



TOWN OF ARLINGTON
DEPARTMENT OF PLANNING and
COMMUNITY DEVELOPMENT

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MEMORANDUM

To: Jennifer Raitt, Director of Planning and Community Development
From: Kelly Lynema, Senior Planner
Date: August 12, 2020
RE: Shadow Study for Docket #3602, 1207-1211 Massachusetts Avenue

At the 7/6/2020 Arlington Redevelopment Board hearing, members of the public raised concerns about the shadow study provided by the applicant for redevelopment of 1207-1211 Massachusetts Avenue. In response, the Department of Planning and Community Development (DPCD) agreed to provide an independent study of the shadows resulting from structures currently on the property and those that would be generated by the proposed development. Staff also felt that it was important to provide drawings that included impervious surfaces and trees on the proposed project site and the surrounding properties.

Methodology

DPCD staff prepared a model of the project site and abutting properties using the free version of Google SketchUp. A scale base map of the area was uploaded from Google Maps; this base map was overlaid with a more detailed map of the vicinity based on the Town's GIS data. Both maps were used in conjunction with information provided on Assessor's records, prior ARB and ZBA dockets, aerial photography from Google Earth, images on Google Street View, and three site visits to develop a detailed model of the area.

Staff included impervious surfaces and sidewalks based on the Town's GIS. Tree locations and estimated heights were assessed using the Town's Street Tree Inventory and a combination of Google Street View and site visits.

Projections of shadows are provided for the following:

	Existing Conditions	Proposed Conditions
March 21 (Spring Equinox)	9am, 12pm, 3pm with trees 9am, 12pm, 3pm without trees	9am, 12pm, 3pm with trees 9am, 12pm, 3pm without trees
June 21 (Summer Solstice)	9am, 12pm, 3pm with trees	9am, 12pm, 3pm with trees
September 21 (Autumnal Equinox)	9am, 12pm, 3pm with trees	9am, 12pm, 3pm with trees
December 21 (Winter Solstice)	9am, 12pm, 3pm with trees 9am, 12pm, 3pm without trees	9am, 12pm, 3pm with trees 9am, 12pm, 3pm without trees

A separate pair of plan view images showing the topographical conditions of the site with 10' elevation contour lines is provided for additional context.

Limitations of the Study - There are several limitations to this study based on available data and the limits of the free version of SketchUp.

Available Data:

- The Assessor's database identifies the number of floors in a structure, but does not include records of specific building heights; where possible, building heights were sourced through reviewing older ARB and ZBA dockets for prior cases reviewed in the neighborhood, but not all structures in the neighborhood have been through a Special Permit review. Site visits and Google Street View served to provide verification of building heights for structures abutting properties for which heights could be identified. Where building heights could not be determined, staff used a height of 35' for 2½-story structures, 24' for two-story structures, and 14' for single-story commercial structures.
- Staff used the Town's tree inventory to identify specific locations for street trees, however the inventory does not provide estimated tree heights, nor does it provide locations or heights for trees on private property. Again, site visits and Google Street View were used to estimate tree heights.
- It has been suggested that one of the trees at the rear of the 1207-1211 lot is slated to be removed, but staff was unable to find confirmation of which tree is proposed for removal. For the purposes of the study, there are two different scenarios. The March and December studies show two scenarios: one with all trees on the property and adjacent properties, and the other without trees on the property and adjacent properties.

Software Limitations:

- Drawings could not be exported to scale; providing graphics at a 1":20' ratio was not possible. Staff used precise measurements from Assessor's records and the applicant's drawings to portray the existing and proposed conditions as accurately as possible.
- A tool in SketchUp allows for the projection of shadows based on date and time of day; drawings in the attached files are labeled accordingly, but the specific points and graphics for sun direction are not provided.
- Staff generated generic tree forms instead of species-specific trees. To approximate the seasonal difference in shadows cast by deciduous trees, two versions of the March and December studies are provided: one with foliated trees and one without trees.
- While sections and elevations are not provided, there are a few important notes to observe. The ground level of the Children's Room on Massachusetts Ave and other buildings along Appleton Street are roughly 10 to 15 feet higher in elevation than the base of the 1207-1211 Massachusetts Ave site. While the area flattens out to the north and east side of the project site, it is significantly more sloped south and west of the Appleton/Mass Ave and Lowell/Mass Ave intersections.
- Poly lines and shapefiles could not be directly imported from GIS. All street, sidewalk, and elevation lines were drawn by hand.

Conclusions

There is limited shadow impact on the surrounding area by the proposed development. Additionally, the drawings demonstrate that the existing tree barrier between the commercial buildings on Massachusetts Avenue and the residential structures on Peirce Street nears the height of the proposed structure. As the ARB evaluates the impact of shadows from the proposed structure, this study should provide additional clarity around where those shadows are cast, and whether they land on structures, open space or driveways. Finally, this study appears to support similar conclusions in the shadow study previously provided by the applicant.