

COMPATIBLE-SCALE INFILL HOUSING  
(R-2 ZONES) PROJECT

EXHIBIT A, APPENDIX A-3

MARCH 4, 2019

PUBLIC HEARING DRAFT

## SOLAR ACCESS STEP-BACK

### Summary:

This new standard intends to retain an equivalent level of solar access protection for residences in the R-2A, R-2D, and R-2M districts as existed under the 2.5-story limit. The level solar access protection addresses the increase in potential shadowing that would otherwise result from the R-2 amendment removing the 2.5-story standard. The step-back re-creates the effect of a 2.5-story building built to the minimum side yard setback next to an existing home, with an height and incline approximate to a sloping roof pitch over a half-story. This effectively retains a similar building entitlement for the builder along the shared lot line as existed under the 2.5-story limit.

The step-back's advantage over the 2.5-story limit for the builder is that it applies only along lot lines shared with a residential property to its north, east, or west—i.e., where it would shadow the neighbor. It does not apply along a southern property boundary (any property line oriented within 30 degrees of south). The builder can reach the full three-stories to the 30-foot height limit within the rest of the building site. By comparison, the 2.5-story standard limits heights and controls roof slope across the builder's entire development site.

In response to homebuilders' public comments and concerns expressed in consultation meetings, the Planning Department reassessed the solar access step-back standard. The Planning Department also consulted with homebuilders to conduct a comprehensive test of the combined effect of all Title 21 zoning regulations on four hypothetical multifamily 4-unit townhouse development scenarios, using an 11,200 square-foot urban redevelopment site, under the recommended R-2 amendments. Findings regarding the solar access step-back:

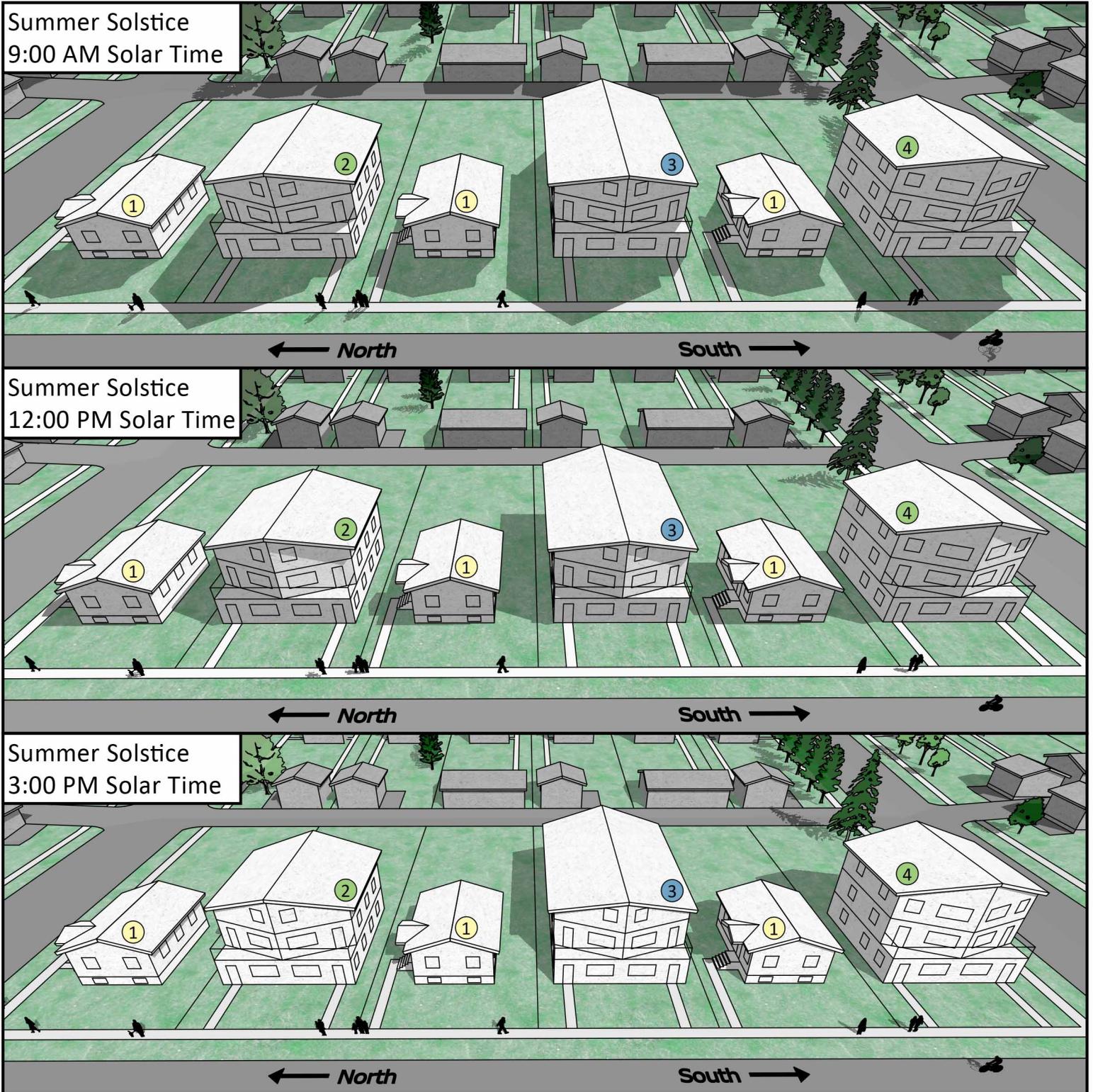
- In all test case development scenarios, the solar access step-back had no effect on building or unit sizes or configurations, and allowed for three-story buildings.
- The primary effect of the step-back was to shift the building placement relative to parking and other site requirements.
- The step-back standard was simple to use. It is brief, clear, and objective, comprising a single sentence on two lines (lines 18-19) on page 6 of Exhibit B, and accompanied by a pair of illustrations.

A review of the step-back dimensional requirements as compared to typical construction dimensions found that the 22-foot starting height for the step-back allows for two story buildings to be placed at the side setback. However, the 6:12 incline in the Public Hearing Draft should be increased to 8:12 to accommodate half-story attic spaces particularly on 50-foot wide standard lots. This edit appears in the Recommendations section of Exhibit A, on page 35.

The following pages include images from a solar study of several model developments. These show the shadowing effects of different developments, without a solar access step-back. The three larger structures represent: a., the maximum size development under this proposed amendment (building 2), b., the maximum size allowed under current code (building 3), and the proposed maximum size with different standards (building 3). The first five images show duplexes with gabled roofs, then five images of duplexes with flat roofs. After those, three images of fourplexes illustrate the necessity of a solar access step-back.

