Table of Contents

1. Introduction ...................................................................................................................... 1
2. The Runway Extension Project .......................................................................................... 3
3. Location in the Road Network .......................................................................................... 6
4. National, Regional and Local Plans ................................................................................8
   4.1 National Transport Strategy .......................................................................................... 8
   4.2 Regional Land Transport Strategy ............................................................................... 8
   4.3 Ngauranga to Wellington Airport Corridor Plan .............................................................. 9
   4.4 Long Term Council Community Plan ............................................................................ 11
   4.5 Wellington Airport’s Masterplan .................................................................................. 11
5. Existing State Highway Environment .............................................................................. 12
   5.1 SH2 (Petone to Ngauranga) ........................................................................................ 12
   5.2 SH1 (Ngauranga to Cobham Drive and Calabar Road) ..................................................... 13
6. Transport Routes through Rongotai ............................................................................... 16
7. Recommended Route Haulage ....................................................................................... 18
   7.1 Inbound Haulage Route ............................................................................................... 18
   7.2 Outbound Haulage Route ............................................................................................ 20
   7.3 Summary of Recommended Rongotai Haulage Route ...................................................... 34
8. Alternative Routes through Rongotai ............................................................................. 38
   8.1 Alternative Haulage Route (1) ..................................................................................... 38
   8.2 Alternative Haulage Route (2) .................................................................................... 38
   8.3 Alternative Haulage Route (3) .................................................................................... 41
   8.4 Road to Wharf ............................................................................................................. 43
9. Road Safety ..................................................................................................................... 44
10. Traffic Generation .......................................................................................................... 46
    10.1 Site Establishment Works ......................................................................................... 46
    10.2 Runway Extension Construction ............................................................................... 47
    10.3 Operational Traffic Generation .................................................................................. 49
    10.4 Traffic Generation Summary .................................................................................... 49
    10.5 Overdimension Loads ............................................................................................... 50
11. Route Travel Times ....................................................................................................... 51
12. Traffic Analysis .............................................................................................................. 52
13. Construction Traffic Management Planning ................................................................... 54
14. Conclusion ....................................................................................................................... 55

Appendix A

Construction Traffic Management Plan Framework
Figures
1. Road Transport Network
2. Ngauranga to Wellington Airport Corridor Improvements
3. Traffic Volumes on SH2, South of Petone Interchange
4. Traffic Volumes on SH 1, South of Ngauranga Interchange
5. Traffic Volumes on SH 1, Terrace Tunnel
6. Traffic Volumes on SH 1, Cobham Drive
7. Traffic Volumes on SH1, Calabar Road
8. Overdimension Routes
9. Recommended Haulage Route through Rongotai
10. Traffic Volumes on Moa Point Road
11. Truck Tracking at Lyall Parade / Tirangi Road roundabout
12. Traffic Volumes on Tirangi Road
13. Truck Tracking at Tirangi Road / Coutts Street roundabout
14. Traffic Volumes on Coutts Street
15. Truck Tracking at Coutts Street / Bridge Street intersection
16. Traffic Volumes on Bridge Street
17. Traffic Volumes on Cairns Street
18. Proposed Improvements at Cairns Street / Rongotai Road
19. Proposed Exit at Jean Batten Street / Cobham Drive
20. Proposed Improvements at Rongotai Road / Jean Batten Street
21. Entry / Exit Tracking in Rongotai
22. Alternative Haulage Route (1)
23. Alternative Haulage Route (2)
24. Troy Street / Rongotai Road intersection
25. Alternative Haulage Route (3)
1. Introduction

Wellington International Airport Limited (“WIAL”) has engaged Traffic Design Group Limited (“TDG”) to examine and assess the transportation planning effects arising as a consequence of its proposal to extend its existing airport runway.

This assessment is based on the project description provided by the overarching application. Due to the scale of the proposed works, the report has a particular focus on the likely extent and nature of the construction related transport effects.

The principal traffic engineering and transportation planning considerations involved include the following:

- movement of construction vehicles to and from the site;
- types of haulage vehicles likely to be used, and the practical travel time for trucks to transport material to site in a timely and effective manner;
- access requirements and provisions, including the suitability of existing roads;
- the transportation of over-dimension and over-weight loads;
- transportation route characteristics;
- alternative transportation options;
- traffic volume data on the state highways and the local road networks;
- road safety;
- adjoining land uses;
- local road and intersection capacity and adequacy;
- site servicing constraints relating to construction;
- mitigation improvements; and
- construction traffic management planning.

The relevant provisions of the local, regional and national Plans are addressed, as is WIAL’s 2030 Masterplan, with a view to presenting the future context.

Key conclusions of this report are that:

- the existing state highways and local road networks are capable of supporting all construction related traffic subject to the implementation of a “Construction Traffic Management Plan” (“CTMP”);
- haulage operations shall not occur during the weekday morning and evening peak hour traffic periods in order to minimise any adverse traffic related impacts during these time periods to other road users. In a similar manner, no haulage related transportation will occur on the road network on weekends. Accordingly, the CTMP will define the times of the day when haulage operators are able to transport and deliver construction materials to the site;
- inbound haulage trucks will use a southbound route through the airport precinct, following Stewart Duff Drive, with the corresponding outbound route following roads on the west side of the airport. The proposed separate inbound and outbound haulage
movements will reduce (halve) the likely impact which would otherwise exist in relation to local residents, businesses, schools and other public facilities located adjacent to Wellington Airport in the event all trucks used local roads on the west side of the airport;

- local temporary improvements are needed at the Rongotai Road / Cairns Street intersection, Rongotai Road / Jean Batten Street intersection, and within Jean Batten Street including forming a new exit to Cobham Drive;

- prior approvals from the road controlling authorities are needed for the use of HPMV’s on public roads that are not currently designated for this purpose; and

- the CTMP will provide controls on the operational requirements of all construction related traffic travelling to and from the proposed construction site and the manner in which these traffic controls are to be introduced at various locations along the defined haul routes.

With these arrangements, construction, operation and maintenance of the proposed runway extension and associated auxiliary activities can be achieved in a manner that would not unduly compromise the function, capacity and safety of the road network.

The fuller findings and conclusions reached in this report should be read in conjunction with the Construction Methodology Report that sets out the detail of the planned construction and methodology, and informs the assessment of temporary effects associated with construction of the runway extension.
2. **The Runway Extension Project**

WIAL has identified a need to extend its existing runway to provide a take-off length of at least 2300 metres, to accommodate larger passenger aircraft so as to enable Wellington International Airport to link directly with overseas long haul destinations.

The proposed works involve the extension of the existing runway on reclaimed land at Lyall Bay, at the airport’s southern end. Construction is expected to be completed by a combination of land and marine based methods which will become more clear as construction planning is refined. The full details are set out in the Construction Methodology Report and Management Plans accompanying the application.

Broadly, the construction methodology involves the establishment of a rock dyke around the full perimeter of the runway extension and filling to create a reclaimed land platform inside the rock dyke. The rock dyke and reclamation are expected to be constructed with imported fill sourced from local quarries and/or combined with dredged material. Primary armouring will also be placed on the periphery of the reclamation. This will involve the construction of concrete akmon units which, due to their size, may be batched on-site. Fuller details of the methodology are set out and described in the Construction Methodology Report.

It is anticipated that the reclamation will require compaction and settlement, involving a period of surcharging by the placement of additional fill material to expedite its compaction. Once the surcharging is complete, the additional fill material will need to be transported off site prior to the construction of the sealed runway and the installation of other associated runway infrastructure.

The proposed runway works also involve the extension of the taxiway, requiring bridging over Moa Point Road. Moa Point Road is to remain accessible to the public and also construction traffic throughout the proposed construction period, albeit with some traffic management at times.

The primary site compound, including site offices, amenities, storage for plant and equipment, and parking for construction staff and construction vehicles is proposed to be established on the eastern side of the existing runway, close to Moa Point Road.

**Table 1** indicates the likely volumes of materials anticipated to be required for all of the described works. The expected source and mode of transport is also provided.
<table>
<thead>
<tr>
<th>Work Activity</th>
<th>Quantity m³ (Solid in Place)</th>
<th>Mode of Transportation (and Alternatives)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Site Compound Aggregate</td>
<td>1,000</td>
<td>Direct to site on road</td>
</tr>
<tr>
<td>Moa Point Road Bridge</td>
<td>2,000</td>
<td>Direct to site on road</td>
</tr>
<tr>
<td>Stone Columns</td>
<td>40,000</td>
<td>Direct to site on road, or</td>
</tr>
<tr>
<td>Stone Blanket</td>
<td>56,000</td>
<td>Direct to site on road, or</td>
</tr>
<tr>
<td>Rock Dyke Core</td>
<td>163,000</td>
<td>Direct to site on road, or</td>
</tr>
<tr>
<td>Filter Material</td>
<td>48,000</td>
<td>Direct to site on road, or</td>
</tr>
<tr>
<td>Secondary Dyke Armour</td>
<td>137,000</td>
<td>Likely sourced from Nelson area and barged to site</td>
</tr>
<tr>
<td>Primary Dyke Armour (prefabricated)</td>
<td>152,000</td>
<td>Materials transported direct to site then batched and placed, or prefabricated units barged to site</td>
</tr>
<tr>
<td>Wave Wall (prefabricated)</td>
<td>980 lineal metres</td>
<td>Direct to site on road</td>
</tr>
<tr>
<td>Fill</td>
<td>850,000</td>
<td>Direct to site on road, or</td>
</tr>
<tr>
<td>Surcharge Material</td>
<td>200,000</td>
<td>Direct to site on road, or</td>
</tr>
<tr>
<td>Surcharge Removal</td>
<td>200,000</td>
<td>Direct to site on road, or</td>
</tr>
<tr>
<td>Runway Aggregates</td>
<td>13,000</td>
<td>Direct to site on road</td>
</tr>
<tr>
<td>Asphalitic Cement (Runway and Taxiway)</td>
<td>13,000</td>
<td>Direct to site on road</td>
</tr>
</tbody>
</table>

*Table 1: Construction Quantities and Transport Options*

As indicated, a significant volume of land based material could be trucked to the site or trucked then barged to site, while other materials may be excavated from marine sources and directly barged. This assessment has been purposefully conservative in this regard, and assumes a worst-case scenario in respect of the volume of material that may need to be transported by road, both direct to the site and / or to an intermediary local wharf for short-haul barging to the site. At this stage, wharf options for barging have not been identified and separate detailed assessments will be required at the time should separate land use consents be sought.

