

Ref: 23030
6 October 2023

Campana Landowners Consortium
c/o Capstone Projects Ltd
349B Manukau Road
Epsom,
Auckland

Attention: Tom Anderson

Issued via email: **tom@capstoneprojects.co.nz**

Dear Tom

Transportation Assessment – Storage Activities, Campana Road, Puhinui

Following your recent instruction, Don McKenzie Consulting Ltd is pleased to provide the following assessment of transportation implications of a proposed development of storage facilities, alongside the consented SPCA facility, within the subject land at Campana Road, Puhinui.

It is anticipated that this assessment would form part of a wider transport assessment to support a rezoning application to “live zone” the subject land from Future Urban Zone (“**FUZ**”) to Business – Light Industrial Zone (“**LIZ**”). The following assessment focusses on the establishment and operation of the interim activities within the subject land prior to establishment of planned additional and enhanced transport infrastructure along Puhinui Road.

1. Background

This transportation assessment has been prepared on behalf of the Campana Landowners Consortium (“**the Consortium**”) to describe and assess the traffic engineering and transportation planning aspects associated with a proposal to establish and operate storage activities and the recently consented SPCA animal care facility within subject land at Campana Road.

The key transportation issues relevant to this site and proposed activities include:

- The ability of the surrounding road network (especially the Campana Road frontage and its connection to Puhinui Road | State Highway 20B (“**SH20B**”) to safely and effectively support the proposed storage activities and SPCA animal care facility;
- Expected traffic generation of the activity to and from Campana Road and surrounding roading network;
- The relationship of the proposed vehicle access serving the planned storage facility with respect to the recent and future roading upgrades that are the subject of the Airport to Botany Notices of Requirements along Puhinui Road, and
- The co-ordination of the proposed vehicle crossings serving the planned storage activities with other property access to Campana Road near the subject land.



The above points and other matters will be addressed in the detail of the following report.

2. Site Location

The subject site at Campana Road comprising the following properties:

- 5 Campana Road (Lot 1, DP 482013)
- 10 Campana Road (Lot 3, DP 71211)
- 11 Campana Road (Lot 2, DP 71211)
- 485 Puhinui Road (Lot 2, DP 482013)
- 457 Puhinui Road (Allotment 190 Parish of Manurewa)

Figure 1 shows an aerial photograph view of the site location within the context of the surrounding environment.



Figure 1: Site Location (Source: Saddleback Planning Group)

Together the properties comprise approximately 30.8ha in total land area and have legal road frontage either directly or via Right of Way to Campana Road.

Existing activities within the subject properties comprises of generally rural residential and horticultural production in nature including shade hoses, packing sheds and storage yards. A number of driveways and access connect to Campana Road along its 400m (legal road) length from Puhinui Road.

The SPCA has also recently obtained resource consent to establish an animal housing and care facility within 485 Puhinui Road.



3. Existing Transportation Environment

3.1 Puhinui Road

Puhinui Road is a classified Arterial Road in terms of the Auckland Unitary Plan in which role it is expected to cater primarily for through-traffic connecting major destinations within the Auckland metropolitan area.

At a strategic level Puhinui Road provides for one of the two major connections (along with Geroige Bolt Memorial Drive SH20A) between the Southwestern Motorway (SH20) and Auckland International Airport. As a classified arterial road it not expected to prioritise property access, with such movements to adjoining properties generally catered for via side road intersections (such as Campana Road). Arterial routes such as Puhinui Road are also expected to operate with higher posted travel speeds and carrying larger traffic volumes.

The current intersection with Campana Road is a cross-road, signalised intersection and is shown in Figure 2 below.



Figure 2: Campana / Puhinui Intersection (Source: Google Earth)

The southern leg of the intersection connects to the new Auckland Airport Park and Ride South (“PnR South”) facility, providing up to approximately 3,900 off-street carparking spaces.

Puhinui Road through the intersection with PnR South and Campana Road is broadly in the form of a four-lane carriageway including a T3 high occupancy transit lane in each direction, plus one general travel lane. Turning movements to and from the side roads are catered for via a combination of separated and shared left and right turning lanes for each of the movements from Puhinui Road. On the eastern side of the intersection, an additional through traffic lane is developed catering for westbound movements towards the airport. Beyond Campana Road, this additional westbound through lane merges back into a single westbound through lane approximately 100m downstream of the signals. In a similar way, the eastbound through movement along Puhinui Road is provided with an additional through lane while the left turn into Campana Road is shared within the kerbside T3 lane. Downstream (to the east) of the intersection the additional through lane drops resulting in one general traffic lane plus the T3 lane extending through to the Manukau Memorial Gardens instruction and the Puhinui Interchange located approximately 1km to the east of Campana Road.



From the latest data available from Waka Kotahi | New Zealand Transport Agency (“**Waka Kotahi**”) sources Puhinui Road has an annual average daily traffic volume (“**AADT**”) of approximately 24,500 vehicles per day (“**vpd**”). Previous AADT figures from the period 2016-2020 (prior to the Covid pandemic period) were in the range of 27,000 – 29,000vpd.

The posted speed limit on Puhinui Road in the vicinity of the Campana Road intersection is 60 km/hr.

In broad terms therefore, the Puhinui Road SH20B route represents a significant arterial route, playing a major access function for regional traffic flows between the Southwestern Motorway and the airport. It operates with high daily and peak period through volumes, and the recent development of the airport’s PnR South facility has been accompanied by a significant new signalised intersection which also connects Campana Road to the route.

3.2 Campana Road

Campana Road is a No Exit local road approximately 400m in length (legal extent) connecting into the Consortium land holding to the north of Puhinui Road. Only the first 50m length of Campana Road is sealed.

A recent resource consent obtained by the SPCA enables the establishment and operation of an animal care facility within the property (one of the Consortium members) at 485 Puhinui Road.

The Campana Road carriageway is approximately 6.0m in width and provides for two-way traffic movement along its largely unsealed length from Puhinui Road into the Consortium’s land. The initial 50m of sealed carriageway is marked with a simple painted centreline plus a Keep Clear zone adjacent to the access lane (running parallel and to the north of the main carriageway of Puhinui Road) into the front portion of the 485 Puhinui Road property.

The nature and scale of current activities that gain access off Campana Road indicates that the existing daily traffic count along Campana Road would be less than approximately 100vpd.

3.3 Walking and Cycling

There are currently no footpaths or dedicated crossing facilities provided on either side of Campana Road in the vicinity of the subject land site. The recent establishment of the signalised control and upgrading of the Puhinui Road / Campana Road intersection together with the overall route improvements to Puhinui Road including shared pathways and formalised crossing facilities, has increased the provision for active travels modes near the site from what it has been in past. While the onward connections from Puhinui Road through the airport to the west of the Campana Road location and the SH20 Puhinui Interchange to the west create some limitations and restrictions for walking and cycling activity, it is considered that the current facilities within the surrounding area as generally appropriate for the scale and nature of current activities within the Campana Road environment.

The planned increases in employment-related activity associated with the development of the subject land as discussed in this report will need to take into account the need for further extension of these facilities including along Campana Road and connecting to the Puhinui Road bus stops and PnR South.

3.4 Public Transport

The nearest bus stops to the Consortium’s land interests are positioned over 2km to the east along Puhinui Road (beyond the Puhinui Interchange) and are served by the AirportLink bus route. It is understood that additional bus stops are proposed to be developed by Auckland Transport in the vicinity of the Campana Road intersection associated with the PnR South site



and operation. The T3 lanes on Puhinui Road are intended to provide improved travel times and reliability for buses and other higher occupancy vehicles along this route and will be available for future employees and visitor of the planned development of the Consortium's land.

The T3 lanes and associated services will in the future also enable improved connection to Puhinui Train Station, and with the other planned improvements in the near future including additional public transport connections and enhanced services will enable onward connection to Britomart, Newmarket, Manukau, Pukekohe and other key rail nodes, at improved frequencies of.

As such, the site is considered to have relatively good connection to the wider Auckland area, with enhanced services and facilities planned in the near future.

3.5 Future Road Network

Puhinui Road is a part of what Auckland Transport and Waka Kotahi refer to as the "Southwest Gateway Programme" which aims to provide safer and more reliable travel choices, including to and from Auckland Airport. The three primary projects within the programme include:

- Airport to Botany ("A2B"): this is the process currently going through notified hearings seeking designations along Puhinui Road (and other parts of the route through to Botany Town Centre) as part of the AT/Waka Kotahi proposal to deliver a dedicated public transport route between Auckland Airport, Manukau, and Botany.
- 20Connect: this project (largely completed along the Puhinui Road corridor via the T3 lanes and associated facilities currently in place) was targeted at improving journey time reliability and safety along SH 20, SH20A, and SH20B. It enables priority lanes for public transport, improved access for freight, and better walking and cycling connections.
- Auckland Airport Precinct developments: a range of projects targeting consistent, reliable journeys within Auckland Airport's own transport network aiming to support a shift to improved public transport options.

Future activities within the Consortium's land holdings as set out in this development application would be positively served by aspects of this programme of works. While staged construction of the long-term works will take some time to deliver (i.e. over the next decade in respect of A2B), as noted above parts of the programme are already in place such as:

- Puhinui Road T3 lanes;
- Redevelopment of the Manukau Memorial Gardens intersection;
- Dedicated shared path with improved wayfinding and controlled/signalised crossings such as at Campana Road, and
- Safety improvements (such as central median barrier protection, improved lighting, and change in speed limits) along the wider Puhinui Road corridor and through the Puhinui Interchange.

As such these AT/Waka Kotahi-led improvements and the on-going development of land-use activities within the parts of the Puhinui Precinct on the southern side of Puhinui Road, are each indicative of an on-going enhancement of travel options and overall network connectivity for multiple travel modes that are well-aligned with the proposed development within the Consortium's land.



4. Anticipated Traffic Generation

The Consortium proposes to establish and operate storage activities and a SPCA animal facility within its land holdings at Campana Road.

It is anticipated that the assessment of traffic generation of the proposed activities should proceed on the basis of setting particular traffic generation thresholds (in terms of peak period volumes) that could be accommodated within the external connection of the subject land to Puhinui Road. It is then recommended that the total traffic generation and associated traffic performance of the Campana Road/Puhinui Road intersection would be monitored either on a regular (e.g. annual) basis or when a new consent was sought.

The assessment of the available traffic capacity at the Campana/Puhinui intersection has been framed around identification of a level of additional peak period traffic movements beyond that already approved within the SPCA resource consent being approximately +53vph (AM peak) and +49vph (PM peak) inclusive of arrivals and departures from Campana Road. The Stantec New Zealand transportation assessment report (December 2022) accompanying the SPCA application included detailed assessment of the base (without SPCA) and a with SPCA scenario in terms of intersection performance. In order to provide consistency with that assessment, a similar set of traffic models (using the traffic models used by Stantec in its assessment and supplied via SPCA) have been adopted.

In terms of the future traffic generating potential of the Consortium land (beyond the SPCA activity) the following calculations are made:

- The total Consortium landholding (including SPCA) involves approximately 30.72 hectares of useable land;
- Excluding the SPCA facility (occupying part of the 485 Puhinui Road property across approximately 3ha of the total property), the total useable land would be approximately 27.7ha;
- An allowance of 30% of the developable land for road reserves/accesses/drainage, and a 70% site coverage for useable storage area;
- Adopting a typical storage trip generation rate of approximately 10 vpd per hectare of storage activities;
- Accordingly, application of the above factors results in daily two-way flows of approximately 280vpd (IN+OUT) to and from the Consortium's land, with the busiest hour generating in the range of approximately 30-40vph (IN+OUT)

The following section addresses the practical operation of the Campana/Puhinui intersection on the basis that there will be a practical performance-based limitation on the total traffic generation imposed by the traffic signal operation at the intersection and the desire to protect the overall levels of service performance for the Puhinui Road arterial corridor.

5. Projected Intersection Performance

The effects of the expected traffic generation from the Consortium land on the Puhinui Road / Campana Road intersection has been assessed using the intersection analysis tool SIDRA Intersection and adopting a similar set of SIDRA models to that used by Stantec New Zealand in its work on behalf of SPCA through the resource consent application for its animal care facility within the property at 485 Puhinui Road. The existing signalised intersection design was adopted for this analysis.



Two scenarios for the weekday morning and afternoon peak hour periods were modelled, namely:

- a baseline using existing traffic flows plus the consented developments accessing via the Campana/Puhinui intersection including the Southern Gateway Puhinui Precinct activity, PnR South and the SPCA animal care facility, and
- future scenario adding 50vph (IN+OUT) to the consented baseline (adopting a generally conservative estimate of the trip generation of the proposed storage activities within the subject land).

The existing model traffic data (including the movement data for the PnR South and SPCA facility) has been sourced from the Stantec SPCA assessment which itself drew upon reporting and assessment of the PnR South development.

The following tables present the results of the SIDRA model analyses for each peak period across each of the range of scenarios. The performance of the intersection is represented by the following three measures:

- 95th percentile queue length (95% Queue) expressed in terms of number of vehicles in the queue;
- average vehicle delay in seconds per vehicle (sec/veh),
- Level of Service (LOS) which is a generalised measure of the operation of the intersection ranging from LOS A (limited or no delay or queuing, and indicative of generally free-flow conditions); LOS C and D is good or acceptable, and LOS E and F are indicative of notable delays and congestion.

Table 1 shows the modelled performance measures for the morning peak period (in the hour ended 8.30am) with each of the intersection turning movements listed down the left-hand column, with the baseline and the development traffic generation scenario across the top of the page. Each scenario then has the three performance measures (delay, LOS and queue) with each part of the table.

**Table 1: SIDRA Intersection Performance Results - AM Peak**

Approach	Mvmnt	Baseline (Existing + Consented incl SPCA)			Baseline + 50vph		
		Avg Delay (sec/veh)	LOS	95% Queue (veh)	Avg Delay (sec/veh)	LOS	95% Queue (veh)
Park N Ride (South)	Left	52.2	D	4.6	52.2	D	4.6
	Through	46.8	D	14.6	47.5	D	15.0
	Right	51.5	D	14.6	52.3	D	15.0
SH20 B (East)	Left	40.3	D	44.4	40.4	D	44.4
	Through	44.7	D	14.0	45.0	D	14.0
	Right	26.4	C	0.6	26.6	C	0.8
Campana Road (North)	Left	34.0	C	0.9	34.8	C	1.2
	Through	28.4	C	0.9	29.2	C	1.2
	Right	34.0	C	0.9	34.8	C	1.2
SH20 B (West)	Left	34.9	C	1.1	34.4	C	1.6
	Through	45.8	D	4.1	45.7	D	4.1
	Right	66.7	E	9.3	66.7	E	9.3
INTERSECTION		46.1	D		46.1	D	-

In broad terms the above table shows that:

- The intersection turning movements experiencing the highest delays during the morning peak period are the left turn into PnR South and the right turn into PnR South from the west. This pattern is generally replicated across each of the additional traffic scenarios.
- The through movements along Puhinui Road are experiencing delays in the range of 45-48 sec/veh across the scenarios. As can be appreciated there is little change between the various performance measures with and without the storage activity traffic generated to and from Campana Road.
- When viewed across the whole intersection, the effect of the storage-related traffic movements to and from Campana Road is modest in terms of all three performance measures. The intersection average delay changes by less than about 2 sec/veh. In terms of the critical turning movements, the net change in delay (say for the right turn into PnR South from the west and the left turn from the east) generally reflect these intersection average delay changes – there effectively being no change in this critical movement delay once account is taken of the storage related activity. The overall LOS for the intersection is not affected by the additional traffic generation through the intersection.

Table 2 then presents the equivalent results for afternoon peak period (the hour end 5.30pm).



Table 2: SIDRA Intersection Performance Results - PM Peak

Approach	Mvmnt	Baseline (Existing + Consented incl SPCA)			Baseline + 50vph		
		Avg Delay (sec/veh)	LOS	95% Queue (veh)	Avg Delay (sec/veh)	LOS	95% Queue (veh)
Park N Ride (South)	Left	18.8	B	12.6	18.6	B	12.6
	Through	52.7	D	46.6	53.2	D	46.9
	Right	57.6	E	46.6	58.2	E	46.9
SH20 (East)	Left	9.5	A	6.9	9.9	A	8.0
	Through	51.1	D	17.5	51.1	D	17.5
	Right	56.3	E	2.1	56.6	E	2.4
Campana Road (North)	Left	34.1	C	1.5	36.2	D	2.8
	Through	28.6	C	1.5	30.6	C	2.8
	Right	34.2	C	1.5	36.2	D	2.8
SH20 (West)	Left	44.2	D	4.5	44.3	D	4.8
	Through	59.4	E	23.4	59.6	E	23.4
	Right	73.5	E	9.7	73.5	E	9.7
INTERSECTION		44.9	D	-	45.2	D	-

The key features to arise out of the assessment of the modelled performance in this later afternoon period are as follows:

- Broadly the average delays for the through movements along Puhinui Road through the intersection are somewhat higher, the queues longer and LOS worse than the equivalent AM peak period. In general, the effect of the Campana Road storage-related traffic generation generates similar level of modest change in performance during the afternoon to that experienced during the morning peak.
- Critical movements during this period include the eastbound through movement along Puhinui Road (59 sec/veh) together with the right turn into PnR South from the west (73 sev/veh). Once again, the effect of the additional storage activity to and from Campana Road is negligible.
- During this PM peak the Campana Road approaches are predicted to experience some minimal increase in delay and reduced overall LOS albeit that queuing is not substantial being only up to a maximum of only about three vehicles on the approach to the Puhinui Road lights.
- Across the intersection as a whole and reflective of these critical movement changes already discussed, the effect of the proposed storage activities is largely negligible with limited changes to delay and/or queueing generally.

On the basis of the above traffic modelling and analysis, and appreciating the sensitivity of the Puhinui Road corridor to dynamic changes in traffic performance as a result of day-to-day and hour-to-hour traffic activity, it is concluded that the additional traffic generation into and out of Campana Road will have limited if any effect on the operation of either PnR South or Puhinui Road through movements during peak hours. At other times of the day the effect of the storage activities are similarly expected to be negligible. Any change in delay, queueing and Level of Service will be largely similar to that presented (and confirmed by Auckland Council) within the application for the SPCA animal care facility within 485 Puhinui Road.



6. Assessment of Proposed Access

Given that the proposed access movements to and from the Campana Road landholdings (with the possible exception of 487 Puhinui Road and the front portion of 485A Puhinui Road) all gain access from Campana Road and via the Campana/Puhinui traffic signals, it is considered that appropriate driveway connections (designed and located in accordance with the Unitary Plan Chapter E27 Transportation rules) will be satisfactory to accommodate these levels of traffic movement. From the investigations and analysis undertaken to date it is not considered that there would be any further need for additional upgrading of the Puhinui Road intersection as a result of the generated traffic volumes.

It is recommended that in order to cater for the generated scale and nature of traffic movements to and from the Consortium's land that provision should be made to form Campana Road to full sealed road standard, as well as making formal provision for fully sealed footpaths connecting to the Puhinui Road signalised intersection and the paths/crossings connecting to the intersection.

7. Summary

This report has been commissioned by the Campana Landowners Consortium in support of its planning application/process to establish and operate storage activities and a SPCA animal care facility within land at Campana Road. Specific consideration has been given within this report to the traffic capacity and operational performance of the Campana Road / Puhinui Road intersection which will largely dictate the available scale of traffic movements that can be effectively and safely catered for by the intersection.

The result of the intersection analysis and modelling undertaken using previous traffic models available through the SPCA's recent consent application, has shown that a generated traffic activity level equivalent to the SPCA application (approximately 50vph during AM and PM peak hours) plus +50vph from development within the Consortium's landholdings would be appropriately catered for by the Campana/Puhinui intersection without any notable degradation to the performance of the intersection or the arterial movements along Puhinui Road.

I would be happy to further discuss any of the details of this report as required. Please do not hesitate to contact the writer as per below.

Yours sincerely

Don McKenzie Consulting Ltd

Don McKenzie
Director

E: don@dmconsulting.co.nz
M: 021 656 191

12 September 2024

Campana Landowners Consortium
c/o Capstone Projects Ltd
349b Manukau Road
Epsom
Auckland

Attention: Tom Anderson
Issued via email: tom@capstoneprojects.co.nz

Dear Tom

**Proposed Private Plan Change – Campana Road
Clause 23 Request for Further Information Response (Transport)**

Following our recent instruction, Don McKenzie Consulting Ltd is pleased to provide the following responses to the Council's Request for Further Information issued under Clause 23 of the Resource Management Act ("Clause 23 RFI") in relation to the proposed Campana Road Plan Change ("Plan Change") in advance of it being notified by Council. The responses build on discussions held with the Council's representatives Peter Reaburn (planning) and Andrew Temperley (transport) on 31 July 2024.

It is understood that additional responses to some (non-transportation) matters raised in the Council's Clause 23 RFI are being provided by other members of the Applicant team and will be reported on separately. .

1. Land use and transportation Integration

Information Concern

The S32 evaluation does not consider the integration of the PPC area with transport projects along the state highway 20B (SH20B) corridor, namely the 20Connect long term improvements and Airport to Botany rapid transit. The FDS identifies 20Connect as an infrastructure prerequisite for the Puhinui (stage 2) future urban area, which the PPC site is part of.

Information Request SP2 – Land use and transportation Integration

Please provide a further assessment in relation to the integration of the PPC area with transport projects along the state highway 20B (SH20B) corridor.

Response:

The Plan Change focusses on the development of yard-based storage being considered within the context of the current transport environment focussed on the SH20B Puhinui corridor. As discussed at the meeting with Council on 31 July (and as will be discussed in the next section of this response) the 50vph threshold is intended to ensure that any more substantial traffic and other mode generation associated with more intense development will be assessed via resource consent and associated traffic assessments at the time when such development is advanced including alignment and consistency with these wider strategic projects and processes.

The Plan Change's 50vph permitted traffic movement "ceiling" is considered to be generally consistent with the broad expectation of the 20Connect/Airport-Botany Busway over the next several years, with any future development potential beyond what is currently provided for within the Plan Change area assessed accordingly as required by future consent processes.

2. Staging of development activities and consequent traffic generation potential

Information Concern

The Transportation Assessment memo considers traffic generation potential associated with the consented SPCA facility and proposed storage activities, including the impact of this traffic generation on the performance of the intersection of Campana Road / Puhinui Road. However, it does not consider traffic generation potential and effects associated with the development of other sub-precinct areas within the Plan Change area, nor how the effects would be mitigated.

Further information is needed to understand the full potential transportation effects of the PPC when fully developed and inform appropriate transportation provisions and mitigation measures required (see item III below).

Auckland Transport (AT) have similarly confirmed their support for further information in relation to trip generation, as well as assumptions in relation to trip distribution. AT have also reaffirmed that Waka Kotahi Guidelines for assessing Plan Changes require modelling assessments for 10 years into the future, in addition to the existing scenario.

Information Request T2 - Staging of development activities and consequent traffic generation potential

Please provide information in relation to traffic generation potential of land-use activities within the whole PPC area and consequent transport effects on the adjoining network.

Response:

The discussions with Council representatives on 31 July identified that the potential for future land-use activities to be established within the Plan Change area should be framed around a more strategic, broader framework rather than being considered as a detailed "future baseline" or similar. Other members of the Applicant team will provide greater information on the most feasible and realistic light industrial land-uses/activities that could be considered within the Campana Road location.

