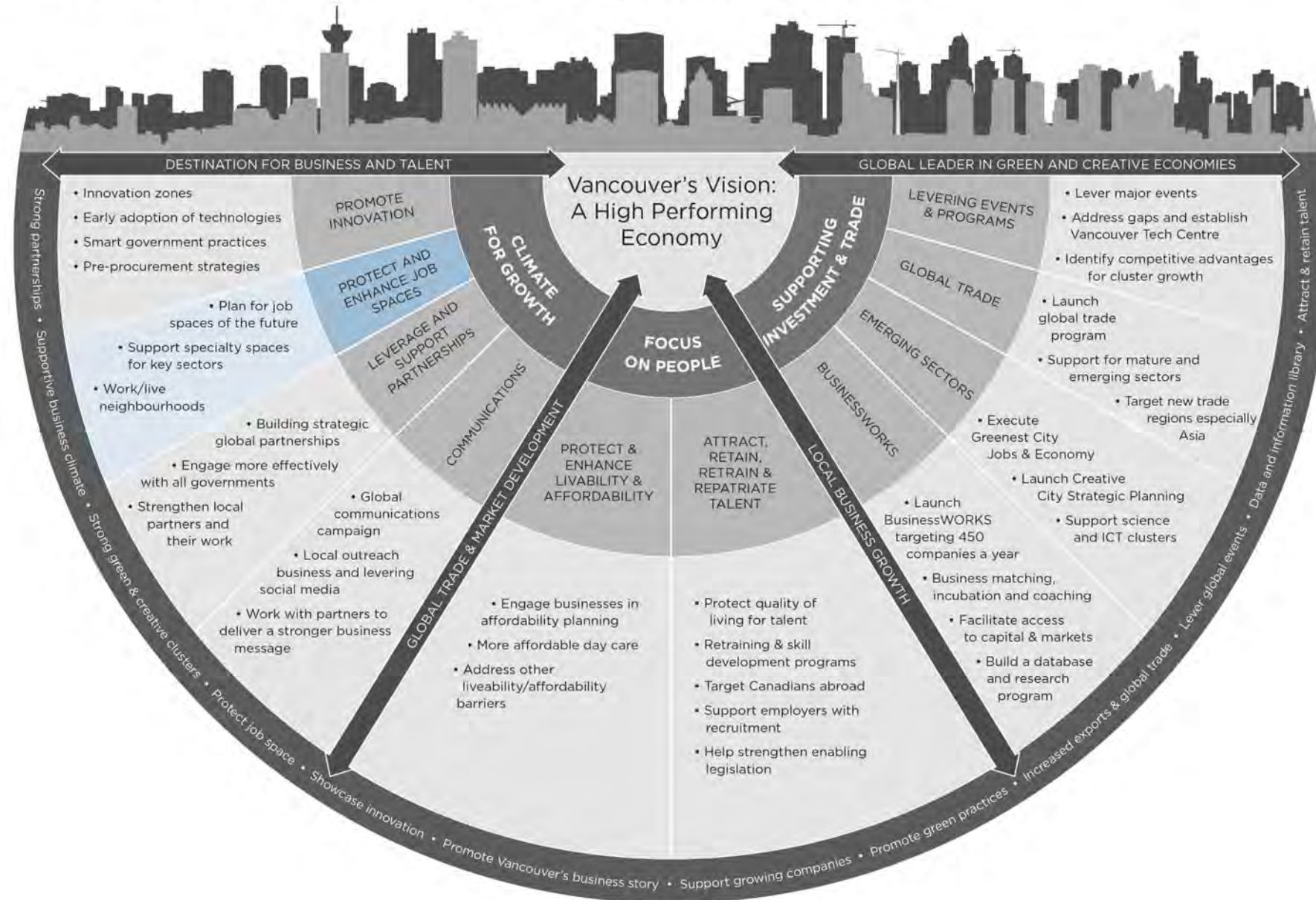


1C POLICY CONTEXT VANCOUVER ECONOMIC ACTION STRATEGY

THE VANCOUVER ECONOMIC ACTION STRATEGY AT A GLANCE



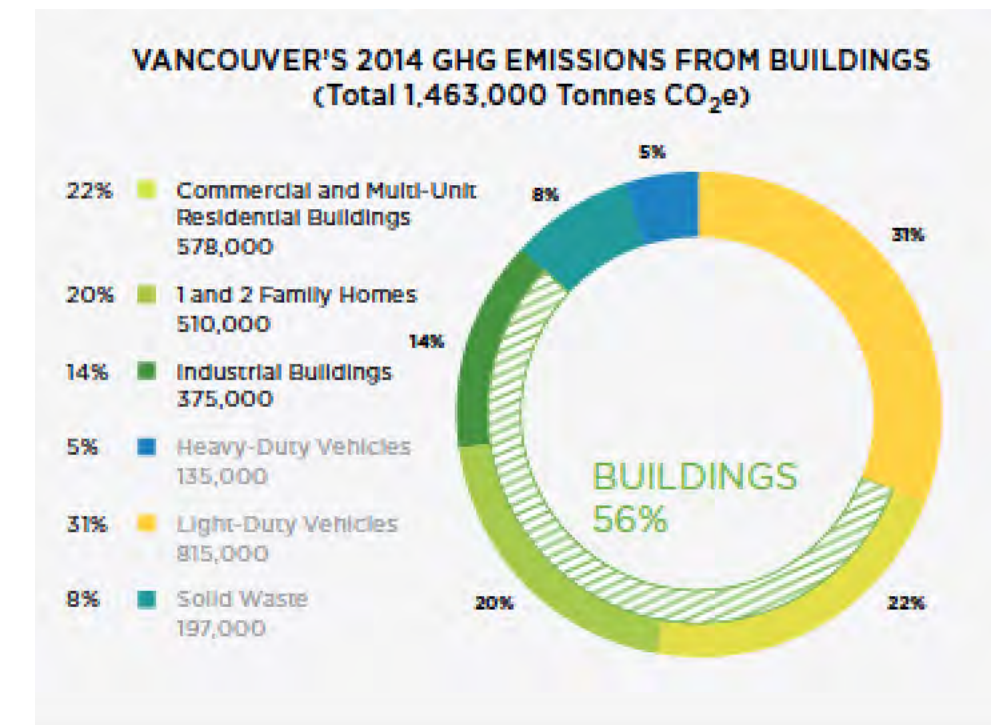
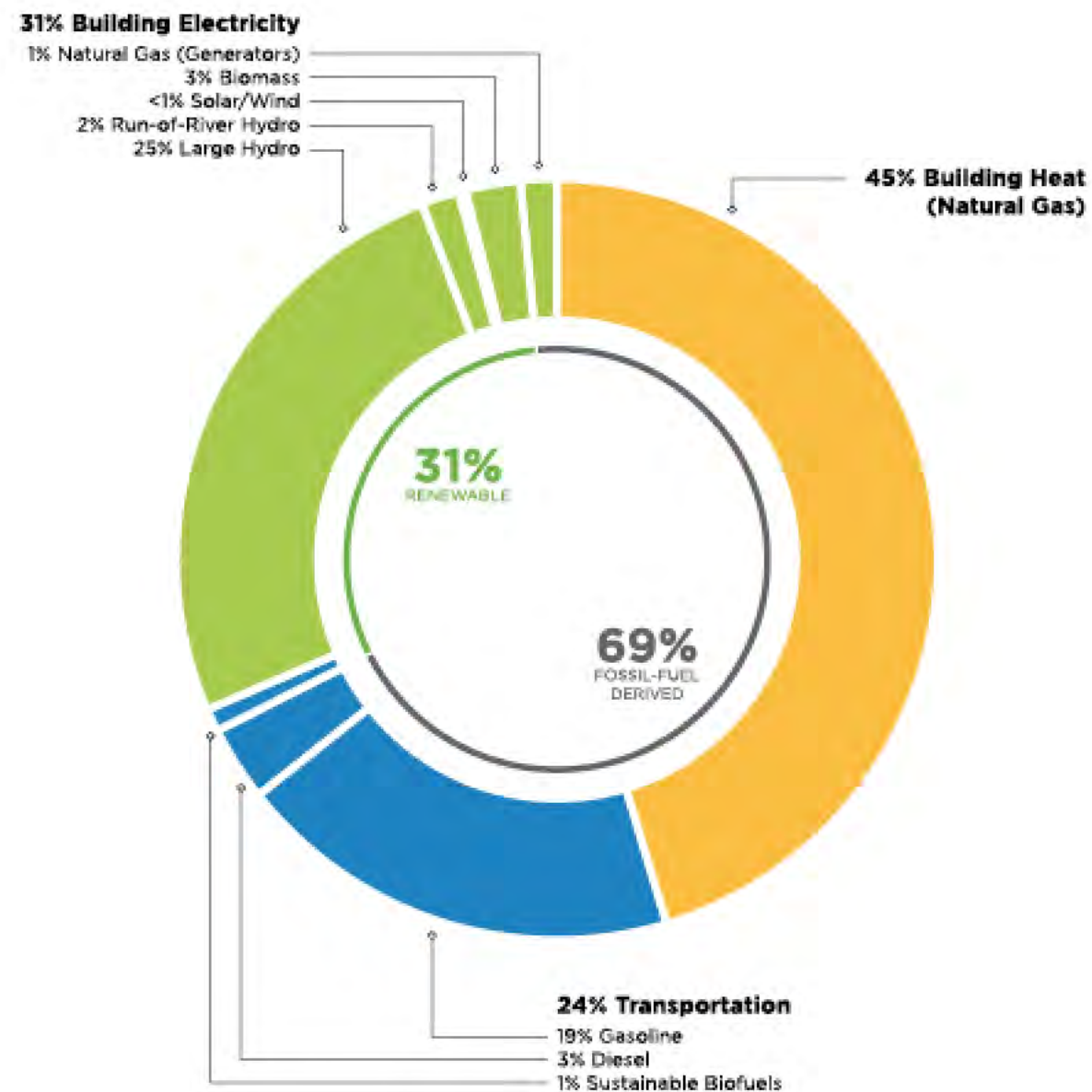
RELEVANT KEY OBJECTIVES

- Protect, enhance, increase and densify employment spaces
- Higher and better use of employment space
- Create better spaces that support new investment and growing companies and their employees
- More people who work in the neighbourhoods in which they live
- Less dependency on automobiles
- Increased employment density in key commercial neighbourhoods and along transportation routes

1C POLICY CONTEXT

VANCOUVER GREENEST CITY 2020 ACTION PLAN

HOW RENEWABLE IS VANCOUVER'S CURRENT ENERGY SUPPLY? (Sources of Energy Used In Vancouver)



