SOCIAL IMPACT ESTIMATION METHODOLOGY

MAY 2010

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1. Introduction

1.1 Background

The National Transport Authority (NTA) has a statutory responsibility to ensure that it obtains maximum social benefit from the funding provided to the CIÉ Group companies with which it holds direct award contracts for the discharge of public service obligations (PSO). To this end, NTA sought to establish a framework for the evaluation of social benefits, to be used where resources need to be prioritised. The purpose of this framework is to give NTA a basis upon which it can approve or initiate changes to socially necessary services, by providing the relevant information to support decision making in marginal or doubtful cases. The NTA will have discretion over the circumstances in which it will require the PSO operators to apply the framework.

The framework was developed during March 2010 through a series of meeting with a working group established and chaired by the NTA with representatives from Dublin Bus, Bus Éireann and Iarnród Éireann. The working group was supported by the consultants, Booz & Co, who produced this methodology document.

As this is a first of its kind for public transport in Ireland, it is proposed to pilot it for a period, and where necessary, adapt it based on the experience gained.

2. Scope Of Methodology

The purpose of this methodology is to provide a basic tool to assist operators in making choices on rationing services based on an assessment of the social value of the services concerned. It is intended to be primarily used to *rank* the relative value of different services (or parts of services) under scrutiny, by producing a *social impact score* and then applying an *estimate of value for money*. The social impact score does not give an objective assessment of the value of a service in itself, but is to be used to compare other services. The score can also be used when testing the impact of service variations that might be considered as options for efficiency savings. The estimate of value for money is also intended to enable comparison to test the net value of funding one service compared to another, on a socially weighted per passenger basis.

This methodology does not produce a complete analytical framework for assessing marginal PSO services, it provides a component that may be used as part of that overall assessment and should be treated as that. It has been developed to enable usage of varying levels of information about services and the nature of locations and passenger they serve, and not to provide a scientific analysis of social impact. It is important that any outputs from this methodology are not seen to form the final basis for any decision to alter or withdraw a service, but as inputs to inform thinking around such decisions.

2.2 Financial Viability

It is assumed that this methodology will not be applied to services which are understood to be financially positive in their own right. As such, it is expected that an assessment of financial viability will already have been undertaken before social impact estimation is considered.

2.3 Economic And Wider Impacts Appraisal

It is assumed that this methodology will not be applied to services which are understood to have net positive economic impacts (e.g. by contributing significantly towards reducing road congestion). The Department of Transport's Common Appraisal Framework (CAF)[1] is the appropriate methodology for guidance if such appraisal is seen to be relevant.

2.4 Existing Services Only

The purpose of this methodology is to engage in comparative analysis between existing services. It is not suitable for assessing the viability of or to support any case for any new or enhanced services. A wider range of considerations would need to be incorporated into such an assessment with consequently higher demands for information and forecasts (e.g. estimates of forecast patronage, costs and fare box revenue). It is important to emphasise that this tool is for ranking services or parts of services that may be subject to rationing, rather than testing the social impact of any new service.

2.5 Compare Services Not Assess Total Social Impact

As this methodology has been produced to enable a *comparative ranking-based estimation* to be undertaken between services that may be rationed, or between options to ration a service, it does *not* provide a comprehensive assessment of the total social impact of any service in and of itself.

The methodology is intended to use available information, which may vary considerably between operators or between services and parts of services.

By providing a mixture of quantitative and qualitative measures and values to estimate a scale of social impact for a service, it has value on a comparative basis, not on an absolute objective basis. The output scores from this methodology do not hold objective meaning outside that explicit context.

A high social impact estimate does not provide a justification in itself for a service, nor would it objectively indicate a service is valuable (or a low score indicate it is not). Similarly, the value for money estimate does not necessarily justify the retention or withdrawal of any service that scores high or low respectively. The methodology was not developed with the intention of producing a sophisticated calculation based on all necessary data to make that sort of definitive statement of value.

However, this methodology's value lies in being a ranking tool to help inform decisions that will be made on service rationing and alterations, when social impact is a relevant consideration (as it is for all PSO services).

The methodology provides adequate scope for *departing* from the scores that are produced, based on evidence of factors that cannot be adequately taken into account through the methodology. What is critical is transparency around such factors, including evidence.

As it is inappropriate to use the methodology to give a value for a service in its own right, it also should not be used to compare the impact of services across different operators, *unless all of the assumptions* used are clearly outlined and shared in the comparative process. Applying this methodology independently without such reference could produce comparisons that are not valid as they are not made on the same analytical basis.

