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**Paper title:** Development of a national appraisal methodology for transport proposals

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**Abstract (200 words):**

In 2002, the Australian Government announced its intention to embark on a new approach to planning, developing and managing Australia's national land transport infrastructure. The new initiative, *AusLink*, provided the impetus to develop a holistic multi-modal transport system management framework, including a methodology for appraising transport proposals. Following release of the *AusLink* Green Paper, a project appraisal methodology was developed for *AusLink*. The Standing Committee on Transport then endorsed the further development of a project appraisal methodology and guidelines that met the needs of all Australian jurisdictions. This was undertaken via two working groups comprised representatives across all three levels of Government in Australia: Federal, State/Territory and Local. This paper discusses the deliberations of those two working groups to date, including a transport system management framework, an assessment methodology, and a national transport data framework. The resulting framework is applicable to the transport planning of all jurisdictions, including *AusLink*. The resulting framework recognizes the importance of strategic planning as the process for identifying potential project proposals. It also recognizes the hierarchy of assessment levels required as a proposal evolves from an initial idea to a well understood detailed project. Finally, the methodology takes into account the multiple objectives of government, and introduces an adjusted benefit cost analysis approach for project appraisal at both rapid and detailed levels.

### Introduction

The conference theme for ATRF04 is Transport and Society: Creative Responses to Change. This paper responds to the theme by setting out a new integrated framework for transport system management to guide strategic planning, investment appraisal and program development, in line with current thinking in the field of transport planning.

The impetus to develop such a framework was the Commonwealth Government's announcement in May 2002 of its intention to introduce *AusLink*, a new approach to funding, planning, developing and managing Australia's national land transport infrastructure. Following release in November 2002 of the AusLink Green Paper (DOTARS, 2002), the Assessment Methodology Working Group (AMWG) developed an assessment methodology for application in AusLink (SCOT, 2003). The AMWG consisted of representatives from Department of Transport and Regional Services (DOTARS), transport and main roads departments of State and Territory governments, and the Australian Local Government Association.

The Standing Committee on Transport (SCOT, a committee consisting of CEOs of transport and main roads departments throughout Australia), then recognised the merit of developing an assessment methodology and associated guidelines that were more broadly applicable to the needs of all Australian jurisdictions. It endorsed two further Commonwealth-State-Territory-Local Government working groups: one to develop a broad methodology and guidelines, and a second to investigate associated data needs. The Working Groups also tapped into specialist input by consultants and Universities.

This paper discusses the deliberations to date of these latter two working groups. Unless otherwise specified, the broader term "Working Group" is used generically in the paper to refer to the collective work of these working groups.

It was acknowledged that, while a range of guidelines exist for evaluating road proposals, there are few comparable established guidelines for transport planning at the strategic level or for proposals that involve rail, sea, air, public transport, non-motorised transport, demand management or Intelligent Transport Systems. The Working Group therefore sought to develop a more holistic, multi-modal approach to transport planning, appraisal and evaluation that takes full account of all relevant social, environmental and economic factors. The first version of the framework focuses specifically on road and rail land transport.

The result is a transport system management framework, an assessment methodology for transport proposals, and a national transport data framework. Key features of the methodology include that it:

- takes into account the multiple objectives of government, but still accords a continuing central role to benefit-cost analysis as a rigorous, transparent and consistent tool for assessing proposals, and acknowledges the complimentary role of qualitative information;
- recognises the importance of strategic planning;
- encourages comparability in project appraisals at both the state and national level, while complementing current procedures in place;
- incorporates a strategic merit test into the project assessment process as an aid to ensuring that the final investment program conforms with strategic plans;
- adopts a hierarchy of decision and assessment levels as a proposal evolves from an initial idea consistent with a broad strategy to a well-understood, detailed project; and

- has an optional adjusted benefit–cost analysis approach for project appraisal, a hybrid of benefit–cost analysis and multi-criteria analysis.

The methodology presents a state-of-the-art framework for project appraisal taking account of multiple objectives within bounds set by strategic planning.

