

# Cycle Atlanta

**Aditi Misra**

School of Civil and Environmental Engineering

**Dr. Kari E. Watkins**

School of Civil and Environmental Engineering

**Dr. Christopher A. Le Dantec**

School Literature, Media, and Communication



7/8/2014

Wicra, Watkins, LeDante







***Data on cyclists is limited:***

- Small and dispersed group
- Missed in traffic counts
- Agencies lack funds earmarked for bicycle counts
- Frequent use of stated preference surveys

***Cycling models are inadequate:***

- Included in demand models as an approximate percentage of total demand
- Trip distribution and mode choice often ignores cyclists
- Route choice models do not consider preference variation based on demographics

Most of Atlanta's bicycle network miles have a level of **service ranking of "E" or worse<sup>1</sup>**



There is a lack of data on the state of bicycle infrastructure in Atlanta

Half of trips made are < 3 miles, but only 1.8% of those trips are made by bike<sup>2</sup>

Cycling can reduce greenhouse gas emission, congestion and provide healthy lifestyle<sup>3</sup>

Cyclists prefer dedicated infrastructure<sup>4</sup>

**Involve citizens**  
to get bicycle data  
to inform infrastructure  
decisions



**How can we achieve this?**



# Crowdsourcing!

## **Greater public participation**

*Removes location and time constraint*

## **Diverse stakeholder involvement**

*Anonymous participation option*

## **Ideal for dispersed user base**

*Less cost intensive than traditional methods*

***MORE DATA FOR BETTER PLANNING!!***



# Crowdsourcing System Components: Our Project

**Problem:** Data  
Collection/User Feedback

**Organizer:** City of Atlanta, Atlanta  
Regional Commission, Georgia Tech

**Participants:**  
Local Cyclists



**Platform:**  
Smartphone based



# Our Precursor: Cycle Tracks, San Francisco



**What did we develop?**



Verizon 3G

1:57 PM



# Cycle Atlanta



A joint project between  
The City of Atlanta  
and Georgia Tech

**Georgia  
Tech**

# Two New Components of Data Collection

1. Demographics
2. Issues and Assets



# Cycle Atlanta: Demographic Categories

<b>Age</b>	<b>Gender</b>	<b>Ethnicity</b>	<b>Home Income</b>
Less Than 18	Male	White	Less than \$20,000
18-24	Female	African American	\$20,000-\$39,999
25-34		Asian	\$40,000-\$59,999
35-44		Native American	\$60,000-\$74,999
45-54		Pacific Islander	\$75,000-\$99,999
55-64		Multi-racial	\$100,000 or greater
65+		Hispanic/Mexican/Latino	Other

<b>Cycle Frequency</b>	<b>Rider History</b>
Daily	Since childhood
Several times per week	Several years
Several times per month	One year or less
Less than once a month	Just trying it/just started



## **Rider Type**

Strong and fearless

Enthusied and Confident

Comfortable, but cautious

Interested, but concerned



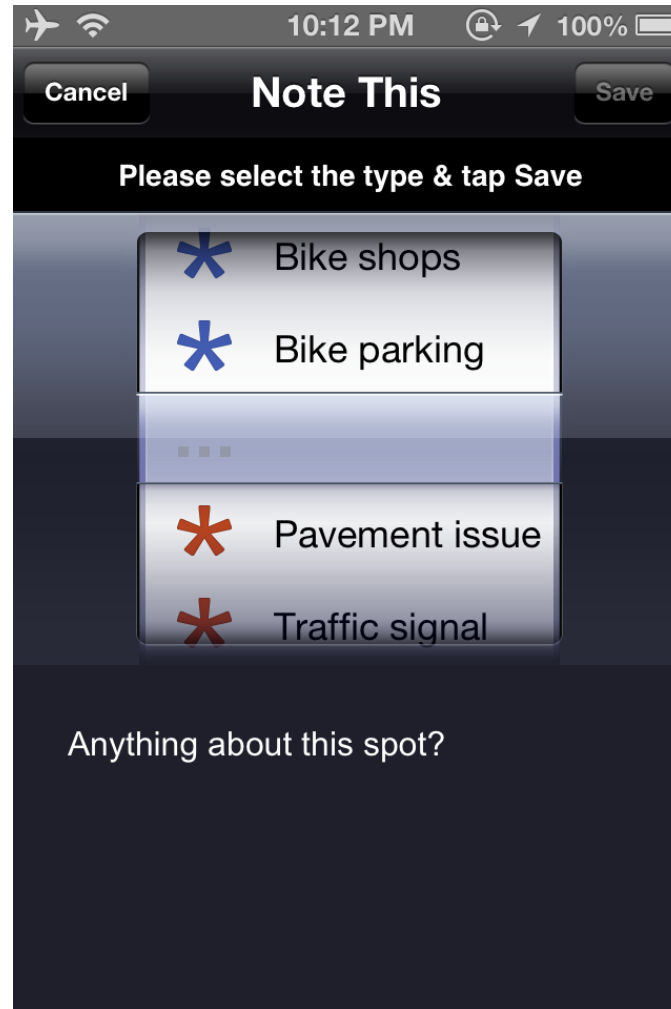
# Cycle Atlanta Data Collection Framework: Infrastructure

## Assets

- + Bike parking
- + Bike shops or repair kits
- + Public restrooms
- + Secret passage
- + Water fountains

## Issues

- Pavement issue
- Traffic signal
- Enforcement
- Bike parking
- Bike lane issue



# How does Cycle Atlanta work?



# Storing Your Demographic Information

10:17 PM 100%

## Personal Info

Save

Getting started with Cycle Atlanta

Tell us about yourself

Age 25-34

Email miss.asad@g...

Gender Female

Ethnicity Other

Home Income Less than \$20...

Your typical commute

Record My Trips My Notes Settings

10:18 PM 100%

## Personal Info

Home ZIP 30308

Work ZIP 30308

School ZIP 30308

How often do you cycle?

Cycle Frequency Several times...

What kind of rider are you?

Rider Type Enthusied & c...

