



Transport  
for NSW

# NSW SAFER ROADS PROGRAM

## Appin Road Safety Review

MARCH 2014



## ***Executive Summary***

The Centre for Road Safety, in conjunction with Roads and Maritime Services, has undertaken a route safety review of Appin Road. The objective of the route safety review is to assess road safety along the route and determine the best means of reducing road trauma along Appin Road.

Appin Road is generally of reasonable standard. The recommendations made as a result of the route safety review focus on an integrated approach to improving road safety along the length of the road. It is recommended to develop, cost and prioritise a program of works that addresses the following:

- Relocating or removing some road side hazards.
- Where relocation or removal of a road side hazard is not achievable, then consideration to providing greater protection from road side hazards through the installation of appropriate safety barrier systems.
- Providing upgraded and consistent warning, advisory and directional signposting with the potential use of Vehicle Activated signage where appropriate.
- Enhancing road user behavioural campaigns, especially those targeting speeding and fatigue.

## ***Appin Rd, Route Safety Review***

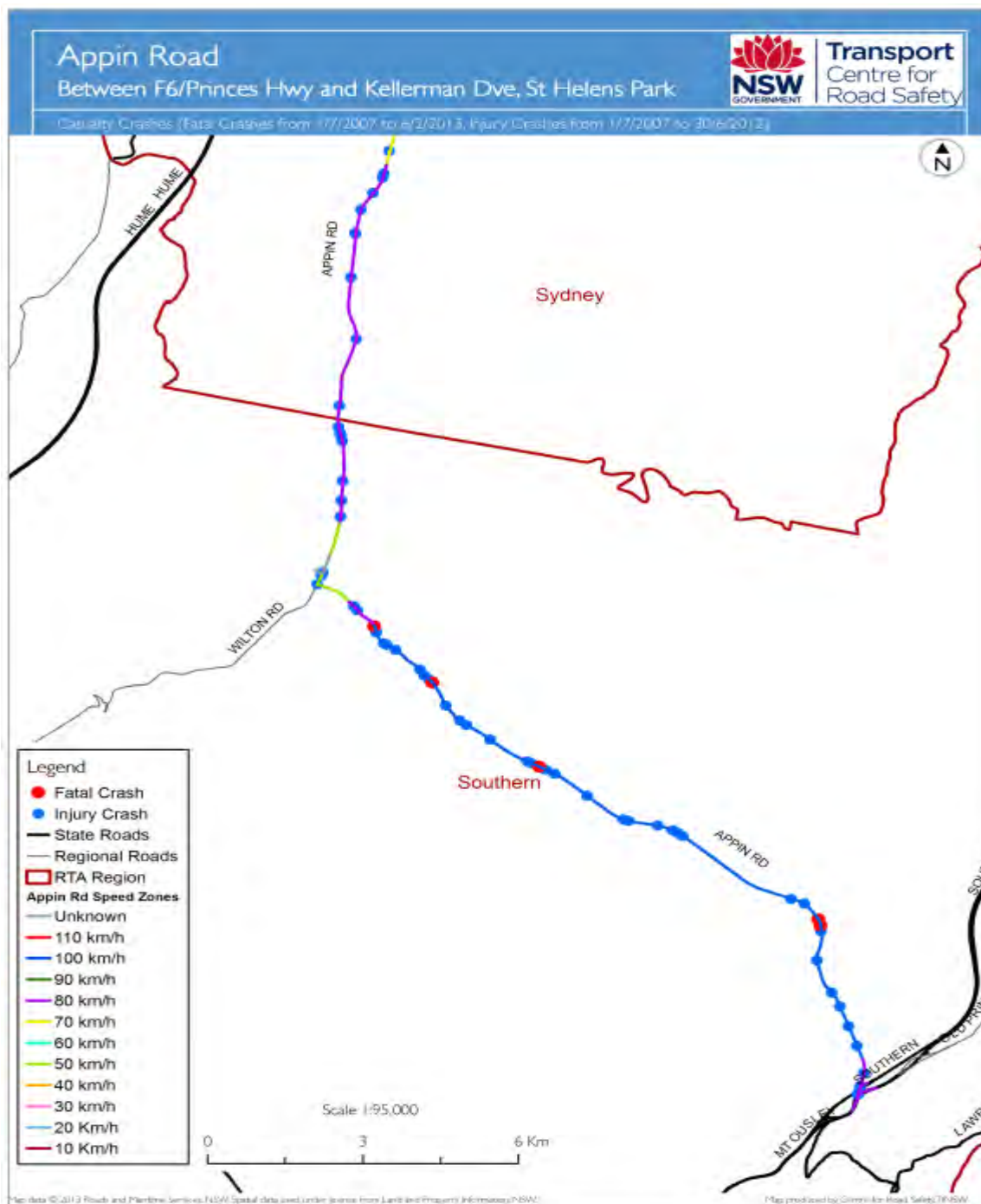
Appin Road (MR177) is a classified state road under the care and control of Roads and Maritime Services. The function of the state road network is to facilitate the safe and efficient movement of people and freight between localities. Appin Road (MR177) is a major arterial road connecting Campbelltown and surrounding areas of south west Sydney to the coast, the Princes Highway (HW1) and Wollongong.

