Fostering passenger intermodality

In a nutshell

SUMMARY
It is best practice to encourage the development of convenient, safe, fast and seamless connections among sustainable modes of transport. Intermodal transport systems link together the infrastructure and services for public transport (buses, trams/light rail and commuter rail), walking, biking, bike sharing, and car sharing. Public administrations can foster passenger intermodality by cooperating with various public transport operators and bike- and car-sharing companies.
Target group
Public administrations responsible for mobility and/or public transport in their territory
Applicability
This best practice is applicable to all local authorities but particularly relevant for cities with complex transport networks and an extended territory.
Environmental performance indicators
• Modal share of journeys (% of journeys made by car, motorbike, public transport, cycling and walking) • Average number of bicycle park spaces at public transport stops per average daily passenger throughput (number of bicycle park spaces/number of passengers) • Percentage of public transport users who combine it with walking/cycling out of the public transport users who live within a reasonable radius (800 m for walking and 3 km for cycling) of high-frequency (at least twice per hour during morning and evening rush hours) public transport stops (%) • Intermodal journey-planning software available to the inhabitants includes walkable and cycleable journey legs (y/n)
Benchmarks of excellence
The share of sustainable modes of transport used in the city (e.g. walking, cycling, bus, tram, train) is 60 % or higher

Description

The tendency over the past several decades has been for many people to view car-based travel as the best mode of transport from the origin to the final destination due to its high level of comfort and convenience. There is also the perception that it affords the greatest freedom of mobility. However, the environmental problems caused by this practice have become ever more pressing: Traffic congestion, increased air and noise pollution, inefficient use of valuable space and an overall reduced efficiency of the transport system are only few of the most prominent ones. The solution is for public authorities to encourage the development of convenient, safe, fast and seamless connections between more sustainable modes of transport; in short: fostering intermodality.

In a smoothly integrated intermodal system people might start their journey as a pedestrian, and then become a driver or a cyclist, then a passenger, and then a pedestrian again for the final metres. Through a clever combination of modes they would avoid each mode’s specific and often inevitable weakness while at the same time utilise their various strengths.

In practice, however, intermodality can never compete with the "one-seat ride" characteristic of the private car. Interchange points often contribute to feelings of uncertainty for the traveller due to unclear signage or pathways at the point of transfer and the potential for delays. Therefore, where, when and how sustainable modes are interconnected plays a large role in their total attractiveness when compared to relying only (or mostly) on the passenger car. The extent to which the connections between modes are quick, easy, safe, reliable (in the sense "as planned") at the designated modal choice nodes ultimately determines the attractiveness of the more sustainable journey option(s).

Intermodality is achieved through the effective intersection between urban land use planning and transport planning in order to make better use of the existing transport infrastructure. Public administrations have an important role to play in this context, as transport infrastructure providers, as facilitators, owners of land space for intermodal hubs, providers of information and as a broker who brings representatives of different modes together. Public administrations can therefore foster passenger intermodality by cooperating with various public transport operators, bike- and car-sharing companies to ensure smart and seamless connections between modes. Intermodal transport systems link together the infrastructure and services for public transport (buses, trams/light rail and commuter rail), walking, biking, bike sharing, and car sharing.

When implementing measures which foster passenger intermodality, public authorities need to consider the interoperability of different transport systems and modes and how they can best collaborate with providers of both 'hardware' (e.g. infrastructure) and 'software' (e.g. ITS, ticketing). First, the existing structure of the transport network plays a large role in identifying the location and configuration of modal choice nodes, which has an influence on the nodes' attractive capacity and ultimately the intermodality of the transport system (Ambrosino & Sciomachen, 2006). In short, this means that it is important to first work with the existing transport infrastructure by creating smarter links between modes wherever possible. This is the most cost-effective solution which can produce quick wins. Therefore, this best practice sets five key measures to be implemented for an effective intermodal transport system:

