



Parramatta Road to Green Square Light Rail

Attract Housing.
Support Workers.
Improve Access.
Transform Communities.



CONTENTS

THE VISION	1
EXECUTIVE SUMMARY	2
INTRODUCTION	8
Sydney Has Embraced Light Rail	10
A Snapshot of Tomorrow	12
The Challenges to be Addressed	14
Introducing the Proposal	16
THE BENEFITS OF PARRAMATTA ROAD TO GREEN SQUARE LIGHT RAIL	18
Supporting Housing Choice as Sydney Grows	20
Connecting Workers and Students to Jobs and Education	22
PHYSICAL AND OPERATIONAL FEATURES	32
The Alignment	36
Stops	40
Transport Network Design Considerations	42
Traffic and Light Rail Co-Existing on Parramatta Road	44
Central Station	46
Rolling Stock and Operations	48
Power, Substations, Utilities and Depots	50
NEXT STEPS	52
About ALTRAC Light Rail	56

THE VISION

Sydney is connected by an integrated light rail network that creates more housing choice in rejuvenated communities where people want to live, work and play.



EXECUTIVE SUMMARY





EXECUTIVE SUMMARY

Sydney has embraced light rail.

It has transformed the CBD, supported new housing and economic investment, and improved how Sydney moves. The light rail network continually sets new patronage records and consistently rates highly on customer satisfaction surveys.

ALTRAC Light Rail proposes a new light rail line running from Parramatta Road to Green Square via Central Station.

The Parramatta Road to Green Square via Central Station light rail line is both feasible and deliverable.

This new line will support new housing, connect key workers to jobs, revitalise communities and add an important new connection to Sydney's public transport network.

Starting to plan for the future network now will give the NSW Government well-developed investment options in the future.

Light Rail Today

Sydney's existing light rail network has had a massive impact on the way people engage with the city. It has also attracted investment in places people want to work, live and play.

- Over 36m trips annually
- More passengers than the Metro and Sydney Ferries networks combined
- Over \$35bn of development across 1,700 projects in the corridor since light rail announced
- 724,000 jobs within a five minute walk of L2/L3 lines

The Challenges of Tomorrow

With a growing population, Sydney faces numerous challenges that need to be addressed.

- Housing availability and housing choice
- Key workers unable to live close to jobs
- A decrepit Parramatta Road and an unconnected Green Square
- The need to reach net zero

But these challenges also present tremendous opportunities.

The Benefits

Light rail in the Parramatta Road to Green Square corridor will deliver a multitude of benefits to the Sydney community.



Support Housing Choice and Population Growth:

When coupled with the right planning policy settings, light rail can attract investment in a diverse mix of new housing including social, affordable and 'missing middle' housing.



Connect Workers and Students to Jobs and Education:

The new line will connect a host of employment, education, healthcare, retail, cultural and sporting hubs.



Bring People Back to Parramatta Road:

Light rail is a proven catalyst for revitalising Sydney's streets. It will improve the urban environment and build people-centric communities.



Join Communities from Green Square to Central:

Light rail will connect communities along the corridor, especially benefiting disparate communities between Central and Green Square.



Move People Out of Cars:

As a simple, convenient and safe public transport mode, light rail is proven to attract people out of cars.



Complement Other Public Transport Investments:

The new line will complement and enhance other public transport investments made by the NSW Government, such as Metro.

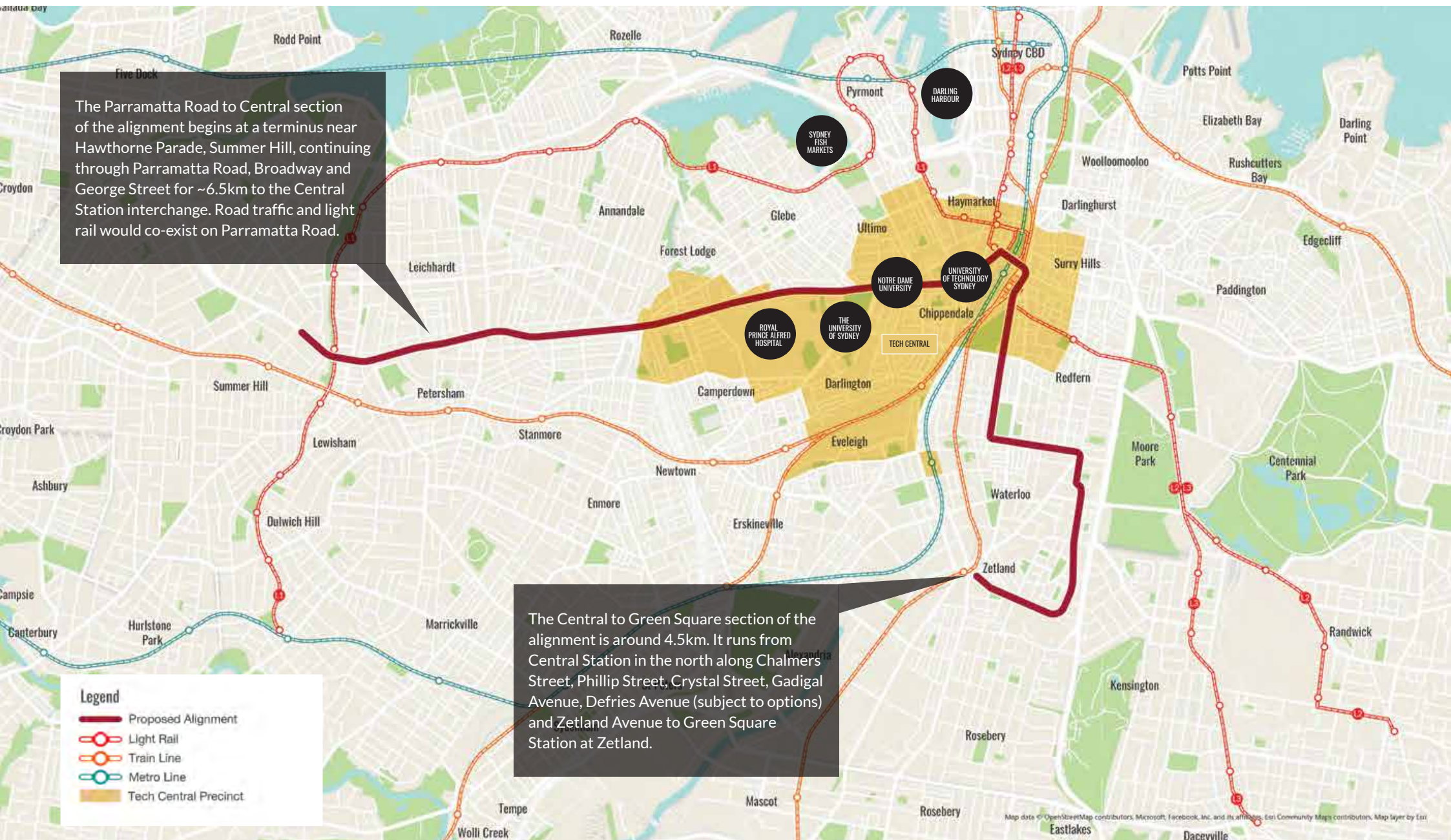


Create a Better Interchange at Central:

The new line offers an opportunity to significantly improve the interchange experience for passengers at Central Station.

The Proposal

Parramatta Road to Green Square Light Rail



Physical and Operational Highlights

Alignment

The Parramatta Road to Green Square line will be approximately 11km in total length.

The Parramatta Road to Central section of the alignment begins in the vicinity of Hawthorne Parade, Summer Hill, continuing through Parramatta Road, Broadway and George Street for approx. 6.5km to the Central Station interchange.

The alignment will see both light rail and road traffic accommodated along the length of Parramatta Road and Broadway.

The new line will converge with multiple other public transport modes at the Central Station Precinct. Introducing light rail on Parramatta Road will increase public transport capacity in that corridor, while the redeployment of bus capacity can increase overall public transport network coverage and frequency.

The Central to Green Square section of the alignment will be around 4.5km long. It runs from Central Station in the north along Chalmers Street, Phillip Street, Crystal Street, Gadigal Avenue, Defries Avenue (subject to options) and Zetland Avenue to Green Square Station at Zetland.

Generally, analysis shows centre-running alignment with island platforms will offer better access for passengers, more flexibility in where services arrive and depart and a smaller total footprint.

Stops

The route will have 21 stops that:

- Follow the same aesthetic design as existing light rail stops
- Are 67m long
- Have shelters and seating
- Contain Opal Card tap-on/tap-off points
- Have ticket vending machines

Light Rail Vehicles

For the purpose of the feasibility analysis reflected in this document, the line is assumed to operate with the same light rail vehicle configuration as the L2/L3 lines where LRVs are comprised of:

- 67m long: two coupled 33m vehicles
- 450 person capacity
- Fully electric
- Climate controlled

Power

It's projected that five substations will be needed within a 100m radius of the proposed line.

There is opportunity for some or all of the line to be wire-free. The specific power supply method will be determined in later design phases.

New Depot

A new depot is required to provide stabling and maintenance for the new fleet. Ideally, the new depot will be located along the new line to minimise 'dead running'. Possible locations for the depot have been identified, including an option which would deliver new public open space above an underground depot facility. A new depot will also provide additional resilience to the existing network.

Proposed Hours of Operation

DAY	TIME	FREQUENCY
Monday – Friday	5am – 7am	Every 12 minutes
Monday – Friday	7am – 7pm	Every 8 minutes
Monday – Friday	7pm – 10pm	Every 10 minutes
Monday – Thursday	10pm – 1am	Every 12 minutes
Friday	10pm – 1am	Every 10 minutes
Saturday – Sunday (incl pub hols)	5am – 7am	Every 15 minutes
Saturday – Sunday (incl pub hols)	7am – 7pm	Every 10 minutes
Saturday	7pm – 1am	Every 10 minutes
Sunday (incl pub hols)	7pm – 1am	Every 15 minutes

Next Steps – ALTRAC Light Rail is Ready

ALTRAC Light Rail is capable and ready to assist the NSW Government to achieve its vision for Sydney.

Under its existing agreement with the NSW Government, ALTRAC Light Rail can work in step-by-step partnership with the NSW Government to deliver the vision of an expanded Sydney light rail network. Starting preliminary planning works now will provide future project options for the consideration of the NSW Government.

Every stage of the development of the proposed new line can be financed by ALTRAC Light Rail. This means there will be no upfront capital required from the NSW Government to deliver this vital infrastructure for the Sydney community.



INTRODUCTION





SYDNEY HAS EMBRACED LIGHT RAIL

Sydney has embraced its light rail network.

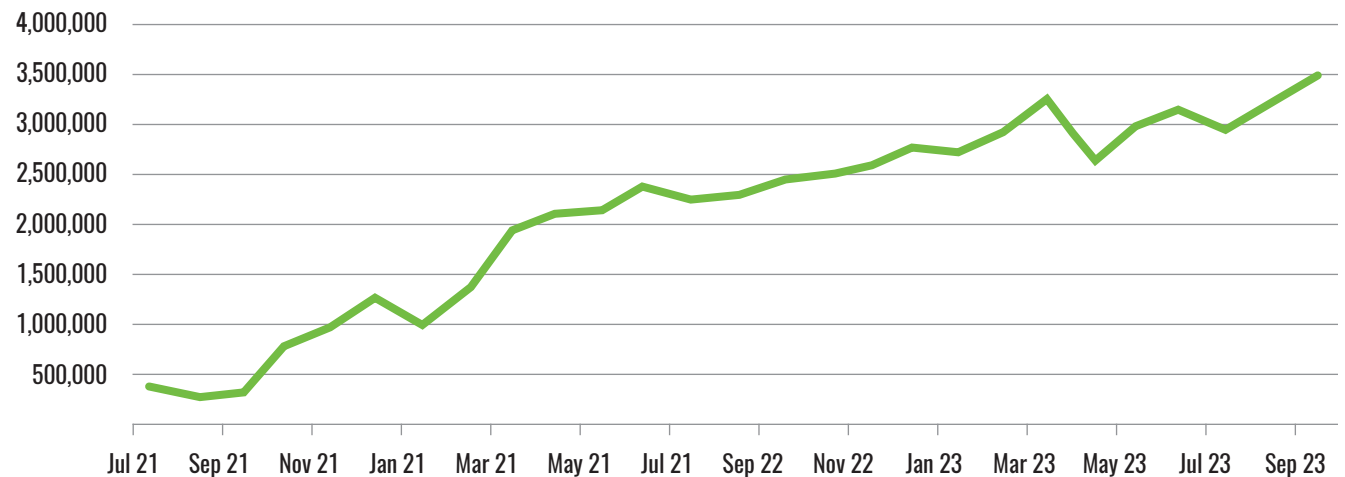
The history of light rail and trams in Sydney is a long one. Sydney's first horse drawn tram line opened in 1861. Over the next 100 years trams graced Sydney's streets, reaching 291km in 1923 and 405 million passengers in 1945. Sydney had one of the world's largest tram networks.

The renaissance of light rail in Sydney began with the conversion of a disused goods line in 1997 to form the L1 line, followed by extensions in 2000 and 2014. With the addition of the L2 and L3 lines in 2019 and 2020, the popularity of the Sydney light rail network has grown at an exceptional rate.

