

Rainbow Mountain Improvements (continued)

Process issues for action

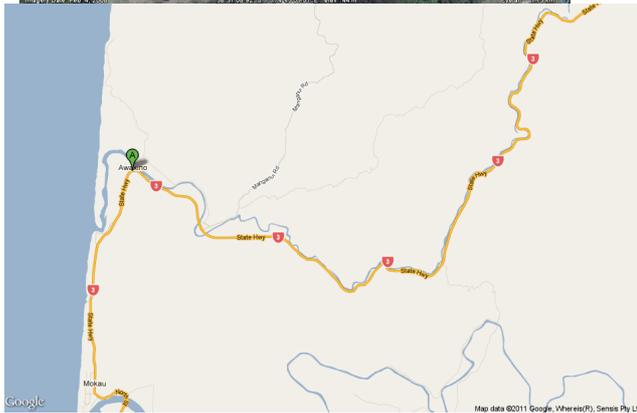
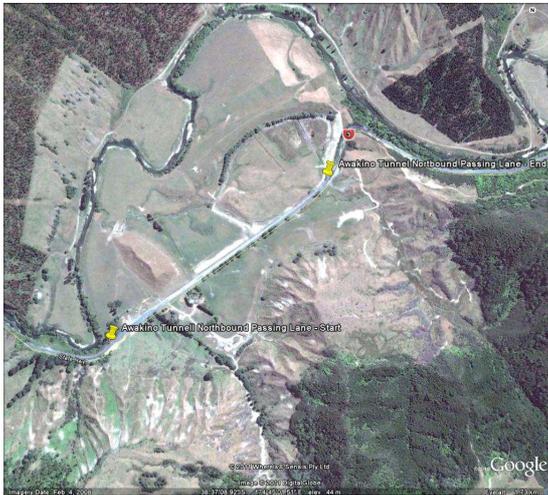
NZTA to consider whether 5 years of historical crash records is appropriate for EEM analysis. The marginal additional effort to base evaluations on 10 years of pre implementation crash records would be small.

NZTA to consider whether restricting traffic growth in economic evaluations to long term averages would be appropriate. While traffic growth at much higher than long term averages is frequently experienced in the short to medium term it is rarely if ever experienced over the full evaluation period. If higher than long term average traffic growth is allowed in evaluations should it be required to be linked to land use analysis/justification?

Awakino Tunnel Northbound Passing Lane (SH3)

NZTA Region: Waikato

Purpose: To improve safety on SH 3



Construction funding approved	November 2005
At a cost of	\$420,000
Construction completed	June 2006
At a cost of	\$781,400
Predicted benefit	\$1.682 M
Of which safety benefits were	\$1.44 M
Predicted BCR	3.5
Results (calculated 2009)	
Safety Benefits are	\$2.731 M
Total benefits	\$2.971 M
BCR	4.2

Continued over

Awakino Tunnel Northbound Passing Lane (continued)

Activity Results (actual)

The activity achieved its principal objective of reducing crash costs on this section of SH3. Achieved accident benefits are about 90% greater than predicted. Traffic volumes are a very close match to the predicted traffic volumes.

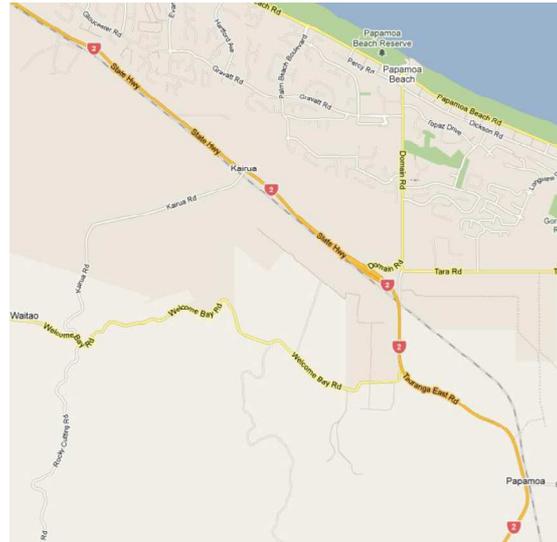
Process issues for action

Construction costs being higher than estimated costs continues to be a concern.

