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MONASH University

Meeting the accessibility needs of urban communities through strategic route planning

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ABSTRACT

Rail infrastructure within urban communities within Australia is capacity constrained. Today, cities are committing to major rail improvements to meet current demand recognising the modes sustainability and efficiency credentials. The introductions of new rail services are often constrained by high initial costs. Today we need to start planning for the next generation of rail networks which will be delivered beyond 2035. The manner in which we approach this task will determine the success of such schemes years from now.

In many cases, future rail services require better infrastructure and possibly new routes all of which have a design life in excess of 100 years. This infrastructure must be developed in a way which recognises demand and predicts how the requirement for rail services will change over the next half a century or more. New infrastructure for future services must be paid for in advance. Political pragmatism and financial constraints have often constrained rail enhancement projects and they remain today part of a 'catch up process'.

The paper argues that establishing an agreed strategic process within which infrastructure enhancements can be planned is a pre requisite to installing confidence in future rail service provision and facilitating future urban development.

1. Introduction

Rail has the potential to assist with many of the current and future urban transport issues facing Australia today. The demand for transport must be set against a backdrop of rising oil prices, energy security and sustainability. Rail has a natural competitive advantage in the delivery of urban transport solutions and can significantly enhance the quality of provision.

The long term planning of rail services is often perceived as being complex and difficult. It is often hindered by organisations failing to provide sufficient distinction between service delivery and strategic network development. Globally, rail is recognised as having clear advantages but the development of new systems requires excellent strategic and long term planning.

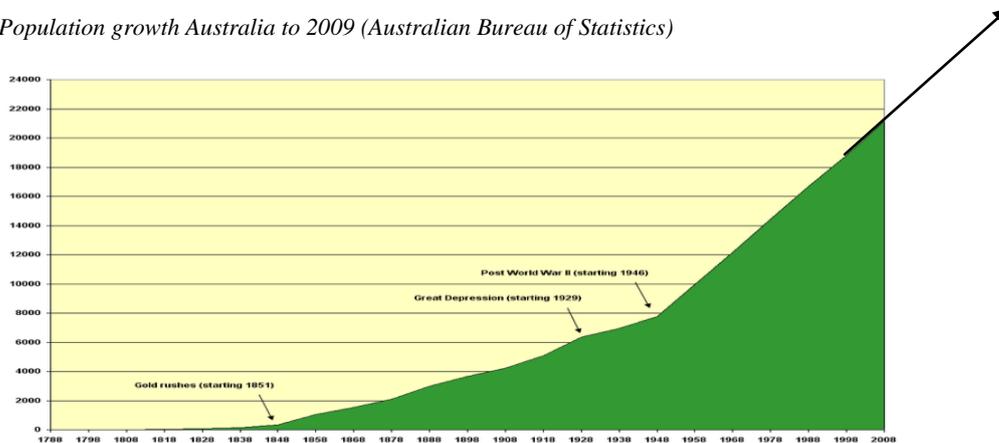
If long term rail planning is going to be able to effectively address the mobility needs of urban communities, a structured and regulated approach must be adopted which has wide stakeholder acceptance, is transparent and is a constituent part of the wider urban planning process.

2. The role of passenger rail within an urban environment

Australia, like most developed and developing countries around the world is experiencing a rapid growth in its cities. By 2050, most Australians will live in or in close proximity to our five major

capital cities. Despite the much heralded internet revolution, people still need to live in close proximity to their work and community. The concentration of business and people within growing cities should not surprise us nor should we be unduly concerned. It is of course economically logical that people and firms should want to concentrate their activities in a way which minimises cost and maximises utility.

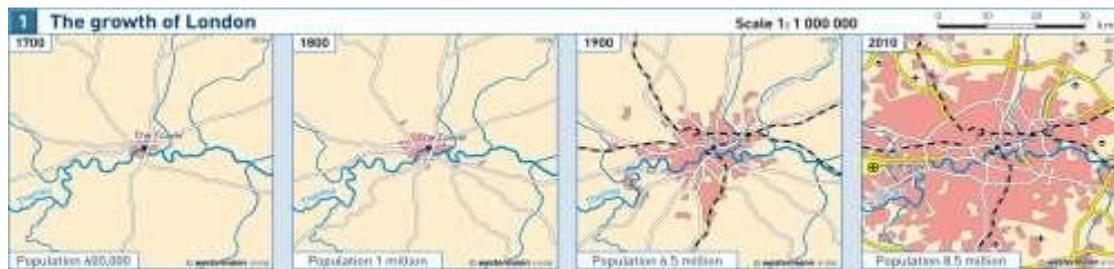
Population growth Australia to 2009 (Australian Bureau of Statistics)



