BRANT + GHENT MASTERPLAN

BURLINGTON, ON

SUN SHADOW STUDY

PROJECT #:2004219

MAY 14, 2021

SUBMITTED TO

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INTRODUCTION

Rowan Williams Davies & Irwin Inc. (RWDI) was retained by the Molinaro Group to conduct a Sun Shadow Study for the proposed Brant Street and Ghent Avenue Masterplan development in Burlington, Ontario (Image1).

The objectives of this study were to illustrate the shadow patterns for the proposed development and determine the potential exposure to sunlight and shadow on and around the study site.

RWDI has conducted this analysis per the requirements of the City of Burlington's Shadow Study Guidelines and Terms of Reference.

This study involved the use of a three-dimensional (3D) computer model of the existing surroundings and the proposed development in place. The 3D model was used to produce renderings of the new shadows cast by the proposed development. The following report provides a discussion of the methodology and graphic results of the Sun/Shadow Study.

Note that the results presented herein are based on an earlier iteration of this design with a shorter version of the Phase 3 tower. RWDI does not expect the alteration to materially change the conclusions of this report.

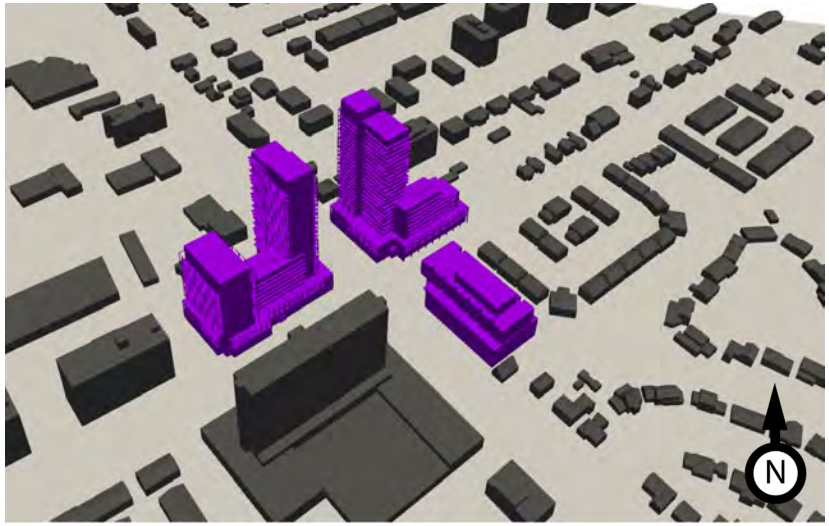


Image 1 – Rendering of the Proposed Project – View from the Southwest

SITE & BUILDING INFORMATION

The proposed masterplan is located on both sides of brant street and Ghent Avenue (see Image 2). The latitude and longitude of the project site is 43.33266° and -79.808712° respectively. The location was determined by a site plan provided by Graziani and Corazza and Google Earth. All Images are oriented with true north at the top of the page.

The heights of the proposed buildings for Phases 1, 2 and 3 are approximately 25 stories (86 m), 25 stories (86 m) and 7 stories (30m) respectfully.

Currently the site consists of low-rise residential buildings and a parking lot. The immediate surroundings consist of low-rise residential buildings punctuated with isolated mid-rise and high-rise buildings. (see Images 1 and 2).

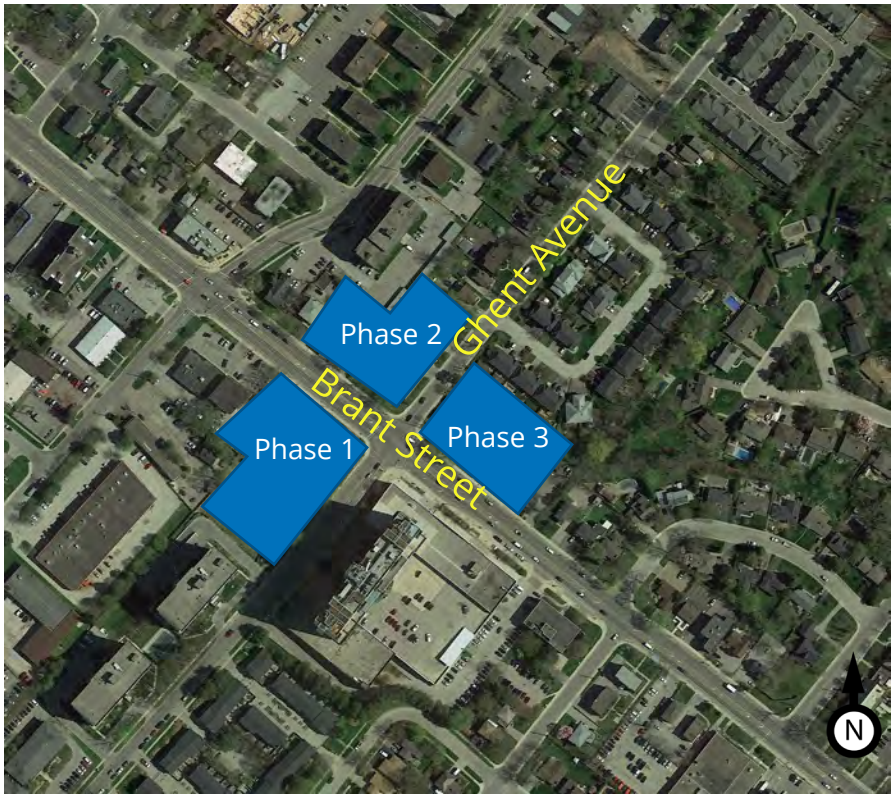


Image 2 – Aerial View of Existing Site and Surroundings (Courtesy of Google Earth)

METHODOLOGY

The shadow plots illustrated in this report (found in Appendix A) were generated with the aid of RWDI's in-house proprietary *Eclipse* software. The software was configured to simulate the appropriate geographic characteristics and solar angles for this site.

Based on the concept plan prepared by Graziani and Corazza Architects (received by RWDI on February 19, 2021), a three-dimensional computer model of the study site was created by RWDI.

The computer-generated renderings exhibit the simulated shadow conditions anticipated to occur in the vicinity of the study site. The tests conducted in this study assume bright sunlight from sunrise to sunset to properly identify shadow patterns created by the proposed structure.

The output of this study illustrates the *net-new shadowing* created by the proposed development (coloured purple on roof surfaces and light blue on ground surfaces). That is to say, the shadowing created by the proposed development, less any shadows that occur due to the existing built environment (coloured in dark grey in the plots).

Per standard industry practice, shadowing due to trees has been purposely neglected as a conservatism.

SUMMARY/CONCLUSIONS

Per the City of Burlington requirements, the new shadows cast by the proposed building were predicted for every hour between 9:00 am EDT and 6:00 pm EDT on March 21 and September 21, as well as for December 21 between 11:00 am EST and 3:00 pm EST and June 21 between 8:00 am EDT and 7:00 pm EDT.

Intermittent new shadowing from the proposed project is expected to fall across the residential properties to the north and east of the site. Shadowing is mostly confined to the area south of Prospect St. and west of Deyncourt Dr. New shadowing in these areas is predicted intermittently during the afternoon hours throughout the year.

Areas as far west at Legion Rd. can also experience new shadowing, though generally only before 11:00 am. Shadows are also anticipated to fall at grade and onto the roofs of neighboring commercial properties.

No shadow impacts were predicted on the yards of Tom Thomson Public, St. John Elementary, Central Public or Central High schools. Likewise no impacts were predicted on Optimist Park.

The roof top amenity spaces of Phase 1 are on all sides of the building. For the north of the tower, it can be shadowed much of the year during the afternoon. For the east and west amenity spaces, they can each be in shade for the morning hours and evening hours, respectively. It is important to note that in some cases (e.g. the southern terrace amenity space of Tower 1) the "net new shadows" predicted are due to an existing building but are flagged as new shadow because the *space itself is new* not because the shadow is from the proposed building. This is a consequence of how new shadowing is to be computed.

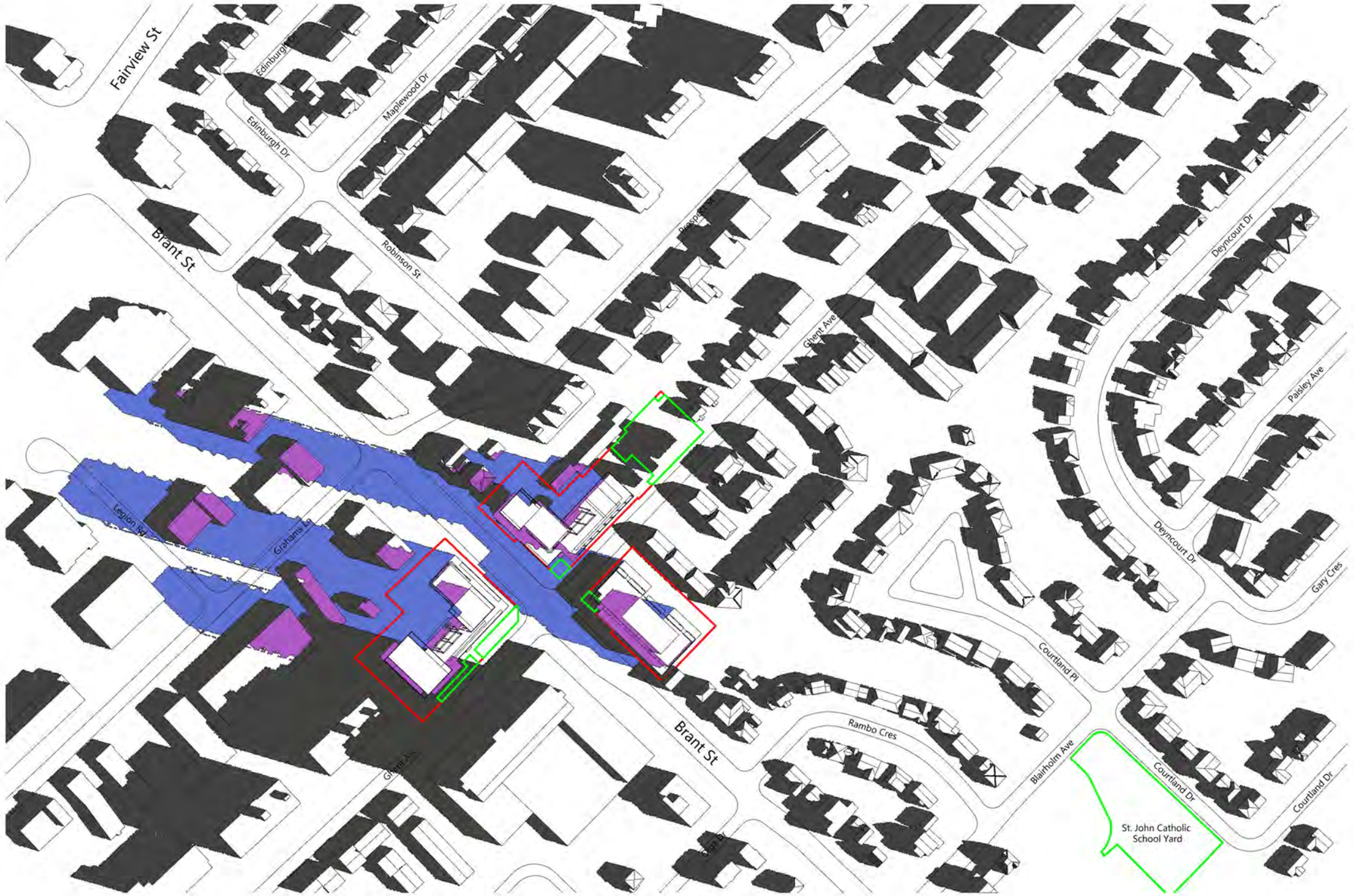
The amenity space of Phase 2 is mainly south of the tower and therefore was predicted to have improved solar access even though it will experience shadow from Phase 1 and 3. During the equinoxes, no shadowing is predicted here before 2:00pm. During summer, higher solar elevations allow sun across the majority of the amenity space essentially all day.

The grade level 'open spaces' outlined in green that are located adjacent to Brant Street are predicted to be shadowed during the morning hours and again in the evening hours. For the open space to the north of the Phase 2 development, shadows are anticipated in afternoon hours all year, though the extent of the shadowing is lower during summer.

The private terraces in the Phase 3 building are on the north and south elevations. Aside from the first hours of the day, the north side is expected to be in shadow the majority of the time. The south facing terraces were predicted to receive much more sun. On the equinoxes, essentially the entire terrace area is in full sun from 11:00 am until 4:00 pm. In summer this time frame extends until 6:00 pm.

APPENDIX A

SHADOW PLOTS



Sun Shade Assessment

Proposed Site Configuration | March 21st, 09:00 EDT

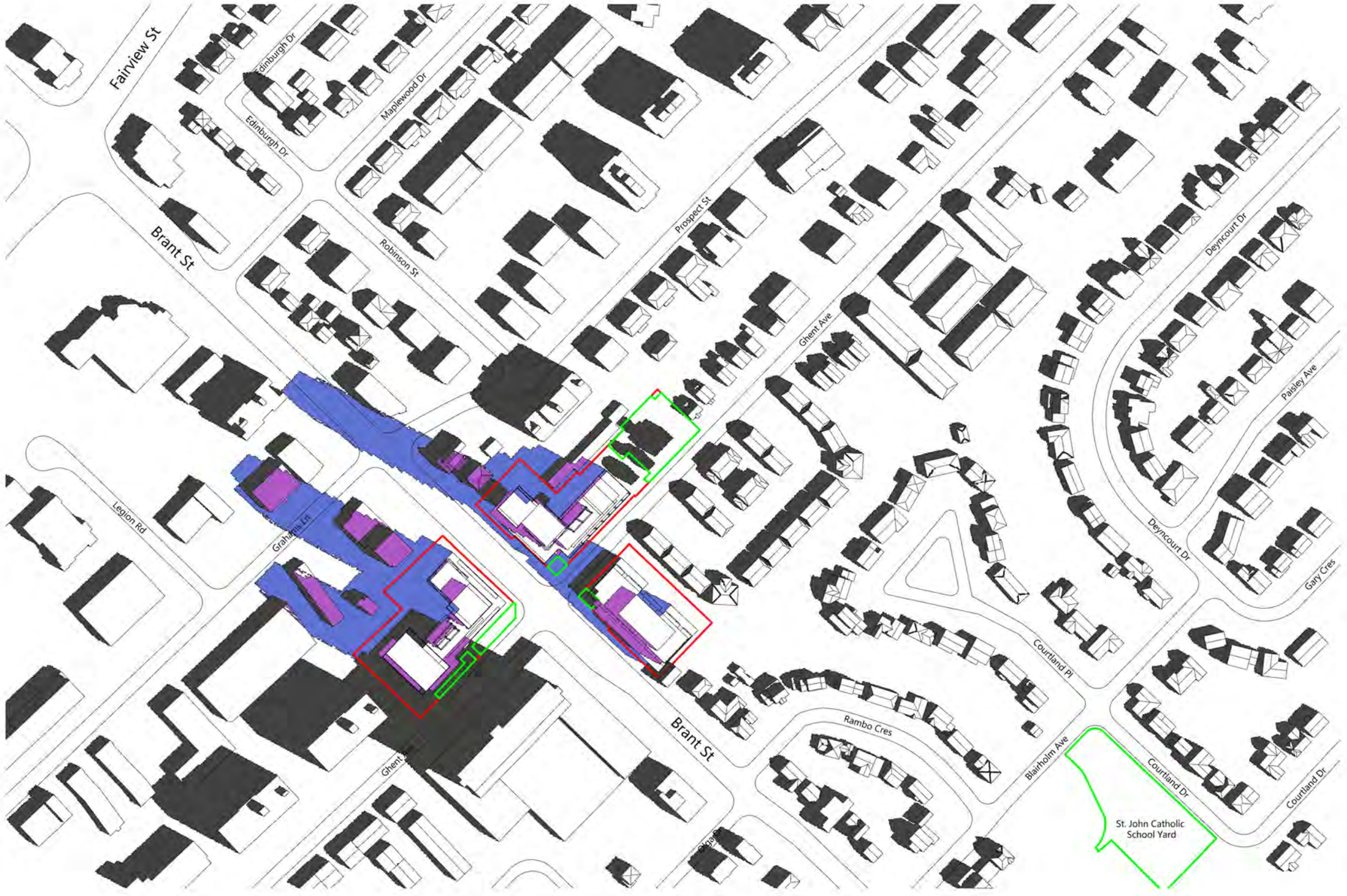
Brant Street + Ghent Avenue Masterplan - Burlington, ON
Project # 2004219

- Net New Shadows Cast on Roof Surfaces
- Net New Shadows Cast on Ground Surfaces
- Shadows Cast by Existing Buildings on All Surfaces
- Open Space
- Site Boundary

