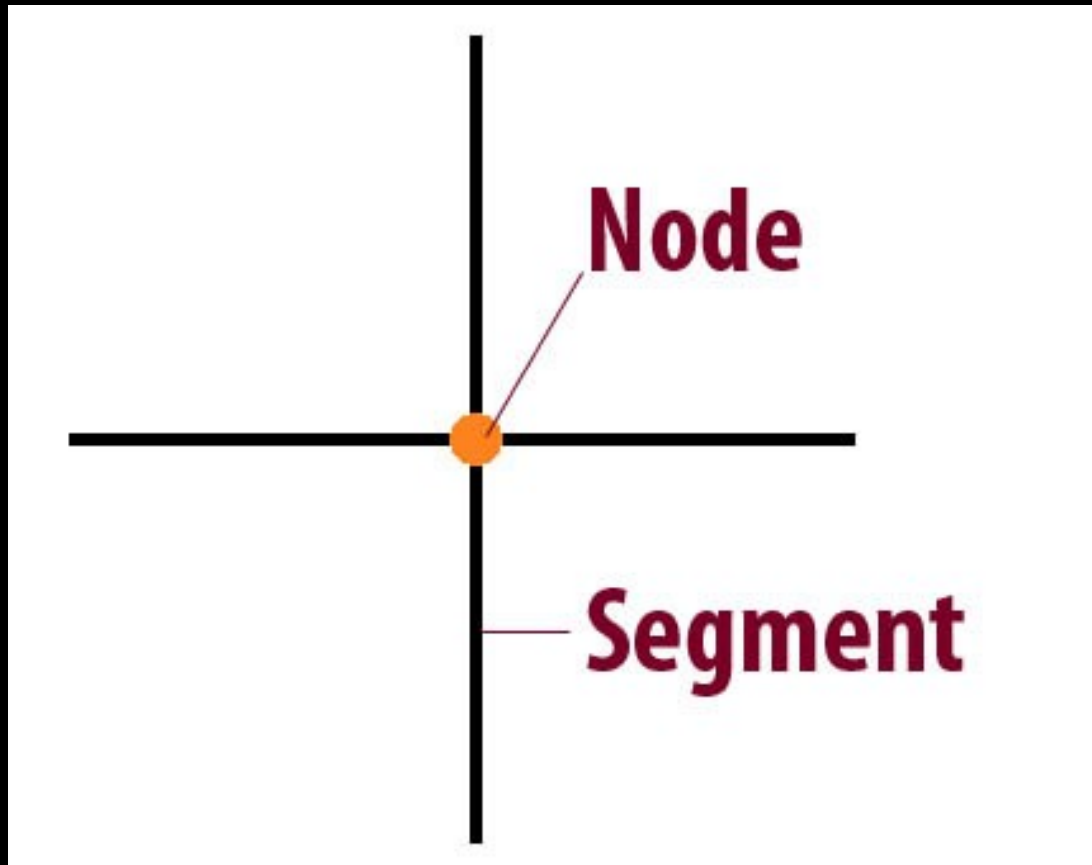


Introduction to the Walkway Network

GIS Jammers
27 March 2013

“Network 101”



What can you do with a network?

- Analyze network connectivity - can you get there from here?
- Combine with demographic data to analyze people's access to destinations and services
- Evaluate the contribution of proposed improvements
- Generate real-time services like best routing

Dynamically-generated walking route on Google maps

The screenshot displays the Google Maps interface with a walking route highlighted in blue. The route starts at point A on N Charleston Ave and ends at point B at Roosevelt High School. The left sidebar provides a list of directions with distances and a warning about the beta status of walking directions.

Google maps

Get directions My places

Walking directions are in beta.
Use caution – This route may be missing sidewalks or pedestrian paths.

