# Submission to future transport and greater Sydney regional plan

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## On almost a page

Public consultation on draft Government plans is vital, not merely to seek community views but to allow for mistakes to be identified and corrected.

This submission briefly comments on rail aspects of the Future Transport and Greater Sydney Commission’s Regional draft plans.

Those drafts:

* do not adequately inform about matters of the greatest significance; and
* demonstrate Government knowledge and analysis is insufficient to make reasonable decisions.

Among other things, the rail parts of the plans suffer profound conflicts; internally, against each other, and against stated Commonwealth intentions including for Badgerys Creek.

The available evidence is the plans have been developed without proper consideration of rail customers or public policy purposes. There is nothing to suggest important lessons have been learned, particularly those vital to development of the ‘Aerotropolis’.

The plans favour affluent inner-city dwellers at the expense of others especially in Western Sydney.

This submission provides a contra example; of rail planning based on customer needs. It identifies a series of projects for the next 40 years including some needed as a matter of urgency such as a north-south line through Badgerys Creek.

Contrary to intimations in both drafts, these needs are for commuter style services in South-West Sydney and therefore infrastructure usable by double and single deck fleets and possibly other train types. The drafts’ version of ‘mass transit’, the State Government’s Metro lines which can never be used by other trains, has no place in this large area.

The risks of ignoring this, or adopting either Future Transport or the Regional drafts, include creating divisions between haves and have-nots in Sydney, ongoing public disruption and waste of tens of billions of dollars.

Even before the unduly short ‘consultation’ period on these drafts has ended there have been reports of Government decisions that may preclude the most important parts of any rail ‘vision’. If these reports are correct, there are questions about the bona fides of the consultation process.

A new process to develop Sydney transport plans, including relevant and proper public consultation supported by independent expertise, is needed. An independent public inquiry is necessary.

The submission should be made public and corrections would be welcomed.

## Introduction

Thank you for providing an opportunity to comment on the Future Transport and Greater Sydney Regional draft plans. My comments start with rail and have implications for all matters in the drafts.

## Overview

The drafts should be amended and new versions issued. This should be part of a thorough, transparent process to properly inform Government and the community on the significant issues.

The current drafts:

* do not adequately inform about matters of the greatest significance; and
* demonstrate Government knowledge and analysis is insufficient to make reasonable decisions regarding those matters.

Any of three reasons lead to these conclusions:

1. Key facts are not presented;
2. The drafts are in conflict, ambiguous and suffer internal contradictions;
3. The process, including consultation, is flawed.

The consequences of continuing the path of decision making without proper public information include: creating divisions between haves and have-nots in Sydney; waste of tens of billions of dollars; insoluble traffic congestion; NSW becoming an ongoing drain on the national economy.

Reflecting these factors, a new process to develop policy and projects, including relevant, lengthy and proper public consultation is needed.

## Issues

### 1. Key facts omitted

The drafts omit the key facts about transport services. Among these are:

* compatibility of different passenger systems with freight;
* travel time; seating capacity;
* ability to retrofit infrastructure for other uses;
* options and lessons;
* Metro is unnecessarily designed to be incompatible with the existing rail system.

One illustration of the relevance of these points: sustainable transport patterns in the Sydney area will require the use of rail for commuting. Commuting requires adequate seating on trains for journeys over, say, 20 minutes. If sufficient train seats are not available commuters will drive on the most heavily congested roads and cause local car parking problems; unnecessary road traffic and parking is contrary to public policy objectives.

The claims of more frequent trains or turn-up-and-go services, in conjunction with fewer seats, really mean Metro as currently conceived will advantage inner city residents by adversely affecting the rest of the metropolis and its commuters. Appendix 1 provides an example; the Bankstown line.

A further illustration: expansion of commuter rail capacity to Parramatta may require a compatible new harbour crossing. However, Metro construction may preclude this. This matter is of such pivotal significance that any Sydney transport plan is not credible unless it is addressed. However, it is not mentioned in the plans, destroying their utility as consultation material.

The drafts ignore hard learned lessons. Appendix 2 identifies some lessons vital for the start of the ‘Aerotropolis’ around Badgerys Creek.

