

RESTART

Mobility Hubs Design Guide

Volume 1 - Introduction to the Guide



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Volume 1 - Introduction to the Guide

November 2023

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Credits

Title

Mobility Hubs Design Guide

Subtitle

Introduction to the Guide - Volume 1 of 7

Publication

EMEL - Empresa Municipal de Mobilidade e Estacionamento de Lisboa, S.A

Date

November 2023

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ISBN

978-989-35432-0-7

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Version History

Version

1.0

Date

10/11/2023

Approved by

Sofia Taborda

Description/Summary of changes

First Edition - Volume 1

Mobility Hubs Design Guide

Volume 1 | Introduction to the guide (this publication)

Volume 2 | General aspects of a mobility hub

Volume 3 | Surrounding multimodal area

Volume 4 | Central access area

Volume 5 | Facilities area

Volume 6 | Operational area

Volume 7 | Operational support area

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Preface

One of the biggest challenges that Lisbon faces in terms of mobility is the reduction of motor traffic in the city centre. In this regard, the European Commission has set very ambitious goals that the municipality must meet as a signatory of the Covenant of Mayors for Climate and Energy. These goals include halving the use of conventionally-fuelled cars in urban transport by 2030, phasing them out in cities by 2050 and achieving essentially CO₂-free city logistics in major urban centres by 2030.

According to the latest Census data, approximately 48% of residents from other municipalities who regularly commute to Lisbon for work or study do so by car. Conversely, 73% of residents in Lisbon use a car for their regular trips outside the city. We also know that the primary reason cited for choosing individual transport is that people consider the public transport system ineffective in meeting their daily needs.

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Immediate action is required through an integrated mobility strategy that focuses on improving the availability of alternative solutions to cars.

Immediate action is required through an integrated mobility strategy that focuses on improving the availability of alternative solutions to cars. A good public transport system is imperative. More options, greater service integration, fewer transfers, increased reliability, cleaner and more dignified spaces are all essential. Only when we are able to offer a better user experience and ensure a high quality of service will we compete with car use.

And by public transport system, I don't just mean the mode of transportation itself, but also the areas of the hub that bring together these services and and that are a key component of the ecosystem.

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Only when we are able to offer a better user experience and ensure a high quality of service will we compete with car use.

As a public agent for mobility in the city of Lisbon, EMEL bears the greatest responsibility in contributing to solutions.

The RESTART project has precisely that purpose: to study the creation of a network of large mobility hubs in Lisbon by assessing scenarios for the retrofitting of the bus terminals of Campo Grande, Colégio Militar, Oriente, Pontinha, and Sete Rios.

The Mobility Hubs Design Guide was developed in response to the need to regenerate Lisbon’s bus terminals. Its objective is to establish some guidelines, in particular the key elements to be considered in the design and retrofitting of these spaces.

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As a public agent for mobility in the city of Lisbon, EMEL bears the greatest responsibility in contributing to solutions.

The guide can and should be used by all those who aspire to achieve better mobility and greater sustainability for the city of Lisbon in the coming years.



1 Introduction

1.1 Framework

The Mobility Hubs Design Guide (of which this publication is Volume 1) was developed as part of the RESTART - Masterplan for Lisbon's Multimodal Mobility Hubs project, coordinated by Lisbon City Council (CML) and developed in partnership with EMEL, Lisbon's municipal company for mobility and parking.

The RESTART project aims to study scenarios for the redevelopment of five Lisbon bus terminals (Campo Grande, Colégio Militar, Oriente, Pontinha and Sete Rios) into mobility hubs. In addition to providing the standard functions of road transport infrastructure, the latter offer a range of services and experiences designed to enhance the comfort and quality of journeys, attract new communities and promote greater harmony with the surrounding areas and their local residents.

The project is underpinned by a people-centred approach. Among other stakeholders involved, the project gave voice to passengers, bus terminal users, residents in the surroundings of each bus terminal, and transport service operators (both at the management and operational levels). In total, around three thousand people participated in the various community engagement activities.

This participatory process enabled the definition of a mobility hub concept for the city of Lisbon, taking into account the needs experienced in the use of the five Lisbon bus terminals studied. It also identified the mobility, support and complementary services and amenities that could be included in these locations.

