



Bolivia Hill Upgrade

The Australian Government has committed funding as part of the Nation Building Program toward the planning and construction of upgrade and safety improvements on the New England Highway at Bolivia Hill.

Bolivia Hill is a section of the New England Highway about halfway between Glen Innes and Tenterfield. The existing highway through the area has narrow traffic lanes and shoulders, with a rock face on one side and a steep valley on the other. Planning for the project has involved the development of route options and the identification of a preferred route.

The project objectives are to:

- Improve road safety.
- Improve road transport productivity, efficiency and reliability of travel.
- Minimise the impact on the natural, cultural and built environment.
- Provide value for money.

The project team has completed the Recommended Preferred Route Option Report which describes study area investigations, community consultation to date, the development and assessment of route options and the proposed new route alignment.

Community and stakeholder consultation

Community and stakeholder engagement started early in the project's development to gain an understanding of the community's issues with the existing highway, receive comments on the project study area and objectives as well as understand community priorities and ideas for a new route alignment.

Consultation activities have included community updates, a survey, community drop-in sessions at Tenterfield and Glen Innes and a meeting with Tenterfield Shire Council.

Community feedback was considered by the project's technical specialists in the development and assessment of the preliminary route options. Key issues and considerations raised by the community are outlined in Table 1.

Feedback is invited

You are invited to provide feedback on the Recommended Preferred Route Option Report. For more information contact us on 1800 024 535 or email boliviahill@cardno.com.au

Table 1 – Community feedback

Concerns with the existing highway	General route option considerations	Specific route option considerations
<ul style="list-style-type: none"> • safety • sharp bends • steep gradients • falling rocks • black ice 	<ul style="list-style-type: none"> • protecting the surrounding environment • provide a cost effective solution • traffic management during construction 	<ul style="list-style-type: none"> • straighten the alignment • widen the road • provide two south bound lanes • provide two north bound lanes • using the existing route • provide a dual carriageway • provide an overtaking lane • avoid the disused Main Northern Railway Line

How were the preliminary route options developed?

The study team identified preliminary route options by:

- Conducting environmental investigations.
- Identifying constraints and opportunities within the study area.
- Determining potential routes.
- Defining the route assessment criteria.

Environmental investigations

Desktop studies were carried out to inform the development of the route options. These included:

- Geotechnical.
- Topography, geology and soils.
- Traffic, transport and road safety.
- Public utilities and services.
- Socio-economic.
- Flora and fauna, terrestrial and aquatic.
- Cultural heritage, Aboriginal and non-Aboriginal.
- Flooding and drainage.
- Land use and planning.
- Assessment of local climatic conditions.
- Visual amenity.

Constraints

Preliminary investigations identified significant constraints that influenced the location and design of the preliminary route options. These constraints included:

- Sub-standard road geometry of the existing highway.
- Very steep terrain.
- The Main Northern Railway (disused).
- Agricultural industry.
- Aboriginal and non-Aboriginal cultural heritage.
- Areas identified as Endangered Ecological Communities and the presence of threatened species.

Potential routes

Community feedback and the investigations carried out informed the identification of the preliminary route options. The 11 feasible routes that were identified for further assessment are shown in Figure 1.

