



Sun Shadow Study

58 York Blvd.,
Hamilton, ON

December, 2022
Project No. 22326

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Purpose

The following Sun Shadow Study has been prepared by GSP Group Inc. in support of a Site Plan application to facilitate the redevelopment on the lands municipally addressed as 58 York Blvd. in Hamilton (referred to as “the Site”).

The Site is located at north east corner of York Blvd. and Park St. N., within the Downtown Hamilton Secondary Plan Area and is within the Urban Growth Centre. The Site has a frontage of ± 43 m along York Blvd., and ± 45.5 m along Park St. N., with a total Site area of $\pm 1,985.5$ sq m (± 0.49 acre).

The proposed development is comprised of a 28-storey residential tower with a 4-storey podium. The total building height, excluding the mechanical penthouse, is approximately 89.085 m (excluding mechanical penthouse + parapet) .

The objective of the City of Hamilton's Development Application Guidelines: Sun Shadow Study is to:

“maintain quality, comfortable and inviting public spaces and pedestrian environments by demonstrating that a development will not cause undue shade on the subject lands, and on the surrounding context, including building facades, private and public outdoor amenity and open spaces, parkland, school yards and buildings, sidewalks and other components of the public realm.”

The Site is zoned D1 (Downtown Central Business District) Holding: H17, H19, H20. The H20 holding provision permits a maximum building height of 22m. A maximum height of 95m may be permitted provided that a Shadow Impact Study (as well as four other studies) has been completed to the satisfaction of the Director of Planning and Chief Planner, demonstrating conformity to the Downtown Secondary Plan. The purpose of this Shadow Impact Study is to assess whether the proposed 89.085 m (excluding mechanical penthouse + parapet) tall building satisfies the sun shadow guidelines and policies of the secondary plan. Approval of this Sun Shadow Study as noted will clear one of the conditions of the H17 holding provisions applicable to the Site.

The following analysis demonstrates how the proposed development will cast shadow on the surrounding urban context and discuss the mitigation strategies, if required, for any undue shadow impact.

Analysis Method - Technical Criteria

Following the City of Hamilton's Development Application Guidelines for a Sun Shadow Study, the analysis is based on the following:

Dates and times

- Spring Equinox, March 21st at solar noon and hourly intervals starting 1.5 hours after sunrise and ending 1.5 hours before sunset.
- Fall Equinox, September 21st at solar noon and hourly intervals starting 1.5 hours after sunrise and ending 1.5 hours before sunset.

Time Zone - Eastern

- Eastern Standard Time: Universal Time minus 5 hours
- Daylight Saving Time: Universal Time minus 4 hours

Geographical Coordinates

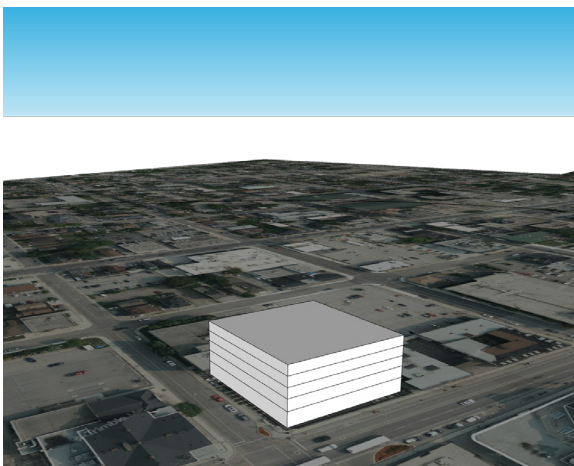
- Latitude: N 43 degrees 14'30"
- Longitude: W 79 degrees 51'00"

Astronomic True North was determined through accurately geo-locating the building model in the SketchUp application. The 3D model of the proposed building was provided by MSAI Architects Inc. and the base map for surrounding context was created using Google Earth.

The shadow analysis incorporates three simulated conditions:

1. It illustrates the current condition of the shadows, shaded in the colour gray.
2. It establishes the as-of-right condition based on the Schedule D: Holding Provisions of the Zoning Bylaw 05-200, for the D1, H20 Zone, which permits a maximum height of 22m, until the holding provisions have been lifted. The as-of-right shadows are shaded yellow in the shadow analysis diagrams.
3. It establishes the proposed condition based on the 28-storey (89.085 m) tower with a 4-storey podium. These proposed heights comply with the conditional permitted maximum heights of the D1, H20 regulations of the Zoning By-law 05-200 and Figures 1 and 15 of Schedule F - Special Figures. The net new shadow (new shadow minus the as-of-right shadow) is shaded in a light blue in the shadow analysis diagrams.

As-of-right Building Model



Proposed Building Model



Assessment Criteria and Analysis - Impact

The City's Sun Shadow Guidelines include Impact Criteria and considerations analysis as follows:

Criteria A - Public realm

Shadows from proposed development shall allow for a minimum of 3 hours of sun coverage between 10:00am and 4:00pm as measured from March 21st to September 21st on public sidewalks, and public and private outdoor amenity space such as patios, sitting areas, and other similar programs.

Quantification & Assessment

Vine St.: With the application of step-backs and slender tower design, the proposed development successfully mitigates any undue shadow impact and will allow a minimum of 4 hours of sun coverage (pg. 5 & pg. 16) between 10am and 4pm on public sidewalks, and public and private outdoor amenity spaces such as patios, sitting areas, and other similar programs.

Park St. N.: The proposed development allows for a minimum 3 hours of sun coverage along most of the Park St. N. but fails to meet the criteria on the sidewalk immediately north-west of the proposed development and will have approximately 2.5 hours of sunlight between 10am and 4pm. As-of-right building massing will also have the same result as this shadow is casted by the podium of the development, and given our geographical location, avoiding casting any shadows onto this section of sidewalk would be difficult to achieve. Moreover, the section of Park St.N. sidewalk with less that 3 hours of sunlight between 10am and 4pm, will have more than 3 hours of sunlight between 11am and 5pm. So, overall throughout the day, all public sidewalks will receive a minimum of 3 hours of sunlight and therefore the proposed development will have a minimal shadow impact.

Criteria B - Common Amenity Areas

Shadows from the proposed development shall allow for a minimum of 50% sun coverage at all times of the day as measured from March 21st to September 21st on public plazas, parks and open spaces, school yards, and playgrounds.

Quantification & Assessment

The proposed development allows for at least 50% sun coverage on all public plazas, parks, open spaces, school yards, and playgrounds during all test times.

Assessment Criteria and Analysis - Impact

Criteria C - Primary Gathering Spaces in Downtown Hamilton

Downtown Hamilton contains a number of parks, squares, plazas and open space areas that serve as civic gathering spaces in the Downtown area. The quality, image, and amenity of these spaces strongly affect how people perceive the Downtown. Development shall not cast any new net shadow between 10:00 a.m. and 4:00 p.m. as measured from March 21st to September 21st on Gore Park, Prince's Square, City Hall Forecourt, Whithern Museum and Ferguson Station.

Quantification & Assessment

During all test times the proposed development avoids casting any shadow effects on all key downtown civic gathering spaces listed in the Terms of Reference.

MITIGATION MEASURES

Orientation

This proposed location and the orientation will have the least shadow impact on the sidewalks given the geographic location of the site.

Height and Massing

The 4-storey podium and point tower design proposed has been appropriately located on the Site to mitigate any undue shadow impact due to height and massing.

Step-backs and Building Separation

The proposed building steps back above the 4-storey podium, reducing the overall massing along the street edge. Additionally the tower has a separation of 14.2 m from northern property line, which minimizes shadow impacts.

The application of these mitigation measures results in minimal unacceptable shadow impacts from the proposed development, when considering the City's Sun Shadow criteria.

Conclusions

This assessment of the proposed development proves to meet the intent of shadow impact criteria as outlined in the City of Hamilton's Development Application Guidelines for sun shadow studies. With the application of sleek massing, step-backs, and building orientation, the proposed building design results in acceptable shadow impacts pursuant to the City's shadow impact criteria.

SPRING EQUINOX - MARCH 21ST

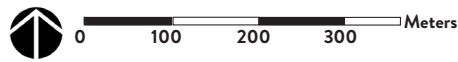
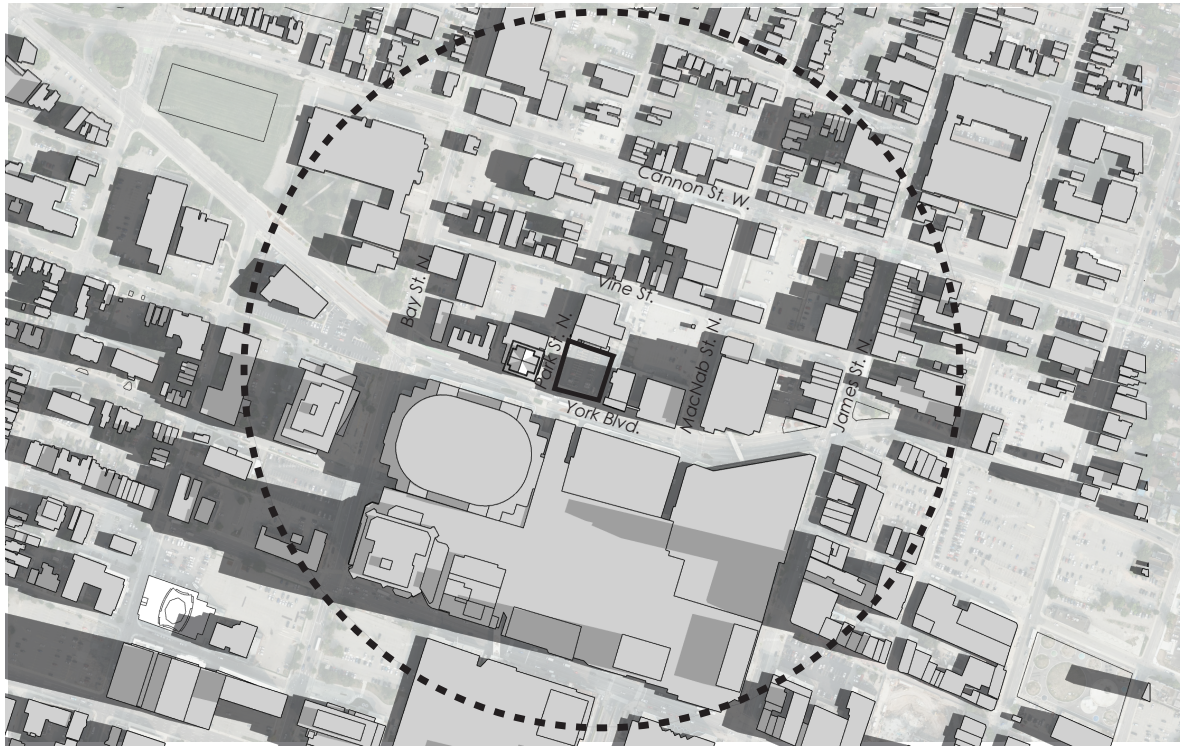
Shadow Interval (City's shadow impact criteria)

- Solar Noon.
- Hourly intervals starting 1.5 hours after sunrise and 1.5 hours before sunset.

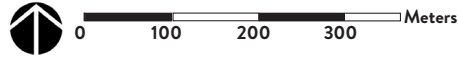
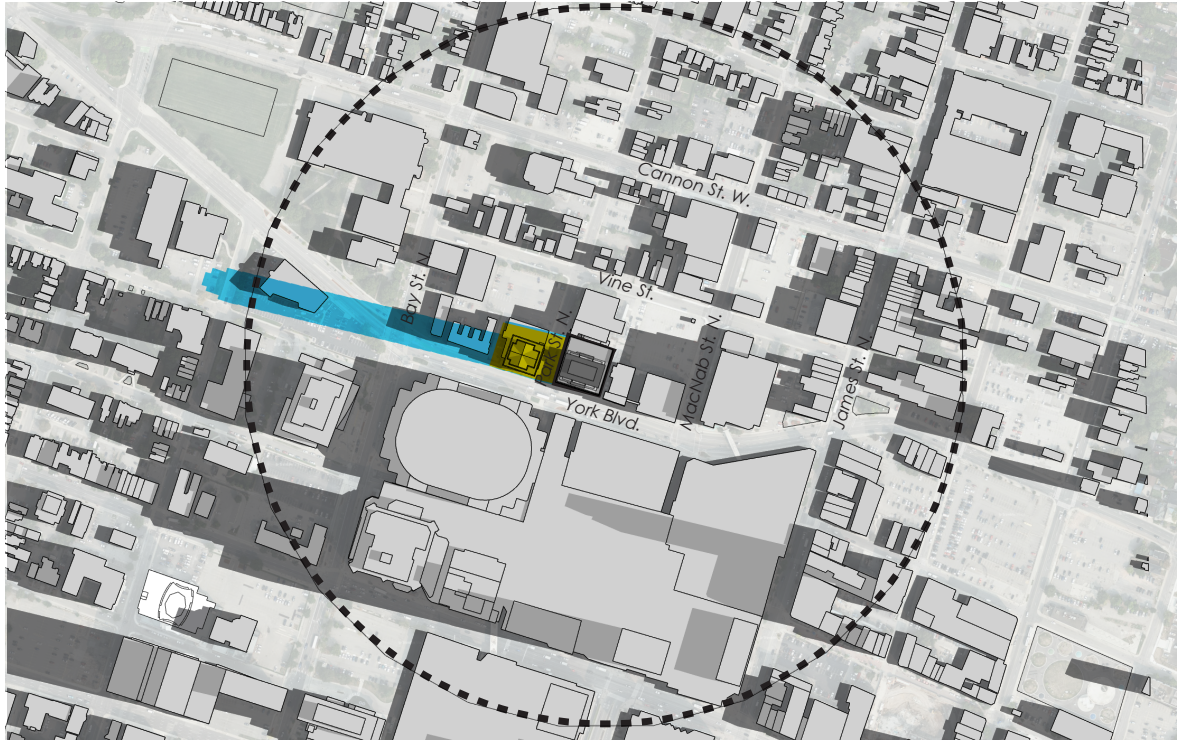
Sunlight Hours | Between 10am to 4pm



Existing Condition (Vacant Parking Lot)

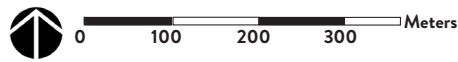
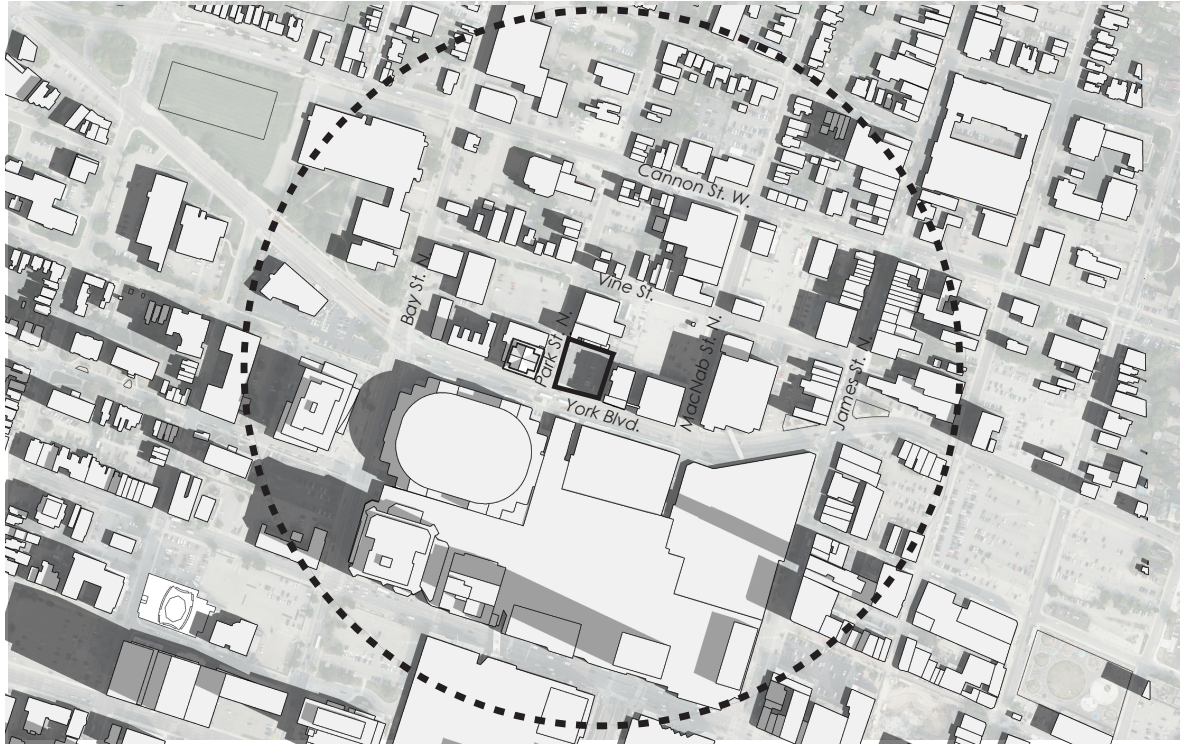


