Stantec

Memo

To:	Expert Panel Fast Track	From:	Chris Rossiter Mark Georgeson
Project/File:	310206525	Date:	02 September 2026

Reference: FTAA-2604-1207 Southern Link Inland Port

The report provides technical information in response to the transport related matters summarised as Issues 1 through 4 in Minute 9 from the Expert Panel.

This report has been prepared by Chris Rossiter in accordance with the Code of Conduct for Expert Witnesses contained in the Environment Court Practice Note (2023).

1 Q1 Mode Shift

1.1 Q1 (a) Rail Mode Share

SLPL has provided the following information regarding container movements at Port Chalmers Terminal and also at the Dunedin Container Depot in the 2025 Fiscal Year (FY25). The figures for bulk product represent a container equivalent value for comparison with containerised freight volumes. In FY25, about 34,800 (18,886 + 15,863) containers comprising a mix of full and empty were moved to or from Port Chalmers by rail with about 35,800 (16,549 + 19,241) being moved by road. Based on this information, the movement of containers in FY25 was almost evenly split between road and rail.

Table 1-1: Summary of container equivalent movements at Port Chalmers FY25 (Source: SLPL)

Activity	Received		Released	
	Rail	Road	Rail	Road
Port Chalmers – Full	17,766	11,124	1,073	8,644
Port Chalmers - Empty	1,120	5,425	14,790	10,597
TOTAL	18,886	16,549	15,863	19,241
Port Chalmers – Bulk	11,184	2,585[1]		

SLPL has also provided the following information relating to the forecast container and Heavy Commercial Vehicle (HCV) movements for each stage of development under four operating scenarios

[1] Transport of bulk product involves two HCV movements per container equivalent.

reflecting different road/rail mode shares. The floor areas for each stage reflect the most recent information received from SLPL.

Table 1-2: Summary of forecast container movements by road (HCV) (Source: SLPL)

Scenario	Road/Rail	Stage 1	Stage 2	Stage 3
Warehouse Area (m^2 GFA)		32,748	72,222	79,802
Packed container movements per annum		10,526	23,214	25,651
Total HCV Movements per annum assuming no rail[2]		34,736	76,607	84,647
No transfer to rail	100% / 0%	34,736	76,607	84,647
Low transfer to rail	40% / 60%	13,895	30,643	33,859
Expected transfer to rail	25% / 75%	8,684	19,152	21,162
High transfer to rail	10% / 90%	3,474	7,661	8,465

The primary purpose of the SLIP is to increase the rail mode share for container movement to and from the port. The colocation of the warehouse facilities with the railway siding allows packed containers to be loaded direct onto the railway for transport to the port without the need for any transport by road.

Under SLPL's expected operating scenario (highlighted), full development of the SLIP is forecast to generate 21,200 (21,162) HCV movements per annum by road.

1.2 Q1 (b) Commercial Effects

I am not qualified to comment on the commercial aspects of the SLIP.

Appendix A to this report includes commentary prepared by SLPL in response to this question.

1.3 Q1 (c) SH87 and SH88 Volumes

Based on the SLPL container equivalent movement data for FY25, as reported in Section 1.1, about 40,960 HCV movements per annum would be required on SH88.

If the SLIP did not achieve any transfer from road to rail, which represents a highly unlikely scenario given its intended purpose, there would be no change to traffic volumes on SH88.

Table 1-2 shows the anticipated volumes of container movements generated by the SLIP on SH87 at each stage of development with the expected road / rail mode share, a low rail mode share and a high rail mode share. In the low mode share scenario, the volume of truck movements by road could increase to about 33,900 per annum, which represents an increase of 12,700 per annum compared with

[2] See traffic generation under Section 3.3

the SLPL expected operating scenario. If a higher rail mode share was achieved, then truck movement volumes at SLIP would reduce compared with the expected operating scenario.

1.4 Q1 (d) Economics

I am not qualified to comment on economics of the transport benefits or the environmental benefits.

Appendix A to this report includes commentary prepared by SLPL in response to this question.

1.5 Q1 (e) Existing Mode Shift

Based on the information provided by SLPL (see Appendix A), I understand that the initial trials by SLPL were intended to test the operating scenarios for the SLIP. The reduced volume of HCV movements as a result of this trial is not additional to any benefits associated with the SLIP as the trial operations would transfer to the SLIP.

2 Q2 Cap on Movements

2.1 Q2 (a) Need for a cap

Condition 59A sets limits on overnight rail movements specifically to control noise effects. Its intent is not to control activity levels during the day.

Since Dukes Road North and SH87 form part of the designated High Productivity Motor Vehicle (HPMV) network and there are large areas of undeveloped land within the Dukes Road Industrial Zone, increased HCV and HPMV volumes can be expected in the future irrespective of the proposed SLIP development.

Figure 2-1 shows the locations of land within the Dukes Road Industrial Zone that is currently undeveloped. I have estimated that this comprises about 30 ha which represents about 30% of the overall Dukes Road Industrial Zone land area.

Based on the DCC surveys from February 2026[3], the existing activity along Dukes Road North generated about 4,100 vehicle movements per day (vpd). Since the existing developed area of the industrial zone comprises about 70ha, development of the remaining zoned land (30 ha) could increase traffic volumes by about 2,000 vpd to about 6,000 vpd. While this is some uncertainty over the rate of development that could be anticipated, information received from DCC indicates that the SLIP could attract businesses to the Industrial Zone and increase local growth rates above the wide area growth rate.

Setting a cap on movements at the SLIP would not necessarily manage effects on the wider network and any contribution to the effects generated by the SLIP would be small compared with other activities. At around 450 vehicle movements per day, the average daily traffic generation of the SLIP represents

[3] Received from DCC July 2026

about 10% of the potential future volumes of traffic on Dukes Road North based on 5% background growth over ten years, less than 10% of the total volumes on SH87 south of Dukes Road North with this percentage reducing further south along Gordon Road

Based on the sensitivity analysis presented in Table 1-2, the daily HCV volumes could increase by 50 to 100 movements (in the low rail scenarios) if the expected rail mode of 75% is not achieved. This represents only a small proportion of the potential growth in vehicle movements that could arise from full development of the industrial zone which could increase traffic volumes by up to 2,000 vpd.

Since the SLIP only accounts for a small proportion of the overall existing and possible traffic generation of activities within the industrial land zoned along Dukes Road North, an isolated cap on its movements would not manage growth and effects contributing from existing and other new activities.