### 2. Conflict, ambiguity and contradiction

The Greater Sydney Commission’s rail vision conflicts with that of Future Transport (below).

|  |  |
| --- | --- |
| **Greater Sydney Regional Plan** | **Future Transport**  |
|  |  |

The visible differences include:

* the title; the Commission infers all Sydney railways are to be converted to mass transit;
* (implied) definitions of ‘train’ and ‘mass transit’;
* line segments such as CBD-Chatswood.

Ambiguities arise from this conflict and also are apparent within each ‘vision’. For example:

* the Greater Sydney Commission’s diagram represents the two different passenger rail systems as a single network; this is false and can only be rectified by conversion of all rail lines to mass transit (Metro) or conversion of Metro to specifications interoperable with Sydney trains;
* the Future Transport diagram has Chatswood-CBD as ‘new trains/mass transit’ while its Parramatta- CBD has both ‘new trains/mass transit’ and ‘train corridor’ meaning:
* Chatswood-CBD, i.e. North Shore line, segment is to be converted to Metro; and/or
* no new trains for Campbelltown/Penrith/Sutherland/Hornsby - CBD.

Contradictions in the documents include:

* varying use of the term ‘mass transit’[[1]](#footnote-1);
* the claim of ‘turn-up and go’ services that travel to different destinations;
* different versions of the ’30 minute’ city concept, none of which conform to transport precepts;
* projects that directly undermine (two of) the ‘three cities’;
* claims of the customer being at the centre yet the key customer criteria are ignored;
* proposals fundamentally inconsistent with the principle of optimising infrastructure use.

There also are numerous mistakes and silly comments, for example:

* the claim that in 2056 Sydney’s population will be similar to that of London today
	+ in fact, the projection is for it to be 1 million people less;
* the claim that settlement density in ‘Greater Parramatta’ will approximate that of London
* Greater Parramatta (as defined by the Government) is 35sq km, 0.3% of Sydney’s 12,368sq km; London has 9 million people in 1,600 sq. km;
* the claim that Metro can only run as many trains as commuter rail
* while not generally correct it may be the case for the under-construction Sydney Metro
* if correct, ‘mass transit’ rail should be ruled out.

### 3. Flawed process

The above matters make it difficult to offer comments. It is unclear what is proposed at any level; principles, direction or detail. This alone questions purposes of consultation limited to these drafts.

It would be unreasonable to claim that any submission in response to the drafts could support any part of the plans. New drafts, including all relevant facts and identifying options, need to be issued for public consultation.

There are other overwhelming reasons to restart the entire process, including planning, to ensure the Government is well informed about what it might want to do:

* a trust deficit
	+ previous rail ‘plans’ had biased criteria, dubious assessments against those criteria and, in some cases, were followed by actions that contradicted assessments. Fundamental questions were not answered and there was speculation about motives;
* failure to refer to authoritative work and inquiries underway
	+ such as the public inquiry into Sydney public transport (Christie, 2010) and estimation of rail capacity for the NSW Government (Douglas, 2012)
	+ the present process could be seen as attempting to usurp the joint Commonwealth-State Western Sydney rail needs scoping study.

In the meantime, there are reports perhaps implying the Government is undermining its own draft plans even before the end of the unduly short consultation period.[[2]](#footnote-2)

The relevant claims could mean options for a north-south line through Badgerys Creek – the most important transport project for South-Western Sydney – are rendered impractical or unaffordable because of Government decisions to allow new housing on land ‘earmarked’ for the corridor. If correct, these claims raise questions about the bona fides of at least the consultation process.

## Conclusion

The drafts widen the trust deficit. They have many mistakes, inconsistencies and omissions. While the two drafts purport to be mutually consistent, and despite their numerous cross references, they portray fundamentally different ‘visions’. Then there are reports of decisions that may pre-empt matters raised in the drafts.

These matters mean the planning process, including engaging with the community and experts, has already failed. It also means the drafts cannot be the last word in consultation.

There is a high risk of enormous negative consequences for Sydney and Australia of decision making in these circumstances, even if there are so-called business cases and cost-benefit analyses.

Planning and public engagement for rail and transport in Sydney needs to start again. The process suggested by Christie (2010) should be adopted as the starting point.

The NSW Parliament should ask the Commonwealth Parliament to take the lead as an honest broker.

