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From: Ron de Rooy, Senior Project Manager **Date:** 18 March 2013

Ref: **Pages:** 36

Subject: Foxground and Berry bypass
Value Management Study Report, March 1996



Transport
Roads & Maritime
Services

MEMO

Issue

Publication of the *RTA Princes Highway Berry Bypass Project Value Management Study Report, March 1996*.

Background

The 1996 Value Management Study was commissioned by the then RTA to confirm the project objectives, examine concept design options and local access issues and ensure concerns raised by the project stakeholders were taken into account at the then pre-concept stage of the then Berry Bypass project.

It was a timely review of the work done to date as well as the development of an appropriate strategy which was carried out through the Study.

A Value Management Workshop (VMW) was held on 13 and 14 March 1996 as a key element of the Study.

A report *RTA Princes Highway Berry Bypass Project Value Management Study Report, March 1996*, was developed and given out to members of the community upon the conclusion of the workshop. This report was not published on a website at the time of distribution. RMS are preparing responses to current submissions on the environmental assessment that refer to this report, therefore publishing this report on the project website would be appropriate.

Comment

This Study was part of a process that was terminated in 1998 by the then NSW Government with subsequent planning starting years later that took a fresh look at a possible bypass for Berry.

Recommendation

To publish the *RTA Princes Highway Berry Bypass Project Value Management Study Report, March 1996*, on the Foxground and Berry bypass project website.

Attachments

RTA Princes Highway Berry Bypass Project Value Management Study Report, March 1996.

Approvals Ron de Rooy, Senior Project Manager

Ron de Rooy 18/3/13

Adam Berry, Acting Manager Development South

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**RTA - Princes Highway,
Berry Bypass Project**

Value Management Study

Report

March 1996



DEPARTMENT OF PUBLIC WORKS AND SERVICES

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Executive Summary

The village of Berry is strategically located between Nowra and Wollongong and reflects a unique lifestyle environment in an historic rural setting. However, traffic conditions in the commercial centre for through and local traffic are deteriorating rapidly with adverse impacts on both Princes Highway safety and efficiency as well as the environmental amenity of Berry.

Investigations into a bypass for Berry date back to the early 1960s. By 1966 a scheme to provide a motorway with a road reservation width of 200 feet and grade separation at the Kangaroo Valley Road intersection had been approved. A number of properties affected by the scheme have subsequently been acquired although little design work has proceeded since that time. The Shoalhaven LEP No.1 (1981) contained the corridor, zoned as 5(d), Arterial Road.

In 1977 the link between Shoalhaven Heads and Gerroa (the "Sand Track") was sealed providing a drop in traffic volumes along Queen Street (being the Princes Highway) through Berry.

In the late 1980s the pedestrian crossing in Queen Street (SH1) was removed in the interests of safety and as a result of deputations, kerb blisters and a pedestrian refuge were installed. Concerns that the RTA intended closing Queen Street were denied.

Investigations for highway improvements including the re-routing of the highway between Berry and Gerringong have been recently undertaken.

The Berry Chamber of Commerce pressed for the inclusion of a Berry traffic relief route as part of those investigations. However, the Berry Bypass was seen as a project in its own right.

The Berry Bypass Project is currently at a pre-concept stage and a timely review of the work done to date as well as the development of an appropriate strategy to progress the project is now being undertaken through a Value Management Study process.

The Value Management Study was commissioned by the Roads and Traffic Authority (RTA) to confirm the project objectives, examine concept design options and local access issues, and ensure concerns raised by the project stakeholders are taken into account at this pre-concept phase of the project.

The concentrated workshop session (being the key element of the Study) was attended by a range of stakeholders on **13th and 14th March, 1996**.

The Value Management Study builds on the detailed and specialist knowledge which resides with the workshop participants, then structures the analysis and generation of value improvement ideas from a functional base (ie. what the project must do).

During the Workshop, a project overview was presented (**Section 2**) with an analysis of its functional elements (**Section 3**). Ideas for improvement were generated, themes developed and decisions and their implications considered (**Section 4**).

The mechanism for progressing the Project and resolving the issues raised during the Workshop is the Action Plan (**Section 5**) which should ensure the issues noted in the report are addressed.

A summary of outcomes and decisions as a result of issues raised and discussed during the Workshop is listed below.

Workshop Outcomes & Decisions

As a result of the Workshop, the participants:

- **Reviewed** the project objectives being "*to improve network efficiency, improve road safety and improve the amenity of Berry township*" and **agreed** on what the project **must** achieve to be successful.
- **Agreed** that there was a need for a bypass of Berry.
- **Identified** a range of issues and concerns associated with the project including potential environmental, heritage, planning and community impacts and summarised them under the key categories of:-
 - *Town Amenity Issues*
 - *Highway Deficiency Issues*
 - *Economic Impact Issues*

- **Identified** a number of project "givens"/ constraints and assumptions. The assumptions associated with the project were assessed, based on the information available, as either valid or challengeable (ie. requiring further investigation).
 - **Developed and weighted** route option selection criteria which highlighted *heritage impacts, town amenity and visual/landuse impacts* as very significant factors when determining a route.
 - **Reviewed** the route options as presented to the workshop and **developed** alternatives/ variations. The group discussed option advantages and disadvantages as well as value improvements to them.
 - **Reviewed** the key design parameters including:
 - *Design speed to be 100km/h (desirable), 80km/h (minimum).*
 - *Design flood level to be to the 1% flood level (desirable) however this needs to be further investigated.*
 - *Accident rates to be reduced to 0.5 accidents/million vehicle kilometres for two lane, two way road and 0.3 accidents/million vehicle kilometres for dual carriageway (target).*
 - *Road corridor width to be nominally 60 metres wide (minimum) and 80 metres wide (desirable). This may vary at specific locations.*
 - *Landscaping to be sympathetic with the Berry environs.*
 - *Compliance with environmental impact guideline requirements.*
 - *Compliance with traffic noise guidelines.*
 - *Compliance with erosion and sedimentation control guidelines.*
 - *Vertical clearance from the underside of decks to electric railway tracks (6.1m), roads (5.3m) and above high flood level (1m).*
 - **Recommended** as a result of the workshop that:
 - ***The RTA further investigate the modified southern route developed by the group in order to better understand its economic and engineering parameters.***
 - ***The northern option and its variations (ie. Blue Route) be further investigated and modified to overcome the issues identified by the group (ie. visual and noise impacts, severance of potential town expansion opportunities, access links to the sporting complex).***
 - ***The modified northern and southern routes be compared using the selection criteria developed by the group together with measurable criteria (ie. cost, economic performance) in determining the final bypass location.***
 - **Agreed** that two access points to Berry from the bypass should be provided with the locations to be determined.
 - **Noted** a number of issues outlined in the Action Plan to be considered as the project progresses.
 - **Confirmed** the need for further community consultation prior to a final decision being made on the preferred route. Mr Ian Archer, Project Manager, Wollongong Zone was confirmed as the RTA contact officer.
 - **Gained** first hand awareness and appreciation of the wider issues involved in the project (ie. road network issues, economic, technical and safety issues, social, heritage, urban planning and environmental concerns and community perspectives). Participants were given the opportunity to openly express their points of view and were able to obtain clarification or resolution, where possible, of the issues raised.
- Value Study Team Comment**
- The Value Study highlighted a number of positive aspects associated with the planning of the project. In particular, undertaking the Study at this early stage of its development, allowed an outlining of the direction and scope that the project should take and set the foundation for further investigations/detail design. It also provided an early opportunity for participants' concerns to be tabled and addressed as the project progresses.*
- The Workshop provided the appropriate forum with the mix of participants present to review the proposed options and suggest alternatives from a "whole of system" point of view and air issues including through traffic issues, local traffic/pedestrian movements, safety, lifestyle impacts, environmental, heritage, social, recreational, visual and commercial concerns. The Group referred the preferred options for further investigation to the Action Plan.*

Finally, the Value Study highlighted the existing commitment by all participants to the project and its needs. This was demonstrated by the Group's willingness to question and review options, project parameters, option selection criteria and their applicability to the project, as well as the Group's approach to the optimum project solutions, local access and cross connection issues.

1. Introduction

1.1 Value Study Background

The village of Berry is strategically located between Nowra and Wollongong and reflects a unique lifestyle environment in an historic rural village setting. However, traffic conditions in the commercial centre for through and local traffic are deteriorating rapidly with adverse impacts on both Princes Highway safety and efficiency as well as the environmental amenity of Berry.

Investigations into a bypass for the town of Berry date back to the early 1960s. By 1966 a scheme to provide a motorway with a road reservation width of 200 feet and grade separation at the Kangaroo Valley Road intersection had been approved. A number of properties affected by the scheme have subsequently been acquired although little design work has proceeded since that time. The Shoalhaven LEP No.1 (1981) contained the corridor, zoned as 5(d), Arterial Road.

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In the late 1980s the pedestrian crossing in Queen Street (SH1) was removed in the interests of safety and as a result of deputations, kerb blisters and a pedestrian refuge were installed. Concerns that the RTA intended closing Queen Street were denied.

Investigations for highway improvements including re-routing the highway between Berry and Gerringong have been recently undertaken.

The Berry Chamber of Commerce pressed for the inclusion of a Berry traffic relief route as part of those investigations. However, the Berry Bypass Project is seen as a project in its own right.

The Berry Bypass Project is currently at a pre-concept stage and a timely review of the work done to date as well as the development of an appropriate strategy to progress the project is now being undertaken through a Value Management Study process.

The Value Management Study was proposed to confirm the project objectives, examine concept design options and local access issues, and ensure concerns raised by the project stakeholders are taken into account at this pre-concept phase of the project.

1.2 Value Study Methodology

The Department of Public Works and Services, Product Evaluation Unit (PEU) was commissioned by the Wollongong Zone, Southern Region RTA to undertake the Value Management Study for the project. A key element of the Study structure is the concentrated workshop session attended by a range of stakeholders. This was held on the **13th & 14th March 1996**.

The Value Study Group included representatives from:

- **NSW Roads and Traffic Authority**
- **Shoalhaven City Council**
- **Department of Land & Water Conservation**
- **The local community including**
 - *Berry Precinct Forum*
 - *Berry Chamber of Commerce*
 - *Berry Historical Society*
 - *Berry Sporting Complex Committee*

The Value Study Team comprised Ross Prestipino as Workshop Facilitator, John Haynes of RUST - PPK Consultants as Technical Independent and Bob Andrews as Value Analyst.

A full list of participants is provided in **Appendix 1**.

