

Public Transport Strategy



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EXECUTIVE SUMMARY:

This report investigates various modes of public transport including their potential for use in Tweed Shire at strategic overview level and discusses benefits and weaknesses associated with the modes.

Mode options considered are heavy rail, light rail, bus ways, bus lanes and combinations of these modes. An analysis of the available public transport modes indicates that a rapid transit corridor bus system is the optimal rapid transport mode for Tweed Shire because of the Shire's relatively low current and future population and its dispersed patterns of development.

It is not considered expedient to rely on heavy rail as part of a Tweed Public Transport Strategy, due to its extreme uncertainty. However if at some future date a decision was taken at a state or federal level to construct a link from the Gold Coast Airport Transport Hub to Yelgun or thereabouts this would be a welcome addition to the suite of public transport modes within Tweed Shire. A heavy rail link would be compatible with the rapid bus transport corridor system that Council may construct in the interim period.

Public transport planning in Tweed Shire is dependent on higher level planning by the NSW and Queensland Governments. The yet to be commenced *NSW Far North Coast Regional Transport Strategy* needs to be completed and fully integrated with South East Queensland for Tweed Shire to have a clearer regional framework on which to plan its local public transport strategy.

Notwithstanding these higher level strategic planning constraints, this report aims to establish a preferred strategic transport direction for Tweed Shire that is achievable in terms of sustainability, cost and population, and to support integration with public transport modes proposed or existing within the Gold Coast City Council and South East Queensland areas.

KEY PUBLIC TRANSPORT STRATEGIES:

At its meeting held on 19 July 2011 Council adopted the following key transport strategies:

- 1. Request the NSW Government to integrate the bus services in Tweed Shire into the Queensland 'Trans Link' transportation system.**
- 2. Develop a Rapid Bus Transit Corridor Plan from Gold Coast Airport Transport Hub to Pottsville through the coastal villages with links to Murwillumbah.**
- 3. Request the NSW Government Ministry of Transport to advise on progress on The Cross Border Transport Taskforce Report 2009 recommendations.**
- 4. Due to uncertainty that it will ever be constructed, Council will not rely on a heavy rail link from Coolangatta to Yelgun in a medium to long term Tweed Shire Public Transport Strategy.**
- 5. Council will not include the southerly extension of light rail south of the Coolangatta Airport Hub in any medium/long term Tweed Shire Public Transport Strategy.**

REPORT:

1. Introduction

At its meeting on 16 November 2010 Council resolved:

"That Council brings forward a report on developing a long term Public Transport Strategy and how future transport corridors could be preserved in the Tweed."

A workshop titled 'Draft Public Transport Strategy Overview for Tweed Shire' was presented to Councillors on the 7 June 2011. This report follows on from that workshop and aims to set a strategic direction for a Public Transport strategy in Tweed Shire.



This report investigates various forms of public transport including potential options and identifies benefits and issues with them.

Mode options considered are heavy rail, light rail, bus ways, bus lanes and combinations of these modes.

Public transport planning in Tweed Shire is dependent on higher level planning by the NSW and Queensland Governments. The yet to be commenced *NSW Far North Coast Regional Transport Strategy* needs to be completed and fully integrated with South East Queensland for Tweed Shire to have a clearer regional framework on which to plan its local public transport strategy.

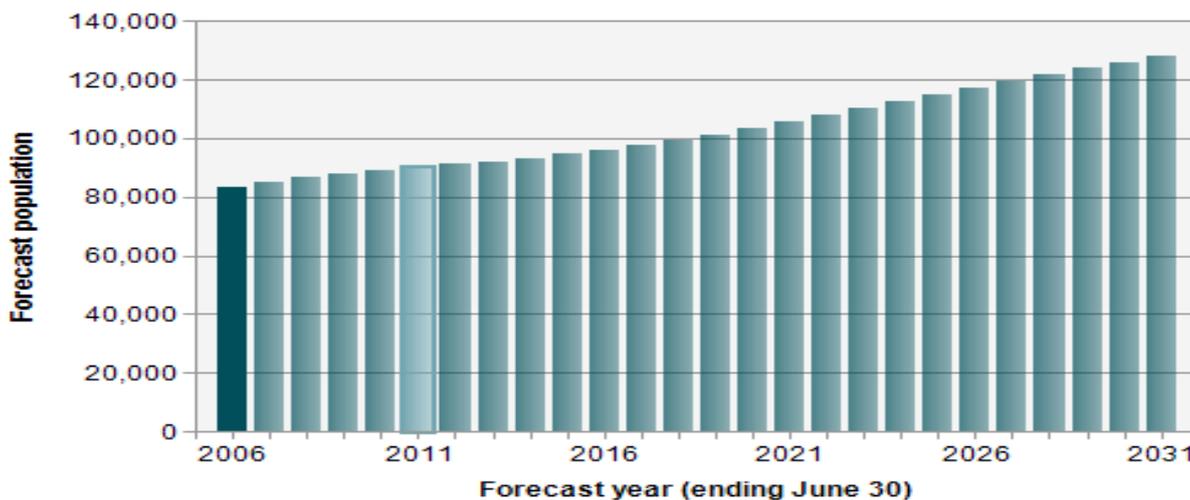
Notwithstanding these higher level strategic planning constraints, the report aims to establish a preferred strategic transport direction for Tweed Shire that is achievable in terms of sustainability, cost and population, and to support integration with public transport modes proposed or existing within the Gold Coast City Council area.

