

221213_ClarksonGO: Shadow Study

Notes developed referencing the City of Mississauga's "Urban Design Terms of Reference: Standards for Shadow Studies, June 2014"

3.1 RESIDENTIAL PRIVATE OUTDOOR AMENITY SPACES

Proposed shadows must not exceed **one hour duration (two consecutive hourly test times)** on areas such as private rear yards, decks, patios, and pools of surrounding residential dwellings on June 21 and Sept 21.

For Criteria 3.1, the proposed shadows do not hit the "No Impact Zone" for more than two consecutive hourly test times on June 21. On September 21 shadow from the proposed development hits portions of the South-East Townhouse Complex's private outdoor amenity (private rear yards) at 16:12, 17:12 and 17:48.

3.2 COMMUNAL OUTDOOR AMENITY AREAS

Included in the surrounding of our site: kids play areas, park features, senior outdoor areas, outdoor amenity areas associated with commercial + employment areas.

This criterion set out in 3.1 also applies to public amenity areas and common outdoor amenity areas that are part of a proposed or existing development. These areas include:

- Twin Spruce + Centennial Park (labelled 'Park' in the Shadow Study Key Plan) Eastern Neighbourhood Playground (labelled 'Playground' in the Shadow Study Key Plan, and located within the South-East Townhouse Complex)
- SE Outdoor Amenity (labelled 'Patio' in the Shadow Study Key Plan)

JUNE 21: SURROUNDING AREA STUDY

June 21 requires full sun at least half the time, or 50% sun coverage all the time.

TIME	AREA AFFECTED BY SHADOW
7:07	
7:20	
8:20	
9:20	
10:20	
11:20	
12:20	
13:20	
14:20	
15:20	
16:20	SE Outdoor Amenity
17:20	SE Outdoor Amenity
18:20	SE Outdoor Amenity
19:20	SE Outdoor Amenity
19:33	SE Outdoor Amenity

SEPT 21: SURROUNDING AREA STUDY

Sept 21 requires full sun at least half the time, or 50% sun coverage all the time.

TIME	AREA AFFECTED BY SHADOW
8:35	
9:12	
10:12	
11:12	
12:12	
13:12	
14:12	
15:12	Twin Spruce + Centennial Park
16:12	Twin Spruce + Centennial Park, SE Outdoor Amenity
17:12	SE Outdoor Amenity, Eastern Neighbourhood Playground
17:48	SE Outdoor Amenity, Eastern Neighbourhood Playground

DEC 21: SURROUNDING AREA STUDY

Dec 21 requires full sun at least half the time, or 50% sun coverage all the time.

TIME	AREA AFFECTED BY SHADOW
9:19	
10:17	
11:17	
12:17	
13:17	Twin Spruce + Centennial Park
14:17	Twin Spruce + Centennial Park
15:15	Twin Spruce + Centennial Park

For Criteria 3.2, the Key Plan outlines the public amenity areas and common outdoor amenity areas close to the proposed site. Shadows from the proposed development allow for full sun on the surrounding existing amenities for more than half the time on all required dates, following the criteria.

221213_ClarksonGO: Shadow Study

Notes developed referencing the City of Mississauga's "Urban Design Terms of Reference: Standards for Shadow Studies, June 2014"

3.3 PUBLIC REALM CRITERIA: SUN ON THE OPPOSITE BOULEVARD

(3b Along Mixed Use, Commercial, Employment and High Density Residential Streets)

Sept 21 requires full sun on the opposite boulevard including the full width of the sidewalk for at least 5hrs that must include 2hr period between 12:12pm-2:12pm, and an additional 2hr period from either 9:12-11:12 or from 3:12-5:12.

12:12pm - clear

13:12pm - clear

*14:12pm - shadow occurs on the west side of Southdown Rd/sidewalk; *and an addition 2 hr period:*

9:12am - clear

10:12am - clear

11:12am - clear

Criteria 3.3 (Opposite Boulevard) outlines there should be no shadow at specific intervals on September 21st along Mixed Use, Commercial, Employment and High-Density Residential Streets. On September 21, at 14:12pm, at the end of the two hour time period, there is a small portion of the proposed shadow hitting the opposite boulevard along Southdown Rd. See angular plane limit diagrams. The additional 2 hour period (9:12-11:12am) has been met.

3.3 PUBLIC REALM CRITERIA: PUBLIC OPEN SPACES, PARKS AND PLAZAS

(3b Along Mixed Use, Commercial, Employment and High Density Residential Streets)

Developments should be designed to provide **sun access factor** of at least 50% on public open spaces, parks and plazas on **Sept 21**

For Criteria 3.3 (Public Open Spaces), the proposed development has shadows hitting the adjacent Twin Spruce + Centennial Park, as well as the SE Outdoor Amenity area for two time intervals. The sun access factor would be under the minimum of 50%.

3.4 TURF AND FLOWER GARDENS IN PUBLIC PARKS

Sept 21 requires turf and flower gardens in public parks to have direct sunlight for 7 test times.

For Criteria 3.4, the proposed development shadows hit surrounding turf and flower gardens in public parks for a range of 1-2 hours. Therefore, the remaining 9 hours of sunlight exceeds the minimum requirement of 7 test times in full sunlight.

3.5 BUILDING FACES TO ALLOW FOR POSSIBILITY OF USING SOLAR ENERGY

Shadow impacts from proposed developments should not exceed **1hr in duration** on roofs, front, rear and exterior side walls of adjacent low rise (1-4 storeys) residential buildings on **Sept 21** in order to allow for possibility of harvesting solar energy. The "no impact zone" is a 3m radius around residential properties.

The South-Eastern Townhouse Complex will be impacted by the proposed developments shadows during September 21. There is one additional hour (48mins) that the shadow is impacting the townhouses: 16:12, 17:12 and 17:48.

CONCLUSIONS

- For the purpose of this application, the Mississauga Official Plan, Section 19.4.5 requests a Shadow Study. This assessment has followed the Urban Design Terms of Reference: Standards for Shadow Studies (2014) to analyze the impact of the proposed development's shadowing on

221213_ClarksonGO: Shadow Study

Notes developed referencing the City of Mississauga's "Urban Design Terms of Reference: Standards for Shadow Studies, June 2014"

the surrounding areas. The study assessed the new shadow impacts on June 21, September 21 and December 21, conducted at Solar Noon, and at hourly intervals before and after Solar Noon, up to and including 1.5hrs after sunrise and 1.5hrs before sunset.

