# Pedestrian Exposure Data

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NTSB Pedestrian Safety Panel

May 10, 2016

Washington, DC

# Agenda

- Pedestrian Counting
  - Where?
  - When?
  - How?

- Data Management:

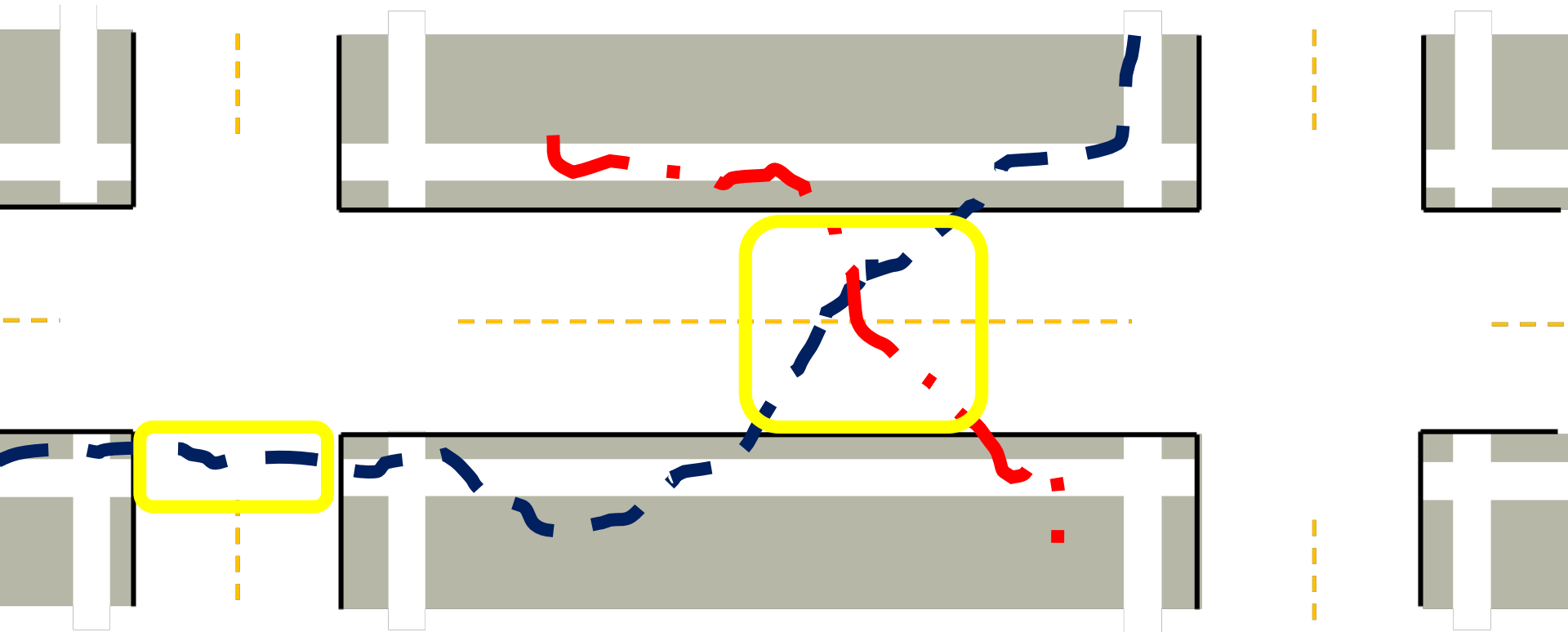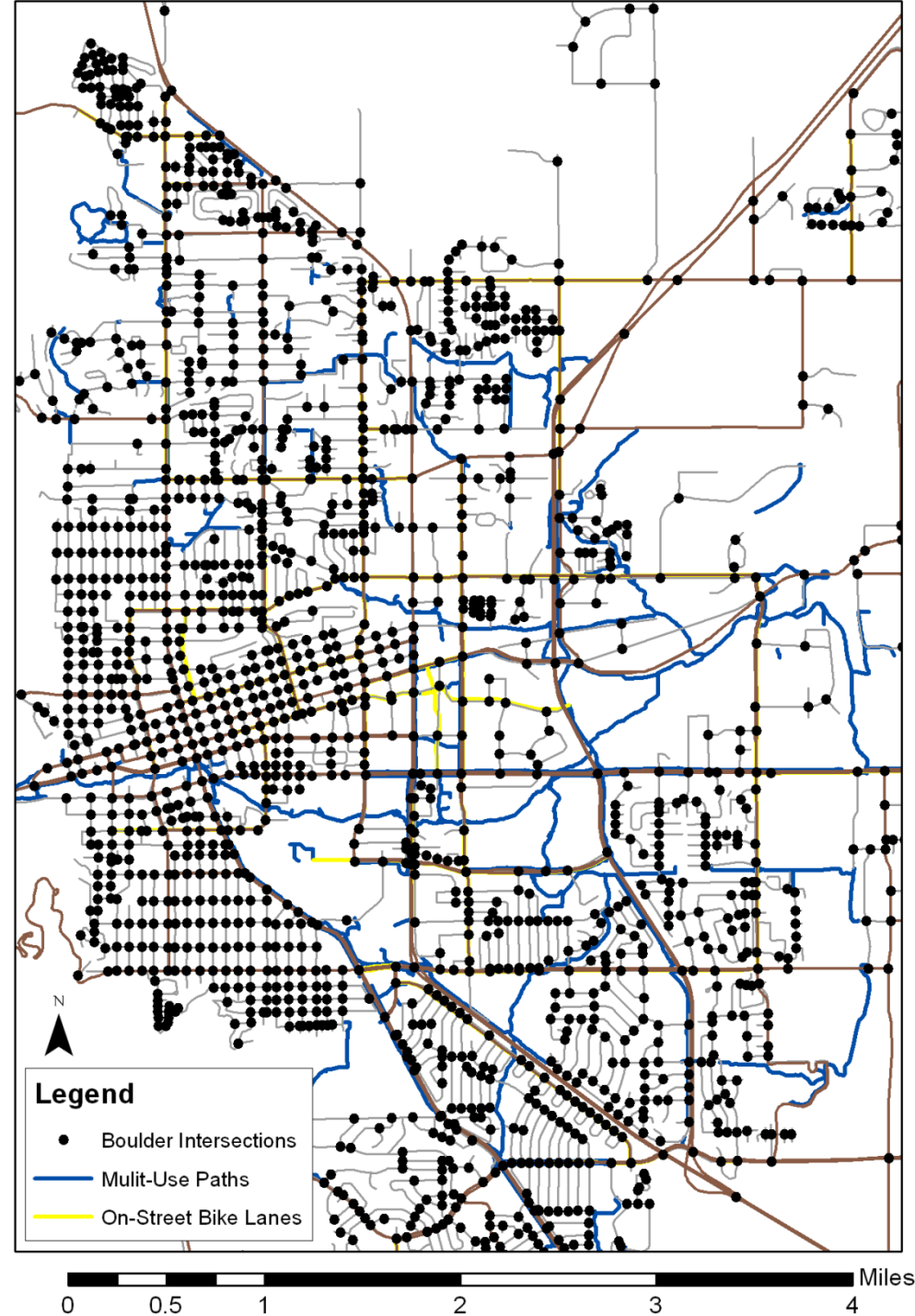    Bike-Ped Portal

