Customer Outcomes

More Trains, More Services Stage 1
November 2017 Timetable

November 2018

Technical Report

Contents

1   Summary of Findings

The November 2017 Timetable delivered a range of benefits for suburban customers, on the targeted T1 Western, T2 Inner West and Leppington, T3 Bankstown, T5 Cumberland, and T8 Airport and South lines.

Outcomes included:

- The train lines targeted by the Timetable have seen a 4.3% increase in morning peak passengers over the last year. Despite this, average train loads have reduced from 137% to 127% on these lines. Some parts of the network have seen train loads decline by as much as 47 percentage points.

- 89% of customers have turn up and go services in the AM and PM peak, with a train every 10 minutes at a minimum.

- 70% of suburban stations (or 93% of customers) now receive a minimum 15 minute service frequency across most of the day. This has increased from 29% of stations before the Timetable was introduced.

- More services have reduced wait times by 5% on weekdays and 8% on weekends.

- 110 suburban stations (representing 67% of trips) have seen reductions in average journey time in the AM peak.

- 1,500 extra weekly services, including 750 on weekends and 180 late night services have led to a significant increase in demand across all time periods.

- The growth in journeys made on the weekend (13.6%) and late night (10.7%) has outstripped AM and PM peak travel as a result of the more frequent and consistent services provided by the Timetable.

- The level of customer demand has been more evenly spread across the T1, T2 and T3 lines.
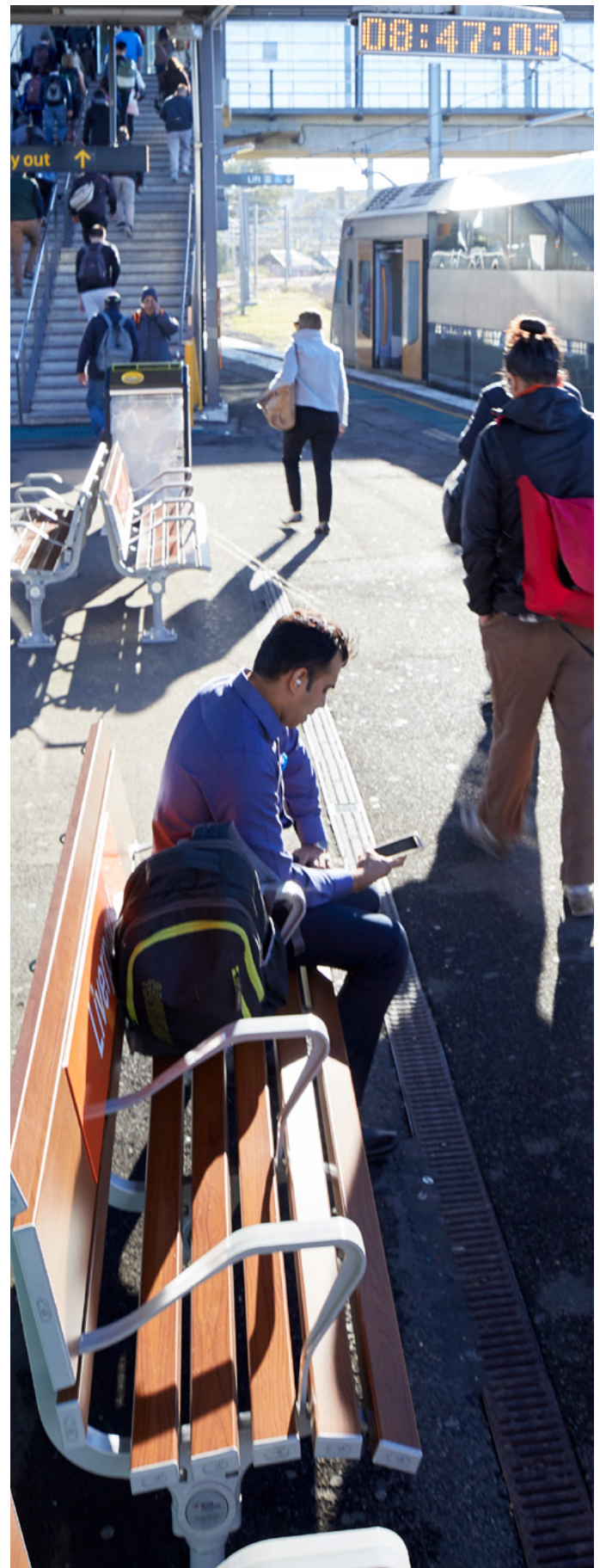
2   Background

## 2.1   Rail patronage in Sydney

Historically, patronage on the Sydney suburban and intercity rail network has grown by 1.2% a year. However, the level of growth has increased substantially more recently, averaging 7.6% in the last three years. Opal data shows weekday demand for rail travel has increased by 5% across the network over the last year (March 2017 to March 2018), this continues a trend that has seen train patronage grow by 30% over the past 5 years.

Rail patronage is forecast to grow by 21% between 2016 and 2021. The implemented Timetable was necessary to meet rapidly growing demand for public transport. It is also apparent that as rail services improve, additional customer demand is created. Figure 1 demonstrates the challenge created by the growing popularity of the rail network.

The purpose of this report is to examine the performance of the 2017 More Trains, More Services (MTMS) Stage 1 Timetable (the Timetable) in meeting the adopted customer objectives. This analysis informs the implementation of future stages of the MTMS program.