2. Demographics

To develop a public transport plan for the future demographics for the Shire need to be considered as it is a critical factor in identifying the most appropriate transport mode.

The Shire's population is currently 90,381 and is expected to grow to 128,134 by 2031. This is an increase of nearly 42% at just under 2% growth per year and is shown on the graph below:

Forecast population, Tweed Shire



Source: Tweed Shire Council

Where people live and work is also important to understand and the following two tables show the area of residence for people working in Tweed Shire (Table 1) and the number of workers that travel across the border to or from Tweed Shire to reach their place of employment (Table 2).



These tables show that about 80% of Tweed Shire workers live in Tweed Shire and also work within the Shire and that almost all the remaining 20% live in Queensland, mostly on the Gold Coast. They also show that whilst about 6,300 residents of Tweed Shire cross the border to work, 3,600 residents of Queensland travel into Tweed Shire to work. This indicates that about 10,000 workers could be targeted by better regional transport and a further 18,000 by better local (Tweed Shire) transport.

Table 1:

Local Government Areas of residence^(a) for workers in Tweed Shire Council, 2006

Rank	Local Government Area	Number	Percent (%)
1	Tweed	17,784	79.8
2	Gold Coast	3,591	16.1
3	Byron	383	1.7
4	Lismore	67	0.3

Source: Tweed Shire Council

Table 2:**Workers travelling across the Border 2006**

Rank	Local Government Area	Number	Percent (%)
1	Tweed Shire To Gold Coast	5,824	19.9
2	From Gold Coast to Tweed Shire	3,591	16.1
3	Tweed Shire To Brisbane	357	1.2
4	Tweed Shire To Logan	62	0.2

Source: Tweed Shire Council

These figures are relatively low and are problematic in planning public transport in terms of cost effectiveness because by applying population growth figures to workers, it is estimated that 17,000 interstate workers and 25,000 local workers would be in the area by 2031.

In contrast the Gold Coast currently has 560,000 residents and 40,000 visitor/nights (6 times greater than Tweed).

Also of major importance is the data on travel to work methods shown in Table 3 below:

Table 3:

Travel method	number	%	Regional NSW %
Car, as driver	18,688	59.3	57.4
Car, as passenger	1,887	6.0	6.2
Train	15	0.0	0.5
Train and Car	25	0.1	0.2
Train and other	3	0.0	0.1
Train and multiple other methods	7	0.0	0.0
Bus	276	0.9	0.7
Bus and car	41	0.1	0.1
Bus and other (not train)	11	0.0	0.0
Ferry	3	0.0	0.0
Truck	619	2.0	1.9

Travel method	number	%	Regional NSW %
Motorbike/Motor scooter	212	0.7	0.7
Bicycle	286	0.9	0.8
Taxi/Other	186	0.6	0.7
Other - multiple methods	184	0.6	0.5
Walked only	962	3.1	4.4
Worked at home	1,647	5.2	6.0
Did not go to work	3,568	11.3	11.1
Unemployed	2,238	7.1	7.0
Total	31,500	100.0	

Source: Tweed Shire Council



The data is not encouraging showing only 1% of workers use buses to travel to work with just as many riding bikes to work and three times as many walking. This is very poor public transport usage and it would appear to reflect on the current public transport services and availability.

The Gold Coast had 3.5% public transport usage in 1992 with a target of 6.5% in 2011. Based on this even if Tweed Shire achieved 6.5% public transport usage by 2031, it would still only equate to about 2,700 employment related commutes per day.

