

9184/4  
19 August 2009

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Dear David

**Publicly Notified Proposed Private Plan Change Business 8 Zone St Lukes  
Response to Council / URS Further Information Request: Traffic / Transport**

As requested, we provide herein a response to the traffic and transport related sections of the Auckland City Council ("Council") request, via URS dated 16 July 2009, for further information ("RFI") regarding the Private Plan Change ("PPC") application for the Westfield St Lukes centre.

It is assumed that the issues raised supersede earlier discussions held with Council's Transportation Engineers; therefore where possible we have attempted to cover all outstanding issues. In light of this, and with reference to several concerns raised in the letter regarding the results of the Paramics model, we would summarise the background and current situation as follows:

- To demonstrate the effect of the enabled development on the surrounding street network, we have prepared a detailed Paramics model. This has been peer reviewed by SKM, and found to be "fit for purpose". Council, through its consultants Resolve and TES, has expressed reservations about the model - specifically that it does not accurately reflect current traffic conditions and therefore by implication will be unable to predict future intersection performance.
- We understand that this is not based upon a peer review of the model itself, but rather disagreement in interpretation of the data used to calibrate the model. Following a consultants meeting on 23 June 2009, it was agreed to resolve this difference and increase confidence of the calibration of the model by carrying out a further series of route timing surveys. In summary, the additional surveys were consistent with our previous survey base which formed the basis of calibration of the Paramics model, and therefore were entirely consistent with the modelling results for the current pre-development situation.
- It is therefore considered that as the Paramics model accurately reflects existing performance, as confirmed by the SKM peer review of the model and the additional surveys, its future year results are reliable and should be used as the basis for the assessment of potential traffic effects.

We list our response to specific issues raised in the letter according to the numbering of the Council request provided via URS New Zealand Limited ("URS") to David Drew on 16 July 2009.

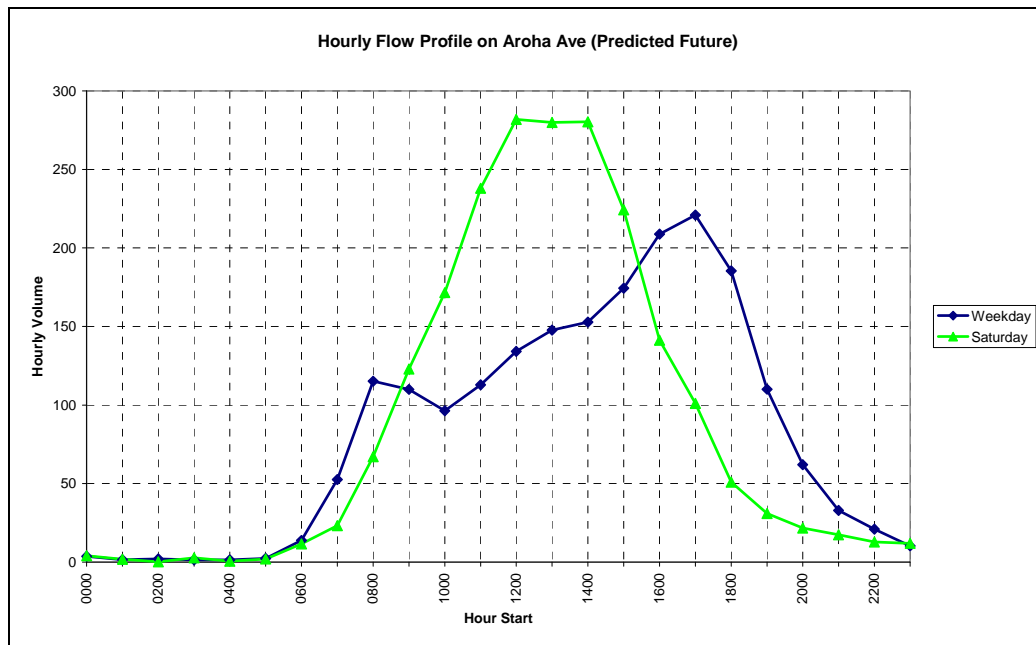
### Section 3.1 of the URS request, Traffic Noise

***Request:*** Please provide traffic data for [Aroha Avenue] as hourly flows for both existing and predicted future traffic over a weekday and Saturday 24 hour period.

The traffic modelling projects that during the evening peak hour the two-way traffic volume using Aroha Avenue is expected to increase from 50 to 221 vehicles per hour. Based upon this peak hour volume, the weekday average daily traffic (“ADT”) for Aroha Avenue has been estimated at 1,974 vehicles per day (“vpd”) and the corresponding 7-day ADT at 1,813 vpd.

The Saturday peak hour two-way volume is expected to increase from 78 to 282 vehicles per hour. Based on this peak hour volume, the average daily Saturday volume can be estimated at 2,100 vpd.

These ADT's have then been assigned to hourly flows throughout the day by reference to the flow profiles already experienced by other streets adjacent to the shopping centre, particularly on Bournemouth Avenue. The resulting flow profiles are provided below as Graph 1:



Graph 1: Projected 24h flows on Aroha Avenue

***Request:*** Please provide traffic noise levels at houses on Aroha Avenue for existing and predicted future traffic, as well as an assessment of the increase in traffic noise.

To be provided under separate cover by Westfield based on the flow profiles provided above.

### Section 5.1 of the URS request, Existing Traffic Issues in the Area

***Request:*** Morningside Drive / St Lukes Road - increased intersection capacity and improved pedestrian safety and access is required...

We note that additional capacity is proposed at the Morningside Drive / St Luke's Road intersection by way of an additional left turn lane from Morningside Drive into St Luke's Road. Refer Development Control C1(a) bullet point two, and Diagram E06-05(4) of the proposed Concept Plan.

We also note that traffic modelling has shown no further need for mitigation at this intersection, other than the additional Morningside Drive approach lane. The validity of the model is discussed above.

The existing intersection includes signalised pedestrian crossings for three of the four approaches, with only the north-western arm over St Lukes Road (considered the arm with the least pedestrian demand) not being signalised. This layout provides a high level of safety, and a good level of amenity.

Pedestrian waiting space will be increased on the east side of Morningside Drive and the south-eastern quadrant of the intersection between Morningside Drive and St Lukes Road as part of the Morningside Drive mitigation works. This area will be further improved inside the site once this part of the centre frontage is redeveloped with active edges and a main pedestrian entry.

A suggestion is made in the RFI that the free left turn for St Luke's Road into Morningside Drive be removed, and that the St Luke's Road south-east bound approach to the intersection be widened to accommodate a left turn lane, two through lanes, and a right turn lane.

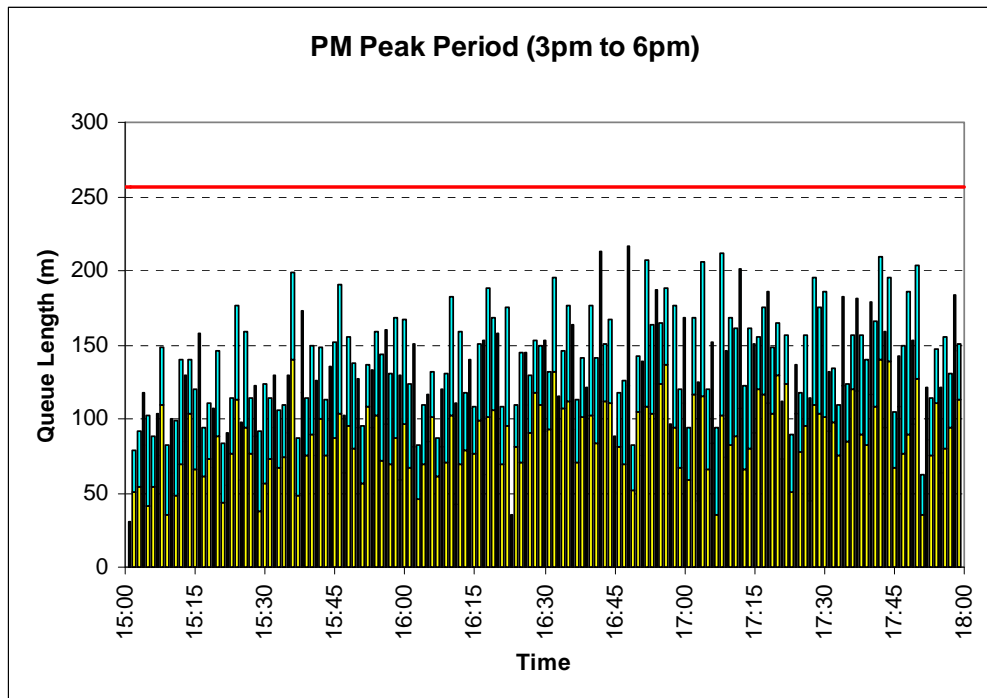
We do not consider this a feasible solution, due to the lack of space for an additional traffic lane. Any such lane would have to use significant amounts of private land on the northern or southern side of St Lukes Road. Furthermore, removing the existing left turn slip and integrating the left turn within the existing lanes (without the ability to widen St Luke's Road to achieve an additional lane) would significantly reduce the capacity of the intersection.

It is noted that there have been no crashes on the zebra crossing over the left-turn slip, indicating that there are no existing safety problems with the layout.

