

MULTI-CRITERIA ANALYSIS FOR SITE SELECTION

WEIGH RIGHT PROGRAMME

Proposed Commercial Vehicle Safety Centre between Wellington and Levin

29 April 2020

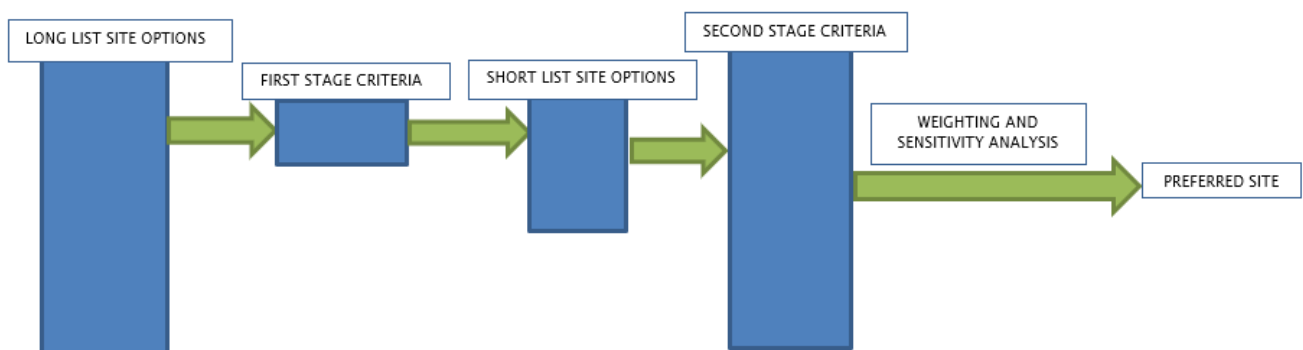


Executive Summary

The NZ Transport Agency has a statutory responsibility to provide a safe and efficient state highway network. Heavy motor vehicles that exceed their weight limits create a higher level of crash risk, increase road maintenance costs for the National Land Transport Fund and local ratepayers, and create unfair market outcomes for freight operators. The **Weigh Right Programme** aims to increase compliance with heavy motor vehicle weight restrictions on the national state highway network by providing provide safe and easily accessed facilities to target and test heavy motor vehicles using the network.

The network between Wellington and Levin is travelled by high volumes of heavy motor vehicles and is projected to experience a growth in freight volumes going through CentrePort, Wellington Airport, and the smaller freight processing hubs located north of Wellington. A Commercial Vehicle Safety Centre (CVSC) located between Wellington and Levin is therefore a strategic necessity for the Weigh Right Programme. It is important that any future CVSC is able to capture heavy motor vehicles travelling on the new Transmission Gully motorway as well as on the existing State Highway 1.

In order to select the most appropriate site for a CVSC, a Multi-Criteria Analysis (MCA) was undertaken. The stages involved in the MCA process are outlined in the diagram below.



A “long list” of fourteen CVSC site options located between Porirua and Ōtaki were initially identified on sites large enough to accommodate a CVSC that were located within 2km of State Highway 1. A “first-stage” assessment was then undertaken to assess the fourteen sites against the following three “first-stage” strategic criteria:

- **Favourable Ground**

The infrastructure needed for the CVSC and associated infrastructure (weigh bridges and weigh-in-motion sensors) is highly sensitive and cannot be placed on soft or filled ground as this will threaten the long-term accuracy and performance of the infrastructure. The state of the existing ground can also have significant cost implications for a project.

- **Difficult to Avoid**

A number of techniques are employed by heavy motor vehicle operators to avoid being selected for weighing. These include waiting for a vehicle to be pulled into the CVSC which stops other vehicles being pulled in, diverting from the route where the weigh facility is operating or selecting an alternate route, and off-loading at a local commercial site. Where there are too many avoidance routes or opportunities for avoidance, it is difficult for the police to resource the coverage they need and difficult to enforce avoidance behaviour. Therefore, where there is more than one avoidance route, a site is not considered suitable for a CVSC.

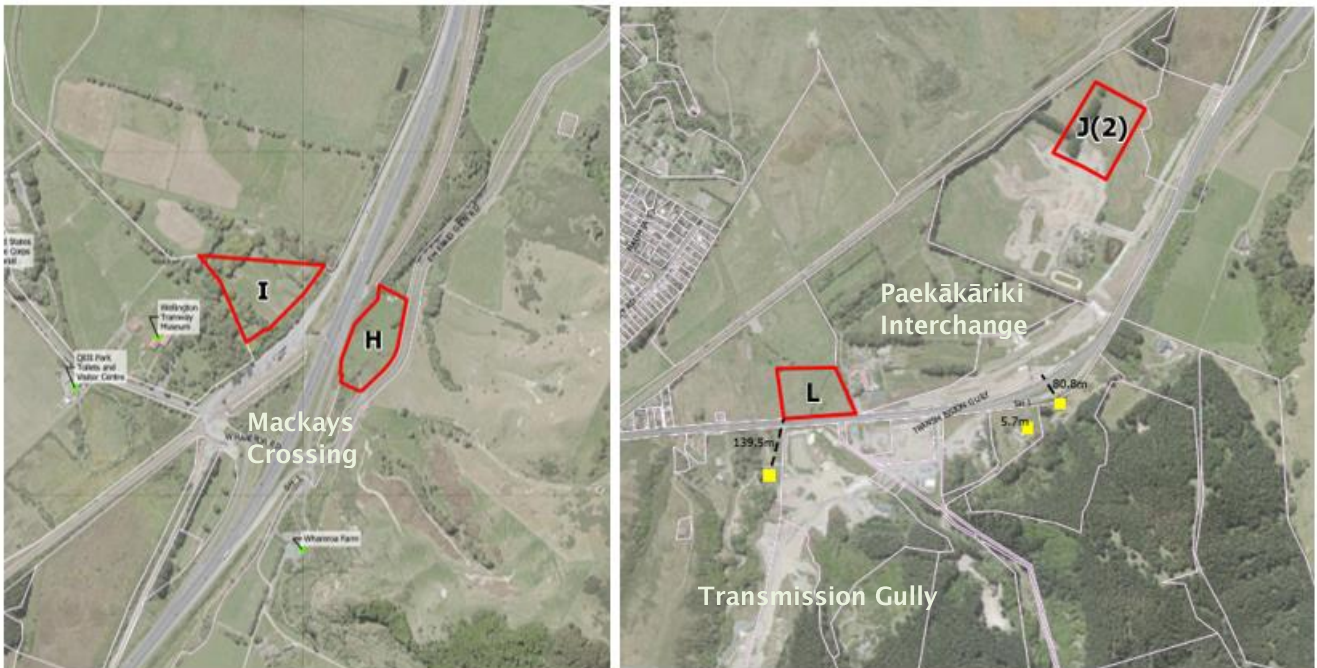
- **Feasibility and Efficiency**

The feasibility and efficiency criteria require that:

- a) access and egress between the site and the highway/expressway is achievable for northbound and southbound heavy motor vehicles;
- b) the length of the required diversion from their route does not exceed 5 kilometres in accordance with a Land Transport Act 1988 restriction; and
- c) there are no obvious costs associated with the site option that would result in a cost that exceeds \$5million (over and above what a single CVSC would normally cost to construct and operate).

If a site or combination of sites is not able to meet the above requirements, it is not considered suitable for a CVSC.

Following an assessment of the fourteen sites against the first stage criteria, ten of the site options were identified as being unsuitable for a CVSC because they could not meet one or more of the three critical strategic criteria. Four sites in the vicinity of Mackays Crossing near Paekākāriki were identified as feasible options that warranted further assessment (the “short list”), and are shown below.



The “short list” of four site options were then assessed through the MCA process. The MCA process involved five technical experts assessing the sites against five key areas identified as the “second stage criteria”, as follows:

- **Design requirements;**
- **Cost to construct;**
- **Property purchase;**
- **Safety for all road users; and**
- **Environmental considerations.**

The experts scored the four sites across a range of criteria utilising a simple –3 to +3 scale.

An independently facilitated workshop was held on 28 January 2020 to ensure that the scoring was consistently applied, that the meaning of the criteria were clear, that all sites were scored using the same set of baseline assumptions, and that there were no overlaps in the criteria used or scoring.

The final scores were then totalled and averaged. Sensitivity testing was undertaken by giving different weightings according to five different scenarios:

- Baseline Scenario (Equal Weighting for all Considerations)
- Scenario 1 (Emphasis on Safety and Environmental Considerations)
- Scenario 2 (Emphasis on Safety and Design Requirements)
- Scenario 3 (Emphasis on Cost and Land Purchase + Design)
- Scenario 4 (Emphasis on Cost and Land Purchase + Environmental)

Overall, Sites I and L (QEII Park and Paekākāriki Interchange) were considered to have too many disadvantages and were therefore considered to be unsuitable for a CVSC. Both sites would require substantial earthworks and be costly to construct. Site I forms part of QEII Park, so the land and RMA approvals would be very difficult to obtain. Site L has some watercourses running through the site which present significant environmental and engineering challenges.

Site H (Whareroa Farm – Emerald Glen Road) overall scored relatively well and could be suitable for a CVSC. However, there are some challenges associated with this site: substantial earthworks would be required, there are space constraints and conflicts with recreational users in the vicinity, and a gas main and fault avoidance area traverse the site.

Ultimately, Site J(2) – Kāpiti performed the best through the MCA process, and is therefore the preferred for the location of a CVSC. In particular, Site J(2) was considered to have a number of key advantages over Site H, including:

- The site is owned by the Crown and is already gazetted for “ use in connection with a road”. Land acquisition for the project and its RMA authorisation (by resource consent or designation) is expected to be straightforward;
- Space is not constrained;
- There are no identified hazards;
- Only minimal earthworks are expected to be required;
- The site is located at a substantial distance from any residential dwellings and there will be minimal conflict with recreational users (cyclists, horse riders, walkers); and
- The site is largely shielded from view from the local vicinity and Transmission Gully motorway by natural landforms.

