



# SUN SHADOW STUDY

OPA 20-002P, A006-20 RESUBMISSION

603-643, 645-699 KINGSTON ROAD  
CITY OF PICKERING

November 2023  
WESTON FILE #9737

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# 1.0 INTRODUCTION

This Sun Shadow Study ('Study') has been prepared by Weston Consulting to illustrate the shadow impacts of the proposed mixed-use development on the lands municipally addressed as 603-643, 645 & 699 Kingston Road in the City of Pickering.

The proposed development consists of 7 buildings including 3 mid-rise buildings and one high-rise building along Kingston Road and 3 high-rise buildings abutting Highway 401. A total of 3,460 dwelling units are accommodated on-site as well as 2,707 square metres and 3,457 square metres of retail and office space, respectively. A total of 2,768 parking spaces are accommodated within the revised proposal through two levels of underground parking and an above-grade parking structure within the podiums of Buildings A, B and C.

This Study supports the revised proposal, reflecting comments received from Municipal Agencies and Departments and comments received from the public. The enclosed material is being resubmitted in accordance with communications received from the City Planning and Development Services Staff.

Within the immediate vicinity of the subject site are predominantly big-box retail stores and light industrial uses. Approximately 130 meters north of the site, across Kingston Road and behind various retail stores, is a primarily single detached dwelling neighbourhood. The subject property is also in close proximity to Steeple Hill Park to the northwest, and Petticoat Creek Conservation Area to the south by Lake Ontario. In terms of the surrounding development context, a 12-storey residential mid-rise building is currently under construction along Whites Road. Municipally addressed as 1475 Whites Road North, the development features a total of 227 units and 2 levels of underground parking. The built form was included in the Study and massed approximately given available resources to assess the potential shadow impacts.

The Terms of Reference for this Study was provided by the City of Pickering and is described as a technical document that provides a visual model and written description of the impact of shadows cast by a proposed development on adjacent parks, schools, buildings and properties.

A Shadow Study is required for applications for development over 13 metres (4 storeys) in height. This Study has been prepared in accordance to the terms of reference.

The Study includes:

- all streets, lots, blocks, parks, schools and open spaces as well as buildings to a distance adequate to show the shadow impacts during requested times;
- the shadow conditions from other abutting buildings; and,
- references a base plan plotted at a standard metric scale with a bar scale on each sheet.

Test Times include: March 21st, June 21st, September 21st and December 21st at the following hours:  
9:18 am, 11:18 am, 1:18 pm, 3:18 pm, 5:18 and 7:18 pm (if before sunset).

• Format of the Study:

- The Study was conducted using a geolocated 3D Sketch-up model that was run through shadow simulations at the required times.
- Building heights were determined through standardized floor-to-floor heights:
  - Ground Floor: 4.5 meters
  - Podium Floor along Hwy 401 (parking): 4 metres
  - Residential Floor: 3 meters

The current development concept, as represented in the conceptual site plan drawings and development statistics prepared by Graziani + Corazza Architects, dated October 25, 2023, enclosed with this submission, is preliminary in nature and is subject to change. As such, it is anticipated that the development concept as presented be considered conceptual and will be revised, as necessary, to account for new and/or evolving considerations related to the master-planned community.

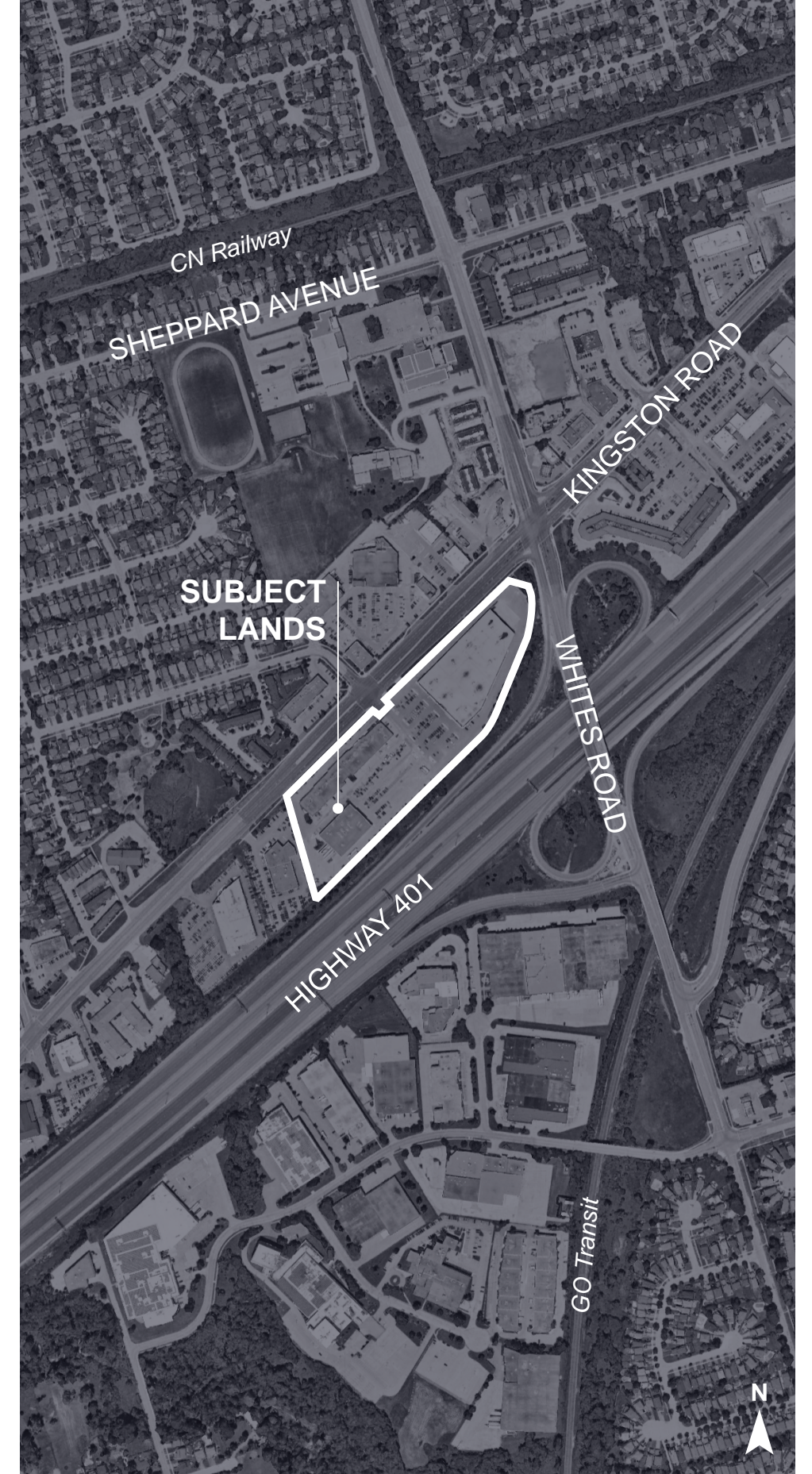


Figure 1: Air Photo of Subject Lands

# 2.0 SHADOW IMPACT ANALYSIS

2.1 March 21

2.2 June 21

2.3 September 21

2.4 December 21

2.5 Summary of Impacts

## 2.1 MARCH 21

At 9:18 am shadows from the proposed development impact Kingston Road and the associated retail buildings along the northern edge of the road. There is minor impact on the rear yards of residential properties 557, 559, 561, 563 and 568 along Steeple Hill. The southeast portion of Steeple Hill Park is impacted. By 11:18 am, the shadow impacts are limited to the front yards of the retail uses on the north side of Kingston Road. Shadows at 11:18 am are predominantly concentrated within the property boundary and Kingston Road right-of-way ('R.O.W.').