Today, light rail patronage is high and growing fast. It has attracted investment along the network and transformed the Sydney streetscape. George Street is just one example of how light rail has delivered not only transport, but urban realm and economic benefits to Sydney.

Passengers consistently rate light rail as being easy and safe to use. Sydneysiders are flocking to light rail.

Sydney Light Rail Monthly Patronage



36m+

light rail trips per year

Excellent

overall passenger satisfaction scores

More passengers

than the entire Metro and Sydney Ferries combined

\$35bn+

development in the light rail corridor across 1,700 projects

More than doubled

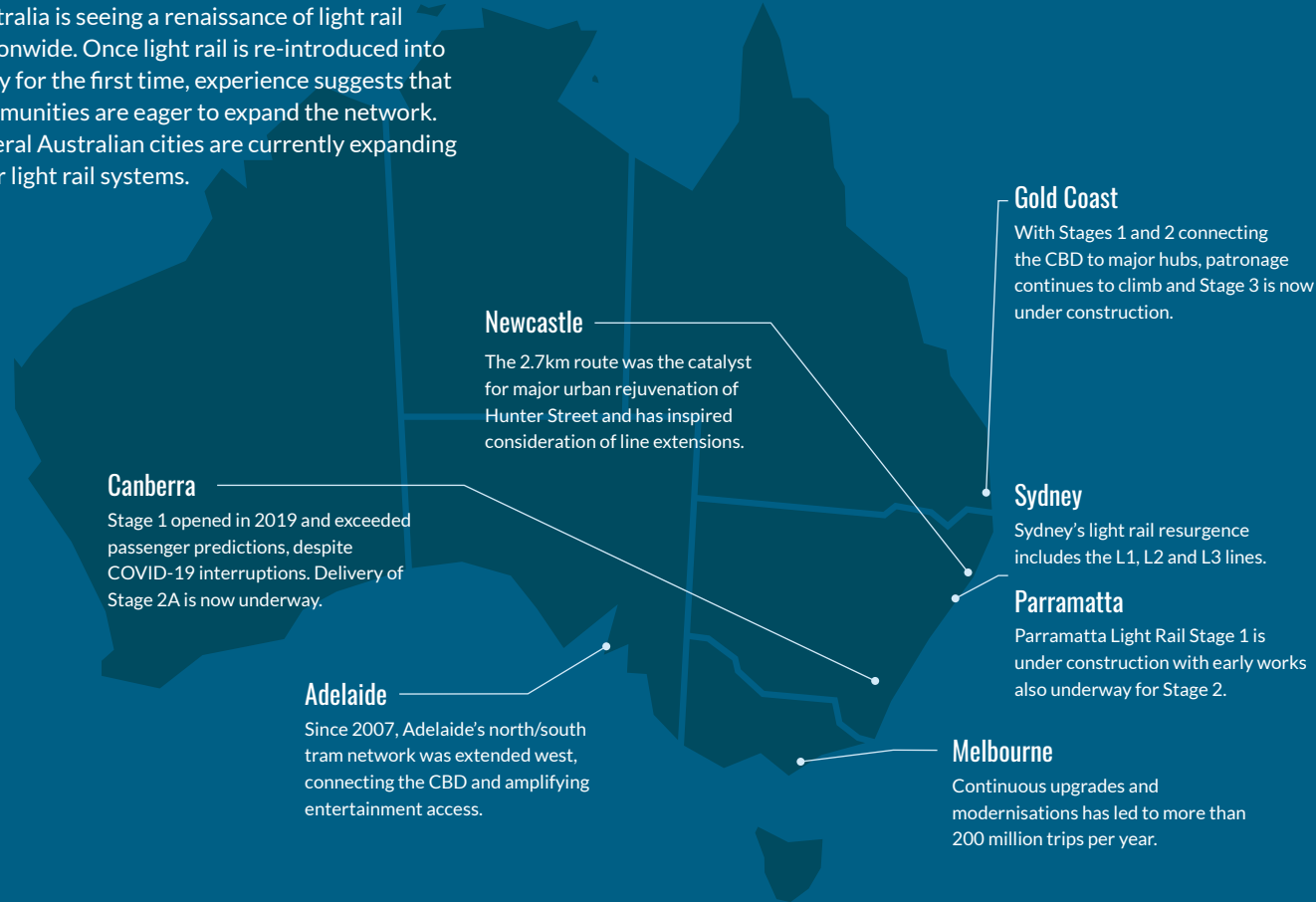
passenger growth 2021-22 to 2022-23

97%

passenger satisfaction for safety and security

Not Just Sydney

Australia is seeing a renaissance of light rail nationwide. Once light rail is re-introduced into a city for the first time, experience suggests that communities are eager to expand the network. Several Australian cities are currently expanding their light rail systems.



Linking Jobs and Education

The existing light rail network has transformed access to some of Sydney's biggest health and education institutions, and tourism hotspots. Key points of interest on the current network include Darling Harbour, the Prince of Wales Hospital, the University of NSW, Randwick TAFE, the Sydney Cricket Ground and Sydney Football Stadium, the International Convention Centre, the Sydney Fish Market, and more.



Events

Sydney's light rail has supported some of Sydney's largest and most prominent events, including the FIFA Women's World Cup, Sydney Mardi Gras and WorldPride 2023, major concerts, Royal Randwick Racecourse, Vivid and many others. The network makes it easy to move around for visitors and locals alike.



Catalyst for Housing

The existing light rail has helped catalyse major modern housing developments such as Lewisham West and Arlington on the L1 and along Anzac Parade on the L2/3.

These housing developments have also led to significant urban regeneration/rejuvenation along the light rail corridors.



GEORGE STREET BEFORE LIGHT RAIL



GEORGE STREET AFTER LIGHT RAIL

A SNAPSHOT OF TOMORROW

The Sydney of tomorrow is one that will need to house and move more people with changed living, work and travel habits.

Population

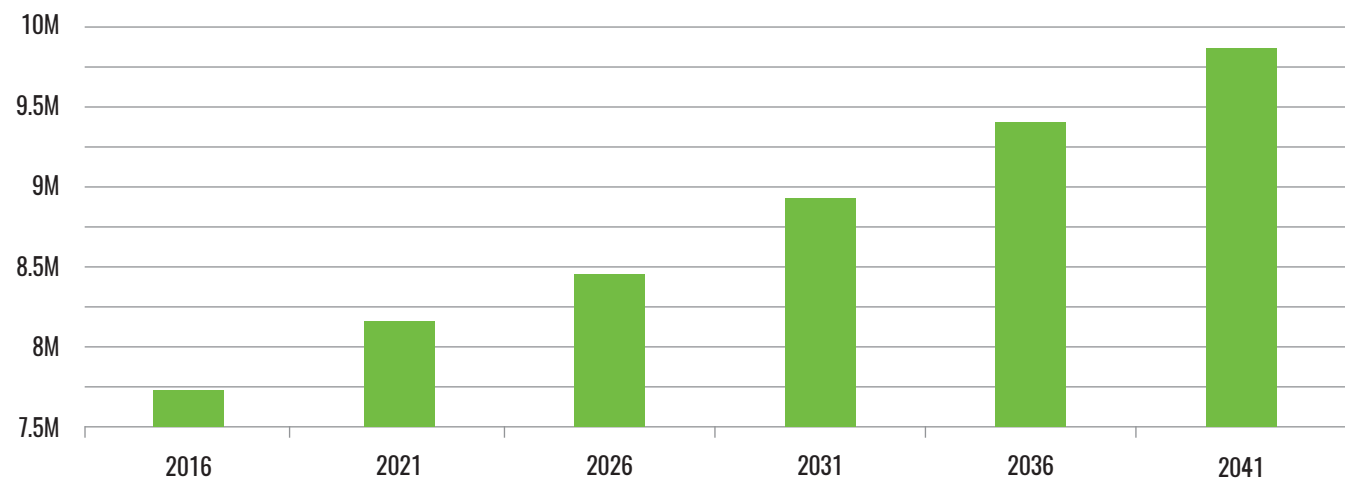
- Sydney's population is predicted to grow to 6.1m by 2041
- Parramatta Road between Central and Strathfield catchment to grow by 23% to 90,000 people by 2035
- Central to Green Square catchment to grow by 85% to 70,000 people by 2035
- Green Square is set to become the most densely populated area in Australia
- By 2041 Sydney will see comparative growth in older age groups who will benefit from safe, reliable and accessible public transport
- Net migration will be a larger contributor to population growth than natural change

Jobs

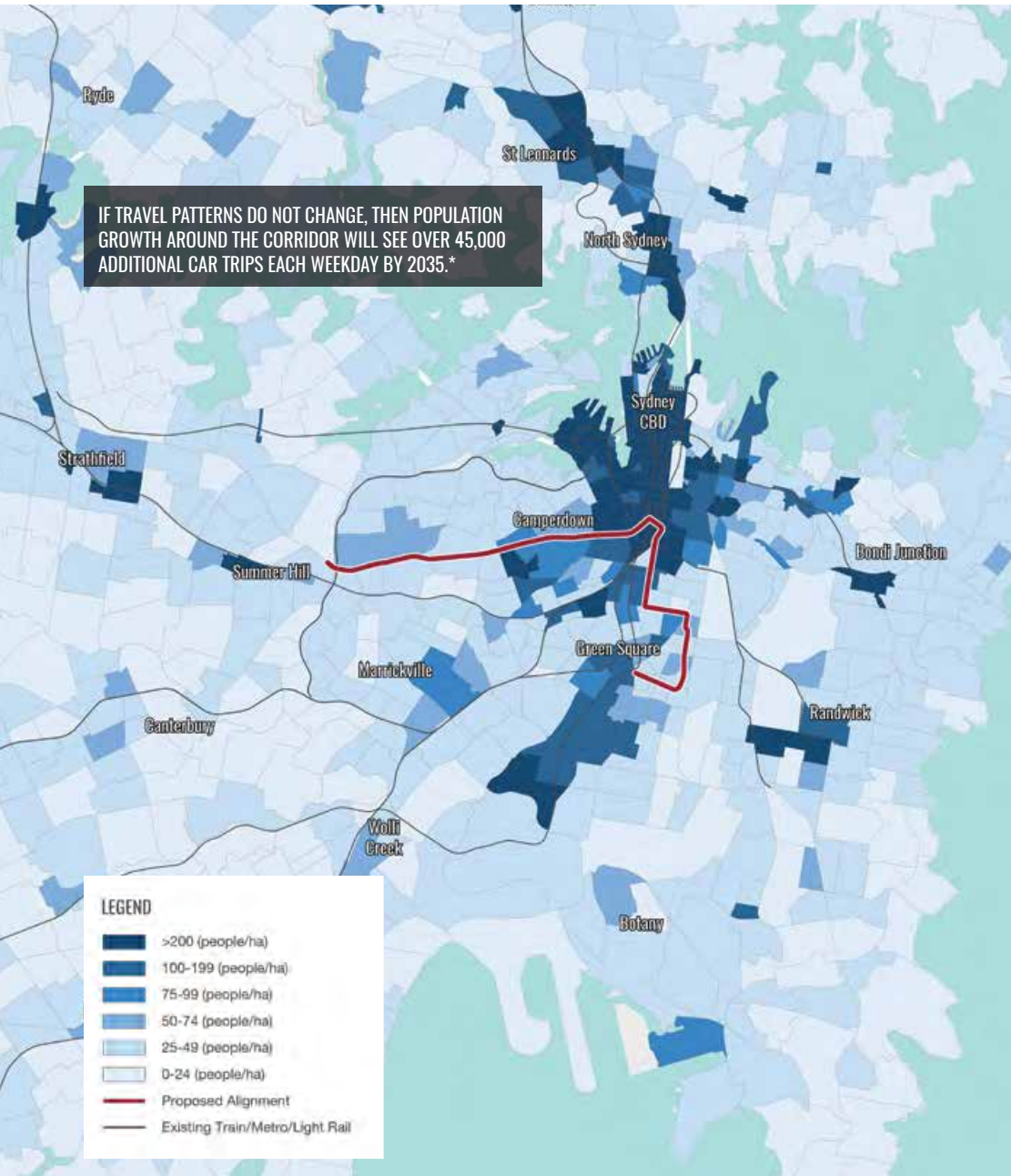
The Sydney CBD and adjoining inner-city areas are expected to remain an important centre for jobs in NSW well into the future.

