

# APPENDIX J

## Waitarere Beach Road Curves Project

### Consideration of Alternatives

Prepared for The New Zealand Transport Agency

December 2015



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# 1. INTRODUCTION

## 1.1 Background

This report has been prepared to accompany the documentation for a Notice of Requirement (NoR) to enable the Waitarere Beach Road Curves project (the Project). The report documents earlier work on alternatives carried out in relation to the State highway system in the area, including the ongoing consideration of alternatives documented in the preliminary and detailed business case work on this part of State Highway 1 (SH1) and the continuing work of refinement as design work has proceeded.

The Resource Management Act (RMA) requires that where a requiring authority (in this case the New Zealand Transport Agency (the Transport Agency)) does not have a sufficient interest in the land to undertake the project or work, or where it is likely that adverse effects on the environment may be significant, “adequate consideration” must have been given to alternative sites, routes or methods (section 171(1)(b)). This does not necessarily mean that the requiring authority must choose the “best” alternative under any evaluation scheme: rather it must be able to demonstrate that it has identified and considered a range of possible alternatives.

The author of the report has been involved in all the investigations and decisions which are described or explained in the report. Others involved at various stages have been MWH Project engineers including transport analysts and safety experts, and the Project’s landscape and visual experts, its ecologists, geotechnical, archaeological and cultural advisers. In addition, consultation with a range of people – from Horowhenua District Council officers, to local residents and road users, local Iwi representatives, and agencies such as Heritage NZ, the Department of Conservation and Horizons - has provided information and contributed to the decisions made at various stages of the development of the Project.

## 1.2 The Context of the Waitarere Beach Road Curves Project

The Project is part of the Ōtaki to North of Levin Road of National Significance projects (RoNS). This is the northernmost of eight Transport Agency project sections which make up the Wellington Northern Corridor RoNS. The Wellington Northern Corridor RoNS is focused on SH1.

When work began on the Ōtaki to North of Levin RoNS project in 2011, it was envisaged that there would be a largely new road built to full expressway standard (i.e. a four-lane highway meeting defined geometric standards) between the Peka Peka to Ōtaki RoNS section and the vicinity of the Manawatu River.

Work on the Ōtaki to North of Levin RoNS project commenced on future route investigations on the basis of the now-established ACRE process. This process was developed for significant linear infrastructure, to suit New Zealand conditions<sup>1</sup> and involves the investigation and gradual narrowing down of suitable routes within an area of receiving environment through the following (generalised) stages:

**Area** – determine the boundaries within which the infrastructure could be located and investigate constraints.

**Corridor** – identify broad corridors within the Area which avoid major environmental and social constraints and generally achieve the project objectives, within which the infrastructure could be located.

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<sup>1</sup> Initially by Transpower NZ, but subsequently used by many other infrastructure providers. It also reflects best international practice for route identification.

**Route** – select potential routes within the corridors on the basis of more detailed investigations and community consultation inputs. Analyse routes (including through iterative processes) to narrow down preferences and determine the preferred option or options.

**Easement** – refine the preferred option or options through consultation with affected parties to determine the specific areas to be protected for the project or work through a designation process.

For the wider Ōtaki to North of Levin RoNS project, the process proceeded for the area as a whole through the Area stage to the Corridor stage<sup>2</sup>. At this stage, any future potential routes to the west of Levin were ruled out on environmental (including social and cultural) grounds. This particular RoNS project, unlike the Wellington Northern Corridor RoNS project further south, had the added complexity of State Highway 57, which diverted a substantial proportion of SH1 traffic to the east.

Parallel investigations into transport needs and potential benefits of an expressway, and an economic evaluation, determined that the provision of the RoNS through the Ōtaki to North of Levin area should be delivered progressively, initially with safety and intersection improvements on the existing alignment with some sections being two lane (with passing areas) and some four lane. It was considered that the four lane sections would be located to the south of the SH1 and SH57 intersection with a primarily two lane configuration to the north of this location.

The RoNS investigations then identified a number of areas on SH1 where there were existing problems and where improvements were required. These areas included, from south to north, Manakau township area, the area between the two railway overbridges between Manakau and Ohau townships, Ohau township area, Levin town centre, and north of Levin. In addition, the junction of SH1 and SH57 was identified as having particular problems, so an alternative route linking SH1 and SH57 was sought. A bypass route to the east of Levin was also investigated to inform the design of any proposed improvements further to the north and south, to ensure that such improvements would not compromise the future development of such a by-pass.

Subsequent work has been done on all these project areas. In some cases upgrades are under construction or have been completed (such as at Ohau and Manakau). In other cases, such as the Levin bypass, further work concluded that work/improvements are not justified at this time. Investigations continue on other project areas.

### 1.3 North of Levin Improvements

The area of SH north of Levin was found to have a number of problems, which justified a number of investigations which have continued to the lodging of the NoR for the Project. The range of issues was signaled in the Project Feasibility Report<sup>3</sup> 2013 (available on the Transport Agency's Project website).

Investigations between 2013 and 2015 have assessed how the safety and efficiency of SH1 from north of Levin to the Manawatu Bridge could be improved. These investigations included engagement with the Waitarere community and concluded with a package of improvements to the corridor comprising safety improvements at Waitarere, new north bound passing lanes to the north and south of this location, safety improvements (right turn) into Poroutawhao School, as well as

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<sup>2</sup> See reports listed in Appendix L, Volume II: *Ōtaki to North of Levin Expressway Area Analysis Report* (August 2011), *Ōtaki to North of Levin Expressway Corridor Analysis Report* (September 2011), and *Ōtaki to North of Levin Expressway Scoping Report* (July 2012).

<sup>3</sup> *Ōtaki to North of Levin, Route Improvements Project Feasibility Report* (February 2013).

route long edge barriers<sup>4</sup>.

In this context, the Waitarere Beach Road Curves area was identified as a priority for improvement.

## 1.4 Relevance of Area and Corridor Stage Work

Although the nature of the work on the Ōtaki to North of Levin RoNS has changed over the period since 2011, information collected at the Area stage has assisted with the evaluation of route options and assessment of effects of the preferred option for the Project.

