



Scenario assessment

PART 5

SCENARIO ASSESSMENT

5.1 Scenarios 1-7 assessment

For modelling assumptions refer to Appendix 3. Scenarios 1-7 should be read in conjunction with the Basin Reserve Options Workshop Datapack.



Scenario 1

From Mt Victoria Tunnel towards Buckle St state highway traffic is to the north (city) side of the Basin on an **elevated retaining walls**.

From Kent / Cambridge Tce towards Adelaide Rd traffic is split **at-grade** **either side** of the Basin (as currently exists).



Scenario 1A

From Mt Victoria Tunnel towards Buckle St state highway traffic is to the north (city) side of the Basin on an **elevated structure/viaduct**.

From Kent / Cambridge Tce towards Adelaide Rd traffic is split **at-grade** **either side** of the Basin (as currently exists).



Scenario 2

From Mt Victoria Tunnel towards Buckle St state highway traffic is to the north (city) side of the Basin on an **elevated structure/viaduct**. Approx 50m away from Basin Reserve.

From Kent / Cambridge Tce towards Adelaide Rd traffic is split **at-grade** **either side** of the Basin (as currently exists).



Scenario 3

From Mt Victoria Tunnel towards Buckle St state highway traffic is to the north (city) side of the Basin on an **elevated structure/viaduct**. Approx 30m away from Basin Reserve.

From Kent / Cambridge Tce towards Adelaide Rd traffic is split **at-grade** **either side** of the Basin (as currently exists).



Scenario 4

From Mt Victoria Tunnel towards Buckle St state highway traffic is to the north (city) side of the Basin on an **elevated structure/viaduct**.

From Kent / Cambridge Tce towards Adelaide Rd all traffic is **at-grade** **via Sussex St**.



Scenario 4A

From Mt Victoria Tunnel towards Buckle St state highway traffic is to the north (city) side of the Basin **at-grade**.

From Kent / Cambridge Tce towards Adelaide Rd all traffic is **elevated** **over** the state highway **via Sussex**



Scenario 5

From Mt Victoria Tunnel towards Buckle St state highway traffic is to the north (city) side of the Basin **at-grade**.

From Kent / Cambridge Tce towards Adelaide Rd all traffic is through a **tunnel** under the basin reserve.



Scenario 6

From Mt Victoria Tunnel towards Buckle St state highway traffic is to the north (city) side of the Basin on an **elevated structure/viaduct**.

From Kent / Cambridge Tce towards Adelaide Rd all traffic is **at-grade** **via Dufferin St**.



Scenario 7

From Mt Victoria Tunnel towards Buckle St state highway traffic is to the north (city) side of the Basin in a **trench 3m** below existing ground level.

From Kent / Cambridge Tce towards Adelaide Rd traffic is split either side

TECHNICAL SCENARIO ASSESSMENT - STRATEGIC TRANSPORT GROUP

Scenario 1 - elevated E-W retaining wall, overpass Dufferin St & Buckle St



Disadvantages include:

- Vertical wall with bridging at two points (Dufferin Street and Buckle Street)
- South to east movement not well provided for
- Splits PT movements - Cambridge Tce to Dufferin St, and Adelaide Rd to Sussex St
- Heritage buildings and Grandstand Apartments within land take requirements

Advantages include:

- Provides for traffic functionality, reduces traffic conflict and travel time
- Enables PT stops to be located away from the doorstep of the Basin Reserve
- Potentially enables alternative road configurations around the Basin

Scenario 1A - elevated E-W structure, overpass Dufferin St



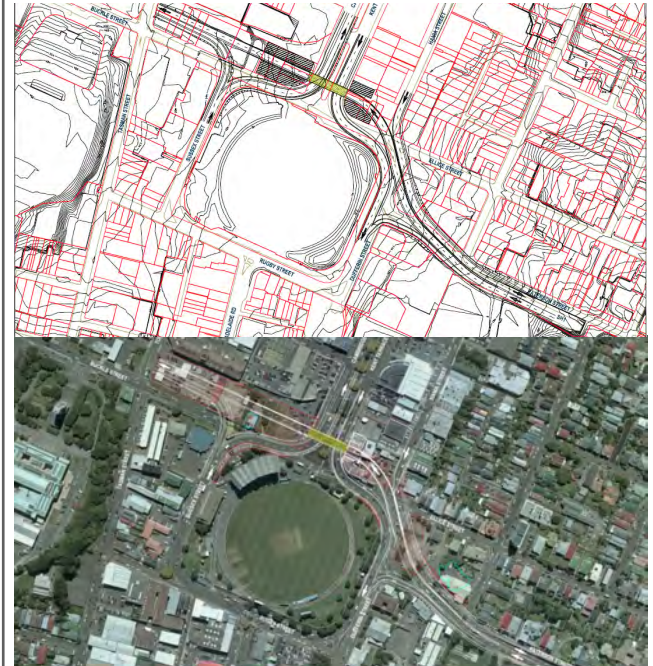
Disadvantages include:

- Top of the elevated structure still slightly visible from the stands of the Basin Reserve
- Begins to restrict pedestrian movement on the NE corner of the gyratory
- Heritage buildings and Grandstand Apartments within land take requirements

Advantages include:

- Same functionality as scenario 1, allows for good access and movement efficiency
- Geometrically is able to redesign the elevated structure to fit over the existing roadway designation
- Better for pedestrian movement to the gate of the Basin
- Acts as a PT roundabout
- Enables PT stops to be located away from the doorstep of the Basin Reserve
- Potentially enables alternative road configurations around the Basin

Scenario 2 - elevated structure 50m north of Basin, Hania St to tunnel



Disadvantages include:

- Hania Street is used for Kent Terrace to Mt Victoria tunnel traffic. Noise, air quality, visual and access effects on a lower order road
- Hard to create good building fronts and backs
- Heritage buildings and Grandstand Apartments within land take requirements

Advantages include:

- Improved legibility for PT
- Better for viewshafts and experience of area as structure is moved back from the Basin
- New buildings are able to address the street with structure tucked in between.
- Geometry could be tighter to more closely follow the existing road designation

TECHNICAL SCENARIO ASSESSMENT - STRATEGIC TRANSPORT GROUP

Scenario 3 - elevated structure 30m north of Basin, Hania St to tunnel



Disadvantages include:

- In between scenarios 1 and 2, not functionally different
- Isolates Government House and schools in SE corner
- Bridge structure north of Buckle Street, poor for south to east movements
- Heritage buildings within land take requirements

Advantages include:

- Avoids the Grandstand Apartments

Scenario 4 - E-W overpass Sussex St, Sussex St dominant



Disadvantages include:

- Doesn't provide well for south to east movement
- Has a large footprint and land acquisition requirement
- Isolates Government House and schools in SE corner, requires school buses to complete turning movements on Dufferin Street

Advantage includes:

- Potentially enables alternative road configurations around the Basin

Scenario 4A - E-W underpass Sussex St, Sussex St dominant



Disadvantages include:

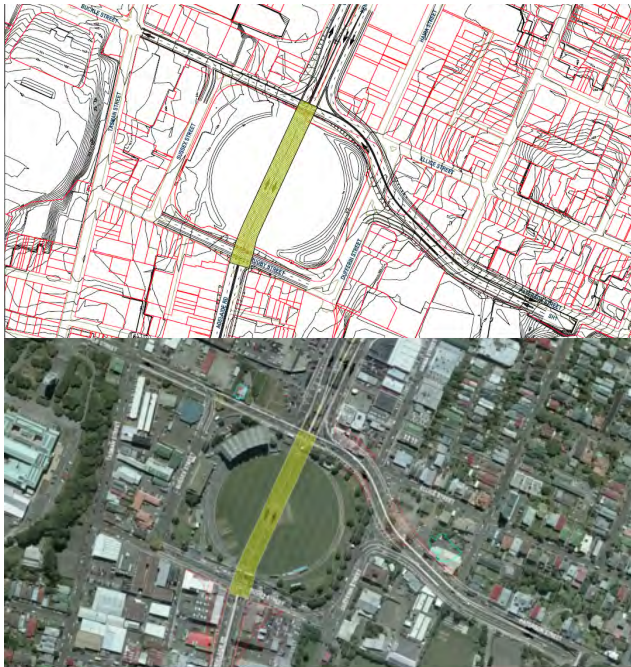
- Western edge of the Basin Reserve gyratory is isolated as the roadway is required to rise up to get over the top of the state highway, state highway is partially trenched
- Problem of mixing tight vertical and horizontal curves, pushes road standards
- Gradient is not cycle friendly
- Isolator of Government House and schools in SE corner
- Heritage buildings within land take requirements

Advantages include:

- Not visible from the stands of the Basin Reserve, maintains view shaft
- Avoids the Grandstand Apartments
- Potentially enables alternative road configurations around the Basin

TECHNICAL SCENARIO ASSESSMENT - STRATEGIC TRANSPORT GROUP

Scenario 5 - N-S tunnel under Basin Reserve, E-W at-grade



Disadvantages include:

- Poor for pedestrian, cycle and PT due to long ramps (approximately 200m) north and south of the Basin Reserve. Estimated ramp lengths are based on the need to comply with horizontal and vertical clearance standards
- PT stops need to be located further from the Basin
- Discourages and poorly integrates with non vehicular modes
- Creates a visual and functional barrier adjacent to the roadway, isolates land uses
- Requires widening of Kent and Cambridge Terrace
- Heritage buildings within land take requirements

Advantages include:

- Avoids the Grandstand Apartments

Scenario 6 - E-W overpass Dufferin St, Dufferin St dominant



Disadvantages include:

- Poor for local access including access to schools and Government House in the NE corner. A high volume of traffic over four lanes is being channeled past, coupled with the removal of the school slip lane access
- Splits major traffic flow
- Impacts on the geometry of the Basin gyratory
- Negative visual impact caused by grade separation immediately north of the Basin
- Heritage buildings and Grandstand Apartments within land take requirements

Advantages include:

- Operationally efficient for strategic traffic movement
- Provides for local movement Dufferin Street to Hania Street

Scenario 7 - overpass Dufferin St & Buckle St, road trenched



Disadvantages include:

- Variation of scenario 1 with a 3m trench which creates a visual and functional barrier for pedestrian movements
- Poor for the schools and Government House access in the NE corner

Advantages include:

- Operationally similar to scenarios 1 and 1A
- Potentially enables alternative road configurations around the Basin

5.2 Additional scenario formulation and testing

Six additional scenarios were formulated and technically assessed midway through the workshop. These scenarios were devised in an problem solving attempt to resolve some of the identified poorer contextual responses of the original seven scenarios.

Of these additional scenarios, three were variations of the original scenarios, and three were new scenarios based around at-grade intersection solutions.

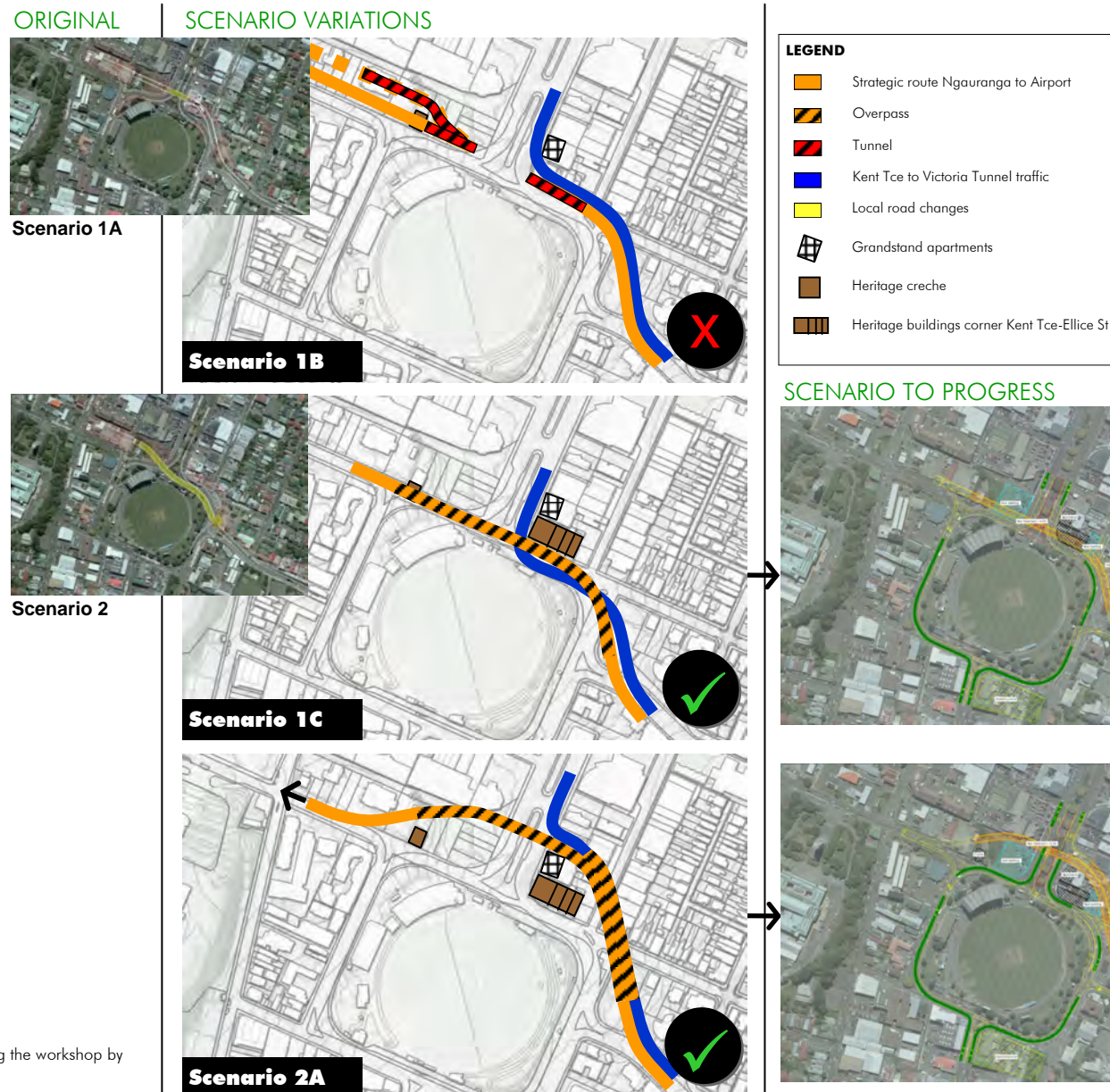
Variations of existing scenarios tested

- Scenario 1A variation: which tunnels state highway traffic under Kent and Cambridge → **Scenario 1B**
- Scenario 1A variation: pushes the elevated structure north of Buckle Street mid block → **Scenario 1C**
- Scenario 2 variation: pushes the elevated structure north of Buckle Street over the top of the existing Repco building (77-79 Kent Terrace) → **Scenario 2A**

Scenario 1B was tested and found not to be geometrically workable with the land topography at Ellice Street west to Buckle Street. This scenario was not progressed further.