- By 2026, only 22% of people working in the inner city and south are expected to live in the region
- By 2036, 23% of jobs in Greater Sydney will be located in the Inner City and South
- Over 15,000 additional jobs in Central Precinct between 2021 and 2036

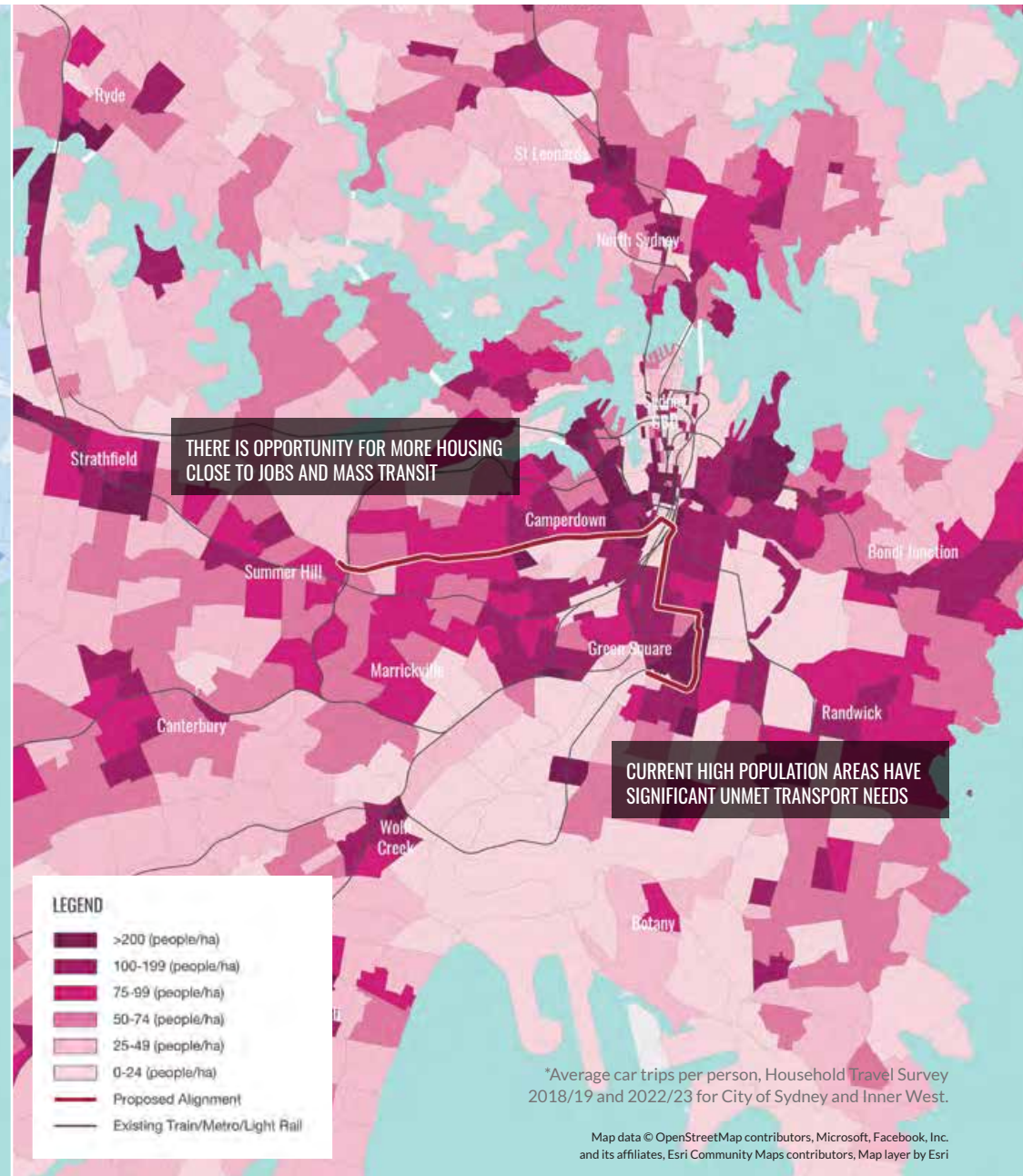
NSW Population



Estimated Employment Density 2036



Estimated Population Density 2036



THE CHALLENGES TO BE ADDRESSED



Sydneysiders Need Somewhere to Live

Sydney's housing crisis is clear and widely acknowledged. The NSW Government has stated that "housing affordability and availability is the biggest single pressure facing the people of NSW."

The NSW Department of Planning and Environment estimates NSW will require approximately 900,000 additional dwellings by 2041.

The housing crisis, however, is not simply one of raw numbers. As well as there simply not being enough homes in Sydney, there are not enough homes in the right places. Additional housing should be located where there is existing transport and social infrastructure to support community development.

There is a need for greater choice in Sydney's housing stock, with more 'missing middle' homes required.

Sydney also suffers from a shortfall of social and affordable housing.

The NSW Productivity Commission has found "that the greatest effect on house prices could be achieved with a planning process that increases housing density in areas of highest demand, particularly in areas closest to the Sydney CBD." The Commission also recently found that "to build more housing in Sydney's existing housing areas, we should ... allow more development near transport hubs to leverage existing infrastructure capacity."



Reduce Worker Commute

As Sydney grows and changes, more people need to live near where they work and play. For a great many Sydneysiders, their jobs are in the CBD and surrounds with its concentration of employers, tertiary institutions, hospitals and other employment nodes.

In recent years though, a scan of housing completions in Sydney shows that much of Sydney's housing growth is happening on the city's fringes.

The NSW Productivity Commission has noted that this "has come at a heavy cost: it has driven up the need for expensive new infrastructure and has left many of Sydney's people too far from the city centre's facilities."

Similarly, according to the Committee for Sydney, "this again has a disproportionate effect on low and middle income people living further from jobs, highlighting questions and risks on the city's equitability as well as productivity."

Accordingly, the challenge for Sydney is to build more new homes in areas closer to Sydney's centre. In the words of the NSW Productivity Commission, "these areas offer both the richest collection of job opportunities, and a supply of already-built infrastructure and other amenities whose capacity can be leveraged and expanded."



Parramatta Road – Ready for Renewal

Parramatta Road, once a bustling artery of Sydney, has been overshadowed by underdevelopment and neglect. Despite its historical significance, it has been plagued by a long and steady decline.

The result is outdated infrastructure, dilapidated buildings and inconsistent land use. Traffic congestion has created a hostile environment for people walking and cycling, and divides the Inner West.

As noted in a 2020 Committee for Sydney report, there is "a once in a generation opportunity to reclaim Parramatta Road as a series of dense, vibrant urban places".

The challenge – and opportunity – is to be the government that fixes Parramatta Road.





Supporting Growth at Green Square

Green Square is home to Australia's fastest growing population. However, while being a hub of contemporary development, it remains relatively disconnected from other parts of Sydney with unmet public transport demand.

Limited direct public transport links make accessing Sydney's central areas and peripheral regions cumbersome for Green Square residents – and vice versa. This sense of isolation will only grow as more people call Green Square home.

This disconnectedness is manifested in more private vehicle journeys than needs to be the case. It also means Green Square's neighbouring communities miss out on the benefits that come from being within an easy, short commute of each other.



Moving More People – Sustainably

As Sydney's population grows, there's an unavoidable need to ensure its inhabitants can move around the city efficiently and easily.

With the city's sprawling layout, the private motor vehicle remains the predominant choice for many. But it will not be sustainable to combine Sydney's population growth with a commensurate increase in the number of cars on the road. Increased traffic congestion has a real and negative impact upon both Sydney's economy and the well-being of its community. Traffic congestion detracts from Sydney's liveability and investability.

Sydney must find ways to move more people without simply tipping them into an already congested road network.



New Transport for Changed Lifestyles

The challenge of keeping Sydney moving is not only driven by Sydney's population growth. Sydneysiders are also changing how they live.

COVID changed how many in Sydney move around the city. With an increased number of employees splitting work time between the office and home, there is an expectation that a range of services accessed around employment nodes like the CBD should also be accessible locally.

For Sydney's transport system, the challenge is to ensure the transport network is flexible enough to easily facilitate both peak hour commutes and local journeys throughout the day.

Sydney's shift towards a more interconnected, local and green city demands transport that aligns with these values.



Reaching Net Zero

Transport is the second biggest contributor to NSW's greenhouse gas emissions.

Carbon emissions are driving unprecedented changes in Australia's climate. As Sydney's population grows, demand for energy consumption will also grow. Without action, this growth will exacerbate greenhouse gas emissions and make the job of avoiding tipping points with irreversible climatic consequences even harder.

Recognising the global imperative to combat climate change, the NSW Government has committed to cutting emissions by 70% by 2035 and reaching net zero by 2050. This means that every journey in NSW will need to be zero emission by 2050.

The challenge for the NSW Government is to implement practical solutions that will enable it to achieve its zero emissions target.



INTRODUCING THE PROPOSAL

ALTRAC Light Rail proposes a new light rail line running from Parramatta Road to Green Square via Central Station.

This new line will support new housing, connect key workers to jobs, revitalise communities and add an important new connection to Sydney's public transport network.



Line length – 11km



44 new light rail vehicles

(coupled to make 22 longer vehicles)



Stops – 21



Potential wire-free running



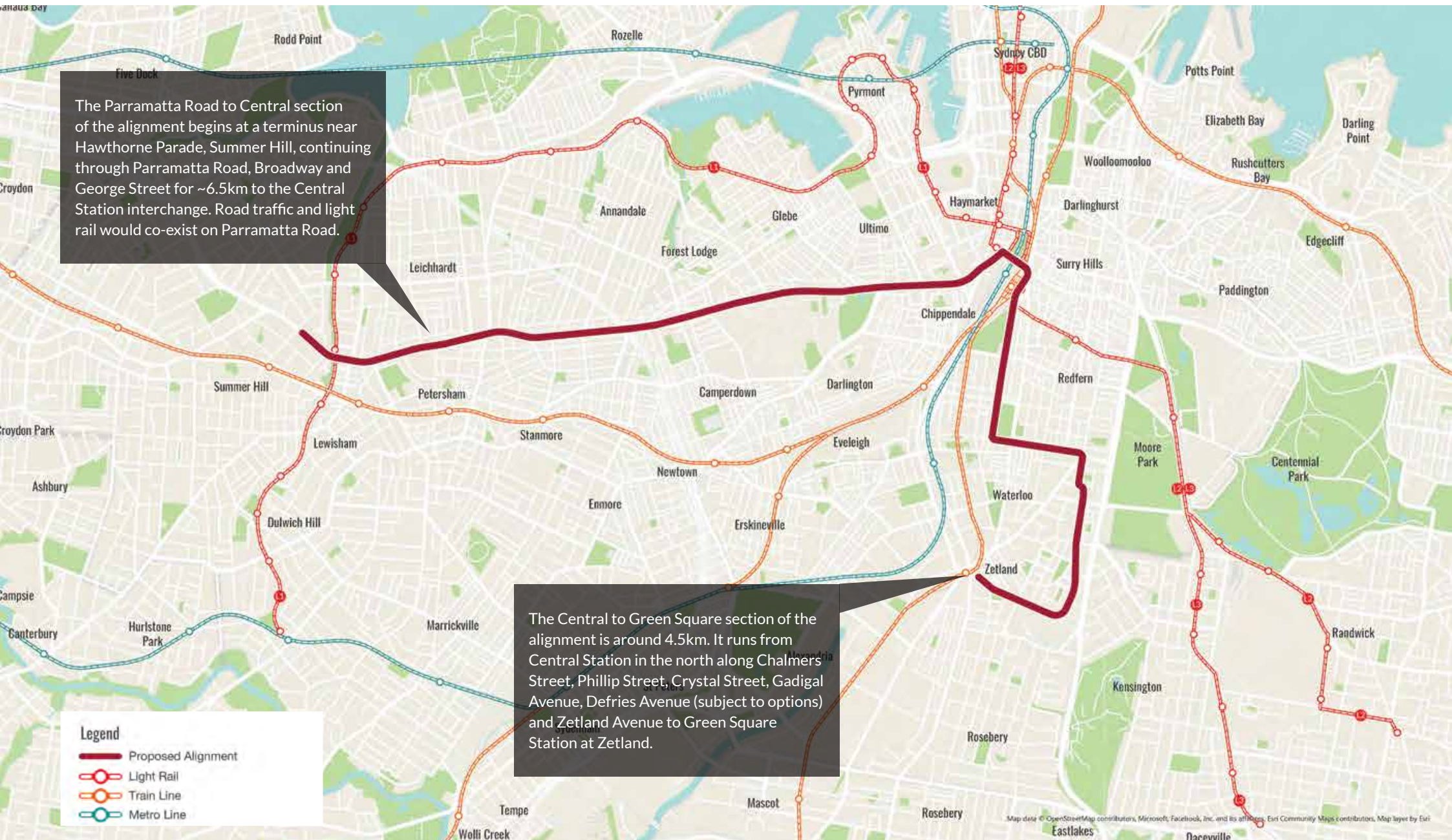
Reconfigured Light Rail Interchanges at Central Station



Fully financed by ALTRAC

Corridor Overview

Proposed Alignment



THE BENEFITS OF PARRAMATTA ROAD TO GREEN SQUARE LIGHT RAIL





SUPPORTING HOUSING CHOICE AS SYDNEY GROWS

Light Rail Drives:

- Housing Investment
- Housing Availability
- Housing Choice

Sydney is currently facing a housing crisis in which more and more people are unable to live in diverse housing stock in well-located and connected suburbs. Light rail-driven urban renewal along the Parramatta Road to Green Square route can play a major role in solving this problem.

Importantly, new housing in inner Sydney will benefit all of the Sydney community. The NSW Productivity Commission has noted that “building more housing closer to the CBD will improve affordability there and elsewhere.” It results in more, better quality and more affordable housing stock across all of Sydney, once its effects filter through the entire city.

The permanency of ‘tracks in the ground’ provides confidence for developers to invest in housing in the corridor.