This work led to a mobility hub concept that suggests that:

A mobility hub is a place of connectivity that provides quality experiences and services. It combines various mobility options with different activities and areas (for waiting, leisure or commerce), thus attracting and benefitting new communities.

It also contributes to the competitiveness of alternative modes of transportation to the private car and the adoption of more sustainable mobility habits. It is more than a passing place or stopover in passengers' multimodal journey. It is a space for interaction accessible to all, thus making it a lived, pleasant, safe and sustainable place.

It is also an infrastructure designed to effectively meet the needs of transport operators, and thus contribute to a better experience in using alternative modes of transportation to cars.

1.2 Objectives of the Mobility Hubs Design Guide

The Mobility Hubs Design Guide is one of the main outcomes of the RESTART project. It results from approximately two years of work, including an in-depth literature review and consultation with experts and professionals in the mobility, transportation, and infrastructure arenas.

The objectives of the Mobility Hubs Design Guide are as follows:

1. **Establish design guidelines**, in particular the **key elements** that should be considered when designing a mobility hub, minimising the margin of interpretation of the adopted guiding principles ([see section 2](#)).
2. **Translate the established concept of a mobility hub into minimum user experience requirements**, defining, among other aspects, the different uses and functions of the space.

The guidelines and requirements were compiled using documentary research and technical validation of best practices in the design of mobility hubs. Generally, these guidelines represent a higher level of ambition than that established in the current legal and regulatory framework in Portugal at the time.

This guide informs the project specifications for a mobility hub, from the planning to the design phase ([see Figure 1](#)), serving as a support tool for realising the vision of the **Project Owner** (or Mobility Hub Managers) by **Project Teams**, whether in the redevelopment of an existing bus terminal or in the design of a new mobility hub.

