

4. Highway access strategy

4.1 Introduction

The access strategy developed for the Oxley Highway to Kempsey section of the Pacific Highway Upgrade project has been designed based on a two stage development process including:

- ▶ Arterial standard - two lanes in each direction, posted speed limit of 100 km/h, limited access condition roadway with provision for grade separated access points where appropriate.
- ▶ Motorway standard - two lanes in each direction, a median to accommodate future upgrading to three lanes in each direction, posted speed limit of 110 km/h, controlled access condition roadway with grade separated access points and provision for a continuous alternative route to the upgraded highway.

The Oxley Highway to Kempsey access strategy for the arterial and motorway upgrade stages has been developed in accordance with the key project objectives outlined in Section 4.1.1.

Section 4.2 'arterial standard' and Section 4.3 'motorway standard' provides a summary of the significant features of the access strategy for the arterial and motorway standards respectively. The overall philosophy for the access strategy is to provide geometric design of access points to motorway standard, however at locations where staging has been identified as viable, a layout that meets the arterial standard will be provided initially. While the geometric design of access points may be subjected to further refinement, the functionality of each location and hence the intent of the overall strategy is not envisaged to change.

4.1.1 Key program objectives

The key program objectives for the Pacific Highway Upgrade project include:

- ▶ Significantly reduce road accidents and injuries.
- ▶ Reduce travel times.
- ▶ Reduce freight transport costs.
- ▶ A community satisfied with the physical development of the route.
- ▶ A route that supports economic development.
- ▶ Reconstruction of the route managed in accordance with ecologically sustainable development principles.
- ▶ Maximum effectiveness of expenditure.

4.2 Arterial standard

The access strategy for the arterial upgrade scenario for the Oxley Highway to Kempsey project is described in the sections below in terms of highway classification, service roads, interchanges, at-grade intersections, private accesses, crossover and U-turn locations.

4.2.1 Highway classification

For the arterial scenario it is proposed to design the road to both arterial and motorway geometric design standards to maximise the effectiveness of existing and new infrastructure in terms of safety, efficiency and expenditure.

Oxley Highway to Cooperabung Close

The section of highway between Oxley Highway and Cooperabung Close will initially be upgraded to motorway standard. The implementation of controlled access points are proposed at Sancrox Road, Blackmans Point Road and Haydons Wharf Road, as well as a continuous service road located between Sancrox Road and Cooperabung Close providing an alternate route for local traffic. No at-grade intersections permitting cross highway movements or private access points will directly access the highway along this section of the alignment.

Cooperabung Close to Stumpy Creek

The section of highway between Cooperabung Close and Stumpy Creek will be upgraded to arterial standard as a result of the at-grade junctions and segregated service road. In order to facilitate the safe and efficient movement of traffic, particularly for the high number of heavy vehicle movements associated with the surrounding land uses, a limited number of at-grade intersections and private accesses will directly connect with the highway and grade separated access is proposed at Yarrabee Road and Kundabung Road.

4.2.2 Service/access roads

For the arterial upgrade scenario new service roads are proposed to be constructed in the first instance to assist with the rationalisation of at-grade intersections/private accesses and to provide access between proposed interchange locations.

As stated in Section 4.2.1 the section of highway between Oxley Highway and Cooperabung Close is initially proposed to be constructed to motorway standard with a continuous service road running adjacent to the highway. Between Cooperabung Close and Kempsey a continuous service road will not be provided in the first instance, however several new service roads are proposed to be constructed to maximise the use of the existing roads and accommodate private access.

At locations where it is proposed to use the existing highway as a service road, the asset will be handed over to council upon completion of the upgrade. If access for B-double vehicles on a service road is required this will be negotiated with council. The currently gazetted B-double route for the existing highway alignment will move to the new alignment upon project opening.

