



Regional Road Inspection Tour

August 2022



South-eastern Queensland Highways

- D'Aguilar Highway (Caboolture to Nanango)
- Burnett Highway (Nanango to Rockhampton)
- Bruce Highway (Rockhampton to Gympie)

INTRODUCTION

The information contained in this document is based on visual inspections along both national and State Highways in south-eastern Queensland comprising the D'Aguilar Highway, Burnett Highway and Bruce Highway. The inspection was conducted in June, 2022.

RACQ performs these surveys to better understand the current road surface condition of Queensland roads and assess their road safety, capacity and vulnerability to flooding. Meetings with Department of Transport and Main Roads representatives were also held in Rockhampton (Fitzroy District) and Bundaberg (Wide Bay / Burnett District) to discuss road and transport projects and priorities for the regions, as well as discuss the challenges of engineering resilient roads in regional areas with inferior soil conditions and harsh weather.

Road surface conditions and flood immunity levels can decrease freight efficiency and increase vehicle operating costs, resulting in lost productivity. In terms of crashes, approximately seventy-five percent of those occurring on rural highways are run off-road, head-on and intersection crashes. As a result, a focus of the inspection was to assess the standard and quality of the road infrastructure including roadside conditions, road and shoulder widths (including bridge / culvert / floodway width) and intersection safety.

Implementing proven engineering countermeasures such as lane and shoulder widening, removing roadside hazards, upgrading intersections as well as installing audio tactile line marking and wide centre-line treatments with median barriers, would go a long way to reducing crashes and providing more resilient and productive highways. Progressive duplication is also required on high volume freight and tourism corridors such as the Bruce Highway.

The results of this report are used as supporting information to supplement other RACQ technical surveys such as the Australian Road Assessment Program (AusRAP). The information also helps RACQ prioritise advocacy for those roads most in need of upgrades and additional infrastructure investment.

METHODOLOGY

Two staff from RACQ's Public Policy Department undertook the tour and drove each of the selected highways, generally in one direction. Visual inspections including images taken were performed by the two RACQ staff and included noting traffic lane, shoulder and clear zone widths. It also included observing and cataloguing other visual qualities of the roads such as pavement condition, delineation including audio tactile line marking (ATLM), types of roadside hazards and bridge and culvert quality and width.

Disclaimer: This report is based on a visual inspection of highways. While attempts have been made to ensure the accuracy of the information contained in this report, the Royal Automobile Club of Queensland makes no statements, representations, or guarantees about the accuracy or completeness of it.

CRASH HISTORY

While this report focuses on the inspection results, the latest AusRAP* crash risk mapping results are shown below.

