9. Traffic and Transport Issues

This chapter of the EA describes the traffic and transport issues associated with the construction and operation of the Capital 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 summarized in this chapter.

9.1 Overview of Traffic and Transport Issues

The main traffic impacts of the Capital Wind Farm project will occur for the local roads surrounding the site during the 8 month construction stage of the project. This is mainly due to the additional volume of traffic on the normally lightly trafficked local roads and the need to use over-size and over-mass vehicles. The construction staff involving about 50 personnel will travel to and from the site on a daily basis. In addition, over-size loads will include about 95 trucks carrying the 44 metre turbine blades, and over-mass loads will include 63 nacelles, each of more than 60 tonnes.

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 of the operational stage will be minor and readily managed.

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

Off-site traffic issues mainly relate to:

- Choice of local roads to be used for access and the timing of travel
- Ability of local roads to handle the volume of construction traffic particularly in regard to over-size and over-mass vehicles
- Road safety
- Traffic management measures

On-site issues mainly relate to:

- Location of new track work and environmental considerations
- Standard of track work required, including upgrade of existing tracks
- 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 turbine equipment will be imported from overseas and may pass through ports in Sydney, Port Kembla or Melbourne. 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.

The existing road transport infrastructure for the area surrounding the wind farm site is shown on Figure 9.1.

Road transport to the Goulburn locality will use the Hume Freeway. The Hume Freeway runs from Sydney to Melbourne. It is a four lane divided carriageway that passes about 20 kilometres north of the wind farm site on its route between Goulburn and Yass. It is a main transport route for freight vehicles, buses and cars and has a speed limit of 110 km/hour. The delivery of equipment and materials to the locality will initially be via the Freeway.

From the freeway there are three possible access routes to the wind farm site:

- Via Goulburn and Braidwood Road
- Via the Federal Highway and Collector Road
- Via Bungendore to the south

The review of these options (Appendix I) has shown that the route via Goulburn and the Braidwood Road is the most direct and also the most suitable means by which the over-mass and over-size vehicles can access the site.

The exit from the Freeway to local roads involves passage through Goulburn City. Several route options have been reviewed and the selection of the final route will be undertaken in consultation with Goulburn Mulwaree Council.

A brief description of key local roads in the area surrounding the wind farm and which would be used for access to the wind farm site is provided below.

Several alternatives were considered for access to the site and the analysis of the alternatives is provided in Appendix I. The analysis considered aspects of suitability of existing roads which could be used, the directness of various routes, traffic safety issues and the extent of community disturbance. Based on the analysis and discussion with respective Councils, a preferred access route has been proposed and is described in the following.

9.2.1 Braidwood Road (Goulburn to Tarago)

The Braidwood Road connects Goulburn and Braidwood and passes through Tarago. It is a two lane sealed road in good condition with a general speed limit of 100 kilometres/hour. From Goulburn to Tarago (approx. 36km) the road passes through gently undulating country crossing several water courses.

Approximately 7km south of Goulburn the road passes through Tirranaville, which has a small primary school fronting the main road. This section of road is speed restricted during school hours. The road also passes through the small settlement of Lake Bathurst approximately 30 kilometres from Goulburn. There are a number of properties located adjacent to the road and the road is speed limited to 60 kph through this area. The use of this road for access to the site should present no problems with only minor inconvenience for local road users.

The township of Tarago is located at the junction of the Braidwood and Bungendore Roads. All project vehicles will leave the Braidwood Road at Tarago and follow the Bungendore Road through the town of Tarago. The township has a number of residences and commercial business premises fronting the main roads as well as a school, which fronts the Braidwood Road.

The roads through the town should provide adequate clearance for the wind farm traffic however the main intersection will require careful negotiation for RAV's. Similarly the turn out of the main street (Wallace Street) onto the Bungendore Road will also be subject to traffic control during the passage of the RAV's.

The timing of movements of equipment to site will be scheduled to mitigate impact on the local residents and the local school arrival and departure times.