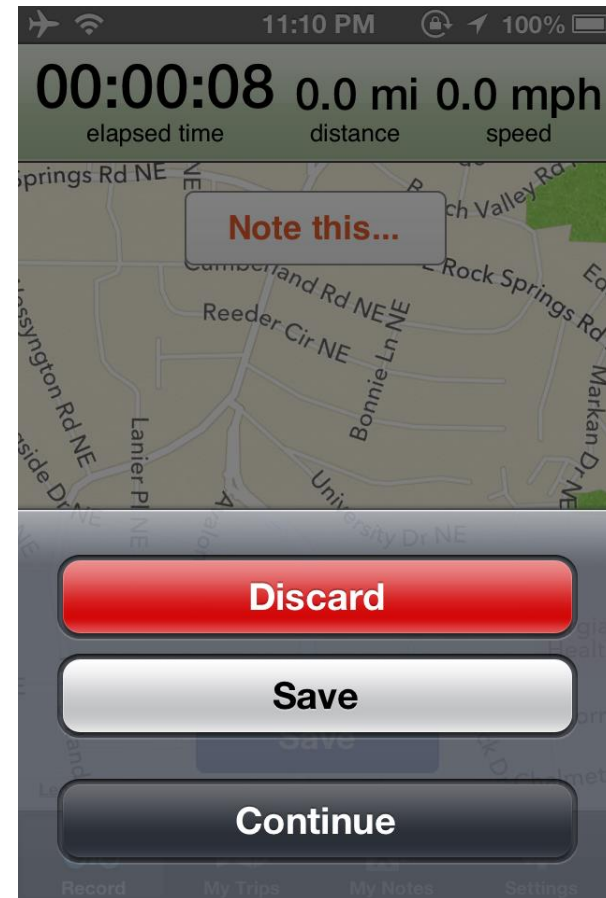
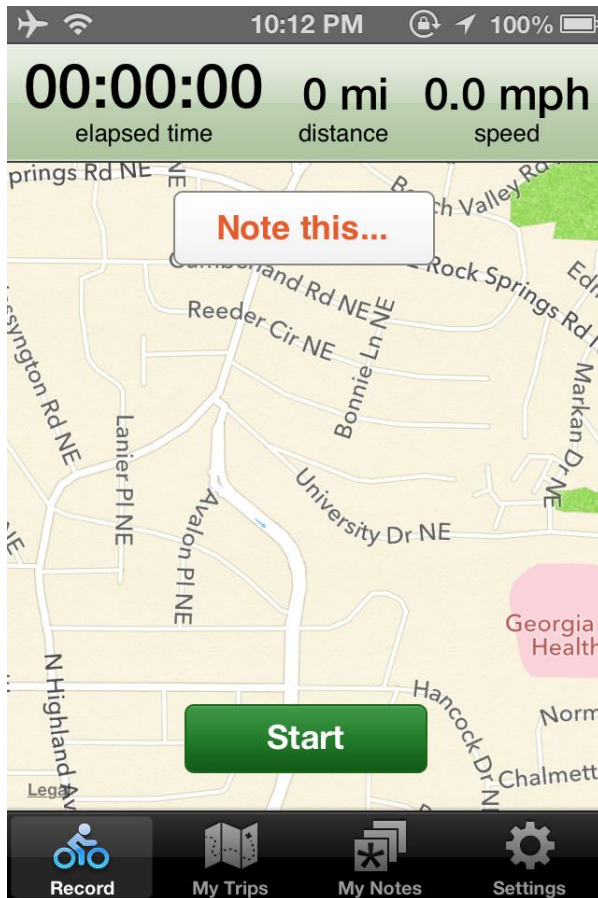
How long have you been a cyclist?

Rider History One year or less

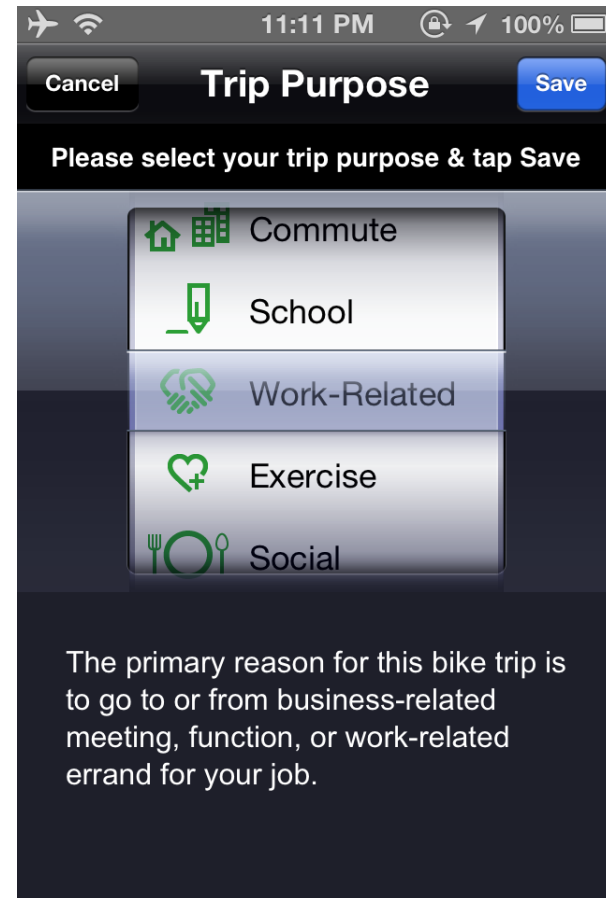
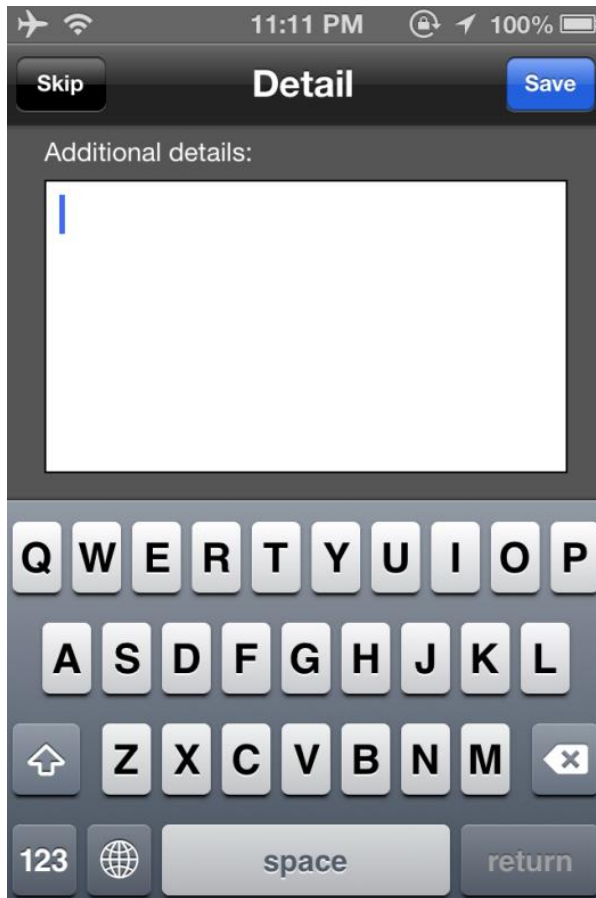
Record My Trips My Notes Settings



