Parramatta Light Rail
How the preferred network was determined

Client:
Transport for NSW

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1 Executive Summary

About this report
On 8 December 2015, the NSW Government announced a preferred Western Sydney light rail network that will connect Parramatta's CBD to the key hubs of Sydney Olympic Park, Westmead Hospital, Western Sydney University and Strathfield. This network will also branch to Carlingford, replacing the existing heavy rail shuttle.

This report has been prepared to document the assessment process that was undertaken by Transport for NSW (TfNSW) through the Parramatta Transport Corridor Strategy (PTCS) to select the preferred network. This assessment process consisted of a number of key steps as indicated in figure 1 below. This report is structured in chapters that describe each of these key steps.

Figure 1 the process for the selection of the preferred network

Strategic context
Greater Parramatta lies at the centre of the growth that will occur in Sydney over the next 20 years. Over this time Greater Parramatta is expected to undergo a major transformation, growing both in size and its economic and cultural output. The success of Greater Parramatta’s transformation will depend on more than organic growth – it will rely on a concerted effort across government jurisdictions and the private sector to strengthen Parramatta as Sydney’s second CBD.

The NSW Government’s aspiration to strengthen Parramatta as Sydney’s second CBD is reflected in a number of strategic planning documents, including the NSW Long Term Transport Master Plan and A Plan for Growing Sydney. It is also reflected in the multi-billion dollar public and private sector investments in Greater Parramatta such as Parramatta Square, urban renewal in the historic Parramatta North, the expansion of the Westmead health precinct, and the new Cultural Precinct in the Parramatta city centre.

Overview of need
Currently, many journeys to and within Greater Parramatta by road are serviced by indirect and slow public transport options. As a result, there is high private vehicle usage, roads are frequently congested and travel times are unreasonably long.

Already, the NSW Government is making major transport infrastructure investments that will directly benefit Greater Parramatta, including Westconnex, the Western Rail Line Upgrade, and new Bus Rapid Transit services along key transport Corridors. Each of these projects offers part of the transport solution for Greater Parramatta. However, these projects alone will not meet the region’s transport challenges.

In June 2014 the NSW Government announced it would investigate the feasibility of creating a Western Light Rail network with Parramatta at its centre. This would build on the Parramatta City Council’s feasibility study.

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1 While a Plan for Growing Sydney was not released until December 2014, the Parramatta Transport Corridor Strategy was informed by internal discussions between TfNSW and the NSW Department of Planning and Environment prior to the Plan’s release.

2 For more detail on bus rapid transit services being planned, see Sydney’s Bus Future, p.8
study into light rail for Western Sydney. Following this announcement, Transport for NSW initiated the Parramatta Transport Corridor Strategy (PTCS).

**Assessment of 13 routes against MCA and government policy**

In June 2014, the NSW Government announced that it would be investigating a longlist of potential light rail routes that would connect to Parramatta. Transport for NSW identified 13 transport routes across nine priority transport corridors for an initial investigation. These 13 routes, drawn from the Long Term Transport Masterplan and from Parramatta City Council's 2013 Light Rail Feasibility Study, connected Parramatta to either Sydney CBD or key growth centres in the west, southwest and northwest of Sydney.

The 13 options were assessed through a multi-criteria analysis (MCA), which used six criteria to provide a high level assessment of how well they met the PTSC project objectives and performed in comparison to each other. Together with key government policies, TfNSW used the results of the MCA to identify the shortlist of options for further investigation through a strategic business case.

Descriptions of the 13 routes are provided in the figure below.

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**The 13 options under consideration**

1. Parramatta to Rouse Hill via North Parramatta and Old Windsor Road (T-Way alignment)
2. Parramatta to Castle Hill via Windsor Road and Old Northern Road
3. Parramatta to Castle Hill via Windsor Road and Norwest via Showground Road
4. Parramatta to Macquarie Park via Camellia, Kissing Point Road, Eastwood and County Road Reserve
5. Parramatta to Macquarie Park via Telopea, Carlingford and Epping
6. Parramatta to Ryde via Victoria Road
7. Parramatta to Burwood / Strathfield via Sydney Olympic Park
8. Parramatta to Burwood / Strathfield via Parramatta Road
9. Burwood / Strathfield to Sydney CBD via Parramatta Road
10. Parramatta to Bankstown via Clyde, Lidcombe and Regents Park (using rail line)
11. Parramatta to Bankstown via Clyde Street and Chester Hill
12. Parramatta to Liverpool via the Cumberland Highway
13. Parramatta to Mount Druitt / Eastern Creek via Great Western Highway

**Shortlist of four options**

On 27 October 2014, the NSW Government announced that the following four corridors were shortlisted for further investigation for light rail through a Strategic Business Case:

» Parramatta to Macquarie Park via Carlingford
» Parramatta to Castle Hill via Old Northern Road
» Parramatta to Bankstown, via Clyde and Chester Hill
» Parramatta to Strathfield / Burwood via Sydney Olympic Park.

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4 Note: the then Minister for Transport announced on 2 June 2014 that ten route options were under investigation. TfNSW added a further three routes to the list of options to ensure a robust investigation of all priority corridors. For more details on these options, please see Chapter 5.

Strategic Business Case assessment of the four options

The Strategic Business Case assessed the feasibility, costs and benefits of light rail along the four shortlisted corridors.

A common CBD spine was included for each of the corridors. This CBD spine served as a core of the network, providing connections to key residential, business and education precincts across Greater Parramatta.

Parramatta Light Rail preferred network

In July 2015, Transport for NSW completed the Strategic Business Case, which recommended a preferred network connecting Parramatta city centre to key destinations across Greater Parramatta (the CBD spine), to Strathfield via Sydney Olympic Park and to Carlingford. The selection of the preferred route was based on the following findings from the Strategic Business Case.

Parramatta to Olympic Park via Strathfield

The Parramatta to Olympic Park via Strathfield route presented the greatest opportunity to support planned land use changes in relation to the Greater Parramatta to Olympic Peninsula Priority Growth Area. It also presented significant transport benefits by integrating with transport interchanges at Parramatta and at Strathfield. A light rail terminus at Strathfield was selected over Burwood as it was shown to have higher customer demand, better integration with the transport network and a reduced impact on the road network.

Parramatta to Carlingford

By re-using the Carlingford Line heavy rail corridor, the Parramatta to Carlingford route offers a feasible and cost effective way of providing significant transport and land use benefits to the existing and growing population along this corridor. The Parramatta to Carlingford line will be a step towards connecting Parramatta to the Global Economic Corridor in Macquarie Park.

As the Carlingford to Macquarie Park section of this route presents a number of engineering challenges, it was determined that further investigations were needed before proceeding with this route.

The CBD spine

The CBD spine would provide a direct, convenient and reliable transport option to key destinations across Greater Parramatta. This CBD spine would also support urban renewal and economic activity in growth areas identified in A Plan for Growing Sydney.
2 Introduction

2.1 About this report

This report provides an overview of the assessment of potential light rail corridors through TfNSW’s Parramatta Transport Corridor Strategy (PTCS). The period of assessment documented in this report begins in 2012 with the start of Parramatta City Council’s Western Light Rail Feasibility Study and ends at the announcement of the preferred network in December 2015.