Investment in light rail, coupled with the right policy settings, can attract investment in a diverse mix of new housing, including social, affordable and market rate options. There is the opportunity to support ‘missing middle’ housing – not just at the proposed light rail stop locations, but along the whole length of the corridor. Light rail’s at-grade running, and the closer spacing of light rail stops, provides scope to amplify housing density right along the line.

Building houses alone is not enough. As neighbourhoods densify, light rail offers an intermediate transport option to connect people to where they regularly need to be (schools, hospitals, libraries, community facilities etc.). Light rail is an opportunity to reimagine and reprioritise streets for people and communities, including slower and safer streets, better walking and cycling links for people of all ages, local green spaces and more.

While Green Square and surrounds have already had significant population growth, much more is planned. By 2036 there will be an additional 9,000 residents within 400m of a possible light rail stop on the Green Square to Central Station section than there are today.

The Parramatta Road section of the corridor has considerable potential for higher density and urban renewal than current projections.

In 2016, the NSW Government published the Parramatta Road Corridor Urban Transformation Strategy, which details a 30-year plan to guide coordinated employment and housing growth by 2050, including investment in 27,000 new homes and 50,000 jobs. Light rail can kickstart, support and grow this housing investment.



CONNECTING WORKERS AND STUDENTS TO JOBS AND EDUCATION

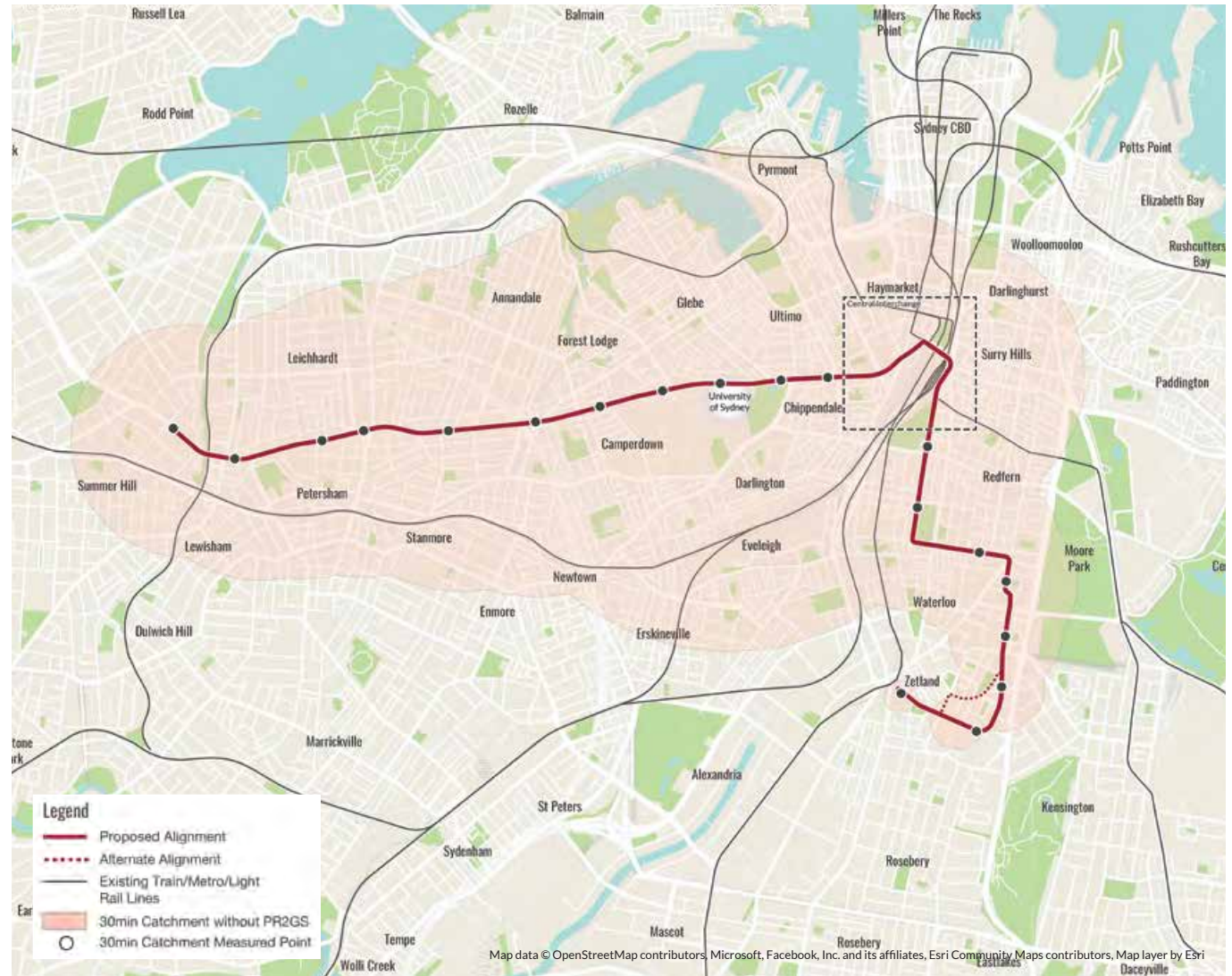
The Parramatta Road to Green Square via Central Station line will provide light rail connectivity to many places of interest along the route, including:

- **Education:** University of Sydney, University of Technology Sydney, University of Notre Dame, Fort Street High School, Inner City High School and more
- **Healthcare:** Royal Prince Alfred Hospital, medical centres, GP clinics, allied health services and more
- **Tech and Innovation:** Tech Central, hundreds of small to medium businesses and more
- **Retail:** Broadway Shopping Centre, Norton Plaza Leichhardt, East Village, hundreds of independent retail stores and more
- **Cultural:** The Footbridge theatre, community arts centres, street art, independent galleries and more
- **Sports and Recreation:** Petersham Oval and pool, Camperdown Park, Prince Alfred Park and pool, Redfern Park, Gunyama Park and more

The line will create new, single-seat public transport journeys and better transport connections. Based on planned growth, in 2036, 250,000 people will be able to walk up and catch a Parramatta Road to Green Square Light Rail service and reach the University of Sydney within 30 minutes, without needing to interchange with another mode. With interchanges, this would increase to 350,000 people.

It will also provide new and better connections not only for those living along the route, but for the broader public who make public transport connections. For example, a nurse living in Dulwich Hill will be able to connect via light rail to RPA.

30 Minute Catchment Measured from the University of Sydney



The new light rail route will connect retail, commercial and industrial jobs in the corridor with investment in new housing along the line.

Connecting people better to their communities and places of work drives productivity. It improves local economies through local spending. Less time commuting in a lower-stress transport mode can lead to better well-being.

Number of People with Access to Destinations Within 30 Minutes* with the New Rail Line

DESTINATION	TYPE OF DESTINATION	NUMBER OF PEOPLE WITHIN 30 MIN
TIME: AM PEAK 8.00–9.00AM		
Royal Prince Alfred Hospital (RPA), Camperdown	Health and health jobs	240,000
University of Sydney, Camperdown (Quadrangle)	Education and education jobs	350,000
University of New South Wales (UNSW)	Education	290,000
World Square, Sydney CBD	Commercial	480,000
Taverners Hill Terminus	Terminus	360,000
Green Square Terminus	Terminus	510,000
TIME: SATURDAY 11.00AM–12.00PM		
Stadium Precinct, Moore Park	Events & tourism	280,000
Gunyama Park and Aquatic Centre	Community facility	260,000
Circular Quay	Events & tourism	400,000

*2036 land use projections

Bringing People Back to Parramatta Road

Today, Parramatta Road from Taverners Hill to Glebe Point Road is an uninviting, neglected arterial road. The road often acts to sever communities located on either side due to the lack of permeability and low-quality pedestrian experience. Car movements dominate, the pedestrian environment is hostile and there is little on-street activity that gives the street meaning as a place to gather as a community.

Light rail offers the opportunity to transform Parramatta Road into a true Main Street environment. It will do this by:

- Reallocating road user space to encourage public transport, walking and cycling along and across Parramatta Road, reintegrating local communities
- Anchoring new residential and commercial developments that face towards, not away from, Parramatta Road, and encouraging people to spend time on and around the street
- Reducing traffic noise and pollution, and creating a slower, safer street environment
- Being a catalyst for street transformation, with wider footpaths, spaces to socialise, shade and planting
- Providing capacity to move up to 6,000 people per hour

Many studies over decades have highlighted the need to 'fix' Parramatta Road. Light rail is the proven way to solve the problems it faces.





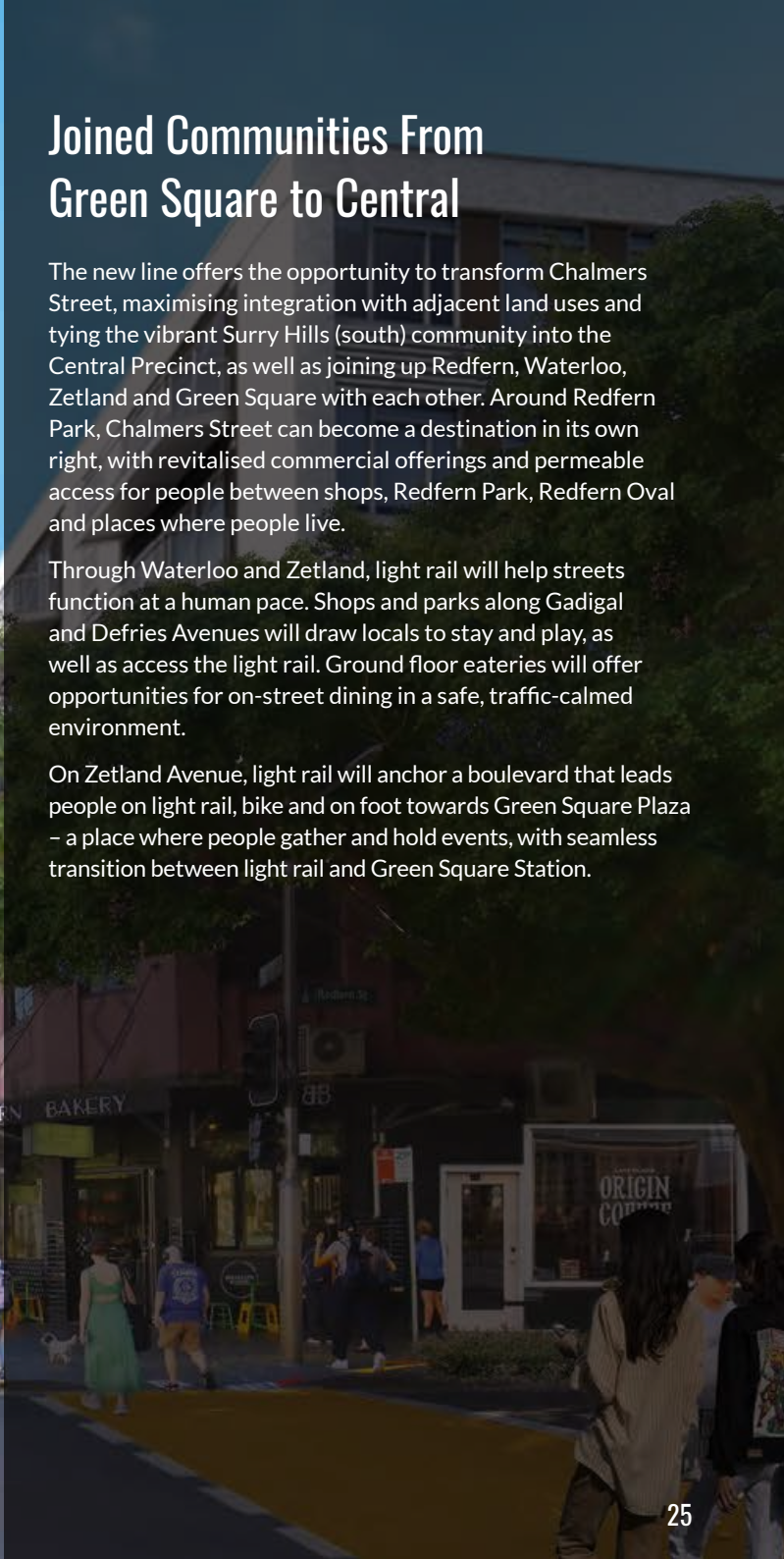
PARRAMATTA ROAD TO GREEN SQUARE LIGHT RAIL

Joined Communities From Green Square to Central

The new line offers the opportunity to transform Chalmers Street, maximising integration with adjacent land uses and tying the vibrant Surry Hills (south) community into the Central Precinct, as well as joining up Redfern, Waterloo, Zetland and Green Square with each other. Around Redfern Park, Chalmers Street can become a destination in its own right, with revitalised commercial offerings and permeable access for people between shops, Redfern Park, Redfern Oval and places where people live.

Through Waterloo and Zetland, light rail will help streets function at a human pace. Shops and parks along Gadigal and Defries Avenues will draw locals to stay and play, as well as access the light rail. Ground floor eateries will offer opportunities for on-street dining in a safe, traffic-calmed environment.

On Zetland Avenue, light rail will anchor a boulevard that leads people on light rail, bike and on foot towards Green Square Plaza – a place where people gather and hold events, with seamless transition between light rail and Green Square Station.