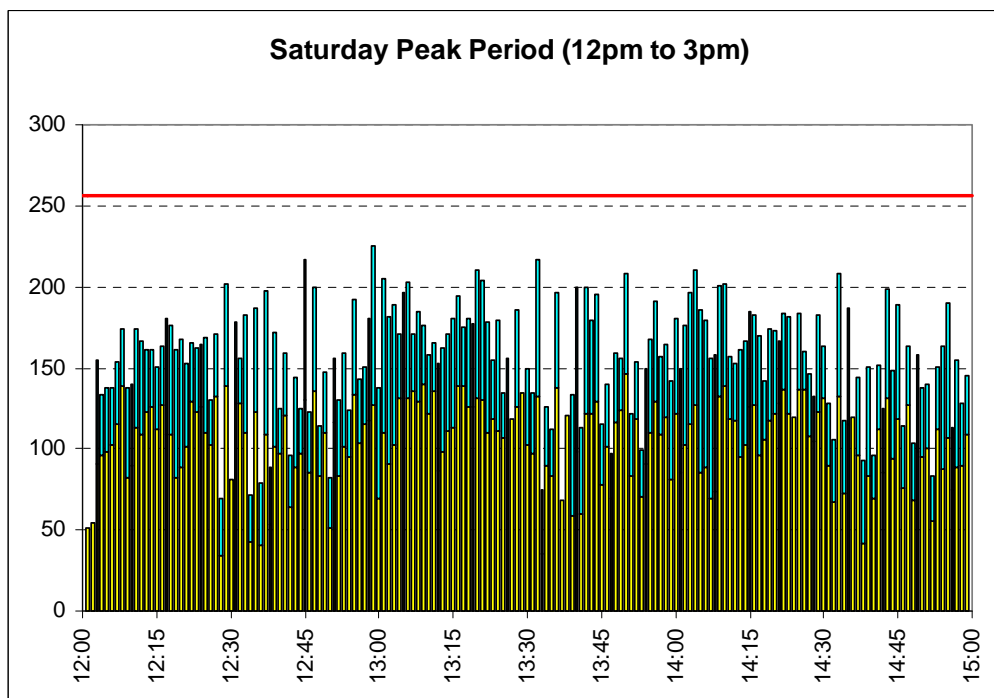
***Request: St Luke's Road/Cornwallis Street – the right turn queues that form in St Luke's Road at the Cornwallis Street intersection could end up being very long and could impact significantly on the operation of St Luke's Road. As this is the main entrance from the east, please provide a contingency plan showing how capacity of this intersection can be improved.***

Along St Lukes Road between the two intersections of Cornwallis Street and Sandringham Road, a painted median strip exists to accommodate overflow queues from the two right turn bays into Cornwallis Street and Sandringham Road respectively. The total distance between the two intersections is some 256m.

The future scenario models show that the coincident right turn queue lengths between the two intersections tends to vary significantly throughout the model periods during the evening peak and Saturday peak. **Graphs 2 and 3** provided below plot the maximum queue lengths of the right turn queue into Cornwallis (yellow bars) plus - stacked on top - the right turn queue into Sandringham Road south (blue bars), clearly illustrating this effect. In both graphs the red line signifies the maximum space available for storing queued vehicles (total length between the two intersections).



Graph 2: Right Turn Queues using Median Strip between Cornwallis and Sandringham (PM)



Graph 3: Right Turn Queues using Median Strip between Cornwallis and Sandringham (SAT)

As shown by the details in Graph 2, during the evening peak period the maximum queue on average is around 140m, marginally over half of the available space. Around 4% of the time the queue exceeds 200m but on each occasion the queue is only momentary. During the Saturday peak period in Graph 3, the average of the maximum queues is around 155m and queues

exceed 200m around 8% of the time. However, as with the PM peak long queues are only momentary.

Overall, the model is showing that there is sufficient queuing space between the two intersections to accommodate the likely demands and therefore no mitigation is considered necessary.

***Request: St Lukes Road/Wagener Place - advice on what changes are proposed in light of the potential increased pedestrian use of the crossing across St Lukes Road and the current crossings inability to cater for increased pedestrian use.***

The signalisation of this intersection was undertaken by Council in 2003, with the express purpose of providing a means for pedestrians to cross St Luke's Road. There have been improvements, undertaken by Council since then to achieve a better alignment for the pedestrian crossing point.

We do not agree with the statement that the current crossings are unable to cater for increased pedestrian use. Furthermore, while it is acknowledged that there may be some increased pedestrian travel between the St Luke's Mega Centre and the Westfield St Luke's Shopping Centre, we do not consider that the quantum of change will be sufficient, in itself, to warrant major changes to the existing pedestrian facilities.

***Request: A scheme should be supplied that addresses the accidents at the existing Morningside Drive vehicle entrance closest to St Luke's Road and in the car park as this has been identified as a problem...***

In order to assist in the understanding of this issue, NZTA's CAS crash database was queried for the 10-year period 1999 to 2009. The search extended for approximately 100m mid-block length of Morningside Drive, centred on the car park driveways, but excluded the Exeter Road and St Lukes Road intersections with Morningside Drive; crashes that occurred fully within the car park (away from the driveways); crashes that occurred mid-block (more than approximately 20m away from the driveways); and two crashes that had been geo-coded incorrectly.

Excluding these unrelated incidents, 16 crashes had been reported near or at the driveways in the last 10 years, i.e. an average of 1.6 each year. Two crashes caused injury - in one crash, an inattentive / drunk cyclist on Morningside Drive was hit by a southbound car a short distance south of one of the car park driveways, causing serious injury. The other involved failure to give way when turning right into one of the Westfield St Lukes driveways, and which caused a car to hit another car going straight through on Morningside Drive in the opposite direction, causing one minor injury.

The driveways were also assessed for their typical accident rates (treated as intersections) as per the "Economic Evaluation Manual" (Land Transport New Zealand) method, based on the surveyed / base model flows. This led to an "expected" accident rate of 0.16 injury crashes per year at the northern, and 0.17 injury crashes per year at the southern access. This translates to a total "expected" injury crash number of 3.3 within a 10 year period. The 2 crashes that occurred in practice indicate that the driveway performs better than expected, especially when considering that the serious injury crash appeared to be totally unrelated to a driveway.

Assessing the non-injury crashes, the dominant crash cause was right turners into the access failing to give way to southbound through movements. Other contributing factors in some crashes were right turners out of the driveways, as well as movements through gaps in stationary southbound queues (right turners being hit by vehicles going past on or turning left into the kerbside lane).

In summary, it is considered that the driveways are performing with appropriate levels of safety. The non-injury crashes of similar pattern that have been found here are considered to be primarily due to the high volumes of daily traffic using these driveways - which like all priority intersections retain some residual risk.

Furthermore, given the fact that the positions of each driveway are fixed; and that any further restriction on turns able to be achieved will impact on other driveways and the traffic demands on other frontages; it is found that options available for improving driveway operations are limited.

However, notwithstanding the above statistics, it is acknowledged that the south-western driveway on Morningside Drive, which has the poorest performance of the two existing Morningside Drive driveways, could be improved at the resource consent stage by way of a condition requiring more permanent and prominent restriction on right turn exit manoeuvres. This could readily be achieved by improved pavement markings and signage.

***Request: It appears that for the future road network (full development) reliance is being placed on the generated traffic diverting around the road network and using the residential streets, to ensure that St Luke’s Road does not become further congested. The current travel times in the peak hour already indicate that St Luke’s Road is over-congested e.g. vehicles have to stop more than once. Accordingly, a local area traffic management scheme for treatment of the relevant local streets should be supplied. This is to ensure the generated traffic does not have an adverse impact on the local streets.***

Again, it is considered that this is matter that is better addressed at the resource consent stage of assessment.

However, having discussed this matter with Mr Smith who has prepared the Proposed Plan Change rules and assessment criteria, it is agreed that an amendment to Rule D2 would assist in providing some certainty regarding the traffic environment on Aroha Avenue. In this regard, a new matter for control is recommended as follows:

*D2(f) The extent to which traffic management measures are implemented to mitigate potential effects of generated traffic on, Aroha Avenue. Measures may include coloured and textured paving at intersections, raised tables at intersections, slow points, pedestrian platforms, or other accepted traffic management mechanisms.*

In order to further assist in the understanding of this issue, the modelling provided shows the projected effects on a number of local residential streets that could be affected by the new access provisions / additional development potential:

| Year                     | PM Peak Hour (observed) | PM Peak Hour (future) | Saturday Peak (observed) | Saturday Peak (future) |
|--------------------------|-------------------------|-----------------------|--------------------------|------------------------|
| Kenneth Avenue           | 122                     | 122                   | 118                      | 106                    |
| Cabbage Tree Swamp Drive | 203                     | 188                   | 129                      | 128                    |
| Aroha Avenue             | 51                      | 220                   | 78                       | 282                    |
| Sainsbury Road           | 480                     | 369                   | 217                      | 286                    |

**Table 1: Peak Hour Traffic Changes on Nearby Local Roads**

It is clear that with the exception of Aroha Avenue, future projected traffic flows on these streets remain generally consistent, and therefore should be linked to a monitoring regime assessing actual function rather than prescribed in advance of issues that may or may not materialise.

However, as expected, and as described in the ITA, Aroha Avenue will see a general increase in traffic flow, which should be treated with a traffic management scheme at the detailed design stage, as the result of a resource consent condition and to the satisfaction of Council. As is evident from the treatment of other local roads within Auckland City, a range of effective schemes are available.

## **Section 5.2 of the URS request, Paramics Model**

***Request: No traffic count data is available for the section of St Luke's Road between the New North Road and Sandringham Road intersections. In such cases the annual traffic growth rate of 1.5% recommended in the New Zealand Transport Agency Project Evaluation Manual for Auckland City should be used, not just 0.5%.***

We consider that based on surveys at and around Westfield St Lukes, the use of a 1.5% per annum level of growth would be excessive and fails to recognise existing growth patterns, where existing capacity limits inhibit further traffic.