			Avg. Daily Traffic (Veh/day)	FSI Crashes	FSI Injuries				Individual Risk Rating	Combined Risk Rating^	
Road Name	From-To	Length km	2016-20	2016-20	2016-20	2016-20	Collective Risk Rating	Annual average FSI crashes per 100 million veh-km	Annual average FSI crashes per 100 million veh-km	(FSI Crashes)	
Bruce Highway	Bald Hills to Caboolture	24	118020	121	143	6	1.01	High	23.52	Low	High
D'Aguilar Highway	Caboolture to Woodford	27	13013	56	84	2	0.41	High	86.69	Medium	High
Bruce Highway	Caloundra to Cooroy	42	39350	105	129	7	0.50	High	34.53	Low	High
Bruce Highway	Caboolture to Caloundra	36	62140	90	111	2	0.50	High	22.08	Low	High
D'Aguilar Highway	Kilcoy to Yarraman	49	3858	56	72	4	0.23	High	162.03	High	High
D'Aguilar Highway	Nanango to Kingaroy	21	4552	22	26	2	0.21	High	124.73	Medium-high	High
Bruce Highway	Gympie to Tiaro	56	10980	78	113	5	0.28	High	69.36	Low-medium	High
Burnett Highway	Nanango to Goomeri	60	1463	25	29	3	0.08	High	156.71	High	High
Burnett Highway	Dululu to Rockhampton	63	1915	28	45	2	0.09	High	127.28	Medium-high	High
Bruce Highway	Traveston - sth Gympie (Sect C,10km)	10	17160	7	11	2	0.23	High	37.26	Low	High
D'Aguilar Highway	Woodford to Kilcoy	23	7735	21	32	0	0.18	High	63.77	Low-medium	Medium-high
Bruce Highway	Tiaro to Childers	79	8550	69	102	11	0.17	High	55.89	Low	Medium-high
Burnett Highway	Goomeri to Gayndah	101	1288	27	29	8	0.05	Medium-high	114.09	Medium-high	Medium-high
D'Aguilar Highway	Yarraman to Nanango	18	3980	10	13	1	0.11	High	76.48	Medium	Medium-high
Bruce Highway	Childers to Gin Gin	52	4380	30	51	4	0.12	High	72.02	Low-medium	Medium-high
Bruce Highway	Mt Larcom to Rockhampton	69	5980	44	62	4	0.13	High	58.43	Low-medium	Medium-high
Burnett Highway	Eidsvold to Monto	73	690	10	14	2	0.03	Medium-high	108.68	Medium-high	Medium
Bruce Highway	Gin Gin to Miriam Vale	95	3420	40	56	8	0.08	High	67.66	Low-medium	Medium
Burnett Highway	Biloela to Dululu	71	1095	12	14	1	0.03	Medium-high	84.59	Medium	Medium
Burnett Highway	Monto to Biloela	94	891	10	18	1	0.02	Medium	65.57	Low-medium	Low-medium
Bruce Highway	Miriam Vale to Mt Larcom	94	5690	33	48	3	0.07	Medium-high	33.88	Low	Low-medium
Burnett Highway	Gayndah to Eidsvold	78	1059	8	10	1	0.02	Medium	52.77	Low	Low
Bruce Highway	Cooroy to Sankeys Rd (Sect A)	13	18370	3	3	0	0.06	Medium-high	8.73	Low	Low
Bruce Highway	Sankeys to Traveston Rds (Sect B)	11	17500	3	3	1	0.05	Medium-high	8.42	Low	Low

*AusRAP assesses generally non-urban high speed sections of the highway network with speed limits of 80 km/h or more. Thus crashes in the table above may not add up to crashes along the whole corridor.

[^]**Combined Risk Rating** – Collective and Individual Risk have been combined with equal weighting to produce a single risk score per road section (the Combined risk score). Once a section of highway has received a combined risk score, it is assigned one of five corresponding rating bands from Low to High (the Combined Risk Rating). The cut-off points between rating bands are determined by ranking sections from worst to least risk across the 21,528 km of Queensland roads included in the assessment (2016-20 crash data analysed in October 2021) and then dividing this result into the five rating bands, each representing as close as possible to 20 per cent of the network length assessed.

FSI – Fatal and Serious Injury.

SURVEY ROUTE

The highways surveyed during this regional road inspection tour are listed below. In total, approximately 1,350km of road was surveyed.

- D'Aguilar Highway (Caboolture to Nanango)
- Burnett Highway (Nanango to Rockhampton)
- Bruce Highway (Rockhampton to Gympie)



Figure 1: Regional Road Tour Survey Route

SUMMARY OF RESULTS

In June 2022, RACQ's Public Policy Department conducted a road inspection along national and State Highways in south-eastern Queensland. These were the D'Aguilar Highway, Burnett Highway and Bruce Highway.

While the key objective of this report is to identify and catalogue road surface conditions, road safety and infrastructure deficiencies, it is important to recognise that significant lengths of roads in this assessment were in good condition and built to a suitable standard. It is also noted that there has been a high level of investment commitments delivering upgrades or rehabilitation/strengthening over recent years, for example the Bruce Highway Upgrade Plan is an in-total \$13 billion program of works over a 15-year period, 2013–14 to 2027–28.

