

Summary:

Public Transport Planning – Planning by Objectives

Part 1. Experience from the ‘Hundvåg package’, one year on

In 1996 and 1997, the Norwegian Ministry of Transport and Communications provided support for public transport trial projects through grants aimed at comprehensive ‘packages’ of measures. During this period, grants were made to 9 projects of which 6 were concentrated with urban areas. The county of Rogaland¹ in south-west Norway received grants for a packet of measures “Public transport development in Rogaland” in 1996, and to the “Hundvåg² package” in 1997.

When making grants the Ministry placed demands upon evaluation. The requirements for evaluation follow a common plan for projects in other counties and consist of a User Survey and a Travel Survey among a representative part of the population. The objective for this common evaluation plan was to undertake an *overall analysis* of all the projects.

Under commission from Rogaland County administration, the Institute of Transport Economics carried out an analysis of the local data from both the User Surveys and the Panel Surveys, while the county itself would be responsible for the organisation of the surveys and the basic information relevant to the analyses. Further, Rogaland County would be responsible for the evaluation of those parts of the packages which did not incorporate surveys.

¹ Rogaland is located in south-west Norway. The largest settlement is Stavanger with approx. 100 000 inhabitants.

² Hundvåg is a rapidly growing suburb of Stavanger.

Public transport growth in Rogaland

The projects “Public Transport growth in Rogaland” and the “Hundvåg package” include several public transport measures.

Among other things, the aim is to increase the share of public transport through improved coordination, timetable efficiency, and the development of a more market-oriented fares thereby providing the best possible service

The projects have their basis in the Strategy Programme for Public Transport in the County. The overall objective is to increase the number of passenger by 50 percent within the year 2003. In order to reach this goal, an offensive marketing campaign has been launched with the emphasis, among other things, on the following:

- Route efficiency project
- Expansion of the fares and discount system
- Marketing campaign
- Clarification of responsibility for termini and bus stops.

The Hundvåg Project

Hundvåg is a suburb of Stavanger with about 10 thousand inhabitants although it is estimated that housing development in the district will increase the population to around 15 thousand. The suburb is located on an island linked by a single road bridge to the mainland, i.e. the bridge connection to Stavanger centre, itself a traffic bottleneck. The importance of focussing on public transport for Hundvåg is manifest and had been a feature of Stavanger municipality’s Public Transport Report of 1994. The aim of the “Hundvåg proj-

ect” has thus been to increase the share of public transport in the suburb in order to reduce the expected increase in transport over the bridge in the future.

The changes which were carried out in public transport in Hundvåg in May 1998 essentially comprise:

- ❑ Simplification/streamlining of the route network. This largely follows up a principle on giving priority to the main routes along heavily trafficked stretches and the introduction of feeder routes to districts where there is little demand for the current routes. The aim is to contribute to a more simple and efficient route net.
- ❑ Increased frequency along the main routes with most passengers, from a 10 minute to a 5 minute frequency, Monday – Friday, from the morning until 18.00 in the evening between Hundvågkrossen and Stavanger centre.
- ❑ Infrastructure measures such as district terminus at Hundvågkrossen. Measures for improved traffic flow for buses and improved bus stops and shelters.
- ❑ Extensive marketing to build up a positive profile of public transport and those measures being implemented. The new routes were publicised to each individual household. At the same time the connection with the package project “Public transport growth in Rogaland” was advertised throughout the Stavanger region in the spring of 1998.
- ❑ Other quality improvements included the introduction of low-floor buses on all routes on Hundvåg.

The Hundvåg surveys

The measures implemented at Hundvåg are analysed on the basis of the User Surveys among passengers and the Travel Surveys among a representative sample of the population.

The analyses of how passengers on public transport evaluate the new services are summed up through a User Survey carried out on board the busses. These were made with the aid of a questionnaire delivered to all passengers on 5. November 1996 and 21. October 1998. A total of 3606 passengers replied to the survey which is summed up in this report.

