SHADOW STUDY

**600-620 LOLITA GARDENS** 

CITY OF MISSISSAUGA

PREPARED FOR:

August 2019 Hanseatic Holdings Limited





Job Number - 16154-5

#### 1.0 INTRODUCTION

The following information prepared by Bousfields Inc. is to be read in conjunction with the accompanying shadow drawings as well as the architectural drawing set prepared by Quadrangle Architects.

## 1.1 Site Latitude and Longitude

The information taken from OpenStreetMap regarding the site of 600-620 Lolita Gardens, Mississauga, Ontario, L5A 3K8 is located at:

Latitude: 43°35′38.73″N

Longitude: 79°36'09.79"W

Astronomic north was determined by geolocating the 3D model in SketchUp based on OpenStreetMap. The origin of the base plan is from City of Mississauga CAD files, Google Earth satellite imagery, and architectural drawings prepared by Quadrangle Architects.

# 1.2 Software Used to Prepare Shadow Analysis

SketchUp Pro was used for 3D work, calculations were done using AutoCad, final composite images were done in Photoshop.

### 1.3 Description of Areas

Residential private outdoor amenity spaces are determined as private rear yards, decks, patios and pools of surrounding residential dwellings (See fig. 1).

Communal outdoor amenity areas are determined as public amenity areas and common outdoor amenity areas that are part of proposed or existing development (See fig. 2).

Public realm is determined as sidewalks, open spaces, parks and plazas (See fig. 3).

Turf and flower gardens in public parks within the public realm have not been identified (See fig. 4).

Building faces have been identified to allow for possible use of solar energy (See fig. 5).

The findings of that study are summarized as follows:

# 2.0 RESIDENTIAL PRIVATE OUTDOOR AMENITY SPACES

Section 3.1 of the Mississauga Urban Design Terms of Reference - Standards for Shadow Studies requires the identification of private outdoor amenity spaces within the vicinity of the proposed development. Areas outlined in teal were identified as private outdoor amenity spaces, including rear yards, decks, patios and pools within 7.5m of the rear wall or other appropriate exterior building wall, known as the line of impact assessment or "no impact zone".

Testing times include June 21st and September 21st to maximize the use of these spaces.

The criteria is met if there is shadow impact for no more than two consecutive hourly test times within the space between the exterior wall of the dwelling that abuts the amenity space and the line of impact assessment.

The findings of the shadow analysis show that the proposal for no more than two consecutive hourly test times are in accordance with this standard. As such, the criteria for section 3.1 is met.

Figure 1 - Residential private outdoor amenity spaces key map identifies all areas in the vicinity.

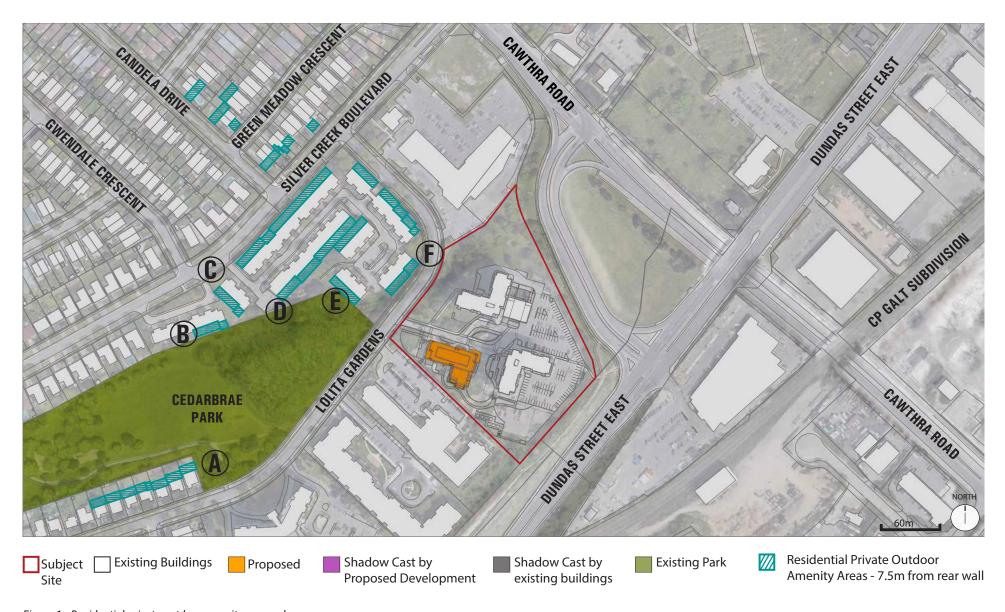
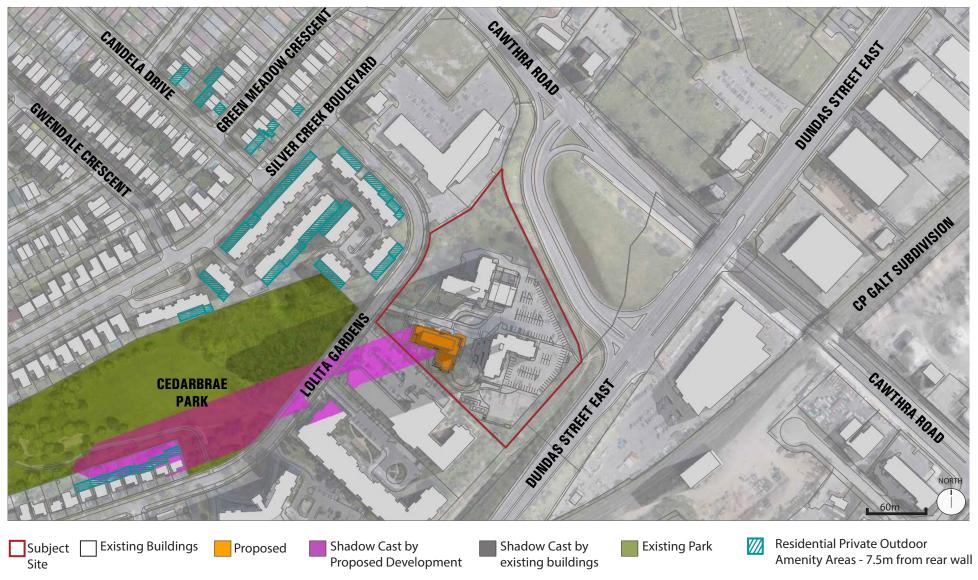
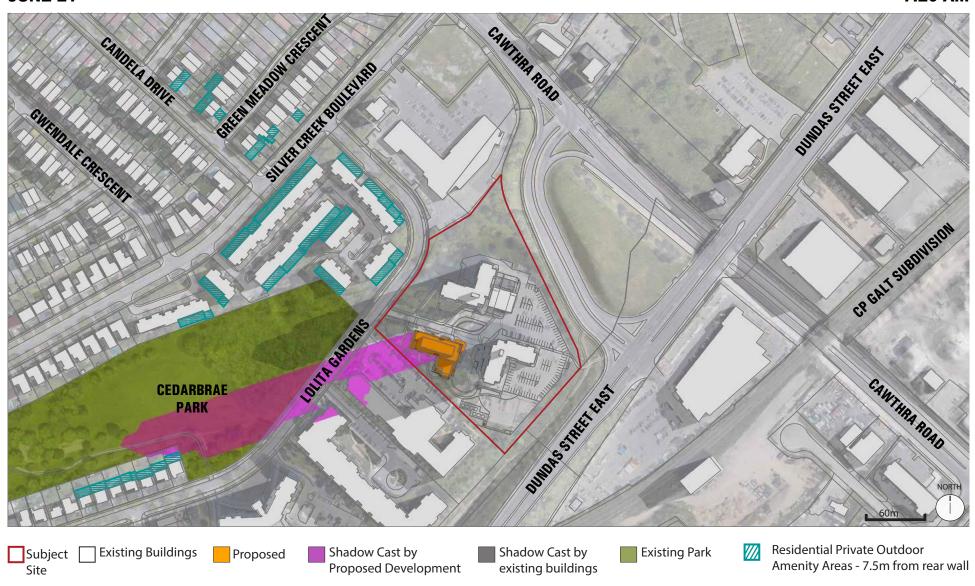


