

## Shadow Study Guidelines

### 1. Mississauga: Standards for Shadow Studies (2011)

Shadow Studies and Analyses will be conducted for the following dates:

- **June 21**
- **September 21** (similar to March 21, and therefore, criteria for Sept. 21 are deemed to apply to March 21)
- **December 21**

At the following times:

- **Solar Noon (SN)**
- **Hourly intervals before and after Solar Noon (SN), up to and including 1.5 hours after sunrise and 1.5 hours before sunset**

**Hourly solar data are specified for each date**

### 2. [Burlington: Shadow Study Guidelines and Terms of Reference](#) (2020)

#### 3.1 Introduction

The required Shadow Study dates and times of day will vary depending on the specific Shadow Impact Criteria (see Section 4.0). Each Shadow Impact Criterion has a unique methodological standard corresponding to the shadow impact on the solstices or equinoxes.

The solstices, June 21st and December 21st, represent the seasonal extremes for each season (Figure 3.1). June 21st is the longest day of the year when the sun angle is at its highest and shadows are shortest. December 21st is the shortest day of the year when the sun angle is at its lowest and shadows are longest. The equinoxes, March 21st and September 21st, represent seasonal averages (Figure 3.1). Each Shadow Impact Criterion in Section 4.0 utilizes different dates and times based on the expected seasonal use. Shadows shall be determined using the applicable solar altitude and azimuth (sun angle) data for Burlington and the project site.

#### 3.2 Study Test Dates

- March 21st;
- June 21st;
- September 21st; and,
- December 21st

#### 3.3 Study Test Times

Hourly test times may include:

- 08:00
- 09:00
- 10:00
- 11:00
- 12:00
- 13:00
- 14:00
- 15:00
- 16:00
- 17:00
- 18:00
- 19:00

#### 3.4 Time Zone

Shadow Studies must be prepared using the following time zone standards:

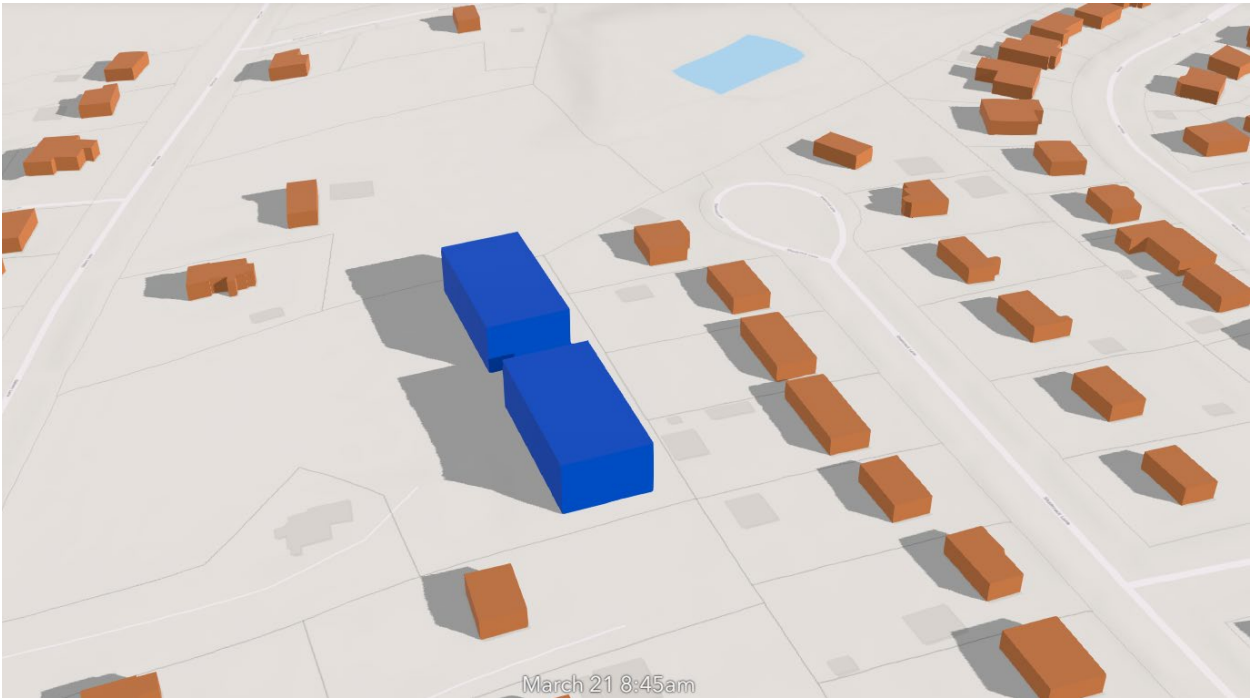
- Time Zone: Eastern
- Standard Time: Universal Time minus 5 hours (Winter Solstice - December 21st)
- Daylight Saving Time: Universal Time minus 4 hours (Vernal Equinox - March 21st; Summer Solstice - June 21st; and Autumnal Equinox - September 21st)