Domain Road Roundabout

NZTA Region: Bay of Plenty

Purpose: To construct a 60m roundabout at the intersection of Domain Road, Papamoa with SH2.



Construction funding approved	2004
At a cost of	\$4.95 M
Construction completed	2006
At a cost of	\$6.24 M
Predicted benefit	\$4.33 M
Of which accident savings were	\$3.41 M
Predicted BCR	1.2 Assuming 13 Year Life of Roundabout before construction of Tauranga Eastern Link and assuming 40% Residual Value of project for land and pavements 2.6 Assuming full 25 Years of benefits

Results (assessed 2010)

Accident savings were	\$3.34 M
Total benefits	\$4.05 M
BCR assuming 10 years of use	0.9
BCR assuming 13 years of use	1.0

Continued over

Domain Road Roundabout (continued)

Activity results (actual)

The activity achieved accident cost savings, which to date have been as predicted on a social cost of crashes basis. However the new roundabout has significant accident numbers but of a lower severity. 41 crashes have been recorded at the roundabout since opening including 2 Serious Injury Crashes and 5 Minor Injury Crashes. It would appear that users are finding it hard to negotiate the curved exit road from SH2 to Domain Road with a high number of loss of control accidents.

Actual traffic growth of 2.7% is lower than the predicted 4% traffic growth, although this is still high compared to recent national traffic growth; This lower than predicted growth has reduced Travel Time benefits.

At the time funding was approved for the roundabout it was known that if the Tauranga Eastern Link (TEL) was constructed early, as has turned out to be the case, then the benefit stream of the roundabout would be reduced. The BCR was calculated for a 13 year life and the full 25 year evaluation period at the time. Construction of the TEL started early in 2010 and as a result only 10 years of benefits will be realised giving a BCR of 0.9. If the original assumption of 13 years of use was assumed the PIR BCR would be 1.0

In the original evaluation it was assumed that if the TEL interchange went ahead then a residual value of 40% of the project value would be realised through reuse of land, earthworks and pavements. HNO's consultant advised that none of the roundabout will be reused for the new interchange. However some of land, earthworks and drainage in the existing roundabout will be of some value to the new interchange therefore a residual value of the roundabout of 205 (half the original assumption) has been assumed for the PIR BCR.

Process issues for action

NZTA to reinforce need for good record keeping.

During construction of TEL NZTA to consider temporary safety measures at the roundabout if needed to reduce ongoing loss of control accidents.

NZTA to consider whether more definitive design of future upgrades is undertaken prior to constructing interim improvements to maximise the residual value of short term improvements.

Awatere Bridge

NZTA Region: Marlborough

Purpose: Improve travel times; reduce maintenance and repair costs; reduce vehicle operating costs; improve safety; and improve network security.



Construction funding approved	July 2005
At a cost of	\$15.14M
Construction completed	October 2007
At a cost of	\$14.2 M
Predicted benefit	\$17.62 M
Of which travel time savings were	\$14.0 M
Predicted BCR	2.0
Results (assessed 2010)	
Travel Time savings were	\$13.4 M
Total benefits	\$16.85 M
BCR	1.9

Continued over

Awatere Bridge (continued)

Activity Results (actual)

The road has achieved significant time savings as the speed environment is now that of an open road with 100kph limit. Previously the significant delays on the bridge were caused by the traffic lights required on the original road/rail bridge, which was one lane only.

2.9% actual traffic growth is lower than the 3.6% predicted. Traffic growth has been flat since 2005. This has led to a pro rata reduction in travel time benefits achieved versus travel time benefit predicted. This is a common issue nationally at present and is not specific to this project or region.

