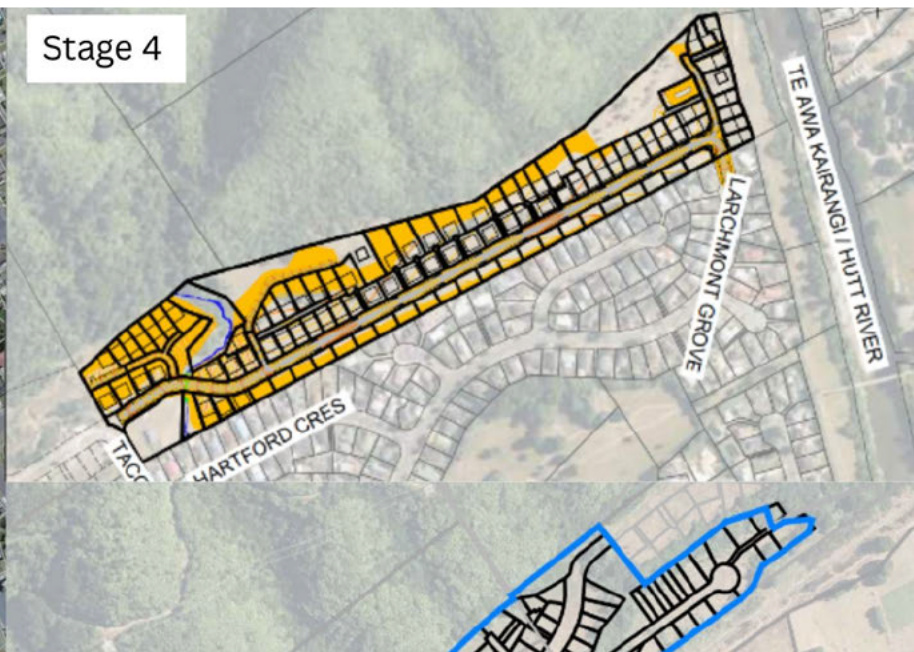
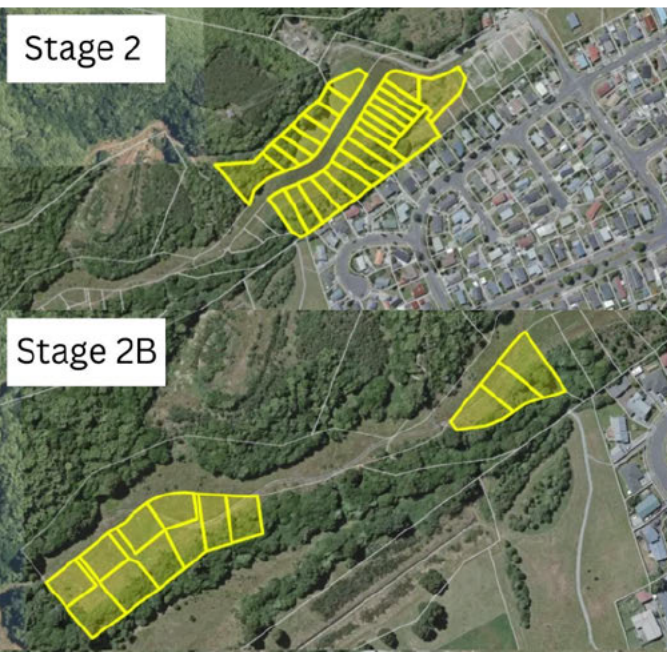




Tōtara Park Subdivision

Traffic Impact Assessment (Fast Track)

Tohunga Transport Advisory Partners Limited

June 2026

Version 3.0

For Cannon Point Development Limited

Traffic Impact Assessment (Fast Track)

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1. Introduction

1.1 Purpose and Scope of this Report

This report forms part of a suite of technical assessment prepared to support the Cannon Point development (the Project) Fast Track application for the proposed development.

The purpose of this report is to assess the impacts of the proposed development on the surrounding transport network based on the staged development scenarios and to evaluate the potential effects arising during the construction phase to ensure that all impacts are appropriately identified, captured and considered. Based on this approach, the report will focus on two key components:

Table 1-1: Report Structure Overview

Construction Traffic	• Identify and describe the existing traffic and transport environment; • Describe the proposed construction staging and methodology and assess the associated transport network impacts including ○ Construction traffic generation, ○ Traffic movements; ○ Site access locations and construction traffic movements ○ Impacts on public transport ○ Impacts on pedestrian and cyclist accessibility ○ Impacts on parking; and ○ Safety Concern • Provide an appraisal of the traffic impacts rising impacts arising from key features of the construction activity for the project and associated temporary traffic management methodologies; • Recommend measures as appropriate to avoid, mitigate or manage potential adverse construction traffic effects (including any conditions/ management plan required); and • Present an overall conclusion of the level of potential adverse construction traffic effects of the Project after recommended measures are implemented
Development Traffic	• Identify the trips generated based on different stages of the construction, current stages used for the assessment include: ○ Base Stage 2025: Simulation of existing traffic demand; ○ Do Min Future Scenario 2032: Base + Future Traffic Demand + Stage 1 and 2; and ○ Option 4 2032: Do Min Future Scenario 2032 + Stage 3 and 4. • Identify the operational effects of the proposed development on the transport network in terms of the travel time, congestion, queue length, turn level of service and vehicle count. • Identify any crash concern based on the proposed development; and • Identify any emission generated based on the proposed development;

- Recommend appropriate mitigation measures and transport management strategies where necessary to address any identified adverse effects on the transport network.

1.2 Summary

This report assesses the transport effects of the proposed Tōtara Park residential subdivision (Stages 3 and 4) in Upper Hutt. The assessment addresses both the temporary construction phase and the long-term operational impacts of the completed development on the surrounding transport network. The key findings are summarised below.

1.2.1 Construction Traffic

Construction of Stages 3 and 4 is anticipated to occur sequentially between 2027 and 2031, delivering approximately 225 additional residential lots (refer to Chapter 4, Section 4.4). The primary construction access is via Colorado Road, with the majority of construction activities occurring within the development site boundary.