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1 Guidelines on a Common Appraisal Framework for Transport Projects and Programmes, June 2009, Department of Transport

2.6 Tool To Inform Decisions

Finally, it is important to reiterate that this methodology is only a tool to inform decisions made on rationalising or changing services. It does not provide a substitute for any financial or economic assessment of the wider societal benefits of any services. It is not intended to be a part of a full network review, although the need for such a review may arise following the use of this methodology. It is not a comprehensive methodology for determining all of the social impacts of the presence or removal of a service, but to provide a relatively easy to use "ready reckoner" using available evidence to estimate overall impacts and enable any other considerations to be transparently identified. It is expected that results from using this methodology will be made available so that any discussion about the results and decisions arising from them can be done so openly.

3. Principles For Methodology

3.1 Access

The dominant purpose people use public transport is to access various locations for different purposes. It is a utilitarian function. Although a few may use PSO services for tourism/sightseeing purposes in their own right, the assumption in this methodology is that all users treat the service as providing access. Access can be to employment (as a commuter), to retail premises (as a shopper) or to a wide range of other facilities as a consumer of goods and services, or simply for social purposes (meet family or friends). It is assumed that passengers of existing services make optimal choices for themselves. In that regard, they are assumed to have already compared a range of factors to conclude that the service in question is *best* for them given the available alternatives. Services which currently do not have high patronage may be seen as having a *future* value worth preserving ("option value"), but in this methodology it is assumed that unless a strong case can be made for why a service may have a higher value beyond those who currently use it, that this should not be automatically taken into account. What should be always central to the outcome of this methodology is to gain an understanding clearly as to *who* is served and *what* types of locations are they able to access as a result.

3.2 Key Generators

Generators are the locations where trips start or have their origin. Important to the methodology is to understand the types of users that are being serviced. The possible range of indicators of social benefit is wide, but in respect of public transport the key social benefit is that it provides access to those who do not have a reasonable alternative for particular trips. Outside the context of peak commuter services, where congestion and the cost/availability of parking can make car commuting less attractive, public transport primarily offers access to those without access to a private car.

Car ownership tends to be a reflection of household wealth. The number of motor vehicles per capita in the Republic of Ireland is 0.51[1], which indicates that the average household has access to a motor vehicle. However, this includes 34% that have two or more motor vehicles available, whereas 25% have access to none[2]. The propensity to not having access to a motor vehicle is primarily income related.

Similarly, those of lower incomes tend to be more likely to live distant from key locations such as employment and town centres.

The Department's Guidelines, in relation to deprived geographical areas, recommend the following:

'Establish whether the project improves accessibility for people in socially deprived areas, particularly CLÁR and RAPID areas'.

The RAPID (Revitalising Areas by Planning Investment and Development) Programme is a Government initiative which targets 51 of the most disadvantaged areas in the country. CLÁR (Ceantair Laga Árd-Riachtanais) is a targeted investment programme in rural areas which complements the work of RAPID. The application of CLÁR and RAPID areas alone is incomplete as these areas are discrete entities, while PSO services operate on a nationwide basis. For this reason, it is preferable to use a measure of deprivation on a national basis.

The Department of Community, Rural and Gaeltacht Affairs, which is responsible for both the CLÁR and RAPID social inclusion investment programmes, has a social deprivation index which it has mapped on a DED basis for the entire country (by Haase and Pratschke, 2002, updated in 2008).

This one composite score is computed by reference to the following explanatory variables:

→ Demographic Decline (predominantly rural)
- Population loss and the social and demographic effects of emigration (age dependency, low education of adult population)

→ Social Class Deprivation (applying in rural and urban areas)
- Social class composition, education, housing quality

→ Labour Market Deprivation (predominantly urban)
- Unemployment, lone parents, low skills base[3].

The application of a single score allows for the mapping of deprivation against every DED in the country (see Figure 1, top of next page).

This is important as it is not only income that indicates a lack of choices, but also a wider range of factors such as employment and educational status. For those who are in areas of high social deprivation, having access to potential employment and educational opportunities is particularly important in raising their own (and their families') standards of living. In addition, those who are in areas of highest deprivation are also least likely to be able to change their location or the destination of their trip (particularly if necessary for employment), increasing the value that a service may have to them. If wider social policy goals about focusing government policy and funding on areas of greatest needs are to be taken into account, it seems appropriate to use these maps as a basis for assessing and rating those who are served by public transport services.

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1 Source: http://www.rsa.ie/publication/publication/upload/RSA_RCF_2006_v7.pdf
2 Source: Central Statistics Office Ireland, Number of Cars available to Private Households, Ireland, 2006.

