



Temporary Transport Service Plan

Sydney Metro City & Southwest Sydenham to Bankstown

Released Under NSW GIPA Act 2009

Project:	Sydenham to Bankstown	Date:	18 May 2018
Group:	City & Southwest	Status:	Draft
Author:	R Kaberwal (WSP)	Revision:	1.0
File name:	PS101737-ITP-RPT-001_1.0.docx		

Version	Revision date	Status	Reason for update	Author	Reviewer	Approver
0.1	9 February 2018	Draft	-	G Mills (WSP) R Kaberwal (WSP) R Powell (WSP)	B Watkins (Sydney Metro)	-
0.2	13 April 2018	Draft	Sydney Metro comments	G Mills (WSP) R Kaberwal (WSP) R Powell (WSP)	N Daniels (Sydney Metro) A Ho (Sydney Metro) C Dunn (TfNSW) F Passarelli (TfNSW)	-
1.0	18 May 2018	Final	Sydney Metro comments	G Mills (WSP) R Kaberwal (WSP) R Powell (WSP)	C Fitzgerald (WSP)	A Walsh (Sydney Metro)

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Abbreviations and Glossary

EB	Eastbound
GTFS	General Transport Feed Specification
NB	Northbound
PTPM	Public Transport Project Model
PU	Pick-up
RPD	Rail Program and Delivery (Group within TfNSW)
SB	Southbound
SD	Set-down
SMDO	Sydney Metro Delivery Office
TfNSW	Transport for New South Wales
TPA	Transport Performance and Analytics
TTMP	Temporary Transport Management Plan, describes how the temporary services and wider impacts on the transport network will be managed during a specific possession. TTMP is a component of the TTP.
TTP	Temporary Transport Plan, multi-modal transport plan for temporary possession of the T3 Bankstown Line. The TTP is an evolution of the TTS for a specific possession period and consists of a TTSP and TTMP.
TTS	Temporary Transport Strategy, framework document describing how the project will plan and deliver a multi-modal transport network to support customer movements during temporary possessions of the T3 Bankstown Line.
TTSP	Temporary Transport Service Plan, defines the temporary rail and bus services that will operate during a specific temporary possession. TTMP is a component of the TTP.
WB	Westbound

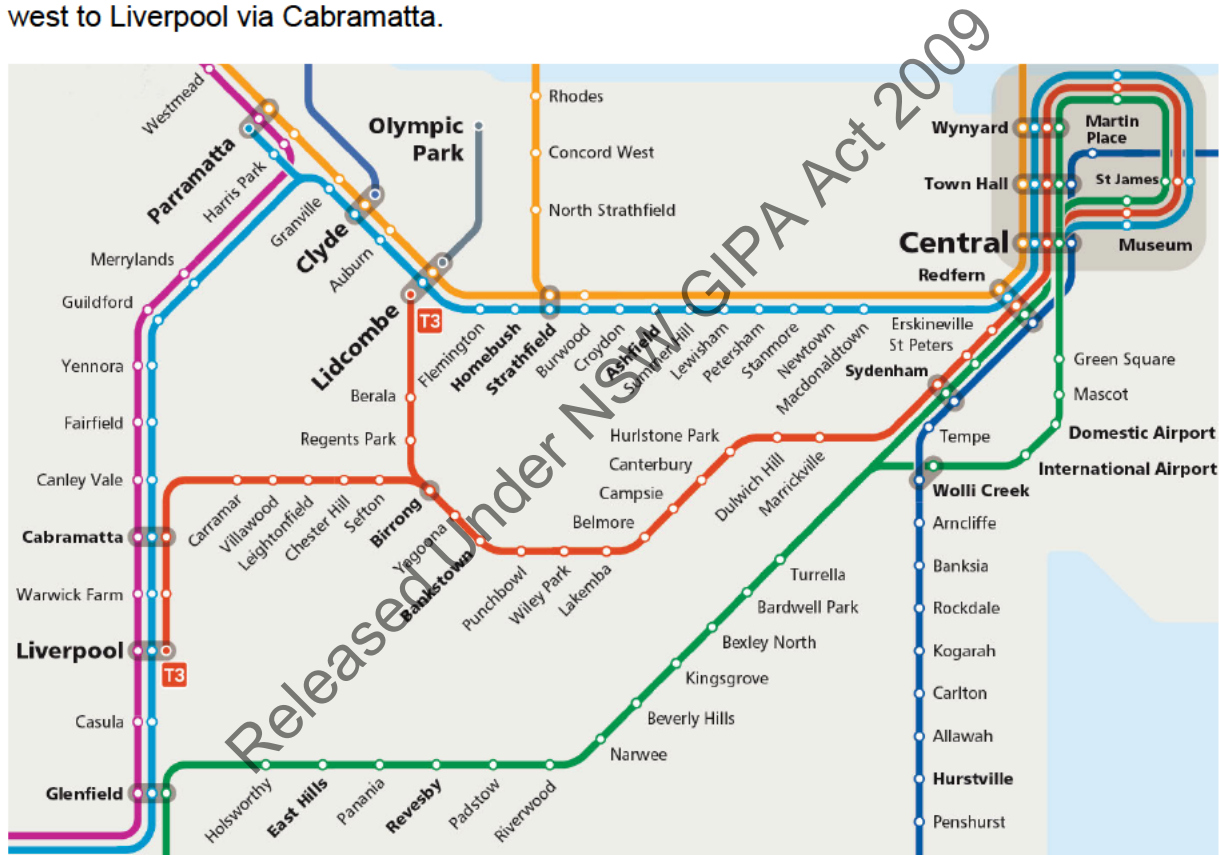
2. Development of the Temporary Transport Service Plan

