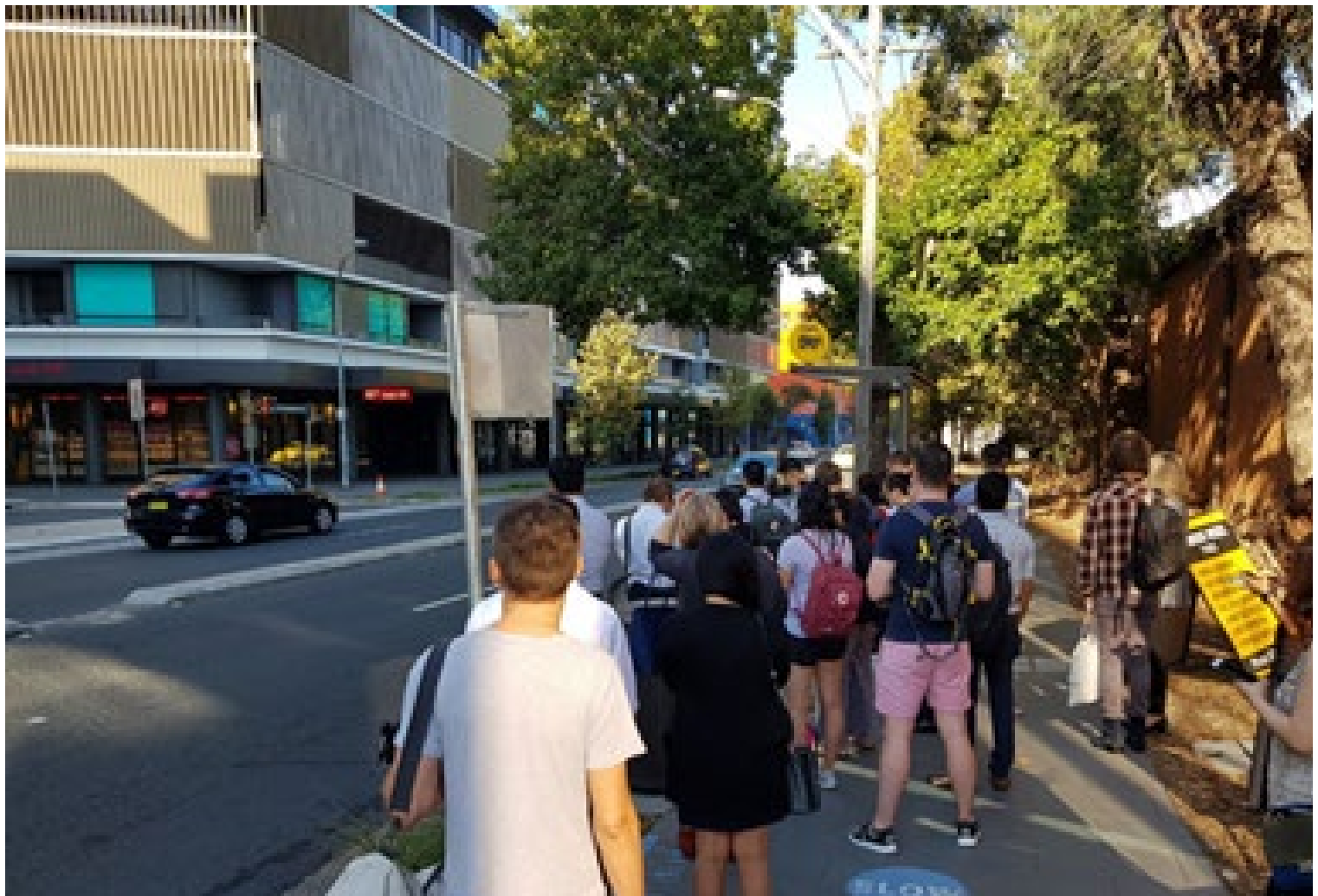


Attachment I

**Green Square and Waterloo Transport
Action Plan – Danks Street Background
Paper. Dated November 2018**

Green Square and Waterloo Transport Action Plan – Danks Street Background Paper

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1. Overview

1.1. The Green Square and Waterloo Transport Action Plan

Transport for NSW (TfNSW) and the City of Sydney (The City) have jointly funded and collaboratively developed the draft Green Square and Waterloo Transport Action Plan (draft Action Plan), including jointly funding the technical studies that supported the development of the draft Action Plan.

