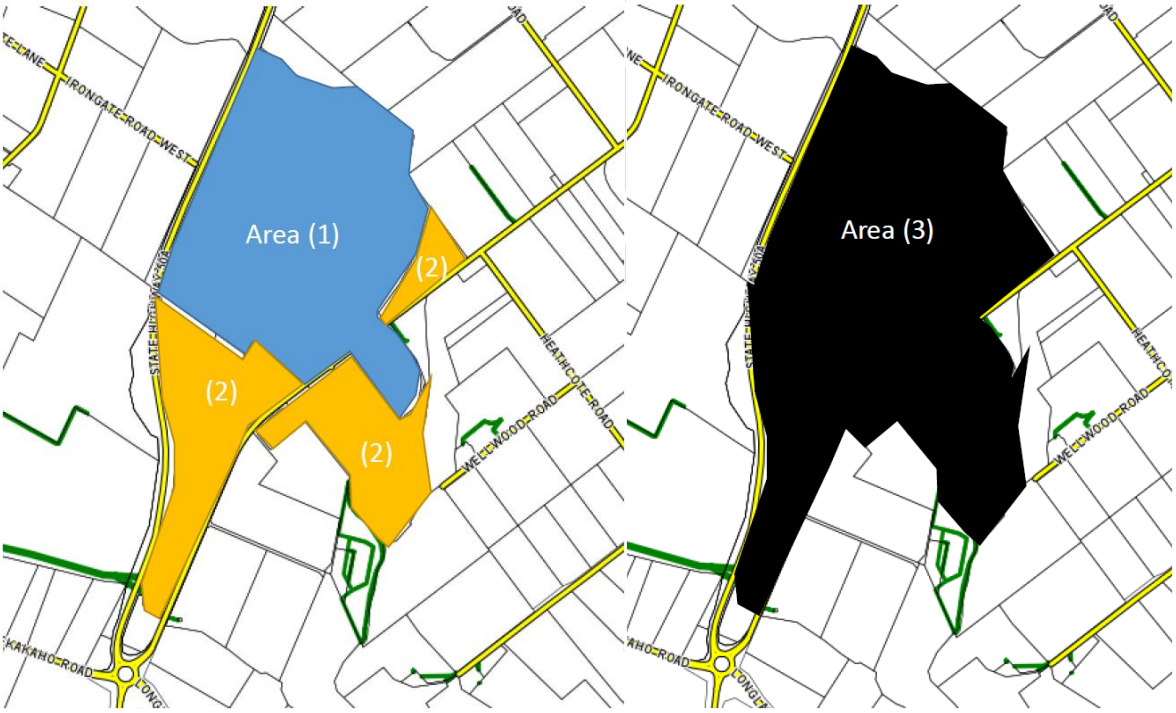
Report by: Gavin O'Connor, MWH NZ Limited

Irongate Industrial traffic generation assumptions:

I've undertaken the modelling for the Irongate/Maraekakaho intersection and the York Road/Maraekakaho Intersection as discussed. This was a little more complicated than first envisaged due to changes between actual observed flows now compared to modelled flows previously. The traffic generation used for the respective peak periods against the development by year is detailed below – this is based on the traffic generation estimations previously predicted. It is more appropriate to observe the intervention requirements in relation to the area of developed land rather than year of intervention. The year could change depending on development rates moving forward and if development did occur quicker the intervention would be required earlier.

Year	16/17	23/24	29/30	35/36	45/46
Developed Area (ha)	13.5	35.5	53.5	71.5	99.5
% Developed	19%	50%	75%	100%	139%
Irongate Movements AM	349	471	609	787	1095
Irongate Movements PM	422	569	736	952	1325

The increase in potential development area (from 71ha to 100ha) has little impact in terms of intersection improvements and timing of interventions. The areas are represented below.



Whilst the above shows a number of scenarios for the development staging from a traffic perspective the end solution is not affected. Roundabout treatments will be required at both the intersection of Irongate Road/Maraekakaho Road and York Road/Maraekakaho Road. These roundabouts will be sufficient to accommodate the anticipated traffic flows associated to 100ha if that scenario occurs.

Intersection Analysis

Irongate/Maraekakaho:

All previous assessments have concluded that the intersection could likely continue to function up to 36Ha of development as a T intersection. This would require interventions at the intersection in 2023/24. However, the current observed traffic flows are significantly less that those previously estimated. As such, it is expected the T-intersection can continue to operate to a satisfactory level of service beyond this point. The main risks at this intersection relate predominantly to the number of heavy vehicles at the intersection and the speed environment being 100km/h. I've made traffic movement assumptions based on 25% of traffic heading south and 75% heading north from Irongate – I'd strongly suggest this is validated after years 1 and 2. If the level moving south is higher it is likely the interventions will be needed sooner. Similarly, if it is lower the modelling indicates you may be able to delay the timing of the roundabout. Summary of modelling provided below which show LOS D in 2030 deteriorating to LOSF in 2035 (based on 25:75 traffic movement split). I recommend development contributions are based on intervention of roundabout in year 2030 – monitoring over the next 2 years will confirm whether this is a reality. In any case – no intersection improvements are needed over the next 10-15 years based on current assumptions.

