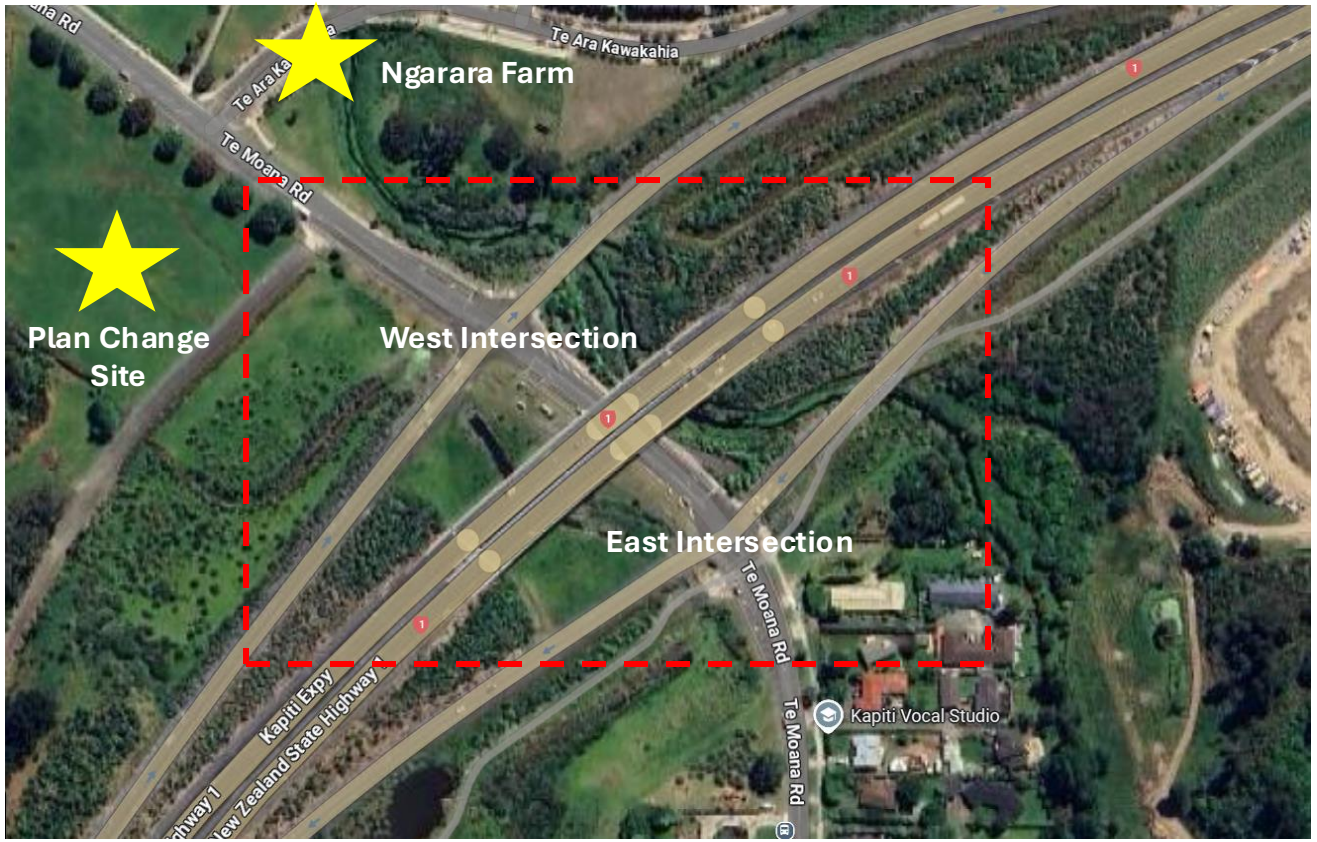
SH1/Te Moana Rd Interchange Modelling – Proposed Private Plan Change

- Existing Interchange (AM & PM Peaks)
- Existing Interchange + Ngarara Farm (AM & PM Peaks)
- Existing + Interchange + Ngarara Farm + Plan Change Site (AM & PM Peaks)



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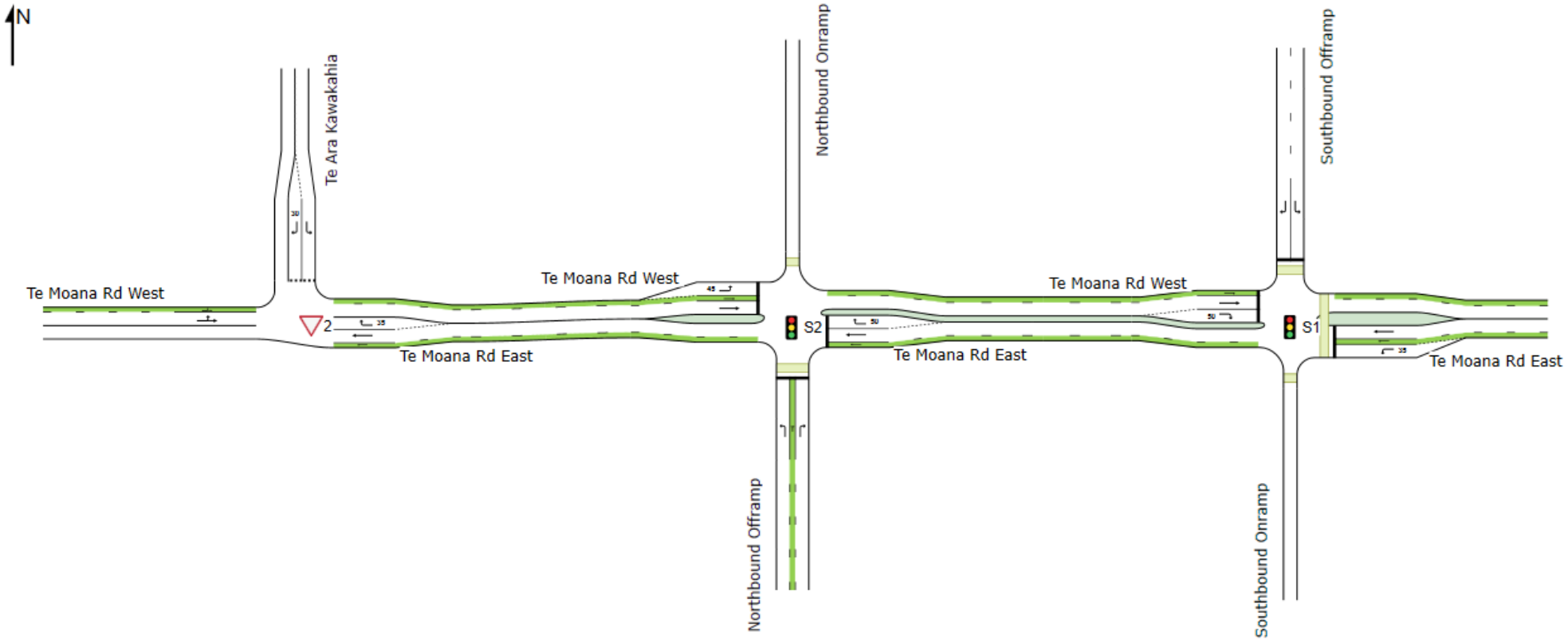
Existing Interchange AM & PM Peaks :

- Interchange input volumes provided by WTOC (Wellington Traffic Operations Centre) for the 16th September 2024.
- Input phasing provided by WTOC
- AM Peak (8am - 9am)
- PM Peak (4:30pm - 5:30pm)
- 6% heavies applied to all movements
- Correct geometry including lane lengths, widths etc. applied to all legs of interchange
- Existing traffic from Te Ara Kawakahia based on 55 dwellings currently constructed.