Figure 1: Historical and forecast rail patronage growth
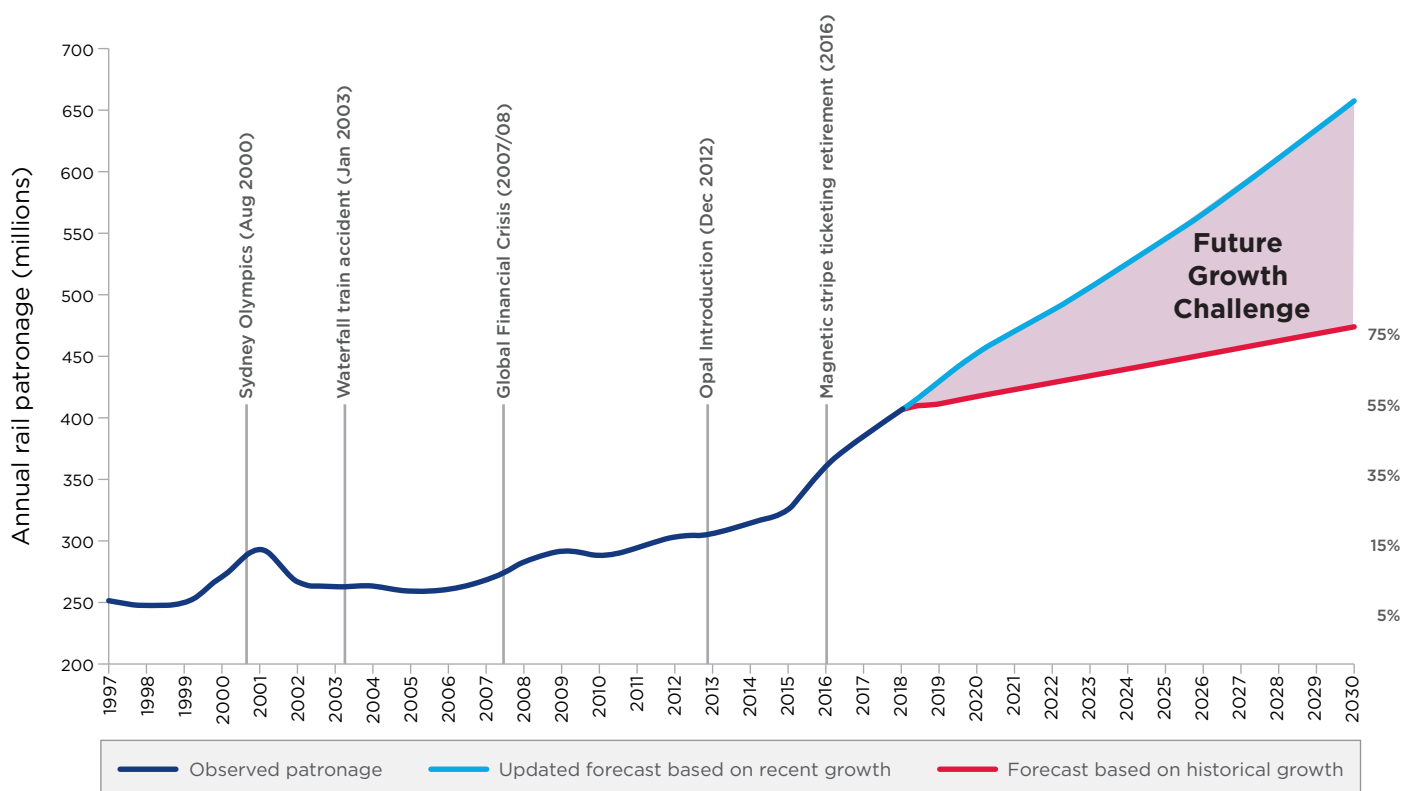
Methodology

Statistics quoted in this report are derived from comparisons of March 2017 to March 2018 Opal and Rail Opal Assignment Model (ROAM) data. All comparisons are weekday to weekday unless otherwise specified. Patronage figures are calculated from Opal entry and exit data for stations on the network.

ROAM uses Opal data to assign customers to services based on Sydney Trains punctuality data (train locations) and the daily working timetable. ROAM provides estimates of customer load at each station on a train's route and allows other statistics, such as wait times, to be calculated.

The accuracy of ROAM has been validated by comparison to previous survey methods and independent testing and analysis undertaken by the University of Technology, Sydney.

March is a good representation of train travel, being one of the busiest times of the year, with all major customer groups represented including regular commuters, school and university students.

AM peak hour is defined as 08:00 to 08:59. PM peak hour is defined as 17:00 to 17:59. Definitions of other service periods are given in Table 1 on page 4.

2.2   Overview of the Timetable

The Timetable delivered major improvements to Sydney's rail network, with a particular focus on western and south-western Sydney as shown in Figure 2. Almost 1,500 extra services were introduced each week.