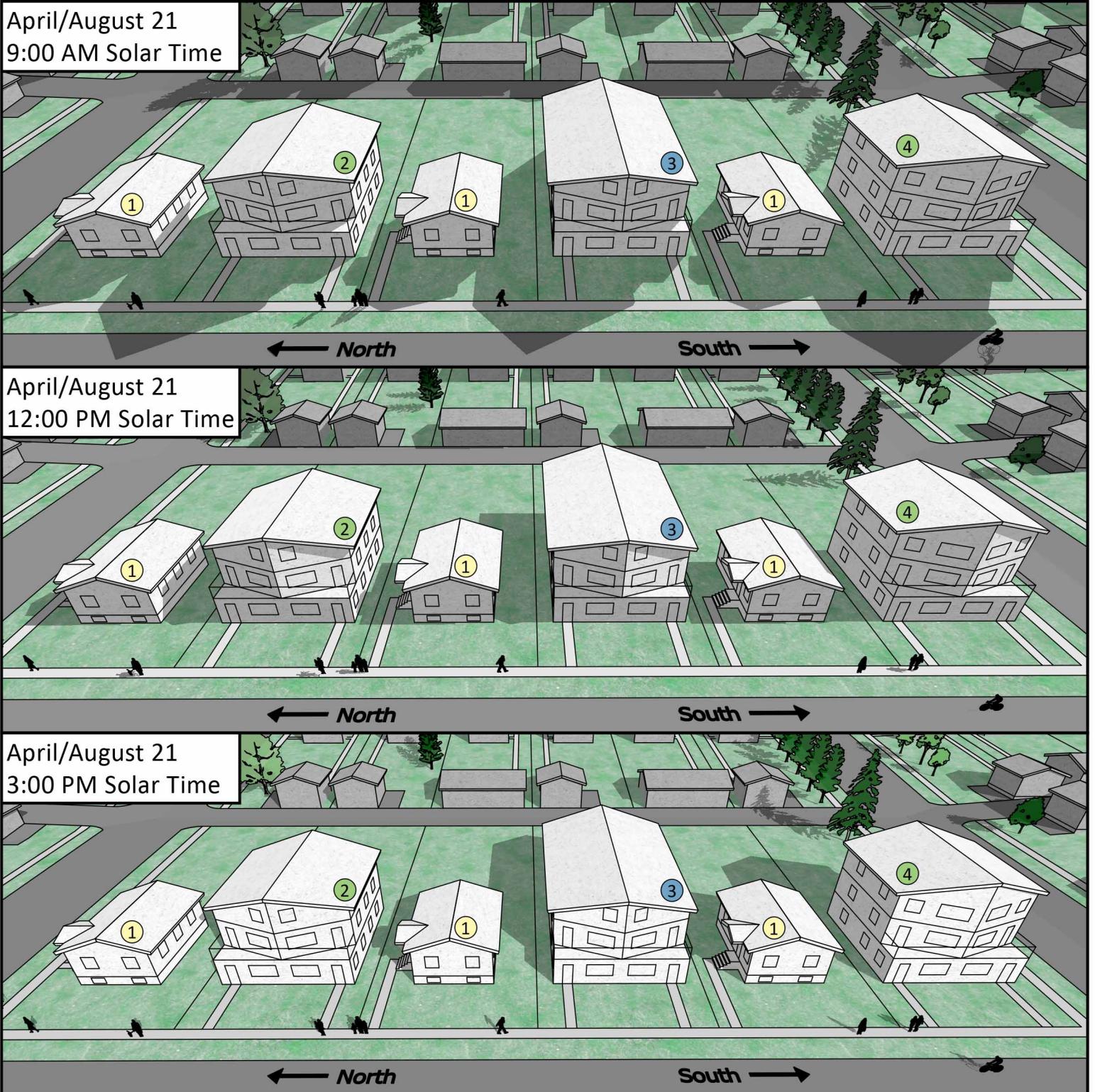
# Shadow Analysis of Maximum Allowed Duplex Sizes, R-2M Zone

Sunlight Shadowing Impacts at Summer Solstice (June 21), Row of Lots North and South of Each Other



# Shadow Analysis of Maximum Allowed Duplex Sizes, R-2M Zone

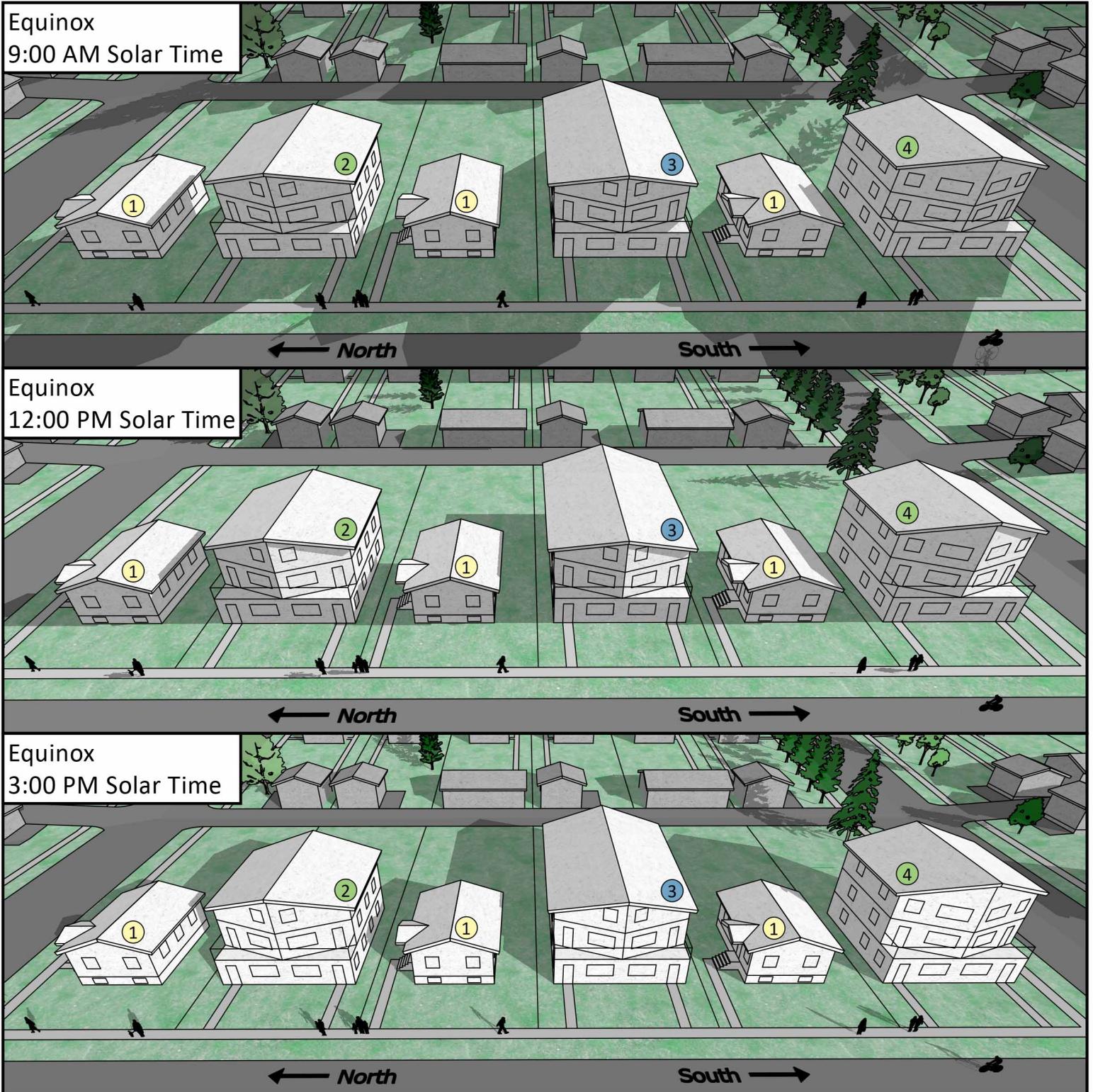
Sunlight Shadowing Impacts at Apr. & Aug. 21, Row of Lots North and South of Each Other