Scenarios 1C and 2A are explained in more detail in Section 5.3.

RIGHT FIG. 5-1: Three scenario variations formulated during the workshop by participants, November 2008.



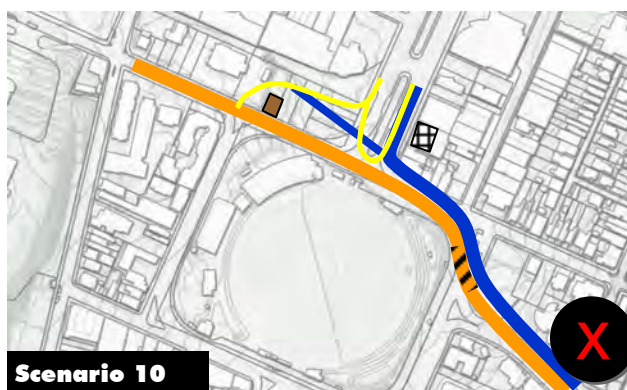
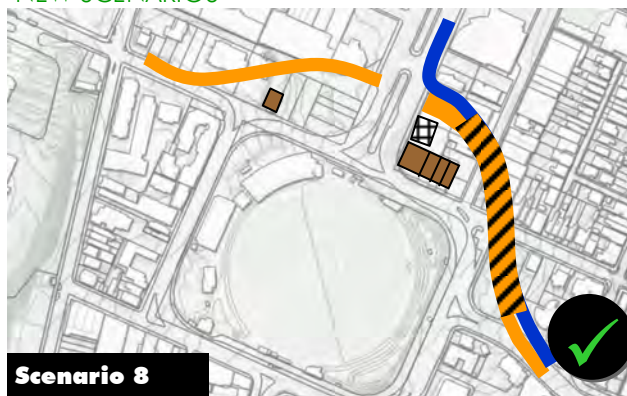
New scenarios tested

- At-grade scenario (1): puts a major at-grade intersection mid block of Kent and Cambridge Terrace → **Scenario 8**
- At-grade scenario (2): extends Sussex Street north to provide an at-grade intersection adjacent to the Basin Reserve → **Scenario 9**
- At-grade scenario (3): combination of scenario 6 at Dufferin St and an at-grade Buckle St intersection → **Scenario 10**

Scenario 10 was tested and found not to be geometrically workable with the land topography at Cambridge Terrace.

Scenarios 8 and 9 are explained in more detail in Section 5.3. These scenarios were found to work geometrically and were otherwise tested within constraints of, and necessary assumptions used at the workshop. These limited workshop-based investigations gave sufficient confidence that these new scenarios should be considered further. More detailed traffic modelling and further testing is however required to fully validate these scenarios, including their capability of accommodating traffic flows.

NEW SCENARIOS



SCENARIO TO PROGRESS



RIGHT FIG. 5-2: Three new scenarios formulated during the workshop by participants, November 2008.

5.3 Additional scenario assessment

Scenario 1C - Elevated Buckle St



Scenario variations

- (1) Use Hania Street to connect Kent Terrace and Mt Victoria tunnel for airport bound traffic
- (2) Link to Hania Street north of the Grandstand Apartments
- (3) Deviate the overpass at Buckle Street to accommodate Memorial Park design
- (4) At-grade pedestrian crossing facility over the on ramp to allow east-west movement from the tunnel, schools and Basin

	Advantages include:	Disadvantages include:
STRATEGIC MOVEMENT	<ul style="list-style-type: none"> → Separates strategic traffic to reduce traffic conflict and travel time → Provides a high level of service for PT 	
LOCAL ENVIRONMENT	<ul style="list-style-type: none"> → Preserves the possibility of a linear Memorial Park extending to Cambridge Tce, although the Memorial Park development may impact on achieving consistency with the Te Aro grid → Is able to project the Te Aro grid alignment of Buckle Street → Basin Reserve recto-linear geometry remains intact 	<ul style="list-style-type: none"> → Top of the elevated structure still slightly visible from the stands of the Basin Reserve → Visual impact within the local environment → Not as far from the Basin as other scenarios increasing noise impacts
LAND USE	<ul style="list-style-type: none"> → Heritage buildings corner Kent Tce and Ellice Street and Grandstand Apartments are outside of land take requirements → Provides opportunity for redevelopment of site corner Cambridge Tce / Buckle St → Opportunity to provide an active edge by constructing buildings under the viaduct and to provide frontage to local streets around the Basin 	<ul style="list-style-type: none"> → Requires shifting the heritage creche → May impact on properties (pre 1930's) in Ellice Street → Relies on careful redesign of the block on the corner of Kent and Ellice Streets. Active edges on this corner of the Basin are crucial to pedestrian performance
LOCAL MOVEMENT	<ul style="list-style-type: none"> → Potentially enables alternative road configurations around the Basin → Retains local movement around the Basin and reduces traffic volumes 	<ul style="list-style-type: none"> → Does not provide local access between Hania and Ellice Streets → Will reduce pedestrian and cycle access if no link from Ellice Street to the edge of the Basin at Ellice / Buckle Streets is provided

Scenario 2A - Elevated mid block



Scenario variations

- (1) Explore taking SH1 traffic from Kent Terrace to Mt Victoria tunnel under overbridge and around Basin to minimise property take.
- (2) At-grade pedestrian crossing facility over the on ramp to allow east-west movement from the tunnel, schools and Basin
- (3) Connect Hania Street to Ellice Street for local connectivity

	Advantages include:	Disadvantages include:
STRATEGIC MOVEMENT	<ul style="list-style-type: none"> → Maintains movement efficiency of grade separation at Kent and Cambridge Tces → Separates strategic traffic to reduce traffic conflict and travel time → Provides a high level of service for PT, retaining one way system → Is able to work with either Buckle Street alignment 	<ul style="list-style-type: none"> → Awkward design at the convergence of Sussex and Buckle Streets
LOCAL ENVIRONMENT	<ul style="list-style-type: none"> → Elevated structure with the least visual intrusion to the Basin Reserve → Is able to project the Te Aro grid alignment of Buckle Street → Overpass is perpendicular to Kent / Cambridge and orients to the city grid 	<ul style="list-style-type: none"> → Still has visual and noise impacts for the local environment and Basin Reserve → Relies on careful design of the overpass and buildings to protect safety and quality of the local environment → Impacts on the recto-linear geometry of the Basin Reserve
LAND USE	<ul style="list-style-type: none"> → Provides opportunity for redevelopment of site corner Cambridge Tce / Buckle St, and end Hania St → Heritage creche, heritage buildings corner Kent Tce and Ellice Street and Grandstand Apartments are outside of land take requirements 	<ul style="list-style-type: none"> → Mid block Kent / Cambridge intersection has a large footprint → Provides a nominal clearance (4.0m) between the Grandstand Apartments and the structure - reverse sensitivity issues → Impacts on properties (including pre 1930's residential) in Ellice Street → May sterilise land uses fronting Dufferin St and Paterson St west
LOCAL MOVEMENT	<ul style="list-style-type: none"> → Potentially enables alternative road configurations around the Basin → Retains local movement around the Basin and reduces traffic volumes → Provides for pedestrian & cycle connection between the Basin & NE 	<ul style="list-style-type: none"> → Does not provide local access between Hania and Ellice Streets → Will reduce pedestrian and cycle access if no link from Ellice Street to the edge of the Basin at Ellice / Buckle Streets is provided

Scenario 8 - At-grade mid block



Scenario variations

- (1) Split traffic two ways around the Basin so that it functions like a street and not a roundabout
- (2) Use Hania Street to connect Kent Terrace and Mt Victoria tunnel for airport bound traffic
- (3) At-grade pedestrian crossing facility over the on ramp to allow east-west movement from the tunnel, schools and Basin

	Advantages include:	Disadvantages include:
STRATEGIC MOVEMENT	<ul style="list-style-type: none"> → Is able to work with either Buckle Street alignment → Retains one way system around the Basin for PT efficiency 	<ul style="list-style-type: none"> → Signalised intersection mid block and Kent/Cambridge Tce introduces delays, and reduces strategic movement and PT efficiency
LOCAL ENVIRON	<ul style="list-style-type: none"> → Moves away from the Basin Reserve maintaining its iconic, landscape quality → Basin Reserve recto-linear geometry remains intact 	<ul style="list-style-type: none"> → Low clearance overpass of Ellice Street has low local environment quality and amenity
LAND USE	<ul style="list-style-type: none"> → Provides opportunity for redevelopment of site corner Cambridge Tce / Buckle St, fronting Dufferin St and end Hania St → Heritage creche, heritage buildings corner Kent Tce and Ellice Street and Grandstand Apartments are outside of land take requirements 	<ul style="list-style-type: none"> → Mid block Kent / Cambridge intersection has a large footprint → Impacts on the built environment in the north-eastern corner → Impacts on properties (including pre 1930's residential) in Ellice Street
LOCAL MOVEMENT	<ul style="list-style-type: none"> → Local oriented movement provided for around the Basin Reserve gyratory → Potentially enables alternative road configurations around the Basin because of reduced traffic → Ellice Street underpass maintains pedestrian and local access → Opportunity to improve pedestrian experience on western edge as the dominant commuter route 	<ul style="list-style-type: none"> → Prevents local access between Ellice and Hania Street → Will reduce pedestrian and cycle access if no link from Ellice Street to the edge of the Basin at Ellice / Buckle Streets is provided

Scenario 9 - At-grade Buckle St



Scenario variations

- (1) Grade separation of Sussex Street north

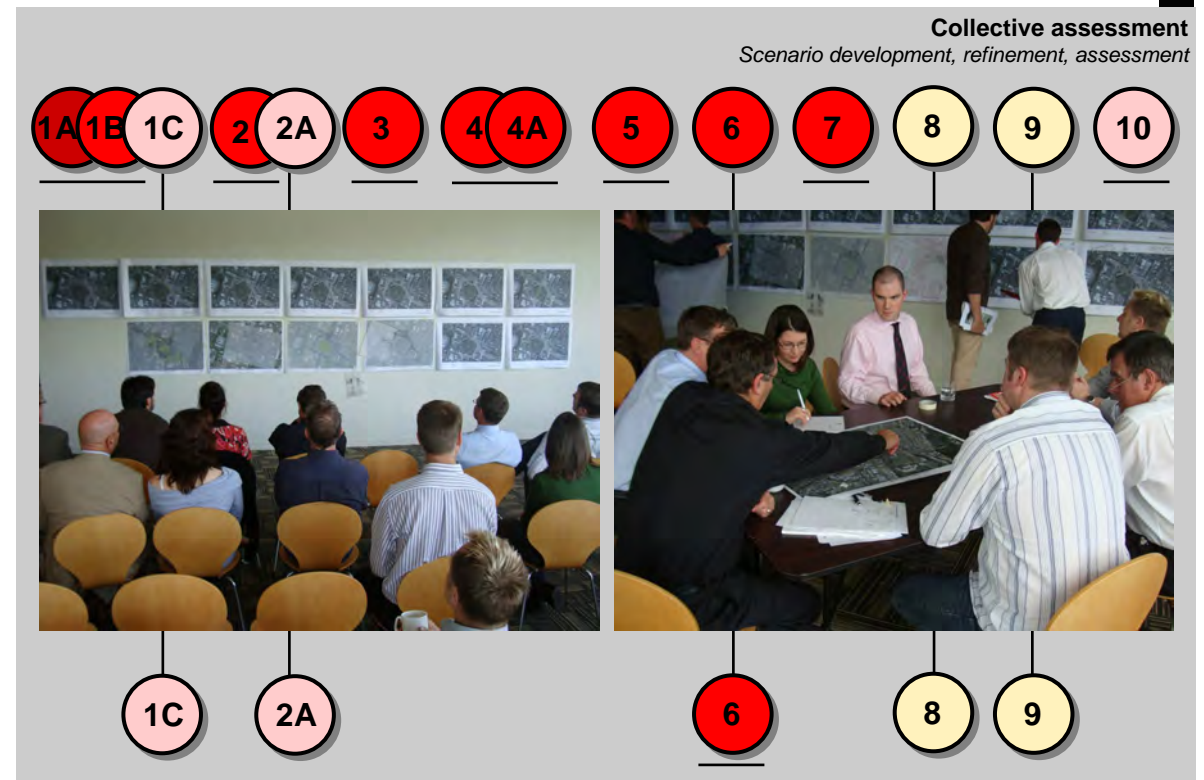
	Advantages include:	Disadvantages include:
STRATEGIC MOVEMENT		<ul style="list-style-type: none"> → Does not separate strategic from local traffic → Uncertain level of service for passenger transport and general vehicles → Need to improve passenger transport level of service → Splits SH1 city bound traffic from Ngauranga traffic. Intersection arrangement at Kent / Cambridge Terraces potentially more complex and less legible to motorists
LOCAL ENVIRON	<ul style="list-style-type: none"> → Impacts on local character are reduced in area by retaining existing topography and a moderately scale intersection 	<ul style="list-style-type: none"> → Impacts on the recto-linear geometry of the Basin Reserve
LAND USE	<ul style="list-style-type: none"> → Has relatively less impact on the built environment following existing designations as much as possible → Heritage creche and Grandstand Apartments are outside of land take requirements → Provides opportunity for redevelopment of site corner Cambridge Tce / Buckle St and fronting Ellice St 	<ul style="list-style-type: none"> → Impacts on the built environment in the north-eastern corner → Heritage buildings corner Kent Tce and Ellice Street may be within land take requirements → Impacts on the recto-linear geometry of the Basin Reserve
LOCAL MOVEMENT		<ul style="list-style-type: none"> → Poor pedestrian experience around the Basin → Pedestrian safety reduced at the Dufferin Street intersection

