during both the AM and PM peak periods in the base and future years. 95th percentile queues are short and are not expected to impact upon adjacent intersections.

7.2.5 Dorville Road / Site Access Intersection

The intersection layout used for the SIDRA analysis for the Dorville Road / Site Access priority controlled intersection is shown in **Figure 7.9**. Analysis results are provided in **Table 7.11**. This intersection was only analysed with the site traffic because the access is currently not in use. The 12m long left turn pocket on the Site Access approach has been included for this analysis. Although this pocket is not formally marked, the queuing space is provided in the existing intersection layout and the intersection is expected to operate with this informal left turn lane as there is sufficient width in the approach (approximately 6m) for two cars to queue side by side.

Figure 7.9 Dorville Rd / Site Access Intersection Layout

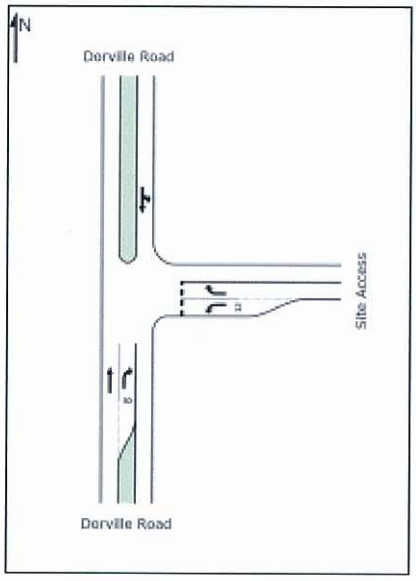


Table 7.11 Dorville Rd / Site Access Intersection – SIDRA Results (2011)

Scenario	AM Peak				PM Peak			
	DOS	Ave. delay (sec)	LOS	Queue Length (m)	DOS	Ave. delay (sec)	LOS*	Queue Length (m)
2011 With Carseldine GOP	0.36	2.7	D	6.3 [a]	0.37	3.0	E	11.2 [b]
2021 With Carseldine GOP	0.47	2.9	F	10.0 [a]	0.76	5.0	F	26.2 [b]

*LOS based on worst movement for the intersection
[a] Longest queue on Dorville Road South Approach
[b] Longest queue on Site Access East Approach

The analysis results provided in **Table 7.11** indicate that the Dorville Road / Site Access intersection is expected to experience acceptable 2011 and 2021 peak period operations in terms of the critical degree of saturation, vehicle queuing and average delay with the addition of the traffic generated by the site. While the worst level of service for the intersection is a LOS F during the 2021 analysis, the intersections operations are considered acceptable due to the low traffic volumes on the critical leg of the intersection. This is the right turn out of the

site onto Dorville Road. All other movements at the intersection are experiencing a minimum LOS B.

8. Vehicular Access Arrangements

8.1 Access Driveway Requirements

In lieu of a specified requirement for access driveway types within the FUDA Development Scheme, the BCC *TAPSPSP* has been used as a guideline, such that the site remains consistent with the surrounding area. The access driveway design and location requirements for the subject site are as follows:

- Design – a 13m wide Type C2 driveway (including a 5.5m wide entry, a 1.5m wide median, and a 5m wide exit) is required, as per Table 8 of *TAPSPSP*, for a site with a major road frontage and a low / medium turnover of 251 to 500 car parking spaces;
- Vehicle Queuing Provision – a minimum of nine vehicle lengths or 54m (assuming average length of vehicle queue length of 6m) as per Table 10 of *TAPSPSP*;
- Location – separations of 30m are required for major intersections and 20m for minor intersections for accesses on a major road, as per Table 5 of *TAPSPSP*;
- Sight Distance – a desirable sight distance of 110m, or an absolute minimum of 85m is to be provided for access driveways on a 60kph speed limit road, as per *TAPSPSP* Tables 6 and 7 respectively
- Gradient – the first 6m of driveway inside the property boundary is to be no steeper than 1:20

8.2 Adequacy of Proposed Access Driveway Arrangements

It is proposed to retain the three existing access driveways to the subject site which are located as follows:

1. Beams Road access – approximately 400m east of the Beams Road / Dorville Road intersection and 35m west of the Beams Road / Balcara Avenue signalised intersection;
2. Dorville Road access (south) – approximately 320m south of the Beams Road / Dorville Road intersection and 70m north of the Dorville Road / Denver Road intersection; and
3. Dorville Road access (north) – approximately 70m south of the Beams Road / Dorville Road intersection.

An existing set-down on Beams Road, approximately 170m east of the Beams Road / Dorville Road intersection will be removed.

The adequacies of each driveway in relation to BCC's *TAPSPSP* design and location requirements are as follows:

- Design Adequacy:
    - Beams Road – access driveway crossover width of 14m (including 6.5m entry width, 2m median width, and 5.5m exit width);
    - Dorville Road (south) – access driveway crossover width of 14m (including 6m entry width, 2m median width, and 6m exit width); and

- Dorville Road (north) – entry driveway crossover width of 4m and an exit width of 3.7m with a separation of 50m for the one-way short term parking area.

The three access driveway design arrangements satisfy BCC requirements.

- Internal Vehicle Queuing Provision Adequacy:
  - Beams Road access – 30m vehicle queuing length (approx. 5 car lengths);
  - Dorville Road access (south) – 40m vehicle queuing length (approx. 6 car lengths); and
  - Dorville Road access (north) – 8m vehicle queuing length (approx. 1 car length).

The combined on-site vehicle queuing provision arrangements of approximately 78m (equating to about 12 car lengths) satisfy BCC requirements.

- Location Adequacy:
  - Beams Road access – located approximately 35m to the west of the Balcara Avenue intersection and approximately 400m to the east of the Dorville Road intersection;
  - Dorville Road access (south) – located approximately 70m to the north of the Denver Road intersection and 70m to the south of the Whitehorse Street intersection; and
  - Dorville Road access (north) – the entry is located approximately 70m to the south of the Beams Road intersection and the exit is located approximately 120m to the north of the Whitehorse Street intersection.

The locations of the three access driveways satisfy BCC requirements.

- Sight Distance Adequacy:
  - Beams Road access – achieves sight distances of at least 150m in both directions;
  - Dorville Road (south) – achieves sight distances of at least 150m to the south and approximately 130m to the north; and
  - Dorville Road (north) – achieves sight distances of approximately 130m to the south and approximately 120m to the north.

The sight distances of the three access driveways satisfy BCC requirements.

- Gradient Adequacy:
  - The first 6m of driveway inside the property boundary for all three access driveways have a gradient no steeper than 1:20

The gradients of the three access driveways satisfy BCC requirements.

The access driveway arrangements for the proposed Carseldine GOP satisfy BCC design and location requirements and are therefore considered suitable.

9. Commercial Vehicle Servicing Arrangements

9.1 Commercial Vehicle Servicing Requirements

In lieu of a specified service vehicle requirement within the FUDA Development Scheme, the BCC *TAPSPSP* have been used as a guideline, such that the site remains consistent with the surrounding area.

According to Tables 1 and 2 of the BCC *TAPSPSP*, for an office development with a GFA of 15,000m^2 to 19,999m^2, the site should provide the following service vehicle facilities:

- Five Service Van bays;
- Two Small Rigid Vehicle (SRV) bays; and
- One Medium Rigid Vehicle (MRV) bay.

It is also necessary for a standard Refuse Collection Vehicle (RCV) to access the site.

The key BCC design requirements for commercial vehicle servicing facilities are presented in **Table 9.1**.

Table 9.1 BCC Commercial Vehicle Servicing Design Requirements

Design Vehicle	Minimum Bay Width	Minimum Bay Length	Minimum Vertical Clearance	Minimum Aisle Width	
				One-Way	Two-Way
Service Van	3m	5.4m	2.3m	4.5m	6.5m
SRV	3.5m	7m	3.5m		
MRV	3.5m	9m	4.5m		
RCV	3.5m	10.5m	4.5m		

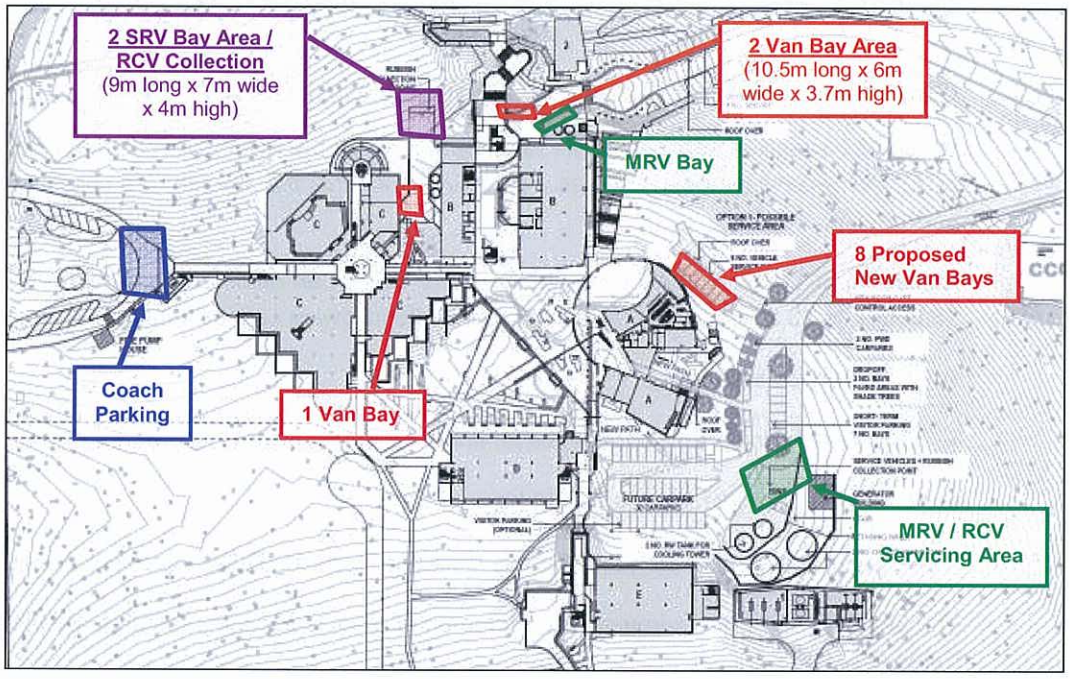
9.2 Adequacy of Proposed Commercial Vehicle Servicing Arrangements

The commercial vehicle facilities available to the proposed Carseldine GOP are as follows:

- 11 Service Van bays;
- Two Small Rigid Vehicle (SRV) bays;
- Two Medium Rigid Vehicle (MRV) bays, including one shared RCV bay; and
- One Coach bay.

It is recommended that the service bays be clearly marked at each building as shown in **Figure 9.1**.

Figure 9.1 Proposed Carseldine GOP Commercial Vehicle Servicing Areas



The installation of boom gates as described in Section 4.2.1 on the site is not expected to impact on the overall servicing of the site, due to the majority of service bays being provided outside the gated areas.

The provision of two Type C2 driveways and a seven metre wide internal road allows a standard refuse collection vehicle to traverse the site and enter and exit in a forward gear.

In order to demonstrate the adequacy of the commercial vehicle servicing manoeuvring on-site, Halcrow have applied AutoTURN to the site plan for each respective design vehicle (above Van size) and their bay locations. The SRV, MRV, RCV and Coach turn path diagrams are provided in **Figure 9.2**, **Figure 9.3**, **Figure 9.4** and **Figure 9.5** respectively.

The internal road leading to the refuse collection area at Building A is currently 3.2m wide. In order to cater for a RCV, it is recommended that this road be widened to a minimum width of 4.5m.

The Coach turn path shown in **Figure 9.5** is based on the assumption that the southbound carriageway of Dorville Road is located approximately eight metres west of the Carseldine GOP property boundary. This assumption takes into account the verge and shoulder width.