The analyses of how the population of Hundvåg as a whole had reacted to the route changes are summed up in the Panel Survey. The Travel Surveys were conducted in the period 29. September – 5. October 1997, and in the period 8. – 27. March 1999 where the same persons were interviewed on the ‘before and after’ situations. The interviews were carried out on all days of the week and among a random sample of the population over 15 years in Hundvåg, and with Kvernevik as a control district. A total of 1292 interviews were made in Hundvåg and 322 in Kvernevik. The panel comprised 457 persons in Hundvåg and 113 in Kvernevik.

Many departures, but poorly organised prior to reorganisation

Even though a number of different measures have been implemented at Hundvåg, it is the increased frequency of services which is the dominant improvement. This has been virtually doubled between the ‘before’ and ‘after’ situation, from a 14-minute service to a 7-minute service following the implementation of the package. This is on the same level as the frequency in a number of major European “public transport” cities. However, this is the frequency in Stavanger centre. For those travelling to other districts the frequency is less favourable, and comparison with other European towns is less relevant.

There is nevertheless reason to emphasize that the level of public transport service Hundvåg was relatively high prior to the introduction of the package, accounting for 13 per cent of all journeys. This is virtually the level as in Oslo, and higher than in the other major Norwegian towns of Bergen, Trondheim and the rest of the Stavanger district. But public transport does not provide a comprehensive picture of how many regularly use public buses in Hundvåg (Fig. S.1). Our analyses reveal that 46 per cent of the population used the bus at least one a week, and 70 per cent at least once a month prior to the measures being implemented. Corresponding results from surveys in other towns show that only in Oslo was there a correspondingly high percentage of inhabitants who regularly used public transport for diverse purposes. The proportion travelling by public transport at least once a month is equally as high in Hundvåg as in

Oslo, and about 15 per cent higher than in Bergen.

The effect of the Hundvåg project must therefore be seen in association with the initial high level of public transport users. In spite of the high proportion in this category, there has been a relatively large passenger increase following the implementation of the measures. In this connection we have distinguished between the increase in the number of passengers arising from the general increase in passengers from Hundvåg, and that public transport passengers travel more on those days when the bus is used. According to our estimates there has been a 6 per cent passenger increase as a result of more residents at Hundvåg used the bus occasionally. The main reason for this increase not being higher is the relatively high *initial* level of bus passengers.

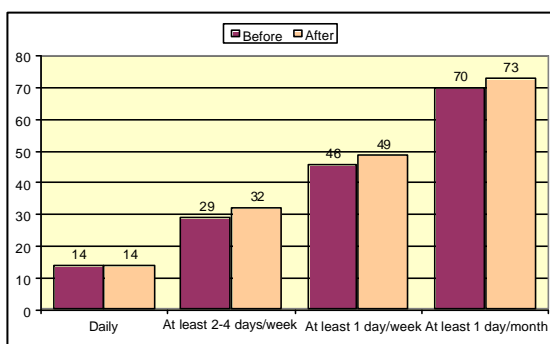


Figure S.1: Hundvåg residents – relative frequency of public transport use ‘before and after’. Accumulated percentage. Travel Surveys/Panel Surveys at Hundvåg 1997 and 1999. $N=457$.

Our analyses show that the number of passengers has increased by 20 per cent compared with the situation prior to the package being implemented (Fig. S.2). This must indicate that in addition to the general bus passenger increase at Hundvåg, a further 14 per cent has arisen from the fact that passengers on public transport use the bus for a variety of purposes, i.e. now use public transport more frequently.

A 20 per cent increase in passengers indicate a demand elasticity of 0.25; i.e. for every percentage increase in the number of departures, the increase in the number of passengers has been 0.25 per cent. This is somewhat lower than previous experience has revealed. By comparison, an analysis of the development of public transport in the 10 largest urban areas has yielded a demand elasticity of 0.43. The lower effect at Hundvåg is probably due to the fact that the

initial service was relatively good with a 14-minute frequency.

