

# Gungahlin to City Transit Corridor

Project update 3



September 2012



**ACT**  
Government

Environment and  
Sustainable Development





## FOREWORD



The Canberra community is passionate about transport and has shown great interest in the proposed rapid transit way down our iconic Northbourne Avenue. I am therefore very pleased to provide the third update for the Gungahlin to City Rapid Transit project, which has been underway for

the past 12 months. A rapid transit investment on this corridor would be transformational for Canberra and an important first step in a city-wide rapid transit system.

This update includes more detail on cost estimates for LRT and BRT. Some trade-offs in the proposed redesign of Northbourne Avenue have led to lower estimated costs – \$614m for LRT and \$276m for BRT. These estimates will be further refined as the project moves from feasibility into detailed design in the coming year.

To help us progress this important work to the next stage of design, the ACT Government has provided a detailed business case to Infrastructure Australia, seeking \$15m of funding through the Nation Building II program. The submission includes the benefit-to-cost ratios and a detailed economic assessment for both LRT and BRT options.

The ACT Government will match the proposed Australian Government contribution. This project would not have progressed as far as it has without the support of the National Capital Authority, the Chief Executive of which has written to Infrastructure Australia in support of the ACT's submission, and continues to work closely with ACT planners on Gungahlin to City Rapid Transit.

This update also includes information on how the Gungahlin to City corridor project is being considered as part of an eventual city wide network of rapid transit linking all of our key centres. Possible staging and options are included for the community's information.

I thank the Canberra community for your continued interest in this project, and I look forward to seeing the project progress to the next stage under the guidance of the newly established Gungahlin to City project office.

**Simon Corbell MLA**

Minister for the Environment and Sustainable Development  
September 2012





# Gungahlin to City Transit Corridor

## Introduction

The Gungahlin to City Transit Corridor project is exploring the feasibility of developing Bus Rapid Transit (BRT) or Light Rail Transit (LRT) between Gungahlin, Canberra's fastest growing district, and the City, Canberra's major employment centre.

To date the project has included the following work: engineering concept design, pre-feasibility cost estimates which have been further refined in this update, public transport modelling, economic and financial evaluations, community consultation and an Infrastructure Australia submission.

In April and May 2012, the ACT Government asked the community for comments on which mode (LRT or BRT) they preferred, whether they preferred a median or kerbside transit on Northbourne Avenue, and for any other comments that would help inform the project. More than 1500 people had a say on this important project. See page 6 for a summary of what we have heard from the community so far.

This project update provides further information about the cost estimates and economic evaluation for LRT and BRT, outlines the feedback from the community consultation, and details the next steps for the project.







## Public transport network context

The Gungahlin to City Transit Corridor is part of wider improvements to Canberra's public transport network established through Transport for Canberra and the ACT Planning Strategy.

Transport for Canberra establishes how transport will develop in Canberra for the next 20 years. It introduces the Frequent Network, which identifies a rapid network of high frequency public transport services across Canberra. This will be the backbone of Canberra's public transport system.

Rapid transit can range from bus priority lanes (like the lane on Barry Drive) with priority signals at intersections, to public transport corridors that are separated from the roads (like the high quality LRT or BRT proposed for the Gungahlin to City corridor). Figure 1 shows the Rapid network where these services will be built and operated.

The Gungahlin to City Transit Corridor is the first stage of a rapid transit roll-out across Canberra. Options for investigation for the second stage of the rapid transit network are Kingston (East Lake) to the City via Barton, and Woden to the City. Future stages would include Belconnen, Lanyon, Kippax, Weston Creek, Molonglo, and Queanbeyan in the network (see Figure 1).

In the meantime, the Government is implementing major public transport improvements across Canberra with a range of projects underway including upgrades to Constitution Avenue, the Belconnen to City transit way, Canberra Avenue bus priority, Adelaide Avenue bus stops investigation and Gungahlin to Belconnen improvements.



Figure 1. Frequent Network rapid lines



## Land use context

The ACT Planning Strategy highlights opportunities for locating more people and employment around Canberra's town and group centres and along the rapid transit corridors identified in Transport for Canberra. These opportunities capitalise on the existing structure of the centres and transport connections as shown in Figure 2.