Figure 9.2 SRV Turn Path Diagram

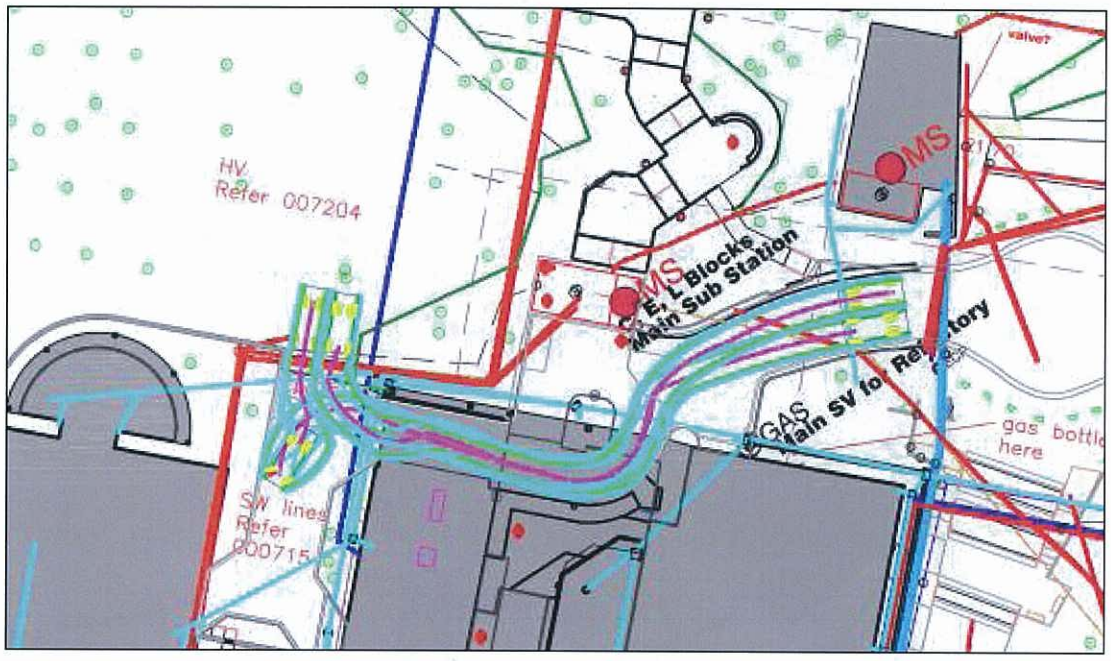


Figure 9.3 MRV Turn Path Diagram

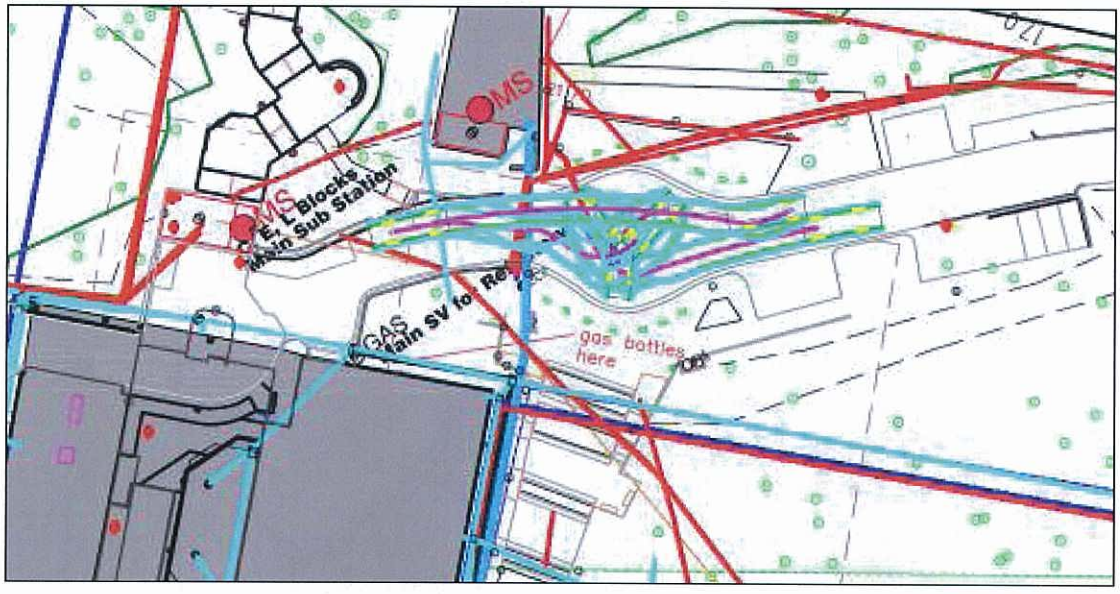


Figure 9.4 RCV Turn Path Diagram

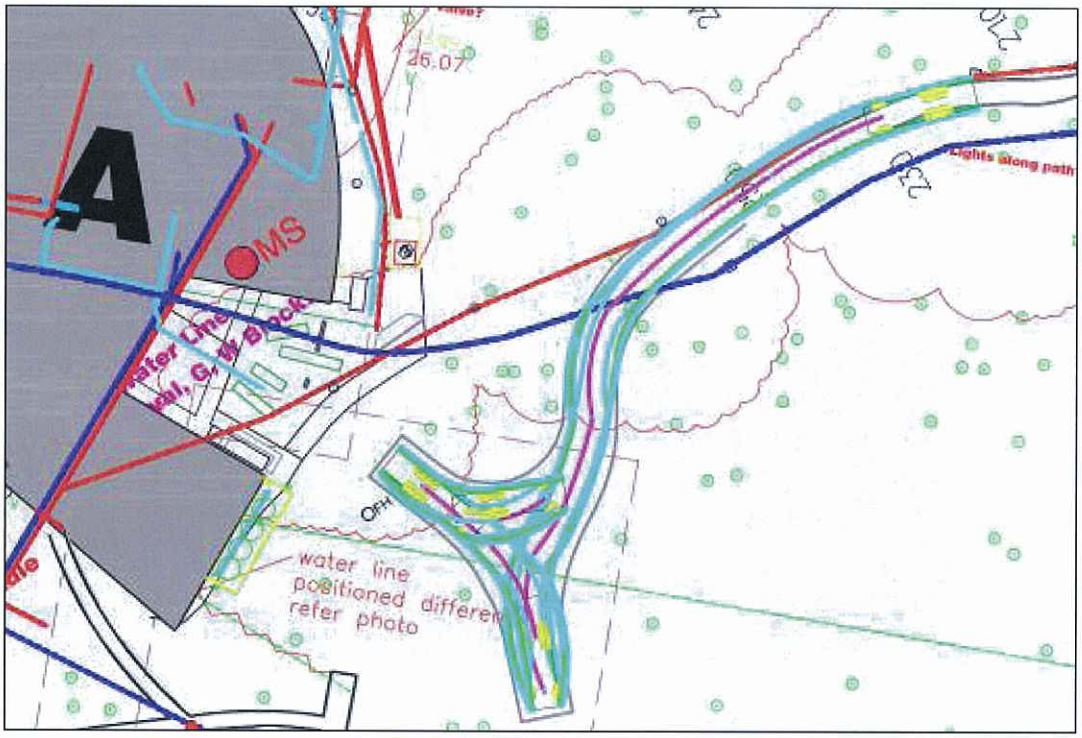
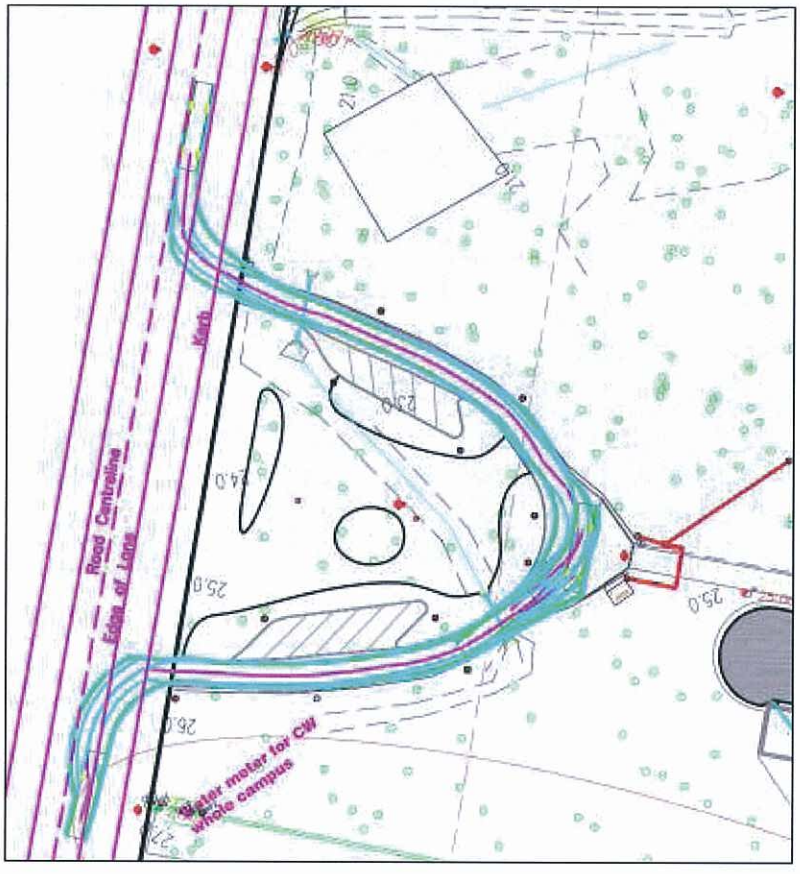


Figure 9.5 Coach Turn Path Diagram



10. Active and Public Transport Arrangements

10.1 Public Transport Arrangements

The subject site is located approximately 200 metres from the Carseldine Railway Station, which is serviced by the Caboolture line. The walking route from the station to Building A via the existing pedestrian paths is approximately 500m.

There are several bus routes that service the area, including routes 335 and 339 which depart from Taigum shopping centre to the east, and routes 340, 341 and 344 which depart from Beams Road. There is also a proposed busway to pass through the subject site demonstrated in the FUDA Structure Plan in **Appendix B**. The current Public Transport operations available to service the Carseldine GOP have been detailed in **Section 3.3**. It is considered that these services will adequately service the Public Transport demands of the proposed Carseldine GOP.

10.2 Active Transport Arrangements

A pedestrian / cycle link connects the site with the Carseldine Rail Station. There is a high level of pedestrian connectivity both internally and externally. The internal pedestrian / cycle linkages connect with the existing pedestrian paths on Beams Road, Dorville Road and the cycle route along the Cabbage Tree Creek. It is recommended that the footpaths fronting the site be measured against AUSTROADS and upgraded as required.

In regards to lighting, further investigations are required to ensure the safety of pedestrians after daylight hours.

Bicycle storage and end of trip facilities are provided within the Carseldine GOP to encourage the use of active transport modes for the journey to work. It is recommended that these be provided consistent with the Queensland Development Code for Sustainable Buildings as shown in **Table 10.1**.

Table 10.1 Queensland Development Code End of Trip Facility Requirements

Element	Queensland Development Code Rates	Minimum Requirement for Carseldine GOP
Bicycle Parking Spaces	5% of number of employees	49 spaces
Lockers	1.6 locker per 1 bicycle parking space	78 lockers
Change Rooms	1 male and 1 female change room	2 change rooms
Showers	2 male and 2 female showers plus 1 additional for each sex for every additional 20 bicycle spaces	6 showers
Sanitary Compartments	2 sanitary compartments for each sex	4 sanitary compartments
Wash Basins	1 wash basin for each sex	2 basins

11. TravelSmart Study

The Queensland Government has established the TravelSmart program which is a voluntary travel behaviour change program that encourages people to use sustainable travel modes such as public transport, walking, cycling and carpooling in favour of single occupancy vehicle travel.

An example of how influential the implementation of a TravelSmart program can be to the overall travel behaviour of an office development is illustrated by the following achievements at the Kedron Department of Community Safety:

- 15% reduction in weekly car trips to work since the introduction of a TravelSmart initiative; and
- Increase in public transport trips to 15.2% of all weekly trips. It is important to note that the Kedron Department of Community is located approximately 600m from a railway station and is therefore not classified as a Centre Activities facility under BCC.