2.2 The study area

The study area for the PTCS had Greater Parramatta at its centre and extended to the surrounding key regional centres of Rouse Hill, Castle Hill, Macquarie Park, Blacktown, Liverpool, Bankstown and the Sydney CBD. This study area was informed by priority transport corridors to Greater Parramatta that were identified in the NSW Transport Long Term Master Plan (2013) and the Parramatta City Council’s Western Light Rail Feasibility Study (2013).

2.3 About Greater Parramatta

Transport for NSW defined the Greater Parramatta area as encompassing the suburbs of Parramatta, North Parramatta, Westmead, Harris Park, Rose Hill, Rydalmere, and Mays Hill. Figure 2 below shows the boundaries of the Greater Parramatta area.

![Figure 2 Map of Greater Parramatta](image-url)

Source: Parramatta City Centre Access Strategy
3 Strategic context

3.1 About this chapter

This chapter provides a high level overview of the policies and initiatives that underpinned the objectives of the Parramatta Transport Corridor Strategy.

3.2 The growth of Greater Parramatta

Greater Parramatta lies at the centre of the growth that will occur in Western Sydney over the next 20 years. Over this time Greater Parramatta is expected to undergo a major transformation, growing both in size and its economic and cultural output. The success of Greater Parramatta’s transformation will depend on more than organic growth – it will rely on a concerted effort across government jurisdictions and the private sector to strengthen Parramatta as Sydney’s second CBD.

The NSW Government’s aspiration for Greater Parramatta to become a more important economic and cultural hub is reflected in a number of strategic planning documents, including the NSW Long Term Transport Master Plan and A Plan for Growing Sydney. This aspiration is also reflected in the multi-billion dollar public and private sector investments in Greater Parramatta such as Parramatta Square, urban renewal in the historic Parramatta North, the expansion of the Westmead health precinct, redevelopment of Parramatta stadium, and the new Cultural Precinct in the Parramatta city centre.

3.3 Policies shaping the future of Greater Parramatta

The growth of Greater Parramatta is being shaped by a number of NSW Government policies from across multiple portfolios including Transport for NSW and the Department of Planning and Environment. Some of the policies that were instrumental to shaping the Parramatta Transport Corridor Strategy were:

» The NSW Long Term Transport Master Plan (2012)
» Sydney’s Light Rail Future (2012)

These policy documents and their relation to the project are described briefly below. For more detail about relevant state and local government policies shaping Greater Parramatta, refer to Appendix B.

Responding to the evolving policy landscape

A number of key government policies have been released over the course of the options assessment period, including A Plan for Growing Sydney (2014) and the draft Parramatta Road Urban Transformation Strategy (2014-15). The Parramatta Light Rail project has evolved to respond to this changing policy landscape.
3.3.1 **NSW Long Term Transport Master Plan**

The NSW Long Term Transport Master Plan was prepared in 2012 and articulates the NSW Government’s 20-year vision for public transport, roads and freight infrastructure services to support economic, social and environmental goals for NSW.

The Master Plan highlights a number of major transport challenges for Parramatta, including congestion, limited public transport connectivity to and within Greater Parramatta, and the increasing pressures of population growth. It also notes that a number of Sydney’s most constrained transport corridors are connected to Parramatta, including the Parramatta to Sydney via Top Ryde corridor (Victoria Road) and the Parramatta to Sydney via Strathfield corridor (Parramatta Road and T1 Western Line).

In response to these challenges, the Master Plan lists a series of actions to improve transport services in and around Parramatta. The PTCS responded to a number of these actions, including the commitment to investigate public transport improvements on high demand corridors and for the NSW Government to collaborate with Parramatta City Council on city centre improvements and light rail.

3.3.2 **Sydney’s Light Rail Future**

Sydney’s Light Rail Future provides a plan for expanding light rail services in Sydney, with a focus on the CBD and inner Sydney over the short-medium term, and other high transport demand corridors over the longer term. Sydney’s Light Rail Future identifies Parramatta Road, and the Western Sydney region more generally, as requiring light rail investigations over the long term.

3.3.3 **A Plan for Growing Sydney**

In 2014, the Department of Planning and Environment released ‘A Plan for Growing Sydney’ to guide land use planning decisions to accommodate Sydney’s growing population over the next 20 years. The Parramatta Transport Corridor Strategy was informed by internal discussions between TfNSW and the NSW Department of Planning and Environment prior to the Plan’s release.

Key directions in A Plan for Growing Sydney that are relevant to the PTSC are:

**Direction 1.2: Grow Greater Parramatta - Sydney’s second CBD**

- Grow Parramatta as Sydney’s second CBD by connecting and integrating Parramatta CBD, Westmead, Parramatta North, Rydalmere and Camellia.
- Grow the specialised health and education precincts at Westmead and Rydalmere.
- Renew Parramatta North to create a vibrant mixed-use precinct.

**Direction 1.3: Establish a new priority growth area - Greater Parramatta to the Olympic Peninsula**

- Establish a new partnership to manage renewal of the Greater Parramatta to Olympic Peninsula Priority Growth Area.
- Identify and deliver enabling infrastructure to support growth and urban renewal.
- Deliver priority revitalisation precincts.
- Grow the knowledge economy as part of the extension of the Global Economic Corridor.

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6 NSW Long Term Transport Master Plan, p.136,
7, NSW Long Term Transport Master Plan, p.200 & p.345
3.3.4 Parramatta Council Feasibility Study

In 2013, the Parramatta City Council conducted a two-part feasibility study into the potential for light rail to serve Western Sydney. The study evaluated 15 possible routes against five criteria (transport, environment, economy, social health and land use). The study nominated two preferred routes: Parramatta to Castle Hill and Parramatta to Macquarie Park.

This feasibility study acted as an advocacy document for Parramatta City Council to make the case for better public transport services for Greater Parramatta and was a catalyst for the NSW Government to establish the Parramatta Transport Corridor Strategy.
4 Overview of need

4.1 About this chapter

This chapter provides an overview of Greater Parramatta’s transport challenges and the commencement of the Parramatta Transport Corridor Strategy.

4.2 About the Parramatta Transport Corridor Strategy

Transport for NSW commenced the Parramatta Transport Corridor Strategy (PTCS) in June 2014 following the NSW Government’s commitment to investigating the highest priority corridors for light rail in Parramatta.

4.2.1 Identifying the project problems

A more connected, accessible and convenient transport network is fundamental to making Greater Parramatta an attractive place to live, visit, and to do business. However, currently many journeys to and within Greater Parramatta are serviced by indirect and slow public transport options. As a result, there is high private vehicle usage, roads are frequently congested and travel times are unreasonably long.

Already, the NSW Government is making major transport infrastructure investments that will directly benefit Greater Parramatta, including Westconnex, the Western Rail Line Upgrade, and new Bus Rapid Transit services (see Appendix C for more detail about key transport projects). Each of these projects offers part of the transport solution for Greater Parramatta. However, these projects alone will not meet the region’s transport challenges.

The first step in the PTSC was to identify the specific problems that the strategy needed to address. Through an assessment of transport data and key transport policies and studies, the project team identified the following four core problems to be addressed by the PTSC:

- Limited public transport accessibility
- Poor existing public transport service in Western Sydney
- Significant growth and potential for growth could exacerbate traffic congestion
- Parramatta is not reaching its potential as Sydney’s second CBD.

