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23/06/2023

Issued via email:

Dear Alison and Vanessa,

Re: Response to further information request for the Warkworth Package

Thank you for working with Te Tupu Ngātahi through the post-lodgement review process. This letter collates responses to the questions and matters raised in the Informal Request for Further Information letter, dated 6 June 2023 and as outlined in *Table 1 – Information Requested*. These were identified by Council to provide assistance in the analysis, and to better inform the consideration of the Warkworth Notices of Requirement.

As stated in the request letter, this information is sought on an informal basis as it is not considered to impact on a person's understanding of the notices of requirement in a manner that would affect notification.

Requests for information are set out in Table 1. However, please let us know if Council considers any correspondence is outstanding and not otherwise addressed.

Table 1: Council information request correspondence

Date	Topic
23 May 2023	<i>Supporting Growth Warkworth – Information Request</i> Transport Assessment
6 June 2023	<i>Supporting Growth Warkworth – Information Request</i> Ecological Assessment Planning Assessment Noise Assessment Transport Assessment Landscape Assessment Urban Design Evaluation

Note: Council advised that there were no Arboricultural, Stormwater/Flooding or Archaeological/Heritage information requests.

Through reviewing specialist commentary in the information request, we note there were several comments which raised the same issues relating to the approach to the assessment of receiving environment and methods to manage effects.

The approach to these matters is set out in Volume 2 AEE Section 9.3. For the avoidance of doubt, we have summarised the approach and provided a general response to these comments below.

Approach to assessing likely future receiving environment

The approach below has been discussed with Council at various stages in the Te Tupu Ngātahi programme and was accepted through the Te Tupu Ngātahi Drury Project hearing process.

Due to the time period between the designations being confirmed and construction commencing (up to 15 to 20 years depending on the NOR), assessing the effects on the environment solely as it exists today (i.e., at the time of this assessment) will not provide an accurate reflection of the environment in which construction and operation effects will be experienced.

In some cases, information based on the existing environment will effectively be redundant or outdated by the time the project is constructed. This is particularly the case in areas that are recently live zoned, up-zoned or FUZ and are currently rural, or peri-urban which are likely to experience material change as a result of urbanisation, enabled or anticipated by planning provisions.

Approach to managing future environment uncertainty

Due to the time period between the designation being confirmed and construction commencing, flexibility is sought to enable a response to future environment uncertainty. Therefore, in general, the NORs seek to use management plans which allow an adaptive approach, rather than standard conditions, which are more rigid and better suited to short term implementation projects. Several of these management plans will utilise the outline plan process, discussed below.

While the NOR secures the necessary envelope required to deliver the project and sets out the district plan matters to be authorised, the NORs will utilise the outline plan process as set out under s176A of the RMA. This allows for certain details of a project to be provided to the territorial authority at a later stage prior to construction, rather than with the NOR. The process enables the territorial authority to request changes to the outline plan, which the Requiring Authority can choose to accept or not.

This process is outlined in Figure 1 below. See AEE Volume 2, Appendix C for conditions proposed.

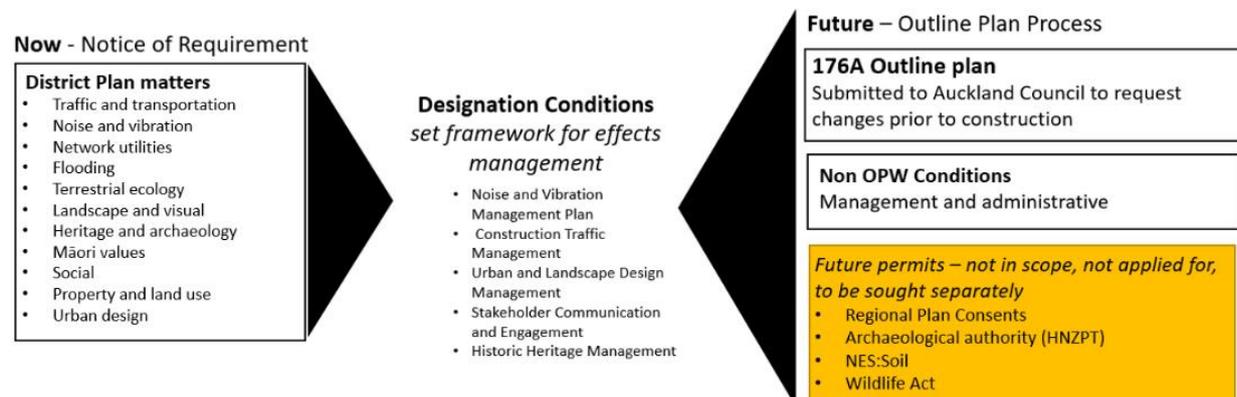


Figure 1: Notice of Requirement and Outline Plan Process

Responses are set out in Table 1 – Information requested below under the following subject headings:

- Transport
- Ecology
- Noise
- Urban design
- Landscape

Where the information is provided in the finalised documentation cross reference is made and the information is not duplicated in the table. Where clarification has been sought this is set out and where additional information is requested this is provided in the table and cross referenced.

Yours sincerely,

A handwritten signature in blue ink, appearing to read 'S. Titter', is positioned above the printed name.

Simon Titter

Lead Planner Warkworth

Response to Request for Further Information

Notices of Requirement - NoR 1 – NoR 8 – Warkworth

Item	NoR #	Material Reference	Item of Concern	Information Request	Reason for Request	<i>Te Tupu Ngātahi Response</i>
TRANSPORT						
TR1.	All	Assessment of Transport Effects Appendix 2 – Existing Crash Records		Review the date range that the crash data has been provided for so that the data is representative of network conditions that had typical traffic movements not influenced by COVID19 restrictions (i.e. pre-2020).	The crash data includes records during 2020 and 2021 during COVID. As noted in the appendix traffic volumes were reduced for extended periods during these years and may have had an influence on the number of crashes occurring.	<i>Although covid restrictions have influenced traffic volumes, the results do not indicate a significant difference in crash records across the years. In addition, it should be noted that it is difficult to compare historic crash results within a predominately rural Warkworth to a proposed future urban environment with lower traffic speeds. Notwithstanding this, for your information a summary of crashes for the five years pre Covid has been provided. See Attachment A.</i>
TR2.		General Comment – Road Cross-sections		For all NoRs, the key dimensions for the cross-sections should be provided to demonstrate that the anticipated corridor width (24m or 30m depending on the NoR) is able to accommodate all the proposed elements.	The cross-sections shown do not include key dimensions of the various elements. Dimensions should be provided to demonstrate that the proposed road reserve widths are sufficient for all the proposed design elements.	<i>The cross sections are at this stage considered to be indicative and the elements within the 24m and 30m comply with Auckland Transport Design Manual standards. The designation does not include more land than what is reasonably required. Notwithstanding this, there is scope within the corridor width to vary the allocation of space to</i>

				<p>Provide details of how the designation would take into account changes in design standards that may result in greater road reserve widths.</p>	<p>The NoRs are anticipated to be provided over a period of up to 25 years. Standards may change over that time, and this could affect the width of various elements of the road cross-section. The assessment does not consider how the designation may address changes in design standards should a greater road reserve width be required.</p>	<p><i>individual elements in a detailed design from that which is indicatively shown. In general, the following elements are provided for</i></p> <ul style="list-style-type: none"> - 6.8m berm environment to include 1.8m footpaths and 2.0m cycle paths - 10.4m carriage way (for a 24m cross section), and 16.4m carriageway (for 30m cross section). <p><i>There are exceptions to this within Warkworth to respond to typography and environmental constraints. This includes the use of a bidirectional cycle path (3.0m) and the rationalisation of berm and flush medians in isolated areas.</i></p> <p><i>These are all considered to be indicative layouts and further refinement of the cross section for all NoR is likely to occur at the detailed design phase.</i></p>
TR3.	All	General Comment – Medians on bridges		<p>Provide reasoning for the removal of the medians on the bridge decks in relation to the Safe System approach that has been adopted.</p> <p>Provide an assessment of the effects on the designation of retaining the</p>	<p>The designation drawings generally show that where a road bridge is provided and there is a median, the median is removed at the bridge, presumably to reduce the width of the bridge deck. The removal of the median may result in</p>	<p><i>The bridge designs have been indicatively shown without flush medians as this space is not required to facilitate turning movements. However, it is noted that the designations are sufficient enough to provide for a wider bridge at implementation if required.</i></p>

				<p>medians in order to provide flexibility in future design.</p>	<p>increased safety risks as there is no separation between opposing traffic flows at those locations. Furthermore, as design standards and requirements change over time, retaining the medians on the bridges for the purposes of setting the designation would appear appropriate unless there are other constraints that restrict the width of the bridges.</p>	
TR4.	All	General Comment – Access to adjacent land		<p>Provide details of how access to adjacent land that is either FUZ or likely to be developed will be enabled from the proposed NoRs.</p>	<p>It is not clear for a number of the proposed NoRs how access to adjacent land to be developed will be provided. For instance, the Western Link Road (South) and for Sandspit Link Road, these only appear to allow for through traffic movements; opportunities for new intersections to provide access to adjacent land appear extremely limited due to cut and fill.</p>	<p><i>Batters are based on existing topography. It is anticipated that these will change with earthworks completed by developers in association with the development of the adjacent land. Detailed design will consider opportunities for refining the design to enable connections and integration with adjacent development.</i></p> <p><i>In this regard the UDLMP condition further addresses the integration of the Project's permanent works into the surrounding landscape and urban context, including the surrounding existing or proposed topography.</i></p>

TR5.	All	Assessment of Transport Effects 3.2.2 Transport Guidance and Documents		Confirm that the corridor typology and modal split of each corridor has been approved by the Auckland Transport RASF Committee as outlined in Section 3.2.2	The typology and modal priority derived from the Auckland Transport Roads and Streets Framework (RASf) is required to be approved by Auckland Transport. If the typologies assumed in the analysis have not been approved by Auckland Transport this poses a risk that the NoR may not provide sufficient corridor width.	<i>We've been working with AT SME's throughout the DBC/NOR process. We can confirm that the Indicative RASf provided have been endorsed by the Auckland Transport RASf Committee as part of the Warkworth DBC. It is noted that the RASf assessments are subject to change in response changing land use. It is expected that the RASf assessments will be updated prior to implementation.</i>
TR6.	NoR3	Assessment of Transport Effects 8.3 Project Interdependencies (NoR 3)		Provide details of traffic volumes on SH1 within the NoR 3 corridor between the SH1 / Wider Western Link Road intersection with and without the southern interchange.	The table in this section presents traffic volumes on SH1 south of the Future Urban Area with and without the southern interchange. These flows will be outside of the NoR corridor (or at least in the southern extent of the corridor where flows are likely to be lowest). Details of traffic volumes on SH1 within the corridor north of the SH1 / Wider Western Link Road intersection should be provided so that the effects of the southern interchange are better understood.	<i>The traffic volumes on SH1 to the north of the Wider Western Link are expected to be With the Southern Interchange (2048+): 15,356 ADT Without the Southern Interchange (2048+): 13,971 ADT These ADT are expected to be reasonably accommodated within a two lane corridor. The increase in traffic volumes with the interchange in place is due to a rerouting of traffic from accessing Ara Tūhono in the north, to an increase in traffic accessing from the Southern Interchange.</i>

TR7.	NoR4	Assessment of Transport Effects Layout for NoR 4		Review the indicative design where it ties into the Matakana Link Road roundabout to confirm that the designation is sufficient in this location.	The indicative alignments for the NoR do not tie in with the underlying alignments on the approaches to the Matakana Link Road roundabout. This may affect the extent of the designation in the vicinity of the Matakana Link Road roundabout.	<i>As stated, design is at this stage indicative and sufficient to inform the required footprint. Our designation ties into and overlaps with the designation for Te Honohono ki Tai providing sufficient flexibility for tie in to occur. Details of tie in will be confirmed at detailed design phase.</i>
TR8.	All	Assessment of Transport Effects 5.2.3 Recommended measures to avoid, remedy or mitigate construction effects (Wider Network Effects)		Confirm that the condition recommended in Section 5.2.3 of the Transport Effects Report will be included in the conditions for each NoR.	A CTMP condition is recommended within the report. However, the conditions provided for each NoR do not reflect this recommended condition. Therefore, the identified effects may not be adequately mitigated.	<i>While the Transport Assessment suggests a Hill Street related condition it is noted that the CTMP condition is intentionally broad in order to respond to the prevailing transport environment at the time of implementation. As such it is considered that the CTMP is sufficient.</i>
TR9.	NoR1	Assessment of Transport Effects 6.6 Recommended		Please provide details as to how the positive benefit of improved access to the cemetery adjacent to NoR will be achieved or	Improved access to the cemetery is identified as a positive benefit of the NoR. The proposed conditions do not make reference to the	<i>The Transport Assessment has identified this as an opportunity. The proposed Urban Design and Landscape Management Plan Condition specifies that a UDLMP will be prepared prior to</i>

		ded measures to avoid, remedy or mitigate construction effects (NoR 1)		protected by the conditions for NoR 1.	cemetery access and therefore, there is no certainty that this benefit will be realised. A condition that refers to cemetery access being provided or at least not precluded by the design should be included.	<p><i>the Start of Construction for a Stage of Work. It will specify that:</i></p> <p><i>To achieve the objective, the ULDMP(s) shall provide details of how the project:</i></p> <p><i>(i) Is designed to integrate with the adjacent urban (or proposed urban) and landscape context, including the surrounding existing or proposed topography, urban environment (i.e. centres and density of built form), natural environment, landscape character and open space zones;</i></p> <p><i>(ii) Provides appropriate walking and cycling connectivity to, and interfaces with, existing or proposed adjacent land uses, public transport infrastructure and walking and cycling connections;</i></p> <p><i>(iii) Promotes inclusive access (where appropriate);</i></p> <p><i>It is considered that this condition will sufficiently capture the opportunity for connectivity to the cemetery.</i></p>
TR10.	NoR7	Assessment of Transport Effects 12.2.3		Please provide plans that show how alternative access routes would be achieved within the designation to provide	The report states that there are options to provide access to properties that are affected by the alignment of the Sandspit Link which	<i>During construction the effects on access are proposed to be managed via the CTMP Condition.</i>

		Property Access (NoR 7)		access to the properties that are affected by the Sandspit Link during the operation of the project.	follows the existing driveway / access. These options include construction staging from the north or provision of an access route adjacent to the corridor. It states that the designation is sufficiently wide to provide for this. However, the plans provided show extensive batters that extend for much of the designation width and it is not clear whether it is practical to provide adjacent access routes.	<i>It is intentionally general to cover sites that are present at the time of implementation, some of which may not exist currently. We consider that the designation is wide enough to accommodate construction and access through the use of haulage routes or implementation staging. This will be completed in consultation with properties that utilise the access.</i>
TR11.	NoR7	Assessment of Transport Effects 12.4 Recommended measures to avoid, remedy or mitigate construction effects (NoR 7)		Please provide details as to how the conditions specifically address the effects of the construction of the NoR on access to the Quarry and the recycling plant as recommended in the Assessment of Transport Effects report Section 12.4.	The Assessment of Transport Effects specifically references the need to give consideration to the quarry and the recycling plant in the CTMP. These activities are not included in the condition. There is a risk that these activities may not be appropriately considered for mitigation.	<i>During construction the effects on access are proposed to be managed via the CTMP Condition.</i> <i>It is intentionally general to cover sites that are present at the time of implementation, some of which may not exist currently. We consider that the designation is wide enough to accommodate construction and access through the use of haulage routes or implementation staging. This will be completed in consultation with properties that utilise the access.</i>

TR12.		Assessment of Transport Effects Appendix 3 - Traffic Modelling		Please provide further modelling output in the form of SIDRA Model layouts, modelled traffic signal phasing (where applicable) and Summary Lane Outputs should be provided.	Summary SIDRA modelling output has been provided in Appendix 3. To assist in reviewing the modelling output the SIDRA Model layouts, modelled traffic signal phasing (where applicable) and Summary Lane Outputs should be provided.	<i>The requested SIDRA files have been provided. However, it is noted that these intersection models have been developed to inform the indicative footprint for key arterial intersections on the Warkworth network. The actual intersection form and layout is expected to be reviewed in the future when greater certainty is available. It is noted that this is covered in the UDLMP where the intersection form will be confirmed as part of the concept design.</i>
TR13.	NoR2	Assessment of Environmental Effects Table 12.1 (NoR 2)		Please provide confirmation as to whether the access to 101 Woodcocks Road is able to be reinstated and whether the property is to be included within the designation. If the access is unable to be reinstated, provide details as to why this cannot be achieved and an assessment of the effects in the Assessment of Transport Effects report.	Table 12.1 of the AEE states that the access to 101 Woodcocks Road is not feasible to reinstate and that the designation will include this property. However, the Assessment of Transport Effects states that all property accesses are able to be reinstated. Furthermore, the plans for the designation do not show that the whole property is included in the designation. It is therefore unclear whether this property access is able to be reinstated.	<i>Following a design review we have reduced the designation adjacent to 101 Woodcocks Road as an access solution is considered to be feasible. Notwithstanding this, the proposed access condition requires the Requiring Authority to consult with landowners that are directly affected by proposed changes to existing vehicle access. In this regard it is confirmed that there is a drafting error in Table 12.1 of the AEE and that the transport assessment is correct and should be referenced in the first instance.</i>

TR14.	NoR5	Assessment of Environmental Effects Table 12.1 (NoR 5)		<p>Table 12.1 refers to accesses to properties at 34 and 36 Sandspit Road. There is no reference to the effects on access to these properties in the Assessment of Transport Effects. There is uncertainty around the development of this site and thus how the site may be accessed in the future (depending on lodged consents and / or plan changes for the site). Therefore, there is a risk that the NoR may not adequately address access to these properties. It is noted that the AEE also refers to the access to 325 Sandspit Road, but this is not mentioned in the Assessment of Transportation Effects.</p>	<p>An assessment of the effects on the access to 34 and 36 Sandspit Road, and on access to 325 Sandspit Road should be included in the Assessment of Transportation Effects, including any recommendations to mitigate the effects on access to these properties.</p>	<p><u><i>34 and 36 Sandspit Road</i></u></p> <p><i>Following a design review we have reduced the designation adjacent to 34 and 36 Sandspit Road as an access solution is considered to be feasible were these properties to remain as standalone lots. Additionally, it is noted with regard to these properties that the landowner has advised us that an alternative access through the adjacent Part Lot 51 DP 703 (which is now held in common ownership with 34 and 36 Sandspit Rd) may also be a possibility to service these properties.</i></p> <p><i>Consent (BUN60400973) has also recently (May 2023) been granted for the development of 34 and 36 Sandspit Rd, and the adjacent Part Lot 51 DP 703. Were this development to proceed as per the approved consent the existing dwellings would be removed with a new access arrangement established to service this development. The proposed designation would not preclude this access being established.</i></p> <p><i>It is confirmed that there is a drafting error in Table 12.1 of the AEE and that the transport assessment is correct and</i></p>
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						<p><i>should be referenced in the first instance.</i></p> <p><u><i>325 Sandpit Road</i></u></p> <p><i>It is likely that the access to 325 Sandpit Road will need to be redesigned at detailed design to ensure an appropriate tie in</i></p> <p><i>In this regard it is confirmed that there is a drafting error in Table 12.1 of the AEE and that the transport assessment is correct and should be referenced in the first instance.</i></p>
ECOLOGY						
EC1	All	EclA Section 16.2 & 16.3	Wetland/ Stream reclamation	Please provide information to demonstrate that the designations boundaries have sufficient capacity to provide potential required offsetting for wetland and stream reclamation.	<p>The EclA estimates that approximately 14,863 m² of wetland and 868 m of stream habitat will be reclaimed across the 8 NoRs as part of the works.</p> <p>The EclA states that both streams and wetlands “<i>have been modified and degraded to varying degrees, and there is opportunity to restore riparian habitat along these features.</i>”</p>	<p><i>As indicated potential offsetting which may be required for streams and/or wetlands is a regional matter. Due to the indicative nature of the design, and therefore an acknowledged level of uncertainty regarding the extent of offsetting which may be required at the time of implementation, it is considered appropriate to address this matter at the detailed design phase through the regional consenting process. For example, some wetlands may not be impacted in the future, or to a lesser extent, following completion of detailed design through reduction/integration of</i></p>