Suggested routes

Walking directions to Roosevelt High School

A N Charleston Ave

1. Head **northeast** on **N Charleston Ave** toward **N Lombard St** 144 ft
2. Turn **right** onto **N Lombard St** 56 ft
3. Slight **left** to stay on **N Lombard St** 0.2 mi
4. Turn **left** onto **N Mohawk Ave** 223 ft
5. Turn **right** onto **N Central St** 0.5 mi
6. Turn **left** onto **N Ida Ave**
Destination will be on the left 335 ft

B Roosevelt High School
Portland, Oregon

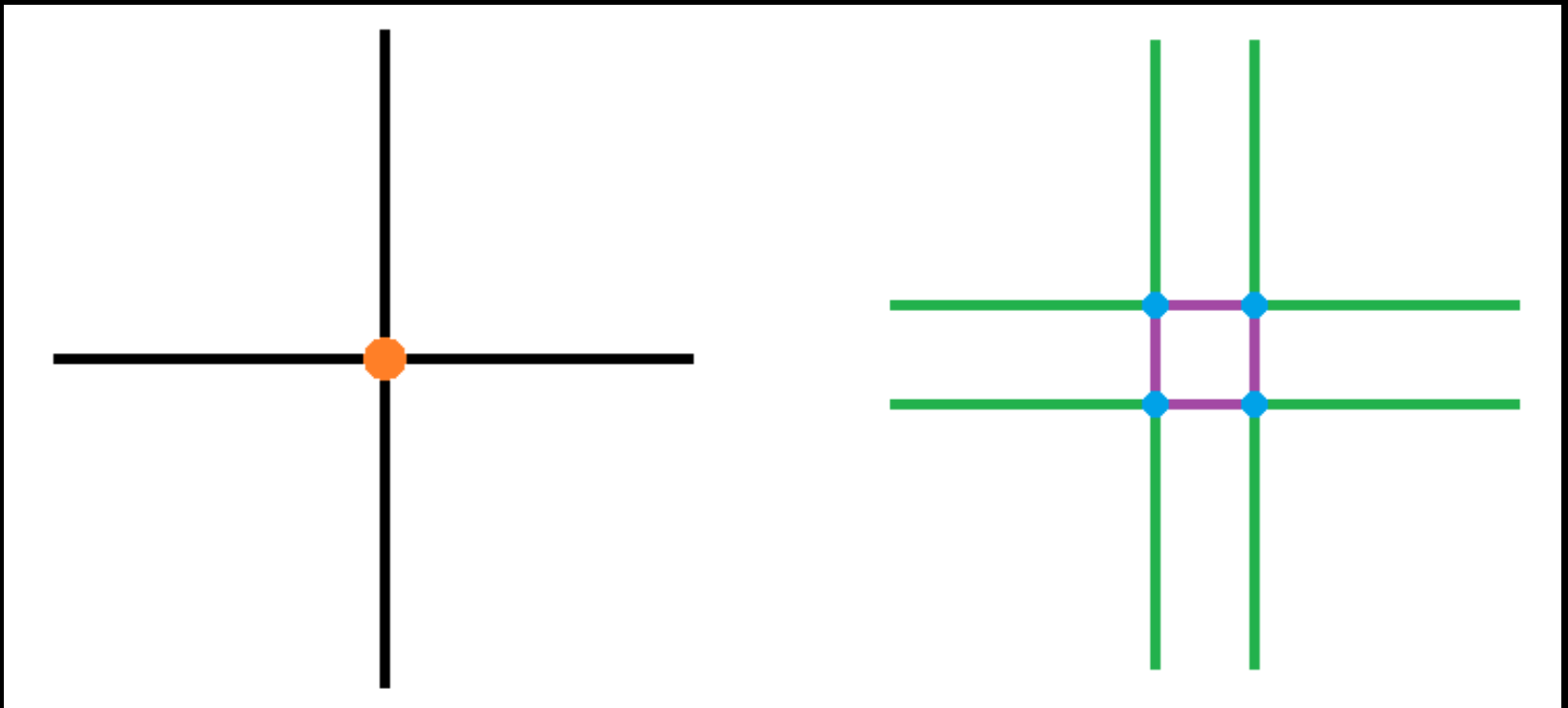
Map controls: Street View, Satellite, Traffic, Scale bar (1000 ft / 200 m), Copyright (©2011 Google - Map data ©2011 Google - Terms of Use | Report a problem)