Construction traffic generation is estimated at approximately 26 worker vehicle trips per day (13 inbound and 13 outbound), with a peak-hour demand of up to 4 one-way trips during the PM peak period (refer to Section 4.6). Workers are expected to arrive before 7:00 AM, avoiding the morning peak period. Heavy vehicle movements are limited to an initial mobilisation phase, with plant and equipment remaining on-site for the duration of the works.

The development site remains largely undeveloped, with approximately 4% of the overall area currently constructed. This provides sufficient internal space for construction vehicle circulation, parking, and material storage without significant interaction with the surrounding road network (refer to Chapter 5, Sections 5.1 to 5.3). Temporary Traffic Management measures on the public road network are not currently considered necessary, though a Construction Traffic Management Plan (CTMP) will be prepared to manage construction vehicle access, internal circulation, and pedestrian safety (Section 5.5).

Overall, the effects of construction traffic on the surrounding transport network are expected to be minor and temporary and can be accommodated within existing road capacity.

1.2.2 Development Traffic

The operational traffic effects of the proposed development have been assessed using a microsimulation model, calibrated to NZTA standards, for the Tōtara Park Road / SH2 signalised intersection (refer to Chapter 6). Three scenarios were modelled: Base Model 2025 (existing conditions), Do Min 2032 Scenario (base plus background growth and Stages 1–2 traffic), and Option 4 (Stage 3 and 4 traffic).

The trip generation methodology, based on NZTA Research Report 453, adopted a rate of 0.66 vehicle trips per dwelling per peak hour. 224 lots were assessed to understand the impact of the traffic demand generated by Stages 3 and 4 (Section 6.1.2). The base model calibration achieved GEH statistics, RMSE and R-squared values that meet or exceed NZTA modelling standards (Section 6.1.1.1), confirming its reliability for scenario testing.

Key findings from the development traffic assessment include:

- **Travel Time:** Option 4 is not expected to result in significant increases in travel times compared to the Do Min 2032 Scenario. The maximum increase observed is approximately 30 seconds during the AM peak and 47 seconds during the PM peak (Section 6.4.2). Most approaches demonstrate minor improvements in travel times.
- **Turn Level of Service (LoS):** The average turn LoS is maintained at Level D under Option 4, consistent with acceptable performance thresholds based on the Highway Capacity Manual (Section 6.4.4). During the AM peak, the average turn delay changes from 59 seconds (Do

Min) to 54 seconds (Option 4). During the PM peak, the average turn delay changes from 48 seconds (Do Min) to 46 seconds (Option 4). Refer to Tables 8-1 and 8-2 for detailed comparison.

- **Queue Length:** The overall queue length performance under Option 4 is broadly consistent with the Do Min 2032 Scenario during both peak periods, with the intersection continuing to operate within manageable levels (Section 6.4.3).
- **Vehicle Count:** The the most notable increase in traffic volumes during the AM peak is observed on the Totara Park Road right-turn movement, which is expected to increase by up to 74 vehicles per hour. The Totara Park Road through movement is also expected to experience a noticeable increase of approximately 46 vehicles per hour. During the PM peak, the most significant increase is observed on the SH2 left-turn movement, which is expected to increase by up to 53 vehicles per hour.
- **Weekend Model:** A weekend traffic assessment was also undertaken and confirms that the traffic impact of the development during the Saturday interpeak period is consistent with the weekday findings – impacts are minor and within acceptable operational limits. Refer to Appendix C for the full weekend model assessment.
- **Road Safety:** A crash analysis using the Surrogate Safety Assessment Model indicates a marginal increase in predicted injury crashes (3–5%) at the Tōtara Park Road / SH2 intersection under the development scenarios (Section 6.4). The surrounding road network is classified as Low Volume under the One Network Framework, and the development is not expected to impact the strategic function of the wider transport network (Section 6.5).
- **Emissions:** Under the VEPM modelling (Section 6.6), a short-term increase in emission costs is anticipated under Option 2 (2025), rising from \$1.92M to \$2.15M per year. However, the long-term forecast under Option 4 (2032) shows a reduction to approximately \$1.39M per year, reflecting improvements in vehicle fleet composition including increased electric vehicle uptake.

Based on the assessment, the proposed development (Option 4, 224 dwellings tested conservatively) the Totara Park Road/SH2 intersection can accommodate the cumulative traffic demand from Stages 3 to 4. The Level of Service and delay times remain within acceptable thresholds, and the proposed development is expected to have a minor impact on the surrounding road network. It is recommended that Stages 3 and 4 proceed, contingent on traffic monitoring measures at the Tōtara Park Road / SH2 intersection post development. (refer to Chapter 9).

2. Transport and Land Use Environment

2.1 Project Description

The Tōtara Park development is located at the northern extent of the Tōtara Park suburb in Upper Hutt.

During the previous resource consent stage, the transport effects of Stage 1- Stage 4 were assessed, with traffic primarily distributed via Larchmont Grove.

This Fast Track application considers the development across Stages 1 to 4 with **particular emphasis on Stages 3 and 4** and the proposed connection to Colorado Road, which will provide an additional access route between Stage 1-3 and Stage 4. The purpose of this assessment is to evaluate the potential transport effects associated with the proposed taking into account projected future traffic demand. The analysis considers the current staging of the subdivision, including the following stages relevant to this assessment

- **Base Stage 2025:** Simulation of existing traffic demand;
- **Do Min 2032 Scenario:** Base + Future Traffic Demand + Stage 1 and 2;
- **Option 4:** Do Min 2032 Scenario + Stage 3 and 4.

The primary access routes to the site include State Highway 2 (SH2), Tōtara Park Road Bridge and Two Nearby Roundabouts California Drive/ Tōtara Park Rd Roundabout North and California Dr/ Tōtara Park Rd Roundabout South, all of which are critical to assessing the potential transport impacts of proposed development. These access points link the development to key destination such as Upper Hutt CBD, Lower Hutt, Porirua and other regional centres.

