

ABSTRACT – HAMILTON SOUTHERN LINKS

Hamilton Southern Links is a partnership between Hamilton City Council and the New Zealand Transport Agency to investigate and plan for the long term transportation and integrated land use infrastructure needs of the southern area of Hamilton in the Waikato.

The Southern Links project involves 32 kilometres of future transport network, including 21km of State Highway (straddling Waipa District, Hamilton City, and Waikato District) and 11km of urban arterial roads located within Hamilton City.

This was a unique and complex investigation because the evaluation requires multiple considerations of economic, environmental, social and cultural elements for each link in a very large transport network that impacts various projects and land use activities.

Through extensive consultation, collaboration and working together as a community, the investigation confirmed the preferred route network which was typically 400 metres wide including a new crossing over the Waikato River, a taonga to Maori. This was then refined to approximately 100m. Provision for providing smarter, more resilient and safer transport infrastructure is essential for future generations.

The Southern Links road network has been developed using a robust and comprehensive approach, the results of which have been publicly consulted to ensure stakeholder issues are understood and incorporated into the preferred option wherever practicable. Protecting the corridor for the preferred network is important to allow Hamilton to grow and cater for future demands.

HAMILTON SOUTHERN LINKS

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INTRODUCTION

This paper provides a summary of why planning for tomorrow’s infrastructure is crucial to meet future aspirations of prosperity for our cities. The provision of land designations enable future generations the ability to collaborate, transform and deliver future infrastructure in a much easier way. We need provision for smarter, stronger and more resilient infrastructure and above all safer transport infrastructure. Planning for tomorrow is imperative if we are to provide good quality infrastructure for the well-being of our future generations.

In October 2010, a jointly funded project between the New Zealand Transport Agency (the Transport Agency) and Hamilton City Council (HCC) was progressed to investigate, develop and confirm a preferred corridor for the Hamilton Southern Links (Southern Links) project. This collaborative approach was considered to have joint benefits that would result in a robust future network that would benefit the long term strategies and policies of Hamilton.

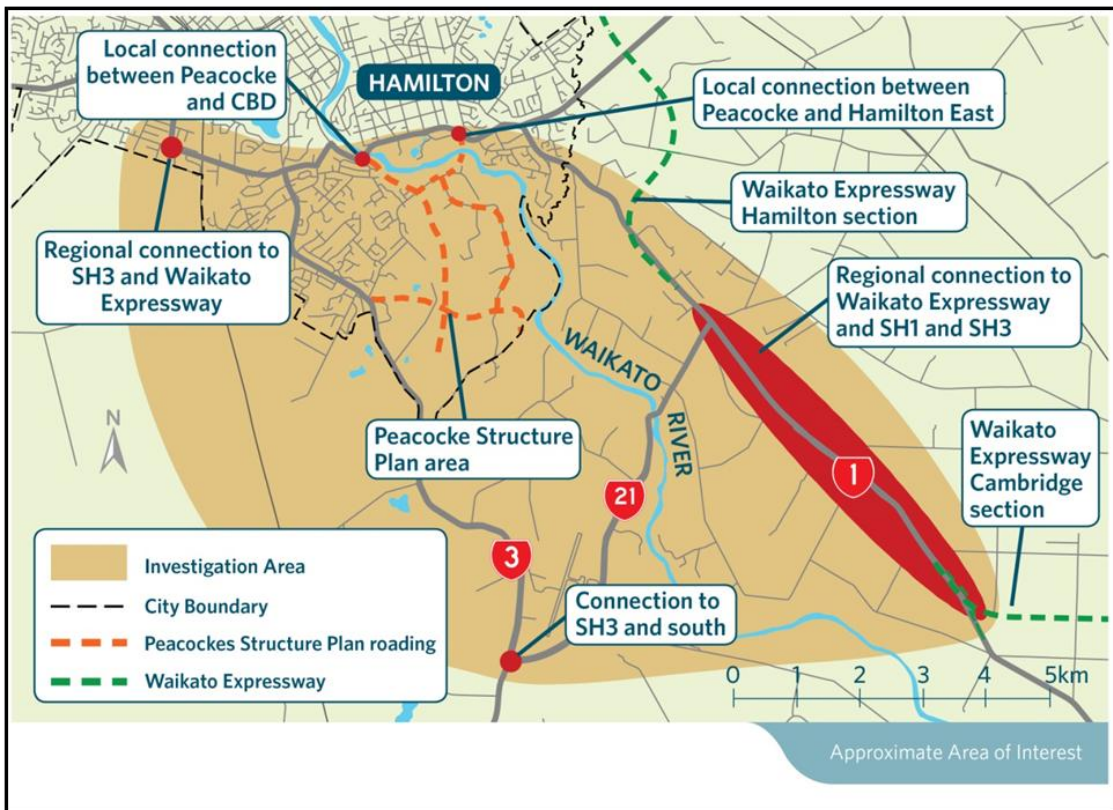


Figure 1 Southern Links Investigation Location

Hamilton Southern Links (Southern Links) is an investigation project. It has progressed to plan for the long term transportation and integrated landuse needs of the southern area of Hamilton. Particularly taking into consideration the projected growth and development within the Peacocke and Waikato Regional Airport Limited (WRAL) areas. It involves around 32 kilometres of future transport network involving both, State Highway and urban arterial roads, in and around the south of Hamilton City. The investigation area is shown in **Figure 1**. The red dots shown in the figure represent key connections to the existing transport network. As part of the study, the Agency and HCC required that Southern Links was to provide direct connections to these locations.

PROJECT OBJECTIVES

The objectives for the project derive from the issues that the Southern Links network is designed to address. Those issues are highlighted in strategic planning documents such as the Hamilton Urban Growth Strategy (HUGS), Access Hamilton 2010-2040, Waikato Regional Land Transport Strategy 2011-2041 and the Waikato Expressway Network Plan.

The **Agency's objectives** for the Southern Links project are as follows:

- Contribute to the objectives of the New Zealand Transport Strategy, the Land Transport Management Act 2003 and the Waikato Regional Land Transport Strategy;
- Contribute to the Agency, HCC, Waikato District Council, Waipa District Council and Waikato Regional Council's strategic objectives for integrated land use planning, urban growth and economic development including Future Proof;
- Contribute to and support the HCC strategies, in particular Access Hamilton and Hamilton's Urban Growth Strategy;
- Support economic development for the Hamilton and southern/south-western Waikato sub-region, including appropriate provision for accommodating utilities and services within the road corridor;
- Contribute to the objectives of the Waikato Expressway (improve journey time and reliability, ease congestion, improve transport connections for economic growth, access to markets, transport efficiency and road safety);
- Develop an appropriate road hierarchy in the sub-region;
- Improve options for public transport, walking/cycling and demand management, both within Hamilton City and Waikato and Waipa District Council areas adjoining Hamilton City;
- Improve amenity and safety through reduced conflict and crash potential along the existing SH1, SH3, SH21, existing key arterial and collector routes within Hamilton City and key local roads;
- Minimise and mitigate adverse environmental, cultural and social effects;
- Protect the long-term function of the State Highway and the key arterial or collector road networks.

