Travel information on urban public transport: a comparative analysis of Berlin and Amsterdam

Goede, E.; Nijkamp, P.

2002

document version
Publisher's PDF, also known as Version of record

Faculteit der Economische Wetenschappen en Bedrijfskunde

SERIE RESEARCH MEMORANDA

Travel Information on Urban Public Transport: A Comparative Analysis of Berlin and Amsterdam

Esther Goede
Peter Nijkamp

Research Memorandum 2002-11 March 2002

vrije **Universiteit** *amsterdam*

TRAVEL INFORMATION ON URBAN PUBLIC TRANSPORT: A COMPARATIVE ANALYSIS OF BERLIN AND AMSTERDAM

Esther Goede Peter Nijkamp

PN013EG

Department of Spatial Economics
Free University Amsterdam

Abstract

This paper emphasises the need for adequate travel information as a policy tool to increase the service leve1 of urban public transport. Particular attention is given to the role and competence of public authorities in offering proper travel information systems. Two elements in particular are highlighted, viz. the management perspective and the institutional context. By means of a comparative case study approach to Amsterdam and Berlin, the actual possibilities of public transport authorities are explored, while finally some policy conclusions are formulated.

1 Setting the Scene: The Need for Travel Information

Since the early beginning of human history people have coped with the 'tyranny of distance'. To overcome the limits of geographical space a big effort was needed. Caravan trails and sailing routes are examples of organising a logistic system that would allow for an expansion of the daily action radius. In modern times, this 'nomadic' behaviour has not changed. Only the transport modes have changed: the camel has been replaced by the car, the sailing ship by the airplane, the horse drawn carriage by the train, and so forth. In addition, the frequency of travelling and the distance of trips have increased significantly in the past centuries. Apparently, the modem man is permanently 'on the move'.

Spatial mobility is partly a result of human needs (e.g., recreation, tourism, social and cultural visits), partly an economic necessity caused by a worldwide product differentiation and division of labour. The rise in travel mobility has in recent decades confronted the western societies with severe problems related to the limited capacity of our logistic systems to absorb an ongoing mobility. These capacity limits are inter alia reflected in traffic congestion, environmental decay, resource depletion and lack of safety.

In the past years an intensive debate has started on the question how to cope with the above mentioned negative extemalities of transport in a mobile society. The remedies proposed range from market-oriented mechanisms (such as road pricing or eco-taxes) to heavy investments in public transport, notably (light) railway systems and bus systems. A major question is of course that the critical mass of flows of passengers or goods is by far not sufficient to warrant a huge sum of public expenditures in public transport infrastructure. There are only practically two cases where public transport might offer an economically feasible solution, viz. point-to-point connections between large population (or activity) centres (e.g. Madrid-Seville, Paris-Lyon, or Milan-Rome) and

metropolitan areas with a sufficiently large population size and density (e.g. Greater London, Tokyo). The interest of the present paper is predominantly in the latter issue, i.e., the potential of public transport in large urban areas.

The quality of urban public transport is usually not meeting high service standards. Numerous causes contribute to the low performance of many urban public transport systems, such as unqualified management, unmotivated personnel, lack of market incentives, poor maintenance of rolling material, and unreliable time schedules. In general, the quality of information on the operation of public transport (e.g., frequency, destinations, connections, transit possibilities, delays) leaves much to be desired. And it is surprising that in our modern ICT age the leve1 of information provision to travellers is so poorly developed. For public transport to become a full-scale and attractive altemative to private modes of transport, the quality of the service needs to be drastically upgraded. One of the necessary vehicles to reach this goal is to develop a sophisticated system of reliable travel information.

Transport telematics has in recent years become a popular technological option to improve the operation and added value of public transport (see Nijkamp et al., 1995). Several cities have indeed introduced various telematic infrastructure options so as to make public transport more competitive. But telematics is not mainly a matter of technological sophistication, but of user adoption and institutional support. Against this background, the present study will centre around the issue of institutional support mechanisms in urban areas with a view to an effective use of travel information on public transport services by (potential and actual) clients.

This paper will in particular address three interrelated questions on the task and competence of the urban administration in regard to information provision on public transport in the city, viz. (i) what is the role and task of the city administration in stimulating public transport operators to offer reliable travel information, (ii) how can the city administration use its influence to ensure the design and use of an up-to-date information system to the benefit of the traveller, and (iii) what kind of promising future strategies can be developed by the city administration in the area of public transport travel information?

After some genera1 and theoretical reflections (in Sections 2-4), we will address these questions from a practica1 perspective by investigating the travel information systems in two European cities, viz. Amsterdam and Berlin, by way of comparative analysis. Section 5 offers some genera1 information about the two case study cities. A description of the actual provision of public transport travel information in these two cities is offered in Section 6. This is followed by an analysis of the actual and planned usage of advanced information systems on public transport in these cities (see Sections 7). Section 8 discusses the urban institutional views on travel information of public transport. In Section 9 the views of the relevant institutions on the planned open tendering of public transport and the accessory program of demands with regard to travel information are described. Based on a qualitative comparative scan, some policy guidelines are presented together with a concluding retrospective view (Section 10).

