

23. Operational traffic and transport

The Transportation and Traffic Assessment Report provides an assessment of the effects on the existing and future transport network arising from the operation of the Project. Traffic effects in relation to the construction phase of the Project are the subject of a separate report and are summarised in Section 13 of this AEE.

The Report describes the existing transport environment in the Project area, including the existing SH1 and the local road network. It discusses the methodology and modelling used to determine the future transport environment and assesses the actual and potential effects of the operation of the Project on the road network and road users.

The following is a summary of the issues and potential effects identified in the Transportation and Traffic Assessment Report. This summary and the Report subsequently inform the recommended mitigation contained in Section 28 and will inform the Project conditions.

23.1 Assessment methodology

The Transport team assessed the operational effects of the Project by first forecasting the performance of the transport network in the future for a 'Base Case' scenario, which assumed that the Project was not constructed. They then forecast the performance of the transport network in the future for a 'Project' scenario, which assumed construction of the Project. The Transport team then determined the transport effects of the Project by comparing the performance of the transport network in the two scenarios.

23.1.1 Traffic modelling

Much of the Transport team's assessment of operational transport effects was based on the outputs of traffic modelling. A SATURN traffic model was initially developed for the Auckland to Whangarei Strategic Assessment¹²⁶ by SKM. The Transport team updated that model for the Pūhoi to Wellsford scheme assessment phase which was completed in 2011. The model was again used by the Transport team for use in the transport assessment for this Project. They enhanced the accuracy of the model by including a more detailed road network and applying a zoning system around Warkworth and Wellsford.

Further information regarding the details of the SATURN model is provided in Section 2.2 of the Transportation and Traffic Assessment Report.

23.1.2 Base Case and Project scenario definition

(a) Base Case scenario

The Base Case scenario represents the future transport environment baseline. The Transport team developed land use forecasts for the Base Case scenario from the following sources:

- Auckland Regional Growth Strategy (and Auckland Regional Transport model);

¹²⁶ Refer Section 2.2.1 of the Transportation and Traffic Assessment Report.

- Rodney District Council Growth Model (as at late 2009); and
- Adopted Structure Plans, including the non-statutory Warkworth Structure Plan growth figures which the NZTA and the former RDC have used to help predict future infrastructure needs.

The Transport team used year 2026 as the forecast model year in order to be consistent with information gleaned from the Regional Growth Strategy and SATURN model.

The Base Case scenario also assumes a number of changes relating to the future transport network. These changes include works likely to be undertaken (or already completed) around the Hibiscus Coast Highway, in and around Warkworth township, on SH16 and SH18, and on SH1 between Constellation Drive and Greville Road.

(b) Project scenario

The Project scenario is essentially the same as the Base Case model, but includes the Project, some increased land use growth and some changes to the form of the Hill Street intersection with the existing SH1 at Warkworth. The Transport team have assumed that the construction of the Project will induce additional traffic across the Project Area due to improved accessibility between Pūhoi and Warkworth / Northland. To account for the additional traffic in the SATURN model, they applied an extra 1% traffic growth per annum in the Project scenario. The Transport team have sensitivity tested this assumption. The results showed no material change assuming that this level of induced traffic is not experienced. The Transport team also assumed some small induced traffic during the holiday peak periods as a result of the Project.

The Project scenario assumes that land closest to the Project's northern interchange will become more attractive for development, and that the forecast growth within Warkworth would relocate to an area adjacent to Hudson Road. This assumption has also been subject to sensitivity testing by the Transport team, which showed no material change in the event that this relocation of growth does not occur.

Further information on the assumptions made for the Base and Project scenarios is provided in Section 2 of the Transportation and Traffic Assessment Report.

23.2 Existing transport environment

The SH1 corridor from Pūhoi to Warkworth is primarily characterised by rolling or steep terrain with some particularly low speed horizontal curves and steep grades. The route is primarily a single carriageway with some passing lanes. The majority of the route has a posted speed limit of 100kph. Warkworth experiences significant congestion during the weekday evening commuter peak, on weekends and also during holiday periods.

Traffic volumes on the existing SH1 are forecast by the Traffic team to grow at a rate of approximately 4.4% per annum between 2009 and 2026 without the Project. This rate means that daily traffic volumes on SH1 between Pūhoi and Warkworth are expected by the Traffic team to be in the order of 25,000 vpd in 2026 without the Project.

The following sections highlight a number of key transport issues for the existing SH1 corridor in the Base Case scenario. The Transport team anticipate that these issues will generally to worsen over time as traffic volumes increase.

23.2.1 Travel times and congestion

Warkworth is currently subject to regular congestion during weekday evening peak periods. More severe congestion is experienced when incidents such as slips, flooding or crashes occur, or during holiday periods. This congestion results in increased and unpredictable travel times.