4.2.2 Defining the PTSC objectives

TfNSW used these four problems to develop six project objectives for the PTCS. These six project objectives address the growing demand for more convenient and connected public transport options, and also to

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9 Principally, the NSW Long Term Transport Master Plan, Sydney’s Light Rail Future and Parramatta City Council’s Western Light Rail Feasibility Study.
facilitate urban renewal and jobs growth in Greater Parramatta and surrounding growth areas. These six objectives are mapped against the four project problems in table 1 below.

**Table 1  PTSC objectives**

<table>
<thead>
<tr>
<th>Problem</th>
<th>Objectives</th>
</tr>
</thead>
<tbody>
<tr>
<td>Limited public limited public transport accessibility</td>
<td>Improve public transport accessibility to, from and within the Parramatta CBD</td>
</tr>
<tr>
<td>Poor existing public transport service in Western Sydney</td>
<td>Configure the public transport network in Western Sydney to improve services (faster, frequent, reliable and safe) for a range of trip purposes</td>
</tr>
<tr>
<td>Significant growth and potential for growth could exacerbate traffic congestion</td>
<td>Manage congestion on key routes in the study area</td>
</tr>
<tr>
<td>Parramatta is not reaching its potential as Sydney's second CBD.</td>
<td>Support planned land use change and provide opportunities for urban renewal in Western Sydney</td>
</tr>
<tr>
<td></td>
<td>Support Greater Parramatta as Sydney's second CBD</td>
</tr>
</tbody>
</table>
5 Assessment of 13 routes along nine corridors

5.1 About this chapter

This chapter provides an overview of the assessment of the 13 route options identified as candidates for light rail. As per the figure below, this was the first step in the options assessment process for the Parramatta Transport Corridor Strategy.

5.2 How the 13 options were identified

In June 2014, the then Minister for Transport announced the NSW Government would be investigating the feasibility of light rail in 10 transport routes across eight corridors. These routes connect Parramatta to the Sydney CBD and key growth centres in the west, southwest and northwest of Sydney. Subsequent to this announcement, Transport for NSW identified a further three routes to be included in these investigations to ensure a robust assessment of all priority corridors. As a result a total of 13 transport routes across nine transport corridors were investigated (see section 5.2.1 below).

These route options were selected on the basis of their potential to support existing and projected population growth, and to relieve associated levels of road congestion. The selection of these corridors was informed by priority transport corridors identified in:

» NSW Long Term Transport Master Plan
» Sydney’s Light Rail Future
» Parramatta City Council’s Western Light Rail Feasibility Study.

5.2.1 Strategic alignment of routes

Table 2 below provides a high level description of the 13 routes that were assessed. TfNSW developed base alignments for each route based on key destinations in each. These were used to aid decision making on the merits of each route and corridor but with the understanding that detailed alignments would be developed at later stages of the project.

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<table>
<thead>
<tr>
<th>Corridor</th>
<th>Route</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Route  1A</td>
<td>Parramatta to Rouse Hill via North Parramatta and Old Windsor Road (T-Way alignment).</td>
</tr>
<tr>
<td>2</td>
<td>Route  2A</td>
<td>Parramatta to Castle Hill via Windsor Road and Old Northern Road.</td>
</tr>
<tr>
<td></td>
<td>Route  2B</td>
<td>Parramatta to Castle Hill via Windsor Road and Norwest via Showground Road.</td>
</tr>
<tr>
<td>3</td>
<td>Route  3A</td>
<td>Parramatta to Macquarie Park via Camellia, Kissing Point Road, Eastwood and County Road Reserve.</td>
</tr>
<tr>
<td></td>
<td>Route  3B</td>
<td>Parramatta to Macquarie Park via Telopea, Carlingford and Epping.</td>
</tr>
<tr>
<td>4</td>
<td>Route  4A</td>
<td>Parramatta to Ryde via Victoria Road.</td>
</tr>
<tr>
<td>5</td>
<td>Route  5A</td>
<td>Parramatta to Burwood / Strathfield via Sydney Olympic Park. Note: it was initially announced in June 2014 that only Parramatta to Sydney Olympic Park was under investigation. TfNSW added Burwood/Strathfield in order for this corridor to connect to a major transport interchange.</td>
</tr>
<tr>
<td></td>
<td>Route  5B</td>
<td>Parramatta to Burwood / Strathfield via Parramatta Road. Note: TfNSW added this corridor to the options under investigation subsequent to the announcement in June 2014.</td>
</tr>
<tr>
<td>6</td>
<td>Route  6A</td>
<td>Burwood / Strathfield to Sydney CBD via Parramatta Road. Note: it was initially announced in June 2014 that the Parramatta to Sydney CBD corridor would be investigated.</td>
</tr>
<tr>
<td>7</td>
<td>Route  7A</td>
<td>Parramatta to Bankstown via Clyde, Lidcombe and Regents Park (using rail line). Note: initially it was announced in June 2014 that only one route to Bankstown was under investigation. To ensure this corridor was thoroughly examined, TfNSW determined that two route options to Bankstown should be investigated.</td>
</tr>
<tr>
<td></td>
<td>Route  7B</td>
<td>Parramatta to Bankstown via Clyde Street and Chester Hill</td>
</tr>
<tr>
<td>8</td>
<td>Route  8A</td>
<td>Parramatta to Liverpool via the Cumberland Highway</td>
</tr>
<tr>
<td>9</td>
<td>Route  9A</td>
<td>Parramatta to Mount Druitt / Eastern Creek via Great Western Highway. Note: TfNSW added this corridor to the investigation subsequent to the announcement in June 2014.</td>
</tr>
</tbody>
</table>
5.3 Multi-criteria analysis (MCA)

TfNSW developed six criteria to provide a high level assessment of how well each of the 13 options met the PTSC project objectives and how each option performed in comparison to each other. Each route was assessed using information obtained from past transport studies, existing data and desktop investigation.

Together with key government policies, the results of the MCA were used to assist TfNSW to identify a short list of options to be further investigated in the PTCS Strategic Business Case.

Table 3 provides a description of each criterion, sub-criteria and how they were assessed.
## Table 3  Multi-criteria analysis

