NZ TRANSPORT AGENCY
WAKA KOTAHI

highways and network operations

This booklet contains
20 Value for Money Stories
contributed from across the country in the
3 months ending November 2011.

Take a look and if you want to learn more, email or call the contributor, or just make use of their idea!

If you have a VfM Story that you would like to contribute, please email one of the following for a blank slide.

Auckland/Northland Tony.Fisher@ama.nzta.govt.nz

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NZ TRANSPORT AGENCY WAKA KOTAHI

highways and network operations

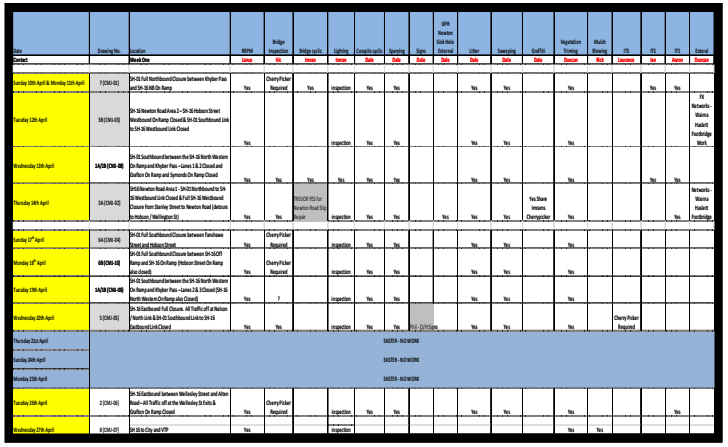
Value for Money Initiative: AN1 CMJ Combined Closures

Opportunity

CMJ is a unique area of the Auckland Motorway network, with a number of links which need closing at the same, in order to carry out mainteance. Three capital projects are also working in the area at the same time. A large number of maintenance activities need to be completed in this area due with a high combined cost of traffic control and impact on traffic flows.

Solution

All interested parties got together to combine closures, draft appropriate TMP's to cover the CMJ section of the network (10 closures are required to close every section of the network), work with the various teams & Capital Projects to deliver the works, efficiently, timely & safe manner when working in a tight site.



Estimated Costs & Benefits

90 closures reduced down to 10 (approx. cost saving $352,000.00 in traffic control).

Significantly less disruption to the traveling public

Highways Strategic Priority	Impacts
Safe Journeys	Yes
Efficient & Reliable Journeys	Yes
Social & Environmental Responsibility	Yes
People & Processes	No
Efficient Delivery of Works	Yes

Contributors

Kelly Foy, Mike Marsden and numerous others from the AMA

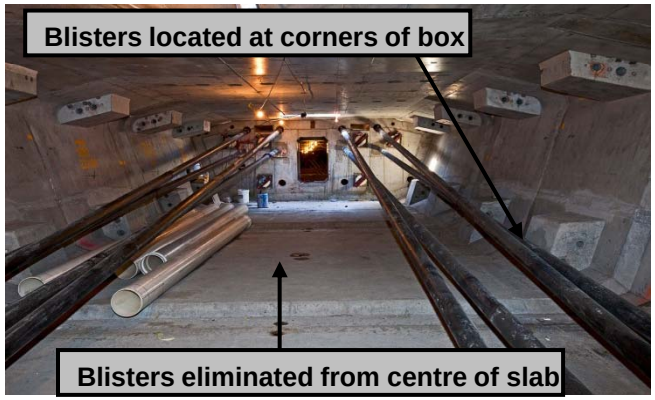
Value for Money Initiative: AN2 New viaduct – Deck segments – Relocation of Temporary Blisters

Opportunity

Remove large concrete 'blisters' from central portion of segment floor slab to improve construction & long term maintenance access, and eliminate trip hazards

Solution

'Temporary' stressing blisters relocated to outer web/slab corners of segments



Estimated Costs & Benefits

- **Improved access for construction & long term maintenance.**
- **Trip hazards & deceptive shadows eliminated from access walkway in box**
- **Thinner box bottom slab (200min.) than if in centre. Less rebar in blister.**

Highways Strategic Priority	Impacts
Safe Journeys	Yes
Efficient & Reliable Journeys	No
Social & Environmental Responsibility	No
People & Processes	No
Efficient Delivery of Works	Yes