3 New Measures of Deprivation in the Republic of Ireland: An Inter-temporal and Spatial Analysis of Data from the Census of Population, 1991, 1996, 2002 and 2006 *Trutz Haase & Jonathan Pratschke*
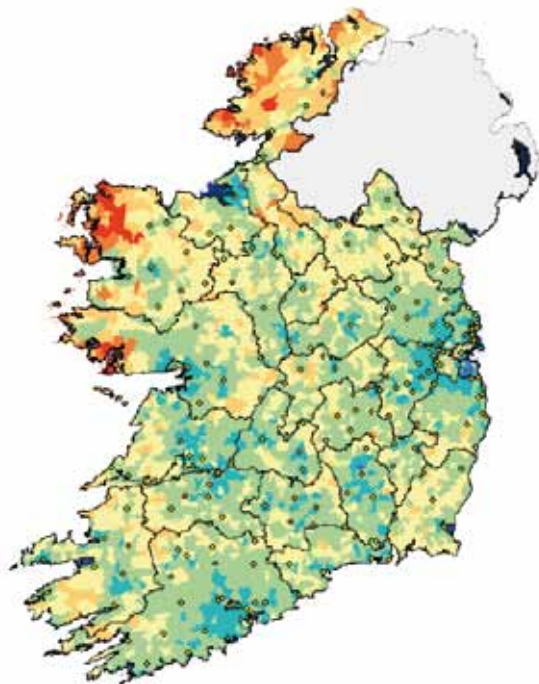
Relative Index Scores, 2002
Haase & Pratschke, 2008

- ■ Extremely Affluent   (1)
- ■ Very Affluent   (80)
- ■ Affluent   (371)
- ■ Marginally above average   (1306)
- ■ Marginally below average   (1202)
- ■ Disadvantaged   (327)
- ■ Very disadvantaged   (96)
- ■ Extremely disadvantaged   (26)

The maps have been selected as the basis for the scoring under the methodology to provide an objective basis to differentiate the nature of trip generators for each service.

Accepting that access is the primarily objective of PSO services, then providing access to those who objectively are already seen as having the least range of choices, due to a range of factors, would appear to have a higher social value. As such, scoring a service in part based upon the social deprivation status of those trip generators is considered to be a useful indicator of social value of a service.

3.3 Key Attractors

Attractors are the locations on a service that are the key destinations served. They are the places people board a service to go to for specific purposes. Typically such attractors will be workplaces, key public service facilities (medical or educational), retail or leisure activities. Some services may be primarily about connecting to a hub of other transport services. Of course, the range of attractors for any service will be diverse, as some will use a service to travel between residences of family and friends, and to make multiple different types of trip on one occasion (e.g. retail, leisure, social).

Part of the assessment of the social value of a PSO service is to determine what attractors are being accessed by those who are using the service. Whilst ideally there would be comprehensive survey data of the key purposes of the trips of passengers, it is understood that it is neither practicable nor viable to do this in the current conditions. A pragmatic

alternative approach is to assume the key attractors for a service based purely on the geography of the service itself.

The value that a service has can then be weighted first according to the key attractors, and may be adjusted according to further detail known about the types of users.

Employment can be seen as having the highest value, because only through employment and the income it brings are most people able to access improvements in housing, leisure and other social opportunities. It is important to note that employment does not necessarily mean users accessing for current employment, but being able to access key employment centres for *potential* employment. The removal or reduction in service that hinders someone who may be unemployed from accessing opportunities at a key location for employment is of similar social concern as it would be if someone is currently commuting with that service. As a result, locations of employment should have the highest social value.

Secondary to employment is access to health and education facilities. Typically, most people access health services out of necessity, and would be disadvantaged if that access were hindered. Educational facilities are accessed in order to improve wider opportunities, including employment. However, the relative isolation of any particular facility is an important factor in relation to both health and educational facilities. If a facility is a key regional or specialist centre (e.g. specialist hospital or a university), then there is unlikely to be a reasonable alternative centre for people to be able to access. As

such, a local school or doctors' practice has a lower social value than a major hospital or university, because those attending the local facilities are more likely to be able to access alternatives. Locations with primarily a leisure or retail function for trips are considered to have a lower social value, as trips to such locations are typically more discretionary than those for employment, health or educational purposes.

In the absence of any additional information about the types of users (e.g. information based on time of day or types of tickets purchased), it is a fair assumption that major retail centres are also key employment locations and can be classified as such. The type of information that might give reason to change that assumption would be, for example, if there is evidence that most users are pensioners. Similarly, while a major hospital is a key health facility, it is also a key employment location, so can be classified as such. Equally, a university is a key educational facility, but also a key employment location.