Without the Project in place, travel times in the corridor as a whole are forecast to increase as traffic volumes on SH1 increase in the future. For example, compared to 2009, the Traffic team forecast travel times on SH1 southbound (between the proposed northern tie-in and Pūhoi) to increase by 11 minutes (75%) in the PM peak from 15.5 minutes to 26.5 minutes by 2026.

They consider that these increased travel times will have an adverse impact on the efficiency of general traffic and freight movements in the corridor. Increased travel times will also have a negative impact on accessibility between Auckland, Warkworth and Northland.

23.2.2 Consistency of journey times

As noted above, the corridor is currently subject to regular congestion during weekday evening peak periods, when incidents occur or during holiday periods. This congestion not only results in increased travel times but also increased variability of travel times. Increased variability makes journey planning difficult for individuals and businesses such as freight operators.

The Traffic team consider that without the Project in place, travel time consistency in the SH1 corridor is likely to become a significant issue in the future as traffic volumes and travel times increase.

23.2.3 Crashes

Although some road safety improvements have been achieved in recent years along the existing SH1 route, the ability to achieve further reductions in the frequency and severity of crashes is constrained by its geometry.

Compared to the five years up to 2012, the average number of injury crashes per year on SH1 (between the proposed connection north of Warkworth and the Johnstone's Hill tunnels) is forecast by the Traffic team to increase by nine (68%) to 22 by 2026.

23.2.4 Route security

The existing SH1 route is often fully or partially closed for varying durations as a result of incidents such as crashes, flooding or slips blocking the road.

23.2.5 Other Modes

As discussed in Section 13.7 of this AEE, inter-city bus services and tourist shuttles currently provide public transport services within the corridor. A bus service between Warkworth and

Silverdale has been included in the Draft Auckland Regional Public Transport Plan for implementation within the next ten years. These buses and shuttles utilise the existing SH1 and will be subject to the same network issues as general and freight traffic.

There is some use of the existing SH1 by recreational cyclists. Walking and cycling also takes place within Warkworth itself. Whilst the SH1 corridor has seen some improvements in pedestrian and cycle facilities in recent years, these road users can feel intimidated by the high volumes of SH1 traffic, which affects the perceived safety and enjoyment of travel by these modes of transport. As the demand for walking and cycling increases (in line with growth in Warkworth) and traffic volumes on SH1 also increase, this problem will worsen.

Further information regarding the existing transport environment is provided in Section 3 of the Transportation and Traffic Assessment Report.

23.3 Assessment of operational effects

The Project has been specifically developed to address many of the issues identified for the existing transport environment under the Base Case scenario described in Section 23.2 above.

The Project will provide a new four-lane dual carriageway road designed and constructed to motorway and NZTA RoNS standards. This road will provide a higher quality alternate route to the existing SH1 and will improved journey times and safety.

The Traffic team assume daily traffic volumes in the corridor as a whole will grow by approximately 1% per annum, as a result of induced demand for travel from the Project. However, they expect daily volumes on the existing SH1 to reduce significantly with the Project due to traffic electing to use the new route. Daily traffic volumes on SH1 between Pūhoi and Warkworth are expected to be in the order of 14,500 vpd in 2026. This volume is 10,500 vpd (40%) less compared to the Base Case scenario. The Traffic team expect traffic volumes on the Project road between Pūhoi and Warkworth to be in the order of 14,000 vpd in 2026.

23.3.1 Travel times and congestion

The Project's new motorway standard four-lane alignment will reduce travel times and allow journeys to be planned with a greater level of certainty. The Project will reduce congestion and travel times between Pūhoi and the north during typical peak periods. This benefit will be experienced by general and freight traffic alike. The Project will also improve travel times during the holiday periods when large delays are currently experienced.

Travel times on both the existing SH1 and on the Project road to and from the north of Warkworth will be faster than the Base Case travel time on SH1. For example the Traffic team forecast travel times on the Project alignment southbound (between the proposed northern tie-in and Pūhoi) to be 10 minutes in the 2026 PM peak. This is a reduction of 16 minutes (approximately 60%) when compared to the Base Case travel time on SH1.

23.3.2 Consistency of journey times

The Project will result in significant reductions in regular congestion and the effects of random incidents. This reduction will almost eliminate travel time variability for travel between Pūhoi and north of Warkworth. These are important benefits of the Project, enabling individuals and businesses to plan their travel with a much greater degree of certainty. It also provides for a much more robust network that can cater for some disruption without significant increases in travel time.

Travel time consistency will be improved for freight traffic because of the reduced congestion, improved geometric alignment and improved passing opportunities.

By enabling reduced and more certain travel times during all periods, the Project will remove deterrents to travel in the corridor and improve accessibility between Auckland, Warkworth and Northland.