True North

Scale = 1:3000

0 25 50 100 200 m



Sun Shade Assessment

Proposed Site Configuration | March 21st, 10:00 EDT

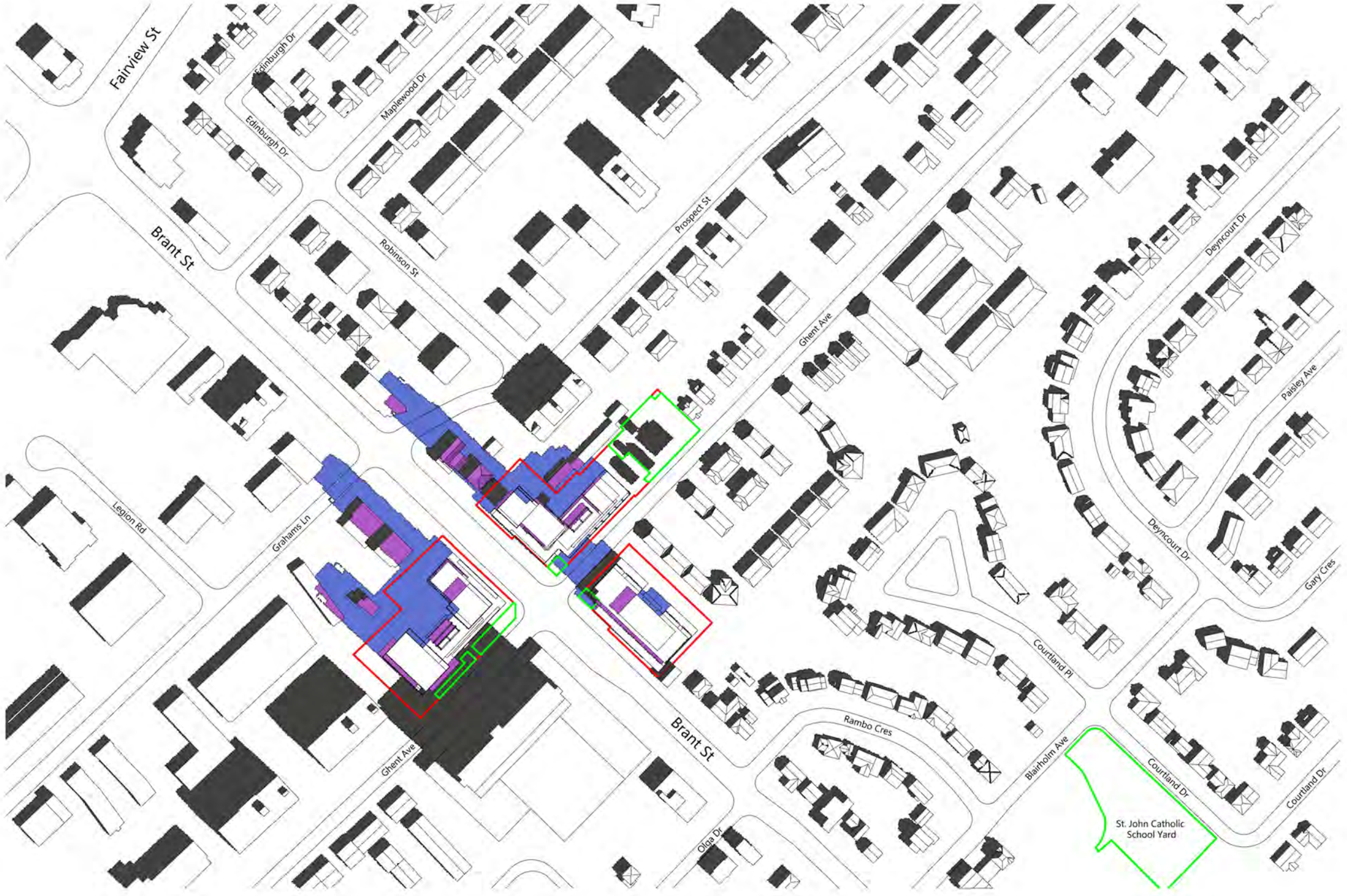
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Sun Shade Assessment

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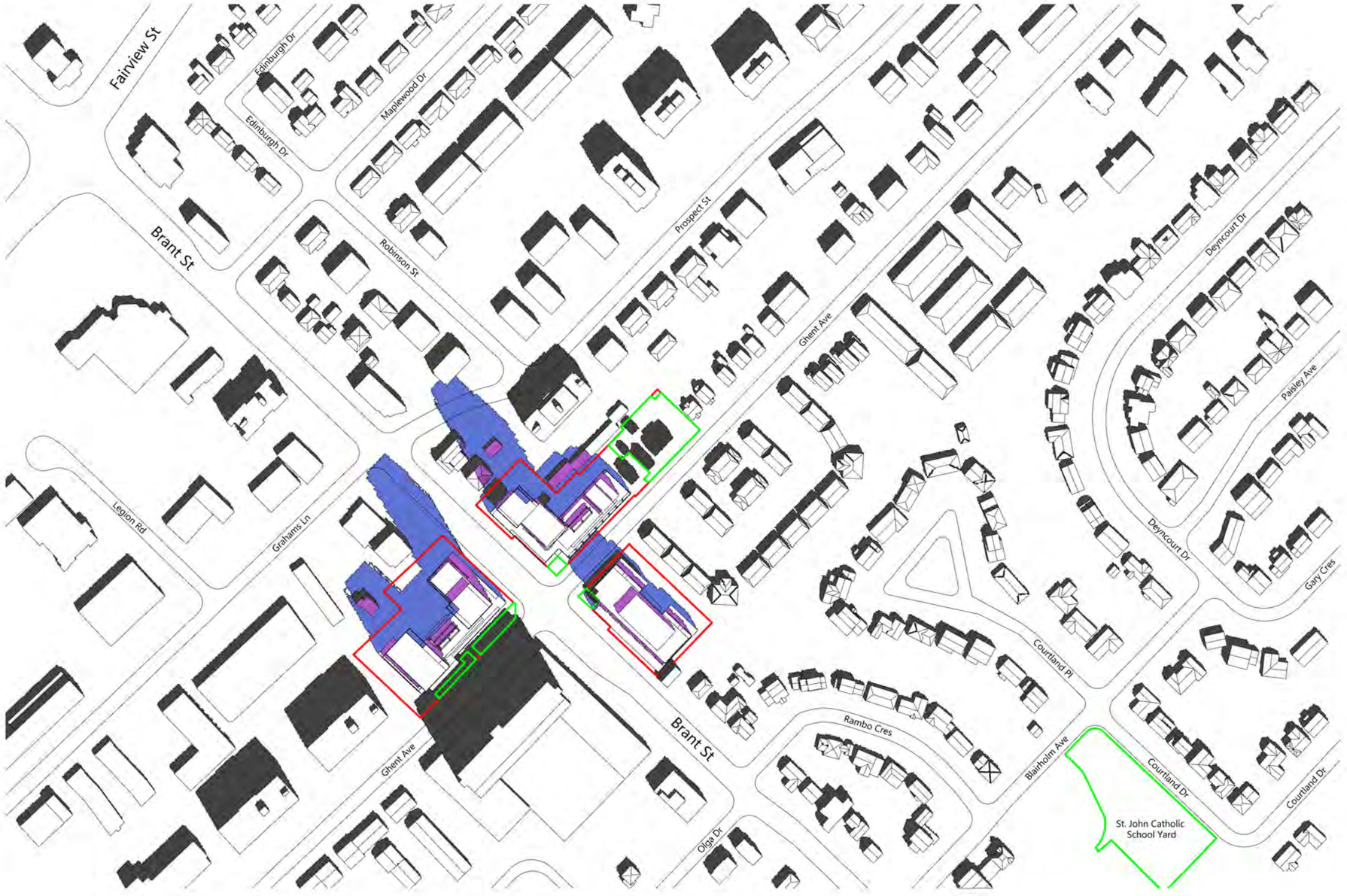
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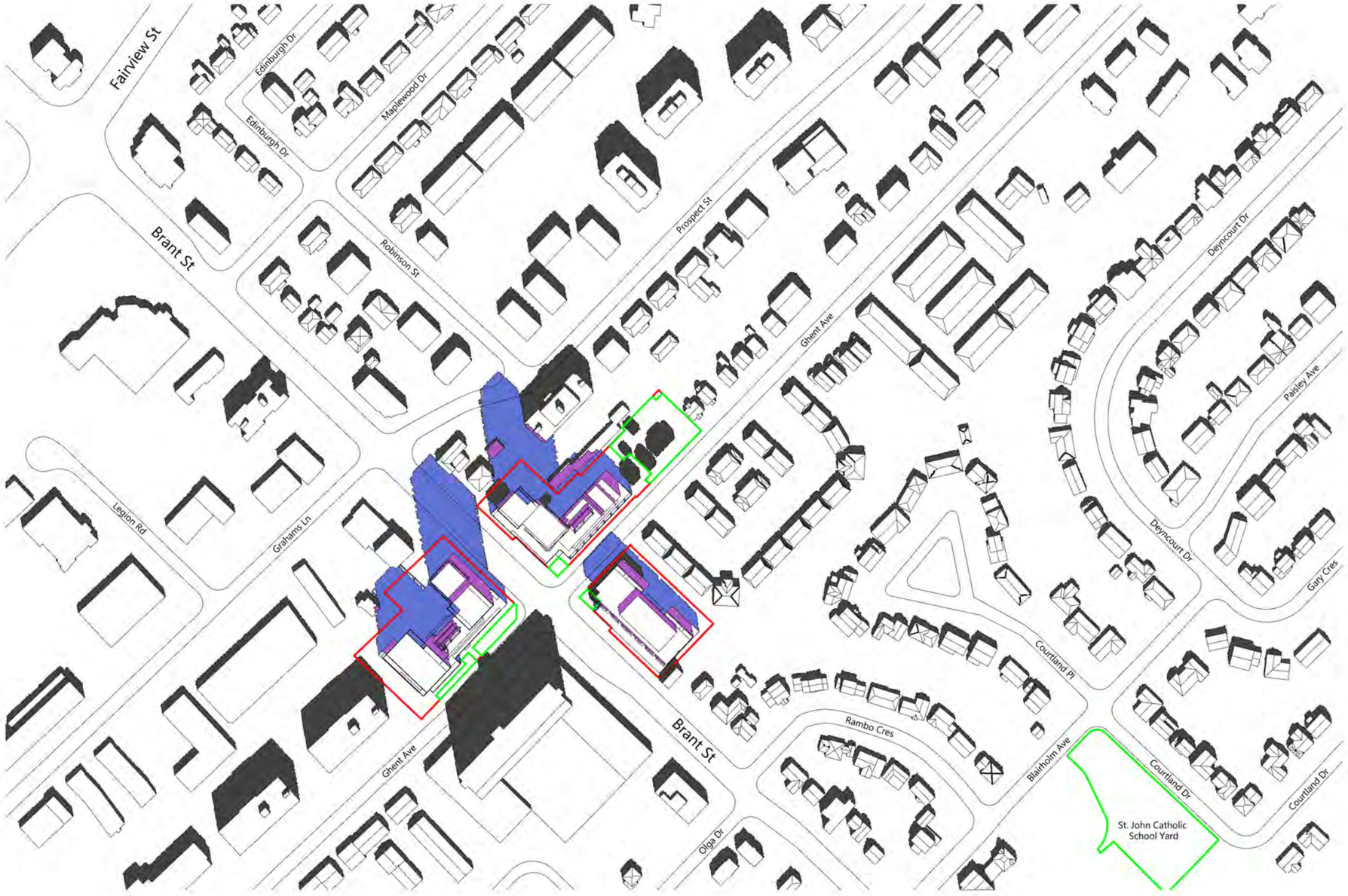
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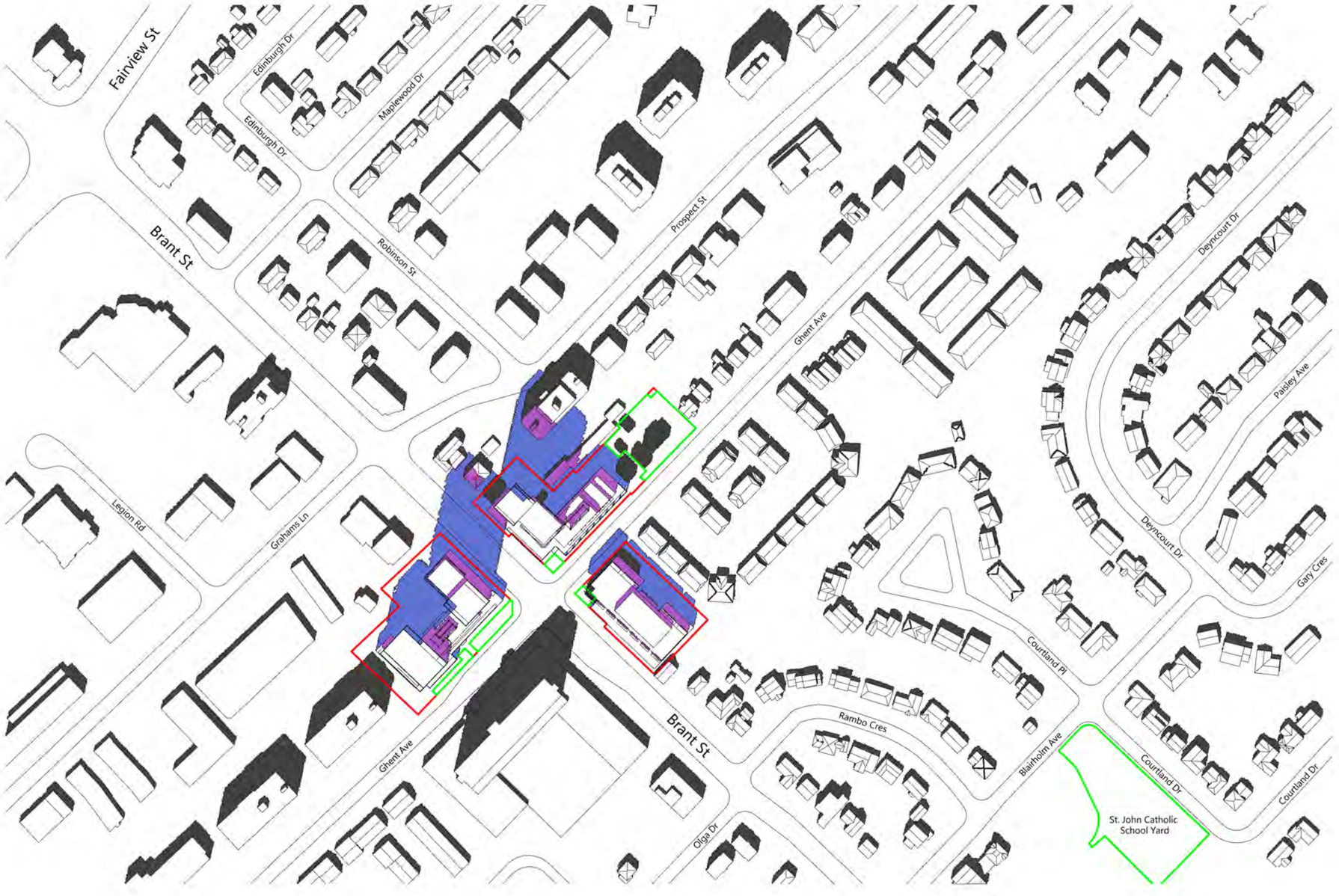
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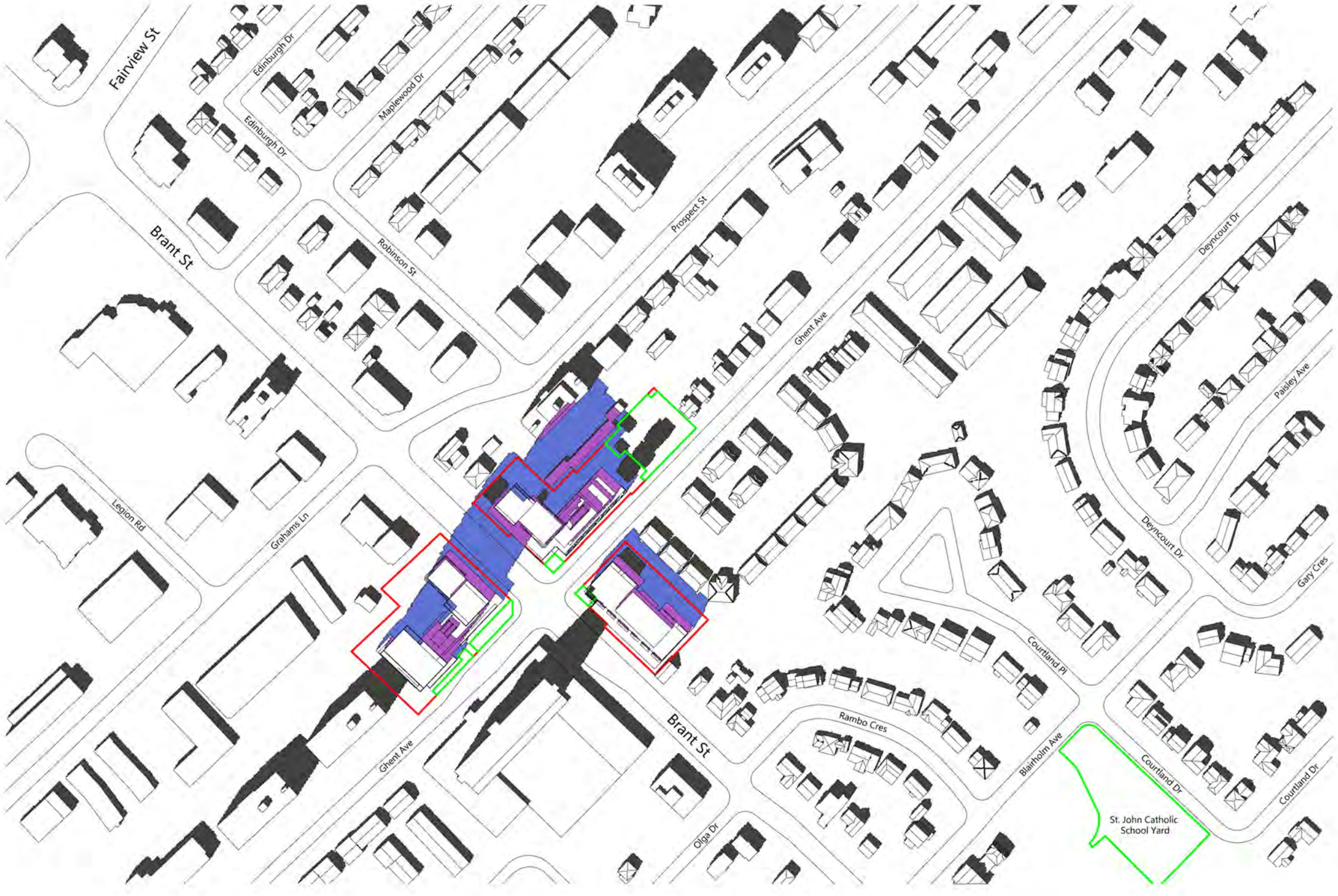
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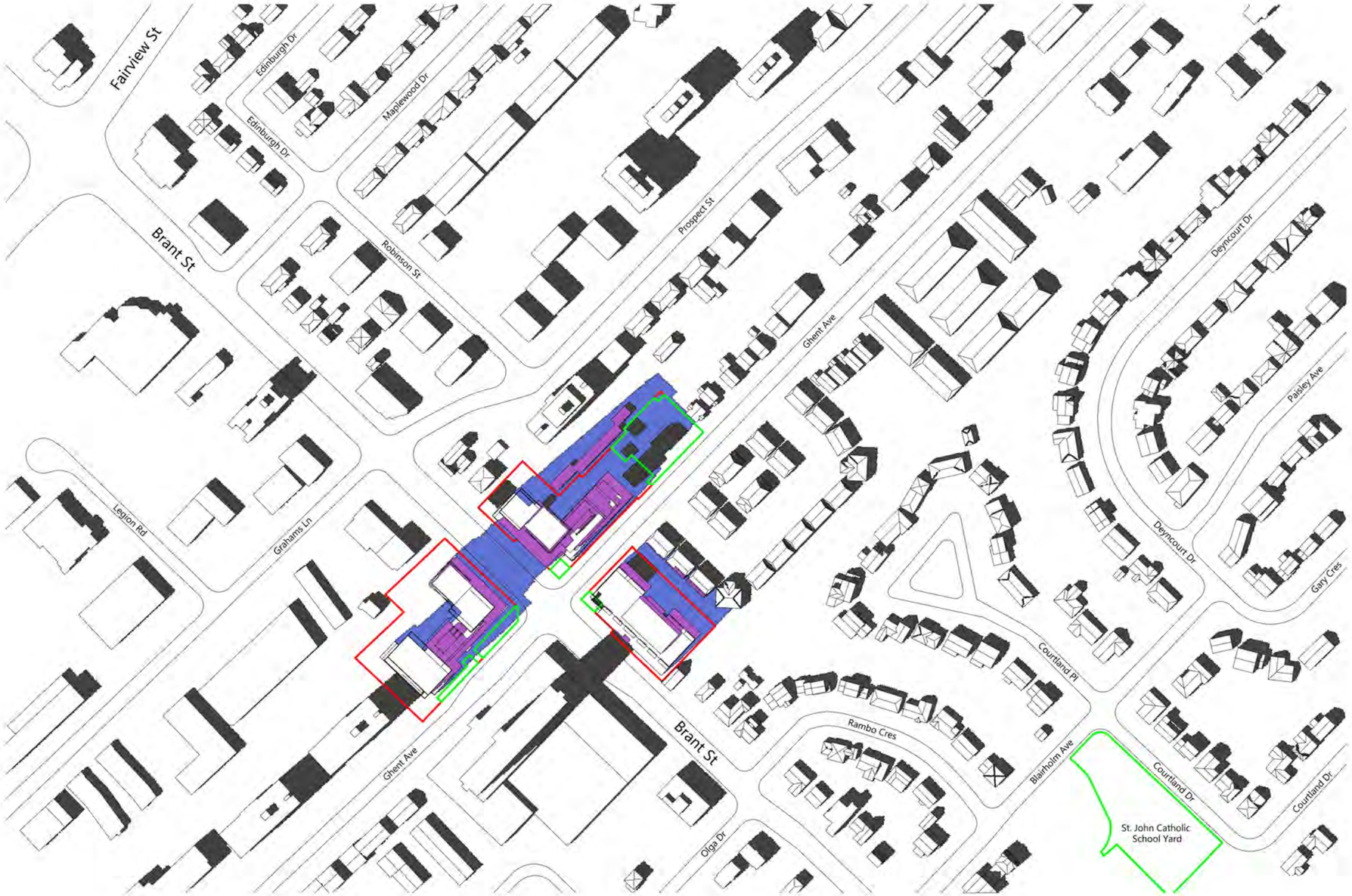
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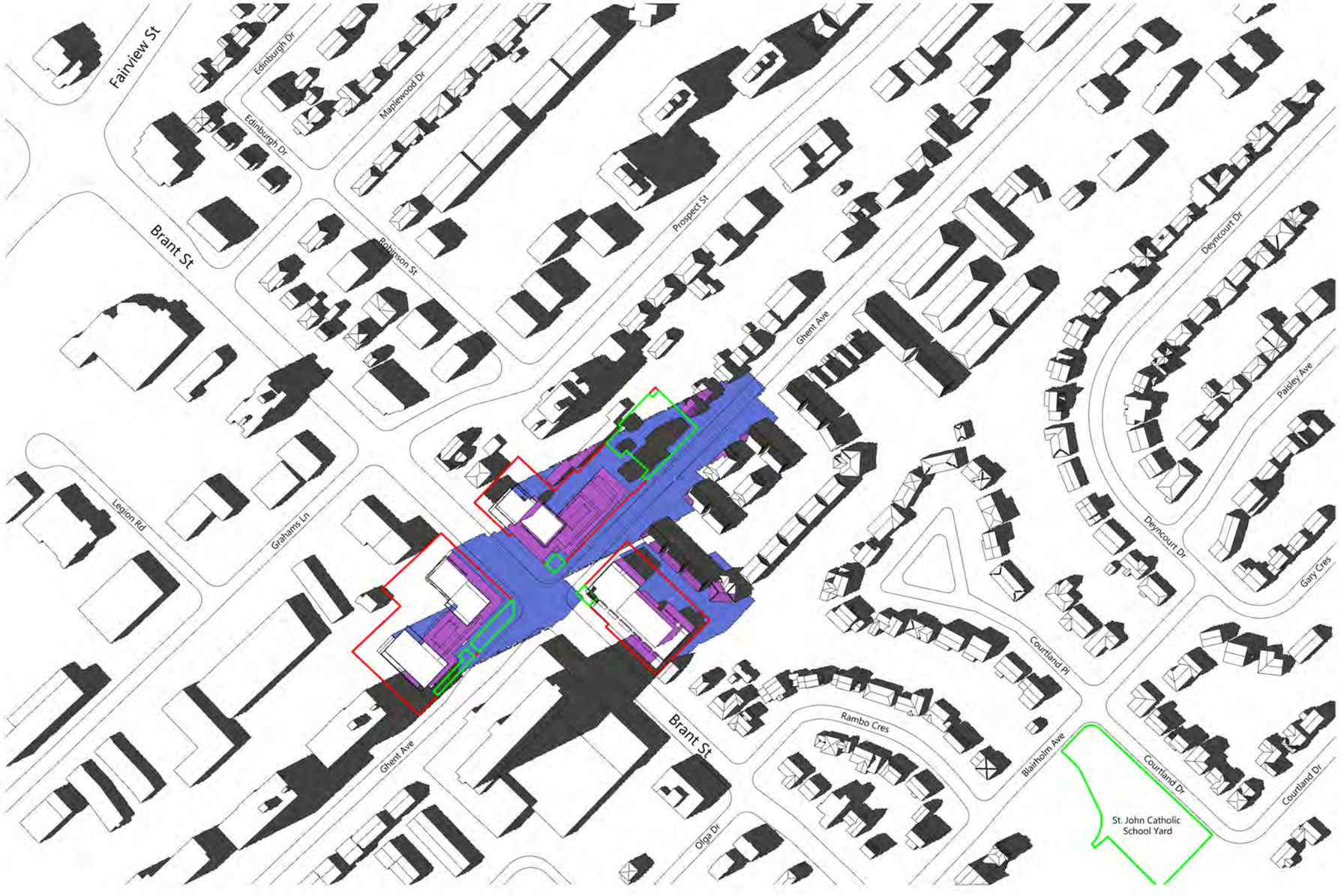
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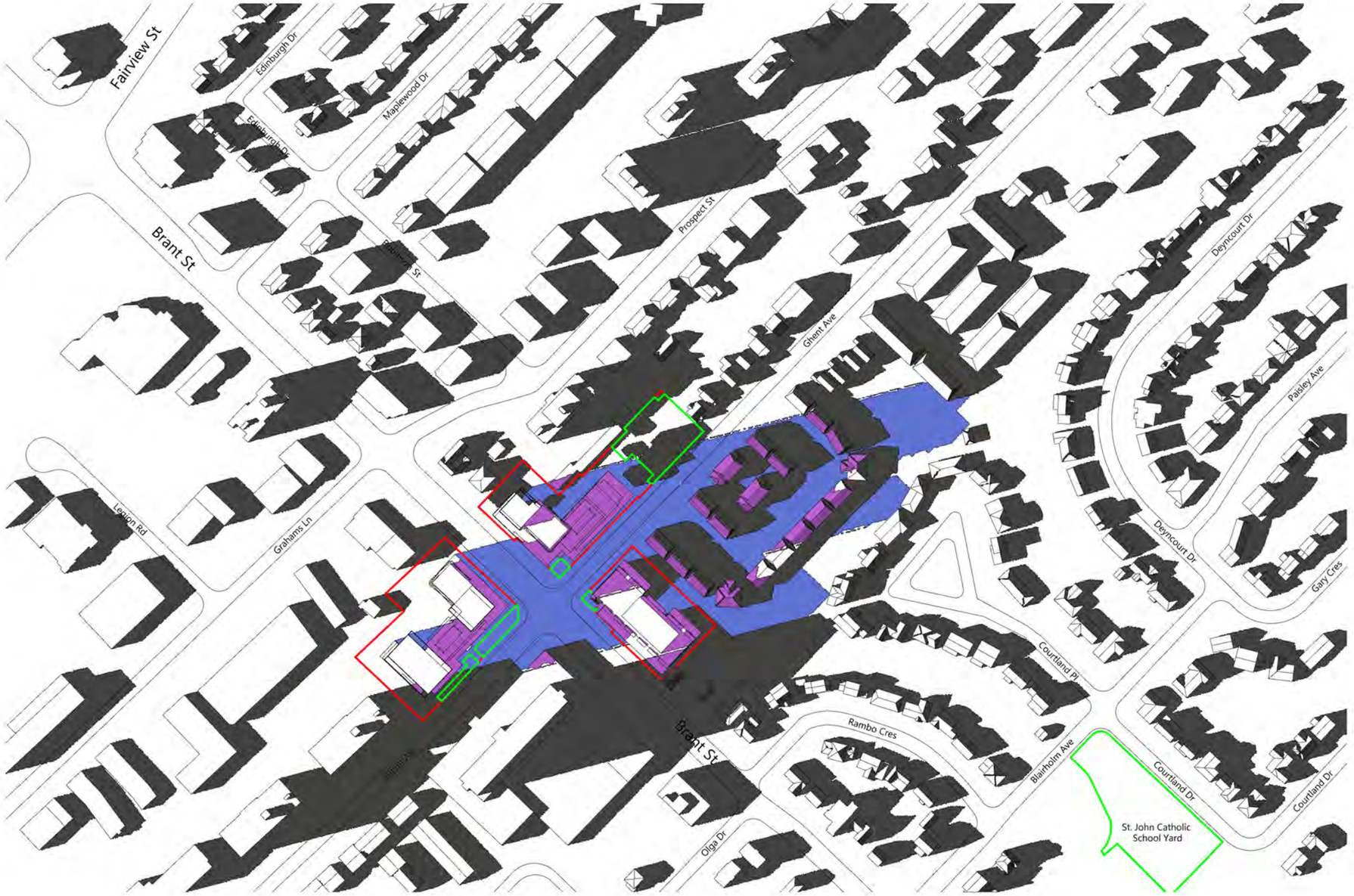
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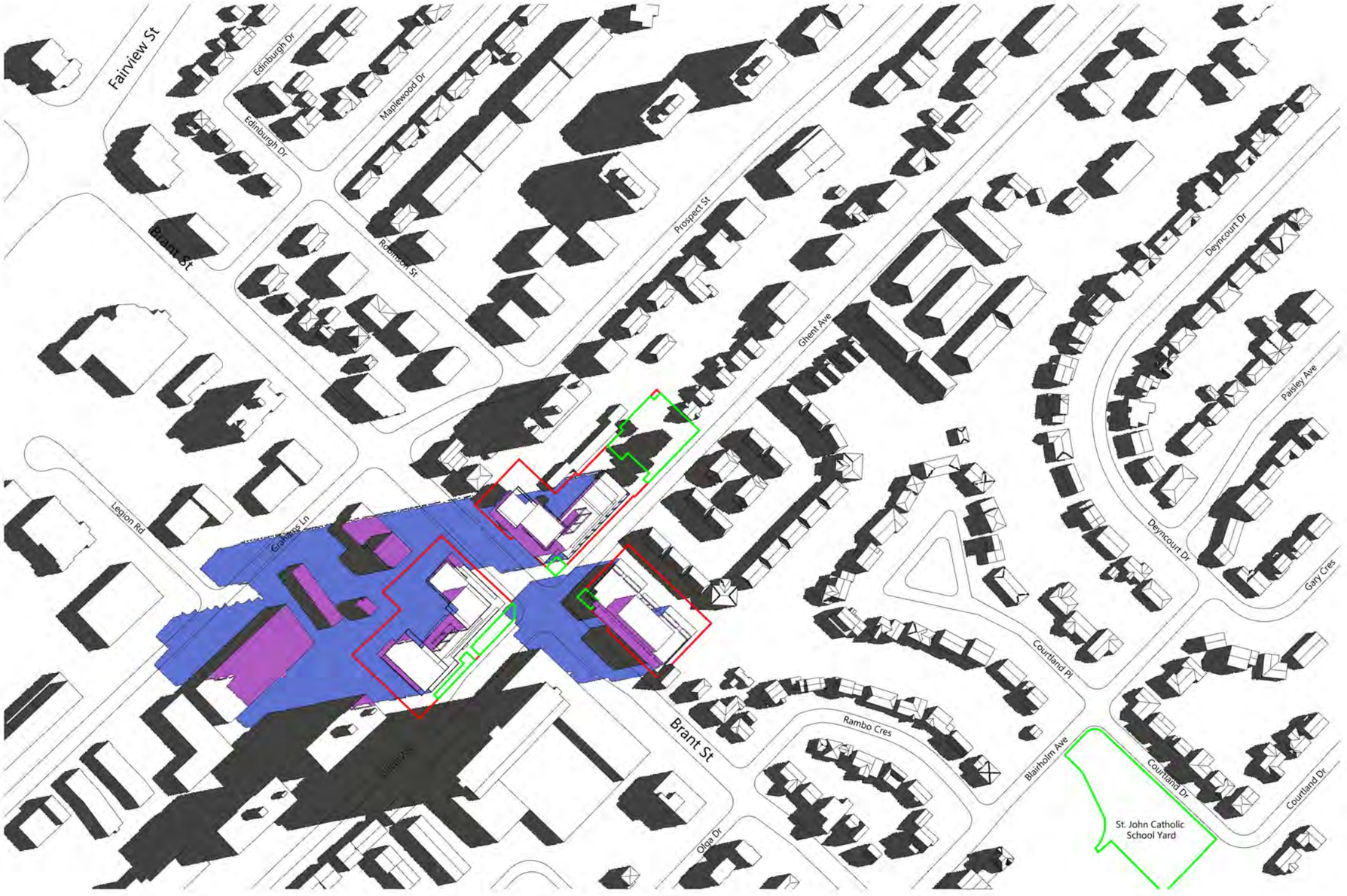
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Sun Shade Assessment