3.4 Absence Of Reasonable Alternatives

If a service is rationalised or withdrawn, the social impact will be minimised if most of those who use it can use an alternative service, or can use another mode of transport to undertake their trips. So an important component of estimating the social value of a service is to determine how unique the service is for those served by it. If users would face severe delays or high costs to make the same trip, it would imply the service has a high social value, as there are no reasonable alternatives. If there are a range of relatively easy/low cost alternatives, then the service may be better defined as being socially desirable rather than socially necessary.

Scoring as to the presence of alternatives has been developed based upon an assessment of either the amount of delay involved in any alternatives (this can include time taken to reach a stop/station, waiting time and/or travel time), and/or the price. For shorter trips, walking should be considered as an alternative. In most instances, alternative services considered should be limited to PSO services funded by the NTA. A separate analysis should be presented, if relevant and available, of the alternatives provided by school bus services, commercial services, rural transport initiative services, HSE services or any services provided by the voluntary and community sectors.

4. Methodology

4.1 Summary Of Steps

The key steps in the methodology are summarised as follows:

→ Identify and describe the service (route, service number, timetable, route length, fare);

→ Explain the changes that are under consideration;

→ Determine and score the average of the key generators (locations where passengers are likely to come from);

→ Determine and score the average of the key attractors (locations where passengers are likely to go to);

→ Determine and score the average of the major alternatives if the service is withdrawn or changed in the manner proposed;

→ Include a factor to take into account past patronage if seen to be relevant;

→ Produce a total score;

→ Multiply score by total patronage to give a weighted average social value;

→ Divide weighted average social value by cost of service to give a value for money estimate of the service;

→ Test options for alternative rationing of the service against withdrawal;

→ Use results to inform decisions on service continuation or change.

4.2 Description Of Service

It is important to have clarity as to what service is subject to review through this methodology. In this case, a service can mean an entire route, a portion of a route, or part of the time of operation of a service (e.g. Sundays or after 7pm). It is expected that this will be one of several services being considered at once, but each service should be clearly defined separate from each other.

Information about the service should be as comprehensive as is practicable. This provides the evidential base for applying this methodology, but also becomes a useful reference for any decisions on the service itself. Included in this information can be the original basis for review. A list of desirable information to provide during this step is contained in Figure 2.

Figure 2: Service Description Information

Service description information
Route or partial route definition (length, stops, vehicle type)
Operating hours/days, frequency
Stopping patterns and radius of catchment for services (by foot, interchange, park and ride) if known
Key geographical generators and attractors for users, including connections to other services
Fares and any breakdown of known ticket type usage
Passenger numbers (historic trends) including where usage might be concentrated by location and time
Revenues and cost recovery information
User profiles

It is important to note that if not all information is available, it does not prevent application of the methodology, but the greater the provision of information the more likely it is that any results can be more readily defended.

4.3 Identification Of Key Generators

A key generator is a location on a service route that is one of the major boarding points (or series of boarding points, if it is a local bus service). There may be multiple such generators, in which case only those that are estimated to generate the vast majority of trips need be identified and scored. At its simplest level, these generators may be identified as simply the towns, suburbs or localities served, without data on actual boarding. However, the case being made will be more robust if there is actual data on boarding to support the relevance of the generators. For example, five localities may be served as generators, but if only three generate 90% of the patronage (and there is evidence for this) it would make sense to apply the methodology to only those three. Localities that are served, but which are clearly understood to contribute a very small proportion of patronage (and this is not assumed to change) may be excluded.

Unless there is evidence to the contrary, it is assumed that trips are return in that generators need not be identified in both directions. For example, a commuter does not undertake two trips in this analysis, but one return trip. The generator is the commuter's residence, not the workplace.

As the generators are to be measured against Department of Community, Rural and Gaeltacht Affairs' geographically-based indices of social deprivation for each DED (see Chapter 3), they need only be identified down to that level of geographic precision. In order to support the decisions made as to inclusion or otherwise of localities, operators should give a brief summary as to their reasons why they have selected particular localities as key generators and excluded others.

4.4 Weighting And Scoring Of Key Generators

Once key generators have been identified, they all need to be scored so that an average score of the key generators for a service can be estimated.

The scores available for a locality are based on a simple integration of the Department of Community, Rural and Gaeltacht Affairs social deprivation index. Each key generator should produce a score based upon this. It is predicted that there should be no more than five key generators at the most, and in some cases there may be only one. Figure 3 gives the scores

Figure 3: Scoring of Social Deprivation Indices

Score	Correlation to Social Deprivation index scores
5	Very Disadvantaged and Extremely Disadvantaged
4	Disadvantaged
3	Marginally Below and Marginally Above Average
2	Affluent Areas
1	Very Affluent and Extremely Affluent Areas

Once all key generators have been identified, then information about the number of trips from each generator should be used to estimate a weighted average generator score. This could be actual data, surveyed estimates or, if none of this is available, an extrapolated figure based on broad estimates of the proportion of total passengers accessing the service from the key generators. In any case, the information source should be identified. Once each generator has been identified and the number of trips from each generator estimated, they can all be scored. The number of trips from each key generator is then multiplied with the score for the generator area, producing a weighted aggregate value for the trips from each generator. The resulting value is an aggregate generator score for a service.