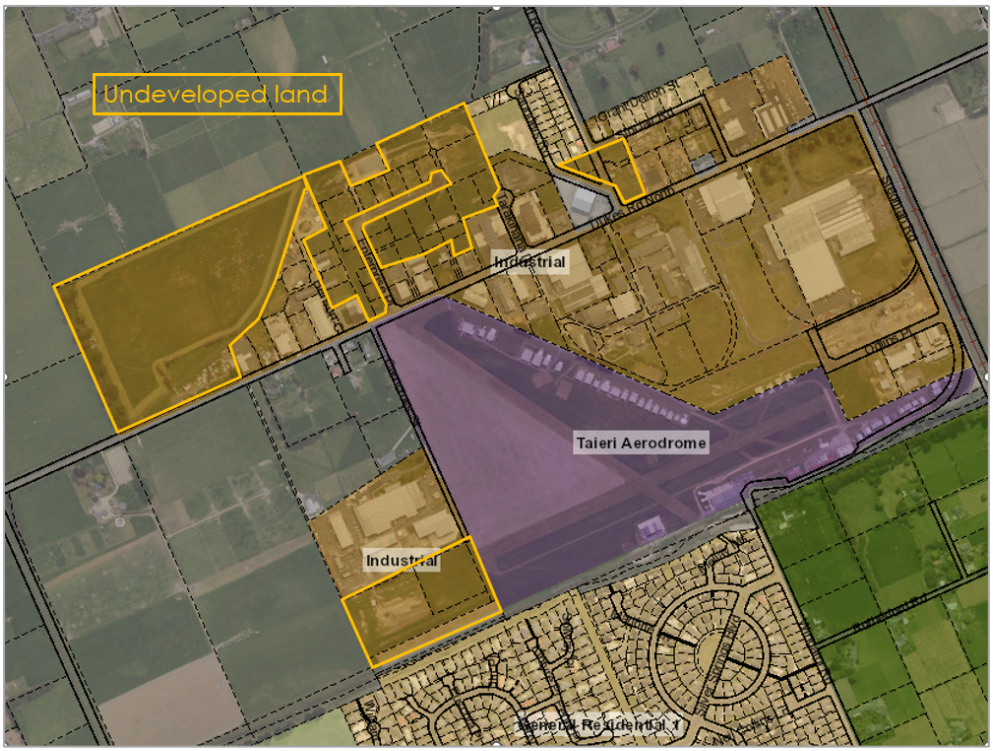

Figure 2-1: Undeveloped land within the industrial zone

2.2 Q2 (b) Alternative to a cap

In the absence of a cap, a monitoring condition can provide information on the total HCV movements generated by SLIP which can be combined with a summary of container movements by rail to establish the mode share that is being achieved.

2.3 Q2 (c) Monitoring Condition

If a monitoring condition was imposed, it would be appropriate for SLPL to maintain a record of all HCV arrivals at the SLIP and provide a summary of movements to DCC / NZTA at intervals (e.g. annually) and for a time period to be agreed.

In the event that the annual volumes of HCV movements exceeded a threshold to be agreed, e.g. 50,000 per annum, then a further assessment of effects on the road network should be prepared and submitted to DCC/NZTA. The focus of the assessment should be effects on safety with the scope of the study agree with DCC and NZTA.

In the event that any mitigation works are identified as necessary, funding of any works should be based on a cost share agreement that reflects the SLIP contribution to the effects identified.

2.4 Q2 (d) Staging

A monitoring condition would provide confidence that the HCV movements being generated by the SLIP are aligned with the SLPL forecasts. If a summary report is provided at regular intervals, then there is no need for specific assessment or additional monitoring at each stage.

3 Q3 Growth Forecasts

3.1 Q3.2 (a) Dukes Road Industrial Zone

Figure 2-1 shows areas of undeveloped land within the Dukes Road Industrial Zone. The yellow-outlined areas comprise about 30 ha of the industrial zone which has a total area of about 100 ha.

Looking ahead to 2033 and 2038, NZTA has provided the following growth forecasts for SH87, recognising ongoing land development and traffic growth in the area, including the Dukes Road Industrial Zone. These traffic growth forecasts calculate at less than 1% per annum.

Table 3-1: SH87 Growth forecast (Source: NZTA)

SH87 Gordon Road	2033	2038
Northbound	4.5%	7.8%
Southbound	4.3%	7.4%

3.2 Q3.2 (b) SH87 Heavy Vehicle Volumes

Table 3-2 shows the forecast traffic volumes in 2033 and 2038 based on the 50th percentile volumes recorded in 2025 on SH87 by NZTA, the growth rates provided by NZTA, and the changes in volumes that could be expected with SLIP Stage 3 development complete by 2033 based on an additional 300 light vehicle movements per day on average and 150 heavy vehicle movements per day on average. Based on this traffic data, the forecast of SLIP generated traffic (light and heavy) represents just 2.5% of the total volume on SH87 in 2038. The SLIP heavy vehicle volume represents less than 1% of the total future volume.

Table 3-2: Forecast traffic volumes forecast (50th percentile volumes)

SH87 Gordon Road	No SLIP		With SLIP Stage 3	
	Light	Heavy	Light	Heavy
2025	14,600	500		
2033 (5% growth)	15,330	525	15,630	675
2038 (8% growth)	16,560	570	16,860	720

Table 3-3 shows the forecast volumes on SH87 based on the 90th percentile volumes recorded in 2025 by NZTA to provide an indication of the peak period of activity along the highway. In 2038, it is forecast that the SLIP would account for about 2.5% of the total volume of traffic on SH87, with heavy vehicle volumes accounting for less than 1% of the total volume.

Table 3-3: Forecast traffic volumes forecast (90th percentile volumes)

SH87 Gordon Road	No SLIP		With SLIP Stage 3	
	Light	Heavy	Light	Heavy
2025	15,600	680		
2033 (5% growth)	16,380	715	16,680	890
2038 (8% growth)	17,690	770	17,990	950

3.3 Q3.2 (c) Traffic Generation

The NZ Trips and Parking Database includes surveys for a range of storage related activities but largely distribution type centres which are not directly comparable to the way that the SLIP is designed to operate. The import and export operations effectively involves a change in the way products are packaged.

The forecast traffic generation of the SLIP has been derived from first principles by SLPL to reflect the existing level of activity by Dynes / Icon and Port Otago in terms of container movements and warehouse areas. This remains the most reliable estimate of future activity because they will be relocating to the SLIP.

For this assessment, all containers have been assumed to be 40 ft containers. Since a truck and trailer unit can carry 54 pallets of product and a container can only carry 30 pallets of product, the average number of vehicle movements involved in exporting a single container is in the range 3.1 to 3.5 HCV movements per container. This comprises two truck movements for the container (one full and one empty) plus a fraction of two movements for the truck and trailer to bring product to the warehouse. Table 3-1 shows the calculation of HCV movement volumes for three locations based on a movement factor of 3.3 per container.

Table 3-4: Traffic generation calculations based on no rail

Site	GFA (m^2)	Containers (pa)	HCV Movements (pa/10,000m^2)
Fonterra Mosgiel (dry)	28,000	9,000	10,607
Fonterra Mosgiel (cold)	7,500	1,350	5,940
D Shed	30,000	7,800	8,580

To provide a conservative assessment, the base HCV movement demands in Table 1-2 included earlier, before allowing for any mode split, have been based on the highest rate within Table 3-4 (i.e. 10,607 movements pa/10,000m^2).

3.4 Q3.2 (d) Gross Floor Area

The total warehouse floor area available for each stage is set out in Table 1-1 included earlier. I understand that these are fixed by the site layout plans and represent upper limits. These floors form the basis of the estimates of the number of containers that can be managed by a warehouse and hence the level of vehicle generation.

In the event that additional expansion of warehouses was sought, this would require a separate resource consent and be subject to further assessment of effects.

3.5 Q3.2 (e) Tenancy Scenario

This is addressed in the SLPL information included as Appendix A.

3.6 Q3.2 (f) Effects on safety conclusions

Appendix B includes outputs from SIDRA intersection models of the SH87 / Dukes Road North intersection for 2026 and 2033 with and without the SLIP. The analyses indicates that the 95th percentile queue lengths on SH87 Gordon Road for the right turn movement into Dukes Road North is less than one vehicle even with the SLIP development fully built-out, and that the average delay for this movement is less than 10 seconds. This reflects the low opposing volumes for the movement. The longest queues at the intersection are forecast on the Dukes Road North approach with the longest approach delays being on the Dukes Road South.

