

INTEGRATED TRANSPORT PLANNING: A QUEENSLAND EXPERIENCE

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ABSTRACT

Transport plays a vital role in maintaining quality of life and enhancing attractiveness for industry development and investment. Therefore, the transport system must be maintained effectively and enhanced through an integrated planning approach. A suitable framework for such an approach should combine long-term planning for land use, all modes of transport and the environment.

A framework for integrated transport planning consists of three key components:

- *Outcomes* that determines the desired transport system
- *Principles* to guide the development of transport system options, and
- A *planning process* that provides a systematic and consistent approach to transport planning.

Integrated transport planning has progressed from planning for outputs to planning for outcomes. Outcomes are broad statements of the desired transport system. A number factors drive transport system outcomes. Broadly, these can be classified as system drivers (eg land use, population growth, societal values) and process drivers (eg legislation, plans and policies).

Principles are categorised under 'balance', 'integration' and 'partnerships'. Integrated transport planning is about finding the right balance across a wide range of economic, environmental and social factors to achieve the best overall outcomes. To consider the benefits, costs, risks and opportunities in a balanced way requires an understanding of how these factors interact and influence each other.

There are four key aspects to integration:

- integrating the transport system
- integrating transport and land use
- integrating transport and other planning
- integrating across levels of planning and jurisdictions.

Strong partnerships across governments, industry and the community are essential in integrated transport planning. This allows planners to draw on a wide range of views, expertise and experience to ensure the needs, priorities and values of stakeholders are met.

Planning to achieve the desired transport system requires a formal and systematic approach to integrated transport planning that is both transparent and aligns with best practice. Not only should the planning process provide actions and strategies but also it should involve an iterative process of continuous improvement.

This paper discusses each of the above aspects of integrated transport planning and its application in Queensland, Australia. It does not commit Queensland Transport to the views expressed within in this paper.

1. INTRODUCTION

1.1 Background

Transport is fundamental to all Queenslanders. It plays a vital role in maintaining the quality of life and enhancing attractiveness for industry, tourism development and investment. It brings people together and connects people with goods, services and information. However, the transport system has a number of negative impacts such as damage to the environment (eg pollution, energy consumption, congestion) and human health (eg inactive lifestyle, accident victims, pollution). Therefore, the transport system needs to be planned, developed, operated and used in a way that maximises benefits while limiting damaging effects.

1.2 What is integrated transport planning?

Transport systems are complex and multi-dimensional with many parts that comprise the whole. The objective of integrated transport planning is to find balance among these dimensions so that planning and investment decisions contribute optimally to the economic, social, cultural and physical potential of the transport system and society in general. Integration is a concern with the whole, with common objectives and agreed desired outcomes. The different options, goals and points of view must be integrated to identify realistic solutions to community problems.

1.3 New directions

Transport planning has evolved from its traffic functional origins to a more systematic approach. In the past, transport plans typically predicted future transport demand based on past growth. Agencies often planned in isolation with limited coordination and consultation with stakeholders and the community.

Integrated transport planning is more than coordinated transport planning. It integrates multiple and sometimes-conflicting objectives to reach more sustainable transport outcomes that contribute to community, industry and government priorities.

The move towards integrated transport planning has involved a number of important shifts away from traditional transport planning approaches:

From....	To....
Linking investment in transport to outputs	Linking investment and infrastructure to outcomes
Meeting private vehicle travel demand	Managing private vehicle travel demand and widening travel choices
Planning the movement of cars and trucks	Planning the movement of people and goods
Supplying new transport infrastructure	Making best use of existing infrastructure
Making decisions to meet current needs	Making decisions that also consider the needs of tomorrow (sustainability)
Integrating across transport modes	Integrating transport, land use and other planning
Accepting the negative impacts on the environment	Reducing the negative impacts on the environment

2. AN INTEGRATED TRANSPORT PLANNING FRAMEWORK

2.1 A Framework for integrated transport planning

The IIEC (1996) define integrated transport planning as "a process or framework that serves as a guide to gathering information about transport and analysing it".

A framework for integrated transport planning consists of three main components:

- *Outcomes* that captures the prevailing needs and values of government, industry and the community
- *Guiding principles* that provide guidance towards achieving the desired transport system outcomes
- *Planning process* that provides conscious effort to make more informed decisions about investment choices to meet the desired transport system outcomes within the context of the guiding principles.

2.1.1 Transport system outcomes

There are a number of factors that drive the outcomes of a transport system. These include land use types and density, population age and growth, industry growth, technological advances, community values and behaviour, government priorities and the physical environment.