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Quality Assurance Statement

Project Manager: Ashley Rideout, Jacobs

Prepared by: Kate McNab, Jacobs

Reviewed by: Andrew Henderson, Jacobs
Robert Schofield, Boffa Miskell

Approved for issue by: Deepak Rama, Principal Transport Planner – Transport Services
on behalf of Waka Kotahi / NZ Transport Agency

Contributors

Graham Taylor, Principal Project Manager, NZ Transport Agency

Ulvi Salayev, Project Delivery Manager, NZ Transport Agency

Nimisha Rama, Graduate Spatial Analyst, Jacobs

Jasmin Collosa-Tarr, New Zealand Spatial Team Lead, Jacobs

Jerry Spinks, Team Leader Wellington Ground Engineering, Jacobs

Michael Spittal, Geotechnical Engineer, Jacobs

Louis Bargh, Senior Civil Engineer, Jacobs

Simon Ingamells, Senior Civil Engineer, Jacobs

Bruce Walton, Regional Business Leader, Jacobs

Andrew Henderson, Principal Planner, Jacobs

Kate McNab, Graduate Planner, Jacobs

Jonathan Gulland, Senior Property Acquisition Manager, NZ Transport Agency

Errol Ritson, Senior Safety Engineer, NZ Transport Agency

Deepak Rama, Principal Transport Planner, NZ Transport Agency

Robert Schofield, Planner and Partner, Boffa Miskell – acting as independent facilitator for the workshop held on 28 January 2020 and independent reviewer

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1. BACKGROUND

1.1 The NZ Transport Agency

The New Zealand Transport Agency ('the Transport Agency') is a Crown entity with its objective, functions, powers and responsibilities set out in the Land Transport Management Act 2003 and the Government Roadway Powers Act 1989. The Transport Agency is also a requiring authority under s.167(3) of the RMA.

The Transport Agency's purpose is creating transport solutions for a thriving New Zealand. The Transport Agency shapes New Zealand's transport networks and people's safe and efficient use of them. The Transport Agency connects families, helps businesses take goods to market, and helps others work, study and play.

An integrated approach to transport planning, funding and delivery is taken by the Transport Agency. This includes investment in public transport, walking and cycling, local roads and the construction and operation of State Highways. The Transport Agency exhibits a sense of social and environmental responsibility when undertaking this work.

1.2 The Weigh Right Programme

The Transport Agency regulates heavy motor vehicle trips and monitors heavy motor vehicle loads. Currently, it is estimated that some 10% of heavy motor vehicle trips are exceeding their authorised load limits. Although there is an established network of weigh station sites around the country, this system is inefficient and is unable to identify and target non-compliant operators. This system has created a situation where there is a very low probability of overloaded vehicles being subject to an inspection and discovered.

Heavy motor vehicles that are illegally overloaded can:

- pose a safety risk (this can be significant if a vehicle is not rated to carry the additional weight and is poorly maintained);
- increase costs for the National Land Transport Fund (NLTF) and local councils (ratepayers) through accelerated pavement and structure deterioration resulting in increased maintenance and renewal costs for highways and local roads;
- reduce revenue for the NLTF (through operators not paying the appropriate road user charges to reflect the higher costs that overloaded vehicles impose on the national road network); and
- create unfair market distortions (as operators working within the law are unable to compete with those operating illegally and achieving better margins).

Crash trends from the Ministry of Transport (Truck crash facts, 2012) reveal that "*...Deaths from crashes involving trucks make up around 17 percent of the total road toll, while only about 6% of the total distance travelled on New Zealand roads is travelled by trucks*". Of these crashes, around one third are caused by the operation of the truck. The consequences of crashes involving heavy motor vehicles are severe. Although the extent to which the road toll can be attributed to overloaded heavy motor vehicles is unknown, reducing the incidence of weight infringements will nonetheless contribute to the wider objective of creating safer vehicles across the national fleet.

The Weigh Right Programme is intended to address the above risks and achieve a national reduction in heavy motor vehicle overloading through the targeted selection of overloaded vehicles. The programme uses roadside technology and intelligent software to identify and direct potentially overloaded vehicles into 12 Commercial Vehicle Safety Centres (CVSC – formerly known as weigh stations) strategically located throughout New Zealand.

As part of this system, ‘weigh-in-motion’ sensors will be installed within the road on the approaches to the CVSC. The new weigh-in motion sensors and automatic number plate recognition (ANPR) cameras will send information to a vehicle screening system that will assess whether a heavy motor vehicle complies with its allowable weight and relevant permits. The system will identify a heavy motor vehicle that is potentially overweight, either on gross vehicle mass or by axle weight distribution. That information is then communicated to the Variable Message Signs (VMS) alongside the State Highway. Only those heavy motor vehicles which are identified as potentially overweight will be directed by the VMS to pull in to the CVSC. Once in the CVSC, other safety checks are performed on the vehicle for common issues such as worn brakes and non-functioning lights.

Any heavy motor vehicles which the weigh-in-motion sensors register as compliant will go on their way without needing to pull in. This is expected to reduce delays for compliant operators as they will no longer be required to pull in to be assessed and so provides benefits to the haulage industry in NZ.

To capture the above strategic approach, the following objectives have been developed for the Weigh Right Programme:

1. To enable the safe and efficient use of the state highway network for all users.
2. To increase compliance with heavy motor vehicle weight restrictions on the national state highway network.
3. To provide safe and easily accessed facilities to target and test heavy motor vehicles using the State Highway network.
4. To construct and commission CVSC to maximize the opportunity to screen non-compliant vehicles.

2. STRATEGIC CASE FOR A WELLINGTON SITE

2.1 Traffic Volume

The Weigh Right Programme is designed to maximise the detection of overweight heavy motor vehicles within a value for money framework. A strategic approach has been taken to identifying site locations, so that, overall, the first twelve CVSC sites will cover 46% of the freight kilometres travelled across New Zealand. In order to achieve this efficiency, the NZ Transport Agency has determined that CVSC must be located on or near to High Volume National or Arterial roads that carry at least 1200 heavy motor vehicles per day¹. Such roads tend to be located close to major centres, seaports or significant highway junctions.

¹ Please refer to Appendix 1.

State Highway 1 between Wellington and Levin was identified as a length of highway carrying more than 1200 heavy motor vehicles per day, and one where there is currently a significant gap in data coverage. The traffic volumes in the Wellington region are also expected to increase. The projected freight growth is around 75%, from about 8 million tonnes in 2014 to 14 million tonnes by 2042².

2.2 Freight in the Wellington Region

The Wellington region's freight network consists of road, rail and sea freight. The region's key road freight destinations are Seaview/Gracefield, Petone, Porirua/Tawa and CentrePort.

- **Wellington's CentrePort** is a strategic hub linking road, rail, domestic and international shipping services. Along with KiwiRail's Interislander ferry service, CentrePort is a key link for road and rail freight between the North and South Islands. CentrePort's infrastructure enables the movement of approximately 11 million tonnes of freight per annum, making it one of the busiest ports in New Zealand. Port traffic at Wellington's CentrePort is expected to increase in line with economic growth trends, with most freight arriving at or departing the port by road. In particular, growth in log and container volumes is predicted to continue.
- Air freight through **Wellington Airport** plays a fairly minor role at this time but is expected to increase. A future increase in freight movement from 5,000 tonnes to 28,000 tonnes by 2030, mainly from increases in international freight, is predicted as a result of planned improvements to the airport identified in the 2030 Master Plan³.
- **Road and rail freight** are the land transport modes that provide important connections for the onwards movement of freight by other modes and for delivery to the place of consumption. On a national scale (tonnes per kilometre), road freight accounts for 75% of freight movements, while rail makes up 12% and coastal shipping 14%⁴. While some growth in freight movements via the improved North Island Main Trunk Line is expected to occur, rail freight is only feasible and practical for some longer distance bulk freight where timing is less critical.

The predicted growth in road-based freight transport means that unless an appropriate system or programme is in place to monitor and enforce compliance with heavy vehicle weight restrictions, there is likely to be a corresponding increase in non-compliant vehicles, increasing the risk to road users. A facility based in the vicinity of the principal transport routes on the west coast of the Wellington Region is likely to capture a large proportion of non-compliant vehicles.

² Ministry of Transport, "National Freight Demand Study" March 2014. Retrieved from URL: <http://www.transport.govt.nz/research/nationalfreightdemandsstudy>

³ Regional Land Transport Strategy

⁴ Ministry of Transport, National Freight Demand Study 2017/18, September 2019, Retrieved from URL: <https://www.transport.govt.nz/mot-resources/freight-resources/nationalfreightdemandsstudy/>

2.3 Transmission Gully

The Transmission Gully motorway is a 27km four-lane motorway currently being constructed from south of Porirua to Mackays Crossing, as indicated in Figure 1 below. It is anticipated to open in late 2020 or early 2021.