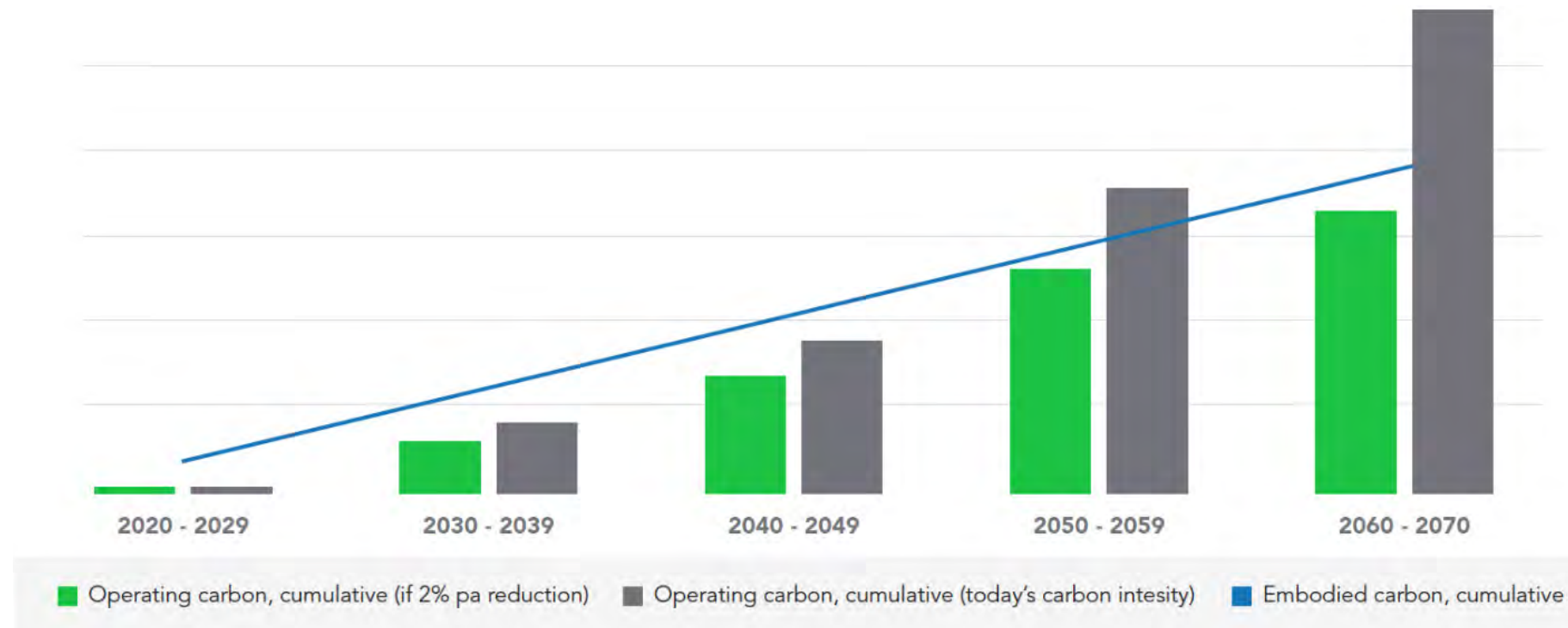
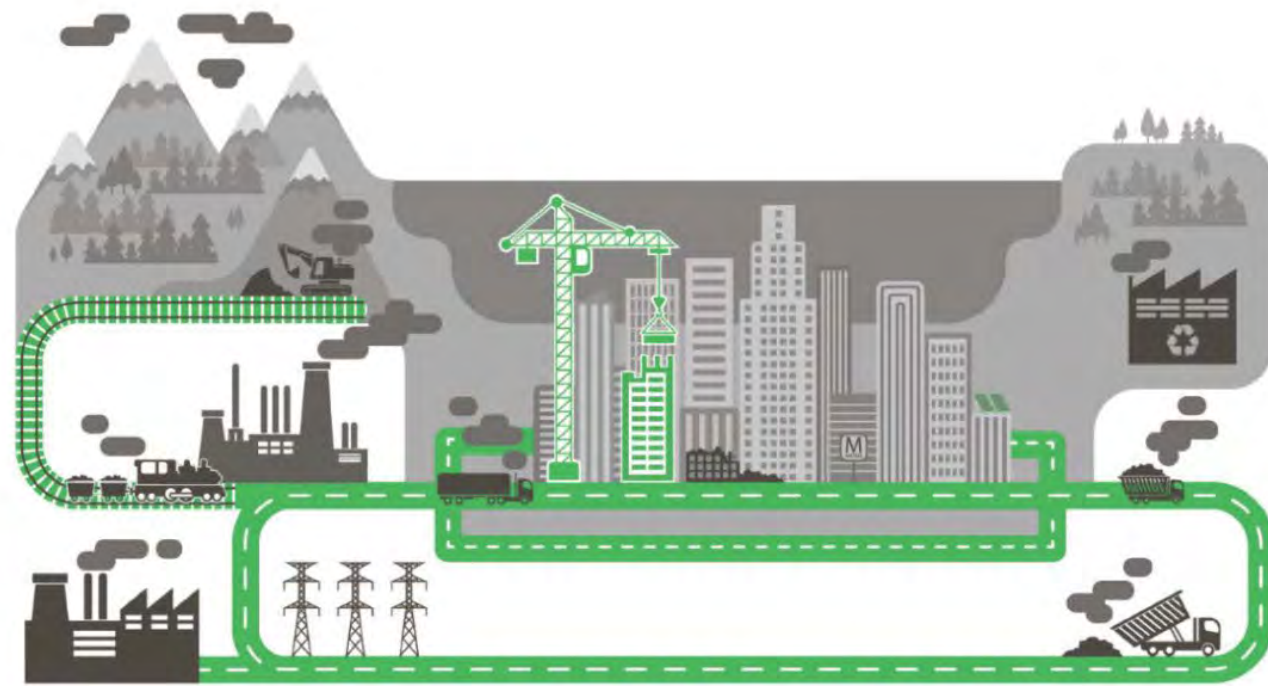
RELEVANT KEY OBJECTIVES

- Improve efficiency and reduce Greenhouse Gas Emissions in new and existing buildings
- Reduce solid waste by encouraging building deconstruction, renovation and adaptive reuse
- Reduce electrical demand by improving efficiency of building systems
- Reduce dependence on natural gas by shifting to high-efficiency, electricity based heating and cooling systems
- Reduce the carbon footprint of new construction and building operation

Left and Right Graphs from Greenest City 2020 Action Plan 2015–2020, pages 13 + 15

1C POLICY CONTEXT

ZERO EMISSIONS BUILDING PLAN



RELEVANT KEY OBJECTIVES

- Implement high-performance building envelope and ventilation systems
- Reduce Greenhouse Gas Intensity (GHGI)
- Reduce Thermal Energy Demand Intensity (TEDI) and Total Energy Use Intensity (TEUI)
- Reduce Embodied Carbon and encourage the use of wood, the only naturally carbon sequestering material

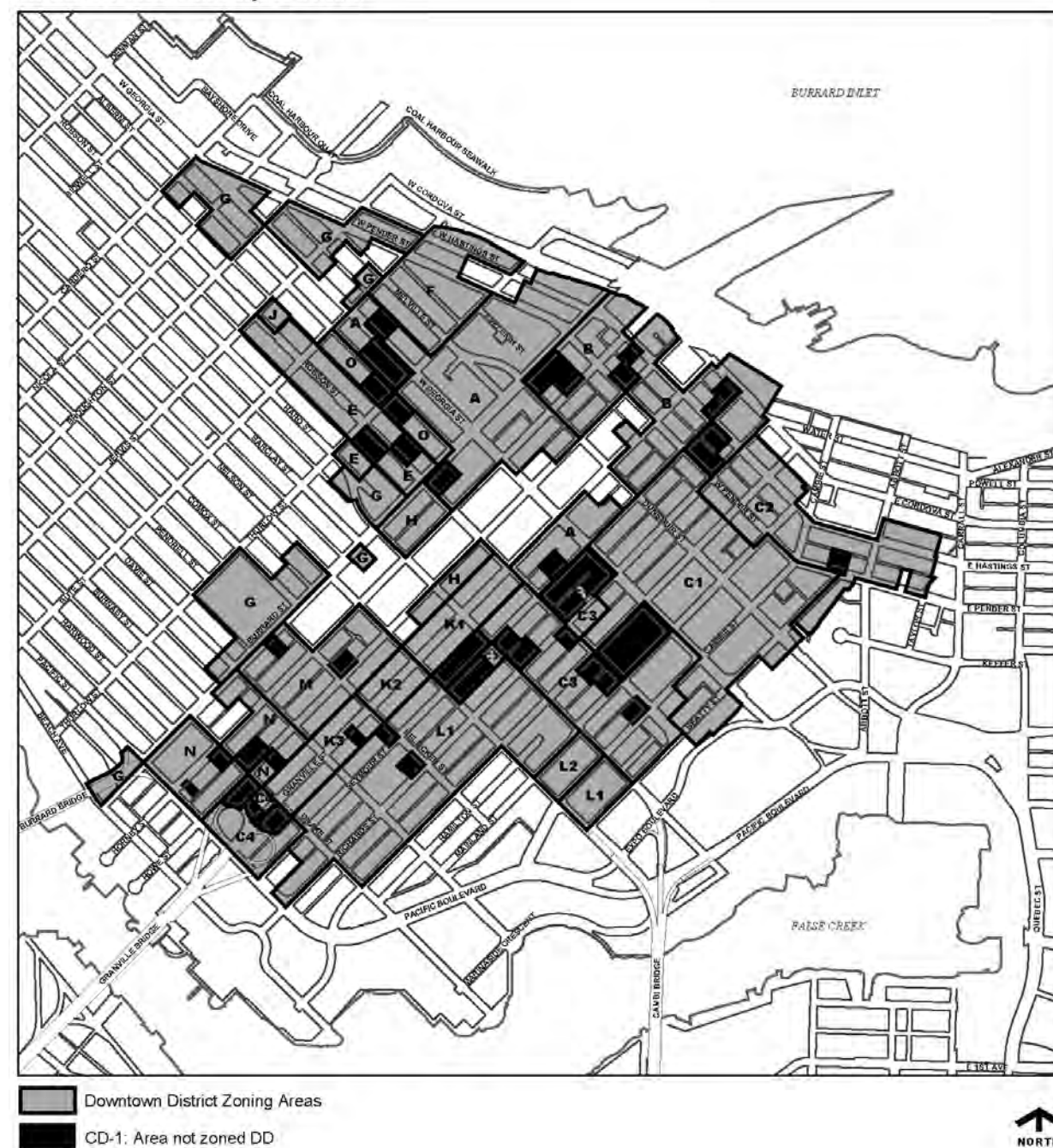
Top Embodied carbon emissions arise from the life cycle material flows of buildings (Bionova Ltd., 2018)

Bottom Embodied and operating carbon for new buildings 2020-2070 (Bionova Ltd., 2018)

Both images from Policy Research On Reducing The Embodied Emissions Of New Buildings In Vancouver

