

An aerial photograph of a wide, tree-lined city street during the 'golden hour' of sunset. The sun is low on the right side, casting long, warm shadows across the road and sidewalks. Several vehicles are visible: cars, motorcycles, and a group of cyclists. A white van with a ladder on its roof is prominent in the lower right. The text 'STRAVA | METRO' is overlaid in large, white, sans-serif font across the center of the image.

# STRAVA | METRO

UBDC Active Travel Data Challenge Day

Haynes Bunn  
Customer Success GIS Engineer

**What is Strava?**

# What is Strava?

The social network for cyclists and runners

The screenshot shows the Strava web interface. At the top is a navigation bar with the Strava logo, a search icon, and links to Dashboard, Training, Explore, Challenges, and Shop. On the right of the navigation bar are icons for notifications, a user profile, and a plus sign for additional options.

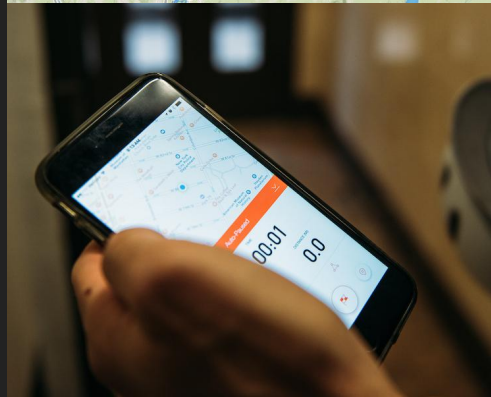
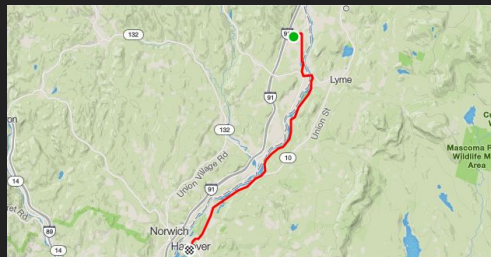
The main content area is titled "Activity Feed" and includes a dropdown menu set to "I'm following". It displays a list of recent activities:

- 08/17/2015 Long Pond, Pennsylvania** by Steve Liu: 7:25 AM, 4.8mi, 8:07mi. Includes a map thumbnail.
- Morning Ride** by Clint Angwin | FullSquish MTB Suspension: 6:03 AM, 6.9mi, 8:20ft. Includes a map thumbnail.
- Morning Ride** by Byron Haynes: 5:27 AM, 29.7mi, 1,627ft. Includes a map thumbnail.
- Morning Run** by Michael Rea: 6:44 AM, 3.2mi, 7:51mi. Includes a map thumbnail.

On the right side of the dashboard, there are sections for "This Week" and "This Year" progress:

- This Week:** Shows 0h 0m / 7h for cycling and 0 / 5 mi for running.
- This Year:** Shows 68 mi / 108 mi projected for cycling and 923 mi / 1,471 mi projected for running.

Below these are sections for "Find Your Friends On Strava" (with a button "Find and Invite Your Friends"), "Upcoming" (stating no races or goals are coming soon), "Discover More" (with buttons "Find a Race" and "Set a Goal"), and "Clubs" (with a "Create a Club" button and several club logos).







**Tens of Millions of users around the world (80% outside the US)**

**About 140 employees: HQ in SF.  
small offices in Bristol. UK and  
Hanover, NH**

**More than 10 million activities  
uploaded every week**

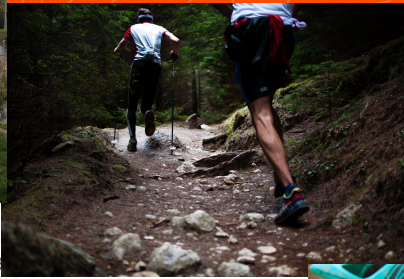
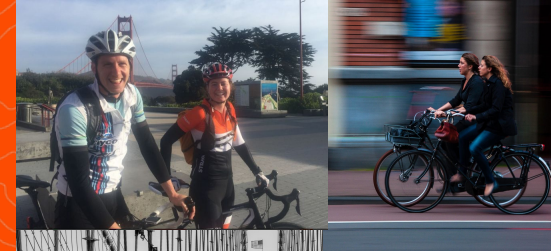
**16 activities uploaded every second**