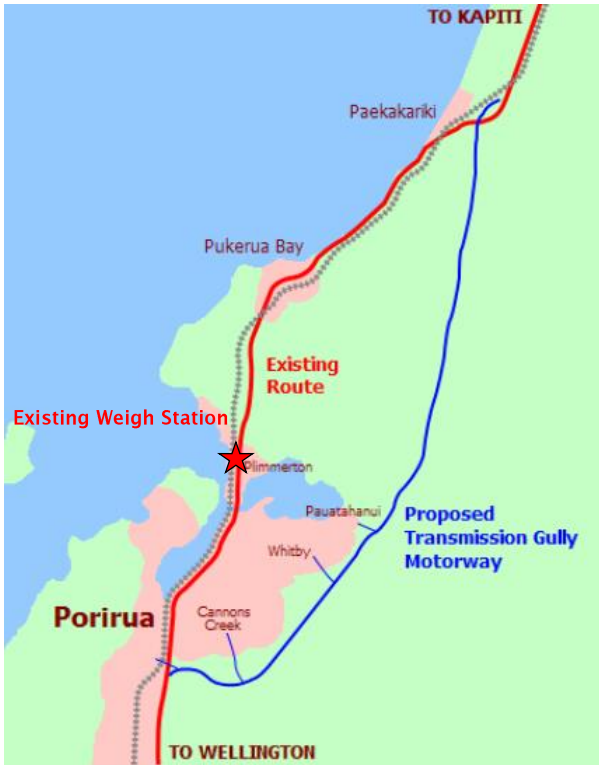


Figure 1 - Transmission Gully

Transmission Gully will provide benefits in terms of travel time savings, safety and route security. Transmission Gully will also provide a more direct freight route to the Hutt Valley logistics centre at Seaview/Gracefield.

The majority of freight movements are expected to utilise the Transmission Gully Motorway rather than the existing State Highway 1, as it will provide a faster and straighter through-route and will not be tolled. The predicted change in overall traffic volumes on State Highway 1 is indicated below in Table 1.

Table 1 – Predicted percentage change in traffic volumes following the construction of Transmission Gully⁵

Road	Section	Weekday Traffic Volume, 2026		Change, 2026	
		Basecase (without Project)	With Project	Absolute	%
State Highway 1	North of MacKays	23,800	26,100	+2,300	+10%
	South of Paekakariki	22,900	3,100	-19,800	-86%
	South of Pukerua Bay	24,100	5,900	-18,200	-76%
	Mana Esplanade	35,000	20,500	-14,500	-41%
	South of Paremata	43,700	26,800	-16,900	-39%
	South of Whitford Brown	60,600	44,100	-16,500	-27%
	South of Mungavin	58,100	44,200	-13,900	-24%
	South of Linden	58,100	62,500	+4,400	+8%

It is therefore important that any commercial vehicle safety centre located between Wellington and Levin is located such that it is able to capture the heavy motor vehicle traffic from Transmission Gully motorway as well as the existing State Highway 1.

2.4 Existing Weigh Station at Plimmerton

There is an existing weigh station located at Plimmerton. The weigh station consists of two weigh bridges, one on the western side of the road to capture northbound traffic, and one on the eastern side of the road to capture southbound traffic, as shown below in Figure 2.

⁵ Statement of evidence of Timothy Martin Kelly (Transportation) for the NZ Transport Agency and Porirua City Council, dated 15 November 2011, page 30. Retrieved from URL: <https://www.epa.govt.nz/assets/FileAPI/proposal/NSP000008/Evidence-Applicants-evidence/63e19c66e6/EIC-Tim-Martin-Kelly-Transportation.pdf>



Figure 2 - Existing Plimmerton Weigh Station (within red boundaries)

As indicated in Figure 1, the existing Plimmerton site is to be bypassed by Transmission Gully. Once Transmission Gully is opened, it is expected that heavy vehicles will use that route given it is shorter and more direct. The Plimmerton site will no longer be able to capture that traffic. Nevertheless, the existing site has been included in the following assessment as a potential site for the proposed CVSC. Its continued use may be possible, but it would have to be in conjunction with another CVSC site located at or near Transmission Gully, and additional Vehicle Screening Systems on State Highway 58.

However, a CVSC requires a minimum area of 1 hectare to allow for an inspection shed, an office for staff, an offload area and manoeuvring space, as well as a weigh bridge⁶. Therefore, additional property purchase and construction would be required in order to upgrade the site to a commercial vehicle safety centre. Taking those factors into account, the total estimated cost to upgrade the existing site would be similar to the cost for a new site.

⁶ This site option is identified as Site M in Appendix 2 – Long List Site Options.

3. METHODOLOGY

The multi-criteria analysis (MCA) is a multi-step process, as indicated below in Figure 3. The MCA process allows for site options to be scored and weighted against various criteria with the aim being to identify a preferred site.

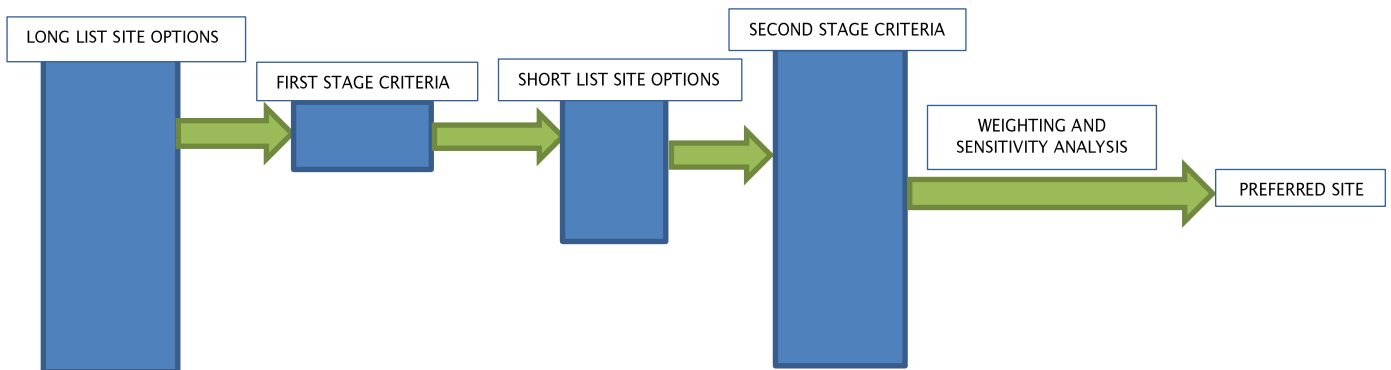


Figure 3 – Multi-Criteria Analysis Process Diagram

These steps are outlined below.

3.1 Identify Site Options (The ‘Long List’)

The first step in working towards the identification of an appropriate site for a new commercial vehicle safety centre between Wellington and Levin was the identification of a number of potential sites. Initially, 10 potential sites were identified by the NZ Transport Agency. These sites were identified generally because of their location in relation to the existing Stage highway network. Following a meeting held on 26 November 2019, four additional sites were identified by Mackays Crossing and Paekākāriki community members (a fifth site was excluded because it lay in the alignment of Transmission Gully Motorway).

These fourteen sites are referred to as the “Long List”. The identified sites are listed in section 4.1 and shown in the Site Options Maps provided in Appendix 2.

3.2 Develop First Stage Criteria

Once the Long List of potential sites was identified, the first step in the process was to consider the sites individually against the Transport Agency’s ‘First Stage’ criteria. These criteria are considered as “must-haves”, or attributes the sites must have, in order to be considered further. The ‘First Stage’ criteria were used to screen out sites that are not feasible options, and create a shortlist of sites that warranted more detailed consideration.

The First Stage criteria are taken from the National Site Selection Criteria listed in the NZTA Weigh Right Site Selection document dated 3 August 2017⁷. This document was requested and approved by the Weigh Right Steering Committee. The criteria listed in that document, and the reason for using (or not using) the criteria in this MCA, are listed in Table 2 below.

⁷ Appendix 3 – NZTA Weigh Right site selection – 2017 Report

Table 2 – National Site Selection Criteria

Criteria	Selected for use in this analysis?
Heavy vehicle volumes	Not Selected All 14 site options are located on or near a State Highway that has a daily volume (AADT) of 1200 vehicles or more. This criterion is therefore not helpful for distinguishing between the site options.
Heavy vehicle risk profile	Not Selected The criteria states that overloading of commercial is widespread throughout New Zealand. There is no data provided that is specific to the Wellington region, or any data indicating that some regions have greater degrees of non-compliance than others. It can be reasonably assumed that all site options have a similar heavy vehicle risk profile. This criterion is therefore not helpful for distinguishing between the site options.
Sites Difficult to Avoid A number of techniques are employed by errant operators to avoid being selected for weighing. These include waiting for a vehicle to be pulled into the weigh station which stops other vehicles being pulled in, diverting from the route where the weigh facility is operating or selecting an alternate route, and off-loading at a local commercial site. Locating screened weigh facilities where opportunities to avoid the facility are reduced is a key criterion.	Selected This criterion is able to be applied to the site options.
Site Design Requirements Weigh sites cannot be placed on soft or filled ground. The tolerance on weigh bridge approaches for weigh-in-motion weighing is ± 2 mm and for weigh pits is ± 4 mm. Filled ground regularly settles 5–10% of the fill height.	Selected This criterion is able to be applied to the site options. It is imperative that the site has appropriately solid ground and this criterion will enable a clear distinction to be made between appropriate land and land which should be discounted.
Communication Coverage Ideally the selected sites should have Asymmetric Digital Subscriber Line (ADSL) or fibre for data transfer capability. For secondary or back-up transmission, 3G or 4G wireless capability is desirable.	Not Selected All 14 site options are able to access ADSL fibre. This criterion is therefore not helpful for distinguishing between the site options.
Location of Police Commercial Vehicle Safety Teams (CVST) Police CVST personnel are spread throughout New Zealand with a higher concentration around major centres where there are significant heavy vehicle movements.	Not Selected All 14 site options are within one hour's travel of Wellington City. This criterion is therefore not helpful for distinguishing between the site options.
Asset Risk The largest risk is to the Automatic Number Plate Recognition (ANPR) cameras, the Variable Message Signs (VMS) and the roadside equipment, all of which are isolated from the weigh station.	Not Selected The risk to the roadside assets will be the same no matter where they are located. This criterion is therefore not helpful for distinguishing between the site options.