This section summarises how the Temporary Transport Service Plan (TTSP) has been developed to meet customer needs during the July 2019 Bankstown Line possession.

2.1 Rail services during the temporary Bankstown Line closure

The T3 Bankstown Line currently operates between the City Circle via Sydenham through to either Liverpool or Lidcombe via Bankstown (Figure 2.1).

To the east of Sydenham, the Bankstown Line also services St Peters and Erskineville Stations as it continues through to the City Circle. Similarly, to the west of Bankstown, the line services Yagoona and Birrong before branching into two lines, north to Lidcombe and west to Liverpool via Cabramatta.



Source: Transport for NSW

Figure 2.1 Current Plan of the T3 Bankstown Line

During the July 2019 Bankstown Line possession, the entire line between Marrickville Station and Bankstown Station will be closed. In addition, due to the existing track and power supply infrastructure configuration, services will not be able to operate between Sefton Park Junction and Bankstown (currently serving Birrong and Yagoona stations) when Bankstown Station is not operational. The full extent of the temporary line closure is shown in grey in Figure 2.2 below.



Figure 2.2 Proposed rail operations during possession

A multi-modal strategy is prescribed in Sections 2.4 and 2.5 for connecting customers to the east at Sydenham and adjoining rail lines including T2 Inner West Line and T8 Airport and South Line.

The stations on the existing T3 Bankstown Line between Liverpool and Lidcombe¹ will remain open but will be served by an altered train service between Liverpool and the CBD via Lidcombe. This will also allow for additional services for customers connecting at Lidcombe or Ashfield.

Consequently, this TSP considers the needs of customers west of Bankstown, including those who use Yagoona and Birrong stations, who will no longer be able to travel via the Bankstown Line to destinations east of Bankstown including the CBD.

East of Marrickville, Sydenham Station will remain operational during the July 2019 possession and services on the T4 Illawarra Line and T8 Airport & South Line will continue to operate.

St Peters and Erskineville Stations, currently served by T3 Bankstown Line services, will instead be served by the T8 Airport & South Line.

¹ Warwick Farm, Cabramatta, Carramar, Villawood, Leightonfield, Chester Hill, Sefton, Regents Park and Berala.

2.2 Identification of customer markets of the TTSP

Up to 54,000 customers travel on the Bankstown Line each weekday (2017) resulting in up to 90,000 customer trips. Of these, approximately 72,000 trips start or end at one of the ten stations from Marrickville to Bankstown that will be upgraded.

Over the next seven years, demand is forecast to grow by up to 6% per annum. By 2019 (the proposed possession time targeted by this TTSP) demand to travel on the T3 Bankstown Line is expected to exceed 100,000 customer trips per weekday. Whilst demand levels observed during school holiday periods are typically at least 15% lower than during school term, for planning purposes, the conservative approach has been adopted. Hence, the demand estimates in this report are based on a typical weekday during school term.