In order to manage the car parking supply and traffic generation of the Carseldine GOP in a manner that services the immediate and future needs of the Carseldine Urban Village precinct, Halcrow have undertaken a desktop TravelSmart workplace assessment to ascertain the site's most sustainable and practical transport modal use. This study includes the assessment of the following relevant areas within the TravelSmart workplace assessment guideline:

- Site population;
- Local environment;
- Public transport modes servicing the site;
- Cycling and walking;
- Carpooling;
- Traffic congestion;
- Vehicle parking (car, motorbike, scooter); and
- Flexible work arrangements.

11.1 Site Population

The TravelSmart workplace assessment analyses the total staff (including full-time staff; part-time staff and shift workers) and visitors to the site per day. Analysing the type of staff for office land use has a greater influence on mitigating the peak hour traffic generation of the site than mitigating the parking supply required for the site.

Peak hour traffic generation can be managed by offices scheduling alternate work times for full-time staff as a mechanism to spread the length of peak arrival and departure traffic flows of staff against the peak hour traffic periods of the surrounding road network.

It should be noted that data is not available on the estimated part-time staff numbers for the Carseldine GOP. As a conservative measure, it is assumed that there are no part-time staff numbers that could potentially mitigate the parking supply requirements for the site.

11.2 Local Environment

The Carseldine GOP is located on the corner of Beams Road / Dorville Road as defined in Section 3. The subject site is located approximately 200 metres to the west of the Carseldine Railway Station. This station is located on the Caboolture Line which forms a strategic component of Queensland Rail's network and TransLink Transit Authorities public transport operations.

Proximate to the subject site, Brisbane Transport provides several bus routes that service the area, including routes 335 and 339 which depart from Taigum shopping centre to the east, and routes 340, 341 and 344 which depart from Beams Road along the subject site frontage.

There are existing cycle routes along the Cabbage Tree Creek through Carseldine, Sandgate Road, and a connection between the Carseldine precinct and the subject site. Shared cycle / pedestrian paths are currently provided on both Beams Road and Dorville Road.

11.3 Public Transport Modes Servicing the Site

The public transport modes that service the Carseldine GOP, in the form of trains and buses, are presented in **Section 3.3**.

The accessibility and convenience of the train services to Carseldine Railway Station compared to private car commuting have been assessed and presented in **Table 11.1**. The comparison compares the estimated travel times and direct costs of making the trip as well as available park and ride facilities.

Table 11.1 AM Period Train vs Private Car Journey Comparison to Carseldine

Journey (from Railway Station)	Distance to Carseldine Railway Station (km)		Car Trip		Train Trip		Park & Ride Spaces	Estimated Train Benefit	
	Road	Rail	Travel Time (min)	Cost	Travel Time (min)	Cost		Travel Time (min)	Cost
Caboolture	34.6	33	33	$5.19	35	$4.72	675	-2	$1.85
Morayfield	32.8	30	31	$4.92	32	$4.72	233	-1	$1.51
Burpengary	26.2	24	27	$3.93	27	$4.14	417	0	$0.84
Narangba	22.4	19	24	$3.36	23	$4.14	363	1	$0.12
Dakabin	22.2	16	26	$3.33	19	$3.68	22	7	$0.54
Petrie	12.5	11	23	$1.88	14	$3.68	520	9	-$1.31
Lawnton	11.5	9	22	$1.73	12	$3.11	159	10	-$0.93
Bray Park	8.8	7	18	$1.32	9	$3.11	152	9	-$1.44
Strathpine	7.7	6	16	$1.16	7	$3.11	398	9	-$1.65
Bald Hills	5.6	4	12	$0.84	4	$2.65	147	8	-$1.59
Zillmere	2.2	2	4	$0.33	2	$2.65	218	2	-$2.23

Journey (from Railway Station)	Distance to Carseldine Railway Station (km)		Car Trip		Train Trip		Park & Ride Spaces	Estimated Train Benefit	
	Road	Rail	Travel Time (min)	Cost	Travel Time (min)	Cost		Travel Time (min)	Cost
Geebung	3.9	3	7	$0.59	4	$3.11	35	3	-$2.37
Sunshine	5.6	4	10	$0.84	6	$3.11	82	4	-$2.05
Virginia	6.6	5	10	$0.99	8	$3.11	20	2	-$1.86
Northgate	7.8	7	15	$1.17	11	$3.11	383	4	-$1.63
Nundah	9.2	8	17	$1.38	13	$3.68	176	4	-$1.93
Toombul	9.9	9	18	$1.49	15	$3.68	104	3	-$1.80
Eagle Junction	11	10	17	$1.65	17	$3.68	123	0	-$1.59
Wooloowin	10.4	11	20	$1.56	19	$3.68	189	1	-$1.70
Albion	11.1	12	20	$1.67	21	$3.68	292	-1	-$1.57

The car costs relate to the average running cost of 19 cents per kilometre identified by RACQ which combine the costs associated with fuel consumption, tyre wearing, and vehicle servicing / repair costs per kilometre travelled. Train costs relate to the 2011 Translink fare schedule for each respective journey. For car journeys, road distances and travel times have been measured from the Google Map directions estimating function. Travel times derived in this manner would yield a conservative approach as peak hour travel time delays are not generally counted within this analysis. However, it should be noted that travel times for the sections of the Bruce Highway between Boundary Road and Beams Road and Gympie Road between Anzac Avenue and the Hoyland Street ramps have considered the results of DTMR's 2009 travel time surveys.

The journey travel time and cost estimations presented in **Table 11.1** indicate that generally the train travel times are the same, if not shorter than car journey times while the costs are slightly more expensive on the train with the exception of railway stations north of Petrie.

The most significant travel time savings on the train will potentially be made for railway stations north of Carseldine between Bald Hills and Dakabin.

The provision of park and ride facilities increases the catchment area of the train line beyond the traditional catchment area of the 1km radius surrounding railway stations. There are approximately 4,700 parking spaces available for stations between Albion and Caboolture. Therefore, there is ample opportunity for commuters to drive and park at railway stations that are conveniently located within their travel path to Carseldine. In particular, the stations north of Carseldine on the Caboolture line are generally surrounded by low density areas, whereas stations to the south are surrounded by medium-high density areas. Consequently it is envisaged that the northern railway stations are more attractive for park and ride travel to Carseldine as it is less convenient to walk to the station.

The accessibility and convenience of bus services to the Carseldine GOP site compared to private car commuting are presented in **Table 11.2.** The analysis compares the estimated travel times and direct car running costs of making the trip. Bus costs relate to the 2011

Translink fare schedule for each respective journey. For car journeys, road distances and travel times have been measured from the Google Map directions estimating function.

Table 11.2 AM Period Bus vs Private Car Journey Comparison to Carseldine

Journey (from Bus Stop)	Distance to Carseldine GOP (km)		Car Trip		Bus Trip		Estimated Bus Benefit	
	Bus Path	Short Car Path	Travel Time (min)	Cost	Travel Time (min)	Cost	Travel Time (min)	Cost
Taigum	2.2	2.2	5	$0.42	4	$2.65	1	-$2.23
Bridgeman Downs	2.8	2.8	6	$0.53	8	$2.65	-2	-$2.12
Aspley	3	5.2	6	$0.57	15	$3.68	-9	-$3.11
Chermside	5.5	8.2	10	$1.05	27	$3.68	-17	-$2.64
Stafford	8.5	11.9	15	$1.62	29	$3.68	-14	-$2.07
Lutwyche	9.6	12.6	15	$1.82	36	$3.68	-21	-$1.86
Wilston	11.4	14.8	20	$2.17	36	$3.68	-16	-$1.51
Fortitude Valley	14.1	19	25	$2.68	48	$3.68	-23	-$1.00
Brisbane CBD	15.4	20.5	27	$2.93	52	$3.68	-25	-$0.75

Again, the results form a conservative estimate of public transport benefit, since the travel times do not incorporate vehicle delay that would be experienced during peak hour traffic conditions.

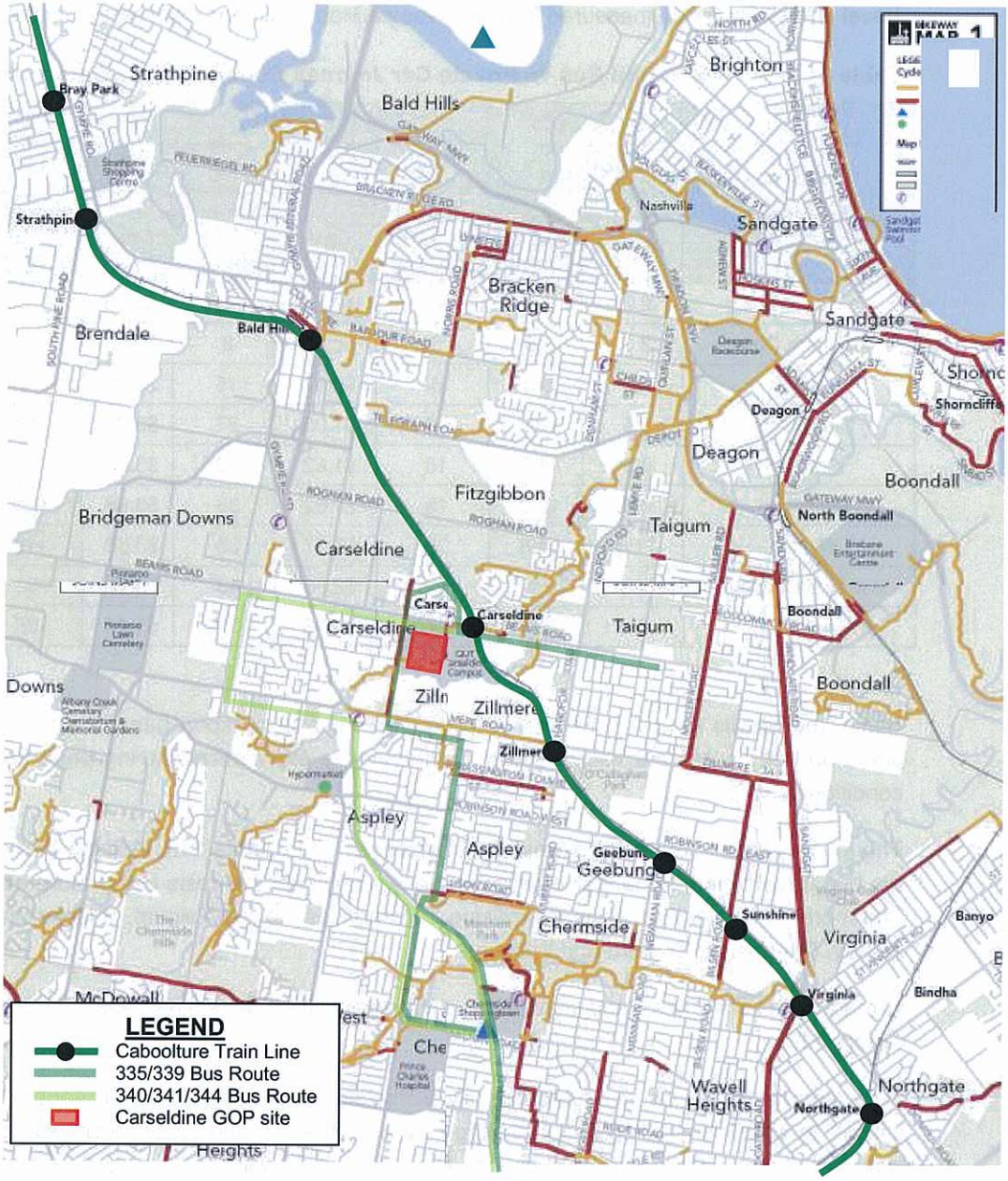
The journey travel time and cost estimations presented in **Table 11.2** indicate that generally the bus travel times are longer than car journey along with the costs being more expensive. The more convenient locations for utilising bus services include Taigum, Bridgeman Downs, Aspley, Chermside, Stafford and Wilston.

A map of the train lines and bus routes surrounding the Carseldine GOP are provided in **Figure 11.1**.

With regards to bus service utilisation by Carseldine GOP staff, it is envisaged it will be difficult to significantly increase patronage through the existing limited services available. However, it is expected that bus service utilisation by staff will significantly increase with the construction of the Kedron to Bracken Ridge busway.

