

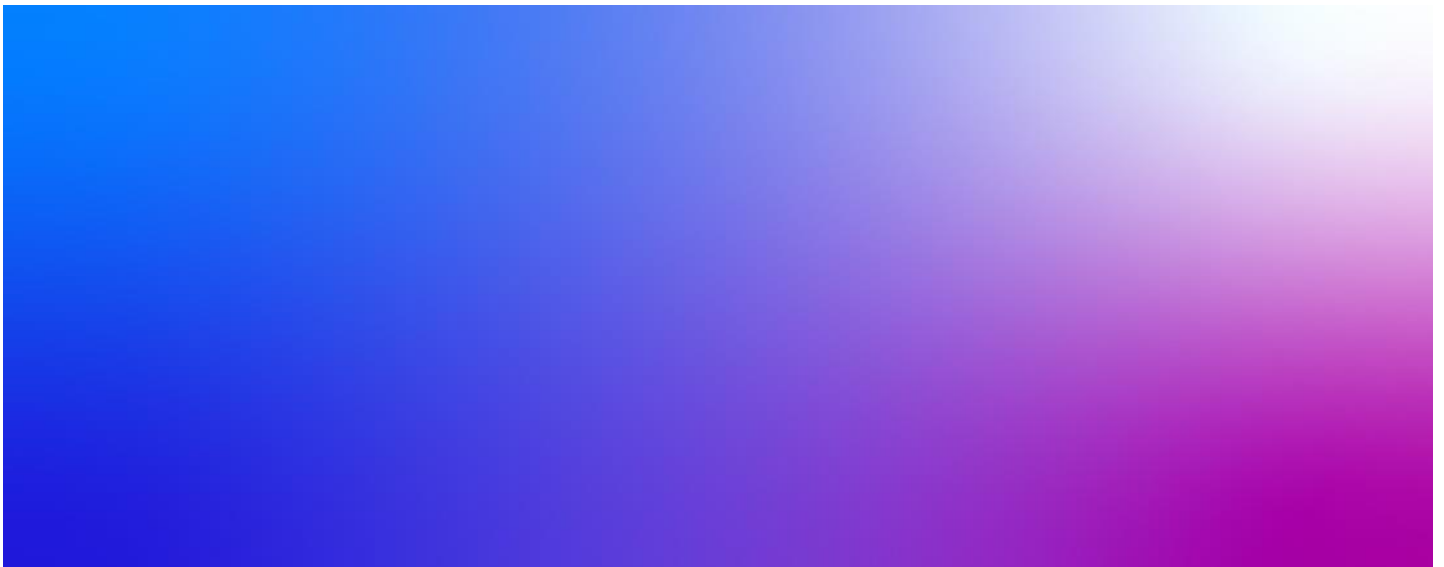


Weigh Right – Multi-Criteria Analysis

Feasibility and Efficiency Assessment

January 17, 2020

Simon Ingamells, Senior Civil Engineer



Introduction

The following assessment has been undertaken as part of the Multi-Criteria Analysis for the site selection for a proposed Commercial Vehicle Safety Centre (CVSC) located between Wellington and Levin. This assessment identifies problems with the sites that would create significant additional cost and/or practical difficulties, to a degree that would render the project uneconomic or the site impracticable for use as a CVSC.

This assessment considers possible and likely access arrangements between the site and the adjacent road, and the length of the diversion required. This assessment has incorporated the proposed alignment of the Peka Peka to Ōtaki Expressway.

In particular, this assessment considers:

- The likely access arrangements between the site and the adjacent road, and the likely access arrangement from the nearest interchange or intersection. In particular, whether achieving access to the sites is possible.
- The length of the diversion that heavy motor vehicles would be required to take. There is a legal requirement in section 125(3)(a) of the Land Transport Act 1998 that precludes the NZ Transport Agency from requiring a driver to travel a distance that would increase the total length of the journey by more than 5km. Therefore, a diversion length of more than 5km would remove a site from further consideration.
- Cost. Where any obvious costs of >\$5million (over and above what a CVSC would normally cost to construct and operate) are identified, the site is removed from further consideration.

Where access to a site is not possible, a required diversion exceeds 5km, and/or a significant cost of >\$5million is identified, the site is not considered to be a feasible or efficient option.

The assessment also notes where the site would result in outcomes that are contrary to the stated objectives of the NZ Transport Agency and its previous projects, and where a potential solution would be inconsistent with the Safe System approach.

Assumptions and Disclaimers

This assessment has assumed that obtaining direct access from the Transmission Gully Motorway, the Kāpiti Expressway or the Peka Peka to Ōtaki Expressway is not possible. However, direct access from old State Highway 1 may be possible.

This assessment has not considered traffic safety considerations such as distances from intersections, sharpness of turns or width of carriageway. These aspects are assessed in detail by a suitably qualified and experienced expert in the second stage of the Multi-Criteria Analysis.

All distances have been measured via a desktop assessment on the Jacobs GIS. As such, the distances are approximate as there may be a margin of error of ± 500 metres.

This assessment identifies obvious sources of cost only (for example, a new off-ramp). The cost to widen existing roads and/or bridges has not been considered. A more detailed assessment of cost implications for the shortlisted sites is provided in the second stage of the Multi-Criteria Analysis.

Site A – Taylor’s Road (North of Ōtaki)

The Peka Peka to Ōtaki Expressway will result in the re-alignment of Taylors Road to connect to State Highway 1 under the Waitohu Stream bridge. The NZ Transport Agency made the decision to close the existing Taylors Road intersection because it was identified as being unsafe. Creating direct access and egress between Site A and the Expressway, particularly for northbound traffic, would be highly problematic and inconsistent with the NZ Transport Agency’s Safe Systems approach.

The safest, and only feasible way to obtain access to Site A would be to construct an extension to the local road off old State Highway 1, as indicated below in Figure 1.

