Flyers Creek Wind Farm Pty Ltd

Flyers Creek WIND FARM

Environmental Assessment

CHAPTER 13
Traffic

13. Traffic and Transport Issues

This chapter of the Environmental Assessment describes the traffic and transport issues associated with the construction and operation of the Flyers Creek Wind Farm (including the wind farm, substation and 132 kV transmission line and switching station for grid connection). It identifies the issues arising and potential impacts of the development, as well as the proposed management of these potential impacts.

13.1 Overview of traffic and transport issues

The main issues for traffic management are associated with the construction stage of the Flyers Creek Wind Farm project, due to the additional volumes of traffic on local roads and the need to use over-size and over-mass vehicles to transport the wind farm components and associated materials to the site. The over-size (longer than 19 metres) or over-mass (gross mass in excess of 42.5 tonnes) vehicles are described as Restricted Access Vehicles (RAVs). The typical dimensions of vehicles used for the transport of turbine components are depicted in Figure 13.1. Movements of construction staff to and from the site on a daily basis will also temporarily increase the traffic volumes on local roads.

Once the wind farm is operational there will be a low level of traffic accessing the site, mainly comprising a small number of on-site staff but also including periodic visits by maintenance staff and mobile plant as required. Overall, 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 is when the vehicles associated with the project are travelling on public roads. Once vehicles have left the public roads and entered the site they will travel on tracks developed and maintained for the wind farm project, described as on-site access.

Off-site traffic issues mainly relate to:

- Movement of RAVs 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 the RAVs
- Location of site entry points and agreement of Council with regards to suitability and any site entry upgrade works required
- Road safety for all road users
- Traffic management measures to be incorporated in the project Construction EMP (CEMP)

On-site issues mainly relate to:

- Location of new access track works and environmental considerations
- The 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

13.2 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 Newcastle, Wollongong or even interstate ports. Options that have been considered for delivery of the turbine equipment from the NSW Ports or inter-state locations include road and rail transport.

- **Rail:** The site is located about 13 kilometres west of Blayney, which is on the Main Western Railway line (290 kilometres from Sydney). The section of the NSW rail system to the east of Wallerawang is part of the RailCorp network, while that to the west is managed by the Australian Rail Track Corporation Ltd (ARTC). A review of the option to transport the turbine components from NSW Ports to the site 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. Even if rail transport were possible it would involve an additional stage of handling to transfer the various items from rail to road transport vehicles for delivery to site, which is not desirable.

