Public transport developments in integrated transport and land use planning in the three largest Australian cities

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Abstract

The feedback relationship between land use and the transport system is well understood by transport engineers and planners. However, in the traditional urban transport planning process, the impact of land use on transport (travel demand) has been taken into account but the feedback of the transport system on land use has largely been ignored. The traditional planning process is based on the premise that capacity requirements of urban transport networks should be dimensioned to meet predicted demand as a result of changes in socio-economic factors and planned land use changes (1950s-70s). No effort is made to incorporate the effect of transport system developments on land use. However, the current thinking in the urban transport planning process emphasises an integrated framework. In recent plan developments, the emphasis is on sustainable urban transport and represents a considerable shift in the treatment of transport modes and land use in the planning process. Transport plans are becoming an integral part of the strategic plans for improving the quality of life and liveability in the cities. In this paper, the salient shifts in objectives and processes are brought out through detailed examination of the urban transport plans of three largest Australian cities (Brisbane 2002-16), Melbourne (2030) and Sydney (2010). These recent plans are based around the integrated transport-land use framework. The translation of the objectives of integrated transport and land use plan on public transport developments and infrastructure investment is highlighted.

Keywords: transport planning, land use, integrated framework, public transport system, Australia, transport infrastructure.
1 Introduction

The traditional urban transport planning (UTP) process dating back to the 1950’s was based on the premise that capacity requirements of urban transport networks should be dimensioned to meet predicted demand. Travel demand was related to population, employment socio-economic characteristics and land-use. The four-step travel demand forecasting process was developed as a part of the Chicago Area Transport Study (CATS). It entailed the collection of large sets of data, analysis of data by digital computers, development of models for sequential travel choice process, predicting travel demand using these models, and evaluating alternative transport plans proposed to meet the predicted demand.

Transport systems management since late 1970’s stressed better use of existing systems, developing short-term projects for transport system improvements and managing travel demand.

However, the failure of integrating land use and transport planning in cities and the absence of explicit link between transport system and land use has resulted in a declining share of public transport and ever increasing dominance of car mode. Most cities have witnessed a significant decline of urban amenities and accessibility for many of their residents. The ever-expanding urban road transport system has been accompanied by astronomical community costs in road fatalities and injuries, congestion, massive capital investment and environmental degradation.

It is rare to see the large UTP exercises of CATS era in recent times. Transport plans are becoming integrated part of the strategic plans on improving the quality of life and liveability in our cities. Specific goals include reducing reliance on private car, increasing public transport share of urban travel, providing for cyclists and walkers, improving environmental quality, ensuring sustainability and enhancing residential amenity.

The objectives and processes of urban transport planning have undergone significant transformation. The emphasis is on sustainable urban transport. Revival of public transport and development of cycling strategies are given major emphasis in the process. The recent transport plans aim towards achieving higher target shares of non-car modes. Transport investments for improving and expanding public transport infrastructure and services are getting a greater share of the total transport expenditure than over the past half a century. This should facilitate the achievement of target modal shares. The overall objectives are to improve the amenity and liveability in cities, maintain or improve the environmental quality, and achieve sustainable urban transport systems.

2 Integrated transport planning

Queensland Transport [1] has defined integrated transport planning as a process to identify current and future access needs – for people, places, goods and services – and inform decision-makers on ways to manage the transport system and land use to best address these needs. It aims to do this in a way that sustains
economic growth, conserves the environment and supports the quality of life of current and future generations.

Integrated transport planning includes
(1) integrating the transport system
(2) integrating transport and land use, and
(3) integrating transport and other planning.

Integrating the transport system requires the integration of infrastructure and services across all modes to create an interconnected and coordinated transport system thus providing real travel choices for people and goods. Integrating transport and land use strives to match land use activity, location, densities and design with transport routes and services to ensure efficiency, connectivity and amenity. It anticipates and influences transport needs and impacts of future developments. Transport decisions must be made in cognizance of other planning and priorities of industry and governments.

The relationships between land use and transport networks have a fundamental influence on the overall level of demand for travel, patronage of various travel modes, accessibility, travel distances and costs of travel, as well as the ongoing cost of providing essential infrastructure and services. It is, therefore, crucial that decisions about transport and land use should be considered together. Transport and land use planning must work together to develop a coordinated and integrated transport network.

