Item No	RMS's Comments	Hyder's Response	Suggested Way Forward
	appropriately for Stage 1. Another access is likely to be required to the State road network - emergency access issues also.	level of service (B to C) for Stage 1 development. For the emergency access, the street layout in Huntlee Entry Village provides for connections through to North Rothbury Streets. These connections are to Scott and Dai Streets and are currently road reserves. For Stage 1 Huntlee development, it is proposed that they serve as open space linkages for pedestrian and cyclists and would not be open for regular traffic. They could however be designed to be able to be used in an emergency if the Village 1 Access Road (with Wine Country Drive) is not available. Gates can be installed to allow emergency vehicle use only. The emergency access will be available from the start of the development. At some point in times, the northern access from Village One to HEX Link Road will be considered and provides an alternative access. For modelling purpose, Hyder has not assumed any connection between North Rothbury and Village One.	Rothbury and Village One for regular traffic.
20	Access to the existing development of North Rothbury needs to be resolved. It may be an option to close access or limit access to Wine Country Drive and provide access through the new road system and an upgraded access being provided. However, this should be done in consultation with existing community and should be known up front. RMS would be concerned with the community implications of directing Huntlee traffic through or restricting	For modelling purpose, there is no connection for general traffic from Village One directly access through North Rothbury.	Hyder has not assumed any connection between North Rothbury and Village One.

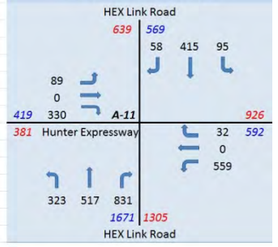
Item No	RMS's Comments	Hyder's Response	Suggested Way Forward
	access to / from existing residential areas		
20	As a minimum, there should be in principle agreement to the future road infrastructure requirements, including intersections. This is to ensure that what is being approved for Stage 1 is consistent with the future stages and the road network continues to function at an acceptable level of service.	Noted.	
20	As a general comment subject to the above issues being addressed, the assumptions are sound and acceptable for proceeding with the traffic and transport study for Huntlee. All electronic input / output files should be provided for RMS assessment.	Hyder will submit the relevant model files after completing the traffic report.	
20	The developer should also investigate innovative and practical ways of integrating public transport and other alternative modes (walking, cycling) into the Stage 1 and future stages to the ultimate development of Huntlee. This will ensure that car usage is minimised and facilities are available to residents and employees from the early stages of development.	Noted.	

Figure 1 Proposed Infrastructure Upgrade for Stage 1 Development.

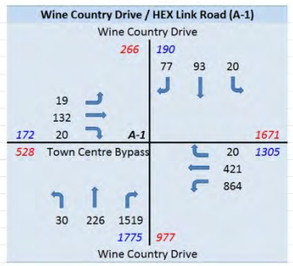
APPENDIX E

FUTURE YEAR TURNING VOLUMES WITH HUNTLEE (SCENARIOS)

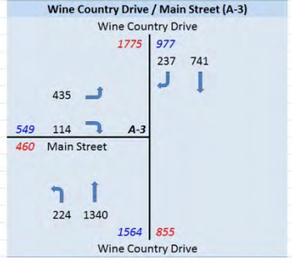
Branxton Interchange (A-11)



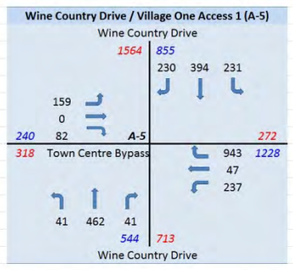
Wine Country Drive / HEX Link Road (A-1)



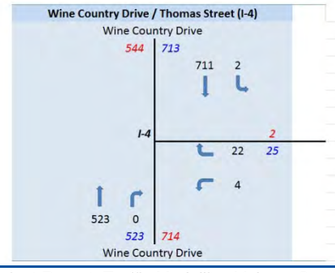
Wine Country Drive / Main Street (A-3)



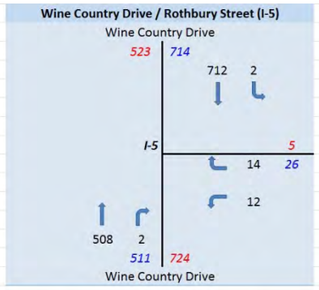
Wine Country Drive / Village One Access 1 (A-5)

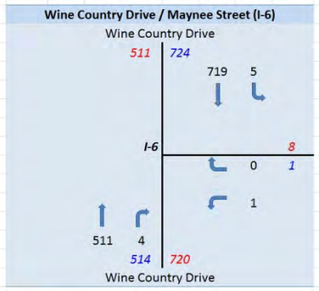


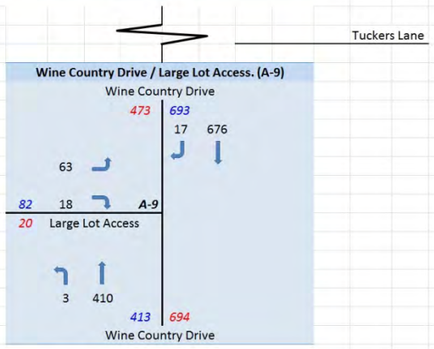
Wine Country Drive / Thomas Street (I-4)

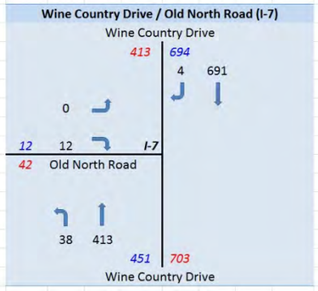


Scenario 1 - AM









Scenario 1 - AM

2020 PM Average Peak One Hour Intersection Flow After Dev Traffic Future Development Turn Table_(Scenario 2Csp).xlsx

Branxton Interchange (A-11)

HEX Link Road

713 720

94 592 34

61

0

446 385 A-11 794

471 Hunter Expressway 100 1179

0

1080

377 552 760

1689 2056

HEX Link Road

Wine Country Drive / HEX Link Road (A-1)

Wine Country Drive

247 232

69 143 20

95

519

634 20 A-1 1689

549 Town Centre Bypass 20 2056

450

1586

30 133 1150

1313 1749

Wine Country Drive

Wine Country Drive / Main Street (A-3)

Wine Country Drive

1313 1749

462 1287

398

650 252 A-3

633 Main Street

171 915

1086 1538

Wine Country Drive

Wine Country Drive / Village One Access 1 (A-5)

Wine Country Drive

1086 1538

257 436 846

392

116

596 88 A-5 1220

395 Town Centre Bypass 229 271

0

41

138 465 258

861 564

Wine Country Drive

Wine Country Drive / Thomas Street (I-4)

Wine Country Drive

861 564

546 19

I-4 22

9 14

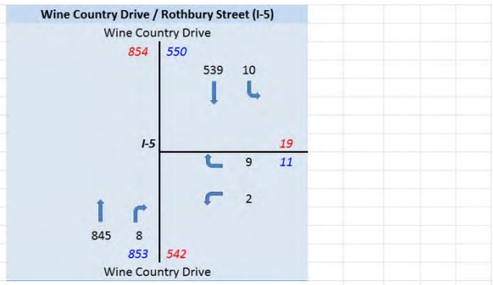
4

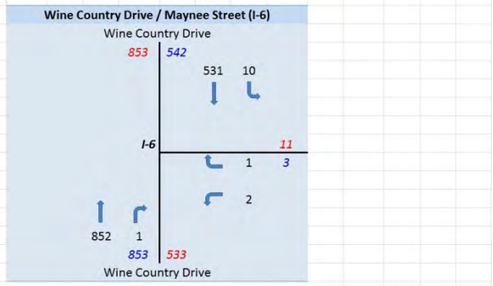
851 3

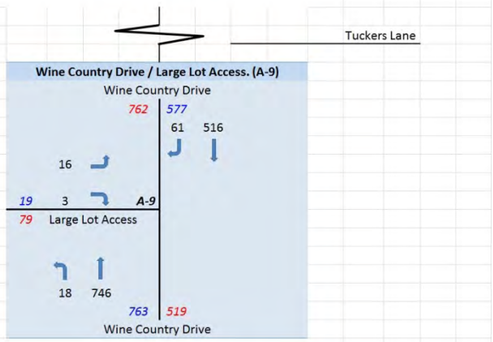
854 550

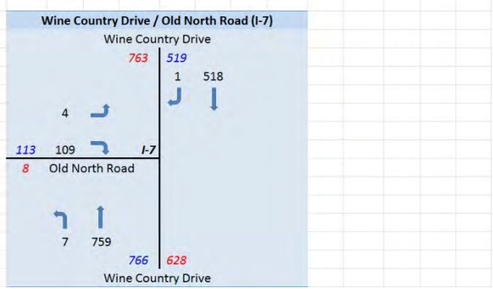
Wine Country Drive

Scenario 1 - PM



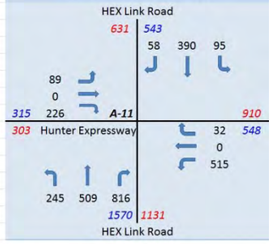




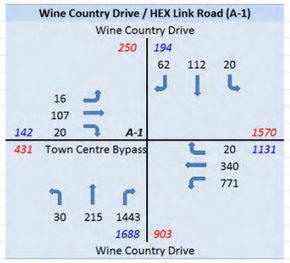


Scenario 1 - PM

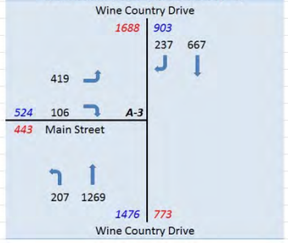
Branxton Interchange (A-11)



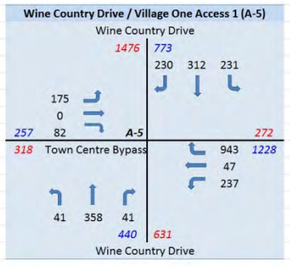
Wine Country Drive / HEX Link Road (A-1)



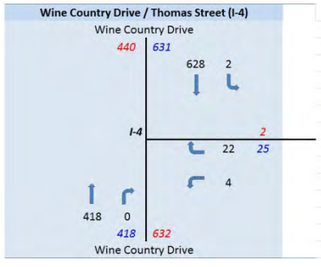
Wine Country Drive / Main Street (A-3)



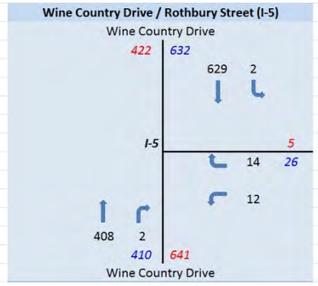
Wine Country Drive / Village One Access 1 (A-5)

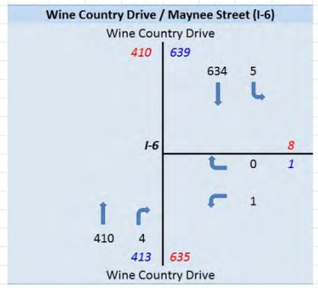


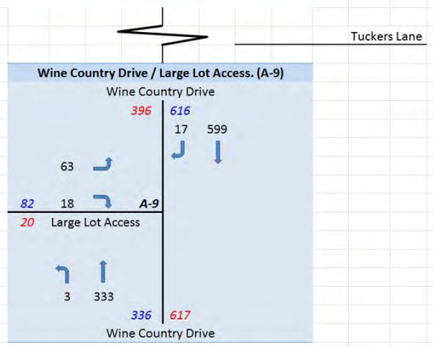
Wine Country Drive / Thomas Street (I-4)

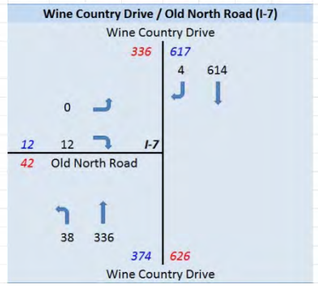


Scenario 3 - AM



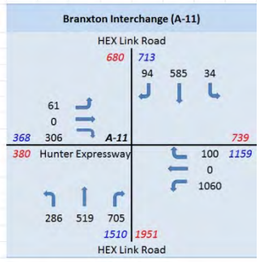


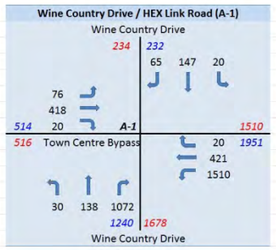


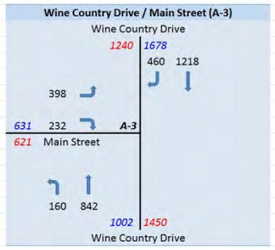


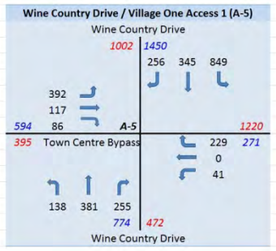
Scenario 3 - AM

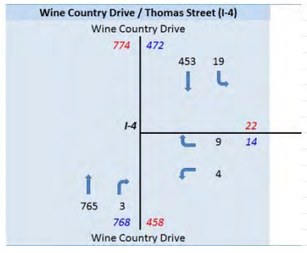
2020 PM Average Peak One Hour Intersection Flow | After Dev Traffic | Future Development Turn Table_(Scenario 2Dp).xlsx