## Principles

The framework has been developed with several overriding principles in mind, i.e. that:

- project-level decision-making can benefit from (but is not limited by) strategic thinking and planning, which in turn reflects broad government and community objectives;
- the future assessment of transport initiatives (policy, strategy, programs and projects) need to be based on a holistic multi-modal perspective that accounts for key interactions within the transport system and with closely related systems (e.g. land use);
- transport decisions should be guided by a range of types of information, quantitative and qualitative, objective and subjective;
- data and quantitative assessment should play an important role in decision-making;
- information about the impacts and merits of a policy, strategy, program or project needs to be presented to decision-makers in a way that recognises the full range of impacts of that intervention, yet presented in a format that is easily understood;
- the framework and its future development should be owned by jurisdictions collectively;
- the methodology shouldn't duplicate, but instead build upon the processes already in place by States/Territories.

Each of these is discussed further at appropriate points within the paper.

## The framework

The framework, summarised in figure 1 adopts a hierarchical approach to assessment. The framework takes the government's high-level objectives as its starting point, brings together relevant information, data, analysis and, through stakeholder engagement, develops transport-system objectives. It then uses strategic planning and project appraisal to identify and assess individual projects against the objectives set at the strategic level to develop an investment program.

*Objectives-led:* The starting point is the jurisdictional government's high-level objectives. The aim is that strategies developed, and ensuing decisions, reflect the broad objectives of the government and the community. These strategies would be developed for segments of the transport system (network, area/region, corridor, or terminals) and should provide the basis for identifying potential projects. There may be more than one layer of strategies, e.g. an overall network strategy combined with a series of more detailed corridor strategies.

Strategic planning is viewed as a “top-down” process influenced by “bottom-up” ideas and information arising externally. Information should be sought from a range of sources, including analysis of data and stakeholder engagement.

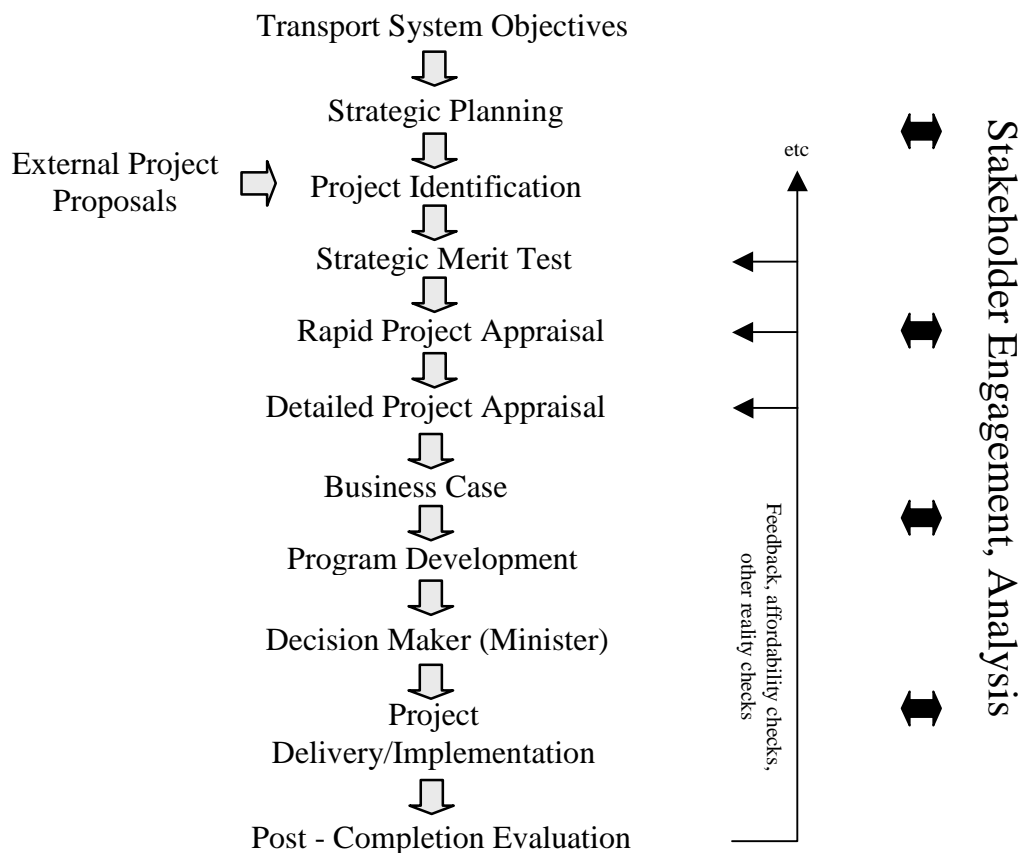
*Strategic planning guiding project identification:* Project identification and assessment needs to be guided by strategic plans, if individual project decisions are to be consistent with the

desired overall direction outlined in a strategic plan. Once a proposal or set of options has been identified, it/they are then appraised. A range of project appraisal models exist for example, benefit–cost analysis, triple bottom line, multi-criteria analysis, and cost–effectiveness analysis. The main models underpinning the methodology are benefit–cost analysis and a “Strategic Merit Test (SMT)”, which aims to ensure alignment with strategic plans. Each of these methodologies are discussed in further detail below.