### 3. Nova Scotia Sunrise & Sunset data:

<https://www.timeanddate.com/sun/canada/halifax?month=12&year=2024>

### 4. For this study I used all dates, +/- sunrise/sunset times, solar noon, and additionally the times when the shadows hit the property line, and the base of the neighbouring houses (if different).

March 21 8:45am (sunrise +1.5hrs)



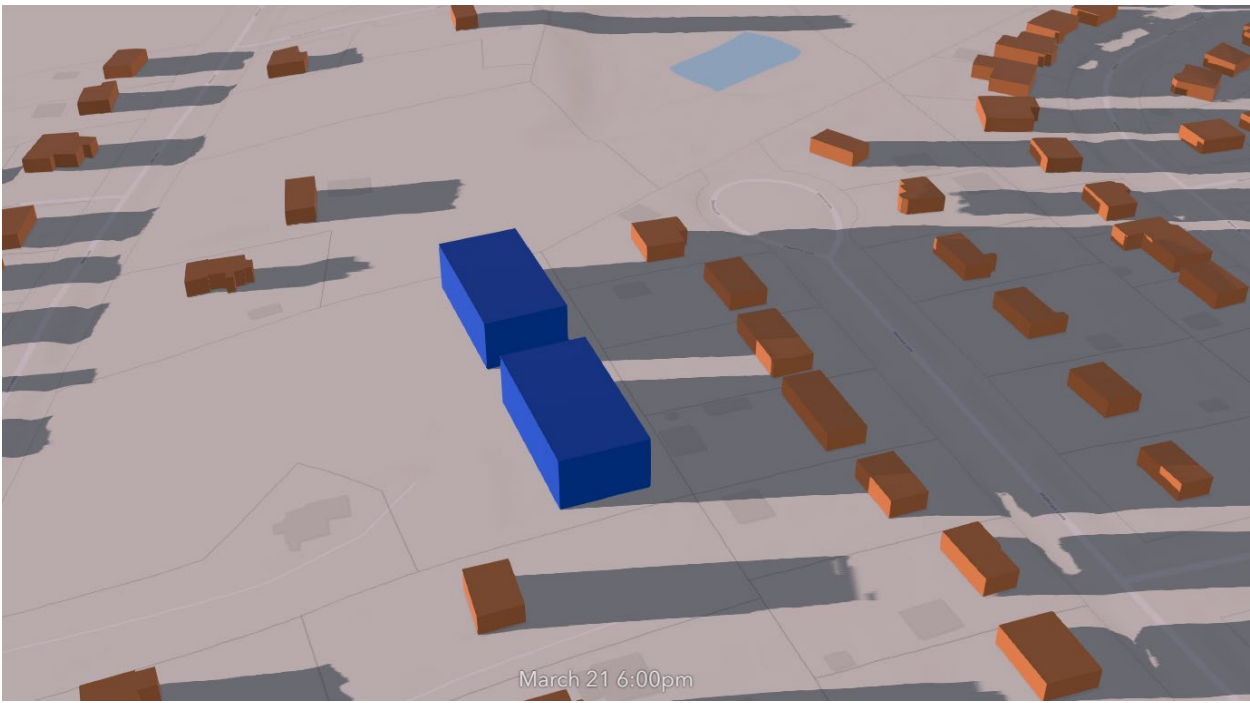
March 21 1:15pm (Solar Noon)