DOWNTOWN OFFICIAL DEVELOPMENT PLAN - AREA C3

Downtown District Map 1 - Areas



Permitted Land Uses	Hotel, light industrial, office commercial, other commercial, parking garage, parks and open space, public and institutional, dwelling uses, retail commercial, social recreational and cultural (including Casino – Class 1 and Bingo Hall); may include live-work
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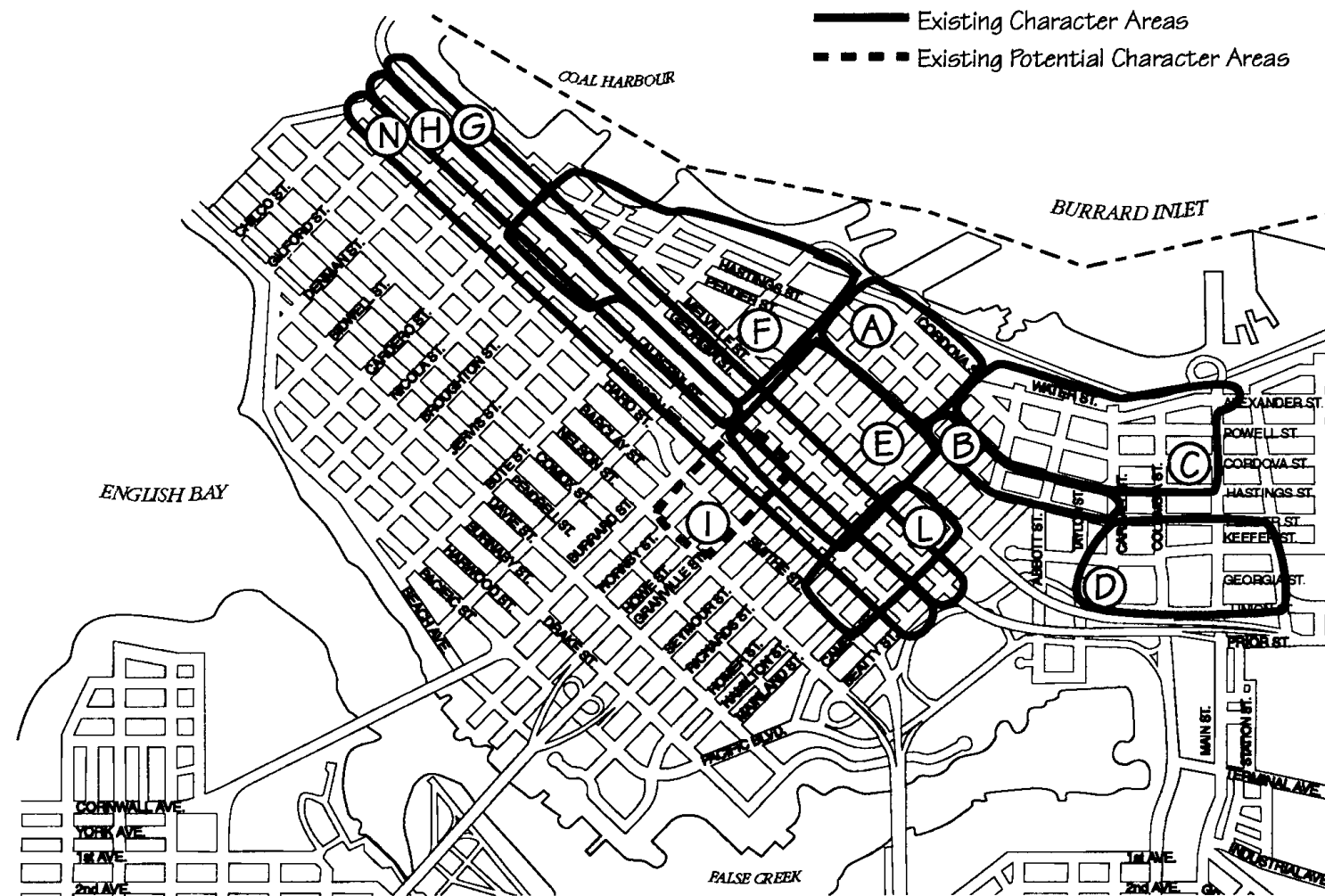
Density	5.00 with a minimum 2.00 of non-residential use. The Director of Planning or the Development Permit Board may permit an increase in floor space ratio for a development which includes the restoration of an existing building and if Council approves a heritage designation by-law. Heritage bonus to a maximum of 10 percent over the permitted floor space ratio = additional 0.5.
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Relaxations

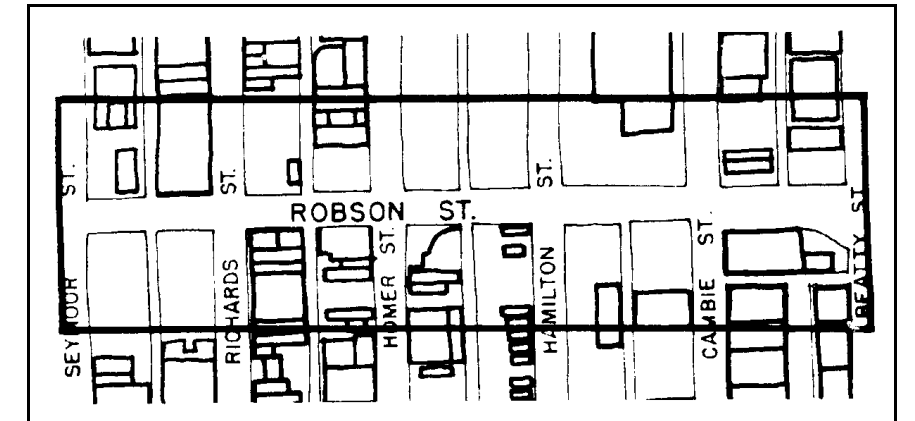
The Development Permit Board may relax the provisions of this Plan in any case where literal enforcement would result in unnecessary hardship, particularly for the renovation of buildings on the Vancouver Heritage Register. Must consider advice from the Vancouver Heritage Commission and consider the responses received from adjacent property owners and tenants.

1C POLICY CONTEXT

DOWNTOWN DISTRICT CHARACTER AREA DESCRIPTIONS



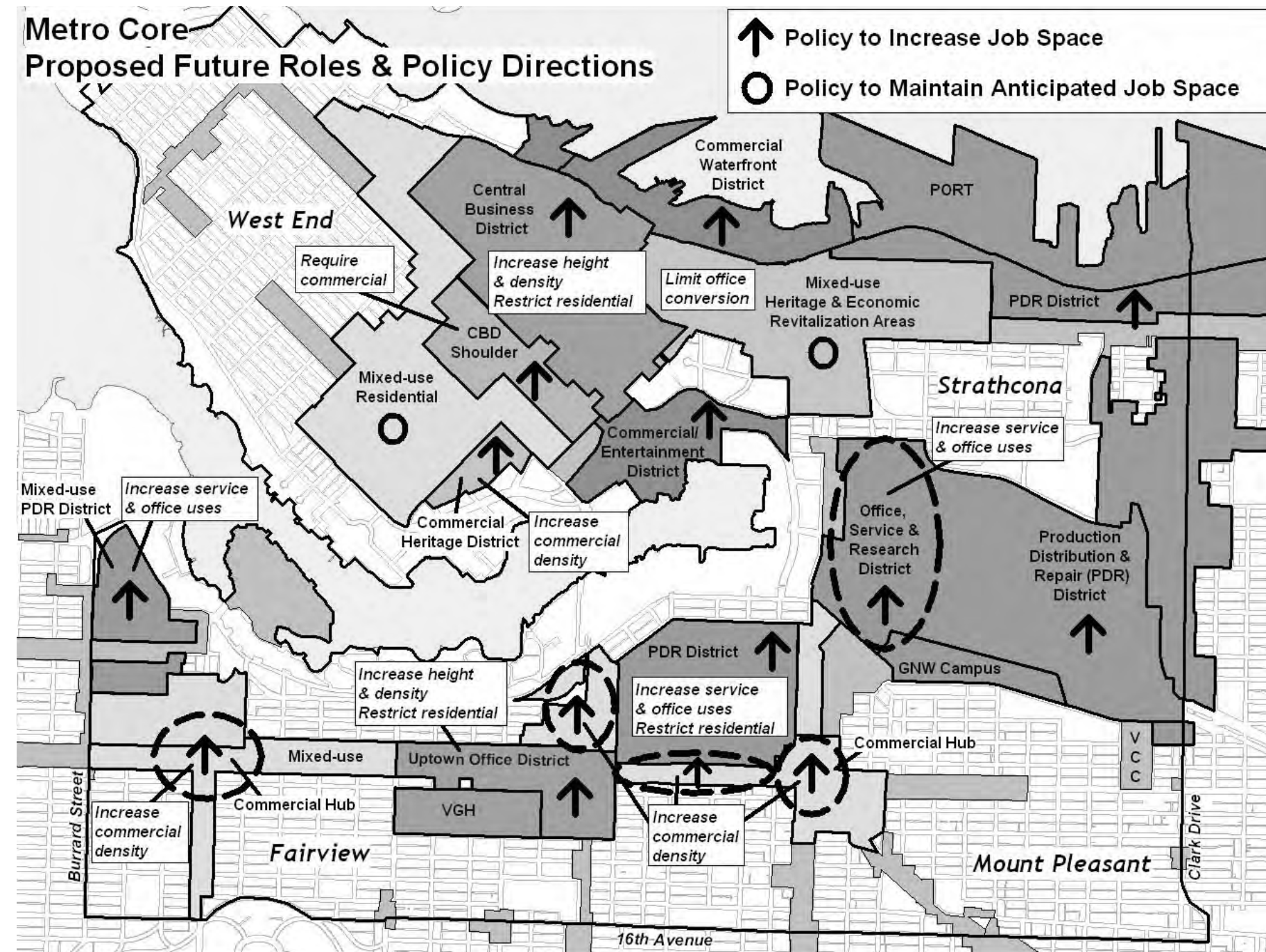
- | | |
|-------------------|------------------|
| Ⓐ Financial | Ⓒ Georgia St. |
| Ⓑ Hastings | Ⓓ Alberni St. |
| Ⓒ Gastown | Ⓘ Robson Square |
| Ⓓ Chinatown | Ⓛ Library Square |
| Ⓔ Central Core | Ⓝ Robson St. |
| Ⓕ Golden Triangle | |



CHARACTER AREA N: ROBSON STREET

SUB-AREA 6: SEYMOUR BEATTY

- Recognize the increasing pedestrian movement related to the Stadium, False Creek North and Library Square as an opportunity to create a strong pedestrian-oriented character area
- Reinforce the visual terminus of Robson Street at the Stadium
- Provide small, usable, human scale open spaces



RELEVANT KEY OBJECTIVES

- Part of the CBD Shoulder core area and adjacent to the Commercial Heritage District
- Plan to increase commercial density
- Support the creation of more commercial job space and a diversity of job space
- Explore parking strategies and standards that support sustainable transportation modes and the re-use of existing buildings
- The CBD Shoulder is well served by rapid transit and can support additional jobs and services

1C POLICY CONTEXT

DOWNTOWN DESIGN GUIDELINES



Terry Fox Memorial at Terry Fox Plaza, Douglas Coupland, 2011

PUBLIC OPEN SPACE

- Seeks to provide varied and interesting open spaces that provide places to sit, sheltered spaces, bicycle racks, washrooms, drinking fountains, sculptures, clocks, stages, ponds, pools or fountains
- Should be integrated with recognized pedestrian routes

PHYSICAL DESIGN

- The urban environment should be of a very high quality
- New structures should be energy-conserving
- Buildings should be sympathetic to the pedestrian level
- Lighter colour buildings are preferred
- New development in historically sensitive areas shall respect the scale and general design quality of their neighbouring buildings and attempt to blend into the overall design of the street or area

SOCIAL AND CULTURAL AMENITIES

- Historic structures should be restored and incorporated in the development of sites
- New structures in an area of older buildings should respect their scale, window rhythms and general façade treatments

ENVIRONMENTAL

- New buildings should prevent or minimize shadowing of public or semi-public open spaces
- An analysis showing the impact of the proposal will be requested for shadowing on the opposing sidewalk and adjoining open spaces at the spring and fall equinoxes (March 21 and September 21) between the hours of 11:30 am and 2:30 pm
- Where possible and appropriate, weather protected pedestrian routes should be provided
- New buildings which are higher than the surrounding buildings should not increase the ground floor wind velocity appreciably
- The introduction of nature is encouraged