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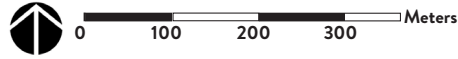
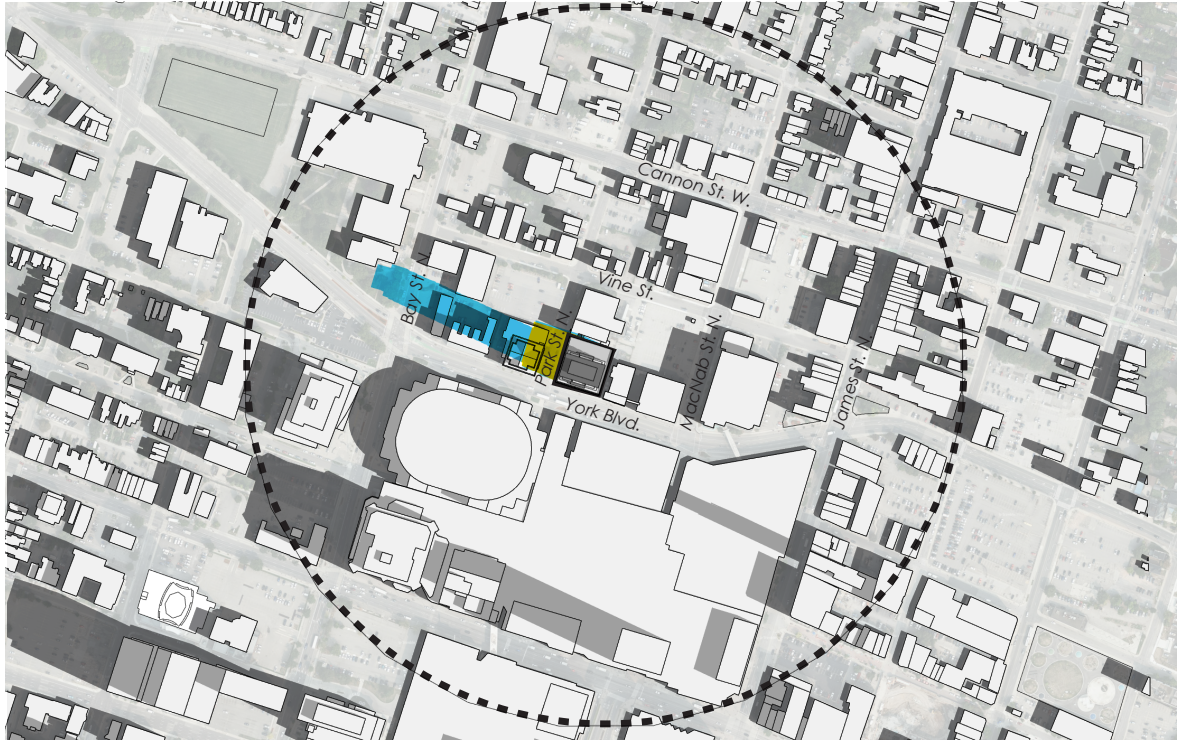


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- Net New Shadow
- Existing Shadow
- Distance Of Shadow Impact (4X Building Height: 89.01m x 4 = 356m)
- Property Boundary

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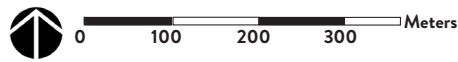
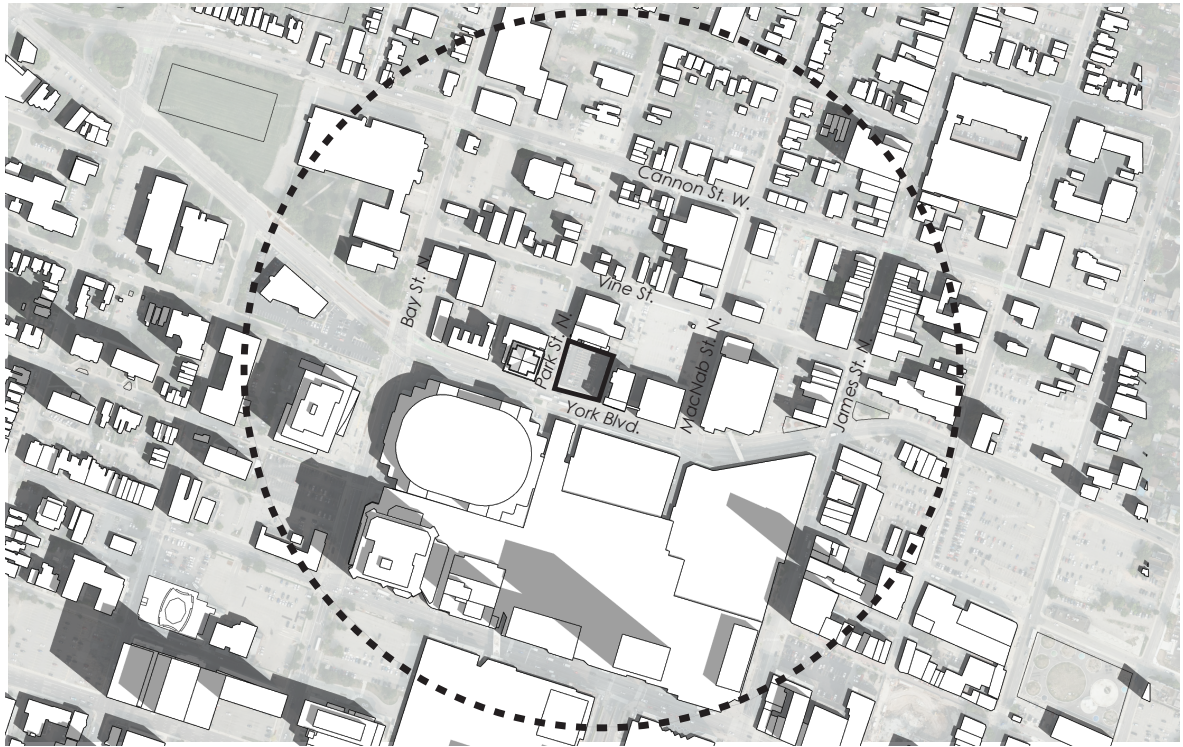


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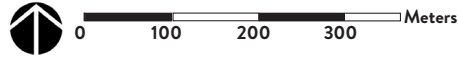
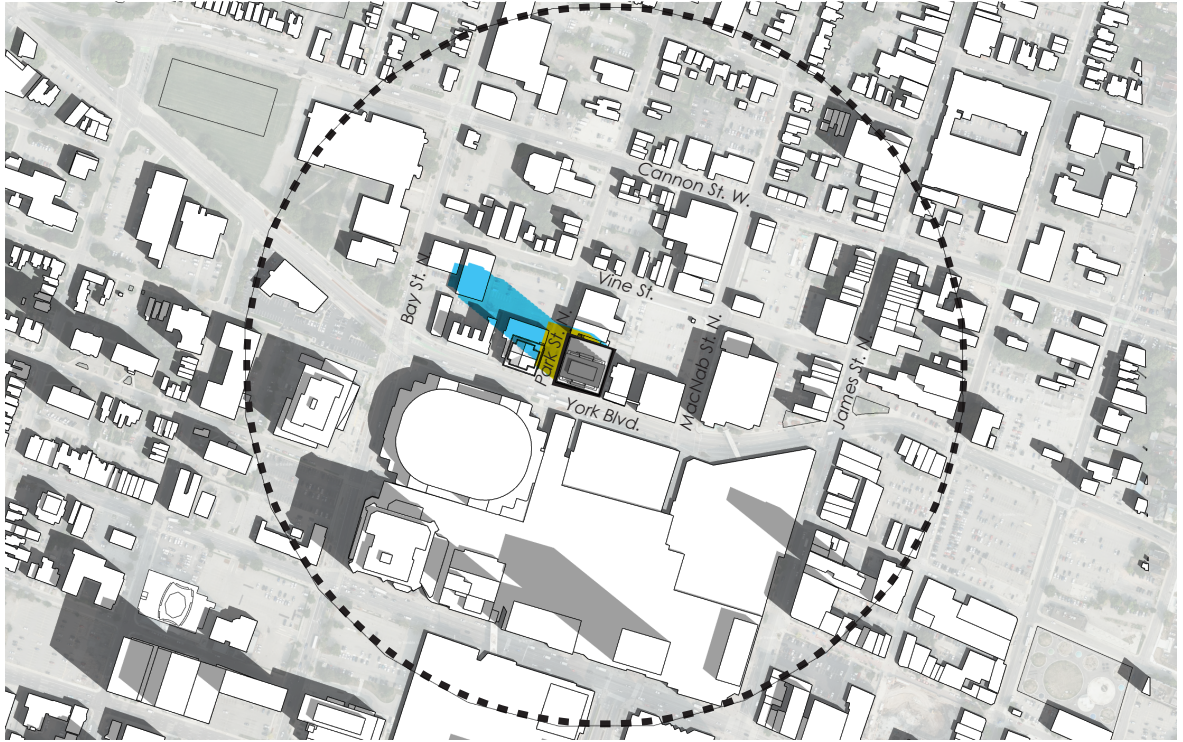


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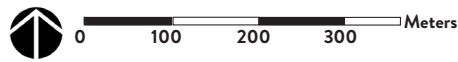
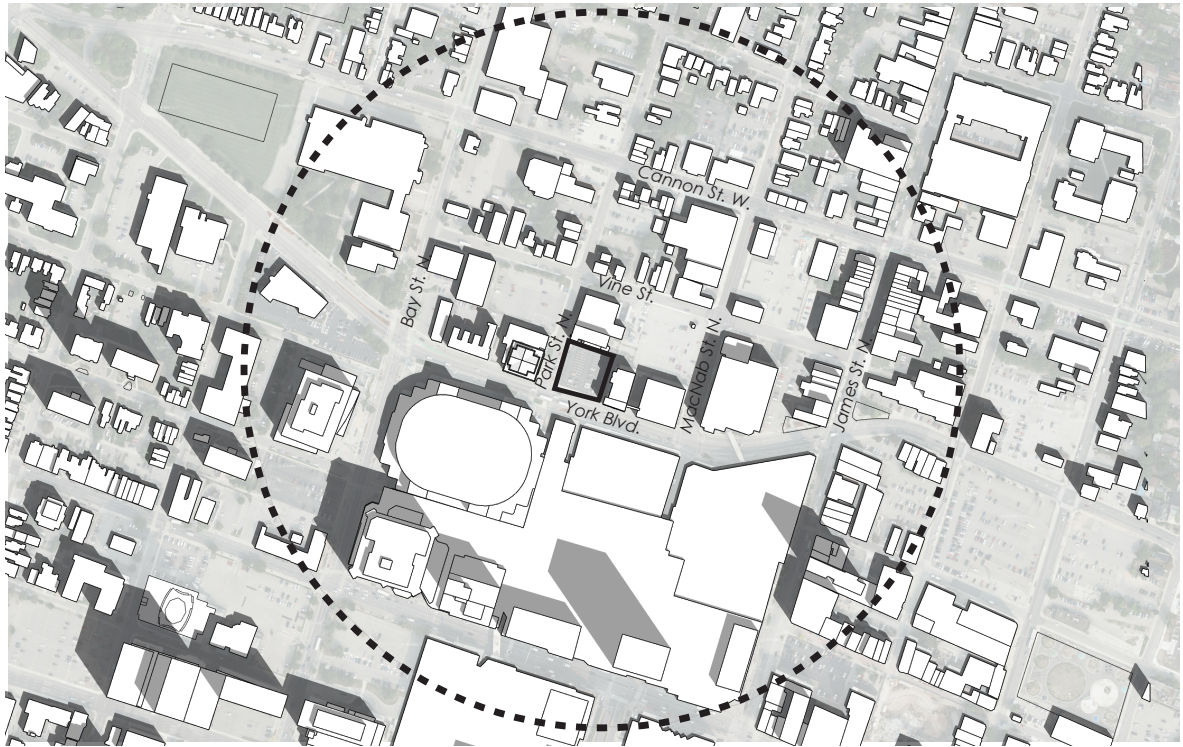


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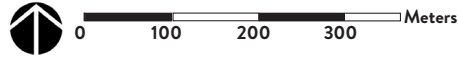
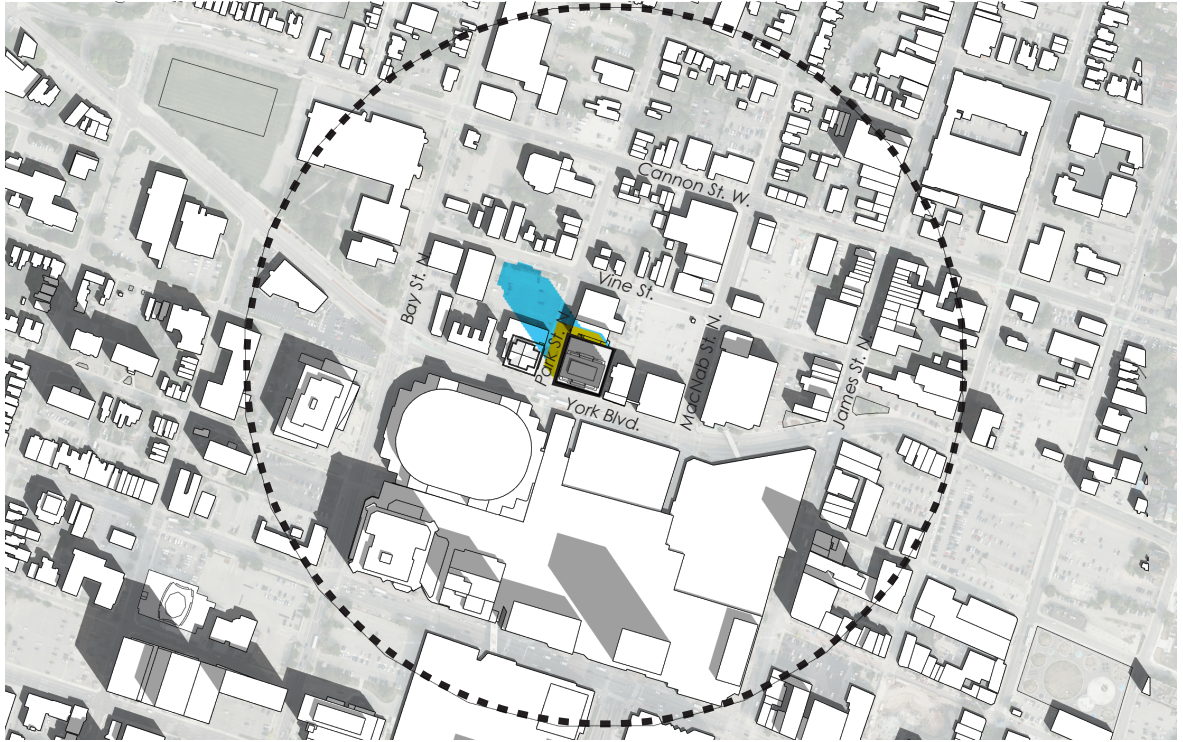