East Portland in Motion

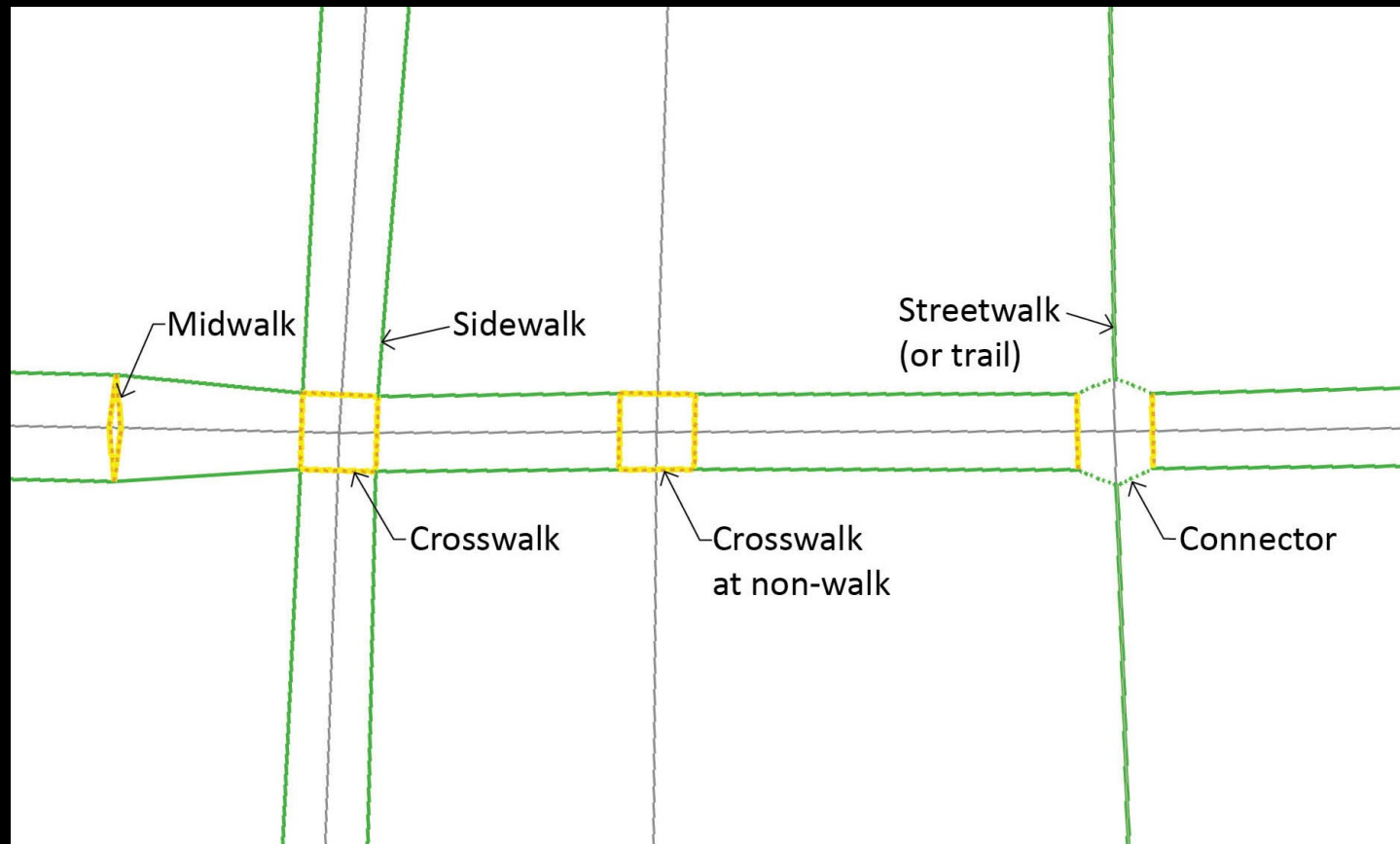
Active transportation implementation strategy



Street centerline network vs. the Walkway Network



Elements of the Walkway Network



“Weighting” the network



How far out of direction would you go to avoid walking on this segment?