23.3.3 Crashes

The Project will be constructed to meet modern motorway standards, including:

- Grade separation of all local roads;
- Design speed of 100-110km/h;
- Dual lanes in each direction with divided carriageways;
- Minimum shoulder and median widths with a wire rope barriers (safe systems approach);
- Minimum horizontal curve radius of 820m and maximum uphill grade of 6%; and
- Minimum sight distance requirements.

The motorway will have an improved crash performance when compared with the existing SH1. This means that the average annual number of injury crashes in the corridor is forecast to decrease from 22 to 17, a reduction of five (23%) in 2026 when compared to the Base Case scenario. As a result, the Project will have a positive effect on road safety across the corridor as a whole.

23.3.4 Route security

The Project will introduce a high-quality, parallel alternative route to SH1. As a result, the effects of incidents (crashes and natural events such as slips and flooding) on travel along the existing SH1 or along the Project alignment will be significantly reduced.

23.3.5 Other Modes

The Project will have a minimal but positive impact on existing or potential public transport service performance. Following the construction of the Project, the same performance improvements anticipated for general traffic would be enjoyed by existing or improved public transport services.

The much lower volumes of traffic along the existing SH1 route will improve safety and amenity for vulnerable road users (ie pedestrians and cyclists). These lower volumes will also create opportunities for the implementation of measures to encourage walking and cycling, which would be more consistent with the new more local function of the existing SH1 route.

The Project will improve recreational cycling amenity along the existing SH1 between Pūhoi and Warkworth by reducing traffic volumes. It will also improve crash risk by reducing the exposure of cyclists along this section.

As the Project will remove a significant amount of traffic from SH1 through Warkworth, it will improve walking and cycling amenity and reduce potential conflicts between modes in and around the township. Parts of the Warkworth community will also benefit from improved levels of connectivity, accessibility and safety, thereby reducing physical severance.

23.3.6 Off-line effects

The Transport team forecast there to be a two-way increase in traffic volumes between the Base Case and the Project scenario of 4,700 vpd (24%) to 23,900 vpd in 2026 on SH1 between Hill Street and Hudson Road. This increase is predominantly as a result of the additional growth assumed adjacent to Hudson Road (as described in Section 4.1 of the Transportation and Traffic Assessment Report), and partly as a result of changed traffic patterns as a result of the Project. Vehicles accessing the Project from Warkworth or the eastern beaches that used to travel south on SH1 through Warkworth, now travel north to access the Project alignment to travel south via the northern interchange. Mitigation is recommended to address this potential traffic effect.

23.4 Overall effects and recommendations

Overall, it is considered that the operation of the Project will have a significant positive effect on the transport network. The Project will increase capacity within the corridor, improving road safety, reducing journey times, and improving consistency of journey times for general traffic and freight. It will improve route security by providing an alternative route built to higher standards which is more resilient to incidents.

There are two potentially adverse effects identified as a result of the induced traffic north on the Project (1% additional traffic) north of Warkworth. The additional 1% induced traffic results in increased delay during the peak hour at the intersection of Kaipara Flats road and SH1 and also an increase in the predicted accident rate on SH1 north of Warkworth.

The Project design has allowed for the provision of a right turn bay into Kaipara Flats Road which will ensure the potential adverse effect at Kaipara Flats Road is minor. Whilst there is an increase in accident rate predicted north of Warkworth, overall the Project results in an overall reduced accident rate between Pūhoi and Wellsford.

The Transportation and Traffic Assessment Report provides the following recommendations:

- A review of road safety associated with Warkworth Primary School should be undertaken prior to the opening of the Project or any significant development adjacent to Hudson. The NZTA and Auckland Transport have confirmed that they will undertake such a review if traffic volumes on Hill Street continue to rise.
- Prior to the completion of the Project, a management strategy should be developed by the NZTA for the section of SH1 from the northern tie-in to Hill Street. This may include closure of the northbound passing lane north of Hudson Road, a revised speed limit(s) for

this length and treatments such as painted flush medians to cater for adjacent land uses and reinforce the lower speed and more urban environment.

I support these recommendations.

The Transportation and Traffic Assessment Report concludes in Section 5 that the Project will:

- Increase travel time consistency;
- Decrease travel times;
- Alleviate congestion at Warkworth;
- Improve long-term corridor capacity; and
- Improve route quality, safety and resilience.

The Transport team considers that the Project contributes positively to all of the NZTA's objectives for the Project. In particular, the Project will reduce congestion in Warkworth compared to the existing transport environment and Base Case scenario. In the year 2026 with the Project in place, congestion levels would be close to levels experienced in 2009. In my opinion, this represents a significant benefit of the Project.