- ① Existing Older Home
- ② Proposed Max. Duplex Size: Half-story Under a Pitched Roof Design Scenario
- ③ Current Code Max. Duplex Size: Typical Ceiling Heights Under 2.5-story Height Limit
- ④ Proposed Max. Duplex Size: 3-story, Pitched Roof Design Scenario

# Shadow Analysis of Maximum Allowed Duplex Sizes, R-2M Zone

Sunlight Shadowing Impacts at Equinox (Mar. & Sept. 21), Row of Lots North and South of Each Other



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# Shadow Analysis of Maximum Allowed Duplex Sizes, R-2M Zone

Sunlight Shadowing Impacts at Feb. & Oct. 21, Row of Lots North and South of Each Other

February/October 21  
9:00 AM Solar Time



February/October 21  
12:00 PM Solar Time



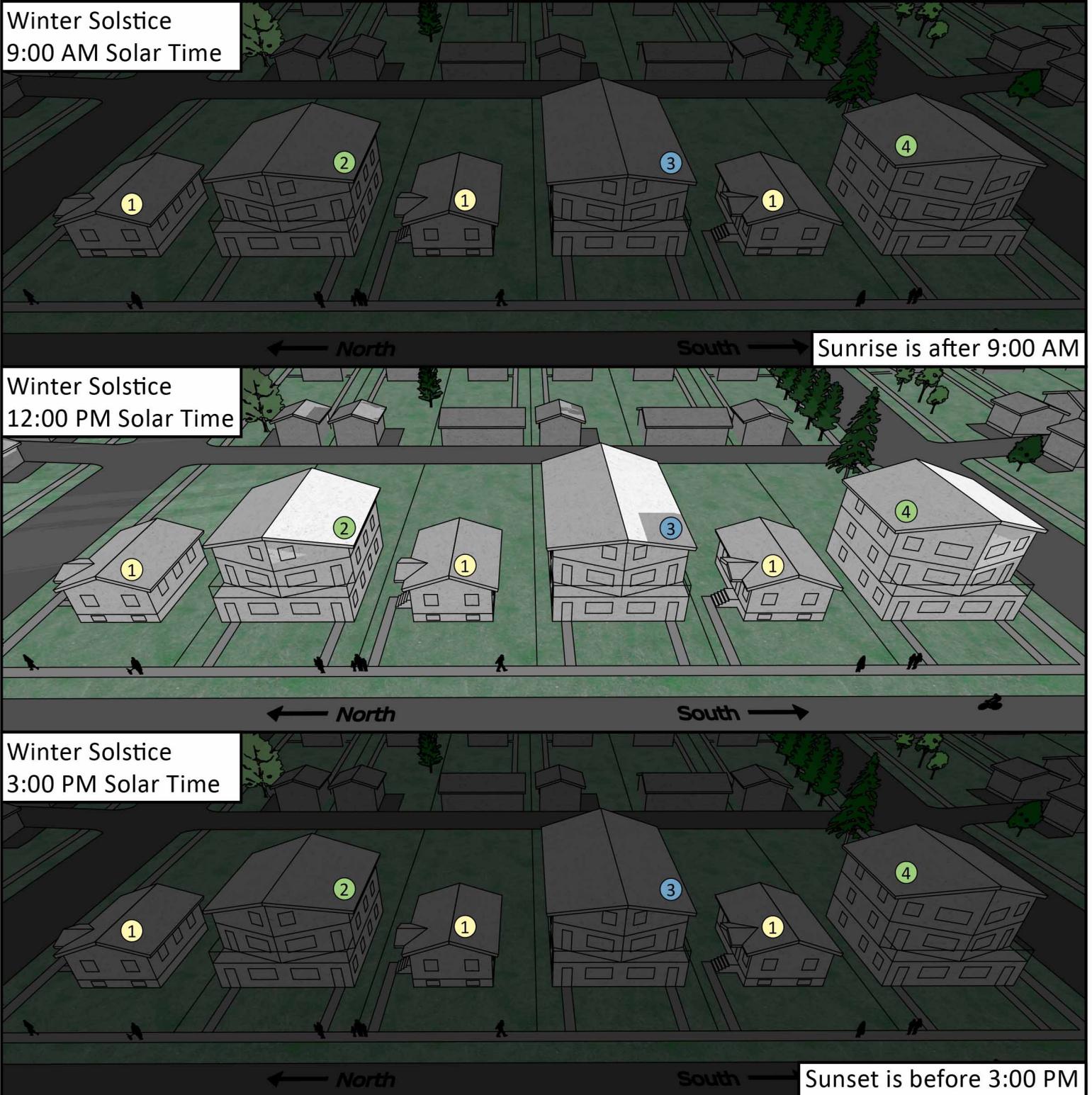
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Sunlight Shadowing Impacts at Winter Solstice (Dec. 21), Row of Lots North and South of Each Other