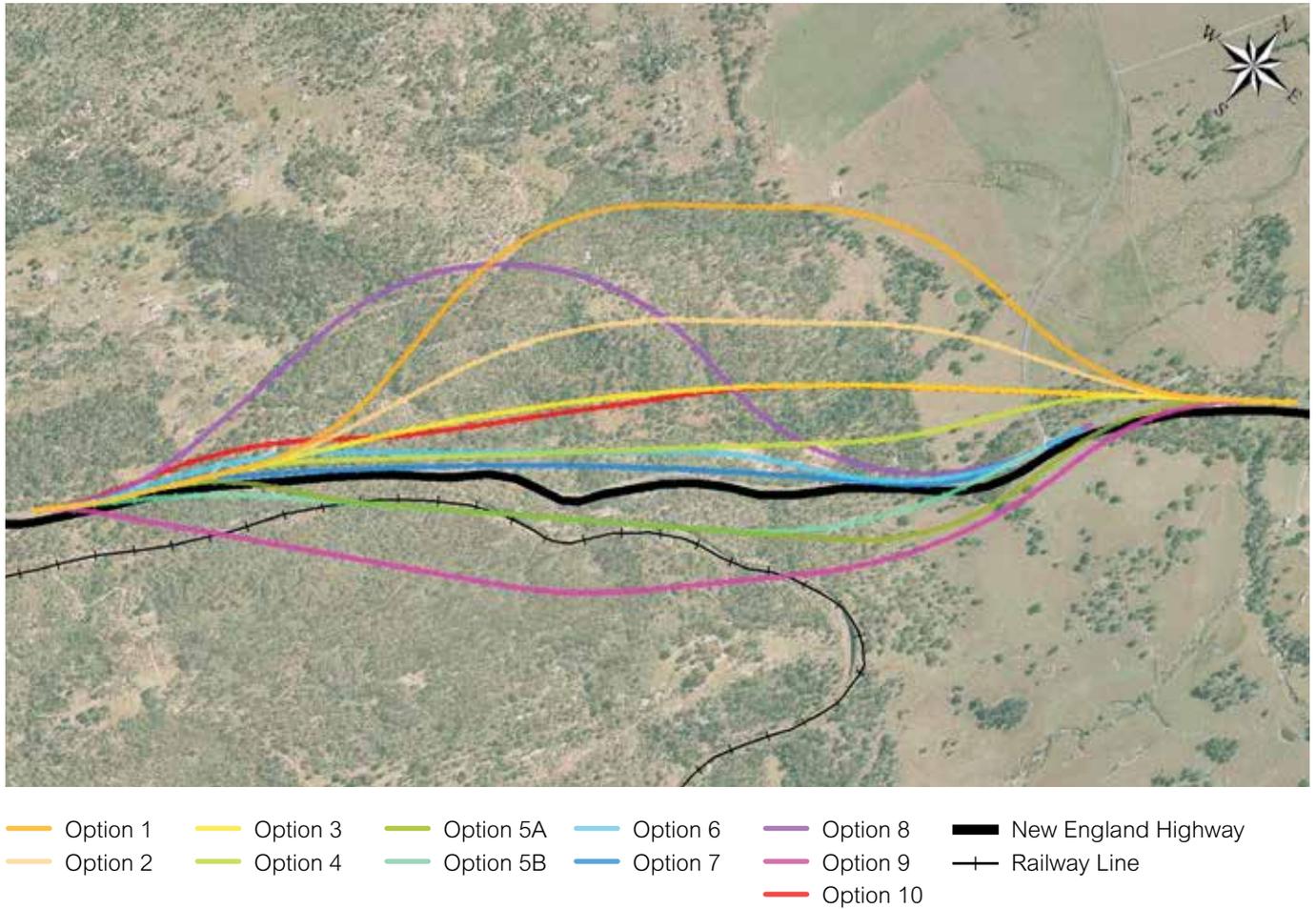


Figure 1 – Eleven preliminary route options

A number of community suggestions received reflected; or were similar to, the preliminary route options discussed below.

Table 2 – Preliminary route options description

Option	Length	Description
Option 1	3.45 km	Partly follows the former Cobb & Co road to the west of the existing highway. Requires a bridge up to 150 metres long. Several community members suggested an alignment to the western side of the study area, similar to Option 1.
Option 2	3.2 km	West of the existing highway, reduces overall route length and amount of hard rock excavation required. Requires a bridge up to 200 metres long.
Option 3	3.12 km	Achieves the best geometric outcomes as it is the most direct with minimal horizontal direction change, however, this requires a major bridge/viaduct of approximately 1,500 metres.
Option 4	3.1 km	Alignment kept as close to the existing highway alignment as possible, while achieving conforming horizontal and vertical alignments.
Option 5a	3.2 km	An eastern option which would require a tunnel underneath Bolivia Hill Nature Reserve to ensure no disturbance to the nature reserve and the Main Northern Railway line.
Option 5b	2.5 km	A variant to Option 5a with steeper grades, which increases the length of the tunnel under the Bolivia Hill Nature Reserve but reduces the overall route length. Several community members suggested an alignment to the east of the existing highway along the existing railway alignment, similar to Options 5a and 5b.
Option 6	2.85 km	A variant of Option 4. It also has conforming horizontal and vertical alignments, but presents a shorter route length and connects before Pyes Creek Road.
Option 7	2.35 km	Considered an upgrade to the existing highway, utilising as much of the existing pavement as possible. A number of community members proposed upgrading the existing alignment through widening.
Option 8	3 km	A shorter variant of Options 1 and 2; it connects into the existing highway alignment prior to Pyes Creek Road.
Option 9	3.2 km	A variant of Option 5 with a significantly longer tunnel under the Bolivia Hill Nature Reserve, eliminating the requirement for bridge structures at the northern tunnel portal. Several community members suggested an alignment to the east of the existing highway through Bolivia Hill Nature Reserve, similar to Option 9.
Option 10	2.95 km	A variant of Option 3, it attempts to follow the ridgeline to the west of the existing highway while attempting to avoid potential impact on the creek. Reduced overall bridge length (approximately 1,050 metres) relative to Option 3