- The site latitude and longitude used in shadow drawings, and the astronomic north was determined using Revit 2020. The base plan was taken from the provided City of Mississauga 3D scan available online.
- All locations and uses of areas not meeting the shadow impact criteria include the South-East Townhouse Complex of 1-4 storey residential buildings, as well as a portion of the Southdown Rd Boulevard. See below for summary:
 - For Criteria 3.1, on September 21 shadow from the proposed development hit portions of the South-East Townhouse Complex's private outdoor amenity (private rear yards) at one additional time interval than allowed: 16:12, 17:12 and 17:48. Considering these private "rear yards" face the very busy roads Lakeshore Rd and Southdown Rd they are rather considered as "front yards" moving the importance of solar access to the quieter side of the homes. Design consideration incorporated into the towers to mitigate the shadow include stepped back upper levels to reduce shadowing.
 - These shadows also impact Criteria 3.5, and proposed shadows exceed 1hr in duration on roofs, front, rear, and exterior side walls of the South-Eastern Townhouse Complex during September 21. There is one additional hour (48mins) that the shadow is impacting the townhouses: 16:12, 17:12 and 17:48.
 - Criteria 3.3 (Opposite Boulevard) outlines there should be no shadow at specific intervals on September 21st along Mixed Use, Commercial, Employment and High-Density Residential Streets. On September 21, at 14:12pm, there is a small portion of the proposed shadow hitting the opposite boulevard along Southdown Rd. See angular plane limit diagrams and shadow study. This is, however within a road widening easement.
- Setbacks and step backs used in the design and placement of this development were referenced from the Mississauga Downtown Core: Built Form Standards, Schedule 21A. The minimum required 3m dimension for setbacks and step-backs were used throughout, with an additional step back of 1.5m for a total of 4.5m on the eastern side of the property's podium, to mitigate shadowing towards the east. The eastern side of the top three levels of each tower have also been stepped back to limit shadow impacts on the public realm and surrounding properties and maximize access to sunlight and open views of the sky from the public realm.

There are minimal shadow impacts on the public realm and surrounding properties. There is minimal shadowing resulting from the proposed development during December.

- The proposed heights of the towers on the western block are 29 and 27 storeys, and on the eastern block 25 and 23 stories. Height limitations are affected by shadowing of neighboring properties, therefore, rigorous design studies with varying tower heights led the to the proposed massing. These studies allowed the team to assess which shadowing criteria were affected and informed the design decision making process on what the most appropriate tower heights should be. The proposed heights and massing respect the intent of shadowing

221213_ClarksonGO: Shadow Study

Notes developed referencing the City of Mississauga's "Urban Design Terms of Reference: Standards for Shadow Studies, June 2014"