Studies show that there is capacity in the Gungahlin to City corridor for more people to live and work. The transport modelling tested the feasibility of BRT and LRT using two possible scenarios based on how many people and jobs could be located in the corridor over time.

**Scenario 1:** Business as usual population projections assume the normal growth of the corridor population based on the ACT Government's official population projections.

**Scenario 2:** Higher residential and employment populations: 38% more people and 21% more employment are possible within the corridor by 2031. This is in line with the ACT's total population projections and the ACT Planning Strategy. The increased development is within the provisions of the existing Territory Plan and recent planning projects, such as the Dickson Group Centre and Gungahlin Town Centre Master Plans.



Figure 2: Planning Strategy defines areas for future population growth

The ACT Government will do further work in consultation with the community before determining the optimum population and employment numbers for the Gungahlin to City corridor.







## Community consultation

The community was consulted during April and May 2012 about:

- overall level of support for transit improvements in the corridor
- preferred transit mode – LRT or BRT
- preferred transit alignment for Northbourne Avenue – median or kerbside and
- other aspects to be considered in the concept design of the corridor.

To reach the greatest number and diversity of Canberrans, the study used a range of consultation methods, including:

- community information sessions at Civic, Dickson and Gungahlin
- workshops with business, industry and community groups
- online survey
- phone survey and
- requests for written submissions.

## Key messages

Survey respondents showed strong support for the long-term approach to transport planning in the proposed changes in the Gungahlin to City Corridor that seek to cater for future population growth.

The consultation gauged varying levels of support for a transit improvement in the corridor (either LRT or BRT), with 98% support from online survey respondents and 65% support from participants in a cross-Canberra phone survey.

The majority of consultation participants preferred light rail. In the telephone survey, there was more than 65% support for LRT initially, but after people were informed of the initial cost estimates, the support for LRT and BRT was equal at 46%.

Responses in submissions, online comments and at public workshops illustrated a strong public view that light rail could improve and transform Canberra and that environmental impact was the most important reason for preferring LRT.

Many survey respondents were undeterred by the higher cost estimates for LRT, believing it to be an investment in the future of Canberra.

Respondents preferred the option for a median alignment for the transit corridor. There was also strong support for the inclusion of segregated cycleways along the corridor.



## City to Gungahlin Transit Corridor



### What is light rail transit?

Light rail transit (LRT) is a rail mode, similar to trams, which operates at road level and uses electrically powered vehicles. LRT vehicles can receive power through overhead wires, known as catenary, or can be catenary free and recharge when braking utilising a rapid charge accumulator system. LRT can operate at slow speeds in higher density urban areas with

closer spaced stops or at higher speeds in segregated corridors. LRT systems operate primarily in their own lane but can also share lanes with other vehicles and share space with pedestrians. Widely spaced stops are also common as LRT has a broader walking catchment than local bus services. LRT is a popular mode choice due to its comfort, speed, reliability and high capacity.



Artist impression of Civic Light Rail Terminus



Artist impression Light Rail route Northbourne Avenue

#### Advantages

- Popular and attractive form of public transport.
- High capacity vehicles.
- Permanent transport infrastructure.
- Can operate at low and high speeds depending on urban environment and stop spacing.
- Energy efficient and can use cleaner power options (hybrid, electric).

#### Disadvantages

- Expensive in both capital and operational expenditure.
- Requires purpose built depot for stabling and maintenance, adding to cost.
- Inflexible as fleet cannot be used outside of the City to Gungahlin corridor, unlike BRT, unless extended throughout the rapid network.

### What is bus rapid transit?

Bus Rapid Transit (BRT) is a high quality bus system which operates in its own segregated space. This allows for higher speeds, frequency and reliability than normal bus services. BRT systems are more flexible than LRT by being able to transition into general traffic and can use existing fleet.

BRT vehicles can be purpose designed to achieve similar passenger comfort and quality as LRT, carrying up to 200 passengers.

BRT includes high quality stops and stations, providing a light-rail-like experience for significantly lower cost.



