



Integrating the New Transitways for Sydney

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Abstract

Action for Transport 2010, the NSW Government's 'integrated transport plan' for Sydney commits to building seven 'Rapid Bus Only Transitways'. This is a very significant advance for public transport in Sydney.

Transitways are new roads, or lanes reserved on existing roads, for the exclusive use of buses. They provide rapid travel between two regional centres. The exclusive corridor anchors a service network that spreads beyond the Transitway route.

The first Transitway will link Liverpool and Parramatta in western Sydney. Analysis shows that the planning so far has concentrated on the exclusive bus road, while integration with the local bus network has received less attention. This is understandable, as the Transitway is the major capital investment. However, integration of the Transitway with local bus services is critical to overall success. There are at least two factors constraining the implementation of the integrated network of bus services with the exclusive bus road.

The first factor is that Transitways challenge the existing practices of the bus industry. The NSW Government regulates bus services through contracts that give the holder the exclusive right to provide bus services within geographical boundaries. The Liverpool Parramatta Transitway will run through the contract areas of five bus operators. Maximising the benefits of Transitways will involve some change to the exclusive rights operators now guard.

The second factor is the layout of suburbs along the Transitway. Attracting more public transport users is dependent in part on the quality of services linking suburban areas with the Transitway. The design of the modern subdivisions completed and planned along the route of the Transitway discourages the penetration of buses to households and their linkage to the Transitway is likely to suffer.

Developing the integrated bus networks requires closer attention to regulating of bus operations and bus service connections from new suburbs.

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Introduction

On 23rd November 1998 the NSW Government announced an 'integrated transport plan' for Sydney, *Action for Transport 2010*. The plan emphasises improving air quality and reducing greenhouse gas emissions. Much of the investment in transport infrastructure and resultant service provision involves public transport. The report suggests that meeting air quality targets requires increasing the proportion of people travelling to work by public transport from 20% presently to around 30%.

The 2010 plan includes a new type of public transport service not previously implemented in Sydney. The plan commits the NSW Government to building seven 'Rapid Bus Only Transitways', all in western Sydney. Transitways are new roads, or lanes reserved on existing roads, for the exclusive use of buses. They provide frequent, rapid travel between two regional centres.

Buses have the capacity to operate both on the Transitway and on the existing road network. This flexibility combined with the priority of the Transitway facilitates integration of Transitway services with local bus services. A Transitway has the capacity to anchor an integrated network of bus services across urban areas surrounding the Transitway route. The local bus services and Transitway services are mutually supportive. Increased frequency of service on one underpins service improvements in the other.

Establishing Transitways in Sydney means planning public transport in ways different to established practices. We outline the Transitway strategy to promote the use of public transport. We summarise the planning documents released to the public on the Liverpool-Parramatta Transitway. We consider the planning for the Liverpool-Parramatta Transitway in the light of the Transitway strategy. From this review, we identify some factors that potentially constrain the quality of public transport services delivered by the proposed Transitways.

Our analysis shows that the planning so far has rightly concentrated on the exclusive bus road - the major Transitway infrastructure. Integration with the local bus network has received less attention. This is understandable, as integrating the local service network requires no additional major infrastructure. However, there are at least two factors likely to constrain implementation of the integrated bus service network anchored by the new Transitway.

Developing integrated bus networks requires closer attention to regulating bus operations and bus service connections from new suburbs. These are difficult issues.

The Transitway strategy

The development of Transitways to encourage greater public transport use in western Sydney relies on the benefits of integrated bus rapid transit (IBRT) (Gosselin 1998).

Integrated bus rapid transit is a network of bus services providing frequent and fast travel to a range of destinations within a large urban area. An exclusive bus only route (or busway) which links two major centres is the core of an IBRT scheme. This route provides the 'line haul' function – moving large numbers of people to and from common major destinations. Typically stations (stops) along the busway occur at intervals of approximately one kilometre and have high quality passenger facilities. The frequency of service along the busway is high – no more than 10 minutes between buses and more likely no more than five minutes between buses. The priority afforded by the busway reduces travel times well below conventional bus operations and private car travel in congested conditions. The priority of the exclusive bus route contributes the 'rapid' in IBRT.

