TABLELAND ACCESS OPTIONS REPORT

March 2022

Regional Development Australia Tropical North Inc.

1. PURPOSE

This report provides a factual appraisal of:

1. Previous studies
2. Current alternate solutions

2. BACKGROUND

The Cairns Region comprises 5 Local Government areas with contiguous population centres

Coastal (East of Wet Tropics):

- Cairns Regional Council
- Cassowary Regional Council
- Douglas Shire

Tablelands (West of Wet Tropics):

- Mareeba Shire
- Tablelands Regional Council

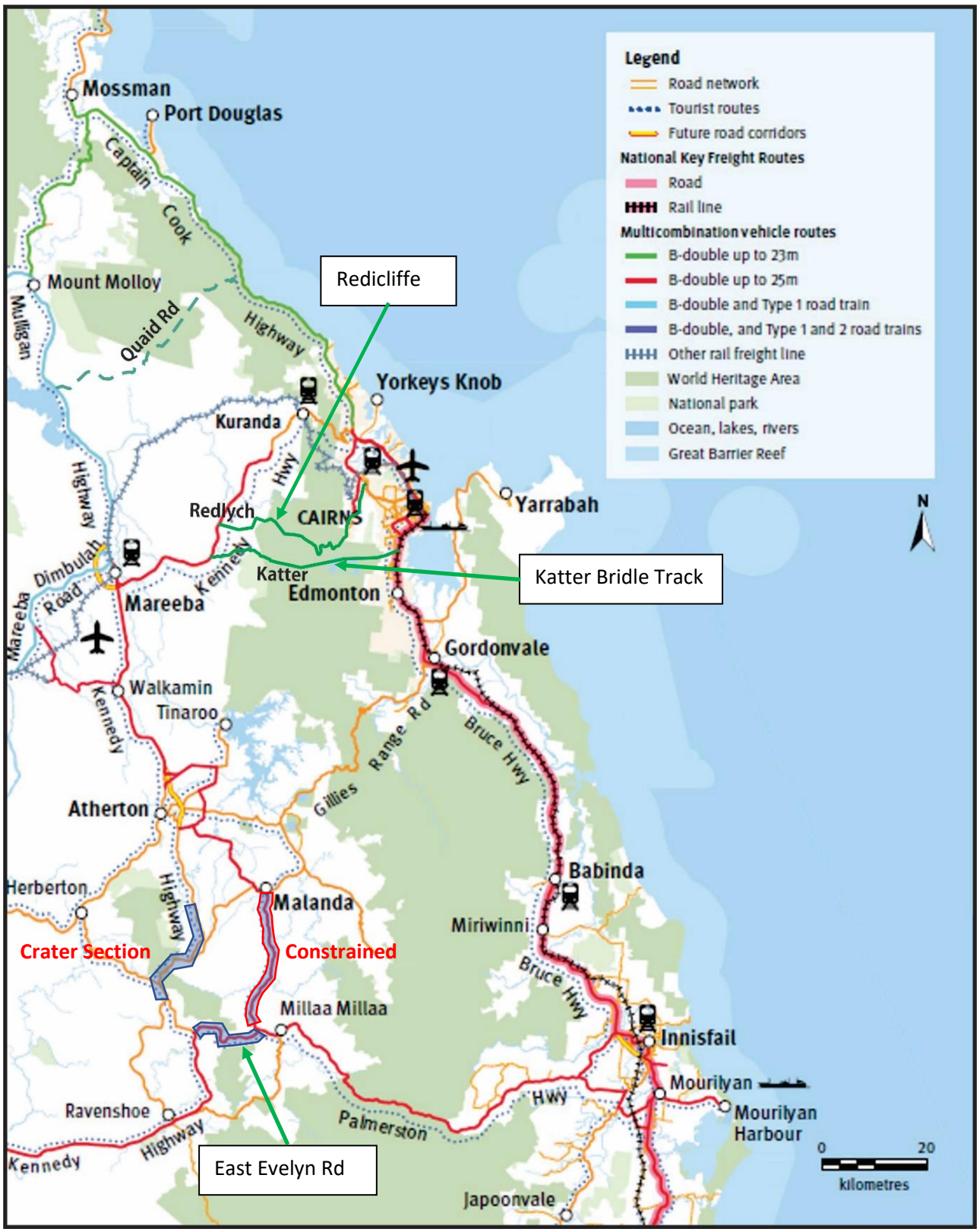
The coastal and tablelands areas (with concentrated population) total about 11,000sqkm. (Excludes the sparser dry country to the west in Tablelands and Mareeba Local Government areas). This compares with the area of Greater Brisbane of 10,432sqkm (Brisbane, Gold Coast, Ipswich, Logan, Moreton Bay, Noosa, Redland, Sunshine Coast).