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Sub-criteria</th>
<th>What was assessed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Improve public transport accessibility to, from and within Parramatta CBD.</td>
<td>» Service areas with low resident accessibility to jobs</td>
<td>» Travel time saving (in-vehicle time and wait time) offered by rapid transit over existing bus travel over the length of the corridor&lt;br&gt;» Serve areas with high social disadvantage</td>
</tr>
<tr>
<td></td>
<td>» Serve areas with high social disadvantage</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Configure the public transport network in Western Sydney to improve services</td>
<td>» Improve public transport service quality</td>
<td>» The ratio of existing peak public transport journey times to off-peak public transport journey times&lt;br&gt;» Serve corridors of high existing public transport demand</td>
</tr>
<tr>
<td></td>
<td>» Serve corridors of high existing public transport demand</td>
<td></td>
</tr>
<tr>
<td>Support planned land use and provide opportunities for urban renewal</td>
<td>» Potential to support planned increase in housing in the route catchment</td>
<td>» Forecast population growth between 2011 and 2036 for travel zones within 400 metres of the route&lt;br&gt;» Potential to support planned increase in employment in the route catchment&lt;br&gt;» Potential to support new urban renewal opportunities</td>
</tr>
<tr>
<td></td>
<td>» Potential to support planned increase in employment in the route catchment</td>
<td></td>
</tr>
<tr>
<td></td>
<td>» Potential to support new urban renewal opportunities</td>
<td></td>
</tr>
<tr>
<td>Manage congestion on key routes in study area</td>
<td>» Minimise impact on the strategic road network</td>
<td>» The proportion of the route that overlaps with the strategic road network&lt;br&gt;» The proportion of the route where the available road corridor is less than 20 metres in width&lt;br&gt;» Alternate routes available to mitigate the impact the proposal would have on network capacity</td>
</tr>
<tr>
<td></td>
<td>» Serve corridors of high existing car demand</td>
<td></td>
</tr>
<tr>
<td>Support Greater Parramatta as Sydney’s second CBD</td>
<td>Provide a feasible and cost effective transport solution</td>
<td></td>
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<tr>
<td>--------------------------------------------------</td>
<td>-----------------------------------------------------</td>
<td></td>
</tr>
<tr>
<td>» Increase productivity through business to business connections</td>
<td>» Minimise environmental and planning risks</td>
<td></td>
</tr>
<tr>
<td>» Align with Western Sydney’s future strategic public transport network</td>
<td>» Minimise property acquisition</td>
<td></td>
</tr>
<tr>
<td>» Effective job density (EJD) divided by travel time in reaching these external jobs, with travel time weighted for transport mode</td>
<td>» Qualitative assessment of the potential environmental impact of light rail / BRT along each of the routes</td>
<td></td>
</tr>
<tr>
<td></td>
<td>» A quantitative assessment of the land and property acquisitions potentially required</td>
<td></td>
</tr>
</tbody>
</table>
6 Shortlist of four options

6.1 About this chapter
This chapter provides an overview of:
» The key justifications that provided the basis for the shortlisting of the four options
» The key limitations of the remaining nine options that were not shortlisted.
As per the figure below, the shortlisting of these four options was the second step in the assessment process for the Parramatta Transport Corridor Strategy.

6.2 The four shortlisted options
On 27 October 2014, the then Minister for Transport announced the following four corridors would be investigated as candidates for light rail through a strategic business case, which would assess their feasibility, and preliminary costs and benefits:
» Parramatta to Castle Hill via Old Northern Road
» Parramatta to Strathfield / Burwood via Sydney Olympic Park
» Parramatta to Bankstown along Clyde Street
» Parramatta to Macquarie Park via Carlingford and Epping.
A high level overview of the rationale for shortlisting each of these four route options is provided below.

6.2.1 Parramatta to Castle Hill via Old Northern Road
Travel between Parramatta and Castle Hill is limited to the road network, primarily Windsor Road and Old Northern Road, with few alternative route options available. General traffic, freight and public transport all share the same road space and congestion is a major problem not only in the peak periods but throughout the day and weekend. Public transport is adversely impacted by this congestion with poor bus travel times and reliability.

The Sydney Metro Northwest is a major opportunity for the area and will provide customers with a link to the Sydney CBD via Epping and Chatswood. This link, however, will not provide any transport improvement along the corridor into Parramatta.

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11 TfNSW determined that only the Parramatta to Strathfield route (not to Burwood) would be examined in the Strategic Business Case. This decision was based on Strathfield having higher customer demand, integrates with the transport interchange and has a reduced impact on the road network.
The PTCS showed that replacing some existing bus services with light rail had the potential to improve journey times, increase capacity and offer a greater level of reliability between Parramatta and the Hills area. This improved transport link would not only serve a significant proportion of Parramatta's current workforce but also support future growth along the corridor.

6.2.2 Parramatta to Strathfield / Burwood via Sydney Olympic Park

Sydney Olympic Park has relatively limited direct access by public transport. A train line from Lidcombe provides a regular service from the T1 Western line, but does not serve a wide range of destinations. Bus services to the area are affected by road congestion. As a result, car usage is very high in the area and traffic congestion is particularly acute during major events at Sydney Olympic Park.

The PTCS showed that light rail would offer the opportunity to create significant improvements to the public transport options for the area via a new direct link between Parramatta and Strathfield / Burwood. Connecting with existing transport hubs at Strathfield / Burwood and Parramatta would significantly improve accessibility and help to create an integrated network serving the area. This, in turn, has the potential to strengthen Parramatta as Sydney's second CBD by making it a more accessible place to work and to do business, and connecting new growth precincts along the corridor, particularly Sydney Olympic Park.

Parramatta to Macquarie Park via Carlingford and Epping

6.2.4 Parramatta to Macquarie Park via Carlingford and Epping

Without a strong public transport connection from Macquarie Park into Western Sydney, significant congestion will continue on the arterial road links such as Epping Road, Carlingford Road and Pennant Hills Road.

The PTCS showed that a light rail connection to Macquarie Park could present a significant opportunity to support planned land use changes, to extend the Global Economic Corridor and to strengthen Greater Parramatta as Sydney's second CBD.

This route to Macquarie Park via Carlingford was selected over the other Macquarie Park route (via Eastwood) as it presented fewer environmental and construction risks.

Furthermore, the analysis showed that there was a significant opportunity to replace the indirect and low frequency Carlingford heavy rail line service with a frequent light rail service, which would greatly enhance accessibility to Parramatta and the wider public transport network.

6.3 Options not shortlisted

The remaining nine options outlined below were not taken forward for further investigation due to their weaker alignment with selection criteria and NSW Government policies.
6.3.1 Parramatta to Ryde

This option presented significant challenges due to the constrained conditions along Victoria Road, which means there is limited capacity to accommodate light rail. The implementation of light rail would potentially have a high impact on the existing bus network, interrupting services to the CBD. In addition, this option presented fewer opportunities for urban renewal. Though not judged suitable for light rail studies at the time of this investigation, the Parramatta to Ryde corridor was still deemed to require improved transport and, as such, TfNSW determined to look further at this as a Parramatta to Sydney CBD transport corridor.\(^\text{12}\)

6.3.2 Parramatta to Bankstown, via Clyde, Lidcombe and Regents Park

Although this route presented a number of strengths, this route was assessed as the weaker of the two Bankstown options. Compared to the Parramatta to Bankstown route along Clyde Street option (see 6.2.3) this option presented a lower level of engineering feasibility, and higher environmental and planning risks.

6.3.3 Parramatta to Liverpool via the Cumberland Highway

This option was not shortlisted due to the potential conflicts with existing road freight transport in the corridor. In addition, compared to the other options assessed, the Parramatta to Liverpool route presented a lower level of public transport demand and offered limited potential for urban renewal.

6.3.4 Parramatta to Rouse Hill

This option offered limited opportunity to improve travel times over the existing bus services that operate through this corridor via the North West Transit Way. Additionally, this option presented significant constraints with respect to existing gradients.

6.3.5 Parramatta to Castle Hill via Windsor Road

This route was assessed as the weaker of the two route options to Castle Hill. Compared to the Parramatta to Castle Hill via Old Northern Road route (see 6.2.1.), this route presented a lower level of public transport demand, and a less direct and slower route to Parramatta.

6.3.6 Parramatta to Macquarie Park via Eastwood

This route was assessed as the weaker of the two route options to Macquarie Park. Compared to the Macquarie Park via Carlingford and Epping route (see 6.2.4), this route presented a lower level of public transport demand and offered fewer opportunities for urban renewal.

6.3.7 Parramatta to Mount Druitt

Compared to the other options assessed, this route presented lower levels of public transport demand due to being currently serviced by heavy rail. This option also offered limited potential to support urban renewal.