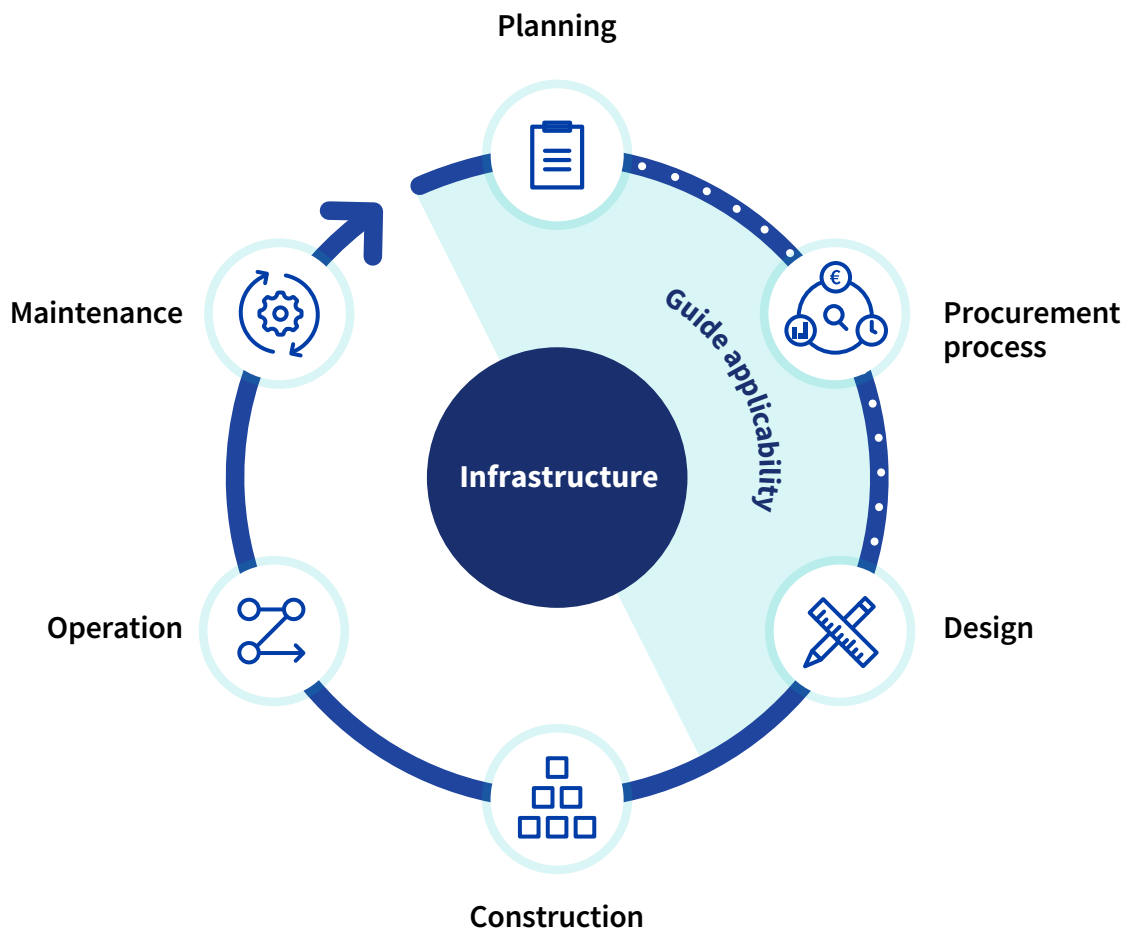


Figure 1: Life cycle of an infrastructure

The specifications presented are applicable to the majority of mobility hubs. However, it should be noted that aspects related to the operational area ([see section 4](#)) are based on the specific features of collective road transport.

Finally, it is important to mention that, even though this publication is intended to be a live document, updated following new discoveries, validations and developments in best practices, updates to any of the standards or manuals referenced herein with stricter guidelines and requirements should supersede those established in this guide.

1.3 Guide layout

The Mobility Hubs Design Guide is divided into seven volumes:

Volume 1 - Introduction to the guide (this publication)

Volume 2 - General aspects of a mobility hub

Volume 3 - Surrounding multimodal area

Volume 4 - Central access area

Volume 5 - Facilities area

Volume 6 - Operational area

Volume 7 - Operational support area

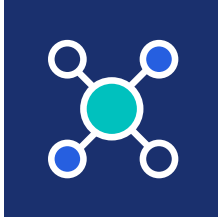
Each of the thematic volumes sets out the minimum requirements for designing a mobility hub. It is worth noting the cross-cutting nature of the aspects detailed in Volume 2, which includes requirements related to the movement of people, safety and security, information and communication, and the sustainability of the infrastructure.

For the convenience of readers, external references (such as manuals, national legislation or standards) that are considered relevant for a better understanding of the indicated requirements and to assist in their implementation during the project development phase are provided throughout the sections of each volume.

2 Guiding principles

Seven guiding principles have been established to steer the work of the different teams involved in the design and management of future mobility hubs in the city of Lisbon. These principles should be considered during the different phases of the life cycle of infrastructures of this kind, and they are particularly critical during the design phase to ensure a «by design» approach. The principles are as follows:

	1. Connectivity and seamless journeys
	2. Equality and autonomy in access and use of space
	3. Ease of navigation and comfort
	4. Safety and security
	5. Sense of place for different communities
	6. Flexibility and efficiency throughout the infrastructure's life cycle
	7. Environmental, social and financial sustainability



1. Connectivity and seamless journeys

A mobility hub should bring together various mobility options, creating connections to the different transport modes around it, including public transport, pedestrian and cycling networks and points of access to on-demand and private transport, whether individual or shared. Modal integration should be enhanced not only through connection to existing modes within the hub's environment but also by creating conditions that foster the attraction of new mobility options in the future.

The very design of the hub should encourage multimodal travel, enhancing convenience by creating efficient routes that promote seamless journeys and minimise the distance and time required for multimodal transfers.

The layout of the space and circulation routes should be designed to reduce the effort required for transit and interactions. In other words, changes in level should be minimised and any barriers that could unnecessarily lengthen routes should be eliminated. Decision-making moments should be made easier, and touchpoints should be optimised for efficiency.



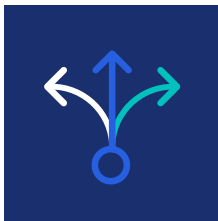
2. Equality and autonomy in access and use of space

A mobility hub should be an inclusive space, ensuring equal access and enjoyment for all people, regardless of their condition, characteristics, age, religion, gender or any other attribute.