From a transportation and traffic generation point of view, and as was set out in the Transportation Assessment accompanying the Plan Change application the "generic light industrial" activities occupying could generate traffic movements as follows:

In terms of the future traffic generating potential of the Consortium land (inclusive of the SPCA land) the following calculations are made:

- The total Consortium landholding (including SPCA) involves approximately 30.7 hectares of useable land;
- An allowance of 30% of the developable land for road reserves/accesses/drainage, and a 40% site coverage for buildings or useable storage facilities;
- Adopting 70% of the net developable land (60,172 sqm) to provide for warehousing/storage at a typical trip generation rate of 0.5 vph per 100 sqm;
- The remaining 30% (25,788 sqm) to provide for permitted ancillary office activities in support of the light industry/warehousing at a peak period generation rate of 1vph per 100sqm;
- Application of the above factors results in peak hour two-way flows of up to approximately 560vph (bothways) to and from the Consortium's land associated with such generic light industry and ancillary office activities.

More detailed evaluation of the Puhinui/Campana intersection would be undertaken once specific activities are known (and consent sought when/if these activities are planned), however at this stage (and on the basis of the above commentary regarding what development will be facilitated and enabled by the Plan Change), it is expected that the generic form of infrastructure response to cater for the light industrial activity would typically involve:

- Widening of Campana Road to an "urban collector" form of roading carriageway involving one lane in each direction, formed footpaths (or shared paths) on each side of the road, plus suitably dimensioned roadside shoulders and berms.
- Potential widening of the Campana Road approach to the Puhinui Road intersection to enable separation of left and right turning movements out of Campana Road.

The current legal road width of Campana Road at approximately 20m is generally sufficient to enable the widening of the carriageway to the "collector" standard incorporating footpaths and other associated design elements. The widening at the intersection with Puhinui Road may involve additional land requirements from the properties making up the Applicant's landholding to achieve the additional turning width.

In this regard it is considered (from a transportation engineering point of view) that there is suitable resilience and flexibility within the current Plan Change landholdings and legal road width of Campana Road to respond to future potential light industrial land use scenarios beyond the permitted traffic generation ceiling (of 50vph) proposed within the Plan Change.

3. Triggers for Transport Improvements and Mitigation Measures

Information Concern

While the Transportation Assessment Memo refers to the upgrading of Campana Road and to future walking and cycling improvements, it does not provide full details, including appropriate phasings and trigger points for improvements.

Further information is needed to ensure that appropriate outcomes for the transport network can be delivered in alignment with the staged development of the PPC area

Information Request T3 - Triggers for Transport Improvements and Mitigation Measures

Please provide information on appropriate transportation infrastructure provisions and appropriate mitigation measures for the PPC development, in addition to identifying

appropriate trigger points for improvements, including responsibilities for funding and delivery.

Response:

The above high-level assessment has shown that under a future hypothetical development scenario delivering a generalised light industrial development form could require upgrading of the general form set out under the response to Information Request T2 to provide for up to approximately 16.5ha of development area (or an equivalent of 65,800 sqm GFA). The specific triggers (prior to or at this level of development) for the delivery of the infrastructure discussed would be considered and derived through the subsequent consenting processes beyond what is proposed by the current Plan Change.

The responsibilities for funding and delivery of such upgrading is expected to be given consideration at a later time when any improvements are being planned. Standard approaches to the funding of such improvements would be expected to follow the normal processes including consideration of the proportional contribution of such improvements towards mitigation of external effects associated with the landuse proposed, and the additional wider benefit such improvements might deliver for the wider community.

4. Operational and Safety Assessment of access to 457 Puhinui Road

Information Concern

While the Transportation Assessment Memo assesses the performance of the intersection of Puhinui Road / Campana Road, it does not consider the safety and operational performance of the separate intersection point to 457 Puhinui Road. It further does not confirm whether this intersection arrangement is expected to be subject to any changes or upgrades, in response to future development and / or any safety issues.

Further information is needed to fully understand the traffic and safety impact of the PPC on the adjoining road network. The existing access intersection to 457 Puhinui Road is noted to already be handling regular truck movements, whilst constrained by a ban on the outbound right-turn manoeuvre and few convenient opportunities for vehicles to undertake U-turning manoeuvres along Puhinui Road in the immediate vicinity.

Information Request T4 - Operational and Safety Assessment of access to 457 Puhinui Road

Please provide an assessment of the safety and operational performance of this intersection, which should take account of the future development potential of this site, in accordance with the above. If appropriate, the assessment should also confirm recommended improvements to address safety and / or operational issues.

Response:

The Applicant has considered a potential form of alternative transport access to this part of the Plan Change area. The updated structure plan supporting the Plan Change application shows an indicative realignment and positioning of the existing "service lane" that extends (within legal road reserve) across the Puhinui Road frontage of the SPCA property between Campana Road and the 457 Puhinui Road property. It is indicatively shown extending further north through the SPCA property and connecting to Campana Road a minimum of 30m north of the existing Campana / Puhinui intersection (satisfying the relevant AUP Chapter E27 access location standards).

5. Campana Road Upgrade

Information Concern

While the Transportation Assessment Memo refers to the upgrading of Campana Road, it does not provide further details, such as confirmation of cross-sectional standards. While the infrastructure report provides a proposed cross-section for Campana Road, it does not assess this according to Auckland Transport Code of Practice (ATCOP) requirements.

Further information is needed to ensure that the key route connecting the PPC site to the wider transport networks is fit for purpose.

Information Request T5 - Campana Road Upgrade

Please provide a cross-section design for Campana Road which complies with ATCOP Standards and clarification as how provisions for active mode users will integrate with adjoining networks at either end.

Response:

The relevant ATCOP (Auckland Transport Code of Practice) and Transport Design Manual (TDM) standards will be referenced within future resource consents. As discussed under Information Request T2 above, there is sufficient legal road reserve width to deliver an appropriate design standard of urban industrial collector road comprising of for example, an 11m width two-way carriageway). In terms of active modes, the 20m road reserve width is suitable to accommodate footpath or other active mode provision as may be appropriate in the future. Any potential additional width requirements to provide for greater design requirements per ATCOP or other design standards can be achieved from land held by the Plan Change applicants.

An indicative cross-section of Campana Road is provided as an Attachment to this response.

6. Campana Road Structure Plan

Information Concern

It is considered that the Campana Road Structure Plan would benefit from further detail and supporting assessments in relation to the areas specified in the information request below.

Information Request T6 – Campana Road Structure Plan

Please provide:

- ***A plan showing strategic transport movements, which could be an elaboration of the information presented in the plan on page 4 of the Structure Plan, showing strategic transport connections between the PPC site and the wider network and indicative internal connections within the PPC sub-precinct areas, for vehicular traffic, active modes and public transport.***
- ***Further assessment and clarification in relation to the indicated realigned access to 457 Puhinui Road, shown on the same plan.***
- ***Further assessment and clarification in relation to the indicated 'Public Walkway opportunity' following the coastlines of the peninsulas making up the PPC area. While the identified routes appear to offer significant amenity value, it would be helpful to understand how these walkways would be expected to serve the PPC site at a functional level and integrate with other provisions for access by active mode users.***

Response:

An updated Structure Plan has been prepared by other members of the Applicant's advisory teams and is attached to this response as **Attachment B**. From a transportation point of view and in response to the initial two bullet points of the Council's request above, the updated Structure Plan shows:

- The indicative extension of the Campana Road alignment to the north towards and connecting with each of the land parcels in the northern sector of the Structure Plan area;
- An indicative alignment of the accessway serving the 457 Puhinui Road property and its indicative connection to Campana Road (via the SPCA land) located a minimum of 30m north of the Puhinui Road intersection;
- A potential indicative connection (Future Western Connection) from the western side of Campana Road (and north of the accessway to 457 Puhinui Road) towards non-Plan Change land on this western side of Campana Road.

Beyond this more strategic-level and structural transport indication shown in the attached updated Structure Plan, any more detailed or specific accessway, driveway or vehicle access development is considered premature and of limited relevance to the overall consideration of the transportation implications of the Private Plan Change. Due to the nature of the current landholdings within the Plan Change area there could be any number of arrangements of future development potentially including a single comprehensive operational development requiring only a single point of entry, or alternatively several development parcels potentially subdivided from the current land-holdings or amalgamating current parcels. On this basis, any more detailed or fine-grained indication of access provision would be theoretical at best.

The indication of a connection to the land to the west of Campana Road reflects the potential for Campana Road to cater for such movements, and the potential (at least in concept) for this to extend further west to connect with Orr's Road. However, existing topographical challenges in this area indicate that a roading connection in this area would not be readily or easily provided.

Response to the third RFI bullet point (relating to the Public Walkway Opportunity) is responded to by the Applicant's planning consultant.

I would be happy to discuss or expand on any of the details of the above as required. Please don't hesitate to contact via the below.

Yours sincerely



Don McKenzie | **Director**
Don McKenzie Consulting Ltd

E: don@dmconsulting.co.nz

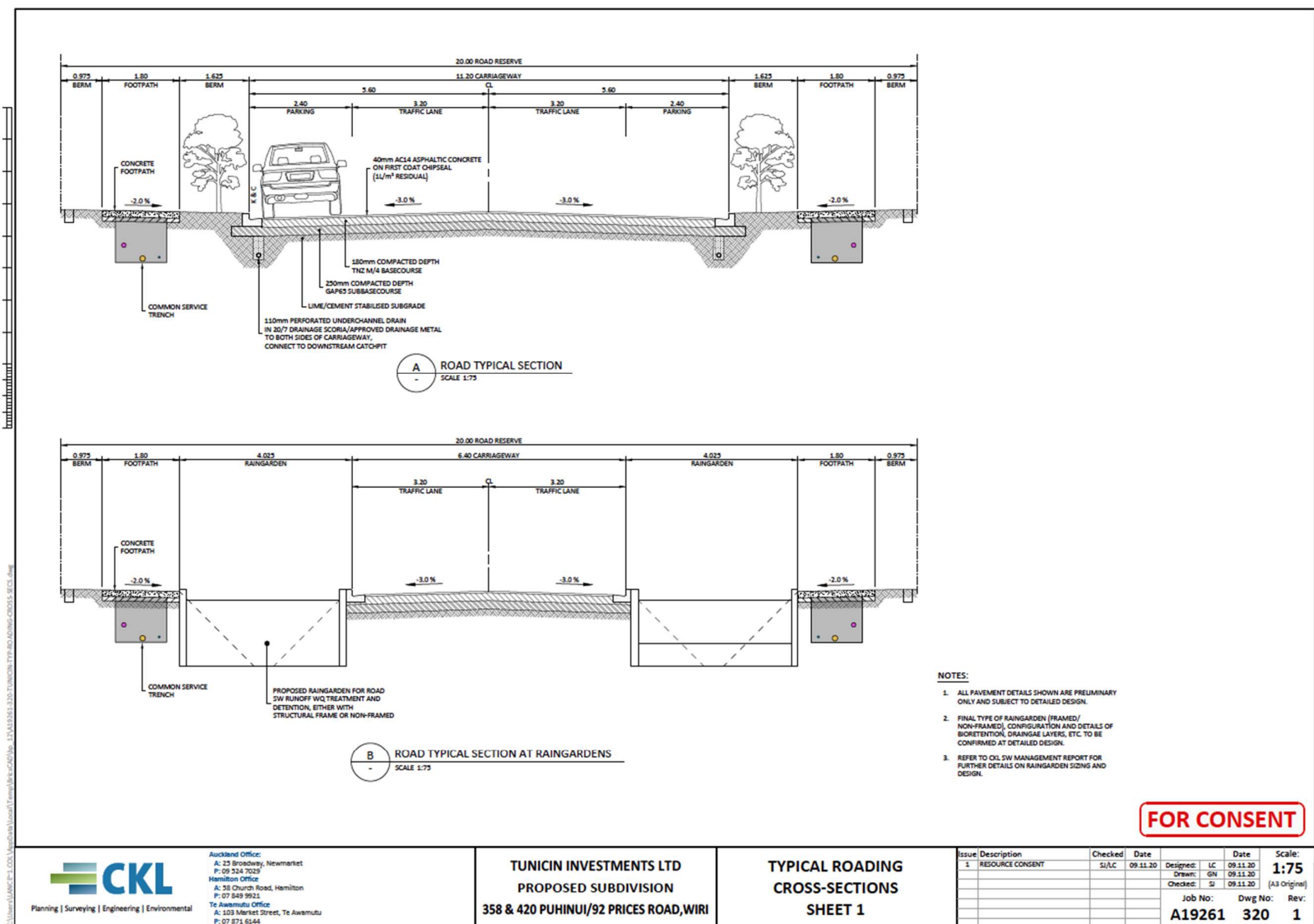
W: www.dmconsulting.co.nz

M: 021 656 191

Attachment A – Indicative Cross-Section

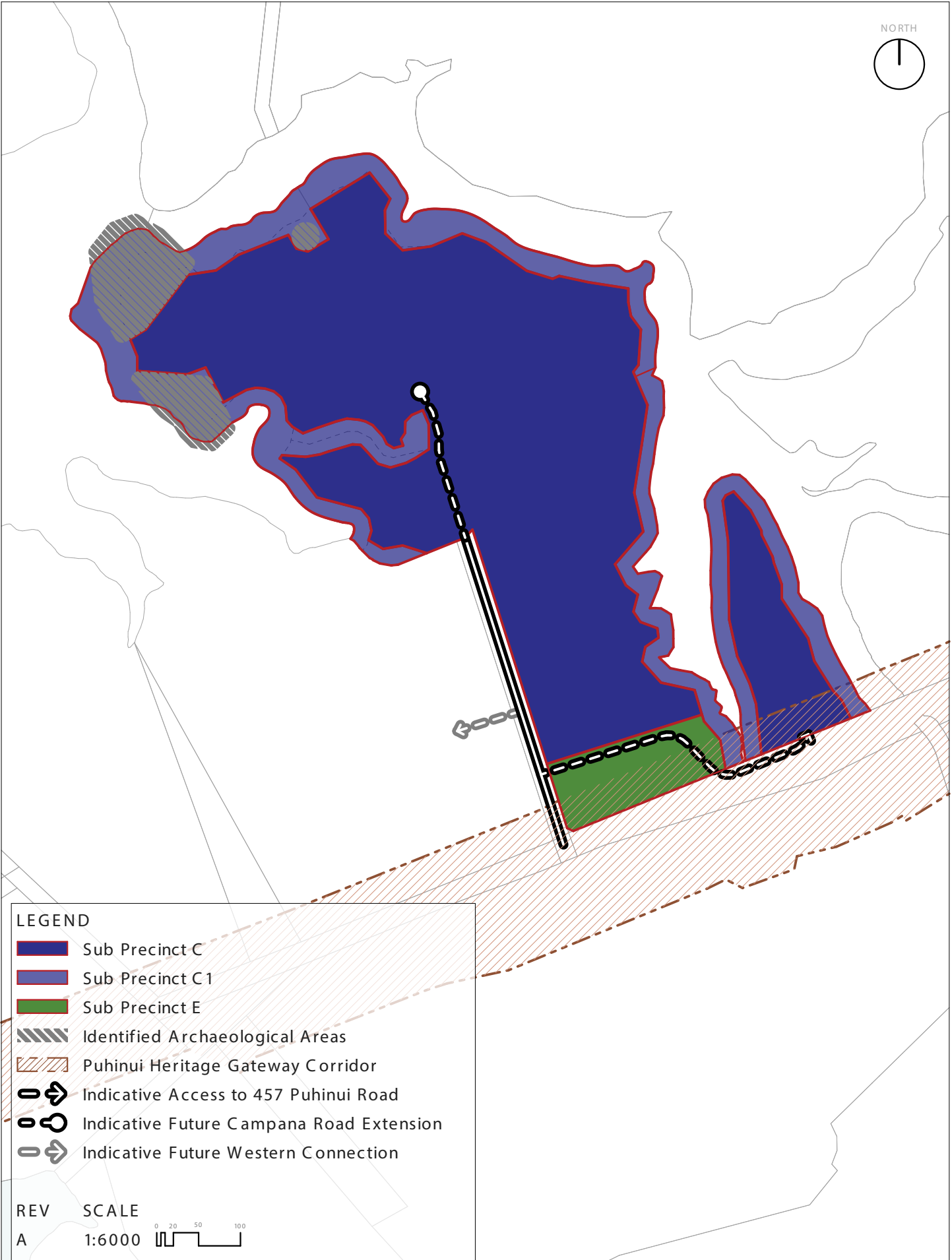
Attachment B – Campana Road Structure Plan (Rev. A)

ATTACHMENT A – Indicative Cross-Section (Campana Road)



ATTACHMENT B – Campana Road Structure Plan (Rev. A)

Campana Road Structure Plan



19 November 2024

Campana Landowners Consortium
c/o Capstone Projects Ltd
349b Manukau Road
Epsom
Auckland

Attention: Tom Anderson
Issued via email: tom@capstoneprojects.co.nz

Dear Tom

**Proposed Private Plan Change – Campana Road
Additional Clause 23 Request for Further Information Response (Transport)**

Following our recent instruction, Don McKenzie Consulting Ltd is pleased to provide the following responses to the Council's Additional Request for Further Information dated 11 October 2024 ("**Council's Second RFI**"). The responses below build on the previous discussions with Council's representatives, and the previous Clause 23 RFI response (transport) prepared by Don McKenzie Consulting on behalf of the Campana Landowners Consortium dated 12 September 2024 ("**Original RFI (Transport) Response**").

It is understood that additional responses to some non-transportation matters raised in the Council's Second Clause 23 RFI are being provided by other members of the Applicant team and will be reported on separately.

1. Potential long-term transport outcomes resulting from Business – Light Industry Zoning

Request for Information

Further information is requested in relation to potential land-use scenarios associated with each of sub-precincts within the PPC area.

Response:

Following the response set out in the Original RFI (Transport) Response prepared in response to the Council's original RFI request, further consideration has been made with respect to theoretical, ultimate development with the Plan Change area across the Sub-precincts. With advice provided by the development team including planners and urban designers, the following future land-use scenario (land-use activities and areas) has been developed:

Component	Light Industrial (m ²)	Commercial (m ²)
Net Area	226,760	15,969
Roading/Access	5,000	4,000
Floor Areas		
Warehousing	77,600	-
Offices	11,000	-
Transport	11,000	-
At-Grade Storage	122,160	-
Retail / Service	-	4,000

As discussed in the Original RFI (Transport) Response, the details associated with development and refinement of a future, fully-developed, land-use scenario consistent with the zoning and provisions proposed by the Plan Change being sought or development of different scenarios are difficult. Accordingly, it is considered that the above scenario best represents the likely ceiling of a fully-developed, future transport effects associated with development of the Plan Change area.

2. Staging of development activities and consequent traffic generation potential

Request for Information

Having regard to the above, further information is requested in relation to traffic generation potential of land-use activities within the whole PPC area and consequent transport effects on the adjoining network.

Response:

Consistent with the general methodology presented in the Original RFI (Transport) Response the following assumptions have been made with regard to estimation of the traffic generation of the fully-developed, land-use scenario set out above:

- Floor areas set out in the above table;
- Warehousing/transport/storage at a trip generation rate of 0.5 vph per 100 sqm;
- Office activities at a peak period trip generation rate of 1vph per 100 sqm;
- Retail activity assessed at AM peak rate of 2.0 vph per 100 sqm and PM peak generation rate of 5.0 vph per 100 sqm;
- Some allowance of between 10% and 20% internal cross-visitation between activities within the site (e.g. between office, warehousing/storage and retail functions);
- An allowance for pass-by rates (typically 50% of retail and 10-15% of other uses) drawn from passing flows along Puhinui Road;
- Overall, the gross external traffic generation of the fully-developed Plan Change area could be between approximately 755 and 875 vph (IN+OUT) during AM and PM peaks, respectively. This is equivalent to between approximately 20.2 and 23.2 vph/hectare

which is broadly consistent with other similar developments around the Auckland region.

On the basis of the consideration of pass-by trip proportions, the net additional traffic generation of the Plan Change area under this fully-developed, land-use scenario would be between 661 vph (AM peak) and 757 vph (PM Peak).

These generated volumes have then been assessed (using the SIDRA Intersection assessment modelling software) alongside the background (existing) and Southern Gateway/SPCA volumes assessed and reported in the Original RFI (Transport) Response to identify (broadly) the general nature of future intersection performance that might be expected from the future fully-developed scenario. The assessment and SIDRA analysis has been undertaken at a broad level consistent with the nature of the current Plan Change phase of investigation and reflecting the current AUP controls applying to the Southern Gateway land on the southern side of Puhinui Road.

Scenarios were assessed (initially) using the existing intersection layout for Campana/Puhinui for:

- 2023 surveyed traffic volumes;
- 2023 volumes plus fully operational AIAL Park and Ride (“PnR”) facility plus Southern Gateway precinct volumes (at 1035 vph cap)
- Above, plus Campana Plan Change (fully developed).

The SIDRA assessment of the above scenarios demonstrates that:

- The existing intersection accommodates current volumes at an acceptance level of performance;
- With the addition of PnR and Southern Gateway (but excluding the Campana Plan Change) the intersection overall operates acceptably, however with some movements operating over-capacity. These critical movements are the left turn into the PnR access (from the east) and the right turn out of PnR (towards the east). The volumes (predicted by the Stantec assessment on behalf of AIAL associated with the PnR planning application), are associated with significant turning flows (of the order of 1,200 vph turning left in via a single lane in the AM peak, and 1,400 vph turning right out towards the east in the PM peak);
- As would be expected, adding the additional Campana Plan Change volumes set out above results in an unacceptable intersection performance with long queues and high delays – primarily in the PM peak when the Plan Change development leads to the greatest overall trip generation and greatest intensity of demand overlapping with the exit movements out of the PnR site.

In order to test the availability and suitability of future possible changes to the transport network to address this sub-optimal performance of the existing intersection layout to cater for all of the future demand placed on it, a number of improvement options have been identified and evaluated. The potential upgrades include:

- Option 1 – new additional left and right turn lanes on the Campana Road (north) approach to Puhinui Road;
- Option 2 – as above (Option 1) plus the right turn movement out of Campana Road (north) permitted from the through lane to create an effective double right turn movement;
- Option 3 – as above (Option 2) plus left turn lane changed from signal control to Give Way (i.e. free left turn);

- Option 4 – as above (Option 3) plus an extra through lane added to the Campana Road (south) approach out of PnR.

The SIDRA analysis undertaken has shown that Options 1, 2 and 3 all work to a broadly acceptable performance level during the AM peak period except for the left turn into Campana South (AIAL PnR). This results from the PnR's reliance on the current design of the access into the PnR facility on a single left turn lane (and its associated traffic-carrying capacity) into the PnR providing some 3000 – 4000 PnR spaces.

Options 1, 2 and 3 all show unacceptable performance during the PM peak associated with the from the Campana South (AIAL PnR) approach is over-capacity associated with the heavy right turn volume towards the Puhinui Interchange with the SH20. The additional of an extra approach lane (Option 4) on the AIAL PnR approach, achieves an acceptable outcome addressing the over-capacity performance issues identified in this future scenario (even if the Campana Plan Change is not included).

It is therefore concluded from the work undertaken that there is a practical intersection layout that can be achieved to accommodate the effects associated with the Campana Plan Change activity. However, there is clear evidence that the AIAL PnR and SCG forecasts result in significantly elevated trip generation demands and intensity of peak period movements being catered for by single turning lanes. In reality, those demands would be expected to disperse both spatially (for example via the McLaughlins Bridge link towards Roscommon Road with a greater proportion of PnR users approaching from the south) and temporally as the peak travel demands spread through the peak periods.

The Stantec report accompanying the AIAL PnR application discusses how the timing of staff, visitor, domestic and international related activities are offset, but they have conservatively added them contemporaneously (as has been followed with the assessment of the Campana Plan Change traffic effects). In this regard, the southern leg (PnR and SG) demands would only need to be marginally lower (i.e. more dispersed demand) to achieve an acceptable performance. A potential reduction of 200vph from the PnR demands during the PM peak period would result in a broadly acceptable outcome (with volumes less than the carrying-capacity of the right turn lane out of the PnR site).