- Modal choice nodes: Conveniently placed multimodal transport hubs, also referred to as "modal choice nodes" (Ambrosino & Sciomachen, 2006) which are typically formed around existing public transport stops or stations and which have clear signage and information;
- Infrastructure network: A comprehensive network of infrastructure for public transport (e.g. established bus routes, tram or rail lines), bike lanes on existing roads and separated paths for walking and cycling built with safety and accessibility in mind, including the ability to bring bikes onto transit;
- Intermodal journey planning software: Provision of real-time intermodal journey planning information tailored to individuals' travel needs, e.g. through the use of intelligent transport systems (ITS) for apps and a website, ideally also considering cycling and walking as well as available car sharing and bike sharing schemes.;
- Integrated ticketing and e-ticketing;
- Pricing and demand management schemes: e.g. congestion charging.

The EU-funded SYNAPTIC project (2012) provides a clear conceptual overview of the various aspects which need to be considered for intermodal trips. Figure 1 provides a representation of a typical multimodal journey, while the following list comprises the main factors which need to be considered when planning measures that foster intermodality:

1. Journey planning at the 'home hub'
2. 'First mile' connections, from origin to local interchange
3. The local interchange experience
4. Feeder access to major interchange
5. The major interchange
6. 'Hub-to-hub' services
7. The destination interchange
8. 'Last mile' connections, from final interchange to destination

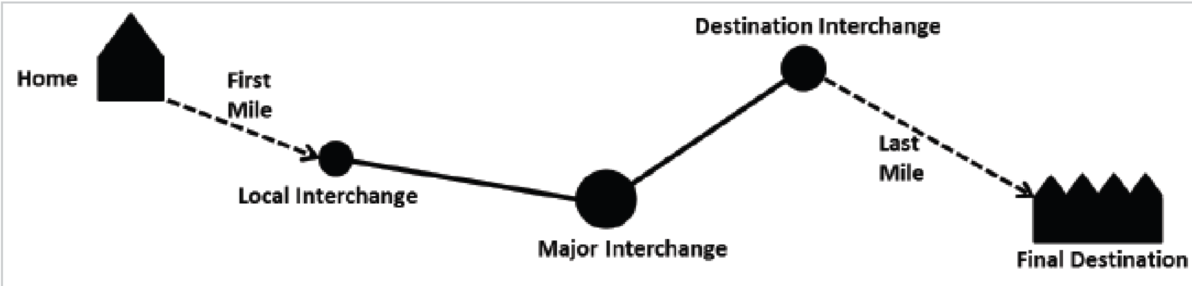

Figure 1: Diagram of a typical multimodal journey (*Source: SYNAPTIC, 2012)*

In essence, fostering intermodality means thinking of mobility as a service which should be made available to all citizens. Sampo Hietanen, CEO of ITS-Finland, a not-for-profit public/private sector association, defines the concept of Mobility as a Service (MaaS):

“The vision is to see the whole transport sector as a cooperative, interconnected ecosystem, providing service reflecting the needs of customers. (…) The ecosystem consists of transport infrastructure, transport services, transport information and payment services” (Hietanen, 2014).

One of the main findings of the EU-funded INTERCONNECT project was that fostering intermodality requires “co-operation between a range of authorities and providers in the public and private sectors and may necessitate a wider vision than might otherwise prevail”, and that organisational issues relating to this wider vision heavily influence the development of intermodal systems (Bak, Pawlowska, & Borkowski, 2012). Further, Bak et al. (2012) cite institutional barriers, lack of investment and failure to innovate as the main institutional challenges for effective interconnection of modes. It is therefore important for public authorities to act as an effective broker who brings representatives of different modes and sectors together to reach a common vision for a coherent intermodal transport system.