Having regard to the above criteria, only two of the National Site Selection Criteria are considered to be useful to apply in the first-stage assessment to determine which sites should progress to the short list. These criteria are:

1. **Difficult to Avoid**
2. Site Design Requirements. For ease of understanding, this criterion is re-labelled as **“Favourable Ground”** for the remainder of this report.

Both criteria will be provided with a simple traffic light system to be applied to each site, as follows:

Favourable Ground	Difficult to Avoid
Favourable ground, remediation not likely to be required.	No more than one alternative route.
A larger amount of design effort required than the other weigh right sites and/or a residual geotechnical risk such as a fault line or soft/weak soils.	No more than one alternative route with extra vehicle screening equipment on old State Highway 1.
Significant amount of geotechnical investigations and design effort required to develop the site. Triggers include liquefaction, very weak ground (i.e. peat) and a requirement for large retaining structures.	Two or more alternative routes.

Orange indicates some cost implications that make the site less desirable, but which are not insurmountable. For the Favourable Ground assessment, red indicates significant cost implications for the construction of the CVSC that would make the project uneconomic and would threaten the long-term geotechnical performance of the site. For the Difficult to Avoid assessment, red means that two or more alternative routes would make the site unworkable, as police resources are not able to cover more than one avoidance route.

An additional assessment was also undertaken in the first stage, to assess the feasibility and efficiency of the site options.

3. Feasibility and Efficiency

Where access to a site is not possible, or where access requires a diversion from the State Highway that exceeds 5km, and/or an obvious significant cost of >\$5million is identified, the site is not considered to be a feasible or efficient option. This assessment did not incorporate an orange classification, and simply used green or red.

Feasibility and Efficiency

	Access is possible without significant cost of more than \$5 million and the length of diversion is less than 5km.
	Access is not possible without significant cost of more than \$5 million and/or the length of diversion is more than 5km.

3.3 Assess Long-List Sites Against Assessment Criteria

The long list of fourteen sites were then assessed against the three assessment criteria, using the green/orange/red method.

Any site that is categorised as red on one or more of the ‘Favourable Ground’, ‘Difficult to Avoid’ or ‘Feasibility’ criteria is to be discounted as an option, because it would likely be too costly to construct or ineffective to operate. Such sites would be inconsistent with the overall objectives of the Weigh Right programme. Sites that are categorised as orange or green following the application of the First Stage Criteria will progress to more detailed consideration as part of the assessment of properties on the short list.

3.4 Develop Second Stage Criteria and Scoring

The second stage assessments are broadly described as:

1. **Design Requirements**
2. **Cost to Construct**
3. **Property Purchase**
4. **Safety of all road users**
5. **Planning Considerations**

Each of the above assessments comprise a number of criteria against which each of the short-listed sites were evaluated. The scale used to assess the criteria was as follows:

3	Positive
2	
1	
0	Neutral
-1	
-2	
-3	Negative

The experts were provided with information about the shortlisted sites to assist in their evaluation and scoring against this scale. The experts determined which matters needed to be assessed and determined the criteria to be applied. For example, a criterion that would not assist in differentiating between any of the sites was typically discarded. The experts also determined how the scale was applied, and what different scores meant for each of the criteria they assessed.

3.5 Assess Short-List Sites and Undertake Sensitivity Analysis

3.5.1 Workshop Assessment

The assumptions and scoring of the sites against the second-stage criteria were presented and tested at a workshop led by independent facilitator Robert Schofield on 28 January 2020.

The purpose of the workshop was to ensure that all experts used a common set of assumptions, and that there were no inconsistencies or overlaps in scoring.

Each expert presented their assessment to the room. The workshop participants questioned the assumptions or scores to test their robustness. As a result of the workshop discussions, the assessment criteria and experts' scores were confirmed.

3.5.2 Weighting and Sensitivity Analysis

The final scores were then tested against five different scenarios:

- Baseline Scenario (Equal Weighting for all Considerations)
- Scenario 1 (Emphasis on Safety and Environmental Considerations)
- Scenario 2 (Emphasis on Safety and Design Requirements)
- Scenario 3 (Emphasis on Cost and Land Purchase + Design)
- Scenario 4 (Emphasis on Cost and Land Purchase + Environmental)

Under each scenario, greater weighting was given to the scores for certain considerations, such as cost or safety. The purpose of the weighting and sensitivity analysis is to test the robustness of the scores and allow for any uncertainties.

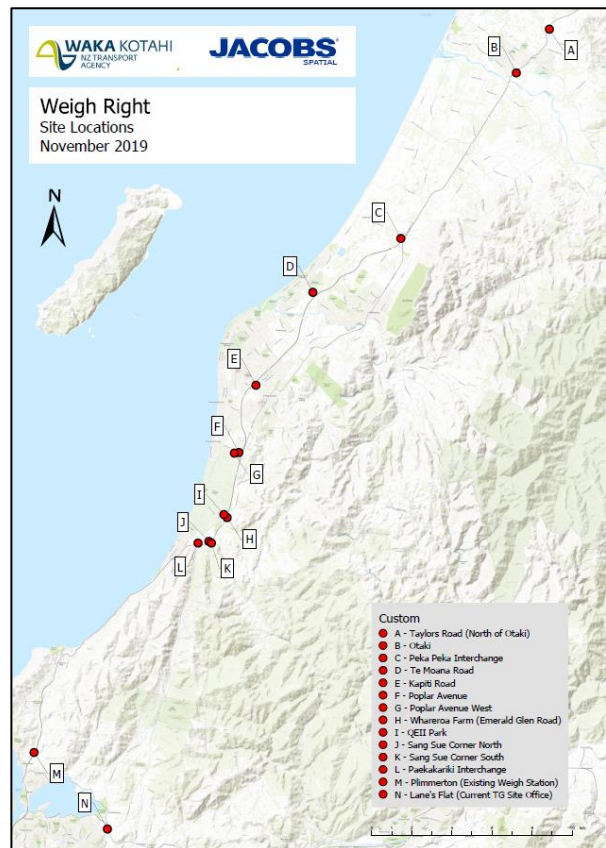
4. LONG LIST AND FIRST STAGE ASSESSMENT

4.1 Long List of Site Options

4.1.1 Original Long-List

A total of fourteen sites were originally selected to be considered. Initially, 10 potential sites were identified by the NZ Transport Agency. These sites were identified generally because of their location close to the existing stage highway network. Following a meeting held on 26 November 2019, four additional sites were identified by Mackays Crossing and Paekākāriki community members. The identified sites are shown in Appendix 2 – Long List Site Options Maps, and are listed below.

- A – Taylors Road (North of Otaki)**
- B – Otaki**
- C – Peka Peka Interchange**
- D – Te Moana Road**
- E – Kapiti Road**
- F – Poplar Avenue**
- G – Poplar Avenue West**
- H – Whareroa Farm (Emerald Glen Road)**
- I – QEII Park**
- J – Sang Sue Corner North**
- K – Sang Sue Corner South**
- L – Paekākāriki Interchange**
- M – Plimmerton (Existing Weigh Station) and**
- N – Lane’s Flat (Current TG Site Office)**



It is noted for completeness that sites M and N would operate together; Site M to capture the traffic from State Highway 1, and Site N to capture the traffic from the Transmission Gully motorway. All the other sites would be capable of capturing both north and south-bound traffic within one commercial vehicle safety centre site.

Any sites north of Ōtaki were not considered, as the Police Commercial Vehicle Safety Unit staff are based between Wellington and Porirua, and the commute time involved with a site located north of Ōtaki was considered to be too long.

Sites between Peka Peka and Ōtaki were not considered as, once the Peka Peka to Ōtaki Expressway is constructed, there is no location between the Peka Peka and Ōtaki interchanges to provide safe access and egress to and from the Expressway. Old State Highway 1 would also provide an alternative route.

4.1.2 Site J

Site J (Sang Sue Corner North) was initially identified by a community member, but was ruled out from consideration early in the first stage assessments as the site was within the alignment of the Transmission Gully motorway and associated new roading. However, an alternative site, J(2) (Kāpiti), was identified approximately 400 metres north of Site J and was included in the site options. Site J(2) forms part of a site that has been used to store gravel and fill for use in the construction of the Transmission Gully motorway. The location of Site J2 relative to other potential sites south of Mackays Crossing (K and L) is shown below.



4.2 First-Stage Assessment Criteria

4.2.1 Favourable Ground

The assessment of the favourable ground criteria was undertaken by two geotechnical engineers at Jacobs, Jerry Spinks and Michael Spittal. They undertook a desktop study, looking at the following items:

- Published geology;
- Active faults;
- Topographical setting;
- Published research from Greater Wellington Regional Council relating to severity of earthquake hazards;
- Publicly available borehole data source from the NZ Geotechnical Database; and
- Any other relevant surrounding features that would have a potential impact on the design.

They then undertook a qualitative assessment, using the above factors and drawing on their experience in the region, to decide on the rating for each site. The Favourable Ground Assessment is provided in Appendix 4.

4.2.2 Difficult to Avoid

Jacobs' Geospatial team were able to identify whether alternative roads were available at each of the sites. An alternative road was defined as:

- a road that is classified in the Transport Agency's One Network Road Classification (ONRC) as an arterial, primary collector or secondary collector road, and that allows vehicles to travel north-south (the general direction of SH1 traffic in this corridor). This definition excluded low-volume local roads, as well as some roads that travel in an east-west direction and reach a dead end.
- a road that would allow a heavy vehicle to avoid the weigh-in-motion sensor.

The resulting maps showing the alternative routes and classifying the sites as green, orange or red are provided in Appendix 5. Each map contains supplementary explanations detailing the assumptions used and any alternative scenarios that warrant consideration.

