



Effects of Bicycle Boulevards

Findings from a Longitudinal Panel Study

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What is a bicycle boulevard?

- aka “Neighborhood Greenway”
- Low-traffic street with
 - traffic calming devices that reduce the volume and speed of motor vehicle traffic
 - treatments at intersections with major streets that facilitate safe crossing



Bumps
(humps)

Sharrows



“Flipped”
Stop Sign



Diverter



Diverter & pocket park





Rectangular Rapid
Flash Beacon

Crosswalk

HAWK signal (under construction)

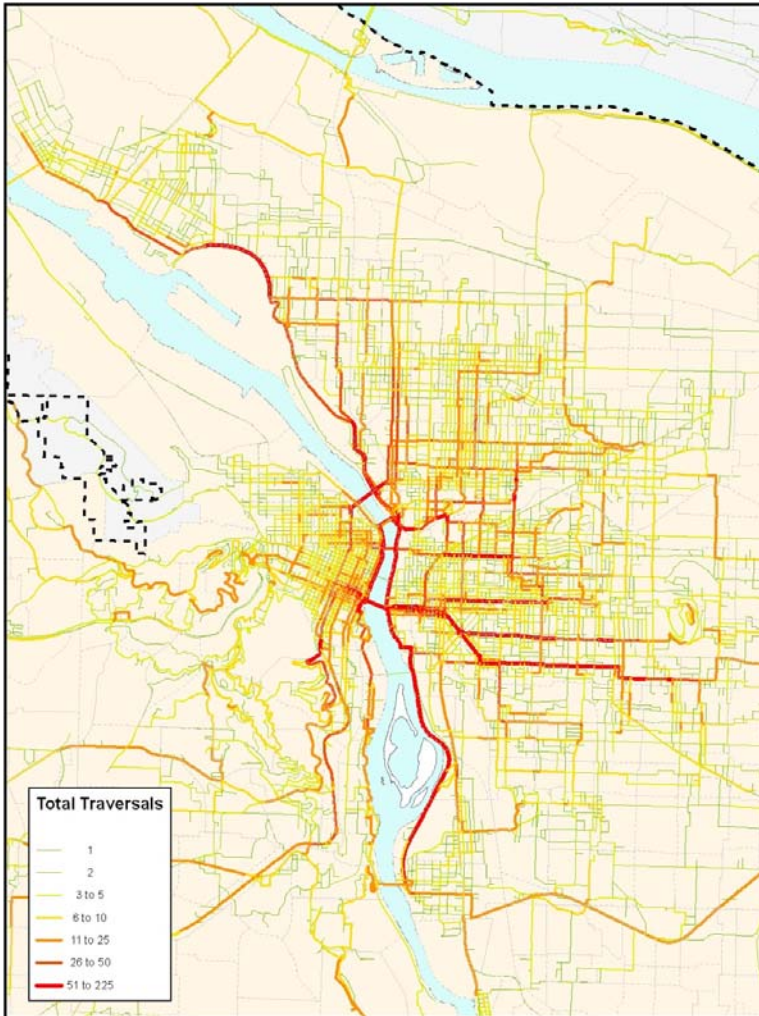


Wayfinding Signage

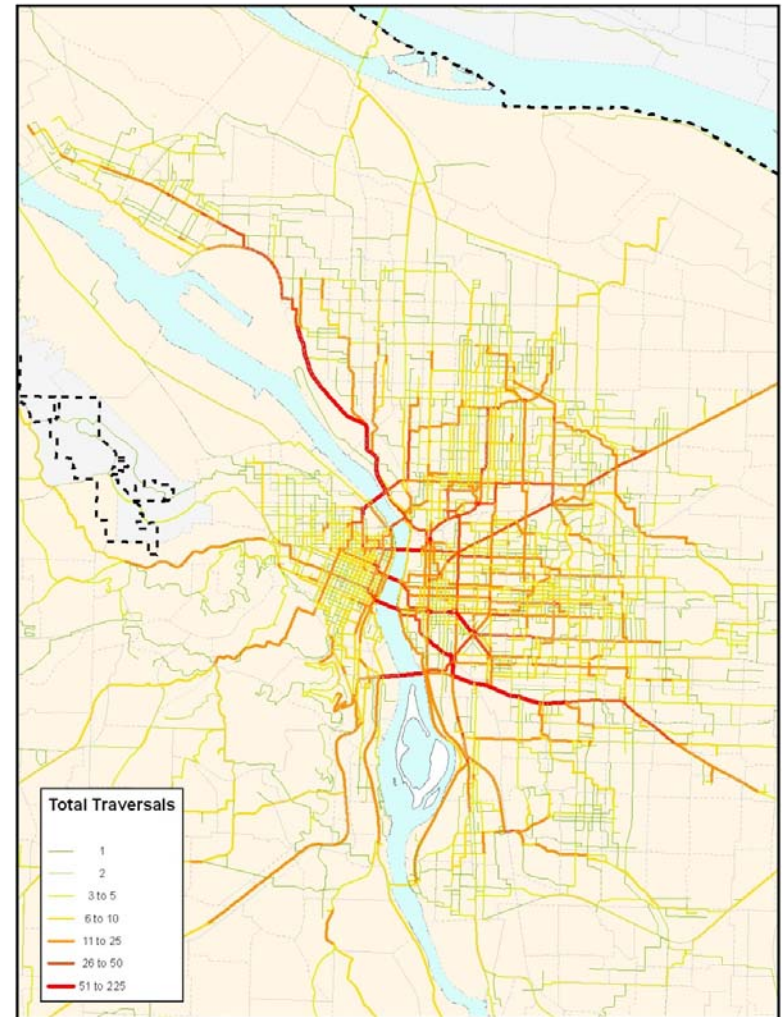


Why study them?