The safety review assessed a 27 kilometre length of Appin Road (MR177) between the intersection of Kellerman Drive, Rosemeadow (B) and the intersection with the Princes Highway at Bulli Tops. The review length spans 3 Local Government Areas (LGAs) (Campbelltown City Council, Wollondilly Shire Council and Wollongong City Council), and covers both Sydney and Southern Roads and Maritime Services Regions (Fig 1).

The road is two-way, single carriageway with frequent overtaking opportunities, and traverses mainly undulating country. Appin Road passes through the town of Appin.

Appin Rd carries up to and over 10,000 vehicles a day (AADT) with approximately 15 per cent of these being heavy vehicles. It provides access for a number of mining operations along the Eastern section between Appin and the Princes Highway. Heavy vehicles were involved in 10 per cent of crashes on Appin Road over the last five years, however this is not considered significant as their proportion of road use (15 per cent) is more than double that of the state wide average (approximately 7 per cent).

It is recognised that sections of Appin Road can be improved to address particular road environment issues and provide a more consistent and safer travelling experience. The recent crash trends on the road have shown an increase in casualty crashes. There have been 5 fatal crashes, two of which occurred in 2012, and 76 casualty crashes (119 casualties) over the last five years.



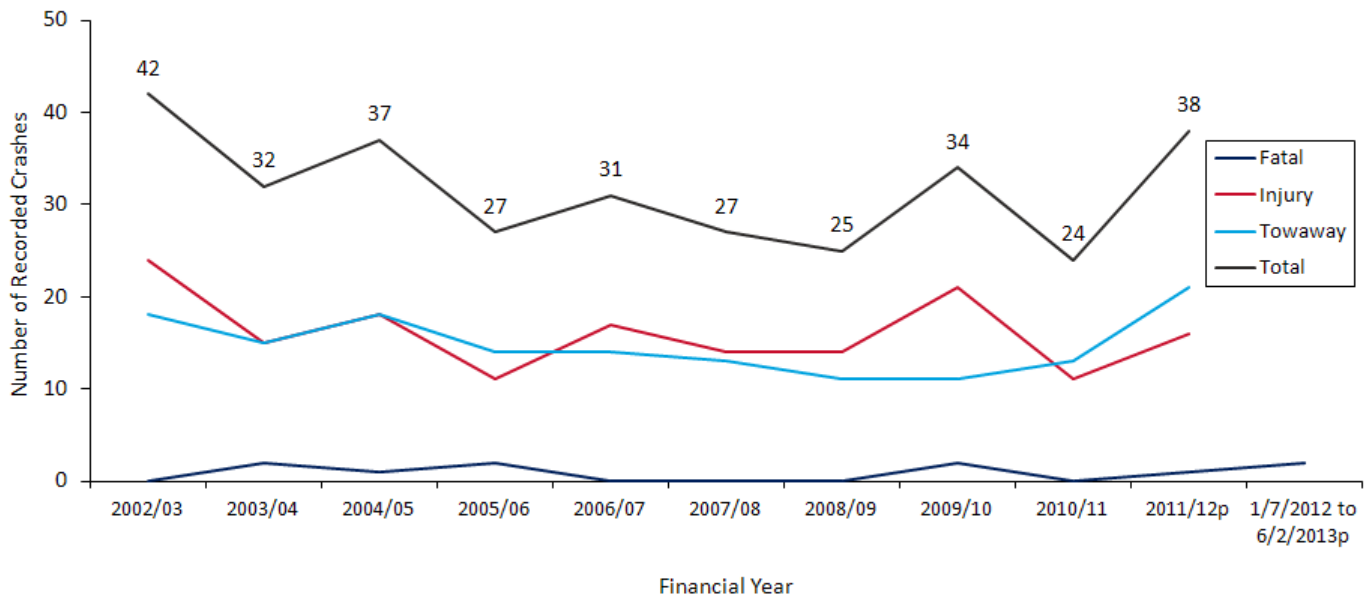
**Figure 1 – Appin Road Casualty Crashes**

A range of analysis, and highway inspections were undertaken during the review. These included:

- A desk based review of Appin Road including the use of the Roads and Maritime Services GIPSIAM (Global/Inertial Positioning System and Image Capture for Mapping) system to review areas of highway road environment