Contributors

Ted Polley, Peter Lipscombe & Jon Varndell

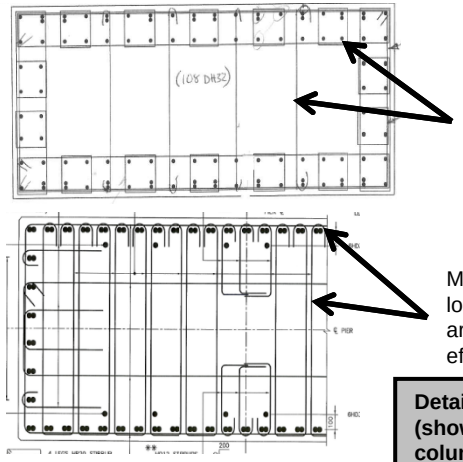
Value for Money Initiative: AN3 New viaduct – Pier Column Reinforcing

Opportunity

TOC design used longitudinal bars in groups with small hoop bars for restraint (refer to next page for sketch). As a result, there is an opportunity to improve the structural efficiency of the longitudinal reinforcement.

Solution

Relocate longitudinal reinforcement to outer portion of pier cross section. Restrained longitudinal bars by small diameter stirrups spanning across the smallest column dimension



TOC Design

Less stirrups but more inefficient longitudinal bars

More stirrups but longitudinal bars are working more efficiently

Detailed Design (showing half of a pier column reinforcing)

Estimated Costs & Benefits

- **More efficient use of longitudinal bars**
- **Required less large diameter stirrups**
- **Reduced steel costs**
- **Made reinforcing cage more rigid during lifting into place**

Highways Strategic Priority	Impacts
Safe Journeys	Yes
Efficient & Reliable Journeys	No
Social & Environmental Responsibility	No
People & Processes	No
Efficient Delivery of Works	Yes

Contributors

Ted Polley, Peter Lipscombe & Jon Varndell

Value for Money Initiative: AN4 New viaduct – Temporary Retaining Walls

Opportunity

Reduce the extent of excavation by constructing concrete box retaining walls

Solution

Deep excavation to basalt for pad foundations required large batter slopes to allow workers to expose and clean the basalt. This was costly and impacted on access for construction. The solution was to trench four walls and pour in concrete. The walls braced off each other and provided a retaining box around the excavation

Estimated Costs & Benefits

-Reduced excavation and backfill quantities and limited the impact of excavation footprint on construction traffic
-Retained excavated slopes to allow workers to clean basalt safely

Contributors

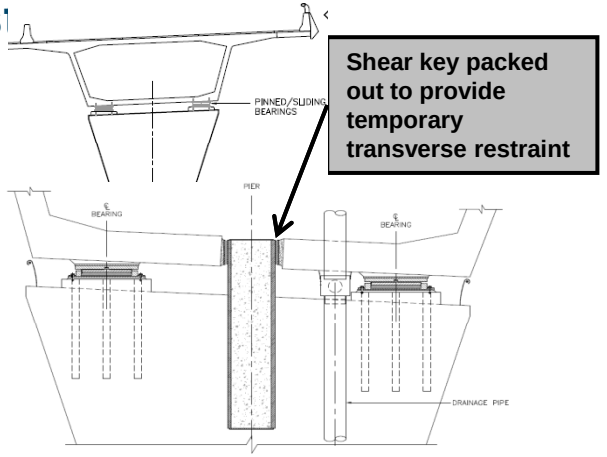
Ted Polley, Peter Lipscombe & Jon Varndell

Highways Strategic Priority	Impacts
Safe Journeys	Yes
Efficient & Reliable Journeys	No
Social & Environmental Responsibility	No
People & Processes	No
Efficient Delivery of Works	Yes

Value for Money Initiative: AN5 Pier Shear Key – Temporary Transverse Res

Opportunity

Northbound viaduct requires temporary transverse restraint during construction because the northbound viaduct is supported on free sliding bearings



Solution

Provide temporary stainless steel plate packing around northbound pier permanent shear keys. The packing still allows longitudinal movement to occur

Estimated Costs & Benefits

- **Removes the use of temporary works to provide transverse restraint**
- **Requirement for temporary works deleted saving costs**
- **Avoided the requirement for lifting heavy temporary works in a difficult location**

Highways Strategic Priority	Impacts
Safe Journeys	Yes
Efficient & Reliable Journeys	No
Social & Environmental Responsibility	No
People & Processes	No
Efficient Delivery of Works	Yes

Contributors

Ted Polley, Peter Lipscombe & Jon Varndell

Value for Money Initiative: AN6 Culvert Replacements

Opportunity

Deep culverts and streams are located under the highway at multiple locations and act as drainage channels for the highway. Because of the height difference they are a road side hazard and they require constant maintenance.