In this regard, a detailed analysis of traffic count data has been carried out on the main roads surrounding the St Lukes site where historical traffic count data is available, including:

- Balmoral Road (west of St Andrews Road)
- Dominion Road (north of Landscape Road)
- New North Road (east of Western Springs Road)
- Mt Eden Road (north of Balmoral Road)
- St Lukes Road (south of Asquith Avenue), and
- Sandringham Road (north of Balmoral Road).

The approximate locations of the count sites are shown in **Figure 1**. The data has been obtained from the Auckland City Council website.

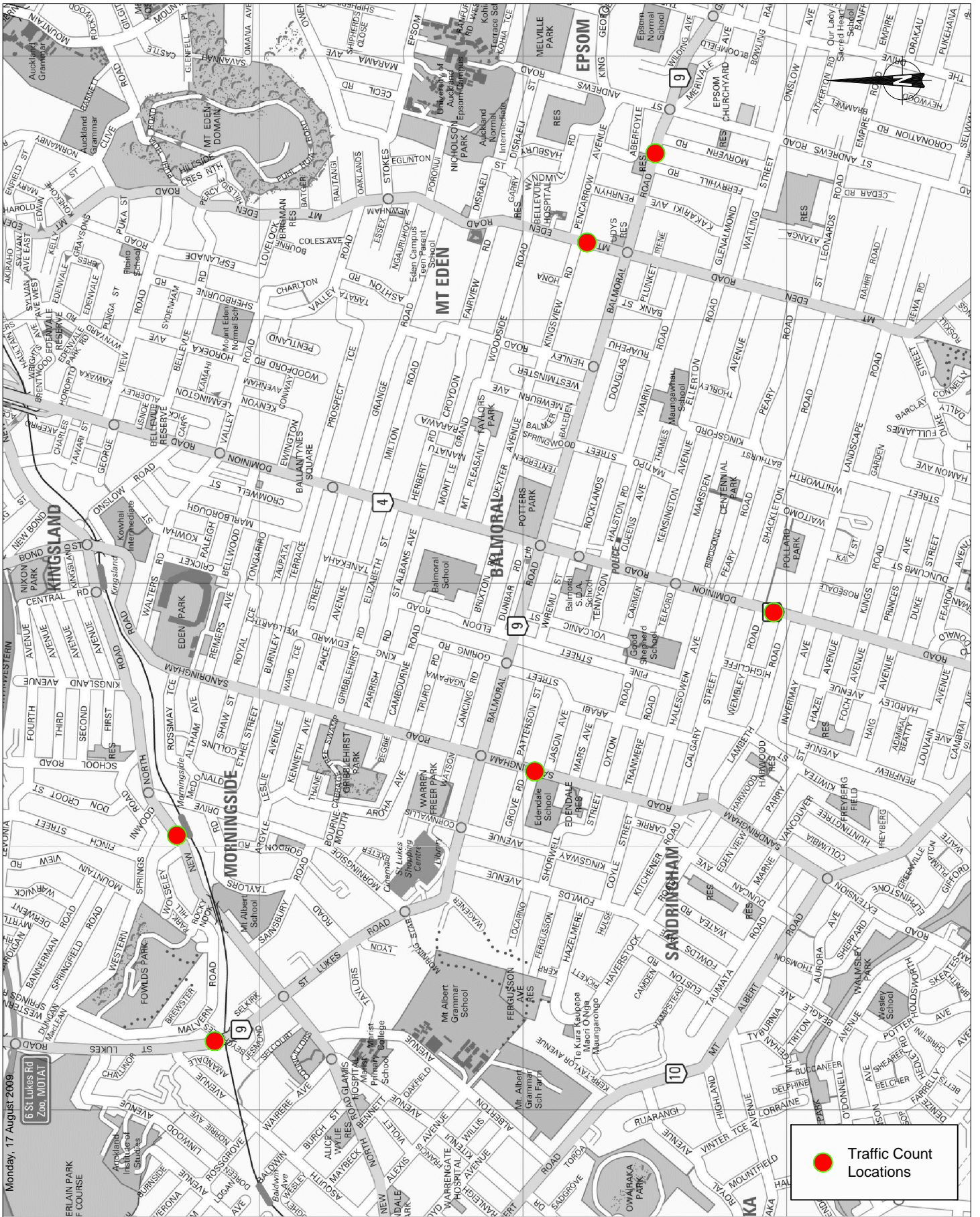
In the Traffic Engineering Solutions ("TES") Peer Review of the modelling for the St Lukes project, Section 3 of the report discusses traffic growth. Seasonal variation has been mentioned but the factors have been erroneously obtained from the Australian Roads & Traffic Authority of New South Wales "Guide to Traffic Generating Developments" (the "RTA Guide") – which is only relevant for a particular land use activity, being Retail Shopping Centres – rather than for the general traffic flows of the area, of which site traffic is only a share.

It is also important to distinguish between a growth rate in daily traffic flows and a growth rate in peak hourly flows. As the modelling analyses as undertaken for this Plan Change are based on peak hour traffic demands, it is not appropriate to apply daily growth rates to peak hour growth rates, as the two rates can be quite different.

A preferable and acceptable reference document for estimating traffic growth rates is the Transfund New Zealand Research Report No. 205, published in 2001 ("Report No. 205").

To estimate daily traffic growth, the procedure outlined in Report No. 205 indicates that if there are four or more data points in the last six years, then the equation of best fit should be plotted (using linear regression, with the slope being the annual arithmetic change in vehicles per year). The annual growth per annum as a percentage can then be calculated from the line of best fit. This procedure has been followed and the details of the analyses for each site are provided in **Appendix A**.

By way of summary, the annual growth rates for each of the sites are shown in Table 2.



Monday, 17 August 2009  
6 St Lukes Rd  
Zoom: MOTIAT

Westfield St Lukes Shopping Centre Development  
URS Response : Traffic Count Locations

Traffic Design Group **1**  
SCALE: NTS

| Site             | Location                | 5day-ADT growth | 7day-ADT growth | Saturday growth |
|------------------|-------------------------|-----------------|-----------------|-----------------|
| Balmoral Road    | West of St Andrews      | -1.9%           | -1.9%           | -2.9%           |
| Dominion Road    | North of Landscape      | -3.7%           | -4.2%           | -6.3%           |
| New North Road   | East of Western Springs | -2.6%           | -2.4%           | -2.0%           |
| Mt Eden Road     | North of Balmoral       | -0.4%           | -0.3%           | -0.3%           |
| St Lukes Road    | South of Asquith        | -0.6%           | -0.9%           | -2.1%           |
| Sandringham Road | North of Balmoral       | -4.0%           | -3.7%           | -2.6%           |

**Table 2: Average Daily Traffic Growth Rates on Surrounding Roads**

As shown, daily traffic volumes on all of the roads around the St Lukes Centre are decreasing.

A further, more relevant analysis has been undertaken of peak hour and peak three-hour traffic volumes at the St Lukes Road site. As before, peak hour and three hour volumes have been factored accordingly to take account of seasonal variations.

| Year                     | PM Peak Hour | Saturday Peak Hour | PM Peak Three Hour | Saturday Peak Three Hour |
|--------------------------|--------------|--------------------|--------------------|--------------------------|
| 2003                     | 2750         | 2470               | 6750               | 7170                     |
| 2004                     | 2610         | 2530               | 7230               | 7430                     |
| 2005                     | 2570         | 2310               | 7110               | 6800                     |
| 2006                     | 2610         | 2630               | 7230               | 7600                     |
| 2007                     | 2550         | 2280               | 6890               | 6840                     |
| 2008                     | 2590         | 2200               | 7070               | 6350                     |
| Annual arithmetic growth | -27          | -51                | 20                 | -145                     |
| Growth rate (%)          | -1.1%        | -2.3%              | 0.3%               | -2.2%                    |

**Table 3: Peak Hour and Peak Three Hour Growth Rates on St Lukes Road**

As shown, weekday evening peak hour flows are experiencing negative growth of around -1.1% per annum, while Saturday peak hour flows have experience negative growth of -2.3% pa. Only the weekday evening peak three hour period shows any growth, of around 0.3% per annum.

The reasons for the generally negative growth in daily and peak hourly traffic flows in the vicinity of the shopping centre are varied and sometimes interactive, but are likely to include factors such as:

- increasing fuel prices and vehicle running costs
- increased use of public transport and other non-car modes
- bottlenecks on the wider road network that create capacity limits elsewhere, that influence traffic flows closer to the shopping centre.

On the basis of this analysis therefore, it would be illogical and inappropriate to apply a generic daily growth rate of 1.5% to the background traffic in the Paramics peak period models developed for assessing the St Lukes Plan Change application. Rather, given that most peak hour traffic growth in the vicinity of the shopping centre has been negative, the proposed adoption of +0.5% growth is considered appropriate, conservative and robust.

**Request: Confirmation is required on the exact connection point of the Exeter Road extension to Aroha Avenue and if not as shown in the Paramics plots the effect of the change on the Paramics results is to be advised.**

The original modelling undertaken was based on a concept design that involved a straight line connection between Aroha Avenue and the Exeter Road extension. Since that time the conceptual plans have been modified to show the connection point now being some 40m north of the bend on Aroha Avenue. Subsequent modelling has been carried out to test the effect of the realignment on traffic volumes using Aroha Avenue and the results are summarised in Table 4.

| Period   | Two-way traffic volume on Aroha Avenue |   |                           |
|----------|--|---|---------------------------|
|          | Surveyed                               | Future – straight alignment<br>(as per the ITA) | Future – realigned Exeter |
| PM       | 51                                     | 248   | 221                       |
| Saturday | 78                                     | 329   | 282                       |

Table 4: Change in Two-way volumes on Aroha Avenue

As can be seen, the modelling shows that with the Exeter / Aroha connection being offset as currently proposed, a decrease in traffic using Aroha Avenue is observed over the straight alignment scenario, due to the less direct routing. This layout also aligns with intentions to reduce traffic speeds on this link to appropriate levels for residential streets and for the future Exeter Road layout.