3. Previous Public Transport Studies

Public transport within Tweed and the region has been the subject of previous studies, the ones of most significance to Tweed Shire are listed below, along with their recommendations:

1. Gold Coast City Transport Plan 1998
 1. Identified a "line haul" corridor along the Gold Coast to Gold Coast Airport
2. Gold Coast Light Rail Feasibility Study 2004
 1. Identified light rail was feasible from Helensvale to Broadbeach
 2. Broadbeach to Gold Coast Airport more likely to be Bus Rapid Transport
3. Cross Border Transport Taskforce Discussion Paper 2007
 1. A senior officer working group comprising representatives from relevant Queensland and NSW agencies and reporting to the Cross Border Task Force should be formed to take long term responsibility for the establishment of viable regional and cross border public transport in the Northern NSW/South East Queensland region. That group should immediately begin to identify a potential corridor.
 2. The Working Group should also begin to identify an appropriate interchange location and preserve capacity to build such a facility.
 3. That planning for a rail line should be premised on it being staged southwards from the Queensland border.
 4. That as part of the rural and regional bus reform process, new planning, funding and contracting arrangements be introduced in the Northern NSW Region as a matter of priority.
 5. That a cross border consultation capacity be established at the local level between the two states to achieve over time a more consistent planning and regulatory approach for the cross border region.
4. Cross Border Transport Taskforce Report 2009
 1. That no further work be advanced on potential rail links between northern New South Wales and South-east Queensland, including the infrastructure requirements, costs and delivery timeframe for any such rail link.
 2. That a cross-border liaison officer be nominated by both the New South Wales Ministry of Transport and by the Queensland Trans Link Transit Authority to provide continuing coordination of effort to better integrate public transport services on both sides of the border.
 3. That Rail Infrastructure Corporation be asked to assess the feasibility of enabling road traffic to traverse the rail line at an additional location in Byron Bay township. This could involve, for example, a second level-crossing, but would need to be subject to a commitment from both RIC and Byron Shire Council to agree on a grade-separated crossing if ever regular rail services through Byron Bay township were resumed.

The first two recommendations of the Task Force Report 2009 are of considerable importance to Tweed Shire and are currently the most up to date.

4. Proposed Studies

Whilst Recommendation 4.1 rules out any future rail link between northern NSW and South East Queensland, the NSW Government has proposed that a Far North Coast Regional Transport Strategy be developed as an outcome of the NSW State Plan 2010.

Work has yet to commence on the Strategy however Northern Rivers Regional Organisation of Councils (NOROC) has been actively trying to stimulate the NSW Government into commencing preparation of the Strategy.

Any Tweed Shire Public Transport Plan or direction will need to be integrated into the proposed Far North Coast Regional Transport Strategy which may not be finalised for some time. This creates uncertainty for this report as the Regional Framework that a Tweed Shire Transport Strategy must reflect and integrate with is unknown.

It is also essential to consider the recommendations of various South East Queensland Transport Strategies in developing a Strategy for Tweed Shire and the Far North Coast.

These studies recommended that:

1. The heavy railway currently terminating at Varsity Lakes be progressively extended to the Gold Coast Airport Multi Modal Transport Hub.
2. A rapid transport corridor following the Gold Coast Highway be developed from Broadbeach to the Gold Coast Multi Modal Transport Hub (this may be a bus way or light rail) in 2026.
3. The Gold Coast Airport Multi Modal Transport Hub will be the transport Interchange for the southern corner of the Gold Coast and the Tweed.
4. Requests to extend the Rapid Transport Corridor to Coolangatta are being considered.
5. A new study is being undertaken titled the 'Gold Coast Urban Area Strategy' including the impact of growth in northern NSW.

From these recommendations, it is highly probable that the Regional Multi Modal Transport Interchange will be located at Gold Coast Airport. This means that any transport planning strategy for Tweed Shire needs to integrate with this location.

5. Public Transport Modal Options

There are several modes of public transport that can form the basis of a transport strategy either as standalone options, or, more commonly combinations of modal options.

5.1 Heavy Rail Option

At best heavy rail is considered a long term option (2030+) because it is extremely expensive and has been rejected as a viable option by the 2009 Cross Border Taskforce Report.

The Gold Coast Airport is planned as the future Regional Multi Modal Transport Interchange and any heavy rail option for Tweed needs to feed into this hub.

Tweed Coast, Cobaki and Bilambil Heights are Tweed Shire's major growth areas and population base. South of the Tweed River, growth is concentrated along the coast, it is expedient to maximise potential patronage by locating a heavy rail corridor along the coastal strip. Murwillumbah and other rural areas would need to be serviced by a high frequency bus service connecting with a future station at or near the Chinderah Interchange.