While the draft Action Plan is yet to be finalised, and is not yet available for publication, TfNSW announced significant rail and bus service improvements in November 2018.

This Green Square and Waterloo Transport Action Plan – Danks Street Background Paper (Background Paper) provides some background about how the draft Action Plan has been developed, as well as highlighting the announced key actions that specifically relate to and will support the future development of Danks Street South.

The draft Action Plan focuses on urgently needed transport service and infrastructure improvements in the period up to 2024 (when additional rail capacity can be provided). It aims to address the pressing existing transport issues currently affecting people travelling to, from and within the Green Square and Waterloo

These transport improvements capitalise on key upcoming opportunities:

- The commencement of CBD and South East Light Rail services, which enables a bus network with greater emphasis on connections for Green Square and Waterloo. The new bus services and increased frequencies that TfNSW announced in November 2018 is the first stage of this evolution.
- The completion of the Eastern Transit Corridor through Green Square in the short term
- Preparing for the metro station at Waterloo 2024 – this requires the establishment of bus services and active transport routes to provide access to this major transport hub; and
- Opportunities for traffic management and reallocation of road space arising from the diversion of regional (through) traffic onto WestConnex when it opens (2023-24).
- The potential for significant re-allocation of road space to achieve better active transport, public transport and place outcomes in Green Square with the completion of WestConnex around 2023/24.
- The rollout of short term initiatives such as improving Bus travel time reliability on the important north-south public transport corridors in the precinct will be deliberately aligned with long term transport and planning objectives for Green Square and Waterloo, and the longer term transport capacity improvements that will flow from investment in metros, rail and light rail.

The City is working with TfNSW to secure endorsement of the full draft Action Plan by the Minister for Transport and Infrastructure in 2018.

1.2. Progress on Actions relevant to Danks Street South - Summary

The NSW Government has already announced a number of key actions that will provide specific benefits to Danks Street South. These are summarised in the table below.

Additional detail relating to these actions (sourced from the NSW Government's 2018 media releases) is provided in the following section.

Ref	Action	Priority
GSW1	Green Square – Waterloo bus capacity improvements (note: first tranche announced November 2018 to commence December 2018)	Short term (0-2 yrs)
GSW6	Improve bus travel time reliability on the important north-south public transport corridors: <ul style="list-style-type: none"> • Botany Road/ Regent Street and Wyndham Street/ Gibbons Street • Elizabeth Street • Bourke Street 	Short term (0-2 yrs)
GSW14	More Trains More Services 2 – increase rail services for Green Square Station	Medium term (2-6 yrs)
GSW15	More Trains More Services 3 and 4 - further increase in rail services at Green Square Station	6-10 years
GSW16	Provide 16 trains an hour at Waterloo Metro station	Medium term (2-6 yrs)

A large number of other actions in the draft Action Plan relate to the City's existing programs implemented in partnership with Transport for NSW and Roads and Maritime Services. These focus on walking, cycling, and management of local roads, such as reducing speed limits where appropriate.

When the draft Action Plan is finalised, and funding of actions is agreed, implementation of these actions will improve the connectivity of Danks Street South, supporting the already announced public transport improvements.

1.3. Progress on Actions relevant to Danks Street South – Additional Details

Additional detail relating to the actions summarised above is provided in the following section. This has been sourced from the NSW Government's 2018 media releases.

Action GSW1. Green Square – Waterloo bus capacity improvements

From December 2018, a new bus route 304 will connect Rosebery and Green Square to Circular Quay. This will feature a minimum 12 minute frequency, operating 24/7. It will serve eastern parts of Green Square, including East Village. TfNSW has advised this will increase capacity on this corridor by 18%.

There will also be additional services on the 343 bus route on Elizabeth Street (approximately 250m west of the site), with an 18% capacity increase between 7am-8am, and a 16% capacity increase between 8am-9am.

Action GSW6. Improve bus travel time reliability on the important north-south public transport corridors

From December 2018, existing bus services 301-3, which currently operate to Circular Quay, will operate to Redfern (via the site of the future Waterloo Metro station). Operating services to Redfern should make them more reliable, and will

allow a greater frequency, yet reduces overall journey times for most trips due to the directness of rail trips from Redfern (and Waterloo Metro, when operational).

