

9	TRANSPORT	9-1
9.1	Introduction.....	9-1
9.2	Methodology	9-1
9.3	Transport Methods and Routes.....	9-1
9.4	Potential Impacts and Mitigation Strategies	9-8
9.4.1	Weir and Weir Pumping Station	9-8
9.4.2	Pipeline	9-12
9.4.3	Summary of all vehicle movements.....	9-17

9 TRANSPORT

9.1 Introduction

Volume 1 of the EIS (and the corresponding Transportation Technical Report) assesses the impact of transporting 16,500 tonnes of construction material for the raw water supply pipeline from Brisbane to the Project MLAs. This is based on the southern water supply pipeline option and the tonnage of material for the pipeline for the Glebe Option is likely to be similar but loads will be limited by the larger size of pipes to be used for the Glebe Weir pipeline rather than by weight.

9.2 Methodology

Transport impacts of the Glebe Option have been assessed by:

- identifying the roads where appreciable traffic increases are likely;
- assessing the current use of these roads including estimates of traffic volumes where these are available;
- estimating the likely increases in traffic resulting from the Glebe Option and associated impacts; and
- identifying mitigation strategies.

9.3 Transport Methods and Routes

Construction activities for the Glebe Option will be dependent on road transport because Taroom is not served by rail infrastructure with the nearest operational railhead being at Miles, 125 km south. There is a railway line to Wandoan but this has not been used for four years, is in poor condition, and there are no unloading facilities capable of handling large freight or the bulk materials required for this project.

As few vehicle movements will be required during the operation phase of the project, impacts on roads associated with increased vehicle movements will be limited to the construction phase.

Road distances from a number of towns and cities to Glebe Weir and the southern end of the pipeline route are given in **Table 9-1** together with details of a number of other journeys that may be relevant to the Glebe Option. Alternate routes are given where appropriate.

Characteristics of the roads likely to be used during construction of the Glebe Option are shown in **Table 9-2** together with the types of traffic carried and access for multi-combination vehicles. The locations of these roads in the vicinity of Taroom and Wandoan are shown in **Figure 9-1**.

Table 9-1. Road distances from a number of towns and cities to Glebe Weir and the southern end of the pipeline route using a number of alternative routes

Journey	Route	Distance (km)
Taroom to Glebe Weir north end	Leichhardt Highway and Glebe Weir Road	53
Taroom to Glebe Weir south end	Taroom — Cracow Road, Glebe Road, and to-be-constructed access road	44
Theodore to Glebe Weir north end	Leichhardt Highway and Glebe Weir Road	93
Theodore to Glebe Weir south end	Cracow, Taroom — Cracow Road, Glebe Road, and to-be-constructed access road	120
Cracow to Glebe Weir south end	Taroom — Cracow Road, Glebe Road, and to-be-constructed access road	71
Cracow to Glebe Weir north end	Low-level Dawson River crossing at Delusion Creek, Leichhardt Highway, and Glebe Weir Road	107
Wandoan to Glebe Weir north end	Leichhardt Highway and Glebe Weir Road	112
Wandoan to Glebe Weir south end	Leichhardt Highway, Nathan Road, Taroom — Cracow Road, Glebe Road, and to-be-constructed access road	98
Wandoan to Glebe Weir south end	Leichhardt Highway, Taroom, Taroom — Cracow Road, Glebe Road and to-be-constructed access road	105
Taroom to southern end of pipeline route north of Wandoan	Leichhardt Highway	52
Wandoan to southern end of pipeline route	Leichhardt Highway	7
Brisbane to Glebe Weir north end	Ipswich Motorway, Warrego Highway, Leichhardt Highway, and Glebe Weir Road	517
Brisbane to Glebe Weir south end	Ipswich Motorway, Warrego Highway, Leichhardt Highway, Nathan Road, Taroom — Cracow Road, Glebe Road, and to-be-constructed access road	503
Brisbane to southern end of pipeline route	Ipswich Motorway, Warrego Highway, and Leichhardt Highway	412
Gladstone to Glebe Weir north end	Dawson Highway, Leichhardt Highway, and Glebe Weir Road	319