Figure 1 - Residential private outdoor amenity spaces key map

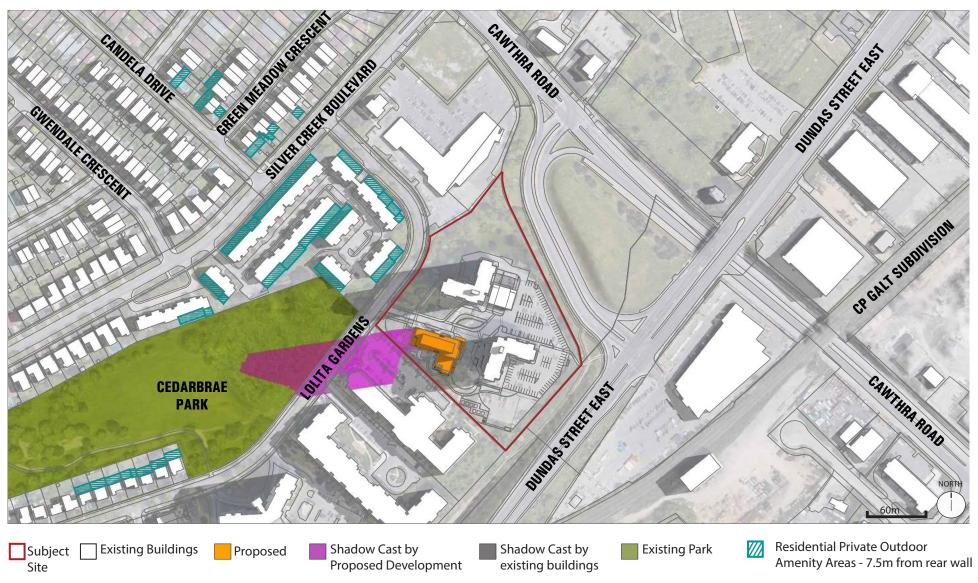
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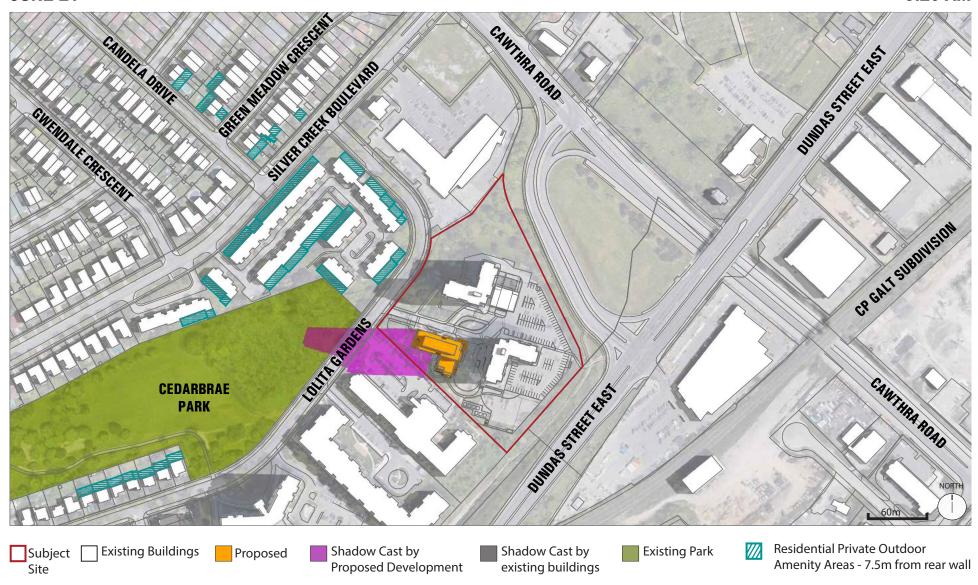
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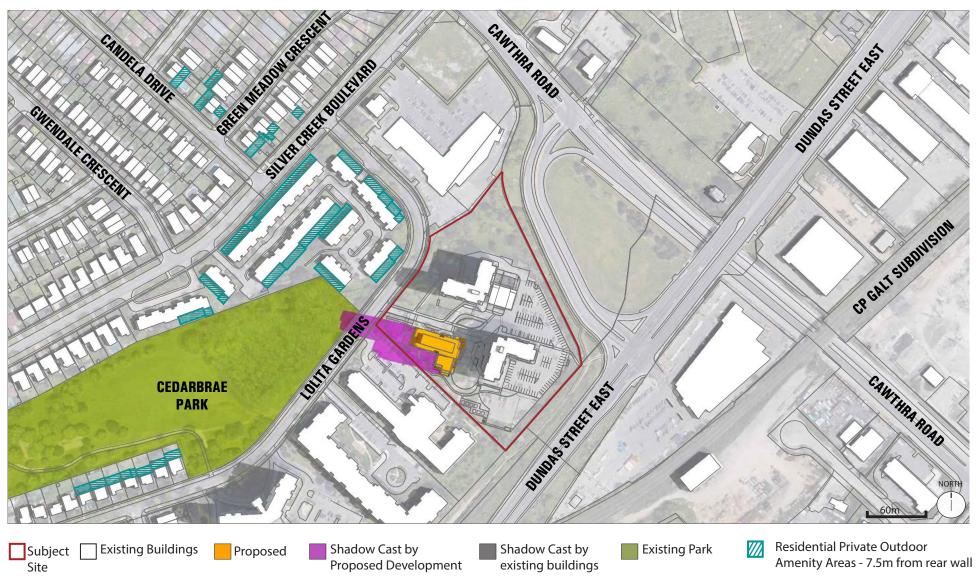
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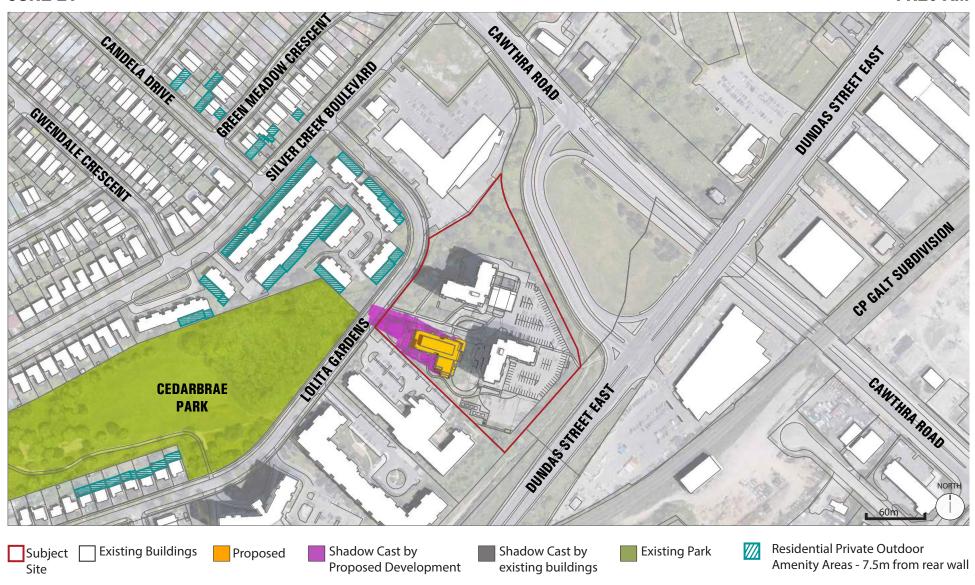
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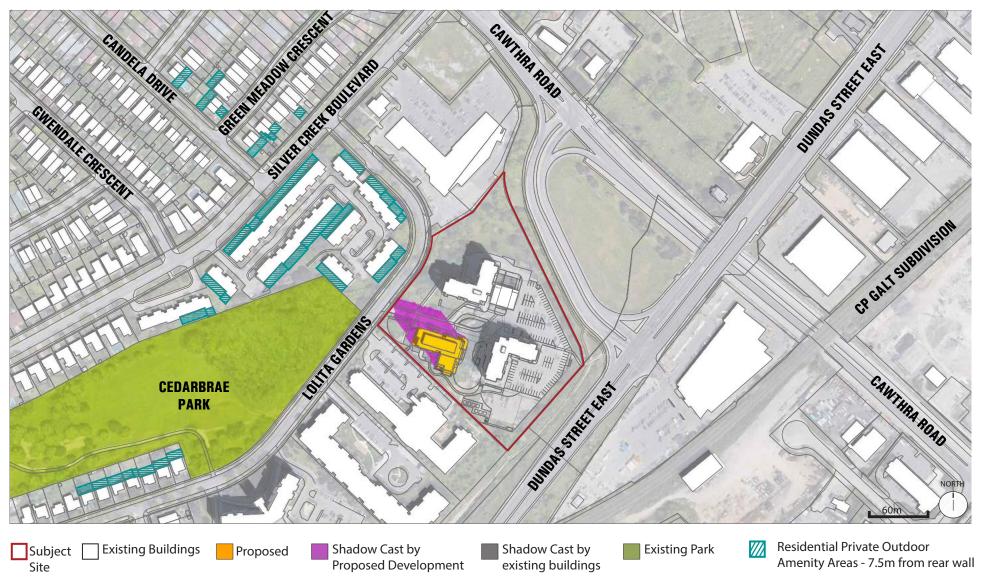
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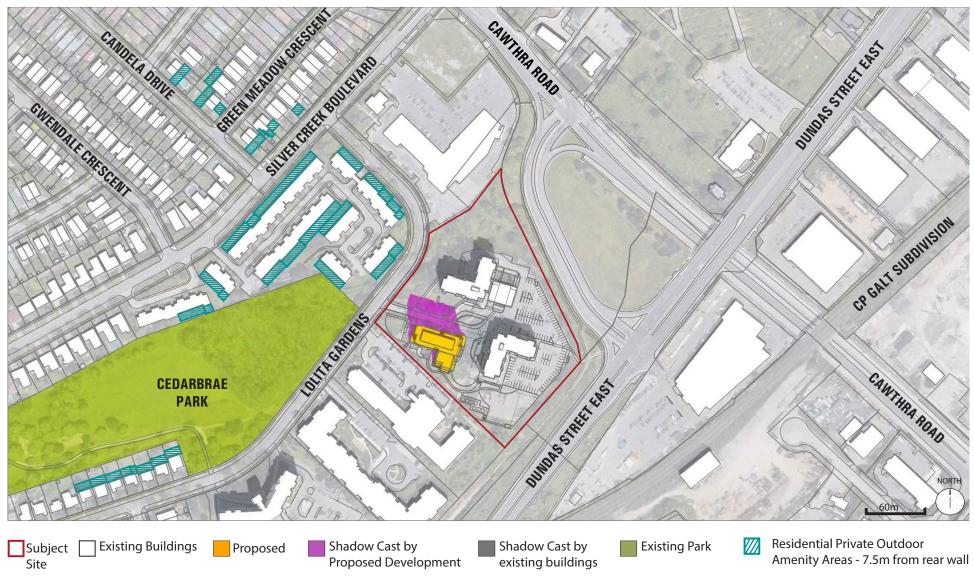
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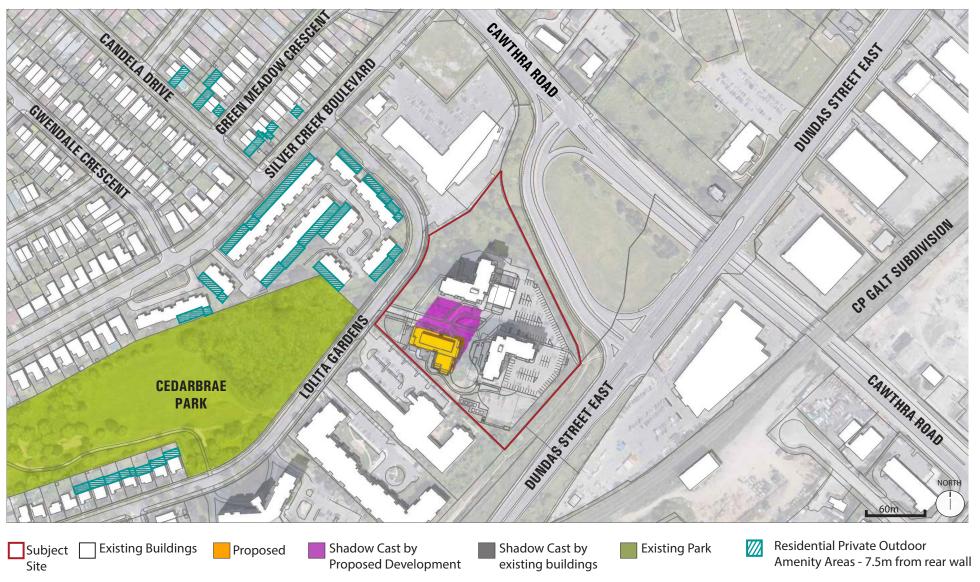
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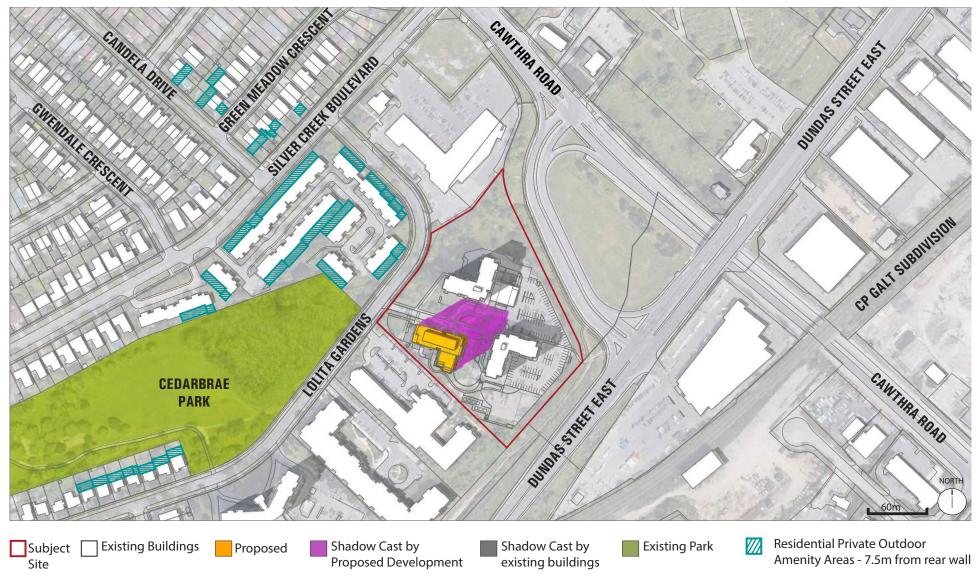
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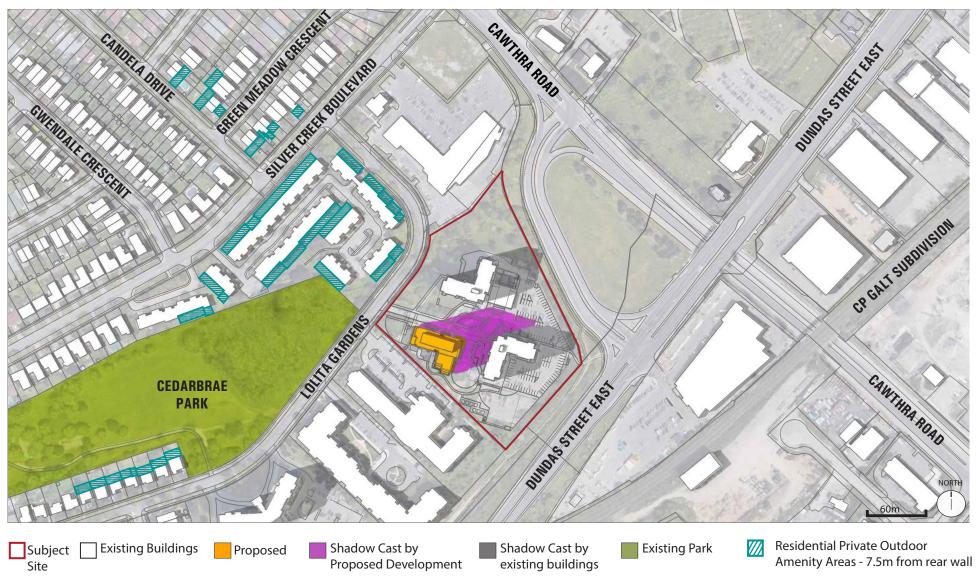
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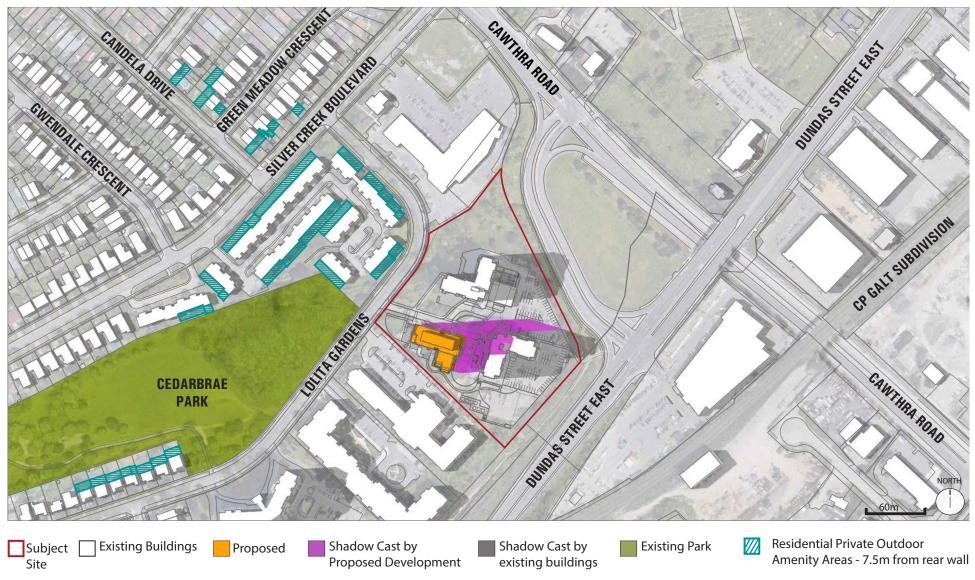
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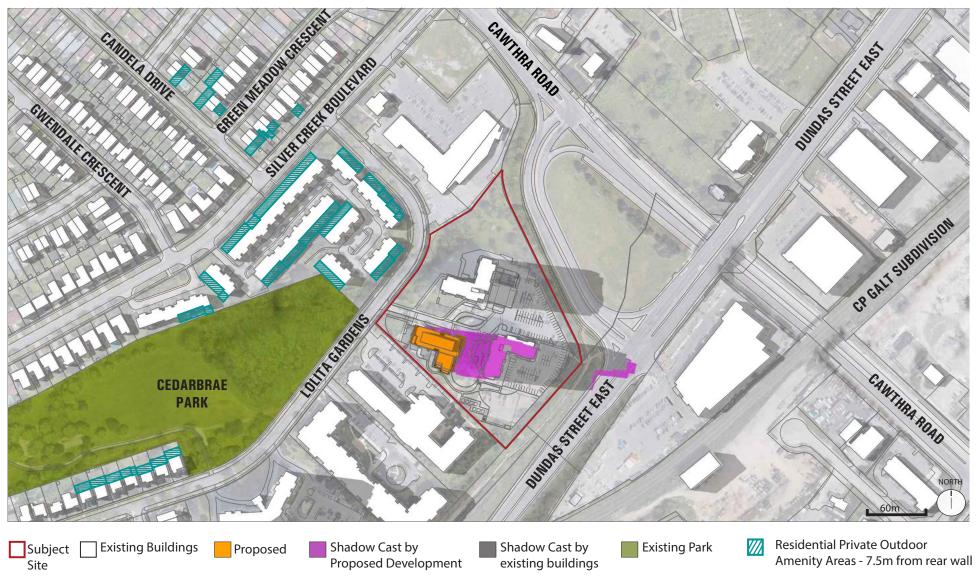
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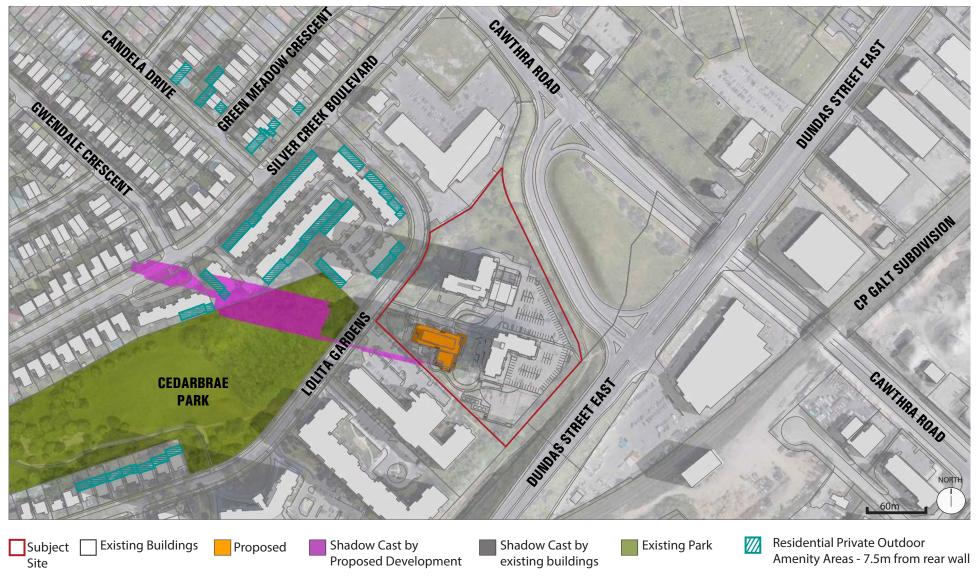
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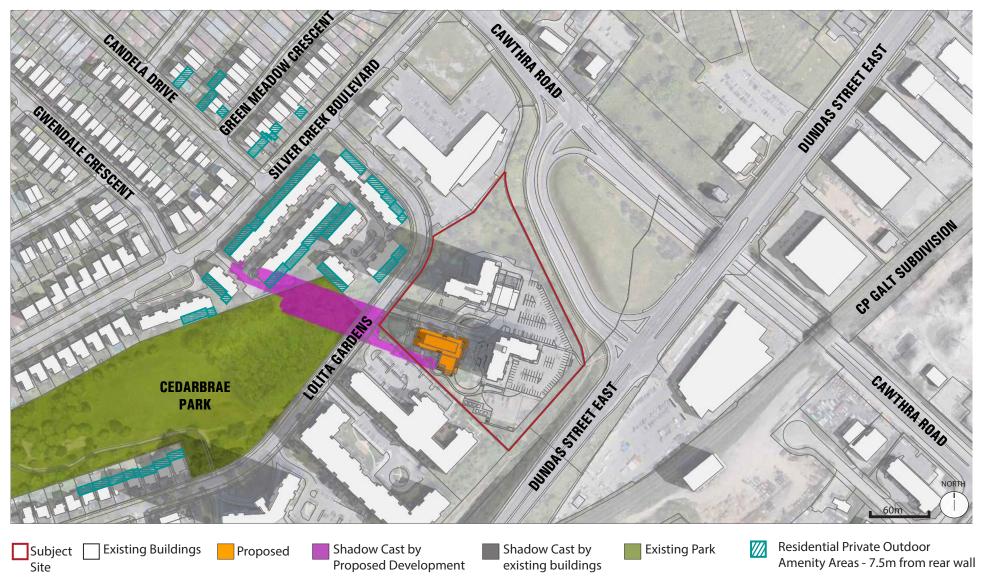
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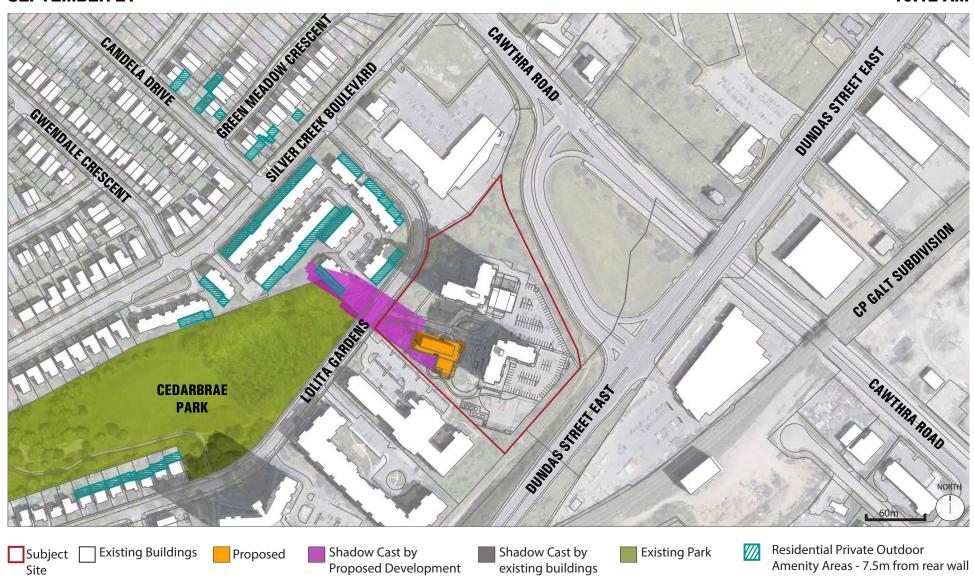
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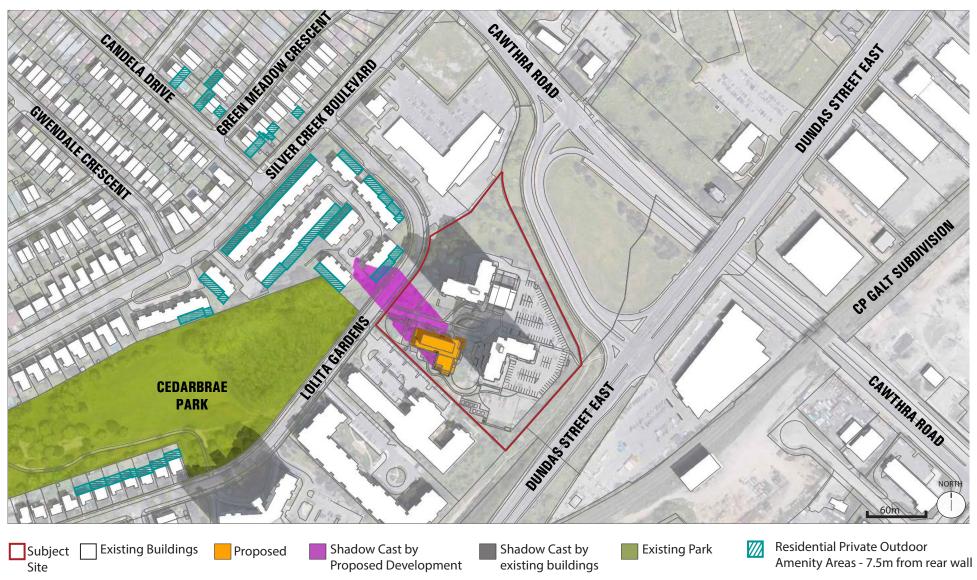
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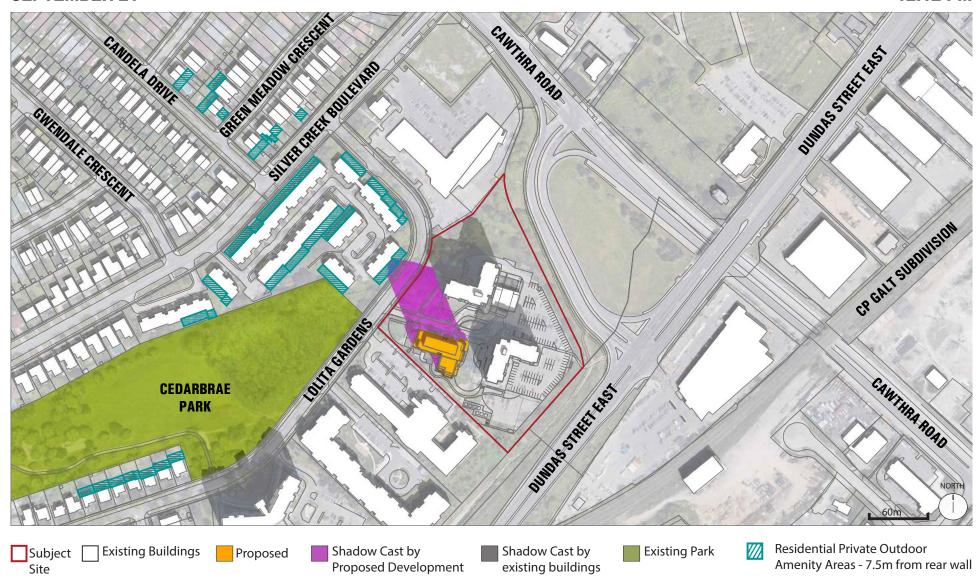
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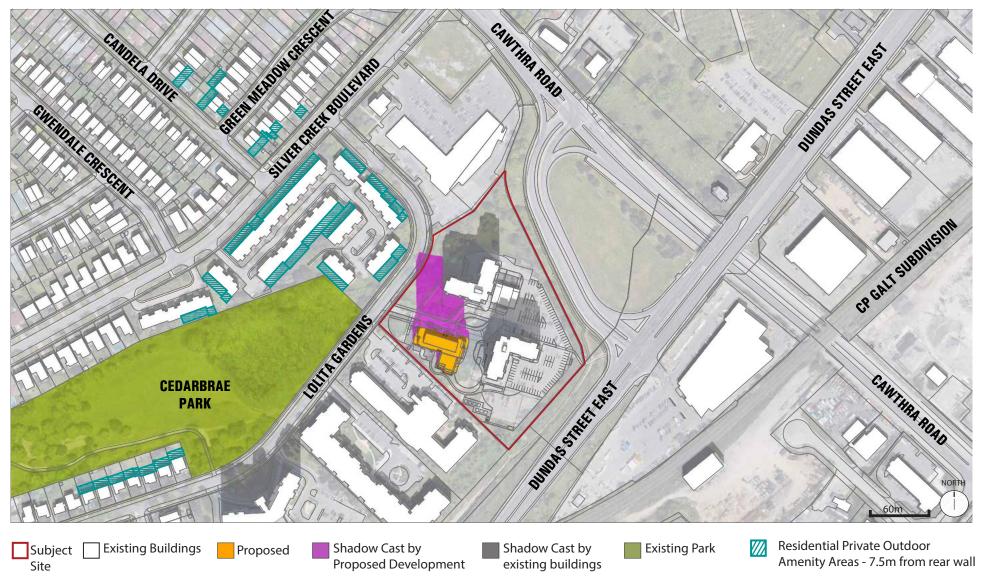


