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Anita Lange  
Manager of Special Projects,  
City of Port Phillip

Via email: [ALange@portphillip.vic.gov.au](mailto:ALange@portphillip.vic.gov.au)

Dear Anita,

**RE: Clarifying points of interest in the Triangle Site Development Economic and Community Impact Assessment**

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Following on from our conversation on Friday afternoon I have drafted this letter to provide some additional clarification around the issues we discussed.

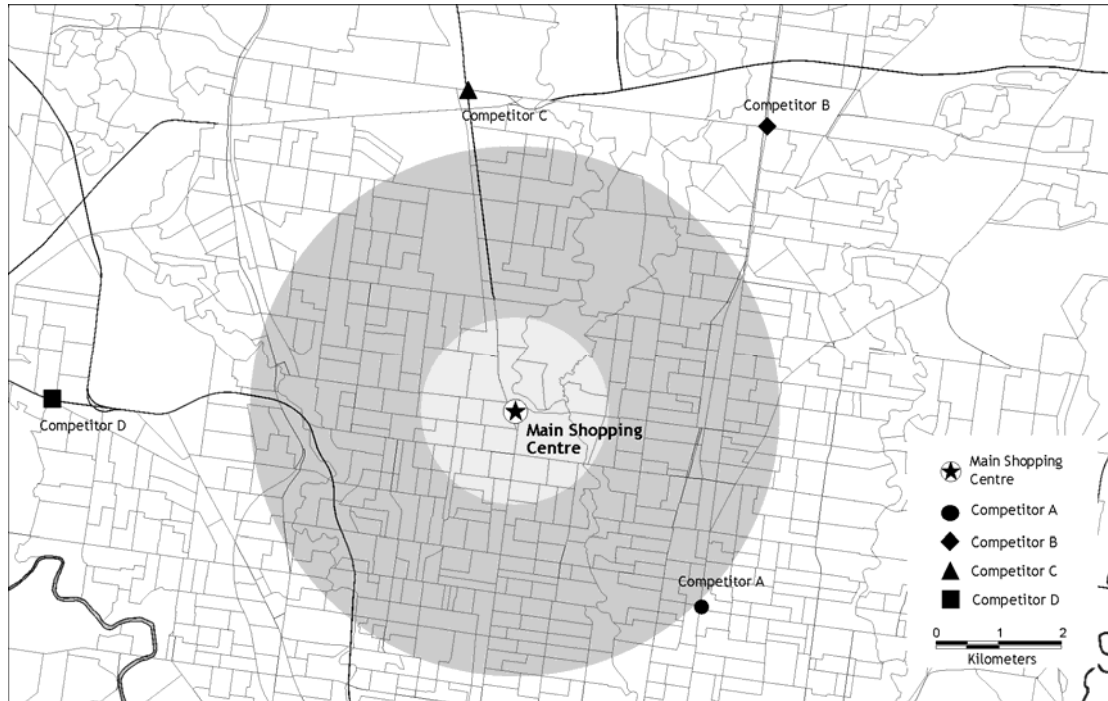
The first issues is related to the SGS Economics and Planning Retail Model. The Retail Model was developed around 5-6 years ago and has proved to be an invaluable tool in providing policy makers information on the potential impact of retail developments.

The model itself is a great advancement on the historical approach which was used heavily by retail analysts in the past. In the historical approach to retail analysis, a planner would usually define a shopping centre catchment by travelling out to the centre in question and asking shoppers where they live.

The primary catchment is then defined using a cordon that covers the majority of the survey respondents that are closest to the shopping centre. The process is then repeated with the remaining respondents to create a secondary catchment (see Figure 1).

However there are problems with the historical approach. The first problem with the historical approach is that the entire population throughout the catchment is assumed to have the same propensity to shop at the centre in question, which isn't necessarily true. Consider people living in the northern and southern parts of the secondary catchment. If there happens to be a shopping centre just to the south of the secondary catchment area then these two populations will have very different expenditure habits.