It is estimated (at most) that approximately 1.5Mm³ of material would be transported by trucks either directly to site or to a wharf. While this total volume of material is relevant, in terms of overall construction timeframes, this assessment has concentrated on determining transport limitations, and management thereof, in relation to the material source, road.
transport, and site restrictions, in a way that informs appraisal and analysis of effects based on busiest hour operations.

In order to transport the above quantities by road, this assessment has anticipated that truck and trailers will predominately be 23m long ‘High Productivity Motor Vehicles’ (‘HPMV’s’). Such trucks can typically carry up to 20m³ of loose material. As is explained in more detail later in this report, conservative cartage quantities have been purposely adopted when assessing the likely volumes of material to be transported, to take account of possible variations in truck loads and the potential for standard truck and trailers to also be used in combination with HPMV’s.

Where HPMV’s need to deviate from roads already designated as being fit for their purpose, prior permits and route approvals will be required from the appropriate road controlling authorities.

The supply of the majority of the rock and fill material is expected to be sourced from local land quarries. Two local quarries have been identified as being the most likely sources of most of the required rock dyke and fill material, involving Kiwi Point (a Holcim managed quarry at Ngauranga Gorge) and the Horokiwi Quarry south of Petone.

Initial enquiries have indicated that the Kiwi Point and Horokiwi quarries are both able to supply the volume of materials required for the runway extension and related works, and that the materials at these sources are of the appropriate quality required. Both quarries are also understood to have the appropriate resource consents and have no current limitations on their hours of operation or on the quantities they are able to extract.

Further discussions have confirmed that both quarries could manage the loading and site operational requirements of 30 trucks per hour relatively efficiently, but larger volumes would require more gearing-up on site. The two quarries may therefore be relied on in tandem to provide the required material.

The construction works will require no more than 50 staff on the site at any one time to fulfil all of the daily construction tasks including (but not necessarily limited to):

- on site construction supervision;
- operating construction machinery; and
- traffic management of arriving and departing trucks.

Staff will likely reside locally in Wellington and/or be temporarily accommodated nearby.
3. Location in the Road Network

Figure 1 identifies the location of Wellington Airport, the state highway and non state highway routes relevant for haulage, and the key locations for sourcing fill materials.

Wellington Airport is well connected and serviced by the state highway network. In addition, and of relevance to the anticipated transport routes, Wellington City Council (WCC) is responsible for the urban road networks that suitably link with the state highway routes within the proximity of the airport.

In this location, the intended construction site is well positioned with respect to both road and sea options available for transporting construction materials by truck and/or by barge.

Most heavy construction equipment and over-dimensional loads will be delivered to the site using State Highway 1 (SH1) and State Highway 2 (SH2) and other defined overdimensioned routes described in Chapter 6 of this report. As previously stated, the vast majority of the materials will be transported to the proposed construction site from the existing quarries located at Kiwi Point (Ngauranga Gorge) and Horokiwi (south of Petone), with transportation routes centred principally on SH1 and SH2.

Accordingly, the principal road transport routes likely to be used by construction related traffic for the runway extension are proposed to involve the following roads to and from the two nominated quarries:

- SH2 (connecting with SH1 at Ngauranga Gorge);
- SH1 from Ngauranga Gorge to Cobham Drive and Calabar Road;
- then requiring inbound (southbound) transportation through the airport precinct and outbound (northbound) transportation through local Rongotai roads.

As will be explained in more detail to follow, several route options are available to connect between SH1 and the site, each of which has been considered as part of this assessment, with a recommended route set out in Chapter 7.

Trips by construction workers, sub-contractors, and small goods deliveries will be made via Stewart Duff Drive, through the airport precinct.
4. National, Regional and Local Plans

4.1 National Transport Strategy

The New Zealand Transport Strategy is the national guide document, issued by the Minister of Transport, to direct transportation outcomes in New Zealand. Its vision for transportation outcomes in New Zealand is:

‘People and freight in New Zealand have access to an affordable, integrated, safe, responsive and sustainable transport system’.

That vision is supported by five transport objectives:

- ensuring environmental sustainability;
- assisting economic development;
- assisting safety and personal security;
- improving access and mobility; and
- protecting and promoting public health.

Extending Wellington International Airport’s runway and the improvement it will make to the transport system, is well matched with the vision and objectives of the National Transport Strategy.

4.2 Regional Land Transport Strategy

An assessment of the objectives of Greater Wellington’s Regional Land Transport Strategy ("RLTS"), 2007 – 2016, indicates that there are several relevant regional wide strategic outcomes, including:

- increased peak period passenger transport;
- increased mode share for pedestrians and cyclists;
- reduced greenhouse gas emissions;
- reduced severe road congestion;
- improved regional road safety;
- improved land use and transport integration; and
- improved regional freight efficiency.

More particularly, the RLTS also provides the following long term vision for the Ngauranga to Wellington Transport Corridor:

“Along the Ngauranga to Wellington Airport Corridor, access to key destinations such as Centre Port, Wellington City CBD, Newtown Hospital and the International Airport will be efficient, reliable, quick and easy. Priority will be given to passenger transport through this corridor, particularly during the peak period. Passenger transport will provide a very high quality, reliable and safe service along the Wellington City growth spine and other key commuter routes. The road network will provide well for those
trips which cannot be made by alternative modes and will be managed at levels that balance the need for access against the ability to fully provide for peak demands due to community impacts and cost constraints. Maximum use of the existing network will be achieved by removal of key bottlenecks on the road and rail networks.”

As above, priority and improvements are to be afforded in the corridor to facilitate reliable peak period travel and reduced congestion. Informed by these outcomes, this assessment has identified that the transportation of construction materials should avoid traffic peaks and rely on the availability of good road capacity and more reliable travel times during off-peak periods, in the way described through subsequent chapters of this report.

4.3 Ngauranga to Wellington Airport Corridor Plan

In addition to the RLTS, Greater Wellington Regional Council has an endorsed strategy for the transport corridor between Ngauranga and the Wellington Airport. This separate Plan (2008) recognises the regional importance and significance of this transport corridor and its role as a key commuter route and link with the airport. WIAL has continued to show its support for the Plan.

The Plan also contains a map, repeated in this report as Figure 2, that confirms the key areas where improvements are planned or have been identified as requiring further intervention between 2008 and 2018.
Physical improvements have been made at the Cobham Drive roundabout, delivering increased capacity, and NZTA continues to be committed to duplication of The Terrace and Mt Victoria tunnels and four-laning of Wellington Road and Ruahine Street. It is anticipated that construction of the proposed runway extension will not overlap with these future highway works.
4.4 Long Term Council Community Plan

WCC currently has in place a Long Term Council Community Plan (LTCCP) for 2009-2019. This document identifies the key transportation activities planned and / or proposed for Wellington’s urban roading network.

WCC is substantially focused in its forward LTCCP programme on enhancement of the local road network to accommodate future growth and ongoing changes in travel patterns associated with changes in land use. There are no current road improvements planned and/or already underway that would have an effect on the ability to deliver the proposal or its construction. Similarly, the proposal will not impact on the ability for the Council to deliver the proposed roading improvements as defined in the current and proposed LTCCP programmes.

4.5 Wellington Airport’s Masterplan

WIAL’s 2030 Masterplan presents a framework for facilitating and responding to the airport’s projected growth and development. Good airports need good transport access and, as identified above, WIAL supports the road improvements identified for the Ngauranga to Wellington Airport corridor.

The forecast of aircraft movements, worldwide, anticipates the introduction of progressively larger aircraft types. Better performance on Tasman routes and the opportunity to make direct flights to Asian destinations is anticipated, and a potential future runway extension is anticipated, as now proposed.

Transport access to the airport is addressed, with travel time reliability identified to be of primary importance. Again, for reasons of ensuring travel reliability for not only passengers but also other commuters, and avoiding congestion, the transportation of construction materials on public roads to the site is proposed in a manner to avoid traffic peaks.

Other than temporary works to facilitate runway construction, no other roading works are required as a prerequisite for the growth anticipated to occur progressively in response to increased travel afforded by the runway extension. Rather, such future works are identified through the Masterplan and will be the subject of separate investigations, funding and construction programmes.
5. **Existing State Highway Environment**

TDG has completed route inspections of the various roads available for haulage trucks arriving at and departing from the proposed runway extension site.

For the transportation of fill material by road, SH2 (Petone to Ngauranga) and SH1 (Ngauranga to Cobham Drive and Calabar Road), have been identified as the relevant state highway routes.

### 5.1 SH2 (Petone to Ngauranga)

This section of SH2 is expected to be used by truck and trailer units transporting bulk fill material either directly to the Wellington Airport (via SH1 to the south) and to a wharf option from where some of the fill material could be barged to site.

Available traffic data indicates that this section of SH2 typically supports 68,000 vehicles per day ("vpd"), involving some 2,800 heavy trucks. The weekday peak transport period occurs in the morning between 7:15 and 8:15am at a rate of around 6,000 vehicles per hour (vph). The weekday evening peak is more defined, occurring between 4:30 and 5:30pm and involves around 7,000 vph.

**Figure 3** provides a graphical representation of these traffic volumes on SH2, south of the Petone Interchange, and also provides a Saturday and Sunday traffic profile for comparison.

![Two-way Traffic Volumes on SH2 South of Petone Interchange](image)

**Figure 3: Traffic Volumes on SH2, South of Petone Interchange**

Of relevance, the blue-coloured weekday profile shows significant AM and PM peaks corresponding to workbound and homebound commuter demands, with substantially less traffic flows through the intervening period, which are also less than the corresponding weekend flows. Traffic congestion occurs during these commuter peaks, when travel times are also less reliable and often widely different on different days. This is one of the reasons for proposing that the transportation of fill materials on public roads avoids these traffic peaks and instead occur during on the following transport windows:
9.00am to 3.00pm weekdays; and
6.00pm to 10.00pm weekdays.