A number of prior assessments have been conducted for earlier phases of the development, including:

- **Traffic Assessment and SIDRA Model** by Tim Kelly (2019) - estimated impacts based on earlier concept with 160 dwellings and included assumptions on potential bridge widening.
- **Traffic Report** by VECTA- That has assessed the transportation impacts of Stage 4 of the Tōtara Park Subdivision, discussed current poor intersection performance is not worsen by the development and development should proceed.
- **Tracks Model** by Abley- Assessed the traffic split, traffic volumes and delay times.
- **Traffic Impact Assessment- Resource Consent (Stage 4)** by TTAP- Assessed the Traffic Impact of the proposed Stage 4 development.

This Traffic Impact Assessment primarily focuses on the effects of the proposed Stage 3 and Stage 4 development, while also considering the cumulative traffic impacts generated by the full build out of Stage 1 through Stage 4.

2.2 Location Plan



Figure 2-1: Proposed Development

2.3 Existing Consent

At the time of preparing this report, the stages of each development stage are as follows:

Table 2-1: Development Stage Status

Stage	No of Lots	Status
Stage 1	11	Consented and completed.
Stage 2a	25	Consented, currently under construction, with completion estimated by the end of 2026.
Stage 2b	13	Consented, currently under construction, with completion estimated by the end of 2026.
Stage 3	108	Currently under Fast Track application and expected to be completed within five years after Stage 2 is completed.
Stage 4	116	Currently under Fast Track application and expected to be completed within five years after Stage 2 is completed.

2.4 Land Use Environment

2.4.1 Existing Land Use

The subject site is currently undeveloped greenfield land, with no existing built structures or any known history of residential, commercial, or industrial activity. The terrain primarily consists of natural vegetation, including grass cover, shrubs, and small trees. There is no evidence of infrastructure, sealed surfaces, or earthworks that would indicate prior land development. Based on these characteristics, the site is categorised as a vacant greenfield lot.

2.4.2 Adjacent/ Surrounding Land Use

The subject site is located within a developed residential area at the northern end of the Tōtara Park suburb in Upper Hutt. It is surrounded predominantly by existing low-density residential dwellings.

The adjacent land comprises residential housing along local access roads, low volume roads and cul-de-sacs. There are no commercial or industrial zones in proximity to the site, and no land within the immediate catchment has been identified for non-residential zoning or uses.

The site is zoned 'Green Field', General Rural Area as defined within the Upper Hutt City Council GIS map with the immediate surrounding area zoned as General Residential.



Figure 2-2: GIS Map of Surrounding Land Use

2.5 Congestion

During peak hours, significant congestion is observed across the Tōtara Park Bridge in the outbound direction during the AM and PM Peaks, with queues extending to approximately 15 or more vehicles. This suggests that the bridge is operating close to its maximum capacity during commuter peaks. The constrained geometry and merging movements at the Tōtara Park Rd/ SH2 intersection further exacerbate delays, particularly where outbound traffic from residential areas merges with main highway flows during the AM Peak.

With the proposed development, there are concerns regarding whether the existing network can adequately accommodate the additional traffic demand. The congestion issues are discussed in further detail in Chapter 6.

3. Description of the Proposal

3.1 General Elements of the Proposal

The proposed Cannon Point development comprises a staged residential subdivision located at the northern extent of the Tōtara Park suburb in Upper Hutt. The development is proposed to be delivered under the Fast-track Approvals Act 2024 and will include multiple stages of residential development.

For the purposes of this application, **Stage 3 and Stage 4** form the primary focus of the proposed development.

- **Stage 3** relates to Lot 3 DP 306622 and comprises approximately **108 residential lots**, with the existing wetland area excluded from development to avoid ecological effects.
- **Stage 4 (East Block)** relates to Lot 2001 DP 588162 and comprises approximately **117 residential lots**, with the wetland area incorporated into the overall design of the development.



Stage 3 and Stage 4 are anticipated to be constructed sequentially, with Stage 4 expected to be delivered first, followed by Stage 3, over an indicative period between **2027 and 2032**.

3.1.1 Key Development Elements

The proposed development will include the following key elements:

- **Earthworks and Land Development**
 - Bulk earthworks including cut and fill operations to establish building platforms
 - Site levelling and formation of residential allotments
 - Implementation of erosion and sediment control measures
- **Three Waters Infrastructure**
 - Installation of **stormwater infrastructure**, including drainage networks and stormwater management systems
 - Installation of **wastewater infrastructure** to service residential lots
 - Provision of **water supply infrastructure**, subject to servicing capacity
- **Transport and Access Infrastructure**
 - Construction of internal road networks to service the subdivision
 - Provision of vehicle access, including connections to the existing road network
 - Construction of associated infrastructure such as:
 - kerb and channel
 - footpaths
 - vehicle crossings
 - street lighting
 - traffic signage and road markings

- **Utilities and Services**
 - Installation of essential services, including:
 - electricity
 - telecommunications
 - gas (if required)
- **Environmental and Landscape Considerations**
 - Landscaping and amenity improvements
 - Management of ecological effects, including habitat protection and mitigation measures