The second element to IBRT is local bus routes that serve the urban area surrounding the busway. This network contributes the 'integrated' in IBRT. The local bus routes connect with the busway and extend the benefits of rapid travel beyond walking distance of the busway. Bus priority measures on local bus routes are also a feature of IBRT. The local bus routes not only connect with the busway to transfer passengers, but join, leave and rejoin the busway eliminating the need for a change of vehicles. Local bus routes serve other destination not on the busway. This integration is achieved by the same mode (buses), performing the function of feeding the busway as well as the rapid line-haul function along the busway. In this way the bus services on the Transitway and in the suburbs surrounding the Transitway become an integrated network of bus services.

A general pattern of services provided by the integrated bus service network appears below:

- dedicated services that remain on the Transitway at all times – these may be all stops or limited stop services;
- local or feeder services that are adjusted to integrate with the Transitway. These link key busway stations (which are important activity centres), with other key destinations in the region, and;
- express and limited stop services, generally operating at peak times that are a combination of feeder and Transitway services – picking up passengers in local areas before joining the Transitway to run express to the final destination or to select stops along the Transitway.

Transport mode is important to understanding IBRT. Of the major public transport modes – railways, light rail (trams) and buses, only buses can use existing roads with no or very limited modification. Buses generally perform the feeder function to line haul public transport services. When buses also undertake the line-haul function, an integrated network results. In many instances this integration eliminates the need for interchange between feeder and line haul services.

IBRT is not a universal public transport solution. It is an improved form of bus operation for circumstances where buses are the appropriate mode for encouraging public transport use. The IBRT form of operation does extend the capacity of the bus mode beyond the point where higher passenger capacity modes such as light rail and railways are usually favoured. Decisions about the most appropriate mode always call for judgement, but only after fully understanding the requirements of travellers.

Typically buses are the favoured mode in urban areas of moderate population density and dispersed travel destinations. The lower passenger capacity of buses means that they must operate more frequently to carry the same number of passengers as the larger capacity rail and light rail systems. In areas where population density is moderate, the need to operate more frequently is an advantage. The bus operator has a greater chance of making a return from the relatively lower patronage while maintaining a frequency of service that makes public transport attractive.

IBRT enhances service frequency through bus priority measures, both on the busway and in the suburbs. The faster a trip by bus the more frequently the bus service runs in any period. The opportunity that IBRT gives to increase the frequency of bus services means that services are more attractive and come closer to the convenience of the private car.

The seven 'Rapid Bus Only Transitways' that the NSW Government proposes in *Action for Transport 2010*, are IBRT schemes. The term Transitway identifies the busway component and the possibility of conversion of the busway to a light rail route in the future.

On its own, *Action for Transport 2010* gives the impression that the Transitway projects are simple infrastructure solutions. It must be supported by a clear statement of the importance of integration of the new system with the prevailing bus network. This integration is an important characteristic with implications for public transport travel region-wide.

Transitways for Western Sydney

All seven proposed Transitways are in western Sydney - an area of moderate population densities and dispersed activity centres. A report by the Western Sydney Region of Councils (1996) found that the area of western Sydney was significantly more car dependent than the area to the east of Parramatta. The report states:

'With widespread car ownership and cheaper land availability in outer urban areas, residential development has become more dispersed and increasingly distant from the rail network. Subsequently, the proportion of journeys made by public transport has decreased and four out of five journeys to work made by residents of Greater Western Sydney now utilise a private vehicle. Employment had also dispersed over recent decades, further limiting the utility of public transport in people's journeys to their workplaces....'

The form of urban development in western Sydney favours buses and the Transitway strategy.

The Liverpool-Parramatta Transitway

The Sydney Region Outline Plan of 1968 identified the need for a corridor for public transport between Liverpool and Parramatta to the west of the Main Southern Railway. Liverpool is a regional centre in the outer south west of Sydney. Parramatta is the second central business district of Sydney, situated in the centre of the Greater Sydney area.

