

BEFORE THE DUNEDIN CITY COUNCIL

IN THE MATTER OF of the Resource Management Act 1991

AND

IN THE MATTER OF A Notice of Requirement by the Otago Regional Council for a designation pursuant to section 168 of the Act in relation to a Central City Bus Hub (DCC Notice of Requirement: DIS-2017-1)

STATEMENT OF EVIDENCE BY ANDY CARR ON BEHALF OF THE OTAGO REGIONAL COUNCIL

9 OCTOBER 2017

1. INTRODUCTION

QUALIFICATIONS AND EXPERIENCE

- 1.1 My full name is Andrew (Andy) David Carr.
- 1.2 I am a Chartered Professional Engineer and an International Professional Engineer (New Zealand section of the register). I hold a Masters degree in Transport Engineering and Operations and also a Masters degree in Business Administration.
- 1.3 I served on the national committee of the Resource Management Law Association between 2013-14 and 2015-17, and I am a past Chair of the Canterbury branch of the organisation. I am also a Chartered Member of Engineering New Zealand (formerly the Institution of Professional Engineers New Zealand), and an Associate Member of the New Zealand Planning Institute.
- 1.4 I have more than 28 years experience in traffic engineering, over which time I have been responsible for investigating and evaluating the traffic and transportation impacts of a wide range of land use developments, both in New Zealand and the United Kingdom.
- 1.5 I am presently a director of Carriageway Consulting Ltd, a specialist traffic engineering and transport planning consultancy which I founded in early 2014. My role primarily involves undertaking and reviewing traffic analyses for both resource consent applications and proposed plan changes for a variety of different development types, for both local authorities and private organisations. I am also a Hearings Commissioner and have acted in that role for Greater Wellington Regional Council, Ashburton District Council, Waimakariri District Council and Christchurch City Council.
- 1.6 Prior to forming Carriageway Consulting Ltd I was employed by traffic engineering consultancies where I had senior roles in developing the business,

undertaking technical work and supervising project teams primarily within the South Island.

- 1.7 I have a wide range of experience in traffic engineering of relevance to this commission, including studies of car parking, public transport and pedestrian movements. Past projects include the design of the temporary bus exchange in Christchurch following the 2011 earthquakes, undertaking the research and much of the drafting for the NZTA Pedestrian Planning and Design Guide, and undertaking studies of parking usage and occupancies in seven UK towns and cities.
- 1.8 I have carried out commissions in Dunedin for more than twelve years and am familiar with the city and environs.
- 1.9 I confirm my obligations in terms of the Environment Court's Code of Conduct for Expert Witnesses contained in the Practice Note 2014. I re-confirm that the issues addressed in this brief of evidence are within my area of expertise. I re-confirm that I have not omitted to consider material facts known to me that might alter or detract from the opinions that I express.
- 1.10 In this matter, I have been engaged by the Otago Regional Council to prepare transportation-related evidence in relation to the Notice of Requirement for a central city bus hub.

2. SCOPE OF EVIDENCE

- 2.1 Within this evidence I address the following matters:
- a. A brief description of the existing transportation networks in terms of their geometry, traffic flows and road safety records;
 - b. An assessment of the potential pedestrian volumes and distribution arising from the designation, and the management of these;
 - c. A discussion regarding the effects on on-street parking and the ways in which these can be managed;

- d. An evaluation of the existing vehicle crossings onto Great King Street and the effects of the proposed bus hub on these; and
 - e. A response to submissions which raise issues pertaining to the pedestrian volumes, on-street parking and vehicle crossings.
- 2.2 By way of background, in 2014 I provided preliminary advice for the use of Great King Street as a bus hub, including a broad-brush assessment of the potential implications for road users. I then assisted Otago Regional Council by evaluating the effects in more detail and these were reported in the 'Assessment of Transportation Matters' report that accompanied the Notice of Requirement.

3. EXISTING TRANSPORTATION NETWORKS

- 3.1 By way of context, the section of Great King Street subject to the Notice of Requirement ("the site") lies 150m to the northeast of the Octagon. It is bounded by Moray Place to the south, and St Andrew Street to the north.
- 3.2 The Dunedin City District Plan classifies this section of Great King Street as a Local Road, meaning that its primary purpose is to provide access to properties, rather than to act as a through route. It has a flat and straight alignment, with a 13.6m wide carriageway, comprising a 4.8m traffic lanes, 2m parking bays and 3m footpaths on both sides of the road.
- 3.3 There are several accesses to adjacent properties on both sides of Great King Street, including two off-street car parks on the western side, and public accesses for a discount retail outlet, the police station and a supermarket on the eastern side.
- 3.4 In total there are 16 P60 parking spaces on the western side of the road plus 2 P5 spaces, and 18 P60 parking spaces plus 2 P5 spaces on the eastern side of the road.
- 3.5 Moray Place to the south is a Collector Road, indicating a role in both traffic movement and property access, and distributing traffic within and between

neighbourhoods. It has a carriageway width of 13m, with 4.5m wide traffic lanes and 2m wide parking bays on each side. There are footpaths on either side.