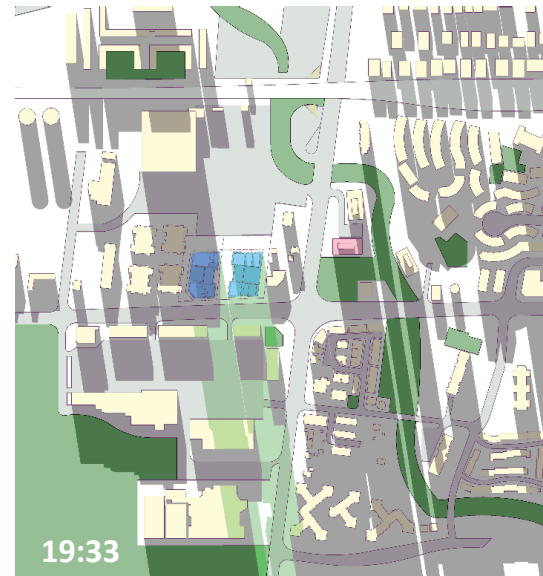
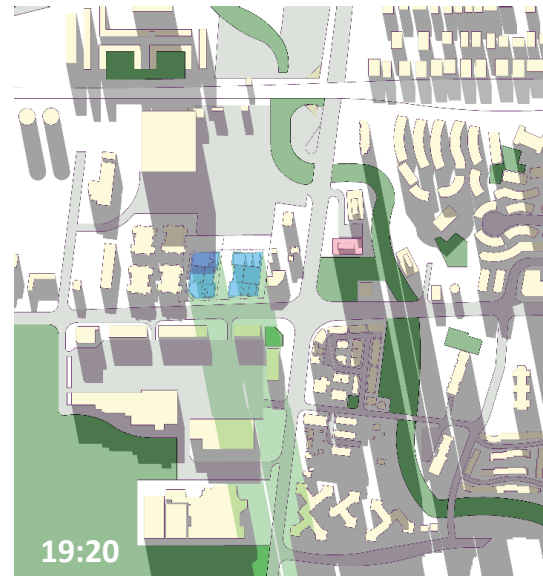
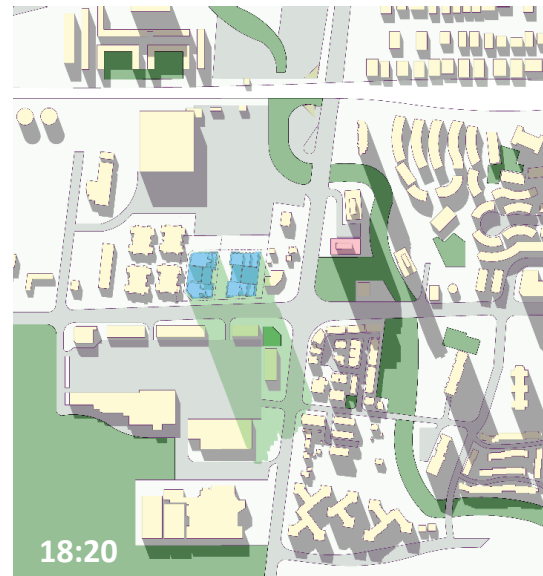
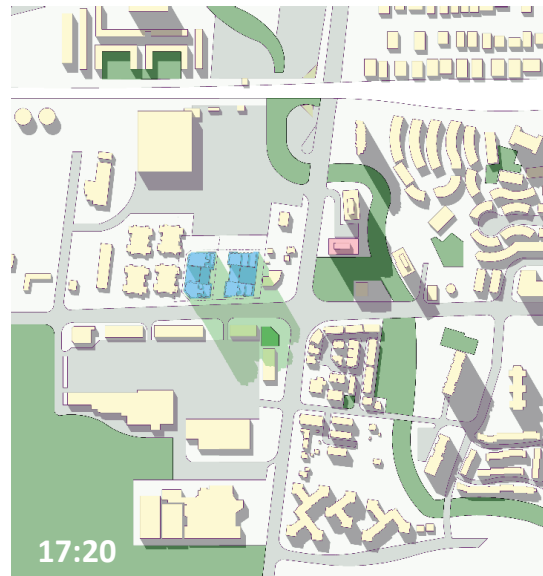
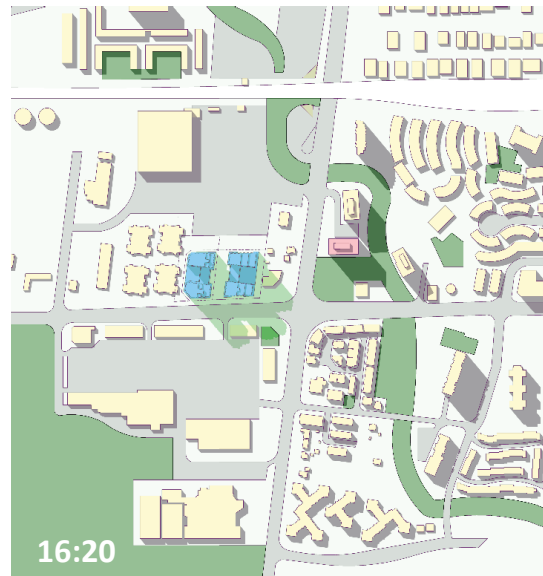
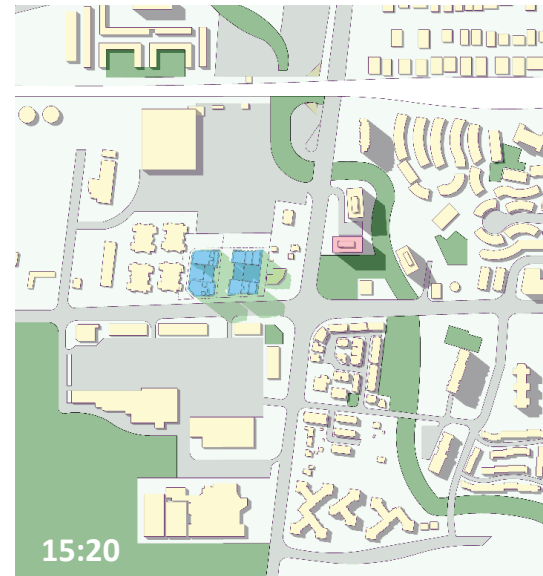
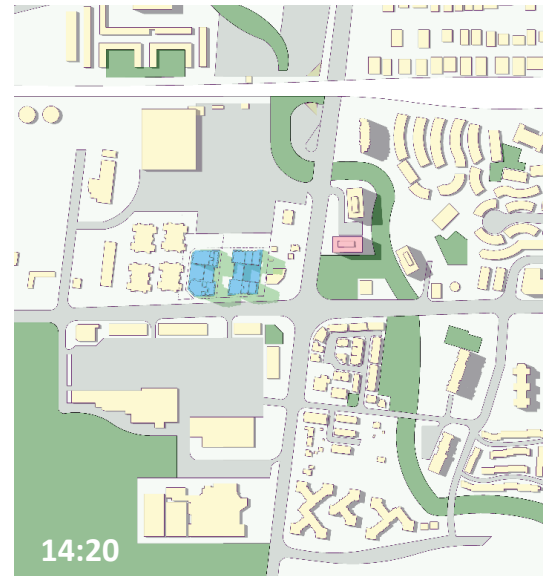
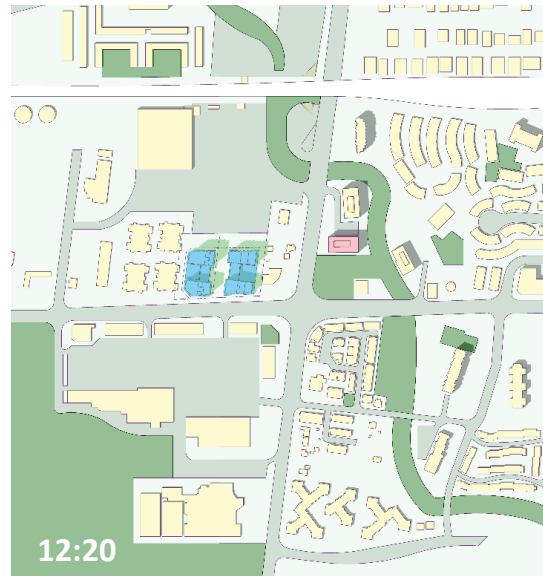
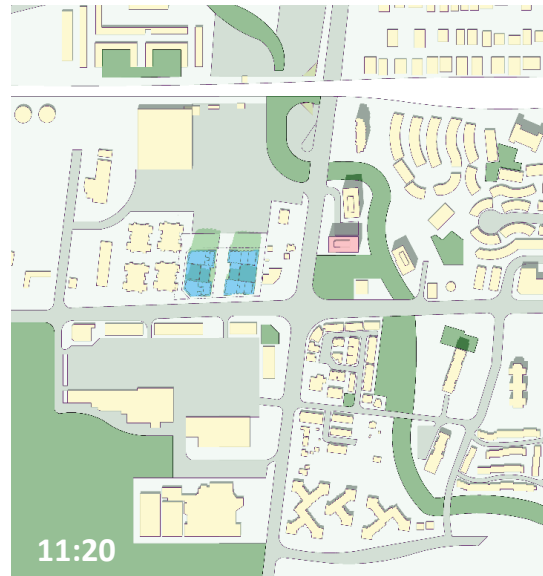
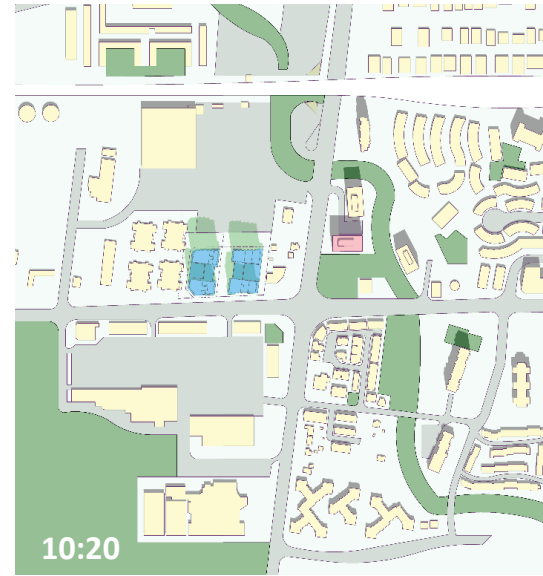
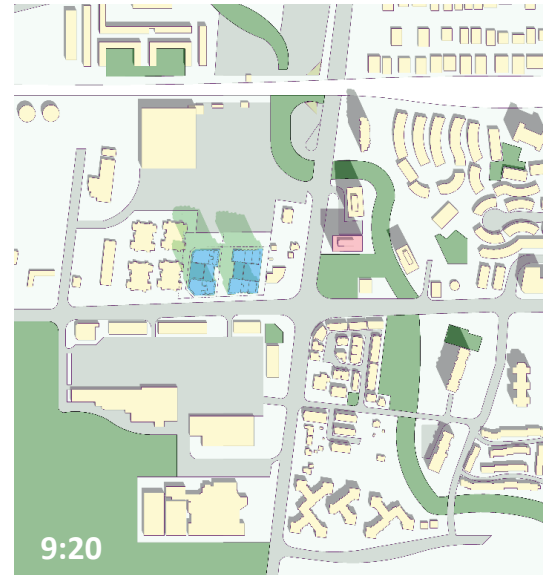
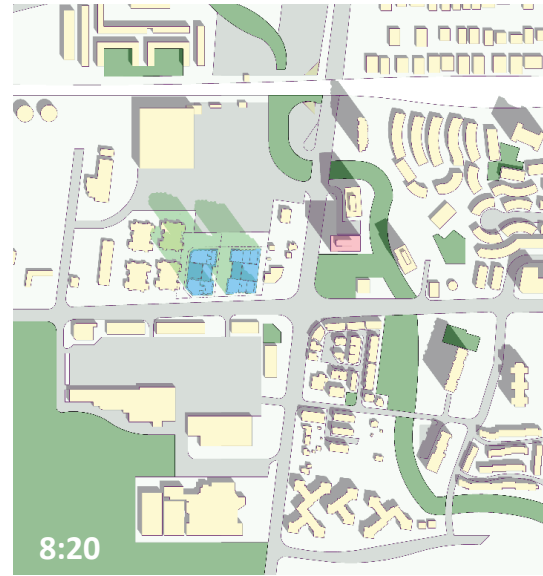
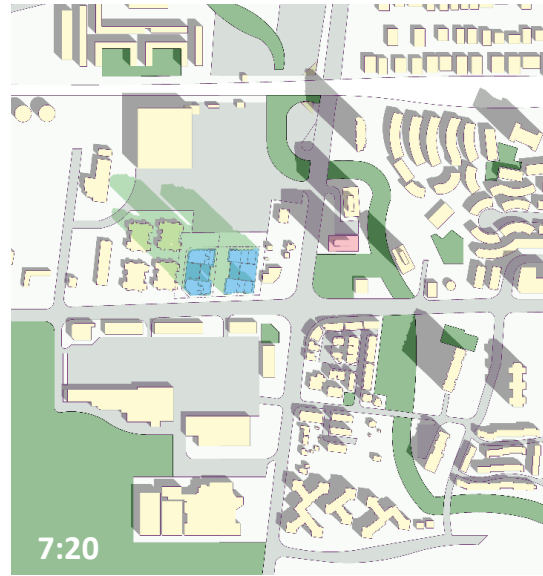