Investigations at the Area stage<sup>5</sup> assembled and mapped information relevant to the wider Waitarere area under the following headings:

- Landscape and urban design quality
- Landscape absorption capability
- Landscape features
- Heritage areas
- Tangata Whenua areas of significance
- Lifelines
- Population distribution
- Geological constraints
- Natural hazards
- Flooding
- Ecological areas of significance
- Land use capability
- Special land ownership
- District and Regional Plan provisions
- Contaminated land.

This has contributed to the understanding of constraints and potential effects of roading development, including new alignments in the vicinity of the Project area.

Further investigations at the Corridor stage<sup>6</sup> confirmed the general significance of the Project area to tangata whenua, and identified that potential corridors which might pass to the west of Levin (either east or west of Lake Horowhenua) to join SH1 in the vicinity of the Waitarere Beach Road, would potentially affect many tangata whenua values (as well as other values) and should not be considered further.

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<sup>4</sup> In terms of priority the investigations concluded that the safety improvements at Waitarere are important, and that this should be undertaken at the same time as or in advance of a safety improvement (right turn) into Poroutawhao School. A new north bound passing lane to the south of Waitarere could not be implemented in advance of the safety improvement at Waitarere.

<sup>5</sup> See footnote 2.

<sup>6</sup> See footnote 2.

## 2 IDENTIFICATION AND CONSIDERATION OF ALTERNATIVE ROUTE OPTIONS

### 2.1 Constraints Mapping

The Project area for improvements at the Waitarere Beach Road curves, as part of the north of Levin investigations, was determined to extend on each side of the Waitarere Beach Road intersection as far as a practicable alternative route alignment<sup>7</sup> could be established<sup>8</sup>.

The major constraints applying in this area were identified (including from the Area maps) and mapped. Figure 2-1 gives this information. The mapped constraints mainly related to areas of cultural significance, although it was recognised that these also had historic and potential archaeological significance, and some had local landscape significance. An area of wetland at the southern end was also identified from the Area maps.

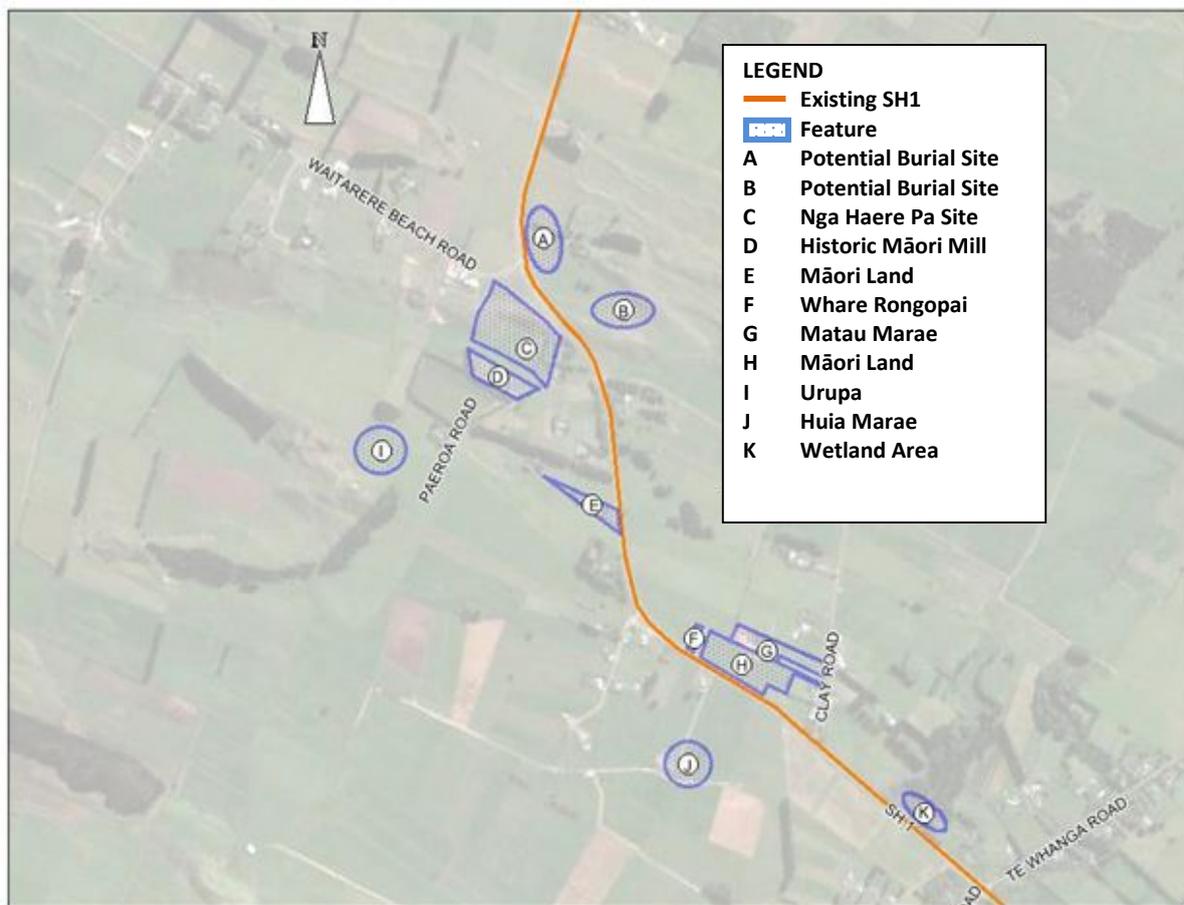


Figure 2-1 Preliminary Constraints Map

<sup>7</sup> I.e. one that would not be significantly longer or more complex than the current SH1.

<sup>8</sup> The Project area was later extended to include improvements at Poroutawhao School. Alternative layouts were considered here as a separate exercise relatively late in the design development stage of the overall Project.

## 2.2 Route Options and Analysis

To commence consideration of options, a range of possible routes was developed that allowed the objectives for the North of Levin section of the Otaki to North of Levin in RoNS to be met. For reasons of safety and efficiency, a key aspect of identifying route options for further analysis was the need to be able to develop an alignment that met the relevant geometric standards relating to road curves. The options identified also took into account the known constraints, as shown on Figure 2-1. Figure 2.2 shows the options which were developed from a long list for further detailed consideration, and a brief description of each is provided below.