- 3.6 Great King Street meets Moray Place at a priority intersection where traffic on Great King Street must yield the right of way. The intersection does not have auxiliary turning lanes although the width of the Great King Street approach is such that two vehicles can queue side by side. There is a raised island at the throat of the intersection, which has a 'cut-through' to assist pedestrians crossing the road. Sight distances for vehicles emerging from Great King Street are 75m towards the south and 90m towards the north, and in both cases are affected by the presence of buildings.
- 3.7 Towards the north, St Andrew Street and Great King Street meet at a signalised intersection. Two turning lanes are provided on both of the Great King Street approaches, and these are achieved through restricting on-street parking over a short length of road. There are three approach lanes provided on St Andrew Street, achieved through restricting on-street parking and also narrowing the exit lanes from the intersection.
- 3.8 Under the Dunedin City Integrated Transport Strategy, Great King Street, Moray Place and the western part of St Andrew Street are all noted as being *"inner city priority and secondary routes"* for walking (Figure 19, Integrated Transport Strategy). As such, these are roads where the Council will *"prioritise wider footpaths and better facilities to enhance the pedestrian experience. This may include safety improvements, enhanced crossing points, pedestrian refuges, seating, lighting, greater pedestrian priority at intersections and signals, and general amenity improvements such as paving and planting"*. However none of the roads are part of the strategic cycle network.
- 3.9 Section 4 of the Assessment of Transportation Matters report set out the traffic flows in the immediate area of the site, noting that Great King Street carries 5,700 vehicles per day with Moray Place and St Andrew Street carrying between 3,450 to 7,850 vehicles per day. Additional traffic surveys were

carried out at the Great King Street / Moray Place and Great King Street / St Andrew Street intersection in 2014 and 2016 to provide further understanding of background traffic volumes. The later, 2016, surveys are discussed in more detail in the evidence of Mr Lightowler.

- 3.10 The 2014 surveys at the Great King Street / Moray Place also recorded pedestrian crossing movements. Over the evening peak hour (4:15pm to 5:15pm), there was an average of two pedestrians observed to cross Great King Street each minute. I have used the equations of the NZTA 'Pedestrian Planning and Design Guide' to calculate that at present Level of Service B is provided for crossing pedestrians, noted in the guide as being 'very good'.
- 3.11 I have used the NZTA Crash Analysis System to identify the location and nature of the recorded crashes in the vicinity of the site between 2012 and 2017, between and including the intersections with St Andrew Street and Moray Place.
- 3.12 This showed that there have been three crashes on Great King Street itself, with nine crashes occurring at each of the Great King Street / St Andrew Street and Great King Street / Moray Place intersections. The crashes generally have different contributing factors, but typically relate to conflicting turning movements at accesses and intersections, and crossing pedestrians being struck by vehicles. In my view however, the patterns of accidents at each location are typical for an urban area, and do not indicate any inherent deficiencies in the roading geometry.

4. PROPOSAL

- 4.1 The nature of the Notice of Requirement and designation has been described by others and I adopt their description for the purposes of my evidence.
- 4.2 From a transportation perspective, the key issues are that the formation of the bus hub will involve the removal of kerbside parking on this section of Great King Street and the re-marking of the road with parking restrictions and markings for the bus stops. Infrastructure for waiting passengers will also be

provided on the footpath. Several accesses which serve existing developments and/or car parking areas on Great King Street will also be revised, and I discuss this subsequently.