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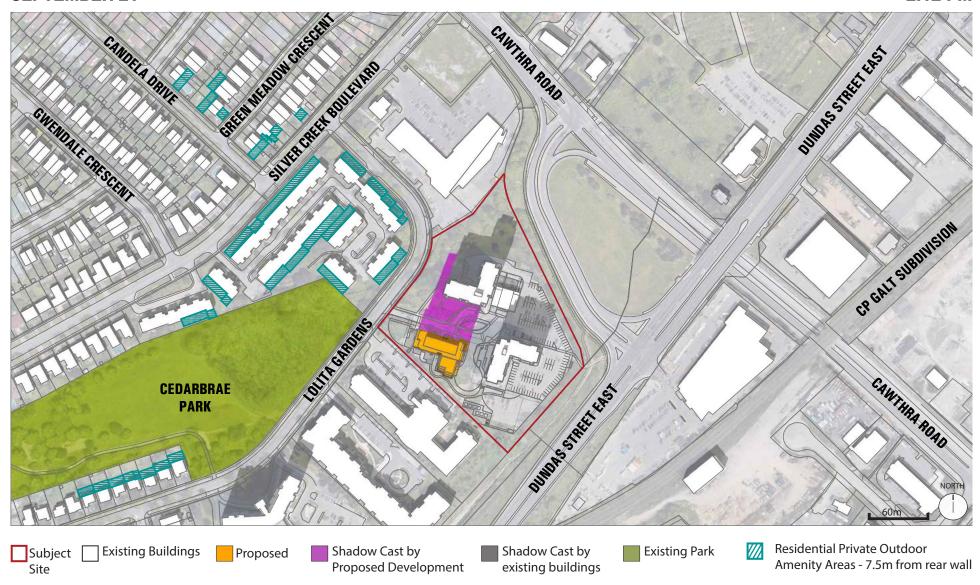


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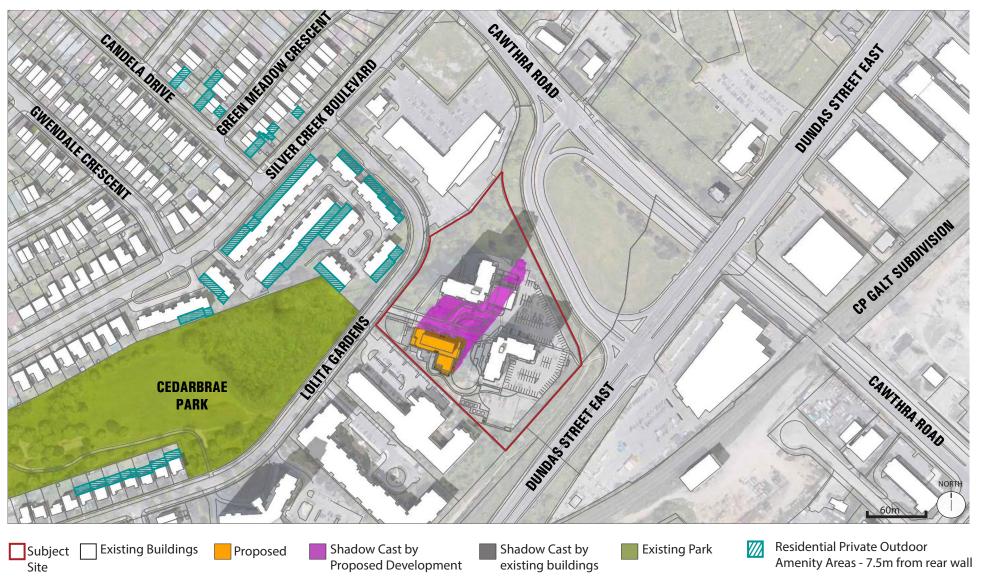
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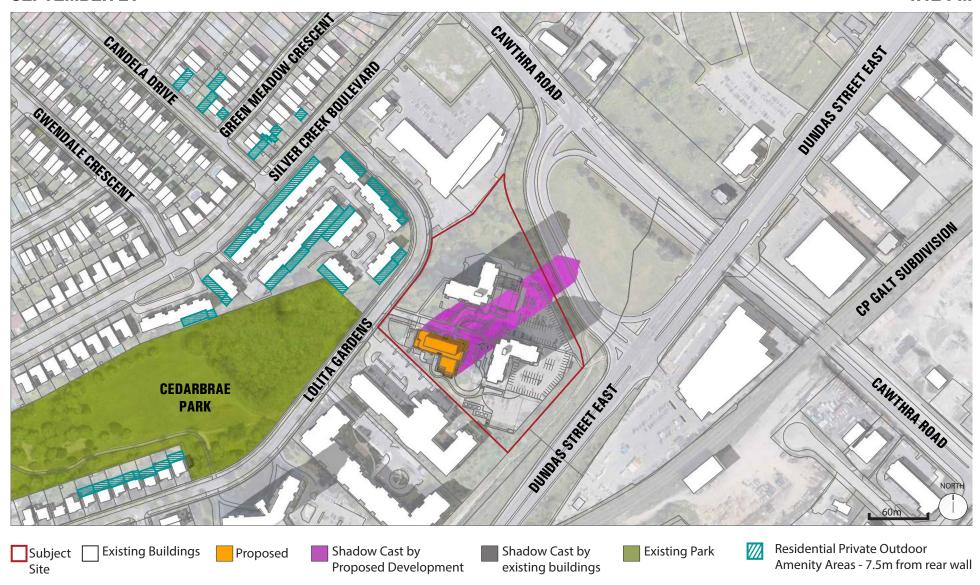
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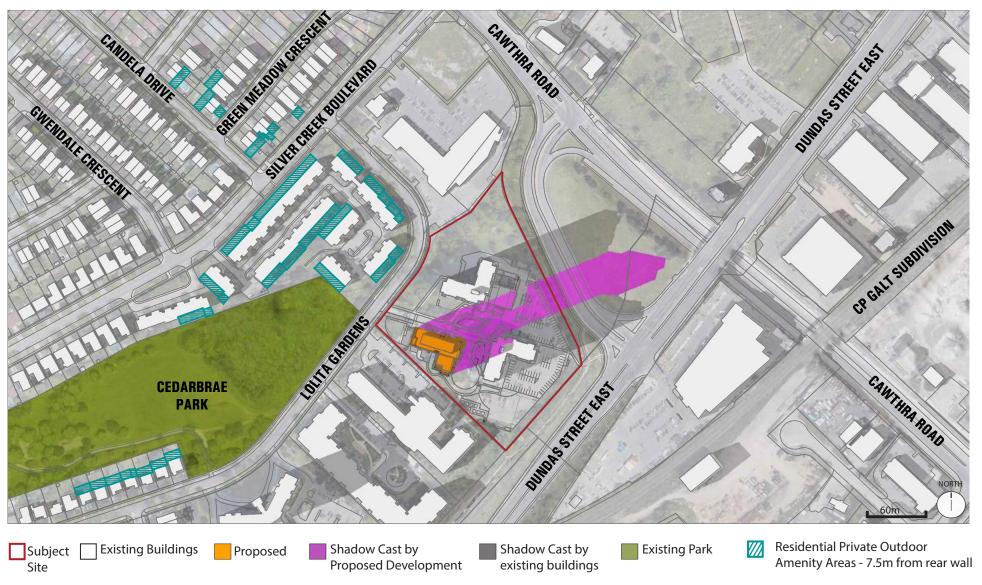
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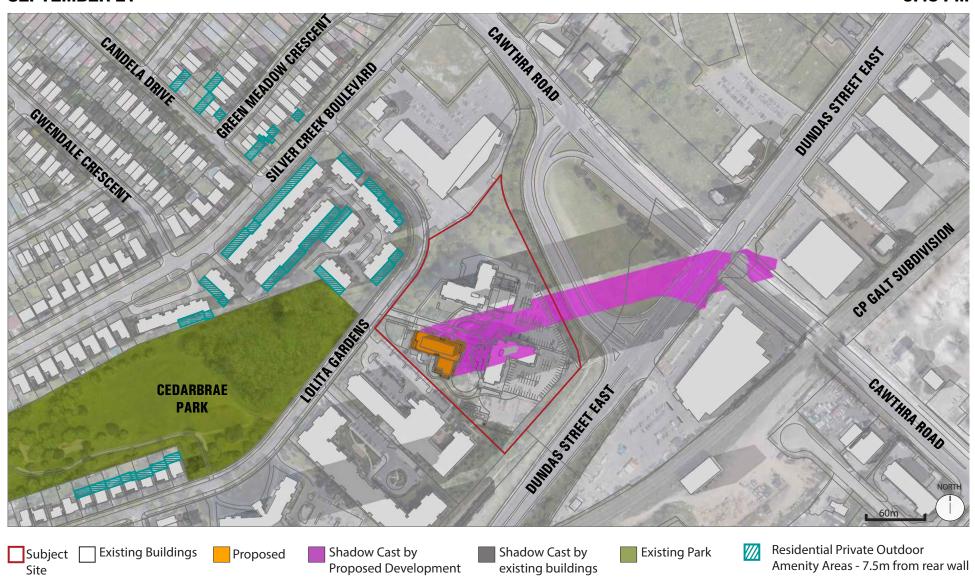
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#### 3.0 **COMMUNAL OUTDOOR AMENITY AREAS**

Section 3.2 of the Mississauga Urban Design Terms of Reference - Standards for Shadow Studies requires the identification of communal outdoor amenity areas within the vicinity of the proposed developments. Areas outlined in purple were identified as communal outdoor amenity areas and include children's play areas, school yards, tot lots, and park features such as sandboxes, wading pools etc. It also includes outdoor amenity areas used by seniors and those associated with commercial and employment areas.

Testing times include June 21st, September 21st, and December 21st.

As defined by the Terms of Reference, shadows from a proposed development should allow for full sun on identified areas at least half the time, or 50% sun coverage all the time. If the "sun access factor" is at least 50% or 0.5 on each of the test dates (As(ave)/AT = 0.5 or more), then the shadow impact is considered to be in compliance with these terms of reference.

The findings of the shadow analysis show that the proposal allows for full sun on the communal outdoor amenity areas and is in accordance with this standard. As such, the criteria for section 3.2 is met.

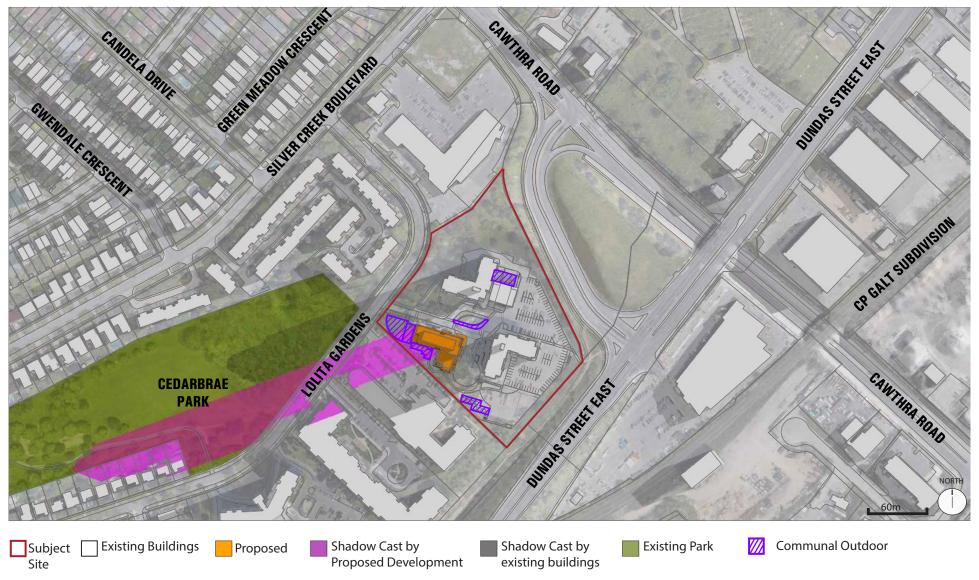
Please refer to section 8.0 Calculations for details.