2 Elements of a Travel Information System

The majority of the world population lives in urban areas. In the western world the average urbanisation rate is approximately 70 percent. Consequently, urban public transport might in principle offer great opportunities for satisfying the mobility needs of many people. In practice, the role of public transport in many cities is rather modest, as a result of the flexibility offered by private transport modes and the poor quality of urban transport. Since mobility behaviour concerns a great many travel motives, routes and destinations, it is not easy to design a collective form of urban transport that would be able to cover the wide spectrum of mobility decisions (McDonald, 1997). The fine tuning of space-time dimensions of travel decisions - in terms of bundling and differentiation - needs much insight into possibilities and impediments regarding trip-making behaviour (Jones, 1981). With an expansion of our geographical action radius the vulnerability of travel chains increases drastically and many travellers do not like to be dependent on an uncertain provision of travel opportunities (see Nijkamp et al., 1995). To accommodate the rising mobility in an urban area adequate insight into expected travel time during any period of the day is necessary (Bovy et al., 1993). For public transport this means an up-to-date real-time travel information provision and public access to such information in terms of travel scheduling (frequency, departure time, arrival time, etc.) of public transport. Only in such a way will public transport become more competitive and hence contribute to the fulfilment of urban sustainability objectives. Clearly, there may be other supporting mechanisms as well (e.g., reduction in overall mobility, cleaner vehicle technology, etc.), but a modal shift to public transport in cities might offer a major contribution.

Since, in general, public transport does not offer door-to-door services, but needs often even several transfers, a better package of services needs to be developed, in which reliability, frequency, speed, and quality against reasonable prices play a major role (see Kelly, 1996). In this context, high quality information may offer an integrating added value to public transport, as this will stimulate better decisions (see Samuelson et al., 1977). A necessary condition is then that the information supply is timely, comprehensive, accurate and readily accessible (Dhingra, 2000). Good information provision may also lead to a consideration of real altematives and to an elimination of unwarranted stigma's of public transport. Consequently, information supply is critical in favouring urban public transport (Clowes, 1996; Casey et al., 1998), both as pre-trip and as en-route information. The elements of a proper information system for public transport should at least pertain to time(table) information, route information and price information, under both normal and special circumstances (Finn et al., 1996).

In the light of the above remarks, it is evident that a user-friendly and proper information supply on urban public transport use and operations requires the fulfilment of many criteria. The most important ones are:

- accessibility and availability (at distance, en-route, static/dynamic, visual/audible);
- real time (correct, up-to-date, accurate, actual, reliable);
- comprehensibility (clear, simple, multi-lingual);
- standardisation (uniformity, easy-to-leam);
- multi-modality (transfer points and time etc.);
- flexibility (customer-made, specific, active and passive information supply).

Clearly, whether an actual information system is able to meet these requirements and hence to offer high quality information, depends on many factors such as the organisation of the information chain, the user perspective, the technology and the institutional support.

3 Transport Telematics Services

The advent of information technology enables operators to provide quality information at all stages of a journey related to their own services, and for passengers to find out details of competing services. A key to this information revolution is the provision of real time information at home, in the office, at stops or stations and in vehicles, and its integration into a total information system (Clowes, 1996). Real-time information is made possible by transport telematics. Transport telematics is a blend of information technology and telecommunication technology that is used in the transport sector. This blend of information technology is seen as a new possibility for improving the performance of transport systems while respecting at the same time conditions imposed by environmental and safety goals (Nijkamp *et* al., 1995). It also provides major improvements in access to information by potential users, in service provision, operational efficiency, and in the ability to improve the business (Finn *et al.,* 1996).

Telematics applications for transport can be categorised into two main groups (Finn *et al.,* 1996):

- *Foreground technologies,* which are experienced directly by the customer, such as infonnation systems, ticketing, booking or reservation systems
- *Background technologies,* which are experienced by the operator, such as location systems, network management tools, scheduling and optimiser systems.

As a result, transport telematics is not only an instrument to make a service more attractive to the customer, but it can also be helpful to improve the service directly in terms of efficiency. Through this, it is possible to improve the whole information chain of collecting, processing and distibuting, as transport telematics can be helpful in every phase.

The use of telematics in the transport sector has different appearances and concerns different modes (Nijkamp *et al.,* 1995):

- *the provision and use of information* by means of telecommunication to trip-makers in order to increase the efficiency and reliability of transport operations (for example; EDI).
- telematics technologies which may have an *immediate day-by-day consequence for transportation behaviour.* Examples are route-guidance, variable message signs (VMS) or radio data information.
- telematics applications which have a *structuring impact on mobility behaviour* (tele-working etc.)

Especially the first and the second category can be useful in the public transport sector. It is these uses of telematics that directly influence and help the travellers.

The key functions that can be supported by transport telematics have been identified by Finn *et al.* (1996) as:

- Network management and control
- Provision of passenger information

- Booking and reservation systems
- Payment and fare collection systems
- Demand responsive transport systems
- Scheduling and planning of networks
- Management information systems (MIS)

Functions such as bus priority at traffic lights, fuel monitoring and control, and maintenance support systems are also supported by advanced technology systems.

The following telematics media can be distinguished according to three location-specific information systems:

- *at distance*: personal computers (CD-ROM or Internet with route-plamrers, timetables, etc.), mobile phones (WAP or UMTS);
- at *stops or stations:* interactive passenger terminals, dynamic displays, automatic audible announcements, televisions (monitors), mobile phones;
- *in vehicle:* dynamic displays, automatic audible announcements, televisions, mobile phones.