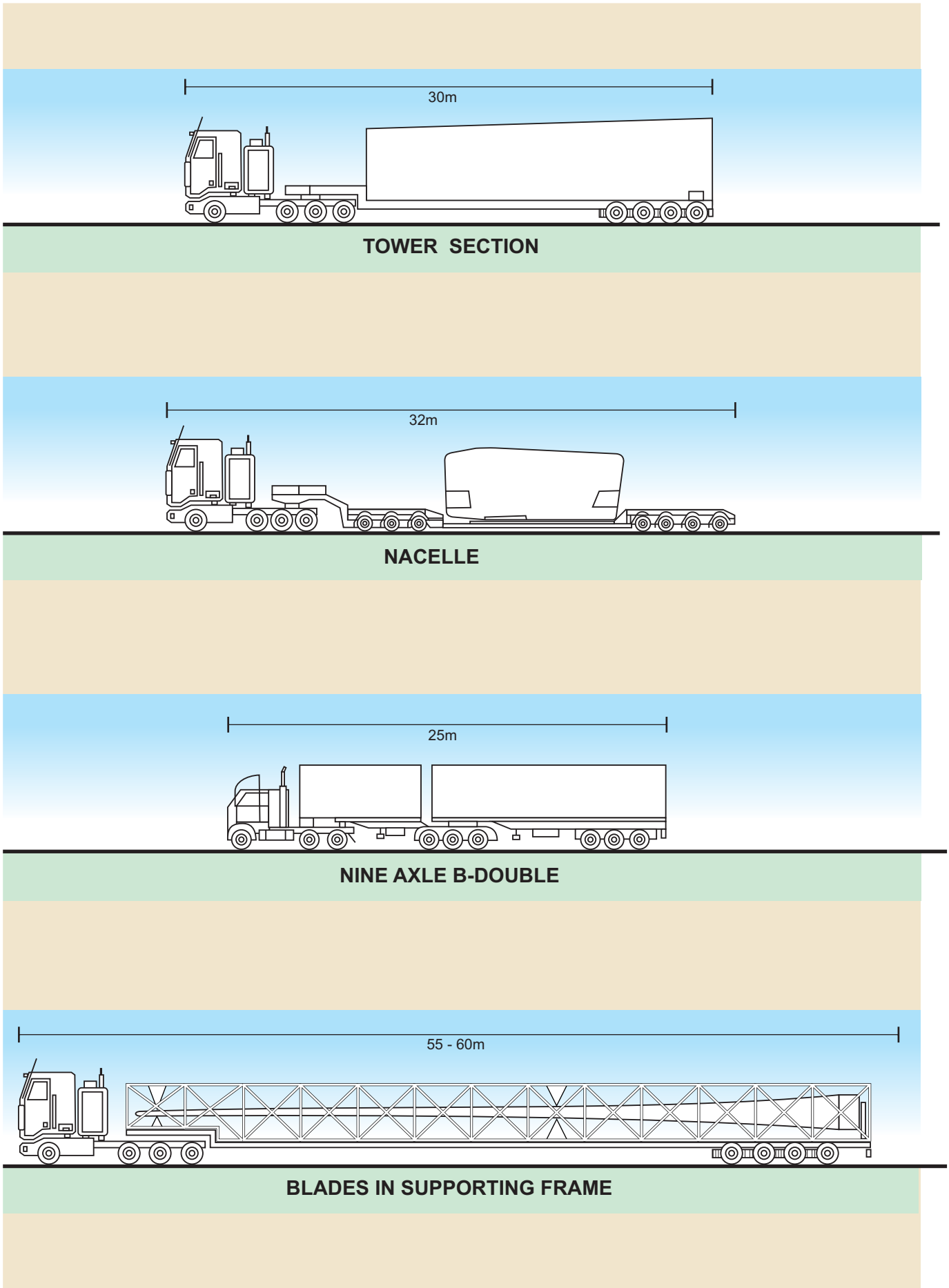


Figure 13.1: Indicative Wind Turbine Transport Vehicle Dimensions

- **Road:** The review of the options for transport of components to site by road has considered delivery from NSW ports or inter-state locations. For imported components (turbine components and some electrical components) arriving via either Port of Newcastle or Port Kembla, transport is likely to be via the following routes:

  - From Port Kembla, items would be transported from Port Kembla to the Hume Highway, similar to the successful transport of wind turbine components for the Capital and Woodlawn Wind Farms. Transport would then be south to Goulburn and Yass and then via Lachlan Valley Way and the Mid Western Highway via Cowra.
  - From Port of Newcastle, items could use the Pacific Highway and Hume Highway and then as for deliveries from Port Kembla. Alternatively, items could travel west from Newcastle and take an inland route to the Blayney/Orange locality.

  It should be noted that the road transport option using either Bells Line of Road or the Great Western Highway over the Blue Mountains is not feasible for RAVs that transport the over-size and / or over-mass wind farm components. These more direct routes may still be used for the transport of smaller wind farm components, subject to compliance with relevant regulations.

Tower sections for wind turbines may be manufactured in Victoria, Queensland, NSW or a combination of these. If transported from Victoria, the likely road transport route from Victoria to the wind farm site could be via the Hume, Olympic and Mid Western Highways. Tower sections delivered from Queensland may be transported via the Newell Highway and approach the locality from the north and via an inland highway on the western side of the Great Dividing Range.

The State Highways that could be used for delivery of wind farm components to the project site are important transport routes for freight vehicles, buses and cars, and generally have a speed limit of 100 or 110 kilometres per hour. Use of the State Highways by RAVs will be subject to permits issued by NSW Roads and Traffic Authority and the equivalent in other states, if inter-state transport is required. Depending on the nature of the RAVs and the route travelled, escort vehicles will be required for parts of the transport activities. The Roads and Traffic Authority has been consulted regarding the proposed project and comments provided in Appendix B. Further Consultation will be ongoing in respect of the approved project and the contractor's development of the Traffic Management Plan.

13.3 Local Transport to the Wind Farm Site

13.3.1 Site Access from Regional Centres

The main commercial centres surrounding the project area are Bathurst, Orange and Cowra, which are all significant regional centres with many commercial businesses, residences and schools. The large Cadia mine is also in this area, approximately 20 kilometres south of Orange. Many of the smaller project components, resources and services required during the construction phase of the wind farm may be sourced from these regional centres or smaller towns such as Blayney and Millthorpe. Deliveries to site from more distant locations may also pass through the large regional centres or bypass them.

Deliveries to the site from more distant locations, particularly larger or heavy items involving RAVs, may approach via one of the following routes:

- from the south via the Mid Western Highway and passing through Cowra
- from the north involving the Newell Highway and Mitchell Highway and passing through Orange.

It is unlikely that any RAVs will approach the site via Bathurst and more likely that the bulk of deliveries are from the south via Cowra with a lesser number from the north via Orange.

Key considerations for the transport of wind farm plant and equipment through such centres are outlined in Table 13.1 below.