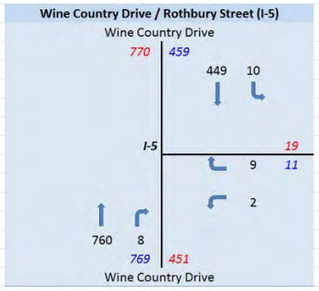


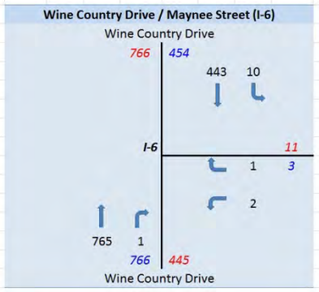


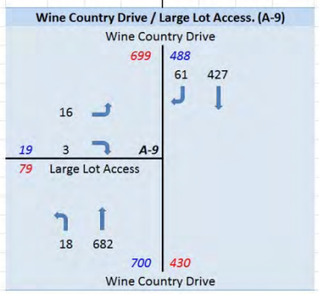


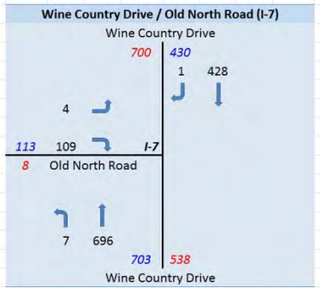


Scenario 3 - PM





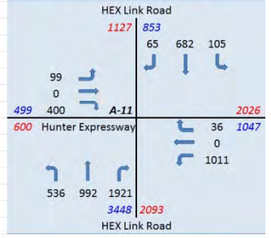




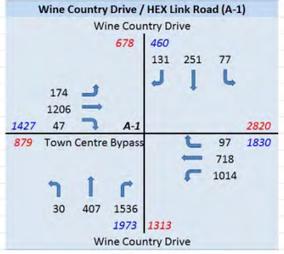
Scenario 3 - PM

2036 AM Average Peak One Hour Intersection Flow After Dev Traffic Future Development Turn Table_(Scenario 3B).xlsx

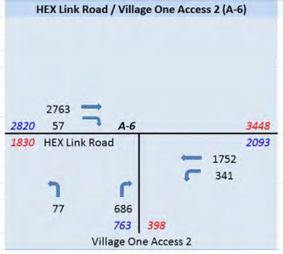
Branxton Interchange (A-11)



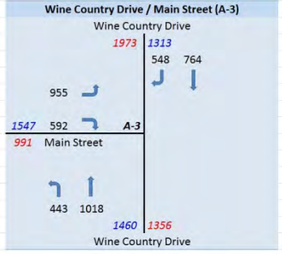
Wine Country Drive / HEX Link Road (A-1)



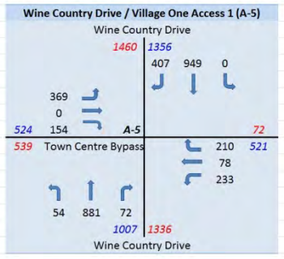
HEX Link Road / Village One Access 2 (A-6)



Wine Country Drive / Main Street (A-3)

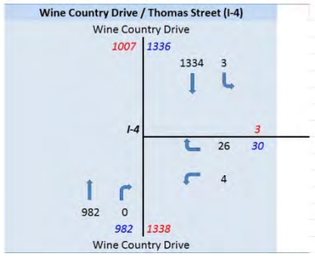


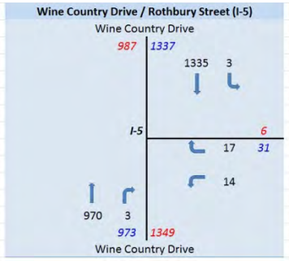
Wine Country Drive / Village One Access 1 (A-5)

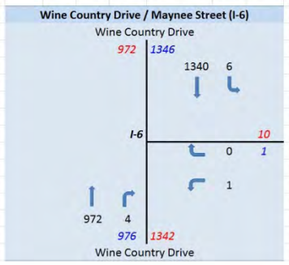


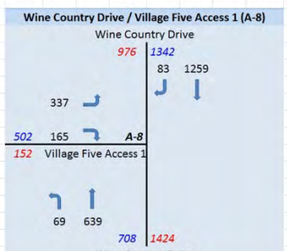
Scenario 4 - AM

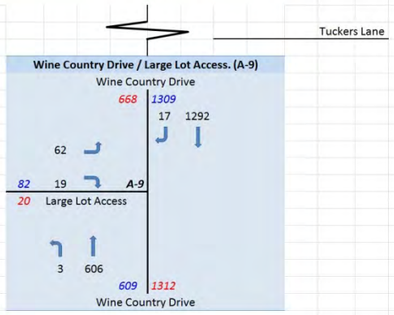
Wine Country Drive / Thomas Street (I-4)

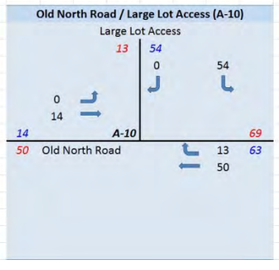


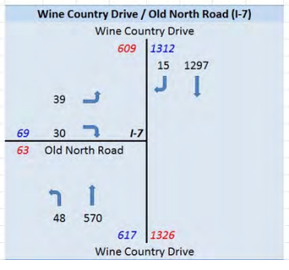








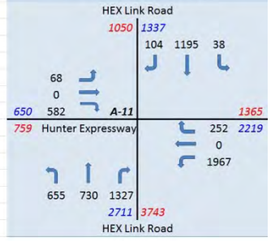




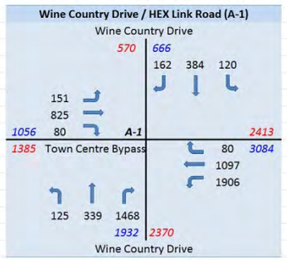
Scenario 4 - AM

2036 PM Average Peak One Hour Intersection Flow | After Dev Traffic | Future Development Turn Table_(Scenario 3B).xlsx

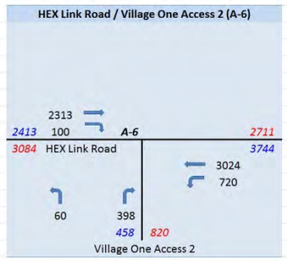
Branxton Interchange (A-11)



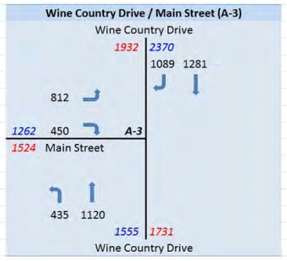
Wine Country Drive / HEX Link Road (A-1)



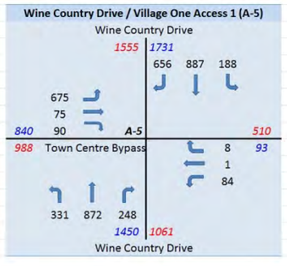
HEX Link Road / Village One Access 2 (A-6)



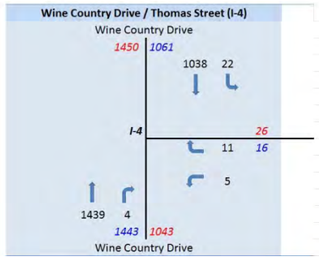
Wine Country Drive / Main Street (A-3)



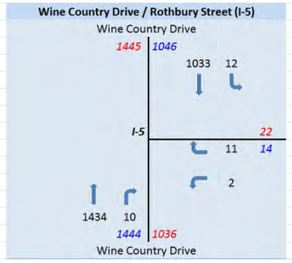
Wine Country Drive / Village One Access 1 (A-5)

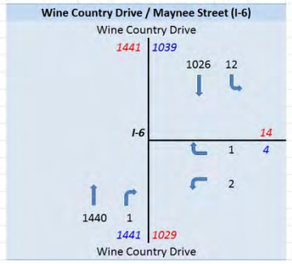


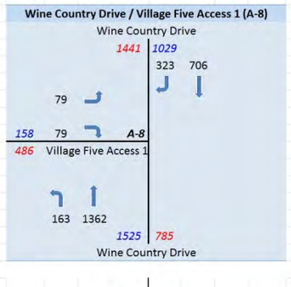
Wine Country Drive / Thomas Street (I-4)

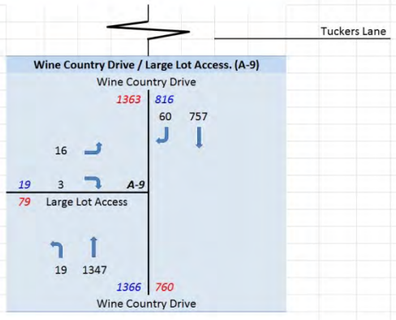


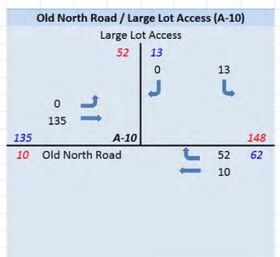
Scenario 4 - PM

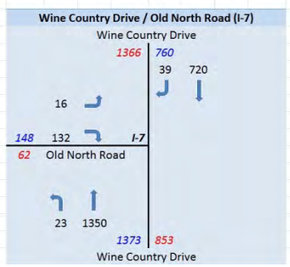








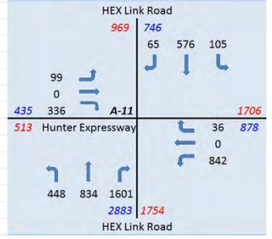




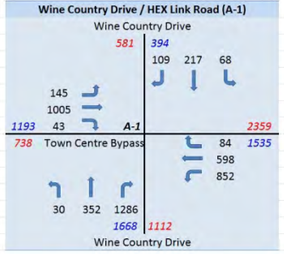
Scenario 4 - PM

2036 AM Average Peak One Hour Intersection Flow | After Dev Traffic | Future Development Turn Table_(Scenario 4B).xlsx

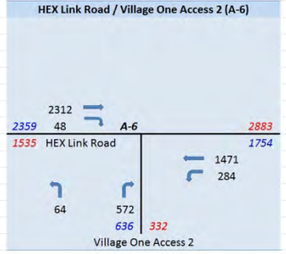
Branxton Interchange (A-11)



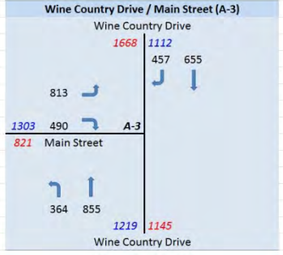
Wine Country Drive / HEX Link Road (A-1)



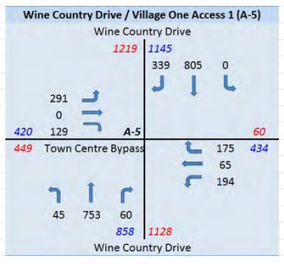
HEX Link Road / Village One Access 2 (A-6)



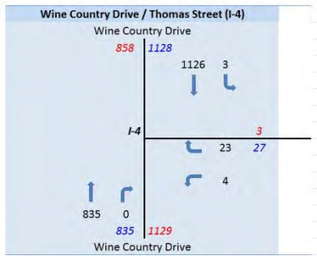
Wine Country Drive / Main Street (A-3)



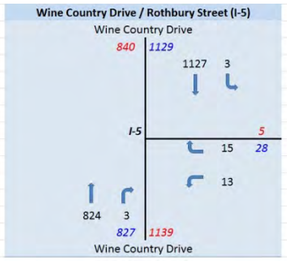
Wine Country Drive / Village One Access 1 (A-5)

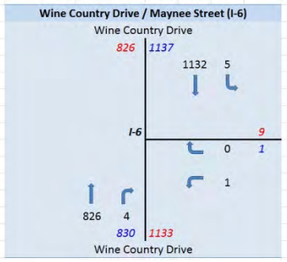


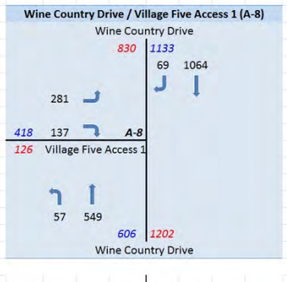
Wine Country Drive / Thomas Street (I-4)