Policies which aim to solve mobility challenges and create a more integrated, sustainable transport system require a holistic approach of multi-sectoral (horizontal), multi-level (vertical) and cross-territorial cooperation. Public authorities need to consider the interoperability of different transport modes and how they can best collaborate with providers of both ‘hardware’ (e.g. infrastructure) and ‘software’ (e.g. ITS, ticketing). As previously mentioned, intermodality is achieved through the effective intersection between urban land use planning and transport planning in order to make better use of the existing transport infrastructure. Therefore, public authorities should involve all relevant internal departments (e.g. building and land use, urban planning, transport, environment, energy, etc.) and may need to cooperate with neighbouring authorities (e.g. municipalities, local authorities, communities, districts, etc.) in order to determine the best locations and configurations for modal choice nodes and additional infrastructure. Cooperation with the private sector may also be needed for features such as car sharing, bike sharing and creating intermodal journey planning software. The end result should be an interconnected, coherent transport system which meets citizens’ mobility needs while enabling them to travel more sustainably.

To illustrate this BEMP, three cities have been chosen as frontrunners: London (UK), Bremen (Germany) and Lund (Sweden). These three cities represent good practice for fostering passenger intermodality in large, medium and small cities respectively. While the number of modes and their interchange points vary between London, Bremen and Lund, each city's approach is appropriate to scale, striving to make the smartest use of its transport system. The result is a modal share of sustainable modes of about 60% in all three cities (see Figure 2). Together, these three cities will demonstrate how public authorities’ approaches to fostering passenger intermodality differ across scales, and will therefore help to identify benchmarks of excellence which are widely applicable to cities across Europe.

Environmental benefits

The actual effects of a smooth integration of multiple transport modes are hard to predict and so are the related environmental benefits. After all, the convenience of combining the private car with cycling, public transport and walking could – theoretically – prompt a bicycle commuter to switch to a combination of motorised and non-motorised vehicles. In the majority of cases, however, the opposite shift is likely to materialise: people who typically use their private car from their origin to their final destination might discover that a clever combination of modes (all of which being at least to some degree more energy- and space efficient) does not cause more hassle, does not cost more money, does not take longer, is not less safe and overall not less convenient than the option with a private car. Ideally, a well-integrated multi-modal system is not only *not worse* but *better* than the car-bound alternative.

The cumulative environmental effects of successful efforts to turn multi-modal trips into a realistic and convenient proposition are identical to those accruing from less complex modal shift strategies. Related key benefits are therefore also mentioned in the BEMP on “Fostering walking and cycling.” The most important ones are related to a reduction of air pollution, through lower levels of NO_x, PM, SO_2, as well as to lower levels of CO_2-emissions. In cases where walking and cycling replaces motorised traffic, good intermodal systems further can cause a reduction of noise levels, which currently causes severe stress (exceeding 55Lden) for affects almost 67 million people, that is, 55% of the population living in agglomerations with more than 250,000 inhabitants (European Environment Agency, 2009).

Less exclusive and less intensive use of private cars also has positive effects on congestion levels and land use. These are environmental benefits that would not accrue from a strategy that focuses purely on the technical substitution of fossil with renewable fuels or with electricity. A relaxation of spatial pressures due to a reduced number of cars requiring parking space in a city, for example, can open possibilities to rededicated space to public parks and other convivial spaces as well as to habitats for wildlife, thereby increasing urban biodiversity. Of course, social and health-related benefits are also worth mentioning in local discussions about the benefits of a well-integrated multimodal transport system. Prominent among them are improved health levels due to more active transport and greater access to mobility for women, lower socio-economic groups and other marginalised groups.

Apart from these effects that stem from the *results* of intermodal integration initiatives it is also important to note that related *measures* can have positive environmental effects in themselves. The main ones are related to the increase of urban density, which is an integral component of any effort to foster non-car-bound modes of travel. A higher concentration of people living within walking distance of transit stops, for example, does not only help to make public transport more financially viable but also typically reduces distances overall and can help to preserve valuable land for other uses. This is, again, very similar to nearly all modal shift strategies.