An important quality leap could be made, if the system would be able to indicate the position of the traveller at any preferred moment. In that way, travel information could be more individual. Mobile phones with WAP or UMTS-frequencies can be appropriate for this purpose, because a mobile positioning system can answer the question "where am I" via these mobile phones out of the telecom-network (Egeter et al., 2000). Especially for the non-familiar travellers (e.g., the car driver) it is in this area that these personal information devices will have their biggest impact (see Clowes, 1996).

4 The Role of the Government

The public regulation, the financial support and, often, the ownership of public transport is usually rationalised on the basis of three major sets of reasons: economic grounds, primarily related to efficiency and equity; politica1 realities, including the power of interest groups; and the social role of mass transit (Berechman, 1993). This indicates that there are several reasons why govemments do interfere in public transport. The first reason is the inefficiency and ineffectiveness of public transport. Public transport services need to be subsidised, because they are often unprofitable. This has to do with the attractiveness of the car, the more or less fixed tariffs and sometimes with so-called "black-riders" (De Wit et al., 1996). Govemments also worry that non-profitable lines will be dismissed if they are not subsidised. This is not only an inefficiency reason, but also a kind of patemalistic or social equity motive. The second reason is to achieve a modal shift to public transport, because of the extemal costs of other transport means such as the (private) car. This reason has to do with the second function of public transport and is a politica1 reason. A final reason is that public transport is perceived as a social and important service, especially for the so-called captives. Its omnipresent availability to all inhabitants of an area at uniform (and below full marginal cost) prices, independent of location or income level, is regarded as a necessary condition for the functioning of an urban society. As a result, public transport can be seen as a merit good, because the govemment interferes out of patemalistic motives (see Berechman, 1993).

The newly planned govemment interference in public transport for the nearby future is a sort of deregulation,

i.e. public (competitive) tendering leading to a concession. With this, private firms will start to compete for the right to become the sole suppliers of a certain service bundle under conditions that are specified in a contract, issued and supervised by a public agency (Berechman, 1993). Competitive tendering is also called "public-private competition", since public agencies may also compete for services (Cox, 1997). Reasons for tendering are that the subsidisation of public transport is too expensive; there are, probably, inefficiencies; competition is seen as an altemative, but free competition is rejected by politicians on the ground of the fact that it may harm the quality of public transport (van de Velde, 1995).

There are two types of competitive tendering: one that leads to a comprehensive contract and another that leads to a franchise. A comprehensive contract defïnes a service to be supplied by the selected operator at pre-specified conditions involving prices, subsidy and levels of service. The planning responsibility for the service's quality, distribution and other attributes (e.g., frequency and timetable) is thus retained by the regulatory agency (in our case the urban govemment). A franchise is the granting of monopoly rights to a firm for a given price (or subsidy), leaving the bulk of the planning tünctions within the private firm's domain (Berechman, 1993).

In public transport an approach tends to be chosen that merges these two forms of tendering by stipulating a contract that does not fully specify all possible contingencies, but retains a considerable planning role for urban govemments. This form is called a tender contract (see Berechman, 1993). Tendering can also be called "controlled competition", because urban govemments will act as principals and directors (see Groenedijk, 1998). A tender contract is given to the company with the best offer of public transport, both in quality and in price. This company (the (new) licensee), subsequently, has the right to perfonn public transport in a certain area for a certain period. This right is called a concession and the considered area can be a whole city, a district, a certain transport-mode or even only one line. The period in question has a maximum (e.g., six years) (Scheerders, 2000). There is only one moment of competition namely at the moment of the granting of the concession (Mouwen, 2000).

The most important feature of the tender system is a coherent set of selection criteria aimed at the realisation of the pre-specified objectives (van de Velde, 1995). Further, a clear process architecture is required in a public-private co-operation (Moret Ernst & Young, 1998). Urban govemments have to take a considerable planning role in the public tendering of public transport, as they grant the concessions. Therefore, it is prescribed by law that they have to formulate a program of demands (PoD) (Wet Personenvervoer, 2000). This PoD has to describe in genera1 terms what urban govemments think is important in public transport (Mouwen, 2000).

After public tendering it seems probable that several suppliers will operate public transport in an urban area. In any case, travel information is important, but its importance will grow by the number of suppliers. Politicians do usually have the opinion that the integration of timetables and route systems (and other travel information) is a determining factor for the quality of transport services. In the case of several suppliers in a public transport region, this integration may be threatened (van de Velde, 1995). Consequently, the existence of travel information requires specific attention in the PoD (Mouwen, 2000). To ensure and stimulate an integration of

travel information in a region[1], urban govemments should formulate standards with regard to travel information. Further, the travel information demands in the PoD should be provided in a functional order, because that will link up better with the preferences of the clients (Mouwen, 2000).

Necessary conditions for travel information in a public tender are the previous described elements of a travel information system (see Section 2). In short necessary conditions for travel information are accessibility and availability at every travel location (at distance and en-route) and in every possible way (static, dynamic, visual and audible). Travel information has to contain information about routes, timetables, prices and genera1 businesses under any circumstances of public transport services. Provided information should be actual, comprehensible, complete, but relevant, flexible and standard.