3.2 Design

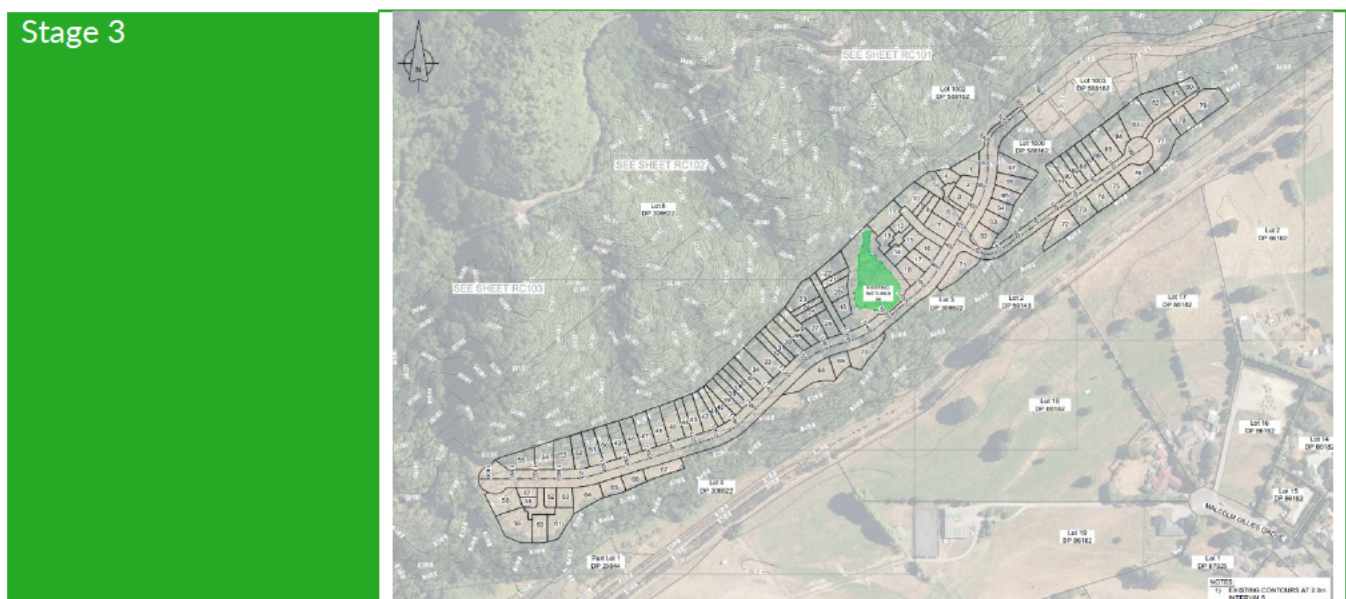
The table below illustrates the layout of the proposed development; further details are provided under document:

- Cannon Point Stage 3 Civil Design 24.08.16 WIP; and
- 5 24092 Cannon Point East Block Civil Plans.

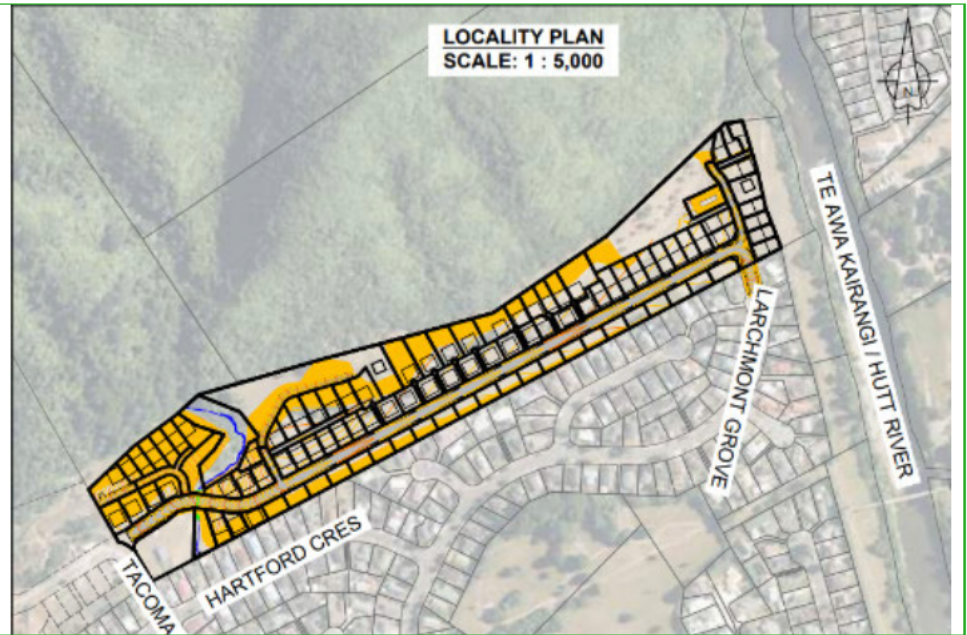
The roading design is compliance to the following:

- NZ4404:2010- Land Development and Subdivision Infrastructure
- Upper Hutt City Council (UHCC) Code of Practice

Table 3-1: Design Standards Summary



Stage 4



3.3 Accessibility

This section considers accessibility for the proposed development, including provision for walking, cycling, and access to public transport. The potential need for additional infrastructure, such as pedestrian refuge islands, pedestrian crossings, shared paths, cycle lanes, and bus stop facilities on **Colorado Road**, as well as **Road 1** (refer to Stage 4 Civil Plan) connecting to Larchmont Grove to the east of Tōtara Park, has been assessed with reference to traffic volumes on roads fronting or adjacent to the site, including

- Colorado Road;
- Tacoma Drive;
- Hartford Cres; and
- Larchmont Grove;

According to the Mobile Road Data, the Average Daily Traffic (ADT) volumes for the surrounding road network are as follows:



3.3.1. Walking Network

Visible footpath has been identified to be provided for the proposed new development. But no pedestrian crossings have been identified within 500m in proximity of the surrounding neighbourhood.

Given the low traffic volumes within the area, a dedicated pedestrian crossing facility is not considered necessary. The surrounding environment is characterised by low-speed residential roads (50 km/h), with no nearby schools, shops, or town centres that would typically generate high pedestrian demand. Accordingly, pedestrians are expected to be able to cross safely using available gaps in traffic along Colorado Road and Road 1.

3.3.2. Cycling Network/ Shared Path

There are no existing cycling networks or shared path facilities identified within approximately 500 metres of the surrounding neighbourhood.