Whilst significant expenditure is required to determine an acceptable and physically constructible alignment, the following option is put forward for strategic assessment.

A heavy rail option corridor could consist of 3 distinct elements which are:

Part 1

Continue from Gold Coast Airport Transport Hub via Tweed City to Barneys Point Bridge with a proposed station at Tweed City. It would most likely need to be constructed underground.

Part 2

Overland through Chinderah following Pacific Highway alignment with proposed stations at Chinderah Interchange, Bogangar Interchange and Pottsville Interchange and merging with the existing railway at Yelgun.

Note: This alignment would be the most achievable as a corridor along the freeway would only require incremental widening of existing property resumptions. A new corridor would fragment many currently unaffected properties and create a barrier across the Tweed landscape that would adversely impact on the social amenity of the area and the environment.

Part 3

A system of feeder bus routes to and from proposed stations for the Coastal Villages and Murwillumbah.

A strategic level cost estimate based on expenditure for recently completed rail projects has been prepared.

In 2007 dollars based on Epping/Chatswood underground railway and Mandurah WA surface railway an indicative cost of the above proposal is:

7.5km underground at \$177.6M/km	=	\$1,332 M
24km overground at \$42.3M/km	=	\$1,015 M
Total Indicative Construction Cost	=	\$2,347 M

(only covers Gold Coast Airport to the connection with existing railway at Yelgun)

The high cost of a heavy rail option and relatively low population base indicates this option is very unlikely to proceed.

This is an indicative estimate only and can only be used for comparison purposes in this report and should not be used for any budgetary type considerations.

The Recommendation of the Cross Border Transport Task Force Report 2009:

"That no further work be advanced on potential rail links between northern New South Wales and south-east Queensland, including the infrastructure requirements, costs and delivery timeframe for any such rail link."

Indicates there is currently insufficient high level support for a heavy rail link through Tweed Shire.

The indicative cost to construct a heavy rail link (through Tweed Shire from Coolangatta to Yelgun) is \$2.3 billion, this is not sustainable for an area with an estimated future population of 128,134. However the link may be more feasible in an interstate/inter regional connection context.

Given the high cost of construction and current lack of meaningful high level support a heavy rail link cannot be relied upon as a component of Tweed Shires long term public transport strategy.

It is recommended that Council does not rely on a heavy rail link from Coolangatta to Yelgun in any medium to long term Tweed Shire Public Transport Strategy.

It is not considered expedient to rely on heavy rail as part of a Tweed Public Transport Strategy, due to its extreme uncertainty. However if at some future date a decision was taken at a state or federal level to construct a link from the Gold Coast Airport Transport Hub to Yelgun or thereabouts this would be a welcome addition to the suite of public transport modes within Tweed Shire. A heavy rail link would be compatible with the rapid bus transport corridor system that Council may construct in the interim period.

5.2 Rapid Bus Option

This option can consist of two sub options being dedicated bus ways which are separate roads only accessible by buses or bus lanes where lanes on existing roads are marked for bus use only. There is some interaction with other traffic as turning vehicles need to cross or use short lengths of these lanes.

In developing this option, Surfside Buslines were consulted in regard to their strategic vision and views on how to best service the Tweed.

It was advised that to maximise attractiveness to potential passengers, the major route should travel along the coast through as many population centres as possible so as to be readily accessible and minimise changes between buses.

It is proposed that the Rapid Bus Corridor would follow the route of Wharf Street, Minjungbal Drive and the Tweed Coast Road. This route can be broken down into 2 segments being:

1. Dedicated bus lanes from Darlington Drive to the Gold Coast Transport Hub including bus priority activated traffic signals.
2. Bus lanes along the Tweed Coast Road.

Murwillumbah would be serviced by a separate route either interchanging at Chinderah or continuing on through Tweed Heads South to the Gold Coast Airport Multi Modal Interchange.

A major benefit of this option is that the Bus Corridor can be developed and upgraded in stages as funds become available and in accordance with demand. For example Minjungbal Drive bus lanes and priority activated traffic signals would be Stage 1 of Segment 1 above, then Stage 2 being Wharf Street bus lanes.

The following figure shows the Potential Tweed Shire Rapid Bus Corridor:



Figure 1

Indicative Cost Estimate

An indicative cost estimate has been prepared based on the 2007 costs of constructing bus lanes which varied between \$5M and \$8M/km.