Action GSW14 and 15. More Trains More Services 2, 3 and 4 – increase rail services for Green Square Station

The NSW Government announced in June 2018 plans to increase the capacity and reliability of services on the Airport Line, as well as at Green Square station. This is badged *More Trains More Services*.

A suite of improvements, to stations and to signalling, provide the system requirements to support 16 trains an hour through Green Square and Mascot. This will be delivered in stages to 2024 and corresponds to a 25% increase on 2018 capacity.

The key opportunity comes in 2024 when the Bankstown Line services no longer utilise the City Circle – these train paths become available to services on the Airport Line.

Action GSW16. Provide 16 trains an hour at Waterloo Metro station

The Waterloo Metro station will be on Botany Road south of Raglan Street. This project is under construction and will be completed by 2024.

The Metro will provide an initial 16 train services per hour to the City Centre and the Lower North Shore/Macquarie Park. The services will be world-class in terms of stations, vehicles, travel time and reliability.

The service is to be fed by the existing Bankstown Line. This ensures there will be significant capacity at Waterloo for journeys in either direction.

1.4. Working towards the longer term transport outcomes

The draft Action Plan focusses on the 0 – 5 year planning horizon up until 2024. It however supports and is consistent with the longer term plans and priorities to address the transport and development challenges in the City-Airport corridor, which has been identified repeatedly as one of the key national priorities for investment.

The draft Action Plan explicitly begins the transitioning to a future more integrated, turn up and go, distributed network. This will minimise the changes that are required when each major transport initiative commences.

Key elements of a long term approach are already in the public domain, with some projects underway, some committed but not commenced, and others undergoing planning at the moment. Of note are the following:

South East Transport Strategy

This is Transport for NSW's place-based plan for the area between Central, the coast and Botany Bay, including Green Square. It addresses a 40-year horizon, with a detailed plan for the 20-year timeframe. It is being developed by TfNSW in consultation with councils and key stakeholders such as Sydney Airport. It will be released in mid-2019.

The Strategy will articulate a network development approach, supporting the delivery of the key centres and other places identified in the NSW Government's spatial plans, such as the Eastern City District Plan. The network development strategy will be informed by the final scope and role of new projects.

Metro station at Waterloo as part of the Sydney Metro CBD and South East project

This is described at Action GSW16 above.

The services at Waterloo create the opportunity to attract patronage from local residents of the Waterloo urban renewal; people from areas of Green Square who can walk or ride to Waterloo; and bus passengers from services on Bourke St (commencing December 2018) and Botany Road.

Increase in service frequency at Green Square (and Mascot) railway stations

This is described at Action GSW14 and 15 above.

Similar to services at Waterloo Metro, this increased capacity at Green Square (and Mascot) provides opportunities for walk-up patronage, for active transport access and for bus-rail interchange, for services from the South (Botany Road) and South-East (Joynton Avenue). This would increase capacity on bus routes north of the Town Centre.

Metro station at Zetland as part of the Sydney Metro West project

The NSW Government is investigating the potential of a station at Zetland as part of the Sydney Metro West project. This could be considered for the terminus of stage one of Sydney Metro West, before extension to the South-East at a later date. Zetland has advantages for a terminus compares to some sites such as Central.

Serving the area around Green Square Town Centre with metro as soon as possible will help manage the transport impacts of ongoing development. The City's view is that the ideal commencement of Metro West services for Zetland is 2028-30. The scope of Metro West will be confirmed in the South East Transport Strategy.

Because services would commence from / end at Zetland, there would be virtually unlimited capacity to serve trips to the City Centre and Parramatta. As well as catering for trips to and from the Town Centre and surrounding residential areas, there is further opportunity for bus-rail interchange, including for routes from the South, South-East and UNSW/Randwick. This would increase capacity on bus routes north of the Town Centre.

WestConnex

The WestConnex project (and associated projects such as Sydney Gateway) will provide a significant increase in arterial road capacity under and around the Green Square and Waterloo area. A key aim of WestConnex is to take regional / through traffic off surface streets (local and arterial)

This will enable a significant reallocation of space on surface roads to serve the local access needs (by walking, public transport and cycling) as well as supporting the place requirements of these dense and vibrant emerging urban areas. WestConnex will be operational by 2024

Light Rail for Green Square and future role of Eastern Transit Corridor

The City of Sydney has proposed a light rail connecting Green Square and the City Centre at Central Station, utilising the Eastern Transit Corridor the city worked with developers to provide.

