

Transport for NSW | Centre for Road Safety

NSW Safety Performance Indicators Observational Study

Summary report

June 2021



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1 Key findings

Observational studies have been undertaken in NSW that have identified prevalence of key road user behaviours, but these studies have usually focused on a single behaviour and have not been undertaken regularly or systematically. A review found that no up to date data was available to develop Safety Performance Indicators for three road user behaviours and this project aimed to address those data gaps, develop the baseline data and inform ongoing development of strategy to address any identified risks or issues.

Observations occurred across NSW during October and November 2020 and focused on:

- Light vehicle seat belt use (driver and front seat passenger only)
- Motorcycle helmet and protective gear use
- Bicycle helmet use.

The methodology for this study also allowed for the observation of mobile phone use by light vehicle drivers, motorcyclists and cyclists. Mobile phone use is not a current SPI in NSW.

Light vehicle seat belt use

Across NSW, 99.3 percent of all observed drivers and front seat passengers were wearing their seatbelt correctly fitted and adjusted.

Observed correct seatbelt use was slightly higher in regional and rural areas (99.6 per cent) compared to in metro areas (99.1 per cent; see page 9). In most regions correct seatbelt use of 99.0 per cent or higher was observed, however at the Southern Sydney sites only a 96.7 per cent compliance rate was observed (page 10).

Mobile phone use was also observed and 96.9 per cent of drivers were observed not holding a mobile phone (Page 10). People driving slowly through an intersection were observed not to be holding their mobile phone more often (99.1 per cent) than drivers that were stopped at an intersection (96.1 per cent). Drivers who wore their seat belt correctly were more often observed not holding a mobile phone (97.0 per cent) compared to drivers who were not wearing their seat belt or wearing it incorrectly (90.0 per cent; page 11).

Motorcycle helmet and protective gear use

Nearly all riders and passengers observed wore a helmet (99.9 per cent; see page 12). Just under one third of riders and passengers (31.5 per cent) wore complete protective gear.

Less than half of one per cent of motorcyclists (13 of 2620 riders) were observed holding a mobile phone.

Bicycle helmet use

More than 9 out of 10 cyclists observed (91.2 per cent) wore a helmet (see page 13). Of those cyclists wearing a helmet, 99.4 per cent wore a fastened helmet.

The rates of helmet use were significantly higher among males (92.0 per cent) than females (88.5 per cent). Nearly all cyclists estimated to be 10 years old or younger were wearing a helmet (95.5 per cent), however this rate drops considerably for cyclists estimated to be 11-17 years old at only 75.7 per cent. Most adults (18 years and over) were observed wearing a helmet (92.6 per cent).

2 About the Safety Performance Indicator study

2.1 Purpose of the study

This study aimed to address a gap in the available data for three specific road user behaviours and their associated safety performance indicators:

- Light vehicle seat belt use
- Motorcycle helmet and protective gear use
- Bicycle helmet use

Observational studies have been undertaken in NSW that have identified prevalence of key road user behaviours, but these studies have usually focused on a single behaviour and have not been undertaken regularly or systematically. The aim of this research was to conduct an observational study that provided baseline data on the relevant SPIs for ongoing monitoring of these behaviours. The study grouped these behaviours because they could be observed accurately during the same observation sessions.

The NSW Centre for Road Safety (CRS) commissioned Taverner Research to conduct the Safety Performance Indicator Observational Study. This report presents a summary of the study's findings. The full report is available to read here:

<https://roadsafety.transport.nsw.gov.au/research/reports/index.html>

2.2 About Safety Performance Indicators

The Road Safety Plan 2021 commits NSW to setting new road safety targets every 10 years to make sure we continue to move Towards Zero trauma. This relies on having a robust system for managing road safety performance linked to trauma outcomes.

Safety Performance Indicators are an internationally recognised approach to improving road safety management, in which improvements will yield the greatest tangible trauma reductions and provide measures of risk in the road system. SPIs relate to the safe system and require monitoring changes in road user behaviour, changes in the vehicle fleet and changes in the road environment.

Only focusing on fatality and serious injury outcomes does not allow for scrutiny of the impact of specific road safety actions in effecting change towards trauma outcomes. Safety performance indicators (SPIs) are defined as measures of risk in the road system, and therefore provide visibility of performance across all the different elements of the safe system. Improvements in SPIs show that the system is being made more error tolerant and survivable¹.