4.2.3 Feasibility and Efficiency

This assessment was undertaken by Jacobs' Senior Civil Engineer Simon Ingamells. The assessment looks at each of the sites in more detail, particularly:

- Accessibility – the likely access arrangements between the site and the adjacent road, and the likely access arrangement from the nearest interchange or intersection. This assessment particularly considered whether achieving access to the sites is possible.
- Diversion – 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 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 removes a site from further consideration.
- Cost – where any obvious costs of >\$5million are identified (over and above what a CVSC would normally cost to construct and operate), the site is removed from further consideration.

The assessment also notes where the site would result in outcomes that are contrary to the stated objectives of the Transport Agency and its previous projects, and where a potential solution would be inconsistent with the Safe System approach. The assessment is provided in Appendix 6.

4.3 Assessment Results

Based on the above assessments, each of the fourteen sites were categorised as red, orange or green against all three criteria in Table 3 below. Ten of the sites had a fatal flaw or critical deficiency, leaving four sites, all in the Mackays Crossing vicinity, with attributes that met the acceptability criteria to be considered in the short-list (sites H, I, J2 and L).

All four of the sites meet the feasibility and efficiency criterion in that access to these sites is possible without a significant cost of more than \$5 million. For all four sites, the length of diversion is less than 5km. None of the sites fully met the ground conditions and avoidance criteria in that each site would require a larger amount of design effort required than is ideal, and/or would have a residual geotechnical risk such as a fault line or soft/weak soils. In addition, none of the sites fully met the avoidance criterion in that, while there only one alternative route, each site would require extra vehicle screening equipment on the existing State Highway 1 in addition to equipment on the Transmission Gully Motorway.

Table 3 - First Stage Assessment Results

Site Option	Favourable Ground	Difficult to Avoid	Feasibility and Efficiency
A - Taylors Road (North of Otaki)	Green	Green	Red
B - Otaki	Green	Red	Red
C - Peka Peka Interchange	Red	Yellow	Red
D - Te Moana Road	Red	Yellow	Red
E - Kapiti Road	Red	Red	Green
F - Poplar Avenue East	Yellow	Red	Red
G - Poplar Avenue West	Yellow	Red	Red
H - Whareroa Farm (Emerald Glen Road)	Yellow	Yellow	Green
I - QEII Park	Yellow	Yellow	Green
J(2) - Kāpiti	Yellow	Yellow	Green
K - Sang Sue Corner South	Red	Yellow	Green
L - Paekākāriki Interchange	Yellow	Yellow	Green
M - Plimmerton (Existing Weigh Station)	Green	Yellow	Red
N - Lane's Flat (Current TG Site Office)	Yellow	Yellow	Red

5. SHORT LIST AND SECOND STAGE ASSESSMENT

5.1 Short List of Site Options

As outlined in section 4.2, the four sites that were short-listed are referred to as –

H – Whareroa Farm (Emerald Glen Road)

I – QEII Park

J(2) – Kāpiti

L – Paekākāriki Interchange

The locations of these sites are shown below.



In order to enable more detailed technical assessment of these sites, a set of images were produced to show the indicative locations of the access to the CVSC sites, and the indicative locations of the Vehicle Screening Systems (the weigh-in-motion sensors and variable messaging signs). The images enabled all assessments to utilise a common set of assumptions to ensure consistency in the scoring. The images are provided as Appendix 7.

5.2 Second Stage Assessment Criteria

Five experts were invited to assess each of the four short-listed sites against their area of expertise. The experts proposed scores at a workshop held on 28 January 2020. The scores were tested and confirmed at the workshop.

The criteria assessed by each of the experts is expanded on in the sections below.

5.2.1 Design Requirements

The Assessment of Design Requirements was undertaken by Louis Bargh, Senior Civil Engineer at Jacobs. Louis identified four criteria:

1. VSS Operation

The VSS Operation criteria assesses whether the VSS (Vehicle Screening Systems) complies with all the technical guidelines. Technical requirements include:

- A maximum slope grade of 2%;
- A maximum crossfall (slope between the sealed road and the shoulder, road reserve or swale) of 3%;
- A requirement to be located on a road with 1–2 lanes of free-flowing traffic in each direction;
- Minimum distances between the WIM, VMS and CVSC site; and
- Minimum sight distances for the VMS.

2. VSS Implementation

The VSS Implementation criteria assesses:

- the risk of technical issues with the design and construction of the VSS, such as the relocation of existing infrastructure; and
- the risk of interfaces with other projects, such as the Transmission Gully Motorway. Such interfaces can create constraints and result in significant additional time and cost to co-ordinate designs and construction timeframes.

3. Travel Route to CVSC

The Travel Route to CVSC criteria assesses:

- the length of the diversion required from the motorway;
- the simplicity or “intuitiveness” of the route; and
- whether there are any constraints for over-dimension or over-weight vehicles on the route.

4. CVSC Construction Feasibility

The CVSC Construction Feasibility assesses the technical design requirements for a CVSC. These requirements include:

- The size of the site and constraints on space;
- Any differences in the levels between the site and the road which may make the construction of the access more difficult;
- Interface with strategic assets (eg, gas lines, railway lines or overhead power lines);
- The scale and nature of the earthworks required for the weigh bridge; and
- Known natural hazard risks.

The full assessment, including explanations for what each score (3 to –3) means for each criterion, and a site-specific explanation for each score given, is provided as Appendix 8.

5.2.2 Cost to Construct

The Cost to Construct Assessment was undertaken by Simon Ingamells, Senior Civil Engineer at Jacobs. Rather than technical feasibility (ie, can it be done?), Simon's assessment focused on the cost only. Simon identified five criteria:

1. New Structures Required

Additional structures (over and above the standard weigh bridge, inspection shed and office/control building required at all CVSC sites) is an additional cost. Such structures might include retaining walls or widening for bridges.

2. Changes to Existing Roads Required

Enabling the safe movement of heavy motor vehicles may require widening or structural changes to existing roads.

3. Earthworks Required

The amount of cut and fill required to engineer the ground levels is a significant determinant of cost. A site that is already flat will require less earthworks than a site that has variable topography.

4. Previous Site Use Requiring Remedial Treatment

The Previous Site Use Requiring Remedial Treatment criteria assesses the likelihood that soil on the site has been contaminated through the past use or storage of hazardous substances. The testing, management and safe disposal of contaminated soil can result in significant additional costs.

5. Major Service Diversion Required

The Major Service Diversion Required criteria assesses whether overhead power lines will need to be moved or undergrounded as a result of the new structures, and whether the presence of other infrastructure will impose additional costs through special engineering requirements.

The full assessment, including explanations for what each score (3 to -3) means for each criteria, and a site-specific explanation for each score given, is provided as Appendix 8.

5.2.3 Property Purchase

The Property Purchase assessment was undertaken by Jonathan Gulland, Senior Property Acquisition Manager at the Transport Agency. Jonathan identified twenty criteria:

1. Title Raised/Gazettal

The Title Raised/Gazettal criteria assesses whether the site has an existing Record of Title or Gazette Notice. Where there is no existing Title or Gazette, there will be extra costs and delays involved in completing these processes.

2. Māori Reservation

Māori Reservations are subject to severe restriction on alteration and may not be sold. Reservation land does not provide adequate tenure nor programme protection.

3. Māori Freehold Land
Multiple owners is common for this land type. While Māori Freehold Land can be acquired, it is complex and time-consuming.
4. Crown Land
Land that is already vested in the Crown is easier to acquire.
5. Instruments, encumbrances and notations
Land transfer instruments indicate where other parties have an interest in the land, such as a caveat, covenant, easement, mortgage and restriction. The interest will need to be resolved via the acquisition process and require compensation to be paid to the interest-holder, which can mean a complex and costly financial process.
6. Number of owners and/or interest holders
Multiple owners and interest holders increases the complexity of the transaction, adding costs and time.
7. Government or Private
This criterion assesses whether the site is privately-owned or owned by the government.
8. Owner Type
This criterion assesses whether the land is held by the Crown or owned by private citizens or corporates or trusts.
9. Motivation
This criterion assesses whether the owner wants to sell the land or is motivated to object to the acquisition.
10. Hardship
This criterion assesses whether the landowner is suffering any hardship that will influence the sale and acquisition decisions.
11. History and Context
This criterion assesses whether there have been any previous history between the NZ Transport Agency and the landowner that might influence the relationship and the likelihood of a successful sale.
12. Political or Ministerial approval
This criterion assesses whether the decision to sell the land requires Ministerial approval.
13. Owner representation
This criterion assesses whether it is clear who owns the land and who to deal with when negotiating the sale.

14. Agreement of other interest holders

This criterion assesses whether the consent of other interest holders (apart from the landowner) will be required, and how likely it is that the consent/s will be obtained.

15. Multiple decision makers

This criterion assesses whether ~~more~~ **more** than one person or party is involved in the decision to sell the land. This will increase the time needed for negotiation and settlement.

16. Compulsory acquisition under the Public Works Act 1981

This criterion assesses whether compulsory acquisition under the Public Works Act 1981 is a possibility.

17. Negotiated acquisition

This criterion assesses whether acquisition can be negotiated for fair and reasonable compensation and deliver the land in time for the project.

18. Compensation payable

This criterion assesses how much money the land is likely to cost.

19. Administrator's costs related to acquisition

This criterion assesses the likely costs associated with reimbursing the landowners costs (lawyers, valuations etc) related to the land acquisition.

20. Crown costs to acquire

This criterion assesses the likely costs (lawyers, valuations etc) for the Crown related to the land acquisition.

The full assessment, including explanations for what each score (3 to -3) means for each criteria, and a site-specific explanation for each score given, is provided as Appendix 9.