March 21 4:45pm



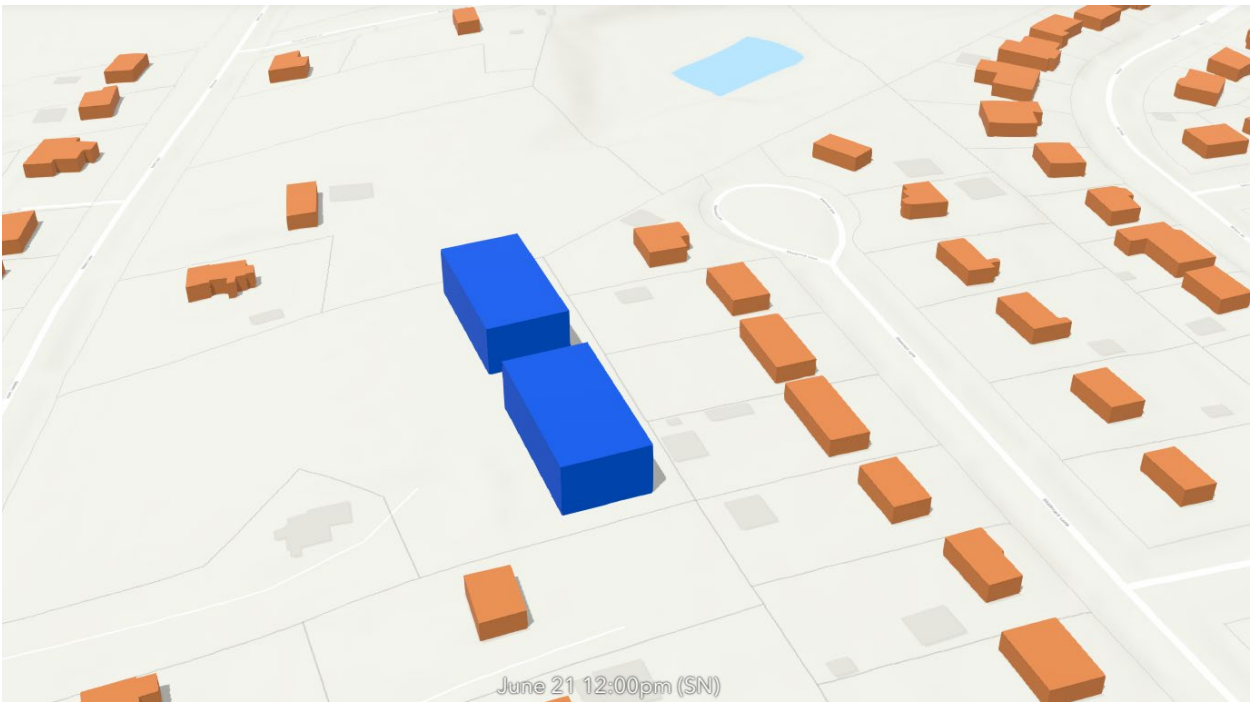
March 21 6:00pm (sunset -1.5hrs)



June 21 7:00am (sunrise +1.5hrs)