2.1 Transport and land use linkage

Transport is the consequence of spatial separation of different types of land use in an urban area. At the same time, improved accessibility resulting from transport network can lead to increased separation and changes in the nature of land use. This fundamental relationship between transport and land use produces the movement and traffic flow patterns seen in cities. The accessibility of places has a major impact on land values and shapes the land use pattern. Unfortunately, transport and land development decisions have all too often been regarded as distinctly separate issues in analysis, planning, design and evaluation. Disregard of this crucial link has contributed to adverse consequences of transport and imposed significant costs to community. It is, therefore, imperative that this link must be explicitly considered in transport planning for cities.

2.2 Integrated transport planning framework – Queensland Transport

Queensland Transport has taken a lead role in land use planning to ensure that urban and regional development is environmentally, socially and economically sustainable.

The Integrated Transport Planning Framework is a guide for transport planning in Queensland. It sets out a collaborative, consistent and sustainable approach to transport planning. It is a tool for transport and land use planners and decision makers in state and local government and industry offering 'hands on' advice for integrated transport planning across urban, rural and remote...
locations. It is a joint initiative of Queensland Transport, Department of Main Roads, Department of Local Government and Planning and the Local Government Association of Queensland.

The framework aims to facilitate good-practice transport planning. It does this by setting out:

(a) Desired outcomes that provide a consistent framework to focus planning on achieving good outcomes for the community and the transport system.

(b) Directions and principles that provide guidance on how to achieve the desired outcomes and

(c) Planning steps that offer a process to follow when undertaking integrated transport planning.

The framework recognises sustainability, integration and partnerships as the foundations of successful integrated transport planning as shown in Figure 1.

![Figure 1: Integrated transport planning framework. Source: Queensland Transport, 2003](image)

Transport and land use are managed to create a preferred urban form that increases accessibility and connectivity, and supports sustainable travel behaviour.

### 2.3 Integrated transport planning framework – New South Wales Government

Planning guidelines for improving travel choices and managing travel demand to improve the environment, accessibility and liveability have been jointly prepared by Transport NSW, the Department of Urban Affairs and Planning and the NSW Roads and Traffic Authority. The integrated land use and transport planning policy, released by the NSW government on 11 September 2001 [2], aims to:
• improve access to housing, jobs and services by walking, cycling and public transport
• increase the choice of available transport and reduce reliance on cars
• encourage people to travel shorter distances and make fewer trips
• support the viable operation of public transport services
• provide for the efficient movement of freight.

3 Integrated transport land use plans for the three largest Australian cities

The recent transport plans for the three largest Australian cities are reviewed in this section. The key differences between current and the traditional transport planning process are in the areas of reducing the dominance of private car and increasing real travel options with a view to increasing the use of sustainable modes and greater emphasis on environmental quality. To achieve these goals, governments are allocating a greater share of transport finances to expand public transport infrastructure and services.

Each of these cities anticipates increase in the share of public transport modes. For example, in Melbourne, the share of public transport modes is planned to increase from the current 9% to 20% by 2020 (20/20 plan), and Brisbane expects to double the share of public transport during the plan period from 7 to 14%. Sydney is also planning for major growth in public transport patronage.

3.1 Transport plan for Sydney: Action for Transport 2010

A key action plan for Sydney 2010 [3] is to integrate future urban development in Sydney with the expansion of the city’s public transport services and infrastructure. New developments are to be provided with equitable access to roads. Sydney’s action plan targets

i reducing traffic congestion
ii improving air quality
iii reducing greenhouse emissions
iv increasing public transport use
v expanding CityRail capacity
vi making freight more competitive, and
vii improving road safety.

In recent years, Sydney’s residential and employment growth has moved beyond the transport network and people have found it difficult to get around without a car. In other words, the land use (urban development) and transport network have lost integration and are not in unison. The integrated transport and land use approach being adopted in Sydney 2010 plan will focus new developments in existing transport corridors and at major centres. Sydney will reserve corridors for new transport facilities and guide future urban growth.

Redevelopment of the inner harbour-side suburbs of Pyrmont and Ultimo was planned at the same time as building the light rail to service the growing
population, new workplaces and entertainment venues. The Airport Line is regenerating existing suburbs. New housing and jobs are being planned around the stations at Green Square, Mascot, and Wolli Creek. The regional Environmental Plan for Parramatta – Sydney’s second centre – combines new land use planning, heritage, economic development and transport initiatives such as the Liverpool to Parramatta transitway and the Parramatta Rail Link. Similar integrated plans are being followed in several other areas in Sydney such as Penrith, Liverpool, Blacktown, North Ryde/Macquarie etc. These developments clearly demonstrate the success of an integrated transport and land use approach. The integrated transport land use plan will result in major new railways and bus only transitways and not just more roads for private car.