2.2.1 Defining the peak period

For the planning of temporary transport services, the weekday morning peak period represents the most significant challenge as this is when the highest travel demand is observed when measured on an hourly basis. This peak period is typically defined as having a 3.5-hour duration, from 6:00 am to 9:30 am, in which the hour with the highest observed demand is defined as the AM peak hour. The AM peak hour is also the busiest hour of the day, and represents the highest levels of customer demand that will need to be accommodated by each TTSP.

The exact time that the AM peak hour occurs varies depending on location, with locations closer to the Sydney CBD experiencing it later than locations further out. For planning purposes, the peak hour has been adopted as 8:00 am to 9:00 am, based on the review of Opal data for the Bankstown Line.

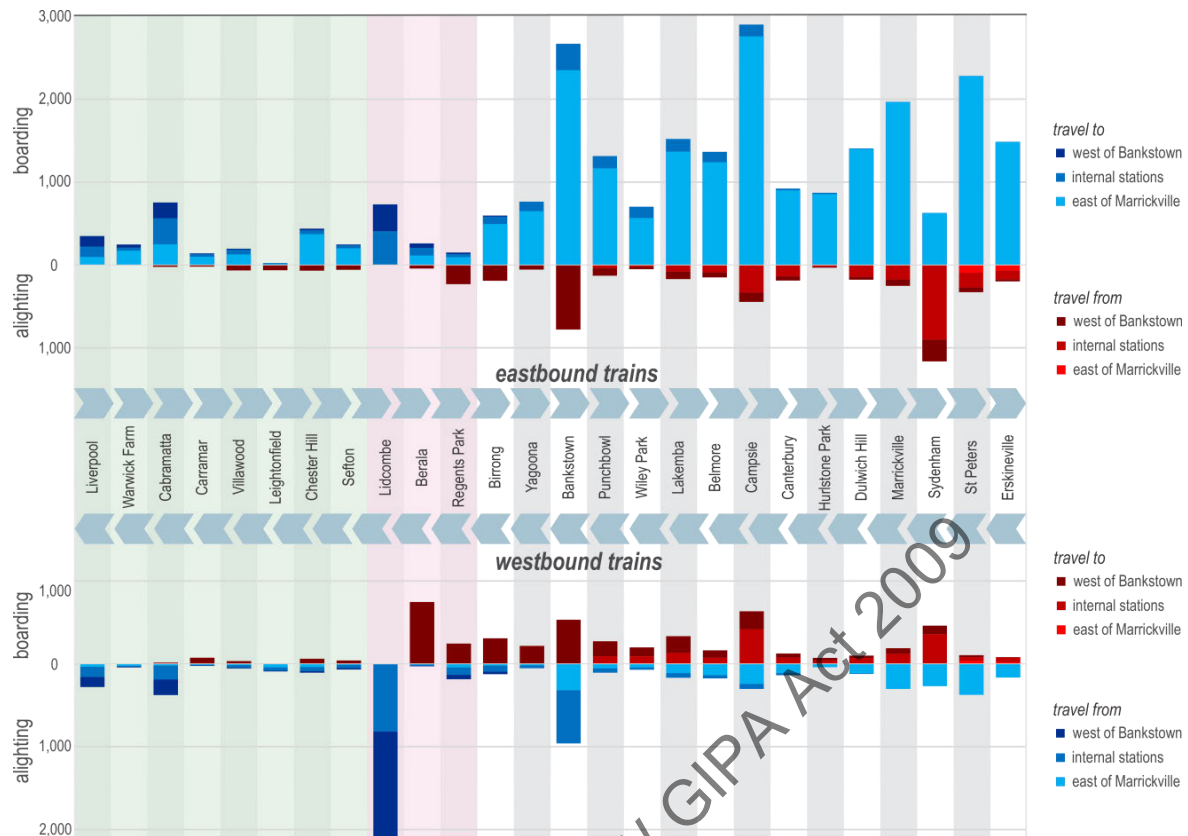
The afternoon peak period is defined as the 3.5-hour period from 3:30 pm to 7:00 pm although demand during this period is more evenly distributed compared to the morning peak period. Consequently, the demand in the PM peak one-hour is lower than in the AM peak one-hour.

2.2.2 Customer Groups

During the possession, TTSP bus services will be provided for the following customer groups:

- Customers travelling 'internal' to the corridor, which for the purpose of this assessment includes passengers moving between Marrickville and Bankstown
- Customers travelling to/from an 'external' location west of Bankstown, including other T3 Bankstown Line stations (Yagoona, Birrong, Regents Park, Berala, Sefton, Chester Hill, Leightonfield, Villawood and Carramar) and beyond
- Customers travelling to/from an 'external' location east of Marrickville, including other T3 Bankstown Line stations (Sydenham, St Peters and Erskineville) and beyond.