¹ Woolley, J., & Crozier, J. (2018, September). *Inquiry into the National Road Safety Strategy 2011-2020*. Retrieved November 1, 2018, from http://roadsafety.gov.au/nrss/files/NRSS_Inquiry_Final_Report_September_2018.pdf

2.3 Selecting the indicators for this study

The indicators for this research were selected following a review of available data for all NSW safety performance indicators. The road user behaviours that are the focus of this research can all be captured from roadside observations and light vehicles and motorcycles can be observed during the same observation sessions.

2.3.1 Compliance with seat belt laws

There is good evidence that 3-point seat belts are effective in preventing fatalities and injuries², as are laws mandating the use of seatbelts and related enforcement activities (particularly in combination)³.

A meta-analysis of enforcement found that it significantly increased seat belt use by 21% during the enforcement period and by 15% afterwards. The effect was greater during the night than during the day⁴. A separate meta-analysis of seat belt use concluded that a seat belt reduces the risk of being killed or severely injured by 60% among front seat occupants and by 44% among rear seat occupants⁵.

Between 2015 and 2019, 15.6% of NSW light passenger vehicle drivers killed were not wearing an available seatbelt and 2.2% of NSW light passenger vehicle drivers seriously injured were not wearing an available seatbelt. This data only identifies whether or not a seatbelt has been worn, not necessarily whether it was worn correctly.

2.3.2 Share of motorcycle and bicycle riders wearing a helmet

Regarding motorcycles, the literature shows consistent statistically significant reductions in the risk of death and serious injuries to the head or face when a helmet is used compared to no helmet⁶. Between 2015 and 2019, 6.4% of NSW motorcycle riders killed were not wearing a helmet and 2.8% of NSW motorcycle riders seriously injured were not wearing a helmet.

For bicycles, there is good evidence for statistically significant reductions in the severity of head and facial injuries for cyclists when a helmet is used, compared to no helmet⁷. Between 2015 and 2019, 14.4% of NSW bicycle riders killed were not wearing a helmet and 12.7% of NSW bicycle riders seriously injured were not wearing a helmet.

² Andersson, M. (2017). *Seatbelts*. Retrieved August 3, 2018, from European Road Safety Decision Support System, developed by the H2020 project SafetyCube: https://www.roadsafety-dss.eu/assets/data/pdf/synopses/Seatbelts_15062017.pdf

³ Alfonsi, R., Meta, E., & Ammari, A. (2017). *Seatbelt law and enforcement*. Retrieved August 1, 2018, from European Road Safety Decision Support System, developed by the H2020 project SafetyCube: https://www.roadsafety-dss.eu/assets/data/pdf/synopses/Seatbelt_law_and_enforcement_14062017.pdf

⁴ Høye, A. (2009). Control of the use of personal protective equipment. In *The Handbook of Road Safety Measures, Norwegian (online) version*. <http://tsh.toi.no/index.html?22743>

⁵ Høye, A. (2016). How would increasing seat belt use affect the number of killed or seriously injured light vehicle occupants? *Accident Analysis & Prevention*, 88:175-86

⁶ Reed, S. (2018). *PTW Helmets*. Retrieved August 8, 2018, from European Road Safety Decision Support System, developed by the H2020 project SafetyCube: https://www.roadsafety-dss.eu/assets/data/pdf/synopses/PTW_Helmets_23022018.pdf

⁷ Reed, S. (2018). *Cycle protective clothing - Helmet*. European Road Safety Decision Support System, developed by the H2020 project SafetyCube.

2.3.3 Rates of full-body motorcycle protective gear use

The use of motorcycle protective gear is itself not a Safety Performance Indicator, but protective gear use was observed during this study to provide insight into the safety habits of NSW motorcyclists. The focus on motorcycle helmets meant this research could simultaneously observe the protective gear being worn without having to conduct a separate study.

The right protective gear can greatly reduce the likelihood of permanent injuries from a crash and shorten hospital recovery times. Riders are best protected when their whole body is covered with abrasion resistant materials, with added impact protection for the joints. Riders wearing protective motorcycle clothing, especially when fitted with impact protection, are less likely to have any injuries in a crash, while those who are injured are less likely to be hospitalised.