					<p>Whilst it is recognised that these are preliminary figures, requiring additional analysis; no further information has been provided to demonstrate how any freshwater offsetting can be provided for within the designation boundaries.</p> <p>Although any activities requiring an offset are likely regional consenting matters, the NoR process would impact on any future assessments.</p>	<p><i>earthworks (with adjacent development), use of retaining and/or bridging structures.</i></p> <p><i>The NOR conditions, notably the ULDMP also provides for consideration of opportunities with regard to wetlands and riparian habitat features.</i></p>
EC2	2, 4, 7	EclA Section 16.1.4	Vulnerable terrestrial invertebrates	Please amend condition 21, or include a new condition, for a pre-vegetation clearance inspection for the identified terrestrial invertebrates.	Due to the potential presence of threatened native terrestrial invertebrates, the EclA recommends a pre-clearance inspection is undertaken prior to vegetation removal within NoRs 2, 4, and 7. No provision for such an inspection has thus far been included within the proposed conditions.	<i>Inspections are not considered to be required to address district matter effects. Section 16.1.4 is relevant to future resource consent considerations. Management under the Wildlife Act will require the inspections referenced in this section.</i>

EC3	All	Proposed Conditions	Pre-construction Survey Condition	<p>Please amend the pre-construction ecological survey condition (21) on the designation to include the entire footprint and to include a survey of all native fauna.</p> <p>Survey findings should also be provided to Council for certification.</p> <p><i>Note that this would also require amendments to the EMP conditions (22-24).</i></p> <p>Due to the presence of at-risk herpetofauna and absence of any required management within the proposed conditions, it is recommended to include an advice note stating the need to comply with the Wildlife Act, such as the below.</p> <p>Advice Note: <i>All native birds, bats, and lizards are protected under the Wildlife Act 1953 (unless specifically excluded), under which it is</i></p>	<p>It is considered the lapse period of the designations means that native species not previously identified could colonise the area; particularly for non-wetland birds within the designation boundaries for new roads (current rural land, NoRs 1, 6, 7, 8).</p> <p>Additionally, habitat values could significantly improve, or the threat status of the native fauna present could be altered over the lapse period (which would affect the ecological value, and level of effect).</p> <p>The relief sought is to include the entire designation footprint for the survey, rather than being specific to 'confirmed biodiversity areas'.</p> <p>Furthermore, although the EclA has determined no mitigation is required for native herpetofauna, it does note the likely presence of at-risk species across all</p>	<p><i>The level of effect (for district matters) was informed by specific spatial features (habitat or potential habitat) for both present and future environments. Where there was uncertainty, the likelihood of the potential effect occurring was increased. Following this approach, 'the confirmed biodiversity areas' include features that would otherwise not have been included and is therefore considered a conservative estimate.</i></p> <p><i>There is no basis to support the assumption that habitat within the existing rural areas will significantly improve in value, or that species that may recruit into this habitat is sensitive to district matter effects.</i></p> <p><i>The provisions of the Wildlife act are not constrained to 'confirmed biodiversity areas'.</i></p>
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				<i>an offence to disturb, harm, or remove them without a permit from the Minister of Conservation.</i>	NoRs and the potential for individual effects.	
EC4	All	Proposed Conditions	Conditions definition	Update the definition to include potential future revisions of the EIANZ Guidelines.	Concern is expressed with the definition as proposed, referring to the 2018 EIANZ Guidelines, which could be substantially out of date when the designation is given effect to.	<i>The condition reflects the current guidelines - no change is proposed.</i>
NOISE						
CNV1.	All	Construction Noise and Vibration	Executive Summary and NoR Sections	Please update and confirm the potential effects relative to those identified as identified in your Table 7-1.	The executive summary and NoR sections appear to downplay the potential effects description for a number of the instances where predicted levels are above 80 dB LAeq, please update and confirm the potential effects relative to those identified as identified in your Table 7-1.	<i>The effects we have described in the executive summary and NoR sections are valid based on the noise level and expected durations of exposure, however we note that external noise levels above 85 dBA could also result in internal noise levels that are unlikely to be tolerated for any extent of time. It is anticipated that (as required) this will be addressed through the CNVMP.</i>
CNV2.	All	Construction Noise and Vibration		Please either update or provide clarification as to how these hours and limits have been identified as appropriate. Noting that 1mm/s PPV night-time limit was adopted for Drury.	The hours and limits in Table 5-3 don't match those in the AUP for vibration limits (particularly night-time limits for category B), please either update or provide clarification as to how these	<i>The Category A criteria relate to amenity, and are consistent with the criteria set out in the AUP. We note that we have used a longer duration for the night-time than is set out in the AUP criteria, which would lead to a better outcome for receivers in terms of vibration exposure. The Category B</i>

					hours and limits have been identified as appropriate. Noting that 1mm/s PPV night-time limit was adopted for Drury.	<i>criteria primarily relate to building damage during the daytime, however we consider 2 mm/s PPV is an appropriate night-time criteria for Category B, and this aligns with the criteria adopted for the North-West SGA packages.</i>
CNV3.	All	Construction Noise and Vibration		This table should be checked and updated to ensure it is in accordance with NZS 6803.	Table 6-2 contains free field noise levels at varying distances which don't match the identified sound power levels in the same table (unless they include façade corrections, but they are labelled free-field). This table should be checked and updated to ensure it is in accordance with NZS 6803.	<i>The table erroneously identifies the noise levels as being free-field. The levels should be labelled as facade-corrected. The corrected table is reproduced in this response as Attachment A.</i>
CNV4.	All	Construction Noise and Vibration		These numbers should be checked and updated to ensure it is in accordance with NZS 6803.	Similar to above, the set back distances to comply in Table 6-3 don't make sense as presented (they may not include façade correction). These numbers should be checked and updated to ensure it is in accordance with NZS 6803.	<i>The set-back distances in this table are based on free-field noise levels and not facade-corrected noise levels, this was done in error. An updated list of receivers that fall within the relevant set-back distance for a facade-corrected level is presented in this response as Attachment D. We note that this change has almost no impact on the outcomes of the assessment, as noise effects will be re-considered in detail at the time of construction when the CNVMP is prepared.</i>

CNV5.	All	Construction Noise and Vibration		Appendix A and B list the existing properties where exceedances of noise and vibration are expected but does not provide the corresponding predicted noise/vibration levels. This is important in helping to understand the context, i.e., the actual level of exceedance across the receivers.		<i>That would be a significant amount of work and not serve much purpose with construction happening far into the future. For each NOR we have described the upper noise levels in the report. We consider the assessment should focus on management rather than levels.</i>
CNV6.	All	Construction Noise and Vibration		Please also provide the expected duration of infringements (noise and vibration) to enable understanding of the context.		<i>Construction will take place many years from now, and predicting these infringements requires knowledge of the construction methodology to a degree that will only be available much closer to the time of construction. The CNVMP and Schedules (if required), which will be produced at the time of construction, will contain this level of detail.</i>
CNV7.	All	Construction Noise and Vibration	AUP OP rules	It would be helpful to have confirmation that identification of whether E25.6.29 or E25.6.27 apply (due to future road corridor status) or would take place at detailed design phase.		<i>We are not proposing to apply E25.6.29. Application of this provision will be confirmed at the detailed design phase.</i> <i>It is considered that typically this provision would not be as relevant to Projects of a larger scale. Additionally, it is anticipated that other development works will also be likely to be occurring outside of the road corridor at the same</i>

						<i>time. As a result it can be potentially confusing and difficult to separate out different parts of the works and apply the different rules.</i>
CNV8.	All	Construction Noise and Vibration	Vibration measurement	Mention is made of measurement of vibration on other major projects resulting in much lower levels than predicted – given this statement it would be beneficial if these measurements/lessons learned could be used to provide a more accurate prediction of extent of vibration effects for this project.		<i>Each site is different, and this will depend on the ground conditions, foundation type, construction of buildings, and exact equipment used and its location relative to the receiver. This assessment is to support the confirmation of route protection and more accurate predictions of vibration readings for this project can be completed during the detailed design and regional consenting stage.</i>
CNV9.	All	Construction Noise and Vibration	Construction boundaries	The closest existing receivers to the construction boundary are provided for each NoR. It would be useful to understand (for each of the NoRs) what the closest future buildings potentially could be (acknowledging specifics cannot be known but that future zones and non-fanciful developments can be assumed) at the time of works taking place.		<i>Due to the current nature of the surrounding environment and future development anticipated we are unable to provide an indication of all the buildings which exist at the time of construction. When the projects are ready for implementation all buildings within the extent of the project will be included in the CNVMP.</i>

				This would enable appreciation of future effects when the works take place given the references are provided to the distance from works at which certain limits would be met.		
CNV10.	All	Construction Noise and Vibration	Vibration measurement	Vibration is referred to as exceeding certain categories but no specific levels are provided, so the magnitude is difficult to understand (cosmetic damage only or greater potential effects). Provision of the upper levels of vibration based on distances as already predicted, as has been provided for noise, would be useful in informing this.		<i>We don't calculate exact vibration levels at this stage, because we are only providing information to support the confirmation of route protection and are unable to confirm the future environment. We use the emission radii to determine where exceedances could occur. This is standard practice.</i>
CNV11.	All	Construction Noise and Vibration	Vibration Limits	Where Category A vibration limits (AUP amenity limits) are likely to be exceeded it would be useful to understand the potential anticipated durations of these exceedances based on		<i>It is not possible to know this at this stage as construction for the projects will not commence until 15-25 years from now.</i>

				experience on other similar projects.		
OPNV12.	All	Operational Noise/Vibration	Altered Road	It would be helpful if the evidence/more information were provided for each NoR identified as not meeting the definition of Altered Road explaining how this position has been arrived at rather than just a statement that it is the case. Not a repeat of the definition but a short statement clearly noting predicted levels/changes within the report body text to make it clear.		<i>The definition of an Altered Road is set out in Section 2.1. Each NOR refers back to this section when the definition is not met. We can copy and paste the definition into each NOR but we were trying to avoid unnecessary repetition. In terms of evidence, all of the predicted levels under each scenario are in tables in the appendices so it is easy to verify if the definition is met or not. We consider that the report provides sufficient detail to understand whether a given PPF met the definition of an Altered Road.</i>
OPNV13.	All	Operational Noise/Vibration	Consideration of likely effects	Whilst NZS 6806 limits its scope to existing and consented PPFs, given the future anticipated environment is noted as likely to change significantly in a number of scenarios (to include large increases in dwelling density and types, some of which may have been built ahead of the proposed projects) it would be beneficial to see more of		<i>We have assessed existing PPFs in accordance with NZS 6806. We provide noise contours across adjacent land which developers can use to appropriately locate and design their developments. This approach is consistent with earlier packages for SGA. As the report has been prepared to support NORs for future construction, we cannot identify what will be constructed and the projects associated to the NORs will undergo further detailed design and consider future effects. Only those noise sensitive</i>

				likely effects at future 'non-fanciful' development along the NoRs in those scenarios. This may be already partly considered for example if there existing dwellings which can be taken to be indicative of likely future developments in terms of location/distance from roads etc.		<i>buildings that exist at the time of the assessment (or have building consent) are assessed in relation to mitigation. The reason is that structural mitigation such as barriers require knowledge of the positions to be assessed, including any site access, and building modification mitigation only applies to habitable rooms, so are specific to the receiving buildings. Should any noise sensitive buildings be constructed between designations being obtained and the construction of the Projects, these buildings can be constructed to take account of the future noise levels using the noise level contours that have been produced. There is a shared responsibility of the road controlling authorities providing mitigation in the form of low noise road surface (where appropriate) and developers providing appropriate building envelopes and planning any subdivisions to avoid a conflict at the interface.</i>
OPNV14.	All	Operational Noise/Vibration	Uncertainties	The uncertainties section should be expanded to indicate where the true value is expected to be within X dB of the estimates provided for 95% of all observations –		<i>The uncertainties section contains sufficient detail for this assessment. It is consistent with the Drury and NW assessments. We are satisfied that the extent of detail covered in the report regarding uncertainty is sufficient for this assessment.</i>

				this is commonly provided using the ISO Guide to Measurement Uncertainty.		
URBAN DESIGN						
UD1.	All	Urban Design	Condi tions	Please provide an explanation as to how the urban design recommendations have been incorporated into the conditions, particularly those relating to the development of qualitative outcomes.	Each notice of requirement (NoR) references Section 12-21 of the AEE, which is focused on route protection, rather than implementation and development of specific outline plans. However, protecting a route and drawing boundary or designation lines on a cadastral map does throw up some potential aspects of any future project which need to be guided to avoid adverse effects on our urban and landscape environments. Warkworth Urban Design Evaluation, Section 17 Urban Design Matters to all NORs is based around a series of 'principles' and description of what they mean, further information and descriptions are provided and some intentions which read very	<i>We consider all of the urban design recommendations are addressed through the proposed NOR conditions - most notably Condition 9 which requires a ULDMP.</i>

					<p>much like policies example (2.4 To enable equitable local connectivity and cross corridor access to commercial centres and areas of high density...)</p> <p>'Policy commitments' is a means of managing effects of the designation, as they are able to create more certainty for outcomes and inform the development of the outline plan of works. I consider these aspects of the recommendations importance to the development of the outline plan of works, however the conditions relating to the individual NoR's appear to dispense with these matters, and the urban design recommendations more specific to each NOR are not referenced in any way in Condition 9 relating to the ULDMP.</p>	
UD2.	All			Please provide the reference within these documents, that support the policy type intent	Reference has been made to the ULDMP being prepared in general accordance with several	<i>The documents referenced are current Auckland Transport and Waka Kotahi Guidance. As these documents may change in the future identifying specific</i>

				<p>recommendations contained in the Urban Design Evaluation; and where there is no support in these documents, appropriate additional notation in 9. (d) of the conditions. This would provide a level of confidence that the UDDMP will incorporate the relevant guidance and weighting appropriate for the development of the outline plan of works relating to each NoR.</p>	<p>documents which influence design outcomes. Many documents of this type provide for a pick and mix selection which still enable poor outcomes and effects on the environment depending on the mix chosen.</p>	<p><i>areas within these documents is not considered appropriate at this time. Note: The ULDMP condition also makes reference to any subsequent update version(s) of these documents.</i></p>
UD3.	All			<p>Please notate the recommendations contained in the Warkworth Urban Design Evaluation to illustrate their inclusion within condition 9 (d) (i) through to (iv), and where they have not been covered suggest changes to part (d) of the condition.</p>	<p>It may be considered that the recommendations of the Warkworth Urban Design Evaluation are covered by condition 9 (d) (i) through to (iv) however please confirm if this is the case.</p>	<p><i>We consider the recommendations in the Urban Design Evaluation are appropriately reflected in the NOR conditions as a whole.</i></p>
UD4.	All		Condi tions 7 and 9	<p>Please advise if there is any consistency issue, and what is the difference or advantage of 9 (a).</p>	<p>Consistency between Condition 7 and 9. Condition 7 Management Plans, of which Urban and Landscape Design</p>	<p><i>Condition 7 covers all management plans and as such is broader in nature and provides a degree of flexibility as may be appropriate to a particular activity and/or management plan. In all</i></p>

					<p>Management Plan (ULDMP) is one, states that it is to be submitted as part of the Outline Plan (v) (either in whole or in stages (b) (i)). But, as part of a full or staged outline plan. Condition 9 (a) however, requires the ULDMP to be prepared prior to the start of construction for a stage of work.</p>	<p><i>cases the more specific condition i.e. Condition 9 ULDMP takes precedence over the general management plan condition.</i></p>
UD5.	NoR1		Building works for bus station etc	<p>Please confirm whether it is the intention that the design of the buildings associated with the busway station be managed through a resource consent process (assuming it is not a permitted activity), or outline plan of works?</p>		<p><i>It is anticipated that buildings will be managed through the outline plan process. The ULDMP condition (e)(iii)c requires a design response to any public transport stations/building.</i></p>
UD6.	NoR1		Building works for bus station etc	<p>Please provide a solution to ensure that the design quality and consequent effects of these buildings can be considered at either the resource consent stage (needs to be included in the condition) or outline</p>	<p>The ULDMP offers no guidance to the design quality of the busway stations buildings, and (d) deals mainly with the functionality aspects of design and not the qualitative design of its appearance or relationship</p>	<p><i>The established standards and guidelines provide guidance for public transport stations/building. In addition, ULDMP condition (e)(iii)c requires a design response to any public transport stations/building.</i></p>

				plan or works in relation to NoR 1.	to the existing busway station buildings.	
UD7.			Condi tions	Please provide an assessment and approach to managing the affects of acoustic fencing on the environment	Condition 24 and 25. Traffic noise is significantly generated by the sound of vehicles rolling over a surface and passing through the air, noting that stop and starts, inclines and speed also contribute to the traffic noise environment. There is concern that it would be unacceptable to have acoustic fencing adopted either in future urban zonings and rural zones to mitigate noise on dwellings and places subject to high pedestrian use as a first line of mitigation. In these situations, low noise road surface needs to be applied, and the use of double glazing to protect the internal environment of affected dwellings and potentially the repositioning of dwellings. Acoustic fencing will impact on amenity, overlook and street	<p><i>A condition is proposed requiring the use of low noise road surface for an upgrade or extension to an existing road is within or adjacent to urban zoning.</i></p> <p><i>For potential traffic noise it is acknowledged that while acoustic fencing is one form of mitigation it is not necessarily a desired outcome for an urban environment. The conditions require that as part of the detailed design of the Project, the Selected Mitigation Options for the identified PPFs are to be determined. Selected Mitigation Options means the preferred mitigation option resulting from a Best Practicable Option assessment undertaken in accordance with NZS 6806. Detailed Mitigation based on the Selected Mitigation Option are to be developed prior to construction. Additionally, the ULDMP condition requires a design response to noise mitigation (if required), which would be confirmed as required through detailed design. The UDLMP also requires the integration with adjacent urban and landscape context and appropriate interfaces with adjacent land uses. In</i></p>

					frontage conditions, and it would be rarely acceptable to create significant lengths within a rural context without undermining landscape amenity.	<i>this regard it is anticipated that developers of adjacent land also have a role to play with regard to these interfaces, with a shared responsibility to any response to noise (as required).</i>
LANDSCAPE						
LS1	All	Proposed conditions requiring ULDMPs	Too generic	For each proposed ULDMP conditions, provide bespoke design principles and localised requirements to avoid, remedy and/or mitigate adverse landscape and visual effects that are specific to the context and issues of each NoR corridor / area.	While the approach and intent of each ULDMP condition for the NoR corridor / areas is understood, with design detail to be provided at Outline Plan stage, these conditions should be informed by the findings of the assessment of landscape effects that has occurred when assessing each of the NoRs. This request is similar to the urban design request at UD1 above.	<i>All of the landscape and visual recommendations are addressed through the proposed NOR conditions - most notably Condition 9 which requires a ULDMP. We are confident the recommendations in the landscape and visual assessment are reflected in the NOR conditions as a whole.</i> <i>Until detailed design is undertaken, bespoke or localised requirements to avoid, remedy or mitigate effects cannot be developed given that future urbanisation processes of the surrounding area may alter the appropriate design response.</i>
LS2	All	Assessment of the effects on the natural character of rivers and their margins	Lack of any assessment	The assessment of landscape effects provides very little consideration of the potential adverse effects on natural character that may arise for each of the NoR corridors / areas that are in close	Once a designated corridor has been confirmed, it may make it difficult to meaningfully avoid, remedy or mitigate adverse effects on the natural character of rivers and their margins, particularly given spatial	<i>For FUZ land which is currently rural, or peri-urban, it is anticipated that these areas are likely to experience material change (from the existing situation) as a result of urbanisation, enabled or anticipated by planning provisions, including in relation to the perception of natural character in this environment.</i>