Sydney Regional Environmental Planning Policy No 18 (SREP 18) reserved a corridor known as the Hoxton Park Corridor extending from Castle Hill north of Parramatta to Hoxton Park west of Liverpool. The reservation allowed for either a bus or light rail (tram) modes (Department of Environment and Planning, 1989). Figure 1 shows the SREP 18 reservation.

On 3rd May 1998 the Minister for Transport and Minister for Roads, the Hon. Carl Scully MP announced the development of the Liverpool-Parramatta Transitway by 2003, highlighting the potential for the staged construction and operation of the facility. This announcement preceded the release of the *Action for Transport 2010* plan. The *Action for Transport 2010* plan incorporated the Liverpool - Parramatta Transitway.

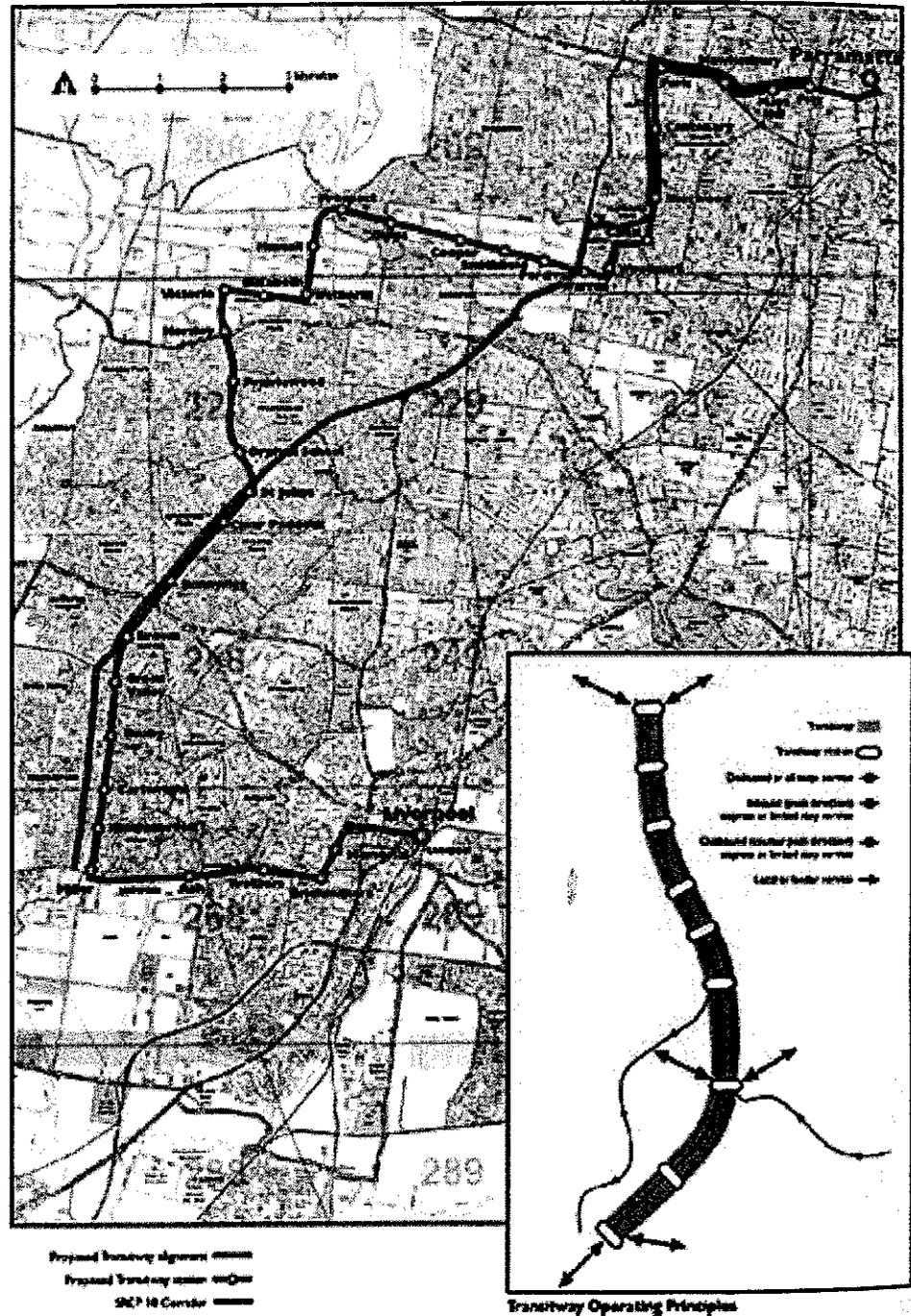
Overview Report

The Department of Transport authorised a feasibility study of the Liverpool-Parramatta Transitway. This was a major investigation of the route options, urban design and planning issues, physical characteristics, transit service operations, positive and negative impacts and economic analysis. The *Overview Report* (PPK 1998) is the summary report from the feasibility study released for public comment in November 1998.

The feasibility study found that the sections of the SREP 18 corridor south of Merrylands were not appropriate for the Transitway. Some sections of the available corridor were too narrow to build a busway or light rail system. The more important reason was the SREP 18 corridor did not connect the main areas of employment and retail, developed away from the corridor (including the Smithfield-Wetherill Park industrial area and some suburban malls). The feasibility study recommended a 30kms Transitway route using only sections of the SREP 18 corridor. This longer route connects areas of activity attracting to public transport people who wanted to access these areas rather than just the major centres of Liverpool and Parramatta. Figure 1 also shows the Transitway route.

Importantly the route penetrates the Wetherill Park industrial area, which provides employment for 30,000 people. The proposed route also connects other activity centres. The Prairiewood centre is a major shopping complex west of Fairfield, Bonnyrigg Plaza is a district centre north west of Liverpool and Merrylands West is a small local centre strategically placed on the bus corridor to Merrylands. In the most southern section of the Transitway the area around Hoxton Park TAFE may develop in the longer term as another district centre.