Artist impression of the BRT route along Northbourne Avenue



Artist impression of the BRT route along Northbourne Avenue

#### Advantages

- Cost-effective alternative to light rail.
- More flexible than LRT with integration to existing bus fleet and network.
- Operates at low and high speeds depending on urban environment and stop spacing.
- Can have similar passenger comfort and quality as LRT for less cost.
- Flexibility to convert to light rail corridor in future.
- No overhead catenary lines as in the case of light rail.

#### Disadvantages

- Perception that a bus based system has lower amenity than LRT.
- Passenger capacity per BRT vehicle is half of LRT vehicles.





## Economic evaluation of LRT and BRT

Cost benefit analysis is a way of calculating and comparing the total expected benefits and costs of a project to determine its feasibility. This analysis is expressed as a benefit cost ratio (BCR) which indicates the overall value for money of a project. For example, a BCR of 2.0 indicates that every dollar invested returns a benefit of two dollars.

### Benefits and costs of the project

#### Benefits

- Public transport travel time savings
- Highway travel time savings
- Incremental fare revenue
- Unperceived vehicle operating costs
- Environmental externalities
- Avoided accident costs
- Avoided road damage costs

#### Costs

- Planning and design
- Enabling works
- Road infrastructure
- Signalling
- Transit vehicles
- Electrification and tracks (LRT)
- Stations and stops
- Cycle lanes
- Landscaping

### Cost estimates

Since the release of initial cost estimates in April 2012, work has been continuing on refining the design of the corridor which has led to a reduction in cost estimates.

The previous cost estimates were \$700–860m for LRT, and \$300–360m for BRT. The revised estimates are \$614m for LRT and \$276m for BRT. Changes to the design have reduced costs, improving the overall viability of the project by:

- using a median alignment for the BRT or LRT along the entire length of the corridor reflecting the community preference during consultation; the previous costs were based on kerbside LRT or BRT on Northbourne Avenue
- retaining the existing verge and median widths of Northbourne Avenue; the previous proposal relocated the road to reduce the width of the median and increase the width of the verges to provide improved public realm and cycle lane upgrades
- maintaining the 3 metre-wide segregated cycle lanes previously proposed but with a 0.6 metre rather than 4 metre separation from the roadway
- retaining existing pedestrian crossing distances on Northbourne Avenue
- maintaining the existing public realm on the verges; and
- the possible removal of some trees in the median and verge to allow for transit operation and 3m-wide cycle lanes.

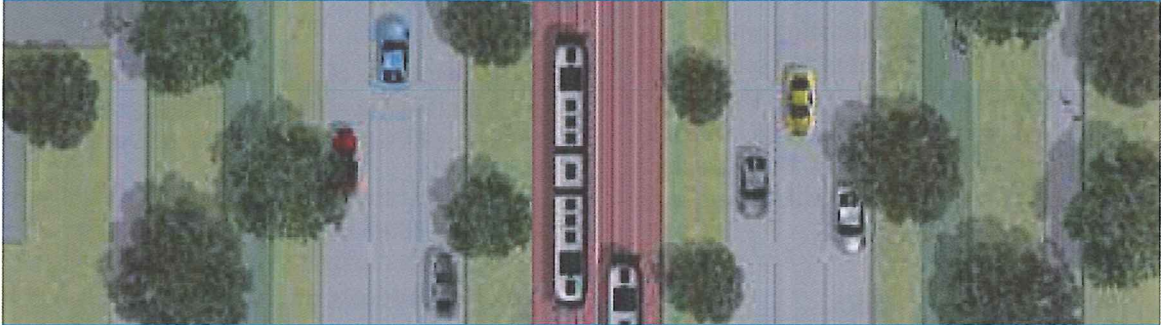
The existing, previous, and revised proposals for Northbourne Avenue are shown in Figure 3 for both LRT and BRT.