The deficiencies of the drafts confirm a formal public inquiry is necessary; the inquiry must be independent of the NSW Government and authors of these materials. The authors should be asked to provide evidence to the inquiry. Prior to any developments, plans or particular projects being started, there should be public exhibition of full network train operating plans, the matters indicated in Appendix 3 and independently conducted and assessed cost-benefit analyses

Information demonstrating each of the above points is at thejadebeagle.com.

An example of a rail plan with the ‘customer at the centre’ is at Appendix 3. Dealing with the Macarthur-Liverpool area in South-West Sydney, it demonstrates the need for commuter style services, infrastructure usable by various trains - double deck, single deck and possibly other trains. It also demonstrates the most important project to be a north-south line through Badgerys Creek.

I would be pleased to elaborate on any matter.

I also would be pleased for this submission to be made public and to be corrected on its content.

Again, thank you for the opportunity to provide comments and I look forward to commenting more favourably on more appropriate proposals in the future.

J Austen

22 November 2017

## Appendix 1: Bankstown example

This appendix considers the arithmetic of capacity of trains, using the case of replacement of Sydney trains with Sydney Metro on the Bankstown line.

The basic figures (drawn from the Sydney Metro Environmental Impact Statement (EIS)) are:

* Metro: 15 trains per hour, 17,000 seats in three hours. This implies 378 seats per train;[[3]](#footnote-3)
* Sydney trains: 10 trains per hour. 880 seats per train.[[4]](#footnote-4) Capacity of 26,700 seats in three hours.

Other relevant estimates are:

* Metro: total train capacity, standing and sitting, 900 to 1350 (2 to 4 people per square metre);
* Sydney trains: total train capacity, standing and sitting, 1200 to 1750.

To compare like with like, it is assumed Sydney trains at present can run at 10 per hour and could be increased to 12 per hour.[[5]](#footnote-5) The results are shown in Table A1.

**Table A1: Indicative train capacity comparison, Bankstown line**

|  |  |  |  |
| --- | --- | --- | --- |
|  | **Metro** | **Sydney trains** | **Difference** |
| EIS (a)Trains per hourSeats in 3 hoursTotal 3 hr pax. capacity | 1517,00040,500 | 1026,40036,000 | +5-9,400+4,500 |
| Potential (b) Trains per hourSeats in 3 hoursTotal 3 hr pax. capacity (b)Total 3 hr pax. capacity (c) | 1517,00040,50060,750 | 1231,68043,20063,000 | +3-14,680-2,700-2,250 |

1. From Environmental Impact Statement (EIS above) with 2 people per square metre
2. From EIS (above) and for Sydney trains text above with 2 people per square metre
3. From EIS (above) and for Sydney trains text above with 4 people per square metre

The Table indicates Metro lines (not just trains) have:

* less seating capacity than current potential Sydney train operations;
* less total passenger capacity than Sydney trains operating at comparable levels.

Another manner of explanation is: for the 3-hour period, the capacity of Metro’s (45) trains can be matched by 19 Sydney trains for seating or 34 Sydney trains for total passengers.

This is not to say Metro is always and everywhere bad. The EIS implies the 10 Sydney trains services do not stop at each station on the line. It claims Metro offers faster travel between Bankstown and Sydney’s CBD – albeit with fewer stops between Sydenham and the CBD.

Metro may also have positive effects on other network segments, but if so the Bankstown line would appear to be disadvantaged to support other projects and inner-city dwellers.

In any event, much more customer relevant information needs to support Metro claims, or any decision to adopt Metro, especially if it impacts on Sydney trains operations.

## Appendix 2: Lessons for Badgerys Creek

A number of critical matters need to be addressed for development of the ‘Aerotropolis’ centred on Badgerys Creek. While hard lessons should have been learned from the Kingsford Smith airport line, Skytrain in Brisbane etc. these have been overlooked in the drafts.

The lessons can be grouped into three inter-related classes:

* purpose;
* retrofitting;
* commercial pressures.

The following comments relate to lessons from the airport line at Kingsford Smith, opened in 2000.

**Purpose**

Conceived well after Kingsford Smith airport was operating, the airport line has two purposes the conflict between which became progressively exposed as ridership grew.

One purpose was to enable rail travel for the 10km between Sydney city and the airport; to allow airport growth without corresponding road traffic increases.