Figure 1 Liverpool-Parramatta Transitway: Study Area and Proposed Route



The proposed route runs approximately four kilometres to the west of the Main Southern Railway line, through areas of mostly post-1960 detached housing. The southern sections of the Transitway around Hoxton Park are adjacent to a large area identified for new suburban development over the next 20 years. The Transitway is critical to ensuring that residents of these suburbs have access to a rapid, frequent public transport service.

The feasibility study confirmed the viability of a bus-based Transitway service.

Patronage analysis

The patronage analysis underpins the feasibility of the Transitway and shows the potential for attracting greater use of public transport through improved infrastructure and integrated bus service networks.

The estimation of patronage potential generated by the Transitway used three approaches. While different all three produced comparable results (PPK 1998). The most sophisticated of the approaches was the patronage demand modelling which employed results of stated preference surveys, combined with data from the Department of Transport 1991 Home Interview Survey and the 1996 Census. Table 1 summarises the public transport trips forecast using this approach.

Table 1 Forecast public transport trips for peak hour 1996 to 2016 with and without the Transitway (source: PPK (1998a), p.8-3)

Option Trip Type	1996	2006	2016
Study Area ¹ Public Transport Trips without Transitway (Base Case):			
Internal ²	217	216	223
External ³	1 026	1 501	1 547
Total	1 243	1 717	1 770
Study Area Public Transport Trips with Transitway:			
Internal	1 477	1 769	2 011
External	1 977	2 929	3 102
Total	3 454	4 698	5 113

Notes

- 1 Study area is shown in Figure 1
- 2 Internal trips are bus only trips that start and finish with the study area
- 3 External trips are bus/rail trips that have one end within the study area and the other end external to it.

Table 1 shows a theoretical total of about 3,400 total bus trips in the study area (shown in Figure 1) with the Transitway in place in 1996. This includes trips on local bus services linking with the Transitway and new Transitway services.