Given the site's close proximity to Carseldine Railway Station, it is expected that the Carseldine GOP will be able to achieve a modal split for trains significantly higher than Brisbane's average even without the implementation of a TravelSmart program due to its close proximity to the site. Halcrow believe train ridership can be further increased by staff with the implementation of a TravelSmart program that highlights the above mentioned cost and travel time comparisons and other TravelSmart identified benefits such as increased relaxation and free time; potential exercise opportunities and health improvement; and the wider benefits to the community and environment.

Figure 11.1 Carseldine GOP Surrounding Public Transport Lines



11.4 Cycling and Walking

The cycling and walking facilities that service the Carseldine GOP are presented in **Section 3.4**. TravelSmart identifies research that indicates the greatest travel time benefits for cycling in comparison to car travel are achieved for distances less than 5km. Depending on the cycling speed, TravelSmart indicates that cycling a distance of 5km can take anywhere between 12 and 20 minutes. In view of this, it is estimated that the 5km radius area of the Carseldine GOP would be the equivalent of the "No Excuse Zone" established for Brisbane CBD workers that can ride to work within 30 minutes.

In relation to walking, TravelSmart notes the average person can walk approximately one kilometre every 15 minutes.

In view of these findings, it is assumed that the areas most suitable for cycling and walking to the Carseldine GOP are within a 5km and 1km radius respectively which are illustrated in **Figure 3.2**.

As presented in **Figure 3.2**, the area within a 1km radius of the Carseldine GOP comprises of residential subdivision dwellings catchments that total a population of approximately 4000. According to 2006 census data, the 5km radius zone incorporated a population of approximately 108,000 which has been projected to increase to 115,000 people in 2011.

The area within a 5km radius of the Carseldine GOP includes strong bikeway connectivity to the northeast which includes the suburbs of Taigum, Deagon, Boondall, Bracken Ridge, Sandgate and Shorncliffe. There is also good bikeway connectivity through to areas of Bridgeman Downs and McDowall which are located to the southwest of the site within a 5km radius.

Other residential areas within a 5km radius of the site, primarily to the south and east including Aspley, Chermside and Geebung, have a disconnected bikeway network to the site. The disconnected areas are mainly between 2-3km from the site and it should be noted that there are significant segments of bikeways within these areas.

DTMR's Connecting SEQ 2031 identifies in **Figure 9.4** that approximately 26% of journey to work trips in Brisbane are less 5km in length. This equates to approximately 250 staff (or 0.22% of total population) at the Carseldine GOP being located within the "No Excuse Zone" for active transport.

Halcrow are of the view that the Carseldine GOP is well serviced by bikeway facilities within a 5km radius and a reasonable population within a 1km radius that are suited to walking. This will allow the site to implement a TravelSmart strategy that can effectively highlight to staff the benefits of walking and cycling and in doing so, increase the proportion of staff adopting active transport modes. Example TravelSmart strategies that have been identified to assist in the promotion of cycling and walking include the following:

- Participation in the Queensland and National 'Ride to Work' and 'Walk to Work' days;
- 'Fuel for your feet' health information sessions;
- Establishment of a 'bike buddy' network within the office which assists in rider confidence, best route choice finding and riding skills on the road network;
- Self defence classes at assist those with personal safety concerns associated with active transport; and
- Cycling skills and bicycle maintenance workshops aimed at extracting the maximum benefits of cycling to work.

A further measure that can be adopted by the Carseldine GOP to increase the use of cycling is to provide end-of-trip facilities that exceed the minimum Queensland Development Code requirements which include 49 bicycle parking spaces. Halcrow recommends the provision of 70 bicycle parking spaces and associated end-of-trip facilities required to compliment this level of supply which would assist in achieving a 6% cycling and 3% walking mode share. The provision of additional bicycle parking spaces will result in an increase of ancillary end of trip facilities to remain consistent with the Queensland Development Code requirements as shown in **Table 11.3**.

Table 11.3 Queensland Development Code End of Trip Facility Requirements

Element	Queensland Development Code Rates	Recommendations for Carseldine GOP
Bicycle Parking Spaces	5% of number of employees – Increased to 70 spaces	70 spaces
Lockers	1.6 locker per 1 bicycle parking space	112 lockers
Change Rooms	1 male and 1 female change room	2 change rooms
Showers	2 male and 2 female showers plus 1 additional for each sex for every additional 20 bicycle spaces	8 showers
Sanitary Compartments	2 sanitary compartments for each sex	4 sanitary compartments
Wash Basins	1 wash basin for each sex	2 basins

11.5 Carpooling

Carpooling is where people share a car to a destination to reduce travel costs, fuel use, pollution and traffic congestion. TravelSmart indicates that on average, 1.09 people occupy vehicles being used to commute to work. With higher awareness induced by the proposed TravelSmart initiative, it is envisaged that the carpooling program within TravelSmart is capable of achieving a higher than average vehicle occupancy rate for workplaces.

The TravelSmart program identifies the following benefits that can be attained for staff by choosing to carpool:

- Environmental – through a reduction in cars on the road and the consequent reduction in traffic congestion and vehicle emissions;
- Cost savings – through a sharing of travel costs associated with private car travel (i.e. fuel consumption, tyre wearing, and servicing / maintenance); and
- Travel time savings – through the use of high vehicle occupancy transit lanes.

For Carseldine GOP staff that elect to carpool, there will be environmental and cost benefits. However, it will be difficult to achieve travel time savings as there are no high vehicle occupancy transit lanes in the surrounding road network. As an offset to the potential lack of travel time savings, the Carseldine GOP could introduce the carpooling promotional measure of allocating the most conveniently located and desirable car parking spaces to carpooling vehicles.

A carpooling program can be established for staff that identifies the following options that staff may be open to carpooling with:

- Identify staff that live within the same postcode; and
- Identify convenient pick up points along routes of long distance travelling staff that are suitably located for short distance travelling staff which minimise the impact on travel time.

The implementation of the carpooling program at the Carseldine GOP would also have to include establishing TravelSmart guidelines on carpooling organising and operational etiquette as well as fundamental carpooling rules to ensure the program endures.

11.6 Traffic Congestion

The traffic congestion analysis of the surrounding road network is presented in **Section 7**. The analysis found that with the car parking supply recommended in **Section 4**, the surrounding road network will operate satisfactorily through to 2021.

11.7 Vehicle Parking (car, motorbike, scooter)

As presented in **Section 4**, the existing parking supply for employees for the Carseldine GOP is 521 parking spaces (includes 10 motorcycle spaces), with an additional 11 motorcycle spaces provided. This motorcycle parking supply is approximately 4% of total parking supply which is double BCC's recommended motorcycle parking supply of 2%.

Therefore, given the Carseldine GOP has the capacity to promote a high level of motorcycle use, it is recommended that motorcycle use promotions are included in the TravelSmart program.

11.8 Flexible Work Arrangements

Flexible work arrangements that have the ability to be implemented at the Carseldine GOP include flexible working hours, which influence peak period traffic generation volumes, and compressed work weeks, which influences car parking demand and peak period traffic generation volumes. TravelSmart research indicates that flexible work arrangements are an effective tool for improving staff job satisfaction and work / lifestyle balance; increasing organisational working hours without increasing pay; and increasing workplace productivity and time management.

As an example, the following flexible working hour options could be implemented for the Carseldine GOP as a means of mitigating the extent of peak hour traffic generation on the surrounding road network from the site:

- 20% of full-time staff work from 7am to 4pm;
- 60% of full-time staff work from 8am to 5pm; and
- 20% of full-time staff work from 9am to 6pm.

The implementation of staff shift arrangements along the lines of the above would ensure that the peak morning and afternoon traffic generation would be more evenly spread across two hour periods as opposed to the traditional majority of trips being made during a one hour period. Assuming there is some overlapping of the above shift arrangements, it could be estimated that the proportion of staff arriving and departing within the peak hour traffic periods could be between 60%-70%. With regards to compressed working weeks, offices can implement working hours which enable staff to work nine day fortnights. The implementation of compressed working weeks for staff will only reduce car parking demand for the site if there is an even distribution of staff being allocated a day off work across the 10 working days within the fortnight. This would effectively reduce the car parking demand for the site by approximately 10%.

11.9 TravelSmart Action Plan

Based on the TravelSmart assessment presented in **Sections 11.1 to 11.8** for the Carseldine GOP, Halcrow believe the estimated travel mode shares presented in **Table 11.4** are achievable targets for the site. The proportions were calculated based on the provision of 535 staff parking spaces and a public transport mode share target of 25%.

It is important to note that it is expected that active transport and bus service utilisation for the Carseldine GOP staff will be significantly higher in the future with the development of the FUDA and Kedron to Bracken Ridge busway. These initiatives will further reduce the need for parking which may in turn lead to lower levels of parking utilisation of the current proposed parking supply.

Table 11.4 Target Carseldine GOP Transport Mode Share

Transport Mode	Target		Action Required
	Proportion	Staff Numbers	
Private car driver	55%	535	Current provision of parking spaces for employees on the Carseldine GOP site.
Private car passenger	11%	110	Estimated increase in vehicle occupancy to 1.2 from baseline Brisbane rate of 1.1.
Private car drop-off	1%	10	No change to private car drop-off trips.
Walk	2%	19	Assumed no increase from 2% estimated baseline.
Bicycle	4%	39	Assumed no increase in bicycle work trips compared to the estimated 4% baseline bicycle mode share. (This equates to an approximate 55% utilisation of the bicycle parking supplied for employees)
Bus	4%	35	A lower than existing Brisbane Bus mode share for work trips, however there will be an overall increase of people by Public Transport compared to the existing PT usage for the area.
Train	21%	199	Overall increase of 7% from 2008 existing estimate of public transport usage in Brisbane.
Motorcycle	2%	19	Estimated 9 new motorcycle / scooter trips on top of BCC motorcycle provision rate of 10 spaces (assumed 90% utilisation of existing supply of 21 motorcycle spaces).
Taxi	0.5%	5	No change to estimated baseline taxi mode splits for work trips in Brisbane.

12. Zillmere Contact Centre Survey

To supplement the traffic generation assumptions adopted for this study, Halcrow undertook a traffic generation survey of the Zillmere Contact Centre (ZCC). The ZCC is considered to be similar in nature to the proposed Carseldine GOP Site as both sites are located within 200m of a railway station and are state governmental office land use.

Notable dissimilarities between the two sites are that the Carseldine GOP has stronger bus, walking, and cycling facilities. The ZCC is also located within a commercial / industrial zone with no immediately surrounding residential dwellings. Consequently it is envisaged that the accessibility of the Carseldine GOP site is more conducive to non-private car transportation modes.

Information provided in Lambert and Rehbein Traffic Impact Assessment[2] of the ZCC indicates that the site comprises of 6,780m^2 GFA with approximately 400 full-time call centre staff and approximately 50 additional long term training staff.

12.1 Traffic Generation Survey Results

Halcrow undertook AM and PM peak period traffic generation surveys at the two access points for the Zillmere Contact Centre between 7:00AM - 9:00AM and 4:00PM - 6:00PM on Wednesday 22nd June 2011. The observed AM (7:15 AM - 8:15 AM) and PM (4:00 PM - 5:00PM) peak hour traffic volumes are presented in **Table 12.1**.

Table 12.1 Zillmere Contact Centre Traffic Generation Survey Results

Movement	Peak Hour Period		Land Use Traffic Generation Rate (vte per 100m^2 GFA)		Staff Traffic Generation Rate (vte per staff)	
	AM	PM				
Staff Access In	52	0				
Staff Access Out	0	35				
Staff Access Total	52	35				
Visitor Access In	42	2				
Visitor Access Out	3	45				
Visitor Access Total	45	47	AM	PM	AM	PM
Combined Access Total	97	82	1.43	1.21	0.22	0.18
Est. Contact Centre Total	75	59	1.11	0.87	0.17	0.13

The traffic generation survey of the ZCC indicates that the site generates approximately between 1-1.5vte per 100m^2 GFA during the AM and PM peak hour periods. In comparison, this is at a lower level than the traditional traffic engineering practice office generation rate (2vte per 100m^2 GFA) and the ULDA recommended rate (2.88vte per 100m^2 GFA).