Figure 2 - Communal outdoor amenity areas key map identifies all areas in the vicinity.



Figure 2 - Communal outdoor amenity areas key map

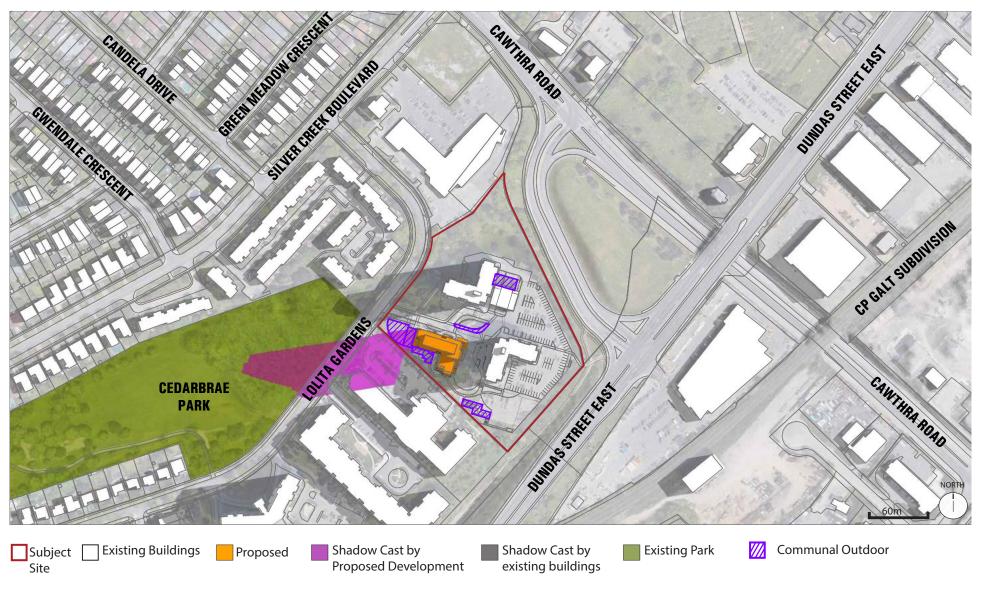
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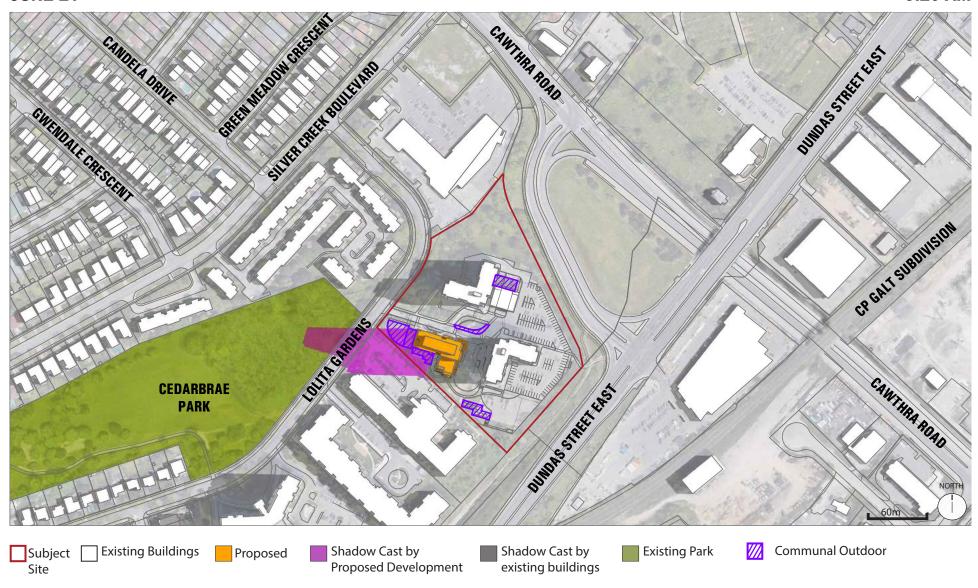
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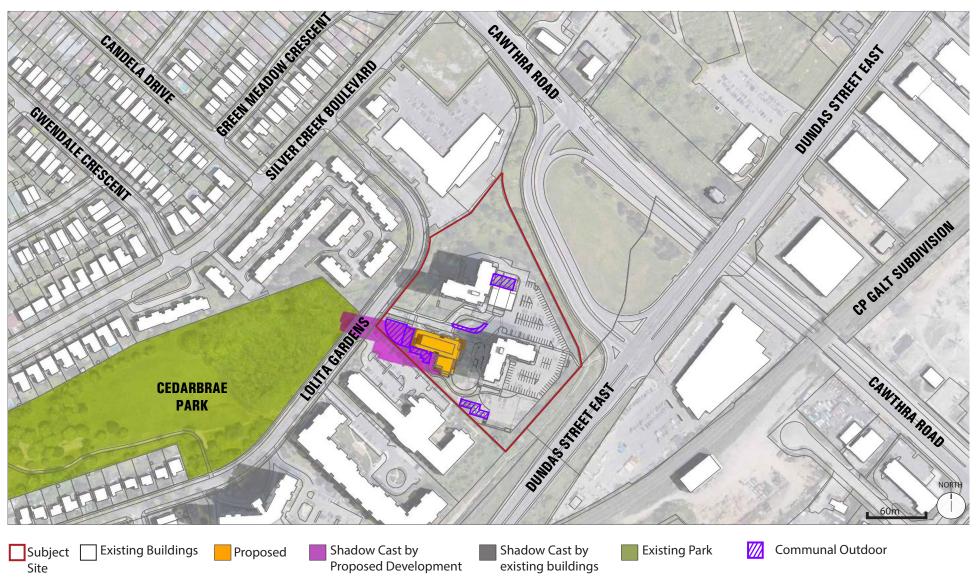
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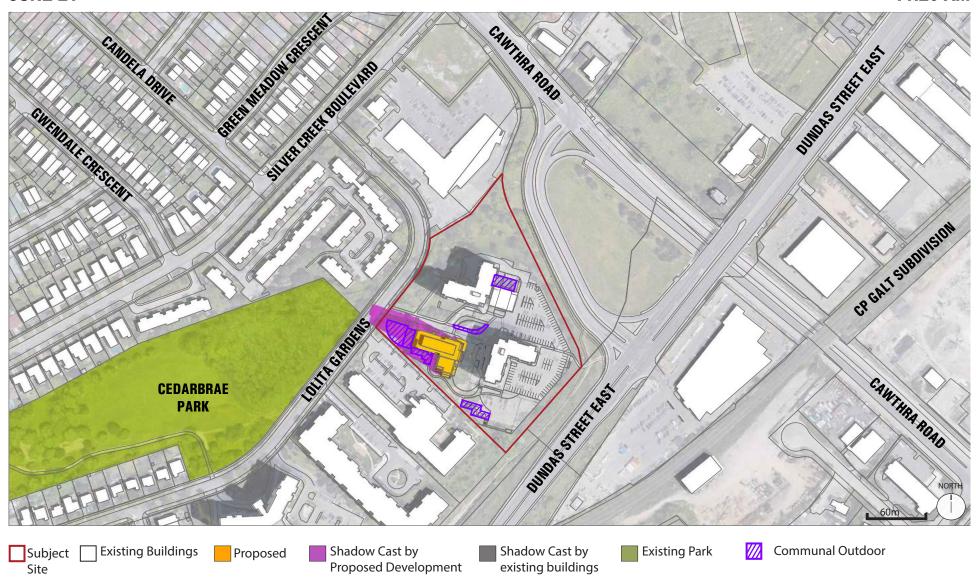
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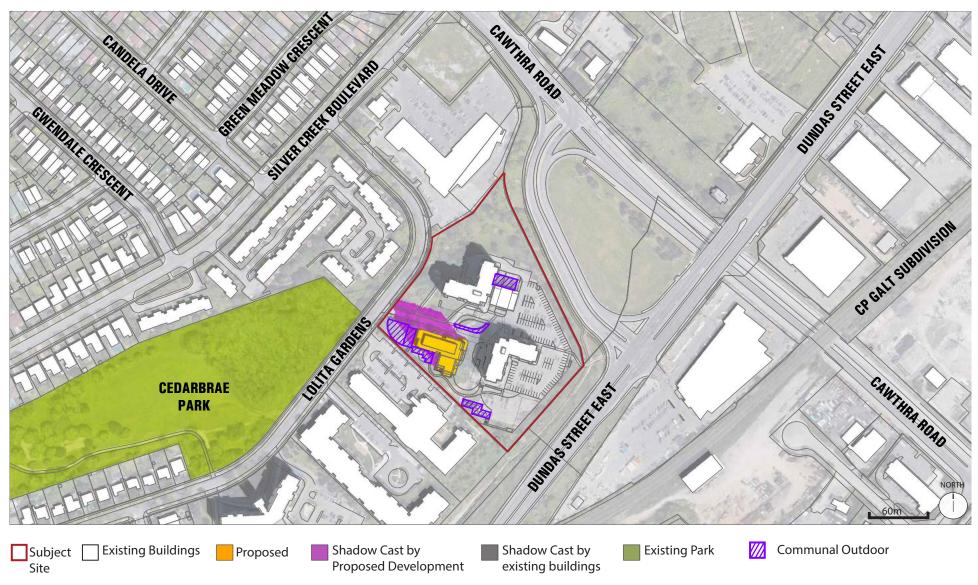
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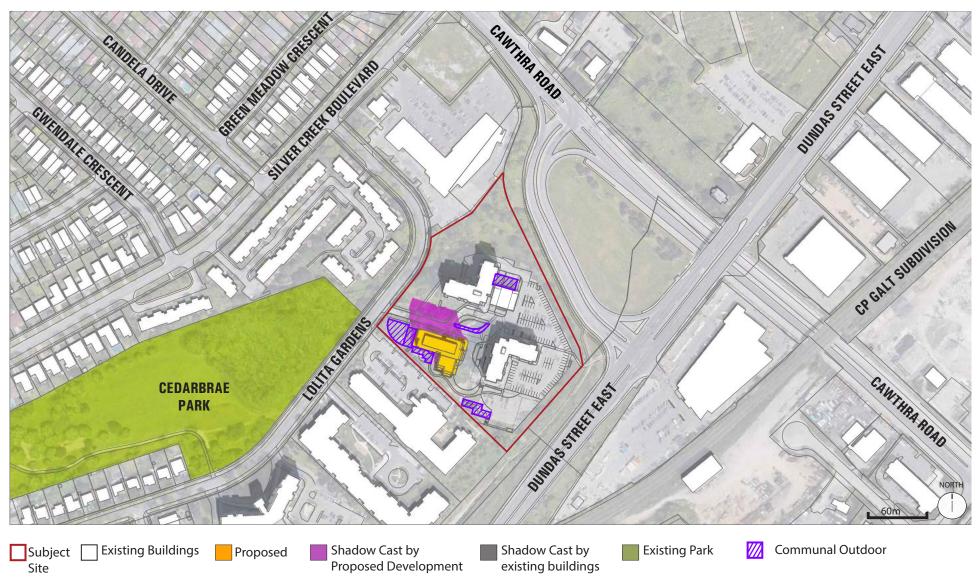
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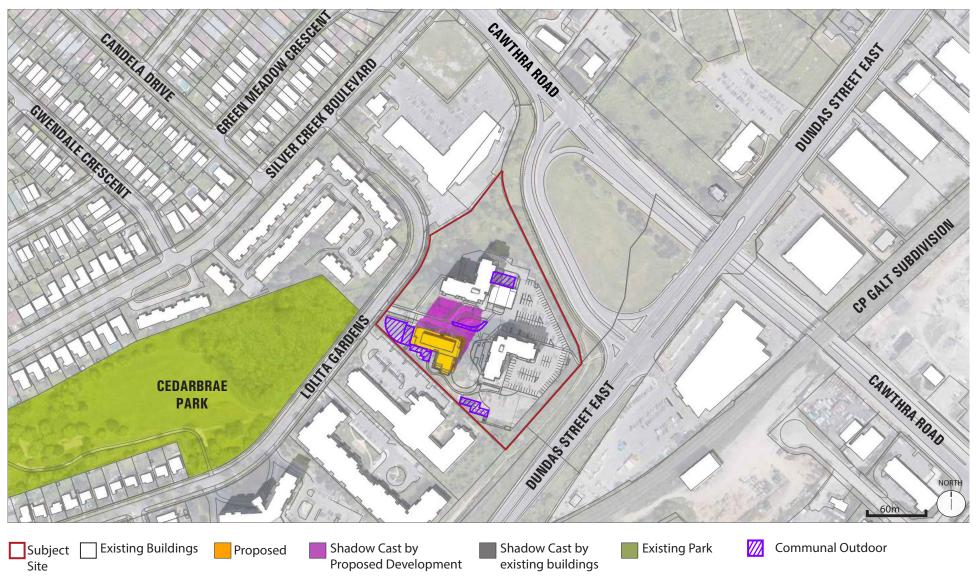
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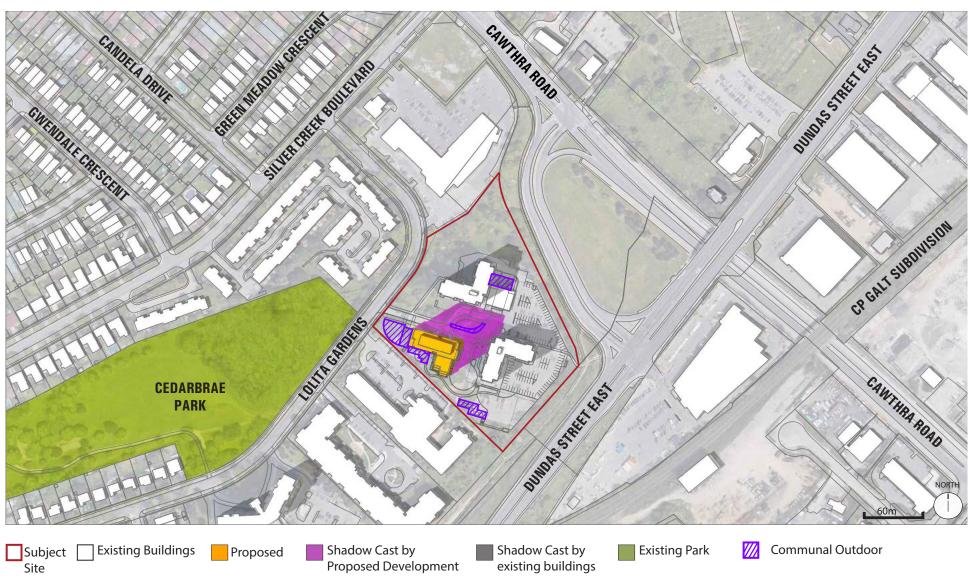
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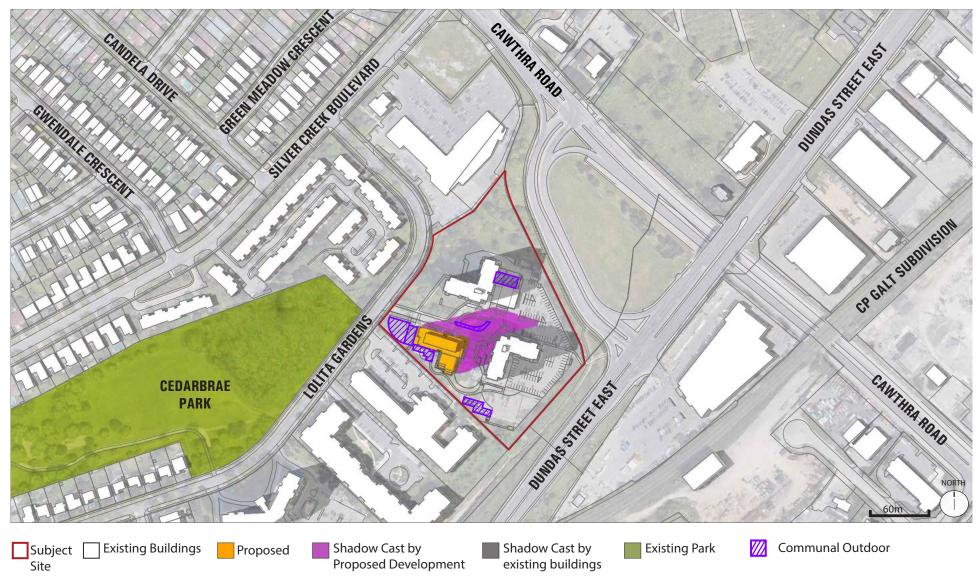
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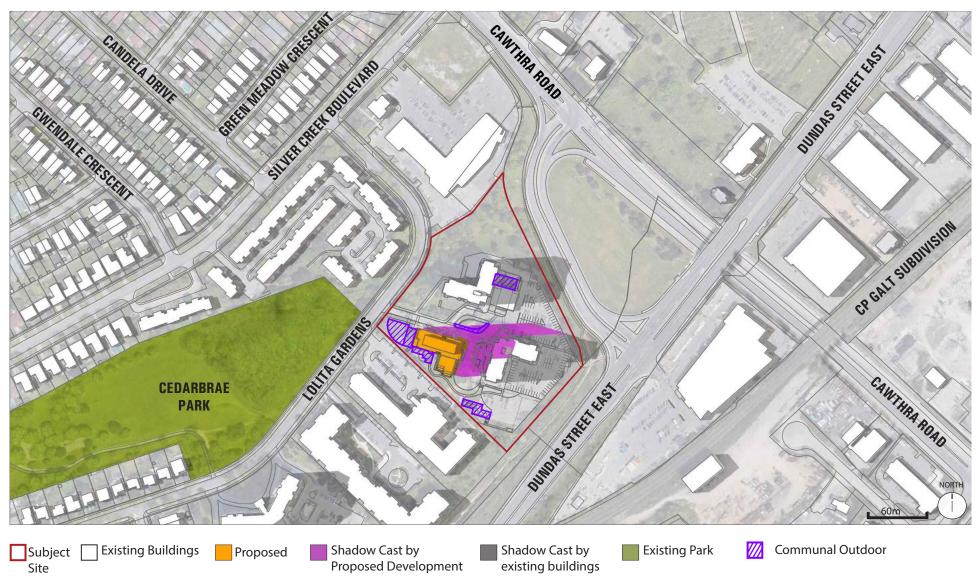
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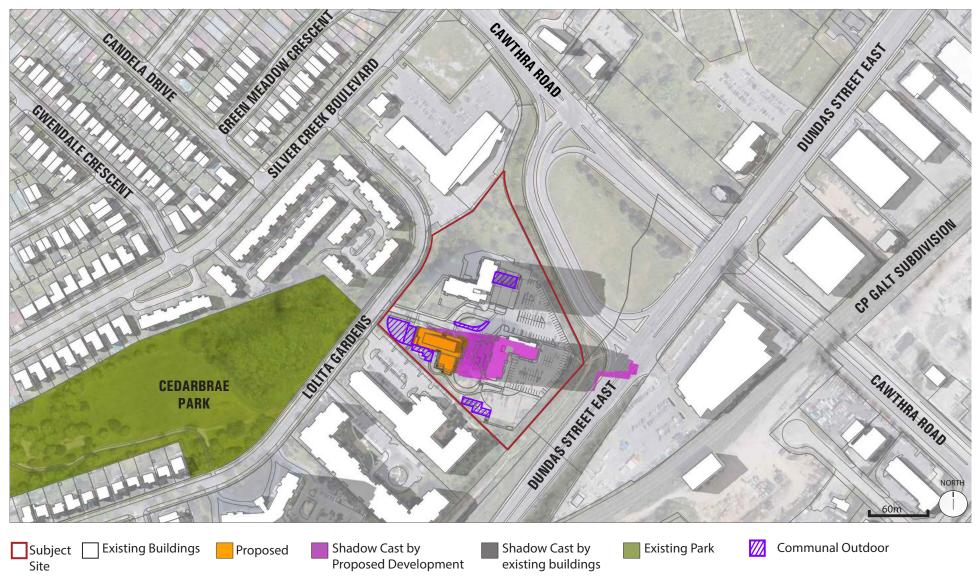