From 1:18 pm to 3:18 pm there is no major impact on adjacent properties, though there is minor shadowing along Kingston Road. There is also minor shadowing on Whites Road North at 3:18 pm. The Whites Road Shopping Centre plaza parking lot incurs minor shadow impacts at 3:18 pm.

At 5:18 pm, the shadows extend southeast and impact Whites Road, Highway 401 and the Bayly Street R.O.W. The neighbourhood south of Bayly Street along Marinet Crescent is slightly impacted by the proposed development shadows. There are minor shadow impacts to the property south of Highway 401 at 5:18 pm.

Shadow Impacts upon the public realm are of short duration. No amenity space is critically impacted.

See Appendix 1.

## 2.2 JUNE 21

At 9:18 am there is minor impact on the retail property west of the subject site at 575 Kingston Road. There is also minor impact on Kingston Road, though throughout the majority of the day past 11:18 am there is no shadow impact.

From 1:18 pm to 3:18 pm there is minimal shadow outside of the subject site. At 3:18 pm, there is minor shadow impact onto the Highway 401 and Whites Road R.O.W.

At 5:18 pm shadow begins to have an increasing impact on Highway 401 and Whites Road. The shadows are contained within the R.O.W.

At 7:18 pm, just before the sun sets, there are extended shadow impacts to to the southeast. Residential neighbourhoods around Oklahoma Drive receive shadows but are limited towards the end of the day.

Shadow Impacts upon the public realm are minimal. No amenity space is critically impacted.

See Appendix 2.

## 2.3 SEPTEMBER 21

At 9:18 am shadows impact Kingston Road and the associated retail buildings on the northern edge of the road. Rear yards of residential properties 559, 561, 563, and 568 along Steeple Hill are impacted during this time. Similar to March shadows, there is shadowing on the south eastern portion of Steeple Hill Park. By 11:18 am the mentioned residential properties, and park are not impacted.

At 11:18 am there is minor impact on a retail building on the northern edge of the road at 670 Kingston Road.

From 11:18am to 3:18 pm there is no impact on adjacent properties, although there is minor shadowing along Kingston Road. There is also minor shadowing on Whites Road North and Whites Road Shopping Centre at 3:18 pm.

At 5:18 pm shadows are mainly cast onto the Highway 401 and Whites Road R.O.W. Several properties southeast of Bayly Street also incur minor shadow impacts which subside by 7:18 pm.

Shadow Impacts upon the public realm are of short duration. No amenity space is critically impacted.

See Appendix 3.

## 2.4 DECEMBER 21

At 9:18 am shadows briefly impact the residential community to the north and a portion of the property of the high school north of the site. Significant shadow is cast from the existing dwellings at this hour, minimizing the net shadow impact.

At 11:18 am the shadows have moved off of the residential community and only impact the retail stores on the north side of Kingston Road and small portion of the southern edge of the high school yard.

At 1:18 pm shadows impact Kingston Road and a portion of Whites Road North as it meets Kingston Road.

At 3:18 pm shadows impact retail stores northeast of the site across Whites Road North.

These impacts, of which are primarily on retail stores, are due to the angle of the sun throughout the winter. Shadow impacts upon the public realm and streetscape are present. No amenity space is critically impacted.

See Appendix 4.

## 2.5 SUMMARY OF IMPACTS

In summary, it is our opinion that the shadow impacts from the proposed development upon the neighbouring residential properties and the public realm are acceptable and short in duration. The shadows have an acceptable level of impact for the following reasons:

- The majority of cumulative shadowing impacts are moderate, with shadow impact falling primarily away from residential properties.
- Public space is minimally impacted, receiving shadowing for a short period

In conclusion, it is our opinion that shadow impacts from the proposed development are acceptable.



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# 3.0 SHADOW DIAGRAMS

3.1 Appendix 1, March 21

3.2 Appendix 2, June 21

3.3 Appendix 3, September 21

3.4 Appendix 4, December 21

3.1 APPENDIX 1, MARCH 21

9:18AM



11:18AM



- Property Boundary
- Existing Shadow
- Overlapping Shadow
- Proposed Building
- Proposed Shadow