HCC's objectives for the Southern Links project are as follows:

- Facilitate the achievement of HCC's strategic objectives for integrated land use planning, urban growth, infrastructure provision and economic development;
- Protect the Southern Links transport corridor to facilitate the provision of an integrated transport network which supports the future urban development of the Peacocke Structure Plan Area;
- Protect the Southern Links transport corridor in the Peacocke Structure Plan Area in light of the risk of build-out along the preferred route;
- Provide for growth needs in the south of Hamilton City through the protection of the long-term function of State Highway and key arterial, collector and local road networks;
- Provide connectivity between the Peacocke Structure Plan Area and the existing Hamilton City infrastructure network, hospital, airport and State Highway network;
- Improve the amenity and safety of key arterial, collector and local road networks in Hamilton City;
- Provide new transport routes to redistribute freight and regional trips to Hamilton on to appropriate corridors that will relieve congestion and make existing networks operate more efficiently;
- Provide opportunities for passenger transport and alternative transport modes which will not preclude the potential development of rail transport in the long term;
- Improve residential, industrial and retail environments in Hamilton City, in particular in Hillcrest, Melville and Hamilton East through the provision of an integrated transport network which will, in turn, reduce travel trips and demand on existing transport networks;
- Provide an appropriate road corridor to accommodate network utilities and services to provide for growth in the south of Hamilton City.

The Southern Links network achieves the project objectives of both the Transport Agency and HCC. Note that other Territorial agencies like Waipa District Council and Waikato Regional Council provided support to the project through the lead requiring authority agencies.

PREVIOUS INVESTIGATIONS

The origins of the current Southern Links project derive from a series of historical investigations and studies from 1962 to 2007. The concept of a ring road to the south and south-west of Hamilton has been identified for several decades. The Hamilton Arterial Roading Study (HARS) of the late 1980's considered the future State Highway and associated local authority arterial roading needs in the south west of Hamilton City.

More recent work in the period 2004-2007 identified a broad preferred network corridor, intersection and staging options for a State Highway and urban arterial network in the area. Since the last work on the Southern Links concept in 2007 there have been a number of relevant developments in the fields of strategic planning, transport planning and land development that affect the Southern Links project area.

In the context of this previous work, there were three phases of work awarded: Background Report and Scoping; Scheme Investigation and Notice of Requirement.

PROBLEM DESCRIPTION

Through analysis of traffic data, the majority of traffic approaching Hamilton from the south travels along SH1 and SH3 and has a destination within Hamilton City. Much of this traffic stops in the Central Business District (CBD) or along the western corridor. The western corridor provides access to key commercial and industrial areas including established industrial areas along Kahikatea Drive and Greenwood/Lincoln Street, the Crawford Street inland port and future industrial growth areas in Te Rapa.

The existing transport network in the south of Hamilton experiences congestion at peak times. The current route for SH1, between Kahikatea Drive and the SH26 roundabout at Hillcrest, does not adequately cater for the mix of heavy vehicles bound for the west of the city and local commuter trips because of lengthy delays. SH3 between Airport Road and Lorne Street also experiences congestion and conflict between freight and local journeys. This reduces network efficiency and creates road safety issues. These issues limit the ability of Hamilton-based industry and business to connect with domestic and export markets and have negative impacts for local, commuter and inter-regional journeys. Reliable and safe private and public transport access to Hamilton International Airport and its associated industrial/commercial land uses is also a key consideration.

The Hamilton Western Corridor is an important connection to existing and future commercial and industrial areas¹. While the northern access to the western and eastern corridors has and is being improved by the Te Rapa Bypass and the Waikato Expressway, the southern access to the western corridor is predicted by modelling to become progressively worse with sections of SH1 and SH3 experiencing very poor Levels of Service² ("LOS") by 2020. This would result in significant negative economic impacts for Hamilton through delays experienced by commercial traffic seeking access to markets.

¹ NZTA Board Paper 09/12/0307, dated 18 December 2009, endorsing Southern Links investigation funding

² Level of Service (LOS) is a measure of the efficiency and capacity of a roading network. LOS A is the best ranking, when a network is operating at near to maximum efficiency with minimal delays. LOS F is the worst ranking, when a network is operating at or exceeding its capacity with long delays.

BACKGROUND REPORT AND SCOPING PHASE

The Southern Links project involves 32 kilometres of future transport network, including 21km of State Highway (straddling Waipa District, Hamilton City, and Waikato District) and 11km of urban arterial roads located within the Peacockes area of Hamilton City.

Once completed it will link SH1 from Kahikatea Drive in Hamilton to Tamahere and the Waikato Expressway in the south, and SH3 from Hamilton International Airport to central and east Hamilton. The urban arterials will establish the key transport network within the Peacocke growth cell and become the building blocks for future urban development. See the plan of the Hamilton Southern area shown as **Figure 2** which identified several historical potential network options considered. These were developed from a series of historical investigations.