The modelling used indicative bus services involving both local and Transitway routes in an integrated network. The results of the modelling show that the integrated bus service network will lead to a substantial increase in the number of public transport trips. Not all these trips will come from substitution of car trips. As with any transport service improvement, the enhanced capacity to access a wider range of activities will generate more demand to travel. Nevertheless, the attractiveness of bus travel underpinned by the priority of the Transitway will encourage the substitution of trips presently undertaken by car.

Integrated bus service network and integrated ticketing

The Overview Report considered the integrated bus network anchored by the Transitway, particularly in the patronage demand modelling and in the economic analysis. Planning for the route of the Transitway took account of the major points where the local bus services connect with the Transitway.

Wetherill Park industrial area, Prairiewood centre, Bonnyrigg centre, Hoxton Park and to a lesser extent Merrylands West are already desired destinations because of the activities occurring in these centres. These centres are important destinations on bus routes. These activity locations along the Transitway route are logical places for the connection of the local bus service network. People will use an individual bus route to undertake a range of different trips if bus routes are concentrated at the activity centres. This promotes efficient operation, as the one location is where buses join the Transitway and where passengers interchange between local buses and between local buses and Transitway services. These locations become a focus for the restructuring of the local bus network. The activity locations are major nodes on the busway route and the logical stations for limited stop Transitway services. Through serving these nodes with superior Transitway services, they become a focus for access to the Transitway. This generates patronage and requires improvement in the level of service on local bus routes linking to the nodes. Ideally what ensues is a self-supporting system of on-going patronage growth led by service improvements.

The integrated bus service network allows the opportunity for (and creates a need for) integrated ticketing. Integrated ticketing means that one ticket would enable the user to travel by different modes and vehicles to reach a final destination. Bus operators in the area of the Liverpool-Parramatta Transitway presently sell single trip tickets only. There is no opportunity to change buses or connect with trains without the need to purchase further tickets. Passengers and potential passengers highly value the convenience of integrated ticketing.

While the *Overview Report* explains the concept for structuring the overall bus network, it places the most emphasis on the Transitway infrastructure – the busway component.

The report leaves the detail of implementing the overall integrated bus service network to subsequent study. Consequently, there are at least two factors requiring the further attention of Government. Without decisive action, these factors will constrain the implementation of an integrated bus network.

Constraints on the integrated bus network

The first factor that requires attention is the regulation of bus operations. Transitways challenge the existing practices of the bus industry in NSW. The NSW Government regulates bus services through contracts that give the holder the exclusive right to provide bus services within geographical boundaries. Each bus operator plans the vast majority of their services to operate mainly within their geographical area. The Liverpool-Parramatta Transitway will run through the contract areas of five bus operators. Maximising the benefits of Transitways must involve some change to the exclusive rights operators now guard.

The second factor is the layout (urban form) of suburbs along the Transitway. Without an integrated network of bus services the Transitway would provide travel only to people who were in walking access of the stations along the route. Attracting more public transport users is dependent in part on the quality of service on the bus routes linking suburban areas with the Transitway. The modern subdivisions completed and planned along the route of the Liverpool - Parramatta Transitway discourage the movement of through traffic by discontinuous street networks and culs de sac. The outcome is discrete suburbs with few links to adjacent ones. The penetration of buses to households and their linkage to the Transitway is likely to suffer by imposing indirect and inefficient routes. At this stage there is no specific provision to ensure the layout of new suburbs takes account of bus access to the Transitway.

Regulation of bus operations

The Passenger Transport Act 1990 allows regulation of bus services through issuing five year renewable contracts. Contracts cover a defined geographical area, or a specific route, or both. All contract holders have the sole right to provide route bus services to residents within the area of their contract or along the specified route. The only exceptions are a limited number of competing services operating before the commencement of the Act and some cross-regional bus services that operate under restrictions. In the former case both operators retain rights to provide services. In general, the extent of competition between urban route bus operators in existing urban areas is restricted to the rare occasions when the Department calls for tenders for a contract area.