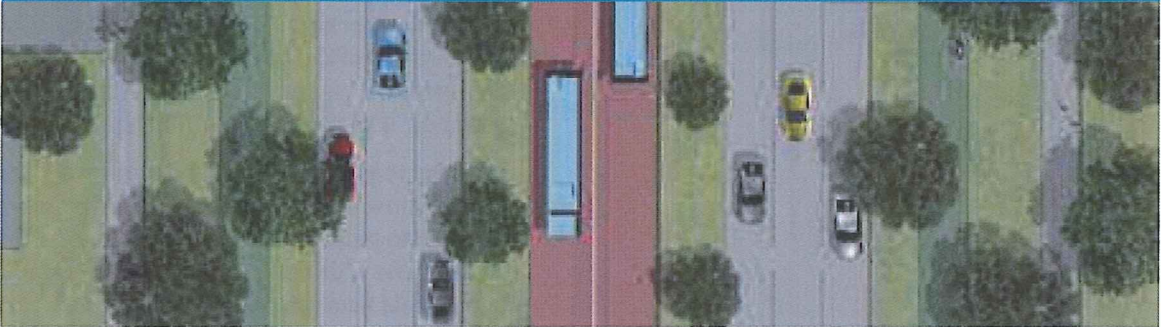




Previous LRT median alignment for Northbourne Avenue



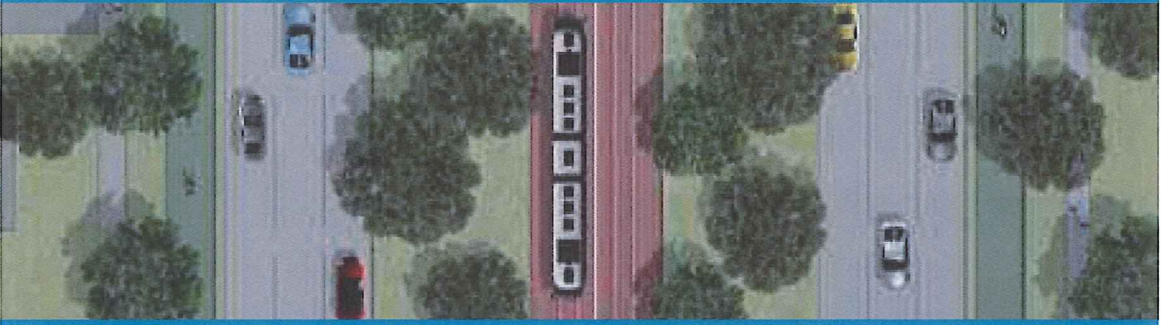
Previous BRT median alignment for Northbourne Avenue



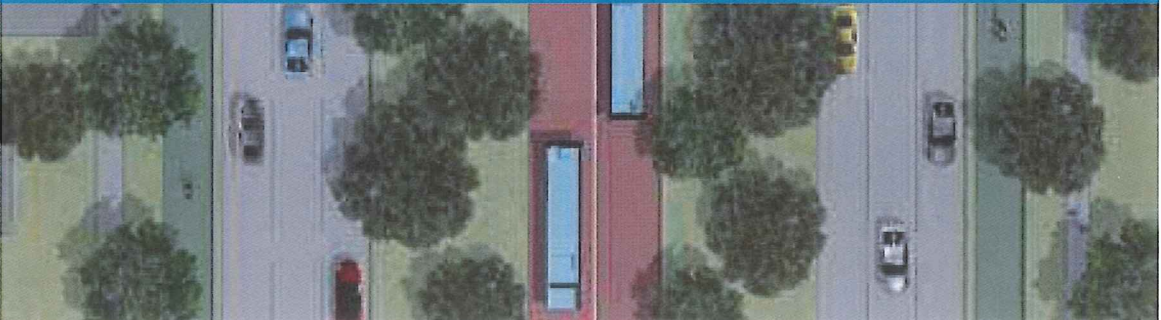
Current alignment for Northbourne Avenue



New median alignment for LRT on Northbourne Avenue



New median alignment for BRT on Northbourne Avenue







These changes to the concept for the Northbourne Avenue section have resulted in the revised cost estimates shown below.