Proposed Site Configuration | June 21st, 08:00 EDT

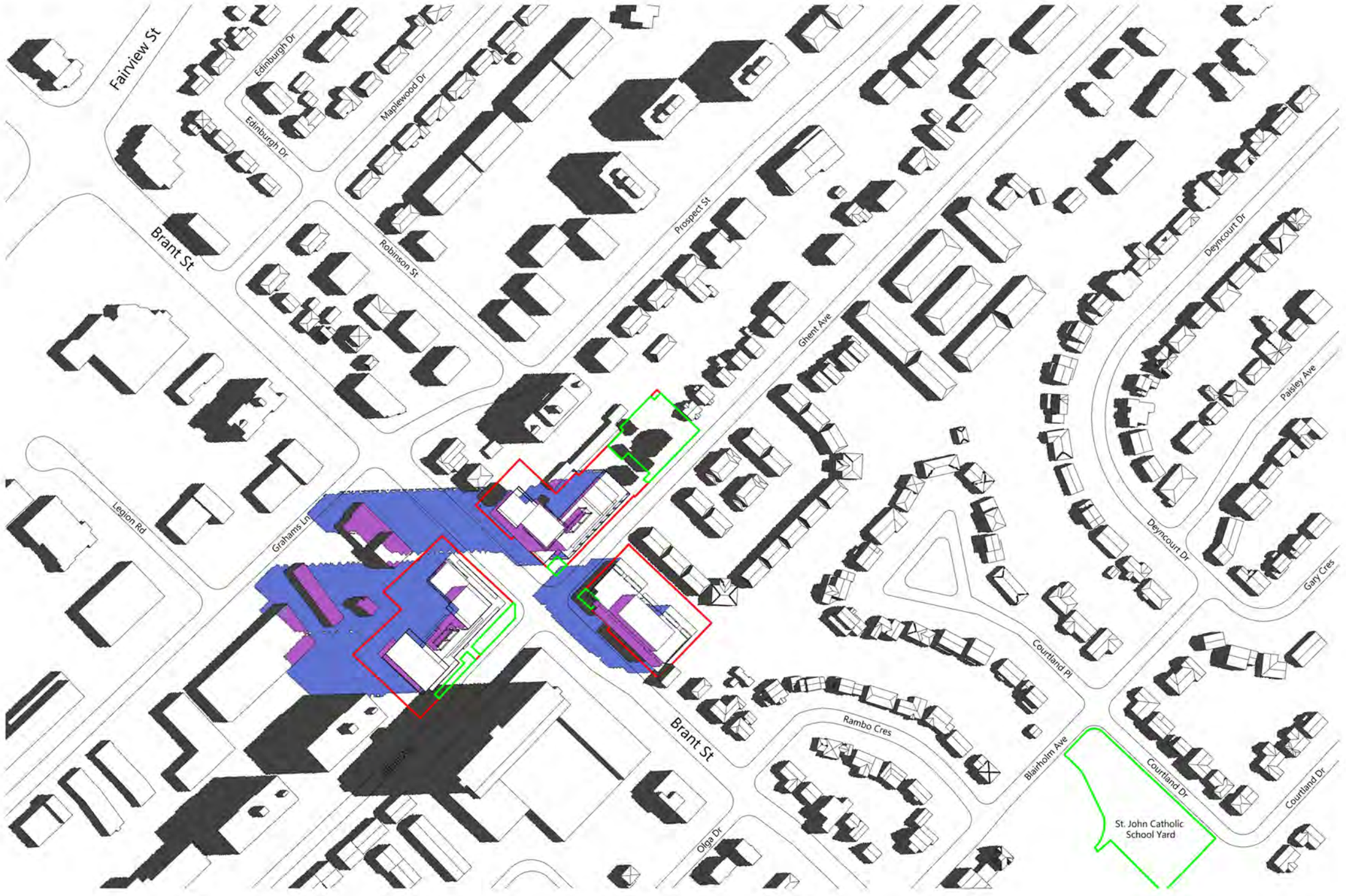
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Sun Shade Assessment