This equates to \$130M for a 26km rapid bus corridor from Pottsville to the Gold Coast Airport Multi Modal Transport Interchange.

5.3 Light Rail

Light rail has similar attributes to Rapid Bus Transport, but can carry more passengers per hour than Bus Ways and can potentially be faster depending on the extent of interaction with traffic.

Current plans for Gold Coast Rapid Transport have light rail terminating at Broadbeach with a potential extension to Coolangatta Airport Transport Hub after 2026. Local groups have also requested that it be extended to Coolangatta.

The extension of light rail is dependent on future decisions by the Queensland Government and current information suggests the probability of extension of light rail south of Broadbeach is marginal. Published SEQ studies only identify 'a rapid transport corridor' along the Gold Coast Highway Corridor to the Gold Coast Airport, and high frequency bus services could be utilised instead of light rail.

Indicative Cost Estimate

The Gold Coast Light Rail Project currently under construction is costing \$949M for 13km at \$73M per kilometre which is very expensive. In the unlikely event that such a system was to be built in Tweed Heads and Tweed Heads South, this order of costs (**\$73M per kilometre**) would be similar as extensive road realignment, upgrades, intersection realignments and property acquisitions would be required.

5.4 Rapid Transport Options

Both Light Rail and Bus Rapid Transport can be considered as rapid transport options for Tweed.

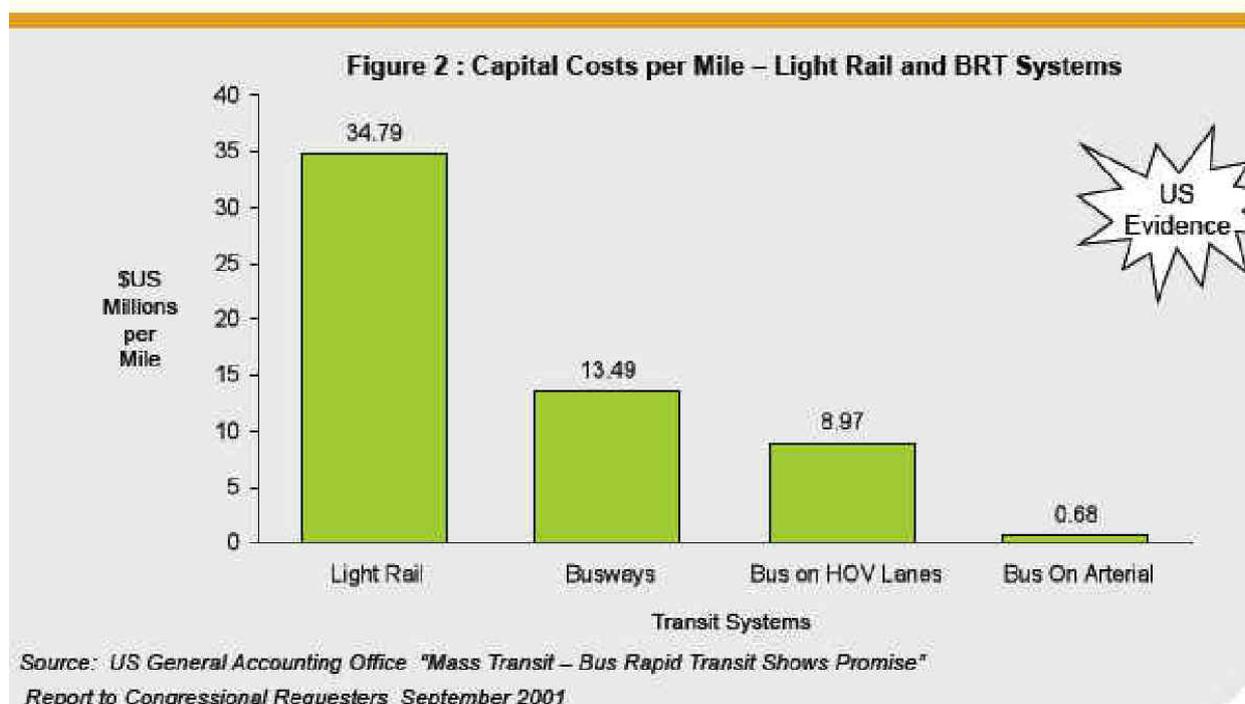
Light Rail is handicapped as a viable Tweed option by a number of issues:

- Current publicly available material suggests it is unlikely the Gold Coast Light Rail will be extended to the Southern Gold Coast and that the preferred option is likely to be bus rapid transport. Therefore Tweed is unlikely to have long term connectivity to the Gold Coast Light Rail system. An isolated Tweed system would not be viable.
- There is a very large cost disadvantage for light rail compared with bus rapid transport
- Even with the most optimistic public transport utilisation assumptions there are insufficient potential public transport users in the long term to create the volume of passengers that would utilise the capacity of a light rail system. A Tweed light rail system

would be permanently underutilised and therefore not viable on a cost/benefit basis compared with a rapid bus system.