Typical demand levels for the weekday AM peak period are presented in Figure 2.3 showing the number of customers boarding and alighting at each station on the Bankstown Line, and the station group where they travelled to/from.



Source: Transport for NSW based on Opal card data, 17 August 2016

Figure 2.3 Typical AM peak period (3.5 hours) travel demand on the T3 Bankstown Line

It is apparent from Figure 2.3 that stations on the T3 Bankstown Line are predominately origin stations. The largest destination for all the stations along the line are stations within the Sydney CBD - nearly 70% of demand from stations east of Campsie, and over 50% for locations further west.

3.3 Assessing impacts on train services and customers on other rail lines

The potential increase in rail patronage on surrounding lines was assessed through an iterative process utilising PTPM. Changes were made to the rail plan to provide additional capacity on the T2 Inner West & Leppington and T8 Airport & South Lines train lines to accommodate the anticipated increases in demand together with consideration of the TTSP rail planning objectives outlined in Section 2.4.

The scenarios and assessment of the temporary rail plan options considered is summarised below.

3.3.1 T2 Inner West and Leppington Line

3.3.1.1 Weekday AM Peak Period

Two scenarios of the T2 Inner West & Leppington Line were tested in PTPM:

- Providing a 4-car shuttle between Liverpool and Lidcombe via Regents Park, with the reintroduction of Homebush services to provide relief to the T2 Inner West & Leppington Line.
- Providing four trains per hour from Liverpool to the CBD via Regents Park, stopping limited stops through the Inner West.

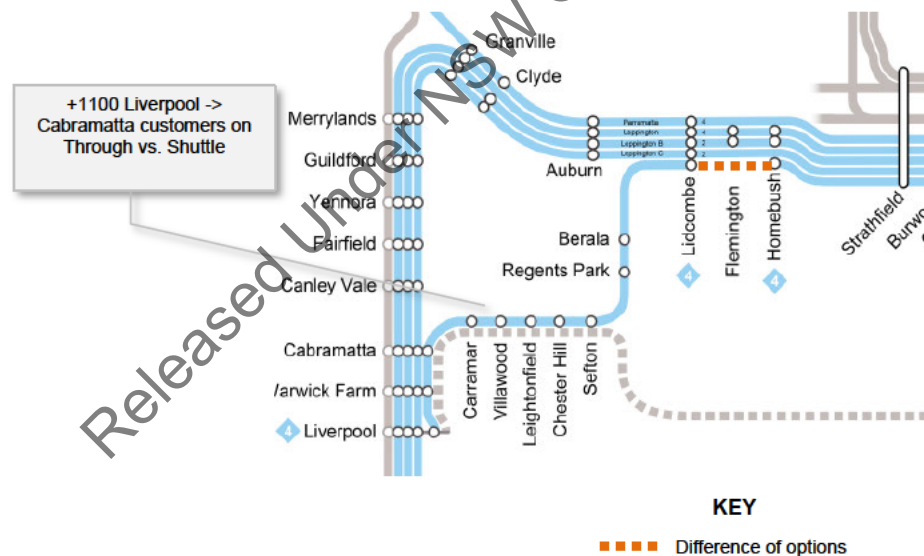


Figure 3.3 T2 Inner West & Leppington Line options

PTPM modelling illustrated that the shuttle option created a bottleneck on the T2 Inner West & Leppington Line between Homebush and Lidcombe. Additionally, the Liverpool through to the CBD via Regents Park option performed better than the shuttle option because it:

- Delivered a faster journey to the CBD for Liverpool to Cabramatta customers via Regents Park, reducing the shift of customers to the T1 Western Line
- Minimised the impact to existing customers by injecting onto the T2 Inner West & Leppington Line at the last moment, where all services are then required to be slowed down on approach to the CBD
- Provided the fastest service to most stations west of Bankstown

- Reduced the amount of transfers required for displaced customers who are forced to interchange at Lidcombe under the shuttle option.