Figure 2: Geographic focus of the Timetable
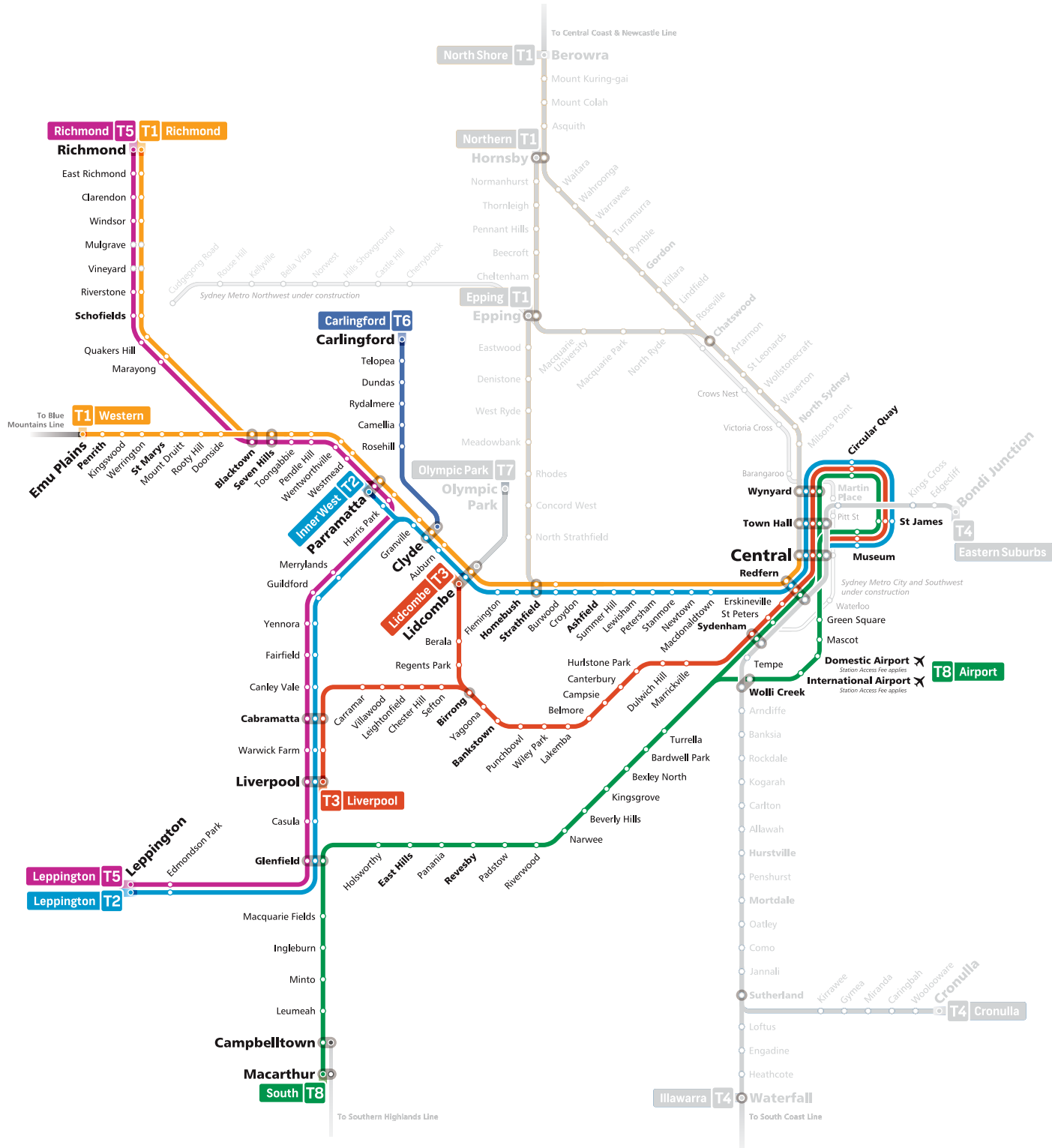
A key Government commitment of the Timetable was the provision of additional peak hour express services between Parramatta and the City and the full integration of the South West Rail Link. To enable these outcomes, the technical design of the Timetable included:

- Removal of the merge between T1 and T2 line services at Granville, converting all four T1 Western Line services that stop between Parramatta and Strathfield to express services. Separating the T1 and T2 lines has simplified the network, providing more capacity, while the extension of the T2 Line has created a new direct link to Parramatta for Inner West customers for the first time.

- Provision of faster services on the T3 Line encouraging Liverpool to Cabramatta customers to use the T3, thereby releasing capacity on the T2. This initiative was intended to spread demand more evenly across the T1, T2 and T3 lines.

- Re-routing the T2 and T5 lines to Leppington enabled the full integration of the South West Rail Link, directly connecting customers from south-west Sydney to Parramatta, Liverpool and the City for the first time. This reconfiguration allows capacity to be increased for Campbelltown to Glenfield customers on the T8 Line travelling to the City.

- The T5 provides a dedicated link between north-west and south-west Sydney via Parramatta, with services now running throughout the week, in all time periods, with modern air-conditioned trains.

Table 1 provides details of the extra services provided through the Timetable. By improving service frequency, reducing journey times and creating a more consistent product across each day and service period, more off-peak travellers are attracted to rail. This improves access to transport, achieves a better overall utilisation of transport assets and alleviates off-peak and weekend road congestion. A more attractive off-peak service will also draw patronage from the AM and PM peaks, reducing pressure on the system at its busiest times.

Against this backdrop of unprecedented demand for public transport, the design of the Timetable focused on improving the experience for a majority of customers, working within the constraints of a network that is operating close to capacity.

