Wheelchair Requirements

Slope ratio 1:20 – Every foot in elevation change requires 20 feet horizontally.

Cross slope – If the cross slope is too great, a person risks tipping over. Proposed federal regulations specify 2-3% depending on the surface.
Powell Butte Nature Park

Mountain View Trail

Current details of the trail according to Portland Parks & Recreation...

- Length: .65 miles
- “Accessible”
- Elevation Change: 158 ft
- Slope: Up to 5%
- “You can see forever!” 5 mountain peaks are supposedly visible from Powell Butte.
Our Questions

• Is the Mountain View Trail as accessible as Portland Parks & Recreation says?

• Can trail analysis performed on the Mountain View Trail be applied on a greater scale?

• Can you see five mountain peaks from Powell Butte as the literature says?

Mountain View Trail Analysis
The Bigger Picture: Applying Our Methodology to Larger Areas
Potential Methodological Issues

Using Profile Surface to Discover Digitizing Error

Note Digitizing Error
Max Slope per Segment
- 0 - 5
- 6 - 8
- 9 - 12
- 13 - 15
- 16 - 20
- 21 - 95

Trails Around the Region

Trail Ownership by Entity

Miles of Trails Per County

- Washington
- Multnomah
- Clackamas
Viewshed Analysis

• Raster Catalog used to assemble DEMs from the USGS Seamless Server

• Locate points of interest – in this case the five mountain peaks

• Perform analysis along segment of a ring to minimize ArcGIS processing time

Comparison of Viewsheds using a DEM and a DSM

Visible from PB (DSM) 74 Sq Miles
Visible from PB, (DEM) 80 Sq Miles
Challenges

• Cross slope of a trail can be difficult to derive from 3ft lidar data.
• Accurately digitizing trails or extracting from DEM (algorithms applied to derived surfaces or ArcScan).
• Revising trail segments and updating 3D attributes.
• Familiarity with the study area (knowing where trails start and stop).

Conclusions

• The Mountain View Trail can be improved to make it more accessible for individuals in wheelchairs.
• This methodology and analysis shows promise and may be useful on a larger scale.
• Yes, you really can “see forever!” Five mountain peaks should be visible.
References


• Great Wheel Chair Accessible Hikes.com [http://www.greatwheelchairaccessiblehikes.com/](http://www.greatwheelchairaccessiblehikes.com/)


Questions?