3.3.1.2 Weekday PM Peak Period

A desktop assessment was undertaken to understand the PM peak demand expected on the rail network during the full line closure of the T3 Bankstown Line. This is required as the PTPM model is an AM peak based model. The results concluded that the four trains per hour on CBD to Liverpool via Regents Park services on the T2 Inner West & Leppington Line was sufficient. The proposed weekday PM peak train plan is in line with the plan for the AM peak period and will be sufficient to meet demand.

3.3.1.3 Weekday Off Peak, Evenings and Weekends

A demand assessment was initially conducted to verify that there will be no capacity issues on the T2 Inner West & Leppington Line when T3 Bankstown Line customers are bused to these lines. To maintain consistency between the AM and PM-peak rail plans, Liverpool to CBD via Regents Park services will be provided during the off-peak at a frequency of two trains per hour, maintaining the service levels offered to Liverpool via the T3 Bankstown Line as per the standard timetable.

3.3.2 T8 Airport & South Line

3.3.2.1 Weekday AM Peak Period

Demand assessment was undertaken to better understand the impact on the range of different service offerings (i.e. stopping patterns) on the T8 Airport & South Line. Following this, an additional four trains per hour service pattern starting from Revesby will be implemented and is designed to uplift the Revesby all-stops and provide increased capacity for customers transferring to/from a TTSP bus service.

Due to the limitation of ten trains per hour that operate through the Airport Tunnel, it is considered more efficient to shift most Macarthur services via Sydenham to avoid complex operations at Wolli Creek. The additional benefit of this change is that it provides improved connectivity for customers at Sydenham, St Peters and Erskineville.



Figure 3.4 T8 Airport and South Line options

While it is acknowledged that this option compromises the rail objective to minimise the impacts to existing customers, it is necessary to compliment the available network infrastructure for service prioritisation.

3.3.2.2 Weekday PM Peak Period

A desktop assessment was undertaken to understand the PM peak demand expected on rail network during the full line closure of the T3 Bankstown Line. This desktop assessment was required as the PTPM model is an AM peak based model. The results of the demand assessment concluded that the four trains per hour on CBD to Revesby services on the T8 Airport Line. This proposed weekday PM train plan is in line with the plan for the AM peak period and will be sufficient to meet demand.

3.3.2.3 Weekday Off Peak Evenings and Weekends

Initially two off-peak options were considered for the T8 Airport and South Line, with the preferred solution being the continued operation of the More Trains More Services (MTMS) service plan during all off-peak periods. This preferred option provides sufficient capacity for disrupted T3 Bankstown Line customers and will minimise disruption to customers specifically through the co-ordinated cross-platform interchange between T2 and T8 services at Glenfield.

The alternate option was to provide an additional 2tph to Revesby with the goal of services being evenly spaced every 10 minutes. This was not preferred due to the requirement of extended dwell times in the CBD, removal of coordinated interchanges at Glenfield and poor capacity utilisation for T8 services.

To ensure St Peters and Erskineville have consistent services throughout the day, a shuttle will operate between Sydenham and the CBD every 15 minutes. This will also provide capacity to customers bussed to Sydenham station. As the Sydenham Junction

configuration will not be completed by July 2019, these services will be required to run empty to Kingsgrove to turnback. A RailSys assessment of the interaction of these services with regional trains accessing the Sydenham (XPT) Maintenance Centre and freight services operating along the Illawarra Corridor indicated that all services could be retained.

3.3.3 Other Changes

Key lessons have been adopted throughout the optioneering process and in the interest of managing demand on the T1 Western and T4 Illawarra Lines, sensitivity tests were performed at Strathfield and Sydenham. This resulted in the following change:

- Removal of the Sydenham stop from the T4 Illawarra Line suburban services originating from Waterfall/Cronulla/Wollongong. This will concentrate displaced T3 Bankstown Line passengers to board the T8 Airport & South services or the T4 Hurstville starters at Sydenham where there will still be capacity, and avoid overloading the longer distance T4 services that would be at capacity once reaching Sydenham.

While no changes have been applied to Strathfield, further station management may be required at both stations during the operation of this service plan.