*Gradual development of project ideas:* Moving through the process, the level of specificity of transport proposals increases, starting with broad societal-type objectives, through to objectives for parts of the network in form of targets, and ending with a detailed program of investments and non-infrastructure proposals.

*Complementing stakeholder views with analysis:* The framework recognises that transport system decisions are made within a complex political environment in which the views of a range of stakeholders need to be accommodated. At the same time, it recognises that those views are often based (at best) on anecdotal evidence, and may be highly subjective. Accordingly, the framework also emphasises the critical role of structured thinking and analysis. It helps to confirm or correct conclusions reached by intuition and subjective views alone. It can draw out conclusions from available data, make projections about the future, test the viability of options, and compare alternative options. Such a process, that combines the views of stakeholders with analysis of experiences elsewhere and of the system in question, can only improve the quality of advice to decision-makers.

**Figure 1: Assessment Methodology for Transport Proposals**



*Quantitative and qualitative assessment:* There is a role for both quantitative and qualitative data and assessment. Where quantitative data is available, it can greatly assist decision-making. On the other hand, the lack of quantitative data should not eliminate from decision-making important considerations which may only be described in qualitative terms. For example, at the Strategic Merit phase of a project appraisal, the project(s) are assessed with a view to developing an investment program that aligns with its objectives, and is qualitative in nature. The embodiment of this principle in the framework is reflected in the way the final Business Case for a project is presented to the decision-maker. This is done via an Appraisal Summary Table, a presentation format developed by the UK Department for Transport (2004), which presents quantitative and qualitative information about the merits of a project side by side on a single page in a user-friendly format (- see Business Case discussion below).

*A hierarchical approach to assessment:* The framework adopts a hierarchical approach to assessment. Broad direction setting 'strategy' decisions only require broad-brush indicative assessment, which is mainly qualitative. At the other end of the scale, final decisions about the exact nature and timing of projects requires detailed assessment and information. Therefore, as the decision level goes from strategic to specific, so assessment becomes more detailed.

## Objectives

The first step in framework is the specifying of objectives. Simply, if you can't specify what you want, you can't measure success or failure? Stating objectives is an operational way of expressing the outcomes or vision the strategic plan (and supporting programs and projects) is aiming to achieve. The objectives should be aligned with community values as a whole, and are therefore more numerous and varied, and more likely to be competing than those an organisation would have for itself. For a private firm, maximising shareholder value will have primacy, while for a transport system, the objectives are likely to be along the lines of broad government objectives: economic, environment, safety, equity and security.

The community's expectations are diverse. Economic considerations such as travel time and vehicle operating costs are obviously important to transport users. However, some stakeholders will give emphasis to environmental factors (e.g. vehicle emissions, noise) or equity considerations such as adequate access by remote communities to essential goods and services. After identifying the objectives, their relative importance has to be determined.

Objectives often need to be treated hierarchically because concepts such as 'economic' and 'environmental' are multi-dimensional and leave much to interpretation at the operational level. Hence, within each of these broad categories, further down the hierarchy, there will be more narrowly defined objectives. For example, growth and trade are sub-objectives under the 'economic' primary objective heading. Similarly, air quality, greenhouse gas emissions and noise are sub-objectives under the 'environment' primary objective heading.

System objectives are closely related to system outcomes, and often are the flip side of the same coin. For example, the level of greenhouse gas emissions is one type of outcome. The desired objective is the *reduction* of greenhouse gas emissions. Similarly, the number of road injuries is another outcome. The desired objective is a *reduction* in road injuries. At a more sophisticated level of planning, specific targets or performance benchmarks can be specified.