5. PEDESTRIAN VOLUMES AND DISTRIBUTION

- 5.1 The proposal does not involve a particular land use, but will nevertheless result in an increased number of pedestrian movements on Great King Street due to people walking to and from the bus services.
- 5.2 The number of pedestrians depends on the number of services and the bus patronage. Based on information provided by Otago Regional Council, I expect that there will be approximately 35 buses that travel north on Great King Street in the weekday peak hours (8am to 9am and 5pm to 6pm), plus 35 buses that travel south. Allowing for each bus to carry up to 30 people in the peak hours, this suggests that at the busiest times, there could be a total of well over 1,000 pedestrian movements generated on Great King Street.
- 5.3 Pedestrians walking to and from the bus hub are able to enter/exit towards the north via St Andrew Street or to the south by Moray Place. Taking account of the locations of employment and retail opportunities in my view it is likely that there will be a 50-50 split between the two route options.
- 5.4 The St Andrew Street / Great King Street intersection already has pedestrian crossing phases at the traffic signals, and the proposed designation plans for the bus hub show that the Moray Place / Great King Street intersection is to be signalised and will also have pedestrian crossing phases also. Both of these intersections will have associated kerb build-outs to reduce the width of carriageway that pedestrians are required to cross.
- 5.5 In addition, a formal mid-block pedestrian crossing will be provided, just south of the access to the police station and the Wilson Parking car park on the southern side of Farmers department store. This will also have kerb build-outs.

- 5.6 Finally, the configuration of the footpaths on Great King Street are shown as being changed on the proposed designation plan for the bus hub, in order to accommodate infrastructure for waiting passengers. One outcome of this however is that additional width will be provided for pedestrian movements.
- 5.7 I consider that these layouts will ensure that there is suitable infrastructure provided for pedestrian crossing movements. Further details regarding the layouts is provided in the evidence of others.

6. ON-STREET PARKING PROVISION

- 6.1 The proposed designation plans show that 38 public parking spaces will be removed by the designation, although provision will be made for a 6m loading bay on each side of the road (approximately 25m south of St Andrew Street). These 38 parking spaces occupy a kerbside length of 210m.
- 6.2 However I understand that one outcome of the revisions to the bus services and development of the bus hub is that a number of stops in other locations will be rationalised, either through being shortened or removed completely. Details provided by Otago Regional Council show that within 350m of the site, existing bus stops that can be removed or shortened would yield a total of 309m of additional kerbspace space. The locations of these bus stops are shown in Annexure A to my evidence.
- 6.3 The management of the district roading network is a matter for Dunedin City Council rather than the regional council, and so I am unable to make further comment as to how the kerbspace gained will be utilised. It is possible that it could be used for amenity improvements, but some or all could also be used for additional car parking spaces. It can be seen that the bus hub would result in a net gain of 99m of kerbside length, meaning that there is the potential for the loss of car parking spaces within Great King Street to be largely or completely offset.
- 6.4 Further afield, a further 82m of kerbside length could be achieved through the removal of additional bus stops. The locations of these are also shown in

Annexure A to my evidence. Again, this could be used for a range of purposes, but if some or all of this is used for car parking then it would contribute a net gain to the overall parking stock.

- 6.5 One expected outcome of the bus hub and associated changes in service routes and frequencies is that public transport will become more attractive to a greater number of passengers, and accordingly the Regional Council anticipates that over the next ten years there will be a 44% increase in patronage due to both the bus hub and changes in routes. This means that the use of private cars to travel to the city centre will be reduced, and accordingly, I anticipate that this will also lower the demand for parking.
- 6.6 Conversely, I understand that there will also be locations in the immediate vicinity of intersections where car parking will be removed, predominantly to enable buses to turn. At the Moray Place / Great King Street and St Andrew Street / Great King Street intersections, there will be a net loss of eight spaces. At other locations in the city, a further 11 spaces will be lost. These are shown on Annexure B to my evidence, and comprise a loss of kerbspace in the order of 114m.
- 6.7 Overall, this means that the implementation of the bus hub would result in a loss of 324m of kerbspace (currently used for parking) but would enable 391m of kerbspace to be gained. That is, there would be a net gain of 67m of kerbspace.

7. MANAGEMENT OF EXISTING VEHICLE CROSSINGS

- 7.1 The designation will result in several changes to existing vehicle accesses on Great King Street.
- 7.2 The access to Countdown is located towards the south of the site and serves a car park with approximately 220 parking spaces. Based on the car park size, I estimate that this access carries a maximum volume of 120-150 vehicle movements (two-way), applying standard trip generation rates to the floor area

of the supermarket. This vehicle crossing is to be converted to left-in/left-out operation only.