**Request: The latest Paramics models for the existing base and full development are to be supplied to enable any changes made as a result of TDG's work with SKM and the additional traffic surveys undertaken during the pm peak on Thursday 2 July 2009 to be assessed.**

These models have been supplied.

**Request: The Paramics plots show the retention of the current entrance off St Luke's Road adjacent to the bus stops, whereas within the ITA it is stated that this entrance is to be closed. Confirmation is required that the entrance is to be closed.**

The closure or otherwise of the St Luke's Road vehicular access point to the shopping centre is a measure that will be driven by the nature of development of the southern side of the shopping centre. At this point in time, it is anticipated that ultimately, the undercroft parking at the southern end of the centre will be in-filled, thereby removing the usefulness of vehicular access and egress at that point. In reality, it is expected that this is likely to occur during the later stages of redevelopment of the site.

Accordingly, and in order to take this eventuality into account in the modelling of the shopping centre, the future St Luke's frontage was modelled without this point of access / egress (retaining the link in the model but closed off / without traffic flows). This then produces a situation where the shopping centre traffic that would otherwise use this point of access / egress has been assigned to the other driveways and network connections that serve the shopping centre, thereby providing a worst case scenario when assessing the overall road network effects of the proposal, particularly with regard the assignment of new traffic flows to the Exeter Road connections.

Hence, the short answer to the request above, is that yes, the entrance will ultimately likely be closed, but only at the later stages of redevelopment of the site.

### **Section 5.3 of the URS request, Integrated Transport Assessment**

***Request: Please provide schemes showing how capacity can be improved if required as a result of monitoring of previously advised intersections.***

It is considered that this request is unreasonable and unwarranted, bearing in mind that the model does not indicate any problems that require mitigation above those schemes already identified. As set out in the PPC, improvements are proposed to the following network links / intersections at various development stages:

- St Lukes Road / Morningside Drive (additional lane onto south-western approach)
- Morningside Drive / Exeter Road (introduce traffic signals)
- Extend Exeter Road into Aroha Avenue
- Aroha Avenue traffic management measures.

These schemes are necessary to improve transportation accessibility and mitigate the effects of the development on the surrounding street network.

### **Section 5.4 of the URS request, Service Lane Parallel to St Luke's Road**

***Request: Please provide details of the hours of use and any other proposed conditions for vehicle use of the proposed service lane parallel to the frontage of the centre along St Luke's Road and partway along the northwest Morningside Drive frontage to ensure that there is no conflict with pedestrians accessing the centre and utilising the active edges.***

At this Plan Change stage, detailed plans of the nature and operation of servicing arrangements for the site do not exist. Details of the design and operation of a service lane along the St Luke's Road frontage would be addressed with a resource consent application, at which time assessment criterion D3.3(c) would apply:

*"Any service lane proximate to Interface Type D is designed as a pedestrian oriented, at-grade lane providing a high level of pedestrian amenity while allowing for occasional use by small service vehicles"*

### **Section 5.5 of the URS request, Exeter Road Connection to Aroha Avenue**

***Request: Please advise whether the access off Exeter Road to this ground level car parking area [southeast of Exeter Road] also provides access to these three basement levels of car parking.***

At this Plan Change stage, detailed internal design has not yet been undertaken. Details regarding on-site circulation would be defined at the resource consent stages of development at which time proposed assessment criteria in rules D1 and D2 will apply.

In this regard however, it is noted that it is likely that access will be provided as queried, and the modelling has assumed this. Linking up the car parks internally is standard Westfield practice and generally also provides the best balance for the road network, as traffic can re-route better to avoid delays and provide directional flexibility.

***Request: Please provide plans showing how the concept design will work for the two lane exit into Exeter Road at the top of the development as the Paramics future model shows two lanes exiting the car park (left and right turns). The Paramics model shows only 60 meters into the car park but queuing extends beyond this.***

At this Plan Change stage, detailed internal design has not yet been undertaken. Details regarding on-site circulation and lane arrangements would be defined at the resource consent stages of development at which time the proposed assessment criteria in rules D1 and D2 will apply.

In this regard however, it is noted that width for a separate left turn and a right turn exiting onto Exeter Road is intended to be provided. This will be accommodated without reducing the pedestrian amenity / footpath widths in this area.

As per the Paramics model, the Exeter Road / car park access intersection will be designed so that turns left out into Exeter Road and right into the car park access receive priority. This will be reinforced by road design and signage, and ensure that Exeter Road is less attractive as a through link (or for traffic turning left into the car park or right out).

Exeter Road will also be designed as a traffic-calmed, pedestrian-friendly street. This will ensure slow speeds and may encourage some car parking traffic to instead use more direct routes into the development car parking.

It is accepted that some queuing may occur during peak times. This is a standard situation in any large shopping centre, with the effects contained within the site. Internal design, undertaken at the resource consent stage, will ensure that these internal effects are appropriately minimised.

## **Section 5.6 of the URS request, Parking**

***Request: Details are required of the measures intended by Westfield St Luke's under the plan change to ensure workers do not park on the surrounding local streets.***

At this Plan Change stage, detailed parking management measures have not yet been defined. Details regarding on-site and off-site parking management would be defined at the resource consent stages of development at which time the assessment criteria in proposed rule D1 will apply. Criterion D1(a)(i) is particularly relevant.

In this regard however, it is noted that the parking rates proposed for the PPC in the ITA report were devised based on previous Concept Plan rates and parking occupancy surveys. With a proposed parking rate for new areas of 1:22 sqm GFA (being slightly higher than the current effective rate), the parking will better provide for staff demands.

Improved TDM measures would also assist in reducing the amount of staff travel to the site by private car. As set out in the ITA, parking provision, especially for staff, is a balance between addressing concerns regarding off-site parking, and the provision of a degree of parking restraint consistent with Auckland City and Auckland Regional transportation policies.

Measures that could be implemented as part of any expansion of the shopping centre include the provision of some on-site parking for staff, with a proportion of that parking to be used as car pooling spaces, to be used only for ride sharing with two or more people per car.

It should be noted that parking on streets surrounding town centres and shopping centres is common and to be expected. If this becomes a concern in residential area there are measures available to Councils, such as resident permit parking, to address the issue.

***Request: Confirmation is required that the distribution to the carparks, especially the new ones, and the streets servicing them can accommodate the associated traffic and where relevant any turning movements i.e. Exeter Road, Morningside Drive and Cornwallis Street.***

At this Plan Change stage, detailed parking area designs and parking allocations have not yet been defined. Details regarding design and access capacity would be defined at the resource consent stages of development at which time the assessment criteria in proposed rule D1 will apply.

In this regard however, it is noted that the modelling confirms that for the proposed development concept, the car park access points to the road network, and the streets that feed from those access points can, with the mitigation measures that have been identified, accommodate the traffic demands that are anticipated.

***Request: Confirmation is required that the volume of traffic using Exeter Road and the proposed extension to Aroha Avenue for ingress to/egress from the retained and new carparks off Exeter Road “fits” the proposed use of the street e.g. Exeter Road is intended to become a pedestrian friendly main street.***

The Saturday peak hour modelling establishes that Exeter Road, west of the car park access, will accommodate approximately 1,400 vehicles per hour (both directions). Traffic flows east of the car park access will be significantly lower. To assess pedestrian amenity (crossing over Exeter Road), reference is made to the “Pedestrian Planning and Design Guide” - Land Transport New Zealand, 2007, Figure 6.2 – (interrupted flow, due to the signals at Exeter Road / Morningside Drive).

It should also be noted that the high vehicle flows quoted represent peak traffic conditions, and outside of these hours there would be considerably less traffic, leading to a general improvement in pedestrian amenity.

This reference suggests that if Exeter Road - while shown in the concept plans without a median – is provided with a median of at least 1.5m effective width to assist pedestrian crossing movements, good pedestrian amenity will be possible. This would not be designed as a classical raised and kerbed median, but would instead have short sections of low planting beds / tree planters alternating with informal median crossing locations (at grade to the feature paving of the street). This would break up the crossing movement and reduce delay (and associated safety issues) to less than 10 seconds, allowing the street to operate with a pedestrian service level of B, “very good”.

There are numerous examples in Auckland where vehicles and pedestrians can ‘share’ the same road space in a manner that ensures appropriate and acceptable levels of pedestrian safety and amenity. Examples include the access to the Eastern Viaduct, Elliott Street and High Street (Auckland CBD), and Nuffield Street (Newmarket).

There is no question that a pedestrian-friendly environment will be achievable even with the car parking traffic that Exeter Road will also have to accommodate. Design details will be resolved at resource consent stage when the proposed assessment criteria in Rules D1 and D2 will apply.