While RACQ welcomes this investment, sections with a narrow sealed surface that are prone to surface defects such as pot holes still exist on highways in this survey. Greater levels of funding are required for safety, capacity, widening, rehabilitation and strengthening works to improve the road condition and deliver a more resilient, safe and productive road network. Increased State and Federal funding is also required to maintain the road network over the long term.

D'Aguilar Highway

The D'Aguilar Highway carries significant volumes of heavy vehicles and is prone to pavement damage. Improvements should focus on widening of narrow sections with Wide Centre Line Treatments (WCLT) and median barriers where required, rehabilitation and strengthening of pavement prone to failures as well as establishing safe roadsides by removing trees or installing safety barriers to protect occupants from roadside hazards. Considering both general vehicle volumes and high percentage of heavy vehicles, additional overtaking lanes (with WCLT and median barrier) are also required, with a potential need to duplicate the highway along high volumes sections between Caboolture and Kilcoy.

Continuation of Audio Tactile Line Marking (ATLM) on the edge and centre line and flood immunity improvements, bridge and culvert widening is also recommended to reduce road closures as well as improve safety and productivity.

Burnett Highway

Overall, the Burnett Highway is a lower volume highway in comparison to the D'Aguilar and Bruce highways and as a result receives a smaller proportion of funding. The highway was in reasonable condition with generally safe roadsides and sections of suitable width and featuring Audio Tactile Line Marking (ATLM), however narrow sections and sections prone to surface failures still exist between Goomeri and Mount Morgan.

It is recommended that Burnett Highway upgrades focus on widening, strengthening and rehabilitating narrow sections between Goomeri and Mount Morgan to at least 8m width with a future target to provide a consistent seal width of 9m or more along the entire Burnett Highway. In addition, continue installation of ATLM and allocate suitable funding to adequately maintain the road surface. Consider further safety barrier treatments where required (e.g., hilly sections south of Goomeri and near Mount Morgan) and raise and widen floodways and creek/river crossings through low lying areas to reduce road closures and improve productivity.

Bruce Highway

The Bruce Highway is Queensland's major north-south freight and commuter corridor and also a key component of the National Land Transport Network (NLTN). The Bruce Highway experiences high traffic volumes, including freight movements, and therefore it is important that the corridor is subject to continual maintenance and upgrade works to address deficiencies and ensure it is fit for purpose. There were a number of significant upgrade projects underway along sections of the Bruce Highway between Miriam Vale and Gin Gin, Childers and Maryborough and on approach to Gympie.

The Bruce Highway is receiving substantial funding commitments, with the Australian Government committing over \$10 billion to the Bruce Highway Upgrade Program from 2013-14 to 2027-28 to deliver priority upgrades along the route. The program was initially developed as an \$8.5 billion 10-

year commitment jointly funded by the Australian and Queensland Governments. In May 2018, the Australian Government committed an additional \$3.3 billion (based on 80:20 funding arrangements) to its existing \$6.7 billion commitment.

The Queensland Government also committed to providing \$200 million each year (based on 80:20 funding arrangements) for upgrades on the Bruce Highway. This has delivered a combined investment of approximately \$1 billion per year in the Bruce Highway. In total, the program will deliver \$13 billion of works over a 15-year period (2013–14 to 2027–28).

To assist in guiding and delivering long-term upgrades to the Bruce Highway, the Queensland Government established the Bruce Highway Trust Advisory Council (BHTAC). The role of the BHTAC is to oversee the development and delivery of a 15-year Vision and Action Plan – to be developed in three 5-year action plans commencing from 2024. The key objectives of the action plans are to:

- unlock economic growth
- build flood resilience and
- improve safety.

Continued duplication of the Bruce Highway is necessary to improve safety and productivity on higher volume sections north of Curra, while widening should occur on all narrow single lane each-way sections to include wide centre line treatments, with median safety barrier on high volume or high risk sections. Narrow bridges and low level river and creek crossings also require widening and raising to improve safety and productivity.

While there has been significant investment over recent years, future upgrades should focus on accelerating all safety, capacity and flood immunity projects under the current Bruce Highway Upgrade Plan (BHUP) and future Bruce Highway 15-year Vision and Action Plan (BHVAP), by increasing combined annual budget allocations from both levels of government from \$1 billion to \$1.5 billion.