Solution

Rather than simply placing a barrier in front of the culvert for protection we have developed a system whereby we extend the culvert and build a drop-manhole over the end, filling the surrounding ground and producing a traversable slope for errant vehicles

Estimated Costs & Benefits

The cost of ~$76k is equivalent to the cost of a protective barrier. The benefits from this solution come in eliminating the hazard (rather than protecting it) and reducing ongoing maintenance costs. The manhole requires less maintenance than the old culvert and can be carried out in relative safety well off the carriageway without the need for expensive TTM. The benefits include maintenance cost reductions and safety to both the public and workers

Highways Strategic Priority	Impacts
Safe Journeys	Yes
Efficient & Reliable Journeys	Yes
Social & Environmental Responsibility	Yes
People & Processes	Yes
Efficient Delivery of Works	Yes

Contributors

Joint effort between Transfield and NZTA Regional Asset team.

Value for Money Initiative: AN8 Emergency Works Tender

Opportunity

Areas on SH1 North of Waiwhiu Road , Culvert 87, Culvert 88 and Moirhill southbound and SH16 Wharehine Road were all subject to significant underslips following storm weather in January 2011.

Solution

Rather than automatically awarding the works through the existing maintenance contract for the area, the works were packaged into two distinct schemes and issued for competitive tender.

Estimated Costs & Benefits

The contract price came in at approximately $4.33M a saving of approximately $2M had the contracts been automatically been awarded to the maintenance contractor for the area

Highways Strategic Priority	Impacts
Safe Journeys	Yes
Efficient & Reliable Journeys	Yes
Social & Environmental Responsibility	Yes
People & Processes	Yes
Efficient Delivery of Works	Yes

Contributors

NZTA Regional Asset team

Value for Money Initiative: AN 9 Efficiencies in the Waterview Board of Inquiry(BOI) process

Opportunity

The Projects Assessment of Effects to be heard by the BOI consisted of a five volume 2000 page document supported by 31 Technical Reports and 300 Plans. The opportunity was to make this complex and large volume of information easily accessible to both affected and interested members of the public and to the five member Board of Inquiry (BOI) panel. It was also essential to have the ability to quickly disseminate any new evidence to all interested parties.

Solution

A number of initiatives were used including providing a 'friend of the submitter' and the use of 'ebooks' published on a dedicated website. Each of the five BOI members were issued with IPADs loaded with all of the application material, including updated briefs of evidence produced during the hearing. Once Evidence Briefs were prepared there was a statutory requirement to serve copies on all parties to the Hearing. By servicing this evidence electronically to two thirds of submitters the NZTA was able to achieve significant time, cost and environmental savings.

Estimated Costs & Benefits

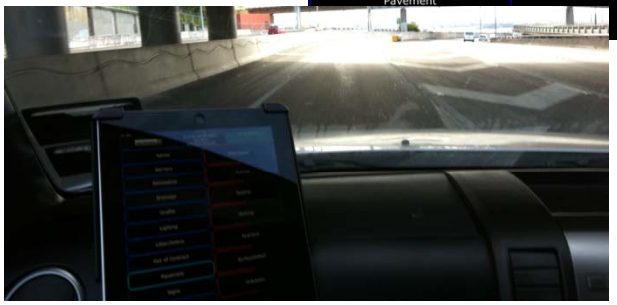
Up to a week of hearings time was estimated to have been saved, by using iPads and ebooks which is considerable given each day of the hearing was estimated as a $20,000 cost to the NZTA (total cost saving $100,000). Two thirds of evidence recipients elected to be served electronically. This provided a $200,000 saving in printing bills. There was additional time saving to the hearing process also as once evidence was written it could be instantaneously pdf'd and uploaded to a website and a link sent by email to satisfy electronic service of the evidence.