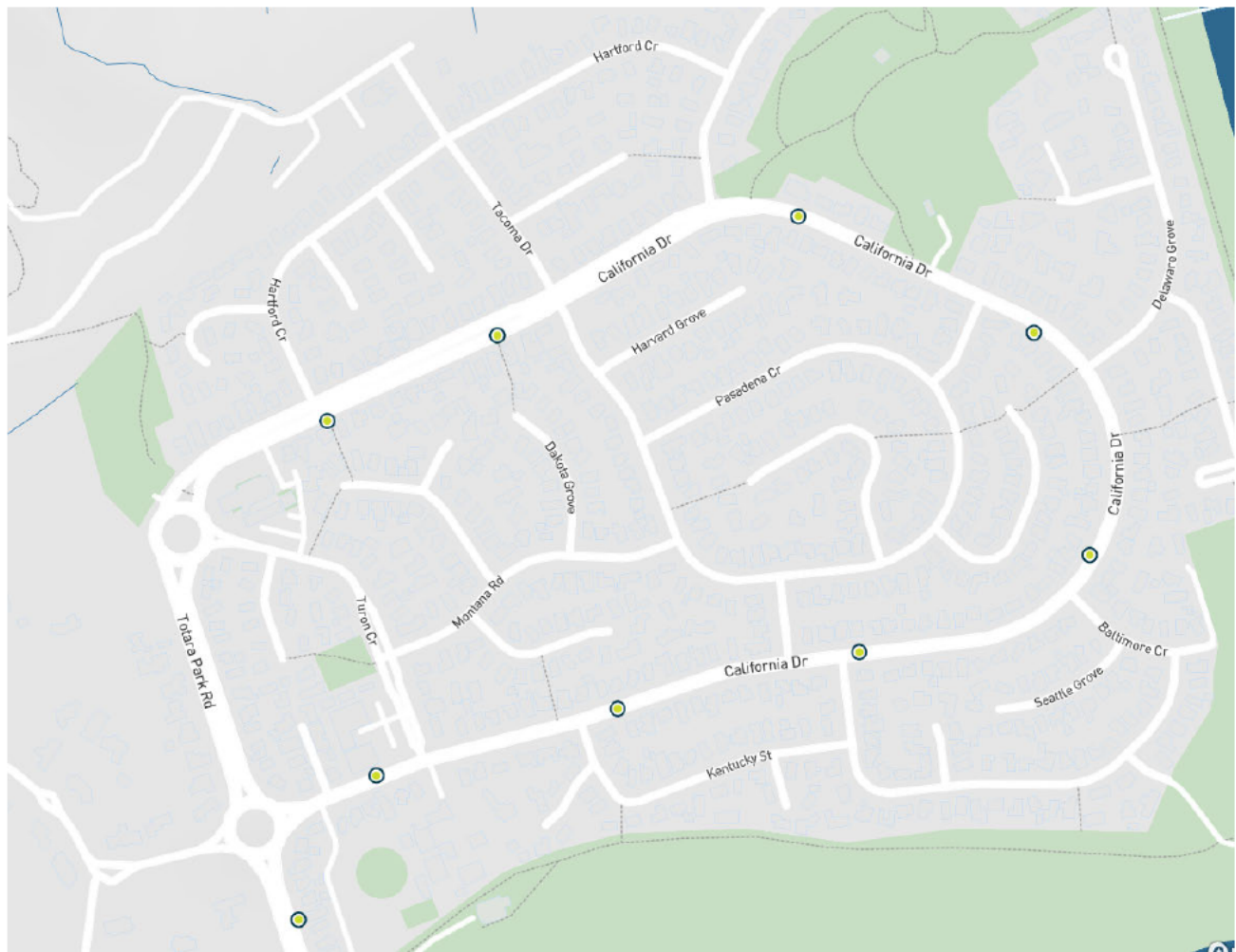
Given the low traffic volumes and residential nature of the surrounding road network, the provision of segregated cycling infrastructure is not considered necessary. Cyclists are expected to utilise the existing carriageway, which is appropriate for a low-speed environment.

3.3.3. Public Transport Mode

No public transport network has been identified within 200m proximity surrounding the new development. The closest observed public transport available is on California Drive, bus services:

- 111 (Upper Hutt)
- 935 (School Bus)

Figure 3-1 shows all the bus stops located within the Tōtara Park Suburb according to Metlink Services.



111 TO UPPER HUTT - TOTARA PARK - UPPER HUTT MONDAY TO FRIDAY*									
Stops		AM							
RAIL connection from Wellington	WELL	Wellington Station					6:44	7:08	7:47
	UPPE	Upper Hutt Station					7:29	7:53	8:32
	8579	Upper Hutt Station - Stop A			6:34	6:54	7:16	7:36	7:58
	8511	Tōtara Park Shops - California Drive		6:22	6:42	7:02	7:24	7:44	8:06
	8504	Tōtara Park - Tūia Park		6:26	6:46	7:06	7:28	7:48	8:10
RAIL connection to Wellington	8580	Upper Hutt Station - Stop B		6:31	6:51	7:11	7:33	7:53	8:15
	UPPE	Upper Hutt Station		6:40	7:00	7:16	7:40	8:00	8:20
	WELL	Wellington Station		7:18	7:38	7:54	8:18	8:38	9:05
TU									
To Upper Hutt - Totara Park - Upper Hutt continued									
Stops		PM							
RAIL connection from Wellington	WELL	Wellington Station		3:57	4:17	4:37	4:57	5:22	5:43
	UPPE	Upper Hutt Station		4:36	4:56	5:16	5:36	6:01	6:22
	8579	Upper Hutt Station - Stop A		4:42	5:02	5:22	5:42	6:08	6:30
	8511	Tōtara Park Shops - California Drive		4:50	5:10	5:30	5:50	6:16	6:38
	8504	Tōtara Park - Tūia Park		4:54	5:14	5:34	5:54	6:20	6:42
RAIL connection to Wellington	8580	Upper Hutt Station - Stop B		4:59	5:19	5:39	5:59	6:25	6:47
	UPPE	Upper Hutt Station		5:04				6:07	6:30
	WELL	Wellington Station		5:49				6:52	7:15
SATURDAY									
Stops		AM							
RAIL connection from Wellington	WELL	Wellington Station					7:35	8:35	9:35
	UPPE	Upper Hutt Station					8:20	9:20	10:20
	8579	Upper Hutt Station - Stop A			6:30		7:30	8:30	9:30
	8511	Tōtara Park Shops - California Drive		6:38	6:45	7:38	7:45	8:38	8:45
	8504	Tōtara Park - Tūia Park		6:42	6:49	7:42	7:49	8:42	8:49
RAIL connection to Wellington	8580	Upper Hutt Station - Stop B			6:54		7:54	8:54	9:54
	UPPE	Upper Hutt Station			7:00		8:00	9:00	10:00
	WELL	Wellington Station			7:45		8:45	9:45	10:45