3 Methodology

The aim of the study was to observe the road user behaviours in both metro locations (Sydney, Newcastle, and Wollongong) and regional/rural areas.

- The targets set were for 100 observations per site for a total of 1600 observations at 16 sites for light vehicles and motorcycles and 1500 for bicycles (15 sites)

- Observation instruments and coding that captured key details about each of the road user behaviours being observed and important features of the vehicle or rider.

- Sites were selected based on previous studies and in consultation with key CRS stakeholders.
- Sites chosen were signalised intersections where vehicles would be stopped or travelling slowly to enable accurate observations.

- The number of observation sites selected were to enable at least 1100 metro observations and 400 regional/rural observations, assuming 100 observations of each road user at each site.
- 16 locations were selected for light vehicle and motorcycle observations and 15 for bicycle observations

- Observers underwent extensive training including detailed information on how to determine each observation detail based on photograph examples, how to record the data and undertook practice examples.

- Two observers were assigned to each site and both observed each vehicle and determined key information. If an observation detail was not clear, observers recorded "undetermined".
- In this study, observers estimated age and assumed gender

- Data was recorded on Android tablets and uploaded in real-time to a secure Australian-based server.
- Observers were trained on how to manage the data securely.

Data reported in this report may be different (+/- 1 per cent) to the sum of the individual elements shown in a figure or table due to rounding. Sum totals displayed in figures or tables may not add to 100 per cent due to rounding. Tests of statistical significance are noted where relevant, where $p \leq 0.05$.

3.1 Observation sample

In total, 9455 light vehicles were observed during the study and 2714 motorcycles were observed (Table 1). These numbers greatly exceeded the planned number of 1600 total observations each for light vehicles and motorcycles. A total of 2901 bicycle observations were completed during the study.

CRS and Taverner Research were unsure what traffic volumes to expect during the observation session, especially for motorcycle and bicycle observations. Researchers planned to achieve the minimum number of observations and continued to observe and record light vehicles, motorcycles and bicycles during the scheduled observations rather than stopping once the minimum counts had been met. These counts enhanced the findings of the study and further supported the SPIs.

Table 1. Completed observations

Region	Light vehicle observations	Motorcycle observations	Bicycle observations
Inner Sydney	832	470	748
Northern Sydney	1995	502	383
Southern Sydney	917	464	260
Western Sydney	1177	178	196
Outer Metro	1441	350	733
Coastal NSW	1455	390	350
Inland NSW	1638	360	231
Total	9455	2714	2901

Source: NSW 2020 Safety Performance Indicator Observational Study, October-November 2020

The following table shows the suburbs in which observations occurred and are linked to regions (Table 2). These include observation sites for light vehicles, motorcycles and bicycles however not all of these three vehicle types were observed in each suburb.

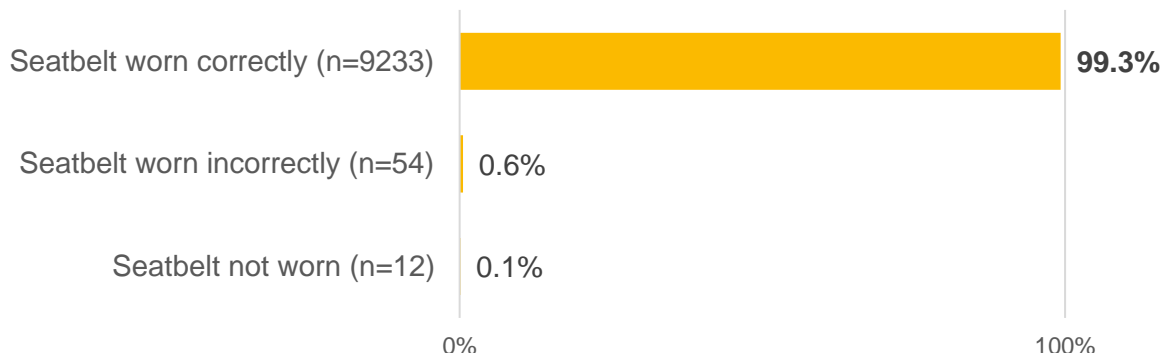
Table 2. Regions and their observed suburbs