Providing an Attractive Transport Alternative

Sydney needs to offer public transport that is a realistic alternative to the car.

Given a choice, research shows that passengers prefer light rail over other forms of public transport due to its convenience, frequency, reliability and comfort. Today's Sydney light rail system consistently rates very highly for overall passenger satisfaction, with safety and security scoring exceptionally high in passenger surveys.


There are many reasons why people will choose light rail over cars or even over other modes of public transport. Light rail is simple to use and simple to understand. It is frequent, safe, comfortable and easy to access. There's no need to have a licence or bear costs associated with car ownership.

Light rail also provides significant travel time savings. Travel time is not simply about how fast a vehicle goes. In the case of a car it's influenced by challenges such as traffic congestion, finding a parking spot and walking from the parking station to the destination. For other modes of public transport, travel time is influenced by time at a stop, traffic in the case of buses, or the time taken to walk to or from station platforms in the case of heavy rail.

By comparison, light rail is frequent, at street level and, with signal prioritisation, does not get stuck in traffic.

Sydney's light rail system can also move many more people per hour in less space than is required by cars or buses. It's self-evident that as Sydney grows, traffic congestion will only grow much worse if more cars or buses are simply tipped into transport corridors like Parramatta Road.

Light rail is a real alternative to the private motor vehicle, as evidenced by the tremendous popularity of Sydney's existing light rail network.

A photograph of a light rail station platform. A red and white light rail train is stopped at the platform. Several passengers are walking on the platform. The station has a high, arched ceiling with a clock hanging from it. The floor is paved with light-colored tiles.

Initial forecasting indicates that 2030 patronage on the Parramatta Road to Green Square via Central Station line will be in the order of 7.5 to 11 million passenger journeys annually.

Who Will Benefit From Light Rail?

Light rail will benefit workers, businesses, visitors and more.



DIVYA – DAILY COMMUTER

Divya's daily commute involves taking a busy bus to Green Square Station and then a train to the city.

As her Monday shift starts at 9am sharp, Divya has to leave home earlier than she would like, just in case the traffic is bad or the train is late.

Light rail simplifies Divya's journey into the city, eliminating transfers and offering a more dependable commute. She can now take on additional shifts at short notice and also expands where she can look for work in the future.



NAEMA – INCLUSIVE ACCESS TRAVELLER

Naema feels strongly about being able to travel independently to Zetland Mosque. Buses can get her from A to B, but she relies on staff to help her board, and many stops have obstacles like curbs, stairs and tight spaces that make it difficult to manoeuvre around.

Naema much prefers light rail – accessible platforms are available along the entire line and digital wayfinding tools and effective lighting make independent travel easy and safe.



JASON – OFF-PEAK TRAVELLER WITH TWO YOUNG CHILDREN

Jason's wife is a patient at RPA and he highly values taking his two young children to visit her throughout the week.

However, getting there and back can become complicated. Getting out the door on time, carrying nappy bags and keeping an eye on the kids is easier said than done when taking the bus. So, Jason usually ends up driving there despite how close the hospital is and the high cost of parking options.

The light rail offers Jason's family a pram-friendly design, and extra space in the carriages will allow him to leave the car at home and spend the trip engaging with his kids instead of driving.



SAM – ENVIRONMENTALLY AND SAFETY CONSCIOUS CUSTOMER

After catching up with some uni friends after class at USYD, Sam is heading to her home in Green Square. Sam usually tries to opt for greener transport options, however, often ends up taking an Uber or Taxi instead.

Like many in LGBTQI communities, Sam sometimes feels unsafe using public transport at night, especially when walking to, and waiting at, bus stops with poor lighting. Although it's a longer walk to the light rail stop, Sam feels safer travelling on the light rail network – it's clean, well maintained, it feels open, easy to see around and there are more people using it throughout the day and night.



CLAIRE – LOCAL CAFÉ OWNER

Claire's café on Parramatta Road is busier than ever since the light rail arrived and, with it, an influx of new people living in the local area. The changes to Parramatta Road have made the whole area a more welcoming and inviting place to work and live.

With less and slower traffic, people are spending more time out and about. It's easier for her staff to arrive at work on time thanks to how reliable the light rail is. With business looking up, Claire is excited to take advantage of the reduced road noise and create an outdoor dining space, adding more tables and even live music to attract new customers.



ARI – OFF-PEAK TRAVELLER TRANSFERRING BETWEEN LINES

Ari works night shifts at the Prince of Wales Hospital in Randwick and the commute from his affordable housing unit in Zetland used to be quite difficult. Travelling by light rail and bus, he often has to take different bus routes or use different stops depending on the time of day, and after a long shift found navigating networks and timetables to be just more exhausting.

Now that the light rail line extends all the way to Zetland, Ari's commute is seamless. His transfer experience in particular is much improved thanks to the reconfigured light rail interchange at Central while he welcomes the consistent journey no matter the time of day that allows him to switch off after a long day, turning his commute home into valuable 'me-time'.

Complementing Other Public Transport Investments

There is, of course, no single mode of transport that can meet all of Sydney's transport needs by itself. The best outcomes will be achieved where Sydney's transportation system – with all its different modes – works in an integrated, easy to navigate way.

For example, the NSW Government is investing in Sydney's Metro network. Metro offers excellent mass transit capacity over longer distances and allows super-densification around widely spaced stations. Light rail complements this by encouraging development between stops and providing popular shorter-distance trips.

Similarly, as the NSW Government considers improvements to the bus network from the Bus Industry Taskforce, light rail can complement bus services by growing public transport patronage and provide easy interchange opportunities along the corridor.

A quick car trip to the shops or train station is easily replaced with light rail.

The map on page 29 shows how the new light rail line fills the gap between other light rail, heavy rail and Metro lines. It addresses a gap in the overall public transport network. Integration with local bus routes along the corridor and other public transport nodes such as:

- Taverners Hill – light rail
- Central Precinct – light rail, heavy rail, Metro
- Green Square – heavy rail

Should new Metro stops be planned for Zetland or the University of Sydney, light rail will feed and support them, not detract.

A new light rail line along Parramatta Road to Green Square is not about taking passengers away from Metro or heavy rail.

It's about enticing new users onto an attractive form of transport that enables people to complete their trips, end to end, entirely on Sydney's public transport system. Light rail also represents exceptional value for money in the context of the patronage it attracts, the development and urban rejuvenation it supports, and when compared to the cost of heavy or metro rail.

In April 2023 the NSW Government indicated that Sydney Metro West is estimated to cost \$25.32bn and the full cost of Sydney Metro City and Southwest is at least \$20.5bn. By comparison, the NSW Auditor-General reported the final total cost of the L2/L3 line to be approximately \$3.1bn – less than a quarter of the cost per kilometre than Sydney Metro West.



Creating a Better Interchange at Central Station

Existing interchanges at Central are sub-optimal. They are often uncovered, unintuitive and not easy to find. Consequently, most transfers between light rail lines occur at the Capitol Square and Chinatown stops.

This new line will offer an opportunity to improve the interchange experience between light rail lines but also from light rail to bus and heavy rail, locating stops closer to each other and creating an easy-to-navigate network.

Although Central Station is already undergoing major change as part of the Central Precinct Renewal Program, the new light rail line will be a further catalyst to rethink major streets around Central Precinct and tie the station into its surrounds in the southern CBD, especially around Eddy Avenue-Belmore Park and George Street-Railway Square.

With recent, and likely future, changes to Central's design and neighbouring developments, the Central Station of tomorrow will be accessed and used in a very different manner to the Central Station of today.

The new light rail line will offer an opportunity to rethink how light rail integrates with Central Station to ensure the interchange experience is optimised for many decades to come.

Protecting the Environment

Light rail is a crucial part of sustainable urban transportation that supports NSW's transition to net zero.

It's an all-electric system that enhances the environment by:

- Supporting a compact city by reducing the distances people need to travel
- Reducing car dependence
- Being a catalyst for reimagining our streetscapes with net-positive biodiversity
- Making active travel more appealing with safe and efficient interchange options

Ultimately, light rail represents an eco-friendly and sustainable transportation solution that contributes to a greener, healthier planet.



Supporting Events and Attracting People

Sydney is proud of its many and varied special events attended by millions of locals and visitors every year. Moving people in and out of these events via public transport is a priority.

Light rail is particularly well suited to servicing major events. Its high capacity allows large crowds to be cleared quickly. Its clear, fixed routes combined with ease of access makes it attractive to moving people who don't typically use public transport.

The existing Sydney light rail network services numerous important major event hubs, including the stadiums of Moore Park, Circular Quay and the Convention Centre. The Parramatta Road to Green Square line will connect to the existing network at Central Station, enabling easy connection to events.



Potential also exists for special event services to be run on the network, resulting in single seat event journeys that are in addition to regular services.

For example, it may be possible to run a Parramatta Road to Moore Park direct special event service for a major concert or sporting event at the Sydney Football Stadium or Parramatta Road to Circular Quay direct services.

Providing the Next Step in a Network

A decision to build the Parramatta Road to Green Square line as the next stage of Sydney's light rail network is the next logical phase of the system's development. Delivering this line will also facilitate subsequent expansion of the network well into the future.

Light rail networks deliver the greatest overall benefits when they are just that – networks. The Parramatta Road to Green Square line will solidify the network nature of the system and allow for future developments.

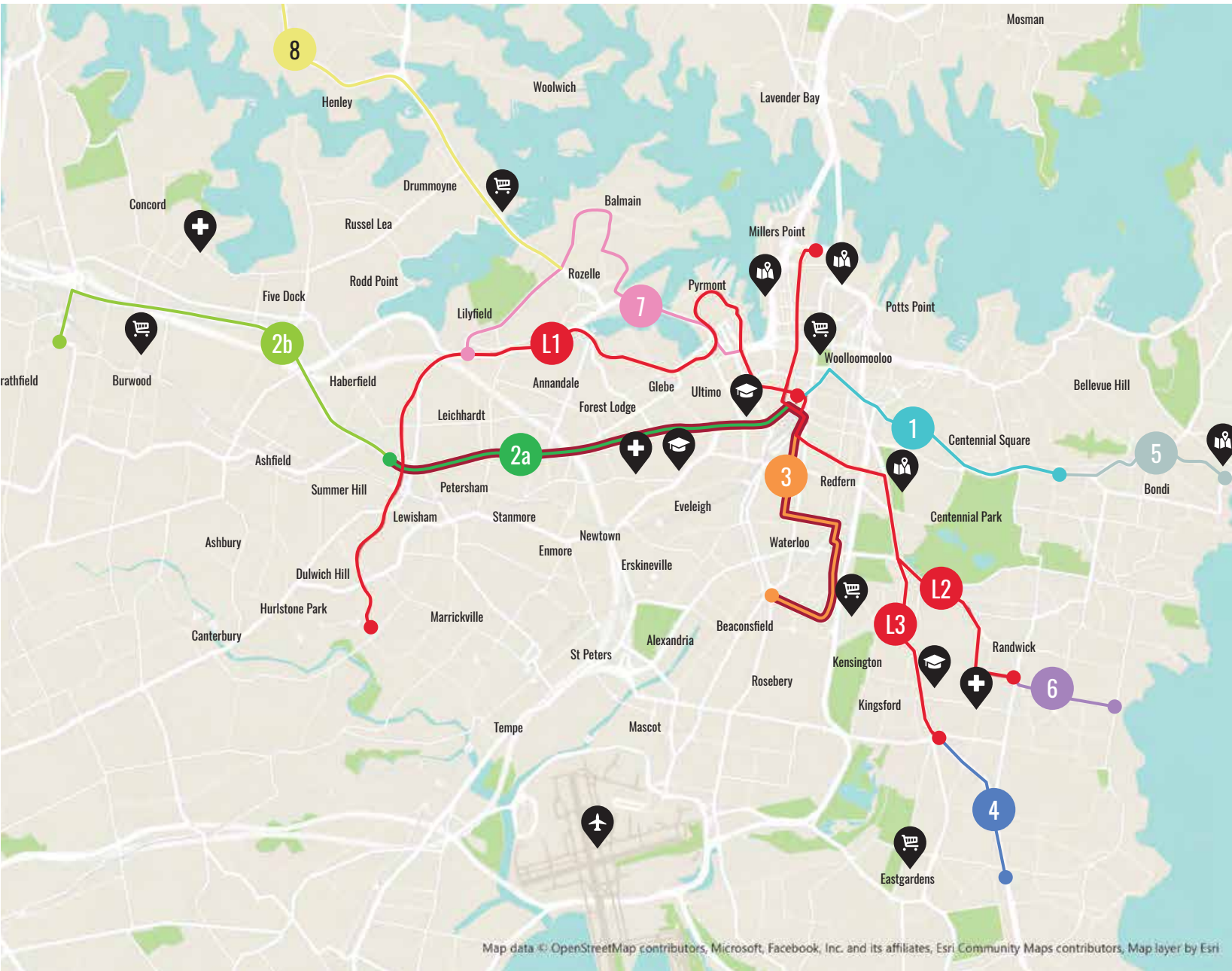
For example, subsequent stages of light rail could:

- Extend further west along Parramatta Road, potentially combining in the future with Parramatta light rail
- See light rail traverse Oxford Street, integrating with a reimagined Central Station interchange
- Extend further south along ANZAC Parade, Victoria Road and other locations

An expansion of the light rail system creates new possibilities for how Sydney may move in the future.