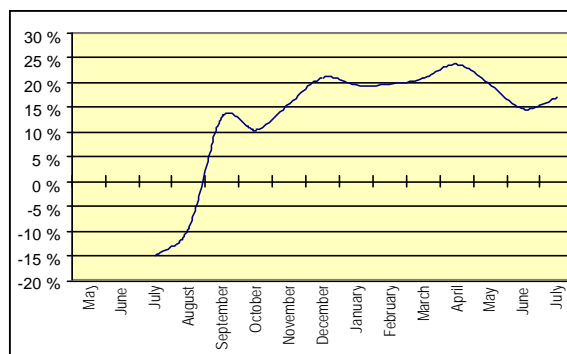


Figure S.2: Passenger growth on buses serving Hundvåg. Percentage change from level prior to implementation of measures. 3 months' moving average.

Improved services: passengers travel more frequently

In total, 70 per cent of passengers consider that the reorganisation has resulted in better services. In only one zone did passengers consider that services were not as good as previously.³ The service improvements have also resulted in an increased use of public transport. On average, 36 per cent state that they travel more frequently on public transport than previously. This suggests that among those passengers stating that services have improved, only a half of these travel more frequently.

In two zones, a majority of passengers stated that they used public transport less frequently after reorganisation.⁴ Among those stating that services were less favourable, about 70 per cent stated that they now travelled less frequently.

³ Zone 8, Ormøy/Bjørnøy/Roaldsøy.

⁴ Zone 6, Øvre Vågen, and Zone 8, Ormøy/Bjørnøy/Roaldsøy.

Table S.1: Has the reorganisation of bus services resulted in change in your use of bus services, in total, and whether this is a consequence of better or worse services? User Survey on the Hundvåg routes 1998. N=1809

Changed use of bus	Total	No reply	Better	Worse	Unchanged
No reply	12	80	1	2	5
Yes, travel more frequently	36	7	49	7	10
Yes, travel less frequently	9	1	1	63	5
No, no change	44	12	49	28	79

Workers and school pupils are considerably more satisfied with the new arrangements than the other passengers, in spite of the fact that these groups have not increased their travel frequency correspondingly. On the contrary, working people have had a lower increase in use of public transport than the improved arrangements might suggest. This is due to the fact that the improvements, including increased frequency, particularly favour the regular users simultaneous to the fact that these have reached an upper level, concerning bus travel in the district. This signifies that Hundvåg has acquired many more satisfied customers but without an corresponding increase in travel frequency.

These measure have also resulted in an increase number of passengers with good access to a car. In all, 27 per cent state that they could have used a car for that journey when they were being interviewed, and that this proportion has increased by four per cent following the reorganisation. There are also a clear over-representation of passengers with good access to car among frequent users, with approximately 70 per cent higher share compared with those whose use of bus has remained unchanged or declined.

In addition, passengers with season tickets have increased their travel frequency significant more than other passengers. In total, of those stating that they have increased their travel by bus, season ticket users account for some 40 per cent higher share compared with those with unchanged or reduced frequency. This is explaining the high share of existing public transport passengers having increased their use of the bus.

Analyses show that the changes in services contribute to explaining 80-85 per cent of passenger increase. Increased frequency is the most important reason, this accounts for 60 per cent of the total increase. For those who reduced the bus

travel, there are a number of factors explaining the reduction, but which to a large extent are overlapping. These apply in the first instance to changes in the route net, change of bus, reduced frequency and increased journey time. These factors account for 70 per cent of the decline in the use of the bus.

Increased number of public transport passengers to workplace

Public transport accounts for a high market share of those travelling to school/workplace, and where about 20 per cent state that bus is most frequently used. This market share has not changed following the implementation of the new measures. On the other hand, the market share using public transport occasionally had increased significant. In total 25 per cent of the population in Hundvåg used various transport modes to school/workplace during the week, a proportion which increased to 36 per cent following the implementation of the new measures. This growth is due to increased use of public transport and car passengers. The proportion using bus to school/workplace some times during the week increased from 27 to 32 per cent. This shows that that the project managed to increase the number of occasional public transport users while the share of permanent bus users is more difficult to change.