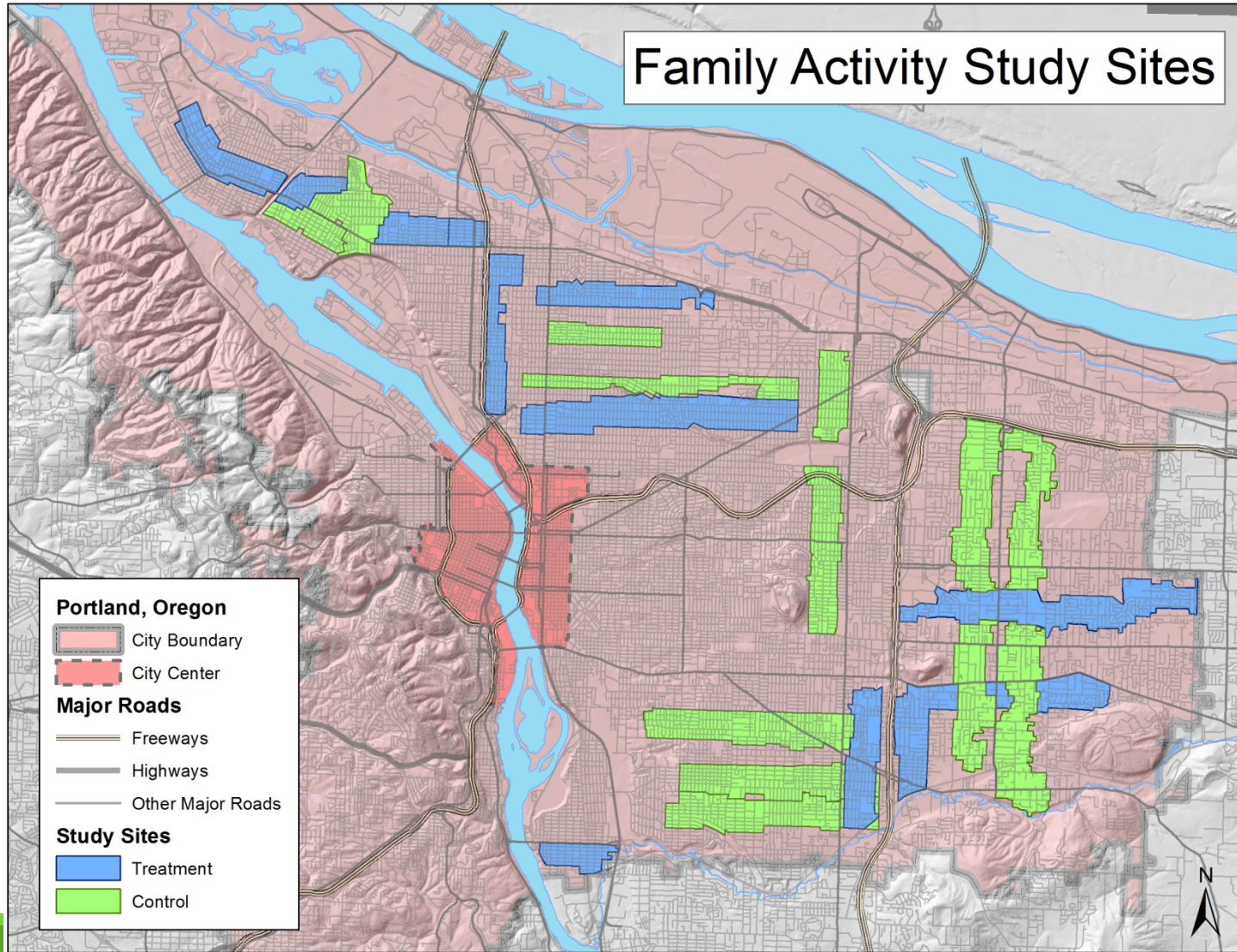
Actual Trips



Shortest Paths



Study Locations: Portland, OR



Data collection

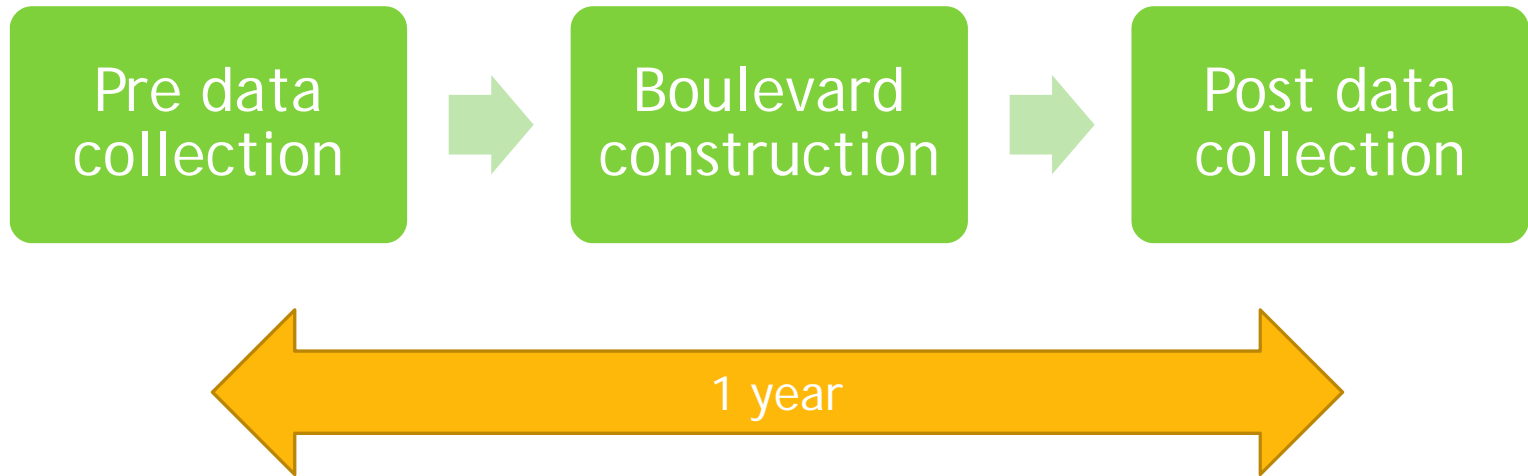
- Surveys
- GPS (GlobalSat DG-100) and accelerometer (Actigraph GT3X) for 5 days



