PUBLIC TRANSPORT VALUE FOR MONEY MEASURES

Transfund New Zealand Research Report No. 105

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Wellington, New Zealand

Transfund New Zealand Research Report No. 105

ISBN 0-478-11063-4
ISSN 1174-074

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Gammie, F. Public Transport Value for Money Measures
Transfund New Zealand Research Report 105. 30pp.

Keywords: public transport, performance measures, value for money

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EXECUTIVE SUMMARY

OBJECTIVE

The objective of the project was to "*establish the feasibility of a national system to derive passenger kilometres and/or passenger boardings per $ subsidy for all public transport services (at the route/time period or RFT level)*".

Passenger kilometres and/or passenger boardings per $ subsidy are recognised as the best 'readily available measures' providing approximations for the average benefit per $ subsidy for a public transport service. A good first step in addressing the issue of allocative efficiency, is to determine whether it is feasible to establish a national service performance system based on these measures.

METHODOLOGY

A pilot study was undertaken, with two regional councils, in order to clarify the data problems and analysis difficulties involved in establishing a service performance system based on passenger-kilometres and passenger-boardings. The regional councils involved were the Wellington Regional Council (WRC), as representative of a larger council (in terms of public transport provision) and Environment Waikato (EW), as representative of a smaller-medium council.

The pilot study involved:

- Discussions with the regional councils involved regarding data availability, suitable format and issues arising;
- Preparation of information by regional councils (neither council had the data available in a suitable format, and considerable effort was required to do this);
- Further discussion with councils over issues arising from preparation of data;
- Analysis of data provided; and
- Discussions with councils in regard to significance of results.

CONCLUSIONS

A number of conclusions can be drawn from the analysis carried out for this project:

- Analysis of public transport services on the basis of subsidy $ per passenger-boarding or
- passenger-kilometre provides a useful indicator of service performance. Poorer performing services can be readily identified, and service performance can be analysed by service type.
- Analysis by subsidy/passenger-boarding and by subsidy/passenger-kilometre do not give the same results. Both passenger-boardings and passenger-kilometres should be used to give a better picture of the distribution of subsidies.
- Passenger-boarding data is readily available, and analysis of service

performance on a national basis using subsidy/passenger-boarding would be relatively easy to implement. Passenger-kilometre data, however, is not readily available at present. In addition, different methods are used by different operators and regional councils to derive this, and a standard approach, along the lines of that outlined in this report, would be required to allow meaningful comparisons between regions and avoid any systematic bias.

- Analysis at a disaggregated level (ie below contract level) would be difficult to implement on a national basis, given that some regions do not have access to patronage data at a disaggregated level, and subsidy amounts are only known for the contract (not for segments of it). This is a weakness for a public transport service performance system. However, it could be partially overcome by developing a cost model to allow analysis of selected services at a more disaggregated level (in addition, regional councils would need to obtain more disaggregated data from operators for those services).
- Concessionary Fare Systems (CFS) should be analysed separately from services (at least initially), given that the subsidy payments are on a different basis.
- Comparisons of subsidy levels from different regions will need to take into account the different proportions of commercial services in different areas. This poses a potential difficulty, as patronage information is not generally available to regional councils for commercial services. However, several options are available to overcome this difficulty.

OVERALL CONCLUSION

The overall conclusion reached, in terms of the project objective, is that it is feasible to establish a national system to derive passenger kilometres and passenger boardings per $ subsidy for all public transport services at the contract level (subject to the constraints above). Analysis of performance at a more disaggregated level (at the route/time period or RFT level) would require development of a cost model, and regional councils obtaining disaggregated data from operators.

ABSTRACT

This project was an initial examination of means of assessing the value for money being achieved from individual publicly-funded transport services. The feasibility of a national system to derive passenger kilometres and/or passenger boardings per $ subsidy for all contracted services at the route/time period or contract level was assessed. This involved a pilot study of two regions to identify data problems and analysis difficulties. Conclusions were drawn from this pilot study for a national system.

1. INTRODUCTION

1.1 Background

Reforms introduced in 1991 in regard to public transport (particularly competitive tendering for provision of services) addressed the issue of 'technical efficiency' (unit cost levels). But they did not address the issue of 'allocative efficiency', that is whether the "right" services are being provided, and whether the public subsidies are being directed most effectively to achieve the potential benefits sought from public funding of passenger transport services.

Both Treasury and the Audit Office have expressed concerns that this issue has not been properly addressed. They wish to see performance evaluation methods, and measures that assess the value for money being obtained from public funding, by Transit New Zealand/Transfund or regional councils, to passenger transport services.

In early 1994, Transit New Zealand commissioned an initial research project to address these concerns, and to advise on performance evaluation methods for public funding of passenger transport services. The 1994 research report recommended that, as a first stage, passenger kilometres and/or passenger boardings per $ subsidy be derived for all contracted services at the RFT level. The research project reported here undertaken by Symonds Travers Morgan (NZ) Ltd (STM), builds upon the 1994 research.

This research initially comprised two stages, the first of which was completed and reported here. The second stage did not proceed.

1.2 Objectives

The objectives of the project were to:

a) *Stage 1: Establish the feasibility of a national system to derive passenger kilometres and/or passenger boardings per $ subsidy, for all public transport services (at the route/time period or RFT level).*

b) *Stage 2: Develop a methodology to assess marginal user and external benefits per marginal $ subsidy, and trial it in one region (not carried out).*

Passenger kilometres and/or passenger boardings per $ subsidy are recognised as the best 'readily available measures' providing approximations for the average benefit per $ subsidy for a public transport service. A good first step in addressing the issue of allocative efficiency, is to determine whether it is feasible to establish a national service performance system based on these measures. This was done for this project.

A performance system based solely on passenger kilometres and/or passenger boardings per $ subsidy will, however, have several important limitations. It will not take account of the different level/type of external benefits from different services; nor will it

recognise the different levels of disbenefit that might occur for different situations/market segments in cutting or withdrawing services. The second stage of the project was to focus on supplementary or complimentary approaches in which the major emphasis would be on developing and trialing a system to allow an assessment of the marginal return or benefit per marginal dollar of subsidy.

1.3 Structure of Report

This report is set out as follows:

Chapter 2 - outlines the results of the pilot project undertaken with two regional councils; the Wellington Regional Council (WRC) and Environment Waikato (EW).

Chapter 3 - discusses issues arising from the pilot project, and develops an appropriate methodology for determining the performance measures.

Chapter 4 - sets out conclusions and recommendations.

Appendices:
Appendix A - WRC keyfactor report.
Appendix B - Regional council data provided.
Appendix C - WRC contract extracts in regard to confidentiality of information.

2. PILOT STUDY RESULTS

2.1 Scope

A pilot study was undertaken, with two regional councils, in order to clarify the data problems and analysis difficulties involved in establishing a service performance system based on passenger-kilometres and passenger-boardings. The regional councils involved were the Wellington Regional Council (WRC), as representative of a larger council (in terms of public transport provision) and Environment Waikato (EW), as representative of a smaller-medium council. It was considered that these two councils would provide a good cross-section of services and operators, and enable identification of the types of issues which were likely to arise in regard to establishing a national service performance system.

The pilot study involved:

- Discussions with the regional councils involved in regard to data availability, suitable format, and issues arising;
- Preparation of information by regional councils (neither council had the data already available in a suitable format, and considerable effort was required to do this);
- Further discussion with councils over issues arising from preparation of data;
- Analysis of data provided; and
- Discussions with councils in regard to significance of results.