**Over 3 trillion GPS data points  
collected globally**

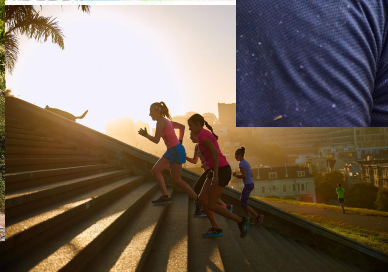
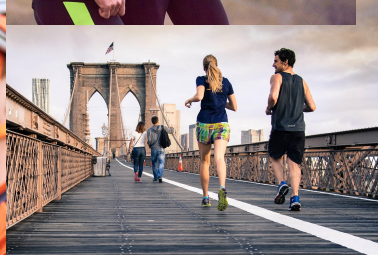
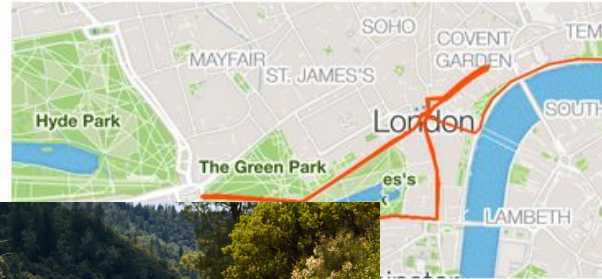
**2017**



# The Heart of Strava: Community



Oscar Nunez rode with 20 other  
Yesterday at 8:00 PM



**STRAVA** | METRO

**What is Strava Metro?**

# Strava Metro Mission Statement

**To produce state-of-the-art spatial data products and services to make cycling, running, and walking in cities better.**

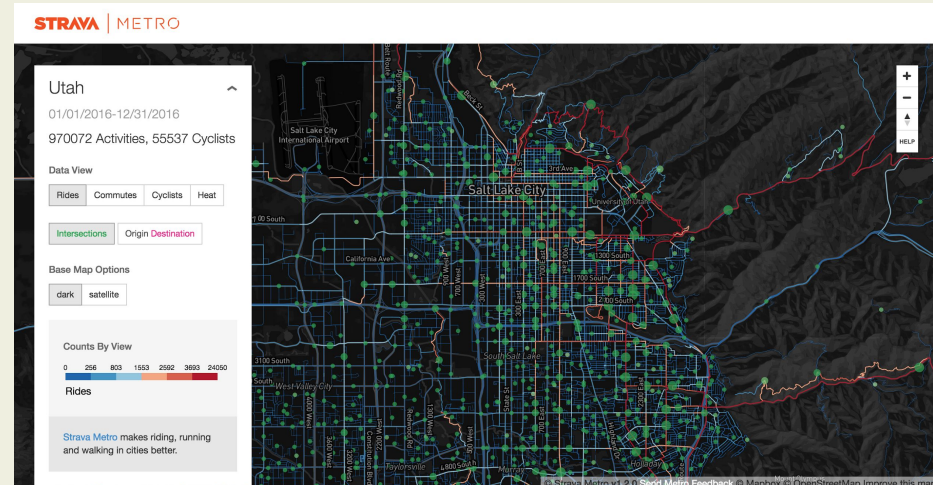


# What is Strava Metro?

- Aggregated, anonymized activity data from Strava's tens of millions of users
- Allows for analysis of popular or avoided routes, peak commute times, intersection behavior times, and origin/destination zones

# What is Strava Metro?

- **Enterprise:** Processed for compatibility with Geographic Information System (GIS) and relational database environments
- **DataView:** in-browser visualization