5.4 Scenario refinement and prioritisation (1)

REFINING SCENARIOS TO PROGRESS

- Scenario 1/1A superseded by **scenario 1C**
- Scenario 2 superseded by **scenario 2A**
- Scenario 3 superseded by **scenario 2A**
- Scenario 4 discarded because of the required footprint size of the intersection
- Scenario 4A discarded because of the tight horizontal curve interacting with the vertical curve slope change
- Scenario 5 discarded because of the negative impacts on land use and pedestrian, cycle, PT movement north and south of the Basin Reserve caused by tunnel ramps
- **Scenario 6 retained** for evaluative criteria assessment due to continued uncertainties relating to access, grades and street configuration space
- Scenario 7 discarded because access to the school is prevented by the 3m trench and alternative scenario 10 is also geometrically not possible
- **Scenario 8 retained** for evaluative criteria assessment
- **Scenario 9 retained** for evaluative criteria assessment

Following comprehensive design inquiry of workshop scenarios, the workshop group achieved consensus in selecting five scenarios (1C, 2A, 6, 8 and 9) as the most appropriate transport concepts to progress through to more detailed evaluation and criteria assessment.



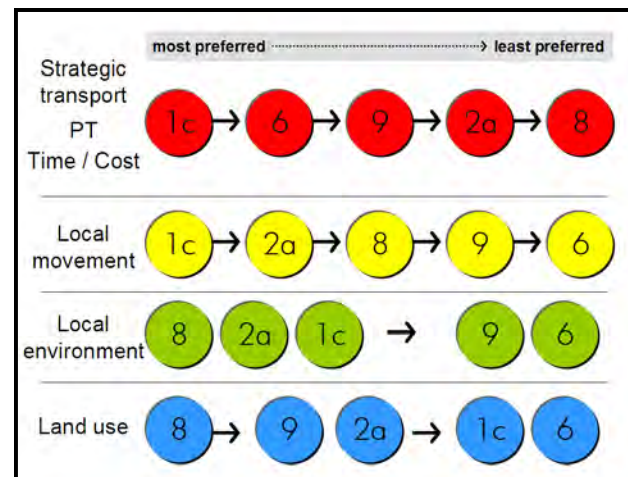
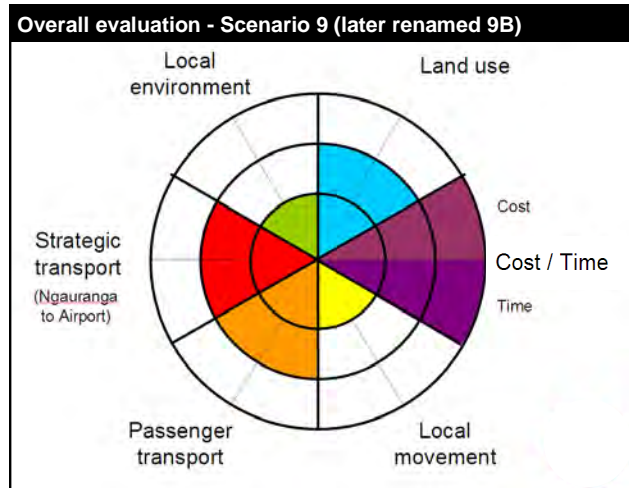
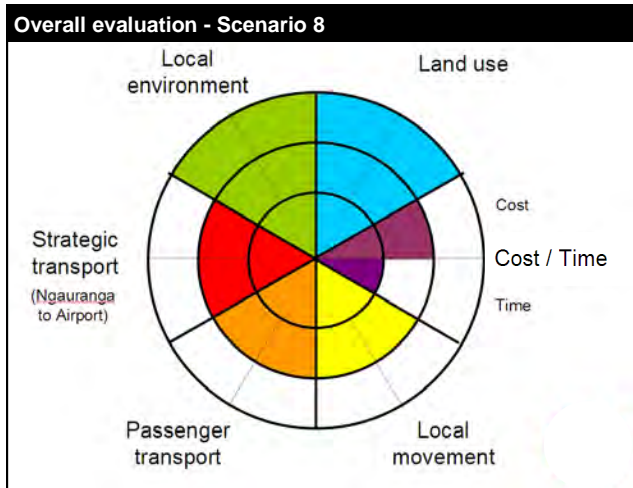
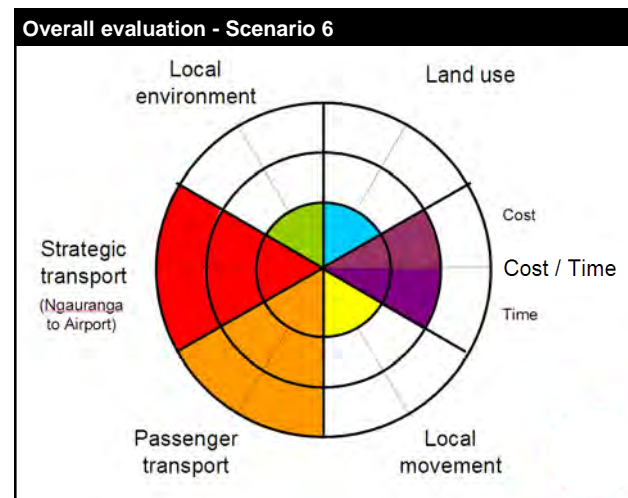
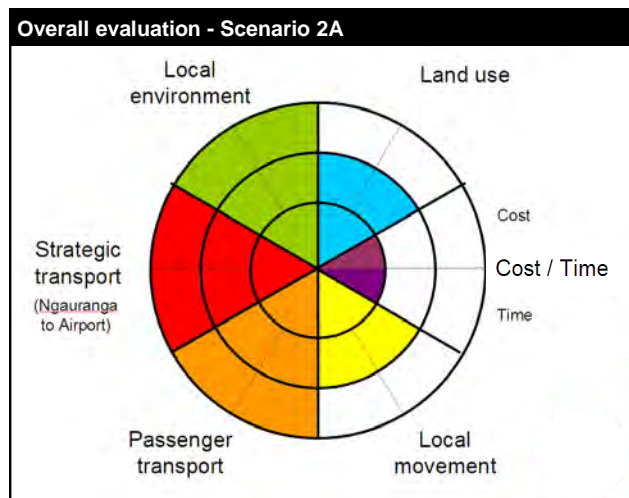
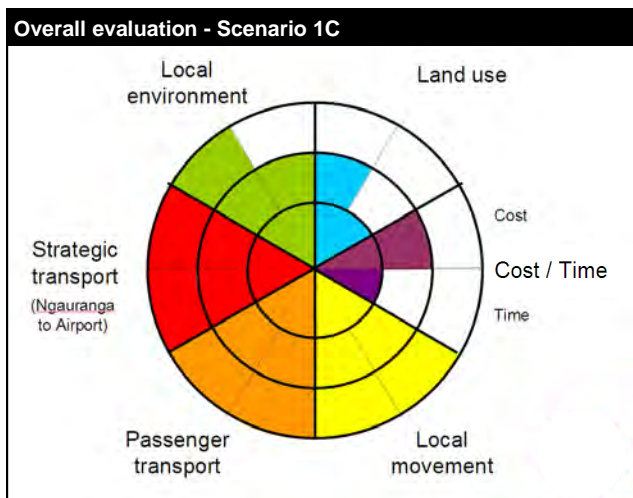
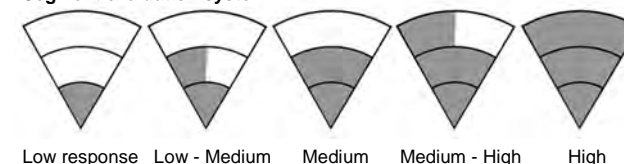
ABOVE FIG. 5-3: Collective assessment phase of the workshop which began to narrow down scenarios.

SCENARIO EVALUATION

Each of the five scenarios selected by the workshop group were in turn evaluated and prioritised by the transport and context sub-groups. The resulting scenario evaluation is represented in Figure 5-4 below.

For a full list of evaluative criteria and breakdown of sub-group assessment by criterion refer to Appendix 5.

Segment evaluation system



ABOVE FIG. 5-4: Overall scenario evaluation wheels which resulted from sub-groups assessment and prioritisations.

5.5 Scenario refinement and prioritisation (2)

REFINING SCENARIOS TO PROGRESS TO SCHEME ASSESSMENT

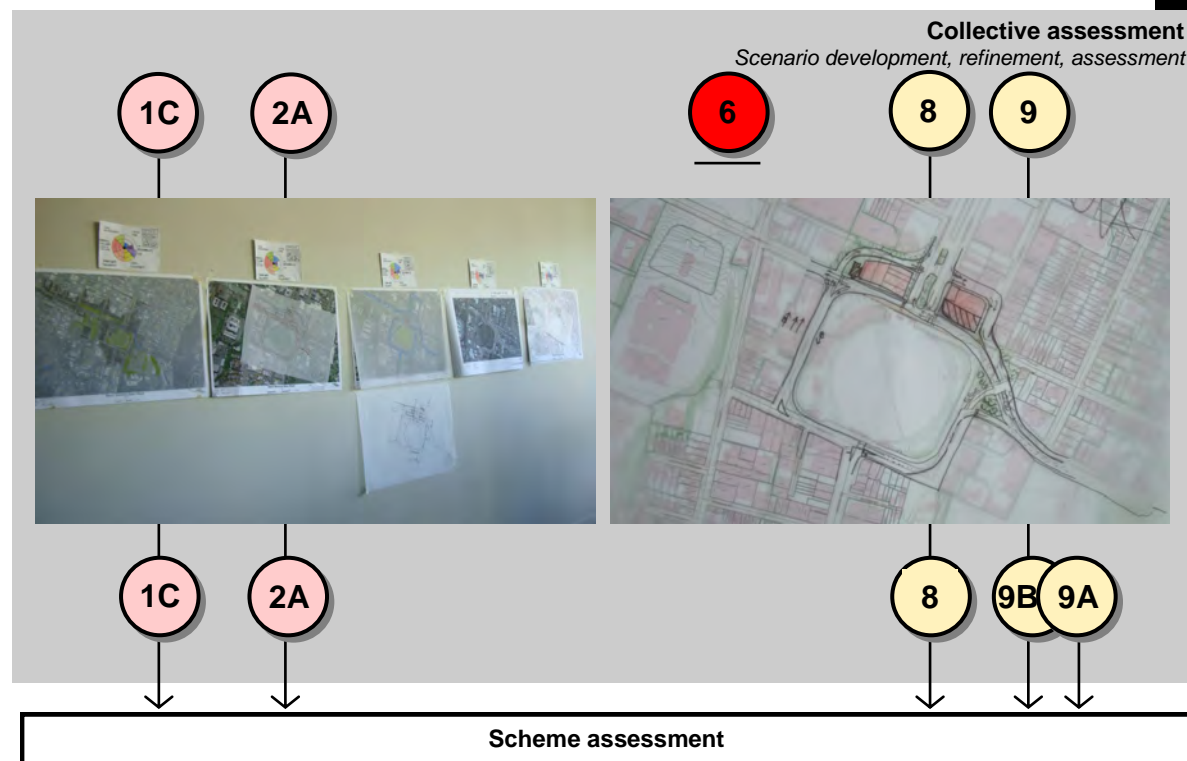
- Scenario 1C retained for progression through to scheme assessment.
- Scenario 2A retained for progression through to scheme assessment.
- Scenario 6 discarded following further technical testing. Collectively, thinking was stretched to design a variation of scenario 6 which reduced the visual intrusion of the grade separation, and enabled improved pedestrian access across the north edge of the Basin Reserve.

Variations tested included:

- a scenario which trenches 2m to get to ground level at Kent Terrace, however this was found to only be workable with a 10% grade;
- a scenario which used the alignment of scenario 1C, however this was found to only be workable if an overpass could sit over the traffic lanes;

It was raised that if further land take was possible in the south-eastern corner of the Basin gyratory, a part tunnel could be explored provided it did not worsen pedestrian movement.

- Scenario 9 renamed **Scenario 9B** for progression through to scheme assessment.
- Scenario 9A formulation for progression through to scheme assessment.



ABOVE FIG. 5-5: Collective assessment phase of the workshop which resulted in a second distillation of scenarios, and consensus on the preferred 5 scenarios to progress into scheme assessment.

Scenario 9A - At-grade Buckle St

Scenario 9A (refer to Figure 5-6) was developed as a response to design inquiry on a two-stage scenario, which could give temporary relief to congestion and capacity problems around the Basin and also provide corresponding time and cost advantages by modest intersection changes. This first stage scenario could also fit into a longer term intersection design.

Scenario 9A was found to work geometrically and was otherwise tested within constraints of, and necessary assumptions used at the workshop. These limited workshop-based investigations gave sufficient confidence that this new scenario should be considered further. More detailed traffic modelling and further testing is however required to fully validate the scenario, including its capability of accommodating traffic flows.