The process to identify the preliminary route options and assess the recommended preferred route option is included in the Recommended Preferred Route Option Report available for download from the Roads and Maritime Services (RMS) website www.rta.nsw.gov.au/roadprojects/projects/north_eastern_region/new_england_bolivia.html

Route assessment criteria

Route assessment criteria were based on the project objectives. The table below outlines the criteria used to assess the 11 preliminary options.

Table 3 – Route assessment criteria

Project Objective	Description of assessment criteria
1. Improve road safety	<ul style="list-style-type: none"> • Provide for an overtaking lane for southbound traffic. • Provide an alignment that minimises problems in construction (constructability). • Maintain at least one lane of the highway open during construction of the upgrade. • Minimise work health and safety risk in construction and maintenance.
2. Improve road transport productivity, efficiency and reliability of travel	<ul style="list-style-type: none"> • Provide appropriate vertical and horizontal road geometry (maximum vertical grade of 8 per cent and minimum curve radius of 640 metres).
3. Minimise the impact on the natural, cultural and built environment	<ul style="list-style-type: none"> • Minimise adverse impacts on native vegetation. • Minimise adverse impacts on sensitive habitats. • Minimise adverse impacts on Endangered Ecological Communities. • Minimise adverse impacts on surface water quality. • Minimise adverse impacts on flooding and drainage. • Minimise adverse impacts on known Aboriginal heritage sites, values and areas of archaeological potential. • Minimise adverse impacts on known non-Aboriginal heritage sites, values and areas of archaeological potential. • Potential to use recycled or waste materials.
4. Provide value for money	<ul style="list-style-type: none"> • Minimise project cost.

Preliminary route option assessment

A route assessment workshop, attended by RMS and technical specialists, was held to identify the preliminary options which on balance best achieved the project objectives.

The process used to assess the preliminary route options is listed below:

- Step 1 – Review the options against the assessment criteria.
- Step 2 – For each criterion, rank each option (relative to the best option) where:
 - 1 was best and 11 worst.
- Step 3 – For each route, review the rankings for the project objectives (each project objective was given equal weighting) and agree (by consensus) on final option rankings.

This process resulted in four of the 11 preliminary options being short-listed, each of these options contained an overtaking lane. The short-listed options were then presented to the RMS Major Projects Review Committee.



Option 2



Option 6



Option 7



Option 10

Figure 2 – Four short-listed route options

The review by the RMS Major Projects Review Committee determined that the short-listed options met the majority of the project objectives, however, the project team was asked to investigate Option 7 with only one lane in each direction as traffic studies carried out demonstrated an overtaking lane was not required as part of the Bolivia Hill upgrade. This option was identified as Option 7b.

When is an overtaking lane required?

An overtaking lane may be required if the lack of an overtaking opportunity significantly impacts road network efficiency or results in road safety issues. Design criteria for the project initially included an overtaking lane for south bound traffic to address a lack of an overtaking opportunity.

Road network efficiency

A lack of overtaking opportunities can reduce the flow of traffic and impact road network efficiency. It is generally accepted that if 65 per cent of vehicles are travelling within close proximity to another vehicle

an overtaking lane is required. Traffic surveys of the existing road network and modelling of the proposed route options indicated that only a small proportion of traffic travels in close proximity to another vehicle through the study area, with northbound overtaking lanes either side of the study area.

Road Safety

A lack of overtaking opportunities can present a potential road safety concern if drivers use the opposing traffic lane to overtake in unsafe locations, leading to head on collisions. The review of crash data over the past 10 years revealed no head on collisions, resulting in injury or fatality, were recorded for the Bolivia Hill section of the New England Highway.

Option 7b

Key features of Option 7b:

- 1,635 metres in length.
- One northbound lane and one southbound lane.
- Two metre wide road shoulders on either side, to allow maintenance trucks to safely park beside the traffic lanes.
- A cantilevered concrete structure, in parts, to assist in widening the road reserve and straightening out the bends in the steepest section of the highway.
- A bridge up to 360 metres long to ensure the road avoids the creek line.



