

Philip Paulson

GEO593 Final Abstract

The purpose of this research was to determine who would benefit by limiting the maximum building height of the Marquam Hill Plan District as laid out in Title 33 Chapter 555, Section 230. The assumed benefit is the increased value of properties which have a clear view of Mt. Hood and/or the Willamette River which would be blocked by increased development of the Marquam Hill medical campus, resulting in an interest in limiting those heights. The researcher created two viewshed analyses conducted using a section of the Willamette River derived from an Oregon State river shapefile and a 1000 meter contour line derived from the Digital Elevation Model (DEM) of Mt. Hood as the observation features. The first viewshed analysis was conducted using a 10 meter DEM from the Oregon Geospatial Data Clearinghouse. A new DEM was created by replacing the values of this DEM with the maximum height values digitized from a planning map in the zoning code document for the Marquam Plan District, and a second viewshed analysis was conducted. A difference matrix was created from the resulting viewshed rasters, and regions showing a difference were used to derive the value of the properties affected by an increased height within the Plan District from an RLIS taxlots dataset. The researcher found that the average total value of the properties effected was \$500,797, which was lower than the hypothesis that the average value of these properties would exceed \$1 million, though there were several properties that exceeded this estimate.

Marquam Hill Planning District

A Viewshed Comparison

Background

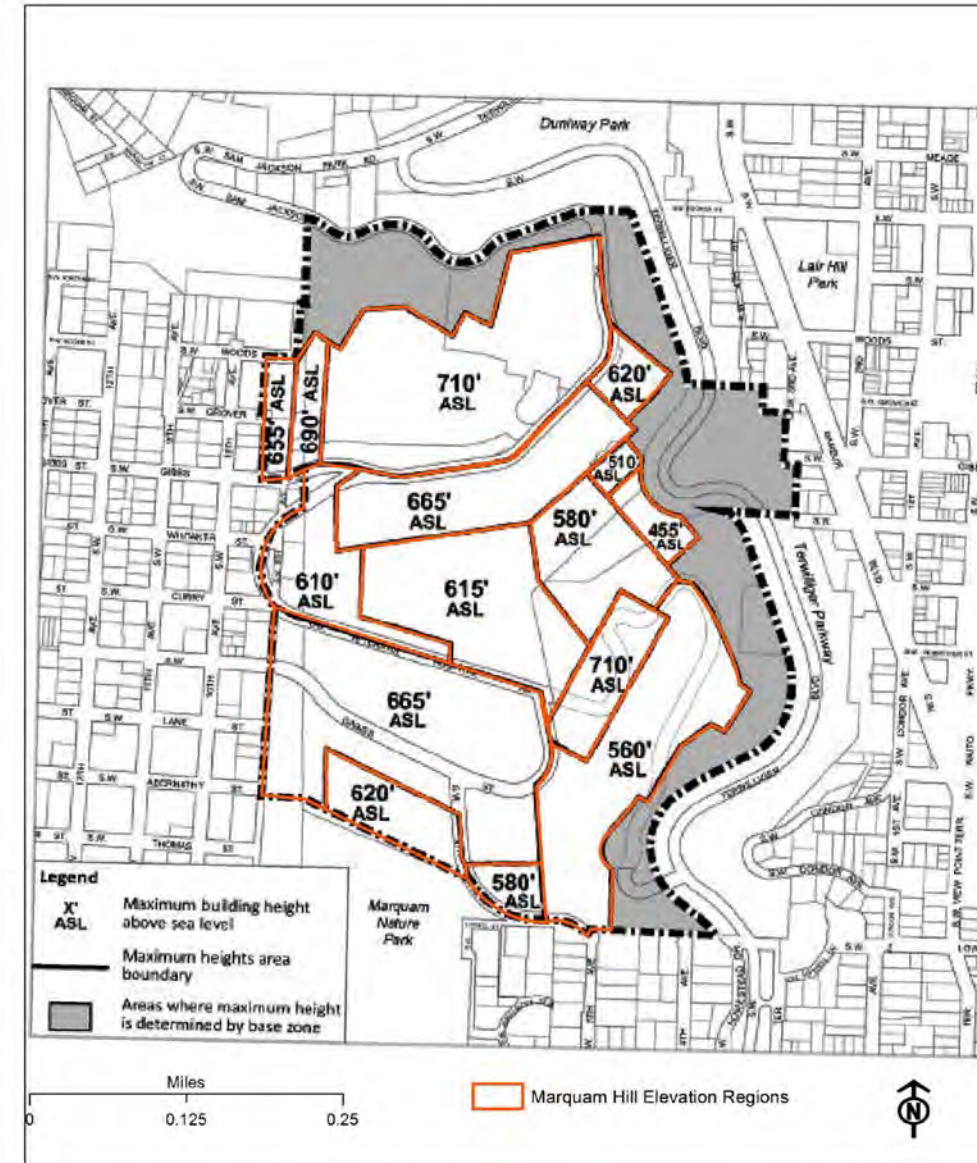
The city of Portland has a series of special Plan Districts which have zoning specifications that differ from the “base” zoning plan for the city. The Marquam Hill Plan District is one such district, encompassing the main OHSU and Veterans Affairs Campus just to the west of the Portland’s south waterfront district.