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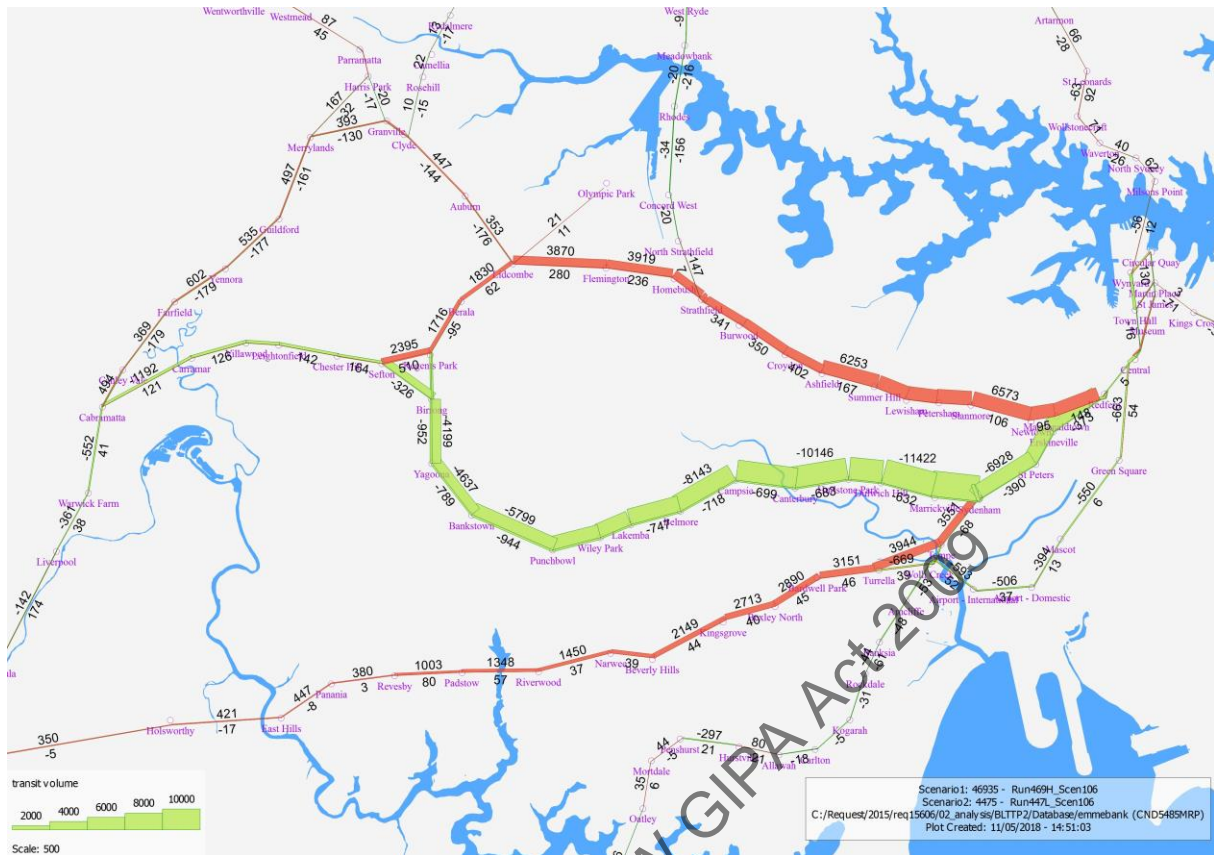


Figure 8.1 Demand difference (pre-shutdown v shutdown) for heavy rail during the AM peak

As outlined in Section 3.3, changes were made to the rail plan to provide additional capacity on the T2 Inner West & Leppington and T8 Airport & South Lines train lines to accommodate the anticipated increases in demand noted above. These changes include the:

- Addition of 4tph Liverpool via Regents Park on the T2 Inner West & Leppington Line
- Addition of 4tph Revesby via Airport on the T8 Airport & South Line.

The 2019 pre-shutdown and TTSP volume-capacity (v/c) plots of the surrounding rail network are shown in Figure 8.2 and Figure 8.3. The volume-capacity is defined as the forecast patronage per service divided by the seated capacity of the service. The standing capacity of the service is an additional 33% over the seated capacity.

