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Authors: Alberte Ruud and Edvin Frøysadal
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Summary:

Targeted public transport

Summary of current knowledge and examples of measures

Purpose and contents

The purpose of this handbook is to give planners in roads offices, transport and communications departments and public transport companies advice on how best to implement differentiated product development of public transport services. The handbook summarises current knowledge in the field, demonstrates good examples, gives advice on the planning process and on evaluating public transport measures.

What is targeted public transport?

Targeted – or differentiated - public transport can be defined as *public transport provision which is adapted to the market* – in other words, a service which is oriented towards a defined market, and which is adapted to the needs of existing and potential users of public transport.

There are various different forms of market adaptation of public transport provision. In this handbook, we will distinguish between two types of market – adapted provision:

- *"Public transport services which attract large streams of traffic"*, a large -scale public transport service which is oriented towards "total demand" in the market. Examples of this are setting up high frequency trunk lines with fixed timetables along routes with a heavy flow of traffic.
- *"Tailor-made" services* for specific, small customer groups. Examples of these are service routes adapted for elderly users, or work buses to and from places of employment.

This handbook deals primarily with measures for *local* public transport. We have chosen to focus on buses as forms of public transport.

1.1 Public transport users' evaluation of public transport service provision

A journey is made up of a number of components: walking to and from the bus stop and the journey itself, with or without a seat. When changing buses, we have to find our way to the second bus and wait until next departure before we can continue our journey.

In order to a gain an understanding of how people evaluate a journey, it is necessary to include more than the price one has to pay for the journey and the actual time used. The total journey sacrifice depends on how those travelling experience the disadvantage of the difference journey elements and standard factors, how they *evaluate* these and their *weighing up* of standards and prices.

When a journey time component has a high value, for example walking time to the bus stop, this means that the walking time is regarded as a major disadvantage. In other words, there is a high level of willingness to pay in order to reduce walking time.

A summary of Norwegian and international literature in this area shows that different elements of the journey are valued in different ways:

- The journey time when standing is regarded as a greater disadvantage than a journey with a seat.
- The evaluation of journey times, both with and without a seat, increases with the length of the journey. The longer the journey time, the more willing people are to pay to reduce the journey time.
- The higher the frequency, the less one is willing to pay to increase frequency even more.
- Transport users are willing to pay more to avoid delays.
- Transport users experience changing buses as a disadvantage, both the actual changing and the time it takes. They are willing to pay

approximately twice as much to reduce walking times to and from the bus stop as for reducing journey times by bus.
- Public transport users are willing to pay for covered stations or shelters at the bus-stop.

Analyses of comparative studies in six medium sized urban areas (Kristiansand, Moss, Skien /Porsgrunn (Grenland), Tromsø, Ålesund and the Drammen region) show that different road user groups evaluate the different elements of the journey in different ways:

- Men value increased frequency more highly than women. For their part, women are more concerned with increasing the standard of bus-stops than men are.
- Pensioners stand out with a lower evaluation than other groups.
- There is a tendency for those with high incomes to be more willing to pay than others in order to reduce walking times. Those with high incomes also value journey times more highly than others, i.e. they are willing to pay more than others in orders reduce journey times.
- People who undertook optional journeys (leisure journeys) value walking time and hidden waiting times more highly than others, i.e. they are willing to pay more than others to reduce walking time and increase frequency. Those making compulsory journeys (school /work journeys) value bus stop shelters more highly than others.
- Young people (16 – 19 years) and adults (36 – 66 years) are generally more willing to pay for improvements to public transport provision than young adults (20 – 35 years) and the elderly (67 years and above). This tendency also applies when the age groups are analysed in relation to journey purpose. Young people stand out the most, with a high evaluation of the majority of journey time components.

The analyses of the different transport user groups' preferences show that the preferences for improvements to public transport provision vary somewhat, but that - on the whole- such differences are small. This supports the point that targeting public transport should not be over stretched, since the market base could then become too small. In many cases it might be more useful to adapt the existing public transport provision so that service provision covers more user groups' needs, than to implement specially designed services targeted towards one given customer group.