These areas are connected by 4 range road transport routes (from south to north):

1. Palmerston Highway
2. Gillies Range Road
3. Kennedy Highway (Kuranda Range)
4. Mossman-Mt Molloy Road (Rex Range)

In addition, internal range roads connect the Millaa Millaa area to Ravenshoe (East Evelyn Road) and Atherton to Ravenshoe (Crater section of the Kennedy Highway). The section of road between Millaa MIllaa and Malanda is also severely restricted by hilly geography (slowing traffic), currently narrow, and with few overtaking opportunities.
(See **Figure 1**)

Figure 1


Legend
Road network
Tourist routes
Future road corridors
National Key Freight Routes
Road
Rail line
Multicombination vehicle routes
B-double up to 23m
B-double up to 25m
B-double and Type 1 road train
B-double, and Type 1 and 2 road trains
Other rail freight line
World Heritage Area
National park
Ocean, lakes, rivers
Great Barrier Reef
Redicliffe
Katter Bridle Track
East Evelyn Rd
Crater Section
Constrained
Mossman
Port Douglas
Mount Molloy
Yorkeys Knob
Kuranda
Redlych
CAIRNS
Yarrabah
Mareeba
Katter
Edmonton
Gordonvale
Walkamin
Tinaroo
Atherton
Herberton
Malanda
Millaa Millaa
Babinda
Miriwinni
Innisfail
Mourilyan
Mourilyan Harbour
Ravenshoe
Japoonvale
Cook Highway
Quaid Rd
Mulligan Highway
Dimbulah Road
Kennedy Highway
Range Rd
Gillies
Bruce Hwy
Palmerston Hwy
N
0
20
kilometres

4. NEED

The perceived need for improved connectivity between the Coast and the Tablelands has always been to provide more efficient transport for the potential expansion in either the productive agricultural areas or an improved economic environment in the Cairns region.

In the early days, the Kuranda Railway network provided this outlet and connected to the Port of Cairns when alternative connections to either Townsville or further south did not exist.

The Palmerston Highway is the only current route designed and approved for Freight Efficient Vehicles (FEV) up to B-double class (25m long) though 23m B-doubles are permitted on the Rex Range and Captain Cook Highway for the sugar industry alone. The Palmerston Highway is therefore the preferred and only continuous FEV route to Cooktown and Cape York Peninsula particularly from southern points of origin. It also offers an FEV route from Cairns to the Gulf, though roadtrains must 'break down' at Mt Garnet when coming from the southern inland to traverse the Tableland or proceed to Cooktown.

Transport from origins in the coastal south going to the Gulf will travel via Charters Towers rather than the Palmerston Highway.

5. OBJECTIVES

The objectives for improvements to the Kuranda Range (or alternate routes) has always been:

a. to service the Tableland industries and allow faster and more efficient travel to Cairns itself as both a seaport/airport hub or as a service centre, and
b. to provide for more effective utilisation of transport through use of larger vehicles, to at least B-Double and provide greater economic benefits.

6. CONSTRAINTS

Constraints to transport improvements include:

a. Environment - "Wet Tropics", EPBC Act and offsets. These all have financial impacts on any route selection and affect all of the current or proposed routes from the coast to the Tablelands. These issues require preservation of significant animal travel paths, vegetation connectivity, and indicates the preference for extensive use of bridging or tunnels.
b. Safety "Range road, steep winding" – all current routes suffer from excessive winding alignments. This reduces travel speeds for all users but especially for heavy transports. With steep roads, narrow pavement, no shoulders, no stopping places for breakdowns, makes it difficult for emergency vehicles to access and turn around, while stopping traffic for extended periods.
c. Freight Efficiency – Narrow winding roads not allowing safety or adequate width to accommodate freight vehicles larger than a semi-trailer, noting that the Gillies Range Road, while allowing semi-trailers, is generally not wide enough to ensure vehicles stay in the designated lane on curves.

7. DESIGN STANDARDS

Issues for the long term design of road routes of 4 lanes to cater for heavy and longer vehicles include:

a. The road will require a solid median barrier to avoid head-on collisions. This will also require provision for removal of barriers for emergency vehicle access or diversion of traffic during any full lane closures. Solid barriers (which are preferred as they are a safer obstacle for motor bikes in event of a collision) restrict visibility should there be

an object on the road adjacent to the barrier. This results in a wide inner shoulder next to the barrier.

b. An outer shoulder width sufficient for vehicle breakdown as well as cyclist provision is required.
c. Current slow speed designs result in a high 'camber' up to 10% which is dangerous for top heavy large vehicles contributing to rollover. Reducing camber to a more acceptable 3% to 6% means the curvature must be larger, usually resulting in higher fills and cuts and increasing costs. Slower speeds also result in rear wheel tracking over a larger area of pavement and increases in road width.