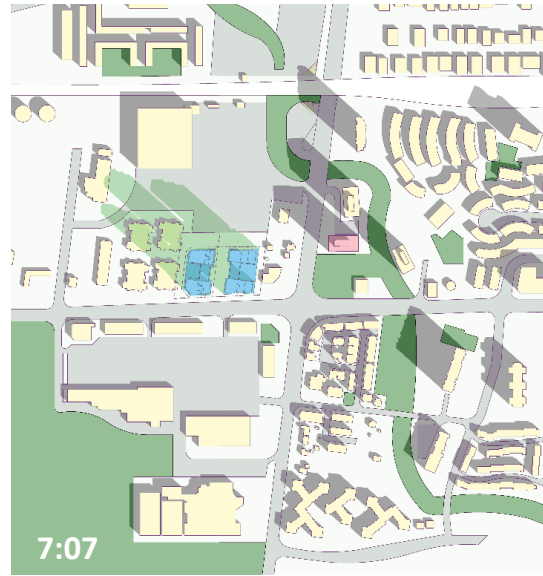
limitations and have minimal impact on neighbouring sites, and at the same time balance the need for housing. Other features such as increased set backs on the east as well as terracing the top three storeys of each tower down towards the east and the residential areas, help mitigate shadowing and creates interest. It is our opinion that these features realize an appropriate transit-oriented development that will not only increase the supply of housing in the area, but add value to the Mississauga skyline.