The other purpose was to provide additional rail capacity to the East Hills line which carried commuters from South-West suburbs as far out as Macarthur; around 50km from the airport. Some trains would be routed through the airport instead of through Sydenham.

The visible result on this line remains today; airline passengers with luggage boarding unsuitable double-deck carriages crammed with commuters travelling much longer distances. Less visible results include unbalanced train loads; trains passing through Sydenham have more passengers on board because they are faster and above-ground.

More recently, property development between the airport and Sydney exacerbated the situation such that there are calls for new transport ‘strategies’ for that area.

The core issue for the Kingsford Smith line is conflict between the land planning assumption that the airport is a major destination and the railway assumption of the airport being just another stop on a line. The latter arises from a desire to ease operating pressures originating in ‘real’ destinations far away from the airport in Sydney and the Macarthur region.

In the case of Badgerys Creek, the co-location of airport and destination i.e ‘Aerotropolis’ creates a different planning issue; a potential false expectation that rail demand will be driven by airline traveller numbers rather than employment etc. at the airport and (more significantly) the adjacent business precincts. Apart from the fact that commuters undertake at least twice as many trips per day as airline travellers there are likely to be far more commuters than travellers at the Aerotropolis – as is the case on trains passing through Kingsford Smith.

*Lesson: Transport conflicts arise about (retrofitted) airport rail lines. The conflicts are not merely between businesses; they are in the planning community and bureaucracy. Proper resolution requires non-ideological consideration of demand at the airport, (especially) surrounding and associated precincts, and further destinations. This needs to take into account different travel habits of commuters and travellers.*

**Retrofitting**

The Kingsford Smith airport line took 10 years to build at a (then) public cost of around $1bn; well in excess of original estimates. Substantial cost items included retrofitting station cavities under the airport terminals and tunnel boring (very carefully!) under runways / the Illawarra rail line.

While the State Government’s initial expectation was for the line to be built and operated by private funding, this proved impractical. The stations were built and owned by the private sector, but changed hands due to financial difficulties. The Government paid for the line.

Government was involved in after-the-event financial negotiations for a number of reasons including claims that low station use was attributable to problems with CityRail (now Sydney trains).

*Lesson: The length of time and cost to build a rail line will increase substantially if it needs to be retrofitted to an airport*.

**Commercial issues**

Widespread commercial issues arose including allocation of financial and construction related risks.

One class of issue related to disruption to existing business; railways reduce demand for other public transport including privately owned and operated buses, taxis and hire cars.

Other issues arose out of car use; railways also reduce demand experience on privately owned tolled motorways near the airport and airport car parks.

At the time the line opened Sydney airport was publicly owned. It was subsequently privatised and has significant earnings from parking and other vehicle fees; profits reportedly run at near $100m per annum.[[6]](#footnote-6)

Another class of commercial issue relates to ‘investment’ along potential rail corridors; in some cases with expectations of property being resumed by Government.

*Lesson: Many parties should be expected to seek commercial and compensation ‘negotiations’ with Governments unless an airport rail line is built within clearly identified parameters and time frames.*

**Overall**

There are two take out lessons.

First, compared with a rail line and airport constructed simultaneously, a later rail connection will cost substantially more due to fewer passengers and:

* design, engineering and risk costs at the site and elsewhere in the associated rail network;
* complex negotiations and contracts including for compensation and to address probity issues;
* delays due to engineering issues and the negotiations.

Second, the potential for loss of focus – for conflicting rail objectives – and the range of stakeholders imply decisions are best be taken outside transport portfolios. Processes for the Aerotropolis should be overseen by the Prime Minister.

It is imperative to avoid ‘capture by planners’ – of being solely focussed on convenience for airline travellers, even if that is ‘core business’ for transport departments.

Decisions need to take into account the long term, the likely structure of optimal demand, and the probable greater needs of commuting that will be required to transform the airport into the centre – one part of - an ‘Aerotropolis’.

That the Commonwealth Government is talking up a potential ‘city-deal’ for Badgerys Creek etc., extending beyond aviation matters, means it is already responsible for wider outcomes.

Again, as the ‘Aerotropolis’ is to grow around Badgerys Creek, its co-location of commuter and traveller destinations creates a situation unlike the Kingsford Smith airport line where these destinations vary up to 70km.