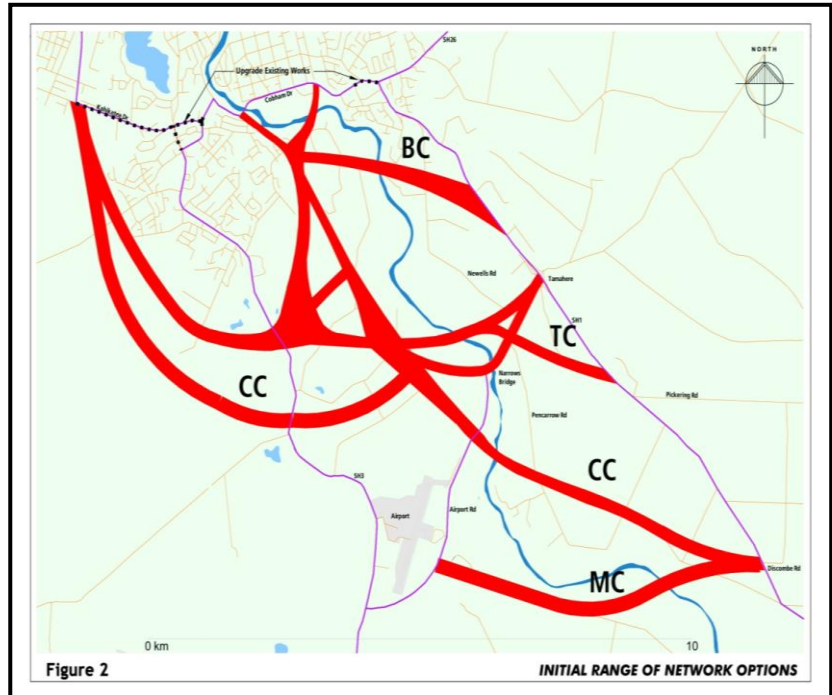
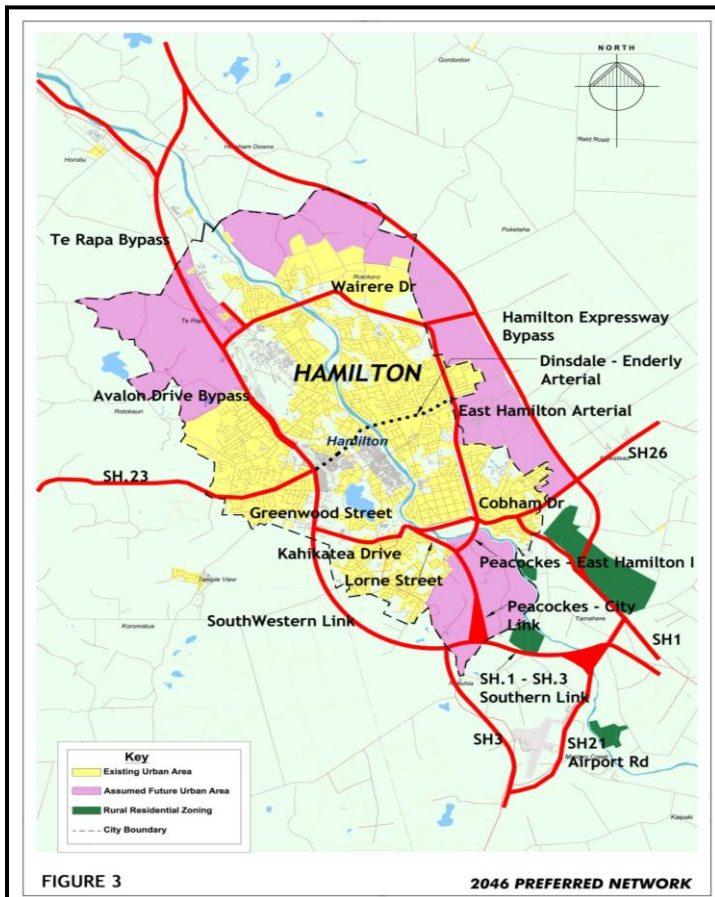


Figure 2 Southern Links Network Options



Recent work after the Hamilton Arterial Roding Study from 2004-2007, identified a broad preferred network corridor, intersection and staging options for a State Highway and urban arterial network in the area. See **An Easement** can then be identified which is suitable to allow the option to proceed but not constrain an alignment for design and construction.

The four stages of the ACRE assessment are defined in **Table 1**

showing the network corridor which has been extensively published and is well known to the public.

Further work was undertaken to confirm the suitability of that network. Phase 1 Background Report and Scoping completed in 7 February 2011 described the preliminary stages of the Southern Links Scoping Investigation, defined the project objectives and the identification and analysis of alternative options and resulting envelope that met those

objectives.

Figure 3 Southern Links (2004 Report) Preferred Network

The Scoping Phase³ used the *ACRE* (Area, Corridor, Route, Easement – route identification process to assist decision making) methodology as a basis to describe how a route and easement could be developed following the identification of potential corridors within an envelope from the Scoping phase. *ACRE* is an acronym for which are four stages of increasingly refined geographical area that are assessed in increasing detail. Key decisions are made at each stage using appropriate decision techniques, taking into account the information relevant to that stage. *ACRE* is an iterative process and some overlap between stages was experienced throughout the study to test suitability of proposed solutions.

Once an *Area* is identified for consideration, potential *Corridors* are then developed. Within these corridors, *Routes* are assessed using a Multi Criteria Assessment (MCA) which is a widely accepted process as a formal method of decision making. Decisions are guided by rating the alternative solutions, in this case the different Route options. This is achieved by assigning scores to a set of chosen criteria or attributes for each route. Criteria or aspects chosen should cover all relevant attributes of the options. In New Zealand it is considered good practice to ensure that the aspects relate to the four well-beings, namely Social, Cultural, Environmental and Economic factors that underpin the purpose of the Local Government Act 2002.

The scores for the different aspects are combined (usually as a weighted sum) in order to rank the options. The contribution that each aspect makes to the sum of scores for an option is weighted to reflect their relative importance. The best performing route options for each area are then combined, reviewed and agreed by consensus as the preferred Route network.

An *Easement* can then be identified which is suitable to allow the option to proceed but not constrain an alignment for design and construction.

The four stages of the *ACRE* assessment are defined in **Table 1**

ACRE Definitions	
Area Stage	This stage defines a feasible Area for investigation and constraints mapping.
Corridor Stage	Typically this stage identifies a number of corridors connecting two points on a map. These should avoid the constraints identified during the Area stage. Because the Southern Links investigation is aimed at developing a road network, this stage identified a number of potential corridors between multiple locations.
Route Stage	Typically this stage identifies a few route alignments connecting two points on a map. The scoping phase identified three potential networks connecting key locations to create an envelope for consultation. A typical width of 400 metres for the route network was selected.
Easement Stage	This involves the refinement of the preferred route, including the review of options arising from consultation to identify a designation easement (typically 100 metres wide to accommodate expressway standards). The limits of the designation width incorporate the carriageway and associated elements and may be wider for intersections, embankments or storm water treatment

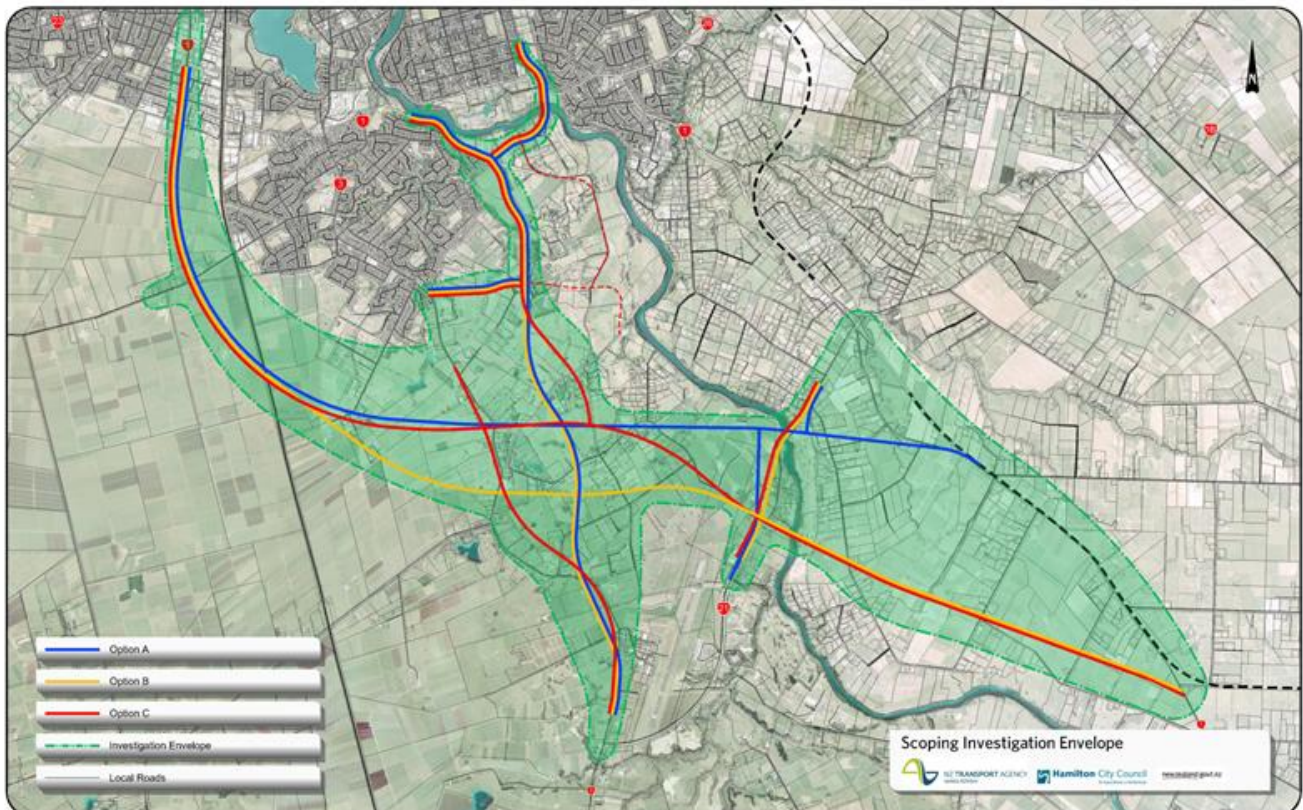
³ NZTA 2/09-019/501 Hamilton Southern Links Investigation: Scoping Report, 27/5/2011