1.3 Value Study Objectives

Definitive aims and objectives are required to maintain value study focus and direction during the workshop. Preliminary objectives were circulated in the Background Papers and were confirmed by the Value Study Group on the first morning of the workshop. The agreed objectives were:

General Aim

In broad terms the objective of the Value Management Study is to provide all necessary functions required of the project at the lowest total cost consistent with the required levels of quality and performance.

Specific Study Activities

The following activities were noted for consideration within the workshop so that the Study Objective could be achieved:

- *Review the project objectives;*
- *Review the broad option selection criteria;*
- *Review route options and examine alternative options;*
- *Recommend a preferred option, if appropriate;*
- *Identify issues which will impact on the project including potential environmental and community impacts;*
- *Examine local access issues and determine the most appropriate connections;*
- *Canvass and address key issues and concerns of the major stakeholders;*
- *Develop an Action Plan to progress the project.*

1.4 Value Study Report

This report has been compiled by the Product Evaluation Unit (PEU). It seeks to provide an objective overview of the project aspects and Value Study outcomes including production of the Action Plan.

The report is built from the pre-study briefings, Value Study Background Papers and the information and discussion generated from the formal Value Study Workshop sessions.

It is intended to provide a basis for the final decisions on project direction and scope.

2. Project Overview

2.1 Introduction

In order to allow all participants to gain an understanding of the planning and philosophy of the project to date, a number of brief overviews were presented on its salient aspects. This provided a platform for informed questioning and later generation of ideas for improvements. The information presented is briefly discussed below with notes tabled in the workshop to be found in **Appendix 2**.

2.2 RTA Corporate Perspectives

The Zone Manager, Wollongong Zone, Southern Region RTA, presented a brief overview of the RTA perspective. A summary of the key points raised included:

- RTA have a Corporate Directorate which controls road network budgets. The Wollongong Zone develops strategies for routes within its zone, obtains approval, then develops projects to achieve those strategies and bids for funds to construct the projects.
- The RTA are aware of the NRMA poor rating of the Princes Highway and have been addressing those concerns with its work program focussing on safety improvements.
- The strategy for the Princes Highway is to maximise the life of the existing road asset by undertaking a number of minor projects along the route. This avoids major capital expenditure and also minimises adverse impact on the environment and the community.
- However, major capital works on the Princes Highway will be required at Wollongong and Berry. Ultimately the highway may be dual carriageway from Wollongong to Nowra and single carriageway with overtaking lanes further south. Projects are being progressively developed from Wollongong to the south.
- The RTA will continue to monitor the performance of the Princes Highway and undertake capital works and minor improvement works as required and funding becomes available.
- For projects to succeed they need to meet the criteria of being feasible, economically viable and affordable. Berry appears to fulfil all three criteria.

- The timing for the funding is not clear at present. However, Berry Bypass is being progressed so as to be ready when funding is approved.
- The RTA has not looked for a bypass route that starts and finishes a long way each side of Berry due to economics and also the desire to maximise use of the existing road asset.
- The existing road each side of Berry will probably remain for a period of 10-20 years, provided overtaking lanes and other improvements are carried out.
- Also the RTA needs to take a long term view to ensure that any bypass route will enable a four lane upgrade to be accommodated in the future.

2.3 Council Perspective

Issues raised by representatives of Shoalhaven City Council included:

- Berry is close to Nowra and therefore is subject to development pressures. This has to be balanced with maintaining its rural village lifestyle.
- Natural constraints on development are the floodplain to the east and north and steep land to the west. Growth could occur to the south. Opportunities for growth need to be protected.
- The impact of a four lane road on present and future development is a very important issue. Severance of the community is also a major concern.
- The town has developed a heritage theme which needs to be maintained and nurtured. Berry is a desirable place to live due to its lifestyle and unique character.
- The town centre, sporting complex and retirement facilities are important items which need to be considered in any route selection.
- Population in the 1991 census was approximately 1500 with a 2.7% per annum growth rate and a projection of around 3000 people within 20 years or so.
- Age profile is similar to Nowra but its residents have a higher level of disposable income.
- Basically the town is a suburb for Nowra with dependence on tourism, especially the markets on Sundays.
- Any development in Berry needs to be within budgetary constraints and also needs to be done in consultation with the community.

- The whole area has been classified by the National Trust as "significant natural landscape" and therefore aesthetics need to be taken into account.
- The railway line is currently planned to be electrified and this should be borne in mind when planning future infrastructure. It is an important strategic asset.
- Future development is planned for the Ford Street area (ie. 300 residential lots) and therefore access to this area will be important.
- Any industry that is attracted to Berry needs to fit in with the local culture (ie. cultural tourism, craft etc).
- The rural community around Berry needs to be considered. Council is undertaking a Rural Plan to protect Berry's agricultural base.
- Berry residents have put pressure on Council to avoid dual occupancy and maintain larger blocks which demonstrates the level of community awareness, activeness and pride in local matters.
- Water supply and sewerage treatment facilities and infrastructure would have to be increased to support a population of 3000-4000 people.
- The Graham Park site may be developed by the University of Wollongong in the future.
- A Tourism Plan is being developed within the local government area. Access needs to be maintained to the commercial centre from bypass.
- The original concept for a bypass was developed in 1966 and included in Council's LEP in 1981. Ongoing acquisition action has been based on this bypass proposal. Only a few properties have still to be acquired.
- The proposed design (developed 30 years ago) was for a Berry Bypass along North Street with a service road for existing properties. At-grade intersections were proposed at Edwards Street and Woodhill Mountain Road (Brogers Road), with a grade separated intersection at Kangaroo Valley Road.
- Since this bypass proposal was initially developed, noise and air pollution have become major social issues and the proposal needs to consider these impacts.
- A study by the Bureau of Transport & Communications Economics was carried out on the impacts of economic development on small towns which have been bypassed by a highway. The results indicate that the land values have increased in some areas. (This study was made available to stakeholders)

Design Options

- Design Options were developed prior to the VM Workshop using a number of criteria such as:
 - *minimise length of route*
 - *minimise earthworks*
 - *minimise and simplify structures*
 - *minimise property effects*
 - *minimise or rationalise intersections and accesses*
 - *maximise construction opportunities (ie. staging the works)*
 - *maximise standard of alignment and grading.*

2.4 Project Overview

The Zone Planner and the Project Manager presented an overview of the project concentrating on its salient aspects, with other project team members presenting relevant information. Key points raised included:

- The Berry Bypass Project is driven by three factors:
 - **Efficiency of road network.** 70% of traffic through Berry, (which is 8000 AADT) would use the bypass. This was based on the 1991 origin/destination study. BCR would therefore exceed 2.
 - **Safety.** Accidents per million vehicle kilometres is currently over one which is just below the State average of 1.3 for shopping centres. The problem of heavy vehicles close to pedestrians in Queen Street is also an issue.
 - **Environmental amenity** including noise, air pollution is progressively getting worse. The environmental amenity and perceived safety problems in Queen Street are obvious.
- Based on these criteria, three options (with some sub-options) were developed. Their descriptions, advantages and disadvantages as well as a sketch as distributed to the Group, are shown in **Appendix 2**.

Concept Estimates

- The options and estimates presented to the Group (**Appendix 2**) were based on very preliminary gradings for each option and "order of magnitude" type quantities. Final gradings would depend upon factors such as earthworks balancing (if possible) and provision of a flood free route for the 1% probability flood of the local waterways. Only very broad comparison between various options could be made at this stage.

- Rates and costings were based upon the following assumptions:-
 - Currently two lane rural road construction costs generally are in the order of \$600,000 per lane kilometre.
 - Earthworks generally comprise approx 33% of total roadworks costs. The remainder of the roadworks is 67% of total cost (ie. \$400,000 per lane kilometre).
 - Earthworks costing rates are for cut-to-fill or cut-to-spoil. Imported fill is factored at a higher rate.
 - Bridge width of 10 metres is assumed for two lane bridges over the waterway.
 - Investigation and design costs are assumed to be proportional to the length of the work, but are not included in these concept estimates.

- **Points raised in initial discussion of the Options presented included:**
 - Longitudinal sections of the proposed road were reviewed for the two major options (ie. the northern route - "Blue Route" and the southern route - "Green Route").
 - Extra bridge structures may be required to cross the flood plain.
 - Assumed the need for the 1:100 flood free route (ie. 1% probability of flood in any year). This may not be required and certainly is a major cost factor.
 - Based on the estimates presented, the RTA preferred option of North Street ("Blue Route") is considerably less expensive than the other two routes presented (ie. the southern route - "Green Route" and the route parallel to the railway line - the "Yellow Route").
 - All options would have the same level of service and life expectancy.
 - Estimated costs and quantities are for comparison purposes only.
 - A further sub-option for the North Street option is the installation of a roundabout at the intersection of Prince Alfred and Queen Street and the North Street bypass and defer the Broughton Mill Creek bridge as a staging option if funds are not available.
 - The bypass would be signposted at 100 km/h wherever possible with grade separated intersections.
 - There is a need to balance between landuse planning and road infrastructure.
 - Off and on ramps would be provided to both the north and south of the village on all options.

- All options can be linked to any of the options being considered to the north of Berry (ie. Princes Highway, Gerrigong to Berry Project).
- No separate cycleways or pedestrian use are planned on the bypass.
- Sources of suitable and economically available fill material have not been investigated at this stage. However, it is assumed available and will need to be addressed in an EIS for the project.
- The project is to proceed to an EIS process once a firm option has been developed..
- Each option allows ultimately for two lanes in each direction with one in each direction being built initially until demand warrants.
- The target accident rate is 0.25 crashes/million vehicle kms. Each option should be able to achieve this target.
- Currently in Queen Street, Berry the most frequent number of accidents are in the same direction (ie. rear end) with pedestrian accidents being low (5%).
- No flood studies are available at this time. However, Council can provide some information in this area.
- Overtaking opportunities will be provided only by straights and large radius curves. There are overtaking opportunities to the north and south of the project.

2.5 Community Perspectives

A number of community perspectives were presented to the Group including that of the Berry Precinct Forum, Berry Chamber of Commerce, Berry Historical Society and Berry Sporting Complex Committee. Issues raised included:

- The Community (including the Chamber of Commerce) supports the need for a bypass of Queen Street, Berry.
- The bypass needs to not only solve the traffic problems but also maintain the amenity of Berry as regards heritage, sporting, environment, business and community values.
- A firm line on the map is required so planning can occur with some certainty. Also landscaping could start early in the project life cycle to ensure mature screening.
- Need to consider and protect the historical importance of the early town near the Broughton Mill Creek bridge and keep it intact.
- Need to ensure adequate connections with existing local road and future sub-division networks.
- Community would not support a heavy industry area in or near the village.