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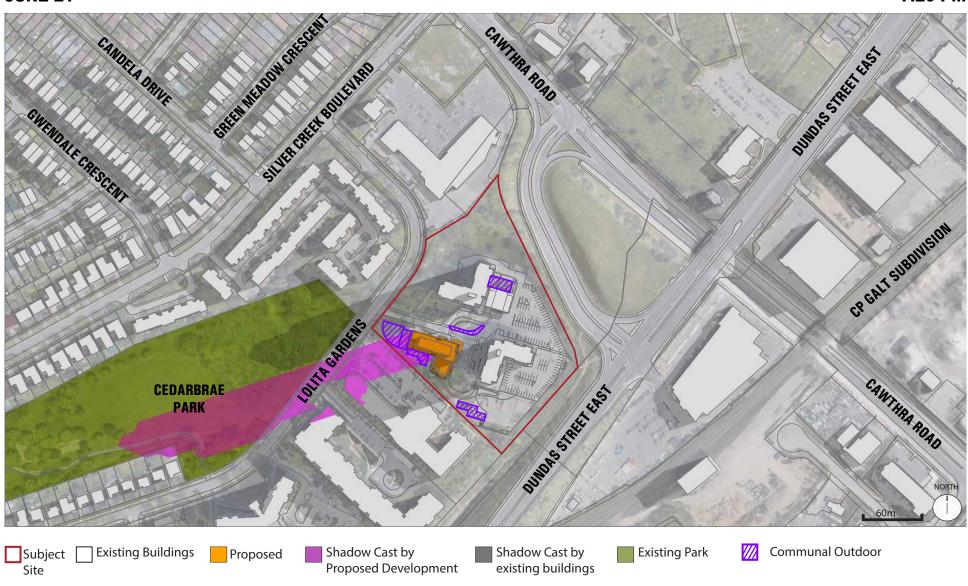
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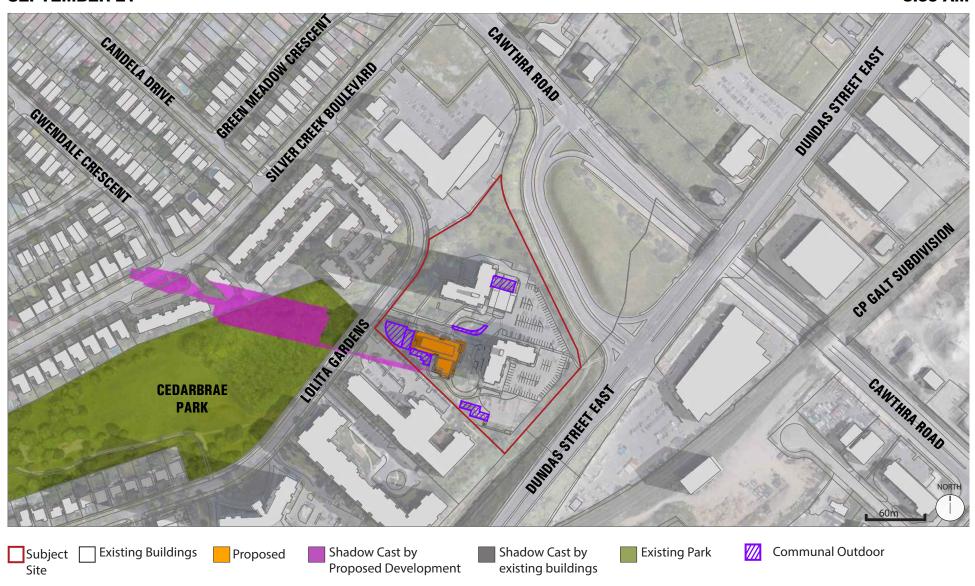
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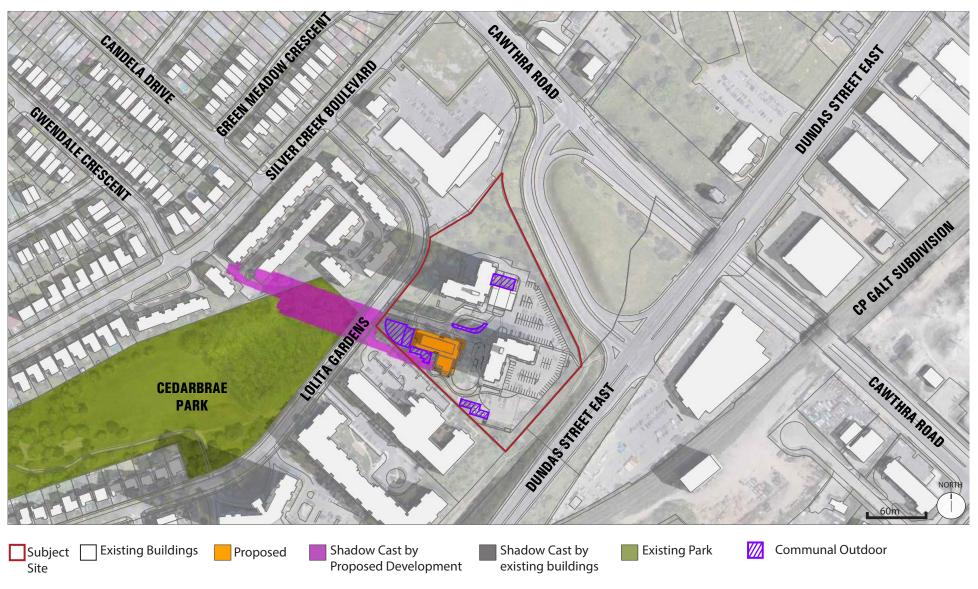
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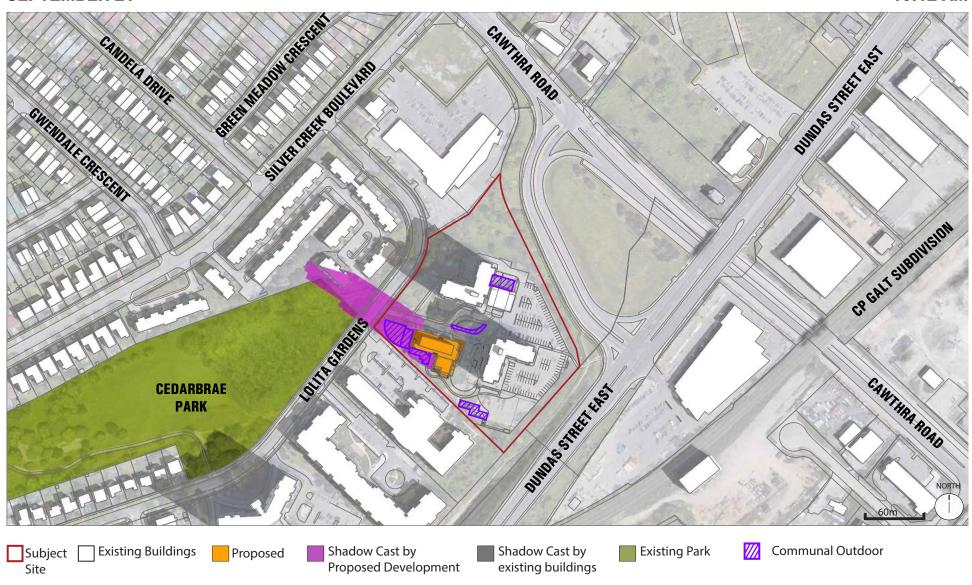
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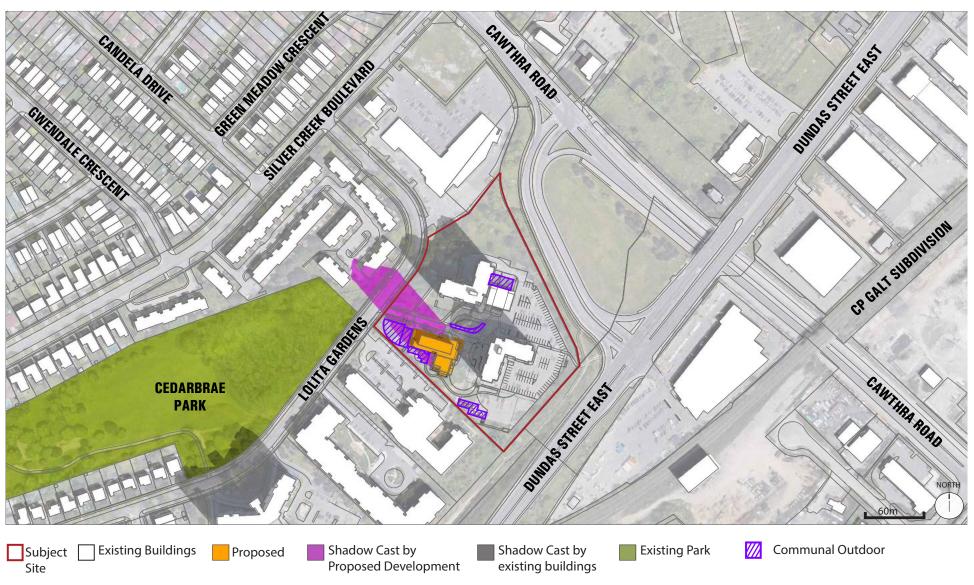
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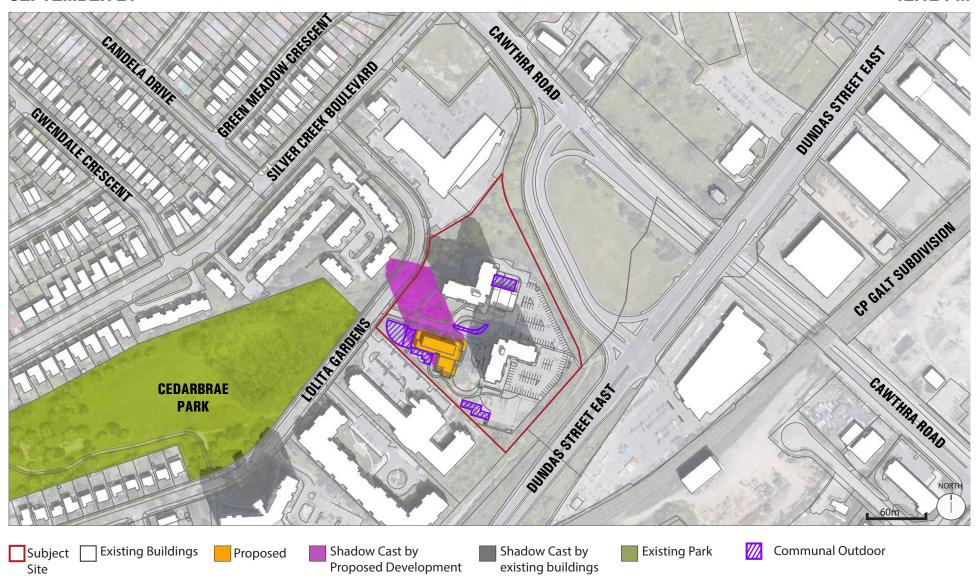
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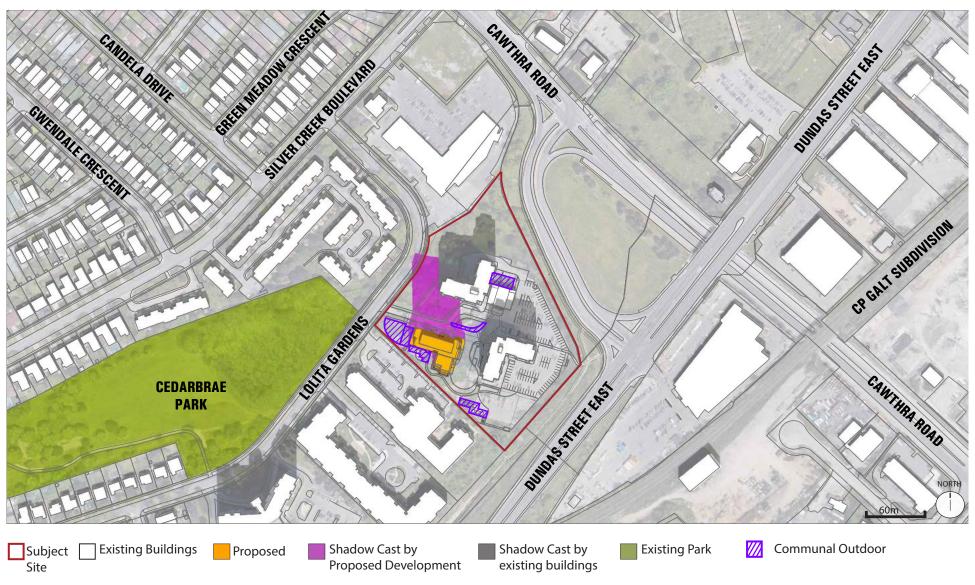
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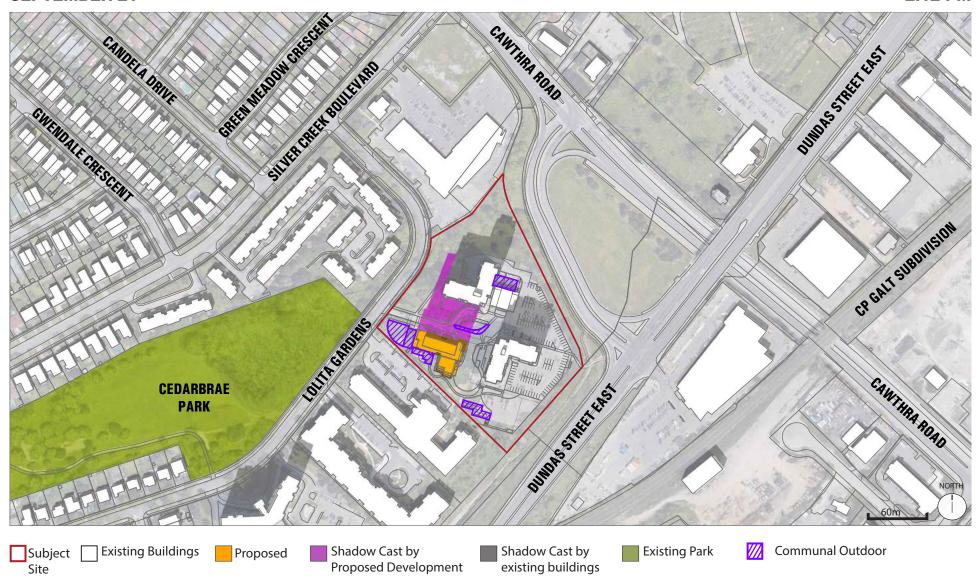
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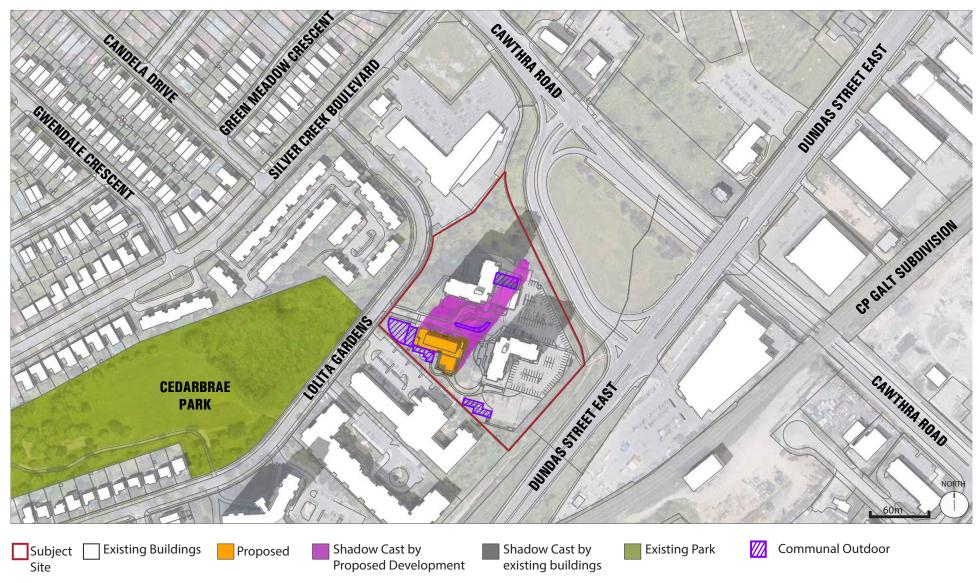
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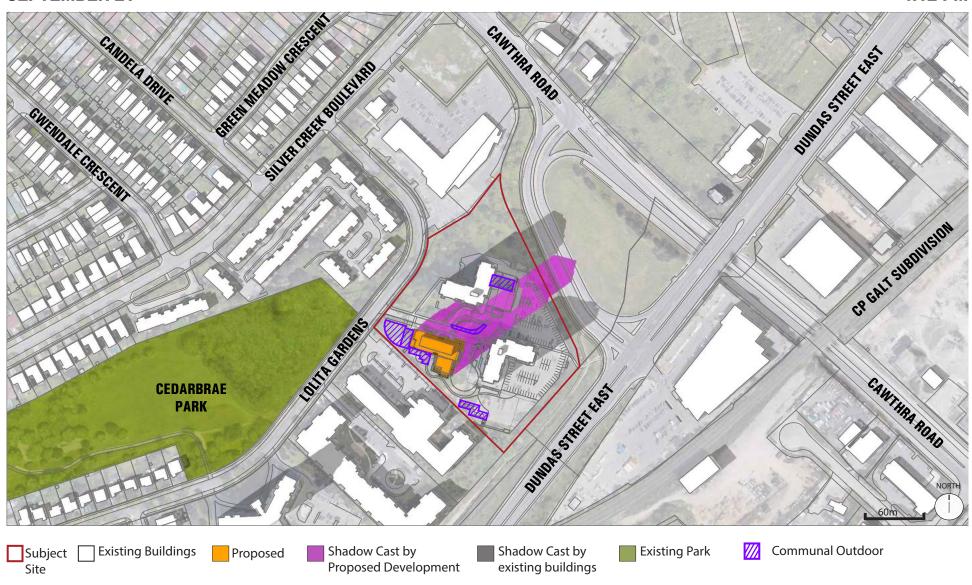
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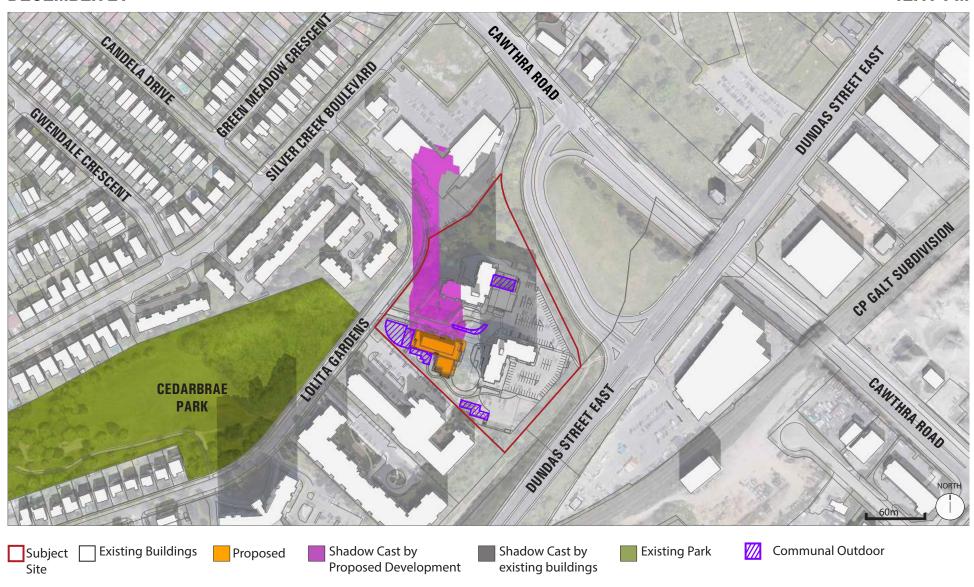