- Analysis of reports on fatal crashes.
- Analysis of crash trends, such as severity, crash type and crash factors.
- Physical inspections of the road to examine the locations and circumstances of fatal crashes, casualty crash clusters and hazardous locations identified by the community, speed limits and speed zones and to assess the road from both a behavioural and road environment perspective.

The review adopted the Safe Systems model approach. This approach aims to influence the behaviour of road users, but acknowledges that drivers will inevitably make mistakes. It requires the system to anticipate and 'forgive' driver error. Consequently, a safe road environment (road and roadside) is integral to managing and improving road safety outcomes.

### Number of recorded crashes on Appin Road, 2002/03 to 2011/12p, 2012/13p (to 6/2/2013)



### The Route Safety Review

The Appin Road route safety review was established to examine and report on the following road safety issues:

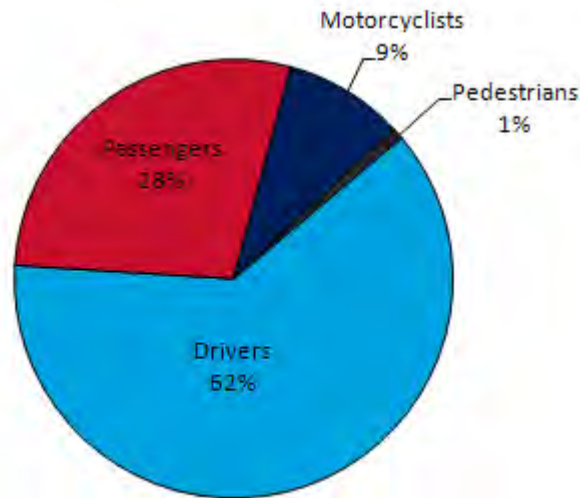
- The circumstances surrounding recent fatal crashes and other casualty crash cluster locations.
- General road conditions along the road
- Facilities, such as signage, intersection treatments, line marking, safety barriers and the configuration of overtaking lanes along the highways.
- The appropriateness of current speed limits and speed zones.
- Issues associated with driver behaviour, such as speeding and fatigue.
- Enforcement activities.
- Future priorities for rehabilitation and maintenance programs and the way in which road safety outcomes can be integrated into these programs, especially at high risk locations.