Operators are also responsible for service development, but must meet minimum service levels, including in periods of low patronage. The expectation is that operators with exclusive rights in an area will undertake service development to increase patronage. Operators should involve themselves in issues that affect the provision of urban route

bus services in local areas. In particular this means consulting with local government on local urban planning (NSW Department of Transport 1993)

Bus services should operate as a business, competing against other transport modes for patronage, driven by the desire for greater profit. The Government expects not to subsidise urban route bus services in order to meet these minimum levels of service.

The Department of Transport sees its role as promoting policies and providing infrastructure to increase the use of public transport (Department of Transport 1993). The Transitways are a continuation of this view.

Linking service provision and service development is reasonable, perhaps even effective for established urban areas. In these areas bus service development usually involves fine tuning service plans in response to the gradual redevelopment of the area. The Bus and Coach Association of NSW (BCA) states that privately owned route bus operations have delivered major increases in service standards (Bus and Coach Association NSW 1995). However, this does not mean that the present contract system suits all circumstances. Where there is a significant impetus to increase the use of public transport and the consequent development of new public transport infrastructure such as a Transitway, problems arise

First Stage services

It is possible that the first Transitway services to be introduced would parallel the Transitway route using existing roads. As each section of the Transitway was progressively completed services would transfer to the Transitway route proper.

First stage bus services would operate with relatively attractive levels of service, with reasonable directness, but with longer travel times than the ultimate Transitway services. They would be less attractive and novel, without the special buses and livery, quality station facilities, etc of full Transitway services. Accordingly, only modest levels of patronage are likely, which should grow as awareness of the service increases and sections of the Transitway are completed.

There are existing cross-regional bus services between Parramatta and Liverpool and Blacktown and Liverpool. Both of these routes serve the Wetherill Park industrial area, albeit at low frequencies. There is overlap between the first stage service and the Parramatta - Liverpool cross-regional service in areas immediately adjacent to the industrial area both north and south. The importance of the Wetherill Park industrial area to patronage on the Transitway means that there is some potential to affect the rights of the supplier of the Parramatta - Liverpool cross-regional service. Over a large section of the route, the cross-regional service would not be affected by the first stage services.

At the time of writing the first stage services were yet to operate. One possible cause for the delay is difficulties over contractual rights with the operator of the Liverpool-

Parramatta cross-regional service near the Transitway route. Section 21 (4) of the Passenger Transport Act 1990 precludes the Department of Transport from entering a contract resulting in substantial competition with the service provided by an existing contract holder.

The rights of contract holders are not immutable. Section 22 of the Passenger Transport Act 1990 allows the Department of Transport to extinguish exclusive rights to the extent necessary to ensure the operation of services in the public interest. This is possible only if the contract holder declines to vary the contract. We are unaware of this section of the Passenger Transport Act ever being used.

Other relevant aspects of the legislation are Sections 18 and 24. Section 18 would allow the Department of Transport to issue a contract for the operation of first stage Transitway services where the Department paid the operator for providing the service. Presumably the cross-regional service operator could still pursue their rights under Section 21(4). Section 24 allows for the variation of the route or region that is the subject of a contract only by the agreement of the parties. However, when a contract is renewed the Department of Transport may vary the region or route if necessary to improve services in the public interest.

Without going further into the intricacies of the *Passenger Transport Act*, the Department of Transport has two general options – to grant a contract or varied contract to the operator of the cross-regional service or use the public interest powers to issue another contract.

Under either of these options the Department will probably need to pay at least part of the cost in providing the service. While high frequency services from commencement will be an important factor in the Transitway's, it is unlikely that an operator would be willing to provide the first stage services at sufficient frequency to meet all Transitway objectives.

The first stage services do not seek the integration of local bus services with Transitway services. This is required when the full Transitway is in operation. Therefore, there is little difference between either of the two options. The option of least resistance is probably having first stage services provided by the operator of the Liverpool-Parramatta cross-regional service.