The activity has achieved good accident cost savings. No accidents have been recorded to date. This is better than forecast accident costs based on national averages for this type of road. For the passing lane accident benefits as forecast have been accepted in the absence of the economic evaluations sheets.

The project was completed at a cost of \$14.2m which is below the forecast cost of \$15.14m which is a good outcome.

Summary

The project forecast tangible benefits have been achieved to overall date and the actual implementation costs are slightly below the estimate. As a result the Post Implementation Review BCR has been assessed at 1.9 which is same as the tangible BCR at the time funding was approved which is a good outcome.

Process issues for action

A summary only of the economics that supported the funding application is available. NZTA to consider whether it should be mandatory for the full economics worksheets to be posted onto LTP Online prior to funding approval.

Kaitoke to Te Marua Realignment (SH2)

(This Post Implementation Review was completed in 2010/11 but finalised in 2011/12)

NZTA Region: Wellington

Purpose: To reduce accident costs and improve travel time on SH2



Construction funding approved	July 2002
At a cost of	\$14.4 M
Construction completed	April 2006
At a cost of	\$18.4 M
Predicted benefit	\$40.4 M
Of which accident savings were	\$19.2 M
Predicted BCR	3.5
Results (calculated 2010)	
Accident savings were	\$11.9M
Total benefits	\$28.6M
BCR	2.0

Activity Results (actual)

Accident savings within the project length have been achieved, but north of the site there has been a marked increase in accident costs since the project was opened. Subsequent to this Post Implementation Review being completed, HNO investigated the causes of the crashes and they do not appear to be accident migration. It would still be useful for HNO to consider whether any low cost safety initiatives may help to mitigate crash risk in this area in future.

Continued over

Kaitoke to Te Marua Realignment (continued)

Traffic volumes are about 12% less than was predicted, which has proportionally eroded the other predicted benefits. Very high growth of HCV traffic was predicted and does not appear to have been realised.

Process issues for action

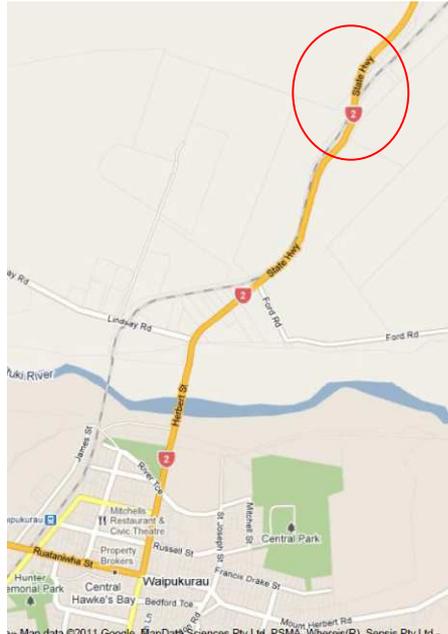
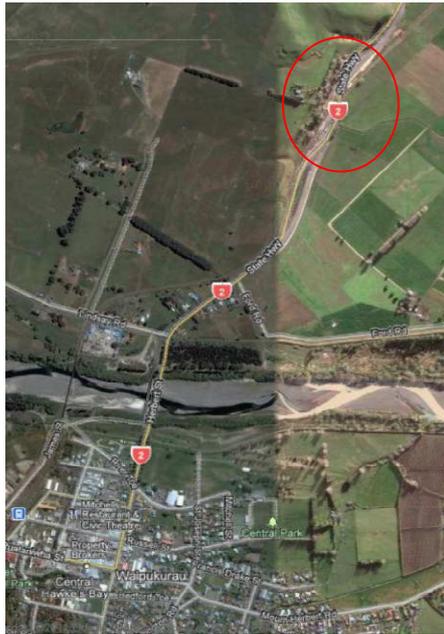
The consultant was instructed by HNO to use very high traffic (HCV) growth (10% pa for three years then 5% pa ongoing). NZTA should consider whether restricting traffic growth in economic evaluations to long term averages would be appropriate. While traffic growth at much higher than long term averages is frequently experienced in the short to medium term it is rarely if ever experienced over the full evaluation period. If higher than long term average traffic growth is allowed in evaluations, NZTA should consider requiring an explanation with a link to land use analysis/justification.