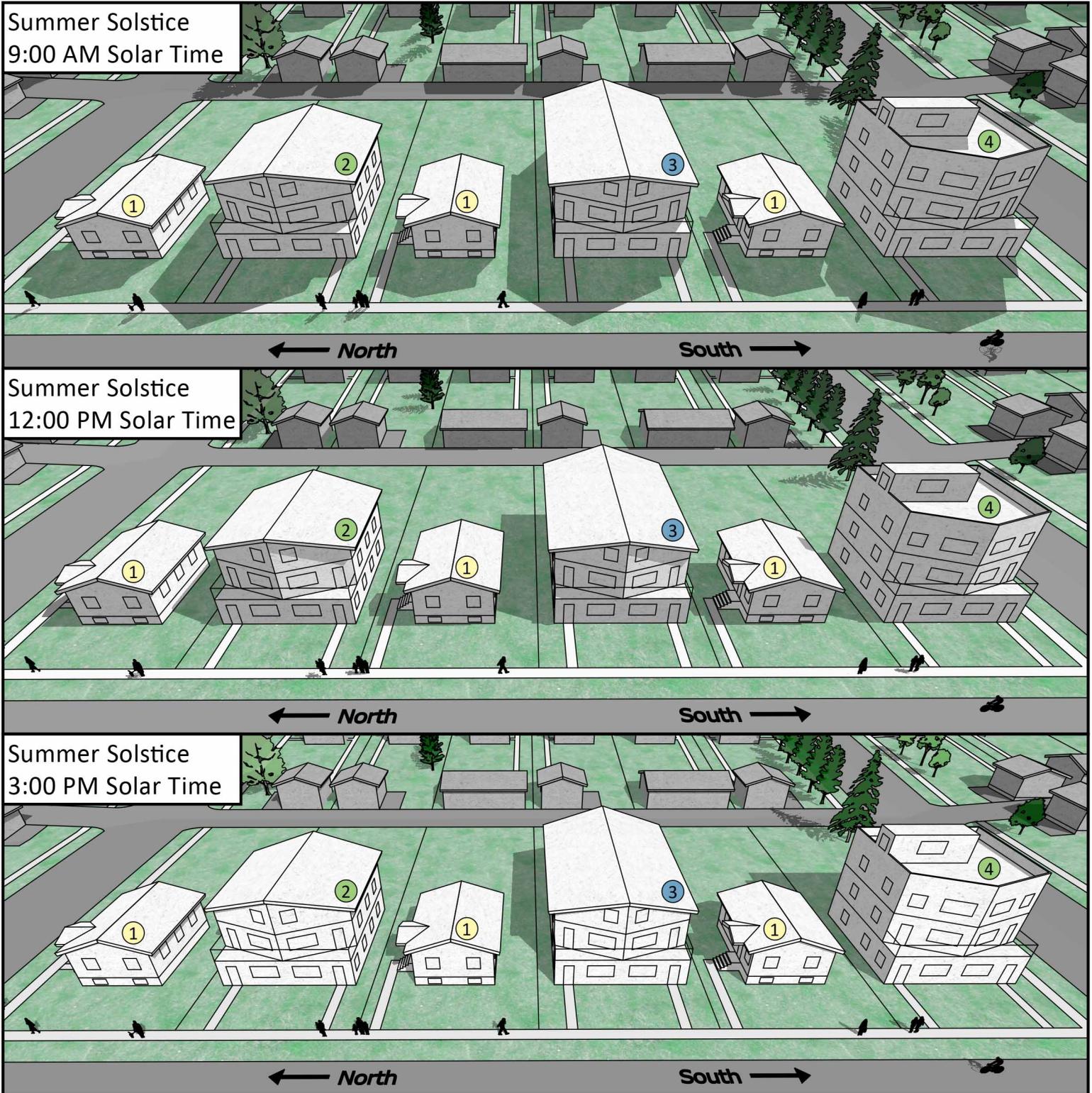


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## 3-Story Flat Roof Scenario

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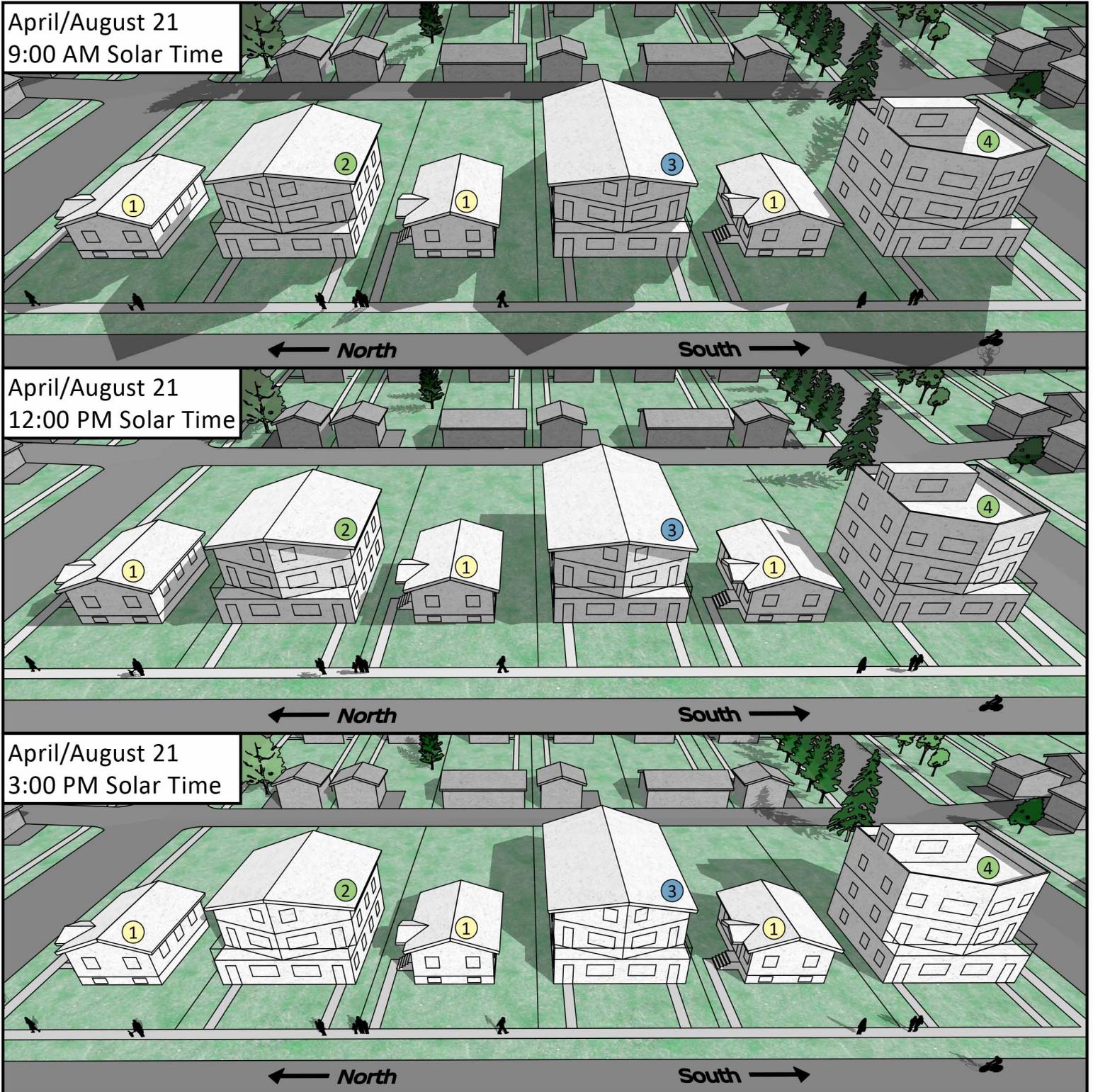