- There are over 200 businesses in the town.
- Need for noise barriers would have to be included in any estimates. Noise will be a consideration along North Street.
- Concern of the impact on the floodplain of the option to the south.
- Pedestrian access needs to be considered across the bypass, particularly to the sporting facilities for the North Street option.
- No aboriginal sites have been identified at the present time on or near the route options.
- The southern options should be adjusted to avoid the trees at the southern gateway to the village.
- Community wants to be kept informed of project's progress.
- The severance of the town is a major concern, along with splitting the business area from future growth areas and sporting areas.
- Easy access to town centre needs to be maintained for non-heavy vehicles.
- There are perceived short term negative economic or commercial impacts on the town even though long term benefits can be seen.
- Any significant heritage or archaeological item that is uncovered during construction should be advised to the Council and community as soon as possible for photography and recording.
- There are 8 clubs and 870 people who utilise the 10 ha sporting area. Retention of turf wicket by the oldest cricket club in the region is an issue. Show jumping complex is being developed. Bowling club is considering moving to this area.
- Access to the sporting area for pedestrians, cyclists, cars and horse floats is an issue. One access point is planned.
- The sporting complex land is zoned "operational" and owned by Council in fee simple. Therefore negotiation will need to occur with Council to purchase the land. Finding another 10 ha of flat land for the sporting complex would be difficult.
- Access to the David Berry Memorial Hospital needs to be maintained.
- On the southern route there are acid sulphate soils. This may not be a problem with fill embankments required.
- No major environmental issues appear to be associated with any of the routes. All will require appropriate design consideration at the detail development phase of the project.
- The area around the proposed Broughton Mill Creek bridge will require planning to ensure suitable embankment and soil stability as well as water quality control is maintained.

2.6 Department of Land & Water Conservation

The following issues were raised by the Department of Land and Water Conservation (DLWC) representative:

- From a DLWC point of view its concerns will relate to the final route selected and ensuring that erosion and sedimentation control are addressed along with vegetation sustainability.

3. Project Analysis

3.1 Introduction

The information presented in this Section is a consolidation of the perceptions and general outputs of the Value Study Group on the analysis of the project in the Workshop.

3.2 Problem Situation

With such a wide range of expertise available within the Value Study Group and to gain a better focus of the project, the "Problem Situation" was recorded as a starting point.

As the Value Study Group saw it, the "Problem Situation" comprised to varying extents the following:

- North Street option has potential to split town
- Impact on sports complex
- Safety issues (speed through town, sub-standard alignment to the north of the village)
- Conflict between highway and local traffic
- Pedestrian safety
- Loss of traffic efficiency through Berry (ie. delays, high vehicle operating cost)
- Lack of overtaking opportunities
- Congestion through Queen Street
- Accommodating traffic growth
- Character of traffic (9% heavy vehicles)
- Impact on town amenity
- Highway going through town has negative impact on amenity (ie. cultural, aesthetics, heritage)
- Noise and air quality concerns
- Competing scarce land use resources (ie. agricultural land, road infrastructure).
- Restriction of the existing alignment to allow improvements
- Poor intersections (sight distances)
- Lack of alternative transport options
- Peak period congestion (holidays, market days)
- Existing road is not a flood free route
- Restriction on cyclist movements
- Vibration damage to buildings (particularly heritage buildings)
- Limitation on revitalisation schemes for commercial centre
- Heavy vehicles are already using North Street as a bypass (wide loads)

- Impact on property values
- Victoria Street being used as alternative to highway
- Planning uncertainty issues (the project has been on the drawing board for 35 years)
- Existing highway impacts on historic village
- Existing Broughton Mill bridge is narrow/restrictive
- Perceived problem of "dangerous" material laden trucks
- Through traffic using local road system
- Difficult to get across highway in Berry which divides town
- Mindful of the cultural landscape
- Highway is both a local and through route
- Intersection of two existing Tourist Drives (Coolangatta Road, Kangaroo Valley Road) and potentially others
- A number of roads/routes lead to Berry
- Proliferation of signage
- Location of key developments (Graham Park, Sports Centre - satellite to town)
- Berry being a commercial/rural service centre
- Must look at the regional perspective

3.3 Project "Givens"/Constraints

To assist in determining the limits to which the project could be challenged, questioned or endorsed, the Value Study Group listed the **Project "Givens"/Constraints**. For the purpose of the Value Management Study, these were identified as:

- Geographic constraints
- Floodplain/rivers and creeks
- Railway corridor
- Heritage items
- Sporting complex/broad current usage
- Some existing residential dwellings still need to be acquired
- Potential residential developments
- Tree stands at the southern gateway to town
- Existing road pattern
- Natural environment, flora, fauna, aboriginal, archaeology and soil conditions
- Traffic noise is a constraint
- Economic performance (including costs of project)
- Traffic capacity needs
- Availability of fill
- Impacts of staged construction
- Land ownership issues

- The Berry/Gerrington upgraded highway route is a long term corridor option (ie. > 20 years in the future) and the same scenario exists for the road upgrades south of Berry. Therefore, Berry bypass is a project which stands alone and will happen first
- The project **must** be affordable to proceed.

3.4 Project Assumptions

With the benefit of having reviewed the Background Papers and listened to the presentations, the Value Study Group examined the assumptions which underpinned the project.

These were classified in the course of the Study in terms of those that were accepted as valid and those that warranted further challenge. Both groups of assumptions are listed below. The challengeable category was used as prompts in the evaluation of ideas and further actions to enhance the project "value".

Challengeable Assumptions

- Each route has equal potential to satisfy the three key requirements - safety, amenity, development
- Assume two lanes and overtaking will be adequate for 20 years
- Assume fill material is economically available and needed for some options
- Assume appropriate noise protection possible on North Street option
- Assume most future development is residential
- Assume environmental impacts can be managed
- Funding will be provided for the project
- The project will be affordable
- A high degree of access to Berry from the highway will be provided
- The bypass will have a 100 km/h design speed
- The reservation along North Street is sufficiently wide for noise attenuation and a four lane bypass
- The bypass should be provided to a 1% flood probability standard
- The bypass will not increase the impacts from flooding
- The bypass will not reduce residential amenity
- The Blue Route (North Street option) will be grade-separated at Kangaroo Valley Road
- The project will be a two lane bypass
- Speed limit will be 100 km/h
- The project will be economically viable
- The RTA will fund the full bypass

- Duplication (ie. 4 lanes) not needed until the year 2020
- There are no major environmental impediments
- One of the options identified to date is the best
- All major stakeholders have been represented
- All major problems with the North Street option relate to the northern connection

Valid Assumptions

- Assume some of the "Sand Track" traffic will divert back to SH1
- Assume Berry will expand (ie. population doubles)
- "Do Nothing" option is unacceptable
- Flood regime remains
- Assume railway line remains
- Assume high value on heritage issues
- Village severance is an issue
- Assume broad community support for concept of a bypass
- There is a long term strategy to upgrade the highway
- Highway traffic will increase
- The demand for improved environmental amenity will get stronger
- Berry will continue to expand
- The sporting complex will be a constraint
- The bypass will be access controlled and provide a high degree of service to through traffic
- The project will improve traffic conditions
- Community expectation is that the project will not proceed until the year 2000 (2 lanes)
- The bypass is needed
- Any of the options presented is constructible
- An acceptable level of local access will be maintained at all times (during construction)
- RTA is committed to the final preferred option (subject to funding)
- RTA design and construction standards won't deteriorate
- The bypass will be a controlled access road

3.5 Summary of Key Issues and Concerns

From the information presented, the Group summarised the key issues and concerns that needed to be addressed by the project as:

- **Highway Deficiency needs to be addressed**
 - Safety issues (ie. through/local traffic, pedestrian movements)
 - Efficiency, congestion

- **Town Amenity needs to be protected**
 - *Social, Cultural, Natural Environment, Heritage*
- **Economics/Benefit Cost/Affordability**
 - *Positive potential to community*
 - *Minimise adverse impact of bypass on tourism*
 - *Improve access to South Coast*
 - *Commercial opportunity to town*
 - *Must be affordable*

3.6 Function Analysis

At the very core of the Value Management process is the analysis of function (ie. what the system, project, or task must do, what are the cost implications, what are the alternatives). It is this aspect which distinguishes Value Management from other methods of improving value.

Function analysis involves identifying what the road actually does or perhaps more importantly, what it must do to achieve the project objectives.

Through the analysis of functions, it is possible to identify duplication, unnecessary expenditure and possible wastage, and thus provide the opportunity for value to be improved. The function analysis perspective not only enables value management to explore the requirements of the project and/or the project brief but also to test the assumptions and needs perceived by its authors.

The function analysis for the project was undertaken in two ways. **Firstly**, the Value Study Group focussed on what the project must do. The Group concluded that in order to be successful the project must:

- ***Divert through traffic away from the main street***
- ***Attract traffic from the local system and the "Sand Track" (Gerroa Road)***
- ***Be of economic benefit to the region and the town specifically***
- ***Improve overall traffic efficiency and the level of road safety within the bounds of the bypass***
- ***Enhance the town's amenity (including being aesthetically pleasing)***
- ***Have regard to the local cultural, heritage, visual and aesthetic, environmental and landscape values***
- ***Support the district growth strategy***
- ***Provide access to and from Berry***
- ***Improve accessibility within Berry***
- ***Satisfy all environmental criteria***
- ***Be affordable***
- ***Be acceptable to the community***

- ***Be flood free (level to be defined)***
- ***Not raise upstream flood levels***
- ***Must allow for future electrification of the railway***
- ***Accommodate pedestrians and cyclists along and across the bypass***
- ***Provide alternate access to adjoining landowners of the bypass route***
- ***Comply with best practice principles during construction***
- ***Have ongoing community consultation during the pre-construction phase.***

As a result of undertaking this exercise, the Group confirmed the project objectives as being **"to improve network efficiency, improve road safety and improve the amenity of Berry township"** and agreed on what the project must achieve to be successful. Also it became apparent that such a project was required with the Group **agreeing to the need for a bypass of Berry** (for the reasons mentioned earlier).