Table 9-2. Characteristics of roads likely to be used during construction works on the Glebe Weir Project

Road	Most Common Arrangement	Present Traffic	Multi-Combination Vehicle ¹ Access
Ipswich Motorway and Warrego Highway to Toowoomba	Divided carriageway, two lanes each way, bitumen sealed and paved	Light vehicles: <ul style="list-style-type: none"> Local Travellers and tourists to and from west and north-west Queensland and Northern Territory Heavy vehicles: <ul style="list-style-type: none"> Local Long distance to and from west and north-west Queensland, New South Wales, and Northern Territory 	23 m and 25 m B-Doubles only
Warrego Highway west from Toowoomba	Two lane bitumen sealed and paved	Light vehicles: <ul style="list-style-type: none"> Local Travellers and tourists to and from west and north-west Queensland and Northern Territory Heavy vehicles: <ul style="list-style-type: none"> Local Long distance to and from west and north-west Queensland and Northern Territory 	Type 1 Road trains 23 m and 25 m B-Doubles
Leichhardt Highway north from Miles	Two lane bitumen sealed and paved	Light vehicles: <ul style="list-style-type: none"> Local Travellers and tourists to and from central, north and north-west Queensland and Northern Territory Heavy vehicles: <ul style="list-style-type: none"> Local Long distance to and from central, north and north-west Queensland and Northern Territory Oversize vehicles transporting goods and equipment to central Queensland. 	All multi-combination vehicles (excluding Type 2 Road Trains)
Dawson Highway Gladstone to Biloela	Two lane bitumen sealed and paved	Light vehicles: <ul style="list-style-type: none"> Local Travellers and tourists to and from Dawson-Callide, central, and north-west Queensland, and Northern Territory Heavy vehicles: <ul style="list-style-type: none"> Local Long distance to and from Dawson-Callide, central, and north-west Queensland, and Northern Territory 	23 m and 25 m B-Doubles only
Dawson Highway Biloela to Leichhardt Highway	Two lane bitumen sealed and paved	Light vehicles: <ul style="list-style-type: none"> Local Travellers and tourists to and from Dawson-Callide, central, and north- 	All multi-combination vehicles (excluding Type 2 Road Trains)

Road	Most Common Arrangement	Present Traffic	Multi-Combination Vehicle ¹ Access
		west Queensland, and Northern Territory Heavy vehicles: <ul style="list-style-type: none"> Local Long distance to and from Dawson-Valley, central, and north-west Queensland, and Northern Territory 	
Glebe Weir Road	Single lane bitumen sealed and paved	Light vehicles: <ul style="list-style-type: none"> Local Travellers and tourists to and from Glebe Weir Heavy vehicles: <ul style="list-style-type: none"> Local 	All multi-combination vehicles (excluding Type 2 Road Trains) ²
Taroom — Cracow Road	Single lane bitumen sealed and paved for 27 km north-east of Taroom then formed earth with gravel in some places	Light vehicles: <ul style="list-style-type: none"> Local Travellers and tourists to and from Cracow Heavy vehicles: <ul style="list-style-type: none"> Local including Cracow 	All multi-combination vehicles (excluding Type 2 Road Trains) ²
Nathan Road	Mostly single lane bitumen sealed and paved for approximately 36 km north from Leichhardt Highway then mostly formed earth with gravel in some places (Plates 15.1, 15.2, 15.3, 15.4)	Light vehicles: <ul style="list-style-type: none"> Local Travellers and tourists to and from Cracow Heavy vehicles: <ul style="list-style-type: none"> Local including Cracow 	All multi-combination vehicles (excluding Type 2 Road Trains) ²
Glebe Road	Formed earth	Light vehicles: <ul style="list-style-type: none"> Local Heavy vehicles: <ul style="list-style-type: none"> Local 	All multi-combination vehicles (excluding Type 2 Road Trains) ²
Red Range Road	Mostly formed earth	Light vehicles: <ul style="list-style-type: none"> Local Occasional travellers to and from the Auburn River area Heavy vehicles: <ul style="list-style-type: none"> Local 	All multi-combination vehicles (excluding Type 2 Road Trains) ²

Note 1. Detail of routes through town areas has not been included.