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Sunlight Shadowing Impacts at Apr. & Aug. 21, Row of Lots North and South of Each Other

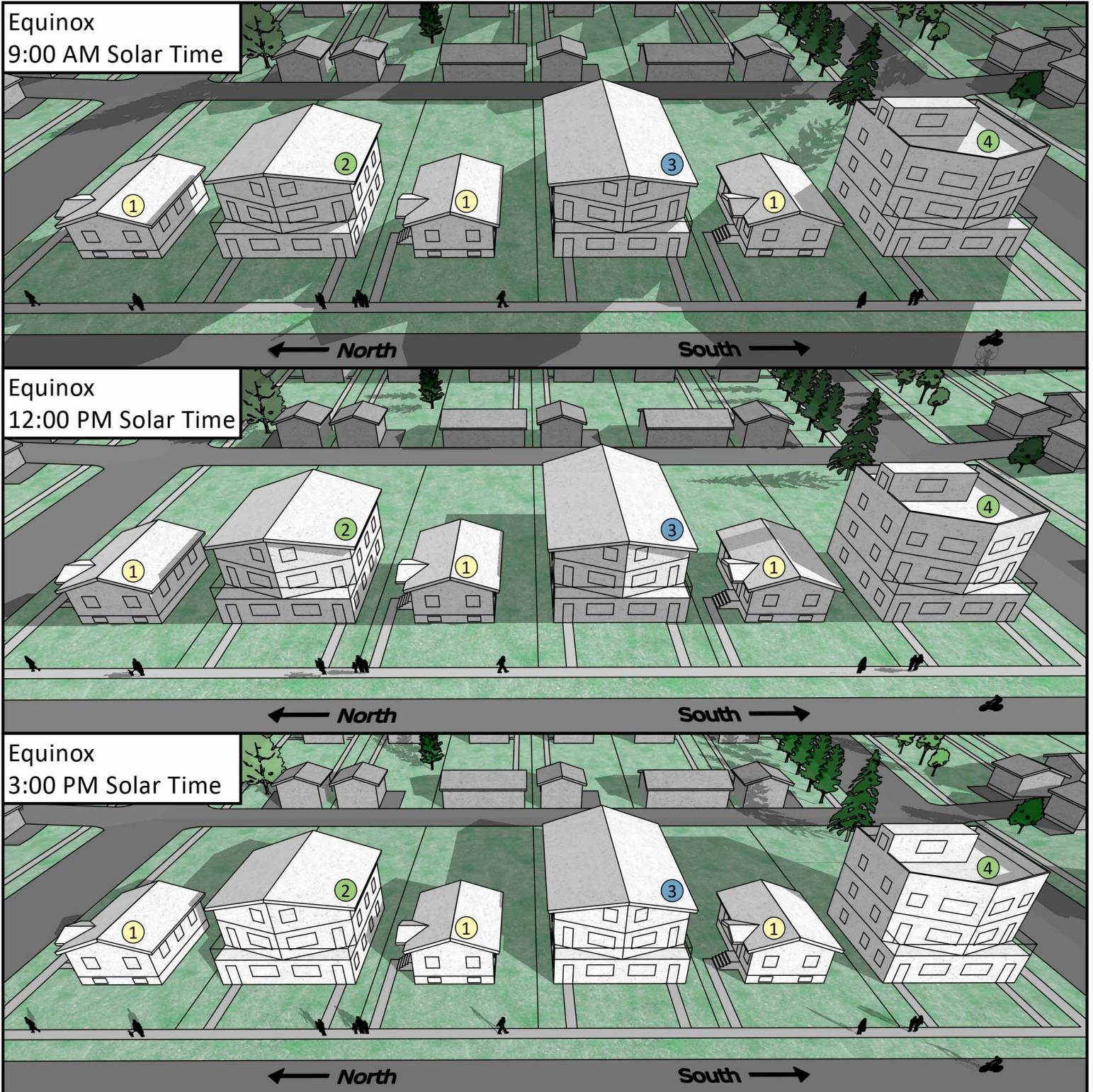


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