Table 1: Service change by time period

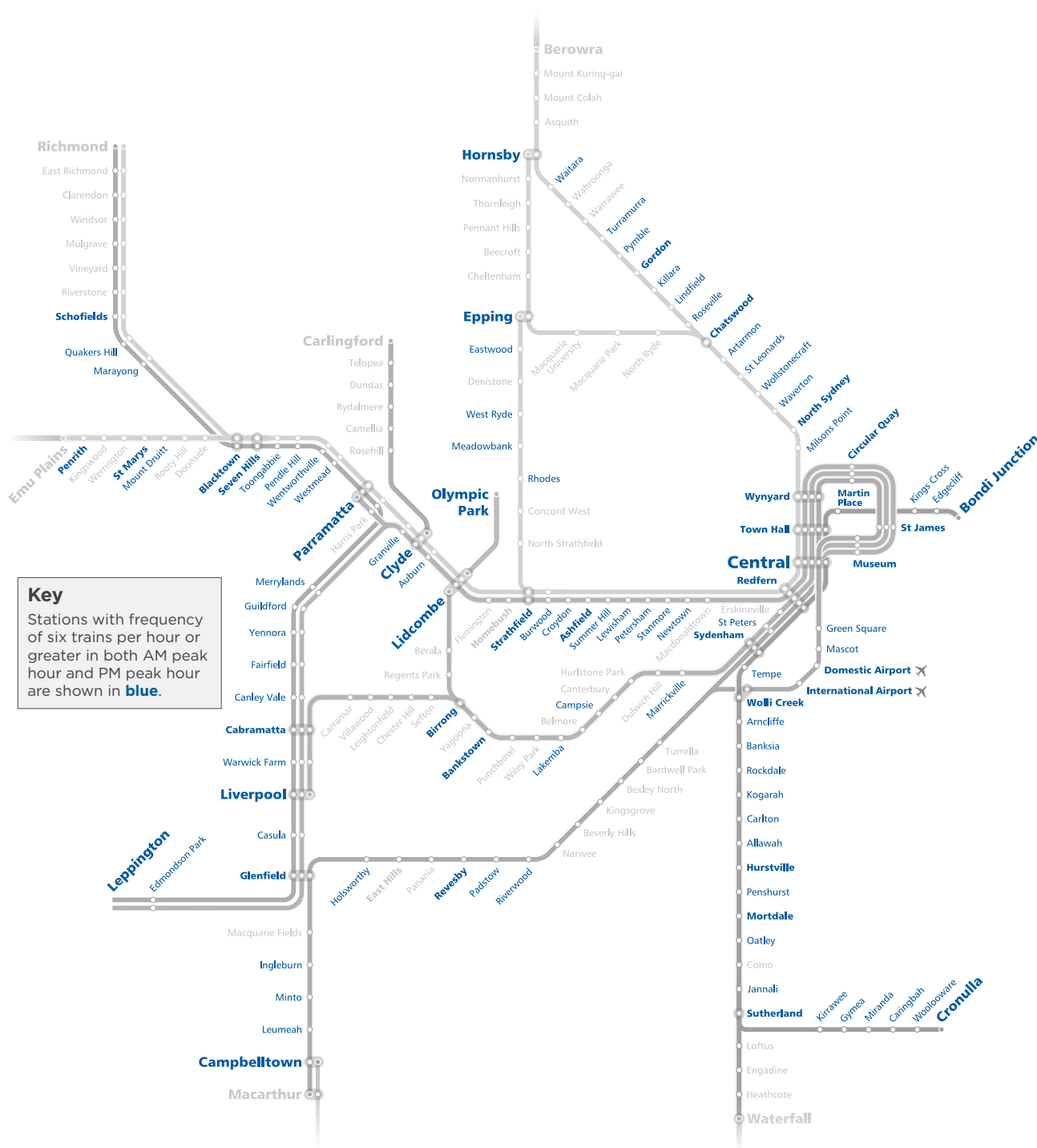| Service span	Time period	Previous service count (per week)	2017 Timetable service count (per week)	Change
Early morning	02:00 – 05:59	806	906	+12.4%
Pre AM peak shoulder	06:00 – 07:59	1820	1880	+3.3%
AM peak hour	08:00 – 08:59	1265	1320	+4.3%
Post AM peak shoulder	09:00 – 09:59	1030	1025	-0.5%
Inter-peak (day)	10:00 – 14:59	3520	3695	+5%
Pre PM peak shoulder	15:00 – 16:59	1930	2000	+3.6%
PM peak hour	17:00 – 17:59	1205	1230	+2.1%
Post PM peak shoulder	18:00 – 18:59	1025	1040	+1.5%
Inter-peak (evening)	19:00 – 21:59	2255	2295	+1.8%
Late night	22:00 – 01:59	1334	1516	+13.6%
Saturday	02:00 – 01:59	2213	2640	+19.3%
Sunday	02:00 – 01:59	2177	2526	+16%
Total (week)		**20,580**	**22,073**	**+7.3%**

3 Overall Timetable Outcomes

3.1 Turn Up and Go Frequency

Modern rail networks around the world are responding to customer demands by providing 'turn up and go' services (defined as receiving a service every 10 minutes or less). Following the introduction of the Timetable, 89% of suburban peak hour customers now experience turn up and go services, as shown in Figure 3.

With a more consistent and regular service offering in off peak periods, 70% of suburban stations (or 93% of customers) now receive a minimum 15 minute frequency across most of the day. This has increased from 29% of stations before the timetable was introduced.

Figure 3: Stations with turn up and go frequency in peaks

Key

Stations with frequency of six trains per hour or greater in both AM peak hour and PM peak hour are shown in **blue**.

3.2 Crowding

Crowding on rail services are usually expressed as a percentage of seated capacity. When train loadings exceed 135%, the reliable operation of services may be impacted.

There was a 10 percentage point reduction in train loads on the targeted lines, as shown in Table 2.

In the AM peak hour, the median count of services departing with loads above the 135% benchmark decreased by 13.5% on the lines targeted by the Timetable.

Table 2: Reduction in AM peak hour crowding on targeted lines

Line	Average load of AM peak hour services **March 2017**	Average load of AM peak hour services **March 2018**	Change (percentage points)	AM peak line patronage growth **March 2018 vs March 2017***
T1 Western	132%**	120%**	-12	+5.4%
T2 Inner West and Leppington	150%†	128%†	-22	+3.5%
T3 Bankstown	135%†	123%†	-12	+4%
T8 Airport and South	134%‡	137%‡	+3	+4.4%
Total	137%	127%	-10	+4.3%

Note: The T5 is not included in this table as improvements were limited to change of train type and operation of the line across the week. The T5 did not receive any uplifts in capacity or service frequency.

*Entries and exits between 07:00 to 09:00 for stations on the respective line.

**Loads are measured arriving Strathfield for trains that reach Central between 08:00 to 08:59. This point has been chosen to measure the crowding reduction for Western Sydney customers prior to Strathfield customers boarding T1 Western Line services.

†Loads are measured arriving Redfern for trains that reach Central between 08:00 to 08:59.

‡ Loads are measured arriving Redfern or Green Square for trains that reach Central between 07:50 to 08:49.