The Corridor penetrates the high density areas to the east and north of the Green Square Town Centre, that are furthest away from Green Square Station and the future Waterloo Metro station.

As well as providing an additional north-south transit corridor, relieving pressure on Bourke Street, the Corridor can also be used to feed residents and businesses to the north back to the Town Centre, and the extensive facilities being provided there.

The light rail system is also designed to provide additional transport capacity in the City-Airport corridor, recognising the existing capacity issues and the network factors that impact on capacity at areas close to the City Centre (growth in Southwest Sydney or Airport rail patronage, for example).

The Green Square Light Rail proposal emerged in the late 2000's. Since then, the CBD and South East Light Rail has been developed, Sydney Metro City and SouthWest (Waterloo) is underway and Metro West (Zetland) is being firmed up.

Depending on which of these projects are committed (and when) and what other commitments come out of the South East Transport Strategy, the City might need to revisit its Green Square Light Rail proposal. In the interim, the ETC is nearing completion and offers an opportunity for active and public transport in terms of scope, and timing, as outlined in this Action Plan.

2. Context – Green Square Transport and Development

2.1. Location

Green Square and Waterloo are key centres and renewal areas between the City and the Sydney Airport. Figure 1 shows the extent of the area covered by the Action Plan.

2.2. Development and Growth

Green Square and Waterloo will continue to grow strongly for the next 10-20 years.

Green Square's population is planned to grow from 33,000 in 2016 to 61,000 in 2031. By then it is expected to also host around 8,000 jobs.

Waterloo is proposed to undergo urban renewal based around a new station on Sydney Metro. Renewal in the Waterloo area, principally at Waterloo Metro Quarter and the Waterloo Estate, will see population increase from around 3,000 in 2016 to as much as 14,000 by 2036.

2.3. Transport

There is substantial transport infrastructure and services in the area, but the overall system performs poorly for the current population, especially during the peak periods.

The proposed bus improvements build on the recent rail improvements such as doubling the number of weekend daytime services and increased late night weekday services at Green Square, Mascot and Sydney Airport stations last year.

Ongoing growth will result in this situation deteriorating even further in the short-medium term.

One of the catalysts for the Action Plan is ongoing concerns about a lack of public transport and road congestion impacting on the liveability and productivity of the urban renewal area and surrounding places. These concerns continue to be raised as the City progresses its planning processes, such as consideration of the Danks St South planning proposal.

Improvements to public transport and active transport opportunities will drive travel choices and behaviours that are consistent with NSW Government and City of Sydney policies. This will counteract the current situation where 24% of Green Square residents who work in the CBD currently drive to work and 47% of people living and working within Green Square drive to work.

2.4. Policy

The draft Action Plan is consistent with NSW Government's land use and transport plans and strategies - the Eastern City District Plan and Future Transport 2056.

The draft Action Plan is developed with a view to Transport for NSW's South East Transport Strategy, being prepared in 2019. The Strategy will reconcile:

- The short and long term land use and transport issues and opportunities

- Movement and place considerations.

The Strategy will use a “place-based” approach that fosters the improved livability and competitiveness of key centres. The City of Sydney is a key participant in the Strategy.

The draft Action Plan and longer term Strategy are being developed using consistent evidence and assumptions, collaborative approaches, and commitment to applying the Movement and Place Framework.