ponds.

Table 1: ACRE Assessment

Specialists in the study team supported this approach and it was accepted by the Agency and HCC as an appropriate method to develop Southern Links. Decision making was achieved using a consensus approach throughout the ACRE process to ensure that a robust methodology had been applied to develop an optimal road network for Southern Links. Various disciplines of environment, engineering, economic and social were represented by specialists on the study team and they provided advice on technical matters to aid the ACRE process.

The envelope from the Route Stage that was developed from ACRE is shown below in **Figure 4**.

**Figure 4 Southern Links Scoping Investigation Envelope**

Through consultation, further analysis and assessment of traffic modelling, geotechnical investigation, environmental and social considerations, a preferred envelope with three potential corridor networks (Options A, B and C) was developed in which benefits and costs could be further assessed. This envelope was taken forward to consultation with many stakeholders and at Information days in April 2011, November and December 2011 and May 2012.

SCHEME PHASE

Phase 2 Scheme Assessment, identified a preferred network and consultation was undertaken to help inform the selection of that preferred network. The Scheme Phase finalised the ACRE methodology following the Easement Stage. Technical aspects to the formation of this preferred network was completed including transport modelling benefits, intersection and main line engineering treatments, geotechnical, noise, urban design, bridge forms and impacts to the environment. An assessment of environmental effects was then undertaken on this final preferred network.

A MCA was used on the Corridor, Route and Easement stages within the ACRE methodology. This included determining the categories and criteria that were developed, discussed and then

agreed for assessment by the study team including the client agent, the Agency and HCC clients. This helped to inform the study team and then identify a potential preferred network alignment within a 400 metre wide corridor. This process using the criteria outlined in **Table 2** to assess options was undertaken with a wide range of specialist input from the study team including iwi.

An example of this MCA assessment being used in full for the categories in Table is shown as **APPENDIX A** in Error! Reference source not found.. Areas were selected for consideration within the investigation envelope. These were East North, East Centre N, East Centre S, East South.

Category	Criteria
Economic Growth	Project Cost, Road User Benefits, Economic Development, Staging
Environmental	Noise, Vibration, Air Quality, Ecology, Stormwater Management, Urban Design, Landscape Visual, High Quality Soils.
Transport	Walking & Cycling, Cars – local versus long distance, Freight movements, Public Transport, Route Security, Waikato Expressway
Social	Community, Lifestyle, Amenity
Cultural	Archaeology & Heritage, Known Cultural Sites

Table 2: Categories and Criteria Considered

Once all the options being considered were scored, the study team validated the scores to ensure consistent application across the options considered. However, these slight modifications to the scores did not make a significant difference to the ranking but was enough to provide a clear differentiation between particular routes being considered.

Further transportation modelling was undertaken to determine whether the preferred network with a critical connection to the Waikato Expressway provided a level of service that met the project objectives and was technically superior to others considered. Further consideration was also required to confirm that good levels of access for the existing network would remain. The resulting preferred route network corridor approximately 400 metre wide was developed as shown in **Figure 5**.

Further work was then undertaken to confirm an alignment within that envelope that met all the relevant engineering standards and guidelines. This was based upon many considerations with constraints like access from SH3 to SH21 (and Airport Terminal), airport operations, significant trees to be avoided, length of river and gully crossings and developable land.

In addition, a key element of understanding how the final preferred route network should be developed was based on the link function and associated form of infrastructure and connectivity by the desired support of that function. The final alignment developed as a result of these considerations is shown by the green alignment in **Figure 6**.

The preferred route network then became the preferred network alignment option. A corresponding hierarchy for the preferred route network alignment was then developed and is presented in **Figure 7**.

The easement development and definition of the designation network arising from that preferred route network is shown in **Figure 8**.