One implication: compared with an east-west line e.g to Parramatta, a north-south line through Badgerys Creek is a better strategy and higher priority.

A north-south line would be needed for either airline travel or for commuting to the Aerotropolis; fortunately for its economics it would be used for both.

Compared with an east-west line, a north-south line faces less risk of delay, complexity and dissatisfaction due to addition of rail integration/operational objectives, such as improving a ‘West Metro’ between Sydney and Parramatta.

Another implication: at a minimum, construction of Badgerys Creek airport and in associated surrounds needs to facilitate – include engineered cavities/ space for – stations and corridors for rail lines compatible with Sydney trains. This needs to be done now, as the airport is being built.

A ten-year planning horizon, as indicated in Greater Sydney Regional Plan and Future Transport, is wholly unsatisfactory and will create strong commercial pressures opposing the rail lines needed for South-Western Sydney.

In this context, recent reports of State Government permission for housing on land ‘earmarked’ for rail corridors to Badgerys Creek - if accurate - raise grave concerns and could negate the credibility of the State’s transport planning process and Commonwealth ‘city-deals’.

## Appendix 3: Customer focus – Macarthur Liverpool area

This Appendix illustrates a customer focused approach to rail transport planning. It starts with urban customers and then considers their fleet requirements. The fleet requirements are used to identify infrastructure projects that will be among those needed in the next 40 years in the Macarthur and Liverpool areas of South-West Sydney.

Table 1 identifies urban passenger types and basic travel patterns.

Table 2 identifies distances and suggests target travel times for some of these patterns.

Table 3 sets out basic characteristics of train types.

Table 4 identifies the changes needed to support the travel patterns.

Table 5 identifies the infrastructure projects needed for the changes.

Projects, including those identified in the Regional Plan draft, Future Transport draft and here, should not go ahead without prior public exhibition of: full network train operating plans including freight; matters indicated below; independently conducted and assessed cost-benefit analyses.

**Table 1: South-West Sydney urban rail passenger types, patterns**

|  |  |  |
| --- | --- | --- |
| **Passenger type** | **From** | **To** |
| Commuters  | MacarthurNarellanLiverpoolBankstownPicton | SydneyParramattaEpping (Global arc)Badgerys CkWollongong |
| Travellers  | MacarthurNarellanLiverpoolBankstownWollongong | ParramattaBadgerys CkKingsford Smith |
| Transiters | Macarthur-NarellanLiverpool-Parramatta |

Table 1 indicates the primary use of passenger rail in South-West Sydney will be commuting. There is and will remain virtually no transit. Present rail segments can also be used by freight trains.

Table 2 (below) provides actual and possible (conservative) target travel times by rail in South-West Sydney using Macarthur, Liverpool and Badgerys Creek as examples.

Table 2 shows all current and nearly all potential rail distances in South-West Sydney to exceed 30km and rail travel times of more than 25 minutes. This confirms commuting is the principal task.

The likely profile of demand for Badgerys Creek ‘Aerotropolis’ will see commuting as the primary task; unlike the case of Kingsford Smith in Sydney’s east. Among the implications is strong demand in a north-south rail axis from at least Leppington to St Marys. Travel will be a secondary use.

The Table proposes relatively slow train trips – conservative targets – easily achievable with existing, rather than new generation, Sydney trains including current signalling.

These times are all less than one hour, meaning they effectively bring all key metropolitan centres (Table 1) into commuting reach of South-West Sydney. Connection by rail would reduce substantial commuting pressure on motorways; pressure experienced when rail trips take longer due to indirect routes or train to train interchanges by passengers.

Table 2 shows a target travel time for Liverpool-Sydney (Circular Quay) reduced by 15 minutes or 25 from the present. Such trips are probably significantly faster than achievable by extension of Metro from Bankstown to Liverpool.

The Table also includes a target travel time between Badgerys Creek and Kingsford Smith airports.