5.2.4 Safety of all Road Users

The Safety assessment was undertaken by Errol Ritson, Senior Safety Engineer at the Transport Agency. Errol identified seven criteria:

1 AADT (Average Annual Daily Traffic) on State Highway 1

Traffic volumes is one factor that can influence how safe a new development, and the associated access arrangement and heavy motor vehicle manoeuvres, will be.

2. Crash History 2014-2019

The crash history (and the causes of the crashes in a location) can indicate existing risks and behaviours on the roads that the proposed CVSC could either exacerbate or address.

3. Ease of Access to and from Highway

The Ease of Access criterion focuses on the safety risks associated with the heavy motor vehicle movements required to access the CVSC site.

4. Vulnerable Users

The Vulnerable Users criterion assesses the safety risk associated with any potential conflicts between heavy motor vehicles and motorcyclists, cyclists and pedestrians.

5. Environment

The Environment criterion assesses the risks associated with other activities occurring in the vicinity of the site. For example, farming activity can cause unexpected hazards associated with stock movements. The assessment also notes where flooding may affect the road, and where the road is currently too narrow for the proposed heavy motor vehicle movements.

6. Geometry

The Geometry criterion assesses factors such as sight distances, and any risks associated with heavy motor vehicle movements at the CVSC's access point.

7. Risk Factors

This criterion identifies issues that are detrimental to and which have a negative effect on the development envisaged.

The full assessment, including explanations for what each score (3 to -3) means for each criterion, and a site-specific explanation for each score given, is provided as Appendix 10.

5.2.5 Environmental Considerations

The assessment of planning considerations was undertaken by Andrew Henderson, Principal Planner at Jacobs. Andrew identified twelve environmental criteria:

1. Coastal Environment

Section 6(a) of the Resource Management Act 1991 (RMA) requires that the natural character of the coastal environment be protected from inappropriate subdivision, use and development. Sites that are located within the coastal environment will present additional constraints.

2. Waterbody Matters

Section 6(a) of the RMA requires that the natural character of wetlands, lakes and rivers be protected from inappropriate subdivision, use and development. A CVSC site located adjacent to or in the immediate vicinity of a waterbody will require additional consideration given to the management of any effects on the quality of that waterbody.

3. Flora/Fauna

Section 6(c) of the RMA requires the protection of areas of significant indigenous vegetation and significant habitats of indigenous fauna as a matter of national importance.

4. Cultural Issues

It is standard practice for the Transport Agency to engage with relevant iwi organisations regarding all developments. However, there are factors, such as proximity to sites that are identified as being of significant value to mana whenua, which may present additional challenges to work through and result in additional time and costs.

5. Natural Hazards

Section 6(h) of the RMA requires the management of significant risks from natural hazards. The presence of natural hazards affecting a site may present barriers to obtaining approval for a development or require additional technical assessment.

6. Amenity

Section 7(c) of the RMA requires the maintenance and enhancement of amenity values. Amenity values is a broad concept, defined as *“those natural or physical qualities and characteristics of an area that contribute to people’s appreciation of its pleasantness, aesthetic coherence, and cultural and recreational attributes”*. This criterion assesses the impact of a CVSC on amenity, particularly where residential properties may be impacted by heightened noise from truck movements or a change in views. Where recreational activity occurs in the vicinity of a site, a CVSC may adversely affect people’s experience in that area.

7. Regional Consents: Operational Stormwater

Resource consent from the Greater Wellington Regional Council may be required to discharge operational stormwater from the site.

8. Regional Consents: Operational Wastewater

Resource consent from the Greater Wellington Regional Council may be required to discharge operational wastewater from the site.

9. Regional Consents: Operational Greywater

Resource consent from the Greater Wellington Regional Council may be required to discharge operational greywater from the site.

10. Regional Consents: Earthworks

Resource consent from the Greater Wellington Regional Council may be required for the earthworks on the site associated with construction.

11. Other Hazards

Other hazards, apart from natural hazards, can present additional challenges and require additional assessment when obtaining statutory approvals under the RMA. The main hazard identified for these sites is the FirstGas gas main.

12. KCDC Policy Framework

The policy framework of the local authority (in this case, the Kapiti Coast District Council) is a relevant consideration when obtaining statutory approvals under the RMA. A strong “avoid” policy can make a statutory approval difficult to obtain.

The full assessment, including explanations for what each score (3 to -3) means for each criteria, and a site-specific explanation for each score given, is provided as Appendix 11.

5.3 Workshop Assessment

A workshop was held on 28 January 2020 at Jacobs' Wellington offices. The purpose of the workshop was to allow for assumptions to be tested, and for any inconsistencies or overlaps to be identified and eliminated. The experts then outlined their initial evaluation against their final assessment criteria and, following discussion, agreement was reached in the workshop on the final scores for each criterion.

Minutes of the workshop are provided as Appendix 13. The final scores from each of the assessments are presented below.

Design Requirements Criteria	Site H	Site I	Site J(2)	Site L
VSS Operation	1	1	1	1
VSS Implementation	0	0	0	0
CVSC Route	3	2	1	0
CVSC Feasibility	-2	2	2	-3
Average Score	0.5	1.3	1.0	-0.5

Cost to Construct Criteria	Site H	Site I	Site J(2)	Site L
New Structures Required	-2	3	3	3
Changes to Existing Roads Required	-2	1	2	2
Earthworks Required	-2	-3	3	-3
Previous Site Use Requiring Remedial Treatment	3	-2	1	1
Major Service Diversion Required	-1	0	0	--2
Average Score	-0.8	-0.2	1.8	0.2

Property Purchase Criteria	Site H	Site I	Site J(2)	Site L
Title raised / Gazettal	3	3	3	3
Māori Reservation	3	3	3	3
Māori Freehold Land	3	3	3	3
Crown Land	2	2	2	3
Encumbrances and notations	-1	-2	-1	--2
Numbers of owners and/or interest holders	3	-2	2	3
Government or private	3	3	2	3
Owner type	0	0	2	3
Motivation	-1	-3	3	3
Hardship	-2	-2	3	3
History and context	0	-2	3	3
Political or Ministerial approval	-2	-3	3	3
Owner representation	0	0	3	3
Agreement of other interest holders	-1	-2	-1	-2

Multiple decision makers	-2	-2	2	2
Compulsory acquisition under the Public Works Act	-3	-3	3	3
Negotiated acquisition	0	0	3	3
Compensation payable	-2	-2	-1	-2
Owners costs related to acquisition	1	-1	3	3
Crown costs to acquire	-1	-1	3	3
Average Score	-0.1	-0.6	2.3	2.3

Safety Criteria	Site H	Site I	Site J(2)	Site L
AADT on SH1	0	0	0	0
Crash History 2014-2019	-1	-1	-1	-1
Ease of Access to and from the State Highway	1	-3	2	-1
Vulnerable Users	-3	-1	-1	-2
Environment	1	-1	2	2
Geometry	2	-1	2	-1
Risk Factors	-2	-3	-1	-2
Average Score	-0.3	-1.4	0.4	-0.7

Environmental Criteria	Site H	Site I	Site J(2)	Site L
Coastal Environment	2	-1	-1	-1
Waterbody Matters	2	-1	-1	-2
Flora/Fauna	1	-1	-1	-2
Cultural Issues	1	-1	-1	-2
Natural Hazards	-1	1	1	-1
Amenity	-3	-2	3	-1
Operational Stormwater	0	-1	0	0
Operational Wastewater	0	0	0	0
Operational Greywater	0	0	0	0
Earthworks	0	0	0	0
Other Hazards	-1	0	0	-1
KCDC Policy Framework	-1	-2	-1	-1
Average Score	0	-0.7	-0.1	-0.9

5.4 Sensitivity Analysis

The baseline scores above assume that no set of criteria is more significant or important than others: for example, that safety is as important as costs of construction. Sensitivity analysis is the process of applying different weightings to the results: for example, what would the results look like if safety had a greater level of importance: i.e. more weight.

Sensitivity analysis has the following advantages:

- The use of different weightings allows for uncertainty that may be inherent in the original scores. For example, by applying a high weighting to safety considerations, that scenario

makes up for the possibility that the original assessment may have underestimated the impact or risks associated with a particular factor.

- The use of different scenarios allows the decision-making process to have more transparency. For example, where one site performs better on economic and cost factors while another performs better on environmental or safety factors, the reasons for the selection of the site, and the trade-offs involved in the decision, are made more explicit.
- Sensitivity analysis ensures that the final decision is robust, and provides confidence for stakeholders. The use of different weightings used for different factors ensures that different concerns are accommodated within the assessment. Where one site performs best under a variety of scenarios, the decision-maker and all stakeholders can feel confident in the decision.

The participants at the workshop held on 28 January agreed on what scenarios should be tested in the sensitivity analysis. A total of four scenarios were identified, as follows:

1. Emphasis on Safety and Environmental Considerations

Under this scenario, safety had the greatest weighting (35%), with environmental considerations given 30% of the total weight

2. Emphasis on Emphasis on Safety and Design Considerations

Under this scenario, safety had the greatest weighting (35%), with design considerations given 30% of the total weight.

3. Emphasis on Cost to Construct and Property Purchase Considerations + Design

Under this scenario, cost had the greatest weighting (35%), with property purchase having 30% of the total weight. While safety was weighted at 20%, design was weighted more than environmental considerations under this scenario (10% compared with 5%).

4. Emphasis on Cost to Construct and Property Purchase + Environmental

Under this scenario, cost had the greatest weighting (35%), with property purchase having 30% of the total weight. While safety was weighted at 20%, environmental considerations were weighted more than design considerations under this scenario (10% compared with 5%).

The scoring for each of the four scenarios are provided as Appendix 14.