A Potential Future Sydney Light Rail Network



Legend

Proposed Alignment

Existing lines

L1 Central to Dulwich Hill

L2 Kingsford to Circular Quay

L3 Randwick to Circular Quay

Potential new routes

1 Oxford St: Central to Bondi Junction

2a Parramatta Rd (Phase 1): Central to Summer Hill

2b Parramatta Rd (Phase 2): Summer Hill to Strathfield

3 Green Square: Central to Green Square

2a 3 Parramatta Rd (Phase 1) + Green Square

4 Maroubra: Kingsford to Maroubra Junction

5 Bondi Beach: Bondi Junction to Bondi Beach

6 Coogee Beach: Randwick to Coogee Beach

7 Balmain: Pyrmont to Victoria Rd / Rozelle via Balmain

8 Victoria Rd: Rozelle to Melrose Park

Amenities

Universities

Major shopping centres

Hospitals

Tourist attractions

Airport

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PHYSICAL AND OPERATIONAL FEATURES





The Parramatta Road to Green Square via Central Station light rail line is **feasible and deliverable**.

Preliminary technical analysis has been undertaken by ALTRAC Light Rail and its technical advisor.

As with all major infrastructure projects, the route will involve opportunities and challenges. These can be worked through in future design processes with close consultation between the NSW Government and ALTRAC Light Rail.





Green Square

GREEN SQUARE

GREEN SQUARE



THE ALIGNMENT

Overview

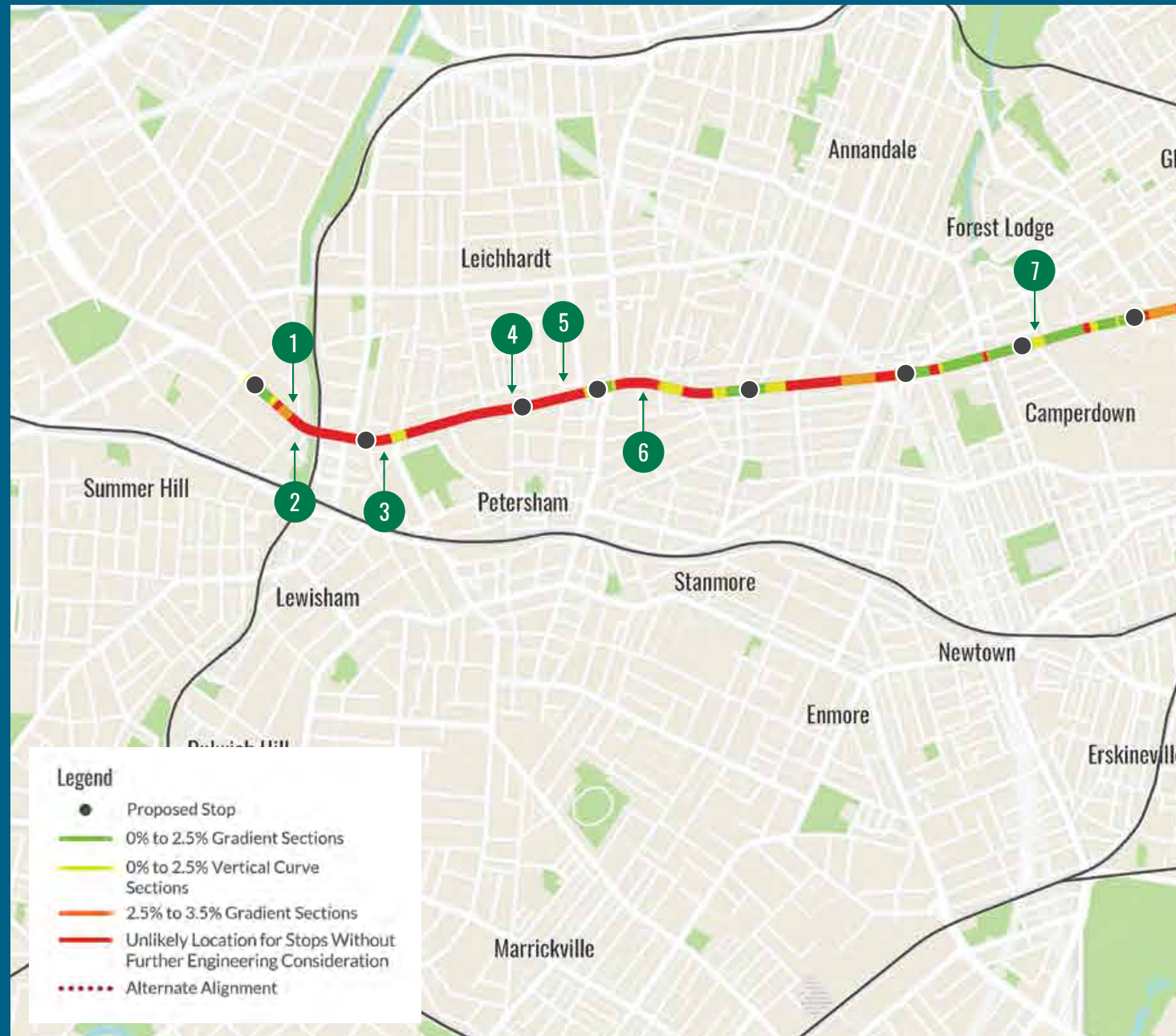
The Parramatta Road to Central section of the alignment begins at the Hawthorne Parade terminus, continuing through Parramatta Road, Broadway and George Street for 6.5km to the Central Station interchange.

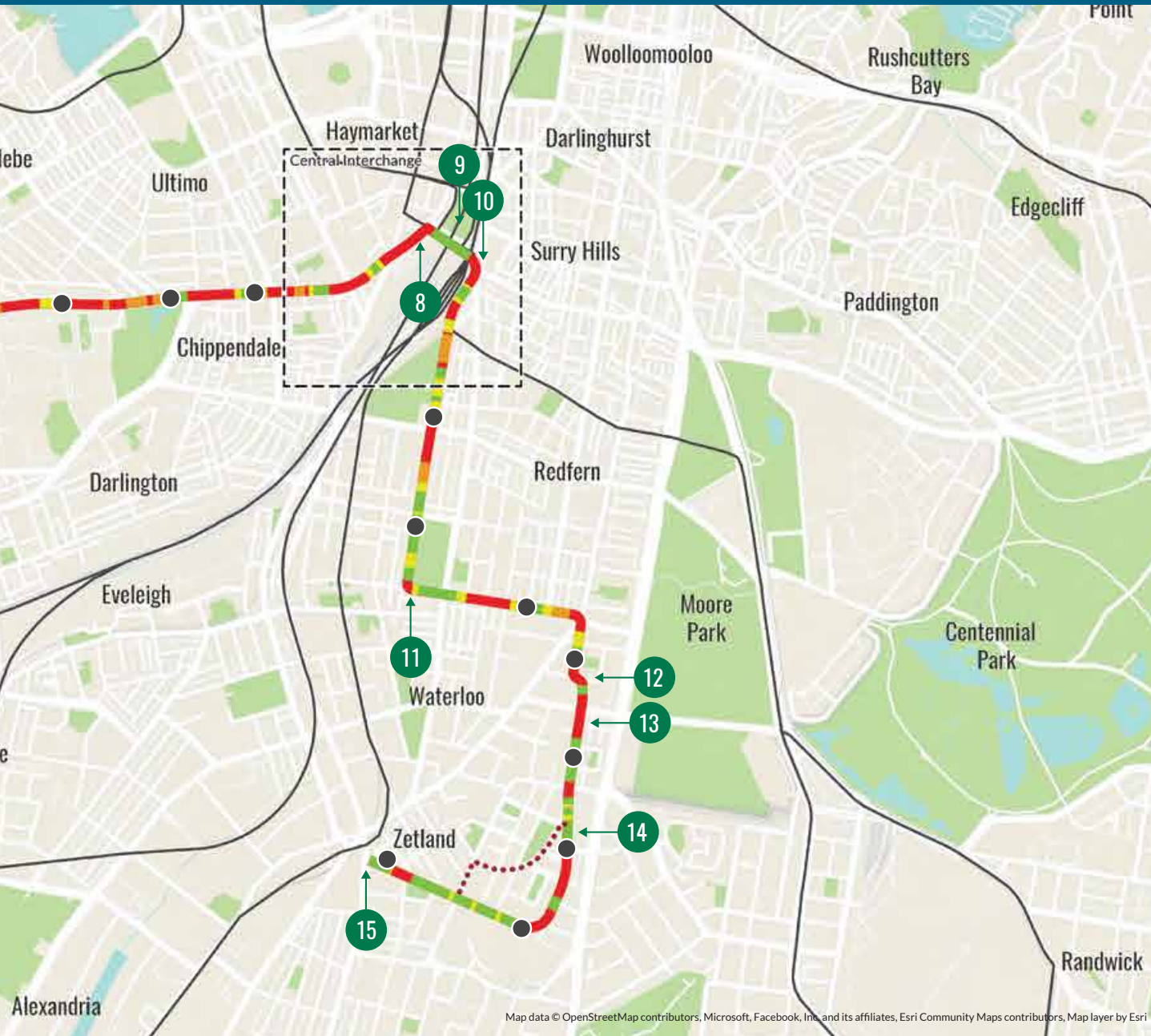
The new line will converge with multiple other public transport modes at the Central Station Precinct. Light rail operations in this area are complex, with both the L1 and L2/L3 lines converging on Central Station in addition to dozens of bus services at Railway Square, Eddy Avenue and Chalmers Street.

The Central to Green Square section of the alignment will be around 4.5km long. It runs from Central Station in the north along Chalmers Street, Phillip Street, Crystal Street, Gadigal Avenue, Defries Avenue (subject to options) and Zetland Avenue to Green Square Station at Zetland.

The corridor connects well-established 'terrace zones' of Redfern with urban renewal suburbs at Waterloo and Zetland. As part of the planned development of Green Square, the City of Sydney reserved a portion of this corridor (south of Crystal Street) for mass transit, known as the 'Eastern Transit Corridor'.

Corridor Overview Proposed Alignment





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Engineering Considerations

The following map highlights some of the engineering considerations uncovered in our feasibility investigations that can be addressed.

- 1 Further investigation required into bridge capacity should terminus be located west of Battle Bridge.
- 2 Light rail must pass under three adjacent bridges (L1 rail bridge, L1 pedestrian bridge, Brown Street road bridge).
- 3 Potential stop at Carrington Street may require modification to Parramatta Road alignment and consideration of surrounding properties.
- 4 Elswick Street stop is on the crest of a curve. While a site with a constant gradient would be preferred, there are no compliant gradients in the vicinity to place the stop instead.
- 5 Steep grades (6.5%) between Flood Street and Palace Street, approaching maximum 7% grade suitable for light rail.
- 6 Existing pedestrian overbridge at Elswick Street has sufficient clearance (4.3m) for wire-free operations but potentially not for wired operations.
- 7 Limited space to provide turning lane(s) to enable north-south movements across Parramatta Road between Norton and Crystal Streets. Alternative intersection configurations may be required.
- 8 Tight curve from Pitt Street into Eddy Avenue.
- 9 Reconsideration of bus turnaround movements at Pitt Street/Eddy Avenue/Elizabeth Street required.
- 10 Alignment avoids heritage Central Station building and colonnade structures along Eddy Avenue.
- 11 Tight curve radii required to follow the proposed corridor.
- 12 Existing heritage chimney at corner of Potter St and Gadigal Ave and its proximity to the alignment is to be considered.
- 13 Challenging curvature for the alignment due to orientation of Crystal Street and Gadigal Avenue.
- 14 Challenging intersection geometry at Gadigal Avenue/Defries Avenue/Wolseley Grove.
- 15 The design of Green Square Library project safeguarded a 12m corridor for light rail to the north of the library. The track may need to be designed with noise and vibration mitigation to reduce impacts.

Alignment Options: Case Studies

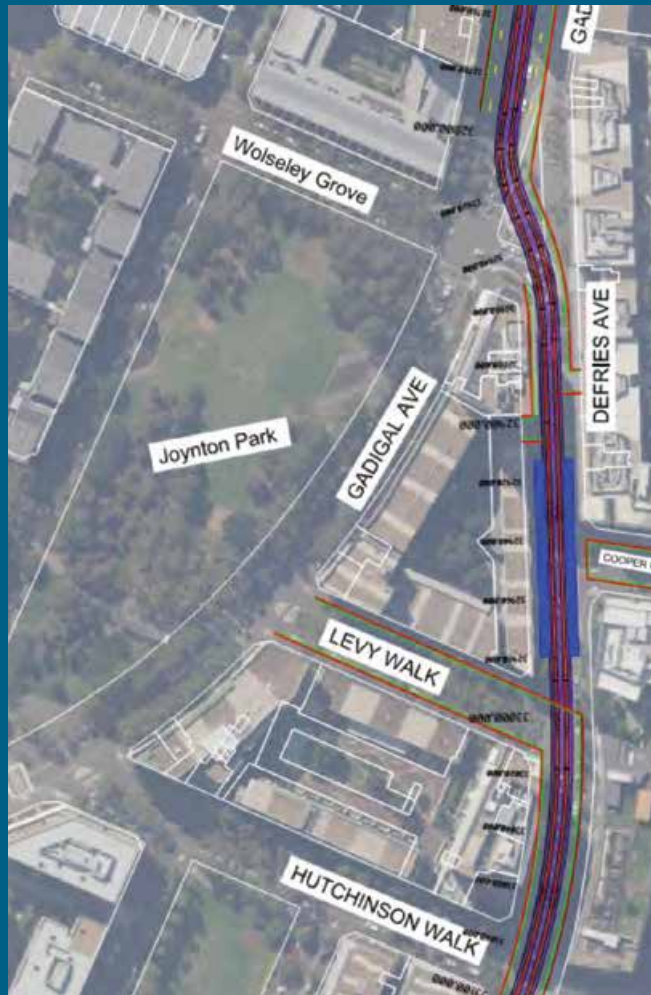
Green Square

Initial analysis has determined the light rail route is feasible. Nonetheless, there are a number of locations where close design consideration will be required.