Outcomes are broad statements about what we want to achieve. Typical outcomes include:

- Achieving economic development
- Improved access and mobility
- Improved safety and security
- Reduced environmental impacts
- Improved liveability and community well being.

2.1.2 Guiding principles

Guiding principles provide agreed standards and approaches to be consistently applied to the integrated transport planning process to achieve desired transport system outcomes.

Integrated transport planning is based on the concept of sustainability. Sustainable transport 'is achieved when the needs for access to people, services and goods are met without doing permanent harm to global environments, damaging local environments, and reducing social equity' (OECD, 1997).

There is a wide range of measures that need to be considered in pursuing sustainable transport. In general terms, sustainable transport involves consideration of the following operating principles:

- Linking investment in transport infrastructure and services to economic, social and environmental objectives
- Widening choices in transport mode
- Reducing vehicle travel demand by influencing user behaviour
- Making better use of transport infrastructure and services
- Integrating transport and land use in transport corridors
- Reducing the impact of traffic and transport on the environment
- Making decisions on transport and land use that create sustainable options for future generations.

2.1.3 The integrated transport planning process

Current integrated transport plans differ markedly from those developed in the 1960's. According to May (1991) the main differences can be identified as:

- The emphasis on a vision (outcomes), which provides a context for the development of the transport system
- The appreciation that targets or constraints need to be identified from the outset
- The treatment of a wider range of influences such as land use and the use of multi criteria evaluation methods
- The use of robust testing as a way of treating uncertainty.

Westerman (1998) proposed a new direction for integrated transport planning. He argued that in view of the complex factors involved in integrated transport and land use planning and the trade-offs involved, the planning process is of critical importance.

He suggested that

- Processes be holistic
- Stakeholders be involved in the process
- Process be applicable for all levels of planning
- Guidelines are developed to ensure good practice.

3. INTEGRATED TRANSPORT PLANNING IN QUEENSLAND

3.1 The key transport drivers in Queensland

Key transport drivers for Queensland include land use types and density, population age and growth, industry growth, technological advances, community values and behaviour, government priorities and the physical environment.

3.1.1 Land use

Across Queensland, household sizes are decreasing while the number of households is increasing. In South East Queensland there will be increased density in inner urban areas while there will be increased low density expansion in outer areas and regions.

3.1.2 Demographics

Queensland's population will grow by more than 1.5 million in the period from 1996 to 2021.

Most of the population growth will be in South-East Queensland. As the majority of the population growth will occur in suburban locations there will be an increasing number of jobs outside the CBD. Queensland's population is ageing at more than twice the rate it is growing. By the year 2031, a quarter of Queensland's population will be aged over sixty.

3.1.3 Industry

The highest contribution to Queensland's gross state product comes from primary products and services such as tourism and education with a lower contribution from manufactured goods. Road freight makes up almost 90% of freight movements and road based freight growth is expected to continue. Road-based tourism represents nearly 80% of all tourist trips in Queensland.

3.1.4 Technology

Advances in technology are improving connections and enabling employees and their place of employment, retail and consumer to be separated physically. In Queensland businesses will not need to locate in or around commercial centres. New technology will provide better travel information to allow people to make more informed decisions about their travel behaviour and patterns.

3.1.5 Community

The transport disadvantaged have a lack of access to mainstream private vehicles and mainstream public transport systems do not suit their needs. Part time jobs will increase which will result in more people travelling outside of peak hour. In November 2000, 7% of employed adults in Australia had an agreement with their employer to work from home on an ongoing basis.

3.1.6 Government

Strategies for managing broader impacts are often developed and adopted at the national level such as the National Competition Policy, the National Strategy for Ecologically Sustainable Development and the National Greenhouse Strategy. Transport system outcomes for Queensland

currently align with government priorities, policies, plans and strategies. Changes in the government priorities could affect the transport system. In Queensland the Transport Planning and Coordination Act 1994 sets a framework for strategic transport planning and nominates Queensland Transport as the lead agency for coordinating transport planning in Queensland. The Integrated Planning Act 1997 seeks to further improve integrated planning in Queensland to achieve sustainability by ‘coordinating and integrating local, regional and state planning’.

3.1.7 Environment

Greenhouse gas emissions for the transport sector in Queensland represent 17% of the state’s total greenhouse gas emissions. Queensland has a high rate of car ownership. Over half a million extra vehicles would be registered in Queensland by 2011. Congestion costs in Brisbane are estimated to rise from Aus\$2.6 billion (R11.7 billion) per year in 1995 to Aus\$9.3 billion (R41.9 billion) by 2015, almost a 260% increase. The state and local governments have a strong commitment to the principles of ecologically sustainable development.