Contributors

Western Ring Route consenting team

Highways Strategic Priority	Impacts
Safe Journeys	No
Efficient & Reliable Journeys	No
Social & Environmental Responsibility	Yes
People & Processes	Yes
Efficient Delivery of Works	Yes

Value for Money Initiative: AN 10 Electronic Inspections



Opportunity

The Auckland Motorway Alliance Engineering team's network inspections involve considerable post processing of audio data, typing notes, looking up RP's and loading to AMATrac (the AMA job management system). It is important that information is transferred soon after the inspection is completed which is often very late at night. On average this task requires 5 hours per inspection.

Solution

Upon request the AMA IT team created an electronic inspection device that allows capture of 54 inspection types inc. free text and automatically populates RP's, converted from the devices in-built GPS. Inspections can be edited in the field. This modular scalable and cross platform solution works on modern tablets and smartphones such as Apple and Android and also Windows based laptops with 3rd party GPS. This zero administration software is easy to install and produces data in Microsoft Excel format, ready for upload into any other system.

Estimated Costs & Benefits

Saving of 10 hours per week for network engineers

Build cost of 32 hours of IT developer time

Highways Strategic Priority	Impacts
Safe Journeys	No
Efficient & Reliable Journeys	No
Social & Environmental Responsibility	No
People & Processes	No
Efficient Delivery of Works	*Yes*

Contributors

Tony Darby on behalf of the AMA

NZ TRANSPORT AGENCY WAKA KOTAHI

highways and network operations

Value for Money Initiative: AN11 LRMS Explorer

Opportunity

Locations on the NZTA State Highways are referenced using the New Zealand's State Highways Linear Referencing system (LRMS), with assets referred to by their respective RS/RP. In the field this required the use of vehicle trip meters, a very inefficient process in the Auckland Motorway Environment. The opportunity was to create a software application to convert GPS position to the RS/RP from RAMM.

Solution

The app works on GPS enabled Apple and Android smart phones and tablets or Windows laptops with external GPS. The app is user installed thereafter no internet connection is required. RS/RP datasets are available for all NZTA regions and are refreshed monthly. Lane width and surfacing information can also be displayed.

In the field, using iPhone as an example the display updates every second.

Estimated Costs & Benefits

This system cost under $10k to create and has been made freely available on the AMA Website lrms.aucklandmotorways.com The system is used by AMA, contractors, consultants and NZTA staff. It can also be used on-line at the same web site, a feature that seems very popular with 90,000 conversions to date..

Highways Strategic Priority	Impacts
Safe Journeys	No
Efficient & Reliable Journeys	No
Social & Environmental Responsibility	No
People & Processes	No
Efficient Delivery of Works	*Yes*

Contributors

Andrew Litchfield of the AMA

Value for Money Initiative: AN7 - Contractor safety in Temp. Traffic Management

Opportunity

As Principal, NZTA is required under the HSE in Employment Act to take all practicable steps to ensure the safety of contractors. Lifting injuries are prevalent in the TTM sector of our service providers, who often use sand bags to hold signs in place.

Solution

To develop a simple filling device that ensures bags hold no more than 15kg of dry sand (20kg wet) and to use unique bag colour per contractor, clearly identifying bags on the road network as being of the 15/20 kg type.

Estimated Costs & Benefits

Cost of building the device was less that $1000. Benefits are that employees in the field know with a high degree of certainty that a bag is of a safe weight for a single person lift, thereby significantly reducing the potential for personal injury.

Contributors

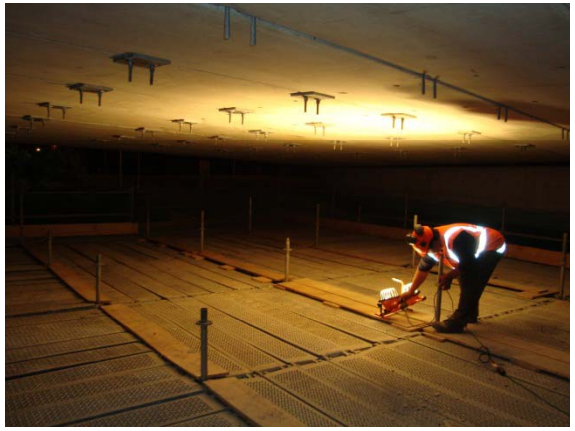
Be
Daryl.ball@ama.nzta.govt.nz on behalf of Auckland Motorways

