

Survey and Analysis of Transportation Investment Models in Other Countries

Stage 1 Supplementary Report: Survey and Analysis of the Frameworks that Govern Transportation Investment in Other Countries

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Abbreviations and Acronyms

Acronym	Definition <i>[Jurisdiction in which acronym is used]</i>
ANAO	Australian National Audit Office <i>[Australia]</i>
AST	Appraisal Summary Table <i>[United Kingdom, Australia]</i>
ATC	Australian Transport Council <i>[Australia]</i>
ATIMOC	Survey and Analysis of Transportation Investment Models in Other Countries
BCA	Benefit-Cost Analysis
BCF	Building Canada Fund <i>[Canada]</i>
BCP	Building Canada Plan <i>[Canada]</i>
CBA	Cost-Benefit Analysis
CC	Communities Component <i>[Canada]</i>
CEA	Cost-Effectiveness Analysis
CGE	Computable General Equilibrium
COAG	Council of Australian Governments
DEL	Department Expenditure Limit <i>[United Kingdom]</i>
DfT	United Kingdom's Department for Transport
DITRD LG	Australia's Department of Infrastructure, Transport, Regional Development and Local Government
DOT	U.S. Department of Transportation
DSO	Departmental Strategic Objective <i>[United Kingdom]</i>
EAP	Economic Action Plan <i>[Canada]</i>
EPA	U.S. Environmental Protection Agency
ETC	Electronic Toll Collection
EYF	End-Year Flexibility <i>[United Kingdom]</i>
GTF	Gas Tax Fund <i>[Canada]</i>
GST	Goods and Services Tax
HUD	U.S. Department of Housing and Urban Development
IPC	Infrastructure Planning Commission <i>[United Kingdom]</i>
ITS	Intelligent Transportation Systems
IUK	Infrastructure United Kingdom <i>[United Kingdom]</i>
LCC	Life Cycle Costing
LTP	Local Transport Plan <i>[United Kingdom]</i>
MARAD	U.S. Maritime Administration

Acronym	Definition <i>[Jurisdiction in which acronym is used]</i>
MCA	Multi-Criteria Analysis
MIC	Major Infrastructure Component <i>[Canada]</i>
MIU	Major Infrastructure Unit <i>[United Kingdom]</i>
MRIF	Municipal Rural Infrastructure Fund <i>[Canada]</i>
NAO	National Audit Office <i>[United Kingdom]</i>
NATA	New Approach to Appraisal <i>[United Kingdom]</i>
OGC	Office of Government Commerce <i>[United Kingdom]</i>
OST	U.S. Office of the Secretary of Transportation
PAF	Project Assurance Framework <i>[Australia]</i>
PBS	Portfolio Budget Statements <i>[Australia]</i>
PSA	Public Service Agreement <i>[United Kingdom]</i>
PwC	PricewaterhouseCoopers LLP
RIP	Roads Implementation Plan <i>[Australia]</i>
SMT	Strategic Merit Test <i>[Australia]</i>
TCP	Transport Coordination Plan <i>[Australia]</i>
TIGER	Transportation Investment Generating Economic Recovery Discretionary Grant Program
UK	United Kingdom
U.S.	United States
VICS	Vehicle Information Communication System
VERTIS	Vehicle, Road and Traffic Intelligence Society <i>[Japan]</i>
VfM	Value for Money

1.0 Executive Summary

This Supplementary Report (the Report) provides a summary of the research and key observations and provides supplementary information on topics related to Stage 1 of the Analysis of Transportation Investment Models in Other Countries: Survey and Analysis of the Frameworks that Govern Transportation Investment in Other Countries.

This Report focuses on the investment frameworks and appraisal models adopted by the United Kingdom (UK) and Australia to prioritize and select transportation projects. In addition, this Report discusses the following additional topics identified by the U.S. Department of Transportation (U.S. DOT) as important to the U.S. transportation industry:

- Relationships between national and sub-national governments for transportation investment decision making
- Use of investment frameworks across levels of government
- Use of appraisal models and economic analysis to support decision making
- Use of general funds for transportation infrastructure investment
- Performance-based decision making approaches
- Insight into Canadian infrastructure programs (e.g., Building Canada Plan)

Section 2.1 summarizes how the research topics for Stage 1 is addressed in this Report. Further detailed information on the research and key observations for Stage 1 is provided in the 'Stage 1 Report: Survey and Analysis of the Frameworks that Govern Transportation Investment in Other Countries.'

In both the United Kingdom (UK) and Australia, the national governments have established consistent and transparent approaches to appraising and evaluating infrastructure investments. Infrastructure frameworks have been developed to help investment decision makers identify the community's service needs and assess the options to effectively meet the service needs. The investment frameworks in both countries incorporate the use of appraisal models that provide further assistance for decision makers to assess and compare the merit of various project options¹. Although the experiences in the UK and Australia are not directly comparable to the U.S. due to structural differences at the national and sub-national government level, the methods and models developed in these jurisdictions offer important options for consideration by U.S. policy makers.

The research and key observations for Stage 1: Survey and Analysis of the Frameworks that Govern Transportation Investment in Other Countries, may assist the U.S. DOT in implementing a department-wide investment framework model that establishes consistent guidelines to evaluate projects based on the U.S. government's overall objectives for transportation. In addition, there are lessons in the use of appraisal models that may assist U.S. DOT in implementing a widespread and consistent approach to appraisal models, such as cost-benefit analysis, for prioritizing and selecting transportation investment options for federal programs. These observations are based on the structural differences between investment frameworks in the UK and Australia, and those implemented by U.S. DOT.

As one example, U.S. DOT implemented a cost-benefit analysis methodology in support of project selection under the Transportation Investment Generating Economic Recovery (TIGER) Discretionary Grant Program². Appropriately adapted, this methodology could be applied more broadly to consider and justify the use of federal funds for other U.S. DOT programs. Applying the lessons learned from

overseas jurisdictions to the U.S. by implementing a standardized approach to cost-benefit analysis and other appraisal methods may assist U.S. DOT in assessing options across different transportation modes to satisfy a particular need or government objective. Another benefit, as noted from other countries' experience, is that a consistent appraisal process for potential investment opportunities that incorporates lessons learned from past investments may improve the potential for projects to achieve the anticipated benefits and an improved return on investment.

What is a Transportation Investment Framework?

A transportation investment framework is a process to identify the transportation needs of the general community and the business community, evaluate alternatives that could address the needs, and assess how to invest funds for transportation infrastructure³.

As illustrated in Figure 1 below, investment frameworks can be used in the first two stages of a project lifecycle (i.e., need identification, and feasibility) to help decision makers identify projects that may provide the best value for the government’s investment, in line with its objectives.

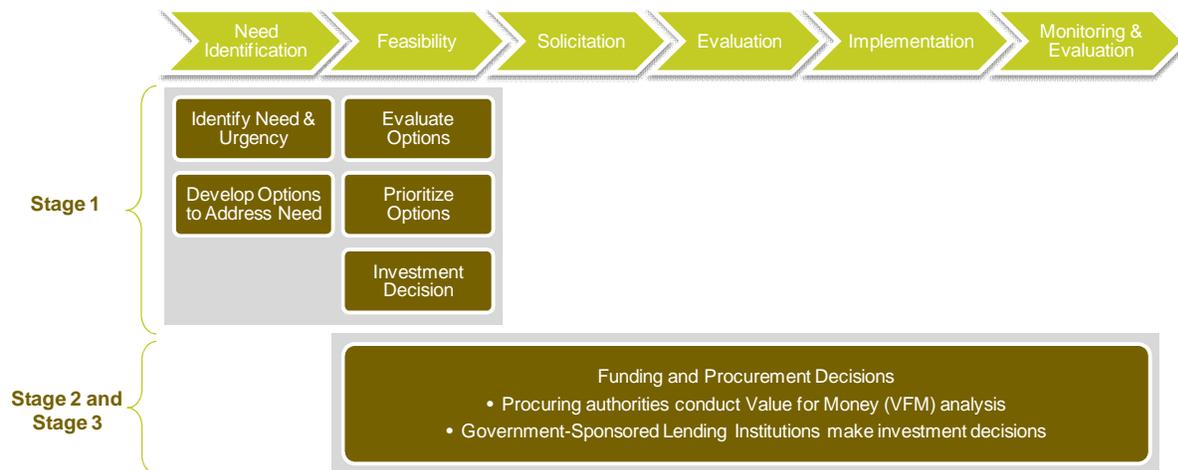


Figure 1: Investment Decision Making Process

Governments in other jurisdictions utilize investment frameworks in determining the most urgent service needs and to support decisions on distributing funds between departments and programs. Investment frameworks can be used at multiple levels of the government to support investment decisions. For instance, a government-wide investment framework can be utilized at a national or state level to set overarching national policy and promote consistent investment decisions across individual departments. A department-level framework supports an individual department’s investment decision making and can adopt government-wide policies to fit the department’s unique needs. At the lowest level, project-level frameworks provide high-level guidance to help solve challenges specific to an individual project.

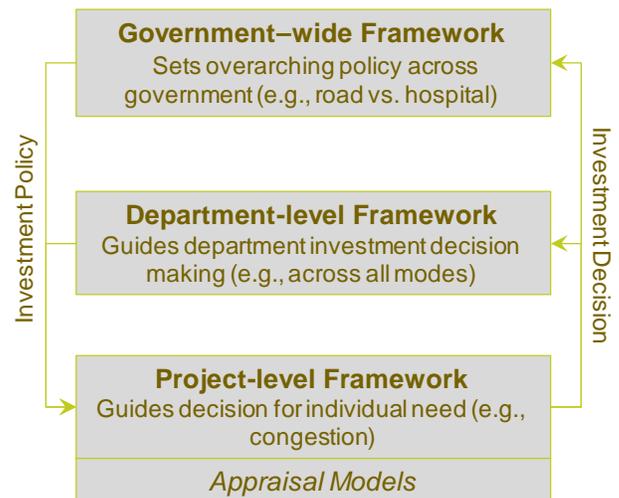


Figure 2: Levels of Investment Frameworks

Figure 2 illustrates the dependencies and relationships between the three levels of investment frameworks. For example, department- and project-level frameworks align with government-wide policies, and national investment decisions are supported by the project-level frameworks that identify the projects included in the department's request for national funds.⁴

The research conducted for Stage 1 indicates that the key characteristics of investment frameworks utilized by international jurisdictions include:

- **Consistent and transparent process:** A consistent process is used to evaluate options and select projects across industry sectors and modes of transportation, with the aim of enabling effective decision making and use of government funds. Involving various stakeholders and being transparent about the evolution of an investment framework and policy changes may assist in fostering public and political support for the government's selected approach. In the UK, Her Majesty's (HM) Treasury's Green Book - Appraisal and Evaluation in Central Government is an example of a consistent and transparent appraisal and evaluation process that is required for all of the Central Governments' (i.e., department and ministers responsible for national affairs) policies and capital projects. Through the use of the Green Book's standard appraisal methods and processes, the UK government is able to compare potential projects across sectors to assess which projects have the potential to deliver the highest value for money. To further promote consistency, the UK's Department for Transport (DfT) has a transport specific framework (e.g., Transport Appraisal Guidance) that incorporates the Green Book's requirements while tailoring the appraisal and evaluation process for cross-modal transportation decisions. Through its online website of Transport Appraisal Guidance (WebTAG), DfT posts draft policies and procedures for public consultation, responds to feedback, and provides guidance and tools to aid transportation investment decision making.⁵
- **Alignment with government objectives:** Investment frameworks that are aligned with government priorities can assist investment decision makers in prioritizing projects that support the country's national objectives. By promoting national objectives as part of an investment framework, the government's priorities are an important consideration in the project sponsors' request for funding, and it helps create a link for how government funds are used by projects to support the government's goals.⁶ For example, the DfT's transport investment framework is centered on the extent an option addresses the UK's five goals for transport (i.e., tackle climate change; support economic growth; promote equality of opportunity; improve quality of life and promote a healthy, natural environment; and better safety, security and health).⁷ Summarizing the impacts of an option under the goals and associated challenges (e.g., the goal is to tackle climate change, and an associated challenge is to reduce greenhouse gas emissions), helps align the goals set by the national government with the departmental activities, as well as the projects selected for funding.

Investment frameworks provide a process to assist procuring authorities in making difficult investment trade-offs and decisions. Lessons learned from the UK and Australia indicate that consistent and transparent investment frameworks can provide important information to governments to support:

- Best value and efficiently allocating limited budget resources;
- Objective and accurate decisions across modes and sectors;
- Public and political consensus on long-term policy approaches; and
- Prioritizing projects that support national objectives.⁸

Investment Framework Supporting Tools

Many investment frameworks also provide appraisal models to assist investment decision makers in assessing and comparing the potential value offered by different projects or project options. In assessing the potential value of a project, appraisal models can consider both the qualitative and quantitative factors. Value for Money (VfM) is a key concept in the investment decision making process in overseas jurisdictions. VfM also assists procuring authorities in determining the preferred procurement method for a project, and the use of VfM for this purpose is addressed in Stage 2 of the Analysis of Transportation Investment Models in Other Countries.⁹

The key appraisal models utilized in the UK and Australia to support the investment framework include:

- **Cost-Benefit Analysis (CBA):** A cost-benefit analysis can be used to assess the potential value of implementing a project to the community as a whole. CBA quantifies the benefits and costs brought about by a project to calculate a monetary value for its impact. This monetary value can then be compared against other project options and/or the status quo.
- **Appraisal Summary Table (AST):** An AST can be used to summarize the quantifiable benefits and costs of a CBA as well as other factors that are not easily monetized. Investment decision makers may use AST to assess both the quantitative and qualitative impacts of an option, to assist them in evaluating the overall value for money of the option. .

Research into the different appraisal models used in international jurisdictions indicates that:

- Conducting accurate assessments of monetized benefits and costs and using reliable data as inputs (e.g., travel demand forecasts) has a significant impact on the validity of the appraisal model outcomes; and
- Providing guidance that includes specific techniques for valuing the costs and benefits of a potential project contributes to the development of accurate analyses that is comparable across sectors and modes.

Appraisal models and other supporting tools of investment frameworks can be utilized by decision makers to compare projects of different modes and across sectors on a consistent and standardized basis.¹⁰

Relationship and Accountability between Levels of Government

In countries around the world, national, state, and local levels of government invest in transportation. The distribution of responsibilities between each level of government for planning, funding, and executing infrastructure investments varies by jurisdiction and can evolve over time, particularly when the country experiences political change.

In the UK, general revenues are centrally collected by the national government and then distributed to local governments for transportation infrastructure and service investments. Historically, the UK national government has played a large role in establishing national objectives for transportation investments and developing policies that are adopted by the local governments.¹¹ In spring 2010, a change in national leadership resulted in a trend towards greater decentralization, with the newly formed national government announcing its preference to transfer aspects of transportation decision making from national to local authorities. As part of this shift, the national government no longer oversees the execution of communities' Local Transport Plans (LTPs) through regular reviews, however communities are required to develop LTPs. This shift towards decentralization in the UK may provide the local government more flexibility in determining how to allocate their funds to best meet its regional needs.¹²

In Australia, the federal government provides vision-oriented policies and an investment planning approach for transportation. However, state-level governments also have the power to influence national transportation policies and programs. All levels of government are represented on the Council of Australian Governments (COAG), and meet as needed to discuss and debate national policy reforms, including transportation issues, before implementing a decision. State and territory governments are responsible for regulating transport operations and funding transportation system improvements. Over the past 10 years, changes to Australia's taxation system have shifted the states' historical reliance on state-based taxes to federal financial assistance, due to large tax rebates from the federal government that now constitute a major component of the states and territories' revenue base.¹³

Summary

The research and key observations from Stage 1 of the Survey and Analysis of Transportation Investment Models in Other Countries, indicates that a long-term vision, cross-sector views, and justification for need are common themes across international transportation investment models that may provide benefits to the U.S. For example, the U.S. DOT Strategic Plan expresses the Department's priorities and long-term vision for transportation. U.S. DOT may seek to leverage the strategic plan as a basis for the development of investment frameworks, to align investment decisions with the Department's goals.

Based on the topics outlined for Stage 1, the following observations may assist U.S.DOT in adopting:

- Social, environmental, and economic objectives to guide the jurisdictions' transportation infrastructure investment models. The appraisal models take into account both the quantitative and qualitative impacts of projects to assess the option's value for money. U.S. DOT may consider encouraging standardized rating scales for project sponsors to quantify impacts that are not easily monetized.
- Inputs from private sector investors and external advisors, with the public sector being able to make informed investment decisions regarding transportation infrastructure. In certain circumstance, the investment decisions may involve the private sector through public-private partnerships or other procurement methods.
- A combination of government grants and revenues with private sector financing, which may provide upfront financing for transportation infrastructure investment and leverage existing U.S. DOT funding to meet transportation infrastructure needs.
- A structured investment framework that incorporates an analysis of the project's potential to provide a valuable return on investment for taxpayers. An investment framework that also addresses national or departmental priorities, such as those listed in the U.S. DOT Strategic Plan may assist procuring authorities in selecting projects that align with national priorities.
- Appraisal models throughout the investment decision process to evaluate and compare the potential value of different options, to increase the degree to which transportation systems are contributing to economic growth. Formal cost-benefit analyses, such as those conducted under the TIGER Discretionary Grant Program, may assist in prioritizing investment decisions.

2.0 Introduction

The United States Department of Transportation (U.S. DOT) Office of the Secretary of Transportation (OST) recently requested the development of research materials for transportation officials and other stakeholders to learn more about the infrastructure investment models used in other countries. The analysis includes three stages:

- Stage 1: Survey and Analysis of the Frameworks that Govern Transportation Investment in Other Countries
- Stage 2: Survey and Analysis of the Use of Public Sector Comparator (PSC) and Value for Money (VfM) Analyses in Developed Countries with Mature PPP Programs
- Stage 3: Survey and Analysis of Investment through Government-Sponsored Lending Institutions

The purpose of Stage 1 is to provide U.S. DOT with a summary of how other countries approach transportation investment decisions, and tools or processes they use to help enable valuable returns on their investments. Detailed information on the research and key observations for Stage 1 is provided in the 'Stage 1 Report: Survey and Analysis of the Frameworks that Govern Transportation Investment in Other Countries.' This Supplementary Report (the Report) addresses key points of emphasis identified by U.S. DOT. In addition to providing an introduction to infrastructure investment frameworks, this Report provides a discussion and key observations on the following topics:

Key Points for Emphasis	Summary of International Approach
Investment frameworks across levels of government	Section 6.0 focuses on the UK and Australia's three levels of investment frameworks: Government-wide, Department-level, and Project-level.
Relationship between national and sub-national governments for transportation investment decision making	Section 5.0 provides insight into the UK's national/local relationship, and Australia's federal, state, and local relationships, and the key roles and responsibilities of each level of government with regards to transportation infrastructure investment.
Use of Appraisal Models and Economic Analysis to Support Decision Making	Section 7.0 summarizes the appraisal models and economic analyses used in the UK and Australia, and the benefits quantified in and lessons learned from each. This section also highlights the use of life cycle costing in Australia.
Use of General Funds for Transportation Infrastructure Investment	Section 8.0 addresses how investments in transportation infrastructure in the UK and Australia come from general revenues, and the pros and cons to this process.
Use of a performance-based decision making approach	Section 9.0 details how the UK and Australia measure goals for transportation investments, as well as how their processes are applied to make investment decisions.
Canada's Building Canada Fund	Section 10.0 details and provides relevant best practices from Canada's Building Canada Plan, including the project selection process and evaluation criteria.

This document concludes with an analysis of the key observations relevant to U.S. DOT in Section 11.0.

2.1 Summary of Report Research Analysis Questions

The following table highlights the key research questions for Stage 1 as requested by U.S. DOT. The table briefly summarizes the research conducted for each question and provides references to where the questions are addressed in this Report:

Research Question	Summary of International Approach	Report References
<i>i. What are the objectives of the jurisdiction's transportation infrastructure investment model?</i>	The jurisdictions have specific social, environmental, and economic goals for their transportation infrastructure investment models.	Section 4.0 and Section 6.0
<i>ii. What are the relative roles of the public and private sector in transportation infrastructure investment?</i>	The public sector is responsible for making investment decisions typically using input from the private sector. The private sector acts as investors and external advisors, and is increasingly responsible for new and on-going infrastructure through public-private partnerships.	Section 5.0
<i>iii. What are the best ways to provide upfront financing for transportation infrastructure investment, including the use of government sponsored credit assistance?</i>	The UK and Australia use a combination of government grants and revenues with private sector financing, and no dedicated allocation for transportation exists.	Section 8.0
<i>iv. What is the best way to ensure that taxpayers are getting a valuable return for dollars invested in the transportation system?</i>	Value for money analysis assists decision makers in identifying options with the potential for the greatest quality and effectiveness from taxpayer investments. Investment frameworks provide the consistent and transparent decision process.	Section 4.0, Section 6.0 and Section 7.0
<i>v. What are the best ways to ensure that transportation systems are contributing to economic growth?</i>	Throughout the investment decision process, jurisdictions can use appraisal models to evaluate and compare the benefits and costs of options.	Section 7.0
<i>vi. How does the jurisdiction ensure that its transportation infrastructure investment model is achieving valuable results?</i>	Jurisdictions can use investment frameworks that assess benefits realization and conduct project evaluations to evaluate if their investments are achieving valuable results. Performance based decision making can help jurisdictions assess which projects to invest in based on return from previous investments.	Section 6.0 and Section 9.0

3.0 Summary of the Jurisdictions Selected For This Report

U.S. DOT determined that Australia and the UK have the most current and relevant frameworks to be researched for this Report. Canada was also considered, with research focusing on the country's CAD \$33b Building Canada Plan that was introduced in 2007. The key determinants for selecting each jurisdiction for this Report are summarized below.

Australia

Australia has similar Federal-State governance structure to the U.S., with responsibilities for transportation policy and funding split between federal, state and local governments. Australia has developed extensive guidance material on evaluation methods (e.g., cost-benefit analysis, financial analysis and cost-effectiveness analysis) to help the decision maker assess if projects and programs are an efficient and effective use of public money.¹⁴

This Report provides information on Australia's investment framework, the levels of decision making, government relationships, appraisal models, and the use of general funds for transportation investment. Information on Australia's investment approach is provided in the 'Stage 1 Report: Survey and Analysis of the Frameworks that Govern Transportation Investment in Other Countries.'

United Kingdom

Following the landmark Eddington Transport Study in 2006, the UK has undergone substantial reforms of its transportation frameworks. The UK has a history of using quantitative appraisal models (e.g., cost-benefit analysis, multi-criteria analysis) to test the value for money or social returns from projects before making investment decisions. UK's Department for Transport developed the New Approach to Appraisal (NATA), which is a body of advice, software, and analytical tools used to promote consistency between assessments of transportation investments. NATA has been refreshed several times since its initial introduction, to incorporate economic growth, and the environmental and social impacts of policies or investments. These appraisal models are the building blocks of successful transportation investment frameworks. UK's historical experience and recent reforms may provide a well-developed perspective to this analysis.¹⁵

This Report provides information on the UK's investment framework, the levels of decision making, government relationships, appraisal models, and the use of general funds for transportation investment. Information on the UK's investment approach is provided in the 'Stage 1 Report: Survey and Analysis of the Frameworks that Govern Transportation Investment in Other Countries.'

Canada

Canada's Building Canada Plan shares similarities with recent U.S. DOT programs (e.g., TIGER Discretionary Grant Program), and also has a variety of programs that emphasize sustainable transportation. Canada's experience in incorporating sustainability and livability into transportation policy planning provides several important examples and lessons learned for the U.S.¹⁶

This Report provides an overview of Canada's transportation investment frameworks, and its leading infrastructure program, the Building Canada Plan. Additional information on Canada's transportation investment approach and incorporation of sustainability topics in its investment decisions is provided in the 'Stage 1 Report: Survey and Analysis of the Frameworks that Govern Transportation Investment in Other Countries.'

4.0 Overview of Transportation Investment Frameworks & Appraisal Models

4.1 Investment Frameworks

An investment framework is a process to identify needs, develop and assess options to address needs, and make investment decisions for transportation infrastructure. Consistent investment frameworks can provide an overarching, long-term policy approach to transportation investments to deliver agreed upon national or departmental objectives.¹⁷

Investment frameworks are used in other jurisdictions to help governments identify most urgent needs and inform the allocation of funds among departments or programs. Additional rationale for investment frameworks include being able to follow a consistent and transparent investment decision process, which can help to:

- Foster public and political consensus on long-term policy approach
- Support objective and accurate decisions to deliver cross-sector goals
- Promote overall value for money and efficient allocation of limited budget resources (e.g., valuable return on taxpayers' investment)¹⁸

Investment frameworks can be used at multiple levels of the government to support investment decisions:

- **Government-wide Framework:** Sets overarching policy across the government to promote consistent decision making across individual departments (e.g., UK HM Treasury Green Book, Australia's ATC Guidelines and Reform & Investment Framework)
- **Department-level Framework:** Guides department investment decision making by following government-wide policies that are adopted for a specific department's needs (e.g., UK Department for Transport NATA)
- **Project-level Frameworks:** Provide high-level investment frameworks to help solve individual challenges at the project level, normally conducted during the feasibility stage of the investment lifecycle¹⁹

As highlighted in Figure 3, dependencies and relationships exist between the frameworks used Government-wide and at the Department-level and Project-level. For instance, Government-wide frameworks drive the policy that the Department- and Project-level frameworks must follow, and Project-level frameworks drive the investment decisions by identifying the potential projects that compose the department's request for funding from Government-wide funds.²⁰

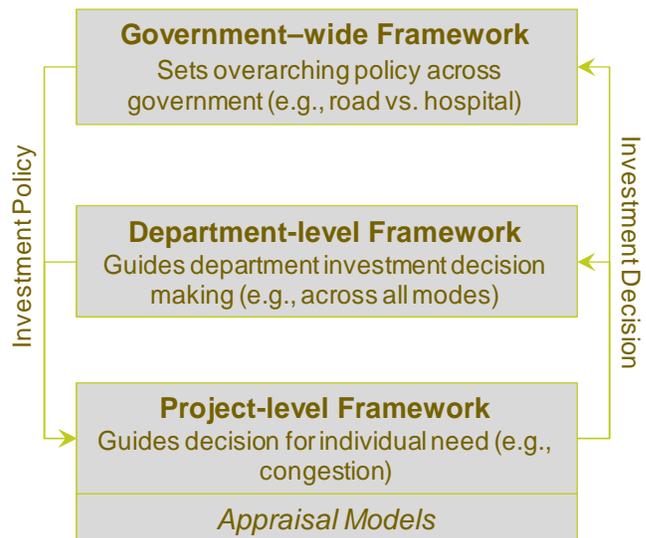


Figure 3: Levels of Investment Frameworks

Figure 3 is used throughout the Report's discussion on the levels of investment frameworks used in the UK and Australia to indicate whether the government-wide, department-level and/or the project-level framework is used.