Table 1. Impact of Key Drivers on the Transport System.

Key Drivers	Impacts on Transport System
Land use	Dispersed and rural residential land uses increases distance travelled and hence imposes a cost to both system user and provider. More dwellings will lead to increased trip making independent of population levels.
Demographics	An ageing population will result in increased off-peak travel and leisure travel. More people will be accessing suburban shopping centres, recreation facilities and hospitals rather than workplaces. An ageing population will mean an increased demand for safe and accessible public transport. A declining population in rural and regional areas will reduce feasibility of public transport in these areas. It will also affect the planning of services and infrastructure.
Industry	Short-distance, small-load freight services will increase in importance with the changing nature of industry. Just-in-time regional freight and transport nodes will play an increasingly important role. Increasing road based freight will impact on the overall transport system through congestion, safety and the need for improved infrastructure, with an increasing demand on rail. Road-based tourism will increase demand for quality access.
Technology	Intelligent transport systems can reduce travel demand and make more efficient use of existing system capacity.
Community	Changing work patterns present challenges for public transport. If public transport options are inflexible, workers will use their private vehicles for work transport. The increasing number of transport disadvantaged who do not have access to the private motor vehicle either as passenger or driver will increase the demand for alternative transport.
Government	Government priorities value the environment and a better quality of life for Queenslanders. A balanced approach will be required as funding for transport will be limited.
Environment	With increase traffic greenhouse emissions will continue to rise while habitat destruction will continue with increased transport infrastructure requirements.

3.2 Key transport outcomes for Queensland

A key direction in integrated transport planning in Queensland is moving from planning for outputs to planning for transport outcomes.

Key transport outcomes for Queensland include (Queensland Transport Strategic Plan 2001-2005):

- Supporting industry growth
- Improved access and mobility
- Improved safety
- Liveability and community well being
- Environmental responsibility.

These outcomes align with and support those sought by the Australian Transport Council (ATC).

3.2.1 Supporting industry growth

Transport contributes to industry growth by linking investment to industry objectives and connecting people, goods and services. A seamless, coordinated and integrated cross-modal transport system maintains and improve access to productive natural resources, industrial areas, transport terminals such as airports and ports, freight handling facilities, tourist areas and major centres. It also creates employment in the areas of infrastructure development and transport services.

3.2.2 Improved access and mobility

The transport system provides fair access and mobility to communities across Queensland. It provides for the movement of people and goods through a variety of travel and land use choices. Widening travel choices is key to meeting community needs. Improved mobility and access also implies an affordable, equitable and reliable transport system that incorporates continual performance improvements benchmarked against the world's best transport systems.

3.2.3 Improved safety

Several deaths and injuries occur on the transport system annually. Community health can be improved by encouraging safer behaviour and by providing safer transport infrastructure and services.

3.2.4 Liveability and community well-being

Queensland communities have a strong interest in improving residential amenity and creating a sense of place. Regional and local transport systems should facilitate community amenity and liveability. Maintaining a balanced relationship between the function of transport and land use corridors is important to achieving this.

3.2.5 Environmental responsibility

A sustainable transport system should seek to meet the needs of current generations without diminishing or limiting the rights of future generations while actively working to minimise the adverse effects of transport on ecosystems and the environment. This implies minimising land degradation, maintaining biodiversity, reduce emissions and conserving resources and cultural heritage.

3.3 Principles for integrated transport planning in Queensland

Queensland's Integrated Planning Act of 1997 defines ecological sustainability as *a balance that integrates:*

- protection of ecological processes and natural systems at local, regional, state and wider levels;
- economic development; and
- maintenance of the cultural, economic, physical and social well-being of people and communities

In order to achieve a sustainable transport system some key principles needs to be adhered to. These principles can be broadly categorised as those relating to balance, integration and partnerships.

Table 2. Guiding Principles.

Balance	– Support a healthy economy, society and environment for current and future generations
Integration	– Integrate the transport system – Integrate transport and land use – Integrate transport and other planning – Integrate across levels of planning and jurisdictions
Partnership	– Engage and develop effective partnerships across governments, industry and the community

3.4 Improving the integrated transport planning process

3.4.1 Planning levels in Queensland

The integrated transport planning task in Queensland occurs at the following levels:

- statewide
- regional
- local
- route and site.