2.2 Wellington Regional Council Analysis

2.2.1 Data Presently Collected

2.2.1.1 Contracted bus services

The WRC contracts to provide bus and rail services within the Wellington region. Bus contracts cover one or more routes, and can cover the following time periods/service types (individually or in combination):

- Regular (non-trolley bus) timetable services
  - week day
  - peak
  - peak morning
  - interpeak
  - evening
  - Saturday
  - Sunday
  - weekends.
- Wellington City trolley bus services
- Shopper services
- School services

- Concessionary fare schemes
  - week day
  - peak
  - morning peak
  - afternoon peak
  - interpeak
  - Saturday.

For all contracted bus services operators are required to complete a monthly Key Factor Report (copy attached as Appendix A). This form covers both passenger-boardings (separated by adults, children and pensioners) and (total) passenger-kilometres. This information is thus provided *by contract,* and, *by month.* However, several operators provide incomplete key factor reports (several do not provide passenger-kilometre information, for example). The Wellington trolley bus services are covered by one contract, although data on passenger-boardings is provided at a route level.

2.2.1.2 Contracted rail service

The WRC contracts with Tranz Rail for provision of the urban rail service. All Wellington urban rail services are in one contract. An annual passenger-kilometre and annual passenger-boarding figure is provided to WRC.

2.2.1.3 Commercial bus services

A significant proportion of bus services are operated as commercial services (services not contracted by the WRC). No information is provided to the WRC for these services, apart from where a concessionary fare scheme is in place.

2.2.1.4 Concessionary fare schemes

WRC provides compensation, via a Concessionary Fare Scheme (CFS), to operators for revenue foregone by the operator as a result of instituting the Council's concessionary fare structure. CFS applies for commercial services and contracts instituted since April 1994 (but not separately for earlier contracts). The compensation payable is based on the number of concession passengers carried. Operators therefore provide the WRC with data in regard to the number of concession passengers for these services. Passenger-kilometre data is not provided.

Table 2.1 below provides the subsidy and performance data available for the main categories of public transport in the Wellington region (trolley bus details have not been separated, and rail details not included, given that these are both run by one operator, and the confidentiality agreement for this project does not allow identification of individual operators).

2.2.1.5 Surveys

In addition, WRC conducts surveys and cordon counts of passenger numbers. However, the surveys are generally on an ad-hoc as required, and the cordon counts only provide data for travel on the count day. They are also not very helpful in determining passenger-kilometres.

2.2.1.6 ETM Data

The WRC does not have access to the operators' Electronic Ticketing Machine (ETM) data.

TABLE 2.1 WRC bus service and concessionary fare scheme statistics-1995/96

	Annual Subsidy ($)	Passenger-Boardings - 1995/96	Passenger-Kilometres - 1995/96
Shopper bus services	99,368	55,119	315,625
School bus services	896,354[1]	788,203	5,165,309
Other contracted bus services[2]	8,909,357	11,466,248	75,312,766
Commercial bus services	0	2,176,000[3]	15,226,000[3]
Total Bus Services	9,905,079	14,485,570	96,019,700
Concessionary Fare Schemes	550,774	2,687,839	NA

Note: (1) Some school bus services also included in other bus contracts.
(2) Includes trolley bus services.
(3) WRC estimate.

2.2.2 Data Provided to STM

Initially WRC considered that they would not be able to provide any data to STM given the confidentiality of information provisions of its contracts with operators. However, data was eventually provided, in such a way as to hide the identity of the route(s) and operator involved (this issue is discussed in the next chapter). WRC provided passenger-boarding, passenger-kilometre, and subsidy data for a sample of public transport service contracts for the 1995 calendar year (47 out of 95 PT service contracts, receiving 78% of PT service subsidy, and 15 concessionary fare schemes).

As indicated above, passenger-kilometre data is not provided for a large number of WRC contracts, and was not provided for 20 of the 47 service contracts reported, or for any of the concessionary fare schemes. In addition, for a number of the services where passenger-kilometre data was provided, this was estimated by WRC (by averaging information provided by the operator in regard to section lengths for the routes covered by each contract).

2.2.3 Analysis of Contracted Service Data

The analysis of WRC data was confined to the contracted services for which *both* passenger-boarding and passenger-kilometre data was provided. Subsidy $ per passenger-boarding and subsidy $ per passenger-kilometre were calculated (shown in Appendix B). The inverse of these measures were also calculated: passenger-boarding per subsidy $, and passenger-kilometre per subsidy $.

Key points to note from this data were:

- Subsidy $/passenger-boarding ranged from $0.22 to $4.62, with the weighted average for all services being $1.20.
- Subsidy $/passenger-kilometre ranged from $0.03 to $1.84, weighted average of $0.13.
- Weekend, school and shopper services had high subsidy/passenger values, while interpeak and peak services had low values.
- The ranking changes depending on which service performance measure is used: passenger-boardings or passenger-kilometres. For the WRC services, there was a reasonably good parallel between the two measures in terms of the bottom third of services. Around 80% of services in this group were the same under both measures), but only a moderate matchup for the middle and top thirds. (The WRC services are ranked in Figures 2.1 and 2.2.)
- The distribution of service performance was analysed in terms of proportion of total passenger-boardings, total passenger-kilometres, and total subsidy covered by these services. The results are shown in Figures 2.3 and 2.4. Ninety nine percent of passenger-boardings were made on services with a subsidy/passenger-boarding below $2.50, while 82% were on services below $1.50. The more expensive services (subsidy/passenger-boarding $1.50+) provided 17.7% of the boardings and required 28.5% of the subsidy. Ninety nine percent of passenger-kilometres were made on services with subsidy/passenger-kilometre below $0.60, while 93% were on services below $0.30.

2.2.4 Analysis of Concessionary Fare Scheme Data

The following points were noted in regard to the concessionary fare schemes:

- Subsidy $/passenger-boarding ranged from $0.21 to $0.55, with the weighted average for all schemes being $0.37. Although this is lower than the bus service average, the two cannot be compared directly given that passenger numbers for concessionary fare schemes only represent concession passengers.
- Passenger-kilometre data was not provided, and subsidy/passenger-kilometre could not be calculated.
- School services were at the lower end of performance, while peak services were at the top end (reflecting the differences in provisions of the CFS for children and adults).
- 80% of passenger-boardings were made under schemes with a subsidy/passenger-boarding below $0.50, although these only accounted for 70% of the subsidy.