Region	Suburbs of observations
Inner Sydney	Moore Park, Rozelle, Millers Point
Northern Sydney	Lane Cove West, Mosman, Berowra, North Ryde, Manly
Southern Sydney	Sutherland, Ramsgate, Kirrawee, Brighton Le Sands
Western Sydney	Penrith, Blacktown, Seven Hills, Glenwood
Outer Metro	Berkeley, North Wollongong, Wickham, Albion Park, Wallsend
Coastal NSW	Coffs Harbour, Nowra, Jervis Bay
Inland NSW	Tamworth, Bathurst, Wagga Wagga

4 Results - Light vehicle seat belt use

Observed seatbelt compliance was high across NSW. In light vehicle observations 99.3 per cent of observed drivers and front seat passengers wore their seat belts correctly fitted and adjusted (Figure 1).

Figure 1. Observed seatbelt compliance in NSW, 2020

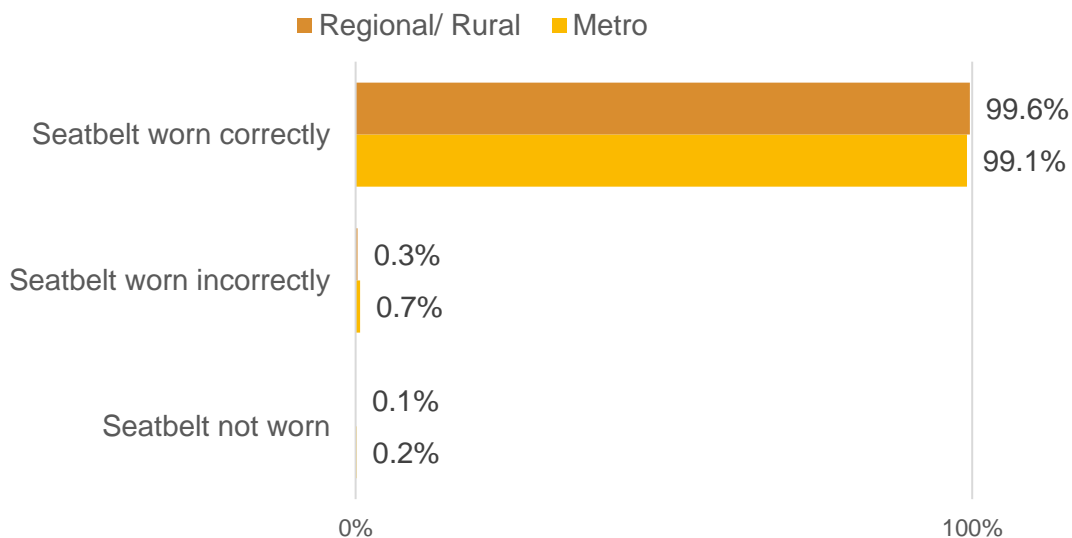


Source: NSW 2020 Safety Performance Indicator Observational Study, October-November 2020

Note: N=9299. Excludes n=120 'Worn – undetermined' and n=36 'Undetermined'

At locations in regional and rural NSW higher rates of seat belt use (99.6 per cent) were observed than at Metro locations (99.1 per cent; Figure 2); this difference is statistically significant.

Figure 2. Observed seatbelt compliance in NSW, Regional/ Rural vs Metro, 2020



Source: NSW 2020 Safety Performance Indicator Observational Study, October-November 2020