6.3.8 Parramatta to Liverpool via the Cumberland Highway

The assessment showed that this route may conflict with existing freight transport in the corridor. In addition, compared to the other options assessed, this route presented a lower level of public transport demand and less potential to support urban renewal.

\(^{12}\) As at May 2016, this corridor is now being investigated as part of the Victoria Road Bust Rapid Transit Study.
6.3.9 Burwood to the Sydney CBD (Parramatta Road)

While offering some potential for urban renewal, this option offered limited opportunity for supporting the growth of the Parramatta CBD. It is important to note that transport services will continue to be investigated for this corridor through UrbanGrowth NSW’s Parramatta Road Urban Transformation Strategy.
7 Assessment of four shortlisted options

7.1 About this chapter

This chapter provides an overview of the investigations into the feasibility, costs and benefits of the four shortlisted corridors through the Strategic Business Case. As per the figure below, this was the final stage in the options assessment process in Parramatta Transport Corridor Strategy.

7.2 The corridors at a glance

This section provides an overview of each of the four shortlisted options that were investigated through the Strategic Business Case. Base case alignments were prepared for each corridor – these were used for the purpose of making a high level assessment of feasibility, costs, constraints and opportunities for each option.

7.2.1 The Parramatta CBD spine – the core of the network

A common CBD spine that provides a connection across Greater Parramatta was included in the assessment for all four corridors. This CBD spine was selected on the basis that it helps to service the key destinations in Greater Parramatta, enabling greater public transport connectivity to, through and within Greater Parramatta. The CBD spine also allows for the staged delivery of all four corridors and aligns with growth areas identified in A Plan for Growing Sydney and the Parramatta North Urban Transformation project.

The route transverses the Parramatta City Centre, linking specialised centres at Westmead and Rydalmere through the CBD via Parramatta North. Rydalmere is a major educational precinct, with two Western Sydney campuses. Westmead is the pre-eminent health campus for Western Sydney, home to one of the largest hospitals in Australia and major teaching, clinical and research facilities, as well as a Western Sydney University campus.

Both of these specialised centres are heavily car dependent and public transport trips between the two centres currently requires at least one transfer between services and takes up to three times longer than driving. A light rail connection through Greater Parramatta would provide a convenient and reliable public transport alternative to the car.

The CBD spine was chosen after an investigation into a number of possible alignments. The key destinations that are connected by the CBD spine include:

» Westmead Health precinct
» Parramatta North Urban Renewal
» Parramatta CBD
» Western Sydney University Rydalmere Campus
» Rydalmere
Parramatta to Strathfield via Sydney Olympic Park

Sydney Olympic Park is a strategic centre, which includes residential, employment areas, and Sydney’s largest sporting and entertainment facilities. It is located to the north of the M4 Western Motorway and Parramatta Road. Over the coming years, as defined by the Sydney Olympic Park Authority Masterplan, there will be significant growth in housing and employment in the area, as well as enhanced leisure and activity based development.

The primary method of travel in the area is car and traffic congestion is significant during major events at Sydney Olympic Park. As a result, bus services from Sydney Olympic Park are relatively slow at peak hour and to/from major events.

Public Transport at Strathfield

Strathfield Station is a transport interchange with access to multiple bus services and heavy rail that is serviced by the following lines:

- North Shore Line
- Western Line
- Inner West and South Line
- Blue Mountains Line
- Central Coast and Newcastle Line.

Public transport at Sydney Olympic Park

Sydney Olympic Park Station is supported by bus services to a number of destinations and heavy rail from Lidcombe on the Western Line.

Connections between Parramatta, Sydney Olympic Park and Strathfield

Strathfield connects with Parramatta on heavy rail via the Western Line. Bus services operate between Sydney Olympic Park and Parramatta.

The light rail corridor

The Parramatta to Strathfield via Sydney Olympic Park corridor would offer customers services to at a number of strategic centres and interchanges including Camellia, Silverwater, Newington, Sydney Olympic Park, North Strathfield, and Strathfield. By connecting with two transport hubs - at Strathfield and Parramatta - this corridor greatly enhances accessibility and helps to create an integrated network serving the area.

This option would establish a new link in the transport network, improving east-west access through a range of employment precincts in Camellia, Silverwater and Sydney Olympic Park. It would also support the NSW Government’s plans for the growth of residential development in Camellia, Sydney Olympic Park and in North Strathfield / Homebush.

This route would help to meet growth demand for transport and support improved public transport usage, reducing pressure on the road network. The route may also alleviate pressure on the heavily utilised Western rail line and improve accessibility to Sydney Olympic Park from the east.

Parramatta to Bankstown, via Clyde and Chester Hill

Bankstown is a major centre serving Sydney’s South West. Residential densities are currently relatively low, with moderate population growth expected in the Regents Park area and in Bankstown.
Transport options at Bankstown

Bankstown Station offers access to multiple bus services and heavy rail access to the Bankstown Line.

Sydney Metro is planned to extend to Bankstown Station, providing high frequency rail services between Bankstown, Sydney CBD, a new harbour crossing and connections to the Sydney Metro Northwest.

Connections between Parramatta and Bankstown

There is an existing high frequency bus corridor between Parramatta and Bankstown. However, bus journeys are often affected by road congestion.

There are no direct train connections between Parramatta and Bankstown.

The light rail corridor under assessment

This corridor provides a direct connection between Bankstown and Parramatta - which is currently connected by transport links that require multiple interchanges. The corridor has assumed reuse of part of the Bankstown heavy rail line, between Bankstown and Birrong.

7.2.4 Parramatta to Macquarie Park

Macquarie Park is a major business and education hub in Northern Sydney. The area is home to the Macquarie Park business precinct, which includes a range of telecommunications, technology, pharmaceutical and electronics industries. Also situated in the area is Macquarie University, the Macquarie University Hospital, and Macquarie Shopping Centre.

In September 2015, the NSW Government designated Herring Road (near Macquarie University and the Macquarie Shopping Centre) as a Priority Precinct. This will see this area become a site of higher density residential and commercial development to support Sydney's growing population.

Public transport at Macquarie Park

Macquarie Park has access to the following public transport options:

» Epping to Chatswood Rail
» Bus services
» Sydney Metro Northwest (from 2019).

Connections between Parramatta and Macquarie Park

There is significant congestion on the arterial road links between Macquarie Park and Parramatta, including Epping Road, Carlingford Road and Pennant Hills Road, with the Epping Town Centre being a major bottleneck. A high frequency bus corridor operates between Parramatta and Macquarie Park, but travel times can be protracted due to road congestion.

The heavy rail service on the Carlingford Line provides a low frequency service connecting to Clyde. Due to the low frequency and lack of integration with the transport network, the Carlingford Line has low patronage with less the 800 people boarding and alighting in the AM peak on average each day (BTS, 2013).

The light rail corridor under assessment

The Parramatta-Macquarie corridor would see Parramatta connected to key destinations in Sydney's northwest including the Macquarie Park business precinct, Macquarie University, Macquarie Shopping Centre, Epping and Carlingford. The western end of the corridor would see the reuse of the existing Carlingford line as a dual track, high frequency light rail service.

Currently, bus services along this corridor are affected by road congestion. A more reliable, fast and direct light rail connection between Parramatta and Macquarie Park would provide strong support for these two centres as the major drivers of jobs growth outside Global Sydney. It would also help to make better use of the under-utilised Carlingford rail line.
This corridor would create faster and more reliable connections to Macquarie Park than is provided by existing bus services. This improved connection would support the NSW Government’s goal to create more jobs outside of the Sydney CBD and to extend the Global Economic Corridor to Parramatta.

