Summary:

Targeted public transport

Sub-report 2: Passenger preferences

A more differentiated travel pattern increases the need for targeted public transport

The development in the population's travel patterns show that

- we travel more
- our pattern of travel is becoming ever more differentiated

The car is the form of transport which best meets the need to be able to travel when and where we want. However, public transport has also developed a number of good services which are adapted to the travel requirements of different groups.

Public transport users are not an homogenous group. Public transport users belong to groups in all categories, in all layers of society, with different needs and requirements with regard to travel and with different levels of willingness and capability to pay. Thus, public transport presents a major challenge with regard to developing a service which will meet the demands of these different groups.

Developing a standard service designed to satisfy the needs of all groups may result in a poor service for the majority. In recent years, more tailor-made local public transport services have been tested with great success in a number of places. Examples of such tailor-made services are service lines, express buses, pre-ordered transport using taxis etc.

In the project entitled *Targeted product development for different market segments*, the objective is to create a simple handbook which can provide planners in road offices, transport and communication offices and public transport companies with advice on how this type of product development can best be implemented.

The project work is divided into five phases:

1. Summarising national and international experiences with tailor-made public transport
2. Summarising national and international knowledge of different public transport groups preferences and valuation of public transport
3. Analysing different public transport users preferences for improvements in public-transport
4. Analysing the costs and traffic base which are necessary to be able to service the different routes

5. Creating a simple handbook with examples and advice for developing tailor-made services

Sub-report 2 summarises national and international knowledge about different public transport groups' preferences and valuation of public transport. The report does not give any "recipe" for how to design a targeted public transport service. We will deal with this at a later date in a simple handbook for this. However, the report looks at experiences from home and abroad with regard to passengers' preferences. It is important to identify these preferences in order to design a public transport service which is targeted towards the different market segments.

Different components of the journey are evaluated differently

A journey is made up of a number of components: walking to and from the bus stop and travelling on the various forms of transport, with or without a seat. When changing transport during the journey, the traveller has to find his way to the second form of transport and wait for the next departure before he can travel further.

Different people experience the journey in different ways. How much time one has to spare, attitudes towards the different forms transport, mobility, the design and maintenance of the bus stop, access to information, whether one finds a seat or not, contact with the driver or other personnel etc are all factors which are significant for the individual's experience of the journey.

In order to understand how people evaluate a journey, it is important to include more than just the price one pays for the journey and the actual time which is used. The total cost of the journey depends on how passengers experience the disadvantages of the different journey elements and standard factors, how they *evaluate* these and their *opinion* of standards and prices.

We will consider two different journeys, journey1 and journey2, which both start and end at the same place. For journey1, the actual journey time is 33 minutes: walking time to the bus-stop takes 5 minutes, waiting time at the bus stop is 3 minutes and the journey takes 10 minutes using the first form of transport. On this form of transport, we find a seat. Then we need to change transport and wait for 5 minutes before the next form of transport arrives. On this form of transport, the journey time is 5 minutes, but we do not find a seat. Finally, it takes 5 minutes to walk from the bus stop to our destination (table S.1).

Journey2 is a direct journey where the actual journey time is 44 minutes. On this journey, walking time to the bus stop takes 3 minutes, where we then wait for 4 minutes. The journey takes 35 minutes, while we then take 2 minutes to get from the bus stop to our destination.

Journey1 involves a number of "exertions" or "costs" in the form changing transport, which are not found on journey2. However, journey2 takes more time.

Table S.1: Non-weighted and weighted or generalised journey time for two alternative journeys. Minutes

	Non-weighted journey time		Weighted/generalised journey time			
	Journey1	Journey2	Journey1		Journey2	
			Weight	Total	Weight	Total
Walking time to bus stop	5	3	2	10	2	6
Waiting time at bus-stop	3	4	3	9	3	12
Journey time for transport 1 – with seat	10	35	1	10	1	35
Time taken to change transport	5		2,5	12,5	-	-
Journey time for transport 2 - no seat	5		2,5	12,5	-	-
Walking time from bus stop	5	2	2	10	2	4
Total journey time	33	44		64		57

The question is whether people prefer to take journey1 because it takes less time or whether the effort associated with journey1 is so great that journey2 appears to be a better alternative. Such evaluations will vary from group to group and from person to person.