Table 13.1 – Key considerations for the transport of wind farm plant and equipment

Key consideration	Mitigation measures proposed
Timing of the vehicle movements to minimise disruption to local traffic and night time noise at residences along the transport route.	• Consultation will be undertaken to determine optimum timing • Intention to avoid main streets and periods of peak activity • Consideration of local sensitivities, school zones, quiet zones, etc.
Access past roundabouts, tight bends or narrowing of roads	• Temporary modifications may be needed • Focus on utilising streets and intersections that are of sufficient width to allow the transit of the large vehicles involved, particularly designated RAV routes
Impact on road due to RAVs	• Overall use of roads suitable for over-size and over-mass vehicles

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 Blayney Shire Council (and other Councils where relevant) and Roads and Traffic Authority, and they would be implemented in accordance with any agreed conditions. There are Roads and Traffic Authority approved heavy vehicle routes that can be used for transport to the Flyers Creek Wind Farm site via Cowra, Orange and Bathurst.

Subject to the transport contractor obtaining the necessary permits, the timing of the deliveries will be the main consideration for transport to the site. The actual timing will be confirmed through the development of the Project Traffic Management Plan in consultation with the local regulators and stakeholders and in accordance with applicable permit requirements. 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.

The following describes the expected access options via the regional centres. The following descriptions are supported by Figure 1.2 and 13.2.

Cowra to site

It is likely that all RAV access from NSW Ports to the Flyers Creek site will be via Cowra, due to the unsuitability of the Great Western Highway and Bell's Line of Road for RAVs. Transport using RAVs from Victoria (via Hume Highway) or Queensland (via Pacific and Hume Highways) could also be via Cowra. Vehicles travelling through Cowra to reach the site would use the Mid Western Highway to access the project area.

The point of exit from the Mid Western Highway is proposed to be via the Carcoar locality (and Errowanbang and Gap Roads to access the site), described as "Errowanbang and Gap Road" access. An alternative route is through Blayney, Millthorpe and Forest Reefs to Beneree at the northern end of the project area (described as "Millthorpe" access). The Errowanbang and Gap Road approach is the most direct and has least impact on built-up areas as well as being associated with lower levels of local traffic movements. These routes are further discussed in 13.3.2.

Orange to site

The access from Orange to the Flyers Creek Wind Farm site is via the Mitchell Hwy, Millthorpe Rd/Orange Road to Millthorpe then Forest Reefs and Beneree (Millthorpe access). While the roads for this route are in good condition and suitable for both light vehicles and trucks, any over-size RAV vehicles accessing this route via Orange will require special consideration for the turn at Millthorpe

toward Forest Reefs. The contractor would consult with Blayney Shire Council in regard to suitability of this route for any proposed access to the site, particularly the RAV vehicles.

Any RAV vehicles approaching from Orange could also travel south to Carcoar and use the Errowanbang and Gap Road route.

Bathurst to site

Access to the Flyers Creek Wind Farm site via Bathurst will predominantly be for site construction workers and sub-contractors or for the transport of various components, materials and supplies that are likely to be transported by non RAV vehicles (ie not over-size or over-mass). This is because Bathurst is not on the RAV transport routes but is on the direct route from Sydney via either Bell's Line of Road or the Great Western Highway, which may be used for the transport of smaller wind farm components and construction traffic.

Access from Bathurst to the site could be via the Mid Western Highway to Blayney or via Mitchell Highway and Millthorpe as an alternative. Both the Mid Western and Mitchell Highways are two lane sealed roads in good condition with suitable clearances, grades and road alignment that are Roads and Traffic Authority rated for B-double class vehicles.

Any RAV vehicles approaching from Bathurst could also travel south to Carcoar and use the Errowanbang / Gap Road route.

13.3.2 Local Access to Site

Due to the distributed nature of the wind farm in hilly terrain a number of different access routes may be used to access different parts of the site, as outlined above. The number of separate access points to the project area relates to the difficulty in establishing continuous access tracks between parts of the wind farm site that are suitable for the types of vehicles involved, and also the fact that construction traffic for the wind farm construction may come from many different directions and it is desirable to access the site in the most efficient path, minimising unnecessary traffic movements.