All of these issues work against less expensive roads even when proactive safety management is in place.

8. HISTORY

a. 1993 – Road Corridors Through The Wet Tropics – capacity estimated due to mountainous terrain and tight curves at 10,000 to 12,000 vehicles per day (vpd).
b. 1995 – First assessment of alternate transport corridors.
c. 1998 – Commencement of Integrated Transport Study (ITS) to support the FNW 2010 Regional Plan
d. May 1999 – ITS Evaluation of Route Options - - investigated 14 surface and tunnel roads, and 4 rail tunnel routes. This includes the Lake Morris/Davies Creek Route. **(Att A)**
e. Feb 2000 – Release of FNQ 2010 Regional Plan
f. Aug 2000 – ITS Impact Assessment Study released.
g. Sept 2001 – Reporting to Cabinet with recommendation for more work to be done
h. 2004/5 – Formal notification under the WTMP and EPBC
i. 2004 – CD prepared to support public consultation around the Impact Assessment Study. Presentation reported likely construction costs for a surface solution at around $300million and a tunnel at around $500million. Capacity was still at about 10,000 vehicles per day.
j. 2007 – Approval permits (with conditions) from WTMA and EPBC until 31 December 2030.
k. 2008 – Further report to Cabinet
l. May 2014 – Presentation to WTMA advising outturn costs to be $3.04Billion.
m. Subsequent to 2014 – government proceeds to investigate limited upgrade to Kuranda Range mainly for safety.
n. Feb 2022 – Cairns to Northern Tablelands Access Strategy – capacity not reached until 2051. No justification provided. No alternative route considered viable.

9. COSTS

The direct cost to build as estimated in 2001 was $300Million for a surface route. This had risen to $700Million by 2006. The factors resulting in the $3.04Billion (outturn) reported in Item (l.) include the time to construct, whether one off over 10 years, or staged over 20 years, and the debt servicing costs.

10. TRAFFIC

In considering traffic capacity, steep winding roads prevent high capacity (e.g. up to 20,000 vehicles per day on straight level ground for 2 lanes). Not only is traffic slower, but heavy vehicles are even slower and longer than passenger vehicles. It is estimated that a semitrailer is equivalent to between 3 and 6 cars. **Table 1** shows the impact of only allowing for the equivalent of 3 cars on traffic volumes. Capacity calculations are always expressed as equivalent cars, so earlier estimates of 10,000 vpd allow for this.