Table 1: Revised cost estimates

Asset	Cost Component	Cost Type	Assumed Life (Years)	LRT: Median Alignment	BRT: Median Alignment
Enabling works	Planning	Direct costs	0	\$13.355	\$13.355
Other general planning and management	Planning	Direct costs	0	\$9.713	\$9.713
Traffic management / temporary works	Planning	Direct costs	0	\$5.095	\$5.095
Track work	Below rail infrastructure	Direct costs	30	\$101.984	
Road infrastructure	Bridges	Direct costs	30	\$13.520	\$13.520
Road infrastructure	Segregated Rapid Transport Lanes	Direct costs	30	\$25.440	\$25.440
Road infrastructure	Road works / footpaths and cycle lanes	Direct costs	30	\$8.937	\$8.937
Road infrastructure	Medians / Landscaping	Direct costs	30	\$5.200	\$5.200
Road infrastructure	Drainage	Direct costs	30	\$4.589	\$4.589
Road infrastructure	Utilities	Direct costs	30	\$28.880	\$28.880
Signalling	Electrical	Direct costs	15	\$9.713	\$9.713
Power supply, transformers and sub-stations	Electrical	Direct costs	40	\$72.000	
Other electrical and mechanical systems	Electrical	Direct costs	15	\$15.589	\$12.821
Passenger ticketing	Passenger interface and communications	Direct costs			
Passenger information displays and Platform control systems	Passenger interface and communications	Direct costs	10	\$10.927	\$7.285
Vehicle monitoring systems	Passenger interface and communications	Direct costs	10		
Bus stops	Existing stops relocated from kerb	Direct costs	20	\$3.642	\$3.642
Bus / Light rail stations		Direct costs	50	\$27.317	\$18.212
Other buildings and structures	Depots	Direct costs	100	\$91.058	\$48.000
Bus fleet	Fleet	Direct costs	20		\$11.250
Light rail rolling stock	Fleet	Direct costs	35	\$54.635	
<b>Subtotal: Direct Costs</b>				<b>\$501.594</b>	<b>\$225.651</b>
Preliminaries and design 20% of direct costs	Preliminaries and design	Indirect costs	0	\$100.319	\$45.130
Government costs 2.5% of direct costs	Project delivery costs	Indirect costs	0	\$12.540	\$5.641
<b>Subtotal: Indirect Costs</b>				<b>\$112.859</b>	<b>\$50.772</b>
<b>TOTAL (\$mil)</b>				<b>\$614.452</b>	<b>\$276.423</b>

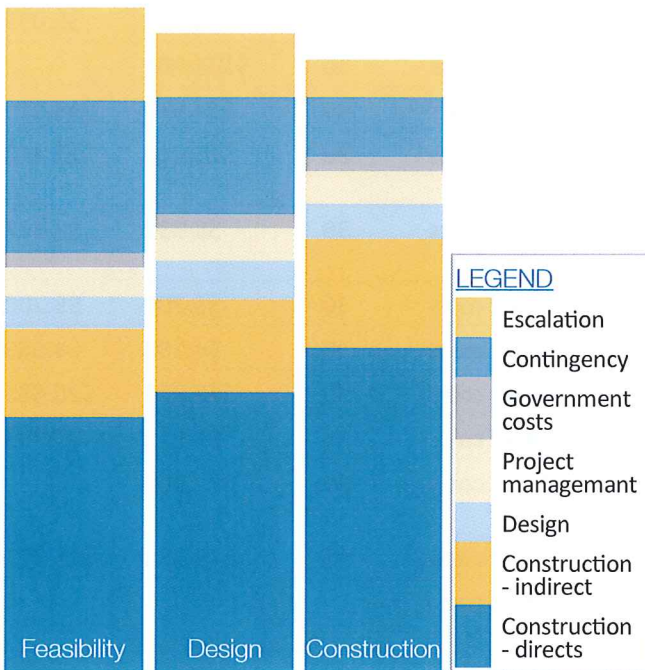
The cost estimates recognise that the level of design is at a pre-conceptual or 'concept screening' phase. In these circumstances, the typical range of accuracy is expected to vary between a low range of -15% to -30% to a high range of +20% to +50%. These estimates are at 2011 prices.





Figure 4 shows that project costs become more certain as a project progresses from feasibility to design and construction. This means that the cost estimates for the Gungahlin to City Corridor will be further refined in the next stage of forward design, which would start in 2013-14 subject to Federal Government funding.

Figure 4  
Project costs become more certain over time



Source: Adapted from Department of Infrastructure, Transport, Regional, Development and Local Government – Best Practice Cost Estimation for Publicly Funded Road and Rail Construction, 2008

Cost estimates were prepared in accordance with the Department of Infrastructure, Transport, Regional, Development and Local Government – Best Practice Cost Estimation for Publicly Funded Road and Rail Construction, 2008.