Side effects

The creation of improvement of “intermodality-facilitating” infrastructure often requires additional space in dense urban settings. Therefore, one of the first areas of potential impact is the additional land area needed to construct modal choice nodes and additional transport infrastructure (e.g. cycling paths, tram lines, etc.). This might even encroach on existing green spaces. Bicycle parking is one such example which takes up a certain amount of space – often in the very core of a city. However, car parking takes up even more space, so it could also be argued that the increased land use needs for fostering sustainable passenger intermodality would be offset by the reduced need for car parking spaces. This of course assumes that as part of its plan to foster intermodality, the public authority would in fact actively reduce the available car parking spaces, which is highly recommended indeed.

It is also important to be aware of the possibility for an unfavourable “cannibalisation across different sustainable modes of travel” when intermodality measures are implemented. As public transport becomes faster and more convenient, some cyclists and pedestrians (i.e. the modes with the least environmental impact) might decide to switch to public transport more often. While public transport is considered a relatively sustainable mode of transport – particularly when compared to only using a car – it still uses energy which typically results in GHG emissions. However, ideally the convenience of intermodal journeys using mostly sustainable modes would reduce the likelihood that people would switch to mostly relying on a car.

Sometimes policies with the best intentions to improve intermodality result in unforeseen consequences for the city’s modal split. For example, Munich's efforts to create ‘bike-friendly legislation’ in its *Radlhauptstadt* initiative resulted in a successful increase in the share of cycling, from 8.1% to 14% between 2000 and 2008. However, this came at the expense of walking and public transport, which decreased by 7% and 11% respectively (Marsh & Ritzau-Kjaerulff, 2012). At the same time, the car modal share increased by 13%. This result in Munich highlights the need for holistic approaches to fostering intermodality which cover more than just one mode at a time.

Applicability

All cities can benefit from measures which foster intermodality. The question which public authorities should ask is which of the five aspects from the intermodality ‘menu’ it should choose to focus most of its attention on. This depends on a number of factors, from current environmental and social challenges, to the degree to which the city is already intermodal.

Modal choice nodes

The size and quantity of modal choice nodes should correlate to the size of the city in terms of population and density. For example, London is a megacity with many dense “centres” which call for large interchanges. It also offers the widest variety of modes. One example is the Vauxhall Interchange is a large complex which links the London Underground with bus as well as cycling and Barclays Cycle Hire points. Bremen, as a medium-sized city which also happens to be the least dense of the three frontrunners, has a large interchange at the central station and several mobil.punkt hubs throughout the city which integrate car sharing. The smallest city on the list, Lund, is quite dense and takes up less land area. It also only has two forms of public transport: rail and bus. Therefore, its main modal choice node is the central station, and its multiple bus interchanges integrate walking and cycling.

Infrastructure network

The existing infrastructure is the first thing that a public authority should analyse, because there may already be very quick and simple solutions for improved integration which could have a big impact. For example, there already may be a comprehensive network of cycling paths and many well-placed bus stops, but no bike parking and a lack of timetable information and maps at the bus stops. Bike parking and paper maps are a first step towards a more intermodal transport system which attracts more users, and the costs are relatively low.

It can also help to look at the modes already in use, and their modal share. This may provide further insight into trends and disconnects between modes. For example, if there is a strong cycling culture, but a low share for public transport and a high share for car use, then focusing on integrating cycling and public transport could draw car users to these more sustainable modes.

Intermodal journey planning software

Journey planning software is often the point of entry for attracting potential new users, and it is applicable in all local contexts. It has the potential to showcase all available modes in a city and their connectivity for different journey types. Most public transport providers already offer a journey planning tool, although many only incorporate public transport and walking. Public authorities can therefore engage with the public transport providers and other potential partners to incorporate data from other modes into the journey planning software. This usually does not cost very much, and is another “quick win” for a public authority to explore.

Integrated ticketing

Much like intermodal journey planning software, integrated ticketing is also applicable in any urban context with multiple modes. The main issue is with the cost of implementing an integrated ticketing scheme. There would also need to be enough users of the system to justify the scheme.