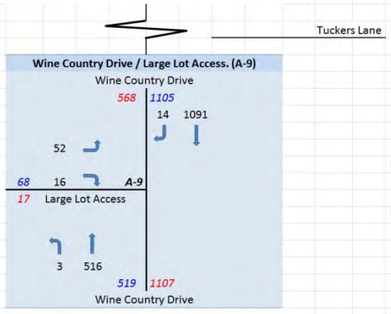


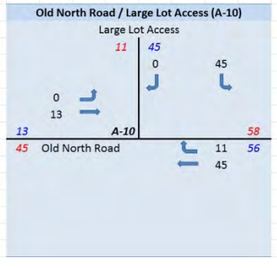
Scenario 5 - AM

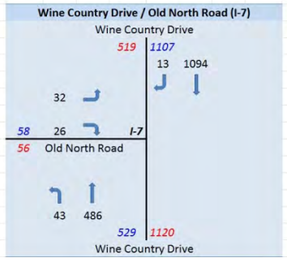








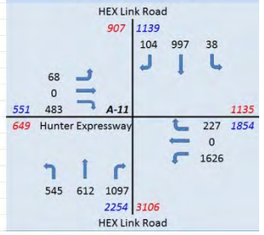




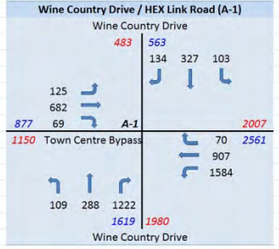
Scenario 5 - AM

2036 PM Average Peak One Hour Intersection Flow | After Dev Traffic | Future Development Turn Table_(Scenario 4B).xlsx

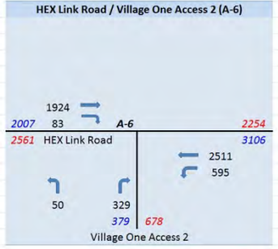
Branxton Interchange (A-11)



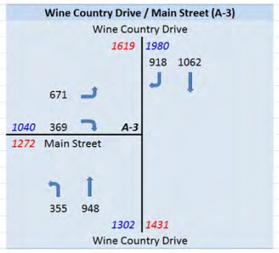
Wine Country Drive / HEX Link Road (A-1)



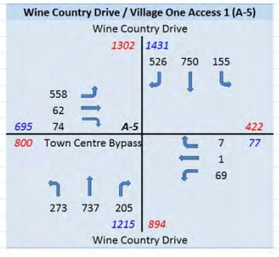
HEX Link Road / Village One Access 2 (A-6)



Wine Country Drive / Main Street (A-3)

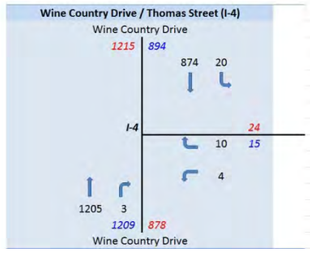


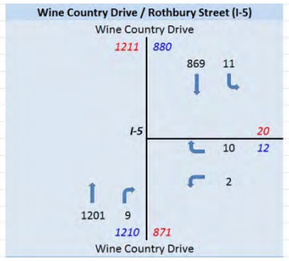
Wine Country Drive / Village One Access 1 (A-5)

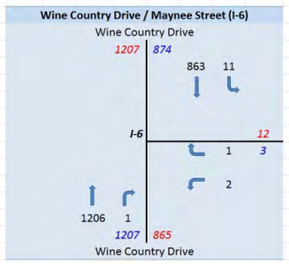


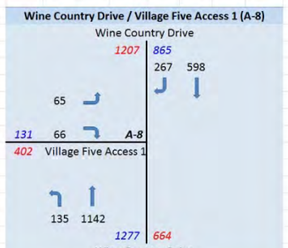
Scenario 5 - PM

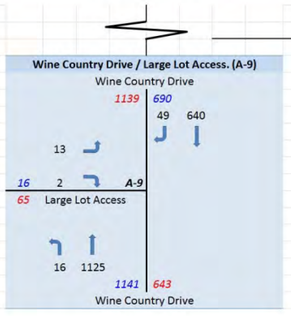
Wine Country Drive / Thomas Street (I-4)

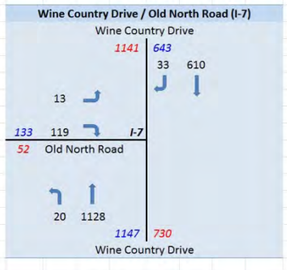












Scenario 5 - PM

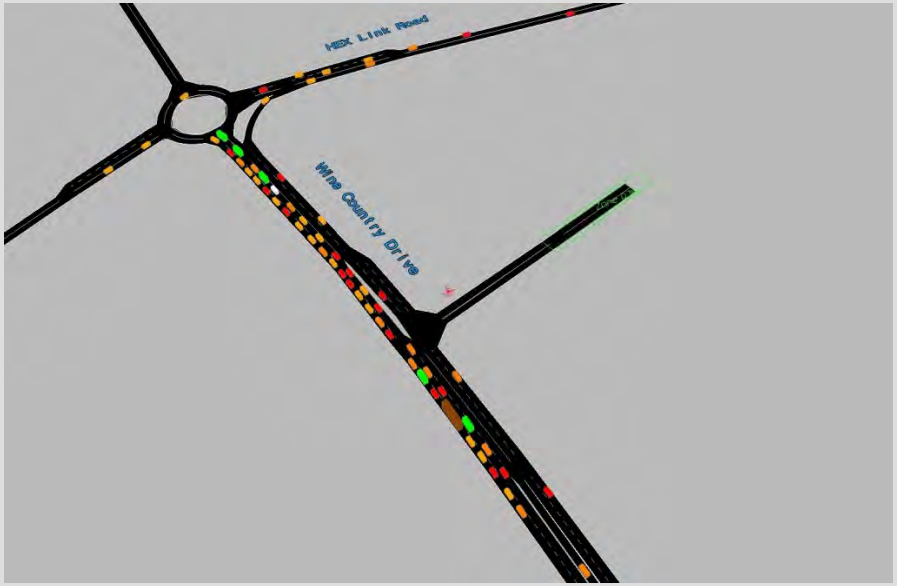
APPENDIX F

FUTURE YEAR INTERSECTION PERFORMANCE WITH HUNTLEE (SCENARIOS)

Scenario 1

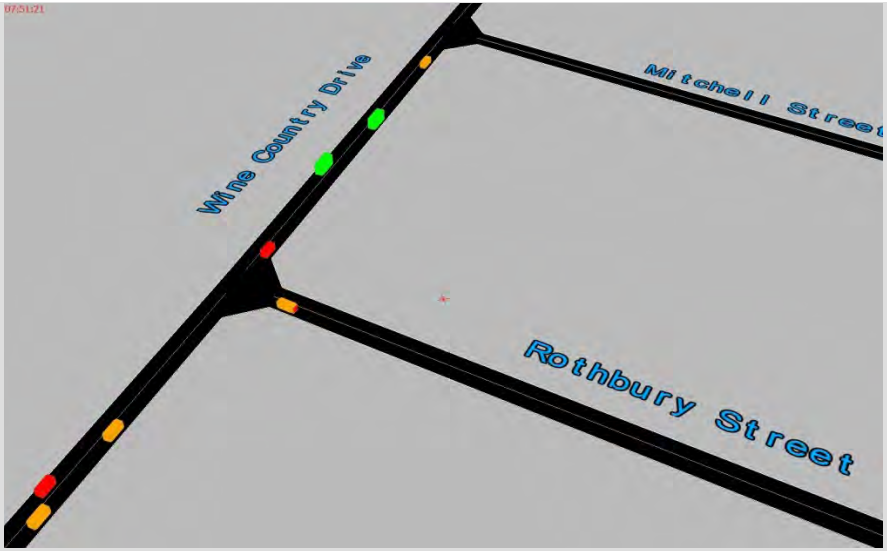
Scenario 1 details impact from Stage 1 Huntlee development. Chapter 7 of Volume 1 included SIDRA results (see Table 7-4). A copy of all SIDRA files would be submitted to RMS. This section summarises network operational issues for Stage 1 using Paramics. Both SIDRA and Paramics showed similar level of service results.
All relevant Paramics files would be submitted to RMS.

Scenario 1 - Stage 1-Network Operation AM and PM Peak (Paramics Model)

ID	Location	Control Type	Observations	Paramics snapshot
A-1	Wine Country Drive / Hex Link Road / Town Centre Bypass	Roundabout	The network operational issues were identified for Stage 1 in 2020. The model forecasts overall intersection LoS D and LoS B for the AM and PM peak periods respectively. The model suggests that in AM peak high right turn demand from Wine Country Drive to Hunter Expressway Link Road may experience relatively high delay. Model forecasts LoS D. Model suggests occasional northbound queues along the Wine Country Drive approaching roundabout during AM Peak period.	

ID	Location	Control Type	Observations	Paramics snapshot
A-3	Wine Country Drive / Main Street	Signal	The model forecasts overall intersection LoS B for the AM and PM peak periods respectively. Model suggests in AM Peak northbound occasional residual queue from the upstream roundabout (intersection A-1). Traffic from unsignalised left turn slip lane from Main Street may be affected occasionally.	
A-5	Wine Country Drive/Village one Access 1/Town Centre Access	Signal	The model forecasts overall intersection LoS C and LoS B for the AM and PM peak periods respectively. No significant traffic delays were observed in AM and PM peak period.	

ID	Location	Control Type	Observations	Paramics snapshot
A-9	Wine Country Drive/Large Lot 3 Access	Priority	No significant traffic delays were observed during AM and PM peak period. The model forecasts good intersection operation with LoS A in AM and PM peak period.	
I-4	Wine Country Drive/Thomas Street	Priority	No significant traffic delays were observed in AM and PM peak period. The model forecasts good intersection operation with LoS A for the AM and PM peak period.	

ID	Location	Control Type	Observations	Paramics snapshot
I-5	Wine Country Drive/Rothbury Street	Priority	No significant traffic delays were observed in AM and PM peak period. The model forecasts good intersection operation with LoS A for the AM and PM peak periods.	
I-6	Wine Country Drive/Maynee Street	Priority	No significant traffic delays were observed in AM and PM peak period. The model forecasts good intersection operation with LoS A to B in AM and PM peak periods.	

ID	Location	Control Type	Observations	Paramics snapshot
I-7	Wine Country Drive/Old North Road	Priority	No significant traffic delays were observed in AM and PM peak period. The model forecasts good intersection operation with LoS A in AM and PM peak periods.	

Scenario 5

Scenario 5 detailed impact from Full Huntlee development in 2036. Chapter 7 of Volume 1 included SIDRA results (see Table 7-5). A copy of all SIDRA files would be submitted to RMS.

Scenario 3

Scenario 3 detailed impact from Stage 1 development in 2020. A copy of all SIDRA files would be submitted to RMS. Below shows SIDRA results for scenario 3.

Table F-1 Overall LoS summary results, (2020 Stage1) – Scenario 3

Ref.	Intersection	Control Type	AM Peak			PM Peak		
			DoS	Average Delay (sec)	LoS	DoS	Average Delay (sec)	LoS
I-4	Wine Country Drive/ Thomas Street	Priority	0.33	14	A	0.41	16	B
I-5	Wine Country Drive/ Rothbury Street	Priority	0.33	20	B	0.41	19	B
I-6	Wine Country Drive/ Maynee Street	Priority	0.34	34	C	0.40	12	A
I-7	Wine Country Drive/ Old North Road	Priority	0.32	16	B	0.37	21	B
A-1	Wine Country Drive / HEX Link Road	Roundabout Upgrade	0.81	23	B	0.82	22	B
A-3	Wine Country Drive / Main Street	New Signals	0.67	21	B	0.75	24	B
A-5	Wine Country Drive/ Village One Access	New Signals	0.83	40	C	0.86	28	B
A-9	Wine Country Drive/ Large Lot Access	New Priority	0.31	13	A	0.37	15	B

For Stage 1 impact, the result from scenario 3 is similar to scenario 1. The scenario 3 results suggest that proposed upgrade on Wine Country Drive and associated key intersections would provide satisfactory level of service.

Scenario 4

Scenario 4 detailed impact from full development in 2036. A copy of all SIDRA files would be submitted to RMS. Below shows SIDRA results for scenario 4.

Table F-2 Overall LoS summary results (2036 Full Development) – Scenario 4

Ref.	Intersection	Control Type	AM Peak			PM Peak		
			DoS	Average Delay (sec)	LoS	DoS	Average Delay (sec)	LoS
I-7	Wine Country Drive/ Old North Road	Priority (Seagull)	0.67	21	B	0.77	51	D
A-1	Wine Country Drive / HEX Link Road	Signals (Improved Option)	0.90	30	C	0.98	37	C
A-3	Wine Country Drive / Main Street	Signals	0.92	36	C	0.99	47	D
A-5	Wine Country Drive/ Village One Access	Signals	0.94	51	D	0.93	49	D
A-6	HEX Link Road / Village One Access	Signals (Improved Option)	0.81	20	B	0.83	21	B
A-8	Wine Country Drive / Village Four Access	Roundabout	0.64	16	B	0.78	19	B
A-9	Wine Country Drive/ Large Lot Access	Priority	0.67	33	C	0.71	44	D
A-10	Old North Road/ Large Lot Access	Priority	0.03	8	A	0.06	8	A

For full development, an alternative scenario 4 for worst case was tested. The Huntlee development traffic in scenario 4 is about 18 per cent higher than scenario 5. The improved intersections layout identified for scenario 5 (see Figure 7-4, Volume 1 report) were also tested for scenario 4. This provides robustness in required road and intersection upgrade identified in the longer term when the site is fully developed. With forecast traffic volumes for scenario 4 (full development in 2036) the following intersections may have some capacity problem (DoS is close to 1) depending on the actual development rate.

- Wine Country Drive / HEX Link Road / Town Centre Bypass (A-1).
- Wine Country Drive / Main Street (A-3).
- Wine Country Drive / Village One Access / Town Centre Bypass (A-5)
- HEX Link Road / Village One Access (A-6): A new signal was tested for this intersection.