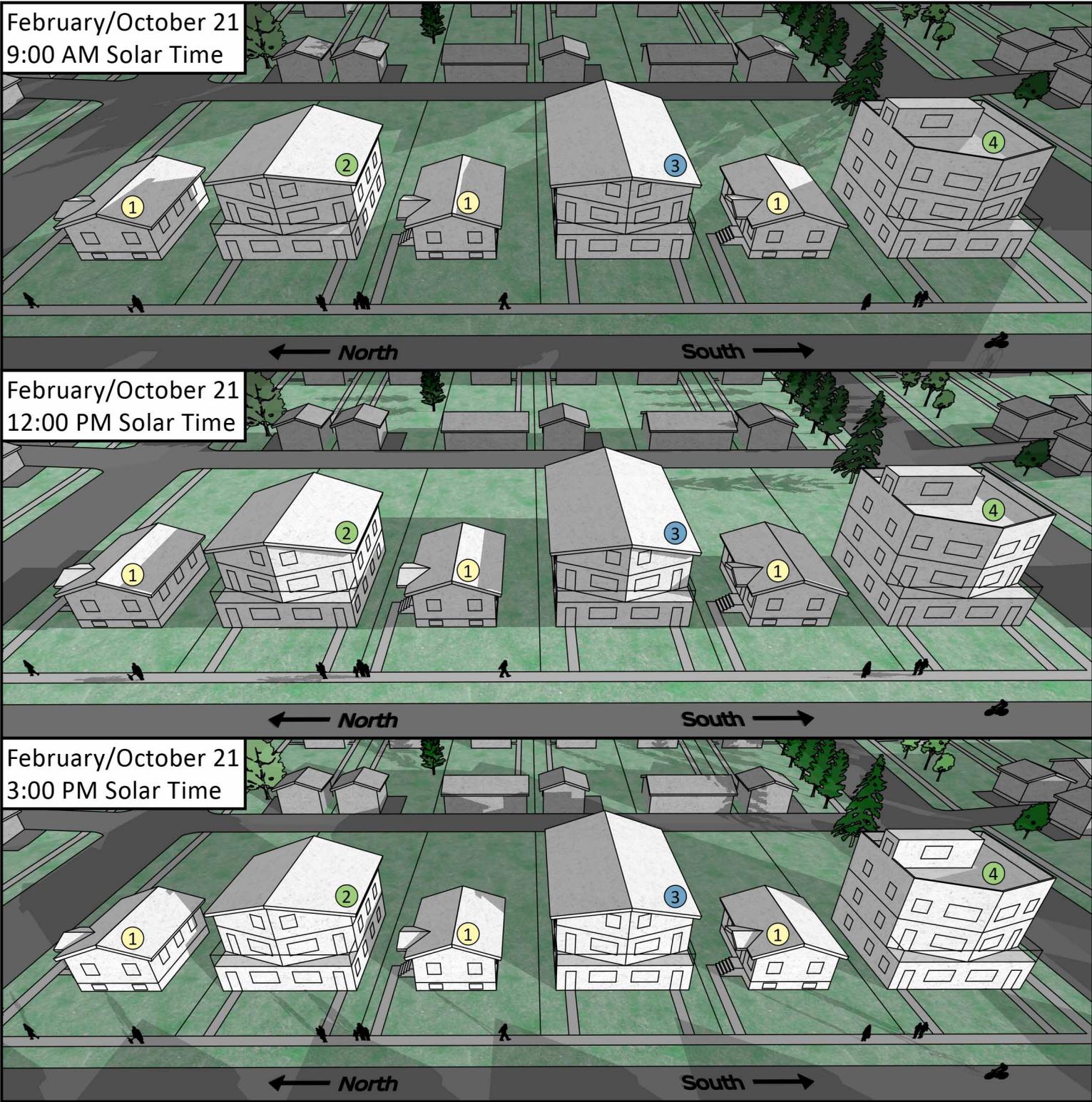


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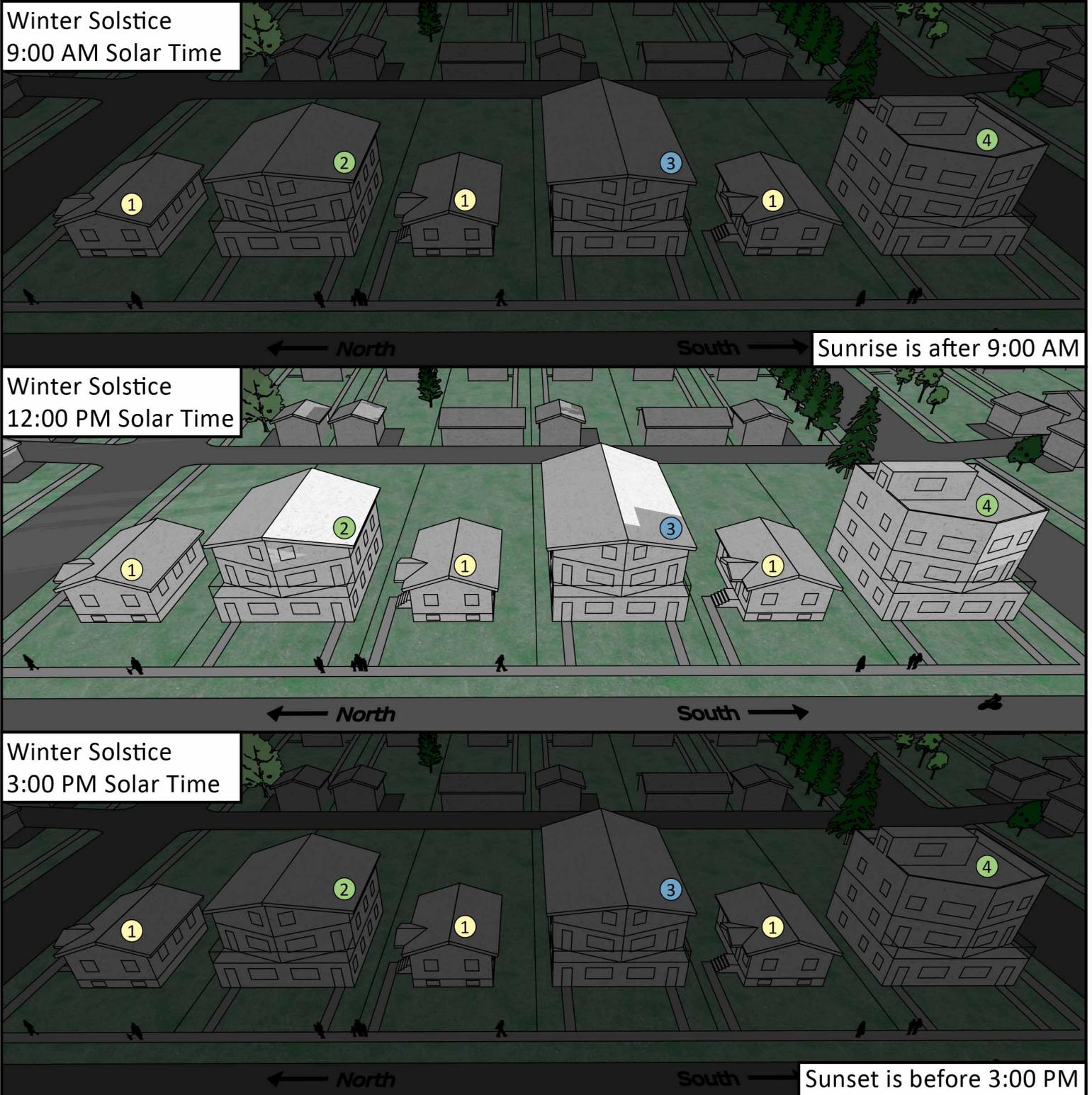


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## 3-Story Flat Roof Scenario