Secondly, the Group reviewed the project's key design parameters to clarify and understand what they meant and their potential impact on the project. A summary of the points raised included:

Design Speed

- *100km/h to 110 km/h (desirable)*
- *80km/h (minimum)*
- *Staged construction (part of bypass possible at 60 km/h)*
- *Vertical alignment desirable to match horizontal alignment but could be up to 10 km/h less*

Design Flood Level

- *1% flood level frequency desirable (1:100 year flood)*
- *Insufficient flood information at this stage*
- *5% minimum flood level frequency if economically preferable.*
- *Railway line has not been flooded in this area. Maybe we should design to this level.*
- *Design flood level and its impact is a major issue and requires further investigation.*

Safety

- *Accident rates to be reduced to the following targets:*
 - *Two lane, two way road - 0.5 accidents/mvkm*
 - *Dual carriageway - 0.3 accidents/mvkm*

Corridor Widths

- *Nominal: 60m minimum
80m desirable*
- *The Blue Route width includes the existing North Street. However, need to fit in service*

road and noise control as well within the corridor.

- Wider corridor at culverts for water quality control and wider corridor for some batters where cuts or fills are deep.
- Width increase for high batter areas, berms etc.
- Could modify width (ie. alter median width)
- Vary width at specific locations, especially intersections and interchanges

Carriageway Widths

- 3.5m lanes
- 3m shoulders (1m inner shoulder)
- 10m median
- 10m toe of batter to boundary

Landscaping

- To be sympathetic with Berry environs

Noise Control

- Barriers will impact with views
- Comply with RTA guidelines

Erosion & Sedimentation Control

- As per RTA guidelines

Other Environmental Issues

- As per environmental impact guideline requirements

Vertical Clearance for overpasses and railway tracks (from underside of deck)

- to electric railway tracks (6.1m)
- to roads (5.3m)
- above high flood level (1m)

3.7 Major Cost Influences

The Value Study Group then examined the major cost influences affecting the project in order to identify areas of "leverage" (ie. components which the Group could focus on as pareto items in terms of cost or effort) to provide prompts to generate alternatives for resolution to the problems identified. The Group reviewed the indicative cost breakdown as shown below based on information provided by the Project Manager.

CONCEPT ESTIMATES (TWO LANE)

NORTH STREET OPTION (ie. Blue Route)

Item	Qty.	Unit	Rate	Amount
General	5.6	lane kms	400,000	2,240,000
Earthworks: cut to fill	25,000	m3	6	150,000
	imported fill 25,000	m3	20	500,000
Bridges	5,000	m2	1200	6,000,000*
Acquisitions: Land	4	ha	5000	20,000
	Houses 4	ea	200,000	800,000
				\$9,710,000

RAILWAY ALIGNMENT OPTION (ie. Yellow Route)

Item	Qty.	Unit	Rate	Amount
General	9	lane kms	400,000	3,600,000
Earthworks: cut to fill	50,000	m3	6	300,000
	imported fill 250,000	m3	20	5,000,000*
Bridges	1500	m2	1200	1,800,000
Acquisitions: Land	24	ha	5000	120,000
	Houses 13	ea	200,000	2,600,000*
				\$13,420,000

SOUTHERN ALIGNMENT OPTION (ie. Green Route)

Item	Qty.	Unit	Rate	Amount
General	9.4	lane kms	400,000	3,760,000
Earthworks: cut to fill	45,000	m3	6	270,000
	imported fill 455,000	m3	20	9,100,000*
Bridges	2000	m2	1200	2,400,000
Acquisitions: Land	25	ha	5000	125,000
				\$15,530,000

* Major cost influences

The following points were raised during discussion of the costs presented:

- There is a need to add acquisition costs already spent on the North Street option so a true comparison of the overall costs can be made.
- Noise protection is not included in any option and would differ pending on the option selected.
- Environmental protection costs are not included.
- No contingencies have been included in the costs.
- **The major cost influences affecting the options were identified as the design flood level used, design speed adopted, imported fill requirements and availability for each option, bridge structure requirements, land acquisition of the southern option.**

The Group felt that the costs presented were broad and because they did not include the items mentioned earlier (ie. land acquisition forgone, noise amelioration etc) it made it difficult to compare the cost of options (ie. "apples" with "apples").

3.8 Option Selection Criteria

The Group was requested to determine option selection criteria which would help in differentiating between options. The selection criteria (which were not prioritised at this stage) were determined to be:

- Higher cost
- Economic performance (ie. travel time as a measure)
- Safety benefits
- Stageability
- Community acceptance
- Heritage impact
- Noise impact
- Environmental impact
- Disruption during construction
- Ability to support district growth
- Accessibility to Berry
- Visual impact
- Ability to support town centre amenity improvements
- Construction impacts
- Severance impacts
- Agricultural land impact

The Group would later modify and weight the selection criteria for use when evaluating options during the next phase of the Study.

Having focussed clearly on the functions of the project, the project design parameters, indicative costs and option selection criteria, the Value Study Group was now in a position to use the issues raised to generate ideas for potential project improvement and evaluation.

4. Project Improvements

4.1 Methodology

Sections 2 and 3 of this report summarise the outcomes of the first two stages of the Value Management “Job Plan”, ie. Information Phase and Analysis Phase. These phases provide the platform for the generation of ideas/options for improving the project’s value.

The ideas generated were achieved by asking questions with respect to the following generic prompts:

“Can We.....?”

- **Simplify anything?**
- **Eliminate anything?**
- **Combine anything?**
- **Re-locate anything?**
- **Change anything?**
- **Add anything?**

During the information and analysis phases, the Group was already questioning assumptions and formulating ideas and improvements for the project. Subsequently, during this more formal speculative phase of the Workshop, some of these issues were revisited, elaborated upon and reinforced.

The generation of ideas was undertaken in two sub-groups to ensure a wide coverage of salient aspects of the project and to maximise the range of ideas. Participants were asked to generate as many ideas as possible and to defer judgement of ideas until later in the workshop.

4.2 Ideas Generated

Ideas/questions generated by the sub-groups were assessed by the whole Value Study Group.

Given the workshop session was of limited duration, the discussion of each of the ideas was assessed by the Value Study Group as:

1. **Further evaluation of the idea now;**
2. **Action Plan - the idea should be assigned to the Action Plan and further pursued outside the workshop;**

3. **Discard the idea - there is no benefit in further pursuing the idea or the idea is outside the scope of the study and rejection of the idea is concurred by the Group.**

Ideas adjudged category “1” by the Group were further categorised against the following headings for later evaluation:

- A. **New Options**
- B. **Improvements to Options**
- C. **Local Access Improvement**
- D. **Community Improvement Ideas**
- E. **Staging Improvements**

A list of the speculative “Can We” ideas/questions and the Group’s assessment is provided in **Appendix 3**.

4.3 Route Options

As a result of the assessment of ideas and their categorisation, the Group began to converge their thinking and focus on solutions.

4.3.1 Selection Criteria Weighting

The Group reviewed the selection criteria it had previously identified (Section 3.8) and separated the quantitative (measurable) criteria from the qualitative selection criteria. Some of the qualitative criteria were combined and/or changed by the Group to reflect their intention.

To provide a basis for option comparison the qualitative criteria were refined to:

- *Stageability*
- *Construction Impact (including disruption)*
- *Heritage Impact*
- *Town Amenity*
- *Visual/Landscape Impact*
- *House Take*
- *Accessibility to Berry and CBD*
- *Supporting Planned Residential Growth*
- *Environmental Impact (flora, fauna, water quality)*
- *Land Severance Impact*
- *Agricultural Land Impact*

Quantitative criteria which would be measured for option comparison were:

- *Cost/Affordability*
- *Travel Time*
- *House and Land Acquisition*

Weightings for the qualitative selection criteria were individually assessed at first and then negotiated in sub-groups. The sub-group weightings were averaged to produce weightings agreed to by the whole Group.

Qualitative selection criteria and the weightings are shown in **Table 1**.

Qualitative Selection Criteria	Sub Group 1	Sub Group 2	Average
Stageability	10	7	8.5
Construction Impact	0	2	1
Heritage Impact	15	15	15
Town Amenity	15	15	15
Visual/Landscape Impact	15	14	14.5
House Take	5	10	7.5
Access to Berry/CBD	8	8	8
Support for Planned Residential Growth	5	9	7
Environmental Impacts	9	10	9.5
Land Severance Impact	9	6	7.5
Agricultural Land Impact	9	4	6.5
TOTAL			100

Table 1: Qualitative Selection Criteria Weighting

- In developing and weighting option selection criteria, the Group highlighted **heritage impacts, town amenity and visual/landscape impacts** as very significant factors when determining the preferred route.

4.3.2 Route Evaluation

The Group undertook a second pass assessment of the route options and modifications presented by the RTA and/or generated during the speculative phase of the workshop. At this stage the Group eliminated:

- A near northern option due to noise impacts on the village
- A northern option which utilised more of the existing road at the northern end (ie. "Dotted Blue" and "Light Green" modifications, see sketch in **Appendix 2**) due to visual impact, noise and geometry.
- A four lane low speed option and a lower graded option of the northern route since it would not meet the project objectives.
- A northern route combined with a route to the west of the existing route (since there was little or no value/benefit seen in this route).
- The alignment parallel to the railway line (ie. the "Yellow" Route) due to acquisition difficulties, railway relocation issues as well as noise and visual impact to the village.

As a result the Group were left with the following options to be further developed and considered:

Northern Options

- The current northern option (ie. Blue Route) possibly widened to cater for noise amelioration and landscaping.
- A route further to the north of the current North Street option and west of the existing route in the south.
- A route along the North Street option and further west of the existing route in the south.

Southern Options

- The presented southern option (ie. Green Route)
- A modified southern option with lower gradings to lessen visual impact and reduce cost by reducing amount of imported fill.
- A modified southern option which avoids the village's southern gateway trees.

Concern was expressed about the visual and noise impact of all routes and the need to address these aspects of any route if community acceptance is to be gained.

The Group again formed two sub-groups. One sub-group was requested to develop the best option bypass around the north of the village and the other sub-group to develop the best option bypassing the south of the village.

4.3.3 Southern Option

This sub-group presented their preferred solution for a southern option. Notes and a sketch of their presentation are shown in **Appendix 4**. Key points of their presentation included:

- A modified southern route was recommended which included:
 - Lower grades to minimise visual impact, imported fill and cost (pending a suitable design flood level and railway line clearance being determined).
 - Southern end of alignment modified to avoid the village's southern gateway trees.
 - Grade separated interchange required at the northern end of the village.
- An indicative cost estimate for this route was thought to be \$13 million which may reduce to \$12 million if the North Street acquisitions were sold and earthworks could be reduced by 30%. However, possibly an extra bridge structure would be required and land acquisition prices are likely to be higher on the southern side of the village.
- The travel time was estimated to be 2.5 mins.
- There seemed little opportunity for staging (possible for access connections to the village only).
- Construction impacts were not considered insurmountable.
- There seemed no foreseen heritage impacts.
- There seemed low noise impact as well as low impact on Kangaroo Valley Road and developments in that area. Supports the planned residential growth of the village.
- A high visual and landscape impact is still expected.
- No house takes are foreseen.
- Access at the northern end of the village would be enhanced by grade separation and signage.
- Low and manageable environmental impact.
- Represents a significant change of landuse from agricultural land to road infrastructure.
- Minimal impact of acidic soil since the road will be on fill.