# Recording Your Trip



# Providing More Information



# Viewing Your Trip

10:15 PM 100% battery

**My Trips**

April 17, 2013 at 11:05 AM  
**other** 00:00:40  
CO2 Saved: 0.1 lbs Calories Burned: 1.4 kcal

April 17, 2013 at 3:31 AM  
**other** 00:29:13  
CO2 Saved: 0.2 lbs Calories Burned: 10.0 kcal

March 29, 2013 at 11:00 AM  
**School** 00:29:51  
CO2 Saved: 3.4 lbs Calories Burned: 179.7 kcal

March 29, 2013 at 2:08 AM  
**Commute** 00:00:06  
CO2 Saved: 0.0 lbs Calories Burned: 0 kcal

March 28, 2013 at 6:47 PM  
**Other** 00:14:54  
CO2 Saved: 1.9 lbs Calories Burned: 96.7 kcal

Record My Trips My Notes Settings

10:16 PM 100% battery

elapsed: 00:29:51 ~ March 29, 2013, 11:00 AM

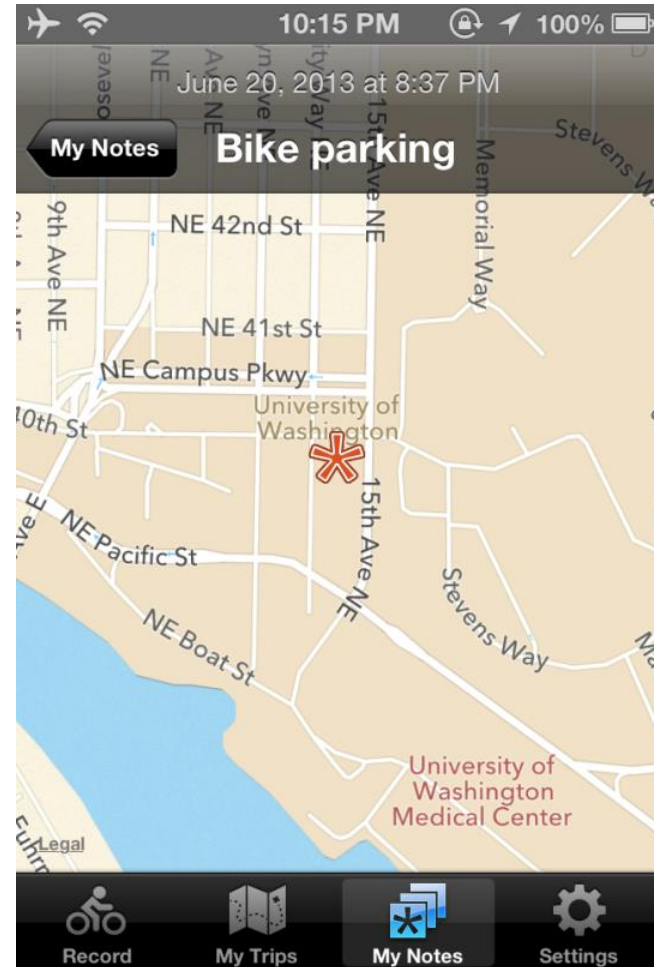
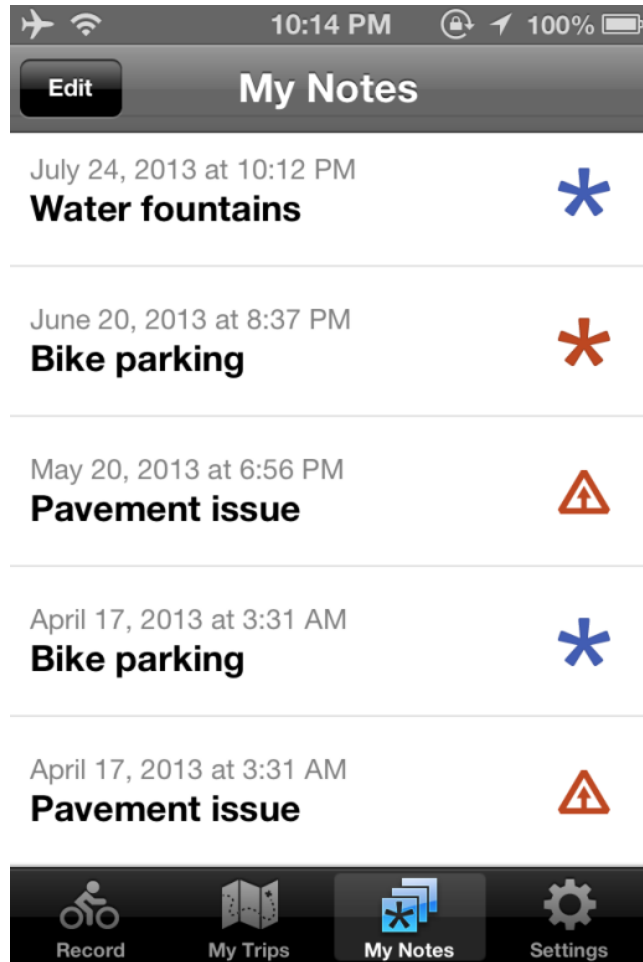
**My Trips** 3.7 mi ~ 7.4 mph

Map view showing a route through a city grid with streets like Beverly Rd NE, 10th St NE, and N Highland Ave NE.