1C

POLICY CONTEXT
HERITAGE POLICIES AND GUIDELINES

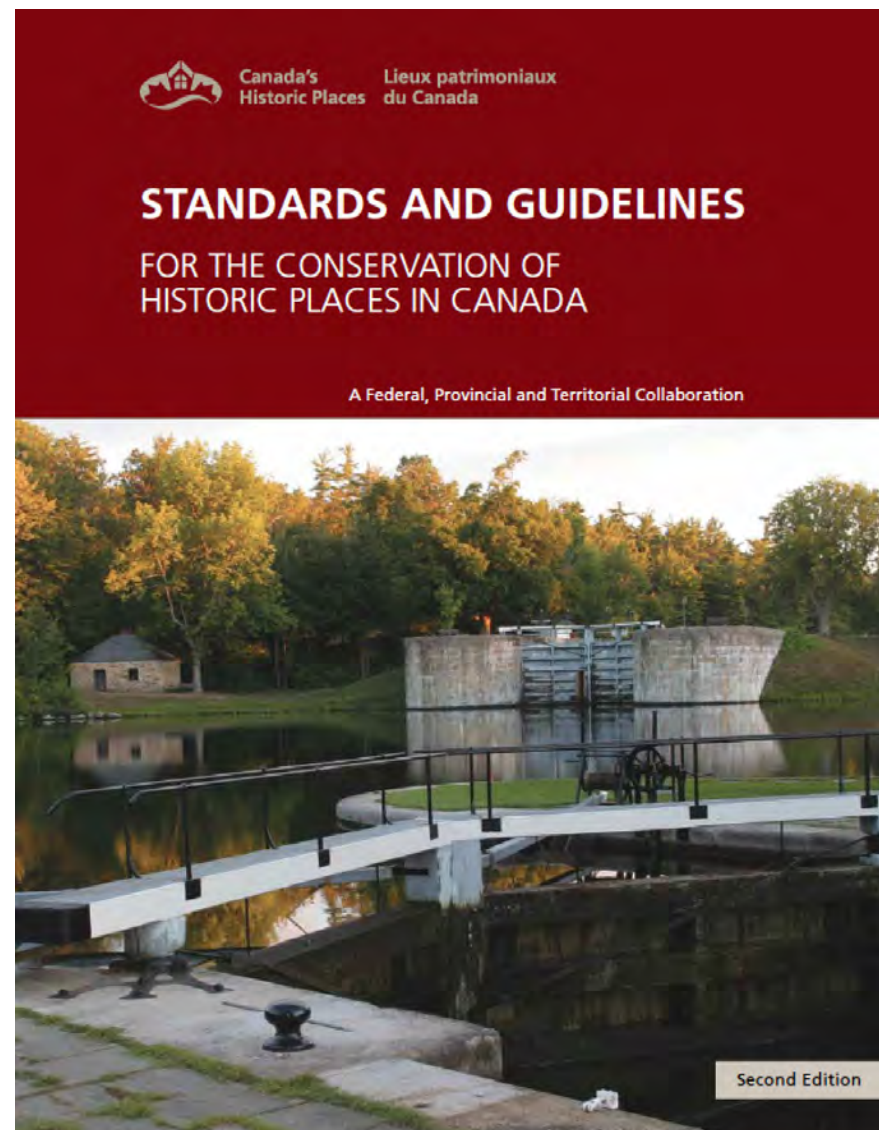


564 Beatty Street, Vancouver. A LEED Gold heritage restoration and commercial addition by Reliance Properties. Completed in 2014.

Heritage Status	<p>C - Contextual or Character on the Vancouver Heritage Registry.</p> <p>This category represents those buildings that contribute to the historic character of an area or streetscape, usually found in groupings of more than one building but may also be of individual importance</p>
Heritage Bonus	<p>Category C buildings on the Vancouver Heritage Register are eligible for a bonus for heritage preservation subject to the approval of Council. Legal designation is a prerequisite to accepting bonuses and incentives.</p>
Relaxations	<p>Section 3.2.5 of the Zoning and Development By-law and the interpretation sections of most official development plans permit the relaxation of regulations in order to conserve a building on the Vancouver Heritage Register</p> <p>Section 3.2.1(e) of the Parking By-Law permits relaxation for the retention of a heritage site providing that the Director of Planning may require heritage designation of a building on the Register in exchange for the relaxation</p>
Heritage Guidelines	<p>The massing and design of the addition should be compatible with and distinguishable from the heritage building</p> <p>The structural requirements of the addition do not involve the removal of significant historic fabric, especially on façades facing streets</p> <p>The addition will not block significant public views or overshadow public open space</p>

1C POLICY CONTEXT

GUIDELINES FOR THE CONSERVATION OF HISTORIC PLACES



REHABILITATION STANDARDS

STANDARD 10

- A** Repair rather than replace character-defining elements.
- B** Where character-defining elements are too severely deteriorated to repair, and where sufficient physical evidence exists, replace them with new elements that match the forms, materials and detailing of sound versions of the same elements.
- C** Where there is insufficient physical evidence, make the form, material and detailing of the new elements compatible with the character of the historic place.

STANDARD 11

- A** Conserve the heritage value and character-defining elements when creating any new additions to an historic place or any related new construction.
- B** Make the new work physically and visually compatible with, subordinate to, and distinguishable from the historic place.

- Additions or new construction may be needed to assure the continued use of an historic place. Additions or new construction must not obscure, radically change or have a negative impact on character-defining materials, forms, uses or spatial configurations.
- Physical compatibility includes using materials, assemblies and construction methods that are well suited to the existing materials.
- To accomplish an addition that is visually compatible with, yet distinguishable from, the historic place, an appropriate balance must be struck between mere imitation of the existing form and pointed contrast, thus complementing the historic place in a manner that respects its heritage value.
- An addition should be subordinate to the historic place, best understood to mean that the addition must not detract from the historic place or impair its heritage value. Subordination is not a question of size; a small, ill-conceived addition could adversely affect an historic place more than a large, well-designed addition.



1D OUTCOMES OF ANALYSIS

1D OUTCOMES OF ANALYSIS EMERGENT DESIGN PRINCIPLES



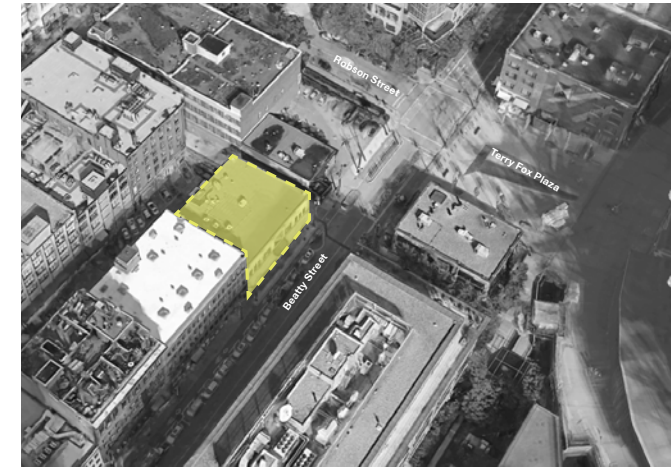
A MINIMIZE SHADOW IMPACT ON OPEN SPACES

- Minimize net incremental increase in shadow impact to Terry Fox Plaza on the summer solstice between 4:00 pm and 7:00 pm
- Prevent or minimize shadowing of public or semi-public open spaces at the spring and fall equinoxes between 11:30 am and 2:30pm



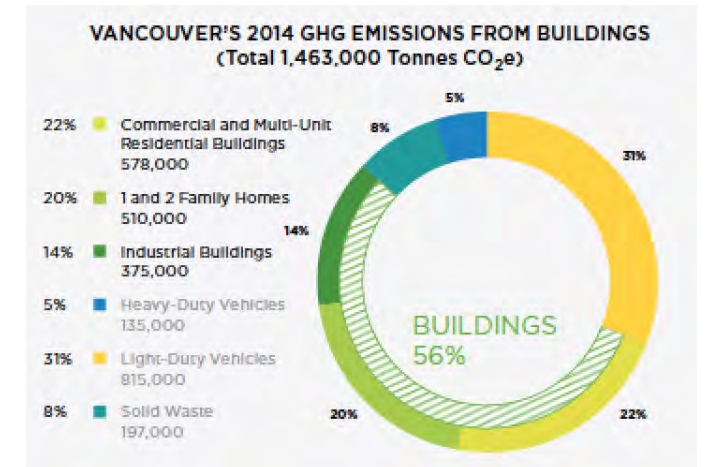
B RESPOND TO THE HERITAGE CONTEXT

- The addition should be sensitive to the heritage building and maintain the unique character of the block created by the grouping of heritage context buildings
- The historic structure should be rehabilitated and incorporated in the development
- The massing and design of the addition should be physically and visually compatible with, subordinate to, and distinguishable from the heritage building



C INCREASE EMPLOYMENT DENSITY

- Protect, enhance, increase and densify employment spaces and support the creation of more commercial employment space, particularly within the CBD Shoulder Area
- The existing density is 2.0 while the allowable density is an outright (FSR) of 5.0 + conditional 0.5 Heritage Bonus = 5.5 — increase site utilization with an additional 3.0 FSR of commercial office to maximize employment space



D REDUCE GHGI + EMBODIED CARBON

- Improve energy efficiency of the existing building through upgrades to envelope, mechanical systems, service water heating and lighting
- Reduce solid waste by rehabilitating the existing building and reusing existing mass timber elements
- Create the addition using mass timber to reduce embodied carbon
- Eliminate the use of natural gas for base building mechanical systems in favour of high-efficiency, electric heat pumps and electric hot water

02 DESIGN PRINCIPLES



2A MINIMIZE SHADOW IMPACT ON OPEN SPACES

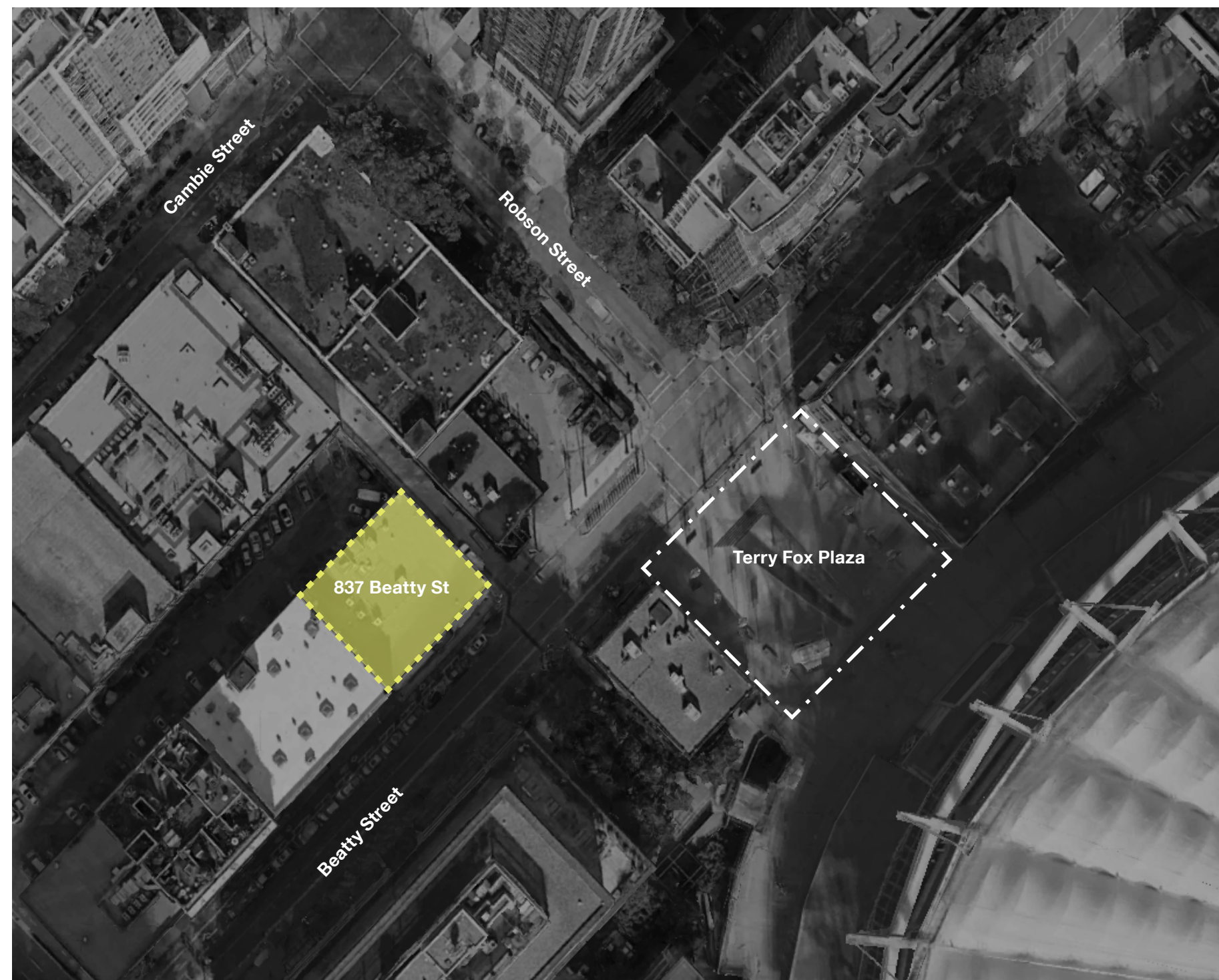
2A MINIMIZE SHADOW IMPACT ON OPEN SPACES TERRY FOX PLAZA

Civic Address	855 Expo Boulevard, Vancouver, BC V6B 2M6
Site Dimensions	Approximately 42.5 x 37.4 m
Site Area	Approximately 1,589.5 m ² (17,109 sf)
Revitalized	2011
Designed by	Grout McTavish Architects (plaza) & Douglas Coupland (memorial)

Located at the terminus of Robson Street, Terry Fox Plaza is a public open space with a simple, open design. A memorial to Terry Fox occupies the central portion of the site with flag poles arranged on either side of its longitudinal axis complemented by concrete benches. The west side of the plaza is separated from the street with bollards. The memorial sits on a plinth that has stairs along its northern end. During games and events, the plaza serves as a high traffic entrance and exit for the stadium as well as being the final destination for the Whitecaps March to the Match events.

