

City-HUBs:

Sustainable and Efficient Urban Transport Interchanges

Summary

This City-HUBs project focuses on the design of “sustainable and efficient interchanges”, aiming to provide guidance and recommendations to enable seamless mobility, travel efficiency, user satisfaction and improved performance of the interchange. The main concern is to ensure that all people are given equal opportunities for reaching their destination, to optimize interconnections between alternative modes in the trip and, at the same time, to ameliorate interchange space utilization and integration in the city context.

The approach is based on a concise analysis conducted within the City-HUB project, which has the main objective: to contribute to developing intermodality standards, minimum requirements, quality management tools, benchmark case studies and public transport service levels in Europe. All these elements will provide the definition of operational good practices for urban interchanges and respective guidelines across European countries.

INTEGRATED TRANSPORTATION IN AN ERA OF CHANGE

Over recent decades, integrated transport has become one of the most prominent topics and areas of interest, in which the contribution of the EU has been realised by the formation of concrete policies in the topic, the creation of funding transport facilities and the definition of priorities for different transport networks (Adamos et al. 2012).

As a follow-up to the 2011 White Paper, in 2013 the European Commission produced the “Urban Mobility Package”, which introduced the concept of “Sustainable Urban Mobility Plans” (SUMPs) (Annex I to COM (2013) 913 final 2013). The concept defines the basic characteristics that a modern and sustainable mobility and transport plan should include, and comprised *the balanced and integrated development of all modes* as one them.

Although the European Commission has been addressing the upgrading of urban interchanges in order to increase public transport use (COM 2001), the results in terms of impacts on increasing intermodal trips remains very low. It is therefore essential to build an understanding of the key factors of interchanges that affect public transport and intermodal/multimodal trips.

Good practices of urban passenger interchanges in Europe were firstly presented in the GUIDE (Group for Urban Interchanges Development and Evaluation) project (Terzis and Last 2000). In their analysis, interchanges were considered as an inescapable feature of supporting seamless public transport.

Experience has shown that the introduction of interchanges increases the use of public transport (Monzón et al. 2013; Di Ciommo et al. 2009; Brons et al. 2009). The European Commission has started on a path towards the upgrading of urban interchanges for increasing public transport use along with many Public Transport Authorities worldwide (COM 2001). A key role for increasing the use of public transport and soft modes and the reduction of private motorised trips is related to users' perceptions and preferences in respect to time savings and time use during the intermodal trip (Crozet and Joly 2004). Various other studies using a pure utility approach show that transfer time is perceived as negative and as a disutility (Mackie et al. 2001). To pay more attention to the physical location where the transfer happens will be a key issue for attracting additional users of intermodal trips. Urban interchanges are oriented to increase comfort, safety and security perception during public transport use, making intermodal trips more attractive. This is a way to reduce car dependency in sprawling cities: the trade-off is no longer between planning more to travel less, but between planning more for better travel (i.e. low carbon transport). Therefore, the EU Directorate of Transport Research identified urban interchanges as key infrastructure for sustainable mobility, and defined a proposal for extensively analysing urban European interchanges.

The novelty of the City-HUB approach has been to focus the attention on the physical space where people interchange between two modes of transport. It has adopted an holistic approach including three key domains for managing, operating and using an interchange: governance, service and user requirements.

CITY-HUB VISION OF INTERCHANGES

The City-HUB project focused on defining different issues of multimodal trips in urban areas. However, although European transport research budget funding for intermodal policy and technology projects is 10% of the total transport research budget (TRI-Value, 2014), the results in terms of impacts on increasing intermodal trips remain very low. This means that cities require greater effort, to improve the understanding of the key factors for increasing public transport trips through improving intermodality, and that this process of transferring from one mode to another usually takes place in more efficient conditions at modal interchanges. Different multimodal trips require different types of interchanges.

The City-HUB project starts from an holistic approach taking into account these different perspectives and including elements affecting the quality of an interchange for the transport services; the different stakeholders; and the city itself (see Figure 1-1 City-HUB vision of interchanges.).