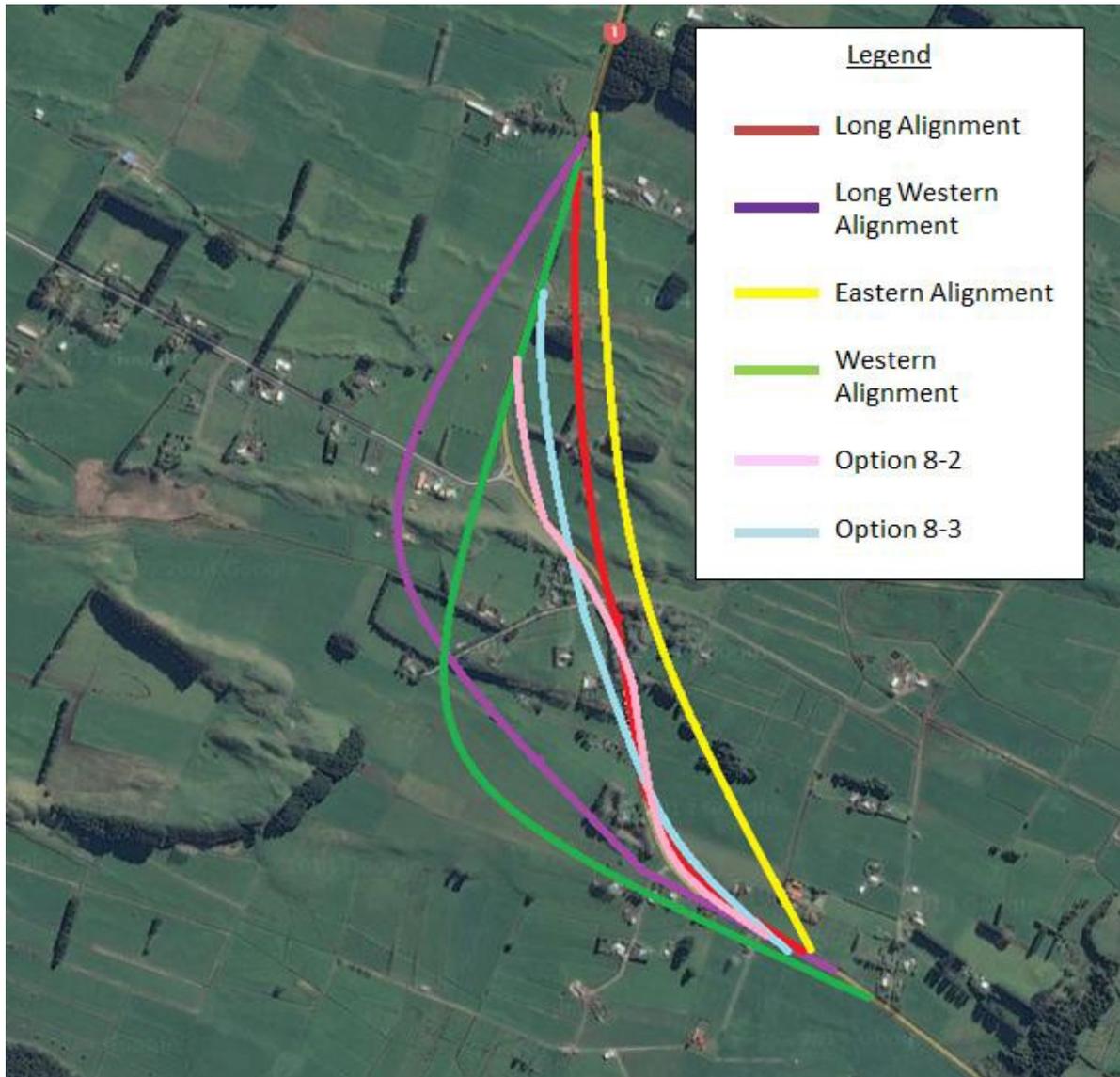


Figure 2-2 Preliminary Route Options

### 2.2.1 Options for Analysis

#### Western Alignment Option

A western alignment was identified. The option involved extending the existing straight section from Clay Road further west before making the right hand bend and joining back to the existing SH1 just north of Waitarere Beach Road. This would move the road away from the majority of the

dwellings that front the highway through this section.

### **Eastern Alignment Option**

An eastern alignment was identified. This option involved deviating right from the highway to the north of Clay Road, traversing through the sand hills and connecting back to SH1 approximately 900m north of Waitarere Beach Road. This option was retained for evaluation as it would provide the shortest route through the Project extent, thereby providing the best outcome in terms of travel time efficiency.

### **Long Alignment**

This option was identified on the basis of reducing the southern curve north of Clay Road and continuing straight ahead, bypassing the curves at Paeroa Road and Waitarere Beach Road to connect back into the highway approximately 800m north of Waitarere Beach Road. This option had similarities to the eastern alignment, but was located further west.

### **Long Western Alignment**

A longer western alignment was also identified, similar to the western alignment, but further west. This option was developed in an attempt to avoid adverse effects close to the new highway which were thought to be associated with the western alignment.

### **Option 8-2**

A shorter alignment option was also identified, which would closely track the existing highway, but would incorporate some geometric improvement to the curve radii, as well as improved consistency through the curves.

### **Option 8-3**

A new alignment in close proximity to the existing highway was identified, which incorporated two larger radii curves and a long section of straight. This option provided the potential for reduced highway length as well as a balance between a full realignment without deviating far from the existing highway.

The options were considered as broad alignments of around 100m, considerably greater in width than an eventual road reserve would need to be, and it was recognised that there would be opportunities to refine the alignment of a preferred option. It was also acknowledged that some of the effects of an option would extend well beyond the alignment itself.

## **2.2.2 Analysis**

It was decided to undertake a simple form of multi-criteria analysis (MCA) to compare these six route options. The generic methodology for MCA is set out in Appendix 1. Because the area was relatively confined and did not contain a wide range of types of potential constraints, a reduced number of criteria (compared to the earlier MCAs undertaken as the Corridor stage) were developed and applied<sup>9</sup>. These criteria were specifically tailored to the issues in the area.

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<sup>9</sup> Note that, with the exception of areas of tangata whenua value, associated heritage values, and the presence of the wetland at the southern end of the area of interest, the area did not contain any attributes which are RMA section 6 matters. As the wetland could be avoided, only cultural and archaeological values required consideration in the analysis, to address this.

