that wayfinding is coordinated throughout the airport experience. It is these underlying notions that will facilitate a Wayfinding strategy that is consistent with the Principles.

In order to achieve this, it is recommended that LAirA airports should seek to establish airport-wide coordination across departments and zones of responsibility do develop Wayfinding Strategies. Furthermore, LAirA airports should be encouraged to develop standardised icons for each service available at an airport which, if embraced by all stakeholders, could be adopted across all LAirA airports and beyond.

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