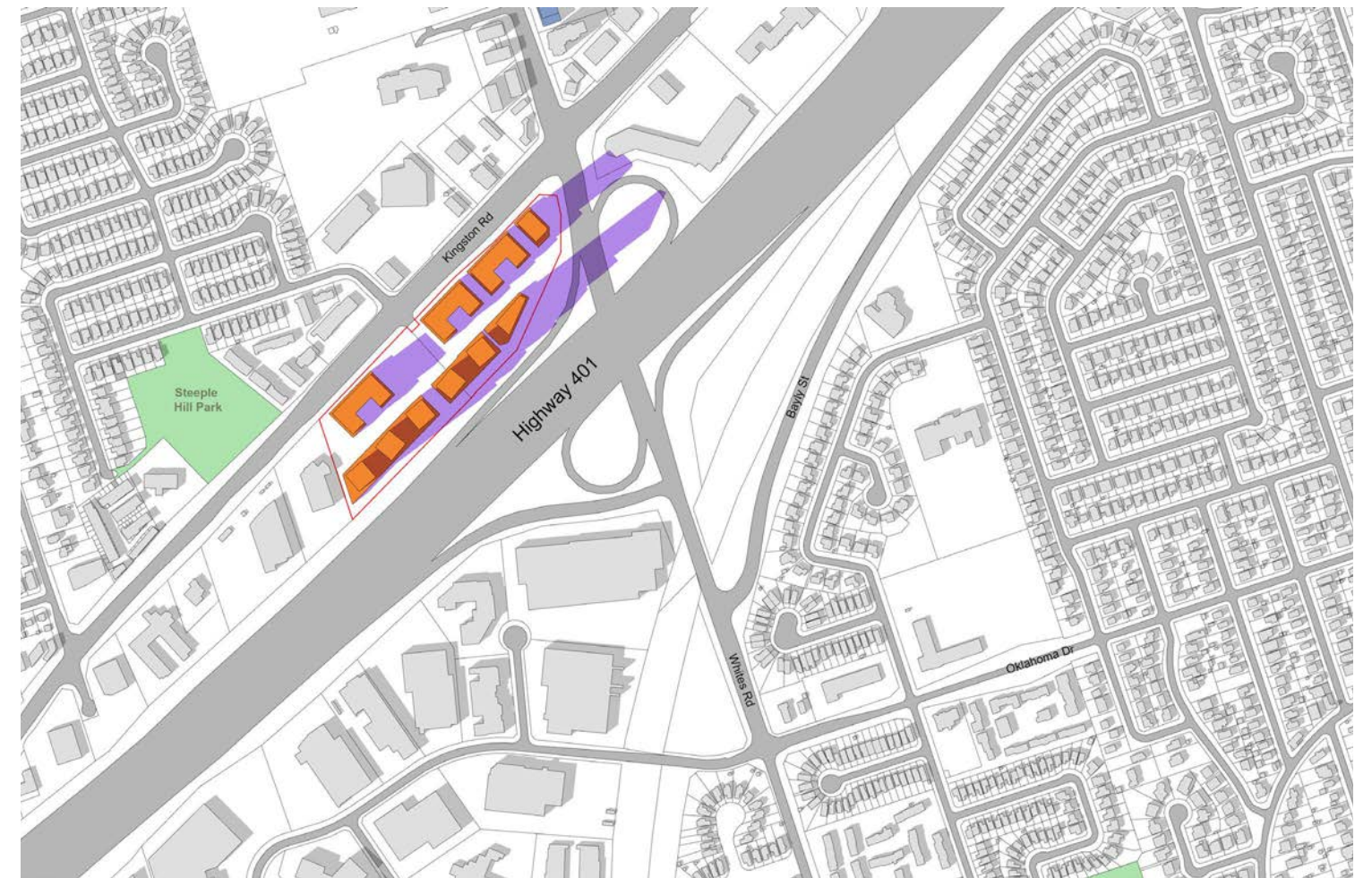
0m 200m 400m

Figure 2: March 21 Shadow Diagrams Prepared by Weston Consulting

1:18PM



3:18PM

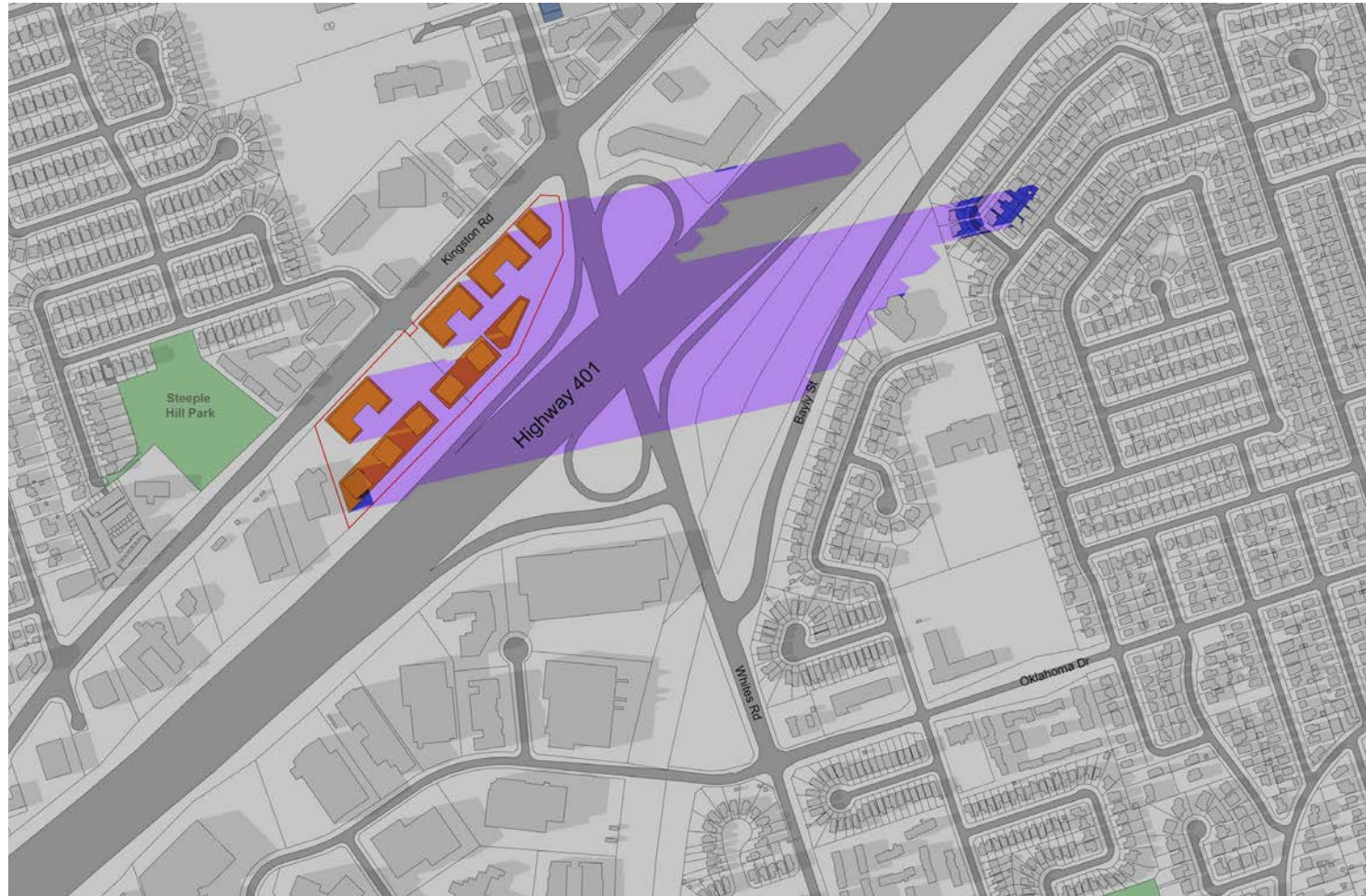


- Property Boundary
- Existing Shadow
- Overlapping Shadow
- Proposed Building
- Proposed Shadow

0m      200m      400m

Figure 3: March 21 Shadow Diagrams Prepared by Weston Consulting

5:18PM



7:18PM



- Property Boundary
- Existing Shadow
- Overlapping Shadow
- Proposed Building
- Proposed Shadow

0m 200m 400m

Figure 4: March 21 Shadow Diagrams Prepared by Weston Consulting

3.2 APPENDIX 2, JUNE 21

9:18AM



11:18AM



- Property Boundary
- Proposed Building
- Existing Shadow
- Proposed Shadow
- Overlapping Shadow