Note 2. Queensland Transport mapping notes that some routes in this area cannot be used by road train or B-double combinations — operators should check with Queensland Transport.

The major State-controlled road serving the area is the Leichhardt Highway. This highway runs from the Warrego Highway at Miles and joins the Capricorn Highway about half-way between Rockhampton and Duaranga. Also, the Leichhardt Highway crosses the Dawson Highway at Banana. Both the Dawson and Capricorn highways provide links west, and north and the Dawson Highway provides a link east through Biloela to Gladstone.

Annual Average Daily Traffic (AADT) estimates for the Leichhardt Highway have been obtained for the two road segments where the Glebe Option may have appreciable impacts. One segment is between Taroom and the Bauhinia Downs Road intersection and other is between Taroom and the Jackson — Wandoan Road intersection (Table 9-3). In general, Main Roads considers a development's road impacts to be insignificant if it generates an increase in traffic on State-controlled roads of no more than 5%, as measured by AADT (Department of Main Roads, 2006).

Table 9-3. Estimates of background traffic on the Leichhardt Highway without the Glebe Option

Road Segment	2008 AADT	Percentage of Commercial Vehicles	Calculated Number Commercial Vehicles
Taroom to Bauhinia Downs Road intersection	537	35	190
Taroom to Jackson — Wandoan Road intersection	654	29	189

Local Roads including Glebe Weir Road, the Taroom — Cracow Road, Glebe Road, Red Range Road, and Nathan Road from about 36.7 km north of the Leichhardt Highway (Maidens Road junction) are under the control of Banana Shire, while the southern portion of Nathan Road is under the control of Dalby Regional Council.

No data on vehicle movements are available for council controlled roads such as Glebe Weir Road, Nathan Road and the Taroom – Cracow Road. Usage of these roads is highly seasonal depending on such things as rural activity levels (i.e. cattle and grain movements) and tourism (increased usage during the winter months by caravaners).

Inspections of the Warrego and Leichhardt Highways, Glebe Weir Road, the Taroom — Cracow Road to Nathan Road, Nathan Road, and Glebe Road in May 2008 found that they were well maintained (Plates 9-1 to 9-4). These roads are generally safe for drivers used to travelling country roads and adjusting speed to road design and surface conditions but some bends, particularly those leading into and out of creek crossings require caution. Also, the frequency of road-kill indicates that animal strikes pose a safety hazard.



Plate 9-1. The southern, single lane, bitumen paved and sealed section of Nathan Road north of Roche Creek



Plate 9-2. A wider, formed earth, section of Nathan Road north of Cockatoo Creek



Plate 9-3. A narrow, single lane, formed earth, section of Nathan Road between Cockatoo Creek and Maidens Road



Plate 9-4. A single lane bitumen sealed and paved part of the northern section of Nathan Road at the intersection with the road to Eidsvold via Dearne just north of Cockatoo Creek

As part of the Glebe Option, it is proposed to undertake minor upgrading works on some local roads that will be subjected to additional traffic during the construction phase and to construct a permanent SunWater-controlled access road from Glebe Road to the weir pumping station site on Cockatoo Creek from Glebe Road *in lieu* of the existing private tracks. Any works on local roads to mitigate construction impacts will be subject to negotiation with Banana Shire and Dalby Regional Council, and subject to a repair and maintenance agreement with those councils.

9.4 Potential Impacts and Mitigation Strategies

9.4.1 Weir and Weir Pumping Station

Impacts on road infrastructure and other road users associated with raising Glebe Weir and constructing the pumping station at the weir will result from transport of relocatable buildings, plant, and machinery, prefabricated components and raw materials to the work site and from the provision of support services as well as from daily movement of the workforce to and from the sites.

Most relocatable buildings, plant and machinery for the weir and weir pumping station will likely be brought from Brisbane to the northern side of the weir site via the Leichhardt Highway and Glebe Weir Road.