				<p>proximity to existing waterbodies – for the reason that these issues are to be addressed as part of future applications for regional resource consents.</p>	<p>constraints of designated land. Any potential effects should be raised at the time of NoR.</p>	<p><i>Landscape matters were a consideration through the option/alternatives assessment process to endeavour to avoid and address, adverse landscape effects in the first instance, where it was practicable to do so.</i></p> <p><i>As noted, the issue of potential mitigation which may be required following confirmation of the detailed design will be addressed as part of future applications for regional resource consents. This approach is considered appropriate due to the indicative nature of the design and the subsequent uncertainty around what the actual effects will be, as well as the uncertainty around what features, and what the status of these may be, at the time of implementation.</i></p> <p><i>This is consistent with the approach for ecology and stormwater / flooding management which is the basis for the landscape approach.</i></p>
LS3	All	Mapping analysis	Mapping scale is too large at	Please provide GIS elevation and hydrology mapping that is specific for each NoR spatial corridor /	The GIS elevation and hydrology maps that are included within and support the assessment of	<i>It is considered that the current GIS elevation and hydrology mapping information, combined with the additional documentation and drawings,</i>

			1:30,000	area and includes the general arrangement plan information, at a closer scale (minimum 1:10,000) than has currently been provided within the assessment.	landscape effects are at too large a scale to allow for an understanding of the proposal within context of the local landform, such that it is difficult to assess potential effects.	<i>is sufficient for assessment of the NOR to occur. The NoRs are available to view on the Auckland Council GIS viewer with hydrology contours.</i>
LS4	All	Structure Plan overlay map	Consistency check	Please provide a map at the same scale as the Warkworth Structure Plan map, with an overlay that illustrates the location and extents of the corridors / areas for each NoR.	In order to understand whether or not the proposed NoR corridors / areas are consistent in location and extent as the roading infrastructure anticipated in the Warkworth Structure Plan.	<p><i>Section 9.1, AEE - The Structure Plan sets out the pattern of land uses and supporting infrastructure network for the future growth areas of Warkworth. The structure plan provides guidance for future development and infrastructure but is noted as being indicative and subject to future processes.</i></p> <p><i>Where relevant, the urban land use patterns and indicative infrastructure outlined in Auckland Council's Structure Plan for the Warkworth growth areas has been considered. In the majority of cases the proposed corridors generally align with the indicative corridors shown in the structure plan - refer Warkworth Overall Plan.</i></p> <p><i>NoRs are available to view with structure plan overlay on the Auckland Council GIS Viewer</i></p>
LS5	All	Consideration of Māori	Lack of detail	Please provide further consideration of the actual	The assessment of landscape effects is not	<i>Only Manawhenua can speak to the impact that a project may have on their</i>

		cultural landscape values		and potential effects on identified Māori cultural landscape values as part of the assessment of landscape effects, taking into account the Cultural Values Assessment(s).	entirely consistent with the Tuia Pito Ora, New Zealand Institute of Landscape Architects, 2022 Te Tangi a te Manu Aotearoa New Zealand landscape assessment guidelines.	<p><i>cultural values, heritage and aspirations. The methodology for assessing effects has been to engage with Manawhenua representatives and seek input on the potential impacts of each corridor. Manawhenua Māori culture, values and aspirations are addressed in the AEE section 11.</i></p> <p><i>Due to the expressed preferences from the author of the CIA this document was not made available for consideration in specialist assessments, including the landscape assessment.</i></p> <p><i>Te Tangi a te Manu is a guide, in this specific project we have deferred to the wishes of Manawhenua. Refer to the proposed conditions for process of incorporating Manawhenua values into process.</i></p>
LS6	All	Assessment of landscape effects document	General observations	<p>a. Parts of the assessment have been written in the 'first person' rather than being consistently in the 'third person';</p> <p>b. There is a 'hyperlink' error message / typo within the last sentence before the heading of</p>	A suggestion that these matters be tidied-up or addressed where possible.	<p>a) <i>this is not considered a material requirement for the assessment - no change.</i></p> <p>b) <i>Formatting Issue. Link unnecessary and has been removed. The Urban Design Evaluation is included in Volume 4.</i></p>

				<p>'Section 2 Introduction' on page 6; and</p> <p>c. The summary tables on pages 113-115 are somewhat confusing and it is recommended that there is some form of explanatory text associated with each table so that they can be put into context. For example, does the first table (which starts on page 113) record the existing landscape and natural character of the various areas / scales? The first row on each of the second and third tables should be checked against Table 8 on page 35 as there appears to be some discrepancy between these findings.</p>		<p>c) <i>Formatting error - headings were on the table, but below instead of above table, and summary table was repeated. Pages 113-115 have been updated to have headings and provided below as Attachment F. Thanks for picking up track-changes issues with summary table 8, this has been rectified and provided below as Attachment E.</i></p>
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Attachment A – TR1 – Crash Summary Pre-COVID

Existing Crash Records

	Vehicle Crashes per year						Total	Mid-Block (Total over 5 years)				Intersection (Total over 5 years)				Total DSI's
	2018	2019	2020	2021	2022	F		S	M	N	F	S	M	N		
Mansell Drive	1	2	0	0	0	3	0	0	0	1	0	0	2	0	0	
Sandspit Road	7	4	3	3	3	20	0	1	3	5	0	0	1	10	1	
Matakana Road	2	1	1	1	0	5	0	0	1	3	0	0	0	1	0	
Woodcocks Road (urban)	2	3	1	0	0	6	0	0	1	1	0	0	1	3	0	
Woodcocks Road (rural)	1	2	3	0	0	6	0	1	2	1	0	0	2	0	1	
SH1 (southern section)	6	10	5	5	4	30	2	1	7	5	0	0	7	8	3	

	Vulnerable Road User Crashes per year						Pedestrian (Total over 5 years)				Cyclist (Total over 5 years)				Motorcyclist (Total over 5 years)				Total DSI's	
	2018	2019	2020	2021	2022	Total	F	S	M	N	F	S	M	N	F	S	M	N		
Mansel Drive	0	1	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0
Sandspit Road	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1	0	0	0
Matakana Road	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Woodcocks Road (urban)	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0
Woodcocks Road (rural)	0	1	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0
SH1 (southern section)	0	1	0	1	0	2	0	0	0	0	0	0	0	0	0	0	1	1	0	0

	Vehicle Crashes per year						Total	Mid-Block (Total over 5 years)				Intersection (Total over 5 years)				Total DSI's
	2015	2016	2017	2018	2019	F		S	M	N	F	S	M	N		
Mansell Drive	0	0	0	1	2	3	0	0	0	1	0	0	2	0	0	
Sandspit Road	1	2	3	7	4	17	0	0	2	3	0	0	0	12	0	
Matakana Road	2	4	1	2	1	10	0	1	3	5	0	0	0	1	1	
Woodcocks Road (urban)	3	3	5	2	3	16	0	0	3	3	0	1	4	6	1	
Woodcocks Road (rural)	2	3	7	1	2	15	0	2	2	7	0	0	2	2	2	
SH1 (southern section)	6	5	6	6	10	33	1	2	8	10	0	0	4	8	3	

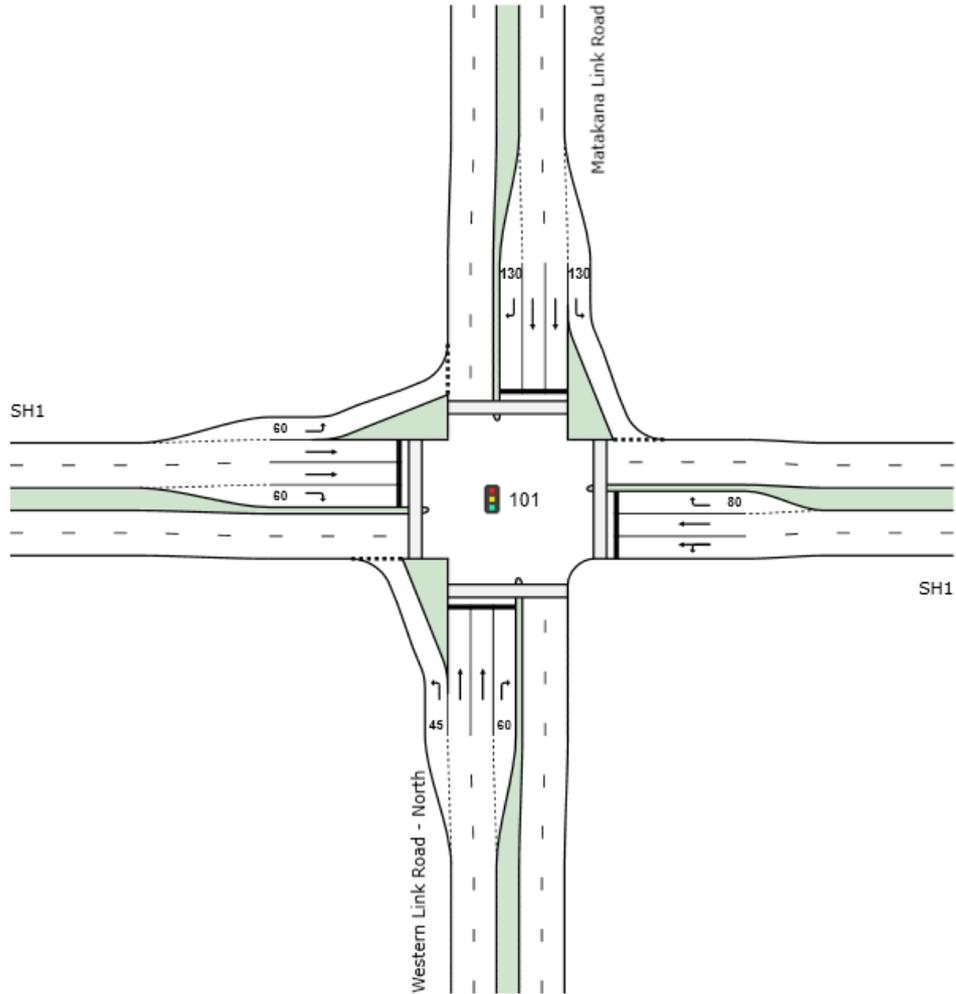
Attachment B – TR12 - SIDRA Output

Western Link - North /SH1/ Matakana Link Road

SITE LAYOUT

 **Site: 101 [Matakana Link Road - Western Link Road_AM]**

New Site
Site Category: (None)
Signals - Fixed Time Isolated



PHASING SUMMARY

Site: 101 [Matakana Link Road - Western Link Road_AM]

New Site
 Site Category: (None)
 Signals - Fixed Time Isolated Cycle Time = 100 seconds (Site User-Given Cycle Time)

Timings based on settings in the Site Phasing & Timing dialog

Phase Times determined by the program

Phase Sequence: Variable Phasing

Reference Phase: Phase A

Input Phase Sequence: A, B, C, D

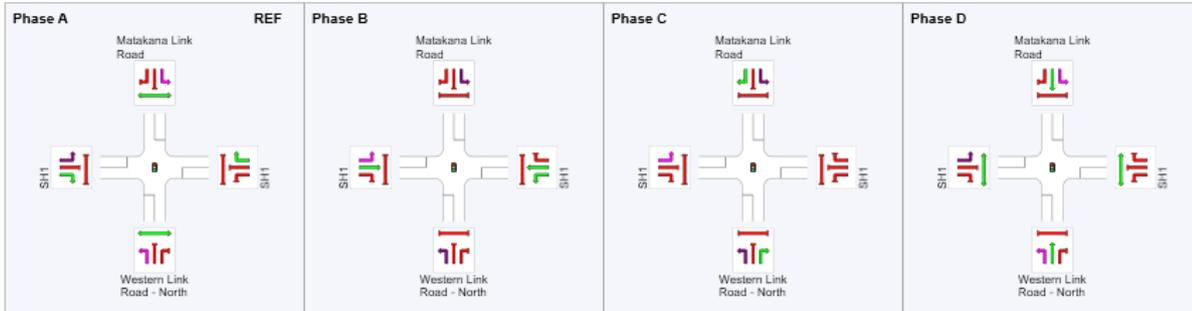
Output Phase Sequence: A, B, C, D

Phase Timing Summary

Phase	A	B	C	D
Phase Change Time (sec)	0	23	51	79
Green Time (sec)	17	22	22	15
Phase Time (sec)	23	28	28	21
Phase Split	23%	28%	28%	21%

See the Phase Information section in the Detailed Output 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, Phase Actuation and Phase Frequency values (user-specified or implied) less than 100%.

Output Phase Sequence



REF: Reference Phase
 VAR: Variable Phase



PHASING SUMMARY

Site: 101 [Matakana Link Road - Western Link Road_PM]

New Site
 Site Category: (None)
 Signals - Fixed Time Isolated Cycle Time = 100 seconds (Site User-Given Cycle Time)

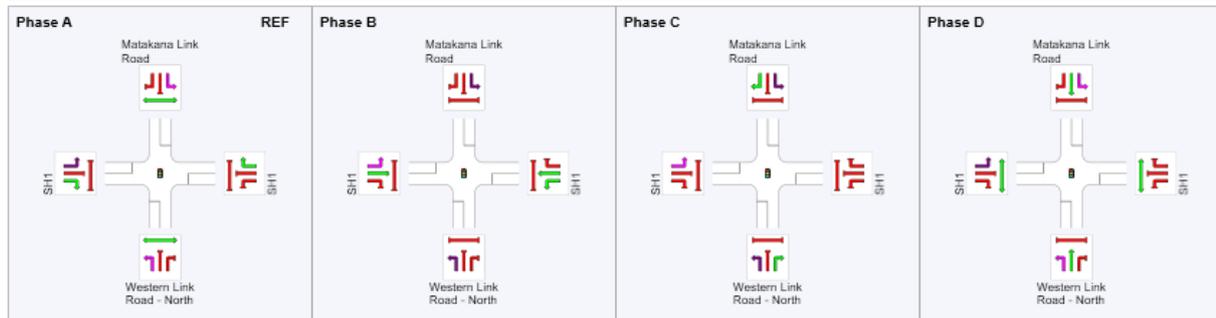
Timings based on settings in the Site Phasing & Timing dialog
 Phase Times determined by the program
 Phase Sequence: Variable Phasing
 Reference Phase: Phase A
 Input Phase Sequence: A, B, C, D
 Output Phase Sequence: A, B, C, D

Phase Timing Summary

Phase	A	B	C	D
Phase Change Time (sec)	0	28	55	79
Green Time (sec)	22	21	18	15
Phase Time (sec)	28	27	24	21
Phase Split	28%	27%	24%	21%

See the Phase Information section in the Detailed Output 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, Phase Actuation and Phase Frequency values (user-specified or implied) less than 100%.

Output Phase Sequence



REF: Reference Phase
 VAR: Variable Phase



LANE SUMMARY

Site: 101 [Matakana Link Road - Western Link Road_AM]

New Site

Site Category: (None)

Signals - Fixed Time Isolated Cycle Time = 100 seconds (Site User-Given Cycle Time)

Lane Use and Performance													
	Demand Total	Flows HV	Cap.	Deg.	Lane	Average	Level of	95% Back of Queue	Dist	Lane	Lane	Cap.	Prob.
	veh/h	%	veh/h	Satn	Util.	Delay	Service	Veh	m	Config	Length	Adj.	Block.
				v/c	%	sec					m	%	%
South: Western Link Road - North													
Lane 1	167	18.2	1017	0.165	100	10.2	LOS B	2.4	19.0	Short	45	0.0	NA
Lane 2	106	6.4	284	0.375	100	42.4	LOS D	4.8	35.5	Full	500	0.0	0.0
Lane 3	106	6.4	284	0.375	100	42.4	LOS D	4.8	35.5	Full	500	0.0	0.0
Lane 4	82	21.8	357	0.230	100	40.9	LOS D	3.3	27.8	Short	60	0.0	NA
Approach	462	13.4		0.375		30.4	LOS C	4.8	35.5				
East: SH1													
Lane 1	200	15.3	387	0.518	100	39.8	LOS D	8.8	69.5	Full	500	0.0	0.0
Lane 2	201	18.3	387	0.518	100	37.7	LOS D	8.8	71.2	Full	500	0.0	0.0
Lane 3	88	11.9	294	0.301	100	45.8	LOS D	3.9	29.9	Short	80	0.0	NA
Approach	489	15.9		0.518		40.0	LOS D	8.8	71.2				
North: Matakana Link Road													
Lane 1	89	28.2	1026	0.087	100	8.3	LOS A	0.9	7.4	Short	130	0.0	NA
Lane 2	65	10.5	277	0.236	100	41.3	LOS D	2.9	21.9	Full	500	0.0	0.0
Lane 3	65	10.5	277	0.236	100	41.3	LOS D	2.9	21.9	Full	500	0.0	0.0
Lane 4	195	8.1	390	0.499	100	43.2	LOS D	8.5	63.5	Short	130	0.0	NA
Approach	415	13.2		0.499		35.1	LOS D	8.5	63.5				
West: SH1													
Lane 1	248	14.0	1324	0.188	100	6.8	LOS A	1.6	12.8	Short	60	0.0	NA
Lane 2	159	22.2	379	0.420	100	36.8	LOS D	6.8	56.6	Full	500	0.0	0.0
Lane 3	159	22.2	379	0.420	100	36.8	LOS D	6.8	56.6	Full	500	0.0	0.0
Lane 4	146	19.4	280	0.522	100	47.9	LOS D	6.7	54.9	Short	60	0.0	NA
Approach	713	18.8		0.522		28.6	LOS C	6.8	56.6				
Intersection	2079	15.8		0.522		33.0	LOS C	8.8	71.2				

LANE SUMMARY

Site: 101 [Matakana Link Road - Western Link Road_PM]

New Site

Site Category: (None)

Signals - Fixed Time Isolated Cycle Time = 100 seconds (Site User-Given Cycle Time)

Lane Use and Performance													
	Demand Total	Flows HV	Cap.	Deg.	Lane	Average	Level of	95% Back of Queue	Dist	Lane	Lane	Cap.	Prob.
	veh/h	%	veh/h	Satn	Util.	Delay	Service	Veh	m	Config	Length	Adj.	Block.
				v/c	%	sec					m	%	%
South: Western Link Road - North													
Lane 1	178	18.9	1084	0.164	100	9.3	LOS A	2.2	18.0	Short	45	0.0	NA
Lane 2	156	4.4	287	0.544	100	43.7	LOS D	7.3	52.9	Full	500	0.0	0.0
Lane 3	156	4.4	287	0.544	100	43.7	LOS D	7.3	52.9	Full	500	0.0	0.0
Lane 4	172	6.7	322	0.532	100	46.8	LOS D	7.8	57.8	Short	60	0.0	NA
Approach	662	8.9		0.544		35.2	LOS D	7.8	57.8				
East: SH1													
Lane 1	193	16.5	364	0.530	100	41.5	LOS D	8.6	68.4	Full	500	0.0	0.0
Lane 2	189	24.4	357	0.530	100	38.7	LOS D	8.4	71.1	Full	500	0.0	0.0
Lane 3	54	25.5	349	0.154	100	40.2	LOS D	2.1	18.3	Short	80	0.0	NA
Approach	436	21.0		0.530		40.1	LOS D	8.6	71.1				
North: Matakana Link Road													
Lane 1	120	7.9	1093	0.110	100	9.3	LOS A	1.5	11.2	Short	130	0.0	NA
Lane 2	87	3.6	289	0.303	100	41.8	LOS D	3.9	28.1	Full	500	0.0	0.0
Lane 3	87	3.6	289	0.303	100	41.8	LOS D	3.9	28.1	Full	500	0.0	0.0
Lane 4	129	13.0	309	0.419	100	45.9	LOS D	5.8	44.8	Short	130	0.0	NA
Approach	424	7.7		0.419		33.9	LOS C	5.8	44.8				
West: SH1													
Lane 1	388	5.7	1342	0.289	100	7.2	LOS A	3.4	24.9	Short	60	0.0	NA
Lane 2	176	11.6	385	0.458	100	37.9	LOS D	7.7	59.0	Full	500	0.0	0.0
Lane 3	176	11.6	385	0.458	100	37.9	LOS D	7.7	59.0	Full	500	0.0	0.0
Lane 4	206	12.8	378	0.545	100	43.8	LOS D	9.1	70.8	Short	60	0.0	NA
Approach	947	9.4		0.545		26.6	LOS C	9.1	70.8				
Intersection	2469	11.0		0.545		32.5	LOS C	9.1	71.1				

MOVEMENT SUMMARY

 Site: 101 [Matakana Link Road - Western Link Road_AM]