# What is Strava Metro?

- Began when the first Strava Global Heatmap was published
- High demand for quantifiable bicycle and pedestrian data





**Just use the heatmap?**

**What is the heatmap good for?**

**No temporal scale**

**Point saturation, not use saturation**

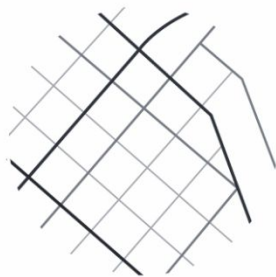
**Large cropping of start and ends**

**Showing that people ride bikes**

**Starting dialogues with the community**

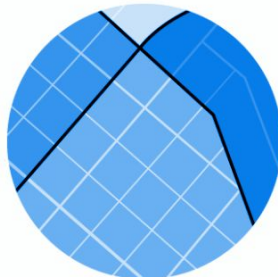
**Editing your basemap / finding missing geometry**

# Strava Metro Data



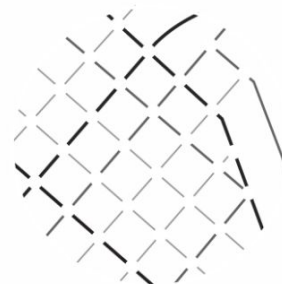
**Streets**

Minute-by-minute counts  
across your entire network



**Origin / Destination**

Understand activity starting  
and ending points, by region

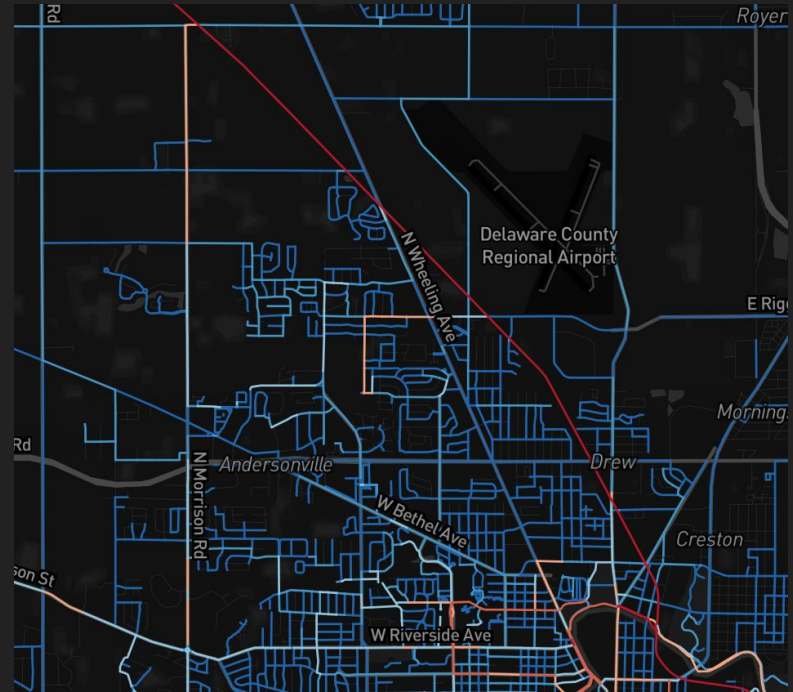


**Intersections**

Activity counts and wait  
times at every intersection

# Why Build Strava Metro?

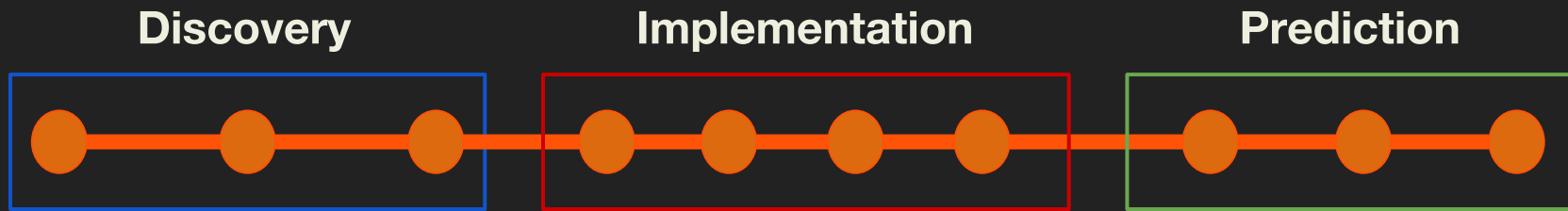
- **Global need for consistent cycling data**
- **Continues to serve the Strava user**
- **Further bonds the cycling and pedestrian community**
- **It's the right thing to do**