Highways Strategic Priority	Impacts
Safe Journeys	Yes
Efficient & Reliable Journeys	No
Social & Environmental Responsibility	Yes
People & Processes	Yes
Efficient Delivery of Works	Yes

Health and Safety Success Story AN13 - Right of Refusal: Scaffolding

Opportunity

During Bridge Clamping Works at Silverdale overbridge, the AMA engaged a subcontractor to erect Scaffold to enable work to be completed at height. Upon arrival to site on the first night, with traffic detours already in place, the AMA Structures Team found that the Scaffolding had not been tagged to verify safety compliance.



Solution

Recognising the hazard, the foreman had the courage to not commence work. He phoned the subcontractor, and insisted that he travel to site and certify the scaffold before work could commence that night.

Estimated Costs & Benefits

The team lost a few hours work. The benefit was that they completed the work knowing the scaffold they were working on was safe. The AMA has used this example at Toolbox talks of exactly the safety behaviour it wants from its employees.

Highways Strategic Priority	Impacts
Safe Journeys	No
Efficient & Reliable Journeys	No
Social & Environmental Responsibility	Yes
People & Processes	Yes
Efficient Delivery of Works	No

Contributors

Imran Ibrahim, Symon Heslop, Manu Tanielu and Paul Wright of the AMA

Value for Money Initiative: AN 12 Motorway Inspections Course

Opportunity

COPTTM requires all personnel undertaking inspections on the motorway to be trained to STMS L2/3 NP. This is 3 individual courses totalling 5 days of training which takes several months to complete. It does not provide training specific to inspections.

Solution

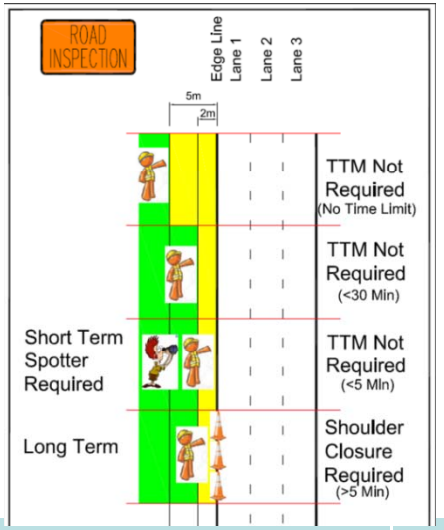
To developed the Motorway Inspections Course. It trains staff specifically for inspection activities; what work can be done without TTM; when TTM is required; vehicle safety checks; PPE; site entry and exit procedures; and general and specific safety issues that may be encountered.

Estimated Costs & Benefits

Better trained staff, more safety awareness, cost savings for not having to do full STMS course to undertake inspections. As course is more appropriate to the work being undertaken, less chance of people taking the risk of "just popping on to the network" with out the required training and qualification.

Contributors

Jim Bernhard, Doris Stroh on behalf of AMA



Highways Strategic Priority	Impacts
Safe Journeys	Yes
Efficient & Reliable Journeys	No
Social & Environmental Responsibility	Yes
People & Processes	Yes
Efficient Delivery of Works	*Yes*

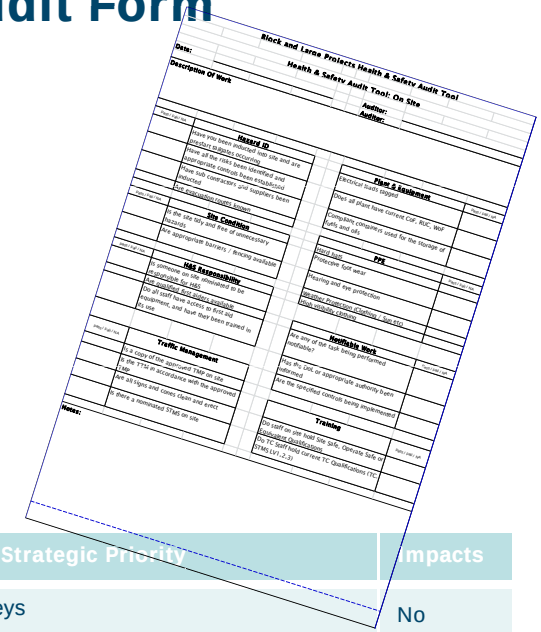
Value for Money Initiative: C2 Health and Safety Audit Form