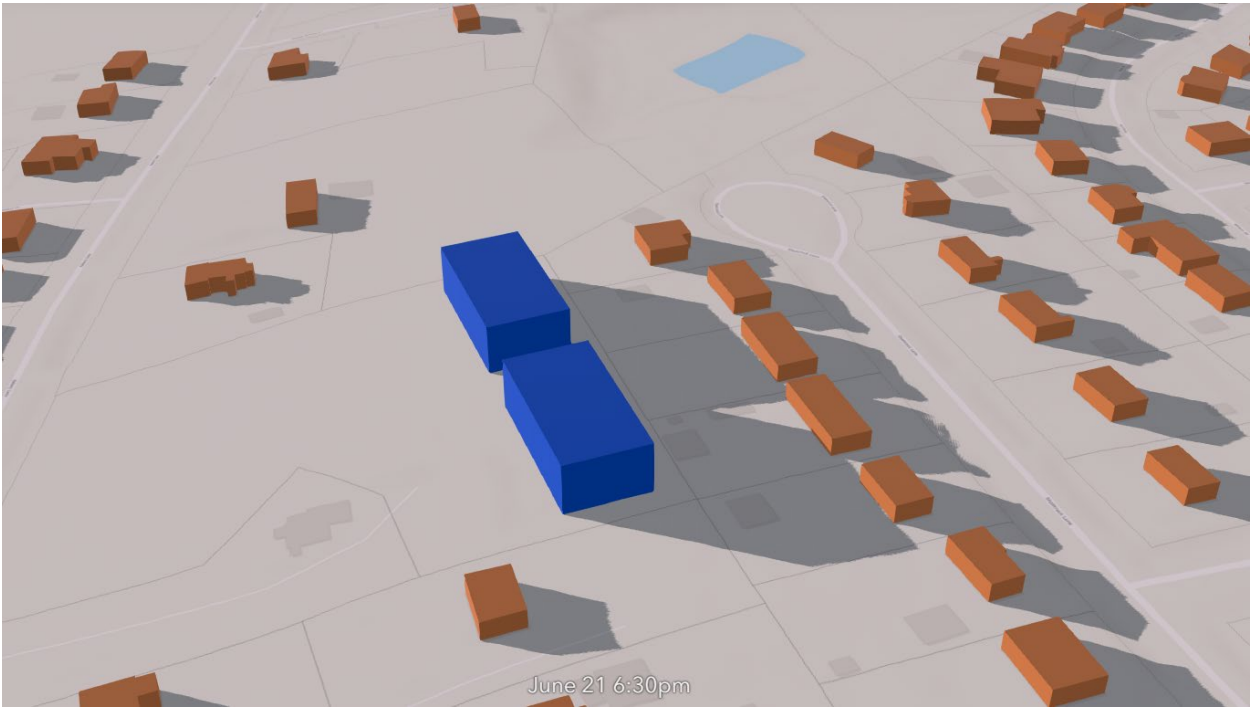
June 21 12:00pm (Solar Noon)