The matters which formed the basis of the analysis were:

- Land severance (the extent to which existing land parcels would be affected)
- Effects on known archaeological/cultural values
- Project length (this would affect cost and also travel time)
- Earthworks (likely extent and volume as a proxy for the extent of landscape change as well as construction implications)
- Effects on dwellings (how many dwellings would need to be removed, and would the effects on the remaining dwellings be positive or adverse?)
- Road connections (would there be sufficient connectivity within the network and would all land parcels have legal connection to a road?).

These aspects were considered to be most relevant to the potential effects that would arise from changes to the highway, and included matters that would be important to local community and road users.

All options are considered to provide opportunities for substantial safety and geometric benefits (given this is the fundamental project objective) and such aspects were considered to be adequately available across all options<sup>10</sup>.

A score was applied to each criterion. The analytical system uses five scores: -2, -1, 0, +1 and +2, with the -2 score indicating poor performance in terms of the criterion, and +2 indicating the most positive performance. The scores represent the extent of an effect, or change. The 5-step scoring system involving positives and negatives is an accepted framework which allows for a 'neutral' assessment when compared with the existing situation, and an adequate range of differentiation between options. It was not intended that the scores awarded should be totaled or the different criteria weighted – rather the scores provided a basis which could inform the consideration of the merits and disadvantages of each option by the multi-disciplinary team<sup>11</sup> at this early stage of route development.

The options were assessed and scored by the project team on the basis of a review of the route centre line and affected area. Members of the project team had visited the area and were familiar with the likely issues. The assessment was aided by use of aerial photographs. The project team who undertook the analysis comprised:

- Phil Peet
- Jamie Povall
- Marten Oppenhuis
- Sylvia Allan
- Morrie Love

The Transport Agency Team, including Jo Draper and Susan Rawles, was consulted on the results of the assessment undertaken.

The findings of the evaluation are tabulated on the following page.

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<sup>10</sup> I.e. the differences in these aspects were not a basis on which the alternatives could be distinguished.

<sup>11</sup> The broad scoring system was anticipated to clearly identify one or a small number of options which performed better than others in terms of most criteria, which could then be progressed further.

	WESTERN ALIGNMENT		EASTERN ALIGNMENT		LONG ALIGNMENT		LONG WESTERN ALIGNMENT		OPTION 8-2		OPTION 8-3	
	Description	Score	Description	Score	Description	Score	Description	Score	Description	Score	Description	Score
<b>Land Severance</b>	This option severs seventeen land parcels; it is particularly adverse for some properties where it splits existing farms and may create difficulties with future use of land.	-2	This option severs eleven land parcels. Most are large and would become oddly-shaped, potentially creating future land use difficulties.	-1	This option severs 14 land parcels and would potentially affect use of land; though not as greatly as the Eastern Alignment.	-1	This option severs eighteen land parcels, the greatest number land parcels of all the options.	-2	This option would not sever any properties but would affect six land parcels to some extent.	2	This option should not result in severance of land parcels, but the deviation from the existing highway involves land from up to fourteen land parcels.	1
<b>Archaeological/Cultural</b>	This option traverses close to Nga Haere Pa site and the historic mill site with significant potential to disturb them.	-1	This option has major impacts on Matau Marae and its surrounds. It will run very close to the marae and sever the land between the marae and the highway. [Potential fatal flaw]	-2	Crosses more of the land (mainly sand dunes) likely to have burials. Also close to Whare Rongopai (a Māori church).	-1	Potentially a very large effect due to the relatively close proximity to the Urupa and associated noise and visual effects.	-2	Limited impact, due to closely following the existing highway.	1	Potentially adverse due to the location near known significant sites	-1
<b>Route Length</b>	The approximate 2668m length (in comparison to the existing 2400m) length would result in travel time and vehicle operating cost disbenefits.	-2	The approximate 2230m length is shorter than the existing highway and other options.	1	Project length of approximately 2315m is similar to three other options.	1	The length of approximately 2670m is the longest of all the options.	-2	The length of approximately 2377m is slightly shorter than the existing	1	Length of approximately 2325m which is shorter than three of the other options.	1
<b>Earthworks</b>	No issues envisaged.	0	As this option traverses through hilly terrain, the earthworks are likely to be quite significant.	-2	No issues envisaged.	0	Relatively extensive earthworks due to the extra length.	-1	No issues envisaged.	0	No issues envisaged.	0
<b>Dwellings</b>	Whilst this option is further away from most dwellings, it does have direct <sup>12</sup> effects on at least two dwellings. Increased noise and visual effects could be expected for a number of other dwellings.	-1	Overall this option moves the highway away from dwellings but will result in greater noise and visual effects on several dwellings.	-1	Directly affects three dwellings with one dwelling likely to need to be removed.	-1	Directly affects six dwellings. An additional two dwellings are considerably affected by this option through increased noise and visual effects.	-2	No increased effects expected.	2	Potential direct effects on up to four dwellings	-1
<b>Road Connections</b>	This option can provide all necessary connections.	0	Potential difficulties with the connection to Waitare Beach Road because of topography (10m difference in elevation).	-1	A new connection to Waitare Beach Road is needed, and the topography should allow this.	0	This option provides for all necessary connections.	0	This option provides for all necessary connections.	0	This option provides for all necessary connections.	0

<sup>12</sup> Direct effects are when the broad alignment encompasses a dwelling. While a refined alignment may be able to avoid it, there would still be significant adverse effects on these dwellings.

As can be seen from the analysis above, most of the options, while performing adequately in terms of the objectives<sup>13</sup> and being able to meet geometric standards, would have impacts on the local area (and local residents and landowners) that would be difficult to justify given the availability of other options with lesser effects.

The Eastern Alignment option was identified as having a potential fatal flaw as well as a number of other issues associated with it. The Western Alignment, the Long Western Alignment and the Long Alignment were also each found to have a range of issues and concerns which were sufficient to make them unlikely candidates to proceed to further investigation.

Options 8-2 and 8-3 however had few impediments, and there was the possibility that route refinement would be able to overcome or at least mitigate that two aspects of concern associated with Option 8-3 (effects on dwellings and effects on archaeological/cultural sites).

From the analysis, Options 8-2 and 8-3 were found to be the two preferred route options which could be further evaluated and, if appropriate, further developed to address the problems with the existing stretch of SH1.