9.2.2 Tarago to the Wind Farm

The Bungendore road crosses the Goulburn to Bombala Railway Line and exits Tarago to the south. There is a low level of rail traffic using the line between Goulburn and Canberra and in addition, trains transporting containers of waste pass through the crossing to reach the 'Intermodal' transfer station to the south of Tarago. The level crossing is an ungated, signal controlled level crossing.

The Collex operated Intermodal Terminal south of Tarago accepts container loads of waste offloaded from trains and loaded onto trucks for transport and disposal at the Woodlawn Bioreactor site.

The intersection of the Bungendore and Collector Roads is 4 km south of Tarago. Vehicles accessing the wind farm site will use the Collector Road and Taylors Creek Road. The Woodlawn Bioreactor is about 4.2 kilometres west of the junction of the Collector Road and Taylors Creek Road. While the Collector Road becomes narrower as it heads west, the section between Taylors Creek Road and Bungendore Road is a two lane road of adequate width for over-size vehicles. The section of Collector Road to the north-west of Taylors Creek Road intersection through to Collector is unsuitable for construction vehicles and will not be used for access.

Taylors Creek Road is mostly unsealed and has several 'dips' and some tight corners. Subject to traffic control measures to be adopted for the project, it is considered generally suitable for the types of vehicles involved. Renewable Power Ventures is negotiating an agreement with Palerang Council for the sealing of the Taylors Creek Road.

Vehicles going to the substation will continue on the Bungendore Road to the south of the Collector Road. The Bungendore Road south of Collector Road is a sealed road, which is generally in good condition and has a designated 100 kilometres/hour speed limit. An intersection of Bungendore Road with Taylors Creek Road occurs about 7.5 kilometres south of the Collector Road, but none of the over size Wind Farm construction vehicles will enter by that route.

The access to the substation from the Bungendore Road is located about 2.5 km south of the Mt Fairy Road intersection. This access uses an existing entrance that has good visibility from both directions, but which may require minor upgrading. Only about 2% of the trucks visiting the site will be directed to the substation entrance. None of the oversize vehicles delivering equipment to turbine sites will use this access.

An alternate access to the Ellenden Group is located a further 4 kilometres to the south. This is an existing access road to Currandooley and Ellenden properties.

The development of the wind farm and the traffic it generates will have a temporary impact on the Tarago to Bungendore road and its users. The entrance point to the substation will be designed in consultation with Palerang Council.

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 of vehicles to access the site and the approximate number of trips involved. Table 9.1 provides details of the equipment and materials to be delivered to site, the estimated number of vehicle movements over the 8 month construction period and the expected vehicle types involved. This provides a basis for assessing the potential impacts and for developing appropriate management measures.

Table 9.1 - Predicted Traffic Movements on Public Roads for Transport of Equipment and Materials to the Site

Material	Quantity	One–Way Vehicle Movements		Vehicle Type
Foundation Materials				
Concrete including:	25,600 m^3	(On-site)		Concrete Truck
Cement	5,500 t	280	2,380	Semi trailer/truck
Aggregate	14,900 t	990		Semi trailer/truck
Sand	11,300 t	750		Semi trailer/truck
Water	7,200 kl	360		Truck
Reinforcing Steel	2,300 t	130		Semi-trailer
Road and other items				
Road aggregate	22,500 m^3	2,930 *		Truck
Water for dust control	4 trucks per day	1,080 *		Truck
Select fill	15,000 m^3	1,050		Truck
Misc Equipment	Nominal	200		Semi-trailer
Misc Materials	Nominal	50		Semi-trailer
Wind Turbine components				
Tower Sections (4 per tower)	252	252		RAV
Nacelles	63	63		RAV
Hubs	63	63		RAV
Blades (3 per turbine) 2/truck	189	95		RAV
Generator Transformers	63	21		RAV
Substation				
Substation Transformer	1	1		RAV
Misc Substation Items	Various	80		Semi-trailer
33kV Transmission Poles	130	44		RAV
Cables and overhead lines				
Underground cables	27 km	100		Semi-trailer
Overhead conductors	51 km	10		Semi-trailer
Site work activities				
Site Establishment	Nominal	10		Semi-trailer
Cranes	2	14		Semi-trailer
Construction Equipment	25	40		Various
Site Disestablishment	Nominal	10		Semi-trailer
Employees Cars	50	9,000		Car / 4WD
Total One-way traffic movements		**8,568 Trucks 9,000 Cars**		

Note: * Indicates may be sourced from on-site and avoid these vehicles using local roads.