Over the last 50 years Sydney has grown in size from around 2 million people to nearly 5 million today and by 2056, it is expected to reach 7.5 million. Brisbane is expected to see similar growth trends with the population estimated to reach just under 5 million people by 2056. Such growth is sustainable but only if the mobility of people and goods is sustained both within the urban area and on inter urban feeder networks. Many today argue that this growth and the associated change in land use have been undertaken without reference to the strategic provision of public transport services. The difficulties we face today in terms of delivering urban mobility reflects the challenge in linking together land use and transport planning. Although there is some credence to this argument, a simple examination of the experiences of cities around the world suggest most urban areas face the same challenge and that the problem may indeed be more complex.

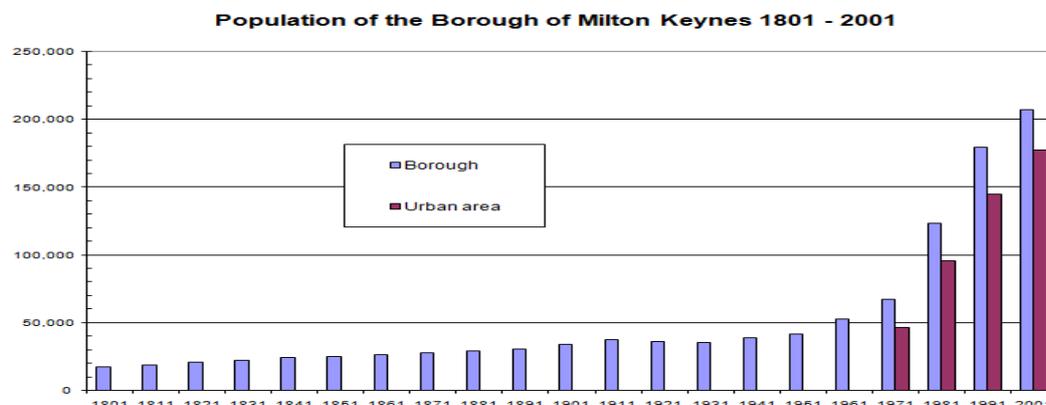
Rail has been at the heart of the debate on the delivery of urban transport solutions since their first inception. Indeed it was the initial functionality of railways in the 19th century which allowed major urban areas to expand to produce many of the modern metropolises we see today. Cities will always be limited in size by their ability to support their population. Railways were able to not only facilitate the transportation of goods into the urban areas but they also delivered exceptional standards of people mobility. Throughout the world, railways and then roads have allowed cities both to increase in population but also to expand in terms of geographical coverage.

One of the key features of city growth is the emergence of major centres within urban areas but often outside the CBD. These new centres are growing in importance and contribute directly to the success of the urban area as a whole. This phenomenon is not new. London consists of a number of significant central areas often specialising in activities. The City and Docklands focuses on business, the west end is driven by leisure activities and Westminster is the central administration area. Their collective success is almost totally due to the provision of effective transportation systems, most notably rail.



The rail mode of transport is uniquely suitable to urban transportation. Rail is able to move large numbers of people within dedicated corridors in a controlled manner very quickly. Rail is at its best when it is able to provide services to well populated area. It is of course no surprise to note that growth hot spots in many of our urban areas are close to major rail networks. This observation highlights the advantages of rail systems as perceived by users. They are recognised as being reliable and trust worthy. Because rail operates against a timetable, consumers feel more confident about using services particularly with modern passenger information systems. In most cases, the service offer is defined by higher overall speeds without the need to consider road congestion. Service frequency is often set at a level which frees the user from the need to consult timetables and access to central city locations is generally assured. It could be argued that those who have access to urban rail services are well served. It is therefore not surprising to note that regional and local authorities will argue strongly in favour of developing rail links. They recognise the substantial economic benefits which will accrue to their areas through greater connectivity with central urban locations

Global experience tells us that when urban planning is linked to the development of rail services, the results are almost always successful in the long term. The principle differentiator between schemes appears to be it the length of time it takes for the new services to become fully integrated within consumers transport demand profile. The ability of rail to connect urban areas and deliver the economic and social benefits both to the individual and the community are clear to see. These benefits can be defined in terms of enhancements to the employment opportunities either without or within the area and a growth in business within the area. New rail links gives access to wider employment markets driving up the spending power of the community and acting as seed corn wealth generation within the local area. An excellent example here from the United Kingdom is Milton Keynes. Just over 40 years ago, Milton Keynes was a small town of 30,000 inhabitants, 73 km from London. A new city was created with excellent rail links to the capital. Today the population is fast approaching 250,000 and the city is regarded as one of the most prosperous locations in the UK. Much of this success must be attributed to its connectivity with the capital.