The intersection analysis does not raise any capacity concerns at the SH87 / Dukes Road intersection that could contribute to safety concerns.

The primary safety concern at the intersection remains the short length of the right turn bay on SH87. SLPL have accepted a proposed condition of consent that involves altering the line marking to extend the right turn bay to address this concern.

Overall, it has been concluded that no additional works would be necessary to address safety effects even if the target mode share for rail was not achieved.

3.7 Q3.2 (g) Stage 3 forecast

Table 1-2 included earlier has been based on the future warehouse floor areas which are largely fixed by the SLIP development plans. I understand that any changes to the floor areas, if any, will be small.

While future tenants are yet to be confirmed, the traffic generation would be expected to lie within the range set out by the low and high mode shift scenarios presented in Table 2-1. If a tenancy results in a lower mode shift outcome, there will be more HCV movement on the road network, compared to the 'expected scenario. If a tenancy operates with a higher mode shift, there will be less HCV movement on the road network. Table 1-2 sets out the upper and lower limits of HCV movement volumes. Based on these limits, the volume of HCVs could range from a reduction of 50 to 100 per day to an increase of 50 to 100 per day. Compared with the forecast volumes on the road network, these variations are small and would not lead to different conclusions as to effects.

4 Q4 Road Safety

4.1 Q4.1(a) Safe System Assessment

The Integrated Transport Assessment – Addendum, dated 31 July 2026 includes a preliminary Safe System assessment of the four main sections of road that would be used by freight vehicles travelling to and from the proposed Southern Links Inland Port (SLIP). The Panel has sought to understand any changes to the ratings that would be directly attributed to the SLIP.

The primary factor within the Safe System rating score that will be influenced by the SLIP is the increase in traffic volumes on the road network. The traffic volumes adopted with Addendum were based on annual average volumes reported on the MobileRoad website. Since the Panel is seeking an understanding of the effects of the SLIP in the context of the peak summer period, the following further analysis has been based on the turn count information provided by DCC in February 2026 which was received after the Addendum was prepared.

For context, Figure-4-1 shows the daily traffic volumes recorded on SH87 Gordon Road north of SH1 from July 2025 to June 2026. It indicates that daily volumes recorded in February are comparable to those recorded at other busier times of the year. Figure 1-2 shows the heavy commercial vehicle (HCV) counts for the same period (NOTE: Different vertical scale). The HCV data shows some evidence for seasonal variation with a broad peak across the late summer period which includes the DCC February survey period.

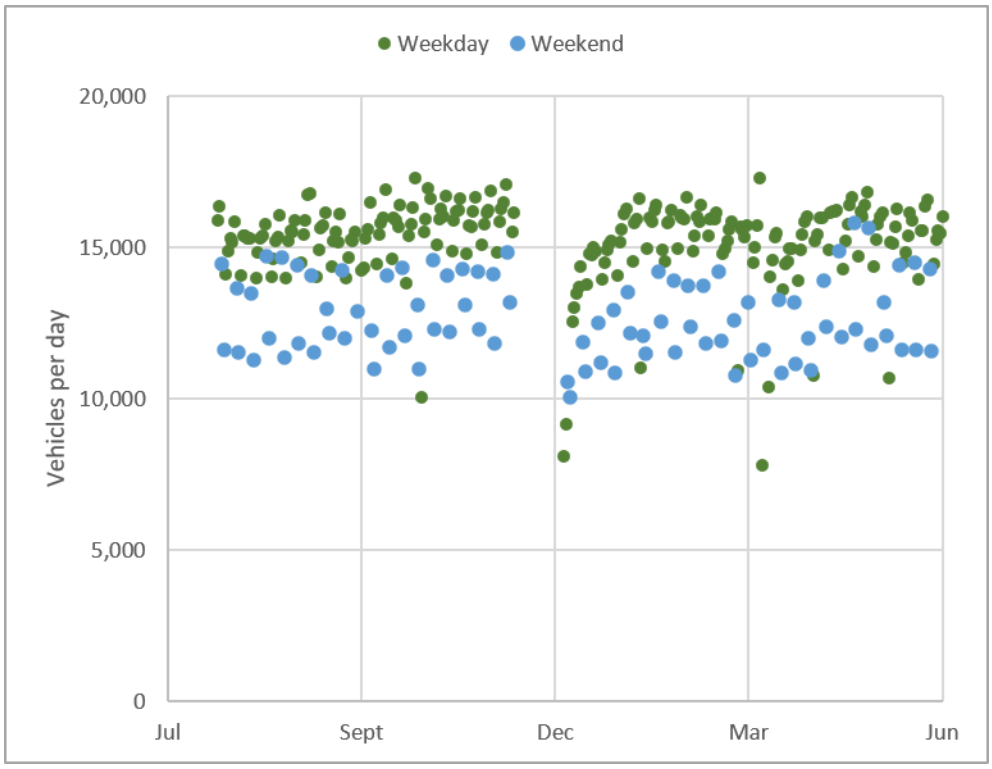

Figure-4-1: Daily counts on SH87 north of SH1 - July 2025 to June 2026

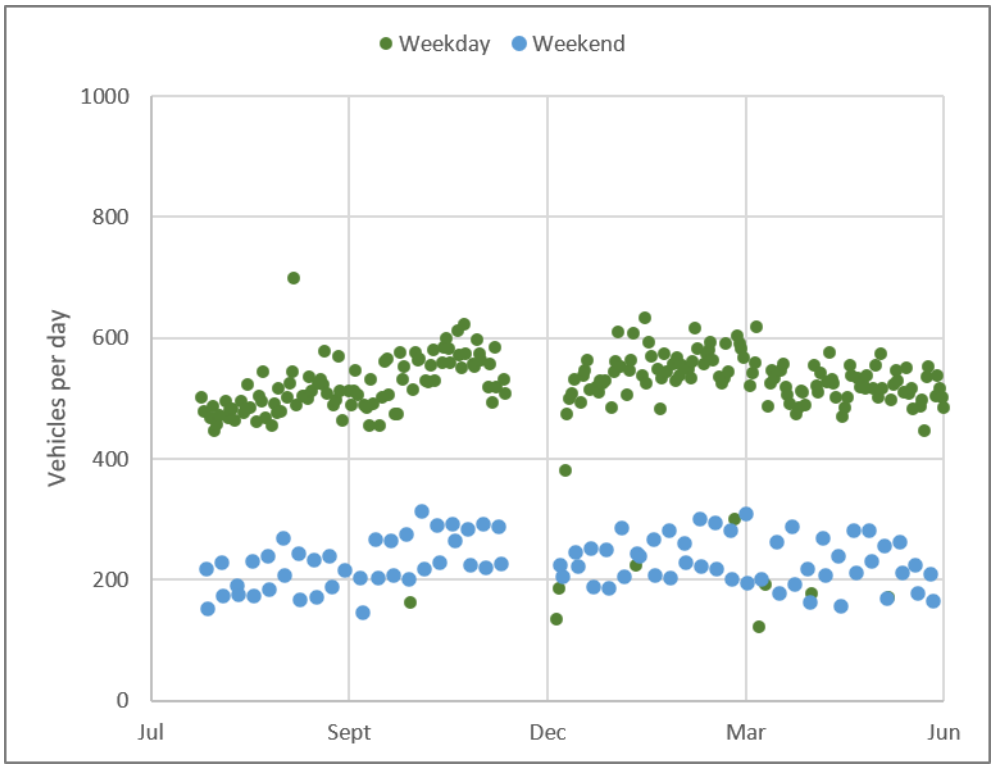

Figure 4-2: HCV counts on SH87 north of SH1 - July 2025 to June 2026

Table 4-1 shows the exposure rating (in brackets) based on the DCC survey data at the SH87 / Dukes Road North intersection. While these volumes are higher than adopted in the Addendum Appendix B as they reflect more recent count information, they remain within the same exposure rating range. For the urban section of road, the rating has been based on the weekday traffic volumes recorded in February 2026. The table then shows the rating with about ten years' growth to reflect recent growth in activity on Dukes Road North without and with the traffic generation associated with the SLIP.