3.2 Transport plan for Melbourne: Melbourne 2030

Melbourne 2030 [4] is a blueprint for the future of the second largest city in Australia. It addresses questions like what sort of city would Melbourne be like? how will people travel around it? how will travel choices available to them be increased?, which suburbs will grow and what kind of houses will people want? how can the city be planned better so the transportation systems are efficient and ‘green’? how can improved transport systems help build communities and enhance the quality of life for Melbournians? In the consultation process for Melbourne 2030, transport emerged as a dominant theme.

Melbourne 2030 proposes to integrate land use and transport policies around activity centers to create a balanced and workable city. The focus has shifted from expansion on city’s perimeter, requiring major new infrastructure, to urban consolidation and better use of existing transport resources. It has a strong emphasis on integrated transport and land use planning. It recognizes that the location of community activities should be as widely accessible as possible. Melbourne 2030 provides for better transport links with priority on public transport network through following policies:

(a) Upgrade and principal public transport network and local public transport services to connect activity centers and link Melbourne to the regional cities.
(b) Improve the operation of existing public transport network with faster, more reliable and efficient on-road and rail public transport
(c) Coordinate development of all transport modes to provide a comprehensive transport system
(d) Manage the road system to achieve integration, choice and balance by developing an efficient and safe network and making the most of existing infrastructure.

Other integrated transport land use planning initiatives include making jobs and community services more accessible, giving priority to cycling and walking, and promoting the use of sustainable personal transport options. Integrated transport and land use strategies will target additional development in areas that are highly accessible to the public transport system and to principal public transport network.
3.3 Transport planning in Brisbane, 2002-2016

Brisbane is the third largest city in Australia after Sydney and Melbourne. The rapid growth of this vibrant city has made traffic and transport as one of the most important issues. It recognises that the current travel behaviour in Brisbane is not sustainable. The share of public transport has continued to decline as a direct result of the increasing dispersed population and employment and an increasing dependence on the private vehicle. Brisbane has now planned to year 2016 to provide a reliable and efficient transport system.

In 1998, the Brisbane City Council launched its five-year integrated transport strategy and delivered a number of major projects. The Transport Plan for Brisbane 2002-2016 [5] has been developed as an integrated Local Transport Plan under the objectives of the Integrated Regional Transport Plan. It continues to pursue the integrated transport strategy of 1998. The objectives include the coordination of transport and land use, developing sustainable transport system, and providing for pedestrian and cyclists. The Transport Plan sets focused targets for public transport patronage and an acceptable level of service on roads. It is aimed to provide for increased accessibility to employment, entertainment, medical, education and community facilities. To this end, Brisbane will be providing the community with more travel choices – flexible, high quality public transport services, more bike and walking paths, and better connected roads as part of an integrated transport solution.

The outcome of Brisbane Transport Plan 2002-2016 is ‘a vibrant and prosperous Brisbane, where all people have high quality access to facilities and services, while the city’s environmental quality and liveability are maintained’. Some key features of this plan include

(a) Reliable, frequent public transport to improve accessibility and reduce private car use by providing viable alternatives
(b) Balancing road capacity by taking existing lanes for bus lanes, bus priority measures, and bike lanes
(c) Better land use integration with transport to encourage more people to live closer to public transport interchanges and use public transport.

4 Emphasis on public transport development in integrated transport and land use plans

Integrated transport and land use planning requires massive investments in public transport infrastructure and expansion of the network to new developments and those poorly serviced by public transport at present. It is believed that these investments will facilitate the achievement of the focused targets on modal shares and to contribute to sustainable urban transport systems.
4.1 Public transport developments in Sydney

Sydney claims to have one of the largest and best public transport systems in the world providing excellent value for money. Major public transport modes include CityRail, Sydney buses, private buses, ferries, light rail and taxis. The public transport network has been, however, outgrown by rapid urban development and overtaken by car use. Under the integrated transport and land use framework, the Sydney Transport Plan incorporates major construction projects for new rail, light rail, rapid bus only transitways and cross regional bus services. Some of the significant public transport infrastructure projects included in Sydney 2010 plan are the following:

*(a) Rapid Bus Only Transitways*
- Liverpool to Parramatta
- Parramatta to Strathfield
- St. Mary to Penrith
- Parramatta to Blacktown
- Blacktown to Castle Hill
- Blacktown to Wetherill Park
- Parramatta to Mungerie Park

*(b) Heavy Rail*
- Airport line
- Bondi Beach Railway
- Parramatta Rail Link to Epping and Chatswood
- Hornsby to Newcastle High Speed Rail
- North West Rail Link Epping to Castle Hill
- Hurtsville to Strathfield Railway
- Liverpool Y Link

*(c) Light Rail*
- To Lilyfield

The New South Wales Government proposes to spend $300 million a year over the next 12 years just on new rail projects. Rapid bus only transitways will be funded from the annual urban roads budget.