The Group discussed the option put forward and concluded:

- *The option is worth further consideration if the impacts can be mitigated.*
- *The option compliments the long term plan for the highway (ie. same side of village as the "Gerrigong/Berry" project).*
- *Reduces impact on the community, mountain views from town, sporting complex and does not sever the village or its potential for growth.*
- *The amount of fill required still needs to be determined as well as its availability.*
- *Visual impact of this option still needs to be considered and further investigated.*
- *Southern end connection back to the existing highway needs to be fine tuned bearing in mind the gateway trees, University entrance and existing highway crest.*
- *Cost of earthworks for the four lanes of the proposed bypass needs to be considered and four lanes of earthworks possibly constructed at the initial stage.*

As a result, the Group recommended the RTA further investigate the modified southern route developed by the group in order to better understand its economic and engineering parameters.

4.3.4 Northern Options

This sub-group presented their evaluation of northern options. The options evaluated are listed in **Section 4.3.2**. The results (shown in **Table 2**) indicated no significant difference between the three options.

The issues raised about the northern options during discussion which need to be addressed included:

- Severance of the sporting complex from the village and the need to plan suitable access links (both road and pedestrian) to the complex.
- Severance of potential town expansion opportunities.
- Noise reduction measures will be required.
- High visual impact of the bridge at the northern end of Berry.
- The cost of bridge work (ie. long bridges required).
- The connection at the northern end into the ridge before the bridge crossing.
- Development of land and access from the Ford Street development and other potential developments.
- The potential connection of a northern option bypass to the "Gerrigong/Berry" project in the long term.

- Protection of the heritage precinct at the northern end of the village.
- Majority of the acquisitions have already been undertaken.
- May need to widen the existing corridor to cater for service road, four lane bypass as well as noise and visual amelioration.
- It is shortest length option with the possibility of balancing earthworks.
- Staging opportunities exist particularly at the Broughton Mill Creek bridge.

On the level and detail of information available, the Group could not rule out the possibility of a northern option and recommended the option and its variations (ie. Blue Route) be further investigated and modified to overcome the issues identified by the Group (ie. visual and noise impacts, severance of potential town expansion opportunities, access links to the sporting complex).

4.3.5 Comparison of Options

The Group reviewed the preferred southern option and the three northern options on the basis of cost, land acquisition, travel time and satisfaction of the selection criteria. When broad acquisition costs, noise amelioration, lower grading and modification were taken into account, it appeared that there was no significant difference in cost between the options. However, information was

very indicative and it requires more analysis during design development phase of the project.

Travel time differences between the four options was not significant with all achieving greater than three minutes travel time savings. Based on some broad assumptions, calculations indicated that there could be for all options:

- Estimated travel time savings \$3.2m pa
 - Estimated operating cost savings \$0.7m pa
 - Estimated accident savings \$0.1m pa
- \$4.0m pa

Other benefits as well as validation of the above should be quantified during the project analysis phase. Stageability will be an important factor in the economic performance. All options would appear to generate a Benefit Cost Ratio (BCR) greater than 2.

The four options were then assessed against the qualitative selection criteria. The results indicated that there was no significant difference between the northern or southern options (see Table 2) although there was a feeling within the Group (particularly from the community representatives) that the southern option was the more favourable route. However, as expressed earlier, the level and detail of information available needed to be refined before formal decisions could be made.

Selection Criteria	Weight	Northern Option		Far North & West Option		Northern & West Option		Southern Option	
		R	WS	R	WS	R	WS	R	WS
Stageability	8.5	5	42.5	2	17	3	25.5	1	8.5
Construction Impacts	1	3	3	5	5	4	4	5	5
Heritage Impacts	15	4	60	5	75	4	60	5	75
Town Amenity	15	3	45	5	75	4	60	5	75
Visual/Landscape Impact	14.5	4	58	2	29	3	43.5	2	29
House Take	7.5	3	22.5	2.5	18.75	2.5	18.75	5	37.5
Access to Berry/CBD	8	5	40	4.5	36	4.5	36	4.5	36
Support for Planned Residential Growth	7	2	14	5	35	4	28	5	35
Environmental Impacts	9.5	4	38	2	19	3	28.5	2	19
Land Severance Impact	7.5	2	15	4	30	3	22.5	5	37.5
Agricultural Land Impact	6.5	4	26	1	6.5	3	19.5	1	6.5
TOTAL			364		346.3		346.3		364

Table 2: Options Evaluation Matrix

NOTE: WS - Weighted score R - Group rating on a 1-5 scale

As a result of the evaluation and discussion in the workshop, the Group recommended further investigation and refinement of both routes and that the modified northern and southern options should be compared using the selection criteria developed by the Group together with measurable criteria (ie. cost, economic performance) in determining the final bypass location.

Value Study Comment

It should be noted that an error was made in calculating the southern option score during the Option Evaluation Matrix exercise at the workshop. During the workshop it appeared the southern option scored a 20% superior ranking to the northern option. However, when this was recalculated for report documentation and the error discovered, it was found that there was no significant difference between the options (as indicated in Table 1). It should be noted that this error did not affect the workshop outcomes.

4.3.6 Staging Issues

The issue of staging was reviewed and it was felt that this needed to be carefully analysed to ensure that a sub-optimal solution was not realised.

The Group noted that:

- A northern option was stageable (ie. bridge work could be deferred, local access connections could be at-grade initially) but it was felt that ongoing planning of the village could still not proceed with certainty.
- The southern option did not lend itself to staging and the benefits to the through and local traffic could not be enjoyed until the whole project to be completed.
- Short term benefits would need to be pursued on the existing highway to address the current problems should the southern option be chosen due to the potential delay in achieving the benefits of that option.
- Consideration should also be given to building dual carriageways at the initial phase of the project and/or possibly building dual carriageways with at-grade intersections.
- Stageability issues were referred to the Project Team for further investigation.

4.3.7 Other Issues

The Group raised a number of other issues including:

Access

The Group agreed that two access points should be provided from the bypass to Berry with the locations to be determined. However, it was suggested that these should generally be at the northern and southern ends of the village to preserve the integrity of the local road network.

The Group also requested the following access issues be referred to the Action Plan for further investigation and evaluation as the project progresses including:

- *Access to future subdivisions east and west of the highway.*
- *Access to sporting fields across the northern option (including pedestrian access).*
- *The location of the two appropriate access points to Berry.*
- *At grade and/or grade separated interchanges as part of staging options.*

Community Consultation

The Group confirmed the need for further community consultation prior to a final decision being made on the preferred route. Mr Ian Archer, Project Manager, Wollongong Zone was confirmed as the RTA contact officer.

The Group also believed a consultation process should be developed to involve all relevant stakeholders including those not present at the workshop and keep the community informed of the progress of the project.

Miscellaneous Issues

Other issues raised in discussion and referred to the Action Plan for further investigation included the need to:

- *Investigate if there are any significant aboriginal sites on the preferred route corridors.*
- *Investigate the economic availability of suitable fill material (if an off-site borrow is required).*
- *Clarify flood level heights in the area including the differences between the 1% and 5% flood levels and determine the appropriate design level.*

- Investigate restricting development west of SH1 until appropriate infrastructure is provided via Development Control Plans.
- Investigate the heritage status of the properties identified along the North Street route.
- Investigate short term remedial actions such as calming traffic in Queen Street until the bypass is built.
- Consider as detail design notes:-
 - Minimise noise and visual impacts of routes.
 - Cyclist facilities.
 - Investigate the connection at the southern end of the southern option which considers the University entrance, avenue of trees and the current highway crest.
 - Earthworks needed for four lanes.
 - Intersection and interchange treatments.
 - Landscaping the agreed route early.

4.4 Workshop Outcomes & Decisions

As the final output of the Workshop, an Action Plan (**Section 5**) was formulated which identified matters needing to be resolved and pursued to enable the project to be further developed. Additionally issues raised and discussed during the Workshop led to the following **Decisions and Workshop Outcomes**. As a result of the Workshop the participants:

- **Reviewed** the project objectives being “to improve network efficiency, improve road safety and improve the amenity of Berry township” and **agreed** on what the project **must** achieve to be successful.
- **Agreed** that there was a need for a bypass of Berry.
- **Identified** a range of issues and concerns associated with the project including potential environmental, heritage, planning and community impacts and summarised them under the key categories of:-
 - Town Amenity Issues
 - Highway Deficiency Issues
 - Economic Impact Issues
- **Identified** a number of project “givens”/ constraints and assumptions. The assumptions associated with the project were assessed, based on the information available, as either valid or challengeable (ie. requiring further investigation).
- **Developed and weighted** route option selection criteria which highlighted *heritage impacts, town amenity and visual/and use impacts* as very significant factors when determining a route.
- **Reviewed** the route options as presented to the workshop and **developed** alternatives/ variations. The group discussed option advantages and disadvantages as well as value improvements to them.
- **Reviewed** the key design parameters including:
 - Design speed to be 100km/h (desirable), 80km/h (minimum).
 - Design flood level to be to the 1% flood level (desirable) however this needs to be further investigated.
 - Accident rates to be reduced to 0.5 accidents/million vehicle kilometres for two lane, two way road and 0.3 accidents/million vehicle kilometres for dual carriageway (target).
 - Road corridor width to be nominally 60 metres wide (minimum) and 80 metres wide (desirable). This may vary at specific locations.
 - Landscaping to be sympathetic with the Berry environs.
 - Compliance with environmental impact guideline requirements.
 - Compliance with traffic noise guidelines.
 - Compliance with erosion and sedimentation control guidelines.
 - Vertical clearance from the underside of decks to electric railway tracks (6.1m), roads (5.3m) and above high flood level (1m).
- **Recommended** as a result of the workshop that:
 - **The RTA further investigate the modified southern route developed by the group in order to better understand its economic and engineering parameters.**
 - **The northern option and its variations (ie. Blue Route) be further investigated and modified to overcome the issues identified by the group (ie. visual and noise impacts, severance of potential town expansion opportunities, access links to the sporting complex).**

- ***The modified northern and southern routes should be compared using the selection criteria developed by the group together with measurable criteria (ie. cost, economic performance) in determining the final bypass location.***

applicability to the project, as well as the Group's approach to the optimum project solutions, local access and cross connection issues.