## Annual Average Daily Pedestrians (AADP)

# Pedestrian Counting

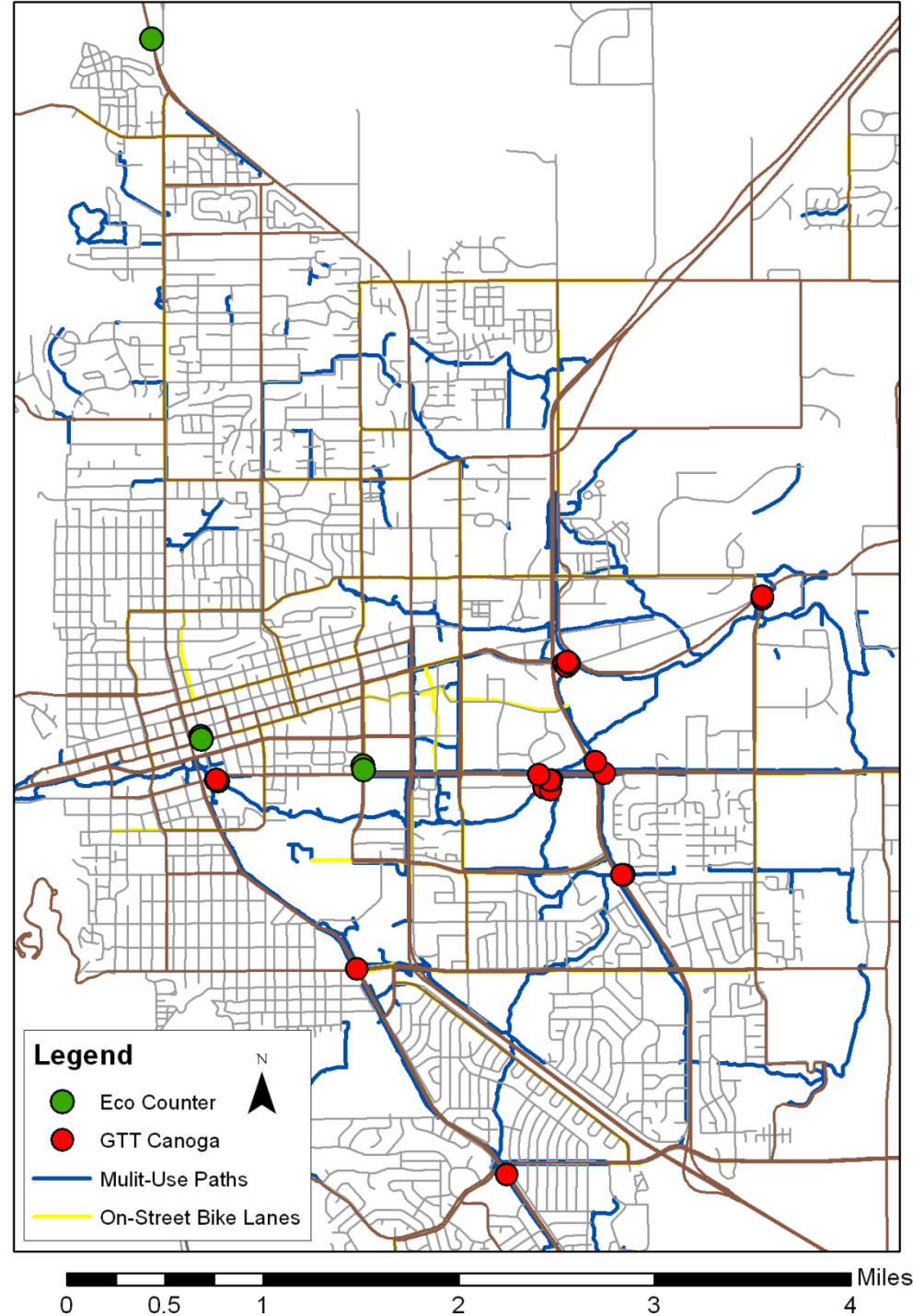# Pedestrian Exposure

# Problem

- I want to know AADP at 2,000 intersections.