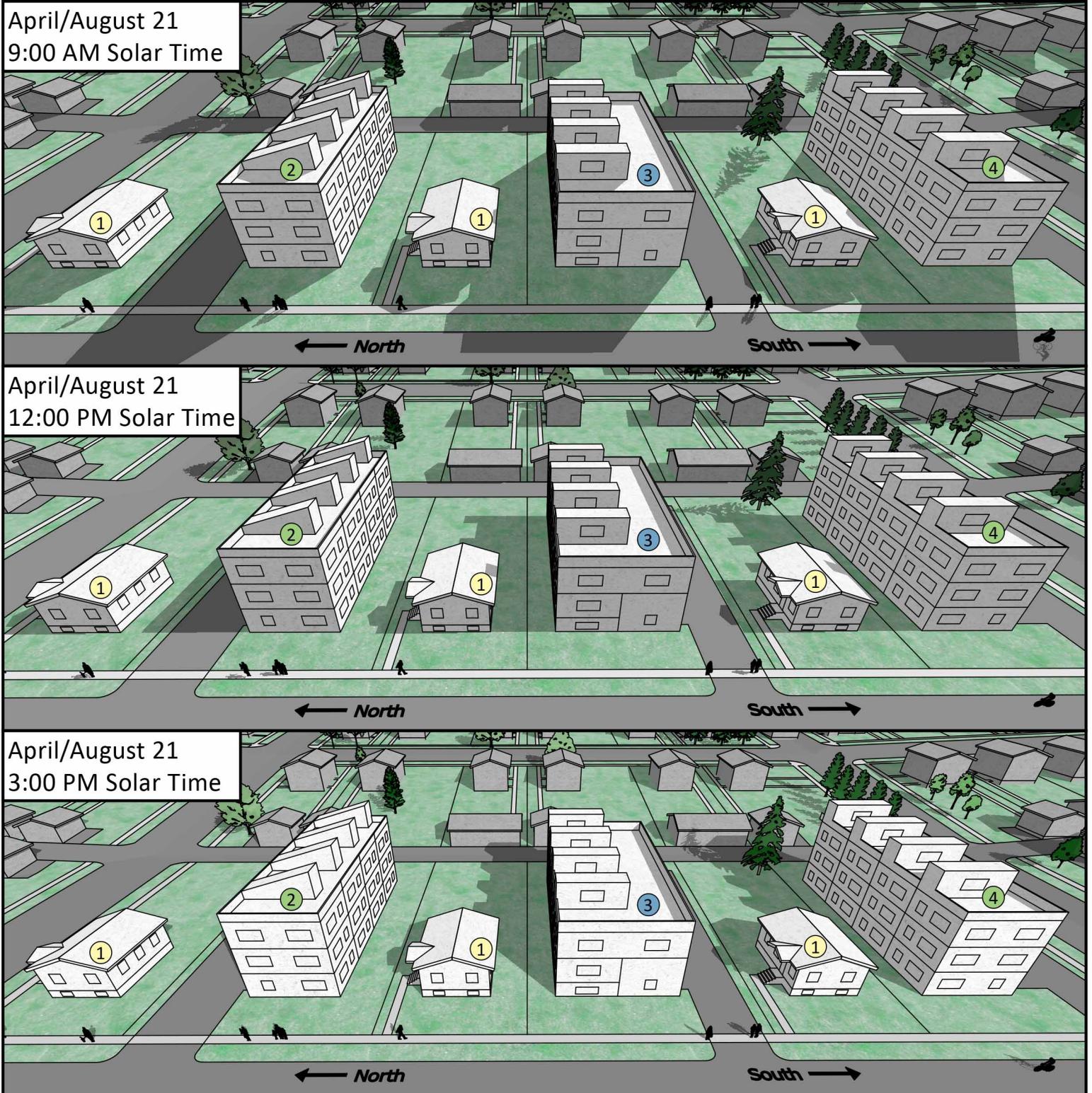
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# Comparison of Potential Shadow Impacts of Four-plex Multifamily Buildings on 11,200 Square-foot Lots, R-2M Zone

Sunlight Shadowing Impacts at Apr. & Aug. 21, Row of Lots North and South of Each Other



① Existing Older Home on 7,000 Square-foot Lot

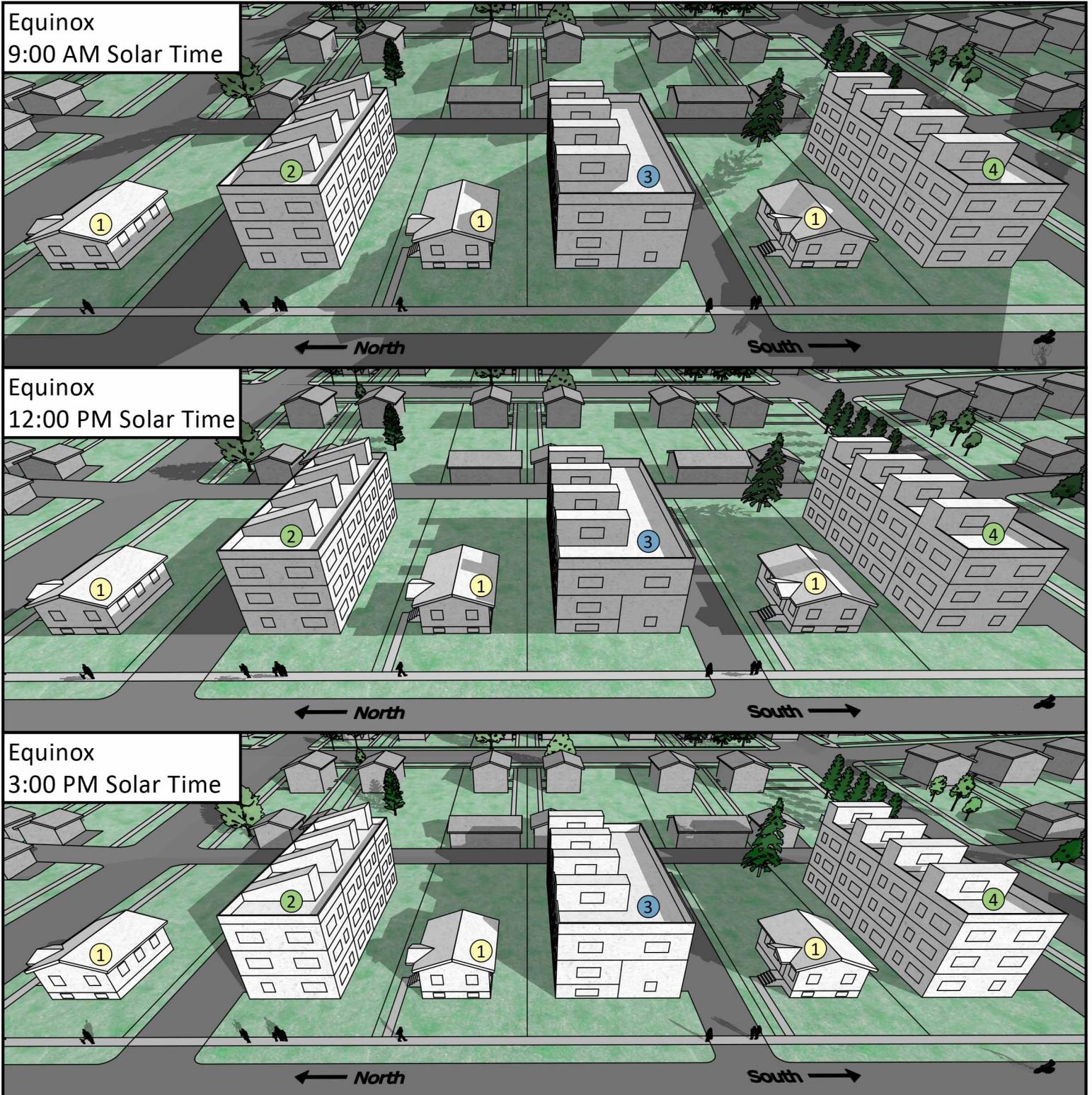
② Proposed Max. Four-plex Size on 11,200 Square-foot Lot: with Solar Access Step-back from North Lot Line