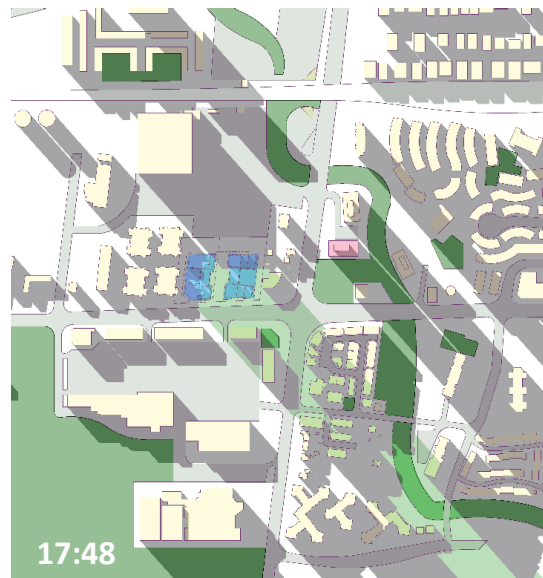
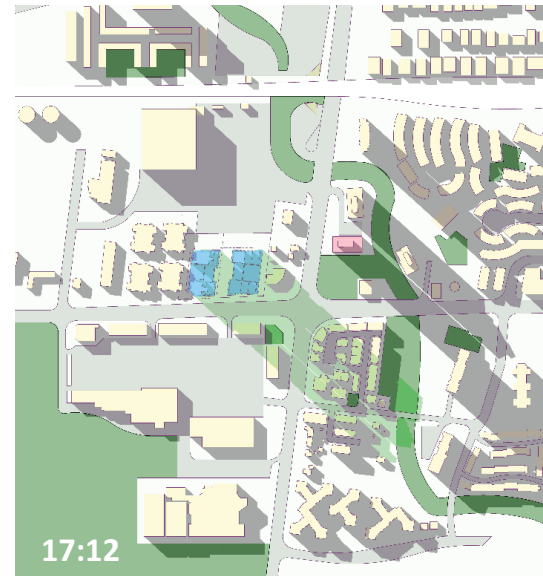
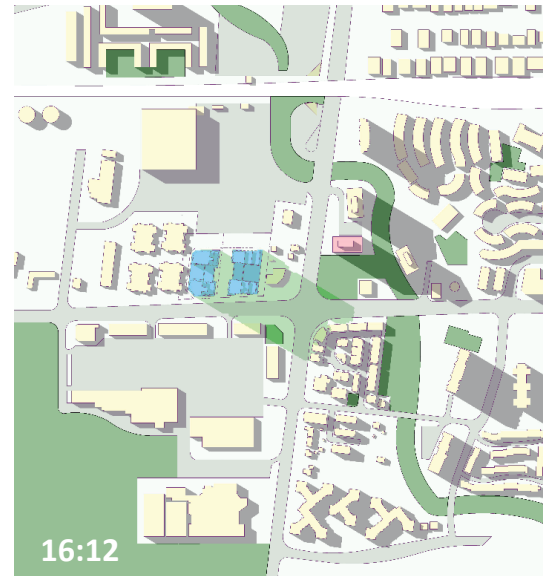
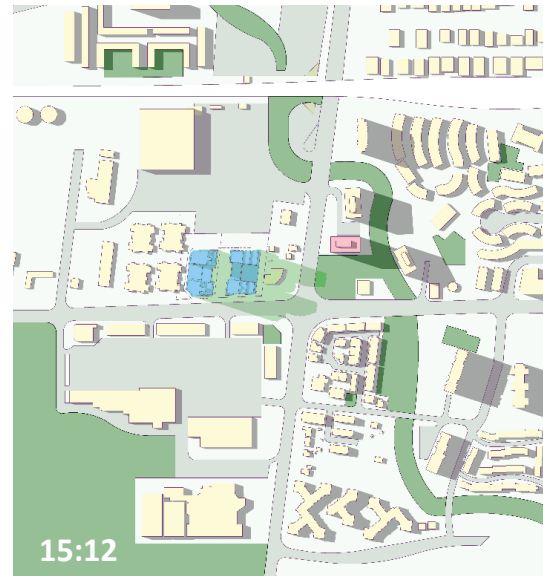
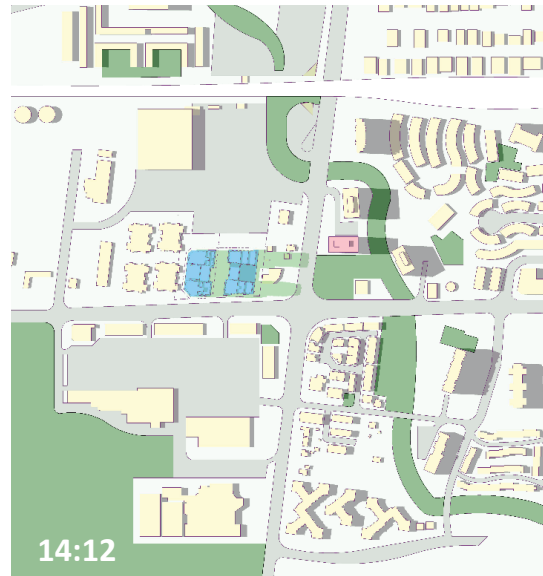
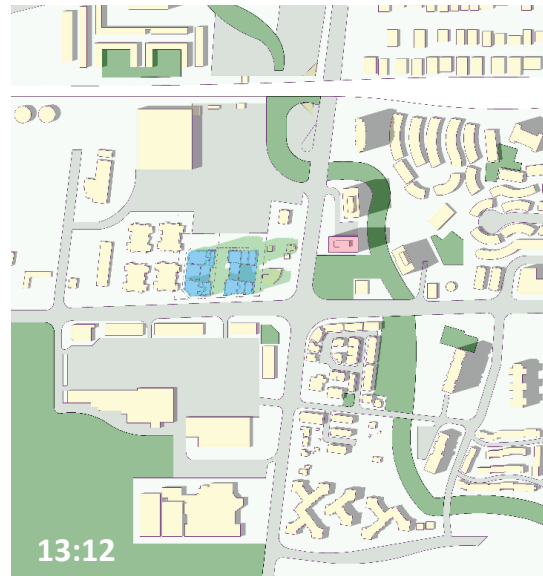
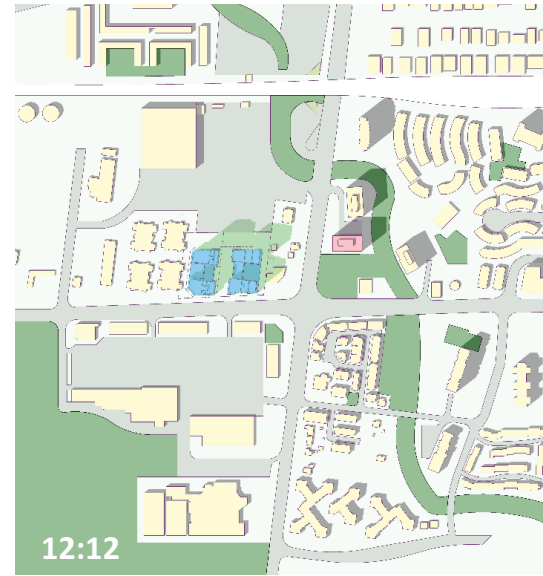
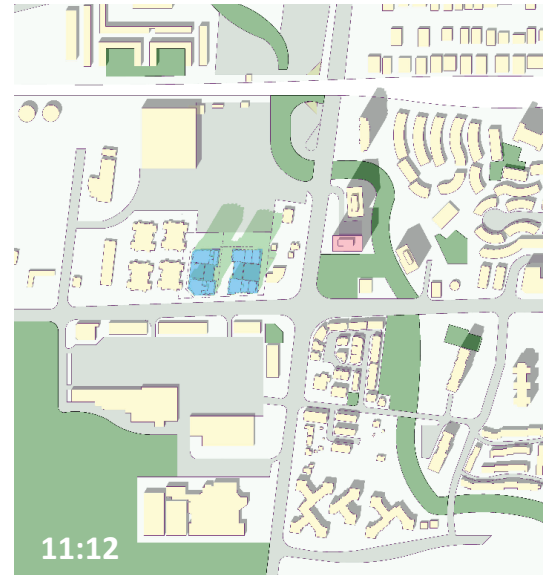
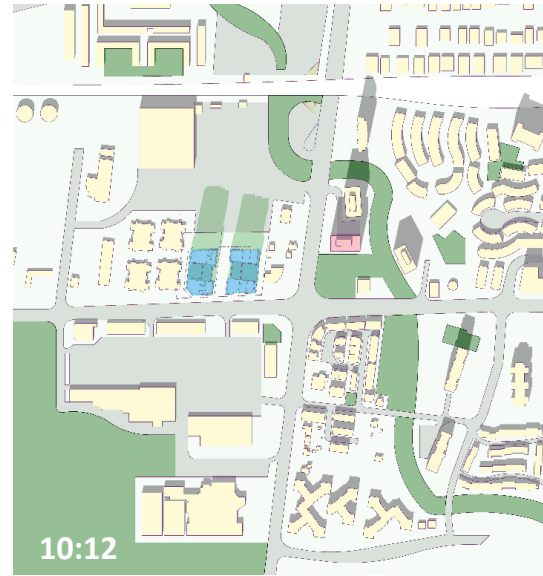
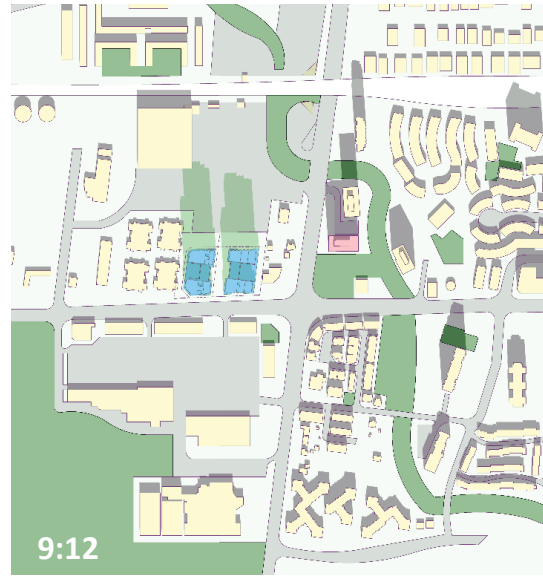
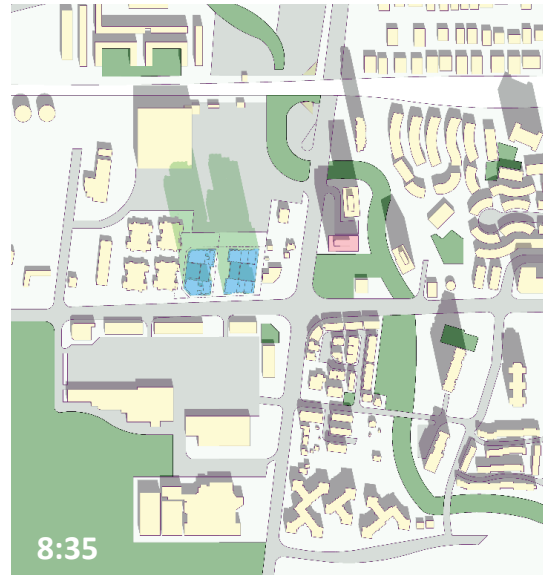
- Proposed Development
- S2 at Stonebrook Condominiums In Construction
- Green Space
- Outdoor Amenity Space
- Existing Context Buildings
- Roads + Parking
- Areas not meeting shadow impact criteria:
 1. South-East Townhouse Complex (3.1 + 3.5)
 2. Southdown Rd Boulevard (3.3)