[2] Lambert and Rehbein, *Zillmere Joint Contact Centre (JCC) – Traffic Impact* Assessment, for Project Services (June 2008)

13. Conclusion

Findings and conclusions from Halcrow's traffic engineering assessment of the proposed Government Office Precinct at the former Carseldine QUT Campus are:

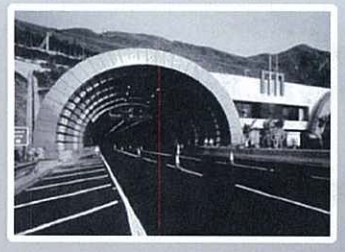
- The parking provision at the site is proposed to be 600 parking spaces and is broken down as follows:
    - 525 staff car parking spaces (including 42 existing spaces which are provided on the site's internal road);
    - 8 car parking spaces for the childcare centre;
    - 6 car parking spaces for the QUT research field station (Building G);
    - 21 motorcycle parking spaces (15 of which are provided on the site's internal road); and
    - 40 proposed additional visitor parking spaces.

  These figures include nine PWD parking spaces proposed on the site, including three existing designated spaces adjacent to Building C, three proposed spaces adjacent to Building E and three propose spaces adjacent to Building A.

  The study has found that the proposed parking supply as detailed above is expected to be adequate for the site.

- The site has adequate provision of service vehicle bays, however some of these bays are not clearly defined. It is recommended that the proposed 11 van bays, two Small Rigid Vehicle Bays and two Medium Rigid Vehicle bays be clearly marked as detailed in **Section 9**.
- Access to the site is via two existing accesses on Beams Road and Dorville Road. Both accesses are designed to a Type C2 standard and allow a Large Rigid Vehicle to enter and exit the site.
- Public transport and active transport modes such as walking and cycling are well catered for at the subject site. There are multiple pedestrian paths and cycle path connections both internally and externally and end-of-trip facilities are proposed for the office precinct buildings. The site is within 200m of the Carseldine Railway Station and a Busway Station is proposed to be located adjacent to the site.
- End of trip facilities are proposed to be provided at the Carseldine GOP as detailed in **Section 10**.
- The site is expected to generate a total of 423 vehicle trip ends in the morning and evening peak hours. These trips are made up of the existing 61 trips generated by the childcare centre and the QUT research facility, while the additional trips are generated by the Carseldine GOP.
- The traffic impact assessment found that the site is not expected to create any adverse impacts on the surrounding road network through to 2021 provided the following ameliorative works are provided:

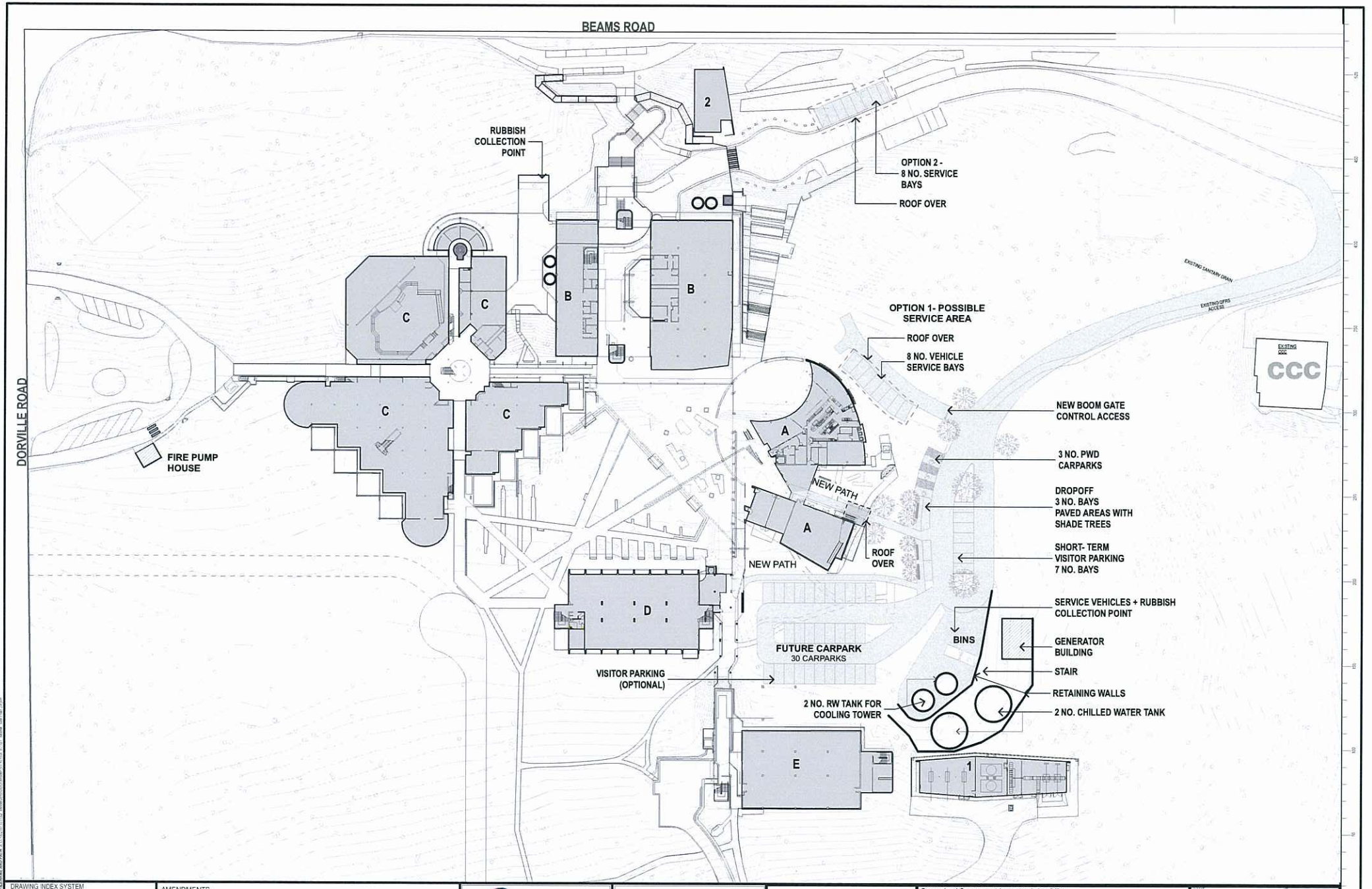
- Ban right turn movements from the site onto Beams Road by approximately 2015; **or**
- Relocate the Beams Road / Site Access intersection to align with the signalised Beams Road / Balcara Avenue intersection to form a four-way signalised intersection; and
- Alter the southern approach of the Beams Road / Dorville Road roundabout to accommodate left turns from the two approach lanes (i.e. one short left turn lane plus a shared all movements lane).




Appendices

Halcrow

Appendix A - Site Plan



DRAWING INDEX SYSTEM
FOR PROJECT SERVICES - LOG ST CS USE ONLY

- CEILING PLANS
- CONSTRUCTION DETAILS
- ELEVATIONS
- EXTERNAL WORKS
- FLOOR PLANS
- FURNITURE & EQUIPMENT
- HYDRAULICS
- MASTER PLAN
- MISCELLANEOUS DETAILS
- OTHER
- PLAY STRUCTURES
- ROOF PLANS
- SECTIONS
- SET OUT PLAN
- SITE PLAN
- STANDARDS

AMENDMENTS

ISSUE	DATE	SUBJECT	AUTHORISED

Queensland Government
CONSULTANT
Project Services
Department of Public Works

DLO	26/07/2011	
DRAWN	DATE	
A.Papi	26/07/2011	
D.SCPLNE TEAM LEADER	DATE	
J.Tainton	26/07/2011	
AUTHORISED FOR ISSUE	DATE	

Queensland Government Accommodation Office

CARSELDINE GOVERNMENT OFFICE PRECINCT

REFURBISHMENT OF EXISTING BUILDINGS

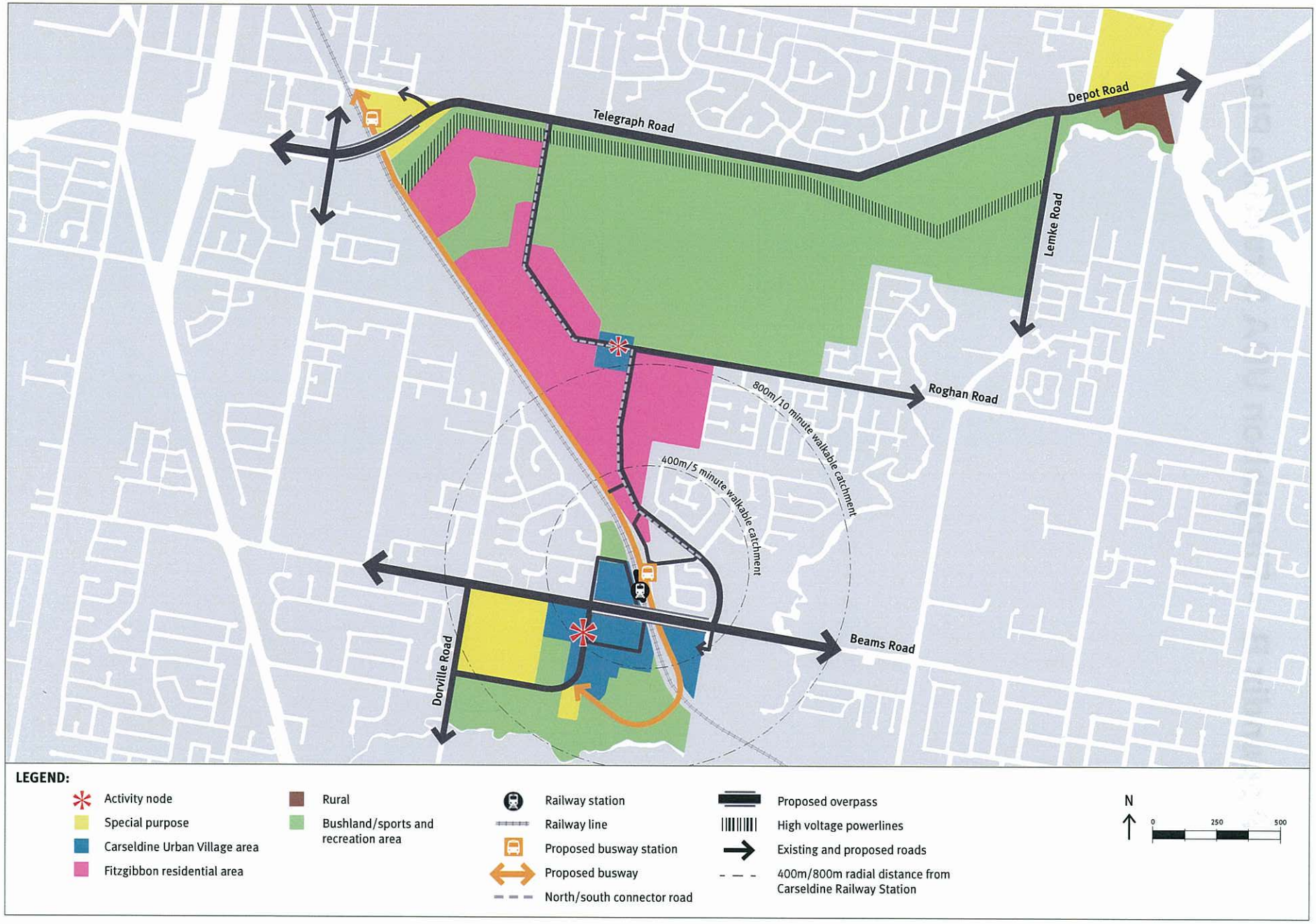
532 BEAMS ROAD CARSELDINE

ALTERNATE MAIN ENTRANCE

SCALE	A1 SIZE
1:500	
MASTER SITE NUMBER	CLIENT REFERENCE NUMBER
37002	
DRAWING NUMBER	ISSUE / SHEET NO
67101 / DD / A 01.09	