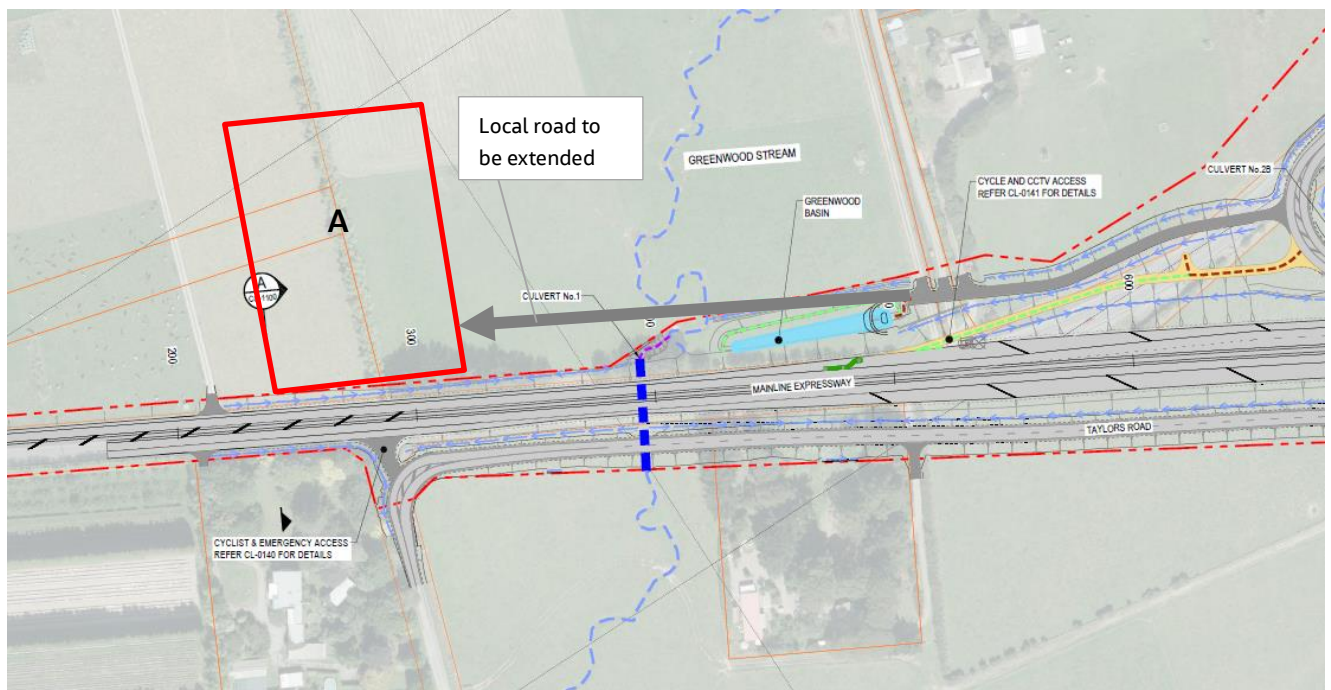


Figure 1 – Likely access to Site A. Image sourced from PP20 Full Alignment Design, General Arrangement Layout Plans dated 10 Oct 2018, Drawing No. PP20-DR-GN-1061 URL: <https://www.nzta.govt.nz/assets/projects/peka-peka-to-Ōtaki-expressway/PP20-full-alignment-design.pdf>

Therefore, the movements required to access Site A are:

- Southbound traffic must take the first exit ramp and turn back north to access Site A. To return to the Expressway, traffic must travel south on State Highway 1 through central Ōtaki and enter the Expressway via the entry ramp at the Interchange located south of the Ōtaki River.
- Northbound traffic access must take the first exit ramp from the Interchange located south of the Ōtaki River onto State Highway 1, travel through central Ōtaki on State Highway 1 and continue north to access Site A. To re-enter the Expressway, traffic must go south and take the entry ramp at the Interchange located north of central Ōtaki.

The indicative movements are shown below in Figure 2.



Figure 2 – Route to access Site A from Peka Peka to Ōtaki Expressway. Image sourced from URL:

<https://www.nzta.govt.nz/assets/projects/peka-peka-to-Ōtaki-expressway/docs/PP20-alignment-map.pdf>

The distance of the required detour is 6.3km in both directions. This distance exceeds the maximum diversion distance of 5km required by section 125(3)(a) of the Land Transport Act 1998.

Site A would result in a situation whereby heavy motor vehicles are diverted from the Expressway to travel through the township of Ōtaki, an outcome which undermines the objective of the Expressway to increase the efficiency of vehicle movements. Heavy motor vehicles could experience significant delays, especially at rush-hour.

Recommendation: That Site A be removed from consideration.

Classification: Red.

Site B – Ōtaki

The alignment of the proposed Peka Peka to Ōtaki Expressway relative to Site B is indicated in Figure 3 below.