It is recommended to monitor traffic on the Wine Country Drive as development progress.

HUNTLEE NEW TOWN

Addendum Stage 1 Preferred Project Report (PPR)

Traffic Modelling

August 2012

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HUNTLEE NEW TOWN

Addendum Stage 1 Preferred Project Report, Traffic Modelling

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Approver	Mukit Rahman	

Report No AA004866_TM_02

Date August 2012

REVISIONS

Revisions	Date	Description	Prepared by	Approved by
A to B	10 August 2012	Addendum to Traffic Modelling Report	MR, KN, JL	
C	10 August 2012	DRAFT for Client's review and comments	MR, KN, JL	MR
D	13 August 2012	Final submitted to RMS	MR, KN, JL	MR

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APPENDICES

Appendix A Repsonse to RMS's Comments Raised In 2 AUG 2012

Appendix B SIDRA Additional Intersection Analysis and Results

1 Introduction

This report is an addendum to Stage 1 Huntlee New Town Preferred Project Report (PPR) Traffic Modelling July 2012 prepared by Hyder Consulting for the Huntlee Pty Ltd (herein referred to as the 'July 2012 PPR Report'). That report detailed traffic assessment of Stage 1 Project Application proposal. In that report Huntlee total development frame work was considered. The ultimate road works requirements were also documented for key roads and intersections on the Wine Country Drive and Hunter Expressway Link Road. In July 2012, the 'PRR Report' was submitted to the Roads and Maritime Services (RMS).

1.1 Purpose

The purpose of this addendum is twofold:

- Responding to traffic issues raised by the RMS in an email dated 2 August 2012. In RMS comments, reference was made to the Stage 1 Paramics micro-simulation traffic model. RMS has raised future operational issues observed in Paramics model particularly in the PM peak. The Paramics model did not suggest adverse queue issue in the AM peak. The PM peak queue issues were raised on the Hunter Expressway particularly at the Branxton interchange and associated ramps. The Hunter Expressway (HEX) is under construction and expected to be completed by 2013. At this point in time, there is no "benchmark queue data" available on the Hunter Expressway until it opens to traffic. The actual nature of queues that may impact the operation of the Hunter Expressway is unknown. It is recommended that actual operational data is collected after the Hunter Expressway is opened to traffic. Regardless of the absence of "benchmark queue data" on the Hunter Expressway, additional Paramics modelling were undertaken to address the RMS requirements.
- Reporting on additional traffic modelling undertaken at proposed Branxton interchange, its ramps and future connection to Huntlee Village One from HEX Link Road.

1.2 Scope

This addendum is to be read in conjunction with the July 2012 PPR Report as this work is an extension to that previously reported. Consideration is given to matters which differ from the results previously reported or where RMS identified issues can be more fully explained.

Detailed response to RMS specific issues is included in ***Appendix A***.

In this addendum more detailed modelling results are provided for Branxton interchange, future connection to Huntlee Village One from HEX Link Road (northern access) for Stage 1 and full development. Additional Paramics modelling was undertaken with northern access from Village One to HEX Link Road. Development thresholds in Stage 1 were determined in relation to the Branxton interchange and connections to the Wine Country Drive and Huntlee.

2 Additional Traffic Modelling

Hyder previously modelled five scenarios assessing impact from Huntlee Stage 1 and full development. Section 7.2 of July 2012 PPR Report documented scenarios assessment undertaken.

To address the RMS further issues raised, the following four additional scenarios (6 to 9) were modelled in Paramics for Stage 1. These scenarios were developed identifying further upgrading works that would improve Branxton interchange operation particularly in the critical PM peak.

Additional SIDRA modelling was also undertaken for Branxton interchange, HEX Link Road/Northern access intersection for Stage 1 and full development. In all additional modelling scenarios, proposed road and intersection upgrading works were assumed in line with previously determined in July 2012 PPR Report (refer to Figure E-1 in July 2012 PPR Report). **Appendix B** included level of service results.

- Scenario 6. This scenario involves upgrading two intersections at both end of Branxton interchange in a view to improve Branxton interchange roundabout operation. Two new signals are tested at Wine Country Drive/Hex Link Road intersection and New England Highway/HEX Link Road. Figure 2.1 below shows indicative locations of two new signals. The Stage 1 development was assumed in line with original yields i.e. 2,345 dwellings and 21.4 ha GFA. Paramics model showed marginal improvements in interchange roundabout operation. The queuing issues remained at Branxton interchange in the PM peak. The scenario 6 was rejected.

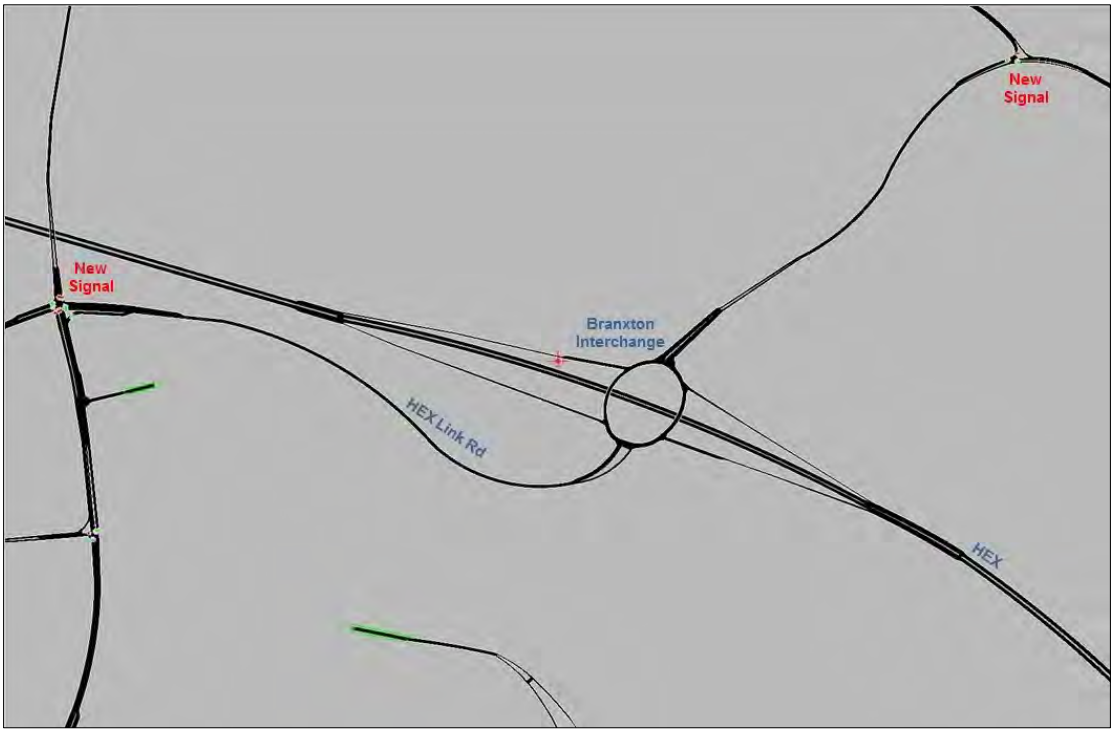


Figure 2-1 Proposed changes in Scenario 6

- Scenario 7. This scenario has tested likely maximum development threshold for Stage 1. This scenario 7 has assumed road and intersection upgrading works in line with previously determined. Paramics model was run iteratively until a satisfactory level of service was obtained for Wine Country Drive, HEX Link Road and Branxton interchange. The modelling results suggested that up to 1900 dwellings and up to 17.1 ha GFA of Stage 1 could be developed. The Stage 1 development thresholds are about 20% lower than previously estimated. The queuing issues at Branxton interchange improved significantly in the critical PM peak. The queues are contained within the designated turning lanes. Paramics model does not suggest any spills back queue to the HEX. Figure 2.2 shows Paramics snapshot of the Branxton interchange for scenario 7 in the PM peak.

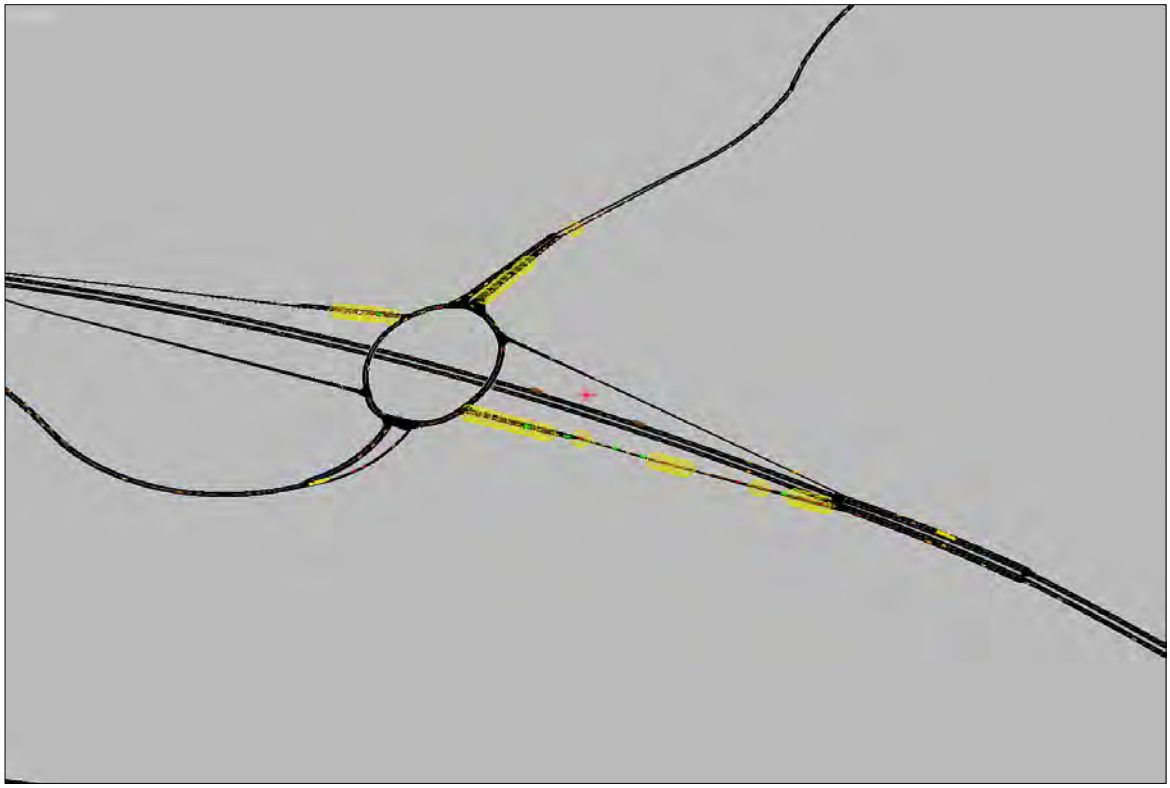


Figure 2-2 PM peak queue at Branxton interchange for Scenario 7

- Scenario 8. This scenario 8 builds on previous scenario 7. In this scenario 8, the impact of proposed northern access from Village One to HEX Link Road is tested. A new two lane roundabout is proposed at Hex Link Road/Village One access intersection. Concurrent with northern access, the HEX Link Road between Village 1 and Branxton interchange would require some upgrading. In general, the upgrading works would involve double through lanes along the HEX Link Road from Village 1 northern access to Branxton interchange (about 370 m) in both directions. Some lane discipline changes would be required at the Branxton interchange for southbound off ramp allowing dual right turn lanes. The proposed additional upgrading works are modelled in scenario 8. The queues are contained within the designated turning lanes. Paramics model does not suggest any spills back queue to the HEX. Figure 2.3 shows Paramics snapshot for Branxton interchange for scenario 8 in the PM peak.

