



Summary:

Public Transport Packages of Measures 1996-2000

Passengers' evaluation of service improvements on trip frequency

Background

In 1991, Ministry of Transport and Communications set up the "Experiment to develop rational and environmentally friendly transport" to strengthen public transport. The evaluation of the experiment showed that a number of measures together can often complement each other and increase the effect of the measures. The recognition that measures work in a system, and that there are links between the effects of different measures, led the Ministry of Transport and Communications to extend the experiment from 1996 onwards from largely covering single measures to granting funding to packages of measures. From 1996 until the experiment ended in 2000, the Ministry of Transport and Communications granted around NOK 86 million in "Subsidies for developing rational and environmentally friendly transport", popularly known as the "Packages of measures". In total, 18 packages of measures have received support.

Funding and organisation

The subsidy scheme for packages of measures has been organised and run by the Ministry of Transport and Communications. The Ministry invited county councils to apply for funding for long-term packages of measures/ development projects which were anchored in politically - approved plans.

The packages of measures were financed with joint funding from the Ministry of Transport and Communications and local contributors to ensure that the state funding would encourage targeted use of local funding. The Ministry of Transport and Communications financed 50 per cent of the packages of measures, while local participants contributed the remaining 50 per cent.

In order to ensure local evaluation, the final third of the funding from the Ministry of Transport and

Communications was only released when the local evaluation was completed, reported and approved by the Ministry.

In the majority of cases, the county councils have planned and implemented the packages of measures in cooperation with a group of local participants (municipalities, Public Roads Administration, bus companies, taxi centrals/local taxi drivers, the Railways Company, (NSB, i.e. the Norwegian State Railways) and similar). The project management did not necessarily fall to the county council but was appointed on the basis of local considerations. However the county council was responsible for the application and for following up the package of measures with regard to both reporting and financial control.

The local project organisation usually consisted of a main group where the project owners were represented and one or more project groups which have taken the implementation of the projects on themselves.

Common evaluation system

The "Packages of measures" are a learning process where the exchange of experiences and spread of information form important elements.

In order to make it possible to compare several packages of measures, the evaluation system has been standardised.

Homogeneous evaluation makes it possible to compare the effects from the different projects and draw general conclusions for different thematic areas through combined evaluation. TØI has been commissioned by the Ministry of Transport and Communications to develop a common system of baseline evaluation of local measures which ensure the

best possible unified basis for comparable analyses of the main aims of the different packages of measures.

The base line evaluation, that is to say the minimum requirement for the evaluation system, is primarily designed for packages of measures in urban areas. This baseline system is documented in guidelines for local evaluation of packages of measures (Renolen 1998). This is a relatively comprehensive evaluation and consists of the following surveys and data collection/ registration:

- *Travel survey with panel selection*
Carried out amongst a sample of the population in the area affected by the measures.
- *User survey*
Carried out amongst those travelling by bus on the actual day of the survey.

Both types of survey are to be carried out both before and after the measures are put into force. The baseline evaluation also contains:

- *Registration of area data (zone data)*
The area data describes characteristics of the different transport alternatives, primarily public transport provision and changes in these factors (frequency, journey time, fares etc).
- *Registration of passenger numbers*

Combined evaluation

By putting together the data from a number of packages of measures it is possible to find out the effects of different types of measures and the framework conditions which need to be in place in order to achieve the best effects. Ministry of Transport and Communications commissioned the Institute of Transport Economics to carry out the combined evaluation of all the packages of measures based on the local surveys.

The aim of the majority of packages of measures is to achieve more effective public transport provision for passengers and the bus companies, as well as getting more people to use public transport. The evaluation system is concentrated around methods which can provide answers to these questions.

Two main problems in evaluating the packages of measures are:

- The extent to which the packages of measures have contributed to better service provision

- The extent to which the packages of measures have led to a change in transport mode choice

In the joint evaluation system for urban packages of measures, the focus was on the following problems:

1. The extent to which the packages of measures have led to passengers changing their choice of transport and/or the whole scope of their journey.
2. How the passengers evaluate the various measures and their evaluation of the different measures (journey time, changing buses, frequency, price etc).
3. The extent to which the measures have won car drivers over to using public transport and the possible net environmental benefit of the packages of measures.
4. The socioeconomic benefit of the project.
5. The extent to which different barriers (physical psychological or informative) limit the effect of the measures.
6. The extent to which the framework conditions for the journey (both the characteristics of alternative forms of transport and the chances of using these as an alternative to public transport) have influenced the effect of these measures.
7. The extent to which synergy effects mean that a combined package of measures has a greater effect than the sum of each individual measure on their own.
8. The extent to which planning, organisation and development of the packages of measures affects the results of the measures and the planning solution which is chosen.