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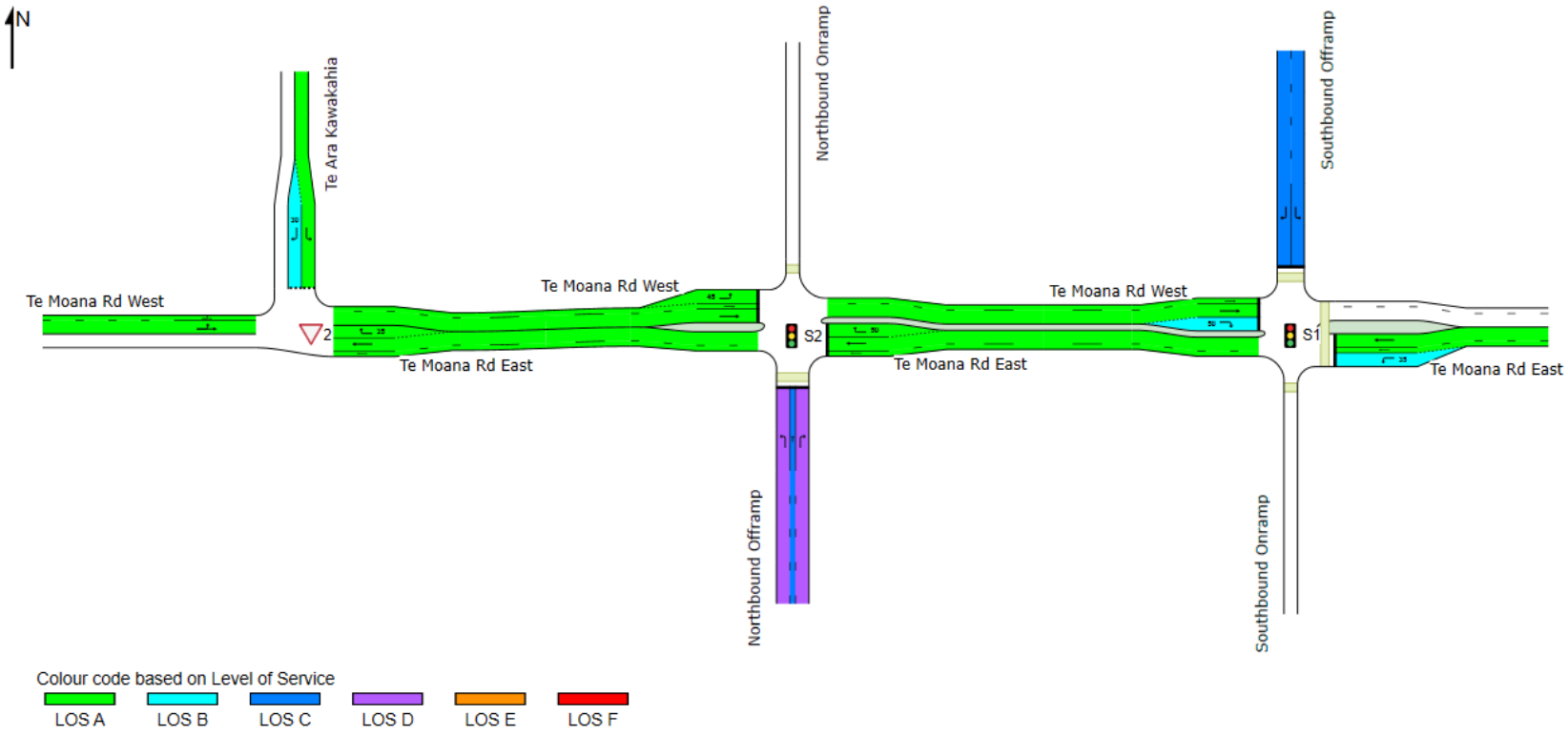
Existing Interchange AM Peak Results:

Network Performance

Network Cycle Time = 80.0 seconds (Network Practical Cycle Time)
Critical Site / Common Control Group that determines the Network Cycle Time (for Coordinated Sites)
Network Scenario: 1 | Local Volumes

Network Performance - Hourly Values		
Performance Measure	**Vehicles:**	**All MCs**
Network Level of Service (LOS)		LOS D
Speed Efficiency		0.66
Travel Time Index		6.23
Congestion Coefficient		1.51
Travel Speed (Average)	km/h	33.4
Travel Distance (Total)	veh-km/h	1109.9
Travel Time (Total)	veh-h/h	33.2
Desired Speed	km/h	50.6
Demand Flows (Total for all Sites)	veh/h	2735
Arrival Flows (Total for all Sites)	veh/h	2735
Demand Flows (Entry Total)	veh/h	1116
Midblock Inflows (Total)	veh/h	38
Midblock Outflows (Total)	veh/h	0
Percent Heavy Vehicles (Demand)	%	5.6
Percent Heavy Vehicles (Arrival)	%	5.6
Degree of Saturation		0.485
Control Delay (Total)	veh-h/h	6.96
Control Delay (Average)	sec	9.2
Control Delay (Worst Lane by MC)	sec	37.8
Control Delay (Worst Movement by MC)	sec	37.8
Geometric Delay (Average)	sec	1.7
Stop-Line Delay (Average)	sec	7.5
Ave. Que Storage Ratio (Worst Lane)		0.33
Effective Stops (Total)	veh/h	1083
Effective Stop Rate		0.40
Proportion Queued		0.38
Performance Index		81.2

Lane LOS



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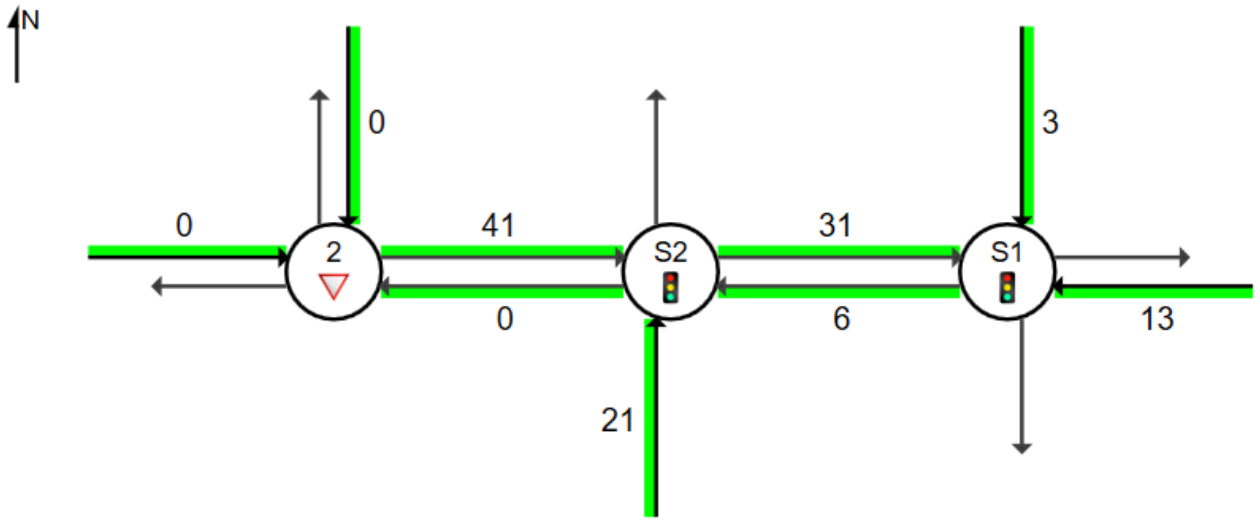
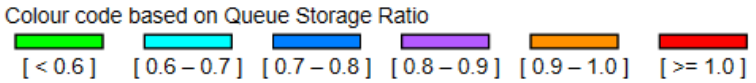
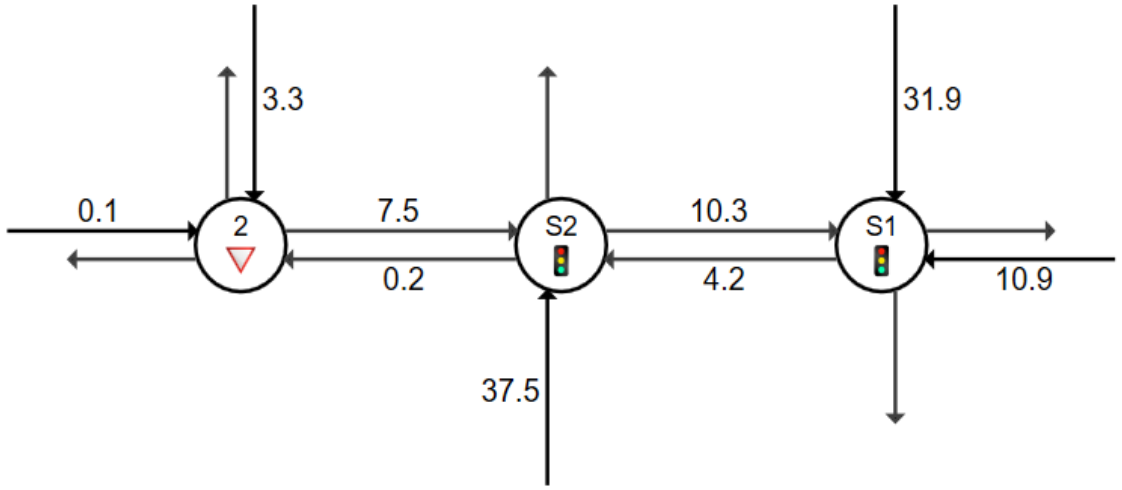
Existing Interchange AM Peak Results:

Average Queue (m)





Average Delay (s)



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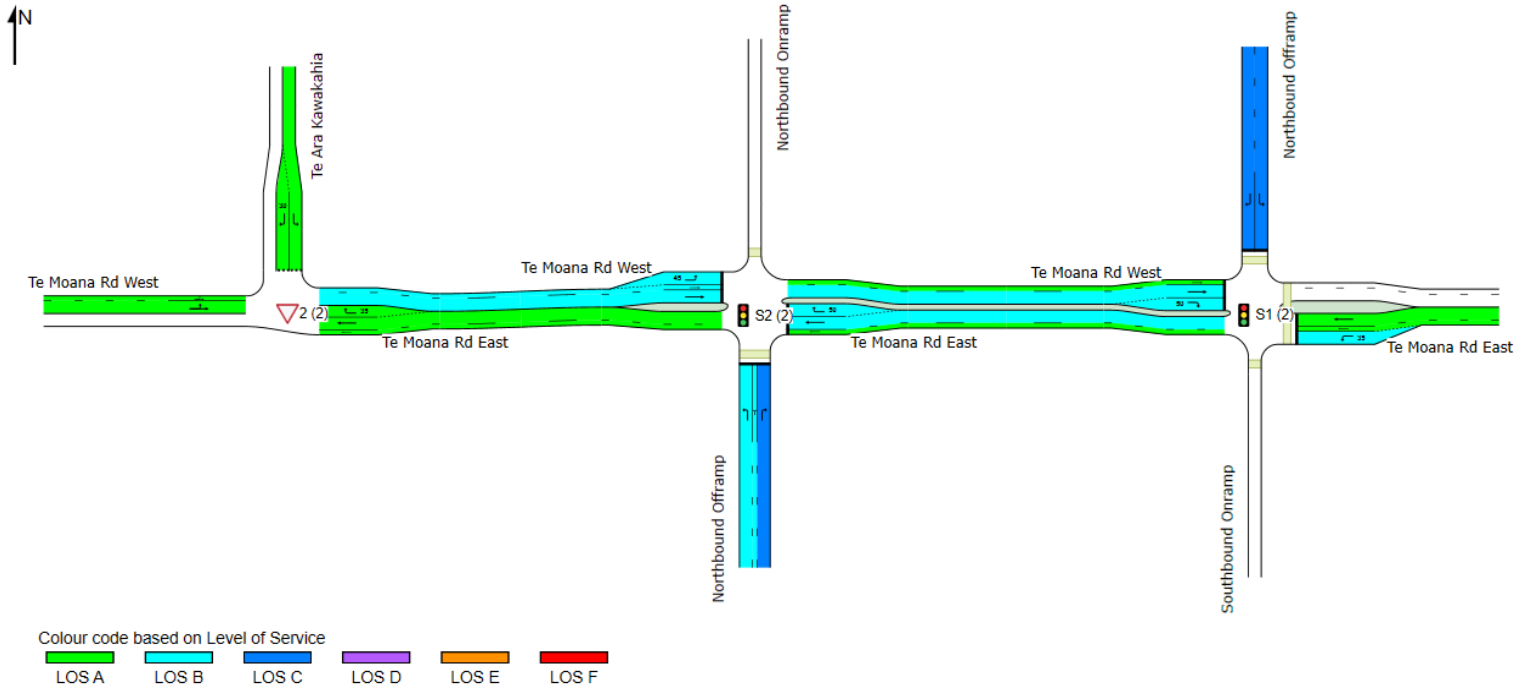
Existing Interchange PM Peak Results :

Network Performance

Network Cycle Time = 80.0 seconds (Network Practical Cycle Time)
Critical Site / Common Control Group that determines the Network Cycle Time (for Coordinated Sites)
Network Scenario: 1 | Local Volumes

Network Performance - Hourly Values		
Performance Measure	**Vehicles:**	**All MCs**
Network Level of Service (LOS)		LOS D
Speed Efficiency		0.64
Travel Time Index		6.03
Congestion Coefficient		1.56
Travel Speed (Average)	km/h	33.0
Travel Distance (Total)	veh-km/h	1250.1
Travel Time (Total)	veh-h/h	37.9
Desired Speed	km/h	51.4
Demand Flows (Total for all Sites)	veh/h	2771
Arrival Flows (Total for all Sites)	veh/h	2771
Demand Flows (Entry Total)	veh/h	1303
Midblock Inflows (Total)	veh/h	26
Midblock Outflows (Total)	veh/h	-1
Percent Heavy Vehicles (Demand)	%	5.7
Percent Heavy Vehicles (Arrival)	%	5.7
Degree of Saturation		0.414
Control Delay (Total)	veh-h/h	9.04
Control Delay (Average)	sec	11.7
Control Delay (Worst Lane by MC)	sec	31.9
Control Delay (Worst Movement by MC)	sec	31.9
Geometric Delay (Average)	sec	2.1
Stop-Line Delay (Average)	sec	9.7
Ave. Que Storage Ratio (Worst Lane)		0.53
Effective Stops (Total)	veh/h	1324
Effective Stop Rate		0.48
Proportion Queued		0.48
Performance Index		99.8

Lane LOS



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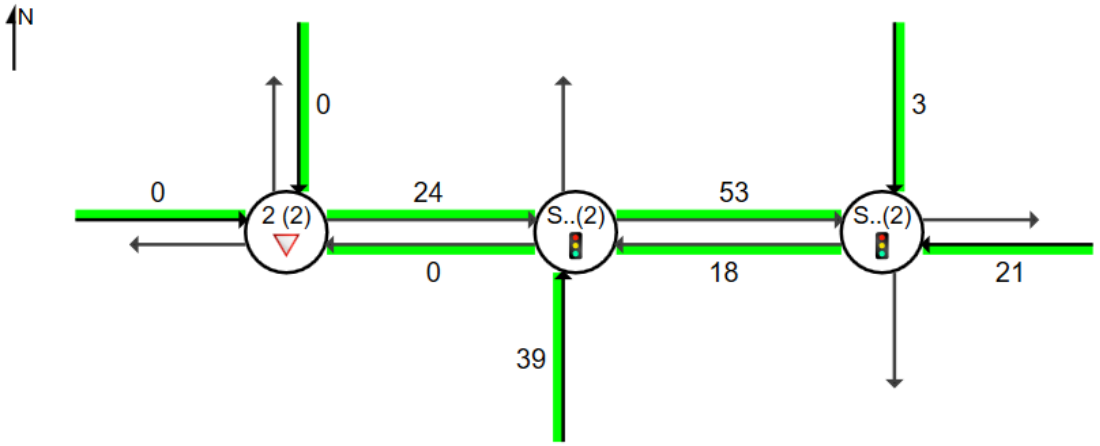
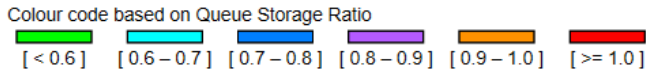
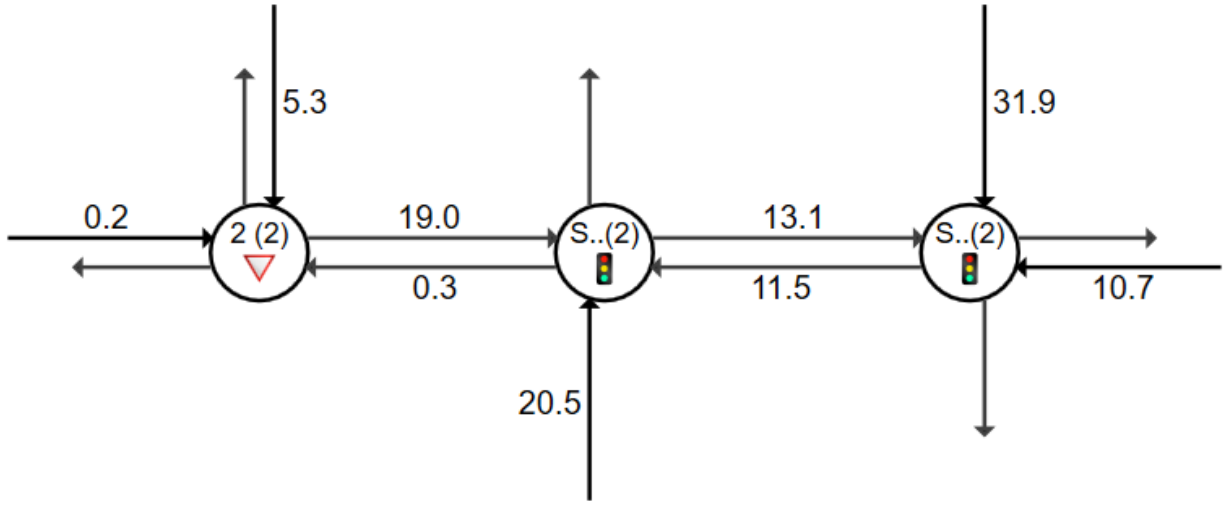
Existing Interchange PM Peak Results :