**Figure 1 – Catchment Definition using Historical Methodology**



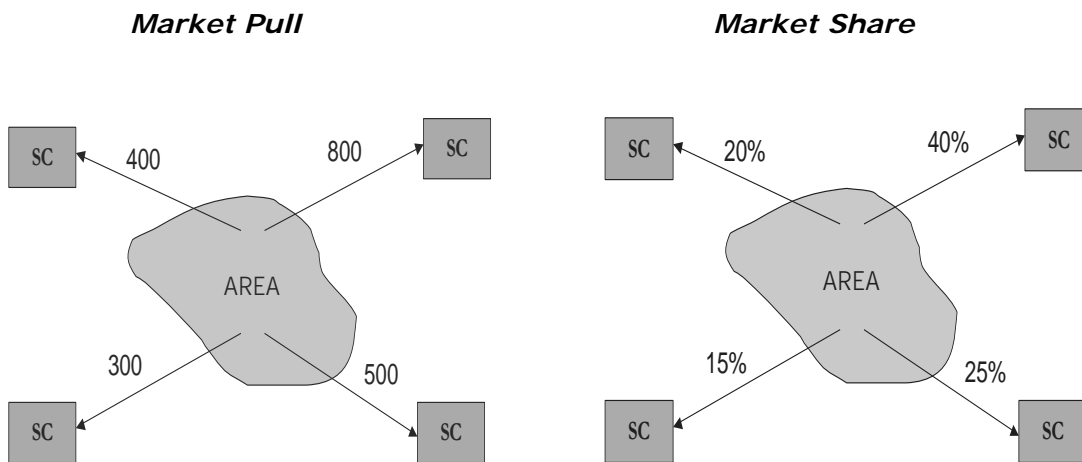
Another problem is that catchments are usually treated the same for every commodity group. In most cases the catchment for department store shopping in a retail centre will be very different for supermarket shopping, as people are more willing to travel much greater distances for clothes than they would for food. A third problem lies in trying to predict changes in shopping centre catchments as new retail centres are built. Survey questions probing intentions with respect to a new – as yet un-built – shopping centre are highly hypothetical and unreliable.

In an attempt to fix these problems Gravity Theory was brought into play. The gravity theory is based on Reilly's law from 1929 that states:

*“Two centres attract trade from intermediate places approximately in direct proportion to the size of the centres and in inverse proportion to the square of the distances from these centres to the intermediate place”*

Reilly's law was formulated to deal with the “evolving catchment” problem. By breaking up the study area into many small sections, the market share in each section can then be found by dividing the pull of the shopping centre in question by the total pull of every retail centre.

The main criticism of Reilly's law is it assumes the only feature that consumers consider is the size of the shopping centre. It does not take into account other attributes, such as entertainment complexes and product range.



At SGS Economics and Planning, we developed a Retail Model which improved on the gravity model by replacing Reilly's Law with Bates's Law. Bates's Law is:

$$P = k * F / t^2$$

where:

- P is the market pull,
- k is a variable representing the 'attractiveness' of a shopping centre for a particular commodity group,
- F is the floorspace (by commodity group), and
- t is the time it takes to travel to the shopping centre.

Each shopping centre is now compared using **real world data** by examining aspects of their relative attractiveness (e.g. turnover, rent levels, etc). Also notice that time has replaced distance as a factor. This is to account for consumers going to alternative shopping centres that are based along a major road or freeway.

Figure 2 represents the same catchment graph as Figure 1, but this time using Bates's Law. Each area is shaded according to the market share won by the Main Shopping Centre. Note that this catchment is not limited by any **arbitrary boundary**.

To predict future changes in catchment size, we can add the extra floorspace to be considered into the system and run the simulation again. By the use of careful surveys, it is also possible to find "attractiveness" indicators for each commodity group or shop type under study. Hence a shopping centre can be a great place to buy clothes, but a poor place to buy food goods. The new approach outlined above allows different catchments to be defined for different commodity groups for the one centre.