This includes continuing duplication of the Bruce Highway north of Curra towards Childers, widening narrow bridges, widening narrow sections with Wide Centre Line Treatment (WCLT) and median barriers where appropriate, and constructing additional overtaking lanes – also with WCLT and median barrier where appropriate. Lengthening existing overtaking lanes should also be investigated.

Due to the continuing significant number of fatal head-on crashes on the Bruce Highway, TMR should consider modifying standards to provide a wider WCLT with ATLM, at all new installation sites as well as retrofit them to existing locations by 2034 (or install median barrier).

Other safety initiatives should be delivered, including safety barrier or roadside hazard removal, intersection turn lanes and lighting improvements, additional heavy vehicle/ general rest areas (with EV chargers) and additional stopping bays on sections with narrow shoulders to enable drivers to check loads or attend to other critical or emergency needs. The Childers (Heavy Vehicle) Bypass should be investigated once the Tiaro Bypass is delivered.

Increased dedicated maintenance funding is also required over the long term from both Queensland and Federal Governments to preserve the road condition, quality and resilience to future flood damage. RACQ asks the Federal Government to increase maintenance funding agreements with the Queensland Government to more adequately maintain as well as rehabilitate and strengthen National Land Transport Network (NLTN) roads under betterment initiatives, reducing the maintenance backlog in Queensland and improving resilience to future damage, saving future expenditure for both levels of Government.

Both Queensland NLTN Maintenance and National Road Maintenance Backlog projects listed in the Infrastructure Australia (IA) Priority List (Stage 1) should be progressed by the Queensland Government through further stages of the IA assessment process to be made ready for Federal Government investment.

Table 1 presents a summary of recommendations and priorities for improvements on the surveyed highways. Appendix A shows a catalogue of images taken during the inspection tour.

Table 1 – Recommendations and Priorities*

							KEY	Priority			
								High	Medium	Low	Not Required
Road Segment	Widen seal and/or shoulders	Bridge / culvert widening	Hazard removal / protection	Additional overtaking lanes	Improve flood immunity	Rehabilitate / strengthen pavement	Comments				
D'Aguilar Hwy (Caboolture to Nanango)	Medium	Low	Medium	High	Low	High	Initial sections of the highway featured a wide median but were subject to patchy road surface. Considering both general vehicle volumes and a high percentage of heavy vehicles, there is potential need for duplication and/or more overtaking lanes along high volume sections between Caboolture and Kilcoy, including consideration for wide centre-line with median barrier treatments on all higher volume sections. Regardless, more regular overtaking opportunities should be provided in both directions along the entire highway. Roadworks were noted as underway at Wamuran, however sections between Wamuran and Woodford were generally rough and undulating. It is recommended that works continue to improve pavement quality. There were other sections prone to surface failures or poor ride quality (rough/undulating) along the D'Aguilar Highway (e.g. south of Blackbutt, Yarraman to Nanango), and rehabilitation and strengthening should occur on these to improve safety, ride quality and reduce future failures, especially after rain. Some narrow sections are still present (e.g., Moore to Nanango) and these should be widened to minimum 9m standard. Many sections of the D'Aguilar Highway still present as tree-lined, creating roadside hazards within the clear zone. These sections should be prioritised for roadside hazard reduction or safety barrier treatments to lower risk or prevent injuries due to run off road crashes. Audio Tactile Line Markings (ATLM) are present over much of the highway and these should continue to be marked, and remarked when required.				
Burnett Highway (Nanango to Biloela)	High	Low	Low	Medium	Low	Medium	The section between Nanango and Goomeri is generally wide (8m+), has ATLM and is safe and of good quality apart from some widening and safety barrier required on the southern side of Goomeri town. Immediately north of Goomeri the road is very twisty/winding and it is recommend to straighten and widen this narrow section.				