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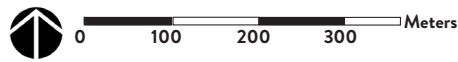
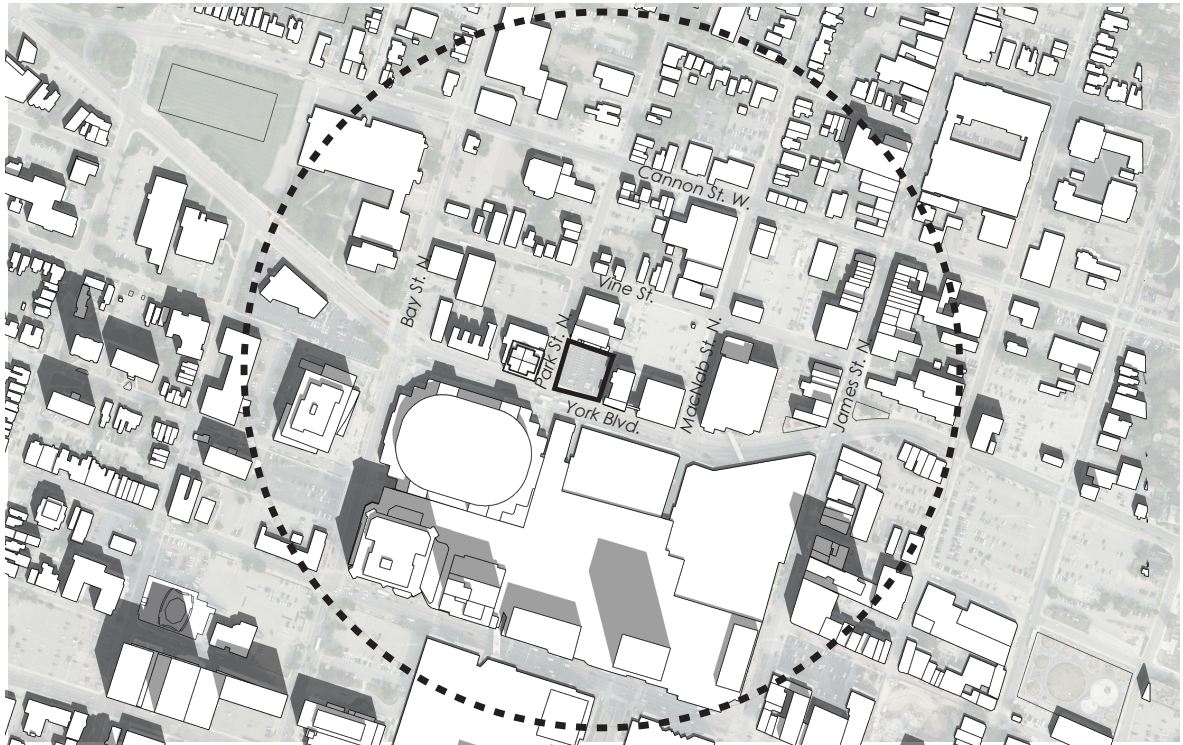


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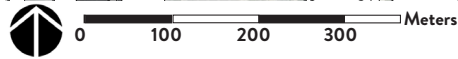
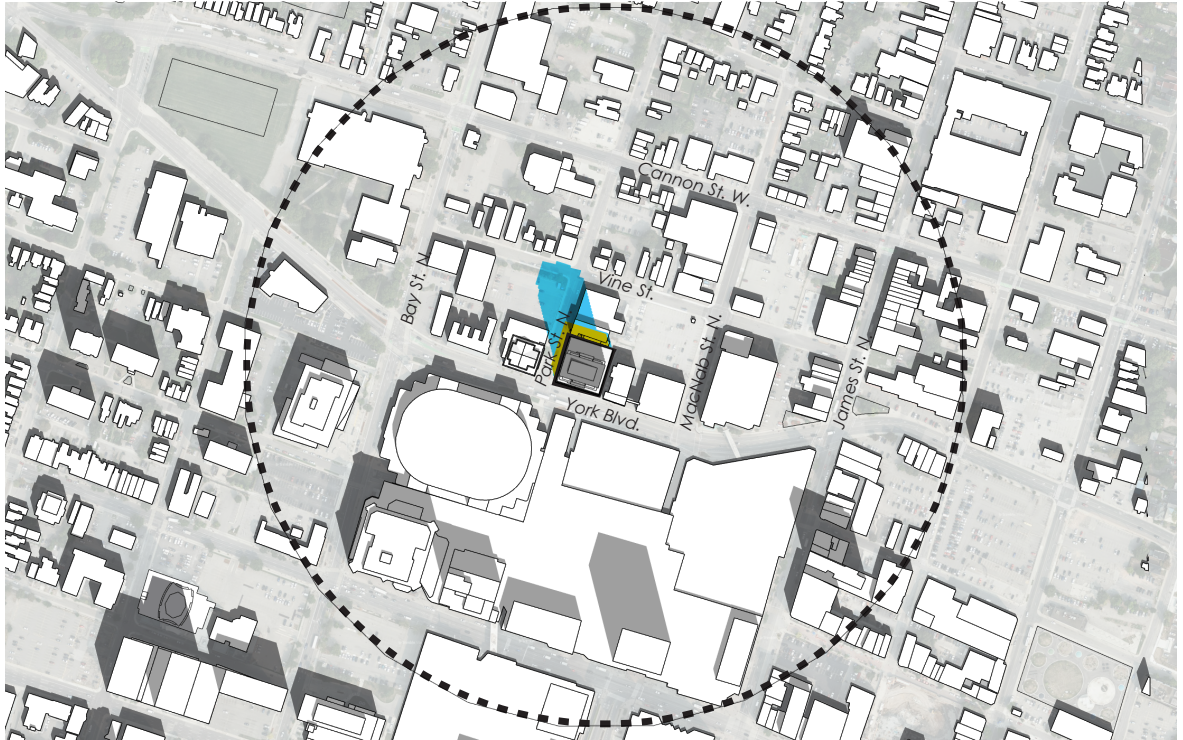


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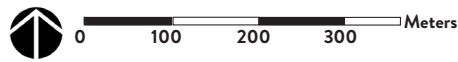
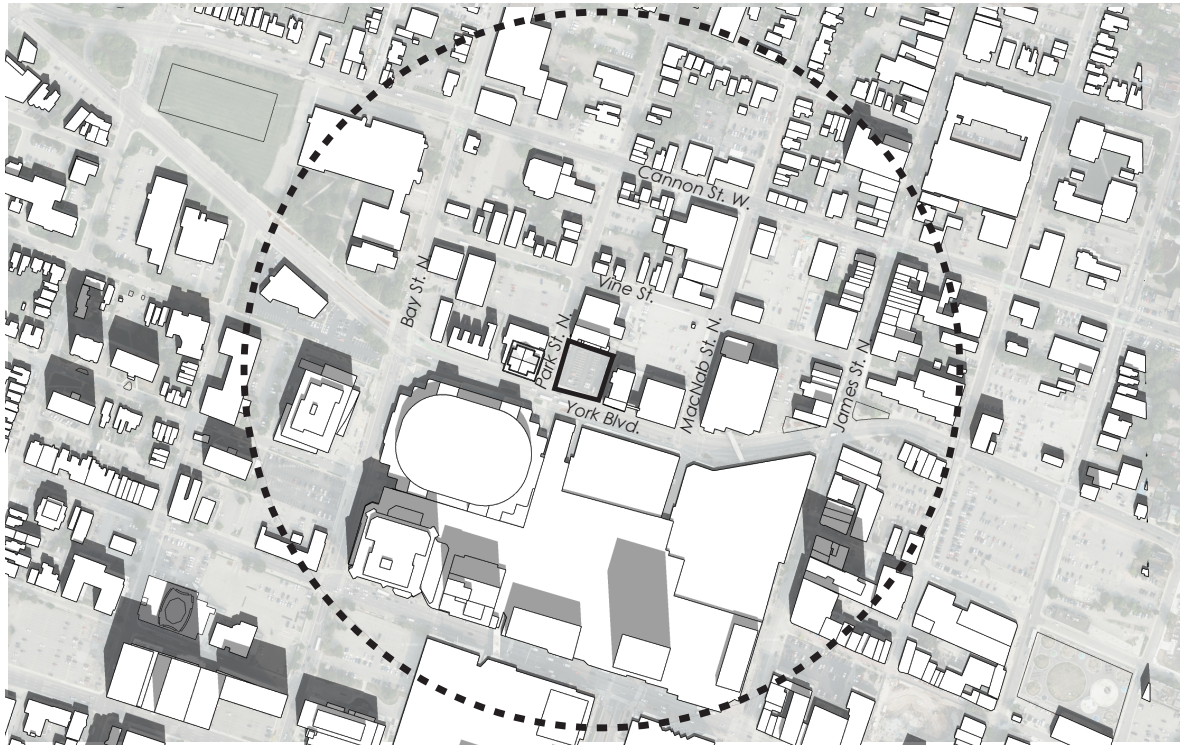


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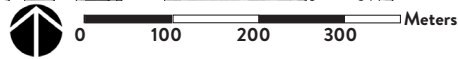
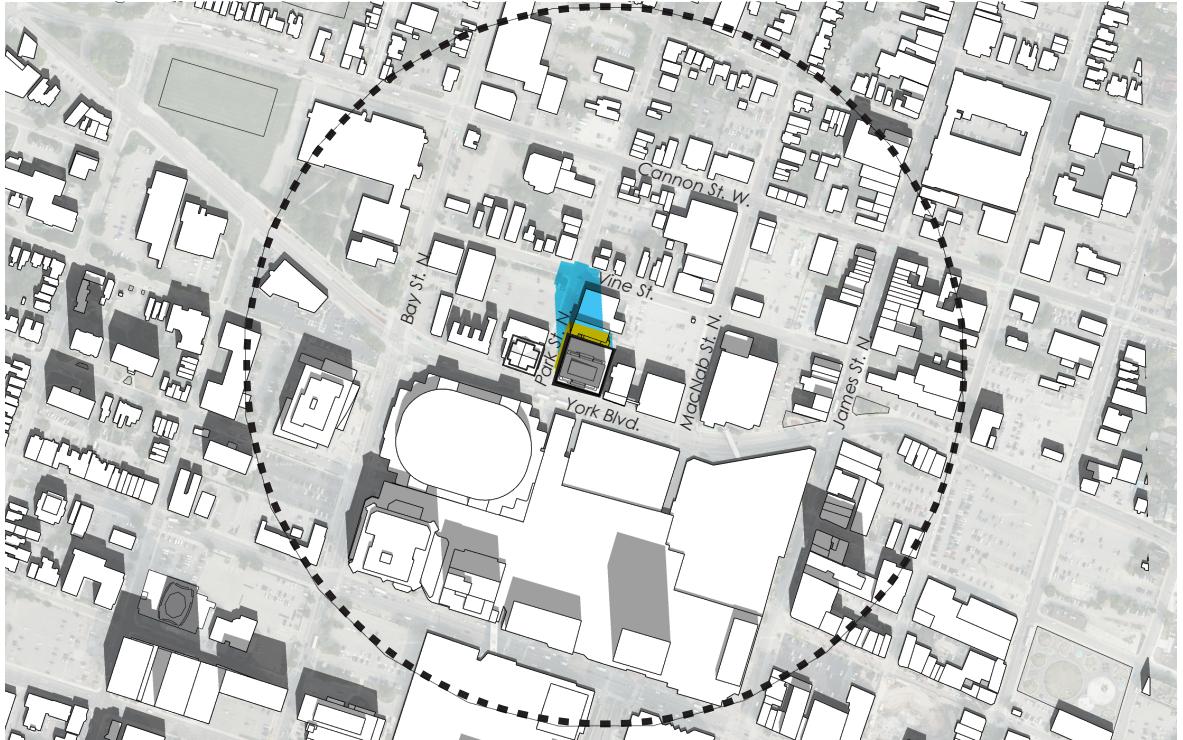


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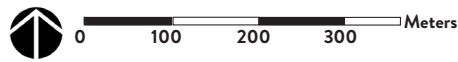
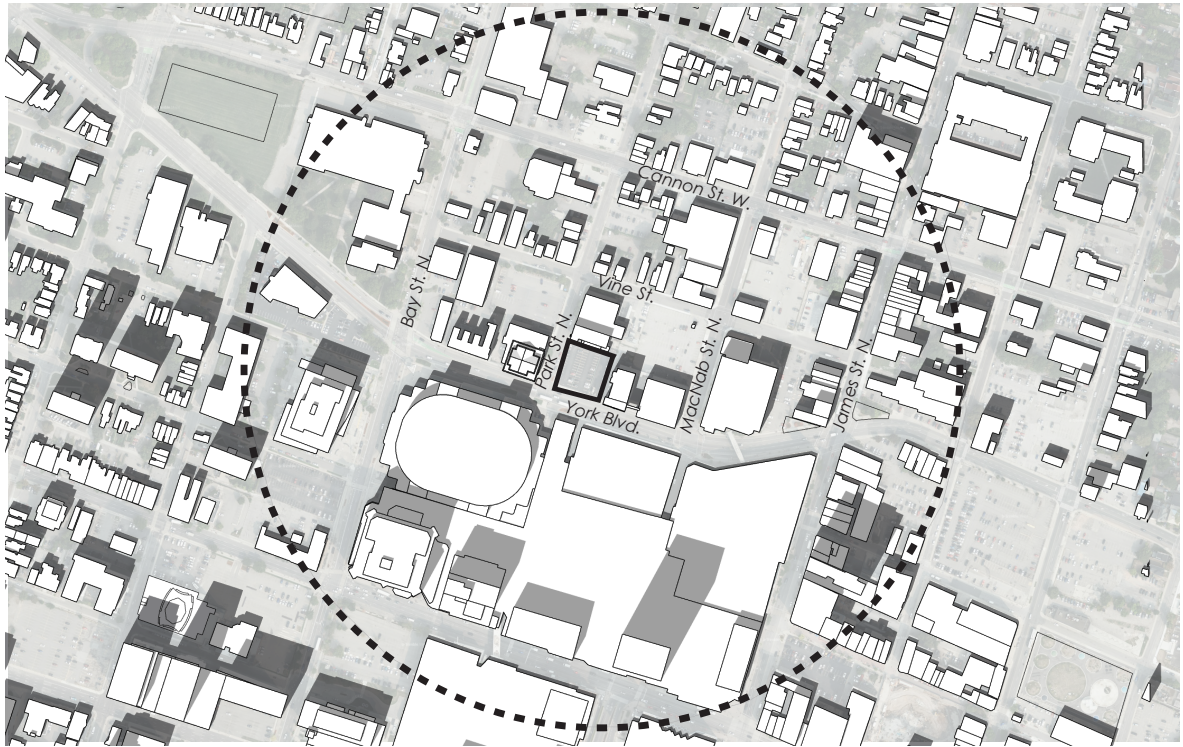