Appendix B - Fitzgibbon UDA Structure Plan

Map 2: Fitzgibbon Urban Development Area structure plan



Appendix C – SIDRA Movement Summaries

MOVEMENT SUMMARY

Site: Bea_Dor_2011_BC_AM

Beams Road / Dorville Road, Carseldine
2011 Base Case
AM Peak Period
Roundabout

Movement Performance - Vehicles

Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Dorville Road											
1	L	118	2.0	0.110	7.8	LOS A	0.6	4.4	0.47	0.65	48.2
2	T	13	0.0	0.104	6.9	LOS A	0.6	3.9	0.48	0.58	48.0
3	R	86	1.0	0.103	12.7	LOS B	0.6	3.9	0.48	0.76	44.9
Approach		217	1.5	0.110	9.7	LOS B	0.6	4.4	0.48	0.69	46.7
East: Beams Road											
4	L	173	5.0	0.304	8.8	LOS A	2.0	15.1	0.56	0.72	48.0
5	T	405	11.0	0.304	8.0	LOS A	2.0	15.1	0.57	0.68	48.2
6	R	4	0.0	0.301	13.7	LOS B	1.9	14.9	0.57	0.89	45.2
Approach		582	9.1	0.304	8.3	LOS B	2.0	15.1	0.57	0.69	48.1
North: Dorville Road											
7	L	26	0.0	0.071	11.5	LOS B	0.3	2.4	0.66	0.85	45.8
8	T	86	4.0	0.153	9.0	LOS A	0.8	6.1	0.67	0.76	47.1
9	R	43	0.0	0.153	14.4	LOS B	0.8	6.1	0.67	0.95	44.3
Approach		156	2.2	0.152	10.9	LOS B	0.8	6.1	0.67	0.83	46.0
West: Beams Road											
10	L	15	0.0	0.461	7.0	LOS A	3.9	28.4	0.32	0.58	49.4
11	T	904	6.0	0.463	6.0	LOS A	3.9	28.4	0.33	0.48	49.8
12	R	356	2.0	0.463	11.7	LOS B	3.8	27.6	0.33	0.71	45.7
Approach		1275	4.8	0.464	7.6	LOS B	3.9	28.4	0.33	0.54	48.6
All Vehicles		2229	5.4	0.464	8.2	LOS A	3.9	28.4	0.43	0.62	48.1

Level of Service (Aver. Int. Delay): LOS A. Based on average delay for all vehicle movements. LOS Method: Delay (HCM).
Level of Service (Worst Movement): LOS B. LOS Method for individual vehicle movements: Delay (HCM).
Approach LOS values are based on the worst delay for any vehicle movement.
Roundabout LOS Method: Same as Signalised Intersections.
Roundabout Capacity Model: SIDRA Standard.

MOVEMENT SUMMARY

Site: Bea_Dor_2011_BC_PM

Beams Road / Dorville Road, Carseldine
2011 Base Case
PM Peak Period
Roundabout

Movement Performance - Vehicles

Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Dorville Road											
1	L	427	0.0	0.480	10.1	LOS B	3.4	23.9	0.71	0.90	46.9
2	T	88	4.0	0.352	9.3	LOS A	2.0	14.6	0.68	0.80	46.8
3	R	156	2.0	0.353	15.0	LOS B	2.0	14.6	0.68	0.95	43.6
Approach		672	1.0	0.479	11.1	LOS B	3.4	23.9	0.70	0.90	46.0
East: Beams Road											
4	L	127	2.0	0.419	7.4	LOS A	3.2	22.7	0.41	0.62	48.9
5	T	909	4.0	0.419	6.4	LOS A	3.2	22.7	0.42	0.54	49.3
6	R	19	6.0	0.421	12.3	LOS B	3.1	22.5	0.42	0.82	46.3
Approach		1056	3.8	0.420	6.7	LOS B	3.2	22.7	0.42	0.56	49.2
North: Dorville Road											
7	L	16	13.0	0.032	11.1	LOS B	0.1	1.2	0.59	0.75	46.2
8	T	36	3.0	0.065	7.5	LOS A	0.3	2.5	0.56	0.64	47.9
9	R	24	0.0	0.065	13.2	LOS B	0.3	2.5	0.56	0.84	45.2
Approach		76	4.1	0.065	10.1	LOS B	0.3	2.5	0.57	0.73	46.7
West: Beams Road											
10	L	51	0.0	0.320	7.6	LOS A	2.3	16.9	0.46	0.65	48.7
11	T	547	5.0	0.320	6.7	LOS A	2.3	16.9	0.47	0.57	48.8
12	R	139	0.0	0.320	12.4	LOS B	2.3	16.4	0.47	0.78	45.7
Approach		737	3.7	0.320	7.8	LOS B	2.3	16.9	0.47	0.61	48.2
All Vehicles		2540	3.0	0.479	8.3	LOS A	3.4	23.9	0.51	0.67	47.9

Level of Service (Aver. Int. Delay): LOS A. Based on average delay for all vehicle movements. LOS Method: Delay (HCM).
Level of Service (Worst Movement): LOS B. LOS Method for individual vehicle movements: Delay (HCM).
Approach LOS values are based on the worst delay for any vehicle movement.
Roundabout LOS Method: Same as Signalised Intersections.
Roundabout Capacity Model: SIDRA Standard.

MOVEMENT SUMMARY

Site: Bea_Dor_2011_PC_AM

Beams Road / Dorville Road, Carseldine
2011 Project Case
AM Peak Period
Roundabout

Movement Performance - Vehicles

Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Dorville Road											
1	L	132	2.0	0.125	7.9	LOS A	0.7	5.0	0.49	0.66	48.1
2	T	14	0.0	0.109	7.0	LOS A	0.6	4.1	0.49	0.59	47.9
3	R	86	1.0	0.108	12.8	LOS B	0.6	4.1	0.49	0.77	44.8
Approach		232	1.5	0.125	9.7	LOS B	0.7	5.0	0.49	0.70	46.8
East: Beams Road											
4	L	173	5.0	0.325	9.1	LOS A	2.2	16.8	0.60	0.74	47.8
5	T	419	11.0	0.325	8.4	LOS A	2.2	16.8	0.61	0.71	48.0
6	R	5	0.0	0.329	14.1	LOS B	2.1	16.4	0.61	0.90	44.9
Approach		597	9.2	0.325	8.7	LOS B	2.2	16.8	0.61	0.72	47.9
North: Dorville Road											
7	L	29	0.0	0.077	11.8	LOS B	0.4	2.7	0.68	0.86	45.4
8	T	91	4.0	0.167	9.3	LOS A	1.0	6.8	0.70	0.79	46.9
9	R	43	0.0	0.167	14.8	LOS B	1.0	6.8	0.70	0.96	44.1
Approach		163	2.2	0.167	11.2	LOS B	1.0	6.8	0.69	0.85	45.8
West: Beams Road											
10	L	15	0.0	0.491	7.0	LOS A	4.4	32.1	0.34	0.58	49.3
11	T	954	6.0	0.499	6.1	LOS A	4.4	32.1	0.35	0.48	49.7
12	R	405	2.0	0.499	11.8	LOS B	4.3	31.2	0.35	0.71	45.6
Approach		1374	4.8	0.499	7.8	LOS B	4.4	32.1	0.35	0.55	48.4
All Vehicles		2365	5.4	0.499	8.4	LOS A	4.4	32.1	0.45	0.63	47.9

Level of Service (Aver. Int. Delay): LOS A. Based on average delay for all vehicle movements. LOS Method: Delay (HCM).
Level of Service (Worst Movement): LOS B. LOS Method for individual vehicle movements: Delay (HCM).
Approach LOS values are based on the worst delay for any vehicle movement.
Roundabout LOS Method: Same as Signalised Intersections.
Roundabout Capacity Model: SIDRA Standard.

MOVEMENT SUMMARY

Site: Bea_Dor_2011_PC_PM

Beams Road / Dorville Road, Carseldine
2011 Project Case
PM Peak Period
Roundabout

Movement Performance - Vehicles

Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Dorville Road											
1	L	477	0.0	0.551	10.8	LOS B	4.3	30.1	0.76	0.95	46.2
2	T	93	4.0	0.380	9.8	LOS A	2.3	16.2	0.70	0.85	46.6
3	R	156	2.0	0.380	15.5	LOS B	2.3	16.2	0.70	0.96	43.2
Approach		725	0.9	0.551	11.7	LOS B	4.3	30.1	0.74	0.94	45.6
East: Beams Road											
4	L	127	2.0	0.445	7.5	LOS A	3.4	24.9	0.44	0.63	48.8
5	T	959	4.0	0.445	6.6	LOS A	3.4	24.9	0.45	0.56	49.1
6	R	22	6.0	0.442	12.4	LOS B	3.4	24.6	0.45	0.82	46.2
Approach		1108	3.8	0.445	6.8	LOS B	3.4	24.9	0.45	0.57	49.0
North: Dorville Road											
7	L	17	13.0	0.034	11.1	LOS B	0.2	1.2	0.60	0.76	46.3
8	T	37	3.0	0.067	7.6	LOS A	0.4	2.6	0.57	0.65	47.9
9	R	24	0.0	0.067	13.2	LOS B	0.4	2.6	0.57	0.84	45.2
Approach		78	4.2	0.067	10.1	LOS B	0.4	2.6	0.58	0.73	46.6
West: Beams Road											
10	L	51	0.0	0.332	7.6	LOS A	2.5	17.9	0.48	0.65	48.6
11	T	561	5.0	0.334	6.7	LOS A	2.5	17.9	0.48	0.57	48.7
12	R	152	0.0	0.333	12.4	LOS B	2.4	17.3	0.48	0.78	45.6
Approach		763	3.7	0.333	7.9	LOS B	2.5	17.9	0.48	0.62	48.0
All Vehicles		2675	3.0	0.551	8.5	LOS A	4.3	30.1	0.54	0.69	47.7

Level of Service (Aver. Int. Delay): LOS A. Based on average delay for all vehicle movements. LOS Method: Delay (HCM).
Level of Service (Worst Movement): LOS B. LOS Method for individual vehicle movements: Delay (HCM).
Approach LOS values are based on the worst delay for any vehicle movement.
Roundabout LOS Method: Same as Signalised Intersections.
Roundabout Capacity Model: SIDRA Standard.

MOVEMENT SUMMARY

Site: Bea_Bal_2011_BC_AM

Beams Road / Balcara Street, Carseldine
2011 Base Case
AM Peak Period
Signals - Fixed Time Cycle Time = 120 seconds (User-Given Cycle Time)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
East: Beams Road											
5	T	478	11.0	0.181	5.5	LOS A	5.8	44.5	0.34	0.29	50.7
6	R	23	14.0	0.149	53.3	LOS D	1.7	13.6	0.87	0.71	24.4
Approach		501	11.1	0.181	7.7	LOS A	5.8	44.5	0.36	0.31	48.3
North: Balcara Avenue											
7	L	68	0.0	0.543	32.1	LOS C	3.6	24.9	0.65	0.73	31.8
9	R	44	2.0	0.138	53.5	LOS D	3.2	22.8	0.88	0.74	24.3
Approach		113	0.8	0.543	40.5	LOS D	3.6	24.9	0.74	0.74	28.3
West: Beams Road											
10	L	46	2.0	0.548	30.2	LOS C	21.3	155.5	0.74	0.93	34.3
11	T	985	5.0	0.547	21.9	LOS C	21.4	156.2	0.74	0.66	35.7
Approach		1032	4.9	0.547	22.3	LOS C	21.4	156.2	0.74	0.67	35.7
All Vehicles		1645	6.5	0.547	19.1	LOS B	21.4	156.2	0.63	0.57	38.0

Level of Service (Aver. Int. Delay): LOS B. Based on average delay for all vehicle movements. LOS Method: Delay (HCM).
Level of Service (Worst Movement): LOS D. LOS Method for individual vehicle movements: Delay (HCM).
Approach LOS values are based on average delay for all vehicle movements.