- **Agreed** that two access points to Berry from the bypass should be provided with the locations to be determined.
- **Noted** a number of issues outlined in the Action Plan to be considered as the project progresses.
- **Confirmed** the need for further community consultation prior to a final decision being made on the preferred route. Mr Ian Archer, Project Manager, Wollongong Zone was confirmed as the RTA contact officer.
- **Gained** first hand awareness and appreciation of the wider issues involved in the project (ie. road network issues, economic, technical and safety issues, social, heritage, urban planning and environmental concerns and community perspectives). Participants were given the opportunity to openly express their points of view and were able to obtain clarification or resolution, where possible, of the issues raised.

Value Study Team Comment

The Value Study highlighted a number of positive aspects associated with the planning of the project. In particular, undertaking the Study at this early stage of its development, allowed an outlining of the direction and scope that the project should take and set the foundation for further investigations/detail design. It also provided an early opportunity for participants' concerns to be tabled and addressed as the project progresses.

The Workshop provided the appropriate forum with the mix of participants present to review the proposed options and suggest alternatives from a "whole of system" point of view and air issues including through traffic issues, local traffic/pedestrian movements, safety, lifestyle impacts, environmental, heritage, social, recreational, visual and commercial concerns. The Group referred the preferred options for further investigation to the Action Plan.

Finally, the Value Study highlighted the existing commitment by all participants to the project and its needs. This was demonstrated by the Group's willingness to question and review options, project parameters, option selection criteria and their

5. Action Plan

The Action Plan represents the final consolidated outcome of the structured workshop activity. The investment return flowing from the Value Study Workshop is greatly dependent on the vigour with which the Action Plan tasks are pursued by both those nominated and the Action Plan Co-ordinator.

It should be noted that this Action Plan consists of items which were specifically tabled at the end of the second day of the workshop, with workshop participants responsible for the carriage of those items to report to the Action Plan Co-ordinator after their completion.

Some of the actions on the list are already in hand. However, to ensure an appropriate level of resource is applied to the tasks, Mr. Ian Archer, Project Manager, Project Manager Wollongong Zone, RTA was suggested as the Action Plan Co-ordinator.

No.	Action	Responsibility	Completion
1.	Investigate the preferred southern corridor option as modified by the group to ensure it is economically and engineeringly feasible. Compare with the best northern route (ie. modified or improved "Blue" route). (Key areas of investigation include cost of bridges and earthworks).	Ian Archer	End June 1996
2.	Investigate the stageability of the northern route.	Ian Archer	End June 1996
3.	Investigate and evaluate the access issues including: <ul style="list-style-type: none"> • Access to future subdivisions east and west of the highway; • Access to sporting fields across the northern option; • Provision of two appropriate access points to Berry; • At grade and /or grade separated interchanges as part of staging options. 	Ian Archer	End June 1996
4.	Investigate if there are any significant aboriginal sites on the preferred route corridors	Ian Archer	End April 1996
5.	Investigate the economic availability of suitable fill material (if an off-site borrow is required).	Ian Archer	End April 1996
6.	Clarify flood level heights in the area including the differences between the 1% and 5% flood levels.	Ian Archer	End April 1996
7.	Investigate restricting development west of SH1 until appropriate infrastructure is provided via Development Control Plans.	John Flett	In line with Development Control Plan Review
8.	Investigate the heritage status of the properties identified along the North Street route.	John Flett	End April 1996
9.	Develop a consultation process to involve all relevant stakeholders including those not present at the workshop and keep the community informed of the progress of the project.	Ian Archer	Ongoing
10.	Investigate short term remedial actions such as calming traffic in Queen Street until the bypass is built.	Simon Belfield	Ongoing
11.	Consider as detail design notes:- <ul style="list-style-type: none"> • Minimise noise and visual impacts of routes • Cyclists facilities • Investigate the connection at the southern end of the southern route (Green) option which considers the University entrance, avenue of trees and the crest • Earthworks needed for four lane • Intersection and interchange treatments • Landscaping the agreed route early. 	Ian Archer	Ongoing

Appendix 1. Value Study Participants

RTA : SH1 - PRINCES HIGHWAY, BERRY BYPASS PROJECT VALUE STUDY PARTICIPANTS LIST

Roads & Traffic Authority

Ken Collis

Planner, Wollongong Zone

Ian Archer

Project Manager, Wollongong Zone

Peter Beattie

Design Supervisor, Wollongong Zone

Simon Belfield

Traffic Engineering Officer, Wollongong Zone

Neil Lamb*

Zone Manager, Wollongong

Shoalhaven City Council

Pam Arnold

Councillor

Fintan O'Meara

Manager, Future Road Infrastructure & Traffic

John Flett

Urban Design Planner

Berry Precinct Forum

John Ings

Vice President

Berry Chamber of Commerce

Robert Packer

President

Berry Historical Society

Nancy Thomas

Berry Sporting Complex Committee

John Wells*

Secretary

Department of Land and Water Conservation

David Zerafa

Soil Conservationist

Value Study Team

Bob Andrews

Workshop Co-Facilitator

John Haynes

Technical Independent

Ross Prestipino

Co-Facilitator and Reporter

* Part Time



SH1 - PRINCES HIGHWAY

BERRY BYPASS

BACKGROUND INFORMATION

LOCAL GOVERNMENT AREA

Shoalhaven City Council

PROJECT DESCRIPTION

A bypass of Berry township extending from north of Broughton Mill Creek to south of Kangaroo Valley Road.

PROJECT BACKGROUND

Traffic conditions through the commercial centre of Berry are deteriorating rapidly with adverse impacts on both Highway safety and efficiency, and environmental amenity of the commercial centre.

PROJECT OBJECTIVES

- Improve road network efficiency.
- Improve road safety.
- Improve the amenity of Berry township.

OTHER CONSIDERATIONS

- Utilisation of existing bridge at Broughton Mill Creek for bypass route.
- The need for a grade separated interchange at Kangaroo Valley Road.

- Allow for future duplication to dual carriageways.
- Allow for staging opportunities.
- Heritage buildings adjacent to the existing and proposed routes.
- Access to sporting complex north of North Street.
- Location of the Highway reservation south of Berry.
- Flooding impacts of a new route.
- Connections to the existing Highway and the future route of the Highway between Gerrigong and Berry.
- Access to Berry commercial centre.

SH1 - PRINCES HIGHWAY

BERRY BYPASS

ALTERNATIVE ROUTES

Assumptions

Vertical clearances adopted for bridges are 7m between finished surfaces for roads, 7m between track and finished surface for railways, and 2m between high flood level and finished surface for waterways.

NORTH STREET ALIGNMENT (blue line)

A 2.3km bypass north of Berry that utilises the existing land zoned 5(d) and land already aquired by the RTA.

Advantages

- Lower cost for remaining acquisitions.
- Shortest length option.
- Least earthworks.
- Possibility of earthworks balance.
- Staging opportunity at Broughton Mill Creek bridge (light green line).
- Least severance to properties.
- Flattest grades.

Disadvantages

- Minimum 4 houses require demolition.
- Long bridge over Broughton Mill Creek, Bundewallah Creek and Woodhill Mountain Road.
- Proximity to existing residences in North Street.
- Effect on Sporting Complex.

RAILWAY ALIGNMENT (yellow line)

A 4km bypass south of Berry that parallels the existing railway corridor.

Advantages

- Consolidates major transport routes through Berry into one corridor.
- Shorter length of the two southern options.
- Smallest amount of bridgeworks.
- Less severance than southern alignment.

Disadvantages

- Extra acquisition costs over reserved corridor.
- Minimum 12 houses and the Scout Hall require demolition.
- More earthworks than reserved corridor.
- Imported fill required.
- Accessibility to Berry Railway Station.
- No staging opportunities.
- Proximity to retirement units in Albany Lane and existing residences in Prince Alfred, Station and Gwenda Streets.

SOUTHERN ALIGNMENT (green line)

A 4.2km bypass south of Berry that passes south of the existing railway corridor.

Advantages

- No effect on houses or buildings.
- Least effect on existing residential areas.

Disadvantages

- Extra acquisition costs over reserved corridor.
- Longest length option.
- Most earthworks.
- Significant amount of imported fill required.
- Large amount of bridgeworks.
- Most severance of properties.