As identified in the Original RFI (Transport) Response, the current legal road width of Campana Road at approximately 20m would be sufficient to allow for the widening to both a “collector” standard for the mid-block carriageway as well as providing additional width to accommodate the improvements identified above to provide for additional turning movement lanes.

In this regard, it is considered (from a transportation engineering point of view) that there is suitable resilience and flexibility within the current Plan Change landholdings and legal road width of Campana Road to respond to future fully-developed, land-use scenario within the Plan Change land.

3. Triggers for Transport Improvements and Mitigation Measures

Request for Information

Having regard to the further information referred to above further information is sought on appropriate transportation infrastructure provisions and appropriate mitigation measures for the PPC development, in addition to identifying appropriate trigger points for improvements, including responsibilities for funding and delivery

Response:

As previously identified in the Original RFI (Transport) Response, the likely advance of development within the Plan Change area through a series of future resource consents will provide the opportunity for staged response to future transport effects and associated mitigation measures. The specific assessment of land-use transport effects is considered to be most appropriately addressed when the land-use quantum and nature is known. As discussed in the previous section, the influence of the Southern Gateway land and the PnR operation is particularly relevant and the consequential mitigation or improvement projects for the Campana/Puhinui intersection cannot be specifically defined at this stage.

4. Operational and Safety Assessment of access to 457 Puhinui Road

Request for Information

Please provide a concept design for the combined intersection arrangement, including confirmation of layouts of road lanes, locations of traffic signals and vehicle tracking for critical manoeuvres.

Please address the service lane intersection should in the traffic modelling assessment discussed above. It is unclear whether this proposed access will have access restrictions or if it will provide access to Sub-Precinct E in the future.

Alternatively, please confirm whether the existing service lane is to be removed.

Response:

The details of this intersection once again will be largely dependent on the specific nature and scale of land-use development that emerges within the Plan Change area affecting the potential use of the Right of Way connecting to Campana Road. It will be of limited value in assessing the overall effects of the Plan Change (currently) to specify the detailed design matters set out above (e.g. number of lane and nature of intersection traffic control). These are most appropriately addressed at a consent level when those details are known – at this stage the consideration of “possible” designs and land-uses would be of limited value in assessing the Plan Change.

It can be confirmed from a transportation point of view that if the access road is established through the Plan Change area to the west of the waterway, the current service lane parallel with Puhinui Road would be removed. There is a transportation need for only one form of access to the 457 Puhinui Road property.

5. Campana Road Upgrade

Request for Information

Please provide further information in relation to the trigger for the indicative extension further north of Campana Road.

Response:

It is confirmed that the extension to Campana Road into both the Plan Change land at the northern end of Campana Road, as well as to the neighbouring land to the west, was intended to be indicative only. It is considered that at this stage of the Plan Change process further specific design detail is not considered necessary to properly ascertain the transportation effects of the Plan Change.

I would be happy to discuss or expand on any of the details of the above as required. Please do not hesitate to contact me via the below.

Yours sincerely

A handwritten signature in black ink, appearing to be 'Don McKenzie', with a stylized, cursive script.

Don McKenzie | **Director**
Don McKenzie Consulting Ltd

E: don@dmconsulting.co.nz

W: www.dmconsulting.co.nz

M: 021 656 191

21 February 2025

Campana Landowners Consortium
c/o Capstone Projects Ltd
349b Manukau Road
Epsom
Auckland

Attention: Tom Anderson
Issued via email: tom@capstoneprojects.co.nz

Dear Tom

**Proposed Private Plan Change – Campana Road
Clause 23 Request for Further Information Response (Transport)**

Following your recent instruction, Don McKenzie Consulting Ltd is pleased to provide the following additional responses to the Council's further information request received via email from Peter Reaburn (Council's consultant planner) dated 17 February 2025 ("Third RFI"). The responses below build on the previous discussions with Council's representatives, and the two previous Clause 23 RFI response (transport) prepared by Don McKenzie Consulting on behalf of the Campana Landowners Consortium dated 12 September 2024 and 19 November 2024 ("Original RFI Responses").

It is understood that responses to other non-transportation matters raised in the Council's Third RFI will be supplied by other members of the Applicant team and will be reported on separately.

Request for Information

“Layout plans to confirm the 4 potential upgrade options for the Campana Road / Puhinui Road intersection, discussed in the second Clause 23 Response, and any further appropriate improvement options to ensure that the combined intersection arrangement operates at an acceptable level of service.”

Response:

The below extract from the latest Google Earth and Auckland Council GeoMaps systems respectively show the updated intersection layout of the Puhinui / Campana / Park ‘n Ride junction, and the legal boundary details of the Campana Road Nd Puhinui Road road reserve.



***Figure 1: Campana / Puhinui intersection
(Source: Auckland Council GeoMaps, image date 2019/2020)***

The above figure indicates that the legal road reserve within Campana Road (north of Puhinui Road) is 20m and the current carriageway within the legal width represents approximately 40% (or some 6m out of the 20m reserve width). It is understood that the Airport’s PnR project and upgrading of the intersection to traffic signals (see below) has not altered the property or road reserve boundaries of Campana Road.



Figure 2: Upgraded Campana / Puhinui / Park n Ride
(Source: Google Earth, image date February 2022)

Figure 2 above indicates that the upgrading of the Campana intersection alongside the Airport's Park n Ride South (PnR) development has delivered the intersection upgrading including substantial widening on the southern side of Puhinui Road. From the latest references available, for example through the Airport to Botany Notice of Requirement (see Figure 3 below), it is understood that NZTA will ultimately incorporate the widened intersection within the legal boundaries (and State Highway designation) applying to Puhinui Road.

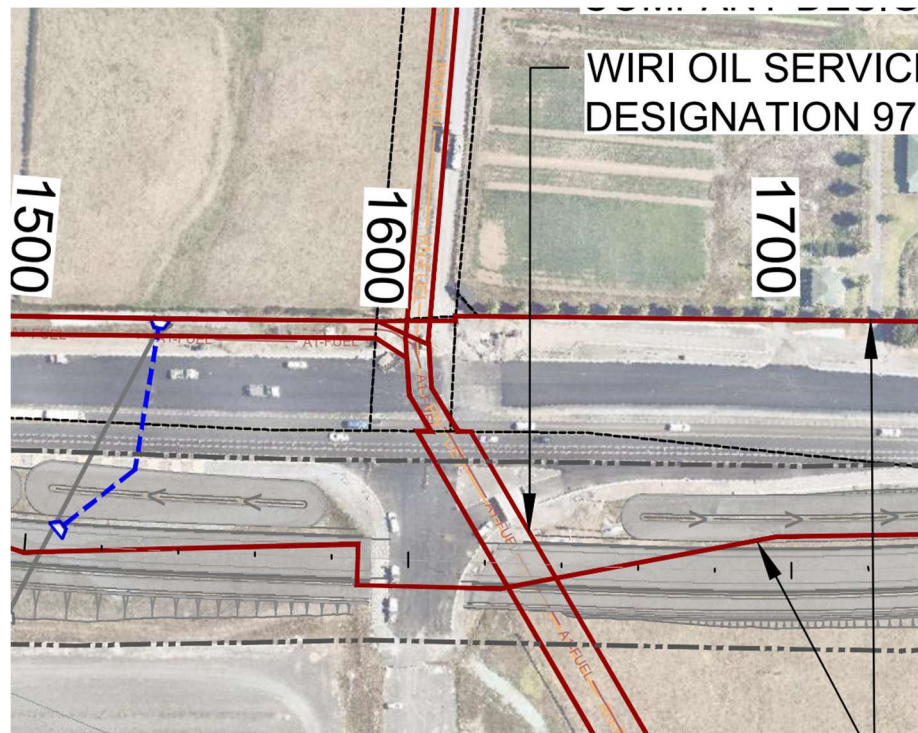


Figure 3: General Arrangements Plan – NOR 4B Airport to Botany
(Source: Application Material NoR 4(b) – Volume 1)

On the basis of the above references, it can be confirmed that there is sufficient legal width within the Campana Road corridor (up to 14m additional to current carriageway) to facilitate the addition of an extra through or turning lane (or both) should this be required at a later stage of development of the Plan Change land and activities.

Request for Information

Expanded traffic modelling to additionally incorporate a new access intersection serving 457 Puhinui Road, based on an appropriate ‘test’ scenario for industrial / commercial development on the site of 457 Puhinui Road.

Response:

The area contained within the property at 467 Puhinui Road¹ was included within both the initial calculation of potential traffic generation contained within the Don McKenzie Consulting Transport Assessment dated 15 February 2024 accompanying the Plan Change application, as well as the subsequent Clause 23 responses provided to Council.

The reference to the property “457 Puhinui Road” (as opposed to 467 Puhinui Road) in the Council’s Third RFI is considered to reflect what may have been a previous mislabelling of this property in previous documentation. There is no property at 457 Puhinui Road.

All assessments reported to date have included this property and its traffic generation effects within the assessment of the Puhinui/Campana intersection. The consideration of generated traffic movements from this property as it connects to Campana Road itself is not considered to require specific assessment as the generated peak hour movements to and from Precinct C are expected to be modest compared to the generated movements to and from Precincts A-B.

¹ Allotment 190 of Parish of Manurewa

Request for Information

Please also provide summaries of traffic modelling results to confirm intersection capacities / Levels of Service, etc.

Response:

The SIDRA traffic modelling results are attached for the existing layout and the four possible improvement options discussed in the Second RFI response (19 November 2024).

I would be happy to discuss or expand on any of the details of the above as required. Please do not hesitate to contact me via the below.

Yours sincerely

A handwritten signature in black ink, appearing to be 'Don McKenzie', with a stylized, cursive script.

Don McKenzie | **Director**
Don McKenzie Consulting Ltd

E: don@dmconsulting.co.nz

W: www.dmconsulting.co.nz

M: 021 656 191

SITE LAYOUT

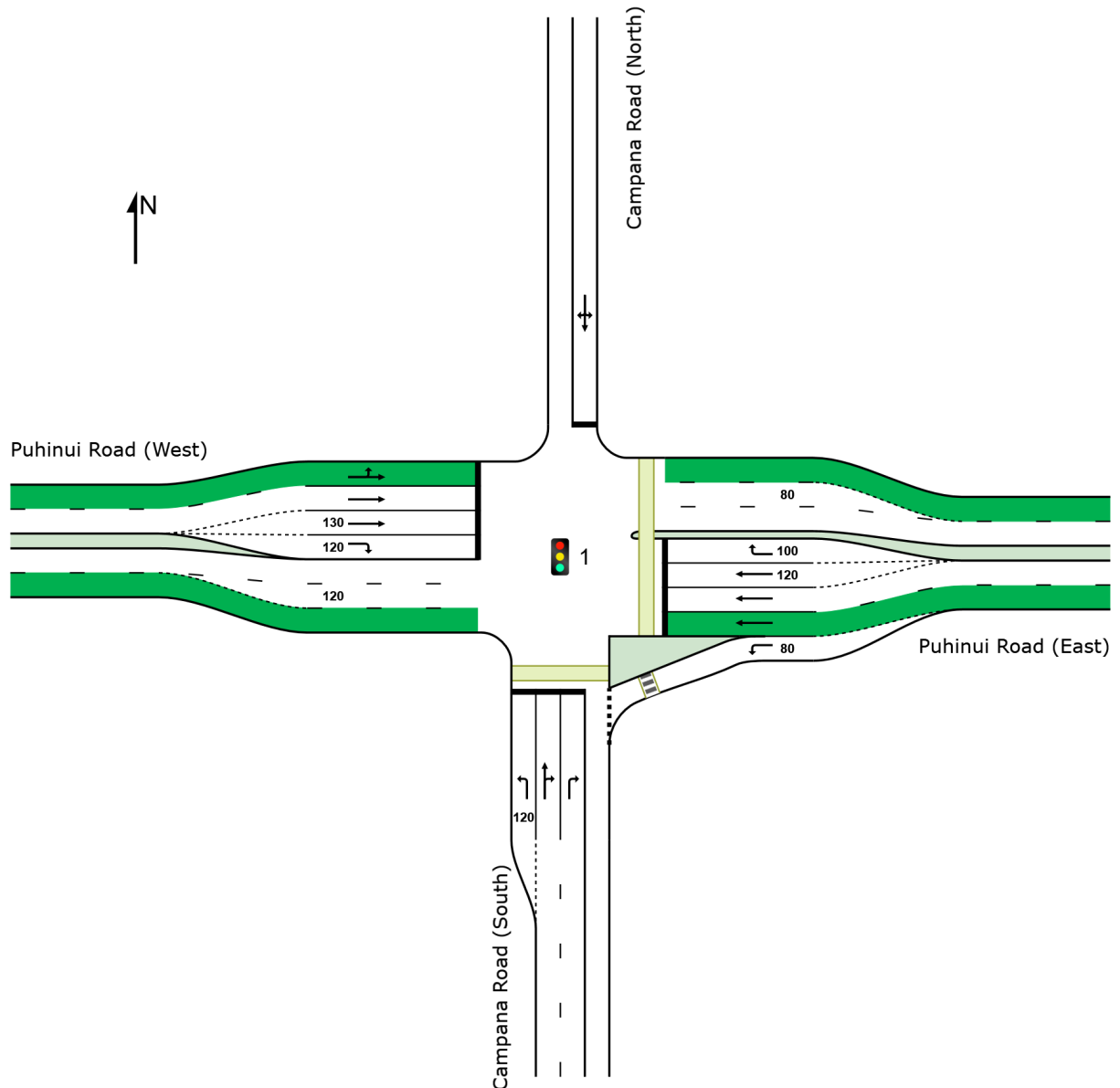
 Site: 1 [Puhinui Campana AM 2023 + P&R + SCG + PC w ex intersection (Site Folder: General)]

NA

Site Category: (None)

Signals - EQUISAT (Fixed-Time/SCATS) Isolated

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



SIDRA INTERSECTION 9.1 | Copyright © 2000-2024 Akcelik and Associates Pty Ltd | sidrasolutions.com

Organisation: AJW | Licence: NETWORK / 1PC | Created: Friday, 8 November 2024 11:27:24 am

Project: C:\Users\anna\OneDrive\AW Consulting\Projects\119 Campana Road DMC\2024\November 2024\SH20 Campana Rd_Plan Change Scenarios.sip9

MOVEMENT SUMMARY

 **Site: 1 [Puhinui Campana AM 2023 + P&R + SCG + PC w ex intersection (Site Folder: General)]**

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

NA

Site Category: (None)

Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 80 seconds (Site Optimum Cycle Time - Minimum Delay)

Variable Sequence Analysis applied. The results are given for the selected output sequence.

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	Aver. Back Of Queue		Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed
			[Total HV]		[Total HV]					Aver. Veh.	Back Of Dist				
			veh/h	%	veh/h	%	v/c	sec		veh	m				km/h
South: Campana Road (South)															
1	L2	All MCs	40	55.0	40	55.0	0.077	21.7	LOS C	0.6	6.3	0.66	0.68	0.66	39.8
2	T1	All MCs	75	9.3	75	9.3	* 0.872	43.0	LOS D	8.1	59.3	1.00	1.04	1.28	32.7
3	R2	All MCs	518	3.7	518	3.7	0.872	47.7	LOS D	8.1	59.3	1.00	1.03	1.28	40.4
Approach			633	7.6	633	7.6	0.872	45.5	LOS D	8.1	59.3	0.98	1.01	1.24	39.5
East: Puhinui Road (East)															
4	L2	All MCs	1397	10.0	1397	10.0	1.024	54.2	LOS D	38.8	295.3	1.00	1.13	1.42	39.5
5	T1	All MCs	858	12.9	858	12.9	* 0.873	39.6	LOS D	10.1	78.9	0.98	0.95	1.20	53.0
6	R2	All MCs	233	10.3	233	10.3	0.673	26.4	LOS C	4.0	30.2	0.97	0.84	1.03	44.0
Approach			2488	11.1	2488	11.1	1.024	46.6	LOS D	38.8	295.3	0.99	1.04	1.31	43.1
North: Campana Road (North)															
7	L2	All MCs	138	9.4	138	9.4	* 0.809	20.9	LOS C	6.2	47.2	1.00	0.97	1.19	39.8
8	T1	All MCs	53	11.3	53	11.3	* 0.809	51.1	LOS D	6.2	47.2	1.00	0.97	1.19	37.0
9	R2	All MCs	90	11.1	90	11.1	0.809	56.8	LOS E	6.2	47.2	1.00	0.97	1.19	35.9
Approach			281	10.3	281	10.3	0.809	38.1	LOS D	6.2	47.2	1.00	0.97	1.19	38.2
West: Puhinui Road (West)															
10	L2	All MCs	130	10.0	130	10.0	0.412	22.2	LOS C	2.3	18.0	0.90	0.78	0.90	41.7
11	T1	All MCs	114	60.5	114	60.5	0.412	42.2	LOS D	2.3	18.0	0.97	0.75	0.97	54.0
12	R2	All MCs	132	30.3	132	30.3	0.691	48.8	LOS D	3.3	29.3	1.00	0.84	1.13	35.1
Approach			376	32.4	376	32.4	0.691	37.6	LOS D	3.3	29.3	0.96	0.79	1.00	42.7
All Vehicles			3778	12.5	3778	12.5	1.024	44.9	LOS D	38.8	295.3	0.99	1.00	1.26	42.0

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).

Vehicle movement LOS values are based on average delay per movement.

Intersection and Approach LOS values are based on average delay for all vehicle movements.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Green.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

* Critical Movement (Signal Timing)

Pedestrian Movement Performance												
Mov ID	Crossing	Input Vol.	Dem. Flow	Aver. Delay	Level of Service	AVERAGE BACK OF QUEUE		Prop. Que	Eff. Stop Rate	Travel Time	Travel Dist.	Aver. Speed
		ped/h	ped/h	sec		[Ped ped]	[Dist] m			sec	m	m/sec
South: Campana Road (South)												
P1	Full	15	8	31.5	LOS D	0.0	0.0	0.89	0.89	46.9	20.0	0.43

East: Puhinui Road (East)												
P2	Full	15	8	34.2	LOS D	0.0	0.0	0.93	0.93	49.6	20.0	0.40
All		30	16	32.9	LOS D	0.0	0.0	0.91	0.91	48.3	20.0	0.41
Pedestrians												

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

PHASING SUMMARY

 **Site: 1 [Puhinui Campana AM 2023 + P&R + SCG + PC w ex intersection (Site Folder: General)]**

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

NA

Site Category: (None)

Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 80 seconds (Site Optimum Cycle Time - Minimum Delay)

Variable Sequence Analysis applied. The results are given for the selected output sequence.

Timings based on settings in the Site Phasing & Timing dialog

Phase Times determined by the program

Green Split Priority has been specified

Phase Sequence: Leading Right Turn

Input Phase Sequence: A, A1*, A2*, B, C, D

Output Phase Sequence: A, A2*, B, C, D

Reference Phase: Phase A

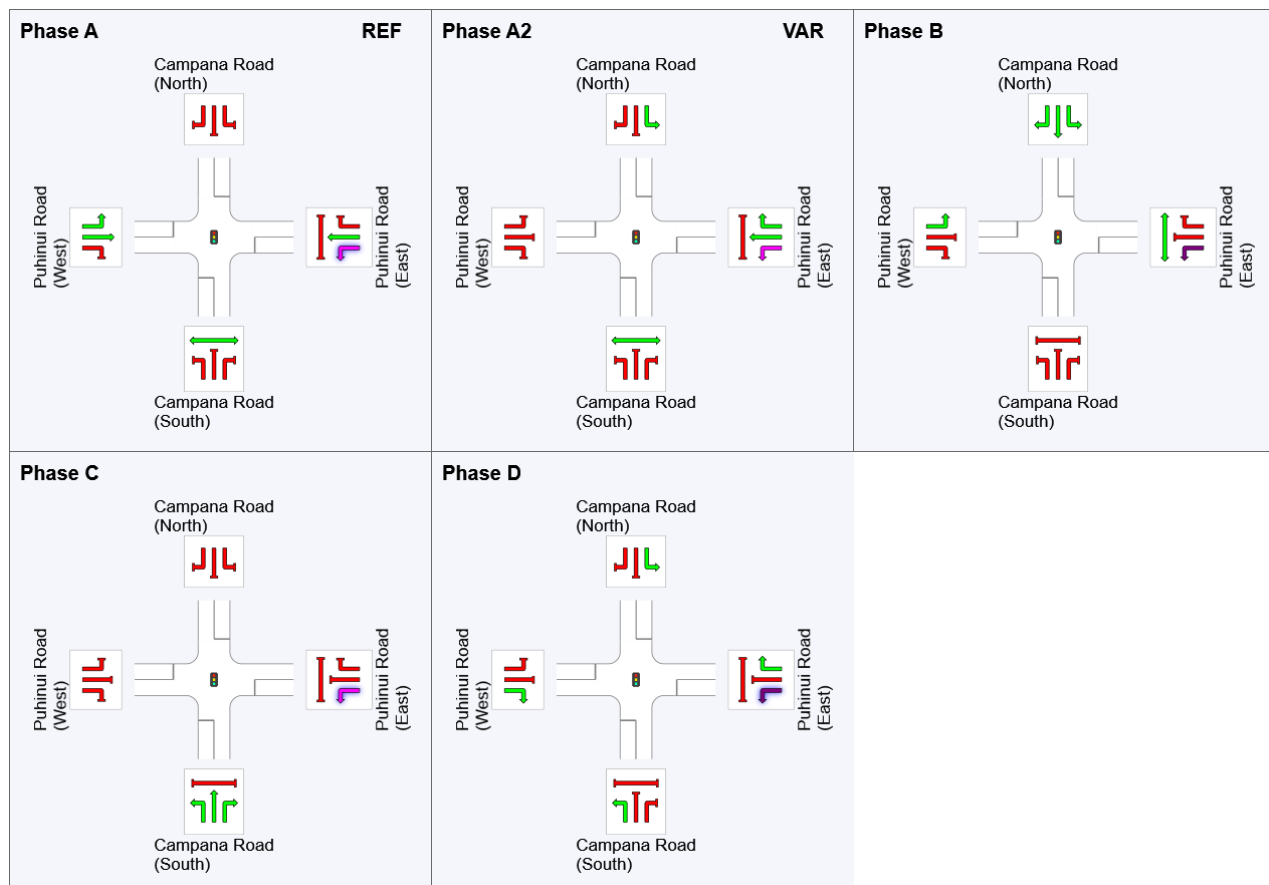
(* Variable Phase)

Phase Timing Summary










Phase	A	A2	B	C	D
Phase Change Time (sec)	0	13	25	43	64
Green Time (sec)	7	6	12	15	10
Phase Time (sec)	13	12	18	21	16
Phase Split	16%	15%	23%	26%	20%
Phase Frequency (%)	100.0	100.0	100.0	100.0	100.0

See the Timing Analysis report for more detailed information including input values of Yellow Time and All-Red Time, and information on any adjustments to Intergreen Time, Phase Time and Green Time values in cases of Pedestrian Actuation, Minor Phase Actuation and Phase Frequency values (user-specified or implied) less than 100%.