For example, at Green Square, the street network poses challenges due to tight turning geometries and narrow carriageway widths that limit the capacity for traffic to operate alongside light rail stops.

Two alignment options were investigated – one along Defries Avenue and one along Gadigal Avenue. There are trade-offs in each case. Light rail along Defries Avenue would involve closing Gadigal Avenue to traffic between East Village and Levy Walk, and signalling the intersection at the Coles Car Park Entry. Light rail along Gadigal Avenue would mean closing Gadigal Avenue to traffic between Levy Walk and Victoria Park Parade.

Further engineering investigation and consultation with residents and local businesses would be needed before confirming a preferred option.



Option A – Defries Avenue



Option B – Gadigal Avenue

Crystal Street

The close distance between Crystal Street/Potter Street intersection and Potter Street/Gadigal intersection is challenging geometry for the light rail to navigate through while minimising impact to property boundaries and roadside objects.

Three possible options for this section of alignment have been considered, each with different trade-offs.



Option A



Option B



Option C

STOPS

The Parramatta Road to Green Square via Central line is proposed to have 21 stops.

Community consultation throughout the detailed design process will help inform the exact location and number of stops.

The stops will be designed and built to look similar to stops on the L2/L3 line. This will help create an accessible, legible, easy to understand network for all passengers.

Local artwork, storytelling and planting will be incorporated into the stop structures, enhancing the urban realm.

All 21 Stops Will:

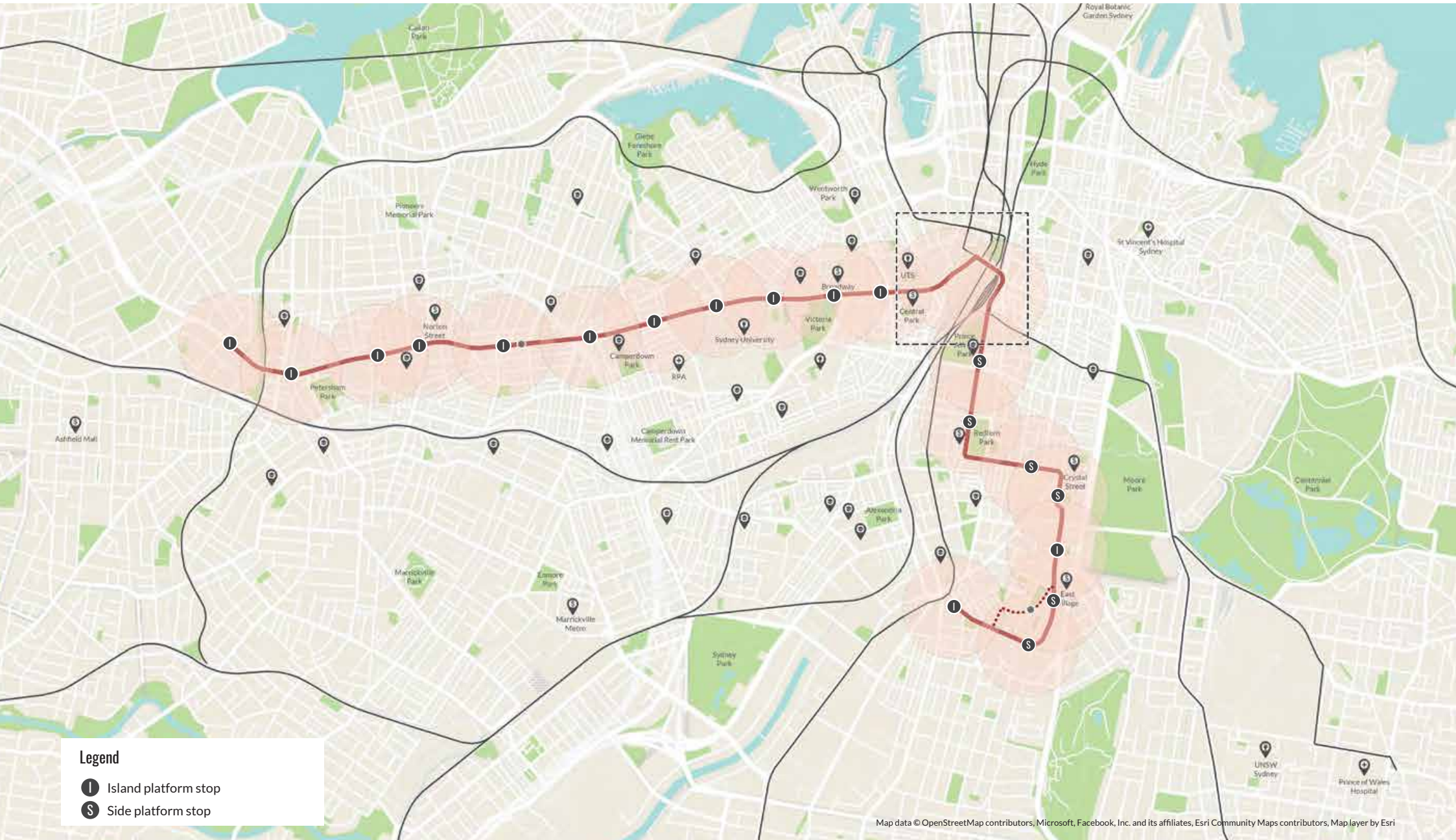
- Be 67m long
- Have shelters and seating
- Contain Opal Card tap-on/tap-off points
- Have ticket vending machines
- Stop Location Options

Options exist for the exact location and design of stops along the line, particularly at Norton Street, Annandale, Taverners Hill and Green Square.

Community consultation and further technical analysis will be of great benefit in optimally locating stops throughout the alignment.



Potential Stops



TRANSPORT NETWORK DESIGN CONSIDERATIONS

The Parramatta Road to Green Square line will form part of an integrated Sydney transport network.

The design and construction of the new line will present a rare opportunity to rethink how transport is used and accessed on and around the proposed route.

A key consideration will be the optimal delivery of an integrated transport network that supports local communities, liveability, productivity and the environment.

The design of the line will reflect the need to ensure road traffic continues to be facilitated while enabling more emphasis on accessible public transport and active travel.

NSW Government Order of Road User Space Consideration



1 – Walking

Many housing, community and urban realm benefits will be optimally realised where walking is facilitated through the built environment. Pedestrian design considerations may include:

- Ensuring footpath widths are in line with the Walking Space Guide
- Providing pedestrian crossings (including at stops) to allow better pedestrian access across major roads – especially on Parramatta Road, Phillip Street and Cleveland Street
- Speed limits which facilitate safe pedestrian access while maintaining road network functionality



2 – Cycling

The delivery of light rail offers an opportunity to also consider how cycling may be facilitated in the corridor. Cycling design considerations may include:

- Bike storage facilities which are integrated with light rail stops
- Investigating the potential for separated cycleways on Parramatta Road or in the corridor
- Providing north-south cycling connections with signalised crossings and bike lanterns
- Retaining cycle paths on Crystal Street, Gadigal Avenue and Zetland Avenue
- Alternative cycling links around Redfern and Central Station identified by City of Sydney
- Continuing to enable east-west cycle access across Chalmers Street via the laneway network



3 – Public Transport

Other forms of public transport, including buses, heavy rail and Metro, will be complementary to the new light rail line, especially where close attention is given to integration between those different modes. Public transport design considerations may include:

- Integrating light rail interchange locations, such as at Central Station and at the termini of the new line
- Investigating the potential reconfiguration of bus services to enable passengers to access the system easily and minimise duplication of services. Bus network reconfiguration may also enable bus services to be deployed in a way which expands overall public transport coverage and improves frequencies on existing routes
- Retaining existing City Road/Broadway bus services from the city's southwest to the CBD and also bus lanes on Broadway alongside the light rail corridor



4-6 – Traffic and Parking

Parramatta Road will need to continue to provide important traffic functions. The new light rail line and traffic can co-exist in this corridor just as light rail and traffic co-exists in light rail alignments around the world. Road network design considerations may include:

- Detailed evaluation of light rail and traffic movements along Parramatta Road. Light rail and road traffic will both operate on Parramatta Road. As outlined in the Parramatta Road Corridor Urban Transformation Strategy (PRCUTS), this will enable opportunities to enhance the urban environment and transform land use along the corridor
- The needs of bus, freight, emergency services and other traffic
- Capacity for north-south movements at Norton Street/ Crystal Street will require detailed evaluation
- Opportunities for design features made possible due to changes to traffic lane configurations – while still facilitating vehicular road use
- On-street parking arrangements and other parking opportunities in the corridor

TRAFFIC AND LIGHT RAIL CO-EXISTING ON PARRAMATTA ROAD

The full length of Parramatta Road will continue to accommodate road traffic as well as light rail.

Unlike George Street, the design of light rail on Parramatta Road will see motor vehicle traffic and light rail along its entire length. This reflects the important multiple functions of Parramatta Road. Emergency services vehicles, freight, buses and private motor vehicles will continue to use Parramatta Road following the introduction of light rail.

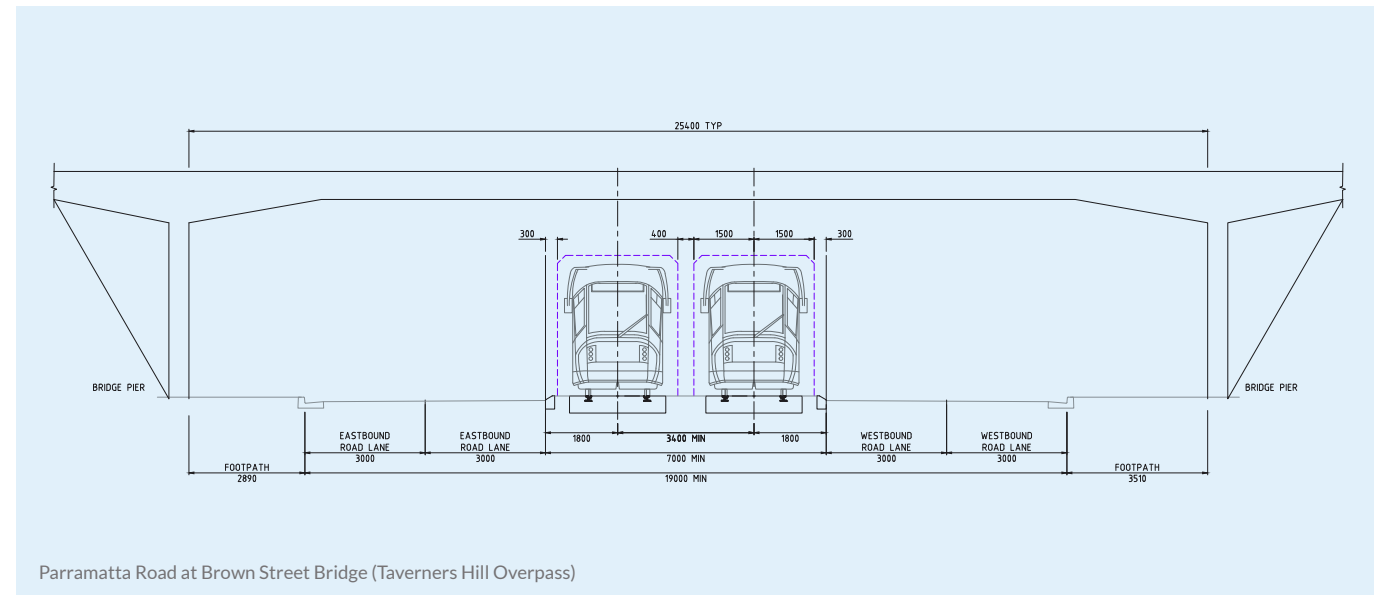
Parramatta Road / Broadway is capable of handling both road and light rail traffic. Indeed, this was the case for many decades prior to the dismantling of Sydney's once massive tram network.

By converting bus capacity currently on Parramatta Road to light rail, **overall public transport capacity will also be increased**. Each light rail service can carry around 450 passengers, which is as many as up to nine standard buses. This also has benefits from an operational efficiency and reliability perspective. Redeployed bus services can be used to enhance overall public transport coverage and frequency, providing knock-on benefits for Sydney's entire public transport network.