Record My Trips My Notes Settings



# Viewing Your Notes

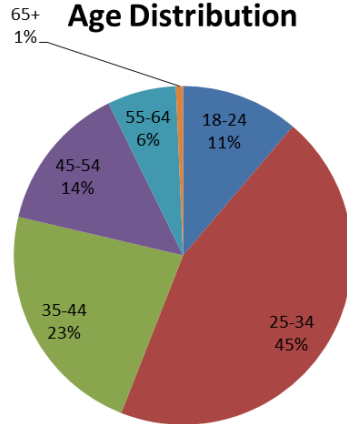


**Who is using it?**



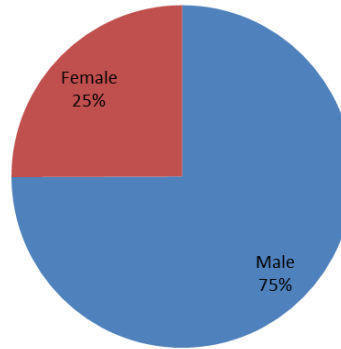
# Rider Demographic Distribution

**Age Distribution**



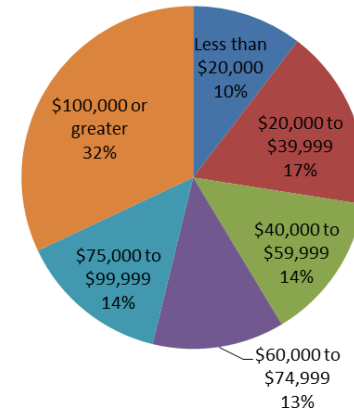
N=881