Proposed Site Configuration | June 21st, 09:00 EDT

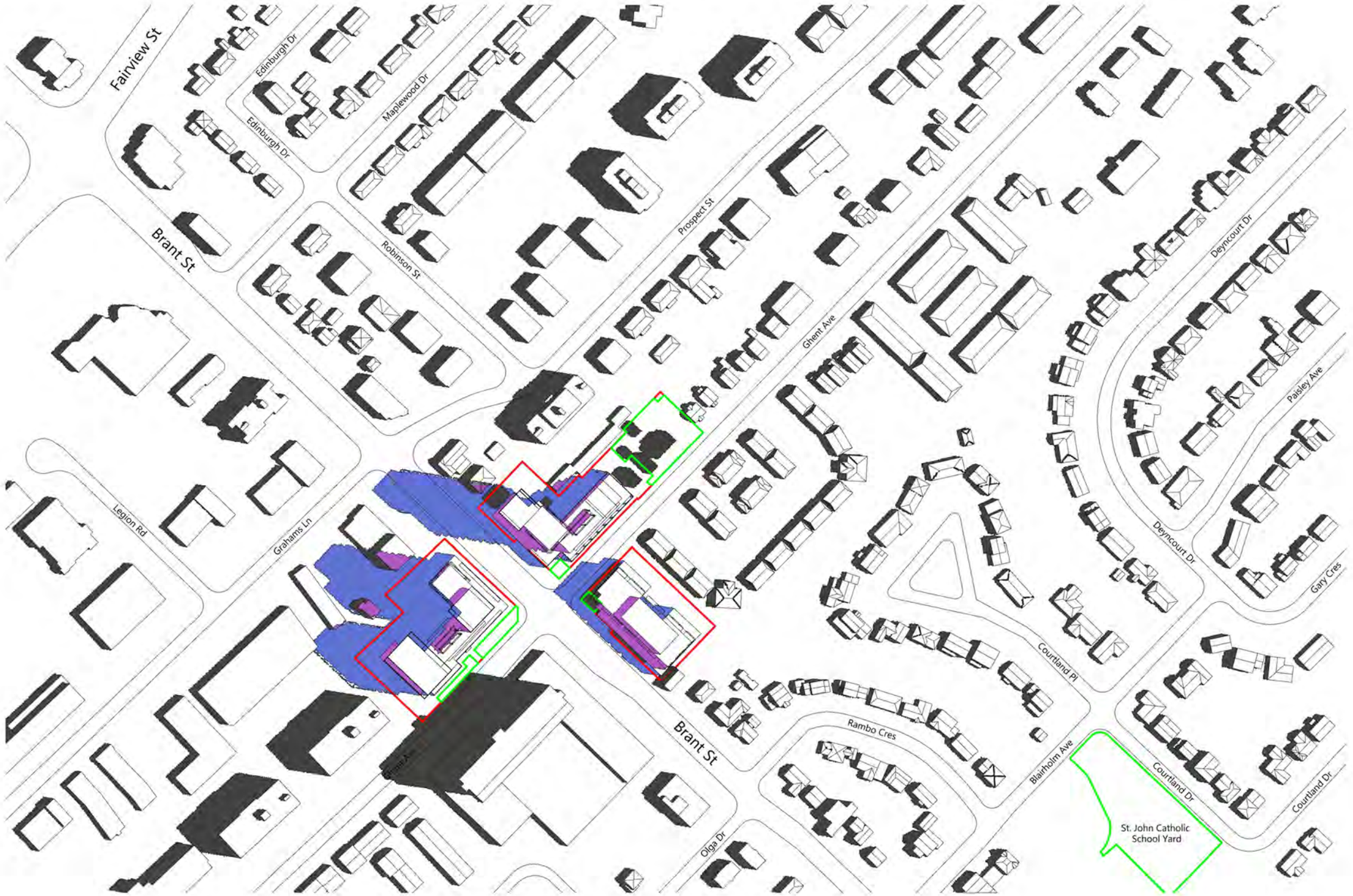
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Sun Shade Assessment

Proposed Site Configuration | June 21st, 10:00 EDT

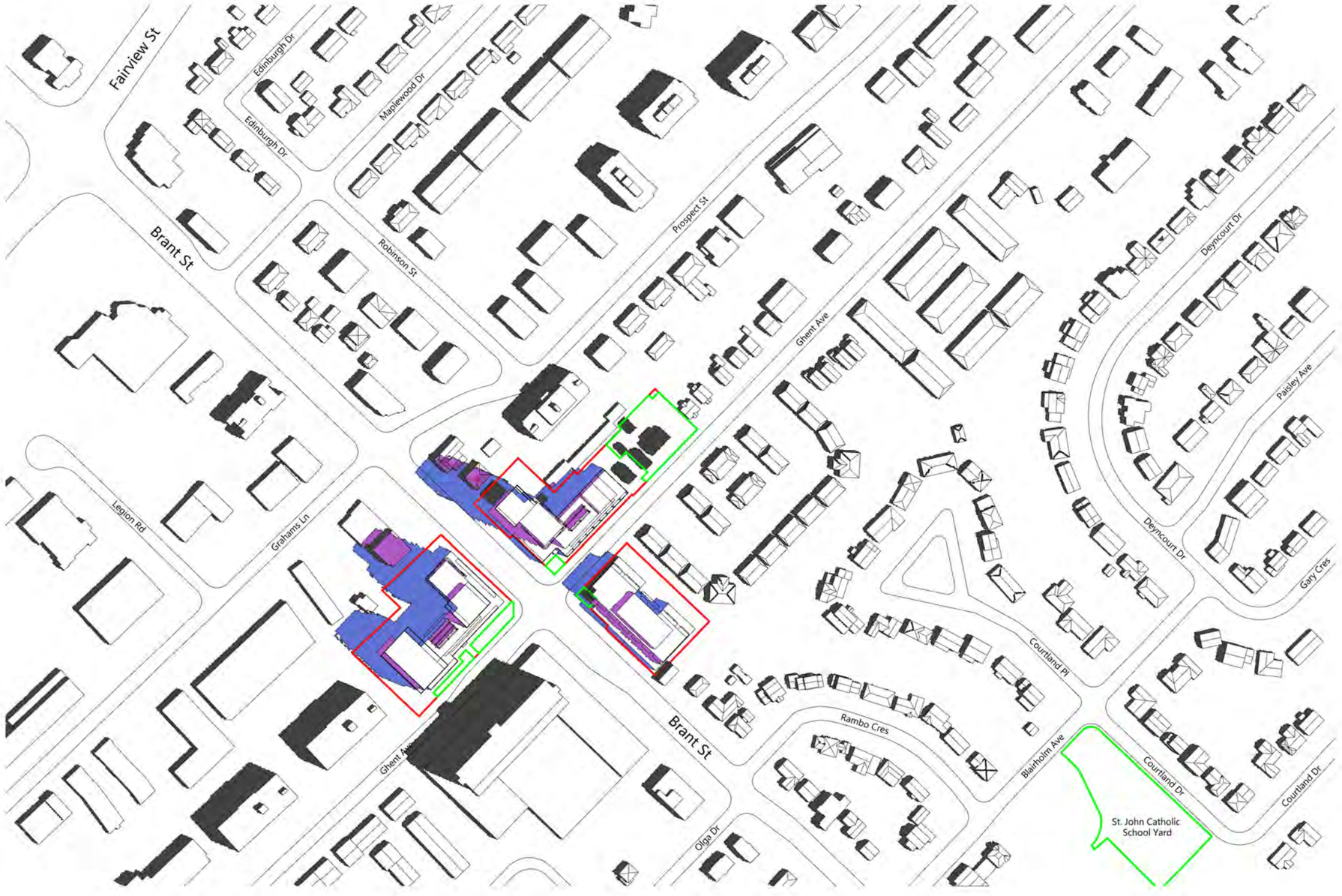
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Proposed Site Configuration | June 21st, 11:00 EDT