PM									
9:30	10:30	11:30	12:30	1:30					3:06
10:15	11:15	12:15	1:15	2:15					3:51
10:25	11:25	12:25	1:25	2:25					3:32
10:33	10:41	11:33	11:41	12:33	12:41	1:33	1:41	2:33	2:41
10:37	10:45	11:37	11:45	12:37	12:45	1:37	1:45	2:37	2:45
10:50		11:50	12:50	1:50				2:50	3:49
11:00	12:00	1:00	2:00	3:00	4:02	4:21			
11:45	12:45	1:45	2:45	3:45	4:47	4:59			
CU									

ROUTE INFORMATION	
0000	Bus interchange stop Connections to routes HVL, WFL, 110, 111, 112, 113, 114 & 115 can be made at Upper Hutt Station
TU	On school days continues to Upper Hutt College
CU	On school days commences from Upper Hutt College
VMR	Travels via Moonshine Road for access to Upper Hutt College, Fergusson Intermediate, Trentham Schools and Hereaunga College
*	No service on Sundays & public holidays
**	No service on weekends & public holidays
Public holidays A Sunday timetable applies on all public holidays except when Waitangi Day and Anzac Day fall on a Saturday when a Saturday timetable will operate	

PM									
10:35	11:35	12:35	1:35	2:35	3:35	4:35	5:35		
11:20	12:20	1:20	2:20	3:20	4:20	5:20	6:20		
11:30	12:30	1:30	2:30	3:30	4:30	5:30	6:30		
10:45	11:38	11:45	12:38	12:45	1:38	1:45	2:38	2:45	3:38
10:49	11:42	11:49	12:42	12:49	1:42	1:49	2:42	2:49	3:42
10:54	11:54	12:54	1:54	2:54	3:54	4:54	5:54	6:54	
11:30	12:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	
11:45	12:45	1:45	2:45	3:45	4:45	5:45	6:45	7:45	

Figure 3-1 Bus Stops in Tōtara Park and Timetable (111)

3.4 Development Parking

Parking for the proposed development will be provided within individual residential lots.

No communal or shared parking areas are proposed as part of the development. As such, parking demand generated by the development is expected to be accommodated entirely within the site, with no reliance on on-street parking within the surrounding road network.

Given the provision of on-site parking for each lot, adverse effects associated with spillover parking, queuing, or parking-related congestion on adjacent roads are not anticipated.

4. Construction Traffic Impact

4.1 Transport Infrastructure

The purpose of this Construction Traffic Management Plan (CTMP) is to outline how construction traffic associated with the Tōtara Park subdivision development will be managed during the construction period. The CTMP identifies measures to ensure that construction-related traffic movements are undertaken safely and efficiently while minimising potential impacts on the surrounding transport network.

As discussed in Chapter 1, the Tōtara Park subdivision is being delivered in multiple stages, with Stages 1 completed and Stage 2 to be fully completed by 2026. The focus of this assessment relates to the future development of Stage 4 and Stage 3, which together will deliver 273 residential lots.

Construction activities associated with these stages are anticipated to occur between 2027 and 2031, beginning with Stage 4 and followed by Stage 3. Construction works include site earthworks, installation of drainage and civil services, roading construction, landscaping, and residential building construction.

The development site remains largely undeveloped, with only approximately 4% of the overall development area currently constructed. As a result, there is substantial available space within the site for construction activities to occur without significant interaction with existing residential areas or the surrounding transport network.

The CTMP outlines how construction vehicle access, internal vehicle circulation, worker parking, and temporary traffic management measures will be managed throughout the construction period.

4.2 Typical Traffic Management Activity Framework

In addition to the RMA framework, Temporary Traffic Management (TTM) is governed by New Zealand legislation, in particular, the Land Transport Act 1998. Land Transport rules made pursuant to that Act, which relate to TTM, include:

- Land Transport (Road User) Rule 2004;
- Land Transport Rule: Traffic Control Devices 2004; and
- Land Transport Rule: Setting of Speed Limits 2003.

The New Zealand guide to temporary traffic management (NZGTTM) outlines how to use a risk-based approach to plan and mitigate the risks to road workers and road users. It is the primary standard reference that will be adhered to in planning, coordinating and implementing TTM for this project.

Upper Hutt City Council is the Road Controlling Authority for all public roads within Upper Hutt City (except for state highways). All traffic management activities affecting the local road corridor will need to be approved by Upper Hutt City Council through their Corridor Access Request application process.

The approval of the Corridor Access Request application is based upon strictly complying with the following key requirements:

- Plan / Implement TTM safely in accordance with the requirements in the NZGTTM;
- Minimise disruption and inconvenience for road users and adjoining residents and businesses; and
- Avoid unnecessary disruption and cost through conflicts in the timing of works and activities.

Further to NZGTTM the engagement of a contractor will include a set of Principal's Requirements that will form part of the binding contract in which Contractors must comply with during construction. The

Principal's Requirements are specific to a project. The Principal's Requirements will consist of a section outlining specific requirements with respect to temporary traffic management activities. This will often bring to attention more specific requirements like maximum allowable delays, work hour restrictions and analysis requirements for work activities.

4.3 Operational Details

Construction of the remaining stages of the Tōtara Park subdivision is anticipated to occur sequentially, beginning with Stage 4, followed by Stage 3.

Table 4-1: Construction Staging Programme

Construction period:	- Stage 4 construction period: approximately 2027-2029 - Stage 3 construction period: approximately 2029-2032
Construction activities:	Earthworks and site preparation: 2 months. Installation of drainage and civil services: 3 months. Roading construction and associated landscaping: 1 month. Residential building construction: 2 years.
Construction Time:	7:00am and 6:00pm
Construction Day:	- Monday to Friday. - Construction activities will not take place on public road during weekends. - A shutdown period is proposed over Christmas and New Year holiday periods. (Confirm and insert date)

4.4 Construction Methodology

The proposed development at Cannon Point involves staged construction of residential subdivision infrastructure followed by residential building works. Construction activities will primarily occur within the development site and will progress sequentially through the various stages of civil construction.