### Benefit – cost ratios

The economic assessment completed by Deloitte Australia for the ACT Government’s Infrastructure Australia Submission has produced the following benefit-cost ratios for the project options:

Mode	Population and employment over time	Benefit – cost ratio (BCR)
BRT	Business as usual	1.98
	Higher population and employment in the corridor	4.78
LRT	Business as usual	1.02
	Higher population and employment in the corridor	2.34

The economic appraisal was undertaken in accordance with Australian Transport Council and Infrastructure Australia investment appraisal guidelines. The results show that both BRT and LRT are feasible projects, and that feasibility increases as the residential and employment population increases over time.

The economic assessment uses the methodology prescribed by Infrastructure Australia which includes only the traditional transport benefits like travel time savings, carbon emission reductions, vehicle operating costs and road accident costs. Intangible or newer economic benefits like the health benefits of increases in public transport, walking and cycling are not yet able to be included in Infrastructure Australia assessments, even though these sorts of improvements would produce significant benefits to the Canberra community from the Gungahlin to City Transit Corridor improvements.

### Infrastructure Australia submission

A submission was lodged with Infrastructure Australia for Nation Building II funding from the Federal Government in early August 2012. The submission seeks \$15m from the Federal Government for feasibility and forward design during 2013–14 to 2014–15. If successful, a dollar for dollar matching contribution would be required from the ACT Government.

The forward design and feasibility work would provide the basis for seeking further funding from the Federal Government and would explore options for private investment. The announcement of any funding from Infrastructure Australia would occur in conjunction with next year’s Federal Budget. In the meantime, work will continue on this project.

### Gungahlin to City Project Office

The Gungahlin to City Project office has been established to coordinate delivery of transit corridor projects and corridor redevelopment opportunities. The ACT Government recognises there is significant potential for the redevelopment and renewal of the corridor. The ACT Government is the planning and transport authority and the owner of a significant amount of land along the corridor. As such, the ACT Government is uniquely positioned to not only plan for but also implement and realise the opportunities and benefits of the transit oriented corridor redevelopment and renewal, in a way that no other Australian jurisdiction can.





## Gungahlin to City Transit Corridor Timeline

Commencement of study September 2011	ACT Government engaged URS Australia Pty Ltd in conjunction with Deloitte Touche Tomatsu and other partners to undertake a study investigating rapid transit options - Light Rail Transit (LRT) and Bus Rapid Transit (BRT) - for the Gungahlin to City Corridor
Background analysis and internal consultation	Engineering concept design options Strategic transport modelling Government stakeholder consultation
Project Update 1 December 2011	Introduction and outline of the study Benefits of BRT and LRT BRT and LRT alignment and cross section drawings Land use principles Timeframes for study
Concept design evaluation and economic assessment	Concept designs refined and evaluated Initial cost estimates by URS Economic assessment commenced
Community consultation and Project Update 2 April – May 2012	The consultation asked the community whether they preferred LRT or BRT, how the rapid transit lanes should be aligned on Northbourne Avenue, and what other views they had on improving transit in the corridor Community consultation program included community information sessions, phone survey, online survey and written submissions
Concept design and cost estimate refinement	The concept design was refined based on the community's preference for a median alignment on Northbourne Avenue Cost estimates and economic assessment revised based on concept design refinements
Gungahlin to City Project Office May 2012	Office established to coordinate the delivery of the transit corridor and associated planning and development projects
Infrastructure Australia (IA) submission August 2012	Submission for Nation Building II funding lodged with IA seeks \$15m contribution for 2 years of forward design, to be matched by the ACT Government subject to budget decision-making
Project Update 3 September 2012	Update includes a summary of community consultation, an update to concept design based on community feedback, and revised cost estimates to reflect the revised design, and economic results.
Announcement of IA funding Federal 2013–14 Budget	Possible announcement of funding for design stage
Forward design 2013–14 to 2014–15	Forward design of the corridor over 2013–14 - 2014–15 subject to Federal Government funding