Waipukerau Overbridge Realignment

Approved Organisation: NZTA HNO Hawkes Bay Region

Description: Realignment to eliminate relatively narrow railway over bridge on a reverse curve alignment with substandard vertical geometry.

Purpose: Reduce high crash rate and improve level of service to motorists.



Construction funding approved	October 2008
At a cost of	\$6.400 M
Construction completed	March 2010
At a cost of	\$6.532 M
Predicted benefit	\$10.043 M
Of which accident savings were	\$4.577 M
Predicted BCR	2.3
Results (assessed 2010)	
Accident savings were	\$4.577 M
Total benefits	\$9.631 M
BCR	2.3 (provisional)

Continued over

Waipukerau Overbridge Realignment (continued)

Activity results (actual)

No accidents have been recorded at the site since the project was completed. However, only just over a year has elapsed since opening which is insufficient time to complete a full assessment against the EEM. A provisional assessment of 100% of safety benefits has been assessed based on no accidents since opening. Other factors affecting the actual accident benefits are the BCR was not updated at the time of the funding application and forecast traffic is lower than anticipated.

The original economics assumed that average speeds through the site after opening would improve to 90km/hour. The pre project average speed was 74km/hour. The PIR included a drive over which indicated that vehicle speeds of 100kph were not uncommon. However no post construction speed survey has been done to verify this. Travel Time benefits based on an average speed of 95kph has been assessed for the purpose of this PIR increasing Travel Time benefits by 21%. VOC benefits have been reduced to take account of the higher actual speeds

Traffic counts at the site for 2010 have yet to be published. 2009 counts indicate the traffic volumes are 11% below those forecast for 2009. Travel time and VOC benefits have been reduced in the PIR to take account of this.

The outturn construction cost is 2% higher than the original funded amount. Opus advised the increase was due to an increase in scope to cover a 135m extension to the passing lane north of the project and an additional concrete cycleway. Funding was approved by the NLTP Review Group. NZTA's project engineer advised the cycleway is part of a cycleway from Waipawa to Waipukerau. This aspect of the project was approved by NZTA Head Office.

Process issues for action

The BCR was not updated at the time of construction funding application to take account of the increased cost and changes to accident benefits since the original economics.

Long Swamp to Rangiriri Safety Improvements (continued)

Activity Results (actual)

Traffic volumes may be about 8% more than was predicted; however there is some doubt about this as there is confusion about traffic count station references.

Substantial accident cost savings are being achieved, largely to the level predicted in the SAR. Actual accident cost savings are about 11% less predicted in the SAR. Traffic volumes are about 8% higher than predicted. Adjusting the achieved accident cost savings to account for the higher than predicted traffic volume would result in the achieved accident saving being about 3% less than predicted.

The economic evaluation concluded that the improvements would reach capacity in 2013; and assumed a 10 year life. The project was commissioned in December 2005, so it may reach capacity after only 8 years of service. Benefits in years 9 and 10 may be eroded by capacity issues. Additionally traffic growth is running 8% ahead of predictions, so capacity may be reached prior to 2013. On the other hand construction of the Rangiriri Bypass Four Laning project (which effectively supersedes this wire rope barrier project) is now expected in 2015-2018, so the project may have a longer life than expected and hence produce benefits over an extended timeframe.

The community expected a four laning project - community expectations could have been managed better.

The single lane sections do not have sufficient width to allow general traffic to pass slow moving traffic (such as agricultural machinery or left turners); some additional pavement width in the single lane sections could have been considered.