Based on recent growth in traffic volumes on Dukes Road North, the average daily volumes could increase from 4,100 vehicle movements per day (vpd) to over 4,400 vpd by 2033 based on the wide area 5% growth rate suggested by DCC. This does not change the exposure rating . With SLIP traffic added to the forecast growth, there is no further change in rating.

Table 4-1: Changes in Safe System exposure ratings

Road	2026	2033	2026 + Growth + SLIP
Dukes Road North – Industrial	4,100 vpd (2)	4,400 vpd (2)	4,900 vpd (2)
Dukes Road North – Rural	4,100 vpd (2)	4,400 vpd (2)	4,900 vpd (2)
SH87 – Rural	5,300 vpd (3)	5,700 vpd (3)	6,100 vpd (3)
SH87 - Urban	15,500 vpd (4)	16,300 vpd (4)	16,700 vpd (4)

4.2 Q4.1 (b) Effects of increased HCV Volumes

Figure 4-3 and Figure 4-4 show the traffic volume forecasts in 2033 for SH87 south of Dukes Road North and for Dukes Road North-east of SH87 without and with the SLIP based on the DCC growth wide area growth forecast. This may represent an underestimate of growth on Dukes Road North given the large areas of undeveloped land that are available and the recent rate of growth (2022 to 2026). The forecasts indicate that HCVs will account for less than 10% of the total volume of vehicles on this part of the road network even with the SLIP fully developed.

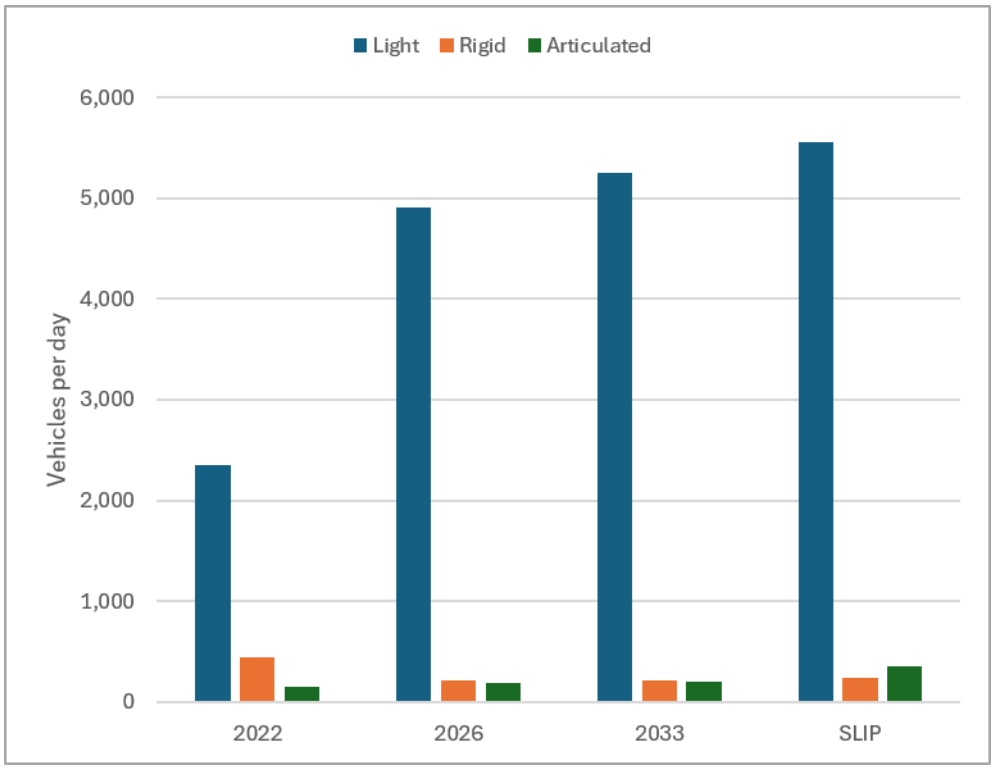

Figure 4-3: Traffic Volumes forecasts for SH87 south of Dukes Road North

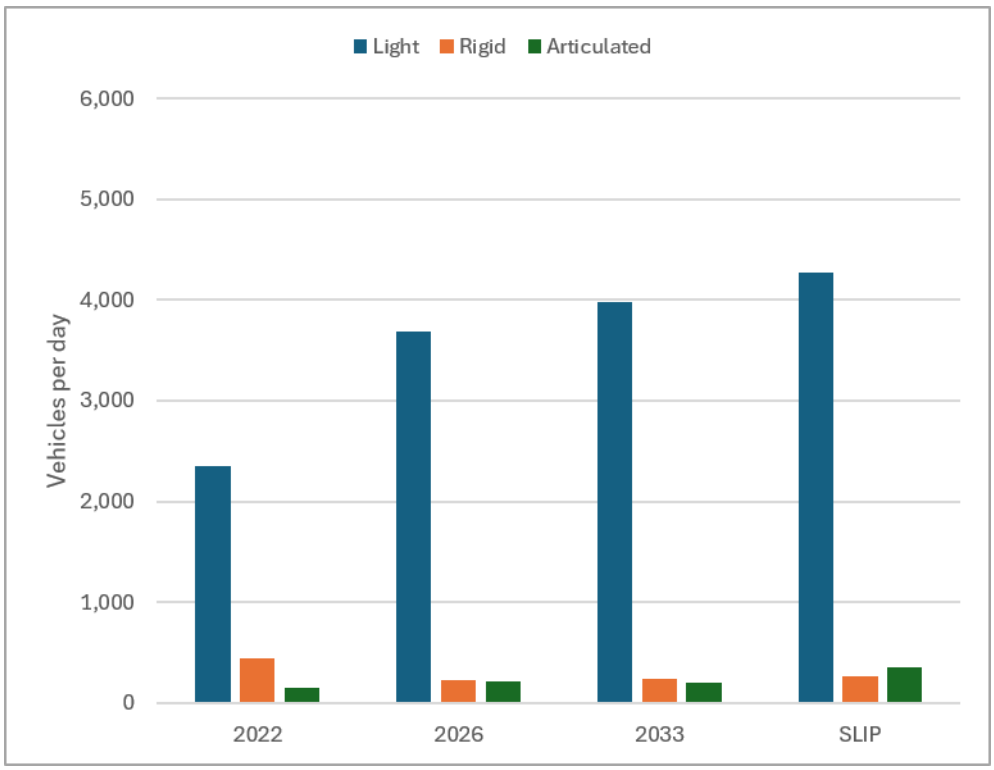

Figure 4-4: Traffic volume forecasts for Dukes Road northeast of SH87

4.3 Q4.1 (c) Crash Rate Modelling

The NZTA Moneterised Benefits and Costs Manual includes generic crash models for assessing effects of developments on crash rates. These have been used to assess the effect of the SLIP on crash rates in a future network scenario based on 8% growth in traffic volumes compared with 2025 to reflect the DCC growth forecasts to 2038. Figure 4-5 shows the injury crash rate forecasts at key intersections and at mid-block locations on the route between the SLIP and the SH87 / Hagart Alexander Drive intersection. Taking the total route, the analysis indicates that the general background growth in traffic volumes could increase predicted injury crash rates by less than 0.2 per annum (3.148 vs 3.320). The SLIP traffic could contribute to a predicted increase in crash rates of just 0.07 (to 3.390), or one additional injury crash every 14 years.