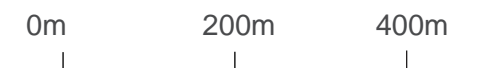


Figure 5: June 21 Shadow Diagrams Prepared by Weston Consulting

1:18PM



3:18PM

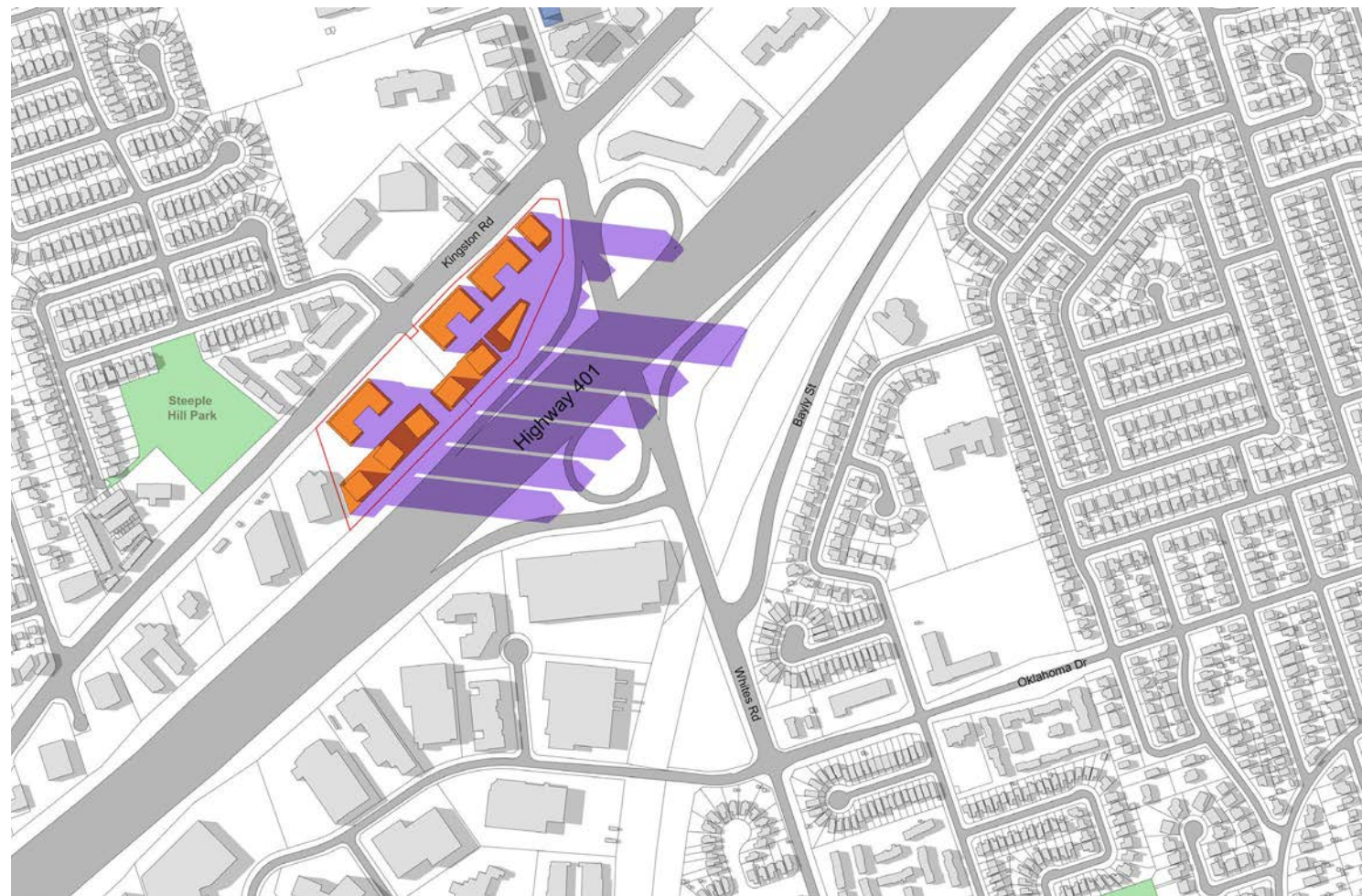


- Property Boundary
- Existing Shadow
- Overlapping Shadow
- Proposed Building
- Proposed Shadow

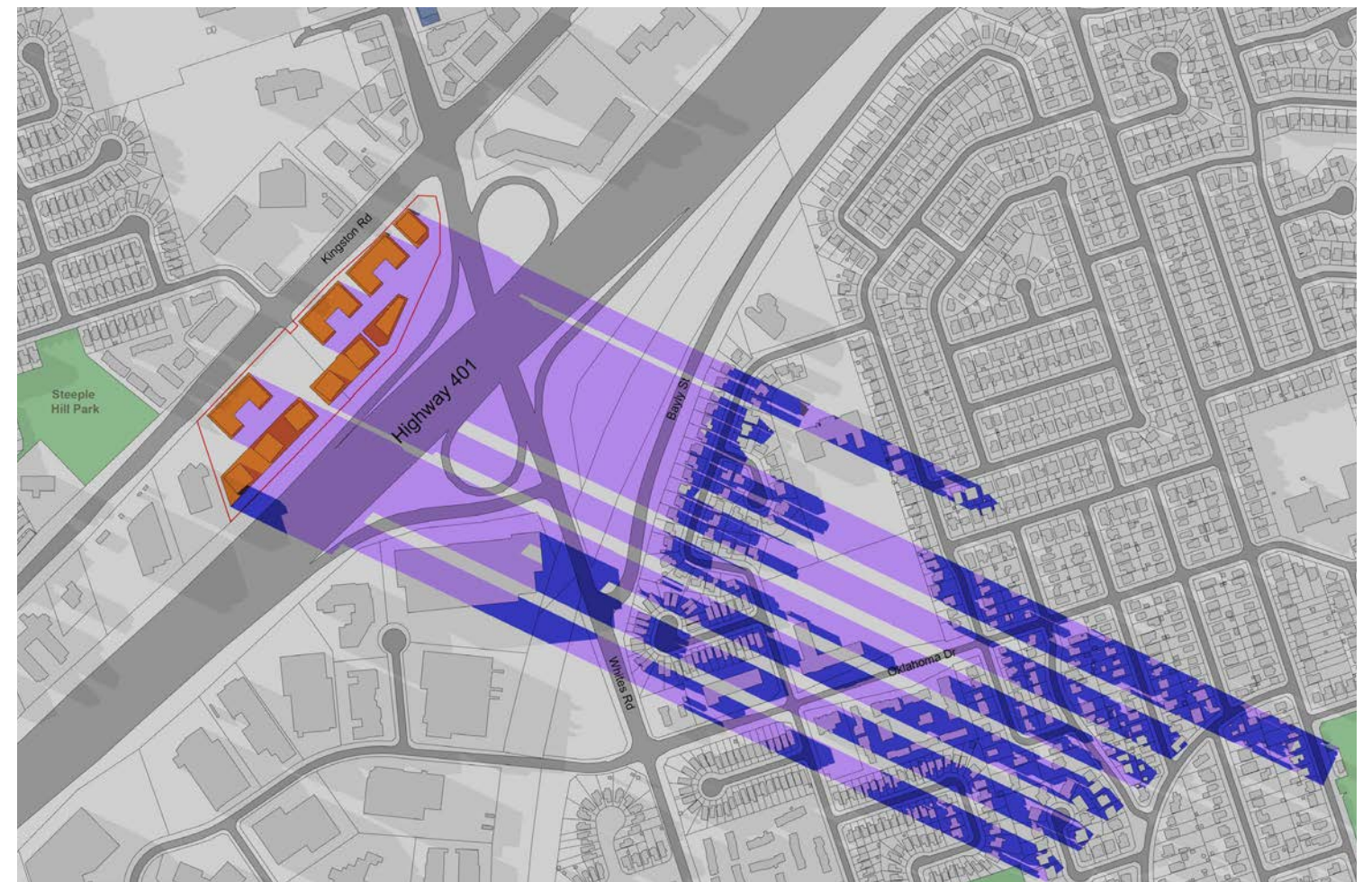
0m      200m      400m

Figure 6: June 21 Shadow Diagrams Prepared by Weston Consulting

5:18PM



7:18PM



- Property Boundary
- █ Existing Shadow
- █ Overlapping Shadow
- █ Proposed Building
- █ Proposed Shadow