Description of the packages of measures which are included in the combined evaluations

The packages of measures vary with regard to the types of measures which are implemented and the scope of the measures. Some packages of measures have achieved little in terms of changes to public transport provision in itself (route and frequency changes), while others have put the main emphasis on this area. Some packages have largely involved measures on the infrastructure side, including improvements to bus stops, setting up new bus shelters or improvements of junctions and terminals.

Vestfold county – Tønsberg and surrounding area

The package of measures consists largely of extended public transport services in the winter season on stretches with a high proportion of cyclists in the

summer months, better provision for combinations of bicycles and public transport, and for interchange between train and bus, renovating bus stops and developing interchanges. Information and marketing were also used to increase awareness.

Rogaland county – Hundvåg

Hundvåg is a suburb of Stavanger city and is situated on an island. The only access route to the suburb is across a bridge, which suffers from increasing congestion problems. This makes the prioritising of public transport an important measure for Hundvåg. Increases in service frequency were the most dominant element in the "Hundvåg package". The route structure was reorganised on Hundvåg to prioritise main routes, with increased frequency on heavily trafficked roads. The main routes were supplemented with feeder routes. New low-floor buses were introduced on all routes. The package also covered infrastructure measures such as improvements to bus stops, new bus shelters, a terminal for feeder buses and accessibility measures. Comprehensive information and marketing of the new routes were carried out in the suburb.

Buskerud county – Drammen region

Four municipalities are involved in the package of measures for the Drammen region; Drammen, Lier, Nedre Eiker and Øvre Eiker. The package of measures consists of coordinating train, bus and taxi provision on one main route, altering a commuter route, extending service bus and express bus provision, accessibility measures and renovating and maintenance of existing bus stops along a demonstration line (around 160 bus stops). Information and marketing measures were also carried out.

Østfold county – Nedre Glomma

Nedre Glomma covers the cities of Fredrikstad and Sarpsborg. The package of measures mostly involves infrastructure- and bus stop work, as well as measures to improve accessibility for buses. A new route has also been set up in Sarpsborg which serves shopping centres and residential areas. where previously there was no public transport provision. Marketing and information measures have also been implemented, including the upgrading of telephonic route information through the introduction of a route information telephone number, 177.

Vestfold county – Larvik

The package of measures for Larvik consist of a new route concept which includes increased service

frequency on two corridors, renovating bus stops along new routes, bicycle racks at local interchanges, route information on touch screens in the city terminal area, as well as a pre-project for planning and developing a shared terminal for train, bus, boat and taxi with bicycle racks and integrated tourist information. In addition, some information and marketing measures have been implemented.

Møre og Romsdal county – Ålesund and Giske

Renovating bus stops was the most comprehensive project in the package of measures. All the bus stops now have a bus shelter. Infrastructure measures have also been implemented to improve accessibility for bus traffic. Fixed route times have been introduced on the routes along the main axis and one route was given an increase in the number of departures. Some profile-raising and information measures have also been implemented.

Telemark county – Grenland

Grenland comprises a continuous urban area with a typical band structure. The area includes the cities and towns of Skien, Porsgrunn, Brevik, Stathelle and Langesund. The package of measures involved re-organising and updating the route system, electronic ticketing and changes to the fare structures. Over 60 new bus shelters and new information screens at the bus terminals and in the major shopping centres in the area have been set up. Various marketing and information measures were also implemented.

Oppland county – Lillehammer and Gjøvik

The package of measures consists of a number of measures of which one of the most important was the introduction of a new, high quality regional system (Mjøspilen) with hourly departures between the cities of Lillehammer and Gjøvik. In Gjøvik, the city bus service has been reorganised. Marketing and information measures have also been implemented.

Troms county – Tromsø

The package of measures is a continuation of a major re-organisation of the bus and fares systems which was introduced in 1997/98. The package mainly consists of building a public transport terminal in the city centre (public transport street) and in front of the main entrance to the University hospital. Improvements have also been carried out to selected bus stops on some routes by setting up bus shelters financed by advertising. Real time information systems have been introduced on 2 bus lines.

Sør-Trøndelag county – Trondheim

The major part of the package involves route changes and an increase in frequency along a number of routes. A total of 1200 to 1300 new departures per week have been introduced. A new route across the Cecilienborg bridge resulted in a significantly shorter journey time to the city centre. Two service routes were established. New monitors were installed at Trondheim central station, together with new route maps, route leaflets and route information at the bus stops. Journey guarantees and comprehensive marketing of the new services were implemented. The project also included the purchase of 25 new low-floor buses. Beyond the package of measure, accessibility and infrastructure measures were also introduced and some 550 new bus shelters, financed through advertising, were set up in the city.