## 2.3 Further Evaluations and Selection of Preferred Option

The two preferred options were then developed further and assessed in terms of the Transport Agency's standard considerations to determine if either or both could be developed as a feasible project<sup>14</sup>. The feasibility investigations included an economic assessment, a high level social, environmental and consenting assessment, preliminary consideration of geotechnical matters and land requirements, and the identification and documentation of potential maintenance issues.

This investigation concluded that Option 8-3 would deliver a higher standard of geometry than Option 8-2. Option 8-3 would generate more transport benefits but would cost more than Option 8-2. Option 8-2 would have a lesser land requirement than Option 8-3 but would also have a lower benefit to cost ratio. Option 8-3 was also found to be the better fit with the project objectives.

Part of this investigation involved some development of design for the two options, so that transport and other benefits, as well as costs and other implications, could be more clearly determined. The "recommended package" from this exercise included a reduced number of, and higher radius, curves; an improved cross section; edge safety barriers, and an improved intersection at Waitarere Beach Road.

In February 2013 the Transport Agency considered both options and noted that both options would meet objectives and achieve transport benefits, and that both would affect the Whare Rongopai and other properties. Option 8-3 was able to achieve curve easing to a higher standard, with greater costs and higher benefits, but with a greater impact on the Whare Rongopai, while Option 8-2 would have lower standard curve easing, with lesser costs, lower benefits, a slightly lower benefit to cost ratio and less impact on the Whare Rongopai.

The Transport Agency concluded that the higher standard Option 8-3 was preferred, due to its geometric and safety performance and that public feedback should be received on this before proceeding to the next stage of investigations.

Public consultation through a series of Open Days in May 2013<sup>15</sup> included information outlining the two options and seeking responses as to preferences. There was a very limited response to the

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<sup>13</sup> Although the greater length of the Western and Long Western alignments bring this somewhat into question.

<sup>14</sup> Details are provided in **Waitarere Beach Road Curves Project Feasibility Report** (February 2013)

<sup>15</sup> See <http://www.nzta.govt.nz/assets/projects/Ōtaki-to-north-of-levin/docs/poster-11.pdf>, May 2013, and Consultation Report: Consultation Stages 1-3 (August 2013) by MWH

opportunity to comment, with the broader curve (Option 8-3) being preferred in the few public comments and Horowhenua District Council indicating its acceptance of either option. On this basis, the Transport Agency's preferred option remained as Option 8-3. This was announced in the August 2013 Newsletter<sup>16</sup> with requests for any further feedback on that option. Subsequent newsletters in 2014 and 2015 reported progress on design development of the proposed works at Waitarere.

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<sup>16</sup> <http://www.nzta.govt.nz/assets/projects/Ōtaki-to-north-of-levin/docs/project-update-05.pdf>

## 3 REFINEMENT OF ALIGNMENT AND DESIGN CHANGES

### 3.1 Introduction

While the above processes have effectively addressed the Route stage of the ACRE process, further refinement of the preferred option (Option 8-3) was undertaken in the Easement stage as a result of both more detailed project investigations and consultation. These processes and major design changes are briefly described in this section.

### 3.2 Consultation

There had been public and key stakeholder consultation on the wider RoNS from mid-2011, and then on the package of Ōtaki to North of Levin RoNS projects from mid-2013, including on the priorities for the North of Levin component. Consultation with the local community and potentially affected parties began in April 2014 with group meetings hosted by local residents and individual meetings with property owners.

While this consultation was commenced on the basis of the preferred option (Option 8-3)<sup>17</sup>, the consultation commenced and continued on the basis that refinements to this were expected. Consultation was considered to be a method of eliciting further information about local values as well as obtaining more information about the biophysical aspects of the local environment (including a more detailed understanding of the local drainage system and any areas of ecological significance). It was also appropriate to gain an improved understanding of how local farmers and community activity patterns would be affected.

In particular, an ongoing process of consultation and liaison with tangata whenua through the two marae was commenced which has yielded considerable additional information. In particular, the extent of local Māori land ownership, along with the existence of two hitherto unidentified Māori roadways (Paeroa and Clay Roads), have been revealed through the consultation processes. In addition, cultural values and the significance of some areas which the Project should seek to avoid have been highlighted.

As well as discussions which have helped the Project team understand local values, and which have assisted in the more precise definition of known sites, the processes, along with parallel background research relating to archaeological risk aspects, have led to further investigation of the status of a number of land parcels.

At a relatively late stage (March 2015) a parcel of land, known to be in Māori ownership, which was to be affected along most of its length, was found to be Māori Reservation land. This had not been identified earlier due to inadequacies in the LINZ (Land Information New Zealand) database<sup>18</sup>.

Figure 3-1 (on the following page) shows the likely extent of Māori Land ownership in the area including the Māori Reservation land owned in terms of the Te Ture Whenua Māori Act (multiple ownership) and land which is General Land considered as a result of consultation processes to be traditional land owned by local Māori<sup>19</sup>. In addition, Clay Road is Māori roadway as far as the entrance to the Matau Marae, and Paeroa Road is also Māori roadway<sup>20</sup>.

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<sup>17</sup> Including indications of design and likely land requirements for the highway and associated facilities such as stormwater management.

<sup>18</sup> This land would be extremely difficult to acquire and utilise for highway purposes, and its identification resulted in an adjustment of route as described later.

<sup>19</sup> The classification of such land is not always clear. Case law is increasingly recognising such traditional ownership of effectively "private", single-owner land. Figure 3-1 may not be completely accurate.

<sup>20</sup> Although maintained by Horowhenua District Council in recent years.

There have also been preliminary discussions with potentially affected landowners as to the need for the Transport Agency to permanently acquire land, or to temporarily access land for construction purposes only.