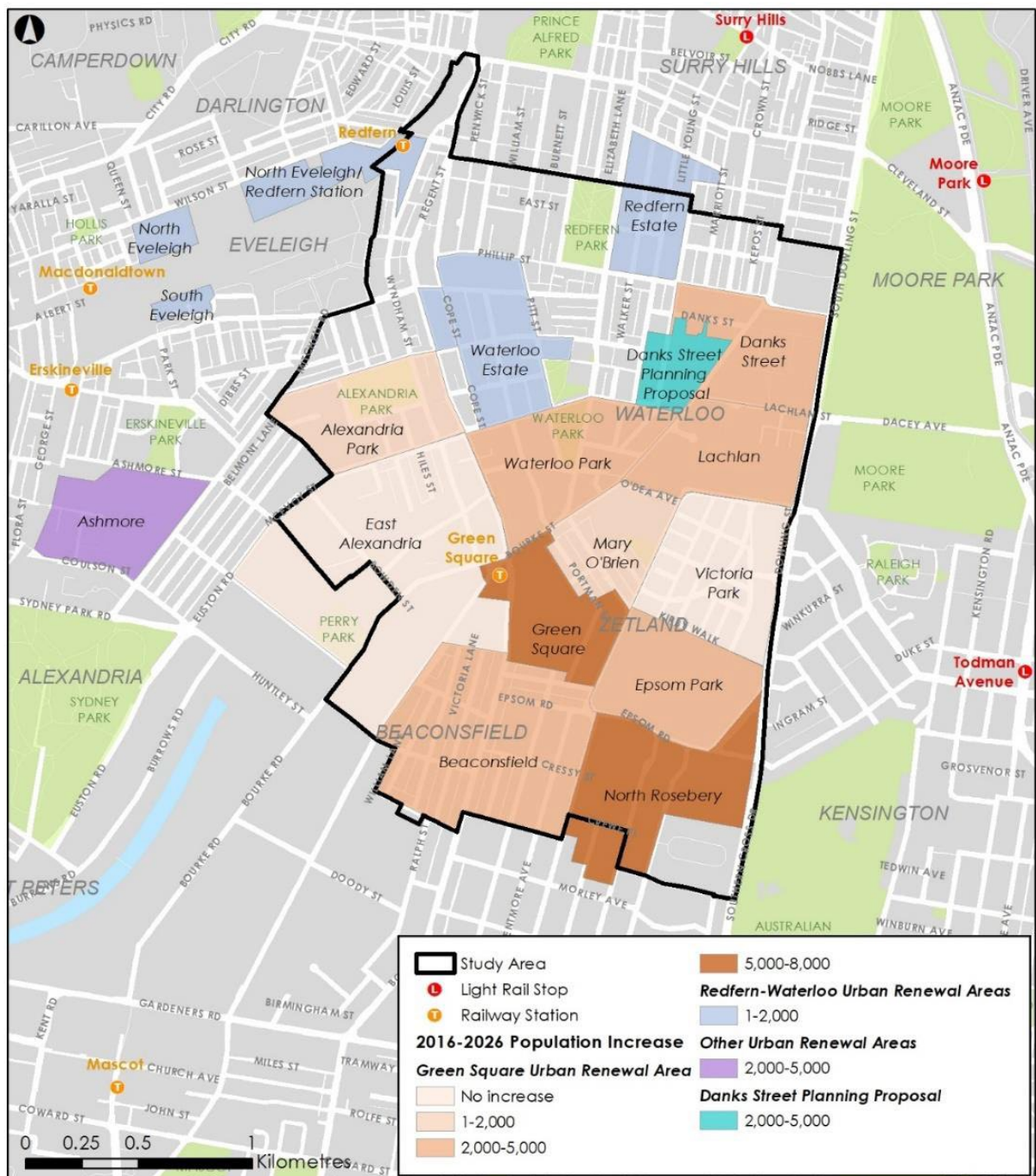


Figure 1 Green Square and Waterloo Transport Action Plan boundary, and existing and planned development

3. Purpose and Objectives of the Action Plan

3.1. Purpose

The Action Plan will perform a number of important functions:

- It will **boost transport system capacity and performance** in a corridor of national significance, addressing the key issues outlined in Section 3.
- It will do this by providing a **coherent, action-oriented framework** for existing and new infrastructure, services and policy.
- By doing this, it will increase certainty that the transport system will be able to consistently provide a level of service that **will cater for current and planned development** in the corridor.
- It will provide the City with **more surety as to committed transport improvements in order to assess developments** such as the current Danks Street South planning proposal, through processes such as gateway reviews. The City's inability to address the community's concerns about the impact of this development, given the existing bus performance on the Bourke St corridor, resulted in the Department of Planning and Environment needing to extend the gateway timeframe twice. The TAP will reduce the risk of this in future.
- It will begin the process of outlining a trajectory from the current system to a **longer term future system**, where significant investment, especially in rail, creates the opportunities for a network that:
 - is turn up and go
 - multi-directional and **truly networked** – where interchange is an opportunity, and more than one trip option is available
 - manages congestion
 - is structured to utilise the **Eastern Transit Corridor** through Green Square.
- In doing this, it will translate the NSW Government's emerging **Movement and Place Framework** to the sub-regional scale, showing how well-planned changes to transport systems can improve both movement AND place outcomes.