If we give the cost of walking to the bus-stop a weight of 2 in relation to having a seat on the bus, a weight of 3 for the waiting time, a weight of 2.5 for having to change transport and a weight of 2.5 for having to stand on the journey, we find that the weighted journey time for journey1 is 64 minutes and 57 minutes for journey2. This means that, with the weighting we have given, journey2 appears to be a better alternative than journey1. The differences are not particularly great, but they illustrate an important point:

Passengers will not necessarily choose the shortest journey time from door to door, but rather the alternative which appears overall to be the most convenient.

Valuing journey time components

- Passenger valuation of the journey time depends on whether they have a seat or not. In Norwegian studies, journey times with a seat are evaluated on average at NOK 15-20 per hour, while journey times without a seat are evaluated at around NOK 40 per hour.

- The evaluation of the journey time, both with and without a seat, increases with the length of the journey. Those who pay for their journey with a single ticket or a ticket for a specific number of journeys evaluate the journey time more highly than those who have a monthly travel pass.

- Time-evaluation of journeys varies with the purpose of the journey. The time evaluation is higher on journeys which are undertaken in connection with work than for leisure journeys and higher on business journeys than on journeys to and from work.

- People with a high income generally have a higher time-evaluation than people with low incomes.

- The evaluation of frequency goes down when the interval between departures increases. The actual waiting time at the bus stop stabilises at 4-5 minutes even

with a low frequency, that is to say that road users adapt the time when they go to the bus stop on the basis of the stated departure times.

- Passengers are willing to pay a lot to avoid delays. Delays seem to be a greater disadvantage on leisure journeys than on journeys to or from work. People with a high income are willing to pay more to avoid delays than people with low incomes.

- Passengers experience changing from one form of transport to another as a disadvantage, both with regard to the actual change and also the time it takes to change.

- Passengers are willing to pay approximately twice as much to reduce walking time to/ from the bus stop as for reducing the journey time using public transport. Road users appraisal of walking time clearly varies with age. Older people find the walking time as more burdensome than others.

Valuing the qualities of the form of transport and the journey itself

- Norwegian studies indicate that passengers prefer track-based public transports rather than buses. However, there may be greater differences in the quality of different bus services than between bus and railway.

- Passengers want comfort and convenience, both at the bus stop and during the journey itself. A number of Norwegian studies show that passengers are willing to pay for a covered station or bus stop shelter.

- More women than men experience feelings of a lack of safety when using public transport, but this is largely a big city problem. Passengers are therefore willing to pay for manned stations or for guards patrolling the stations.

- Information is essential for those using public transport. Real time information can contribute to making public transport more attractive for those who seldom use public transport. Studies from Stockholm show that passengers have a relatively high valuation of this type of information. The Norwegian studies show a lower valuation of real- time information. This may be due to the fact that few such information measures were to be found when the studies were carried out.

- Some passengers are more dependent on good access to transport, to the bus stop or to the platform, than others. This applies to groups with different types of physical handicaps, the elderly and those pushing prams. A good proportion of public transport users have or have had problems with getting on and off buses. Both Norwegian and Swedish studies show that passengers who need help to get on and off buses are willing to pay for this service.

Valuing line structure and routes

- There is no general answer to the question of how the line network should be designed. The different alternatives should be evaluated from the type and density of building in the area and the needs which the population may have.

- A high priority network with fewer routes and higher frequency has produced good results in both small towns and large cities. Converting the route network to a high priority network results in somewhat longer walking distances to the bus-stop, but increased frequency. The main idea is to develop a service with such a high frequency that public transport users no longer need to adhere to timetables, and where the route system is such that it is simple to orientate oneself as to where the buses go and where the nearest bus stop is.

- A high priority network has fewer direct routes, i.e. more passengers need to change buses during their journey. Given that changing transport is generally regarded as a disadvantage for public transport users, the service must be built up around good junctions/interchanges.

- The high priority network must be supplemented with a small bus network, which runs close to where people live. The small bus network must be designed so the walking time becomes as short as possible. This service may have a lower frequency, because this customer group is rather less concerned with frequent departures, but will result in somewhat longer total journey times.

- It may be necessary to distinguish between regional routes and city bus routes. The regional buses must have a high level of seating comfort. City buses, which drive through city centres, must have fast "circulation" with rapid embarkation and disembarkation, while seating comfort is less significant. A city bus route should have a high frequency and short distances between bus stops so that it can also be competitive over short distances.