SUMMARY

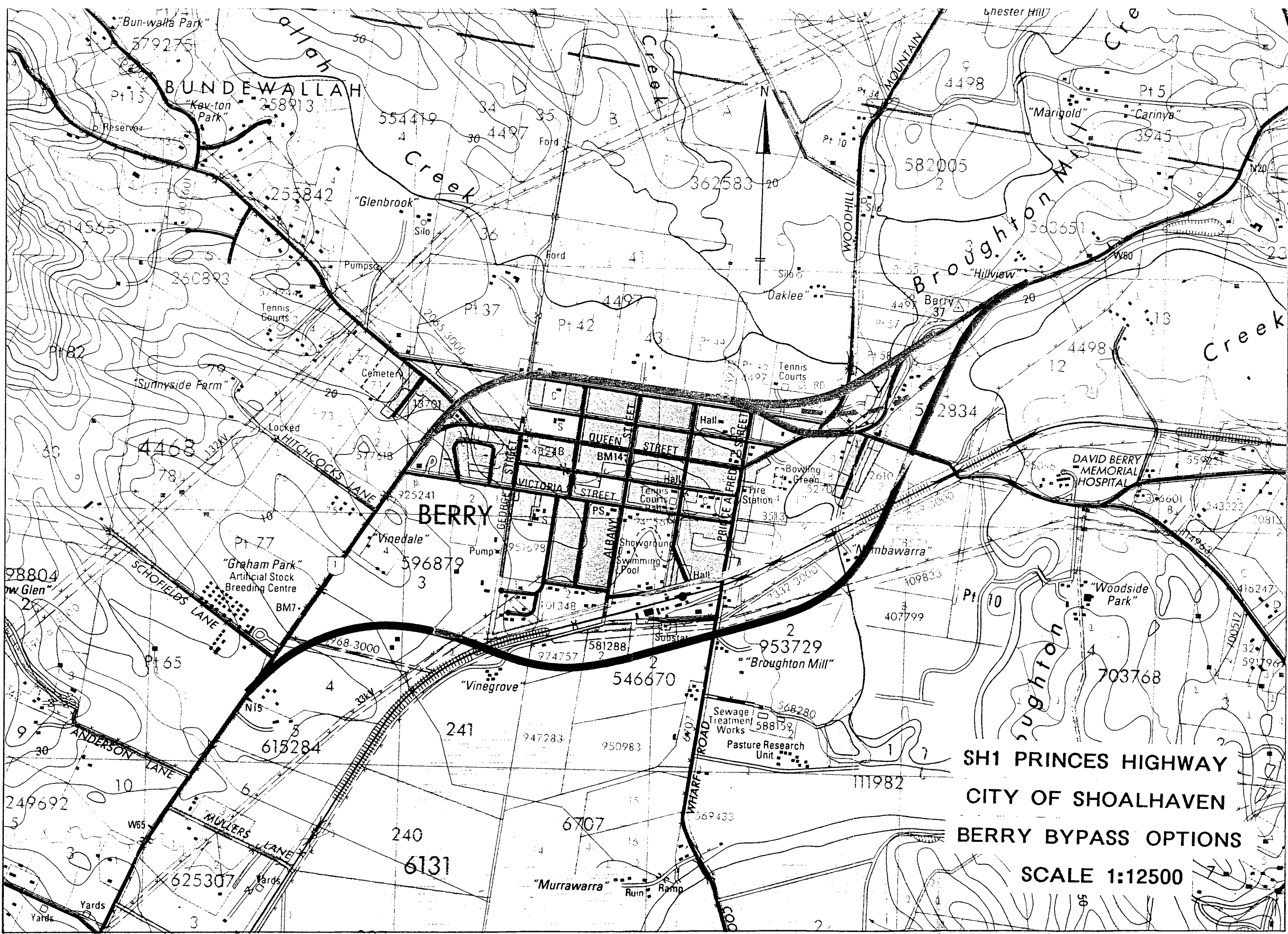
	NORTH STREET () refers to broken blue line	RAILWAY ALIGNMENT	SOUTHERN ALIGNMENT
Length kms	2.3	4	4.2
Pavement area m²	33,000	56,000	59,000
Cut m³	25,000	50,000	45,000
Fill m³	50,000 (150,000)	300,000	500,000
Bridges m²	5,000 (4,000)	1,500	2,000

SH1 - BERRY BYPASS

CONCEPT ESTIMATES

OPTION	ITEM	QUANTITY	UNIT	RATE	AMOUNT
North Street	General	5.6	lane kms	400,000	2,240,000
	Earthworks:- Cut to Fill	25,000	m3	6	150,000
	Imported fill	25,000	m3	20	500,000
	Bridges	5000	m2	1200	6,000,000
	Acquisitions: Land	4	ha	5000	20,000
	Houses	4	ea	200000	800,000
Railway Alignment	General	9	lane kms	400,000	3,600,000
	Earthworks:- Cut to fill	50,000	m3	6	300,000
	Imported fill	250,000	m3	20	5,000,000
	Bridges	1500	m2	1200	1,800,000
	Acquisitions: Land	24	ha	5000	120,000
	Houses	13	ea	200000	2,600,000
Southern Alignment	General	9.4	lane kms	400,000	3,760,000
	Earthworks:- Cut to fill	45,000	m3	6	270,000
	Imported fill	455,000	m3	20	9,100,000
	Bridges	2000	m2	1200	2,400,000
	Acquisitions: Land	25	ha	5000	125,000
					\$15,530,000

Ian Archer
Project Manager
13/3/96



SH1 PRINCES HIGHWAY
CITY OF SHOALHAVEN
BERRY BYPASS OPTIONS
SCALE 1:12500

Appendix 3. Speculative “Can We” Questions

Speculative “Can We...?” Questions

During the speculation phase of the Workshop, ideas/questions were generated by the Group in two sub-groups. Ideas/questions generated by the sub-groups were reviewed by the Value Study Group as a whole.

Given the workshop session was of limited duration, the discussion of each of the ideas was categorised by the Value Study Group for assessment as:

1. *Further evaluation of the idea now;*
2. *Action Plan - the idea should be assigned to the Action Plan and further pursued outside the workshop;*
3. *Discard idea - there is no benefit in further pursuing the idea or the idea is outside the scope of the study and rejection of the idea is concurred by the Group.*

Ideas adjudged category “1” by the Group were later categorised against the following headings for further evaluation:

- A - New Options**
- B - Improvements on Options**
- C - Local Access Improvements**
- D - Community Improvement Ideas**
- E - Staging Improvements**

The list of categorised speculative “Can We” ideas/questions for evaluation is shown below. The ideas rated “1” were evaluated during Day 2 of the workshop and either pursued as part of the preferred options, Action Plan or eventually rejected after further discussion and analysis.

VALUE MANAGEMENT SUB-GROUP QUESTION SUMMARY

No.	Question	Assessment
Can We?		
1.	Develop a series of alternative options to the north of North Street	1A
2.	Provide the Blue Route with an appropriate corridor width for noise attenuation and landscaping?	1B
3.	Delete the Yellow Route?	1D
4.	Minimise community severance associated with the Blue Route?	1D
5.	Address the problem of access to future subdivisions east and west of the highway and south of Kangaroo Valley Road? (Grade separate the highway and Victoria Street?)	1C
6.	Provide appropriate access to the sporting fields across the Blue Route? What about pedestrians?	1C
7.	Shift the cricket field?	1D
8.	Progress the project to a point where landscaping can commence?	2
9.	Reduce the costing for the Green Route?	1B
10.	The Green Route be adjusted at the southern end to remove impact on trees?	1B
11.	Identify staging options for the Green Route?	1E
12.	Emphasise visual impacts of each route as part of the evaluation?	Design Note
13.	Modify Blue route to the north?	1A
14.	Relocate railway line towards Green Route and put Yellow Route along railway?	3
15.	Upgrade “Sandtrack” to accommodate heavy vehicles?	3
16.	Go to the west of proposed subdivisions?	1A

No.	Question	Assessment
Can We?		
17.	Acquire properties on south side of North Street?	3
18.	Have one way pair of roads (eg. North Street one way and Albert Street the other way)?	3
19.	Move blue line over the Bunderwalla Creek?	1B
20.	Modify southern end of Green Route?	1B
21.	4 lane low speed option (ie. Blue or Yellow routes)?	1B
22.	Relocate part/all sporting complex?	1C
23.	Widen blue corridor to 80 metres?	1B
24.	Lower grading on Green Route (ie. reduce costs)?	1B
25.	Lower grading on Blue Route (ie. reduce noise by being in cutting)?	1B
26.	Provide midpoint access to Berry as well as north and south accesses?	1C
27.	Provide at-grade intersections (roundabout)?	1C
28.	Full interchange at each end?	1C
29.	Create interim truck route and identify long-term bypass?	3
30.	Build dual carriageways initially?	1B
31.	Incorporate proposed development access into Blue Route?	1C
32.	Build dual carriageways with interim at-grade intersections?	1E
33.	Ask Council to restrict development west of SH1 until road infrastructure is provided?	2
34.	Restrict truck speeds along Queen Street?	2
35.	Restrict truck speeds on bypass (ie. reduce noise)?	3
36.	Develop vibration absorbing pavements?	2
37.	Calm traffic in Queen Street until bypass is built?	2

Appendix 4. Sub-Group Option Development Presentation Material

SOUTHERN OPTION SUB GROUP

MODIFIED GREEN ROUTE

- LOWER GRADES
- AVOID TREES
- GRADE SEPERATE NORTHERN END

COST

\$13m (\$12m if NORTH ST RESERVE SOLD)
FILL - 30% , EXTRA BRIDGE
HIGHER LAND COST

TRAVEL TIME

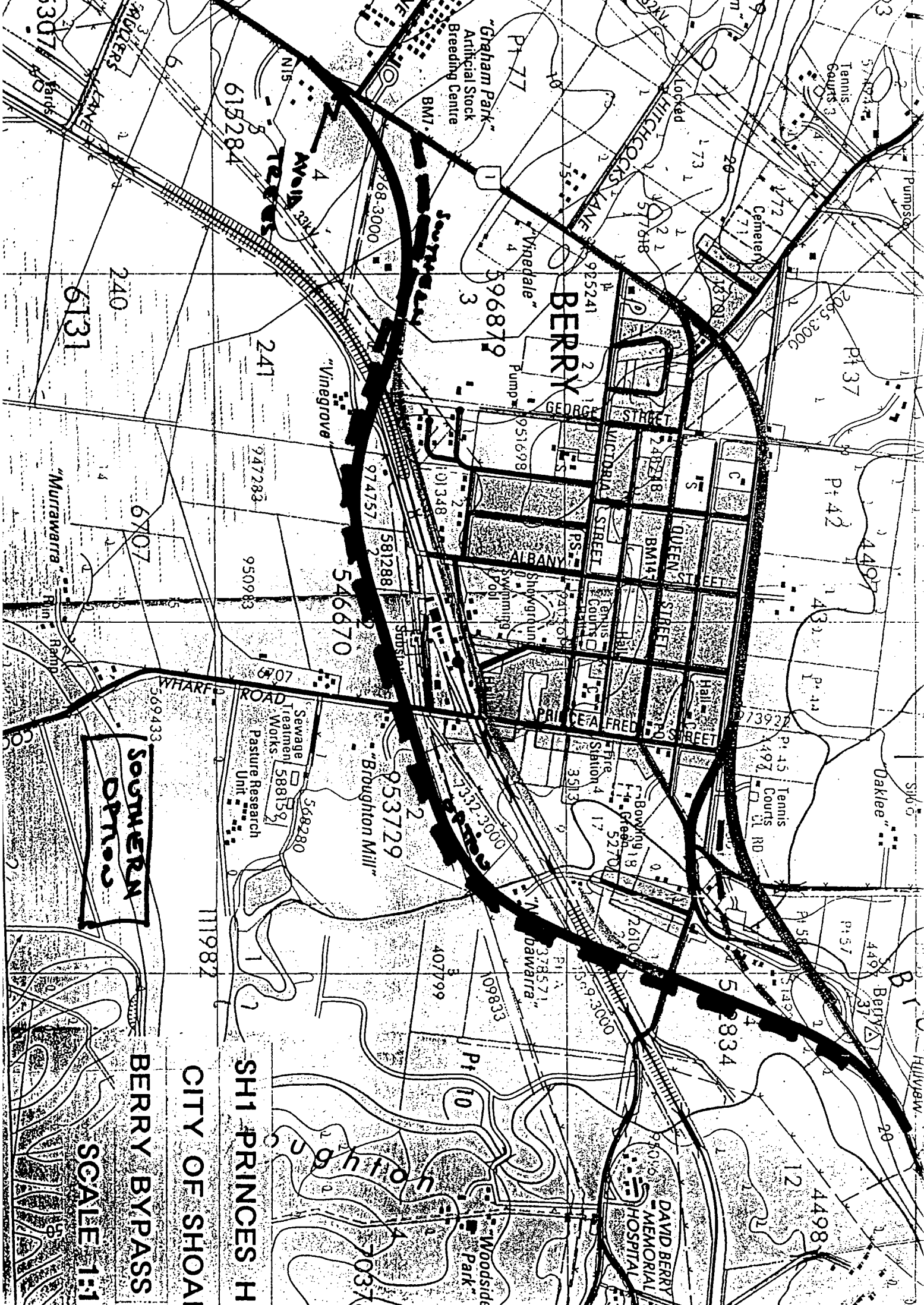
2.52 mins

OTHER

1. NONE , COULD BE FOR ACCESS WITH COST SAVINGS
2. NOT INSURMOUNTABLE
3. NO EFFECT
4. LOW NOISE, LOW IMPACT ON K.V. ROAD
5. HIGH IMPACT
6. ~~LOW~~ NONE
7. NEED IMPROVED ACCESS NORTHERN END
8. GOOD
9. LOW
10. SIGNIFICANT , CHANGE OF LAND USE POSSIBLE
11. "