A sample table of this calculation is seen in the Appendix.

4.5 Identification Of Key Attractors

Similar to the identification of key generators, key attractors should be identified according to the locations where passengers primarily alight from services. Again, the basis for this may be as simple as key locations served (such as a town centre) or patronage data if available. Clearly, the availability of any data on key attractors would improve the value of the overall estimate. Key destinations would include major attractors such as retail malls, business centres, hospitals and universities. As with key generators, it is not expected that all attractors be identified, simply those that are dominant, for the majority of trips. It is expected there may be one or up to five key attractors.

4.6 Weighting And Scoring Of Key Attractors

The key attractors should be scored against the values shown below in Figure 4 below. Many main attractors could by default be classified as employment centres (e.g. retail centres or hospitals) and could justify this classification if it is reasonably assumed that the service in question has a key function in providing access for workers. However, if more information about patronage is available that indicates otherwise (e.g. universities may attract more students than staff on public transport), then the classification should be accordingly, or an average between the key functions. If it is thought that an average between scores would be a fairer indicator of the range of functions, then that should be applied.

Figure 4: Scoring of Attractor Indices

Score	Categories of attractors
5	Employment
4	Regional/specialist health or education facility
3	Local health/education facility, public offices, Major retail, major transport hub
2	Major leisure, minor transport hub
1	Local retail, minor leisure

A pragmatic way to determine the attractor category is to simply look at the key locations served. However, if there is better data on where passengers alight and their likely trip purpose (to inform the attractor status) it should be used to inform the scoring.

A sample calculation table is shown in the Appendix.

4.7 Identification Of Alternatives

There are five types of alternatives that may be available to users of an existing service. These are:

→ Another scheduled service with similar stopping locations (or different ones that are still accessible);

→ Private car;

→ Unscheduled services (e.g. taxi or on demand transport for special purposes);

→ Walking (and cycling);

→ Change of destination.

The first key point in identifying alternatives is clarifying what these are alternatives for. There may be alternatives serving some attractors and some generators, but unless any of them are available to connect at least one key attractor with one generator, then the alternatives are not realistic.

Alternative scheduled services should be identified according to whether they connect at least one key attractor and one generator.

Scheduled services should be relatively easy to identify, as should some measure of the difference in experience using those alternatives will be for what. However, it may be worth identifying if the absence of the current service is likely to see an alternative emerging(on commercial grounds). This is more likely to happen in respect of the withdrawal of rail services.

The identification of the car as an alternative is expected to be available for generators rated a 1 or 2, and for a proportion of passengers from generators rated 3. However, care should be taken on this as some users from generators may not have car access because of age and other factors. It may be a fair assumption that outside urban trips to town centres for commuting, most car owners would probably use a car over any public transport options.

Unscheduled services should be identified if there is strong evidence of their likely availability for certain trips. This may particularly be relevant for certain health and education related trips.

Walking is an option only for relatively short trips and for some age groups. Cycling may be seen as a subset of this, as those likely to cycle will be a smaller proportion of those who will walk. However, this should be highlighted if the most likely alternative is to walk.

A final alternative is not to be measured through the scoring process, but in the qualitative assessment. If a significant proportion of trips are to an attractor for which there may be a reasonable alternative (e.g. local retail), it might be considered less socially valuable than trips to an attractor with no such alternative. Given that the purpose of the tool is to compare services, this may be a useful differentiating point in a few cases.

4.8 Weighting And Scoring Of Alternatives

The scoring of alternatives is about valuing the penalty alternatives would impose upon existing users of a service. It will need to take into account the primary trip patterns the service represents. It is expected that some statement of justification for the selection of the identified trip pattern will be made. Similarly, whilst there may be several alternatives, the likelihood is that most groups of users are likely to face no more than two options, private car use and the best alternative scheduled (or unscheduled) public transport option. The scoring for options will be based on estimates of cost and travel time compared to the existing service. If it is thought that there is no penalty at all for a significant number of users then it may be possible to rank alternatives as zero.