### Findings

#### Crashes

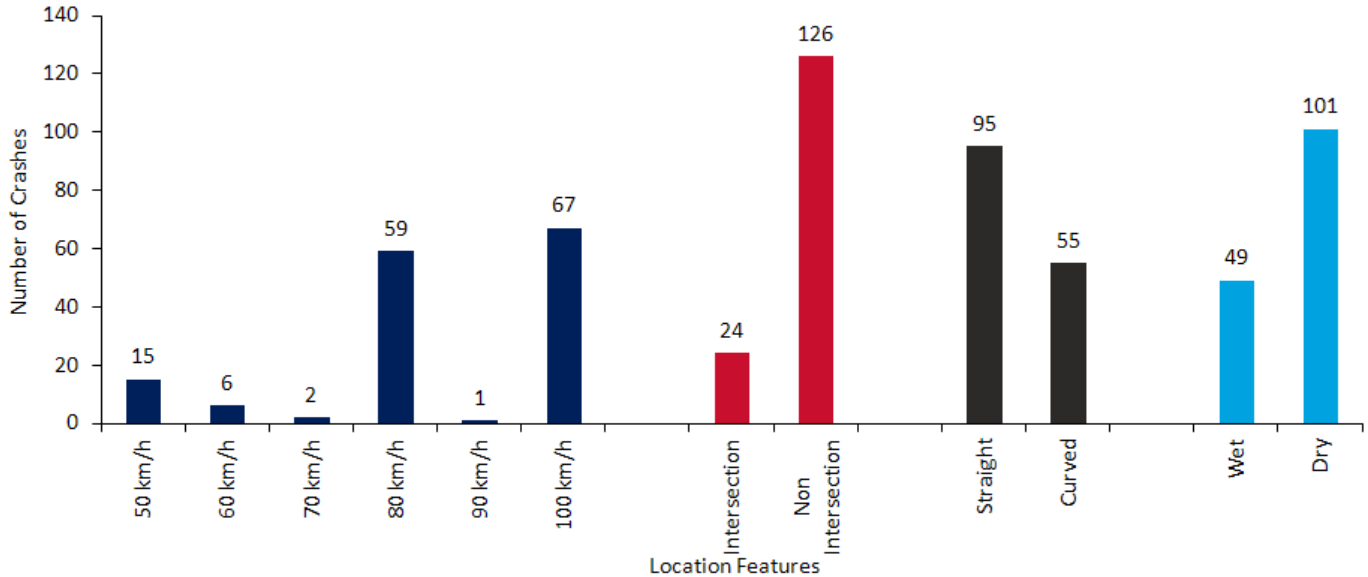
Between 2007/08 and 2011/12 there have been 5 fatal crashes, 76 injury crashes and 69 non-casualty (tow away) crashes on Appin Road, resulting in 5 fatalities and 119 persons injured. Including a further 2 fatalities and 4 injuries that occurred in 2012/13, drivers sustained the majority of casualties (62 per cent) suffered in crashes.