No truck transportation of fill materials on public roads is proposed on weekends.

The existing local intersections that connect the Horokiwi quarry with SH2, including turnaround facilities at Petone and at Ngauranga that support the left-in / left-out configuration of Horokiwi Road, serve the existing quarry traffic well and have been assessed to remain suitable to handle increased truck traffic, as already occurs in practice with routine fluctuations in quarry demands. No road improvements are required for SH2.

5.2 SH1 (Ngauranga to Cobham Drive and Calabar Road)

SH1 (including the Wellington Motorway) is anticipated to be the principal travel route for trucks hauling materials to the proposed airport extension site. It follows the western side of Wellington Harbour and then traverses through Wellington City, around the Basin Reserve and then to Cobham Drive (via the Mt Victoria Tunnel) and terminates at the southern end of Calabar Road at Wellington Airport. It includes urban and motorway sections.

As expected for a state highway, the route is equally able to support trucks transporting materials and equipment to the proposed construction site, without the need for change.

The Kiwi Point Quarry is located on the western side of SH1 midway up Ngauranga Gorge. Access to this site only permits left-turn entry and left-turn exit movements. Accordingly, trucks intending to travel south from the site are required to first travel north and turnaround at the Newlands Interchange.

Figures 4, 5, 6 and 7 confirm the typical weekday traffic volumes on SH1, taken at the following three separate locations:

- SH1 south of Ngauranga Interchange;
- SH1 through The Terrace Tunnel;
- SH1, Cobham Drive, west of Troy Street; and
- SH1, Calabar Road, south of Caledonia Street.

These selected traffic count sites appropriately cover the range of vehicular demands along this haul route. Existing daily and heavy truck volumes are shown in Table 2.

<table>
<thead>
<tr>
<th>Location</th>
<th>Daily Traffic Volume</th>
<th>Daily Heavy Truck Volume</th>
</tr>
</thead>
<tbody>
<tr>
<td>South of Ngauranga Interchange</td>
<td>87,000</td>
<td>3,000</td>
</tr>
<tr>
<td>Terrace Tunnel</td>
<td>45,000</td>
<td>1,400</td>
</tr>
<tr>
<td>Cobham Drive</td>
<td>35,000</td>
<td>1,000</td>
</tr>
<tr>
<td>Calabar Road</td>
<td>23,000</td>
<td>700</td>
</tr>
</tbody>
</table>

*Table 2: SH1 Traffic Volumes*
In a very similar manner to the traffic profiles observed for SH2, these four graphs show a weekday morning peak on SH1 from about 7.00am and the evening peak from about 4.00pm. In each instance, traffic during the middle of the day remains smaller, and again less than the equivalent weekend flows. As before, it is proposed that transportation of fill materials on public roads occur on weekdays, avoiding the congested AM and PM traffic peaks.

**Figure 4: Traffic Volumes on SH1, South of Ngauranga Interchange**

**Figure 5: Traffic Volumes on SH1, Terrace Tunnel**
Near the Basin Reserve, SH1 supports a large volume of commuter traffic travelling to and from the city and suburbs on the eastern side of Mt Victoria Tunnel and importantly also, the airport. It provides access to the regional hospital and, in the immediate area, access to many local schools (including Wellington East Girls College, St Marks Church School and Wellington College), and also Massey University. Further south, SH1 provides access to the Wellington Aquatic Centre, St Patricks College, Rongotai College, as well as many retail and commercial businesses throughout.

These local and wider land use sensitivities are another reason for proposing truck transport in a way that avoids the ‘before’ and ‘after’ school peaks.
6. Transport Routes through Rongotai

In 2013, WIAL made substantial improvements to the airport precinct and main northern entrance from Stewart Duff Drive, including installation of entry and exit gates. These changes, coupled with development of the layout and access arrangements for the existing car parking facilities, were made to improve the control and management of vehicle arrivals and departures at the airport. Further improvements are imminent.

Due to these physical changes, overdimensioned vehicles cannot travel on Stewart Duff Drive through the airport precinct. Consequently, NZTA’s designated Overdimension Vehicle Route (OVR), which had previously followed Stewart Duff Drive now diverts from the route at the intersection of Station Drive and continues (airside) across the airport to link with Freight Drive, in the manner shown by the dashed green line in Figure 8. This revised OVR is subject to strict airport permissions.

While the airside OVR is practical for occasional overdimensioned loads, airport operations prevent it from being considered a viable truck access route for construction purposes. In the same way, it is not practical to provide for trucks to access airside on the western apron. Airport Operations advise that frequent truck volumes cannot be managed in a responsible and safe manner across the critical airside activities, without significantly risking and interfering with aircraft and apron movements. Instead, and as set out in the next chapter of this report, road access to and from the construction site needs to be achieved via local roads on each side of the airport, identified by the blue dashed lines in Figure 8 that extend from the OVR.

On the eastern side of the airport, Calabar Road extends southwards as Stewart Duff Drive, through the airport precinct, to connect with Moa Point Road. This is a viable southbound haul route, but the return northbound route through the airport precinct following immediately adjacent the terminal is not, since it would compromise the safety and movement of departing customers in this very active and dynamic part of the airport precinct. Rather, roads on the western side of the airport need to be relied on to connect between Moa Point Road and SH1. The local roads in this vicinity are all currently controlled by posted 50km/h speed limits and are managed by WCC.

Further to the west, the available local routes include the use of (or a combination of) Crawford Road, Kilbirnie Crescent, Evans Bay Road, Onepu Road and Lyall Parade. In addition to residential homes, all of these roads provide a direct connection with local schools, commercial activities and businesses, and shopping within the Kilbirnie town centre. For these reasons, these roads would not be suitable to support the transportation of fill materials to the runway site and using them would create substantial adverse traffic and road safety effects that would be very difficult to mitigate.

Further assessment of the local road network has identified several potential road transport routes that could be used on the western side closer to the airport. In so doing, consideration has been given to the possibility of making some changes to these routes in order to gain further transport efficiencies and / or recognising road safety issues that may potentially be present with increased truck traffic.

The next chapter of this report sets out and describes the recommended truck haulage route, with the other alternatives investigated (and subsequently discarded) included for completeness at Chapter 8.
Sourced from Terralink Street Maps

Wellington International Airport Proposed Runway Extension

Overdimension Routes

State Highway Haul Routes
Other Overdimension Vehicle Routes
Updated Overdimension Vehicle Route
Non State Highway Haul Routes
Site Location

G:\TDG PROJECTS\13,000-13,999\13043 Wellington Airport Investigations\CAD\13043 N1B.dwg
7. **Recommended Route Haulage**

The recommended local haulage route to serve the construction site is illustrated in Figure 9, with the inbound and outbound sections of the route described individually next, capturing the local road connections from and to SH1.

### 7.1 Inbound Haulage Route

SH1 (Calabar Road) has its southern end at the Broadway roundabout. Extending south from this intersection this inbound haulage route continues as Stewart Duff Drive through the airport precinct to connect with Moa Point at a tee intersection. Stewart Duff Drive is a private road through the airport, to which through-traffic is granted access by WIAL.

The central length of Stewart Duff Drive running parallel to the Miramar Golf Course functions as a one-way southbound road, with the corresponding northbound movements handled immediately adjacent the terminal. Vehicle movements through this core part of the airport precinct are controlled by barrier arms.

As a private airport road, truck traffic can be managed by WIAL through the precinct in a manner that minimises disruption for other airport-related traffic, including for example by dedicating barriered entry and exit lanes to haul trucks. All such management arrangements will be addressed by the CTMP.

At its southern end, Stewart Duff Drive intersects with Moa Point Road as shown next in Photograph 1. From this point, trucks will travel directly across Moa Point Road to access the construction site. Full temporary traffic management arrangements will be in place at this intersection to safely handle crossing truck traffic.

*Photograph 1: On Stewart Duff Drive facing south to Moa Point Road*
Wellington International Airport Proposed Runway Extension

Recommended Haulage Route

- Jean Batten Street
- Bridge Street
- Coutts Street
- Tirangi Road
- Lyall Parade
- Moa Point Road
- Stewart Duff Drive
- SH1
- SH1
- Rongotai Road
- Carnie Street

Inbound Haulage Route

Outbound Haulage Route
7.2 Outbound Haulage Route

The recommended haulage route on the western side of the airport follows Moa Point Road, Lyall Parade, Tirangi Road, Coutts Street, Bridge Street, Cairns Street, Rongotai Road and Jean Batten Street.

Each section of this route is discussed in turn next.

7.2.1 Moa Point Road and Lyall Parade

Moa Point Road provides a transport connection between the coastal suburbs of Lyall Bay and Breaker Bay. It also services some existing airport traffic as well as supporting light industrial businesses at the southern end of the airport. It extends northwards from the runway extension site on the western side of the existing runway, and is proposed to provide the first section of the outbound haulage route.

The route around the south coast, including Moa Point Road and Lyall Parade is designated within the Wellington City District Plan as involving Principal Roads, being part of the city’s primary road network. Photograph 2 confirms that Moa Point Road (and indeed its continuation around the northern corner as Lyall Parade) is well appointed with two 3.5m traffic lanes and sealed shoulders adjacent a formed kerb on both sides.

Photograph 2: On Moa Point Road facing north

Along its seaward side, a rock seawall has been constructed for erosion protection, along which there is an informal pedestrian track. On its opposite side, against Wellington Airport’s security fence, is a 1.5m wide concrete footpath. At its southern end, the road passes beneath the runway through a short tunnel which also has a dedicated pedestrian pathway. At its northern end, the road continues around Lyall Bay as Lyall Parade.

Traffic count data confirms that this section of the route has an average daily volume of around 4,000vpd. As can be seen in the following Figure 10, the weekday morning and evening peak flows are in the order of 325 and 380vph respectively. These peaks have
been measured to occur between 8:00 to 9:00am and 3:00 to 4:00pm. As also shown, greater flows are experienced on weekends, reflecting the popularity of the coastal area and coastal drive on weekends.