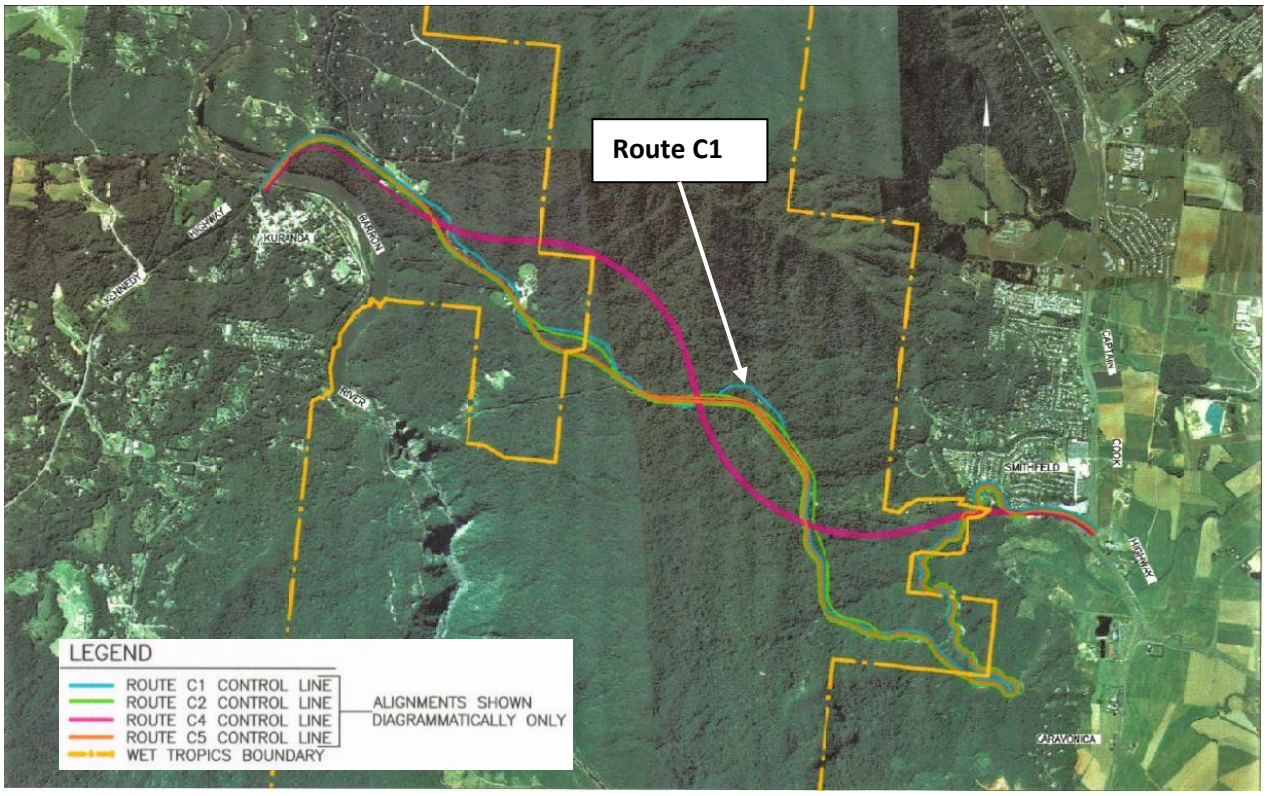
TABLE 1

Year	2006	**2012**	**2017**	**2018**
Annual Average Daily Traffic	7229	8171	8871	8940
AADT Cars		7493	7786	7778
Annual Compound Growth Rate		2.06%	1.66%	0.78%
Commercial Vehicles %		8.30%	12.23%	13%
Commercial Vehicles No's		678	1085	1162
CV Equiv cars (1CV = 3 cars)		2035	3255	3487
Equiv AADT		9527	11041	11264

11. ALTERNATE ROUTES

Previous studies in 1995 and 2001 all considered up to 17 different routes including some train routes and road or rail tunnels. The 2001 study led to a more detailed evaluation of both surface (approx. C1 **BLUE**)and tunnel (**RED**) road routes generally along the current road route. (**Figure 2**). The CD presentation provided for public consultation includes a video representation of the likely surface route which, to satisfy predominantly environmental objectives but also to lessen some earthworks costs due to high cuts and fills, included 40% of the road area on bridges or viaducts.

Figure 2 – New Routes on current Kuranda corridor



With the exception of the Palmerston Highway, all other routes between the coast and the Tablelands will have similar impacts to an upgrade of the Kuranda Range alignment. **Table 2** shows the comparative distances along routes connecting Cairns and Mareeba. While **Table 3** provides some commentary on each route. The location of the Katter and Redicliffe alignments are only assumed for the purposes of comparison. A more recent article in The Express

Newspaper shows a 3D depiction of the Redicliffe Route using GIS software and is more accurate (**Figure 3**). This does not detract from the below comparison. **Figure 1** shows all routes.

TABLE 2

Route Name Shortest to Longest	Distance Cairns to Mareeba km
Katter_Bridle	45.86
Redicliffe	46.64
Kuranda Range	61.91
Quaid Road	99.83
Gillies	109.14
Rex Range	142.57
Palmerston Hwy	216.47

TABLE 3

Route Name Nth to Sth	Distance Cairns to Mareeba km	New Construction km	Comment.
Rex Range	142.57	NIL	Not suitable due to distance. Shortest section of range but not convenient location for access to Mareeba or the Tablelands.
Quaid Road	99.83	31.8	Needs to include upgrade of the Captain Cook Hwy to Wangetti. Is a significant detour from access to Mareeba, with traffic diverted 25.7km north on the coastal section of the Captain Cook Hwy, then travelling a further 28.8km south to Mareeba. Current design and construction is substandard. Has grades to 10%, tight curves, fill batter slopes nearing 1 vertical to 1 horizontal (45° and unstable), and drainage is likely to be inadequate as there have already been failures and slips.
Kuranda Range	61.91	12.0	New alignment approved by Wet Tropics but design could be refined. Original approval has few additional requirements. 150Ha environmental offset.
Redicliffe Hwy	46.64	25.3	Actual bypass section cuts through Redlynch with severe residential dislocation. Grades to 7%.
Katter_Bridle	45.86	23.7	This distance differs from Katter's assertion of 16km straight and 1 to 2 km tunnel. Difficult to avoid Copperlode dam. Tunnel is likely to be 11 to 12 km long followed by on ground western section for about 12km.
Gillies	109.14	19km	Min of 19km of range road to be duplicated. Does not target Mareeba, so not suitable for a route to Mareeba and the main regional traffic volumes.
Palmerston Hwy	216.47	NIL	Not suitable to Mareeba due to distance other than for heavy freight. Range section is 29km long, would need four lanes in the long term for this if no alternate route is found.