**Figure 2 – Catchment Definition using the SGS Retail Methodology**



The use of arbitrarily defined catchments in the current approach to retail modelling is flawed for a number of reasons. Assumptions are made about the distribution of retail spending which clearly do not reflect reality. Little acknowledgement is given to the fact that catchments can vary for various commodity groups or store types, and it is also extremely difficult to predict the economic impact of increased competition.

The gravity model can be improved by incorporating real world data. Survey and other data can be used to calibrate shopping centre “attractiveness”, and travel times can be used to replace distance as a measure of convenience. By running the improved model separately for each commodity group or store type a level of detail can be achieved that is simply not possible using other analytical techniques. Therefore the SGS Retail Model is a very powerful analytical tool in estimating retail turnover and escape expenditure.

We also discussed the issue of the impact on retail turnover in 2011 rather 2016. Using the information provided in Tables 12, 13, 19 and 22 of the SGS Economic and Planning report a rough estimate can be made for the impact of the Triangle site development on each existing retail centre for 2011.

Given the large positive effect in Scenario 1 only results for Scenario 2 are produced. By removing the effect of population and income growth (which affects average retail expenditure) from the 2016 estimates the impact on Acland St of the Triangle site development can be estimated for 2011. Also for ease of calculation the impact of the two new supermarkets in the Clarendon St region has been excluded.

The total impact on Acland Street retail turnover in 2011 would be around 14%-16.7%. Clarendon Street would have total retail turnover reduced by around 1.2%-2% and Fitzroy Street total retail turnover would be reduced around 0%-1%. All other existing centres continue to experience a positive impact in 2011.

These are rough estimates which provide an indication of the impact for 2011. With additional time the SGS Retail Model can be used to produce detailed and robust estimates for 2011. Rough estimates are provided below for each year between 2011 and 2016 for Acland St.

	Range of Impacts	
2011	-14.2%	-16.7%
2012	-12.9%	-14.9%
2013	-11.7%	-13.2%
2014	-10.5%	-11.5%
2015	-9.2%	-9.7%
2016	-8.0%	-8.0%

However, as pointed out in the report a number of steps can be undertaken to ensure that Scenario 2 is a highly unlikely outcome.

The Triangle site development report also outlined that the area around the proposed centre would suffer from travel congestion but this congestion would merely be transferred from other areas of Melbourne. This is a fairly reasonable assumption to make, however, there is information available which can provide some context to this assumption.

Using results generated by the SGS Retail Model the Triangle site development is estimated to save 4.5 million kilometres travelled out of an estimated total of 6.7 billion kilometres travelled within the Melbourne Statistical Division. Assuming that around 40% (a conservative estimate) of the trips are made by car, this equates to a reduction of 1.8 million kilometre travelled by car in the Melbourne Statistical Division. This would suggest that a net reduction in congestion might occur as a result of the Triangle site development.

However, given the lack of detail information on people's propensity to travel by car, the current areas of traffic congestion related solely to retail trips and the relatively small kilometres travelled producing data on the traffic congestion would have been difficult. Any such estimate would have to be based more on ad hoc ponderings rather than any statistical method. So the assumption that there is no net increase in travel congestion appears more robust than any alternative assumption which could be made.

However, if there is a detail data source relating to St Kilda residents propensity to travel by car available, SGS Economic and Planning would be more than happy to use this data to supplement our existing statistical models to produce a robust set of estimates on travel congestion.

As you might know SGS Economics and Planning has been in operation for almost 30 years. We employ town planners, economists, statisticians, social scientists and other disciplines amongst out 60 staff. We pride ourselves on providing independent and robust advice to all levels of governments and the private sector. We stand by the findings of the Triangle site development report and remain eager to discuss any issues with yourself or any other staff members at the City of Port Phillip.

Also I would like to apologise again for not including the 6.75% discount rate from the report. That was an over sight on my part.

Yours sincerely,

Terry Rawnsley  
**Project Manager**  
**St Kilda Triangle Site Development**  
**SGS Economics and Planning**