# **Strava Metro Global Use Cases**

# Bike/Ped Planning Spectrum

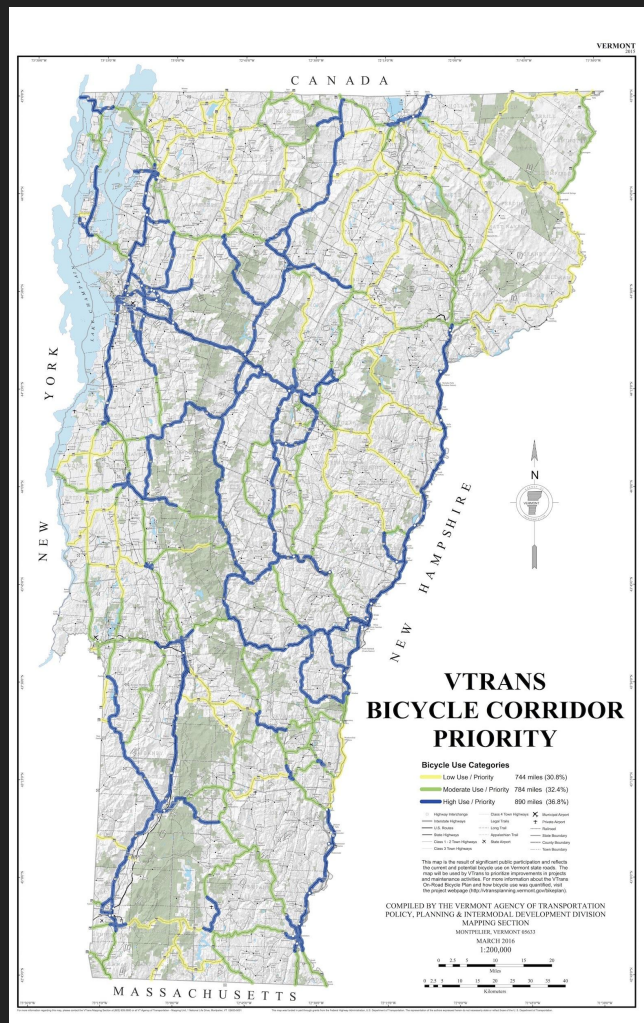


# Discovery

- Justification that people ride bikes
- When and what changes riding frequency
- Locating intersection hot zones and possible route conflicts