**Gender Distribution**



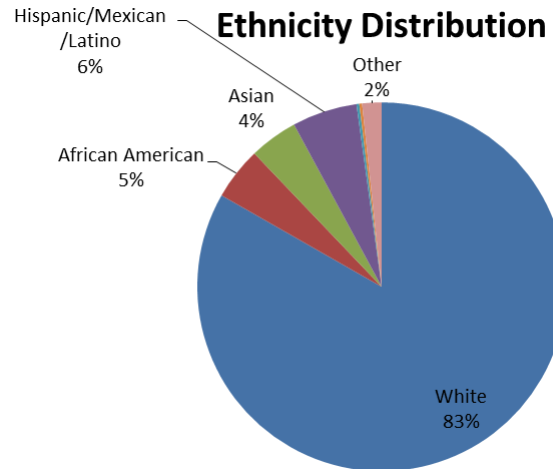
N=866

**Income Distribution**



N=684

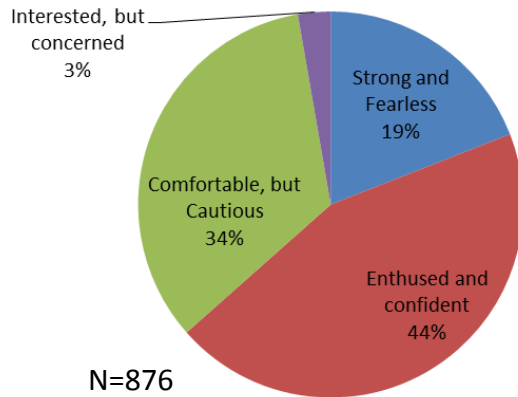
**Ethnicity Distribution**



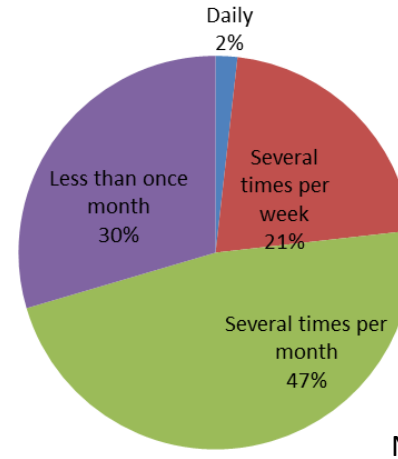
N=824

# Rider Characteristic Distribution

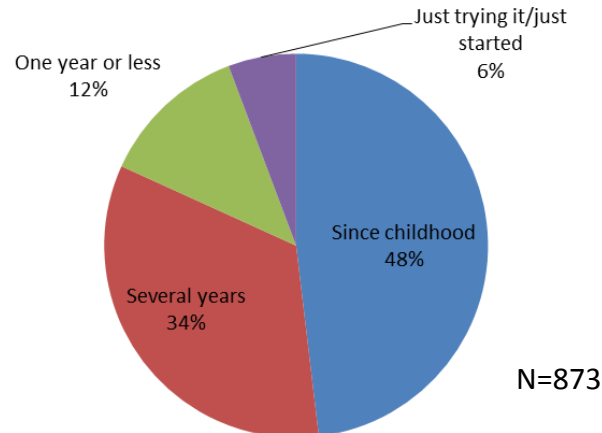