Figure 4-6 shows the Death and Serious Injury (DSI) crash rate forecasts for the same route. The totals show that background traffic growth to 2038 (without SLIP) could contribute to an increase in the DSI crash rate of 0.028 (0.491 vs 0.519), which represents one additional DSI crash every 30 years on average. The SLIP could increase the DSI rate by 0.012 (to 0.531) or one extra crash every 80 years.

Since the crash models do not provide a mechanism for attributing crashes to light or heavy vehicles, the percentage of heavy vehicles has been used to estimate the likely changes in crash rates involving heavy vehicles. This is summarised in Figure 4-7. It suggests that the crash rate for heavy vehicles could increase by 0.06 from 0.106 per annum to 0.112 per annum as a result of background growth to 2038. That represents one additional crash involving a heavy vehicle every 16 years on average. The SLIP could contribute to an increase of just 0.003 per annum in the crash rate (to 0.115). This represents one additional crash involving a heavy vehicle every 300 years.

Overall, the crash model analysis indicates that the SLIP traffic generation will contribute to only very small changes in the crash rates on the HPMV road network. Background growth in traffic volumes will contribute to larger changes.

Crash Rates Forecast Summary				
Type	Location	Crash Rates		
		2026	2033	2033&SLIP
Intersections	SH87 / Dukes Road North	0.262	0.271	0.274
	SH87 / Factory Road	0.365	0.376	0.377
	SH87 / Inglis Street	0.285	0.295	0.296
	SH87 / Hagart Alexander Drive	0.203	0.211	0.211
	SH87 / Gladstone Road North	0.488	0.505	0.506
Segments	Dukes Road North (Stedman to Puddle Alley)	0.014	0.015	0.018
	Dukes Road North (SH87 to Stedman)	0.147	0.156	0.168
	SH87 (Dukes Road N to Eden)	0.012	0.013	0.014
	SH87 (Eden to Factory)	0.044	0.047	0.048
	SH87 (Factory to Inglis)	1.200	1.296	1.337
	SH87 (Inglis to Hagart Alexander)	0.129	0.137	0.141
Totals		3.148	3.320	3.390

Figure 4-5: Injury crash rate forecasts

DSI Rates Forecast Summary						
Type	Location	Land Use	DSI Equiv.	DSI Rates		
				2026	2033	2033&SLIP
Intersections	SH87 / Dukes Road North	Rural	0.30	0.0628	0.0650	0.0659
	SH87 / Factory Road	Urban	0.13	0.0450	0.0465	0.0466
	SH87 / Inglis Street	Urban	0.13	0.0351	0.0364	0.0365
	SH87 / Hagart Alexander Drive	Urban	0.13	0.0251	0.0260	0.0261
	SH87 / Gladstone Road North	Urban	0.13	0.0603	0.0623	0.0625
Segments	Dukes Road North (Stedman to Puddle Alley)	Rural	0.29	0.0032	0.0034	0.0041
	Dukes Road North (SH87 to Stedman)	Rural	0.29	0.0341	0.0362	0.0389
	SH87 (Dukes Road N to Eden)	Rural	0.29	0.0028	0.0030	0.0033
	SH87 (Eden to Factory)	Urban	0.18	0.0072	0.0076	0.0078
	SH87 (Factory to Inglis)	Urban	0.18	0.1944	0.2100	0.2167
	SH87 (Inglis to Hagart Alexander)	Urban	0.18	0.0210	0.0223	0.0228
Totals				0.491	0.519	0.531

Figure 4-6: Death and Serious Injury crash rate forecasts

HCV Contribution to Crash Rates					
Type	Location	HCV %	Crash Rates		
			2026	2033	2033&SLIP
Intersections	SH87 / Dukes Road North	3%	0.008	0.008	0.008
	SH87 / Factory Road	3%	0.011	0.011	0.011
	SH87 / Inglis Street	3%	0.009	0.009	0.009
	SH87 / Hagart Alexander Drive	3%	0.006	0.006	0.006
	SH87 / Gladstone Road North	3%	0.015	0.015	0.015
Segments	Dukes Road North (Stedman to Puddle Alley)	10%	0.001	0.001	0.002
	Dukes Road North (SH87 to Stedman)	10%	0.015	0.016	0.017
	SH87 (Dukes Road N to Eden)	5%	0.001	0.001	0.001
	SH87 (Eden to Factory)	3%	0.001	0.001	0.001
	SH87 (Factory to Inglis)	3%	0.036	0.039	0.040
	SH87 (Inglis to Hagart Alexander)	3%	0.004	0.004	0.004
Totals			0.106	0.112	0.115

Figure 4-7: Heavy vehicle crash rate forecasts

4.4 Q4.1 (d) SH87 / Dukes Road North

Figure 4-5 above shows the forecast change in injury crash rate at the SH87 / Dukes Road North intersection as a result of background traffic growth without the SLIP and also with the SLIP. The general growth in traffic volumes is predicted to increase the injury crash rate at the intersection from 0.262 per annum to 0.271 per annum, an increase of 0.009 or one additional crash every 100 years on average. In the case of the SLIP, the forecast injury crash rate is predicted to increase by just 0.003 per annum (to 0.274) or one additional crash every 300 years.

4.5 Q4.1 (e) Vulnerable users

Based on the analysis of crash rates, the injury crash rate on the urban sections of SH87 Gordon Road is predicted to increase from 2.71 per annum to 2.87 per annum (SH87 Eden Street to Hagart Alexander Drive) as a result of growth in traffic volumes. The SLIP could increase the crash rate on this section of the road by 0.05 per annum (to 2.92) or one additional crash every 20 years on average.

There are a range of pedestrian crossing facilities along Gordon Road as summarised in Table 4-2

Table 4-2: Locations of formal pedestrian crossing facilities in Mosgiel

Location	Type
SH87 / Eden Street	Signals
SH87 South of Hartstone Avenue	Painted crossing with kerb extensions
SH87 / Factory Road / Bush Road	Signals
SH87 South of Factory Road	Painted crossing with kerb extensions
SH87 North of Cargill Street	Painted crossing with kerb extensions
SH87 / Inglis Street / Woolworths	Signals
SH87 North of Bruce Street	Courtesy crossing with kerb extensions
SH87 / Hagart Alexander Drive	Signals

The formal pedestrian crossing facilities are located close to the SH87 / Factory Road / Bush Road intersection which is in the centre of Mosgiel township. This reflects the higher demand for pedestrian movement within the town centre compared with other parts of Mosgiel.