York Road/Maraekakaho Road:

The York/Maraekakaho Intersection is detailed below. As indicated previously the development traffic volumes equate to approximately 1/3rd of the total traffic volumes at this intersection as detailed below.

Base traffic volumes without development (2035)	1,199 vehicles in peak hour
Irongate development traffic growth (2035)	590 vehicles in peak hour (33%)
Total traffic volumes with development (2035)	1789 vehicles in peak hour

It is worthy of note that the increase in volumes is on the conflicting straight through and right turn out movements and as such the intervention is only actually required to service this development – without this growth in traffic the T-intersection would likely suffice from an operational perspective (not withstanding any safety concerns). The modelling completed indicates an intervention is required from a traffic operation perspective in approximately 2030 or when 53Ha are developed. As with Irongate intersection there may be drivers to action this earlier to resolve any safety concerns at the intersection but this is very difficult to predict. I suggest you base development contributions on year of intervention being 2030.

Mid-block Analysis

Maraekakaho Road:

In addition to the required intersection enhancements identified it is likely that further interventions are necessary along the Maraekakaho Road frontage. It is possible that lots fronting Maraekakaho Road will be afforded direct access from Maraekakaho Road, albeit limited, and this could have implications for road safety.

In addition, the development of a large industrial area will lead to an increase in demand for alternative transport mode access to this site. Whilst the location is not overly attractive to encouraging walking to and from the site (due to the distance from residential areas) it is highly likely that employees of the industrial area may choose to cycle to and from the site.

DRAFT

To ensure the safety of all road users is maintained it is necessary to increase the road cross-section of the Maraekakaho Road frontage to accommodate both a widened sealed shoulder (for left turning vehicles and cyclists) and also a central flush median (for right turning vehicles). Given the local speed environment on this frontage and also considering the side conflicts expected here (additional access points) it is recommended that these interventions are progressed. A high level cost estimate of the seal widening and flush median provision is estimated at $505k. The intervention year for these facilities is highly dependent on the update of the development and whether this takes access direct from Maraekakaho Road.

Development Scenario B and C:

As indicated previously the increase in development size up to 100ha doesn't change the required interventions nor timing of interventions at the intersections of Maraekakaho Road with Irongate Road or York Road. As you have indicated the additional development simply results in a longer development period the year of intervention will largely remain the same. However, should development be expedited the year of intervention will occur sooner.

Whilst there are no material changes to the intersection enhancements to support the increased development area there is likely additional access road requirements to permit servicing of the sites. Whilst 28ha is a significant increase in development size, based on recent proposals for Irongate industrial area this could actually relate to just 4-5 additional lots. The level of intervention proposed should be cognisant of this. It is envisaged that the area to the south east of Maraekakaho Road can be serviced via a 4th leg on the proposed roundabout. This will have some additional costs in relation to the roundabout construction, service relocations and a new road.

The area to the south west of Stage 1 (Timu site) would be best serviced from the existing infrastructure and access road for the Timu site. This access is designed to a very high T-intersection standard and would require no additional works to open up this site for development (other than extension of access road and some widening). Given this access will likely serve less than 5 lots it is suggested any enhancements or extensions are minimised or alternatively retained as private access provision and met by the developers of individual lots. It is not clear whether Timu will remain in operation should the proposed development proceed. The diagram below indicates the likely access provisions for the wider development area.

A high level assessment of the anticipated additional infrastructure costs (roading) to service the wider area has been completed. Essentially this relates only to the fourth leg on the Irongate/Maraekakaho roundabout and the associated access road and the extension of the access road at Timu. Using the estimated Irongate Road costs to inform the likely increase in infrastructure costs it is suggested a further $500k is secured to allow the changes to the roundabout and the provision of an access road to the southeast of Maraekakaho Road and a further $500k to upgrade the Timu access road.