**Figure 10: Hourly Traffic Volumes on Moa Point Road/Lyall Parade**

Separate manual counts have identified the use of Moa Point Road by cyclists and both the adjacent footpath and informal seaside track by pedestrians. The counts were undertaken in fine weather on a weekday and Saturday in February 2015, with the number of movements as recorded in **Table 3**.

<table>
<thead>
<tr>
<th>Period</th>
<th>Cyclists per hour</th>
<th>Pedestrians per hour</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weekday AM peak</td>
<td>44</td>
<td>3</td>
</tr>
<tr>
<td>Weekday Interpeak</td>
<td>11</td>
<td>3</td>
</tr>
<tr>
<td>Weekday PM peak</td>
<td>19</td>
<td>4</td>
</tr>
<tr>
<td>Saturday AM peak</td>
<td>107</td>
<td>11</td>
</tr>
<tr>
<td>Saturday Interpeak</td>
<td>29</td>
<td>17</td>
</tr>
</tbody>
</table>

**Table 3: Cyclist and Pedestrian Activity on Moa Point Road**

In a similar manner as vehicle patterns, the counts show heightened cyclist and pedestrian activity on the Saturday, with lowest flows observed during the middle of the day on weekdays when haulage truck movements are planned. In this way, the effect of haulage trucks on vehicle, cyclist and pedestrian users of Moa Point Road and its continuation around Lyall Bay as Lyall Parade will be mitigated.

Overall, the road is assessed to be in good condition and that it is well able to support haulage trucks transporting materials to and from the site, without the need for mitigation works, except at the point where the egress from the construction site joins Moa Point Road, which will be subject to localised traffic management to be set out in the CTMP.
7.2.2 **Lyall Parade / Tirangi Road Roundabout**

Photographs 3 and 4 below illustrate the form of the Lyall Parade / Tirangi Road roundabout. As shown, the roundabout has single approach lanes and a single circulating lane, appropriate for the traffic volumes it carries, and has a design that involves a main central island with a mountable apron.

![Photograph 3: Westbound Approach to Roundabout](image1)

![Photograph 4: Central Island Detail](image2)

Photograph 3: Westbound Approach to Roundabout  Photograph 4: Central Island Detail

The concrete apron is designed in such a way that enables larger vehicles (such as trucks and buses) to track across the edge of the roundabout in order to perform a turn, whereas cars and vans can negotiate the roundabout within the paved lane space. As shown in Figure 11, truck and trailers can perform the right turn from Lyall Parade into Tirangi Road by tracking across the roundabout apron, as intended.

No mitigation improvements are considered necessary, although the CTMP will capture road condition surveys that might require remedial improvements.

7.2.3 **Tirangi Road**

Tirangi Road forms part of the city’s secondary network, and has a defined Collector Road function. It serves local airport services and industrial activities, and has a predominant weekend traffic function serving the Airport Retail Park. This is obvious in the traffic volume graph that follows, as Figure 12, in which the heightened traffic activity in the area on Saturdays and Sundays can be clearly identified.
Wellington International Airport Proposed Runway Extension

Tracking at Lyall Parade/Tirangi Road
Figure 12: Hourly Traffic Volumes on Tirangi Road

On weekdays, peak hourly flows are about one third less than on weekends, again reinforcing the relevance of avoiding weekend haulage. Overall, daily volumes are in the order of 6,000 vpd, with weekday volumes peaking at 700 – 800 vph, commensurate with a Collector Road.

As shown in Photograph 5 that follows, the road is wide, at approximately 15m between kerbs, with a central painted median dividing northbound and southbound traffic, and with kerbside parking permitted.

Photograph 5: Tirangi Road facing north

As identified in Figure 8, Tirangi Road forms part of the defined OVR.
7.2.4  Tirangi Road / Coutts Street Roundabout

Photographs 6 and 7 below illustrate the form of the roundabout at the north end of Tirangi Road, at the Coutts Street intersection. It also has single approach and circulating lanes, again commensurate with the required traffic capacity but, unlike the design of the Lyall Parade / Tirangi Road roundabout, has a central island with a fully mountable profile.

![Photograph 6: Northbound Approach to Roundabout](image1)
![Photograph 6: Central Island Detail](image2)

Figure 13 shows the manner in which haul trucks will track across the central mountable island in making a right turn from Tirangi Road into Coutts Street (east). Again, since the roundabout design facilitates this movement, no mitigation improvements are considered necessary, although remedial measures may be identified through the CTMP.

7.2.5  Coutts Street

The short section of Coutts Street between Tirangi Road and Bridge Street is a lightly trafficked local road that predominantly provides for local property access as well as a key cycle connection with the underpass that runs beneath the airport runway. The arrangements are as shown in Photograph 8 below.

![Photograph 8: On Coutts Street facing east towards the airport](image3)
Wellington International Airport Proposed Runway Extension

Tracking at Tirangi Road/Coutts Street
Traffic volumes on Coutts Street involve an average daily flow of just 850vpd. The morning and evening peak volumes are between 80 and 90vph. These are small flows, reflective of the local function of this eastern end of Coutts Street.

**Figure 14** illustrates the traffic volume patterns on Coutts Street.

Figure 14: Hourly Traffic Volumes on Coutts Street

At the Coutts Street / Bridge Street intersection, the predominant traffic movements involve:
- the left turn from Coutts Street (west) into Bridge Street; and
- the corresponding right turn from Bridge Street into Coutts Street (west).

**Figure 15** illustrates the tracking of a 23m long HPMV truck and trailer turning left from Coutts Street (west) into Bridge Street. It shows the truck taking a wide sweep into Bridge Street, facilitated by the open form of the intersection and the low trafficked nature of the location. The turn into Bridge Street does not cross onto the exiting (southbound) lane of Bridge Street.

With the exception of temporary traffic management provisions that may be deemed appropriate through the CTMP, no physical changes are considered necessary at this location of the outbound haulage route.

### 7.2.6 Bridge Street

From Coutts Street, Bridge Street has two 2.5m wide kerbside parking lanes with two 3.0m wide traffic lanes. At its centre there is a 2.5m wide painted flush median.

**Photograph 9** illustrates the general profile of the road leading north towards Cairns Street, with Airport owned properties to the right. As can be seen, the road is well delineated and wide.
Traffic volumes on Bridge Street involve an average daily flow of just 600 vpd. The morning and evening peak volumes are 50 vph and 55 vph respectively.

**Figure 16** illustrates the traffic volume patterns on Bridge Street.

![Hourly Traffic Volumes on Bridge Street](image)

**Figure 16: Hourly Traffic Volumes on Bridge Street**

Site inspections confirm that this road has ample carriageway provisions to be able to support truck movements, northbound, as proposed.

### 7.2.7 Cairns Street

Cairns Street, which provides a short connection between Bridge Street and Rongotai Road, is also designated as a Local Road in the Wellington City District Plan. The road also has a
short 70m stub that leads from Bridge Street and terminates at a cul de sac adjacent to the Airport’s western boundary.

As identified in **Photograph 10**, the section of Cairns Street between Bridge Street and Rongotai Road is wide, at 13m. As shown, it is able to accommodate regular kerbside parking, including buses related to the adjacent works depot, and still retain a wide trafficable carriageway.

**Photograph 10: On Cairns Street facing north**

Traffic count data confirms that the section of Cairns Street between Bridge Street and Rongotai Road carries some 50 to 60vph during the morning and evening peak hour periods. The daily traffic volume on Cairns Street is around 700vpd. **Figure 17** shows the average weekday and weekend day volumes profiles. Flows remain small throughout.

**Figure 17: Hourly Traffic Volumes on Cairns Street**

The acute angle of the Cairns Street / Rongotai Road corner requires some physical changes to safely provide for outbound truck and trailers to turn right from Cairns Street into
Rongotai Road, in the manner illustrated in Figure 18. As shown, these involve the marking of no stopping lines on the northern kerb of Rongotai Road, formalised marking of the east approach and widening of the eastern corner. These changes could remain as permanent improvements if the Council considers such to be desirable.

7.2.8 Rongotai Road and Jean Batten Street

The eastern end of Rongotai Road, continuing as Jean Batten Street, is designated as a Local Road and serves light industrial and airport service businesses. Jean Batten Street extends northwards from Rongotai Road along the airports western boundary and has a cul de sac end at Cobham Drive. Measurements confirm the road has a sealed carriageway of 9.5m with a concrete footpath along its western side. There is a 3m wide grassed berm adjacent an airport security fence on its eastern side.

Photograph 11 illustrates the general configuration of Jean Batten Street. As can be seen, the road supports parallel parking on both sides. These parked vehicles are predominately owned by staff and visitors to the businesses located on this street. Site visits have confirmed that the level of parking demand is high with most available parking spaces being occupied during weekday business hours, with little turnover outside of morning arrivals and evening departures. As such, the proposed transport window between 9.00am and 3.00pm, and again from 6.00pm will avoid most parking movements.

Photograph 11: On Jean Batten Street facing north

With both kerbsides well used for on-street parallel parking, there is approximately 5.5m of sealed carriageway remaining for two-way traffic flows. With these current carriageway limitations, trucks would find Jean Batten Street too restrictive and unsafe unless parking changes are made. In the manner shown in Figure 19, it is proposed that Jean Batten Street be widened by approximately 1.5m to enable parking on the eastern side to be retained within a widened road, to give an overall trafficable width of around 7m that will safely provide for outbound trucks and the occasional passing car.
Wellington International Airport Proposed Runway Extension

Proposed Improvements at Cairns Street/Rongotai Road

FIGURE 18

Wellington International Airport Proposed Runway Extension

Proposed Improvements at Cairns Street/Rongotai Road
Wellington International Airport Proposed Runway Extension

Proposed Exit at Jean Batten Street/Cobham Drive

FIGURE 19

SCALE: 1:400 (A4)
Enabling this road to be used by trucks to complete their return trips will require the construction of a temporary exit onto Cobham Drive. **Photograph 12** confirms the excellent sightline provisions (being in excess of 160m) that would be available to drivers completing this manoeuvre. Notwithstanding the good level of available sightline provisions, it is recommended that Cobham Drive’s two westbound lanes be managed with temporary speed restrictions of 50km/h during haulage operations. Lowering the speed limit to this level will further assist exiting drivers to select an appropriate gap in oncoming traffic, without undue compromise to the movement of arterial traffic.