Movement Performance - Pedestrians

Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Average Back of Queue Distance m	Prop. Queued	Effective Stop Rate per ped
P3	Across E approach	53	54.2	LOS E	0.2	0.2	0.95	0.95
P5	Across N approach	53	18.7	LOS B	0.1	0.1	0.56	0.56
All Pedestrians		106	36.4				0.75	0.75

Level of Service (Aver. Int. Delay): LOS D. Based on average delay for all pedestrian movements. LOS Method: Delay (HCM).
Level of Service (Worst Movement): LOS E. LOS Method for individual pedestrian movements: Delay (HCM).

MOVEMENT SUMMARY

Site: Bea_Bal_2011_BC_PM

Beams Road / Balcara Street, Carseldine
2011 Base Case
PM Peak Period
Signals - Fixed Time Cycle Time = 120 seconds (User-Given Cycle Time)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
East: Beams Road											
5	T	1061	3.0	0.383	6.6	LOS A	13.1	94.1	0.41	0.37	49.1
6	R	55	4.0	0.331	65.4	LOS E	4.4	31.7	0.98	0.75	21.4
Approach		1116	3.0	0.383	9.5	LOS A	13.1	94.1	0.44	0.39	46.2
North: Balcara Avenue											
7	L	33	3.0	0.301	38.5	LOS D	2.0	14.2	0.73	0.71	29.1
9	R	60	2.0	0.187	54.0	LOS D	4.3	30.3	0.89	0.76	24.1
Approach		93	2.4	0.301	48.6	LOS D	4.3	30.3	0.83	0.74	25.7
West: Beams Road											
10	L	41	0.0	0.327	21.8	LOS C	12.2	89.5	0.55	0.94	38.9
11	T	677	6.0	0.328	13.6	LOS B	12.2	90.1	0.55	0.48	41.9
Approach		718	5.7	0.328	14.1	LOS B	12.2	90.1	0.55	0.51	41.7
All Vehicles		1926	4.0	0.383	13.1	LOS B	13.1	94.1	0.50	0.45	42.8

Level of Service (Aver. Int. Delay): LOS B. Based on average delay for all vehicle movements. LOS Method: Delay (HCM).
Level of Service (Worst Movement): LOS E. LOS Method for individual vehicle movements: Delay (HCM).
Approach LOS values are based on average delay for all vehicle movements.

Movement Performance - Pedestrians

Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Average Back of Queue Distance m	Prop. Queued	Effective Stop Rate per ped
P3	Across E approach	53	54.2	LOS E	0.2	0.2	0.95	0.95
P5	Across N approach	53	13.5	LOS B	0.1	0.1	0.48	0.48
All Pedestrians		106	33.8				0.71	0.71

Level of Service (Aver. Int. Delay): LOS D. Based on average delay for all pedestrian movements. LOS Method: Delay (HCM).
Level of Service (Worst Movement): LOS E. LOS Method for individual pedestrian movements: Delay (HCM).

MOVEMENT SUMMARY

Site: Bea_Bal_2011_PC_AM

Beams Road / Balcara Street, Carseldine
2011 Project Case
AM Peak Period
Signals - Fixed Time Cycle Time = 120 seconds (User-Given Cycle Time)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
East: Beams Road											
5	T	591	11.0	0.224	5.7	LOS A	7.2	54.9	0.35	0.31	50.4
6	R	23	14.0	0.151	54.3	LOS D	1.8	13.8	0.88	0.71	24.1
Approach		614	11.1	0.224	7.5	LOS A	7.2	54.9	0.37	0.32	48.4
North: Balcara Avenue											
7	L	68	0.0	0.551	33.0	LOS C	3.6	25.3	0.66	0.74	31.4
9	R	55	2.0	0.171	53.9	LOS D	3.9	27.9	0.89	0.75	24.2
Approach		123	0.9	0.551	42.3	LOS D	3.9	27.9	0.76	0.74	27.7
West: Beams Road											
10	L	49	2.0	0.556	29.7	LOS C	21.9	159.4	0.74	0.93	34.5
11	T	1016	5.0	0.556	21.5	LOS C	21.9	160.1	0.74	0.66	36.0
Approach		1065	4.9	0.556	21.9	LOS C	21.9	160.1	0.74	0.67	35.9
All Vehicles		1802	6.7	0.556	18.4	LOS B	21.9	160.1	0.61	0.56	38.5

Level of Service (Aver. Int. Delay): LOS B. Based on average delay for all vehicle movements. LOS Method: Delay (HCM).
Level of Service (Worst Movement): LOS D. LOS Method for individual vehicle movements: Delay (HCM).
Approach LOS values are based on average delay for all vehicle movements.

Movement Performance - Pedestrians

Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Average Back of Queue Distance m	Prop. Queued	Effective Stop Rate per ped
P3	Across E approach	53	54.2	LOS E	0.2	0.2	0.95	0.95
P5	Across N approach	53	18.2	LOS B	0.1	0.1	0.55	0.55
All Pedestrians		106	36.2				0.75	0.75

Level of Service (Aver. Int. Delay): LOS D. Based on average delay for all pedestrian movements. LOS Method: Delay (HCM).
Level of Service (Worst Movement): LOS E. LOS Method for individual pedestrian movements: Delay (HCM).

MOVEMENT SUMMARY

Site: Bea_Bal_2011_PC_PM

Beams Road / Balcara Street, Carseldine
2011 Project Case
PM Peak Period
Signals - Fixed Time Cycle Time = 120 seconds (User-Given Cycle Time)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
East: Beams Road											
5	T	1092	3.0	0.394	6.7	LOS A	13.5	97.2	0.42	0.37	49.0
6	R	55	4.0	0.364	66.8	LOS E	4.4	32.1	0.98	0.75	21.2
Approach		1146	3.0	0.394	9.5	LOS A	13.5	97.2	0.44	0.39	46.1
North: Balcara Avenue											
7	L	33	3.0	0.305	39.3	LOS D	2.0	14.4	0.73	0.71	28.8
9	R	62	2.0	0.194	54.1	LOS D	4.4	31.3	0.89	0.76	24.1
Approach		95	2.3	0.305	49.0	LOS D	4.4	31.3	0.84	0.74	25.6
West: Beams Road											
10	L	52	0.0	0.379	21.8	LOS C	14.2	103.7	0.57	0.94	38.9
11	T	789	6.0	0.379	13.6	LOS B	14.2	104.5	0.57	0.50	41.8
Approach		841	5.6	0.379	14.1	LOS B	14.2	104.5	0.57	0.53	41.6
All Vehicles		2082	4.1	0.394	13.2	LOS B	14.2	104.5	0.51	0.46	42.7

Level of Service (Aver. Int. Delay): LOS B. Based on average delay for all vehicle movements. LOS Method: Delay (HCM).
Level of Service (Worst Movement): LOS E. LOS Method for individual vehicle movements: Delay (HCM).
Approach LOS values are based on average delay for all vehicle movements.

Movement Performance - Pedestrians

Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Average Back of Queue Distance m	Prop. Queued	Effective Stop Rate per ped
P3	Across E approach	53	54.2	LOS E	0.2	0.2	0.95	0.95
P5	Across N approach	53	13.1	LOS B	0.1	0.1	0.47	0.47
All Pedestrians		106	33.6				0.71	0.71

Level of Service (Aver. Int. Delay): LOS D. Based on average delay for all pedestrian movements. LOS Method: Delay (HCM).
Level of Service (Worst Movement): LOS E. LOS Method for individual pedestrian movements: Delay (HCM).

MOVEMENT SUMMARY

Site: Dor_Den_2011_BC_AM

Dorville Road / Denver Road, Carseldine
2011 Base Case
AM Peak Period
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Dorville Road											
1	L	24	0.0	0.127	8.2	LOS A	0.0	0.0	0.00	1.02	49.0
2	T	218	3.0	0.127	0.0	LOS A	0.0	0.0	0.00	0.00	60.0
Approach		242	2.7	0.127	0.8	LOS A	0.0	0.0	0.00	0.10	58.7
North: Dorville Road											
8	T	632	0.0	0.324	0.0	LOS A	0.0	0.0	0.00	0.00	60.0
9	R	33	0.0	0.033	9.3	LOS A	0.1	1.0	0.33	0.65	47.4
Approach		664	0.0	0.324	0.5	LOS A	0.1	1.0	0.02	0.03	59.2
West: Denver Road											
10	L	36	0.0	0.169	16.5	LOS C	0.7	5.1	0.55	0.69	41.2
12	R	26	0.0	0.169	16.6	LOS C	0.7	5.1	0.55	0.86	41.2
Approach		62	0.0	0.169	16.5	LOS C	0.7	5.1	0.55	0.76	41.2
All Vehicles		968	0.7	0.324	1.6	NA	0.7	5.1	0.05	0.10	57.5

LOS (Aver. Int. Delay): NA. The average intersection delay is not a good LOS measure for two-way sign control due to zero delays associated with major road movements.

Level of Service (Worst Movement): LOS C. LOS Method for individual vehicle movements: Delay (HCM).

Approach LOS values are based on the worst delay for any vehicle movement.

SIDRA INTERSECTION

MOVEMENT SUMMARY

Site: Dor_Den_2011_BC_PM

Dorville Road / Denver Road, Carseldine
2011 Base Case
PM Peak Period
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Dorville Road											
1	L	55	0.0	0.397	8.2	LOS A	0.0	0.0	0.00	1.04	49.0
2	T	713	1.0	0.397	0.0	LOS A	0.0	0.0	0.00	0.00	60.0
Approach		767	0.9	0.397	0.6	LOS A	0.0	0.0	0.00	0.07	59.1
North: Dorville Road											
8	T	284	2.0	0.148	0.0	LOS A	0.0	0.0	0.00	0.00	60.0
9	R	33	0.0	0.061	13.7	LOS B	0.3	1.8	0.64	0.88	43.5
Approach		317	1.8	0.148	1.4	LOS B	0.3	1.8	0.07	0.09	57.8
West: Denver Road											
10	L	25	0.0	0.139	20.6	LOS C	0.6	3.9	0.77	0.92	38.2
12	R	12	0.0	0.140	20.7	LOS C	0.6	3.9	0.77	0.93	38.2
Approach		37	0.0	0.139	20.7	LOS C	0.6	3.9	0.77	0.92	38.2
All Vehicles		1121	1.1	0.397	1.5	NA	0.6	3.9	0.04	0.11	57.7

LOS (Aver. Int. Delay): NA. The average intersection delay is not a good LOS measure for two-way sign control due to zero delays associated with major road movements.

Level of Service (Worst Movement): LOS C. LOS Method for individual vehicle movements: Delay (HCM).

Approach LOS values are based on the worst delay for any vehicle movement.

SIDRA INTERSECTION

MOVEMENT SUMMARY

Site: Dor_Den_2011_PC_AM

Dorville Road / Denver Road, Carseldine
2011 Project Case
AM Peak Period
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Dorville Road											
1	L	24	0.0	0.189	8.2	LOS A	0.0	0.0	0.00	1.04	49.0
2	T	338	3.0	0.190	0.0	LOS A	0.0	0.0	0.00	0.00	60.0
Approach		362	2.8	0.190	0.5	LOS A	0.0	0.0	0.00	0.07	59.1
North: Dorville Road											
8	T	664	0.0	0.341	0.0	LOS A	0.0	0.0	0.00	0.00	60.0
9	R	34	0.0	0.034	9.9	LOS A	0.2	1.1	0.42	0.69	47.0
Approach		698	0.0	0.341	0.5	LOS A	0.2	1.1	0.02	0.03	59.2
West: Denver Road											
10	L	39	0.0	0.226	20.1	LOS C	1.0	6.9	0.66	0.81	38.6
12	R	26	0.0	0.227	20.2	LOS C	1.0	6.9	0.66	0.90	38.6
Approach		65	0.0	0.226	20.1	LOS C	1.0	6.9	0.66	0.85	38.6
All Vehicles		1125	0.9	0.341	1.6	NA	1.0	6.9	0.05	0.09	57.4

LOS (Aver. Int. Delay): NA. The average intersection delay is not a good LOS measure for two-way sign control due to zero delays associated with major road movements.

Level of Service (Worst Movement): LOS C. LOS Method for individual vehicle movements: Delay (HCM).

Approach LOS values are based on the worst delay for any vehicle movement.