Finally, the following desirable conditions for travel information in a public tender would have to be met:

- A co-operation between public transport companies, service providers who process data to individual travel information and telecommunication companies (Mouwen, 2000);
- Plans for providing more specific and individual travel-information that is able to meet the preferences of the clients;
- Plans for more use of telematics media like, for example, Internet and WAP or UMTS frequencies of mobile telephones for providing travel information;
- Other research and development plans to irmovate, improve or expanse travel information provision.

As mentioned before, the transport companies that provide the best offers - those that meet the PoD in the best way - will get the concession. Furthermore, it is recommended to control and monitor the execution of the PoD frequently with, for example, the help of random checks and customer satisfaction investigations.

5 Genera1 Information about the Two Case Study Cities

For the empirical part of this article, the urban public transport companies and the urban authorities of Amsterdam and Berlin have been studied. The relevant public transport companies of these cities were analysed from the viewpoint of their actual travel information provision and their usage of, and ideas with regard to, transport telematics. Furthermore, the urban authorities were studied with regard to their actual policies in the area of travel information provision and with regard to their views for the future conceming the planned open tendering of public transport. The basis for this information comprises qualitative expert interviews with the parties concemed.

Urban Public Transport

In Amsterdam one urban public transport company is operating, called Gemeente Vervoerbedrijf Amsterdam (abbr. GVB)[2]. In Berlin, two public transport companies are operating, but only the Berliner Verkehrsbetriebe

[1] This region could be at an urban, national or even intemational scale; it would be useful when all urban authorities of a country (or maybe of the whole EU) would treat the aspect of travel information in the same way (Mouwen, 2000).
[2] Translation: Amsterdam Urban Transport Authority.

(abbr. BVG)[3] has been analysed for this study. The GVB and BVG offer both their services by means of trams, buses and subways[4].

In Amsterdam and Berlin, urban public transport has two different positions. The GVB plays an important role because of the complex city-structure and the protected monuments in Amsterdam, while the BVG has a more difficult position because of the large and wide infrastructure and the multiple centres of Berlin. Despite the different positions, the amount of passengers per year differs approximately with a factor 3, which is consistent with the different sizes of the companies. This can be seen below in Table 1. Together with this, it should be remembered that Berlin is circa 5,4 times larger in seize than Amsterdam and that this city has approximately 5 times more inhabitants.

[Insert Table 1 about here]

Urban Authorities on the Area of Urban Public Transport

The responsible urban govemment divisions of Amsterdam and Berlin are respectively the Service of Infrastructure, Transport and Traffic (DIVV) and the Senate of Urban Development. Both are the 100% owners of public transport and the complete financier. They use the same type of regulatory system: the urban authority edits yearly a program of demands or a treaty that the public transport company has to meet. Therefore, the GVB and the BVG produce on a yearly basis a production plan that has to reflect the demands of the urban authorities, before permission is granted.

The main difference between the urban authorities of Amsterdam and Berlin is the "Transport Union Berlin-Brandenburg" (VBB) in Berlin. This is a communal union that arranges amongst others pre-travel information-tools in the whole region of Brandenburg (and so Berlin). The purpose of this union is to provide a fine-tuned and large-scale public transport at shorter distances with one uniform tariff and also with the same information possibilities. The VBB is owned by several authorities of the region Berlin-Brandenburg, and also by the Senate of Urban Development of Berlin. The plans of the VBB need to be approved by these govemmental bodies.

6 Travel Information in Amsterdam and Berlin

An important issue at the level of travel information provision is the interpretation of this issue by the two public transport companies of Amsterdam and Berlin. The GVB of Amsterdam City has a relatively superficial and narrow definition of travel information compared to the definition of the BVG of Berlin City. Whereas the BVG thinks of travel information as getting the clients to know how to come from A to B under any circumstances and as extensively as possible, the GVB only speaks of providing information to intemal and extemal clients about the timetable, the line-net, current events, calamities, derailments, diversions and etc. This'gives the impression that the GVB has a relatively static and passive view on travel information provision, while the view of the BVG can be stipulated as more dynamic and active on this subject.

[3] Translation: Berlin Transport Companies.

The companies also attach different values of importance to travel information provision. The GVB holds the view that travel information is necessary, because without it, they can not perform. According to them, it consists of two essential elements: availability and actuality. The BVG has a more customer friendly view: they want to secure the entire travel information chain (see Figure 1) as extensively as possible. The BVG does not see travel information as just necessity, but as a challenge. This is noticeable in the effort to become a large-scale information supplier of the city of Berlin.
[Insert Figure 1 about here]

One large difference behveen Amsterdam and Berlin is the fact that the GVB of Amsterdam depends, with regard to travel information provision, for a large part on the national public transport travel information provider (OVR). The OVR is a national company that has been started in 1992 as initiative of the Ministry of Traffic and Communications. The purpose of this initiative was to put an end to all the different telephone lines of the different public transport companies in the Netherlands. Today, all public transport companies of the Netherlands finance the OVR, because they are the stakeholders of the OVR.

The dependence of the GVB on the travel information provision of the OVR is in contrast to the BVG of Berlin. The BVG has a much larger part of travel information provision under own control, next to the regional public transport travel information provider, the VBB. The integrated products for the whole region of the VBB are an exception to this, although it should be mentioned that the BVG has its own integrated Internet site and hotline.