There are eight school bus services providing transport to schools within Mosgiel. Figure 4-8 highlights the roads used by the school bus services. The North Taieri services (D130304, D130318) travel along Dukes Road North between Hazlett Road and Puddle Alley. There are no residential dwellings on the SLIP frontage to Dukes Road North or between Hazlett Road and Stedman Road that will create a demand for a bus stop.

There are two services that utilise SH87 Gordon Road north of Mosgiel (D130312, D130313) for students travelling from Outram or areas further west on SH87. Neither of these services have stops on SH87 between Dukes Road North and schools.

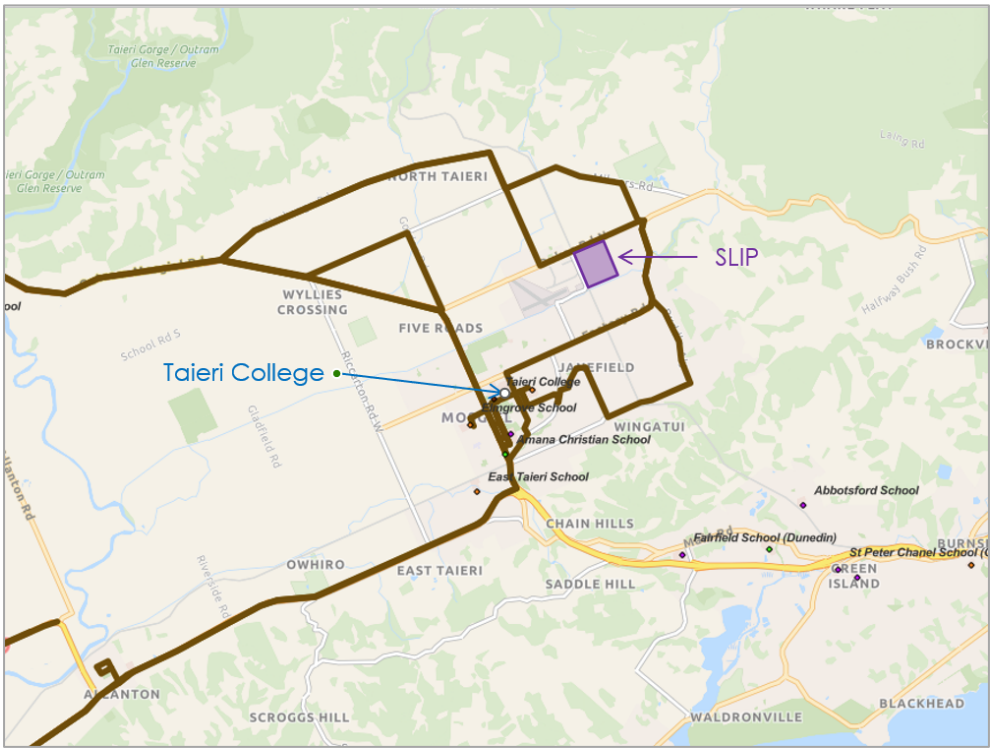

Figure 4-8: School bus service routes (Source: Ministry of Education)

While the school bus services follow routes that are also used by other heavy vehicles, this reflects the fact that those roads are designated and designed for heavy vehicle use. Where the services are on heavy vehicle routes in Mosgiel, there are no bus stops which would contribute to a pedestrian crossing demand. On that basis, the changes in heavy vehicle volumes attributable to the SLIP would not contribute to adverse safety effects for the buses slowing for and turning in and out of bus stops.

SH87 Gordon Road crosses the Main South Line north of the Gladstone Road intersection. The rail level crossing is controlled with barriers, bells and lights in conjunction with the traffic signal controls for the Gladstone Road intersection. The modest change in traffic volumes attributable to the SLIP does not create a need for additional controls at the level crossing.

4.6 Q4.1 (f) Speed limit

As noted in the ITA, SH87 has an out of context curve at the Dukes Road Intersection. Advance warning signs and chevrons have been installed to advise drivers of the curve. Although this represents a potential safety hazard, there is no evidence in the crash records that the curve is contributing to crashes.

The management and setting of speed limits on SH87 is the responsibility of NZTA. NZTA has not identified a need for safety improvements at the intersection beyond the extension of the right turn bay. The changes in traffic volumes due to the SLIP and potential effects of the SLIP on safety are not sufficient to warrant a change in the speed limit.

On that basis, no additional works are considered necessary to manage speeds on SH87 if the SLIP is approved.

Stantec New Zealand

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Appendix A SLPL Supplied Information

Appendix B SH87 / Dukes Road North SIDRA Model Results

MOVEMENT SUMMARY

Site: [1] SH87_Dukes - 2026AM (Folder1)
Output produced by SIDRA INTERSECTION Version: 10.0.5.217

Morning Peak Period - 2026 Feb
Site Category: (None)
Stop (Two-Way)
Site Scenario: 1 | Local Volumes

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Queued	Eff. Stop Rate	Number of Cycles to Depart	Aver. Speed km/h
South: Gordon Road															
1	L2	All MCs	11	0.0	11	0.0	0.032	6.9	LOS A	0.0	0.0	0.00	0.11	0.00	71.8
2	T1	All MCs	51	2.1	51	2.1	0.032	0.0	LOS A	0.0	0.0	0.00	0.11	0.00	77.9
3	R2	All MCs	149	9.9	149	9.9	0.099	7.3	LOS A	0.5	3.6	0.26	0.61	0.26	60.4
Approach			211	7.5	211	7.5	0.099	5.5	NA	0.5	3.6	0.19	0.46	0.19	64.4
East: Dukes Road North															
4	L2	All MCs	113	18.7	113	18.7	0.210	7.9	LOS A	0.9	7.4	0.34	0.61	0.34	57.2
5	T1	All MCs	25	8.3	25	8.3	0.210	8.6	LOS A	0.9	7.4	0.34	0.61	0.34	60.6
6	R2	All MCs	36	58.8	36	58.8	0.210	13.7	LOS B	0.9	7.4	0.34	0.61	0.34	48.0
Approach			174	25.5	174	25.5	0.210	9.2	LOS A	0.9	7.4	0.34	0.61	0.34	55.5
North: SH87															
7	L2	All MCs	31	3.4	31	3.4	0.017	7.0	LOS A	0.0	0.0	0.00	0.63	0.00	63.4
8	T1	All MCs	107	2.9	107	2.9	0.058	0.0	LOS A	0.0	0.1	0.01	0.01	0.01	79.8
9	R2	All MCs	2	50.0	2	50.0	0.058	7.6	LOS A	0.0	0.1	0.01	0.01	0.01	55.9
Approach			140	3.8	140	3.8	0.058	1.6	NA	0.0	0.1	0.01	0.15	0.01	75.1
West: Dukes Road South															
10	L2	All MCs	1	0.0	1	0.0	0.070	9.0	LOS A	0.2	1.8	0.42	0.91	0.42	61.2
11	T1	All MCs	39	10.8	39	10.8	0.070	11.3	LOS B	0.2	1.8	0.42	0.91	0.42	58.0
12	R2	All MCs	11	0.0	11	0.0	0.070	12.0	LOS B	0.2	1.8	0.42	0.91	0.42	61.1
Approach			51	8.3	51	8.3	0.070	11.4	LOS B	0.2	1.8	0.42	0.91	0.42	58.7
All Vehicles			575	12.1	575	12.1	0.210	6.2	NA	0.9	7.4	0.21	0.47	0.21	63.0