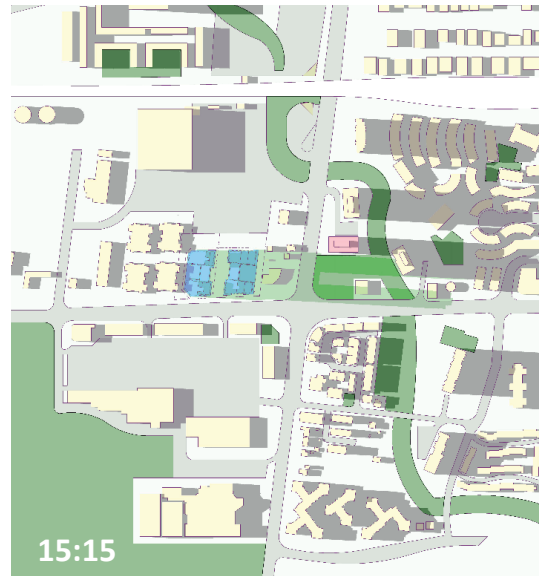
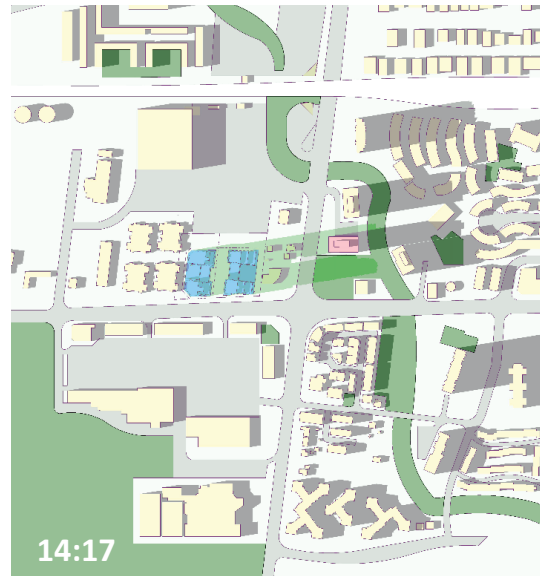
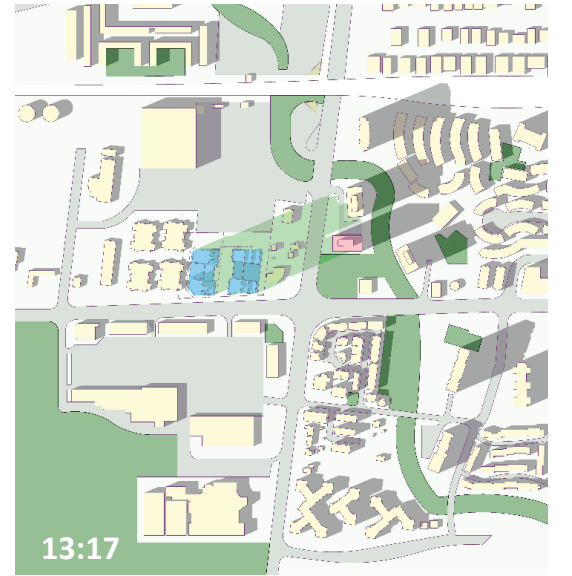
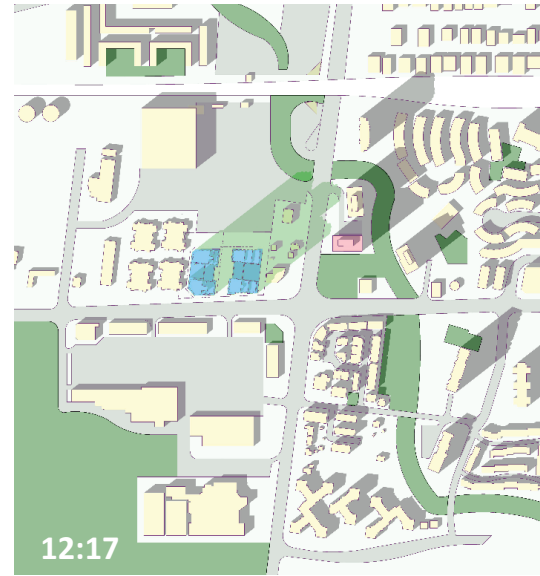
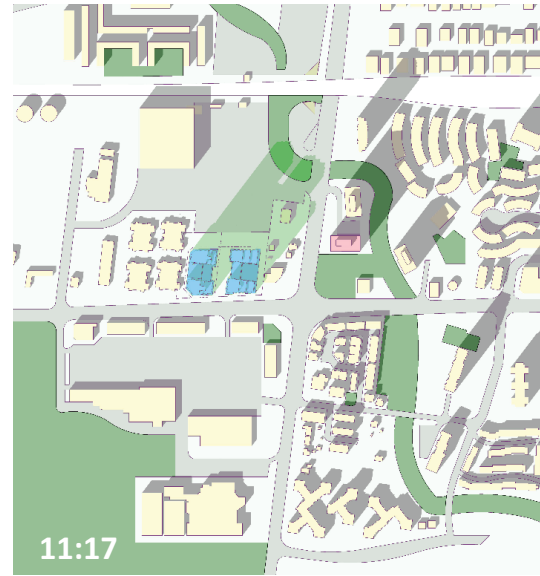
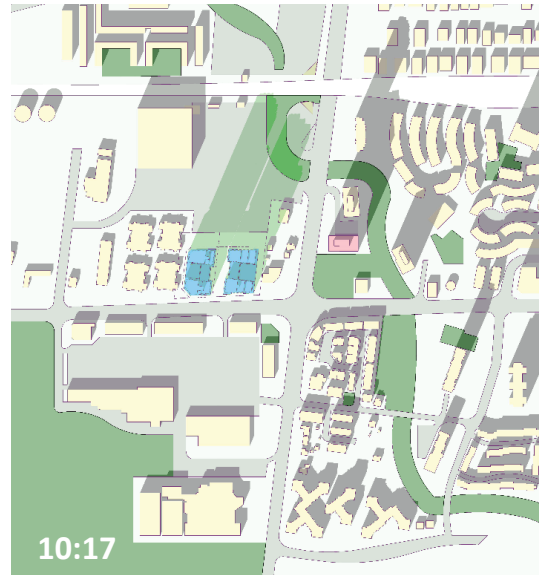
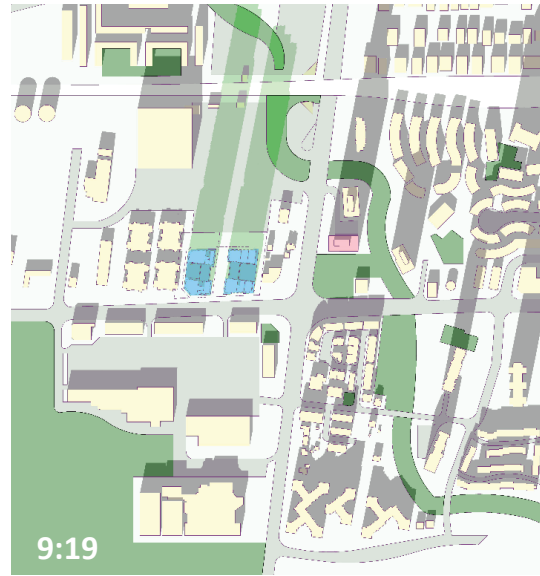
JUNE 21