Fly ash and cement will likely be brought from the Callide and Gladstone via the Dawson Highway to the Leichhardt Highway. The estimated quantities of goods and materials required, the number of truck trips (one way movements based on 30 tonnes per trip where applicable), and the likely periods when the trips will be made have been estimated (**Table 9-4** and **Table 9-5**).

Table 9-4 represents traffic delivering to the north side of the river via Glebe Weir Road while **Table 9-5** represents traffic delivering to the south side of the river via Glebe Road (readers should be careful not to confuse the two similarly named roads). Glebe Road is a public road to service Lot 15 on FT 2, Lot 14 on CP FT 1 and Lot 1 on CP FT 823. The pumping station access road referred to in **Table 9-5** is entirely on private property (namely Lot 14 on CP FT 1) and is not available for public access. It will be used purely for construction traffic during the construction phase, and intermittently for maintenance access during the operational phase.

The possible daily maximum number of trips has been estimated in some cases. Periods for delivery are based on the work schedule given in the Project Description (**Chapter 5, Figure 5-12**) and maximum daily trips have been estimated based on the periods available for delivery with time allowances for sourcing. The supply of potable water and of services to the site is presented separately as these journeys only commence in Taroom so do not affect other parts of long distance haulage routes.

Table 9-4. Estimated quantities of materials for raising Glebe Weir and constructing the weir pumping station and associated truck vehicle trips via the Leichhardt Highway and Glebe Weir Road

Goods or Materials	Quantity	Truck Trips	Period (Inclusive)	Estimated Maximum Daily Trips
Relocatable buildings to site	NA	15	July 2009 to Aug 2009	7
Plant and equipment to site	NA	30	July 2009 to Oct. 2010	4
Cement	1,100 t	37	May 2010 to Nov. 2010	2
Fly ash	300 t	10	May 2010 to Nov. 2010	2
Reinforcing steel and other components	450 t	15	May 2010 to May 2011	2
Rubber dams and supporting material	NA	8	March 2011 to Dec. 2011	4
Weir pumping station construction equipment and components	NA	15	May 2010 to Dec. 2010	2
Relocatable buildings from site	NA	15	Aug. 2011 to Oct. 2011	5
Plant and equipment from site	NA	30	Aug. 2011 to Oct 2011	4
Total / likely total		175		12
Total / likely total movements including return empty		350		24
Potable water, waste and other services ex Taroom (one-way)	Up to 15 trips per week	1,500	July 2009 to Nov 2011	8

Table 9-5. Estimated quantities of materials for raising Glebe Weir and constructing the weir pumping station, the number of truck trips via Glebe Road and the pump station access road

Goods or Materials	Quantity (Tonnes)	Truck Trips	Period (Inclusive)	Estimated Maximum Daily Trips
Coarse aggregate from licensed quarry	9,300	310	April 2010 to March 2011	8
Coarse sand from Cockatoo Creek area	2,100	70	April 2010 to March 2011	4
Fine sand from licensed extraction area	2,700	90	April 2010 to March 2011	6
Coarse rock for erosion protection from licensed quarry	450	15	April 2010 to March 2011	2
Total / likely total	14,100	485		20
Total / likely total movements including return empty		970		40

In addition to the commercial vehicle trips set out in **Table 9-54**, buses will bring employees to the weir work sites from Taroom following the Leichhardt Highway and Glebe Weir Road. Sedans, utilities, and light vans will bring personnel, visitors on business, and small items to the work sites. Numbers of people travelling to the weir and weir pumping station sites will vary over the construction period but the total number of bus and light vehicle trips over this period is estimated as follows:

- buses — Two return journeys per day or **2,400 bus movements** over the construction period (buses driven out in the morning, remain on site, and return in the evening); and
- sedans, utilities, and light vans — Twelve return journeys per day or **14,400 vehicle movements** over the construction period.