Services which attract large streams of traffic

Long-term, totally market- oriented measures

Public transport will be faced with new and demanding challenges if it is going to form an attractive and competitive alternative to the car in Norwegian urban areas. If public-transport "stagnates", that is to say, if it maintains service provision, vehicle fleets and fares at the level they are today, this will lead to an annual reduction in the number of public transport users of 1.6 per cent in the 10 biggest urban areas. This means that continuous, targeted product development must be implemented to maintain, and ideally increase the numbers using public transport

There are a number of small and medium-size cities in Austria, Switzerland and Germany which have achieved positive developments in public transport as the results of several years conscious targeting. Factors which have contributed to this progress to a large extent are:

- Public transport which is adapted to customers needs and requirements
- Higher levels of frequency, fixed timetables, a route network with good area coverage and easy changes between routes
- Standard design of forms of transport, bus-stops, information etc
- Physical accessibility (for example buses with low floors) and "mental" accessibility (simple, visible traffic, simple fares system etc)
- Measures which prioritise buses

Schaffhausen is used to describe an example of how long-term, targeted emphasis has produced very positive results.

High priority networks: Think tram, go by bus

In order to develop the public transport system according to the high priority network principle, this means that stretches of heavy traffic, for example between junctions, major suburbs and the city centre

must be served by public transport with high levels of frequency and large capacity (Stangeby and Jansson 2001).

Public transport users will have a better overall standard of travel if the emphasis is on a high priority network network with the following characteristics:

- Well over 500 metres between bus-stops
- High frequency
- Good capacity
- Separate bus lanes and active priority at junctions
- Well-equipped bus-stops, with accessible, visible information and high standards

The purpose of the high priority network system is to develop public transport provision which is faster and simpler to use, which attracts new customer groups, which is cheaper than track-based solutions and which reduces the negative elements through the flexibility of buses.

High frequency is the most important element in a high priority network network. Frequent departures are an extremely important factor if the number of those using public transport is to increase in urban areas.

Increasing frequency is important for several reasons:

- High frequency means increased flexibility, because people have greater opportunities to choose their time of travel
- High frequency reduces waiting times between departures
- High frequency means that the public transport gets closer to the important advantage of individualised transport: being able to travel when you want

An evaluation of the package of measures in four urban areas showed that changes in the frequency of departures formed the factor which public transport users value most. In line with this, the national travel habits survey of 1991 – 1992 showed that there was a clear connection between the number of departures and how often inhabitants use public transport.

Increasing the frequency of departures means that the number of buses in service and the number of drivers must be increased. Increases in frequency are thus a relatively costly measure to implement. At the same time, major savings can be made if increased frequency is combined with improved accessibility for buses, as with the high priority network network.

Several Swedish cities have introduced a public transport network along the high priority network principle, such as Jönköping which is used as an example in this handbook .

There are no places in Norway which have developed a high priority network network. Several cities have introduced a considerable simplification of the route network and introduced high frequency routes in densely populated areas, in line with the high priority network principle. In this handbook, Drammen is used as an example of a city which has adopted this approach.

City centre oriented routes – making changing easier

Developing the high priority network network, with shorter journey times and higher frequency has meant that more passengers have to change buses. This increases the demand for simple changes which work well.

Public transport users experience changing buses as a disadvantage. It takes time to change and it can be something of a challenge to get off at the right stop and to find out when and where the next bus goes. The cost of changing buses, (direct change) is called change resistance when is expressed in minutes. Normally the exchange time is valued two to three times higher than the journey time (with a seat).

Tests in Stockholm show that it is possible to simplify changes so that they are not experienced as more negative than the journey time. The test was set up so that a local line was used as a feeder bus to a main bus route (the airport bus route). Changing between the local line and the main line occurred at a docking terminal [1], where travellers can transfer directly between buses under cover and thus do not have to wait for the next bus at the terminal. The test showed that the customers accepted journeys involving a change of bus when the change occurred as conveniently and as quickly as possible.

In this report, Stjärntrafiken in Västra Frölunda, Gothenburg, is used as an example of a good set- up for changing buses.