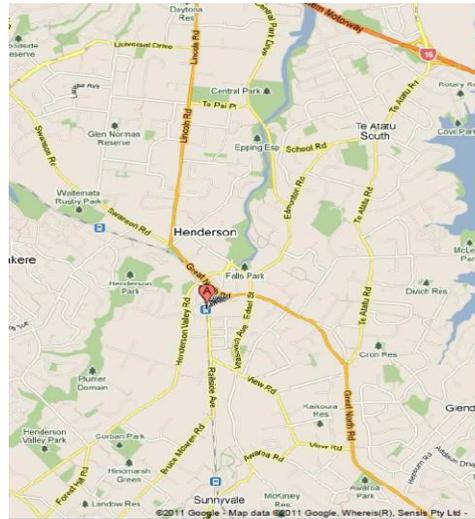
Process issues for action

None.

Henderson Transport Interchange

Approved Organisation: Waitakere City Council

Purpose: The project consists of a package of passenger transport, walking and roading initiatives to redevelop the Henderson rail station and create an interchange for pedestrians, cyclists and users of rail, bus and car. The project also provided access to the new Waitakere City Council civic centre. Only transport related works were financially assisted by NZTA. Works associated with the civic centre were funded separately by WCC including the extra width needed for the link bridge.



Construction funding approved	October 2005
At a cost of	\$8.665 M (\$4.593M LTNZ share)
Construction completed	July 2008
At a cost of	\$8.925 M
Predicted benefit	\$16.93 M
Of which PT User Benefits were	\$6.44 M
Predicted BCR	1.4
Results (assessed 2010)	
PT User Benefits	\$4.41 M
Total benefits	\$11.6 M
BCR	1.0

Continued over

Henderson Transport Interchange (continued)

Activity results (actual)

Patronage has increased substantially at the Henderson Transport Interchange (HTI) from 1,148 in 2005 to 2,418 in May 2010.

However passenger counts to assess the link bridge usage and park and ride usage have not been conducted to date making it difficult to quantify the benefits for these improvements.

Overall patronage on the Western Line has increased to about 3.3M trips per annum growing at a rate of about 15% per annum. This is less than the 4M trips per annum by 2011 used in the Western Line duplication evaluation. Passenger growth is nevertheless still growing at around 15% per annum at the present time, so the project may still be in its high growth phase.

The number of additional passengers using Henderson Transport Interchange over and above the average 15% growth on the Western Line has been estimated at 375 which is 31% less than the 547 additional passengers predicted in the original economic analysis.

This has been used as the basis for estimating overall benefits for the project which have been estimated at 31% less than forecast and the resulting estimated BCR has dropped from 1.4 to 1.0.

It is acknowledged that the HTI BCR may improve in future if the passenger growth at HTI continues to grow above the Western Line duplication average growth.

Process issues for action

NZTA to consider whether post construction patronage surveys of the station should be carried out to assist with quantification of the actual benefits arising from the project.

Ashburton Business Park (Northpark Rd/SH1 intersection upgrade)

Approved Organisation: Ashburton District Council

Description: Intersection improvements to the Northpark Road / SH1 and Works Road / SH1 intersections and widening of Northpark Road, Works Road and Company Road.

Purpose: Reduce Travel Time, Vehicle Operating Costs and Accident Costs that were anticipated to arise from additional traffic generated by development of the Ashburton Business Park.



Construction funding approved	2008/2009
At a cost of	\$1.3154 M
Construction completed	December 2008
At a cost of	\$ 0.9896 M
Predicted benefit	\$4.397 M
Of which accident savings were	\$1.4755 M
Predicted BCR	4.0
Results (assessed 2010)	
Accident savings were	-\$52.8243 M
Total benefits	-\$52.643 M
BCR	-13.4

Continued over

Ashburton Business Park (continued)

Activity results (actual)

The project's predicted benefits relied almost entirely on a very large increase in traffic volumes accessing the newly constructed Ashburton Business Park from SH1 via Northpark and Works Roads and from Ashburton via Company Road. At the time of the site visit (May 2011) none of the lots in the Ashburton Business Park had been occupied and the predicted increase in traffic volumes had not occurred. The predicted benefits have not been achieved as the predicted development on the industrial lots with its associated generated traffic has not occurred.