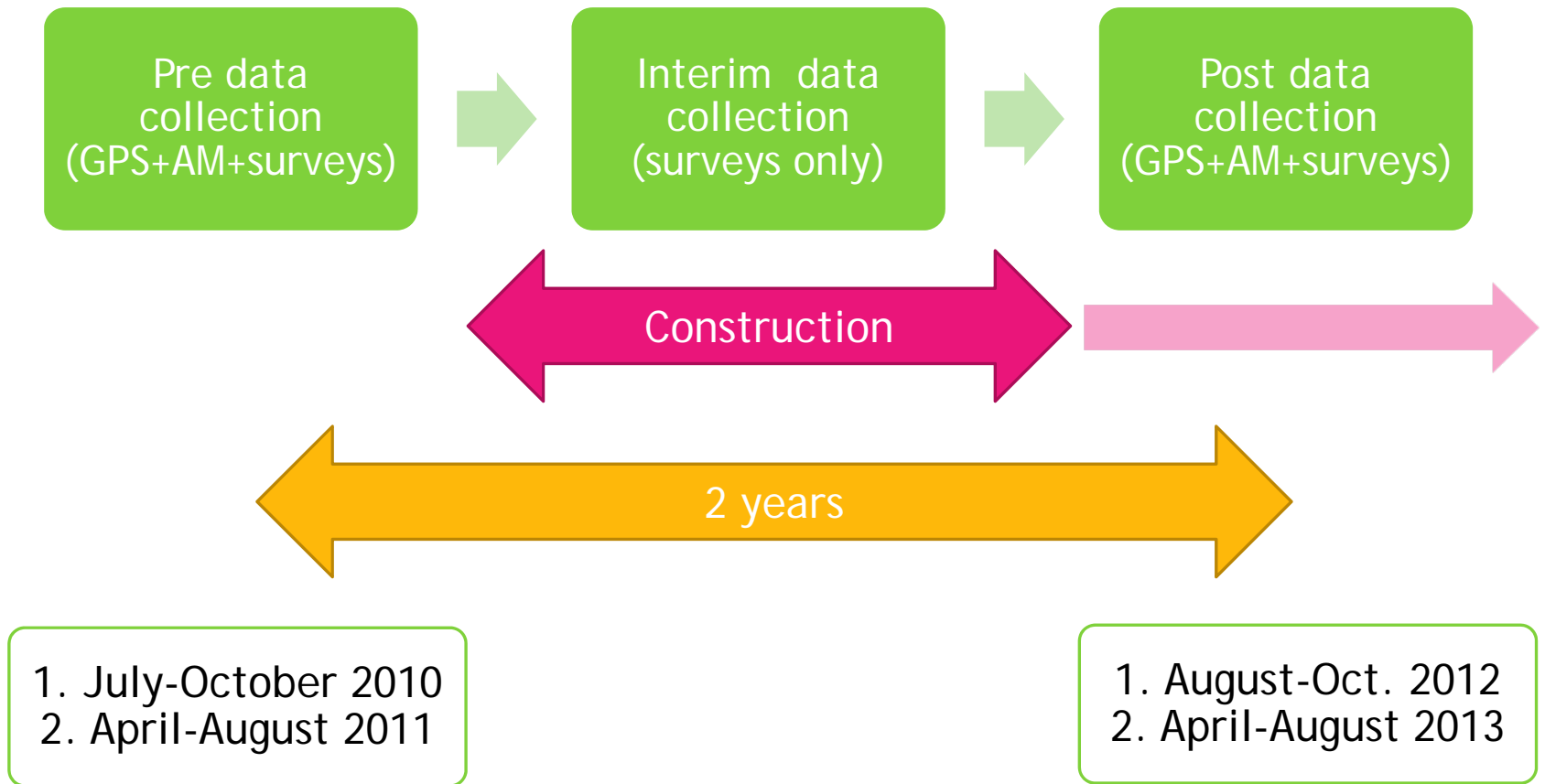
GPS Device Activity Monitor



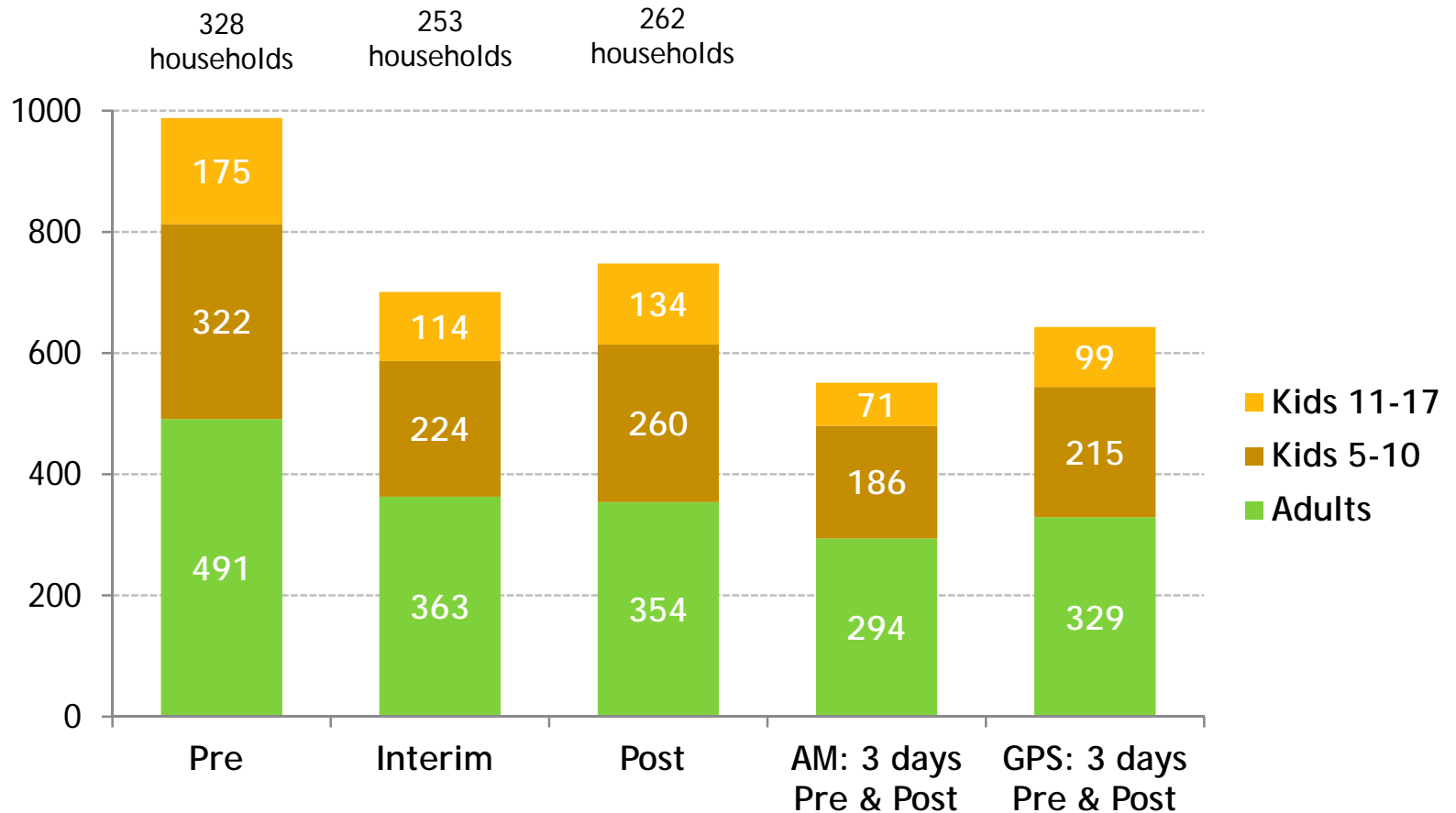
Project Timeline: Original



Timeline: Reality



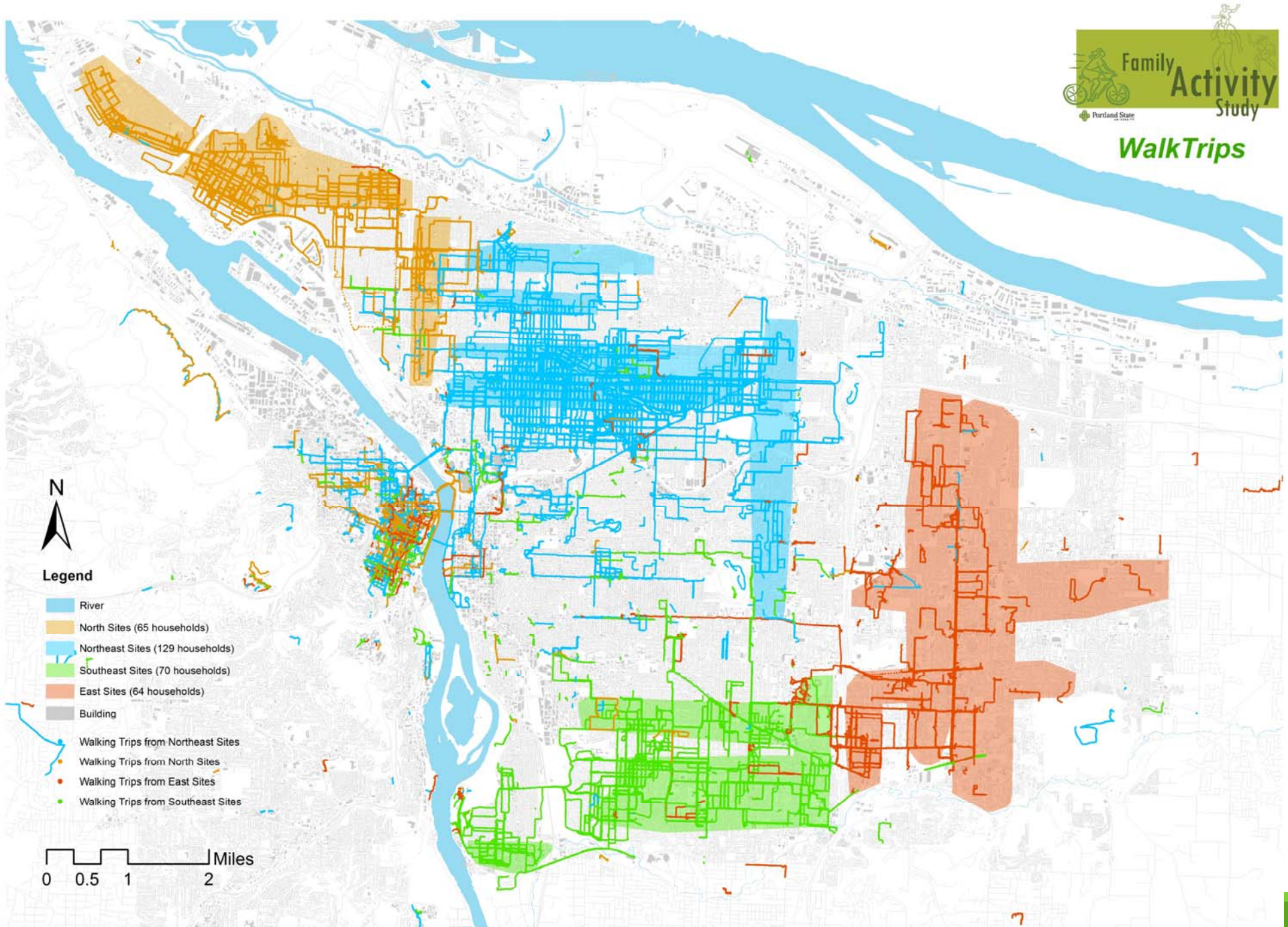
Sample size by phase



Data, data, data

