



Sydney rail development: the next fifty years

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Abstract:

Since Bradfield's work in the first two decades of the twentieth century Sydney has lacked a comprehensive strategic plan for the development of its metropolitan rail system. This has resulted in a number of lost opportunities and has been partly responsible for the diminution in rail's relative role. Increased emphasis on integrated metropolitan planning in the last few years, together with the development of an initial CityRail Strategic Plan, has achieved much to redress the imbalance. Yet as the pace of urban consolidation lifts, accompanied by increasing concern over road congestion and environmental pollution, Sydney does not have a vision for rail beyond 2006 and the anticipated completion of the Parramatta-Chatswood link. Yet for rail to maximize its benefit to Sydney it requires an integrated concept plan at least 40 years longer. This paper outlines possibilities based on known future operational constraints and the implications of desired metropolitan trends in urban consolidation and total travel by different modes.

Four key concepts are identified:

1. a need to create a strong focus on Parramatta maximizing usage of its Parramatta-Chatswood underground station;
2. development of strong developmental axes along existing and currently proposed rail lines in Western Sydney;
3. construction of a number of relatively low cost, incremental branch extensions to existing and proposed rail routes linking in other existing and potential major activity centres;
4. construction of an additional core metro line from Parramatta to Sydney via Olympic Park and Leichhardt and its extension to the Northern Beaches.

The implications of this strategy for the development of inter-city and freight operations is also discussed.

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Introduction

Since Bradfield's visionary work in the first two decades of the twentieth century, Sydney has lacked a comprehensive strategic plan for the development of its metropolitan rail system. This has resulted in a number of lost opportunities and has been partly responsible for the decline in rail's market share.

Increased emphasis on integrated metropolitan planning in the last few years, together with the development of an initial CityRail Strategic Plan, has achieved much to redress the imbalance. Yet as the pace of urban consolidation lifts, accompanied by increasing concern over road congestion and environmental pollution, Sydney does not have a vision for rail beyond 2006 and the anticipated completion of the Parramatta-Chatswood link.

For rail to maximise its benefit to Sydney it requires an integrated concept plan at least 40 years longer. This paper outlines possibilities based on known future operational constraints and the implications of desired metropolitan trends in urban consolidation and total travel by different modes.

Need for Integrated Strategic Transport Planning

CityRail, as a key transport operator, must identify potential customer perceptions and address the challenges of meeting changing customer requirements across many market segments. CityRail planning must be in harmony with integrated landuse and transport planning to maximise the use of public transport in Sydney over the next fifty years.

Integrated transport planning, within CityRail, will become more important in the coming years. Integration of bus access/ priority and light rail infrastructure and corridors with the CityRail network will ensure a seamless passenger interface and be the basis for CityRail business growth to meet the Government's Air Quality guidelines.

Limited numbers of passengers can access rail on foot from their homes. Some 45 % of CityRail's passengers use another mode before and/ or after their rail journey.

A considerable proportion of CityRail growth will come from new areas remote from existing rail track. Extensions to the CityRail network will not serve all these areas. A higher proportion of future CityRail passengers, possibly up to 75%, are expected to use integrated transport facilities; mostly from Western and South-Western Sydney.

Community Attitudes and Perceptions towards Public Transport

Long term attitudes are shifting favourably towards rail based public transport, largely influenced by external factors like air quality and road traffic congestion.

NRMA Clean Air 2000 had conducted surveys, since 1995, on attitudes towards air quality and motor vehicles and found increasing community concern towards air quality and traffic congestion. In 1997, 78% of NRMA respondents nominated a need for improved public transport and a greater range of public transport choices to reduce dependence on the car, hence reduced air pollution and traffic congestion.

The NRMA found 61% of respondents would be willing to pay for better air quality, but economic measures to reduce car use were felt to be ineffective and socially unacceptable, except for increased parking charges in larger commercial centres and an environmental levy on vehicle drivers to improve public transport. (NRMA 1997).

The main reasons nominated by NRMA respondents, on a percentage response basis, for not taking public transport are illustrated in Table 1.

Table 1: NRMA findings on attitudes to Public Transport.

Reason	Greater Sydney	Western Sydney
No direct route to destination	38%	40%
Takes longer than driving a car	30%	30%
Infrequent service	21%	22%
Need vehicle for work purposes	19%	19%
Too inflexible for travel needs	16%	na
Nearest station or bus stop too far from home	15%	18%
Does not cater for people with prams, shopping, bikes	9%	9%
Not safe at night	8%	12%
Nearest station or bus stop too far from destination	8%	na
Unreliable	7%	na
Costs too much	6%	na
Not safe to travel during the day	5%	8%
Uncomfortable	3%	na
Car is more convenient/ personal preference	3%	na

Source: NRMA 1997.

The most significant reasons why people do not use public transport are related to lack of integrated service, an infrequent and inflexible service and duration of journey time. Traditional railway concerns like safety (from attacks) and service reliability are perceived by non users as relatively minor issues, although our customers believe safety to be very important.

The NRMA results also suggest a potentially strong latent demand for public transport providing appropriate infrastructure and services are supplied.