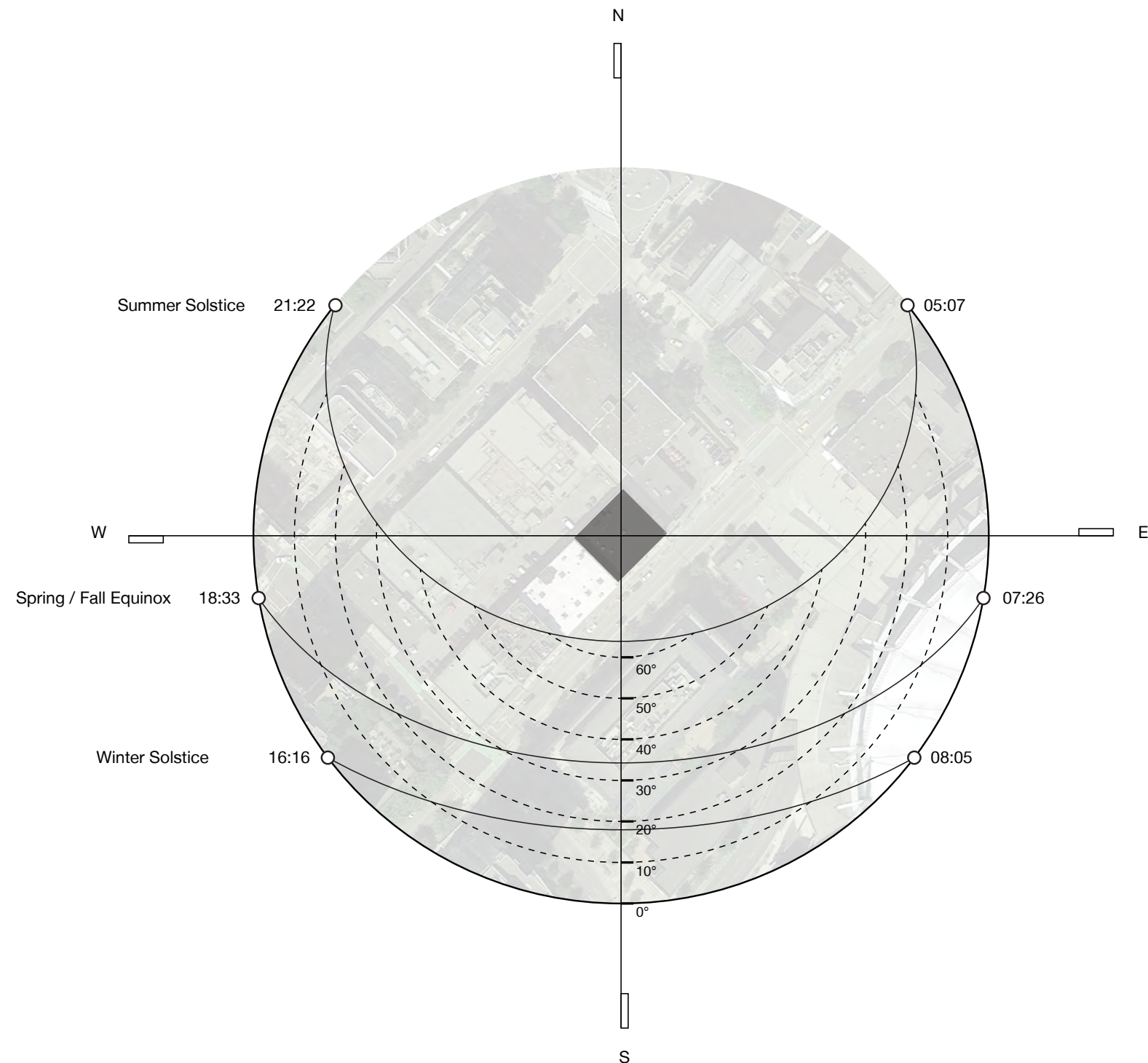
Due to the unique nature of this open space which is used most heavily on summer evenings, City staff have directed that shadow studies be conducted between the hours of 16:00 and 19:00 at the summer solstice. In addition, we have conducted the typical sun shadow study for the spring and fall equinox between 11:00 and 14:00.

The results of our analysis are that, at the spring and fall equinox, the plaza is primarily shadowed by BC Place, and that surrounding context to the west and north of the site has little impact. At the summer solstice, the plaza is impacted by existing or approved context buildings by 17:00 and is completely in shade by 19:00.