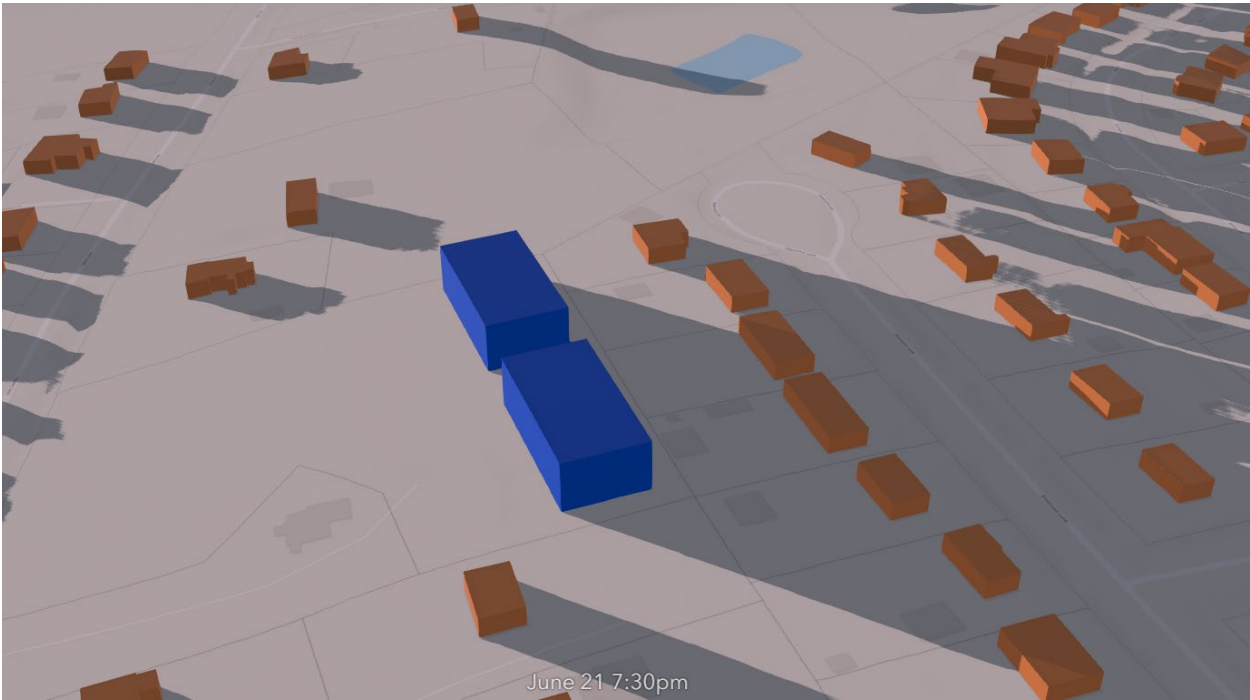
June 21 2:30pm



June 21 6:30pm



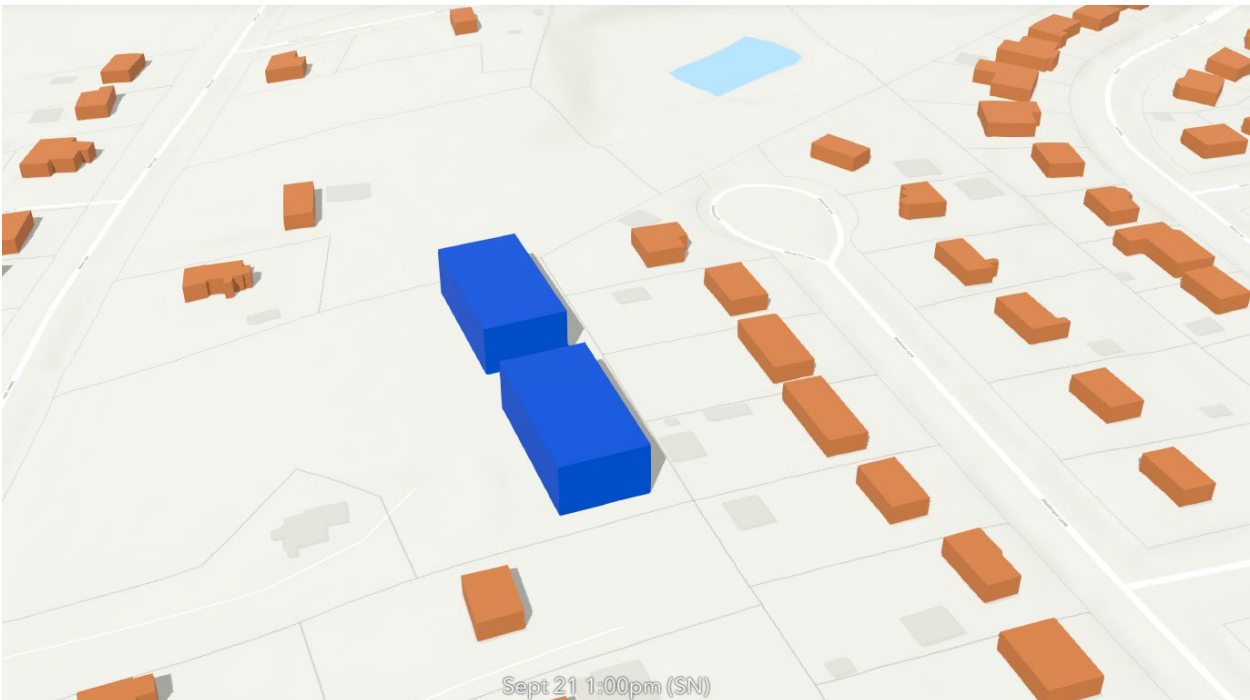
June 21 7:30pm (sunset -1.5hrs)



Sept 21 8:30am (sunrise +1.5hrs)



