

Marija Bakulich

From: Andrew Quinn
Sent: Monday, 19 November 2012 4:29 p.m.
To: 'S.Reddish'; 'jos@trafficplanning.co.nz'; 'Jon England'
Cc: 'Peter Bradshaw'; Caron Greenough; 'Eric Whitfield'
Subject: Safety Audit Tracking Forms
Attachments: NZ1-6371019-M2PP Decision Tracking Form_completed.pdf; NZ1-6371019-M2PP Decision Tracking Form_completed.pdf

Hi Steve and team; for your records and Designer's action, please find attached NZTA's comments and completed Decision Tacking Forms for Expressway and Otaihanga Road I/S.

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RSA report recommendations – Decision-tracking form – PMM 6.5a



NZ TRANSPORT AGENCY
WAKA KOTAHU

Project title	MacKays to Peka Peka Expressway	RSA stage	2A: Specimen design (for costing)
Project manager	Andy Quinn	Designer	M2PP Alliance
Road safety auditors	Jos Vroegop & Steve Reddish (TPC), Jon England (MWH)		

Recommendation*	Report reference and severity*	Designer comments	Decision
Matters arising from previous safety audit.	2.1 Comment	Agree with the Safety Auditors' recommendation to address these issues during detail design. We note that the SAT have raised some issues again specifically as part of this audit. In these instances (e.g. items 2.2 and 2.3) we have provided designers' comments how to treat them in this decision tracking form.	In general, it isn't desirable or good practice to carry over issues that were raised in the last safety audit and NZTA expects that a substantial number of these matters would have been resolved by this stage. Prior to the TOC Pricing stage and before the Specimen Design stage can be considered as complete, the Designer must close out all serious and significant issues to the satisfaction of the NZTA. The designer must also affirm that any unresolved issues carried over to the next stage will not alter the current land requirement, designation or resource consent application.
Design of roundabouts at interchanges a. Ensure that the roundabout central island diameters are based on likely	2.2 Significant	a. The size of the roundabout central island diameter will be confirmed	This item was raised as a significant issue at the Stage II safety audit, so it should be

- approach speeds.
- b. Avoid the use of aprons around the central island.
- c. Ensure all designs are in accordance with AustRoads GTRD Part 4B.
- d. Ensure that there is adequate land available in each instance to design a safe roundabout.
- e. Install at least two PW-69 chevron boards on the central island facing each approach to a roundabout.

- at detailed design. The size shall be in accordance with the likely approach speeds. Mitigation shall include control of the entry environment to reduce approach speeds with signage, road markings and/or road calming measures. The size shall also consider the rural setting and potential for greater HCV movements.
- b. The design of the aprons is provided to allow scope for heavy vehicle tracking.
- c. Agreed. Refer item a.
- d. The land requirement provides space to allow the roundabout to be developed further at detailed design.
- e. Agree. This detail will be added in the detailed design.

addressed at this stage and not carried over to the next stage. Undersized roundabouts have proved in the past to have consequences for land requirements and other effects, so it's important that this item is given serious consideration by the designer.

Cyclists using the expressway

- a. Prohibit the use of the expressway by cyclists through a local KCDC bylaw or by designating the expressway as motorway.
- b. Direct cyclists to use the adjacent off-road facility and the old SH1.

2.3
Serious

- a. The Expressway does not prohibit use by pedestrians and cyclists in accordance with the principles requirements.
- b. Noted – A dedicated, attractive, off-road cycleway has been provided as part of the project and the use of this facility and old SH1 will be promoted and sign-posted.

If cyclists are not to be prohibited by local bye-law, the specimen design set of drawings should include crossing facilities at on/off ramp merge areas and any other area where cyclists are vulnerable.

The shoulder on two lane off-ramps will be increased to 1.5m, where possible, to make provision for cyclists.

Furthermore the design shall incorporate appropriate signage to direct cyclists to the off-road facility and the alternative SH1 route.

Cyclist provision at on and off-ramps is provided in accordance with AustRoads GRD, Part 4C, Figure 14.2 to be included on the drawings at detailed design.

Given the seriousness of the issue, we do not think it acceptable to leave this to the detailed design phase. Treatment can also be extended to audio tactile strips on the edge of the trafficked lane to alert vehicles and/or warning signs to alert drivers to the presence of cyclists on the on-road facility.

We note the Safety Auditor's concerns and their views are also shared by the Automobile Association (AA). NZTA's preference is to promote alternative routes and provide appropriate signage to encourage cyclists to use alternative route along SH1 or the off-road pathway.

Cycle path tie in at local roads and signage

- a. Provide guidance signage on the local road network to direct cyclists to the off-road facility, including signing the

2.4
Minor

- a. A signage strategy shall be developed as part of the detailed design in accordance with KCDC's area wide strategy on the local road network and to direct cyclists to the off-road facility. The design will include signing the discontinuity between El Rancho and Puriri Road and using Otaihang Road and Ngarara Road to move between the

Include the draft signage strategy as part of the Specimen Design package and with reference to

<p>discontinuity between El Rancho and Puriri Road and using Otaihangā Road and Ngarara Road to move between the paths either side of the expressway.</p> <p>b. Review the use of gabion basket walls at the interface of the cycleway and local roads and at intersections along the cycleway having regard to the inter-visibility between cyclists and young children.</p>	<p>2.5 Significant</p>	<p>paths either side of the expressway.</p> <p>b. Gabion basket walls used as physical means to delineate the cycleway intersections with local roads. This will alert users to a change of environment and encourage safer use. The detailed design shall consider the inter-visibility between cyclists and young children at this location.</p>	<p>signage on the local road network to direct cyclists to the off-road pathway provided as part of the Expressway project for local benefit.</p> <p>Prior to finalisation of the Specimen Design and pricing, review the use of gabion blocks at the edge of the walkway.</p>
<p>Lighting of the off-road cyclist/pedestrian path</p> <p>Provide lighting of the shared use pedestrian/cycle path between Poplar Avenue and Te Moana Road having regard to safe use of the path by commuters and school pupils during the winter months in particular.</p>	<p>2.5 Significant</p>	<p>Lighting of the shared use pedestrian/cycle path is provided in high use/urban areas where lighting can be maintained. Lighting of the path in rural area where the Expressway is unlit may cause added distractions to motorists. The detailed design should review the lighting strategy for the path between Poplar Avenue and Te Moana Road for use by commuters and school pupils during the winter months in particular. Alternatively low maintenance/low level lighting should be considered.</p>	<p>This was identified in the previous Safety Audit. Prior to finalisation of the Specimen Design and pricing of the TOC, the designer should confirm the extent of lighting for the walkway and type of lighting to be provided, having regard for user requirements, the local community, council, and CPTED principles.</p>
<p>Kerbs shown on local road bridge drawings</p> <p>Use fully mountable kerbs on bridges.</p>	<p>2.6 Significant</p>	<p>Agree. Where it is not realistic to remove 200mm high kerbs as part of the detailed design, mountable kerbs will be considered. In addition, this issue will be assessed in light of the new draft bridge manual.</p>	<p>The use of bridge kerbs on bridges is under review but meantime the designer should adopt the recommendations of the Safety Audit team which is to use fully mountable kerbs where delineation of the footpath is desired. The client decision at last safety audit clearly stated "bridge kerb is not to be used".</p>
<p>Signage and pavement marking on off-ramps</p> <p>a. Install gated MI-38 "Wrong Way – Go Back" signs on all off-ramps.</p>	<p>2.7 Minor</p>	<p>a. Agree. MI-38 signs to be provided under the detailed design.</p>	<p>Agree with both Audit Team and the Designers proposal to address the issue at the detailed design</p>