Average Queue (m)





Average Delay (s)



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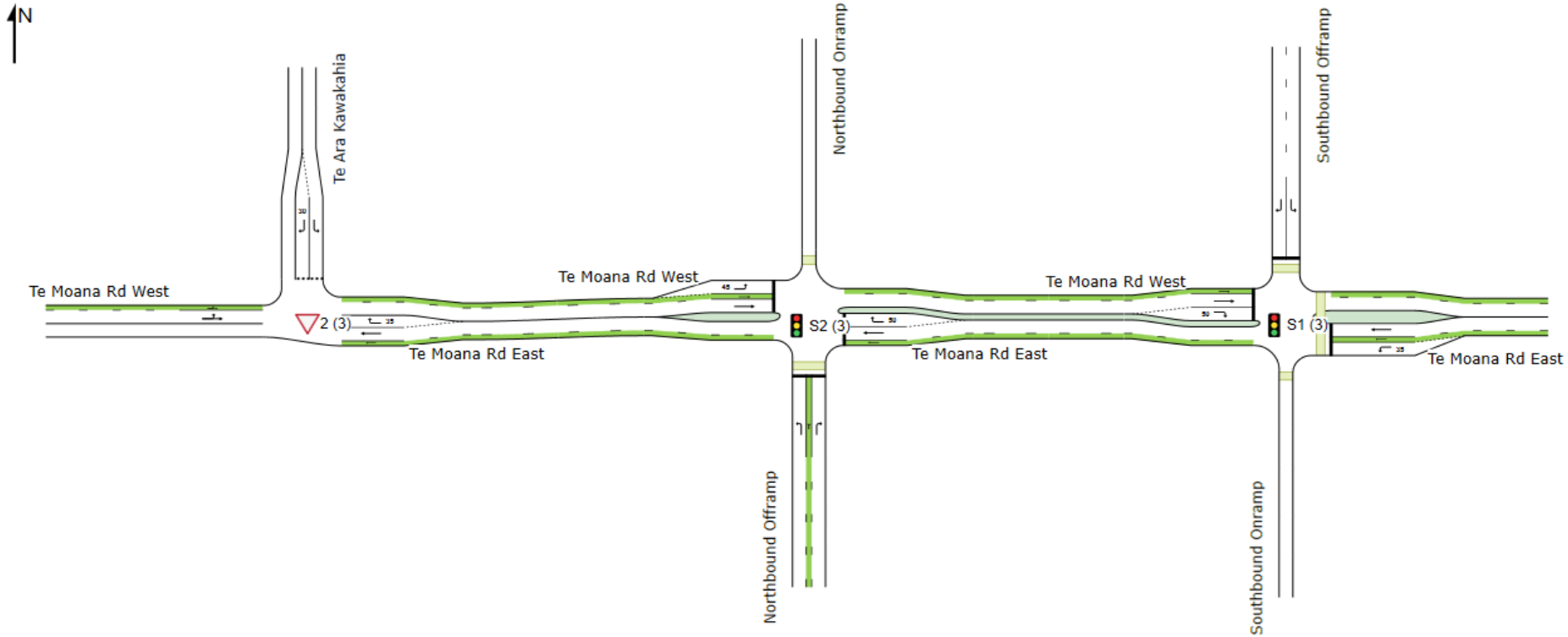
Existing Interchange + Ngarara Farm AM & PM Peaks:

- Interchange input volumes provided by WTOC (Wellington Traffic Operations Centre) for the 16th September 2024.
- Additional traffic volumes from Ngarara Farm Plan Change Area (enabled for development) as agreed with council (AM peak: + 578 vehicles & PM peak + 744 vehicles)
- Input phasing same as existing interchange
- AM Peak (8am - 9am)
- PM Peak (4:30pm - 5:30pm)
- 6% heavies applied to all movements
- Correct geometry including lane lengths, widths etc. applied to all legs of interchange



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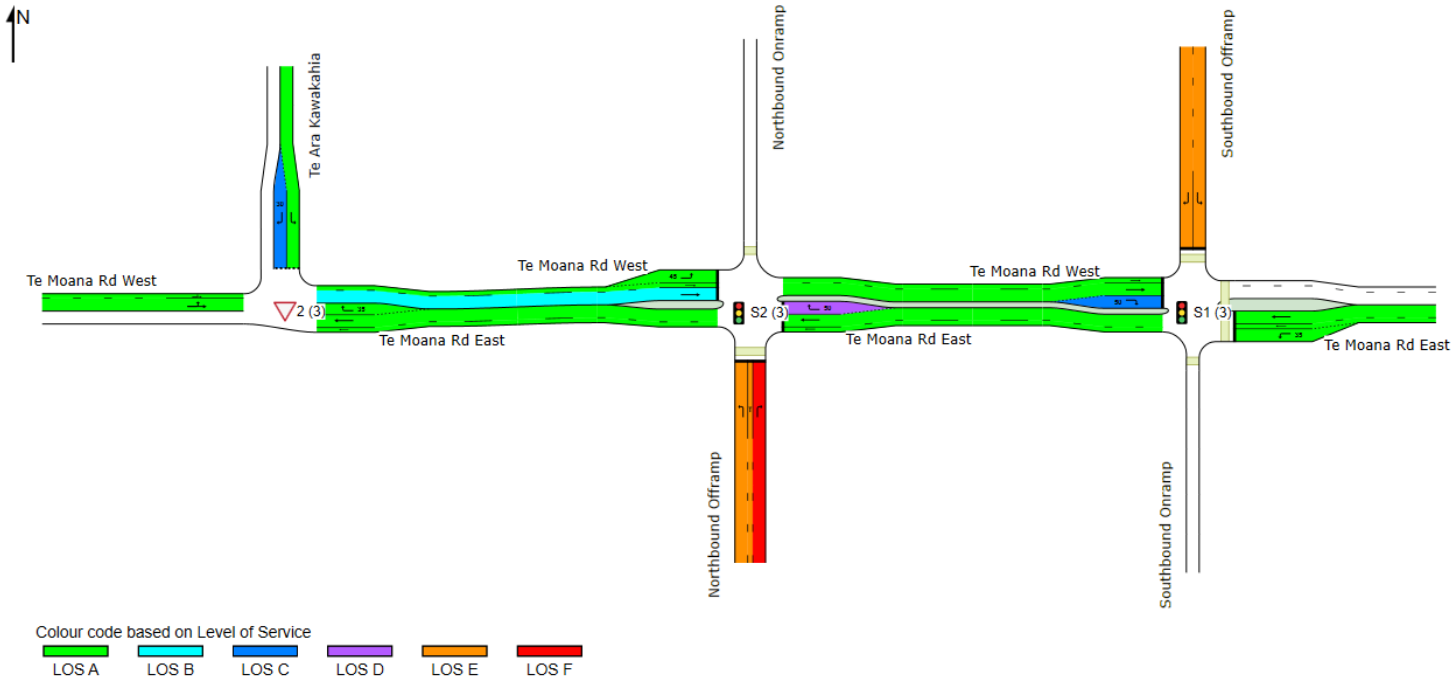
Existing Interchange + Ngarara Farm AM Peak Results :