2.3 Environment Waikato Analysis

2.3.1 Data Presently Collected

Environment Waikato contracts to provide bus services within the Waikato region. Bus contracts cover one or more routes, and operate Monday to Saturday, or Monday to Friday. Environment Waikato previously had separate contracts for weekends, but these have been incorporated in with the weekday services. The majority of the subsidy is spent on urban services in Hamilton City (94%), with the remainder used for subsidising

Figure 2.1 WRC Subsidy/Passenger Boarding

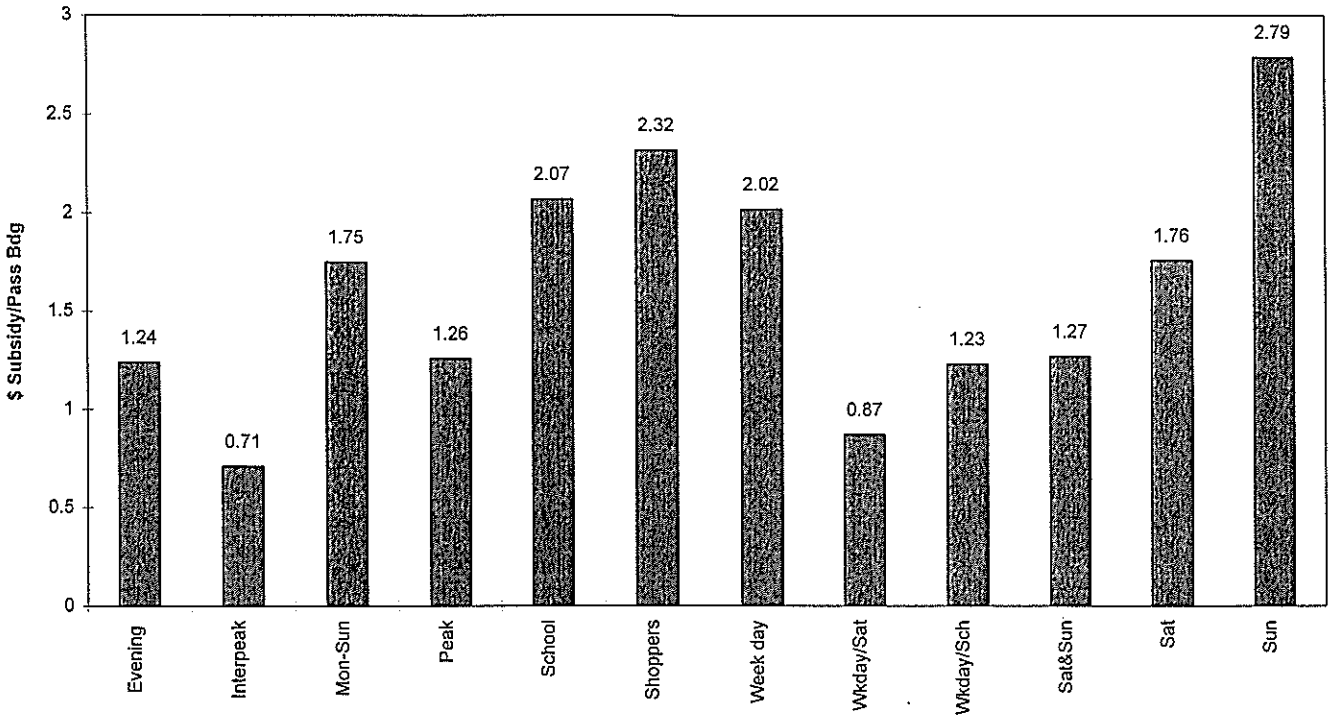


Figure 2.2 WRC Subsidy/Passenger Kilometre.

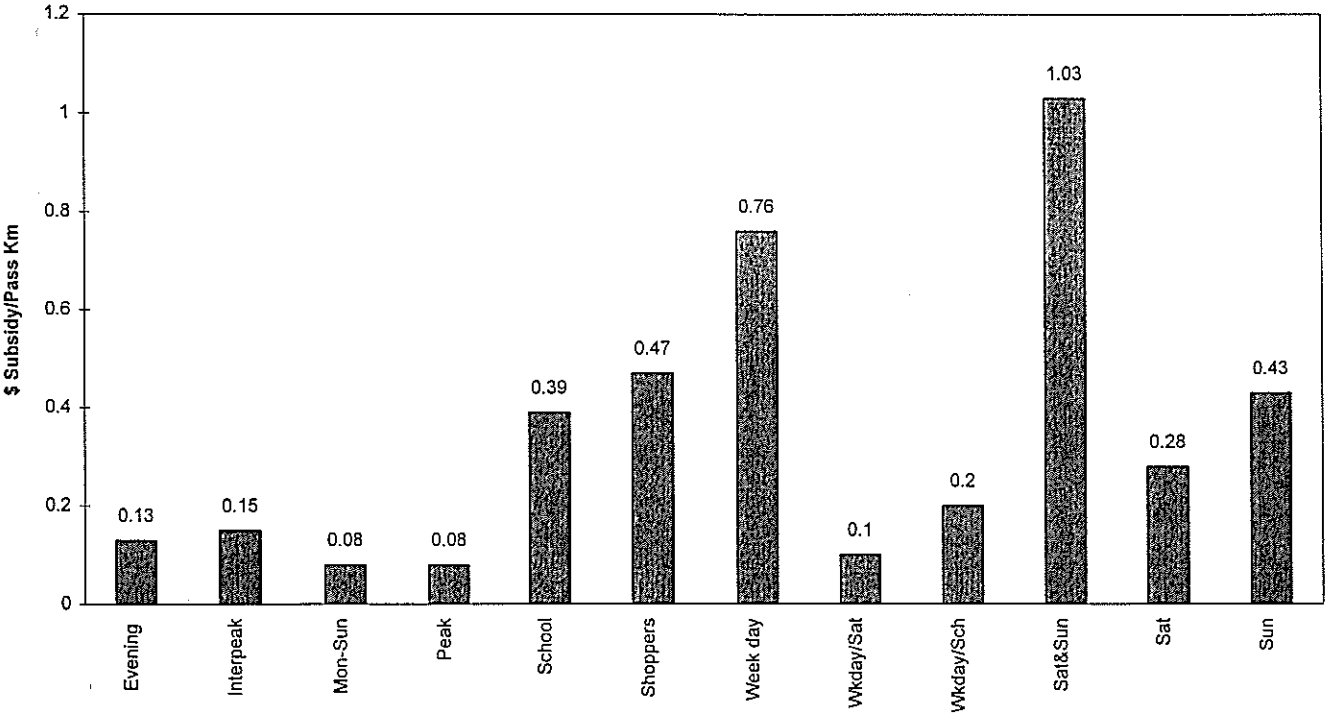


Figure 2.3 WRC Bus Services. Proportion of Subsidy and Passenger Boardings (subsidy/passenger boardings)