<p>b. Intersect the edge line on the right hand side of the off-ramp and the edge line of the local road at 90° and not with a radius.</p>	<p>2.8 Comment</p>	<p>b. Agree. Edge line to be provided in accordance with the RSA's stage recommendation.</p>	<p>Designer's comments noted. The risk of errant vehicles hitting culvert headwalls is lessened by the use of edge protection i.e. WRB to the main expressway.</p>	
<p>Culvert headwalls not protected by barrier</p>	<p>2.9 Comment</p>	<p>Agree. We note this comment should read "culvert headwalls should have traversable safety intakes" and relates to local road culverts. The detailed design will investigate the use of traversable safety intakes on culverts where there is a potential safety hazard.</p>	<p>Clearly the design of the pedestrian bridge is at an early stage and will be developed further for the Detailed Design stage.</p>	
<p>Kāpiti to Raumati pedestrian bridge</p>	<p>2.10 Minor</p>	<p>The detailed design of the pedestrian footbridge will ensure the landing point's tie-in with the adjacent landform and pathway arrangements.</p>	<p>Agree with designer's response</p>	
<p>Landscaping issues Ensure that the detailed landscaping proposals take account of road safety requirements, especially any potential effects on visibility and the locations of unprotected trees that could be hazards.</p>	<p>2.11 Comment</p>	<p>Agree. We note that consideration will be given to road safety issues during the detail design of the landscaping.</p>	<p>Agree with the Audit team's comments</p>	
<p>Cycleway realignments</p>	<p>Raised median with wire rope barrier on bridges a. Eliminate raised medians where wire rope barrier is to be installed. b. If a raised median is necessary on the bridges to support the wire rope barrier, use only fully mountable low profile kerbs for the raised medians.</p>	<p>3.1 Significant</p>	<p>a. The kerb at this location is required for drainage purposes. b. Agree - Low profile/fully mountable kerbs will be used to at raised medians.</p>	<p>Agree with Designer's response</p>
<p>Median barrier offset from drain Where the median barrier needs to be offset</p>	<p>3.2</p>	<p>Agree. Median 'V' drain to be generally located within 350mm of the wire</p>	<p>Agree with the Audit team's</p>	

<p>from the centre of the median for forward sight distance, locate the median "V" drain within 350mm of the wire rope median barrier or with an offset that is greater than 2m.</p>	<p>Minor</p>	<p>rope barrier or offset greater than 2m.</p>	<p>comments</p>
<p>Planted medians</p>	<p>3.3</p>	<p>a. Agree – Planting shall not affect the structural integrity of the wire rope barrier. b. Agree – Median planting is to be low maintenance. c. Silt run-off measures will be considered during detailed design where there is a crowned planted median.</p>	<p>NZTA's preference is for a sealed median rather than mass planting, if it compromises road safety.</p>
<p>Barrier design at CCTV sites Design overlapping barriers in front of the CCTV infrastructure to allow safe entry/egress for service vehicles via the expressway shoulder.</p>	<p>3.4 Minor</p>	<p>Agree – Overlapping barriers will be used to provide a gap to access CCTV infrastructure. Where this cannot be achieved a wider shoulder will be considered.</p>	<p>NZTA's preference is for overlapping barriers rather than a wider shoulder. This item i.e. serviceability should be reviewed with the NZTA Network Operations Manager (Des O' Sullivan).</p>
<p>Barrier test level on bridges Undertake the appropriate risk assessment to determine the barrier test level required on all the expressway bridges, including local road bridges going over the expressway.</p>	<p>3.5 Minor</p>	<p>Agree - Design has been carried out in accordance with the TNZ Bridge Manual for appropriate geometry and traffic volumes. The barrier test level at Te Moana Road bridge is TL-4. Any disparity with the new draft bridge manual and future proof criteria will be corrected at detail design.</p>	<p>Undertake the risk assessment as part of the completion of the Specimen Design and pricing stage so that the test level for each bridge is determined.</p>
<p>Northern termination at Peka Peka interchange a. Provide a full interchange with south facing ramps at the Peka Peka Road interchange from the outset, or</p>	<p>4.1 Serious</p>	<p>a. Multi-criteria assessment has directed the construction of a partial interchange with north facing ramps at Peka Peka Road.</p>	<p>There are land development pressures on the Peka Peka interchange and this has influenced the configuration of on/off ramps i.e. limited</p>

- b. As an interim measure provide a northbound off-ramp exit at Peka Peka Road to the roundabout on the western side of the expressway.
- c. In designing the recommended northbound off-ramp, ensure that the two lanes to one lane merge at the end of the expressway occur after the exit.
- d. Extend the wire rope barrier northwards along a median on the existing SH1 to prevent unsafe U-turns at the end of the expressway.

b. Refer item d below.

c. Refer item d below.

d. Agree – The wire rope barrier will be extended to the north to prevent unsafe manoeuvres. (Note: The single lane tie-in to SH1 is based on the removal of the passing lane located to the north of Te Kowhai Road and may form separate safety works, which include provision of the wire rope median barrier).

connectivity. The Audit Team's recommendation and comments are acknowledged but not accepted in full. The median barrier should however be extended beyond Peka Peka Road to lessen the potential for cross centre-line crashes and unsafe manoeuvres; and the two to one lane merge moved further north after the exit. In addition the Design team should ensure the signage strategy covers Peka Peka Rd/Te Horo access off the expressway. The temporary tie-in as a stage between M2PP and PP2O completions requires special attention and liaison between both design teams.

No expressway termination threshold measures

Install threshold measures and signage to highlight the change in environment when going from a grade separated median divided expressway to a rural two-way highway north of Peka Peka.

4.2
Significant

Agree – Threshold signage to be provided to enhance road markings and warning signs. Additional threshold arrangements shall be considered at detailed design with regard to the anticipated duration before the Expressway is extended.

Agree with the Audit Team's recommendations, this action should be completed prior to TOC pricing.

Lighting at Peka Peka interchange

Extend lighting on the expressway south from the Peka Peka on-ramp merge area to also cover the two lanes to one lane merge area on the mainline and the northbound off-ramp recommended in item 4.1.

4.3
Significant

Agree – Detailed design to consider lighting the Expressway over the length of the lane drop arrangement and a northbound off-ramp, where appropriate.

Agree with the Audit Team's recommendations, this action should be completed prior to TOC pricing.

Signage at Peka Peka interchange

a. Install gated PW-43.3 signs on the

4.4

a. Agree – Gated PW-43.3 signs to be installed on northbound carriageway.