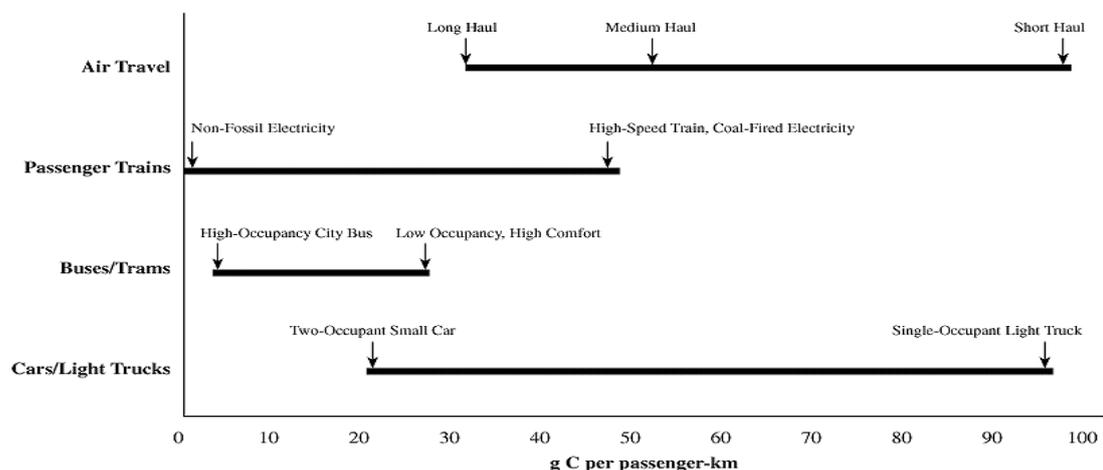
The ability of railway systems to open up new areas to urban development and to work hand in hand

with land use planners is recognised by policy makers both today and since their inception. In the absence of formal planning structures, the railways would make use of market forces to developed urban areas. Throughout the history of railways, it was not uncommon for promoters to acquire land on which new urban areas would be constructed. A symbiotic relationship between transport service providers and urban developers has been responsible for many urban railways in existence today. Leaving the development of our major cities to market forces to market forces may not represent the most efficient way within which we sustain future development. Market forces are still involved however and one of the biggest challenges we face today is how to extract the external value of transport schemes. How is it possible to capture long term increases in the value of private property in proximity to new transport schemes?

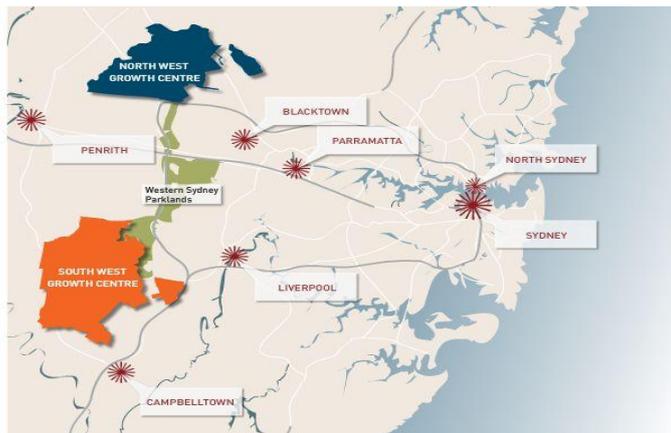
3. The challenges faced by rail in the delivery of urban transport mobility

Over the next 30 years, the urban mobility challenge will be to meet a growing transport demand (both in terms of quality and volume) and to cater for changes in modal use. In particular, the requirement to move towards more sustainable modes represents one of the biggest challenges facing Australian urban communities. It is highly likely that the real cost of oil based products including petrol will rise significantly in real terms over the next 10 years. Further issues surrounding energy security will also become more apparent. The impact on the way our cities operate will be significant and Australia with its high reliance on vehicle transportation in urban areas is particularly vulnerable. Rail, as a relatively sustainable mode will increasingly have a greater role to play in the urban environments of the future.

Rail emissions relative to other modes



If rail is such a potent solution for delivering urban transport mobility, why is it that today we see cities in Australia and throughout the world struggling to define the role rail can play and failing to articulate sustainable transportation solutions with realistic rail based methodologies? Close to home, we do not have to go far to witness existing systems struggling to cater for growing demand. We see scheme plans change with the arrival of new political administrations and we witness the birth and death of new institutions charged with delivery. This is set against a backdrop of increasing populations relying to a greater extent on fully functioning cities.