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

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MOVEMENT SUMMARY

Site: [1 (6)] SH87_Dukes - 2033AM (Folder1)
Output produced by SIDRA INTERSECTION Version: 10.0.5.217

Morning Peak Period - 2026 Feb plus 5% growth to represent 2033
Site Category: (None)
Stop (Two-Way)
Site Scenario: 1 | Local Volumes

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Qued	Eff. Stop Rate	Number of Cycles to Depart	Aver. Speed km/h
South: Gordon Road															
1	L2	All MCs	12	0.0	12	0.0	0.034	6.9	LOS A	0.0	0.0	0.00	0.12	0.00	71.8
2	T1	All MCs	54	2.0	54	2.0	0.034	0.0	LOS A	0.0	0.0	0.00	0.12	0.00	77.8
3	R2	All MCs	158	10.0	158	10.0	0.106	7.3	LOS A	0.5	3.8	0.27	0.61	0.27	60.3
Approach			223	7.5	223	7.5	0.106	5.6	NA	0.5	3.8	0.19	0.46	0.19	64.4
East: Dukes Road North															
4	L2	All MCs	117	18.9	117	18.9	0.224	7.9	LOS A	0.9	8.0	0.36	0.62	0.36	57.0
5	T1	All MCs	26	8.0	26	8.0	0.224	8.8	LOS A	0.9	8.0	0.36	0.62	0.36	60.5
6	R2	All MCs	38	58.3	38	58.3	0.224	14.2	LOS B	0.9	8.0	0.36	0.62	0.36	48.0
Approach			181	25.6	181	25.6	0.224	9.4	LOS A	0.9	8.0	0.36	0.62	0.36	55.3
North: SH87															
7	L2	All MCs	33	3.2	33	3.2	0.018	7.0	LOS A	0.0	0.0	0.00	0.63	0.00	63.5
8	T1	All MCs	114	2.8	114	2.8	0.061	0.0	LOS A	0.0	0.1	0.01	0.01	0.01	79.8
9	R2	All MCs	2	50.0	2	50.0	0.061	7.6	LOS A	0.0	0.1	0.01	0.01	0.01	55.9
Approach			148	3.5	148	3.5	0.061	1.7	NA	0.0	0.1	0.01	0.15	0.01	75.1
West: Dukes Road South															
10	L2	All MCs	1	0.0	1	0.0	0.075	9.0	LOS A	0.3	2.0	0.44	0.91	0.44	61.0
11	T1	All MCs	41	10.3	41	10.3	0.075	11.4	LOS B	0.3	2.0	0.44	0.91	0.44	58.1
12	R2	All MCs	11	0.0	11	0.0	0.075	12.2	LOS B	0.3	2.0	0.44	0.91	0.44	60.9
Approach			53	8.0	53	8.0	0.075	11.5	LOS B	0.3	2.0	0.44	0.91	0.44	58.7
All Vehicles			605	12.0	605	12.0	0.224	6.3	NA	0.9	8.0	0.22	0.47	0.22	62.9

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

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MOVEMENT SUMMARY

Site: [1 (8)] SH87_Dukes - 2033AM - SLIP (Folder1)
Output produced by SIDRA INTERSECTION Version: 10.0.5.217

Morning Peak Period - 2026 Feb plus 5% growth to represent 2033
SLIP Traffic Generation added
Site Category: (None)
Stop (Two-Way)
Site Scenario: 1 | Local Volumes

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Qued	Eff. Stop Rate	Number of Cycles to Depart	Aver. Speed km/h
South: Gordon Road															
1	L2	All MCs	12	0.0	12	0.0	0.034	6.9	LOS A	0.0	0.0	0.00	0.12	0.00	71.8
2	T1	All MCs	54	2.0	54	2.0	0.034	0.0	LOS A	0.0	0.0	0.00	0.12	0.00	77.8
3	R2	All MCs	226	14.0	226	14.0	0.155	7.5	LOS A	0.8	6.0	0.29	0.61	0.29	59.1
Approach			292	11.2	292	11.2	0.155	6.1	NA	0.8	6.0	0.22	0.50	0.22	62.3
East: Dukes Road North															
4	L2	All MCs	132	28.0	132	28.0	0.261	8.2	LOS A	1.1	9.9	0.39	0.62	0.39	54.3
5	T1	All MCs	26	8.0	26	8.0	0.261	9.8	LOS A	1.1	9.9	0.39	0.62	0.39	60.0
6	R2	All MCs	38	58.3	38	58.3	0.261	16.5	LOS C	1.1	9.9	0.39	0.62	0.39	47.7
Approach			196	31.2	196	31.2	0.261	10.0	LOS B	1.1	9.9	0.39	0.62	0.39	53.5
North: SH87															
7	L2	All MCs	33	3.2	33	3.2	0.018	7.0	LOS A	0.0	0.0	0.00	0.63	0.00	63.5
8	T1	All MCs	114	2.8	114	2.8	0.061	0.0	LOS A	0.0	0.1	0.01	0.01	0.01	79.8
9	R2	All MCs	2	50.0	2	50.0	0.061	7.6	LOS A	0.0	0.1	0.01	0.01	0.01	55.9
Approach			148	3.5	148	3.5	0.061	1.7	NA	0.0	0.1	0.01	0.15	0.01	75.1
West: Dukes Road South															
10	L2	All MCs	1	0.0	1	0.0	0.083	9.0	LOS A	0.3	2.2	0.48	0.93	0.48	60.3
11	T1	All MCs	41	10.3	41	10.3	0.083	12.1	LOS B	0.3	2.2	0.48	0.93	0.48	57.4
12	R2	All MCs	11	0.0	11	0.0	0.083	13.4	LOS B	0.3	2.2	0.48	0.93	0.48	60.2
Approach			53	8.0	53	8.0	0.083	12.3	LOS B	0.3	2.2	0.48	0.93	0.48	58.0
All Vehicles			688	15.0	688	15.0	0.261	6.7	NA	1.1	9.9	0.24	0.49	0.24	61.3

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

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MOVEMENT SUMMARY

Site: [1 (2)] SH87_Dukes - 2026PM (Folder1)
Output produced by SIDRA INTERSECTION Version: 10.0.5.217

Evening Peak Period - February 2026
Site Category: (None)
Stop (Two-Way)
Site Scenario: 1 | Local Volumes