3.2. Objective of the Action Plan

The objective of the Action Plan is to support current and planned development in Green Square and Waterloo, by improving transport system capacity and performance in the period before 2024. The actions are developed with specific reference to the Green Square and Waterloo context.

The draft Action Plan aims to achieve its objective by developing a package of actions that are deliverable within that timeframe. The actions are based on proven approaches, and are consistent with most likely long-term network development approaches.

The draft Action Plan aims to achieve its objective by focusing on a range of initiatives to create a cumulative impact, rather than any one initiative (which is unlikely to be deliverable in the time and budget constraints).

4. Issues that the Action Plan will address

The draft Action Plan's main purpose is to address current transport capacity and performance issues, and provide interim solutions for the period until 2024, at which time significant additional rail capacity will be available in the corridor:

- Waterloo Metro opens in 2024, with an initial 16 trains an hour
- Green Square station receives a major increase in capacity, from "SmartRail" improvements to the Airport Rail Line and City Circle
- Beyond that, the potential Zetland station on Metro West would provide additional capacity, ideally by 2028-30.

In the intervening period, the focus is on smaller scale measures that address the key issues that have been identified by residents and transport customers over a long period. These have been investigated, confirmed and quantified as part of the Action Plan and are outlined below.

Trains and generally full before Green Square, and crowding on trains and platforms is affecting the system

Trains from Green Square to the City are fed by the T8 Airport Line. They access the City via Central and then the City Circle, usually via Museum and around to Town Hall.

There is currently a maximum 11 trains an hour in the peak. This effective cap on the number of services exists because the Airport Rail Line feeds the City Circle and shares train paths there with the Bankstown Line.

Opal data provided by TfNSW shows that:

- 75% of all rail trips (2,000 trips) from Green Square between 7-10 AM are to City Centre destinations. Approximately 300 people catch a train to stations north of the Harbour.
- Between 7 and 10am on weekdays, many trains arrive at Green Square so full that people on overcrowded platforms cannot board them. The problem is worst between 8 and 9am, where many trains are significantly overloaded. Station staff on occasions have had to restrict access down to platforms to maintain passenger safety.

Consistent over-crowding on trains and platforms slows trains down, and over time reduces the number of trains that can be run on a line – leading to even more crowding.

Buses are often full, so passengers get left behind, especially at the northern stops

Green Square and Waterloo are served by bus routes to the City Centre and lower North Shore, on Botany Road, Elizabeth and Bourke Streets. Many of these routes also connect Green Square to the South (Mascot and Port Botany); and the South-East (University of New South Wales). There are also limited cross-regional services

that connect Green Square to Wolli Creek, Marrickville, Sydney University and Newtown, and Moore Park/Bondi Junction.

While there are more than 50 services in the peak hour to the City Centre, there is a lack of priority for surface public transport through Green Square and between Green Square and the Sydney City Centre. Bus priority boosts the speed, reliability and capacity of services.

There are 2,500 bus journeys from stops in Green Square between 7-10AM, and 60% of these are to the City Centre. 20% of AM peak trips are to the University of New South Wales.

Opal data confirms the community's often-expressed position that loading on buses is significant in Green Square. In addition to stops on Botany Road, one of the stops served with the highest proportion of heavily crowded buses is Stop 201738 on Bourke Street north of Danks Street (served by 301-3 and M20 services). Stop on 201722 on Elizabeth Street at Waterloo Park is also served by a significant proportion of heavily loaded route 343 services.

Buses operate slowly, often at walking pace

Bus service operating speed is a key determinant of customer travel time. It is a function of factors such as road congestion; priority over other vehicles along routes, at stops and especially signals; stop spacing; and dwell time at stops to allow boarding and alighting.

Bus operating speeds were calculated for each major corridor in Green Square, using Opal and other data. The analysis included sections of the route either side of Green Square, and the City Centre, to allow benchmarking of the speeds within Green Square with the corridor conditions more generally.

Bus operating speeds of most routes on many sections within Green Square approach walking speeds i.e. as low as 5km/h. The following analysis of the M20 services illustrates this.