### 7.2.5 Parramatta to Castle Hill

Castle Hill is the major centre serving the North West of Sydney and has been identified as a Strategic Centre in A Plan for Growing Sydney. Castle Hill has been earmarked for major urban renewal and development over the short to medium term, including new commercial developments and residential densification. Castle Hill will be one of eight new stations on the Sydney Metro Northwest.

#### Public transport at Castle Hill

Public transport at Castle Hill currently consists of multiple bus services providing connections to key centres across Sydney including the Sydney CBD, Macquarie Park, and Parramatta. From 2019, Castle Hill will be serviced by the Sydney Metro Northwest.

#### Connections between Parramatta and Castle Hill

A high frequency bus corridor operates between Parramatta and Castle Hill, but travel times can be protracted by congestion.

#### The light rail corridor under assessment

A light rail link between Parramatta and Castle Hill would provide a missing cross-regional connection between the town centres of Baulkham Hills and Castle Hill and the Parramatta CBD. Despite improvements to this well-established bus corridor, there are issues with bus speeds and reliability between Parramatta and Castle Hill. This connection would improve travel times and reliability for existing bus customers and integrate with the Sydney Metro Northwest and reconfigured bus networks.

### 7.3 About the PTCS Strategic Business Case

This section provides a high level summary of the investigations into the feasibility, benefits and costs of each corridor as part of the PTCS Strategic Business Case.

#### 7.3.1 Design and operation principles

As per table 4 below, each of the four light rail options was assessed using a standard design and operating principles.

<table>
<thead>
<tr>
<th>Service frequency</th>
<th>Vehicle size and capacity</th>
<th>Priority</th>
<th>Stops</th>
</tr>
</thead>
<tbody>
<tr>
<td>» Services operate at least every 10 minutes 7am-7pm weekdays</td>
<td>» 30 m vehicles with capacity of 200 passengers</td>
<td>» Light rail to typically operate in separated lanes in the centre of the road</td>
<td>» Stops typically 600m apart in Parramatta CBD and 1km along each corridor</td>
</tr>
<tr>
<td>» Early morning,</td>
<td>» Provision for future expansion to 45 m</td>
<td></td>
<td>» High quality</td>
</tr>
</tbody>
</table>

**Table 4 Light rail design and operation used for assessment**
Parramatta Light Rail – How the preferred network was determined

7.3.2 Customer outcomes

The following drivers of customer satisfaction were used by TfNSW to guide the desired outcomes of the Parramatta Transport Corridor Strategy:

» Timeliness
» Personal safety & security
» Ticketing
» Convenience
» Accessibility
» Comfort
» Cleanliness
» Information.

7.3.3 Maintenance and stabling facilities

The Parramatta light rail network will require a facility for heavy and light maintenance, stabling and an operational control centre. The PTSC investigated a number of sites that could provide a suitable location for stabling and maintenance facilities, and could serve any of the four corridors.

7.3.4 Transport demand

Transport demand forecasting for each of the corridors was conducted using the Public Transport Project Model (PTPM) developed and run by the Bureau of Transport Statistics (BTS). Patronage modelling took into account predicted changes in land use, employment and travel patterns in the study area.

7.3.5 Construction and engineering feasibility

Potential construction issues and engineering challenges were assessed for each of the four corridor options, including traffic management, disruptions to public transport services, road widening, interfaces with existing roads and the design and construction of new bridges and structures.

7.3.6 Traffic network assessment

Surface transport network impacts of the proposed corridors were assessed using a mesoscopic simulation traffic model. This was also used to identify potential impacts on the road network that would be caused by the operation of light rail within existing road corridors.
7.3.7 Environmental impacts

The PTSC conducted a desktop review of potential environmental impacts from constructing light rail in each of the four corridors. This assessment looked at:

- Impacts on vegetation
- Potential flooding issues
- Impacts on heritage items
- Presence of contamination and acid sulphate soils
- Potential noise impacts on surrounding areas
- Impacts on public land e.g. on open space and community facilities.

7.3.8 Jobs and housing growth

The project team assessed the potential for light rail to stimulate urban renewal and jobs growth in each of the four corridors above current projections by the Bureau of Transport Statistics.

7.3.9 Constructing light rail in stages

The project team examined the merits of constructing light rail in discrete stages along each of the corridors. The potential benefits of staging the construction of light rail include:

- Deferring upfront capital expenditure
- Containing construction and traffic impacts
- Coordinating construction with land use changes and transport demand
- Allowing later stages of delivery to learn from the delivery of earlier stages.

To make this staging assessment, each of the corridors was divided into sections that provided connections between key centres. The sections assessed for each corridor is outlined below.

**Parramatta to Macquarie Park**
- Parramatta-Carlingford
- Carlingford-Epping
- Epping-Macquarie Park

**Parramatta to Castle Hill**
- Parramatta-Baulkham Hills
- Baulkham Hills-Castle Hill

**Parramatta to Strathfield**
- Parramatta-Sydney Olympic Park
- Sydney Olympic Park-Strathfield

**Parramatta to Bankstown**
- Bankstown-Birrong
- Birrong-Parramatta

7.3.10 Bus staging options

The Strategic Business Case examined the potential benefits of improving bus services along each of the proposed corridors prior to the construction of light rail. The purpose of this assessment was to determine whether improved bus services could assist in building demand and improve services for customers prior to the introduction of light rail.

7.3.11 Bus Rapid Transit (BRT) comparator

The project team made a high level appraisal of the costs and benefits of introducing Bus Rapid Transit (BRT) along each corridor instead of light rail. The purpose of this assessment was to ensure that the cost of light rail in each corridor would return a commensurate level of benefit. To make this comparison, the project team used the same alignment, stop locations, service frequency, and run times for each corridor.
7.4 The benefit cost analysis

The Strategic Business Case conducted a benefit cost analysis to assess the economic merits of the four corridors. The benefits and costs assessed for each corridor are outlined below.

7.4.1 Benefits

Benefits for these four options were categorised into transport benefits, wider economic benefits, and land use benefits.

Transport benefits

» Changes in the generalised cost of travel journeys for users through changes in travel time, amenity, and access/interchange time

» Increased transport reliability for users who switch away from bus

» Resource corrections, including congestion and externality savings

» Public transport operating savings for bus and heavy rail

» Residual value (the remaining asset life at the end of the appraisal period).

Wider economic benefits

» Agglomeration benefits

» Competition benefits

» Labour supply and productivity benefits.

Land use benefits

Land use benefits arising from:

» Redistributing population and employment from fringe areas to urban centres served by public transport

» Public infrastructure cost savings and externality savings from higher density urban form

» More active and sustainable travel patterns in the corridor compared to greenfield sites.

7.4.2 Costs

Estimates of direct and indirect costs were calculated for each corridor. Due to the limited information available for the assessment of each corridor, cost estimates were based on domestic and international light rail precedents. The specific costs calculated for each option were:

» Enabling works

» Stops

» Roads and utilities infrastructure

» Rail alignment

» Signalling, rail systems and power

» Depot and stabling

» Ancillary works

» Preliminaries

» Traffic management

» Design

» Insurances and bonds

» Overheads and profit

» Rolling stock

» Project delivery costs

» Property acquisition

» Risk and contingency

» Escalation

» Corporate overhead recovery.
8 Selection of the preferred network

8.1 About this chapter

This chapter documents how the key findings from Strategic Business Case informed the selection of the preferred network.