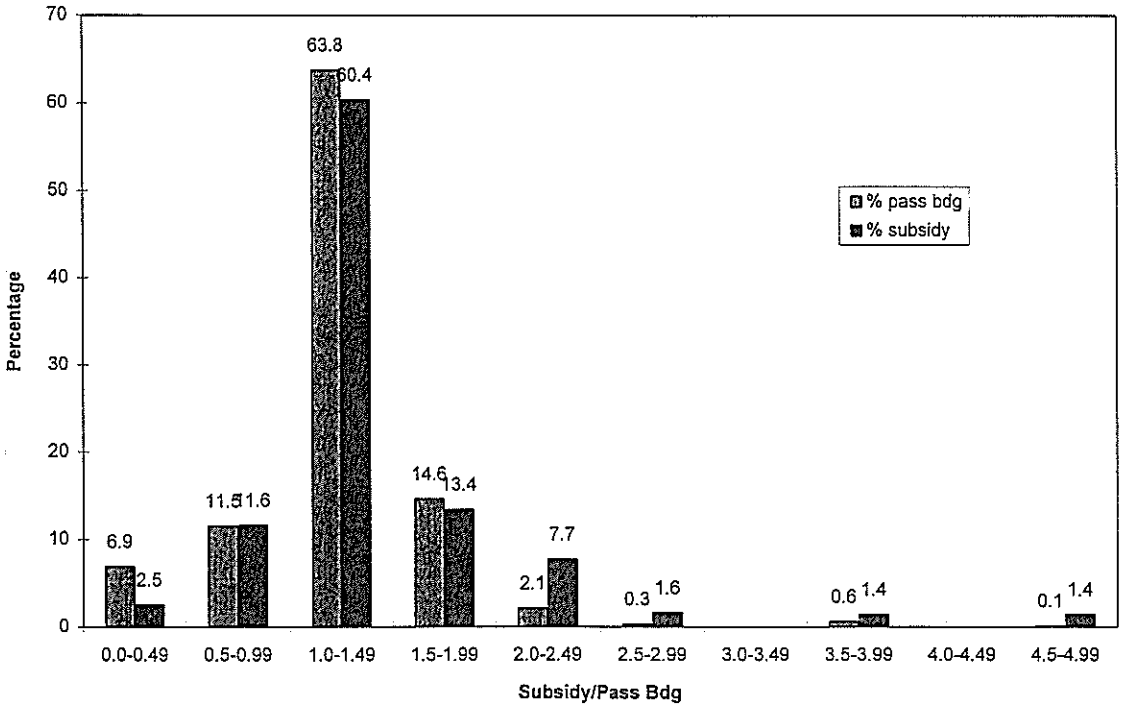
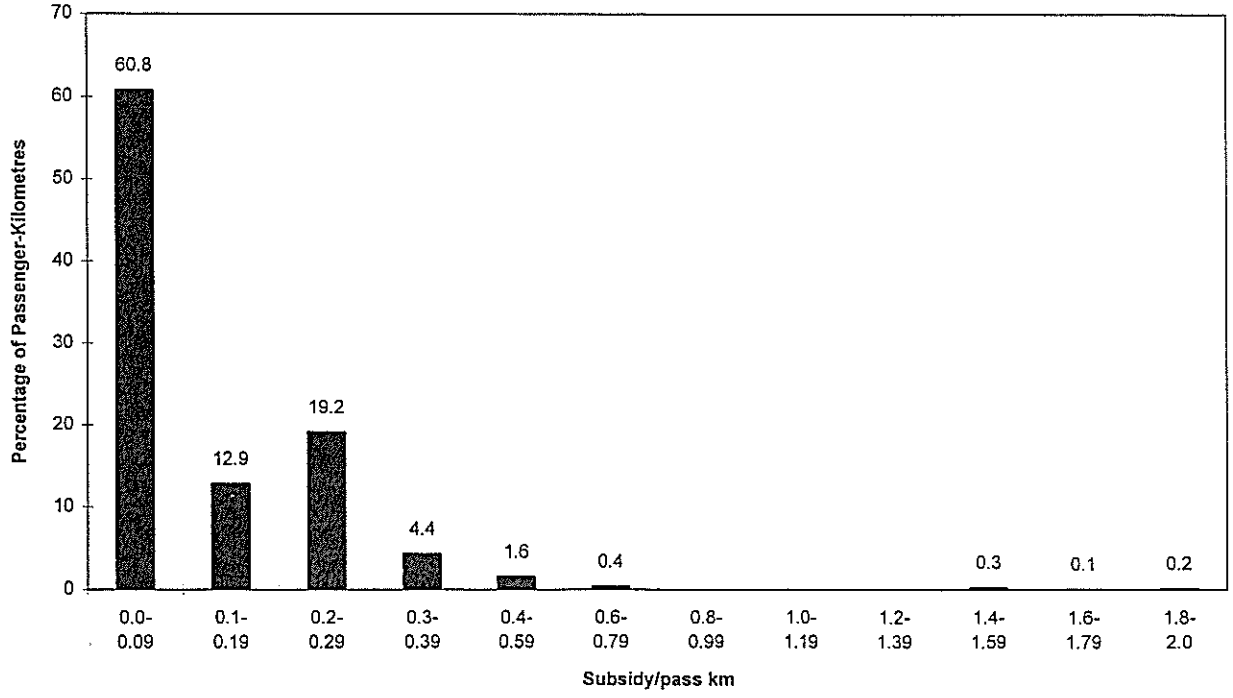


Figure 2.4 WRC Bus Services. Proportion of Passenger Kilometres (subsidy/passenger-kilometre).



rural services. No concessionary fare schemes are presently provided (although these are being considered for school children on several commercial services).

For all of the Waikato contracts the operators provide EW with the Electronic Ticketing Machine (ETM) data (this is presently also provided for several commercial services). This includes all patronage and revenue data received by the operators from the ticketing system, enabling patronage and revenue analysis by route and time period on a daily basis (if necessary).

2.3.2 Data Provided to STM

Environment Waikato provided data for all the Waikato contracted bus services (with route and operator identity obscured) for the 1995/96 financial year. Passenger-boarding, passenger-kilometre, and subsidy data was provided on a contract basis (i.e. annual total for each contract). Environment Waikato was able to provide the passenger-boarding and passenger-kilometre data on a disaggregated basis (for example, by route and time period). The subsidy amount could only be provided on a contract basis.

The passenger-kilometre data was calculated by EW using the following method:

1. Origin/destination surveys of all routes have been conducted previously for all services.
2. The OD survey results have been used to determine the average trip length for all services.
3. Overall, the average trip length is 80% of the route distance.
4. The average trip length has been determined for each route using the 80% rule.
5. The number of passenger-boardings for each service have been multiplied by the average trip length for that service to arrive at the passenger-kilometres for that service.

2.3.3 Analysis of Data Provided

Subsidy $ per passenger-boarding and subsidy $ per passenger-kilometre were calculated, and the results are shown in Appendix B (the inverse of these measures were also calculated: passenger-boarding per subsidy $, and passenger-kilometre per subsidy $).

Key points to note from this data were:

- Subsidy$/passenger-boarding ranged from $0.25 to $14.15, with the weighted average for all services being $0.70.
- Subsidy$/passenger-kilometre ranged from $0.01 to $2.97, with the weighted average being $0.07.
- Rural services have lower subsidy rates than urban services, particularly in terms of passenger-kilometres. The weighted average subsidy/passenger-boarding for urban services was $0.72 compared to $0.48 for rural services; and, the weighted average per passenger-kilometre for urban services was $0.10, compared to $0.01 for rural services.
- As for the WRC services, it was found that the ranking for a particular service can change depending on whether passenger-boardings or passenger-kilometres are

used. However, there was a very good parallel between the two measures in terms of the bottom and top third of services, and a reasonably good matchup for the middle third. The distribution of service performance was analysed in terms of proportion of total passenger-boardings, total passenger-kilometres, and total subsidy covered by these services. The results are show (Figures 2.5 and 2.6) 99.7% of passenger-boardings were made on services with a subsidy/passenger-boarding below $1.50, while 87% were on services below $1.00. The more expensive services (subsidy/passenger-boarding $1.00+) provided 13.1% of the boardings and required 20.7% of the subsidy. Ninety nine percent of passenger-kilometres were made on services with a subsidy/passenger-kilometre below $0.30, while 97.5% were on services below $0.20.

2.4 Comparison Between Regions

The relative service performance of the two regions, in respect of services for which data was made available, is outlined below. Comparisons between the regions is difficult given the differences between them, particularly in regard to the respective proportion of commercial services, and the average trip lengths. The following comparisons relate to contracted bus services only.

- The weighted average subsidy$/passenger-boarding was $0.70 for EW ($0.72 urban, $0.48 rural); $1.20 for WRC.
- The average subsidy$/passenger-kilometre was $0.07 for EW ($0.10 urban, $0.01 rural); $0.13 for WRC.
- Ninety nine percent of EW passenger-boardings were made on services with a subsidy/passenger-boarding below $1.50; 82% of WRC passenger-boardings.
- Ninety nine percent of EW passenger-kilometres were made on services with a subsidy/passenger-kilometre below $0.30; 93% of WRC passenger-kilometres.