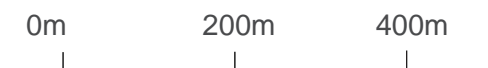


Figure 7: June 21 Shadow Diagrams Prepared by Weston Consulting

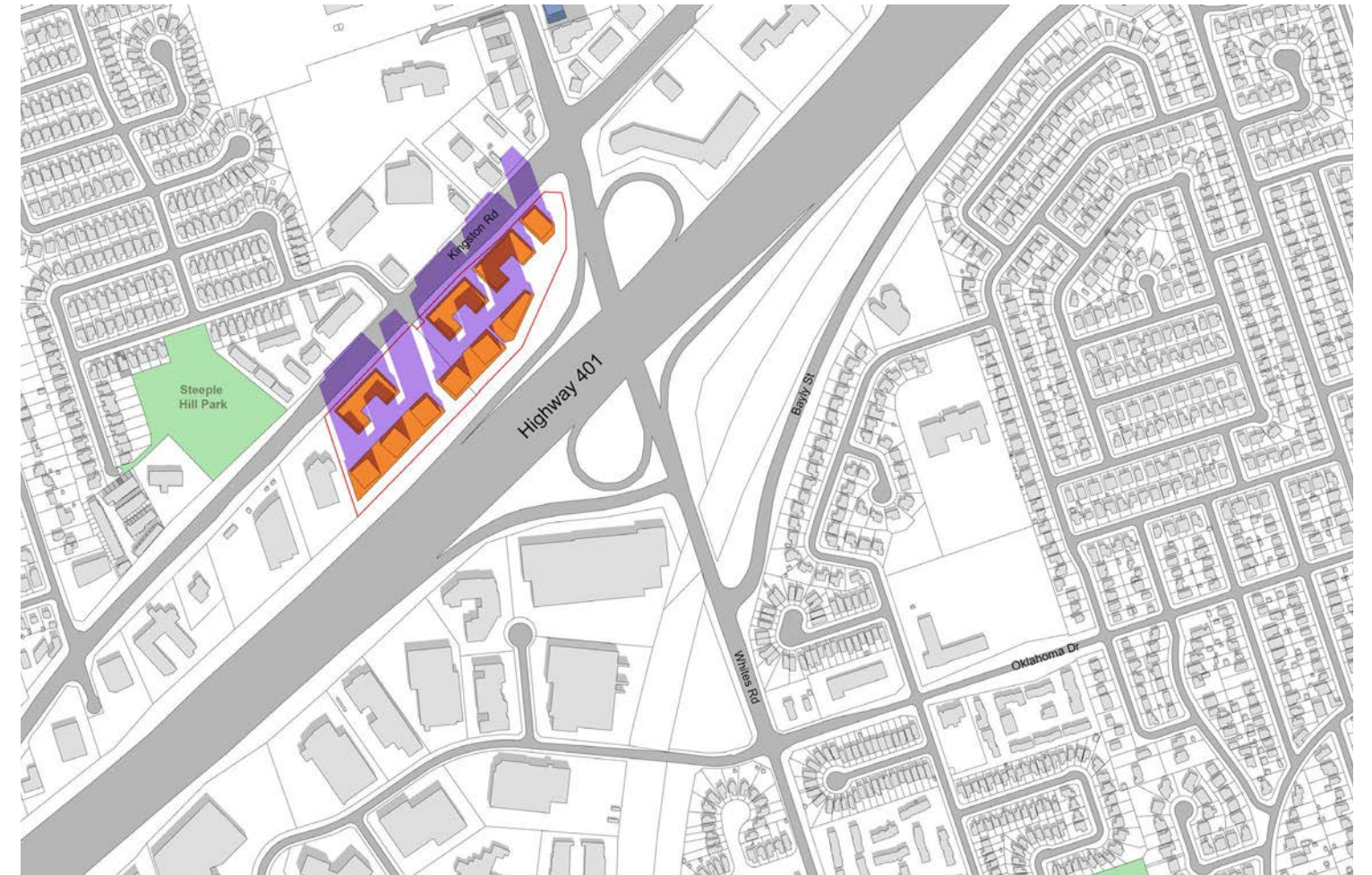


3.3 APPENDIX 3, SEPTEMBER 21

9:18AM



11:18AM



- Property Boundary
- Existing Shadow
- Overlapping Shadow
- Proposed Building
- Proposed Shadow

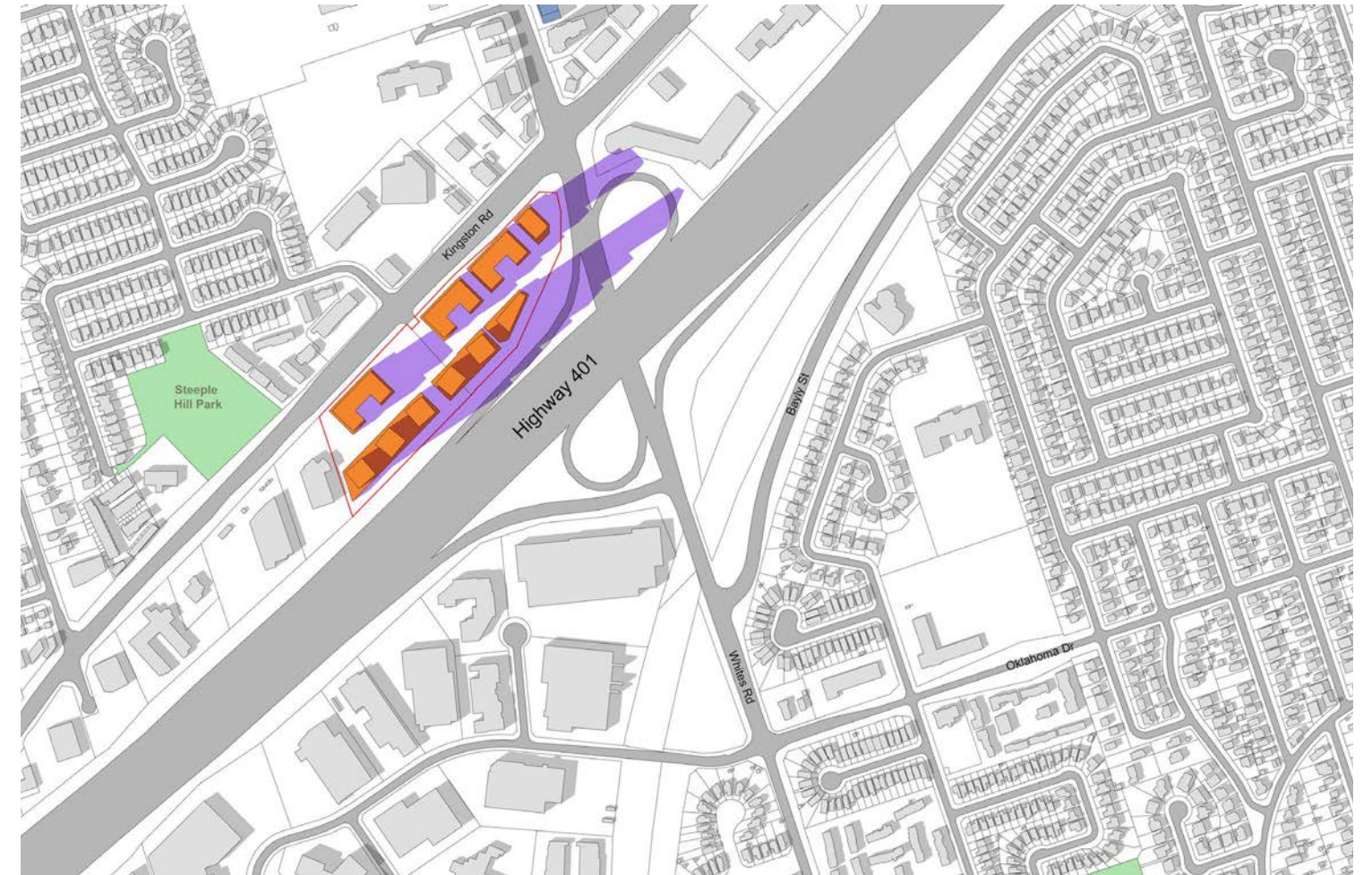
0m 200m 400m

Figure 8: September 21 Shadow Diagrams Prepared by Weston Consulting

1:18PM



3:18PM



- Property Boundary
- Existing Shadow
- Overlapping Shadow
- Proposed Building
- Proposed Shadow

