



## Memorandum

To: Hamilton City Council  
From: Tony Penny  
Date: 16 August 2018  
Job N°: 13646.018  
Subject: **TDG S92 Response Feedback**

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S92 ITEM	RESPONSES
<p><b>Transportation</b></p> <p><b>Traffic Modelling and Traffic Generation</b></p> <p><u>Basis of Modelling / Trip Generation/ Network Impacts</u></p> <p>41. Please provide a summary showing the basis for traffic modelling. The summary should include as a minimum:</p>	<p><b>Introduction</b></p> <p>The basis for the traffic modelling is the WRTM 2006-based model which we were instructed by the Council to use for this analysis. The details of that model have been approved by and are known to the Council.</p>

<p>a. levels of development in base and scenarios – e.g. households/jobs by zone and year.</p>	<p>The critical scenarios for the Amberfield analysis are the 2021 base and with subdivision scenarios. For the base there were approximately 10 households and 15 jobs allocated to the zones representing the subdivision area. For the with subdivision scenario 1,000 new households were added.</p> <p>No jobs were added as it was not clear at the time whether the area tentatively allocated for a neighbourhood centre would be developed in the same timeframe as the residential subdivision. Any future commercial activities within the centre would be subject to further resource consents. However, it should be noted that if it were developed and jobs were created then the overall traffic effect would be less. This is because some residents in the proposed subdivision would be likely to take some of the jobs created while other residents would use the activities provided at the centre. Accordingly, there would be fewer vehicle trips generated by the subdivision travelling beyond the local road network. There would be some vehicle movements attracted to the new neighbourhood centre from outside the area, but these are expected to be fewer in number and would be travelling in the non-peak direction.</p> <p>Overall therefore the traffic modelling undertaken is expected to over-estimate the traffic effect of the subdivision.</p>
<p>b. growth assumptions – e.g. level of development at airport.</p>	<p>The growth assumptions in the 2006 WRTM are inputs to the model produced and approved by the Council in association with other members of the model ownership. The Amberfield modelling analysis did not involve any change to growth assumptions other than the simple (worst case) addition of 1,000 households to the subdivision zone.</p>
<p>c. Amberfield proposal assumptions (including timing / staging) and how these relate to years / modelling periods.</p>	<p>The modelling analysis assumed that the full subdivision development would be completed by 2021. So again, it represents a worst case in terms of traffic effects. We now know that the first stage of the subdivision is unlikely to be completed before 2020 with the remainder of the subdivision likely to be completed over the following seven years.</p> <p>With the HIF projects now being included in the Council’s work programme, there is a good chance that some of the local transportation upgrades will have been completed prior to the completion of the subdivision. (Although noting that the Amberfield project does not rely on the HIF projects proceeding. As stated in the ITA, the mitigation measures identified would enable the Amberfield subdivision to operate without significant adverse transportation effects if the HIF network upgrades were delayed).</p>