Vest-Agder county – Kristiansand

The purpose of the package of measures in Kristiansand is to develop a land use policy which generates less transport, and which has comprehensive bus services (bus metro) with higher frequency, shorter journey times and higher comfort standard. The bus metro consists of bus routes which are timed in such a way that the main route has a high frequency and regular departures to many of the city’s work places, services and school. The main route has high quality bus stops, easy access for buses and real time information.

Several overlapping sources of data and different types of analyses

The packages of measures are evaluated using several overlapping sources of data and different types of analyses, primarily user surveys, travel surveys and passenger numbers.

User surveys

While travel surveys and panels surveys look at all types of journeys and the whole population, user surveys are targeted at public transport users. This provides the basis for far more detailed analyses of the significance of the individual measures and the variations between different user groups with regard to the importance of different measures.

The surveys primarily provide answers to how the passengers value the measures implemented.

User surveys have been carried out in 11 areas with a total of 14,400 interviews before the measures were

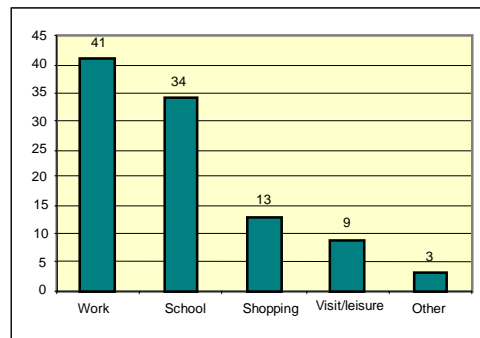
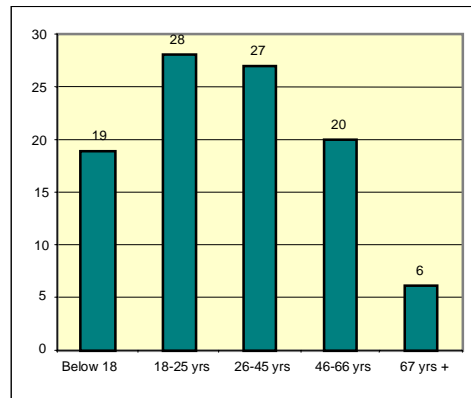
brought into effect and 11,212 interviews after the measures were brought in.

Characteristics of public transport users

Good knowledge of the market is vital to be able to successfully develop public transport provision. The market is heterogeneous and different groups have different requirements. A service which meets the public's needs is therefore dependent on knowing who the customers are.

There are major age and gender differences when it comes to using public transport. Around 65 per cent of passengers are women and almost half the users are under the age of 26 on average for all the surveys. Those in employment and school children and students form the largest groups of passengers, with 43 per cent in both groups. Public transport is used mostly for "fixed" journeys, i.e. journeys to/from work and school, which comprise 3/4 of all journeys.

However, there are large variations between the different cities and areas. Two urban areas, Tromsø and the Drammen area stand out with a lower proportion of passengers under the age of 26. Here, public transport is used for journeys to and from work to a greater extent.



TOI report 736/2004

Figure S.1: Public transport users, age and main trip purpose. User surveys. Percentages

In Trondheim the proportion of school journeys (senior schools) is also low, but this is a student city with a relatively high proportion of passengers aged between 18 and 26.

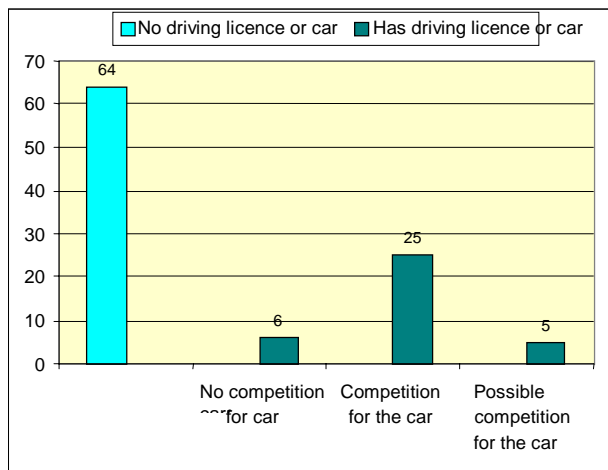
In Kristiansand, Tønsberg, Nedre Glomma, Grenland and particularly in Larvik, the proportion of younger passengers is high and public transport is used to a large extent for school journeys.

The smallest cities, Tønsberg, Larvik and Gjøvik, stand out somewhat from the others in that they have a relatively high proportion of shoppers using public transport than the other cities.

Public transport users are less likely to have a driving licence

Amongst public transport users over the age of 18, 65 per cent hold a driver's licence, while the proportion amongst the population as a whole is 80 per cent. Less than 70 per cent of public transport users live in a household which has a car, while 85 per cent of the population as a whole live in households with a car.