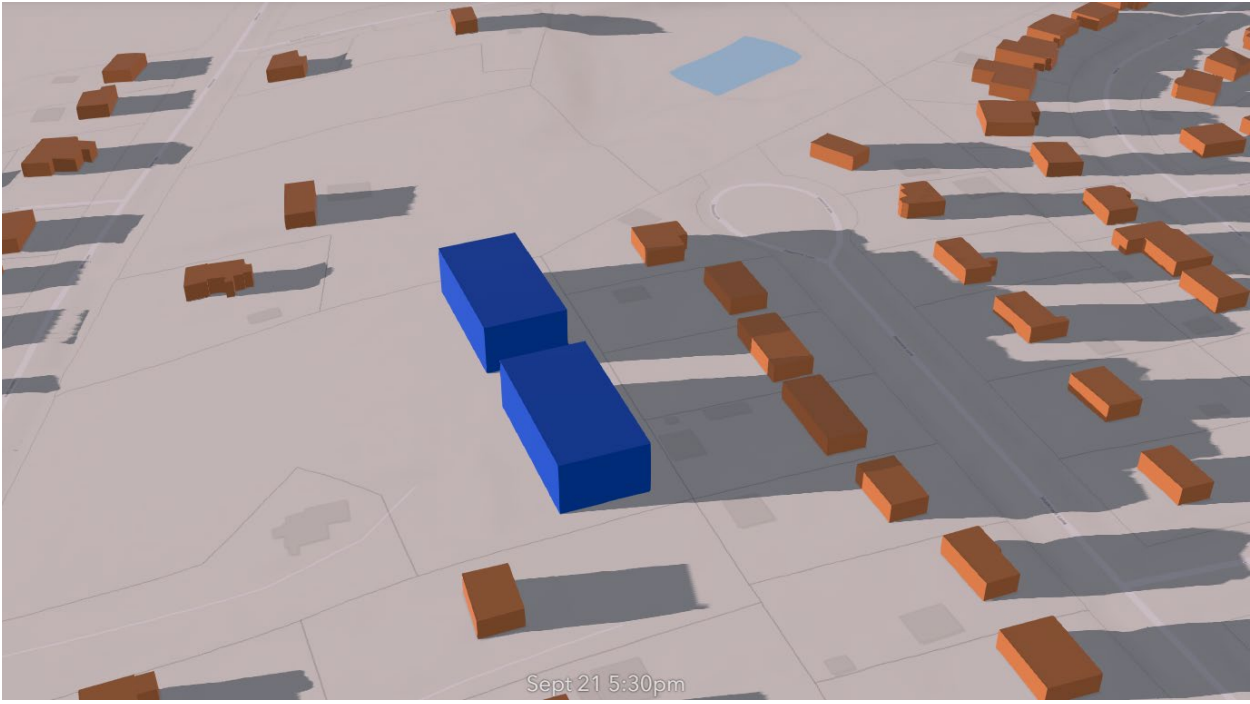
Sept 21 1:00pm (Solar Noon)