[1] Docking means that the buses park side by side at the junction, but with the front ends facing in opposite directions, so that the back of one bus is located next to the front of the second bus Passengers leave the first bus by the front door and enter the second bus at the back.

Well- designed public transport junctions enable changes to take place in a more flexible and comfortable way for the passengers. The county of Akershus has a number of good examples of public transport terminals. The bus terminal in Lillestrøm is used as an example of how a central public transport junction is designed.

Commercial bus service provision

In a market which is becoming increasingly more focused on income and effectiveness, local public transport traffic can learn much from the express bus concept. This kind of service is totally demand – oriented, which has a major effect on the thinking connected with marketing and planning. Probably the best -known example of a medium distance express bus route in Norway, the TIME Express between Notodden and Oslo, is described in this handbook.

Tailor made service provision

Work routes

The great majority of Norwegian employees use the car to get to and from work. Many companies feel that there is a great potential to get more employees travel in a more environmentally friendly way to and from work. By taking responsibility for their employees' work and service journeys, companies can contribute to improving the company's economy, improve the working environment and contribute to developing a good environmental profile.

Some companies go beyond standard public transport provision and offer special transport provision for their employees in order to obtain a service which is adapted to their employees needs as far as possible. This handbook uses an example from the Philips company in Stavanger, which has been successful with its own transport routes for its employees for many years.

This type of private initiative is undoubtedly positive, but it should not be taken for granted that the companies themselves should take on this responsibility. There needs to be greater dialogue between the public transport companies/ transport and communications authorities and the companies themselves about measures which can contribute to increased use of public transport on work -related journeys.

Service routes

Service routes are tailor-made public transport services specifically designed for people who have difficulty in using the standard public transport provision, but which can be used by the general public as well. This service has the following characteristics:

- The routes are serviced with function friendly small buses with low steps, level floors, wheelchair lifts / ramps etc. In this way, the service can partially replace special transport arrangements for the physically handicapped.
- Drivers will help passengers when necessary
- Routes and bus stations form part of a flexible system between residential areas and important journey destinations, with emphasis on short walking distances.
- Small buses can often make minor detours from fixed routes and stop for people to get on and off as required, not just at permanent bus stops. In residential areas, the service could even run without permanent bus stops.
- The flexibility of the system means that the service routes must have substantial timetables and that accessibility is assured through the use of functional material.

Even though service routes are very popular among consumers, experience shows that many of these services attract relatively few customers and that furthermore they are expensive to operate. In the example used in the handbook, Førde, a decision was taken to adapt ordinary route- based transport to deal with some of the service line functions.

Hospital services

The main purpose of hospital routes is to provide effective and comfortable transport to/from hospital which at the same time is cheaper than taking a taxi (Frøysadal and Norheim 2001). It is important to reach new target groups and to get more people to use buses. Thus the hospital service routes are open to all user groups. The hospital bus route running between Nordfjord and Førde is used as an example of a successful type of this kind of service.

Pre-booked services

Pre-booked transport is demand -controlled public transport using routes which are more or less fixed. Buses depart according to the posted timetable only if someone has booked a trip in advance. This minimises driving empty buses. Examples of characteristics of pre-booked public transport are as follows:

- The area which is not covered by the main route is divided into suitable operating areas to be served by pre-booked transport
- Each operating area is served by taxes /mini buses on one or more days of the week.
- Buses run at given tines
- Journeys must be booked in advance, possibly by turning up where the route begins.
- The trip is cancelled if no bookings are made
- The route is decided by the driver according to the bookings which have been made
- Passengers are collected /dropped off at or close to their homes
- The routes can be direct routes to or from towns or feeder routes which link up with other forms of public transport
- The transporters are paid a fixed price per kilometre driven, or a minimum amount per trip driven and compensation for cancelled trips.

As a rule, pre- booked routes are available to everybody, even though they are primarily targeted at specific groups and for specific journey purposes Important target groups are the elderly/pensioners, the physically handicapped, those at home, children and young people.

In this handbook, suburban buses in Norrköping as an example of a place which has abandoned the service bus concept in favour of a pre- booked transport system because this meets customers' needs more satisfactorily. Bygderuta Favoritten in Vest-Agder is used as an example of a successful pre- booked transport service serving rural communities.