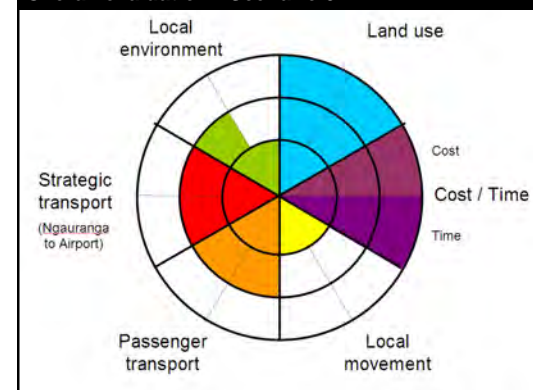
Scenario description

This scenario effectively uses the capacity around the south and western areas of the Basin Reserve gyratory to provide two options for city bound Mt Victoria traffic - either south around the Basin (Dufferin, Rugby, Sussex Streets) or north using Ellice, Buckle Streets).

FIG. 5-6: Scenario 9A



Overall evaluation - Scenario 9A



	Advantages include:	Disadvantages include:
STRATEGIC MOVEMENT	→ Provides improved PT priority around the west of the Basin	→ Does not separate strategic from local traffic → Uncertain level of service for passenger transport and general vehicles → Splits SH1 traffic, motorist visibility south of the Basin is limited
LOCAL ENVIRONMENT	→ Descals the Kent/Cambridge Tce intersection → Moves away from the Basin Reserve maintaining its iconic, landscape quality → Is able to project the Te Aro grid alignment of Buckle Street	→ Impacts on the recto-linear geometry of the Basin Reserve
LAND USE	→ Minimises disruption to sensitive land uses → Provides opportunity for redevelopment of site corner Cambridge Tce / Buckle St → Heritage creche, heritage buildings corner Kent Tce and Ellice Street and Grandstand Apartments are outside of land take requirements	→ Impacts on the built environment along the western edge of the Basin
LOCAL MOVEMENT	→ Provides additional space around the east of the Basin for access, amenity and safety improvements	→ Parking and some footpath area are lost along Sussex Street to bring PT along the western edge of the Basin



Workshop preferences PART 6

WORKSHOP PREFERENCES

6.1 Synthesis of scenarios

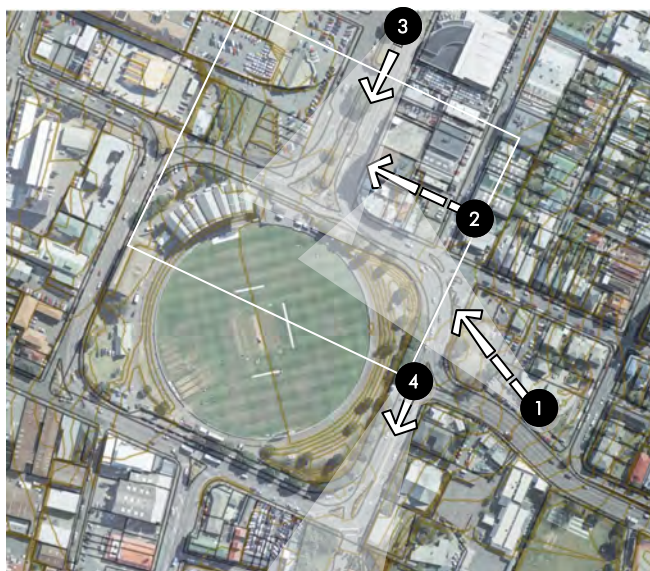
The perspectives on of the following pages are intended to highlight the key similarities and differences in spatial terms for each of the preferred scenarios.

The following three areas have been targeted:

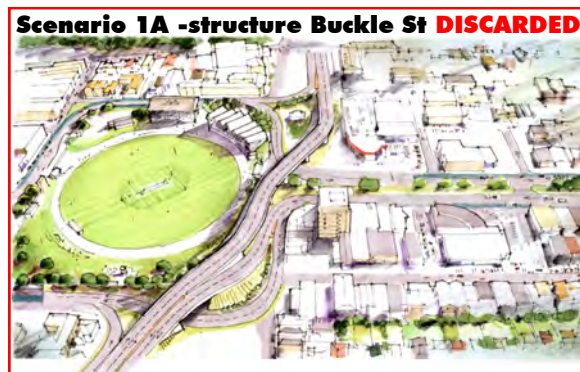
- Dufferin Street looking north-west towards the intersection Kent / Cambridge Terrace with Ellice and Buckle Streets (1, Figure 6-1).
- Mid block intersection at Kent / Cambridge Terrace (2).
- Kent / Cambridge Terraces looking south to the intersection of Buckle and Ellice Streets (3).

A summary table on pg. 54-55 provides details on the impact of each scenario on important contextual and land use elements.

Local network improvements around the Basin Reserve may also be possible under some of the scenarios. Refer to Section 6.2.



ABOVE FIG. 6-1; Perspective target areas.



Scenario 1C - Elevated Buckle St



Scenario 2A - Elevated mid block



Scenario 8 - At-grade mid block



Scenario 9A - At-grade Buckle Street



Scenario 9B - At-grade Buckle Street



ABOVE FIG. 6-2; Schematic overview of preferred transport interchange scenarios against the preferred scenario (1A) favoured prior to the workshop.

DUFFERIN TO ELLICE STREET



Scenario 1C - Elevated Buckle St



Scenario 2A - Elevated mid block



Scenario 8 - At-grade mid block



ABOVE FIG. 6-3: Perspectives Dufferin Street looking north-west towards the intersection Kent / Cambridge Terrace with Ellice and Buckle Streets.

DUFFERIN TO ELLICE STREET



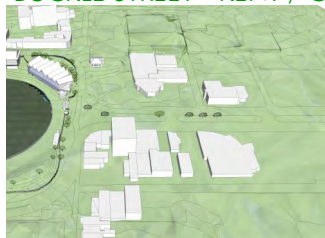
Scenario 9A - At-grade Buckle Street



Scenario 9B - At-grade Buckle Street



BUCKLE STREET - KENT / CAMBRIDGE INTERSECTION



Scenario 1C - Elevated Buckle St refer to pg.51



Scenario 2A - Elevated mid block

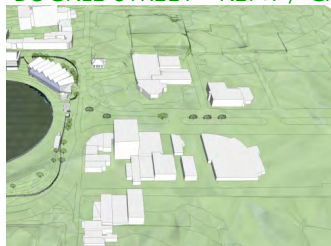


Scenario 8 - At-grade mid block



ABOVE FIG. 6-4: Perspectives mid block intersection at Kent / Cambridge Terrace.

BUCKLE STREET - KENT / CAMBRIDGE INTERSECTION CONTINUED



Scenario 9A - At-grade Buckle Street



Scenario 9B - At-grade Buckle Street



Scenario 1A VS Scenario 1C

Scenario 1C locates the elevated two-lane structure overtop of the buildings corner Ellice Street and Cambridge Terrace, and seeks to reduce its visibility from street level by screening it behind the building parapet.

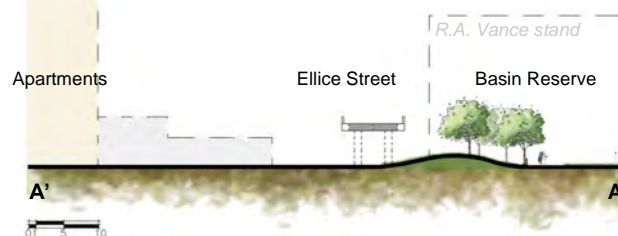
Scenario 1A locates the structure immediately north of the Basin Reserve grounds above the existing carriageway. Refer to Figure 6-5 showing a conceptual cross-section through Ellice Street comparing both scenarios.

Scenario 1C as a variation of 1A was favoured by workshop participants. In contrast to the original scenario, it enables the one storey heritage valued buildings to be retained, has a smaller footprint with less collateral damage to the built environment, and shifts the structure further away from the Basin Reserve.

Scenario 1A - Elevated Buckle St **DISCARDED**



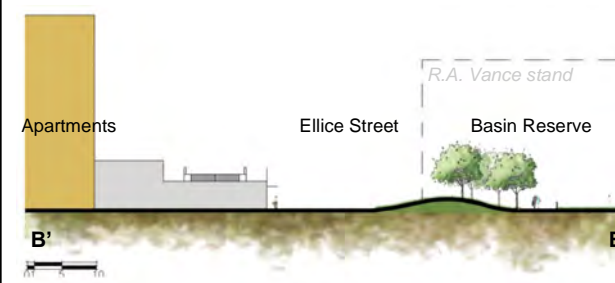
Conceptual cross-section



Conceptual model



Scenario 1C - Elevated Buckle St north



RIGHT FIG. 6-5: Comparative conceptual cross section, model and perspective showing the elevated structure in scenarios 1A and 1C and their location relative to the buildings fronting Ellice and Buckle Streets and the Basin Reserve.

Scenario 1A - Elevated Buckle St ~~DISCARDED~~



Scenario 1C - Elevated Buckle St north



ABOVE FIG. 6-6: Comparative perspectives of scenarios 1A and 1C (looking north towards Kent and Cambridge Terrace) and their location relative to the Basin Reserve R.A Vance Stand.

EXISTING KENT / CAMBRIDGE TERRACE



Scenario 1C - Elevated Buckle St



Scenario 2A - Elevated mid block



Scenario 8 - At-grade mid block



ABOVE FIG. 6-7: Perspectives Kent / Cambridge Terraces looking south to the intersection of Buckle and Ellice Streets

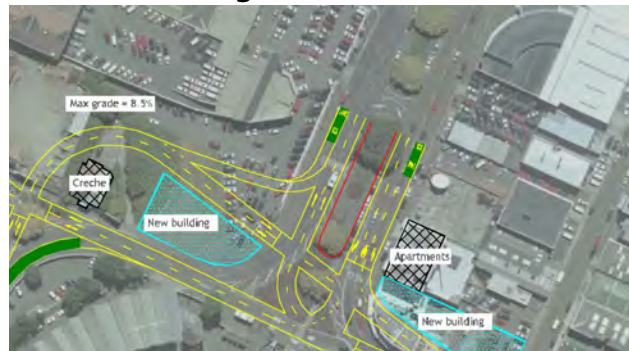
KENT / CAMBRIDGE TERRACE



Scenario 9A - At-grade Buckle Street



Scenario 9B - At-grade Buckle Street



6.2 Local network improvements

Given the expected reduction in traffic volumes around the Basin Reserve gyratory achievable under the preferred scenarios (subject to traffic modelling), strategic transport improvements also present a positive opportunity to create local network improvements.

As illustrated in Figure 6-8 showing the north-eastern corner of the gyratory, network improvements could include modest streetscape enhancements such as:

- Street trees;
- Footpath extensions and paving improvements;
- Additional parking bays;
- Street lighting; and
- Other public amenities such as pedestrian shelter and seating.



Existing street view Dufferin St

ABOVE FIG. 6-8: Perspective representing local network opportunities around the Basin Reserve which may be possible under preferred transport scenarios

6.3 Summary - spatial implications of preferred scenarios

Table 6-9 provides a summary comparison of spatial implications each scenario and the original preferred scenario 1A has on key land use and contextual elements of critical relevance around the Basin Reserve.

	Scenario 1C	Scenario 2A	Scenario 8	Scenario 9A	Scenario 9B	Scenario 1A
Basin Reserve – How does it impact on the northern access? – What is its impact on visibility to the ground or from the stands? – Does it involve any land take?	Recto linear edge to Basin Reserve gyratory remains intact Structure visible from stands & Adelaide Rd to Kent / Cambridge Tce, Buckle St to Mt Victoria tunnel viewshafts. Environmental effects reduced due to its distance north of the ground. Potential effects less in scale than those associated with scenario 1A	Structure visible from stands & Adelaide Rd to Kent / Cambridge Tce, Buckle St to Mt Victoria tunnel viewshafts. Environmental effects reduced due to its distance north of the ground. Potential effects less in scale than those associated with scenarios 1A, 1C	Recto linear edge to Basin Reserve gyratory remains intact Bridge portion partially visible from stands, environmental effects reduced due to its distance east of the ground Potential effects less in scale than those associated with scenario 1A, 1C, 2A	Not visible from the Basin, external viewshifts remain intact	Not visible from the Basin, external viewshifts remain intact	Structure visible from stands & Adelaide Rd to Kent / Cambridge Tce, Buckle St to Mt Victoria tunnel viewshafts. Environmental effects increased due to its proximity immediately north of the ground Part of structure is located within the Basin Reserve grounds (at the Ellice Street corner behind the existing grassed embankment)
Memorial Park – Can it work with a linear park extending to Cambridge Tce? – Does it provide flexibility to link with Buckle Street if shifted north?	Extended linear Memorial Park concept remains possible Maintains possibility of linking to Buckle St north	Extended linear park not possible Maintains possibility of linking to Buckle St north	Extended linear park not possible Maintains possibility of linking to Buckle St north	Extended linear park not possible Maintains possibility of linking to Buckle St north	Extended linear park not possible Maintains possibility of linking to Buckle St north	Extended linear park not possible Maintains possibility of linking to Buckle St north
City grid, Buckle Street – Does it provide flexibility of realigning Buckle Street to the City grid?	Uses the city grid alignment of Buckle St	Unlikely, will link to existing Buckle St alignment	Unlikely, will link to existing Buckle St alignment	Unlikely, will link to existing Buckle St alignment	Unlikely, will link to existing Buckle St alignment	Unlikely, will link to existing Buckle St alignment
Heritage crèche – Does it impact on the Buckle Street creche?	Structure located through path of creche, requires building relocation north Associated environmental effects due to proximity of structure	No physical impact on building Associated environmental effects due to proximity of structure to the north	No physical impact on building Associated environmental effects due to proximity of 3 travel lanes to the north. Potential effects less in scale than those associated with scenarios 1C, 2A	No physical impact on building Associated environmental effects due to proximity of 2 travel lanes to the north. Potential effects less in scale than those associated with scenarios 1C, 2A, 8	No physical impact on building Associated environmental effects due to proximity of 2 travel lanes to the north. Potential effects less in scale than those associated with scenarios 1C, 2A, 8	No physical impact on building Associated environmental effects due to proximity of structure immediately north

ABOVE FIG. 6-9; Table summarising scenario response to identified critical land use and contextual elements.