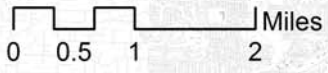
~11.6
million GPS
data points

38,402 trips



Legend









-  River
-  North Sites (65 households)
-  Northeast Sites (129 households)
-  Southeast Sites (70 households)
-  East Sites (64 households)
-  Building
-  Walking Trips from Northeast Sites
-  Walking Trips from North Sites
-  Walking Trips from East Sites
-  Walking Trips from Southeast Sites

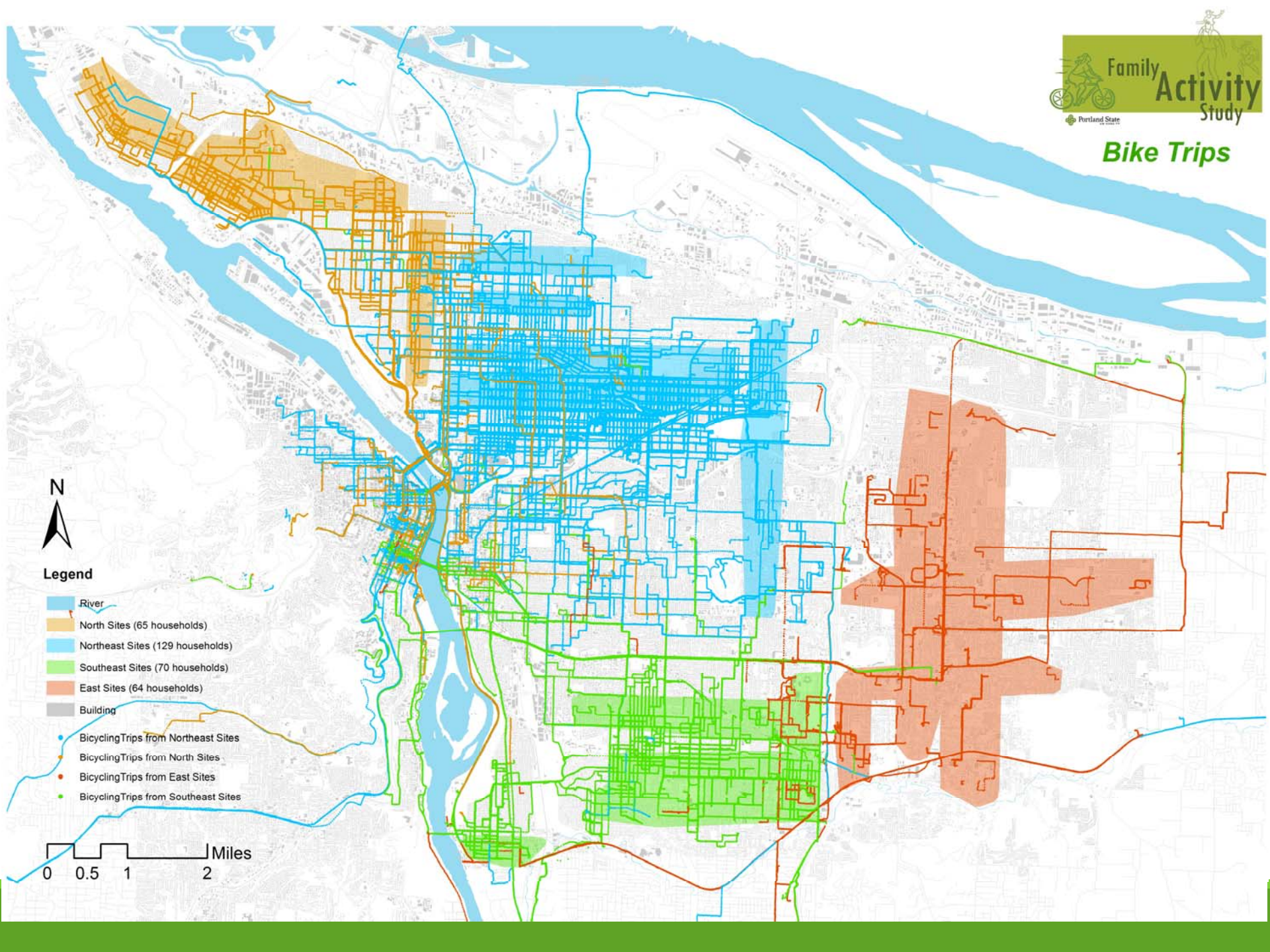
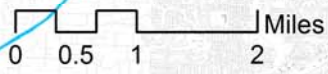