CityRail's overall customer satisfaction is in the order of 75%. The main issues that concern our passengers are on time train running, train and station safety and passenger information. These main attributes have been improving in recent years and further attention to detail will ensure higher overall levels of satisfaction (CityRail; Customer Satisfaction Survey 1997/ 98)

CityRail's recent on time arrival performance with over 93% of trains running within three minutes of schedule would be difficult, if not impossible, to consistently achieve by car, bus or taxi on Sydney's increasingly congested road system.

The Environment and Traffic Congestion in Sydney by 2020

By 2020 Sydney, without upgrading of public transport infrastructure, could well experience gridlock. Demands to constrain mobility of the motor car will also be high on the agenda of many planners. The current initiatives of Sydney City Council to widen footpaths and restrict vehicle access, should be regarded as trend setting.

Increasing community environmental and congestion concerns are likely to place renewed expectations and demands on CityRail, and other public transport operators. All operators must look towards integrated networks, ticketing and information systems to replace a proportion of motor car trips not only to work, but for many other purposes integral to lifestyle in a complex urban community.

By 2020, it has been estimated that road traffic congestion in Sydney will increase by 600%, unless corrective action is taken to reverse the dependence on the motor car. Total demand for urban travel, on all modes, is expected to increase by 84%.

This suggests that Sydney's ability to absorb additional vehicles on the roads, particularly at peak hours, is very limited.

One way to beat congestion is by dedicated right of way for high volume rail transit on prime corridors connecting major centres supported by integrated bus/ rail operations, priority bus lanes and traffic signals feeding commuters to rail, as well as integrated ticketing and passenger transit information systems.

An outline of CityRail's vision to overcome these problems is included later in this document.

Air Quality Management Plan

The NSW Government on 4 March 1998 announced a comprehensive Air Quality Management Plan (AQMP) to address rising community concern relating to air pollution and traffic congestion. The thrust of this AQMP as embodied in the Premier's Press release of 4 March 1998, is summarised below:

New South Wales Government Commitment to the Environment.

Air quality blueprint for NSW;

"the Government aims to prevent high pollution levels in the future, linking air quality goals with transport planning and setting of zero growth in vehicle kilometres travelled by 2021..... this would mean a reduction in projected growth of vehicle travel in Sydney by around 43% by 2021.....the air quality management plan aims to have 30% of people travelling to work in Sydney to choose public transport by 2021, up from the present 20%.....we must give families and businesses more and better transport choices to break our growing dependence on the car."

Mr Bob Carr. Premier of NSW. News Release. 4 March 1998.

The impact of these AQMP guidelines for CityRail is growth in passenger journeys from the current 270 million to a minimum of 400 million per annum by 2020

In practical terms this means for CityRail;

- in the order of an extra 500, 000 passengers per day;
- up to 50 additional train services per hour, with many to the Sydney CBD to serve this demand;
- growth into nodes like Parramatta is expected to be more intense than system averages, but will be able to take advantage of substantial spare capacity in the current counter peak direction;
- track into the Sydney CBD is at or close to capacity and not capable of meeting substantially increased demand;
- new rolling stock will be required, including options on the Fourth Generation Train (4GT) contract allowing up to 200 cars; and
- separation from freight operations will be essential.

CityRail must improve the service quality performance of the existing system. New rail infrastructure is expensive to develop in new residential areas. However the projected growth to 400 million passenger journeys cannot be achieved without new lines and support of an improved and enhanced existing system that minimises rail congestion.

The launch of the AQMP is a superb opportunity for CityRail and other public transport operators to raise the public profile and objectives of urban public transport. Development of visionary strategic plans designed to influence and shape public thinking are as important as the future design of infrastructure and efficient operation of transport systems in Sydney.

It is essential to ask what is the business context and growth required of public transport in the next fifty years. Key ingredients include enhancement of existing facilities and infrastructure, new corridors, interchanges plus commercial ticketing facilities to enable integrated transport to be a reality.

Demand for Urban Transit 2000 to 2050: Trends that will change travel demand

Demand has diversified in the past 50 years, and we must expect further changes over the next 50 years. Planning is an inexact science. However, infrastructure planning is a long term process that develops hardware with often even longer lifecycles and returns on investment.

The impact of expressway building, removal of tolls and increases in traffic congestion now means that rail primarily services centres which are subject to significant road congestion. It is expected that in the future the impact of improved roads will be more than cancelled out by increased congestion and urban consolidation policy. Key issues affecting rail demand are likely to be:

a) Location of population growth

By 2020, Sydney's population is likely to grow to 4.5 million from the current 3.8 million, with much of the growth in Sydney's west. The Department of Urban Affairs and Planning forecast Sydney's population between 1996 and 2006 to increase by approximately 300,000 with nearly 210,000 in Sydney's west.