③ Current Code Max. Four-plex Size on 11,200 Square-foot Lot: 10-foot Side Setback from North Lot Line

④ Proposed Max. Four-plex Size on 11,200 Square-foot Lot: 10-foot Side Setback, No Solar Access Step-back

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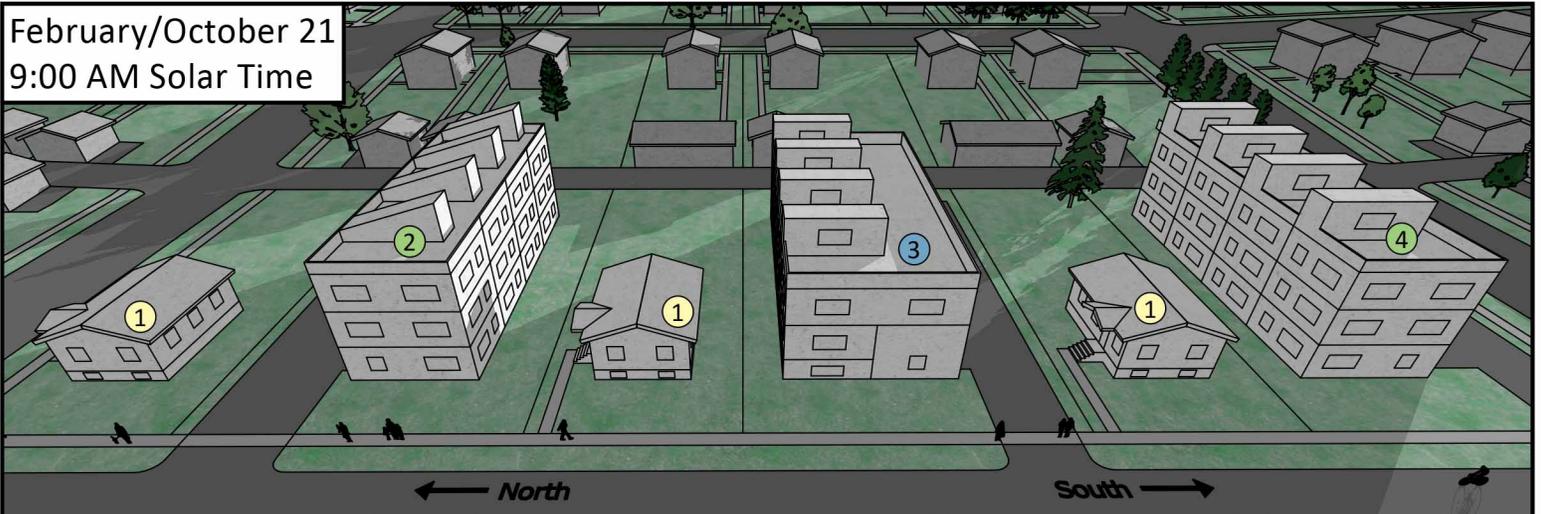


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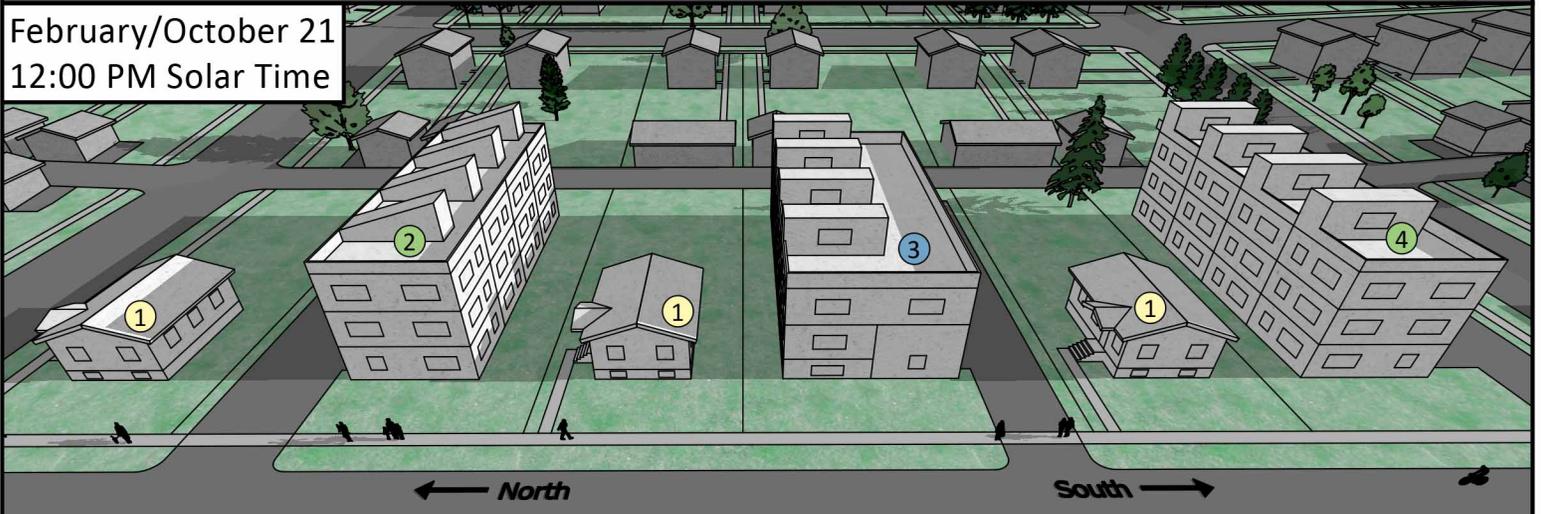
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