Sydney growth areas and centres

The initial question to address is should this be perceived as a failure or part of the normal planning process? In general transport infrastructure expenditure in Australia is starting to catch up following a real decline in the latter decades of the twentieth century. New rail schemes are now being planned and starting to come on line. Recent developments in Perth, Sydney, Melbourne, Adelaide and Sydney are testimonial to this policy. They represent an attempt to both plan for the future and to meet a known and present demand for transportation services. In this context, failure is now a not a word which should be considered. Excellent as these schemes are however, the question must be asked both here in Australia and on a global basis, has enough been done to meet future urban mobility challenges?

Rail faces a range of challenges when it comes to integrating strategic modal development with long term land use and spatial planning. The causes are long and complex however the following points may provide some insight.

- The rail mode of transport grew in tandem with of city growth. The core networks in use today were established in some cases over 100 years ago. Subsequent piecemeal developments make changing how these networks are used, extremely difficult.
- Rail assets have a life of over 100 years for infrastructure and over 30 for other systems. Their gestation can also be long with a typical railway programme taking over 15 years to deliver. Predicting what demand these assets will need to serve 50 years from now is almost impossible. Early railways were fortunate because engineers did not fully understand tolerances; surplus capacity was often built into the system. This has carried many railways and allowed them to cater for rising demand. Today, systems are built with much finer tolerances and their capability to absorb a growth in capacity demand will be strictly in line with their initial development plans. Today rail planners have to address the vexed question of how much additional surplus capacity to build in to a new system to cater for an unknown demand some 50 years from now.
- Railway systems are expensive. Compared to other integrated forms of transport their capital requirements can be seen as excessive. This often leads to reluctance on behalf of funders to engage in such schemes when alternative provision can be made in the short term by other modes. It is also noted that the benefits of investing in new rail may be politically unattractive if it is not being undertaken to solve an immediate need. There are no votes in building a rail system which will provide services in 20 years time.

- Railway management and their political overseers often focus on short term delivery issues. A culture where the importance of daily delivery is stressed is essential. Such a culture must not however be at the expense of ensuring that there is widespread community and political buy in to the importance of strategically planning rail services and their associated development. Such confusion is often evidenced in the blurring of financing between that for operational expenditure and that allocated for future capital requirements.
- Strategic planning of the rail network cannot be taken in isolation. It requires widespread stakeholder acceptance, a clear and consistent vision and clarity of role and purpose. Too often, strategic rail planning is sub optimised because there is a lack of organisational accountability or responsibility. Groups operating within the public sector are often subject to change, reorganisation and alteration of political priorities. In such environments, it is not surprising that in the past, long term strategic rail planning is often not perceived as an imperative.
- The final key issue which has merit for discussion the lack of appetite for risk. Providing long term funding for rail investment will always be challenge irrespective if it is privately or publicly sourced. Business investment risks can to a major extent be controlled when there is a clear understanding as to why the investments are required to be made. For a railway, there is a fundamental need to understand;
 - current network capability in terms of its ability to meet demands as defined by capacity, performance and cost
 - what the current demand for network capability is and how this will change over the planning period
 - the areas where capacity shortfalls will occur over the planning period and the associated identification of relevant mitigation measures

A failure to adequately address these issues will significantly impede the long term strategic planning process.

4. Aligning land use planning with rail network development

Who understands the rail industry? A question frequently asked but often not answered. Railways are often perceived as being difficult to understand and sometimes reluctant to engage in dialogue. A history of close public scrutiny linked to a strong delivery culture has made rail organisations appear sometimes remote from market pressures and the long term drivers of demand. Rail is however simply one mode amongst a mix of transport modes which deliver mobility. Strategic land use planners understand rail capability in the same way as other modes. Rail planners must also understand the role of the mode, not simply in railway terms but how it fits into the wider strategic picture.

Recognising that railway development plans are a component part of a wider urban strategic plan may seem simplistic. Often however the grandiose integrated transport plans developed by many of our cities at great expense have not adequately addressed how land use planning fits together with rail transport planning. Excellent and well conceived strategies fail to address the institutional required to achieve successful long term implementation. Critical to this is providing the policies and tactical actions which incorporates rail within an overall long term land use planning process. As part of the institutional responses, providing clarity as to the role of constituent bodies in the delivery of long

term urban land use and transport plans must be seen as a pre requisite to success.