**Table 2: Travel patterns distances and conservative target times, Macarthur, Liverpool example**

|  |  |  |  |
| --- | --- | --- | --- |
| **Segment** | **Distance km (a)** | **Current train travel time minutes** | **Conservative target: maximum train travel time minutes** |
| Liverpool-Sydney (Quay) | 49  | 65 | 50 (b) |
| Liverpool-Badgerys Ck | 33 | - | 30 (c) |
| Macarthur-Sydney (Quay) | 61 | 60 | 60 (d) |
| Macarthur-Badgerys Ck | 47  | - | 40 (c) |
| Macarthur-Narellan | 9  | - | 10 (d) |
| Macarthur-Epping | 56  | 100 | 55 (e) |
| Macarthur-Wollongong | 135  | 165 | 60 (f) |
| Macarthur-Picton | 32 | 25 | 25 (d) |
| Narellan-Badgerys Ck | 40 | - | 25 (b) |
| Badgerys Ck-Kingsford Smith | 60  | - | 50 (b) |

1. Distance by existing rail line, then road distance for missing rail segment
2. Via East Hills. An option proposed elsewhere is to extend Sydney Metro from Bankstown to Liverpool. Sydney Metro claims travel time savings of up to 7 minutes between Bankstown and Sydney Central; 3 minutes of which relate to fewer stops inbound from Sydenham. Total travel time from Bankstown is claimed at 28 minutes <https://www.sydneymetro.info/sites/default/files/document-library/Sydenham%20to%20Bankstown%20Environmental%20Impact%20Statement%20Overview.pdf>. If this average speed was maintained, Liverpool to Sydney by Metro would take around 52 minutes; but Table 3 shows mass transit to be unsuitable for commuters – due to the need to stand for long periods on board trains with few seats.

Routing current commuter services via Holsworthy would result in a scheduled train trip time of less than 49 minutes and arrive further into Sydney’s CBD; this commuter option is preferable on both travel times (at least 5 minutes) and suitability of fleet.

1. Via Leppington
2. Capacity improvements allocated to operating more trains
3. Via Parramatta
4. Via Picton area, reducing distance (by 60km) to 75km.

Table 3 (below) shows typical characteristics of different urban passenger train types/systems; commuter and mass transit. It does not show the characteristics of the NSW Government’s version of mass transit, ‘Metro’.[[7]](#footnote-7)

Proponents of different rail systems make claims about the capacity of trains and lines; these are summarised in the Table as seats and maximum passengers per train. Appendix 1 explored some of these issues.

Douglas advised that ‘crush capacity’ is higher than shown in the Table; up to 1350 for mass transit and 1750 for commuter trains. These were based on 4 people per square metre of carriage space observed at ‘special events’. Special events, such as football finals or community celebrations, are more akin to commuting than transit or travel, being held in a single place and attracting a ‘directional’ flow of patrons.

**Table 3: Urban passenger train, demand types**

|  |  |  |  |
| --- | --- | --- | --- |
|  | **Commuter double deck** | **Commuter single deck** | **Mass transit** |
| **Trains** |  |  |  |
| Typical travel time (a) | Na | Na | Less than 25 minutes  |
| Max. on board time (b) | Na | Na | 35 minutes  |
| Station stops (c) | More than 2km | More than 2km | Less than 2 km |
| Speed (d) | Fast | Medium | Slow |
| Seats per train (e) | 900 | 500 | 400 |
| Max. passengers per train (e) | 1200 | 900 | 1200 |
| Min. waiting time (f) | 1.25 | 1.15 | 1.00 |
| Max. waiting time (g) | 15.00 | 10.00 | 2.00 |
| Hours of operation | 18 | 20 | 22 |
| **Demand** |  |  |  |
| Passenger type (h) | Commuter | Commuter/traveller | Transiter/traveller |
| Road competition (i) | Comfort/convenience | Comfort/convenience | Speed |
| Road policy issue  | Motorway use/car parks | Motorway/arterial use | Local gridlock  |
| Peak: off peak ratio (j) | Higher | Moderate | Lower |
| Peak destination on a segment (k) | Few locations | Several locations | Many locations |
| Peak direction on a segment (l) | One way | One way | Both ways  |