The temporary exit could also serve existing users of Jean Batten Street which would reduce potential conflicts with trucks on other parts of the recommended route.

**Photograph 12: On Cobham Drive (adjacent to Jean Batten Street) facing oncoming traffic**

Figure 19 also shows the treatment proposed to enable safe left turn exits by trucks.

As indicated by the design, the existing landscaped area and seating is proposed to be removed temporarily as part of the required works and an exit crossing constructed at the correct exit width for truck and trailers. This width is required to ensure that exiting trucks are able to fully turn into the inside northbound traffic lane, thereby avoiding the need for trucks to drift into the second northbound lane. The existing bus stop, located to the west of this proposed exit will not be affected by construction of the temporary exit.

Corresponding changes are also intended at the Jean Batten Street corner with Rongotai Road, in the manner shown in **Figure 20**.

Again, it is proposed that the temporary arrangements be removed and the existing cul-de-sac reinstated once the construction works are complete.

### 7.3 Summary of Recommended Rongotai Haulage Route

For the reasons described through this chapter, it is assessed that an effective transport route through Rongotai can be provided as previously illustrated by Figure 9. The further
analysis contained in Chapter 12 of this report examines the performance of the proposed new exit at Jean Batten Street with Cobham Drive, which has been determined to be the critical point of operational capacity on the recommended haulage route. At other intersection locations, including at the state highway roundabouts, the effects of adding haul trucks are suitably mitigated by the recommended transport hours that avoid traffic peaks and utilise available capacity during off-peak periods.

The overall truck tracking shown in Figure 21 illustrates the inbound and outbound paths of 23m long HPMV’s, and has been annotated to identify the individual locations assessed earlier in this chapter.

As has been reported, this investigation has identified some mitigation works would be required along parts of the route to provide for the safe travel of 23m long HPMV’s. The physical works will be supplemented by standard traffic management practices to be confirmed through the CTMP.
Wellington International Airport Proposed Runway Extension
Entry/Exit Tracking In Rongotai

Refer Figure 11

Refer Figure 13

Refer Figure 15

Refer Figure 20

Refer Figure 19

Refer Figure 18

Refer Figure 17

Refer Figure 16

Refer Figure 14

Refer Figure 12

Refer Figure 10

Refer Figure 9

Refer Figure 8

Refer Figure 7

Refer Figure 6

Refer Figure 5

Refer Figure 4

Refer Figure 3

Refer Figure 2

Refer Figure 1

Refer Figure 21
8. Alternative Routes through Rongotai

This chapter sets out the various alternative local road routes through Rongotai that have informed selection of the recommended route as described in the previous chapter of this report. Each involve two-way truck movements on roads on the western side of the airport and, to that end, are observed as not having the ability to offer the same relief as the recommended routes which distributes truck traffic across two (east and west) routes.

For reasons previously explained, western routes more distant from the airport do not present viable haulage choices. As such, routes closer to the airport have provided the focus of the investigation of alternatives. Three options are considered.

8.1 Alternative Haulage Route (1)

As shown in Figure 22, this alternative involves transportation via the following roads:

- SH1 (Cobham Drive and circulating the roundabout at Calabar Road) onto Jean Batten Street (via a new intersection connection), Rongotai Road, Cairns Street, Bridge Street, Coutts Street, Tirangi Road, Lyall Parade and Moa Point Road; and
- return on same route to SH1 via Jean Batten Street.

A preliminary review of this option has identified several road safety and transport efficiency concerns that would be very difficult to resolve to enable this route to be used efficiently and effectively by trucks. As above, this option will require the construction of a new intersection at Cobham Drive / Jean Batten Street to enable two-way flows.

Due to the carriageway width and current parking demands on Jean Batten Street, two-way flows will potentially have a significant impact on the existing businesses located on this street by way of the need to remove parking. Two-way truck movements are also not possible at the southern corner of Jean Batten Street where it intersects with Rongotai Road, and likewise at the next acute intersection with Cairns Street. Additionally, trucks would need to slow on Cobham Drive prior to turning left into Jean Batten Street. Even with a deceleration lane, the movement would impact on the capacity and operational performance of Cobham Drive and upstream on the existing dual lane roundabout at Cobham Drive / Calabar Road.

This assessment has therefore concluded Jean Batten Street should not be used as a two way truck route. It is however considered that a single outbound flow could be supported by Jean Batten Street, and this is confirmed as part of the recommended route.

8.2 Alternative Haulage Route (2)

As shown in Figure 23, this second alternative provides for trucks to travel via Cobham Drive then turn at the dual lane roundabout into Troy Street. From there trucks would travel on Rongotai Road, Cairns Street, and follow the same road route to Moa Point Road as Alternative Haulage Route (1). These vehicles would then return on the same route to SH1.
Wellington International Airport Proposed Runway Extension

Alternative Haulage Route (1)
The inbound route is assessed as offering a practical road transport option, with widening improvements at the Troy Street intersection with Rongotai Road required to facilitate the left turn of 23m long HPMVs. However, on the return trip along Rongotai Road, right turn movements are physically prohibited into Troy Street, as shown by the Google Earth image included in Figure 24.

Instead, all motorists intending to travel north from this intersection are required to progress westbound on Rongotai Road and then complete a right turn through the central median, located immediately west of the intersection. It is also noted that, in order to complete the u-turn, traffic is required to pass over two pedestrian crossings.

Due to these particular constraints and the likelihood of conflicts with following traffic caused by right turning trucks at the median, this assessment has also investigated the potential to construct a new temporary turn in the median opposite the exit from Rongotai Road (east). The configuration would however be complex and present potential new safety issues in terms of conflicts with westbound traffic on Troy Street and confusion with adjacent exits from Salek Street. It was not carried forward for further consideration.

As a consequence of these concerns, this assessment has concluded that trucks should not travel through the intersection at Rongotai Road / Troy Street on their return trip. It was therefore concluded that Jean Batten Street be included as being a more appropriate connection with Cobham Drive for returning trucks, as the recommended local road option.

8.3 Alternative Haulage Route (3)

The third option provides for trucks to turn right from Cobham Drive onto Troy Street from where they would travel via Salek Street, Coutts Street, Tirangi Road, Lyall Parade, and Moa Point Road to the site. As illustrated in Figure 25, these same roads could then be used on the return route to Cobham Drive. This route mirrors the OVR identified in Figure 8.

As an established residential road, Salek Street has traffic calming measures built along its full length with supplementary signage designating the road as a 'Slow Zone'.
As identified in Photograph 13, Salek Street also attracts on street carparking.

Photograph 13: On Salek Street facing north.

Similar sensitivities exist in Coutts Street, which also provides access to Rongotai College, which generates significant pedestrian activity across the road.

Despite being part of the defined OVR, it is concluded that this route option would be the least desirable of the three primary alternatives considered, for the reasons described, and does not present a viable alternative.

8.4 Road to Wharf

As set out earlier in this report, this assessment has been purposefully conservative in evaluating the needs and effects of road-transporting bulk materials direct to the site. Drawing from Table 1, barging may present a viable alternative for transporting some main materials direct to the construction site and, in such instances, will mitigate the road transport needs and effects assessed in this report for the recommended road option.

Barge options may, in due course, be deemed appropriate from various locations around the inner harbour, including at Seaview, Petone, Kaiwharawhara and CentrePort. In each instance, transportation by barge would involve an initial road transport component, for which separate assessments will be required in conjunction with the separate consenting for wharf and barge activities. In other instances, materials may be sourced and barged from the Nelson area.
9. Road Safety

A search has been made of the NZTA recorded crash database for the five-year period 2010 to 2014 to identify truck crashes and their causes across the recommended haul routes to the site. The crash records and the levels of crash severity are presented in Table 4 below for the respective parts of each route. The data is presented for weekdays only since no construction truck movements will occur on weekends.

<table>
<thead>
<tr>
<th>ROUTE SEGMENT</th>
<th>STREETS</th>
<th>SEVERITY</th>
<th>CRASH TYPES</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>9.00am to 3.00pm and 6.00pm to 10.00pm</td>
<td>Other Times</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Fatalities:</td>
<td>Serious:</td>
</tr>
<tr>
<td>Calabar Road (Broadway Roundabout) to Moa Point Road</td>
<td>Local Roads – Stewart Duff Drive.</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Moa Point Road to Jean Batten Street</td>
<td>Local Roads – Moa Point Rd, Lyall Pde, Tirangi Rd, Coutts St, Bridge St, Cairns St, Rongotai Rd, Jean Batten St.</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Mt Victoria Tunnel to Calabar Road (Broadway Roundabout)</td>
<td>SH1 – Taurima St, Ruahine St, Wellington Rd, Cobham Dr, Calabar Rd.</td>
<td>Fatalities:0</td>
<td>0</td>
</tr>
<tr>
<td>Mt Victoria Tunnel to Terrace Tunnel (northern terminus)</td>
<td>SH1 – Paterson St, Dufferin St, Rugby St, Ellice St, Sussex St, Kent Tce, Buckle St, Vivian St, Arthur St, Karo Dr, Motorway.</td>
<td>Fatalities:0</td>
<td>0</td>
</tr>
<tr>
<td>Terrace Tunnel (northern terminus) to Ngauranga Interchange</td>
<td>SH1 – Motorway.</td>
<td>Fatalities:0</td>
<td>0</td>
</tr>
<tr>
<td>Ngauranga Interchange to Newlands over bridge</td>
<td>SH1 – Motorway, Centennial Hwy, all ramps to SH2 and Centennial Hwy, Newlands off-ramp, on-ramp and over bridge.</td>
<td>Fatalities:0</td>
<td>0</td>
</tr>
<tr>
<td>Ngauranga Interchange to Petone Interchange</td>
<td>SH2 – Hutt Rd. Local Roads – Horokiwi Rd.</td>
<td>Fatalities:0</td>
<td>0</td>
</tr>
</tbody>
</table>

Table 4: Recorded Accidents on Proposed Haulage Routes

This road safety analysis indicates that the rate of reported accidents involving trucks is more elevated during peak hour morning and evening periods, as compared with the ten-
hour transport window proposed. This finding further reinforces the proposal to ensure haulage trucks use these roads at times when likely conflicts can be minimised.