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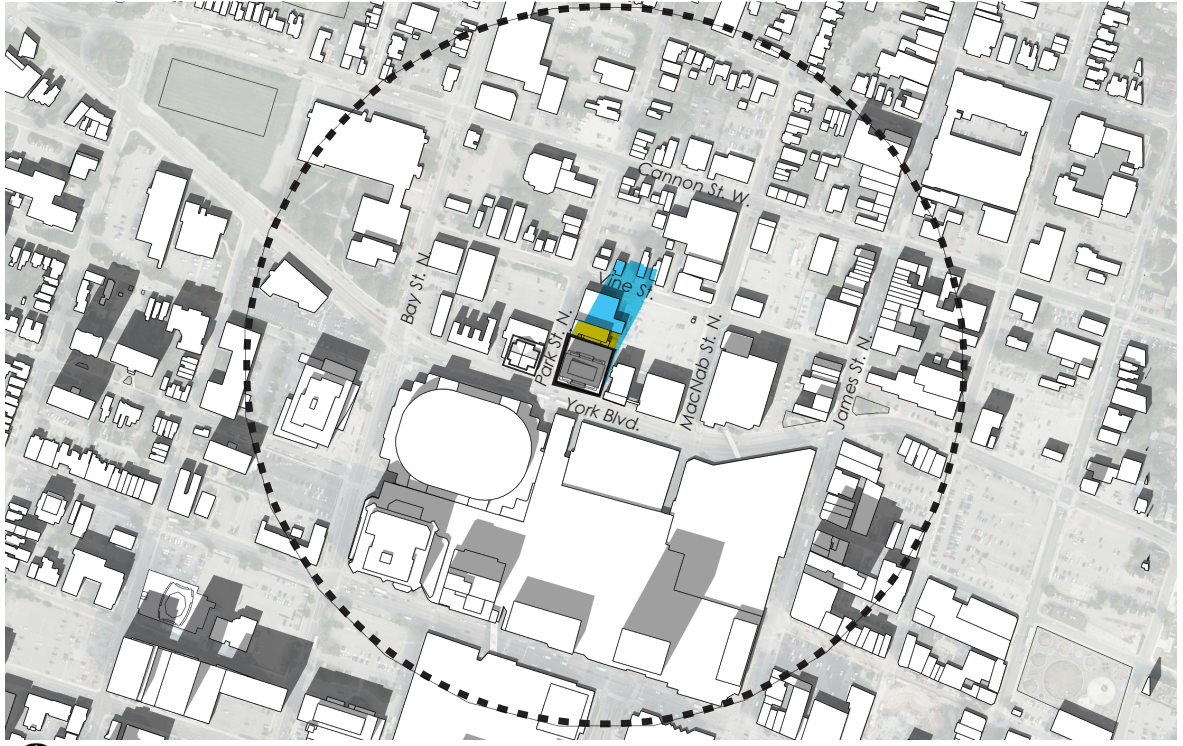


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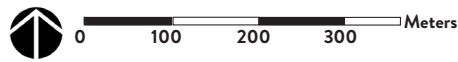
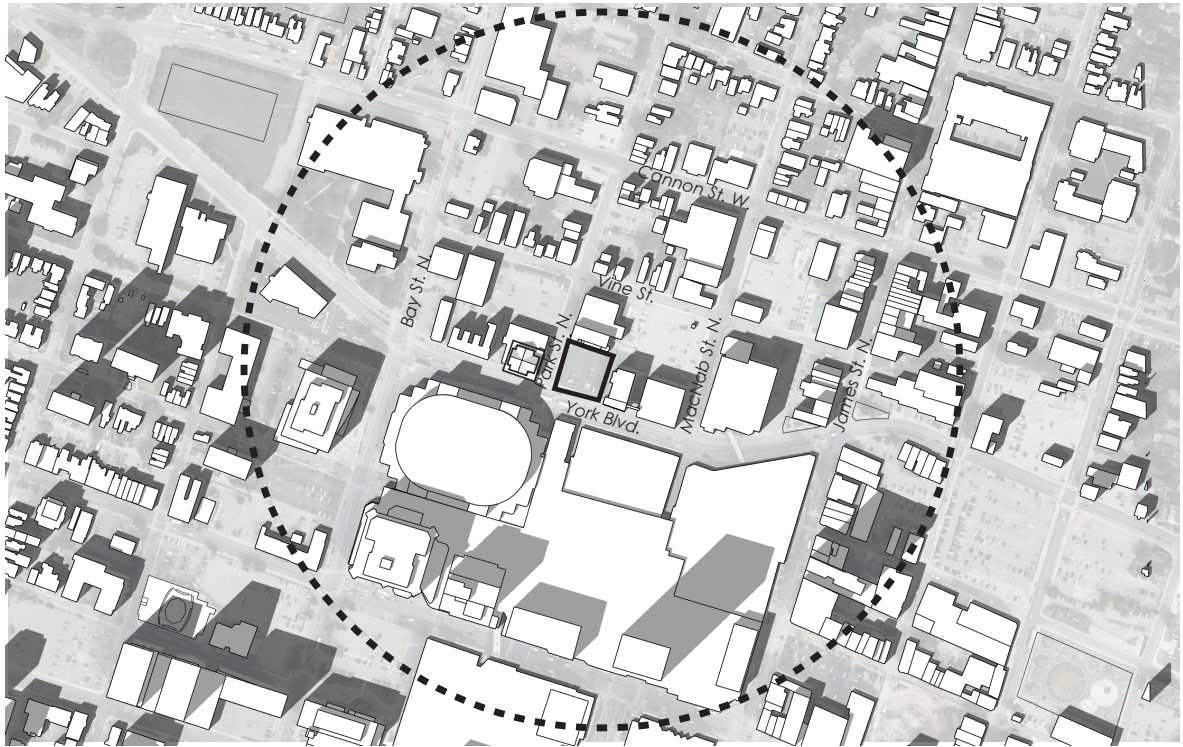


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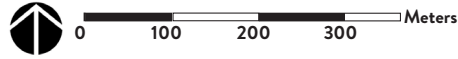
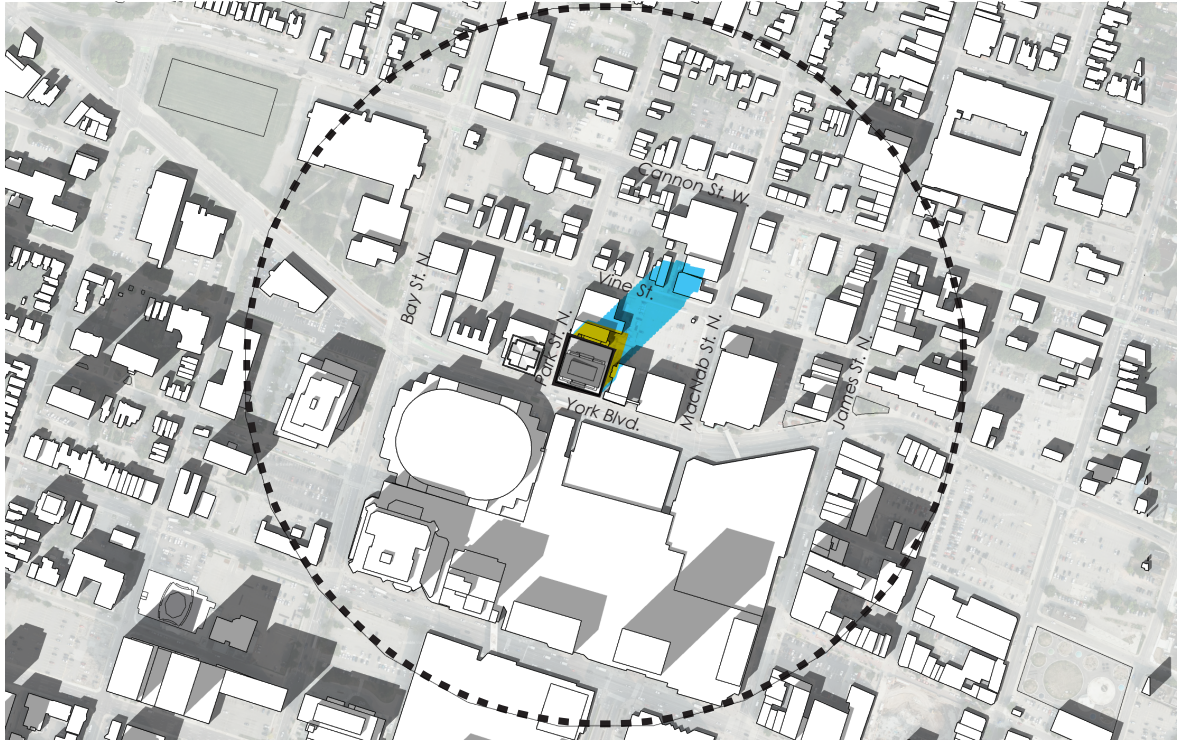


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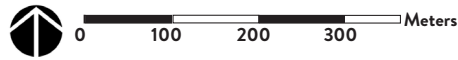
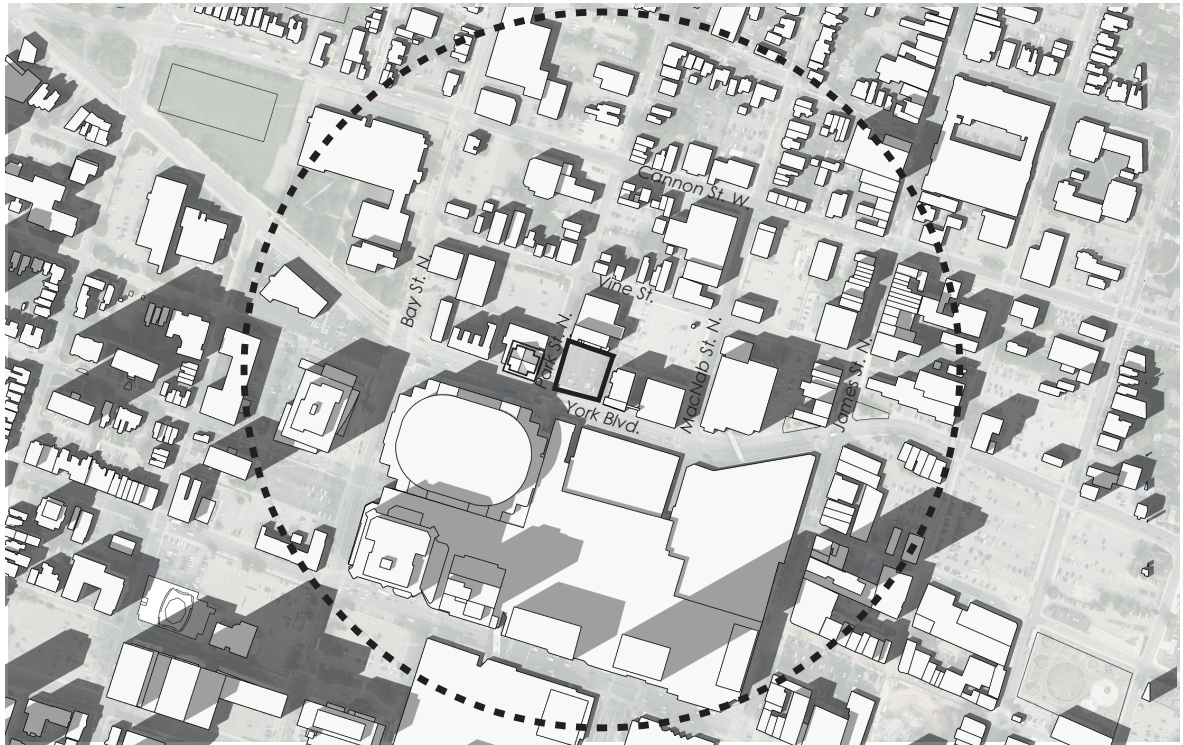


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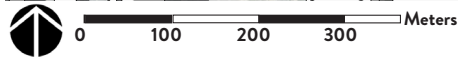
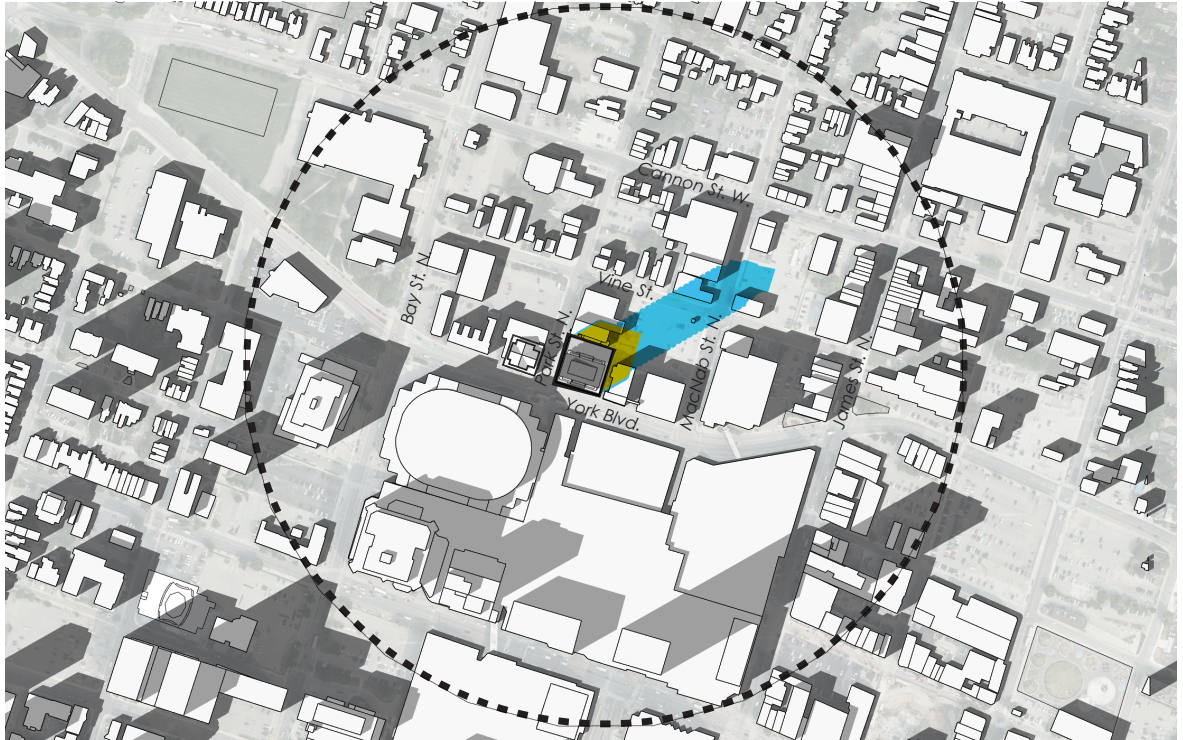