Figure 2.5 WAIKATO Proportion of Subsidy and Passenger Boardings (subsidy/passenger boarding).

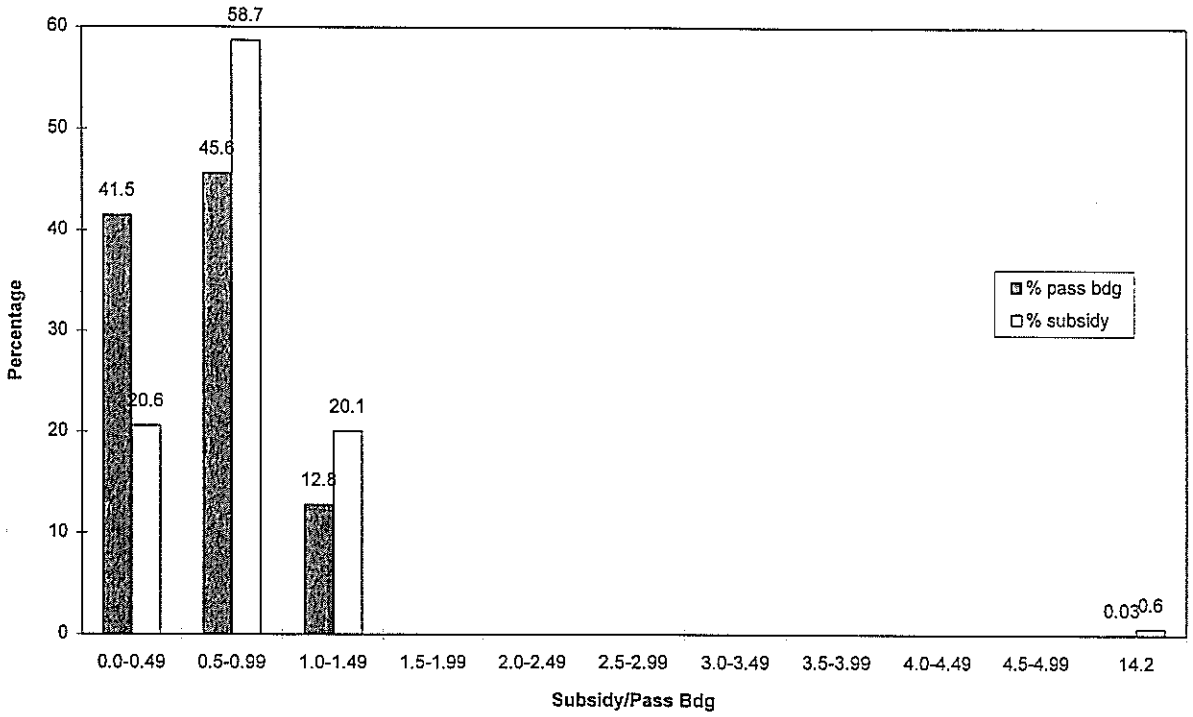
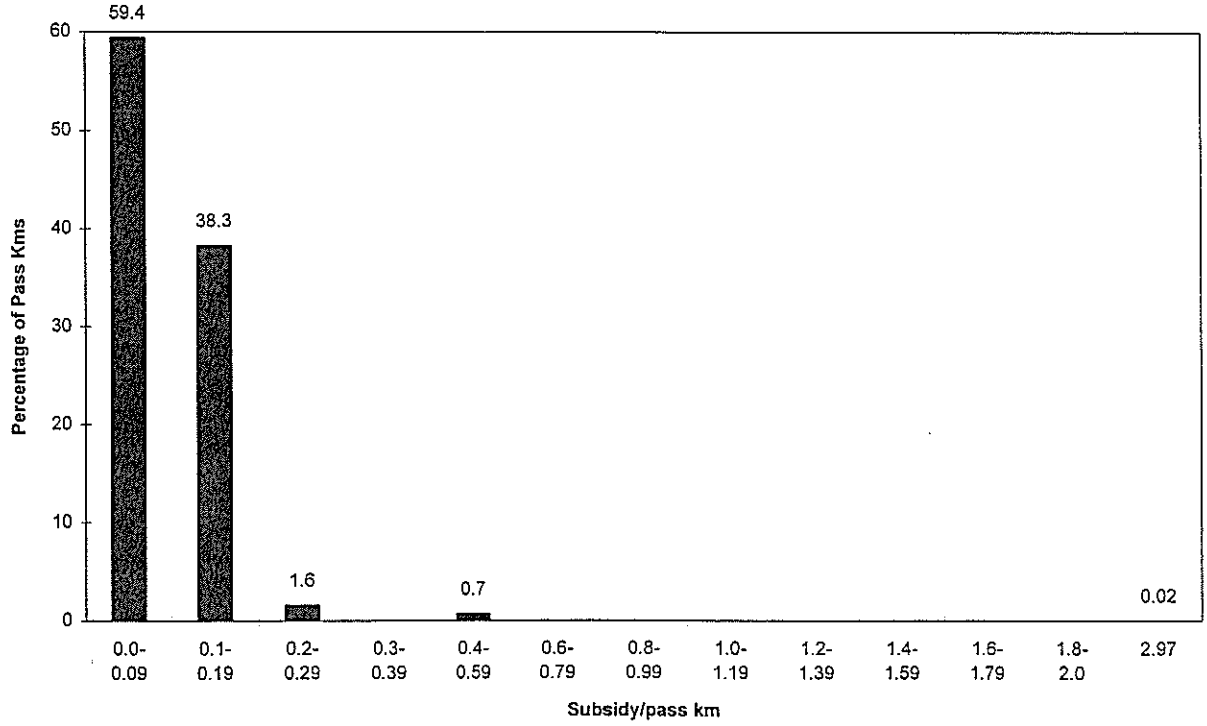


Figure 2.6 WAIKATO Proportion of Passenger Kilometres (subsidy/passenger kilometre).



3. ISSUES AND METHODOLOGY

3.1 Introduction

A number of issues in regard to developing a national system to derive passenger-boardings and/or passenger-kilometres per $ subsidy, to measure the performance of public transport services, have arisen during this project and these are discussed below. A methodology for deriving these performance measures, which takes into account the issues identified, has been developed, and is outlined below.

3.2 Issues

The issues identified are discussed below.

3.2.1 Confidentiality of Information

As noted earlier, WRC considered initially that it would not be able to provide STM with any patronage information because of its contract provisions in regard to confidentiality of information. WRC noted, in a letter to STM, that:

"Under the conditions of our bus and rail contracts the information provided to the Council is to remain confidential, except that the Council may 'publish patronage data in an aggregated form to inform the public of patronage trends and to meet its reporting obligations to Transit New Zealand'."

A copy of the relevant sections of the WRC bus and rail contracts are attached as Appendix C. In the event, the data was provided in such a way that the route and operator was not identifiable. This was also acceptable to EW, which also considered the same constraints applied to it in making service performance data available.

It is noted that the TNZ's original Competitive Pricing Procedures (CPPs) required the publication of passenger data for net tenders. Given the requirement of the national funding body to be able to monitor the performance of public transport services it is funding, it seems justifiable that regional councils be required to provide performance data to Transfund. This can be provided in confidence as 'commercially sensitive' information, not to be released to the public or to be made available to any other party. As long as the information is not put in any public documents this should satisfy the confidentiality concerns of both operators and regional councils, and is not inconsistent with the current contract conditions.