It is also noted that the majority of the roads included in this search are already designated as roads to be used by heavy vehicles. As such, haulage operators are required to use these roads when transporting goods and materials to, from and through Wellington.

There are no identified safety issues on the state highways and arterial routes that need to be addressed to facilitate construction transportation for the runway extension. Where deficiencies have been identified, recommended engineering solutions have been provided to mitigate potential safety issues and conflicts, with local traffic control measures to be developed and implemented through the CTMP.

With selected transport windows, transportation on established routes, and improvements recommended in identified locations, it is concluded that haulage trucks can be safely accommodated by the public road network in the manner proposed. Moreover, the CTMP will have a particular focus on safety, both on and off-site and include provisions around the safe management of truck movements.
10. Traffic Generation

To determine the likely volume and management of construction traffic, this assessment has included evaluation of:

- materials sourced locally and transported by road directly to site;
- transportation of construction plant and heavy equipment required at the site; and
- construction staff and contractors.

Initially, the expected traffic patterns will be a direct function of the delivery of materials and machinery to site to undertake site establishment works. Once this has been completed and the marine based operations are mostly underway, the locally sourced stone, rock and fill material will be delivered. During this period, there will also be an increase in site servicing involving the delivery of fuel, parts and ancillary construction items. Routine numbers of staff will travel to and from the site through each phase of construction.

The traffic generating potential related to the establishment of the runway extension has been derived based on the quantities set out early in this report at Table 1.

10.1 Site Establishment Works

The site establishment works and temporary improvements to the road network, as recommended in this report, will occur at the outset of the project.

The site compound will be established on land located adjacent to Moa Point Road, to the east of the runway. The available area(s) will require some levelling to provide a suitable platform in preparation for the required site operations, access and parking. It is anticipated that some of the site establishment works can be achieved using redistributed in-situ materials, combined with the import of some aggregate.

As previously commented the peak workforce demands expected during the planned construction period involves up to 50 staff on site at any one time. All staff parking will be accommodated on-site. The parking area will be a temporarily formed hard-stand area. All routine staff and service traffic can use Stewart Duff Drive to travel to and from the site.

Also as an early phase of works, for Moa Point Road, it is proposed to bridge the proposed new taxiway. The materials associated with this work will include the supply and placement of prefabricated concrete units and the delivery of wet concrete by standard readymix concrete trucks. These quantities are included in the schedule to follow.

As set out and described in Chapter 7, various temporary improvements are proposed to the road network to safely support truck travel along the recommended haulage routes. Some of these improvements will take the form of temporary traffic management, to be controlled via the CTMP. Other improvements will involve physical works by way of individual projects coordinated with the relevant road controlling authority. They are comparatively minor in nature and are not included in the fuller work activity listings that follow.
10.2 Runway Extension Construction

For the reasons described in this report to manage and mitigate effects, truck haulage will occur Monday to Friday and will involve a 10 hour working day (9.00am to 3.00pm, and 6.00pm to 10.00pm).

Peak truck traffic generation attributed to building the reclamation works is expected to result from the construction of the rock dyke; the reclamation platform; delivery of rock and fill material, and subsequent removal of any surcharge material. The intensity of traffic generation from these key construction activities will be largely unaffected should changes be made to the intended construction programme. That is, there will be physical limitations relative to the rate of material able to be excavated at the two quarries, the volume of material able to be transported to the site and the rate at which this material is able to be received and processed on site.

Table 5 confirms the anticipated schedule of quantities required and the assessed volume of truck deliveries that would transport the material direct to the site by road and / or to a wharf location from where it would be barged.

<table>
<thead>
<tr>
<th>Work Activity</th>
<th>Quantity $m^3$ (Solid in Place)</th>
<th>Loose Quantity $m^3$ (Bulking Factor Applied)</th>
<th>Number of Truck Deliveries (18$m^3$ per Truck and Trailer)</th>
<th>Mode of Transportation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Site Compound Aggregate</td>
<td>1,000</td>
<td>1,200</td>
<td>67</td>
<td>Direct to site on road</td>
</tr>
<tr>
<td>Moa Point Road Bridge</td>
<td>2,000</td>
<td>2,400</td>
<td>133</td>
<td>Direct to site on road</td>
</tr>
<tr>
<td>Stone Columns</td>
<td>40,000</td>
<td>56,000</td>
<td>3,111</td>
<td>Direct to site on road, or Road to wharf then barged</td>
</tr>
<tr>
<td>Stone Blanket</td>
<td>56,000</td>
<td>78,400</td>
<td>4,360</td>
<td>Direct to site on road, or Road to wharf then barged</td>
</tr>
<tr>
<td>Rock Dyke Core</td>
<td>163,000</td>
<td>228,200</td>
<td>12,678</td>
<td>Direct to site on road, or Road to wharf then barged</td>
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<tr>
<td>Filter Material</td>
<td>48,000</td>
<td>58,000</td>
<td>3,222</td>
<td>Direct to site on road, or Road to wharf then barged</td>
</tr>
<tr>
<td>Secondary Dyke Armour</td>
<td>137,000</td>
<td></td>
<td>-</td>
<td>Likely sourced from Nelson area and barged to site</td>
</tr>
<tr>
<td>Primary Dyke Armour</td>
<td>152,000</td>
<td>152,000</td>
<td>8,444</td>
<td>Materials transported direct to site then batched and placed, or precast units barged to site</td>
</tr>
<tr>
<td>Wave Wall</td>
<td>980 lineal metres</td>
<td>980 lineal metres</td>
<td>325</td>
<td>Direct to site on road</td>
</tr>
<tr>
<td>Work Activity</td>
<td>Quantity m³ (Solid in Place)</td>
<td>Loose Quantity m³ (Bulking Factor Applied)</td>
<td>Number of Truck Deliveries (18m³ per Truck and Trailer)</td>
<td>Mode of Transportation</td>
</tr>
<tr>
<td>-------------------------------</td>
<td>------------------------------</td>
<td>-------------------------------------------</td>
<td>---------------------------------------------------------</td>
<td>---------------------------------------</td>
</tr>
<tr>
<td>Fill</td>
<td>850,000</td>
<td>1,020,000</td>
<td>56,667</td>
<td>Direct to site on road, or</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>56,667</td>
<td>Road to wharf then barged, or</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>From dredge</td>
</tr>
<tr>
<td>Surcharge Material</td>
<td>200,000</td>
<td>240,000</td>
<td>13,333</td>
<td>Direct to site on road, or</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Road to wharf then barged, or</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>From dredge</td>
</tr>
<tr>
<td>Surcharge Removal</td>
<td>200,000</td>
<td>240,000</td>
<td>13,333</td>
<td>Direct from site on road</td>
</tr>
<tr>
<td>Runway Aggregates</td>
<td>13,000</td>
<td>15,600</td>
<td>867</td>
<td>Direct to site on road</td>
</tr>
<tr>
<td>Asphaltic Cement (Runway and Taxiway)</td>
<td>13,000</td>
<td>15,600</td>
<td>867</td>
<td>Direct to site on road</td>
</tr>
</tbody>
</table>

**Table 5: Proposed Construction Quantities to be transported to site**

Because the stone materials for the columns and blanket will be placed from barge, it is anticipated that they would first be trucked to a wharf location, rather than direct to the site. Alternatively, the stone materials could be trucked to the site and then loaded onto barge at the site. The particular method will be confirmed by the appointed contractor.

In terms of the rock dyke, it is expected that the construction techniques will be such that the east and west sides of the rock dyke construction can only receive 2,500 m³ per day due to limitations of site management and the practicalities of constructing the dyke and shaping the rock wall.

Primary armouring will be placed on the periphery of the rock dyke for coastal protection. This will involve the construction of concrete akmon units and these, due to their size will likely be batched on-site. The materials required for their construction will be transported to site by truck. Alternatively, and again to be determined by the appointed contractor, the akmon units may be batched off-site and barged to the site.

Other secondary (large rock) armour will likely be sourced from the Nelson area.

For the placement and compaction of quarried fill and any additional surcharge material, the site would be limited to the trucked delivery of approximately 10,000m³ per day. Larger daily quantities could be received and processed in the event these materials were barged to the site. The limitation is due to the time involved for a truck and trailer to physically manoeuvre into place; to dump the material and exit the site; as well as the spreading and compaction of the dumped materials, while ensuring a safe work site. Based therefore on the necessary construction procedures, including multiple tip locations, truck deliveries are anticipated not to exceed 60vph.
From time to time, some on-site stockpiling may be appropriate. Any such instances of trucked material being stockpiled will occur within the recommended road transport hours and volumes on weekdays.

Site access will involve a single “entry only” entrance at the eastern end of the Moa Point Road underpass with an “exit only” egress at the western end of the site in the manner shown previously in Figure 9. This will provide a simple one-way movement across the site and will avoid truck movements through the tunnel.

The construction site entranceways will be gated (for security purposes after hours) and will have an appropriate level of traffic management controls to support turning and crossing trucks. The particular procedures for site management will be addressed in the CTMP, including the way in which the work site(s) will continue to change as the reclaimed area expands.

To enable the fill to be suitably compacted and stabilised, it is anticipated that around 200,000 m³ of additional material will be placed on the reclamation. Once any surcharging process has been completed the overburden material will be stripped and transported in the same manner away from the site. Once the excess material has been removed, roading aggregate materials will then be transported to complete the runway and taxiway.

The supply and placement of all of these materials will involve separate phases of construction. Accordingly, it is unlikely that there would be any coincidence of material deliveries through the key stages of construction.

### 10.3 Operational Traffic Generation

Once the runway extension works are fully commissioned, the area will attract only routine maintenance vehicles, both airside and landside.

These operational requirements already apply for the existing runway. As such, the extended runway will involve little added maintenance over and above existing demands.