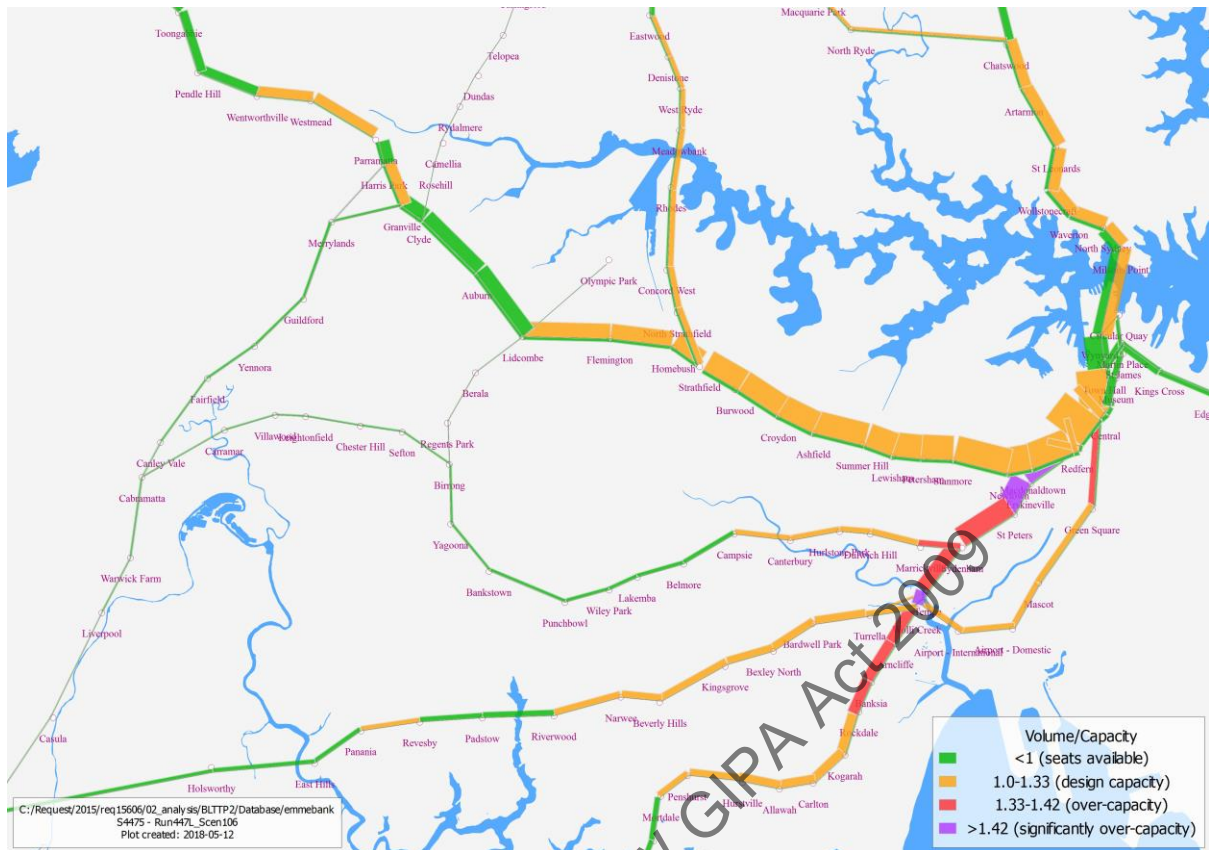


Figure 8.2 Volume/Capacity plots for heavy rail pre-shutdown period during the AM peak