**Used to discover key routes and corridors**

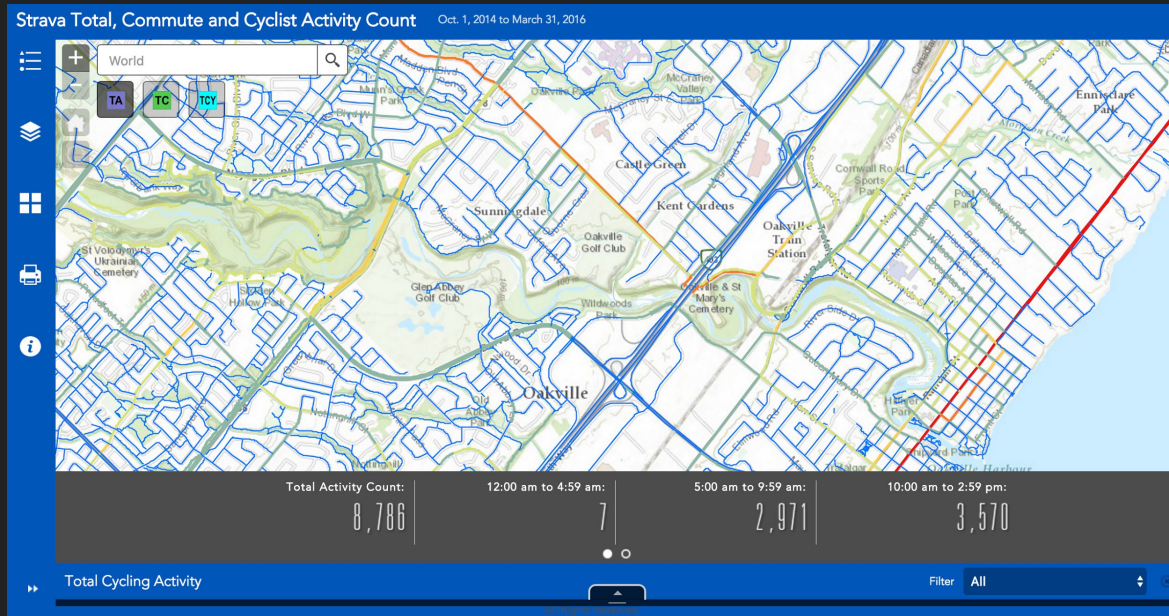
- **Florida** - to prioritize street sweeping/cleaning
- **Vermont** - to prioritize snow plowing and state cycling tourism



# Online Maps

## Oakville, Ontario

- Display map for public
- Explain why new and improved infrastructure is justified
- Back-up requests with data