Table S.2: Proportion varying between several means of transport to the workplace – per cent of Travel Survey/Panel Survey at Hundvåg and in Kvernevik 1997 and 1999. N=362 and N=85

	Before	After	Change
Per cent changing completely:			
- Hundvåg	25	36	11
- Kvernevik	15	13	-2
Per cent using public transport occasionally:			
- Hundvåg	7	12	5
- Kvernevik	6	2	-4

New passenger groups

The service improvements have changed the character and structure of the passengers:

- ❑ Women continue to dominate – but more men travel by public transport following reorganisation
- ❑ Youth under 25 years continue to be the largest user-group, but more in the 25-45 age group use public transport
- ❑ More bus passengers have a season ticket, and more have access to a car
- ❑ An increased proportion of bus passengers had access to car on the specific journey.
- ❑ The share of regular passengers has increased

One of four bus passengers could have used the car

Access to a car provides a general picture of the passengers possibility to travel by another means. The User Survey shows that the share with a driving license is higher following the reorganisation of bus routes than previously – an increase from 45 to 49 per cent. Further, there are more passengers in the ‘after’ situation who have a driving licence and access to a car in the household – an increase from 35 to 38 per cent.

Table S.3: Change in proportion with driving license, access to a car, car and license, and where they could have used the car. User Survey at Hundvåg autumn 1997 and autumn 1998. N=1731 and N=1654

	Proportion in 1998	Per cent change 1997 to 1998
Have driving license	49	4
Car in household	77	2
Have car and license	38	
Could have used car	27	4

The survey also enquired whether they had access to car for the actual journey. In the survey of autumn 1997, 23 per cent stated that they could have used the car, while in the autumn 1998 survey, 27 per cent gave this response. One main conclusion of this survey is that the service improvements have increased the number of passengers with good access to car.

Changes have resulted in more satisfied passengers and improved services

Simplification and reorganisation of the route net is an advantage, although not necessarily for all. Such changes will almost always result in reduced service level for some passengers.

- ❑ The increase in the frequency was well received and 70 per cent of passengers considered that the frequency was better following the reorganisation.
- ❑ Virtually a half of the passengers considered that travel time had been reduced.
- ❑ About one third of passengers considered that the route net had been improved after reorganisation, while half as many meant that it was less satisfactory.
- ❑ Overall, reliability had been improved, but one fifth of all passengers remained dissatisfied.
- ❑ 1 of 4 passengers considered that interchange facilities had been improved after reorganisation in spite of the fact that the proportion requiring to change buses had increased. 14 per cent considered that facilities were not as good as previously.
- ❑ The bus stops had been improved along certain stretches and passengers were generally pleased with the improvements made. The proportion pleased with information in the bus shelters increased even more to 22 per cent, but 30 per cent nevertheless remained generally dissatisfied with conditions.
- ❑ 1 of 3 passengers considered that information on timetables had been improved. These had been sent to all households and was the basis of information for 37 per cent of passengers.
- ❑ Passengers are pleased with the low-floor buses – these make boarding and alighting much easier. They are also pleased with the number of seats available in the buses.
- ❑ Service from the drivers is an important factor for improving quality. One fifth of all passengers continue to be dissatisfied with the service, a factor which increases with younger passengers.

Small increase in knowledge of services after reorganisation

A lack of information is a barrier to travel by public transport. It is necessary to acquire information on times, route nets and fares. At Hundvåg and Kvernevik it does not appear that this is the reason for not using public transport. The majority state that they are familiar with the bus times and frequencies – at least concerning buses to the centre.

All questions relating to knowledge of the services showed a small increase in the before and after situations. The proportion of the population who know the frequency of services from home to Stavanger centre in the rush hours shows the greatest increase, by 11 per cent at Hundvåg. Regular passengers are particularly well informed on rush hour services. This knowledge declines with lower travel frequency. There are also clear variations in the knowledge of the public transport services associated with age. In general, younger persons are most familiar with services.