## Strategic planning

Strategic planning in the framework sets the desired broad direction of the system in which potential projects and investment programs are developed. It provides the direction necessary to develop transport policies and investment programs that will deliver the desired outcomes in a range of likely futures. Generically, strategic planning has been described as:

*“a disciplined effort to produce fundamental decisions and actions that determine strategy. It involves understanding the present environment and anticipating the future environment. It involves asking questions such as ‘are we doing the right thing?’ ‘what are the most important issues to respond to?’ and ‘how should we respond?’ It entails attention to the ‘big picture’ and willingness to adapt to changing circumstances. Although described as ‘disciplined’, strategic planning does not flow smoothly from one step to the next. It is a creative process that involves iteration. It can be complex and challenging”*

(Internet Non-Profit Centre, 1999).

Strategic planning has many advantages over piecemeal decision-making. Benefits include:

- being responsive to community needs and expectation;
- an opportunity to account for interactions in complex interconnected systems, such as transport;
- disciplined thinking about the future;
- application of intelligence and creativity to problem solving and; and
- collaboration across jurisdictions.

In developing strategic plans it is important to ensure that:

- there is commitment to plan;
- the interests of the various stakeholders is balanced, in other words, the interests of the most vocal stakeholders are not given undue weight;
- decisions are well-informed and hence feasible and based on realistic forecasts; and
- the plan has enough inbuilt flexibility to be responsive to changing futures.

To be realistic and achievable, a strategic plan must also take account of the fact that, given other competing priorities of government, the aggregate transport investment desired by users and the community usually exceeds government's capacity to fund these proposals. Government therefore has to make choices and decide on transport investments that are both affordable and responsive to current and future needs. Strategic planning provides an initial opportunity to narrow down the choices about the types of options to be given priority.

The process balances many competing considerations, often involving value judgments, subjective assessments and political considerations that cannot be reduced to quantitative measures. For example, sealing a road to or within a remote aboriginal community could not normally be justified on strictly economic grounds based on traffic volumes. However, in terms of broader government objectives for indigenous communities and equity considerations, such an investment may rank highly from a broader ‘strategic fit’ perspective.

The strategic planning process should begin via a context scan. This involves gaining an understanding of government and community expectations, issues, the likely future, policy instruments at the government’s disposal, and constraints.

To monitor and evaluate the success of a strategic plan, transport objectives need to be measurable through performance indicators. Performance monitoring is therefore required.

### **Strategic planning and analysis for networks and corridors**

The framework has been developed with the needs of all levels of Government in Australia in mind. In this first version, strategic thinking/planning is considered at the transport network and corridor levels. The outputs of strategic planning exercises should be strategy documents that set out network and corridor objectives. These objectives will have associated performance targets and, for corridor strategies these could take the form of infrastructure targets. At the national level, the strategies would need to be developed by the Australian and State and Territory Governments in partnership and jointly agreed.

#### Definitions

*Corridor:* A transport ‘corridor’ can be thought of as the transport connections that enable the movement of people and freight between two major centres of population and economic activity (for example, Sydney and Brisbane) and between intermediate points along the route. In most inter-state corridors, a substantial proportion of the total transport task originates at or moves to centres of population and economic activity along the corridor, rather than end-to-end. Within a corridor, there are specific transport links, eg roads and rail lines, shipping and air links. Link studies may be undertaken to focus on a specific modal link within a wider transport corridor.

*Network:* A network is a collection of transport corridors. The traditional primary multi-modal inter-state land transport corridors in Australia have been: Sydney-Melbourne; Melbourne-Adelaide; Sydney-Brisbane; Sydney-Adelaide; Perth-Adelaide-Melbourne; Perth-Sydney; Melbourne; Melbourne-Tasmania. The nature of transport use on these has evolved over time, and new corridors have merged, e.g. the Melbourne-Adelaide-Darwin corridor is now a high standard multi-modal corridor. Through the *AusLink* White Paper (DOTARS, 2004), the Australian Government recently nominated a ‘national land transport network’ which includes all these corridors, and nominates new corridors and links which it considers to be of national importance (as defined by the *AusLink* objectives).

#### Network planning

Network planning involves developing a vision of how the land transport network should be performing in the future (e.g. up to 15–20 years) consistent with the broad government objectives defined earlier.

The vision could be embodied in a network performance plan that stipulates key performance measures, preferably expressed in quantitative terms. The performance measures will usually express measures relevant to transport users (eg. travel time, safety, reliability) and high-level community objectives (eg. sustainability). Ideally, the performance measures need to be expressed so that there is no in-built bias as to how the performance measures might be achieved. There should be no bias towards a particular transport mode or towards capital investment at the expense of maintenance or towards infrastructure to the exclusion of non-

infrastructure solutions. This will encourage innovative approaches for project proponents and possibly involve a package of measures.