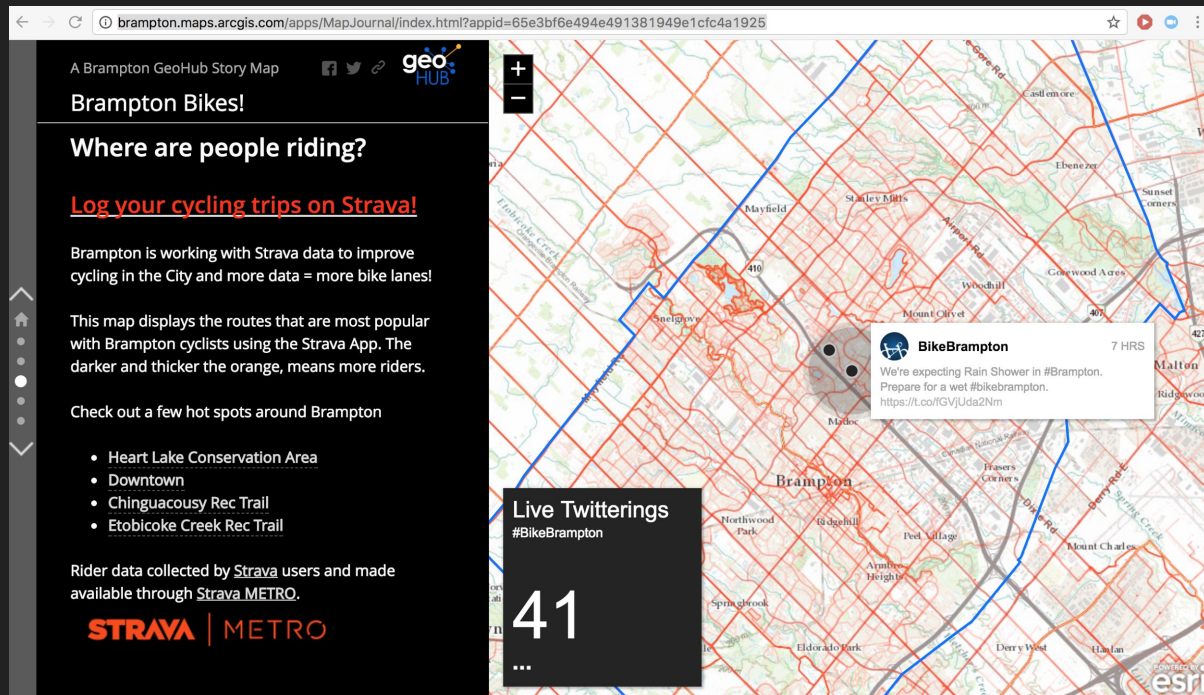




# Story Maps

## Brampton, Ontario

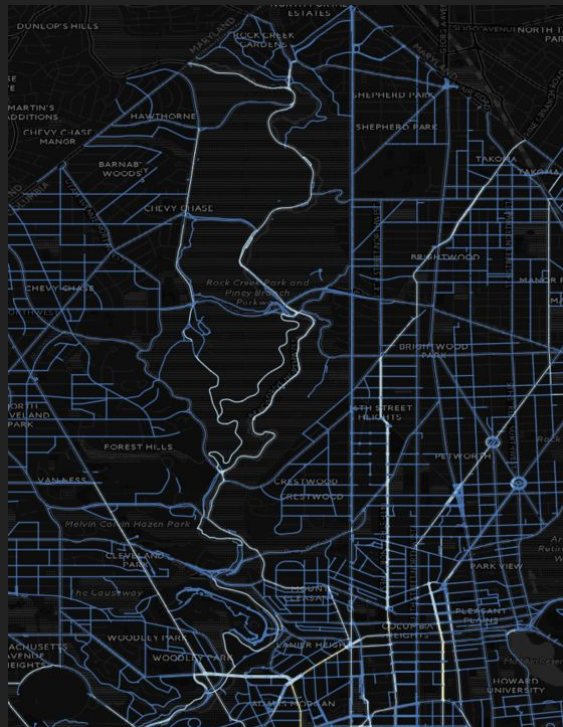
- Popular streets and trails from Strava Metro
- Announcements / Events calendar
- Linked with their Twitter account
- Community rides
- Active Transportation Master Plan information



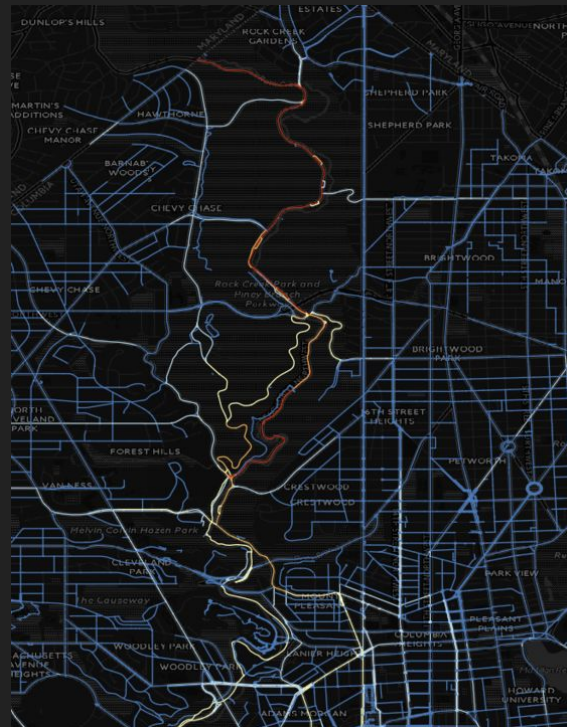
# Core Routes - Temporal

## Rock Creek Park, Washington, DC

- Rock Creek Park is closed to cars on weekends and holidays
- Many more activities on safer roads when cars not present



