

Glen Innes

9

Traffic and Transport Issues



9. Traffic and Transport Issues

This chapter of the Environmental Assessment describes the traffic and transport issues associated with the construction and operation of the Glen Innes Wind Farm. A comprehensive report on the traffic and transport issues has been prepared and is included as Appendix I. An overview of the report's findings is summarised in this chapter.

9.1 Overview of traffic and transport issues

The main traffic impacts of the Glen Innes Wind Farm project will occur during the construction stage of the project. This is mainly due to the additional volume of traffic and the need to use over-size and over-mass vehicles. The construction staff involving approximately 40 personnel will travel to and from the site on a daily basis. In addition, over-size loads will include about 81 trucks carrying the turbine blades of up to 49 m in length and over-mass loads will be required to transport up to 27 nacelles, hubs, generator transformers and up to 108 tower sections. A comprehensive listing of the likely infrastructure components and the resulting predicted traffic movements is outlined in Tables 9.1 and 9.2.

Once the wind farm is operational there will be a low level of traffic accessing the site including a small number of on-site staff and periodic visits by maintenance staff as required. The traffic impact during the operational phase will be minor.

The key traffic issues can be broadly divided into off-site and on-site issues.

Off-site traffic issues mainly relate to:

- movement of oversize vehicles on public roads and the timing of travel
- choice of route and ability of roads to handle the volume of construction traffic particularly in regard to over-size and over-mass vehicles
- road safety
- traffic management measures to be incorporated in project

On-site issues mainly relate to:

- location of new track work and environmental considerations
- standard of track work required, including upgrade of existing tracks
- drainage, erosion and sediment control measures to be incorporated
- restoration of any temporary tracks on completion of the works

9.2 Deliveries to the wind farm site

Some of the components of the wind turbines will be imported from overseas and may pass through ports in Brisbane or Newcastle. Options that have been considered for delivery of the turbine equipment include road or rail. A review of the option to transport the turbines by rail has shown that it is not feasible due to the vertical and horizontal clearances available on the rail system given the long loads required to be transported and due to rail services to Glen Innes having been discontinued.

The delivery of turbine and substation equipment and associated materials to the Glen Innes locality will use the New England Highway. The highway provides an inland link between Brisbane and Newcastle and passes through Glen Innes. It is a main transport route for freight vehicles, buses and cars and has a speed limit of 100 km/hour. The Gwydir Highway provides the main transport route from Glen Innes to the Wind Farm site.

At Glen Innes, the New England Highway intersects with the Gwydir Highway within the main township. Transport of equipment through Glen Innes could proceed directly from the New England Highway to the Gwydir Highway or could use an alternative route suited to large vehicles. The options for passing through Glen Innes have been discussed in Appendix I and are summarized below.

Discussions with Council and route inspections have indicated that the most suitable route for avoiding the centre of Glen Innes appears to be the northern route that goes from the New England Highway to Grafton Street, then Coronation Street and joins the Gwydir Highway about 1.5 kilometres west of its intersection with the New England Highway. Passage of vehicles through Glen Innes will require negotiation of various intersections, which may require minor temporary modifications. The final route to be used and the process for any modifications will be planned in consultation with Council.

The existing road transport infrastructure for the area surrounding the wind farm site is shown in Figure 9.1. Key local roads in the area surrounding the wind farm which could be used for access to the wind farm site are described below. The analysis of the local roads and their suitability for transport of equipment and materials to the site considered aspects of suitability of existing roads, the directness of various routes, traffic safety issues and the extent of community disturbance that may occur if a particular route was used. Based on the analysis and discussion with Council, a preferred access route has been proposed and is described in the following sections.