GIS Jammers have created
multiple tools and apps.

They have solved
many technical challenges.

Active users will help drive future
development of tools and apps.

The Walkway Generator

Walkway Generator

street centerline layer: Layers - clean_streets_trails_bridges

unique street ID attribute: Street_ID

unique "to" ID attribute: T_node_ID

unique "from" ID attribute: F_node_ID

walkway centerline layer: Layers - walkways

Process selected street centerlines into walkways.

sidewalks & crosswalks streetwalks non-walks

Remove selected walkways. Clear walkway file.

clear highlighting

Analysis

walkway centerline layer: Layers - all_walkways

destination layer: Layers - destinations

destination classes

destination class attribute: TYPE

- ☐ Social
- ☐ Senior
- ☒ Grocery
- ☐ School
- ☒ Library

origin results layer: Layers - origins

traversal results layer: Layers - traversals

generate traversals and origin weights

The Analysis Tool

The Weighter

Weighter

street attribute table: Layers - clean_streets_trails_bridges

unique street ID attribute: Street_ID

a walkway type: sidewalk R units: feet

sidewalk R weight formula

attribute	max extra %	min extra %
St_type	40	0
Swalk_L	50	0

an attribute for weighting: St_type don't use

classified attribute (text)

class name: Arterial extra %: 40 extra feet: 0

numeric attribute

attr value: 100.000 maps to: 50 extra %: 1 extra feet: 1

set to max: 0.000 maps to: 0 extra %: 0 extra feet: 0

set to min: 0.000 maps to: 0 extra %: 0 extra feet: 0

walkway centerline layer: Layers - walkways

target walkway centerline weight attribute

generate 'weight A' generate 'weight B' save load

The Node Fixer

Node Fixer

street centerline layer: Layers - clean_streets_trails_bridges

unique street ID attribute: Street_ID

unique "to" ID attribute: T_node_ID

unique "from" ID attribute: F_node_ID

examine and repair intersections

selected all funky ones ignore cul de sac clear highlighting ignore negative same value

Intersection: 1/9

node ID	street ID	end
38871	190061	to
38871	190062	from
38871	191496	from

Make all node IDs the same.