Weekday

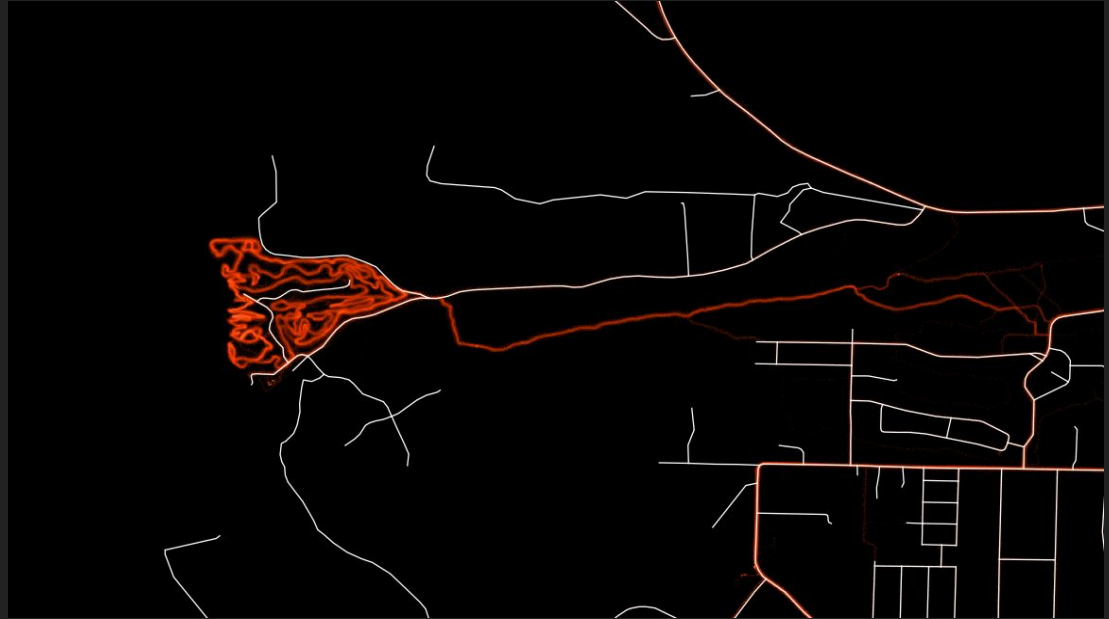


Weekend

# Locating Missing Geometry

## Using the Strava Heatmap

- Tile layer file that can be opened in ArcGIS or QGIS
- Overlaid with basemap to locate missing / misaligned geometry



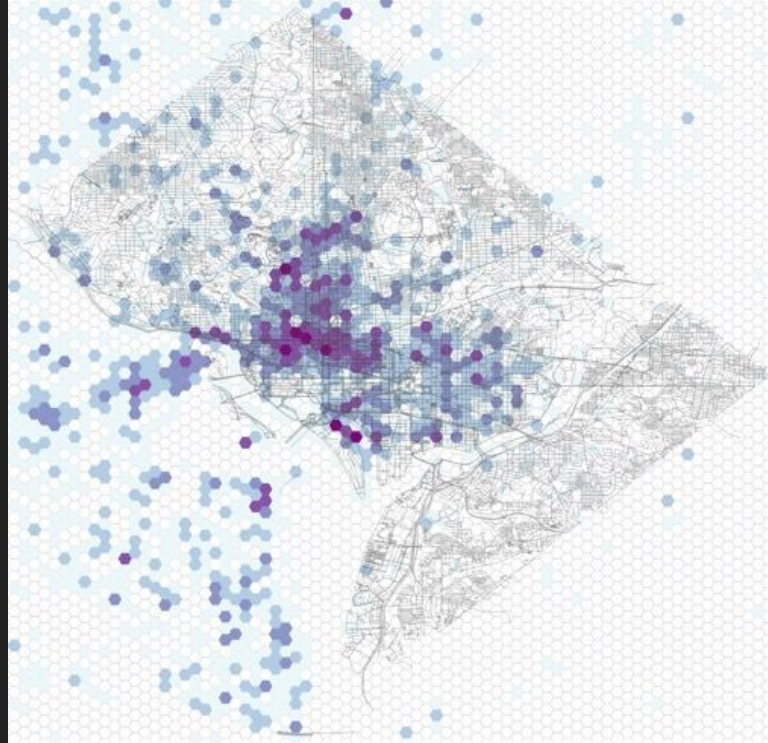
# Implementation

- Identify top Origin and Destination pockets
- Isolate speed and volumes to begin to locate slow down regions
- Evaluate the impact of new cycling investments
- Blending of count data with Strava Metro data to correlate and extrapolate