The following figure shows a United States indicative cost comparison for construction between light rail and Bus Rapid Transport Systems:

BRT is cheaper to build than Light Rail...



* Monash University Data

Figure 2

Given the low population base and resultant public transport users catchment within Tweed Shire, Light Rail fails the cost/benefit test as Rapid Bus Transport is sixty percent cheaper and can easily accommodate expected demand.

Operating costs are also significantly lower for Bus Rapid Transport than Light Rail as shown in the United Kingdom sourced tables below:

Examples of Systems Operating Costs - UK Evidence

	UK Light Rail	UK Bus
£ per vehicle km	£3.79	£0.94
£ per passenger km	£0.14	£0.08

Examples of Out-turn Capital Costs (2002 prices)

	Light Rail	Bus Lanes	Busways	Conventional Guided Bus
Infrastructure cost (£m/km, 3-way)	5-25	0.006-0.8	2.7-1.5	2.7-4.3
Vehicle cost (£'000)	800-2,150	120-200	129-200	120-200
Expected Kilometres (pa)	25-50	8-14	8-14	8-14

Tweed data shows 10,500 workers cross the border now increasing to 17,000 in 2031. If 5% switch to public transport it equates to 850 passengers in peak hour.

Figure 3 below gives indicative capacity ranges for rapid transport systems. As can be seen, light rail becomes a viable option at between 5,000 and 22,000 passengers per hour. At passenger volumes below this, bus based solutions are the only cost effective option.

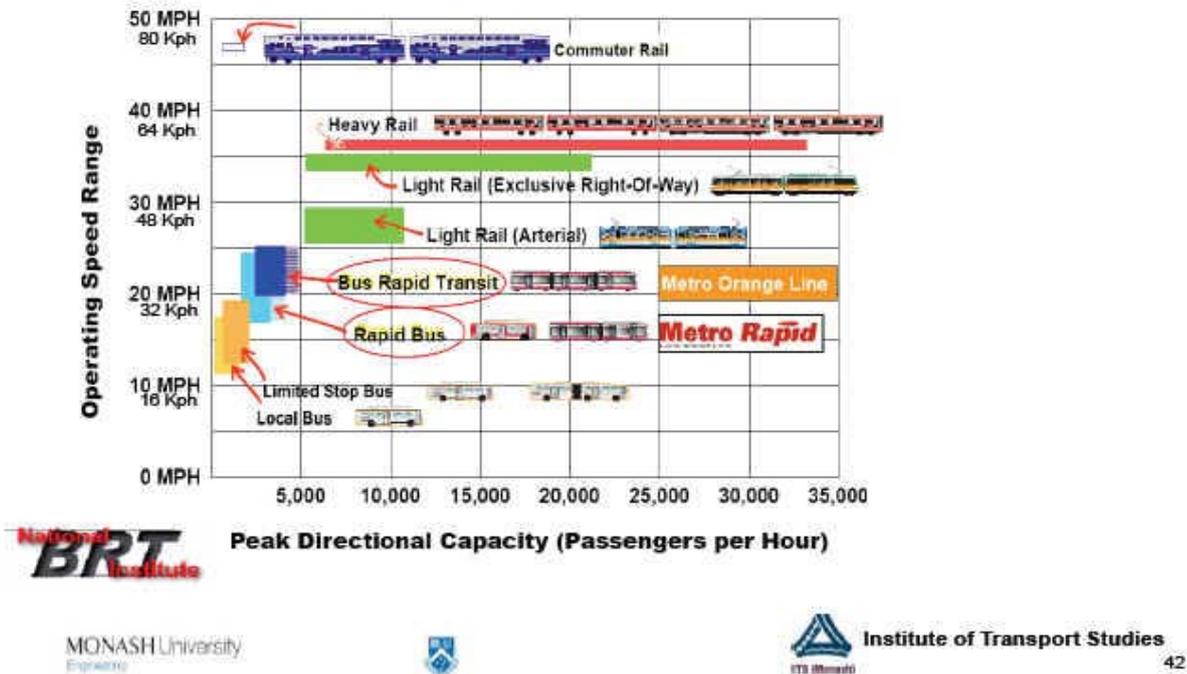


Figure 3

Tweed's future potential of 850 passengers per hour gets nowhere near the volume required to justify a light rail service.