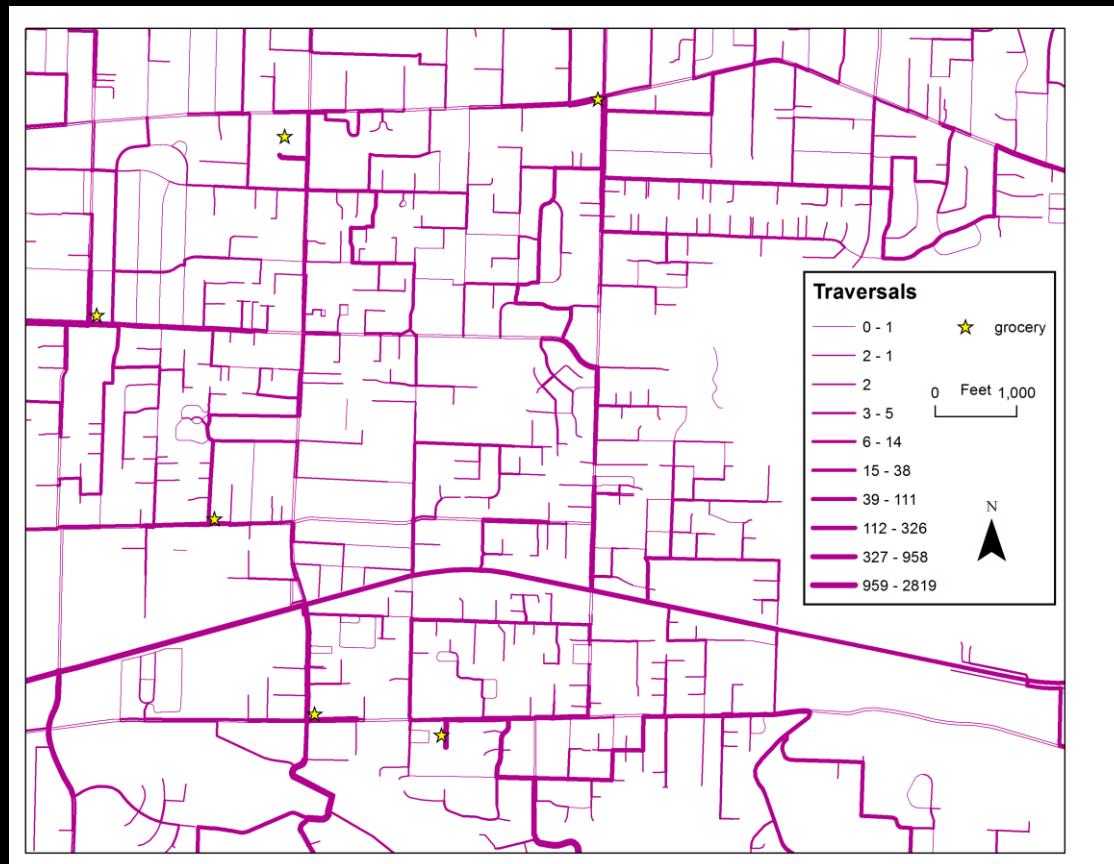
use majority use selected

selected node IDs

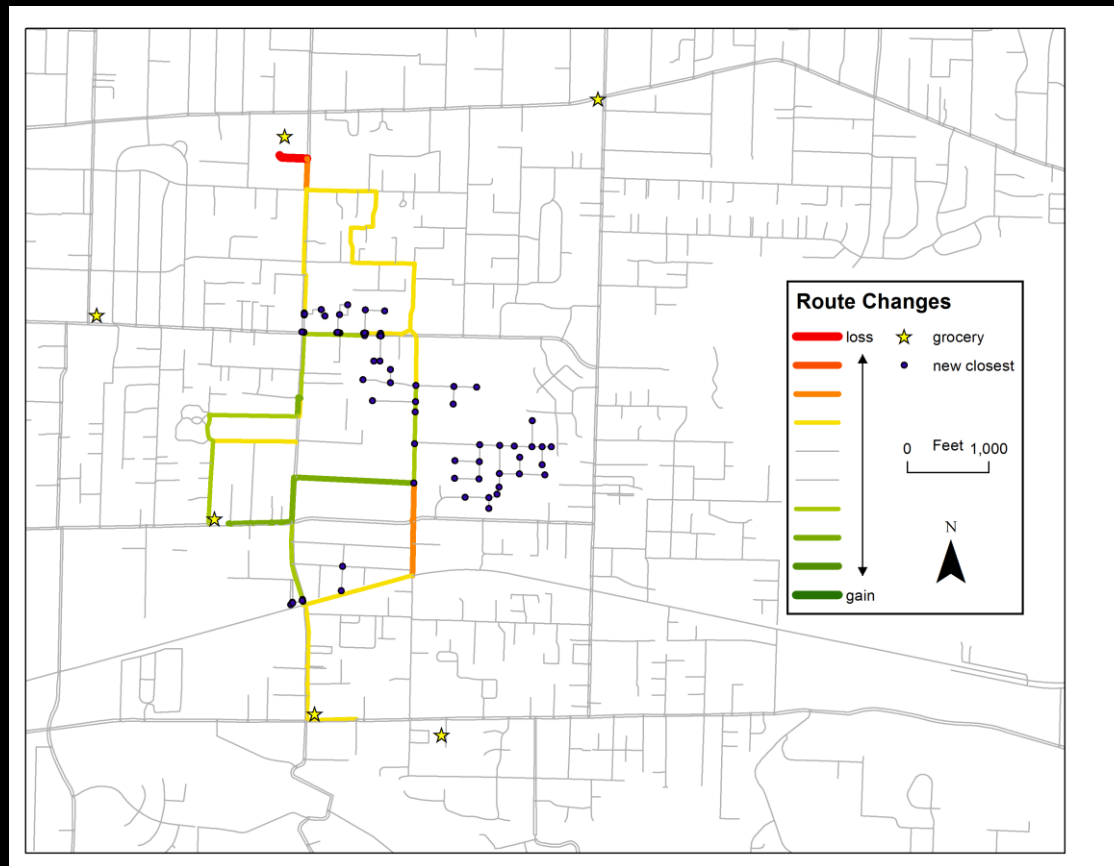
negate enter ...