<p>d. Expected changes in network performance for key intersections:</p> <ul style="list-style-type: none"> <li>i. Peak period delay/vehicle, queue lengths;</li> <li>ii. Change plots or tables showing which roads generated traffic is expected to use (preferably with pictures highlighting impact on performance).</li> </ul> <p>The additional information is required to accurately assess the likely changes in traffic due on the network due to the development, the suitability of proposed intersections and if any further network changes are necessary to accommodate the increased traffic and / or mitigate the effects.</p>	<p>The peak period delays per vehicle and levels of service have been provided in the appendices to the Phase 3 report produced by TDG in 2016 (see response to Item 42). The levels of service with and without the subdivision development are summarised in the Table 6 on page 18 of the Phase 3 report.</p> <p>Change plots indicating the road which generated traffic is expected to use are included in Appendix A of the Phase 2 report from 2016.</p> <p>The above information has been used to assess the effects on the road network of the proposed subdivision development. The performance of the existing and proposed intersections has been assessed and the required changes to the road network and intersections have been identified to accommodate increased traffic and mitigating facts.</p>
<p>42. Section 1.1 of the ITA states the main basis of the assessment relies on a significant transportation assessment undertaken in 2016 when three reports were produced by TDG using the 2006-based Waikato Regional Transportation Model to assess the effects of the proposed subdivision. For completeness please provide a copy of these reports.</p>	<p>The three 2016 reports (Phases 1-3) have been provided to HCC.</p>
<p><u>Basis of Modelling / Trip Generation/ Network Impacts</u></p> <p>43. Please review the Integrated Transportation Assessment (ITA) modelling against the WRTM 2013 modelling prepared for HCC (which HCC will provide access to). The additional information is required to confirm consistency with NZTA and HCC's current basis for investment decisions.</p>	<p>The WRTM 2013 runs provided by the Council indicate overall very similar results to those achieved with the WRTM 2006 modelling. Key elements of this comparison are:</p> <ul style="list-style-type: none"> <li>i. No intersections in the sections of SH3 in the vicinity of the proposed subdivision location in Peacockes indicate levels of service worse than LOS E;</li> <li>ii. Further, none of those intersections have degraded levels of service with the subdivision development in the critical AM peak period. Most notably the intersection of Normandy Avenue and Bader Street was assessed to perform at better than LOS D.</li> <li>iii. In the PM peak period the intersection of Normandy Avenue and Bader Street has indicated to reduce from LOS D to LOS E.</li> <li>iv. By comparison, the equivalent analysis with the 2006 WRTM indicated that Normandy Avenue/Bader Street intersection would perform at LOS B in both peak periods.</li> <li>v. The intersection on Normandy Avenue/Lorne Street would operate at LOS E in the morning peak period.</li> </ul>

	<p>vi. The 2006 WRTM indicated bigger problems at Ohaupo Road/Dixon Road and Ohaupo Road/Raynes Road where LOS F was predicted in the PM peak. The Dixon Road issue will be resolved however by the proposal to now provide a new roundabout intersection immediately to the south. It is noted that the 2013 WRTM also indicates an issue at the Raynes Road intersection albeit with LOS D. This is an existing issue even without the development and it is not significantly aggravated by the proposed subdivision generated traffic.</p>
<p><u>Modelling Accuracy / Sensitivity Checks</u></p> <p>44. Section 8.3 of the ITA (Appendix I) states that mitigation is expected to be required at the Normandy Ave / Lorne Street intersection when the Amberfield Subdivision is around 80% complete. Gray Matter Ltd SIDRA modelling (HCC will provide) suggests that the Bader Street/Lorne Street/Normandy Ave combined intersection performs significantly worse than the WRTM evaluation and has little reserve capacity. The Gray Matter Ltd modelling outcomes appear to be worse than sample observations suggest is happening in reality. Please review the intersection performance modelling (ITA, WRTM and Gray Matter Ltd SIDRA) and comment regarding the discrepancy / difference in modelling outcomes between SIDRA, WRTM 2013 and current observations.</p> <p>This information is required to resolve the discrepancy and ensure confidence in the mitigation measures and timing / thresholds proposed.</p>	<p>We have compared the analysis undertaken for the Normandy Avenue intersections at Bader Street and Lorne Street as indicated in the ITA, the WRTM 2013 analysis and the SIDRA analysis undertaken by Gray Matter Ltd. It is not surprising that there is some discrepancy or difference in the modelling outcomes for these three respective analyses. The ITA relies on the WRTM 2006 modelling which included considerable recalibration to a series of 2016 traffic counts of the traffic and turning movements (in particular) projected by the WRTM 2006 model. The recalibrated turning movements were then analysed using SIDRA Intersection to achieve the final assessed levels of service.</p> <p>The WRTM 2013 analyses were taken directly from the TRACKS macro modelling software without any recalibration to traffic counts. This level of analysis is coarse at best and suitable only for wide area network traffic analysis.</p> <p>In contrast the Gray Matter SIDRA analysis is based on the 2016 traffic counts with the addition of traffic assigned to the network by the WRTM 2013 model. This has also used a different form of SIDRA which has assessed the interactive effect of the Bader Street and Lorne Street intersections on Normandy Avenue. The result of the latter analysis is that these intersections will not perform well even without the subdivision. For example, the right turn from Normandy Avenue into Lorne Street is predicted to perform at LOS F in morning peak. Similarly, the turning movements out of Bader Street and the through movement at that intersection northbound along Normandy Avenue are both predicted to perform at LOS F. These relate to delays of over five minutes which from observation do not occur consistently even in 2018.</p> <p>In the PM peak the right turn from Lorne Street is predicted to operate at LOS F and the turning movements out of Bader Street are also predicted to perform at LOS F albeit with much lower delays of less than two minutes.</p> <p>This is more consistent with the ITA analysis which predicts more problems in the morning peak whereas the WRTM 2013 strategic analysis appears to indicate more issues in the evening peak.</p> <p>SIDRA as a static state or deterministic model tends to overestimate delays and predict worse levels of service than will occur in reality. This is reflected by the analysis</p>