When comparing the travel information provision of the two public transport companies we find, as already appeared from the different definitions, that the BVG has indeed a more extensive and dynamic information system. This has to do with the intensive distribution of traditional information such as maps, but also with the more frequent and more developed usage of dynamic and modem media such as CD-ROM, Internet and dynamic displays. The GVB falls back on the traditional and static media and does not yet have a highly developed distibution system. This is noticeable through the comparison with Berlin where travel information is extensively spread around. The largest differences between the travel information provision of the GVB and the BVG are therefore the distribution of information and the usage of modem media (telematics). In both cases the BVG has an advantage. This is partly because the usage of modem media in the Netherlands is largely in hands of the OVR.

In Table 2 and 3 a comparison is made respectively between the traditional and modem media of Amsterdam and Berlin. These tables just show the usage and not the frequency or distribution of the different media. Therefore, one of the mentioned differences cannot be shown here. From Table 3 it does appear that Amsterdam has a backlog in the usage of modem media.
[Insert Table 2 and Table 3 about here]

[4] The GVB does also provide public transport by ferries, but this mode has been left outside of this study.

7 Use of Transport Telematics in the Present and in the Future

As already shown, especially in Amsterdam many things can be improved in telematics. The telematics tools that the GVB offers today are a limited Internet site and a few dynamic displays at stops and even more rarely inside the transport modes. The GVB is working on the use of new media. They are aware of the possibilities of transport telematics. For example, they have plans to expand the distribution of electronic displays and monitors and want to improve their Internet site. They are also interested in new possibilities via the GSM-net. Luckily, the OVR offers a more extended Internet site and has already started with providing travel information via the Wireless Application Protocol (WAP). The OVR wants to be a proactive information provider; therefore, they are, for example, thinking of introducing a Short Message Service (SMS) in case of en-route problems.

The BVG is trying to initiate and implement telematics possibilities as much as possible. From Table 4 it appears that the BVG offers an Internet site with great many possibilities compared to the GVB site. The main advantage is that the site consists of a lot of search-engines that are easy to use and that the site offers many maps differing in scale and mode. Further telematics applications that are used by the BVG are CD-ROMs and WAP. Special importance is given to the provision of electronic and dynamic displays at stops and stations and in transport modes. Therefore a project named DAISY[5] has been set out to control the implementation and distribution of these displays.

[Insert Table 4 about here]

With regard to the future, the BVG has plans to put televisions in the subways and to place self-service touch screen terminals equipped with a smal1 printer at stops and stations. This should make it possible for passengers to find and print easily the necessary travel information. And of course, they want to continue and finish the DAISY-project. As shows, the BVG is constantly brainstorming about the usage and implementation of new media in its information provision.

With regard to the telematics future plans of the GVB and the BVG it has turned out that both companies have plans in this area, but that the BVG is far more active in this case.

8 Urban Institutional Views on Travel Information of Urban Public Transport

The Amsterdam View on Travel Information

According to the DIVV of Amsterdam, travel information in public transport is an important factor just as the provision of more reliable dynamic travel information. They believe that the GVB is on the right way by introducing departure-time information at the stops (the dynamic displays), but that this is not yet sufficient in the city. Especially the stable functioning of these displays is important according to the DIVV.

The DIVV is not yet concemed with more (dynamic) travel information in Amsterdam, but it recognises that this should be done in the nearby future. They are aware that they have to put in high demands in this area too, in such a way that travel information has to meet a certain standard at a certain number of places in the city. They

see travel information as part of the service of the GVB, which needs to be improved. Improvements have been announced in a recent policy-note of the DIVV called "Public Transport" (1999). These improvements are related to the extension of the current dynamic travel information at stops and to the next stop announcements in the vehicles. Also better and more accessible information material will replace the current maps and timetables. The DIVV also wants to increase the familiarity with public transport by providing new residents of Amsterdam with a standard package of information about the public transport services in Amsterdam (Buffing, 1999). At the moment all information systems are owned and managed by the GVB.

The Berlin View on Travel Information

In Berlin, as mentioned before, two important communal institutions are important in the area of public transport: the Senate of Urban Development and the VBB. The Senate believes that travel information, and especially telematics systems, can play a vita1 role in reducing tmnecessary car-trips. They themselves are involved in a European project called CAPITALS and in a German project called DELFI[6], which are both concemed with travel information.' This shows that the Senate gives priority to the provision of travel information in (public) transport.

The Senate does only set out genera1 instructions at the leve1 of travel infotmation provision of the BVG. The BVG just has to be professionally effective. Therefore, they have to use the most recent technologies to improve their services continually. The business treaty between the Senate and the BVG stipulates that the BVG has to provide travel information to passengers and that passengers need to know at stops, stations and in vehicles about relevant interruptions (BVG, 2000c).

The second communal institutions at the area of urban public transport, the VBB, considers travel information as one of their main tasks. They want to offer the needed information for a trip according to the travel information chain with an exception for en-route information (but they do offer travel information at WAP phones). From the Senate they do get only genera1 instructions. They just have to take care of travel information provision to passengers. It is the task of the VBB to collect travel information of the different (public transport) companies and to offer it in an integrated form to the passengers. This is especially the case of pre- travel information. Therefore, the integrated (pre-) travel information products (such as atlas and timetable books) of the BVG are to a large extent made by the VBB. The necessary data are delivered by the BVG, but are produced by the VBB[8]. The VBB formulates criteria like usefulness, usability and stability to improve the travel information they acquire and provide.