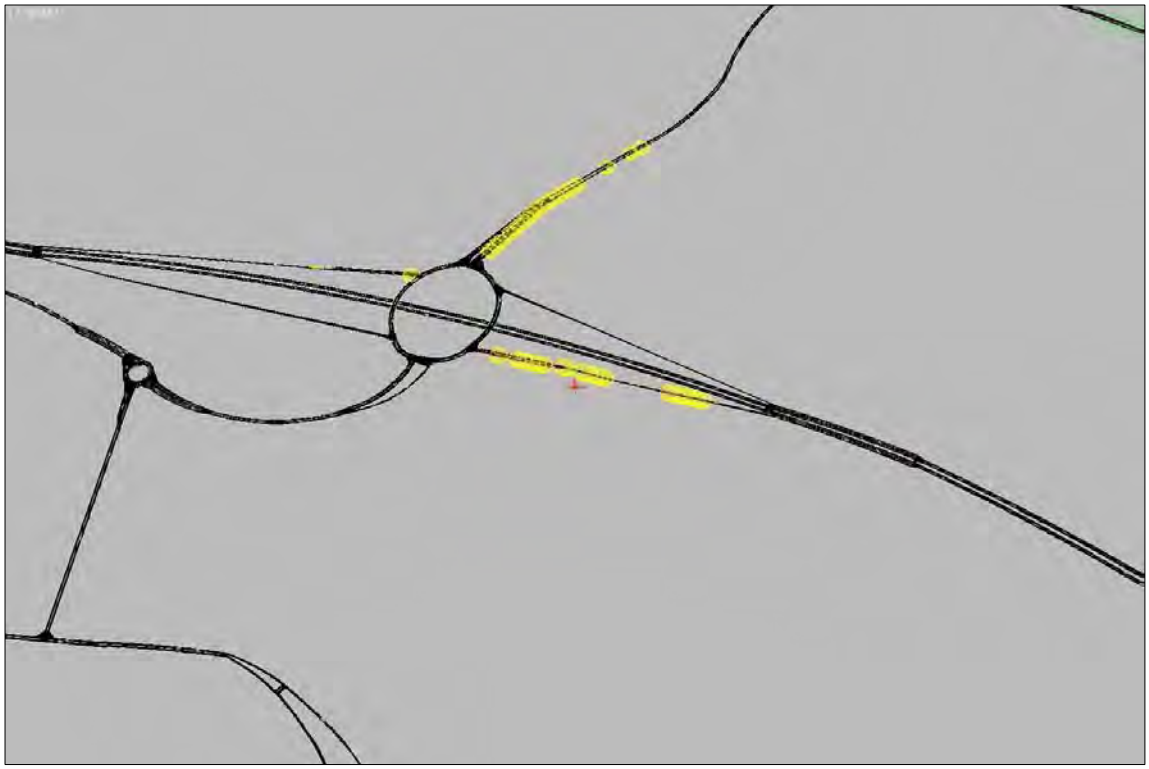


Figure 2-3 Impact of northern access at Branxton interchange for Scenario 8 in PM peak

- Scenario 9. This scenario 9 builds upon previous scenario 8 but keeping Stage 1 yields as per original yields i.e. 2,345 dwellings and 21.4 ha GFA. The proposed upgrade at northern access and HEX Link Road are in line with scenario 8. In this scenario additional upgrading works at Branxton interchange is tested by providing a left turn slip lane from northbound off ramp that directly connect to HEX Link Road. The need of this left turn slip lane is triggered after 1900 dwellings and 17.1 ha GFA are developed and occupied. The Paramics suggests traffic improvement at Branxton interchange. The queues are contained within the designated turning lanes. Paramics model does not suggest any spills back queue to HEX. Figure 2.4 shows Paramics snapshot for Branxton interchange for scenario 9 in the PM peak.

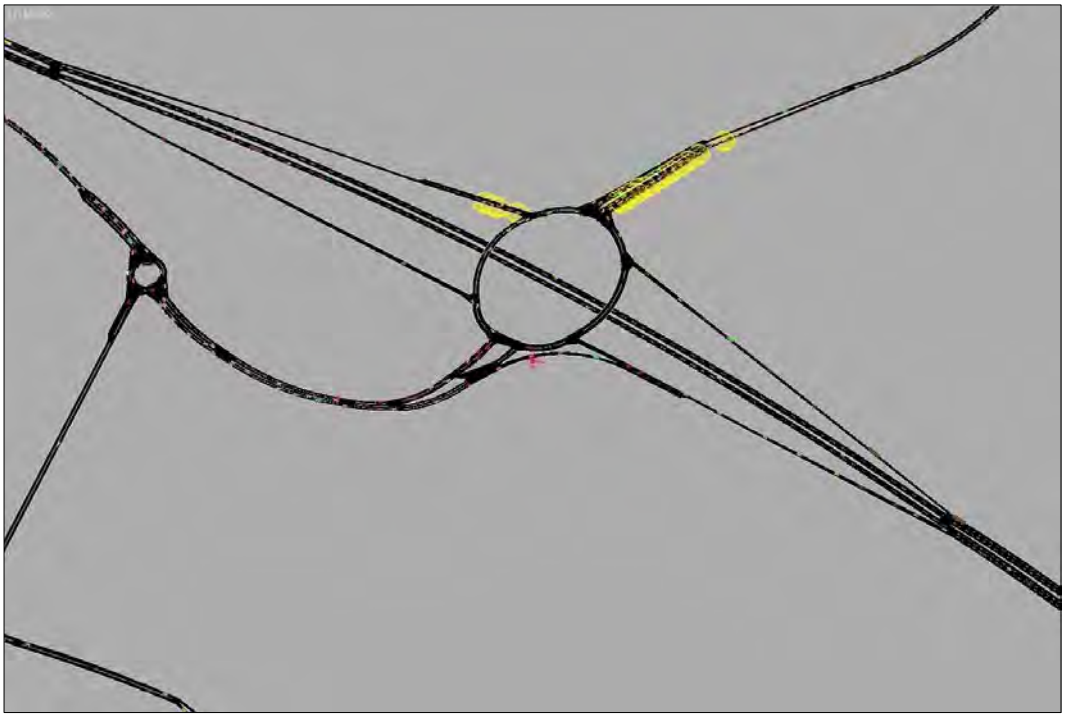


Figure 2-4 Impact of a left turn slip lane at Branxton interchange for Scenario 9 in PM peak

3 Proposed Road and Intersection Upgrade

3.1 Stage 1

Stage 1 subdivision includes approximately 2,345 dwellings and up to 21.4 ha GFA mixed use development. To accommodate additional traffic from Stage 1 the following seven road and intersection improvements (refer to Figure 3-1 overleaf) are recommended. They are in line with previously determined July 2012 PPR Report.

1. Upgrade Wine Country Drive to a four lane (2 lanes each way) between Village 1 access and Hunter Expressway (HEX) Link Road.
2. Provision of an outer bypass through Town Centre. It would be constructed to a four lane road (2 lanes each way) with provision for parking.
3. Upgrade HEX Link Road roundabout with Wine Country Drive to a two lanes roundabout (see A-1 for indicative lane arrangement).
4. Provision of a new traffic light on Wine Country Drive with Main Street (see A-3 for indicative lane arrangement).
5. Provision of a new traffic light on Wine Country Drive with Village One access (see A-5 for indicative lane arrangement).
6. Provision of a sign control intersection on Wine Country Drive to provide access to Anvil Creek Regional Park. It is proposed to construct internal road to cater for parking requirements of the regional park.
7. Provision of a sign control intersection (see A-9 for indicative lane arrangement) to provide access from large lots being proposed as part of Stage 1 development.

In addition to above seven items, the following two items (8 and 9) are now proposed in Stage 1 work program but they would only be required after substantial developments occurred in Stage 1. Items 8 and 9 would be driven by the actual threshold targets and further confirmation through modelling and assessment when time comes.

8. The northern access from Village One to HEX Link Road. This access would be required after 1500 dwellings are built and occupied in Village One. Concurrent with this northern access, a new roundabout is proposed at Village One with HEX Link Road intersection (refer to A-6 for indicative lane arrangement). Concurrent with northern access, the HEX Link Road between Village 1 and Branxton interchange would require upgrading (refer to A-11 for indicative lane arrangement).
9. The provision of a left turn slip lane from northbound off ramp would improve Branxton interchange operation (refer to A-11 for indicative lane arrangement). The need for one additional left turn slip lane is required after 1900 dwellings are built and occupied and 17.1 ha GFA mixed use are also developed and occupied.

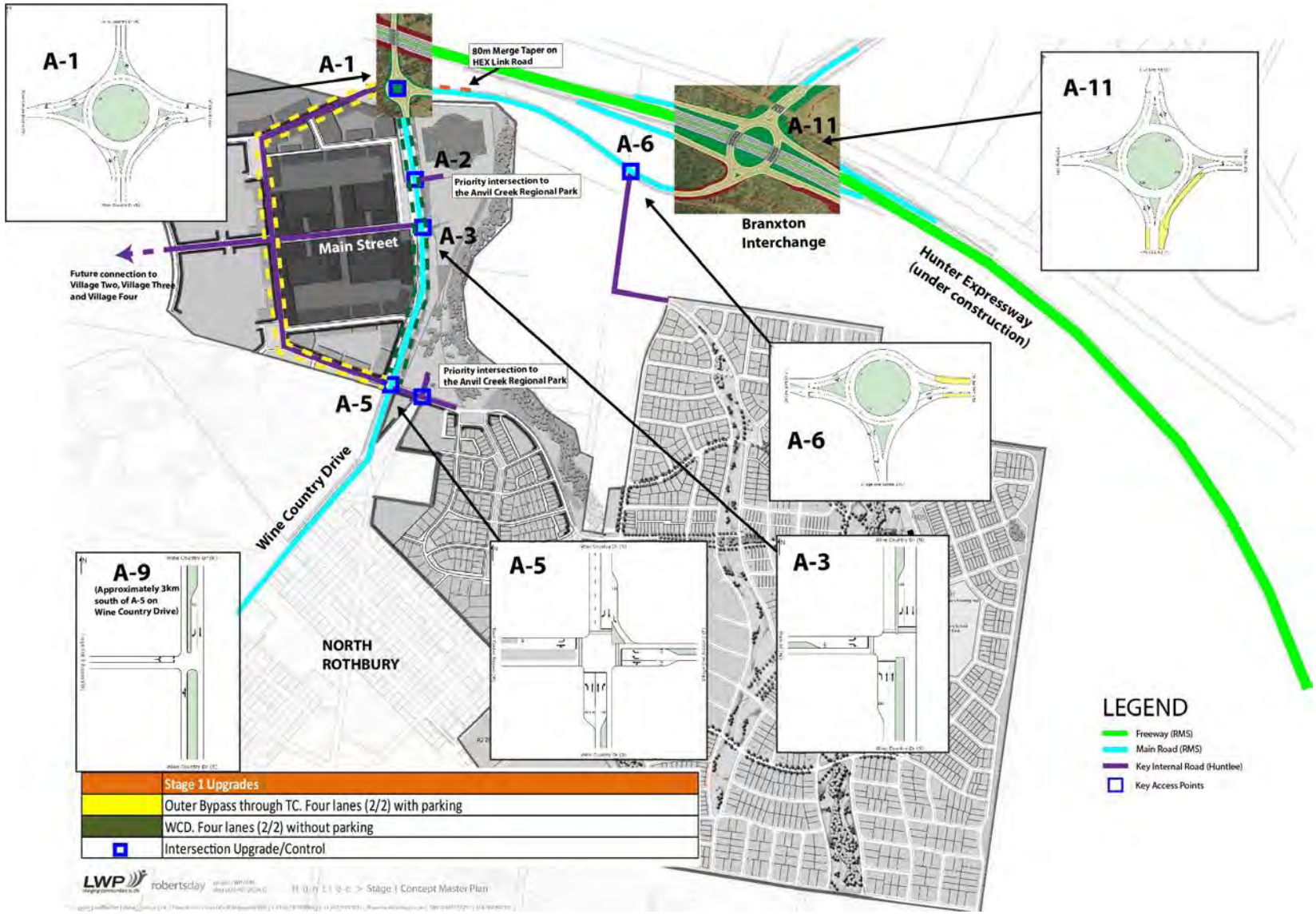


Figure 3-1 Proposed Road and Intersection Upgrade (Stage 1)

3.2 Full Development

The following road and intersection improvements (refer to Figure 3-2 overleaf) are recommended to cater for additional traffic when site is fully developed. They are in line with previously determined.

Additionally proposed upgrading works at Branxton interchange are identified and included in the ultimate work program. These further works provided a framework on the indication of ultimate requirements when the Huntlee site would be fully developed. It is recommended to undertake further confirmation in modelling assumptions and assessment after Stage 1 is completed and occupied.

- Provision of a four lane upgrade on HEX Link Road (2 lanes each way) between Wine Country Drive and Branxton Interchange.
- Provision of a new traffic light on Wine Country Drive with HEX Link Road (A-1).
- Further upgrade of Wine Country Drive traffic light with Main Street (A-3) providing auxiliary turning lanes.
- Further upgrade of Wine Country Drive traffic light with Village One access (A-5) providing auxiliary turning lanes.
- Further upgrade of the roundabout on HEX Link Road with Village One access (A-6).
- Provision of a new roundabout on Wine Country Drive with Village Four access (A-8).
- Provision of a sign control intersection (A-10) that provides access from large lots on the Old North Road.
- Upgrade intersection of Wine Country Drive with Old North Road. (I-7).
- Upgrade of Branxton interchange and associated ramps (A-11).

The package of road and intersection upgrade works described above would deliver adequate capacity and maintain an acceptable level of service to the arterial and local network to accommodate the full Huntlee development.