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undertaken of the 2016 traffic counts producing very poor operational estimates when observations do not support this.

We have reviewed the Gray Matter SIDRA files and while we can produce some slightly better predictions when compared with observations, it still tends to overestimate delays.

The significance of this analysis in relation to the mitigation proposed for the Normandy Avenue/Lorne Street intersection relates to the level of subdivision that could be completed before this mitigation is undertaken. The ITA predicts that 80% of the subdivision could be completed before mitigation measures for the Normandy Avenue/Lorne Street intersection are required, while the Gray Matter analysis questions whether this should be considerably less. Given that some of the HIF projects are likely to be completed before the subdivision is fully developed, this apparent inconsistency may be academic, as the upgrades will not be needed at all if the HIF projects proceed. It is suggested that the performance of the two intersections on Normandy Avenue at Bader Street and Lorne Street should be monitored as the subdivision development progresses and a decision made as to whether the mitigation works for Normandy Avenue / Lorne Street should be implemented sooner rather than later based on threshold performance criteria agreed with the Council. As noted in the ITA if the HIF infrastructure upgrades and particularly the new River Bridge do progress as now expected, then the mitigation proposed for the Lorne Street intersection may never need to be implemented.

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**Safety**

45. Please assess the predicted changes in crash risk on the Peacocke to Bader Street Corridor and Bader Street intersection, and the potential for death and serious injury (DSI's) before and after following the development of the Amberfield subdivision.

CAS records for the Bader St area over the last five years show a total of 33 collisions in the area assessed with 29 of them on Bader St or at its intersection with SH3. Five of these collisions were minor injury with the remaining 28 collisions being non-injury. None of the injury collisions were volume related but involved either loss of control or inattentive behaviour.

A number of collisions did involve collision types that could increase in number with increasing traffic volumes. Five non-injury rear end type collisions occurred at the Bader St / SH3 intersection where vehicles failed to stop for queuing vehicles either on the Bader St approach or on the left turn slip lane onto Bader St. Any increase in traffic volumes along Bader St would be reasonably expected to result in some increase in these rear end type collisions.

In addition, five non-injury merging related collisions were reported involving vehicles turning into Bader St from local side roads or the SH3 slip lane. These collisions typically involved drivers misjudging vehicles speeds or were inattentive whilst undertaking lane changing manoeuvres. Again, the incidence of this type of collision can reasonably be expected to increase with increasing vehicle volumes along Bader St.

There is no indication from the collision record that increased vehicle volumes along Bader St would result in increased collision severity. Indeed, depending upon the level of increase in volume along the road corridor, vehicle speeds can reduce resulting in an overall drop in the severity of future collisions.

46. It is understood the ITA relies on planned network changes that aim to address existing safety issues and to mitigate the safety impacts of the development proposed in Peacockes 1A and the Amberfield Development. Please confirm this understanding is correct. Otherwise please include the impact of the Amberfield development on safety should these network changes not proceed before Amberfield is developed and how the effects will be mitigated.

It can be confirmed that some traffic calming and roading improvement works which have been adopted for implementation by HCC address existing safety issues and mitigate the safety impacts of the proposed development at Peacockes Stage 1A.

The improvement works along Peacockes Road and Bader Street (which were based on recommendations by Gray Matter) will also mitigate the minor road safety effects of the Amberfield development traffic.