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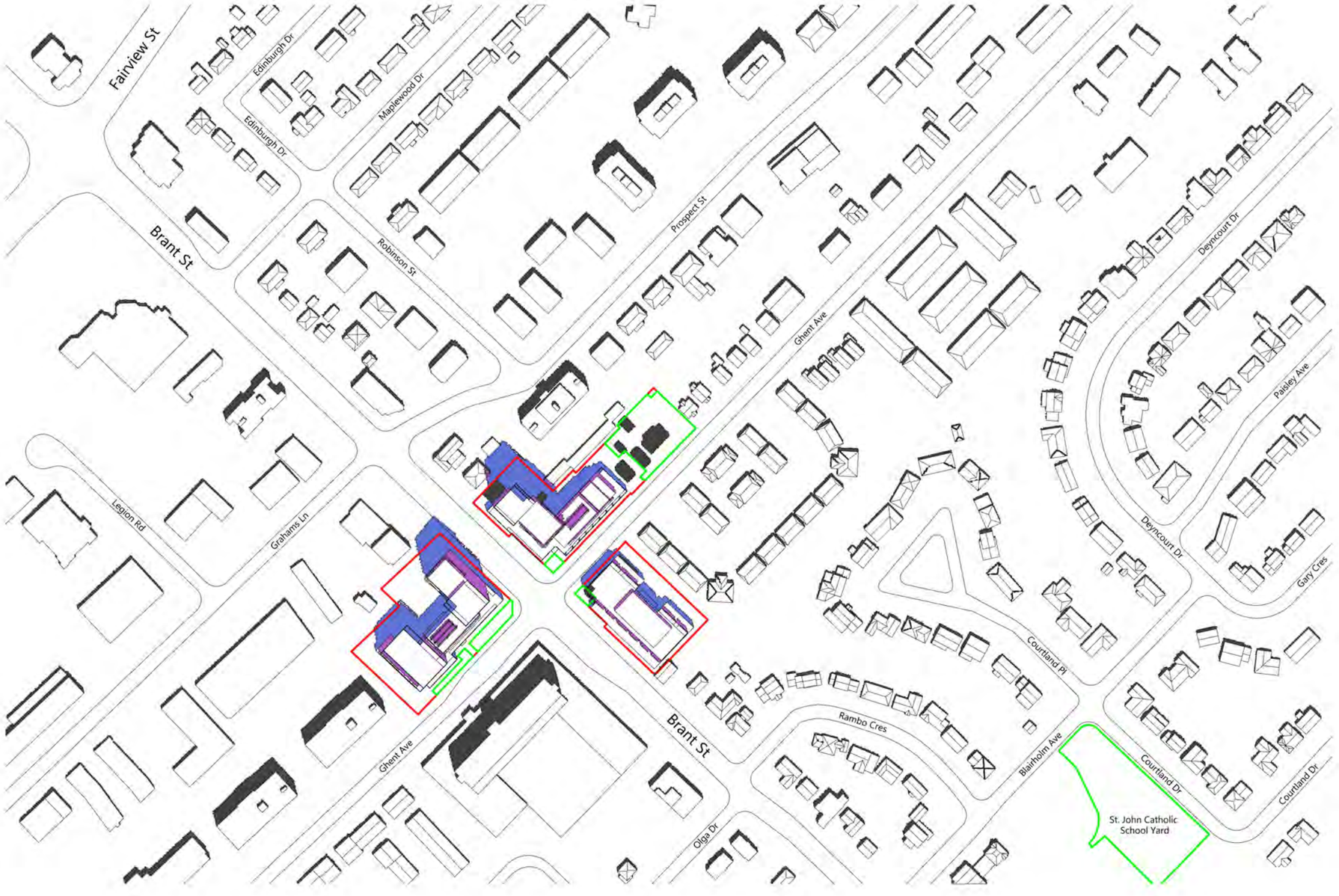
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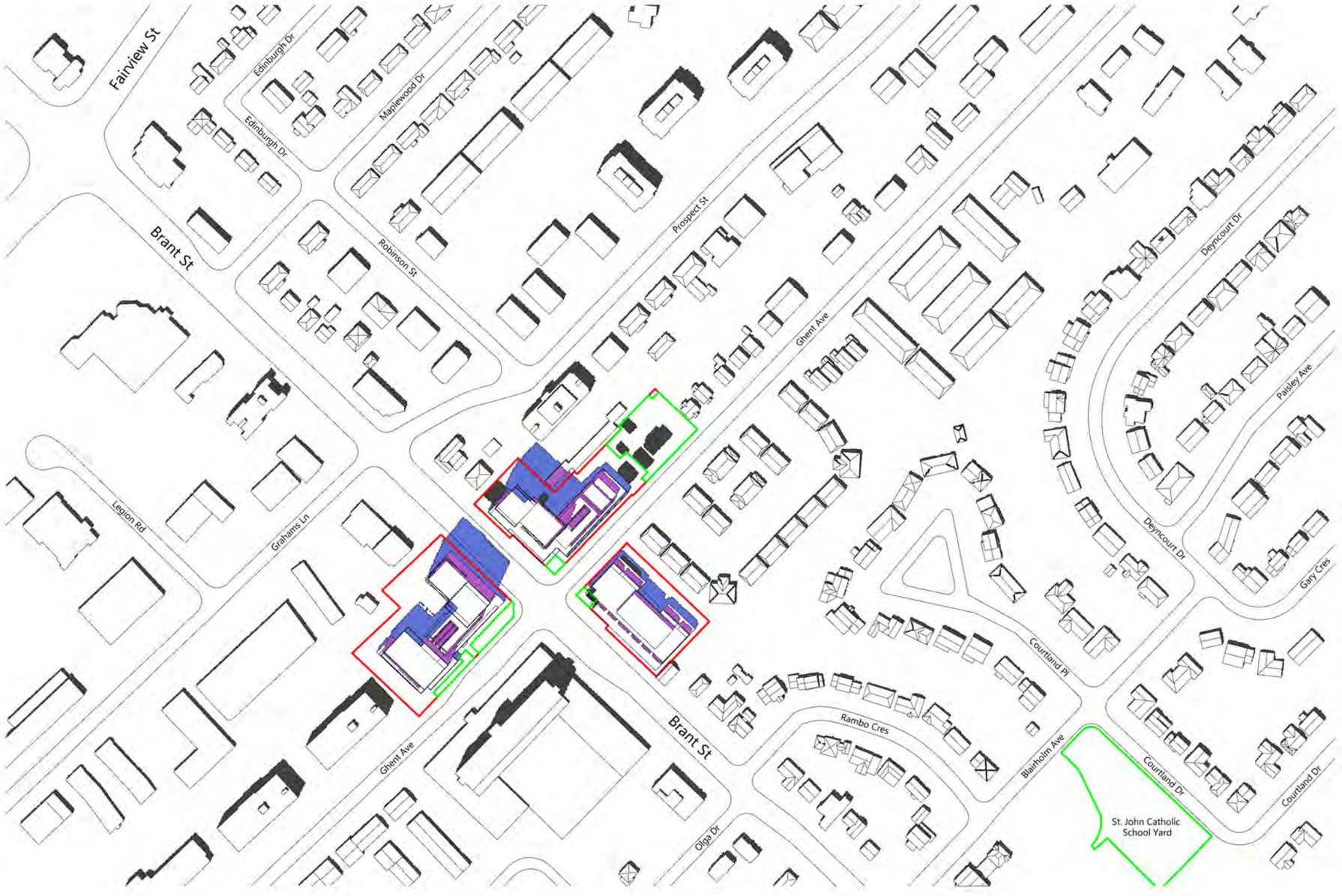
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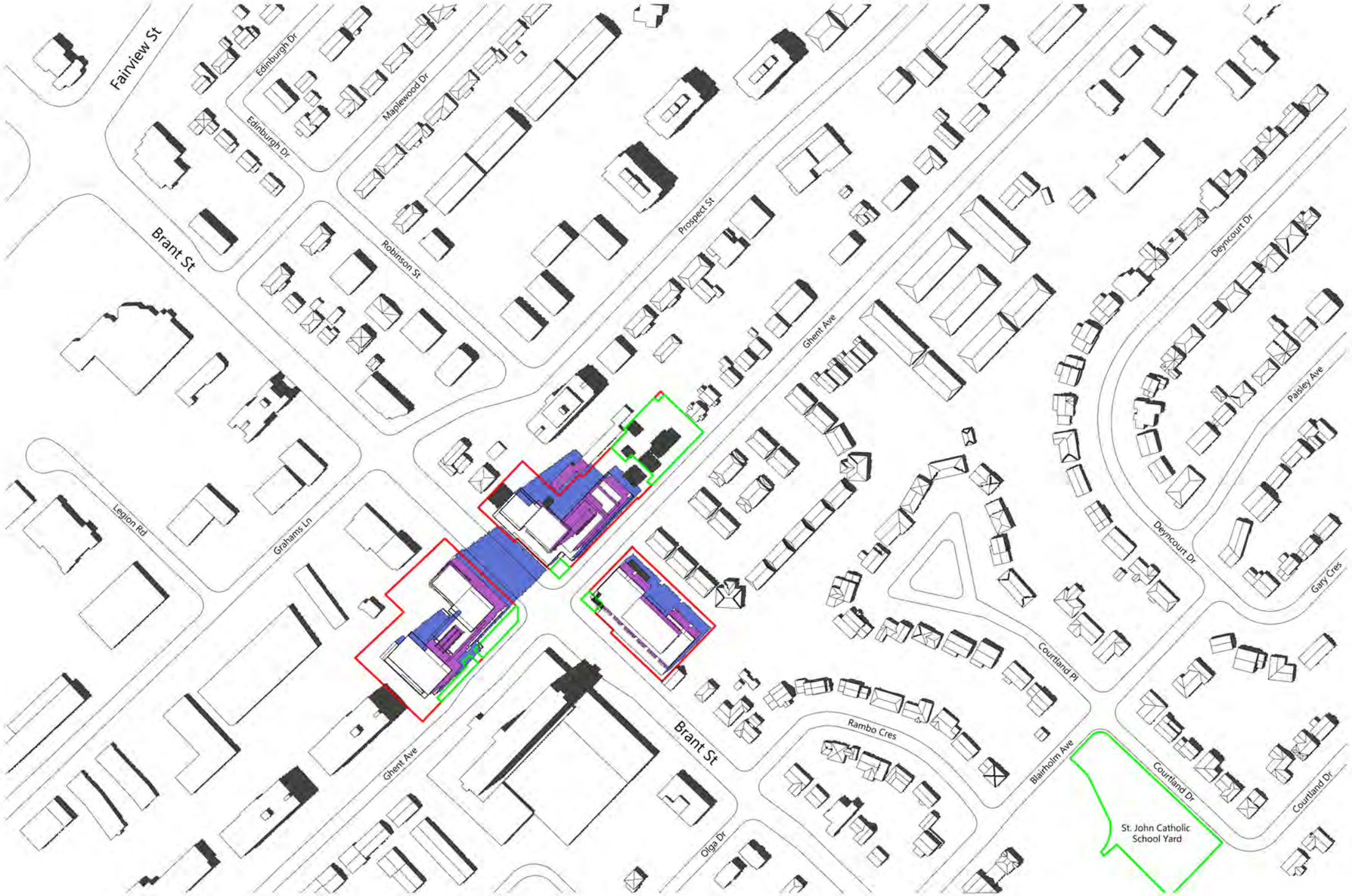
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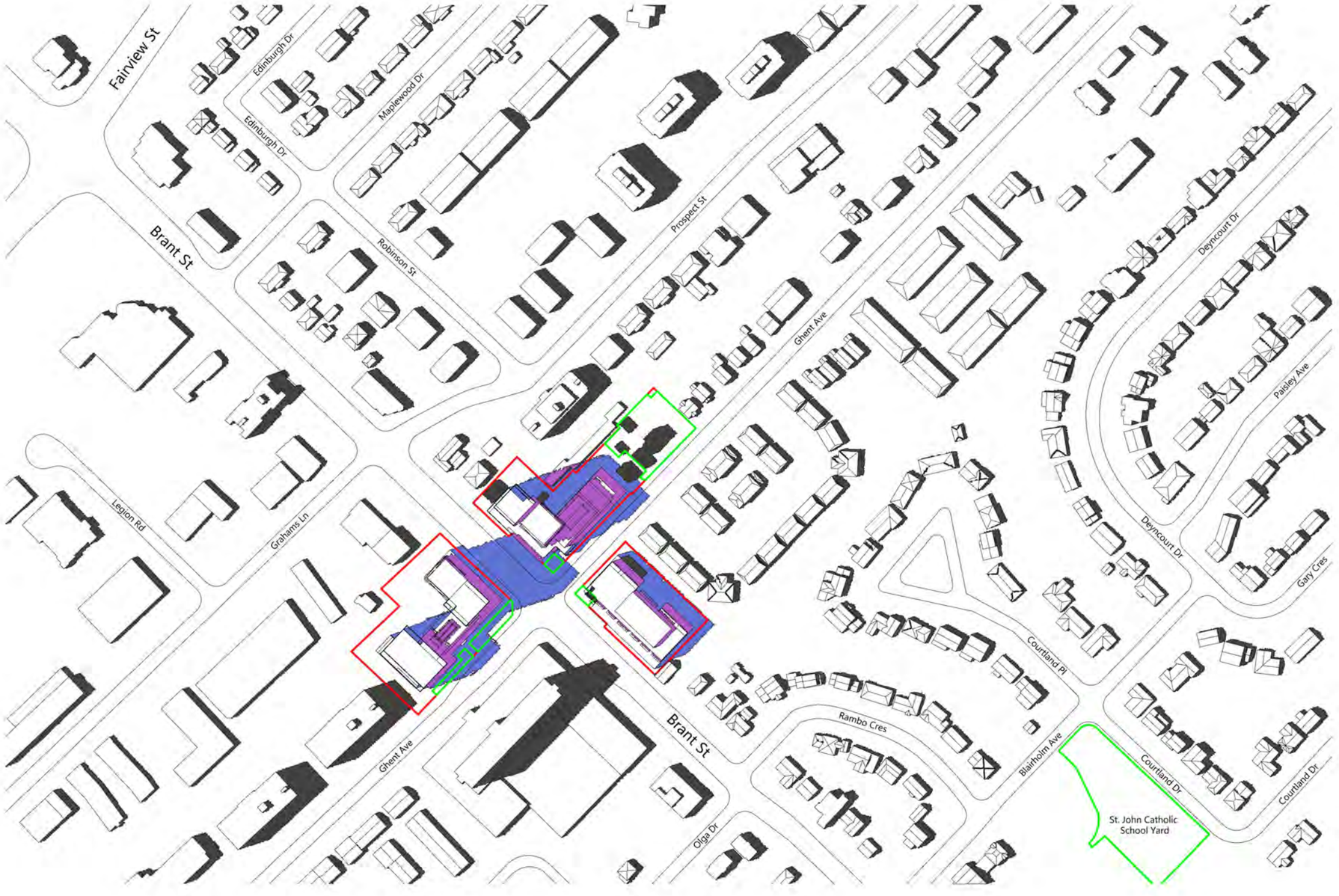
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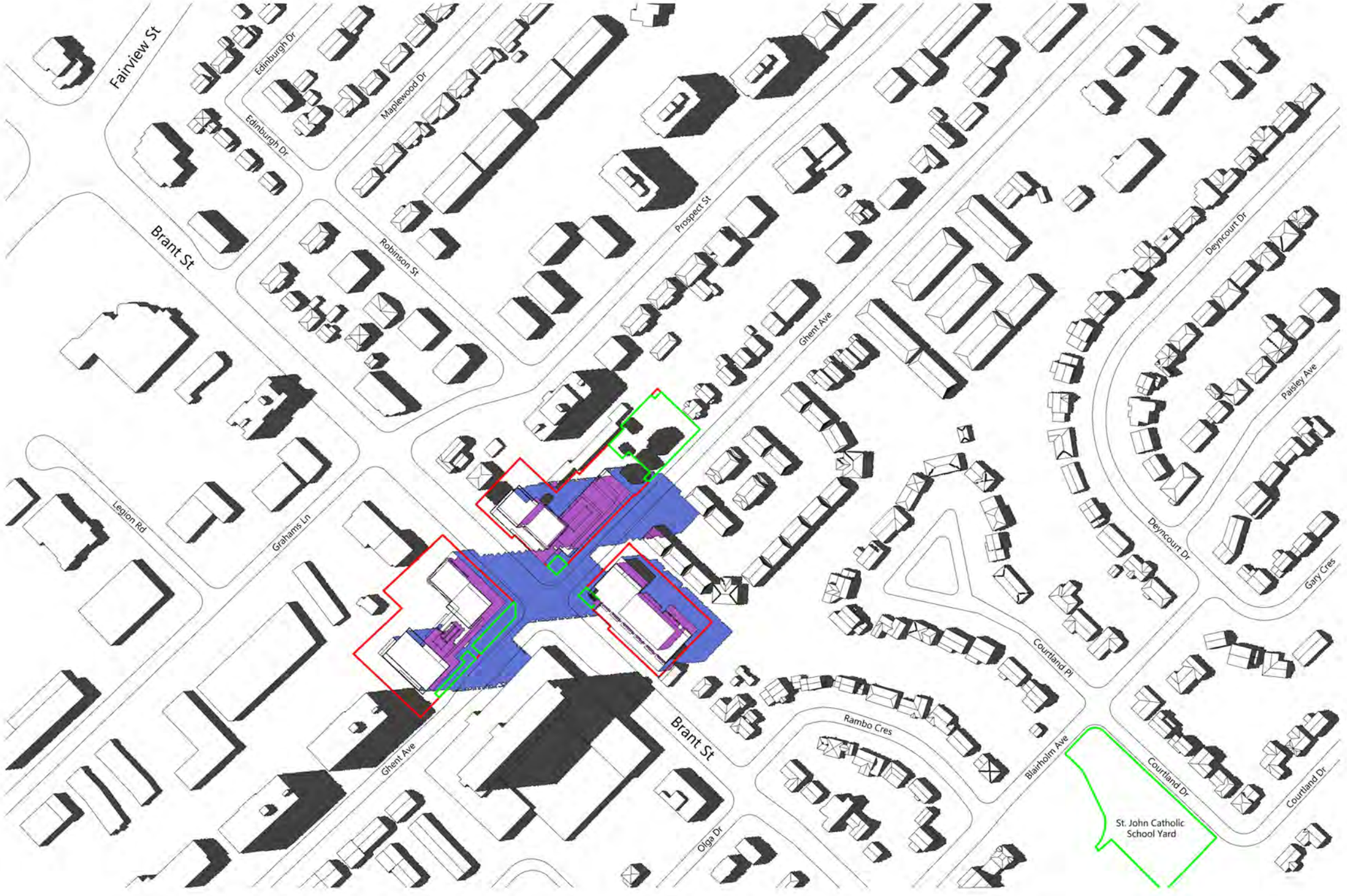
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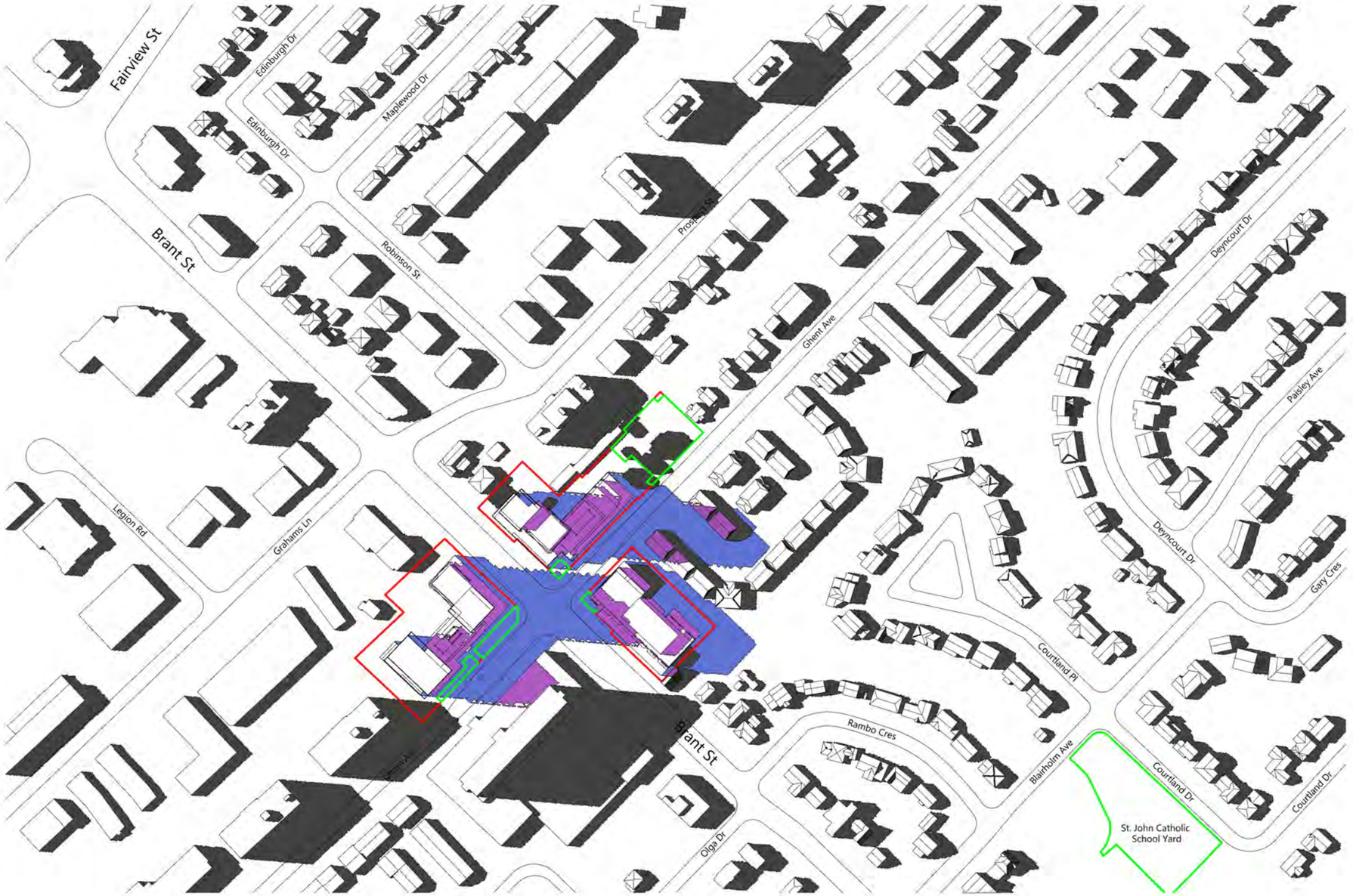
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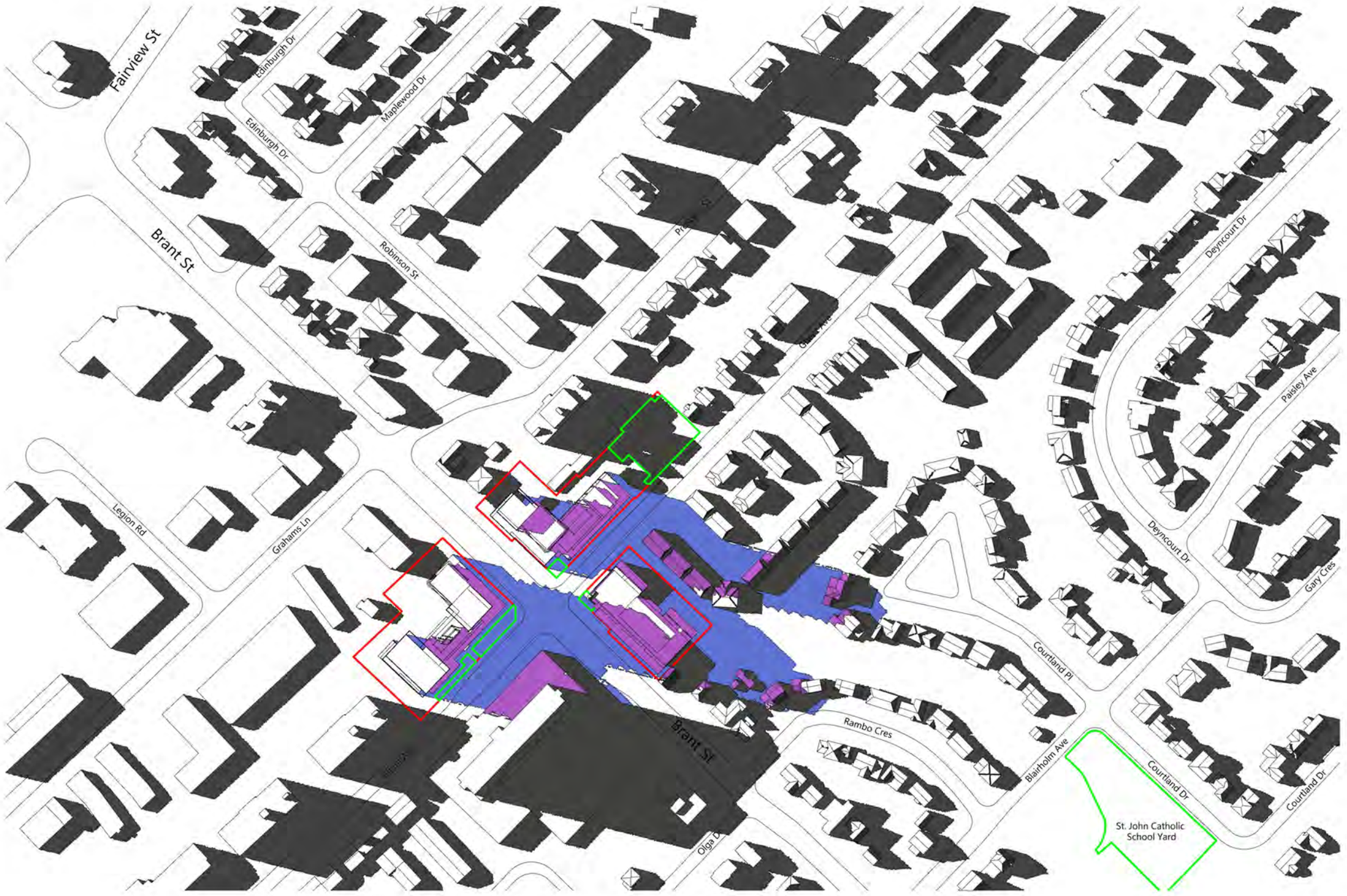
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Sun Shade Assessment