Value for Money (VfM)

VfM secures the best mix of quality and effectiveness for the least outlay, over the whole lifetime of the goods or services, from purchase to disposal. VfM is a key concept that underlies the investment decision making process:

- At the government-wide level, VfM refers to funds being allocated between departments to deliver the greatest value from the government investments.
- At the department-level, VfM refers to investing in the programs that provide the greatest value across all modes.
- At the project-level, VfM refers to the project providing the greatest quality and effectiveness from the investment, taking into consideration the quantitative and qualitative impacts of the project.²¹

VfM analysis can assist in determining the preferred procurement model for a project, which is discussed in Stage 2 of the Survey and Analysis of Transportation Investment Models in Other Countries.

4.2 Appraisal Models

Appraisal models are tools used in the investment decision process to assess and compare the merit of options. Appraisal models support decision makers by evaluating and comparing actions at various points in the investment decision process (e.g., evaluate options, prioritize options). One or multiple appraisal models can be used throughout the investment decision process, to identify and estimate the potential value offered by an option.²²

In general, appraisal models look at both the qualitative and quantitative factors that impact both the benefits and costs offered by a project. Reliable data outputs from strong Travel Demand Models, Capital/Operating Cost Estimation tools, and wider-effect models are important to the validity of the appraisal model outcomes. The wider-effect models are designed to account for the "spill-over" economic benefits and costs that accrue to a geographic area that is not the recipient of the transportation investment.²³

Appraisal models used by individual jurisdictions are discussed further in Section 7.0. Key examples of appraisal models used by both the transportation and other sectors include:

- Cost-Benefit Analysis
- Multi-Criteria Analysis
- Economic Impact Analysis
- Financial Evaluation/Analysis
- Cost-Effectiveness Analysis²⁴

5.0 Relationship between Government Levels in Decision Making

Decision making for transportation investments is often split between the layers of government. In jurisdictions around the world, national, state, and local governments take on various roles and responsibilities for planning, funding and executing transportation infrastructure investments. International experience shows that authority of each level of government, and the relationship between levels can transform over time, as a result of changes in the political landscape or a desire to improve the efficiency of government funds.²⁵ Stage 1 focuses on the UK's national-local relationship and Australia's federal-state-local relationships for transportation infrastructure investment as two approaches to decision making between different levels of government.

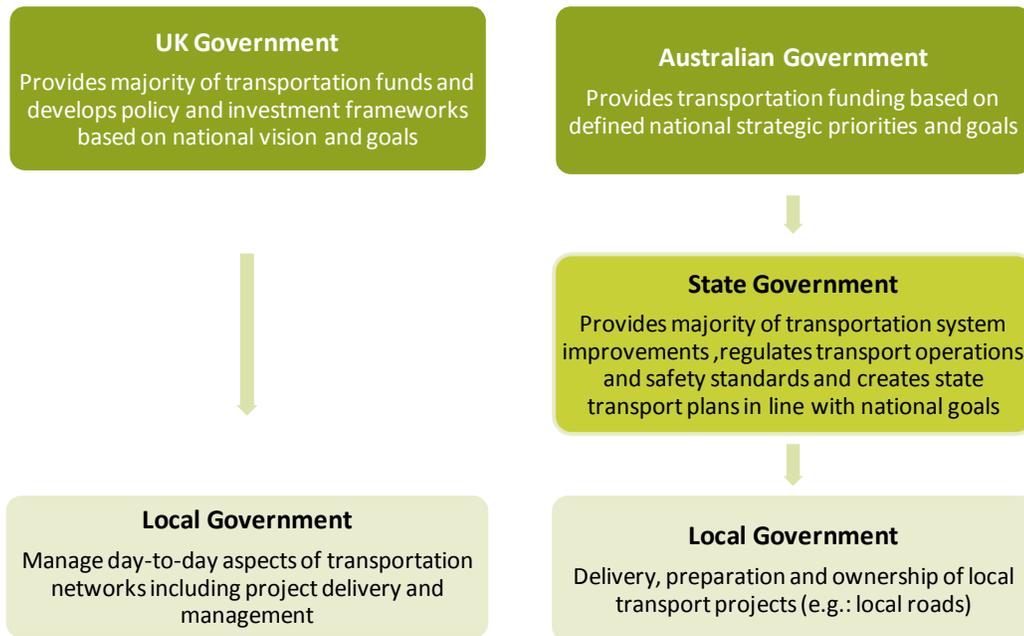


Figure 4: The Relationship between Government Levels of Decision Making in the UK and Australia

The following table highlights the key features of the governance structure adopted in each country:

United Kingdom: National-Local governance structure	Australia: Federal-State-Local governance structure
<ul style="list-style-type: none"> • National government collects and distributes majority of public funds used for transportation, in addition to establishing and prioritizing national objectives for transportation • Infrastructure UK acts as a government-wide infrastructure advisory body • Recent trends of decentralization with the new government established spring 2010 transferring aspects of transportation decision making from national to local authorities 	<ul style="list-style-type: none"> • State governments influence national transportation policies and programs • Infrastructure Australia acts as a government-wide infrastructure advisory body • The national government's role in transportation funding has increased due to a change in the national taxation system • The Council of Australian Governments coordinates policy reform decisions between states and federal government

Table 1: Features of the UK and Australian Governance Structure²⁶

5.1 United Kingdom

The UK is a parliamentary democracy. The political party that wins the highest number of seats in the general election has the power to form government, which acts as the executive branch of the UK. The government develops and implements policies and drafts laws that are then examined, debated, and approved by Parliament, which acts as the UK's legislative branch.²⁷ Similar to the U.S., the UK national government works closely with regional and local partners on the development of transportation policies. Since the UK is highly centralized, both politically and geographically, the national government has significant control over the direction of national transportation guidelines and how general revenues are spent. Public procurement is guided by both UK and the European Union regulations that promote the procurement of public services in a fair and open manner.²⁸

The absence of a state-level government in UK results in a national-local governance model that differs from the U.S. In the UK, the national government centrally collects general revenue funds and then distributes the money across the nation's ministries and departments. Departments compete for general funds by justifying the need and demonstrating the advantages of their projects. National and local governments fund transportation infrastructure and services using the share of funds they receive from the central government's distribution of general revenues. The historical UK national transportation role includes a strong, visible presence in policy development, investment planning and programming driven by an overarching vision and guidance. This includes establishing and prioritizing a set of national objectives to be delivered by the national transportation investments.²⁹

At a **national level**, there are multiple government bodies that influence transportation investment and policy. Key bodies and their respective roles and responsibilities are highlighted in Figure 5.

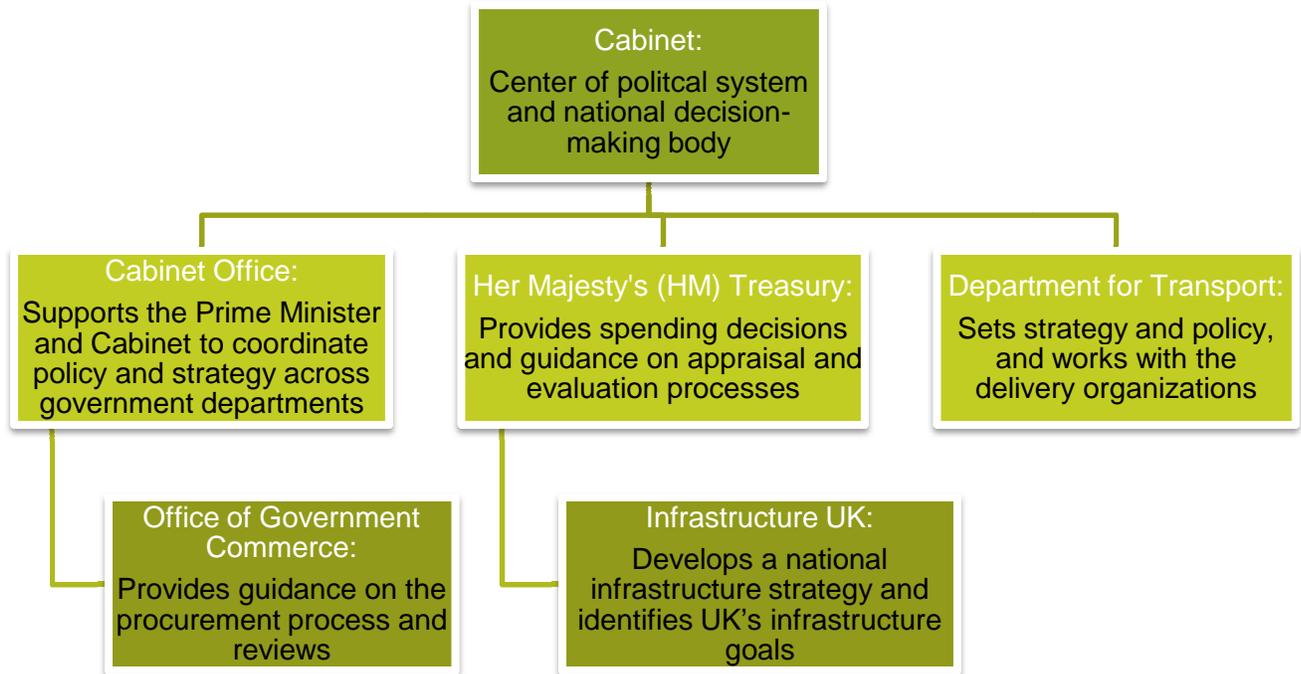


Figure 5: National Government Bodies influencing transport decision making

Each government body is further detailed below, and an example of how the various bodies work together through the decision making process is illustrated in Figure 6.

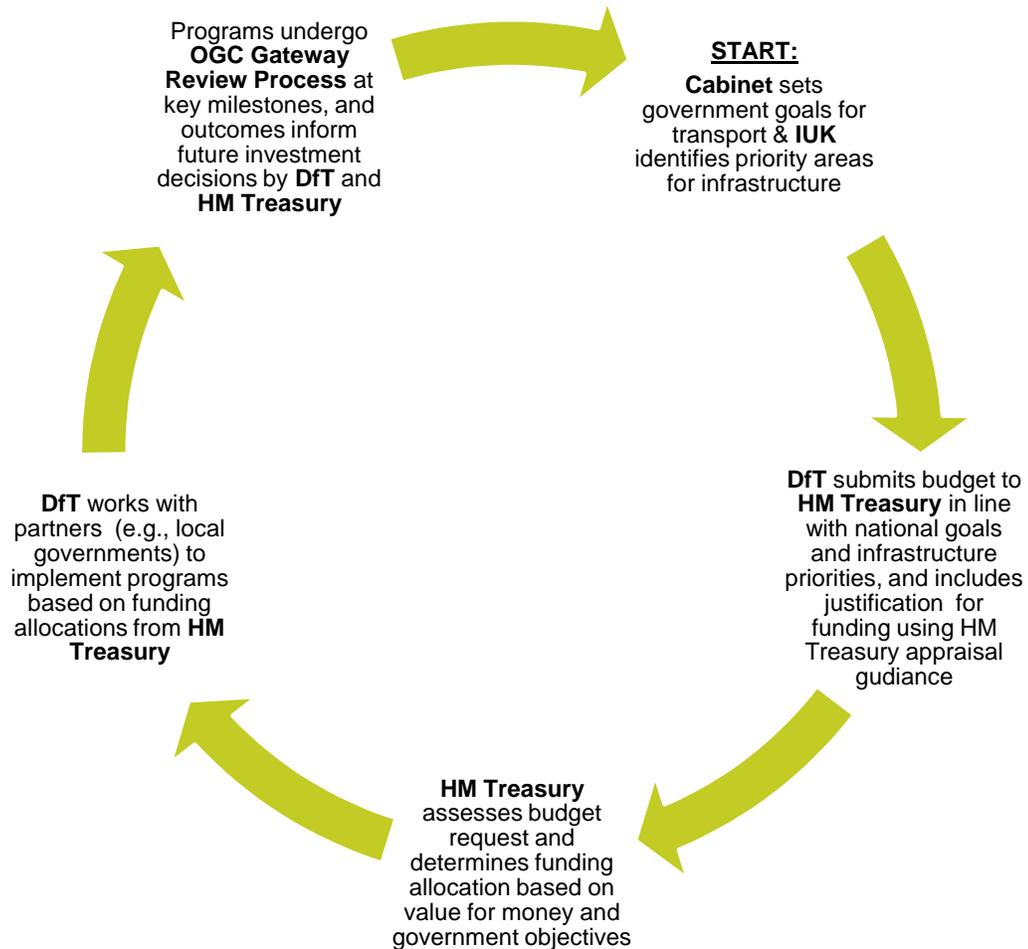


Figure 6: Example Decision Making Flow³⁰

Cabinet: The Cabinet is the center committee of the British political system and is the supreme decision-making body in government. It is comprised of the Prime Minister who selects the Cabinet Ministers' responsibilities across various committees. Although the Cabinet has no legal powers it is accountable to Parliament so all members are bound to support Cabinet decisions.³¹

Cabinet Office: The Cabinet Office supports the Prime Minister and the Cabinet with a goal to promote the effective development, coordination, and implementation of policy and operations across all government departments.³²

HM Treasury: HM Treasury is the UK's ministry of economics and finance. HM Treasury works to maintain sound public finances for the UK, including high and sustainable levels of economic growth and well-being. HM Treasury established appraisal standards for central government and releases budget allocations.³³

Office of Government Commerce (OGC): The Office of Government Commerce (OGC) is part of the Efficiency and Reform Group within the Cabinet Office and is responsible for helping the government to achieve the best value from its spending. The OGC works towards six goals:

- Delivering value for money from third party spend
- Delivering projects to time, quality, and cost, and realizing benefits
- Getting the best from Government estate
- Delivering sustainable procurement and sustainable operations on the Government estate
- Supporting the delivery of Government policy goals
- Improving central Government capability in procurement, project and program management, and estates³⁴

Infrastructure UK (IUK): Following a trend of creating a single government infrastructure advisory body across the globe (e.g., Canada and Australia), Infrastructure UK (IUK) was established in December 2009. The goal for IUK is to help create a new, long-term strategic focus on cross-sector infrastructure planning, prioritization, financing and delivery. IUK works with key government and private sector stakeholders to identify required changes in policies and regulations to encourage infrastructure investment in the UK. IUK also helps identify the interdependencies that impact infrastructure investment needs, provide expertise, and publishes an action plan in response. In addition, IUK supports the delivery of major infrastructure projects and programs and helps build stronger infrastructure delivery capability across government by collaboratively teaming and educating delivery departments (e.g., DfT). IUK operates within HM Treasury, however it is designed to act as an independent advisor and to provide unbiased advice to the ministry.³⁵ As of June 2010, IUK is teaming with other groups within HM Treasury to develop a national infrastructure plan communicating UK's infrastructure goals.

Department for Transport (DfT): DfT's role is to set strategy and policy, and to work with the organizations that are responsible for delivery (e.g., regional, local, or private parties). The central DfT team is organized with five teams, including: Corporate Support Functions (e.g., finance, human resources, shared service, and change), City and Regional Networks, International Networks & Environment, National Networks, and Motoring and Freight Services. The central DfT team actively engages with its Executive Agencies (e.g., Highway Administration, Maritime and Coastguard Agency) when developing transportation policy.³⁶

DfT works with local governments to improve sustainable access to jobs, services, and public transport. Project delivery, preparation and ownership are generally handled by the project sponsor (e.g., local rail authority). The DfT hosts a local transport website that contains the latest policy, guidance and good practice materials that can be used for local planning. The website also includes a benchmarking tool which enables local authorities to benchmark themselves against other authorities on national transport performance measures.

At a **sub-national level**, Local governments manage the day-to-day aspects of local transport networks, and prepare a Local Transport Plan (LTP) which details their strategy, implementation plan and targets for improving transport in their community. LTPs are a requirement under the Transport Act 2000, and the Local Transport Act 2008. These Acts grant local authorities the power to adapt their transport policies, initiatives, and governance to their unique needs and other local initiatives (e.g., local education, or health care priority initiatives). Routine meetings are held to review status of targets outlined in the LTP and to consider any opportunities or threats to its delivery.

With the formation of the Coalition Government in spring 2010, themes of decentralization and localism have arisen, with a vision to transfer power from central government to local authorities. The localism approach reverses the centralization that occurred under the previous national government. The new government's goal is "to achieve a position where strong, empowered local government is able to act in the best interests of its residents with the necessary support, not interference, from central government institutions."³⁷ To aid the localism approach, the Coalition Government has

increased the discretion available to local authorities by removing funding restrictions and providing flexibility on how budget savings are made.

In line with the localism goal, the DfT has also recently shifted its role in the LTPs executed by local authorities. During a July 2010 speech at the “Local Transport Today Conference” the Parliamentary Under-Secretary of State for Transport (Norman Baker MP) announced that the DfT is “no longer seeking to intervene in the way local authorities review their progress against local transport plans...and will no longer require reports or reviews for Central Government.” The Under-Secretary went on to emphasize that developing and executing a LTP continues to be a legal requirement, but the local government need to decide how they are used. The DfT’s role may be limited to “help[ing] prioritize transport schemes that offer the best outcomes to tax payers, business growth, passengers and the environment.”³⁸

In October 2009, the national government put into place an Infrastructure Planning Commission (IPC) to independently examine applications for nationally significant infrastructure projects (e.g., large economic infrastructure projects that support the economy and vital public services). The current process requires developers/project sponsors to consult with relevant organizations (e.g., DfT, or local transport agencies) prior to submitting an application to the IPC. These organizations provide feedback to the IPC on the environmental, economic and social impacts of the projects. By 2012, the Coalition Government plans to abolish the independent IPC and transfer its responsibilities to a new infrastructure body called the Major Infrastructure Unit (MIU).³⁹

Through the "Decentralisation and Localism Bill" set to be released in December 2010, the Coalition Government wishes to increase the degree of democratic involvement in the process, by allowing both Houses of Parliament to vote on National Policy Statements and for the Secretary of State to make the final decision on each project. Previously the IPC made decisions, or provided recommendations to the relevant Secretary of State, on National Policy Statements, which communicate the environmental, social and economic objectives and need for major infrastructure projects. Further details regarding the replacement of IPC with MIU are planned for release by December 2010.⁴⁰

5.2 Australia

Australia is a parliamentary democracy made up of six states and various territories. The Commonwealth Government, known also as the Australian Government or the Federal Government, is divided into three arms: legislature (known as Parliament), executive, and judiciary. Each state has its own state Constitution, which divides the state's government into the divisions of legislature, executive, and judiciary. Each territory is an area within Australia’s borders not claimed by a state, and is governed by the Commonwealth Government or granted a right of self-government similar to a state.⁴¹

The relationship between federal, state and local governments in Australia has shifted over recent years due to increases in federal funding from political and tax system changes.¹ Australia differs significantly from the UK due to the presence of State-level governments who influence national transportation policies and programs. However, similar to the UK, the role for the national government in Australian transportation provides a policy development and investment planning approach.⁴²

¹ In 2000, Australia implemented the New Tax System package, which introduced a 10% Goods and Services Tax (GST) and new personal income tax rates, and changed the collection and payment systems. Previously, states and territories relied on State-based taxes and financial assistance from the Federal Government. Under the New Tax System, GST revenues that are collected by the Federal Government and distributed to states and territories constitute a major component of the states and territories' revenue base.

At a **national level** there are several departments and councils that influence transportation investment and policy. Key bodies and their respective roles and responsibilities are highlighted in Figure 7.

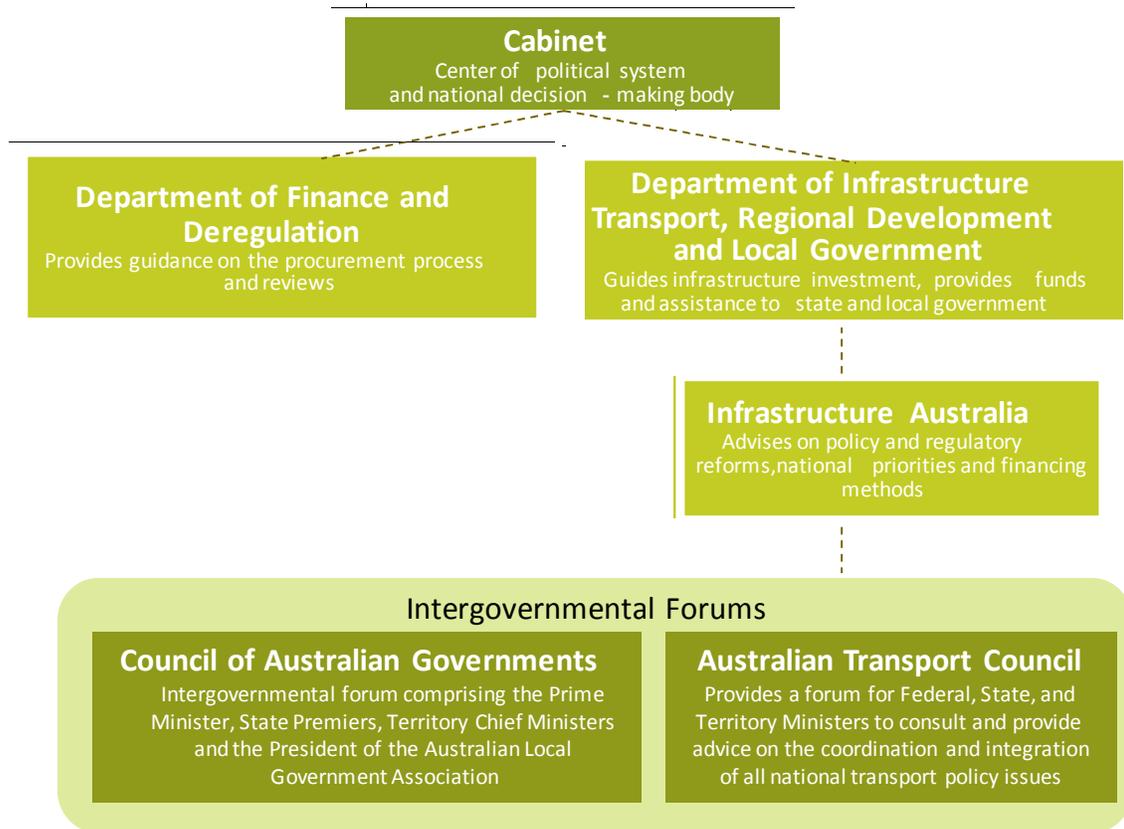


Figure 7: Australian National bodies influencing transport decision making

Department of Finance and Deregulation: Provides guidance on the procurement process and management/risk reviews, including Australia’s Gateway Review Process⁴³

Department of Infrastructure, Transport, Regional Development and Local Government (DITRD LG): DITRD LG plays a key role for transportation infrastructure investment by providing policy advice, programs and regulation to promote economic, social and regional development. DITRD LG is responsible for:

- Providing funding for transport infrastructure
- Promoting safe and secure transport solutions
- Providing a framework for competition between and within transport modes
- Promoting a transport system that is accessible, sustainable and environmentally responsible
- Providing policy advice on whole of government strategies to maximize the potential of Australia’s regions
- Ensuring information about relevant Government policies and programs is disseminated effectively to regional Australia
- Promoting efficient and effective local government which fosters a strong sense of community

DITRDLG is organized into eight business divisions, including: Corporate Services (e.g., Finance, People and Performance, Information and Services, and Legal), Nation Building – Infrastructure Investment, Infrastructure and Surface Transport Policy, Aviation and Airports, Office of Transport Security, Local Government and Regional Development, Office of Northern Australia, and Policy and Research.

Recent administrative changes have transferred the regional development and local government functions of DITRDLG to the newly established Department of Regional Australia, Regional Development and Local Government. The remaining transport and infrastructure functions remain with the renamed Department of Infrastructure and Transport, whose purpose is to promote economic, social and regional development by enhancing Australia's infrastructure and transport performance.⁴⁴ The Department of Infrastructure and Transport focuses on transport infrastructure and services (e.g., Aviation, Maritime, Surface Transport), with similar responsibilities as the U.S. DOT.

Infrastructure Australia: Infrastructure Australia was created in 2008 in response to the federal government taking a more active role in infrastructure funding. Infrastructure Australia's role is to advise the governments and infrastructure investors and owners on policy and regulatory reforms to improve the efficient utilization of national infrastructure networks, national priorities and possible financing mechanisms.⁴⁵ While Infrastructure Australia helps prioritize and confirm need for projects, it is ultimately DITRDLG or other departments who choose to fund the projects.⁴⁶

Infrastructure Australia consists of eleven members plus a Chair appointed by the Minister for Infrastructure, Transport, Regional Development and Local Government. Five of the twelve members, including the Chair, must have acquired relevant knowledge in the private sector, and at least one member must represent local government.⁴⁷ The private sector representatives are very experienced individuals with a reputable and well-respected background which provides credibility to the board's decisions. The introduction of private stakeholders allows the board to develop a broader range of approaches that include the introduction of private sector practices into the public sector. For example, private stakeholders have suggested applying variable pricing concepts used by the private airline industry to the public sector's pricing for toll roads. Although Infrastructure Australia is supported by the Office of Infrastructure Coordinator within DITRDLG, it operates with a considerable and formalized level of independence. This separation allows Infrastructure Australia to conduct audits on the condition of nationally significant infrastructure, and develop unbiased national infrastructure priority lists for the COAG to consider.⁴⁸

Council of Australian Governments (COAG): COAG is an intergovernmental forum comprising the Prime Minister, State Premiers, Territory Chief Ministers and the President of the Australian Local Government Association (ALGA). COAG, chaired by the Prime Minister, was first established in May 1992 and meets on an as needed basis to develop and monitor national policy reforms that require cooperative action by all Australian governments. The meetings act as a forum for states to debate and negotiate policies across all government sectors, including transportation, prior to implementation of national policy. The COAG signs intergovernmental agreements, which signify the commitment of jurisdictions to implement decisions reached by the forum.⁴⁹

Australian Transport Council (ATC): ATC provides a forum for Commonwealth, State, and Territory Ministers to consult and provide advice on the coordination and integration of all transport policy issues. ATC acts as an advisory body to both COAG and the federal government on matters concerning transportation. It is common for COAG to ask ATC to make recommendations concerning a transportation matter.⁵⁰

At a **sub-national level**, state and territory governments are responsible for creating state transport plans, fund system improvements, and regulating transport operation and safety standards. Project

delivery, preparation, and ownership are generally provided by the state and local governments' project sponsor.⁵¹

5.3 Centralized and Decentralized Governments

Historical experience shows that both centralization and decentralization of government decision making has advantages and challenges, and the UK and Australia provide examples of both approaches. In most cases, the level of centralization depends upon what level of government controls the funding distribution, as centralization requires a strong national government that has control over the majority of the funding. If control over collection and distribution of funding is primarily at the sub-national level, a decentralized approach can be effective. The UK adopts a centralized approach where the national government has the authority to make most funding decisions. In Australia, a more decentralized approach is maintained, although the role of the federal government in providing funding for state transportation projects has increased since the New Tax System moved the primary responsibility for collection and distribution of taxes to the federal level.