The primary features of the service road strategy for the arterial upgrade scenario include the following:

Oxley Highway to Cooperabung Close

- ▶ Construction of a new service road from Fernbank Creek Road to Fernbank Creek on the eastern side of the highway.
- ▶ Use of the existing highway as service road from Fernbank Creek to Haydons Wharf Road.
- ▶ Cooperabung Drive will be used as a service road between the Haydons Wharf Road grade separated access and Cooperabung Close (approximate chainage 21000). Wyndell Close will be extended to the Haydons Wharf Road grade separated access to provide the connection between Cooperabung Drive and the upgraded highway.
- ▶ Construction of a new service road linking Blackmans Point Road to Bill Hill Road on the eastern side of the highway.

Cooperabung Close to Kempsey

- ▶ Continuous service road between Kundabung Road interchange and the proposed interchange located just north of Stumpy Creek forming part of the Kempsey to Eungai project. This will involve the construction of the following new service roads:
 - Between Rodeo Drive and Ravenswood Road (approximate chainage 30400 to 31200).
 - Between Ravenswood Road and existing highway (approximate chainage 32400 to 32900).
 - Between Upper Smiths Creek Road and Rodeo Drive
 - Along the existing highway between Old Coast Road and Maria River Bridge (approximate chainage 36600 to 36900).
- ▶ New access road to facilitate access for the nine residential properties located on the eastern side of the highway between approximate chainage 31000 to 32850.

4.2.3 Grade separated accesses

For the purpose of this project the use of at-grade intersections have been minimised for the arterial upgrade scenario. The implementation of grade separated accesses have been based on safety, accessibility, highway performance, adjacent land uses and economic feasibility. The key drivers for implementing a grade separated access at the arterial stage over an at-grade intersection are:

- ▶ Providing safe access locations to the highway for adjacent communities.
- ▶ Reduction of travel times and freight transport costs, by minimising circuitous journeys for traffic to access the highway from the local road network.
- ▶ Providing the best value for money (ie location and layouts of access points based on need).
- ▶ Staging opportunities for intersection and/or interchange development between the arterial and motorway upgrade scenarios, whilst ensuring that any preliminary works can be incorporated into final works.

The preferred access strategy identified five key locations for the implementation of a grade separated access at the arterial upgrade stage including:

- ▶ Sancrox Road (overbridge).
- ▶ Blackmans Point Road (full grade separated access).
- ▶ Haydons Wharf Road (half grade separated access).

- ▶ Yarrabee Road (underbridge).
- ▶ Kundabung Road (overbridge).

An underbridge at Yarrabee Road has been highlighted for the arterial upgrade as an option to an at-grade seagull intersection.

The key features and rationale for each of the above locations are discussed in more detail in the sections below.

Sancrox Road

An overbridge is proposed approximately 600 metres south of Sancrox Road with service road connections to Sancrox Road on the west and Fernbank Creek Road on the east. Left in/left out only and a closed median will be maintained at Sancrox Road and Fernbank Creek Road intersection providing access to/from the highway. The recommended Sancrox Road interchange configuration and that endorsed by Port Macquarie - Hastings Council⁴ is shown in Appendix A.

The rationale for implementing an overbridge at this location with controlled access to/from both sides of the highway are:

- ▶ Facilitate safe and direct east-west connectivity across the highway for the surrounding areas (including Wauchope, Port Macquarie etc).
- ▶ Facilitate safe and direct access to/from the highway to existing commercial enterprises located adjacent to the highway, in particular for the RTA depot, large earthmoving machinery business (Expressway Spares Pty Ltd) and Hanson Quarry located adjacent to Sancrox Road.
- ▶ Accommodate traffic growth as a result of the proposed future developments, including:
 - Steel fabrication plant to be located adjacent to the Expressway Spares site.
 - Area 13 (mixed commercial, rural residential, retail) to be located east of the highway in the vicinity of Oxley Highway interchange (refer to Section 2.4.1).
 - Sancrox Employment Precinct (industrial land use) to be located west of the highway in the vicinity of Sancrox Road (refer to Section 2.4.2).
- ▶ Satisfy the key project objectives as listed in Section 4.1.1.