The main construction activities are expected to include the following:

- Site establishment and mobilisation of construction plant and equipment
- Vegetation clearance and site preparation
- Bulk earthworks including cut and fill operations
- Installation of erosion and sediment control measures such as silt fences and sediment ponds
- Installation of underground infrastructure including stormwater, wastewater, water supply, and utility services
- Construction of internal roads including subgrade preparation, basecourse placement and pavement construction
- Installation of kerb and channel, footpaths, vehicle crossings, street lighting, traffic signage and road markings
- Landscaping works including topsoil spreading and grass seeding
- Construction of residential dwellings on completed lots

4.4.1. Plant, Machineries and Vehicles

Construction will involve a range of civil construction plant and vehicles. These will generally remain within the development site during the construction period, with only limited movements to and from the surrounding road network.

Table 4-2: Plant, Machineries and Vehicle Types

Vehicles	Plant and Machinery	
• Light trucks (including flat-bed trucks) • Dump trucks • Utility vehicles (Utes) • Service contractor vehicles • Concrete trucks • Delivery vehicles transporting materials and equipment	• Excavators • Bulldozers • Motor graders • Rollers / compactors • Water trucks • Backhoes • Pipe laying equipment	• Asphalt pavers • Loaders • Kerb and channel machines • Concrete pump trucks • Forklifts / telehandlers • Mobile cranes

Construction plant will generally be delivered to the site during an initial mobilisation period and will remain within the site for the duration of the civil works where practicable.

4.5 Construction Traffic Generation

Based on the general methodology for construction, a forecast of the traffic generation from the construction is provided below:

4.5.1. Construction Traffic Forecast

Since the construction activities will mainly be conducted internally, this assessment does not consider the different phases of the construction activities but will use the Earthwork phase as the main estimate as it is expected to generate the heaviest construction traffic of all different phases and the assumption is based on both Phase 4 and 3 running concurrently. Construction will occur over a 4-year period, between 2027 to 2031, Monday to Friday, excluding public holidays and the Christmas/New Year shutdown.

The anticipated workforce includes up to 25 staff involved. Based on an average vehicle occupancy of 2 workers per vehicle, the workforce generates:

- 26 worker trips per day (13 inbound + 13 outbound)

Heavy vehicles are expected to undertake internal circulation within the site. Although initial deliveries associated with the mobilisation of materials and equipment will also be considered. This corresponds to:

- 7 truck vehicle one-way (one off)
- 4 container lorry trips one-way (one off)

Construction plant and equipment will be delivered during an initial mobilisation phase and will remain on site for the duration of the works. Bulk containers of materials and equipment will also be delivered during this period, meaning regular heavy vehicle deliveries are not expected during most of the construction programme.

4.5.2. Peak Hour Construction Traffic

An earlier start time of 7:00am would avoid the morning peak period further reducing the impact, with construction workers arriving onsite between 6:00am to 7:00am. Applying a conservative assumption that 15% of daily construction trips occur in the busiest PM traffic hour, the peak-hour demand becomes:

- Total one-way trips per day on public roads: 26 trips
- Peak-hour proportion: 15%
- Peak-hour traffic $\approx$ 1 one-way trips

Rounded conservatively, construction is expected to generate up to 4 additional one-way trips in the busiest PM peak hour. These are primarily worker vehicles, with only minor contributions from movements by light truck for daily delivery of materials and plant to the site.

Given the low construction traffic volumes involved and the temporary nature of the works, the effects of construction traffic on the surrounding road network are expected to be minor and can be accommodated within existing capacity.

5. Construction Transport Impacts

The impacts of the expected construction have been assessed with proposed mitigation measures recommended when required.

5.1 Site Access and Construction Vehicle Routing



Figure 5-1 Site Access and Vehicle Routing Plan

Based on a desktop review and site visit of the existing site conditions, the primary construction access and egress via Colorado Road is not expected to experience operational issues associated with construction vehicle manoeuvring. There is sufficient space for construction vehicles to circulate, turn, and manoeuvre within the site boundary.

Construction activities will primarily occur within the Stage 3 and 4 area, during the time of writing, only a small proportion of residential lots within the wider development have been occupied, interaction between construction traffic and residential traffic is expected to be minimal. The majority of construction vehicle movements, including earthmoving and material transport, will occur internally within the site.

Given the available internal manoeuvring space and the limited surrounding traffic activity, construction vehicles and resident traffic are expected to safely share the existing access routes. Accordingly, Temporary Traffic Management measures on the surrounding road network are not currently considered necessary.

5.2 Temporary Construction Compound/ Construction Vehicle Parking

5.2.1. Stage 3 (Temporary Construction Compound)

The temporary construction compound has been established within the development site to accommodate construction vehicle parking, plant and machinery storage, containers and temporary materials storage. Based on an on-site inspection, there is sufficient available space within and surrounding the Cannon Point development area to accommodate construction-related parking, including vehicles, plant, and container storage. During Stage 3 construction, temporary parking can be accommodated along the road adjacent to Stage 2. See Figure 5-2 for further details:

- Laydown area;
- Parking;
- U-Turn zones;
- Container Storage.



Figure 5-2 Stage 3 Temporary Construction Compound Layout

5.2.2. Stage 4 (Temporary Construction Compound)

Stage 4 remains largely undeveloped, providing ample space for construction loading, access, internal circulation, and manoeuvring. The Colorado Road access corridor is of sufficient width to accommodate two-way traffic movements, including opposing heavy vehicles, without conflict. See figure



Figure 5-3 Stage 4 Temporary Construction Compound Layout

5.3 Internal Vehicle Circulation

5.3.1. Construction Vehicle Manoeuvring.

Vehicle tracking has been completed to confirm that the proposed construction access, internal circulation and manoeuvring arrangements for Stages 3 and 4 can accommodate the largest plausible construction vehicles in a safe and forward-gear manner. The assessment is documented in the following drawings (refer to Appendix D):

- Vehicle Tracking Layout – Stage 3 (dated 22 April 2026); and
- Vehicle Tracking Layout – Stage 4 (dated 22 April 2026).