- 7.3 The access to the Community House is presently lightly trafficked and I estimate that the maximum traffic volume is 20-25 vehicle movements (two-way) which will be associated with employees arriving and departing. The car park has an existing (but presently closed) access at its western end onto Moray Place, and this is to be reopened with the current access onto Great King Street being closed. This may result in minor changes to the on-street parking arrangements in the vicinity of the reopened access.
- 7.4 The access to the Wilson Parking car park on the southern side of Farmers department store will be changed to allow for vehicles to enter from both the north and the south, but exiting vehicles will only be permitted to turn towards the north (that is, left-out).
- 7.5 No changes are proposed to the arrangement of the access, it will retain an ingress and egress function, serving the police station, to ensure the continued effective operation of police vehicles.
- 7.6 The access adjacent to the former 'Just \$2' shop also serves a 30-space car park, where the spaces are reserved for guests of the Victoria Hotel. In view of the size of the car park, I estimate that the access carries 35 to 45 vehicle movements (two-way) in the peak hour. However this car park also has an access onto St Andrew Street which creates the opportunities to revise the manner in which the access onto Great King Street operates. As a result, the access onto Great King Street is to be amended to operate in a one-way direction, accommodating only vehicles exiting the car park.
- 7.7 I understand that agreement has been reached with the respective landowners regarding all of these changes to the accesses.

8. RESPONSE TO SUBMISSIONS

- 8.1 I have reviewed each of the submissions that relate to the matters than I have discussed previously in my evidence, and I respond to these below.

Submitter Concern: The proposal will lead to a loss of car parks

- 8.2 I acknowledge that with the bus hub in place, there would be a loss of 38 on-street car parking spaces from Great King Street, plus 19 spaces in the vicinity of other intersections. However, the bus hub frees-up kerbspace in several locations within 350m of the site, because it enables a number of existing bus stops to be removed or shortened such that those 38 spaces could be replaced plus additional spaces gained. However the reallocation of this kerbspace depends on the City Council, which has responsibility for the management of on-street parking.

Submitter Concern: It is important to provide for pedestrians walking to and from the buses

- 8.3 I agree that safe crossing opportunities are important for people walking to the stops within the bus hub and for passengers that have alighted from a bus. The proposed designation plans show that the Great King Street / Moray Place intersection is to be signalised, and that a pedestrian phase will be provided across each intersection approach. A mid-block pedestrian crossing is proposed on Great King Street, and the Great King Street / St Andrew Street intersection already provides pedestrian crossings on each approach. I consider that these will ensure that suitable road crossing opportunities are provided.

9. CONCLUSIONS

- 9.1 Based on my review, I consider that the designation will result in the removal of car parking on Great King Street and on other routes within the city due to the revised routing of services. In total, 324m of kerbside parking will be lost. However, it also creates the opportunity to gain 391m of kerbside length due

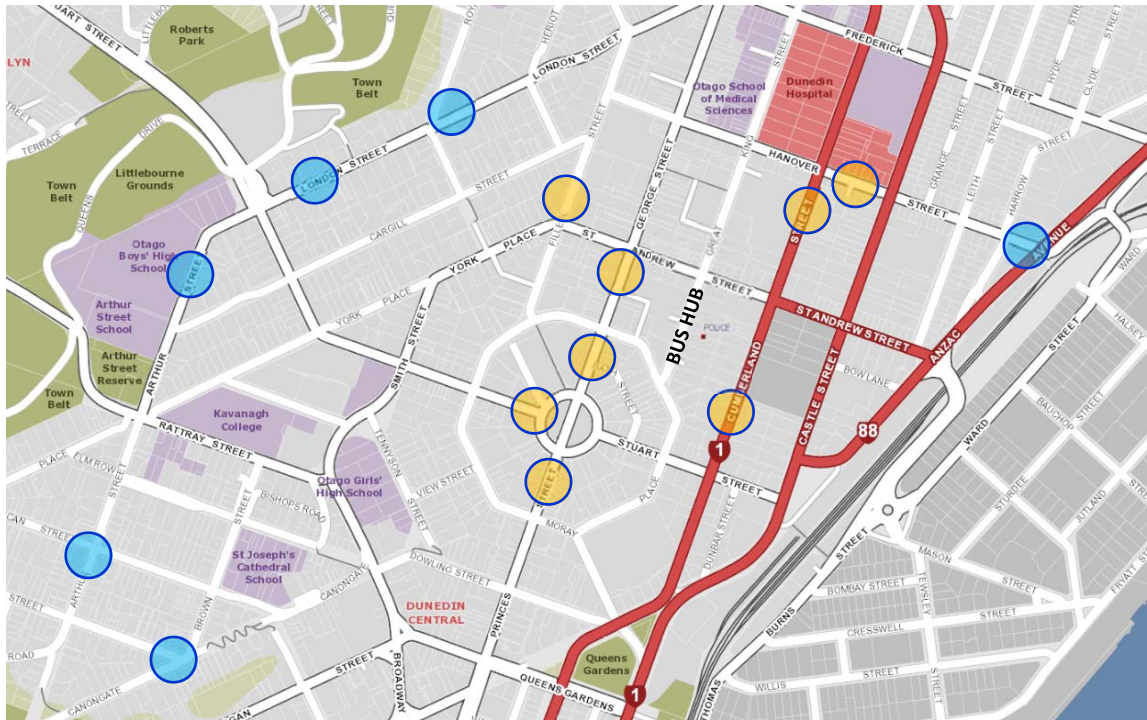
to the rationalisation of existing bus stops in the city centre. That is, there is a net **gain** in kerbside length of 67m which can be used for other purposes by the City Council.