Pricing and demand management

Congestion charging is perhaps the most controversial and least transferrable characteristic of an intermodal transport system. It tends to work best in large cities which have severe traffic congestion. In order for such pricing and demand management schemes to work as “push” measures, there also needs to be adequate access to sustainable modes that will do an effective job of “pulling in” users.

Economics

As set out in the description section, enhancing the intermodality of a transport system relies on the implementation of a series of measures such as improving interchanges, providing safe and attractive walking and cycling infrastructure and the introduction of integrated ticketing. The costs of delivering individual measures do of course vary significantly, while the benefits to travellers could be expected to increase cumulatively as more and more improvements are made across the network – i.e. the overall improvement to the journey experience for a person making a multi-modal trip would be greater than the sum of individual parts.

In the case of Lund, the total costs of running and implementing the project proposals is estimated at SEK 75-80 million (8.1-8.7 million EUR), while investment costs are estimated at SEK 1-3 billion (100-330 million EUR). To this must be added increased operational costs of SEK 5-10 million (550,000 to 1 million EUR) per year as a result of investment or new services” (Lunds kommun, 2007). Undertaking a cost-benefit analysis of a full package of intermodality measures such as this would be immensely challenging, with results relying on many informed assumptions. Nevertheless, a review of some of the Cost Benefit Analyses (CBA) tools developed by mobility practitioners provides a means for identifying the key factors that can be taken into account from the perspective of transport users, operators and providers.

The KITE European knowledge base for intermodal transport CBA tool and UK Department for Transport TUBA (Transport Users Based Assessment) tool identify costs and benefits including the following (Department for Transport, 2014;

Rodrigues, 2009; Transport for London, 2014b):

- Intermodal transport scheme cost
- Overall speed of the journey – values of time are input to TUBA as perceived costs.
- Levels of walking and waiting time at interchanges
- Comfort of the journey – points for consideration include number of seats in waiting areas, cleanliness, weather protection and provision of cafes or shops. In relation to this, it is worth drawing attention to TfL guidance that advises “an interchange can become an identifiable place, with its own character and with potential to become a destination in its own right. This means that an upgrade is likely to boost real estate values and retailers’ turnover. In some cases (e.g. Hong Kong) the city benefits economically from such measures by means of a special policy that allows them to skim some of this value increase for their municipal purse” (Transport for London, 2014b). The cost of interchange improvements may therefore be partly funded by commercial interests, and the ability of travellers to undertake additional tasks such as shopping can be factored as a further benefit.
- Safety and security
- Cost of the journey, such as vehicle operating costs and fuel costs

The environmental benefits of intermodality should also be factored into any assessment of proposals, along with the proven health benefits of walking and cycling.

Clearly different cities have different starting points, in terms of which aspects of intermodality can be improved, and different budgets available. Some cities may need extensive retrofits or expansion of the infrastructure for public transport, cycling or walking which are costly upfront, but which would reap great environmental, social and economic benefits in the long-term. Other cities may only need to do minor adjustments to existing transport hubs to make them more user-friendly. Cheaper options include: improving information/signage, introducing an ITS trip planning website and app, and providing bicycle parking.

The financial and economic issues of intermodality issues have often been found to interact with organisational issues, creating barriers to improving the transport network overall (Bak et al., 2012). For instance, those stakeholders experiencing the greatest benefits of transport network improvements may not be the same as those financing the improvements. The EU-funded EVIDENCE project, which runs from March 2014 until February 2017, seeks to provide advice to decision-makers about the proven economic benefits of sustainable transport initiatives which foster intermodality (EVIDENCE, 2014). It could therefore provide proof for public authorities seeking to promote and implement intermodality programmes.