There will be an estimated additional 20,150 vehicle movements on the Leichhardt Highway north of Taroom over the work period commencing with site establishment in September 2009 and running to site decommissioning in November 2011 (approximately 670 work days, 780 total days). Thus, the AADT on this road segment will increase by 26 vehicles per day or approximately 4.8% of the 2008 value to become 563. Commercial vehicle movements, including buses and the vehicles identified in **Table 9-4**, will increase by an average of 8 vehicles per day or approximately 4% of the 2008 value to become 198 per day. The proportion of commercial vehicles will change little. Most of the traffic will result from provision of services to the site and transport of people to and from the site so will be confined to parts of the Highway between Wandoan and Theodore with the greatest volume between Taroom and Glebe Weir Road.

Glebe Weir and weir pumping station construction will generate an increase in traffic on the Leichhardt Highway north of Taroom of less than 5% of the 2008 AADT over the September 2009 to November 2011 period. Because this increase is less than 5% and because it will be temporary, it should be considered as insignificant. Also, it has been forecast (Volume 1 Chapter 12) that background traffic on the Leichhardt Highway north of Taroom will increase by approximately 6% by 2009, reducing the percentage increase resulting from the Glebe Option.

The Leichhardt Highway is a major two lane, bitumen sealed and paved, State-controlled road and the additional traffic should be generally within its capacity considering both pavement integrity and safety. Nevertheless, safety at the intersection with Glebe Weir Road will be a concern as will increased traffic at school bus times.

Construction related traffic on Glebe Weir Road will be similar to that on the Leichhardt Highway north of Taroom. Glebe Weir Road was constructed to carry traffic for the construction of the existing weir. The road is now bitumen sealed and paved but the age of the formation, road base, and bitumen sealed pavement is such that some damage to the pavement and verges may occur. Also, some aspects of safety may be compromised if the speed limit remains at 100 km/hour.

Weir and weir pumping station construction will require approximately 485 commercial vehicle trips via the access road to be constructed to the pumping station on the southern side of Glebe Weir, Glebe Road, a portion of the Taroom — Cracow Road and, in some cases, part of Nathan Road and part of Red Range Road (Table 9-5). An equal number of empty return trips will be required. These trips will take place from December 2009 to January 2011. The existing roads are earth formation with gravel in some places and the additional commercial vehicle traffic is likely to impact adversely on surface conditions. Surface damage will be particularly severe if commercial vehicles use the roads during wet weather. Safety concerns may arise from dust generation, the radius of some curves, and visibility on some ridge crests.

The impacts of transport of materials and personnel for the Glebe Weir site will be minimised by implementing the following strategies:

- liaising with Queensland Main Roads, Banana Shire Council, Dalby Regional Council and the Police Regional Superintendent of Traffic regarding a Traffic Management Plan to deal with all phases of the construction program. This will include warning signs and speed limits regarding curve radii and crests, among other things;
- providing buses for personnel transport to and from the site, and making bus travel obligatory for people working known, fixed shifts;
- arranging vehicle pooling where small numbers of people will be working outside fixed shifts;
- maintaining awareness of safe driving techniques, the need to drive to road conditions, and the need to be alert for animals in the vicinity of the road;
- making it clear to all personnel that instances of unsafe driving while at work may result in disciplinary action with or without police involvement;
- researching school bus routes and timetables, making drivers aware of these and, if necessary, restricting commercial vehicle movements at school bus times and potentially relocating bus stops if they are at what will be busy intersections;
- encouraging 'piggy backing' of any road train dog trailers for return journeys to minimise vehicle lengths; and
- discouraging travel outside daylight hours to reduce the risk of animal strikes; and
- undertaking regular maintenance of the road surfaces including grading and dust suppression.

SunWater will liaise with Queensland Main Roads, Banana Shire Council, and the Regional Superintendent of Traffic to determine whether some or all of the following should be put in place at the Leichhardt Highway — Glebe Weir Road intersection for the duration of the construction period:

- road widening and construction of turning lanes;
- speed limits that would apply for appropriate distances each side of the intersections; and
- warning signs giving notice of trucks turning and entering.