The hub's design should, as a rule, adhere to the principles of Universal Design¹ in all its aspects (physical infrastructure, services and assistance, information and communication systems, etc.).

¹ «Universal design means the design of products, environments, programmes and services to be usable by all people, to the greatest extent possible, without the need for adaptation or specialised design.» (United Nations Convention on the Rights of Persons with Disabilities, Art. 2)

The space should be able to accommodate the diverse needs of all individuals who wish to use it, ensuring that they can do so autonomously and, whenever possible, independently, unless there are pre-existing infrastructure constraints that, for insurmountable technical reasons, make it impossible to fully meet these requirements.



3. Ease of navigation and comfort

A mobility hub should provide a pleasant, easy-to-navigate environment for users.

The space should be organised intuitively, promoting the easy identification of the different areas and routes through the use of different wayfinding elements (visual, physical, sensory, and/or spatial), accessible to people with different needs.

Additionally, it should promote a positive experience and active use of the spaces by creating inviting areas with comfortable, well-lit spaces, which can also protect from adverse weather conditions.



4. Safety and security

A mobility hub should ensure protection for all users, as well as the safety and integrity of the physical and digital infrastructure and equipment. Solutions should be adopted to minimise the risk of accidents, criminal activities or acts of terrorism.

The design of the space should prioritise passive safety and security features. For example, this can be achieved through a design that minimises hidden corners, provides good lighting in the spaces and uses non-opaque materials that allow for greater visibility.

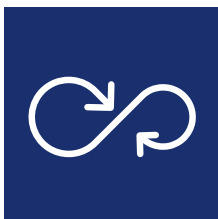


5. Sense of place for different communities

A mobility hub should be integrated with its surroundings, offering amenities that serve not only the people using it to access mobility services, but also the residents of nearby neighbourhoods and even other communities in the city.

Spaces and services that foster a sense of place and belonging should be provided, catering to the aspirations of various groups, both passengers and non-passengers. This will enhance the potential of the hub to attract diverse communities.

Likewise, synergy between the hub and its surroundings should be promoted by offering amenities and services tailored to local characteristics, thereby enhancing permeability between spaces. Therefore, the emphasis should be on providing services that not only address any shortcomings identified by passengers and staff but also complement the amenities already available in the surrounding area.



6. Flexibility and efficiency throughout the infrastructure's life cycle

A mobility hub's design should seek to maximise the infrastructure's lifespan, by providing it with the necessary versatility to adapt to future changes in demand and operational requirements, as well as potential unforeseen uses of the space that were not anticipated during its conception.

In this way, the need to integrate emerging solutions that may require structural changes (for example, preparing electrical systems for future installation of electric vehicle charging stations) should be anticipated.

Additionally, the hub's design and choice of materials should consider means that allow adaptability to new functional and operational paradigms (for example, reducing the area for in-person ticket offices or expanding commercial areas).



7. Environmental, social and financial sustainability

A mobility hub should contribute to the well-being and enrichment of the residents in its vicinity, thus boosting the benefits for local communities.

Energy-efficient and carbon neutral solutions should be favoured through the responsible use of natural resources and the minimisation of waste production and pollutant emissions, promoting circularity during both the construction phase and throughout the entire lifespan of the hub.

3 Diversity of people using the space

As stated in the guiding principle “Equality and autonomy in access and use of space” (see [section 2](#)), the design of the hubs should ensure inclusive, equitable and indiscriminate use of the hub to all individuals who wish to use it. Similarly, the established concept of a mobility hub promotes a vision of space that goes beyond its function as an aggregator of mobility services.

It is therefore essential that space be planned from the perspective of users by adopting a people-centred design approach that reconciles the diverse needs and expectations of the various communities and the types of use that the space will accommodate.

