Project Name: CliffCutter

Project Overview

This project delivers tools and a methodology for Portland Oregon to collect and analyze city-wide data about curb ramp presence and condition. The tools and data can be used by advocates and planners to prioritize allocation of funds to improve access for people who use wheelchairs.

Project Summary

There are two main elements 1) Curb Ramp Inventory and 2) GIS Modeling.

Curb Ramp Inventory

The project uses an open-source, web-based mobile application (runs on most mobile devices) to enable teams of advocates to complete a curb inventory by walking, rolling, or bicycling to each intersection in a survey region and recording observations. The project will inventory 1000's of intersections by 100's of observers.

GIS Modeling

GIS spatial data in metropolitan areas today does not typically contain information important to planning for and routing pedestrians, especially those using wheelchairs. The project will deliver a tool to forecast the locations of sidewalks and crossings and create, using OpenStreetMap data, a model of the resources (corners, curb ramps, crossings) important for pedestrians. Using a mobile application, the Curb Ramp Inventory Application, the model will be populated with curb ramp information. OpenStreetMap will be used in this case to reduce the project cost and to allow advocates low/no cost access to the tools and data they need, but the tools will remain compatible with other data sources as well. Finally, the tool will be used to perform analysis about the Portland pedestrian network and how it can be improved most effectively.

Project Organization

Project Sponsors

The following groups are investing resources of time and/or money to make this project happen. The goals of the project cascade from the goals of these organizations.

- The Oregon Public Health Institute - Innovative projects that promote health and reduce disparities are the focus of OPHI. Oregon Walks (the new name of the Willamette Pedestrian Coalition) is dedicated to promoting walking and making the conditions for walking safe, convenient and attractive throughout the Portland metropolitan region.
- PSU-Oregon Walks GIS Jammers - A group of students and professionals, hosted at Portland State University, focused on applying GIS technology to improve the pedestrian experience in Portland and to advance the state of the art in GIS as it relates to pedestrian access.

Project Manager

The Project Manager, Katie Urey, will interface with the project sponsors as required, negotiate for resources across PSU, delegate responsibilities within the framework of the project, and communicate with team members to ensure successful and timely completion of the project. The Project Manager is responsible for developing the project plan, monitoring the schedule, cost, and scope of the project during implementation, and maintaining control over the project by measuring performance and taking corrective action.

Team Leadership

- Scott Parker: Team lead for GIS Modeling
- Jack Newlevant: Advisor for Osmosis/ GPS tracks, (until January 2013)
- Melelani Sax-Barnett: Team lead for Mobile Application Development and documentation (until January 2013)
- Michael Halleen: Team lead for trail review and volunteer training (until January 2013)

Software Development

Development staffing will be by volunteers. A goal is to tap into student projects in the GIS and the Department of Computer Science. The plan is to create sub-projects which can be student class deliverables. Another goal is to engage working GIS/Software Professionals as contributors.

Data Collection

Oregon Public Health Institute is preparing a grant to secure funding for the data collection using the mobile application. Data collection will be driven out of OPHI.

Infrastructure

Funds ($1,000) will be needed to host the website that offers the application and stores the data as it comes in.