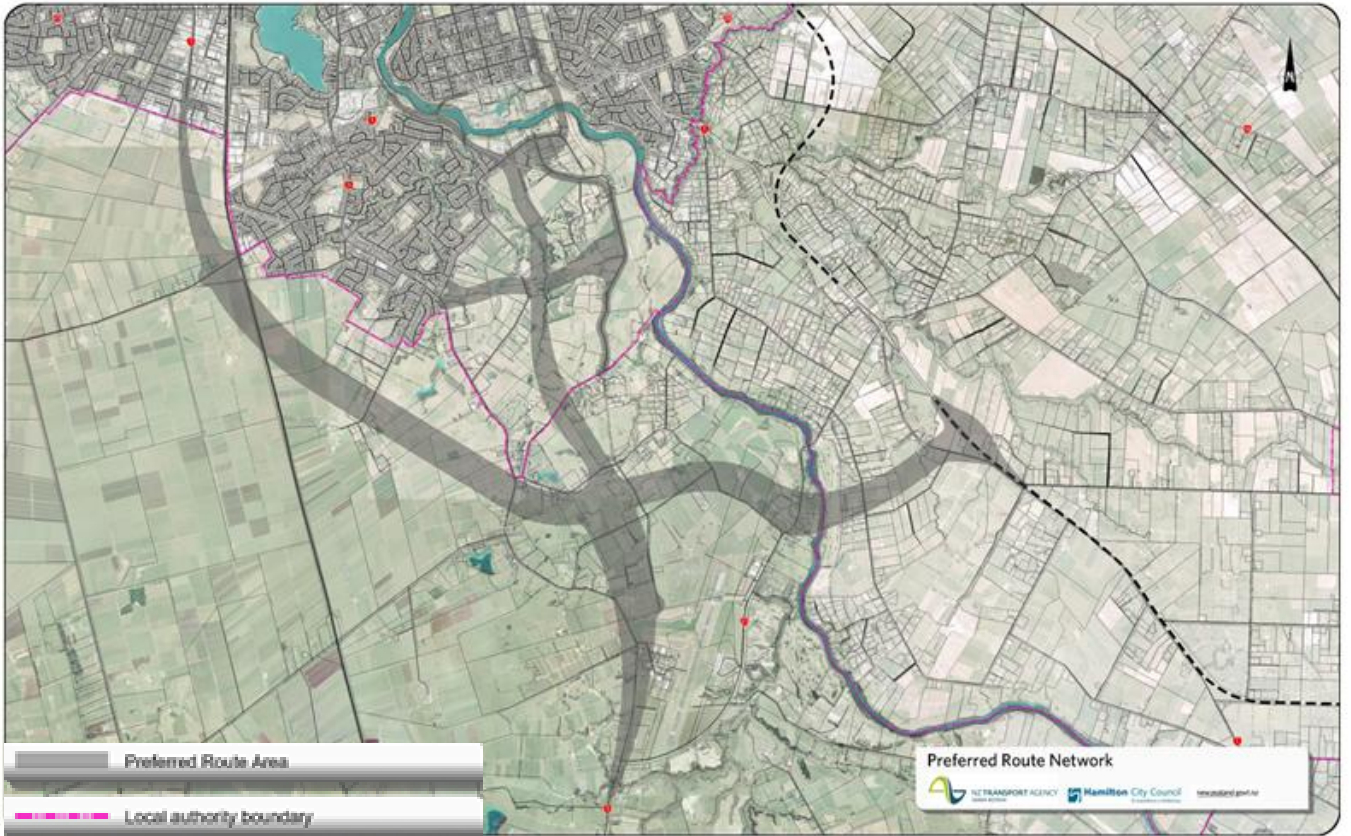


Figure 5 Southern Links Preferred Route Network

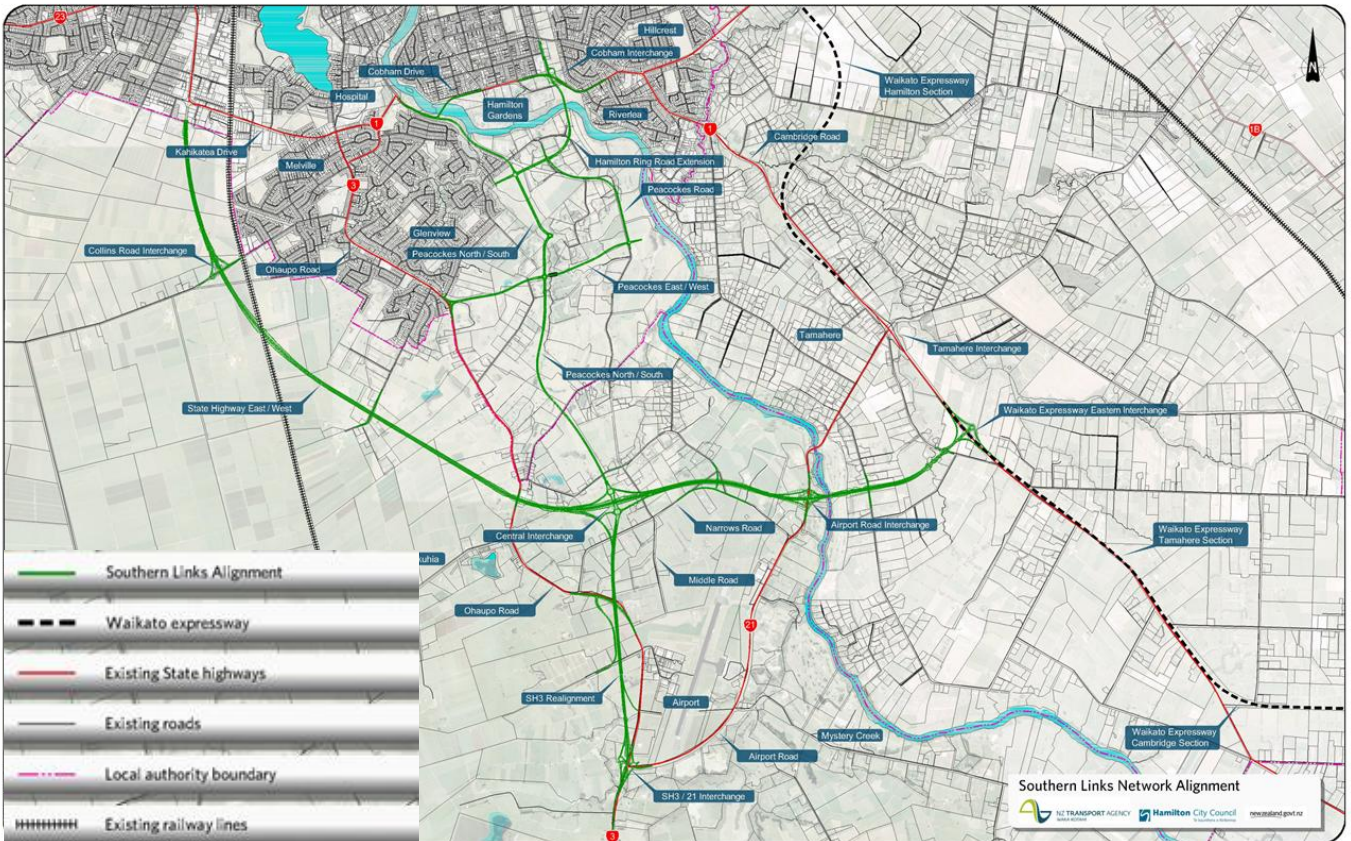


Figure 6 Southern Links Network Alignment

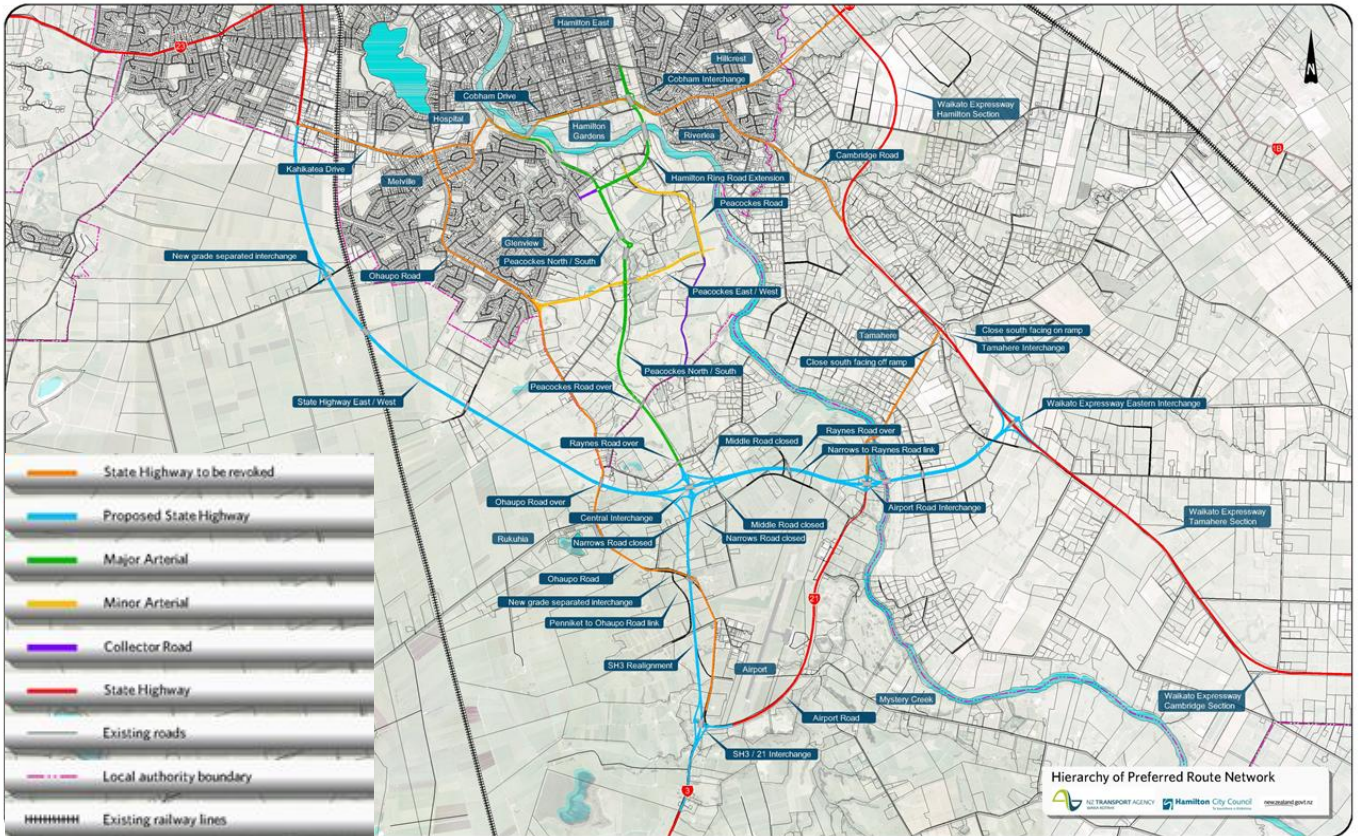


Figure 7 Hierarchy of Preferred Route Network

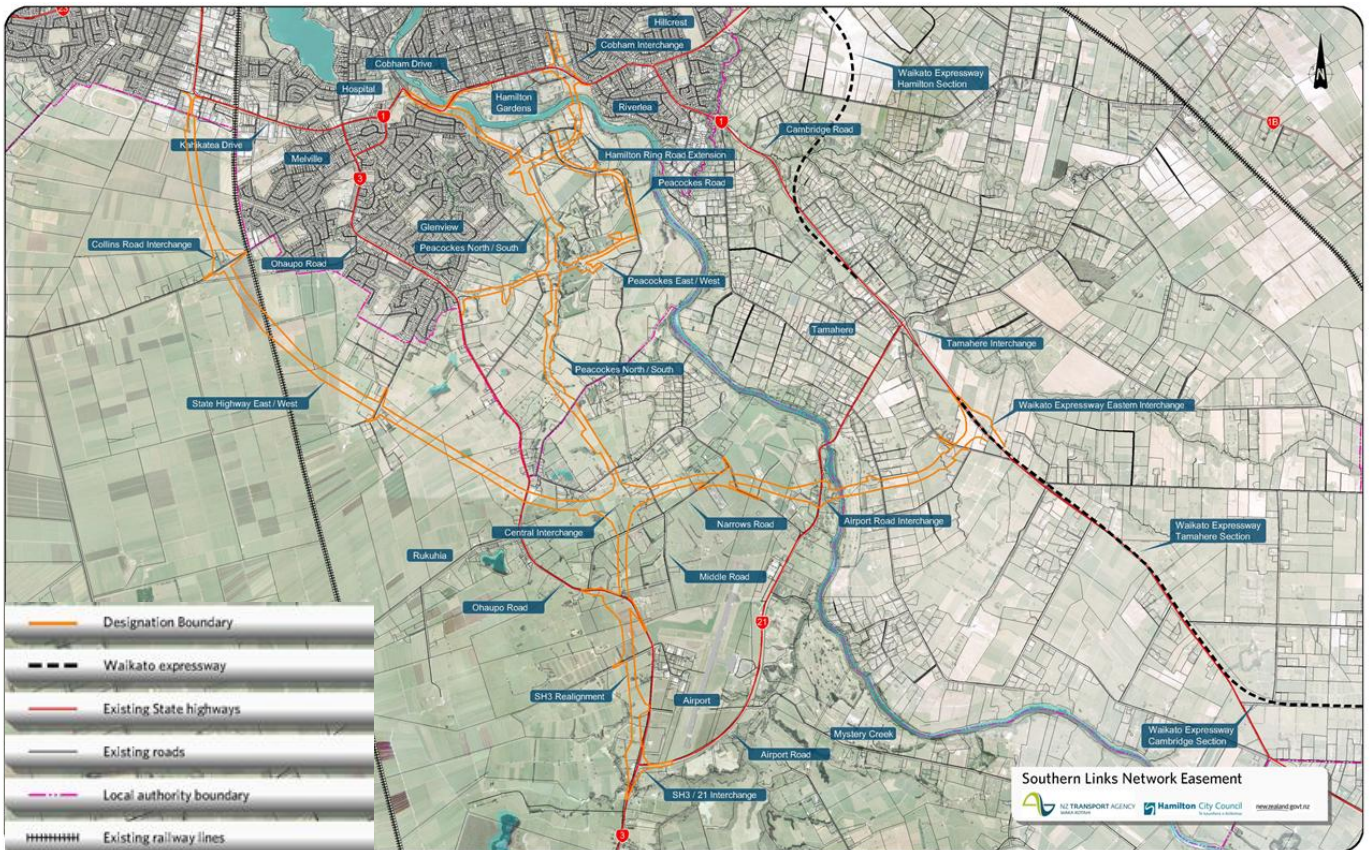


Figure 8 Southern Links Network Easement

ASSESSING THE PREFERRED OPTION

The preferred network alignment now known as The Preferred Option was assessed in relation to risk, environmental effects, statutory requirements, consultation, costs and economics. A strategic evaluation was also undertaken relating to relevant national and local policy and strategy and the project objectives.