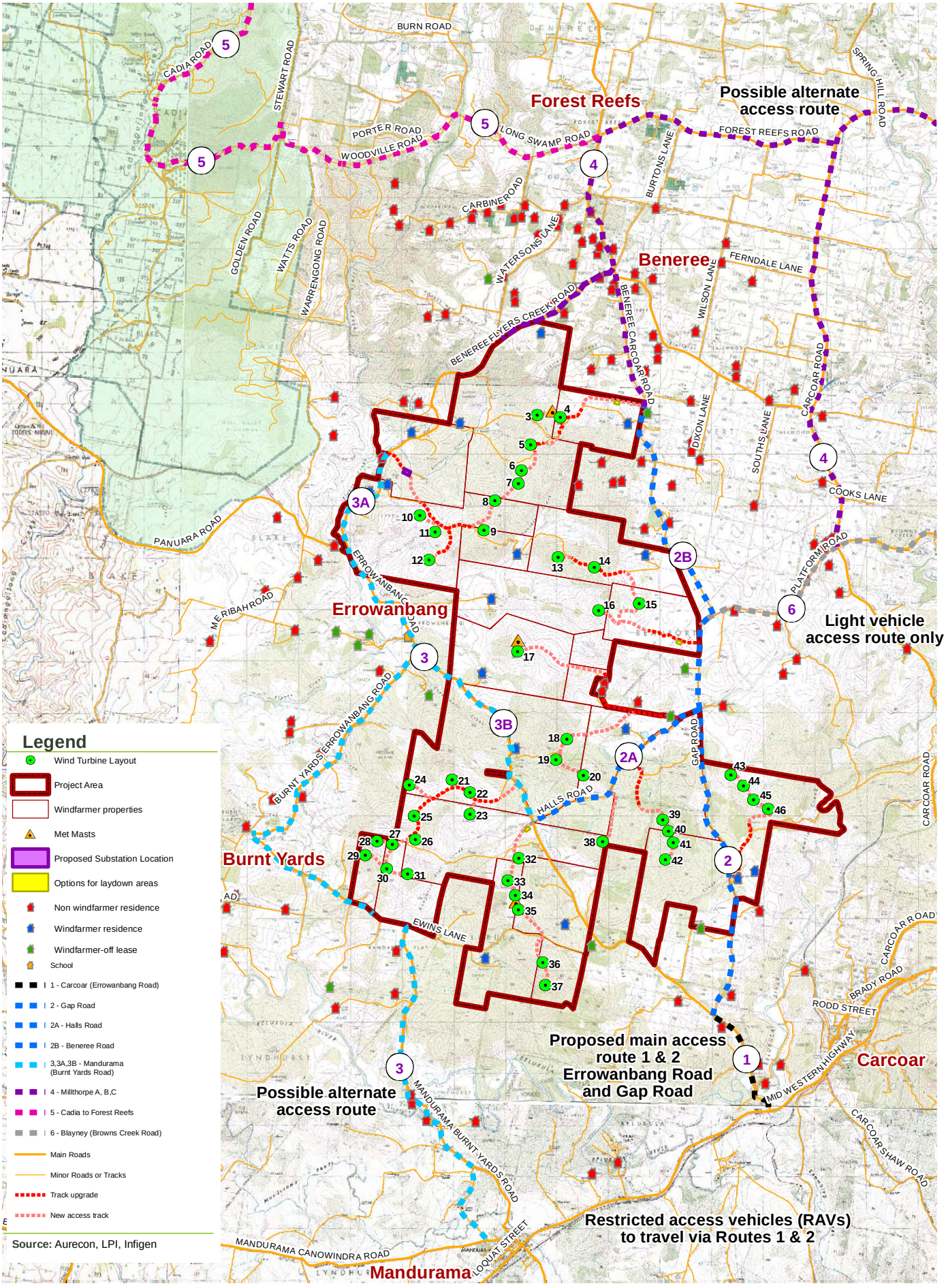
Access will also be required to the substation that is proposed for the north-western side of the wind farm. The delivery of the two large transformers is a key transport issue for the substation construction.

Once the wind farm is operational the operators may be located at the substation site and will access the wind farm both from this point and by one or more separate access points as required for certain parts of the wind farm site. However, as stated previously, the traffic impact during the operational phase will be minor and the focus of this assessment is on the construction phase.

The potential routes for transport to the project area are listed below:

- Errowanbang and Gap Roads to Halls Road and Beneree Road
- Mandurama to Burnt Yards and Errowanbang
- Millthorpe to Forest Reefs and Beneree
- Cadia Road to Forest Reefs and Beneree
- Blayney via Browns Creek Road to Beneree and Gap Roads

The potential access routes are shown in Figure 13.2 and characteristics of the four main route options for access from the State Highways or major roads to the wind farm site are outlined in Table 13.2.



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Flyers Creek Wind Farm **Environmental Assessment**

FIGURE 13.2: Potential transport routes to the project area

Table 13.2 – Summary of local access routes to the project area

Route (see also Fig 13.2)	Description	Suitability RAVs	Degree of existing local traffic	General comments
1. Errowanbang and 2. Gap Roads	Proposed main access route	High	Low	Good overall route, access to the south western side of the site via Halls Road. Minor upgrade works likely to be required for some intersections.
3. Mandurama to Burnt Yards and Errowanbang	Alternative access route	Low for RAVs	Low to moderate, more associated with change of shifts at mine site	Long access route comprising narrow and winding road and more potential for conflict with local traffic including change of shift traffic from Cadia Mine to Mandurama locality.
4. Cadia Road to Forest Reefs and Beneree	Possible alternative access route	Medium	Moderate	Preferable to route via Millthorpe but requires consideration of access from Orange locality.
5. Millthorpe to Forest Reefs and Beneree	Possible alternative access route	Medium	Moderate	Some difficult intersections require upgrade, Potential for conflict with local traffic.
6. Blayney via Browns Creek Road to Beneree and Gap Roads	Light vehicle access route only	Restricted	Low to moderate	Direct route from Blayney. Narrow and winding road with bridge crossing of Cowriga (Browns) Creek having tight bends on either side of the bridge.