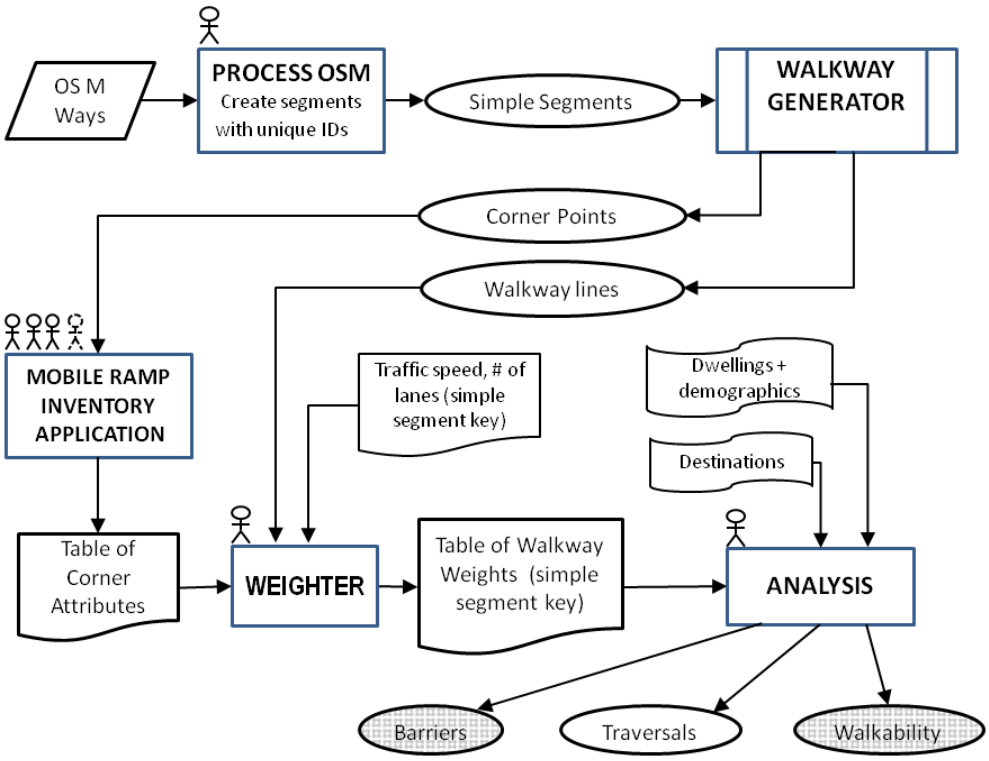
Schedule

The goal is to have the technology in place to have the inventory happen in the good weather of the summer of 2013 in Portland Oregon.

Appendix 1: **Project Deliverables**

1. Tools to pre-process OpenStreetMap (OSM) spatial datasets and create one simple-segment shapefile of streets and trails with a unique identifier for each line segment, the simple segment shapefile.
2. A Walkway Generator that accepts input from the simple segment shapefile and creates two shapefiles. One shapefile forecasts the locations of sidewalks and crossings. The other shapefile forecasts the locations of corners.
3. A Mobile Curb Ramp Inventory Application which allows multiple users to collect curb ramp information in the field.
4. A Weighter to model various walkability scenarios based on weighting factors applied to sidewalks and crossings. Weights factors will be associated with attributes from the Curb Ramp Inventory and from external information such as traffic lanes and expected traffic speed.
5. Analysis tools to evaluate and compare pedestrian travel options by using network routing and demographic overlays. From the Analysis, a traversal shapefile will summarize the model predictions of the number of trips per segment; a raster surface will show the walkability and another raster surface will show barriers to walking.
6. Training material and tools to coordinate volunteers to crowdsource curb ramp data and documentation on how to use the various software tools.
7. A method to audit data collection.
8. A Shapefile (point) of curb ramps with information from the curb ramp inventory.

Block Diagram



When possible, open data and open source tools will be used so that both the methodology and data can be shared with both government agencies and community based groups. Both the Walkway Generator and the mobile application will read-in data in one of two common GIS formats, “ESRI Shapefile” or OpenStreetMap (OSM) data format. Open source GIS tools and databases such as PostgreSQL/PostGIS, a spatially enabled relational database and Quantum GIS, a mapping and analysis application, are increasingly usable and user-friendly. PostgreSQL and QGIS run on Windows, Linux, and Mac OS platforms.

Project Need

People of all ages and abilities travel from place to place to be part of a community. Yet, even when traveling by car or by transit, trips begin or end as a walk or a ride in a wheelchair.

While urban planners and public health advocates set goals to make cities more accessible to those who use wheelchairs and other mobility devices, neither baseline data nor inventory methodologies to augment data about facilities for the disabled are available. Strategic decisions about where to install curb ramps and improve sidewalk and trail surface can be made if planning begins and is judged by a more complete description of accessibility.

This project addresses the need to increase the quantity, quality and availability of data about accessible transportation. It also contributes by sharing the algorithms and tools to generate, collect, and manage this data. By involving student volunteers from Portland State University and volunteers from community groups it also increases public awareness of the need to remove barriers that isolate people who use mobility assists.

The project differs from other initiatives which also address the need for data about the safety and quality of the built environment used by pedestrians. In September 2012, Walkscore.com introduced a free Iphone application that allows people to enhance walkscore.com web based maps with local information, including comments about dangerous intersections. In Berlin, Germany, a group of Social Heroes, Sozialhelden, launched wheelmap.org, a web site which allows anyone to qualify the wheelchair accessibility of a destination.

However, more data is needed. Walkscore has a commercial focus and supports searches for real-estate and apartments. While people can add data to Walkscore, downloads of the data for re-use may be restricted. For instance, the Walkscore web site offers only one sample dataset. Wheelmap does not add information about routes used by wheelchair travelers.