Viewpoints on the level of national oversight and governance vary. A centralized national government is able to develop major priorities, set policy frameworks that result in sound investment decisions, and allocate funding among sub-national governments. This includes the national government providing local governments with processes to evaluate the potential value offered by projects, rather than the national government running or selecting projects that the local governments fund. In contrast, a decentralized approach can allow local governments to select projects that align with local priorities however those projects may not align national priority areas or may be duplicative or contradictory of projects selected by other localities. Without guidance from the national government, local authorities in a decentralized government may have difficulty aligning local priorities so that they also contribute to achieving national priorities.⁵²

Key Observations: Levels of Government

- Australia's states influence the country's national guidelines and policies. State-level policies or initiatives are used as a base foundation for the National policies to inform directions for further reform or potentially result in new national policies and legislation affecting all jurisdictions (e.g., Victoria Transport Plan).
- Strong National guidelines are often supplemented by State specific requirements to drive a consistent approach for appraisals and investment decisions. While this alignment of State and National processes helps promote effective implementation of objectives and appraisals, states often differ by their ability to adopt standard processes that meet national requirements.
- National infrastructure advisory bodies, such as Infrastructure Australia and Infrastructure UK, seek to balance cross-sector priorities and facilitate inter-dependencies by serving as strategic advisors to the government on investment priorities and conducting performance audits and assessments.
- A centralized system can be effective when the central government controls the majority of funding decisions.

It is important to note that while the national and state/local levels of government in the UK and Australia are able to work closely together on transportation policy and investment frameworks, adopting these practices into the U.S. appropriations process may prove challenging due to differences in the government structure and the role of the federal government.

6.0 Levels of Investment Frameworks

Investment frameworks can be used at multiple levels of the government (e.g., government-wide, department-level, and project-level) to drive investment decisions. Government-wide frameworks can act as a strategic framework to set the direction of infrastructure investment for a jurisdiction, and also act as a technical framework to highlight a project's potential to contribute to the government's overall objectives. Department-level and project-level frameworks guide investment decisions by providing approaches based on the sector's or individual project's needs. The UK and Australia have similar multi-level frameworks that guide transportation decision making.⁵³

UK and Australia's Investment Frameworks by Level		
Framework Type	UK	Australia
Government-wide	<ul style="list-style-type: none"> • HM Treasury's Green Book • OGC's Gateway Review Process • Infrastructure UK's National Infrastructure Framework 	<ul style="list-style-type: none"> • Infrastructure Australia's Reform and Investment Framework • Department of Finance's Gateway Review Process
Department-level	<ul style="list-style-type: none"> • DfT's New Approach to Appraisal 	<ul style="list-style-type: none"> • ATC's National Guidelines for Transport System Management

6.1 United Kingdom

Government-wide considerations for infrastructure investment:

The HM Treasury's Green Book

The HM Treasury's Green Book - Appraisal and Evaluation in Central Government, published in 2003, establishes a base set of guidelines for how projects are appraised in the UK. The Green Book provides a consistent and transparent process for appraisal and evaluation of policies and capital projects for all of the Central Government (i.e., department and ministers responsible for national affairs). It covers activities such as: policy & program development, new or replacement capital projects, use or disposal of existing assets, specification of regulations, and major procurement decisions.⁵⁴

The Green Book's process for appraisal, outlined in Figure 8 below, follows a six step process that begins with justification of Government action. The Green Book provides detailed guidance on each step of the Appraisal and Evaluation Cycle. Key excerpts from the Green Book are highlighted below:

- 1. Rationale (Justifying Action):** Make sure there is a clearly identified need, and any proposed intervention is likely to be worth the cost. This may include research to understand impact of no action, market situation, projected trends, potential beneficiaries, and how the problem to be addressed may change over time.
- 2. Objectives (Setting Objectives):** Set desired outcomes and objectives, including target levels to help monitor progress. It is important that the objectives of individual proposals be consistent with government objectives or departmental Public Service Agreements (PSAs).
- 3. Appraisal (Options Appraisal):** Create range of options, and analyze their costs and benefits to develop a shortlist of options. Options Appraisal is the most significant part of the



analysis, and its goal is to develop a value for money solution that meets the objectives of government action. The Green Book recommends a cost-benefit analysis, with supplementary techniques (e.g., multi-criteria analysis, or cost-effectiveness analysis) for weighing non-monetized costs.

- 4. **Monitoring (Developing and Implementing a Solution):** Select decision criteria and judgment to choose best option. Refine chosen option into a solution, and consider procurement routes (start of VfM Analysis). It is important to have transparency surrounding the basis for selecting the best option (e.g., option with highest risk adjusted net present value from cost-benefit analysis), and to use consultation when developing the option into a solution.
- 5. **Evaluation:** Perform post-evaluation by comparing actual vs. expected costs and benefits to develop lessons learned for future projects. This generally includes a cost-benefit analysis or economic appraisal to help the government continually improve their basis for decision making.
- 6. **Feedback:** Communicate outcomes and lessons learned, and apply to assessment of future interventions. This may include broad dissemination of the post-evaluation results and associated recommendations.⁵⁵

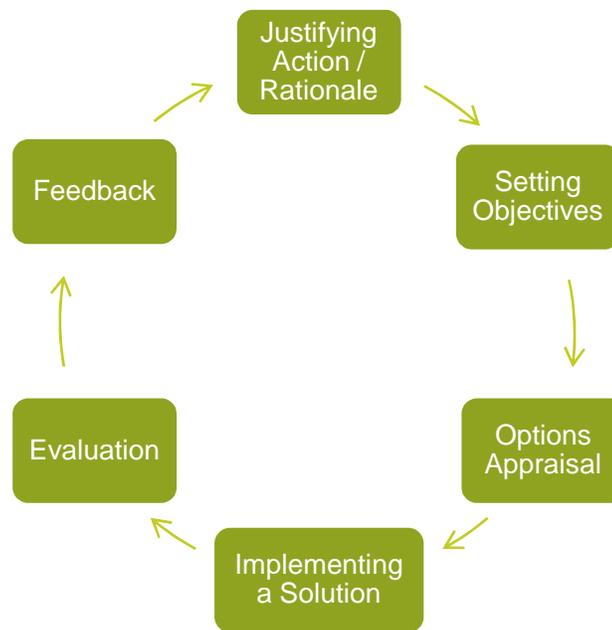


Figure 8: HM Treasury Green Book Process

Source: HM Treasury, The Green Book – Appraisal and Evaluation in Central Government

Office of Government Commerce’s (OGC) Gateway Review Process

In addition to HM Treasury’s Green Book, projects in the UK must also follow the OGC Gateway Review process, which requires an examination of programs and projects after each critical stage in their lifecycle to assure they can progress successfully. The reviews are conducted by independent practitioners with no connection to the program or project. The results are provided to the program or project team, so that they can use the findings to increase their likelihood of a successful delivery. Furthermore, the peer reviews may be considered by some project teams as a challenge to prove the quality of their work to colleagues, thus providing an additional incentive for teams to perform well and deliver exemplary work.⁵⁶ The process includes one program review (Gateway Review 0) and five steps in the project-level review, outlined in Figure 9:



Figure 9: OGC Gateway Review Process
 Source: HM Treasury, OGC - Gateway Review for Programmes & Projects

The reviews help track if investment goals are met, and capture other unexpected outcomes or “flow-in effects” (e.g., loss of local retail business or increase in bicycle accidents due to re-routing of trucks to expressway). This insight can be used to improve future cost-benefit analysis.

The OGC provides detailed guidance materials on its website, including specific questions, and the required documentation is outlined for each review step. The Gateway Review process is aligned with HM Treasury’s Green Book, with the checklist for Gateway Reviews 1 & 2 requiring the project sponsor to confirm that the appraisal and development of options is adequately performed in accordance with the Green Book’s guidance.⁵⁷

Infrastructure UK’s National Infrastructure Framework

As of March 2010, IUK was in the process of developing a National Infrastructure Framework with a long-term, cross-sector view of infrastructure needs. As stated in HM Treasury’s and IUK’s joint

Strategy for National Infrastructure document, the six proposed principles for which infrastructure policies or projects should be appraised include:

1. Long-term costs and benefits, including their expected effect on infrastructure outcomes for the next ten years and their consistency with the 50 year vision, in particular their contribution to the transition to a low-carbon economy
2. Choice of funding and finance models and their efficiency and effectiveness compared with alternative models
3. Options for demand management and more effective utilization of existing or renewed assets as alternatives to major investment in new assets
4. Potential synergies and interdependencies with other infrastructure
5. Impact on the overall resilience of infrastructure networks
6. Any significant impact on the supply chain, particularly innovation and new business opportunities.⁵⁸

UK's National Infrastructure Framework is summarized in Figure 10 as comprising of policies and a portfolio of investments that lead to outcomes to support the long-term vision for infrastructure in the UK:

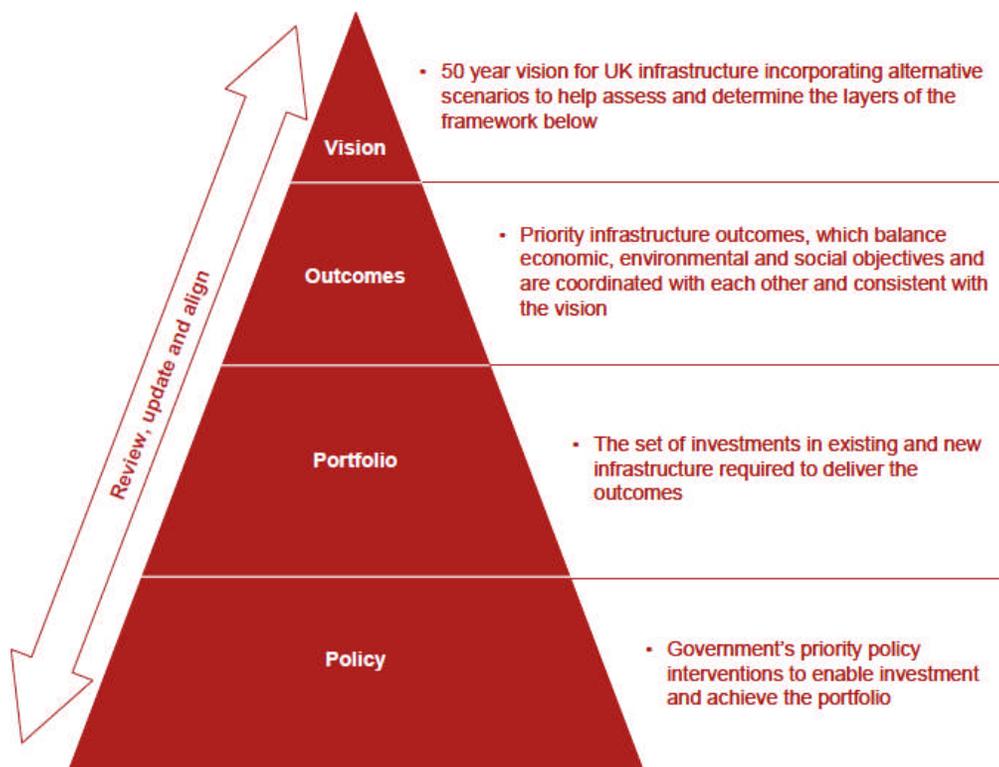


Figure 10: UK National Infrastructure Framework

Source: HM Treasury and Infrastructure UK, Strategy for National Infrastructure

When the new government was established in spring 2010, the status of IUK and the National Infrastructure Framework is uncertain. However, the Emergency Budget published by the new Coalition Government in June 2010 confirmed IUK's role to enable greater private sector investment in infrastructure, and improve the Government's long-term planning and delivery. The new Coalition

Government also announced that a national infrastructure plan with goals for UK infrastructure to be released in fall 2010.⁵⁹ It is unclear if this national infrastructure plan will include the components of the previously released National Infrastructure Framework concept.

Department- and project-level investment framework and appraisal models:

Building on the Green Book and central government priorities, departments (e.g., health, transport, crime, or energy) in the UK have developed detailed guidance documents for appraisals to meet their sector specific needs.

Department for Transport's New Approach to Appraisal

The DfT's New Approach to Appraisal (NATA) is a body of advice, software and data products to support business case development for Government funding or approval. NATA follows a similar appraisal approach to the Green Book and starts with consideration of problems and ends with identification of a preferred solution. Guidance from the HM Treasury's Green Book is applied during the economic appraisal of transport schemes under NATA.⁶⁰

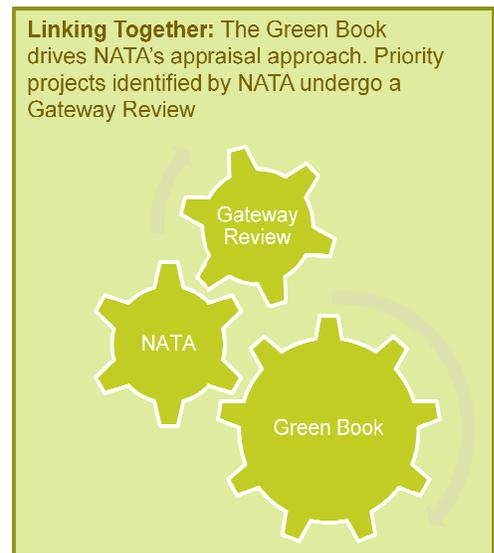


The NATA framework delivers the necessary information for a decision on the project's value, including:

- Appraisal Summary Table which summarizes the alignment with Government objectives
- Achievement of regional and local objectives
- Effectiveness of problem solving
- Supporting analyses of distribution and equity, affordability and financial sustainability, practicality and public acceptability

Detailed guidance materials, tools and templates are available on the DfT's Transport Appraisal Guidance website (known as WebTAG), including:

- Data sources (e.g., Trip-end Modeling Program which forecasts travel demand at geographical level)
- Software for assessing whether road schemes provide VfM
- A National Transport Model, an analytical and policy testing tool that provides a systematic means of comparing the national consequences of applied transport policies
- Research work that aims to improve transport modeling and economic appraisal⁶¹



Guidance materials are refreshed on a routine basis, with consultation and draft versions posted for public comment and review.

Following recommendations from the Green Book, DfT's transport appraisal is performed as part of the overall study process included in NATA. Each of the steps in the process outlined in Figure 11 is implemented according to the type or size of the need or options being addressed.

6.2 Australia

Government-wide considerations for infrastructure investment:

Infrastructure Australia’s Reform and Investment Framework



In 2009, Infrastructure Australia’s National Infrastructure Priorities highlighted an economically, socially, and environmentally sustainable infrastructure future. Through guidance from Sir Rod Eddington, an analytical assessment approach for cross-sector infrastructure investment, known as the Reform and Investment Framework was introduced.⁶²

The Reform and Investment Framework is a top-down approach to infrastructure decision making with seven distinct stages as follows:

- Stage 1: Goal Definition
- Stage 2: Problem Identification
- Stage 3: Problem Assessment
- Stage 4: Problem Analysis
- Stage 5: Options Generation
- Stage 6: Options Assessment
- Stage 7: Solution Prioritization⁶³

This framework informs the government process of setting priority areas for infrastructure investment. The following table further defines the stages of the Reforms and Investment Framework and details the components required for and rationale behind each stage.

Stage	Description	Components Required	Rationale
1. Goal Definition	Definition of the fundamental economic, environmental and social goals that Australia seeks to achieve. For example: <ul style="list-style-type: none"> • sustained economic growth and increased productivity; • lower carbon emissions and pollution; and • greater social amenity and improved quality of life. 	<ul style="list-style-type: none"> • Formalized, comprehensive, and agreed goals, objectives, targets and indicators. • Specific and quantified goals, objectives and targets. • Outline how the initiative fits within existing infrastructure plans. • Outline of how the goals and objectives align with those of other parties (e.g., National, including Infrastructure Australia’s Strategic Priorities, State/ Territory, Regional, Local level and across sectors). 	Goals are needed against which problems and solutions can be assessed.
2. Problem Identification	Objective, specific, evidence-based, and data rich identification of problems of infrastructure systems and networks that may hinder the achievement of those economic, environmental and social goals.	<ul style="list-style-type: none"> • Situation Assessment – a review and analysis of the current status. • Scenario Assessment – a review and analysis of the future status that identifies: <ul style="list-style-type: none"> – Driver and trends of the current and future situation – Base-case using the current trends (certainties) – Alternative futures using future trends (uncertainties) • A list of Problem Statements that can be accurately defined and quantified. 	Specificity regarding inadequacies is essential in order to take targeted and therefore more effective action.

Stage	Description	Components Required	Rationale
3. Problem Assessment	Objective and quantified appraisal of the economic, environmental and social costs of those deficiencies, so that the most damaging deficiencies can be identified and prioritized.	<ul style="list-style-type: none"> • Accurate and objective assessment of the economic/environmental/social impacts of those problems. • Priorities identified which reflect the scale of impacts. 	Understanding the costs/impact of deficiencies allows the worst problems to be identified and prioritized.
4. Problem Analysis	Objective policy and economic analysis of why these deficiencies exist – i.e. what is the underlying cause (depending on the sector, reasons could include market failure, government failure, capital restrictions, etc). This should include an assessment of non-infrastructure reasons for the problem (e.g. land use patterns, peak demand; or business hours).	<ul style="list-style-type: none"> • For each deficiency, analysis of why those problems have developed. • Covers both immediate and underlying causes (e.g. not just 'lack of investment', but causes of under-investment, e.g. regulatory environment). 	Understanding the causes allows effective and targeted solutions to be created. Infrastructure is often not the only cause of problems.
5. Option Generation	Development of a full range of interventions that address the issue in the domains of: <ul style="list-style-type: none"> • reform (regulation, legislation, governance); and • Investment. 	<ul style="list-style-type: none"> • Identify the full range of Options for each problem from the domains of: <ul style="list-style-type: none"> – Reform (e.g. independent pricing, regulation, approvals, coordination); and – Investment (e.g. better use through demand management, capacity increases). 	Identification of a broad range of options – across reform and investment areas – rather than relying on early judgments or pre-conceived ideas – is more likely to identify the best solution or package of solutions.
6. Option Assessment	Strategic analysis and cost-benefit analysis to assess those options. The appraisal should incorporate the full range of economic, environmental and social impacts (including agglomeration and trade impacts, carbon impacts, noise, and social amenity) so that the impact on all goals is measured and understood.	<ul style="list-style-type: none"> • Qualitative and quantitative analysis including: <ul style="list-style-type: none"> – Strategic analysis: using high-level profiling assessment to assist in the analysis of a large number of options; and – Rapid analysis: using a high-level appraisal assessment, such as a Rapid Cost-Benefit Analysis, to assist in the analysis of a smaller of options. 	An understanding of the strategic and economic value along with the risks and uncertainties in delivery – is essential to understand how the options or a package of options may achieve the fundamental goals outlined in Stage 1.
7. Solution Prioritization	Identification of policy and investment priorities from the list of solutions, on an objective basis that gives primacy to the Benefit-Cost Ratio of initiatives, but is balanced by considerations such as strategic fit and deliverability (including risk and affordability).	<ul style="list-style-type: none"> • A structured and objective evaluation framework – that reflects the primacy of Cost Benefit Analysis along-side the strategic value and deliverability risk – is used to make decisions on the long-term infrastructure pipeline. • A review of the solution is made against the fundamental goals/problem identification. 	Benefit-Cost Ratios provide the best available objective evidence as to how well solutions may impact on the goals outlined in Stage 1 – but are not the whole story.

Figure 12: Stages of Infrastructure Australia's Reform and Investment Framework

Source: Infrastructure Australia, Getting the fundamentals right for Australia's infrastructure priorities, June 2010

Infrastructure Australia developed guidance materials and templates for all seven stages to be used when preparing infrastructure investment proposals. The information supports the project owners through the seven stages to arrive at infrastructure investment decisions that align with the needs of the public.

Department of Finance’s Gateway Review Process

Just as the UK’s OGC developed a Gateway Review, the Australian Department of Finance also established a Gateway Review Process (refer to Figure 13). The Gateway Review Process is a government-wide framework that provides tactical guidance for project execution. The Australian Gateway Review process consists of an independent ex-post review conducted by a team not associated with the project at six critical points in the project’s lifecycle to assess the project against its specified objectives and identify areas for corrective action.⁶⁴

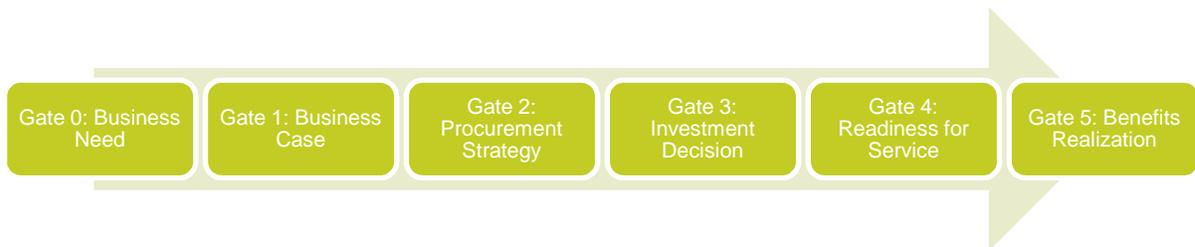


Figure 13: Australian Gateway Review Process
Source: Department of Finance and Deregulation, Gateway Review Process

The review process was introduced to strengthen the oversight and governance of major projects and to deliver agreed projects on-time, on-budget and in-line with stated objectives. It is required for any procurement and infrastructure project over AUD\$20M.⁶⁵

Similar to the UK approach, the reviews track realization of expected and unexpected outcomes to identify outcomes that can improve future analysis predictions. Detailed guidance materials, including specific questions and documentation required, are provided by the Department of Finance for each review step.

Department- and project-level investment frameworks:

Australian Transport Council National Guidelines



In 2006, the Australian Transport Council (ATC) endorsed a detailed framework for transportation planning and development known as the National Guidelines for Transport System Management. It provides a consistent framework and processes, methods and tools to assist and guide transport planning and decision making across Australia. The guidelines aim to move towards a multi-modal approach to transport policy, planning and assessment that compares all feasible solutions, and takes a ‘triple bottom line’ perspective (e.g., social, environmental and economic factors).⁶⁶

The National Guidelines for Transport System Management consists of eight key steps, outlined in Figure 14, starting with objective setting and ending with a performance review (e.g., effectiveness of the framework and initiatives). The guidelines serve as a department-wide framework for transportation investment decisions.

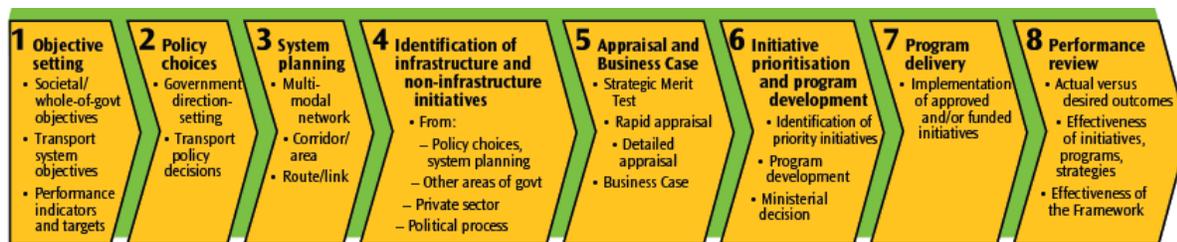


Figure 14: Steps in National Guidelines for Transport System Management

Source: Australian Transport Council, National Guidelines for Transport System Management in Australia

The Framework’s eight phases can be broadly grouped as follows:

- Phase 1 – 3: Objectives-led Strategic Planning
- Phase 4 – 6: Appraisal and Program Development
- Phase 7 – 8: Delivery and Performance Review

The Framework has a whole-of-system focus, takes a multi-modal perspective and considers both infrastructure and non-infrastructure options (such as demand management). Stakeholder engagement is also a key guiding principle for the Guidelines and Framework and their views and feedback have an important role throughout the process.⁶⁷

State Transport Frameworks:

Australia provides an example of transportation investment frameworks aligning across the national and state governments. Strong national guidelines supplemented by state specific requirements support a consistent approach for appraisals and investment decisions. States customize the national policies by adding additional layers of detail to align with their strategic objectives and jurisdictional requirements. For example, Victoria published state-level plans which lay out in more detail the high order goals adopted by the national government. Additional examples include State-level Cost-Benefit Analysis Guidance and Economic Appraisal Guidelines.