### Appin Road casualties by class of road user, 2007/08 to 2011/12p and 2012/13p fatal crashes



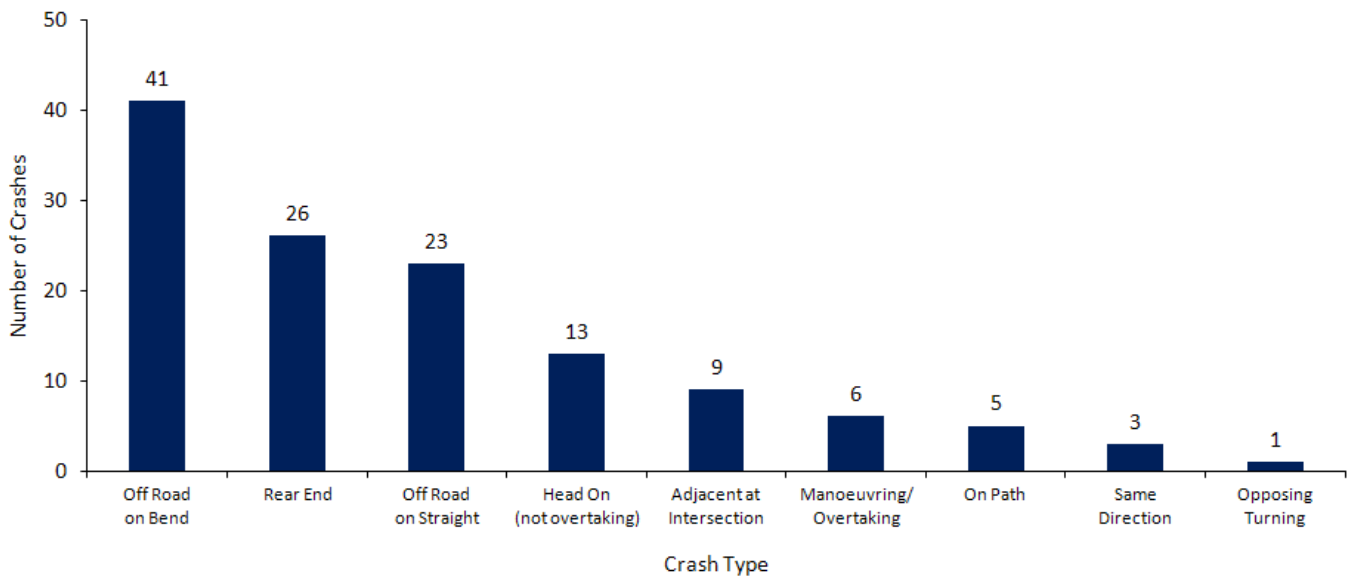
The majority of crashes occurred in 80km/h or more speed zones (85 percent) and away from intersections (84 per cent). Almost two thirds of crashes occurred during dry conditions (67 per cent) and / or on straight lengths (63 per cent) of Appin Road.

### Appin Road crashes by location feature, 2007/08 to 2011/12p and 2012/13p fatal crashes



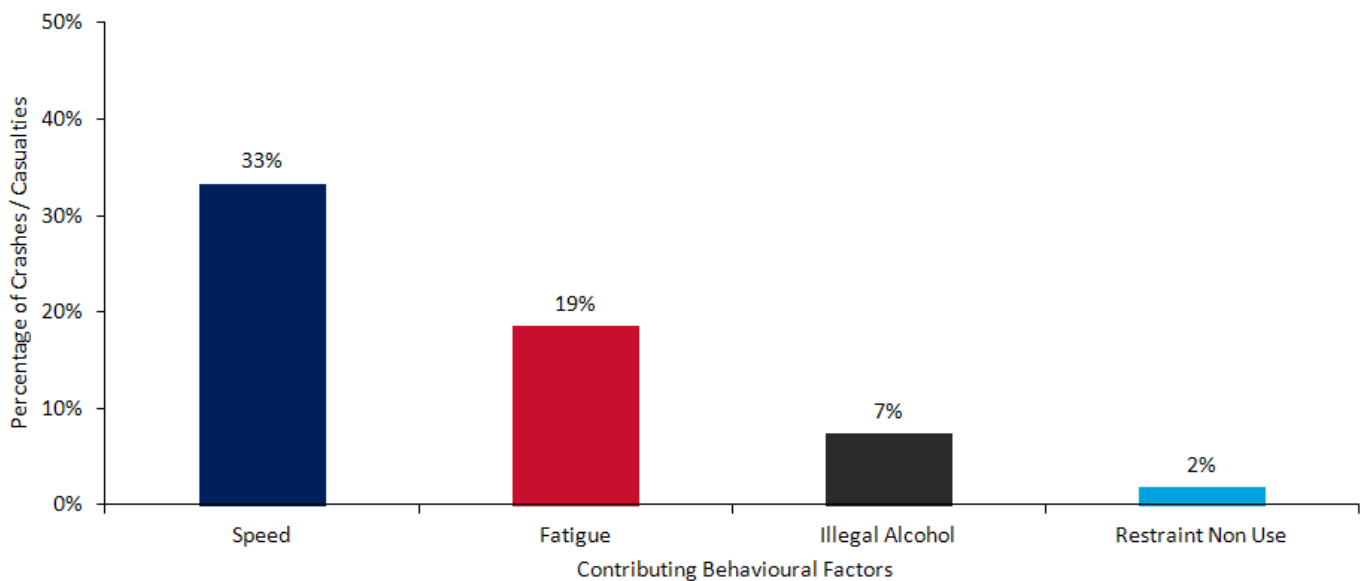
Of the crashes occurring at speeds of 80km/h or above, the most common crash types were off road on bends or straights (50 per cent) and rear end crashes (20 per cent). More than three quarters of the run off roads crashes involved an impact with a fixed object, most commonly trees and bushes.