The Amberfield applicant is separately proposing some minor safety improvements for the existing section of Peacockes Road to the south of the subdivision. The Applicant also proposes to construct a shared path along the east side of the section of Peacockes Road between the subdivision and the existing urban boundary to improve safety for both pedestrians and cyclists rather than have them walking on the berm or sharing the narrow existing carriageway.

The upgrading of Peacockes Road as outlined for the HIF may now take place before the first stage of the Amberfield subdivision is completed and therefore the interim shared path may not need to be constructed.

**Other Network Changes**

47. The ITA mentions other planned changes to the transport network that will reduce the adverse effects of the development on the transport network. Please provide an update on projects now that HCC 10 Year Plan (e.g. ITA Section 8.4 HIF proposals) has been approved that may mitigate Amberfield effects in relation to the likely development timing and staging.

This information is needed to better understand the likelihood and impact of a delay in planned projects on the proposed development, the ability of the network to accommodate the increase in traffic and interim effects.

The planned projects which were included in the road network for the analysis of traffic effects relating to the development of the subdivision included Wairere Drive extension to SH1 and Waikato Expressway.

The HIF projects were not considered in the traffic effects assessment undertaken for the Amberfield subdivision because of their uncertainty at the time. However, the HIF has subsequently become more assured and many of the roading projects are now included in the HCC 10-year plan. Planned future projects now include:

Component	Expected Commencement	Expected Completion
From Peacocke HIF Business Case and in 10-year plan		
Wairere Drive/ Cobham Drive Overbridge	Under way	Jun 2021
SH3 Intersection, E-W Arterial Stage 1 and Water	Dec 2019	Jun 2021
Wairere Drive Extension, Waikato River Bridge, Water, Wastewater	Dec 2021	Jun 2024
North South Arterial Land (Subject to Public Works Act processes)	June 2019 (Notices)	June 2021 (Acquisition)
Peacockes Road urban upgrade	Dec 2023	Jun 2025
East-West Arterial Road, Water and Wastewater Stage 2	Dec 2023	Jun 2025
In 10-year plan		
Minor safety improvements – Bader Street/ Peacocke/ Waterford corridor	Expect construction by end 2019	Expect construction by end 2019
NZTA		
The Waikato Expressway	Under way	Dec 2020

However, the position in terms of the Amberfield application traffic effects is that it does not depend on these projects going ahead and being completed as now programmed. Obviously if they do progress and are completed before the subdivision then the effects of the subdivision will be greatly diminished. The River Bridge would have a particularly beneficial effect in this regard.

**Construction Traffic Effects**

50. The ITA does not include details regarding how construction traffic will be managed. Please state how heavy vehicles will be managed to minimise use of

The major effects of the subdivision are during peak traffic hour whereas it is not expected that construction traffic will have a major effect at these periods. It might be possible to utilise the Raynes Road intersection with SH3 to avoid heavy traffic travelling

residential access routes, including which site access(s) will be used for construction traffic and how heavy traffic safety will be considered, particularly at the Raynes Road intersection.

This information is required to ensure that construction impact on other transport network users will be minimised.

through residential streets. However, the intersection is priority controlled and traffic on SH3 is travelling at a high-speed environment. Obviously therefore there are safety issues and other options should also be considered. It might be a better compromise to have heavy vehicles in particular utilise the proposed new intersection on SH3 just south of the Dixon Road intersection where a new roundabout is proposed. The initial section of the east/west arterial connects to this roundabout and will not have residential development initially and it may be that a compromise of using the residential section of Dixon Road to Waterford Road and then into Peacocks Road would be better than using Raynes Road or Bader Street as the primary access route.

These matters will need to be considered further once the timing for construction of the roundabout is known. They can also be addressed through a requirement for a construction management plan as a condition of consent.

**Travel Demand Management**

51. The ITA outlines provision for passenger transport and active modes. Please state whether there are any specific travel demand management measures planned as part of the development for example for the proposed centre. Include a statement on the likely effectiveness of any TDM measures planned.

It is not expected that there will be any other particular travel demand management measures adopted for the subdivision other than the provision of public transport and encouraging active modes particularly cycling. As mentioned previously, the future development of a neighbourhood centre does reduce the need for longer distance travel for some people and this could be regarded therefore as a travel demand management measure.