Without overly complicating the methodology, the scores applied should be on what is thought of as being the likely average additional penalty for the majority of users. The delay or cost penalty is applied to the current total trip pattern for users, assuming average time to access the stop, waiting time and travel time. Price may or may not be included, and encompasses the surcharge on top of fares that may be faced for the alternative. Whilst both may be considered, the important point is to be consistent among those services being compared with the methodology.

In some cases, the penalty may be infinite, in that the alternative is realistically inaccessible. For example, an alternative that requires a walk to access that would not be taken by a high proportion of passengers (e.g. if it is known they are elderly), may simply mean that for that trip pattern it scores a 5. Whereas a similar sort of alternative, if a high proportion of passengers are young, may mean a far lower penalty, as they may be able to undertake it.

In any case, it is expected that a specific justification will be made for why certain alternatives have been selected and scored based on knowledge of the trip patterns for a service.

Figure 5: Scoring of Alternative Transport Options

Score	Degree of alternative penalty
5	Delay/price penalty of 100% or more
4	Delay/price penalty of 75-100%
3	Delay/price penalty of 50-75%
2	Delay/price penalty of 25-50%
1	Delay/price penalty of up to 25%

A sample calculation table is shown in the Appendix.

4.9 Meaning Of Social Impact Score

The total "social impact estimation score" is produced by adding together the scores for generators, attractors and alternatives. The total score generated by this assessment would be a value between 4 and 15. The score does not have a meaning in and of itself, but it does form a basis for a ranking evaluation against other services scored using the same assumptions and sources of information for determining the individual scores. As such, it should only be considered important in comparison with other scores generated by the same operator using similar assumptions.

4.10 Value For Money Assessment

Following the social impact score, it is important to get a sense of the scale of social impact of a service by applying that score to the average patronage of the service. That patronage measure may be daily, annual, or even for a set period (if the comparison being made is between different times of day for rationalisation). This creates a *socially weighted measure of patronage*.

In itself, this gives a measure of the scale to which a service has social benefit. Clearly, a heavily used service is likely to be considered more favourably than a lightly used service. However, by using the social impact scoring, a comparison could be made that a lightly used service that may serve a more socially deprived area for trips to employment (with little real alternative) may have a higher social impact than a moderately used service to an affluent area for leisure trips (where alternatives are only a minor inconvenience).

In order to measure value for money, there are different ways services might be compared. It may be valid to use one or several measures, depending on how close the results are of the analysis.

Examples of value for money assessment include:

→ Socially weighted measures of patronage can be divided against the total cost of supporting the service (after farebox revenue). This gives a ratio of "social benefit" to cost and a per trip "socially weighted" cost; and/or

→ Socially weighted measures of patronage can be divided against the cost per km of supporting the service (after farebox revenue). This gives a ratio of "social benefit" per km paid and a per km "socially weighted" cost.

The cost of supporting a service should be calculated based on the total cost impact to the operator, net of farebox revenue, if the service were to be withdrawn. This would comprise the immediately avoidable marginal costs (fuel, staff, other operating costs), but may also include some fixed costs (such as ownership costs of a vehicle that may no longer be needed). In many cases these fixed costs are unavoidable, as the service may be a marginal operation on top of existing services. In that case, the marginal cost is what would be saved if the service was discontinued. Being able to compare such marginal costs, and marginal costs plus a fair proportion of fixed costs (which must be recovered somehow) is helpful in comparing the impacts of different service rationalisation options.

These options should allow an operator to compare the social value gained from different services based on the funding for each service (net of farebox revenue).

4.11 Qualitative Impact Input

This methodology has been designed to be pragmatic and easy to apply, rather than to be precise, objective and mathematically based. It is a tool to provide guidance and assistance in the decision making process. The quantitative aspect may not produce incontrovertible outputs from which all decisions can be made on an equally valid basis. A key part of the methodology is final a step to acknowledge that there

may be qualitative issues that need to be explained *after* the initial scoring estimate has been carried out.

What this should do is enable a *ranking* to be made against the other services (or options) under consideration. This ranking would be separate from the original score, but would be based on a robust explanation as to why the initial scoring estimate does not adequately reflect the social impact context of a service.

A number of issues have already been identified that may need to be taken into account in qualitative impact:

→ **Life cycle of a service** - if there is a significant upwards or downwards trend over time, which may indicate a more positive or negative future for the service;

→ **Prospects for likely growth** - the construction of a new major attractor may give reason why a service may have significant future social utility, justifying its retention;

→ **Isolation of generators** - if a service is the last remaining scheduled service for a locality, it may have a more significant impact that the score may indicate. The social significance of localities of certain sizes having at least one scheduled public transport service may need to be compared with the relative cost;

→ **Infrastructure issues, particularly for rail** - it may be better to examine a rail service based on the marginal cost of providing service, rather than the fully allocated costs of infrastructure. Also, there may be option values and other considerations around rail (e.g. tourism) that should be acknowledged and noted;

→ **Network impacts** - A service may be difficult to justify on its own, but its contribution to the overall network, if many passengers use it to connect to elsewhere, may be more positive;

→ **Patronage not recognised in methodology:** Some services may have passengers which primarily are not a reflection of the local demographics (e.g. tourists, transfer passengers).