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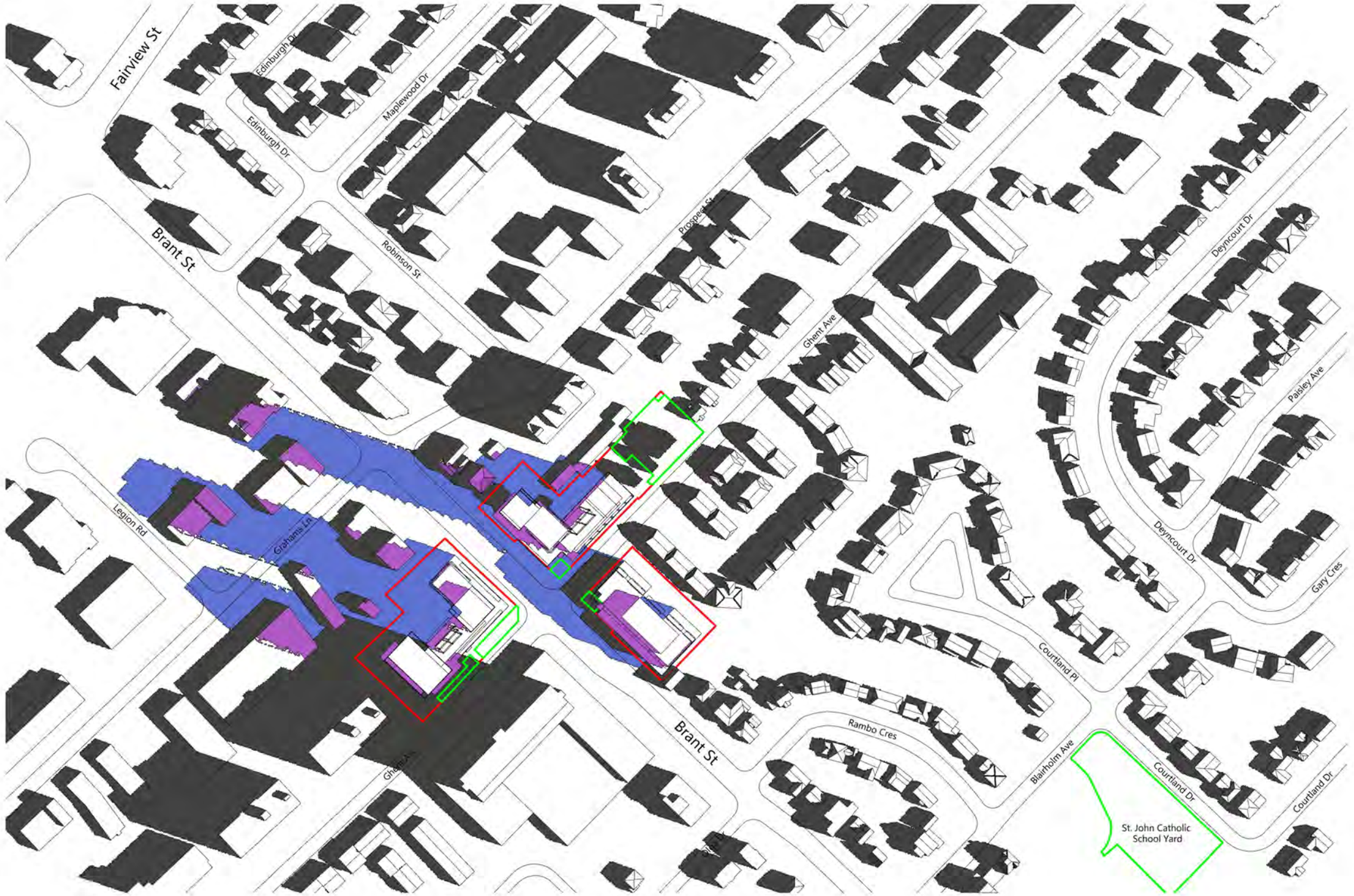
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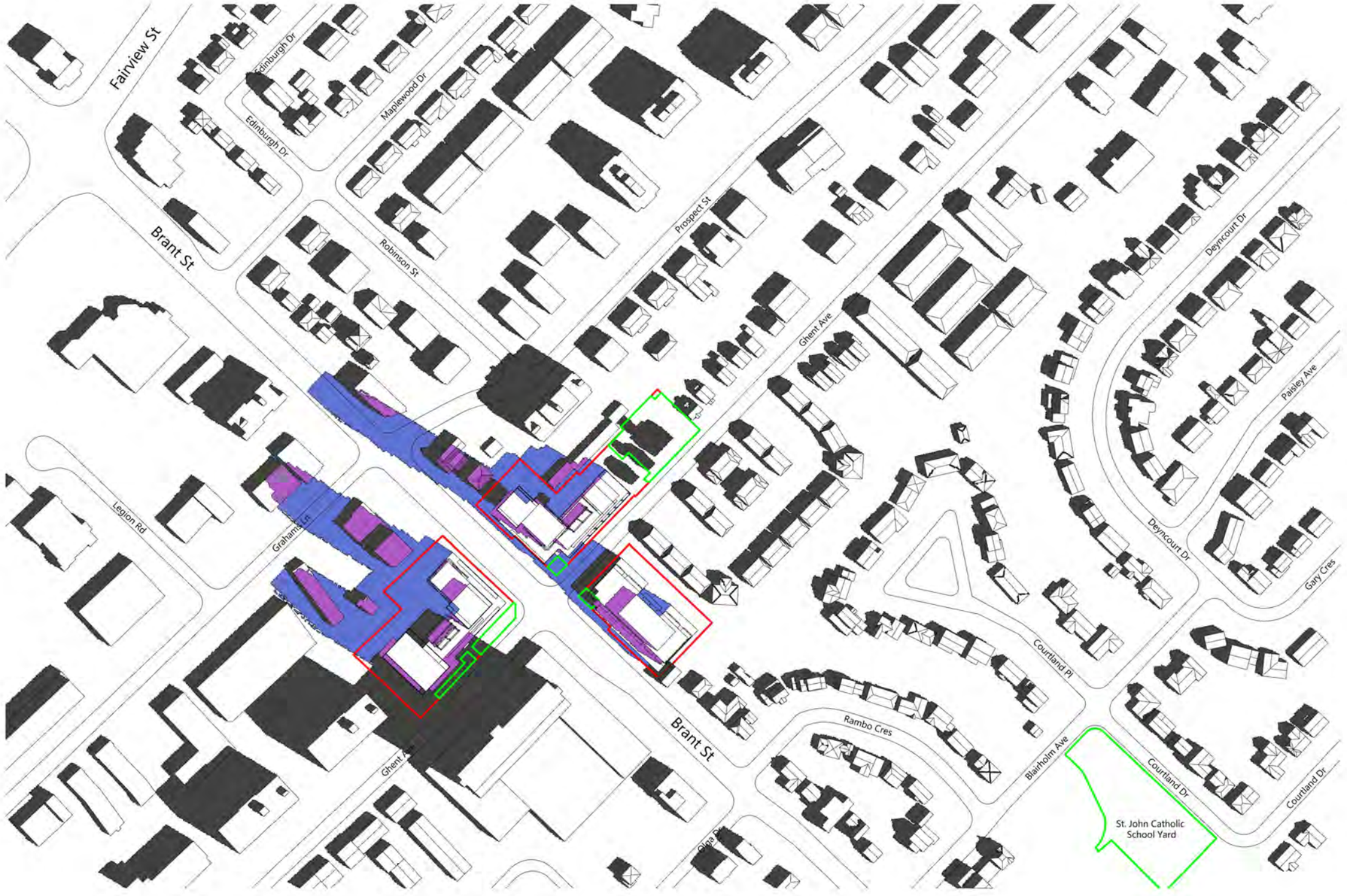
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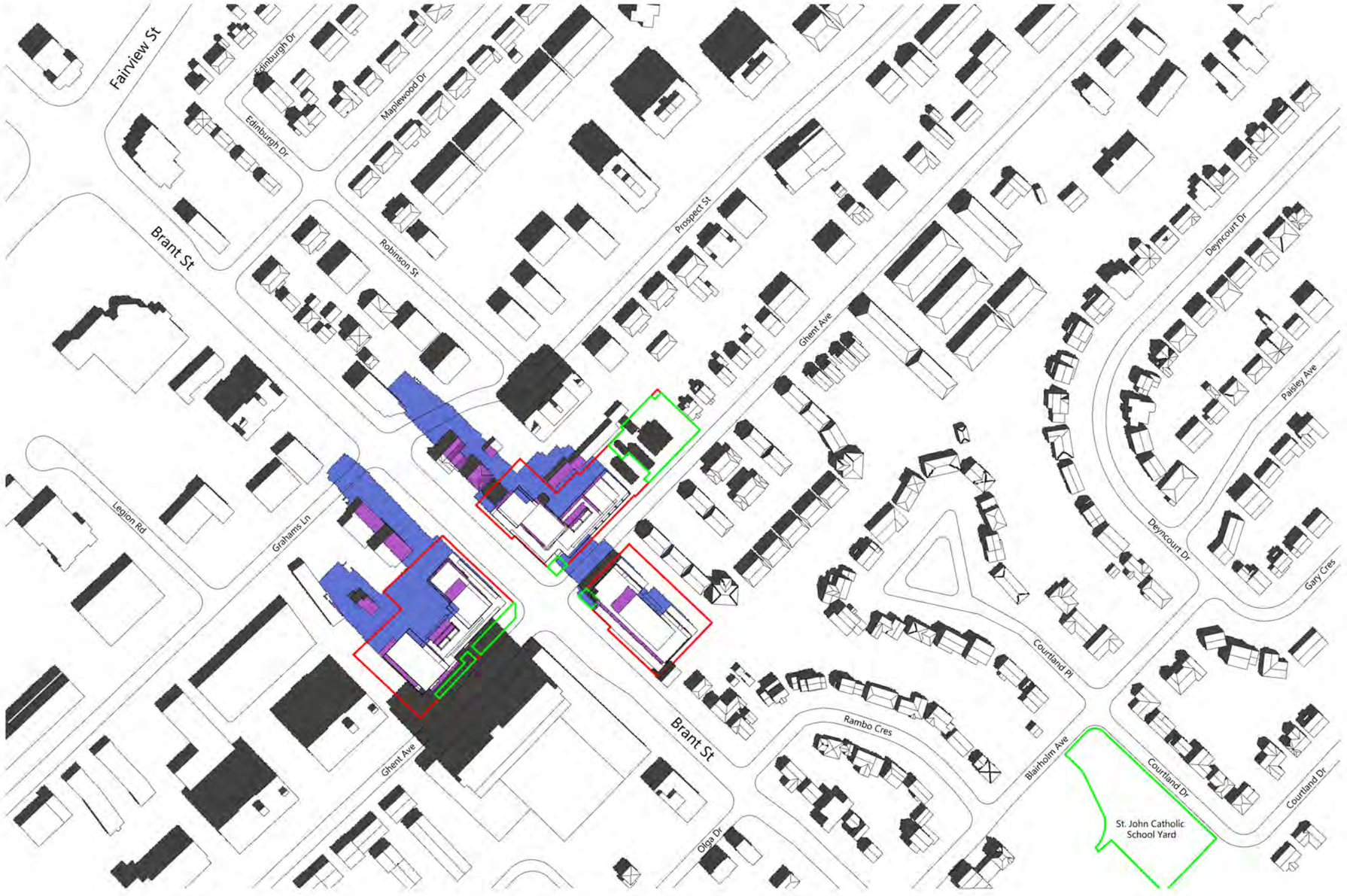
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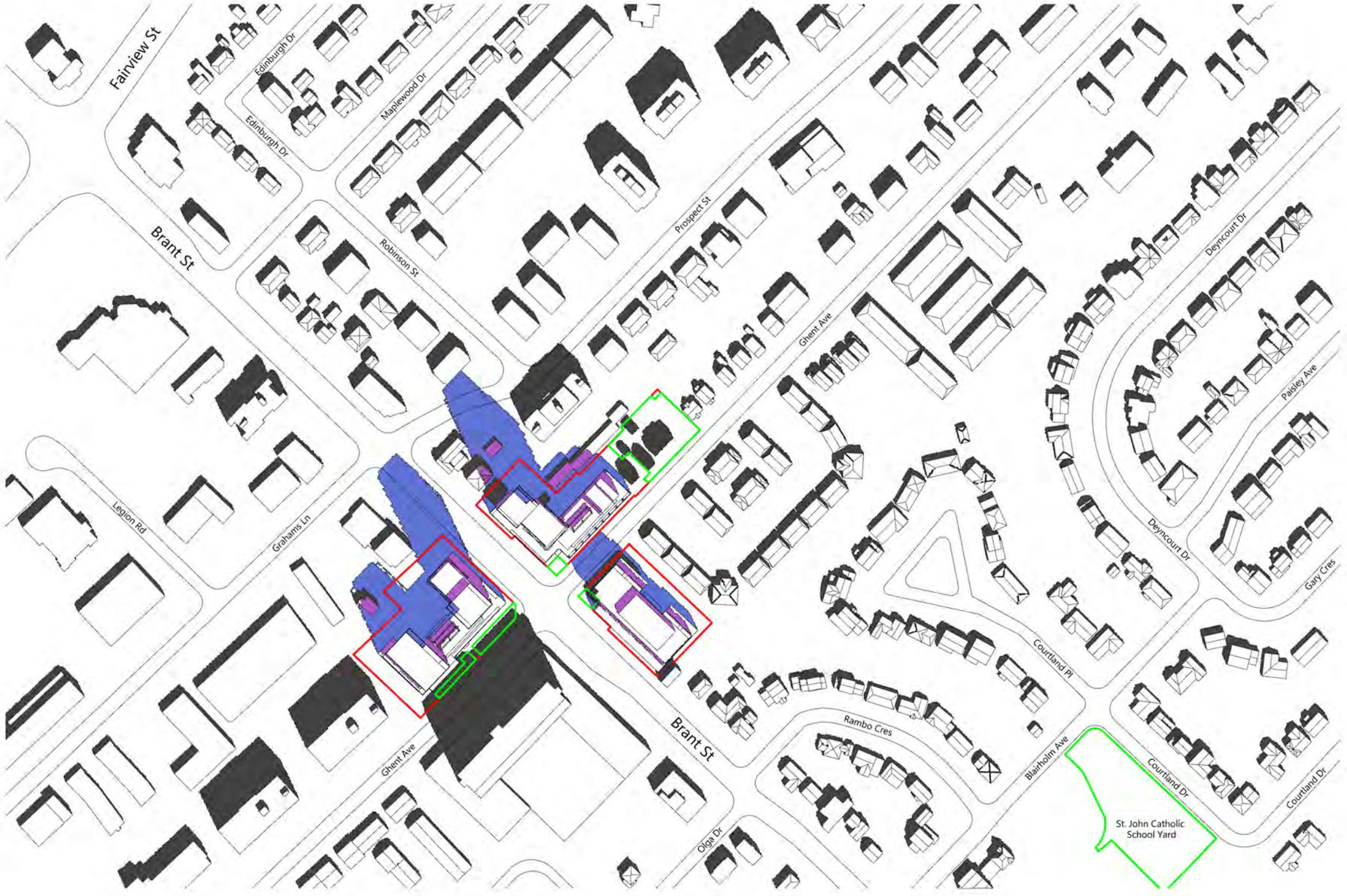
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Sun Shade Assessment

Proposed Site Configuration | September 21st, 12:00 EDT

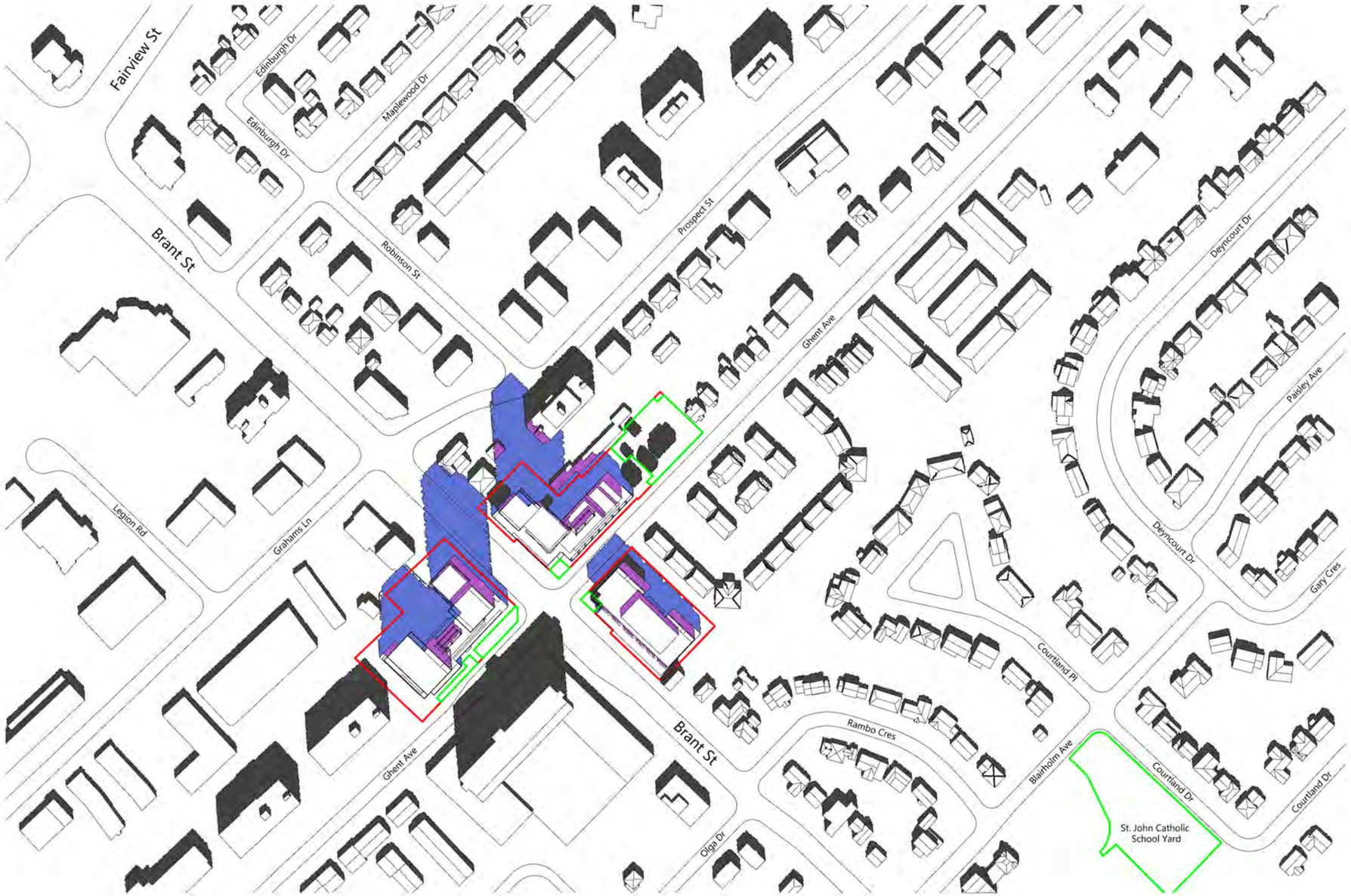
Brant Street + Ghent Avenue Masterplan - Burlington, ON
Project # 2004219

- Net New Shadows Cast on Roof Surfaces
- Net New Shadows Cast on Ground Surfaces
- Shadows Cast by Existing Buildings on All Surfaces
- Open Space
- Site Boundary

True North

Scale = 1:3000

0 25 50 100 200 m



Sun Shade Assessment

Proposed Site Configuration | September 21st, 13:00 EDT

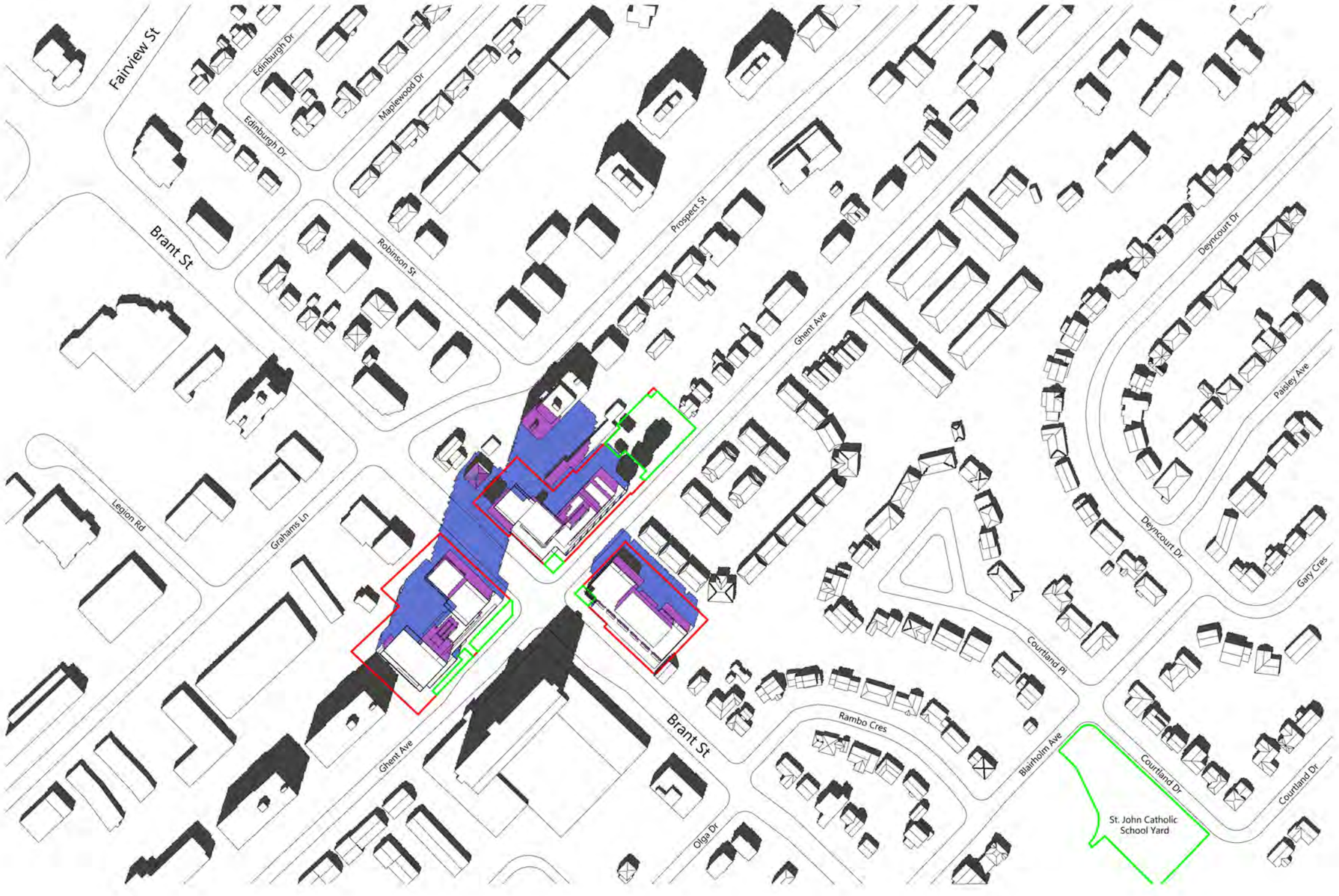
Brant Street + Ghent Avenue Masterplan - Burlington, ON
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True North