The existing at-grade priority cross intersection is considered to be unsafe for vehicle movements accessing/egressing the eastern and western approaches (in particular for heavy vehicle movements). The RTA Northern Region office (Grafton) has advised that prior to supporting future development applications within the area a median at this location is required to restrict conflicting turn movements with high speed through traffic. This additionally advocates the need for the proposed overbridge at Sancrox Road.

⁴ Council meeting held on 27 November 2006

Blackmans Point Road

The RTA has identified the requirement for a grade separated interchange in the vicinity of Blackmans Point Road. An option for an interchange has been developed with its position approximately 500 metres south of Blackmans Point Road with service road connections to Blackmans Point Road on the east, Wharf Road on the west and the highway in the north and south direction. The configuration for this option comprises of a bridge crossing the highway, with both ends of the bridge terminated by a 'five legged' roundabout connecting the side roads and north and south facing highway access ramps.

The rationale for implementing a full grade separated interchange at this location are:

- ▶ Facilitate safe and direct east-west connectivity across the highway for the surrounding areas. To the east of the highway is the community of Blackmans Point, for which the existing intersection is the sole access point. To the west is Wharf Road, which services several rural properties and state forests between the proposed highway and Hastings River.
- ▶ Provide efficient accessibility for the predominant vehicle trips (identified from the *Preliminary Traffic Assessment Report*) travelling between:
 - Telegraph Point and Port Macquarie via Hastings River Drive.
 - Blackmans Point Road and Port Macquarie via Hastings River Drive.
- ▶ Provide the southern gateway to the community of Telegraph Point, the Cairncross Waste Management Facility, the Cairncross State Forest and the Rawdon Creek Nature Reserve.
- ▶ Provide the northern gateway to Port Macquarie.
- ▶ Satisfy the key project objectives as listed in Section 4.1.1.
- ▶ Maximise effectiveness of expenditure by minimising staging and re-construction during the final motorway upgrade stage, and correspondingly minimising disruption to traffic.

The option for this access is shown in Appendix A. The RTA is currently undertaking design work that may result in changes to the orientation and layout of the interchange option. However, this work is not envisaged to affect the functionality of this access point or the overall access strategy.

Haydons Wharf Road

A grade separated access is proposed at the intersection of Haydons Wharf Road and Pacific Highway with north facing ramps only. The recommended Haydons Wharf Road grade separated access configuration is shown in Appendix A. The proposed interchange configuration will utilise the old highway asset as an on-ramp as it approaches the new alignment and will also provide a connection between Haydons Wharf Road interchange and Cooperabung Drive via Wyndell Close. This proposed connection will be vital in keeping the northern parts of Cooperabung Drive connected to Telegraph Point village, and to communities located further to the south.

The rationale for implementing a half grade separated interchange at this location are:

- ▶ Facilitate safe east-west connectivity across the highway for the surrounding areas.
- ▶ Facilitate accessibility for the community of Telegraph Point to/from the northern areas, as well as the communities located in the vicinity of Cooperabung Drive.
- ▶ Satisfy the key project objectives as listed in Section 4.1.1.

Without the implementation of an interchange at this location the community members of Telegraph Point would be isolated or required to undertake significant detours to travel to areas in the north and therefore is considered to be fundamental to the overall access strategy.

Yarrabee Road

Two options have been proposed for access for the arterial standard; an at-grade seagull intersection and an underbridge is proposed at Yarrabee Road with service road connections to/from the highway. An underbridge has been proposed as an option at the arterial stage primarily for the safe movement of heavy vehicles to/from the highway, Yarrabee Quarry and Ballengarra State Forests.

A number of heavy vehicle movements are associated with Yarrabee Quarry located approximately 1.5 kilometres east of the highway and Ballengarra State Forest. The current traffic volumes at the intersection with Pacific Highway has historically been low with a five day average of 60 vehicles per day in both directions, however a high proportion of this traffic comprised of heavy vehicles (ie dump trucks with 'dog' trailers). It is understood that the operators of the quarry are likely to intensify activities in the future and consequently will need to utilise semi trailers and B-doubles to accommodate the growth. The known reserves at the quarry indicate an operating life likely to exceed 100 years. Given the potential for conflict between slow moving heavy vehicles and high speed through traffic, the option for an underbridge is proposed at Yarrabee Road with service road connections to/from the highway which would provide advantages over the at-grade seagull intersection. If an at-grade intersection was provided for the arterial standard the cost of retrofitting a grade separated access for the motorway standard would be disproportionately expensive.