Agree with the Audit Team's recommendations – the Signage

<p>northbound carriageway both in advance of the two lanes to one lane merge and at the merge.</p> <p>b. Delete all reference to "expressway" on ADS and IDS signs directing drivers to the north at Peka Peka.</p> <p>c. Remove EXPRESSWAY sign 174/160 from the northbound on-ramp at Peka Peka.</p>	<p>Significant</p>	<p>b. Agree – Signage for Expressway to the north at Peka Peka is to be removed in the interim period prior to the Expressway being extended.</p> <p>c. Agree - Sign 174/160 is to be removed in the interim period prior to the Expressway being extended.</p>	<p>Strategy is a key deliverable from the Specimen Design stage.</p>
<p>Lighting at Poplar Avenue interchange</p> <p>a. Provide lighting for the expressway carriageway at the Poplar Avenue interchange through to approximately CH 2850.</p> <p>b. Provide at least two under-bridge lights on the Poplar Avenue Bridge to minimise the contrast between daylight and shadow under the bridge.</p>	<p>4.5 Minor</p>	<p>a. Lighting is provided at the Poplar Avenue Interchange ramps, side road and roundabout intersection. Lighting through to approximately CH 2850 is not proposed where there are no significant manoeuvres and it would have environmental impacts. Lighting is designed in accordance with AS/NZS1158 with full transition lighting provided at the interchange. It is noted that road perception is aided using reflectors on edge marker posts and barriers on the Expressway edge and median.</p> <p>b. Agree – A minimum of two under-bridge lights will be provided on the Poplar Avenue Bridge.</p>	<p>The designer shall adopt the recommendations of the Safety Audit team, in particular extending expressway lighting over the Poplar Avenue</p>
<p>ADS signage at Poplar Avenue interchange</p>	<p>4.6 Comment</p>	<p>Agree – ADS signs 10/151 and 6/150 to show "Raumati South".</p>	<p>Noted – address at detailed design stage</p>
<p>Private accesses at Poplar Road interchange</p> <p>a. Design the property access leg of the western roundabout at the Poplar Avenue interchange so it is clearly a driveway but with sufficient width to allow a safe left turn in at the same time as a vehicle may be waiting to exit.</p> <p>b. Amend ADS 6/150 to remove the SH1 direction to Palmerston North and</p>	<p>4.7 Minor</p>	<p>a. Agree – Property access off the roundabout is to be designed as a driveway.</p> <p>b. Agree – Signing strategy to be agreed with the stakeholders.</p>	<p>Actions a. and c. required to be addressed at the specimen design stage and prior to TOC pricing.</p>

- Taupo and show the leg opposite the off-ramp as a private access.*
- c. *Design the access on the northern side of Poplar Avenue some 80m west of the roundabout with a 5-6m long platform area at the Poplar Avenue carriageway that has a grade no greater than 1:20.*

Kapiti Rd Interchange southbound on-ramp merge

- a. *Lengthen the Kapiti Road southbound on-ramp prior to the merge to provide a longer length of parallel lane to give entering drivers more time to assess gaps in the mainline traffic before merging.*
- b. *Ensure that drivers on the southbound on-ramp from Kapiti Road have forward sight distance of the full length of the merge taper.*

4.8
Significant

Lighting at Kapiti Road interchange

Ensure that the lighting of the Kapiti Road southbound off-ramp is at the same level as the other ramps.

4.9
Minor

Barriers at Kapiti Road Interchange

- a. *Shorten and/or extend the semi rigid barriers on the mainline and on-ramps at the Kapiti Road interchange as necessary to ensure that the rear of any barrier is appropriately protected.*
- b. *Extend the semi-rigid barriers on the Kapiti Road off-ramps to provide protection for the rear of the noise wall barriers.*
- c. *Ensure that there is sufficient space*

4.10
Minor

- c. *Agree – A level platform area, approximately 5-6m long, is to be provided where the access connects with Poplar Avenue.*

- a. *Detailed design to investigate providing a length of parallel merge lane for the southbound on-ramp to give drivers more time to carry out a safe merge. In addition, reducing the length of the ramps will be considered to move the merge off the curve*

Because both issues were raised at the previous audit, actions are required to be addressed at the Specimen Design stage and prior to TOC pricing.

- b. *Agree – Visibility is provided for motorists on the southbound on-ramp so that they have sufficient forward visibility along the length of the merge taper.*

NZTA require sign off that this has been completed.

- Detailed design to correct southbound off-ramp to have the same level of lighting as other ramps.*

Given the simplicity of the change, we see no reason why this item can not be closed off at this stage.

- a. *Agree – Rear of barriers are to be adequately protected.*

Make these changes prior to commencing TOC pricing as they have a cost component.

- b. *Agree – Barriers to be provided to protect rear noise wall where it presents a hazard.*

between the semi rigid barrier and the bridge piers on Kapiti Road to allow for deflection of the barrier when struck or substitute a rigid F shape barrier for the semi rigid barrier.

- c. Replace semi-rigid barrier between bridge piers with F-shaped concrete barrier.

Signage at Kapiti Road Interchange

- a. Install No Left Turn signs 211/160 and 212/160 on the respective left hand side primary traffic signal poles on Kapiti Road.
- b. Correct IDS sign 26/151 as shown on drawing CV-MF-110 so that it points toward the southbound on-ramp.

4.11
Minor

- a. Agree – No Left Turn signs to be installed in appropriate locations. Signs will not be installed on traffic signal poles.
- b. Agree – Sign orientation to show correct placement to be read.

Make these corrections on the drawing set that was supplied to the Safety Auditor.

Alignment of southbound Te Moana Road off-ramp

- a. Realign the Te Moana Road southbound off-ramp so that the roundabout is in the view of approaching drivers at approximately CH 12100.
- b. Ensure that the bridge on the Te Moana Road southbound off-ramp over the Waimeha Stream does not exacerbate the forward visibility to the roundabout.

4.12
Significant

- a. The southbound off-ramp at Te Moana Road is aligned to provide a viable stream crossing. Adequate forward visibility and sight stopping distance is provided along the ramp up to the roundabout via a widened structure. Measure shall be provided to indicate the reduced speed on the ramp and change of environment, to include road markings and signage.
- b. Noted – see a. above.

Consider whether it's more practical to re-align the stream rather than compromise road safety, if this will ease the transition onto the roundabout and improves forward vision.

Barriers at Te Moana Road Interchange

Undertake a risk assessment to determine exactly where barriers are required on the on-ramps and off-ramps at Te Moana Road Interchange.

4.13
Minor

Agree – Barrier requirements on the ramps and Te Moana Road shall be consistent with the safe systems approach to protect hazards and will be developed further as part of the detailed design.

Carry out the risk assessment and make these corrections on the drawing set that was supplied to the Safety Auditor.

<p>Signage at Te Moana Road Interchange <i>Ensure that the IDS signs 47/155 and 48/155 on Te Moana Road are located where they can be clearly seen by approaching drivers and are not affected by the shadow of the over-bridge.</i></p>	<p>4.14 Minor</p>	<p>Agree – Sign locations to be finalised as part of the detailed design.</p>	<p>Agree with Safety Audit team.</p>
<p>Right turn into Hadfield Road a. <i>Separate the southbound off-ramp and Hadfield Road traffic, or</i> b. <i>Design options for a safer intersection at Hadfield Road that eliminates the potential for high severity crashes, takes account of the proximity of the rail crossing and provides a definitive threshold between the one way/one lane operation and the two way/two lane operation (e.g. roundabout).</i></p>	<p>4.15 Significant</p>	<p>a. <i>The proposed junction form and available land mean it is not possible to separate the southbound off-ramp and Hadfield Road traffic at this location. A long left turn lane with adequate stacking and deceleration length are provided to avoid any restriction to southbound traffic.</i> b. <i>The current design, allowing for low traffic flows on Hadfield Road, is considered acceptable. The detailed design shall consider additional measures for the safe operation of this intersection to eliminate the potential for high severity crashes, whilst also considering the proximity of the rail crossing. Measure shall be provided to indicate the reduced speed and change of environment, to include road markings and signage.</i></p>	<p>One of the recent fatal injuries occurred at this very junction and given the potential approach speed once the PP20 section is complete, it is simply not acceptable to carry this issue over. If additional land is required for a roundabout, then this should be considered as an option. If there is space for the deceleration lane to Hadfield from the north, then there may be room for a roundabout, even a small one. The issue will be adequate stacking distance for turning traffic at 90° to the rail-line, which I suspect can not be delivered by the current design anyway.</p>
<p>Signage for level crossing in Hadfield Road a. <i>Install signage and pavement markings as specified in TCD Manual: Part 9 Level Crossings on the approaches to and within Hadfield Road.</i> b. <i>Include reference to the railway crossing on ADS sign 69/158 on the southbound off-ramp.</i></p>	<p>4.16 Significant</p>	<p>a. <i>Signage and pavement markings for the level crossing in Hadfield Road are design in accordance with the TCD Manual: Part 9 Level Crossings.</i> b. <i>Agree - The detailed design shall include reference to the railway crossing on ADS sign 69/sign 158 on the southbound off-ramp.</i></p>	<p>Make these corrections on the drawing set that was supplied to the Safety Auditor and then get NZTA sign off, once the revised design layout for this junction has been agreed.</p>