Scale = 1:3000

0 25 50 100 200 m



Sun Shade Assessment

Proposed Site Configuration | September 21st, 14:00 EDT

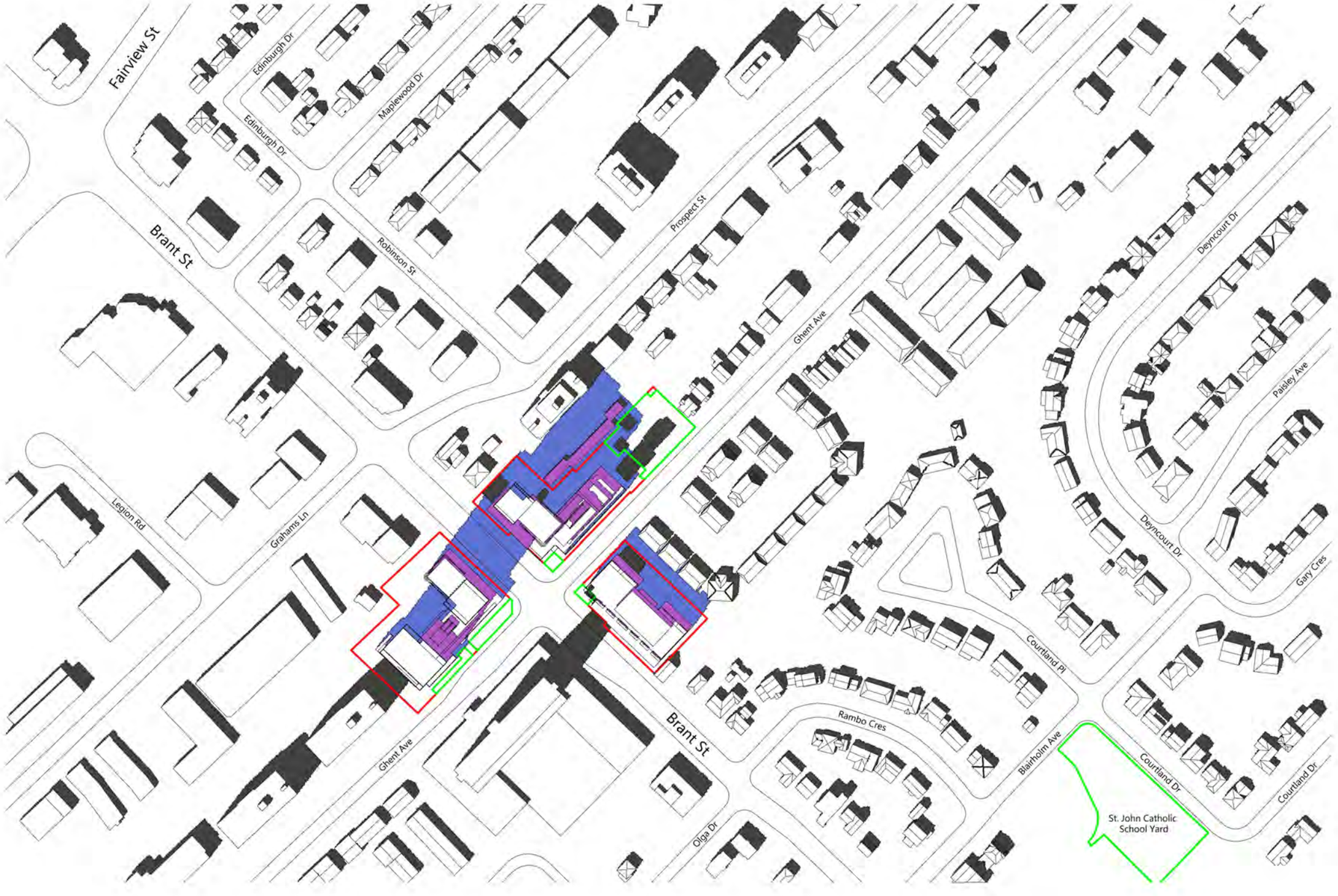
Brant Street + Ghent Avenue Masterplan - Burlington, ON
Project # 2004219

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- Open Space
- Site Boundary

True North

Scale = 1:3000

0 25 50 100 200 m



Sun Shade Assessment

Proposed Site Configuration | September 21st, 15:00 EDT

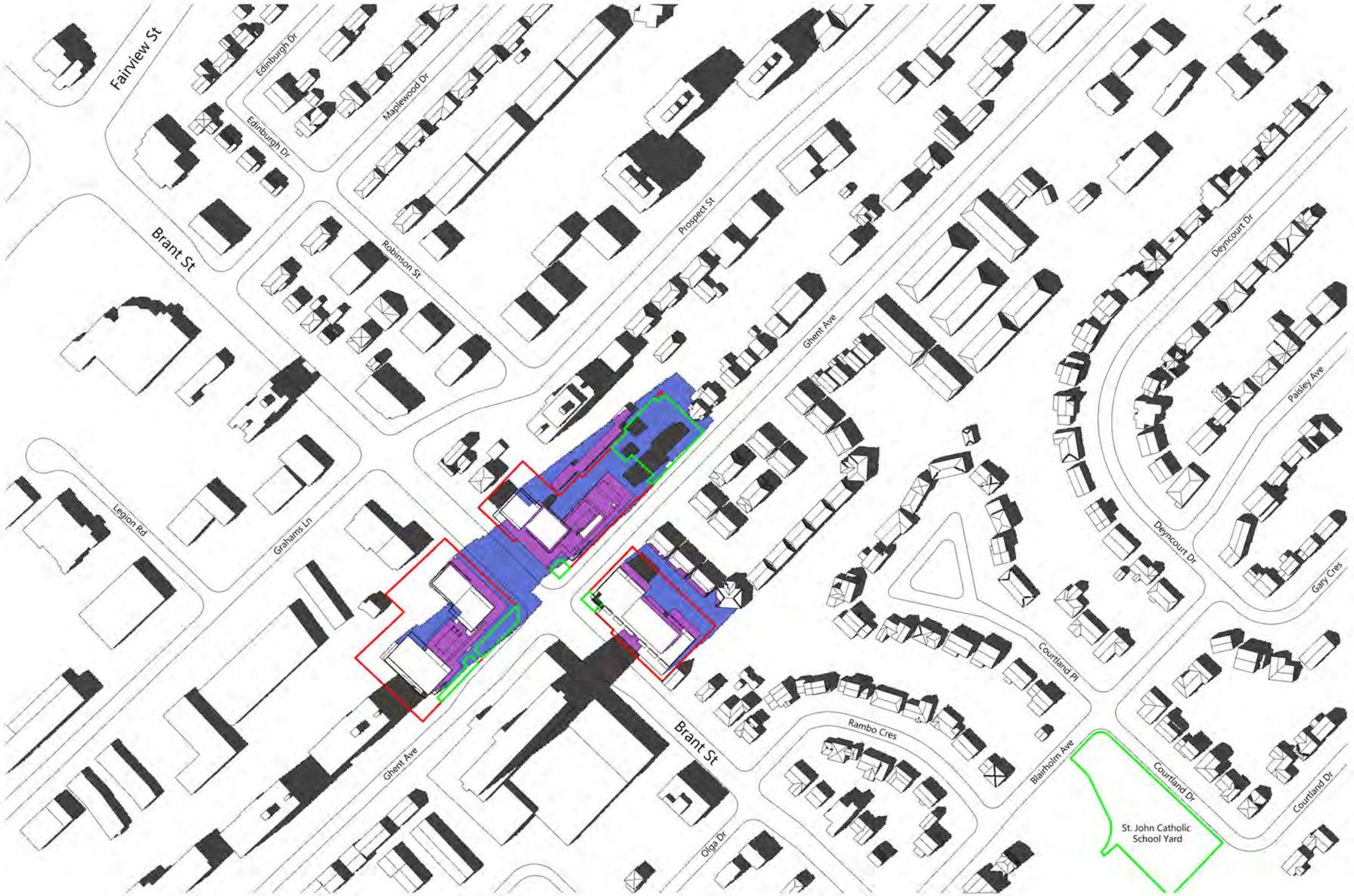
Brant Street + Ghent Avenue Masterplan - Burlington, ON
Project # 2004219

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- Open Space
- Site Boundary

True North

Scale = 1:3000

0 25 50 100 200 m



Sun Shade Assessment

Proposed Site Configuration | September 21st, 16:00 EDT

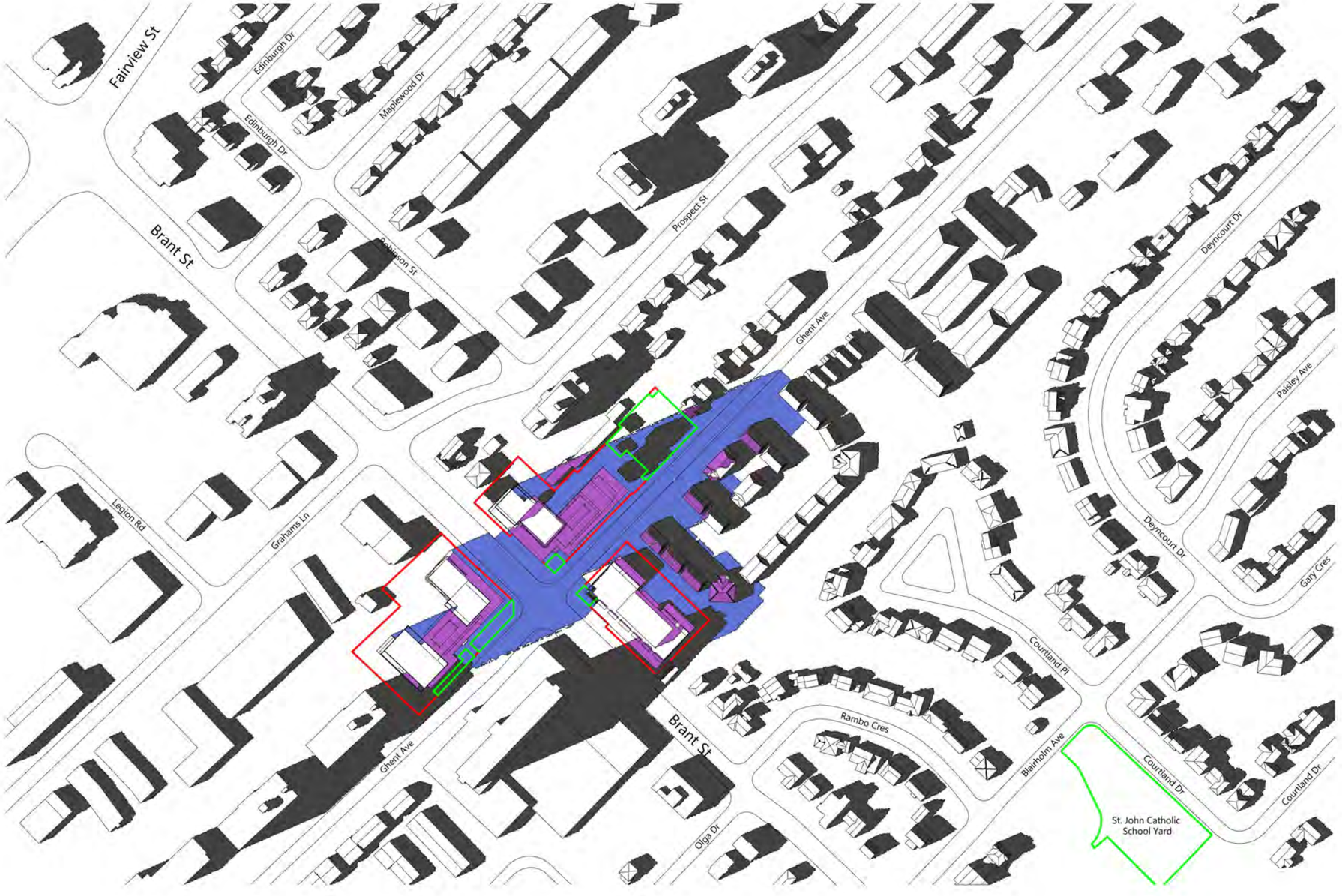
Brant Street + Ghent Avenue Masterplan - Burlington, ON
Project # 2004219

- Net New Shadows Cast on Roof Surfaces
- Net New Shadows Cast on Ground Surfaces
- Shadows Cast by Existing Buildings on All Surfaces
- Open Space
- Site Boundary

True North

Scale = 1:3000

0 25 50 100 200 m



Sun Shade Assessment

Proposed Site Configuration | September 21st, 17:00 EDT

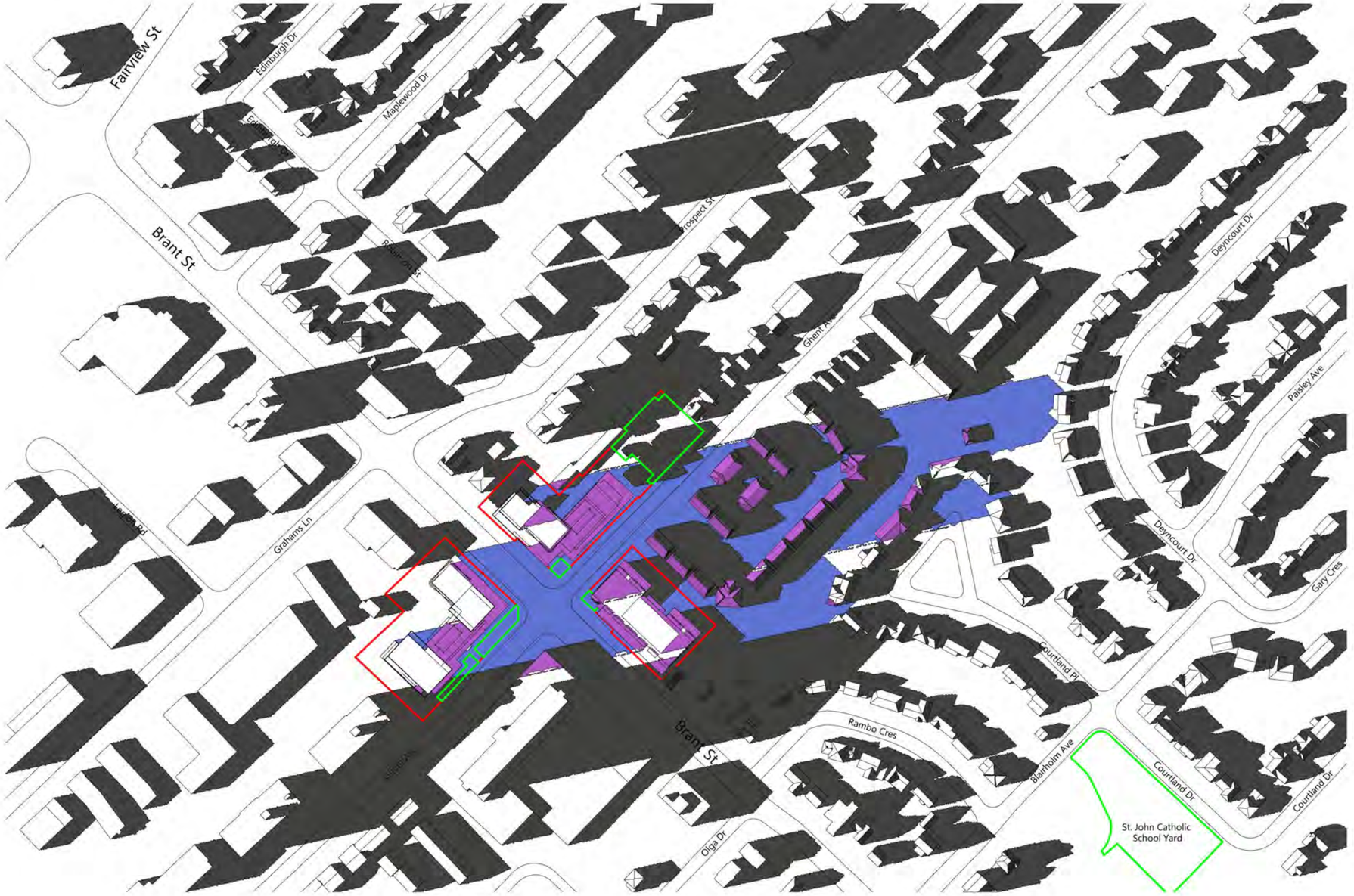
Brant Street + Ghent Avenue Masterplan - Burlington, ON
Project # 2004219

- Net New Shadows Cast on Roof Surfaces
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- Site Boundary