3.3 Journey Times

A customer's journey time is a combination of how long they wait to catch a train and the actual length of the train journey, beginning when they tap on and ending when they tap off. Multi-day Opal analysis shows that on a typical weekday, customers at 60% of suburban stations, on average, experienced a reduction in journey time on the new Timetable.

Due to additional express trains, quicker connections and more turn up and go services this is even more pronounced in the AM peak hour. As shown in Table 3, 110 suburban stations, accounting for 67% of

trips, experienced a journey time reduction of more than a minute per trip, on average.

Reduced platform wait times have also been observed across the network, with the average wait between tap on and boarding a train decreasing by 5% during weekday operations (across the entire day).

With a substantial increase in frequencies on the weekend, customers are also experiencing shorter wait times. On average, wait times have decreased by 8% across the day (Saturday and Sunday).

Table 3: Change in Average Journey Times by Stations, AM Peak Hour

Change in journey time	Number of stations affected	Percentage of trips affected
Faster	**110** of 178 suburban stations	**67.4%** of total AM peak hour trips
Slower (up to 2 minute increase)	**47** of 178 suburban stations	**25.4%** of total AM peak hour trips
Slower (2 to 5 minute increase)	**17** of 178 suburban stations	**6.9%** of total AM peak hour trips
Slower (>5 minute increase)	**4** of 178 suburban stations	**0.3%** of total AM peak hour trips

Examples of the reductions in average journey time seen by customers at particular stations are given in Figure 4.

Figure 4: Reduction in average journey time by station — AM Peak Hour

3.4 Customer Response to Improved Services

In addition to enhancing peak services, the Timetable focused on broader improvements across both weekdays and the weekend. The addition of substantial extra services outside the peaks and on weekends has significantly improved minimum service levels and increased frequencies, providing greater flexibility for public transport users. Key outcomes of this broader improvement included:

- 130 additional services were added to the pre-AM and pre-PM peak shoulders to make travel outside of the peak hour more attractive, helping relieve the peak demand. These uplifts have had the desired effect, with 6.1% more customers (March 2018 vs March 2017) using the network in the pre-AM peak shoulder (between 6am to 8am), and 6.3% more in the pre-PM peak shoulder (between 3pm to 5pm).

- In the late night, the 180 extra services (a 14% uplift) introduced in the new Timetable are providing a more attractive proposition, with nearly 11% more customers using the network at this time (between 10pm to 2am). On the lines targeted this has increased by 17%.

- The 750 new weekend services have also enticed more people to catch the train on Saturdays and Sundays. Around 13% more customers were on the network on Saturdays and Sundays in March 2017 compared to March 2018.

Figure 5 compares the percentage service uplift with levels of patronage growth over the last year.

Figure 5: Service uplift and patronage growth by time period on the Sydney Trains network
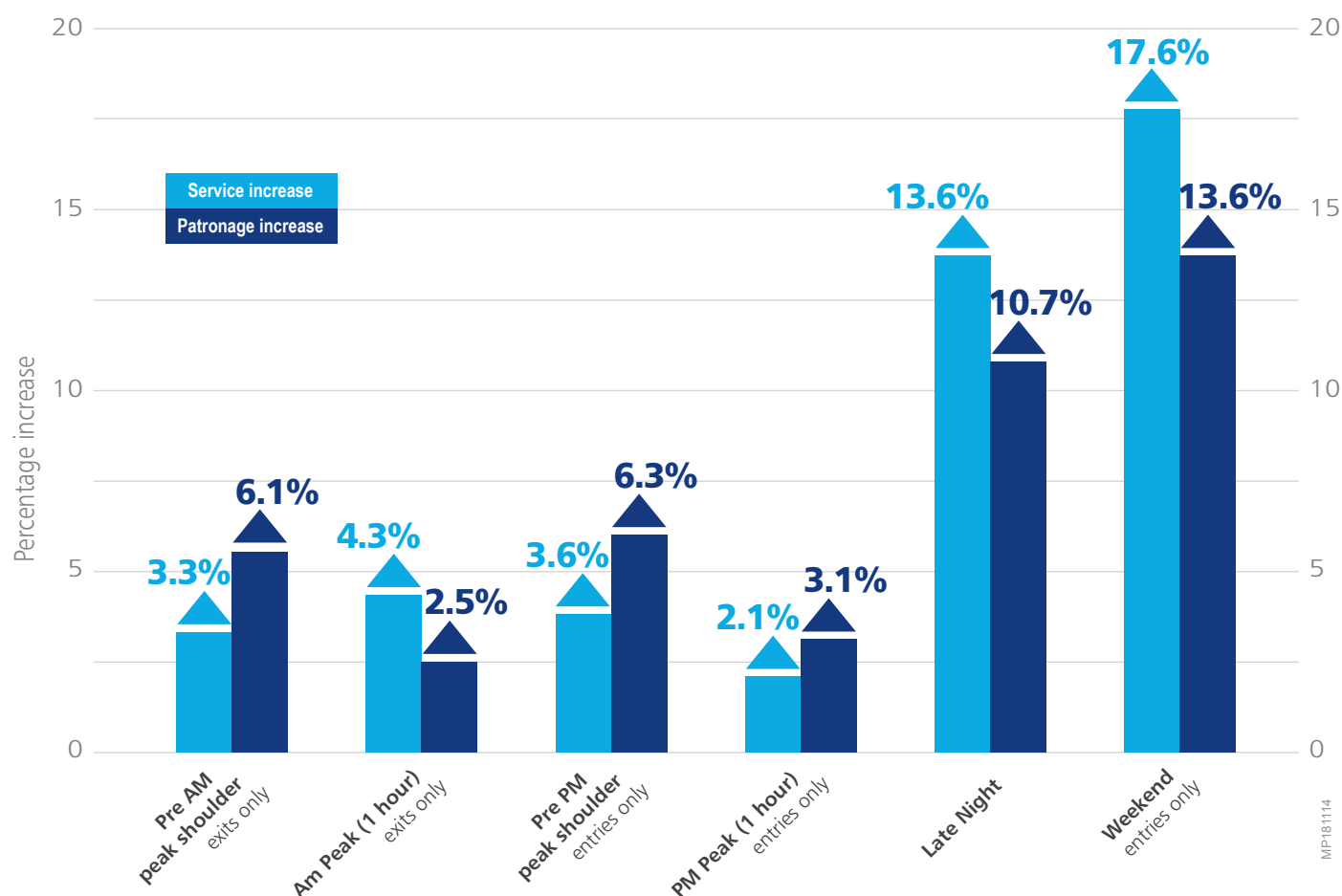
4   Customer Outcomes by Line