The economic evaluation also relied heavily on a single pre-implementation alcohol involved fatal crash on Company Road. This rationale of treating alcohol involved crashes as project related has been retained in the post implementation assessment of benefits for consistency. There has been an alcohol involved fatal crash at the SH1 / Works Road intersection in January 2012 (crash number 201020012), which has significantly impacted on the resulting BCR.

Process issues for action

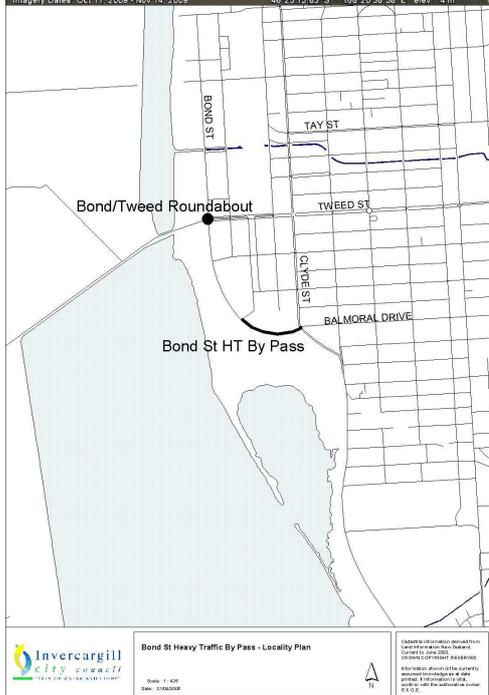
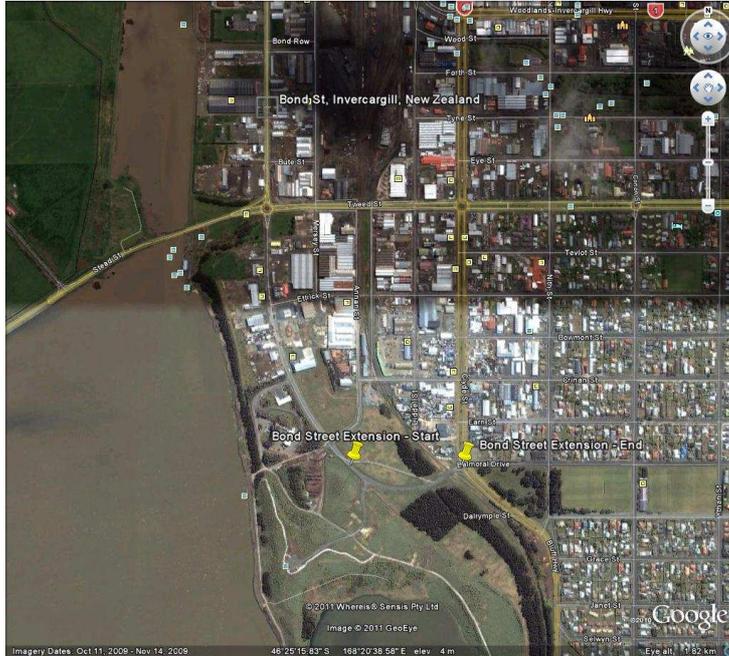
No new industrial activity was evident in the business park at the time of the site. By funding this project NZTA effectively took development risk (if the industrial subdivision development was not successful the nation would not receive the benefits that NZTA intended to purchase when agreeing to subsidise construction of this group of projects). The information made available to this PIR process does not include any recognition that NZTA were taking development risk. NZTA may wish to develop guidelines for staff use when assessing funding requests for activities that are reliant on unproven commercial developments.

Although this package of works was safety related, there was no evidence available to show that road safety audits had been completed. Road safety audits are a condition of NZTA funding and Ashburton District Council needs to ensure these are considered for all improvements in future.