This list is **not exhaustive**, but any other factors should be based on evidence and a clear declaration of the issue, the scale and scope of the issue. The characteristics of the service, its geography, timing and the users are important beyond the social impact estimation undertaken. This should not be used as a "catch all" for issues that are vaguely described, or are merely assertions of opinion that cannot stand close scrutiny.

There are likely to be others, but it is important that this step not be used to undermine the scoring on every occasion this tool is used. It is also important to note that there is ample scope at every scoring point to use qualitative statements and evidence to choose scores that are *not*

immediately obvious based on the generator and attractor geographies. For example, a service that operates to an area of severe deprivation, but which is understood to almost exclusively collect passengers from an area of affluence could be classified as average if there is sufficient evidence to do so. This is particularly important if such qualitative differentiations are needed in the scoring to more clearly separate the results in comparing different services.

If it is found to be necessary to make a specific significant qualitative derogation from the assessment score on a regular basis, this may give sound reasons to input into some amendments to the methodology at a later date.

4.12 Testing Alternative Options

Once a service has been assessed in this methodology, there may be proposals to reduce the intensity of service, change routing or otherwise to save money rather than curtail the service altogether.

With sufficient degree of information, the methodology can be used to compare the social impact of different options for the same service, based on whether the alternatives serve similar users, the extent to which it is inferior to the status quo and the value for money.

Possible variations to services can include:

→   Changing the generators and attractors served (rationalising the extent of a route);

→   Reducing frequencies or removing services at certain times or on certain days.

It is likely to be worthwhile to test such variations against non-social criteria, such as farebox revenue against cost.

It is important to recognise that scorings may not change substantially based on simple changes to service patterns that serve the same geographic areas. This is why to effectively test alternative options there will need to be a greater degree of information disaggregation than might be necessary to compare several distinct services.

In addition, such changes to services may need a greater use of qualitative assessment to explain how specific travel patterns or trip types would or would not be well served.

4.13 Conclusions

A total score can be made to compare specific services or to compare different options to rationalise a service. It could be valuable to compare services at first and then if a service is selected for possible rationalisation, to then use the tool to compare rationalisation options.

5. Comparability Of Assessments

It is important to recognise that the outcome of this estimation process is only indicative. The greater the amount and quality of information available about services and their users, the more effective the tool may be and the more easily able the results can be defended against questioning or queries as to the basis for assumptions used. The absence of information does not prevent the tool from being used, but it might indicate where more information may be helpful if the results, after scoring and qualitative assessment, do not produce significant outcomes that are useful. The importance lies in the use of the key principles behind the scoring categories, which if applied to greater levels of detail provide operators with useful information on how to rank services and service variation options.

6. Appendix : Sample Analysis

The sample analysis outlined here is based upon one detailed example of a service, and its comparison with two other examples.

The sample service is assumed to carry 1500 trips a day, generated (for the sake of simplicity) from three generators of different demographics with passengers travelling to three attractors of different types.

Generators

The application of the methodology to each of the three generators is outlined in the table below, producing an average value for the generators:

As can be seen, each of the generators is identified as being the source for a certain number of daily trips out of the total. If the exact figure is not known, some estimate may be made. The top generators need not add up to the total of all trips, but a significant majority.

Each of the areas has been classified using the scores seen in Figure 3 in Section 4.4. The sample service is dominated by users from a high deprivation area, but also has some from an affluent area and a smaller number from a very high deprivation area. By multiplying the numbers of passengers from generators with the scores, then adding up the totals and dividing them by the total number of passengers, an average generator score is produced.

Attractors

A similar calculation is undertaken for the attractors. The primary attractor is a destination most noted for being a source of employment, the next two significant attractors are known to attract users travelling to be retail customers or for leisure purposes. While both attractor 2 and 3 could be classified as employment, it is assumed for this sample case that there is sufficient information about travel times and understanding of user demographics to be able to assume that the trips are not for employment, but as consumers.

As with the generator calculation, the classifications are multiplied by the number of trips assumed to terminate at attractors (these need not be linked to the generators) and then added up. The total weighted average of attractors is divided by the number of trips, to give an average score for attractors, seen in Table 2.