<p>Keep Left signs on traffic islands on local roads Use RG-17 rather than RG-17.1 keep left signs on the noses of all traffic islands.</p>	<p>5.1 Minor</p>	<p>Agree – RG-17 signs to be used on noses to traffic islands.</p>	<p>Make these corrections on the drawing set that was supplied to the Safety Auditor.</p>
<p>Abrupt end to shared use path at Poplar Avenue Ensure that at the detailed design stage there is safe two-way connectivity provided for cyclists between the shared footpath/cycleway and old SH1 and not an abrupt end to the shared use path.</p>	<p>5.2 Minor</p>	<p>The shared footpath/cycleway currently stops between the two roundabouts on Poplar Avenue. A footpath and on road cycle facility is provided to connect users with the old SH1. The detailed design shall review this arrangement.</p>	<p>Agree with Safety Audit team and happy to leave this until detailed design stage but it must be addressed before construction issue.</p>
<p>Lighting at Mazengarb Road bridge Provide under-bridge lights on both the northern and southern sides of the Mazengarb Road over-bridge.</p>	<p>5.3 Minor</p>	<p>Agree – Under-bridge lights to be provided on both sides of the Mazengarb Road bridge.</p>	<p>Make these corrections on the drawing set that was supplied to the Safety Auditor.</p>
<p>Alignment of Otaihanga Road a. Realign the section of Otaihanga Road to the approaches to and under the expressway to provide improved visibility along the road for the safety of cyclists and pedestrians in particular. b. Ensure that the cycleway (shared use path) intersections with Otaihanga Road on both sides of the expressway provide good inter-visibility between cyclists and drivers having regard to safe stopping distance for the prevailing speed on Otaihanga Road.</p>	<p>5.4 Significant</p>	<p>a. As noted by the SAT adequate visibility is provided along the road for the safety of cyclists and pedestrians. Realigning this section of Otaihanga Road may encourage higher speeds. The detailed design shall consider measures to address high speeds on this section of road including edge bollards, signage, etc. b. The intersection of the shared footpath/cycleway with Otaihanga Road on both sides of the expressway shall be developed at detailed design to provide inter-visibility between cyclists and drivers with regard to safe stopping distances on Otaihanga Road.</p>	<p>Realigning this section of Otaihanga Rd may indeed increase speeds but the designer should investigate what little change to alignment can be achieved to improve sight distance on this particular corner. This issue is not to be carried over to the next design stage.</p>
<p>Shared use path alignment at Te Moana Road Interchange</p>	<p>5.5 Minor</p>	<p>The crossings for the shared use path at the roundabout on the Te Moana Road approach shall be developed as part of the detailed design and have</p>	<p>Make these corrections on the drawing set that was supplied to</p>

<p>Ensure that the shared use path alignment and the detail roundabout design have pedestrians and cyclists crossing the Te Moana Road approach lane at least 6m from the limit line.</p>	<p>pedestrians and cyclists crossing the lane at least 6m from the limit line where possible.</p>	<p>the Safety Auditor.</p>
<p>Speed limit on old SH1 south of Peka Peka</p>	<p>5.6 Comment</p>	<p>The speed limit on the old SH1 south of Peka Peka Road is to be shown as 80km/h in accordance with the current road. The detailed design will consider any intervening developments regarding the rehabilitation of the old SH1. The target speed alignment for this section of SH1 will be reviewed as part of the revitalisation project and revocation.</p>
<p>Urupa access road vertical alignment</p> <p>a. Having regard to the proposed vertical alignment of the Urupa access road, confirm that speeds will not exceed 40 km/h.</p> <p>b. If speeds are likely to exceed 40 km/h, improve the vertical alignment accordingly.</p>	<p>5.7 Minor</p>	<p>a. The alignment of the Urupa Access Road is provisional at this stage. The alignment/form/function of the road remains to be finalised as part of any agreement with the trust for these lands.</p> <p>b. The detail design shall be carried out in accordance with the agreed criteria including and the agreed speed environment.</p> <p>Agree with the Designers.</p>
<p>* Audit team leader to complete, attach to the report, and send electronically to the project manager.</p>		

<p>Signed by project manager</p>	<p>Andrew Quinn</p>	<p>Date: 19th November 2012</p>	<p>For additional rows, click in the bottom right cell of the table above, choose Table from the menu toolbar > Insert > Rows Above or Rows Below.</p> <p>To delete a row, right-click anywhere in the row and then choose delete cells, delete entire row from the table menu.</p>
<p>Signed by traffic and safety engineer</p>	<p>Caron Greenough</p>	<p>Date: 19th November 2012</p>	
<p>Project manager to send completed decision-tracking form to: designer, Audit team leader, traffic and safety engineer (NZTA), project file.</p>		<p>Date: 19th November 2012</p>	

RSA report recommendations – Decision-tracking form – PMM 6.5a



Project title
 Project manager
 Road safety auditors

RSA stage
 Designer

Recommendation*	Report reference and severity*	Designer comments	Decision
<p>Diameter of central island</p> <p>a. Adopt a 48m diameter central island. b. If a 40m diameter central island is progressed, ensure that the design meets the Austroads GTRD Part 4B deflection criteria and consistency of entry speed on all approaches.</p>	2.1 Minor	Agree with recommendations. A 48m diameter central island has been adopted for the scheme design. A 40m diameter central island will be further considered at the detailed design stage. The roundabout design will accommodate a semi-trailer unit and generally comply with Austroads GTRD part.	It's not clear why the design team presented the 40m (minimum diameter) option for review, although it may be further considered during the design development stage, prior to construction. The consent application (and land requirement plans are based on 48m).
<p>Approach speeds</p> <p>At the detail design stage include measures to slow traffic on the approaches to the roundabout such as kerbing on the approaches, high impact warning signage, speed activated warning signs and transverse pavement markings.</p>	2.2 Minor	Agree with recommendation. Within the detail design phase of this work we will apply measures including kerbing, signage and paint markings to provide guidance to vehicles approaching the roundabout. It is considered that measures such as speed activated warning signs and transverse markings only be used where safety issues cannot be mitigated by conventional measures.	Agree with Safety Audit Team; NZTA will like to see approach speeds managed and consideration of additional features to achieve this included in the detailed design stage.
<p>Width and form of median islands on SH1 approaches</p> <p>a. Construct 1.4m width median/splitter islands on the SH1 approaches with 750mm diameter RG-17 signs provided on the approach noses.</p>	2.3 Minor	Agree with recommendations. 1.4m wide median/splitter islands with mountable kerbs will be used where deemed appropriate. Median/splitter islands to tie-in with the existing road marking layout. To the north the paint markings along with the median/splitter island will be design to allow provision for a wire rope barrier to be installed north of the roundabout if NZTA deem	Not sure what the phrase "deemed appropriate" will entail but NZTA certainly would like to see a wider median/splitter island with capacity for retro-fitting a WRB at some point. The designer should check that this