5.4.1 Baseline Scenario (Equal Weightings)

Weightings: 20% Design Requirements
20% Cost
20% Property Purchase
20% Safety
20% Environmental

Average Scores	Site H	Site I	Site J(2)	Site L
Design Requirements	0.5	1.3	1.0	-0.5
Weighted 20%	0.1	0.3	0.2	-0.1
Cost to Construct	-0.8	-0.2	1.8	0.2
Weighted 20%	-0.2	0.0	0.4	0.0
Property Purchase	-0.1	-0.6	2.3	2.3
Weighted 0%	0.0	-0.1	0.5	0.5
Safety	-0.3	-1.4	0.4	-0.7
Weighted 20%	-0.1	-0.3	0.1	-0.1
Environmental	0.0	-0.7	-0.1	-0.9
Weighted 20%	0.0	-0.1	0.0	-0.2
TOTAL AVERAGE SCORES	-0.7	-1.6	5.4	0.3
TOTAL WEIGHTED SCORES	-0.1	-0.3	1.1	0.1

In the baseline scenario, Site J(2) performs the best overall.

5.4.2 Scenario 1 (Emphasis on Safety and Environmental Considerations)

Weightings: 20% Design Requirements
 5% Cost
 10% Property Purchase
 35% Safety
 30% Environmental

Average Scores	Site H	Site I	Site J(2)	Site L
Design Requirements	0.5	1.3	1.0	-0.5
Weighted 20%	0.1	0.3	0.2	-0.1
Cost to Construct	-0.8	-0.2	1.8	0.2
Weighted 5%	0.0	0.0	0.1	0.0
Property Purchase	-0.1	-0.6	2.3	2.3
Weighted 10%	0.0	-0.1	0.2	0.2
Safety	-0.3	-1.4	0.4	-0.7
Weighted 35%	-0.1	-0.5	0.2	-0.3
Environmental	0.0	-0.7	-0.1	-0.9
Weighted 30%	0.0	-0.2	0.0	-0.3
TOTAL AVERAGE SCORES	-0.6	-1.6	5.4	0.3
TOTAL WEIGHTED SCORES	0.0	-0.5	0.6	-0.4

In Scenario 1, Site J(2) performs the best overall.

5.4.3 Scenario 2 (Emphasis on Safety and Design Requirements)

Weightings: 30% Design Requirements
 5% Cost
 10% Property Purchase
 35% Safety
 20% Environmental

Average Scores	Site H	Site I	Site J(2)	Site L
Design Requirements	0.5	1.3	1.0	-0.5
Weighted 30%	0.2	0.4	0.3	-0.2
Cost to Construct	-0.8	-0.2	1.8	0.2
Weighted 5%	0.0	0.0	0.1	0.0
Property Purchase	-0.1	-0.6	2.3	2.3
Weighted 10%	0.0	-0.1	0.2	0.2
Safety	-0.3	-1.4	0.4	-0.7
Weighted 35%	-0.1	-0.5	0.2	-0.3
Environmental	0.0	-0.7	-0.1	-0.9
Weighted 20%	0.0	-0.1	0.0	-0.2
TOTAL AVERAGE SCORES	-0.6	-1.6	5.4	0.3
TOTAL WEIGHTED SCORES	0.0	-0.3	0.8	-0.3

In Scenario 2, Site J(2) performs the best overall.

5.4.4 Scenario 3 (Emphasis on Cost to Construct and Property Purchase + Design)

Weightings: 10% Design Requirements
35% Cost
30% Property Purchase
20% Safety
5% Environmental

Average Scores	Site H	Site I	Site J(2)	Site L
Design Requirements	0.5	1.3	1.0	-0.5
Weighted 10%	0.1	0.1	0.1	-0.1
Cost to Construct	-0.8	-0.2	1.8	0.2
Weighted 35%	-0.3	-0.1	0.6	0.1
Property Purchase	-0.1	-0.6	2.3	2.3
Weighted 30%	0.0	-0.2	0.7	0.7
Safety	-0.3	-1.4	0.4	-0.7
Weighted 20%	-0.1	-0.3	0.1	-0.1
Environmental	0.0	-0.7	-0.1	-0.9
Weighted 5%	0.0	0.0	0.0	0.0
TOTAL AVERAGE SCORE	-0.6	-1.6	5.4	0.3
TOTAL WEIGHTED SCORES	-0.3	-0.4	1.5	0.5

In Scenario 3, Site J(2) performs the best overall.

5.4.5 Scenario 4 (Emphasis on Cost to Construct and Property Purchase + Environmental)

Weightings: 5% Design Requirements
35% Cost
30% Property Purchase
20% Safety
10% Environmental

Average Scores	Site H	Site I	Site J(2)	Site L
Design Requirements	0.5	1.3	1.0	-0.5
Weighted 5%	0.0	0.1	0.1	0.0
Cost to Construct	-0.8	-0.2	1.8	0.2
Weighted 35%	-0.3	-0.1	0.6	0.1
Property Purchase	-0.1	-0.6	2.3	2.3
Weighted 30%	0.0	-0.2	0.7	0.7
Safety	-0.3	-1.4	0.4	-0.7
Weighted 20%	-0.1	-0.3	0.1	-0.1
Environmental	0.0	-0.7	-0.1	-0.9
Weighted 10%	0.0	-0.1	0.0	-0.1
TOTAL AVERAGE SCORES	-0.6	-1.6	5.4	0.3
TOTAL WEIGHTED SCORES	-0.3	-0.5	1.4	0.5

In Scenario 4, Site J(2) performs the best overall.

5.5 Preferred Site

Following the MCA process and the scenario testing, Site J(2) – Kāpiti has been identified as the preferred site under all five tested scenarios (baseline and four weighting scenarios). This provides a high level of confidence that Site J(2) is the best site option for a CVSC overall and is therefore the site that is to be advanced, subject to a geotechnical investigation.

An overall rating for each site is provided below:

	Design Requirements	Cost to Construct	Property Purchase	Safety	Environmental
Site H	Yellow	Red	Yellow	Yellow	Yellow
Site I	Green	Red	Red	Red	Red
Site J(2)	Green	Green	Green	Yellow	Yellow
Site L	Red	Red	Green	Red	Red

KEY

Green	More positive factors than negative	Easy / close to ideal
Yellow	Equal negative and positive factors	Less than ideal, but achievable
Red	More negative factors than positive	Likely to be difficult and costly

The key pros and cons of each site are provided in Appendix 15, and are summarised below.

Site I has a number of key disadvantages that make it unsuitable for a CVSC:

- Land acquisition is very unlikely, as the site forms part of QEII Park, is a Reserve and requires Ministerial approval to be sold. The land forms part of the Park and is not considered to be surplus, so approval from the Minister for Conservation is unlikely. The ownership and management structure is complex, with multiple interests and stakeholders to consider.
- The site has identified contaminated soils and would require substantial earthworks, making construction very costly.
- It would be very difficult to obtain the required environmental/RMA approvals due to the recognised heritage, cultural and amenity values of the site.

Site L is advantageous from a property purchase point of view, as it is already owned by the Crown and gazetted for road purposes. However, it also has a number of key disadvantages that make it unsuitable for a CVSC:

- The site would require substantial earthworks, making construction very costly.
- The presence of watercourses through the site creates significant design, construction and environmental challenges.
- The watercourses are recognised as threatened fish habitat and as having cultural significance. This, and the residential dwellings nearby, would make it difficult to obtain the required environmental/RMA approvals.

Site H could be suitable for a CVSC site. However, there are some key disadvantages associated with the site that made it less suitable than Site J(2):

- The earthworks required would be substantial;
- There would be some conflict with recreational users in the area;
- An underground gas main traverses the site;
- A fault avoidance area traverses the site;
- The size of the site is constrained compared to Site J(2); and
- The land acquisition process would be complex and require Ministerial approval.

Site J(2) has a number of key advantages over Site H:

- The site is owned by the Crown and is already gazetted for “use in connection with a road”. Land acquisition for the project and its RMA authorisation (by resource consent or designation) is expected to be straightforward;
- Space is not constrained;
- There are no identified hazards;
- Only minimal earthworks are expected to be required;
- The site is located at a substantial distance from any residential dwellings and there will be minimal conflict with recreational users (cyclists, horse riders, walkers); and
- The site is largely shielded from view from the local vicinity and Transmission Gully motorway by natural landforms.

It is noted that this conclusion is based on desktop assessments, and that an on-site geotechnical investigation of Site J(2) is still to be undertaken.

6. CONCLUSION

The Transport Agency has a statutory responsibility to ensure a safe and efficient state highway network. Heavy motor vehicles that exceed their weight limits creates a higher level of crash risk, increases costs for the National Land Transport Fund and local ratepayers, and creates unfair market outcomes for freight operators. The Weigh Right Programme aims to increase compliance with heavy motor vehicle weight restrictions on the national state highway network, by providing provide safe and easily accessed Commercial Vehicle Safety Centres (CVSCs) to target and test heavy motor vehicles using the network.