New Site
 Site Category: (None)
 Signals - Fixed Time Isolated Cycle Time = 100 seconds (Site User-Given Cycle Time)

Movement Performance - Vehicles												
Mov ID	Turn	Demand Flows Total veh/h	Flows HV %	Deg. Satn w/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Western Link Road - North												
1	L2	167	18.2	0.165	10.2	LOS B	2.4	19.0	0.41	0.66	0.41	50.4
2	T1	213	6.4	0.375	42.4	LOS D	4.8	35.5	0.94	0.75	0.94	35.5
3	R2	82	21.8	0.230	40.9	LOS D	3.3	27.8	0.86	0.76	0.86	35.2
Approach		462	13.4	0.375	30.4	LOS C	4.8	35.5	0.73	0.72	0.73	39.7
East: SH1												
4	L2	74	10.0	0.518	43.4	LOS D	8.8	69.5	0.93	0.79	0.93	35.6
5	T1	327	18.3	0.518	37.7	LOS D	8.8	71.2	0.93	0.78	0.93	36.9
6	R2	88	11.9	0.301	45.8	LOS D	3.9	29.9	0.92	0.77	0.92	33.9
Approach		489	15.9	0.518	40.0	LOS D	8.8	71.2	0.93	0.78	0.93	36.1
North: Matakana Link Road												
7	L2	89	28.2	0.087	8.3	LOS A	0.9	7.4	0.30	0.62	0.30	51.5
8	T1	131	10.5	0.236	41.3	LOS D	2.9	21.9	0.92	0.71	0.92	35.9
9	R2	195	8.1	0.499	43.2	LOS D	8.5	63.5	0.93	0.81	0.93	34.8
Approach		415	13.2	0.499	35.1	LOS D	8.5	63.5	0.79	0.73	0.79	37.8
West: SH1												
10	L2	248	14.0	0.188	6.8	LOS A	1.6	12.8	0.22	0.61	0.22	52.9
11	T1	318	22.2	0.420	36.8	LOS D	6.8	56.6	0.91	0.74	0.91	37.5
12	R2	146	19.4	0.522	47.9	LOS D	6.7	54.9	0.96	0.80	0.96	33.2
Approach		713	18.8	0.522	28.6	LOS C	6.8	56.6	0.68	0.71	0.68	40.5
All Vehicles		2079	15.8	0.522	33.0	LOS C	8.8	71.2	0.77	0.73	0.77	38.7

MOVEMENT SUMMARY

 Site: 101 [Matakana Link Road - Western Link Road_PM]

New Site
 Site Category: (None)
 Signals - Fixed Time Isolated Cycle Time = 100 seconds (Site User-Given Cycle Time)

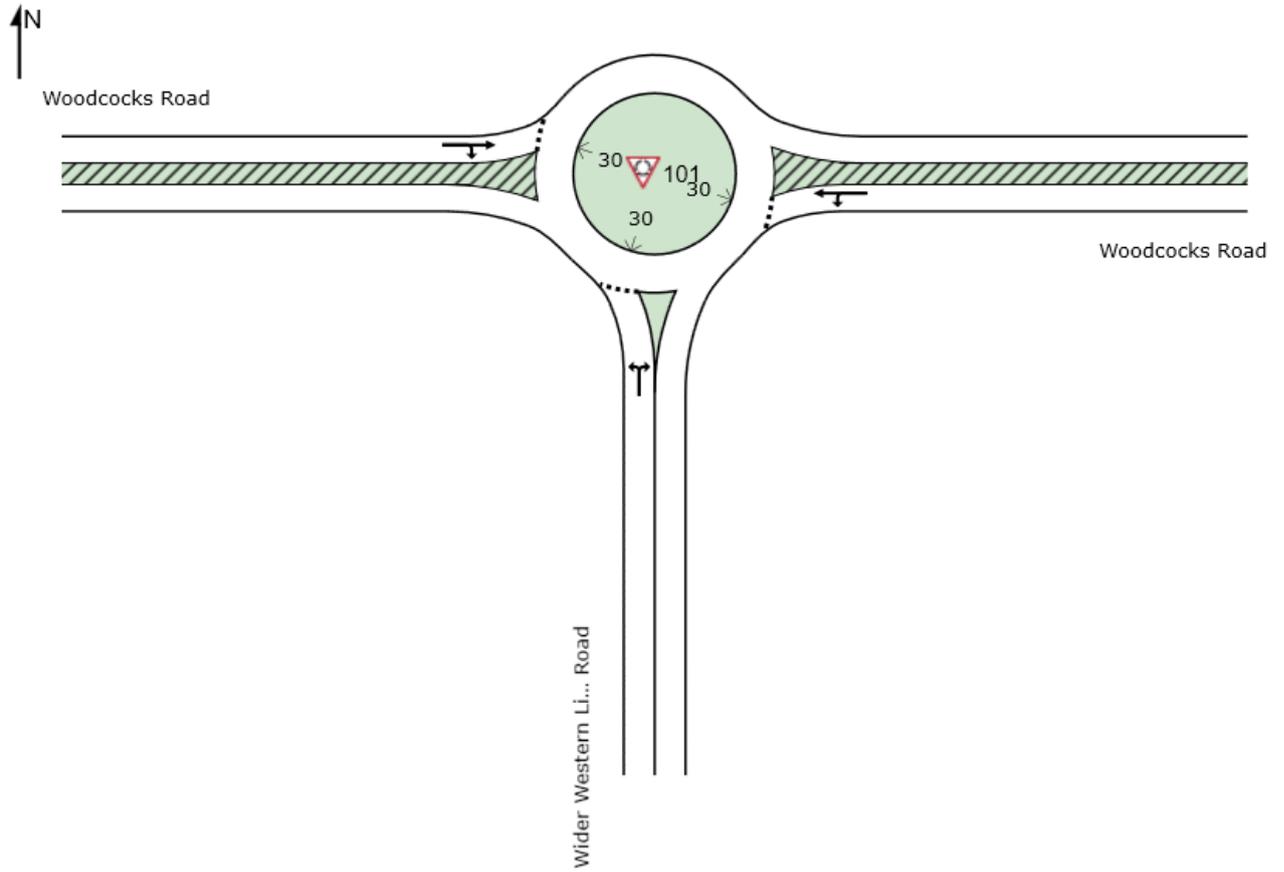
Movement Performance - Vehicles												
Mov ID	Turn	Demand Flows Total veh/h	Flows HV %	Deg. Satn w/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Western Link Road - North												
1	L2	178	18.9	0.164	9.3	LOS A	2.2	18.0	0.37	0.65	0.37	51.0
2	T1	313	4.4	0.544	43.7	LOS D	7.3	52.9	0.97	0.79	0.97	35.1
3	R2	172	6.7	0.532	46.8	LOS D	7.8	57.8	0.96	0.81	0.96	33.5
Approach		662	8.9	0.544	35.2	LOS D	7.8	57.8	0.81	0.75	0.81	37.8
East: SH1												
4	L2	97	8.7	0.530	44.3	LOS D	8.6	68.4	0.94	0.79	0.94	34.9
5	T1	285	24.4	0.530	38.7	LOS D	8.6	68.4	0.94	0.78	0.94	36.4
6	R2	54	25.5	0.154	40.2	LOS D	2.1	18.3	0.84	0.73	0.84	35.6
Approach		436	21.0	0.530	40.1	LOS D	8.6	71.1	0.93	0.78	0.93	36.0
North: Matakana Link Road												
7	L2	120	7.9	0.110	9.3	LOS A	1.5	11.2	0.37	0.64	0.37	51.2
8	T1	175	3.6	0.303	41.8	LOS D	3.9	28.1	0.93	0.73	0.93	35.7
9	R2	129	13.0	0.419	45.9	LOS D	5.8	44.8	0.93	0.79	0.93	33.9
Approach		424	7.7	0.419	33.9	LOS C	5.8	44.8	0.77	0.72	0.77	38.4
West: SH1												
10	L2	388	5.7	0.289	7.2	LOS A	3.4	24.9	0.27	0.63	0.27	52.8
11	T1	353	11.6	0.458	37.9	LOS D	7.7	59.0	0.92	0.76	0.92	37.1
12	R2	206	12.8	0.545	43.8	LOS D	9.1	70.8	0.94	0.81	0.94	34.6
Approach		947	9.4	0.545	26.6	LOS C	9.1	70.8	0.66	0.72	0.66	41.5
All Vehicles		2469	11.0	0.545	32.5	LOS C	9.1	71.1	0.77	0.74	0.77	38.9

Woodcocks Road/Wider Western Link

SITE LAYOUT

Site: 101 [Woodcocks Road - Wider Western Link Road_AM]

New Site
Site Category: (None)
Roundabout



LANE SUMMARY

 Site: 101 [Woodcocks Road - Wider Western Link Road_AM]

New Site
Site Category: (None)
Roundabout

Lane Use and Performance													
	Demand Flows		Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue		Lane Config	Lane Length m	Cap. Adj. %	Prob. Block. %
	Total veh/h	HV %						Veh	Dist m				
South: Wider Western Link Road													
Lane 1 ^d	219	10.6	1441	0.152	100	8.6	LOSA	0.8	6.1	Full	500	0.0	0.0
Approach	219	10.6		0.152		8.6	LOSA	0.8	6.1				
East: Woodcocks Road													
Lane 1 ^d	318	4.6	1571	0.202	100	3.5	LOSA	1.3	9.8	Full	500	0.0	0.0
Approach	318	4.6		0.202		3.5	LOSA	1.3	9.8				
West: Woodcocks Road													
Lane 1 ^d	98	3.2	1219	0.080	100	5.8	LOSA	0.4	3.2	Full	500	0.0	0.0
Approach	98	3.2		0.080		5.8	LOSA	0.4	3.2				
Intersection	635	6.5		0.202		5.6	LOSA	1.3	9.8				

LANE SUMMARY

 Site: 101 [Woodcocks Road - Wider Western Link Road_PM]

New Site
Site Category: (None)
Roundabout

Lane Use and Performance													
	Demand Flows		Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue		Lane Config	Lane Length m	Cap. Adj. %	Prob. Block. %
	Total veh/h	HV %						Veh	Dist m				
South: Wider Western Link Road													
Lane 1 ^d	386	7.6	1399	0.276	100	9.2	LOSA	1.7	12.5	Full	500	0.0	0.0
Approach	386	7.6		0.276		9.2	LOSA	1.7	12.5				
East: Woodcocks Road													
Lane 1 ^d	276	3.8	1498	0.184	100	3.6	LOSA	1.2	9.0	Full	500	0.0	0.0
Approach	276	3.8		0.184		3.6	LOSA	1.2	9.0				
West: Woodcocks Road													
Lane 1 ^d	88	8.3	1021	0.087	100	8.0	LOSA	0.5	3.7	Full	500	0.0	0.0
Approach	88	8.3		0.087		8.0	LOSA	0.5	3.7				
Intersection	751	6.3		0.276		7.0	LOSA	1.7	12.5				

MOVEMENT SUMMARY

 Site: 101 [Woodcocks Road - Wider Western Link Road_AM]

New Site
Site Category: (None)
Roundabout

Movement Performance - Vehicles												
Mov ID	Turn	Demand Total veh/h	Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Queue Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Wider Western Link Road												
1	L2	32	10.0	0.152	3.7	LOS A	0.8	6.1	0.16	0.58	0.16	52.2
3	R2	187	10.7	0.152	9.4	LOS A	0.8	6.1	0.16	0.58	0.16	53.8
Approach		219	10.6	0.152	8.6	LOS A	0.8	6.1	0.16	0.58	0.16	53.6
East: Woodcocks Road												
4	L2	273	5.4	0.202	3.5	LOS A	1.3	9.8	0.14	0.40	0.14	56.0
5	T1	45	0.0	0.202	3.5	LOS A	1.3	9.8	0.14	0.40	0.14	57.9
Approach		318	4.6	0.202	3.5	LOS A	1.3	9.8	0.14	0.40	0.14	56.2
West: Woodcocks Road												
11	T1	75	0.0	0.080	4.4	LOS A	0.4	3.2	0.38	0.48	0.38	55.6
12	R2	23	13.6	0.080	10.4	LOS B	0.4	3.2	0.38	0.48	0.38	55.4
Approach		98	3.2	0.080	5.8	LOS A	0.4	3.2	0.38	0.48	0.38	55.6
All Vehicles		635	6.5	0.202	5.6	LOS A	1.3	9.8	0.18	0.47	0.18	55.2

MOVEMENT SUMMARY

 Site: 101 [Woodcocks Road - Wider Western Link Road_PM]

New Site
Site Category: (None)
Roundabout

Movement Performance - Vehicles												
Mov ID	Turn	Demand Total veh/h	Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Queue Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Wider Western Link Road												
1	L2	29	3.6	0.276	3.9	LOS A	1.7	12.5	0.27	0.59	0.27	51.7
3	R2	357	8.0	0.276	9.7	LOS A	1.7	12.5	0.27	0.59	0.27	53.3
Approach		386	7.6	0.276	9.2	LOS A	1.7	12.5	0.27	0.59	0.27	53.1
East: Woodcocks Road												
4	L2	186	5.6	0.184	3.6	LOS A	1.2	9.0	0.20	0.39	0.20	55.7
5	T1	89	0.0	0.184	3.6	LOS A	1.2	9.0	0.20	0.39	0.20	57.6
Approach		276	3.8	0.184	3.6	LOS A	1.2	9.0	0.20	0.39	0.20	56.3
West: Woodcocks Road												
11	T1	49	0.0	0.087	5.3	LOS A	0.5	3.7	0.53	0.60	0.53	54.2
12	R2	39	18.9	0.087	11.5	LOS B	0.5	3.7	0.53	0.60	0.53	53.9
Approach		88	8.3	0.087	8.0	LOS A	0.5	3.7	0.53	0.60	0.53	54.1
All Vehicles		751	6.3	0.276	7.0	LOS A	1.7	12.5	0.28	0.52	0.28	54.3

SH1/Fairwater Road

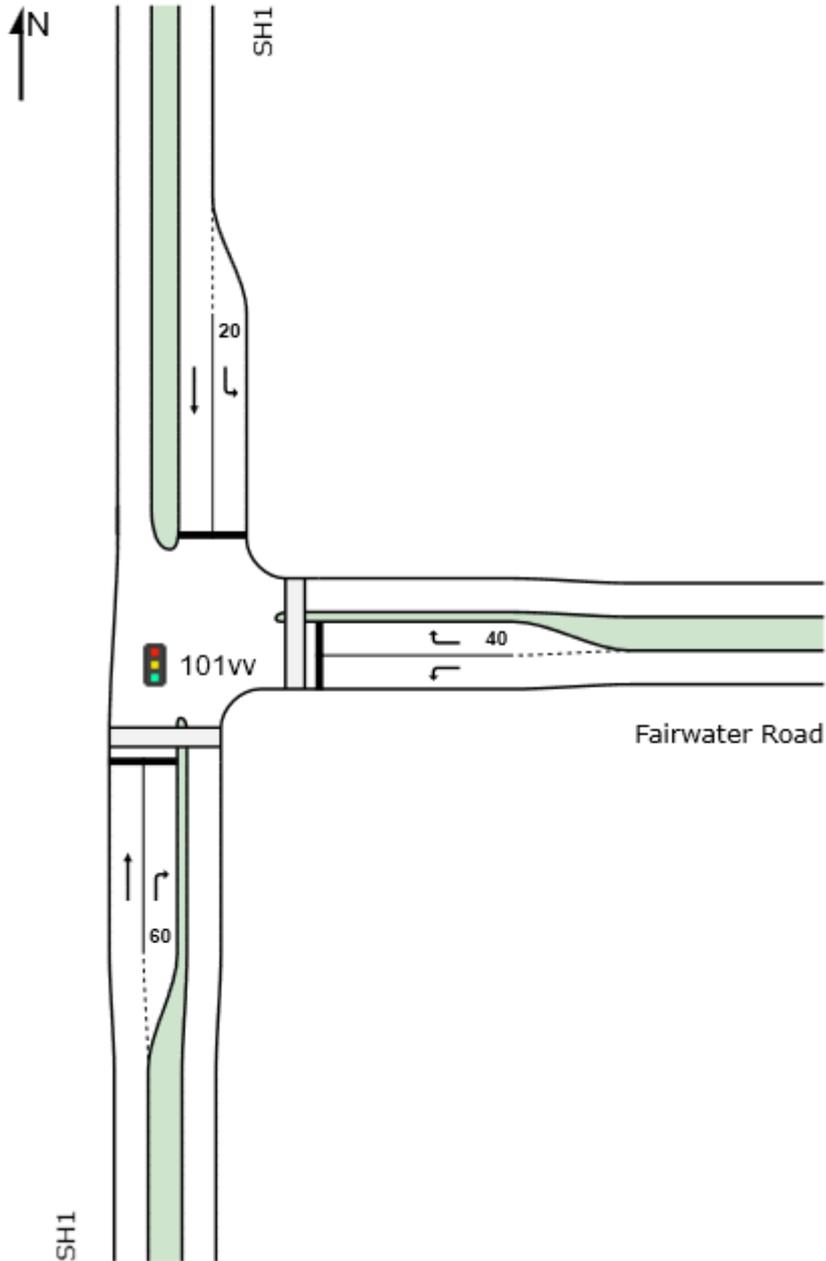
SITE LAYOUT

 **Site: 101vv [SH1 - Fairwater Road_AM Final]**

New Site

Site Category: (None)

Signals - Fixed Time Isolated



PHASING SUMMARY

 **Site: 101vv [SH1 - Fairwater Road_AM Final]**

New Site

Site Category: (None)

Signals - Fixed Time Isolated Cycle Time = 100 seconds (Site User-Given Cycle Time)

Timings based on settings in the Site Phasing & Timing dialog

Phase Times determined by the program

Phase Sequence: Opposed Turns

Reference Phase: Phase A

Input Phase Sequence: A, B, C

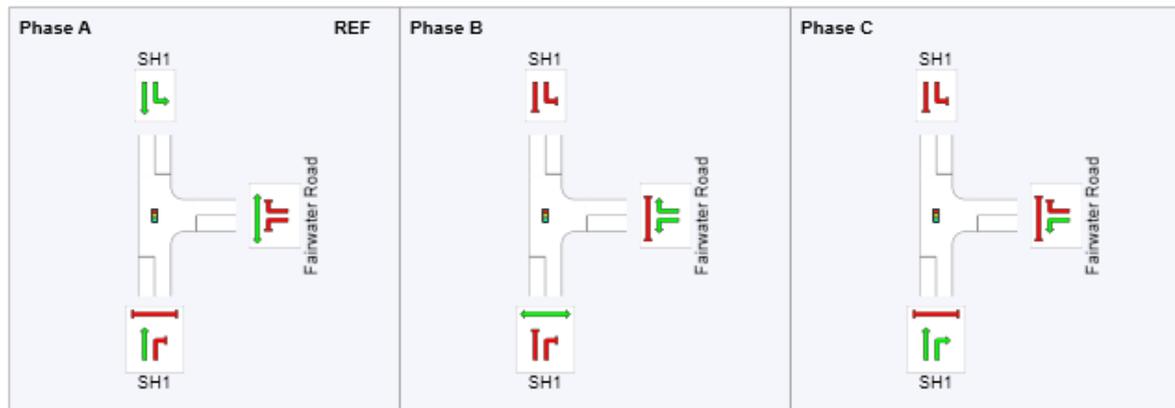
Output Phase Sequence: A, B, C

Phase Timing Summary

Phase	A	B	C
Phase Change Time (sec)	0	73	89
Green Time (sec)	68	11	6
Phase Time (sec)	73	16	11
Phase Split	73%	16%	11%

See the Phase Information section in the Detailed Output 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, 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

PHASING SUMMARY

 **Site: 101vv [SH1 - Fairwater Road_PM Final]**

New Site

Site Category: (None)

Signals - Fixed Time Isolated Cycle Time = 100 seconds (Site User-Given Cycle Time)