In Australia, state-level policies or initiatives (e.g., State Treasury guidelines) are often used as a base foundation for the national policies, to inform directions for further reform, or potentially result in new national policies and legislation affecting all jurisdictions. Alignment of state and national guidelines can be a lengthy process, in order to work out differences between national standards and state-specific requirements. COAG is often used as the forum to agree, based on consensus of state leaders, on cross-state reforms. Depending on the issue, support for reform may be led by an individual state or group of states, or the federal government. The federal government may also provide funding to states in order to help them implement the reforms.⁶⁸

Queensland’s Project Assurance Framework

The Queensland Government’s Department of Infrastructure and Planning established a Project Assurance Framework⁶⁹ (PAF) to “set the foundation for ensuring that project evaluation, procurement and delivery activities are undertaken effectively and efficiently across the Queensland Public Sector, and that the State Government achieves value for money from its investment in projects.”⁷⁰

The PAF establishes a whole-of-government project assessment process that can be used across all departments in Queensland. As highlighted in Figure 15, a strategic assessment and preliminary evaluation is conducted for each project. Once the service requirement priority and infrastructure approach is confirmed, the potential for the project to be delivered as a public-private partnership is

assessed. Traditionally delivered projects proceed through five stages, including: business case development, supply strategy development, source suppliers, establish service capability, and deliver service.⁷¹

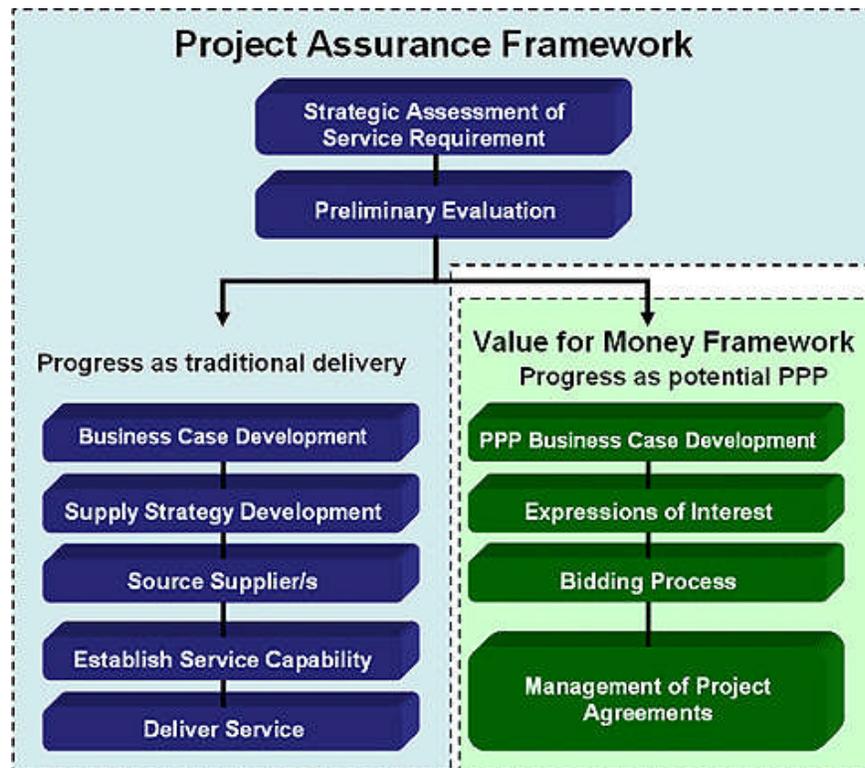


Figure 15: Queensland Project Assurance Framework
Source: Queensland Department of Infrastructure and Planning

The PAF is aligned with a gateway review process, with a decision made at the end of each stage on the readiness to proceed. Detailed guidance materials are provided on the Queensland’s Department of Infrastructure and Planning website to execute and assess the project at each stage in the process. The Department of Infrastructure and Planning provides technical advice to project teams on the PAF and checks that departments (e.g., Department of Main Roads and Transport) comply with the PAF and VfM frameworks for major infrastructure projects.

Victoria’s Investment Management Standard

Victoria’s Department of Treasury and Finance developed the Investment Management Standard that allows an investor (the project owner or sponsor) to clearly define the need for an investment, shape the solution and track the delivery of benefits throughout the investment lifecycle. The Investment Management “aims to reduce the risk of investment failure, provide greater value for money and drive better outcomes.” It has been designed to engage the investor, and enable them to shape and control investments throughout their lifecycle.⁷²

As outlined in Figure 16, the Investment Management Standard includes six guidelines, including:

- **Problem definition:** Clarify the drivers and logic of an investment through creation of an Investment Logic Map
- **Benefit definition:** Identify the benefits desired and the benefits management plan
- **Solution definition:** Identify and scope the type of solution that is likely required

- **Business Case:** Formal documentation of the rationale and framework for investment
- **Investment Reviews:** Review the investment logic and determine if any adjustments are necessary
- **Benefit Reports:** Process of tracking, analyzing and reporting benefits delivered or not achieved⁷³

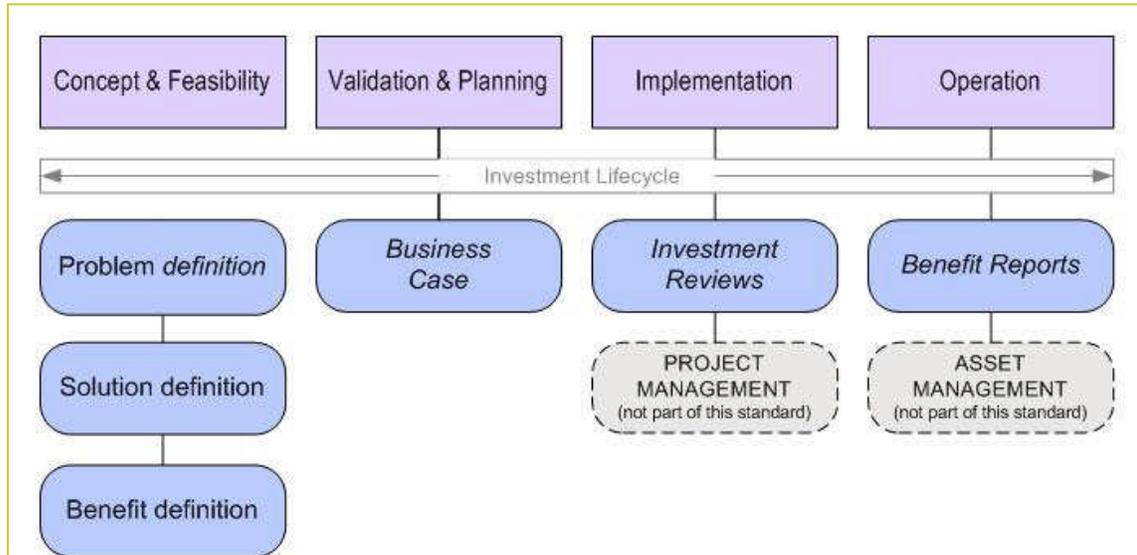


Figure 16: Victoria's Investment Management Standard

Source: Victoria Department of Treasury and Finance, Investment Management Standard

The six guidelines comprising the Investment Management Standard are aligned with a stage in the Investment Lifecycle. Project Management and Asset Management are separate frameworks which support the Implementation and Operation investment lifecycle phases. Each guideline involves an approach to conduct workshops or use tools in collaboration with investors and other knowledgeable individuals to shape the investment and make investment decisions.⁷⁴

Detailed guidance materials are available on the DTF website to aid in the preparation and implementation of workshops as outlined in the standard. Portions of the Investment Management Standard (e.g., investment logic map format) are currently being updated, and a new version of the Investment Management Standard is expected to be released in September 2010.

Victoria Transport Plan

The Victoria Transport Plan provides a transport planning framework for future land use with a long-term vision to develop cities, towns and suburbs in a way that:

- Reduces the distance between houses, jobs and services,
- Creates dedicated links to concentrate freight flows; and
- Encourage economic growth.⁷⁵



It includes more than AUD\$38B in projects and initiatives for cities, regional centers, country towns and rural areas and it represents the largest investment in transport in Victoria's history.

The Victorian Transport Plan was developed with extensive public involvement and expert advice from Sir Rod Eddington's review into improving Melbourne's east-west links. The Victorian Government consulted with community and business groups, local councils, industry and other

stakeholders across the state between August and September 2008, including:

- A web forum involving more than 200 people;
- Eight regional and suburban transport forums;
- A number of community transport forums held by MPs; and
- The Victorian Transport Summit with more than 120 experts from the transport, construction, finance, environment, planning and social services sectors.⁷⁶

After the extensive consultations, the Victoria Transport Plan was released in December 2008 and identified six priorities to drive decision making, including:

1. Shaping Victoria: Using transport investment to change the shape of Victoria to make jobs and services more accessible.
2. Linking rural, regional and metro Victoria: Strengthening the connections between regional, rural and metropolitan Victoria so all parts of the State share in prosperity.
3. Creating a Metro System: Taking practical steps to increase the capacity, frequency, reliability and safety of our trains and trams, and move towards a modern Metro System.
4. Moving Around Melbourne: Linking our communities by closing gaps, reducing congestion and improving safety on the road network.
5. Taking practical steps for a Sustainable Future: Moving towards a sustainable and lower emissions transport system to help Victorians preserve their environment.
6. Strengthening Victoria's and Australia's Economy: New links by supporting freight, industrial growth and new jobs.⁷⁷

The Victoria Transport Plan's website provides report cards and status updates of the governments projects and priorities. Overall, the Victoria Transport Plan brings together the future land use development and transport investment decision making, providing an example for the Sustainable Communities Partnership in the U.S between U.S.DOT, the U.S. Department for Housing and Urban Development (HUD) and the U.S. Environmental Protection Agency (EPA).

Key Observations: Levels of Investment Frameworks

- Investment frameworks support decision-makers in selecting projects that have the potential to provide value for money and efficiently utilize government funding.
- A consistent and transparent investment framework with clear steps and evaluation factors may promote objective and accurate decision making across modes and sectors.
- An investment framework that is aligned with government objectives is more likely to lead to the selection of projects that address national priorities.
- Involving various stakeholders through to development and evolution of a national investment framework is important in fostering public and political consensus.

7.0 Appraisal Models

Appraisal models are tools that may be used in the investment decision process to assess and compare the merit of options. Appraisal models utilized in the transport sector can include an analysis of a project's qualitative and quantitative impacts to inform the potential value for money offered by a project. The qualitative analysis of appraisal models can take into account social and environmental benefits that are not easily monetized, including livability and sustainability impacts (e.g., increased mobility options, improved reliability, decreased noise, or increased visual appeal). Where possible Australia and the UK seek to monetize the livability and sustainability impacts, or they attempt to value their impacts in other ways, such as through rating systems or verbal descriptions (refer to the UK's Appraisal Summary Table). An important input to appraisal models is reliable data from strong Travel Demand Models, Capital / Operating Cost Estimation tools, and wider-effect models. Jurisdictions such as the UK and Australia that apply broad usage of appraisal models as part of the investment decision process, have also developed detailed and standardized approaches for travel forecasting, and cost estimating. Wider-effect models are designed to account for the "spill-over" economic benefits and costs that accrue to a geographic area which is not the recipient of the transportation investment.⁷⁸

Descriptions and circumstances in which the appraisal model may be appropriate are highlighted in the following tables.⁷⁹ Refer to Appendix B: Appraisal Model Guidance Materials and Examples for additional reference materials and examples.

Appraisal Model:	Cost-benefit Analysis (CBA)
Description:	CBA is an economic approach that considers the merits of a project from the viewpoint of the community at large (rather than that of any one organization). It seeks to quantify (i.e., assign a monetary value) the benefits derived and costs incurred by those parties affected by an activity to assess the aggregate net impact to society and the economy. The net impact is then compared to a base case or the status quo.
Lessons Learned:	Key lessons learned indicate that a CBA is most appropriate when: <ul style="list-style-type: none"> • Economic costs and benefits to the community are relevant (rather than cost or benefit to a particular stakeholder). For instance, where there are public good characteristics. • Trade-offs must be made between financial, economic, social and environmental costs and benefits (to the extent that they can be quantified) • Comparisons are required across modes, capital scenarios and management strategies • Economic efficiency is the primary objective (In general, CBA does not acknowledge distributional effects)

Appraisal Model:	Cost-benefit Analysis (CBA)
Examples:	<p>UK:</p> <ul style="list-style-type: none"> UK DfT Transport Analysis Guidance CBA guidelines http://www.dft.gov.uk/webtag/documents/expert/pdf/unit3.5.4d.pdf UK Department for Transport includes a range of ex-ante and ex-post CBA, including the Crossrail Business Case http://www.dft.gov.uk/pgr/rail/pi/crossrail/archive/reviewofthecrossrailbusinesscase?page=4 <p>Australia:</p> <ul style="list-style-type: none"> Commonwealth of Australia (Department of Finance and Administration) Handbook of Cost-Benefit Analysis. http://www.finance.gov.au/publications/finance-circulars/2006/01.html The Australian Bureau of Infrastructure, Transport and Regional Economics has a range of ex-post CBAs on its website: http://www.bitre.gov.au/info.aspx?Nodetd=112
Appraisal Model:	Multi-Criteria Analysis (MCA)
Description:	<p>MCA establishes preferences between options by reference to an explicit set of objectives and measurable criteria to assess the extent to which the objectives have been achieved.</p> <p>In simple circumstances, the process of identifying objectives and criteria may alone provide enough information for decision-makers. However, where a level of detail is required MCA offers a number of ways of aggregating the data on individual criteria to provide indicators of the overall performance of options.</p> <p>A range of criticisms are directed at MCA due to the subjective assessments and weightings required.</p>
Lessons Learned:	<p>Key lessons learned indicate that a MCA is most appropriate when:</p> <ul style="list-style-type: none"> There are a range of different (and potentially competing) policy objectives above and beyond economic and financial goals. Examples include safety, access, the environment etc. Major benefits cannot be easily quantified, or some can and some cannot There is an opportunity to engage with stakeholders and collaboratively develop the criteria, weightings, and generate ownership over the results.
Examples	<ul style="list-style-type: none"> UK Department for Communities and Local Government 2009, Multi-criteria analysis http://www.communities.gov.uk/publications/corporate/multicriteriaanalysismanual Insert Australia MCA Example or Guidance

Appraisal Model:	Economic Impact Analysis
Description:	<p>Economic impact analysis focuses specifically on measurable changes in the flow of money (income) going to households and businesses, including both spending and productivity effects. It can be conducted via two key tools:</p> <ul style="list-style-type: none"> • Input-output modeling • Computable general equilibrium (CGE) <p>CGE modeling is a sophisticated, multi-variant computer based model which recognizes that complex interactions occur and endeavor to replicate how the economy may behave given these complex interactions.</p> <p>Input-output modeling estimates the flow-on economic impacts of a program using a series of integrated multipliers which trace the relationship between the transactions of various industries in the economy. Multipliers measure the direct and flow-on effects of “shocks” to the economy, resulting from changes in demand for the output of specific sectors. They summarize, in a quantitative sense, the direct and indirect economic responses to a change in the economic system.</p> <p>However, an input-output model may overstate the effects of an initiative, because it does not adequately acknowledge scarcity in the economy and that resources expended on a particular activity must have been diverted from some other activity and/or some other region.</p>
Lessons Learned:	<p>Key lessons learned indicate that an Economic Impact analysis is most appropriate when:</p> <ul style="list-style-type: none"> • It is necessary to analyze the extent, flow and distribution of impacts across regions • There is a need to measure impacts on key economic indicators: <ul style="list-style-type: none"> ○ GDP or GSP ○ Real consumption, incomes, investment etc. ○ Employment ○ Government revenues ○ Interest rates, exchange rates, terms of trade etc. <p>CGE are generally appropriate for larger projects; Input-Output models are best for small one-off projects in economically isolated communities, or in regional economic planning</p>
Examples	<ul style="list-style-type: none"> • West Australian Economic Regulation Authority 2005, Frameworks for economic impact analysis and benefit cost analysis http://www.era.wa.gov.au/cproot/2975/2/Frameworks_for_economic_analysis_and_benefit_cost_analysis.pdf

Appraisal Model:	Cost-effectiveness Analysis (CEA)
Description:	<p>Cost-effectiveness analysis (CEA) measures the benefits in physical units rather than in monetary terms. For instance, through measuring cost per life saved or child educated. It offers a priority ranking of programs or activities on the basis of a comparative ‘cost per unit of effectiveness’, or alternatively, of comparative ‘units of effectiveness per dollar’.</p>
Lessons Learned:	<p>Key lessons learned indicate that a CEA is most appropriate when:</p> <ul style="list-style-type: none"> • The benefits from a project are difficult to quantify and/or consistent between options (CEA aims to identify the least-cost option) • Alternatives being assessed are similar in nature <p>In general, CEA is not widely used in the transport sector.</p>

Appraisal Model:	Cost-effectiveness Analysis (CEA)
Examples	<ul style="list-style-type: none"> NSW Treasury Economic Appraisal Guidelines 2007 http://www.treasury.nsw.gov.au/_data/assets/pdf_file/0016/7414/tpp07-5.pdf
Appraisal Model:	Financial Analysis
Description:	<p>A financial evaluation attempts to assess the net financial benefit (or loss) to an agency rather than the net benefit (or loss) to the economy or society. Financial evaluations are only concerned with cash flows in and out of the organization.</p> <p>A financial appraisal is simpler than other economic appraisal methods because it is only concerned with internal costs and benefits that manifest themselves in financial markets.</p>
Lessons Learned:	<p>Key lessons learned indicate that a Financial Analysis is most appropriate when:</p> <ul style="list-style-type: none"> There is a concern for only one organization’s perspective Profitability and cash flows from a commercial opportunities need to be understood Markets are competitive and most costs and benefits are reflected in market prices Government has financial objectives or responsibilities to fulfill or when it is involved in a purely financial decision such as a comparison of different procurement methods (e.g. traditional government ownership vs. outsourcing). <p>Financial Analysis is often applicable in PPP situations</p>
Examples:	<ul style="list-style-type: none"> NSW Treasury Guidelines for Financial Appraisal available at: http://www.treasury.nsw.gov.au/_data/assets/pdf_file/0014/7412/tpp07-4.pdf Stages 1 and 2 of the Financial and Economic Analysis of the Inland Rail project are available on the Australian Rail Track Corporation’s website at: http://www.artc.com.au/Content.aspx?p=192

Transport appraisals in the UK and Australia begin with analysis to understand the economic payback of the project, its impact on the economy and key monetized impacts. Qualitative or non-monetized factors can be added into the appraisal summary (e.g., Appraisal Summary Table), which is used to assess on a case-by-case basis, how benefits outweigh each other. International experience shows that, in general, monetized CBA is the key figure used to make decisions on projects. Typically, non-monetized or qualitative impacts may supplement the monetized CBA, rather than change the decision based on the outcomes of the monetized economic analysis. Qualitative or non-monetized impacts may be helpful when comparing options that have similar monetized CBA results.⁸⁰

Overall, the UK’s and Australia’s appraisal models follow a common set of principles and use CBA as a common currency to assess options across modes. The jurisdictions focus on developing the cost-benefit analysis, identifying a suite of potential options, and deciding what projects to move forward with based on the economic CBA during the early stages of the investment process. The UK may use CBA to also develop improved options, by selecting from a number of different design alternatives to assess which may be most successful (e.g., if building a new road was the best option, using CBA to determine the best road design). Additional detail on each jurisdiction’s approach is outlined below.⁸¹

7.1 United Kingdom

Note: Content in this section is indicative of the Appraisal Models in place as of May 2010.

In July 2010, the Parliamentary Under-Secretary of State for Transport (Norman Baker MP) announced at the “Local Transport Today Conference” that the DfT will be reviewing the NATA formula used for prioritization of transport schemes. The review was stated to focus on removing “idiocies” from the formula (e.g., if a railway scheme reduced vehicle traffic then that has been counted against the railway scheme on the basis that the Chancellor loses fuel duty revenue). The review is estimated to be completed by the end of 2010, and the potential impacts to the current process are unknown.

Transport project appraisals in the UK are aligned with the government’s objective to deliver transport systems that balance the needs of the economy, the environment and society. The UK’s five clear goals for transport support the overall objective and are used as key criteria for evaluating projects during the appraisal process.⁸²

UK Government’s Five Goals for Transport:

- 1) To reduce transport’s emissions of carbon dioxide and other greenhouse gases, with the desired outcome of tackling climate change.
- 2) To support national economic competitiveness and growth, by delivering reliable and efficient transport networks.
- 3) To promote greater equality of opportunity for all citizens, with the desired outcome of achieving a fairer society.
- 4) To improve quality of life for transport users and non-transport users, and to promote a healthy natural environment.
- 5) To contribute to better safety, security and health and longer life-expectancy through reducing the risk of death, injury or illness arising from transport, and promoting travel modes that are beneficial to health.

The HM Treasury’s Green Book recommends use of a cost benefit analysis, with suggestions for using supplementary techniques (e.g., multi-criteria analysis, or cost-effectiveness analysis) to incorporate non-monetized impacts into the overall value for money decision. According to the Green Book, a cost benefit analysis is an “analysis which quantifies in monetary terms as many of the costs and benefits of a proposal as feasible, including items for which the market does not provide a satisfactory measure of economic value.” The Green Book provides guidance on valuation techniques for impacts without known market values, including Willingness to Pay & Accept and plausible estimates based on departmental research (e.g., DfT’s value of working and non-working time, or DfT’s value for prevented fatality).⁸³

In line with the Green Book, DfT’s New Approach to Appraisal (NATA) process is a variation of a multi-criteria analysis that uses a key tool known as an Appraisal Summary Table (AST) to summarize benefit-cost analysis outputs and other factors. DfT believes this approach allows its appraisal to be more inclusive of impacts without known market values than the economic cost-benefit analysis alone.

As highlighted in Figure 17, the AST captures the degree to which the five Government goals for transport would be achieved by a particular project, and includes qualitative (e.g., livability) and quantitative (in either monetized or numerical terms) impacts of an option. Decision makers analyze the AST completed for each option and use their judgment to reach an assessment on the overall value for money of the proposed option (e.g., compare ‘overall net value’ derived from judgment to the overall value). Additional spreadsheets to calculate the transport benefits to consumers, businesses, central and local government are provided on the WebTAG guidance.⁸⁴ Refer to Appendix C: UK DfT NATA – Additional Appraisal Tables for details and examples of these tables.

Appraisal Summary Table

<u>GOAL</u>	<u>CHALLENGE</u>	<u>KEY POINTS</u>	<u>METRICS</u>	<u>ASSESSMENT</u>
TACKLE CHANGE	CLIMATE	Reduce greenhouse gas emissions		PVB £m
	SUPPORT ECONOMIC GROWTH	Improve reliability		PVB £m
Improve connectivity			PVB £m	
Support the delivery of housing			None/PVB £m	
Enhance resilience				
Wider (economic) impacts			PVB £m	
PROMOTE EQUALITY OF OPPORTUNITY	Improve accessibility		Verbal score	
	Improve affordability		Verbal score	
	Reduce severance		Verbal score	
	Enhance regeneration		Number	
	Reduce regional economic imbalance		Verbal Score	
IMPROVE QUALITY OF LIFE & PROMOTE A HEALTHY NATURAL ENVIRONMENT	Reduce exposure to noise		PVB £m	
	Minimize impact on biodiversity		Verbal score	
	Minimize impact on the water environment		Verbal score	
	Minimize impact on heritage		Verbal score	
	Minimize impact on landscape		Verbal score	
	Improve experience of travel		Verbal score/PVB £m	
	Improve the urban environment		Verbal score	
	Improve access to leisure		PVB £m	
BETTER SAFETY, SECURITY & HEALTH	Reduce the risk of death or injury		PVB £m	
	Improve health through physical activity		PVB £m	
	Reduce air quality health costs		PVB £m	
	Reduce vulnerability to terrorism			
	Reduce crime		Verbal score	
IMPACT ON PUBLIC ACCOUNTS	Broad transport budget			PVC £m
	Wider public finance impacts			PVB £m

Figure 17: DfT’s NATA Appraisal Summary Table Template

Source: UK DfT WebTAG website

Using the above AST as part of a multi-criteria analysis enables DfT to quickly assess the monetized and non-monetized impacts of an option and how the option may contribute to DfT’s five goals for transport.

DfT provides detailed guidance on analyzing each goal and challenge (sub-objective) on their WebTAG website. As summarized in Figure 18, standard values for commonly used impacts are posted to WebTAG, in addition to guidance on when to value/monetize objectives and the appropriate valuation techniques. Guidance materials are refreshed and updated on a routine basis to stay aligned with government priorities and goals for transport. Consultation and draft versions of all guidance materials and spreadsheets are posted to the WebTAG website prior to finalization.

Chapter	Section	Common Values
Environment	Noise	<ul style="list-style-type: none"> – Annoyance response relationships for road and rail traffic noise – Valuation of changes in noise level – National average household occupancy
	Air Quality	<ul style="list-style-type: none"> – Air quality Strategy (AQS) objectives for PM10, NO2 – Definition of significant change in air quality
	Greenhouse Gases	<ul style="list-style-type: none"> – Carbon to CO2 converter – Carbon emissions per litre of fuel burnt – Social cost per tonne of carbon (SCC)
Economy	General	<ul style="list-style-type: none"> – Discount rate – Growth in GDP per capita – Indirect tax correction factor – Non wage labour cost mark up
	Values of Time and Operating Costs	<ul style="list-style-type: none"> – Values of working time per person – Values of non-working time per person – Value of time elasticities wrt income – Forecast growth in values of working and non-working time – Vehicle occupancy rates – Percentage change in vehicle occupancy rates over time – Journey purpose splits – Value of time per vehicle – Fuel vehicle operating costs (VOC) – Fuel costs, duty and VAT – Proportion of car fleet using petrol or diesel – Forecast changes in vehicle fuel efficiency – Forecast growth in fuel resource costs – Non-fuel vehicle operating costs (VOC) – Forecast changes in non-fuel vehicle operating costs
	Scheme Costs	<ul style="list-style-type: none"> – Optimism bias uplifts for investment costs
Integration	Transport Interchange	<ul style="list-style-type: none"> – Public transport values of walk, wait and interchange times
Supporting Analysis		<ul style="list-style-type: none"> – Definition of significant change in air quality
Variable Demand Modeling		<ul style="list-style-type: none"> – Public transport values of walk, wait and interchange times – Conventional walking and cycling speeds – Illustrative parameters for vdm - destination choice – Illustrative parameters for vdm - main mode choice – Various elasticities for realism testing
Major Public Transport Schemes		<ul style="list-style-type: none"> – Expected short and long-term trip kilometre elasticities
Rail		<ul style="list-style-type: none"> – Proportion of revenue increase accrued to private sector – National average diversion factors - change in distance travelled as a percentage of change in rail passenger kilometres

Figure 18: DfT’s NATA Common Values Table
 Source: UK DfT WebTAG website

The information provided in Figure 18, along with additional guidance found on the WebTAG website, helps project sponsors choose appropriate valuation techniques to develop project estimates in an organized manner and accurately quantify measurable impacts.