Figure 3 – Option 7b

Option 7b was assessed against the assessment criteria and was considered to meet all of the project objectives as well as or better than the four previously short-listed objectives. In summary, Option 7b would:

- **Improve road safety** by smoothing hazardous curves and widening the road shoulders, improving safety through better visibility, resulting in less risk of crashes.
- **Improve road transport productivity, efficiency and reliability of travel** by providing a 100km/h alignment. Trucks will be limited to 80km/h downhill (they are currently limited to 60km/h).
- **Minimise the impact on the natural, cultural and built environment.** Option 7b has the least impact of all options studied and its footprint lies substantially within the existing road's general alignment.
- **Provide value for money.** Option 7b is the least expensive of all options considered.

Preferred route option

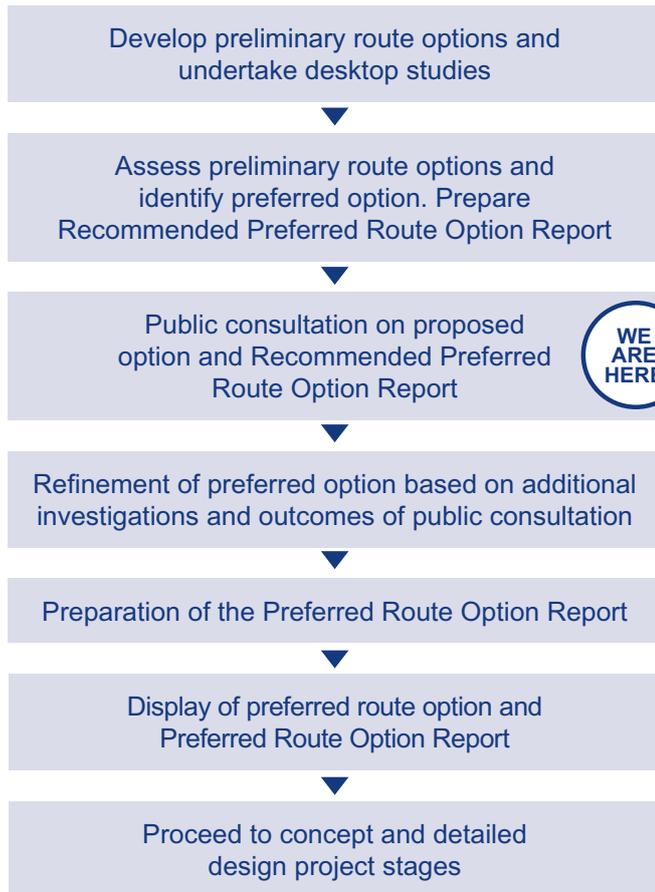
Option 7b was progressed as the recommended preferred route option as it:

- Significantly outperformed the other options against the project objective of providing value for money.
- Performed as well as or better than the short-listed options for all other assessment criteria.

The short-listed preliminary options were not publicly displayed as Option 7b was the most suitable to advance for further engineering and environmental investigations, best achieving all project objectives.

The process undertaken to identify the four short-listed options and the recommended preferred route option is detailed in the Recommended Preferred Route Option Report.

Project planning process



Comment on the Recommended Preferred Route Option Report

The Recommended Preferred Route Option Report is available on the project website www.rta.nsw.gov.au/roadprojects/projects/north_eastern_region/new_england_bolivia.html or by contacting the project team.

Comments on the report are invited by 27 September 2013. Please email boliviahill@cardno.com.au or write to: Cardno – Bolivia Hill Upgrade Reply Paid 86015, St Leonards NSW 1590.

The community is invited to provide feedback on the Recommended Preferred Route Option Report.

Discuss the preferred route with the project team

Come and speak with the Bolivia Hill upgrade project team in person at the following community drop-in sessions:

- **Glen Innes**
Wednesday 18 September
William Gardner Conference Centre,
Glen Innes Severn Learning Centre
71 Grey Street, 3pm – 7pm
- **Tenterfield**
Thursday 19 September
Sir Henry Parkes School of Arts
Corner of Rouse and Manners Streets, 3pm – 7pm

What are the next steps?

The preferred route option will be reviewed and refined following feedback from the community and the results of further technical and environmental investigations.

Once finalised, the preferred route option will be announced and a Preferred Route Report will be prepared.

Concept design and detailed environmental assessment of the preferred option will then be carried out. Once complete, the environmental assessment will be publicly exhibited and submissions sought from the community.

Contact us

To contact the Bolivia Hill Upgrade project team:

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September 2013

RMS 13.393