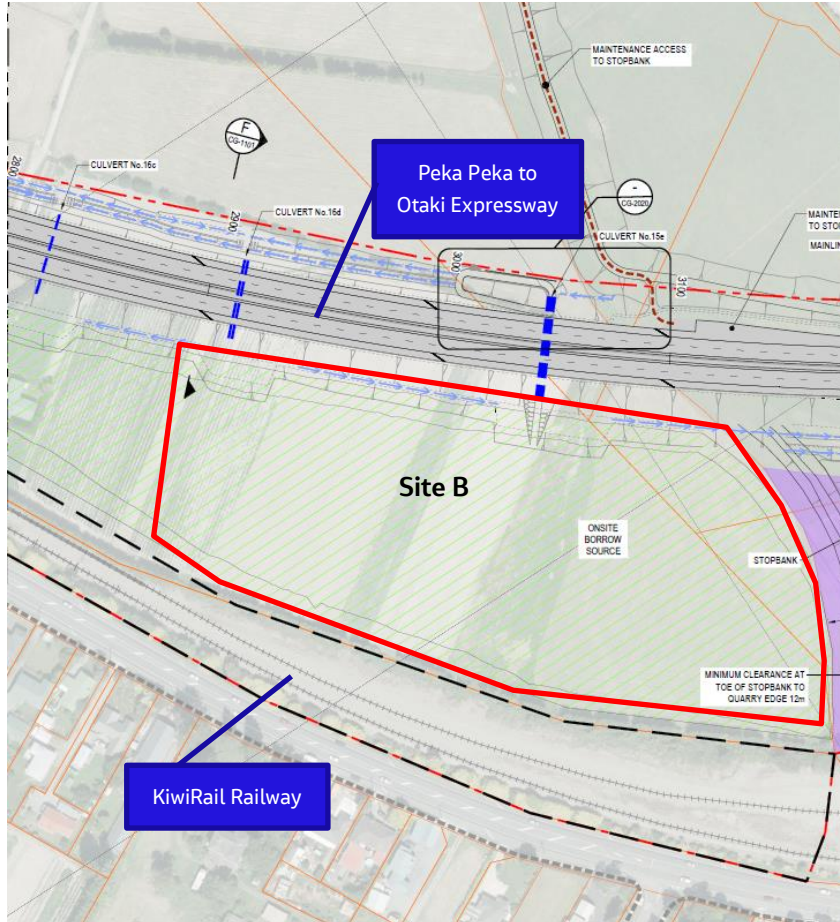


Figure 3 – Site B. Image sourced from PP20 Full Alignment Design, General Arrangement Layout Plans dated 10 Oct 2018, Drawing No. PP20-DR-GN-1065. URL: <https://www.nzta.govt.nz/assets/projects/peka-peka-to-Ōtaki-expressway/PP20-full-alignment-design.pdf>

Obtaining direct access and egress between Site B and the Expressway, particularly for southbound traffic, would be highly problematic and inconsistent with the Safe Systems approach required by the NZ Transport Agency.

From State Highway 1, it is highly unlikely that KiwiRail Holdings Limited would provide approval for an access across their railway line, as this would have significant implications for its operation. Without approval from KiwiRail Holdings Limited, the project could not move forward.

Recommendation: That Site B be removed from consideration.

Classification: Red.

Site C – Peka Peka Interchange

The Peka Peka Interchange is shown below in Figure 5.

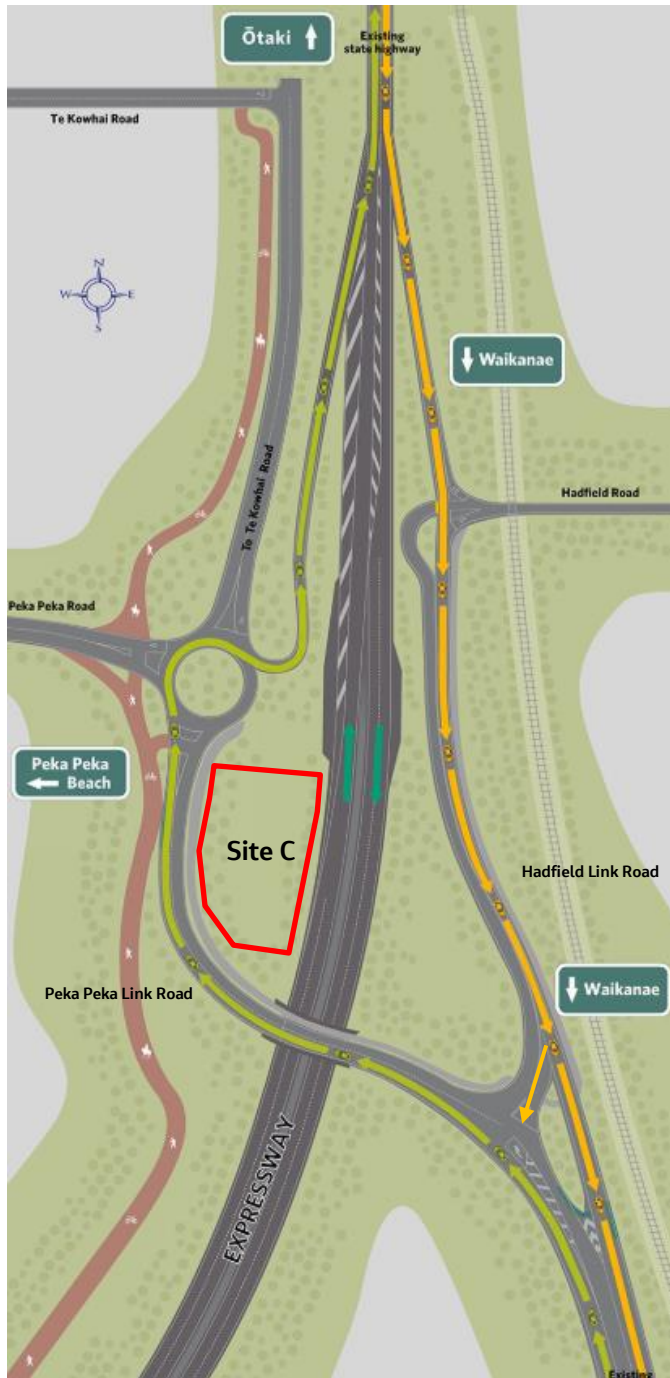


Figure 5 – Peka Peka Interchange. Retrieved from URL: <https://nzta.govt.nz/assets/projects/mackays-to-peka-peka/The-Peka-Peka-Interchange/Peka-Peka-north-and-south-options-bypass-Peka-Peka.jpg>

There is currently no direct access to Site C from the Kāpiti Expressway. Establishing direct access and egress between Site C and the Expressway particularly for southbound traffic, would be highly problematic and inconsistent with the NZ Transport Agency's Safe Systems approach.