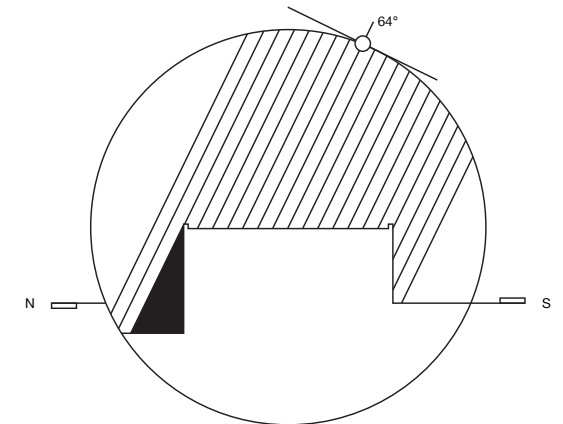


2A MINIMIZE SHADOW IMPACT ON OPEN SPACES

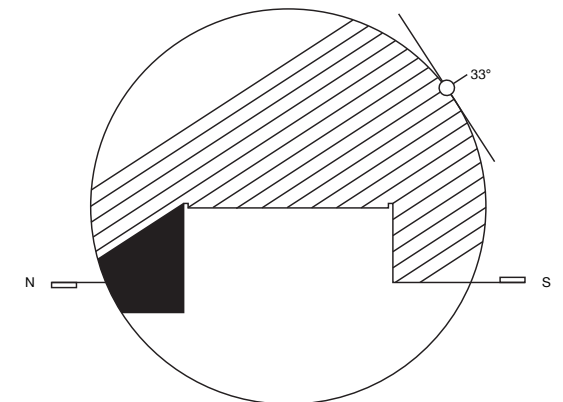
SOLAR PATHS + ANGLES



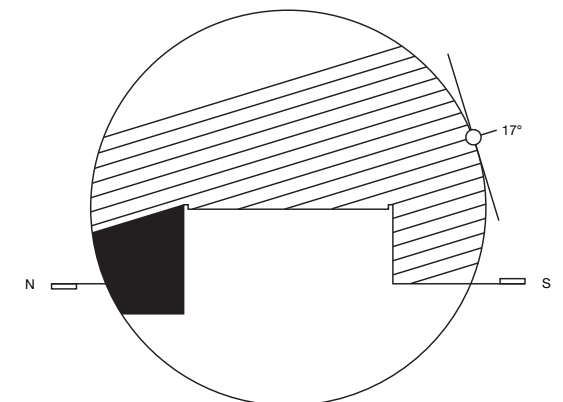
Summer Solstice, noon, 64 degrees



Spring / Fall Equinox, noon, 33 degrees

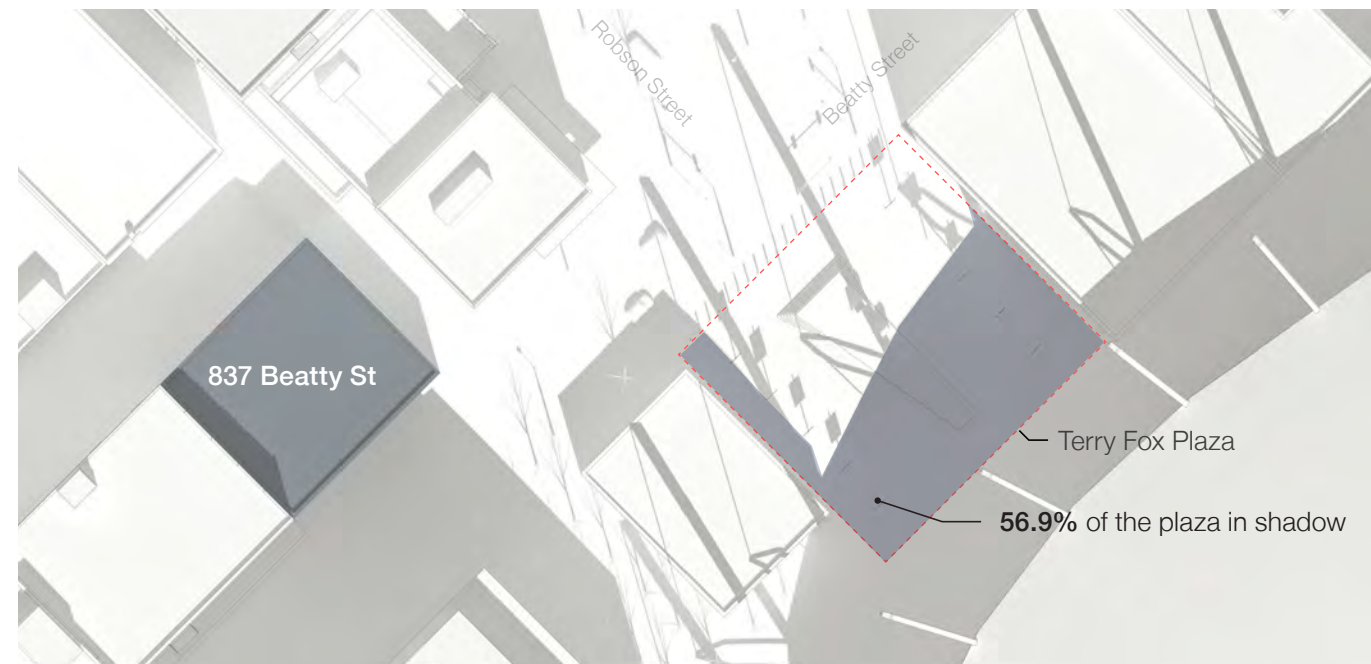


Winter Solstice, noon, 17 degrees

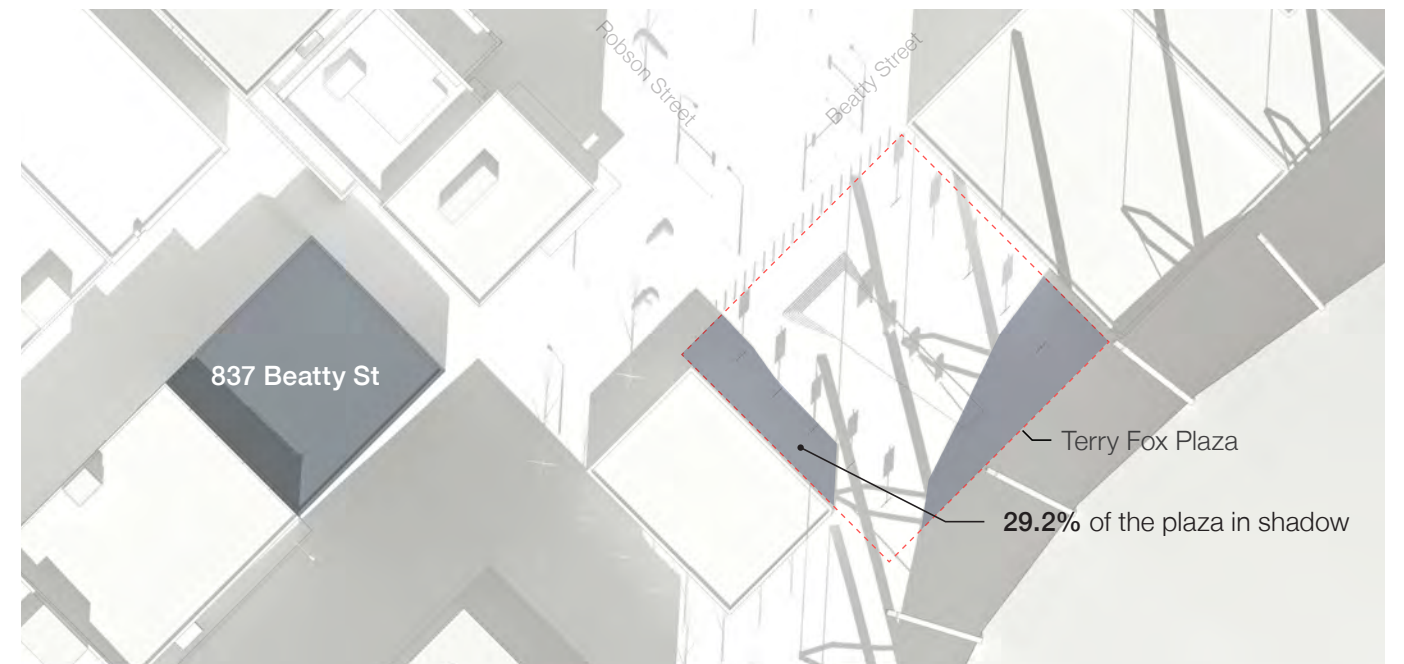


2A

MINIMIZE SHADOW IMPACT ON OPEN SPACES EXISTING SHADOW IMPACT – SPRING/FALL EQUINOX



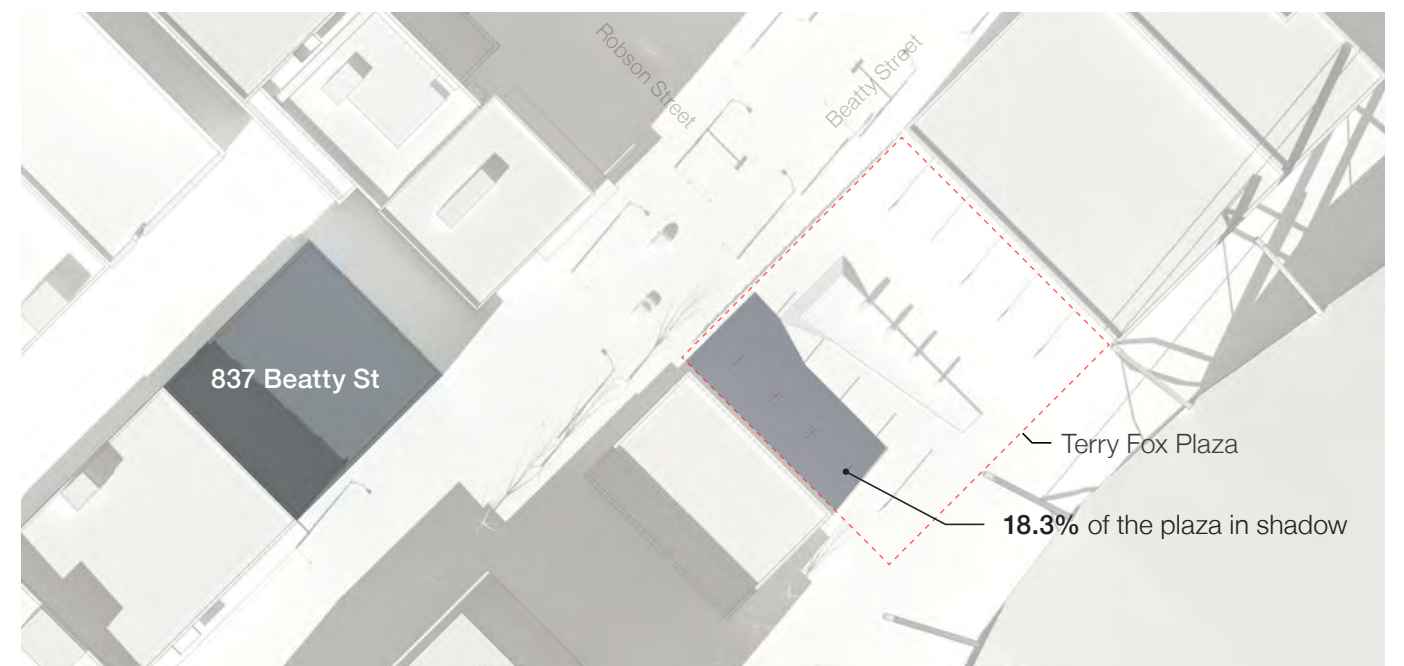
11:30



12:30



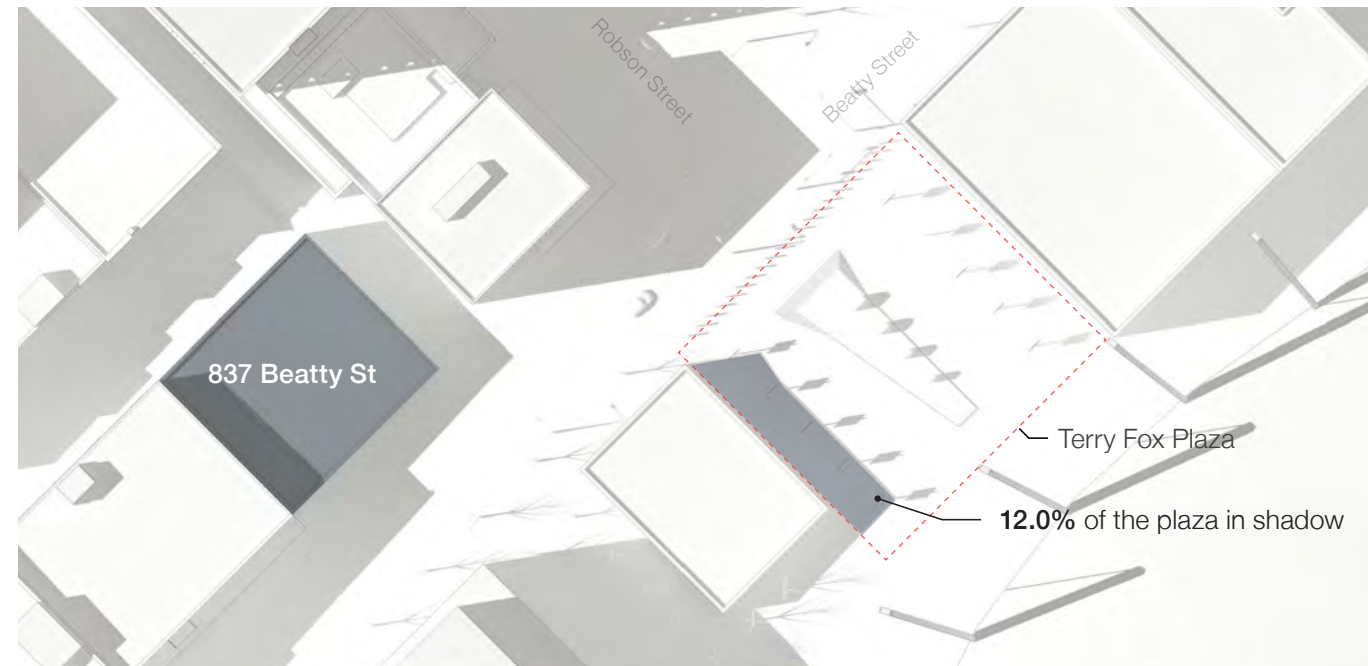
13:30



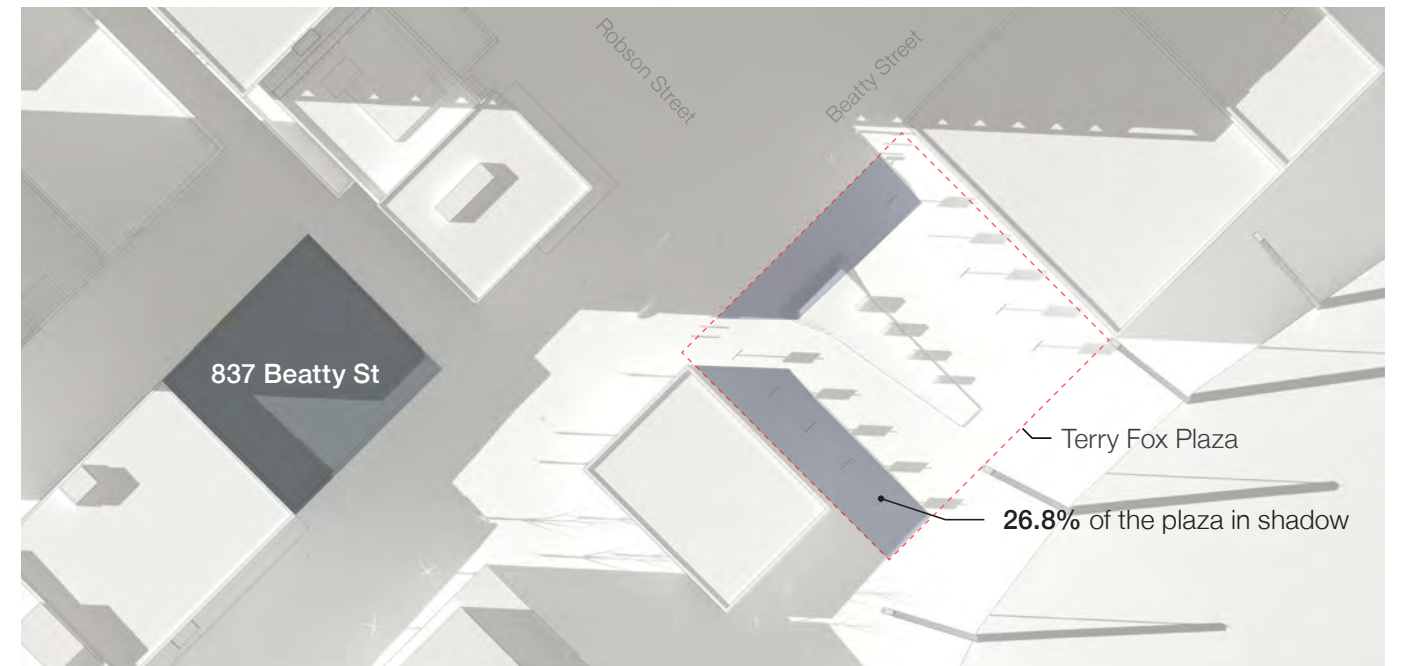
14:30

2A

MINIMIZE SHADOW IMPACT ON OPEN SPACES EXISTING SHADOW IMPACT – SUMMER SOLSTICE



16:00



17:00



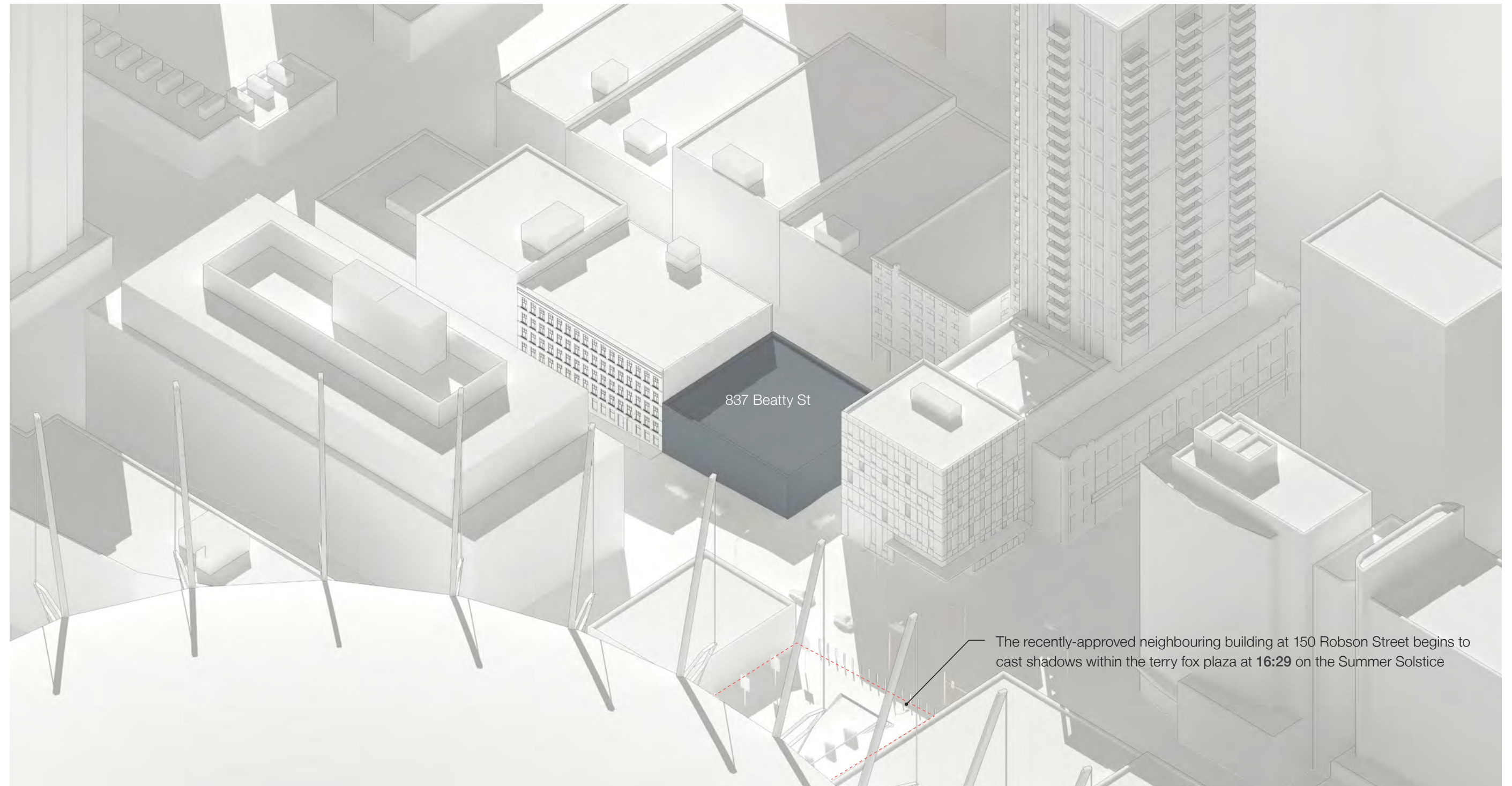
18:00



19:00

2A MINIMIZE SHADOW IMPACT ON OPEN SPACES

EXISTING SHADOW IMPACT – SUMMER SOLSTICE



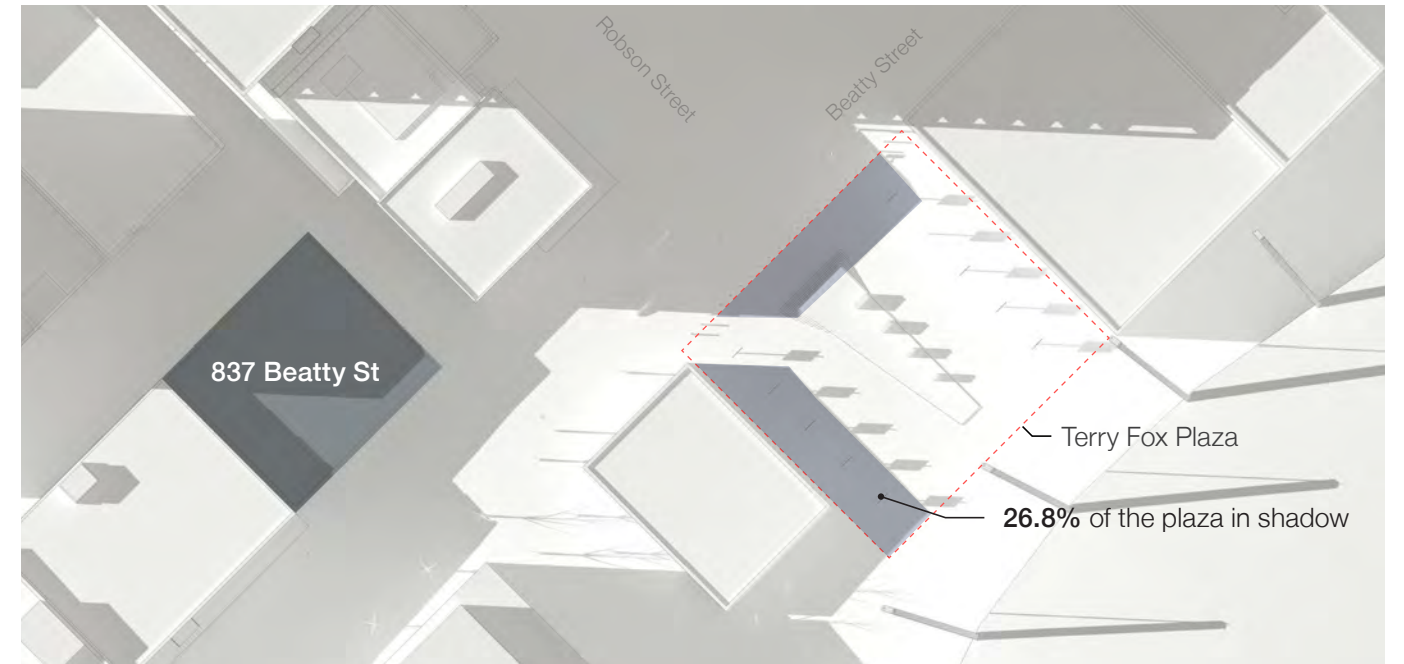
2A

MINIMIZE SHADOW IMPACT ON OPEN SPACES DEFINE ACCEPTABLE SHADOW IMPACT



01 IDENTIFY TIMES WHEN EXISTING SHADOWS IMPACT TERRY FOX PLAZA