Road Segment	Widen seal and/or shoulders	Bridge / culvert widening	Hazard removal / protection	Additional overtaking lanes	Improve flood immunity	Rehabilitate / strengthen pavement	Comments
							There are narrow sections that are prone to surface failures, left wheel path depressions or are rough, bumpy and undulating from Goomeri to approximately 50km south of Biloela, with very narrow (6-7m sections north of Gayndah). It is recommended to progressively widen, strengthen and rehabilitate the road surface to a minimum 8m (preferably 9m min. standard) from Goomeri to Biloela. There are sections of road which have been received suitable maintenance work and it is recommended that work continues to patch where required, to improve ride quality and road condition. There are some low lying / flood prone areas (e.g., 20km south of Gayndah) that could be improved to reduce road closures and improve productivity.
Burnett Highway (Biloela to Rockhampton)	High	Low	Medium	Low	Low	Medium	There are sections of narrow lanes, narrow shoulders, cracking, wheel depressions and undulating surfaces prone to failures north from Biloela, but particularly north of Jambin to Dululu. The section between Dululu and Mount Morgan is mostly narrow lanes with no shoulder and rough while the section from Mt Morgan to Rockhampton is generally wider and better quality. These narrow sections should be progressively widened, strengthened and rehabilitated to a minimum 8m (preferably 9m min. standard). There are sections with steep drop-offs just outside (north) of Mount Morgan where guard-rails could be considered as a safety measure.
Bruce Highway Hwy (Rockhampton to Benaraby)	Low	Medium	Not required	High	Low	Medium	There was evidence of surface failures south of Rockhampton for about 40km (to around Marmor) but significant efforts have gone in to suitable patching/repairs. It is recommended that remediation works continue to be undertaken to strengthen the surface, improve pavement condition and ride quality. Shoulders and lane width are generally adequate over this section and roadsides are safe, however narrow bridges are now the width constraint e.g., Oaky Creek, Twelve Mile Creek, Hut Creek, and should be widened under the Bruce Highway Upgrade Program (and Bruce Highway Trist Advisory Council 5-year Action Plans currently in development).

Road Segment	Widen seal and/or shoulders	Bridge / culvert widening	Hazard removal / protection	Additional overtaking lanes	Improve flood immunity	Rehabilitate / strengthen pavement	Comments
							With high traffic volumes, including caravanners and high percentage of heavy freight vehicles, there are not enough overtaking lanes or opportunities to overtake, resulting in platooning of vehicles and difficulty passing even at overtaking lanes. It is recommended that additional overtaking lanes are delivered. Some deteriorated ATLM was noted south of Mt Larcom.
Bruce Hwy (Benaraby to Gin Gin)	Medium	Low	Medium	High	Medium	High	It is recommended that investigations are undertaken to determine additional opportunities for overtaking lanes between Benaraby and Gin Gin. There is evidence of patching being undertaken along this section and surface failures north of Kolan River. It is recommended patching and longer term repairs are continued where needed to improve resilience to future damage, surface condition and ride quality. TMR and Federal Government are to be commended for the current project between Miriam Vale and Gin Gin to install 12km of wide centre line, intersection upgrades, safety barriers and overtaking lane. This is part of the longer Benaraby to Gin Gin upgrade project. A narrow section without WCLT and some roadside hazards exists between about 35km to 50km north of Gin Gin and should be widened with WCLT. Future widening of Cabbage Tree Creek bridge, just north of Gin Gin, is required in the future.
Bruce Hwy (Gin Gin to Gympie)	Medium	Low	Not required	Medium	Medium	High	Sections between Gin Gin and Childers are prone to surface failures but have been patched. It is recommended that strengthening and rehabilitation works are undertaken to improve the road surface. There is also a narrow section 10-20km north of Childers which should be widened. It was noted that there is a 11km major project currently underway between Maryborough and Torbanlea and when completed will improve the safety and reliability of the Bruce Highway and impacts associated with flooding. It is narrow near and at Chinaman Creek crossing, however it is noted