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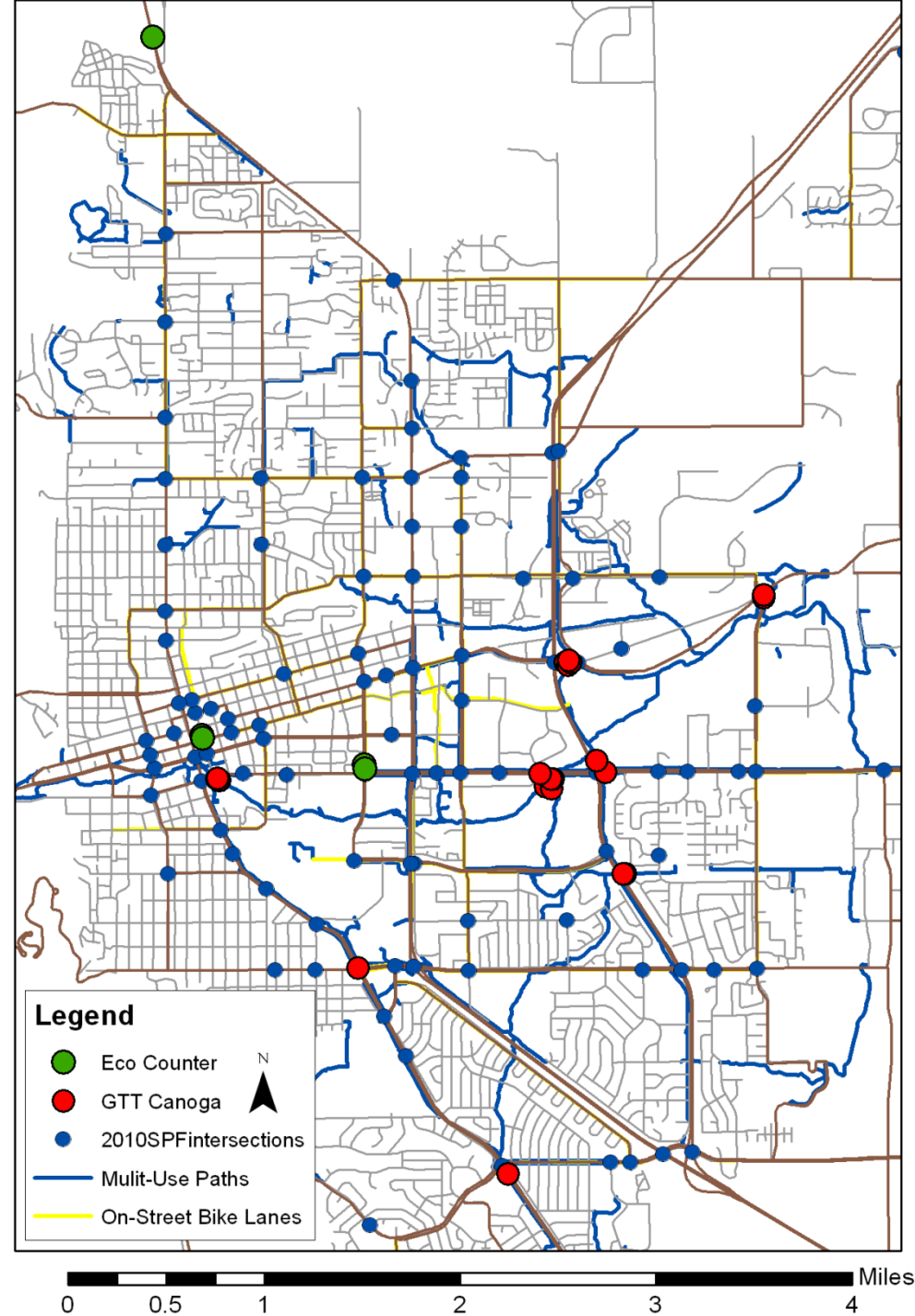- I know AADP at 12 non-intersection locations.