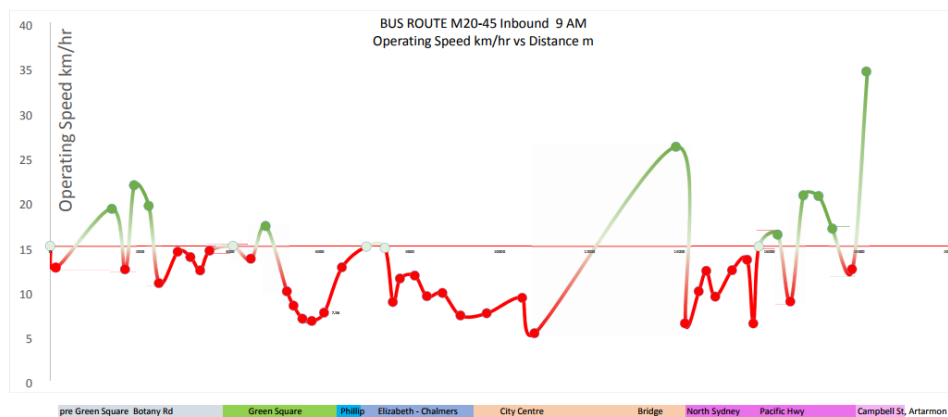


Figure 2 Bus Operating Speeds for M20 services

Buses are unreliable, especially for lower frequency east-west routes

Reliability was assessed using data provided by Transport for NSW. The analysis focused on how often buses ran significantly behind timetabled schedules.

Many bus services in Green Square are unreliable, even taking account of the allowance for delays already factored into timetables.

The most unreliable services are on route 343 going to the City, and there is also significant unreliability for services running along Bourke Street.

Reliability is also very poor for the 370 services towards UNSW, with buses often arriving in Green Square 10 minutes late, and falling further behind their schedule in Green Square.

Pedestrian and bicycle networks are not complete or need improvement, in areas such as signal phasing.

There is significant bicycle infrastructure through Green Square and Waterloo. Connections to the City Centre are via Bourke and George Street cycleways. However connections to other centres are incomplete, such as cross-regional connections to Sydney University (via Newtown) and University of New South Wales.

The City has supported the development of networks with behaviour change programs.

Current walking environments are not always attractive. Some intersections do not have signalised pedestrian crossings on all legs, and signal phasing can result in long wait times for people walking. In some locations, the final street work is not complete, due to the staging of development, and this can reduce the directness and amenity of walking routes.

Despite the networks not being complete, the 2016 Census showed that 9% of people in Green Square ride a bike to work. The City's surveys suggest that similar numbers use bikes for trips to education or for other purposes. In 2011, almost 40% walked if their job was located in Green Square.

5. Development of Action Plan

The draft Action Plan is developed by Transport for NSW and the City of Sydney, working in partnership. They are assisted by external, technical experts, who conducted workshops with the key partners, to develop collaborative solutions.

The draft Action Plan is based on a clear evidence base from detailed observation of the performance of the existing system. This includes field observations, census data, Opal and PTIPS data, and the City's behavioural surveys.

The overarching approach is to employ proven transport network development strategies, tailoring these to the Green Square and Waterloo problem context, while preparing to leverage off upcoming network capacity enhancements. The key strategies include:

- **Behaviour change**, such as Travel Choices
- **Sweating the asset** to increase supply on existing infrastructure, such as boosting capacity on bus systems by boosting priority
- **Adding additional service options**, such as providing additional new bus routes.

The Action Plan is consistent with TfNSW's Travel Choices program and includes:

- **Re-route** actions
- **Re-mode** actions
- **Re-time** actions.

There is limited scope for any single solution or major transformation within the 5-year timeframe to achieve the aims of the draft Action Plan. Rather, the partners agreed to focus on a suite of actions that together can reduce congestion on peak-period services. This approach will cumulatively provide the capacity and resilience for the transport system necessary to cater for demand until significant step-change investment is realised.

Focusing on achieving a number of small improvements across all system elements and locations is also likely to create greater overall benefit, and reduce risk of non-delivery in the timeframes.

In finalising the list of agreed actions, the technical experts developed a series of technical working papers. These focused on problem definition; identification of constraints and opportunities; options development; creation of a long list of potential actions; and assessment of the long list to develop the final list of agreed, priority, immediate-short term actions in the draft Action Plan.

The actions have been investigated to sufficient technical detail to allow their consideration of the draft Action Plan. Many require more work in the next 6-18 months to support their implementation. This is consistent with the translation of strategy to action plan to implementation.