Network Performance

Network Cycle Time = 140.0 seconds (Network Practical Cycle Time)
Critical Site / Common Control Group that determines the Network Cycle Time (for Coordinate
Network Scenario: 1 | Local Volumes

Network Performance - Hourly Values		
Performance Measure	**Vehicles:**	**All MCs**
Network Level of Service (LOS)		LOS D
Speed Efficiency		0.65
Travel Time Index		6.07
Congestion Coefficient		1.55
Travel Speed (Average)	km/h	30.8
Travel Distance (Total)	veh-km/h	1652.2
Travel Time (Total)	veh-h/h	53.6
Desired Speed	km/h	47.7
Demand Flows (Total for all Sites)	veh/h	4488
Arrival Flows (Total for all Sites)	veh/h	4488
Demand Flows (Entry Total)	veh/h	1717
Midblock Inflows (Total)	veh/h	69
Midblock Outflows (Total)	veh/h	-39
Percent Heavy Vehicles (Demand)	%	5.6
Percent Heavy Vehicles (Arrival)	%	5.6
Degree of Saturation		0.876
Control Delay (Total)	veh-h/h	14.95
Control Delay (Average)	sec	12.0
Control Delay (Worst Lane by MC)	sec	85.4
Control Delay (Worst Movement by MC)	sec	85.4
Geometric Delay (Average)	sec	1.4
Stop-Line Delay (Average)	sec	10.6
Ave. Que Storage Ratio (Worst Lane)		1.00
Effective Stops (Total)	veh/h	2097
Effective Stop Rate		0.47
Proportion Queued		0.40
Performance Index		236.0

Lane LOS



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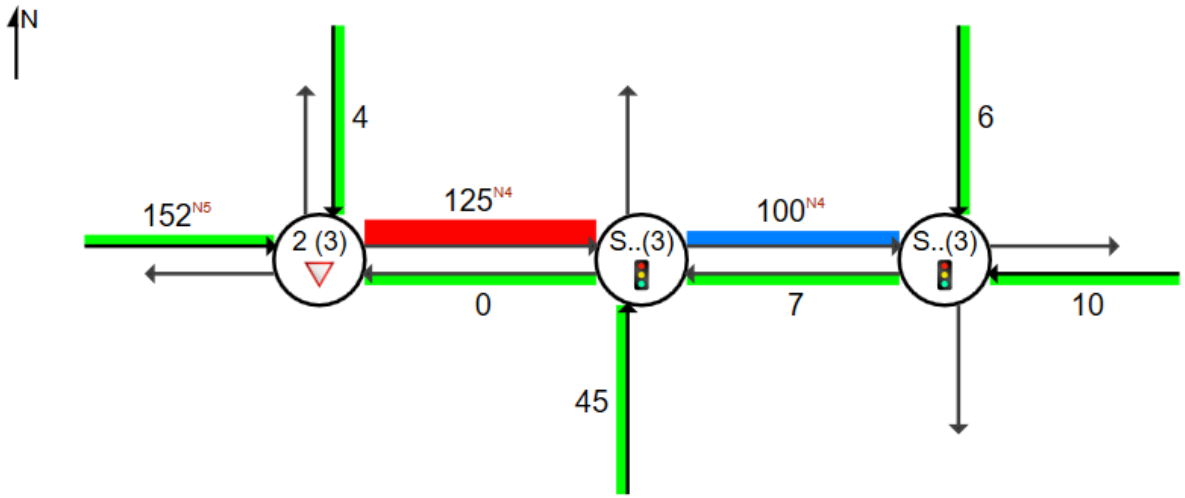
Existing Interchange + Ngarara Farm AM Peak Results :

Average Queue (m)



Colour code based on Queue Storage Ratio

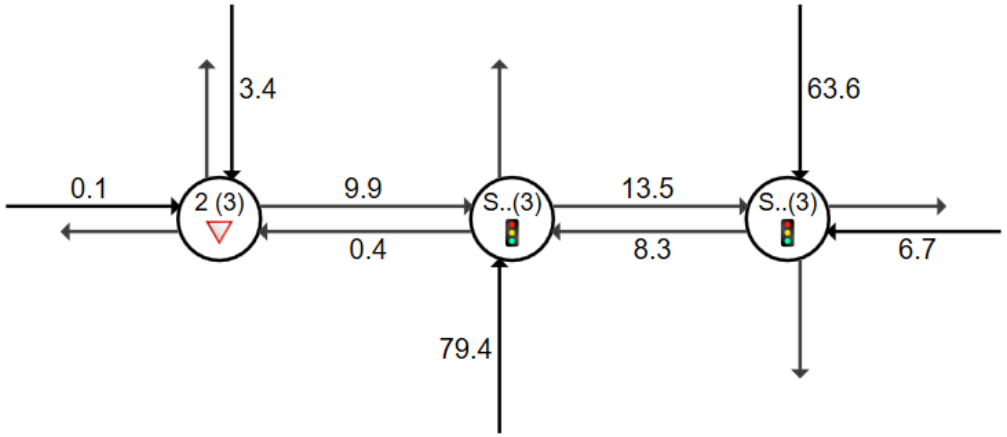
[< 0.6] [0.6 – 0.7] [0.7 – 0.8] [0.8 – 0.9] [0.9 – 1.0] [>= 1.0]

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

N4 Average Back of Queue has been restricted to the available queue storage space as it extends to lanes at upstream Sites.

N5 This result is determined by Average Back of Queue value of a downstream lane (proportional to lane movement flows).

Average Delay (s)



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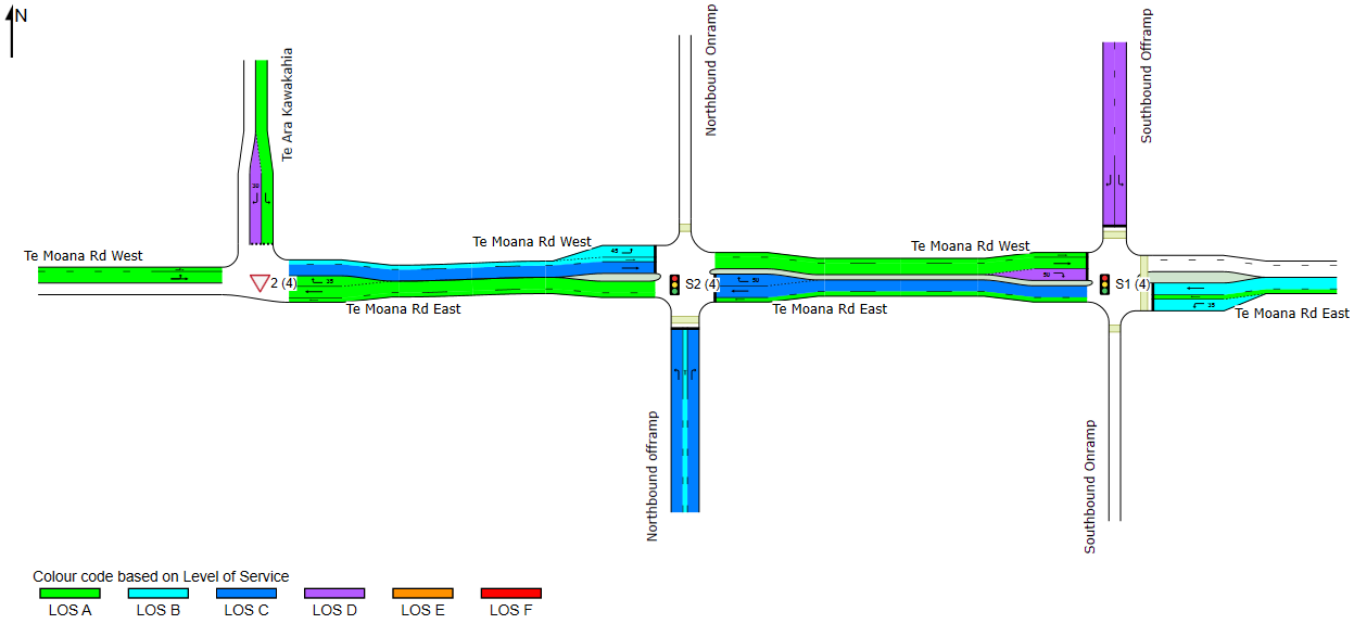
Existing Interchange + Ngarara Farm PM Peak Results :