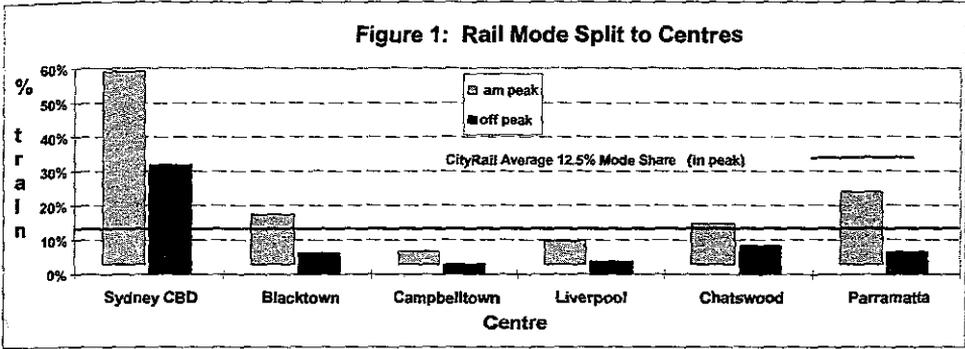
However, the impact of urban consolidation and containment policies may slow the westward trend after 2006 with considerable urban consolidation around rail transport corridors. The impact of an ageing population, net migration and availability of land in middle suburbs could possibly also contribute to this trend. There is also likely to be fewer land releases in the west after 2006 and those which are released, eg Rouse Hill and possibly South Creek; will need to have integrated transport as part of their infrastructure.

b) Employment and the Journey to Work

The CBD has been capturing a declining share of employment falling from 30% in 1945 to 12.5% in 1986 to currently around 12%. This is influenced by city growth, high rents, improving information/communications technology and the suburbanisation of manufacturing employment. Regional centres such as North Sydney, Parramatta,

Chatswood and Hurstville have enjoyed growth in part due to establishment of high grade shopping centres and economies of sharing business services. (Toon et al, 1994).

CityRail's modal share into major centres is illustrated in Figure 1:



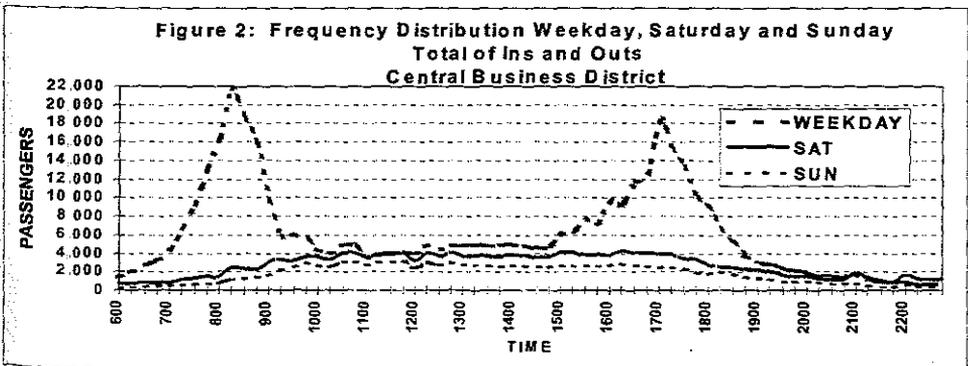
Source: A Compendium of CityRail Travel Statistics. March 1997.

Estimates of total CBD employment in 1991 are less than 1945 levels of 200,000. Demand for non work travel to the CBD for recreation, business or shopping is growing and as large as current work travel to the CBD at around 190,000 journeys per day.

Jobs in finance, community services, personal services, hospitality, tourism and recreation are likely to increase their share of employment and regions with high proportions of these jobs will enjoy prosperity mostly in and around the CBD and major urban nodes. (Toon et al, 1994)

Employed people are working longer hours. Since 1982, average full time working hours per day have increased from 40 hours per week to over 42 hours per week. (Heiler, 1998) This has been evident by the increased spread of the CityRail PM Peak from 2.5 hours to around 3.5 hours in the past decade.

The relative spread of the PM peak can be seen in Figure 2:

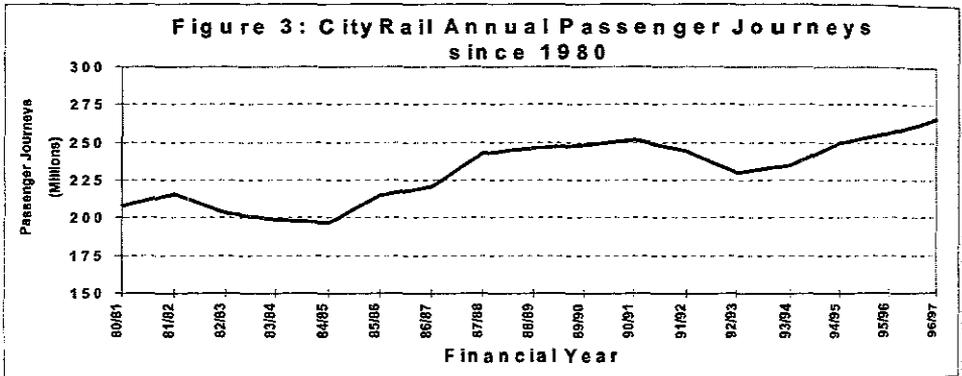


Source: A Compendium of CityRail Travel Statistics March 1997.

Changes in employment patterns; such as increasing participation rates for women and declining rates for men, increasing demand for part time/ casual labour, around the clock and weekend flexible work hours and diversified work locations; will become the norm. All these trends are likely to reduce the impact of the peak and spread the load over a longer period.

The CBD, in relative terms, is likely to further decline as an important source of employment in 20 to 50 years time reflecting communication advances giving rise to decentralised office/ home/ telecommuting practices. However, business and recreational travel to the CBD may offset this decline.

Total annual CityRail Passenger Journeys has increased significantly since 1980 and is following an increasing trend as shown in Figure 3.