Timings based on settings in the Site Phasing & Timing dialog

Phase Times determined by the program

Phase Sequence: Opposed Turns

Reference Phase: Phase A

Input Phase Sequence: A, B, C

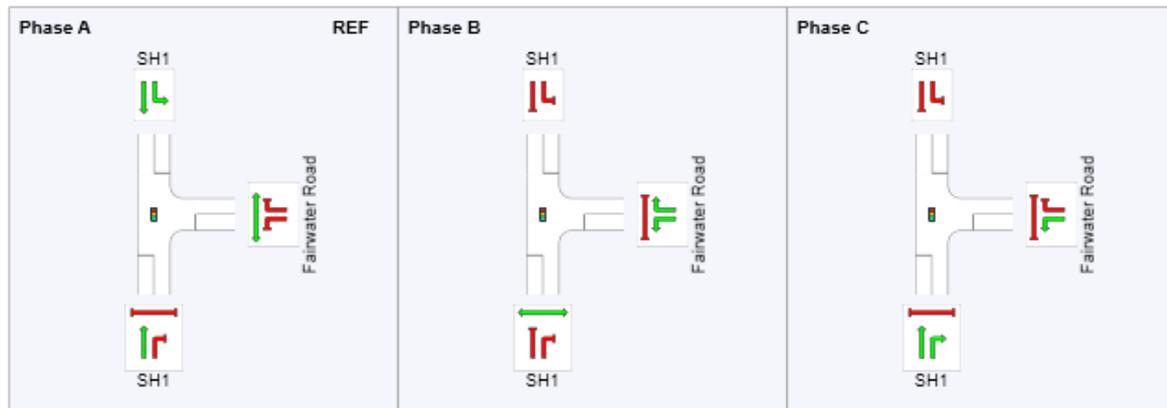
Output Phase Sequence: A, B, C

Phase Timing Summary

Phase	A	B	C
Phase Change Time (sec)	0	69	88
Green Time (sec)	64	14	7
Phase Time (sec)	69	19	12
Phase Split	69%	19%	12%

See the Phase Information section in the Detailed Output 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, 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

LANE SUMMARY

 Site: 101vv [SH1 - Fairwater Road_AM Final]

New Site

Site Category: (None)

Signals - Fixed Time Isolated Cycle Time = 100 seconds (Site User-Given Cycle Time)

Lane Use and Performance													
	Demand	Flows	Cap.	Deg.	Lane	Average	Level of	95% Back of Queue		Lane	Lane	Cap.	Prob.
	Total	HV	veh/h	Satn	Util.	Delay	Service	Veh	Dist	Config	Length	Adj.	Block.
	veh/h	%	veh/h	v/c	%	sec			m		m	%	%
South: SH1													
Lane 1	193	3.8	1519	0.127	100	2.6	LOS A	2.1	15.5	Full	500	0.0	0.0
Lane 2	27	11.5	104	0.263	100	57.5	LOS E	1.4	10.5	Short	60	0.0	NA
Approach	220	4.8		0.263		9.4	LOS A	2.1	15.5				
East: Fairwater Road													
Lane 1	23	13.6	325	0.071	100	40.4	LOS D	0.9	7.3	Full	60	0.0	0.0
Lane 2	38	16.7	184	0.205	100	49.7	LOS D	1.8	14.0	Short	40	0.0	NA
Approach	61	15.5		0.205		46.2	LOS D	1.8	14.0				
North: SH1													
Lane 1	45	14.0	1109	0.041	100	12.3	LOS B	0.8	6.1	Short	20	0.0	NA
Lane 2	346	3.6	1259 ¹	0.275	100	6.6	LOS A	6.5	46.7	Full	500	0.0	0.0
Approach	392	4.8		0.275		7.3	LOS A	6.5	46.7				
Intersection	673	5.8		0.275		11.5	LOS B	6.5	46.7				

LANE SUMMARY

 Site: 101vv [SH1 - Fairwater Road_PM Final]

New Site

Site Category: (None)

Signals - Fixed Time Isolated Cycle Time = 100 seconds (Site User-Given Cycle Time)

Lane Use and Performance													
	Demand	Flows	Cap.	Deg.	Lane	Average	Level of	95% Back of Queue		Lane	Lane	Cap.	Prob.
	Total	HV	veh/h	Satn	Util.	Delay	Service	Veh	Dist	Config	Length	Adj.	Block.
	veh/h	%	veh/h	v/c	%	sec			m		m	%	%
South: SH1													
Lane 1	319	1.7	1482	0.215	100	3.6	LOS A	4.4	31.0	Full	500	0.0	0.0
Lane 2	28	7.4	125	0.228	100	55.8	LOS E	1.4	10.4	Short	60	0.0	NA
Approach	347	2.1		0.228		7.9	LOS A	4.4	31.0				
East: Fairwater Road													
Lane 1	32	13.3	394	0.080	100	38.3	LOS D	1.2	9.5	Full	500	0.0	0.0
Lane 2	54	9.8	246	0.219	100	47.9	LOS D	2.4	18.2	Short	40	0.0	NA
Approach	85	11.1		0.219		44.4	LOS D	2.4	18.2				
North: SH1													
Lane 1	53	10.0	1068	0.049	100	13.9	LOS B	1.0	7.7	Short	20	0.0	NA
Lane 2	268	5.5	1183 ¹	0.227	100	8.0	LOS A	5.4	39.5	Full	500	0.0	0.0
Approach	321	6.2		0.227		8.9	LOS A	5.4	39.5				
Intersection	754	4.9		0.228		12.5	LOS B	5.4	39.5				

MOVEMENT SUMMARY

 Site: 101vv [SH1 - Fairwater Road_AM Final]

New Site

Site Category: (None)

Signals - Fixed Time Isolated Cycle Time = 100 seconds (Site User-Given Cycle Time)

Movement Performance - Vehicles												
Mov ID	Turn	Demand Total veh/h	Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Queue Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: SH1												
8	T1	193	3.8	0.127	2.6	LOS A	2.1	15.5	0.25	0.21	0.25	57.6
9	R2	27	11.5	0.263	57.5	LOS E	1.4	10.5	0.99	0.72	0.99	21.8
Approach		220	4.8	0.263	9.4	LOS A	2.1	15.5	0.34	0.27	0.34	51.3
East: Fairwater Road												
10	L2	23	13.6	0.071	40.4	LOS D	0.9	7.3	0.85	0.70	0.85	26.8
12	R2	38	16.7	0.205	49.7	LOS D	1.8	14.0	0.95	0.73	0.95	23.8
Approach		61	15.5	0.205	46.2	LOS D	1.8	14.0	0.91	0.72	0.91	24.8
North: SH1												
1	L2	45	14.0	0.041	12.3	LOS B	0.8	6.1	0.38	0.65	0.38	41.9
2	T1	346	3.6	0.275	6.6	LOS A	6.5	46.7	0.42	0.36	0.42	54.1
Approach		392	4.8	0.275	7.3	LOS A	6.5	46.7	0.41	0.40	0.41	53.1
All Vehicles		673	5.8	0.275	11.5	LOS B	6.5	46.7	0.43	0.39	0.43	49.3

MOVEMENT SUMMARY

 Site: 101vv [SH1 - Fairwater Road_PM Final]

New Site

Site Category: (None)

Signals - Fixed Time Isolated Cycle Time = 100 seconds (Site User-Given Cycle Time)

Movement Performance - Vehicles												
Mov ID	Turn	Demand Total veh/h	Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Queue Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: SH1												
8	T1	319	1.7	0.215	3.6	LOS A	4.4	31.0	0.31	0.27	0.31	56.6
9	R2	28	7.4	0.228	55.8	LOS E	1.4	10.4	0.98	0.72	0.98	30.7
Approach		347	2.1	0.228	7.9	LOS A	4.4	31.0	0.36	0.30	0.36	53.0
East: Fairwater Road												
10	L2	32	13.3	0.080	38.3	LOS D	1.2	9.5	0.82	0.71	0.82	36.0
12	R2	54	9.8	0.219	47.9	LOS D	2.4	18.2	0.92	0.75	0.92	32.9
Approach		85	11.1	0.219	44.4	LOS D	2.4	18.2	0.88	0.73	0.88	34.0
North: SH1												
1	L2	53	10.0	0.049	13.9	LOS B	1.0	7.7	0.42	0.66	0.42	47.5
2	T1	268	5.5	0.227	8.0	LOS A	5.4	39.5	0.45	0.38	0.45	53.0
Approach		321	6.2	0.227	8.9	LOS A	5.4	39.5	0.44	0.43	0.44	52.1
All Vehicles		754	4.9	0.228	12.5	LOS B	5.4	39.5	0.46	0.41	0.46	49.5

SH1/ Western Link -South/ Mckinney

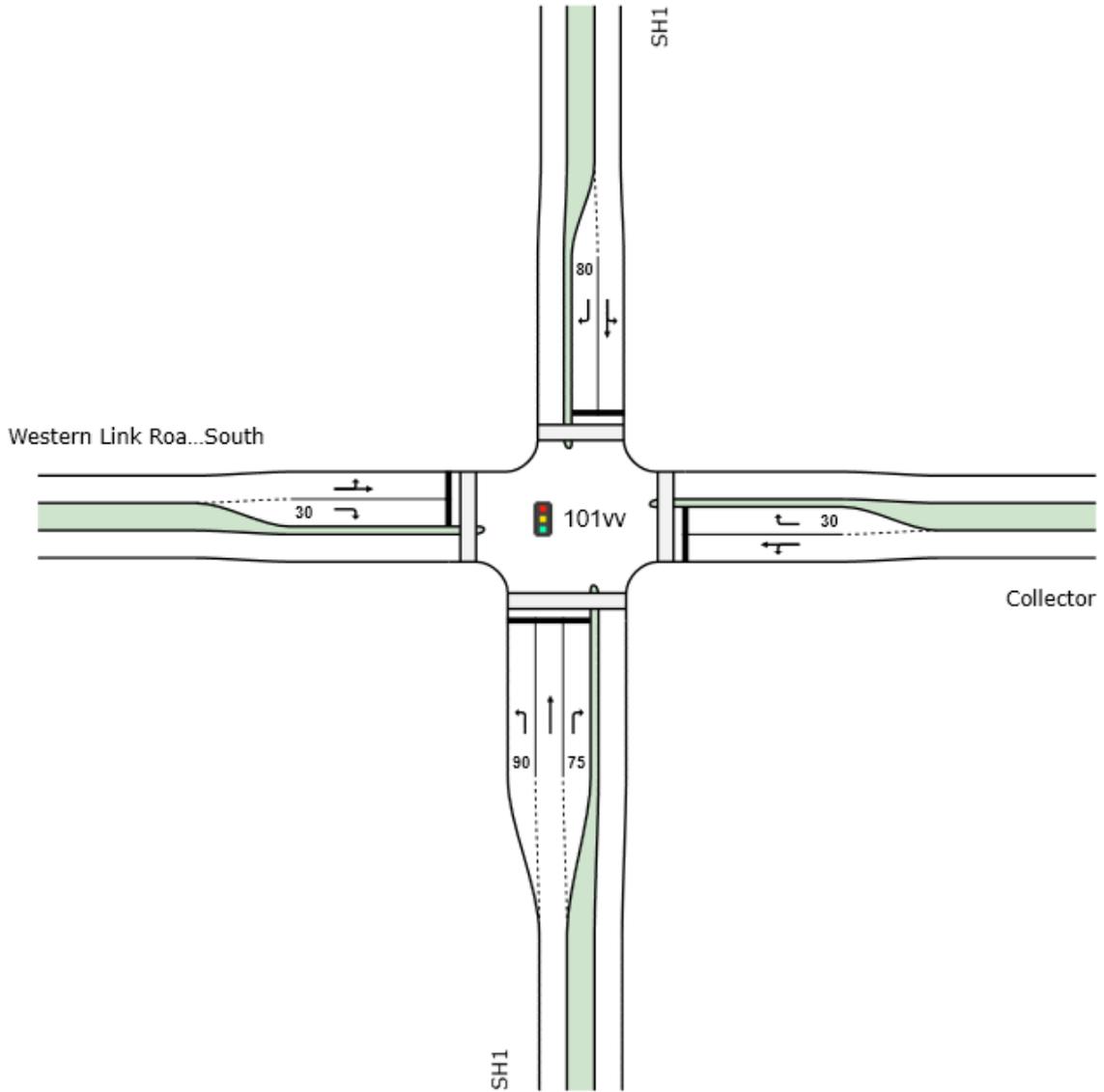
SITE LAYOUT

 **Site: 101vv [SH1 - Western Link Road South_AM - Final]**

New Site

Site Category: (None)

Signals - Fixed Time Isolated



PHASING SUMMARY

Site: 101vv [SH1 - Western Link Road South_AM - Final]

New Site
 Site Category: (None)
 Signals - Fixed Time Isolated Cycle Time = 70 seconds (Site Practical Cycle Time)

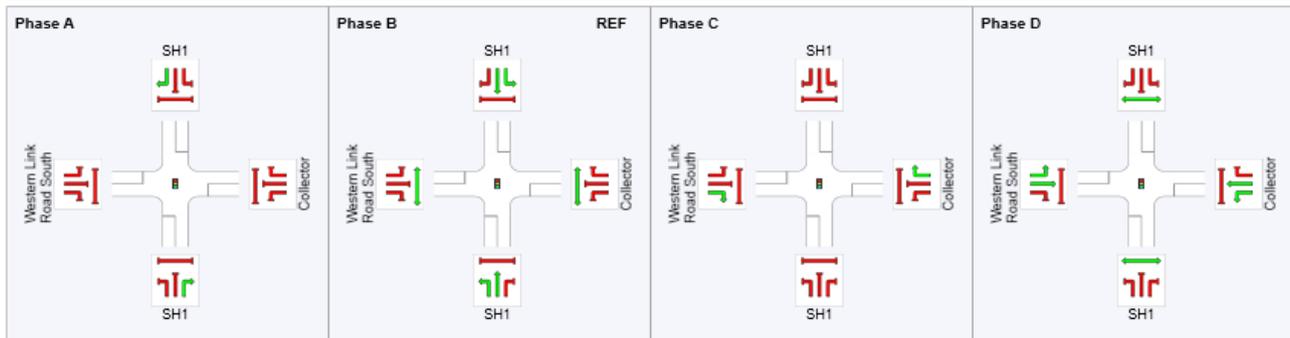
Timings based on settings in the Site Phasing & Timing dialog
 Phase Times determined by the program
 Phase Sequence: Opposed Turns
 Reference Phase: Phase B
 Input Phase Sequence: A, B, C, D
 Output Phase Sequence: A, B, C, D

Phase Timing Summary

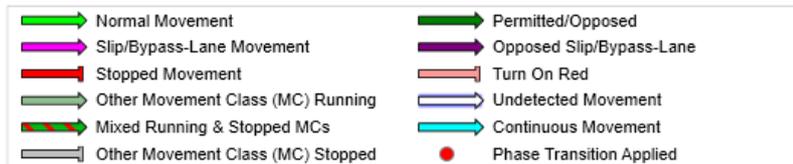
Phase	A	B	C	D
Phase Change Time (sec)	58	0	26	43
Green Time (sec)	6	20	11	9
Phase Time (sec)	12	26	17	15
Phase Split	17%	37%	24%	21%

See the Phase Information section in the Detailed Output 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, Phase Actuation and Phase Frequency values (user-specified or implied) less than 100%.

Output Phase Sequence



REF: Reference Phase
 VAR: Variable Phase



PHASING SUMMARY

Site: 101vv [SH1 - Western Link Road South_PM - Final]

New Site

Site Category: (None)

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

Timings based on settings in the Site Phasing & Timing dialog

Phase Times determined by the program

Phase Sequence: Opposed Turns

Reference Phase: Phase B

Input Phase Sequence: B, C, D, A

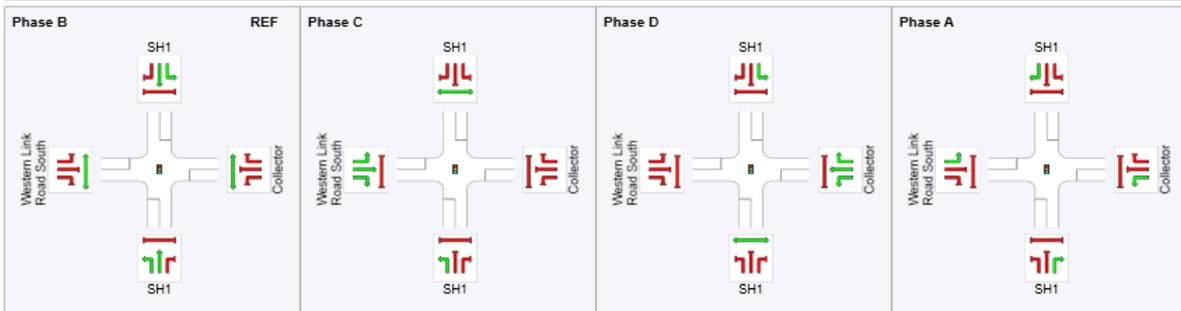
Output Phase Sequence: B, C, D, A

Phase Timing Summary

Phase	B	C	D	A
Phase Change Time (sec)	0	22	51	67
Green Time (sec)	16	23	10	7
Phase Time (sec)	22	29	16	13
Phase Split	28%	36%	20%	16%

See the Phase Information section in the Detailed Output 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, Phase Actuation and Phase Frequency values (user-specified or implied) less than 100%.