*Temporal variation*



Legend

- 🟢 Eco Counter
- 🔴 GTT Canoga
- ▬ Mulit-Use Paths
- ▬ On-Street Bike Lanes

N

Miles
0    0.5    1    2    3    4

# Problem

- I want to know AADP at 2,000 intersections.

- I know AADP at 12 non-intersection locations.

- I have manual counts at <140 intersections.

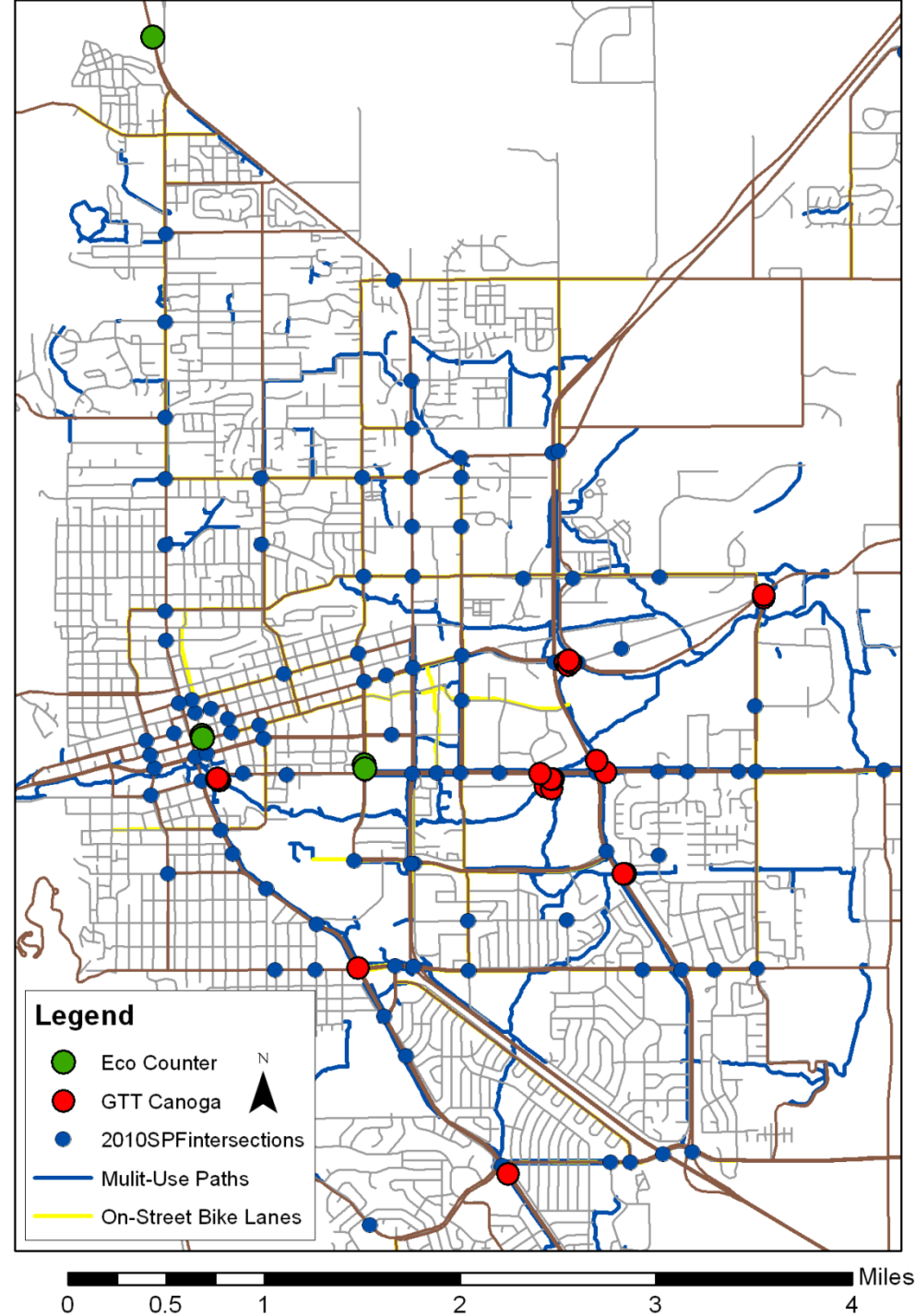*Temporal Variation*

*Spatial Variation*

# Problem

- I want to know AADP at 2,000 intersections.