8.2 The preferred network

On 8 December 2015, the NSW Government announced a preferred light rail network that will support the creation of new communities and employment opportunities across the Greater Parramatta to Olympic Peninsula Priority Growth Area. The preferred network was chosen on its potential to encourage urban growth and contribute to the region’s transport network.

The preferred network will include:

1. A core spine linking precincts within Greater Parramatta including Westmead health precinct, Parramatta CBD and Camellia.
2. The replacement of the existing heavy rail service between Camellia and Carlingford with a more frequent light rail service.
3. A light rail service through Camellia renewal area, Sydney Olympic Park also connecting to Strathfield.

8.3 How the preferred network was selected

8.3.1 Results of the shortlist corridor assessment

The selection of the preferred network was based on the findings from the Strategic Business Case, which was completed in July 2015. Below is a high level summary of the key findings on each of the four corridors. More detail on the benefits of the preferred network is provided in section 8.4 below.

Parramatta to Olympic Park via Strathfield

The Parramatta to Olympic Park via Strathfield corridor presented a good opportunity to support planned land use changes and future growth. Light rail would also provide a new east-west transport link through the Greater Parramatta to Olympic Peninsula Priority Growth Area integrated with the wider transport network at the key hubs at Parramatta and Strathfield. This would provide greater connectivity to those travelling to, through and beyond the corridor.

Parramatta to Macquarie Park

TfNSW’s assessment showed that light rail would help to meet strong and growing transport demand in the Parramatta to Macquarie Park corridor and could link key residential, education and commercial precincts, including the WSU Rydalmere Campus, the Rydalmere Industrial Precinct and Telopea. The majority of these...
benefits were found to be between Parramatta and Epping due to Sydney Metro North West providing a new fast transport connection between Epping and Macquarie Park.

Investigations also showed a number of engineering challenges and high costs in constructing light rail beyond Carlingford, due to a change in grade between the heavy rail line and Carlingford town centre, and the impact on a number of major road intersections and structures.

**Parramatta to Castle Hill**

The Strategic Business Case found that the key challenge for constructing light rail to Castle Hill was the limited capacity for accommodating light rail on the existing road network. The investigations showed that light rail to Castle Hill would result in major disruptions to roads both during construction and once in operation. In addition, compared to the Strathfield via Sydney Olympic Park and Macquarie Park corridors, this corridor presented lower transport demand and less potential for urban renewal.

**Parramatta to Bankstown**

Investigations showed that light rail would not offer the same level of transport benefits to customers in the Bankstown corridor compared to those in other corridors. The existing heavy rail line via Lidcombe will still provide a faster journey to Parramatta than light rail and the Sydney Metro South West will provide a fast connection to Sydney CBD.

Transport for NSW therefore found the Bankstown corridor is best served in the short term by improved bus services that could be developed into rapid bus or light rail as demand grows. While investigations showed light rail to Bankstown could act as a catalyst for future housing growth, this potential would only be realised over the longer term and will not be matched by a similar uplift in employment opportunities.

### 8.3.2 Identifying the preferred network

The above investigations showed that both the Macquarie Park via Carlingford and Strathfield corridors would deliver strong growth and transport benefits. However they also showed challenges in constructing light rail beyond Epping, and that a transport link from Epping would duplicate the Sydney Metro North West line.

TfNSW therefore combined the Strathfield corridor with the Camellia to Carlingford element of the Macquarie Park corridor and the core CBD spine, to form the preferred light rail network.

The Parramatta to Carlingford route offers a feasible and cost effective way of providing significant transport and land use benefits to the existing and growing population along this corridor, and is a step towards connecting Parramatta to the Global Economic Corridor in Macquarie Park.

TfNSW also determined that a further transport study would be done to explore how a light rail extension to Epping could be delivered that addressed some of the technical challenges raised in the Strategic Business Case.

### 8.4 Benefits of the preferred network

Below is an overview of the key benefits of each section of the preferred network.

#### 8.4.1 Benefits of the Parramatta to Strathfield via Sydney Olympic Park route

The Parramatta to Strathfield via Sydney Olympic Park route would offer customers stops at a number of strategic centres and interchanges including Camellia, Silverwater, Newington, Sydney Olympic Park and Strathfield.

The Strategic Business Case showed that key benefits of this route included:
» Creation of an integrated transport network by providing customers with connections to two transport interchanges at Parramatta and Strathfield

» Improved connections to and from businesses, homes and major events at Sydney Olympic Park from transport interchanges at Parramatta and Strathfield

» Support for housing and jobs growth along the Greater Parramatta to Olympic Peninsula Priority Growth Area.

8.4.2 Benefits of the Parramatta to Carlingford route

The existing Carlingford heavy rail line provides local residents with a low service frequency that provides indirect connections to key destinations, including Parramatta. This line has low patronage with less than 800 people boarding and alighting in the AM Peak on average each day (BTS, 2013). As a result, a significant number of residents in adjacent medium density residential development along the heavy rail line rely on private vehicle usage to serve their transport needs. Replacing the existing rail line with a frequent light rail service would greatly enhance residents’ access to Parramatta and the wider public transport network.

The Parramatta-Macquarie Park was the only route that offered significant benefits when delivered in stages. Indeed, the Strategic Business Case assessment showed that the Parramatta-Carlingford section of this route offers significant benefits that can be derived at a comparatively low cost by re-using the under-utilised Carlingford Line heavy rail corridor. The Strategic Business Case showed that key benefits of the Parramatta-Carlingford route included:

» A higher frequency service offering direct connections for customers to key destinations

» Lower operational costs per kilometre operational costs than heavy rail

» Fewer environmental impacts per customer due to the greater efficiency of light rail compared with heavy rail.

8.4.3 Benefits of the CBD spine

The CBD spine will offer a reliable and high frequency service that connects key destinations across Greater Parramatta, supporting growth along the Greater Parramatta to Olympic Peninsula Priority Growth Area as identified in A Plan for Growing Sydney.

The Strategic Business Case showed that key benefits of this route included:

» Improved connections between the Parramatta CDB, the Westmead health precinct, and the Western Sydney University precinct in Rydalmere

» Greater transport choice for residents, visitors and workers

» Support for urban renewal in Parramatta North and Camellia

» Support for the expansion of Western Sydney University

» Support for the expansion of the Westmead health precinct.