Initial consultation has been undertaken with Blayney Shire Council, Engineering Services, who are responsible for the sealed and unsealed road network in the Blayney LGA. Engineering Service personnel made some suggestions and offered some insights into the advantages and disadvantages of the potential routes. For example, it was pointed out that a section of Halls road, which would provide access to turbines 32-37, has a number of natural formations, gates and trees on both sides of the road which might be problematic for large vehicles and would need to be considered in the final design of the access routes. The proponent will continue to liaise with the Shire Council's Engineering Service department with regards to determining the optimum transportation route(s). Implementation of the final routes will be in accordance with any conditions agreed with the Council (and other Councils where relevant) and the RTA.

13.3.3 Proposed main access route via Errowanbang and Gap Roads

The following describes the proposed main access route to the project area using the Errowanbang and Gap Road route. This transport route from Mid Western Highway allows access to all parts of the project area, the southwest, southeast, central and northern areas with the shortest distance of travel from the Highway.

Subject to Council approval and where required, upgrading of the road and intersections, this route is suitable for use by all types of vehicles required during construction, including the RAVs. Lighter vehicles may also approach the site using routes other than Errowanbang/Gap Roads particularly in relation to daily movements of construction and operational staff from locations where they will be accommodated.

Carcoar locality to site using Errowanbang and Gaps Roads

The Flyers Creek wind farm site can be accessed from the Mid Western Highway via an intersection about two kilometres to the south west of the township of Carcoar, the intersection with Carcoar Errowanbang Road (Plate 13.1). Importantly, this route bypasses Carcoar and does not go through the village. The Ashburton Bridge over the Belubula River near Carcoar has recently been upgraded (Plate 13.2). The use of this route as the primary route for RAV vehicles to travel to the site has been discussed with Blayney Shire Council and will be subject to further consultation. There are some aspects that require review such as the Errowanbang Road/Gap Road intersection (Plate 13.5) and several narrow sections of Gap Road (Plate 13.6). Discussions will continue with Blayney Shire Council this year and following the gaining of project approval and appointment of the project contractor as part of the process where the project implementation details are firmed up.

Plate 13.1 – Intersection of Mid Western Highway and Errowanbang Road looking south along highway.

Plate 13.2 – Ashburton Bridge over Belubula River on Errowanbang Road. The bridge has been upgraded recently.

Errowanbang Road is a part sealed, part gravel road in generally good condition that crosses the wind farm site from southeast to northwest. However, it is recommended that only the initial southeast section of Errowanbang Road (east of the Gap Road intersection that is approximately two kilometres northwest of Mid Western Highway) be utilised as the main access for RAVs. Further northwest of the Gap Road intersection with Errowanbang Road there is an old wooden bridge on a winding section of gravel road that is expected to be unsuitable for the over-size RAVs (Plates 13.3 and 13.4).

It is recommended that the main access route turns off Errowanbang Road and onto Gap Road. Relatively minor upgrade work on these roads and upgrade of the Errowanbang / Gap Road intersection may be required allow sufficient turning area and ensure safe access for RAVs (Plate 13.5).

Gap Road continues up the eastern side of the wind farm site and is the shortest route to access much of the wind farm site from the Mid Western Highway. It also appears to have low traffic volumes and offers a route that minimises impact on local traffic flows. Minor works may be needed to temporarily widen the intersection of Gap Road and Errowanbang Road (Plate 13.5) to allow for turning over-size vehicles. Gap Road is sealed at its southern end and unsealed further north (Plates 13.6 and 13.7). It rises from the southern intersection with Errowanbang Road to the intersection with Halls Road (Plate 13.8). Additional maintenance activities may be required during the period that this access route is used by RAVs.

Gap Road to Errowanbang Road via Halls Road

Halls Road is an existing road between Gap Road in the east and Errowanbang Road at the western end. It provides a suitable link between the eastern and the south-western sides of the project area while avoiding more heavily trafficked roads and also providing entry points to at least five turbine sites and perhaps up to nine if the access routes do not include use of Dunstaffage Lane. Halls Road is an unsealed road that is narrow, tree lined and winding in parts. However, it may be more suited to movement of the RAVs than the section of Errowanbang Road between Gap Road and Halls Road. In places along parts of Halls Road mature trees are close to and overhang the road, and some pruning of the trees may be required for RAV access.