9 Towards an Open Tendering of Public Transport with regard to Travel Information

Views of the Public Transport Companies

---

[5] DAISY: Dynamische Auskunfi und Information Systeem (Dynamic Information System). For a description of this project we refer to Goede (2001).

[6] Deutschlandweite Elektronische Fahrplan Information (translation: German-wide electronic timetable information).

[7] For an extensive description of these projects, the reader is referred to www.bau.berlin.de and at www.vmzberlin.de. A short description has been given in Goede (2001).

Both the GVB and the BVG are planning to become a private company. In that case, they can really point out their own direction and strategy. The GVB believes that in that situation they can - and have - to put the customer in a more centra1 place. Because the customer can choose between different services, the public transport companies have to increase the quality of the services offered and especially the travel information service, since that is the device to attract passengers. The transparency of services offered and therefore of travel information is of vita1 importance in the case of several suppliers of public transport. In that situation it may be favourable that one umbrella organisation takes care not only of travel information, but also of tickets and tariffs.

The BVG has similar ideas on its future role. They foresee problems in the area of co-ordination and power and according to them it is important that the transparency is safeguarded. At the level of pre-travel information this will probably not be a problem in Berlin, because of the existence of the VBB. The only problem the BVG is faced with is to be market-competitive by the year 2007; because the company is often criticised for being too expensive.

Views of the Responsible Urban Institutions

It should be mentioned here, that a only few lines with regard to travel information in the future situation of deregulated public transport have been laid down by law in Article 14 (Wet Personenvervoer, 2000). In short, this PoD just describes that in the case of open tendering there has to be at least one national travel information system and that the public transport companies have to deliver data to this system and to finance the system together.

According to the DIVV of Amsterdam, the introduction of competition will be good for a cost reduction in public transport. But it can also produce a paradoxical situation: the introduction of market-driven public transport, without interference of the authority at all can make a more detailed interference of the authority necessary in, for example, the services offered. Therefore, it will be important to fine-tune the different suppliers of public transport in a city. The DIVV believes that in the future situation of competition in public transport, the information infrastructure belong to their competence. To prevent situations like in Great-Britain where the time tables have to be updated every six weeks due to the possibility to start a bus-line whenever someone feels like it, the DIVV thinks it is better to tender only once a year as a maximum.

The VBB of Berlin holds about the same view. They believe that the integration of (travel) information will become more important and more complicated with the introduction of competition in public transport. The VBB thinks it will be the managing company because of grandfather rights.

10 Qualitative Comparative Scan and a Retrospective View

The basis for the empirical part of this study sterns from interviews with public transport companies and urban authorities in Amsterdam and Berlin. It tums out that, they all recognise the importance of reliable travel

[8] It concerns products like timetable books, the atlas, the CD-ROM, a telephone-line and an Internet-site (although the BVG

information provision in urban public transport to their clients, although the organisations involved handle different definitions of travel information.

When comparing the actual information provision with the important theoretical criteria described above, it appears that the GVB in Amsterdam indeed recognises the two important criteria of availability and actuality of real time information. Next, also criteria like comprehensibility, standardisation, multi-modality and flexibility in the light of a highly developed distribution system appear to be important performance indicators. Travel information offered by the GVB is traditional and static. Therefore, it is hardly possible to offer up-to-date information on special circumstances for their passengers. To solve this, telematics tools would have to be used. The recent existence of the national travel planner (OVR) is favourable for the GVB, because in absence of it, travel information provision in Amsterdam would be too confined.

The travel information in Amsterdam is provided at distance and en-route (at stops and stations and in-vehicle) and contains information about routes, timetables and prices. At distance, it would be convenient when the GVB would provide tools like a special telephone line and a more expanded Internet site. En-route information can be improved by expanding the range of dynamic displays and by putting interactive passenger terminals at stops and stations. Also mobile telephones should be able to receive travel information at any time. In vehicles, it seems desirable to provide travel information by tapes, displays and monitors. With regard to the future plans of the GVB we may conclude that they are aware of the (telematics) possibilities of providing dynamic travel information, but are not yet anticipating on it.

Travel information in Berlin is extensive and dynamic and meets almost all demands described above. They attach high importance to dynamic travel information and are constantly trying to develop and implement new ideas in this area. The BVG handles a broad definition of travel information and is also aware that it is very important to inform clients about their travel information possibilities. Availability and actuality is also important to them. They define availability as on-the-spot, wherever people decide to travel.

Travel information in Berlin is delivered at the requested locations and contains the desired information. In almost every situation it is possible for the passenger to deal with specific circumstances. What is missing, is audible information at bus stops and electronic displays in subways. The planned monitors in subways will solve the latter problem soon. The modem ICT media could be expanded with more dynamic displays at stops and stations of buses and trams, with interactive passenger terminals and with more possibilities at mobile phones. The BVG is working on this or has plans for solving all these issues.
The travel information supply in Amsterdam and Berlin would have to be tested on the pre-defined performance criteria of travel information. From experience it is known that the travel information offered in Amsterdam is not always actual and comprehensible. Therefore, it is necessary that the GVB and the OVR advocate more information products by means of a wider range of distribution and by means of more appropriate marketing campaigns. From the Berlin experiences it appears that the travel information meets the pre-defined performance

---

has its own telephone-line and an own Internet-site).

criteria to a large extent, partly because of its marketing activities and because of an intensive distribution of their travel information products.