4.1   T1 Western Line

Four extra express trains between Parramatta and the Sydney CBD in peaks on the T1 Western Line

Better connections between the Sydney CBD and Parramatta were a key objective of the Timetable. To enable this, Harris Park to Lidcombe customers have been transferred from the T1 to the T2, which has allowed four additional express trains to run between Parramatta and the CBD in the peaks.

Collectively, these changes have reduced crowding on the T1 Western Line, with average train loads approaching Strathfield in the AM peak down from 132% to 120%. This is despite the line experiencing a 5% increase in customers over the last year in the AM peak. Similarly, in the PM peak, T1 Western Line trains departing from Redfern have experienced a decrease in average loads from 133% to 120%.
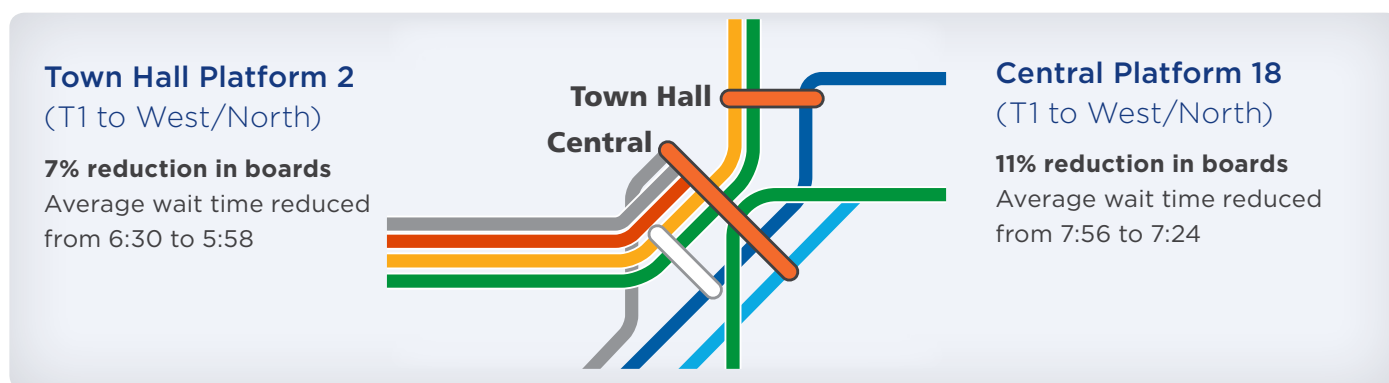
Importantly, the Timetable changes have also reduced pressure on crowded T1 Western Line platforms at CBD stations in the evenings, as shown in Figure 6. Crowding on Town Hall's Platform 2 in the PM peak has been

reduced by over 7%, despite a 3% increase in people tapping on at Town Hall. While at Central, on Platform 18, there has been an 11% decrease in customers boarding trains in the PM peak.

Additional services in the late night and on weekends have also resulted in more customers using the network at these times. Patronage at T1 Western Line stations has increased by 16.4% on weekends and by 17.7% between 10pm and 2am on weekdays.

Faster services on the T1 Western Line have reduced journey times at many stations. Strathfield, Mount Druitt, St Marys and Rooty Hill customers are saving over a minute on average from their AM peak trips. Parramatta, Wentworthville, Pendle Hill and Doonside customers save over two minutes and Seven Hills customers save almost five minutes on their AM peak travel.

Figure 6: Platform crowding at Town Hall and Central — PM peak hour

Town Hall Platform 2
(T1 to West/North)

7% reduction in boards
Average wait time reduced from 6:30 to 5:58

Town Hall

Central

Central Platform 18
(T1 to West/North)

11% reduction in boards
Average wait time reduced from 7:56 to 7:24

4.2 T2 Inner West and Leppington Line

More than double the AM peak services on the T2 Inner West Line for customers including Summer Hill, Lewisham, Petersham and Stanmore Stations

The T2 Inner West Line extended to Parramatta to provide direct access for Inner West customers on weekdays

The new Timetable enabled the full integration of the South West Rail Link, with T2 and T5 line services now starting at Leppington, directly connecting south-western Sydney customers to Parramatta, Liverpool and the City.

Further north on the line, disentangling the T1 from the T2 by removing the merge between the two lines at Granville has simplified the network and improved capacity. Transferring Harris Park to Lidcombe stations exclusively onto the T2 in peak periods has released capacity for Western Sydney customers on the T1 and enabled a direct link between Parramatta and the Inner West (as shown in Figure 7).

For customers in the Inner West, a more than doubling of morning peak services have seen average loads on local Inner West trains headed to the CBD in the morning peak drop by 47 percentage points, to 121%

(arriving Redfern). Across the whole of the T2 Line the loads of trains arriving at Redfern in the AM peak have decreased from an average of 150% to 128%. Examples of load reductions include a 32% decrease at Macdonaldtown, 13% at Stanmore and 6% at Petersham and Newtown.