9.2.1 Former Gwydir Highway alignment

The most direct access to the wind farm site from the Gwydir Highway is via a now disused section of the former Gwydir Highway where it crosses the top of Waterloo Range (Plate 9.1). Local residents have indicated that the Gwydir Highway over the Waterloo Range was realigned about the time of World War 2 with the new alignment having been shifted about 500 metres to the north providing improved grades and a better alignment. The old highway alignment is still clearly visible and trafficable (Plate 9.2). It is unsealed but has a solid rock foundation, formed drainage on either side and mature trees either side of the roadway. It provides a suitable road alignment for access during construction by large vehicles to the northern end of the wind farm site.

The former highway alignment is now within the Wattle Vale Travelling Stock Route (TSR 67474) for which the Rural Lands Protection Board (RLPB) is the responsible custodian. The RLPB has been consulted in regard to the proposed wind farm development and has provided approval for the TSR to be used on a temporary basis for the wind farm construction.

Due to its suitability in terms of grades, minimal impact of rural residences and direct access to the wind farm and the substation site it is proposed that the former Gwydir Highway alignment be used as the primary access for the construction phase of the Glen Innes Wind Farm. It is considered preferable for site management to have only a single access point to the wind farm site and the former Gwydir highway alignment presents the most suitable point to enter and leave the site. Alternative access routes, such as Sinclair Lookout Road, Rose Hill Road, East Furracabad Road and West Furracabad Road are discussed below, however these routes are proposed for use only during the operational phase, if at all.

9.2.2 Sinclair Lookout Road

The Sinclair Lookout Road is an unsealed road in good condition for light vehicles. It is a winding road that rises progressively from the Gwydir Highway to Sinclair Lookout. Its location provides a possible access to the northern end of the wind farm and to the substation site. It is however considered as unsuitable for movement of the oversize vehicles and is not proposed as an access for the construction or operational phases of the project.

9.2.3 Access via Rose Hill Road

Rose Hill Road provides an access route to the middle of the wind farm in the vicinity of Ross Hill. The initial 2.5 kilometre section of this route is unsealed public road that provides access to the Rose Hill and Girrahween residences and to parts of the Rosefield property. At the southern end of Rose Hill Road is an additional 2.5 kilometres of track that leads up to the Ross communications facility and Ross Hill on the main Waterloo Range. The track could be upgraded to provide access for the construction and operations phases but is considered less suitable than the former Gwydir Highway. It is currently proposed that Rose Hill Road only be used for access during the operational phase if the former Gwydir Highway alignment is not available.

Rose Hill Road forms a 'T' intersection with the Gwydir Highway (Plate 9.3) and there is good visibility of the intersection from the eastern and western approaches of the Gwydir Highway. The short section of Rose Hill Road is straight and relatively flat and is suitable for use by the RAV vehicles (Plate 9.4). Council has advised that if this road were used by construction vehicles that sealing in proximity to residences would be appropriate. In the event that Rose Hill Road is used for construction or operation then Glen Innes Wind Power will, in consultation with Glen Innes Severn Council, arrange for the sealing of the section of road in the vicinity of the Girrahween residence and within 200 metres of the junction with the Gwydir Highway.

9.2.4 Access via West Furracabad or East Furracabad Roads

Access to the southern part of the wind farm site can be gained via either East or West Furracabad Roads and then Cherry Tree and Hillside Roads. While both routes are suitable for light vehicles a range of factors make them unsuitable for the passage of large and heavy vehicles. Factors which limit their suitability include the number of residences adjacent these roads, sharp bends that would require realignment and improvements, creek crossings for Furracabad Creek and Seven Mile Creek and various locations requiring widening. For these reasons it is not intended that either route be considered for use by the large vehicles required to transport the large and heavy items to the site.

Light vehicles could use these roads at times for access to the southern part of the site without significant impact to the local community. However, as mentioned previously, it is preferable for effective site management to maintain a single access to the wind farm site. Accordingly, Glen Innes Wind Power will direct all vehicles to enter and exit the site via the northern points, ideally via the former Gwydir Highway alignment or where that is not available via Rose Hill Road.