Because the vision covers a 15–20 year horizon, it may be desirable to have interim performance targets for shorter periods aligned, e.g. the period of forward investment programs (e.g. every 5 years). The purpose of the interim target is to bring the entire network to a minimum appropriate level of performance at the earliest date. This aspiration satisfies high-level objectives arising from equity considerations. Also, in an operational sense, achieving minimum performance targets across the network may provide better network performances than having isolated network sections with varying performance levels.

Finally, transport agencies are charged with achieving effective investment across the full network of responsibility, and to do so within expected funding levels (current and future). The generic steps required to achieve this include:

- understanding the configuration of the present network;
- understanding how alternative configuration of a future network can achieve the desired performance measures;
- estimating the costs to achieve the alternate configurations;
- forecasting future funding levels; and
- determining the configuration that optimises outcomes in terms of the performance measures, within funding constraints.

Such an analysis of the entire network then delivers an ‘affordable’ future configuration, and should help ensure consistency in treatment of corridors during subsequent ‘corridor planning’. A further important role of this analysis is to manage expectations.

### Corridor planning

A key output from network planning is network performance measures and targets. The aim of corridor planning (the output of which are corridor strategies) is to identify corridor investment options and priorities that are consistent with the network performance targets.

A corridor strategy for any given corridor will stipulate the type and mix of interventions (e.g. demand management, investment, regulation, etc) to be pursued to best achieve the performance targets for the corridor. The strategy will also take into account corridor circumstances in respect of land use patterns, environmental issues, freight logistics and so on. Based on these corridor circumstances and stakeholder expectations, the strategy could provide guidance on the relative priority to be given to the different transport modes in the corridor, capital versus maintenance, and the extent to which non-infrastructure solutions (e.g. freight logistics, improved land use, demand management) will be given preference over infrastructure solutions.

Given that each corridor is likely to cover large land areas (e.g. the Brisbane to Sydney transport corridor), the performance targets and desired intervention mix outlined in a corridor strategy will usually need to be fleshed out in more detail at the transport link level. This will provide adequate guidance to what is expected of a particular transport link within the corridor (e.g. Brisbane metropolitan area to Brisbane port). This will be detailed in a link development plan, which will contain its own performance measures and strategies tailored to reflect the local need but within the corridor strategy context.



As with the network performance plan, the 15-20 year corridor strategy and link development plans may contain interim performance targets aimed at bringing the corridor or link to a minimum appropriate performance level over staged periods within the 15-year horizon.

### Network and corridor analysis

As discussed earlier, analysis and assessment can play a critical role in guiding good decision-making. Analytical techniques applied at the network and corridor levels need to be able to look across large parts of the transport system, sacrificing detail in order to gain breadth. The loss of detail is necessary for the assessment work to be cost-effective and timely. The conclusions drawn at this level are not substitutes for detailed project assessments. However, they can assist planning at the strategic level by distilling information about the 'big picture' from masses of detailed data and options. In short, it helps the decision-maker decide on the 'broad direction'.

More specifically, network assessments can assist with:

- categorising a network into sub-networks (including the question of which corridors to include in a network aimed at meeting primary objectives);
- identifying needs at a high level;
- selecting priority corridors or links within corridors for close attention;
- consideration of relationships between corridors; and
- comparing corridors to ensure that the allocation of funds between corridors is in line with government objectives.

At the corridor level, a corridor study usually considers a single transport corridor. Ideally this should occur on a multi-modal basis, although this is not always the case. Corridor studies can provide information to:

- suggest infrastructure and non-infrastructure solutions that might be investigated further to develop into project proposals;
- assist in formulation of corridor objectives by enabling tests to be undertaken of the costs, benefits and effects of implementing different strategies, with different budget constraints;
- explore the cross-modal and upstream-downstream relationships that exist between projects. This would include identifying situations where projects should be bundled together (eg. a program of lengthening passing loops); and
- provide data to assist analysts estimating costs and benefits of specific projects and to assist governments with checking project appraisals.

Network and corridor assessments can consist of both deficiency and economic assessments.