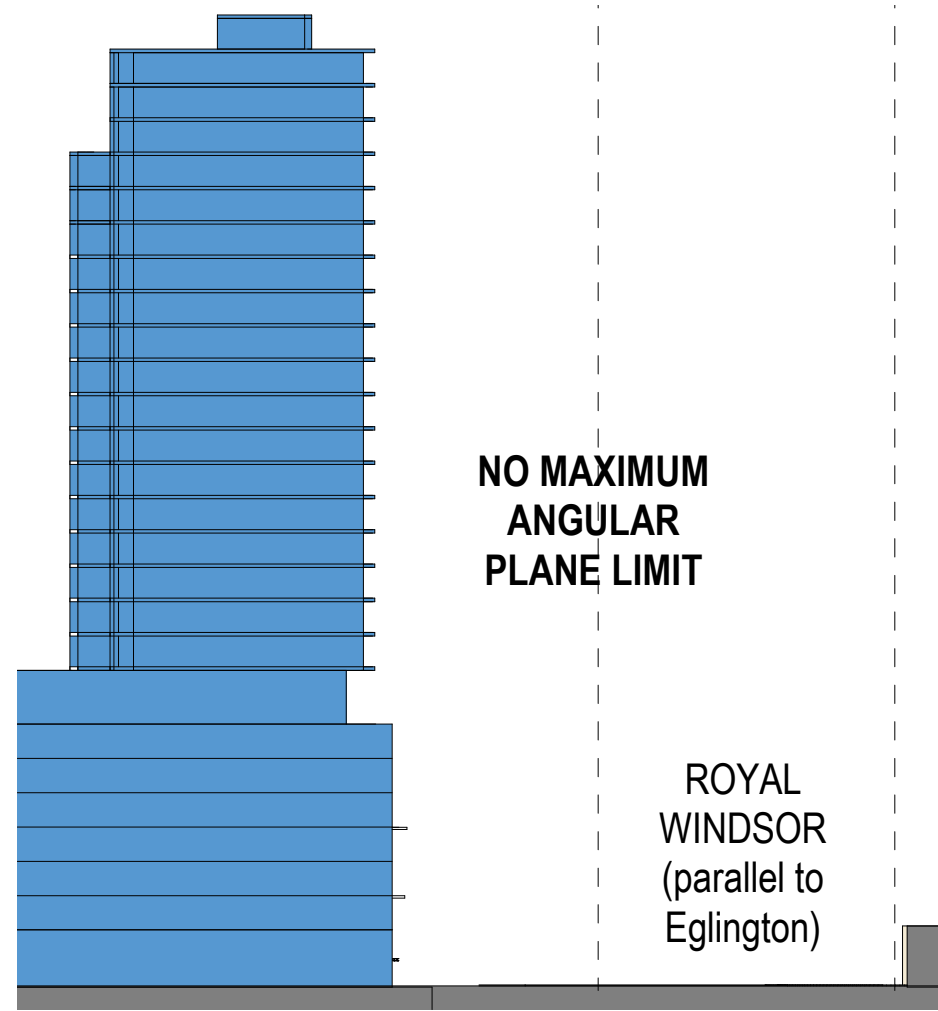
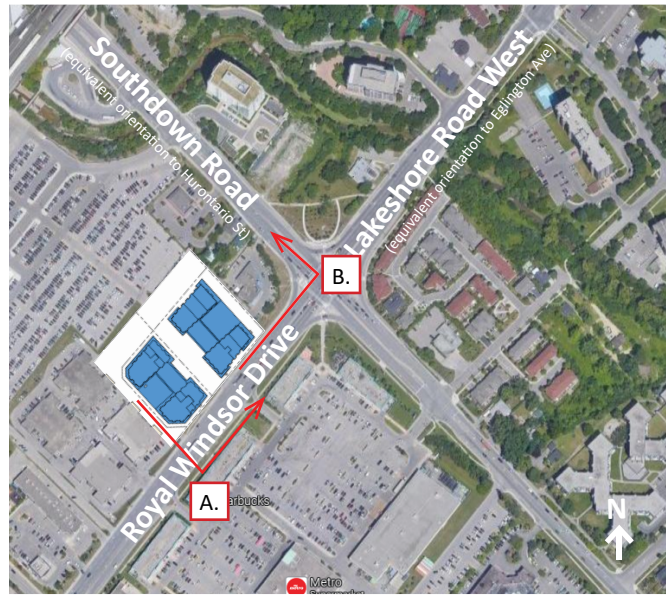
SEPTEMBER 21