The matter of roading improvements that may be required in response to airport growth, including as influenced by the runway extension, is described at Section 4.5 of this report, noting that such future improvements are addressed by WIAL’s Masterplan and will mostly be the subject of actions by road controlling authorities.

### 10.4 Traffic Generation Summary

Table 6 summarises the expected truck traffic movements to and from the runway site. The number of trucks is calculated based on 18 m³ being transported per trip. For the reasons previously identified, all truck movements are planned to occur between 9:00am to 3:00pm and 6:00pm to 10:00pm on weekdays and therefore outside of peak hour network demands, involving a ten hour transport day.
### Activity

<table>
<thead>
<tr>
<th>Activity</th>
<th>Total Trucks over Duration of Works</th>
<th>Expected Number of Trucks per Day</th>
<th>Expected Number of Trucks per Hour (Peak)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Site establishment</td>
<td>67</td>
<td>10</td>
<td>2</td>
</tr>
<tr>
<td>Construct Moa Point Road Bridge</td>
<td>133</td>
<td>12</td>
<td>4</td>
</tr>
<tr>
<td>Supply Rock Dyke Core</td>
<td>12,678</td>
<td>140</td>
<td>15</td>
</tr>
<tr>
<td>Supply Filter Material</td>
<td>3,222</td>
<td>100</td>
<td>10</td>
</tr>
<tr>
<td>Supply Primary Dyke Armour</td>
<td>8,444</td>
<td>555</td>
<td>60</td>
</tr>
<tr>
<td>Supply Wave Wall Units</td>
<td>325</td>
<td>20</td>
<td>4</td>
</tr>
<tr>
<td>Supply Bulk Fill Material</td>
<td>56,667</td>
<td>555</td>
<td>60</td>
</tr>
<tr>
<td>Remove surplus surcharge material</td>
<td>13,333</td>
<td>555</td>
<td>60</td>
</tr>
<tr>
<td>Runway Aggregates and AC Surface</td>
<td>17,334</td>
<td>100</td>
<td>10</td>
</tr>
<tr>
<td>Servicing Traffic</td>
<td>-</td>
<td>20</td>
<td>2</td>
</tr>
<tr>
<td>Staff</td>
<td>-</td>
<td>40 cars/vans</td>
<td>15 cars/vans</td>
</tr>
</tbody>
</table>

*Table 6: Traffic Generated During Construction*

## 10.5 Overdimension Loads

While the specific details of overdimension loads will be dependent on the type and size of construction plant to be used, some special deliveries can be anticipated. These loads will be transported to and from the site via the designated OVR routes (as provided earlier in Figure 8), and will require separate permitting. Experienced specialist heavy haulage contractors will apply for the relevant permits at the appropriate time.

It is likely that the construction machinery will be transported along the preferred OVR route involving SH1 and then across the airport via the newly authorised airside route between Station Drive and Freight Drive.
11. Route Travel Times

Travel time surveys have been completed as part of this assessment to confirm the time a truck will likely take to travel to and from the two identified quarries to the construction site at Wellington International Airport.

**Table 7** summarises the weekday morning (AM), inter-peak and evening (PM) peak travel times relative to each journey involved.

<table>
<thead>
<tr>
<th>Route</th>
<th>Travel Time (rounded to five minutes)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>AM Peak</td>
</tr>
<tr>
<td></td>
<td>Min</td>
</tr>
<tr>
<td>Kiwipoint to Airport</td>
<td>35</td>
</tr>
<tr>
<td>Airport to Kiwipoint</td>
<td>30</td>
</tr>
<tr>
<td>Horokiwi to Airport</td>
<td>40</td>
</tr>
<tr>
<td>Airport to Horokiwi</td>
<td>35</td>
</tr>
</tbody>
</table>

**Table 7: Measured Travel Times**

As can be seen above, the surveys confirmed, as expected, that there is significant variability and added time involved in travel during the weekday AM and PM commuter peak periods, as compared with the interpeak hours.

With less travel reliability, due to highway congestion, and in order to minimise the effect of additional truck volumes and utilise the availability of capacity during off-peak periods, it is proposed that truck transportation occur outside the peak hours, in two windows between 9.00am and 3.00pm, and 6.00pm and 10.00pm.

Transport efficiencies by way of vehicle operating cost savings can also be anticipated through avoidance of traffic peaks.
12. **Traffic Analysis**

As has been previously identified, the peak volume of truck traffic generated by the proposed works will be up to 60 deliveries per hour, based on limitations at both the receiving site and at the source quarries.

As confirmed through this report, the roads recommended to be used as the haulage routes are all able to accommodate trucks, subject to the installation of appropriate traffic management controls and some physical changes as summarised earlier in Figure 20.

As also previously identified, the ‘pinch point’ on the network in terms of operation and capacity would be the new exit from Jean Batten Street to the Cobham Drive arterial. It has been the subject of further analysis accordingly to confirm its operational performance and capacity thereby confirming the optimum number of trucks that could effectively travel on Jean Batten Street and exit onto Cobham Drive in an efficient manner.

In order to assess the future performance of the proposed left-turn exit at Jean Batten Street, the industry recognised intersection modelling software SIDRA has been used in this instance. An assessment was made using a maximum exiting volume of 60vph, against the morning, inter-peak and evening peak hour volumes on Cobham Drive. The results of this analysis are included in Table 8.

<table>
<thead>
<tr>
<th>Period</th>
<th>Average Delay* (Sec/Truck)</th>
<th>95% Queue (Trucks)</th>
</tr>
</thead>
<tbody>
<tr>
<td>AM Peak</td>
<td>108</td>
<td>3</td>
</tr>
<tr>
<td>PM Peak</td>
<td>60</td>
<td>2</td>
</tr>
<tr>
<td>Inter-Peak</td>
<td>27</td>
<td>1</td>
</tr>
</tbody>
</table>

*average delay also includes the geometric delay associated with trucks turning onto Cobham Drive

Table 8: SIDRA Output Table – Jean Batten Street / Cobham Drive Stop Controlled Exit

This analysis has confirmed that during the peak AM period, there would be nearly two minutes of delay to each truck seeking to exit from Jean Batten Street onto Cobham Drive. This delay also represents a queue equivalent to 3 HPMV’s. This is not an acceptable or manageable outcome.

During the PM peak hour there would also be prolonged delays of around a minute.

During the inter-peak period when traffic flows have stabilised and commuter traffic demands have also subsided, these results confirm that the proposed exit from Jean Batten Street would operate with an average delay of 27 seconds and a maximum vehicle queue equivalent to 1 truck.

These results therefore confirm that the proposed new exit is able to accommodate peak truck volumes outside of the traditional morning and evening network traffic peaks, with an acceptable level of delay. At lower exiting volumes, as will be the case in some instances, shorter delays will be experienced. Larger exiting volumes could also potentially be handled at the same location with little increase in delay during off-peak hours. However, since greater volumes cannot be handled at site or at the source, it is proposed that 60 truck deliveries per hour be confirmed as the maximum volume.
Accordingly, this analysis has confirmed that 60 truck and trailer units can travel through this new intersection per hour during peak haulage operations. Subject to the detail of the temporary traffic management arrangements on Cobham Drive, early consultation with NZTA has established that this temporary exit can be introduced in the manner proposed.

Based on this assessment and from site observations, the total volume of traffic on the local road network during peak construction demand, and at the proposed off-peak weekday transport times, will not require any significant improvements to address capacity deficiencies. Some minor works, as set out through this report, are required to enable trucks to safely use the assigned routes, supplemented with the appropriate level of temporary traffic management controls.

With the exception of the provisions to be required for temporary traffic management, there are no physical works required to be undertaken on SH1 and SH2 to mitigate the effects of construction traffic. Again, early consultation with NZTA has established the same expectations from the Agency, noting particularly that the proposed transportation hours suitably manage the effects of adding truck traffic which otherwise may have required mitigation in the event truck haulage was proposed during weekday commuter peak hours.

In order to guide and inform management of construction traffic and mitigate its effect both on and off site, it is intended that a Construction Traffic Management Plan ("CTMP") will be developed and implemented by the contractor. To assist in this regard, a CTMP framework is appended to this report as Appendix A.

This framework has been prepared to provide a broad overview of the minimum required objectives and environmental controls which all construction related traffic activities must adhere to.

The fuller CTMP (to be prepared by the appointed Contractor) may be varied, provided that any variation relates only to the means by which the environmental controls will be met. It is also recommended that a copy of any variations shall be provided to WCC, NZTA and WIAL, prior to being implemented and no later than five working days from the date the variations are made.

The final CTMP will ensure accountability for construction vehicle movements on private and public roads, and will provide a mechanism for forward planning, monitoring and implementation.
14. Conclusion

Having examined the details of the existing transportation environment across the road network serving Wellington International Airport and its proposed runway construction requirements, it is concluded that the existing road network can provide safe and convenient access to and from the proposed works site. With the mitigation measures and management controls described in this report, the road network is assessed as capable of safely accommodating the volumes of truck traffic likely to be generated during construction.

The key to managing construction traffic effects lies in confirming transportation windows for haul trucks that avoid busy commuter traffic peaks, school peaks, business peaks, and weekends, and concentrates movements to the following off peak periods which afford road capacity and less vehicle and land use conflict:

- 9.00am to 3.00pm weekdays; and
- 6.00pm to 10.00pm weekdays.

A series of mitigation measures and physical improvements have been recommended to better enable the haul trucks to be safely and efficiently accommodated, as follows:

- widening of and formalising the Rongotai Road / Cairns Street intersection;
- no stopping bans around the Rongotai Road / Jean Batten Street intersection;
- widening of Jean Batten Street along its east side to enable retention of existing on-street parking, in an indented bay, and added road width for safe truck movement; and
- construction of an exit from Jean Batten Street to Cobham Drive.

These improvements will be temporary for the construction period, with the existing arrangements reinstated at the end of construction unless the relevant road controlling authorities deem it appropriate to retain the changes permanently.

Beyond these local road improvements, no other physical works are identified as necessary on the arterial and state highway networks.

A Construction Traffic Management Plan, applying throughout construction, will provide controls on the operational requirements of all construction related traffic travelling to and from the proposed construction site, and within the site too. The Plan will require approval by the relevant road controlling authorities.