NOTE: None of the alternatives other than the upgrade to the Kuranda Range route addresses the continued access to Kuranda and the on-going maintenance of the existing range road.

Figure 3 – Redicliffe Route

12. *CONCLUSIONS*

General

a. All routes traverse the Wet Tropics World Heritage Area

Surface Routes

b. All surface routes will entail impacts on environmental values and the cost of mitigation measures is unlikely to be significantly different.

c. Widening of the Kuranda Range is likely to have significant environmental impacts (no bridges or short tunnels) than a newer route and the cost may be similar without providing better safety e.g. wider separation between opposing streams, still tight curves with steep camber. To reduce costs and encroachment on Wet Tropics areas outside the current footprint would require near vertical retaining walls but could be achievable.

d. The only means of completely avoiding environmental impacts is by tunnelling.

Tunnel Routes

e. Tunnelling still has impacts if the termination points are within or adjacent to the Wet Tropics areas. These include: ventilation towers (significant height and footprint, visual amenity); the extent of entry civil works at tunnel portals; connection to adjacent and appropriate networks.

f. Tunnelling has significant on-going operational costs including ventilation, lighting, hazard reduction.

g. Tunnels require extensive safety measures including a small exit tunnel, usually located between the two traffic tunnels with means to firelock the exits.

h. It is unusual to allow transport of flammable goods in tunnels due to the significant risks e.g. Channel Tunnel, Swiss Tunnels (Mont Blanc 1999, Gotthard 2001), thus requiring continued use of a surface route.

i. Effective tunnels worldwide need to have very low gradients. High gradients lead to; wind tunnel effects which are problematic for fires and effective ventilation; and safety in the event of runaway vehicles.

Alternate Routes

None of the alternate routes will satisfy the needs, objectives or strategic priorities for either the region or the transport network without some tradeoffs:

j. Routes which do not service Kuranda still require retention of this route with significant questions of on-going ownership, operating costs, need for future upgrades
k. All routes have significant environmental impacts
l. Some routes will have additional impacts on current urban areas due to the corridor or termination points e.g. Redicliffe through Redlynch Valley and exit near Brinsmead, Katter_Bridle exiting near Mount Sheridan.
m. Routes with tunnels usually underestimate the construction and operational costs
n. Appropriate routes need to be as direct as possible so some routes are not effective for access between the Tablelands and Cairns e.g. Palmerston, Gillies, Quaid Rd, and Rex Range.
o. The existing parallel surface route explored in the 2004 study has environmental approval, subject to conditions, until 2030. It is likely that, with clear government intent, this could be extended with consideration of more recent environmental standards. Any move away from this corridor will result in the whole exercise restarting and no certainty of affordable environmental protections.