Output Phase Sequence



REF: Reference Phase
VAR: Variable Phase

	Normal Movement		Permitted/Opposed
	Slip/Bypass-Lane Movement		Opposed Slip/Bypass-Lane
	Stopped Movement		Turn On Red
	Other Movement Class (MC) Running		Undetected Movement
	Mixed Running & Stopped MCs		Continuous Movement
	Other Movement Class (MC) Stopped		Phase Transition Applied

SITE LAYOUT

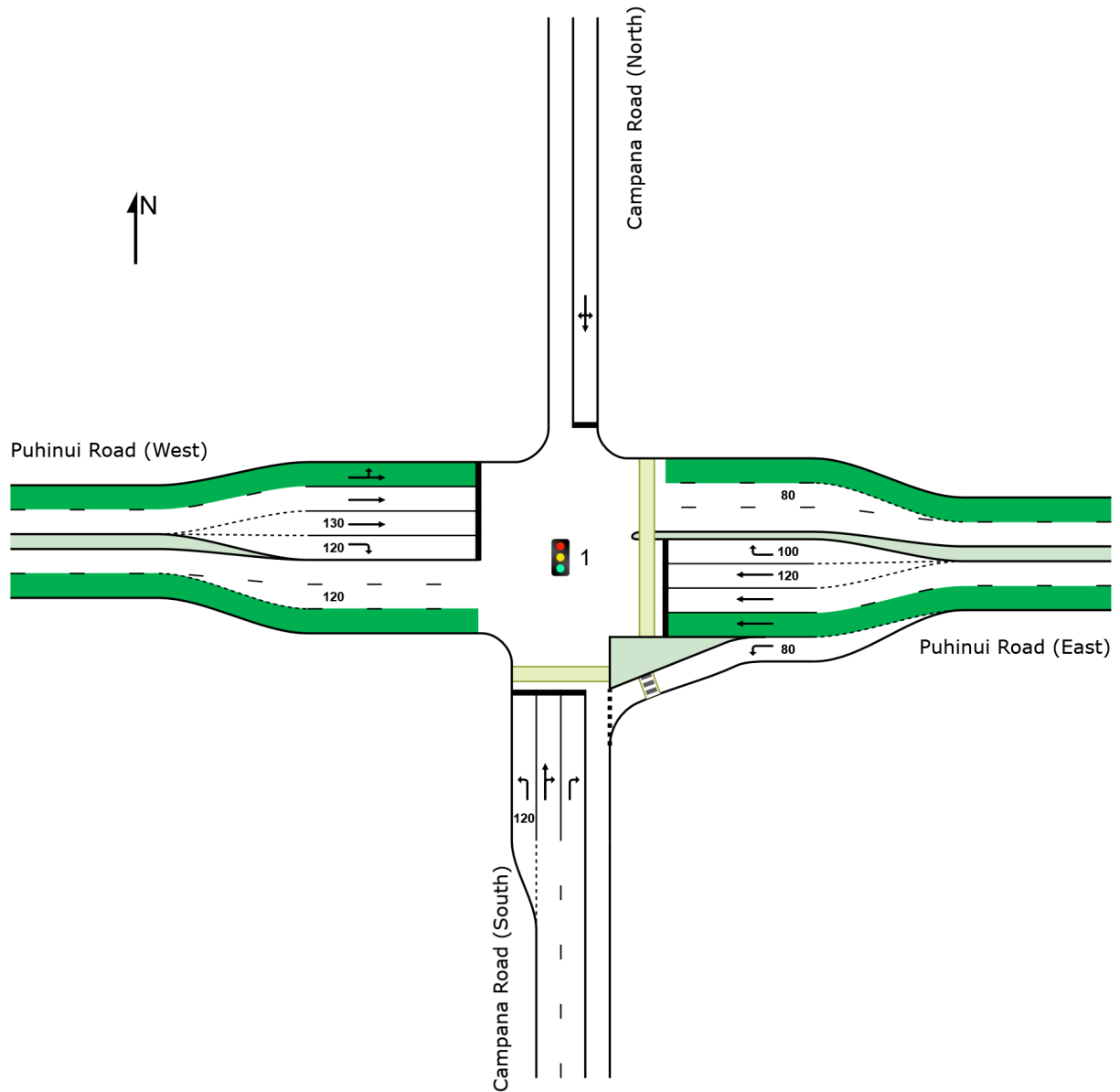
 **Site: 1 [Puhinui Campana PM 2023 + P&R + SCG + PC w ex intersection (Site Folder: General)]**

NA

Site Category: (None)

Signals - EQUISAT (Fixed-Time/SCATS) Isolated

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Organisation: AJW | Licence: NETWORK / 1PC | Created: Friday, 8 November 2024 11:33:16 am

Project: C:\Users\anna\OneDrive\AW Consulting\Projects\119 Campana Road DMC\2024\November 2024\SH20 Campana Rd_Plan Change Scenarios.sip9

MOVEMENT SUMMARY

 **Site: 1 [Puhinui Campana PM 2023 + P&R + SCG + PC w ex intersection (Site Folder: General)]**

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

NA

Site Category: (None)

Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 130 seconds (Site Optimum Cycle Time - Minimum Delay)

Variable Sequence Analysis applied. The results are given for the selected output sequence.

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	Aver. Back Of Queue		Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed
			[Total HV]		[Total HV]					Aver. [Veh. veh]	Back Of Queue [Dist] m				km/h
			veh/h	%	veh/h	%	v/c	sec							
South: Campana Road (South)															
1	L2	All MCs	159	21.4	159	21.4	0.186	34.8	LOS C	2.1	17.2	0.55	0.69	0.55	46.1
2	T1	All MCs	62	9.7	62	9.7	* 1.280	202.2	LOS F	47.9	360.8	1.00	1.45	1.84	14.6
3	R2	All MCs	1545	8.7	1545	8.7	1.280	196.5	LOS F	50.6	380.6	1.00	1.44	1.84	18.6
Approach			1766	9.9	1766	9.9	1.280	182.2	LOS F	50.6	380.6	0.96	1.37	1.72	18.5
East: Puhinui Road (East)															
4	L2	All MCs	611	2.9	611	2.9	0.409	9.9	LOS A	3.9	27.8	0.25	0.71	0.25	62.4
5	T1	All MCs	242	16.9	242	16.9	0.829	72.4	LOS E	4.3	34.3	1.00	0.86	1.19	39.2
6	R2	All MCs	154	9.7	154	9.7	* 1.281	208.2	LOS F	9.5	71.9	1.00	1.22	1.94	16.6
Approach			1007	7.3	1007	7.3	1.281	55.2	LOS E	9.5	71.9	0.54	0.82	0.73	39.9
North: Campana Road (North)															
7	L2	All MCs	254	9.4	254	9.4	1.203	124.3	LOS F	26.9	203.5	1.00	1.27	1.73	19.3
8	T1	All MCs	85	9.4	85	9.4	* 1.203	135.8	LOS F	26.9	203.5	1.00	1.27	1.73	16.0
9	R2	All MCs	144	9.7	144	9.7	1.203	141.5	LOS F	26.9	203.5	1.00	1.27	1.73	15.8
Approach			483	9.5	483	9.5	1.203	131.5	LOS F	26.9	203.5	1.00	1.27	1.73	17.7
West: Puhinui Road (West)															
10	L2	All MCs	114	9.6	114	9.6	0.664	41.3	LOS D	7.9	58.9	0.98	0.83	0.99	30.4
11	T1	All MCs	708	11.4	708	11.4	* 1.042	99.1	LOS F	15.4	119.1	1.00	1.06	1.39	32.7
12	R2	All MCs	39	59.0	39	59.0	0.259	52.1	LOS D	1.2	12.8	0.95	0.74	0.95	34.2
Approach			861	13.4	861	13.4	1.042	89.3	LOS F	15.4	119.1	0.99	1.01	1.31	32.5
All Vehicles			4117	10.0	4117	10.0	1.281	125.7	LOS F	50.6	380.6	0.87	1.15	1.40	23.7

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).

Vehicle movement LOS values are based on average delay per movement.

Intersection and Approach LOS values are based on average delay for all vehicle movements.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Green.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.


* Critical Movement (Signal Timing)

Pedestrian Movement Performance												
Mov ID	Crossing	Input Vol.	Dem. Flow	Aver. Delay	Level of Service	AVERAGE BACK OF QUEUE		Prop. Que	Eff. Stop Rate	Travel Time	Travel Dist.	Aver. Speed
		ped/h	ped/h	sec		[Ped ped	Dist] m			sec	m	m/sec
South: Campana Road (South)												
P1	Full	15	8	59.2	LOS E	0.0	0.0	0.95	0.95	74.5	20.0	0.27

East: Puhinui Road (East)												
P2	Full	15	8	56.3	LOS E	0.0	0.0	0.93	0.93	71.7	20.0	0.28
All		30	16	57.7	LOS E	0.0	0.0	0.94	0.94	73.1	20.0	0.27
Pedestrians												

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

PHASING SUMMARY

 **Site: 1 [Puhinui Campana PM 2023 + P&R + SCG + PC w ex intersection (Site Folder: General)]**

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

NA

Site Category: (None)

Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 130 seconds (Site Optimum Cycle Time - Minimum Delay)

Variable Sequence Analysis applied. The results are given for the selected output sequence.

Timings based on settings in the Site Phasing & Timing dialog

Phase Times determined by the program

Green Split Priority has been specified

Phase Sequence: Leading Right Turn

Input Phase Sequence: A, A1*, A2*, B, C, D

Output Phase Sequence: A, A1*, B, C, D

Reference Phase: Phase A

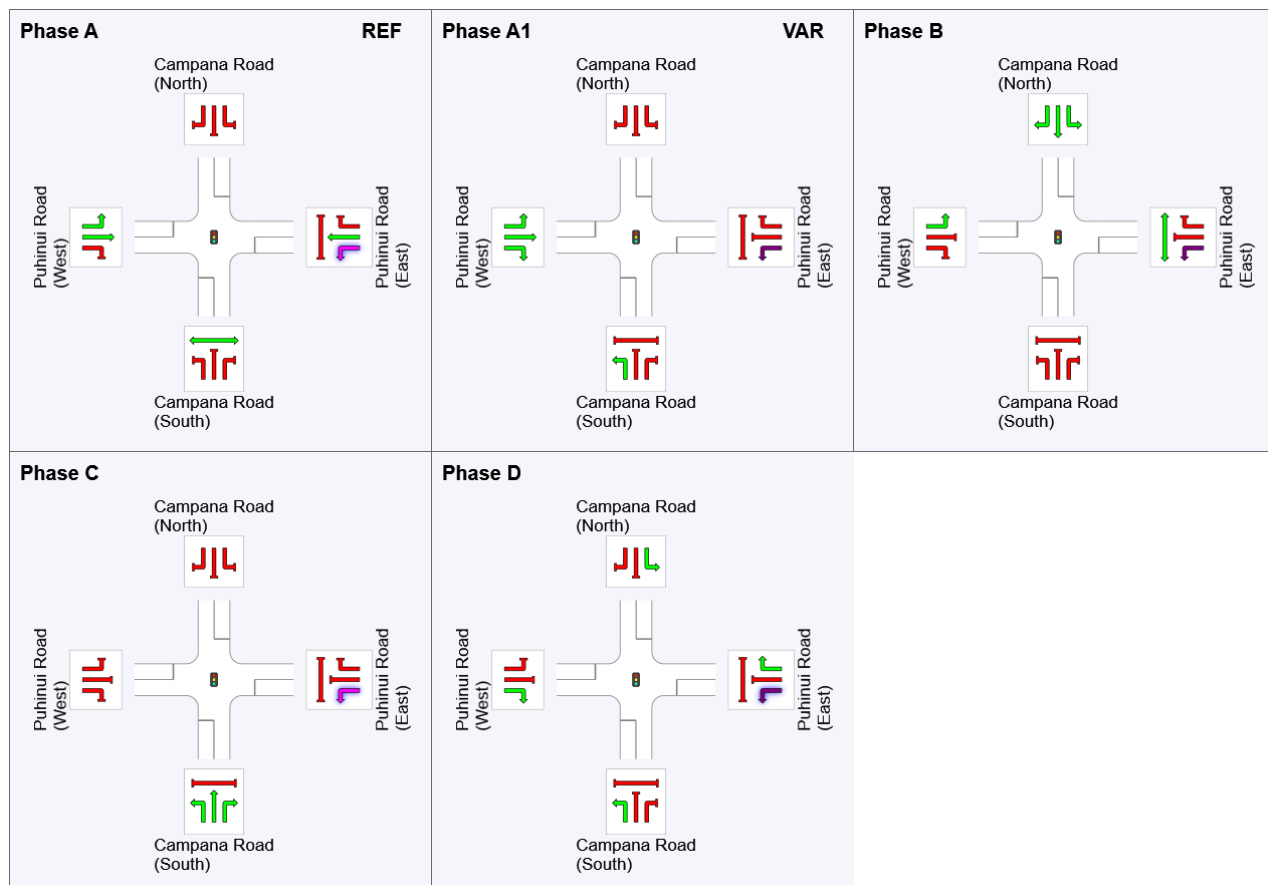
(* Variable Phase)

Phase Timing Summary












Phase	A	A1	B	C	D
Phase Change Time (sec)	0	15	27	61	115
Green Time (sec)	9	6	28	48	9
Phase Time (sec)	15	12	34	54	15
Phase Split	12%	9%	26%	42%	12%
Phase Frequency (%)	100.0	100.0	100.0	100.0	100.0

See the Timing Analysis report for more detailed information including input values of Yellow Time and All-Red Time, and information on any adjustments to Intergreen Time, Phase Time and Green Time values in cases of Pedestrian Actuation, Minor Phase Actuation and Phase Frequency values (user-specified or implied) less than 100%.

Output Phase Sequence



REF: Reference Phase
VAR: Variable Phase

	Normal Movement		Permitted/Opposed
	Slip/Bypass-Lane Movement		Opposed Slip/Bypass-Lane
	Stopped Movement		Turn On Red
	Other Movement Class (MC) Running		Undetected Movement
	Mixed Running & Stopped MCs		Continuous Movement
	Other Movement Class (MC) Stopped		Phase Transition Applied

SITE LAYOUT

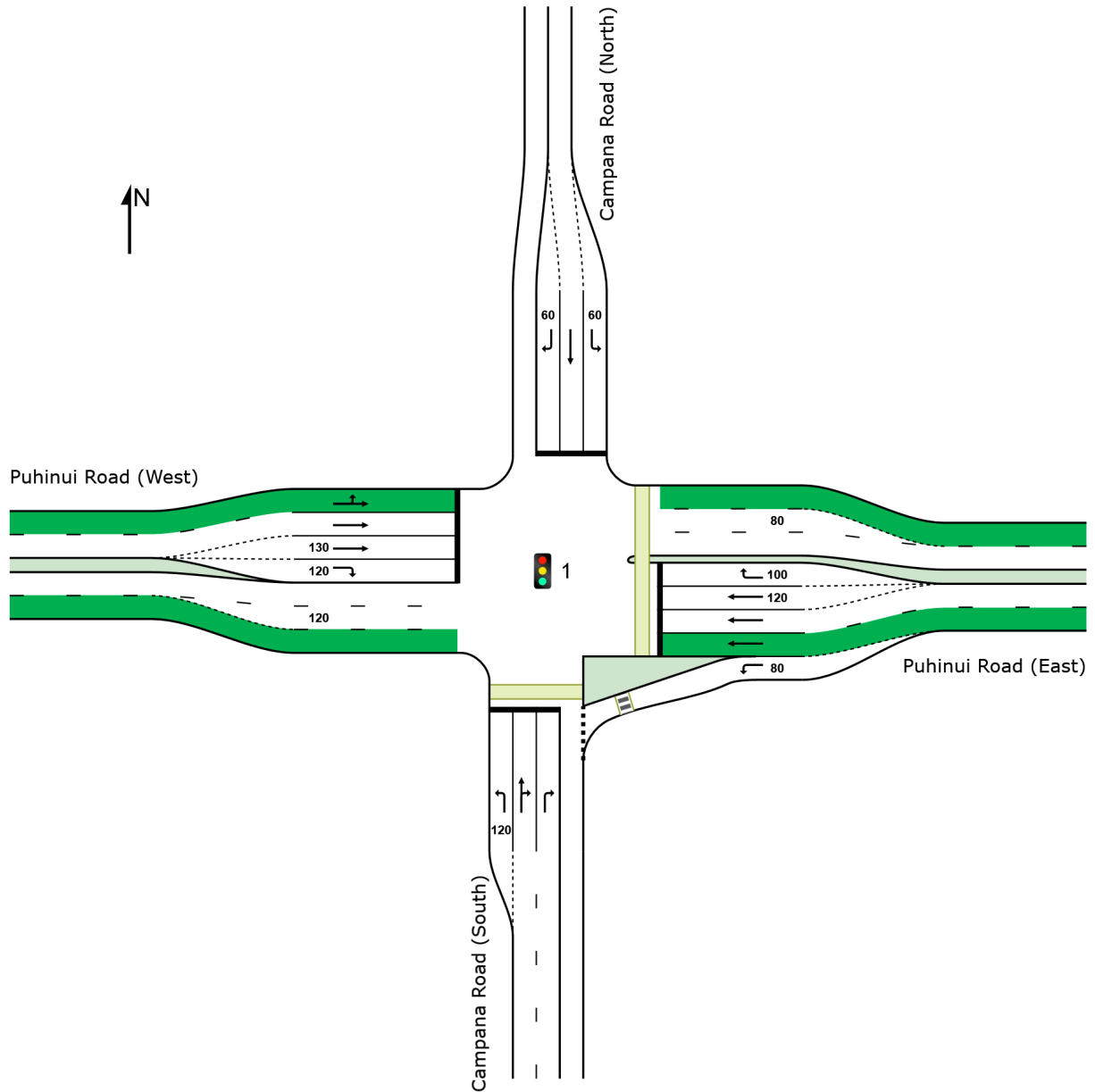
 Site: 1 [Puhinui Campana AM 2023 + P&R + SCG + PC Opt 1
(Site Folder: General)]

NA

Site Category: (None)

Signals - EQUISAT (Fixed-Time/SCATS) Isolated

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Project: C:\Users\anna\OneDrive\AW Consulting\Projects\119 Campana Road DMC\2024\November 2024\SH20 Campana Rd_Plan Change Scenarios.sip9

MOVEMENT SUMMARY

 Site: 1 [Puhinui Campana AM 2023 + P&R + SCG + PC Opt 1 (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

NA

Site Category: (None)

Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 80 seconds (Site Optimum Cycle Time - Minimum Delay)

Variable Sequence Analysis applied. The results are given for the selected output sequence.

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	Aver. Back Of Queue		Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed
			[Total HV]		[Total HV]					Aver. [Veh. veh]	Back Of Queue [Dist]				km/h
			veh/h	%	veh/h	%	v/c	sec			m				
South: Campana Road (South)															
1	L2	All MCs	40	55.0	40	55.0	0.075	21.0	LOS C	0.6	6.1	0.65	0.68	0.65	40.1
2	T1	All MCs	75	9.3	75	9.3	* 0.769	35.7	LOS D	7.3	53.4	1.00	0.92	1.13	35.0
3	R2	All MCs	518	3.7	518	3.7	0.769	40.4	LOS D	7.3	53.4	1.00	0.92	1.13	43.0
Approach			633	7.6	633	7.6	0.769	38.6	LOS D	7.3	53.4	0.98	0.90	1.10	42.0
East: Puhinui Road (East)															
4	L2	All MCs	1397	10.0	1397	10.0	1.063	69.5	LOS E	40.6	308.7	1.00	1.17	1.56	35.3
5	T1	All MCs	858	12.9	858	12.9	* 0.789	33.5	LOS C	9.1	71.1	0.97	0.88	1.08	56.9
6	R2	All MCs	233	10.3	233	10.3	* 0.718	27.2	LOS C	4.0	30.4	0.99	0.86	1.09	43.8
Approach			2488	11.1	2488	11.1	1.063	53.1	LOS D	40.6	308.7	0.99	1.04	1.35	40.5
North: Campana Road (North)															
7	L2	All MCs	138	9.4	138	9.4	0.211	15.5	LOS B	1.4	10.5	0.71	0.74	0.71	48.8
8	T1	All MCs	53	11.3	53	11.3	0.259	36.7	LOS D	1.2	9.4	0.95	0.71	0.95	37.6
9	R2	All MCs	90	11.1	90	11.1	* 0.465	43.7	LOS D	2.1	16.4	0.98	0.77	0.98	34.1
Approach			281	10.3	281	10.3	0.465	28.5	LOS C	2.1	16.4	0.84	0.74	0.84	41.8
West: Puhinui Road (West)															
10	L2	All MCs	130	10.0	130	10.0	0.347	21.9	LOS C	2.0	15.4	0.87	0.77	0.87	42.4
11	T1	All MCs	114	60.5	114	60.5	0.347	39.6	LOS D	2.0	15.4	0.96	0.74	0.96	55.3
12	R2	All MCs	132	30.3	132	30.3	0.768	51.6	LOS D	3.5	30.5	1.00	0.88	1.23	34.2
Approach			376	32.4	376	32.4	0.768	37.7	LOS D	3.5	30.5	0.94	0.80	1.02	42.7
All Vehicles			3778	12.5	3778	12.5	1.063	47.3	LOS D	40.6	308.7	0.97	0.97	1.24	41.0

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).

Vehicle movement LOS values are based on average delay per movement.

Intersection and Approach LOS values are based on average delay for all vehicle movements.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Green.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

* Critical Movement (Signal Timing)

Pedestrian Movement Performance												
Mov ID	Crossing	Input Vol.	Dem. Flow	Aver. Delay	Level of Service	AVERAGE BACK OF QUEUE		Prop. Que	Eff. Stop Rate	Travel Time	Travel Dist.	Aver. Speed
		ped/h	ped/h	sec		[Ped ped	Dist] m			sec	m	m/sec
South: Campana Road (South)												
P1	Full	15	8	29.8	LOS C	0.0	0.0	0.86	0.86	45.2	20.0	0.44

East: Puhinui Road (East)												
P2	Full	15	8	34.2	LOS D	0.0	0.0	0.93	0.93	49.6	20.0	0.40
All		30	16	32.0	LOS D	0.0	0.0	0.89	0.89	47.4	20.0	0.42
Pedestrians												

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

PHASING SUMMARY

 Site: 1 [Puhinui Campana AM 2023 + P&R + SCG + PC Opt 1
(Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

NA

Site Category: (None)

Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 80 seconds (Site Optimum Cycle Time - Minimum Delay)

Variable Sequence Analysis applied. The results are given for the selected output sequence.