The Preferred Option and Do-Minimum estimates were prepared in accordance with the Agency Cost Estimation Manual SM014. The expected estimate for the preferred option was calculated to be \$582.4M with a Benefit Cost Ratio of 2:0.

An Agency project assessment profile was developed summarising the project against strategic fit, effectiveness and efficiency of the solution, in preparation for funding approval. The Agency Assessment Profile is shown in **Table** below:

Strategic Fit	High
Effectiveness of the solution	High
Efficiency of the solution	Medium - BCR 2.0

Table 3: Assessment Profile

NOTICE OF REQUIREMENT

The Transport Agency and HCC have issued Notices of Requirement for designation of land necessary for the Hamilton Southern Links roading project in and to the south of Hamilton.

Four separate Notices of Requirement pursuant to the RMA have been issued for Hamilton City Council (one) and the New Zealand Transport Agency (three) with an alteration to the existing State Highway One (Cobham Drive). These requirements cumulatively sought to designate an integrated transportation network in and to the south of Hamilton known as "Southern Links". The general location and arrangement of the network is shown in **Figure 9**.

All designations have a "lapse" period associated with them. The lapse period is the time within which the designation must have been given effect to (i.e. the work for which the designation is held has been constructed). The standard lapse period for a designation under the RMA is 5 years, unless a longer lapse period is sought and confirmed as part of the Notice of Requirement process. In this case both Hamilton City Council and the NZ Transport Agency sought a lapse period of 20 years with a construction start within 5 years for their respective designations that comprise the overall Southern Links network.

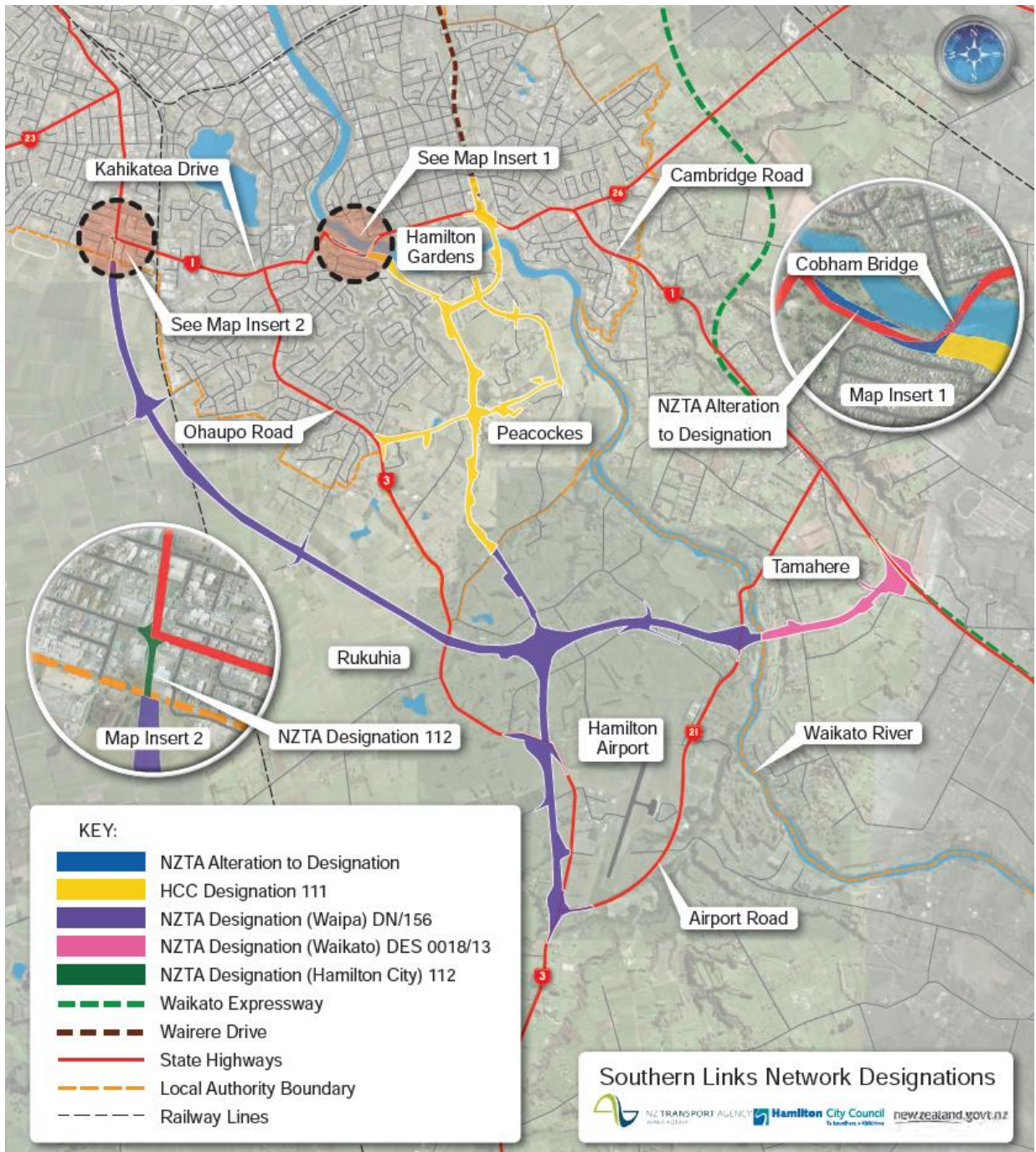


Figure 9

Southern Links Network Designations

CONCLUSIONS

Southern Links meets the project objectives and local, regional and national strategy and policy and can be viewed as a fundable project in line with the Agency requirements with a BCR of 2.0 and at a cost of \$582.4M.

The Southern Links preferred option, has been developed using a robust and comprehensive approach, the results of which have been publicly consulted to ensure stakeholder issues are understood and incorporated into the preferred option wherever practicable. Consultation has also included discussion with project teams developing other infrastructure projects. In particular, this includes the Waikato Expressway (Cambridge and Hamilton Sections).

From all major parties that have been involved in this investigation, it is clear that, given the complexities and timing of Southern Links with other projects, the best solution has been developed through collaboration with a focus to future proof that will ultimately transform the area south of Hamilton. Minimal appeals have been received to the Notice of Requirement which given the size and complexity of Southern Links, further demonstrates the level of commitment to its support in the region.

The proposed alignment for the sections proposed as HCC local road and State Highway meet the project objectives of HCC and the Agency as the respective requiring authorities. Alternative alignments and connections within the study area have been considered during the Scoping and Scheme Assessment phases. These have been tested through a robust MCA process to determine the best practical solution.

The establishment of the Southern Links network will generate a number of positive transportation and traffic effects, common to both the HCC and the Agency designations. The network has an overall positive effect in terms of environmental, cultural and social impacts while meeting client requirements for funding. The outcome of these assessments supports a Notice of Requirement for Southern Links.

Hearings have been completed and final steps are being undertaken to work through final designations for the project. Once the designation is in place, development potential can be unlocked for smarter, more resilient and safer transport infrastructure. The physical delivery of the infrastructure can then be progressed which will achieve the project objectives and that will transform the southern area of Hamilton for the benefit of future generations.