- I know AADP at 12 non-intersection locations.

- I have manual counts at 140 intersections.

- I can estimate AADP at the 140 intersections.

*Temporal Variation*

*Spatial Variation*



Legend

- Eco Counter
- GTT Canoga
- 2010SPFintersections
- Mulit-Use Paths
- On-Street Bike Lanes

N

Miles
0   0.5   1   2   3   4

# Pedestrian Monitoring Webinar and Interview Responses

Of the 17 agencies who volunteered information:

- 90% conduct short-duration counts
- 50% count manually
- 60% count on trails and paths
- 35% have continuous count sites
- 30% count at intersections
- **Only 30% have both short-duration and continuous counts**

# Intersection Pedestrian Count Form



NCHRP 797, Robert Schneider, University of Wisconsin-Milwaukee, 2013

# Pedestrian Count Technologies

- 70% of respondents use infrared devices for counting

# Video Image Processing



(a)    (b)    (c)    (d)

Source:    Malinovskiy, Zheng, and Wang, 2009.

*Traffic Monitoring Guide.* 2013, FHWA: Washington, DC.

# Pedestrian Count Technologies

| Technology | Temporary/ Permanent | Effectiveness (Accuracy) | Cost |
|---|---|---|---|
| Video image processing | Temporary | Miovision clients report low error. | $$$ |
| Passive Infrared | Temporary/ Permanent | 20% error is typical | $ to $$ |
| Pedestrian Pushbutton | Permanent | Measures pedestrian activity, not counts | $ |
| Pressure Plate | Permanent | | $$$ |
| Radar | Temporary/ Permanent | | $ to $$ |

# Pedestrian Phase Counts from Pushbutton Actuation

## Surrogate measure

Kothuri, S. M., T. Reynolds, et al. (2013). Testing Strategies to Reduce Pedestrian Delay at Signalized Intersections. A Pilot Study in Portland, OR. 92nd Annual Meeting of the Transportation Research Board. Washington, D.C., National Academies.

Blanc, B., P. Johnson, et al. (2015). "Leveraging Signal Infrastructure for Nonmotorized Counts in a Statewide Program: A Pilot Study." Transportation Research Record **2527**: 69-79.

# Data management

```
>>>>>>~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~
Factory:_B3.84_C2.77_F8127_EY_ME_D1
=DOCK TIME (yy-mm-dd hh:mm):10-07-19 11:12:40
Counter log start
~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~

System check...
*****V8.0y S/N71128 (c) 2001-2007*****
TRAFx Research Ltd. www.trafx.net
Fx:F6E0R1M3T2T_c26f26L33LN4P0A0E2_m064I2_d

Sets:N:H:001:035:E:060:000:F:Y:F:016:000:Y:000

  *Serial Number   :0712CX
  *Counter name    :          Bobby
  *Mode            :Infrared (IR+)
  *Batt. voltage   :4.2
```

| Start Date | 2/19/2010 | | |
|---|---|---|---|
| Start Time | 2:50:00 PM | | |
| Site Code | SH52 near 79th | | |
| Station ID | SH52_1 | | |
| Latitude | 00' 00.000 South | | |
| Longitude | 00' 00.000 East | | |
| Event # | Ti | Di | |
| 1 | 2/ | | |
| 2 | 2/ | | |
| 3 | 2/ | | |
| 4 | 2/ | | |
| 5 | 2/ | | |
| 6 | 2/ | | |
| 7 | 2/ | | |
| 8 | 2/ | | |
| 9 | 2/ | | |
| 10 | 2/ | | |
| 11 | 2/ | | |
| 12 | 2/ | | |
| 13 | 2/ | | |
| 14 | 2/ | | |
| 15 | 2/ | | |
| 16 | 2/ | | |
| 17 | 2/ | | |
| 18 | 2/20/2010 11:32:45 AM | 4 | |
| 19 | 2/20/2010 11:49:00 AM | 3 | |
| 20 | 2/20/2010 11:56:05 AM | 4 | |
| 21 | 2/20/2010 11:57:28 AM | 4 | |
| 22 | 2/20/2010 2:51:26 PM | 4 | |
| 23 | 2/20/2010 3:23:18 PM | 4 | |
| 24 | 2/20/2010 3:23:21 PM | 4 | |
| 25 | 2/20/2010 3:47:12 PM | 3 | |

| File Name: | N:\STAFF-FOLDERS\LGoeddel\Denver\DENVER COUNTS\13TH&ARAPA |
|---|---|
| Start Date: | 9/15/2009 |
| Start Time: | 7:30:00 AM |
| Site Code: | 29 |
| Comment 1: | |
| Comment 2: | |
| Comment 3: | |
| Comment 4: | |