Statewide planning provides a comprehensive statewide multi-modal perspective to guide transport investment across the state, all modes and agencies to achieve long term sustainable transport outcomes. In Queensland, these include the Transport Coordination Plan 1994 and statewide strategies such as Roads Connecting Queenslanders, Rail Network Strategy for Queensland, Queensland Cycle Strategy and Road Use Management Strategy.

Regional planning identifies transport needs and guide transport investment within a region. It includes planning for an entire region or sub-region, bringing together transport and other regional priorities. Integrated regional transport strategies are transport initiatives that are derived from regional planning processes driven by the department of local government and Planning such as the Central Queensland: A New Millennium and Whitsunday Hinterland and Mackay regional plans.

An integrated regional transport plan contains programs and actions within a defined regional area. These plans normally align with integrated regional transport strategies. A number of these plans have been developed or are under development in Queensland such as the Gladstone Integrated Regional Transport Plan, Mackay Area Integrated Transport Plan and Capricornia Integrated Regional Transport Plan.

Local plans outlines specific transport and land use responses for local areas. These plans are developed by local governments and include actions to address local transport challenges and seek to shape the local transport system to meet existing and future transport needs in a sustainable manner.

Corridor planning focuses on a defined transport corridor and may be aimed at identifying the most suitable mix of transport modes, corridor alignments and supporting actions. Project plans are developed for a specific facility while modal plans focus on a specific mode. Facility plans focus on the development of a specific facility such as a seaport, airport, and transit facility. Commodity or industry specific plans focus on transport issues and demand of a specific industry or activity such as the Cattle Haulage Study and Sugar Industry Transport Study.

Integrated transport planning can also occur across or between these different levels (eg a long-distance corridor study that spans across a number of regions).

The interrelationships between the different levels of planning, levels of government, and sectors are critical in addressing the transport needs of Queensland. Therefore, integration across levels of planning, levels of government and with other sectors is an integral part of successful integrated transport planning.

3.4.2 An integrated transport planning process for Queensland

The Queensland government recognised the need for an integrated planning approach to ensure consistency with its overarching policies and priorities. In 1999 Queensland Transport developed the Draft Integrated Regional Transport Planning Principles. The need for a more comprehensive set of principles across all levels of planning and a consistent approach to integrated transport planning resulted in the development of the Integrated Transport Planning Framework (ITPF) for Queensland in 2002. The development of the Framework is a collaborative approach between the Queensland Departments of Transport and Main Roads and Local Government Association.

Some key issues identified with integrated transport planning in Queensland:

- Integrated transport plans need to be both aspirational (reflecting community desires) and financially responsible. It needs to consider the needs of communities as well as the ability of government to deliver a transport infrastructure and services.
- Planning needs to consider sustainable and responsive transport options. Transport planning can no longer rely on linear predictions but needs to consider a range of possible futures.
- Planning for a future transport system needs to consider accountability. Targets should be set against which the system's performance can be measured. They should be optimistic but also realistic.
- Transport plans need to be dynamic. In order for plans to be 'living' documents they need to include processes to deal with emerging issues and opportunities (Louw, 2002).

A generic, systematic approach was developed (draft) for integrated transport planning to achieve good transport system outcomes.

The process can broadly be divided into five core steps:

- Initiate planning
- Analyse transport system
- Analyse options
- Develop preferred option
- Implement option.

In addition to the five core steps there are two iterative processes:

- Engaging and building partnerships with key stakeholders and the community
- Monitoring and review of the integrated transport planning process and the transport system.

The process can be applied to transport planning of:

- Different types of planning; such as strategic planning, development planning and operational planning
- Different levels; such as state, regional, local and route or site
- Different areas; such as urban, rural or remote areas.

3.5 The Capricornia Integrated Regional Transport Plan

3.5.1 Background

The development of the Capricornia Integrated Transport Plan (CapIRTP) parallel to the ITPF provided an opportunity to incorporate and test the suggested approach to integrated transport planning in Queensland.

The CapIRTP study area incorporates the local government areas of Rockhampton City and Livingstone, Fitzroy and Mount Morgan Shires, all located in the central region of Queensland.

Population growth in the study area has generally been low apart from along the Capricorn Coast. Like the rest of Australia the study area shows an aging population.

Car ownership has increased in the area since the 1996 census. About 90% of all households own cars. This represents an increase of 2% since the 1996 census. The level of car ownership reflects the proportional mode choice for trips to work. Almost 85% of all trips to work are by car. There has been a decrease in walking, cycling and use of public transport since 1996 census.