Results from Walkway Network analysis
can be visualized to show the effects
of changes to the network.

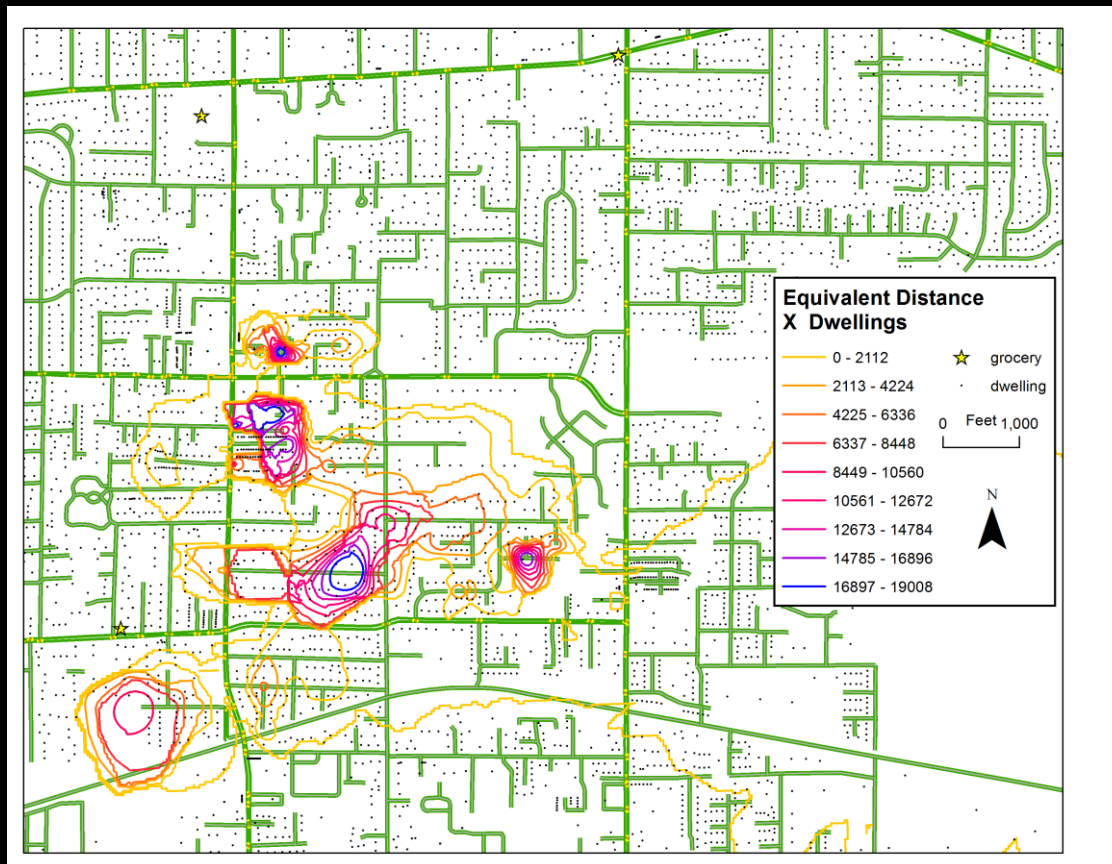
The tools can be used to quickly tally what routes every resident might use to walk to the nearest grocery store