Source: A Compendium of CityRail Travel Statistics. March 1997.

Transport Data Centre Journey to Work 1996 Census information outlines the decline of rail journeys in proportion to total journeys. Journey to work by all modes from all regions in the Sydney, Newcastle and Wollongong Statistical Districts grew by 9.1% between 1991 and 1996. Rail journeys to work grew by only 2.4% over the same period.

However, rail journeys to work to major centres grew by 13.5%, with total journeys growing by 14.4% between 1991 and 1996. Rail continued to be the dominant mover of people into the major centres with a constant 37% share across all centres from 1991 to 1996. The Major Centre proportion of rail journeys increased from 50.6% in 1991 to 56.1% in 1996, further indicating the importance of the major centres to rail.

The Census Data trends, since 1991, indicate the relative decline of rail. These trends outline the extent of the turnaround required in modal share and the increased rate of CityRail business growth needed if the requirements of the AQMP are to be realised.

Tables 2 and 3 provide Census detail of rail's market share by major Centre and Region over the period 1991 to 1996.

Table 2: Journey to Work (excluding walk) to Major Centres

Centre	1996			1991			Rail % Chge 1991/96
	Rail Share	Trip by All Modes*	Rail Trips	Rail Share	Trip by All Modes*	Rail Trips	
Sydney CBD	50%	171,700	86,700	52%	149,100	78,200	10.9
Parramatta	23%	28,500	6,600	22%	25,000	5,500	20.0
North Sydney/Milsons Pt	42%	29,300	12,400	40%	25,100	9,900	25.3
St Leonards/Crows Nest	22%	21,600	4,800	22%	19,500	4,300	11.6
Chatswood	30%	14,900	4,500	26%	11,800	3,100	45.2
Hornsby	20%	4,800	900	22%	4,600	1,000	-10.0
Blacktown	12%	6,100	700	13%	5,200	700	-
Penrith	7%	8,200	600	6%	7,200	400	50.0
Bankstown	10%	8,700	900	12%	7,700	900	-
Liverpool	10%	8,200	800	10%	8,100	800	-
Campbelltown	6%	5,200	300	5%	4,100	200	50.0
Newcastle CBD	5%	11,800	600	5%	11,800	600	-
Wollongong CBD	4%	7,300	300	3%	6,100	200	50.0
	36.8%	326,300	120,100	37.1%	285,300	105,800	13.5
Growth 1991 to 1996		14.4%	13.5%				

Table 3: Journey to Work (excluding walk) from Regions

Region	1996			1991			Rail % Chge 1991/96
	Rail Share	Trip by All Modes*	Rail Trips	Rail Share	Trip by All Modes*	Rail Trips	
Inner Sydney	18%	93,800	17,200	18%	81,900	14,500	18.6
Eastern Suburbs	14%	88,600	12,300	14%	81,300	11,100	10.8
St George/Sutherland	20%	149,700	30,500	22%	141,100	30,400	0.3
Canterbury-Bankstown	20%	91,300	17,800	22%	90,100	19,600	-9.2
Fairfield-Liverpool	13%	92,200	12,300	15%	81,300	12,200	0.8
Outer South Western	16%	71,400	11,100	18%	60,600	10,900	1.8
Inner Western	22%	54,300	11,800	23%	52,600	12,100	-2.5
Central Western	19%	90,100	17,400	20%	85,600	16,700	4.2
Outer Western	14%	103,600	14,300	16%	90,300	14,800	-3.4
Blacktown-Baulkham Hills	14%	130,000	18,800	16%	113,600	17,700	6.2
Lower Northern	12%	107,900	13,000	13%	98,600	12,900	0.8
Hornsby - Ku-ring-gai	23%	87,500	19,800	22%	80,100	17,400	13.8
Manly - Warringah	3%	65,400	1,700	3%	80,200	2,200	-22.7
Gosford - Wyong	13%	74,100	9,400	16%	62,400	9,900	5.1
Total Sydney Stat District	16%	1,299,900	207,400	17%	1,199,600	202,400	2.5
Newcastle	2%	134,100	2,200	2%	121,800	2,100	4.8
Illawarra	4%	103,500	4,500	5%	87,600	4,600	-2.2
Total - All Stat Districts		1,537,500	214,100		1,409,100	209,100	2.4
Growth 1991 to 1996		9.1%	2.4%				
Proportion in Major Centres to Total Journeys		21.2%	56.1%	20.3%	50.6%		

Source: Transport Data Centre; ABS Census Data 1996

Both Tables; exclude walk, 'Worked at home', 'Did not go to work' and 'Not stated'

c) The Multi Purpose Trip

Despite societal aspirations for growth in public transport, there is a risk of increased car usage due to the diversified nature of travel demands, not only for the journey to work, but for multi-purpose trips for leisure and other activities.

The rapid rise of the multi purpose trip by female car drivers has been a phenomenon of the 1990's. Most are working women who need to balance work and child rearing duties and use trips to maximum advantage over a short time period. Overall demand for diversified and multi purpose travel can be expected to increase. This will be largely due to increasing affluence and pace of economic life in Sydney, and will reflect the transport needs of a better educated and mobile population.