**Compliance with policy and other frameworks**

52. The ITA indicates support for regional and national transport policies. Please expand the comments to include assessment against Access Hamilton and associated action plans as required for a Broad ITA in the District Plan. This is required to demonstrate the extent to which the proposal is consistent with HCC’s local objectives and plans.

The proposed development has been assessed against the Access Hamilton Strategy and Action Plan documents as follows.

Policy / Aim	Compliance / Comment
<b>Access Hamilton Strategic Focus</b>	
<ul style="list-style-type: none"> <li>Support Hamilton’s economic, social, environmental and cultural well-being.</li> </ul>	<p><b>Supports:</b> The location of the proposed land use within an identified growth cell is in keeping with the long-term land use, sustainability and infrastructure investment aims of HCC. It is well located to make best use of the existing and planned future transport networks.</p>
<ul style="list-style-type: none"> <li>Support the land use, sustainability and economic development objectives for a compact city with consolidation and intensification around key nodes and a vibrant city centre.</li> </ul>	
<ul style="list-style-type: none"> <li>Manage incremental change in the transport and land use system necessary to achieve Hamilton’s strategic objectives.</li> </ul>	
<ul style="list-style-type: none"> <li>Position infrastructure and land development to meet the city’s long-term needs.</li> </ul>	

	<b>Access Hamilton Themes</b>	
	One: Working together to improve access	<b>Supports:</b> The proposed development is entirely consistent with the planned development of Peacocke.
	Two: Planning for the future	<b>Supports:</b> The proposed development is consistent with the Peacocke Structure Plan which includes a future multi-modal transport network.
	Three: Understanding our choices	<b>Supports:</b> The proposed development is consistent with the Peacocke Structure Plan which includes a future multi-modal transport network.
	Four: Managing and adapting for the future	<b>Supports:</b> The means of access to the site supports efficient and easy use and is fit for purpose in the short and long term.
	Five: Providing for the future	<b>Supports:</b> The location of the development supports future travel choices and allows for transport flexibility.
	<b>The Transport Safety Action Plan – Objectives</b>	
	<ul style="list-style-type: none"> <li>■ Making our roads as safe as possible to reduce environmental factors</li> <li>■ Reversing the trend of increasing numbers of crashes</li> <li>■ Achieving an intersection crash rate that is the same as or is lower than similar cities</li> <li>■ Reducing the level of rear-end crashes</li> <li>■ Making our roads as safe as possible to reduce environmental factors</li> </ul>	<b>Supports:</b> The proposed means of access and egress for the site have a focus on road safety improvements and additions which are appropriate for the proposed land use, and existing and future transport environment.
	<b>Travel Demand Management Action Plan - Objectives</b>	
	<p>Reducing the need to travel / changing travel behaviour in order to:</p> <ul style="list-style-type: none"> <li>■ Improve journey time reliability</li> <li>■ Ease severe congestion</li> <li>■ Improve efficiency for freight supply chains</li> <li>■ Allow better use of existing transport capacity</li> </ul>	

	<ul style="list-style-type: none"> <li>■ Improve access to markets, employment and areas that contribute to economic growth</li> <li>■ Create a secure and resilient transport network</li> </ul>	<p><b>Supports:</b> The site is part of a comprehensively planned growth area with a planned multi modal transport network and mixed land uses to manage travel demand.</p>
<p><b>Active Travel Action Plan - Objectives</b></p>		
	<p>Increase the existing levels of walking and cycling by:</p> <ul style="list-style-type: none"> <li>■ Providing safe networks of routes for cyclists and pedestrians</li> <li>■ Reducing the number and severity of crashes involving cyclists and pedestrians</li> <li>■ Increasing residents' satisfaction with the provision for cyclists and pedestrians</li> <li>■ Promoting active travel and encouraging walking and cycling</li> <li>■ Encouraging good behaviour and respect by both motorised and non-motorised road users</li> <li>■ Considering the needs of the mobility impaired whenever changes are made, or new construction takes place</li> </ul>	<p><b>Supports:</b> The proposed subdivision will provide convenient and safe facilities for pedestrians, cyclists and public transport users. There is provision for footpaths and road crossings as well as a significant provision of off-street paths that will be shared with cyclists. Cyclists will also be provided with on-street cycle lanes. Provision has been made for bus routes to circulate through the subdivision with the possibility of an interim route through the early stages of the subdivision.</p>
<p><b>Transport Activity Action Plan - Objectives</b></p>		
	<ul style="list-style-type: none"> <li>■ To provide a safe, well managed network for vehicles, walking and cycling that integrates with other modes</li> <li>■ To ensure that the road network is maintained in a timely and cost-effective manner</li> <li>■ To plan and budget for future growth needs</li> <li>■ To ensure that economic, social, cultural and environmental factors are all considered when planning or undertaking any works</li> </ul>	<p><b>Supports:</b> The transportation network has been planned in an integrated fashion to be consistent with future growth as indicated in the ITA.</p>