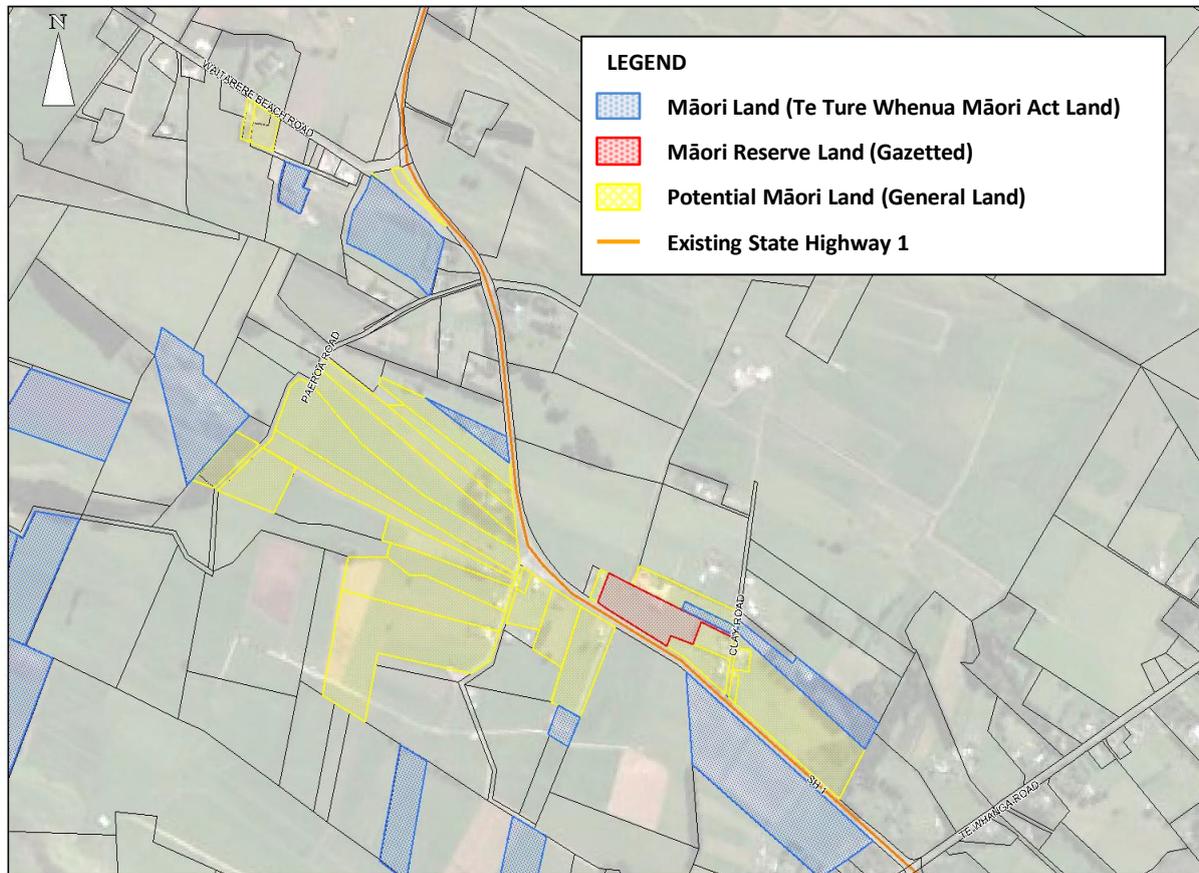


Figure 3-1 Indicative extent of Māori Land holdings in the Project Area

### 3.3 Other Investigations

During the period since the identification of the preferred route option, design development and refinement has taken into account a range of other considerations. For example, reviews undertaken as part of the safe system philosophy<sup>21</sup> which had been adopted by the Transport Agency, led to the inclusion of a central median barrier and a number of consequent additions to the design (for example, the need for a number of accesses to become left-in left-out only, and also for a mechanism by which return movements could be made at the southern extent of the barrier. The latter need was resolved by incorporation of a P-turn bay).

The Project's technical advisors also undertook more detailed investigations which have contributed to the refinement of the option. More detailed advice in the areas of geotechnical input, archaeological risk, ecological values, acoustic impact, safety, construction stage and long-term water management, and visual treatment have led to a range of modifications to the indicative design of route Option 8-3. They have also helped determine the extent of the Project preferred footprint (for example, taking into account earthworks to achieve appropriate batter slopes).

<sup>21</sup> <http://www.saferjourneys.govt.nz/about-safer-journeys/the-safe-system-approach>

Such input has been iterative<sup>22</sup> and has resulted from both individual advice and through methods such as a project mitigation workshop involving all specialist advisors. Such processes enable appropriate reconciliation of engineering design with environmental and social impacts.

### 3.4 Initial Alignment/Design Changes

These consultation and investigation processes have resulted in an ongoing design review process through which numerous modifications to the original conceptual preferred option have been made.

Significant changes to the Project were made in the period January to June 2015. These, and the reasons for them, were:

- Adjustment of the preferred alignment to avoid the Māori Reserve (see Figure 3-1). This shifted the route slightly to the south in the vicinity, with consequent reductions of impact on the Whare Rongopai but increased impact on landowners across the road.
- A decision to close the end of Paeroa Road and to provide an alternative local road for safety reasons. Retaining an intersection at Paeroa Road was found to have adverse implications in terms of safety and efficiency. An alternative local road was designed to connect to Waitarere Beach Road.
- Investigations and decisions on the preferred location of this local road to limit potential archaeological and cultural impacts, particularly relating to Nga Haere Pa site.
- Recognition of the need for a greater extent of earthworks, particularly in the area between Paeroa Road and Waitarere Beach Road. This was partly due to the presence of the proposed left turning slip road into Waitarere Beach Road and the new local road joining Paeroa Road. It was also due to advice on the likely geotechnical conditions of the dune landform.
- The addition to the Project of the right-turn bay at Poroutawhao School was brought forward in response to expressed community concerns about safety in this area.
- A change in the extent of the eastern stormwater management swale at the southern end of the Project area was made to avoid encroachment into the wetland area on private land. This is due to ecological advice and landowner concerns about the disturbance of a wetland.
- The identification of a need for noise walls in two areas to protect existing dwellings from higher levels of noise. This in part resulted from the first change above.
- Subsequently, the draft design designation boundary was modified to address and remove the need for noise barriers.

There were also numerous other minor changes and refinements – for example in access arrangements across private land, and to reduce the size of proposed temporary (construction stage) and permanent stormwater treatment and storage areas. Most have occurred as a result of landowner discussions.

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<sup>22</sup> This is because alignment or design changes in one area can have consequences elsewhere.