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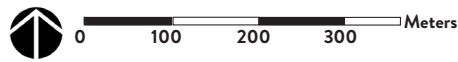
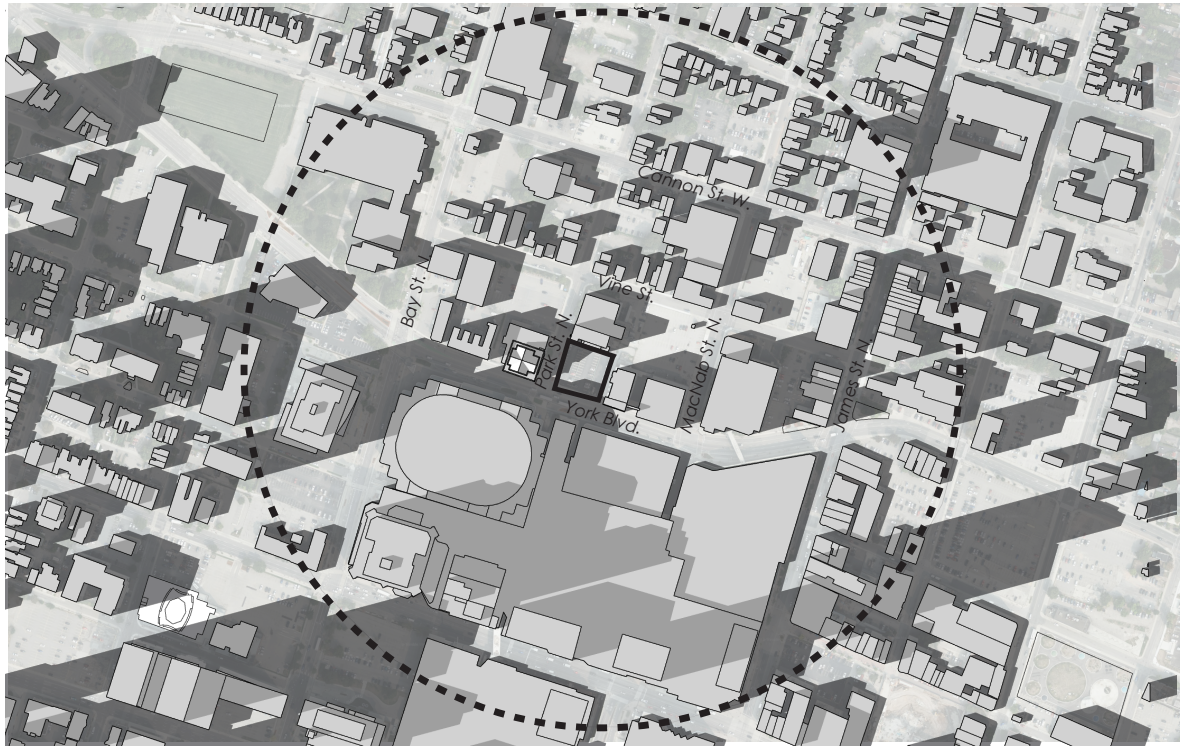


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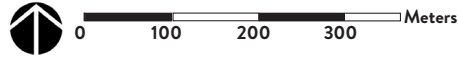
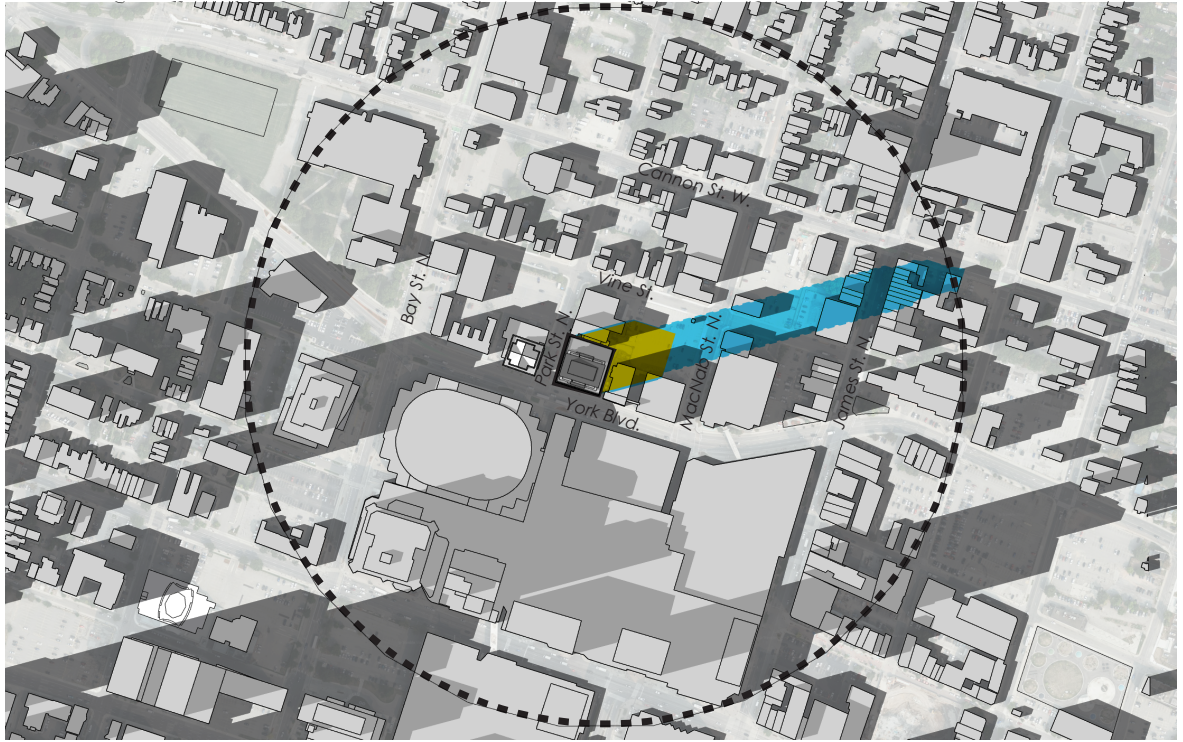


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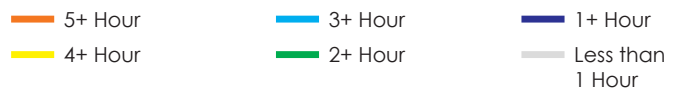
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FALL EQUINOX - SEPTEMBER 21ST

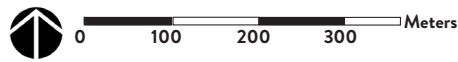
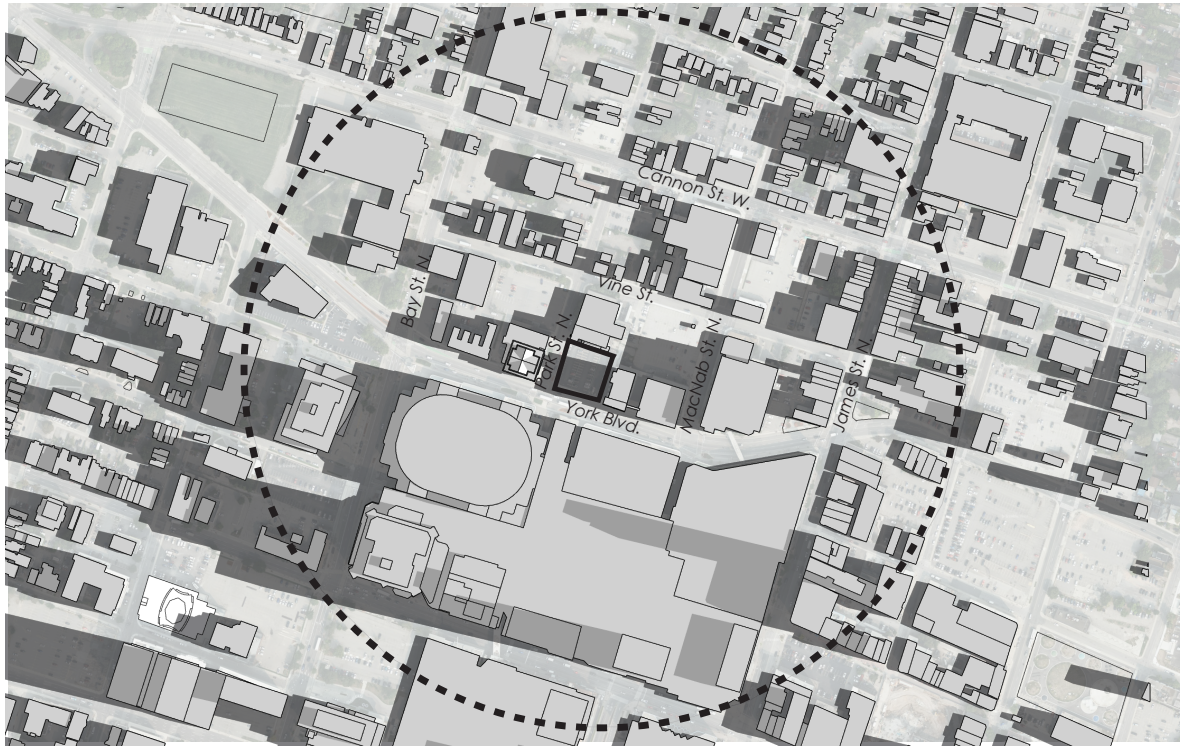
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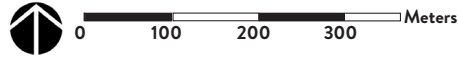
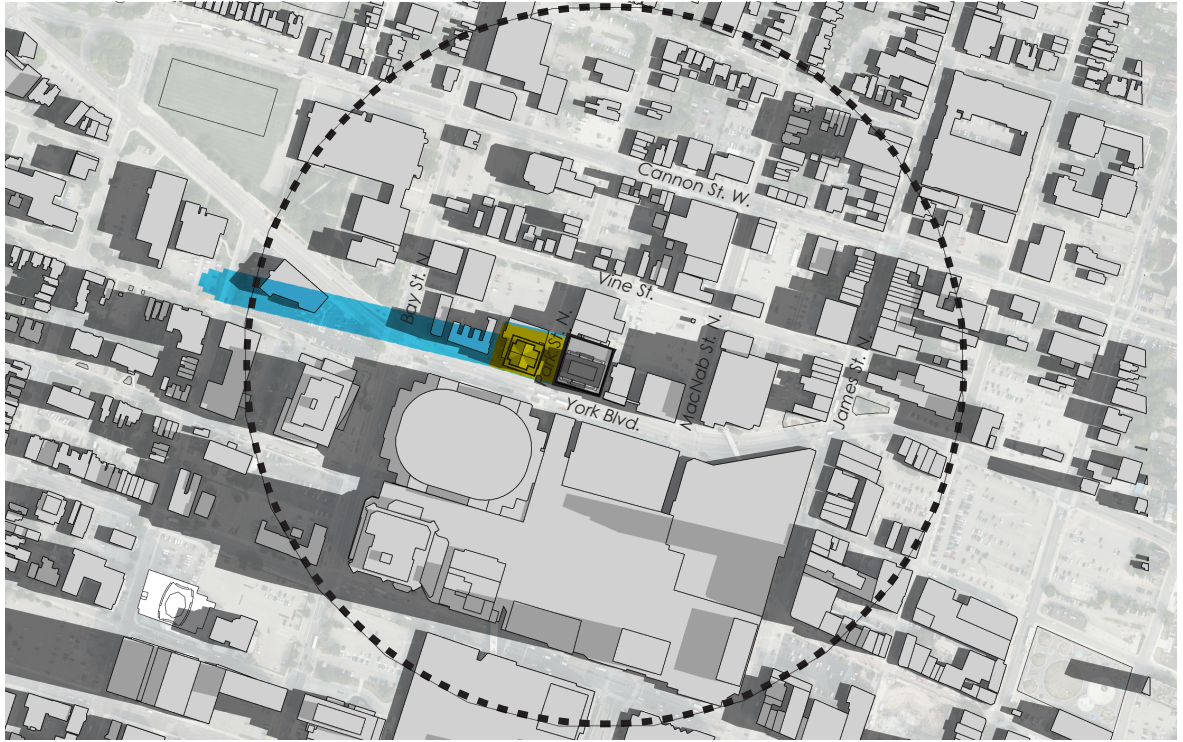
Sunlight Hours | Between 10am to 4pm



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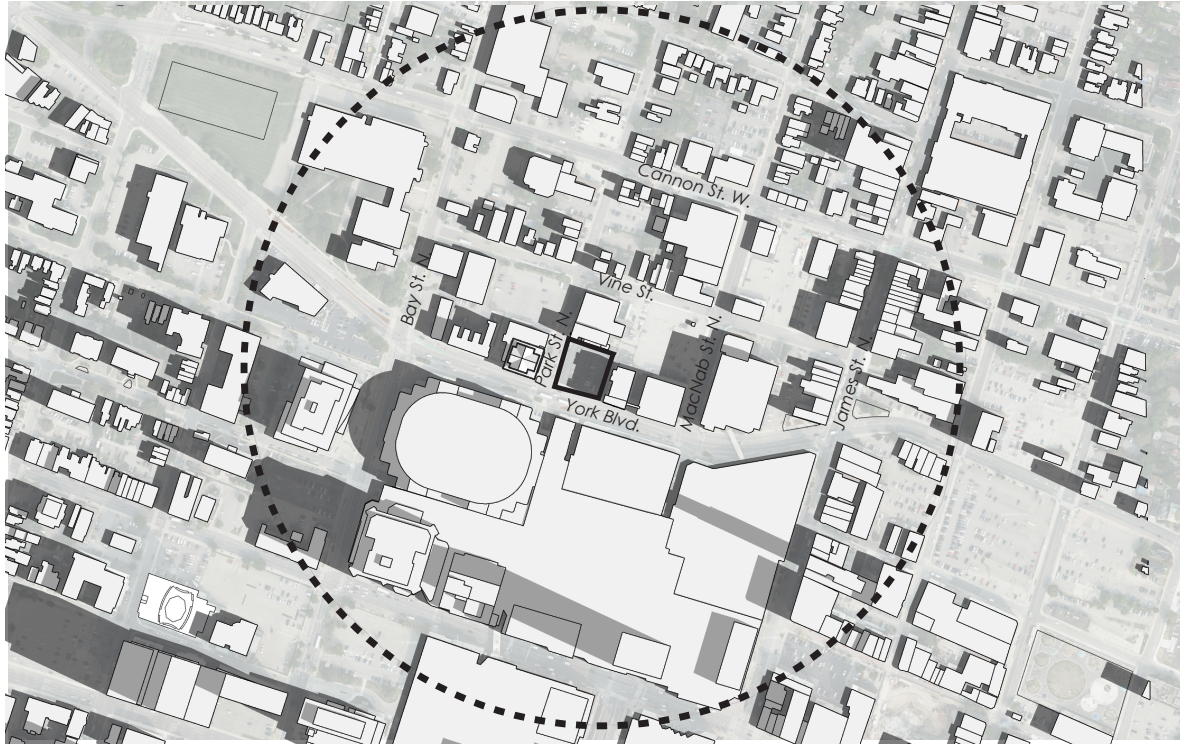