Output Phase Sequence



REF: Reference Phase

VAR: Variable Phase



LANE SUMMARY

 Site: 101vv [SH1 - Western Link Road South_AM - Final]

New Site
 Site Category: (None)
 Signals - Fixed Time Isolated Cycle Time = 70 seconds (Site Practical Cycle Time)

Lane Use and Performance													
	Demand Total	Flows HV	Cap.	Deg. Satn	Lane Util.	Average Delay	Level of Service	95% Back of Queue		Lane Config	Lane Length	Cap. Adj.	Prob. Block.
	veh/h	%	veh/h	v/c	%	sec		Veh	Dist m		m	%	%
South: SH1													
Lane 1	343	3.4	471	0.728	100	33.6	LOS C	11.5	83.1	Short	90	0.0	NA
Lane 2	180	3.5	550	0.327	100	21.6	LOS C	4.9	35.6	Full	500	0.0	0.0
Lane 3	91	10.5	150	0.605	100	42.3	LOS D	3.3	25.1	Short	75	0.0	NA
Approach	614	4.5		0.728		31.4	LOS C	11.5	83.1				
East: Collector													
Lane 1	147	12.1	200	0.737	100	39.8	LOS D	5.4	42.1	Full	500	0.0	0.0
Lane 2	35	9.1	277	0.125	100	33.9	LOS C	1.1	8.0	Short	30	0.0	NA
Approach	182	11.6		0.737		38.6	LOS D	5.4	42.1				
North: SH1													
Lane 1	366	4.3	534	0.686	100	25.8	LOS C	11.6	84.5	Full	500	0.0	0.0
Lane 2	4	0.0	159	0.026	100	38.5	LOS D	0.1	1.0	Short	80	0.0	NA
Approach	371	4.3		0.686		25.9	LOS C	11.6	84.5				
West: Western Link Road South													
Lane 1	72	7.4	238	0.301	100	31.7	LOS C	2.3	17.4	Full	500	0.0	0.0
Lane 2	209	5.5	284	0.738	100	39.6	LOS D	7.5	55.2	Short	30	0.0	NA
Approach	281	6.0		0.738		37.6	LOS D	7.5	55.2				
Intersection	1447	5.6		0.738		32.1	LOS C	11.6	84.5				

LANE SUMMARY

 Site: 101vv [SH1 - Western Link Road South_PM - Final]

New Site
 Site Category: (None)
 Signals - Fixed Time Isolated Cycle Time = 80 seconds (Site Optimum Cycle Time - Minimum Delay)

Lane Use and Performance													
	Demand Total	Flows HV	Cap.	Deg. Satn	Lane Util.	Average Delay	Level of Service	95% Back of Queue		Lane Config	Lane Length	Cap. Adj.	Prob. Block.
	veh/h	%	veh/h	v/c	%	sec		Veh	Dist m		m	%	%
South: SH1													
Lane 1	320	2.6	990	0.323	100	15.7	LOS B	7.0	49.8	Short	90	0.0	NA
Lane 2	323	1.6	390	0.829	100	39.3	LOS D	13.7	97.6	Full	500	0.0	0.0
Lane 3	121	7.0	156	0.774	100	48.7	LOS D	5.2	38.7	Short	75	0.0	NA
Approach	764	2.9		0.829		30.9	LOS C	13.7	97.6				
East: Collector													
Lane 1	124	15.3	251	0.494	100	38.0	LOS D	4.7	37.0	Full	500	0.0	0.0
Lane 2	19	5.6	226	0.084	100	39.1	LOS D	0.7	5.0	Short	30	0.0	NA
Approach	143	14.0		0.494		38.2	LOS D	4.7	37.0				
North: SH1													
Lane 1	294	6.1	374	0.786	100	40.6	LOS D	11.5	84.6	Full	500	0.0	0.0
Lane 2	5	0.0	163	0.032	100	41.9	LOS D	0.2	1.4	Short	80	0.0	NA
Approach	299	6.0		0.786		40.6	LOS D	11.5	84.6				
West: Western Link Road South													
Lane 1	107	3.9	551	0.195	100	25.2	LOS C	3.1	22.4	Full	500	0.0	0.0
Lane 2	377	3.4	468 ¹	0.806	100	37.5	LOS D	14.9	107.3	Short	30	0.0	NA
Approach	484	3.5		0.806		34.7	LOS C	14.9	107.3				
Intersection	1691	4.5		0.829		34.3	LOS C	14.9	107.3				

MOVEMENT SUMMARY

 Site: 101vv [SH1 - Western Link Road South_AM - Final]

New Site
 Site Category: (None)
 Signals - Fixed Time Isolated Cycle Time = 70 seconds (Site Practical Cycle Time)

Movement Performance - Vehicles												
Mov ID	Turn	Demand Total veh/h	Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Queue Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: SH1												
10	L2	343	3.4	0.728	33.6	LOS C	11.5	83.1	0.97	0.88	1.06	37.9
22	T1	180	3.5	0.327	21.6	LOS C	4.9	35.6	0.83	0.68	0.83	44.3
12	R2	91	10.5	0.605	42.3	LOS D	3.3	25.1	1.00	0.81	1.10	34.6
Approach		614	4.5	0.728	31.4	LOS C	11.5	83.1	0.93	0.81	1.00	39.0
East: Collector												
1	L2	82	15.4	0.737	42.3	LOS D	5.4	42.1	1.00	0.89	1.22	35.5
2	T1	65	8.1	0.737	36.6	LOS D	5.4	42.1	1.00	0.89	1.22	36.4
26	R2	35	9.1	0.125	33.9	LOS C	1.1	8.0	0.89	0.72	0.89	37.6
Approach		182	11.6	0.737	38.6	LOS D	5.4	42.1	0.98	0.86	1.16	36.2
North: SH1												
27	L2	37	11.4	0.686	30.9	LOS C	11.6	84.5	0.95	0.84	0.98	41.1
28	T1	329	3.5	0.686	25.2	LOS C	11.6	84.5	0.95	0.84	0.98	42.2
29	R2	4	0.0	0.026	38.5	LOS D	0.1	1.0	0.94	0.64	0.94	36.1
Approach		371	4.3	0.686	25.9	LOS C	11.6	84.5	0.95	0.83	0.98	42.0
West: Western Link Road South												
30	L2	4	0.0	0.301	36.9	LOS D	2.3	17.4	0.95	0.72	0.95	38.8
8	T1	67	7.8	0.301	31.4	LOS C	2.3	17.4	0.95	0.72	0.95	39.5
9	R2	209	5.5	0.738	39.6	LOS D	7.5	55.2	1.00	0.89	1.17	35.8
Approach		281	6.0	0.738	37.6	LOS D	7.5	55.2	0.99	0.85	1.11	36.7
All Vehicles		1447	5.6	0.738	32.1	LOS C	11.6	84.5	0.95	0.83	1.04	38.9

MOVEMENT SUMMARY

 Site: 101vv [SH1 - Western Link Road South_PM - Final]

New Site
 Site Category: (None)
 Signals - Fixed Time Isolated Cycle Time = 80 seconds (Site Optimum Cycle Time - Minimum Delay)

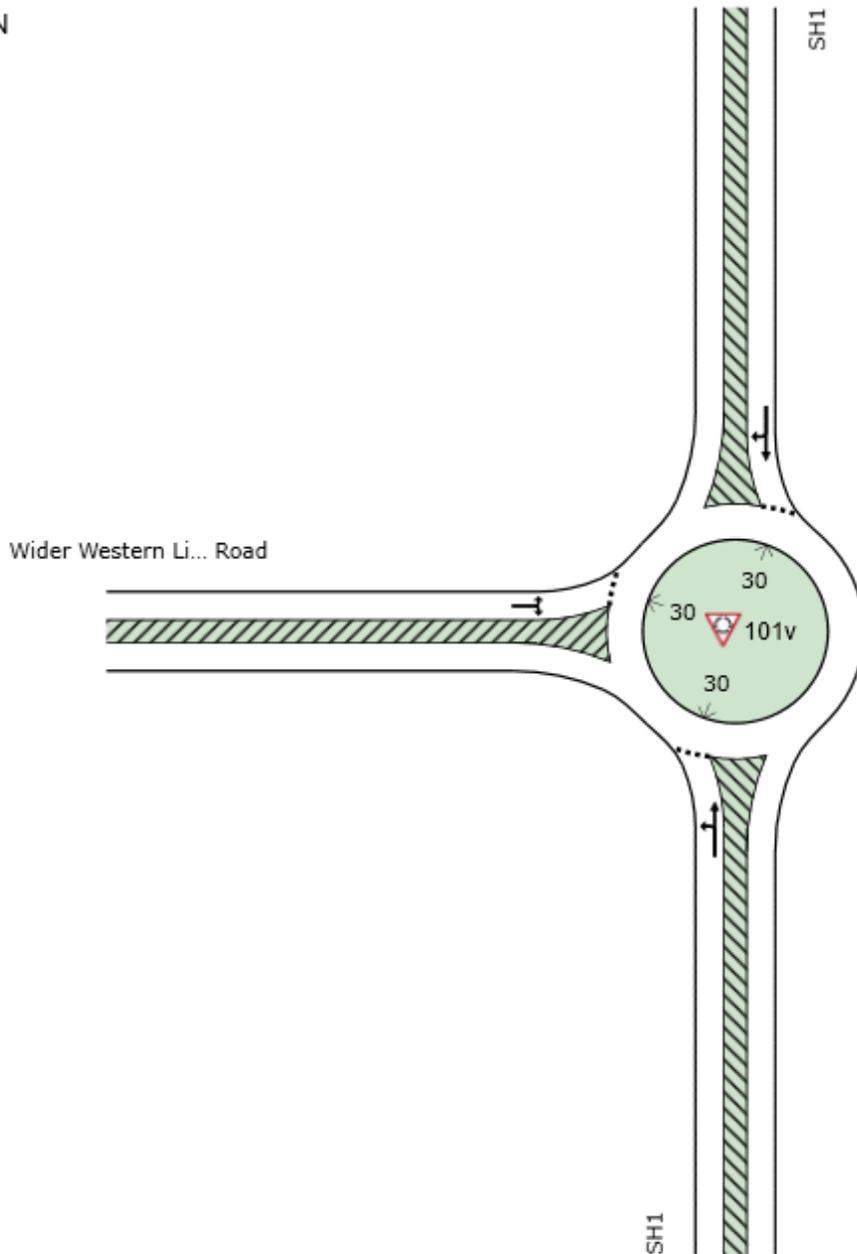
Movement Performance - Vehicles												
Mov ID	Turn	Demand Total veh/h	Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Queue Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: SH1												
10	L2	320	2.6	0.323	15.7	LOS B	7.0	49.8	0.60	0.73	0.60	40.8
22	T1	323	1.6	0.829	39.3	LOS D	13.7	97.6	1.00	1.00	1.24	32.5
12	R2	121	7.0	0.774	48.7	LOS D	5.2	38.7	1.00	0.92	1.29	29.7
Approach		764	2.9	0.829	30.9	LOS C	13.7	97.6	0.83	0.87	0.98	35.0
East: Collector												
1	L2	72	22.1	0.494	40.0	LOS D	4.7	37.0	0.96	0.78	0.96	32.6
2	T1	53	6.0	0.494	35.3	LOS D	4.7	37.0	0.96	0.78	0.96	33.0
26	R2	19	5.6	0.084	39.1	LOS D	0.7	5.0	0.91	0.69	0.91	32.2
Approach		143	14.0	0.494	38.2	LOS D	4.7	37.0	0.96	0.77	0.96	32.7
North: SH1												
27	L2	72	4.4	0.786	44.1	LOS D	11.5	84.6	1.00	1.02	1.58	31.9
28	T1	222	6.6	0.786	39.5	LOS D	11.5	84.6	1.00	1.02	1.58	32.1
29	R2	5	0.0	0.032	41.9	LOS D	0.2	1.4	0.94	0.64	0.94	31.5
Approach		299	6.0	0.786	40.6	LOS D	11.5	84.6	1.00	1.01	1.57	32.1
West: Western Link Road South												
30	L2	5	0.0	0.195	29.5	LOS C	3.1	22.4	0.79	0.65	1.06	36.9
8	T1	102	4.1	0.195	25.0	LOS C	3.1	22.4	0.79	0.65	1.06	37.2
9	R2	377	3.4	0.806	37.5	LOS D	14.9	107.3	0.96	0.93	1.13	32.9
Approach		484	3.5	0.806	34.7	LOS C	14.9	107.3	0.92	0.87	1.12	33.8
All Vehicles		1691	4.5	0.829	34.3	LOS C	14.9	107.3	0.90	0.89	1.12	33.9

SH1/ Wider Western Link

SITE LAYOUT

 **Site: 101v [SH1 - Wider Western Link Road_AM]**

New Site
Site Category: (None)
Roundabout



LANE SUMMARY

 Site: 101v [SH1 - Wider Western Link Road_AM]

New Site
Site Category: (None)
Roundabout

Lane Use and Performance													
	Demand	Flows	Cap.	Deg.	Lane	Average	Level of	95% Back of Queue		Lane	Lane	Cap.	Prob.
	Total	HV	veh/h	Satn	Util.	Delay	Service	Veh	Dist	Config	Length	Adj.	Block.
	veh/h	%	veh/h	v/c	%	sec			m		m	%	%
South: SH1													
Lane 1 ^d	284	4.1	959	0.296	100	6.9	LOS A	2.0	14.2	Full	500	0.0	0.0
Approach	284	4.1		0.296		6.9	LOS A	2.0	14.2				
North: SH1													
Lane 1 ^d	676	3.9	1638	0.413	100	8.1	LOS A	3.7	26.8	Full	500	0.0	0.0
Approach	676	3.9		0.413		8.1	LOS A	3.7	26.8				
West: Wider Western Link Road													
Lane 1 ^d	295	7.9	1152	0.256	100	5.3	LOS A	1.8	13.4	Full	500	0.0	0.0
Approach	295	7.9		0.256		5.3	LOS A	1.8	13.4				
Intersection	1255	4.9		0.413		7.2	LOS A	3.7	26.8				

LANE SUMMARY

 Site: 101v [SH1 - Wider Western Link Road_PM]

New Site
Site Category: (None)
Roundabout

Lane Use and Performance													
	Demand	Flows	Cap.	Deg.	Lane	Average	Level of	95% Back of Queue		Lane	Lane	Cap.	Prob.
	Total	HV	veh/h	Satn	Util.	Delay	Service	Veh	Dist	Config	Length	Adj.	Block.
	veh/h	%	veh/h	v/c	%	sec			m		m	%	%
South: SH1													
Lane 1 ^d	378	2.2	1176	0.321	100	5.2	LOS A	2.2	15.9	Full	500	0.0	0.0
Approach	378	2.2		0.321		5.2	LOS A	2.2	15.9				
North: SH1													
Lane 1 ^d	527	7.6	1456	0.362	100	6.8	LOS A	3.1	23.1	Full	500	0.0	0.0
Approach	527	7.6		0.362		6.8	LOS A	3.1	23.1				
West: Wider Western Link Road													
Lane 1 ^d	594	4.4	1099	0.540	100	6.7	LOS A	4.7	34.1	Full	500	0.0	0.0
Approach	594	4.4		0.540		6.7	LOS A	4.7	34.1				
Intersection	1499	5.0		0.540		6.4	LOS A	4.7	34.1				

MOVEMENT SUMMARY

Site: 101v [SH1 - Wider Western Link Road_AM]

New Site
Site Category: (None)
Roundabout

Movement Performance - Vehicles												
Mov ID	Turn	Demand Total veh/h	Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: SH1												
1	L2	57	3.7	0.296	6.8	LOS A	2.0	14.2	0.69	0.68	0.69	53.2
2	T1	227	4.2	0.296	7.0	LOS A	2.0	14.2	0.69	0.68	0.69	54.8
Approach		284	4.1	0.296	6.9	LOS A	2.0	14.2	0.69	0.68	0.69	54.5
North: SH1												
8	T1	154	4.1	0.413	3.7	LOS A	3.7	26.8	0.18	0.55	0.18	54.2
9	R2	522	3.8	0.413	9.4	LOS A	3.7	26.8	0.18	0.55	0.18	54.5
Approach		676	3.9	0.413	8.1	LOS A	3.7	26.8	0.18	0.55	0.18	54.4
West: Wider Western Link Road												
10	L2	269	8.2	0.256	4.8	LOS A	1.8	13.4	0.52	0.55	0.52	54.2
12	R2	25	4.2	0.256	10.6	LOS B	1.8	13.4	0.52	0.55	0.52	56.3
Approach		295	7.9	0.256	5.3	LOS A	1.8	13.4	0.52	0.55	0.52	54.4
All Vehicles		1255	4.9	0.413	7.2	LOS A	3.7	26.8	0.38	0.58	0.38	54.4

MOVEMENT SUMMARY

Site: 101v [SH1 - Wider Western Link Road_PM]

New Site
Site Category: (None)
Roundabout

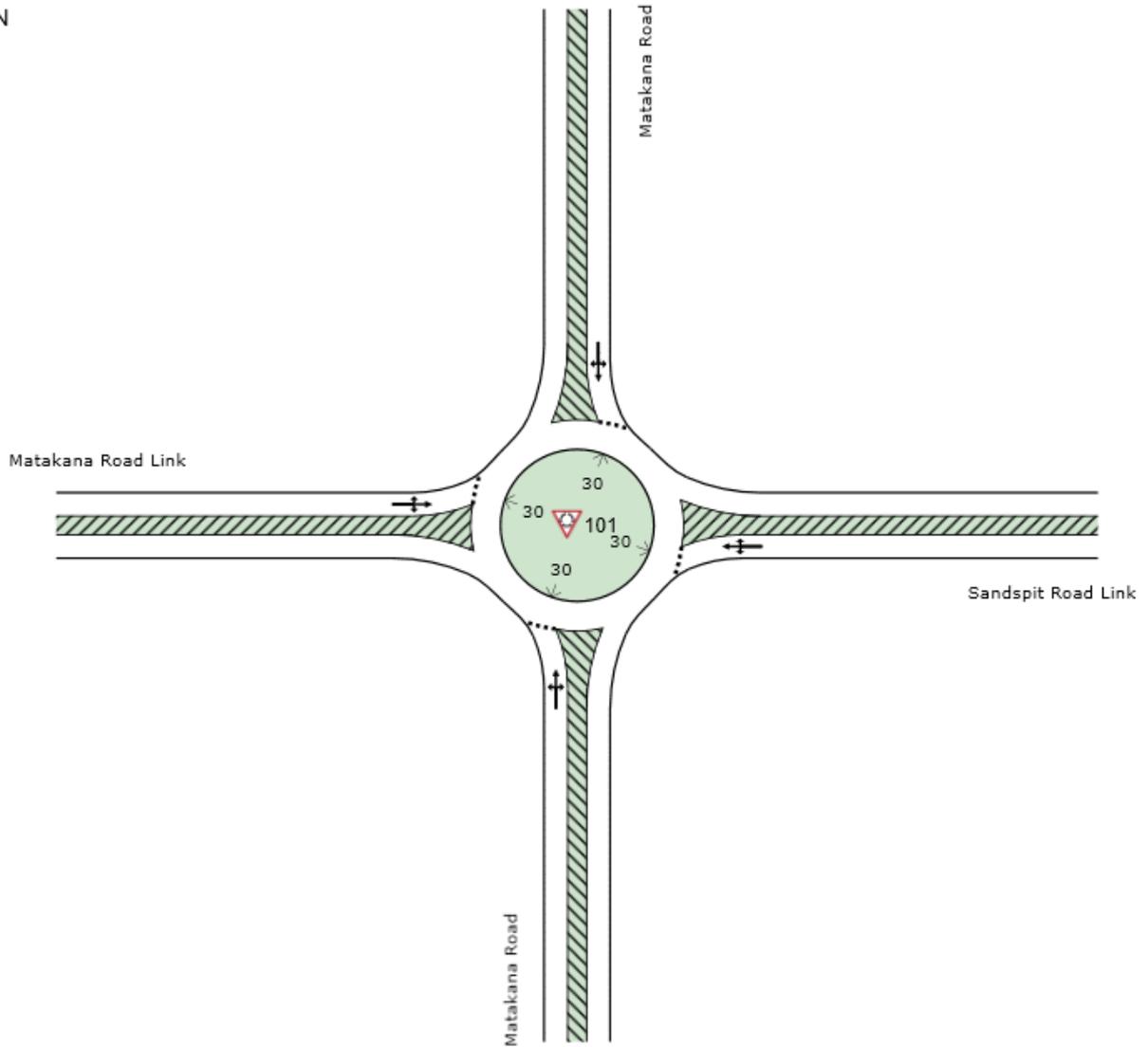
Movement Performance - Vehicles												
Mov ID	Turn	Demand Total veh/h	Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: SH1												
1	L2	47	0.0	0.321	5.0	LOS A	2.2	15.9	0.54	0.52	0.54	53.9
2	T1	331	2.5	0.321	5.2	LOS A	2.2	15.9	0.54	0.52	0.54	55.5
Approach		378	2.2	0.321	5.2	LOS A	2.2	15.9	0.54	0.52	0.54	55.3
North: SH1												
8	T1	267	4.3	0.362	4.0	LOS A	3.1	23.1	0.32	0.50	0.32	54.9
9	R2	260	10.9	0.362	9.7	LOS A	3.1	23.1	0.32	0.50	0.32	54.9
Approach		527	7.6	0.362	6.8	LOS A	3.1	23.1	0.32	0.50	0.32	54.9
West: Wider Western Link Road												
10	L2	524	5.0	0.540	6.1	LOS A	4.7	34.1	0.74	0.69	0.74	53.4
12	R2	69	0.0	0.540	11.7	LOS B	4.7	34.1	0.74	0.69	0.74	55.5
Approach		594	4.4	0.540	6.7	LOS A	4.7	34.1	0.74	0.69	0.74	53.6
All Vehicles		1499	5.0	0.540	6.4	LOS A	4.7	34.1	0.54	0.58	0.54	54.5

Matakana Road/ Matakana Link Road/ Sandspit Link

SITE LAYOUT

 **Site: 101 [Matakana Rd - Sandspit Rd Link _AM]**

New Site
Site Category: (None)
Roundabout



LANE SUMMARY

Site: 101 [Matakana Rd - Sandspit Rd Link _AM]

New Site
Site Category: (None)
Roundabout

Lane Use and Performance													
	Demand Flows Total veh/h	HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Veh	Dist m	Lane Config	Lane Length m	Cap. Adj. %	Prob. Block. %
South: Matakana Road													
Lane 1 ^d	329	8.3	959	0.343	100	6.7	LOS A	2.4	17.7	Full	500	0.0	0.0
Approach	329	8.3		0.343		6.7	LOS A	2.4	17.7				
East: Sandspit Road Link													
Lane 1 ^d	223	1.4	969	0.230	100	6.7	LOS A	1.5	10.7	Full	500	0.0	0.0
Approach	223	1.4		0.230		6.7	LOS A	1.5	10.7				
North: Matakana Road													
Lane 1 ^d	402	11.3	1256	0.320	100	7.6	LOS A	2.3	17.6	Full	500	0.0	0.0
Approach	402	11.3		0.320		7.6	LOS A	2.3	17.6				
West: Matakana Road Link													
Lane 1 ^d	313	14.8	1190	0.263	100	5.6	LOS A	1.8	14.5	Full	500	0.0	0.0
Approach	313	14.8		0.263		5.6	LOS A	1.8	14.5				
Intersection	1267	9.6		0.343		6.7	LOS A	2.4	17.7				