Bond Street Heavy Traffic By-Pass

Approved Organisation: Invercargill City Council

Purpose: To improve journey times on SH1



Continued over

Bond Street Heavy Traffic By-Pass (continued)

Construction funding approved	July 2007
At a cost of	\$1.625 M
Construction completed	27 June 2008
At a cost of	\$1.64 M
Predicted benefit	\$9.28 M
Of which travel time savings were	\$7.45 M
Predicted BCR	5.7
Results (calculated 2009)	
Journey time savings were	\$10.42 M
Total benefits	\$18.20 M
BCR	14.2

Activity results (actual)

The activity achieved its principal objective of reducing journey times for freight vehicles. Better than predicted accident benefits have been achieved for the first 32 months since completion. Traffic volumes are about 40% higher than predicted (which increases the achieved benefits), probably due to diversion from the alternative route.

Process issues for action

None

Crown Range Road Zig Zag Upgrading

Approved Organisation: Central Queenstown Lakes District Council

Description: To generally widen seal width to 6 metres by use of gabion retaining walls on low side of road where practical. Improvements to hairpin bends to permit safer use by 12.6m buses. Erection of timber encased safety fence.

Purpose: To make significant safety improvements to the high use local and tourist traffic route through road widening.



Construction funding approved	2007/08
At a cost of	\$2.273 M
Construction completed	July 2008
At a cost of	\$2.5 M
Predicted benefit	\$5.94 M
Of which accident savings were	\$2.83 M
Predicted BCR	4.9
Results (assessed 2010)	
Accident savings were	\$2.83 M
Total benefits	\$6.686 M
BCR	3.4

Continued over

Crown Range Road Zig Zag Upgrading (continued)

Activity results (actual)

The activity achieved accident cost savings, which to date have been as predicted. Four accidents have been recorded but all were non injury. This indicates that the safety measures introduced have resulted in a reduction of severity of accidents as predicted. Very high traffic growth of 6.1% has been recorded since opening, which compares well to predicted (in the vicinity of 6% pa) although this is based on only one traffic count;

Do Minimum costs include \$819k for widening the worst sections. This should have been part of the option This would have reduced the predicted BCR of 4.9 to 2.9

No Speed Surveys have been carried out to support the increase in average speed from 55kph to 65kph. Time distance measurements at the site visit indicated that both before and after speeds were overstated but the increase in speed of 10kph appears reasonable.

Process issues for action

NZTA to consider whether post construction speed surveys should be mandatory where Travel Time Benefits are a significant proportion of total benefits.

NZTA to consider whether post construction traffic counts are mandatory on all roading projects as the actual benefits are very sensitive to actual traffic counts and actual traffic growth rates. The marginal additional cost to carry out annual counts would be small.

NZTA to consider whether Approved Organisations should be reminded of EEM Do Minimum definitions and that Do Minimums with significant improvement scope in the do Minimum will not be accepted as Do Minimum.

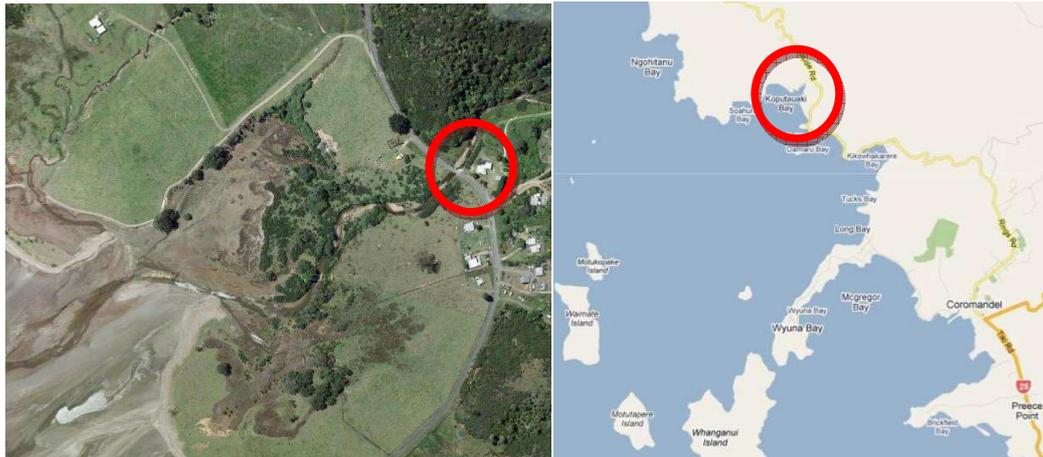
NZTA to consider whether clarification is necessary as to the funding profile threshold of (HMM?) for safety Improvement projects where safety benefits are >50% and Cost is <\$4.5M. (See D 3.5 and G4.9 of PPFM)