Timings based on settings in the Site Phasing & Timing dialog

Phase Times determined by the program

Green Split Priority has been specified

Phase Sequence: Leading Right Turn

Input Phase Sequence: A, A1*, A2*, B, C, D

Output Phase Sequence: A, A2*, B, C, D

Reference Phase: Phase A

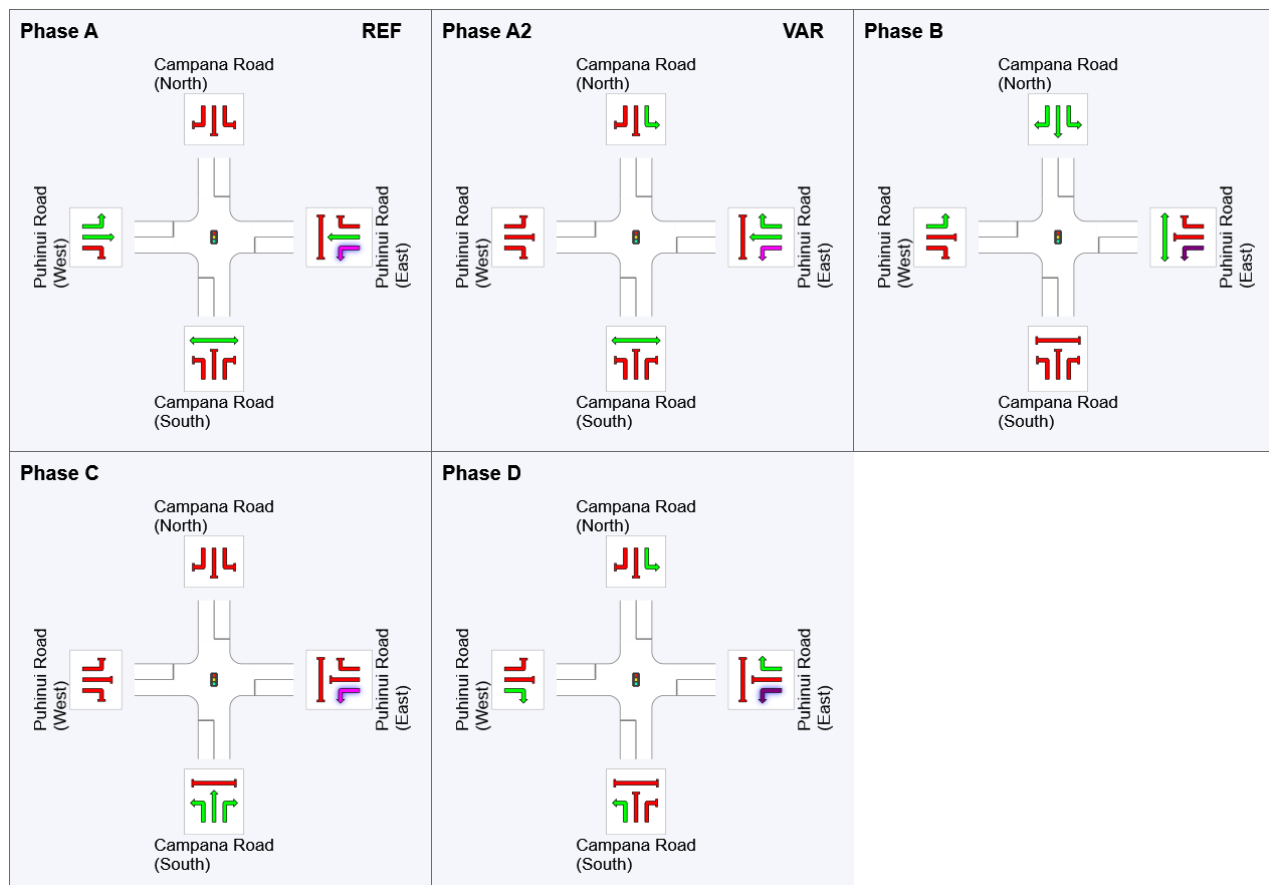
(* Variable Phase)

Phase Timing Summary













Phase	A	A2	B	C	D
Phase Change Time (sec)	0	15	27	42	65
Green Time (sec)	9	6	9	17	9
Phase Time (sec)	15	12	15	23	15
Phase Split	19%	15%	19%	29%	19%
Phase Frequency (%)	100.0	100.0	100.0	100.0	100.0

See the Timing Analysis report for more detailed information including input values of Yellow Time and All-Red Time, and information on any adjustments to Intergreen Time, Phase Time and Green Time values in cases of Pedestrian Actuation, Minor Phase Actuation and Phase Frequency values (user-specified or implied) less than 100%.

Output Phase Sequence



REF: Reference Phase
VAR: Variable Phase

	Normal Movement		Permitted/Opposed
	Slip/Bypass-Lane Movement		Opposed Slip/Bypass-Lane
	Stopped Movement		Turn On Red
	Other Movement Class (MC) Running		Undetected Movement
	Mixed Running & Stopped MCs		Continuous Movement
	Other Movement Class (MC) Stopped		Phase Transition Applied

MOVEMENT SUMMARY

 Site: 1 [Puhinui Campana PM 2023 + P&R + SCG + PC Opt 1 (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

NA

Site Category: (None)

Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 125 seconds (Site Optimum Cycle Time - Minimum Delay)

Variable Sequence Analysis applied. The results are given for the selected output sequence.

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	Aver. Back Of Queue		Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed
			[Total HV]		[Total HV]					Aver. Veh.	Back Of Dist				
			veh/h	%	veh/h	%	v/c	sec		veh	m				km/h
South: Campana Road (South)															
1	L2	All MCs	159	21.4	159	21.4	0.152	22.4	LOS C	1.2	10.2	0.41	0.65	0.41	49.0
2	T1	All MCs	62	9.7	62	9.7	* 1.026	88.2	LOS F	37.8	284.7	1.00	1.18	1.33	25.1
3	R2	All MCs	1545	8.7	1545	8.7	1.026	86.9	LOS F	40.4	303.8	1.00	1.18	1.32	31.4
Approach			1766	9.9	1766	9.9	1.026	81.1	LOS F	40.4	303.8	0.95	1.13	1.24	30.6
East: Puhinui Road (East)															
4	L2	All MCs	611	2.9	611	2.9	0.404	9.9	LOS A	3.8	27.5	0.26	0.71	0.26	62.3
5	T1	All MCs	242	16.9	242	16.9	0.797	68.4	LOS E	4.1	32.6	1.00	0.85	1.17	40.4
6	R2	All MCs	154	9.7	154	9.7	1.008	98.7	LOS F	7.4	55.9	1.00	1.06	1.48	26.7
Approach			1007	7.3	1007	7.3	1.008	37.6	LOS D	7.4	55.9	0.55	0.80	0.66	46.7
North: Campana Road (North)															
7	L2	All MCs	254	9.4	254	9.4	* 0.829	45.1	LOS D	7.2	54.1	1.00	0.91	1.14	37.6
8	T1	All MCs	85	9.4	85	9.4	0.526	61.3	LOS E	3.2	24.0	1.00	0.77	1.00	30.1
9	R2	All MCs	144	9.7	144	9.7	* 0.942	84.7	LOS F	6.4	48.4	1.00	1.00	1.37	24.7
Approach			483	9.5	483	9.5	0.942	59.7	LOS E	7.2	54.1	1.00	0.91	1.19	32.1
West: Puhinui Road (West)															
10	L2	All MCs	114	9.6	114	9.6	0.639	48.1	LOS D	7.5	56.0	0.98	0.83	0.98	31.2
11	T1	All MCs	708	11.4	708	11.4	* 1.002	85.2	LOS F	14.5	112.6	1.00	1.04	1.33	35.8
12	R2	All MCs	39	59.0	39	59.0	0.219	47.3	LOS D	1.1	11.7	0.93	0.74	0.93	35.8
Approach			861	13.4	861	13.4	1.002	78.6	LOS E	14.5	112.6	0.99	0.99	1.27	35.3
All Vehicles			4117	10.0	4117	10.0	1.026	67.4	LOS E	40.4	303.8	0.86	0.99	1.10	34.8

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).

Vehicle movement LOS values are based on average delay per movement.

Intersection and Approach LOS values are based on average delay for all vehicle movements.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Green.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

* Critical Movement (Signal Timing)

Pedestrian Movement Performance												
Mov ID	Crossing	Input Vol.	Dem. Flow	Aver. Delay	Level of Service	AVERAGE BACK OF QUEUE		Prop. Que	Eff. Stop Rate	Travel Time	Travel Dist.	Aver. Speed
		ped/h	ped/h	sec		[Ped ped	Dist] m			sec	m	m/sec
South: Campana Road (South)												
P1	Full	15	8	56.7	LOS E	0.0	0.0	0.95	0.95	72.0	20.0	0.28

East: Puhinui Road (East)												
P2	Full	15	8	56.7	LOS E	0.0	0.0	0.95	0.95	72.0	20.0	0.28
All		30	16	56.7	LOS E	0.0	0.0	0.95	0.95	72.0	20.0	0.28
Pedestrians												

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

PHASING SUMMARY

 Site: 1 [Puhinui Campana PM 2023 + P&R + SCG + PC Opt 1
(Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

NA

Site Category: (None)

Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 125 seconds (Site Optimum Cycle Time - Minimum Delay)

Variable Sequence Analysis applied. The results are given for the selected output sequence.

Timings based on settings in the Site Phasing & Timing dialog

Phase Times determined by the program

Green Split Priority has been specified

Phase Sequence: Leading Right Turn

Input Phase Sequence: A, A1*, A2*, B, C, D

Output Phase Sequence: A, A1*, B, C, D

Reference Phase: Phase A

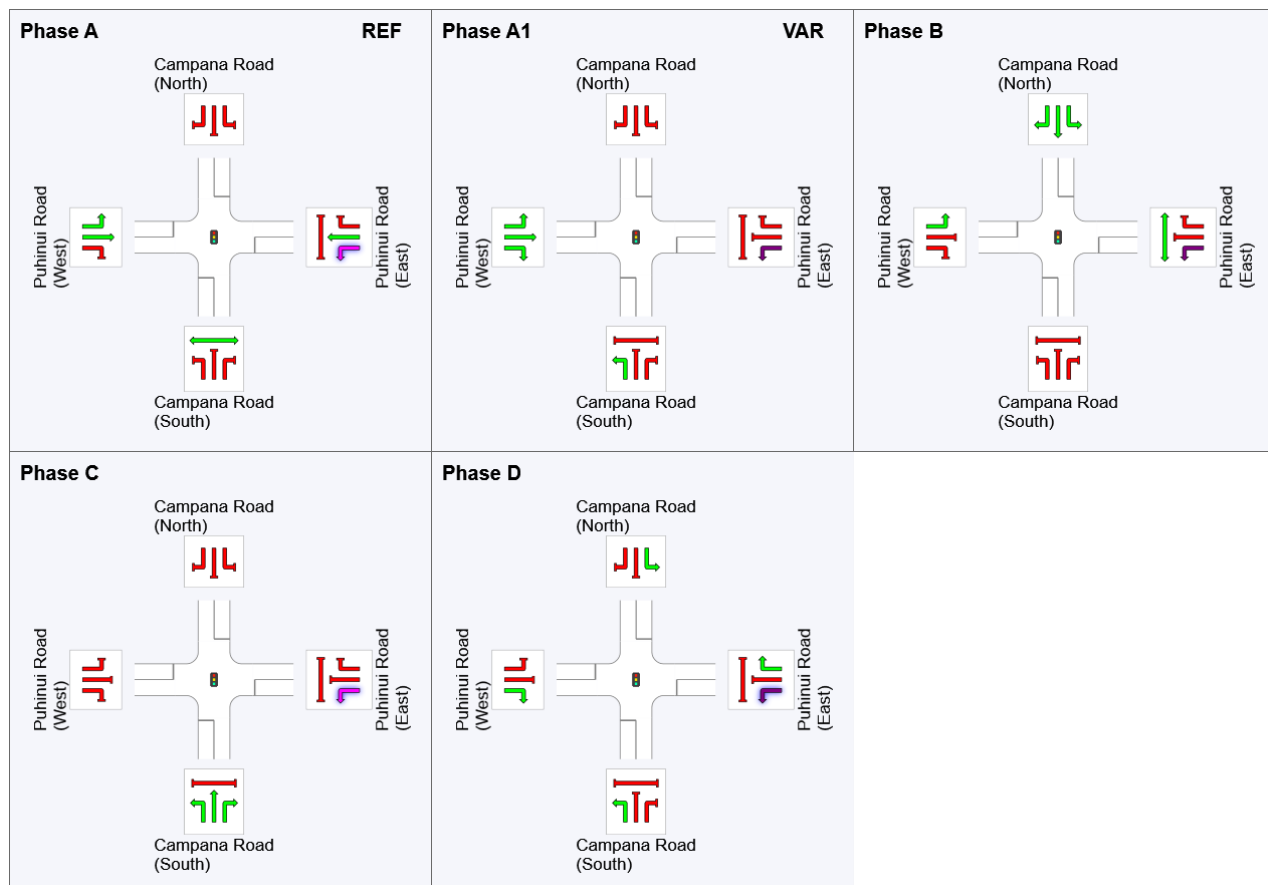
(* Variable Phase)

Phase Timing Summary











Phase	A	A1	B	C	D
Phase Change Time (sec)	0	15	27	44	108
Green Time (sec)	9	6	11	58	11
Phase Time (sec)	15	12	17	64	17
Phase Split	12%	10%	14%	51%	14%
Phase Frequency (%)	100.0	100.0	100.0	100.0	100.0

See the Timing Analysis report for more detailed information including input values of Yellow Time and All-Red Time, and information on any adjustments to Intergreen Time, Phase Time and Green Time values in cases of Pedestrian Actuation, Minor Phase Actuation and Phase Frequency values (user-specified or implied) less than 100%.


Output Phase Sequence



REF: Reference Phase
VAR: Variable Phase

	Normal Movement		Permitted/Opposed
	Slip/Bypass-Lane Movement		Opposed Slip/Bypass-Lane
	Stopped Movement		Turn On Red
	Other Movement Class (MC) Running		Undetected Movement
	Mixed Running & Stopped MCs		Continuous Movement
	Other Movement Class (MC) Stopped		Phase Transition Applied

SITE LAYOUT

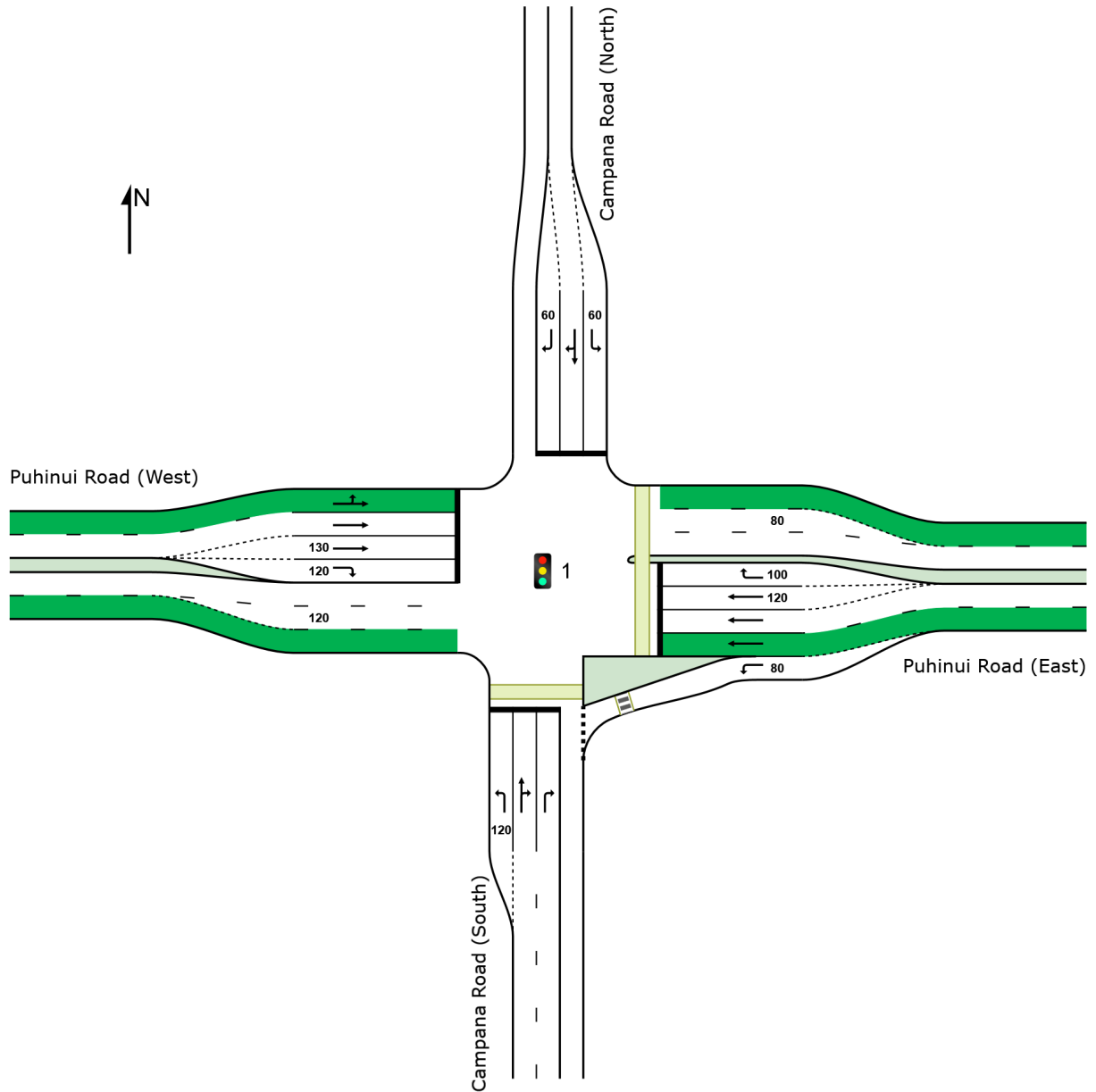
 Site: 1 [Puhinui Campana AM 2023 + P&R + SCG + PC Opt 2
(Site Folder: General)]

NA

Site Category: (None)

Signals - EQUISAT (Fixed-Time/SCATS) Isolated

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Project: C:\Users\anna\OneDrive\AW Consulting\Projects\119 Campana Road DMC\2024\November 2024\SH20 Campana Rd_Plan Change Scenarios.sip9

MOVEMENT SUMMARY

 Site: 1 [Puhinui Campana AM 2023 + P&R + SCG + PC Opt 2
(Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

NA

Site Category: (None)

Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 80 seconds (Site Optimum Cycle Time - Minimum Delay)

Variable Sequence Analysis applied. The results are given for the selected output sequence.

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	Aver. Back Of Queue		Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed
			[Total HV]		[Total HV]					Aver. Veh.	Back Of Dist				
			veh/h	%	veh/h	%	v/c	sec		veh	m				km/h
South: Campana Road (South)															
1	L2	All MCs	40	55.0	40	55.0	0.075	21.0	LOS C	0.6	6.1	0.65	0.68	0.65	40.1
2	T1	All MCs	75	9.3	75	9.3	* 0.769	35.7	LOS D	7.3	53.4	1.00	0.92	1.13	35.0
3	R2	All MCs	518	3.7	518	3.7	0.769	40.4	LOS D	7.3	53.4	1.00	0.92	1.13	43.0
Approach			633	7.6	633	7.6	0.769	38.6	LOS D	7.3	53.4	0.98	0.90	1.10	42.0
East: Puhinui Road (East)															
4	L2	All MCs	1397	10.0	1397	10.0	1.063	69.6	LOS E	40.6	308.8	1.00	1.17	1.56	35.3
5	T1	All MCs	858	12.9	858	12.9	* 0.789	33.5	LOS C	9.1	71.1	0.97	0.88	1.08	56.9
6	R2	All MCs	233	10.3	233	10.3	* 0.718	27.2	LOS C	4.0	30.4	0.99	0.86	1.09	43.8
Approach			2488	11.1	2488	11.1	1.063	53.2	LOS D	40.6	308.8	0.99	1.04	1.35	40.5
North: Campana Road (North)															
7	L2	All MCs	138	9.4	138	9.4	0.211	15.5	LOS B	1.4	10.5	0.71	0.74	0.71	48.8
8	T1	All MCs	53	11.3	53	11.3	0.291	36.9	LOS D	1.4	10.5	0.96	0.72	0.96	37.3
9	R2	All MCs	90	11.1	90	11.1	* 0.433	43.5	LOS D	2.0	15.2	0.97	0.76	0.97	34.3
Approach			281	10.3	281	10.3	0.433	28.5	LOS C	2.0	15.2	0.84	0.74	0.84	41.8
West: Puhinui Road (West)															
10	L2	All MCs	130	10.0	130	10.0	0.347	21.9	LOS C	2.0	15.4	0.87	0.77	0.87	42.4
11	T1	All MCs	114	60.5	114	60.5	0.347	39.6	LOS D	2.0	15.4	0.96	0.74	0.96	55.3
12	R2	All MCs	132	30.3	132	30.3	0.768	51.6	LOS D	3.5	30.5	1.00	0.88	1.23	34.2
Approach			376	32.4	376	32.4	0.768	37.7	LOS D	3.5	30.5	0.94	0.80	1.02	42.7
All Vehicles			3778	12.5	3778	12.5	1.063	47.3	LOS D	40.6	308.8	0.97	0.97	1.24	41.0

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).

Vehicle movement LOS values are based on average delay per movement.

Intersection and Approach LOS values are based on average delay for all vehicle movements.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Green.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

* Critical Movement (Signal Timing)

Pedestrian Movement Performance												
Mov ID	Crossing	Input Vol.	Dem. Flow	Aver. Delay	Level of Service	AVERAGE BACK OF QUEUE		Prop. Que	Eff. Stop Rate	Travel Time	Travel Dist.	Aver. Speed
		ped/h	ped/h	sec		[Ped ped	Dist] m			sec	m	m/sec
South: Campana Road (South)												
P1	Full	15	8	29.8	LOS C	0.0	0.0	0.86	0.86	45.2	20.0	0.44

East: Puhinui Road (East)												
P2	Full	15	8	34.2	LOS D	0.0	0.0	0.93	0.93	49.6	20.0	0.40
All		30	16	32.0	LOS D	0.0	0.0	0.89	0.89	47.4	20.0	0.42
Pedestrians												

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

PHASING SUMMARY

 **Site: 1 [Puhinui Campana AM 2023 + P&R + SCG + PC Opt 2 (Site Folder: General)]**

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

NA

Site Category: (None)

Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 80 seconds (Site Optimum Cycle Time - Minimum Delay)

Variable Sequence Analysis applied. The results are given for the selected output sequence.

Timings based on settings in the Site Phasing & Timing dialog

Phase Times determined by the program

Green Split Priority has been specified

Phase Sequence: Leading Right Turn

Input Phase Sequence: A, A1*, A2*, B, C, D

Output Phase Sequence: A, A2*, B, C, D

Reference Phase: Phase A

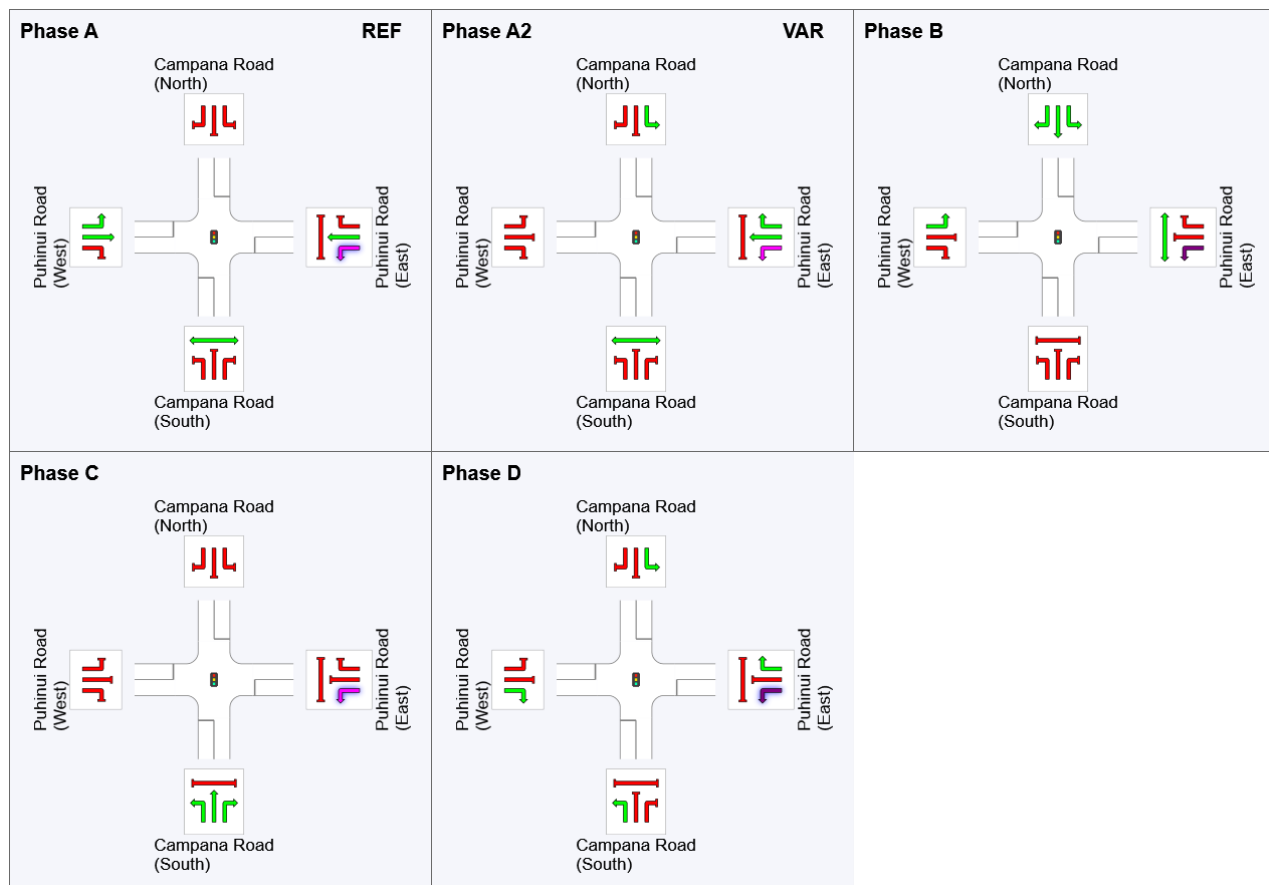
(* Variable Phase)

Phase Timing Summary












Phase	A	A2	B	C	D
Phase Change Time (sec)	0	15	27	42	65
Green Time (sec)	9	6	9	17	9
Phase Time (sec)	15	12	15	23	15
Phase Split	19%	15%	19%	29%	19%
Phase Frequency (%)	100.0	100.0	100.0	100.0	100.0

See the Timing Analysis report for more detailed information including input values of Yellow Time and All-Red Time, and information on any adjustments to Intergreen Time, Phase Time and Green Time values in cases of Pedestrian Actuation, Minor Phase Actuation and Phase Frequency values (user-specified or implied) less than 100%.