Acknowledgements

Many people have been involved in this particular project since 2010 and previously since 1962. It is a project that has been consulted on many times and the communities to the south of Hamilton have contributed to its planning over many years. It is acknowledged that this investigation would not have resulted in an excellent outcome if it were not for the great participation and collaboration of the people in those communities including iwi and those people representing the various organisations that have a vested interest in ensuring that this project provides satisfactory future proofing for future generations for Hamilton.

On behalf of the AECOM NZ Ltd and Opus International Consultants personnel who have worked on this project with the New Zealand Transport Agency, Hamilton City Council, Gray Matter Ltd and the Tangata Whenua Working Group we would like to thank everyone for their inputs, their knowledge and wisdom and technical expertise. Having only received 84 submissions to the NOR's for such a large and significant project for Hamilton is testament to an investigation that has been well communicated and consulted with stakeholders and the community.

See the Agency's website for further information on Southern Links.

<http://www.nzta.govt.nz/network/projects/project.html?ID=55>

Relevant Client Personnel:

- The New Zealand Transport Agency Project Manager – Barry Dowsett and Anuradha Fitzwalter.
- Hamilton City Council Project Manager – Tony Denton and Nathanael Savage.
- The New Zealand Transport Agency and Hamilton City Council Client Agent – Gray Matter Ltd, Alasdair Gray and Alastair Black.

APPENDIX A

Table 4: MCA Workshop No.1 Summary Outputs for East Area – Typical Table Developed for Evaluation

				EAST NORTH	EAST CENTRE N	EAST CENTRE S	EAST SOUTH		
Name:									
Rank:				3	1	1	4		
Category	Criteria	Notes for Evaluation	Score:	-2.4	-1.4	-1.4	-2.6	Comments	
Economics	Weighted Sum (20%):			0.75	0.5	0	-0.25		
	Project Cost	Structures, geotech, constructability, cut fill balance, property, drainage		Neutral / No Change	Slight negative	Slight negative	Negative effect	South most expensive due to length and land costs	
	Road user benefits	TT, VOC, Crashes. Objective #1 & 8		Slight positive	Slight positive	Positive effect	Positive effect	Further south attracts more benefits	
	Economic Development	Refer to objective #s 2, 3 & 4 including land use planning, Objective #1		Slight positive	Slight positive	Neutral / No Change	Neutral / No Change	Slightly better opportunities for access to Tamahere creating economic benefits.	
	Staging	Objective #6		Slight positive	Slight positive	Slight negative	Slight negative	Further north is close to existing routes and easier to stage construction	
Environmental Objective #1 & Objective#10	Weighted Sum (20%):			-1.6	-1.6	-1.8	-2.4		
	Noise			Negative effect	Slight negative	Slight negative	Slight negative	North option is closer to existing built up environments. All can be mitigated	
	Vibration	Rail		Neutral / No Change	Neutral / No Change	Neutral / No Change	Neutral / No Change	No difference between options	
	Air Quality	CO2 emissions, location specific and project wide		Negative effect	Slight negative	Slight negative	Slight negative	North option is closer to existing built up environments	
	Ecology	Biodiversity, aquatic, terrestrial, including river		Negative effect	Negative effect	Negative effect	Negative effect	All have similar affects	

			Name:	EAST NORTH	EAST CENTRE N	EAST CENTRE S	EAST SOUTH	
			Rank:	3	1	1	4	
	Stormwater management	Water quality, quantity control,	Neutral / No Change	Slight negative	Slight negative	Negative effect	North is on mostly existing disturbed area, South has major impact due to length	
	Urban design	Urban boundary, connectivity. Objective #s 1 & 9. Peacocke.	Negative effect	Slight negative	Slight negative	Negative effect	Central options could define urban boundary	
	Landscape visual	Visual amenity	Neutral / No Change	Slight negative	Slight negative	Negative effect	North is on mostly existing disturbed area, South has major impact due to length	
	High quality soils	Productivity, size of farms, District plan, farm viability	Neutral / No Change	Slight negative	Negative effect	Negative effect	Further south affects large productive blocks. South option almost "fatal flaw"	
Transport	Weighted Sum (20%):		0.6	1.2	1.6	2		
	Walking & Cycling	Objective #s 1 & 7	Slight positive	Slight positive	Slight positive	Slight positive	All provide similar opportunities. Acknowledge north uses existing corridors though	
	Cars - local vs long distance	Qualitative assessment	Neutral / No Change	Slight positive	Slight positive	Positive effect	Options further south provide better opportunities to separate trips	
	Freight movements	Qualitative assessment, rail links to the airport	Neutral / No Change	Slight positive	Positive effect	Positive effect	Options further south provide better opportunities direct and separate freight	

			NAME:	EAST NORTH	EAST CENTRE N	EAST CENTRE S	EAST SOUTH	
			RANK:	3	1	1	4	
	Public Transport	Objective #7	Slight positive	Slight positive	Slight positive	Slight positive	Slight positive	All provide similar opportunities. Acknowledge north uses existing corridors though
	Route Security	Objective #11, bridges not all in one place etc	Slight positive	Slight positive	Positive effect	Positive effect	Positive effect	Options with bridges not in one location better for route security
	Waikato Expressway	Objective #5, complements Expressway	Neutral / No Change	Slight positive	Slight positive	Positive effect	Positive effect	Southern option offers opportunity for free flow interchange. Using existing Tamahere interchange has limited capacity
Social Objective #10		Weighted Sum (20%):	-1.2	-0.6	-0.6	-0.6	-1.2	
	Community	Relief of congestion, include recreational	Negative effect	Slight negative	Slight negative	Negative effect	Negative effect	Slightly less negative for routes through the middle of the area due to impact to land activities.
	Lifestyle	Severance and connectivity	Negative effect	Slight negative	Slight negative	Negative effect	Negative effect	Slightly less negative for routes through the middle of the area due to impact to land activities.
	Amenity	Aesthetics, liveability	Negative effect	Slight negative	Slight negative	Negative effect	Negative effect	Slightly less negative for routes through the middle of the area due to impact to land activities.
Cultural		Weighted Sum (20%):	-0.8	-0.8	-0.6	-0.6	-0.8	

		Name:	EAST NORTH	EAST CENTRE N	EAST CENTRE S	EAST SOUTH	
		Rank:	3	1	1	4	
	Archaeology & Heritage	Redoubt	Negative effect	Negative effect	Negative effect	Negative effect	All options considered to be comparable.
	Known Cultural Sites	Pa site, objective #10	Negative effect	Negative effect	Slight negative	Negative effect	The route to the centre south impacted on a known pa site. All other routes impacted on known pa sites that had already been disturbed.

Summary:

- Group to reconvene in a week to look at the central and west sections
- Based on outcome above, Design Team to develop two indicative alignments (centre Tamahere) to assess against criteria in more detail