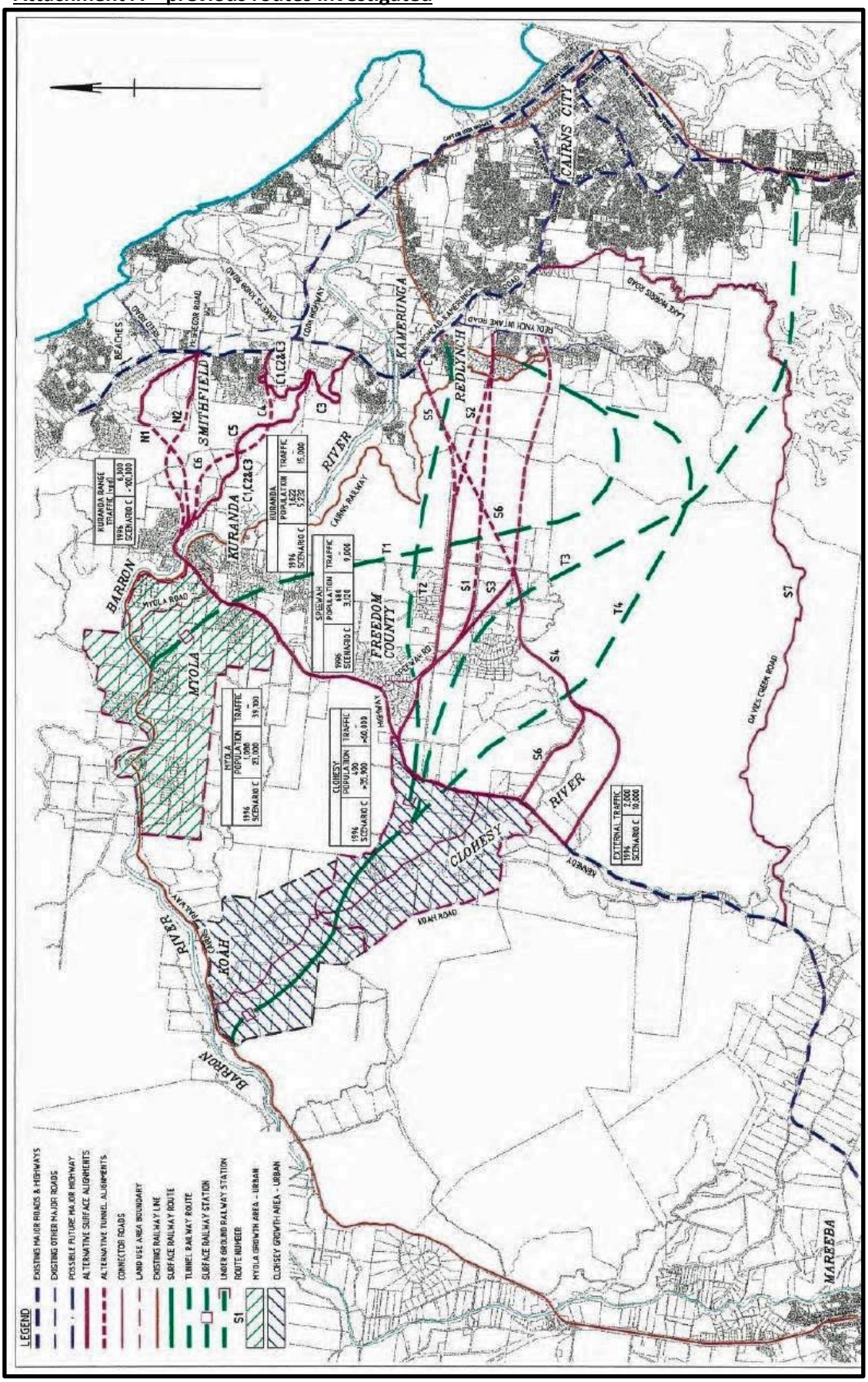
13. IMPORTANT NOTICE / LIMITATIONS

This report has been prepared for Regional Development Australia Tropical North Inc (RDATN.) The report is intended to be a high level analysis of issues surrounding road access between Cairns and the Atherton Tablelands. Data included in this report should not be relied upon for technical decisions or conclusions without independent verification.

The report is not subject to assurance or other standards and, consequently no opinions or conclusions intended to convey assurance have been expressed. RDATN does not make any representation or warranty as to the accuracy, completeness, reasonableness, or reliability of the information included (whether directly or by reference) in the report, and/or the achievement or reasonableness of any plans, projections, forecasts, (whether express or implied) in the report.

The information provided in this report is derived from generally publicly available information. We have not sought to independently verify those sources. Use of this report does not constitute a valid reference for research or other reasons unless expressly permitted by RDATN.