While the UK approach attempts to bring qualitative and quantitative impacts beyond monetized CBA into the decision making process, it presents a challenge in having the time and resources available to complete the estimation and valuation of impacts. To address these challenges, benefits and impacts are often listed within an appraisal under the associated national goal for transport, even if they do not have any assigned values. This allows the decision maker compare projects with similar monetized costs. Also, as the decision maker subjectively interprets the values and priorities of benefits and impacts, it may be difficult for others outside this process to understand the basis for each decision.⁸⁵

7.2 Australia

The Commonwealth of Australia’s Department of Finance and Deregulation defines cost-benefit analysis (CBA) as “a method of quantitative economic analysis used to evaluate existing and proposed projects, programs and policies and inform decision-making.”⁸⁶ The Department of Finance and Deregulation has developed guidance material on the CBA as well as two alternative appraisal methods, including Financial Evaluation and Cost-Effectiveness Analysis (CEA):

Overview of Australian Appraisal Models		
Cost-Benefit Analysis	Financial Evaluation	Cost-Effectiveness Analysis
<ul style="list-style-type: none"> • Methodology for assessing the net benefits accruing to society as a whole • Conducted from the point of view of the local country or possibly the international community • Appropriate time period over which a CBA should be conducted is generally the projected life of the project 	<ul style="list-style-type: none"> • Assesses the impact of a program or project on the organization’s own financial performance • Conducted from the perspective of an individual firm or agency, rather than community as a whole • Can answer the question of whether a proposal offers an acceptable return from an organization’s perspective or determining the lowest cost procurement method 	<ul style="list-style-type: none"> • Determines the cost of achieving a specific physical target • May be undertaken from a national or local perspective • Differs from CBA in that benefits are expressed in physical units rather than in money units. As in CBA, costs are expressed in money terms • Useful in areas such as health, accident safety and education where it is often easier to quantify vs. monetize benefits

Figure 19: Appraisal Models used by Commonwealth of Australia

Source: Australian Department of Finance and Deregulation’s Introduction to Cost-Benefit Analysis and Alternative Evaluation Methodologies

In the transport sector, the Australian Transport Council’s (ATC) National Guidelines for Transport System Management in Australia were developed in 2006 and are still used today as the reference for appraisals of initiatives (e.g., recent Building Australian Fund), including benefits cost analysis. Phase 5 (Appraisal and Business Case Development) of the ATC’s Transport System Management Framework highlights a three-stage appraisal process. Viewed as a series of filters, the three-stage appraisal process includes:

- **Filter 1 Strategic Merit Test (SMT):** A quick, qualitative assessment to assess how well an initiative strategically aligns with jurisdictional objectives, policies, and strategies.
- **Filter 2 Rapid Appraisal:** A rapid benefit-cost analysis (BCA) that incorporates an indicative assessment of the main benefits and costs, without a high level of accuracy. This is used to screen out initiatives that pass the SMT, but are unlikely to pass more detailed assessment.
- **Filter 3 Detailed Appraisal:** A comprehensive analysis (e.g., detailed BCA, a financial or budget assessment, and specific impact analysis) of the impacts and merit of an initiative. Usually involves a BCA to express, in a single figure (e.g., net present value), all the monetary gains and losses created by an initiative to all members of society.⁸⁷

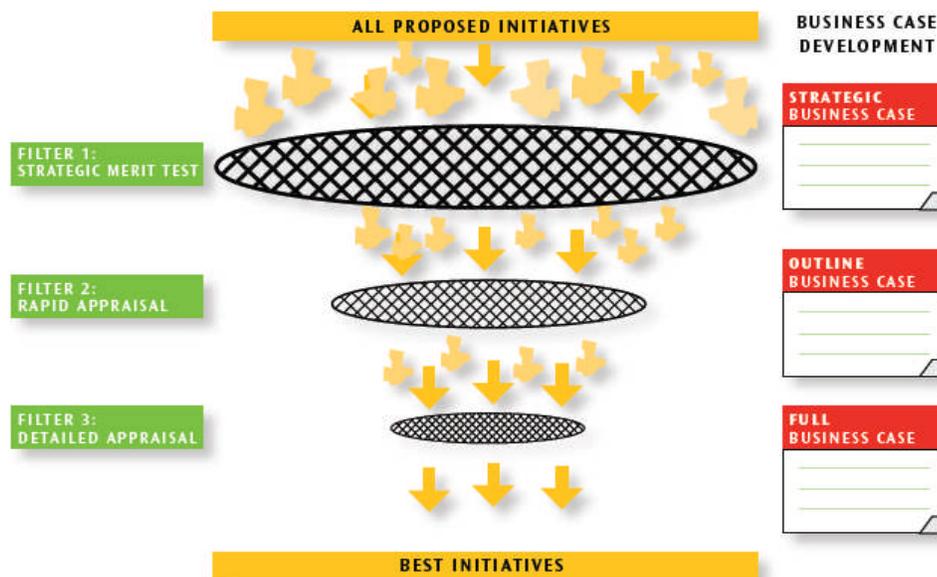


Figure 20: ATC’s Appraisal Process

Source: ATC’s Transport System Management Framework

The ATC’s Transport System Management Framework also suggests the use of an Appraisal Summary Table (AST) to summarize monetized impacts and a qualitative assessment of the scale of the non-monetized impacts. Similar to the UK’s AST, the Australian AST presents a summary of the economic, environmental, and social impacts of a transport option, showing both monetized impacts (from CBA) and non-monetized impacts on a single-page summary. The use of AusLink’s Adjusted Benefit-Cost Analysis technique to apply weights to benefits and costs to reflect their importance (e.g., hybrid of CBA and multi-criteria analysis) is optional. A Business Case is developed to bring together the results of the SMT, CBA, AST and other analyses (financial, environmental and social) in order to present the information to decision-makers.⁸⁸

When conducting a CBA, the ATC Guidelines recommend starting with a list of all the benefits and costs grouped into monetized benefits and costs, non-monetized benefits and secondary or flow-on impacts (e.g., benefits and costs that are passed on, or redistributed, within the economy). The ATC Guidelines provide a list of benefits to include in a benefit-cost analysis, summarized in Figure 21.

Monetized	Non-monetized**	Secondary Impacts
<p><i>Investment Costs</i></p> <ul style="list-style-type: none"> • Planning and design • Site surveying • Site preparation • Investigation, data collection and analysis • Legal costs • Administrative costs • Land acquisition • Construction costs • Consequential works <p><i>Benefits and Dis-benefits</i></p> <ul style="list-style-type: none"> • Savings in vehicle/train operating costs • Savings in time costs for passengers and/or freight • Improvement in service reliability • Savings in crash/accident costs • Reduced environmental externalities (noise, pollution) • Savings in infrastructure operating costs including maintenance and administration • Benefits associated with diverted and generated traffic • Scrap or residual values of assets 	<ul style="list-style-type: none"> • Amenity value • Barrier effects on humans and on biodiversity • Biodiversity and ecosystems • Heritage • Aesthetic value • Culture • Increased comfort, cleanliness and security for passengers • Reduced damage to freight and reduced pilferage <p>** In most cases, the reason these benefits and costs are non-monetized is because it is too expensive to undertake the surveys necessary to produce reasonable estimates of the values people place on them.</p>	<ul style="list-style-type: none"> • Employment (construction and operation phases) • Tourism • Land Values • Industry development • Community spirit / pride • Communication • Connectivity • Information sharing • Social cohesion • Increased incomes • Access to services • Production levels • Productivity for industries

Figure 21: Costs and benefits associated with transport initiatives

Source: Australian Transport Council, National Guidelines for Transport System Management in Australia – Volume 3, 2006

Project sponsors are able to use the table as a checklist to encourage the consideration of the key costs and benefits associated with transport are included in their appraisal.

Within the guidance material for Stage 7 (Solution Prioritization) of Infrastructure Australia’s Reform and Investment Framework, Infrastructure Australia recommends the following costs and benefits to be monetized:⁸⁹

Costs	Economic Benefit/Cost to the User of the Service	Economic Benefit/Cost to Non-Users
Capital Costs	Changes in generalize trip cost	Changes in the cost of congestion
Operating Costs	Changes in vehicle operating costs	Crash Costs
Residual value	Changes in revenues / fare box	Noise impacts Local air pollution Carbon emissions Health /physical fitness

Figure 22: Infrastructure Australia’s Recommendation of Costs and Benefits to be Monetized

Source: Infrastructure Australia, Reform and Investment Framework - Stage 7

In addition to the costs and benefits listed in Figure 22, Infrastructure Australia also provides guidance on the evaluation on non-monetized benefits / costs such as: visual / landscape, social amenity (e.g., parklands), social cohesion, and heritage or cultural impacts. For the non-monetized benefits / costs, Infrastructure Australia requires the rating system highlighted in Figure 23 to be used.

Rating Level	Description
Highly beneficial	Major positive impacts resulting in substantial and long-term improvements or enhancements of the existing environment.
Moderately beneficial	Moderate positive impact, possibly of short, medium or longer-term duration. Positive outcome may be in terms of new opportunities or outcomes which enhance or improve on current conditions.
Slightly beneficial	Minimal positive impact, possibly only lasting over the short-term. May be confined to a limited area.
Neutral	Neutral—no discernible or predicted positive or negative impact.
Slightly detrimental	Minimal negative impact, probably short-term, able to be managed or mitigated, and will not cause substantial detrimental effects. May be confined to a small area.
Moderately detrimental	Moderate negative impact. Impacts may be short, medium or long-term and impacts will most likely respond to management actions.
Highly detrimental	Major negative impacts with serious, long-term and possibly irreversible effects leading to serious damage, degradation or deterioration of the physical, economic or social environment. Requires a major re-scope of concept, design, location, justification, or requires major commitment to extensive management strategies to mitigate the effect.

Figure 23: Infrastructure Australia's Non-Monetized Rating Levels

Source: Infrastructure Australia's Reform and Investment Framework, Stage 7 Template

Infrastructure Australia's mandatory rating system establishes a standard way to analyze and compare non-monetized benefits and impacts of options.

In general, Australia's approach to CBA is widely accepted. However, the inputs into the CBA are often the topics for debate, including demand modeling and cost estimations. For instance, there is often debate around how much time savings may actually accrue as a result of a project based on the population growth and capacity assumptions of the existing network. This results in the demand modeling inputs receiving critical examinations to verify assumptions and accuracy of calculations. Construction cost estimations also receive scrutiny during project appraisals, since initial construction cost estimates often multiply throughout the course of a project. To address this issue, an optimism bias for construction costs may be applied at specific points in the decision making process, which may be difficult and complex to implement.⁹⁰

Use of Life Cycle Costing in Australia

Life Cycle Costing (LCC) is a process to assess the sum of all the costs associated with an asset over its lifecycle. The Australian National Audit Office (ANAO) formula for calculating the life-cycle cost of an asset is:

- $LCC = \text{Capital Cost} + \text{Life-time Operating Costs} + \text{Life-time Maintenance Costs} + \text{Disposal Cost} - \text{Residual Value}$

LCC is used in Australia across various sectors to allow investment decisions to be made in full consideration of all initial and future costs.

There is an Australian Standard on Life Cycle Costing (AS4536), and ANAO developed a Better Practice Guide for LCC in 2001 that is still considered a current guide for investment decision making. The Guide describes the stages when LCC should be used, including the conceptual stage when potential options are analyzed, the procurement/acquisition stage when tenders are being evaluated, and the in-service stage when deciding whether to maintain, improve or dispose of the asset. The Guide also recommends that LCC analysis begin by developing a plan that addresses the purpose and scope of the analysis, and includes:

- Definition of the objectives for the LCC analysis
- Identification of cost drivers and establishment of their parameters;
- Application of the formula, and selection of appropriate discount rate; and
- Analysis of the results.

Challenges with successfully implementing LCC include developing accurate estimates for future costs and selecting appropriate discounting rates for future costs. Since the discount rate is not a fixed rate for all projects, and is generally chosen to reflect the risk-adjusted rate of return, State and National Finance provide advice on selecting an appropriate discount rate. The ANAO Guide cautions that “future costs are usually subject to a level of uncertainty that arises from a variety of factors, including:

- Prediction of the pattern of use of the asset over time;
- Nature and scale of operating costs;
- Need for and cost of maintenance activities;
- Impact of inflation on individual and aggregate costs;
- Prediction of the length of the asset's useful life; and
- Significance of future expenditure compared with present day expenditure.”⁹¹

In both the UK and Australia, investment decisions are made on a full lifecycle costing basis. This process is ingrained in the decision making process and is widely used at all levels of government. These countries have learned from past experience when projects incurred large maintenance costs that were not anticipated when projects were initially funded, resulting in increased operating costs for the department and deteriorating assets when the departments were not able to fund the high number and cost of maintenance requirements.⁹²

Key Observations: Appraisal Models

- Appraisal models support investment frameworks and provide decision makers with tools to assign values to project impacts so that they can compare options.
- National guidance supports the consistent analysis of different projects and programs, enabling procuring authorities to compare options across modes and sectors. Guidance also addresses how to value both quantitative and qualitative impacts.
- Reliable data inputs can increase the reliability of the appraisal model outcomes.
- Life cycle costing assesses the present value of costs that would be incurred over the life of a potential project. In the UK and Australia, projects are compared using their lifecycle costs so as to assess their impacts on both a short and long term basis.

8.0 Investments from General Fund

The budgeting processes in the UK and Australia differs from the U.S., as the majority of funds for transportation investment are allocated from general revenue funds rather than the U.S. approach of direct taxes or earmarks. The budgeting processes in the UK and Australia require the transportation department to compete for funding with other national government departments. Appraisal processes performed by the departments justify the overall value for money of their potential projects, and assists the decision makers in prioritizing funds across sectors. The ability of departments to conduct detailed appraisals and present proposals with strong justifications can influence the budget decisions and the level of funding provided to a department.⁹³

Summary – Investments from General Fund	
United Kingdom	Australia
<ul style="list-style-type: none"> • Central Government has flexibility to allocate the funds, without the requirement of following set limits on the use of specific fund types • Transportation competes with other sectors during Spending Reviews to receive share of government’s discretionary spend budget • DfT determines how to allocate funds based on expenditure limits set by HM Treasury and approved by Parliament • Fiscal constraints impact local transport allocations and projects without economic impacts 	<ul style="list-style-type: none"> • National Government has flexibility to allocate the funds, without the requirement of following set limits on the use of specific fund types • Senior leaders of DITRD LG are questioned during public hearings by the Senate Standing Committees to justify expenditures • Senate Standing Committees compare department budgets and performance to decide allocations of funds • Fiscal constraints tend to impact significant investments in transportation (e.g., large capital projects, or maintenance) first

8.1 United Kingdom

Overview of the UK Budget Process²

In the UK, the budget is a financial document prepared annually by HM Treasury under the leadership of the Chancellor of the Exchequer. It is presented to Parliament for review, although historically significant changes are not made to the HM Treasury version. The purpose of the budget is to:

- Provide an update on the state of the economy and the public finances and to present new forecasts for each
- Set out the Government's economic and fiscal objectives
- Report on the progress the Government has made toward achieving its objectives, and set out further steps the Government is taking to meet them⁹⁴

Spending Reviews set departmental budgets (i.e., Departmental Expenditure Limits) for upcoming years, and are not conducted on an annual basis. For example, the Spending Review planned for release in October 2010 establishes the spending plans for the next four fiscal years (e.g., 2011-12 to

² This section includes information released by the Coalition Government as of September 2010.

2014-15). Departments are set separate resources (e.g., funds consumed in the process of providing public service) and capital budgets.

Spending Reviews are the setting in which the DfT competes with other departments to receive a portion of the discretionary spend budget. The Transport Minister is responsible for submitting a detailed request to HM Treasury on spending needs for the time period in focus. Meetings are conducted between HM Treasury and the Ministers from each department, to discuss and negotiate their expenditure plans. HM Treasury is responsible for presenting the outcomes of the negotiations to Parliament for approval. If a department has a proven history of executing strong value for money and performing detailed appraisals to support their budgets, it may be exposed to a lower level of scrutiny during Spending Reviews. It may also be allocated a high level of funding for their budget proposal, if it includes a wide range of well qualified projects.⁹⁵

Known as end-year flexibility (EYF), HM Treasury allows unspent Department Expenditure Limit (DEL) provisions to be carried over from year to year. Each department must receive approval from HM Treasury to carry over funds for specific purposes, which is based on value for money and affordability. As stated by HM Treasury, EYF “removes any incentive for departments to use up their provision as the year end approaches with less regard to value for money” and “encourages departments to plan over the medium term.”⁹⁶

In addition to the budget document which is released each spring, a Pre-Budget Report is delivered each fall to provide a progress update on the current budget, and lay out the vision leading up to the spring budget.

The UK's budget approach provides the Central Government flexibility in how to allocate the funds, without the requirement of following set limits on the use of specific fund types. While this flexibility allows the government to shift its investment to areas of greatest priority and/or need, it does create difficulty in clearly communicating the benefits that the public may receive as a result of taxes paid. For example, the government may not be able to confirm the direct benefit of a tax increase, as the funds are pooled into the central revenue budget rather than to a specific department or service. Based on the DEL set by HM Treasury and approved by Parliament, DfT makes a determination of how to allocate funds, including the funding provided to local authorities to support development, enhancement and maintenance of transport infrastructure services. DfT must receive approval from HM Treasury for projects that represent a significant portion of its funding. Although DfT has the flexibility to decide how to spend its allocations, there are expectations from the Central government to include projects that support national priorities and goals. Therefore, general revenue reliance does not favor a specific transportation mode or project type, however budgets supporting national goals / priorities may receive a larger allocation.⁹⁷

The DfT provides funding to local authorities in a variety of ways, including needs-based allocations and bid-based grants. To supplement DfT funding, local authorities can source funding locally and from other organizations.⁹⁸ For example, two blocks of DfT funding are allocated to local authorities based on the data they provide each year. The Integrated Transport Block provides capital funding for small transport improvement schemes, and is allocated according to a needs based formula covering accidents, deprivation, congestion, environmental quality, and rural factors. The Highways Maintenance Block provides capital funding for maintenance schemes, and is allocated using a needs based formula covering road length, road condition, bridge condition, and age of street lighting. Funding for both blocks is not limited to transportation purposes, and local authorities can spend the allocations on other non-transportation priorities if desired.⁹⁹

Recent Actions from Budget 2010

In June 2010, the new Coalition Government announced a significant cut in central government spending in order to reduce the overall budget deficit. A £6.2b (approximately USD\$10b) cut in government spending was announced, which represents approximately 4.0% of the estimated budget deficit. The Emergency Budget outlined a 25% cut in departmental budgets over the next four years, with the exception of health and foreign aid budgets, who were exempt from the cuts. The DfT was instructed to reduce their budget by £683m, which the DfT announced would consist of:

- £100m cut in Network Rail spending
- £108m from the Transport for London budget
- £309m reduction in DfT grants to local authorities and deferral of some local road investment schemes
- £166m from within the department and other sources

As highlighted in Figure 24, DfT received the fourth largest cut, on a percentage of current budget basis. Initial forecasts anticipate the local transport authorities may be significantly impacted as a result of the budget cuts. Local governments may also decide to re-allocate some of the funding originally received for transportation purposes to cover non-transportation objectives (e.g., education) since funding restrictions were removed to allow local governments more authority and discretion.¹⁰⁰

Early analysis predicts that the DfT may achieve its budget savings through reductions to both capital and operating expenses. Operating expense reductions at the national DfT level may include implementing pay freezes, adjusting pensions (e.g., increase employee contribution, or increase eligible age), or reducing staff headcount. Capital expense reductions may include cutting projects that do not have a large economic impact on the country. For example, while street lighting projects have received funding over recent years to help reduce crime and improve safety, they are anticipated to be cut since they may not demonstrate as large of an economic return as other projects (e.g., road widening).¹⁰¹

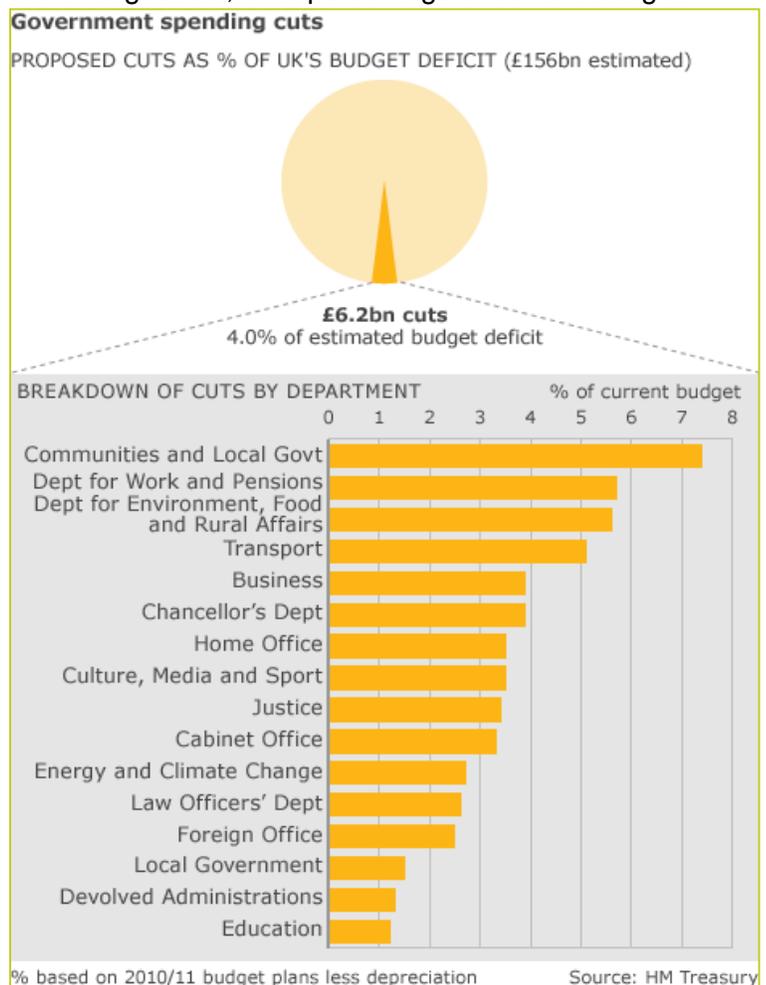


Figure 24: Summary of Coalition Government's June 2010 Budget Cuts

Although DfT is subjected to the same cuts faced by many of the other national departments, the Coalition Government has reiterated its support for continuing infrastructure projects that have a significant economic impact on the country. DfT may fare better during the budget cuts than other sectors, as a result of their ability to demonstrate the economic impact and benefits of transport spending through appraisal models and economic analysis.¹⁰²

8.2 Australia

Overview of Australia's Budget Process

In Australia, the federal government raises money through income tax and other charges. The Department of Finance and Deregulation coordinates the Commonwealth's budgeting process. Each year, the budgeting process sets the funding available to agencies to undertake the activities necessary to support their stated outcomes. Ministers are responsible for managing the budget allocated to their department, and are required to provide budget estimates to the Department of Finance and Deregulation, three times per year (i.e., for use in Mid-year Economic and Fiscal Outlook, prior to the budget deliberations of the Expenditure Review Committee, and basis for the annual Budget).¹⁰³ The role of the Department of Finance and Deregulation is to develop overall budget figures based on the estimates provided by the various agencies.

As outlined on the Department of Finance and Deregulation's website, agencies may receive four different sources of funding, including:

1. **Special Appropriations:** Provisions in acts that authorize the expenditure of money for particular purposes;
2. **Standing Appropriations:** Balances available in special accounts to be spent for specific purposes;
3. **Annual Appropriations:** Contained in acts that provide annual funding to entities to undertake government operations and programs; and
4. **Revenue from Other Sources:** Receipts agencies may retain and spend in accordance with their enabling legislation.

The Budget sets the annual appropriations, which represent about 20% of annual expenditures, and acts of Parliament create the special appropriations that represent the remaining 80% expenditures. Appropriation bills are supported in Parliament by statements submitted by Ministers to facilitate accountability to the Parliament and the public. Portfolio Budget Statements (PBS) inform Parliament of the proposed allocation of resources to government outcomes, and assist the Senate Standing Committees with an examination of the Government's Budget.¹⁰⁴

Senior leaders (e.g., Secretary) of the DITRDLG are questioned during public hearings by the Senate Standing Committees to further explain and justify their expenditure estimates and PBS. This provides the Senate Standing Committees the ability to compare department budgets and performance to aid the decision on future allocations of funds.¹⁰⁵

Similar to the UK, Australia's budget approach provides the government flexibility to allocate funds without earmarks or dedicated tax funds. Under this approach, it may prove difficult for the government to illustrate a direct link between the cost and benefit of a particular program. In Australia, the transport department tends to do very well during the budget allocation process since they can prove with monetized CBA that their project's benefits outweigh the costs more easily than other sectors. In Australia, departments with a strong track record for proving and achieving value for money (such as DITRDLG) may fare better during budget cuts. However, the potential exists for programs to receive government funding despite a lack of robust economic analysis. In instances

where fiscal constraints arise, significant investments in transportation (e.g., large capital projects, or maintenance) may be postponed or cut. This trend is similar to other jurisdictions', as well as the corporate sector's response to fiscal constraints.¹⁰⁶

Insights from State-level Budget Process

State and territory level governments receive more than half of their funding, including all the goods and services tax, from the federal government. Other sources of income at the state and territory level include some funds from income taxes, vehicle registration, land tax, and gambling licenses.¹⁰⁷ At the state-level, governments coordinate budgets among state-level agencies, balancing funding levels received with objectives and needs at the national and state level. Federal funding to the states is subject to review during the annual Australian Government budget cycle.