***Request: Please provide comments on the suitability of a reduction in the proposed carpark ratios with each stage in conjunction with the TMA being established and the change to alternative modes of both customers and staff being encouraged e.g. mini bus shuttle from the Morningside train station especially during public holidays and the lead up to Christmas, bus services etc.***

Westfield does not consider a reduction of the proposed car parking ratios as realistic in light of the concerns by local residents regarding displaced car parking in case of under provision, and in light of uncertainties surrounding public transport provisions and uptake. In regards to public transport, Westfield has no influence over a wide range of factors influencing uptake, including:

- Road congestion in the network (outside of the local area intersections)
- Fuel prices and public transport ticket prices
- Frequency and service routing of bus and rail services
- Physical quality of rail stations, bus stations and buses / trains themselves.

The above factors significantly affect the likelihood of customers arriving at the centre by public transport, and as noted, are out of Westfield's ability to influence. Linking Westfield's ability to expand the centre (in terms of car parking or activity area) to such parameters would therefore be onerous and remove any planning certainty.

It is also important to acknowledge that the viability of a shopping centre is directly linked to the availability of car parking for customers. If parking is under-provided for, then this will put at risk the substantial investment that goes into developing a major shopping centre.

In any regard, there is no information that we are aware of that correlates retail parking restraint with a shift in travel mode. In effect, a constraint in parking at the St Luke's Shopping Centre will have its main impact at around midday on Saturdays, when peak parking demands occur. At this time (as has been experienced at the shopping centre in the past) restricted parking will have as its main effect the generation of on-site and off-site congestion. Retail parking restraint will have no real effect during weekday evening commuter traffic times, as these times do not generate parking peaks of similar intensity.

Nevertheless, it is understood that Westfield is willing to work with Council and ARTA to develop ongoing strategies for improving public transport accessibility for the site as set out in the ITA and in other parts of this response.

***Request: Please provide a scheme for the proposed layout of the carparks and internal circulation. (If not designed correctly it will result in blockages and queuing that could spill over into the adjacent streets). Plans are required showing how queues exiting the car park on Morningside Road will operate i.e. no parking within the queuing area.***

This is very clearly not a Plan Change issue, but is a matter that would be dealt with during the resource consent stages of development. Westfield has not carried out this level of design. During the resource consent stage, the proposed assessment criteria in Rule D1 will apply.

The internal layout shown on the Development Plan that forms part of the application is indicative only at this stage of the planning process. Fixing the layout to a greater degree than defined in the proposed PPC would not be conducive to a good design outcome.

Westfield and TDG have significant experience in designing and managing car parking operations, and have in the past cooperated positively with Council during the resource consent stage to ensure that site-related operation is acceptable. For information purposes, potential options which may be considered for Westfield St Luke's for managing the possibility of queues include:

- signage which clearly directs customers to the various access and egress points
- restricting access of "side road" car park aisles onto the main access car park aisles near the road boundary
- carefully managing parking design in relation to main access aisles

- provision of sufficient queue storage inside the site, by providing extra queue length or extra queue lanes (without restricting pedestrian provisions)
- provision of adequate ramps and other dispersal routes within the car park
- “metering” traffic at internal locations via signals for example
- discouraging the use of some access routes via traffic calming
- reserving some parking areas for specific uses or limited parking durations only.

As noted, the list above sets out potential options only, but shows that methods exist to manage such effects. In summary, it is therefore not considered necessary to provide more detailed plans for internal car park layouts at this Plan Change stage, when these areas are still likely to change significantly as a result of urban design, structural design, retail planning and other disciplines.

Furthermore, the resource consent stage will provide Council with the ability to approve or require modification of the proposed layouts, and the review process will ensure that the layouts perform as designed in practice or are required to be improved.

### **Section 5.7 of the URS request, Public Transport**

***Request: Please provide the following: A schedule for the actions Westfield St Lukes will take to encourage bus patronage and improved bus services.***

***Further details on the types of infrastructure that should be provided to encourage use of public transport e.g. way finding signage and real-time passenger transport information both inside and outside the complex, attractive routes to and waiting facilities at the stops for passengers etc.***

Westfield considers that the provision and improvement of bus / train services and frequencies is primarily a function and responsibility of Council and ARTA. However it is considered that the following measures could be investigated at resource consent stage:

- integration of the centre’s new and upgraded pedestrian accesses with existing and future public transport stops as far as reasonably possible
- pedestrian accesses as per Rule D3.5(f):
 

*“Where pedestrian entrances are near public transport stops, they allow easy, direct and safe access into the centre and are lined by active uses.”*
- public transport timetables and information (including dynamic departure signage for bus and train services if provided) at convenient locations within the centre, in cooperation with ARTA
- way finding signage and centre / surrounding area maps at convenient locations within the centre, showing directions to nearby public transport stops
- a Travel Plan as per Rule D1(c) that encourages public transport use by staff and customers.

Such measures, as well as the general pedestrian improvements for the centre, would help to ensure that public transport is well integrated with the shopping centre.

In relation to the encouragement of public transport use, it is noted that the proposed assessment criterion in Rule D1(c) will apply at resource consent stage.

***Request: Please provide the following: Comment on the location and distance of the Morningside railway station from Westfield St Luke's and the limited number of circular bus routes servicing Westfield St Lukes.***

As noted in the ITA, the extension of the centre to the north will reduce the walking distance to the Morningside Train Station by approximately 200m from 1,000m to 800m for the nearest main entry to the extended centre. While the total distance is still outside of the ideal range for a rail connection of a shopping centre, this is not something that Westfield can influence. It is suggested that Council utilise development contributions from Westfield St Lukes to improve the pedestrian links to and from the train station, providing wider footpaths, improved street lighting and better side road crossing provisions at least on one side of Morningside Drive.

Regarding the low number of circular bus routes servicing the centre, Westfield would welcome improved access / services to be provided by ARTA.

### **Section 5.8 of the URS request, Travel Plan**

***Request: Please provide details of the deliberations on the way to include the requirement for Westfield to develop a travel plan for their St Lukes centre and set appropriate targets for change in transport mode used by staff and shoppers into the plan change.***

The details of a Travel Plan for the shopping centre will be addressed at the resource consent stages of development, in accordance with proposed Rule D1(c)

Development of a travel plan (or the provision of details) for a shopping centre development for which development details have yet to be defined, and which may not occur for several years, is considered premature. At the resource consent stage, the types of measures that would be considered, depending on the scale of a development proposal, include:

- All new staff (both centre management and tenant) to be provided with a travel plan induction pack (timetables, cycling maps, ridesharing information and similar) upon starting work at the centre
- making travel plan information (maps, timetables, dynamic departure signage and similar) accessible to staff and in public (customer) locations
- working with Council and ARTA to investigate the feasibility of a local area shopper bus service, which could also include or be supplemented with a shuttle bus service to the Morningside Train Station
- provision of casual cycle parking spaces for customers (see next section)
- provision of secure cycle parking areas for staff (see next section)
- provision of scooter / motorcycle spaces
- provision of staff car parking areas, including car pool / ridesharing spaces.

***Request: Further consideration is required into how to move more staff and visitors to St Lukes from private cars into public transport and other transport modes, especially with nearly 65% of shoppers living within a radius of 5kms.***

The response provided in the previous section regarding the provision of a travel plan addresses this question. This would be addressed at resource consent stage when responding to the proposed assessment criterion in Rule D1(c).

This is a factor relevant to every single business activity in the region. Increased public transport and active mode usage depends primarily on the facilities and level of service provided by Council and ARTA, over which Westfield has no influence. Westfield would

welcome the use of the development contributions that will be paid for future centre expansion for measures such as the upgrade of public transport stops and similar facilities.

#### **Section 5.9 of the URS request, Cyclists**

**Request: Please provide a summary of access, secure storage and showering facilities to be provided for workers at Westfield St Lukes who want cycle to work.**

This is another matter that is clearly not relevant to this Plan Change stage, but rather is a matter to be addressed during the resource consent stages. Reference is made to the proposed assessment criteria in Rule D1

**Request: Please provide a summary of access and storage facilities to be provided for customers of Westfield St Lukes who want to cycle to the facility.**

This is another matter that is clearly not relevant to this Plan Change stage, but rather is a matter to be addressed during the resource consent stages. Reference is made to proposed Rule D1.

#### **Section 5.10 of the URS request, Mitigation Triggers**

**Request: Please provide details of the proposed triggers for construction of the following road works based on the traffic effects of the proposed staging of the development and the type of development undertaken in each stage.**

Proposed triggers for staging of road works are provided in proposed Rule C1.

**Request: Please provide some proposed triggers for providing improved facilities to better accommodate PT, cycling and walking.**

There are no triggers in the PPC that relate specifically to PT, cycling or walking. However, specific criteria in proposed Rule D1 do address this matter.

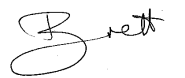
PT, cycling and walking facilities will be improved in line with the staging of the development in general, - i.e. as the physical structures they are situated in or adjacent to are being developed, footpaths will be provided where roads or frontages are redeveloped, internal pedestrian connections through buildings or car parks will be provided as part of the building / car park construction or redevelopment and so on.

As is apparent, many of the matters that have been raised in the request for further information are matters that are not relevant to the proposed Plan Change, but are rather matters that would be considered during the resource consent stages of development; and/or are matters for which proposed rules in the proposed Plan Change address the matters that have been raised. We trust however, that the comments provided above adequately and appropriately address the issues that have been raised. We would be happy to elaborate on any of the above as may be required.