## Rider Type Distribution



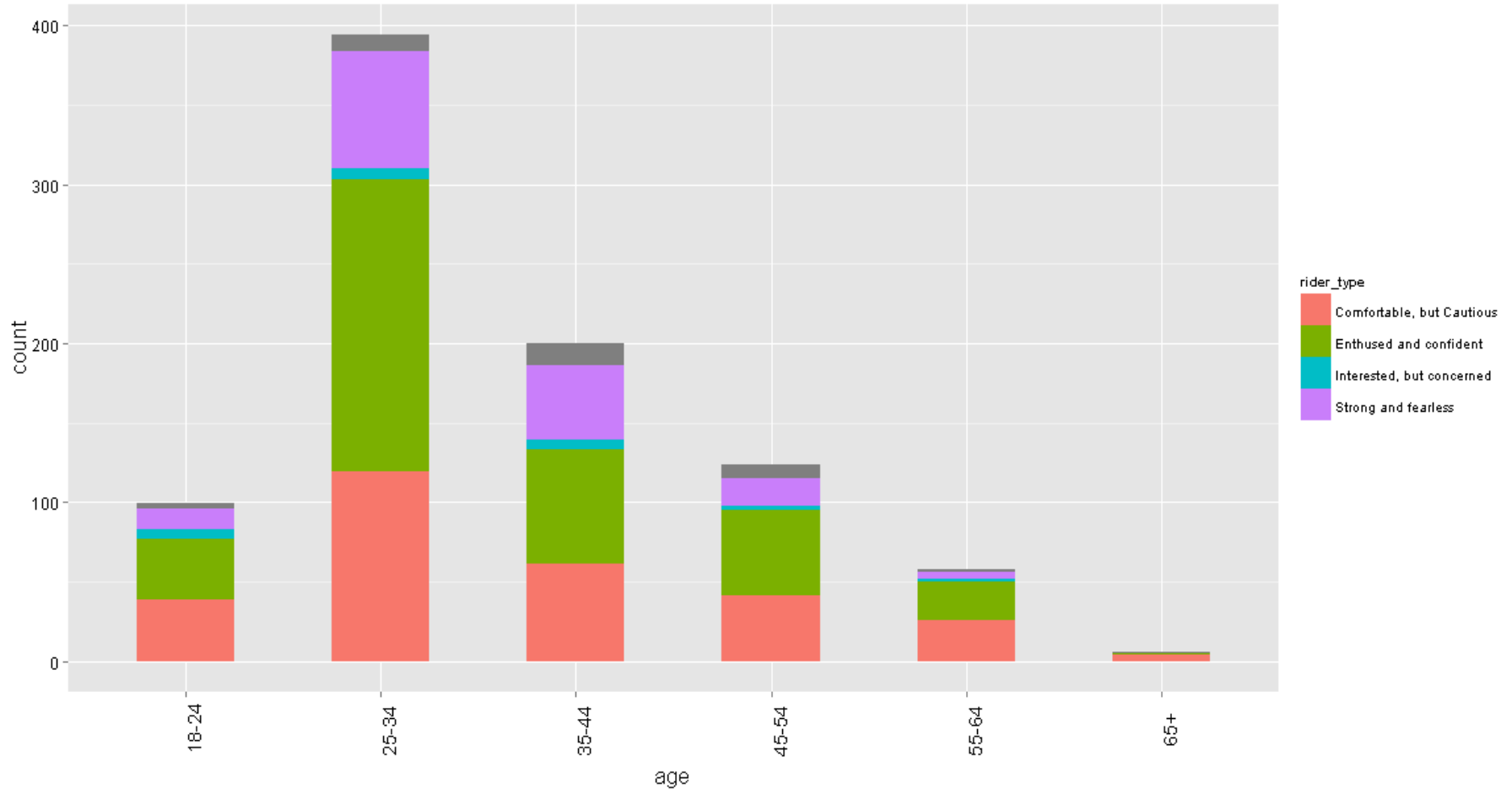
## Distribution by Cycling Frequency



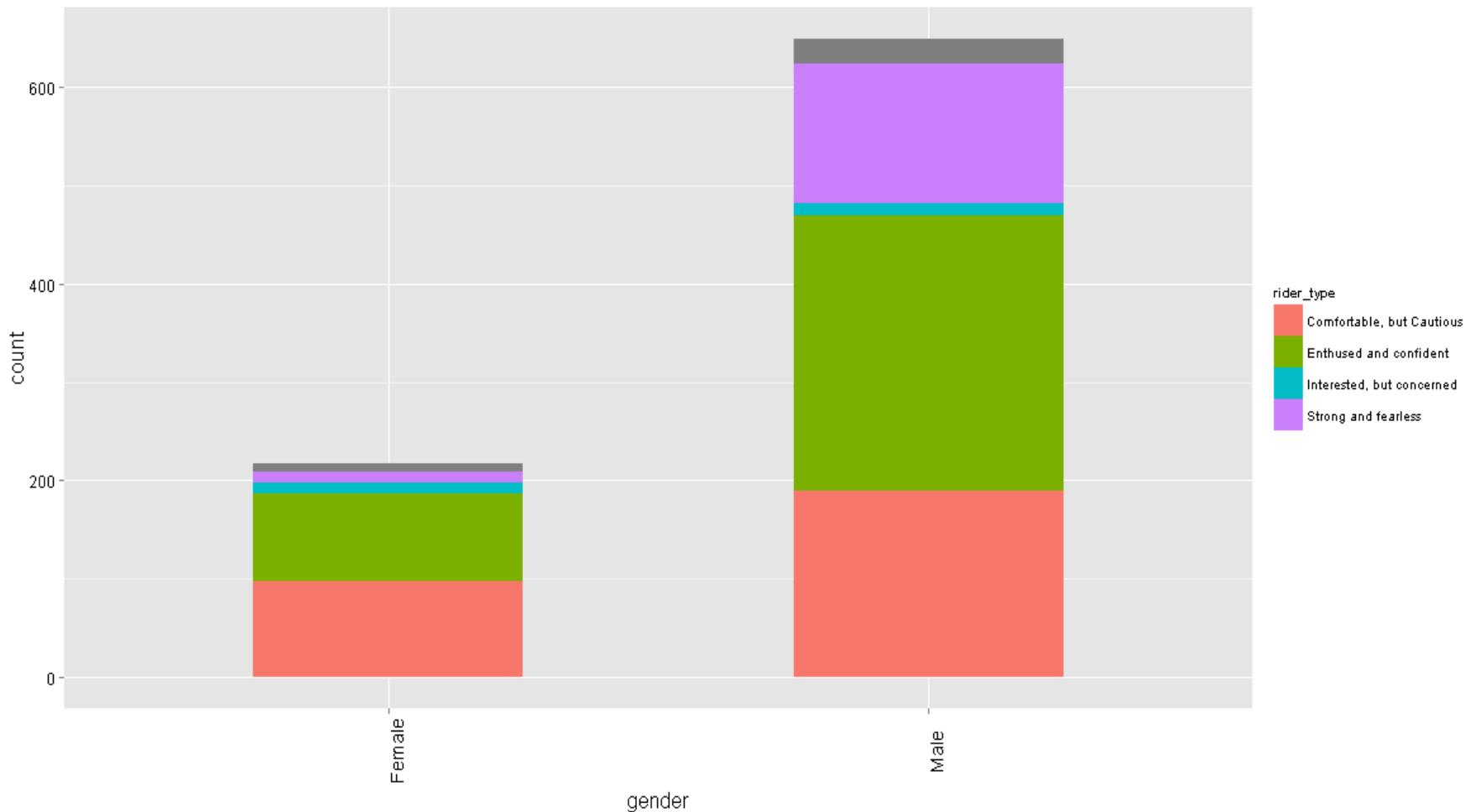
## Distribution by Rider Experience



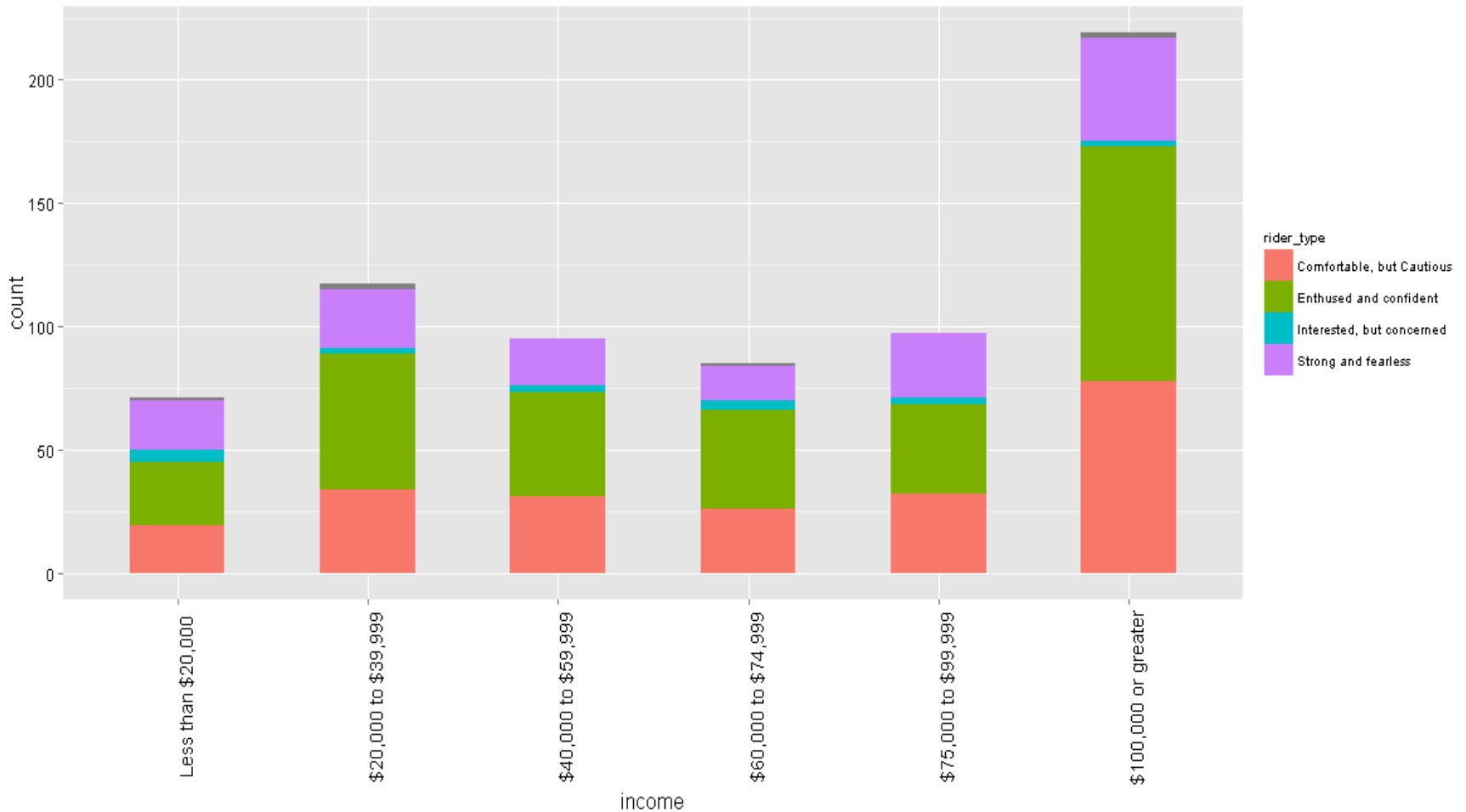
# Rider Type Distribution Across Age



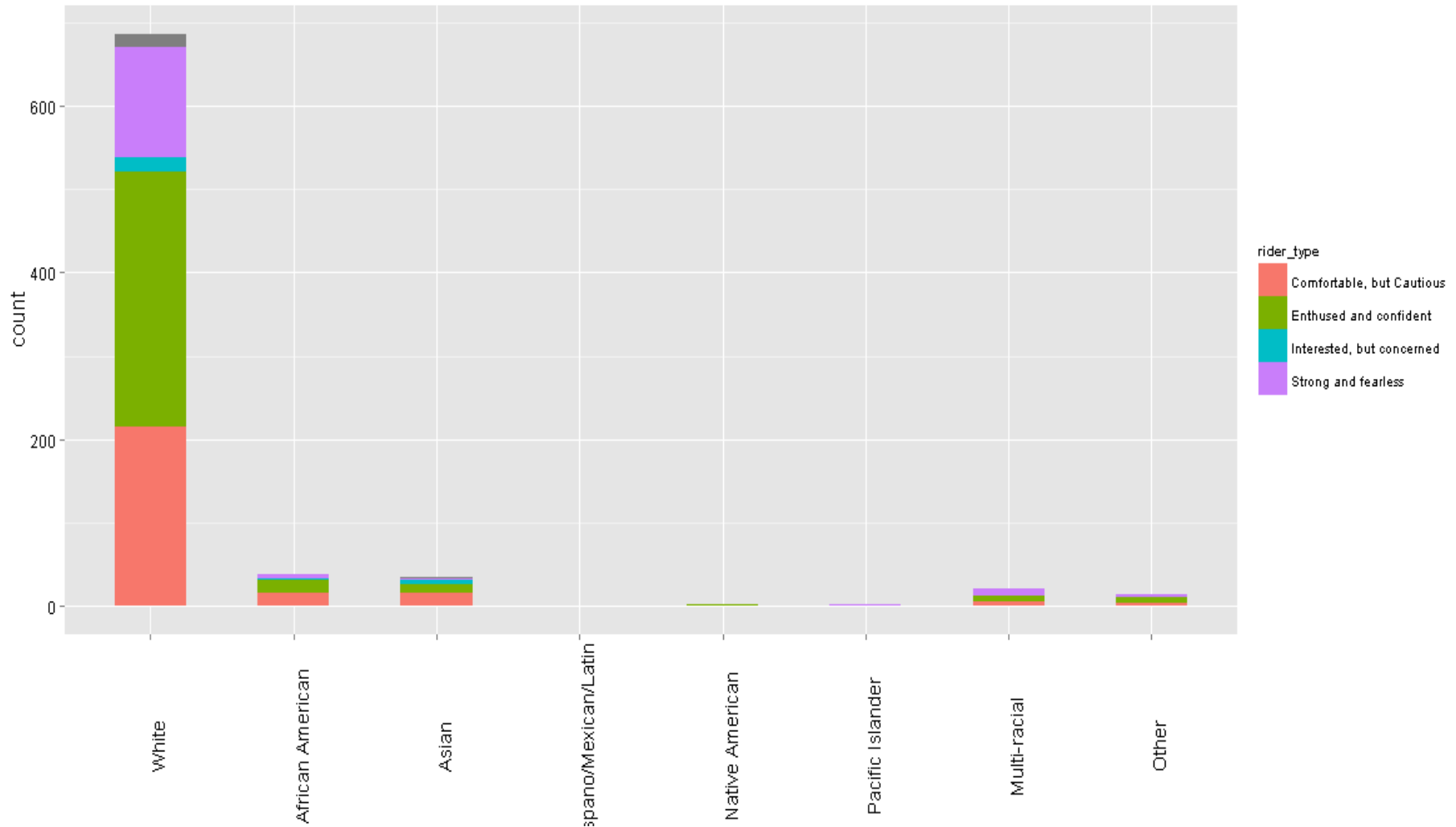