4.2 Public transport development in Melbourne

Melbourne 2030 addresses key weaknesses in transport system – the shortage of quality bus routes that link activity centers and complement the radial train and tram services.

The Victorian Government is committed to providing a more sustainable transport system that offers genuine options to travellers. Melbourne 2030 supports real transport choices for most residents and aims to increase the number of people who use public transport, cycle or walk. The report recognizes that a better balance of use between private and public transport is required and substantial improvements in public transport system are needed. These must be supported by incentives that favour public transport and better information to users on the choices available and implications of making those choices.
The public transport system in and around metropolitan Melbourne will be expanded, resourced and promoted accordingly.

Major upgrades in public transport capability are proposed to be achieved through the establishment of a Principal Public Transport Network by building on existing train and tram services, and creating new cross-town bus services between the principal and major activity centres in metropolitan Melbourne. Local public transport services will be improved, particularly bus services with a key focus on improvement in middle and outer Melbourne areas. The impending capacity constraints in the inner area will also be focussed.

The five existing Transit Cities at Frankston, Dandenong, Ringwood, Sydenham and Footscray, will be complemented by four new ones at Box Hill, Epping, Broadmeadows and Werribee. Many high-density development and improved public transport access projects are planned and being implemented.

Public transport services and interchanges at ‘stand-alone’ shopping centres including the Frankston line and Southland Shopping Centre, tram and bus services at Airport West and Highpoint, and bus services at Chadstone and Doncaster are to be improved.

4.3 Public transport developments in Brisbane

In Brisbane, public transport would receive 51% and the road network (including bikeways) would receive 49% of the anticipated expenditure of about $16.6 billion over 15 years (2002-2016). Of this, six billion dollars will be spent in operating or capital subsidies. This even split is indicative of the balanced transport system proposed in the Brisbane transport plan. About 80% of all government spending is proposed to be used to improve public transport infrastructure and services, road maintenance and minor road upgrades. Major road projects will be funded predominantly by road user tolls. Expenditure on public transport infrastructure is expected to be $2,434 million over the 15-year plan period.

Since adopting the integrated transport strategy “Evolution in motion” in 1998, the Brisbane City Council and the Queensland State Government have delivered several major projects targeting improvements to public transport infrastructure and services. These have included Coronation Drive and Waterworks Road transit lanes, Inner Northern Busway, the South East Busway and up to 500 low-floor, air-conditioned, compressed Natural Gas buses.

The Brisbane Busway Strategy, a key component of Brisbane’s long-term transport future, has the following components:

i South East Busway
ii Inner Northern Busway
iii Green Bridge between University of Queensland and Dutton Park
iv Bus Link connecting South East Busway to at Buranda interchange to Green Bridge
v Northern Busway from Royal Brisbane Hospital to Kedron
vi Eastern Busway

Rail projects include the second CBD crossing and the extension of commuter rail line into Greenbank within the Brisbane-Sydney Rail Corridor.
5 Conclusions

The most recent transport plans for the three largest cities in Australia referred to in this paper place very strong emphasis on integrated transport and land use planning. Urban development and transport network in many cities in the world have gone their separate ways and have lacked coordination and integration. This had drastic consequences – heavy reliance on cars, decline of public transport, continually increasing congestion, environmental degradation, accidents and casualties, and depletion of scarce non-renewable resources.

The integration of transport and land use helps to better coordinate urban development and transport networks. It increases access to and connectivity within a high quality transport network. It encourages movement by all modes – walking, cycling, public transport or car - resulting in sustainable travel behaviour that is also quick and efficient.

The principal goal of integrated transport and land use planning is an efficient, safe and sustainable urban transport system. This must enhance the accessibility of community activities to all people, reduce reliance on private motor car and increase modal shares of public transport, cycling and walking, maintain environmental quality, and improve the amenities and quality of life in cities. These outcomes require massive investments in public transport infrastructure and services. The recent transport plans of the three largest cities in Australia clearly demonstrate that transport planning is being integrated with land use planning with massive investments in public transport development.

References