Continued.

	Scenario 1C	Scenario 2A	Scenario 8	Scenario 9A	Scenario 9B	Scenario 1A
Heritage corner Ellice St and Kent Tce – Does it impact on the heritage / character buildings?	Buildings retained, elevated structure located above roof behind parapet - may have structural implications Refer to Figure 6-8. Associated environmental effects due to proximity	No physical impact on buildings	No physical impact on buildings	Heritage buildings removed and replaced	No physical impact on buildings	Buildings removed to become part of road designation
Grandstand apartments – Does it impact on the Grandstand Apartment building?	No physical impact to building Structure visible from south facing units, associated environmental effects	No physical impact to building Approximately 4.0m clearance between elevated structure and building Structure visible from north facing units, associated environmental effects	No physical impact to building Approximately 4.0m clearance between at-grade 6 lane intersection & building Intersection visible from north facing units, associated environmental effects albeit less in scale than scenarios 1C, 2A	No physical impact to building Approximately 4.0m clearance between at-grade 2 lane intersection & building Intersection visible from north facing units, associated environmental effects albeit less in scale than scenarios 1C, 2A, 8	No physical impact to building Intersection visible from south facing units, associated environmental effects albeit less in scale than all other scenarios	Building removed and part of road designation
St Marks School – Does it impact on St Marks School pick up / drop off zone?	Offers opportunities for local network improvements around the school Lowers traffic volumes around the north-eastern corner of the gyratory	Offers opportunities for local network improvements around the school Lowers traffic volumes around the north-eastern corner of the gyratory	Offers opportunities for local network improvements around the school Lowers traffic volumes around the north-eastern corner of the gyratory	Explore opportunities for local network improvements around the school Confirm lowered traffic volumes around the north-eastern corner of the gyratory	Explore opportunities for local network improvements around the school Confirm lowered traffic volumes around the north-eastern corner of the gyratory	Offers opportunities for local network improvements around the school Lowers traffic volumes around the north-eastern corner of the gyratory
Government House – Does it impact on Government House entrance?	Maintains possibility of future reconfiguration of entrance & alternative Government House entry point via Alfred St	Maintains possibility of future reconfiguration of entrance & alternative Government House entry point via Alfred St	Maintains possibility of future reconfiguration of entrance & alternative Government House entry point via Alfred St	Maintains possibility of future reconfiguration of entrance & alternative Government House entry point via Alfred St	Maintains possibility of future reconfiguration of entrance & alternative Government House entry point via Alfred St	Maintains possibility of future reconfiguration of entrance & alternative Government House entry point via Alfred St

6.4 Time and cost considerations

Each of the five preferred scenarios were broadly evaluated against:

- A baseline cost of \$30-35 million (the estimated cost of the original B3 (1A) elevated scenario); and
- A baseline time frame of 5-6 years for consenting and property purchase (the estimated timeframe of the original B3 (1A) scenario).

Ranking scenarios against time / cost considerations reveals the following prioritisation (from most preferred to least preferred):

Cost: 9A / 9B → 1C / 8 → 2A

Time: 9A / 9B / 1C → 8 / 2A

The workshop group did not factor in costs associated for construction, operation or maintenance in rough order cost assessments. Likewise, the timeliness criterion did not consider the degree of difficulty in construction and sequencing. These issues will be dealt with comprehensively during future scheme assessment stages.

6.5 Where to next

NZTA will progress workshop preferences through to Scheme Assessment reporting phases.



APPENDICES

Notes on the Appendices

1. BASIN RESERVE WORKSHOP ATTENDEES

2. SCENARIO MODELLING ASSUMPTIONS

3. DAY 1 BRIEFING PRESENTATION SLIDES

- Graham Taylor, NZTA - strategic transport Ngauranga to Airport, Basin Reserve Strategy Study
- Greg Campbell, WCC transport - strategic transport - Ngauranga to Airport
- Steve Spence, WCC transport - Adelaide Road transport
- Tom Beard, WCC urban design - walking and cycling
- Gerald Blunt, WCC urban design - workshop purpose, history of the Basin Reserve

4. SUB GROUP EVALUATION CRITERIA

5. SUB GROUP SCENARIO ASSESSMENT CHARTS BY CRITERION

6. MODEL SCREENSHOTS OF EACH PREFERRED SCENARIO

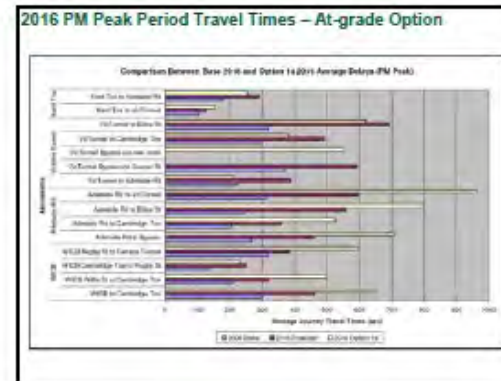
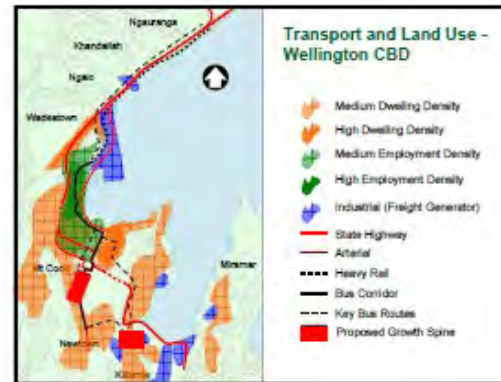
Appendix 1 - Basin Reserve workshop attendees

Name	Organisation
Governmental representatives	
Natasha Hayes	GWRC
Brian Baxter	GWRC
Adam Lawrence	GWRC
Graham Taylor	NZTA
Eric Whitfield	NZTA
Jacque Bell	NZTA
Alexandra Teague	WCC Heritage
Nicci Wood	WCC Infrastructure
Mike Oates	WCC Open Space and Recreation Planning
Glenn McGovern	WCC Recreation Projects
Steve Spence	WCC Transport
Gerald Blunt	WCC Urban Design
Tom Beard	WCC Urban Design
Bruce Duffield	WCC Urban Design
Charles Gordon	WCC Urban Design
Greg Campbell	WCC Urban Development and Transport
Peter Clinton	Basin Reserve Trust
Mike Hannaway	DPMC (Government House)
David Watts	Historic Places Trust

Name	Organisation
Consultant specialist representatives	
Wayne Stewart	Opus Consultants
Ben Holland	Opus Consultants
Mark Edwards	Opus Consultants
Roger Burra	Opus Consultants
Chris McDonald	School of Architecture VUW
Consultant workshop team	
Urbanismplus	
TTM Consulting	

Appendix 2 - DAY 1 briefing presentations

Graham Taylor - NZTA (strategic transport Ngauranga to Airport, Basin Reserve Strategy Study)



Basin Reserve Improvements

Assumption: Adelaide Road is upgraded and Wallace Street is NOT four-laned.

Potential Improvement Types:

"At-grade"

Intersection Examples:

- Traffic signals

- Roundabouts

"Grade-separated"

Intersection Examples:

- Bridges

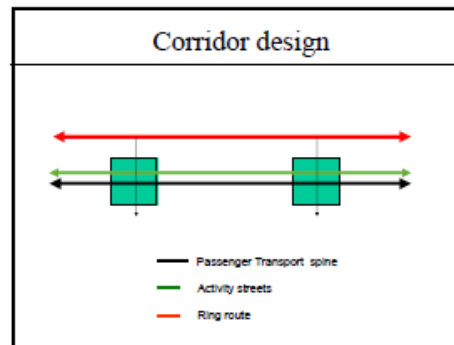
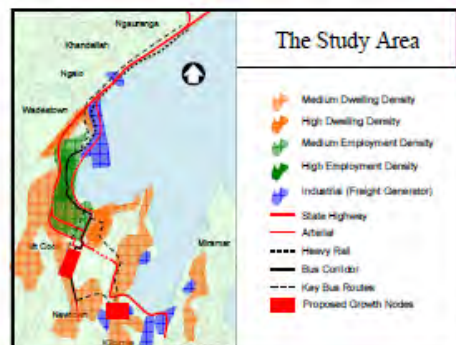
- Tunnels



Corridor Plan Approvals

- NZTA Board adopted the Corridor Plan and encouraged early progress of the grade separation and bus priority measures at the Basin Reserve.
- WCC agreed to support the Ngauranga to Airport Corridor Plan.
- RTC adopted the Ngauranga to Airport Corridor Plan.
 - It was verbally reported that the Hearings Subcommittee had adopted the flyover option as being the only viable solution.

Greg Campbell - WCC transport (strategic transport - Ngauranga to Airport)



- ### Project Initiatives
- Travel demand management
 - Active modes (walking & cycling)
 - High quality PT spine
 - High quality ring road

Proposed Sequencing

Measures within 10 years	BAU+
• TDM, walking & cycling	\$19M
• Bus priority	\$30M
• Ngauranga - Acton	\$33M
• Basin	
• Adelaide Road boulevard	
• Interchanges - 2x tunnels, Rushmore St-Wellington Rd. busway/light rail	\$18M
Measures may be implemented (beyond 10 years)	
• TDM, walking & cycling	
• Busway and/or light rail	\$43M
• Rushmore St-Wellington Rd	\$175M
• Mt Vic tunnel	\$167M
• Waterfront Terrace tunnel	



Steve Spence - WCC transport (Adelaide Road transport)



Project context

- Wellington City is growing
 - 44,000 more people by 2026
- Urban Development Strategy sets out approach for managing growth
 - Growth spine (directing growth to where benefits greatest)
 - Key growth areas (Incl. Adelaide Rd, J'ville)
- An 'area of change' (infill housing review)
- Link to Ngauranga-Airport corridor plan



Adelaide Road

- Well located to support growth
 - walking distance of
 - central city
 - Wellington hospital
 - Newtown shopping centre
 - Massey campus
 - good access to public transport
 - key transport route & connection to south/east
 - development potential



Planning for Adelaide Rd's future

- an example of integrated land use & transport planning
- starting objectives/aims
 - creating a more vibrant 'live/work' area
 - more intensive residential development to accommodate approx 1550 more people (870 dwellings) by 2026
 - but also retaining employment importance
 - enhancing effectiveness of Adelaide Rd as transport connection so it works better for all modes



Adelaide Road Framework

- Long-term vision (20+ years)
- Envisages significant urban change to create a prosperous & high quality mixed-use area
- Provides for:
 - Significant residential intensification
 - More employment opportunities – mixed use
 - Supported by good quality public amenity & streetscape, good public transport & well functioning transport corridor

the vision...

A high quality mixed-use area that is a more vibrant, attractive, better connected, accessible, and safer place that meets the needs of everyone who lives in, works in, and uses the area.

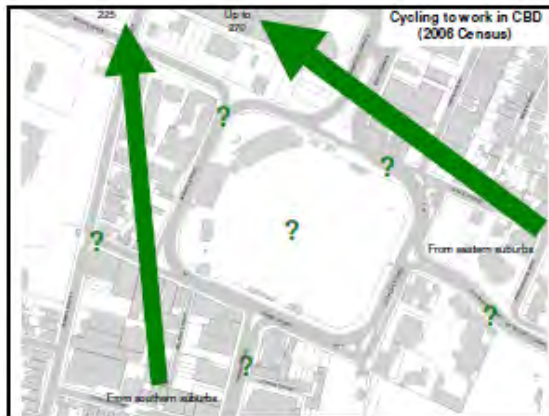
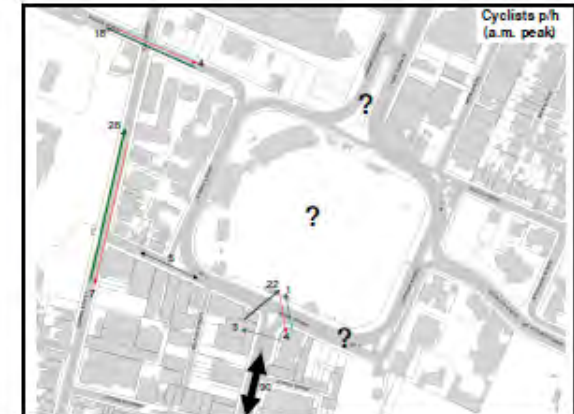


Key elements

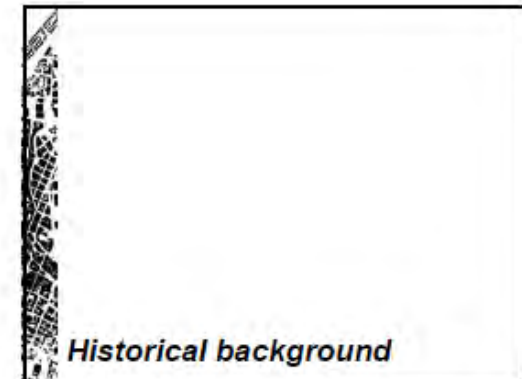
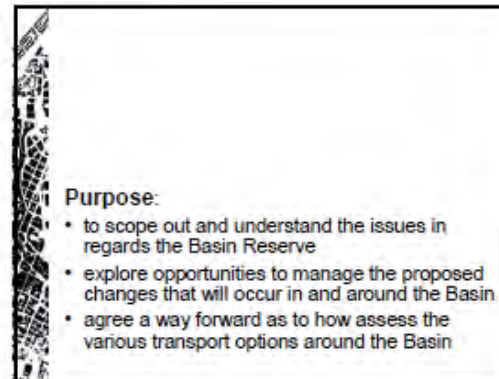
- Adelaide Road improvements (est \$4.5-6.8m – land purchase)
 - widening to 25.5m, 2 traffic lanes each direction – one general traffic, one shared for cycle, on-street parking to support employment uses, streetscape & pedestrian improvements
- John St/Riddiford St Intersection Improvements (est \$650k)
 - removal of median island & creation of dedicated right-hand turn lane; streetscape and pedestrian crossing improvements
- Other pedestrian, amenity & public space improvements (est \$2.3m)
- Intensification for greater mix of residential & employment
 - height increases along Adelaide Rd corridor
 - employment uses on ground floor (including activities associated with Hospital & education institutes)
 - adaptive re-use of important heritage buildings