- 9.2 In addition, the increased attractiveness of public transport due to the bus hub will result in reduced car usage and relieve pressure on the parking stock over a wider area.
- 9.3 In my view, pedestrian movements to and from the bus hub will be facilitated through the inclusion of pedestrian phases on the (signalised) Great King Street / Moray Place intersection and a mid-block crossing of Great King Street, in addition to the existing pedestrian crossing phases at the Great King Street / Moray Place intersection.
- 9.4 The designation will result in amendments to the existing vehicle crossings on Great King Street, with the access to the Community House being relocated onto Moray Place, the access to Countdown being changed to left-in/left-out only, the right-turn movement out of the Wilson Parking car park on the southern side of Farmers department store being prohibited, and the access to the former 'Just \$2' shop being converted to exit only (with entry via St Andrew Street). No changes are proposed to the arrangement of the access serving the police station. I understand that agreement has been reached with the respective landowners regarding these changes to the accesses.
- 9.5 Overall then, within the particular transportation matters that I have assessed, I am able to support the proposed designation from a transportation perspective.

Andy Carr

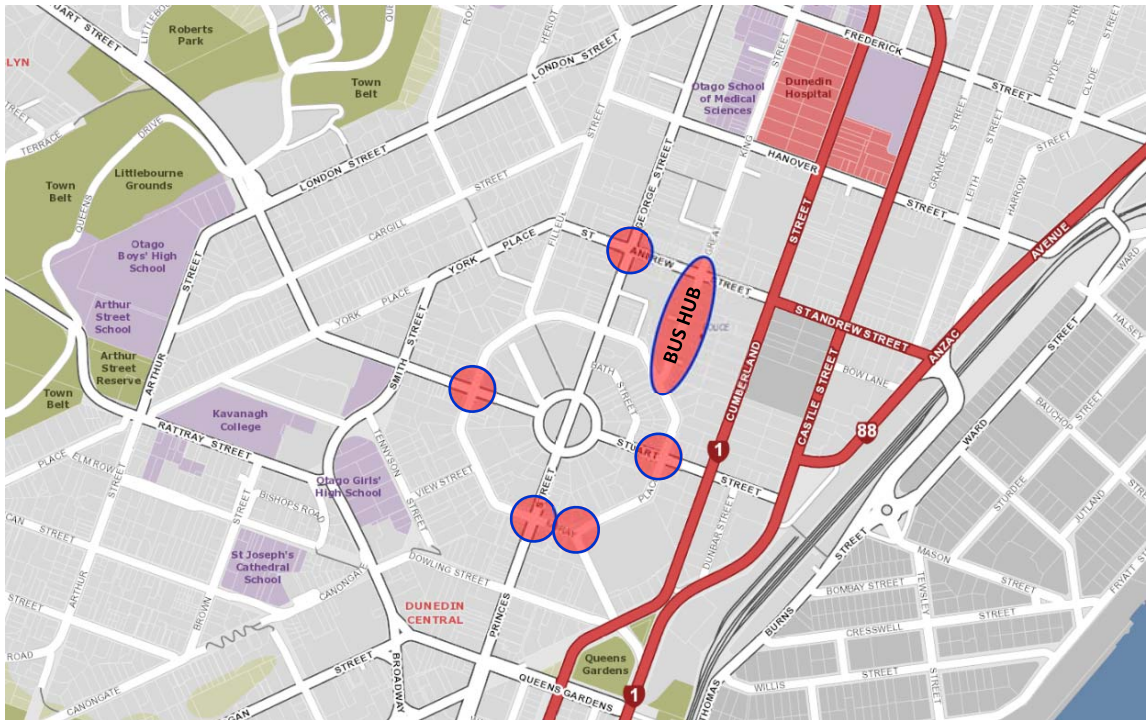
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
ANNEXURE A: LOCATIONS OF POTENTIAL ADDITIONAL CAR PARKING



-  Bus stops within 350m of the bus hub which can be removed/shortened
-  Other bus stops that can be removed

ANNEXURE B: LOCATIONS WHERE CAR PARKING WILL BE REMOVED



 Locations where parking will be removed