A dilapidation survey of Glebe Weir Road will be undertaken prior to commencement of weir construction. Any necessary repairs will be arranged and road condition monitored and maintained in a safe condition throughout construction. Public access to the reserve and camping area at Glebe Weir will not be allowed for safety reasons and also to reduce non-construction use of Glebe Weir Road. In addition, consultations will be held with the Banana Shire and the Regional Superintendent of Traffic as to whether it is desirable to impose an 80 km/hour speed limit on the road for the duration of construction.

The greater proportion of additional traffic on formed earth roads will result from pipeline construction because of the quantities of pipe and bedding sand to be trucked over them so impacts and mitigation measures set out for these roads in **Section 9.4.2** will apply to traffic to and from the weir site.

The weir and weir pumping station construction contractor(s) will prepare and implement a Traffic Management Plan to deal with all phases of the construction program.

9.4.2 Pipeline

As noted previously, Volume 1 Chapter 12 of the EIS assesses the impact of construction traffic for raw water pipeline requirements from Brisbane to the Project MLAs.

Impacts on road infrastructure and other road users associated with constructing the pipeline to the Wandoan Coal Project and the balancing storage will result from:

- transport of relocatable buildings, plant and machinery, pipes, and other prefabricated components;
- transport of raw materials such as bedding sand to the work sites;
- the provision of support services such as water supplies and waste removal;
- the daily movement of the workforce to and from the sites;
- pipeline road crossings (the route crosses the Taroom — Cracow Road, Nathan Road (on two occasions) and the Leichhardt Highway; and
- pipeline construction works in Nathan Road reserve.

It is proposed to use 500 mm nominal diameter (ND) pipe for the first 11 km from the weir pumping station then 1,000 mm or 1,200 mm ND pipe for the remaining 72 km along the undeveloped Nathan Road reserve and Nathan Road to the Wandoan Coal Project. This assessment has assumed the larger pipe and therefore the

large volume of bedding material so if the smaller pipe option is selected, the number of trips to transport material will be reduced commensurately, in the case of bedding sand by almost 50%.

Most of the pipe, bedding sand, prefabricated components, relocatable supporting infrastructure, plant and equipment required for the construction of the pipeline and balancing storage will be required along Nathan Road (Table 9-6). Nevertheless, some of the material for at least the 11 km nearest the weir may be transported via the Taroom — Cracow Road. Also, the transport distance along Nathan Road will vary. The following assumptions have been made in calculating the number of truck trips required for pipeline construction:

- pipe will be in 10 m lengths and carried on articulated trailers capable of carrying 24 lengths of 500 mm ND pipe or 6 lengths of 1,000 mm ND pipe;
- trailers will be shuttled to Toowoomba and 'bulked up' to Type 2 road trains for delivery along the route — trips from Brisbane to Toowoomba have not been considered;
- bedding sand will be carted in truck-trailer combinations capable of carrying 30 tonnes;
- other materials will be carted in semi-trailers carrying an average of 30 tonnes; and
- concrete for the balancing storage, thrust blocks, and similar infrastructure will be delivered in mixer units capable of carrying 8 m³.

Concrete may be sourced from either of the commercial plants operating in Taroom or Wandoan as only relatively small volumes will be required and as requirements will be at a number of locations.

Table 9-6. Estimated quantities of materials for the pipeline from Glebe Weir to the Wandoan Coal Project, the number of truck trips along Nathan Road and likely periods when trips will be made.

Goods or Materials	Quantity	Truck / Road Train Trips	Period (Inclusive)	Estimated Maximum Daily Trips
500 mm ND pipe (road train)	1,100 lengths	25	Dec. 2009 to May 2011	
1,000 mm ND pipe (road train)	7,100 lengths	620	Dec. 2009 to May 2011	
Total road train trips		645	Dec. 2009 to May 2011	8
Total road train movements including return empty		1,290		
Relocatable buildings to site	10	10	Feb 2010 to May 2010	4
Plant and equipment to site	NA	20	Feb 2010 to May 2010	5
Waste and other services	6 trips per week	516	April 2010 to Nov 2011	4
Bedding sand	240,000 tonnes	8,000	Jan 2010 to Mar 2011	40
Concrete	9,000 m ³	1,125	May 2010 to June 2011	10
Reinforcing steel and other components	300 tonnes	10	May 2010 to May 2011	2
Relocatable buildings from site	10	10	Sept 2011 to Nov 2011	4
Plant and Equipment from site	NA	20	Sept 2011 to Nov 2011	5
Total truck trips		9,711		55
Total truck movements including return empty		19,422		
Total truck and road train trips		10,356		63
Total truck and road train movements including return empty		20,712		