Tromsø and Trondheim stand out with a high proportion of public transport users who have a driving licence. At the same time, there are the two cities where public transport users have the lowest rate of access to a car.



TOI report 736/2004

Figure S.2: Public transport users access to car and driving licence. Competition for the family car. User surveys. Percentages

Obviously those who do not have a driving licence or a car cannot use the car as an alternative to travelling by bus. These comprise more than 60 per cent of public transport users and we call them "captive". 6-7 per cent of the public transport users are "competitive

passengers". They choose to use public transport even though they are not competing for the family car. Around 30 per cent of passengers are "potential car users" They compete for the family car(s) and one of the main reasons for travelling by public transport is that someone else is using the family car.

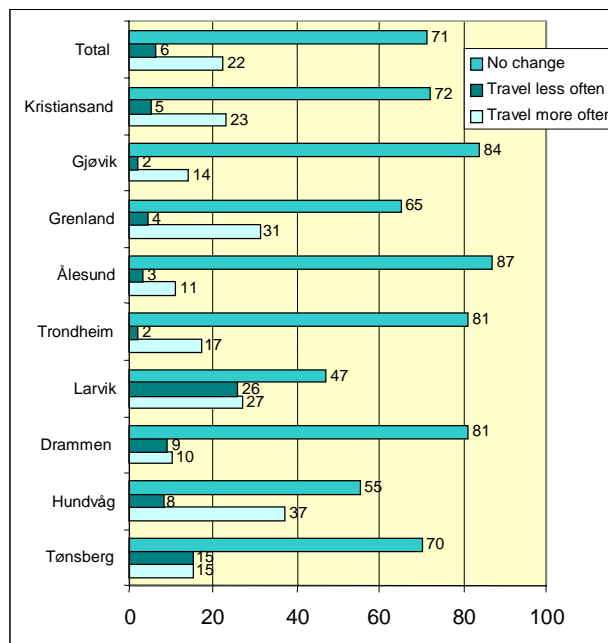
Public transport users often travel by bus

68 per cent of the passengers travel daily by public transport in the winter. Only 5 per cent are sporadic public transport users travelling by bus once a month or less.

Tromsø and the Drammen area have the highest proportion of regular daily users. Here the difference between summer and winter usage is less than in the other areas. In the smallest cities of Larvik and Gjøvik the proportion of daily passengers is lowest.

Changes in frequency of travel

21 per cent of public transport users say that they now travel more often by bus as a result of the packages of measures while some 70 per cent say that they have not changed their use of the buses.



TOI report 736/2004

Figure S.3: Changes in use of buses. User surveys. Percentages

It is primarily public transport users in Hundvåg, Grenland, Kristiansand and Trondheim who say they travel more often as a result of the changes. This indicates that the changes in these cities have affected large

parts of the market. In Larvik and Tønsberg on the other hand, the changes have led to the proportion who travel less equalling the proportion who travel more. This indicates that the changes which have been implemented have not been sufficiently targeted or that the measures which have been brought in have not reached large groups of passengers.

Young people under the age of 26 say that they have increased their use of the bus service to a greater extent than others. Those who travel to work say they have increased their journeys by bus less than others. This may indicate that those who travel to work are and were to a large extent permanent users who travel so often that they cannot increase their use of the bus service unless they start to use the bus for other purposes. This is a challenge for public transport because this will require other types of provision than city-centre based services in the rush hour.

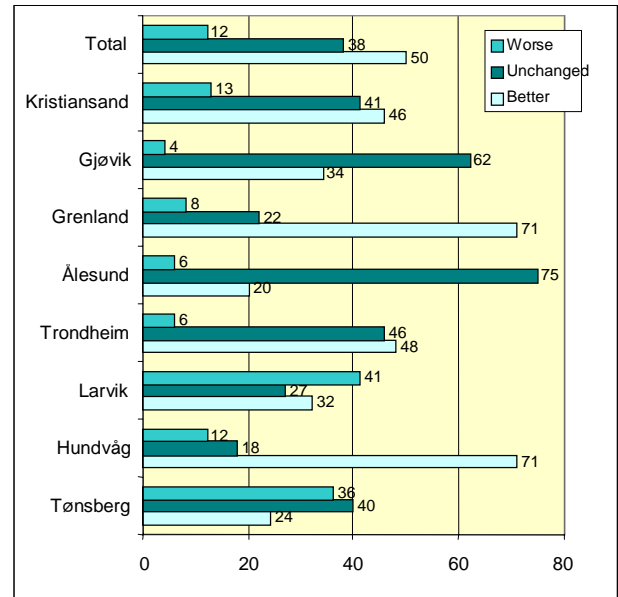
At the same time, the analyses show that those who currently travel frequently, i.e. daily or 2-4 days a week, feel they have increased their use of the bus services to a greater extent. This indicates that the measures have affected those who already used public transport and given them a service which has led to them travelling more often, i.e. they have become even more "permanent" users.