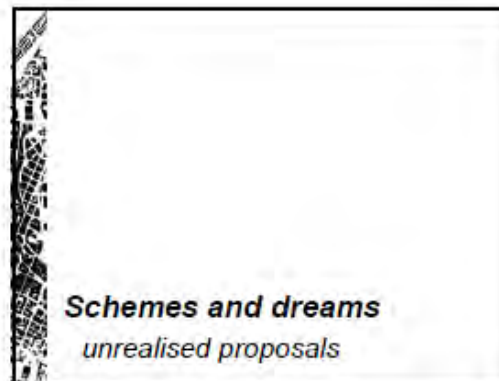
Tom Beard - WCC urban design (walking and cycling)



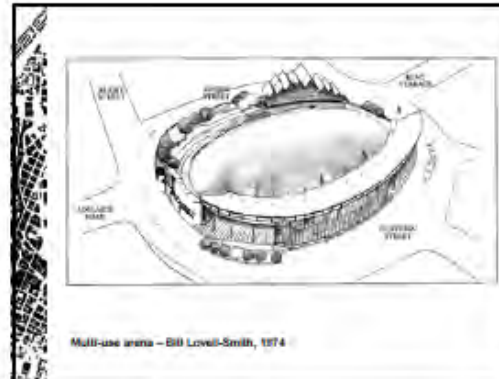
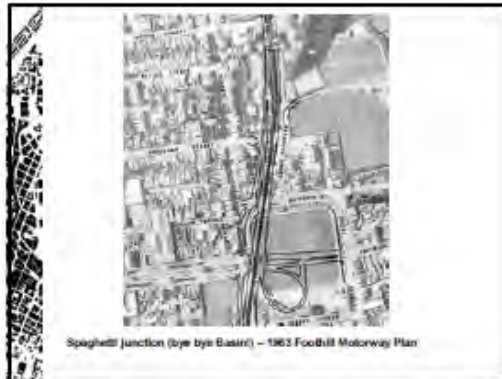
Gerald Blunt - WCC urban design (history of the Basin Reserve)



Continued



Continued



Appendix 3 - Scenario modeling assumptions

Standards used:

- NZTA State Highway Geometric Design Manual
- Austroads: Urban Road Design Guide

- 50km/h design speed adopted on all roads
- Minimum lane width of 3.5m
- Shared Bus/Cycle lane of 4.5m
- Minimum hard shoulder width adjacent to traffic lane is 0.5m
- Cycle lane / shoulder width is 1.5m
- Median width separating opposing traffic is 2.4m (including hard shoulders)

- Additional lane width applied for vehicle tracking where required.
- Additional verge width applied to allow for sight distance at intersections.

- Maximum vertical grade of 6% for scenario 5 (tunnel)
- 6m vertical height clearance to all structures
- Single spans of up to 20m on bridges (single hollow core 1m deck depth)

- Cadastral boundary information obtained from quickmap (± 2 m accuracy)
- WCC contour data supplied at 1m intervals.

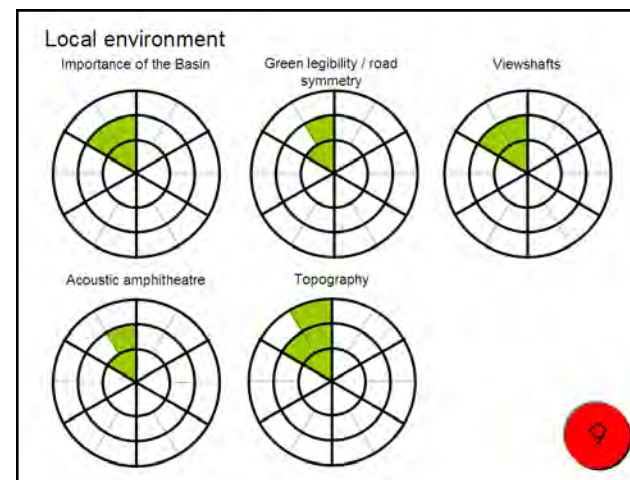
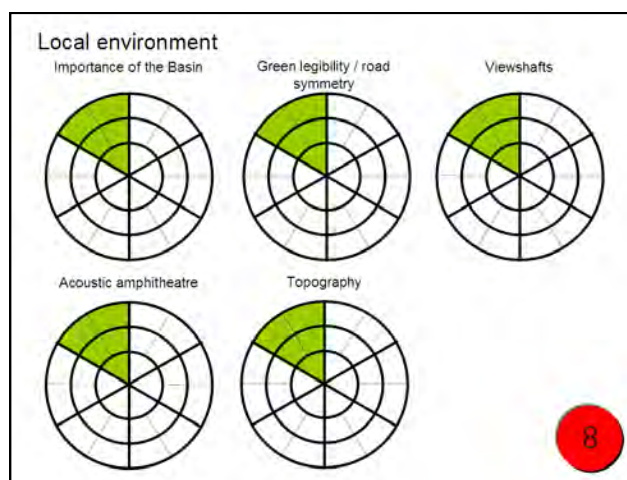
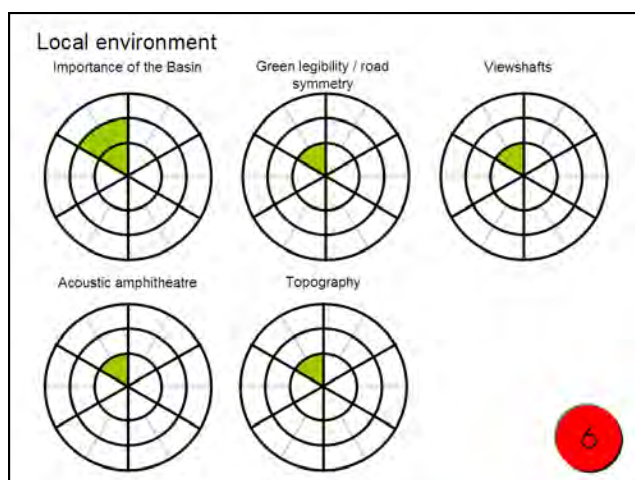
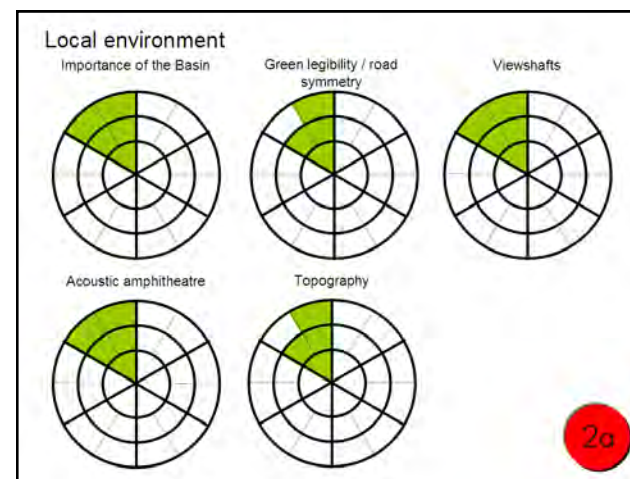
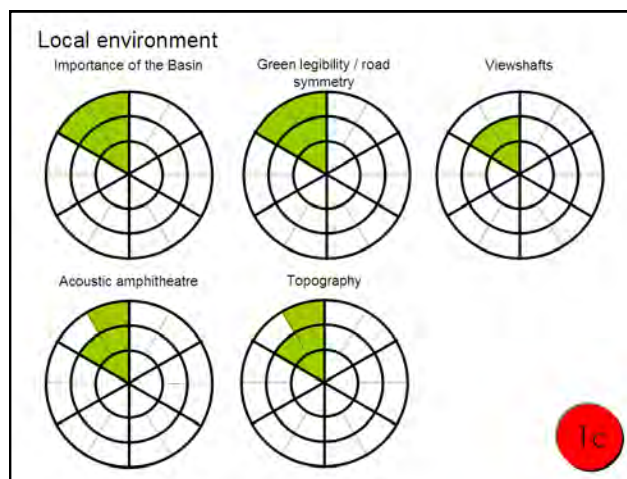
Appendix 4 - Criteria used to evaluate the scenarios

LOCAL ENVIRONMENT		
LE 1	Importance of the Basin	Importance of the Basin's place in this environment as an icon, maintaining its spatial integrity
LE 2	Green legibility / road symmetry	Impact on the legibility of the green pattern and road symmetry
LE 3	Viewshafts	Impact on viewshaft Kent/Cambridge south to Basin and beyond Adelaide Road, Mount Victoria and Adelaide Road north to Basin
LE 4	Acoustic amphitheatre	Noise impact on the Basin
LE 5	Topography	Ability to respect the topography of the Basin and the rising landscape
LAND USE		
LU 1	Community / national icons	Ability to respect and enhance existing community infrastructure such as Basin Reserve, Government House entrance, St Josephs Church
LU 2	School access	Ability to accommodate peak period school related traffic movements including children's safety, pick-up and drop-off
LU 3	Memorial Park / National War	Ability to retain and improve links to Memorial Park and National War Memorial. Ability to retain flexibility with Memorial Park design
LU 4	Basin Reserve local access	To provide quality non-event time local pedestrian and cycle access through the Basin Reserve
LU 5	Basin Reserve event access	Ability to provide quality event access and operational efficiency (bus / shuttle / coach / pedestrian) to and from the Basin during games
LU 6	Development protection	Ability to protect existing and potential land uses where appropriate e.g. employment, residential, recreational
LU 7	Character / heritage pattern	Ability to respect and enhance existing character through protection of heritage items and settlement patterns / pieces that contribute to neighbourhood character
PEDESTRIAN / CYCLE / LOCAL MOVEMENT FUNCTIONALITY		
Ped 1	South to Courtney Place	Ability to improve connectivity for pedestrians/cycles between Courtney Place and Adelaide Road growth node and beyond
Ped 2	South to CBD	Improves connectivity for pedestrians/cycles to CBD and Adelaide Road
Ped 3	East to west	Maintains the possibility for pedestrian/cycle connection between Mount Victoria tunnel and Te Aro / CBD
Ped 4	Local vehicular	Maintains adequate access to development adjacent to the Basin Reserve gyratory
Ped 5	Local active	Maintains optimal active travel access to properties adjacent to the gyratory in the most sensitive areas
Ped 6	CPTED	Avoids creation of crime hot spots and maintains or improves the sense of personal security
PASSENGER TRANSPORT		
PT 1	Passenger transport north to south	Passenger transport reliability and priority
STRATEGIC TRANSPORT		
Str 1	Traffic flow	Impact on traffic flow (includes north to south and east to west movements)
TIME/COST		
TC 1	Cost efficiency	Cost efficiency (using \$30 to 35 million)
TC 2	Time	Time for consenting and property purchase