Driving forces for implementation

Fostering passenger intermodality requires a holistic approach to transport planning and management, meaning that all three pillars of sustainability are taken into account: environmental, social and economic. Because of this, the driving forces for implementation are often three-pronged. London's drive for implementing measures which foster passenger intermodailty are to “mak[e] public transport more attractive to existing and potential passengers” and so that “the transport system, including interchanges, can contribute to the achievement of broader economic, social, and environmental objectives” (Transport for London, 2014a). Lund was motivated to improve intermodality so that “the city and its transport system will be jointly developed to create a sustainable, attractive place that people will want to visit and live in” (Lunds kommun, 2007). The LundaMaTs II plan also states that its goal is to reduce CO_2 emissions from transport per resident by 40% by 2030. Bremen was motivated to improve the urban quality of life by using public space more efficiently and recovering areas for social and ecological functions (WerkstattStadt, 2011).

The immediate and overall goal is to make the most efficient use of the existing transport system. The following factors are the main drivers for a public authority to take a closer look at its overall sustainable mobility strategy:

- Car traffic congestion is a problem which is remaining the same or increasing over time
- The city's modal split is out of balance (e.g. large share of car use, very little public transport, cycling and walking)

- Adequate transport infrastructure is currently available yet underused
- Increasing environmental concerns (e.g. GHG emissions) and rising petrol prices are often cited as driving forces in the implementation of solutions which foster intermodality (Burckhart & Blair, 2009).

Reference organisations

Table 4: Reference organisations in fostering passengers' intermodality

Location	Link/Project title	Intermodality component(s)
Strasbourg, France	http://www.carto.strasbourg.eu/Home	Comprehensive trip planner including multi modes
Almada, Portugal	http://www.eltis.org/index.php?id=13&study_id=2888	Tram filled the gaps between PT networ intermodal info guide (online and paper) + exampl of multimodal trips
Region of Basse-Normandie, France	Comment j'y vais in France: http://www.commentjyvais.fr/	Promotes carpooling for locations >5km from stop, and walking or cycling for <5km
The Netherlands	PT-bike http://www.ov-fiets.nl/	Promotes the multimodal trip using public transp and cycling
Department of Finistère, France	http://www.covoiturage-finistere.fr/ http://www.viaoo29.fr/	Stimulates carpooling through a matching webs and through the PT provider's online route plann complemented by parking near bus stops equipp with bicycle racks.
Bremen, Germany	mobil.punkte: http://www.360cities.net/search/mobilpunkt	Ten car sharing stations located near PT sto which also have bicycle racks and multimodal tra information.
Amsterdam, The Netherlands	OV-Chipkaart (OV-Chipcard)	Ferry services are integrated with the city's pub transport system; smart card system
Utretch, The Netherlands	Utrecth Zuilen (suburban station opened in June 2007)	Intermodality between walking, biking and train, w bicycle lanes, bike storage lockers, touch point O-V Chipcard and clear signage and timeta information. (See SYNAPTIC 2012).
Amsterdam, The Netherlands	Amsterdam Biljmer ArenA (suburban station)	Integration of bus/tram, metro, suburban rail a intercity rail within one clearly marked stati complex.

Newcastle upon Tyne, UK	GoSmarter (Schools Go Smarter and Go Smarter to Work) – partnered with neighbouring local authorities; Co-wheels car club (car sharing); one of the largest electric vehicle charge point networks in Europe; Go Zero	The GoSmarter campaign helps students a working adults to plan their routes to school a work using sustainable modes. GoSmarter offers Personalised Journey Plan as well as a variety activities and support. Co-wheels car club is a c sharing scheme which has a presence at the cent railway station. The Go Zero campaign aims reduce the city's GHG emissions, and includes route planning app which includes information car sharing and EV charging. In addition, Newcas has one of the largest electric vehicle charge po networks in Europe. People can charge their EVs free, and can also park for free as long as they a charging their vehicle.