# Rider Type Distribution Across Gender



# Rider Type Distribution Across Income



# Rider Type Distribution Across Ethnicity



**Where is it used?**

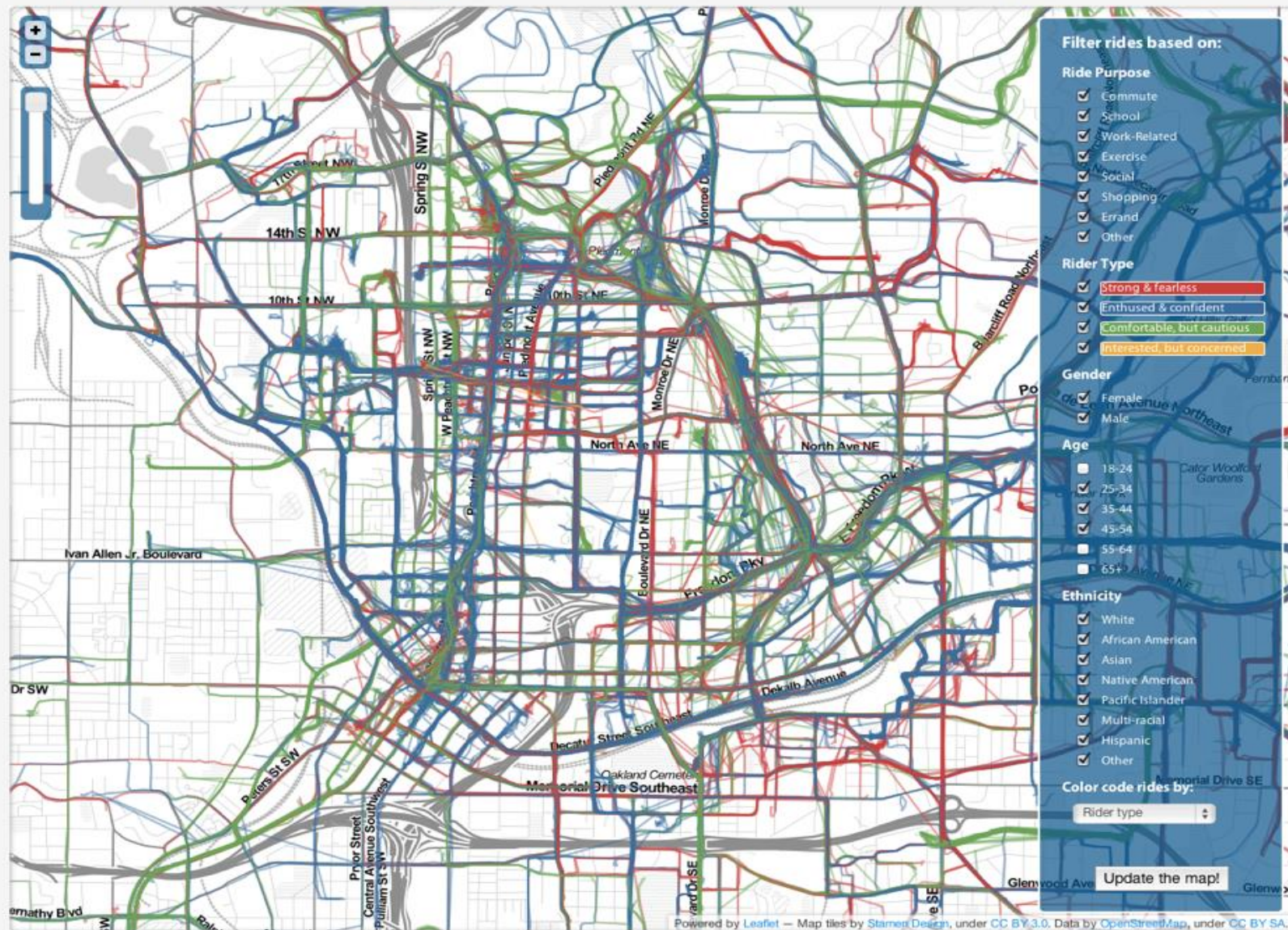


# Cycle Atlanta

Mapping the ride to a better Atlanta.