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Qued	Eff. Stop Rate	Number of Cycles to Depart	Aver. Speed km/h
South: Gordon Road															
1	L2	All MCs	16	0.0	16	0.0	0.065	7.0	LOS A	0.0	0.0	0.00	0.08	0.00	72.3
2	T1	All MCs	109	0.0	109	0.0	0.065	0.0	LOS A	0.0	0.0	0.00	0.08	0.00	78.5
3	R2	All MCs	116	4.5	116	4.5	0.072	7.0	LOS A	0.3	2.4	0.21	0.60	0.21	62.3
Approach			241	2.2	241	2.2	0.072	3.8	NA	0.3	2.4	0.10	0.33	0.10	69.4
East: Dukes Road North															
4	L2	All MCs	234	1.8	234	1.8	0.265	7.4	LOS A	1.2	8.9	0.26	0.59	0.26	63.0
5	T1	All MCs	33	0.0	33	0.0	0.265	8.3	LOS A	1.2	8.9	0.26	0.59	0.26	63.9
6	R2	All MCs	31	13.8	31	13.8	0.265	10.8	LOS B	1.2	8.9	0.26	0.59	0.26	59.2
Approach			297	2.8	297	2.8	0.265	7.8	LOS A	1.2	8.9	0.26	0.59	0.26	62.7
North: SH87															
7	L2	All MCs	17	18.8	17	18.8	0.010	7.3	LOS A	0.0	0.0	0.00	0.63	0.00	58.8
8	T1	All MCs	77	2.7	77	2.7	0.045	0.1	LOS A	0.0	0.3	0.04	0.05	0.04	79.5
9	R2	All MCs	4	75.0	4	75.0	0.045	8.8	LOS A	0.0	0.3	0.04	0.05	0.04	49.9
Approach			98	8.6	98	8.6	0.045	1.7	NA	0.0	0.3	0.04	0.15	0.04	73.2
West: Dukes Road South															
10	L2	All MCs	2	0.0	2	0.0	0.096	9.3	LOS A	0.3	2.6	0.47	0.93	0.47	60.5
11	T1	All MCs	36	17.6	36	17.6	0.096	11.7	LOS B	0.3	2.6	0.47	0.93	0.47	55.6
12	R2	All MCs	23	0.0	23	0.0	0.096	13.4	LOS B	0.3	2.6	0.47	0.93	0.47	60.4
Approach			61	10.3	61	10.3	0.096	12.3	LOS B	0.3	2.6	0.47	0.93	0.47	57.5
All Vehicles			697	4.1	697	4.1	0.265	6.0	NA	1.2	8.9	0.19	0.47	0.19	65.7

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

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MOVEMENT SUMMARY

Site: [1 (7)] SH87_Dukes - 2033PM (Folder1)
Output produced by SIDRA INTERSECTION Version: 10.0.5.217

Evening Peak Period - February 2026 plus 5% growth to reflect 2033
Site Category: (None)
Stop (Two-Way)
Site Scenario: 1 | Local Volumes

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Qued	Eff. Stop Rate	Number of Cycles to Depart	Aver. Speed km/h
South: Gordon Road															
1	L2	All MCs	16	0.0	16	0.0	0.068	7.0	LOS A	0.0	0.0	0.00	0.08	0.00	72.3
2	T1	All MCs	116	0.0	116	0.0	0.068	0.0	LOS A	0.0	0.0	0.00	0.08	0.00	78.5
3	R2	All MCs	121	4.3	121	4.3	0.075	7.0	LOS A	0.4	2.6	0.21	0.60	0.21	62.4
Approach			253	2.1	253	2.1	0.075	3.8	NA	0.4	2.6	0.10	0.33	0.10	69.5
East: Dukes Road North															
4	L2	All MCs	246	1.7	246	1.7	0.280	7.4	LOS A	1.3	9.5	0.27	0.59	0.27	62.9
5	T1	All MCs	34	0.0	34	0.0	0.280	8.5	LOS A	1.3	9.5	0.27	0.59	0.27	63.9
6	R2	All MCs	32	13.3	32	13.3	0.280	11.1	LOS B	1.3	9.5	0.27	0.59	0.27	59.3
Approach			312	2.7	312	2.7	0.280	7.9	LOS A	1.3	9.5	0.27	0.59	0.27	62.6
North: SH87															
7	L2	All MCs	17	18.8	17	18.8	0.010	7.3	LOS A	0.0	0.0	0.00	0.63	0.00	58.8
8	T1	All MCs	81	2.6	81	2.6	0.047	0.1	LOS A	0.0	0.3	0.04	0.05	0.04	79.5
9	R2	All MCs	4	75.0	4	75.0	0.047	8.8	LOS A	0.0	0.3	0.04	0.05	0.04	49.9
Approach			102	8.2	102	8.2	0.047	1.6	NA	0.0	0.3	0.04	0.15	0.04	73.4
West: Dukes Road South															
10	L2	All MCs	2	0.0	2	0.0	0.104	9.3	LOS A	0.4	2.8	0.48	0.93	0.48	60.3
11	T1	All MCs	38	16.7	38	16.7	0.104	11.8	LOS B	0.4	2.8	0.48	0.93	0.48	55.7
12	R2	All MCs	24	0.0	24	0.0	0.104	13.8	LOS B	0.4	2.8	0.48	0.93	0.48	60.2
Approach			64	9.8	64	9.8	0.104	12.5	LOS B	0.4	2.8	0.48	0.93	0.48	57.5
All Vehicles			731	3.9	731	3.9	0.280	6.0	NA	1.3	9.5	0.20	0.47	0.20	65.7

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

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MOVEMENT SUMMARY

Site: [1 (9)] SH87_Dukes - 2033PM - SLIP (Folder1)
Output produced by SIDRA INTERSECTION Version: 10.0.5.217

Evening Peak Period - February 2026 plus 5% growth to reflect 2033
SLIP Traffic generation added
Site Category: (None)
Stop (Two-Way)
Site Scenario: 1 | Local Volumes

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Qued	Eff. Stop Rate	Number of Cycles to Depart	Aver. Speed km/h
South: Gordon Road															
1	L2	All MCs	16	0.0	16	0.0	0.068	7.0	LOS A	0.0	0.0	0.00	0.08	0.00	72.3
2	T1	All MCs	116	0.0	116	0.0	0.068	0.0	LOS A	0.0	0.0	0.00	0.08	0.00	78.5
3	R2	All MCs	137	15.4	137	15.4	0.090	7.3	LOS A	0.4	3.4	0.22	0.60	0.22	58.9
Approach			268	7.8	268	7.8	0.090	4.1	NA	0.4	3.4	0.11	0.34	0.11	66.8
East: Dukes Road North															
4	L2	All MCs	316	6.7	316	6.7	0.342	7.5	LOS A	1.8	13.0	0.28	0.59	0.28	61.3
5	T1	All MCs	34	0.0	34	0.0	0.342	9.0	LOS A	1.8	13.0	0.28	0.59	0.28	63.8
6	R2	All MCs	32	13.3	32	13.3	0.342	11.9	LOS B	1.8	13.0	0.28	0.59	0.28	59.2
Approach			381	6.6	381	6.6	0.342	8.0	LOS A	1.8	13.0	0.28	0.59	0.28	61.3
North: SH87															
7	L2	All MCs	17	18.8	17	18.8	0.010	7.3	LOS A	0.0	0.0	0.00	0.63	0.00	58.8
8	T1	All MCs	81	2.6	81	2.6	0.047	0.1	LOS A	0.0	0.3	0.04	0.05	0.04	79.5
9	R2	All MCs	4	75.0	4	75.0	0.047	8.8	LOS A	0.0	0.3	0.04	0.05	0.04	49.9
Approach			102	8.2	102	8.2	0.047	1.6	NA	0.0	0.3	0.04	0.15	0.04	73.4
West: Dukes Road South															
10	L2	All MCs	2	0.0	2	0.0	0.114	9.3	LOS A	0.4	3.0	0.51	0.94	0.51	59.6
11	T1	All MCs	38	16.7	38	16.7	0.114	12.0	LOS B	0.4	3.0	0.51	0.94	0.51	55.2
12	R2	All MCs	24	0.0	24	0.0	0.114	15.4	LOS C	0.4	3.0	0.51	0.94	0.51	59.5
Approach			64	9.8	64	9.8	0.114	13.2	LOS B	0.4	3.0	0.51	0.94	0.51	56.9
All Vehicles			816	7.5	816	7.5	0.342	6.4	NA	1.8	13.0	0.21	0.48	0.21	64.0

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

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