Both drawings have been prepared at 1:1000 (A3) / 1:500 (A1) for the site layout and at 1:2000 (A3) / 1:1000 (A1) for the overall locality, and have been issued to Upper Hutt City Council for review.

5.3.1.1. Design and Check Vehicles

A two-tier vehicle tracking approach has been adopted, consistent with common practice for residential subdivision construction:

the Construction Design Vehicle – a Large Rigid Truck – represents the typical heavy vehicle expected to access the site (e.g. concrete truck, tip truck, pipe-delivery truck); and

the Construction Check Vehicle – a Semi-Trailer – represents the largest plausible vehicle (e.g. infrequent abnormal deliveries such as long steel or precast concrete members) and has been checked to confirm that access is feasible with basic traffic management support.

Table 5-1: Construction vehicle tracking parameters

Parameter	Check Vehicle (Large Rigid Truck)	Design Vehicle (Semi-Trailer)
Overall length	11.500 m	17.900 m
Overall width	2.500 m	2.500 m
Overall body height	3.632 m	3.695 m
Minimum body ground clearance	0.427 m	0.417 m
Track width	2.500 m	2.500 m
Lock-to-lock time	6.00 s	6.00 s
Wall-to-wall turning radius	12.000 m	10.000 m

5.3.1.2. Stage 3 Construction Access and Manoeuvring

Construction traffic for Stage 3 has been assessed along the Colorado Road / Cannon Point Road corridor. The Vehicle Tracking Layout – Stage 3 drawing confirms that both the Design Vehicle and the Check Vehicle can enter from Colorado Road, reach the Stage 3 work area, and return in a forward direction by using the following dedicated manoeuvring features shown on the drawing:

Tracking envelopes for both vehicles remain within the running surface at all manoeuvring points, with no encroachment onto private property or the existing footpath. Where the Check Vehicle is employed (infrequent oversize deliveries), short-duration traffic management using spotters is proposed in accordance with the New Zealand Guide to Temporary Traffic Management (NZGTTM).

5.3.1.3. Stage 4 Construction Access and Manoeuvring

Construction traffic for Stage 4 has been assessed along Colorado Road, Cannon Point Road, Hartford Crescent and Tacoma Drive. The Vehicle Tracking Layout – Stage 4 drawing confirms that both the Design Vehicle and the Check Vehicle can access the Stage 4 construction compound and depart in a forward direction using the following manoeuvring features shown on the drawing:

Tracking envelopes confirm that the Design Vehicle can complete all intended movements without encroaching onto opposing traffic lanes, private driveways, or existing verges. For the Check Vehicle (Semi-Trailer), the drawing shows that manoeuvring is feasible with the temporary occupation of both running lanes at the designated U-turn point; this will be managed under the CTMP using a traffic marshal and short-duration signalling, consistent with NZGTTM procedures.

5.3.1.4. Colorado Road Entrance

The Colorado Road entrance is the primary construction access for both Stage 3 and Stage 4. Tracking confirms that HCVs entering from Cannon Point Road can make both left and right turns into the site without crossing the opposing lane. Exiting HCVs are able to turn left into Colorado Road and travel south toward Cannon Point Road within their own lane. The swept path maintains adequate clearance from the existing kerbline and the edge of the opposing carriageway.

5.3.1.5. Internal Circulation, Loading and Turnaround

Within each construction compound, sufficient space has been identified for construction vehicle circulation, loading / unloading, and turnaround. The designated loading zones and turning points shown on the vehicle tracking drawings allow HCVs to complete a full circulation loop without reversing onto the public road network. Reversing movements, where required within the site, will be supervised by a spotter in accordance with site induction requirements.

5.3.1.6. Findings

Based on the vehicle tracking assessment, the following findings are drawn:

- Both the Construction Design Vehicle (Large Rigid Truck) and Construction Check Vehicle (Semi-Trailer) can safely access, manoeuvre within, and egress the Stage 3 and Stage 4 construction areas in a forward direction.
- All manoeuvres can be completed within the existing road reserve and proposed construction compounds, with no permanent widening of Colorado Road, Cannon Point Road, Hartford Crescent or Tacoma Drive required.
- Check Vehicle (Semi-Trailer) movements are infrequent and will be managed under the Construction Traffic Management Plan (CTMP) using a traffic marshal and temporary traffic controls at U-turn points, consistent with the NZGTTM.
- No reversing movements are required on the public road network under normal construction operations; any internal reversing will be supervised by a spotter.

The vehicle tracking outcomes support the conclusion that construction vehicle manoeuvring for Stages 3 and 4 can be accommodated safely and without adverse effects on the surrounding road network.

5.3.1. Residential Vehicle Manoeuvring.

This section focuses on residential vehicle parking for Stage 1 and 2. Current parking demand within Stage 1 is relatively low, with only 9 cars observed, therefore does not present a constraint to traffic operations. Stage 2 is currently under construction, and upon completion, sufficient space is expected to remain within and surrounding the site to accommodate vehicle manoeuvring without operational issues.

5.3.1.7. Site Stage 1- Residential Vehicle Manoeuvring

A site inspection and vehicle tracking confirms that the access routes serving Stages 3 via Stage 1 provide adequate carriageway width (approximately 8.5 m) to accommodate construction vehicle movements, including heavy vehicles, without operational constraints. While on-street parking has been observed within the Stage 1 area due to existing residential occupation, sufficient carriageway width remains available to enable safe two-way vehicle movements (8.5m).

Where required, appropriate traffic management measures, such as the use of spotters, can be implemented to assist with vehicle manoeuvring and reversing movements. Each residential lot is provided with dedicated off-street parking and driveway access; therefore, it is not anticipated that construction activities will result in adverse impacts on residential access or necessitate reverse-only vehicle movements within the site.

In addition, there are substantial open areas located approximately 50 m ahead of the access route, which provide sufficient space for construction vehicles to undertake turning and manoeuvring activities safely and efficiently.