### 3.5 Review Process and Further Modifications

Late in the investigation and consultation process<sup>23</sup>, the Transport Agency became aware of specific and relatively widespread local concern about the median barrier. This had not been raised as an issue earlier despite extensive consultation (beyond limited concerns from affected landowners who would have to travel further)<sup>24</sup>. This issue was raised in relation to the wider North of Levin investigations and was associated with discussions about passing lanes north and south of the Project area (which are still under investigation).

A public workshop meeting was held in mid-July 2015, which involved some 50 attendees. From this it was identified that, despite the community prioritizing safety amongst all the Project objectives, a median barrier was not accepted as part of the design. As a result of this, a further review of the design was undertaken. This involved an assessment of the alignment and its performance with and without the median barrier against project objectives (in the context of the overall North of Levin programme). Given the context, which includes future passing lanes and overall roadside safety improvements, the major benefits of the Project are achieved from incorporating the median barriers. Without the barriers the Project would be difficult to justify.

This finding was advised to the community, and consultation continued with a key group of local residents and with Iwi representatives to mid-October. At this stage a further option for local connectivity was promoted by the residents (on behalf of the wider community) including the removal of the link from Paeroa Road to Waitarere Beach Road and its replacement with a link road to the south, and a new intersection in the vicinity of the bend at Hinaupiopio (some 1200m north of the Huia Marae accessway). The new intersection would result in the need for a gap in the median barrier at that point, but would enable the removal of the P-turn facility and provide a slightly extended median barrier to the south. Otherwise, the Project could remain largely unchanged.

Following consideration of some access and turning details, and a further safety review, the Transport Agency decided to adopt this option. This is the basis for the NoR. It is also acknowledged that the current design reduces the need for extensive land disturbance in the culturally-sensitive area around the Nga Haere Pa site, and addresses other cultural issues relating to access to the urupa.

It can be expected that further minor improvements will continue to be made following the NoR processes, when negotiations with affected landowners take place and as part of more detailed design. It is noted that the extent of any such changes will need to be within the extent of the designated area and the general description of environmental effects.

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<sup>23</sup> From early May 2015.

<sup>24</sup> Issues about stock movements with a single landowner had also been raised. These are already acknowledged as an issue.

## 4 CONCLUSION

This report has documented the consideration of alternatives undertaken over approximately a two-year period which has resulted in the Project description and plans in the NoR.

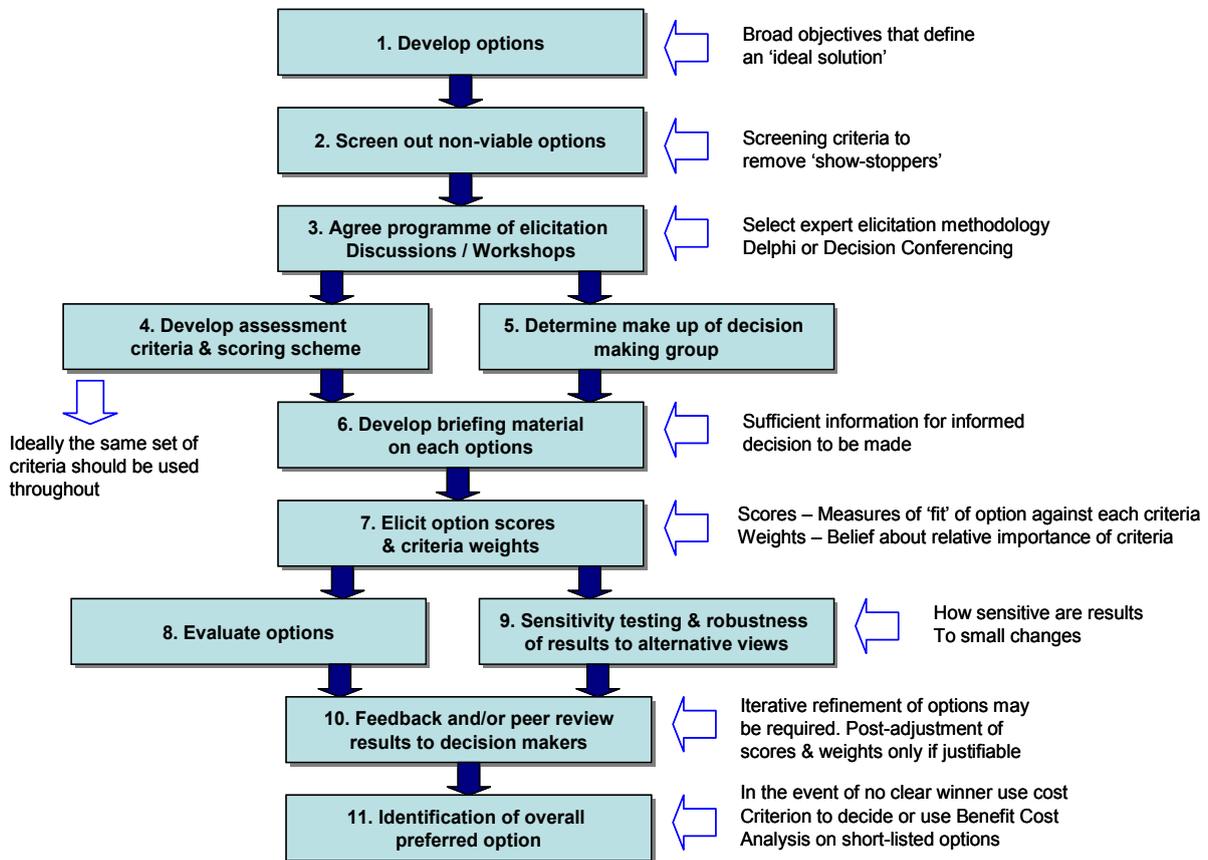
Alternatives at the Route and Easement stages of the ACRE model have been investigated, evaluated, modified and refined through good practice processes under the RMA and in line with Transport Agency guidance.

A recent review of the design, as a result of expressed community concern with median barriers, has found that they are an essential part of the Project to obtain the best safety outcome and are necessary to meet the project objectives for the North of Levin programme with the Ōtaki to North of Levin RoNS. However, further changes have been made recently which retain the barrier and provide alternative means of access and connection for the local community.

## **APPENDIX 1 – MCA METHODOLOGY**

## Multi-Criteria Analysis Method

The figure below sets out a schematic representation of the context within which multi-criteria analysis is applied, particularly in relation to significant infrastructure projects.