The urban authorities in Amsterdam are not actively involved with the travel information provision of the GVB and therefore no demands are formulated in this area. According to the DIVV, this is because of the relative new co-operation with the GVB. The plans of the DIVV in the field of travel information sound like a good start. With regard to the travel information demands formulated before, both the GVB and the DIVV do not meet the standards.

The urban authorities in Berlin do not intervene either in the travel information provision of urban public transport. The Senate has just laid down in a business treaty that the BVG (and the VBB) has to provide travel information to passengers, also in cases of interruptions. With regard to the travel information demands, which have been formulated earlier, the BVG comes close in meeting these standards, whereas the Senate lags behind.

With regard to the nearby future of public tendering, they all share the same ideas. Travel information again needs specific attention, because of the threatened transparency of travel information when different suppliers will perform public transport in a region. Urban authorities in Amsterdam and Berlin both believe they will be the managing company with regard to the integration of travel information, but they have not been specific in how they think they will deal with travel information.

If we look at the national guidelines of public tendering with regard to public transport, we find that - indeed - there are no demands with regard to the travel information provision of public transport companies. The only demand with regard to this topic requires data delivery from the different concessionaires to a national travel information system. However, nothing can be found about travel information provision to passengers. In our view, these guidelines are too limited to stimulate the developments of sophisticated travel information. At least, there should be demands (divided into necessary and desired conditions) with regard to the travel information provision of the performing public transport companies towards their passengers in the way described in our study. In the nearby future these demands should be formulated in a program of demands (PoD) before tendering. The offers of the competing transport companies that meet the PoD best, should then get the concession. The observance of these demands should regularly be monitored and controlled by, for example, the city administration.

References

- Berechman, J. (1993). *Public Transit Economics and Deregulation Policy.* North-Holland: Elsevier.
- Bovy, P.H.L. et al. (1993). Europe: A Heterogeneous 'Single Market'. In: Salomon et al. (1993). *A Billion Trips a Day.* Dordrecht: Kluwer Academic Publishers.
- Casey, R.F. et al. (1998). *Advanced Public Transportation Systems. The State of the Art, Update '98.* www.fta.dot.gov/office/research/apts98.pdf
- Clowes, D.J. (1996). Bus Stop Information - Experience in the Deregulated Environment. In: *International Conference on Public Transport Electronic Systems, 1996, no. 25, 64-68: IEE*
- Cox, W. et al. (1997). Competition in Public Transport: International State of the Art. In: *The Public Purpose (1997),* no. *15,* www.publicpurpose.com/t5.htm
- Dhingra, S.L. *(2000). Application of Advanced Techniques to Urban Transportation Mobility.* http://docs.vircomnet.com/mobilit.../Papers_Full_Documents_S.L.Dhingra_0001_0001.ht
- Egeter, B. et al. (2000). Haalbaarheidsonderzoek IRIS - een Systeem voor Individuele Dynamische OV-Reisinfotmatie. In: *Colloquium Vervoersplanologisch Speurwerk (2000). Wie Betaalt Bepaalt!* Delft: CVS, 1017-1035.
- Finn, B. et al. (1996). The Use of Transport Telematics in Inter-Urban and Rural Bus Services. In: *International Conference on Public Transport Electronic Systems, 1996, no. 25, 5-10: IEE.*
- Goede, E. (2001). *Provision of Travel Information in Urban Public Transport - A Comparative Study on Amsterdam and Berlin.* Master's Thesis, VU Amsterdam.
- Groenedijk, J. (1998). Overheidsinvloed in het Openbaar Vervoer. In: *Nederlands Vervoer (1998), 7, 18-21.*
- Jones, P. (1981). In: Dhingra, S.L. *(2000). Application of Advanced Techniques to Urban Transportation Mobility.* http://docs.vircomnet.com/mobilit.../Papers_Full_Documents_S.L.Dhingra_0001_0001.ht
- Kelly, P. (1996). Quality Bus Transit Systems. *In: International Conference on Public Transport Electronic Systems (1996), no. 25, 11-15: IEE.*
- McDonald, J.F. (1997). *Fundamentals of Urban Economics.* Upper Saddle River, New Jersey: Prentice-Hall.
- Moret Ernst & Young Management Consultants (1998). Publiek-Private Samenwerking: naar een Optimale Rolverdeling. Eindrapportage, Utrecht: Moret Ernst & Young.
- Mouwen, A.M.T. (2000). Reisinformatie en Concessieverlening. In: *Colloquium Vervoersplanologisch Speurwerk (2000). Wie Betaalt Bepaalt!* Delft: CVS, 999- 10 15.
- Nijkamp P., G. Pepping and D. Banister *(1995). Telematics and Transport Behaviour.* Berlin: Springer-Verlag.
- Samuelson, K. et al. (1977). Information Systems and Networks. In: Ouwersloot, H. et al (1991). Economic Aspects of Information and Communication: Some Considerations. In: *Information and Software Technology, 1991, vol. 33, no. 3, 171-180*
- Scheerders, M (2000). Wet Personenvervoer door de Kamer. Spits, p. 5.
- Van de Velde, D.M. (1995). De Zoektocht naar Optimale Aanbestedingen en Contracten in het Openbaar Busvervoer. *Tijdschrift Vervoerswetenschap, 4, 371-380.*
- Wet Personenvervoer 2000. In: *Staatsblad van het Koninkrijk der Nederlanden, 2000, no. 314.*
- Wit J.G. de, en Gent H.A. van (1996). *Economie en Transport.* Utrecht: Lemma.