The new direct connection between Parramatta and the Inner West in both the peak and off-peak have resulted in 23% more customers from Inner West stations travelling to Parramatta during the week by train.

Due to much higher service frequency, Inner West stations are also seeing reduced journey times in the AM peak, with Newtown, Summer Hill, Stanmore, Lewisham, Croydon and Homebush customers saving two minutes on average from their AM peak trips.

Improved services have also increased patronage on T2 stations by 17.5% in the late night and 27% on weekends.

Figure 7: T1 Western and T2 Inner West & Leppington Line key customer outcomes

Source: ROAM March 2018 vs 2017
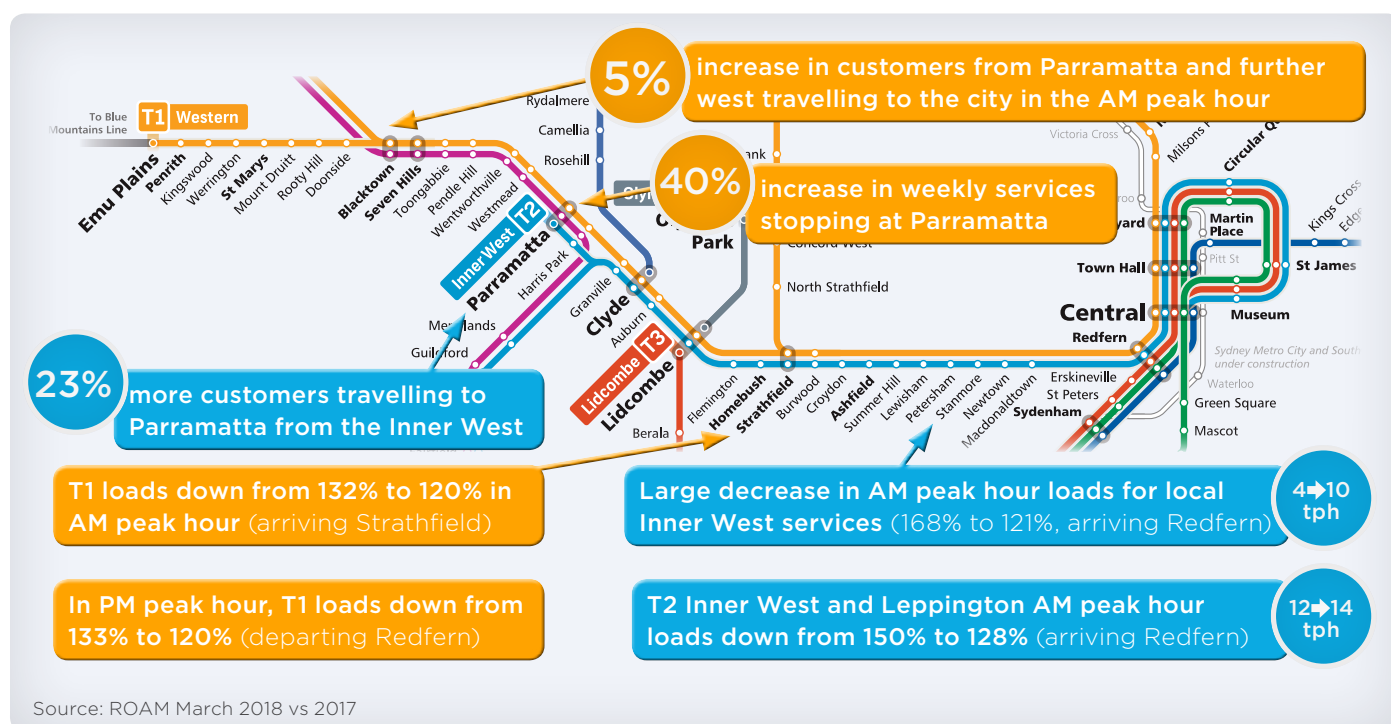
4.3 T3 Bankstown Line

New fast services to the City, with a train every 10 minutes from Liverpool in the AM Peak

The Timetable added fast services to the city in the AM peak on the T3 Line to give Liverpool to Cabramatta customers a more attractive alternative for CBD travel. With the T2 now servicing former T1 Western Line customers from Harris Park to Lidcombe, this helps spread demand more evenly across the network. For example, former T1 customers from Harris Park to Lidcombe have been transferred to the T2 and former T2 Liverpool to Cabramatta customers are now encouraged onto the T3 (as shown in Figure 8).

With a train every 10 minutes (on average) during the AM peak, these faster T3 services have had the intended effect, with an extra 1,900 (+44%) Liverpool to Cabramatta customers choosing to travel on the T3 this year. However, despite 14% more customers arriving at Redfern in the AM peak on the T3, loads have reduced from 135% to 123%, with two additional services being provided. PM peak loads (departing Redfern) have increased from an

underutilised 88% to 106%, making better use of network capacity.

Overall, customers boarding T3 Bankstown Line trains have increased on average by 33% in the AM peak and 48% in the PM peak. The significant uptake of T3 services has played a major role in spreading demand more evenly across the network and away from the T1 and T2 lines.

In the late night, with Birrong to Erskineville customers now receiving an additional two trains per hour from the city, patronage has increased by 17% at these stations in this period.

Timetable changes have also reduced AM peak journey times at many T3 stations. Warwick Farm , Birrong and Regents Park save over three minutes on average from their morning commutes while Dulwich Hill, Sefton, Hurlstone Park, Canterbury, Bankstown, Chester Hill and Yagoona are saving around two minutes.