Part of the plan is “to support the preservation and enhancement of:

- natural open space areas,
- **existing scenic views,**
- Neighborhood livability” (555-1)

Much of the existing scenic view purpose are accomplished by 33.555.230 which establishes a series of zones with height limits above sea level to maintain a “step-down” effect.

Whose existing scenic views are protected by this rule?



Marquam Hill Planning District

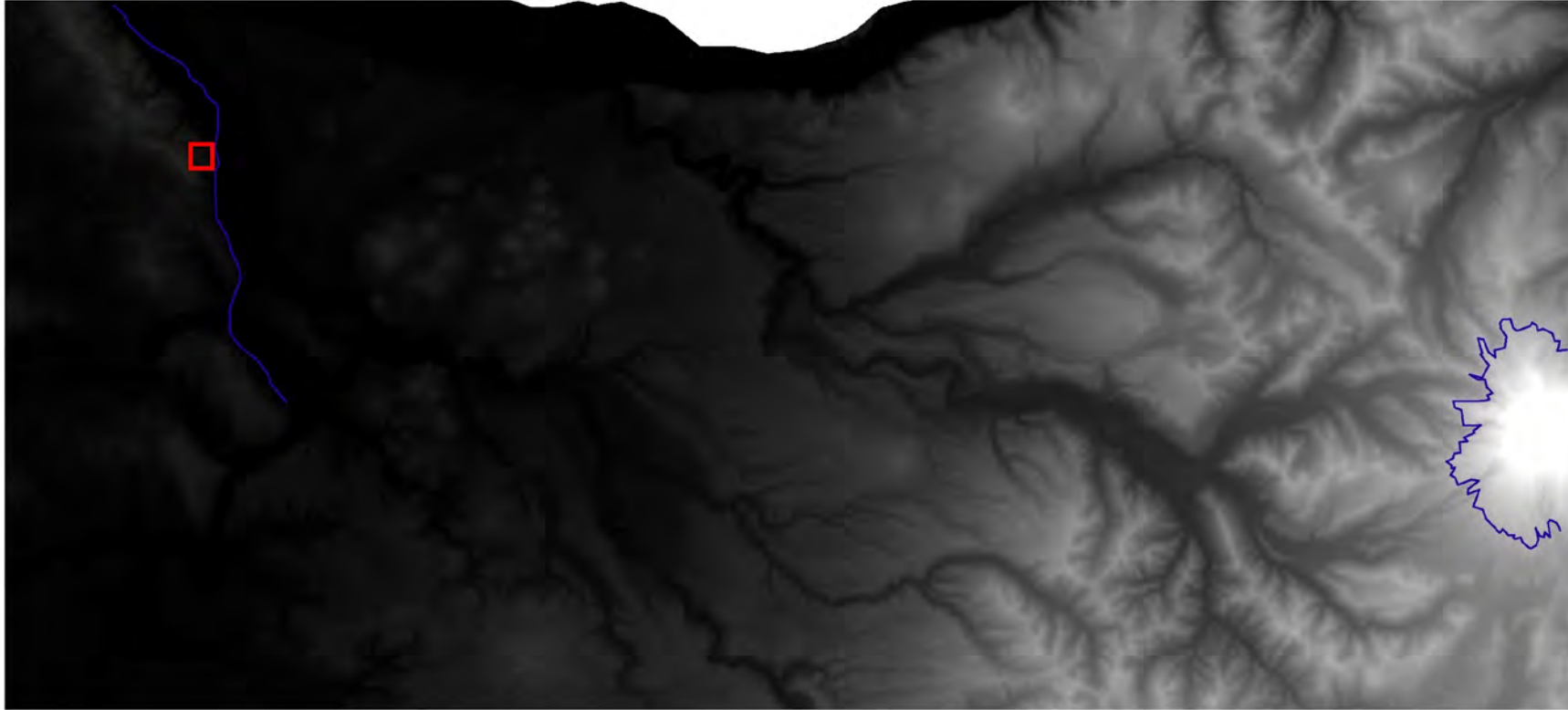
Solution: Determine whose view would be negatively effected by a change in elevation from higher buildings in the area.

General Steps:

- Create Observation points from Mt. Hood and Willamette River.
- Create two Viewsheds, one from original DEM and the second from DEM altered with Plan District maximum elevations.
- Compare the Viewsheds to determine locations that would lose their view if buildings were allowed up to the prescribed heights.
- Determine the characteristics of those regions to determine who has an interest in limiting the height.