3.2.2 Analysis at Disaggregated Level

Ideally a public transport performance system would examine service performance at a disaggregated level, for example, by route and time period (peak, interpeak, evening, weekend).

Two main difficulties in achieving this were identified in the pilot project relating to the way services are grouped into contracts:

1. **Availability of patronage data at disaggregated level**
   WRC does not receive patronage data at the route or time period level, apart from where the contract only covers one route, or a particular time period. Many WRC contracts cover a number of routes and/or several time periods. This is accentuated in regard to trolley bus services and the urban rail services which are covered by one contract each. This would be the case for most regional councils, which generally only receive key factor report data from operators (completed for each contract). By contrast, EW has access to the operators' ETM data, which does enable patronage analysis at a route and time period level. However, STM is aware of only one other council which has access to this information (Canterbury).

2. **Subsidy equals contract price**
   Subsidy amounts are only available on a contract basis (rather than for each route, or time period, within a contract). This means that analysis of performance per subsidy $ can only readily be carried out at the contract level. As indicated above, most contracts do not relate to one route or one time period, but cover a group of routes, and/or a number of time periods (many contracts are Monday to Sunday). Determining the subsidy for a particular route and/or time period cannot be derived directly from the contract price. Further analysis would be required to do this.

An inability to analyse service performance at a disaggregated level would be a severe weakness for a public transport service performance system, as it would prevent detailed analysis of poor performing services. Evening and/or weekend services, for example, will often be the poorer performing parts of the service, and may be operating at unacceptable levels of subsidy per passenger carried. This can be hidden in a Monday to Sunday contract, which overall may be performing at a reasonable level, but is performing very poorly in the evenings and/or weekends (for example). Poorly performing routes can also evade analysis by being grouped with other high performing routes in a group contract.

One possible option would be for Transfund to require regional councils to organise contracts in such a way as to allow analysis at the disaggregated level. However, TNZ has moved away from a prescriptive approach in regards to its public passenger transport CPPs, in recognition that regional councils have responsibility for planning and contracting for passenger services, and that the CPPs should recognise this.

Another option would be develop a costing model for use in regard to services which Transfund considered required further analysis to establish the actual funding at a disaggregated level. This would involve constructing a costs and revenues model to determine indicative net costs for separate routes and/or time periods, and relating this to the contract price to estimate disaggregated subsidy levels. Determining revenues would require regional councils to acquire patronage/revenue data from operators at a more disaggregated level (which is possible given that operators do hold this information).

3.2.3 Passenger-kilometre - Calculation Method

In comparing different services within a region, and between regions, it is important to compare like with like. In calculating passenger-kilometres, different methods are used by different operators within the Wellington region, and a different method again is used by EW.

The WRC Keyfactor report sets out a method for calculating passenger-kilometres (pass-kms). This form has a part where the operator enters the number of passengers travelling 1 section, 2 sections, etc; and, the distance for that section (in kilometres). The number of passengers for each section is then multiplied by the section distance to calculate pass-kms, and these are aggregated to get the total pass-kms for that contract. An obvious difficulty with this approach is that many WRC contracts cover more than one route, and the section length will vary between routes. To calculate pass-kms the operator will need to complete this exercise separately for each route covered by the contract. As operators do not know when passengers get off the vehicle (under present technology), they usually base this on the number of tickets sold in each category (1 section, 2 section etc). This will not be very accurate under a zonal fare system.

As indicated earlier, several of the WRC operators do not provide pass-km data, and for a number of these the WRC estimated pass-km for the purposes of this exercise (at present pass-km is not used for analysis of service performance). This was done by determining the average section length for each contract (usually covering a bundle of routes), and multiplying this by the number of passengers travelling that number of sections. Of the operators who do provide pass-km data, one has indicated they calculate these by "multiplying the number of passengers in any one section by the amount of kilometres in the same section"; and another that "section distance is obtained by dividing the total distance from inner to outer terminal by the number of sections on the journey. The appropriate section distance is then multiplied by the number of passengers travelling that particular number of sections. Each of the sectional answers are then added to give the overall total."

Environment Waikato used a different method for calculating pass-kms:

- Total and sectional distances for each route have been measured.
- Origin-destination surveys have been conducted to determine the travel pattern for each route.
- This has been applied to the distance information to give the average trip length for each route.
- The ETM data is used as a cross-check on the OD survey.
- The average trip length for each route is multiplied by the number of passenger-boardings on that route to give pass-kms for that route.

For this project EW has assumed, on the basis of previous surveys and ETM data, that the average trip length on all services is 80% of the total route distance (distance from inner to outer terminus).

The approach used by EW will produce a more accurate estimation of passenger-

kilometres, given that it was based on an unbiased estimate of travel distances (i.e. an estimate of the average trip length for each route), than the WRC approach (which counts the full length for section travelled i.e. some passengers will travel less than the full value of the ticket).

3.2.4 Commercial Services

Most regional councils do not have patronage, revenue or cost information in regard to commercial services. This has implications for comparison of service performance between regions with few commercial services (e.g. Waikato) and those with a significant proportion of the services operated commercially (e.g. Auckland and Wellington). This is because, for any given group of services, the calculated subsidy per passenger will generally be lower where all the services are tendered in one group, than if some are operated commercially and a portion are contracted (in the latter case, the commercial service passengers are not able to be included in the calculation).

However, several options are available for incorporation of commercial services in service performance assessment:

- Regional councils could estimate the patronage on commercial services from surveys and/or cordon counts: while this does not necessarily require operator agreement, this would be facilitated by agreement of operators.
- Some commercial operators may be willing to provide patronage data for commercial services to regional councils on a confidential basis (this is presently occurring in Waikato).
- A national database could be instituted whereby operators provided full patronage data (covering both commercial and contracted services) to an independent party on a strictly confidential basis for the sole purpose of service performance analysis. This would be dependent on voluntary co-operation unless legislative changes were implemented to enforce provision of information.

3.2.5 Competitive Factors

The WRC, in a letter to STM, state that: "It can be assumed that some of the operators have cross-subsidised their services on some routes to maintain a competitive advantage over potential rivals. This means that on some contracted routes the true cost of the route is not reflected in the annual subsidy payment".

This is correct. Operators will adopt a tendering strategy which takes into account their costing structure, likely revenues, their position in the market, and potential competition. This may mean putting in tender prices well above the actual cost, where the threat of competition is perceived as being very low; or, prices below cost where strong competition is expected (cross-subsidising from other services). The operator's aim will be to maximise their overall profitability, both in the short and longer term, rather than price at the 'correct level'.

Given this situation, funding bodies have two main options in assessing performance:

- Use the actual subsidy paid (the contract price) as the measure of the 'cost' of the service, and calculate performance measures based on this; or,

- Develop indicative net costs based on a costing/revenue model.

Using the first approach is probably most appropriate for a national funding body, which is choosing between competing 'bids' for its subsidy money. Using the actual subsidy will allow it to determine what it is actually 'purchasing' with its money in any given year.

However, the latter approach may be more useful for the contracting body (regional council) which should be aiming to ensure that it is funding the best performing services in terms of benefit delivered (people transported) per resources expended (bus kilometres etc provided). A service which is only carrying a few people, but has a low subsidy because of cross-subsidy, may not justify support when it is compared with other services on a resource basis.

3.3 Methodology For Performance Measures

3.3.1 Public Transport Services

As stated above, a system using the actual subsidy paid to 'purchase' public transport services is the appropriate approach for a performance system linked to the provision of funds on a national basis. The proposed methodology for calculating performance measures therefore adopts this approach. As the subsidy amount is only available on a contract basis, service performance should initially be measured on this basis. However, more detailed analysis, at a more disaggregated level such as route or time period, may be necessary where poor performing services are identified.