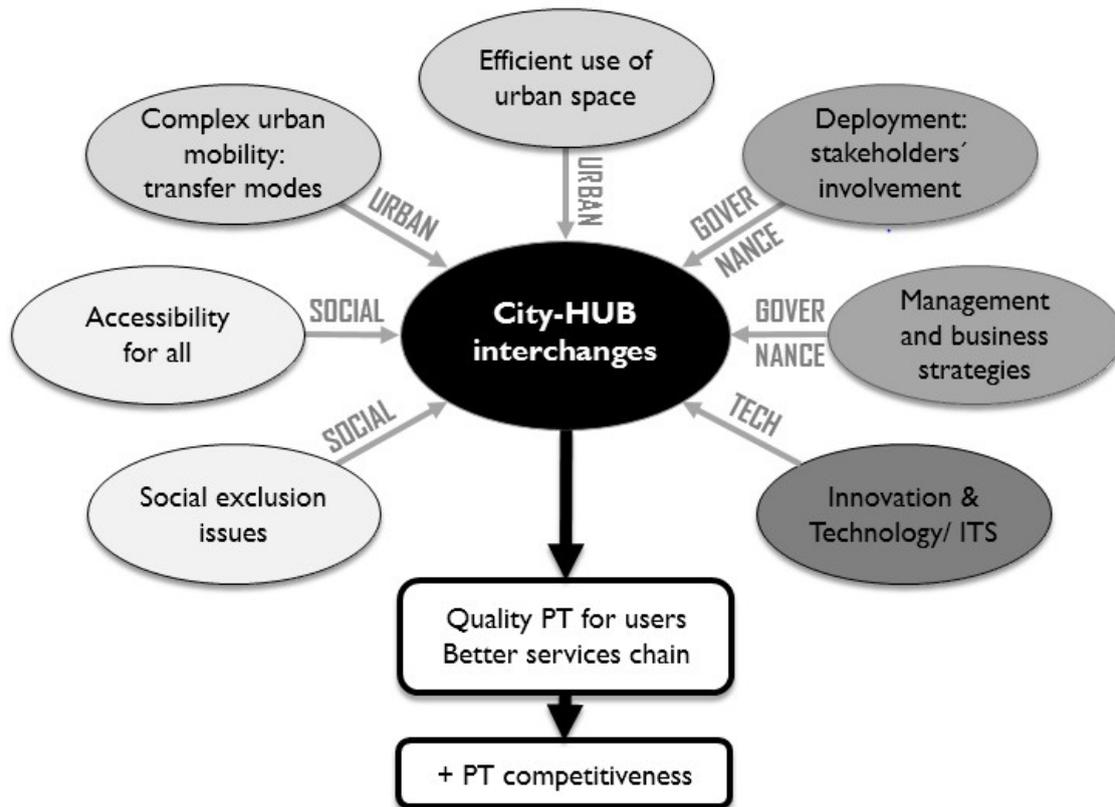


Figure 1 City-HUB vision of interchanges.

The City-HUB vision of interchanges starts by establishing the needs of urban mobility patterns and how to use scarce space in urban areas for a transport interchange. The function of an interchange station is to reduce distance between two different urban areas and, therefore to facilitate multi-activities patterns. The location and design must pay attention to social aspects such as accessibility and social exclusion issues. Information and Communication technologies have a key role for assuring solutions and

their efficiency. But all these technical and urban mobility aspects should fit within adequate business models for strategic stakeholders to promote and manage interchanges.

The main added value of the City-HUB vision is that it provides a multidisciplinary approach, which amalgamates relevant scientific and policy aspects. These refer not only to specific mobility issues, but also to technology, economic, land use planning and social concerns. Figure 1-1 outlines the main priorities of the City-HUB interchanges.

One of the main priorities of the City-HUB vision is related to the current concerns of EU policy makers on urban mobility, in particular with the need to **improve the quality of public transportation services**. According to the Transport White Paper (COM 2011), mobility is vital for the internal market and for the quality of life of citizens as they enjoy their freedom to travel. In this context, the quality, accessibility and reliability of transport services will gain increasing importance in the coming years, inter alia due to the growth of the population, urban sprawl and the need to promote public transport (Ewing 2008; Vuchic 2005). Comfort, easy access, reliability, attractive frequencies of services and intermodal integration are main characteristics of service quality. The availability of information over travelling time and routing alternatives is equally relevant to ensure seamless door-to-door mobility.

Many metropolitan authorities are implementing policies designed to promote public transportation through increasing the investment in new infrastructure and improving the quality of the public transport services offered. However, in spite of the advantages that promoting public transportation has in terms of the reduction of externalities (pollution, carbon emissions, noise, congestion, and so on), investing in new infrastructure is often very burdensome for municipal and regional governments, who presently are having to face serious budgetary constraints (Di Ciommo et al. 2009).

In this context, **urban transport interchanges** play a key role as components of public transport networks to **facilitate the links between different public transportation modes**, particularly the connection of bus services to the subway and metropolitan railway system (Vuchic 2005). Research literature shows that the benefits of urban interchanges mainly relate to time saving, better use of waiting time, urban integration, and improving operational business models (Di Ciommo 2002).

In summary, the City-HUB approach has developed an integrated model which embraces the different aspects of an interchange in order to decrease the barriers to the use of public transport, improve the quality, and propose a business model related to the interchange typology. The approach will help frame pathways to obtain maximum efficiency by upgrading existing urban interchanges or by building new ones and make these more efficient and accessible to all users.

ROADMAP OF CITY-HUB PROJECT

This section proposes the roadmap for the City-HUB Model that aims to provide guidelines that support stakeholders in realising successful interchanges based on the results of the City-HUB project related to the integration of design and management of an interchange in response to travellers' desires. The City-HUB project has based its

research activities on the detailed knowledge of the state of the art, the consultation process with stakeholders and users' experiences and expectations. The implementation process was carried out in different situations and scenarios across Europe using selected case studies based on new and improved urban interchanges.

Within the City-HUB project, the consultation process was designed to understand the key factors for efficient interchanges from the point of view of stakeholders and users. After a comprehensive literature review, this process was based on analysing operations and performance data collection and surveys. Figure 1-2 shows the process based on the analysis of 21 selected interchanges. The lessons learnt from these case studies served as inputs for validating the City-HUB Model through 6 additional case studies.