Figure 8: T3 Bankstown Line key customer outcomes

Source: ROAM March 2018 vs 2017
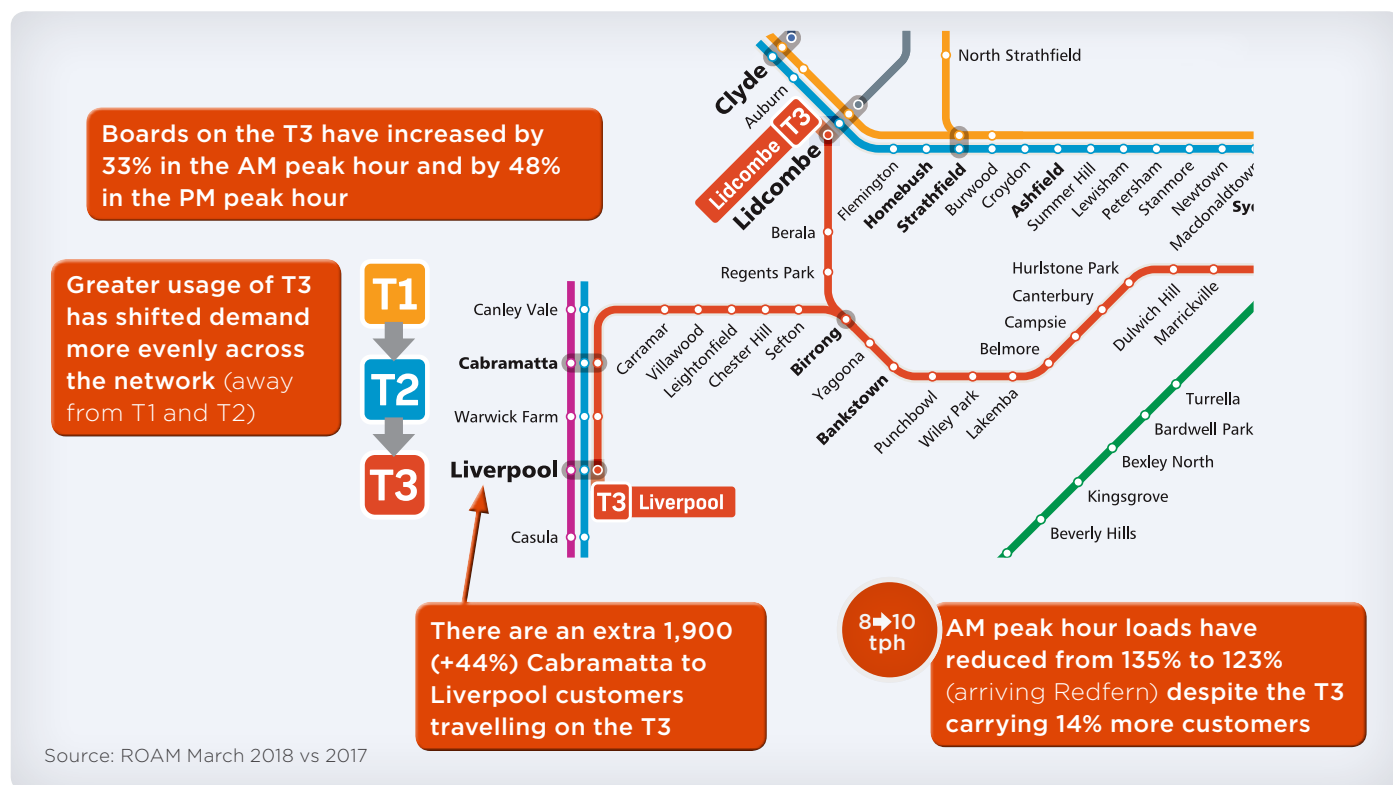
4.4 T5 Cumberland Line

The T5 has been extended to start at Leppington, connecting customers in south-west Sydney to Parramatta and further west.

For the first time, there are also modern air-conditioned trains on the only line that exclusively services Sydney's second CBD.

These improved T5 services have been popular, with 30% more morning peak hour customers tapping off at Parramatta this year from stations to the south.

While direct services to Parramatta have been removed from Campbelltown to Macquarie Fields stations, a cross-platform interchange at Glenfield has made this as seamless as possible. AM peak departure loads for the T5 at Glenfield are 78% on average, indicating that these services remain popular for customers in south-west Sydney.

4.5 T8 Airport and South Line

> ### More than 20 express trains per week in peak hour for Campbelltown and customers on the T8 Airport and South Line

The reconfiguration of the T5 and T2 lines to start at Leppington has allowed for an extra 20 express trains per week in peak hour to run for Campbelltown and Macarthur customers, where demand for CBD bound services has been high.

Despite 12% more customers from Macarthur to Glenfield using these services, average departure loads at Holsworthy are down from 99% to 86% in the AM peak. This change has also ensured that loads have remained relatively stable on the line overall.

In the PM peak, an additional two trains per hour on the Airport Line has seen average arrival loads at Green Square drop from 116% to 99%.

Additional services in the off-peak periods and late night have increased demand at these times, with usage in the inter-peak increasing by 11.3% and the late night by 14.7%.

On weekends, services on the T8 Line have doubled from four to eight trains per hour for much of the day. The uplift has driven significant growth, with 40% more entries and exits at T8 stations on Saturdays and Sundays this year. This demonstrates the benefits of a consistent rail product with regular services available across the week, at all times of the day.

The T8 Line has seen the highest patronage growth on the network, with nearly 9% more weekday customers using T8 stations this year. This has resulted in the number of crowded services increasing in the peaks. The next stages of the MTMS program will focus on this sector of the network as well as the T4 Illawarra Line and South Coast Line.

Figure 9: T5 Cumberland and T8 Airport & South Lines key customer outcomes

Source: ROAM March 2018 vs 2017

T5 AM peak hour departure loads at Glenfield are 78%, indicating these services remain popular with Campbelltown customers

T8 AM peak hour departure loads at Holsworthy are down from 99% to 86%

8➡10 tph

12% increase in Macarthur to Glenfield customers on AM peak T8 services