In Queensland, Director-Generals are required by the *Transport Infrastructure Act 1994* to produce a Roads Implementation Plan (RIP) annually. This document summarizes the program of road infrastructure projects and activities planned for a five-year period. Developed in line with Australian Government and Queensland Government allocations, the RIP complies with the policy objectives of the Australian Government and Queensland Government. The RIPs are presented to the Minister, and approval of the RIP equates to individual project approval with firm commitments for the first two years, and indicative funding for the last three years.¹⁰⁸

Queensland is recognized for their state-wide planning approach, and believes their ability to provide a robust, network-level view of investment needs for the

Queensland section of the national network has helped to secure increases in federal funding over recent years. Figure 25 highlights the Queensland roads funding sources and allocations for the 2009-10 fiscal year. In the Queensland Roads Implementation Program for 2009-10 to 2013-14, the Department for Transport and Main Roads stated their "aim is to take a longer-term, proactive and more consistent approach to planning, one which balances state-wide priorities and regional transport pressures in managing transport demand on the road system."

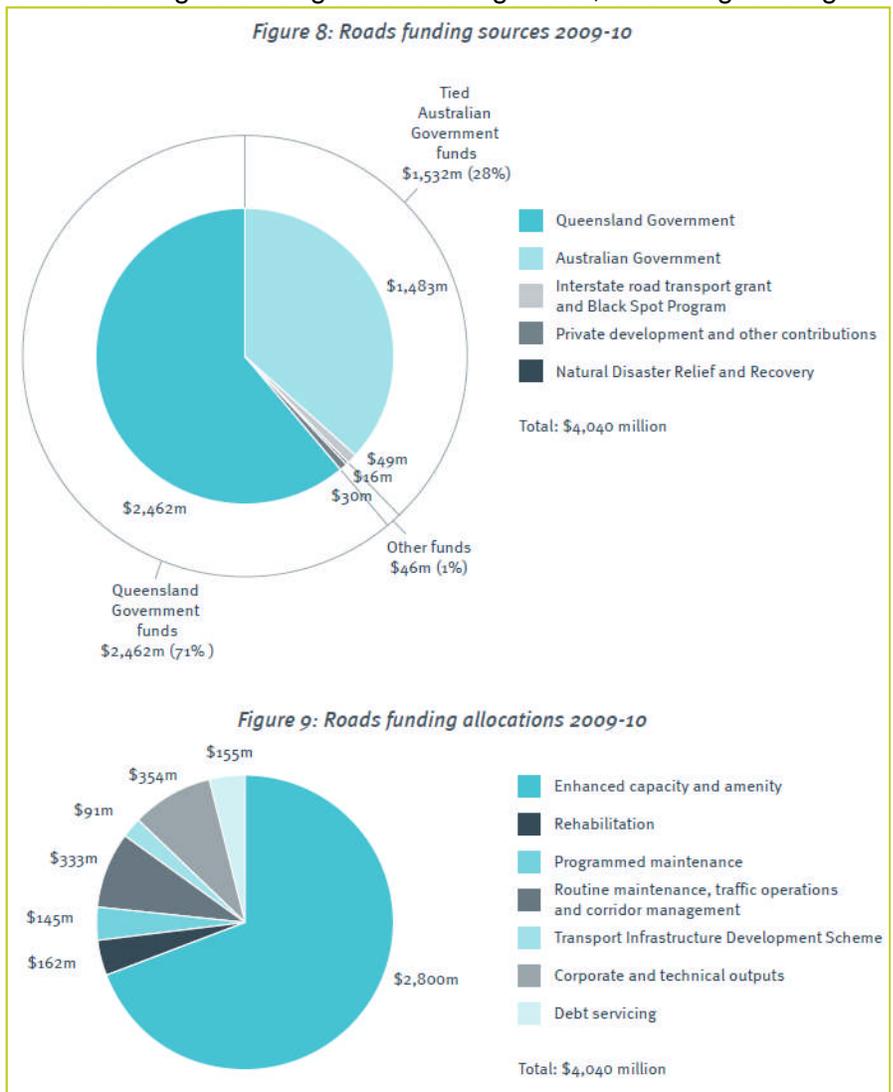


Figure 25: Queensland Funding Sources and Allocation for 2009-10

Source: Queensland Department for Transport and Main Roads, Road Implementation Program 2009-10 to 2013-14

8.3 Earmarks and Hypothecation

In the U.S., earmarks are defined as "funds provided by the Congress for projects, programs, or grants where the purported congressional direction circumvents otherwise applicable merit-based or competitive allocation processes, or specifies the location or recipient".¹⁰⁹ In the UK and Australia, the use of earmarks is not as prevalent as in the U.S.

Hypothecation is defined as the earmarking of certain tax revenues for specific areas of public expenditure, otherwise known as a direct tax. In 1937, the UK national government ended the hypothecation of vehicle excise tax paid into the Road Fund for road construction, moving this tax into central government revenues. Since then, the UK Government has experimented with tax hypothecation (e.g., in the environmental field). In general, the UK has concluded from these pilots that setting taxes and spending revenue should be two separate decisions, noting that linking tax receipts with expenditures can become complete and risky if that revenue source declines.¹¹⁰ In Australia, the Commonwealth Government terminated the hypothecation of fuel excise tax for road funding in 1959, stating that:

- The tax did not only fall on motorists since a large amount of fuel tax was paid by commercial transport operators who passed the cost onto consumers;
- It is an unsound practice to allocate the proceeds of any one tax for any particular expenditure - taxes should contribute to an overall tax pool to be used for any expenditure purposes deemed desirable; and
- There were significant annual fluctuations in fuel tax receipts which would lead to irregular funding for roads, hence making forward planning difficult for road authorities.¹¹¹

Since this time, the national government in Australia has established road funding levels in the national budget process.

Key Observations: The Use of a General Fund

- In the UK and Australia, a central government allocates funds to all sectors through a general fund.
- A general fund provides the national government with the flexibility to allocate funds to areas that demonstrate the greatest need for investment, regardless of sector. However, under a general fund, there is no direct connection between the sector the funds were collected from and where the funds are allocated. This approach may create difficulties for the government when introducing taxation increases.
- When competing for general funds, the ability for transportation projects to demonstrate value for money and economic impact returns can contribute to transportation projects being allocated a large portion of the funding requested.
- Projects that are aligned with national priorities as defined by the central government have a higher probability of being allocated funding.

While it may not be practical for the U.S. government to institute the use of a general fund across all sectors, DOT may consider implementing certain principles learned from the use of a general fund in the UK and Australia to its own investment decision making process.

9.0 Performance Based Decision Making

International jurisdictions use performance results and goals to guide transportation infrastructure investment and funding decisions. Both the UK and Australia have performance management systems that require performance metrics and targets to inform the national government and the public of progress in achieving its transportation goals and objectives. While there are no set penalties for failing to meet the established performance targets, performance against these targets may influence future budgetary decisions or executive compensation levels.

For over a decade, the UK has used some form of a transportation performance management system, which has evolved since it was first introduced. The UK initially implemented a formal performance monitoring process in 1998 with the aim of making government agencies more accountable for their projects and to educate key decision-makers and the public on how investments can be used more effectively. In Australia, a rail development project in New South Wales that underestimated costs and overestimated outputs causing widespread dissatisfaction and attracting negative media attention, contributed to the country's desire to introduce performance measuring.¹¹²

Two FHWA international scans from this decade investigated the use of performance measures in transportation planning and decision making in other countries. The findings and lessons learned from these scans are documented in two reports from 2004 and 2010, in which performance measures in the UK and Australia are covered in detail. This section provides insight into the frameworks the UK and Australia use to assist them in making transportation investment decisions based on performance in their countries. For additional detail on related topics, refer to the International Technology Scanning Program reports: "Linking Transportation Performance and Accountability"¹¹³ released April 2010 and "Transportation Performance Measures in Australia, Canada, Japan, and New Zealand" released in December 2004.

Summary – Performance Based Decision Making	
United Kingdom	Australia
<ul style="list-style-type: none"> Public Service Agreements act as a performance management framework for cross-government objectives Five Departmental Strategic Objectives for DfT are used to communicate progress towards goals on an annual basis Performance towards objectives can be taken into consideration during budget allocation process and compensation of senior officials 	<ul style="list-style-type: none"> Three outcomes for DITRD LG are used to demonstrate how the department is contributing to the government's goals and objectives At the state-level, Transport Coordination Plans and Service Delivery Statements are used to align government objectives with transportation activities and communicate performance to the government and the public Performance towards objectives can impact the level of scrutiny received from Senate Committee during budget hearings

9.1 United Kingdom

Note: Content in this section is based on the Performance Management framework in place as of May 2010.

In June 2010, the Coalition Government announced they are ending “the previous government's complex system of Public Service Agreements, which relied on top-down performance management and too many politically motivated targets. Over the Spending Review, the government will consider the best structures for ensuring departmental accountability for achieving more for less. This will include the publication of departmental business plans showing the resources, structural reforms and efficiency measures that they will need to put in place to protect and improve the quality of key frontline services while spending less. These plans will also include the key statistics and data that the public can use to hold departments to account for spending money efficiently and effectively.”

Changes of the new Performance Management process are expected to be announced in conjunction with the Spending Review released in October 2010.

In 2007, the UK government announced a new performance management framework with thirty cross-government Public Service Agreements (PSAs). The PSAs laid out the Government's priority outcomes for the 2008-2011 time period. For each PSA, there is generally one lead department and a number of supporting departments. Departments set measurable targets to track their progress against and report updates on an annual basis.

The UK government does not have set penalties to apply if the PSAs are not achieved. However, performance towards PSAs can be taken into account during the Spending Review, when departmental budget allocations are set, and during the compensation review of senior officials.¹¹⁴ In addition, the possibility of the National Audit Office conducting an audit on a specific department or program can incentivize a department's performance.¹¹⁵

The DfT leads the PSA titled “Deliver reliable and efficient transport networks that support economic growth.” This PSA was created based on input from the Eddington Transport Study¹¹⁶, and focuses on the contribution that transport makes to economic growth. The DfT uses indicators to assess their progress towards achieving this PSA and provides updates on results achieved in their annual Resource Accounts Report. Highlighted in the top table of Figure 26 are the DfT's targets and results for this PSA. The Department also supplies the bottom table in the report to further demonstrate how its spending is achieving value for money, which is one of the metrics under its PSA.

Survey and Analysis of Transportation Investment Models in Other Countries

Public service agreement	Indicator	Statement on data
CSR07 PSA 5 Deliver reliable and efficient transport networks that support economic growth	1 Journey time on main roads into urban areas By 2010-11 the 10 largest urban areas ¹ will meet the congestion targets set in their local transport plans relating to movement on main roads into city centre. The target will be deemed to have been met if, on the target routes in these areas, an average increase in travel of 4.4% is accommodated within an average increase of 3.6% in person journey time per mile.	Data for the period September 2008 to the end of July 2009 ² showed that the average person journey time across all the target routes had fallen by 5.5% between the baseline (2004-05 and 2005-06) and 2008-09. It was originally anticipated that a typical 30 minute commute on the target routes in the baseline period would take 30 minutes and 46 seconds in 2008-09. However, the data showed that, in 2008-09, such a journey took only 28 minutes and 20 seconds. The average level of travel fell in 2008-09 by 0.8% across all the target routes since the baseline period, against an anticipated increase of 2.6%.
	2 Journey time reliability on the strategic road network Minimise increase in delays between years ending March 2003 and March 2011 for the slowest 10% of journeys in the context of traffic growing by 1-2% a year The SR04 PSA - Make journey times more reliable on the strategic network - has been subsumed into this indicator.	Figures for the year ending March 2010 showed that, across the strategic road network, average vehicle delay on the slowest 10% of journeys across the measured routes fell from 3.90 minutes per 10 miles in the baseline period (April 2007 to March 2008) to 3.65 minutes per 10 miles. This is equivalent to a saving of 14 seconds per 10 miles, or the average speed on these routes rising from 41.3 mph to 45.0 mph for the slowest 10% of journeys.
	3 Level of capacity and crowding on the rail network – overview By 2013-14 increase rail capacity to accommodate an expected increase of 14.5% in rail passenger kilometres from 2008-09 while achieving the train load factors specified in the Government's High Level Output Specification (HLOS) for the railway. 4 Value for money of the Department's spending over the CSR07 period There is no national target for this indicator. However, the Department's aim is to maintain the same proportion of spend in the High Value for Money category as achieved over the SR04 period. Success will be judged over the three-year CSR07 period.	To date we have completed eight Deeds of Amendment with the train operating companies and procured 647 additional vehicles and a total of 56,100 additional capacity in the three morning peak hours. See Figure 1 below. From April 2008 to March 2010, 95% of approved spending was in the 'high' value for money category, in line with the average in SR04 of 95%. Figure 2 below.

¹ These are London, Manchester, West Midlands, West Yorkshire, South Yorkshire, Tyne and Wear, Merseyside, West of England (Bristol), Nottingham and Leicester.
² Transport Statistics Bulletin: Road Traffic and Congestion in Great Britain: Q4 2009 (SB (10) 04)

Figure 2: Value for money of Department for Transport spending

VfM Category	Baseline (SR04 period) £m	CSR07 to date (Apr 08 to Mar 10) £m
High	5,532 (95%)	8,014 (95%)
Medium	206 (4%)	373 (4%)
Low	63 (1%)	36 (0%)
Poor	0 (0%)	14 (0%)
Total 'approved spending'	5,801 (100%)	8,437 (100%)

Number of 'approved schemes'	81	50
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Notes:

Totals may not add up because figures are rounded.

The table includes only spending decisions that are subject to the Department's VfM process.

'Approved spending' and 'approved schemes' refer to spending decisions and schemes that ministers have given final approval to within the period indicated. For example, ministers gave final approval to 81 schemes in the SR04 period covered by the Department's VfM process, though these projects may be delivered after that time.

Spending figures in this table refer to the 'cost to the Department' used in submissions seeking final approval by ministers. In some cases the cost to the Department does not represent the full cost of the scheme or intervention under consideration. Part of the cost might be covered by other public sector or private sector contributions. The cost represents the spending over the life of the project which, in many cases, extends beyond the spending review period.

Costs and/or benefits may change (from those presented to ministers for final approval) but remain within delegated limits. If they move beyond delegated limits, schemes are resubmitted to ministers. Secondly, precise costs and benefits can change when the Department negotiates delivery of projects with external delivery partners.

VfM categories are as follows:

- high - benefits are at least double the costs
- medium - benefits are 1.5 to 2 times the costs
- low - benefits are 1 to 1.5 times cost
- poor - benefits are less than costs

These categories are described in terms of the present value of benefits compared to the present value of costs. In April 2009 we changed this categorisation:

- very high - benefits are estimated to be greater than four times the costs
- high - benefit cost ratio is between 2 and 4

For reporting progress on this indicator, we will continue to use the original VfM categories for the CSR07 period.

Figure 26: DfT PSA Performance Summary Excerpt

Source: UK Department for Transport, 2009-10 Resource Accounts Reports

The DfT provides its Resource Account Summary to illustrate to the Central government and the public how it is meeting the expectations of the PSA.

In addition to its responsibilities concerning the PSA, the DfT established five Departmental Strategic Objectives (DSOs) in January 2009. Progress towards achievement of these goals is also reported on an annual basis in the DfT's Resource Accounts Report. Figure 27 outlines the DfT's five DSOs as of May 2010. Each DSO is supported by tactical actions or performance indicators that track performance.

DSO1: To support national economic competitiveness and growth, by delivering reliable and efficient transport networks

- Journey time on main roads in urban areas.
- Journey time reliability on the strategic road network, as measured by the average delay experienced in the worst 10 per cent of journeys for each monitored route.
- Level of capacity and crowding on the rail network
- Average benefit cost ratio of investments approved over the CSR07 period
- By March 2014 achieve reliability on the railway as measured by the Public Performance Measure Moving Annual Average (PPM MAA) of 92.6 per cent.

DSO2: To reduce transport's emissions of carbon dioxide and other greenhouse gases, with the desired outcome of avoiding dangerous climate change

- Develop a carbon reduction strategy for transport
- Agree an improved EU Emissions Trading Scheme for the post-2012 period that includes aviation.
- Introduce the Renewable Transport Fuels Obligation - requiring 5 per cent of all UK fuel sold on UK forecourts to come from a renewable source by 2010.
- Introduce successor arrangements to the Voluntary Agreements with car manufacturers on new car CO2.

DSO3: To contribute to better safety, security and health and longer life- expectancy through reducing the risk of death, injury or illness arising from transport, and promoting travel modes that are beneficial to health

- Contribute to meeting the Air Quality Strategy objectives for eight air pollutants as illustrated by trends in measurements of two of the more important pollutants which affect public health: particulate matter (PM 10) and nitrogen dioxide (NO2).
- Reduce the number of children killed or seriously injured in road accidents by 50 per cent by 2010 compared with the average for 1994-1998, tackling the significantly higher incidence in disadvantaged communities.
- Reduce the overall number of people killed or seriously injured in Great Britain in road accidents by 40 per cent by 2010 compared with the average for 1994-1998, tackling the significantly higher incidence in disadvantaged communities.
- Deliver Transport's contribution to the Home Office led PSA: target to 'reduce the risk to the UK and its interests overseas from international terrorism.

DSO4: To promote greater equality of opportunity for all citizens, with the desired outcome of achieving a fairer society

- Ensure compliance of the bus fleet by 2017.
- Ensure compliance of heavy rail by 2020.
- Increase the number of stations re/accredited under the Secure Stations Scheme by 15%.
- Access to services and facilities by public transport, walking and cycling.

DSO5: To improve quality of life for transport users and non-transport users, and to promote a healthy natural environment

- Meet critical milestones for relevant transport infrastructure delivery for the 2012 Olympics ensuring delivery stays within approved budgets.
- Open High Speed One services at Stratford International in line with agreed timetable.
- Ensure the rail industry produces Noise Action Plans, in accordance with the Environmental Noise Directive, and delivers in line with the agreed Plans.

Figure 27: DfT Departmental Strategic Objectives as of May 2010
Source: UK Department for Transport, Departmental Strategic Objectives

In the DfT's Annual Resource Accounts Report¹¹⁷, a status update is provided on the five DSOs. Figure 28 is an excerpt of the status update for the 2009-10 fiscal year. The status update includes both qualitative and quantitative data that relates to the tactical activities and performance measures

for each DSO. The status updates are used to inform the government and the public on how well DfT is achieving its strategic objectives.

<p>DSO 2 To reduce transport's emissions of carbon dioxide and other greenhouse gases, with the desired outcome of avoiding dangerous climate change</p>	<p>1 Develop a carbon reduction strategy for transport.</p>	<p>In July 2009 the Department published <i>Low Carbon Transport: A Greener Future</i>, which set out how transport will make a major contribution to reducing greenhouse gas emissions by:</p> <ul style="list-style-type: none"> ▪ supporting a shift to new technologies and fuels; ▪ promoting lower-carbon choices; and ▪ using market mechanisms to encourage a shift to lower-carbon transport. <p>The Department has published its <i>Transport Carbon Reduction Delivery Plan</i> in March 2010.</p>
	<p>2 Introduce successor arrangements to the Voluntary Agreements with car manufacturers on new car carbon dioxide.</p>	<p>In April 2009 the EU adopted a New Car CO₂ Regulation, setting EU-wide, sales-weighted CO₂ emission targets for manufacturers selling cars in Europe. It sets targets of 130g CO₂/km for 2012, with full compliance by 2015, and a long-term target of 95g CO₂/km by 2020. The UK was instrumental in lobbying for a 2020 target for CO₂ reduction. The European Commission has now brought out a draft regulation on van CO₂ emissions, similar to the one for cars. We are playing an active part in the discussions on this dossier.</p>
	<p>3 Agree an improved EU Emissions Trading System for the post-2012 period that includes aviation.</p>	<p>The Directive to include aviation in the EU Emissions Trading System (EU ETS) came into force on 2 February 2009.³ In March 2009 the Secretary of State for Transport announced the appointment of the Environment Agency as Regulator of the System in England and Wales, with specialist input from the Civil Aviation Authority. Following consultation, the Aviation Greenhouse Gas Emissions Trading Scheme Regulations 2009 came into force on 17 September 2009. From 1 January 2010 operators were required to monitor emissions from flights departing from and arriving at EU airports.</p>
<p>DSO 4 To promote greater equality of opportunity for all citizens, with the desired outcome of achieving a fairer society</p>	<p>1 Increase the number of stations re/accredited under the Secure Stations Scheme from 610 to 700 by March 2009.</p>	<p>We exceeded our business plan target of achieving 700 accreditations by March 2009 by 20%, with 350 accredited stations. There are currently 1,009 accreditations exceeding our March 2010 target of 950 accreditations.</p>
	<p>2 Ensure full compliance with Vehicle Accessibility Regulations for the bus fleet by 2017.</p>	<p>All new vehicles registered since 31 December 2000 must meet the provisions of the Public Service Vehicles Accessibility Regulations. These Regulations set out technical requirements that will make travelling on buses easier for disabled people. DfT publishes guidance so that manufacturers and operators understand what is expected in order to comply with the Regulations. Around 62% of the bus fleet is currently accessible to disabled people and meets the low floor requirements.</p>
	<p>3 Ensure full compliance with Vehicle Accessibility Regulations for the heavy rail fleet by 2020.</p>	<p>The proportion of heavy rail vehicles (trains) built in compliance with modern accessibility standards rose during the year from 42% to 45% of the national heavy rail fleet. Across all rail vehicles in public transport service (including trams, underground, etc), 35% were considered to be sufficiently accessible to allow their use after 2010.</p>
	<p>4 Improve access to services and facilities by public transport, walking and cycling.</p>	<p>The Core Accessibility Indicators were published in June 2009. These showed access to seven services for target and 'at risk' population groups by public transport/walking, cycling and by car. In 2008, 97% of the target population was able to access an employment centre within the median travel time (20 minutes). At least 86% of the target population was able to access educational institutions, 77% health care institutions and 95% food stores within the median travel time.</p>

DSO 5 To improve quality of life for transport users and non-transport users, and to promote a healthy natural environment	1 Meet critical milestones for relevant transport infrastructure delivery for the 2012 Olympics ensuring delivery stays within approved budgets.	DfT is accountable for delivery of a number of infrastructure projects and decisions which will contribute to transport outcomes during the London 2012 Games. Many of these reflect specific commitments in the London Bid and/or in the Olympic Transport Plan. Three workstreams were completed during the 2009-10 financial year: the Olympic Route Network was designated; Stratford International Stations opened to the public; and Southeastern began its high-speed service to provide the Javelin shuttle service during the Games.
	2 Open High Speed One services at Stratford International in line with agreed timetable.	Stratford International Station opened on time, in December 2009 and High Speed One domestic services started in line with the agreed timetable.
	3 Ensure the rail industry produces Noise Action Plans, in accordance with the Environmental Noise Directive, and delivers in line with the agreed Plans.	The Department has worked with Defra and the rail industry to establish an action plan describing how rail noise will be managed. Defra published a draft action plan in summer 2009 and the consultation on it closed in early November. The noise action plans covering railways have undergone some small amendments following consultation. The current target remains for the action plans to be formally adopted in 2010 and implemented thereafter.