Table 9.1 indicates the large number of trucks (8,568) that will need to access the site during the 8 month construction period. Some of the trucks 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 (RAV)".

The intensity of truck movements will vary during the construction stage. Events such as pouring the concrete for a turbine footing can generate up to 70 one way trips per day over a period of about 8 hours, for the delivery of concrete by trucks from an off-site location. The presence of two on-site concrete batching plants will minimise the need for these vehicles to use local roads. It is assumed that the contractor will stage the work so that footings are poured sequentially, with the construction crews

preparing them, pouring them and then progressively establishing the tower sections that will support the turbines.

The delivery of the tower and turbine component parts alone will generate about 500 one-way truck movements involving large and heavy vehicles. This part of the project may be spread over four to five months and the movement of these vehicles will be arranged to minimise impact on local communities, who will be kept informed of the progress of construction works, potential impacts and safeguards incorporated.

9.4 On-Site Access Management

The only site entrance fronting on to the Bungendore Road is for access to the substation site. This part of the site access is able to use an existing track that will be upgraded. The entrance will also require minor upgrading including minor trimming or clearing of trees to provide sufficient room for long vehicles to leave the Bungendore Road safely and enter the site access track. The main entrance to the wind farm site is from the Taylors Creek Road at a point about 3.6 kilometres from the intersection with the Bungendore Road. The construction site office will be located at this point.

Figure 1.4 shows the sections of new tracks and upgraded existing tracks for the on-site access.

About 33 km of access tracks are required to access the turbine sites. The sections of new access tracks are mostly along the crests of ridges on land that has low slopes and is often on rocky ground with thin soil cover. An exception to this, where steeper grades may be encountered, is the steep section of access track leading up onto the Hammonds Hill Ridge. This steep section of access track will be benched into the slope and will require particular attention to drainage to prevent erosion of the track and energy dissipation for stormwater flows being diverted from the track onto surrounding land.

There are a number of small creek crossings associated with the access tracks where minor works may be needed to form stable crossings that allow the normal flows to pass and remain trafficable during heavy rain events. Most of the watercourses to be crossed by the access tracks are ephemeral and likely to be dry more often than flowing. The areas adjacent to these watercourses will require closer attention to erosion control due to the more erodible soil profiles that may be present.

Grids may be installed in place of selected gates to facilitate access between turbines. Gates may be used at property boundaries and at other locations.

9.5 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 Goulburn Mulwaree and Palerang Shire's Traffic Management Committee(s).

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 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 may include press releases in the local newspapers, specific newsletters and individual letter drops to neighbouring residents along the access route to the site.

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:

- Route through Goulburn for over-mass and over-size vehicles to be determined in consultation with Goulburn Mulwaree Council
- The unsealed part of Taylors Creek Road to be sealed by agreement with Palerang Council
- Improvements to access roads as required and in consultation with the Council. Improvements may include widening of sections of road and alteration to road alignments, etc.
- Provision of traffic control personnel where large vehicles are required to execute difficult or potentially unsafe manoeuvres.
- Concurrence with permit requirements for oversize and overmass 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 impacts. In particular the following measures will be adopted:
  - restriction of traffic movements to avoid RAVs passing schools at Goulburn, Tirranaville and Tarago during the school zone periods and to avoid RAVs on Taylors Creek Road during school bus operating hours,
  - 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.
- 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.

9.6 Conclusions

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

The traffic issues for the 8 month construction period require a comprehensive Traffic Management Plan and consultation with Local Councils and the community. Subject to a suitable plan being developed, agreed with stakeholders and implemented with the Project EMP, the impacts can be appropriately controlled.