Output Phase Sequence



REF: Reference Phase
VAR: Variable Phase

	Normal Movement		Permitted/Opposed
	Slip/Bypass-Lane Movement		Opposed Slip/Bypass-Lane
	Stopped Movement		Turn On Red
	Other Movement Class (MC) Running		Undetected Movement
	Mixed Running & Stopped MCs		Continuous Movement
	Other Movement Class (MC) Stopped		Phase Transition Applied

MOVEMENT SUMMARY

 Site: 1 [Puhinui Campana PM 2023 + P&R + SCG + PC Opt 2
(Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

NA

Site Category: (None)

Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 125 seconds (Site Optimum Cycle Time - Minimum Delay)

Variable Sequence Analysis applied. The results are given for the selected output sequence.

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	Aver. Back Of Queue		Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed
			[Total HV]		[Total HV]					Aver.	Back Of				
			veh/h	%	veh/h	%	v/c	sec		veh	Dist]				km/h
South: Campana Road (South)															
1	L2	All MCs	159	21.4	159	21.4	0.152	22.4	LOS C	1.2	10.2	0.41	0.65	0.41	49.0
2	T1	All MCs	62	9.7	62	9.7	* 1.026	88.2	LOS F	37.8	284.7	1.00	1.18	1.33	25.1
3	R2	All MCs	1545	8.7	1545	8.7	1.026	86.9	LOS F	40.4	303.8	1.00	1.18	1.32	31.4
Approach			1766	9.9	1766	9.9	1.026	81.1	LOS F	40.4	303.8	0.95	1.13	1.24	30.6
East: Puhinui Road (East)															
4	L2	All MCs	611	2.9	611	2.9	0.404	9.9	LOS A	3.8	27.5	0.26	0.71	0.26	62.3
5	T1	All MCs	242	16.9	242	16.9	0.797	68.4	LOS E	4.1	32.6	1.00	0.85	1.17	40.4
6	R2	All MCs	154	9.7	154	9.7	1.008	98.7	LOS F	7.4	55.9	1.00	1.06	1.48	26.7
Approach			1007	7.3	1007	7.3	1.008	37.6	LOS D	7.4	55.9	0.55	0.80	0.66	46.7
North: Campana Road (North)															
7	L2	All MCs	254	9.4	254	9.4	* 0.829	45.1	LOS D	7.2	54.1	1.00	0.91	1.14	37.6
8	T1	All MCs	85	9.4	85	9.4	0.591	61.9	LOS E	3.6	27.1	1.00	0.79	1.02	29.8
9	R2	All MCs	144	9.7	144	9.7	* 0.877	76.5	LOS E	5.6	42.6	1.00	0.94	1.26	26.2
Approach			483	9.5	483	9.5	0.877	57.4	LOS E	7.2	54.1	1.00	0.90	1.16	32.7
West: Puhinui Road (West)															
10	L2	All MCs	114	9.6	114	9.6	0.639	48.1	LOS D	7.5	56.0	0.98	0.83	0.98	31.2
11	T1	All MCs	708	11.4	708	11.4	* 1.002	85.2	LOS F	14.5	112.6	1.00	1.04	1.33	35.8
12	R2	All MCs	39	59.0	39	59.0	0.219	47.3	LOS D	1.1	11.7	0.93	0.74	0.93	35.8
Approach			861	13.4	861	13.4	1.002	78.6	LOS E	14.5	112.6	0.99	0.99	1.27	35.3
All Vehicles			4117	10.0	4117	10.0	1.026	67.1	LOS E	40.4	303.8	0.86	0.99	1.09	34.9

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).

Vehicle movement LOS values are based on average delay per movement.

Intersection and Approach LOS values are based on average delay for all vehicle movements.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Green.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

* Critical Movement (Signal Timing)

Pedestrian Movement Performance												
Mov ID	Crossing	Input Vol.	Dem. Flow	Aver. Delay	Level of Service	AVERAGE BACK OF QUEUE		Prop. Que	Eff. Stop Rate	Travel Time	Travel Dist.	Aver. Speed
		ped/h	ped/h	sec		[Ped ped	Dist] m			sec	m	m/sec
South: Campana Road (South)												
P1	Full	15	8	56.7	LOS E	0.0	0.0	0.95	0.95	72.0	20.0	0.28

East: Puhinui Road (East)												
P2	Full	15	8	56.7	LOS E	0.0	0.0	0.95	0.95	72.0	20.0	0.28
All		30	16	56.7	LOS E	0.0	0.0	0.95	0.95	72.0	20.0	0.28
Pedestrians												

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

PHASING SUMMARY

 Site: 1 [Puhinui Campana PM 2023 + P&R + SCG + PC Opt 2
(Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

NA

Site Category: (None)

Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 125 seconds (Site Optimum Cycle Time - Minimum Delay)

Variable Sequence Analysis applied. The results are given for the selected output sequence.

Timings based on settings in the Site Phasing & Timing dialog

Phase Times determined by the program

Green Split Priority has been specified

Phase Sequence: Leading Right Turn

Input Phase Sequence: A, A1*, A2*, B, C, D

Output Phase Sequence: A, A1*, B, C, D

Reference Phase: Phase A

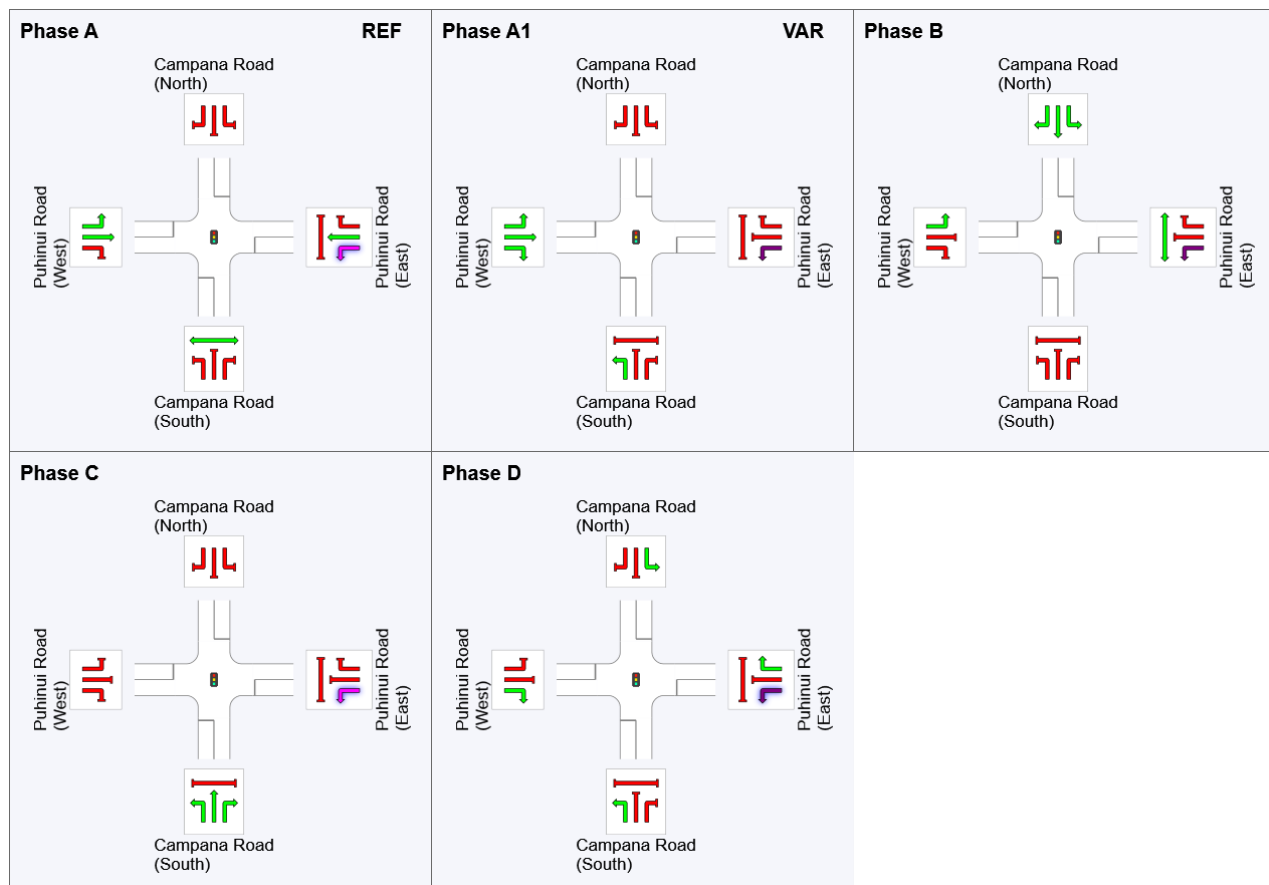
(* Variable Phase)

Phase Timing Summary












Phase	A	A1	B	C	D
Phase Change Time (sec)	0	15	27	44	108
Green Time (sec)	9	6	11	58	11
Phase Time (sec)	15	12	17	64	17
Phase Split	12%	10%	14%	51%	14%
Phase Frequency (%)	100.0	100.0	100.0	100.0	100.0

See the Timing Analysis report for more detailed information including input values of Yellow Time and All-Red Time, and information on any adjustments to Intergreen Time, Phase Time and Green Time values in cases of Pedestrian Actuation, Minor Phase Actuation and Phase Frequency values (user-specified or implied) less than 100%.

Output Phase Sequence



REF: Reference Phase
VAR: Variable Phase

	Normal Movement		Permitted/Opposed
	Slip/Bypass-Lane Movement		Opposed Slip/Bypass-Lane
	Stopped Movement		Turn On Red
	Other Movement Class (MC) Running		Undetected Movement
	Mixed Running & Stopped MCs		Continuous Movement
	Other Movement Class (MC) Stopped		Phase Transition Applied

SITE LAYOUT

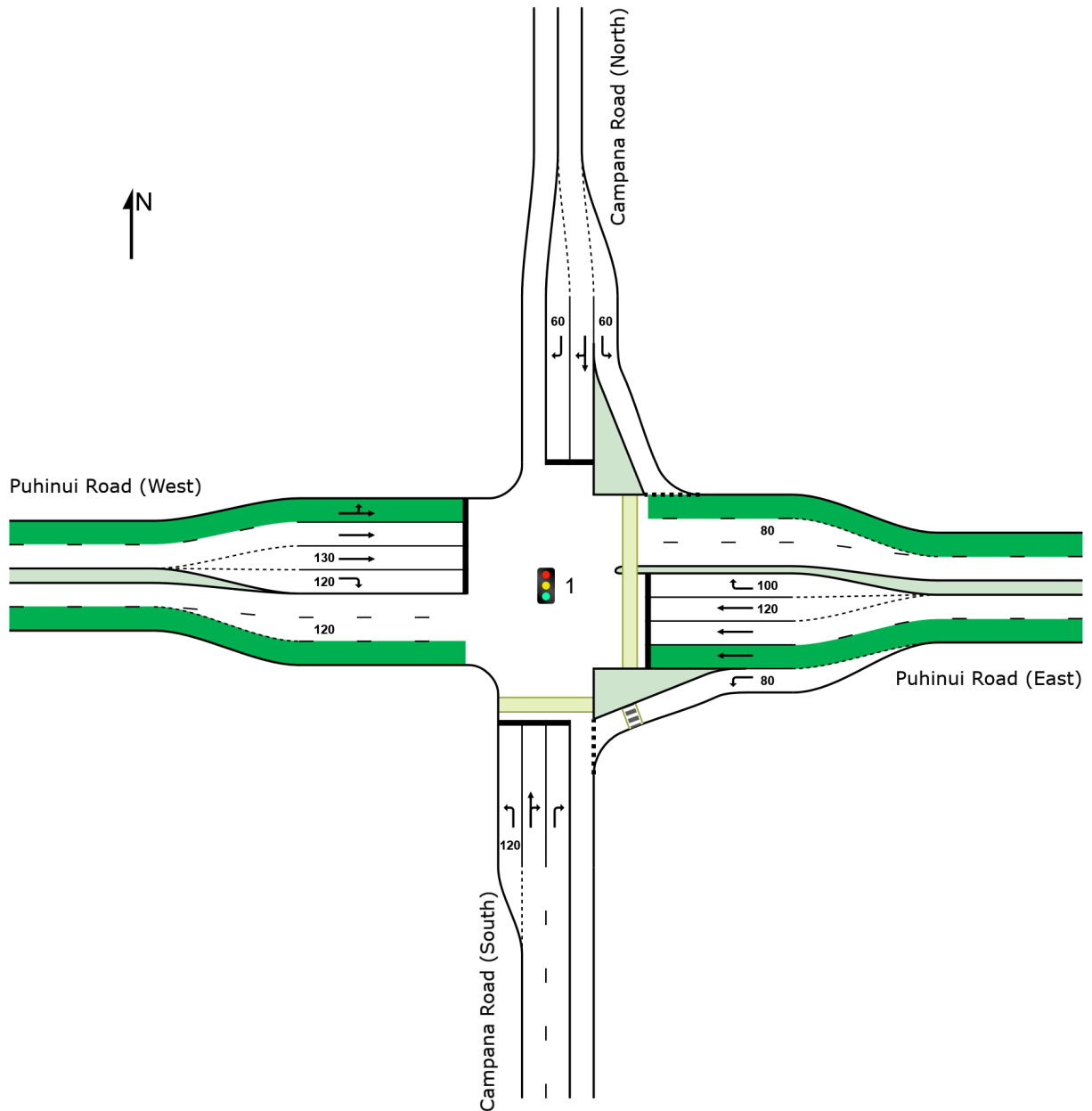
 Site: 1 [Puhinui Campana AM 2023 + P&R + SCG + PC Opt 3
(Site Folder: General)]

NA

Site Category: (None)

Signals - EQUISAT (Fixed-Time/SCATS) Isolated

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



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Organisation: AJW | Licence: NETWORK / 1PC | Created: Friday, 8 November 2024 11:55:39 am

Project: C:\Users\annaj\OneDrive\AW Consulting\Projects\119 Campana Road DMC\2024\November 2024\SH20 Campana Rd_Plan Change Scenarios.sip9

MOVEMENT SUMMARY

 Site: 1 [Puhinui Campana AM 2023 + P&R + SCG + PC Opt 3 (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

NA

Site Category: (None)

Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 80 seconds (Site Optimum Cycle Time - Minimum Delay)

Variable Sequence Analysis applied. The results are given for the selected output sequence.

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	Aver. Back Of Queue		Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed
			[Total HV]		[Total HV]					Aver. Veh.	Dist				
			veh/h	%	veh/h	%	v/c	sec		veh	m				km/h
South: Campana Road (South)															
1	L2	All MCs	40	55.0	40	55.0	0.075	21.0	LOS C	0.6	6.1	0.65	0.68	0.65	40.1
2	T1	All MCs	75	9.3	75	9.3	* 0.769	35.7	LOS D	7.3	53.4	1.00	0.92	1.13	35.0
3	R2	All MCs	518	3.7	518	3.7	0.769	40.4	LOS D	7.3	53.4	1.00	0.92	1.13	43.0
Approach			633	7.6	633	7.6	0.769	38.6	LOS D	7.3	53.4	0.98	0.90	1.10	42.0
East: Puhinui Road (East)															
4	L2	All MCs	1397	10.0	1397	10.0	1.063	69.6	LOS E	40.6	308.8	1.00	1.17	1.56	35.3
5	T1	All MCs	858	12.9	858	12.9	* 0.789	33.5	LOS C	9.1	71.1	0.97	0.88	1.08	56.9
6	R2	All MCs	233	10.3	233	10.3	* 0.718	27.2	LOS C	4.0	30.4	0.99	0.86	1.09	43.8
Approach			2488	11.1	2488	11.1	1.063	53.2	LOS D	40.6	308.8	0.99	1.04	1.35	40.5
North: Campana Road (North)															
7	L2	All MCs	138	9.4	138	9.4	0.125	9.2	LOS A	0.9	7.1	0.39	0.65	0.39	52.3
8	T1	All MCs	53	11.3	53	11.3	0.291	36.9	LOS D	1.4	10.5	0.96	0.72	0.96	37.3
9	R2	All MCs	90	11.1	90	11.1	* 0.433	43.5	LOS D	2.0	15.2	0.97	0.76	0.97	34.3
Approach			281	10.3	281	10.3	0.433	25.4	LOS C	2.0	15.2	0.68	0.70	0.68	43.2
West: Puhinui Road (West)															
10	L2	All MCs	130	10.0	130	10.0	0.347	21.9	LOS C	2.0	15.4	0.87	0.77	0.87	42.4
11	T1	All MCs	114	60.5	114	60.5	0.347	39.6	LOS D	2.0	15.4	0.96	0.74	0.96	55.3
12	R2	All MCs	132	30.3	132	30.3	0.768	51.6	LOS D	3.5	30.5	1.00	0.88	1.23	34.2
Approach			376	32.4	376	32.4	0.768	37.7	LOS D	3.5	30.5	0.94	0.80	1.02	42.7
All Vehicles			3778	12.5	3778	12.5	1.063	47.1	LOS D	40.6	308.8	0.96	0.97	1.22	41.1

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).

Vehicle movement LOS values are based on average delay per movement.

Intersection and Approach LOS values are based on average delay for all vehicle movements.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Green.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

* Critical Movement (Signal Timing)

Pedestrian Movement Performance												
Mov ID	Crossing	Input Vol.	Dem. Flow	Aver. Delay	Level of Service	AVERAGE BACK OF QUEUE		Prop. Que	Eff. Stop Rate	Travel Time	Travel Dist.	Aver. Speed
		ped/h	ped/h	sec		[Ped ped	Dist] m			sec	m	m/sec
South: Campana Road (South)												
P1	Full	15	8	29.8	LOS C	0.0	0.0	0.86	0.86	45.2	20.0	0.44

East: Puhinui Road (East)												
P2	Full	15	8	34.2	LOS D	0.0	0.0	0.93	0.93	49.6	20.0	0.40
All		30	16	32.0	LOS D	0.0	0.0	0.89	0.89	47.4	20.0	0.42
Pedestrians												

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

PHASING SUMMARY

 Site: 1 [Puhinui Campana AM 2023 + P&R + SCG + PC Opt 3
(Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

NA

Site Category: (None)

Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 80 seconds (Site Optimum Cycle Time - Minimum Delay)

Variable Sequence Analysis applied. The results are given for the selected output sequence.

Timings based on settings in the Site Phasing & Timing dialog

Phase Times determined by the program

Green Split Priority has been specified

Phase Sequence: Leading Right Turn

Input Phase Sequence: A, A1*, A2*, B, C, D

Output Phase Sequence: A, A2*, B, C, D

Reference Phase: Phase A

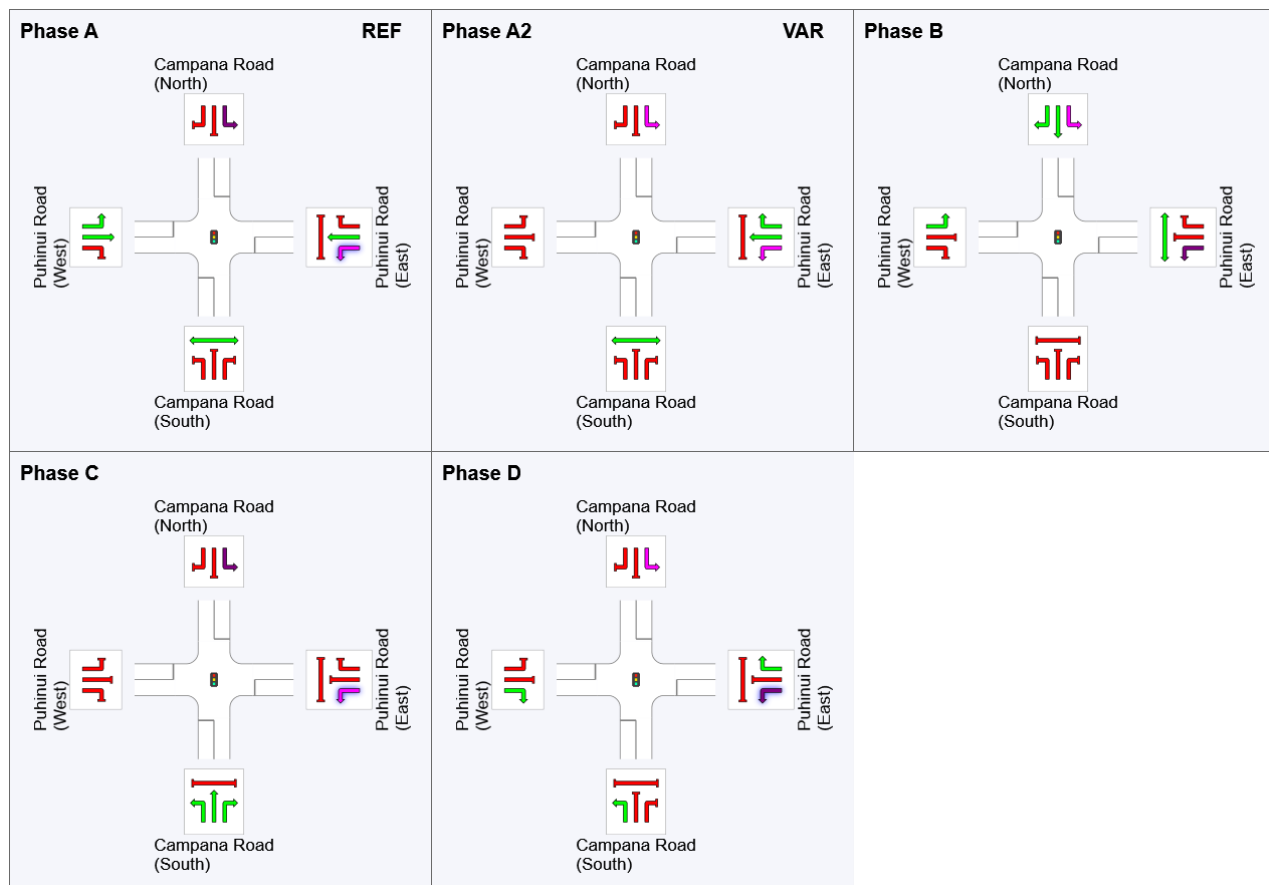
(* Variable Phase)

Phase Timing Summary












Phase	A	A2	B	C	D
Phase Change Time (sec)	0	15	27	42	65
Green Time (sec)	9	6	9	17	9
Phase Time (sec)	15	12	15	23	15
Phase Split	19%	15%	19%	29%	19%
Phase Frequency (%)	100.0	100.0	100.0	100.0	100.0

See the Timing Analysis report for more detailed information including input values of Yellow Time and All-Red Time, and information on any adjustments to Intergreen Time, Phase Time and Green Time values in cases of Pedestrian Actuation, Minor Phase Actuation and Phase Frequency values (user-specified or implied) less than 100%.