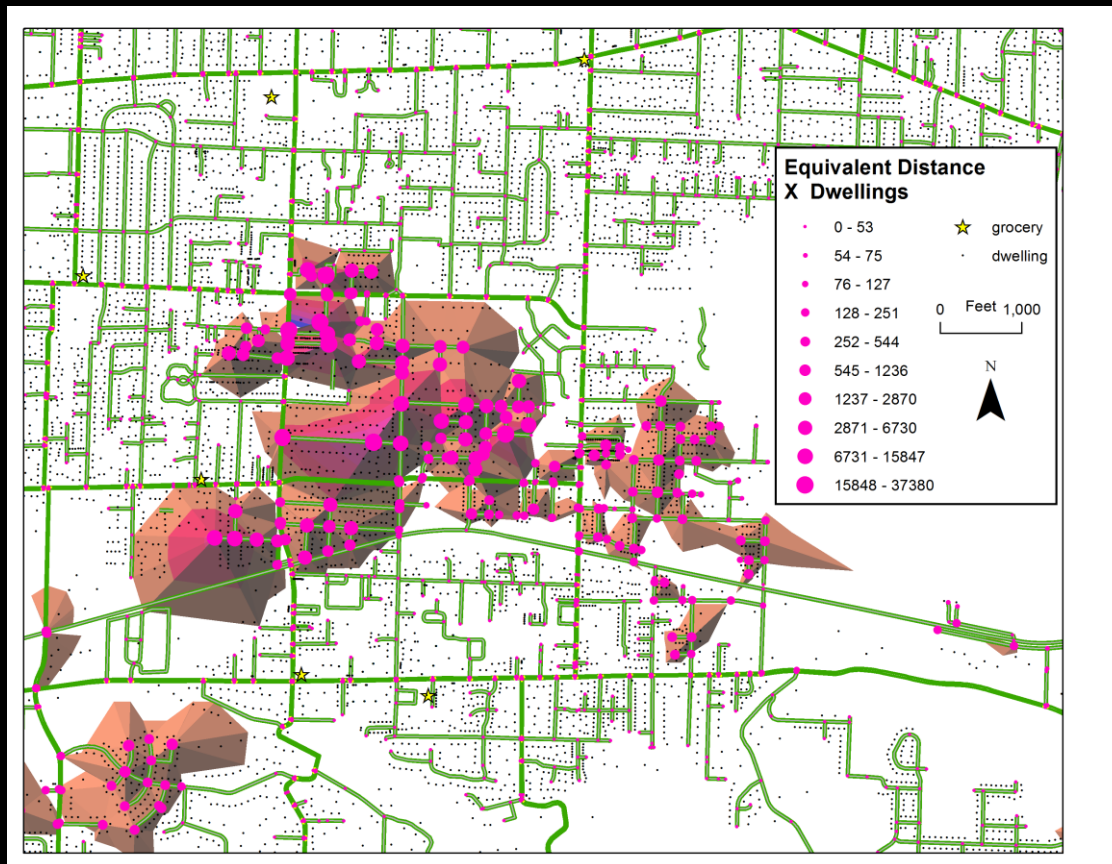
Improving one crosswalk can change people's “effective distance” to the nearest grocery store



The effect can be visualized
as a “surface of difference”



The visualization shows the effect
of improving one crosswalk
can extend a long way



Active users will help drive future development of tools and apps.

Oregon Walks can use these tools and apps to engage their membership in creating an accurate walkway network.

An accurate network can be used to make the case for improvements and generate real-time services.