Opportunity

Fostering a collaborative culture with regards to health and safety on our physical works sites is important not only from an health and safety perspective but also as a way of encouraging communication directly between Agency staff and our suppliers

Solution

NZTA did not have any readily available tools to assist out staff from having this conversation on site so the Wellington Projects Team developed a simple one page checklist which can be used to record health and safety audits but also as a means to having a conversation with on site staff as they are encouraged to participate in the process. Using of the form has the added benefit of being able to be used by our staff to demonstrate efforts we have gone to, to ensure that we are providing a safe work environment.


Block and Large Projects Health & Safety Audit Tool

Health & Safety Audit Tool: On Site

Date:

Auditor:

Auditor:

Description Of Work

Hazard ID

Plant & Equipment

Site Condition

PPE

H&S Responsibility

Healthy Site

Traffic Management

Training

Notes:

Estimated Costs & Benefits

Benefits are improved relationships with suppliers, consistent auditing, being able to provide evidence that NZTA is working in accordance with the HSEA

Highways Strategic Priority	Impacts
Safe Journeys	No
Efficient & Reliable Journeys	No
Social & Environmental Responsibility	Yes
People & Processes	Yes
Efficient Delivery of Works	No

Contributors

Wgtn Block and Large Projects Team

Value for Money Initiative: WBOP1 Best Value to/from Wellington Airport

Opportunity

Many people travelling to Chews Lane from around the country utilise taxis to/from Wellington Airport. Typical taxi fares for $25-$35 each way.

Solution

The Airport Flyer (91) travels every 15 minutes from right outside the terminal to outside Chews Lane. It cost $8.50 and takes 20 mins. Corp Services can buy books to pre-paid tickets

Estimated Costs & Benefits

Assuming only 50% of an assumed 10 people a day visiting Chews Lane use the bus then the typical saving is around $1,000 a week - $50,000 a year……

Contributors

Richard.young@nzta.govt.nz

Highways Strategic Priority	Impacts
Safe Journeys	Yes
Efficient & Reliable Journeys	Yes
Social & Environmental Responsibility	Yes
People & Processes	Yes
Efficient Delivery of Works	Yes

Value for Money Initiative: C1 Advance Fill at Jim's and Two Bobs Corners

Opportunity

The SH2 Muldoon's Corner realignment on the Rimutaka Hill generated a significant volume of excess fill material that required disposal offsite.

Solution

The excess material has been used to fill two other gullies on the Rimutaka Hill Road (at Jim's Corner and Two Bobs Corner) that have been identified for future realignment.

Estimated Costs & Benefits

- Shorter haul distance, less resource than off-hill disposal sites.
- Estimates for Jim's Corner and Two Bobs Corner realignments reduced by approximately two-thirds.
- Corresponding increase in BCR has seen both safety projects included in the RLTP/NLTP.

Contributors

Simon Cribb / Muldoon's Corner Project Team

Highways Strategic Priority	Impacts
Safe Journeys	Yes
Efficient & Reliable Journeys	Yes
Social & Environmental Responsibility	No
People & Processes	No
Efficient Delivery of Works	Yes

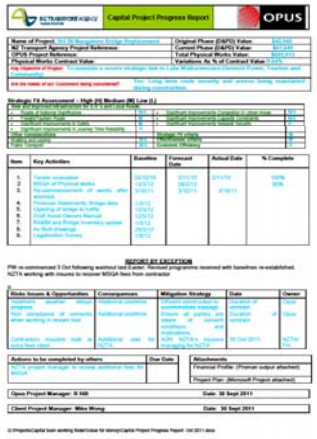
Value for Money Initiative: C3 Capital Projects Consultants Monthly Report

Opportunity

The 'cost' of standard monthly reports in accordance with the NZTA's Standard Professional Services Specifications Contract Management was thought to be disproportionate from the value added, expensive, consumed precious time and diverted resources from other priorities. This led to compromised quality and at worst a waste of paper and demoralised staff dreading the printing and binding.

Solution

A 'one page' 'report by exception' was accepted as an alternative method of reporting on the real issues. All projects are reported on at one meeting (on a surgery basis). Project objectives and customer needs, risk, key milestones and financial progress addressed. Minutes are taken with actions documented. Outcome: clear concise useful info is reported on and poor quality can be identified in an instant.