The CapIRTP includes a vision statement, guiding principles, planning assumptions and a range of actions plans. The vision for the CapIRTP study area provides for a 'A high quality, safe and efficient transport system for the CapIRTP study area that is responsive towards meeting regional growth up to 2030'.

The CapIRTP includes planning assumptions based on the key drivers in the region such as

- Population distribution and growth
- Economic development and employment
- Land use development
- Transport providers, regulatory environment and funding.

The CapIRTP focus on achievable outcomes required to deliver sustainable transport for the CapIRTP study area. The plan includes principles to guide future transport relating to

- Integrated transport planning
- Economic efficiency and growth
- Environmentally sustainable
- Equity, employment and social justice.

The project was managed by a steering committee and developed by a technical committee consisting of key stakeholders. Community involvement was paramount in the development of the plan.

3.5.2 New directions for CapIRTP

The need to develop a 'responsive' transport system that necessitated investigations into futures other than that derived from past trends.

The two major challenges faced included:

- how to get stakeholder buy-in for the process. This is especially difficult given the understandably short term focus of many of the stakeholders; and
- how to actually apply the scenarios in ways that added value to the planning exercise (Louw and Mailloux, 2003).

The first step in the process was to convince local and state government stakeholders about the value of scenario planning in the transport planning process. This was achieved in two ways: firstly, by making the stakeholders aware of the uncertainty of future industrial development and how they could not predict future transport demand and secondly by showing how scenario planning acts as a strategic risk management tool for managing just this kind of risk.

The CapIRTP includes targets for each mode of travel. Targets were set for various travel demand measures. These targets were based on a broad analysis of the current state of the transport system and past trends. The targets were realistic and agreed by key stakeholders.

The plan includes a range of actions. The actions can be divided into three broad categories:

- Those aligning with community aspirations
- Those required to attain a suitable level of service for the transport system
- Those that can realistically be delivered within the context of available funding.

The CapIRTP actions include the necessary processes to ensure ongoing monitoring and review of the transport system and the plan itself. It proposes an implementation committee to oversee implementation and monitoring of the plan.

4. CONCLUSION

Changes in key transport system drivers have altered the way in which we conduct integrated transport planning. The focus is on the delivery of sustainable transport outcomes rather than transport outputs. The integrated transport planning process needs to be holistic, involve all stakeholders and applicable for all levels of planning. To ensure consistent and good practice, guidelines need to be developed. These guidelines need to be consistent with government priorities and policies.

Queensland government realised the need for a comprehensive framework for integrated transport planning. Development of the framework is a collaborative approach that includes both transport and land use planning agencies. The framework broadly provides an overview of possible outcomes for the transport system and planning. It also provides principles to ensure delivery of these outcomes. The planning process included in the framework provides for a good practice approach to integrated transport planning.

Not only has the suggested planning process been benchmarked against those in other states and internationally but also tested in current transport planning processes in Queensland. Key changes were introduced in the CapIRTP process. The changes provided those involved not only with direction but a transparent process and an improved understanding of the transport system as a whole.

5. REFERENCES

- [1] IIEC, 1996. Integrated Transport Planning. International Institute for Energy Conservation Publication.
- [2] Louw, J, 2002. Integrated transport planning: past, present and future. IEAust Regional Transport Challenges in Central Queensland Conference.
- [3] Louw, J and Mailloux, M, 2003. Using scenarios in regional transport planning. ARRB conference.
- [4] May, AD, 1991. Integrated transport strategies: a new approach to urban transport policy formulation in the U.K. Institute for Transport Studies, Transport Reviews, Vol. 11, No. 2, pp.223-247.
- [5] OECD, 1997. Towards Sustainable Transport. The Vancouver Conference, OECD Publications, Paris.
- [6] Queensland Transport Strategic Plan 2001 – 2005, p12.
- [7] Westerman, HL, 1998. Cities for Tomorrow: Integrating land use, transport and the environment. Austroads publication.

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Biography

Johan Louw is the Regional Manager Integrated Transport Planning for Central Queensland. He is the chairperson of Mackay and Gladstone transport implementation committees and Project Manager of the Integrated Transport Planning Framework for Queensland. He is a leading authority in the area of scenario planning in Australia.

Johan plays a leading role in promoting improved integrated transport planning practice at Central Queensland University. He is currently nominated for the Queensland State Achievement and Excellence Awards for his work on scenario planning. He also serves on various development boards.

Johan has also held the roles of Director (Regional Transport Planning) and Regional Director.