Literature

Ambrosino, D., & Sciomachen, A. (2006). Selection of modal choice nodes in urban intermodal networks (Vol. 1, pp. 113–122). WIT Press. doi:10.2495/UT060121

Bak, M., Pawlowska, B., & Borkowski, P. (2012). Cases Studies in Improving Interconnectivity between Passenger Transport Modes-the Context of the EU Transport Policy Objectives. Procedia - Social and Behavioral Sciences, 48, 2738–2747. doi:10.1016/j.sbspro.2012.06.1243

Burckhart, K., & Blair, C. (2009). Urban intermodality: potentials for connecting the cities' public transport (pp. 63–72). doi:10.2495/UT090071

Department for Transport. (2014). TUBA: General Guidance and Advice. Department for Transport.

European Cyclists' Federation. (2010). FACTSHEET - Marrying Cycling and Public Transport. Brussels. Retrieved from http://www.ecf.com/wp-content/uploads/Factsheet-ITF2012-PT.pdf

European Environment Agency. (2009). Transport at a crossroads TERM 2008: indicators tracking transport and environment in the European Union. Luxembourg: Office for Official Publica-tions of the European Communities. Retrieved from http://www.eea.europa.eu/publications/transport-at-a-crossroads

EVIDENCE. (2014). EVIDENCE project. Retrieved August 11, 2014, from http://evidence-project.eu/

Glotz-Richter, M. (2004). Bremen's Integrated Mobility. Brussels. Retrieved from http://www.eltis.org/docs/studies/Bremen_s_Integrated_Mobility.pdf

Hietanen, S. (2014). "Mobility as a Service" - the new transport model? Eurotransport, 12(2), 26–28.

Lunds kommun. (2007). LundaMaTs II Strategy for a sustainable transport system Lund 2030. Trivector Traffic AB. Retrieved from http://www.lund.se/Global/Sidans%20katalog-pdf/lundamats2_lager_CN2_B_eng_orig.pdf?epslanguage=sv

Lunds kommun. (2014a). Spårväg Lund. Retrieved from http://www.sparvaglund.se/

Lunds kommun. (2014b). Uppföljning av Målen (review of goals).

Marsh, P. C., & Ritzau-Kjaerulff, T. (2012). Barriers to the Creation of a Bike-City - A study of Munich's transport policy.

Rodrigues, M. (2009). Deliverable D11 Guidelines for Assessing Intermodal Measures under Data Availability Constraints. TIS.pt – Consultores em Transportes Inovação e Sistemas, S.A. Retrieved from http://www.docstoc.com/docs/79737859/Guidelines-for-Assessing-Intermodal-Measures-under-Data

Stadt Bochum. (2012). Metropolradruhr – Jetzt auch in Wattenscheid! Stadt Bochum. Retrieved from http://www.bochum.de/C125708500379A31/vwContentByKey/W28SSDSE586BOLDDE/nav/6Y8CFR912BOLD

SYNAPTIC. (2012). S-MAP 2030 Seamless Mobility in North-West Europe Technical Report: "Any A to Any B." SYNAPTIC. Re-trieved from http://www.synaptic-cluster.eu/wp-content/uploads/2013/09/SYNAPTIC-Technical-Report-Any-A-to-Any-B-final.pdf

Transport for London. (2014a). Design and evaluation framework | Transport for London Interchange Best Practice Guidelines. Retrieved August 18, 2014, from http://www.tfl.gov.uk/microsites/interchange/16.aspx

Transport for London. (2014b). Design and evaluation framework | Transport for London Interchange Best Practice Guidelines. Retrieved August 18, 2014, from http://www.tfl.gov.uk/microsites/interchange/16.aspx

UITP. (2011, April). Becoming a real mobility provider - Combined Mobility: public transport in synergy with other modes like car-sharing, taxi and cycling... International Association of Public Transport. Retrieved from http://www.uitp.org/sites/default/files/cck-focus-papers-files/FPComMob-en.pdf

WerkstattStadt. (2011). Bremen "mobil.punkt." Retrieved August 22, 2014, from https://maps.google.de/?q=http://www.werkstatt-stadt.de/en/projects.kml&ie=UTF8&t=h&ll=53.07892,8.82436&spn=0.009023,0.018239&z=15&output=embedmfe