Estimated Costs & Benefits

NZTA Std = $1000 est. x 33 (live block phases) x 12 = $396,000.00
VfM Alternative = $200 est x 33 (live block phases) x 12months = $79,200.00

Actual Napier Saving 2009/10 FY = $317,000.00
Potential National Saving 2009/10 FY = what's your guess $$$ per year ?
Potential future National savings = what's your guess $$$ per year ?

Contributors

Simon Barnett PTM Napier Region

Highways Strategic Priority	Impacts
Safe Journeys	No
Efficient & Reliable Journeys	No
Social & Environmental Responsibility	No
People & Processes	Yes
Efficient Delivery of Works	Yes

Value for Money Initiative: C4 - SH6 Three Brothers Intersection Upgrade Pavement Design

Opportunity

A tender was awarded late in the construction season due to NZTA which involved construction of a deep lift granular pavement (850mm granular with 165mm SAC topping) at SH6 Three Brothers Roundabout. NZTA, Opus and Fulton Hogan investigated ways to minimise our collective risk (of constructing a granular pavement in a high stress area toward the end of the construction season) through identifying and implementing an alternative engineering solution.

Solution

A 400 mm cement stabilised granular pavement design was adopted (following significant testing by FH and Opus). This shallower design significantly reduced the risk of services clash (the West Coast Fibre Optic cable runs under the, significantly reduced the impact on the road user and adjacent residents and businesses. The design also reduced the potential impact of rain as we were using AC so could run traffic over the surface without fear of it unravelling. It brought the completion date of the project forward 1 week reducing the risk of working late into the construction season and no loss in service life.

Estimated Costs & Benefits

Although the shallower but cement modified pavement was more expensive (approx $25k), savings were made with respect to traffic management and time related costs in the same order. The significant benefits were travel time savings were to our customers - had we kept the road closed at night for a further week we would have generated over 350 hours of additional travel time through bypassing traffic around the site (most of the traffic passing through at night is trucks). Other benefits included a more sustainable design, less cut to waste volumes and less risk of post construction pavement settlement. Estimated savings > $45,000.00

Highways Strategic Priority	Impacts
Safe Journeys	No
Efficient & Reliable Journeys	Yes
Social & Environmental Responsibility	Yes
People & Processes	Yes
Efficient Delivery of Works	Yes

Contributors

Gavin Gregg

Value for Money Initiative: S2 Caversham: Glen footpath

Opportunity

To achieve a better outcome for pedestrians.

Existing footpath was pretty rough. We were only obliged to fix those areas we made worse.

Solution

Worked out a cost share solution for a whole of footpath treatment based on where fully Council desire, fully necessitated by works, and shared for grey areas.

Estimated Costs & Benefits

Benefits are in outcome, as enabled through deriving a cost share with Council. Instead of a really rough footpath, detracting from our new construction, the site is addressed in a holistic manner. Even the small stuff counts.

Contributors

Simon.underwood@nzta.govt.nz on behalf of team CHI

Highways Strategic Priority	Impacts
Safe Journeys	No
Efficient & Reliable Journeys	No
Social & Environmental Responsibility	Yes
People & Processes	No
Efficient Delivery of Works	Yes

Value for Money Initiative: S1 Caversham: at risk brick manhole tower

Opportunity

The manhole tower is approx. 7m above excavation and extends 5m below excavation. We must compact around it to build the road above. To proactively replace with new (to new standards) would be big dollars; to damage necessitate replacement would be big $s. Plus if it blew out post construction, it would take require a big dig within the new road to fix.

Solution

Local Council not interested in funding replacement, but through team challenge and exploration with Council, resolved to coat with reinforced shotcrete (reinforcing visible on photo).

Estimated Costs & Benefits

Benefits are that risk of construction damage is greatly reduced, as is the risk of future dig-out need.

Council are funding the strengthening work

Highways Strategic Priority	Impacts
Safe Journeys	No
Efficient & Reliable Journeys	Yes
Social & Environmental Responsibility	Yes
People & Processes	No
Efficient Delivery of Works	Yes

Contributors

Simon.underwood@nzta.govt.nz on behalf of Team CHI