*Deficiency assessment:* Involves comparing the physical infrastructure with a benchmark (e.g. lane widths, lengths of passing loops) or its performance against benchmarks (e.g. level-of-service, transit times). Deficiency assessment has recently been used in the rail sector. In August 2002, ATC (Australian Transport Council) endorsed a number of draft 'performance targets' for mainline rail infrastructure for the purpose of identifying potential worthwhile upgrading investments. Following a subsequent infrastructure audit by the Australian Rail Track Corporation (ARTC, 2001), strategies are now being put in place to achieve the performance targets within an agreed timeframe.

Deficiency analysis of physical standards has an obvious role to play where the objective is to provide infrastructure at a certain minimum performance level for reasons of equity or network connectivity.

*Economic assessment:* Economic assessment, on the other hand, allows one to account for the overall level of usage of the network and/or its corridors. Economic assessment at network or corridor levels is undertaken by specifying potential investment projects on a network and subjecting them to ‘superficial BCAs’, with projects only specified in broad terms. The level of detail for assessment is considerably less than for the ‘rapid BCAs’ undertaken in project appraisal (see below). By assessing a large number of potential investment projects using very broad-brush ‘superficial BCAs’ on a network or corridor, it is possible to build up an initial indicative picture of likely future investment needs.

BTRE has previously undertaken economic assessment work of this type for networks (BTCE, 1995, 1997).

The framework also describes assessment methods for analysing maintenance and accessibility.

### **Project identification and appraisal**

#### Project identification

Project identification occurs in a number of ways, with project proposals coming from a number of sources. First, all governments will nominate projects that arise directly from network and corridor strategies. Second, other parties will nominate projects, based either on their inspection of published government strategies (network, corridor, area/region), or independently of those strategies.

They should all be subjected to the same project appraisal process, except for small projects (less than a specified \$ amount) for which the detailed appraisal step can be omitted.

#### Project appraisal

The development of techniques for project appraisal has a long history, starting initially with benefit–cost analysis (BCA), and then developing into a range of other methods. The better known appraisal approaches include: benefit–cost analysis, multi-objective analysis; planning balance sheet; goal achievement matrix; and multi-criteria analysis.

Different jurisdictions use, and will continue to use, different combinations of these. The framework acknowledges this, but provides a way in which the various elements can be brought together into a single framework. This is where the outcomes of the top-down strategic planning and bottom-up assessments of individual projects can be reconciled.

*Strategic merit test:* This test consists of a series of questions to be answered for each project proposal. The most important questions qualitatively assess how well the objectives of the

project line up with government objectives as set out in strategic plans and other relevant documents. It also checks that proper consideration has been given to alternative solutions and options and the broader context of the project. The aim is to establish which projects should proceed to the next stage of assessment, which require further scoping and which should be abandoned because they are inconsistent with government objectives and strategies.

*Rapid project appraisal:* Rapid project appraisal (e.g. rapid BCA) is an initial appraisal screening to eliminate projects that are unlikely to pass more detailed assessment. Projects that pass these first stages are subjected to a detailed project appraisal. The rapid appraisal process can also support the strategic merit test by helping to clarify the objectives of the project.

*Detailed project appraisal:* Detailed project appraisal (e.g. detailed BCA) is what the name suggests. All jurisdictions have formal guidelines for how detailed appraisals are to be evaluated, generally involving benefit–cost analysis as a minimum.

*‘Adjusted BCA’:* The project appraisal methodology includes, as an option, a new technique called *‘adjusted BCA’*, that has been proposed for use in AusLink (DOTARS, 2004). It is a tool for multiple-objective decision making based on the traditional technique of BCA. It is a hybrid of BCA and the version of multi-criteria analysis that uses specific scores/weights, yet retains the monetary measuring rod of BCA. It involves applying weights to those particular benefits (hence objectives) and costs elements within the BCA to which the government wishes to give greater emphasis, or to take account of the distribution of benefits.

The ‘adjusted BCA’ technique may be employed at both the rapid and detailed stages of project appraisal.

Whether a benefit–cost ratio hurdle is imposed is optional, and there are several different ways to impose it. Besides the straightforward single hurdle rate option, there could be multiple hurdle rates, with lower rates allowed for projects that achieve higher passes on the strategic merit test, or imposition of an upper limit on the percentage of funds spent on projects below the hurdle rate.

*Other assessments:* As per standard project appraisal requirements in all jurisdictions, other assessments also need to be undertaken, usually at the detailed project appraisal stage. These include: financial analysis, environmental impact assessment, social impact assessments, regional and distributional impact assessment, employment impact assessment, etc.