Defining future demand for rail services will always be subject to risk and often controversy. Most demand predictions become highly unreliable within a 15 to 20 year time frame yet it is precisely these predictions which are used to justify from a business perspective the viability of a 100 year rail development. Transport infrastructure schemes are often seen as being over evaluated from a business perspective. This is certainly true and has often resulted in potential transport solutions being abandoned. Whilst it should never be the case that transport investment appraisal criteria could abandon financial evaluation, a balance needs to be struck between the way risk is managed and how unquantifiable strategic benefits are accounted for.

Recognising that rail is an integral but not unique part of a long term land use strategy and ensuring that adequate institutional frameworks are defined within which future system capability requirements is essential. Importantly, planners must ensure that in aligning land use and rail plans, all bodies share a common vision and this is reflected in a common process, terminology and implementation timescales. A failure to align any one of these criteria would result in sub optimal plans being developed.

5. Defining the rail planning process

Railways are complex but deliver a simple product. Long term service provision is dependent on the availability of rail infrastructure capacity. In most long term strategic rail plans, schemes are proposed which change capacity provision. Schemes proposing changes to rail capacity (a new line or junction for example) make the assumption that existing capacity is not sufficient and that only by constructing new and expensive infrastructure can the railway network deliver enhanced long term train services. It is only in the last 15 years that railway networks have been able to accurately measure and model infrastructure capacity. New systems now allow rail planners to more accurately identify long term capacity shortfall, options for maximising existing infrastructure utilisation and provide justification for required enhancements. Long term strategic rail planning will benefit from a standardisation of rail modelling tools and developing linkages to overall planning processes. Above all, rail investment needs to be aligned to long term demand and to do this, the industry as a pre requisite must understand the fundamental characteristics of current capability and future requirements.

Only when current and future capability requirements are fully understood can the options for the integration of rail plans into strategic land use planning be considered. In recognising the strategic nature of land use planning, rail capital investment decisions will need to be traded against alternative modes and alternative land strategies. The high cost of rail investment cannot be seen in isolation and as such, if long term benefits are not sufficient to justify a decision and rail represents the only solution, alternative strategies need to be considered.

Defining the level at which strategic rail planning should be undertaken is critical. In most cases railway services are delivered with reference to service groups. A service group will serve a range of communities utilising particular routes and operating to an established pattern. Most strategic rail plans will relate to introducing new service groups or proposing major changes to existing ones. In this context, the most advantageous unit for strategic planning could be considered at a route basis. Infrastructure expenditure is likely to represent the highest capital cost and have the longest whole life cost.

Railway planning at a strategic level should not be seen as a stop start process. If infrastructure route planning is to have long term credibility with land use planners, outputs must be up to date and be consistent with external planning timeframes. Bodies responsible should aim to provide route plans

which are reviewed on a periodic 5 year rolling programme. In this way, rail strategic plans will always be relevant and reflect the future drivers of rail service demand.

Rail strategic planning is about reflecting the needs of users in the long term. In this context the process has to be open and subject to widespread stakeholder involvement. Consultation about what rail route plans contain should be an integral part of the process and be designed to ensure that strategic land use requirements are reflected where necessary in any proposals. As part of the process, consideration will need to be given as to what aspects of land use planning should be considered within the rail plans and what procedures should be adopted if they are not.

A realistic strategic rail plan should consider current network and station performance, options as to how a route could be used (passenger v freight commuter), future route requirements and options by which these need can be met. The options are likely to include a requirement for capital investment schemes. The route plans provide a consensus reference point within which strategic political and economic decisions on rail investment can be made within a land use planning context. In order to implement successful processes for strategic rail planning, cognisance must be made to the requirement to secure long term funding either from private or public sources. To do this, it is necessary to both identify and maximise the long term flow of benefits and minimise the associated risk.

6. Conclusions

Optimal rail planning requires the engagement of a wide variety of stakeholder if it is to have real relevance in the long term. Rail investment is costly but if planned well will provide a flow of benefits to the community beyond most planning time scales. To achieve an optimal solution, rail planning must be seen as a constituent part of the overall city planning framework

A decision to invest in rail requires the confidence of politicians and the wider community. Key to delivering this confidence is the incorporation of rail strategic planning within a wider framework; rail planning must be seen as both transparent and adhering to standardised processes certainly within an urban area but possibly at a national level.

Rail has a major role to play in securing the future transport mobility of our major urban areas. The extent to which the mode is able to capitalise on its natural advantages in terms of sustainability and movement capability depends on the manner in which future developments are planned and consulted on. By adopting common principles and process which are inclusive, trust in the strategic planning environment will grow and the full potential of the mode will be realised. This in itself is a long term strategy.

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