| | 13TH Southbound | | | | ARAPHOE Westbound | | | | 13TH Northbound | | | | ARAPHOE Eastbound | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | PED | Left | Thru | Right | PED | Left | Thru | Right | PED | Left | Thru | Right | PED |
| 07:30 AM | 0 | 0 | 0 | 1 | 4 | 52 | 5 | 1 | 0 | 0 | 1 | 7 | 6 | 40 | 33 | 4 |
| 07:45 AM | 0 | 0 | 1 | 0 | 2 | 40 | 4 | 8 | 0 | 2 | 1 | 10 | 6 | 75 | 30 | 3 |
| 08:00 AM | 0 | 1 | 3 | 3 | 2 | 40 | 6 | 10 | 0 | 0 | 0 | 13 | 13 | 75 | 30 | 3 |
| 08:15 AM | 0 | 0 | 3 | 4 | 8 | 36 | 5 | 6 | 0 | 0 | 1 | 22 | 6 | 65 | 23 | 5 |

```
10-04-03,09:00,00011,00000
10-04-03,10:00,00008,00000
10-04-03,11:00,00006,00000
10-04-03,12:00,00004,00000
10-04-03,13:00,00001,00000
10-04-03,14:00,00000,00000
10-04-03,15:00,00000,00000
10-04-03,16:00,00001,00000
10-04-03,17:00,00000,00000
```
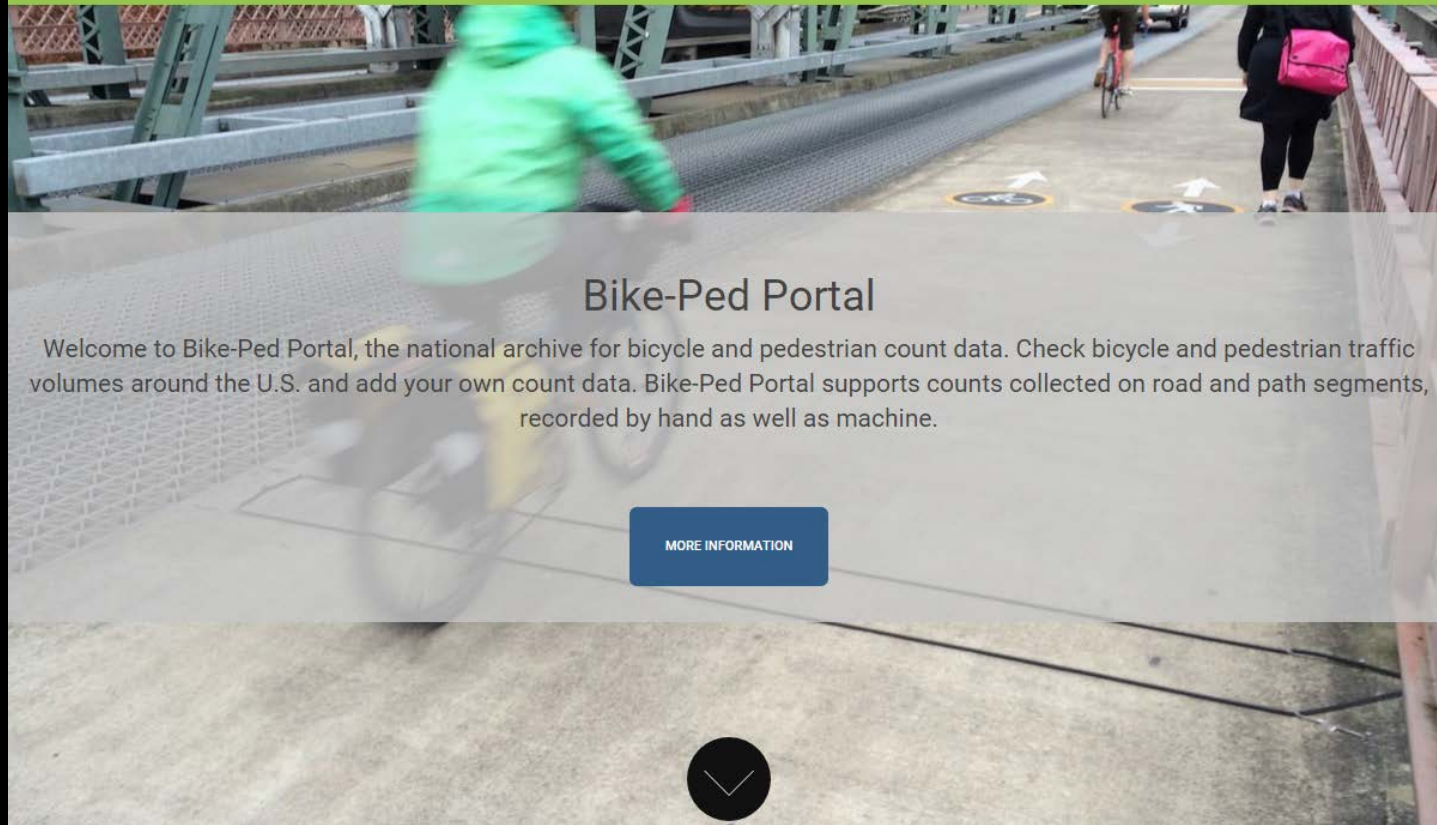
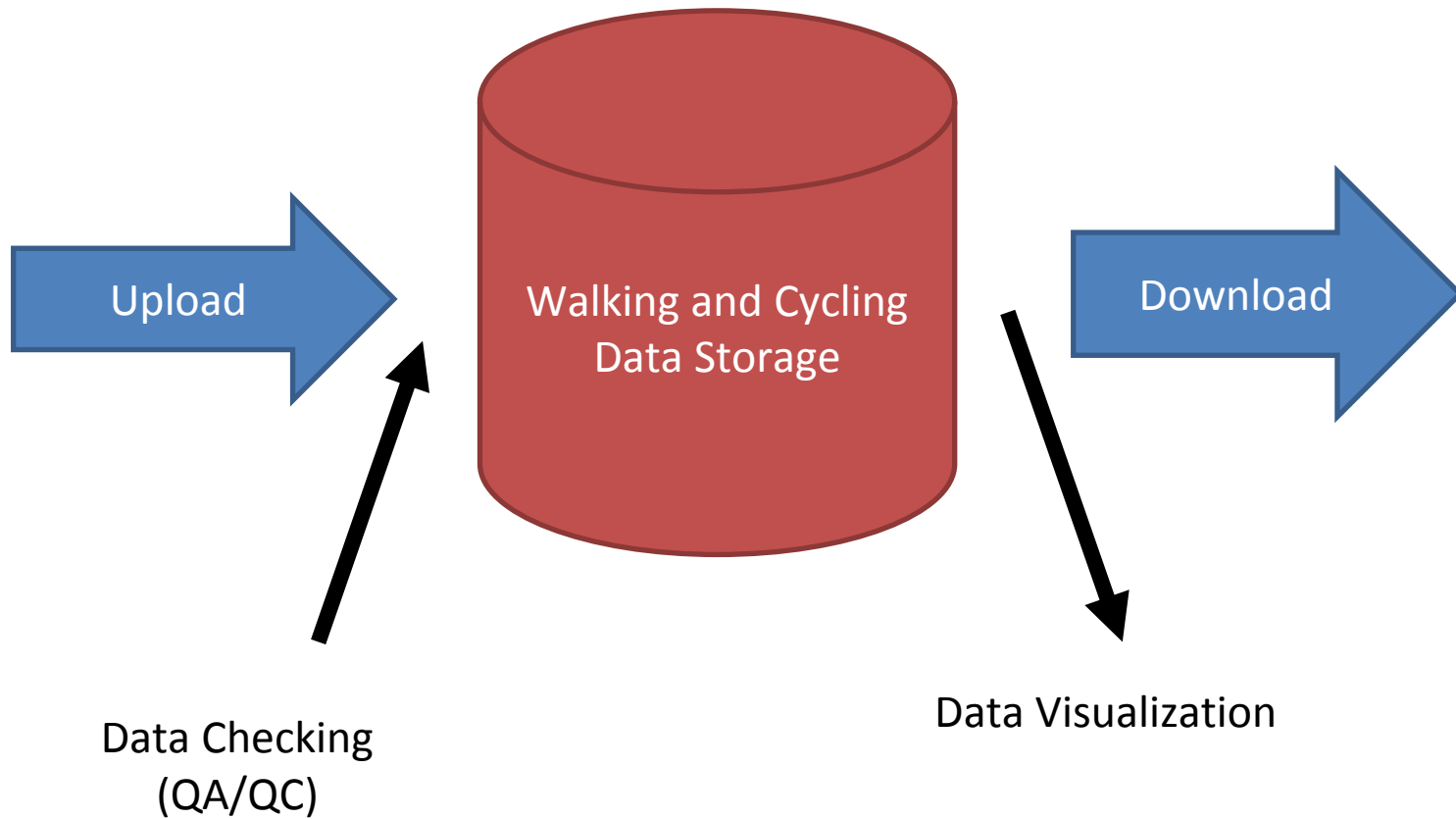# Bike-Ped Portal