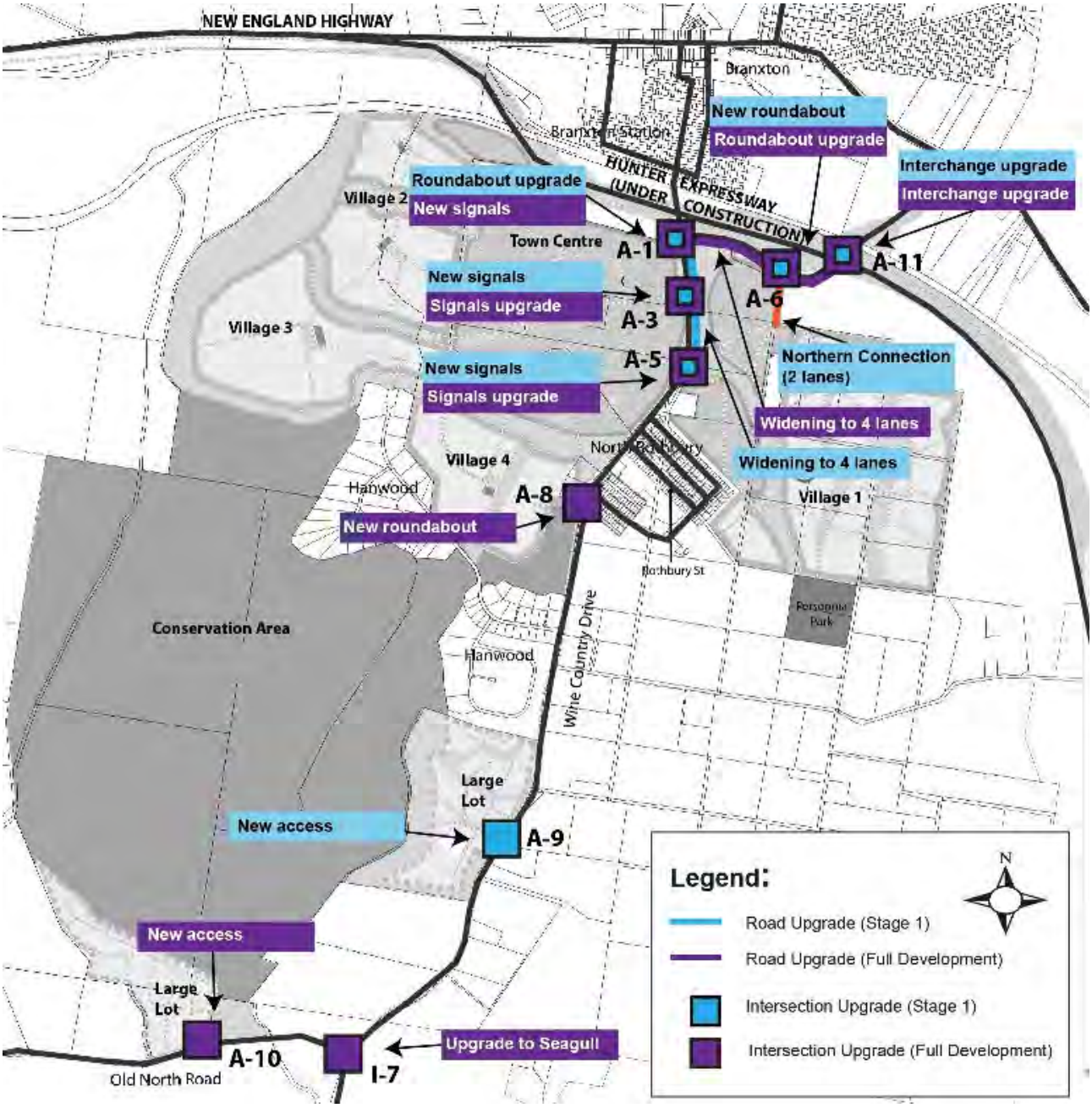
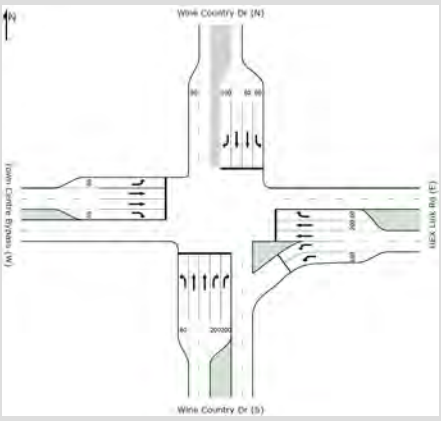
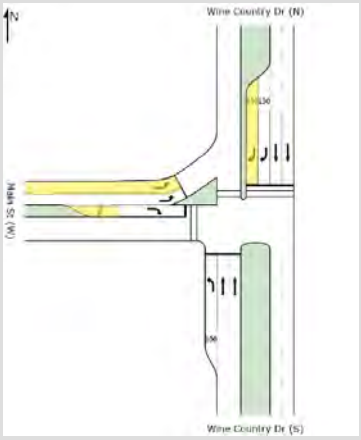
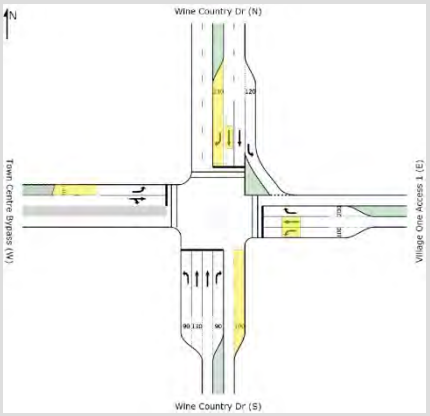
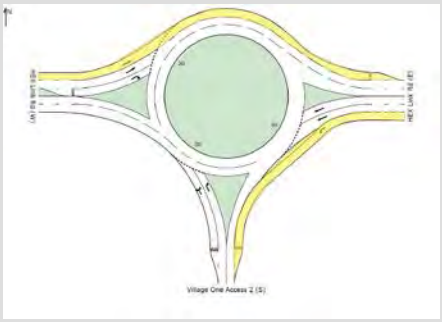
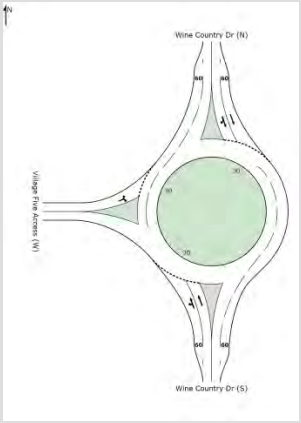
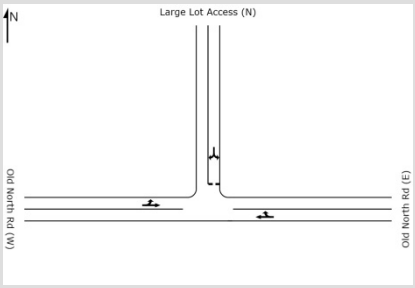
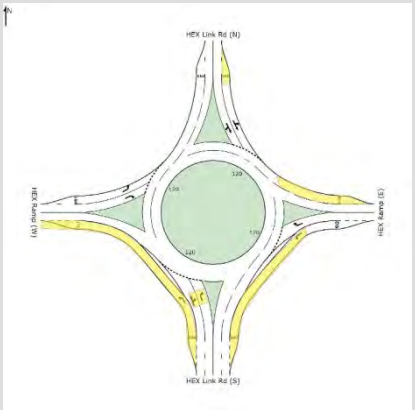


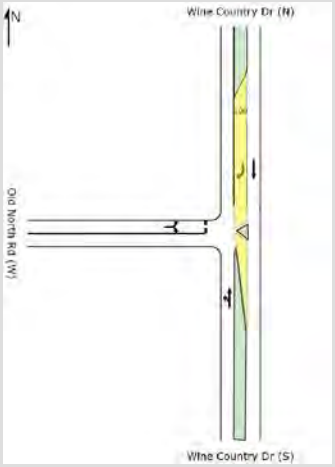
Figure 3-2 Proposed Road and Intersection Upgrade (full development)

Table 3-1 below shows indicative lane configurations at key intersections. Detailed SIDRA modelling results are included in **Appendix B** for Stage 1 and full developments.

Table 3-1 Potential Intersection Upgrade Works with Indicative Layout for Full Development

ID	Road Widening / Intersection Upgrade	Indicative Intersection layout	Revisions
A-1 Wine Country Drive/Hex Link Road	Provision of new traffic signals replacing the roundabout.		Revised as per RMS commenets. The turning lanes are outside of the through lanes.
A-3 Wine Country Drive/Main Street	Upgrade traffic signals providing additional auxiliary lanes including: ▪ one additional southbound right turn bay, ▪ one additional signalised eastbound left turn bay. ▪ extension of eastbound right turn bay from 110m to 200m. Additional upgrade required is shown in yellow colour.		Revised as per RMS commenets. The turning lanes are outside of the through lanes.
A-5 Wine Country Drive/Village One Access	Upgrade traffic signals providing: ▪ one southbound through lane. This will replace previous right turn lane. ▪ One additional southbound exclusive right turn bay, additional 100m southbound exit lane. ▪ Due to northern access, traffic will be reduced on eastern approach. The westbound right turn lane would be converted to a through lane. The westbound left though lane would be converted to a left turn lane. And ▪ Extension of eastbound left turn bay from 70m to 140m. Additional upgrade required is shown in yellow colour.		Revised as per RMS commenets. The turning lanes are outside of the through lanes.

ID	Road Widening / Intersection Upgrade	Indicative Intersection layout	Revisions
A-6 Hex Link Road/Village One Northern Access	Upgrade roundabout providing: ▪ One westbound continuous slip left turn lane directly to Village One Access Road ▪ One additional eastbound exclusive through lane.		Revised as per RMS commenets.
A-8 Wine Country Drive/Village 4 Access	Provision of a 2 lane new roundabout		No change
A-10 Old North Road/Large Lot Access	Provision of a new sign control intersection.		No change
A-11 Branxton Interchange	Upgrade interchange providing: ▪ One northbound continuous slip left turn lane directly to westbound on ramp ▪ One westbound continuous slip left turn lane directly to HEX Link Road ▪ Dual right turn lanes from south approach to eastbound on ramp ▪ extension of southbound left turn bay from 110m to 200m.		Revised as per RMS commenets.

ID	Road Widening / Intersection Upgrade	Indicative Intersection layout	Revisions
I-7 Wine Country Drive/Old	Upgrade the sign control intersection to an intersection with seagull treatment.		No change

3.3 Conclusions and Recommendations

The proposed road and intersection upgrades as outlined in Table 3-2 below are in line with the July 2012 PPR Report.

To address the RMS further issues, additional improvements were identified at Branxton interchange and HEX Link Road. They are also shown in Table 3.2.

It is important to note that the results here do not change the conclusions drawn in the July 2012 PPR Report.

Table 3-2 Recommended Road and Intersections Upgrading Works

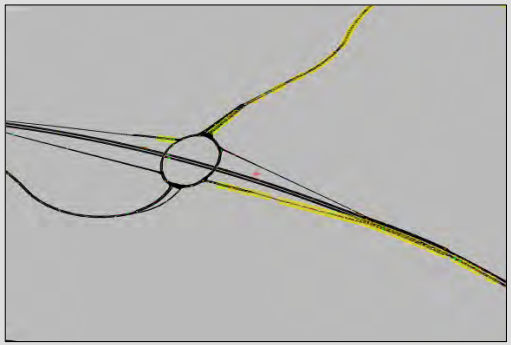
ID	Location	Stage 1 10 Years (up to 2022)	Full Development 15 Years (between 2022 and 2036)
Upgrade works documented in July 2012 PPR Report			
	Widening of Road Sections		
	Wine Country Drive – between HEX Link Road and Village One Access	Widening to 4 lanes (2 lanes each way)	-
	Provision of an outer bypass through Town Centre.	Four lane road (2 lanes each way)	
	HEX Link Road – between Wine Country Drive and Branxton Interchange		Widening to 4 lanes (2 lanes each way)
	Intersections Upgrade		
A-1	Wine Country Drive / HEX Link Road Intersection	Upgrade to a two lanes roundabout	Provision of new traffic signals replacing the roundabout
A-3	Wine Country Drive / Main Street	Provision of new traffic signals	Further upgrade traffic signals providing auxiliary turning lanes.
A-5	Wine Country Drive/ Village One Access	Provision of new traffic signals	Further upgrade traffic signals providing auxiliary turning lanes.
A-6	HEX Link Road / Village One Access		Provision of a new roundabout The need for northern access should be determined after 1500 lots are developed and occupied.
A-8	Wine Country Drive / Village Four Access		Provision of a new roundabout
A-9	Wine Country Drive/ Large Lot Access	Provision of a new sign control intersection	

ID	Location	Stage 1 10 Years (up to 2022)	Full Development 15 Years (between 2022 and 2036)
A-10	Old North Road/ Large Lot Access		Provision of a new sign control intersection
I-7	Wine Country Drive/ Old North Road		Upgrade the sign control intersection to an intersection with seagull treatment
		Provision of a sign control intersection on Wine Country Drive to provide access to Anvil Creek Regional Park. It is proposed to construct internal road to cater for parking requirements of the regional park.	
		It is recommended to monitor traffic via the Branxton interchange as development progress.	
Additional upgrade reported in this Addendum			
A-6	HEX Link Road / Village One Access	Provision of a new roundabout at the northern access from Village One to HEX Link Road. This access would be required after 1500 dwellings are built and occupied in Village One. Concurrent with northern access, the HEX Link Road between Village 1 and Branxton interchange would require upgrading.	Further upgrade of the roundabout
A-11	Branxton Interchange	Provision of a left turn slip lane from northbound off ramp to HEX Link Road after 1900 dwellings are built and occupied and 17.1 ha GFA mixed use are also developed and occupied.	Upgrade of Branxton interchange and associated ramps

APPENDIX A

REPSONSE TO RMS'S COMMENTS RAISED IN 2 AUG 2012

Item	Issue	Hyder's Response	Additional Modelling / Reference to Relevant Sections of 2012 July PPR Report Modelling.
1	▪ The Paramics modelling presents the scenario for Stage 1, not the entire development of Huntlee. While this is acceptable for the current application it would be prudent to work within a total development framework at least to provide some indication of ultimate requirements.	The Paramics micro simulation modelling was undertaken for Stage 1 development assessing impact for year 2020/2022. The future time step is about 10 years from now. In general Paramics is used to assess high level details that allow optimisation of detailed design with respect to lane configuration and intersection controls. Given the strategic concept design we are dealing for Stage 1, the Paramics is suited for Stage 1. The full development is expected to take between 20 to 25 years from now. The future time step for full development is year 2036. The detailed Paramics is not warranted for such a long term horizon 2036. Strategic modelling supported by SIDRA is appropriate tool for the long term planning. In line with above, Huntlee full development was assessed using strategic modelling and SIDRA.	Full Huntlee development impact is documented in Sections 7.1.2, 7.4.2, 7.5.2.