	<p><b>Passenger Transport Action Plan - Objectives</b></p> <ul style="list-style-type: none"> <li>■ Optimise levels of service, working with Waikato Regional Council</li> <li>■ Increase passenger transport patronage and modal share</li> <li>■ Provide infrastructure across the city for consistent, high quality passenger transport services</li> <li>■ Integrate and coordinate the timing of passenger transport service and infrastructure improvements with road improvements and development to ensure a balanced network</li> <li>■ Provide fully accessible passenger transport infrastructure</li> <li>■ Ensure services are easy to understand and well promoted</li> </ul> <p><b>Network Action Plan - Objectives</b></p> <ul style="list-style-type: none"> <li>■ To integrate land use planning and management with transportation planning, including finding opportunities, to provide an effective land transport system that addresses land transport implications of each land-use</li> <li>■ To work with transport partners to provide an appropriate infrastructure to support and develop multi-modal network that compliments the form and function of the strategic network and adjoining land use patterns</li> <li>■ To identify, protect and manage the strategic network to support a transport system that operates at an appropriate level of service and ensures that travel times are reasonable and reliable over Access Hamilton’s 30-year timeframe</li> <li>■ To develop an effective and affordable network through planned approach to the implementation of infrastructure improvements, coordinated and integrated with land use planning travel demand management and activities associated with other modes</li> </ul>	<p><b>Supports:</b> We have worked with WRC to identify public transport routes and connections which are expected to be effective as residential opportunities in Amberfield are taken up and further development of Peacockes progresses.</p> <p><b>Supports:</b> The transport infrastructure required to serve the subdivision development and the wider area has been planned collaboratively with HCC and WRC. It is fit for purpose and has been designed to be compatible with the long term Southern Links strategy.</p>
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Parking Management Action Plan - Objectives	
<ul style="list-style-type: none"> <li>■ Remove minimum parking requirements</li> <li>■ Develop performance-based management policies</li> <li>■ Establish a Transport Management Association</li> <li>■ Investigate supplementary policies</li> </ul>	<p><b>N / A</b> This Action Plan is not relevant to this residential subdivision and parking is provided in line with the requirements of the ODP</p>

**Table 1: Access Hamilton Review**

From Table 1 above, it is concluded that the proposed development supports the Access Hamilton strategy and the objectives of the various action plans where they are relevant to this proposal.

**53. Please list / summarise proposed mitigation measures**

It is proposed to have the following specific mitigation measures associated with the proposed subdivision:

- Building a shared path on the east side of Peacockes Road north of the subdivision.
- The construction of a threshold and crossing facilities at the urban boundary to link the temporary path with existing footpaths.
- Upgrading of the intersection of Normandy Avenue and Lorne Street, if at some stage during the subdivision process the performance of that intersection becomes untenable. This may not be required if the new HIF river bridge is constructed before substantial development of the subdivision.
- Minor road safety improvement measures recommended for the bends on the existing section of Peacockes Road south of the subdivision.

The minor traffic calming and improvement works proposed by HCC for Peacockes Road and Bader Street will also provide some mitigation of Amberfield traffic effects. These include:

- A roundabout at the Waterford Road/Peacockes Road/Plateau Drive intersection,
- Cycle/pedestrian crossings and traffic calming in the vicinity of the local shops on Bader Street.
- Measures to improve visibility on the Peacockes Road approach to its intersection with Norrie Street.