1. On board passenger travel time. Mass transit derived from the design standard of Sydney trains maximum on-board standing time i.e. Not suitable for trips over 25 minutes
2. Time for train to complete its journey. Mass transit derived from (a) and ratio of seats to passenger capacity.
3. Commuter trains may not stop at each station.
4. Result of (c), (e) and (f). Longer distances between stops mean higher speeds. High speeds are unsuitable when most passengers may be standing.
5. From <http://www.abc.net.au/news/factcheck/2014-04-11/barry-ofarrell-sydney-trains-claim-doubtful/5371446>. <http://images.smh.com.au/file/2013/09/23/4770519/trains.pdf>. Sydney Metro has fewer seats than shown here; 378.
6. Half the maximum frequency of trains at a station stop. See note (e). This is correct for ‘turn-up-and-go’ services but overstates waiting times for less frequent trains; at lower train frequencies passengers consult timetables and only arrive at stations close to train departure times.
7. Half the minimum frequency of trains at a station stop. See notes (e) and (f) and State Government statements of mass transit trains with 4-minute frequency.
8. Commuter; journey to/from a single place of work, education etc and return i.e. a morning and evening journey per weekday. Traveller; trip to passenger terminal e.g. Airport, interstate terminus, possibly sporting and special events e.g one journey per day varying times. Transiter; short trips to/from several places e.g. several journeys per day, any times.
9. Characteristics that substantially affect mode choice in the relevant market area. Car parking is a proxy for convenience. To address the road policy issue, trains need to provide a superior service compared with car use in the relevant area. For example, they do not need to achieve high speeds for mass transit, they only need to be faster than gridlocked traffic i.e slow compared with other trains.
10. Number of passengers in peak compared with off-peak; variance in passenger flows.
11. For commuters; in-bound (morning) to a few adjoining central locations, for example to several locations in a CBD. For transit, travel among adjoining locations, for example wholly within a CBD, matching with stations close together; see note (c).
12. As most large cities surround a CBD, rail lines will approach from several directions e.g. sorth and south, each being a segment. The direction of flow for commuters is towards the CBD; one way. For travel within the CBD, passengers will move in several directions.

Table 4 (below) shows the changes in terms of line segments and fleet needed to achieve the targets in Table 2 (above).

The coloured rows represent necessary changes. In brief these are: new line segments; single deck trains for airport travellers; single and double deck trains for commuters. Purple indicates a change in line segments, blue indicates a change in some fleet. As in previous tables, Sydney is assumed to be Circular Quay; termination of trains at Central is unsuitable for metropolitan commuters.

Table 4 does not address a new ‘direct’ east-west link Parramatta-Badgerys Creek; that is a matter for other parts of Sydney. It does, however, imply north-south links on (partly) existing corridors via Liverpool or St Marys. It also points to some segments outside of South-West Sydney needed for that region; Parramatta-Epping and St Marys-Schofields being examples.

**Table 4: Changes needed in and for South-West Sydney**

|  |  |  |  |
| --- | --- | --- | --- |
| **Segment** | **Passenger type** | **Train types (a)** | **Status (b)** |
| Macarthur-Glenfield | Commuter | DD | Current |
| Macarthur-Narellan | Transit | DD | Needed |
| Glenfield-Leppington | Traveller | SD | Change fleet |
| Glenfield-Liverpool | Commuter | DD and SD | Needed, increase, change (b) |
| Glenfield-Revesby | Commuter/traveller | DD and SD | Increase, change part fleet |
| Revesby-Kingsford Smith | Traveller | SD | Change part fleet |
| Revesby-Sydney | Commuter | DD | Current  |
| Leppington-Badgerys Ck | Commuter/traveller | DD and SD | Needed |
| Badgerys Ck-St Marys | Commuter/traveller | DD and SD | Needed |
| St Marys-Parramatta | Traveller | SD | Increase, change part fleet |
| St Marys-Scholfields | Commuter/traveller | DD and SD | Needed |
| Scholfields-Epping | Commuter/traveller | DD and SD | Needed, change part fleet |
| Schofields-Parramatta | Commuter | DD | Current  |
| Parramatta-Liverpool | Commuter/traveller | SD | Change |
| Parramatta-Epping | Commuter/traveller | DD and SD | Needed |
| Picton-Wollongong | Commuter/traveller | SD | Needed  |

1. DD = double deck; SD = single deck; MT = mass transit
2. Needed = new line segment needed; increase = increase corridor capacity; change = alter fleet composition.

Table 5 identifies some possible infrastructure projects over the next 40 years to give effect to this customer focused vision.