Bike Trips

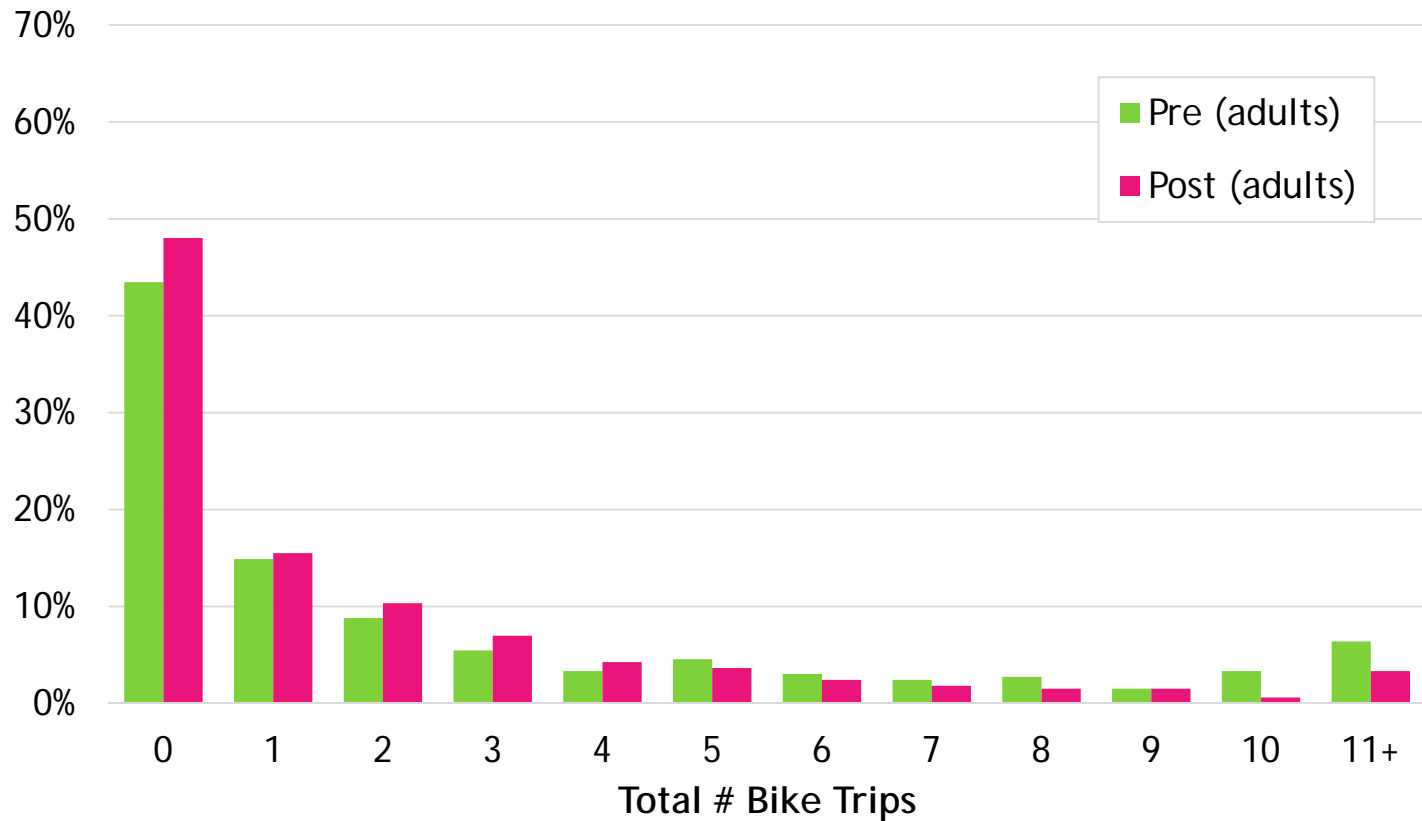


Legend

-  River
-  North Sites (65 households)
-  Northeast Sites (129 households)
-  Southeast Sites (70 households)
-  East Sites (64 households)
-  Building
-  BicyclingTrips from Northeast Sites
-  BicyclingTrips from North Sites
-  BicyclingTrips from East Sites
-  BicyclingTrips from Southeast Sites