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## 4.0 PUBLIC REALM

Section 3.3 of the Mississauga Urban Design Terms of Reference - Standards for Shadow Studies requires the identification of Public Realm within the vicinity of the proposed development. Areas outlined in yellow were identified as Public Realm and include sidewalks, open spaces, parks and plazas.

## Low and Medium Density Residential Streets

As defined by the Terms of Reference, Low and Medium Density Residential Streets should be designed to allow full sunlight on the opposite boulevard including the full width of the sidewalk on September 21st for a total of at least 4 hours between 9:12 am and 11:12 am, and between 3:12 pm and 5:12 pm. The rationale for the criteria for Low and Medium Density Residential Streets is to allow for full sunlight at on the opposite boulevard at times when children and adults would generally be walking to school and other activities in the morning and in the afternoons when children and adults would generally be walking back from school, work and other activities.

As demonstrated by the shadow study, there is shadow from the proposed development on Lolita Gardens sidewalk from 8:35 am to 12:12 pm but no shadows on Dundas Street East sidewalk, therefore criteria 3.3 Low and Medium Density Residential Streets is not met. There is shadowing on the sidewalk adjacent to the park until 10:12 am and shadowing on the sidewalk that abuts residential side and back yards until 12:12pm.

## Public Open Spaces, Parks and Plazas

As defined by the Terms of Reference, shadows from proposed developments should allow for full sun on public open spaces, parks and plazas at least half the time, or 50% sun coverage all the time. If the "sun access factor" is at least 50% or 0.5 on each of the test dates (As(ave)/AT = 0.5 or more), then the shadow impact is considered to be in compliance with these terms of reference. The findings of the shadow study conclude that the proposed development complies with this standard. Please refer to Section 8. Calculations for details.

Figure 3 - Public Realm key map identifies all areas in the vicinity.

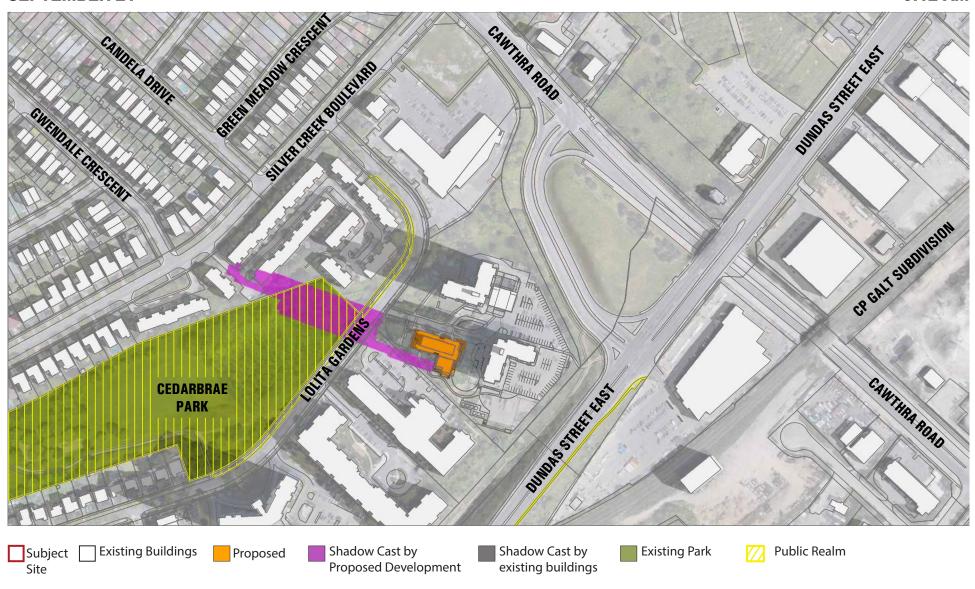


Figure 3 - Public realm areas key map

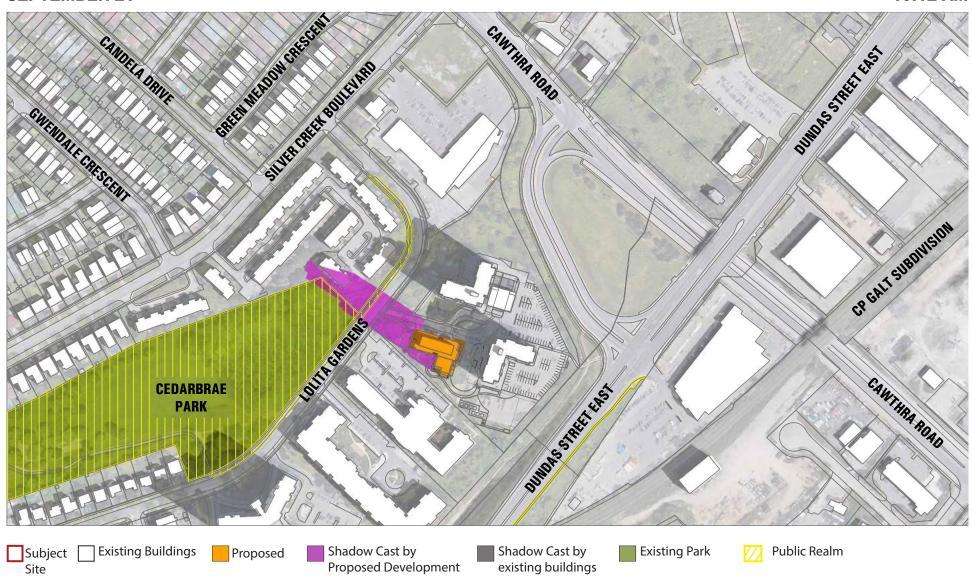
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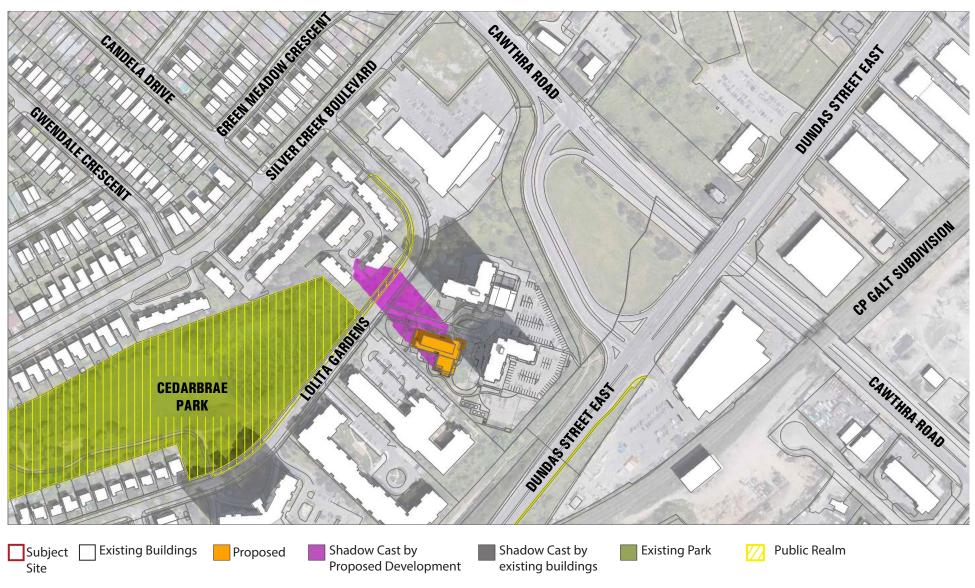
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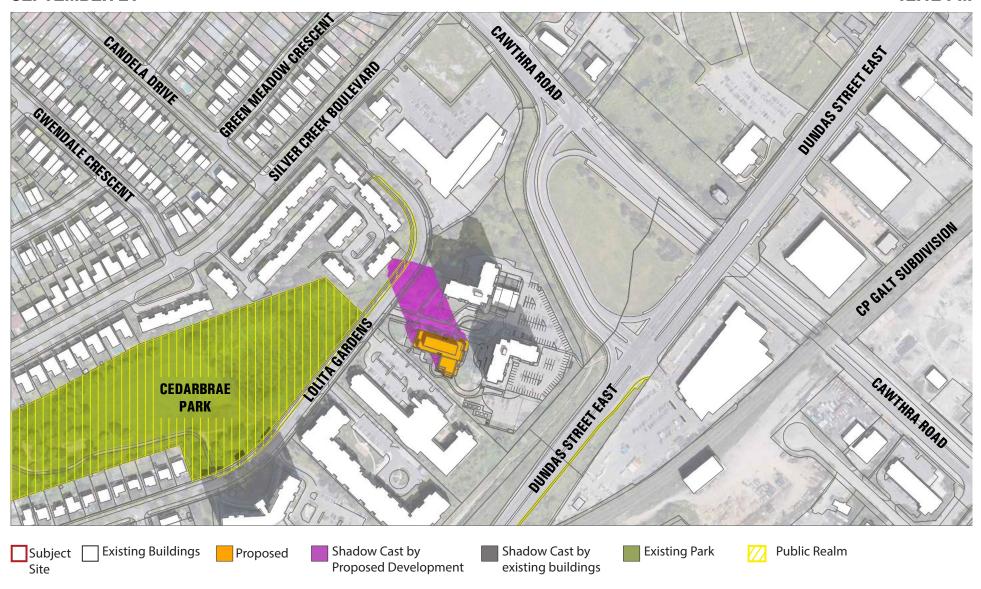
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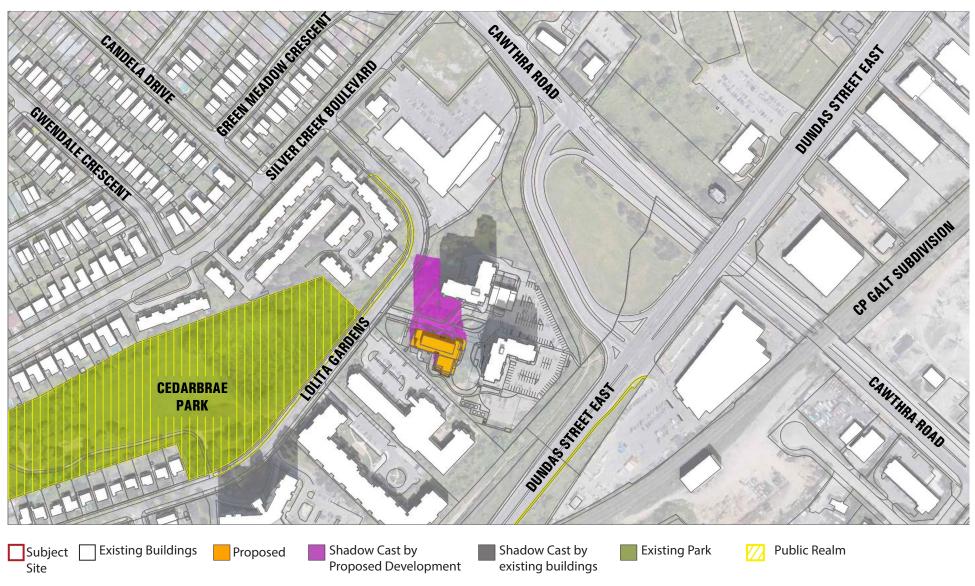
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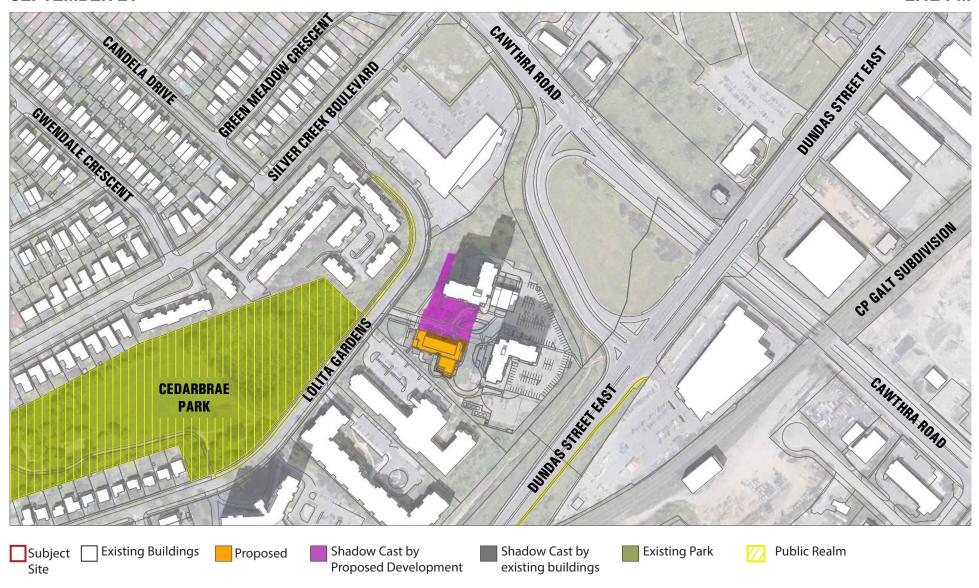
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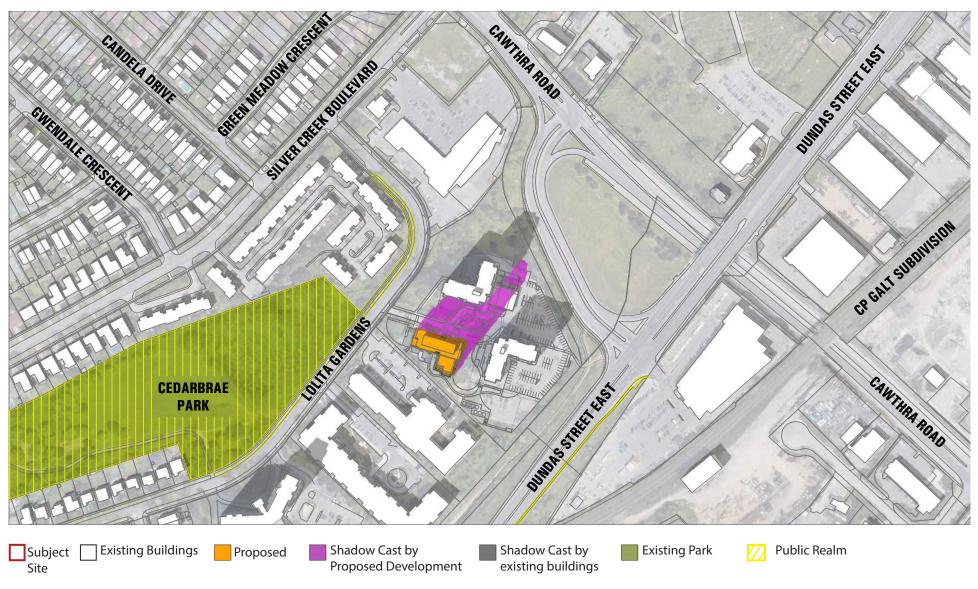