Transport of pipes for the pipeline is predicted to result in an additional 645 Type 2 road train trips on the Leichhardt Highway to the Nathan Road intersection with an estimated maximum number of trips on any one day of eight. An equal number of return trips with the trucks unloaded will be required. These are most likely to occur over the ten month period from April 2010 to January 2011 and these numbers of road trains turning to and from Nathan Road raises safety concerns.

Numbers of people travelling to work sites along the pipeline route may be less variable than those travelling to work sites at the weir because pipeline construction is a more constant task. The main construction period will run from April 2010 to November 2011 and the total number of trips, other than truck trips, is estimated to be 5,220 or approximately 12 per day. These are likely to comprise two bus trips and ten sedan, utility and light van trips with a maximum of 18 on any one day. This constitutes 4350 (8700 return) sedan, utility and light van trips, and 870 (1740 return) bus trips. When return journeys are considered, total vehicle movements, other than trucks and road trains, are estimated to be 10,440 trips.

If all vehicle movements required for pipeline construction, except those required for the transport of bedding sand, involve the Leichhardt Highway in the vicinity of Wandoan, total additional vehicle movements here are estimated to be 15,152 over the April 2010 to November 2011 period. AADT will increase by 25 vehicles or, based on the 2008 AADT for Taroom to the Jackson — Wandoan Road intersection, 4%. Commercial vehicle movements including buses, road trains, and trucks will increase by 11 vehicles per day or 6%.

While this estimate suggests that commercial vehicle movements on the Leichhardt Highway near Wandoan will increase by more than 5% as a result of pipeline construction, impacts should not be significant because:

- the increased traffic will be temporary, confined to the construction period
- the forecast increase in background traffic by 2009 is 6% (Volume 1 Chapter 12), reducing the percentage increase resulting from the Glebe Option; and
- the actual increases in total and commercial vehicle movements are very likely to be less because some vehicles including buses and concrete trucks are likely to travel from Taroom without using the Leichhardt Highway.

The midpoint on the pipeline route will be approximately equidistant from Taroom Wandoan. Thus, it is very likely that a proportion of bus and concrete truck movements will be direct from Taroom without using the Leichhardt Highway. If 50% of bus and concrete trucks travel direct from Taroom, then the commercial vehicle traffic on the Leichhardt Highway just north of Wandoan will increase by only 4%.

Because of the need to transport pipes and bedding sand along Nathan Road, it will be subjected to the greatest increases in traffic generated by the Glebe Weir Project. It is highly likely that Nathan Road will also be subjected to a large traffic load generated by construction of the Surat Basin Rail (SBR). Thus, SunWater will liaise with those responsible for SBR construction to ensure that any upgrading and / or maintenance work initiated as a result of pipeline construction is coordinated with that for the railway.

The road train traffic on Nathan Road will decrease with distance along the pipeline route from the Leichhardt Highway. Nevertheless, a large increase in commercial vehicle traffic leading up to and during the construction period will occur. The southern narrow bitumen sealed and paved section of Nathan Road is likely to suffer appreciable damage to the pavement and verges, and the formed earth and gravel sections will suffer severe damage to their surfaces.

Mitigation strategies applicable to Glebe Weir Road are generally applicable to the bitumen sealed and paved sections of Nathan Road although an 80 km speed limit may not be necessary for the entire length of the sealed sections because long stretches are relatively straight with low grades and there are few crests with poor forward visibility. Nevertheless, an 80 km/hour speed limit or advisory speed signs may be appropriate in some sections where curve radii are low and forward vision is poor. Because commercial vehicle traffic will be high, the advisability of upgrading some sections to two sealed and paved lanes to provide safer overtaking opportunities will be investigated.