The only possible option is to construct an access to Site C from the existing roundabout. This would provide access for vehicles travelling northbound and southbound on State Highway 1 via Hadfield Link and Peka Peka Link Roads with little diversion required.

Vehicles travelling north on the Kāpiti Expressway would divert at the Te Moana Road Interchange and go north through Waikanae on State Highway 1 into Site C, then back onto the Kāpiti Expressway from the roundabout near Site C. The length of the required diversion is 8km.

Vehicles travelling south on the Kāpiti Expressway could divert via the off-ramp at the Peka Peka Interchange and access Site C via Hadfield Link and Peka Peka Link Roads. To continue travelling south on the Kāpiti Expressway, there are two options:

Option One: Take the on-ramp north onto the Peka Peka to Ōtaki Expressway, and travel north until the interchange located to the south of Ōtaki River allows access to the Peka Peka to Ōtaki Expressway in the southbound direction. The length of the required diversion is 32km.

Option Two: Continue south on State Highway 1 and travel through Waikanae, turning right onto Te Moana Road to reach the Te Moana Road Interchange and access the Kāpiti Expressway. The length of the required diversion is 9.5km.

All diversions exceed the maximum diversion length of 5km required by section 125(3)(a) of the Land Transport Act 1998, and results in substantial inefficiencies for heavy vehicle drivers and companies.

Recommendation: That Site C be removed from consideration.

Classification: Red.

Site D – Te Moana Road

There are no impediments to providing access to Site D from Te Moana Road.

The Te Moana Road interchange provides easy access for vehicles travelling north and south on the Kāpiti Expressway, as indicated in Figure 6 below.

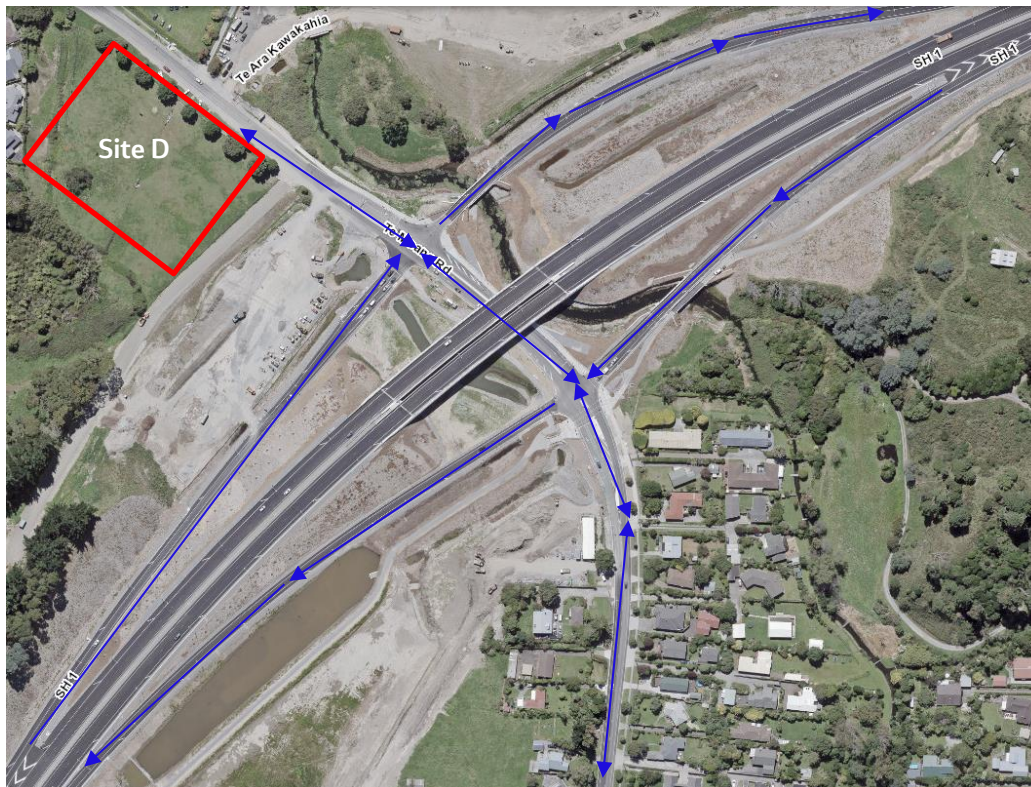


Figure 6 – Site D. Image sourced from Kāpiti Coast District Council Geomaps.

Vehicles travelling north and south on State Highway 1¹ would need to turn off at the intersection with Te Moana Road south of Waikanae, and travel west along Te Moana Road to access the Site D. To continue travelling north or south on State Highway 1, the length of the diversion to reach Site D and go back to the intersection is 6.7km. This distance exceeds the maximum diversion distance of 5km required by section 125(3)(a) of the Land Transport Act 1998.

Recommendation: That Site D be removed from consideration.

Classification: Red.

¹ Technically, the Kāpiti Expressway is now known as State Highway 1, while "old" State Highway 1 is in the process of revocation to the Kāpiti Coast District Council and being provided with new street names. For ease of understanding throughout this report, the Expressways are called by their relevant name (Kāpiti or Peka Peka to Ōtaki), while "old" State Highway 1 is simply called State Highway 1.

Site E – Kāpiti Road

There are no impediments to providing access to Site E from Kāpiti Road. Vehicles travelling northbound and southbound on the Kāpiti Expressway are able to easily access Site E from the Kāpiti Road Interchange, as indicated in Figure 7 below.



Figure 7 – Site E. . Image sourced from Kāpiti Coast District Council Geomaps.

Vehicles travelling north and south on State Highway 1 are able to access Kāpiti Road and Site E using the existing Kāpiti Road/State Highway 1 intersection. To continue travelling north or south on State Highway 1, the length of the diversion to reach Site E and go back to the intersection is 1.8km. This distance is less than the maximum diversion distance of 5km required by section 125(3)(a) of the Land Transport Act 1998.

Recommendation: That Site E moves forward for consideration.