Network Performance

Network Cycle Time = 90.0 seconds (Network Practical Cycle Time)
Critical Site / Common Control Group that determines the Network Cycle Time (for Coordinated Sites
Network Scenario: 1 | Local Volumes

Network Performance - Hourly Values		
Performance Measure	**Vehicles:**	**All MCs**
Network Level of Service (LOS)		LOS D
Speed Efficiency		0.62
Travel Time Index		5.76
Congestion Coefficient		1.62
Travel Speed (Average)	km/h	29.3
Travel Distance (Total)	veh-km/h	1869.2
Travel Time (Total)	veh-h/h	63.7
Desired Speed	km/h	47.4
Demand Flows (Total for all Sites)	veh/h	4636
Arrival Flows (Total for all Sites)	veh/h	4636
Demand Flows (Entry Total)	veh/h	2020
Midblock Inflows (Total)	veh/h	12
Midblock Outflows (Total)	veh/h	-33
Percent Heavy Vehicles (Demand)	%	5.2
Percent Heavy Vehicles (Arrival)	%	5.2
Degree of Saturation		0.780
Control Delay (Total)	veh-h/h	20.03
Control Delay (Average)	sec	15.6
Control Delay (Worst Lane by MC)	sec	39.9
Control Delay (Worst Movement by MC)	sec	39.9
Geometric Delay (Average)	sec	2.1
Stop-Line Delay (Average)	sec	13.4
Ave. Que Storage Ratio (Worst Lane)		1.29
Effective Stops (Total)	veh/h	2917
Effective Stop Rate		0.63
Proportion Queued		0.61
Performance Index		201.5

Lane LOS



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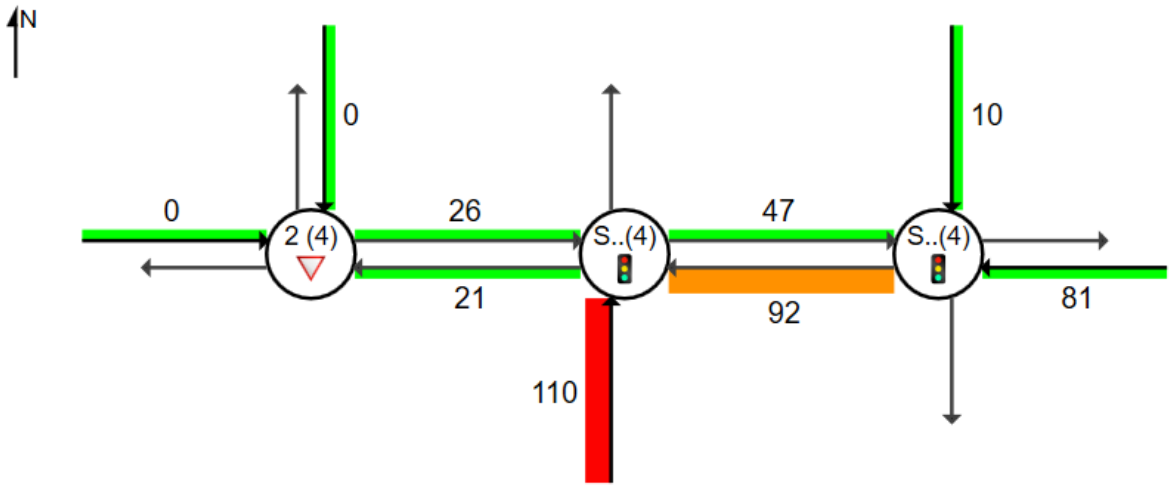
Existing Interchange + Ngarara Farm PM Peak Results :

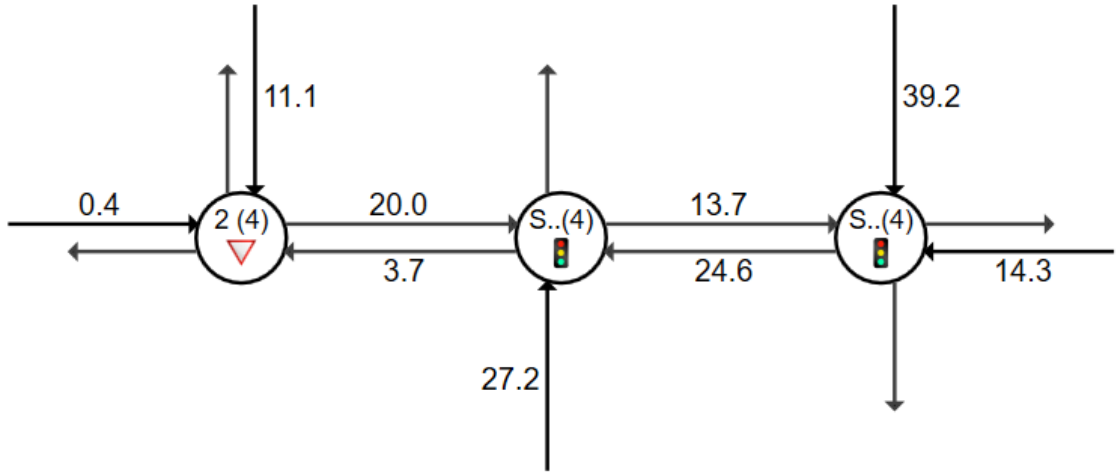
Average Queue (m)



Colour code based on Queue Storage Ratio

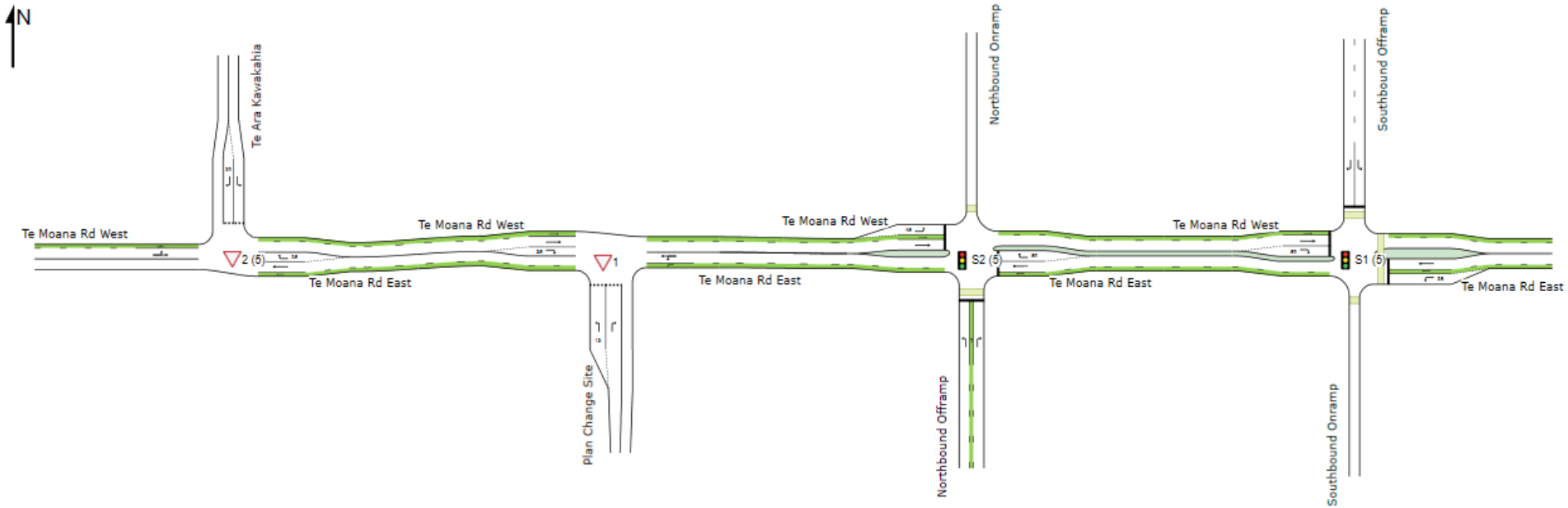
[< 0.6] [0.6 – 0.7] [0.7 – 0.8] [0.8 – 0.9] [0.9 – 1.0] [>= 1.0]