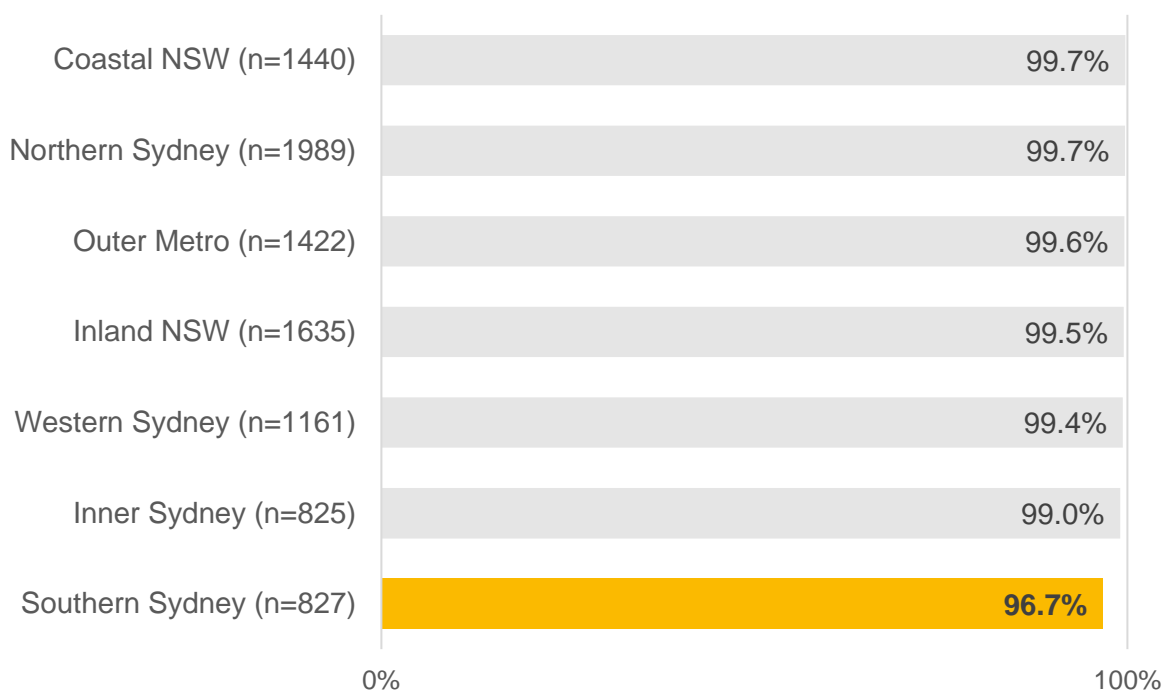
Note: Metro (n=6224) and Regional/ Rural (n=3075). Excludes n=120 'Worn – undetermined' and n=36 'Undetermined'

Seatbelt compliance was high for both males and females, with the proportion of females observed wearing their seatbelt correctly (99.0 per cent) higher than the proportion of males (99.0 per cent). This difference was statistically significant.

Most regions demonstrated high seat belt compliance (99.0 per cent or higher), while at the Southern Sydney locations only a 96.7 per cent compliance rate was observed (Figure 3). This may be explained by a couple of factors. Firstly, the same observers worked at both locations and reported a high number of tinted windows and as instructed, were reluctant to code as "worn-conforming" if they had any doubts. Secondly, there have been press reports of

community back lash to hooning and anti-social behaviour at the Bay Street location (in Southern Sydney) in particular. The observers reported seeing several drivers with the seat belt draped under their arm resulting in four percent “worn - not conforming” at Brighton-Le-Sands and two per cent at Kirrawee. These sites constitute the ‘Southern Sydney’ region in Figure 3.

Figure 3. Observed seatbelt compliance in NSW, by region, 2020

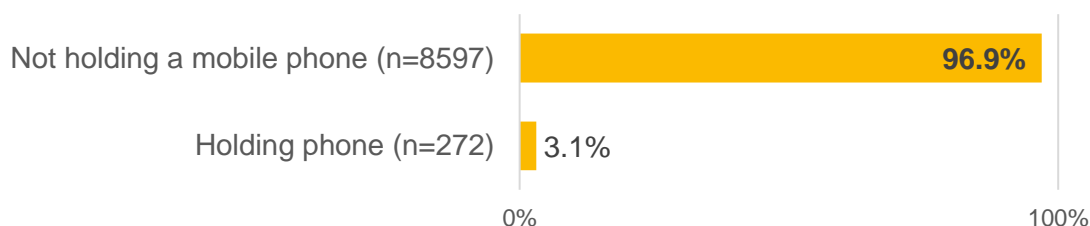


Source: NSW 2020 Safety Performance Indicator Observational Study, October-November 2020

Note: Data not shown for n=120 ‘Worn – undetermined’ and n=36 ‘Undetermined’.

Overall, 96.9 per cent of drivers in NSW were observed **not** holding their mobile phone during this study (Figure 4). Western Sydney was where most drivers not holding their mobile were observed (99.6 per cent not holding). The area that had the most drivers observed holding their phone was in Inner Sydney, where only 89.3 per cent of drivers were observed not holding a phone.