Over the next 20 to 50 years, Sydney will become more diverse in ethnic and household composition, with increased lifestyle expectations. Sydney's residents will demand more diversity in travel patterns and modal choice, especially on the journey to work

d) Recreational travel

Travel for recreational and social purposes is even more diversified. It has been estimated, for example, that as many people travel on all modes around mid day Saturday, over a widely diversified pattern, (eg, shopping, children to sporting events), as travel in the weekday AM peak. This diversified pattern will increase, not only on weekends, but during the week (On Track; SRA, 1995).

The growing demands for large Special Events in Sydney is in part being fostered by the forthcoming Olympics. CityRail believes a considerable niche market is developing for rail not only at Homebush Bay but at other locations like the CBD. CityRail will develop new products around its current "LINK" ticket concept that provides integrated travel and event entry, which is likely to induce travel demand.

Likely Implications and Challenges for CityRail over the next 20 to 50 Years

CityRail is a traditional heavy rail transit system with a number of aspects of its operations approaching best practice. The CityRail network has largely been in place since 1932 when the Sydney Harbour Bridge was opened. Since then Sydney's population has increased from 1.4 to 3.8 million with nearly 2 million now living west of Parramatta.

The current CityRail system was designed to transport large numbers of people to the CBD from suburbs east of Parramatta. Growth west of Parramatta is largely influenced by planning decisions aimed at providing low density residential land at highly competitive prices to accommodate the demands of the post war "baby boom." There was little or no thought to public transport infrastructure with many locations remote from rail based public transport.

The major operational and infrastructure challenges CityRail must address to provide wider competitive choice for the transit consumer, include:

1. Ability to service new and existing locations of residential growth by influencing location of development areas CityRail to where can effectively service.

Given that the largest sector of the passenger market, commuters to/ from the CBD is likely to experience relative decline as the CBD's share of employment reduces, CityRail must ensure it maintains and increases its overall market share in Sydney by capturing new markets to regional centres and for non employment trip purposes;

2. Development of new lines to serve these growth centres and establish how they can be best interfaced into the existing system.

Capacity enhancements will be essential on the existing system to ensure service quality, against a need for more frequent services and additional route complexity. Key junction improvements eg Illawarra Junction and Central Flyovers, will be critical to future development.

3. Ensuring different and new employment locations, times and patterns are in capture areas and / or operating configurations of CityRail or areas served by bus/ rail interchanges extending the CityRail capture area.

CityRail must be tuned into the changes in the employment market and be prepared to quickly adapt services to meet changing demand.

4. Improving intermodal access to service multi-purpose and occasional trips which are not serviced particularly well at present.

This will be a high priority given the existing rail infrastructure remains largely focused on the CBD. Rail is in a poor strategic position to capture cross regional business without inter modal capability.

Integrated ticketing, timetables and passenger transit information must address multi-mode and integrated requirements to provide "seamless travel" for commuters.

The current 45% of CityRail passengers who use another form of transport before/ after riding CityRail will need to increase to ensure growth to 400 million passenger journeys is reached.

5. Meeting the challenges of the all day and potentially the 24 hour railway; as employment conditions diversify to a 7 day, 24 hour basis. The traditional AM/ PM peaks may reduce in intensity and be of a longer duration and spread across many origin/ destination pairs.

Implications arise for enterprise bargaining agreements with staff to ensure the railways are cost competitive on a 24 hour day, 7 day per week basis.

Many train operations challenges will arise to ensure the "dovetailing" of connections on independent lines. The possible relative reduction in peak loads and spread over the 24 hour day offers potential for more even utilisation of the fleet.

Strategic Direction for CityRail

The impact of these trends on CityRail business and investment decisions is likely to be significant and need to be clearly identified in CityRail's Strategic Plans to provide clear direction for implementation.

Most of the technology that will impact on rail transport and its ability to meet demands of the commuter are already in existence, it is an exercise of decision making, investment and management. (Toon et al, 1994)

Strategic options for CityRail are:

- incremental improvements to the existing system with natural population growth increasing overall patronage; or
- enhance and incrementally expand the network based on growth expectations to address AQMP requirements; to address capacity constraints and to provide integrated and cross regional networks that provide real modal choice for customers.

The first option has been largely followed up to now.

This option has brought track upgrading and re-signalling programs plus development of some areas close to best practice. Maintenance standards are much better than 10 or 20 years ago.

Bringing the existing CityRail infrastructure close to best practice and reliability will not necessarily provide significant increases in rail competitiveness. Similarly it will not ensure customer choice, significant increases in demand, or relieve existing points of congestion on the CityRail system.

Nevertheless, natural growth is likely to lead to the existing system being at capacity by 2006 and new lines will be required to relieve congestion on existing corridors, especially to the Sydney CBD.

The second option, given the evolving AQMP, market demands, environmental and political scenarios, is likely to set an agenda for CityRail to become more competitive with expressways and the regional road network.

Infrastructure enhancements, in the short term, need to focus on reduction of rail congestion, to increase track capacity and to improve running times on the existing system plus improve customer service to place CityRail in a stronger competitive position with the ultimate objective of business growth.

Urban consolidation will also play a significant role in the intensification of train numbers on existing lines which will provide a dual role of local services and trunk routes for more outlying areas.