This approach could produce some distortion between regions depending on the level of commercial registrations, and the contracting strategy of each regional council. However, the former could be dealt with by using one of the options detailed above for estimating patronage on commercial services.

Different methodologies are recommended for subsidy/passenger-boarding and subsidy/passenger-kilometre, and these are outlined below. These methodologies are applicable for all public transport services - bus, rail and ferry services : there is no significant difference between collecting passenger-boarding and passenger-kilometre data for bus services, and collecting these for rail and ferry services, as the same overriding factors will determine the availability of data (primarily, contract specification).

1. **Subsidy/passenger-boarding**

   Passenger-boarding data is required by regional councils for all contracted services.

   Calculation of the subsidy/passenger-boarding on an annual basis for each contract will therefore be relatively straight forward (divide annual contract payment by annual passengers-boardings).

2. Subsidy/passenger-kilometre

Passenger-kilometre data is not presently provided by all operators, and those who do provide it calculate it in different ways. The EW approach, which involves regional councils calculating passenger-kilometres, is therefore recommended given that this performance measure is more useful to councils than operators. Using one standard approach will enable a basis for useful comparisons.

The proposed methodology would involve each regional council doing the following (a service is assumed to operate on one route, different routes means more than one service):

- Measure distances for each route (bus stop by bus stop).
- Conduct on/off surveys to determine the travel pattern for each service.
- Apply the route distance information to the survey information to give the average trip length for each service.
- Use any other data available (e.g. ETM data) as a cross-check on the survey.
- Obtain passenger-boarding data for each service from operator.
- Multiply the average trip length for each service by the number of passenger-boardings to give passenger-kilometres for that service.
- Aggregate service passenger-kilometres to give contract passenger-kilometres.
- Divide annual contract payment by annual passenger-kilometres.

3.3.2 Concessionary Fare Schemes

The performance of Concessionary Fare Schemes (CFS) should initially be analysed separately from that of PT services, given that the subsidy is set on a different basis. The subsidy paid for a CFS only covers the shortfall between the revenue which would be earned at the full fare for concession passengers and that which is received at the concession fare, while the subsidy for PT services covers the difference between revenue received and the cost of running the service.

The most readily available data for a CFS will be concession passenger boardings, which operators must supply to regional councils to receive reimbursement. The subsidy per concession passenger-boarding can be easily determined by dividing the subsidy amount by the total number of concession passengers. For commercial services, this may be the only performance indicator which can be readily determined. However, where total patronage data has been gathered for commercial services the subsidy per passenger-boarding (over all passengers) can be determined, and compared to that determined for contracted services.

Where a CFS has been instituted for a contracted service both the benefits gained from the CFS portion of the subsidy paid for that service, and the total subsidy paid, can be assessed. When comparing services on a national basis, the total subsidy paid for that service should be used as the basis for determining performance measures (given that in many regions CFS are not applied to contracted services).

4. CONCLUSIONS AND RECOMMENDATIONS

4.1 Conclusions

A number of conclusions can be drawn from the analysis carried out for this project:

- Analysis of public transport services on the basis of subsidy $ per passenger-boarding or passenger-kilometre provides a useful indicator of service performance. Poorer performing services can be readily identified, and service performance can be analysed by service type.

- Analysis by subsidy/passenger-boarding and by subsidy/passenger-kilometre do not give the same results. These two performance indicators are not interchangeable, and some services will rate much better on a passenger-kilometre basis than they do on a passenger-boarding basis (rural services, for example). Thus, both passenger-boardings and passenger-kilometres should be used to give a better picture of the distribution of subsidies.

- Passenger-boarding data is readily available, and analysis of service performance on a national basis using subsidy/passenger-boarding would be relatively easy to implement. Passenger-kilometre data, however, is not readily available at present. In addition, different methods are used by different operators and regional councils to derive this, and a standard approach, along the lines of that outlined in this report, would be required to allow meaningful comparisons between regions and avoid any systematic bias.

- Analysis at a disaggregated level (i.e. below contract level) would be difficult to implement on a national basis, given that some regions do not have access to patronage data at a disaggregated level, and subsidy amounts are only known for the contract (not for segments of it). This is a severe weakness for a public transport service performance system. However, it could be partially overcome by developing a cost model to allow analysis of selected services at a more disaggregated level (in addition, regional councils would need to obtain more disaggregated data from operators for those services).

- Concessionary Fare Schemes (CFS) should be analysed separately from services (at least initially), given that the subsidy payments are on a different basis. Where a CFS has been instituted for a contracted service, and national comparisons are required, the subsidy should be added to the service contract subsidy to give the full subsidy being paid for that service, and service performance measures derived.

- The potential 'confidentiality of information' issue in regards to regional councils releasing service performance data to Transfund can be overcome by this information being provided 'in confidence' as 'commercially sensitive' and not to be released to the public or any other party.

- Comparisons of subsidy levels from different regions will need to take into account the different proportions of commercial services in different areas. This poses a potential difficulty as patronage information is not generally available to regional councils for commercial services. However, several options are available to overcome this difficulty.

The overall conclusion reached, in terms of the project objectives, is that it is feasible to establish a national system to derive passenger kilometres and passenger boardings per $ subsidy for all public transport services at the contract level (subject to the constraints above). Analysis of performance at a more disaggregated level would require development of a cost model, and regional councils obtaining disaggregated data from operators.

4.2 Recommendation

It is recommended that a national public transport performance system be established, using both the subsidy $ per passenger-boarding and subsidy $ per passenger-kilometre performance measures. Regional councils should be asked to develop the information systems required to allow the proposed standard methodology for calculating passenger-kilometres to be used. Passenger-boarding information should be readily available for nearly all services, and the performance system can be established initially using this measure, with passenger-kilometre information to be added when available by use of the standard methodology.

A pilot project would probably be appropriate to develop and apply a cost modelling approach to desegregate performance from the contract level to the route/time period level. No further work on establishing the national performance system is envisaged in this project.

GLOSSARY

STM	Symonds Travers Morgan
ETM	Electronic ticketing machine
WRC	Wellington Regional Council
EW	Environment Waikato
CPP	Competitive pricing procedures
CFS	Concessionary fare scheme
PT	Public transport
RFT	Request for tender
OD	Origin/destination survey
TNZ	Transit New Zealand

APPENDICES

APPENDIX A - WRC KEYFACTOR REPORT

PUBLIC TRANSPORT DEPARTMENT

KEY FACTOR REPORT, CONTRACT SERVICES

THE REGIONAL COUNCIL

caring about you & your environment

Operator:

File:

Contract Number: _____

Start of Reporting Period: _____

End of Reporting Period: _____

SERVICE SUPPLY MEASURES

1 In Service Vehicle Hours _____

2 In Service Vehicle Kilometres _____

3 Capacity Kilometres: _____

4 Number of Vehicles Used to Service the Contract: _____

SERVICE CONSUMPTION MEASURES

5 Passenger Count

i) Adults: _____

ii) Children: _____

iii) Pensioners (if appropriate): _____

6 Passenger Kilometres:

Sections:	Section Distance (kilometres)		Number of Passengers		
1		x		=	
2		x		=	
3		x		=	
4		x		=	
5		x		=	
6		x		=	
7		x		=	
8		x		=	