Sept 21 4:30pm

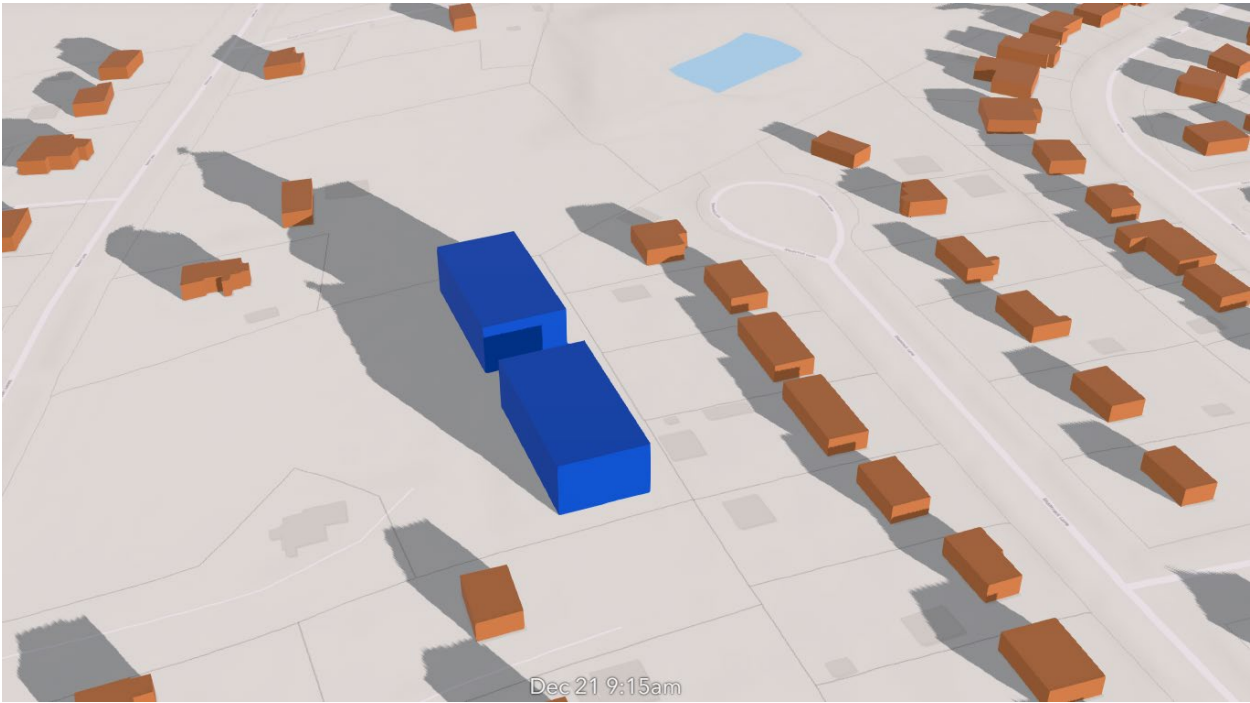


Sept 21 5:30pm (sunset – 1.5hrs)





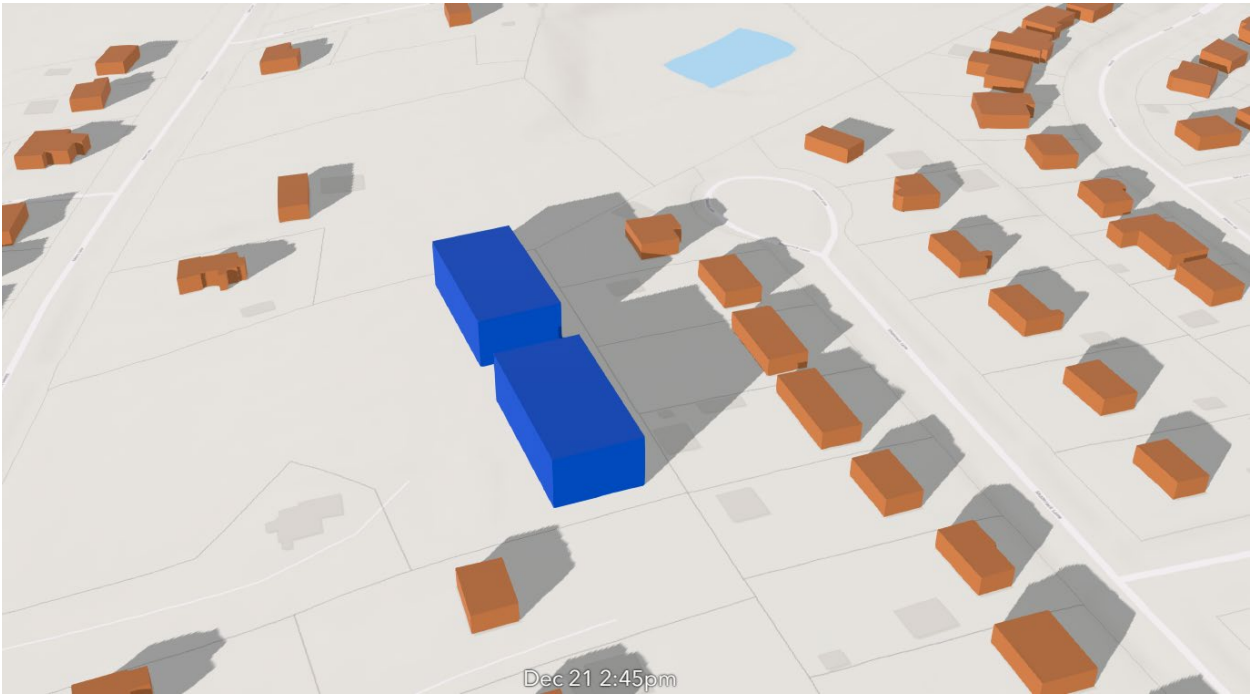
Dec 21 9:15am (sunrise +1.5hrs)



Dec 21 12:15pm (Solar Noon)



Dec 21 2:45pm



Dec 21 3:00pm (sunset -1.5hrs)