Light rail extension beyond the Coolangatta Airport Hub is not viable on an economic or patronage basis and is therefore not a feasible transport option.

It is therefore recommended that light rail extending into NSW not be considered in a medium to long term Tweed Shire Public Transport Strategy.

Conclusion, Rapid Transport Systems

The most viable system of rapid transport south of the Coolangatta Airport Hub is by bus rapid transport.

It is considered that this mode of transport is the optimal public transport mode for Tweed Shire because of the Shire's relatively low current and future population and its dispersed patterns of development.

Rapid Bus Transport is flexible in delivery. It can be delivered in stages and be upgraded as demand grows. It allows for high frequency bus services to use the current heavy rail terminus at Varsity Lakes on the Gold Coast as an interim Modal Interchange which can be progressively shifted south as the heavy rail line is extended to Elanora, Tugun and finally the Gold Coast Airport Multi Modal Interchange.

Rapid Bus Transport is also the most affordable rapid transport option and planning and improvements can start in the short term without waiting for future decisions by the Queensland Government. They can be readily adapted to integrate with any of the public transport options selected for the Gold Coast region.

It is recommended that Rapid Bus Transport be supported as the preferred rapid transport mode for Tweed Shire and its inclusion be supported by Council in any future transportation studies.

6. Short Term Public Transport Issues

Currently Tweed Shire is serviced by public bus operations. These services are privately operated and as such need to be commercially viable. As shown in Table 3 only 1% of workers use public transport as their choice of transport to places of employment.

Impediments to Public Transport Use

1. High Cost

To travel 8km from Kingscliff to Tweed Heads costs \$6.80. The same distance on the Gold Coast (2 zones) is \$3.11 using the Go Card.

2. Infrequent Services

Services are not suitable for commuters (workers) because they are circuitous and infrequent as unsubsidised operators in NSW need to run commercially viable services.

3. **Travel Time**

To go from Kingscliff to Murwillumbah takes 1 ¼ hours and cannot get to Murwillumbah until 8.30am (operator needs to run a viable service).

4. **Changing busses to complete journey**

Forced changes at Bay Street for patrons travelling across the border because of different systems and fee structures in each State and delay and inconvenience.

Potential Short Term Improvements

Public transport in South East Queensland has made strong progress in recent years and of most significance is the formation of the Qld State Government subsidised '**TransLink**' which enabled transport in the greater SEQ Region from the Sunshine Coast to the NSW border to become integrated and have a standardised fee structure apply to all modes of transport.

The simplest and easiest, but potentially politically and legislative difficult improvement that could be made to improve the attractiveness of public transport in Tweed Shire is for the NSW Government to join (and subsidise on a similar pro rata basis as the Queensland Government) the 'Trans Link' system for at least services operated by Surfside Buslines in NSW. Surfside buses operating within Tweed Shire are all equipped to offer integrated TransLink ticketing and consistent fare zoning.

If Surfside services within Tweed Shire were operated under the 'TransLink' system the following benefits would be immediate:

1. **Uniformity of travel costs between NSW and Queensland**

NSW could be added to TransLink zones shown in Figure 4 rather than Surfside having to operate a separate zone system for NSW shown in Figure 5.

2. **More services (not dictated entirely by commercial considerations)**

As TransLink services are government subsidised this would have a financial impact on NSW Government, however they already provide subsidies for Sydney residents (e.g. Hills Bus and subsidised Government busses in Sydney and Newcastle)

3. **Go Card** integrated ticketing

Allows fares to be paid via computerised integrated ticketing card system that is fast and efficient and multi modal (trains, busses, light rail, Brisbane Ferries).

4. **Reduced requirement for bus changes**

As zones and fares would be consistent on both sides of the border, the need for changing busses at the border would be reduced.