Classification: Green.

Sites F and G – Poplar Avenue

Currently there is no feasible way to provide access to Poplar Avenue for heavy motor vehicles travelling southbound on the Kāpiti Expressway.

The current layout of the Poplar Avenue Interchange is indicated in Figure 8 below.



Figure 8 - Poplar Avenue Interchange. Image sourced from Kāpiti Coast District Council Geomaps.

Option One: Construct southbound exit ramp at Poplar Avenue

The first option to provide access between Poplar Avenue and the Kāpiti Expressway for southbound traffic is to construct a southbound exit ramp at the Poplar Avenue location. The minimum cost to construct a single ramp is \$5 million. This is a significant cost that would make the project uneconomic.

A southbound exit ramp at this location presents significant practical problems. The proximity of the railway line prevents the installation of slip roads to the required standard and would require a major re-alignment of State Highway 1.

Option Two: Significant detour from Kāpiti Road Interchange

Another option is for southbound traffic to use the existing exit ramp at the Kāpiti Road / Kāpiti Expressway intersection, and travel along State Highway 1 through Paraparaumu to access Poplar Avenue.

This would remove the addition >\$5million cost of constructing a southbound off-ramp at Poplar Avenue. However, heavy motor vehicles would then be forced to travel through Paraparaumu township rather than on the Kāpiti Expressway, an outcome that is contrary to the objectives of the Kāpiti Expressway project.

Furthermore, the length of the detour is 5.1km. This exceeds the maximum diversion distance of 5km required by section 125(3)(a) of the Land Transport Act 1998.

Option Three – Detour from Raumati Road

A third option is to construct a southbound off-ramp from the Kāpiti Expressway at Raumati Road.

The length of the detour for this option is only 3.2km. However, this option does not remove the >\$5 million cost of constructing an off-ramp.

Recommendation: That Sites F and G be removed from consideration.

Classification: Red.

Sites H and I – Whareroa Farm and QEII Park

There is no obvious physical impediment to providing access to Site H from Emerald Glen Road, or to providing access to Site I from Whareroa Road.

Northbound and southbound traffic are able to access both sites from the Kāpiti Expressway via the Mackays Crossing Interchange, as indicated below in Figure 9.

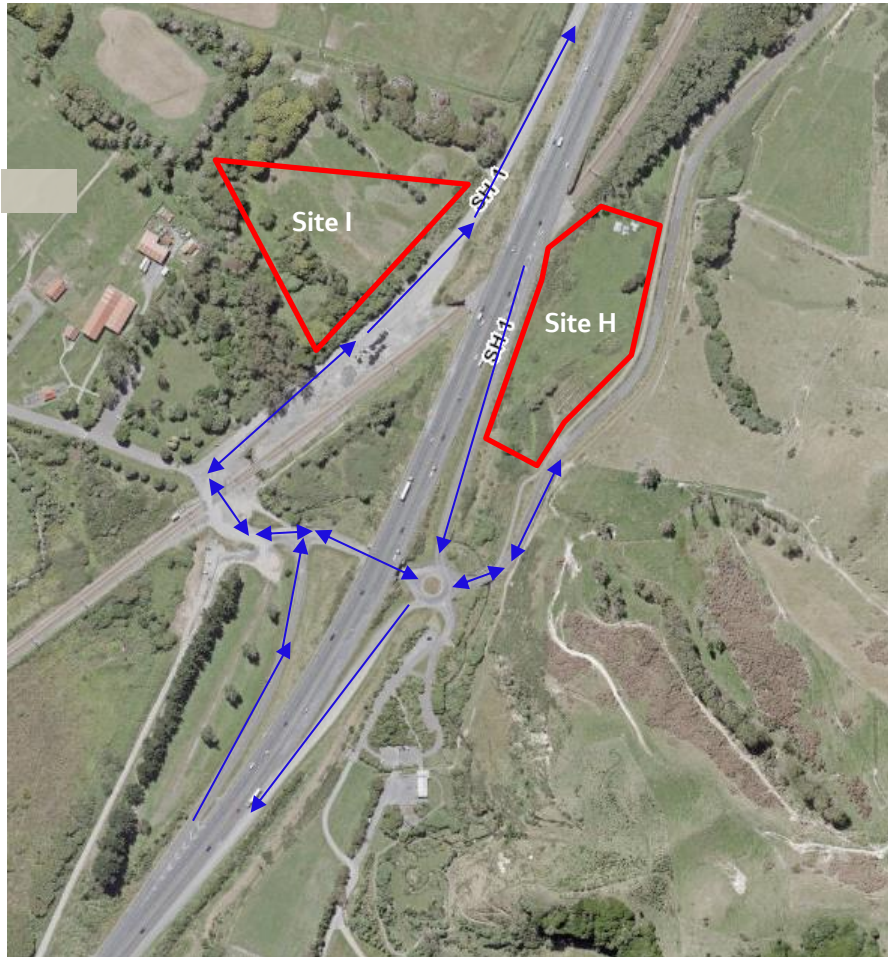


Figure 9 – Sites H and I. Image sourced from . Sourced from Kāpiti Coast District Council Geomaps.

No significant diversions are required.

Recommendation: That Sites H and I move forward for consideration.

Classification: Green

Site J(2) – Kāpiti

Access to Site J(2) could be achieved by constructing an access off the local road constructed between the Mackays Crossing and Paekākāriki Interchanges, as indicated below in Figure 10.