Visualizing rides collected by users of the Cycle Atlanta apps.

Select attributes you wish to view and click "Update the map!" below.



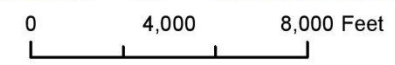
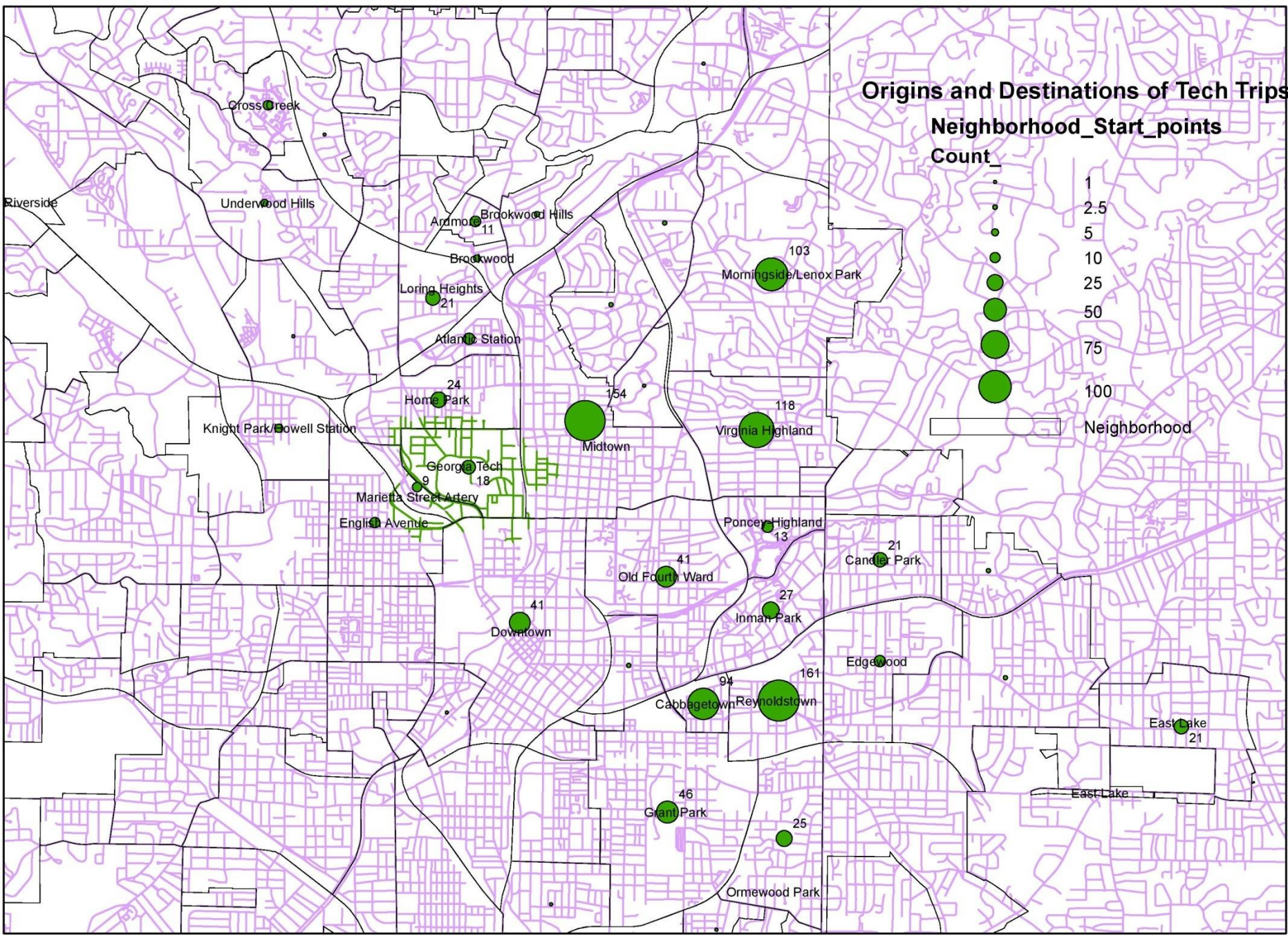
# Origins and Destinations of Tech Trips

Neighborhood\_Start\_points

Count



Neighborhood



**Looking forward**

Route choice analysis

Integration with City of Atlanta work order

Infrastructure ranking tools for city & region

Create mapping tools using data



# Magnetic Wrist Band

<http://vimeo.com/73055934>



# References

1. Tilahun, N. Y., D. M. Levinson, and K. J. Krizek. Trails, lanes, or traffic: Valuing bicycle facilities with an adaptive stated preference survey. *Transportation Research Part A: Policy and Practice*, Vol. 41, May 2007, pp. 287–301.
2. Krizek, K. J., P. J. Johnson, and N. Tilahun. Gender Differences in Bicycling Behavior and Facility Preferences. *Research on Women's Issues in Transportation, Transportation Research Board of the National Academies*. 2004.
3. Atlanta Regional Commission. *Atlanta Region Bicycle Transportation & Pedestrian Walkways Plan*. 2007
4. League of American Bicyclists, 2010,  
<http://www.bikeleague.org/resources/reports/pdfs/nhts09.pdf>
5. Centers for Disease Control and Prevention, 2012,  
<http://www.cdc.gov/nchs/data/databriefs/db82.pdf>
6. International Transport Forum, 2010,  
<http://www.internationaltransportforum.org/jtrc/environment/CO2/USA.pdf>



# Questions?

# Thank You!

Aditi Misra  
amisra7@gatech.edu