Koputauaki Bridge (Colville)

Approved Organisation: Thames-Coromandel District Council

Description: Replace the existing one way bridge (which was inadequate structurally) with a new two way bridge with improved flood clearances.

Purpose: Reduce Travel Time, Vehicle Operating Costs and accident costs through allowing greater loads to be carried on the Coromandel to Colville route.



Construction funding approved	2008/2009
At a cost of	\$0.774 M
Construction completed	December 2008
At a cost of	\$0.910 M
Predicted benefit	\$4.861 M
Of which accident savings were	\$1.562 M
Predicted BCR	8.4
Results (assessed 2010)	
Accident savings were	\$0.781 M
Total benefits	\$3.437 M
BCR	5.2

Activity results (actual)

The project has met its objective of replacing the existing one lane bridge (which was inadequate structurally) with a new two lane bridge with improved flood clearances. The BCR is very sensitive to the traffic flow and no recent counts have been done to verify the traffic counts and growth assumed.

Continued over

Koputauaki Bridge (continued)

Based on the information provided it is unclear whether the benefits predicted will be achieved in full. Uncertainty still remains around HCV traffic counts and the average trip lengths. Also other bridges on the route to Port Jackson may require upgrading in the future to enable the predicted benefits to be realised.

Travel Time and Vehicle Operating Cost benefits are due to fewer trips being required as the replacement bridge is able to carry greater loads. Load and Freight Commodity Factor's from the EEM Simplified Procedures have been used. FCFs cannot be applied to Travel Time costs as has been done in the Full Procedures evaluation.

The PIR assumes that 100% of the Simplified Procedures benefits have been achieved spread 50/50 over Travel Time and Vehicle Operating Costs. No survey of local transport operators to estimate the daily distances travelled appears to have been undertaken as envisaged in the Simplified Procedure. Instead it is assumed the average distance is the distance from Coromandel to Colville - 19km. This introduces further uncertainty to the benefits forecast.

There are safety benefits from widening a 1 Way Bridge to a 2 Way Bridge; however accident severity would increase due to higher speeds. The MWH evaluation (dated 11/12/2007) used the Weighted Attribute Method for both Pre and Post calculation of Accident Costs as there are no recorded accidents at the existing bridge.

It is noted that not all the recommendations of the Safety Audit have been implemented. From inspection the as constructed project does not fully meet the requirements of the GDM. In discussion with NZTA it was noted that it was difficult to quantify the effect of the departures from standards and not meeting safety audit recommendations. NZTA suggested that 50% of the accident benefits could be assumed as an estimate of actual benefits. This is still higher than the Simplified Procedure used in the original evaluation which takes no account of accident benefits for Bridge reconstructions.

Process issues for action

NZTA to consider whether post construction speed surveys should be mandatory where Travel Time Benefits are a significant proportion of total benefits.

NZTA to consider whether post construction traffic counts are mandatory on all roading projects as the actual benefits are very sensitive to actual traffic counts and actual traffic growth rates. The marginal additional cost to carry out annual counts would be small.

NZTA to consider methods to quantify actual accident benefits when standards are not met and safety audits recommendations are not implemented.