LANE SUMMARY

Site: 101 [Matakana Rd - Sandspit Rd Link _PM]

New Site
Site Category: (None)
Roundabout

Lane Use and Performance													
	Demand Flows Total veh/h	HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Veh	Dist m	Lane Config	Lane Length m	Cap. Adj. %	Prob. Block. %
South: Matakana Road													
Lane 1 ^d	323	5.9	1046	0.309	100	5.9	LOS A	2.1	15.8	Full	500	0.0	0.0
Approach	323	5.9		0.309		5.9	LOS A	2.1	15.8				
East: Sandspit Road Link													
Lane 1 ^d	107	4.9	861	0.125	100	7.0	LOS A	0.8	5.8	Full	500	0.0	0.0
Approach	107	4.9		0.125		7.0	LOS A	0.8	5.8				
North: Matakana Road													
Lane 1 ^d	412	10.0	963	0.428	100	9.6	LOS A	3.2	24.5	Full	500	0.0	0.0
Approach	412	10.0		0.428		9.6	LOS A	3.2	24.5				
West: Matakana Road Link													
Lane 1 ^d	601	3.7	1268	0.474	100	6.1	LOS A	4.1	29.8	Full	500	0.0	0.0
Approach	601	3.7		0.474		6.1	LOS A	4.1	29.8				
Intersection	1443	6.1		0.474		7.1	LOS A	4.1	29.8				

MOVEMENT SUMMARY

Site: 101 [Matakana Rd - Sandspit Rd Link _AM]

New Site
Site Category: (None)
Roundabout

Movement Performance - Vehicles												
Mov ID	Turn	Demand Total veh/h	Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Queue Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Matakana Road												
1	L2	195	4.9	0.343	6.4	LOS A	2.4	17.7	0.68	0.68	0.68	53.5
2	T1	122	14.7	0.343	6.7	LOS A	2.4	17.7	0.68	0.68	0.68	55.0
3	R2	13	0.0	0.343	12.0	LOS B	2.4	17.7	0.68	0.68	0.68	55.6
Approach		329	8.3	0.343	6.7	LOS A	2.4	17.7	0.68	0.68	0.68	54.1
East: Sandspit Road Link												
4	L2	17	0.0	0.230	6.2	LOS A	1.5	10.7	0.65	0.64	0.65	53.1
5	T1	192	1.6	0.230	6.3	LOS A	1.5	10.7	0.65	0.64	0.65	54.7
6	R2	15	0.0	0.230	12.0	LOS B	1.5	10.7	0.65	0.64	0.65	55.0
Approach		223	1.4	0.230	6.7	LOS A	1.5	10.7	0.65	0.64	0.65	54.6
North: Matakana Road												
7	L2	9	0.0	0.320	4.3	LOS A	2.3	17.6	0.42	0.56	0.42	52.8
8	T1	175	9.0	0.320	4.4	LOS A	2.3	17.6	0.42	0.56	0.42	54.1
9	R2	218	13.5	0.320	10.3	LOS B	2.3	17.6	0.42	0.56	0.42	54.1
Approach		402	11.3	0.320	7.6	LOS A	2.3	17.6	0.42	0.56	0.42	54.1
West: Matakana Road Link												
10	L2	185	18.8	0.263	4.6	LOS A	1.8	14.5	0.44	0.52	0.44	53.6
11	T1	68	12.3	0.263	4.5	LOS A	1.8	14.5	0.44	0.52	0.44	55.4
12	R2	59	5.4	0.263	10.1	LOS B	1.8	14.5	0.44	0.52	0.44	55.8
Approach		313	14.8	0.263	5.6	LOS A	1.8	14.5	0.44	0.52	0.44	54.4
All Vehicles		1267	9.6	0.343	6.7	LOS A	2.4	17.7	0.53	0.59	0.53	54.3

MOVEMENT SUMMARY

Site: 101 [Matakana Rd - Sandspit Rd Link _PM]

New Site
Site Category: (None)
Roundabout

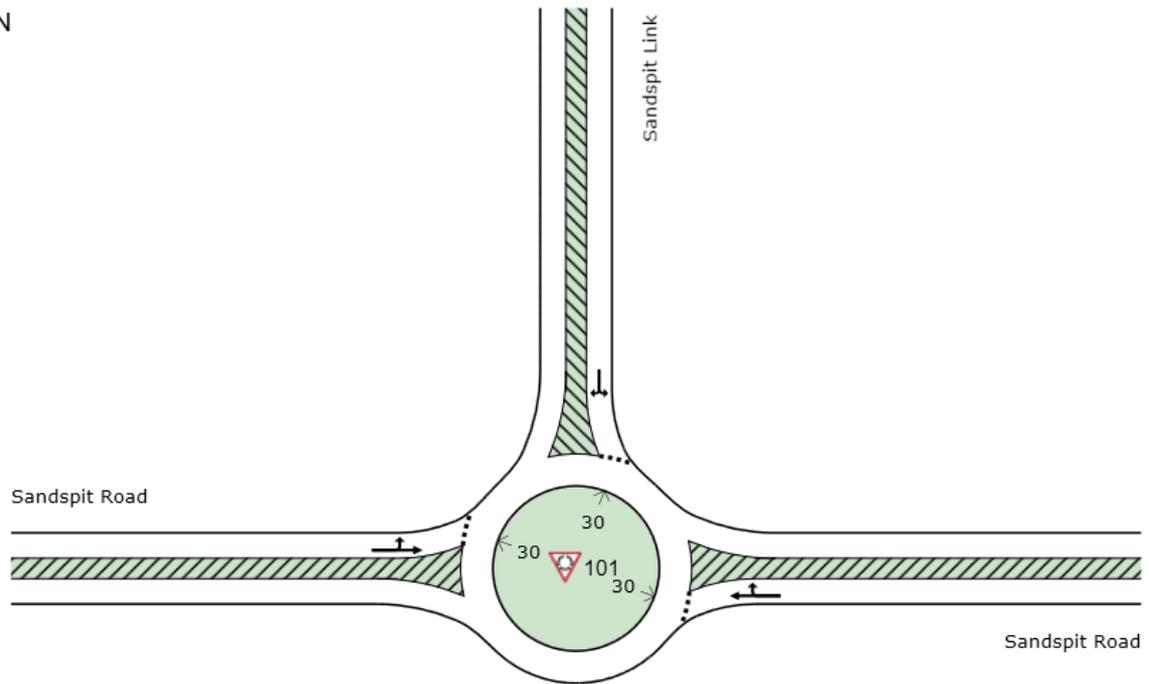
Movement Performance - Vehicles												
Mov ID	Turn	Demand Total veh/h	Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Queue Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Matakana Road												
1	L2	157	6.0	0.309	5.6	LOS A	2.1	15.8	0.61	0.60	0.61	53.6
2	T1	146	6.5	0.309	5.6	LOS A	2.1	15.8	0.61	0.60	0.61	55.2
3	R2	20	0.0	0.309	11.2	LOS B	2.1	15.8	0.61	0.60	0.61	55.7
Approach		323	5.9	0.309	5.9	LOS A	2.1	15.8	0.61	0.60	0.61	54.4
East: Sandspit Road Link												
4	L2	16	0.0	0.125	6.5	LOS A	0.8	5.8	0.68	0.65	0.68	53.0
5	T1	84	6.3	0.125	6.7	LOS A	0.8	5.8	0.68	0.65	0.68	54.5
6	R2	7	0.0	0.125	12.2	LOS B	0.8	5.8	0.68	0.65	0.68	54.9
Approach		107	4.9	0.125	7.0	LOS A	0.8	5.8	0.68	0.65	0.68	54.3
North: Matakana Road												
7	L2	20	0.0	0.428	6.1	LOS A	3.2	24.5	0.72	0.72	0.72	51.6
8	T1	171	6.8	0.428	6.4	LOS A	3.2	24.5	0.72	0.72	0.72	53.0
9	R2	221	13.3	0.428	12.3	LOS B	3.2	24.5	0.72	0.72	0.72	52.9
Approach		412	10.0	0.428	9.6	LOS A	3.2	24.5	0.72	0.72	0.72	52.9
West: Matakana Road Link												
10	L2	228	7.8	0.474	4.8	LOS A	4.1	29.8	0.55	0.55	0.55	53.2
11	T1	232	0.9	0.474	4.7	LOS A	4.1	29.8	0.55	0.55	0.55	55.0
12	R2	141	1.5	0.474	10.5	LOS B	4.1	29.8	0.55	0.55	0.55	55.3
Approach		601	3.7	0.474	6.1	LOS A	4.1	29.8	0.55	0.55	0.55	54.4
All Vehicles		1443	6.1	0.474	7.1	LOS A	4.1	29.8	0.62	0.62	0.62	53.9

Sandspit Road/ Sandspit Link

SITE LAYOUT

▽ Site: 101 [Sandspit Rd - Sandspit Rd Link _AM]

New Site
Site Category: (None)
Roundabout



Sandspit Road

LANE SUMMARY

 Site: 101 [Sandspit Rd - Sandspit Rd Link _AM]

New Site
Site Category: (None)
Roundabout

Lane Use and Performance													
	Demand	Flows		Deg.	Lane	Average	Level of	95% Back of Queue		Lane	Lane	Cap.	Prob.
	Total	HV	Cap.	Satn	Util.	Delay	Service	Veh	Dist	Config	Length	Adj.	Block.
	veh/h	%	veh/h	v/c	%	sec			m		m	%	%
East: Sandspit Road													
Lane 1 ^d	573	2.9	1408	0.407	100	5.3	LOS A	3.4	24.5	Full	500	0.0	0.0
Approach	573	2.9		0.407		5.3	LOS A	3.4	24.5				
North: Sandspit Link													
Lane 1 ^d	160	5.3	1066	0.150	100	8.9	LOS A	0.9	6.7	Full	500	0.0	0.0
Approach	160	5.3		0.150		8.9	LOS A	0.9	6.7				
West: Sandspit Road													
Lane 1 ^d	358	12.4	1285	0.278	100	4.3	LOS A	1.9	14.9	Full	500	0.0	0.0
Approach	358	12.4		0.278		4.3	LOS A	1.9	14.9				
Intersection	1091	6.4		0.407		5.5	LOS A	3.4	24.5				

LANE SUMMARY

 Site: 101 [Sandspit Rd - Sandspit Rd Link _PM]

New Site
Site Category: (None)
Roundabout

Lane Use and Performance													
	Demand	Flows		Deg.	Lane	Average	Level of	95% Back of Queue		Lane	Lane	Cap.	Prob.
	Total	HV	Cap.	Satn	Util.	Delay	Service	Veh	Dist	Config	Length	Adj.	Block.
	veh/h	%	veh/h	v/c	%	sec			m		m	%	%
East: Sandspit Road													
Lane 1 ^d	502	7.1	1519	0.331	100	4.7	LOS A	2.7	19.9	Full	500	0.0	0.0
Approach	502	7.1		0.331		4.7	LOS A	2.7	19.9				
North: Sandspit Link													
Lane 1 ^d	176	0.6	1024	0.172	100	7.1	LOS A	1.1	7.5	Full	500	0.0	0.0
Approach	176	0.6		0.172		7.1	LOS A	1.1	7.5				
West: Sandspit Road													
Lane 1 ^d	539	2.7	1439	0.374	100	4.0	LOS A	2.8	20.2	Full	500	0.0	0.0
Approach	539	2.7		0.374		4.0	LOS A	2.8	20.2				
Intersection	1217	4.2		0.374		4.7	LOS A	2.8	20.2				

MOVEMENT SUMMARY

Site: 101 [Sandspit Rd - Sandspit Rd Link _AM]

New Site
Site Category: (None)
Roundabout

Movement Performance - Vehicles												
Mov ID	Turn	Demand Flows		Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue		Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
		Total veh/h	HV %				Vehicles veh	Distance m				
East: Sandspit Road												
5	T1	453	3.3	0.407	4.1	LOS A	3.4	24.5	0.39	0.46	0.39	55.5
6	R2	120	1.8	0.407	9.8	LOS A	3.4	24.5	0.39	0.46	0.39	55.8
Approach		573	2.9	0.407	5.3	LOS A	3.4	24.5	0.39	0.46	0.39	55.5
North: Sandspit Link												
7	L2	58	12.7	0.150	5.5	LOS A	0.9	6.7	0.53	0.65	0.53	51.8
9	R2	102	1.0	0.150	10.9	LOS B	0.9	6.7	0.53	0.65	0.53	53.8
Approach		160	5.3	0.150	8.9	LOS A	0.9	6.7	0.53	0.65	0.53	53.0
West: Sandspit Road												
10	L2	46	2.3	0.278	4.1	LOS A	1.9	14.9	0.37	0.42	0.37	54.7
11	T1	312	13.9	0.278	4.3	LOS A	1.9	14.9	0.37	0.42	0.37	56.2
Approach		358	12.4	0.278	4.3	LOS A	1.9	14.9	0.37	0.42	0.37	56.0
All Vehicles		1091	6.4	0.407	5.5	LOS A	3.4	24.5	0.41	0.48	0.41	55.3

MOVEMENT SUMMARY

Site: 101 [Sandspit Rd - Sandspit Rd Link _PM]

New Site
Site Category: (None)
Roundabout

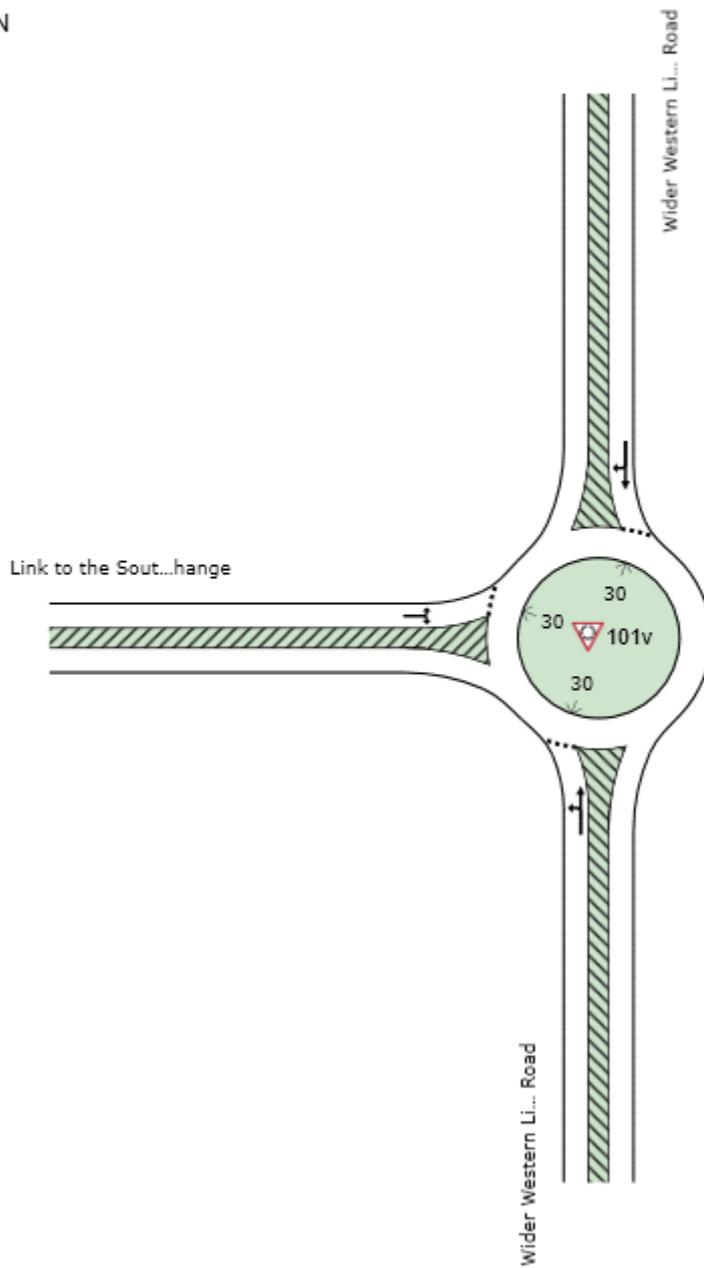
Movement Performance - Vehicles												
Mov ID	Turn	Demand Flows		Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue		Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
		Total veh/h	HV %				Vehicles veh	Distance m				
East: Sandspit Road												
5	T1	414	7.6	0.331	3.7	LOS A	2.7	19.9	0.23	0.40	0.23	56.3
6	R2	88	4.8	0.331	9.4	LOS A	2.7	19.9	0.23	0.40	0.23	56.6
Approach		502	7.1	0.331	4.7	LOS A	2.7	19.9	0.23	0.40	0.23	56.4
North: Sandspit Link												
7	L2	135	0.8	0.172	5.8	LOS A	1.1	7.5	0.60	0.64	0.60	53.4
9	R2	41	0.0	0.172	11.5	LOS B	1.1	7.5	0.60	0.64	0.60	55.4
Approach		176	0.6	0.172	7.1	LOS A	1.1	7.5	0.60	0.64	0.60	53.9
West: Sandspit Road												
10	L2	120	0.9	0.374	4.0	LOS A	2.8	20.2	0.33	0.40	0.33	55.0
11	T1	419	3.3	0.374	4.0	LOS A	2.8	20.2	0.33	0.40	0.33	56.6
Approach		539	2.7	0.374	4.0	LOS A	2.8	20.2	0.33	0.40	0.33	56.3
All Vehicles		1217	4.2	0.374	4.7	LOS A	2.8	20.2	0.33	0.44	0.33	56.0

Wider Western Link/ Link to the Southern Interchange

SITE LAYOUT

 **Site: 101v [Link to the Southern Interchange - Wider Western Link Road_AM]**

New Site
Site Category: (None)
Roundabout



LANE SUMMARY

 Site: 101v [[Link to the Southern Interchange - Wider Western Link Road_AM](#)]

New Site
Site Category: (None)
Roundabout

Lane Use and Performance													
	Demand Flows		Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue		Lane Config	Lane Length m	Cap. Adj. %	Prob. Block. %
	Total veh/h	HV %						Veh	Dist m				
South: Wider Western Link Road													
Lane 1 ^d	417	5.6	1230	0.339	100	4.9	LOS A	2.4	18.0	Full	500	0.0	0.0
Approach	417	5.6		0.339		4.9	LOS A	2.4	18.0				
North: Wider Western Link Road													
Lane 1 ^d	282	4.5	1290	0.219	100	8.6	LOS A	1.4	10.5	Full	500	0.0	0.0
Approach	282	4.5		0.219		8.6	LOS A	1.4	10.5				
West: Link to the Southern Interchange													
Lane 1 ^d	260	13.4	1165	0.223	100	8.0	LOS A	1.5	11.5	Full	500	0.0	0.0
Approach	260	13.4		0.223		8.0	LOS A	1.5	11.5				
Intersection	959	7.4		0.339		6.8	LOS A	2.4	18.0				

LANE SUMMARY

 Site: 101v [[Link to the Southern Interchange - Wider Western Link Road_PM](#)]

New Site
Site Category: (None)
Roundabout

Lane Use and Performance													
	Demand Flows		Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue		Lane Config	Lane Length m	Cap. Adj. %	Prob. Block. %
	Total veh/h	HV %						Veh	Dist m				
South: Wider Western Link Road													
Lane 1 ^d	296	9.6	1343	0.220	100	4.1	LOS A	1.5	11.5	Full	500	0.0	0.0
Approach	296	9.6		0.220		4.1	LOS A	1.5	11.5				
North: Wider Western Link Road													
Lane 1 ^d	309	3.7	1133	0.273	100	7.2	LOS A	1.9	13.4	Full	500	0.0	0.0
Approach	309	3.7		0.273		7.2	LOS A	1.9	13.4				
West: Link to the Southern Interchange													
Lane 1 ^d	448	20.0	1236	0.363	100	8.2	LOS A	2.7	21.9	Full	500	0.0	0.0
Approach	448	20.0		0.363		8.2	LOS A	2.7	21.9				
Intersection	1054	12.3		0.363		6.8	LOS A	2.7	21.9				