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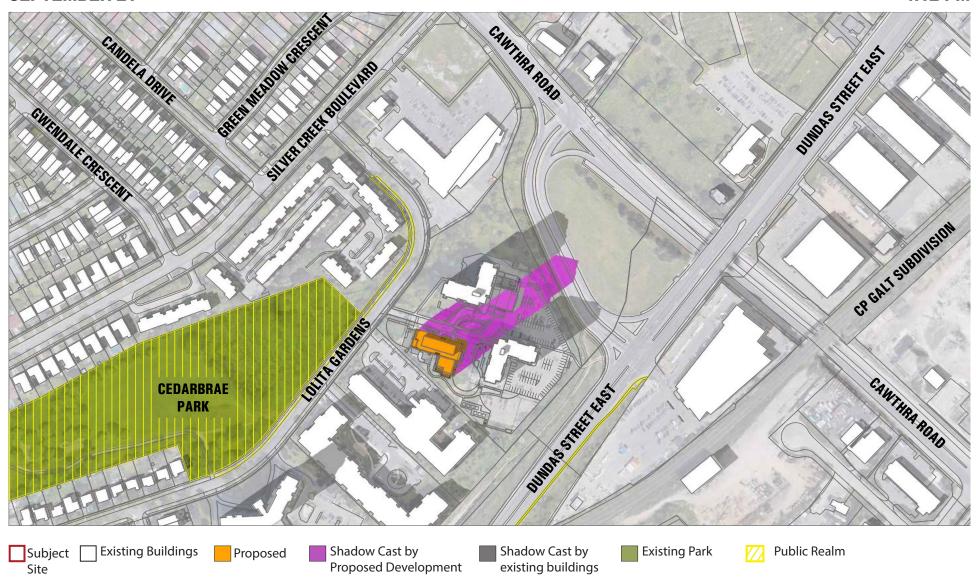


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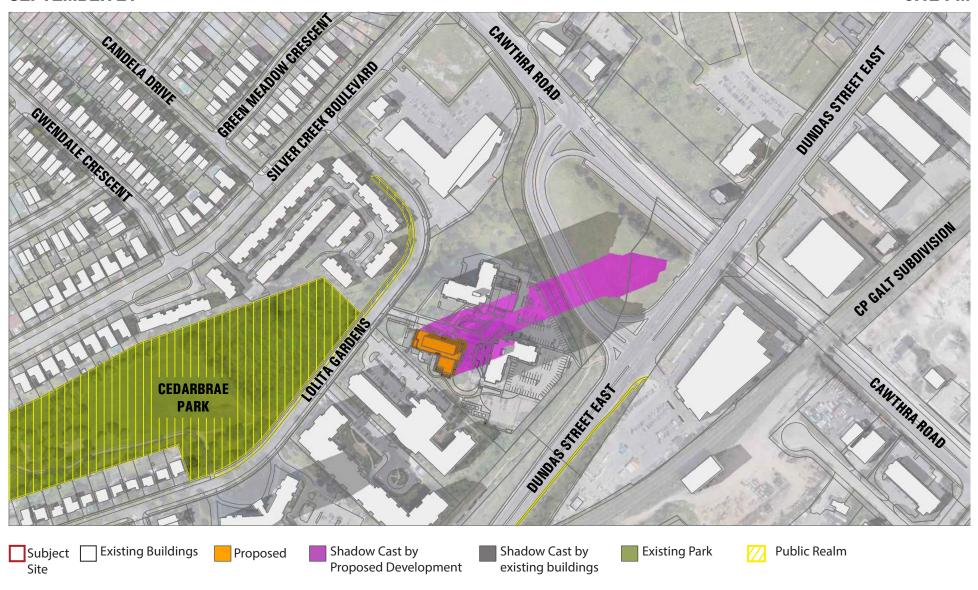
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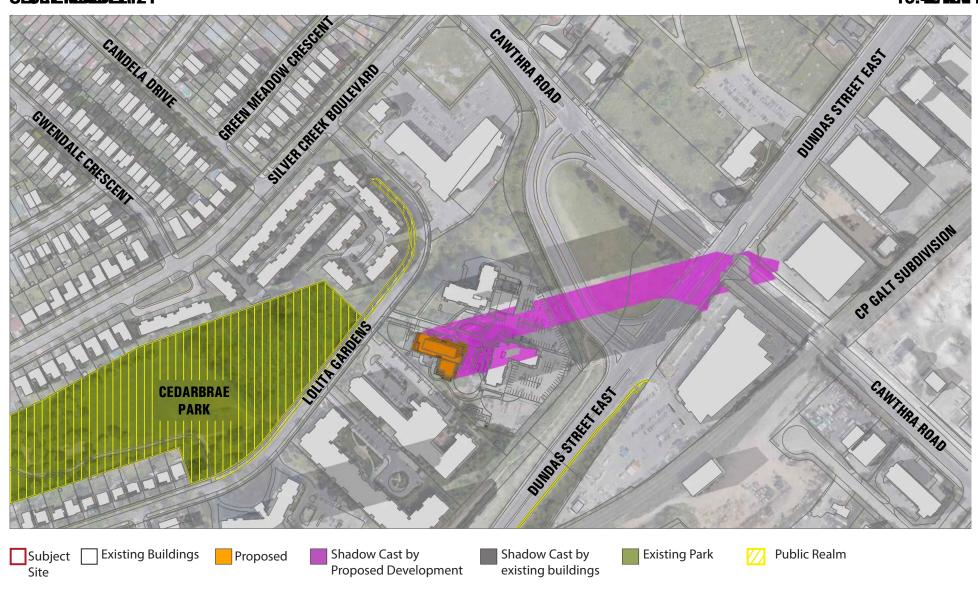
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## SESHENHABERI 21st



# 5.0 TURF AND FLOWER GARDENS IN PUBLIC PARKS

Section 3.4 of the Mississauga Urban Design Terms of Reference - Standards for Shadow Studies states that proposed developments should allow for adequate sunlight during the growing season from March to October by allowing for a minimum of 6 hours of direct sunlight on September 21.

There are no turf and flower gardens in parks identified on the study area.

# 6.0 BUILDING FACES TO ALLOW FOR THE POSSIBILITY OF USING SOLAR ENERGY

Section 3.5 of the Mississauga Urban Design Terms of Reference - Standards for Shadow Studies states that shadow impacts from proposed developments should not exceed one hour in duration on the roofs, front, rear and exterior side walls of adjacent low rise (one to four storeys) residential buildings including townhouses, detached and semi-detached dwellings on September 21, in order to allow for the possibility of harvesting solar energy.

The line of impact assessment shall be a line at grade, 3 m from the front, rear and exterior side wall of the adjacent low rise residential buildings.

This criteria is met if there is shadow impact for no more than two consecutive hourly test times in the "No Impact Zone" (identified in blue) i.e. the space between the front, rear and exterior side walls of the adjacent low rise residential buildings and the respective lines of impact assessment.

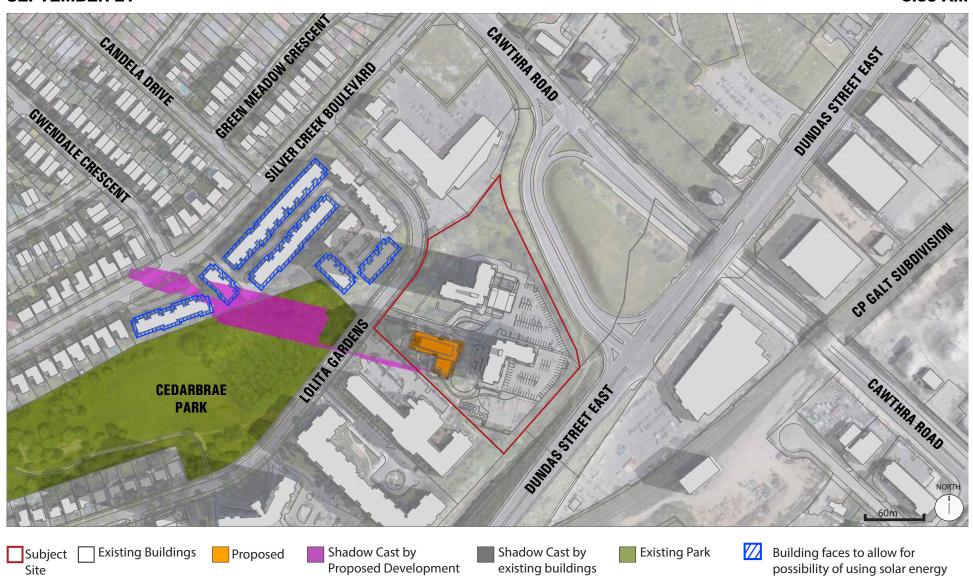
The findings of the shadow analysis show that the proposal for full sun on building faces to allow for the possibility of using solar energy areas are in accordance with this standard. As such, criteria for section 3.5 is met.

Figure 4 - Building faces to allow for possibility of using solar energy key map identifies all areas in the vicinity.