DRAFT


50A
50A
50A
Maraekakaho Rd
Maraekakaho Rd
Maraekakaho Rd
Tumu Timbers
Hawkes Bay Expy

SIDRA Summary

MOVEMENT SUMMARY

▽ Site: AM Iron - Marae 2030

New Site
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
NorthEast: Maraekakaho Road											
5	T1	354	0.0	0.181	0.0	LOS A	0.0	0.0	0.00	0.00	50.0
6	R2	403	20.0	0.437	9.0	LOS A	2.9	23.9	0.65	0.92	43.8
Approach		757	10.7	0.437	4.8	NA	2.9	23.9	0.34	0.49	46.5
NorthWest: Irongate Road											
7	L2	109	20.0	0.110	6.5	LOS A	0.4	3.6	0.45	0.64	45.3
9	R2	54	20.0	0.316	29.9	LOS D	1.1	9.2	0.89	1.00	34.8
Approach		163	20.0	0.316	14.2	LOS B	1.1	9.2	0.59	0.76	41.2
SouthWest: Maraekakaho Road											
10	L2	107	20.0	0.265	4.8	LOS A	0.0	0.0	0.00	0.12	48.6
11	T1	387	0.0	0.265	0.0	LOS A	0.0	0.0	0.00	0.12	49.4
Approach		495	4.3	0.265	1.1	NA	0.0	0.0	0.00	0.12	49.2
All Vehicles		1415	9.5	0.437	4.6	NA	2.9	23.9	0.25	0.39	46.7

MOVEMENT SUMMARY

▽ Site: AM Iron - Marae 2036

New Site
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
NorthEast: Maraekakaho Road											
5	T1	354	0.0	0.181	0.0	LOS A	0.0	0.0	0.00	0.00	50.0
6	R2	537	20.0	0.615	11.4	LOS B	5.5	45.1	0.74	1.13	42.6
Approach		891	12.1	0.615	6.9	NA	5.5	45.1	0.44	0.68	45.2
NorthWest: Irongate Road											
7	L2	144	20.0	0.145	6.6	LOS A	0.6	4.8	0.46	0.65	45.3
9	R2	72	20.0	0.611	55.2	LOS F	2.4	19.6	0.96	1.11	28.0
Approach		216	20.0	0.611	22.7	LOS C	2.4	19.6	0.62	0.81	37.6
SouthWest: Maraekakaho Road											
10	L2	143	20.0	0.287	4.8	LOS A	0.0	0.0	0.00	0.14	48.5
11	T1	387	0.0	0.287	0.0	LOS A	0.0	0.0	0.00	0.14	49.3
Approach		531	5.4	0.287	1.3	NA	0.0	0.0	0.00	0.14	49.0
All Vehicles		1637	10.9	0.615	7.2	NA	5.5	45.1	0.32	0.52	45.2

MOVEMENT SUMMARY

▽ Site: York-Marae 2030

New Site
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
NorthEast: Maraekakaho Road NE											
5	T1	438	0.0	0.393	1.7	LOS A	3.4	23.7	0.40	0.26	47.9
6	R2	298	0.0	0.393	7.1	LOS A	3.4	23.7	0.62	0.40	46.2
Approach		736	0.0	0.393	3.9	NA	3.4	23.7	0.49	0.31	47.2
NorthWest: York Road											
7	L2	315	0.0	0.251	5.8	LOS A	1.1	7.9	0.41	0.61	45.7
9	R2	199	0.0	0.739	32.1	LOS D	4.4	30.8	0.93	1.27	34.2
Approach		514	0.0	0.739	16.0	LOS C	4.4	30.8	0.61	0.86	40.4
SouthWest: Maraekakaho Road SW											
10	L2	102	0.0	0.205	4.6	LOS A	0.0	0.0	0.00	0.14	48.7
11	T1	293	0.0	0.205	0.0	LOS A	0.0	0.0	0.00	0.14	49.2
Approach		395	0.0	0.205	1.2	NA	0.0	0.0	0.00	0.14	49.1
All Vehicles		1644	0.0	0.739	7.0	NA	4.4	30.8	0.41	0.44	45.2

MOVEMENT SUMMARY

▽ Site: York-Marae 2035

New Site
Giveway / Yield (Two-Way)

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
NorthEast: Maraekakaho Road NE											
5	T1	496	0.0	0.426	2.1	LOS A	4.2	29.4	0.45	0.27	47.7
6	R2	298	0.0	0.426	7.7	LOS A	4.2	29.4	0.68	0.40	46.0
Approach		794	0.0	0.426	4.2	NA	4.2	29.4	0.53	0.32	47.0
NorthWest: York Road											
7	L2	315	0.0	0.256	5.9	LOS A	1.2	8.1	0.42	0.62	45.6
9	R2	251	0.0	1.087	97.2	LOS F	15.2	106.1	1.00	2.09	21.2
Approach		565	0.0	1.087	46.3	LOS E	15.2	106.1	0.68	1.27	30.3
SouthWest: Maraekakaho Road SW											
10	L2	118	0.0	0.224	4.6	LOS A	0.0	0.0	0.00	0.15	48.7
11	T1	313	0.0	0.224	0.0	LOS A	0.0	0.0	0.00	0.15	49.1
Approach		431	0.0	0.224	1.3	NA	0.0	0.0	0.00	0.15	49.0
All Vehicles		1789	0.0	1.087	16.8	NA	15.2	106.1	0.45	0.58	40.4

DRAFT