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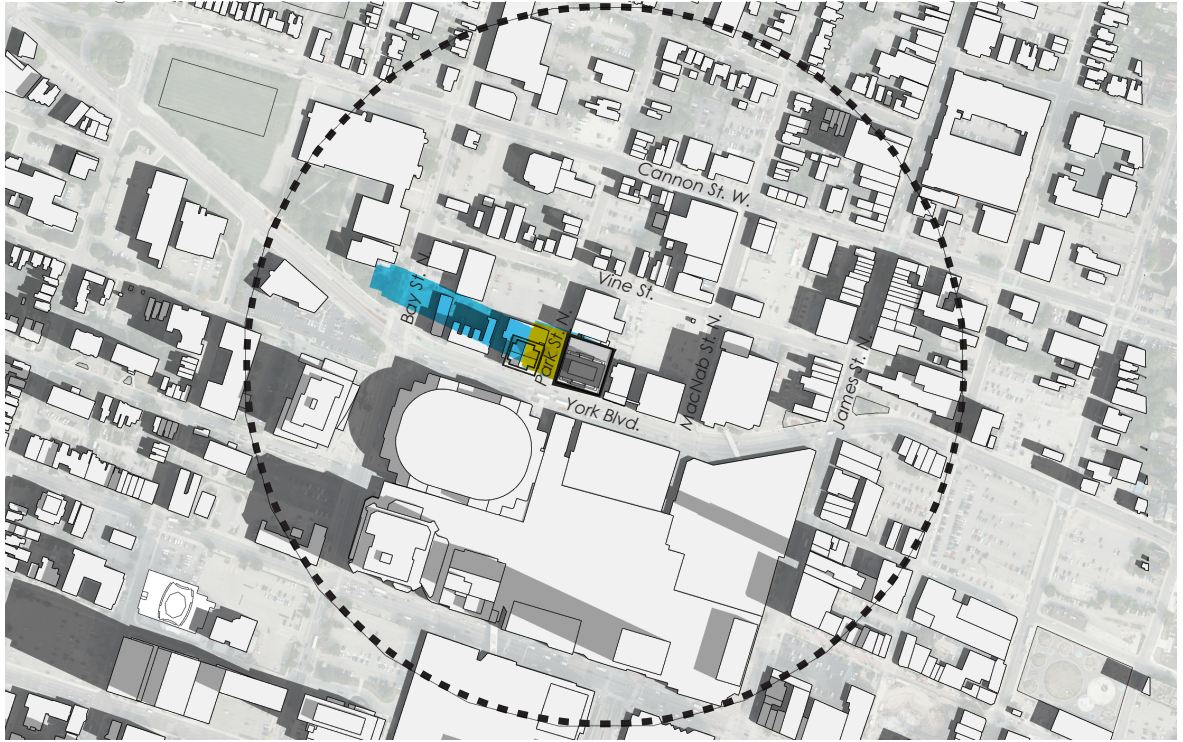


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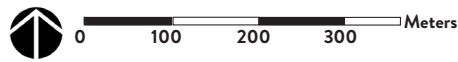
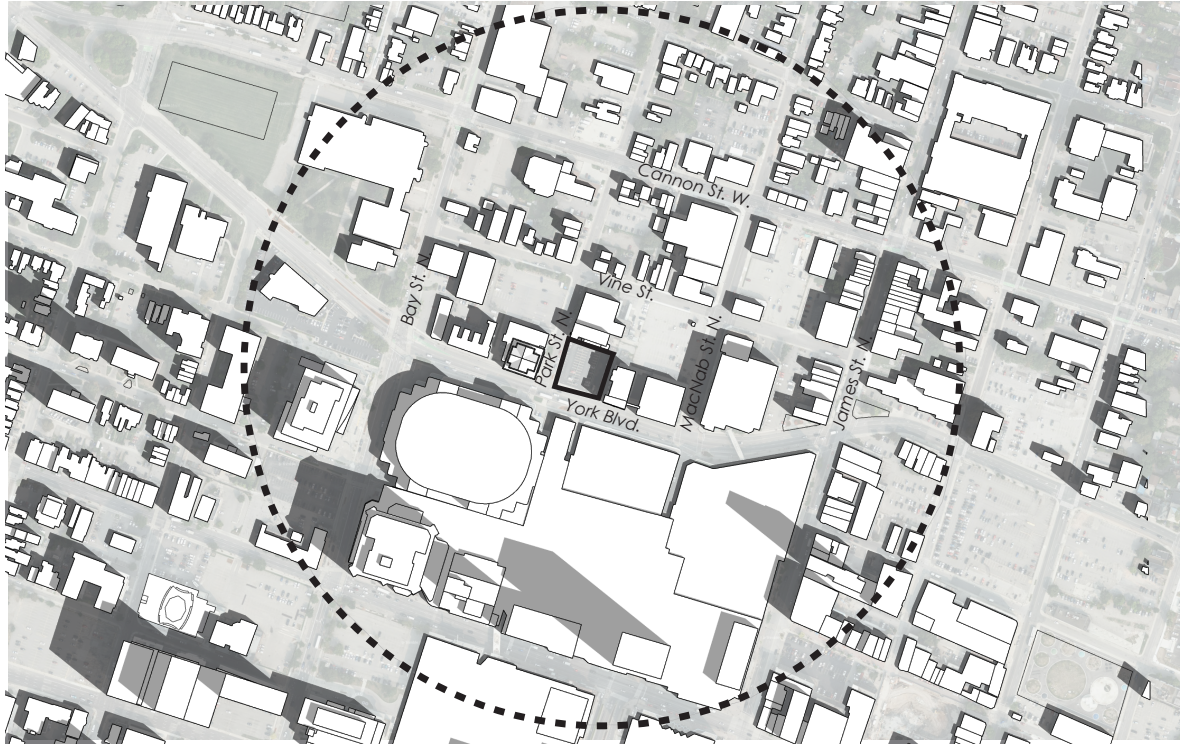


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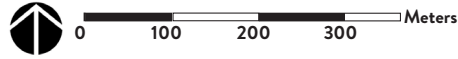
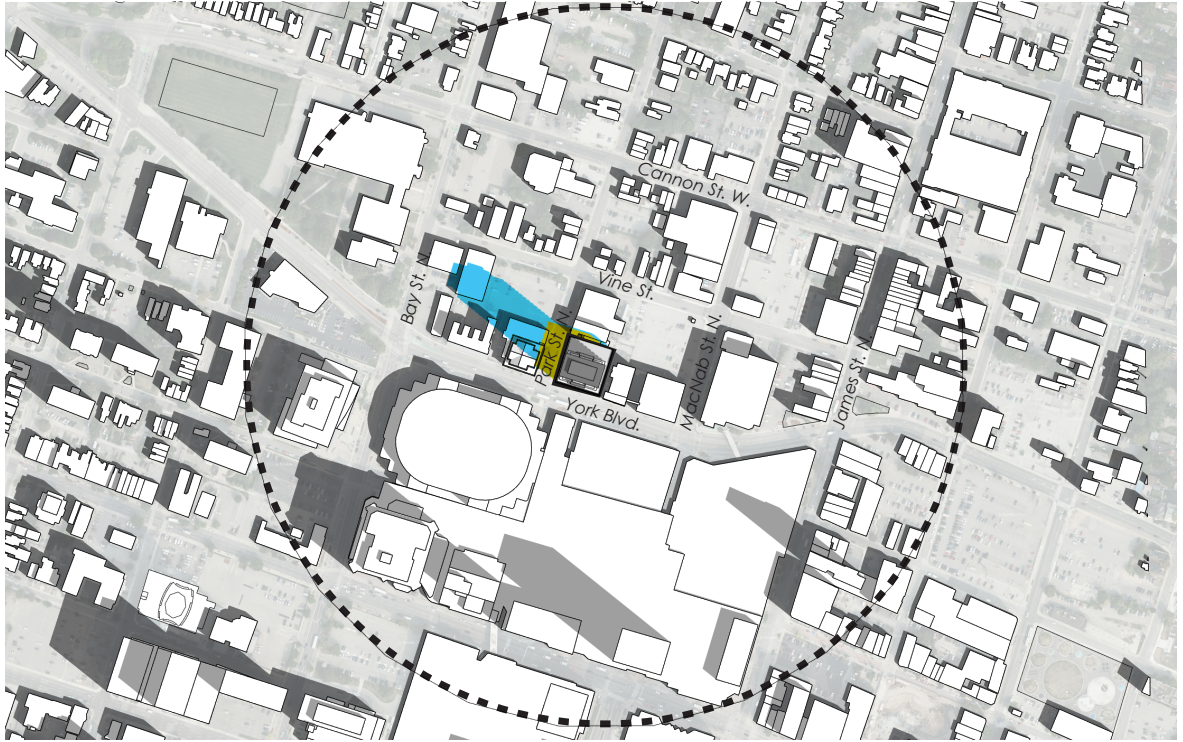


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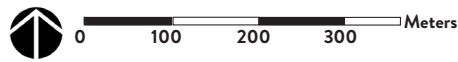
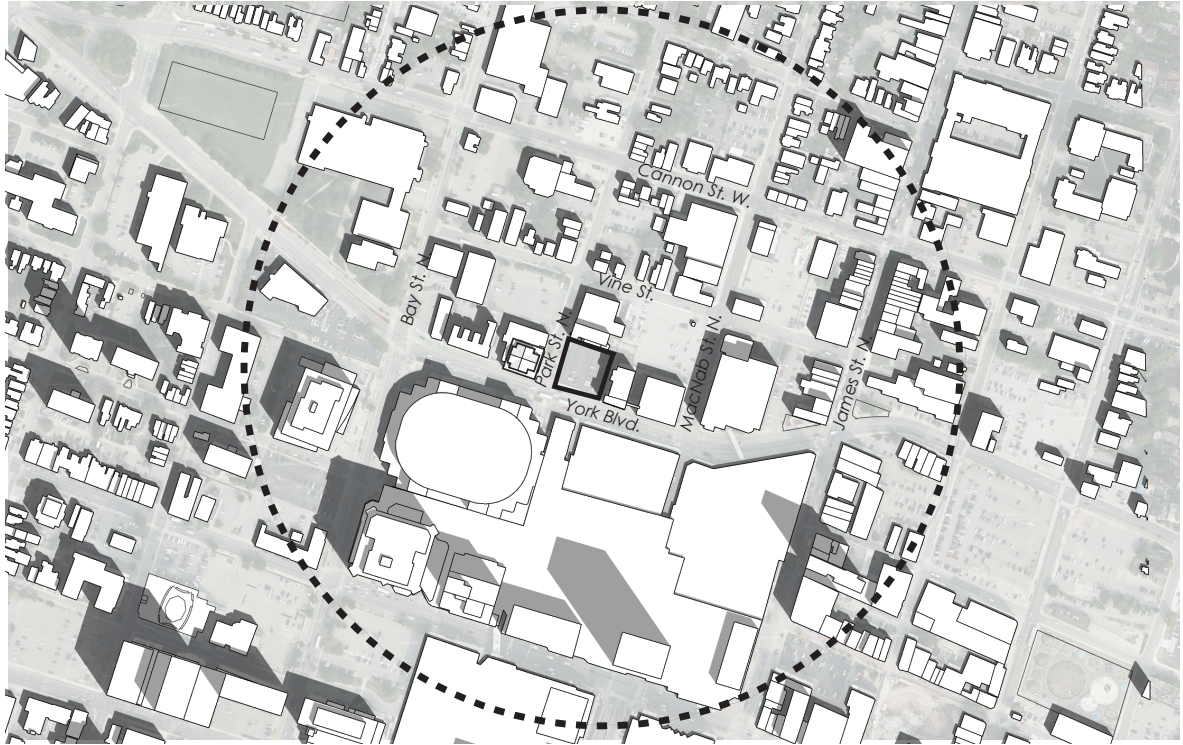


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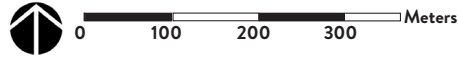
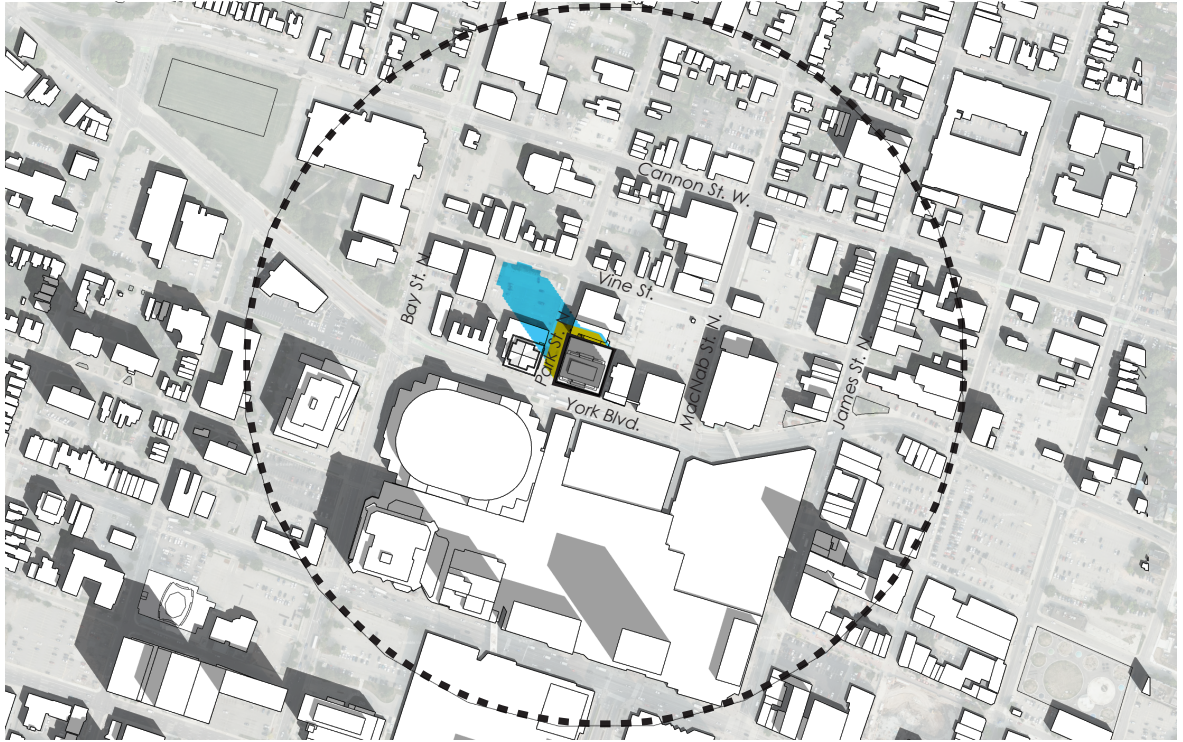


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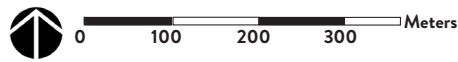
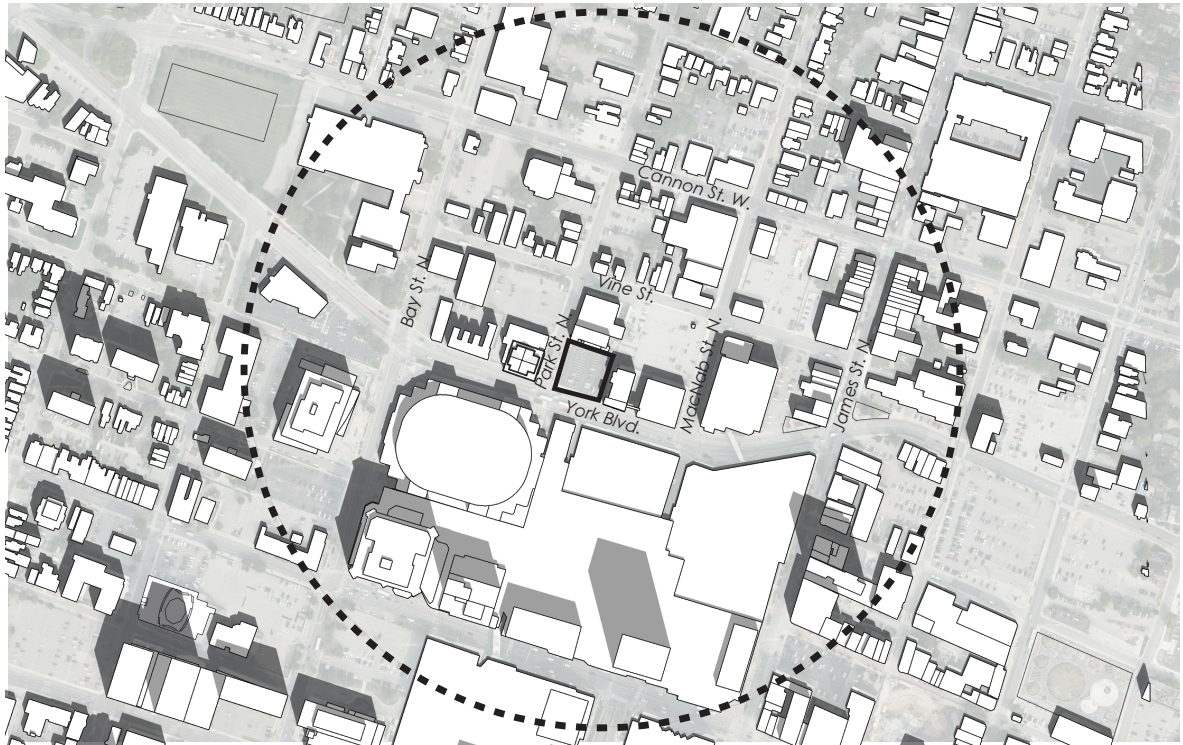