True North

Scale = 1:3000

0 25 50 100 200 m



Sun Shade Assessment

Proposed Site Configuration | September 21st, 18:00 EDT

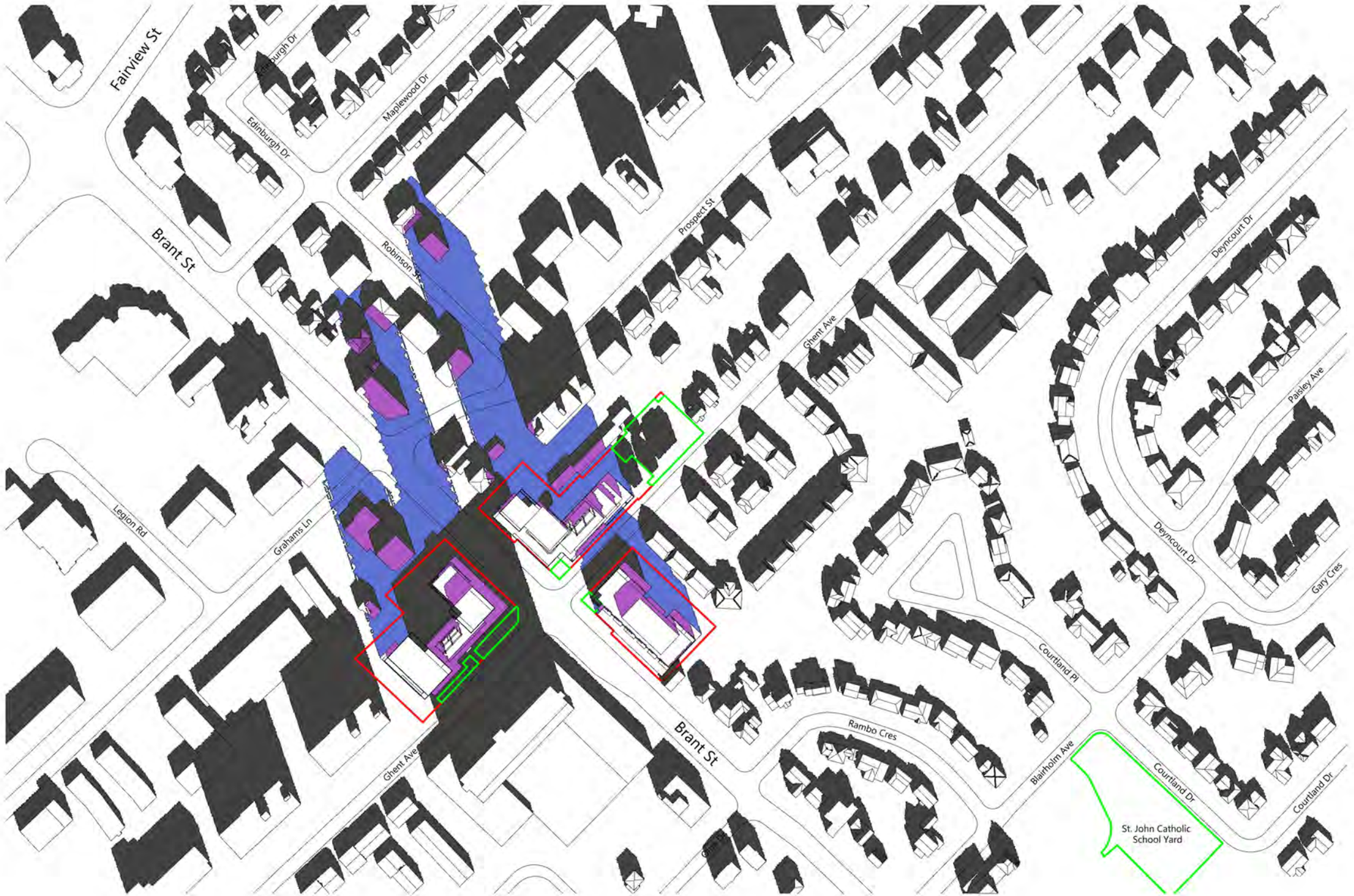
Brant Street + Ghent Avenue Masterplan - Burlington, ON
Project # 2004219

- Net New Shadows Cast on Roof Surfaces
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- Site Boundary

True North

Scale = 1:3000

0 25 50 100 200 m



Sun Shade Assessment

Proposed Site Configuration | December 21st, 11:00 EST

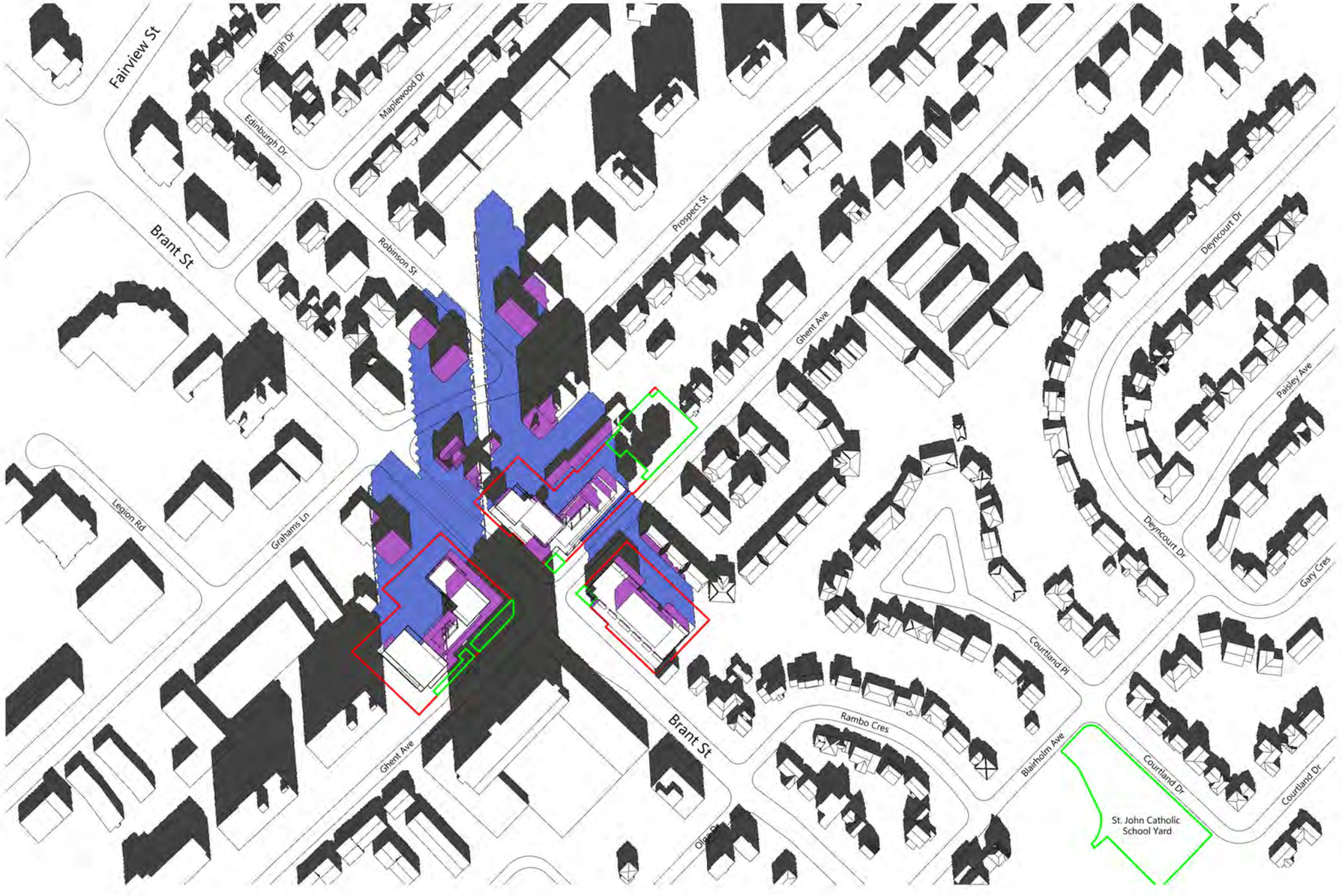
Brant Street + Ghent Avenue Masterplan - Burlington, ON
Project # 2004219

- Net New Shadows Cast on Roof Surfaces
- Net New Shadows Cast on Ground Surfaces
- Shadows Cast by Existing Buildings on All Surfaces
- Open Space
- Site Boundary

True North

Scale = 1:3000

0 25 50 100 200 m



Sun Shade Assessment

Proposed Site Configuration | December 21st, 12:00 EST

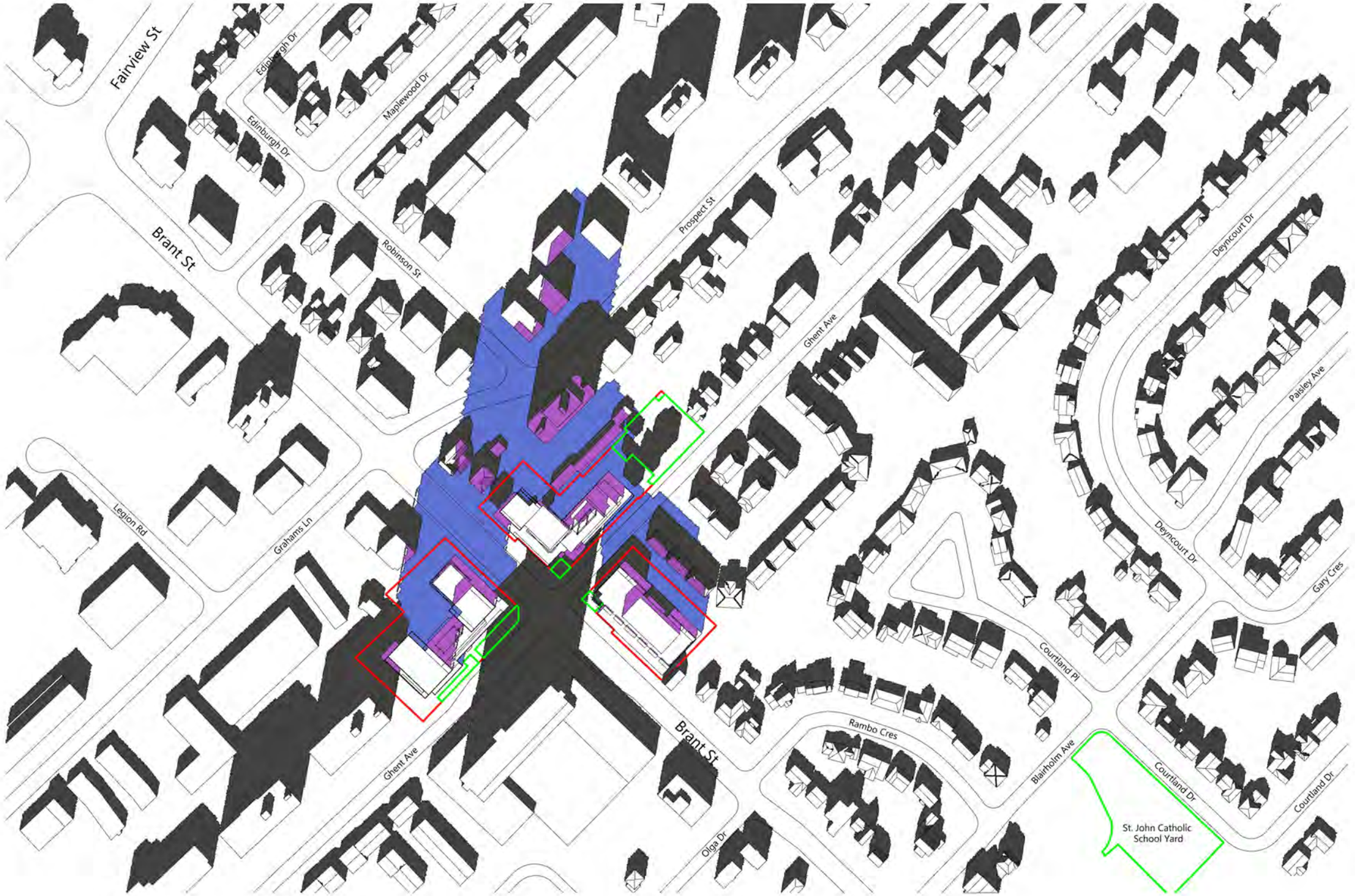
Brant Street + Ghent Avenue Masterplan - Burlington, ON
Project # 2004219

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True North

Scale = 1:3000

0 25 50 100 200 m



Sun Shade Assessment

Proposed Site Configuration | December 21st, 13:00 EST

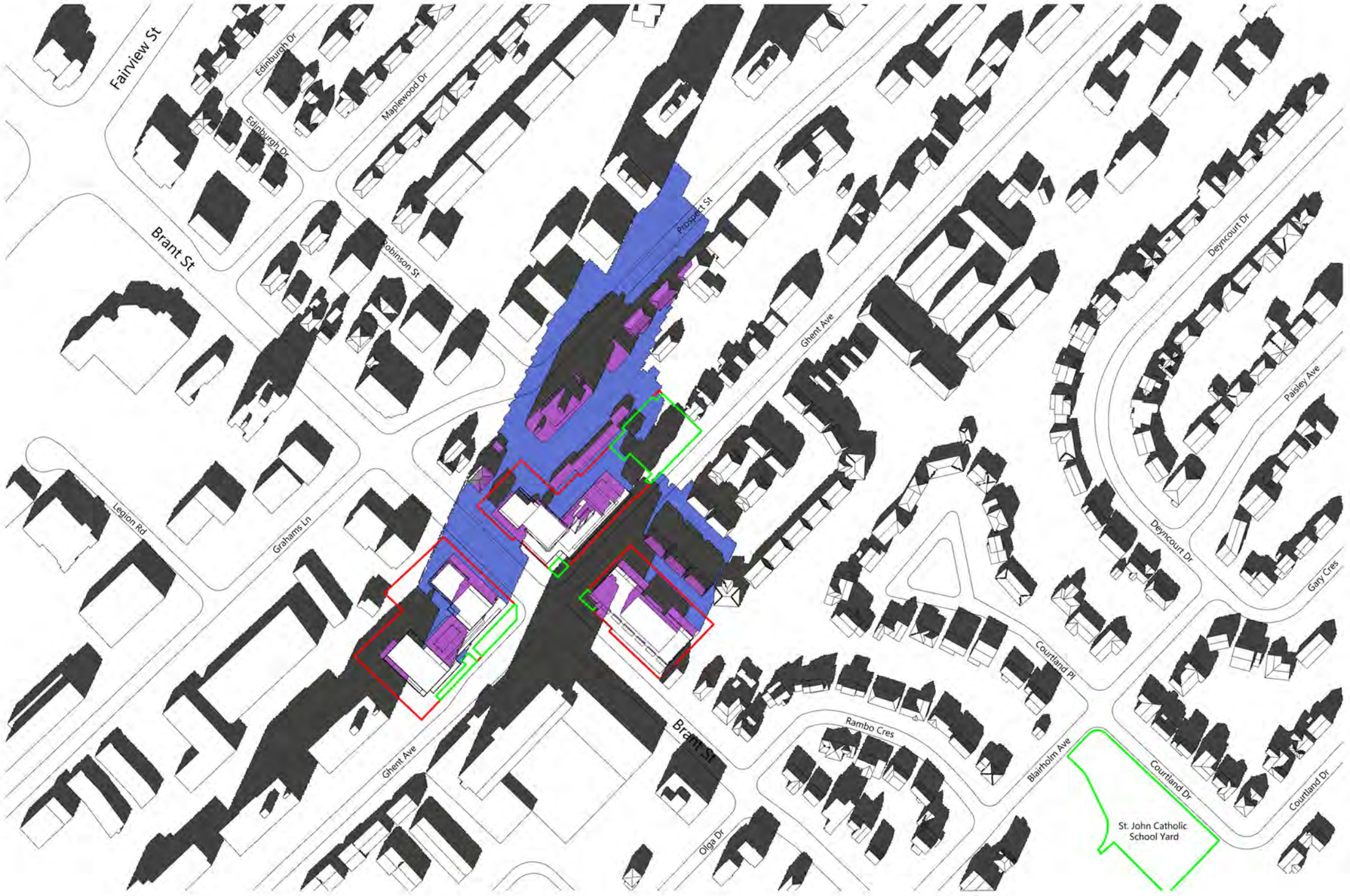
Brant Street + Ghent Avenue Masterplan - Burlington, ON
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True North

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Sun Shade Assessment

Proposed Site Configuration | December 21st, 14:00 EST

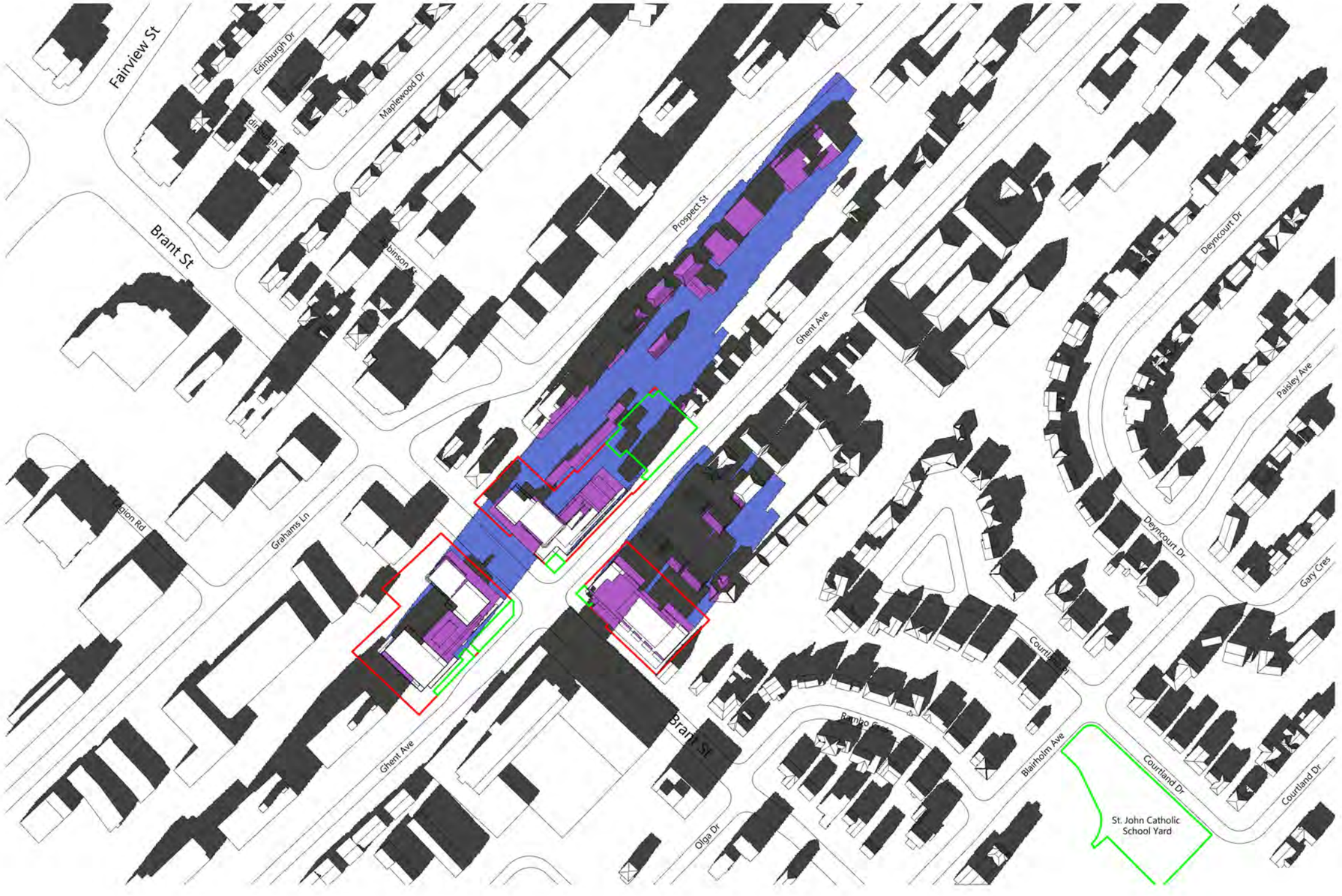
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True North

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0 25 50 100 200 m



Sun Shade Assessment

Proposed Site Configuration | December 21st, 15:00 EST

Brant Street + Ghent Avenue Masterplan - Burlington, ON
Project # 2004219

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True North

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0 25 50 100 200 m