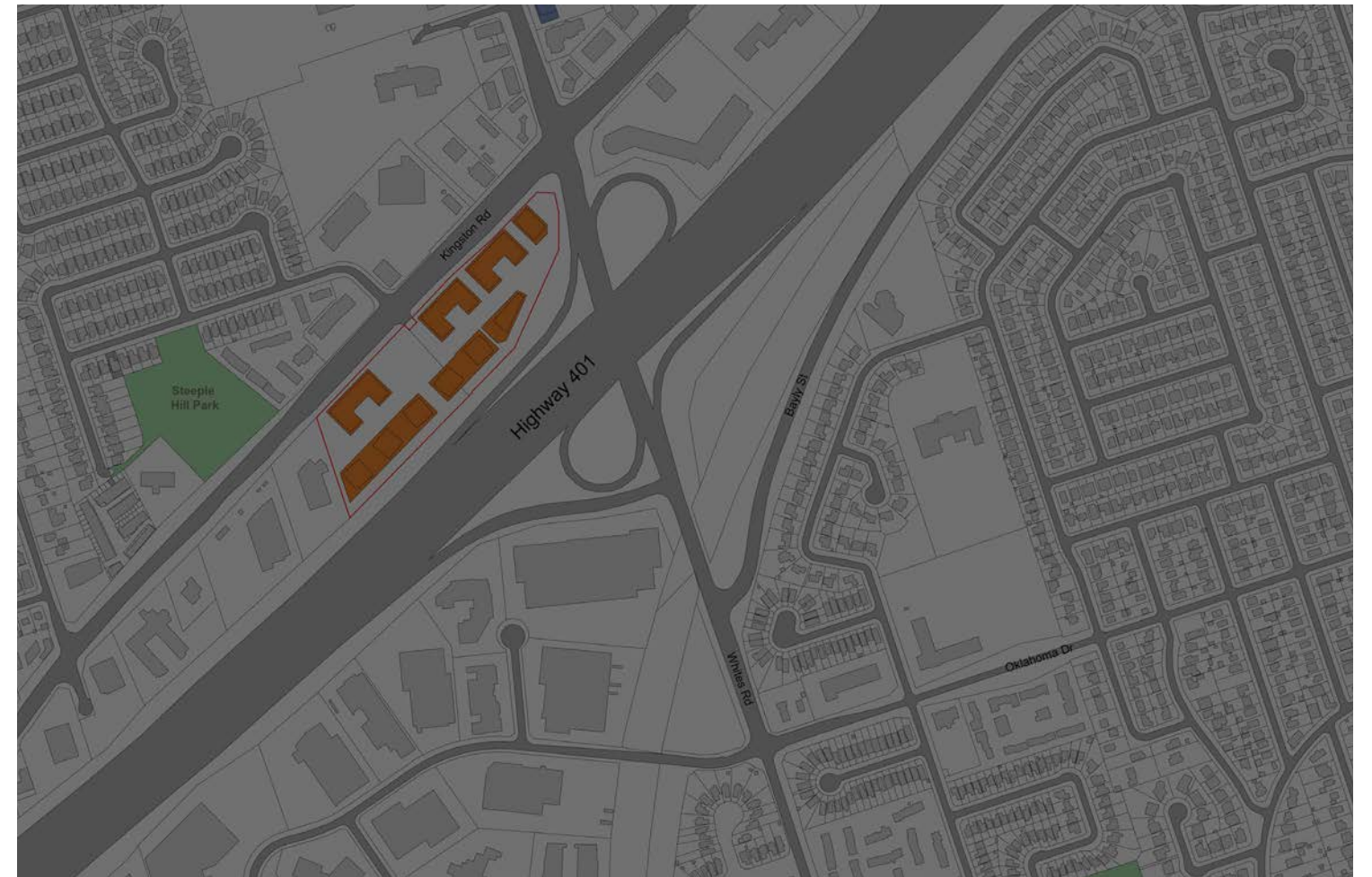
0m      200m      400m

Figure 9: September 21 Shadow Diagrams Prepared by Weston Consulting

5:18PM



7:18PM



- Property Boundary
- Proposed Building
- Existing Shadow
- Proposed Shadow
- Overlapping Shadow

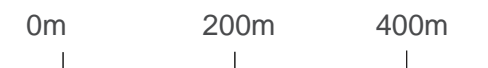
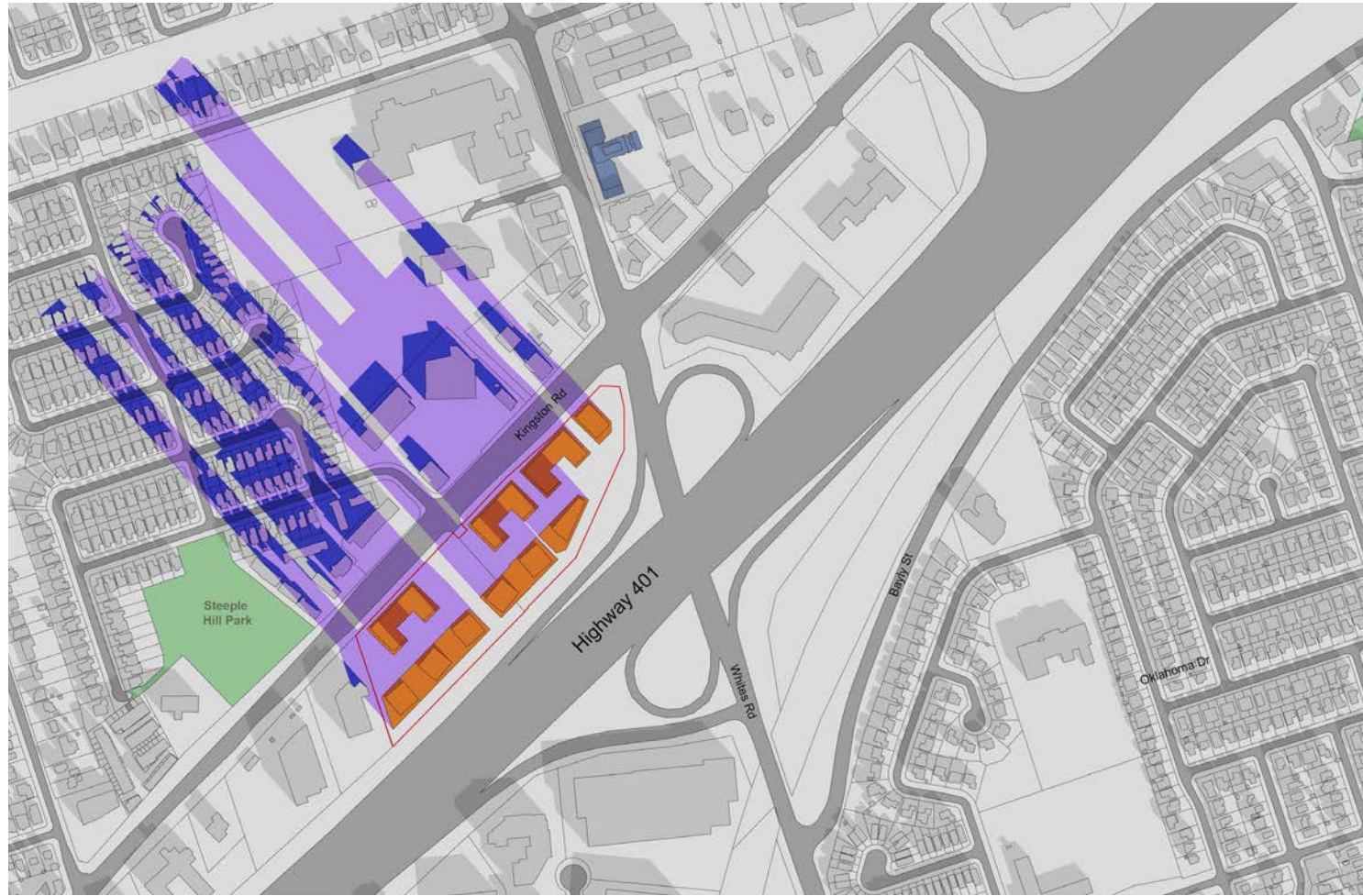