9.3 Nature of traffic on local roads during the construction stage

A key part of the traffic assessment for the construction phase was the analysis of the likely types and numbers of vehicles to access the site. Tables 9.1 and 9.2 provide details of the equipment and materials to be delivered to site, the estimated number of vehicle movements over the construction period and the expected vehicle types involved.

Table 9.1 addresses the delivery of the various materials and components for construction of turbines, the substation and ancillary items. Table 9.2 addresses the transport of concrete for footings.

Some of the trucks delivering the turbine components to the site will be over-size (longer than 19 metres) or over-mass (gross mass in excess of 42.5 tonnes) and are referred to as "Restricted Access Vehicles" (RAVs). Table 9.1 provides details of predicted traffic movements, other than for the concrete footings, as a gauge to indicate the transport issues to be managed.

The delivery of the tower and turbine component parts alone will generate approximately 252 one-way truck movements involving Restricted Access Vehicles (RAVs). The intensity of truck movements will vary during the construction stage. The delivery of component parts of the turbines may be spread

over three to four months and the movement of these vehicles will be arranged to minimise impact on local communities. The consultation for the project will provide the community with updates on the progress of construction works, timing of remaining works and potential impacts and safeguards incorporated.

Table 9.1 - Predicted traffic movements on public roads for deliveries to the site

Material	Approximate Quantity / Number	One-Way Vehicle Movements	Vehicle Type
Materials			
Concrete – footings for turbines and substation	materials see Table 9.2	745	
	12,000 m ³ concrete	2400	Truck or semi-trailer
Reinforcing steel – footings	1,300 t	75	Semi-trailer
Road aggregate	7,550 m ³	950	Truck
Water for dust control	1-2 trucks per day	150 to 300	Truck
Select fill	650 m ³	44	Truck
Misc equipment	Nominal	60	Semi-trailer
Misc materials	Nominal	25	Semi-trailer
Wind turbine components			
Tower sections (4 per tower)	108	108	RAV
Nacelles	27	27	RAV
Hubs	27	27	RAV
Blades (3 per turbine) 1/truck	81	81	RAV
Generator Transformers	27	9	RAV
33kV/(132 or 66)kV Substation and 33kV Cables			
Substation transformer	1 or 2	1 or 2	RAV
Misc substation items	Various	22	Semi-trailer
33kV Transmission poles	4	2	RAV
33kV Underground cables	22 km	65	Semi-trailer
Site work activities			
Site establishment	Nominal	5	Semi-trailer
Cranes	2	10	Semi-trailer
Construction equipment	8	15	Various
Site disestablishment	Nominal	5	Semi-trailer
Total one-way traffic movements on public roads			
Truck movements		2,426 – 4,282	Trucks
Employees - 6 to 12 months	40 persons	4,000	Car / 4WD

Events such as pouring the concrete for a turbine footing can generate up to 75 one-way trips per day over a period of about 10 hours for the delivery of concrete by agitator trucks from an off-site location. Table 9.2 provides a comparison of delivery of concrete from Glen Innes using a fleet of agitator trucks

(Option A) versus trucks delivering materials to a batch plant for concrete production on site (Option B).

Due to the proximity of the site to Glen Innes it is expected that concrete will be imported to the site and that an on site batch plant will not be used. The contractor will need to identify the best approach. Should the contractor wish to install a batch plant on site then it is expected that the contractor will make the necessary assessment of options and obtain the requisite approval(s).

The contractor will stage the work so that footings are poured sequentially, with the construction crews preparing them, pouring them and then progressively erecting the turbines.