Therefore, and in an attempt to typify the main user profiles of a mobility hub, the specific aspects of the following groups should be taken into account:

- 1. Frequent passengers:** people who visit the hub regularly with the primary purpose of meeting their mobility needs (e.g. commuters). They are well-acquainted with the space as well as the transportation services they typically use. They tend to have a highly functional approach to the space and are particularly demanding when it comes to the efficiency of services and the smooth flow of routes within the interface. Their mental map is configured based on their routines, and their decisions are typically automatic and subconscious.
- 2. Occasional passengers:** individuals who visit the hub sporadically (or even just once) for journeys outside of their daily routine. They are less familiar with the space and the services offered, tending to be less autonomous than frequent passengers. Typically, they arrive at the hub with more buffer time and spend longer moving around within it, spending more time in decision-making and waiting areas.
- 3. Visitors:** people who go to the hub (regularly or occasionally) to enjoy amenities which are not directly related to transportation services, or to accompany passengers (meeters and greeters). They prioritise public space amenities, consumer services (such as shops, restaurants and cafés), socialising spaces, and recreational and leisure activities.

- 4. Staff:** people who work at the hub (permanently, such as support staff for operations or commercial facilities, or temporarily, as in the case of drivers). These individuals are typically very familiar with the space and the services offered. They spend extended periods of time at the hub, including rest breaks, so they value spaces that allow for rest and promote their physical and mental well-being. Similarly to frequent passengers, they tend to value amenities and facilities that optimise their personal tasks and facilitate their daily routines.

It is also important to emphasise the diversity of needs that must be considered in designing a mobility hub, in particular people with specific needs. This includes pregnant women, crutch or cane users, wheelchair users, people with dwarfism, blind people with guide dogs, D/deaf people, people on the autism spectrum, people with attention deficit hyperactivity disorder and people with any other temporary or permanent disability or neurodiversity, whose level of access and functionality is substantially compromised by the conditions provided in the space, preventing them from enjoying these spaces as full-fledged citizens.

In creating a hub, the absence of barriers and the various dimensions of accessibility — motor, sensory or intellectual — should be envisaged **from its conception**, rather than being an afterthought.

4 Macro layout of the hub

Mobility hubs are made up of five main areas (or zones) based on their functional characteristics, as shown in [Figure 2](#). It is important to note that their configuration and internal distribution should aim to optimise functional relationships and the smooth flow of movement between the surrounding multimodal area (1), the central access area (2), the facilities area (3), and the operational area (4), to ensure that the journey between the central access area and the platforms is completed in five minutes or less² (excluding ticket purchase time):