Appendix

List of Abbreviations

- BVG: Berliner Verkehrsbetriebe (Berlin Transport Companies)
- DAISY: Dynamische Auskunft und Information Systeem (Dynamic Information System).
- DELFI: Deutschlandweite Elektronische Fahrplan Information (German-wide Electronic Timetable Information)
- DIVV: Dienst Infrastructuur, Verkeer en Vervoer (Service of Infrastructure, Transport and Traffic)
- EDI: Electronic Data Interchange
- GVB: Gemeente Vervoer Bedrijf (Public Transport Company of Amsterdam)
- ICT: Information and Communication Technology
- MIS: Management Information Systems
- OVR: Openbaar Vervoer Reisinformatie (Public Transport Travel Information Provider)
- PoD: Program of Demands
- SMS: Short Message Service
- UMTS: Univerisal Mobile Telecommunications System
- VBB: Verkehrsverbund Berlin-Brandenburg (Transport Union Berlin-Brandenburg)
- VMS: Variable Message Signs
- WAP: Wireless Application Protocol

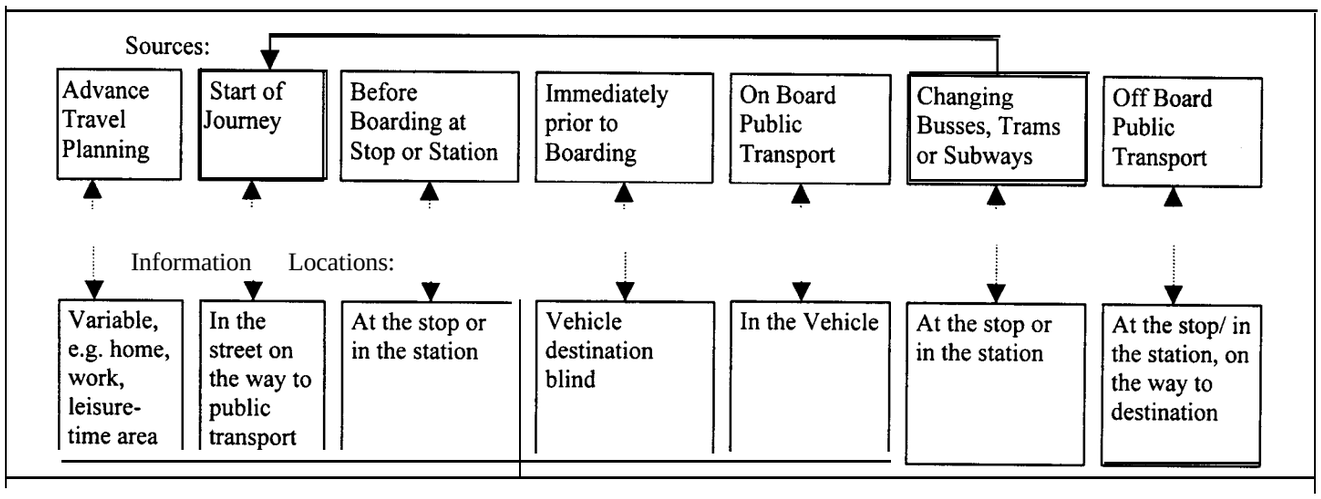

Figure 1: Information Locations in the Travel Chain of Public Transport Users (derived from: BVG, 1998)

Table 1: General figures of the GVB and the BVG

	Employees	***Passengers per year (*million)***	*Amount of stops and stations*
GVB	4.746	325	1900
BVG	15.184	896,5	3244

Table 2: Traditional media compared

	Traditional media	**Amsterdam**	**Berlin**
At distance			
	timetable books with a map	x	x
	newspapers that are spread in case of changes of events	x	?
	atlas with detailed maps	-	x
	separate maps	-	x
	telephone line	x (OVR)	x
At stops and stations			
	timetables and maps	x	x
	newspapers	x	x
	audible announcements about delays and diversions	x	x
	flyers about delays and diversions	x	x
	safety information and service station	x	x
In-vehicle			
	route signs	x	x
	net-maps	x	x
	audible announcements in case of delays or diversions	x	x
	flyers and posters in case of delays or diversions	x	x
	tape announcements about the next stop/station	x	x
	newspapers	x	x

Table 3: Modern media compared

	Modern media	**Amsterdam**	**Berlin**
At distance			
	Internet	x (OVR largely)	x
	CD-ROM		x
Af stops and stations			
	dynamic displays	x	x
	emergency and information pillars		x
	WAP-nhones	x (OVR)	x
In-vehicle			
	electronic displays	x	x
	WAP-phones	x (OVR)	x

Table 4: Internet comparison with regard to travel infonnation

Features	**GVB website**	**BVG website**
Language	Dutch	German & English
Timetable	N 0	Yes
Map(s)	One	Many
Tariff & Ticket Information	Yes	Yes
Diversions & Operations Information	Yes	Yes