A large proportion of the projected population growth in new areas will be remote from existing lines and it will be more practicable to develop feeder services to rail in many cases. Therefore it is important that the strategic significance of new heavy rail lines and role of interchanges in these areas is recognised at an early stage of the planning process.

To ensure the AQMP guidelines are achieved, corridor and mode investment must be co-ordinated to provide an integrated package of bus, light rail and commuter parking facilities feeding into the heavy rail system at strategic locations.

Integrated transport means:

- facilities like interchanges that make the change process easy, quick, understandable and undaunting;
- ticketing systems that avoid delays and the need to purchase individual mode and/ or operator specific tickets. The emerging SmartCard technology is the apparent solution;
- cost efficient, timely and relevant transit information which is available prior to and during trips which enables commuters to plan trips and reassures commuters of their direction; and
- co-ordinated timetables and services designed on the “commuter first” principle of service frequency, reliability and memory timetables across all modes and operators.

CityRail needs to follow the second option to ensure its market share is increased in line with AQMP expectations through incremental expansion of the network by strategic development of new lines.

Building the Railway for the Next Fifty Years

Expansion for the railway to 2050 will be largely dependent on the timing and nature of Sydney's urban development and the demands of the AQMP and future community attitudes towards public transport versus future road development.

Improvements and extensions to the CityRail network fit into three time frames:

- infrastructure improvements necessary to increase train numbers through congested locations by 2001, as a basis to facilitate further growth in train numbers after 2001;
- amplifications to and some extensions linking parts of the existing system by 2006; and
- significant network expansion by 2020 to ensure growth required under the AQMP and facilitate further growth between 2020 and 2050.

The next few years

Congestion is often remote from where passenger growth is occurring in the South and West. CityRail's prime business is peak movement to/ from the CBD and this flow pattern already places extreme pressure on the existing infrastructure in the peak. See Map 1.

Within the next few years there will be a need to increase train numbers to meet growing demand from Penrith/ Blacktown/ Parramatta; Liverpool via Bankstown, Campbelltown via East Hills and the Illawarra. In total, 6 to 8 extra trains per hour will be required to enter the CBD precinct.

To overcome these short term problems system infrastructure enhancements must;

- increase trains numbers through key junctions (increased number of signalling aspects, advance junction indicators, higher speed turnouts);
- increase track capacity at critical locations by signalling improvements and some track amplification;

- provide for turnbacks at key locations to enable system flexibility, improve fleet utilisation, increased robustness and service quality;
- provide a freight by pass and grade separation around the Flemington area to improve access to Olympic Park; and
- ensure development of bus/ rail interchanges at key growth locations in the West and South.

Putting the Building Blocks in Place - CityRail Infrastructure and Operations Development to Around 2006

A key Sydney Planning Strategy is to develop a second CBD at Parramatta, to redirect some of the emphasis of the Sydney CBD. This includes re-structuring of transport infrastructure and contra peak operations into Parramatta.

However, congestion on the peak approaches to the Sydney CBD will continue. Some relief will eventuate from the opening of the Parramatta- Chatswood line around 2006. The strategic importance of this line is to provide a second route to the Sydney CBD from the western suburbs via Carlingford, Epping and the lower North Shore.

The recent announcement by the NSW Government that Parramatta - Chatswood has its in principle support and that a full EIS on the proposed line will be conducted early in 1999 is tangible evidence of a revival in rail infrastructure investment in Sydney. Parramatta - Chatswood will cost an estimated \$1.4 B and will provide access from Western Sydney to the growing employment and educational opportunities in Sydney's north-west and an alternative access to the North Sydney/ Sydney CBDs.

The Western line axis will focus on streamlined stopping patterns aimed at CityRail better serving a hierarchy of stations linked to improved bus services and interchanges; eg Seven Hills, Wentworthville, Quakers Hill and Penrith. Travel time improvements will be expected both in the west and to the northern part of Sydney.

The ongoing issue of freight trains conflicting with CityRail operations and the resulting peak hour embargoes on freight train operations in the Sydney area needs to have been addressed by 2006. A bi-directional freight line should be developed between Glenfield and Chullora to remove the conflict and delays to both freight and passenger trains on the dense southern freight and passenger corridor.

Opportunities also exist for improved passing loops for freight trains on Cowan and Thornleigh Banks in the north, plus Como Bank on the Illawarra. These facilities will be essential to minimise the impact of freight train failures in difficult terrain, improve service quality and maintain timetable robustness as service density increases.

CityRail by 2020

By 2006, it is intended that Parramatta will become a major commercial focus for Western Sydney. A rail mode share to Parramatta of 50% is expected by 2016 with employment in Parramatta CBD in the order of 50,000.

The CityRail network by 2020 should be significantly larger than today's system. This will enable more diversified travel offering a limited range of cross regional corridors and alternative access points between the two CBD's - Sydney and Parramatta.

The most significant residential development in Sydney over the next 15 years will occur in the NW Sector between Castle Hill and Rouse Hill. The likely strategic movement of commuters will be to the Sydney CBD via Chatswood, as well as directly to Parramatta.

A line connecting the NW Sector to the existing Main North at Epping, should be developed by 2012, to provide natural synergy with the then recently constructed Parramatta- Chatswood line and act as an alternative corridor from the NW to the CBD. This proposed line will open new markets for CityRail in an area suffering from a lack of public transport. It will also spread the congestion load in the peak more evenly around the system.