<p>b. Use mountable kerbs for construction of all traffic islands. c. Ensure that the design provides for the retrofitting of wire rope median barrier</p>	<p>2.4 Significant</p>	<p>this suitable in the future.</p> <p>Agree with recommendation. Within the detail design phase of this work, appropriate signs will provide guidance to warn vehicles approaching the roundabout. Two PW69 (roundabouts chevron board) to be placed within the central island for each of the approaches. We will also look at painting the central island kerb with reflectorized paint to delineate the edge. A landscape plan has been prepared for the roundabout which will be further developed in the detailed design stage.</p>	<p>will not change the land requirement plan under discussion with the Browns or the consent application which is at pre-lodgement stage.</p> <p>Agree with Designer's approach to the visibility issue, noting that there will be opportunities for community input into the finished design, inc local iwi.</p>
<p>Point of change of grade on Otaihanga Rd approach</p> <p>On the Otaihanga Road approach, design the instantaneous change of grade to occur at and not prior to the limit line at the roundabout.</p>	<p>2.5 Minor</p>	<p>Agree with recommendation. Detailed design of Otaihanga Road vertical alignment will position instantaneous change of grade in accordance with design standards to provide best and sufficient visibility.</p>	<p>Agree with Safety Audit Team's recommendation, so will be keen to see this issue resolved during the design phase.</p>
<p>Safety of cyclists</p> <p>a. Remove the shoulder markings on the approaches to, and around, the roundabout per Figure 3.17 in MOTSAM Part 2: Markings. b. Design the off-road path to tie in with the ends of the above shoulder markings and with angled ramps to enable cyclists to safely move between the shoulder and the path. c. Use the proposed service lane on the eastern side of the roundabout as a potential section of an off-road cyclist facility with connections to the crossing points.</p>	<p>2.6 Minor</p>	<p>a. Agree with recommendation. Shoulder marking will be amended for cycleway in accordance with MOTSAM. b. Detailed design to provide off road path to tie in with end of the road shoulder as per MOTSAM Part 2 in conjunction with Austroads part 4B: Roundabouts. c. For cyclists traveling from Waikanae to Paraparaumu the design is to encourage them to use the foot path adjacent to the roundabout instead of cycling through the roundabout with connections to crossing points.</p>	<p>Agree with the Safety Audit Team.</p>
<p>Roadmarking and layout issues</p>	<p>2.7</p>	<p>a. Continuity markings are to be removed where two lanes merge to one lane over the taper length.</p>	<p>a. Agree with Safety Audit Team b. Agree with the Designer's</p>

<p>a. Remove the continuity lines from the two lanes to one lane tapers on SH1.</p> <p>b. Extend both the SH1 approach median islands into the circulating carriageway of the roundabout where there will be a single circulating lane.</p> <p>c. Extend the existing flush median width on the southern SH1 approach to tie in with the proposed solid median island and to provide for safer right turns into properties.</p>	Minor	<p>b. The roundabout circulation traffic lanes have been designed as per Austroads Part 4B: Roundabouts. The design currently indicates two circulating lanes. The detailed design will consider painted islands to create a single circulating lane on SH1. This will allow for an additional circulation lane in the future.</p> <p>c. SH1 approach design to be finalised to accommodate existing flush median and new median island.</p>	<p>approach to extend the central median by painting.</p> <p>c. I believe that this has already been amended in the latest Scheme Plan for the southern approach but I'm not convinced it ties in with the width of the new flush median on the northern approach.</p>
<p>Protection of hazards</p> <p>Remove, relocate or protect roadside hazards such as existing power poles, stormwater ponds and culvert headwalls.</p>	2.8 Significant	<p>The detailed design is to remove hazards where practical. Where a hazard cannot be removed, measures to mitigate the hazard, including barriers, will be considered.</p>	<p>Agree with Designer's approach.</p>
<p>Design of local access road</p> <p>Ensure that the entry from the roundabout to the local access road is designed</p> <p>(1) to look like a driveway and not a public road, and</p> <p>(2) to have sufficient width to enable safe turns from the roundabout.</p>	2.9 Minor	<p>1. Agree with recommendation. The service lane access will be designed to look like a driveway and not a public road. Install "no exit" signs at the start of the driveway to discourage motorists from entering the driveway by accident.</p> <p>2. The width of the access will provide sufficient pavement to safely accommodate an 8m rigid truck to/from the roundabout.</p>	<p>Agree with Designer's approach.</p>
<p>* Audit team leader to complete, attach to the report, and send electronically to the project manager.</p>			

Signed by project manager	Andrew Quinn	Date: 19 th November 2012	<p>For additional rows, click in the bottom right cell of the table above, choose Table from the menu toolbar > Insert > Rows Above or Rows Below.</p> <p>To delete a row, right-click anywhere in the row and then choose delete cells, delete entire row from the table menu.</p>
Signed by traffic and safety engineer	Caron Greenough	Date: 19 th November 2012	
Project manager to send completed decision-tracking form to: designer, Audit team leader, traffic and safety engineer (NZTA), project file.		Date 19 th November 2012	

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Marija Bakulich

From: Caron Greenough
Sent: Wednesday, 7 November 2012 1:17 p.m.
To: Wgtn regionalwebqueries
Subject: RE: Crash data # 18946197
Attachments: SH1 Otaihanga Intersection 150m radius within int. (crash diagram).pdf.pdf; SH1 Otaihanga Intersection - 150m radius within int.(english report).PDF.PDF

Hi Derek

I am the Principal Road safety engineer for NZTA Central Area. James King is still producing data for us but I think he is now working for his own company. I am happy to supply data for this area if you need it in the future.

I have extracted the data you requested - I am assuming it is related to the truck crash last week? We have extracted the data for 150m either side of the intersection, which is slightly wider than we would normally use for an intersection. I'm not sure where the 27 crashes you mention - we can only find 23 crashes in the last 5 years and that includes October's data? For the 150m radius there are 3 serious injury crashes and 4 minor injury crashes recorded but not all of them are related to the acceleration lane or the merge as similar to the truck crash.

Anyway I hope the information is useful and please let me know if I can be of assistance.

Regards

Caron

Caron Greenough
Principal Safety Engineer
DDI 04 931 8928
E caron.greenough@nzta.govt.nz

NZ Transport Agency

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PSIS House
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Lambton Quay
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From: CHAPMAN, Derek [<mailto:Derek.Chapman@police.govt.nz>]
Sent: Saturday, 3 November 2012 8:43 p.m.

To: Info@nzta.govt.nz

Subject: Crash data

Hello, I used to deal with James King, Traffic Engineer and do not know who has replaced him.

I have a query about the intersection of SH1/Otaihanga Road. In the past 5 years there have been 27 crashes there and I was wondering how I can obtain a Site Detail Report showing the movements of each of those crashes please.