Figure 28: DSO Update Summary Excerpt

Source: UK Department for Transport, 2009-10 Resource Accounts Reports

Although DfT is required to provide annual updates on its PSAs and DSOs, significant effort and time is also required on the ex-ante analysis leading up to budget allocations. For instance, while criticisms are made for projects that do not remain on time or on budget, less criticism is provided for projects that fail to meet anticipated benefits. Often times this is a result of the length of time it takes for transportation projects to commence services and the benefits / impacts to be realized. The UK's National Audit Office (NAO) can review any government funded project or program, similar to the U.S.'s Government Accountability Office reports. The NAO may highlight concerns on inefficient delivery or poor quality of deliverables. While the possibility of a NAO Audit may encourage performance, the reviews have been criticized for not being timely or effective.¹¹⁸

9.2 Australia

As part of the budgeting process, agencies are required to report against the approved list of outcomes and programs for which they are responsible. In the Portfolio Budget Statement (PBS), agencies include their programs' objectives, financial and non-financial performance and key performance indicators for each program. The Infrastructure, Transport, Regional Development and Local Government Portfolio contributes to the well-being of all Australians through the outcomes highlighted in Figure 29. The DITRD LG is specifically responsible for three outcomes, including:

- **Outcome 1:** Improved infrastructure across Australia through investment in and coordination of transport and other infrastructure.
- **Outcome 2:** An efficient, sustainable, competitive, safe and secure transport system for all transport users through regulation, financial assistance and safety investigations.
- **Outcome 3:** Coordinated community infrastructure and services in rural, regional and local government areas through financial assistance¹¹⁹

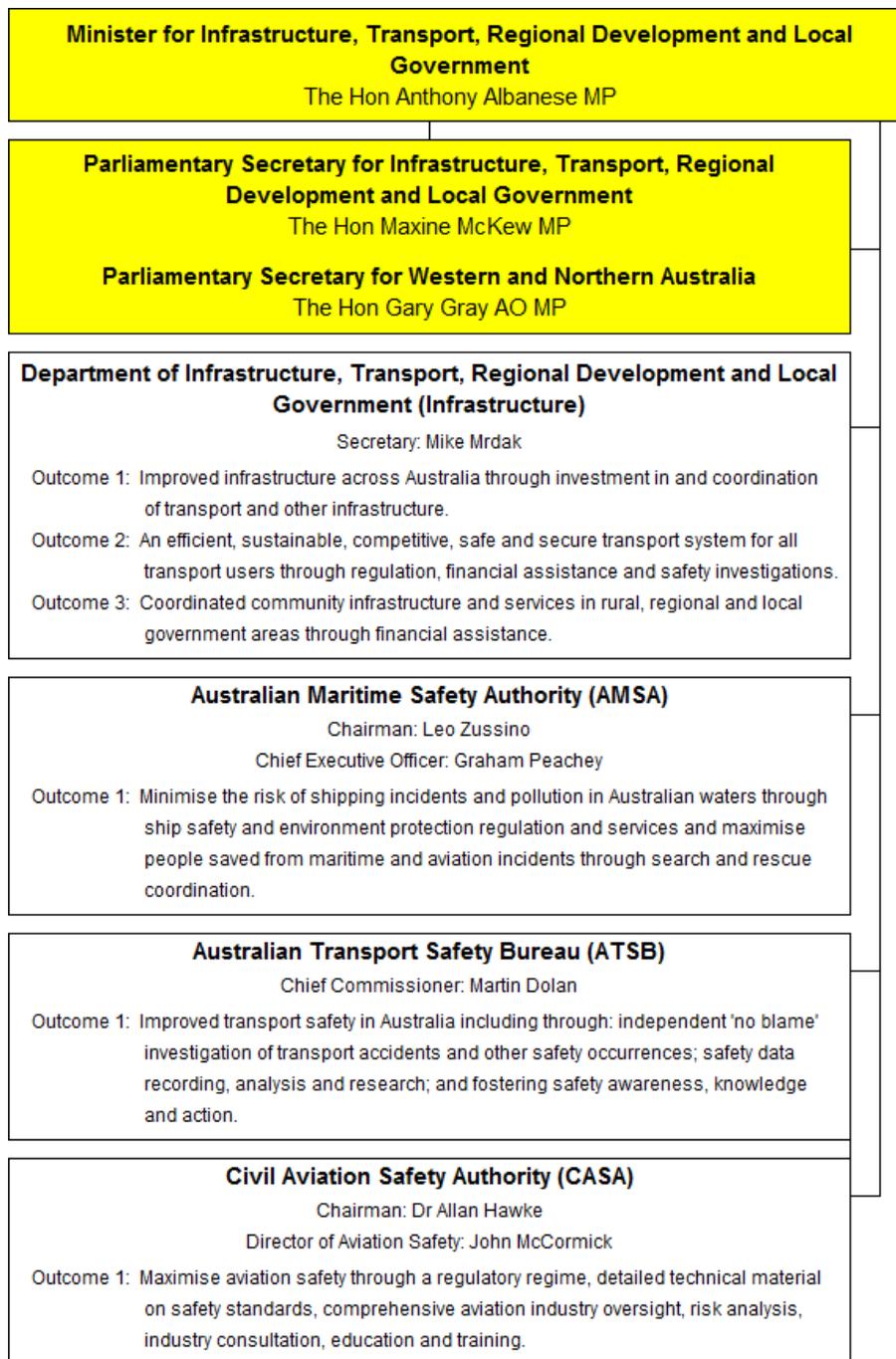


Figure 29: Infrastructure, Transport, Regional Development and Local Government Portfolio Outcomes
Source: DITRD LG Portfolio Budget Statement 2010-11

As displayed in Figure 30, DITRD LG is also responsible for putting together an annual department report that provides a linkage between the outcomes, outputs, groups responsible and key performance indicators. Each outcome is broken down into one or more output groups that provide dividable goals with set accountability. This linkage also helps to demonstrate how each department division or office is contributing to the department's and overall government's set goals and outcomes.¹²⁰

Outcome	Output Group	Output	Division or Office
Outcome 1 Improved infrastructure across Australia through investment in and coordination of transport and other infrastructure	1.1 Infrastructure investment	1.1.1 Infrastructure investment policy and programs	Nation Building—Infrastructure Investment and Infrastructure and Surface Transport Policy
		1.1.2 ¹ Infrastructure investment coordination	Office of the Infrastructure Coordinator and Nation Building – Infrastructure Investment
Outcome 2 An efficient, sustainable, competitive, safe and secure transport system for all transport users through regulation, financial assistance and safety investigations	2.1 Transport safety investigations	2.1.1 Transport safety investigations	Australian Transport Safety Bureau
	2.2 Transport security	2.2.1 Transport security policy, programs and regulation	Office of Transport Security and Office of the Inspector of Transport Security
	2.3 Transport systems	2.3.1 Surface transport policy, programs and regulation	Infrastructure and Surface Transport Policy and National Transport Strategy
		2.3.2 Road safety and vehicle policy, programs and regulation	Infrastructure and Surface Transport Policy
		2.3.3 Aviation and airports policy, programs and regulation	Aviation and Airports
	Outcome 3 Coordinated community infrastructure and services in rural, regional and local government areas through financial assistance	3.1 Regional development	3.1.1 Regional development policy and programs
3.2 Local government		3.2.1 Local government policy and programs	Local Government and Regional Development and Office of Northern Australia

1 Output 1.1.2 is delivered through the work undertaken by the Office of the Infrastructure Coordinator in support of Int Australia and the Nation Building—Infrastructure Investment division.

Figure 30: DITRDG Outputs and Output Structure as of June 30 2009

Source: DITRDG Annual Report 2008-09

For each output, DITRDLG provides an overview that describes its delivery, purpose, status, and example case studies or results from the department’s administered programs. In addition, outputs that can be easily quantified are assigned key performance indicators with set targets and result updates. Figure 31 provides an excerpt of the performance summary for the key performance targets set for the “Infrastructure Investment Policy and Programs” output (#1.1.1).¹²¹

Key performance indicator	Target	Result
Outputs		
<i>Collaborate with state, territory and local governments to plan and evaluate land transport investments consistent with government priorities</i>	Establish the land transport infrastructure investment program between the Australian, state, territory and local governments for the 2009–10 to 2013–14 periods.	National Partnership agreements were negotiated and signed with the states and territories between February and April 2009. The agreements cover land transport infrastructure investment over the six years from 2008–09 to 2013–14.
<i>Coordinate the Road Reform Plan (Phase 1) report for COAG and the ATC</i>	By December 2008.	The Department coordinated cross-jurisdictional research into possible future reform of heavy vehicle charging arrangements. The research was used to draft a Phase 1 report in consultation with the states and territories. The report was considered by the Australian Transport Council (ATC) in May 2009 and by COAG in July 2009, and provided the basis for a COAG decision to proceed to Phase 2 of the COAG Road Reform Plan.

Figure 31: DITRDLG Summary of Performance of Key Performance Indicators used for Outcome 1.1.1
 Source: DITRDLG Annual Report 2008-09

In general, the results of the outcomes and associated outputs are used to demonstrate how each department is contributing to the wellbeing of Australians. Department accountability to the public and the Parliament is provided through performance updates, in the form of annual or quarterly reports, where Departments report on progress towards achieving its stated goals and objectives. No set penalties are established for departments who do not meet their set targets; however, the results can be taken into consideration during the budget cycle. The Minister or Secretary of a department that is not meeting its targets may receive stringent questioning from the Senate Committee, and may be asked to explain why the department has not perform as anticipated.¹²²

Queensland

In Queensland, the Department for Transport and Main Roads develops a ten-year Transport Coordination Plan (TCP) that outlines the strategic direction for Queensland’s transport system. The TCP includes ten primary objectives for the transport system, criteria for deciding spending priorities, performance indicators to assess the effectiveness of decisions, and a framework for the coordinated planning of transport. As displayed in Figure 32, each strategic objective is supported by a list of broad policy responses and performance indicators. For example, the strategic objective “Making the most of the existing transport system” includes policy responses such as “Innovative traffic management solutions will be used to improve traffic reliability”, and performance indicators such as “travel reliability” to track progress. The policy responses and performance indicators explain to the government and public how strategic goals are to be put into action and reported upon.¹²³



Figure 32: Example Strategic Objectives and Performance Indicators
 Source: Queensland Department for Transport, Transport Coordination Plan

The TCP also sets the criteria for prioritizing transport spending, so that funds are spent on initiatives that align with the TCP strategic objectives. As stated in the Queensland TCP for 2008-2018, priority may be given to projects that:

1. Are consistent with the overarching direction for the transport system in Queensland as set out in the TCP, and with other integrated transport plans and strategies endorsed by the government
2. Are based on a 'triple bottom line evaluation' of relative transport needs (economic, social and environmental needs)
3. Provide a rigorous assessment of overall system performance and the whole-of-life benefits and costs of the funding/financing options
4. Are focused on optimizing the existing network and maximizing the use of available resources before providing new infrastructure and services
5. Are fit-for-purpose, long-term solutions offering whole-of-life benefits and achieve multiple positive outcomes
6. Facilitate integration between transport modes where appropriate, and promote a high level of integration between transport planning and land-use planning
7. Are innovative and cost-effective and promote a more sustainable use of the transport system
8. Contribute to improving the value and condition of key transport assets and services

9. Maximize available funding from sources other than State revenue
10. Include a post-implementation evaluation process to increase knowledge about the characteristics of worthwhile future investments.¹²⁴

In Queensland, the Department for Transport and Main Roads develops a five-year strategic plan that incorporates the strategic objectives laid out in the TCP. The five-year Roads Implementation Program translates the strategy into a specific list of projects which have firm funding commitments for the first two years, and indicative funding for the remaining three years.¹²⁵ The Department for Transport and Main Roads is also required to develop an annual Service Delivery Statement, which highlights recent achievements, upcoming priorities and a performance summary of quantified services standards, as highlighted in Figure 33.¹²⁶

DEPARTMENTAL STATEMENTS				
PERFORMANCE STATEMENT				
Service standards	Notes	2009-10 Target/est.	2009-10 Est. actual	2010-11 Target/est.
Service: Rail, Ports and Aviation Systems				
Rail fatalities per 100,000 population		0.10	0.08	0.10
Hospitalised rail casualties per 100,000 population	1	0.28	0.39	0.40
Number of level crossing collision occurrences per 1,000,000 train kilometres travelled	2	0.50	0.21	0.45
State contribution (\$000)		701,886	707,164	710,816
Other revenue (\$000)		38,586	8,557	8,014
Total cost (\$000)		740,472	715,721	718,830
Service: Integrated Transport Planning				
Percentage of integrated transport planning projects meeting milestones		80	82	90
Total value of transport studies and investigations (\$ million)	3	10.3	21	119
State contribution (\$000)		56,462	57,625	58,074
Other revenue (\$000)		15,059	18,319	15,363
Total cost (\$000)		71,521	75,944	73,437
Service: Road Use Management				
Road fatalities per 100,000 population		7.75	6.77	7.25
Hospitalised road casualties per 100,000 population	4	N/A	N/A	N/A
Compliance officer hours on-road	5	70,100	80,000	74,155
Road transport greenhouse gas emissions (1,000 tonnes, CO ₂ eq) per 100,000 population	6	388	385	--
Road transport greenhouse gas emissions (CO ₂ eq tonnes per capita)	7	New measure	New measure	3.85
Percentage of people in target audience who have high-level awareness of road safety campaigns	8	90	90	90
Percentage of national road transport reforms implemented within specified timeframes	8	100	100	100
Average wait time in Customer Service Centres (minutes)	9	10	9	10

Figure 33: Performance Statement Excerpt

Source: Queensland Department for Transport and Main Roads, Service Delivery Statements

The Service Delivery Statements – Performance Statement section includes target versus actual performance for the current fiscal year, as well as the target performance for the next fiscal year across various service standards (e.g., percentage of national road transport reforms implemented within specified time frames, average wait time in Customer Service Centers, or fatalities per population). The results indicate how the Department for Transport and Main Roads is serving the public.¹²⁷

Key Observations: Performance Based Decision Making

- Implementing a performance monitoring process may increase the accountability of government agencies for their investment decisions. Although the UK and Australia have not included set penalties in their performance management systems, government agencies are incentivized to perform as the results of performance monitoring may inform future budget allocations.
- Performance management systems in the UK and Australia use key metrics and targets to assess a project's progress towards achieving its stated goals and objectives. Regular project status updates can inform both the government and the public on the project's progress, and the party responsible for this progress.

10.0 Canada’s Building Canada Plan

The Building Canada Plan

In 2007, the Government of Canada established the Building Canada Plan (BCP, Building Canada) with the vision to make Canada stronger, safer, and better through modern, world-class public infrastructure. The Canadian Government introduced the BCP to address the challenges of funding public infrastructure in collaboration provinces, territories, and municipalities to promote the continued growth of the nation. Building Canada focuses on three themes that support the country's national priorities: growing the economy to improve Canada's competitiveness; achieving a cleaner environment by promoting sustainable growth; and fostering strong, prosperous communities¹²⁸

The new long-term \$33B (Canadian Dollars) infrastructure plan consists of programs and initiatives that balance regional needs with national priorities and support infrastructure in both large and small communities. The funding is divided between base funding, distributed program funding, and targeted program funding, outlined in Figure 34 and described in further detail in the following sections of this report.¹²⁹

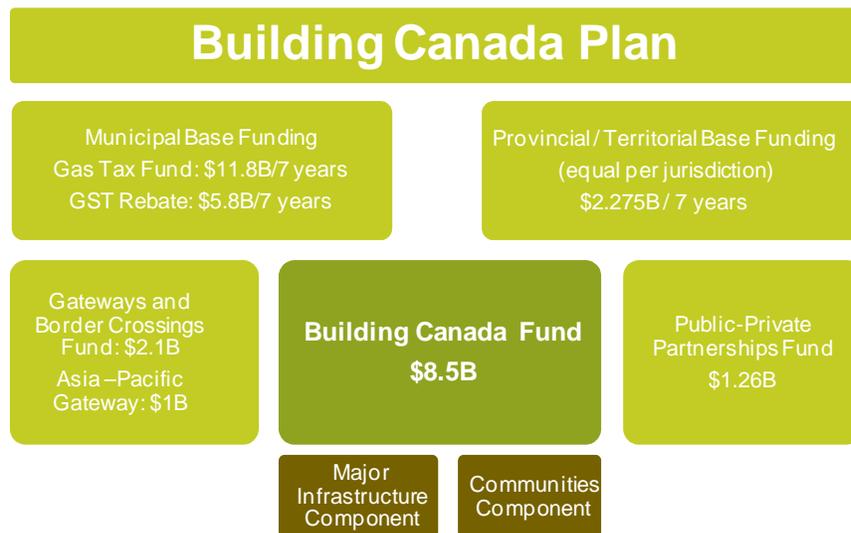


Figure 34: Funding Allocations under the Building Canada Plan (Canadian Dollars)
Source: Infrastructure Canada, Building Canada Plan

Overview of Canada's Government

Canada consists of ten provinces and three territories, governed by a parliamentary democracy.¹³⁰ Provinces tend to have more autonomy than U.S. states because of the structure of national government and the geographic territory of provinces. Provincial and local governments are responsible for most of the infrastructure in their jurisdiction. In general, the national government collects revenues and then distributes funds to the provinces by returning a portion of the revenues.¹³¹

The Building Canada Fund (BCF)

The major infrastructure fund of Building Canada's suite of programs and initiatives is the CAD\$8.5B Building Canada Fund (BCF) for key public infrastructure priorities. The BCF unified the delivery of previously distributed infrastructure funding commitments into one streamlined program. In line with the themes of the Building Canada Plan, the BCF focuses on projects that deliver economic, environmental, and social benefits to all Canadians. To be eligible for funding, projects must align with at least one of 15 categories shown in *Denotes National **Priority**

Figure 35. The five categories denoted as "National Priorities" receive priority funding under the BCF.
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Figure 35: BCF's three themes and 15 categories eligible for funding.

The \$8.5B in BCF funding is allocated to the provinces and territories based on population as of the 2006 census. The federal government works in partnership with each province and territory to address the infrastructure issues specific to the region. Together both governments discuss the regional priorities and agree to cooperate and coordinate on infrastructure issues and programs. These discussions culminate in the signing of high-level umbrella agreements, called Framework Agreements, which demonstrate both governments' commitment to infrastructure and establish a forum to guide subsequent negotiations. The framework agreements also work to align local and regional infrastructure needs with Canada's national priorities and goals.

The BCF consists of two components that aim to balance the needs of urban and rural communities: the Major Infrastructure Component (MIC) and the Communities Component (CC). Geographic equity concerns are addressed twice under the BCF. First, funds are provided across Canada to each province and territory based on population, and then the funds are divided between the two components of the BCF so that funding goes towards urban and rural projects across the jurisdiction. Characteristics of these two components are summarized in Figure 36.¹³³

Major Infrastructure Component (MIC)	Communities Component (CC)
<ul style="list-style-type: none"> • Targets large, strategic projects of national and region significance • 67% of MIC funding must be directed to the 5 national priorities • Projects selected on basis of merit through joint negotiations • All projects are cost shared, with the maximum federal share set at 33% when project involves municipalities 	<ul style="list-style-type: none"> • Focuses on communities with populations less than 100,000 • Competitive, application based process • Projects are cost shared, with the maximum federal share on any one project ranging from 25% to 50% • Common projects include the construction, renewal, and enhancement of basic public infrastructure

Figure 36: Summary of the two components of the Building Canada Fund

Provinces and territories set the division of funding between MIC and CC for their region in their individual Framework Agreements, with the only requirement being that funding under the CC must be at least the amount originally allocated for the jurisdiction under the Municipal Rural Infrastructure Fund (MRIF) that the BCF replaced. Beyond this stipulation, the BCF does not impose any restrictions on the geographic location or mode of projects receiving funding. Splitting funds between the MIC and CC enables jurisdictions to balance national priorities with local needs.¹³⁴ The jurisdictions arrived at various distributions of their allocated BCF funding, highlighted in Figure 37:¹³⁵

	Major Infrastructure Component (CAD)(% of Total)	Communities Component (CAD) (% of Total)	Total (CAD)
Ontario	\$2,735 m (88%)	\$362 m (12%)	\$3,097 m
Quebec	\$1,529 m (88%)	\$210 m (12%)	\$1,739 m
British Columbia	\$929 m (89%)	\$111 m (11%)	\$1,040 m
Nova Scotia	\$199 m (84%)	\$37 m (16%)	\$236 m
Saskatchewan	\$137 m (58%)	\$99 m (42%)	\$236 m
Prince Edward Island	\$13 m (37%)	\$22 m (63%)	\$35 m

Figure 37: The distribution of BCF funds between MIC and CC for six provinces according to their framework agreements

Provinces, local and regional governments, private companies, and non-profit organizations are all eligible to receive funding under the BCF to support public infrastructure. All BCF projects are cost-shared, and the maximum federal contribution to an individual project is 50% of total eligible costs. Infrastructure Canada maintains that only providing up to 50% of project costs in federal funding on a cost-shared basis promotes increased investment in strategic infrastructure through additional contributions from other partners.¹³⁶

How Projects are Selected

The project selection process is different for each component of the BCF. For the MIC, priority projects are identified through federal-provincial discussions, which includes municipalities and non-governmental organizations when appropriate. Once priority projects are identified, project sponsors must develop a thorough business case outlining the costs and benefits of the proposed project. The business cases are then reviewed against key program criteria to assess the extent to which the projects support the economic and environmental objectives of the BCF. The Federal Minister responsible for the fund ultimately approves the federal funding for all projects, while provincial ministers approve funding provided by the province under the MIC.¹³⁷

A competitive, on-line application-based process is used to select projects applying for funding under the CC. Private sector bodies may apply for CC funding, however, their application must be supported by a local or regional government. Projects are also evaluated on the extent to which they meet economic, environmental, and quality-of-life objectives. Applicants apply to the provinces, and an Oversight Committee established in each province jointly selects the projects to receive funding.¹³⁸ Members of the Oversight Committee vary by province, and also include senior officials from both the federal and provincial governments.¹³⁹ Applications for the BCF-CC have been

accepted in phases, and all projects that apply during one phase compete against each other for funding. A formal cost-benefit analysis is generally not required, however including such analysis may strengthen the project sponsor's application.^{140,141}

For both MIC and CC, projects are selected based on a combination of the following variables:

- Quality of application and/or business case
- Number of applications received (amount of competition)
- Funding available to each jurisdiction
- Amount of funding required for project
- Merit of the individual project *based on mandatory and additional leveraging criteria*¹⁴²

Many of the provinces provide publicly available program guides to assist interested project sponsors in completing their applications and business cases. Ontario's online program guide to the BCF-CC provides information on project objectives, expected outcomes and details the mandatory and additional leveraging criteria that the province can use to evaluate projects under each of the BCF categories. For example, public transit infrastructure projects must demonstrate how the project would improve mobility and reduce congestion. Additional leveraging criteria that may assist a public transit project application in being successful include implementing Transportation Demand Management practices or adopting an Intelligent Transportation System technology.¹⁴³

Two Provinces' Approach to the Building Canada Fund

Ontario and Alberta both provided publicly available program guides with over 100 pages of relevant information detailing the provinces' approach to the Communities Component of the Building Canada Fund. Like other provinces, Ontario and Alberta accept applications in phases, called intakes, each with a different deadline. Ontario's first intake accepted projects that aligned with any of its 17 eligible categories, while Alberta focused its two intakes on a particular subset of eligible project categories. Municipalities could only submit one application per intake.

The provinces' Oversight Committees compare all applications under an intake against each other. Alberta reviews and ranks all of the applications against program criteria to assess which projects to grant BCF funding. Ontario assesses projects on their application, technical schedules, and business case. The "shovel-readiness" of projects, meaning how soon they are able to begin construction, is also taken into consideration given the current economic challenges and these projects' ability to stimulate the economy and create jobs. A cost-benefit analysis is not required for applications in Ontario and Alberta, however including this analysis may strengthen the application.

Ontario published contact information for applicants who did not receive funding and wanted to learn more about the reasons they were not approved. Applicants who took advantage of this option could use the feedback they received to strengthen their application and re-submit it in a future intake.^{144,145}

How the Levels of Government Work Together

A distinctive aspect of the Building Canada Plan is the high level of collaboration between the federal, provincial, and municipal governments. Through framework agreements, the different levels of government come together to assess how to strike a balance between local and regional infrastructure needs and national priorities.¹⁴⁶ Infrastructure Canada provides oversight to the selection process conducted by the provincial governments, consulting with other federal organizations to accurately assess the merits of the applications. For example, Infrastructure Canada can seek input from Transport Canada when evaluating transportation applications and business cases for BCF funding. Provincial governments are typically involved on all applications for federal funds, including applications for municipal projects, as all BCF funding flows through the provinces.¹⁴⁷

Once projects are selected, provincial and municipal governments monitor and provide direct oversight on a day-to-day basis. The federal government remains involved with each jurisdiction's implementation of the BCF, meeting at least on a quarterly basis to discuss the status of projects and progress to date.¹⁴⁸

Reporting Requirements

The federal government manages the funding contribution agreements between the national government and the provinces and performs occasional audits of projects based on their relative risk.¹⁴⁹ All projects that receive funding under the BCF are required to report on the outcomes and financial details of their activities. Reporting frameworks are established in each jurisdiction's framework agreement, and the federal government requires at a minimum an annual detailed written report describing project developments and expenditures.¹⁵⁰

The provincial and municipal governments are responsible for collecting project data and then reporting to the federal level through quarterly meetings.¹⁵¹ Types of project information that is collected include:

- Estimated dates of project start and construction start
- Estimated percentage of project completion
- Justification for variances from project plan
- Benefits to the community
- Detailed report of expenditures
- Number of jobs created/retained because of project (requested quarterly)¹⁵²

Example Projects

Since the announcement of the Building Canada Plan three years ago, projects have been awarded funds, mobilized, and completed at varying degrees.¹⁵³ Below are descriptions of example projects that have received federal funding under the programs and initiatives of the BCP:

- **The Ontario-Quebec Continental Gateway and Trade Corridor:** The BCP's Gateways and Border Crossing Fund provides funding to further develop the Ontario-Quebec Continental Gateway and Trade Corridor and improve the efficiency of the multimodal transportation system. The Government of Canada works in collaboration with the provinces of Ontario and Quebec on this project and the federal funding is supplemented by private investments.¹⁵⁴

- **Pine Dock Water Treatment Plant:** One of the 52 Manitoba Infrastructure projects funded by the BCF's Communities Component to replace the Pine Docks water treatment system, ensuring residents have a safe and reliable source of drinking water. The project cost is estimated at a little over CAD\$1M and is expected to receive CAD\$345,635 in federal funding.¹⁵⁵
- **Improved Commuter Services in Vancouver, British Columbia:** The Major Infrastructure Component of the BCF is providing CAD\$9M in federal funding to help the West Coast Express commuter rail service meet the urban demand for public transit. The project adds seven rail cars and extend the platforms at stations to improve passenger safety and accommodate longer trains. Dale Parker, Chair of TransLink, believes the extensive up-front planning helped secure the support of all levels of government for this project.¹⁵⁶

Base Funding and the Gas Tax Fund

In addition to the funding allocated by population provided by the BCF, the Building Canada Plan also provides base funding for the municipalities and provinces. Over half of the CAD\$33B in federal funding under the BCP provides base funding for municipalities in the form of the Gas Tax Fund (GTF) and the Goods and Services Tax (GST) Rebate over the seven year period from 2007 through 2014. CAD\$2.3B in base funding for provinces and territories is to be divided equally between the jurisdictions over the seven years, with each province and territory receiving CAD\$25M per year. This equal division of funds between the provinces and territories works to balance the BCF funding which is allocated based on population. Stable, predictable, and flexible base funding allows governments to plan for the longer-term and finance their ongoing infrastructure needs.¹⁵⁷

The GTF is base funding for municipalities for projects that contribute to cleaner air and water and reduced greenhouse gas emissions. The GTF provides municipalities with CAD\$11.8B from 2007 to 2014 for environmentally sustainable municipal infrastructure, including public transit, water and wastewater infrastructure, community energy systems, and local roads and bridges. The fund offers municipalities flexibility since they are not required to use the funds in the year they were provided, and instead can pool, bank, and borrow against their funding. Funding under the GTF is distributed to the provinces based on population (as of the 2006 census), except for the territories and Prince Edward Island, which are provided set amounts to make sure they receive sufficient funding to meet their infrastructure needs.¹⁵⁸ Below is a description of how all levels of government work together to provide the funding from the GTF:

1. Province/territory receives funds twice a year from the national government.
2. Municipalities receive funding from province/territory once both levels of governments have signed a funding agreement.
3. Municipalities undertake projects.
4. Municipalities report on their use of the funds on an annual basis.
5. Province/territory aggregates information and reports to the Government of Canada.¹⁵⁹

Canada's Economic Action Plan

Canada's Economic Action Plan (EAP) was implemented in January 2009 to help Canadians through the global recession, similar to the American Recovery and Reinvestment Act of 2009. In addition to reducing the tax burden for Canadians and strengthening Canada's financial system, part of the EAP focuses on building infrastructure to create jobs, and aligns with the pre-existing BCP.¹⁶⁰ As part of Canada's EAP, the government made a commitment to accelerate funding under the BCP. The EAP provided additional funds to and streamlined the process for evaluating and approving both MIC and

CC projects.