In addition to the strategies developed to minimise transport and traffic impacts from weir and weir pumping station construction, the following strategies will be implemented to reduce traffic impacts from pipeline construction:

- minimising road closures and, where necessary, providing detours of similar wet weather trafficability to the existing road so that emergency access is possible at all times;
- liaising with SBR to investigate whether construction can be staggered to avoid cumulative traffic related impacts;
- liaising with local and regional Emergency Services to ensure awareness of works that may slow movement of emergency vehicles; and
- ensuring that works that require activity on or in the vicinity of roads have the appropriate signage and, where necessary, traffic control personnel or portable traffic lights.

SunWater will liaise with Queensland Main Roads, Dalby Regional Council, and the Regional Superintendent of Traffic to determine whether some or all of the following should be put in place at the Leichhardt Highway intersection with Nathan Road for the duration of the construction period:

- road widening and construction of turning lanes (**Plate 9-5**);
- speed limits that would apply for appropriate distances each side of the intersections; and
- warning signs giving notice of trucks turning and entering.



Plate 9-5. The intersection of Nathan Road and the Leichhardt Highway where turning lanes may be required

The northern part of Nathan Road and Red Range Road are formed earth roads that will carry considerable additional traffic as a result of pipeline construction. Red Range Road carries the lowest traffic volumes at present so the most severe damage is likely to occur to it. Parts of Red Range Road, Nathan Road and the Taroom — Cracow Road, Glebe Road, and the yet-to-be-constructed weir pumping access road will carry additional traffic as a result of weir and weir pumping station construction as well as from pipeline construction. Damage to unsealed roads will be particularly severe if commercial vehicles use the roads in wet weather.

The radius of some curves, particularly some leading into and out of creeks, will pose safety risks for both vehicles working on pipeline and auxiliary pumping station construction and other road users. There may be a need to improve some road and creek crossing geometry on unpaved roads.

The following strategies will be applied to mitigate impacts of additional traffic on existing and new formed earth roads whether or not they have gravel surfaces:

- arranging for dust suppression when and where this is required;
- restricting Glebe Weir Project traffic access to essential light vehicles during wet weather;
- liaising with Banana Shire Council and Dalby Regional Council to determine upgrading and maintenance requirements, and how the necessary work will be undertaken, including;
 - imposing speed limits and / or advisory speed signs for the duration of construction works where these are required;
 - upgrading or constructing to two lane gravel standard according to local authority specifications as required;
 - improving low radius curves and creek crossings where required;
 - upgrading culverts and bridge works where required; and
 - monitoring road condition and ensuring maintenance is carried out promptly.

As noted, it would be prudent if these discussions were undertaken jointly with other proponents of developments in the area.

The social impacts associated with the transport issues addressed here are discussed in **Chapter 17**.

9.4.3 Summary of all vehicle movements

A summary of all vehicle movements for construction of the Glebe Option is provided in **Table 9-7**. These data have been used for calculations for Greenhouse Gas assessment in **Chapter 10** Air Quality.

Table 9-7. Summary of estimated vehicle movements for roads in the vicinity of the Glebe Option

	Truck	Bus	Sedan/utility /van	Estimated total
Leichhardt Highway (Taroom – Intersection with Glebe Weir Rd)	3,350	2,400	14,400	20,150
Leichhardt Highway (Wandoan – intersection with Nathan Rd.)	4,712	1,740	8,700	15,152
Glebe Weir Road	3,350	#1.	#1.	3,350
Glebe Road	970	#1.	#1.	970
Nathan Road	20712	1740	8700	31 152
Pump station access road	970	#1.	#1.	970

Note: #1. Distribution of construction personnel will vary depending on construction activity either side of the weir. The workforce distributed between the sites is equal to the bus and sedan/utility/van vehicle estimates for the Taroom section of the Leichhardt Highway.