Derek Chapman
Senior Sergeant
Road Policing
Kapiti Mana

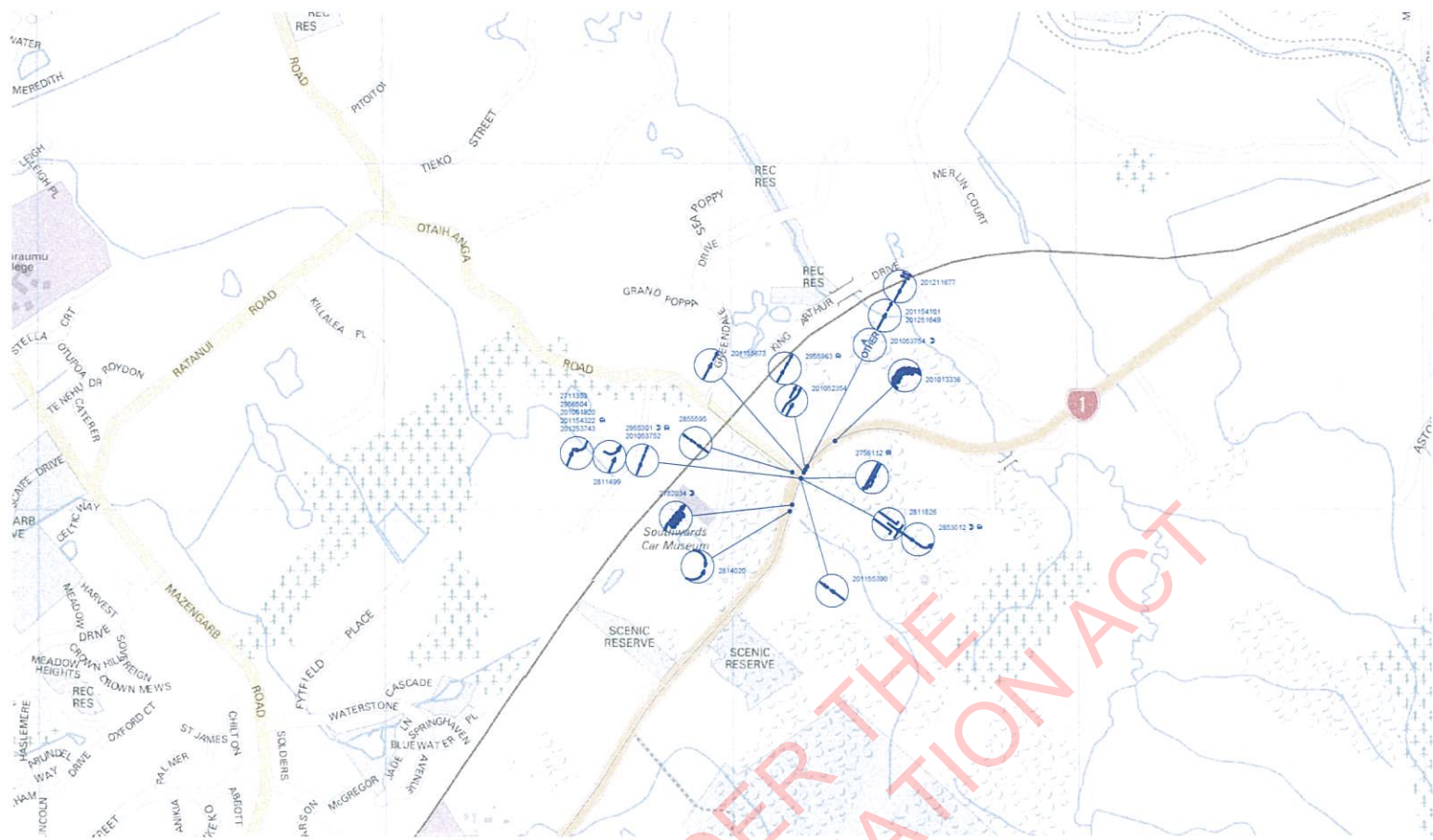
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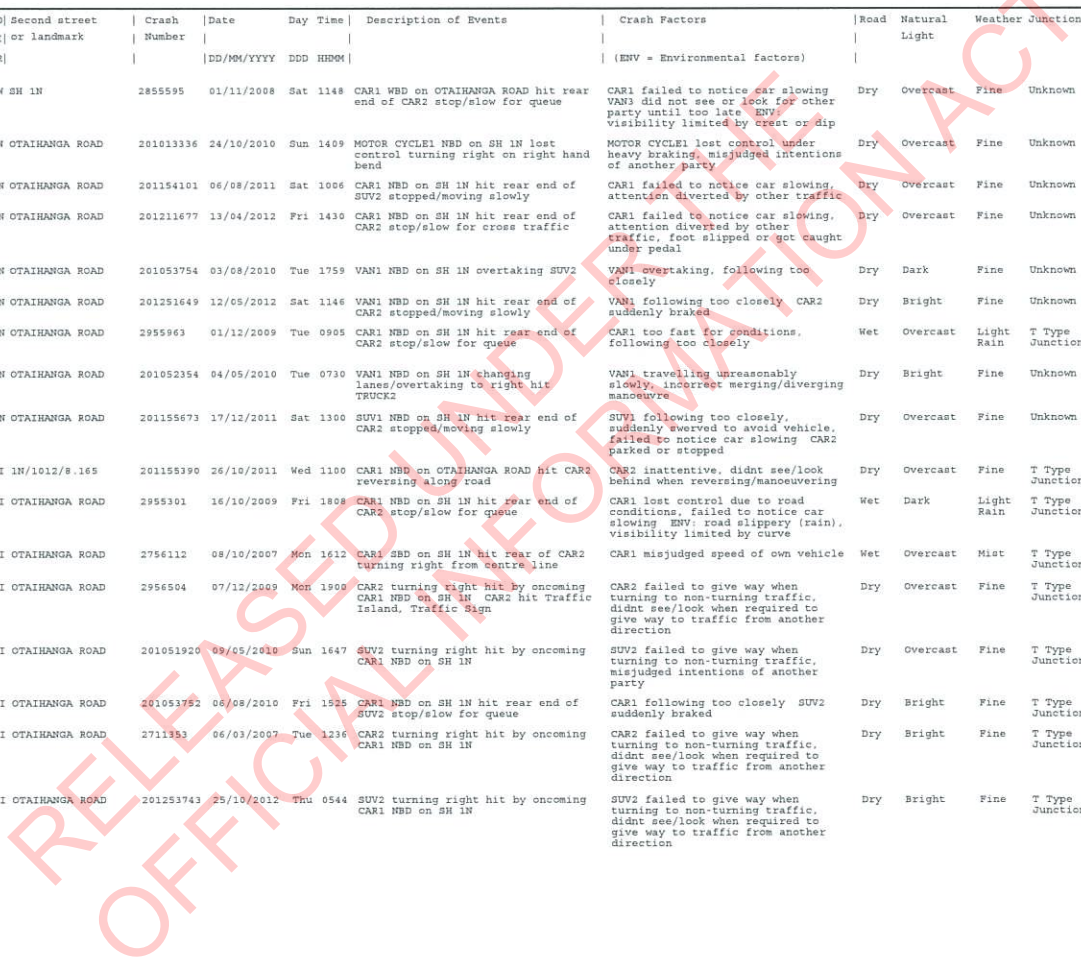
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First Street	[D] Second street [I] or landmark Distance [R]	Crash Number	Date DD/MM/YYYY	Day Time DDD HR00	Description of Events	Crash Factors (ENV = Environmental factors)	Road Natural Light	Weather Junction	Cntrl	Tot Inj F S M A E I T R N
OTAIHANGA ROAD	30W SH 1N	2855595	01/11/2008	Sat 1148	CAR1 NBD on OTAIHANGA ROAD hit rear end of CAR2 stop/slow for queue	CAR1 failed to notice car slowing VAN3 did not see or look for other party until too late ENV: visibility limited by crest or dip	Dry Overcast	Fine	Unknown Nil	
1N/1012/8.015	150N OTAIHANGA ROAD	201013336	24/10/2010	Sun 1409	MOTOR CYCLE1 NBD on SH 1N lost control turning right on right hand bend	MOTOR CYCLE1 lost control under heavy braking, misjudged intentions of another party	Dry Overcast	Fine	Unknown Nil	1
1N/1012/8.125	40N OTAIHANGA ROAD	201154101	06/08/2011	Sat 1006	CAR1 NBD on SH 1N hit rear end of SUV2 stopped/moving slowly	CAR1 failed to notice car slowing, attention diverted by other traffic	Dry Overcast	Fine	Unknown Nil	
1N/1012/8.125	40N OTAIHANGA ROAD	201211677	13/04/2012	Fri 1430	CAR1 NBD on SH 1N hit rear end of CAR2 stop/slow for cross traffic	CAR1 failed to notice car slowing, attention diverted by other traffic, foot slipped or got caught under pedal	Dry Overcast	Fine	Unknown Nil	1
1N/1012/8.125	40N OTAIHANGA ROAD	201053754	03/08/2010	Tue 1755	VAN1 NBD on SH 1N overtaking SUV2	VAN1 overtaking, following too closely	Dry Dark	Fine	Unknown Nil	
1N/1012/8.125	40N OTAIHANGA ROAD	201251649	12/05/2012	Sat 1146	VAN1 NBD on SH 1N hit rear end of CAR2 stopped/moving slowly	VAN1 following too closely CAR2 suddenly braked	Dry Bright	Fine	Unknown Nil	
1N/1012/8.135	30N OTAIHANGA ROAD	2955963	01/12/2009	Tue 0905	CAR1 NBD on SH 1N hit rear end of CAR2 stop/slow for queue	CAR1 too fast for conditions, following too closely	Wet Overcast	Light Rain	Junction Give Way Sign	
1N/1012/8.135	30N OTAIHANGA ROAD	201052354	04/05/2010	Tue 0730	VAN1 NBD on SH 1N changing lanes/overtaking to right hit TRUCK2	VAN1 travelling unreasonably slowly, incorrect merging/diverging manoeuvre	Dry Bright	Fine	Unknown Nil	
1N/1012/8.145	20N OTAIHANGA ROAD	201155673	17/12/2011	Sat 1300	SUV1 NBD on SH 1N hit rear end of CAR2 stopped/moving slowly	SUV1 following too closely, suddenly swerved to avoid vehicle, failed to notice car slowing CAR2 parked or stopped	Dry Overcast	Fine	Unknown Nil	
OTAIHANGA ROAD	I 1N/1012/8.165	201155390	26/10/2011	Wed 1100	CAR1 NBD on OTAIHANGA ROAD hit CAR2 reversing along road	CAR2 inattentive, didnt see/look behind when reversing/manoeuvring	Dry Overcast	Fine	T Type Junction	Stop Sign
1N/1012/8.165	I OTAIHANGA ROAD	2955301	16/10/2009	Fri 1808	CAR1 NBD on SH 1N hit rear end of CAR2 stop/slow for queue	CAR1 lost control due to road conditions, failed to notice car slowing ENV: road slippery (rain), visibility limited by curve	Wet Dark	Light Rain	T Type Junction	Give Way Sign
1N/1012/8.165	I OTAIHANGA ROAD	2756112	08/10/2007	Mon 1612	CAR1 NBD on SH 1N hit rear of CAR2 turning right from centre line	CAR1 misjudged speed of own vehicle	Wet Overcast	Mist	T Type Junction	Stop Sign
1N/1012/8.165	I OTAIHANGA ROAD	2956504	07/12/2009	Mon 1808	CAR2 turning right hit by oncoming CAR1 NBD on SH 1N CAR2 hit Traffic Island, Traffic Sign	CAR2 failed to give way when turning to non-turning traffic, didnt see/look when required to give way to traffic from another direction	Dry Overcast	Fine	T Type Junction	Give Way Sign
1N/1012/8.165	I OTAIHANGA ROAD	201051920	09/05/2010	Sun 1647	SUV2 turning right hit by oncoming CAR1 NBD on SH 1N	SUV2 failed to give way when turning to non-turning traffic, misjudged intentions of another party	Dry Overcast	Fine	T Type Junction	Stop Sign
1N/1012/8.165	I OTAIHANGA ROAD	201053752	08/08/2010	Fri 1525	CAR2 NBD on SH 1N hit rear end of SUV2 stop/slow for queue	CAR1 following too closely SUV2 suddenly braked	Dry Bright	Fine	T Type Junction	Stop Sign
1N/1012/8.165	I OTAIHANGA ROAD	2711353	06/03/2007	Tue 1236	CAR2 turning right hit by oncoming CAR1 NBD on SH 1N	CAR2 failed to give way when turning to non-turning traffic, didnt see/look when required to give way to traffic from another direction	Dry Bright	Fine	T Type Junction	Stop Sign
1N/1012/8.165	I OTAIHANGA ROAD	201253743	25/10/2012	Thu 0544	SUV2 turning right hit by oncoming CAR1 NBD on SH 1N	SUV2 failed to give way when turning to non-turning traffic, didnt see/look when required to give way to traffic from another direction	Dry Bright	Fine	T Type Junction	Stop Sign