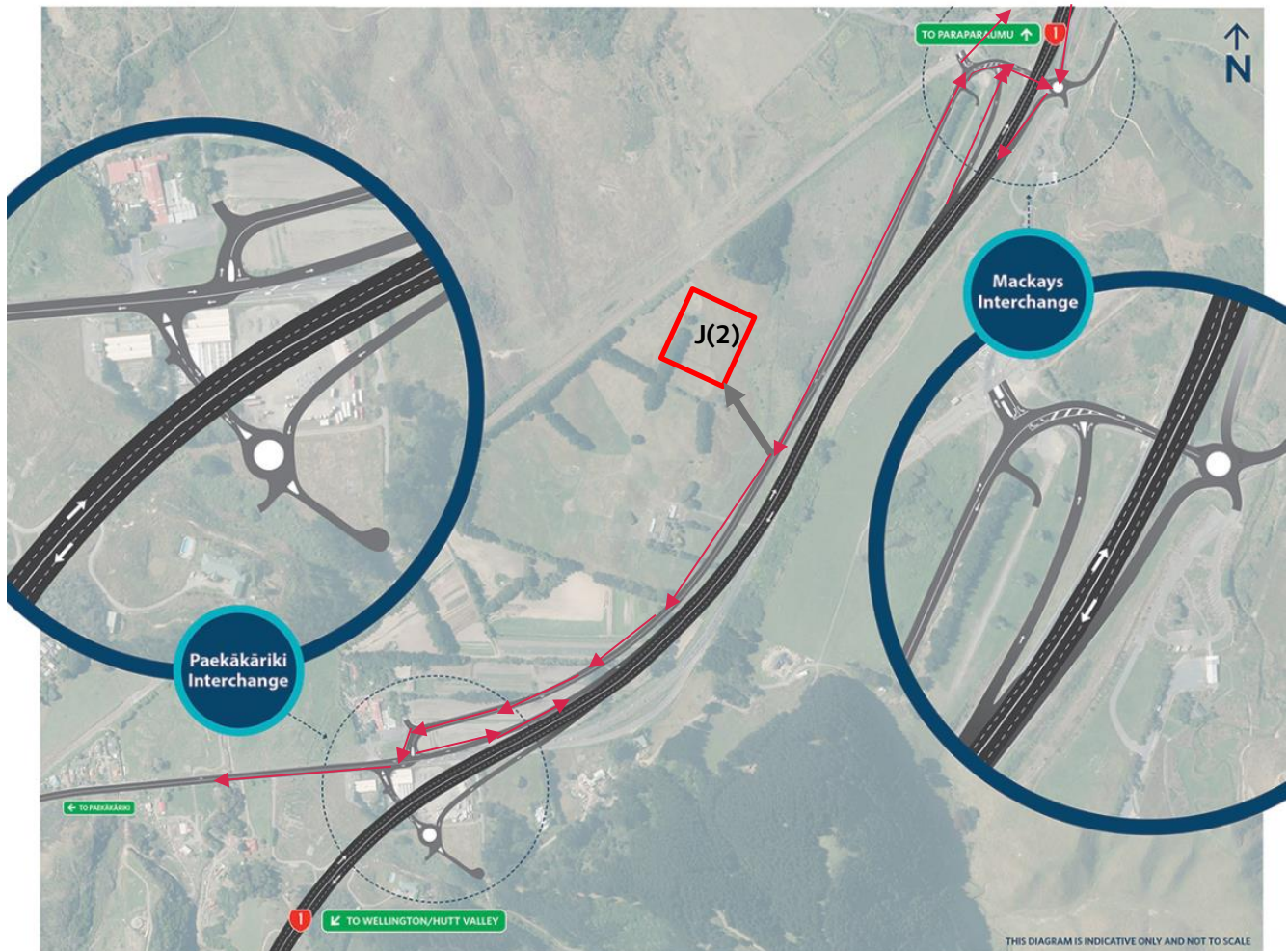


Figure 10 – Site J(2). Image sourced from URL: <https://nzta1.cwp.govt.nz/assets/projects/transmission-gully-motorway/img/mackays-crossing-paekakariki-interchanges-map.jpg>

Southbound traffic is able to access the site via the exit ramp at the Mackays Crossing Interchange, and get back onto the Transmission Gully Motorway via the southbound slip lane at Mackays Crossing Interchange. The length of diversion is 2.8km.

Alternatively, if vehicles seek to continue south on old State Highway 1, this can be achieved at the Paekākāriki Interchange via the local road.

Northbound traffic is able to access the site via the exit ramp at the Mackays Crossing Interchange, and get back onto the Kāpiti Expressway via the northbound slip lane at the Mackays Crossing Interchange. The length of diversion is 2.6km.

Alternatively, vehicles can continue south on the local road and access the northbound on-ramp at the Paekākāriki Interchange. The length of diversion for this option is 3.3km.

All diversions are less than the maximum diversion distance of 5km specified in section 125(3)(a) of the Land Transport Act 1998.

Recommendation: That Site J(2) moves forward for consideration.

Classification: Green

Site K – Sang Sue Corner South

Site K would need to be accessed from the Paekākāriki Interchange. The most feasible access arrangement would be to construct a new access off the roundabout located to the southwest of Site K, as indicated below in Figure 11.