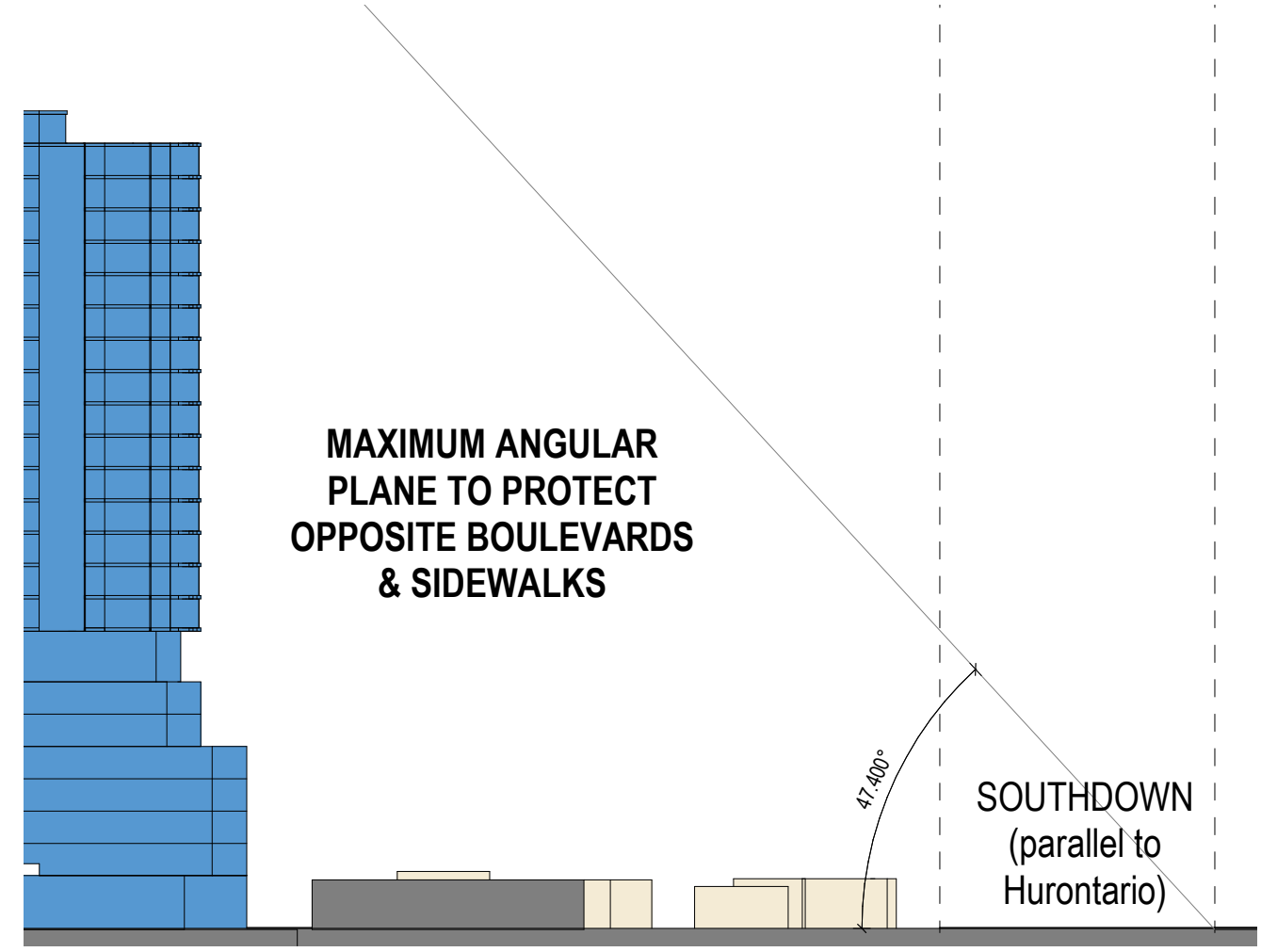
DECEMBER 21



KEY PLAN



A. Solar Angular Plane Royal Windsor
1:500



B. Solar Angular Plane Southdown
1:500