Road Segment	Widen seal and/or shoulders	Bridge / culvert widening	Hazard removal / protection	Additional overtaking lanes	Improve flood immunity	Rehabilitate / strengthen pavement	Comments
							that this section of road will be upgraded as part of the Tiaro Bypass project. There is a series of narrow bridges/creek crossings north of Glenwood which should be planned for future widening (Gutchy Ck, Kellehers Ck and Deacons Ck). Gutchy Creek may be widened under the Gootchie Road to Sheehans Road (Widen pavement and improve safety) project. There is evidence of drivers not identifying or reacting safely to the roundabout installed at the intersection of the Bruce Highway and Wide Bay Highway. It is recommended TMR investigate further delineation / warning improvements to enhance recognition and slow drivers on approach.

***Please note that the ranking of priorities should only be compared on the nominated road segment. No comparison of relative priority should be made between highways or road segments.**

APPENDIX A - Images

D'Aguilar Highway (Caboolture to Nanango)



Wide centre-line treatment



Roadworks at Wamuran



Narrow at Stanley River



Damage and roadworks on D'Aguilar Highway



Narrow and roadside hazards present



Narrow with roadside hazards (south of Blackbutt Range)



Narrow shoulder and vegetation on side of road



Pavement failures



Roadside hazards



Pavement defects

Blackbutt



Burnett Highway (Nanango to Rockhampton)

Nanango





Narrows nearing Goomeri (southern approach)



Narrow, winding section north of Goomeri town

Goomeri



Entering Goomeri– Township Entry Treatment (TET) shown



Narrow lane and shoulder

Ban Ban Springs



Example of Connected Infrastructure



Entering Ban Ban Springs (TET)

Gayndah



Entering Gayndah



Narrow shoulders



Narrow lane and shoulders

Eidsvold



Entering Eidsvold



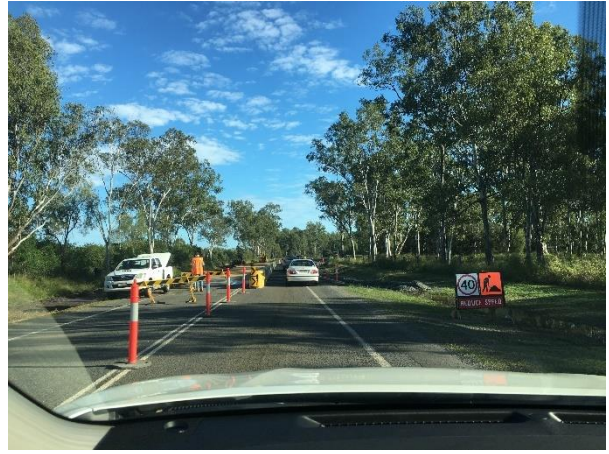
Narrow lane and shoulders



Narrow



Three Moon silo artwork (near Monto)



Roadworks underway after Biloela



Narrow and surface failures and edge breaks north of Monto



Narrow lane and no shoulders

Biloela



Narrow lane and no shoulders

Dululu



Entering Dululu (TET)



Winding section of road

Mount Morgan



Entering Mount Morgan (TET)



Narrow lane, narrow shoulders and steep embankments



Rough surface and evidence of pavement failures



Narrow lane and narrow shoulders

Bruce Highway (Rockhampton to Gympie)



Entering Rockhampton



Wide road with wide shoulders and wide centreline



Patched section of road



Narrow, no WCLT at Twelve Mile Creek (Oak Creek also narrow)



Deteriorated ALTM



Wide shoulders and wide centreline

Benaraby



Entering Benaraby, wide centreline and TET



Narrow at Machine Creek



Surface failures and deteriorated ATLM,
Lowmead area



Narrow section near Kolonga for ~15km

Gin Gin



Entering Gin Gin



Patchy road surface / surface failures



Roadworks south of Gin Gin



Roadworks upgrade project



Wide centreline, ATLM



Narrow section 10-20km north of Childers



Narrows at Burrum River, Torbanlea

Childers



Entering Childers (TET)



Wire barrier in centreline and wide shoulders



Wide centreline and wide shoulders



Evidence of road maintenance, north of Gympie