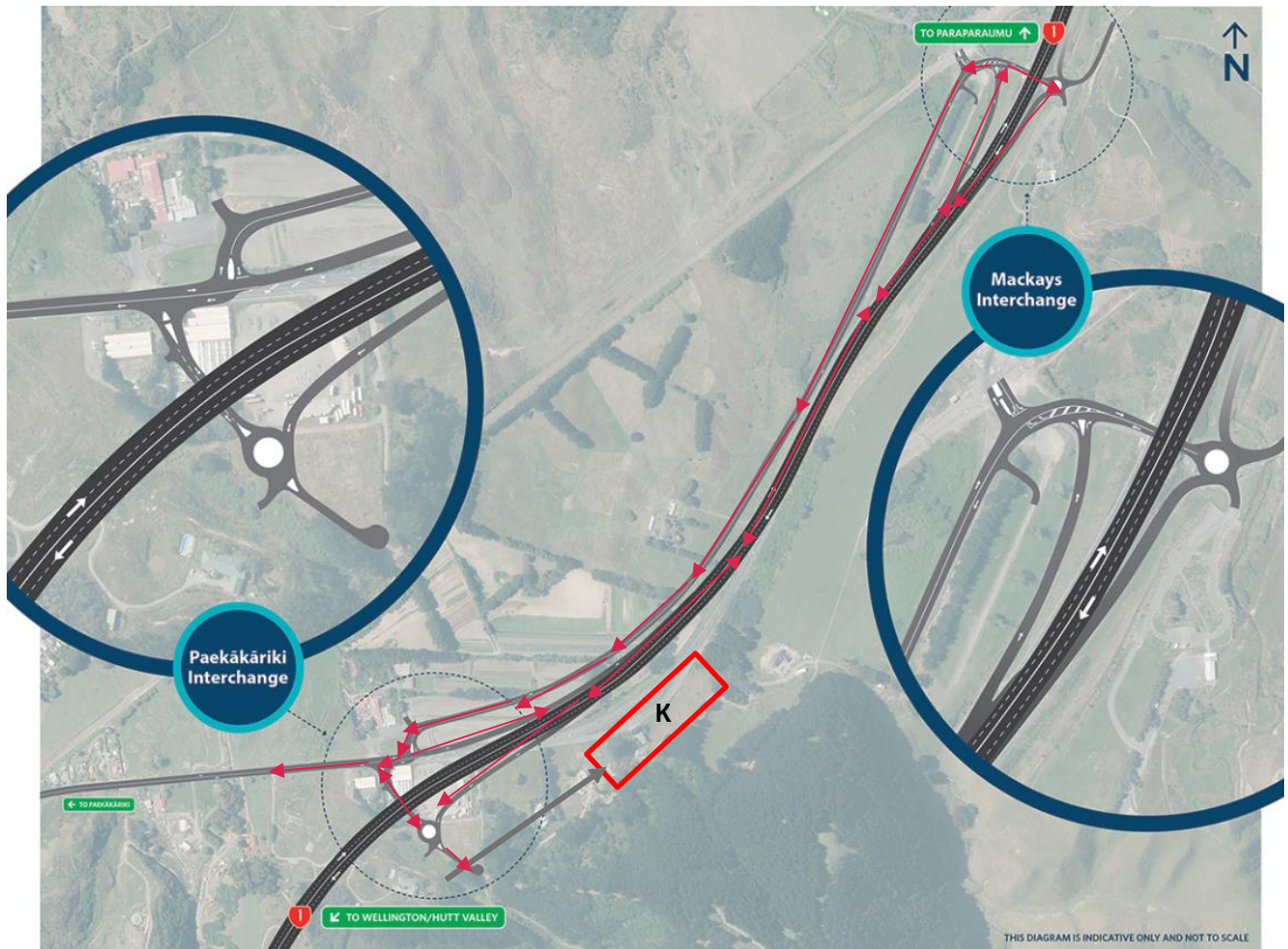


Figure 13 -Site K. Image sourced from URL: <https://nzta1.cwp.govt.nz/assets/projects/transmission-gully-motorway/img/mackays-crossing-paekakariki-interchanges-map.jpg>

Access to Site K can only be obtained by southbound traffic. Southbound vehicles would take the southbound off-ramp at Paekākāriki Interchange and turn onto the access to Site K from the roundabout.

Vehicles travelling south on the Transmission Gully Motorway (the majority of southbound vehicles will be in this category), could travel north on the motorway from Site K via the on-ramp at the Paekākāriki Interchange, exit at the Mackays Crossing Interchange, and enter the motorway again via the southbound slip lane at the Mackays Crossing Interchange. Alternatively, vehicles could exit Site K and travel north on the local road and enter the motorway again via the southbound slip lane at the Mackays Crossing Interchange.

Vehicles travelling south on State Highway 1 could easily continue on from the Paekākāriki Interchange, with a diversion length of 1.34km.

Vehicles travelling north would need to exit the motorway at the northbound exit-ramp at the Mackays Crossing Interchange. Vehicles could travel back south on the motorway via the southbound slip lane at Mackays Crossing. Alternatively, vehicles could travel back south on the local road and access the site through the Paekākāriki Interchange.

To continue north, vehicles can take the northbound on-ramp at the Paekākāriki Interchange re-enter the motorway.

All diversions are 4.4km. This is less than the maximum diversion distance of 5km specified in section 125(3)(a) of the Land Transport Act 1998.

Recommendation: That Site K moves forward for consideration.

Classification: Green.

Site L – Paekākāriki Interchange

Site L would need to be accessed directly from State Highway 1. There are no obvious physical impediments to providing direct access. Vehicles travelling northbound on old State Highway 1 are able to access Site L with no diversion required. The site location and vehicle movements are indicated in Figure 14 below.