TOTAL PASSENGER KILOMETRES

7 Fare Revenue (cash fares & presold tickets): _____ (GST inclusive)

SERVICE PERFORMANCE MEASURES

8 Number of services scheduled in reporting period: _____

~~9 Number of services which departed ahead of scheduled time:~~ _____

~~10 Number of services which departed more than 5 minutes late:~~ _____

~~11 Number of scheduled journeys which did not run:~~ _____

~~(Note: if required, please provide separately details of any services included in 9, 10, or 11 above, including reasons for such occurrences.)~~

APPENDIX B - REGIONAL COUNCIL DATA

WELLINGTON REGIONAL COUNCIL: Public Transport Service Performance: 1995						
Code	Day/time Period	Pass Bdgs/ $ Subsidy	Pass Km/ $ Subsidy	$ Subsidy /Pass Bdgs	$ Subsidy /Pass Km	Average Trip Length
W	Evening	0.94	5.41	1.07	0.18	5.8
X	Evening	0.71	11.92	1.41	0.08	16.8
U	Interpeak	4.55	34.74	0.22	0.03	7.6
T	Interpeak	0.83	3.66	1.20	0.27	4.4
HH	Mon - Sun	0.57	12.97	1.75	0.08	22.7
GG	Peak	0.95	18.39	1.05	0.05	19.4
Z	Peak	0.52	10.96	1.91	0.09	21.0
AA	Peak	1.23	9.03	0.81	0.11	7.3
F	School	0.78	8.52	1.29	0.12	11.0
A	School	0.35	1.54	2.85	0.65	4.4
BB	Shoppers	0.43	2.12	2.32	0.47	4.9
EE	Week day	1.03	4.56	0.97	0.22	4.4
FF	Week day	0.78	4.41	1.28	0.23	5.6
JJ	Week day	0.78	3.11	1.28	0.32	4.0
DD	Week day	0.48	1.77	2.08	0.57	3.7
II	Week day	0.54	0.68	1.86	1.47	1.3
CC	Week day	0.22	0.57	4.62	1.76	2.6
SS	Week day/Saturday	1.15	10.12	0.87	0.10	8.8
RR	Week day/Schools	0.81	4.93	1.23	0.20	6.1
K	Weekends (Sat&Sun)	0.93	4.76	1.07	0.21	5.1
L	Weekends (Sat&Sun)	0.68	0.54	1.46	1.84	0.8
H	Weekends (Sat)	2.42	14.28	0.41	0.07	5.9
M	Weekends (Sat)	0.81	6.30	1.23	0.16	7.8
J	Weekends (Sat)	0.28	1.61	3.63	0.62	5.9
N	Weekends (Sunday)	0.28	4.85	3.53	0.21	17.1
O	Weekends (Sunday)	0.48	2.78	2.09	0.36	5.8
I	Weekends (Sunday)	0.36	1.41	2.74	0.71	3.9
TOTAL		0.61	12.23	1.65	0.08	20.1

ENVIRONMENT WAIKATO: Public Transport Service Performance: 1995/96					
HAMILTON CITY SERVICES					
	Pass Bdgs/	Pass Km/	$ Subsidy	$ Subsidy	Average
Contract	$ Subsidy	$ Subsidy	/Pass Bdgs	/Pass Km	Trip Length
F	3.96	29.64	0.25	0.03	7.5
H	3.08	22.28	0.33	0.04	7.2
G	2.37	15.99	0.42	0.06	6.8
J	1.32	8.84	0.76	0.11	6.7
A	1.08	7.52	0.93	0.13	7.0
D	1.07	8.19	0.93	0.12	7.6
B	1.04	3.57	0.96	0.28	3.4
K	1.03	7.02	0.97	0.14	6.8
I	0.93	6.60	1.07	0.15	7.1
E	0.87	7.99	1.15	0.13	9.2
C	0.07	0.67	14.15	1.49	9.5
TOTAL	1.39	9.76	0.72	0.10	7.0
RURAL SERVICES					
	Pass Bdgs/	Pass Km/	$ Subsidy	$ Subsidy	
Contract	$ Subsidy	$ Subsidy	/Pass Bdgs	/Pass Km	
AA	1.18	101.90	0.85	0.01	86.4
BB	2.59	68.46	0.39	0.01	26.4
CC	1.00	9.56	1.00	0.10	9.6
DD	1.36	51.02	0.74	0.02	37.6
TOTAL	2.09	69.23	0.48	0.01	33.1

APPENDIX C - WRC CONTRACT EXTRACTS

CHAPTER 5 : REPORTING

Report on Operation of Service

5.1.1 The Contractor shall provide for each month, and not later than the last day of the following month, a report on the operation and performance of the service. The report shall be in the form specified from time to time by the Council and shall detail in particular:

(i) on a gross Contract service, financial and operational information, including revenue received, kilometres run, and an account of any individual trips which did not operate or which departed from their starting point late, (as per Clause 4.5.1) together with the reasons for such irregularities.

(ii) on a net Contract service, operational information including kilometres run and an account of any individual trips which did not operate or which departed from their starting point late, (as per Clause 4.5.1) together with the reason for such irregularities.

(iii) passenger count and composition information. The Council reserves the right to undertake surveys to confirm and/or add to the passenger count and composition information provided in this part of the report.

(iv) the health and safety ~~performance~~ of the ~~Contractor~~ for that month.

5.1.2 Copies of records used to generate the above report are to be retained by the Contractor for a period of two years after the date of the trips to which they relate.

5.2 Access to Information

5.2.1 At the request of the Council, the Contractor shall make available on a confidential basis any records or documentation held by the Contractor, relating to the operation of the service, including the information detailed in 5.1.1. The Council shall in no circumstances make such information available, directly or indirectly, to any other Contractor or to the public, except that nothing shall prevent the Council from releasing aggregated gross patronage figures for groups of services, in order to inform the public of trends in public passenger transport patronage.

 (RAIL CONTRACT)

18. PARTIAL INVALIDITY

If any part of this Agreement proves to be invalid this will not stop any other part of this Agreement from being enforceable.

19. RELATIONSHIP BETWEEN THE PARTIES

Nothing in this agreement shall create or evidence any partnership, joint venture, agency or trust between NZR and the WRC and neither NZR or the WRC shall make any representation that any such relationship exists between the parties.

20. ARBITRATION

Any dispute between the parties in relation to this Agreement shall be referred to arbitration under the Arbitration Act 1908 or any other Act which may take its place. If the parties have not agreed upon a single arbitrator within 14 days of one party notifying the other that it wishes to refer a dispute to arbitration then each party will appoint its own arbitrator and those two arbitrators will then appoint a third party to act as umpire. If either party fails to appoint its arbitrator within 14 days of being requested to do so by the other party then the arbitrator appointed by that other party shall be the sole arbitrator. The determination of the arbitrator shall be final and binding on both parties.

21. CONFIDENTIALITY

Except to the extent required by law or the requirements of any applicable stock exchange, each party shall keep confidential all information and data that it may acquire in relation to the affairs and business of the other party in the course of performing its obligations under this Agreement, provided that the WRC may publish patronage data in an aggregated form to inform the public of patronage trends and to meet its reporting obligations to Transit New Zealand.

22. ASSIGNMENT

22.1 NZR may only assign its rights and obligations under this Agreement with the prior written approval of the WRC provided that NZR shall be entitled to assign its rights and obligations to any company which is in the same wholly owned group of companies (as the term is defined in the Income Tax Act 1994) as NZR with the consent of the WRC and such consent shall not be unreasonably withheld.