*Business case :* The Business Case provides a means of bringing together the results of all the assessments and analysis, and is the formal means for presenting information about a proposal to aid decision-making. It should:

- include all information needed to support a decision to proceed with the proposal and to secure necessary approvals from the relevant government agency;
- be a self-standing document so that all information is in one place. Each initiative usually requires its own Business Case;
- be supported by more detailed documents that address specific issues, eg the environmental impact assessment and the detailed BCA.

The centrepiece of the Business Case is the Appraisal Summary Table (discussed earlier), in which both monetised and non-monetised (quantitative and qualitative) information about the

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merits of a project, and the link to objectives, are presented side by side on a single page. The documentation for the strategic merit test has been designed to serve as a first draft of the business case.

*Program development:* From the list of projects evaluated, a selection has to be made to implement out of the available budget. Ranking by benefit–cost ratio provides the most economically efficient combination of projects. Adjusted benefit–cost ratios provide an alternative ranking criteria reflecting explicit value judgements about weights. Either or both these rankings can be employed as a starting point for developing an investment program. Project rankings then would be manipulated in the light of other qualitative factors in project Business Cases, project staging options, possibilities of private sector contributions, and interactions between projects.

*Post-Completion Evaluation:* The aim of post-completion evaluation is to assess, ex post, the efficiency and effectiveness of an investment decision and the management of its implementation. It can be carried out at varying degrees of intensity and can focus on different aspects of the decision making and implementation processes. For example, it could consist of a review of how the decision was made, how the project was implemented, how well the project has achieved its objectives, or the extent to which forecasts in the BCA have been realised (construction costs, operating costs, demand levels, accident rates, other benefits). The post-completion evaluation could extend to full ex-post BCA plus assessments of environmental, social and regional impacts. Reviews can also be carried out of investment programs or entire strategies or policies as well.

### **Other features of the methodology**

#### Valuing transport externalities

The approach adopted in the framework was to provide default values for environmental impacts such as noise, noxious pollution, climate change, water pollution and severance. Default values are standard unit costs that can be applied at the rapid appraisal stage of a project assessment to obtain an estimate of externality costs. Although only a rough guide, employing a default value for an externality is preferable to the alternative of giving it a zero value.

The valuation of externalities through default parameters is an evolving area of expertise, and valuation is dependent on a wide range of factors such as weather patterns, and transferring values from other countries to Australia. Nevertheless, great progress has been made in recent years in developing measurement techniques. The Working Group adopted a view to include “national” values on the basis of the most appropriate sources currently available. In response to this, a series of tables have been developed based on a review of a range of literature sources, including the work undertaken by ARRB Transport Research for Austroads (2004), and Pratt (2002) for the Victorian Department of Infrastructure.

#### Rail assessment and data

There is a disparity between the resources available for the assessment of road projects compared with rail projects. The former have generally been well catered for primarily

through the efforts of Austroads (2004) and individual State and Territory road agencies. In stark contrast, very little information is available for the latter. The working group identified specific areas where published information is lacking:

- modelling rail project impacts on rail costs and service quality;
- demand estimation for rail in a multi-modal context; and
- parameters.

If Australia is to develop a genuine capacity to undertake multi-modal assessment and planning, this situation needs to be rectified. As a first step, the working group engaged the Transport Systems Centre at the University of South Australia in partnership with Arduus Pty Ltd to develop two papers: the first on demand forecasting and modelling in a multi-modal context, and the second on estimating impacts of rail projects on costs, service qualities and performance indicators. The consultants' reports (TSC, 2004a, 2004b) should provide people commissioning or assessing rail project appraisals with a basic understanding of the techniques and models available, their strengths and limitations, and associated terminology. Topics covered include:

- market segmentation, measurement of service quality variables, discrete choice models (to estimate changes in road–rail market shares as a result of changes to relative prices or service qualities), and market survey methods;
- above and below rail costs, using models to simulate single train motion and train interactions aimed at estimating costs, journey times, and performance measurement; and
- default externality values.

#### Other transport data requirements

A major issue is a lack of coherent transport data to meet the strategic longer-term needs of infrastructure planning, development and management. Obtaining the necessary data for strategic planning, network, corridor or project assessments presents an extremely challenging task.