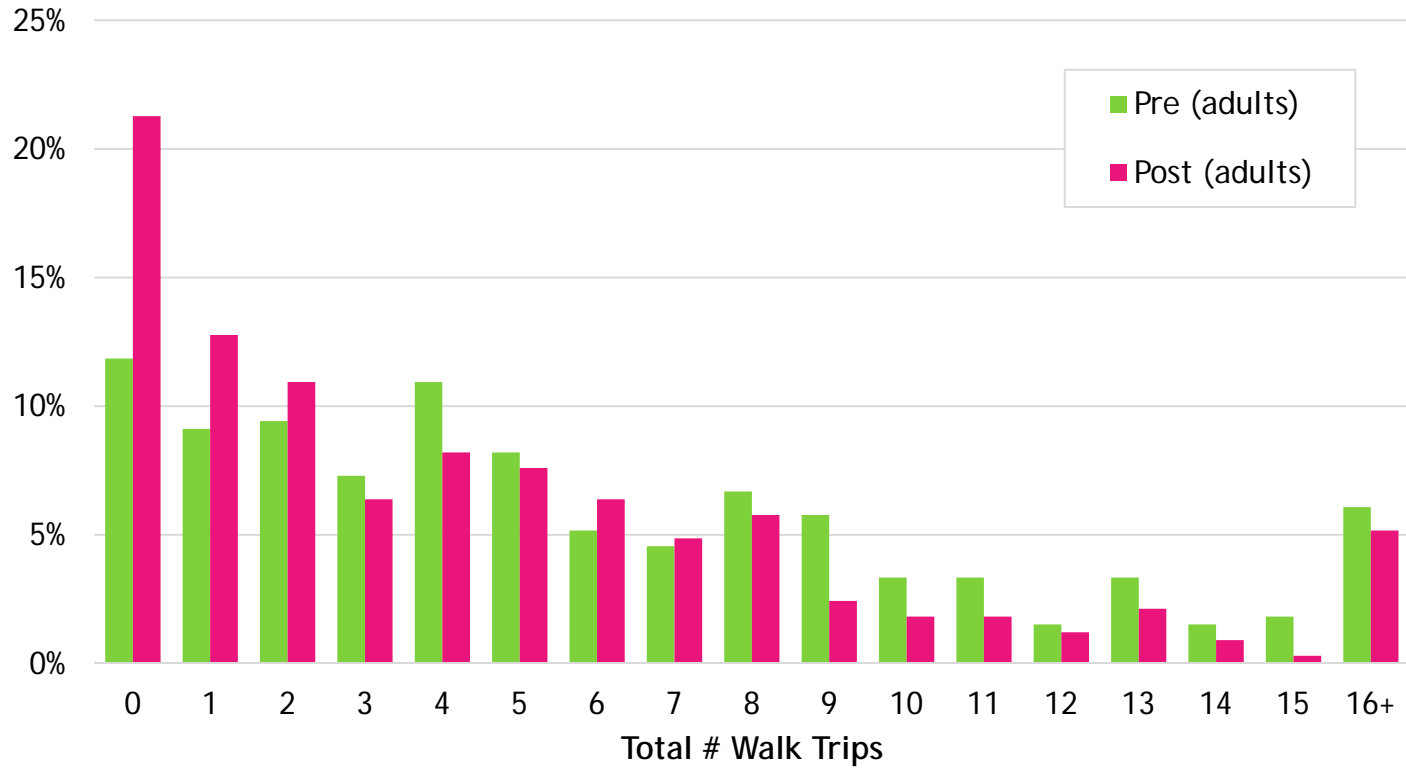


Adult bike trips



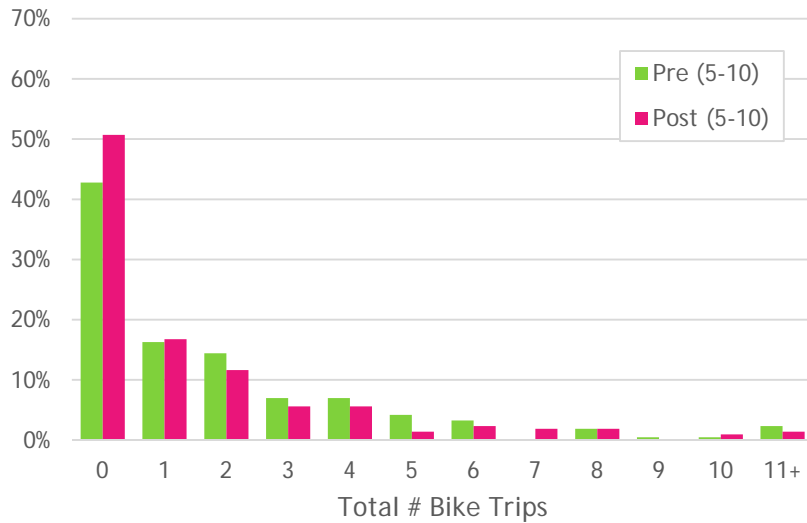
n=329

Adult walk trips

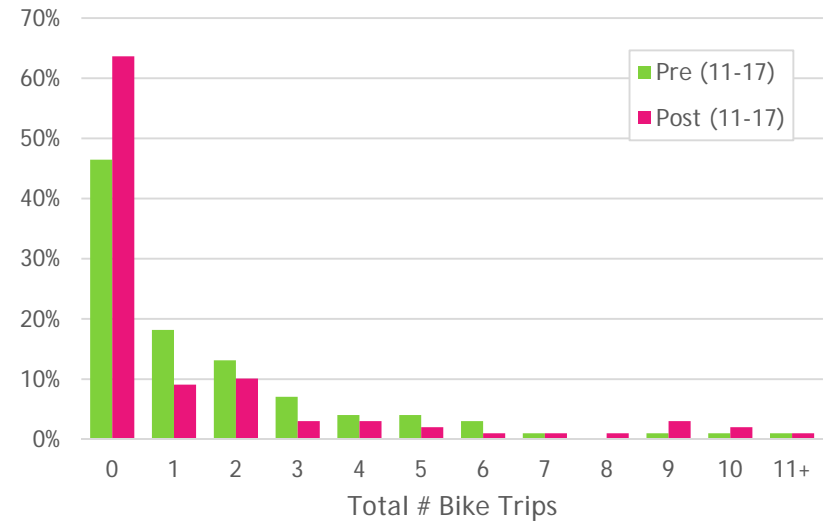


n=329

Children's bike trips

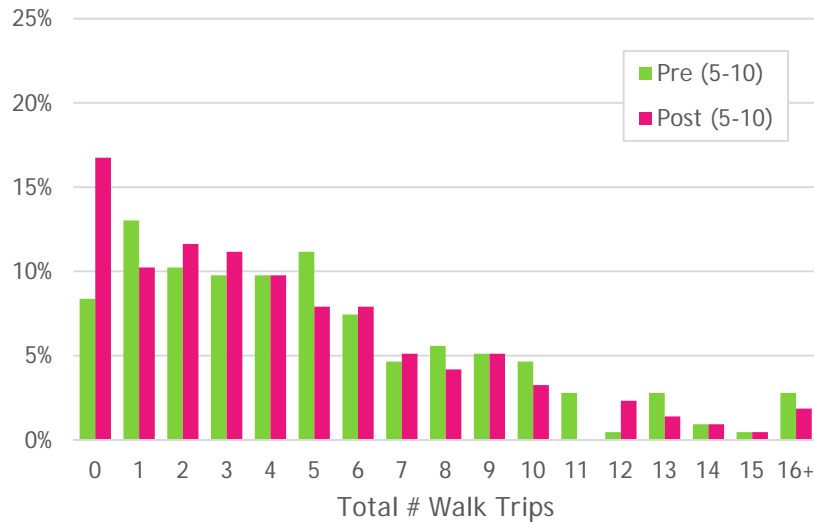


5-10 years
n=215

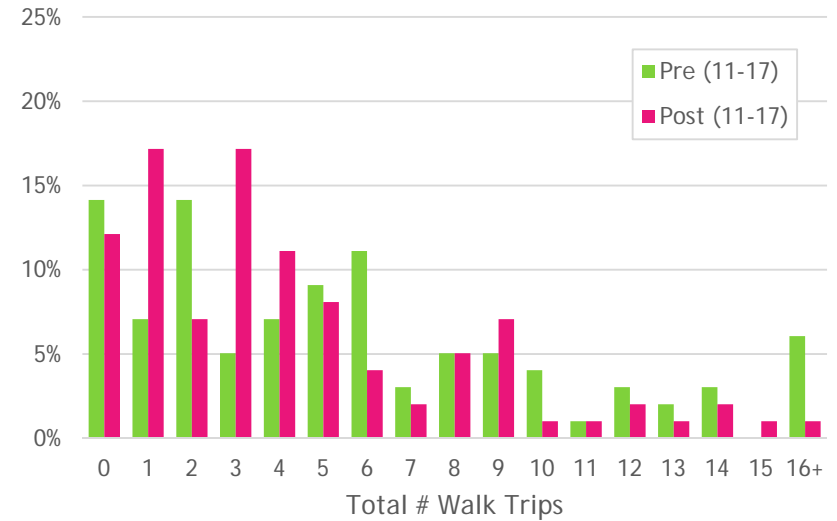


11-17 years
n=99

Children's walk trips



5-10 years
n=215



11-17 years
n=99

Outcomes

GPS &
accelerometer
data

Outcome: adult bicycling

Self-reported

| | Self-reported # days (IPAQ) |
|--------------------|--------------------------------|
| Post | -0.22 (0.02) |
| Treatment | 0.09 (0.33) |
| Post * Treatment | 0.21 (0.10) |
| Pro-bike attitudes | 0.75 (0.00) |
| Poor health | -0.61 (0.12) |
| Fair health | -0.56 (0.00) |
| Good health | -0.35 (0.00) |
| Very good health | -0.02 (0.83) |
| NE Klickitat St. | 0.06 (0.45) |
| # rain days | n.a. |
| Female | -0.30 (0.00) |

Negative binomial regression model

Outcome: Awareness

I know where I can bike safely to get places in my neighborhood...

| Ordered logistic model | Without children | With children |
|---------------------------------|------------------|---------------|
| Threshold (strongly agree=base) | | |
| Strongly disagree | -5.32 (0.00) | -4.26 (0.00) |
| Somewhat disagree | -3.38 (0.00) | -2.24 (0.00) |
| Somewhat agree | -1.03 (0.00) | -0.25 (0.27) |
| Post | -0.41 (0.23) | -0.48 (0.84) |
| Treatment | -0.42 (0.08) | 0.13 (0.58) |
| Treatment * Post | 0.53 (0.12) | 0.33 (0.32) |