Figure 3

13 The Strategic Business Case found that the Carlingford to Macquarie Park section of the Parramatta to Macquarie Park corridor presented a number of engineering challenges. For this reason, TfNSW determined that further investigations were needed before proceeding with this section of the corridor.
## Transport projects supporting Parramatta

<table>
<thead>
<tr>
<th>Transport project</th>
<th>Description</th>
<th>Relevance to Parramatta</th>
</tr>
</thead>
<tbody>
<tr>
<td>Westconnex</td>
<td>WestConnex will provide 33 kilometres of new and upgraded roads that connect a number of major Western Sydney roads, creating a vital link in Sydney’s Orbital Network. This project includes the M4 widening east of Parramatta, the duplication of the M5 East and a new road that connects the M4 to the M5. It is anticipated that WestConnex will remove thousands of daily vehicle trips from Parramatta Road, including up to 3,000 daily truck movements.</td>
<td>Motorists will save up to 40 minutes between Parramatta and Sydney Airport and bypass up to 52 sets of traffic lights when the project is completed.</td>
</tr>
<tr>
<td>Western Rail upgrade</td>
<td>The Western Sydney Rail Upgrade Program is underway and will result in faster and more frequent train services for commuters in Western Sydney. The program includes upgrades to signalling and power supply to improve frequency by safely allowing trains to travel closer together, and building additional track to enable more express trains.</td>
<td>Parramatta Station will have access to more frequent and reliable heavy rail services.</td>
</tr>
<tr>
<td>Parramatta Road improvement works</td>
<td>Road and intersection improvement works will occur along Parramatta Road. This will involve priority upgrades in the short-medium term, to be followed by subsequent upgrades, which will respond to urban development in growth areas and transport demand.</td>
<td>Improvements to Parramatta Road in response to the growth and revitalisation of Parramatta Road through UrbanGrowth NSW’s Parramatta Road Urban Transformation Strategy.</td>
</tr>
<tr>
<td>Transport project</td>
<td>Description</td>
<td>Relevance to Parramatta</td>
</tr>
<tr>
<td>------------------------</td>
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<td>-----------------------------------------------------------------------------------------</td>
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<tr>
<td>Parramatta River ferry</td>
<td>The frequency of Parramatta River services will be increased to respond to demand along western wharves, such as Sydney Olympic Park, Meadowbank, Abbotsford and Cabarita.</td>
<td>Improved ferry services will provide additional public transport options in the growth area.</td>
</tr>
<tr>
<td>services</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bus network</td>
<td>With most of Sydney’s future growth set to take place in Western Sydney, a modern bus network that integrates with the wider transport network is essential to connect customers to jobs, education and services. New and upgraded Rapid routes will strengthen connections between Parramatta, Macquarie Park, Castle Hill, Bankstown, Liverpool, the North West Growth Centre, and central Sydney via Top Ryde</td>
<td>TfNSW will provide high-frequency rapid services for travel between suburbs and centres not directly connected by rail. These will provide significant support for Parramatta’s development as Sydney’s ‘second CBD’ New and upgraded rapid routes will strengthen connections between Parramatta, Macquarie Park, Castle Hill, Bankstown, Liverpool, the North West Growth Centre, and central Sydney via Top Ryde</td>
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</tbody>
</table>

Parramatta Light Rail - How the preferred network was determined
## B Government policies and initiatives relevant to Parramatta Light Rail

### NSW Government policies

<table>
<thead>
<tr>
<th>Policy</th>
<th>Description</th>
<th>Relevant actions</th>
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<td>» NSW Transport Master Plan (2012)</td>
<td>This plan articulates the NSW Government’s 20-year vision for public transport, roads and freight infrastructure to support economic, social and environmental goals for NSW.</td>
<td>» Collaborate with Parramatta City Council on city centre improvements and light rail&lt;br&gt;» Increase rail frequency to reduce pressure on the heavily-constrained road linkages between the Parramatta CBD and the Sydney CBD&lt;br&gt;» Undertake feasibility investigations for a number of light-rail routes including the Parramatta Road corridor.</td>
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<td>» State Priorities (2015)</td>
<td>The State Priorities outlines 30 priorities for NSW to grow the economy, deliver infrastructure, protect the vulnerable, provide safer communities, and improve health, education and public services across NSW. State Priorities replaces the previous whole-of-government strategy, the NSW 2021 Plan.</td>
<td>» The PLR is identified as a state priority, and is included in the NSW Government’s overarching planning document, the “State Priorities”.</td>
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<td>» Sydney’s Light Rail Future (2013)</td>
<td>This plan sets out the role that light rail will play in Sydney’s transport future and how it will offer an effective option that builds on the current transport network.</td>
<td>» Parramatta Road and the Western Sydney light rail network identified as priority corridors for further light rail investigation&lt;br&gt;» Work with Parramatta City Council to complete a Western Sydney Light Rail Feasibility Study.</td>
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| A Plan for Growing Sydney (2014) | The Department of Planning and Environment developed this plan to guide land use planning decisions to accommodate Sydney’s growing population over the next 20 years. | Direction 1.2: Grow Greater Parramatta – Sydney’s second CBD  
» Grow Parramatta as Sydney’s second CBD by connecting and integrating Parramatta CBD, Westmead, Parramatta North, Rydalmere and Camellia.  
Direction 1.3: Establish a new priority growth area – Greater Parramatta to the Olympic Peninsula  
» Establish a new partnership to manage renewal of the Greater Parramatta to Olympic Peninsula Priority Growth Area.  
» Identify and deliver enabling infrastructure to support growth and urban renewal.  
» Deliver priority revitalisation precincts  
» Grow the knowledge economy as part of the extension of the Global Economic Corridor. |
| Rebuilding NSW: State Infrastructure Strategy (2014) | This Infrastructure NSW (INSW) strategy provides independent advice to the NSW Government on the highest infrastructure priorities for the state. | I NSW recommended that the NSW Government continues to boost Parramatta as the second CBD. In response to this recommendation, the NSW Government committed an additional $600m to the Parramatta Light Rail, bringing the total commitment to $1 billion. |
| Parramatta Road Urban Transformation Strategy (2014-15) | UrbanGrowth NSW has developed the draft *Parramatta Road Urban Transformation Strategy* to guide the growth and revitalisation of the Parramatta Road Corridor.  
This Corridor encompasses Parramatta Road and land that fronts the road, connecting Parramatta CBD in the west to the Sydney CBD in the east,  
The draft Strategy is the NSW Government’s 30-year plan for the Parramatta Road Corridor that will see growth and renewal focused in well-established areas close to existing public transport, infrastructure, jobs and services. | UrbanGrowth NSW are working with TfNSW and Roads and Maritime Services to determine what transport services will be required to support the projected population growth along the Parramatta Road Corridor. |
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| Parramatta 2038                       | Parramatta 2038 is the Parramatta City Council’s community strategic plan. It provides the long term-vision for the Parramatta Local Government Area and links to the long-term future of Sydney. | » Development of the Parramatta CBD, Westmead, Camellia and Rydalmere  
» Integrating a light rail network, local and regional roads  
» Promoting the Parramatta River as an ‘entertainment precinct’  
» Connecting a series of parks and recreation spaces. |
| Parramatta CBD Planning Strategy (2015) | The Parramatta CBD Planning Strategy is the Parramatta City Council’s vision for the growth of the Parramatta CBD as Australia’s next great city. It provides principles and actions to guide a new planning framework for the Parramatta CBD. | The Strategy’s implementation plan includes the following actions:  
» Incorporating the Parramatta Road North Urban Renewal Area into the Parramatta CBD  
» Integrating the ‘Auto Alley’ Planning Framework into the CBD Planning Framework  
» Proposing the rezoning of areas to recognise Parramatta’s strategic importance  
» Amending the density controls to reflect continued growth in the Parramatta CBD. |
| Sydney Olympic Park Authority - Master Plan 2030 | The Master Plan 2030 establishes planning and design principles and controls for the future development of Sydney Olympic Park. Under this plan Sydney Olympic Park will be transformed into an entertainment and commercial hub, accompanied by residential development. | The Master Plan aspires to improve transport access to Sydney Olympic Park so that it can continue to host large events while also accommodating new commercial and residential uses. |