Plate 13.3 – Old wooden bridge on Errowanbang Road at Dirt Hole Creek – Considered an unsuitable route.

Plate 13.4 – Winding road near Errowanbang Bridge, sharp bend on western side and large trees to side.

Plate 13.5 – Intersection of Errowanbang and Gap Roads; some wear is evident and the corner may need to be widened.

Plate 13.6 – Northern part of sealed section of Gap Road before the unsealed part further north.

	
Plate 13.7 – Gap Road – Ascent toward Halls Road. Some rilling in surface of road and adjacent erosion is apparent.	**Plate 13.8 – Intersection of Gap Road and Halls Road – There is a large area for RAVs to turn into Halls Road.**
	
Plate 13.9 – Halls Road between Gap Road and Errowanbang Road.	**Plate 13.10 – Intersection of Errowanbang Road and Halls Road at the western end of Halls Road.**

Transport to the north of Gap Road

By continuing north from Gap Road past the intersection of Halls Road, access can be gained initially to the central turbine sites 13 to 16 and subsequently to turbine sites 3 to 12 accessed from Beneree Road (Plates 13.11 and 13.12). Both site entry points from public roads would require upgrading to facilitate safe access by large vehicles.

Plate 13.11 – View north along Beneree Road from intersection with Browns Creek Road. There is plenty of room for RAVs to negotiate this intersection.

Plate 13.12 – Proposed entry point from Beneree Road to Turbine Sites 3 to 12 and potentially the substation site as well. The entry point would require an upgrade to enable easy entry of RAVs.

13.3.4 Alternative access routes that have been considered

Alternative access routes to Beneree via Millthorpe or Cadia Road

Access to the site via Forest Reefs and Beneree from either Cadia Road (to the west) or Millthorpe (to the east) provides alternative access routes to reach the northern parts of the site. The northern access enables direct access to the top of the ridges where parts of the wind farm will be located and to the substation site. Vehicles approaching the region from the north may tend to use access through Orange and seek the shortest route to the site from the northern approaches.

There are higher traffic volumes to the north with a greater settlement density and more commuters between the large Cadia Mine Site and locations of accommodation. Some of the roads in the vicinity of Forest Reefs are winding roads and would require further review as to suitability and discussion with relevant Councils as to their suitability for the purpose. Access via Cadia Road (west of Forest Reefs) may be preferable for any vehicles approaching from the north.

Minor works could be needed to address the intersection at Millthorpe (Orange Blayney Road) and allow access toward Forest Reefs (Plate 13.13) particularly in respect of any RAV access from the north. In addition, the T intersection immediately to the west of the railway underpass on the western side of Millthorpe (Plate 13.14) would be unsuitable for negotiation by RAV vehicles. Should Council allow use of access via this area, a temporary route may be required to be developed for use by RAVs only to the west of the current T intersection. All RAVs will avoid the minor roads within the village of Millthorpe and would only use access via Millthorpe if the route were favoured by Council relative to other options.

Plate 13.13 – Intersection of Blayney to Orange Road and road to Forest Reefs that is located on the western side of the rail line and avoids the underpass west of Millthorpe village.

Plate 13.14 – Intersection west of Millthorpe rail underpass – Current arrangement would be difficult for over-size vehicles to negotiate and a temporary arrangement for RAVs would be needed

The alignment of the remainder of the route is considered suitable with some improvements for movement of RAVs to the site but is not recommended.

Alternative access route - Mandurama Burnt Yards Errowanbang Route

The Mandurama to Burnt Yards Road intersects the Mid Western Highway at the town of Mandurama and allows access to the Flyers Creek site from the south west (Plates 13.15 and 13.16). Mandurama to Burnt Yards Road is sealed along its entire length but is a longer route than the Errowanbang Road and Gap Road route and is narrow and winding with limited space for passing large vehicles in places. It is expected that (with some minor modifications) the intersection with Mid Western Highway in Mandurama would allow RAV access. This route is a possible alternative access route to supplement the main Errowanbang and Gap Road route.

Plate 13.15 – Intersection of Mid Western Highway (looking south) and road to Burnt Yards on right hand side. Highway is wide and will assist large vehicles to negotiate the turn if the Burnt Yards route is used.

Plate 13.16 – View from intersection at Mid Western Highway in Mandurama looking along road toward Burnt Yards.