## Representation of MCA Process

The multi-criteria analysis methodology is a key element of analysis, and a useful aid to decision-making. Multi-criteria analysis is particularly applicable when there are several options to choose between, and where there are numerous complex considerations involved. Multi-criteria analysis is thus commonly used in assessments of options for infrastructure. It is a useful tool for evaluations, including those under the RMA and Local Government Act (LGA), to compare and assess alternative proposals or parts of projects where there are multiple objectives, and where there are a range of diverse potential adverse and beneficial effects affecting different areas and/or communities<sup>17</sup>. The range of attributes that are relevant to a decision between options can be numerous and varied, and it is necessary in such circumstances to bring together the information in a reliable and credible way.

The figure on the following page shows how multi-criteria analysis is applied. Key aspects to be taken into account in the decision are identified, defined, and scored on a consistent basis. Once scored, they can then be weighted as appropriate and combined into a single option score. In multi-

<sup>17</sup> The use of multi-criteria analysis is recommended by the NAMS (the New Zealand National Asset Managers Support organisation) and is a key element of the Optimised Decision Making Guidelines promoted by that organisation. It also finds favour (used in conjunction with CBA) in "Decision-making on Mega-projects: Cost-benefit Analysis, Planning and Innovation", Priemus, H; Flybrjerg, B and van Wee, I, Eds – 2008.

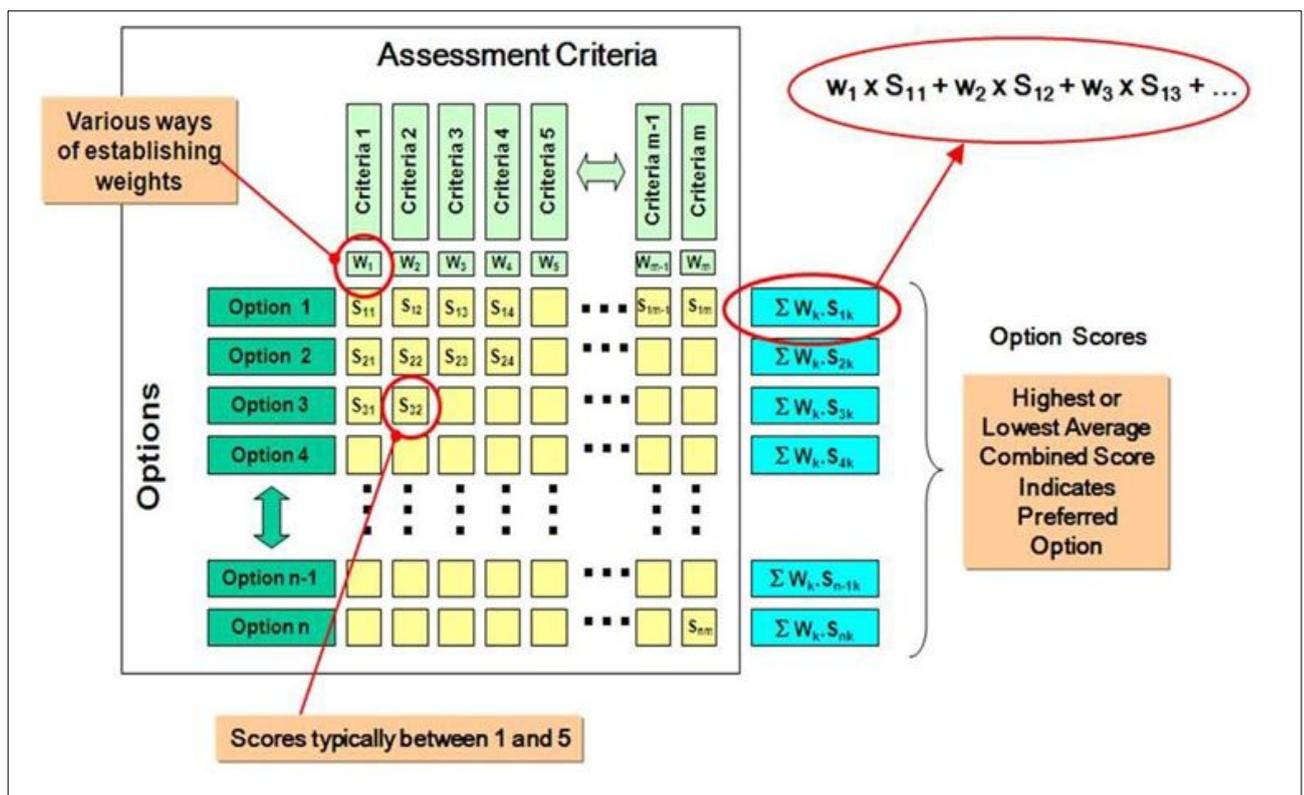
criteria analysis processes, the scores can be seen as surrogates for measures of value for an aspect (allowing for the effects of diverse criteria, with different units, to be combined). The weights represent beliefs or assumptions about what is important in a particular situation or to a particular group of decision makers.

It is possible to strengthen the analysis by applying a range of different weightings to see whether the preference changes due to weighting systems. It is also appropriate to test the sensitivity of the process by carefully reviewing the scoring and identifying the extent to which scoring would need to change to result in a difference preference.

Decisions on criteria, scoring and weighting are ideally made by a group of informed people through a process that allows for testing through discussion, questions and answers. When the criteria are diverse and areas of specialist judgment are called-for, the preferred method is through a “decision conference” or facilitated workshop session, at which a participating group of specialists and generalists share information and work through the issues, finally deciding on the score for each criterion<sup>18</sup>. Ideally consensus is reached on the scores.

The benefits of multi-criteria analysis through decision conferencing include drawing out the detail of the various assessments through discussion and questioning, and the involvement of project leaders who are particularly familiar with the project and the area, as well as examination and testing of the information through the shared scoring process.

The process used for the Project analysis employed an indicative form of scoring and did not attempt to combine scores or to weight the criteria. This was appropriate given the circumstances of the confined area and limited range of criteria that were relevant.



### Multi-criteria Analysis Scoring and Weighting

<sup>18</sup> The method is based on the demonstrated hypothesis (from international research in the early 1990s on roading projects) that groups of people, given the same information and the opportunity to test the information, will make similar decisions on preferences, regardless of their backgrounds.