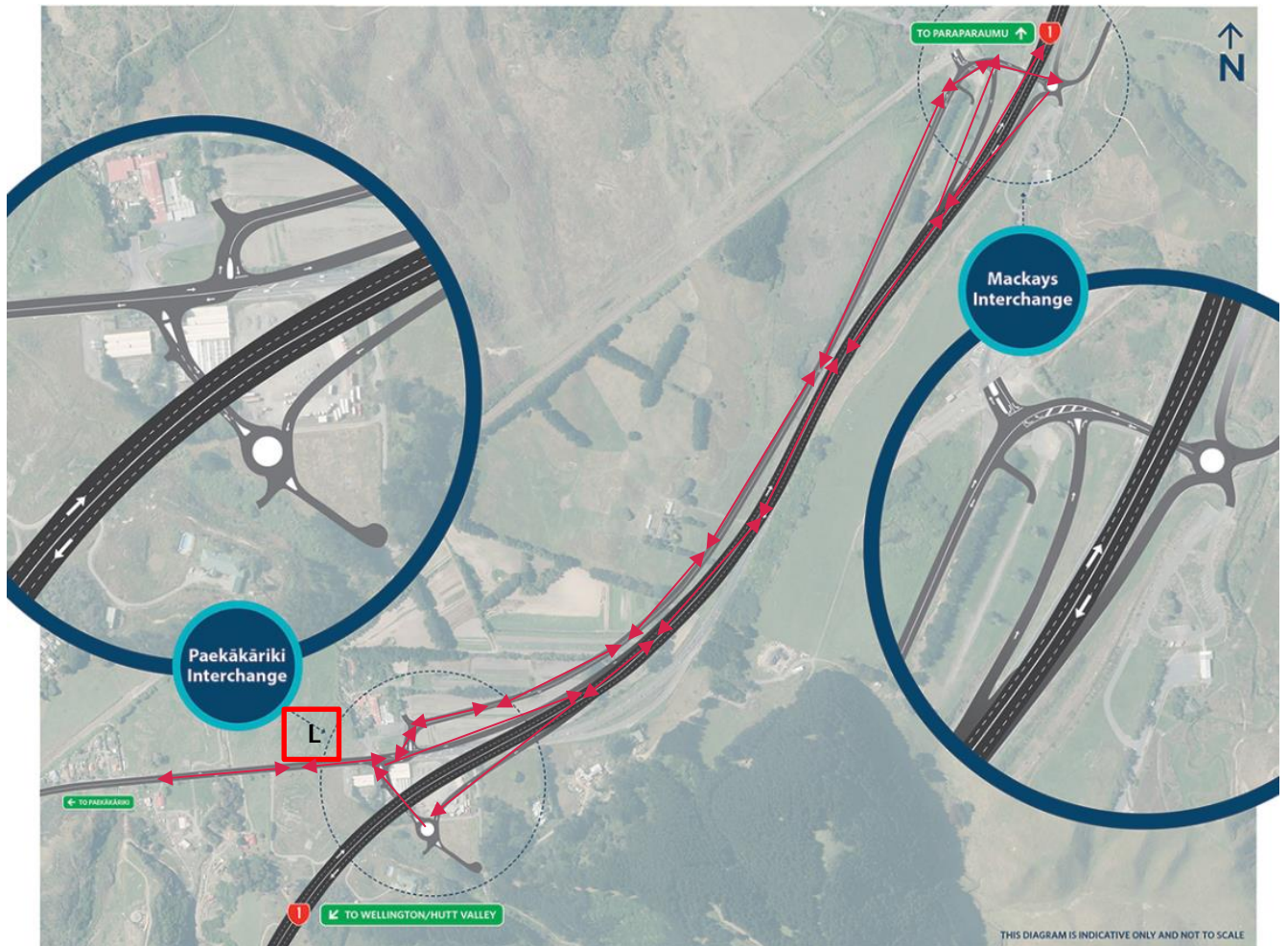


Figure 14 – Site L. Image sourced from URL: <https://nzta.1.cwp.govt.nz/assets/projects/transmission-gully-motorway/img/mackays-crossing-paekakariki-interchanges-map.jpg>

Vehicles travelling north on the Transmission Gully Motorway would be required to exit the motorway at the Mackays Crossing Interchange and travel south on the motorway via the southbound slip lane at the Mackays Crossing Interchange. They would then exit the motorway at the Paekākāriki Interchange, and access Site L from old State Highway 1. As an alternative, vehicles can travel south from the Mackays Crossing Interchange to the Paekākāriki Interchange on the local road rather than the motorway.

From Site L, vehicles can access the motorway again via the northbound entry ramp at the Paekākāriki Interchange, or travel north on the local road and access the motorway at the northbound on-ramp at the Mackays Crossing Interchange.

Vehicles travelling south on the Transmission Gully Motorway would exit the motorway at the Paekākāriki Interchange, and access Site L from State Highway 1. They would then travel north on the motorway via the northbound entry ramp at the Paekākāriki Interchange and exit the motorway at the Mackays Crossing

Interchange. As an alternative, vehicles can also travel north to the Mackays Crossing Interchange via the local road rather than the motorway.

To resume travelling south, vehicles can re-enter the motorway via the southbound slip lane at the Mackays Crossing Interchange. Vehicles continuing south on State Highway 1 could easily continue on from the Paekākāriki Interchange, with a diversion length of 1.34km.

All diversions are 4km. This is less than the maximum diversion distance of 5km specified in section 125(3)(a) of the Land Transport Act 1998.

Recommendation: That Site L moves forward for consideration.

Classification: Green.

Sites M and N – Plimmerton and Lane’s Flat

It is critical that any proposed CVSC is able to capture northbound and southbound traffic from Transmission Gully as well as State Highway 1. In order to achieve this objective, Sites M and N would both need to operate².

The cost to construct two CVSC sites and to install six vehicle screening systems would be significant, and effectively doubles the cost of any of the other identified site options³. The cost would exceed \$5 million. In short, having two CVSC sites makes the project uneconomic.

In practical terms, it is unlikely that the Police would support this option or be able to provide the additional resources that would be required to run two CVSC sites.

Obtaining direct access from State Highway 1 to Site M is problematic as there are semi-rigid median barriers that currently preclude access by southbound vehicles.

For Site N, State Highway 58 has No Crossing barriers that would prevent direct access to Site N for southbound traffic. However, the roundabouts could be used ensure left turns only. This would not result in a significant diversion. The traffic movements are indicated in Figure 15 below.



Figure 15 – Site N. Image sourced from URL: <https://www.nzta.govt.nz/assets/projects/transmission-gully-motorway/docs/TG-SH58-Interchange-map.pdf>

Recommendation: That sites Mand N be removed from consideration.

Classification: Red.

² Diverting traffic from old State Highway 1 to Site N (Lane’s Flat), or from Transmission Gully to Site M (Plimmerton) would involve diverting traffic along State Highway 58, a notoriously dangerous route, for a distance that exceeds 5km.

³ Plimmerton would require upgrading in order to operate as a full CVSC.