Output Phase Sequence



REF: Reference Phase
VAR: Variable Phase

	Normal Movement		Permitted/Opposed
	Slip/Bypass-Lane Movement		Opposed Slip/Bypass-Lane
	Stopped Movement		Turn On Red
	Other Movement Class (MC) Running		Undetected Movement
	Mixed Running & Stopped MCs		Continuous Movement
	Other Movement Class (MC) Stopped		Phase Transition Applied

MOVEMENT SUMMARY

 Site: 1 [Puhinui Campana PM 2023 + P&R + SCG + PC Opt 3
(Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

NA

Site Category: (None)

Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 125 seconds (Site Optimum Cycle Time - Minimum Delay)

Variable Sequence Analysis applied. The results are given for the selected output sequence.

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	Aver. Back Of Queue		Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed
			[Total HV]		[Total HV]					Aver. Veh.	Back Of Dist				
			veh/h	%	veh/h	%	v/c	sec		veh	m				km/h
South: Campana Road (South)															
1	L2	All MCs	159	21.4	159	21.4	0.152	22.4	LOS C	1.2	10.2	0.41	0.65	0.41	49.0
2	T1	All MCs	62	9.7	62	9.7	* 1.026	88.2	LOS F	37.8	284.7	1.00	1.18	1.33	25.1
3	R2	All MCs	1545	8.7	1545	8.7	1.026	86.9	LOS F	40.4	303.8	1.00	1.18	1.32	31.4
Approach			1766	9.9	1766	9.9	1.026	81.1	LOS F	40.4	303.8	0.95	1.13	1.24	30.6
East: Puhinui Road (East)															
4	L2	All MCs	611	2.9	611	2.9	0.404	9.9	LOS A	3.8	27.5	0.26	0.71	0.26	62.3
5	T1	All MCs	242	16.9	242	16.9	0.797	68.4	LOS E	4.1	32.6	1.00	0.85	1.17	40.4
6	R2	All MCs	154	9.7	154	9.7	* 1.008	98.7	LOS F	7.4	55.9	1.00	1.06	1.48	26.7
Approach			1007	7.3	1007	7.3	1.008	37.6	LOS D	7.4	55.9	0.55	0.80	0.66	46.7
North: Campana Road (North)															
7	L2	All MCs	254	9.4	254	9.4	0.505	42.4	LOS D	7.6	57.3	0.89	0.81	0.89	38.6
8	T1	All MCs	85	9.4	85	9.4	0.591	61.9	LOS E	3.6	27.1	1.00	0.79	1.02	29.8
9	R2	All MCs	144	9.7	144	9.7	* 0.877	76.5	LOS E	5.6	42.6	1.00	0.94	1.26	26.2
Approach			483	9.5	483	9.5	0.877	56.0	LOS E	7.6	57.3	0.94	0.84	1.02	33.1
West: Puhinui Road (West)															
10	L2	All MCs	114	9.6	114	9.6	0.639	48.1	LOS D	7.5	56.0	0.98	0.83	0.98	31.2
11	T1	All MCs	708	11.4	708	11.4	* 1.002	85.2	LOS F	14.5	112.6	1.00	1.04	1.33	35.8
12	R2	All MCs	39	59.0	39	59.0	0.219	47.3	LOS D	1.1	11.7	0.93	0.74	0.93	35.8
Approach			861	13.4	861	13.4	1.002	78.6	LOS E	14.5	112.6	0.99	0.99	1.27	35.3
All Vehicles			4117	10.0	4117	10.0	1.026	67.0	LOS E	40.4	303.8	0.86	0.99	1.08	34.9

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).

Vehicle movement LOS values are based on average delay per movement.

Intersection and Approach LOS values are based on average delay for all vehicle movements.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Green.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

* Critical Movement (Signal Timing)

Pedestrian Movement Performance												
Mov ID	Crossing	Input Vol.	Dem. Flow	Aver. Delay	Level of Service	AVERAGE BACK OF QUEUE		Prop. Que	Eff. Stop Rate	Travel Time	Travel Dist.	Aver. Speed
		ped/h	ped/h	sec		[Ped ped	Dist] m			sec	m	m/sec
South: Campana Road (South)												
P1	Full	15	8	56.7	LOS E	0.0	0.0	0.95	0.95	72.0	20.0	0.28

East: Puhinui Road (East)												
P2	Full	15	8	56.7	LOS E	0.0	0.0	0.95	0.95	72.0	20.0	0.28
All		30	16	56.7	LOS E	0.0	0.0	0.95	0.95	72.0	20.0	0.28
Pedestrians												

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

PHASING SUMMARY

 Site: 1 [Puhinui Campana PM 2023 + P&R + SCG + PC Opt 3
(Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

NA

Site Category: (None)

Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 125 seconds (Site Optimum Cycle Time - Minimum Delay)

Variable Sequence Analysis applied. The results are given for the selected output sequence.

Timings based on settings in the Site Phasing & Timing dialog

Phase Times determined by the program

Green Split Priority has been specified

Phase Sequence: Leading Right Turn

Input Phase Sequence: A, A1*, A2*, B, C, D

Output Phase Sequence: A, A1*, B, C, D

Reference Phase: Phase A

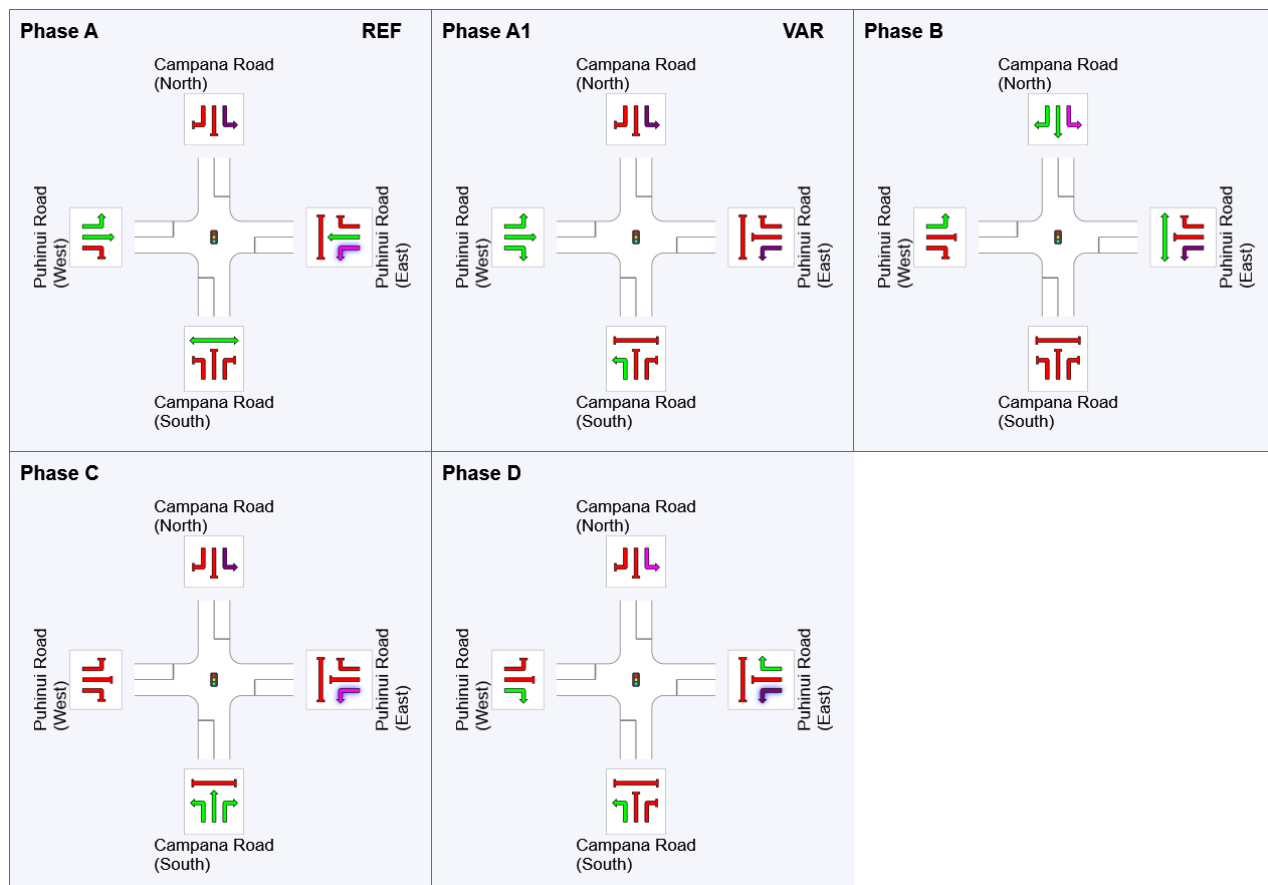
(* Variable Phase)

Phase Timing Summary













Phase	A	A1	B	C	D
Phase Change Time (sec)	0	15	27	44	108
Green Time (sec)	9	6	11	58	11
Phase Time (sec)	15	12	17	64	17
Phase Split	12%	10%	14%	51%	14%
Phase Frequency (%)	100.0	100.0	100.0	100.0	100.0

See the Timing Analysis report for more detailed information including input values of Yellow Time and All-Red Time, and information on any adjustments to Intergreen Time, Phase Time and Green Time values in cases of Pedestrian Actuation, Minor Phase Actuation and Phase Frequency values (user-specified or implied) less than 100%.


Output Phase Sequence



REF: Reference Phase
VAR: Variable Phase

	Normal Movement		Permitted/Opposed
	Slip/Bypass-Lane Movement		Opposed Slip/Bypass-Lane
	Stopped Movement		Turn On Red
	Other Movement Class (MC) Running		Undetected Movement
	Mixed Running & Stopped MCs		Continuous Movement
	Other Movement Class (MC) Stopped		Phase Transition Applied

SITE LAYOUT

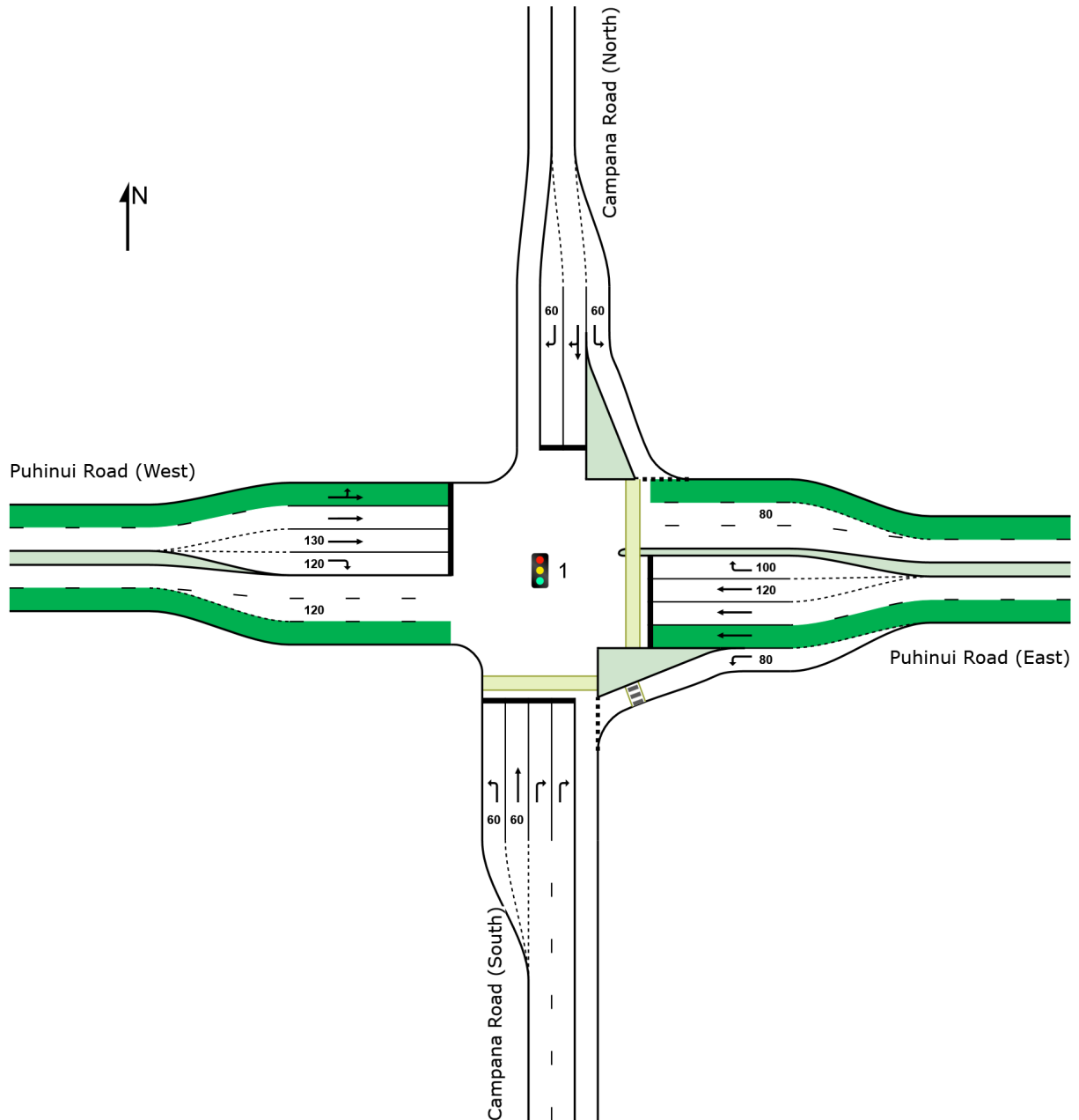
 Site: 1 [Puhinui Campana AM 2023 + P&R + SCG + PC Opt 4
(Site Folder: General)]

NA

Site Category: (None)

Signals - EQUISAT (Fixed-Time/SCATS) Isolated

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



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Organisation: AJW | Licence: NETWORK / 1PC | Created: Friday, 8 November 2024 11:58:19 am

Project: C:\Users\anna\OneDrive\AW Consulting\Projects\119 Campana Road DMC\2024\November 2024\SH20 Campana Rd_Plan Change Scenarios.sip9

MOVEMENT SUMMARY

 Site: 1 [Puhinui Campana AM 2023 + P&R + SCG + PC Opt 4 (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

NA

Site Category: (None)

Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 85 seconds (Site Optimum Cycle Time - Minimum Delay)

Variable Sequence Analysis applied. The results are given for the selected output sequence.

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	Aver. Back Of Queue		Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed
			[Total HV]		[Total HV]					Aver. [Veh.	Back Of Dist]				
			veh/h	%	veh/h	%	v/c	sec		veh	m				km/h
South: Campana Road (South)															
1	L2	All MCs	40	55.0	40	55.0	0.077	22.7	LOS C	0.6	6.6	0.66	0.68	0.66	39.4
2	T1	All MCs	75	9.3	75	9.3	0.204	31.2	LOS C	1.6	12.3	0.87	0.68	0.87	39.9
3	R2	All MCs	518	3.7	518	3.7	* 0.716	41.4	LOS D	6.5	47.2	0.99	0.87	1.06	42.2
Approach			633	7.6	633	7.6	0.716	39.0	LOS D	6.5	47.2	0.95	0.84	1.01	41.9
East: Puhinui Road (East)															
4	L2	All MCs	1397	10.0	1397	10.0	1.057	68.1	LOS E	40.5	308.0	1.00	1.16	1.51	35.7
5	T1	All MCs	858	12.9	858	12.9	* 0.734	31.9	LOS C	9.0	70.5	0.94	0.83	0.99	58.1
6	R2	All MCs	233	10.3	233	10.3	* 0.636	25.6	LOS C	3.9	29.7	0.96	0.82	0.97	44.5
Approach			2488	11.1	2488	11.1	1.057	51.6	LOS D	40.5	308.0	0.98	1.01	1.28	41.0
North: Campana Road (North)															
7	L2	All MCs	138	9.4	138	9.4	0.121	8.7	LOS A	0.9	6.8	0.35	0.64	0.35	52.6
8	T1	All MCs	53	11.3	53	11.3	0.279	38.6	LOS D	1.4	11.0	0.95	0.72	0.95	36.7
9	R2	All MCs	90	11.1	90	11.1	* 0.414	45.2	LOS D	2.1	16.0	0.97	0.76	0.97	33.7
Approach			281	10.3	281	10.3	0.414	26.0	LOS C	2.1	16.0	0.66	0.70	0.66	42.9
West: Puhinui Road (West)															
10	L2	All MCs	130	10.0	130	10.0	0.333	22.6	LOS C	2.1	16.0	0.87	0.77	0.87	42.0
11	T1	All MCs	114	60.5	114	60.5	0.333	41.2	LOS D	2.1	16.0	0.95	0.74	0.95	54.3
12	R2	All MCs	132	30.3	132	30.3	0.735	52.8	LOS D	3.6	31.7	1.00	0.86	1.17	33.9
Approach			376	32.4	376	32.4	0.735	38.8	LOS D	3.6	31.7	0.94	0.79	1.00	42.3
All Vehicles			3778	12.5	3778	12.5	1.057	46.3	LOS D	40.5	308.0	0.95	0.94	1.16	41.4

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).

Vehicle movement LOS values are based on average delay per movement.

Intersection and Approach LOS values are based on average delay for all vehicle movements.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Green.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

* Critical Movement (Signal Timing)

Pedestrian Movement Performance												
Mov ID	Crossing	Input Vol.	Dem. Flow	Aver. Delay	Level of Service	AVERAGE BACK OF QUEUE		Prop. Que	Eff. Stop Rate	Travel Time	Travel Dist.	Aver. Speed
		ped/h	ped/h	sec		[Ped ped	Dist] m			sec	m	m/sec
South: Campana Road (South)												
P1	Full	15	8	32.2	LOS D	0.0	0.0	0.87	0.87	47.6	20.0	0.42

East: Puhinui Road (East)												
P2 Full	15	8	36.7	LOS D	0.0	0.0	0.93	0.93	52.1	20.0	0.38	
All Pedestrians	30	16	34.5	LOS D	0.0	0.0	0.90	0.90	49.9	20.0	0.40	

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

PHASING SUMMARY

 Site: 1 [Puhinui Campana AM 2023 + P&R + SCG + PC Opt 4
(Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

NA

Site Category: (None)

Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 85 seconds (Site Optimum Cycle Time - Minimum Delay)

Variable Sequence Analysis applied. The results are given for the selected output sequence.

Timings based on settings in the Site Phasing & Timing dialog

Phase Times determined by the program

Green Split Priority has been specified

Phase Sequence: Leading Right Turn

Input Phase Sequence: A, A1*, A2*, B, C, D*, E*

Output Phase Sequence: A, A2*, B, C, D*

Reference Phase: Phase A

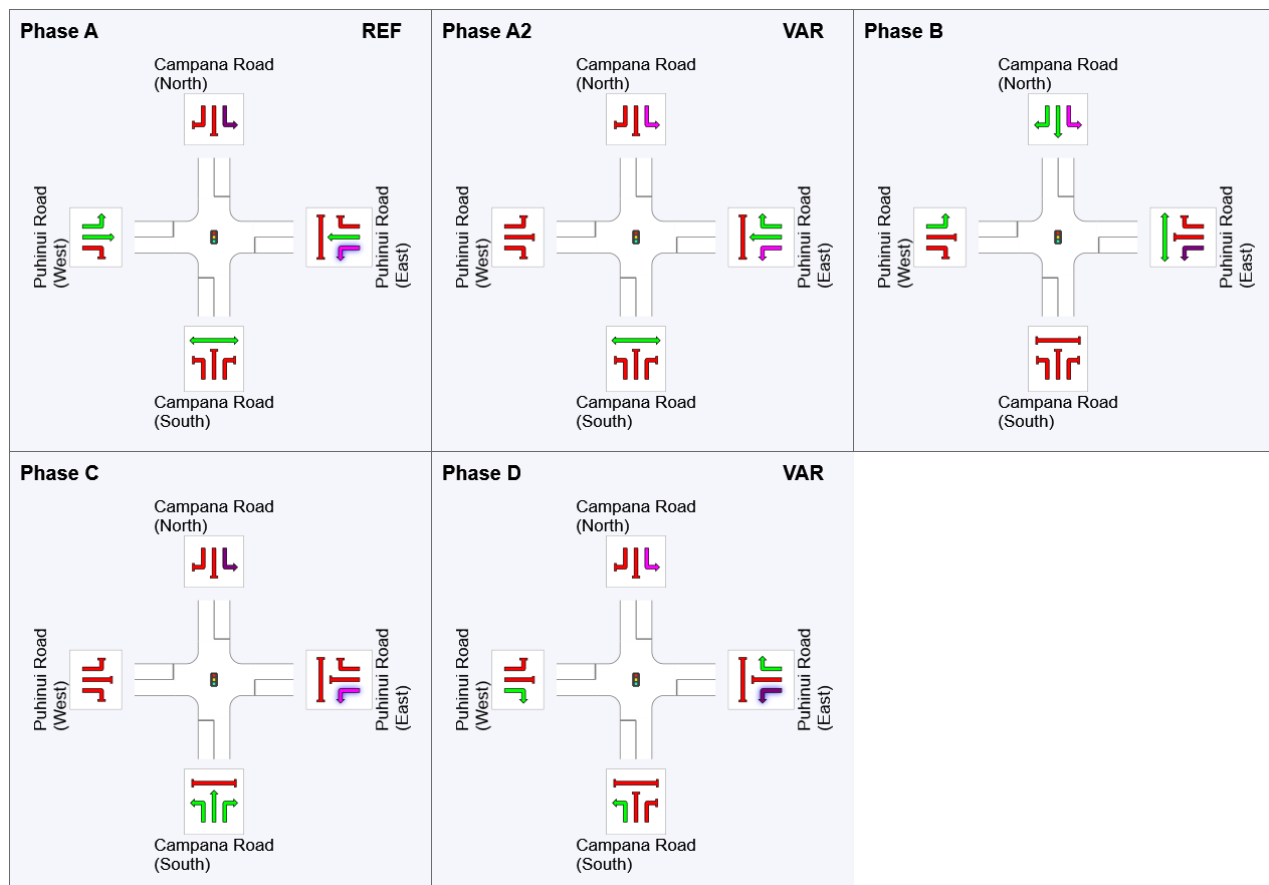
(* Variable Phase)

Phase Timing Summary











Phase	A	A2	B	C	D
Phase Change Time (sec)	0	16	30	46	69
Green Time (sec)	10	8	10	17	10
Phase Time (sec)	16	14	16	23	16
Phase Split	19%	16%	19%	27%	19%
Phase Frequency (%)	100.0	100.0	100.0	100.0	100.0

See the Timing Analysis report for more detailed information including input values of Yellow Time and All-Red Time, and information on any adjustments to Intergreen Time, Phase Time and Green Time values in cases of Pedestrian Actuation, Minor Phase Actuation and Phase Frequency values (user-specified or implied) less than 100%.

Output Phase Sequence



REF: Reference Phase
VAR: Variable Phase

	Normal Movement		Permitted/Opposed
	Slip/Bypass-Lane Movement		Opposed Slip/Bypass-Lane
	Stopped Movement		Turn On Red
	Other Movement Class (MC) Running		Undetected Movement
	Mixed Running & Stopped MCs		Continuous Movement
	Other Movement Class (MC) Stopped		Phase Transition Applied

MOVEMENT SUMMARY

 Site: 1 [Puhinui Campana PM 2023 + P&R + SCG + PC Opt 4 (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

NA

Site Category: (None)

Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 130 seconds (Site Optimum Cycle Time - Minimum Delay)

Variable Sequence Analysis applied. The results are given for the selected output sequence.