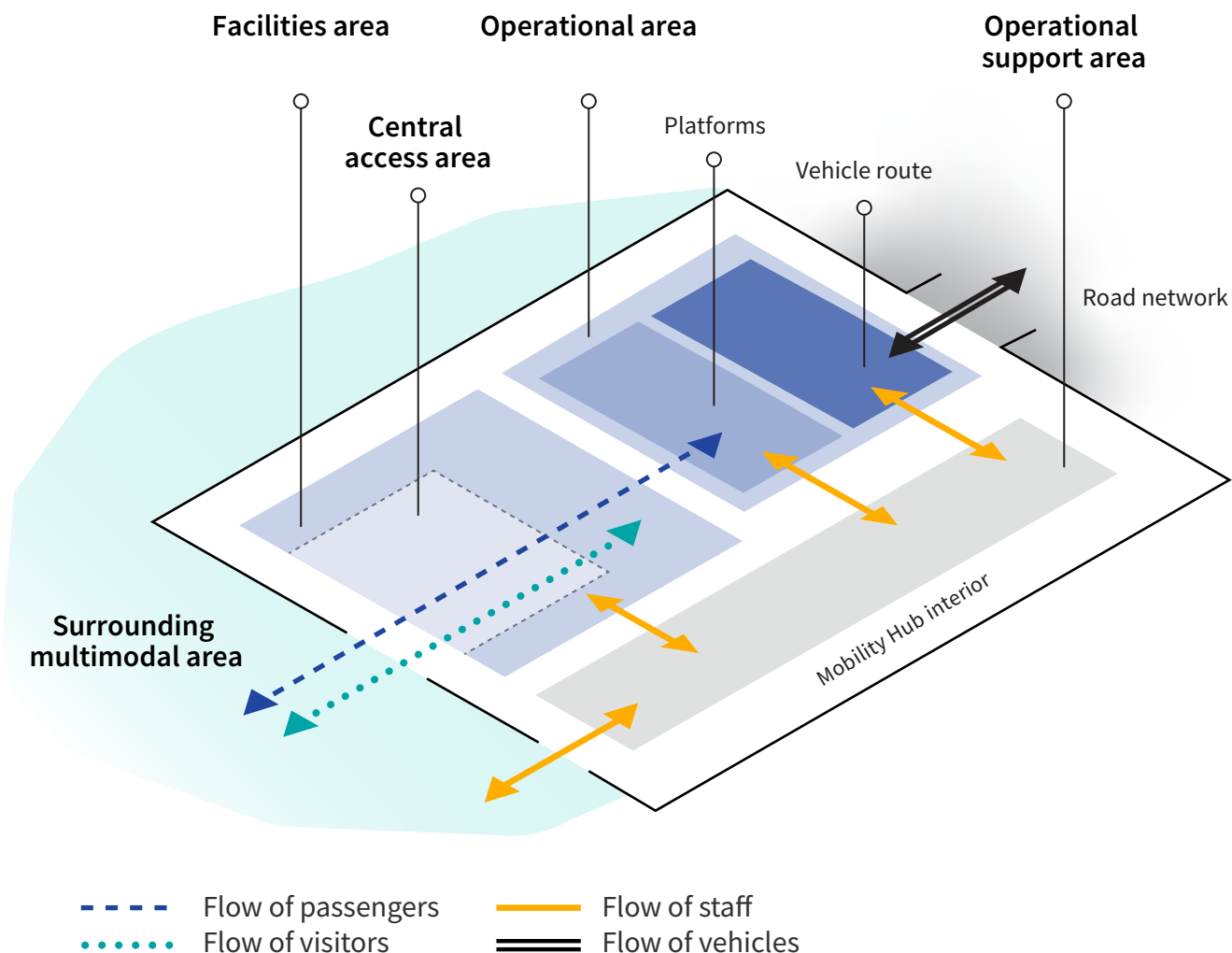


Figure 2: Macro layout of mobility hub (generic outline)

² Assuming an average walking speed of 4 km/h.

1. The **surrounding multimodal area** is where the connections between the hub and the surrounding exterior areas are ensured, as well as the various modes of transportation existing in its area of influence. These connections should be direct and efficient to enhance integration between transportation modes and promote the multimodality of journeys.
2. The **central access area** is the main access area to the hub. This is where the **primary flows of passengers and visitors entering and exiting the hub** are concentrated. As this area connects the surroundings with the hub's internal spaces, it is where people's first contact with the interior or exterior of the hub takes place. **The primary function of this area is to guide and support people.** Flows of people who do not intend to enter or exit the hub should be avoided here to prevent conflict caused by crossing traffic going towards other areas.
3. The **facilities area** is a central, publicly accessible (non-restricted) zone of the hub where the **main services for passengers and visitors** (including meeters and greeters) are concentrated, **as well as the main waiting areas.** Facilities offered in this area include passenger support services (e.g. ticketing), services and amenities that meet minimum and expected needs (e.g. toilets, water fountains). It also provides complementary services to enhance the experience of passengers or other visiting communities, such as people living in the vicinity of the hub (e.g. supermarkets, restaurants).
4. The **operational area** provides access to the transportation services operated at the hub. It is where **passenger boarding and alighting platforms** are located, along with **spaces and equipment to support the operation** of collective road transport, such as bus parking or bus maintenance and cleaning services. Whenever space permits, this area should have restricted access for individuals with valid transportation tickets and authorised personnel. Passenger access should always be ensured through the facilities area.

5. The **operational support area** is where other spaces and equipment required for the effective operation of the hub are concentrated, such as **operational control and maintenance functions**, as well as **staff facilities**. This area should have direct access to the hub's other internal spaces, ideally through dedicated circulation corridors, as well as direct connections to the surrounding area to ensure (dedicated) staff access to the hub.

Recommendations based on journey type

The level of ambition and specific options for each area will depend largely on the type of journeys offered at the hub, whether they are:

- **Local trips**, urban and metropolitan connections.
- **Long-distance trips**, national and international connections.

The guidelines and requirements of the guide will present (in a text box similar to this one) different elements to consider whenever the design of spaces and equipment in the respective area depends on the types of transportation services offered.



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