Public transport users feel that the service has improved

If the changes that are brought in do not lead to more satisfied customers, then such measures can, in the worst possible scenario, be discarded. In the packages of measures, a number of measures are implemented simultaneously in combination. In areas where the emphasis has been on a more effective route structure, numerous measures have been brought in.

Public transport users can evaluate individual measures as both positive and negative. At the same time they will weight different measures differently. The first measure of whether the package of measures is successful is how passengers *as a whole* evaluate the changes in provision.

On average for all the packages of measures, half the passengers feel that the service has improved. At the same time the changes will almost always mean that some people will end up with a poorer service. 12 per cent of passengers feel that the provision over all is worse.



TOI report 736/2004

Figure S.4: Evaluation of the changes in public transport provision. User surveys. Percentages

Two areas stand out positively. At Hundvåg and in Grenland, 70 per cent think that the service is better. In Kristiansand and Trondheim, passengers also feel that the service has improved. Tønsberg and Larvik have succeeded to a somewhat lesser extent. Here there are many who feel that the service is worse rather than better.

Satisfied passengers travel more

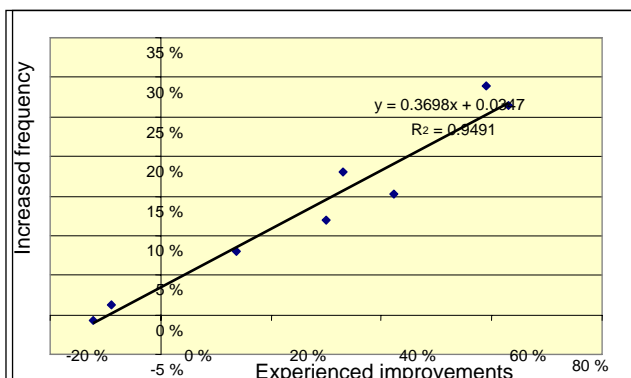
The basis for the analyses of the user surveys starts with the connection between use of buses and passengers satisfaction with the service (table S.1). There is a clear connection between passengers' opinions of whether the service has become better/worse and whether they travel more/less often by public transport, respectively. The diagonal in the table shows the size of the proportion which has a symmetry between experienced changes in the service and changes in their journey frequency. 38 percent of those who say that the service is better also say that they travel more by public transport, while 35 per cent of those who say that the service is worse travel less. However, in both these groups there are some who say that they have not altered their travel patterns, with about 50 per cent in each group. Furthermore a total of 14 per cent of those who have a poorer service, now travel more often! This means that we must look behind these figures in order to be able to say something about why they have altered their use of the bus services.

Table S.1: Has the service improved and have the changes led to increased use of buses? Percentages N=6394 (*)

	Better	Unchanged	Worse
Travel more	38	8	14
No change	60	89	50
Travel less	2	3	35

(*)Østfold, Drammen and Tromsø did not ask these questions and are therefore not included in this table
TOI report 736/2004

In order to find out whether there is any clear connection between increased satisfaction and change in bus use, we have calculated the net changed satisfaction and net changed journey frequency in each of the packages of measures. This is the difference between the proportion who say they are satisfied and dissatisfied, and the difference between the proportion who have increased and reduced their use of the bus service. These analyses show a surprisingly strong correlation between net satisfaction and travel activities (figure S.5). A simple linear third line gives a goodness of fit of 0.95! Based on these 8 packages of measures, this gives a simple "rule of thumb": that 10 percentage points in net increased satisfaction will give 3.7 percentage points in net increased travel activity.



TOI report 736/2004

Figure S.5. The connection between the net experienced improvement and the net stated increased journey frequency

There are no one to one-connection between satisfaction and increased trip frequency. We therefore

need to look more closely at the framework conditions in order to clarify why the passengers have changed their use of the bus service and possibly what has reduced the effect. In the next analyses, we will look more closely at:

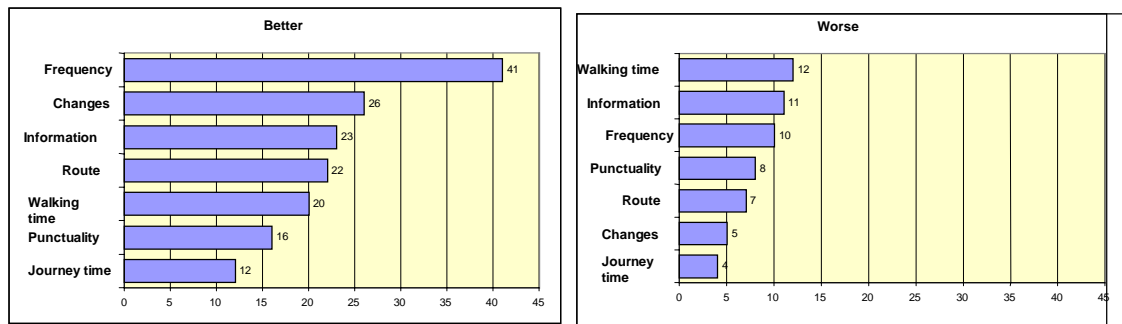
1. the factors which have contributed to passengers becoming more or less satisfied with the service
2. the framework conditions or factors which contribute to an increase or decrease in the use of public transport