MOVEMENT SUMMARY

 Site: 101v [Link to the Southern Interchange - Wider Western Link Road_AM]

New Site
Site Category: (None)
Roundabout

Movement Performance - Vehicles												
Mov ID	Turn	Demand Flows		Deg. Satn	Average Delay	Level of Service	95% Back of Queue		Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed
		Total veh/h	HV %	v/c	sec		Vehicles veh	Distance m				km/h
South: Wider Western Link Road												
1	L2	218	8.7	0.339	4.8	LOS A	2.4	18.0	0.51	0.51	0.51	54.2
2	T1	199	2.1	0.339	4.9	LOS A	2.4	18.0	0.51	0.51	0.51	56.1
Approach		417	5.6	0.339	4.9	LOS A	2.4	18.0	0.51	0.51	0.51	55.1
North: Wider Western Link Road												
8	T1	74	2.9	0.219	4.4	LOS A	1.4	10.5	0.40	0.58	0.40	53.6
9	R2	208	5.1	0.219	10.1	LOS B	1.4	10.5	0.40	0.58	0.40	53.8
Approach		282	4.5	0.219	8.6	LOS A	1.4	10.5	0.40	0.58	0.40	53.8
West: Link to the Southern Interchange												
10	L2	113	12.1	0.223	4.7	LOS A	1.5	11.5	0.46	0.59	0.46	52.5
12	R2	147	14.3	0.223	10.6	LOS B	1.5	11.5	0.46	0.59	0.46	54.2
Approach		260	13.4	0.223	8.0	LOS A	1.5	11.5	0.46	0.59	0.46	53.4
All Vehicles		959	7.4	0.339	6.8	LOS A	2.4	18.0	0.46	0.55	0.46	54.2

MOVEMENT SUMMARY

 Site: 101v [Link to the Southern Interchange - Wider Western Link Road_PM]

New Site
Site Category: (None)
Roundabout

Movement Performance - Vehicles												
Mov ID	Turn	Demand Flows		Deg. Satn	Average Delay	Level of Service	95% Back of Queue		Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed
		Total veh/h	HV %	v/c	sec		Vehicles veh	Distance m				km/h
South: Wider Western Link Road												
1	L2	151	18.2	0.220	4.2	LOS A	1.5	11.5	0.34	0.42	0.34	54.7
2	T1	145	0.7	0.220	4.1	LOS A	1.5	11.5	0.34	0.42	0.34	56.9
Approach		296	9.6	0.220	4.1	LOS A	1.5	11.5	0.34	0.42	0.34	55.8
North: Wider Western Link Road												
8	T1	209	1.5	0.273	5.3	LOS A	1.9	13.4	0.56	0.59	0.56	54.5
9	R2	100	8.4	0.273	11.1	LOS B	1.9	13.4	0.56	0.59	0.56	54.6
Approach		309	3.7	0.273	7.2	LOS A	1.9	13.4	0.56	0.59	0.56	54.5
West: Link to the Southern Interchange												
10	L2	172	28.2	0.363	4.7	LOS A	2.7	21.9	0.44	0.58	0.44	51.8
12	R2	277	14.8	0.363	10.4	LOS B	2.7	21.9	0.44	0.58	0.44	53.8
Approach		448	20.0	0.363	8.2	LOS A	2.7	21.9	0.44	0.58	0.44	53.0
All Vehicles		1054	12.3	0.363	6.8	LOS A	2.7	21.9	0.44	0.54	0.44	54.2

Attachment C - CNV3 Construction Noise and Vibration Report Table 6-2

Equipment	Sound power level (dB L _{WA})	Façade-corrected noise level at varying distances (dB L _{Aeq})				Minimum Setback distance to comply with day-time criteria without mitigation, metres
		5 m	10 m	20 m	50 m	
30T excavator	105	86	80	73	66	30
20T excavator	99	80	74	67	60	13
Roller compactor	101	82	76	69	62	20
Tipper Truck	107	88	82	75	68	36
Loader	105	86	80	73	66	30
Vibratory Plate Compactor	110	91	85	78	71	45
Smooth Drum Roller	103	84	78	71	64	25
Paver	103	84	78	71	64	25
Grader	99	80	74	67	60	13
<i>Bridge Construction Only</i>						
Concrete Truck	107	88	82	75	68	36
Cranes	99	80	74	67	60	13
Concrete Pump	103	81	75	69	61	17
Bored Pilling Rig	111	89	83	77	69	49

Attachment D - CNV4 – Appendix A (Construction Noise Receivers)

NoR 1

Address	Building Type/Structure
42 State Highway 1	Residential

NoR 2

Address	Building Type/Structure
314 Woodcocks Road	Residential
127A Woodcocks Road	Residential
346 Woodcocks Road	Residential
286 Woodcocks Road	Residential
1 Mason Heights	Residential
371 Woodcocks Road	Residential
2 Mason Heights	Residential
314A Woodcocks Road	Residential
372 Woodcocks Road	Residential
12 Oliver Street	Residential
8 Oliver Street	Residential
10 Oliver Street	Residential
3 Mason Heights	Residential
20 Oliver Street	Residential
4 Oliver Street	Residential
6 Oliver Street	Residential
18 Oliver Street	Residential
16 Oliver Street	Residential
14 Oliver Street	Residential
6 Evelyn Street	Residential
87 Woodcocks Road	Residential
326 Falls Road	Residential
5 Evelyn Street	Residential
317 Woodcocks Road	Residential
153 Woodcocks Road	Residential
127 Woodcocks Road	Residential
125 Woodcocks Road	Commercial
70 Woodcocks Rd	Commercial
12 Wyllie Road	Residential
22 Oliver Street	Residential
7 Evelyn Street	Residential
85 Woodcocks Road	Residential
11 Oliver Street	Residential
9 Oliver Street	Residential
13 Oliver Street	Residential
5 Oliver Street	Residential
7 Oliver Street	Residential
15 Oliver Street	Residential
3 Oliver Street	Residential
7 Mason Heights	Residential
24 Oliver Street	Residential

1 Oliver Street

Residential

NoR 3

Address	Building Type/Structure
1/18 Wech Drive	Residential
8E McKinney Road	Residential
1659 State Highway 1	Residential
8 Toovey Road	Commercial'
9 McKinney Road	Residential
8F McKinney Road	Residential
27B Campbell Drive	Residential
1723 State Highway 1	Residential
43 Auckland Road	Commercial
6 McKinney Road	Residential
24 Wickens Place	Residential
33 Campbell Drive	Residential
22 Wickens Place	Residential
1/6 Wech Drive	Residential
17 Wech Drive	Residential
13 Wickens Place	Residential
25 Campbell Drive	Residential
15 Wech Drive	Residential
14 Wech Drive	Residential
67 Auckland Road	Commercial
1794 State Highway 1	Commercial
11 Wickens Place	Residential
11 Wech Drive	Residential
12 Wech Drive	Residential
37 Campbell Drive	Residential
7 McKinney Road	Residential
35 Campbell Drive	Residential
1848 State Highway 1	Residential
16 Wech Drive	Residential
7 Wech Drive	Residential
23 Campbell Drive	Residential
19 Wech Drive	Residential
22 Wech Drive	Residential
21 Campbell Drive	Residential
1673 State Highway 1	Residential
1/1 Fairwater Road	Commercial
8A Wech Drive	Residential
21 Wickens Place	Residential
1 Wech Drive	Commercial
21 Wech Drive	Residential
1728 State Highway 1	Residential
23 Wickens Place	Residential
2/18 Wech Drive	Residential

20 Wickens Place	Residential
9 Wickens Place	Residential
4 Wech Drive	Residential
3/4 Fairwater Road	Commercial
5 Wech Drive	Residential
27 Campbell Drive	Residential
1/4 Fairwater Road	Residential
19 Campbell Drive	Residential
25 Wickens Place	Residential
3 Wech Drive	Residential
1773 State Highway 1	Residential
19 Wickens Place	Residential
31 Campbell Drive	Residential
2/6 Wech Drive	Residential
18 Wickens Place	Residential
17 Wickens Place	Residential
9 Wech Drive	Residential
39 Campbell Drive	Residential
8D McKinney Road	Residential
12A Wech Drive	Residential
20 Wech Drive	Residential
17A Wech Drive	Residential
4A Wech Drive	Residential
17 Campbell Drive	Residential
8B McKinney Road	Residential
29 Campbell Drive	Residential
7 Wickens Place	Residential
16 Wickens Place	Residential
1829 State Highway 1	Residential
3/6 Wech Drive	Residential
3/6 Fairwater Road	Commercial
5 Wickens Place	Residential
3 Wickens Place	Residential
1695A Valerie Cl	Residential
1684 State Highway 1	Residential
41 Campbell Drive	Residential
15 Campbell Drive	Residential
1695B Valerie Cl	Residential
14 Wickens Place	Residential
7A Wech Drive	Residential
3B Wech Drive	Residential
8 Wech Drive	Residential
7 Toovey Road	Residential
43 Campbell Drive	Residential
3/9 Fairwater Road	Commercial
8C McKinney Road	Residential
12 Wickens Place	Residential

20 Campbell Drive	Residential
8 Fairwater Road	Commercial
18 Campbell Drive	Residential
16 Campbell Drive	Residential
4B Wech Drive	Residential
102 Hauti Drive	Residential
13A Campbell Drive	Residential
10 Wickens Place	Residential
13 Campbell Drive	Residential
4/6 Wech Drive	Residential
22 Campbell Drive	Residential
45 Campbell Drive	Residential
98 Hauti Drive	Residential
14 Campbell Drive	Residential
82 Hauti Drive	Residential
100 Hauti Drive	Residential
24 Campbell Drive	Residential
92 Hauti Drive	Residential
8 Wickens Place	Residential
4 Wickens Place	Residential
11B Campbell Drive	Residential

NoR 4

Address	Building Type/Structure
130 Matakana Road	Residential
1 Melwood Drive	Residential
19 Northwood Close	Residential
98 Matakana Road	Residential
160 Matakana Road	Residential
190 Matakana Road	Residential
303 Matakana Road	Residential
170 Matakana Road	Residential
299 Matakana Road	Residential
304 Matakana Road	Residential
297 Matakana Road	Residential
165 Matakana Road	Residential
223 Matakana Road	Residential
2 Melwood Drive	Residential
4 Clayden Road	Residential
2 Clayden Road	Residential
76 Matakana Road	Residential
301 Matakana Road	Residential
120 Matakana Road	Residential
59 Northwood Close	Residential
3 Matakana Road	Residential
211 Matakana Road	Residential
4 Melwood Drive	Residential
23 Northwood Close	Residential
5 Matakana Road	Residential
3 Melwood Drive	Residential
57 Northwood Close	Residential

293 Matakana Road	Residential
140 Matakana Road	Residential
185 Matakana Road	Residential
245 Matakana Road	Residential
41 Northwood Close	Residential
17 Northwood Close	Residential
39 Northwood Close	Residential
295 Matakana Road	Residential
33 Northwood Close	Residential
6 Clayden Road	Residential
49 Matakana Road	Residential
31 Northwood Close	Residential
171 Matakana Road	Residential
45 Northwood Close	Residential
43 Northwood Close	Residential
25 Northwood Close	Residential
15 Northwood Close	Residential
37 Northwood Close	Residential
47 Northwood Close	Residential
2 Millstream Place	Residential
35 Northwood Close	Residential
55 Northwood Close	Residential
61 Northwood Close	Residential
6 Millstream Place	Residential
29 Northwood Close	Residential
40 Clayden Road	Residential
8 Clayden Road	Residential
4 Millstream Place	Residential
185 Matakana Road	Residential
207 Matakana Road	Residential
1 Millstream Place	Residential
27 Northwood Close	Residential
17 Clayden Road	Residential
6 Melwood Drive	Residential
13 Northwood Close	Residential
35 Sandspit Road	Residential
8 Millstream Place	Residential
44 Clayden Road	Residential
10 Clayden Road	Residential
10 Millstream Place	Residential
3 Millstream Place	Residential
11 Northwood Close	Residential
233 Matakana Road	Residential

NoR 5

Address	Building Type/Structure
4 Millstream Place	Residential
209 Sandspit Road	Residential
6 Millstream Place	Residential
108 Sandspit Road	Residential
384 Sandspit Road	Residential
10 Millstream Place	Residential
1 Millstream Place	Residential

3 Millstream Place	Residential
8 Millstream Place	Residential
137 Sandspit Road	Residential
5 Millstream Place	Residential
12 Millstream Place	Residential
7 Millstream Place	Residential
14 Millstream Place	Residential
9 Millstream Place	Residential
146 Sandspit Road	Residential
109 Sandspit Road	Residential
11 Millstream Place	Residential
16 Millstream Place	Residential
117 Sandspit Road	Residential
198 Sandspit Road	Residential
135 Sandspit Road	Residential
130 Sandspit Road	Residential

NoR 6

Address	Building Type/Structure
2 Jamie Lane	Residential
4 Jamie Lane	Residential
6 Jamie Lane	Residential
1 Christopher Lane	Residential
10 Georgetti Way	Residential
3 Christopher Lane	Residential
73 Woodcocks Road	Commercial
3 Dunningham Street	Residential
9 Dunningham Street	Residential
5 Dunningham Street	Residential
8 Jamie Lane	Residential
7 Dunningham Street	Residential
5 Christopher Lane	Residential
1 McKinney Road	Residential
10 Jamie Lane	Residential
8 Georgetti Way	Residential
7 Christopher Lane	Residential
22 Wech Drive	Residential
3 McKinney Road	Residential
77 Morrison Drive	Commercial
12 Jamie Lane	Residential
9 Christopher Lane	Residential
6 Georgetti Way	Residential
2 Christopher Lane	Residential
4 Christopher Lane	Residential
1848 State Highway 1	Residential
21 Wech Drive	Residential
13 Christopher Lane	Residential

6 Christopher Lane	Residential
1 Oliver Street	Residential
6 McKinney Road	Residential
8 Christopher Lane	Residential
3 Oliver Street	Residential
8F McKinney Road	Residential
5 Oliver Street	Residential
16 Jamie Lane	Residential
10 Christopher Lane	Residential
19 Wech Drive	Residential
7 Evelyn Street	Residential
7 Oliver Street	Residential
12 Christopher Lane	Residential

NoR 7

Address	Building Type/Structure
195 Sandspit Road	Residential
137 Sandspit Road	Residential
169 Sandspit Road	Residential
179 Sandspit Road	Residential
209 Sandspit Road	Residential
131 Sandspit Road	Residential
169 Sandspit Road	Residential
198 Sandspit Road	Residential
245 Matakana Road	Residential

NoR 8

Address	Building Type/Structure
346 Woodcocks Road	Residential
12 Wyllie Road	Residential
314A Woodcocks Road	Residential
123 Valerie Close	Residential
317 Woodcocks Road	Residential

Attachment E – LS6 (Table 8)

Table 8. Summary of assessment of effects of recommendations – Warkworth Package overall network

Residual effect after recommendations	Assessment	Recommendation
Effects during construction		
<p>Landscape Character: 'Low-Moderate'</p> <p>Natural Character: 'Low-Moderate'</p>	<p>Larger construction area, than operational footprint. This may result in some additional vegetation removal.</p>	<p>Appropriately integrate Project with existing landscape features (including natural wetlands) and the wider natural landscape.</p> <p>Consider opportunities for suitable felled tree species for re-use as landscape features.</p>
	<p>Work to be undertaken in or near waterbodies.</p>	<p>Minimise sedimentation of waterbodies using appropriate erosion controls, by limiting the extent of exposed earthworks at any one time and revegetate earthworks, as appropriate.</p> <p>Consider opportunities for topsoil stripping and stockpiling for re-use, ensuring that topsoil is suitable for landscape purposes.</p> <p>Where practicable, undertake bridge construction from dry land, avoid piers in the beds of waterways and wetlands, minimise piers on riverbanks, and minimise fill over waterbodies.</p>
	<p>Visual effects from the clutter of materials, machinery, and construction yards.</p>	<p>Where appropriate, select visually discrete locations for the placement of construction yards and material storage. Consider screening of construction yards as mitigation for temporary visual effects.</p> <p>Ensure the reinstatement of construction yards is undertaken in a manner appropriate for the anticipated future use of the land.</p> <p>Take into account the potential visual impacts of structures and look to adopt appropriate</p>

		architectural and landscape treatment to manage these effects.
Residual effect after recommendations	Assessment	Recommendation
Landscape Character (cont'): 'Low-Moderate' Natural Character (cont'): 'Low-Moderate'	Effects on existing residential areas.	Identify opportunities for the survey, collection, and propagation of heritage amenity plants in private gardens that will be demolished to enable construction to occur (subject to the agreement with the landowner), so that as appropriate these may be re-established as part of the planting programme during finishing works.
Operational effects		
Landscape Character: 'Low' Natural Character: 'Low'	Opportunity to integrate the Warkworth Package with the wider landscape.	Consider how the Project (including roadside elements such as lighting, signage and the landscape treatment of structures) can: Enable integration of the Project's permanent works into the surrounding landscape and urban context; and Ensure that the Project manages potential adverse landscape and visual effects and contributes to a quality urban environment. Take into account the potential visual impacts of structures and look to adopt appropriate architectural and landscape treatment to manage these effects. How the Project can enable integration of street trees into the transport corridor design.
Residual effect after recommendations	Assessment	Recommendation

<p>Landscape Character (cont'): 'Low'</p>	<p>Potential for effects on landscape features, including indigenous vegetation and waterbodies.</p>	<p>Integrate the Project with existing landscape features (including natural wetlands) and the wider natural landscape.</p>
<p>Natural Character (cont'): 'Low'</p>	<p>Opportunity to integrate stormwater management.</p>	<p>Consider further refinement of stormwater treatment wetland design to appear 'natural' with a variety of habitats, e.g. irregular shape with curved boundaries, varying depths and islands.</p> <p>Consider water sensitive urban design principles. Recommendation to prioritise the use of soft engineering strategies for stormwater management.</p> <p>It is noted that detailed responses to waterway and natural wetland treatment will be detailed in the future regional resource consenting stages of the Warkworth Package.</p>
	<p>Anticipated likely future environment based on assumptions.</p>	<p>Re-validate the landscape and natural character values identified in the LNCVA prior to the commencement of conceptual design.</p>

Attachment F – LS6 (Page 113 – 115)

Figure 19-1 Summary table illustrating the construction landscape character and natural character effects without recommended measures and following recommended measures

NOR	Construction (Temporary) Effects without Recommended Measures		Construction (Temporary) Effects following Recommended Measures	
	Landscape Character	Natural Character	Landscape Character	Natural Character
Warkworth	M	M	L-M	L-M
Northern Project Area	M-H	M-H	L-M	L-M
Southern Project Area	M	M	L-M	L-M
1	L-M	M	L	L
2	L-M	M-H	L	L-M
3	L-M	L-M	L	L
4	H	L	M-H	L
5	H	H	M-H	M-H
6	M-H	M	M	L-M
7	H	H	L-M	L-M
8	M-H	M-H	M	M
Key: V-L ('Very Low'), L ('Low'), L-M ('Low Moderate'), M ('Moderate'), M-H ('Moderate High'), H ('High') and V-H (Very High).				

Figure 19-2 Summary table illustrating the operational landscape character and natural character effects without recommended measures and following recommended measures

NOR	Operational (Permanent) Effects without Recommended Measures		Operational (Permanent) Effects following Recommended Measures	
	Landscape Character	Natural Character	Landscape Character	Natural Character
Warkworth	M-H	M-H	L	L
Northern Project Area	M-H	M-H	L	L
Southern Project Area	M	M	L	L
1	L	L-M	V-L	L
2	L	M	V-L	L-M
3	L-M	L	L	V-L
4	H	L	M	L
5	M-H	M-H	M	M
6	H	M-H	L-M	L
7	H	H	L-M	L-M
8	H	H	L-M	L-M

Key: V-L ('Very Low'), L ('Low'), L-M ('Low Moderate'), M ('Moderate'), M-H ('Moderate High'), H ('High') and V-H (Very High).