First Street	[D] Second street [Z] or landmark Distance [R]	Crash Number	Date [DD/MM/YYYY]	Day Time DDD HHMM	Description of Events	Crash Factors (ENV = Environmental factors)	Road Natural Light	Weather	Junction	Cntrl	Tot Inj F S M A E I T R N	
1N/1012/8.165	I OTAIHANGA ROAD	201154322	12/08/2011	Fri 1203	CAR2 turning right hit by oncoming CAR1 NBD on SH 1N CAR1 hit Traffic Island, Traffic Sign	CAR2 failed to give way when turning to non-turning traffic, misjudged intentions of another party	Wet	Overcast	Fine	T Type Junction	Stop Sign	
1N/1012/8.165	I OTAIHANGA ROAD	2811826	19/04/2008	Sat 0800	CAR1 EBD on OTAIHANGA ROAD missed inters or end of road	CAR1 illness with no warning (eg heart attack)	Dry	Overcast	Fine	T Type Junction	Stop Sign	1
1N/1012/8.165	I OTAIHANGA ROAD	2853012	24/06/2008	Tue 1750	CAR1 EBD on OTAIHANGA ROAD hit rear of left turning CAR2	CAR1 failed to notice car slowing, misjudged intentions of another party	Wet	Dark	Light Rain	T Type Junction	Stop Sign	
1N/1012/8.165	I OTAIHANGA ROAD	2811499	15/03/2008	Sat 0811	SUV1 NBD on SH 1N hit CAR2 merging from the left	CAR2 too fast to give way at intersection, didnt see/look when required to give way to traffic from another direction.	Dry	Bright	Fine	T Type Junction	Stop Sign	1 1
1N/1012/8.245	805 OTAIHANGA ROAD	2752034	18/02/2007	Sun 0525	CAR1 NBD on SH 1N lost control; went off road to right. CAR1 hit Fence	CAR1 alcohol test above limit or test refused, fatigue (drowsy, tired, fell asleep)	Dry	Dark	Fine	Unknown	Nil	
1N/1012/8.265	1005 OTAIHANGA ROAD	2814020	22/11/2008	Sat 1725	CAR1 NBD on SH 1N swinging wide hit SUV2 head on	CAR1 swung wide on bend	Dry	Overcast	Fine	Unknown	Nil	1

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Philip Chatterley

From: Philip Chatterley
Sent: Thursday, 29 March 2012 5:06 p.m.
To: Simon Oddie
Cc: Jane Black; Eric Whitfield; Peter Bradshaw
Subject: M2PP: Browns Property & Otaihanga R/A

Hi Simon,

With regard to Otaihanga Road roundabout, please see attached draft update.