In response to this identified need, SCOT agreed to establish the National Transport Data Working Group (NTD-WG) to:

- examine the feasibility of developing a National Transport Data Framework (NTDF) that would be sufficiently open and flexible to encompass the broader planning needs of all governments across the country: national, state and local;
- promote consistency in the assessment of land transport infrastructure requirements based on comparable, though not necessarily consistent, data collection requirements;
- assess the availability and accessibility of existing datasets, particularly for strategic planning, network and corridor assessments;
- identify gaps in data and options for addressing those gaps to meet the needs of governments. This includes identification of data gaps for rail; and
- provide a Framework that allows input data to be assembled and accessed by stakeholders under a range of accessibility levels: it would address equity issues for data sharing, ownership options for hosting data requirements, and architecture for future data collections.

The Working Group commissioned Meyrick and Associates (2004) to report on the above objectives. The consultants met with a wide range of stakeholder organisations.

The proposed NTDF will distinguish three categories of data — foundation data, new structure data and unstructured data (i.e. not fitting into a structured database format). Ideas of having a centralised data warehouse were rejected early on as impractical. It is proposed that there be a central website portal through which users can gain direct access the databases of participants. There will be three levels of access: general public, subscriber access, and private access (i.e. access to one's own data).

The Working Group favoured an incremental approach to establishing the Framework (eg inclusion of minimum datasets that meet the common needs of jurisdictions, development of an inventory of data gaps, and a plan to address those deficiencies) because resources available to the NTDF project will be initially limited, and the commitment of participants to the project could be rapidly exhausted if the demands made on them are too extensive.

To gain commitment from all participants, the NTDF has to be owned by all jurisdictions collectively and managed as an independent activity with participation by other key players. An Implementation Committee has recently been established to progress this work.

### **Future developments**

It is important that the momentum established through this Working Group be continued into the future. A range of further activities are required if the framework is to improve over time to most effectively meet the planning needs of the Australian transport sector.

The timing and resourcing of these activities will have to be further considered. The Working Group recognises the need for there to be an ongoing body to progress, monitor, review and improve the framework as experience develops. In the short-term, the Working Group could have a role in this respect.

These developments need to occur in collaboration with other structures:

- Austroads has had a long standing role in providing road evaluation practitioners with basic project evaluation tools and guides, particularly in respect of benefit–cost analysis, and some of the key data inputs (eg. value of time savings, value of accident reduction, vehicle operating costs). Austroads is expected to continue to fulfil this role into the future. The Working Group has been careful to avoid duplication of effort.
- Future versions of the framework will need to be developed in collaboration with other SCOT modal groups (public transport, road, rail, sea, air). This has already occurred in development of the framework to date with respect to rail, with two representatives of the SCOT Rail Group having a close involvement.
- The area of estimation of externality costs (greenhouse emissions, local air quality, noise, etc) is still in its infancy in Australia. To date, estimated values for Australia (Pratt, 2002; Austroads, 2003) have been based on extrapolation of overseas data to Australian conditions. There is a need to derive better estimates using Australian data.
- A range of case studies will need to be developed which demonstrate how the framework is applied to various real multi-modal situations and issues. These will significantly help practitioners in implementing the framework.

## Conclusions

This paper has provided an overview of the activities to date of an inter-governmental working group spanning all levels of government in Australia. It puts forward a transport system management framework that is broadly applicable across Australian jurisdictions, with the first version being designed for planning land transport systems.

The result is a framework which includes strategic planning, network/corridor assessment, project identification, project appraisal and post completion evaluation. To date, the tools of the framework specifically apply to road and rail land transport on a network/corridor basis. It is therefore immediately applicable across the three levels of Australian Government, and to planning the national land transport network, including the new Commonwealth Government *AusLink* initiative.

The framework provides an opportunity for better alignment of methodologies used across jurisdictions.

The framework will need to improve and evolve over time based on learnings from use of the first version. It is anticipated that future versions of the framework will also encompass other spatial settings (in particular urban transport and urban area studies) and other modes (public transport, walking, cycling, sea, air, etc), as well as travel demand management and ITS solutions. The framework should support Australian transport jurisdictions in developing the capacity to provide genuine integrated multi-modal policy, strategic planning and investment advice to decision-makers for the benefit of Australian society, economy and environment.

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## Disclaimer

This paper presents the deliberations of the working group. The framework and its content have not yet been endorsed by SCOT, and do not represent government policy at this stage.

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