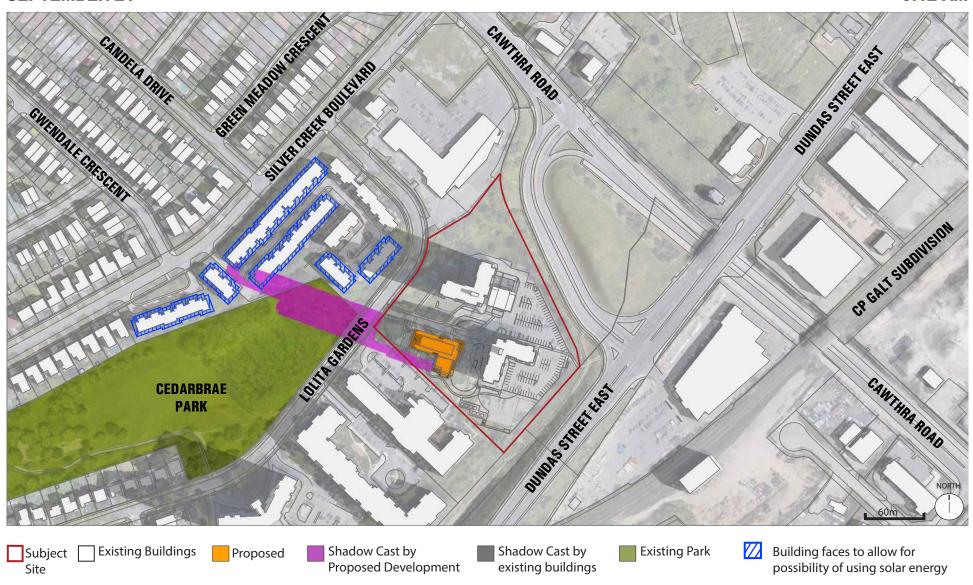


Figure 4 - Building faces areas key map

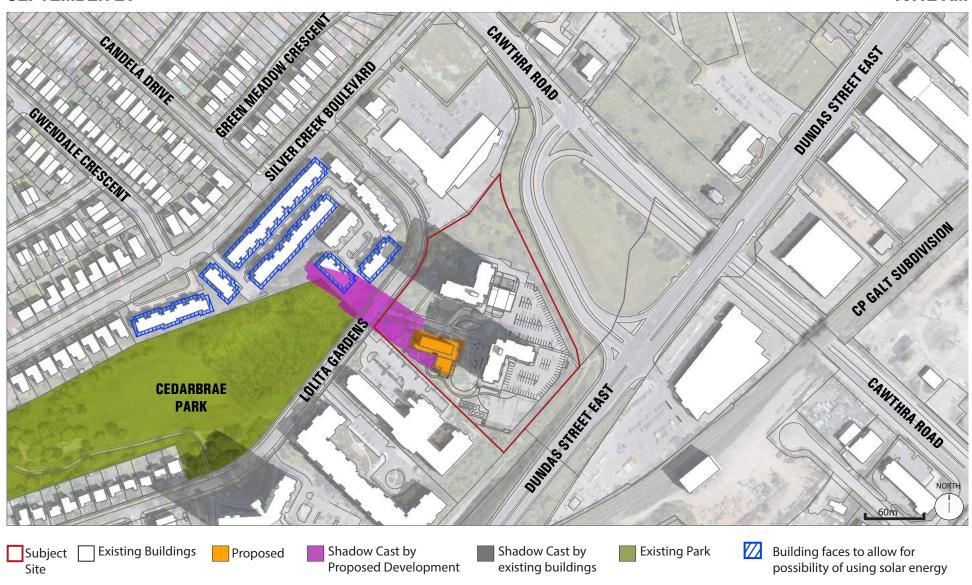
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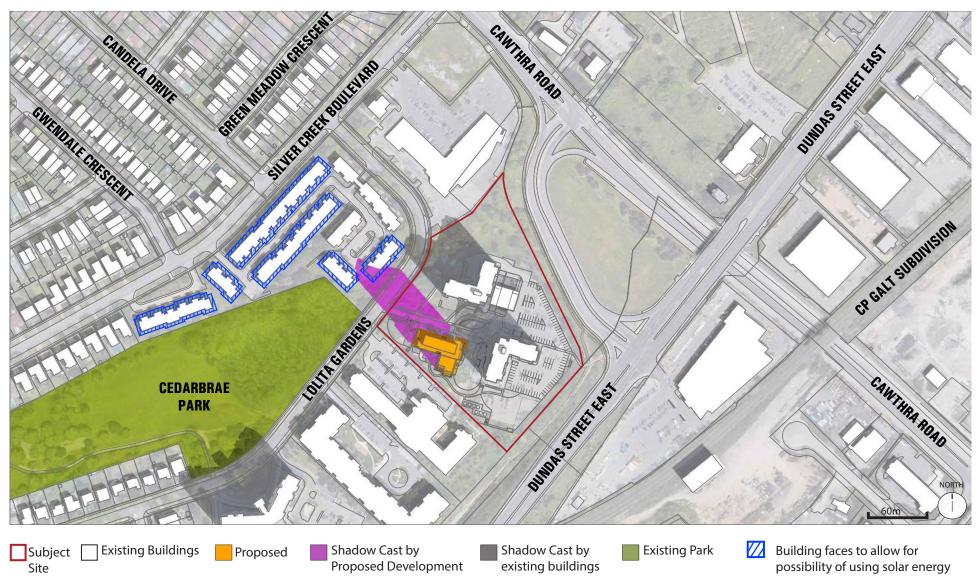
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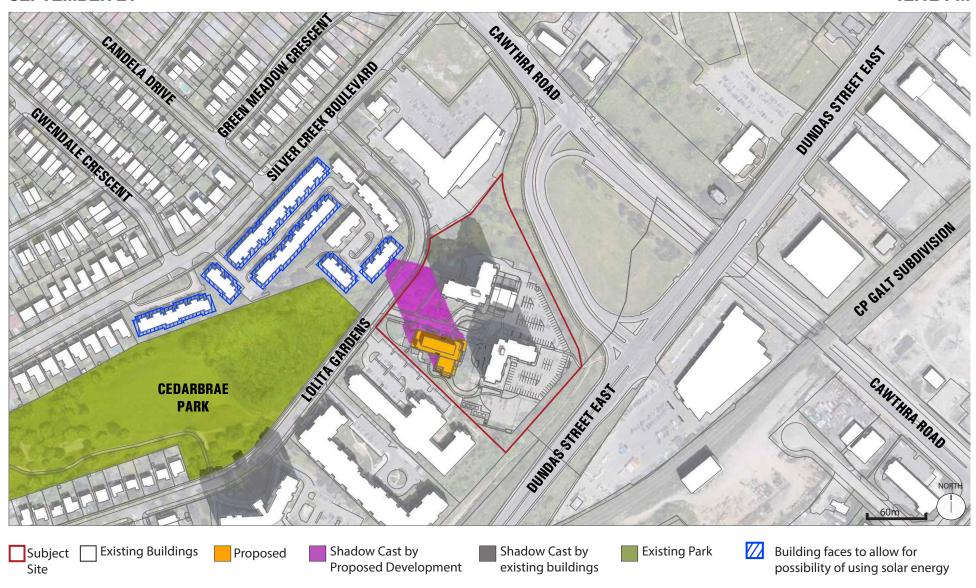
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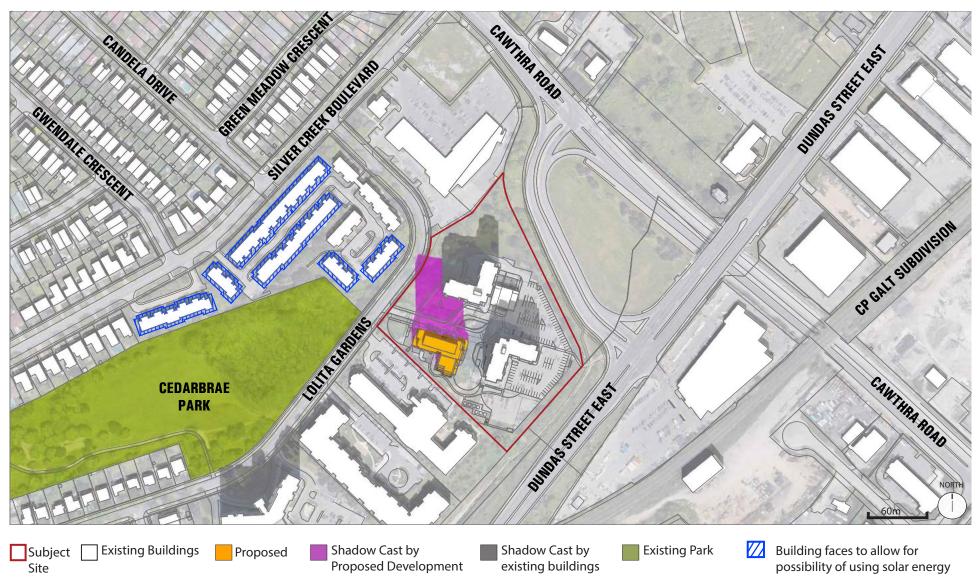
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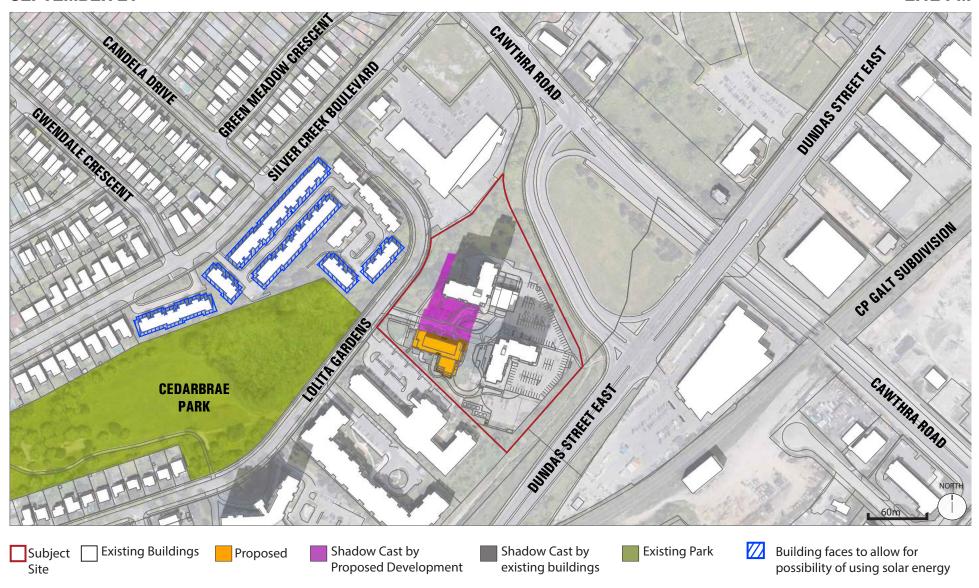
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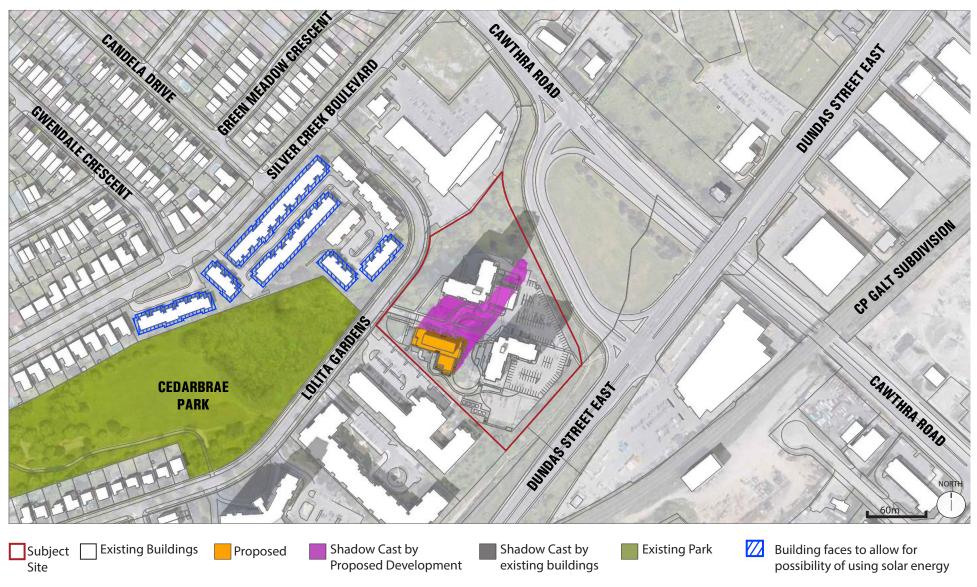
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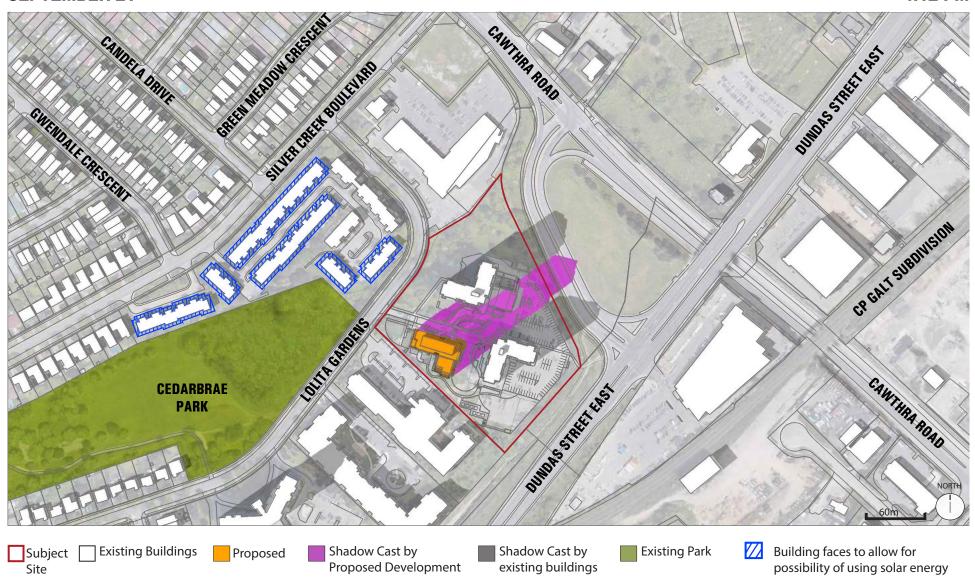
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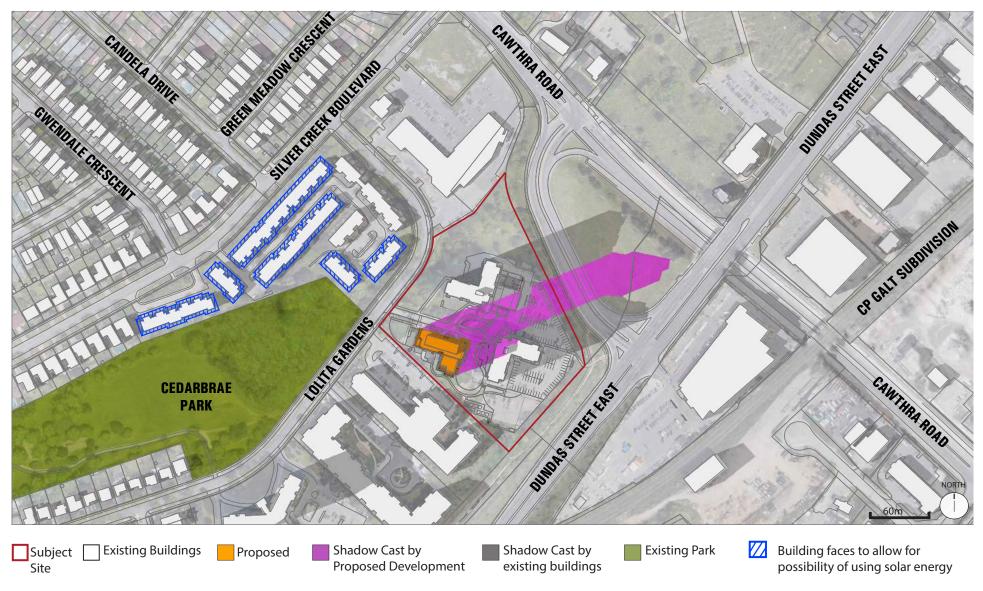
SEPTEMBER 21<sup>ST</sup> 3:12 PM



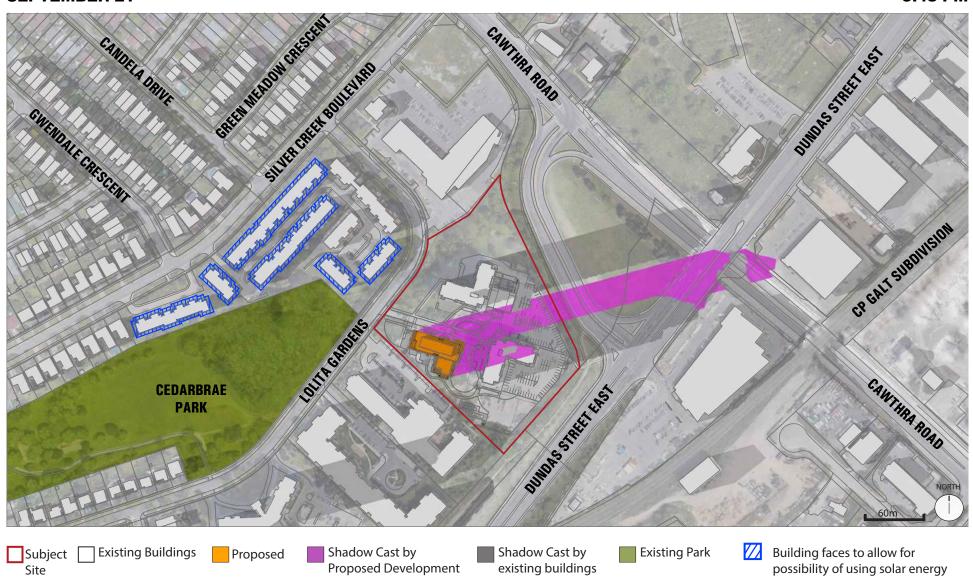
SEPTEMBER 21<sup>ST</sup> 4:12 PM



SEPTEMBER 21<sup>ST</sup> 5:12 PM



SEPTEMBER 21<sup>ST</sup> 5:48 PM



#### 7.0 CONCLUSIONS

Based on this analysis, it is our opinion that the proposed development will create minimal and acceptable shadowing impacts on adjacent low-rise neighbourhoods, private amenity areas, and public parks in accordance with Policy 9.2.2.3 and Policy 9.5.3.9 of the Mississauga Official Plan.

#### 8.0 CALCULATIONS

#### 3.2) COMMUNAL OUTDOOR AMENITY AREA (AT)= 1,162.89m2

June	area in sunshine (As)
707	548.00
720	548.00
820	548.00
920	550.00
1020	537.00
1120	519.00
1220	930.00
120	1,093.00
210	1,006.00
320	830.00
420	830.00
520	847.00
620	935.00
720	935.00
733	935.00
Average of Areas in Sunshine (As(ave))	773.00
Sun Access Factor	0.66

September	area in sunshine (As)
835	475.00
912	451.00
1012	443.00
1112	678.00
1212	880.00
112	995.00
212	1,005.00
312	830.00
412	830.00
512	814.00
548	676.00
Average of Areas in Sunshine (As(ave))	734.00
Average of Areas in Sunshine (As(ave)) Sun Access Factor	734.00 0.63
Sun Access Factor	0.63 area in sunshine
Sun Access Factor  Dec	0.63 area in sunshine (As)
Sun Access Factor  Dec  919	0.63 area in sunshine (As) 597.00
Sun Access Factor  Dec  919 1017	0.63 area in sunshine (As) 597.00 695.00
919 1017 1117	0.63 area in sunshine (As) 597.00 695.00 765.00
Sun Access Factor  919  1017  1117  1217	0.63 area in sunshine (As) 597.00 695.00 765.00 847.00
919 1017 1117 1217 117	0.63 area in sunshine (As) 597.00 695.00 765.00 847.00 839.00
Sun Access Factor  919  1017  1117  1217  117  217	0.63 area in sunshine (As) 597.00 695.00 765.00 847.00 839.00 669.00

### 3.3) Public Open Spaces, Parks and Plazas (Cedarbrae Park)= 35,024.76m2

September	area in sunshine (As)
835	28,588.00
912	30,897.00
1012	33,154.00
1112	34,073.00
1212	34,763.00
112	35,017.00
212	35,025.00
312	34,975.00
412	35,025.00
512	34,855.00
548	34,762.00
Average of Areas in Sunshine (As(ave))	33,740.00
Sun Access Factor	0.96