SH1/Otaihanga Road Roundabout Intersection design

The alliance is currently in the process of scoping the works and preparing a fee estimate to progress the scheme through the to scheme assessment report (SAR). NZTA have advised that the works should be carried out in accordance with the principles of the Standard Professional Services Specification process. The fee proposal to get to SAR stage is to be request through the PAB for additional expenditure.

The current thought is that planning works would progress in parallel to the SAR to allow the scheme to apply for consents at the end of the SAR stage. The indication to date is that KCDC agree in principle to progressing as a minor amendment to the designation. This shall consider gaining agreement from the local parties affected and obtaining affected party sign-off.

To date the alliance has developed a concept for a roundabout intersection, which has being through one iteration to incorporate comments from a safety review. A second safety review on the updated arrangement has been carried out and comments shall be incorporated in the next stage.

A meeting is scheduled with KCDC on 30 March 2012 to present the concept with the aim of obtaining their agreement in principle to the design proposal.

On receipt of KCDC's general acceptance of the scheme the alliance will consult with affected parties and organisations.

A draft programme is attached in accordance with the NZTA estimated time frame for scheme based on 18 month. It is recognised that the opportunity (and NZTA desire) is to overlap phases and so fast track the SAR, consent and design development phases, The fast tracked option shows a "break-through" programme of 12 months whereby the works are completed by March 13.

The alliance recognises that the key ingredient to the success of this programme is gaining the approval of the scheme by our stakeholders...KCDC, landowners and GWRC.

Regards

Phil



Otaihanga RA
programme.pdf

From: Eric Whitfield
Sent: Thursday, 29 March 2012 3:15 p.m.
To: Simon Oddie; Philip Chatterley
Cc: Jane Black
Subject: RE: Browns Property

We had a workshop with KCDC end of February and we are progressing a number of tasks that came out of the workshop. One of them is working with KCDC on why their model produces different results to ours, the other is what happens if Ihakara St Ext is not built. The team will have findings end of next week.

I don't know who the Browns are or how they are affected by changes to Kapiti Road.

Cheers,

Eric Whitfield

Associata - Transportation
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Eric.Whitfield@beca.com
www.beca.com

Most Reputable Organisation 2011 // NZ Management Magazine/Hay Group
Most Sustainable Large Business 2011 // Fairfax Media/PwC Sustainable 60 Awards

From: Simon Oddie
Sent: Thursday, 29 March 2012 2:26 p.m.
To: Philip Chatterley
Cc: Jane Black; Eric Whitfield
Subject: RE: Browns Property

Phillip, as well as your Otaihangā Roundabout update, is it possible to get an update on Kapiti Road area traffic issues that KCDC brought up? See highlighted below for what we previously had.

Simon Oddie

Level 2, 17-21 Whitmore Street, PO Box 8044, Wellington 6143
Mob: +64 21 704 760 DDI: +64 4 460 1772 Email: simon.oddie@m2pp.co.nz

-----Original Message-----

From: Jane Black [<mailto:jane@incite.co.nz>]
Sent: Thursday, 29 March 2012 2:19 p.m.
To: Simon Oddie
Subject: RE: Browns Property

No sorry I don't . try Eric?

Jane Black
Urban Planner

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PO Box 2058, Wellington
Tel 04 801 6862
Mobile 027 2491867
Fax 04 801 6865
jane@incite.co.nz
www.incite.co.nz

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-----Original Message-----

From: Simon Oddie [<mailto:simon.oddie@m2pp.co.nz>]
Sent: Thursday, 29 March 2012 1:08 p.m.
To: Jane Black
Subject: RE: Browns Property

Just clarified with him, the supplier that has been appointed will commission the farm advisor.

M2PP

- Correspondence

Date 29/03/2012

Philip Chatterley

From: Philip Chatterley
Sent: Thursday, 29 March 2012 10:59 a.m.
To: 'John Perkins'
Cc: Michelle Lewis
Subject: M2PP: SH1/Otaihanga Road Roundabout Intersection design, KCDC Meeting 30/03/2012

Hi John

RE: M2PP: SH1/Otaihanga Road Roundabout Intersection design, KCDC Meeting 30/03/2012

As discussed please find attached a copy of the vertical alignment for the three approaches to the roundabout. Please bear in mind this is still at concept stage and was prepared to show the arrangement is feasible to acceptable standards,



M2PP-SAR-DW... M2PP-SAR-DW... ?-SAR-DWG-CV-SI
RevB.PD...

As discussed, please note that the scheme has been developed from an earlier safety review. The earlier roundabout has been increased in size from a 40 to 48m dia. inner island and approach geometry improved.

In addition, I've included a summary of the safety review comments below to show the current thinking on safety of the design,

I trust this is helpful.

Michelle – can you confirm that there will be someone from the planning section attending in Ross's absence?

Regards

Philip J. Chatterley

Associate

Beca

Phone +64 4 473 7551 Fax +64 4 471 5501

Ext: 4675 Mobile +64 27 205 1193

Philip.chatterley@beca.com

www.beca.com

Most Reputable Organisation 2011 // NZ Management Magazine/Hay Group
Most Sustainable Large Business 2011 // Fairfax Media/PwC Sustainable 60 Awards

Summary of Safety Review Findings (21/03/2102)

1. **Design geometry:** The design in terms of the entry path radii through the limit line achieving the desired deflection and hence entry speeds needs to be confirmed by the designers.
2. **Approach speeds:** Treatment to slow vehicles prior to the roundabout will be important. The use of the long splitter/median islands shown on the southbound and northbound approaches is encouraged, but there will still need to be other measures to encourage slower speeds on the approaches.
3. **Splitter islands:** The above mentioned splitter/median islands on the southbound and northbound approaches are recommended to be 1.4m wide so that the islands are clearly visible.
4. **Conspicuousness:** As the roundabout will be elevated with regard to the Otaihanga Road approach, the central island will need to be made clearly visible. This is a critical safety issue.
5. **Otaihanga Road approach:** To see the limit line at the roundabout by approaching drivers, the crest curve should finish at the limit line with an instantaneous change of grade to tie in with the roundabout carriageway crossfall at that point rather than continuing the crest curve past the limit line. The crest curve should be improved from the K value of 23 proposed to a K value of 27.
6. **Cycle/footpaths:** Separate paths are shown for the extent of the works, though only on one side of each leg. Need to provide a suitable off-road facility and safe crossing points on all legs for cyclists who want to avoid using the

roundabout. The path should preferably be at least 2.0m to allow any cyclists and pedestrians to safely pass each other and safely tie-in with existing facilities/shoulders.

7. Property Access: Properties in proximity to the proposed roundabout that will require safe vehicular access. A separate one-way south to north service lane to serve those properties to the eastern side of the roundabout would enable all approach and departure directions to be achieved via the roundabout. An alternative option for a two-way service lane with sole entry/exit via a fourth leg to the roundabout designed as a driveway so that it does not appear to be a public road to avoid the risk of nose to tail crashes and unsafe lane changing on the southbound departure leg generated by a vehicle slowing to turn left into the service lane whilst other vehicles are accelerating away from the roundabout. Sight distance for turning vehicles will need to be considered.
8. Road Marking:
 - a. The two lanes to one lane merges on the SH1 departure legs are shown with marked tapers on the scheme plan drawing whilst the standard arrangement is to not have these taper markings.
 - b. Shoulder markings should be terminated approximately 30m prior to the roundabout for any cyclists electing to remain on the carriageway.
 - c. Correct Alberta markings will need to be applied.
 - d. The layout needs to be designed to tie in with the existing flush median to the south of the roundabout.
9. Power poles: Having regard to the safe system approach to design to minimise trauma in the event of a crash, it is assumed that power poles that present hazards close to the carriageway will be relocated.

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