The integrated service network

The regulatory aspects of who provides the first stage Transitway services may have little consequence for those services in isolation, but they are likely to have a profound effect on the implementation of the integrated service network when the Transitway is complete. How the Department of Transport issues the contract for first stage Transitway services is critical. The Liverpool-Parramatta Transitway runs through the contract area of five operators.

Under usual practice, the operator providing the first stage services gains exclusive rights to operate along the line of route determined for these services. Presumably, with completion of each section of the Transitway, the contract would allow the operator use of the newly completed sections. At the end of construction, the operator could be in the position of being the only operator on the Transitway. This situation would be no different if the Department of Transport called for tenders to supply Transitway services at the end of construction.

The granting of exclusive rights to operate Transitway services would prevent the full development of the integrated service network. It would preclude other operators from selling seats to passengers at stations along the Transitway. The full potential frequency of bus services to stations along the Transitway would not be realised.

The realisation of less than the potential frequency along the Transitway would affect patronage on the Transitway. The other consequence may be in feeder services to the Transitway. If operators cannot share in the profitable aspects of the Transitway they may be less inclined or able to offer a high level of service for feeder routes to the Transitway. This may severely affect the potential of the Transitway to attract public transport use.

Another aspect is that the Transitway operator is likely to attract significant patronage from within walking distance of Transitway stations. In some contract areas this is likely to be a significant proportion of the potential patronage from that area. The erosion of the patronage base may mean that the operator is unable to provide quality feeder services or direct services from suburbs. This situation may also arise where there were multiple operators on the Transitway or where there was open access to the Transitway.

A further problem of regulation is that the present contract boundaries do not facilitate the provision of feeder and direct services linking to the Transitway at the activity centres. An operator cannot service the residents of another contract area to destinations within that contract area. Where routes accessing an activity centre on the Transitway cross a contract boundary they would not be able to service the other contract area. This means that the first operator is running a bus for some of its trip without the opportunity to sell seats and gain revenue. This may make the operation of feeder and direct routes less viable and limit the integrated service network.

The best outcome may arise if all operators cooperated in on-going bus planning establishing and maintaining the integrated service network and sharing the revenue gained from its operation. Accounting for revenue is easily built into the ticket machines required for integrated ticketing. To do this the operators must adopt the attitude that if they institute the integrated service network they will increase the public transport market and they will all enjoy a share of increasing revenue. This is the business-oriented attitude expected from implementing the *Passenger Transport Act*.

Bus operators may remain cautious about the patronage benefits that can follow from the provision of an integrated service network. This is partly due to the way that the

Transitway cuts across contract areas and appears as a threat. Operator concerns for the future of their businesses are understandable. However, the possibility of an integrated public transport service network challenges operators to think about being more than providers of feeder bus services to the closest railway station. There is also an element of private sector sharing of risks in implementing a system with a longer term objective.

The Transitway and the integrated network it anchors provides the opportunity for operators to think about serving the transport needs of their area and to follow the dispersed trip making that occurs. The priority afforded by the Transitway enables bus travel times to be competitive with the car. If the integration of frequent services occurs, then patronage growth should follow. This requires operators who have been secure in local area monopolies to think more like entrepreneurs.

Suburb Layout

The Transitway strategy addresses the characteristics of urban development in western Sydney. In areas of moderate population density with dispersed destinations, it is difficult to deliver frequent public transport. Through the priority that the Transitway provides and the resultant rapid travel it becomes a desirable means of reaching destinations. This concentration of movement along the Transitway justifies high frequency bus services. The local bus services integrated with the Transitway services extend the reach of the Transitway increasing the travel on the Transitway and supporting the frequency of services along the Transitway – more passengers equals more services required. At the same time, the attractiveness of the services on the Transitway underpins local bus services as a desirable means of travel for people beyond walking distance of the Transitway. This enables improvements in the frequency of local bus services. Local bus services and Transitway services are interdependent. Integration of the two services is crucial to maximising public transport patronage. The integrated bus service network is more than the sum of its parts.