CONCLUSION

- WORTH PURSUING IF IMPACTS CAN BE MITIGATED,
- FITS IN WELL WITH LONG TERM PLAN FOR HIGHWAY
- LESS IMPACT ON COMMUNITY
- DOES NOT SPLIT TOWN IN TWO
- AREA MINIMUM IMPACT ON MOUNTAIN VIEWS
- NO IMPACT ON SPORTING COMPLEX



SOUTHERN DISTRICTS

BERRY BYPASS
CITY OF SHOAL

SH1 PRINCES HI

SCALE 1:1

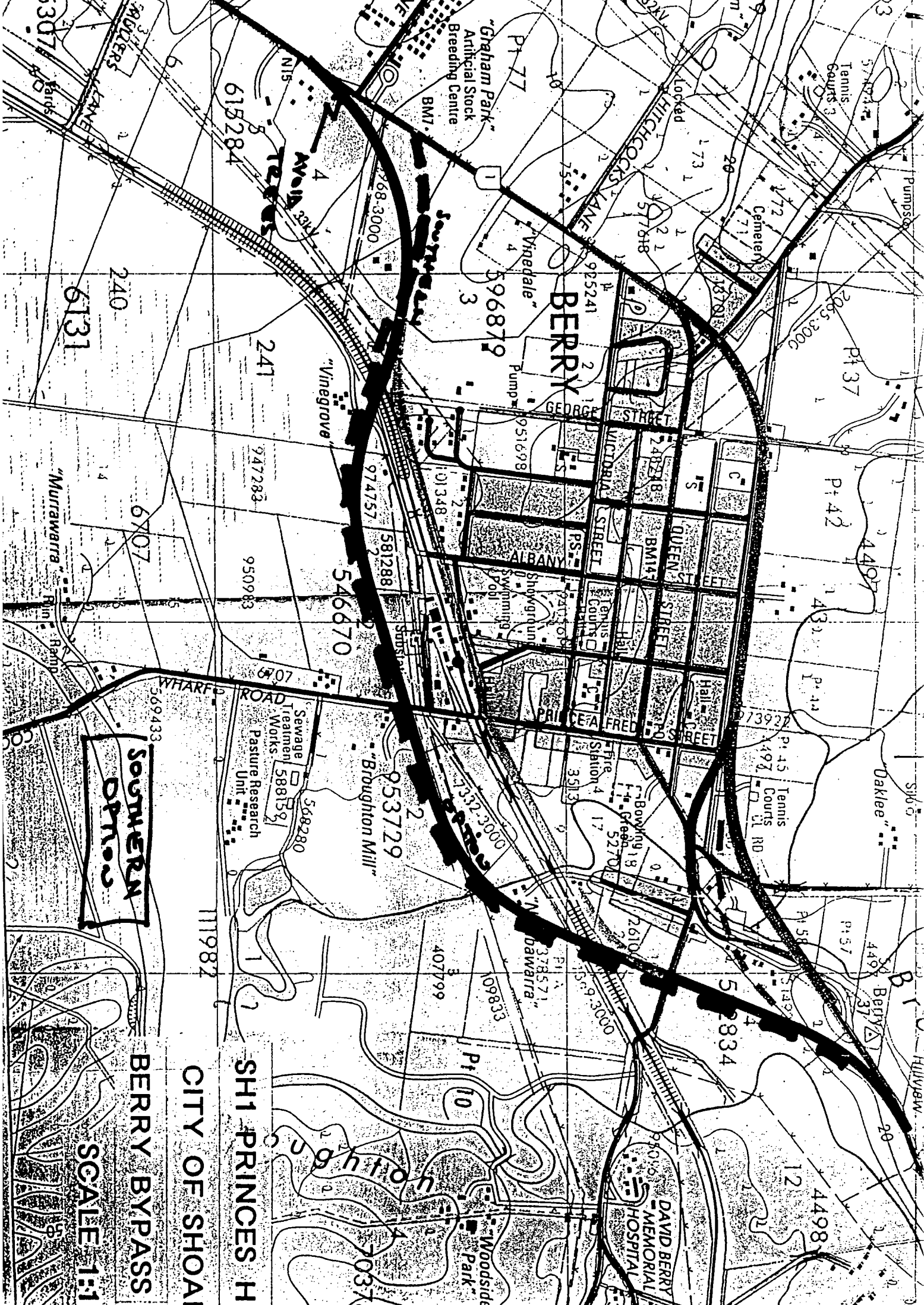
"Graham Park"
Artificial Stock
Breeding Centre

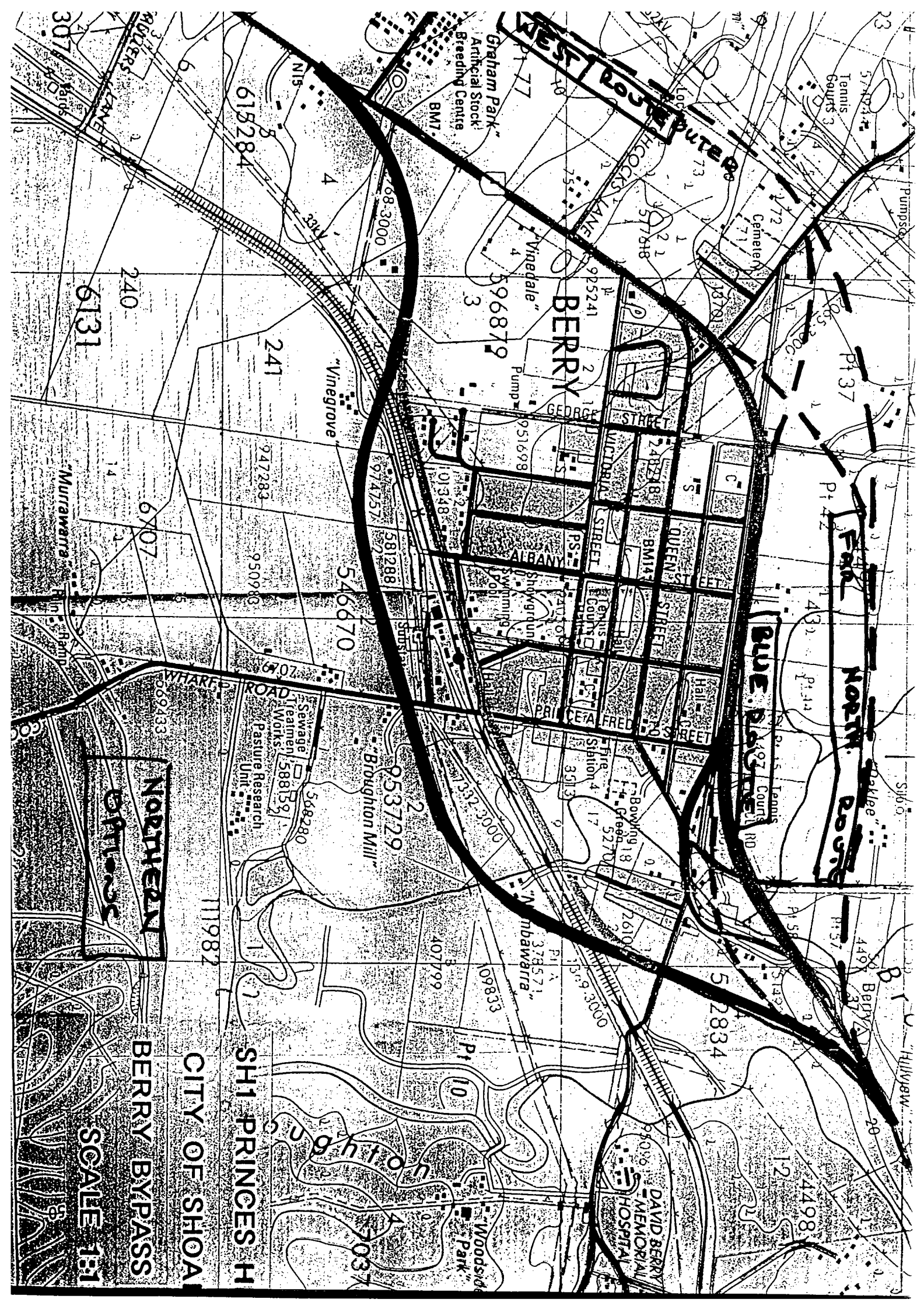
BERRY

**DAVID BERRY
MEMORIAL
HOSPITAL**

"Broughton Mill"

"Woodside
Park"





6131

240

615284

241

BERRY

596879

546670

953729

52834

NORTHERN OPTICALS

CITY OF SHOALWATER

SH1 PRINCES HARBOR

BERRY BYPASS

SCALE 1:81

DAVID BERRY MEMORIAL HOSPITAL

WOODSIDE PARK

MURRAWARRA

GRAHAM PARK Artificial Stock Breeding Centre

BLUE PINES ROAD

FERN NORTH BERRY

GEORGE STREET

VICTORIA STREET

ALBANY STREET

QUEEN STREET

FRED STREET

CEA STREET

STATION STREET

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