

# Barton Highway/Gundaroo Drive/ William Slim Drive roundabout upgrade

## Background

Roundabouts provide a safe, simple form of traffic management at intersections, especially where the flows are balanced on each leg entering the intersection.

The roundabout at the intersection of the Barton Highway, Gundaroo Drive and William Slim Drive provides practical traffic control outside peak traffic periods. However, with traffic growth generated from the developing Gungahlin region and beyond, the existing intersection has become heavily congested in the peak periods. Unbalanced and conflicting traffic flows, heading to and from the city during the peak periods, create lengthy queues and delays on the heavily trafficked legs. The result of these delays is an increase in the frequency of crashes.

The Barton Highway/Gundaroo Drive/William Slim Drive roundabout will be upgraded to incorporate additional lanes and traffic signal control on all four approaches. The signalisation of the intersection will be coordinated to balance the flows on the approaches during the peak periods, which will reduce delays for drivers.



Overlooking the Barton Highway/  
Gundaroo Drive/William Slim Drive  
roundabout

## Site constraints

Prior to 2010, preliminary works looking at options to improve the Barton Highway/Gundaroo Drive/William Slim Drive intersection examined ways to develop the site to reduce traffic delays and congestion and improve safety. Key constraints identified in these preliminary investigations include:

- the layout of the roundabout, with wide separation of the dual carriageway approaches on the Barton Highway
- Ginninderra Creek immediately to the north-west of the intersection
- substantial bridge structures over Ginninderra Creek on both the Barton Highway carriageways which is in close proximity to the intersection
- the hill in the southern quadrant of the intersection adjacent to Giralang (between the Barton Highway northbound and William Slim Drive)
- the boundary of the nature reserve in the northern quadrant of the intersection
- development of the Crace subdivision in the eastern quadrant of the intersection with water quality ponds and abutting housing.

Each of these factors highly constrain the development of the intersection, where additional space is required for on and off ramps, overpass approaches and substantial bridge constructions.

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## Flyover option considerations

A number of options are available when considering a flyover (overpass) at this site. The two most common examples are discussed below.

**The Barton Highway crossing over the lower William Slim Drive/Gundaroo Drive through roads.** This is the preferred overpass solution, however it involves substantial elevated overpass construction across the intersection and Ginninderra Creek. It would include replacement of the existing creek bridges and, as a result, further inconvenience traffic during construction. The project would also involve extensive civil infrastructure to deliver left and right turns from the Barton Highway in each quadrant of the intersection as well as further bridge construction over Ginninderra Creek.

**William Slim Drive/Gundaroo Drive passing over the Barton Highway.** This option would require extended overpass construction over the intersection to bypass the Barton Highway carriageway and wide median. It would also require the construction of extensive left and right turn loops to address the grade (slope) change between the carriageways and elevated civil infrastructure across Ginninderra Creek in two quadrants.

Due to the site's constraints difficulties arise in addressing the turn movements that are part of each flyover option as they require clover leaf construction (an interchange requiring four to six ramps including two loop ramps) to address the direction and level changes. The left turn slip lanes which must follow the

approach and departure grades of the elevated roads also create difficulties as they require extended lengths of at grade pavements; in two instances crossing Ginninderra Creek. These works would intrude into the nature reserve as well as the hilly area in the southern quadrant.

The intersection is therefore not ideally located for development as a flyover as it would require substantial structural engineering to deliver the required movements for all road users. Delivery of a fully functioning flyover solution at this location would therefore be prohibitively expensive.

An alternative to the fully functioning flyover design is what is known as a single point urban interchange, which includes traffic signals to control some movements, with grade separation for others. This option was also discussed however many of the same problems were identified, more typically the physical and environmental constraints. Also, in some cases, this option did not separate the conflicting peak hour movements, meaning the reduction in congestion and conflict was not fully achieved.



Traffic on the Barton Highway/Gundaroo Drive/William Slim Drive roundabout

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## Intersection signalisation

A cost/benefit analysis (CBA) of the options for the signalisation of the intersection was undertaken in the preliminary design stage. The CBA produced a result of 10.4, well in excess of the generally acceptable CBA ratio for similar projects of three (3).

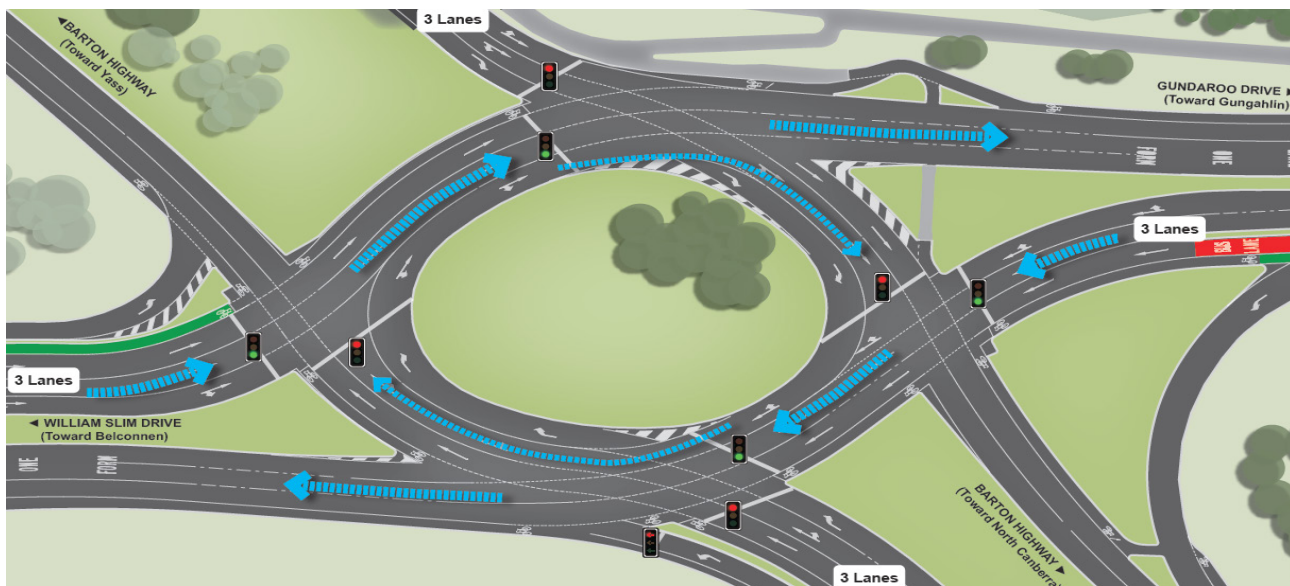
The \$10 million Barton Highway/Gundaroo Drive/William Slim Drive intersection upgrade will:

- introduce traffic signals at the existing roundabout which will be in full time operation
- introduce three lane approaches on each leg of the intersection, including across the Barton Highway southbound approach bridge

- retain the roundabout form of the intersection and signalise the movements through the intersection
- provide safe passage through the intersection for cyclists with the introduction of on-road cycle lanes
- introduce bus only priority lanes on the Gundaroo Drive and William Slim Drive approaches to improve bus access and operations during peak periods.

It is anticipated that the signalisation of the roundabout will result in reduced delays in the morning and evening peak. The new intersection signals will be coordinated to adjust and control traffic flow through the roundabout according to the time of the day.

Construction is planned to commence in October 2015 and is likely to take approximately 12 months to complete.



Barton Highway/Gundaroo Drive/William Slim Drive roundabout signalisation  
William Slim Drive through Gundaroo Drive signal phase