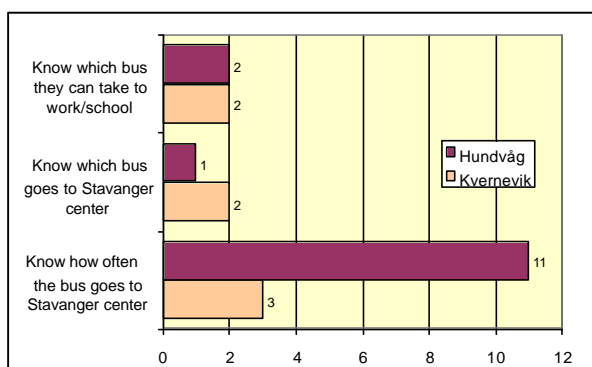


Figure S.3: Change in proportion of positive response regarding familiarity with diverse aspects of public transport where subject resides (per cent). Travel Survey/Panel Survey at Hundvåg and Kvernevik, 1997 and 1999, N=456 and N=112

Many passengers do not use the rebates

In spite of the fact that the majority of passengers use the bus several times a week, as much as a quarter of these purchase a single journey ticket. Following the reorganisation a change occurred in the sales of the various types of ticket, although there is still a considerable pro-

portion who do not avail themselves of the rebates open to them.⁵

This suggests that there remains a considerable proportion of passengers who pay an “excessive” fare for the journey by public transport, either because they are insufficiently aware of the rebates available, or because they consider that a single-journey ticket is more suitable. This situation remains in spite of the campaign for season tickets.

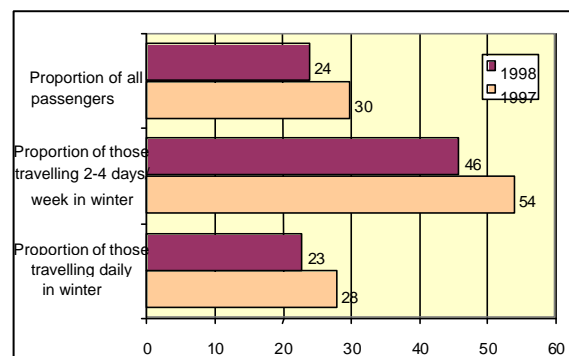


Figure S.4: Passengers paying “excessive” fares in that they do not use discount tickets. User Survey autumn 1996 and autumn 1998 at Hundvåg. N=1725 and N=1649

Those paying an “excessive” fare are initially those travelling daily but who purchase a single ticket and a multiple-journey ticket. These account for 23 per cent of all daily passengers. In addition we have a large group comprising 46 per cent of those travelling 2-4 times per week who use a single journey ticket rather than the multiple-journey ticket.

In order to make passengers more acquainted with the fare structure and the actual costs of using the various forms of ticket, the fares were used in a Marketing Project carried out throughout the Stavanger region. Here, the focus was on the season ticket fare and the price per journey. In order to see whether the passengers had understood information about fares they were asked to quote the price of a season ticket and the fare per journey based on this. 45 per cent replied that they did not know what the season

⁵ Reductions are available for a wider variety of bus tickets than is normal in the UK (for example), including day tickets, season tickets for various periods, pre-paid multiple journey tickets punched when boarding, etc.

ticket cost, and only 28 per cent answered the correct price of NOK 420. Of these, 46 per cent were using the season ticket on that day when they were interviewed. The fare per journey was more difficult to answer and 53 per cent did not reply to this question. 19 per cent replied NOK 17, which is the price for a normal single ticket, and 22 per cent replied correctly – about NOK 9-10.

These results support the hypothesis that it is difficult to disseminate information, particularly relating to the fares structure. The general opinion of the population is that public transport is expensive and difficult to overcome, but getting passengers to be more price conscious must be an objective in itself while at the same time it appears to be difficult to persuade passengers to make use of the cheapest ticket available to them.

Hundvåg residents is more positive to public transport

The attitude of people cannot be seen in isolation from their behaviour in the same way that their behaviour cannot be considered without regard to their attitudes. In general the population of both Hundvåg and Kvernevik were more positive attitude towards public transport, i.e. they

were given a score above 3. The exception was the claim the “*it is cheap to travel by bus*”. There was general disagreement with this statement.