Close consideration, analysis and consultation will be undertaken in designing the future of Parramatta Road. A timely opportunity now exists to undertake this necessary work. With the opening of WestConnex, construction of new Metro lines and need to house and move a greater population, there is a unique chance to consider not only how Parramatta Road itself will operate for decades to come, but also to consider traffic and public transport movements north-south across Parramatta Road.

The next phase of design will cover many detailed, integrated areas to ensure Parramatta Road is future-proofed for generations to come:

- Movement and place assessments
- Safety assessments
- Precinct and public realm planning
- Detailed network planning
- Operational analyses
- Kerbside use studies
- Local freight and access strategies for local centres
- Interim network planning to provide access during construction





Archival photography of road vehicle traffic and trams on Parramatta Road/Broadway

Images courtesy of the City of Sydney Archives



CENTRAL STATION

Multiple options are possible for routing the new light rail line through the Central Station Precinct.

Each option offers different advantages and can complement other NSW Government objectives for Central Station. Each also involves different technical considerations.

Six options for light rail integration have been considered.



Option 1

Base: minimise changes to existing light rail operations.



Option 2

L1 terminates at Railway Square: small changes to existing light rail operations, focussing on light rail interchanges on the eastern and western sides of Central Station.



Option 3

Eddy Avenue light rail stops: moderate changes to existing light rail operations, consolidating services and an integrated stop on Eddy Avenue.



Option 4

L1 moved to Elizabeth Street: re-route L1 onto Elizabeth Street with stop at Chalmers Street.



Option 5

Network reconfiguration: explore other ways of providing overall light rail network connectivity through re-routing, splitting and combining light rail services.



Option 6

Network reconfiguration with L1 on Elizabeth Street: a combination of Options 4 and 5.

ROLLING STOCK AND OPERATIONS

For passenger ease, the Sydney light rail network will operate with consistent frequencies and operating hours across all lines. It will be a true 'turn up and go' service without timetable differences between lines.

Based upon the current L2/L3 line timetable, this means that services will operate as follows:

DAY	TIME	FREQUENCY
Mon - Fri	5am - 7am	Every 12 min
Mon - Fri	7am - 7pm	Every 8 min
Mon - Fri	7pm - 10pm	Every 10 min
Mon - Thur	10pm - 1am	Every 12 min
Fri	10pm - 1am	Every 10 min
Sat - Sun (incl pub hols)	5am - 7am	Every 15 min
Sat - Sun (incl pub hols)	7am - 7pm	Every 10 min
Sat	7pm - 1am	Every 10 min
Sun (incl pub hols)	7pm - 1am	Every 15 min

Preliminary analysis suggests an end-to-end travel time of 46.5 minutes. This travel time will be further analysed during the detailed design process, where decisions about traffic signal prioritisation, alignment, light rail vehicles and power systems will influence total journey time.

Operating details are important in determining various aspects of the line, including the numbers of light rail vehicles needed and power system specifications.

Light Rail Vehicles



Fully electric

450

Person capacity

67m long

Potential for two coupled 33m vehicles



Climate controlled

With this configuration, approximately 22 coupled light rail vehicles (i.e. 44 single-set 33m vehicles) will be required. The purchase of additional spares would be prudent to allow future network flexibility.

An advantage of utilising the same fleet type between the Parramatta Road to Green Square line and the existing L2/L3 lines is that it may provide flexibility for special event services or future operational changes (e.g. the running of special event services from Parramatta Road to Circular Quay).

However, running two coupled 33m vehicles will constrain operating between the new line and the existing L1 line, where platforms are shorter. An alternative of operating single-set 45m light rail vehicles on the new line will be considered during the detailed design process. Either way, platforms will be designed for 67m vehicles.



POWER, SUBSTATIONS, UTILITIES AND DEPOTS

Power and Substations



Potential for wire-free sections



Estimated 5 substations within 100m of the line

An estimated total of five substations will be required along the corridor. Substations will be situated within 100m of the alignment to service the Parramatta Road to Green Square line. This assumes 750V DC traction power and 67m light rail vehicles capable of running at a five minute headway in each direction.

The exact number, size and location of substations will be informed by several factors, including future traction power modelling, available sites, incoming power supply and technical details of substations to be used.

It will be possible for some or all of the line to operate with a wire-free power system. The exact power supply technology and location of wire-free running will be determined in future design stages.

Utilities

The interface between existing utility services and the new light rail line will be an important technical consideration for the project.

Based upon lessons learnt from other projects in Sydney and around Australia, utilities location, design and consultation activities are proposed to commence at the outset of the design process. Opportunities may also exist for early physical utilities work to be undertaken to de-risk later stages of the new line's construction.

The recommended utilities strategy is to avoid and/or minimise impacts on existing utilities as much as possible. The proposed alignment is typically routed along the centre of the road corridor, at or close to existing surface levels. This will assist in reducing potential utilities impact. A review of available Before You Dig Australia (BYDA) utilities records suggest that utilities are primarily located along and beneath existing footpaths, but this will need to be confirmed through utilities survey during future project stages.

Where utilities are routed along, and beneath the proposed alignment, it is likely that a diversion of utilities will be required.



Depot and Stabling

It will be necessary to construct a new depot to provide stabling and maintenance facilities to service the new fleet. This will also have the positive effect of providing additional resilience to the existing network.

Ideally the new depot will be located along the new line to minimise 'dead running.' If factored into designs at an early stage, over-site development would be feasible, particularly for commercial, recreation or light industrial uses.

Identifying a new depot location will be a key project challenge given the city and inner-suburban nature of the new line. Indicatively, a site area of 45,000m² will be required.

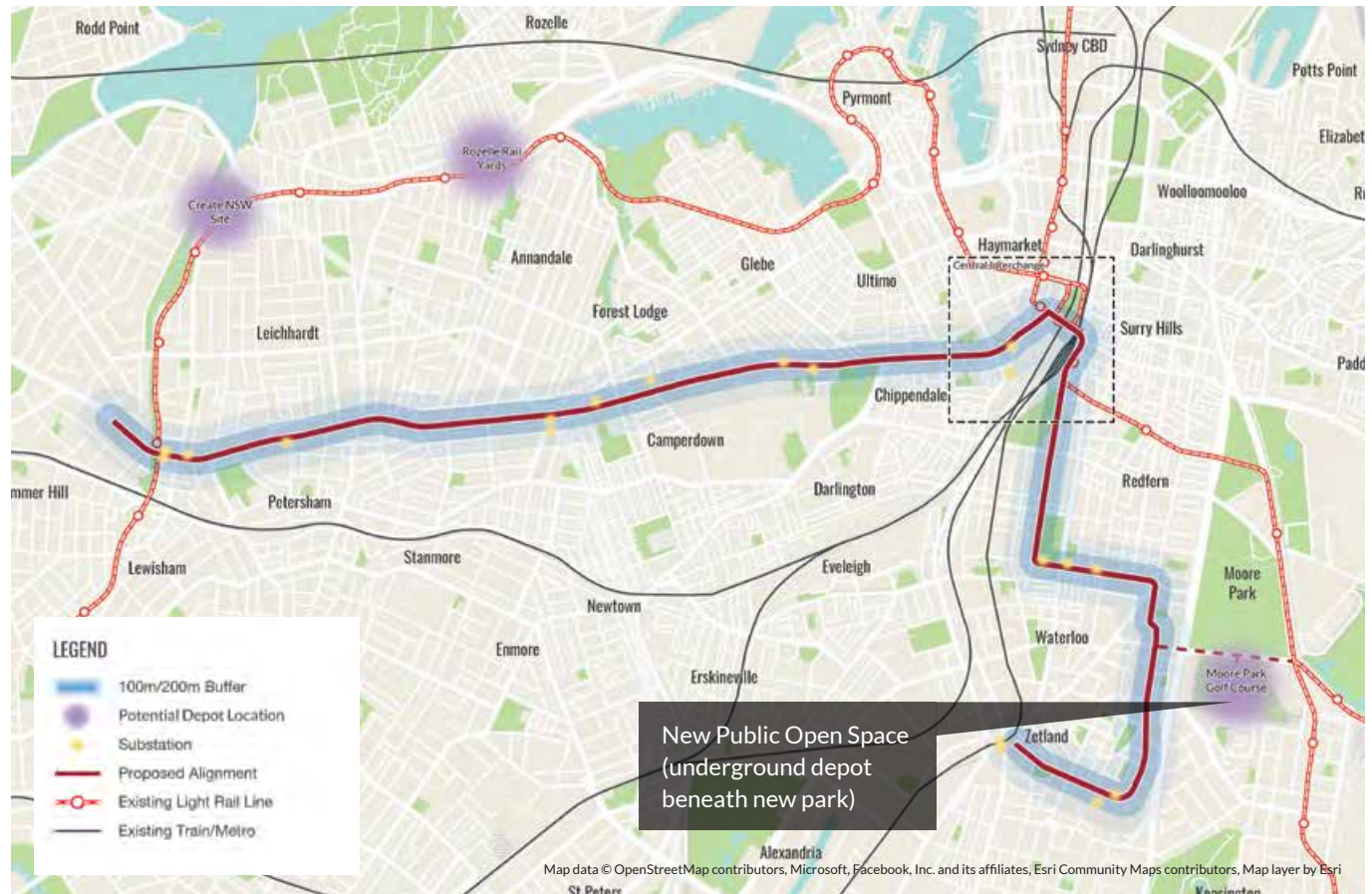
A desktop review indicates that a number of potential depot and stabling locations can be utilised.

The NSW Government has announced plans to transform part of Moore Park Golf Course into a new thriving public park. A tremendous opportunity exists to deliver both a new park and below it a new, important piece of public transport infrastructure.

A new depot and stabling facilities below ground under a new public park at the southern part of the existing golf course would service the new line. It would also provide opportunity to connect to the L3 line, further enhancing network resiliency.

The new public park could be delivered as part of the underground depot works. This dual use will ensure valuable inner-city land is used efficiently.

Other possible locations for the depot have been identified, such as the Rozelle rail yards and on industrial lands on the L1 line in Lilyfield.



NEXT STEPS





NEXT STEPS

Why Now?

The challenges of population growth, housing, congestion and emissions described in this document exist today. Without action, they will only worsen.

Major infrastructure investments take time to plan, consult, procure and deliver.

Taking initial steps now to start the design and planning the Parramatta Road to Green Square via Central light rail line will create future options. It will not be at the expense of other current NSW Government infrastructure commitments. Instead, it will lay the groundwork for informed decisions to be made in the future about what comes next for Sydney's public transportation network.

How to Get Started

Getting started is simple. With the agreement of the NSW Government, an 'Augmentation Consultation Group' can be established under TfNSW's existing contract with ALTRAC Light Rail.

This is a very modest next step for the NSW Government to take with tremendous potential upside.

The Process

ALTRAC Light Rail can work in step-by-step partnership with the NSW Government to deliver the vision of an expanded Sydney light rail network.

| Importantly:

- A step-by-step approach is proposed
- Each step is subject to NSW Government 'go/no-go' decisions
- The NSW Government will be an active partner in procurement of design and construction services
- A network augmentation contractual mechanism already exists under the current Project Deed between the NSW Government and ALTRAC Light Rail
- The network expansion will be fully financed by ALTRAC at pre-agreed equity rates and with market-tested finance. NSW Government payments will be better matched to the life of the asset

Workflow

The general workflow could be as follows:

- 1 Agreement to Begin Exploring a Sydney Light Rail Network Expansion
- 2 Commence Initial Design, Planning and Consultation Activities
- 3 Various NSW Government Consideration Points As Potential Design Evolves
- 4 Co-Development of Augmentation Parameters
- 5 If Approved, Procurement, Finance, Delivery then Operations

ABOUT ALTRAC LIGHT RAIL

Who We Are

Committed to Delivering a World-class Light Rail Service for Sydney

At ALTRAC Light Rail, we help Sydneysiders make over 36 million light rail trips a year across this great city.

We take a whole-of-journey approach to the provision of light rail services. No matter where a passenger steps on or hops off, their experience should reflect the exceptional standard we set for ourselves.

| The experience is everything.

Our Owners and Partners

Working for the Future of Sydney Transport

ALTRAC Light Rail designed, built, financed and now operates the Sydney light rail network.

We are majority owned by Aware Super, one of Australia's largest industry funds for teachers, nurses, firefighters, paramedics, and other essential frontline workers. Aware Super is a leader in investing innovatively in infrastructure and property. Aware Super has a great track record of backing investments that deliver a real dividend to communities, whether that's through affordable housing for essential workers or major city-shaping projects like Sydney's light rail.

John Laing Investments, a leading international investor and active manager of core infrastructure assets, is our second largest owner. John Laing delivers assets that help communities by improving access to essential services, creating jobs and supporting sustainable local partnerships. Our third shareholder is Acciona Concesiones, a global leader in infrastructure investments.

ALTRAC works closely with its key sub-contractors, Transdev and Alstom, in operating and maintaining the Sydney light rail network.

Through ongoing collaboration with the NSW Government and comprehensive engagement with Sydney communities and stakeholders, we hope to build an even more accessible, sustainable, and integrated light rail system – helping our passengers, and supporting housing, workers and the environment in our beautiful city.

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