Alternatives

The determination of alternatives will involve some estimation of those users who can reasonably use another scheduled service, have access to a car or may select other alternatives modes or destinations.

In the sample case it is assumed that the 600 users from the affluent area have a very reasonable alternative. Of the remaining users, it is assumed that another scheduled route that serves some of the generators and attractors is a reasonable alternative to half of the users, but not the others. This produces the result outlined below. As with the first two steps, the number of users are multiplied by the alternative value and added together across alternatives. Then they are divided by the total number of users to get an average value of the alternatives. This is seen in Table 3.

Table 1: Generator Score

Generators All	Number of daily trips	Socio-economic classification	Aggregate value (Numbers x values)
Area 1	700	4 (High deprivation area)	2800
Area 2	600	2 (Affluent area)	1200
Area 3	200	5 (Very High deprivation area)	1000
Total	1500		5000
Average value	**5000/1500**	**3.3**	

Table 2: Attractor Score

Attractors All	Number of daily trips	Functional classification	Aggregate value (Numbers x values)
Attractor 1	1200	5 (Employment)	**6000**
Attractor 2	200	2 (Local retail)	200
Attractor 3	100	1 (Local leisure)	200
Total	1500		5000
Average value	**5000/1500**	**4.3**	

Table 3: Alternative score

Options for users	Number of users	Score value	Aggregate value
Access to car	600	1	600
Reasonable alternative service	450	3	1350
No reasonable alternatives	450	4	1800
Total	1500		3750
Average value	**5000/1500**	**2.5**	

Total Social Impact Estimation Score

The three scores produced for generators, attractors and alternatives can then be added to form a total "social impact estimation" score. This is shown in Table 4.

Scores	Totals
Generators	3.3
Attractors	4.3
Alternatives	2.5
Total Social Impact Estimation Score (out of a possible 15)	10.1

Scale of Social Value

In order for comparative analysis with other services, the total score can be multiplied with total patronage to give a "scale of social value", which effectively is simply weighting the score by the numbers of users. This is not a score of value in itself, but is used for comparative purposes only. This is shown in Table 5.

Table 5: Scale of Social Value

Scores	Patronage	Scale of social value
10.1	1500	15150

Value for money ratio

The net cost of supporting the service can then be calculated against the scale of social value, as a basic measure of value for money. This is not a score of value in itself, but is used for comparative purposes only. This is shown in Table 6.

Table 6: Value for Money Ratio

Scale of Social Value	Net cost to support service	Ratio of Value to Cost
15150	€ 10000	1.52

Comparative analysis

Once this work has been carried out for several services, then a comparison can be made of the relative social values of services and the value for money ratio based on social value. The sample worked up in this appendix is called Service A in the tables below. Services B, C and D have been developed with different scores. Service B is a hypothetical low patronage service serving relatively affluent areas for non-employment trips with high cost. Service C is a hypothetical low patronage service serving seriously deprived areas for employment trips at low cost. Service D is a high patronage service serving average areas for employment trips at low cost. Table 7 below shows how the social value is highest for the service with the greatest patronage, but a low patronage service with a high social impact estimation score gets rated significantly higher than a service with 50% more patronage.

Value for money comparison

This comparison can be taken further, using information about the net cost for supporting each of the services. It is assumed the cost is based upon the savings that would be made if a service was discontinued, but this analysis can clearly include assessment of the cost of providing part of a service (if that is all that is under question). Table 8 below shows how services may be compared based upon the social value generated by the financial support for each service.

As can be seen, Service B, with the lowest value for money may have the lowest subsidy, but also has the second lowest patronage and the lowest social score, making it the lowest ranked value for money service. However, if greater savings are sought, Service A and C may be ranked similarly. The difference is that while Service A carries more passengers, the social score of those served by Service C is substantially higher, and so it may be preferable (in the absence of qualitative factors), using the value for money ratio, to consider terminating Service A over Service C.

As noted in Section 4.11, qualitative assessment will be important in considering the value of this scoring. This may significantly alter how certain services are perceived, and would give an evidential basis for considering a different ranking.

Table 7: Comparison of Scale of Social Value

Service Title	Number of daily trips	Social Impact Estimation Score	Scale of social value
Service A	1500	10.1	15150
Service B	750	4	3000
Service C	500	13.5	6750
Service D	2500	7.5	18750

Table 8: Comparison of Value for Money

Service Title	Scale of Social Value	Net Cost to Support Service	Value for Money Ratio
Service A	15150	€ 11500	1.32
Service B	3000	€ 3000	1.00
Service C	6750	€ 5000	1.35
Service D	18750	€ 10000	1.88

Údarás
Náisiúnta Iompair
National **Transport** Authority