Higher service frequencies are valued most by public transport users

First of all we looked at the factors which passengers regard as having improved in each of the areas (figure S.6). Frequency is the main factor which passengers feel has improved (41 per cent). The majority of other factors lie at around 20 per cent. With regard to things getting worse, there is a much more even distribution and the proportion lies between 4 and 12 per cent for the majority of factors.

There are also major variations within each area. For example, not everyone on Hundvåg or in Grenland has experienced an improved service; nor has everyone in Tønsberg suffered a poorer service: because in the majority of areas there have been both improvements and deterioration. This means that we have a spread in the data material, which makes it unnecessary to use control areas in these analyses as long as we bring in this variation for each individual passenger in the analyses

- ca. 1/3 of the passengers have not experienced any change in the service
- ca. 1/3 of the passengers have experienced at least one improvement and no deterioration
- ca. 1/10 have experienced at least one deterioration and no improvement
- ca. 1/5 have experienced both improvements and deterioration
- ca. 1/6 have experienced more deterioration than improvements
- around 50 percent have experienced more improvements than deterioration



TOI report 736/2004

Figure S.6: Proportion who say that the different quality factors have become better and worse. Percentages N=5893

Which factors affect changes in trip frequency?

We have studied the characteristics of those who have increased or reduced their use of buses, with regard to their evaluation of the new service, their chances of changing their travel pattern and their actual journey pattern at the start. This builds on an assumption that a number of passengers cannot change their patterns, either because they have no other choice or because they travel very often or very seldom from the outset.

This means that if the service quality to/from work improves for those who travel by public transport on a daily basis, it will take a great deal for them to increase their journey activity even though they are more satisfied with the improved service. However, it may help them become loyal customers i.e. that they will not reduce their journey activity. In the analyses we have looked at the probability of a respondent saying that s/he has reduced the amount that they travel by bus.

Characteristics of those who have increased their use of buses

The analyses show that there is a clear connection between the proportion who feel that the service has become better and those who travel more often, but that also there are other factors which reduce or strengthen the effect. The main result from the analyses show that:

Improvements mean most

The most important reason for increased use of buses are improvements in the service, i.e. those who feel that the service overall has become better. At the same time, this analysis shows that those who have

experienced more improvements have a greater probability of increasing their travel activity, and those who were satisfied at the outset also have a greater probability of increasing their travel activity.

Access to alternative forms of transport means a lot

People who do not have alternatives to travelling by bus are underrepresented amongst those who travel more, while those who could use the car are strongly over represented. This means that the proportion of captive passengers depends on the quality of public transport provision and the changes brought in have reduced this proportion.

Frequency of travel means a lot

People who currently travel very rarely by public transport have increased their travel activity less. This means that the increase has largely come amongst those who now travel weekly or more often. At the same time, season ticket holders are similarly over-represented, which may mean that the increase in passengers will not have an equally strong effect on income for the companies. The groups which stand out are those in employment and also to some extent, students where it may appear that they have reached a "ceiling" with daily journeys to/from work or studies, so that they will not increase their travel activity even if the service is improved.

Age means a lot

Young people under the age of 18 in particular have increased their travel activity by public transport. We do not find similar effects for those over 18, which may indicate that access to a car plays an important role in this context. However the youth factor is additional what is explained by the "car factor" above.

Other factors mean a lot

This first analysis can only look at certain aspects of travel activity. At the same time, it shows that there are a number of other factors which are not covered by this model. Roughly speaking, we can say that about three quarters of the increase in passengers as a whole can be explained by this model, while changes for the individual can only explain around 24 per cent. This may be due both to the fact that we have a relatively simple analysis and that changes in the framework conditions for passengers are not covered by this analysis. We will come back to this in the panel survey.

Characteristics of those who have reduced their use of the bus service

The analysis for those who say they have reduced their use of the bus service has been carried out in a similar way. This analysis shows that there is a far stronger connection between those who overall are dissatisfied with the new service and the degree to which they have reduced their use of the bus service. This explains most of the reduction in bus use and the final model can roughly speaking explain around 95 per cent of the decrease and 39 per cent when we look at changes for the individual passenger.

The most interesting aspect of this analysis is the factors which contribute to limiting the number of passengers being lost.