Attachment A – previous routes investigated



Attachment B – Current Alternative Routes

Quaid Road

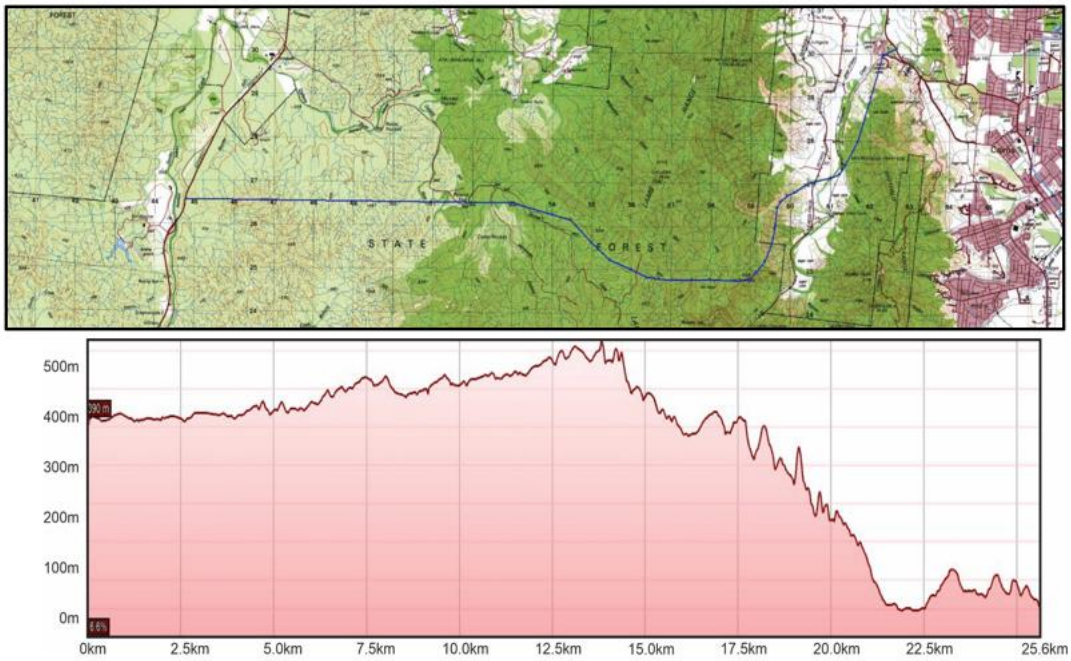
Rd No	To	From	Chg	Chg	KM	Cum
20A	Cairns	Smithfield	0.000	13.069	13.069	13.069
20A	Smithfield	Quaid Rd	13.069	40.209	27.140	40.209
	Quaid Rd	Quaid Rd	0.000	31.800	31.800	72.009
	Quaid Rd	Dimbulh I/S	24.419	0.000	24.419	96.428
34A	Dimbulh I/S	Mareeba	3.400	0.000	3.400	99.828
				TOTAL	99.828	

Kuranda Range

Rd No	To	From	Chg	Chg	KM	Cum
20A	Cairns	Smithfield	0.000	13.069	13.069	13.069
32A	Smithfield	Kuranda Bridge	0.000	12.535	12.535	25.604
32A	Kuranda Bridge	Mareeba	12.535	48.844	36.309	61.913
				TOTAL	61.913	

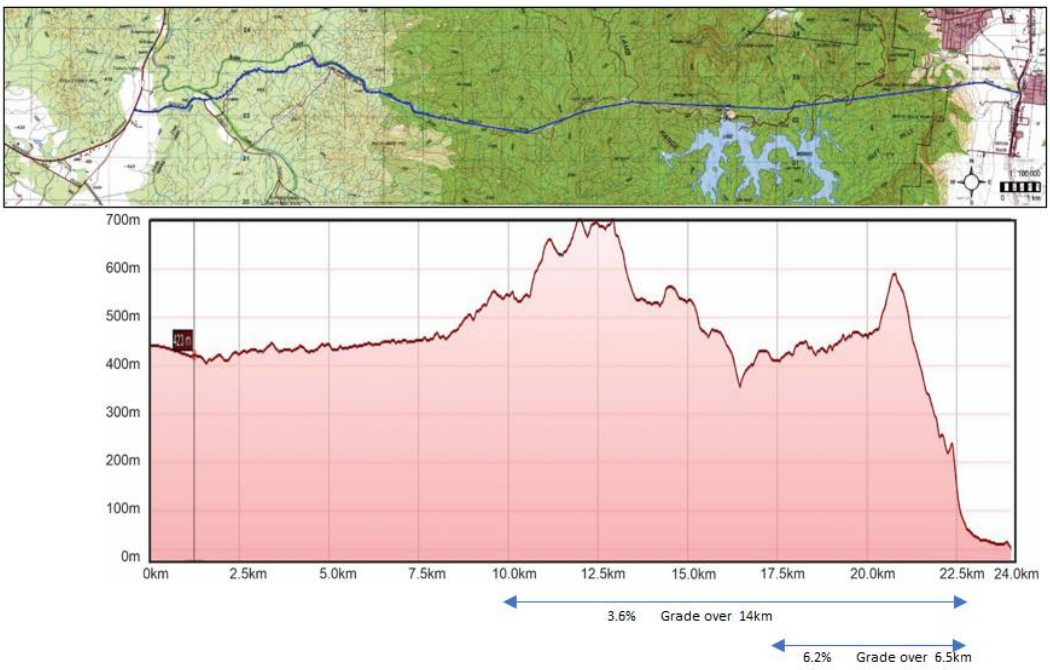
Redicliffe Route

Rd No	To	From	Chg	Chg	KM	Cum
20A	Cairns	Anderson St	0.000	1.708	1.708	1.708
649	Anderson St	Anderson St	2.530	0.000	2.530	4.238
647	Anderson St	Brinsmead	2.370	6.000	3.630	7.868
	Redlynch/Bridle Track	Redlynch/Bridle Track	0.000	25.300	25.300	33.168
32A	Redlynch/Bridle Track	Mareeba	35.370	48.844	13.474	46.642
				TOTAL	46.642	