Item	Issue	Hyder's Response	Additional Modelling / Reference to Relevant Sections of 2012 July PPR Report Modelling.
2	▪ The Paramics modelling shows major issues with the operation of the Branxton interchange on the HEx.	The AM peak Paramics model does not show adverse capacity and queue issue at Branxton interchange, ramps and adjoining road with Wine Country Drive. All queues are contained within designated turning lanes. The PM peak Paramics model shows "moving queues" at following ramps and locations at Branxton interchange: • North bound off ramps; • New England Highway link. See Figure A1 at right hand column showing queues in PM peak. Few points to note regarding Hunter Expressway at Branxton interchange: • The Hunter Expressway (HEX) is under construction and expected to be completed by 2013. At this point in time, there is no "benchmark queue data" available on the Hunter Expressway until it opens to traffic. • The actual nature of queues that may impact the operation of the Hunter Expressway is unknown. • It is recommended that actual operational data is collected after the Hunter Expressway is opened to traffic. • Regardless of the absence of "benchmark queue data" on the Hunter Expressway, additional Paramics modelling were undertaken to address the RMS requirements.	 Figure A1: PM peak predicted queues at Branxton interchange in year 2020. The results from additional modelling are documented in Section 2 of this addendum.

Item	Issue	Hyder's Response	Additional Modelling / Reference to Relevant Sections of 2012 July PPR Report Modelling.
3	▪ The primary driver behind the issue of concern is traffic generated by the Huntlee development alone. That is, if Huntlee did not develop no additional works would be required.	Future traffic conditions on the Wine Country Drive and New England Highway corridor will be influenced by a combination of background growth and a redistribution of traffic effect from the Hunter Expressway (HEX). This means future traffic on the Wine Country Drive will be influenced not only by the Huntlee development traffic, but background growth and redistribution of traffic effect from the HEX. Hyder's modelling has considered a range of key drivers that influence future traffic volumes on existing roads including the proposed HEX.	Section 6.8 of July 2012 PPR Report documented key traffic drivers.
4	▪ The modelling shows major queuing for the HEx northbound off ramp, queuing on the southbound off ramp and queuing on the New England Hwy link in the PM peak. There are also issues in the AM peak but the PM appears to have major capacity constraints which could impact on HEx traffic flows with consequent road safety concerns.	See our response to item 2 above.	See our response to item 2 above.

Item	Issue	Hyder's Response	Additional Modelling / Reference to Relevant Sections of 2012 July PPR Report Modelling.
5	▪ These significant capacity constraint and potential road safety issues on the road network have not been addressed in the report. The implications for the total development should also be considered so that appropriate land can be set aside for any future road infrastructure upgrades.	Hyder has undertaken a comprehensive traffic impact assessment for both Stage 1 and full Huntlee development. In agreement with RMS on modelling assumptions Hyder assessed five modelling scenarios. Section 7 of July 2012 PPR report has documented traffic impact from Huntlee on key roads and intersections from both Stage 1 and full development. The July 2012 PPR report recommended to monitor traffic via the Branxton interchange as development progress. RMS comments have been addressed undertaking further analysis on the following items: • Capacity assessment of Branxton interchange and associated ramps for Stage 1 and full development. • Update Stage 1 Paramics model incorporating Northern access from Village One to HEX Link Road and demonstrate its impact to Branxton interchange.	Section 7 of July 2012 PPR report has documented traffic impact from Huntlee on key roads and intersections from both Stage 1 and full development. Additional four modelling has been undertaken to assess impact on Branxton interchange/ramps and Northern access from Village 1 to HEX Link Road. This has been documented in Section 2 of Addendum report.
6	▪ Thresholds for any staged implementation of road infrastructure upgrades should be determined in relation to the interchange and connections to Wine Country Drive and Huntlee	To accommodate additional traffic from Stage 1, seven road and intersection improvements are recommended. They are documented in Table 8.2 of July 2012 PPR Report. Section 3.1 of this addendum documented staged implementation of road upgrades in relation to the interchange and connections to Wine Country Drive and Huntlee.	Additional scenarios modelling were undertaken to determine thresholds and staged infrastructure. They are documented in this addendum.

Item	Issue	Hyder's Response	Additional Modelling / Reference to Relevant Sections of 2012 July PPR Report Modelling.
7	It is recommended that the following would need to be undertaken: ▪ Remodelling must be undertaken with the required road infrastructure upgrade scenarios in place, addressing the impacts of the Huntlee development on the HEx, the Branxton interchange and connections to Wine Country Drive and Huntlee development areas.	Hyder modelled about nine scenarios assessing impact from Huntlee Stage 1 and full development.	Section 7.2 of July 2012 PPR Report documented five scenarios assessed. To address the RMS further issues raised, four additional scenarios were modelled. They are documented in this addendum.

Item	Issue	Hyder's Response	Additional Modelling / Reference to Relevant Sections of 2012 July PPR Report Modelling.
8	▪ This is required as a minimum to understand road network requirements for Stage 1, including the above. In this regard, would recommend consideration of the following: ▪ Separate northbound off ramp that does not connect to interchange but directly to HEX Link Road. Removes the high left turn demand from the interchange operation. ▪ Increase capacity of Hex Link Road to at least 2 lanes departing Interchange to cater for the above and to allow for two lane approach from New England Hwy link opposite. ▪ Include dual through lane approach at New England Hwy approach to interchange to alleviate queuing on this approach (note capacity improvement noted above required) ▪ Change line marking for southbound off ramp to allow dual right turn lanes on ramp.	To address the RMS further issues raised, the following four additional scenarios were modelled in Paramics for Stage 1. The modelling has identified upgrading works at HEX Link Road/ Village One access and Branxton interchange. The additional works identified in this addendum are in line with RMS recommendations.	Section 2 and 3 of this addendum documented additional roads works identified at Branxton interchange and HEX Link Road.

Item	Issue	Hyder's Response	Additional Modelling / Reference to Relevant Sections of 2012 July PPR Report Modelling.
9	▪ In considering the above, future proposed works need to be articulated to enable RMS to determine requirements:		
9a	▪ The proposed future connection to Huntlee on the HEX Link Rd – ▪ what type of intersection will it be? ▪ What will be the impact back on the interchange? ▪ Is it required in Stage 1 to provide a 2nd access into the major land release area?	Additional modelling scenario was undertaken. The analysis showed that connection on the HEX Link Road (northern access) would be required after 1500 dwellings are built and occupied in Village One. Concurrent with northern access, a new roundabout is proposed at Village One with HEX Link Road intersection. Concurrent with northern access, the HEX Link Road between Village 1 and Branxton interchange would require upgrading.	Sections 2 and 3 of this addendum documented modelling outcome.
9b	▪ Is there an increase in capacity required to the HEX Link Road approaching the interchange? If the new intersection is connected then it is likely.	See item 9a above.	See item 9a above.

Item	Issue	Hyder's Response	Additional Modelling / Reference to Relevant Sections of 2012 July PPR Report Modelling.
9c	▪ The HEx Link Rd / Wine Country Drive intersection has multiple stages proposed. Given the adjacent proposed signalised intersections along Wine Country Dr and the observed poor operation of the proposed dual circulating roundabout proposed for Stage 1, traffic signals should be the upgrade undertaken for Stage 1 (noting it is proposed for the ultimate and will avoid multiple staging of intersection upgrade over time)	The proposed connection on the HEX Link Road (northern access) would remove up to 34% traffic from Wine Country Drive. The dual roundabout at HEx Link Rd / Wine Country Drive intersection would provide adequate capacity and level of service for Stage 1 and beyond Stage 1.	
9d	▪ Wine Country Drive would need to be upgraded to 4 through lanes (median separated) through the town centre from Hex Link Road to Village 1 Access as a minimum. It may need to be extended for future development of Villages to the south in ultimate scenario. Note, through the town centre the turn lanes shall be outside of the though lanes - the modelling currently does not show this arrangement, it would be required.	Wine Country Drive would be upgraded to a four lane (2 lanes each way) between Village 1 access and Hunter Expressway (HEX) Link Road. The proposed connection on the HEX Link Road (northern access) would remove up to 34% traffic from Wine Country Drive. The four lanes on Wine Country Drive should work for ultimate development.	The revised modelling has removed shared left through. Separate turn lanes are provided where appropriate.

Item	Issue	Hyder's Response	Additional Modelling / Reference to Relevant Sections of 2012 July PPR Report Modelling.
9e	▪ Wine Country Drive access to the Regional Park should be restricted or provided via a 4th leg of the proposed signalised intersection to the town centre.	In consultation with RMS Hyder has identified the access strategy for Anvil Creek Region Park. In the longer term, proposed signals on Wine Country Drive would provide adequate gap for small volumes of turning traffic in and out of Park in peak period.	Hyder proposes to retain Anvil Creek Regional Park access as per July 2012 PPR Report.
10	▪ Staging of works proposed during Stage 1 with thresholds needs to be determined, through modelling.	Additional modelling were undertaken to determine Stage 1 thresholds. The revised Paramics model for Stage 1 was undertaken.	Sections 2 and 3 of this addendum documented modelling outcome.
11	▪ Needs to revisit ultimate scenario giving consideration to operation of HEx. While it is agreed in principle that it can be monitored over time as development occurs, we need to ensure adequate road reserve / land is provided along Wine Country Dr & HEx link road and identify how the road network could be treated in longer term with the ultimate development in place.	Additional traffic modelling was undertaken for HEX Branxton interchange for Stage 1 and ultimate scenarios.	Sections 3.1 and 3.2 of this addendum documented modelling outcome of the HEX Branxton interchange.
	▪ It is recommended that when you have revised the report and modelling, taking into account the above issues, that you forward the report to RMS initially for review. If required you should present the outcomes to RMS, Transport for NSW and DPI.	Hyder has prepared this addendum to address RMS issues raised. Additional improvements were identified at Branxton interchange and HEX Link Road. They are shown in Table 3.2 of this addendum.	In line with RMS comments, the Paramics model for Stage 1 was revised that included improvements at HEX Link Road and Branxton interchange. SIDRA modelling was also undertaken for Branxton interchange for Stage 1. SIDRA modelling was undertaken for ultimate development scenarios including Branxton interchange.

APPENDIX B

SIDRA ADDITIONAL INTERSECTION ANALYSIS AND RESULTS

Scenario 7-SIDRA MODELLING RESULTS

Table B1 - Overall LoS summary results (2020 Stage1) –Scenario 7 (2Csp)

Ref.	Intersection	Control Type	AM Peak			PM Peak		
			DoS	Average Delay (sec)	LoS	DoS	Average Delay (sec)	LoS
I-4	Wine Country Drive/ Thomas Street	Priority	0.33	14	A	0.39	16	B
I-5	Wine Country Drive/ Rothbury Street	Priority	0.33	21	B	0.39	19	B
I-6	Wine Country Drive/ Mayne Street	Priority	0.33	34	C	0.39	12	A
I-7	Wine Country Drive/ Old North Road	Priority	0.32	16	B	0.34	20	B
A-1	Wine Country Drive / HEX Link Road	Roundabout Upgrade (to 2 lanes)	0.71	18	B	0.71	19	B
A-3	Wine Country Drive / Main Street	New Signals	0.66	19	B	0.73	21	B
A-5	Wine Country Drive/ Village One Access	New Signals	0.78	37	C	0.80	26	B
A-9	Wine Country Drive/ Large Lot Access	New Priority	0.31	13	A	0.34	15	B
A-11	Branxton Interchange	Roundabout No Upgrade	0.40	21	B	0.80	21	B

Note: DoS – Degree of Saturation, LoS – Level of Service

The scenario 7 results suggest that all the key intersections would provide satisfactory level of service.