**Table 5: Possible infrastructure projects**

|  |  |  |  |
| --- | --- | --- | --- |
| **Line Segment** | **Project** | **Train type (a)** | **Comment** |
| Macarthur-Narellan | New corridor | Commuter DD and SD | Trains to Badgerys Ck; may eventually passes through Parramatta or Sydney |
| Glenfield-Liverpool | South-East facing junction at Glenfield | Commuter DD and SD  | Major reduction in Liverpool-Sydney commuting time |
| Glenfield-Revesby | Amplification | Commuter DD and SD | Connects Badgerys Ck and Kingsford Smith |
| Leppington-Badgerys Ck | New corridor | Commuter DD and SD | Junction at Leppington for Narellan |
| Badgerys Ck-St Marys | New corridor | Commuter DD and SD | Enables access of North-West Sydney to Badgerys Ck; also, necessary for capacity |
| St Marys-Parramatta | Amplification | Commuter SD | For travellers |
| St Marys-Schofields | New corridor | Commuter DD and SD | Access to west end of global arc. Enables access of North-West Sydney to Badgerys Ck. |
| Schofields-Epping | Amplification | Commuter DD and SD | Access to west end of global arc |
| Parramatta-Epping | New corridor | Commuter DD and SD | Access to global arc, reducing travel time by up to 1 hour. Access of northern Sydney to Badgerys Ck. |
| Picton-Wollongong | New corridor | Commuter SD (b) | Reduce travel time by more than 1 hour. Jointly used by freight.  |

1. As for note (a) table 4
2. Level of demand and structure of freight might not justify early electrification.

The most important project is the line Leppington-Badgerys Creek. As it is needed to facilitate almost all other projects (i.e most rail transport tasks) it is the highest priority. Media reports of Government decisions allowing housing on land ‘earmarked’ for this and other rail corridors are of the greatest concern.[[8]](#footnote-8)

All projects should be designed to cater for various train types; double deck and single deck commuter fleets and freight. Some should be designed to later accommodate higher speed trains.

Mass transit, in particular the State Government’s Metro which precludes other train operations, should be avoided; it would create transport problems through South-West Sydney.

All potential infrastructure projects would require information on train operations and infrastructure configuration throughout Sydney. As this is not publicly available, Table 5 can only be treated as indicative even for urban passenger rail in the Macarthur and Liverpool areas of South-West Sydney.

Of course, all proposed projects need to be independently assessed for purpose, merit and workability; a cost benefit analysis is needed for each project.

1. Mass transit usually refers to all urban rail and bus forms. However, following the drafts, here the term ‘mass transit’ is restricted to metro – Paris Metro, New York subway, or London tube *rapid transit* style - trains and not commuter trains. [↑](#footnote-ref-1)
2. http://www.smh.com.au/nsw/new-suburbs-drawn-on-the-western-sydney-map-near-badgerys-creek-airport-site-20171121-gzpoxc.html [↑](#footnote-ref-2)
3. EIS <https://www.sydneymetro.info/sites/default/files/document-library/Sydenham%20to%20Bankstown%20Environmental%20Impact%20Statement%20Overview.pdf> [↑](#footnote-ref-3)
4. <http://www.sydneytrains.info/about/fleet/a_sets> [↑](#footnote-ref-4)
5. Like-with-like relates to occupation of track space including alongside stations. While the ratio of commuter/metro trains reported by the ABC would imply 14 Sydney trains per hour (26/24\*15) <http://www.abc.net.au/news/factcheck/2014-04-11/barry-ofarrell-sydney-trains-claim-doubtful/5371446>; a higher ratio is used here – more favourable to Metro - based on claims Metro could run 30 trains per hour, compared with 24 Sydney trains per hour, (30/24\*15) – giving 12 Sydney trains per hour. [↑](#footnote-ref-5)
6. <http://www.abc.net.au/news/2017-03-06/sydney-airport-parking-prices-highest-in-nation/8327528> [↑](#footnote-ref-6)
7. Mass transit usually refers to all urban rail and bus forms. However, following the drafts, here the term ‘mass transit’ is restricted to metro – Paris Metro, New York subway, or London tube – *rapid transit* style trains and not commuter trains. [↑](#footnote-ref-7)
8. http://www.smh.com.au/nsw/new-suburbs-drawn-on-the-western-sydney-map-near-badgerys-creek-airport-site-20171121-gzpoxc.html [↑](#footnote-ref-8)