Original 10 Meter DEM with Observer Features



Extent of Planning District

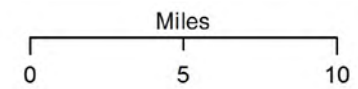


Observer Features

Elevation(ft)

High : 11225.6

Low : 1.06569



Viewshed from Original DEM



Extent of Planning District

Observer Features

Not Visible

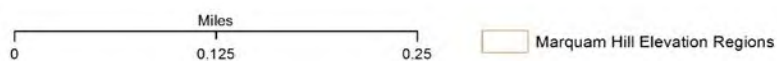
Visible

Miles
0 5 10



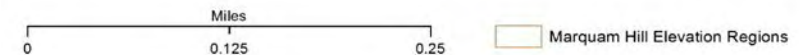
Manipulating the Original DEM

Original DEM

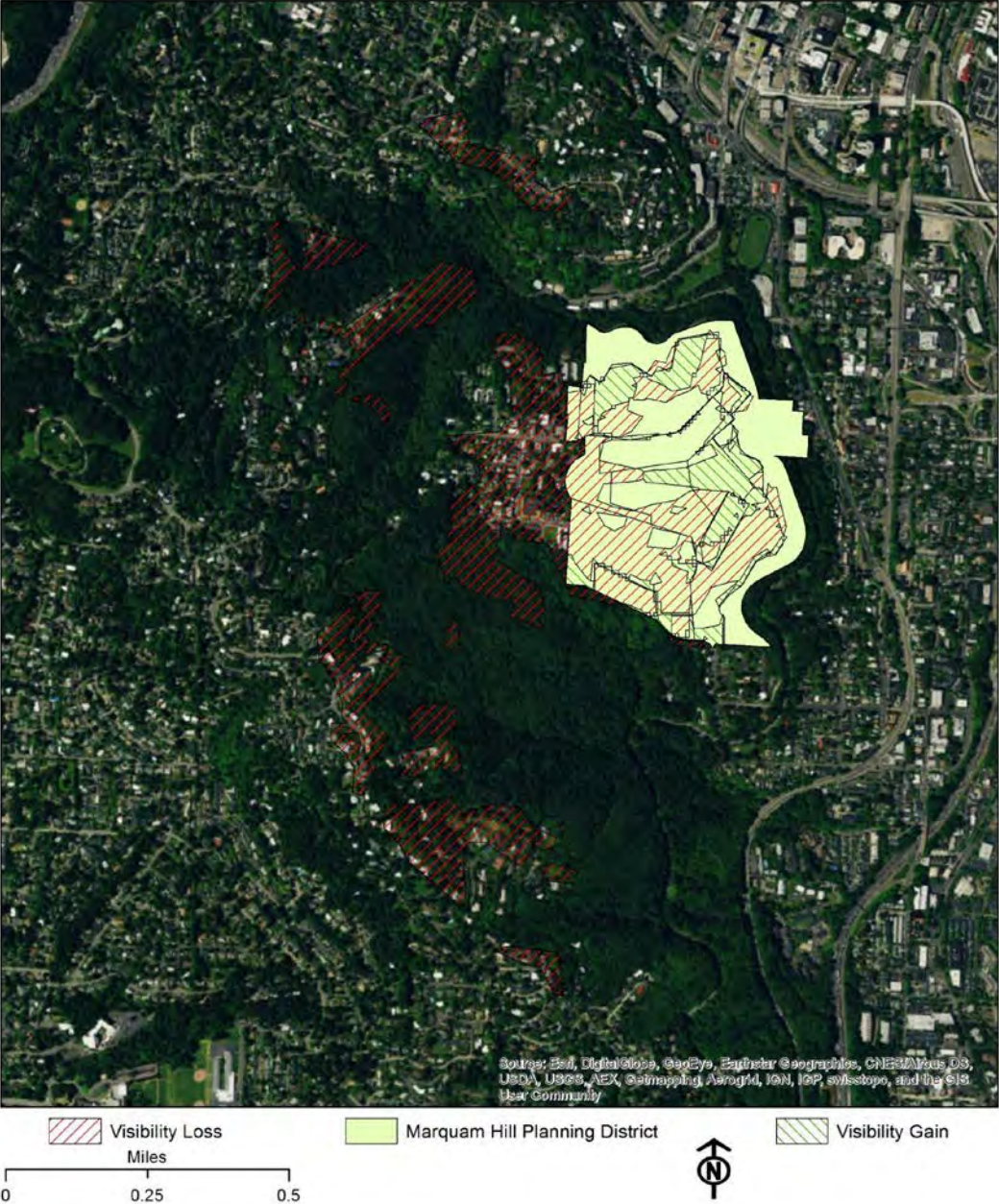


I substituted the values from the planning district into the DEM and ran the View shed Analysis again.