Appendix 5 - Assessment charts of each scenario by criterion

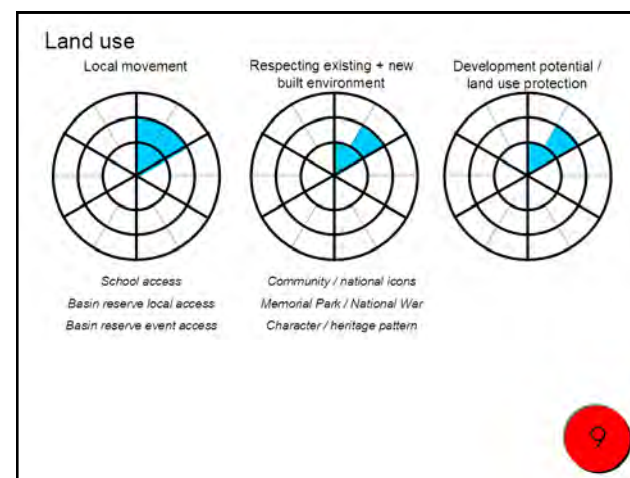
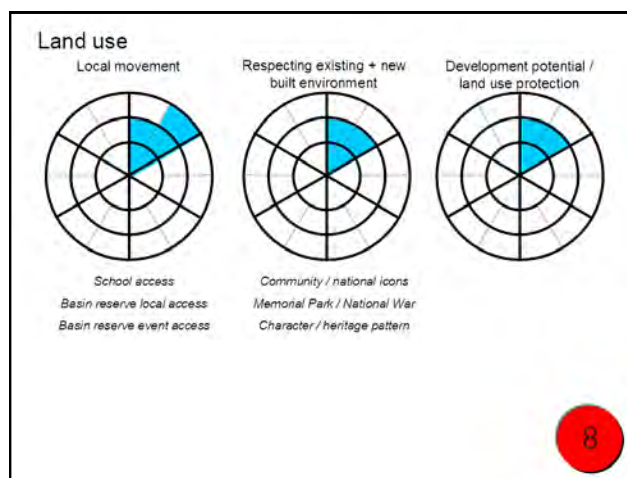
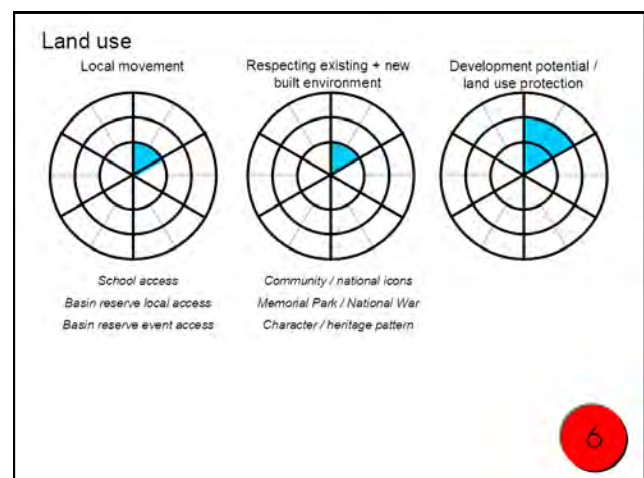
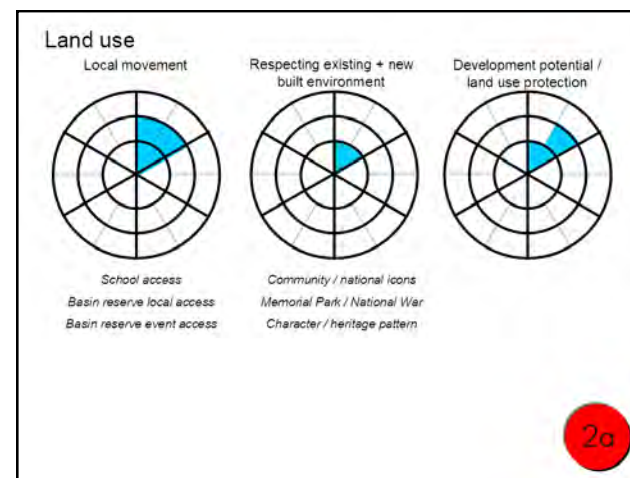
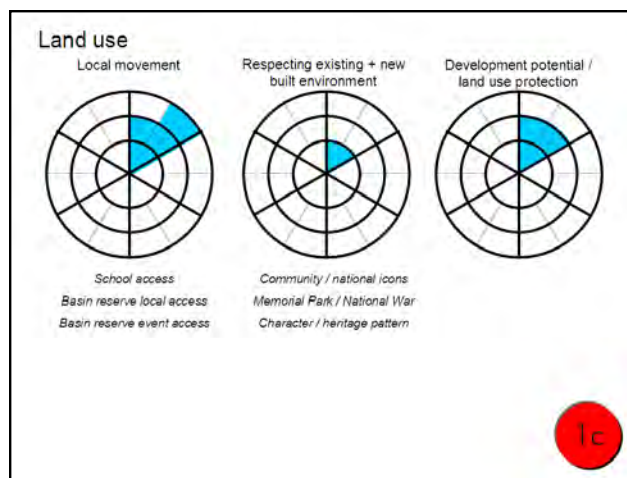
LOCAL ENVIRONMENT

LE 1	Importance of the Basin	Importance of the Basin's place in this environment as an icon, maintaining its spatial integrity
LE 2	Green legibility / road symmetry	Impact on the legibility of the green pattern and road symmetry
LE 3	Viewshafts	Impact on viewshaft Kent/Cambridge south to Basin and beyond Adelaide Road, Mount Victoria and Adelaide Road north to Basin
LE 4	Acoustic amphitheatre	Noise impact on the Basin
LE 5	Topography	Ability to respect the topography of the Basin and the rising landscape



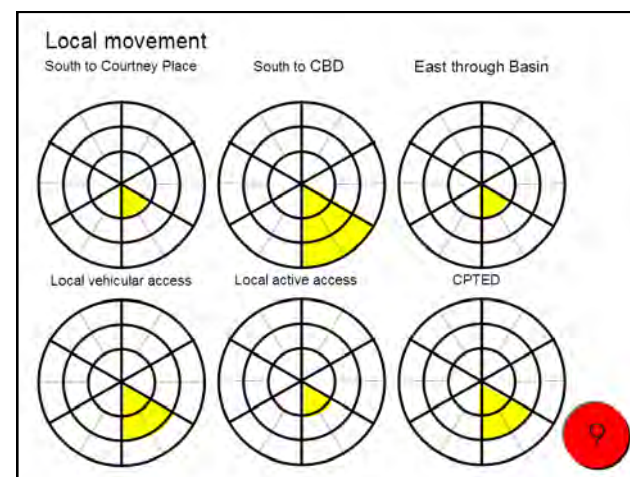
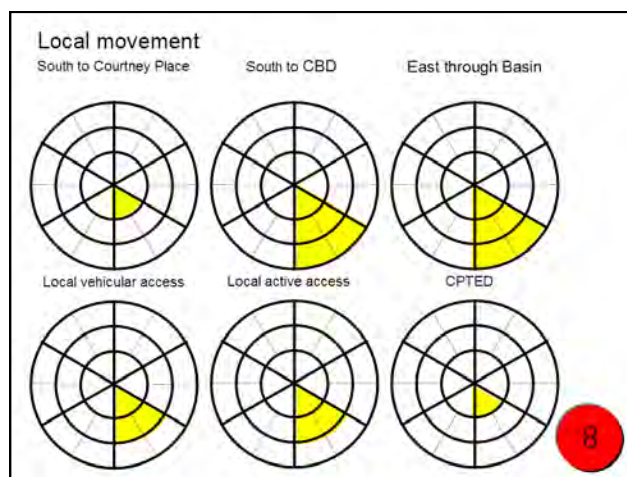
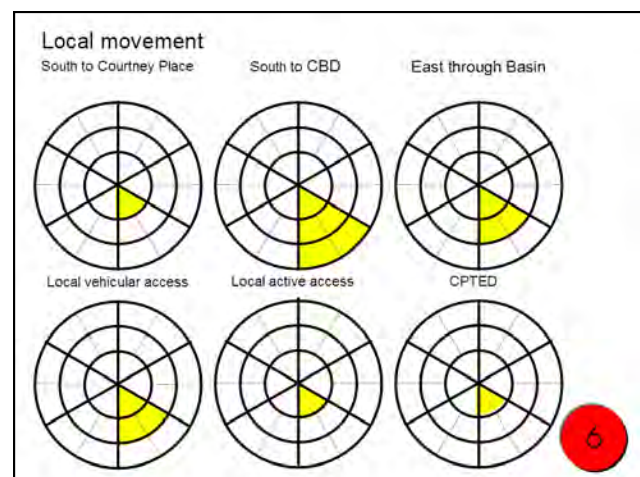
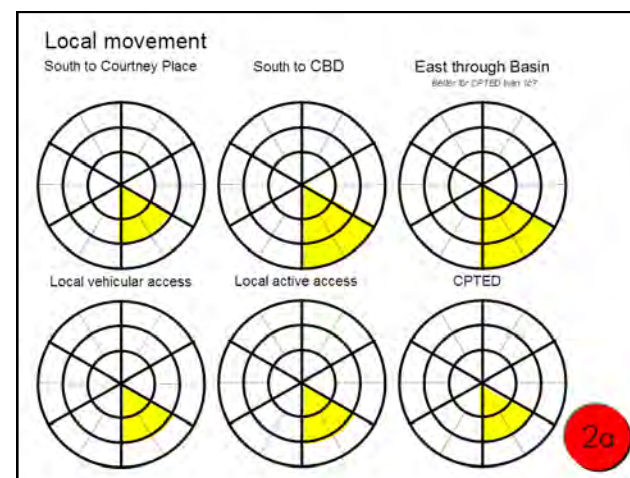
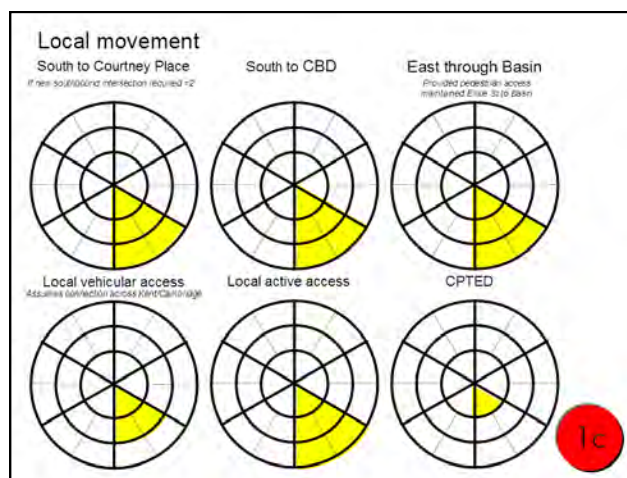
LAND USE

LU 1	Community / national icons	Ability to respect and enhance existing community infrastructure such as Basin Reserve, Government House entrance, St Josephs Church
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LU 3	Memorial Park / National War	Ability to retain and improve links to Memorial Park and National War Memorial. Ability to retain flexibility with Memorial Park design
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LU 6	Development protection	Ability to protect existing and potential land uses where appropriate e.g. employment, residential, recreational
LU 7	Character / heritage pattern	Ability to respect and enhance existing character through protection of heritage items and settlement patterns / pieces that contribute to neighbourhood character



LOCAL MOVEMENT

Ped 1	South to Courtney Place	Ability to improve connectivity for pedestrians/cycles between Courtney Place and Adelaide Road growth node and beyond
Ped 2	South to CBD	Improves connectivity for pedestrians/cycles to CBD and Adelaide Road
Ped 3	East to west	Maintains the possibility for pedestrian/cycle connection between Mount Victoria tunnel and Te Aro / CBD
Ped 4	Local vehicular	Maintains adequate access to development adjacent to the Basin Reserve gyratory
Ped 5	Local active	Maintains optimal active travel access to properties adjacent to the gyratory in the most sensitive areas
Ped 6	CPTED	Avoids creation of crime hot spots and maintains or improves the sense of personal security



PASSENGER TRANSPORT

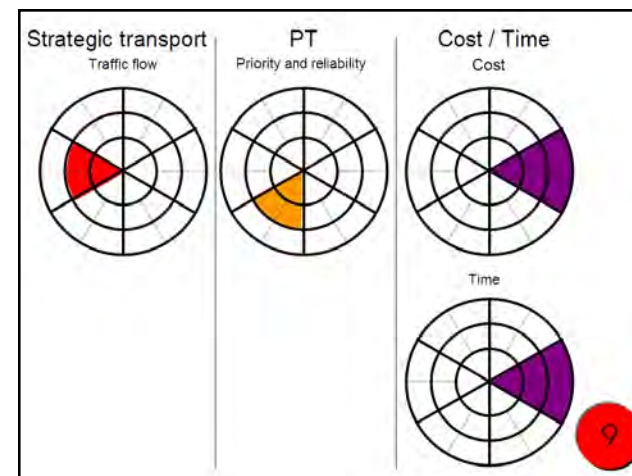
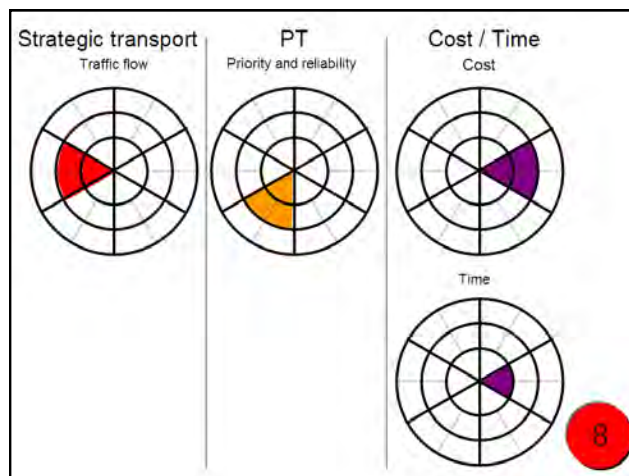
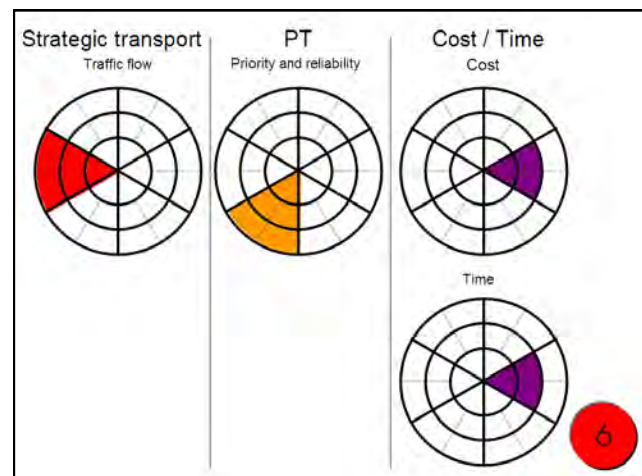
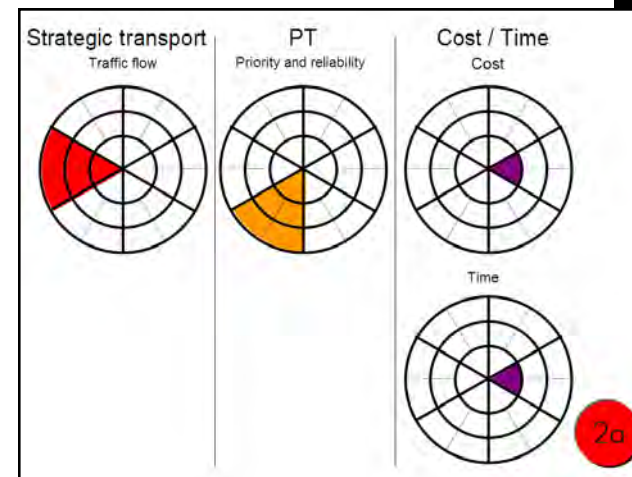
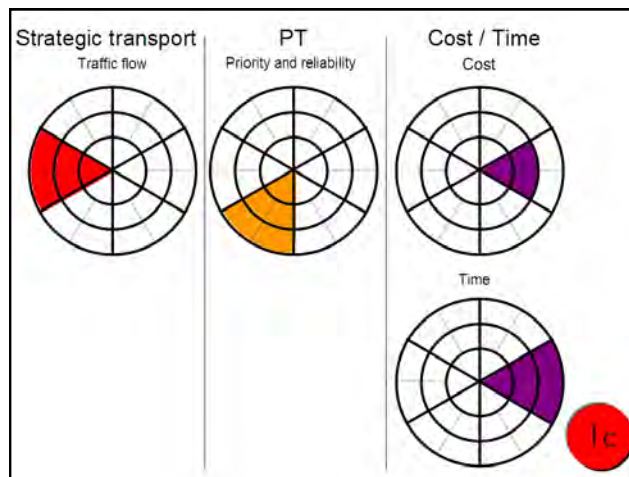
PT 1	Passenger transport north to south	Passenger transport reliability and priority
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STRATEGIC TRANSPORT