Figure 4. Observed mobile phone compliance in NSW, 2020



Source: NSW 2020 Safety Performance Indicator Observational Study, October-November 2020

Note: Drivers only. Excluded includes n=458 ‘Passenger’ and n=128 ‘Undetermined’.

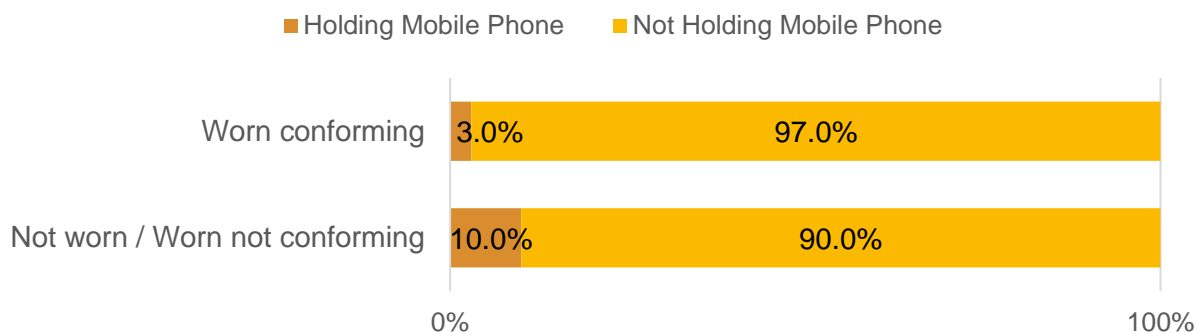
There was little difference in observed mobile phone usage between a drivers regional/metro location, gender or licence classes.

Drivers with passengers were less likely to be observed using their mobile phone (98.0 per cent) compared to drivers with no passengers (96.6 per cent). This difference was statistically significant.

Drivers who were stopped in traffic (either first at the lights or stopped behind others) were more likely to be observed holding their mobile phone (4.0 per cent) than drivers who were moving slowly through the signalised intersection (0.9 per cent). This difference was statistically significant.

In terms of seat belt use and mobile phone usage, drivers observed wearing their seat belts correctly were observed not holding a mobile phone in 97.0 per cent of observations (Figure 5). Ten per cent of drivers who were not wearing a seatbelt or wearing it incorrectly were observed also holding a mobile phone.

Figure 5. Seatbelt use and mobile phone use in NSW, 2020



Source: NSW 2020 Safety Performance Indicator Observational Study, October-November 2020

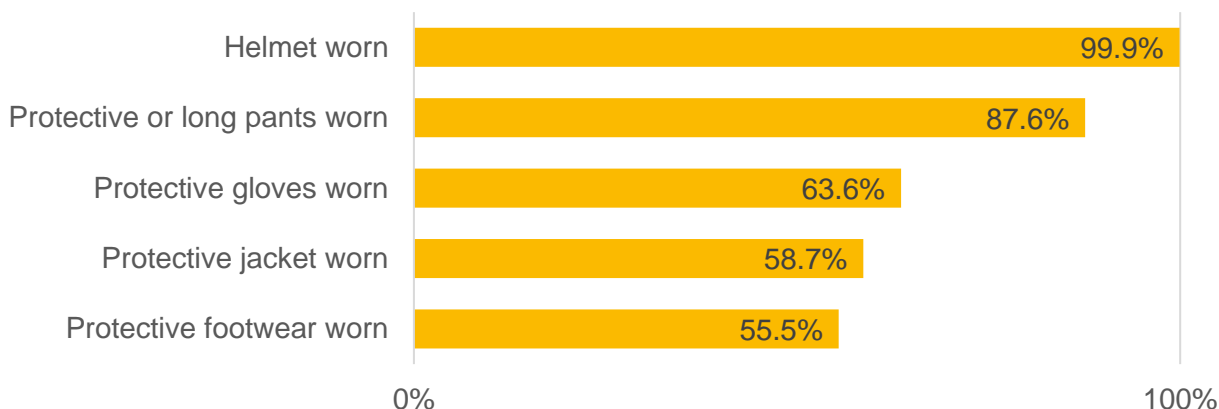
Note: Excludes all undetermined observations. Not tested for statistical significance.