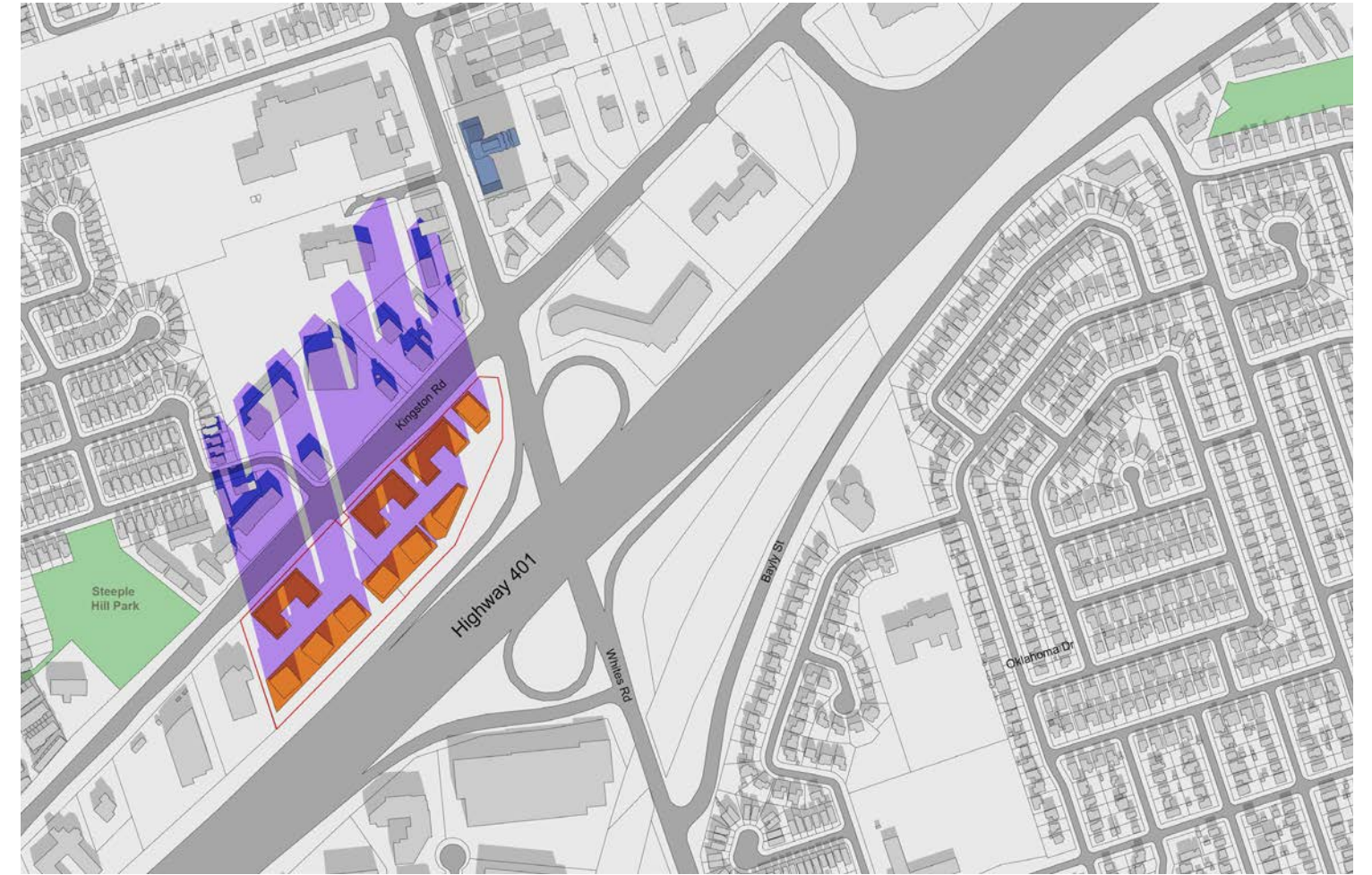
Figure 10: September 21 Shadow Diagrams Prepared by Weston Consulting

3.4 APPENDIX 4, DECEMBER 21

9:18AM



11:18AM



- Property Boundary
- Proposed Building
- Existing Shadow
- Proposed Shadow
- Overlapping Shadow

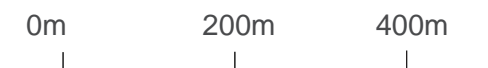
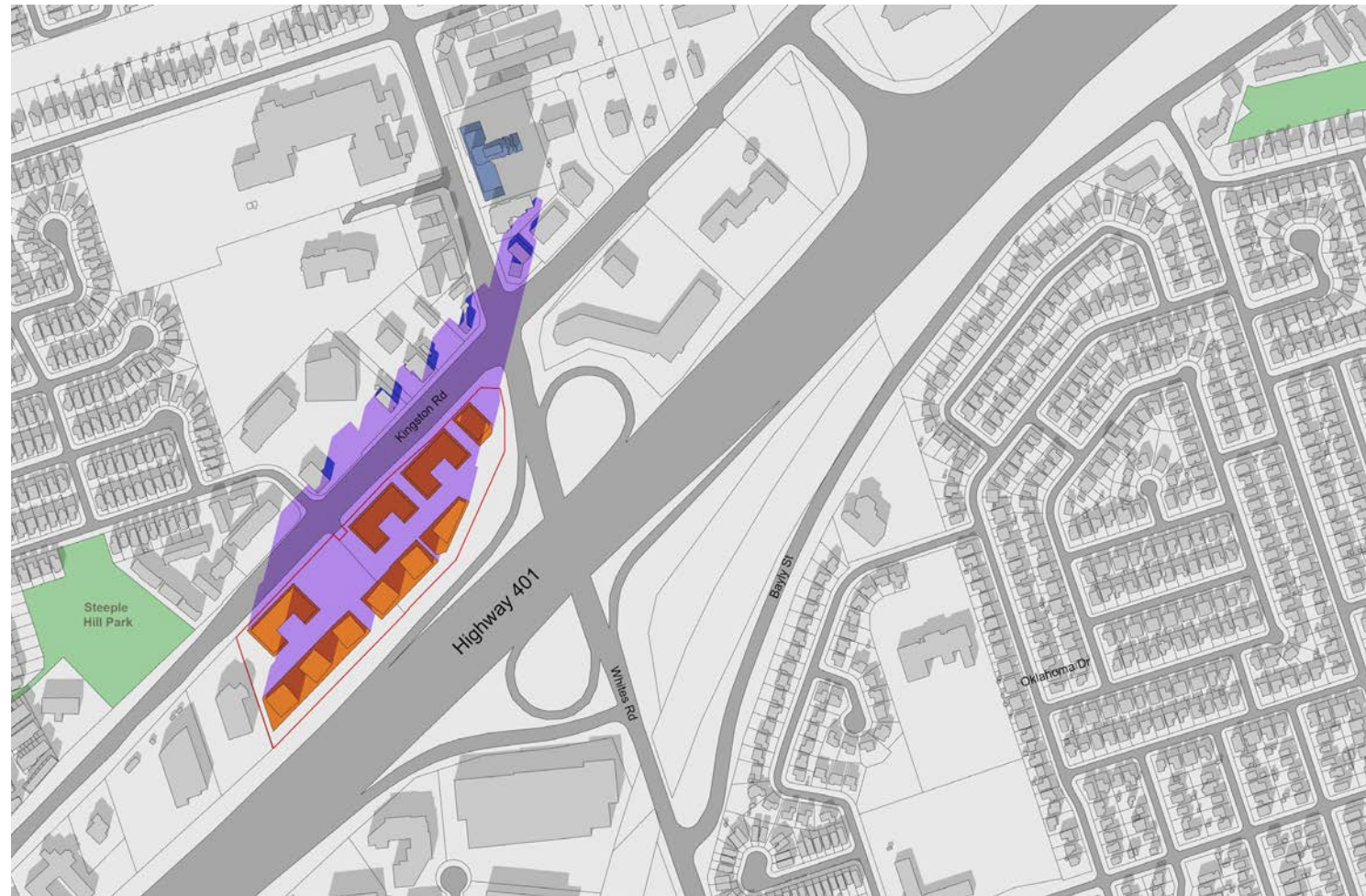
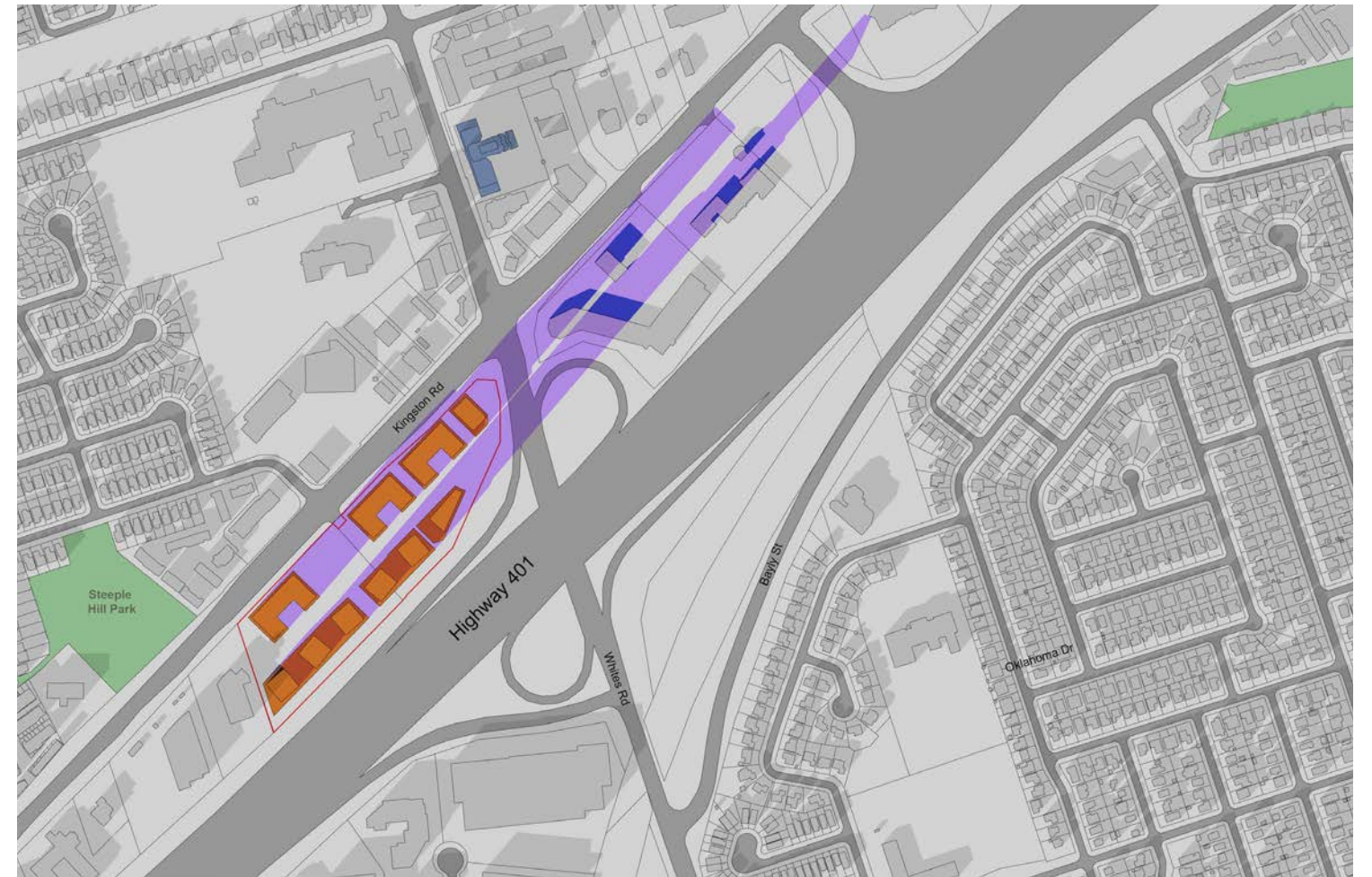