Str 1	Traffic flow	Impact on traffic flow (includes north to south and east to west movements)
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TIME / COST

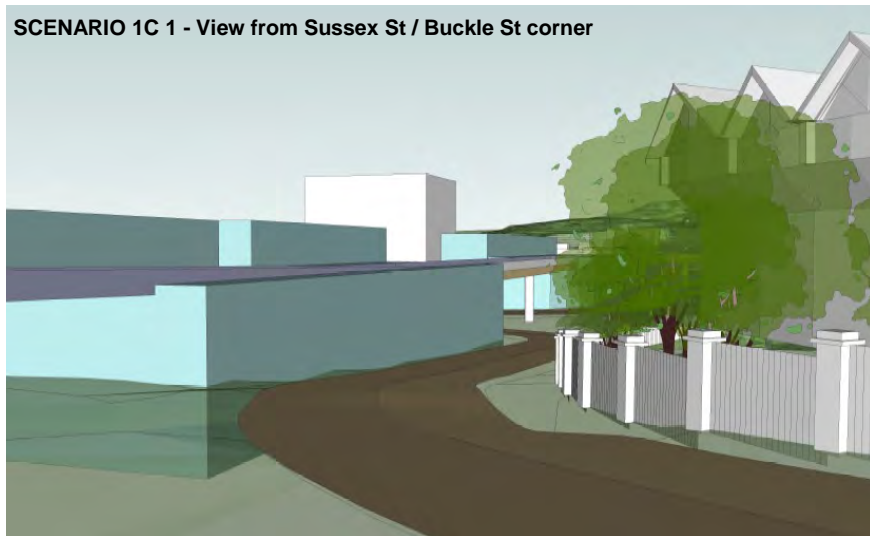
TC1	Cost efficiency	Cost efficiency (using \$30 to 35 million)
TC 2	Time	Time for consenting and property purchase



Appendix 6 - Model screenshots of preferred scenarios

SCENARIO 1C

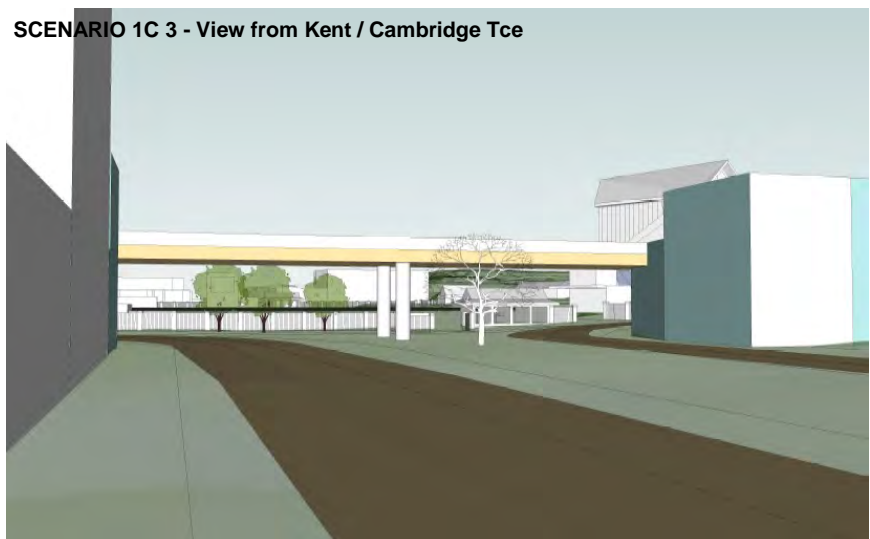
SCENARIO 1C 1 - View from Sussex St / Buckle St corner



SCENARIO 1C 2 - View from Mt Victoria tunnel



SCENARIO 1C 3 - View from Kent / Cambridge Tce

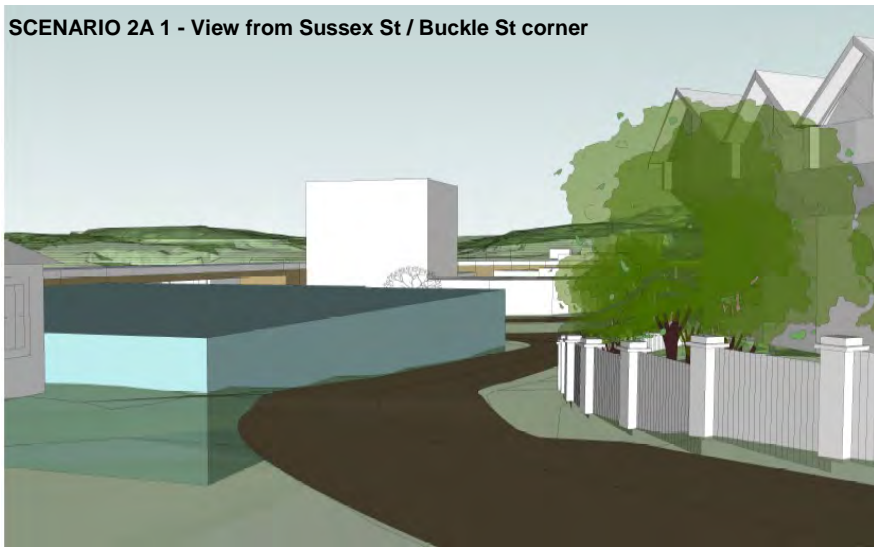


SCENARIO 1C 4 - View from Adelaide Rd / Rugby St



SCENARIO 2A

SCENARIO 2A 1 - View from Sussex St / Buckle St corner



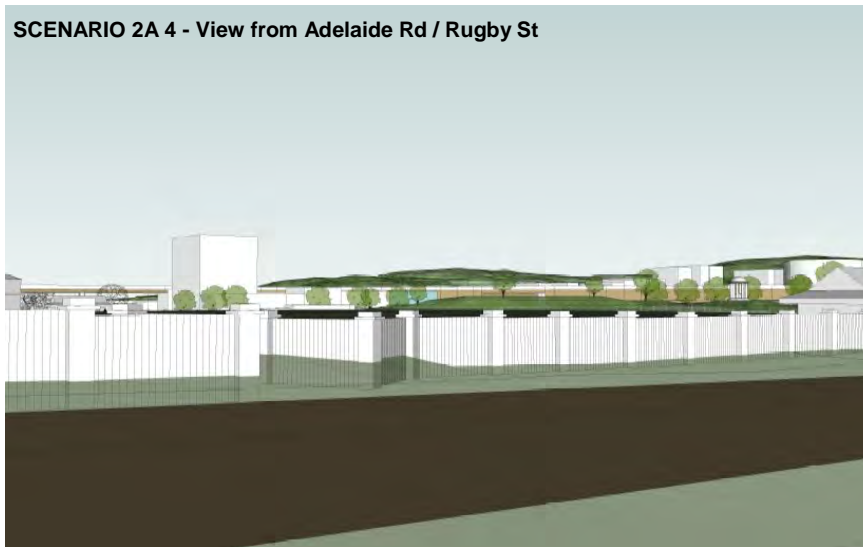
SCENARIO 2A 2 - View from Mt Victoria tunnel



SCENARIO 2A 3 - View from Kent / Cambridge Tce

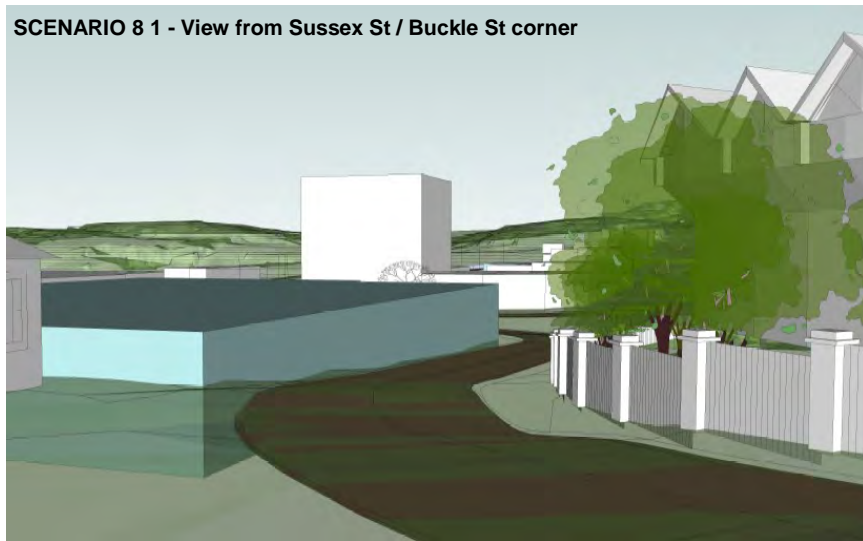


SCENARIO 2A 4 - View from Adelaide Rd / Rugby St



SCENARIO 8

SCENARIO 8 1 - View from Sussex St / Buckle St corner



SCENARIO 8 2 - View from Mt Victoria tunnel



SCENARIO 8 3 - View from Kent / Cambridge Tce

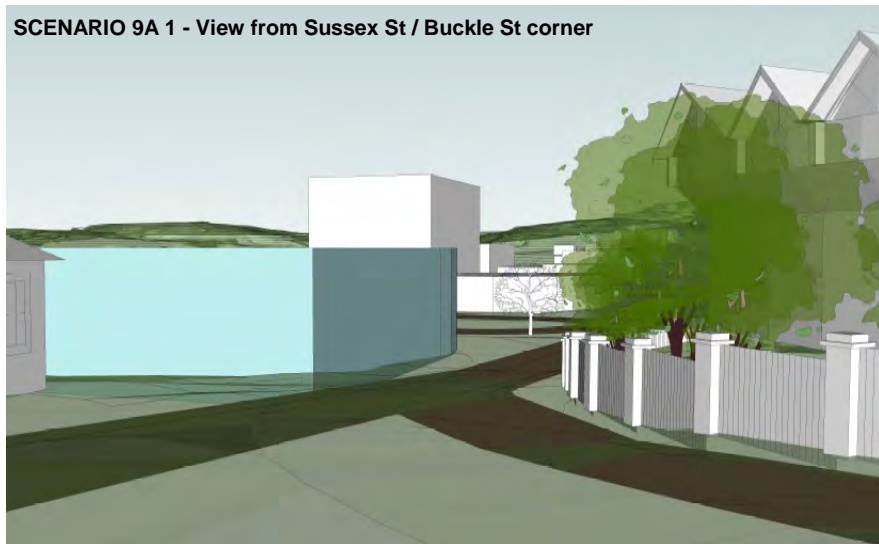


SCENARIO 8 4 - View from Adelaide Rd / Rugby St



SCENARIO 9A

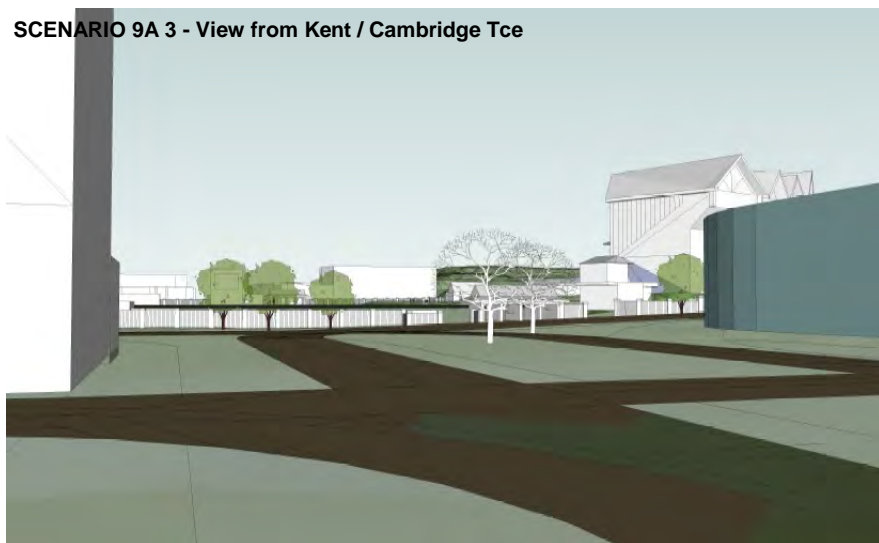
SCENARIO 9A 1 - View from Sussex St / Buckle St corner



SCENARIO 9A 2 - View from Mt Victoria tunnel



SCENARIO 9A 3 - View from Kent / Cambridge Tce



SCENARIO 9A 4 - View from Adelaide Rd / Rugby St



SCENARIO 9B

SCENARIO 9B 1 - View from Sussex St / Buckle St corner



SCENARIO 9B 2 - View from Mt Victoria tunnel



SCENARIO 9B 3 - View from Kent / Cambridge Tce



SCENARIO 9B 4 - View from Adelaide Rd / Rugby St