The planning process

It is inspiring to learn of other places which have been successful in targeting public transport provision. However, the path from good examples to actually realising a similar system in one's own municipality or city can seem a long one.

This handbook looks at the work of developing a pre-booked transport service in five sparsely populated municipalities in Vest-Agder, in order to illustrate how central the process is in the development of targeted service provision.

With Bygderuta Favoritten, it has been possible to develop a service which is adapted to the needs of the inhabitants of rural communities in Vest-Agder. Thus success is due to thorough advance preparation. The process before the start-up has been the most important success factor in this project, also with regard to further development following the start-up, because it has contributed to:

- Local co-operation and initiatives
- Thorough charting of travel requirements and traffic streams
- Prioritisation of the customer groups where the potential is greatest

Information

Market oriented public -transport provision assumes that transport users have information about the service which is available. A number of surveys have shown that customers often have insufficient or incorrect knowledge about their own local public transport services (Lodden 2001). Lack of knowledge about public transport services can be a barrier which contributes to a number of people travelling less than they could have done, or not using public transport at all.

The purpose of public transport user information should be:

- To reduce public-transport users' uncertainty and to give them sufficient information to be able to plan and make journeys using public transport
- That nobody should give up using public transport because they do not know enough about the service available. New technology creates new opportunities to make information available. However, there is a tendency for the new information society to give us an endless amount of information, so that the problem becomes *sorting* the information rather than a *lack* of information. The main challenge in relation to the introduction of I T in road user information is therefore to be able to supply the information that "the customers need when they need it".

It is important for new IT solutions to be in line with customers' actual needs. The new information should not replace traditional forms of information such as printed timetables and route network maps, but should be an important *supplement* to these. Some groups within the population, particularly elderly people, often have greater problems in using this type of "advanced" technical solutions than others do. It is therefore extremely important that traditional forms of information are also in print.

Public transport information should first and foremost be simple and easy to understand. This is easier to achieve if the public transport system itself is also simple and understandable. The main principles for the designing of information can be summarised in the following key words:

- Simple
- Easy to understand
- Unambiguous
- Complete
- Logical

Design

Design in public transport means adapting all sides of the physical products, information, company identity and surroundings to human demands and requirements. Ideally, the public transport system should "speak for itself".

Design is particularly important in information products within public transport. Public transport user information is targeted towards different categories of transport users with varying levels of experience. With the help of unified, logical, clear and effective design, information can made more understandable for everyone who travels (Wikström 1994). Design is therefore an important element in all parts of a journey by public transport:

Before the journey: Information: design of timetables and fare information, network maps, information boards etc.
At the bus stop: the design of signs, footpaths, lighting etc.
At the bus stop /terminal/ station: physical design, planning, colours, lighting, sound, signs, information, symbols etc.
During the journey: construction and design of forms of transport, both internal and external.

On-going adjustments

Developing targeted public transport provision requires knowledge of the effects of the service provision on passenger developments and customer satisfaction. Following an major emphasis on public transport measures, it is of course important to be able to indicate something about the effects of the measure in order to develop public transport services further in the right direction :

- Has the measure (s) contributed to an increase in the number of passengers /changed the distribution of public transport?
- Are public-transport users /inhabitants satisfied?
- Causes of any positive effects
- Causes of any negative effects

What adjustments should be made as a result of the above points?

The way in which the evaluation format can best be designed will vary according to the objectives which had been set for the measures which have been implemented. Smaller measures can be evaluated in a simpler way than more comprehensive measures or packages of measures. Guidelines, which are being developed for the Kommunikationsforsknings-beredningen (KFB) in Sweden, describe a method which works well for evaluating comprehensive measures or packages of measures. Important elements in the main part of the evaluation scheme are:

- Traffic statistics in the before and after situation to measure passenger development.
- Passenger studies in the before and after situation to indicate changes in the use of public transport and transport users satisfaction with the changes.
- Travel habits surveys (panel) amongst the inhabitants in the before and after situation to indicate whether measures have contributed to a changed in the distribution of public transport and changes in attitudes amongst the inhabitants.