Figure 11: December 21 Shadow Diagrams Prepared by Weston Consulting

1:18PM



3:18PM



- Property Boundary
- Proposed Building
- Existing Shadow
- Proposed Shadow
- Overlapping Shadow

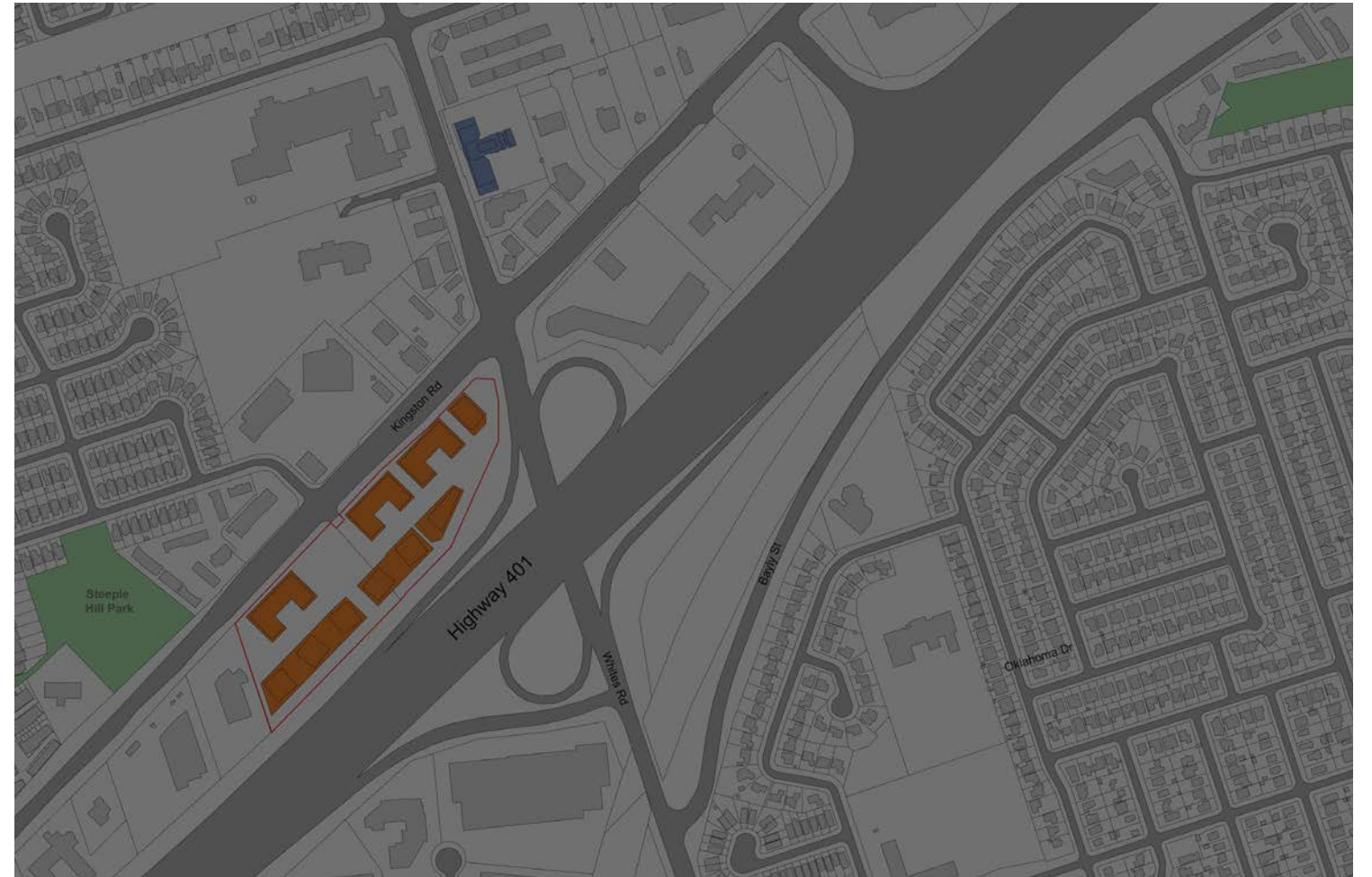
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Figure 12: December 21 Shadow Diagrams Prepared by Weston Consulting

5:18PM



7:18PM



- Property Boundary
- Existing Shadow
- Overlapping Shadow
- Proposed Building
- Proposed Shadow

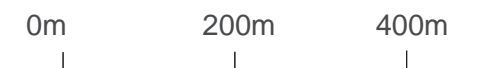


Figure 13: December 21 Shadow Diagrams Prepared by Weston Consulting

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