Track capacity will be reached on most existing corridors by 2015 and planning and/ or construction needs to be well advanced on an alternative line with limited stops, directly connecting the two CBDs.

The proposal to construct an additional line between Parramatta and Sydney is quite recent. Former State Rail Chief Executive, David Hill put forward such a proposal late in 1997, calling the corridor the River Line; see Map 2. Private companies have also expressed interest in this corridor in varying configurations from traditional heavy rail to mag-lev infrastructure and operations.

Whatever the engineering format or ownership, it is essential that the River Line receives the full synergy and benefits of access to new residential and employment markets along the south bank of the Parramatta River. This means that a metro with frequent stops is more appropriate than a high speed link between the two centres.

A Northern Beaches Line will also remain on the agenda involving the strategic issue of a second harbour rail crossing.

Beyond the immediate Sydney metropolitan area track re-alignment to reduce travel time will be necessary on the approaches to the Hawkesbury River on the Northern Line, Thirroul Tunnel on the Illawarra and between Menangle and Mittagong in the South. These proposals potentially interact with the various Very High Speed Train proposals.

Beyond 2020 to 2050

New technology is more likely to influence investment proposals in this period. However the latent business opportunity of maximising the existing CityRail infrastructure and the need to integrate new systems are likely to still predominate in investment decisions.

Increasing affluence and travel diversity demands of Sydney's residents will require cross regional corridors. These corridors may be initially developed as bus and/ or light rail routes from around 2000. Post 2020 opportunities, based on demand, could arise for new rail routes including Strathfield to Hurstville; Hoxton Park/ Liverpool/ Bankstown; South Creek Valley and St Marys to the NW Sector.

Conclusion

It is clear that Sydney's rail system is set to expand in the next 50 years. Community attitudes to rail as a positive contributor to air quality will no doubt firm in the coming years. CityRail welcomes the challenge to enhance and expand its system to meet the demands of increased modal share.

Expansion will be on an incremental basis in line with new development areas and enhancement will enable commuters from these outlying areas to access key CBD and regional nodes with greater ease.

The proposed whole of Government Transport Strategic Plan due for release in November 1998 will be a major step forward in rail's role in a comprehensive strategy. It will enable CityRail to play a key role as a fully integrated transport provider to an increasingly affluent and travel diverse, but environmentally conscious Sydney.

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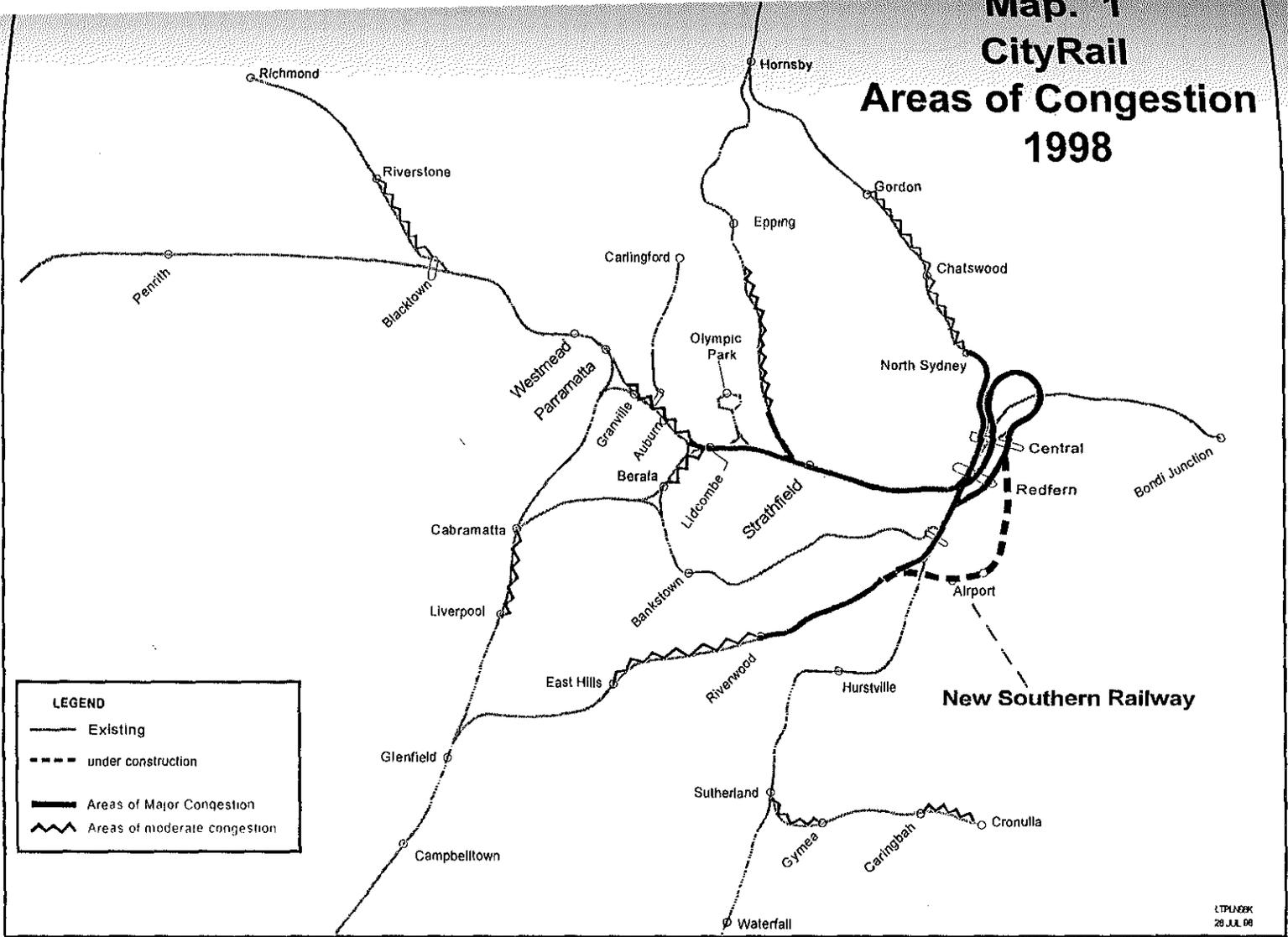
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Map. 1 CityRail Areas of Congestion 1998