# Bike-Ped Portal

- Online database [bp.its.pdx.edu](bp.its.pdx.edu)
- 5 million records loaded for 5 states
- Upload/download data

# Bike-Ped Portal

Upload

Walking and Cycling
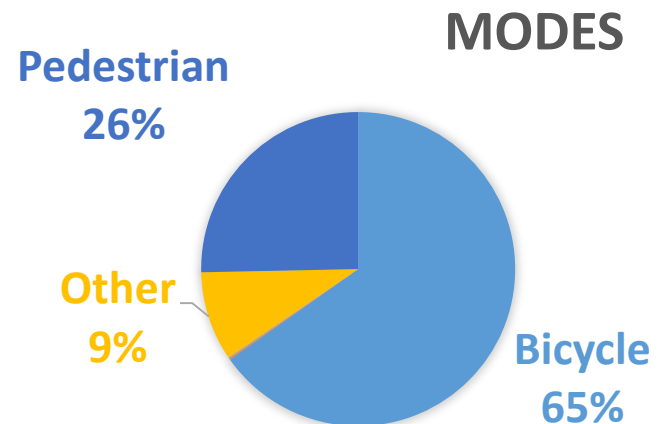Data Storage
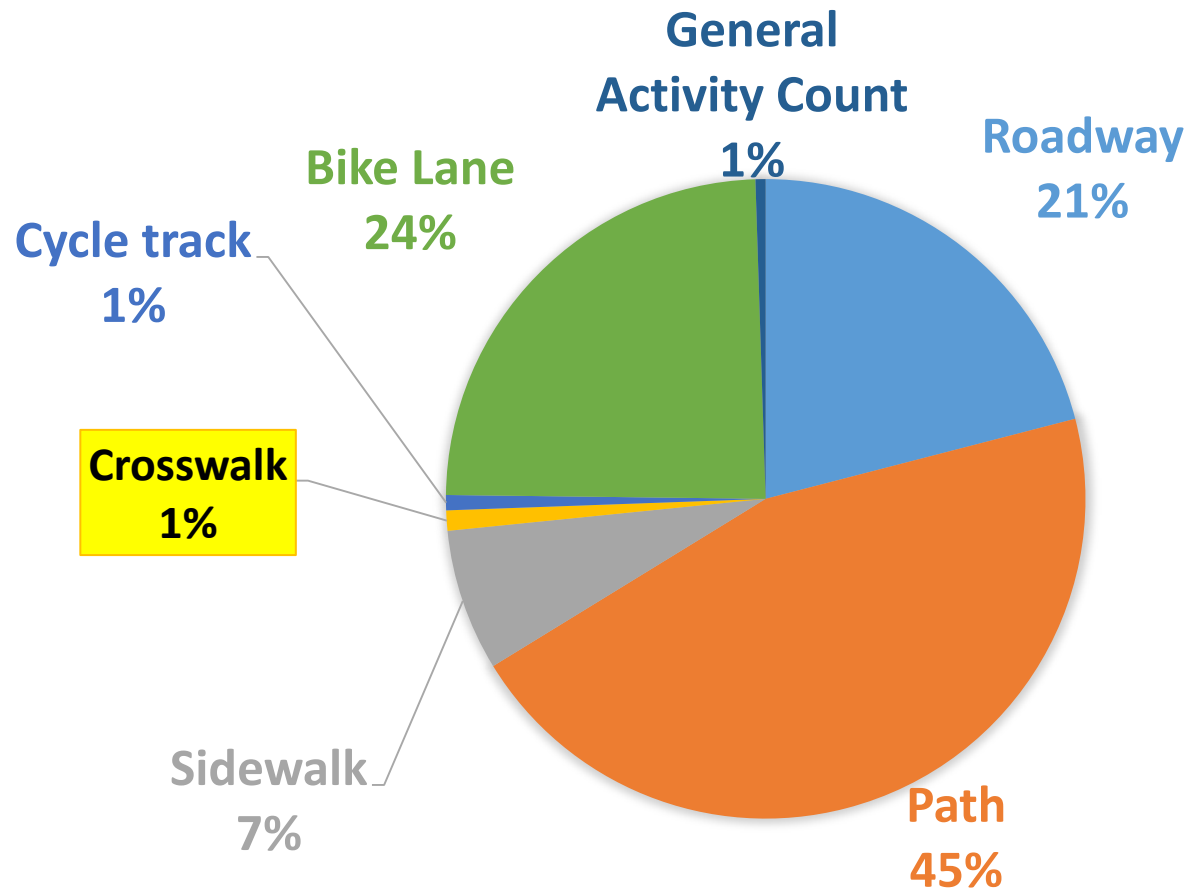
Download

Data Checking
(QA/QC)

Data Visualization

# Uploaded Data

- 5 states

- 12 counties

- 343 road or path segments

- 355 detectors (both human and machine)

- **38 million people counted**

**MODES**

Pedestrian 26%

Other 9%

Bicycle 65%

# Facility Types

# Future Steps

## Funded

- Tool to estimate AADP from short duration counts

- FHWA's Travel Monitoring Analysis System Version 2.8 to include pedestrian counts

## Future Directions for Bike-Ped Portal

- Explore data page

- Include intersection counts

- Manual counting app

# Questions?

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503-725-2897

Guide to Bicycle & Pedestrian
Count Programs
https://www.pdx.edu/ibpi/count

Bike-Ped Portal
bp.its.pdx.edu
bp-demo.its.pdx.edu