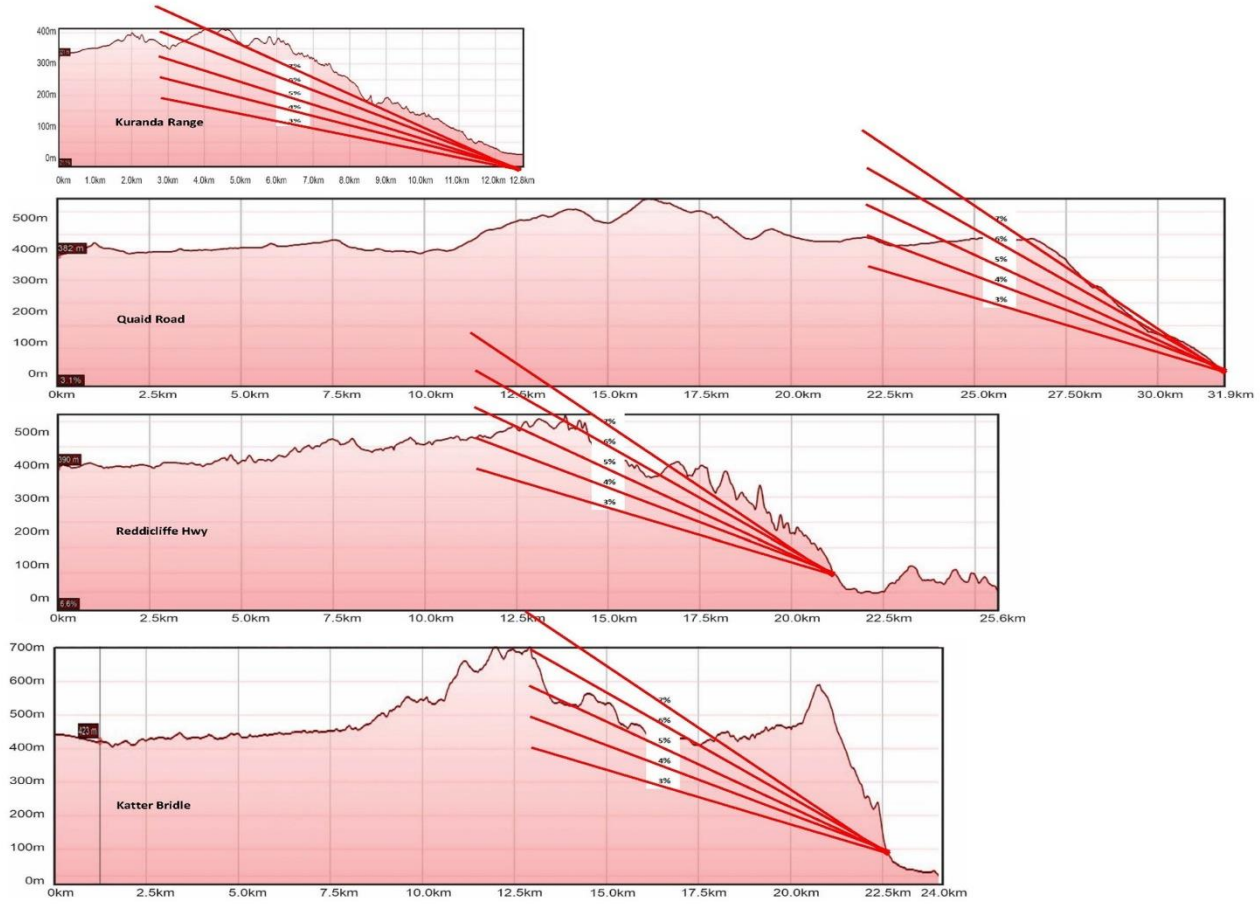


Katter's Bridle Track Route

Rd No	To	From	Chg	Chg	KM	Cum
809	Sheridan St	Port Conn Rd	5.930	5.451	0.479	0.479
810	Port Conn Rd	Port Conn Rd	1.900	0.000	1.900	2.379
10P	Cairns	Katter Bridle track	85.335	79.065	6.270	8.649
	Katter Bridle track	Kennedy Hwy Davies Ck	0.000	23.700	23.700	32.349
32A	Kennedy Hwy Davies Ck	Mareeba	35.373	48.884	13.511	45.860
				TOTAL	45.860	



Attachment C – Comparison of grades on Alternate Routes



Attachment D – Extract from CD Road Alignment

To view the full animation link, see here.