Geodatabase to Assist with Accessible Route Identification for Wheelchair Users

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Project Outline

- The Design objective
- Background
- Methods and Techniques
- Analysis
- Other Applications
Design Objective

To design a geodatabase that will assist wheelchair users with identifying accessible travel routes

Project background

- Wheelchair users face barriers to their mobility while navigating the urban landscape:
  - Incomplete sidewalks
  - Curb ramps that do not connect
  - Steep inclines and declines
- The absence of safe accessible routes can place individuals using wheelchairs in dangerous situations and add to travel time
Missing links of sidewalk

Missing link of sidewalk at the intersection of N. Druid Avenue and Willis Blvd.

Lack of Curb Ramps

No curb ramp  Curb ramp
Data Acquisition

<table>
<thead>
<tr>
<th>RLIS</th>
<th>CITY OF PORTLAND (office of Transportation)</th>
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<tbody>
<tr>
<td>Tax lots</td>
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<td>River</td>
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Geodatabase Methods and Techniques

- Designed and built schema
- Set up domain
- Imported shapefiles clipped to the Portland boundary

Study area

Area extent: Portland
Boise neighborhood located in northeast Portland between Mississippi Avenue and Martin Luther King Blvd and Shaver Avenue and Stanton Avenue
Curb Ramps

- Curb ramp data
  - Walked Boise neighborhood recorded curb ramp locations
  - Created a feature class called Boise_impedances
  - Digitized the curb ramp data (Bureau of Planning has curb ramp data in paper form) with an attribute field indicating yes or no curb ramp

Methods and Techniques

- Digitized east/west and north/south lines along sidewalks
Topology Methods and Techniques

Created a route using digitized lines
Geocoded Methods and Techniques

- Used walkscore.com to determine local business addresses
  - Geocoded the businesses in the neighborhood using RLIS streets

Section of N. Mississippi Ave

Create Turn Table Methods and Techniques

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- ArcInfo was used to create a coverage
- Created a Turn feature class from the coverage
Turn Feature Class

Methods and Techniques

Joined the Boise_impedance feature class to the turn feature class

Create Network Data Set

Methods and Techniques

- Created a network dataset in my geodDB
- Built the network
  - Edges
  - Junctions
Create Network Data Set  Methods and Techniques

Analysis

Shortest path Analysis
No access
Bus stop to school

Closest stop to SEI school is the #44 bus stop on Failing and N.Vancouver

Shortest accessible path is .25 miles

Shortest able bodied path is .15 miles

Trip to the New Old Lompoc Brewery

Wheelchair distance is .7 miles

Able-bodied distance .4 miles
Visiting a friends house

Wheelchair user .8 mile
Able-bodied pedestrian .4 miles

Applications

- Foundation for interactive map
- This geodatabase can serve as the foundation for further studies on curb ramp connectivity
- Resource allocation
  - The BOM will be able to make better use of their monetary resources and make a more profound impact on overall neighborhood accessibility
- Census data can be used to assess neighborhood demographics
- Determine slope of area to find least cost path using DEM
QUESTIONS?

References


‡ www.walkscore.com
‡ www.esri.com
‡ Geoffrey Duh

Thanks to Rhonda, Dan C., Joe, and Luis for their suggestions