Table 9.2 – Predicted traffic movements on public roads for pouring the concrete footings

Material	Quantity / Number	One-Way Vehicle Movements		Vehicle Type
Option A - Concrete delivered from Glen Innes on public roads				
Concrete from Glen Innes No on-site batch plant	12,000 m³	2,400		Agitator Truck
Option B –Batch plant on-site and constituent materials delivery on public roads				
Cement	1,730 t	82	745	Semi Trailer/Truck
Aggregate	4,695 t	310		Semi Trailer/Truck
Sand	3,560 t	238		Semi Trailer/Truck
Water	1,865 kL	113		Truck
Concrete cartage	12,000 m³	On site only		Agitator Truck

Note: Road aggregate and sand to be supplied from a site to be determined in the vicinity of Glen Innes

9.4 Site Entry from Gwydir Highway

The preferred site access point to the wind farm site is directly from the Gwydir Highway (Plate 9.1) via about 1.5 kilometres of the former Gwydir Highway alignment (Plate 9.2) that is within Travelling Stock Route TSR 67474 “Wattle Vale”. The location of the existing access point near the top of the Waterloo Range is on a straight section of the Highway with a passing lane on the side where the entrance is located (Plate 9.1).

To assist the long vehicles to exit the highway and enter the Travelling Stock Route it is possible that the existing entry point may need to be relocated about 100 metres to the east. Subject to relocation and upgrade to the site entrance, provision of suitable drainage works and the installation of appropriate signage at locations agreed with Council and the Roads and Traffic Authority this point is regarded as the best entry point for the following reasons:

- it provides a location where construction vehicles can safely enter and exit the wind farm site
- the location is clearly visible for highway traffic being on a straight section of road
- minimal clearing will be required for this access point and the lack of vegetation along the side where the entry point is located will assist visibility of vehicles exiting the site
- the grades from the highway to the TSR 67474 can be easily negotiated by the oversize vehicles

Use of the former Gwydir Highway alignment would require minor works including lopping of branches that overhang the roadway, minor restoration of drainage for the roadway and clearing of a limited

number of trees to allow the movement from the roadway into the wind farm site. The clearing has been discussed with officers of the Rural Lands Protection Board and would be undertaken in consultation with RLPB to ensure that the impact on native trees is minimised.

An alternative access route via Rose Hill Road and the access track to Ross Hill is also considered suitable but would only be considered for the primary site access if use of the former Gwydir Highway route were not available.

Use of Rose Hill Road would require minor works and an upgrade of the track to Ross Hill. The intersection geometry of Rose Hill Road with Gwydir Highway is a 90° 'T' intersection with the main road (Plate 9.3) having preference for through traffic and with adequate sight distances. A view along Rose Hill Road is shown in Plate 9.4. The track to Ross Hill is narrow and if used by large construction vehicles would require widening, straightening of some sections and improved drainage. The grades appear suitable.

The movement of the construction vehicles to the site from public roads particularly involving the larger vehicles will need to be undertaken in consultation with Council and Roads and Traffic Authority and implemented in accordance with any agreed conditions. Measures to ensure safety for all road users could include modifications to entry points, signage or flashing lights, escort vehicles and/or traffic control personnel and provision of temporary speed restrictions for selected locations.

9.5 On-site access management

Once vehicles have left the public roads and entered the site they will travel on tracks developed and maintained for the wind farm project. The routes of the proposed tracks is shown on Figure 1.4. Access to the substation site and the various ridges where the turbines will be located will be via specially constructed, unsealed access tracks. Small sections of some tracks in areas where there are steeper grades, if required, may be sealed to provide safe access and reduce erosion potential. Examples of steep slopes where access tracks are proposed are shown in Plates 9.5 and 9.6. These locations will require close attention to erosion control.

The proposed locations of the access tracks have been determined in consultation with the respective landowners as well as the recommendations of the ecological and heritage consultants and taking account of the nature of the large construction vehicles that will need to negotiate the grades.

Tracks are mostly located away from watercourses although several crossings of mostly dry water courses will be required. Stormwater culverts will be constructed where access tracks cross over existing creeks and gullies.

The chosen routes also minimise the need to clear existing remnant woodland and are preferentially located in cleared and often exotic pasture. Recommendations with regard to the potential impacts on flora and fauna and indigenous heritage have been considered when establishing the access routes and will be addressed by the Construction Environmental Management Plan.