Average Delay (s)



Existing Interchange + Ngarara Farm + Plan Change Site AM & PM Peaks:

- Interchange input volumes provided by WTOC (Wellington Traffic Operations Centre) for the 16th September 2024.
- Additional traffic volumes from Ngarara Farm Plan Change Area (enabled for development) as agreed with council (AM peak: + 578 vehicles & PM peak + 744 vehicles)
- Additional traffic volumes from proposed plan change site based on 50 lots with 3 dwellings per lot @ 0.85v/h for 128 peak hour movements
- Input phasing same as existing interchange
- AM Peak (8am - 9am)
- PM Peak (4:30pm - 5:30pm)
- 6% heavies applied to all movements except proposed plan change site
- Correct geometry including lane lengths, widths etc. applied to all legs of interchange



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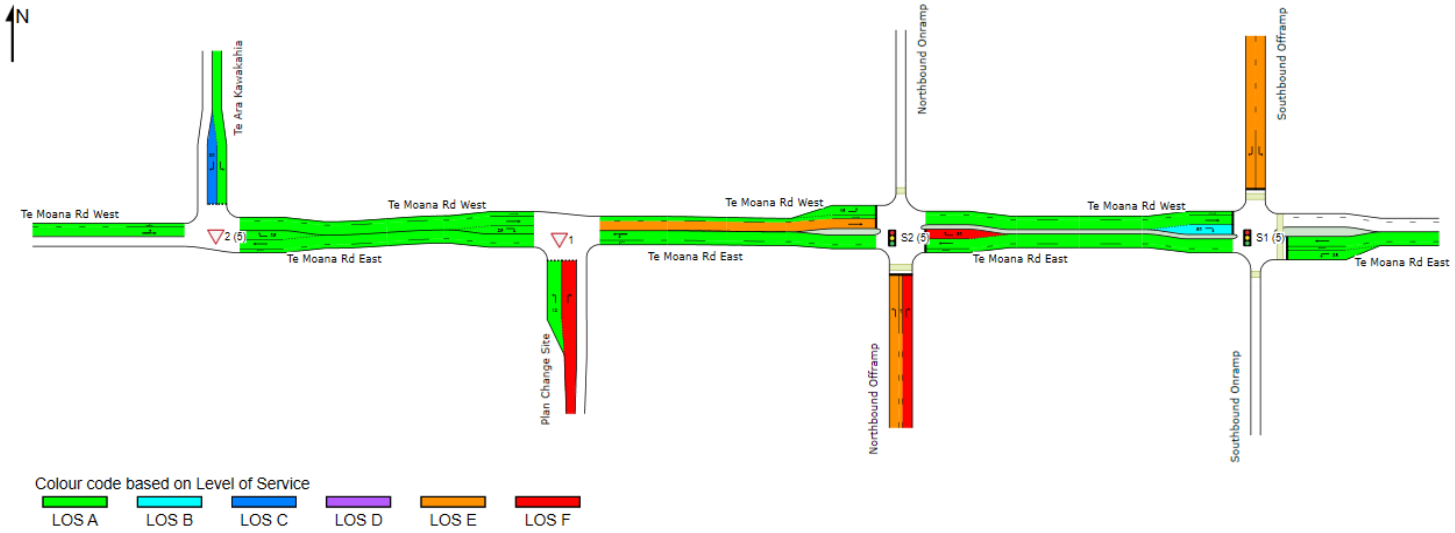
Existing Interchange + Ngarara Farm + Plan Change Site AM Peak Results:

Network Performance

Network Cycle Time = 140.0 seconds (Network Practical Cycle Time)
Critical Site / Common Control Group that determines the Network Cycle Time (for Coordinated Sites)
Network Scenario: 1 | Local Volumes

Network Performance - Hourly Values		
Performance Measure	**Vehicles:**	**All MCs**
Network Level of Service (LOS)		LOS D
Speed Efficiency		0.63
Travel Time Index		5.84
Congestion Coefficient		1.60
Travel Speed (Average)	km/h	30.2
Travel Distance (Total)	veh-km/h	1688.5
Travel Time (Total)	veh-h/h	55.9
Desired Speed	km/h	48.2
Demand Flows (Total for all Sites)	veh/h	6053
Arrival Flows (Total for all Sites)	veh/h	5986
Demand Flows (Entry Total)	veh/h	1818
Midblock Inflows (Total)	veh/h	27
Midblock Outflows (Total)	veh/h	-30
Percent Heavy Vehicles (Demand)	%	5.4
Percent Heavy Vehicles (Arrival)	%	5.5
Degree of Saturation		1.448
Control Delay (Total)	veh-h/h	47.74
Control Delay (Average)	sec	28.7
Control Delay (Worst Lane by MC)	sec	438.9
Control Delay (Worst Movement by MC)	sec	438.9
Geometric Delay (Average)	sec	1.3
Stop-Line Delay (Average)	sec	27.4

Lane LOS



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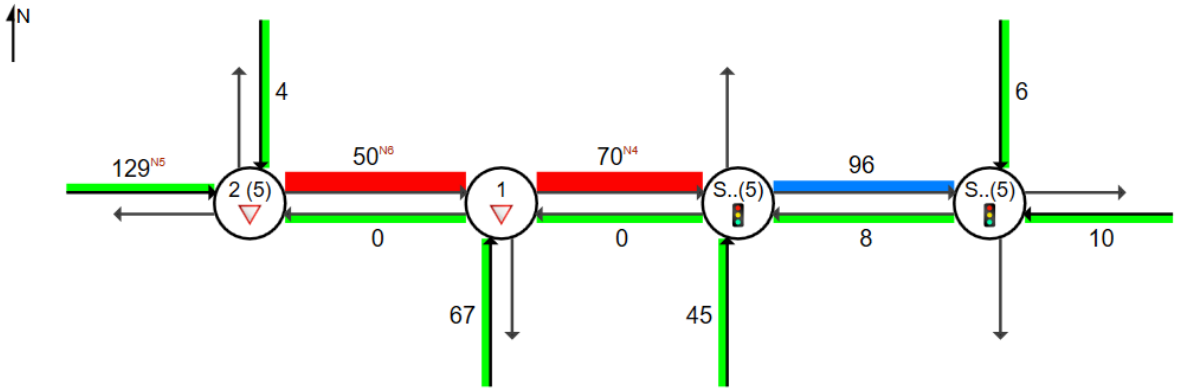
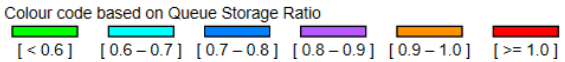
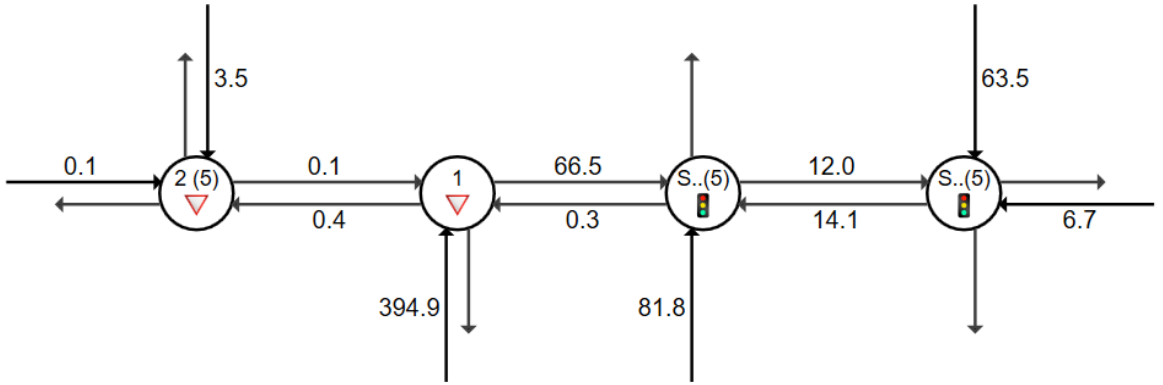
Average Queue (m)