Scenario 9- SIDRA MODELLING RESULTS

Table B2 - Overall LoS summary results (2020 Stage 1) –Scenario 9 (2CspL)

Ref.	Intersection	Control Type	AM Peak			PM Peak		
			DoS	Average Delay (sec)	LoS	DoS	Average Delay (sec)	LoS
I-4	Wine Country Drive/ Thomas Street	Priority	0.38	16	B	0.45	19	B
I-5	Wine Country Drive/ Rothbury Street	Priority	0.38	26	B	0.45	24	B
I-6	Wine Country Drive/ Mayne Street	Priority	0.38	46	D	0.45	14	A
I-7	Wine Country Drive/ Old North Road	Priority	0.36	18	B	0.42	26	B
A-1	Wine Country Drive / HEX Link Road	Roundabout Upgrade (to 2 lanes)	0.57	18	B	0.60	22	B
A-3	Wine Country Drive / Main Street	New Signals	0.66	18	B	0.74	24	B
A-5	Wine Country Drive/ Village One Access	New Signals	0.79	32	C	0.81	30	C
A-6	HEX Link Road / Village One Access	New Roundabout	0.56	17	B	0.74	21	B
A-9	Wine Country Drive/ Large Lot Access	New Priority	0.35	13	A	0.40	16	B
A-11	Branxton Interchange	Interchange Upgrade	0.48	27	B	0.59	28	B

Note: DoS – Degree of Saturation, LoS – Level of Service

Additional network changes in Scenario 9 are:

- Northern access from Village One to HEX Link Road is assumed. A new two lane roundabout is proposed at HEX Link Road/Village Access Intersection;
- Left turn slip lane at the northbound off ramp accompanied with southbound acceleration/merge lane;
- Double through lanes along HEX Link Road from Village 1 northern access and Branxton Interchange (370 m section) in both directions;
- Lane discipline change at New England Highway Link Road approach at the interchange allowing southbound traffic to discharge through two lanes;
- Additional exclusive northbound left turn lane at Wine Country Drive intersections A3 and A5.

Model outcome:

With the network changes above, all of the key intersection would operate with level of service C or better in this scenario 9 (as per original yields of Stage 1 development). Intersections at Wine Country Drive between HEX Link Road and Village One Access would operate with satisfactory LoS.

Scenario 5 (Full Development)

To address RMS further issues raised, additional SIDRA modelling was undertaken for Branxton Interchange (A-11) for full development. The table below shows the revised SIDRA modelling results.

Table B3 - Overall LoS summary results (2036 Full Development) – Scenario 5 (4B) - Revised

Ref.	Intersection	Control Type	AM Peak			PM Peak		
			DoS	Average Delay (sec)	LoS	DoS	Average Delay (sec)	LoS
I-7	Wine Country Drive/ Old North Road	Priority Upgrade (Seagull)	0.57	16	B	0.60	27	B
A-1	Wine Country Drive / HEX Link Road	Signals Upgrade	0.91	46	D	0.88	44	D
A-3	Wine Country Drive / Main Street	Signals Upgrade	0.88	26	B	0.86	33	C
A-5	Wine Country Drive/ Village One Access	Signals Upgrade	0.86	38	C	0.85	35	C
A-6	HEX Link Road / Village One Access	Roundabout Upgrade	0.93	19	B	0.80	36	C
A-8	Wine Country Drive / Village Four Access	New Roundabout	0.53	14	A	0.63	16	B
A-9	Wine Country Drive/ Large Lot Access	Priority	0.57	18	B	0.59	23	B
A-10	Old North Road/ Large Lot Access	New Priority	0.03	8	A	0.06	8	A
A-11	Branxton Interchange	Roundabout Upgrade	0.74	51	D	0.93	55	D

Note: DoS – Degree of Saturation, LoS – Level of Service

With the proposed upgrading works, Branxton Interchange would operate with level of service D in 2036. Other intersections results are in line with previously determined.

Addendum 2, Huntlee New Town, Stage 1 Preferred Project Report (PPR)

500 Dwelling Thresholds Modelling Prior to Wine Country Drive Upgrade

1. Background

Hyder previously modelled key development thresholds that identified proposed road improvements works for Stage 1. They have been summarised in Hyder's Preferred Project Report (PPR) and Addendum of Stage 1 PPR reports dated July and August 2012.

It is proposed that 500 dwellings are developed prior to the Wine Country Drive Upgrade. This addendum 2 documents modelling outcome of interim access arrangements on the existing Wine Country Drive supporting first 500 dwellings. In general, two interim accesses are proposed on the Wine Country Drive at following locations:

- At Main Street (A-3). This is required for accessing proposed Huntlee sales office west of Wine Country Drive.
- At Village 1 access (A-5). This is required for accessing first 500 dwellings east of Wine Country Drive.

2. Modelling assumptions

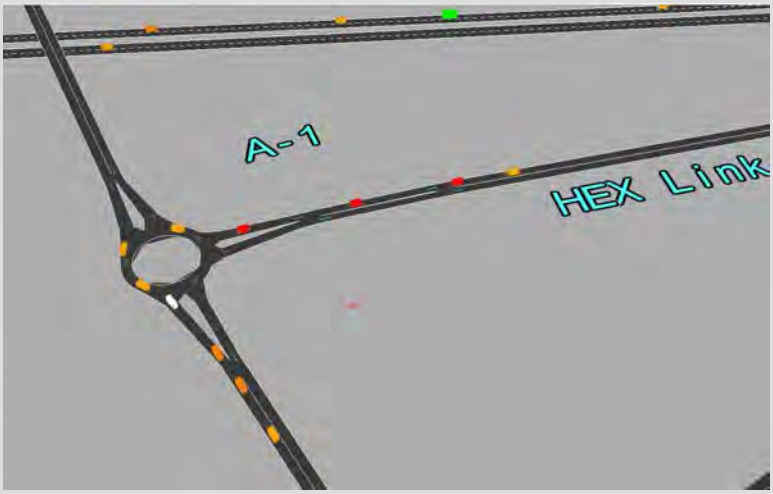
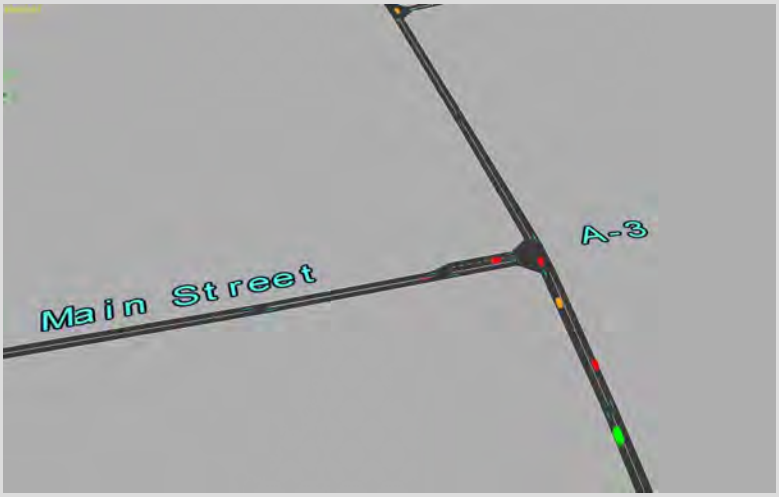
The first 500 dwellings modelling scenario was assessed for both AM and PM peak period using Paramics. The following assumptions are made:

- The first 500 dwellings will be developed east of Wine Country Drive (within Village 1).
- No development will occur on the western side of Wine Country Drive.
- HEX Link Road/Wine Country Drive intersection (A-1) was assumed as per current design as a three leg single-lane roundabout. No western leg connection is assumed to town centre.
- Interim intersection arrangement for access to the sales office at Wine Country Drive/Main Street (intersection A-3) west of Wine Country Drive. A priority (GIVE AWAY sign controlled) intersection is proposed as interim access point. For modelling purpose we have assumed about 30 vehicle trips in one hour (two-way).
- Interim intersection arrangement for access to/from first 500 dwellings development east of Wine Country Drive (intersection A-5, Village 1). A CHR/CHL (sign controlled) intersection is proposed with exclusive northbound (40 m long) right turn bay and exclusive (40 m long) southbound left turn bay on the Wine Country Drive. This interim access is proposed on the existing Wine Country Drive.
- Wine Country Drive through the town centre is assumed on the existing alignment as a two lane/two-way road (single through lane in each direction) as per the existing condition.

3. Modelling outcome

The Paramics model suggests that existing Wine Country Drive have capacity to accommodate additional trips from first 500 dwellings. The interim sign controlled intersections at both Main Street (A-3) and Village 1 access (A-5) would provide satisfactory level of service during AM and PM peak periods. Table 1 showed detailed Paramics modelling results at key intersections for first 500 residential dwellings.

Table 1 Network operation along Wine Country Drive with first 500 dwellings threshold:

Location	Findings	Paramics snapshot
Wine Country Drive/HEX Link Rd intersection A-1	Model shows satisfactory operation at single lane roundabout with HEX Link Road. No queuing issue was observed in both AM and PM peak periods.	
Wine Country Drive/Main Street (interim arrangement) A-3	Model shows satisfactory operation at sign controlled (priority) intersection. No adverse impact was observed in both AM and PM peak periods.	
A-5 Wine Country Drive /Village Access 1 (interim arrangement) A-5	Model forecast good operation of the sign controlled (priority) intersection. No capacity issue or high delays have been observed during both AM and PM peak periods. Model did not indicate traffic delays along Wine Country Drive north and south of the intersection.	

4. Recommendation

It is recommended that first 500 dwellings be approved prior to Wine Country Drive Upgrade.

Addendum 3, Huntlee New Town, Stage 1 Preferred Project Report (PPR)

Proposed Road Improvement Works for Stage 1

This addendum 3 summarises proposed road and intersection improvement works required for Stage 1 Huntlee development. This report should be read in conjunction with the Stage 1 Huntlee New Town Preferred Project Report (PPR) Traffic Modelling Report, Addendum 1 and Addendum 2 dated July, August and September 2012 prepared by Hyder Consulting.

Table 1 below summarises proposed road improvement works for Stage 1. This work program and timing have been agreed with the RMS.

Table 1 Proposed Road Improvement Works for Stage 1

Item	Intersection	Description	Timing (as per Hyder's Traffic Modelling)
1	-	Wine Country Drive shall be upgraded to 4 through lanes (2 lanes in each direction with central median) through the town centre from the Hex Link Road to the Village 1 Access, as a minimum. The left and right turn auxiliary lanes shall be separate to the though lanes.	After 500 occupied dwellings.
3	A1	Upgrade HEX Link Road roundabout with Wine Country Drive to a dual circulating roundabout generally in accordance with the layout shown in the Addendum report dated August	After 500 occupied dwellings. The upgrade HEX Link Road roundabout is proposed concurrently with Wine Country Drive Upgrade (see item 1 above).
3A	A1	Further upgrade HEX Link Road with Wine Country Drive dual roundabout to traffic signal controlled, generally in accordance with the layout shown in the Addendum report dated August 2012.	After the full completion of Stage 1 (after 2,345 occupied dwellings and 21.4 ha GFA mixed use).
4	A3	The Wine Country Drive I Main Street (A-3) intersection shall be traffic signal controlled, generally in accordance with the layout shown in the Addendum report dated August 2012.	It is proposed an interim arrangement for access to the Huntlee sales office to the existing Wine Country Drive prior to its upgrade. A Give Way sign control access is proposed as an interim access. A traffic signal is proposed concurrently with Wine Country

Item	Intersection	Description	Timing (as per Hyder's Traffic Modelling)
			Drive Upgrade (in line with item 1). The traffic signal is proposed prior to any development west of Wine Country Drive.
5	A5	The Wine Country Drive I Village Access 1 (A-5) shall be traffic signal controlled, generally in accordance with the layout shown in the Addendum report dated August 2012.	It is proposed an interim intersection arrangement for the first 500 occupied dwellings east of Wine Country Drive on to the existing Wine Country Drive alignment. A CHR /CHL intersection (protected right and left turn bay) is proposed as an interim access. A traffic signal is proposed concurrently with Wine Country Drive Upgrade (in line with item 1).
6	A2	The Wine Country Drive I Anvil Creek Regional Park intersection shall be a Type CHR/ CHL intersection (protected right and left turn bay) and shall be restricted to left in I left out I right in movements. It is proposed to construct internal road to cater for parking requirements of the regional park.	Prior to opening of park.
7	A9	The Wine Country Drive I Large Lot access (A-9) shall be upgraded to a Type CHR/ CHL intersection (protected right and left turn bay), as a minimum, generally in accordance	Prior to any large lot west of Wine Country Drive.

Item	Intersection	Description	Timing (as per Hyder's Traffic Modelling)
		with the layout shown in the Addendum report dated August 2012.	
8	A6 and A11	The northern access from Village One to HEX Link Road. Concurrent with this northern access, a new roundabout is proposed at Village One with HEX Link Road intersection. Concurrent with northern access, the HEX Link Road between Village 1 and Branxton interchange would require upgrading generally in accordance with the layout shown in the Addendum report dated August 2012.	After 1500 occupied dwellings in Village One.
9	A11	Provision of a left turn slip lane from northbound off ramp at to HEX Link Road generally in accordance with the layout shown in the Addendum report dated August 2012.	After 1900 occupied dwellings and 17.1 ha GFA mixed use in Stage 1.
10		Interim emergency access for Village 1 prior to northern access. It is proposed an interim emergency access through to North Rothbury. The connections are proposed via Scott and Dai Streets and are currently road reserves. For Village 1 Huntlee development, it is proposed that they serve as open space linkages for pedestrian and cyclists and would not be open for regular traffic. They should be designed to be able to be used in an emergency if the access with Wine Country Drive is not available.	Prior to any development east of Wine Country Drive. Gates would be installed to allow emergency vehicle use only.