5 Results - Motorcycle helmet and protective gear use

Motorcycle observations showed that:

- Nearly all riders and passengers wore a helmet (99.9 per cent; Figure 6)
- Only 31.5 per cent of riders and passengers wore complete protective gear, including a helmet as well as protective jackets, pants, gloves and boots.
- Less than half of one per cent of motorcyclists (13 of 2620 riders) were observed holding a mobile phone

Figure 6. Observed rates of motorcycle and protective gear use in NSW, 2020



Source: NSW 2020 Safety Performance Indicator Observational Study, October-November 2020

Note: Excludes all undetermined observations.⁸

Full face helmets were most often worn in Inland NSW and Northern Sydney (both 83.3 per cent) and Southern Sydney (75.7 per cent). Open face helmets were most often worn by motorcyclists in Western Sydney (47.2 per cent), Coastal NSW (41.8 per cent) and Inner Sydney (36.8 per cent). These differences are statistically significant between regions.

Scooter riders were less likely to be observed wearing protective jackets (25.6 per cent), leather or protective pants (2.9 per cent; excludes long pants), protective motorcycle boots or other boots (14.3 per cent) and gloves (27.7 per cent) than other riders. This is statistically significant.

Riders in Inner Sydney (1.9 per cent), Northern Sydney (9.6 per cent) and Western Sydney (11.8 per cent) were wearing leather or protective pants at lower rates than all other regions (statistically significant). Riders in these locations often wore jeans or long pants, so some may have been wearing protective gear that is difficult to distinguish during roadside observations.

When looking at the visibility of riders gear, most riders (78.7 per cent) wore dark or very dark clothing on their upper body and 82.4 per cent of riders wore dark or very dark clothing on their lower body. Nearly two-thirds (65.1 per cent) of motorcycle helmets were dark or very dark.

Motorcyclists can utilise MotoCAP ratings to choose the right gear with the best protection and comfort for their ride at motoCAP.com.au.

⁸ Protective pants category includes 'leather pants', 'other protective pants' and 'jeans and long pants'. If only obviously protective pants are included in this measure (leather pants and other protective pants), the 'Protective pants worn' value is reduced to only 18 per cent.

6 Results - Bicycle helmet use

Bicycle observations showed that:

- 91.2 per cent of observed cyclists wore a bicycle helmet. Of those cyclists wearing a helmet, 99.0 per cent wore a fastened helmet.
- 8.1 per cent of cyclists were observed not wearing a helmet. Less than one per cent of all cyclists observed had a helmet with them but did not wear it
- Observed rates of helmet use were significantly different between males (92.0 per cent) and females (88.5 per cent)
- 93.6 per cent of bicyclists were **not** holding a mobile phone and 3.7 per cent of cyclists had a phone affixed to their bike.

There were several differences in helmet usage between groups with regional cyclists (82.3 per cent), females (88.5 per cent), those estimated to be 11-17 years old (75.7 per cent) and those riding on the footpath (81.6 per cent) or beside a shared path/ cycleway (82.2 per cent) being less likely to be wearing a helmet.

Nearly all cyclists estimated to be 10 years old or younger were observed wearing a helmet (95.5 per cent; Figure 7). The rate drops considerably for people estimated to be 11-17 years old (75.7 per cent). Slightly over 9 in 10 adults (18 years and over) wore a helmet (92.6 per cent). For those cyclists aged 10 years old and younger, all people observed wearing a helmet had it fastened. Nearly all 11–17 year olds (99.5 per cent) and adults 18 and older (99.3 per cent) that were wearing a helmet had it fastened.

Figure 7. Observed rates of helmet wearing by estimated age group in NSW, 2020



Source: NSW 2020 Safety Performance Indicator Observational Study, October-November 2020

Observed helmet wearing rates were statistically significantly between metro areas (93.9 per cent) compared to regional/rural areas (82.3 per cent). Helmet use was generally consistent across the observation locations with only three locations where less than 80.0 per cent of cyclists were observed wearing a helmet including Tamworth (66.0 per cent), Manly (77.4 per cent) and Jervis Bay (79.5 per cent).

Transport for NSW, Centre for Road Safety

Website roadsafety.transport.nsw.gov.au

Contact roadsafety.transport.nsw.gov.au/contactus