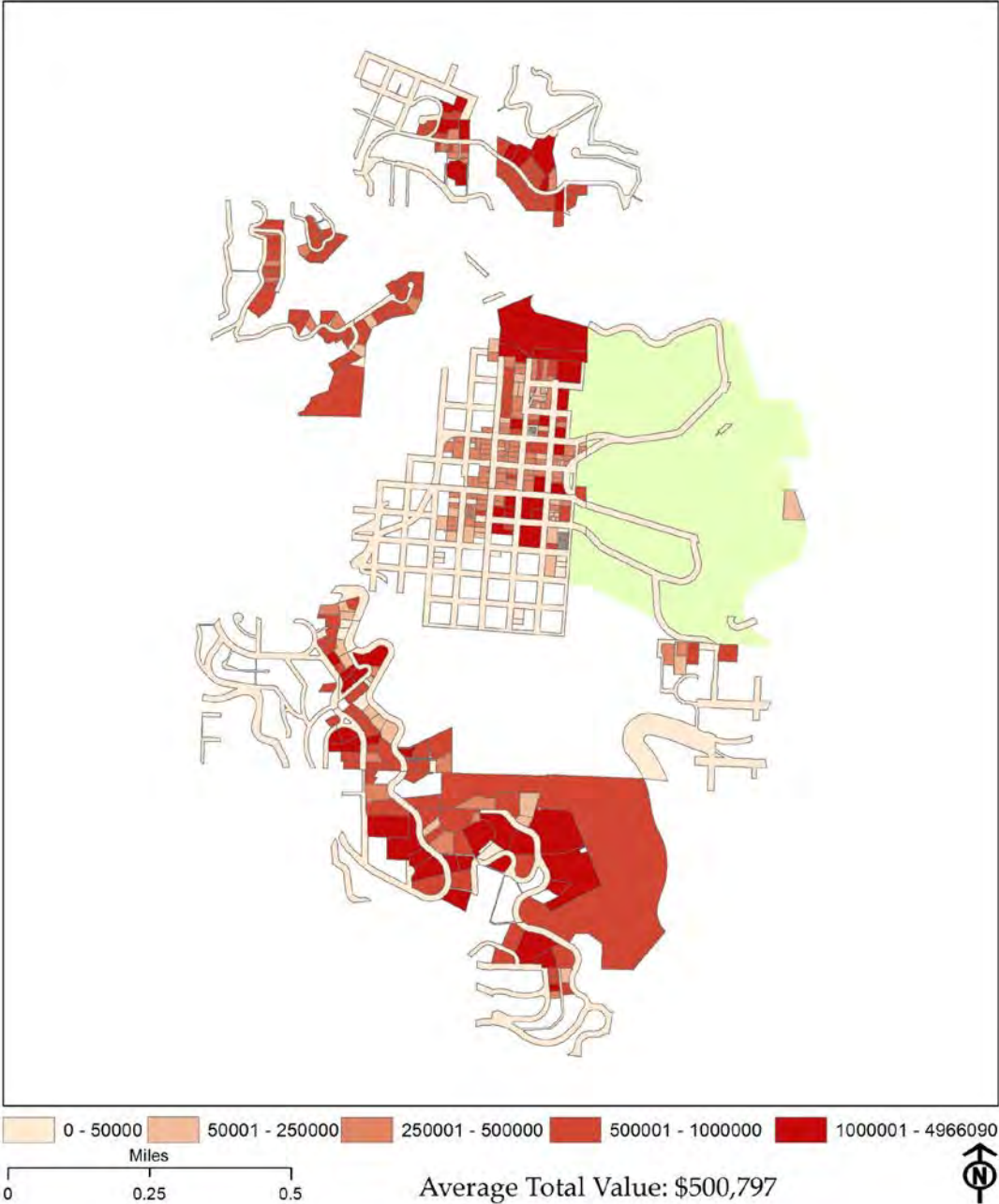
Altered DEM



Regions of Visibility Change



Price (in \$) of Effected Properties



Conclusion:

There would be people affected by building up the Marquam Hill campus up to and above the prescribed heights, some of whom have very expensive properties where part of that value is the view of the Willamette River and Mount Hood, but additional research is required to determine how this influenced the planning document.

References

- Chapter 33.555, Portland City Zoning Regulations, *City of Portland*, June 4, 2015. Web
<http://www.portlandoregon.gov/bps/34563?a=53377>
- 10 Meter DEM, *Oregon Geospatial Data Clearinghouse*, Winter Quarter 2015. Web.
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- OR Rivers Shapefile, *State of Oregon*, December 2nd, 2016. Web.
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- RLIS Taxlots Layer, *Metro*, Accessed September 9th, 2015.