Easier to keep satisfied customers

People who are already satisfied with the service are far less likely to stop using public transport.

The amount of changes in the service affects the fall off rate

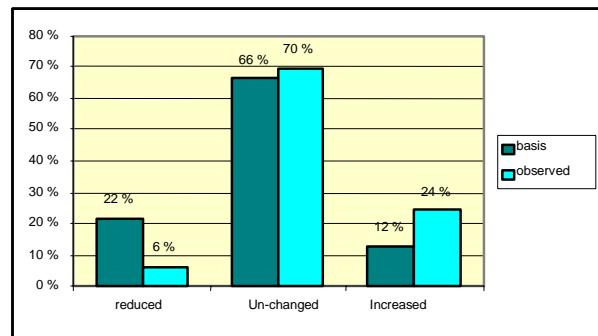
Improvements to the service will also help to reduce the fall off rate by 16 per cent per improvement. However, where the service has become worse the effects are greater, with 34 per cent. This is a clear indication that improvements and deterioration do not have the same effect on the demand for public transport.

Levels of competition versus the car affect the fall off rate. Different passenger groups will react differently to deterioration in the public transport service. It is primarily the permanent users and those who have other bus alternatives who have reduced their use of the bus to a lesser extent. This is probably due to the fact that there are more permanent ("captive") passengers who are less able to change their use of the bus service even though the service has become worse.

This is supported by the fact that only those who have the choice of travelling by car stop travelling by public transport to a large extent. They have a 70 per cent greater probability of reducing their use of the bus service than other passengers.

Underlying negative trend

It is not surprising that around two thirds of passengers are not expected to change their use of the bus service, i.e. clearly the largest group. However it is worth noting that a total of 22 per cent are expected to reduce their use of the bus service, which is almost double as many as those who expected to increase their use. Overall this means that the underlying trend appears to be going in the direction of fewer journeys by public transport¹. At the same time, however, there are a number of conditions which can affect this distribution. Figure S.7. shows the total distribution within the package of measures when all conditions – both characteristics of the passengers and changes in the service- are brought in. We can then see that the greatest change is for those who want to reduce their use of the bus service, where the proportion goes down by 16 per cent. On the other hand, the proportion who say that they have increased their use of the bus service has increased by 12 per cent. This underlines an important point: the effect of the package of measures has led equally to increases and decreases in the number of new journeys.



TOI report 736/2004

Figure S.7: The distribution between the proportion which has increased, not changed or reduced their use of the bus services. Basis distribution, all else being equal and total observed distribution within the package of measures

¹ We do not know how they plan to reduce or increase their use of the bus service. This may affect these conclusions, but the difference between those who reduce and those who increase is so large that the conclusions are probably valid. The average for those who increase their use of the bus service must be around 70% higher than those who reduce in order for these figures to balance.

It is easier to lose passengers than to attract new ones

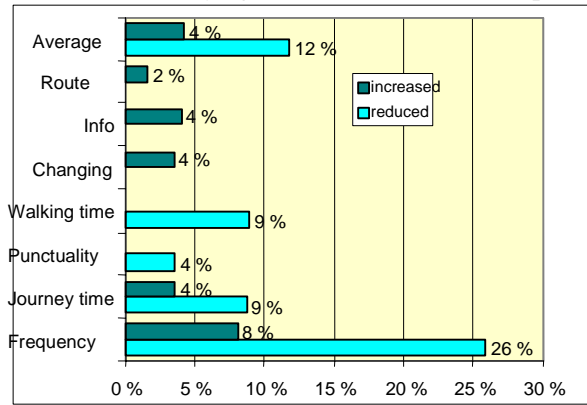
In the analyses we have also found effects of changes in the service. This is the main focus for all the packages of measures, i.e. what the isolated effect of the measures has been on passengers' use of the bus service. These analyses show that frequency is the most important quality factor which can explain the passengers changes in journey frequency, both for those who stop travelling by public transport and for those who travel more (figure S.8). As much as 26 percentage points more passengers reduce their use of the bus if the number of departures drop. Furthermore there is a clear asymmetry in that a poorer service leads to a greater drop off in passengers than the increase resulting from improvements. This means that it is easier to lose passengers than it is to attract new ones.

The effect of a poorer service is greater for nearly all the factors and, for frequency and journey time the effects are almost double as large. On average, the factors which have resulted in improvements have had an effect of 4 percent whereas the factors which have resulted in a poorer service have resulted in some 21 per cent reduction in the amount of travel by bus. Frequency contributes to pulling up this average for reduced journey frequency but even excluding frequency the average effect of the factors which were worse would be 7 per cent.