They were most positive to the statements:

- 🚌 *It is easy to pay on the bus*
- 🚌 *Rarely have problems boarding and alighting*
- 🚌 *Buses go frequently*
- 🚌 *It is only a short distance to the bus stop.*

Among those statements which people disagreed with the most included:

- 🚌 *It is cheap to travel by bus*
- 🚌 *The bus companies are good at providing information through the media*
- 🚌 *The bus stops are well maintained.*

It is the same three statements which achieved the highest level of disagreement prior to reorganisation. Nevertheless, we note that there are now fewer who disagree with the statement that the companies are proficient at providing information through the media. Consequently, there has been an improvement here. In Kvernevik we did not find any changes in attitudes in the ‘before’ and ‘after’ surveys.

Figure S.6: Changed proportion who are satisfied with various aspects of the service. Percentage. User Survey in Hundvåg 1997 and 1998. N=1650 and N=1550

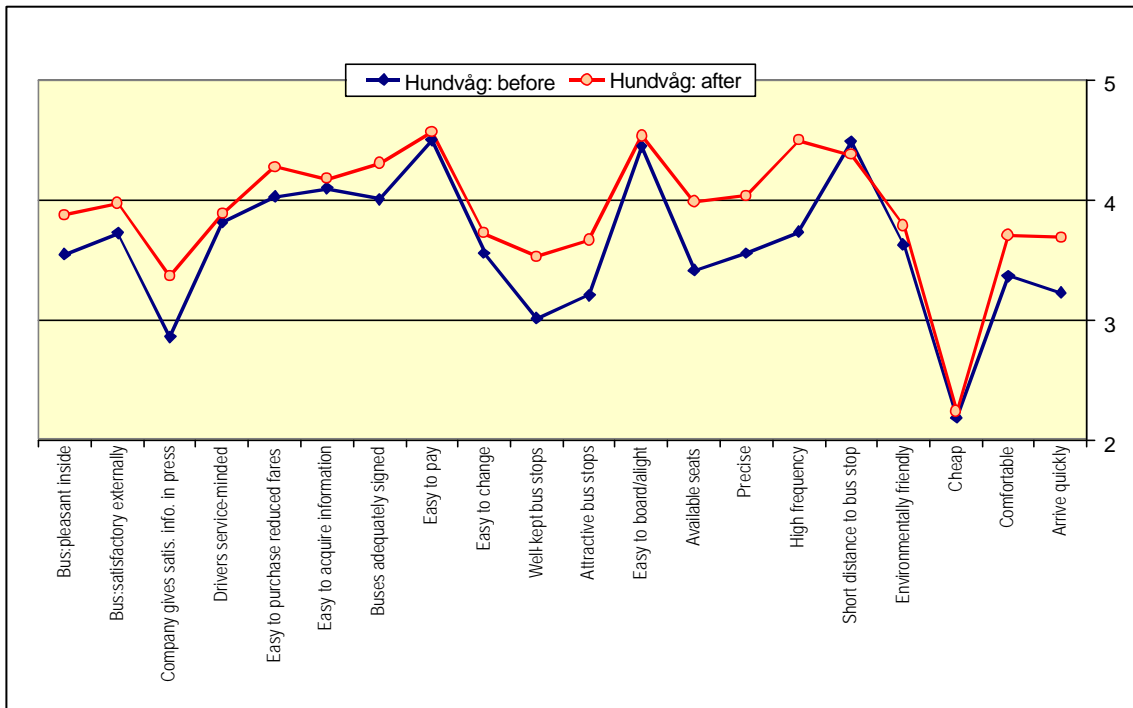


Figure S.7: Attitudes to various aspects of the public transport service by residents of Hundvåg. Travel Survey/Panel Survey, Hundvåg, 1997 and 1999. N=456