- By 17:00 shadows cast by buildings across Beatty Street impact the plaza. The stairs of the memorial plinth are shadowed except at their southwest edge. Fixed seating elements on the southwest side of the plaza are shadowed, but those on the northeast side remain in full sun.
- By 18:00 the majority of the plaza and the memorial plinth are shadowed, including all fixed seating elements on the southwest side of the plaza. The eastern extents of the plaza, primarily hardscaped open space closest to BC Place, remain in full sun.



June 21 - 17:00



June 21 - 18:00

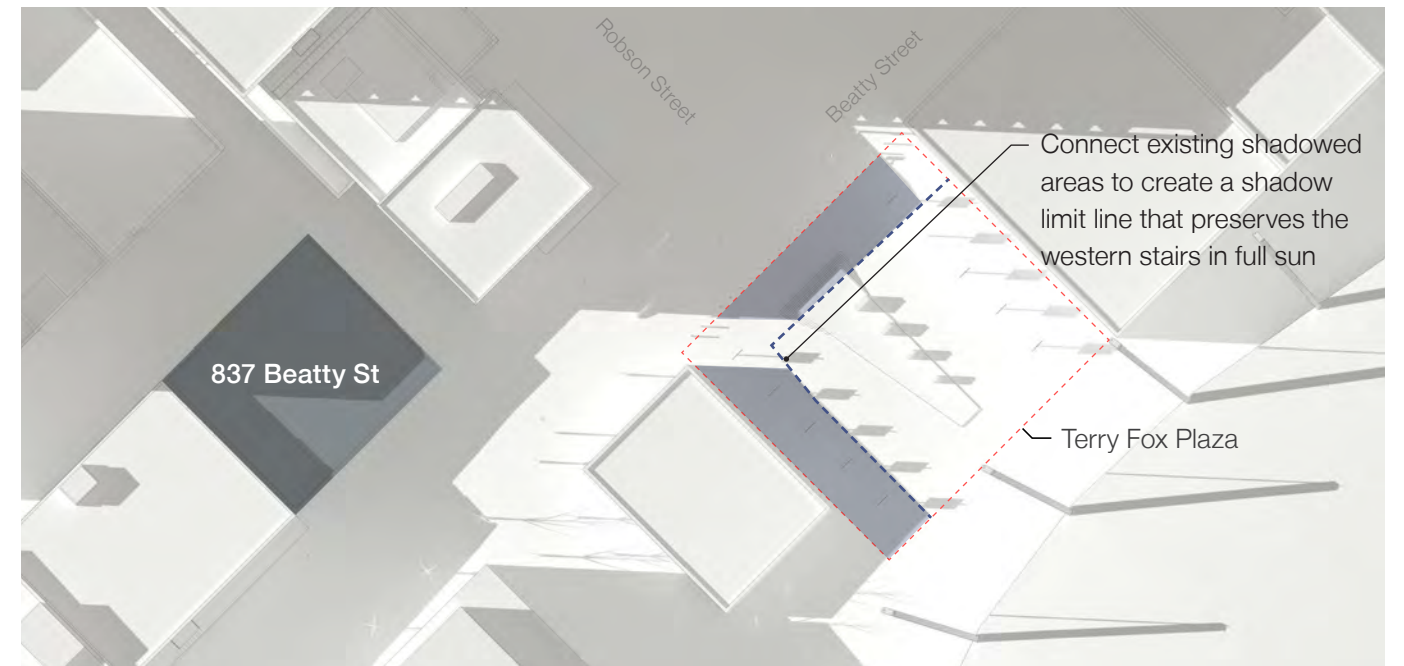
2A

MINIMIZE SHADOW IMPACT ON OPEN SPACES DEFINE ACCEPTABLE SHADOW IMPACT



02 DETERMINE THE SHADOW LIMIT LINE BY CONNECTING EXISTING SHADOW AREAS AND PRESERVING AREAS IN SUN

- At 17:00 a shadow limit line is drawn by connecting the existing shadowed areas at right angles. This limit line preserves full sun at the western edge of the memorial plinth to retain sunny seating/gathering opportunities.
- At 18:00, a shadow limit line is drawn by connecting the shadowed area at the northeast to the shadowed area at the southwest. This limit line preserves full sun to the eastern extents of the plaza, closest to BC Place.