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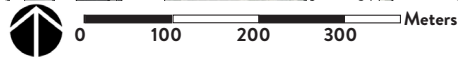
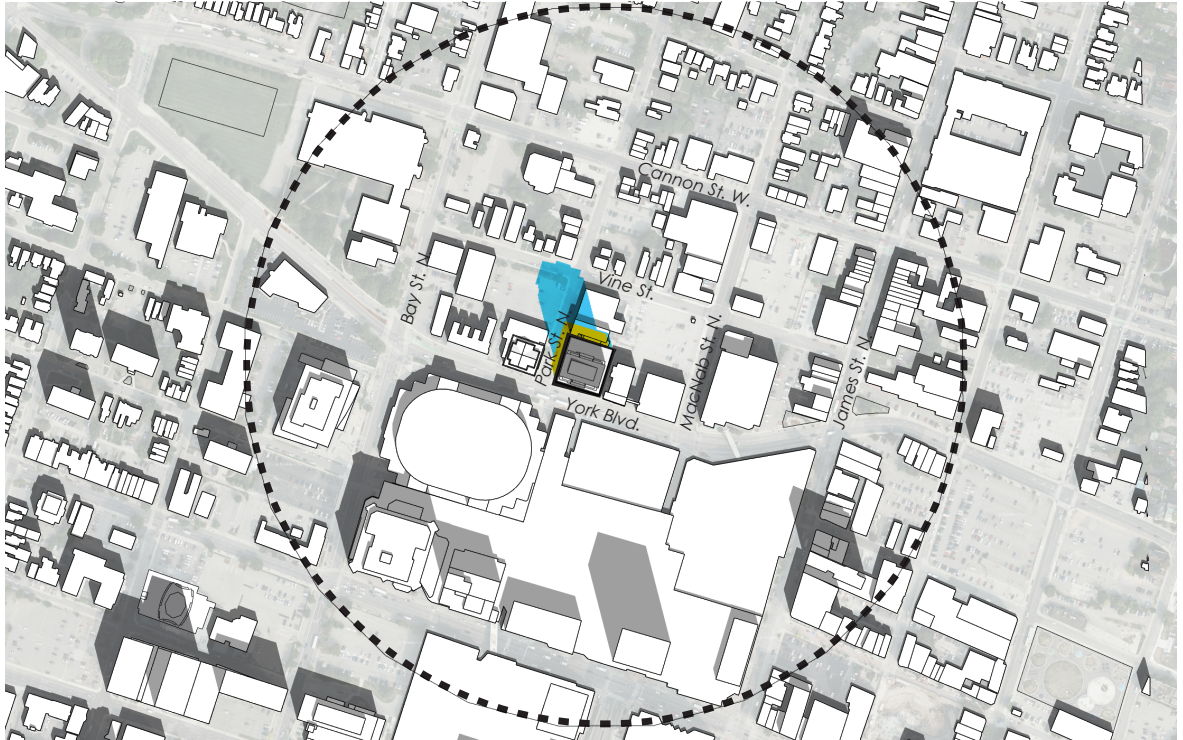


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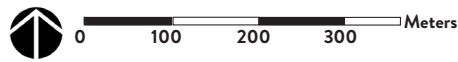
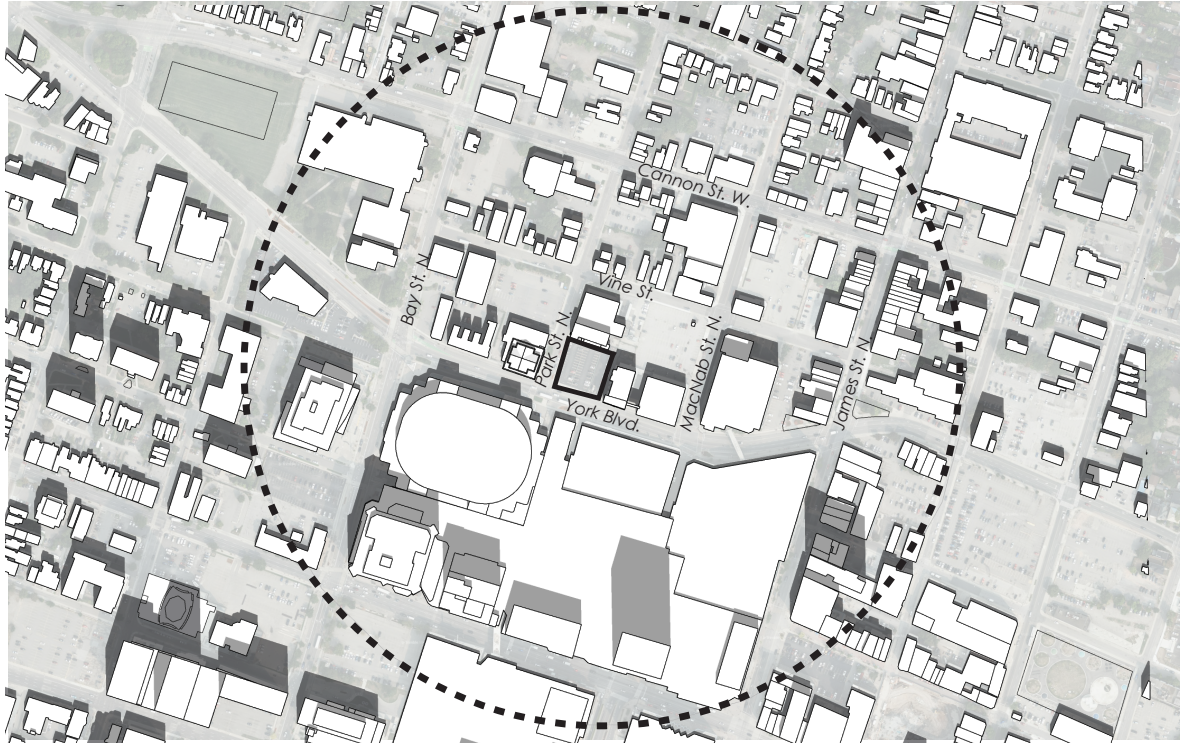


Proposed Condition

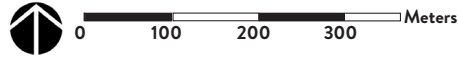
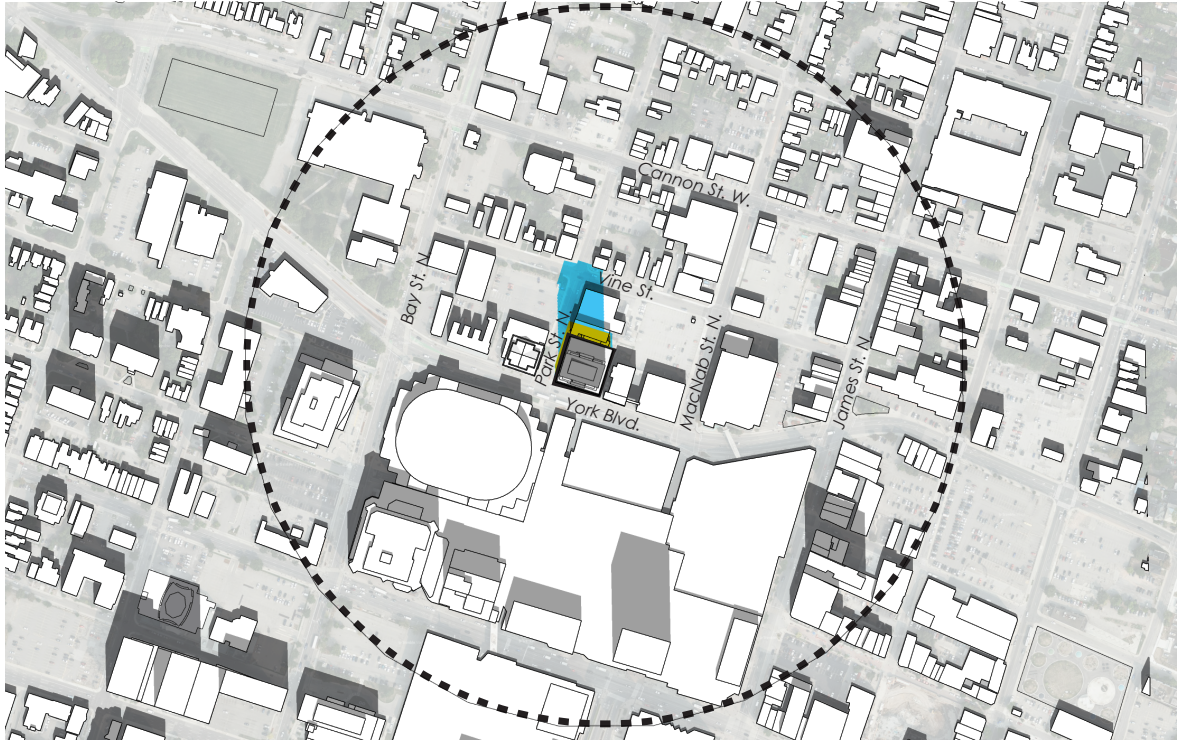


- As-of-right Shadow
- Net New Shadow
- Existing Shadow
- Distance Of Shadow Impact
(4X Building Height: 89.01m x 4 = 356m)
- Property Boundary

Existing Condition (Vacant Parking Lot)

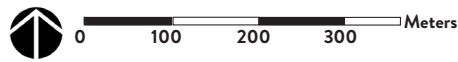
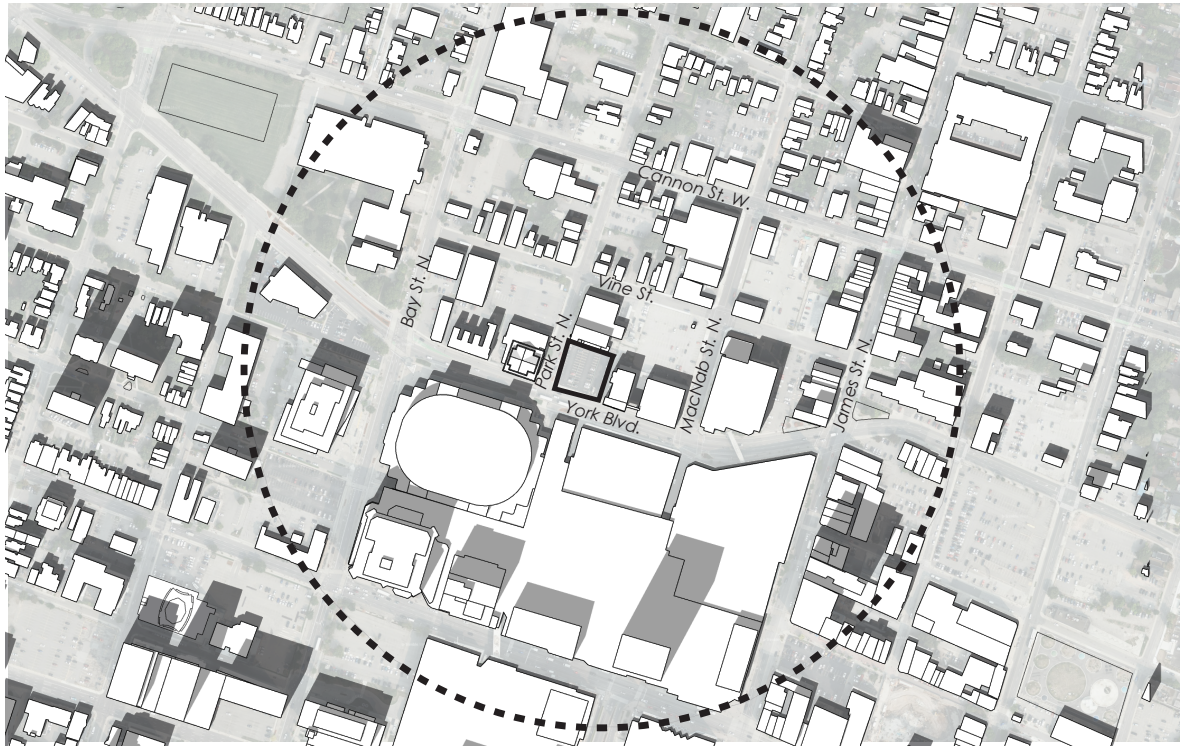


Proposed Condition

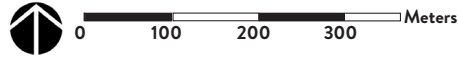
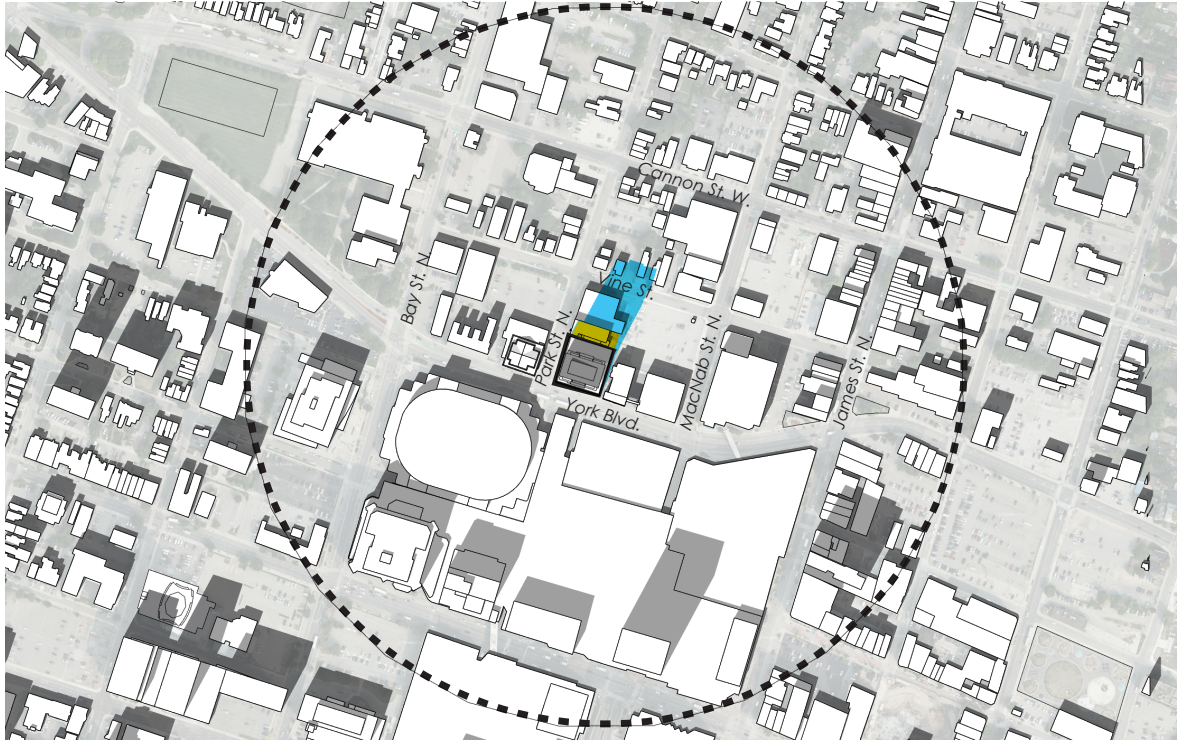