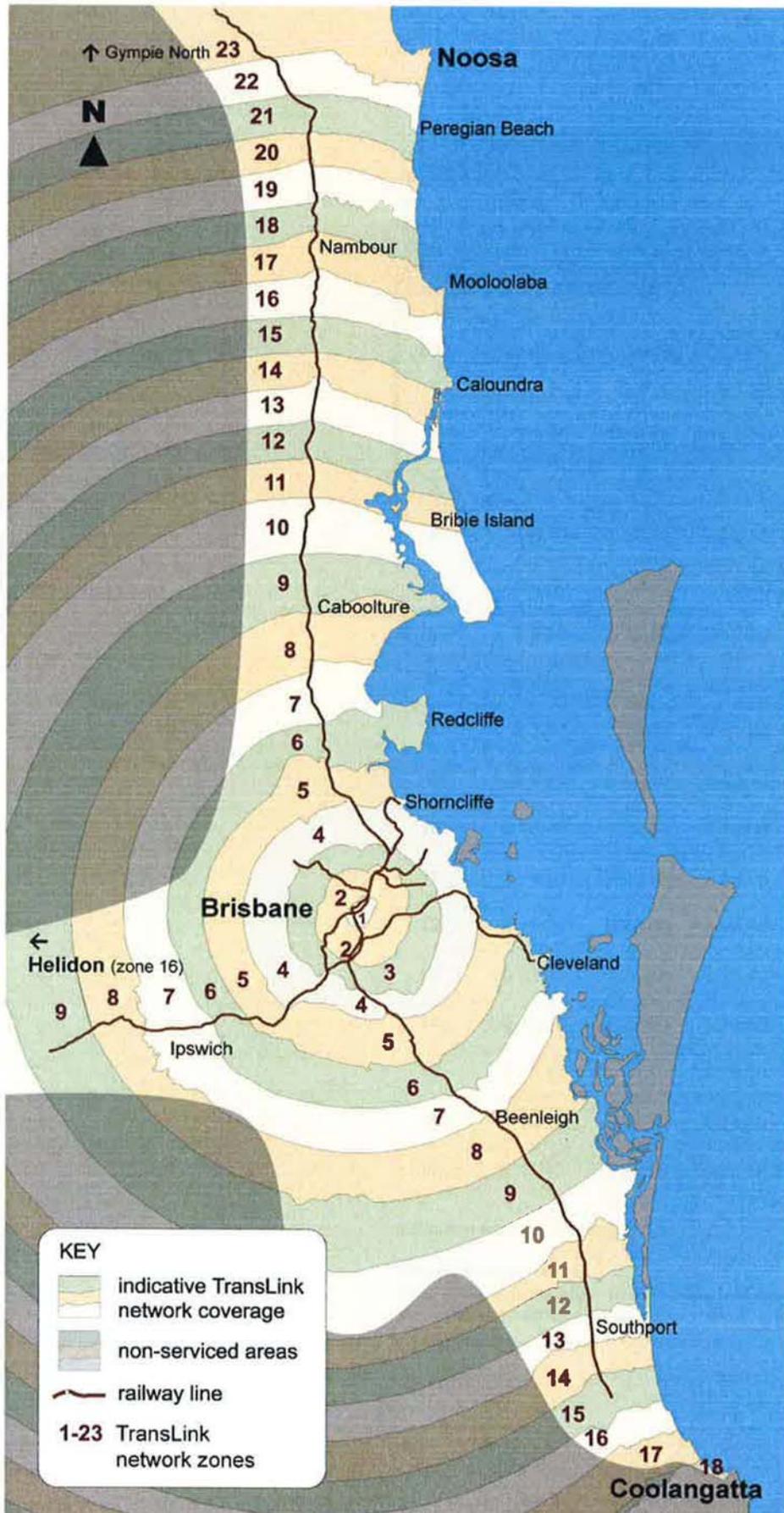


Figure 4 South East Queensland TransLink Zone Map



Figure 5 NSW Zone Map

7. Corridor Preservation

Heavy Rail:

An underground heavy rail corridor from the Gold Coast Airport Multi Modal Transport Hub to Barney's Point would require little corridor preservation, except for access/ventilation portals and stations.

The above ground corridor south of Barney's Point is proposed to be located adjacent to the existing freeway between Chinderah and Yelgun. Development immediately adjacent to the existing freeway reserve that would impact on a future heavy rail corridor in this rural area is likely to be limited.

Light Rail:

Corridor preservation is not further considered as this mode of rapid transport for Tweed is not recommended in the medium or long term in this report.

Bus Rapid Transport:

Corridors need to be created and are recommended.

8. Summary

Based on the above information, the optimal rapid transport mode for Tweed Shire is Rapid Bus Transport. This is a flexible option that is readily adaptable to staging to reflect available budgets.

There is also immediate potential at a joint state government level to improve the attractiveness of the existing bus services in Tweed Shire by NSW negotiating with the Queensland Government for bus services in Tweed Shire to be operated under Trans Link system.

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