Yours faithfully  
**Traffic Design Group Ltd**



Daryl Hughes  
**Associate**



/ Brett Harries  
**/ Managing Director**

Attach: Figure 1

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## Appendix A

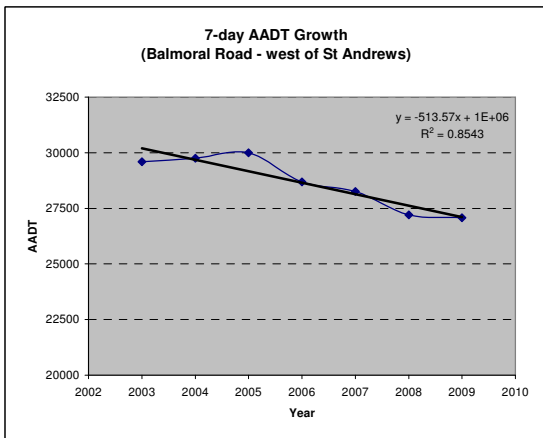
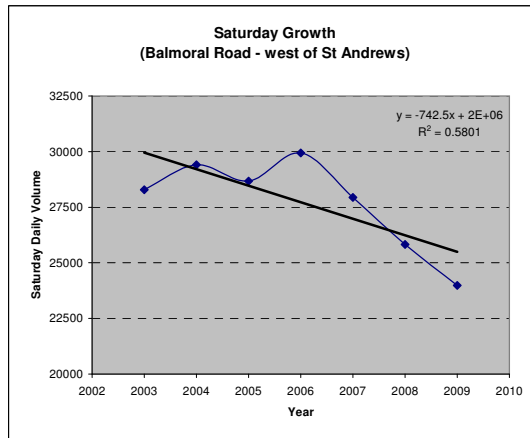
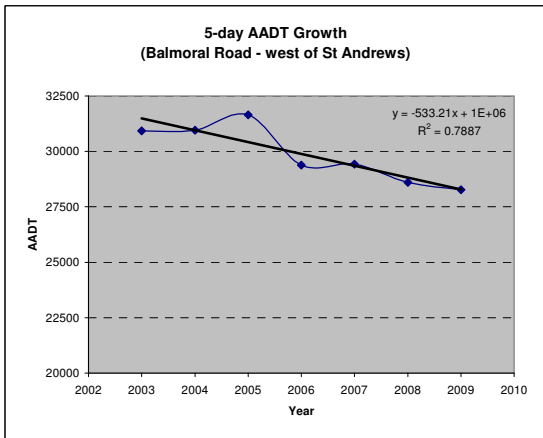
### Growth Rate Graphs

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**Balmoral Road  
West of St Andrews**

| Date       | Dir | 5d_ADT | 7d_ADT | Sat   | Sun   | AM   | MD   | PM   |
|------------|-----|--------|--------|-------|-------|------|------|------|
| 30/11/2003 | EBD | 15864  | 15231  | 14626 | 12671 | 1268 | 1120 | 1317 |
| 30/11/2003 | WBD | 16356  | 15589  | 14834 | 12511 | 1054 | 1211 | 1859 |
| 28/11/2004 | EBD | 16074  | 15478  | 15570 | 12402 | 1244 | 1255 | 1371 |
| 28/11/2004 | WBD | 16177  | 15507  | 15067 | 12597 | 1016 | 1183 | 1803 |
| 23/10/2005 | EBD | 14600  | 13932  | 13684 | 10837 | 1265 | 1091 | 1143 |
| 23/10/2005 | WBD | 15175  | 14286  | 13291 | 10833 | 1002 | 1078 | 1731 |
| 5/11/2006  | EBD | 14674  | 14321  | 15005 | 11872 | 1281 | 1134 | 1118 |
| 5/11/2006  | WBD | 14446  | 14111  | 14665 | 11881 | 984  | 1131 | 1494 |
| 25/11/2007 | EBD | 15023  | 14316  | 13844 | 11254 | 1329 | 1146 | 1178 |
| 25/11/2007 | WBD | 14814  | 14337  | 14497 | 11790 | 1154 | 1200 | 1468 |
| 30/11/2008 | EBD | 14492  | 13813  | 13287 | 10943 | 1182 | 998  | 1178 |
| 30/11/2008 | WBD | 15300  | 14521  | 13623 | 11523 | 943  | 1060 | 1796 |
| 1/03/2009  | EBD | 14159  | 13525  | 12246 | 11634 | 1109 | 1030 | 1108 |
| 1/03/2009  | WBD | 14811  | 14218  | 12321 | 13149 | 977  | 1106 | 1595 |

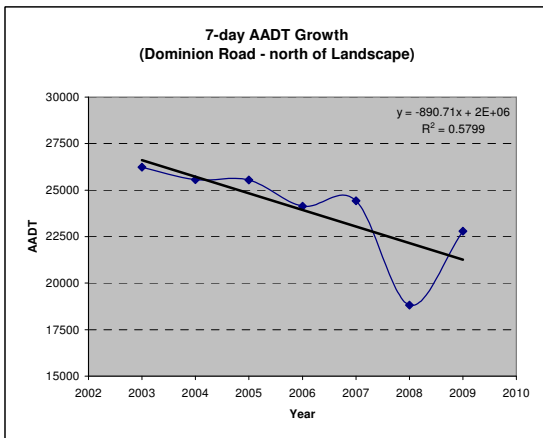
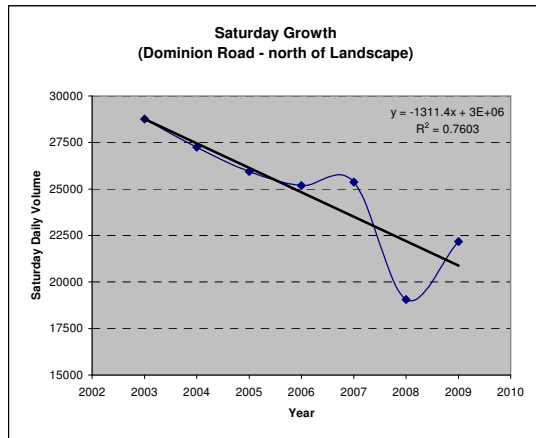
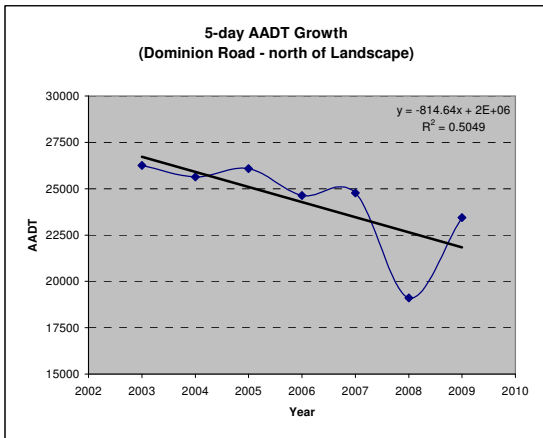
| Date       | Dir  | 5d_ADT | 7d_ADT | Sat   | Sun   | AM   | MD   | PM   | 1b1      |      |        |        | Adjusted |           |        |       |       |
|------------|------|--------|--------|-------|-------|------|------|------|----------|------|--------|--------|----------|-----------|--------|-------|-------|
|            |      |        |        |       |       |      |      |      | Int/Peak | Week | Factor | StdDev | Year     | 5d_ADT    | 7d_ADT | Sat   |       |
| 30/11/2003 | Both | 32220  | 30820  | 29460 | 25182 | 2322 | 2331 | 3176 | 0.73     | 49   | 0.96   | 0.056  | 2003     | 30930     | 29590  | 28280 |       |
| 28/11/2004 | Both | 32251  | 30985  | 30637 | 24999 | 2260 | 2438 | 3174 | 0.77     | 49   | 0.96   | 0.056  | 2004     | 30960     | 29750  | 29410 |       |
| 23/10/2005 | Both | 29775  | 28218  | 26975 | 21670 | 2267 | 2169 | 2874 | 0.75     | 44   | 1.063  | 0.096  | 2005     | 31650     | 30000  | 28670 |       |
| 5/11/2006  | Both | 29120  | 28432  | 29670 | 23753 | 2265 | 2265 | 2612 | 0.87     | 45   | 1.009  | 0.075  | 2006     | 29380     | 28690  | 29940 |       |
| 25/11/2007 | Both | 29837  | 28653  | 28341 | 23044 | 2483 | 2346 | 2646 | 0.89     | 48   | 0.986  | 0.066  | 2007     | 29420     | 28250  | 27940 |       |
| 30/11/2008 | Both | 29792  | 28334  | 26910 | 22466 | 2125 | 2058 | 2974 | 0.69     | 49   | 0.96   | 0.056  | 2008     | 28600     | 27200  | 25830 |       |
| 1/03/2009  | Both | 28970  | 27743  | 24567 | 24783 | 2086 | 2136 | 2703 | 0.79     | 10   | 0.976  | 0.051  | 2009     | 28270     | 27080  | 23980 |       |
|            |      |        |        |       |       |      |      |      |          |      |        |        |          | Est'd     | 28288  | 27111 | 25494 |
|            |      |        |        |       |       |      |      |      |          |      |        |        |          | Ann arith | -533   | -514  | -743  |
|            |      |        |        |       |       |      |      |      |          |      |        |        |          | Growth    | -1.9%  | -1.9% | -2.9% |