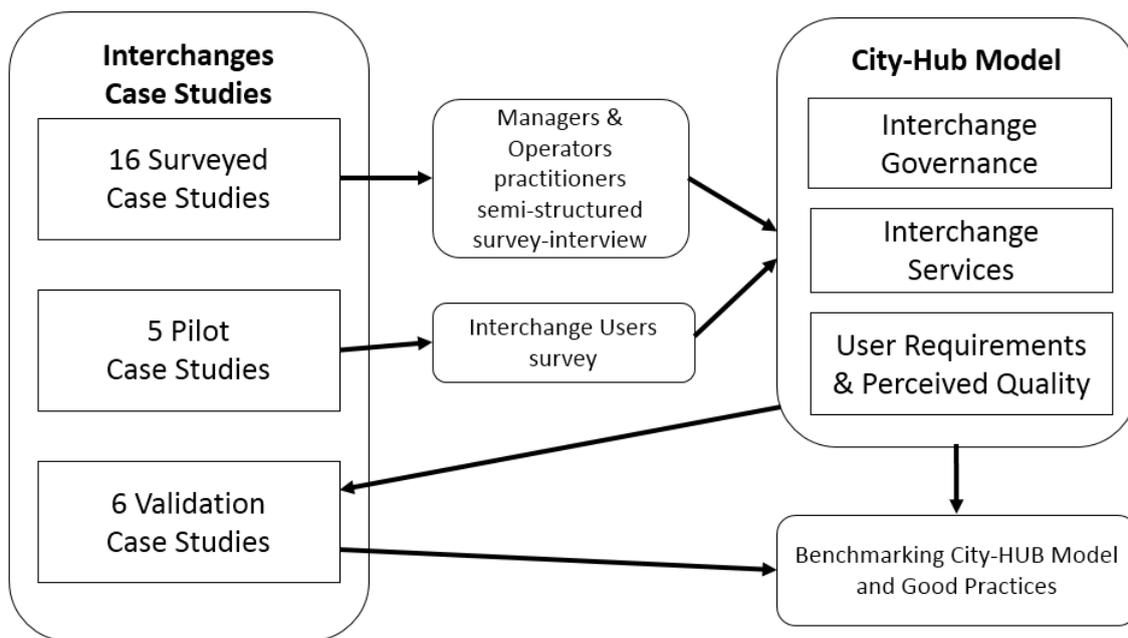


Figure 1-2 Process to develop the City-HUB Model.

The semi-structured interviews of operators and managers in 16 surveyed case studies (see Annex B) settled the basis for developing the analysis and proposals for the Governance and Services of Interchanges. The 2,000 attitudinal surveys in the 5 Pilot Case Studies (see Annex C) served to identify the key factors for travellers at interchanges. This included their perceived quality of the existing services and the need for improvement. In summary, this process allows us to define the City-HUB Model that considers all the aspects for interchange deployment and management and also its integration in the local business and urban fabric. This Model corresponds to the multiple faceted vision of stakeholders and users.

Eckstein (1975) emphasised that the selection of case studies could provide maximum analytical leverage. A least likely and most likely approach can thereby make it possible to find robust support for theories and hypotheses. A least likely approach selects cases which are at the limit of the theory's boundaries, while a most likely approach could identify good reasons for refusing a theory since it is selected from the heart of the theoretically defined scope. In order to validate the City-HUB Model it is necessary to emphasise the careful selection of the case studies (Lijphart 1971). Our point of departure

within the various case studies has been to select cases that are comparable for specific elements, but which are also diverse (Ragin et al. 1992).

The final set of 6 validation case studies was used to assess good and bad practices and to identify improvement potential for developing a successful interchange. From some of the validation case studies it could also be understood that the model was assumed to be more useful for larger than for smaller interchanges. For instance, the more modes involved, the more stakeholders, the stronger need to have an holistic model such as City-HUB. Likewise, the more passengers, the more need to separate passenger flows, offer relevant services, etc.

When moving through the sections, the reader will first be informed about the significance of interchanges in the domain of intermodal transportation, European Policy and goals for increasing interchange effectiveness, and the assessment of the main components of an interchange. Throughout the first two sections, it is presented a synthesis of the literature and the findings of City-HUB project depicting the necessary actions and steps to be undertaken towards delivering a successful interchange, in relation to:

- Governance, which incorporates the identification of the stakeholders, and interchange users, their roles, methods for developing a cooperative scheme for efficient and mutually accepted decision making, development of business models and monitoring and assessment of the implementation performance.
- Services, which are related to the physical design, transportation modes, information provision at the interchange about the interchange and the trip, and visitors' facilitation during their stay at the station.
- User needs and expectations into the interchange design and operation, which involves conducting surveys for data collection about expectations and perception on service quality assessment.

Implementing the guidelines on good practice is the main topic of section three. In this last section the guidelines developed in section two are applied in selected interchanges, validating them and providing valuable and practical feedback on their actual implementation.