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	Aver. Back Of Queue		Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed
			[Total HV]		[Total HV]					Aver. Veh.	Back Of Dist				
			veh/h	%	veh/h	%	v/c	sec		veh	m				km/h
South: Campana Road (South)															
1	L2	All MCs	159	21.4	159	21.4	0.151	9.6	LOS A	1.3	10.5	0.41	0.64	0.41	49.0
2	T1	All MCs	62	9.7	62	9.7	0.073	44.3	LOS D	1.3	9.9	0.59	0.46	0.59	45.1
3	R2	All MCs	1545	8.7	1545	8.7	* 0.983	81.5	LOS F	37.5	281.9	1.00	1.10	1.23	33.8
Approach			1766	9.9	1766	9.9	0.983	73.7	LOS E	37.5	281.9	0.93	1.04	1.13	32.2
East: Puhinui Road (East)															
4	L2	All MCs	611	2.9	611	2.9	0.404	10.0	LOS B	4.1	29.4	0.26	0.71	0.26	62.2
5	T1	All MCs	242	16.9	242	16.9	0.746	68.9	LOS E	4.2	33.2	1.00	0.83	1.11	40.4
6	R2	All MCs	154	9.7	154	9.7	* 0.961	90.2	LOS F	7.2	54.7	1.00	1.02	1.38	28.0
Approach			1007	7.3	1007	7.3	0.961	36.4	LOS D	7.2	54.7	0.55	0.79	0.64	47.2
North: Campana Road (North)															
7	L2	All MCs	254	9.4	254	9.4	0.495	41.3	LOS D	7.6	57.7	0.88	0.81	0.88	38.9
8	T1	All MCs	85	9.4	85	9.4	0.614	65.0	LOS E	3.7	28.3	1.00	0.80	1.03	29.1
9	R2	All MCs	144	9.7	144	9.7	* 0.912	82.6	LOS F	6.0	45.3	1.00	0.96	1.30	25.1
Approach			483	9.5	483	9.5	0.912	57.8	LOS E	7.6	57.7	0.94	0.85	1.03	32.7
West: Puhinui Road (West)															
10	L2	All MCs	114	9.6	114	9.6	0.612	49.0	LOS D	7.7	57.5	0.97	0.82	0.97	31.0
11	T1	All MCs	708	11.4	708	11.4	* 0.952	76.8	LOS E	14.0	108.4	1.00	0.99	1.24	38.3
12	R2	All MCs	39	59.0	39	59.0	0.204	47.5	LOS D	1.1	11.9	0.92	0.74	0.92	35.8
Approach			861	13.4	861	13.4	0.952	71.8	LOS E	14.0	108.4	0.99	0.96	1.19	37.3
All Vehicles			4117	10.0	4117	10.0	0.983	62.3	LOS E	37.5	281.9	0.85	0.94	1.01	36.2

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).

Vehicle movement LOS values are based on average delay per movement.

Intersection and Approach LOS values are based on average delay for all vehicle movements.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Green.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

* Critical Movement (Signal Timing)

Pedestrian Movement Performance												
Mov ID	Crossing	Input Vol.	Dem. Flow	Aver. Delay	Level of Service	AVERAGE BACK OF QUEUE		Prop. Que	Eff. Stop Rate	Travel Time	Travel Dist.	Aver. Speed
		ped/h	ped/h	sec		[Ped ped	Dist] m			sec	m	m/sec
South: Campana Road (South)												
P1	Full	15	8	59.2	LOS E	0.0	0.0	0.95	0.95	74.5	20.0	0.27

East: Puhinui Road (East)												
P2	Full	15	8	59.2	LOS E	0.0	0.0	0.95	0.95	74.5	20.0	0.27
All		30	16	59.2	LOS E	0.0	0.0	0.95	0.95	74.5	20.0	0.27
Pedestrians												

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

PHASING SUMMARY

 Site: 1 [Puhinui Campana PM 2023 + P&R + SCG + PC Opt 4
(Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

NA

Site Category: (None)

Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 130 seconds (Site Optimum Cycle Time - Minimum Delay)

Variable Sequence Analysis applied. The results are given for the selected output sequence.

Timings based on settings in the Site Phasing & Timing dialog

Phase Times determined by the program

Green Split Priority has been specified

Phase Sequence: Leading Right Turn

Input Phase Sequence: A, A1*, A2*, B, C, D, E*

Output Phase Sequence: A, A1*, B, C, D

Reference Phase: Phase A

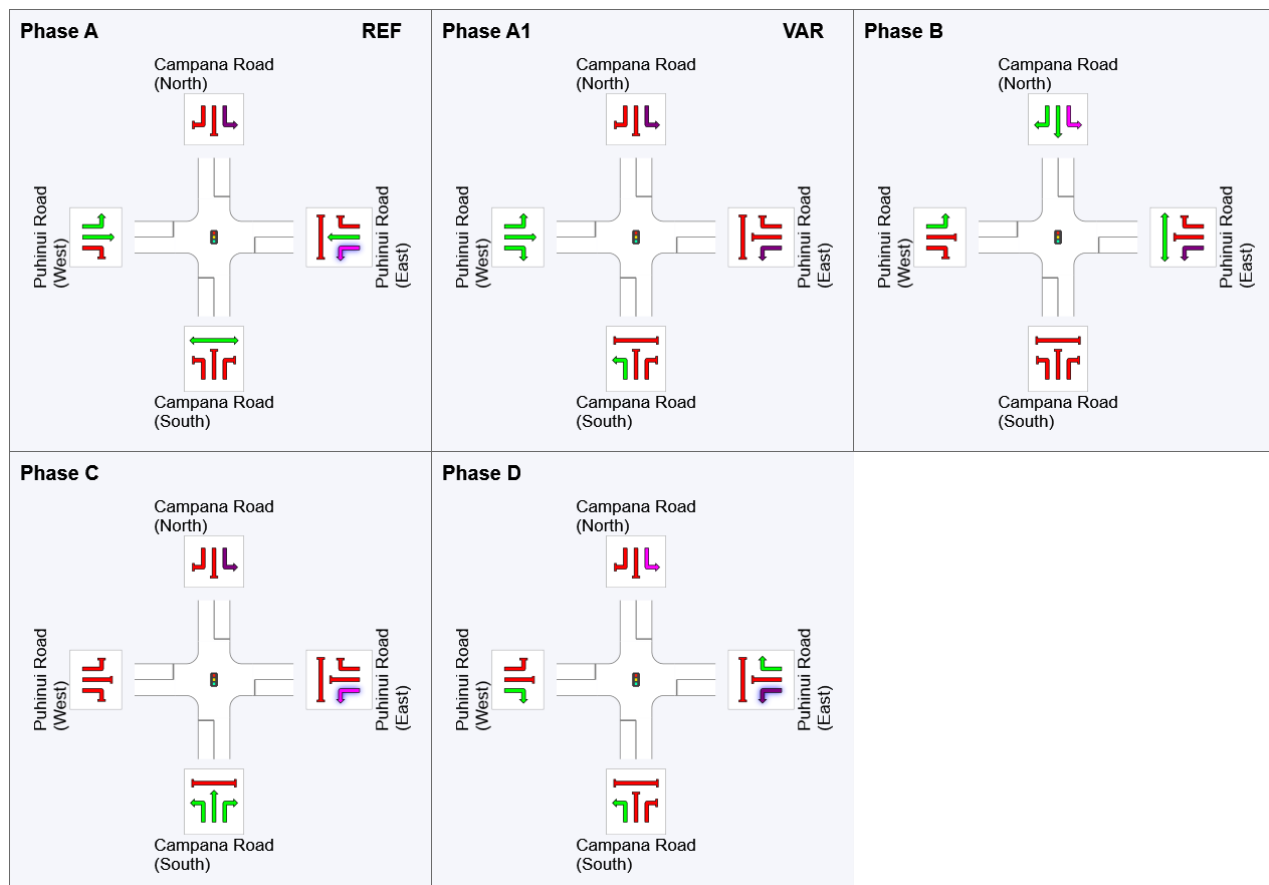
(* Variable Phase)

Phase Timing Summary













Phase	A	A1	B	C	D
Phase Change Time (sec)	0	16	29	46	112
Green Time (sec)	10	7	11	60	12
Phase Time (sec)	16	13	17	66	18
Phase Split	12%	10%	13%	51%	14%
Phase Frequency (%)	100.0	100.0	100.0	100.0	100.0

See the Timing Analysis report for more detailed information including input values of Yellow Time and All-Red Time, and information on any adjustments to Intergreen Time, Phase Time and Green Time values in cases of Pedestrian Actuation, Minor Phase Actuation and Phase Frequency values (user-specified or implied) less than 100%.

Output Phase Sequence



REF: Reference Phase
VAR: Variable Phase

	Normal Movement		Permitted/Opposed
	Slip/Bypass-Lane Movement		Opposed Slip/Bypass-Lane
	Stopped Movement		Turn On Red
	Other Movement Class (MC) Running		Undetected Movement
	Mixed Running & Stopped MCs		Continuous Movement
	Other Movement Class (MC) Stopped		Phase Transition Applied

7 April 2025

Campana Landowners Consortium
c/o Capstone Projects Ltd
349b Manukau Road
Epsom
Auckland

Attention: Tom Anderson
Issued via email: tom@capstoneprojects.co.nz

Dear Tom

**Proposed Private Plan Change – Campana Road
Clause 23 Request for Further Information Response (Transport)**

Following your recent instruction, Don McKenzie Consulting Ltd is pleased to provide the following additional responses to the Council's further (third) request received via email from Peter Reaburn (Council's consultant planner) dated 26 March 2025 ("**Fourth RFI**"). The responses below build on the previous discussions with Council's representatives, as well as previous Clause 23 RFI responses (transport) prepared by Don McKenzie Consulting on behalf of the Campana Landowners Consortium dated 12 September 2024, 19 November 2024 and 21 February ("**Previous, First, Second and Third RFI Responses**").

Request for Information - Campana Road / Puhinui Road intersection

Please provide an indicative intersection layout design with additional capacity to alleviate Levels of Service E/F recorded at this intersection.

Response:

The SIDRA analyses presented in the Third RFI Response (Feb 2025) included diagrammatic representations of the widening options considered and modelled to address the future performance and operation of the intersection under future development demands. A copy of each of these is shown below for ease of reference.

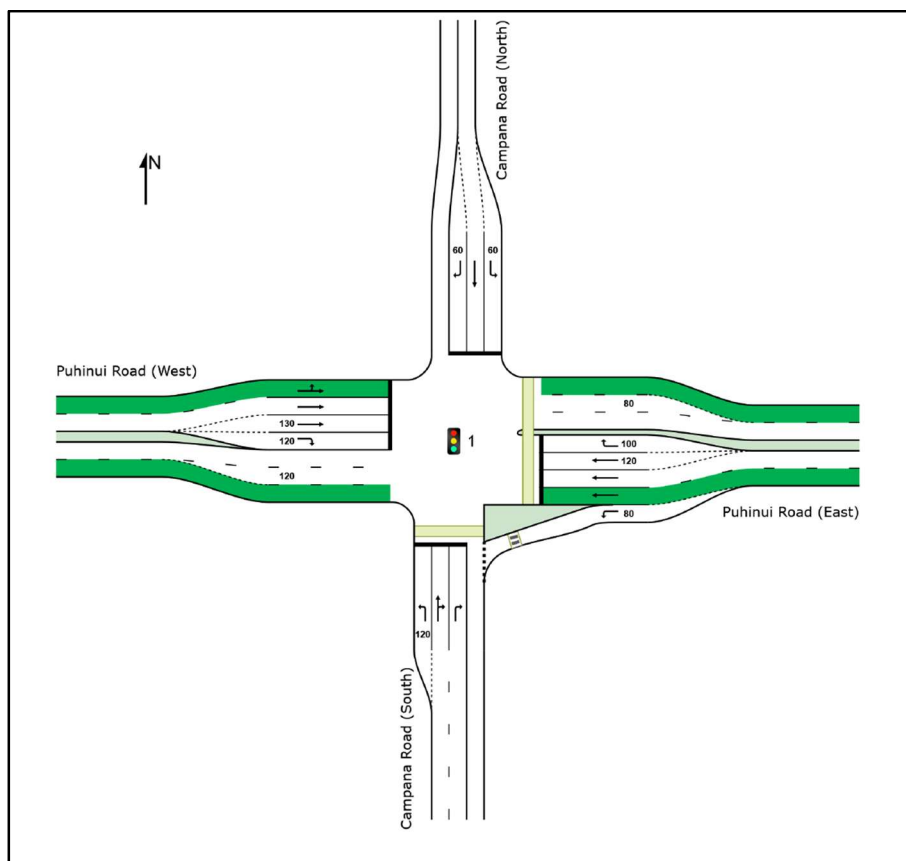


Figure 1: Campana / Puhinui intersection – Indicative Upgrading Option 1

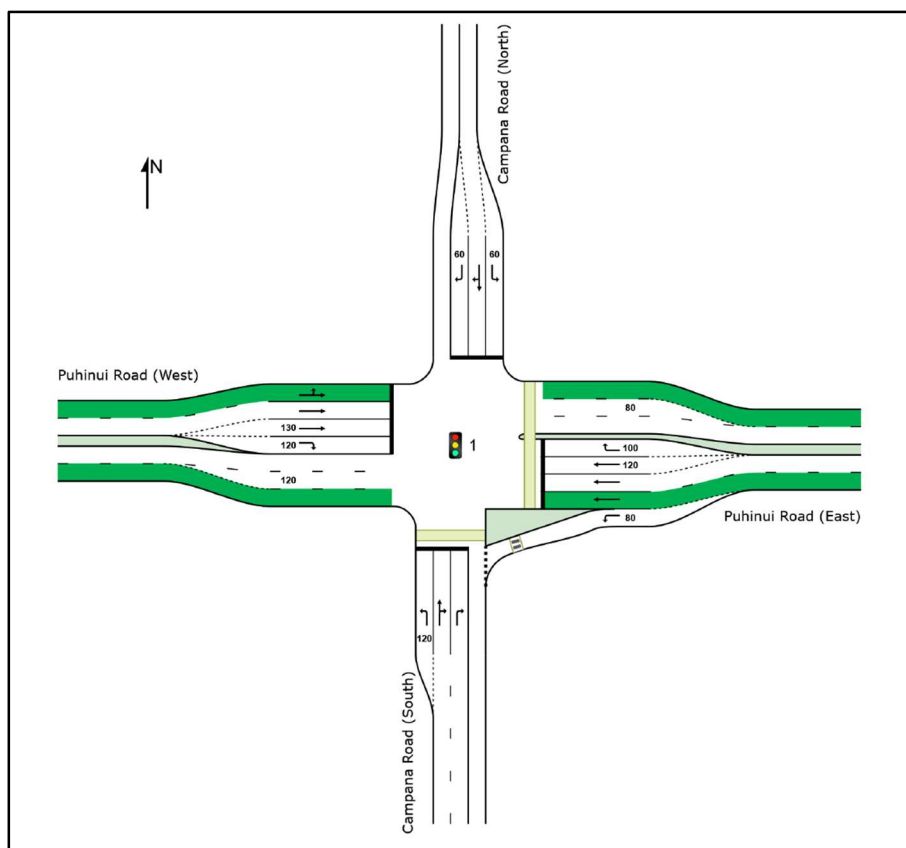


Figure 2: Campana / Puhinui intersection – Indicative Upgrading Option 2

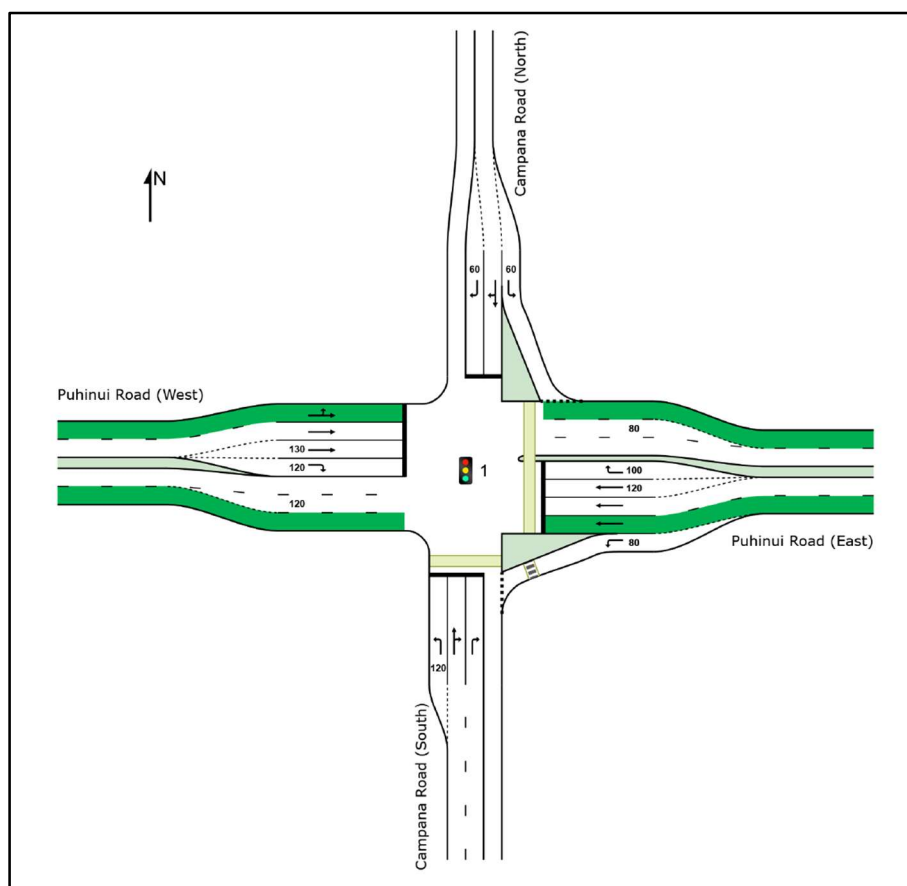


Figure 3: Campana / Puhinui intersection – Indicative Upgrading Option 3

The above figures indicates that each of the upgrading/widening options of the Campana Road approach involve achieving generally a total of four traffic lanes for approximately 60m back from the Puhinui Road signals. As confirmed in the Third RFI Response, the current road reserve with for Campana Road is 20m which can at a concept design level accommodate the width of four traffic lanes (especially reflecting the typical width of turning/queuing lane at an intersection such as this may not necessarily need to be a mid-block lane width).

Request for Information - Access arrangement to 467 Puhinui Road

Please provide confirmation of indicative separation distance on Campana Road between the access intersection for 467 Puhinui Road and the intersection with SH20B Puhinui Road.

Response:

As indicated in earlier Structure Plan documents provided to Council, it can be confirmed that the minimum separation distance from the northern (property) boundary of Puhinui Road to the southern (property) boundary of the accessway to the property at 467 Puhinui Road will be 30m.

Request for Information - Access arrangement to 467 Puhinui Road

Please provide confirmation of an indicative workable intersection form for future access to 467 Puhinui Road off Campana Road, e.g. priority control / signals / etc. In the event that the access off Campana Road to 467 Puhinui Road is to be signalised, this should be added to the

SIDRA traffic model for Campana Road / Puhinui Road to confirm how effectively the combined arrangement would be expected to perform.

Response:

As discussed with Mr Temperley (Council's transport specialist assisting with the Clause 23 process) the proposed form of intersection between the 467 Puhinui accessway with Campana Road is currently likely to be a Give Way controlled tee-intersection. On the basis that the 467 Puhinui property and future activity (sitting within the wider Sub-precinct C) would typically involve peak period traffic generation of no more than approximately 90 vph (IN+OUT) based on the following calculation:

- Approximately 2.13 ha of land available for development within the 467 Puhinui property;
- The total Precinct developable area (inclusive of the 467 Puhinui Road property) 20.54 ha
- The 467 Puhinui property therefore represents approximately 10% of the total Precinct
- The total precinct traffic generation (reported previously) under the "ultimate" scenario (and as presented in the Second RFI Response was between 755 and 875 vph (IN+OUT), and
- Therefore, that part of the Precinct within 467 Puhinui Road could therefore be expected to generate peak hour volumes of between 76 and 88 vph (IN+OUT).

With associated expectations of the total through movements along Campana Road during the peak periods of up to approximately 875 vph (including the traffic generated to and from the 467 Puhinui property), then using generalised capacity analyses of unsignalised intersections¹, it is estimated that the capacity for vehicles turning out of the 467 Puhinui accessway (across the total two-way volumes of say 800 vph, and adopting a critical gap² of 5 seconds) then the capacity of that movement would be approximately 400 vph. For the right turn into the 467 Puhinui accessway where the conflicting volumes would be approximately half of the 800 vph, the capacity of that right turning movement (with the same critical gap) would be at least 700vph. In this regard, there is expected to no or very limited queuing generated by the turning movements to or from the 467 Puhinui accessway when operating in isolation.

There is therefore no expectation that the projected traffic demands associated with 467 Puhinui Road property (and any other access movements catered for by the accessway connection to Campana Road) would rise to a level or intensity requiring signalisation.

As discussed with Mr Temperley following receipt of this latest RFI request, the following factors and performance levels are relevant in consideration of this request. It appears that the above RFI request relates primarily to the potential for queuing to be generated back from Puhinui Road and adversely affecting the overall operation of the Campana Road carriageway.

- Third RFI response (21 February 2024) included outputs from the SIDRA modelling analysis of the various scenarios of development/upgrading. In the base scenario (no upgrading of the Campana Road carriageway, retention of the single approach lane to the signals) the "Average Back of Queue" parameter was predicted to be approximately 47m during the AM peak, rising to 203.5m in the PM peak
- In relation to the three possible improvement options the predicted queuing along Campana Road back from the signals at Puhinui Road was assessed as being in the range 9m – 57m. The greater queuing expectations are associated with the PM peak

¹ AUSTROADS Guide to Traffic Management - Part 2 Traffic Theory, Figure C72.

² The minimum gap between successive vehicles in an opposing traffic stream larger for a turning vehicle to select to complete a turning manoeuvre.

period and as previously reported in Previous RFI Responses, there are a range of assumptions and parameters.

Request for Information - Access arrangement to 467 Puhinui Road

Please provide confirmation of appropriate measures to manage any interaction and potential conflict between the access intersection to 467 Puhinui Road and the signalised intersection of Campana Road / Puhinui Road.

Response:

As noted above the intersection of the 467 Puhinui accessway and Campana Road is proposed to be a Give Way controlled intersection. On the basis of the above indicative analysis of this intersection under development of Plan Change area and without upgrading of the intersection, the peak period queuing back from the Puhinui Road signals may be expected back past the 467 Puhinui accessway. Without intersection upgrading at Campana/Puhinui, and to ensure that there is appropriate performance of the accessway, there are a number of traffic engineering and design approaches available that could be adopted including:

- Hatch box markings adjacent to the 467 Puhinui accessway to ensure that queued vehicles back from the Puhinui Road signals leave a gap for vehicles turning into or out of the accessway;
- Signage visible to the Campana Road approach warning motorists of the presence of peak period queuing (with any associated expectation of change in driving behaviour conscious of leaving gaps for any traffic especially those turning out of the 467 Puhinui accessway, and
- Without formal upgrading of the Puhinui Road/Campana Road, there may be a lesser scale of shoulder widening on the eastern side of Campana Road as it approaches Puhinui Road to provide an additional queueing lane.

Such options can be considered and confirmed through subsequent resource consent processes to be followed for future developments.

I would be happy to discuss or expand on any of the details of the above as required.

Yours sincerely



Don McKenzie | **Director**
Don McKenzie Consulting Ltd

E: don@dmconsulting.co.nz

W: www.dmconsulting.co.nz

M: 021 656 191