Average Delay (s)



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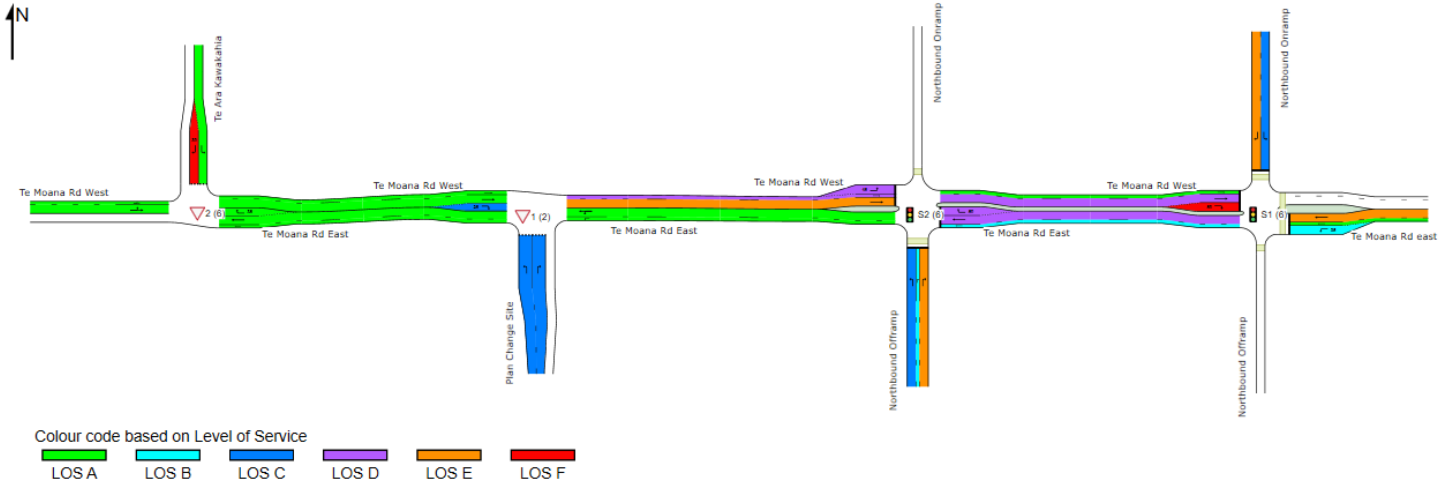
Existing Interchange + Ngarara Farm + Plan Change Site PM Peak Results:

Network Performance

Network Cycle Time = 130.0 seconds (Network Practical Cycle Time)
Critical Site / Common Control Group that determines the Network Cycle Time (for Coordinate
Network Scenario: 1 | Local Volumes

Network Performance - Hourly Values		
Performance Measure	**Vehicles:**	**All MCs**
Network Level of Service (LOS)		LOS E
Speed Efficiency		0.44
Travel Time Index		3.73
Congestion Coefficient		2.29
Travel Speed (Average)	km/h	21.1
Travel Distance (Total)	veh-km/h	1890.6
Travel Time (Total)	veh-h/h	89.5
Desired Speed	km/h	48.4
Demand Flows (Total for all Sites)	veh/h	6111
Arrival Flows (Total for all Sites)	veh/h	6111
Demand Flows (Entry Total)	veh/h	2049
Midblock Inflows (Total)	veh/h	30
Midblock Outflows (Total)	veh/h	-22
Percent Heavy Vehicles (Demand)	%	3.7
Percent Heavy Vehicles (Arrival)	%	3.7
Degree of Saturation		0.962
Control Delay (Total)	veh-h/h	45.79
Control Delay (Average)	sec	27.0
Control Delay (Worst Lane by MC)	sec	85.2
Control Delay (Worst Movement by MC)	sec	85.2
Geometric Delay (Average)	sec	1.7
Stop-Line Delay (Average)	sec	25.3
Ave. Que Storage Ratio (Worst Lane)		1.54
Effective Stops (Total)	veh/h	4108
Effective Stop Rate		0.67
Proportion Queued		0.59
Performance Index		305.3

Lane LOS



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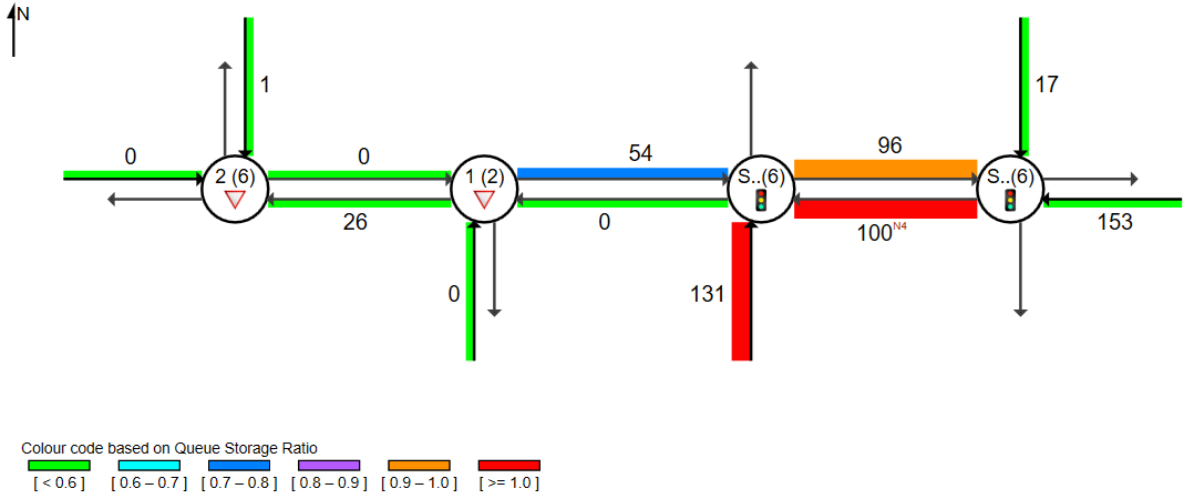
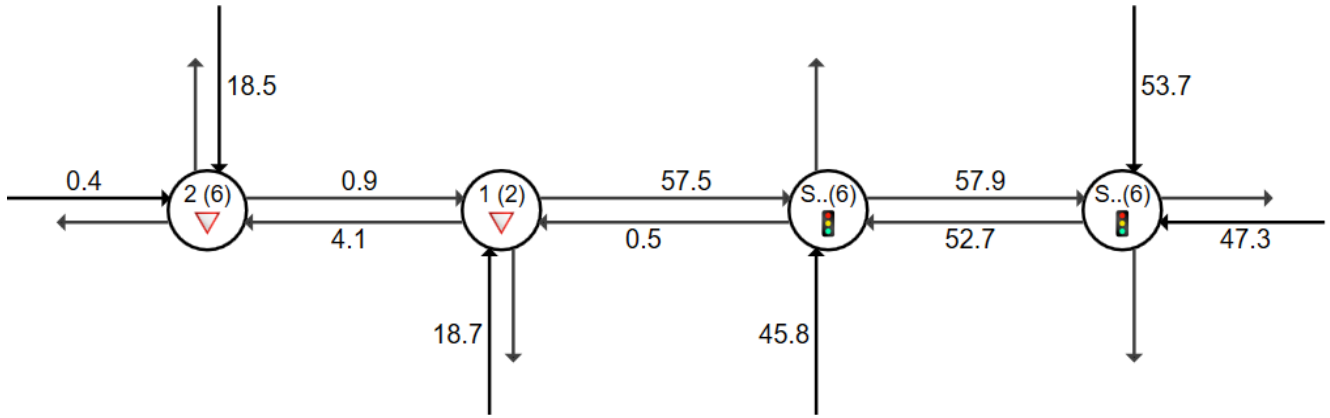
Average Queue (m)



Average Delay (s)



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