In a few places along the top of the Waterloo Range, track work will need to be located through rock outcrops to provide access to the tower sites. Where rocky outcrops are impacted, the access tracks will be constructed by relocating excavated material to either side of the track to maintain the visual appearance of the ridge line and preserving or providing new habitat for reptiles.

9.6 Mitigation measures

A number of measures will be incorporated during the construction and operation of the wind farm to ensure that transport and traffic impacts arising out of the development are minimised. These

measures will be incorporated into a Traffic Management Plan for the project and shall be developed in consultation with Glen Innes Severn Shire's Traffic Management Committee.

An important mitigation measure relating to construction traffic impacts will be the implementation of a community information and awareness program. Prior to construction commencing and during the construction period a program of consultation shall be initiated to ensure the local residents are fully aware of the construction activities with particular regard being given to construction traffic accessing the site. This program will include elements of the following as appropriate to the phase of works, press releases in the local newspapers, specific newsletters and individual letter drops to neighbouring residents along the access route to the site and provision of a web-site providing details of the status of works and contact details for any complaints or enquiries.

General signposting of the access roads with appropriate heavy vehicle and construction warning signs shall also be undertaken in consultation with local authorities. Specific warning signs will be located adjacent to the entrances to the site to warn existing road users of entering and exiting traffic. The use of day warning notices where signs are activated on a specific day to warn local road users of construction activities will also be considered.

Particular attention can be given to traffic control and warning signs where the geometry of the road dictates that a potential safety issue exists. On-site access will be restricted to defined tracks to ensure minimal environmental impact.

Further mitigation measures will include:

- Improvements to any public roads impacted by the project in consultation with the Council. Improvements may include an exit lane from the Gwydir Highway to the former Gwydir Highway alignment and improvements to Rose Hill Road if its use is required
- Provision of traffic control personnel where large vehicles are required to execute difficult or potentially unsafe manoeuvres on public roads
- Concurrence with permit requirements for over-size and over-mass vehicles including the use of escort vehicles as required
- Restrictions on the timing of some large equipment and materials deliveries to site to mitigate specific local impacts. In particular the following measures may need to be adopted:
 - restriction of traffic movements to avoid RAVs passing schools at Glen Innes during the school zone periods and to avoid RAV movements conflicting with school bus operations
 - local deliveries to the site during daylight hours only to mitigate safety problems on local roads and to reduce disturbance for residences near to the access roads
- Confirmation of access track routes in proximity to any environmentally sensitive areas to be guided by relevant specialists
- Establishment of an inspection and maintenance program for the local road access network to ensure condition of roads are maintained in safe state
- Maintenance program for on-site access tracks to ensure safe access
- Implementation of a pro-active erosion and sediment control plan for on-site roads and laydown areas
- At the conclusion of the construction phase, any tracks not required for subsequent operation and maintenance of the wind farm will be restored and revegetated

9.7 Conclusions

The operational wind farm will require low levels of vehicle access to the site from local roads and accordingly will only have minor impact on local traffic.

The traffic issues for the construction period require a comprehensive Traffic Management Plan and consultation with Council, the Roads and Traffic Authority and the local community. Subject to a suitable plan being developed, agreed with stakeholders and implemented with the Project's Construction EMP, the impacts can be appropriately controlled.

	
Plate 9.1 – Site Entry from Gwydir Highway showing passing lane and cleared area adjacent to Gwydir Highway	Plate 9.2 – Gwydir Highway alignment showing wide roadway between corridor of trees
	
Plate 9.3 – Intersection Rose Hill Road and Gwydir Highway showing large cleared area adjacent Gwydir Highway	Plate 9.4 – Rose Hill Road (southern part)
	
Plate 9.5 Access route Turbine 9 to Turbine 10B – Steep descent onto saddle	Plate 9.6 Steep slope access to Turbine sites 20, 21 & 22 – Steep ascent to ridge top