This means that if the packages of measures had given just as many passengers a poorer service as the number who had gained a better service, this would lead to a significant drop off in passenger traffic. It is therefore important to underline that it is primarily through redistribution and prioritising the service towards large passenger groups that these packages of measures have succeeded. The packages which have had the poorest effect are packages where redistribution has not succeeded. Without dragging out these figures too far, there is much to indicate that where a service becomes poorer this can have almost double the impact on demand than an improvement can have. We will look more closely at this in the report which looks at synergy effects.

In this case, however there is reason to maintain that "there and back are not the same distance", at least if we measure by passenger numbers and effects of changes in the service. There can also be adverse side effects if the "try and fail" process used in developing the service is too harsh. It is important to develop the service by testing, but not unless there is a degree of stability and predictability in the service which is

being developed over time. It is therefore very important not to implement measures which we know will be taken away again at the end of the trial period.



TOI report 736/2004

Figure S.8: Isolated effects of a better or worse service on the proportion who increase or decrease their use of public transport. Percentages

The analyses show that where the service becomes worse, this has a greater impact on journey frequency than improvements do. The question is whether this is due to passengers':

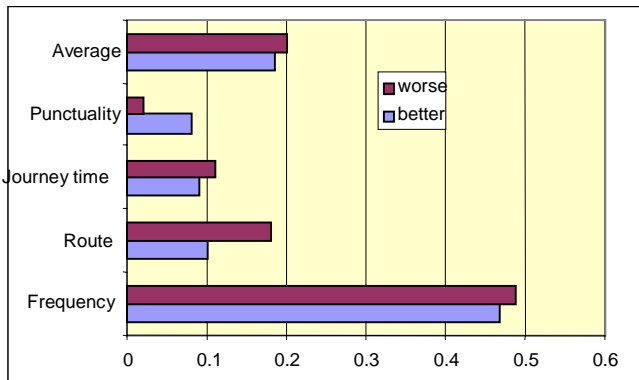
1. *evaluations* of improvements and deterioration which are different, or
2. *opportunities* to change their journey frequency which are different

In order to be able to answer this, we have analysed the data material in two phases; firstly what affects passengers' evaluations of whether the service has become better or worse, and thereafter the extent to which these evaluations affect journey frequency.

Passengers evaluate improvement and deterioration equally

The most interesting point in this analysis is that we have been able to uncover the causes of the asymmetry we found: "it is easier to lose passengers when a service becomes worse than to attract new passengers through improvements". It is not the differences in the passengers evaluations which affect this bias but rather their chances of changing their journey frequency. Even though there are certain differences between the effects, these differences are relatively marginal (figure S.9). For changes in frequency the effect on the evaluation of a better service is 0.47, and 0.49 for a poorer service. The average for the four factors which are common in both the sub models is 0.02 for the

factors which are worse and 0.19 for the factors which have become better. These differences are marginal.



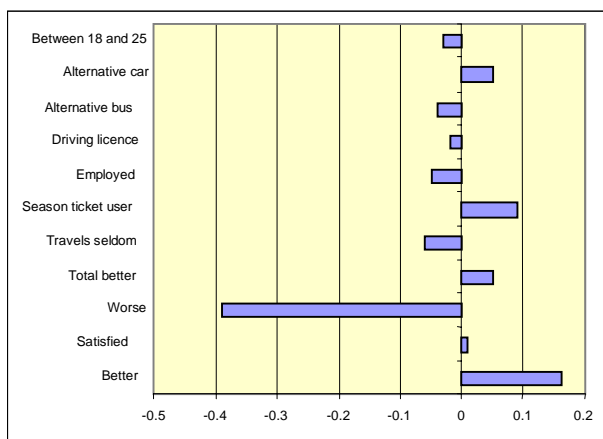
TOI report 736/2004

Figure S.9: Isolated effects of changed quality factors on the total evaluation of whether the service had become better or worse. Excerpt from table 8.6

Its is easier to stop using public transport than to increase use of public transport

The main impact on journey frequency can be found when we look at the effect of the total evaluations (figure S.10): Those who feel that the service has become worse indicate an effect on journey frequency that is more than twice the size compared with those who feel that the service has improved (-0.39 versus 0,16). In addition we find that there are a number of groups who increase their use of the bus service to a greater or lesser extent. However these differences are marginal when compared with the direct effects of the packages of measures. This figure shows with all

possible clarity that there are framework conditions and opportunities to change travel patterns which explain why there are such big differences between the effect of improvements and deteriorations in the service. The effect of changes in the service mean that passengers are more or less equally satisfied or dissatisfied but it is much easier to stop using public transport than to increase one’s use of public transport because of these changes. It is worth also noting the effects beyond those which are covered by the differences in travel patterns and other characteristics which we have found to affect use.



TOI report 736/2004

Figure S.10: Isolated effects of altered total evaluation of the service and characteristics of passengers on changed journey frequency. Excerpt from table 8.6