These two options are currently being considered by the RTA. It is important to note that both options being considered provide the same functionality and hence the same level of influence on the overall access strategy. Options for access to Yarrabee Road are shown in Appendix A.

Kundabung Road

An overbridge is proposed at Kundabung Road with service road connections to Kundabung Road on the east, Smiths Creek Road on the west and the highway in the north and south direction. The recommended configuration of Kundabung Road grade separated access is shown in Appendix A.

The rationale for implementing an overbridge at this location with controlled access to/from both sides of the highway are:

- ▶ Facilitate safe and direct east-west connectivity across the highway for the surrounding areas.
- ▶ Facilitate accessibility to/from the following adjacent trip generators:
 - The motel located at the intersection of Smith Creek Road.
 - The timber mill located on the eastern side of the highway.
 - Kundabung residential community.
 - Kundabung Rodeo, which is one of the largest rodeo events in NSW held each year.
- ▶ Accommodate safe and direct access for heavy vehicle movements (B-doubles) associated with the timber mill. Similar to the Yarrabee Road grade separated access, implementing an at-grade seagull intersection at Smith Creek Road as the primary access to areas in the north and south was not considered ideal, given the potential for conflict between slow moving heavy vehicles and high speed through traffic.

- ▶ Satisfy the key project objectives as listed in Section 4.1.1.
- ▶ Construction of the north and south facing ramps (connecting the overbridge/service roads to the highway) at the arterial upgrade stage would advocate safety and improve efficiency of freight movements associated with the timber mill by minimising circuitous journeys.
- ▶ The cost analysis identified that the construction of an at-grade intersection (sea-gull intersection including appropriate acceleration and deceleration auxiliary lanes) would be similar in magnitude to the construction of the ramps.

Further design refinements may result in an improved layout for this access point. However it is envisaged that its functionality and contribution to the overall access strategy would remain unchanged.

4.2.4 At-grade intersections

A number of at-grade intersections are proposed at the arterial upgrade stage to maintain accessibility for local roads that currently access the highway via an at-grade intersection and have not been allocated a suitable alternative route via the proposed interchanges and service roads forming the arterial upgrade strategy.

The number of full seagull intersection arrangements have been minimised in the design, in favour of left in/left out intersections (in conjunction with nearby public access U-turn facilities) to advocate safety. The at-grade intersections to be implemented at the arterial upgrade stage are shown in Table 4.1.

Table 4.1 Arterial standard – at-grade intersection locations

| Road name | Highway side | Chainage (approx) | Intersection configuration | Accessibility provision |
|-------------------------|--------------|-------------------|----------------------------|--|
| Cooperabung Close | East | 19350 | Left in / left out | The half interchange at Haydons Wharf Road (Ch 18050) will provide access to the north. Yarrabee Road underbridge will facilitate access from the south. |
| Cooperabung Drive | West | 20100 | Left in only | To improve accessibility to Telegraph Point and local communities living in the vicinity of Cooperabung Drive from the south, the provision of a 'left in' only access at Cooperabung Drive is proposed. |
| Mingaletta Road | East | 25350 | Left in / left out | The provision of U-turn facilities for public use at approximate chainage 24200 and 26400 will facilitate access to the north and from the south respectively. |
| Upper Smiths Creek Road | West | 27300 | Left in only | No left out access proposed. Travel to the north via service road connection to Rodeo Drive. |

| Road name | Highway side | Chainage (approx) | Intersection configuration | Accessibility provision |
|---------------|--------------|-------------------|----------------------------|--|
| Wharf Road | East | 27400 | Left in / left out | The provision of a U-turn facility for public use at approximate chainage 26400 will facilitate access to areas in the north. Kundabung Road overbridge will facilitate access from the south. |
| Old Camp Road | East | 36600 | Left in / left out | The provision of a U-turn facility for public use at approximate chainage 35600 will facilitate access to the north. The proposed grade separated interchange just north of Stumpy Creek (as part of the Kempsey to Eungai project) will facilitate access from the south. |
| Kemps Road | East | 37300 | Left in / left out | |

4.2.5 Private accesses

The private access locations that directly connect to the highway and will be maintained for the arterial upgrade scenario are as listed in Table 4.2.