**Appin Road crashes by crash type for speed limits of 80km/h and above, 2007/08 to 2011/12p and 2012/13p fatal crashes**



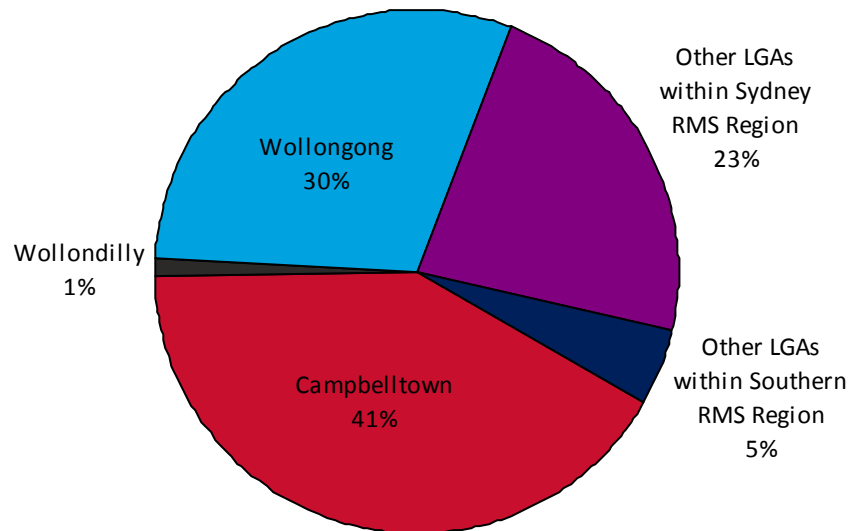
Speed and fatigue were the highest contributing behavioural factors in casualty crashes, contributing 33 per cent and 19 per cent respectively.

**Appin Road casualty crashes by contributing behavioural factor, 2007/08 to 2011/12p and 2012/13p fatal crashes**



Local residents were over represented in the Appin Road crash statistics, accounting for 72 per cent of casualty crashes. People living within the immediate area represented 75 per cent of drivers / riders involved in speed related crashes and 67 per cent of fatigued drivers and riders involved in casualty crashes.

## Appin Road crashes by residence of motor vehicle controller, 2007/08 to 2011/12p and 2012/13p fatal crashes



Appin Road was divided into two sections for further crash analysis, due to the significant differences in road environment and speed limit. Section 1 runs from the Princes Highway to Appin, with section 2 being from Appin, running north to the intersection with Kellerman Drive, in Rosemeadow.

The predominant crash type in section 1 is run off road crashes which make up 56% of all crashes. In most cases these crashes also resulted in the vehicle impacting with an object near roadside, most commonly a tree. All of the fatal crashes over the last 5 years have occurred in this section.