With these arrangements, it is assessed that construction, operation and maintenance of the proposed runway extension and all associated auxiliary activities can be achieved in a manner that would have no undue effect on the function, capacity and safety of the road network. There are no traffic or transportation reasons that would preclude the establishment of the runway extension as proposed.

TDG
Appendix A

Construction Traffic Management Plan Framework
Wellington International Airport
Proposed Runway Extension

Construction Traffic Management Plan Framework

November 2015

TDG Ref: 13043 151106 ctmp appendix .docx
# Table of Contents

1. Preface .......................................................................................................................... 1

2. Environmental Management .......................................................................................... 2  
   2.1 Contractor Objectives ................................................................................................. 2  
   2.2 CTMP Review ............................................................................................................. 3

3. Environmental Controls .................................................................................................. 4  
   3.1 Vehicle Occupancy Rate ............................................................................................. 4  
   3.2 Staff Travel Routes ....................................................................................................... 4  
   3.3 Truck and Overdimension Loads .................................................................................. 4  
   3.4 Temporary Traffic Management .................................................................................. 5  
   3.5 Pre and Post Construction Pavement Condition Survey ............................................. 5  
   3.6 Monitoring .................................................................................................................. 6  
   3.7 Communication Protocols ........................................................................................... 6  
   3.8 Emergency Response and Incident Management ......................................................... 6
1. Preface

This framework identifies the key traffic management elements that will be required to form a final Construction Traffic Management Plan (“CTMP”) for the proposed runway extension at Wellington International Airport.

This report provides a broad outline to assist with the preparation of a comprehensive CTMP that will need to be prepared by the appointed Contractor prior to the runway extension proceeding, and in response to any conditions sought by the road controlling authorities or WIAL.

The environmental controls specified in this report provide the minimum requirements that the Contractor must comply with when undertaking construction activities involving vehicle movements to and from the site. More site specific details are anticipated whereupon the level of positive traffic management controls (including signage, delineation, and the management of the approved transport routes) will be required.

The CTMP may be varied so long as any variation is confined to the methodology by which the objectives and environmental controls within the final plan are achieved.
2. Environmental Management

The CTMP sets out how construction traffic will be managed to ensure that the works are undertaken in accordance with WIAL’s requirements, and any conditions and legislative requirements set by the road controlling authorities.

The CTMP shall include measures to manage the effects on the environment during construction of those fixed elements of the project only, and does not include any ongoing management or monitoring measures except those pertaining to traffic.

The objectives of the CTMP are to:

- meet the specific requirements for construction traffic management including, where required, to obtain approval from road controlling authorities for the activities required. Where any approval is required from a private land holder, or a person having an interest in private land; to obtain those approvals before undertaking any work; to be in accordance with the relevant By-Laws, Acts, Regulations and Wellington City conditions pertaining to traffic, loading and parking;
- adopt NZTA’s Code of Practice for Temporary Traffic Management including any activity that varies the normal operating conditions of any road;
- ensure the application of best practice methodology to all traffic controls associated with construction;
- ensure compliance with relevant legislative requirements;
- effectively manage traffic generated during the construction phases of the project so that:
  - construction traffic volumes are safely accommodated within the existing road network;
  - so far as is reasonably practicable, congestion or traffic delays are avoided;
  - any traffic effects associated with construction are mitigated as far as reasonably practicable; and
  - the needs of other road users and liaison with road controlling authorities, residents, businesses, sports facilities, major events organisers and emergency services are considered and where appropriate addressed.

2.1 Contractor Objectives

The Contractor(s) will be required to set themselves objectives with respect to undertaking the project works which are consistent with the consent holders’ objectives and the resource consents. Those objectives will include consideration of the following:

- complying with the conditions applicable to the Contract Works and associated legislation;
- actively encouraging a culture of environmental awareness and commitment within all staff;
- undertaking regular training and taking advantage of all opportunities to improve environmental awareness; and
undertaking the project to enhance the reputation of both WIAL and the Contractors.

2.2 CTMP Review

The CTMP may be reviewed for the purposes of informing any variation of the methodology or means by which the environmental controls outlined in Section 3 will be met.

CTMP reviews may be undertaken when:
- a previously unforeseen event occurs;
- following any environmental incidents; and
- periodically during and at the end of the project.
3. **Environmental Controls**

The following environmental controls have been identified as those minimum requirements which all construction related traffic activities must adhere to in order to minimise, as far as practicable, any potential adverse environmental effects on the transportation network.

Roading improvements associated with the nominated truck routes and site accessways have been identified within the Transportation Assessment Report prepared by TDG. The recommended mitigation measures will be as conditioned by consent.

### 3.1 Vehicle Occupancy Rate

The contractor will encourage its staff and/or subcontractors’ staff to car-pool, targeting an average vehicle occupancy rate of at least two persons per vehicle, and to use public transport.

### 3.2 Staff Travel Routes

All routine traffic movements associated with construction staff and sub-contractors during the extent of the construction period will be monitored and managed by the Contractor.

Specific travel routes will be recommended to all construction staff and sub-contractors with clear directives to utilise the following roads when travelling to and from the project site during the extent of the construction period, as far as practical:

- SH1 and SH2;
- Stewart Duff Drive (through the airport); and
- Moa Point Road.

### 3.3 Truck and Overdimension Loads

A directive will be given to all truck and overdimension vehicle operators that they will use SH1 and SH2, as far as is practicable, as the preferred travel route during the construction.

The consent holder will ensure that any contractor abides by the requirements for pilot vehicles and other safety measures, as detailed in NZTA’s “Vehicle Mass and Dimensions Rule 2002”, in order to ensure that overdimension loads are delivered without affecting the safety or convenience of other road users. Additionally, the Contractor will be responsible for obtaining permits from the road controlling authorities to transport overdimension loads.

Contractors will schedule haulage truck movements on public roads on weekdays, but to avoid the following peak hours:

- 7.00 – 9.00am; and
- 3.00 – 6.00pm.

The fuller provisions and recommendations of the Transportation Assessment Report relating to haul routes, transport times and volumes shall apply.
3.4 Temporary Traffic Management

Where trucks are required to cross at intersections and/or their turning movements are likely to place them in conflict with existing road users, these sections on the haulage routes will be accompanied by temporary traffic management arrangements in full accordance with the Code of Practice for Temporary Traffic Management.

Detailed temporary traffic measures and layout plans for each area will be prepared by the Contractor and provided to WCC and NZTA, as appropriate, for their prior approval. The Temporary Traffic Management measures are expected to include:

- adoption of ‘Level 1’ (500 to 10,000 vehicles per day) temporary traffic management controls for all WCC roads;
- adoption of Level 2 (greater than 10,000 vehicles per day) temporary traffic management controls for NZTA roads (or as instructed by the Authority);
- appointment of suitably trained Site Traffic Management Supervisor and / or a Traffic Controller and staff in the use, implementation and application of temporary traffic management controls;
- arranging for the publication of approved notices in local newspapers or other media notifying of any potential delays due to construction traffic movements;
- recording details of regular inspections/audits of temporary traffic management measures; and
- reporting of any incidents and responses.

3.5 Pre and Post Construction Pavement Condition Survey

Due to the scale of works and overall volume of construction related traffic that will be generated during this project, the contractor will be responsible for Pre- and Post-Construction Pavement Condition Surveys on the local roads (non state highway and non arterial roads).

They are completed by suitably qualified civil engineers and often assisted with a representative of the road controlling authority.

A Pre-Construction Pavement Condition Survey is considered necessary for this project as it will record the existing road conditions prior to any construction traffic being used. Any defects and / or pavement issues that could potentially fail or deteriorate during the construction period are located, recorded (and photographed), measured and appropriately documented.

Once the construction has been completed a Post Construction Pavement Condition Survey is undertaken to confirm if any previously recorded problems have further exacerbated as a direct result of the project’s construction traffic and/or if any new pavement problems are detected as a result of construction movements and remedial works required.

Equivalent condition surveys may also be appropriate periodically during construction.
3.6 Monitoring

A monitoring protocol will be prepared and submitted to WCC and NZTA as part of the final CTMP, including but not limited to the specific data to be monitored, the method of monitoring, the frequency with which monitoring will be undertaken, the personnel responsible, trigger levels for intervention, and the corresponding response. As a minimum the monitoring protocol will address the following matters:

- travel times, queues, delays and any disruptions resulting from construction vehicles; and
- implementation and compliance with those temporary traffic management provisions outlined in Section 3.4 above, as required by the Code of Practice for Temporary Traffic Management.

The monitoring is required to ensure that there are no inappropriate or unreasonable delays, disruption, or adverse safety effects on other road users. Where that monitoring shows that there are interventions required, the contractor will take steps immediately to address them.

3.7 Communication Protocols

A communications protocol will be developed and implemented including but not limited to the following:

- names and contact details of key staff and/or contractors responsible for implementing the CTMP;
- contact details of key staff within WIAL, WCC, NZTA, and/or any other third party who have operational interests in the surrounding road network;
- contact details and location of the main site office;
- details of signage to be established, including content and locations;
- location of all relevant consents, managements plans, health and safety plans, and other key project documentation;
- a process for receiving and responding to complaints, including a register for recording all complaints and actions taken;
- a process for scheduling planned overdimension loads such that this can be communicated to the general public and road controlling authorities;
- a plan for informing stakeholders and the general public of construction traffic movements, times and routes;
- a process for managing construction traffic during events. Communications with key event organisers will be required; and
- a list of people and organisations that the CTMP will be distributed to. All amendments and updates to the CTMP will then be forwarded to those named on the list.

3.8 Emergency Response and Incident Management

Serious incidents and emergencies must be reported immediately to the relevant emergency services.
All reports of accidents and other environmental emergencies, regardless of their origin are to be reported to the Construction Manager and WIAL. An environmental emergency is any event that causes or has the potential to cause material harm to the environment or people.

Where disruption to traffic or significant damage has occurred within the roading network the appropriate road controlling authority shall be notified immediately.

All incidents involving environmental non-compliance will be recorded and reported through the Contractors' incident and non-conformance procedures. An environmental incident register will held at the Site Office.

TDG