| Pro-bike attitudes | 0.68 (0.00) | 0.56 (0.00) |
| Poor general health | -1.61 (0.07) | -1.97 (0.04) |
| Fair general health | -1.13 (0.00) | -0.79 (0.02) |
| Good general health | -0.96 (0.00) | -0.75 (0.00) |
| Very good general health | -0.46 (0.04) | -0.33 (0.12) |

Outcome: Awareness

I know where I can walk safely to get places in my neighborhood...

| Ordered logistic model | Without children | With children |
|---------------------------------|------------------|---------------|
| Threshold (strongly agree=base) | | |
| Strongly disagree | -5.58 (0.00) | -4.88 (0.00) |
| Somewhat disagree | -4.03 (0.00) | -3.37 (0.00) |
| Somewhat agree | -1.54 (0.00) | -1.09 (0.27) |
| Post | -0.62 (0.01) | -0.32 (0.17) |
| Treatment | -0.14 (0.60) | -0.12 (0.61) |
| Treatment * Post | 0.60 (0.09) | 0.67 (0.05) |
| Pro-walk attitudes | 0.27 (0.00) | 0.35 (0.00) |
| Poor general health | -1.25 (0.14) | -1.43 (0.08) |
| Fair general health | -0.97 (0.01) | -0.84 (0.02) |
| Good general health | -1.15 (0.00) | -1.05 (0.00) |
| Very good general health | -0.37 (0.13) | -0.45 (0.05) |

Initial Insights & Issues, Next Steps

- Natural experiments are challenging
- The treatment's effect on behavior is very unclear
 - No detected change in objectively-measured behavior
 - Some positive association with self-reported behavior
 - Positive associations with awareness of safe routes
- How long does it take for a new facility to affect behavior?
- Additional analysis