The emphasis so far on planning the Transitway means that local bus services are the potential weak link in the integrated bus service network. In areas beyond walking distance from the Transitway the attractiveness of using buses comes not only from the frequency and speed of services on the Transitway. It is important that bus services in the suburbs are frequent, fast, direct and convenient. If they are not there will be increased use of private car travel to access the Transitway. Even worse, once in their cars people may continue to drive to their final destination.

There is a body of research that points to the importance of the form of suburban development particularly the layout of the street pattern in affecting the mode of transport that people use (Cervero 1993; Handy 1992). Fleming and Pund (1994) show how modern subdivision layouts affect the attractiveness of local bus services and ultimately their use. Modern subdivision road layouts have the aim of reducing or eliminating through traffic from suburban areas. The road layout forces traffic onto arterial or sub-arterial roads, which are increasingly fenced from residential areas. To

provide bus services to these new suburbs bus operators must often adopt circuitous bus routes due to the meandering nature of the internal road system. Often the road layout is discontinuous and the operator must run more bus routes than would otherwise be necessary to serve a similar area with a more favourable road network. The effect of the road layout is to make the operation of bus services less efficient. The consequences for local residents are that bus services are infrequent, indirect and slow (and less attractive).

Several NSW Government reports raise the importance of introducing bus services to new suburbs at the outset of development (Environment Protection Authority 1998; NSW Department of Transport 1995). Achieving this aim requires new arrangements for regulating bus operations. Due to the linking of service provision with service development in the contract system there is actually no party that advocates for the consideration of bus services in the planning of new suburban areas. As explained previously the bus operator holding a contract is the advocate for bus services within the contract area. Where there are no roads yet built there is no contract and therefore effectively no advocate. The consequence is little or no consideration for bus services in planning new suburbs (Pund, Rowe and Kennedy 1997).

The NSW Government is aware of the problem and developed the concept of Integrated Local Transport Management to encourage greater awareness of transport issues at the local level (NSW Department of Transport 1995). However, implementation does not seem to have occurred. Action for Transport 2010 states:

'The State Government will ensure that new residential developments are built and designed to support public transport, walking and cycling. The following targets have been set for [new urban areas]:

- Minimum 15 dwellings per hectare.
- Maximum 5 kilometres from an existing or proposed mass transit (bus or train)
- Minimum 15 minute frequency for local public transport in peak periods.

Meeting these targets is important. In the period up to 2021, new urban areas will account for one third of the new housing built in Sydney (Pund, Rowe and Kennedy 1997). It is even more important to implement these targets to realise the full public transport and air quality benefits of Transitway construction. At this stage, there is no link between Transitway construction and the targets for planning new suburban areas.

Conclusion

The Transitways proposed for western Sydney should facilitate public transport services that compete with the convenience of the private car. However, the integrated bus networks anchored on Transitways require closer attention. Developing the integrated bus networks requires close attention to the regulating of bus operations and bus service connections from new suburbs.

The Transitways if implemented to their potential will increase the market for bus services. This should be good news for existing operators who have exclusive contracts with the NSW government. Cooperation between bus operators offers a way to bridge between existing practices and the opportunities that Transitways provide. This will involve integrating services and increasing frequency. It requires the sharing of revenue, facilitated by integrated ticketing.

The contract system of regulating bus operations is a related issue to the planning of new suburbs along the Transitway route. The contract system does not provide a strong advocate for the requirements of bus in the planning process for new suburbs. The road layout of the new suburbs must facilitate the operation of frequent, direct and fast bus services. The local bus services that contribute to the integrated bus service network must provide high quality service. Infrequent, slow and indirect local bus services will diminish the effectiveness of the Transitway in attracting public transport users.

So far the planning for Transitways has concentrated on the busway component. This is understandable because this is the aspect with the greatest capital investment. However, there are a number of factors beyond the Transitway route that require urgent consideration to achieve public transport use and related air quality targets.

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