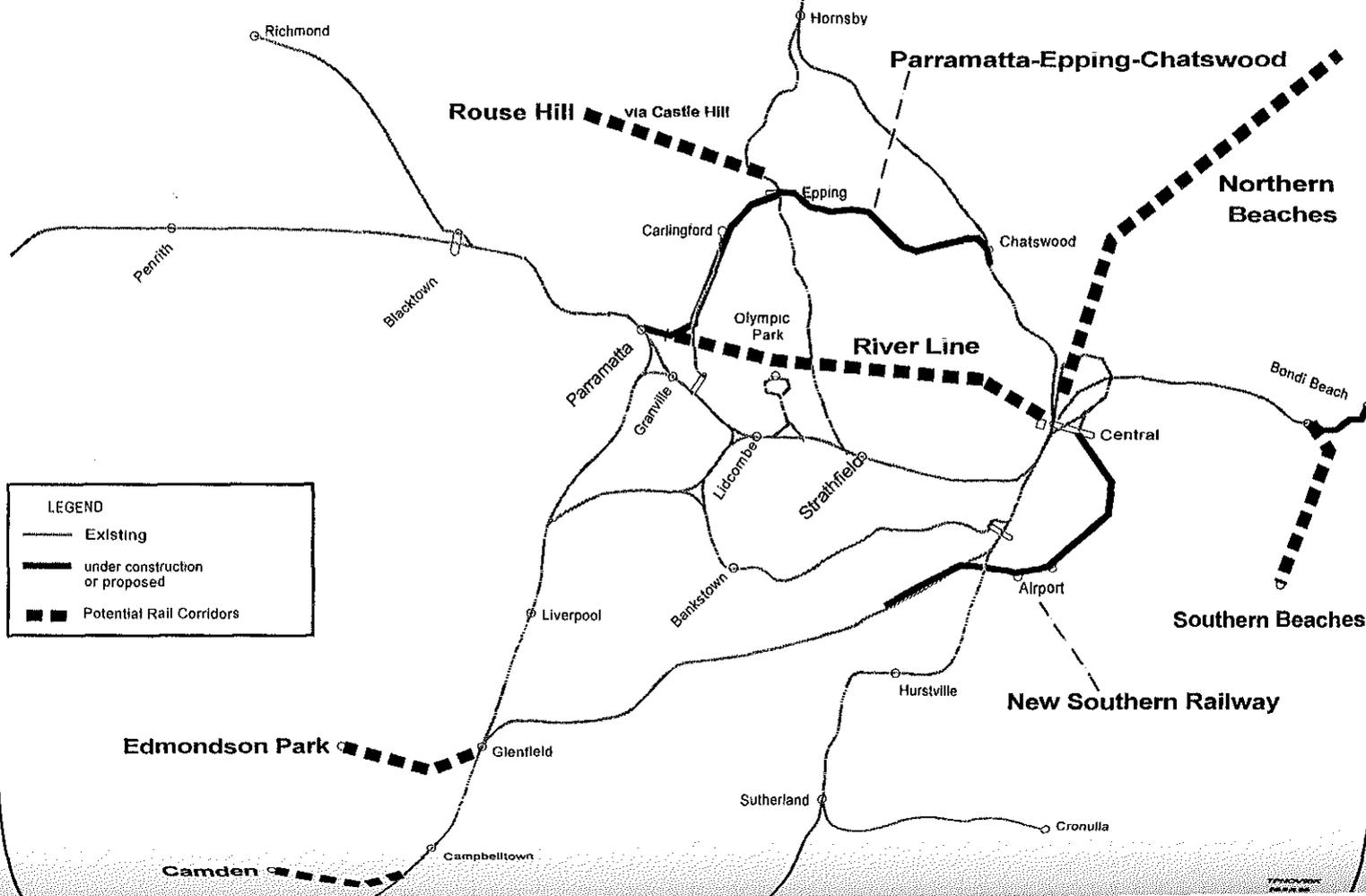


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Sydney Rail Development: The Next Fifty Years

Potential Rail Corridors

Map 2



LEGEND

- Existing
- under construction or proposed
- ▬ Potential Rail Corridors

Dick Day

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TYPESETTING
PARRAMATTA