**Dominion Road  
North of Landscape**

| Date       | Dir | 5d_ADT | 7d_ADT | Sat   | Sun   | AM   | MD   | PM   |
|------------|-----|--------|--------|-------|-------|------|------|------|
| 25/05/2003 | NBD | 12545  | 12464  | 13733 | 11191 | 968  | 1068 | 950  |
| 25/05/2003 | SBD | 13019  | 13081  | 14279 | 12190 | 650  | 1032 | 1175 |
| 25/07/2004 | NBD | 12439  | 12345  | 13118 | 11100 | 1039 | 982  | 874  |
| 25/07/2004 | SBD | 12647  | 12677  | 13541 | 11965 | 559  | 998  | 1166 |
| 20/02/2005 | NBD | 13359  | 12999  | 13030 | 11173 | 1110 | 937  | 804  |
| 20/02/2005 | SBD | 13320  | 13128  | 13492 | 11807 | 574  | 969  | 1226 |
| 6/08/2006  | NBD | 11961  | 11654  | 12069 | 9703  | 1047 | 922  | 797  |
| 6/08/2006  | SBD | 12261  | 12080  | 12688 | 10566 | 568  | 978  | 1154 |
| 19/03/2007 | NBD | 12412  | 12202  | 12750 | 10607 | 1151 | 928  | 884  |
| 19/03/2007 | SBD | 12613  | 12473  | 12876 | 11374 | 594  | 923  | 1139 |
| 3/11/2008  | NBD | 9259   | 9040   | 9014  | 7968  | 775  | 582  | 570  |
| 3/11/2008  | SBD | 9678   | 9613   | 9876  | 9021  | 417  | 628  | 836  |
| 12/02/2009 | NBD | 11663  | 11321  | 11049 | 9884  | 1046 | 834  | 769  |
| 12/02/2009 | SBD | 12038  | 11724  | 11380 | 10502 | 579  | 847  | 1194 |

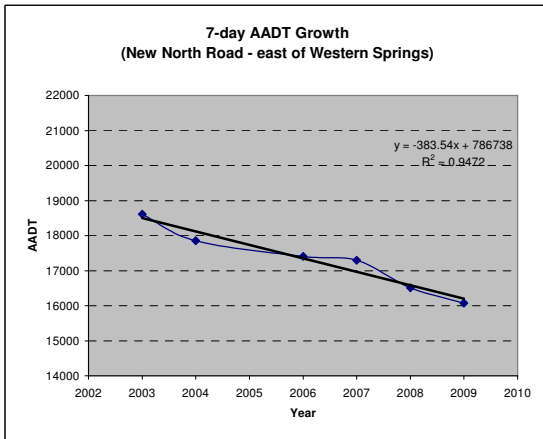
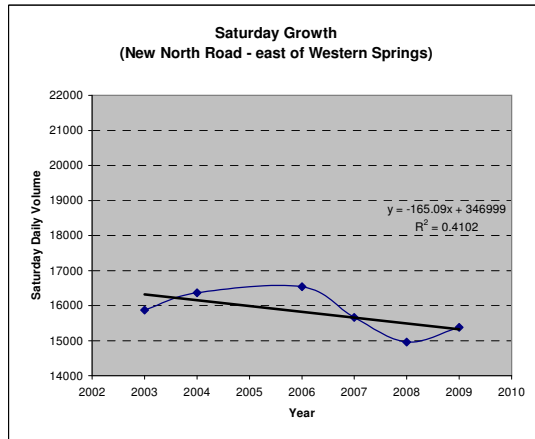
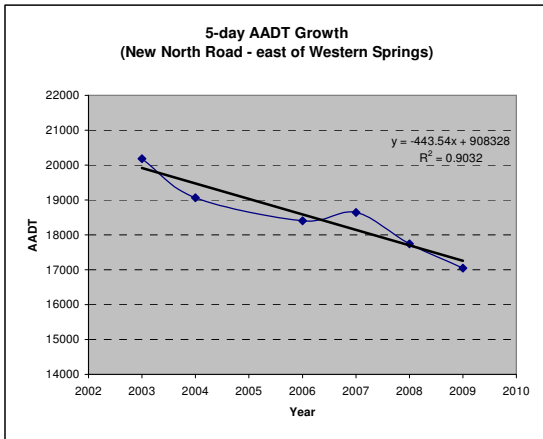
| Date       | Dir  | 5d_ADT | 7d_ADT | Sat   | Sun   | AM   | MD   | PM   | 1b1  | Week | Factor | StdDev | Year | 5d_ADT    | Adjusted 7d_ADT | Sat   |       |
|------------|------|--------|--------|-------|-------|------|------|------|------|------|--------|--------|------|-----------|-----------------|-------|-------|
| 25/05/2003 | Both | 25564  | 25545  | 28012 | 23381 | 1618 | 2100 | 2125 | 0.99 | 22   | 1.027  | 0.079  | 2003 | 26250     | 26230           | 28770 |       |
| 25/07/2004 | Both | 25086  | 25022  | 26659 | 23065 | 1598 | 1980 | 2040 | 0.97 | 31   | 1.022  | 0.066  | 2004 | 25640     | 25570           | 27250 |       |
| 20/02/2005 | Both | 26679  | 26127  | 26522 | 22980 | 1684 | 1906 | 2030 | 0.94 | 9    | 0.978  | 0.047  | 2005 | 26090     | 25550           | 25940 |       |
| 6/08/2006  | Both | 24222  | 23734  | 24757 | 20269 | 1615 | 1900 | 1951 | 0.97 | 32   | 1.017  | 0.062  | 2006 | 24630     | 24140           | 25180 |       |
| 19/03/2007 | Both | 25025  | 24675  | 25626 | 21981 | 1745 | 1851 | 2023 | 0.91 | 12   | 0.99   | 0.058  | 2007 | 24770     | 24430           | 25370 |       |
| 3/11/2008  | Both | 18937  | 18653  | 18890 | 16989 | 1192 | 1210 | 1406 | 0.86 | 45   | 1.009  | 0.075  | 2008 | 19110     | 18820           | 19060 |       |
| 12/02/2009 | Both | 23701  | 23045  | 22429 | 20386 | 1625 | 1681 | 1963 | 0.86 | 7    | 0.989  | 0.061  | 2009 | 23440     | 22790           | 22180 |       |
|            |      |        |        |       |       |      |      |      |      |      |        |        |      | Est'd     | 21832           | 21261 | 20887 |
|            |      |        |        |       |       |      |      |      |      |      |        |        |      | Ann arith | -815            | -891  | -1311 |
|            |      |        |        |       |       |      |      |      |      |      |        |        |      | Growth    | -3.7%           | -4.2% | -6.3% |



**New North Road  
East of Western Springs**

| Date       | Dir | 5d_ADT | 7d_ADT | Sat  | Sun  | AM   | MD  | PM   |
|------------|-----|--------|--------|------|------|------|-----|------|
| 19/10/2003 | EBD | 10376  | 9573   | 8349 | 6781 | 1165 | 655 | 581  |
| 19/10/2003 | WBD | 9314   | 8585   | 7519 | 6003 | 435  | 660 | 1376 |
| 12/08/2004 | EBD | 9966   | 9335   | 8594 | 6924 | 1154 | 652 | 650  |
| 12/08/2004 | WBD | 8887   | 8325   | 7775 | 6063 | 294  | 657 | 951  |
| 17/08/2006 | EBD | 9743   | 9147   | 8653 | 6662 | 1260 | 691 | 609  |
| 17/08/2006 | WBD | 8459   | 8069   | 7886 | 6301 | 343  | 704 | 1099 |
| 9/03/2007  | EBD | 10125  | 9405   | 8427 | 6785 | 1158 | 596 | 559  |
| 9/03/2007  | WBD | 8974   | 8325   | 7232 | 6171 | 547  | 604 | 1105 |
| 12/11/2008 | EBD | 9554   | 8922   | 8037 | 6651 | 1107 | 606 | 475  |
| 12/11/2008 | WBD | 8698   | 8063   | 6920 | 6030 | 345  | 577 | 1033 |
| 23/02/2009 | EBD | 9354   | 8827   | 8384 | 6632 | 1105 | 610 | 534  |
| 23/02/2009 | WBD | 8084   | 7605   | 6994 | 5824 | 316  | 561 | 1111 |

| Date       | Dir  | 5d_ADT | 7d_ADT | Sat   | Sun   | AM   | MD   | PM   | 1b1 Int/Peak | Week | Factor | StdDev | Year | 5d_ADT    | 7d_ADT | Sat   | Adjusted |  |
|------------|------|--------|--------|-------|-------|------|------|------|--------------|------|--------|--------|------|-----------|--------|-------|----------|--|
| 19/10/2003 | Both | 19690  | 18158  | 15868 | 12784 | 1600 | 1315 | 1957 | 0.67         | 43   | 1.025  | 0.057  | 2003 | 20180     | 18610  | 16260 |          |  |
| 12/08/2004 | Both | 18853  | 17660  | 16369 | 12987 | 1448 | 1309 | 1601 | 0.82         | 33   | 1.011  | 0.046  | 2004 | 19060     | 17850  | 16550 |          |  |
| 17/08/2006 | Both | 18202  | 17216  | 16539 | 12963 | 1603 | 1395 | 1708 | 0.82         | 33   | 1.011  | 0.046  | 2006 | 18400     | 17410  | 16720 |          |  |
| 9/03/2007  | Both | 19099  | 17730  | 15659 | 12956 | 1705 | 1200 | 1664 | 0.72         | 10   | 0.976  | 0.051  | 2007 | 18640     | 17300  | 15280 |          |  |
| 12/11/2008 | Both | 18252  | 16985  | 14957 | 12681 | 1452 | 1183 | 1508 | 0.78         | 46   | 0.972  | 0.057  | 2008 | 17740     | 16510  | 14540 |          |  |
| 23/02/2009 | Both | 17438  | 16432  | 15378 | 12456 | 1421 | 1171 | 1645 | 0.71         | 9    | 0.978  | 0.047  | 2009 | 17050     | 16070  | 15040 |          |  |
|            |      |        |        |       |       |      |      |      |              |      |        |        |      | Estd      | 17255  | 16205 | 14873    |  |
|            |      |        |        |       |       |      |      |      |              |      |        |        |      | Ann arith | -444   | -384  | -303     |  |
|            |      |        |        |       |       |      |      |      |              |      |        |        |      | Growth    | -2.6%  | -2.4% | -2.0%    |  |