June 21 - 17:00



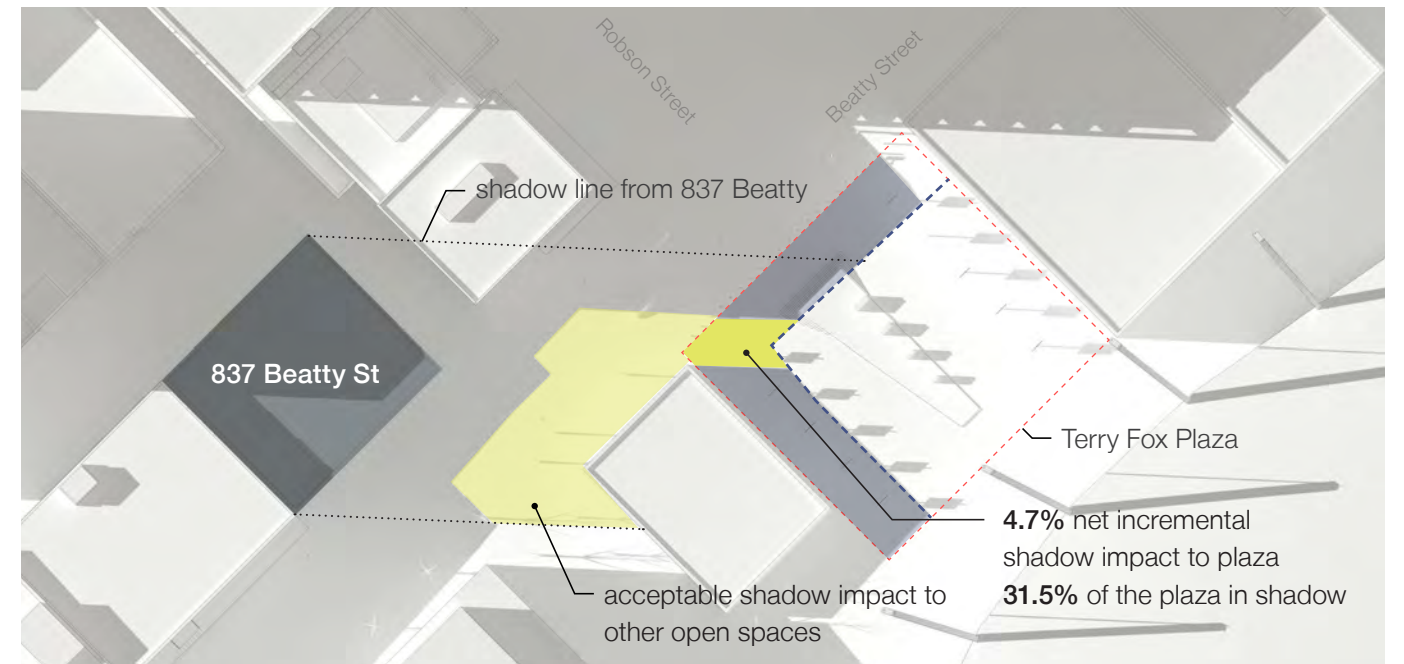
June 21 - 18:00

2A MINIMIZE SHADOW IMPACT ON OPEN SPACES DEFINE ACCEPTABLE SHADOW IMPACT



03 RELATE THE SHADOW LIMIT LINE BACK TO THE SUBJECT PROPERTY TO DEFINE THE AREA OF ACCEPTABLE SHADOW IMPACT

- Extend potential shadow lines from the edges of the 837 Beatty St property lines to the shadow limit line
- The area between the shadow limit line and the plaza property line is the net incremental impact
- At 17:00 the net incremental shadow impact represents only 4.7% of the plaza and new shadows occur only at the hardscaped western corner where there is no fixed seating
- At 18:00 the net incremental shadow impact represents only 6.7% of the plaza and the new shadows occur only over hardscaped areas inbetween existing shadow areas while preserving the eastern extents for gathering in full sun at the stadium entrance/exit

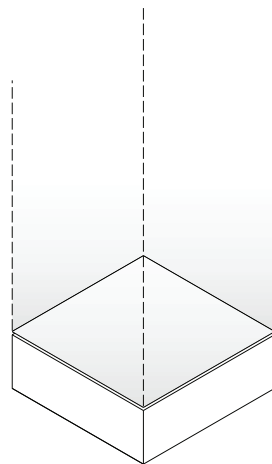


June 21 - 17:00

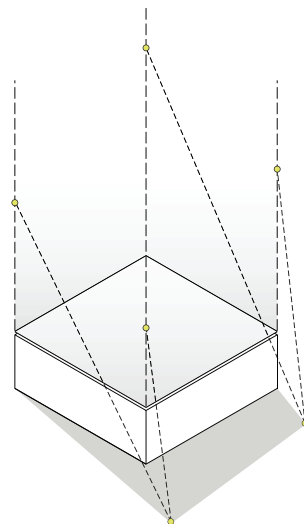


June 21 - 18:00

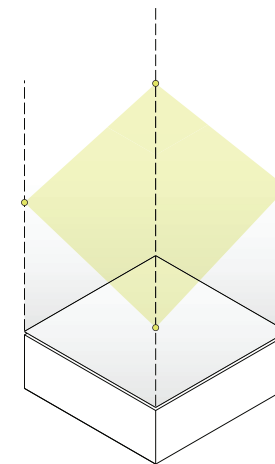
2A MINIMIZE SHADOW IMPACT ON OPEN SPACES DEFINE THE VOLUMETRIC LIMITS OF THE SITE



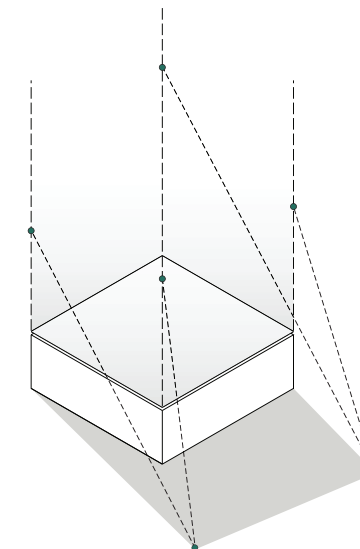
01 Extend vertical lines from the corners of the property lines.



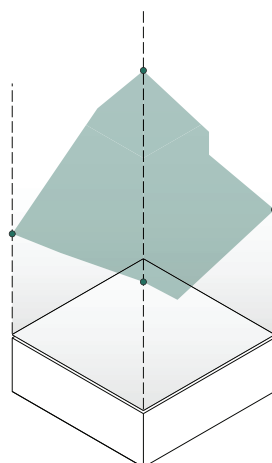
02 Place nodes at the intersection of each corner based on the acceptable shadow impact at **17:00** on the summer solstice.



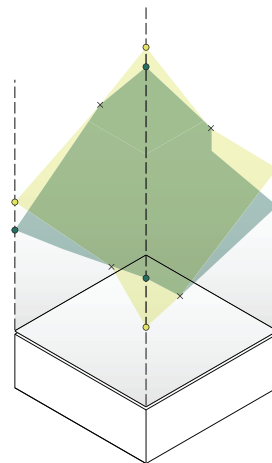
03 Create a surface from the 17:00 nodes.



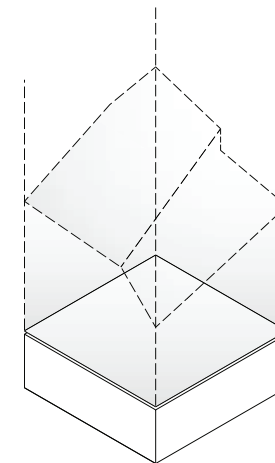
04 Place nodes at the intersection of each corner based on the acceptable shadow impact at **18:00** on the summer solstice.



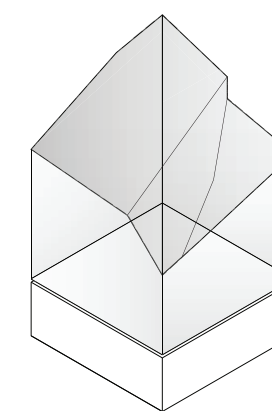
05 Create a surface from the 18:00 nodes.



06 Overlay the two surfaces and nodes. Select the most restrictive (lowest) corner points.

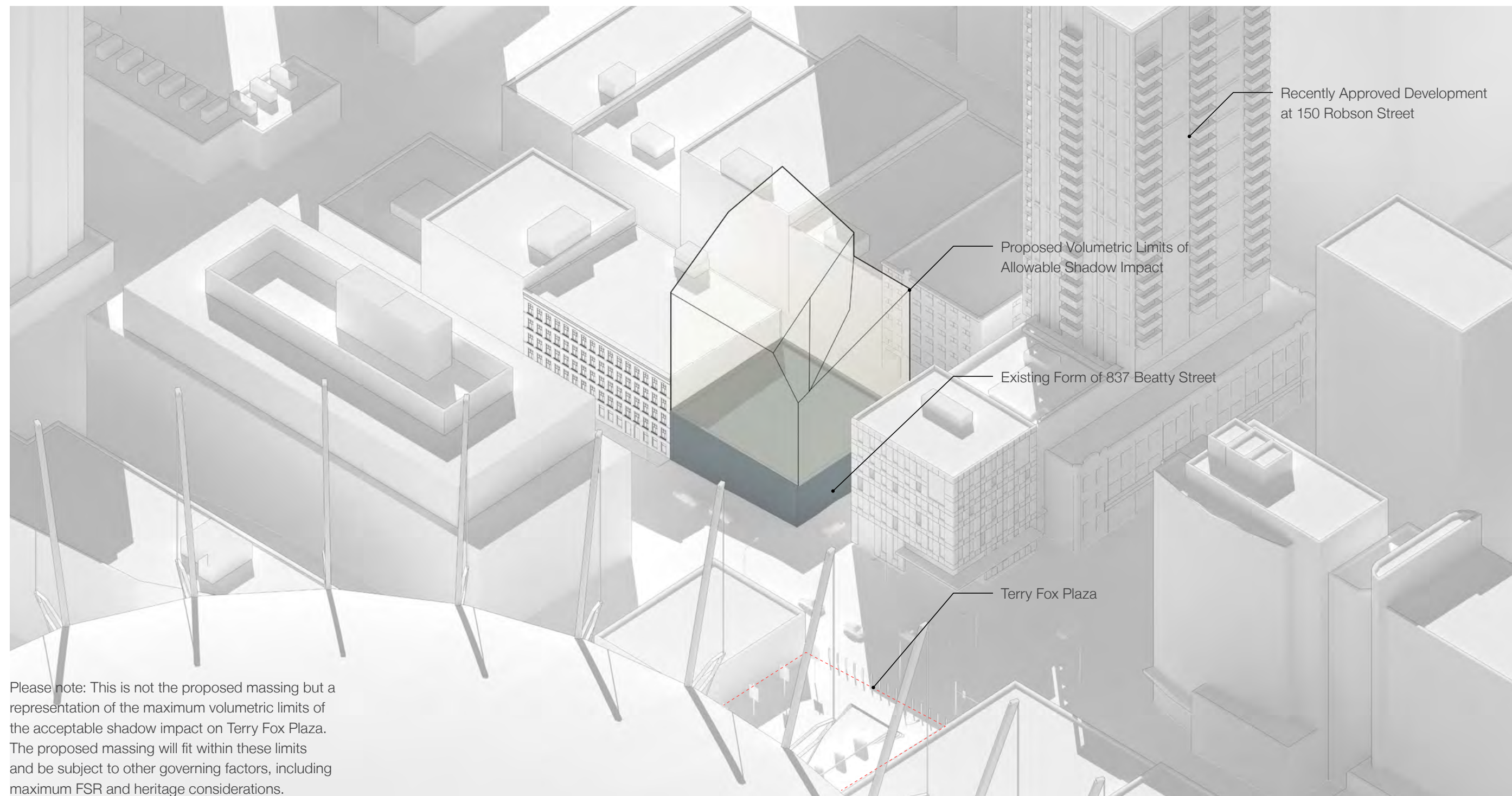


07 Intersect the surfaces to create compound surface.



08 This surface defines the maximum volume that fits within the acceptable shadow limits.

2A MINIMIZE SHADOW IMPACT ON OPEN SPACES VOLUMETRIC LIMITS IN CONTEXT



2A MINIMIZE SHADOW IMPACT ON OPEN SPACES VOLUMETRIC LIMITS IN CONTEXT

BEATTY STREET ELEVATION (SE)

Note: The annotated heights at 837 Beatty Street are taken from the average grade along Beatty Street at approximately 12.8m above sea level. Heights shown for other properties are taken from their respective average grades. This was done to ensure consistency with the application of the zoning bylaw but, when comparing across properties, may result in differing heights for elements at the same elevation above sea level.