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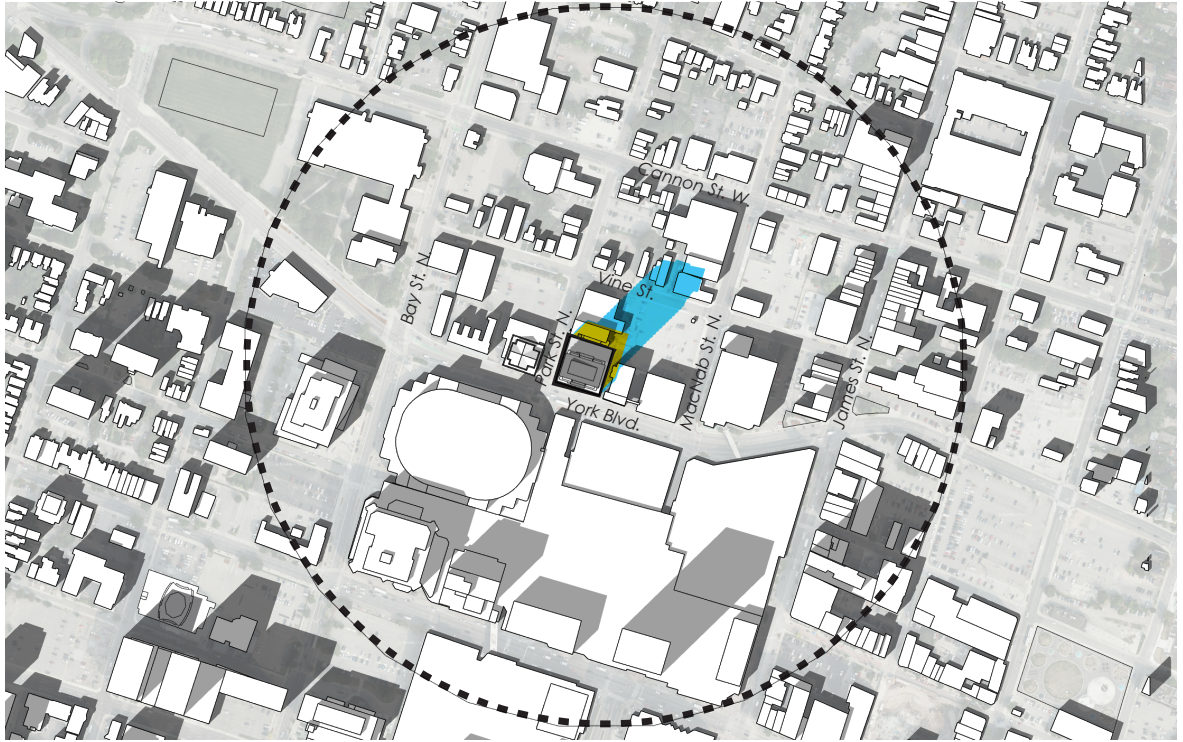


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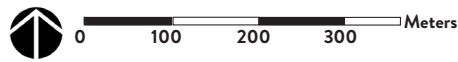
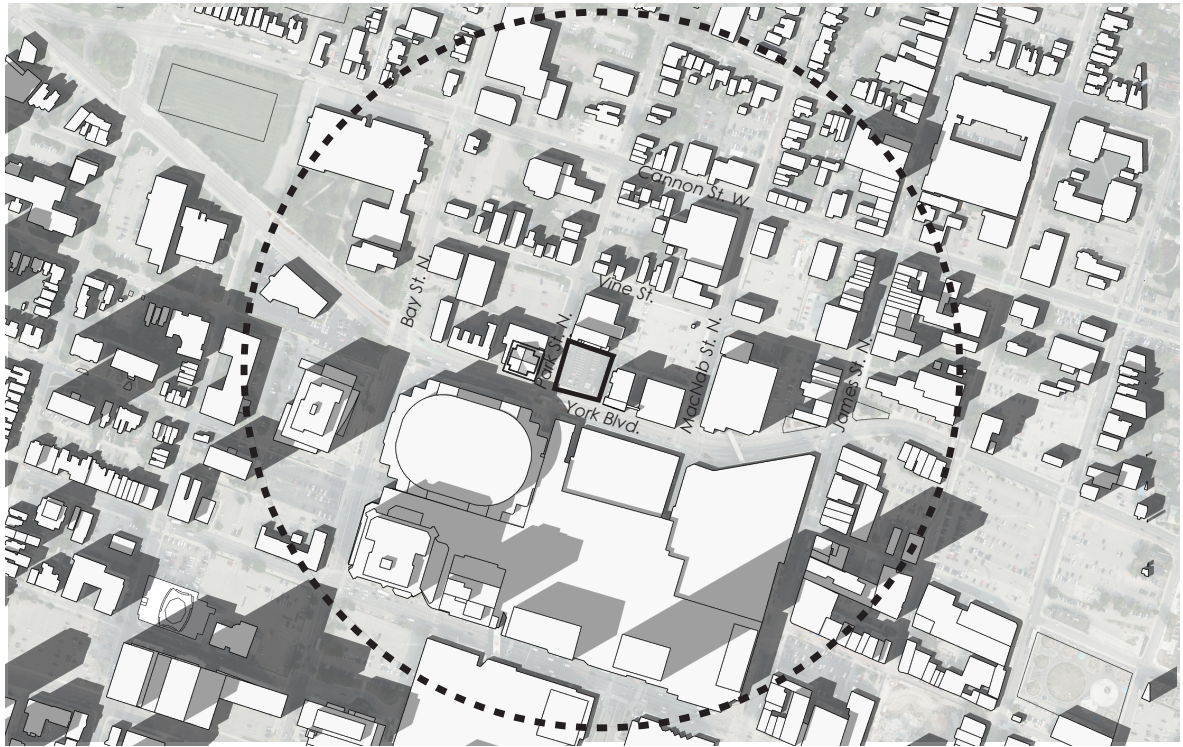


Proposed Condition

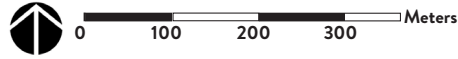
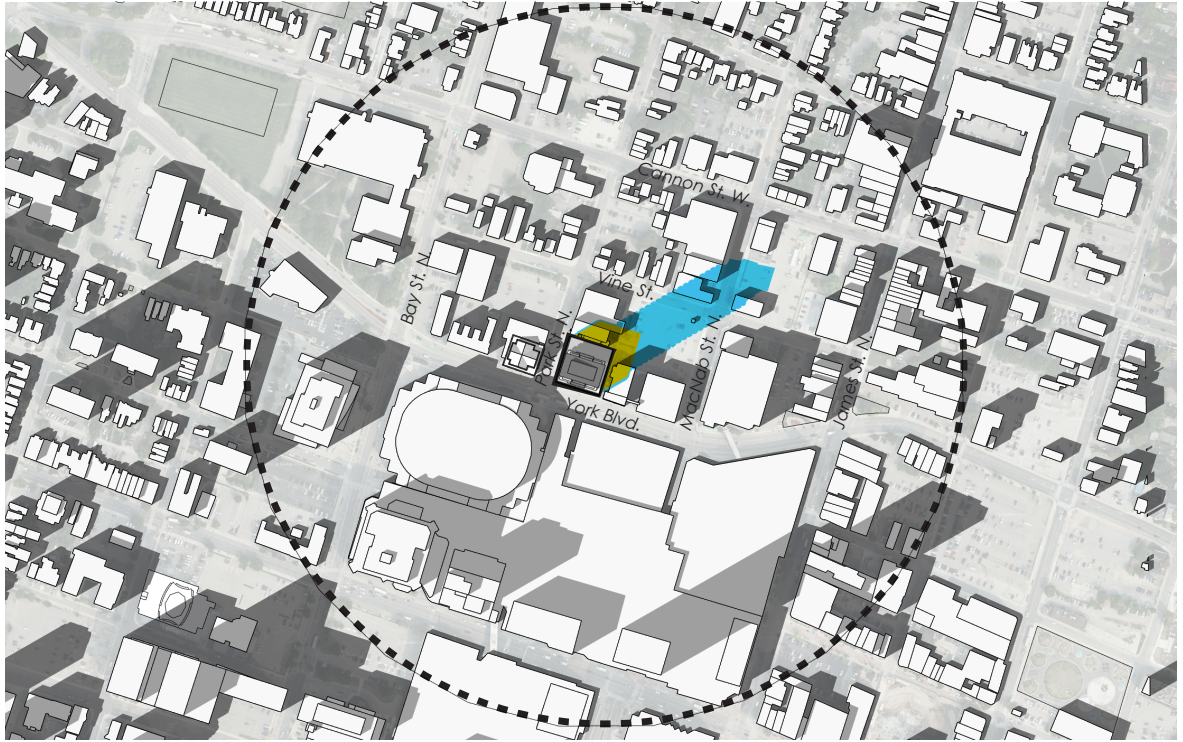


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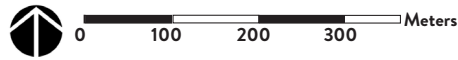
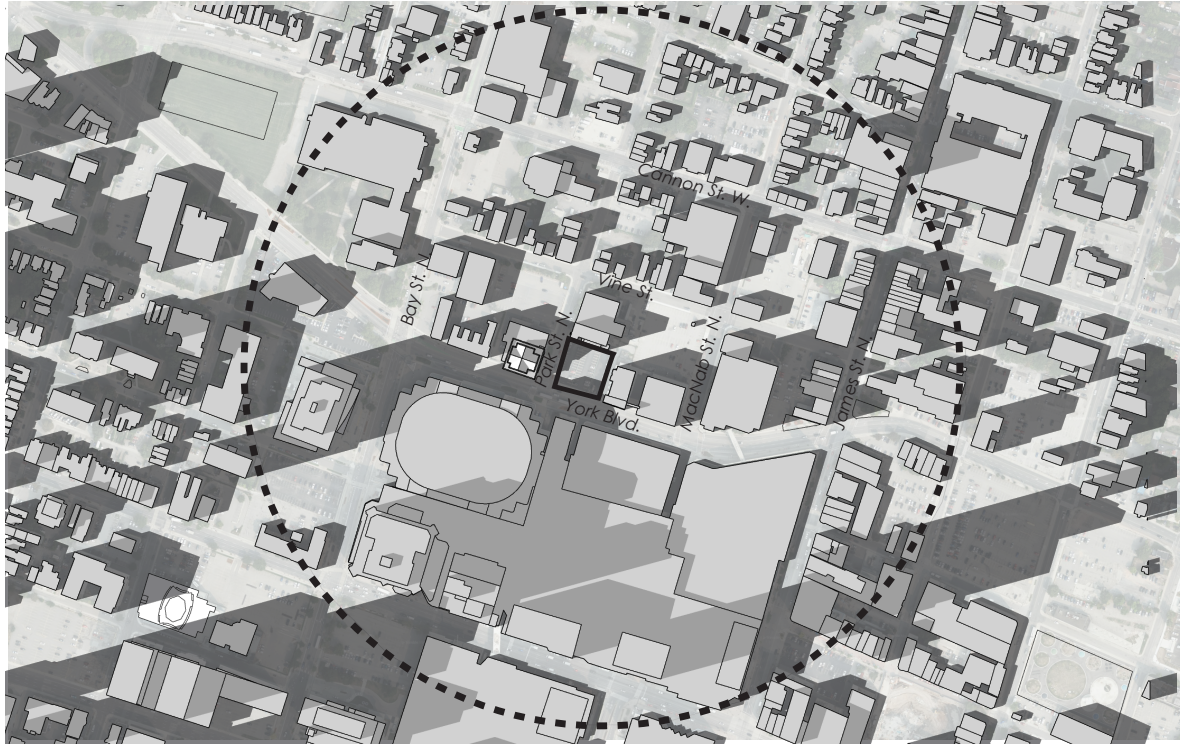


Proposed Condition

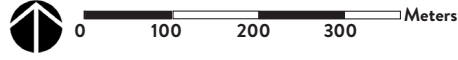
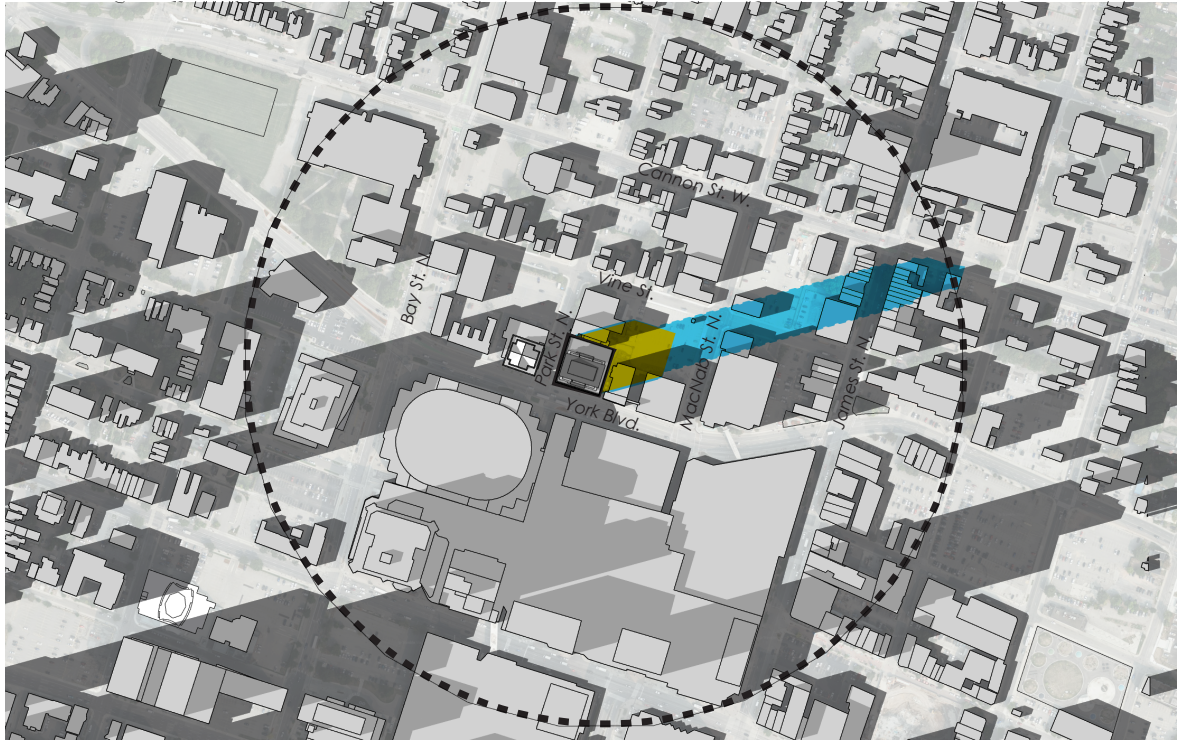


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Proposed Condition



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REFERENCES

- 1) *Hamilton Development Application Guidelines: Sun Shadow Study*
- 2) *Sun rise and sun set times for the City of Hamilton, timeanddate.com*
(<https://www.timeanddate.com/sun/canada/hamilton?month=9&year=2019>)
- 3) *Base map, building location and height: Google earth.*



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