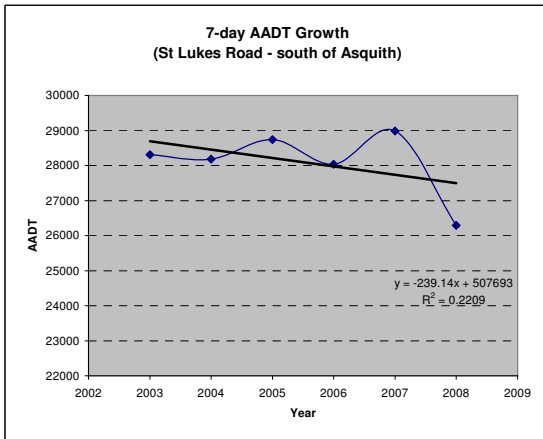
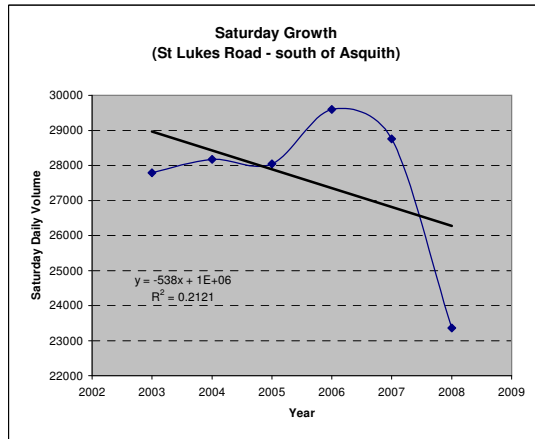
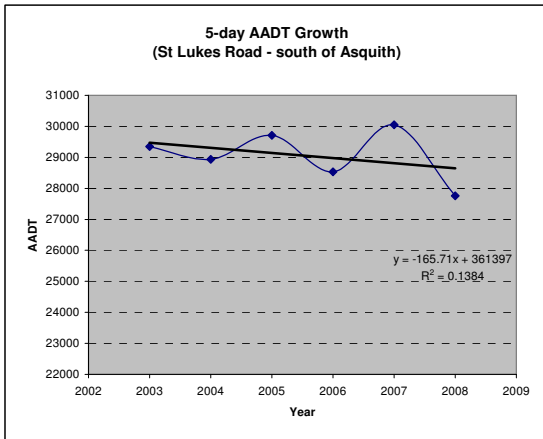




**St Lukes Road  
South of Asquith**

| Date       | Dir | 5d_ADT | 7d_ADT | Sat   | Sun   | AM   | MD   | PM   |
|------------|-----|--------|--------|-------|-------|------|------|------|
| 18/05/2003 | NBD | 14943  | 14288  | 13964 | 11875 | 1230 | 1301 | 1405 |
| 18/05/2003 | SBD | 14091  | 13715  | 13525 | 12026 | 932  | 1208 | 1320 |
| 1/08/2004  | NBD | 14537  | 14131  | 14188 | 12047 | 1097 | 1304 | 1322 |
| 1/08/2004  | SBD | 13918  | 13576  | 13512 | 11931 | 928  | 1176 | 1248 |
| 20/02/2005 | NBD | 15470  | 14865  | 14267 | 12442 | 1112 | 1208 | 1371 |
| 20/02/2005 | SBD | 14909  | 14521  | 14415 | 12684 | 956  | 1201 | 1252 |
| 15/05/2006 | NBD | 14264  | 13955  | 14626 | 11738 | 972  | 1258 | 1306 |
| 15/05/2006 | SBD | 13709  | 13537  | 14395 | 11819 | 885  | 1260 | 1251 |
| 9/03/2007  | NBD | 15463  | 14836  | 14641 | 11895 | 999  | 1241 | 1313 |
| 9/03/2007  | SBD | 15326  | 14863  | 14823 | 12589 | 991  | 1198 | 1296 |
| 28/07/2008 | NBD | 13325  | 12601  | 11140 | 10443 | 776  | 1055 | 1231 |
| 28/07/2008 | SBD | 13840  | 13122  | 11722 | 10932 | 891  | 1118 | 1305 |

| Date       | Dir  | 5d_ADT | 7d_ADT | Sat   | Sun   | AM   | MD   | PM   | 1b1 Int/Peak | Week | Factor | StdDev | Year | 5d_ADT           | 7d_ADT       | Sat          | Adjusted     |  |
|------------|------|--------|--------|-------|-------|------|------|------|--------------|------|--------|--------|------|------------------|--------------|--------------|--------------|--|
| 18/05/2003 | Both | 29034  | 28003  | 27489 | 23901 | 2162 | 2509 | 2725 | 0.92         | 21   | 1.011  | 0.057  | 2003 | 29350            | 28310        | 27790        |              |  |
| 1/08/2004  | Both | 28455  | 27707  | 27700 | 23978 | 2025 | 2480 | 2570 | 0.96         | 32   | 1.017  | 0.062  | 2004 | 28940            | 28180        | 28170        |              |  |
| 20/02/2005 | Both | 30379  | 29386  | 28682 | 25126 | 2068 | 2409 | 2623 | 0.92         | 9    | 0.978  | 0.047  | 2005 | 29710            | 28740        | 28050        |              |  |
| 15/05/2006 | Both | 27973  | 27492  | 29021 | 23557 | 1857 | 2518 | 2557 | 0.98         | 20   | 1.02   | 0.081  | 2006 | 28530            | 28040        | 29600        |              |  |
| 9/03/2007  | Both | 30789  | 29699  | 29464 | 24484 | 1990 | 2439 | 2609 | 0.93         | 10   | 0.976  | 0.051  | 2007 | 30050            | 28990        | 28760        |              |  |
| 28/07/2008 | Both | 27165  | 25723  | 22862 | 21375 | 1667 | 2173 | 2536 | 0.86         | 31   | 1.022  | 0.066  | 2008 | 27760            | 26290        | 23360        |              |  |
|            |      |        |        |       |       |      |      |      |              |      |        |        |      | <b>Estd</b>      | <b>28477</b> | <b>27255</b> | <b>25739</b> |  |
|            |      |        |        |       |       |      |      |      |              |      |        |        |      | <b>Ann arith</b> | <b>-166</b>  | <b>-239</b>  | <b>-538</b>  |  |
|            |      |        |        |       |       |      |      |      |              |      |        |        |      | <b>Growth</b>    | <b>-0.6%</b> | <b>-0.9%</b> | <b>-2.1%</b> |  |



**Sandringham Road  
South of Balmoral**

| Date       | Dir | 5d_ADT | 7d_ADT | Sat   | Sun  | AM   | MD  | PM   |
|------------|-----|--------|--------|-------|------|------|-----|------|
| 8/09/2002  | NBD | 9771   | 9455   | 9258  | 8072 | 1129 | 800 | 672  |
| 8/09/2002  | SBD | 9360   | 9034   | 8860  | 7582 | 423  | 712 | 1086 |
| 24/03/2005 | NBD | 10514  | 10209  | 10623 | 8273 | 1142 | 758 | 754  |
| 24/03/2008 | SBD | 10054  | 9735   | 9773  | 8098 | 455  | 754 | 1206 |
| 10/05/2006 | NBD | 10239  | 9847   | 9957  | 8166 | 1182 | 846 | 682  |
| 10/05/2006 | SBD | 9540   | 9243   | 9417  | 7880 | 439  | 732 | 1136 |
| 15/09/2008 | NBD | 7568   | 7475   | 7781  | 6709 | 893  | 461 | 448  |
| 15/09/2008 | SBD | 7161   | 7061   | 7298  | 6328 | 302  | 462 | 789  |

| Date       | Dir  | 5d_ADT | 7d_ADT | Sat   | Sun   | AM   | MD   | PM   | 1b1  | Week | Factor | StdDev | Year | 5d_ADT    | 7d_ADT | Sat   | Adjusted |  |
|------------|------|--------|--------|-------|-------|------|------|------|------|------|--------|--------|------|-----------|--------|-------|----------|--|
| 8/09/2002  | Both | 19131  | 18489  | 18118 | 15654 | 1552 | 1512 | 1758 | 0.86 | 37   | 1.025  | 0.063  | 2002 | 19610     | 18950  | 18570 |          |  |
| 24/03/2005 | Both | 20568  | 19944  | 20396 | 16371 | 1597 | 1512 | 1960 | 0.77 | 13   | 0.987  | 0.047  | 2005 | 20300     | 19680  | 20130 |          |  |
| 10/05/2006 | Both | 19779  | 19090  | 19374 | 16046 | 1621 | 1578 | 1818 | 0.87 | 19   | 1.023  | 0.099  | 2006 | 20230     | 19530  | 19820 |          |  |
| 15/09/2008 | Both | 14729  | 14536  | 15079 | 13037 | 1195 | 923  | 1237 | 0.75 | 38   | 1.021  | 0.061  | 2008 | 15040     | 14840  | 15400 |          |  |
|            |      |        |        |       |       |      |      |      |      |      |        |        |      | Estd      | 16340  | 16040 | 16846    |  |
|            |      |        |        |       |       |      |      |      |      |      |        |        |      | Ann arith | -655   | -589  | -436     |  |
|            |      |        |        |       |       |      |      |      |      |      |        |        |      | Growth    | -4.0%  | -3.7% | -2.6%    |  |