Section 2 has a slightly different crash profile, with rear end crashes being the major crash type, accounting for 39% of all crashes, this is closely followed by run off road crashes which make up 35% of crashes in this section. As was the case for section one the majority of run off road crashes involved the vehicle impacting with an object close to the road. There have been no fatal crashes in section 2 over the last 5 years.

As figure 1 shows, the casualty crashes are spread along the length of Appin Rd across both sections. There is one crash cluster worth noting, approximately 4km west of the Princes Highway. This section has been the location of 2 fatal crashes as well as a number of injury crashes over the last five years.

## **Junctions**

Treatments to junctions aim to provide suitable and safe access in and out of side roads. Treatments include improved protection for vehicles turning right across opposing traffic, increased warning of an upcoming junction and improved sight distances at the junction.

Observations from the review include:

Earth embankments and vegetation in or around junctions need to be reviewed to ensure a safe sight distance is maintained.

The advance and intersection warning signage and road name signage is inconsistent and in many cases too small to be easily read.

- Delineation and signage at junctions along the route is inconsistent.

## **Clear Zones**

Clear zones that are free of non-frangible hazards minimise the potential harm to drivers, riders and passengers of errant vehicles. When a hazard-free clear zone cannot be provided, the installation of safety barriers to protect road users from the adjacent hazard is an alternative measure.

Clear zones along the entire length of the road need to be more closely examined (particularly in regard to trees), any proposed works prioritised on existing crashes and then potential hazard and an ongoing program to address clear zone issues should be established.

## **Road pavement and shoulders**

The provision of wide sealed shoulders assists road users to regain control of their vehicle should it leave the travel lane. This is especially important on the outside of low radius curves or other locations where more space is needed to enable road users to regain control, such as sections of road with narrow lanes. Observations from the review include:

- The section of road between Rosemeadow and Appin has very narrow to non-existent shoulders in places. This combined with narrow lanes and a road surface showing signs of wear reduces, or in some cases does not provide, any margin for error by the vehicle controller.

## **Signage**

Warning signs provide road users with sufficient information to guide and give advance warning about the road environment ahead. Signs also provide advance information about road and weather conditions and directions to locations such as towns, side roads and features.



Observations from the review include:

- Advance, intersection, guide and directional road name signage is inconsistent and, in many cases, too small to be easily read.
- Curve advisory signs are not consistently applied along the road. The location of signs prior to the curve varies and advisory speed limits are not always applied where they may be required. In some of these situations, winding road signs should be installed.

### **Speed zones**

Speed zoning is used to establish speed limits on particular lengths of road, helping speed management by providing consistency of speed limits. Observations from the review include:

- The application of speed zoning along the road appears to be consistent.

Roads and Maritime Services also carried out a speed review as part of the route safety review, with all current speed zones considered appropriate for the conditions.

### **Lane Width**

The width of the travel lanes should allow for all vehicle types using the road to travel safely and efficiently.

- Lane widths in section one from the Princes Highway to Appin appears to be satisfactory.
- Lane widths in section 2 from Appin to Rosemeadow appear to be narrow at a number of locations.

### **Summary**

Appin Road is a road of a reasonably good standard, however, it is recognised that sections of the road could be improved by addressing the unforgiving nature of the roadside. The recommendations made as a result of the route safety review focus on an integrated approach to improving road safety along the length of the road.

It is recommended that RMS develop, cost and prioritise a program of works that addresses the following:

- Relocating or removing some road side hazards (subject to environmental assessment).
- Further investigation of crash clusters, which may include providing greater protection from road side hazards through the installation of appropriate safety barrier systems if the crashes can not be addressed through other engineering works.
- Providing upgraded and consistent signage, delineation and line marking, with the potential use of Vehicle Activated signage.
- Enhancing road user behavioural campaigns and enforcement especially those targeting speeding and fatigue.