SIDRA INTERSECTION

MOVEMENT SUMMARY

Site: Dor_Den_2011_PC_PM

Dorville Road / Denver Road, Carseldine
2011 Project Case
PM Peak Period
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Dorville Road											
1	L	55	0.0	0.415	8.2	LOS A	0.0	0.0	0.00	1.04	49.0
2	T	744	1.0	0.414	0.0	LOS A	0.0	0.0	0.00	0.00	60.0
Approach		799	0.9	0.414	0.6	LOS A	0.0	0.0	0.00	0.07	59.1
North: Dorville Road											
8	T	403	2.0	0.209	0.0	LOS A	0.0	0.0	0.00	0.00	60.0
9	R	36	0.0	0.071	14.2	LOS B	0.3	2.1	0.67	0.90	43.1
Approach		439	1.8	0.209	1.2	LOS B	0.3	2.1	0.05	0.07	58.2
West: Denver Road											
10	L	26	0.0	0.177	24.2	LOS C	0.7	4.9	0.81	0.94	35.9
12	R	12	0.0	0.175	24.3	LOS C	0.7	4.9	0.81	0.94	35.9
Approach		38	0.0	0.177	24.3	LOS C	0.7	4.9	0.81	0.94	35.9
All Vehicles		1276	1.2	0.414	1.5	NA	0.7	4.9	0.04	0.10	57.7

LOS (Aver. Int. Delay): NA. The average intersection delay is not a good LOS measure for two-way sign control due to zero delays associated with major road movements.

Level of Service (Worst Movement): LOS C. LOS Method for individual vehicle movements: Delay (HCM).

Approach LOS values are based on the worst delay for any vehicle movement.

SIDRA INTERSECTION

MOVEMENT SUMMARY

Site: Bea_Site_2011_BC_AM

Beams Road / Site Access
2011 Base Case
AM Peak Period
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Site Access											
1	L	14	0.0	0.029	11.8	LOS B	0.1	0.7	0.52	0.74	45.3
3	R	7	0.0	0.016	16.1	LOS C	0.1	0.5	0.56	0.77	44.7
Approach		21	0.0	0.029	13.3	LOS C	0.1	0.7	0.53	0.75	45.1
East: Beams Road											
4	L	7	0.0	0.154	8.2	LOS A	0.0	0.0	0.00	1.07	49.0
5	T	553	11.0	0.154	0.0	LOS A	0.0	0.0	0.00	0.00	60.0
Approach		560	10.9	0.154	0.1	LOS A	0.0	0.0	0.00	0.01	59.8
West: Beams Road											
11	T	1024	5.0	0.271	0.0	LOS A	0.0	0.0	0.00	0.00	60.0
12	R	14	0.0	0.018	10.9	LOS B	0.1	0.6	0.52	0.70	46.2
Approach		1038	4.9	0.271	0.1	LOS B	0.1	0.6	0.01	0.01	59.8
South West: Median (RT Stage 2)											
32	R	7	0.0	0.017	8.6	LOS A	0.1	0.5	0.71	0.72	20.2
Approach		7	0.0	0.017	8.6	LOS A	0.1	0.5	0.71	0.72	20.2
All Vehicles		1626	6.9	0.271	0.3	NA	0.1	0.7	0.01	0.02	59.0

LOS (Aver. Int. Delay): NA. The average intersection delay is not a good LOS measure for two-way sign control due to zero delays associated with major road movements.
Level of Service (Worst Movement): LOS C. LOS Method for individual vehicle movements: Delay (HCM).
Approach LOS values are based on the worst delay for any vehicle movement.

MOVEMENT SUMMARY

Site: Bea_Site_2011_BC_PM

Beams Road / Site Access
2011 Base Case
PM Peak Period
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Site Access											
1	L	7	0.0	0.026	19.3	LOS C	0.1	0.7	0.77	0.92	39.2
3	R	14	0.0	0.067	27.2	LOS D	0.3	1.9	0.81	0.95	35.2
Approach		21	0.0	0.067	24.5	LOS D	0.3	1.9	0.80	0.94	36.7
East: Beams Road											
4	L	14	0.0	0.291	8.2	LOS A	0.0	0.0	0.00	1.07	49.0
5	T	1088	3.0	0.288	0.0	LOS A	0.0	0.0	0.00	0.00	60.0
Approach		1102	3.0	0.288	0.1	LOS A	0.0	0.0	0.00	0.01	59.8
West: Beams Road											
11	T	719	6.0	0.192	0.0	LOS A	0.0	0.0	0.00	0.00	60.0
12	R	7	0.0	0.019	16.4	LOS C	0.1	0.6	0.74	0.87	41.4
Approach		726	5.9	0.192	0.2	LOS C	0.1	0.6	0.01	0.01	59.7
South West: Median (RT Stage 2)											
32	R	14	0.0	0.021	5.3	LOS A	0.1	0.7	0.57	0.58	20.8
Approach		14	0.0	0.021	5.3	LOS A	0.1	0.7	0.57	0.58	20.8
All Vehicles		1863	4.1	0.288	0.4	NA	0.3	1.9	0.02	0.03	58.6

LOS (Aver. Int. Delay): NA. The average intersection delay is not a good LOS measure for two-way sign control due to zero delays associated with major road movements.
Level of Service (Worst Movement): LOS D. LOS Method for individual vehicle movements: Delay (HCM).
Approach LOS values are based on the worst delay for any vehicle movement.

MOVEMENT SUMMARY

Site: Bea_Site_2011_PC_AM

Beams Road / Site Access
2011 Project Case
AM Peak Period
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Site Access											
1	L	19	0.0	0.042	12.4	LOS B	0.1	1.0	0.54	0.78	44.7
3	R	43	0.0	0.110	18.2	LOS C	0.5	3.4	0.64	0.90	42.6
Approach		62	0.0	0.110	16.4	LOS C	0.5	3.4	0.61	0.86	43.3
East: Beams Road											
4	L	135	0.0	0.188	8.2	LOS A	0.0	0.0	0.00	0.87	49.0
5	T	553	11.0	0.188	0.0	LOS A	0.0	0.0	0.00	0.00	60.0
Approach		687	8.8	0.188	1.6	LOS A	0.0	0.0	0.00	0.17	57.5
West: Beams Road											
11	T	1024	5.0	0.271	0.0	LOS A	0.0	0.0	0.00	0.00	60.0
12	R	58	0.0	0.087	12.1	LOS B	0.4	2.9	0.58	0.82	45.1
Approach		1082	4.7	0.271	0.6	LOS B	0.4	2.9	0.03	0.04	59.0
South West: Median (RT Stage 2)											
32	R	43	0.0	0.102	9.0	LOS A	0.4	3.1	0.73	0.80	20.1
Approach		43	0.0	0.101	9.0	LOS A	0.4	3.1	0.73	0.80	20.1
All Vehicles		1875	6.0	0.271	1.7	NA	0.5	3.4	0.05	0.13	55.4

LOS (Aver. Int. Delay): NA. The average intersection delay is not a good LOS measure for two-way sign control due to zero delays associated with major road movements.
Level of Service (Worst Movement): LOS C. LOS Method for individual vehicle movements: Delay (HCM).
Approach LOS values are based on the worst delay for any vehicle movement.

MOVEMENT SUMMARY

Site: Bea_Site_2011_PC_PM

Beams Road / Site Access
2011 Project Case
PM Peak Period
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Site Access											
1	L	58	0.0	0.213	21.3	LOS C	0.9	6.3	0.81	0.95	37.8
3	R	135	0.0	0.695	45.5	LOS E	4.3	30.2	0.93	1.18	26.1
Approach		193	0.0	0.696	38.3	LOS E	4.3	30.2	0.90	1.11	29.1
East: Beams Road											
4	L	43	0.0	0.296	8.2	LOS A	0.0	0.0	0.00	1.04	49.0
5	T	1088	3.0	0.296	0.0	LOS A	0.0	0.0	0.00	0.00	60.0
Approach		1132	2.9	0.296	0.3	LOS A	0.0	0.0	0.00	0.04	59.5
West: Beams Road											
11	T	719	6.0	0.192	0.0	LOS A	0.0	0.0	0.00	0.00	60.0
12	R	19	0.0	0.053	17.1	LOS C	0.2	1.6	0.76	0.92	40.8
Approach		738	5.8	0.192	0.4	LOS C	0.2	1.6	0.02	0.02	59.3
South West: Median (RT Stage 2)											
32	R	135	0.0	0.207	5.9	LOS A	1.0	7.1	0.61	0.71	20.7
Approach		135	0.0	0.207	5.9	LOS A	1.0	7.1	0.61	0.71	20.7
All Vehicles		2197	3.4	0.696	4.0	NA	4.3	30.2	0.12	0.17	49.6

LOS (Aver. Int. Delay): NA. The average intersection delay is not a good LOS measure for two-way sign control due to zero delays associated with major road movements.
Level of Service (Worst Movement): LOS E. LOS Method for individual vehicle movements: Delay (HCM).
Approach LOS values are based on the worst delay for any vehicle movement.

MOVEMENT SUMMARY

Site: Dor_Site_2011_PC_AM

Dorville Road / Site Access, Carseldine
2011 Project Case
AM Peak Period
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Dorville Road											
2	T	236	3.0	0.123	0.0	LOS A	0.0	0.0	0.00	0.00	60.0
3	R	135	0.0	0.222	13.3	LOS B	1.1	7.5	0.64	0.89	43.8
Approach		371	1.9	0.222	4.9	LOS B	1.1	7.5	0.23	0.32	52.9
East: Site Access											
4	L	43	0.0	0.102	13.7	LOS B	0.4	2.6	0.61	0.87	43.6
6	R	19	0.0	0.125	31.8	LOS D	0.5	3.5	0.85	0.95	31.9
Approach		62	0.0	0.126	19.2	LOS D	0.5	3.5	0.69	0.90	39.2
North: Dorville Road											
7	L	58	0.0	0.360	8.2	LOS A	0.0	0.0	0.00	1.03	49.0
8	T	640	0.0	0.359	0.0	LOS A	0.0	0.0	0.00	0.00	60.0
Approach		698	0.0	0.359	0.7	LOS A	0.0	0.0	0.00	0.09	58.9
All Vehicles		1131	0.6	0.359	3.1	NA	1.1	7.5	0.11	0.21	55.3

LOS (Aver. Int. Delay): NA. The average intersection delay is not a good LOS measure for two-way sign control due to zero delays associated with major road movements.
Level of Service (Worst Movement): LOS D. LOS Method for individual vehicle movements: Delay (HCM).
Approach LOS values are based on the worst delay for any vehicle movement.

MOVEMENT SUMMARY

Site: Dor_Site_2011_PC_PM

Dorville Road / Site Access, Carseldine
2011 Project Case
PM Peak Period
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Dorville Road											
2	T	705	2.0	0.366	0.0	LOS A	0.0	0.0	0.00	0.00	60.0
3	R	43	0.0	0.045	9.7	LOS A	0.2	1.4	0.40	0.68	47.2
Approach		748	1.9	0.366	0.6	LOS A	0.2	1.4	0.02	0.04	59.1
East: Site Access											
4	L	135	0.0	0.238	10.1	LOS B	0.8	5.3	0.43	0.73	46.9
6	R	58	0.0	0.408	41.4	LOS E	1.9	13.4	0.90	1.03	28.0
Approach		193	0.0	0.408	19.5	LOS E	1.9	13.4	0.57	0.82	39.0
North: Dorville Road											
7	L	19	0.0	0.169	8.2	LOS A	0.0	0.0	0.00	1.05	49.0
8	T	309	0.0	0.169	0.0	LOS A	0.0	0.0	0.00	0.00	60.0
Approach		328	0.0	0.169	0.5	LOS A	0.0	0.0	0.00	0.06	59.2
All Vehicles		1269	1.1	0.408	3.4	NA	1.9	13.4	0.10	0.16	54.8

LOS (Aver. Int. Delay): NA. The average intersection delay is not a good LOS measure for two-way sign control due to zero delays associated with major road movements.

Level of Service (Worst Movement): LOS E. LOS Method for individual vehicle movements: Delay (HCM).

Approach LOS values are based on the worst delay for any vehicle movement.

SIDRA INTERSECTION