There is a long bridge over the Belubula River along Mandurama Burnt Yards Road, but it has recently been upgraded and is expected to be suitable for the RAVs (Plate 13.17). Further assessment would be required by the appointed contractor in later project stages if this route were to be used. Whilst there are two tight turns along this length of road, the road is in good condition and these turns occur at locations where the road is relatively wide allowing the passage of RAVs with only minor road works potentially being required. At the turn shown in Plate 13.18, the road becomes Burnt Yards - Errowanbang Road which continues on to meet Errowanbang Road in a T-intersection. Heading north on Errowanbang Road then allows access toward the northern turbine group and substation site whilst heading south allows access toward the southern and central turbine groups.

Initial assessment indicates this access route is feasible for RAVs and vehicles travelling to the site from Cowra due to the generally good condition of the road, and minimal or no modification to bridges or roads required for heavy vehicle use. The road is indicated as a B-Double approved route. Use of this route minimises impact on local traffic around the townships of Carcoar, Blayney and Millthorpe; however, this route appears to experience some increases in traffic volumes associated with change of shift at Cadia Mine. Use of this route as the primary route would be subject to agreement of Council.

Plate 13.17 – Bridge over Belubula River on road between Mandurama and Burnt Yards. Bridge appears suitable for RAVs.

Plate 13.18 – Intersection four kilometres east of Burnt Yards and eight kilometres north of Mandurama – Tight corner that may need upgrading

Alternative access Blayney Browns Creek Route (Light vehicle access route only)

The most direct road access from Blayney to the Flyers Creek Wind Farm site is via Blayney to Browns Creek Road. This road is sealed and in reasonable condition, although some sections show minor subsidence along the road verges and potholing is evident. This route is suitable for light vehicle access but RAV access would not be suitable due to the tight bends associated with bridge crossing over Cowriga (Browns) Creek and the narrow width of the bridge. The road alignments for the approaches to the bridge are shown in Plates 13.19 and 13.20. It is not proposed that this route be used for any movements of large or heavy vehicles accessing the site.

	
Plate 13.19 – Bridge at Browns Creek viewed from eastern side. Narrow bridge with tight turn on western side	**Plate 13.20 – Browns Creek Bridge, view from western side.**

If the transport route to the site passes through Blayney then RAV vehicles travelling via Blayney would continue north to Millthorpe and Forest Reefs as described in a previous section but that option is not considered the optimum transport route.

13.4 Nature of traffic on local roads during the construction stage

A key part of the traffic assessment for the construction phase has been the analysis of the likely types and numbers of vehicles that will require access to the site. Tables 13.3 and 13.4 provide predicted equipment and materials deliveries to site, the estimated number of vehicle movements over the construction period and the expected vehicle types involved.

Table 13.3 addresses the delivery of the various materials and components for construction of turbines, the substation and ancillary items, providing estimated volumes of traffic movements as a gauge to indicate the transport issues to be managed. Table 13.4 addresses the number of vehicle movements on public roads associated with the pouring of concrete footings based on either delivery of concrete to site or delivery of material to site for batching of concrete on site.

The intensity of truck movements will vary during the construction stage. The delivery of component parts of the turbines may be spread over about six months and the movement of these vehicles will be arranged to minimise impact on local communities. Concrete deliveries would mainly apply for the early phase of construction when footings are prepared.

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 13.3 – Predicted traffic movements on public roads for deliveries to the site for the construction stage

Material	Approximate Quantity / Number	One–Way Vehicle Movements	Vehicle Type
Materials			
Concrete – footings for turbines and substation. Either batch on site (material movements) or truck in concrete (See Table 13.4)	Batch on site: materials transport, refer Table 13.4	734	Semi Trailer/Truck
	Truck in concrete: 5,200 m^3 concrete	1040	Agitator Truck
Reinforcing steel – footings	1,700 t	100	Semi-trailer
Imported road aggregate (assume 25% of total road aggregate estimate)	12,000 - 15,500m^3	800 – 1,035	Semi Trailer/Truck
Water for dust control	2 trucks per day (as required)	800	Truck
Select fill / topsoil	650 m^3	44	Truck
Misc equipment	Various	60	Semi-trailer
Misc materials	Various	25	Semi-trailer
Wind turbine components (44 wind turbine generators)			
Tower sections (4 per tower)	176	176	RAV
Nacelles	44	44	RAV
Hubs	44	44	RAV
Blades (3 per turbine) 1/truck	132	132	RAV
Generator Transformers	44	15	RAV
33 kV / 132 kV Substation and 33 kV Cables			
Substation transformer	2	2	RAV
Misc substation items	Various	25	Semi-trailer
33 kV Transmission poles	55 poles	19	RAV
132 kV Transmission poles	75 poles	25	RAV
33 kV Underground cables	31 kilometres	92	Semi-trailer
Site Work Activities			
Site establishment	Various	8	Semi-trailer
Cranes	2	16	Semi-trailer
Construction equipment	Various	15	Various
Site disestablishment	Various	8	Semi-trailer
Total one-way traffic movements on public roads			
Total RAV movements	Various	457	RAV
Total overall vehicle movements (excl employee movements)	Various	3,910 – 4,545	Various
Employees –12 months (peak to 18 months)	40 persons	5,000	Car / 4WD

It is expected that 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 once the footings are ready and components are available on site. Events such as pouring the concrete for a turbine footing can generate up to 20 one-way trips per day over a period of about 8 to 10 hours for the delivery of concrete by agitator trucks from an off-site location. Table 13.4 below provides a comparison of delivery of concrete from Orange using a fleet of agitator trucks (Option A) versus trucks delivering materials to a batch plant for concrete production on site (Option B).