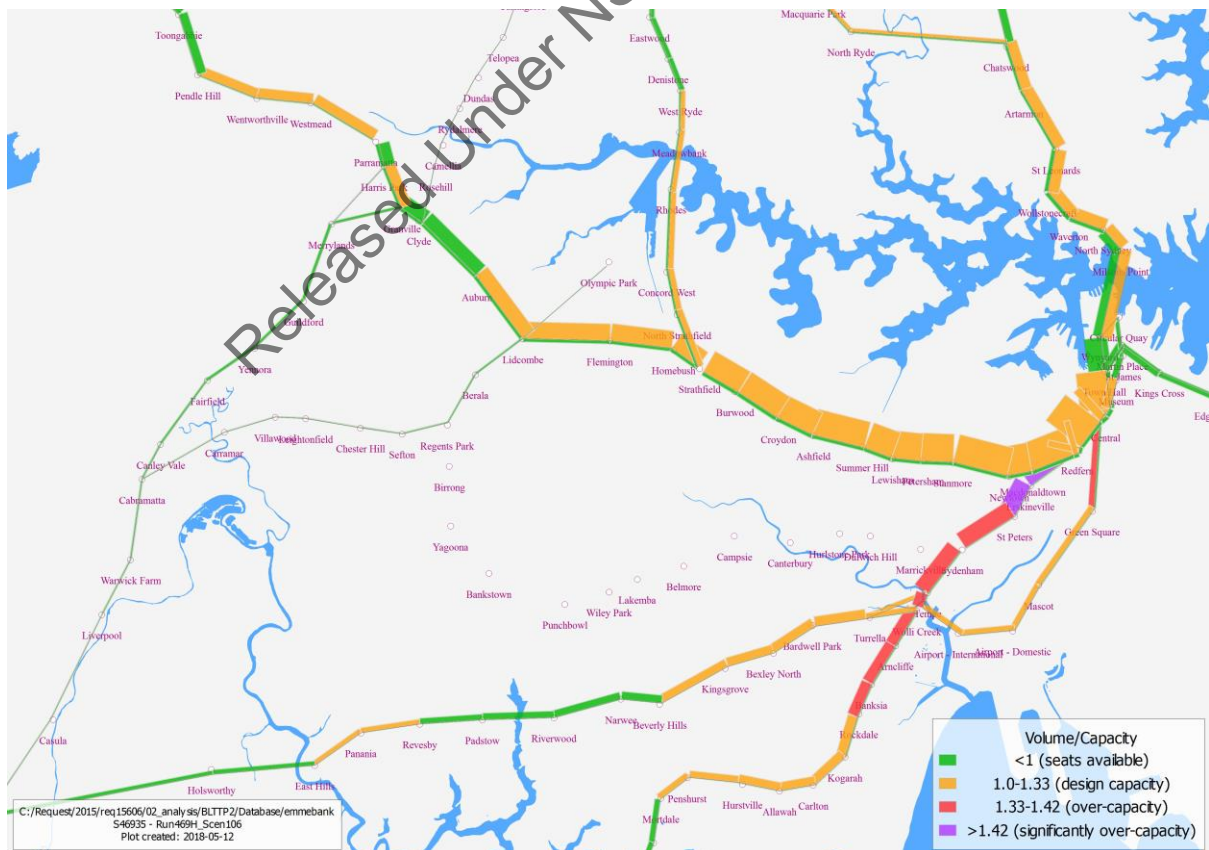


Figure 8.3 Volume/Capacity plots for heavy rail during shutdown period during the AM peak

Overall, volume-capacity ratios remain relatively consistent on all operating lines across the network compared to the 2019 Pre-shutdown scenario, summarised in Table 8.1. It is apparent from the 2016 Base scenario, there are existing capacity constraints to be addressed for the T4 Eastern Suburbs & Illawarra Line, which are expected to worsen by 2019 even without the temporary possession of the T3 Bankstown Line.

Table 8.1 highlights the lines which are (or forecast) to operate:

- At design capacity, between 100-133% seated train capacity, in orange
- Over-capacity, between than 133-142% seated train capacity, in red
- Significantly over-capacity, greater than 142% seated train capacity, in purple.

Table 8.1 AM peak hourly volume compared to capacity of services by Line (base and during shutdown)

Line	Departing	Arriving	Volume-Capacity		
			2016 Base	2019 Pre-Shutdown	2019 Possession
T4 Illawarra	Sydenham	Redfern	135%	145%	146%
IC South Coast	Wolli Creek/Sydenham	Redfern	138%	146%	144%
T3 Bankstown	Ersleville	Redfern	136%	146%	-
T8 Airport via Sydenham	Sydenham	Redfern	151%	125%	148%
T8 Airport via Green Square	Green Square	Central	123%	139%	132%
T2 Inner West & Leppington	Ashfield/Newtown	Redfern	139%	127%	128%
T2 Inner West & Leppington	Macdonaldtown	Redfern	148%	125%	129%
T1 Western	Strathfield/Burwood	Redfern	136%	125%	130%
T1 Northern via Strathfield	Strathfield/Burwood	Redfern	126%	118%	122%
IC Blue Mountains	Strathfield	Redfern	106%	106%	109%
IC Newcastle & Central Coast	Strathfield	Redfern	111%	107%	108%

Improvements between the 2016 Base and 2019 Pre-Shutdown on the T8 Airport via Sydenham and T2 Inner West & Leppington and T1 Northern Lines can be attributed to increased service frequency on these lines between 2016 and 2019.

The increased frequency of the T1 Northern Line may also attract patronage from the T1 Western Line for trips to/from east of Strathfield, and hence improve volume-capacity for T1 Western Line services between Strathfield and CBD.