In order to identify the most appropriate CVSC site within the Wellington Region, a Multi-Criteria Analysis (MCA) has been undertaken to evaluate the relative attributes of a number of potential sites. In the first stage of technical assessments, fourteen potential site options were assessed against

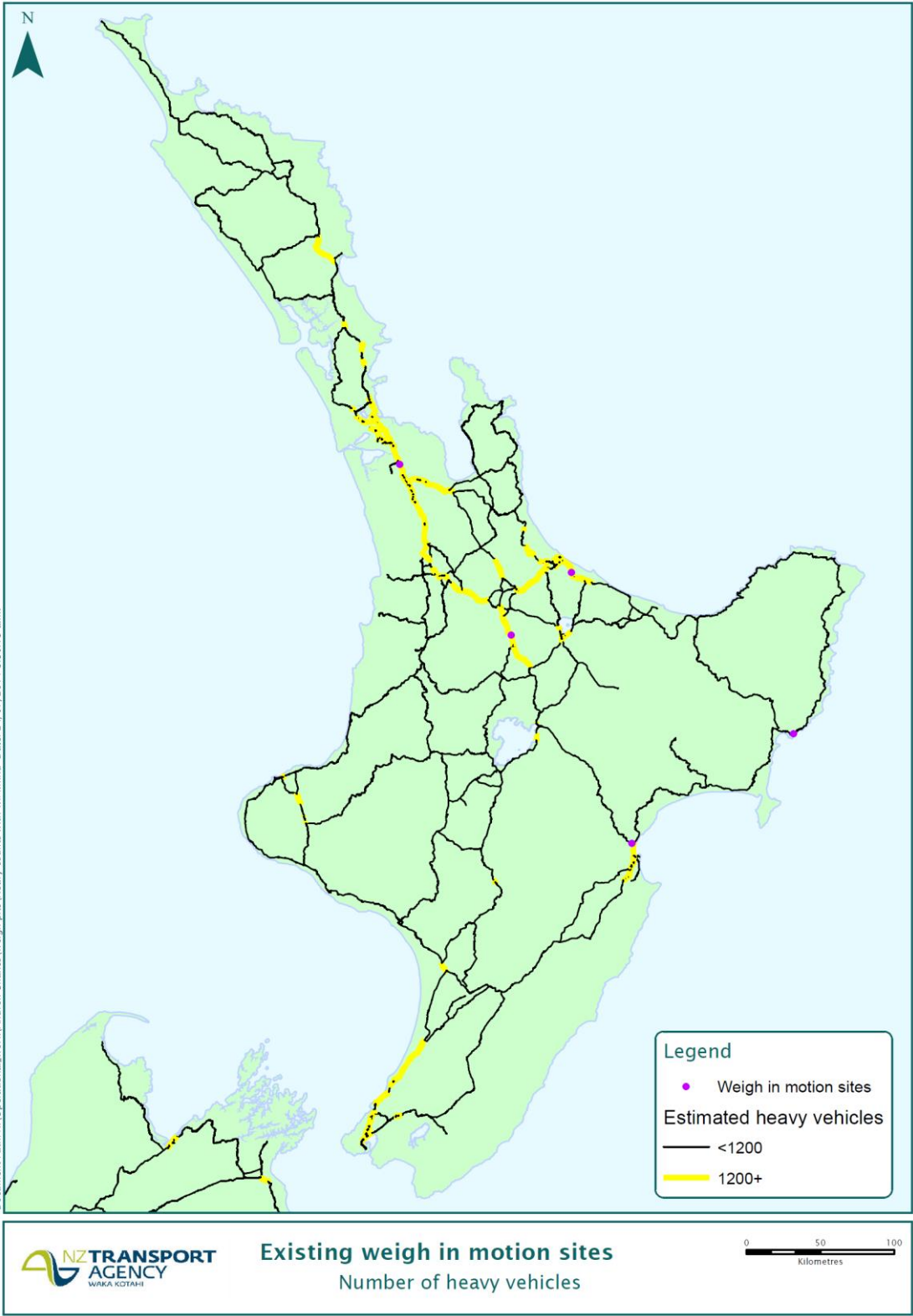
three strategic criteria to determine their suitability for a CVSC. Of those fourteen sites, four were identified as being suitable for a CVSC and warranting more detailed assessments.

In the second stage of technical assessments, five experts assessed the four sites against their area of technical expertise, being; design requirements; cost to construct; property purchase; safety for all road users; and environmental considerations. Following an in-person workshop, the four sites were scored against a range of criteria under the five considerations to provide a baseline score. This evaluation indicated that Site J(2) – Kāpiti performed best.

A sensitivity analysis was subsequently undertaken whereby the scores were tested under four scenarios, which provided different weights on different considerations. The results of this analysis determined that Site J(2) – Kāpiti performed best across all scenarios and therefore is the preferred option. This conclusion is subject to a geotechnical investigation to evaluate the suitability of ground conditions.

Site J(2) will have access from the new local road that will run alongside the Transmission Gully motorway between the Mackays Crossing and Paekākāriki Interchanges. Access to and from State Highway 1 will, once Transmission Gully Motorway is open, be partly from a northbound on-ramp and a southbound off-ramp just to the south of the site, and a full interchange at Mackays Crossing just to the north. The site is part of the Transmission Gully designation and has been used as a borrow pit and laydown area during the construction of the motorway, which is expected to open late 2020 or early 2021.

Appendix 1 – State Highways with more than 1200 heavy motor vehicles per day





 **Existing weigh in motion sites**
Number of heavy vehicles

0 50 100
Kilometres

Appendix 2 – ‘Long List’ Site Options Maps

Appendix 3 – National Site Selection Criteria

Appendix 4 – Favourable Ground Criteria Assessment

Appendix 5 – Difficult to Avoid Criteria Assessment

Appendix 6 – Feasibility and Efficiency Assessment

Appendix 7 – Location of Access and Vehicle Screening Systems for Shortlisted Sites

Appendix 8 – Design Requirements Assessment

Appendix 9 – Cost to Construct Assessment

Appendix 10 – Property Purchase Assessment

Appendix 11 – Safety Assessment

Appendix 12 – Environmental Assessment

Appendix 13 –Workshop Minutes

Appendix 14 – Weighting and Sensitivity Analysis

Appendix 15 – Pros and Cons of Shortlisted Sites

Site	Assessment	PRO +	CON -
Site H – Whareroa Farm	Design Requirements	<ul style="list-style-type: none"> • Only minor non-compliances with guidelines for the VSS equipment • Minimal diversion 	<ul style="list-style-type: none"> • The size of the site is very constrained • Underground gas line adds complexity
	Cost to Construct	<ul style="list-style-type: none"> • Soils are not contaminated 	<ul style="list-style-type: none"> • Large amount of earthworks (fill) required • Widening required for Emerald Glen Road and Emerald Glen Road Bridge.
	Property Purchase	<ul style="list-style-type: none"> • Land is owned by the Crown and is considered to be surplus, as it is physically severed from QEII Park 	<ul style="list-style-type: none"> • Land is a Reserve, and acquisition is complex • Sale requires ministerial approval
	Safety	<ul style="list-style-type: none"> • No right turn movement into the site is required • Adequate sightlines and sight distances 	<ul style="list-style-type: none"> • Shared bridle path adds complexity and safety concerns • Concerns about the manoeuvring via the roundabout
	Environmental	<ul style="list-style-type: none"> • No coastal environment, waterbody, flora/fauna or cultural issues of concern 	<ul style="list-style-type: none"> • Amenity concerns – conflict with recreational use • Gas main is a concern • Fault avoidance area is a concern
Site I – QEII Park	Design Requirements	<ul style="list-style-type: none"> • Only minor non-compliances with guidelines for the VSS equipment • Space is not constrained • Simple navigation for access and egress, very short diversion 	<ul style="list-style-type: none"> • Crossing of railway line is required – limitation on vehicle height
	Cost to Construct	<ul style="list-style-type: none"> • No widening for existing roads required 	<ul style="list-style-type: none"> • Identified contaminated soils • Substantial earthworks required
	Property Purchase		<ul style="list-style-type: none"> • Land is a reserve and is not surplus • Multiple interest holders and decision makers • Ministerial approval required and unlikely to be given

			<ul style="list-style-type: none"> • Costs (lawyers) expected to be high
	Safety	<ul style="list-style-type: none"> • No right turn movement into the site required 	<ul style="list-style-type: none"> • Concerns about the manoeuvring via the roundabout
	Environmental		<ul style="list-style-type: none"> • Located in the coastal environment and close to waterbodies • Cultural issues to consider • Conflict with recreational use • Policy framework is not supportive
Site J(2) – Kāpiti	Design Requirements	<ul style="list-style-type: none"> • Only minor non-compliances with guidelines for the VSS equipment • Space is not constrained • Simple navigation for access and egress 	<ul style="list-style-type: none"> • Maximum diversion exceeds 2km
	Cost to Construct	<ul style="list-style-type: none"> • Flat site, earthworks not large • No widening for existing roads required 	<ul style="list-style-type: none"> • Adjacent to a site with identified contaminated soils – additional assessment and management required
	Property Purchase	<ul style="list-style-type: none"> • Crown land, already gazetted for road purposes and managed by NZTA • The land is soon to be surplus to requirements 	
	Safety	<ul style="list-style-type: none"> • Adequate sight distances 	<ul style="list-style-type: none"> • Concerns about the manoeuvring via the roundabout at Mackays Crossing • Crossing of railway line is required
	Environmental	<ul style="list-style-type: none"> • No proximate neighbours and minimal conflict with recreational users 	<ul style="list-style-type: none"> • Located in the coastal environment and close to waterbodies • Cultural issues to consider
Site L – Paekākāriki Interchange	Design Requirements	<ul style="list-style-type: none"> • Only minor non-compliances with guidelines for the VSS equipment • Space is not constrained 	<ul style="list-style-type: none"> • VMS visibility is challenging • Maximum diversion is 4.1km • Complex navigation • Risk from flooding • Gas main present
	Cost to Construct	<ul style="list-style-type: none"> • No widening for existing roads required 	<ul style="list-style-type: none"> • Adjacent to a site with identified contaminated soils – additional

			assessment and management required • Substantial earthworks required
	Property Purchase	• Crown land, already gazetted for road purposes and managed by NZTA	
	Safety		• Staggered accesses in close proximity - will not meet safety guidelines
	Environmental		• Located in the coastal environment • Site is located close to/over waterbodies that are a threatened fish habitat • Cultural issues to consider • Flooding concerns • Nearby residences