The contractor will need to identify the best approach with regard to the two options, taking into account the total number of trips required and the distance of the site from Orange. Should the contractor wish to install a batch plant on site then the contractor will be responsible for obtaining the requisite approval(s).

Table 13.4 – 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 Orange on public roads				
Concrete from Orange - No on-site batch plant	5,200 m^3	1,040		Agitator Truck
Option B –Batch plant on-site and constituent materials delivery on public roads				
Cement	1,700t	81	734	Semi Trailer/Truck
Aggregate	4,610t	308		Semi Trailer/Truck
Sand	3,500t	234		Semi Trailer/Truck
Water	1,830kL	111		Truck
Concrete cartage	5,200 m^3	On site only		Agitator Truck

Note: Road aggregate and sand to be supplied from a site to be determined (in the vicinity of Flyers Creek)

13.5 Road safety on public roads

The increased movement of large vehicles on public roads during the construction stage presents additional traffic issues to be managed particularly for local roads where such vehicle movements are non-routine. As indicated previously, some of the vehicles will be Restricted Access Vehicles (RAVs) requiring permits for the transport of large and/or heavy components to the project area. The permits will include conditions for the movement of the vehicles that will include routes to be used, requirements for escorts and/or timing for travel on various sections of road.

The Traffic Management Plan for the construction phase will incorporate measures for road safety risk management. Amongst the issues included in the Traffic Management Plan are conditions for movement of RAVs or semi-trailers on public roads, timing of movements and potential for congestion with other road users, identification of parts of the transport route(s) that require special consideration, and the details of selection and preparation of site entry points to the wind farm site. The local community will be kept informed of the status of scheduled traffic movements during the construction stage.

13.6 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 are 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 may, if required, be sealed to provide safe access and reduce erosion potential.

The proposed locations of the access tracks have been determined in consultation with the respective landowners, and are based on the recommendations of the ecological and heritage consultants while considering the access parameters (grade and alignment restrictions) for the large RAVs. Additional recommendations with regard to minimising any potential impacts on flora and fauna and indigenous heritage with the proposed routes will be addressed by the Construction Environmental Management Plan.

The chosen routes are preferentially located in cleared and mostly exotic pasture, minimising the need to clear existing scattered trees. The proposed 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.

13.7 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 developed in consultation with Blayney Shire Council and will be detailed in the Traffic Management Plan for the project.

An important mitigation measure relating to construction traffic impacts is expected to 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 Blayney Shire Council. Specific warning signs will be located adjacent to the entrances to the site to warn existing road users of entering and exiting traffic and this will be supported by the use of escort vehicles for RAVs where necessary, as previously described. 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 will 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 environmental impact is minimised.

Further mitigation measures will include:

- Provision of traffic control personnel where large vehicles are required to execute difficult or potentially unsafe manoeuvres on public roads
- 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 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

- Establishment of an inspection and maintenance program for the local road access network to ensure condition of roads are maintained in safe state
- Construction of access track routes in proximity to any environmentally sensitive areas to be guided by relevant specialists
- Maintenance program for on-site access tracks to ensure safe access
- Implementation of a proactive 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

13.8 Conclusion

The main issues for traffic management are associated with the construction stage of the Flyers Creek Wind Farm project, due to the additional volumes of traffic on local roads and the need to use RAVs to transport the wind farm components and associated materials to the site. There are a number of access routes proposed for the site, due to:

- the fact that construction traffic for the wind farm construction may come from many different directions;
- the distributed nature of the wind farm in hilly terrain, leading to the difficulty in establishing continuous access tracks between parts of the wind farm site that are suitable for the types of vehicles involved (particularly the RAVs);
- the fact that it is desirable to access the site in the most efficient path, minimising unnecessary traffic movements.

The proposed routes for transport to the project area are shown in Figures 13.2.

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 and transport issues for the construction period will be documented in a comprehensive Traffic Management Plan which will be developed in consultation with relevant Councils, the Roads and Traffic Authority and the local community. Based on this assessment, it is concluded that the traffic and transport impacts associated with the construction of the wind farm can be appropriately controlled to minimise adverse impacts on the local community. In addition, such impacts will be limited to the relatively short periods during the construction phase.