Table 4.2 Arterial standard – private access locations

| Chainage (approx) | Highway side) | Intersection configuration | Accessibility provision |
|-------------------|---------------|----------------------------------|---|
| 19800 | East | Left in / left out | Haydons Wharf Road half grade separated interchange will facilitate access to the north (located approximately 1.2 to 1.5 km to the south). Yarrabee Road underbridge will facilitate access from the south. |
| 20100 | East | Left in / left out | |
| 25900 | East | Left in / left out | The provision of U-turn facilities for public use at approximate chainage 24200 and 26400 will facilitate access to the north and from the south respectively |
| 32050 | East | Left in / left out with right in | Nine properties flank the highway at this location. A service road will be provided that will run parallel to the highway and the rural residential properties. Access to north via U-turn at Ch 26400. |

4.3 Motorway standard

Staging opportunities have been identified and implemented that will minimise future construction works, as well as expenditure, that would be required to upgrade the highway to motorway standard. While it is noted that the preferred route alignment provided an opportunity to develop an access strategy that provides for motorway standard at project opening from Oxley Highway to Cooperabung Close.

The construction works that will be necessary to upgrade the highway alignment to motorway standard (based on the arterial upgrade strategy defined in Section 4.2) includes:

- ▶ Removing the left in/left out intersection at Wharf Road and implementing an overbridge that connects Upper Smith Creek Road and Wharf Road maintaining east-west connectivity across the highway. The overbridge will connect to the service road that will run adjacent to the western side of the highway. The closest access point to the highway will be via Kundabung Road grade separated access located approximately 1.8 km to the north.
- ▶ Removing the at-grade left in/left out intersection at Mingaletta Road and constructing an overbridge that connects Mingaletta Road to the service road that will run adjacent to the western side of the highway maintaining east-west connectivity. The closest access points to the highway will be either via Kundabung Road overbridge located approximately 3.8 km to the north or Yarrabee Road underbridge located approximately 3.6 km to the south.
- ▶ Removing all private accesses that directly connect to the highway as detailed in Table 4.2 and providing appropriate service road connections that link to an adjacent interchange(s).
- ▶ Construction of the following new service roads:
 - Between Fernbank Creek Road and Oxley Highway.
 - Between the private access roads at Cooperabung Close, approximate chainage 19800 and 20100 to Haydons Wharf Road on the western side of the highway.
 - Between the private access road at approximate chainage 25900 and Mingaletta Road overbridge.
 - Between the access road for the residential properties located north of Kundabung Road on the eastern side of highway to the service station located adjacent to Ravenswood Road on the western side of the highway via either an underpass or overpass located at approximate chainage 33250 and 33675 respectively.
 - Between the residential access road and Kundabung Road overbridge on the eastern side of the highway.
 - Between Cooperabung Drive and just south of Kundabung Road providing the final link between the service roads designated for the arterial standard on the western side of the highway.

4.4 Key features

The key features of the highway access strategy defined for the arterial and motorway upgrade stages are:

- ▶ Meets the existing and future road network and development needs.
- ▶ Improves safety by separating high speed through traffic and low speed local traffic (in particular for heavy vehicles).
- ▶ Provides a high standard of access to and from the upgraded highway for the adjacent land uses (commercial, rural, industrial, residential etc).
- ▶ Improves amenity and local interconnections for the surrounding communities and commercial enterprises.
- ▶ Ability to be staged and upgraded on an 'as need' basis.