As a result, more than CAD\$2.8B of new federal funding has been approved for approximately 100 priority MIC projects, and an additional CAD\$500M was made available for projects in communities with populations less than 100,000 under Canada's EAP additional funds for the CC. In an effort to further streamline the approval process, provinces were unable to access the additional CAD\$500M in EAP additional funds for CC projects until all original CC funding was obligated. After this incentive was introduced, close to CAD\$1B in federal funding was appropriated for over 875 smaller-scale projects under the original CC of the BCP. The funding was effectively obligated in a fast and streamlined manner.¹⁶¹

Key Observations: The Building Canada Plan

- The Building Canada Plan seeks to achieve equity between jurisdictions through equal base funding provided to each province in addition to funding allocated by population.
- The Major Infrastructure Component and Communities Component of the Building Canada Fund seek to balance the needs of large, metropolitan areas and rural communities, so that both regions receive funding to address their differing needs.
- The Building Canada Fund leverages private investment by only allowing up to two-thirds of a project's costs to be funded by the federal and municipal governments.¹⁶²

11.0 Conclusion and Key Considerations for the U.S.

11.1 Conclusion

Although the UK and Australia's use of investment frameworks and appraisal models may not be directly transferable to the U.S. government structure and budget process, observations from the countries' approach to transportation investment decisions provides important lessons learned for the U.S. Below is a summary of the key research topics highlighted in this Report:

- **Relationships between Government Levels in Decision Making:** Both the UK and Australia have infrastructure bodies to advise the national government on economic infrastructure priorities, and contribute to cross-sector investment prioritization and funding. Both countries have experienced periods of transition in the relationship that each level of government takes for transportation investment. The UK historically followed a highly centralized model, however the new government established in spring 2010 has indicated a shift in power from the national to local government. In Australia, states historically provided the bulk of infrastructure funding and policy development; however, changes in the taxation structure and political landscape has increased the federal government role in surface transportation funding and developing national standardized policies. Within this changing environment, guidance at the sub national level has been developed to address jurisdictional requirements and strategic objectives while aligning with national guidelines.
- **Levels of Investment Frameworks:** Investment frameworks across the UK and Australia provide a consistent process to identify and justify needs, develop and assess options to address needs, and make investment decisions. Investment frameworks may also assist in demonstrating the government's stability and security to public and private partners, by establishing the jurisdiction's long-term plan that incorporates land use planning and cross-mode infrastructure needs. Multiple levels of the government in Australia and the UK utilize investment frameworks, and the two countries often learn from each other when updating or implementing new steps or processes (e.g., Gateway Review Process). The UK's Green Book provides a cross-government approach for appraisal of capital projects and policies, while Australia's Reform and Investment Framework provides a framework for infrastructure projects across all government sectors. Both countries' national investment frameworks begin with need justification and include feedback loops to help contribute to the continuous improvement of future appraisals.
- **Appraisal Models:** Cost-benefit analysis and multi-criteria analysis are the two most common transport appraisal models used in the UK and Australia. Both countries rely on multiple data inputs (e.g., demand forecasting, capital and operating expense estimation models) for their economic appraisal models. In addition, the experience in the UK and Australia indicates that monetized cost-benefit analysis is often the critical factor in decision making, with non-monetized factors acting as supplementary decision factors. The UK and Australia have both developed detailed guidance materials at the national level for appraisal models, including values or estimation techniques for monetized impacts and valuation techniques or rating systems for impacts without known market values.
- **Investments from General Fund:** The budgeting process in the UK and Australia requires the transportation department to compete for funding with other national government departments. Appraisal processes performed by the departments estimate the potential value for money provided by the projects included in their budget proposal, and this information may also assist decision makers in allocating funds across sectors. Under this process, departments who conduct detailed appraisals and present proposals with strong justifications

may have a greater chance of securing allocations from the general funds when compared to departments who do not undertake detailed appraisals.

- **Performance Based Decision Making:** Both the UK and Australia have performance management systems that require development of performance metrics and targets to inform the national government and public of achievement towards goals for transportation. Neither the UK nor Australia has set penalties in place if the established performance targets are not met. However, performance towards goals can influence future budgetary decisions or executive compensation levels.
- **Canada's Building Canada Fund:** Canada's CAD\$33b, seven year Building Canada Plan brings together all levels of government to address local, regional and national public infrastructure needs. Both national projects under the Building Canada Fund's Major Infrastructure Component and local projects that fall under the Communities Component are funded on a cost-shared basis, which emphasizes every level of government's commitment to the plan's projects and promotes increased investment through contributions from other partners. The BCF's two components provide a distribution of funding between rural and metropolitan areas to address the infrastructure needs of both large and small communities. The BCF's combination of base funding and funding based on population provided to each of Canada's provinces and territories helped to establish a fair division of funding across jurisdictions. Canada's 2009 Economic Action Plan accelerated funding under the Building Canada Plan through incentives and provided additional funding for infrastructure so that the nation's public infrastructure needs could be addressed sooner and more jobs would be created.¹⁶³

11.2 Key Considerations for the U.S.

Based on the research conducted for Stage 1 of the Analysis of Transportation Investment Models in Other Countries, incorporating aspects of international investment frameworks and appraisal models into the transportation investment planning process of the U.S. may provide benefits at the national and state level. While some aspects of international investment framework models may not be readily applicable to the U.S. as a result of structural differences, themes relating to long-term visions, cross-sector views, and justifying the project need provide important lessons learned. In reviewing the key considerations of this Report, U.S. DOT is encouraged to carefully consider the role of the transportation agencies, the public and other key stakeholders in incorporating the considerations into U.S. DOT current practices. Below are highlights of additional considerations for the U.S. based on the topics covered in this Report.

Relationship between government levels in decision making

As observed in the UK and Australia, the national transportation body provides overarching goals that link to appraisal guidance for sub-national governments to adopt and supplement as needed. The U.S. can reference leading international examples, such as the UK DfT's WebTAG website which posts draft versions of policy and appraisal guidance materials, for methods to involve key stakeholders beyond the national government in a transparent policy development process.

At the national level, central infrastructure advisory bodies contribute to cross-sector investment prioritization and funding. Other national councils, such as the Coalition of Australian Governments (COAG), act as a forum for state governments to debate and agree on how to address issues and approaches for future national policy. The success of councils like COAG are dependent upon the commitment at both the national and sub-national level in developing interagency agreements. This approach may be a challenging in the U.S., as the government system is more disaggregated than the centralized model of the UK, and has more stakeholders (e.g., states) than the Australian

government system.

Levels of Investment Frameworks & Appraisal Models

Established frameworks and appraisal methods that are aligned with government-wide objectives, and involve significant stakeholder consultation, seek to improve transparency and build consensus for a cross-mode infrastructure investment approach. National frameworks may require periodic updating to align with shifting government-wide objectives and utilizing time tested approaches may minimize changes to national framework as shifts in the political landscape occur.

Based on the experience on the UK and Australia, U.S. DOT may benefit from implementing a department-wide framework model that selects projects based on value for money objectives. The UK government's response to the Eddington Transport Study represents an example of cross-sector agencies (e.g., DfT, and HM Treasury) working together to create a new transport framework, which includes an evidence-based, cross-modal transportation planning and decision making process.¹⁶⁴

U.S. DOT may benefit from expanding its use of the national transportation objectives articulated in the Strategic Plan as a basis for investment decision-making. Similar to the Appraisal Summary Table used in the UK and Australia, U.S. DOT may benefit from capturing the impacts of an option as it relates to the national objectives, outcomes and performance measures of the strategic plan. U.S. DOT may also benefit from conducting a formalized cost benefit analysis, to select and prioritize investment options, and also evaluate actual benefits delivered from investments. The use of cost benefit analysis for the TIGER Discretionary Grant Program, to justify use of federal funds is an important step. U.S. DOT is encouraged to consider all modes or type of interventions (e.g., capital project, policy, pricing) that may be proposed by transportation agencies to address a particular need or objective.

Investments from General Fund

A cross-government process that justifies action prior to funding commitment can support the allocation of funds and resources to those areas that have the potential to provide the greatest value. Although projects across sectors are unlikely to compete for general funds in the U.S. due to the structure of the U.S. appropriations process, U.S. DOT may leverage certain aspects of this concept in its own analysis of transportation projects. The U.S. DOT may benefit from implementing a consistent cross-department process for appraisal of potential investment opportunities, which may incorporate lessons learned from past investments to improve the future allocation of funds.

Performance Based Decision Making

The UK and Australia have developed national goals or outcomes for transportation, which the transportation department has established measurable targets for and provide routine performance updates on their performance against these targets. While a formal reward or penalty process is not publicly established; the reporting process holds each department accountable for their performance and this can impact future budgeting decisions or executive compensation levels. The U.S. may benefit from adapting certain aspects of international performance based decision making processes, including measuring progress towards national priorities and linking performance to future funding decisions.

Canada's Building Canada Plan

The U.S. may benefit from observing the best practices adopted by the Building Canada Plan. One such practice that may be relevant to U.S DOT is the allocation of funds across jurisdictions. The BCP utilizes a combination of funding allocations based on population and a base funding that is divided equally between the jurisdictions. This approach seeks to provide a balanced distribution of funding to support large and small jurisdictions in meeting their unique infrastructure needs.¹⁶⁵

The U.S. may also consider providing different levels of federal funding for projects under its various programs. For example, the TIGER II Discretionary Grants can be used for up to 80% of the costs of a project, while the BCF only allows a maximum of 50% in federal funding for any one project. The Government of Canada believes that having this 50% maximum encourages investments from other levels of government and private entities, requiring support from multiple sources for the projects.

In response to the global financial crisis and lingering global recession, the Canadian Government has emphasized streamlining evaluation and funding approvals to fast track project delivery. Canada's Economic Action Plan uses incentives to obligate Building Canada funds more quickly, such as restricting the province's available to additional funding for the CC of the BCF until all original funds were obligated, which resulted in the entire allocation under CC being appropriated.¹⁶⁶

Appendix A: Stage 1 Source List

UK Sources:

- HM Treasury, Budget 2010: http://www.hm-treasury.gov.uk/d/junebudget_complete.pdf, June 2010
- HM Treasury, Eddington Transport Study: <http://www.dft.gov.uk/adobepdf/187604/206711/executivesummary.pdf>, December 2006
- HM Treasury, Office of Government Commerce (OGC) - Gateway Review for Programmes & Projects: http://www.ogc.gov.uk/what_is_ogc_gateway_review.asp, November 2009
- HM Treasury, The Green Book – Appraisal and Evaluation in Central Government: http://www.hm-treasury.gov.uk/d/green_book_complete.pdf
- HM Treasury and Infrastructure UK, Strategy for National Infrastructure: http://webarchive.nationalarchives.gov.uk/+http://www.hm-treasury.gov.uk/d/budget2010_national_infrastructure.pdf, March 2010
- Office of Government Commerce: <http://www.ogc.gov.uk/>
- UK Department of Communities and Local Government: <http://www.communities.gov.uk/corporate/about/>
- UK Department for Transport, 2009-10 Resource Accounts Reports: <http://www.dft.gov.uk/about/publications/apr/resourceaccounts0910/>, July 2010
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- UK Department for Transport, Consultation for Local Transport Funding: <http://www.dft.gov.uk/consultations/open/2010-32/consultationdocument.pdf>, August 2010
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- Srivastava, Spriha. Infrastructure Investor, “New UK infra body should be in place by 2012, report says”: <http://www.infrastructureinvestor.com/Article.aspx?article=55518>, August 2010

Australia Sources:

- Australian Department of Finance and Deregulation, The Australian Government Budgeting Process: <http://www.finance.gov.au/budget/budget-process/index.html>
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- Australian Department of Finance and Deregulation, Gateway Review Process: <http://www.finance.gov.au/gateway/index.html>
- Australian Department of Infrastructure, Transport, Regional Development and Local Government, Annual Report 2008-09: http://www.infrastructure.gov.au/department/annual_report/2008_2009/files/DITRDLG_AR0809.pdf
- Australian Department of Infrastructure, Transport, Regional Development and Local Government, Portfolio Budget Statements 2010-11, http://infrastructure.gov.au/department/statements/2010_2011/budget/files/DITRDLG_Budget_2010-11_PBS.pdf
- Australian National Audit Office, Life Cycle Costing Better Practice Guide: http://www.anao.gov.au/uploads/documents/Life_Cycle_Costing.pdf
- Australian Transport Council, National Guidelines for Transport System Management In Australia: <http://www.atcouncil.gov.au/documents/ngtasm.aspx>, 2006

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Commonwealth of Australia. Introduction to Cost-Benefit Analysis and Alternative Evaluation Methodologies: http://www.finance.gov.au/publications/finance-circulars/2006/docs/Intro_to_CB_analysis.pdf, January 2006.

Council of Australian Governments: <http://www.coag.gov.au/>

Infrastructure Australia: <http://www.infrastructureaustralia.gov.au/publications.aspx>

Infrastructure Australia, Better Infrastructure Decision-Making:

http://www.infrastructureaustralia.gov.au/files/IA_Reform_Investment_Framework_Guidance_7Oct.pdf, October 2009.

Infrastructure Australia, Getting the fundamentals right for Australia's infrastructure priorities:

http://www.infrastructureaustralia.gov.au/files/Report_to_COAG_2010.pdf, June 2010

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Victoria Department of Treasury and Finance, Investment Management Standard:

<http://www.dtf.vic.gov.au/CA25713E0002EF43/pages/gateway-reviews-and-best-practice-guidelines-investment-management-investment-management-standard>

Victoria Transport Plan: <http://www.transport.vic.gov.au/web23/Home.nsf>, December 2008

U.S. Performance Based Decision Making Sources:

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<http://www.international.fhwa.dot.gov/pubs/pl10011/pl10011.pdf>

International Technology Scanning Program, "Transportation Performance Measures in Australia, Canada,

Japan, and New Zealand": <http://international.fhwa.dot.gov/performance/04transperfmeasure.pdf>

Canada Building Canada Plan Sources:

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<http://www.buildingcanada-chantierscanada.gc.ca/alt-format/pdf/bcfguide-fccmanuel-ab-eng.pdf>, December 2008.

British Columbia Provincial Program Guide:

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<http://www.bcfontario.ca/english/communities/docs/onlineguide-EN.pdf>, September 2008

Treasury Board of Canada Secretariat, Building Canada Fund: Plans, Spending, and Results: <http://www.tbs-sct.gc.ca/hidb-bdih/initiative-eng.aspx?Hi=92>.

Appendix B: Appraisal Model Guidance Materials and Examples

Cost-Benefit Analysis:	<ul style="list-style-type: none"> • UK DfT Transport Analysis Guidance CBA guidelines http://www.dft.gov.uk/webtag/documents/expert/pdf/unit3.5.4d.pdf • Commonwealth of Australia (Department of Finance and Administration) Handbook of Cost-Benefit Analysis. http://www.finance.gov.au/publications/finance-circulars/2006/01.html • NSW Treasury Economic Appraisal Guidelines 2007 available at: http://www.treasury.nsw.gov.au/_data/assets/pdf_file/0016/7414/tpp07-5.pdf • Victorian Government (Department of Transport) 2008, Guidelines for Cost-Benefit Analysis • HM Treasury 2010 – The Green Book http://www.hm-treasury.gov.uk/d/green_book_complete.pdf <p>Examples:</p> <ul style="list-style-type: none"> • The Australian Bureau of Infrastructure, Transport and Regional Economics has a range of ex-post CBAs on its website: http://www.bitre.gov.au/info.aspx?NodId=112 • UK Department for Transport includes a range of ex-ante and ex-post CBA, including the Crossrail Business Case at: http://www.dft.gov.uk/pgr/rail/pi/crossrail/archive/reviewofthecrossrailbusinesscase?page=4 • Stages 1 and 2 of the Financial and Economic Analysis of the Inland Rail project are available on the Australian Rail Track Corporation's website at: http://www.artc.com.au/Content.aspx?p=192
Multi-Criteria Analysis:	<ul style="list-style-type: none"> • UK Department for Communities and Local Government 2009, Multi-criteria analysis: http://www.communities.gov.uk/publications/corporate/multicriteriaanalysismanual
Economic Impact Analysis:	<ul style="list-style-type: none"> • West Australian Economic Regulation Authority 2005, Frameworks for economic impact analysis and benefit cost analysis, available at: http://www.era.wa.gov.au/cproot/2975/2/Frameworks_for_economic_analysis_and_benefit_cost_analysis.pdf <p>Examples:</p> <ul style="list-style-type: none"> • Allen Consulting Group 1996, Economic Impact of the Melbourne City Link: Transurban Project, available at http://www.vicroads.vic.gov.au/NR/rdonlyres/A8921900-E930-4F56-9AA3-E2607B2E1B70/0/allen.pdf • EconSearch 2009, Economic Impact Study of Port and Port Kembla, available at: http://www.kemblaport.com.au/system/files/f2/o838/Port%20Kembla%20Port_Final_091210.pdf
Cost - effectiveness Analysis:	<ul style="list-style-type: none"> • NSW Treasury Economic Appraisal Guidelines 2007 available at: http://www.treasury.nsw.gov.au/_data/assets/pdf_file/0016/7414/tpp07-5.pdf
Financial Appraisal:	<ul style="list-style-type: none"> • NSW Treasury Guidelines for Financial Appraisal available at: http://www.treasury.nsw.gov.au/_data/assets/pdf_file/0014/7412/tpp07-4.pdf <p>Examples:</p> <ul style="list-style-type: none"> • Stages 1 and 2 of the Financial and Economic Analysis of the Inland Rail project are available on the Australian Rail Track Corporation's website at: http://www.artc.com.au/Content.aspx?p=192

Public Accounts Summary Table:

The Public Accounts (PA) table is used to calculate the Present Value of Cost to Public Accounts (e.g., net costs incurred by central or local government bodies). The table calculates two inputs for the AST under the goal "Impact on Public Accounts" - Broad Transport Budget (BTB) and Wider Public Finances (WPF).

Public Accounts

	ALL MODES	ROAD	BUS and COACH	RAIL	OTHER
Local Government Funding	TOTAL	INFRASTRUCTURE			
Revenue					
Operating Costs					
Investment Costs					
Developer and Other Contributions					
Grant/Subsidy Payments					
NET IMPACT					
Central Government Funding: Transport					
Revenue					
Operating costs					
Investment Costs					
Developer and Other Contributions					
Grant/Subsidy Payments					
NET IMPACT					
Central Government Funding: Non-Transport					
Indirect Tax Revenues					
TOTALS					
Broad Transport Budget					
Wider Public Finances					

(7)

(8)

(9)

(10) = (7) + (8)

(11) = (9)

Notes: Costs appear as positive numbers, while revenues and 'Developer and Other Contributions' appear as negative numbers.
All entries are discounted present values in 2002 prices and values.

Source: UK DfT WebTAG, Unit 3.5.1

Analysis of Monetized Costs and Benefits Table (AMCB):

The Analysis of Monetized Costs and Benefits Table shows the impacts which are regularly or occasionally presented in monetized form in transport appraisals. It assists in the assessment of value for money by expressing the important impacts in monetary terms. It uses summary statistics (e.g., BCR, NPV) based on Transport Economic Efficiency and Public Accounts Summary tables.

Analysis of Monetised Costs and Benefits

Noise		(12)
Local Air Quality		(13)
Greenhouse Gases		(14)
Journey Ambience		(15)
Accidents		(16)
Economic Efficiency: Consumer Users (Commuting)		(1a)
Economic Efficiency: Consumer Users (Other)		(1b)
Economic Efficiency: Business Users and Providers		(5)
Wider Public Finances (Indirect Taxation Revenues)		- (11) - sign changed from PA table, as PA table represents costs, not benefits
Option Values		(17)
Present Value of Benefits ^(see notes) (PVB)		$(PVB) = (12) + (13) + (14) + (15) + (16) + (1a) + (1b) + (5) + (17) - (11)$
Broad Transport Budget		(10)
Present Value of Costs ^(see notes) (PVC)		$(PVC) = (10)$
OVERALL IMPACTS		
Net Present Value (NPV)		$NPV = PVB - PVC$
Benefit to Cost Ratio (BCR)		$BCR = PVB / PVC$
<p>Note : This table includes costs and benefits which are regularly or occasionally presented in monetised form in transport appraisals, together with some where monetisation is in prospect. There may also be other significant costs and benefits, some of which cannot be presented in monetised form. Where this is the case, the analysis presented above does NOT provide a good measure of value for money and should not be used as the sole basis for decisions.</p>		

Source: UK DfT WebTAG, Unit 3.5.1 and Unit 3.5.4

Appendix D: End Notes

¹ (Based on Survey of PwC Country Office Staff)

² U.S. Department of Transportation website

³ (Based on Survey of PwC Country Office Staff)

⁴ (Based on Survey of PwC Country Office Staff)

⁵ (Based on Survey of PwC Country Office Staff)

⁶ (Based on Survey of PwC Country Office Staff)

⁷ UK Department for Transport, WebTAG Unit 3.2:

<http://www.dft.gov.uk/webtag/documents/expert/pdf/unit3.2d.pdf>, January 2010.

⁸ (Based on Survey of PwC Country Office Staff)

⁹ (Based on Survey of PwC Country Office Staff)

¹⁰ (Based on Survey of PwC Country Office Staff)

¹¹ (Based on Survey of PwC Country Office Staff)

¹² Department for Transport website: <http://www.dft.gov.uk/>

¹³ (Based on Survey of PwC Country Office Staff)

¹⁴ (Based on Survey of PwC Country Office Staff)

¹⁵ (Based on Survey of PwC Country Office Staff)

¹⁶ (Based on Survey of PwC Country Office Staff)

¹⁷ (Based on Survey of PwC Country Office Staff)

¹⁸ (Based on Survey of PwC Country Office Staff)

¹⁹ (Based on Survey of PwC Country Office Staff)

²⁰ (Based on Survey of PwC Country Office Staff)

²¹ (Based on Survey of PwC Country Office Staff)

²² (Based on Survey of PwC Country Office Staff)

²³ (Based on Survey of PwC Country Office Staff)

²⁴ (Based on Survey of PwC Country Office Staff)

²⁵ (Based on Survey of PwC Country Office Staff)

²⁶ (Based on Survey of PwC Country Office Staff)

²⁷ UK Parliament, Parliament and Government: <http://www.parliament.uk/about/how/role/parliament-government/>

²⁸ (Based on Survey of PwC Country Office Staff)

²⁹ (Based on Survey of PwC Country Office Staff)

³⁰ (Based on Survey of PwC Country Office Staff)

³¹ UK Prime Minister Office website: <http://www.number10.gov.uk/history-and-tour/cabinet>

³² UK Cabinet Office website: <http://www.cabinetoffice.gov.uk/content/about-cabinet-office>

³³ HM Treasury website: <http://www.hm-treasury.gov.uk/>

³⁴ Office of Government Commerce: <http://www.ogc.gov.uk/>

³⁵ (Based on Survey of PwC Country Office Staff)

³⁶ UK Department for Transport website

³⁷ UK Department of Communities and Local Government website:

<http://www.communities.gov.uk/corporate/about/>

³⁸ DfT, Local Transport Today Conference, July 2010

<http://www.dft.gov.uk/press/speechesstatements/speeches/baker20100720>

³⁹ Srivastava, Spriha. Infrastructure Investor, "New UK infra body should be in place by 2012, report says":

<http://www.infrastructureinvestor.com/Article.aspx?article=55518>, August 2010

⁴⁰ HM Treasury website: <http://www.hm-treasury.gov.uk/>

⁴¹ Australian Government, Our Government: <http://australia.gov.au/about-australia/our-government>

⁴² (Based on Survey of PwC Country Office Staff)

⁴³ Australian Department of Finance and Deregulation website: <http://www.finance.gov.au/>

⁴⁴ Australian Department of Infrastructure, Transport, Regional Development and Local Government website: <http://www.infrastructure.gov.au/>

- ⁴⁵ Infrastructure Australia website: <http://www.infrastructureaustralia.gov.au/>
- ⁴⁶ (Based on Survey of PwC Country Office Staff)
- ⁴⁷ Infrastructure Australia website: <http://www.infrastructureaustralia.gov.au/>
- ⁴⁸ (Based on Survey of PwC Country Office Staff)
- ⁴⁹ Council of Australian Governments website: <http://www.coag.gov.au/>
- ⁵⁰ Australian Transport Council website: <http://www.atcouncil.gov.au/>
- ⁵¹ (Based on Survey of PwC Country Office Staff)
- ⁵² (Based on Survey of PwC Country Office Staff)
- ⁵³ (Based on Survey of PwC Country Office Staff)
- ⁵⁴ HM Treasury, The Green Book – Appraisal and Evaluation in Central Government: http://www.hm-treasury.gov.uk/d/green_book_complete.pdf
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- ⁵⁶ HM Treasury, Office of Government Commerce (OGC) - Gateway Review for Programmes & Projects: http://www.ogc.gov.uk/what_is_ogc_gateway_review.asp, November 2009
- ⁵⁷ Ibid.
- ⁵⁸ HM Treasury and Infrastructure UK, Strategy for National Infrastructure: http://webarchive.nationalarchives.gov.uk/+http://www.hm-treasury.gov.uk/d/budget2010_national_infrastructure.pdf, March 2010
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- ⁶¹ UK Department for Transport, Transport Analysis Guidance – WebTAG: <http://www.dft.gov.uk/webtag/>
- ⁶² Infrastructure Australia, National Infrastructure Priorities: http://www.infrastructureaustralia.gov.au/files/National_Infrastructure_Priorities.pdf, May 2009
- ⁶³ Infrastructure Australia, Reform and Investment Framework: http://www.infrastructureaustralia.gov.au/files/IA_Reform_Investment_Framework_Templates_Summary_Table_Stages1_6_7_Oct.pdf and http://www.infrastructureaustralia.gov.au/files/IA_Reform_Investment_Framework_Template_Stage7_7_Oct.pdf
- ⁶⁴ Australian Department of Finance and Deregulation, Gateway Review Process: <http://www.finance.gov.au/gateway/index.html>
- ⁶⁵ Ibid.
- ⁶⁶ Australian Transport Council, National Guidelines for Transport System Management In Australia: <http://www.atcouncil.gov.au/documents/ngtms.aspx>, 2006
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