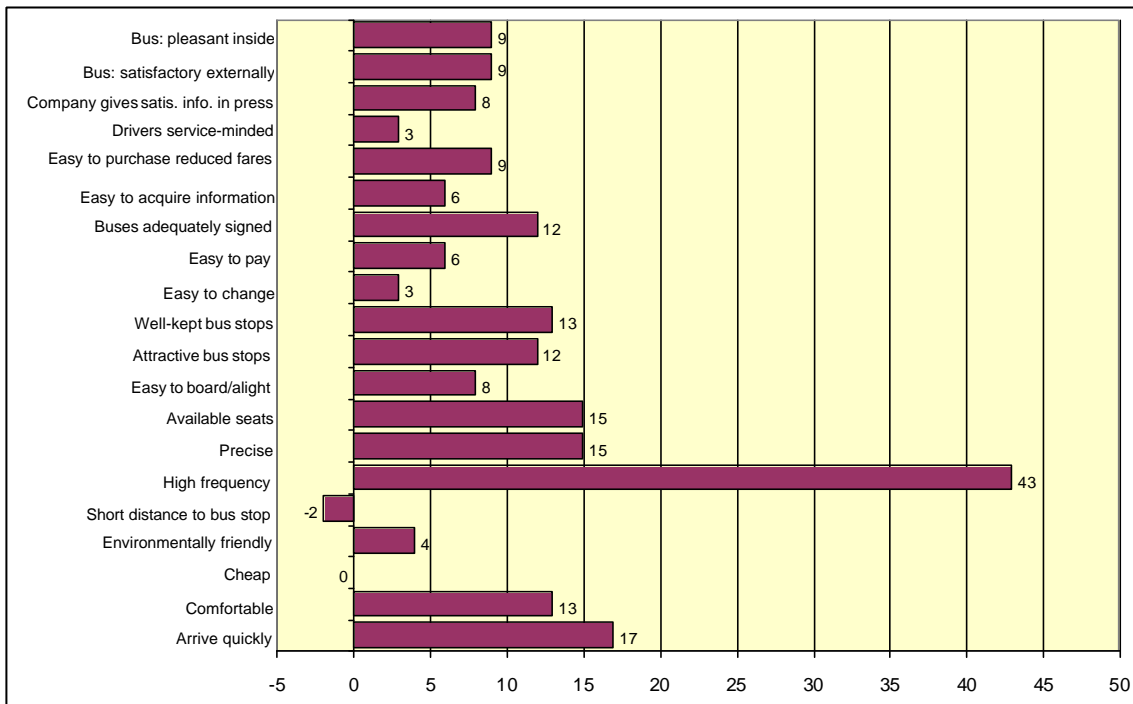


Figure S.8: Changed proportion in agreement to the statements. Percentage. Travel Survey/Panel Survey in Hundvåg 1997 and 1999. N=456

Three of four agree that buses go frequently

If we look at those who are in complete agreement we find a marked increase at Hundvåg, particularly for the statement “*buses go frequently*”. Those who agree completely with this statement have increased by 43 per cent, from 31 to 74 per cent. In general throughout the ‘after’ survey there is broad agreement for all statements with the exception “*It is only a short distance to the bus stop*”.

The calculated mean attitude variable shows that people in both Hundvåg and Kvernevik in general increased their positive attitude towards public transport, and most significant for Hundvåg.

Table S.5: Mean attitude. Travel Survey/Panel Survey, Hundvåg and Kvernevik 1997 and 1999. N=454 and N=111

	Trial district Hundvåg	Control district Kvernevik
Attitude 'before'	3.62	3.68
Attitude 'after'	3.91	3.73
Change in attitude	0.29	0.05

Summary

Our analyses of the Hundvåg package show that the improvements have resulted in a significant increase in passengers by about 20 per cent, and that more passengers are satisfied. The demand effect is, however, somewhat lower than that found in other surveys, something which is essentially due to the fact that a large number of passengers had already reached their “ceiling” in bus travel.

This initially applies to those using public transport daily, but it is also these passengers who are most satisfied with the new services. This indicates that the Hundvåg package has given the passengers a more competitive public transport service, something which is important, not least in respect of the increasing competition of the car.

This is supported by the fact that the project has provided an increased share of the passengers with good access to a car, i.e. “voluntary” bus users. The analyses also show that the improvement in services has resulted in an increased number of occasional passengers, i.e. those who occasionally use public transport to travel to school or the workplace. Today, approximately every third passenger who uses public transport occasionally when going to school or work does so at least once a week.