# Origin / Destination Data

**Use the starting and ending polygon to locate key zones**

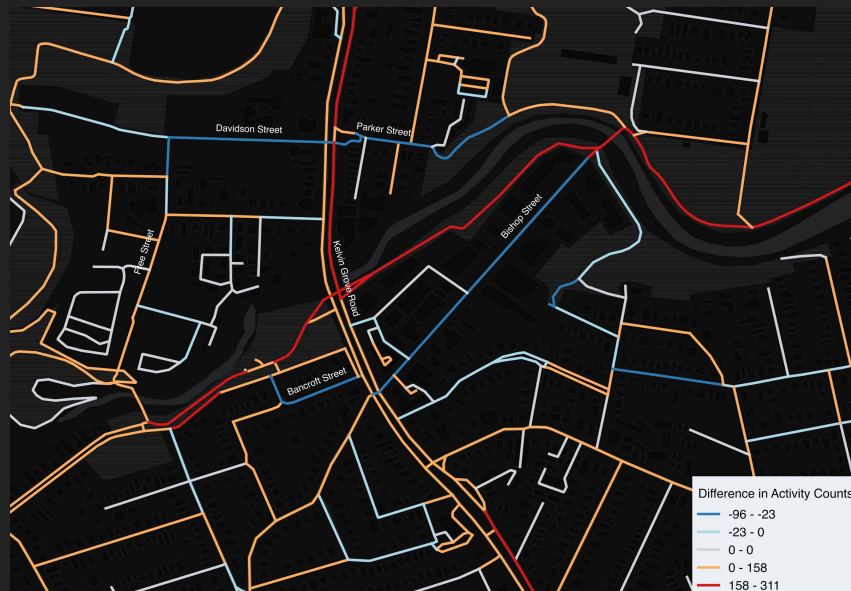
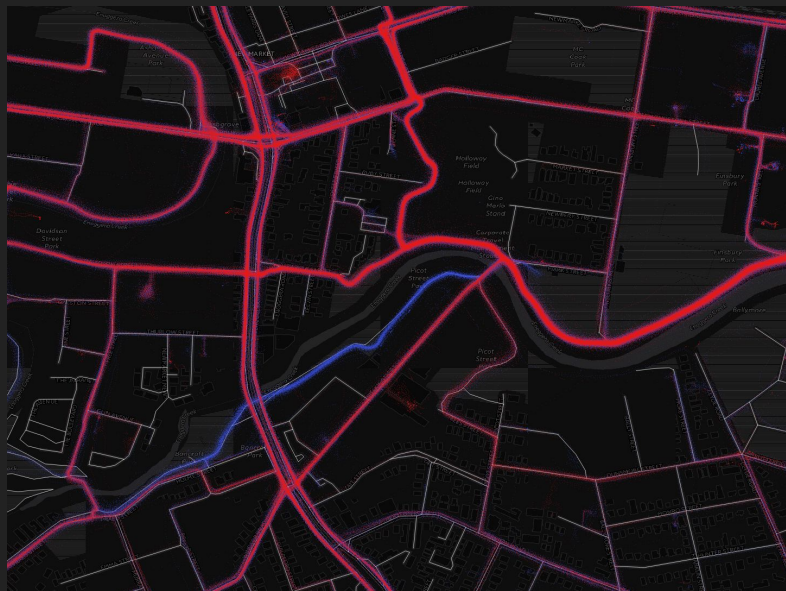
- Using a relational database (such as Postgres) to query for counts of activities that started in each polygon
- Can also query by destination





# Delta Analysis

Queensland, Australia



# Bike Count Correlation

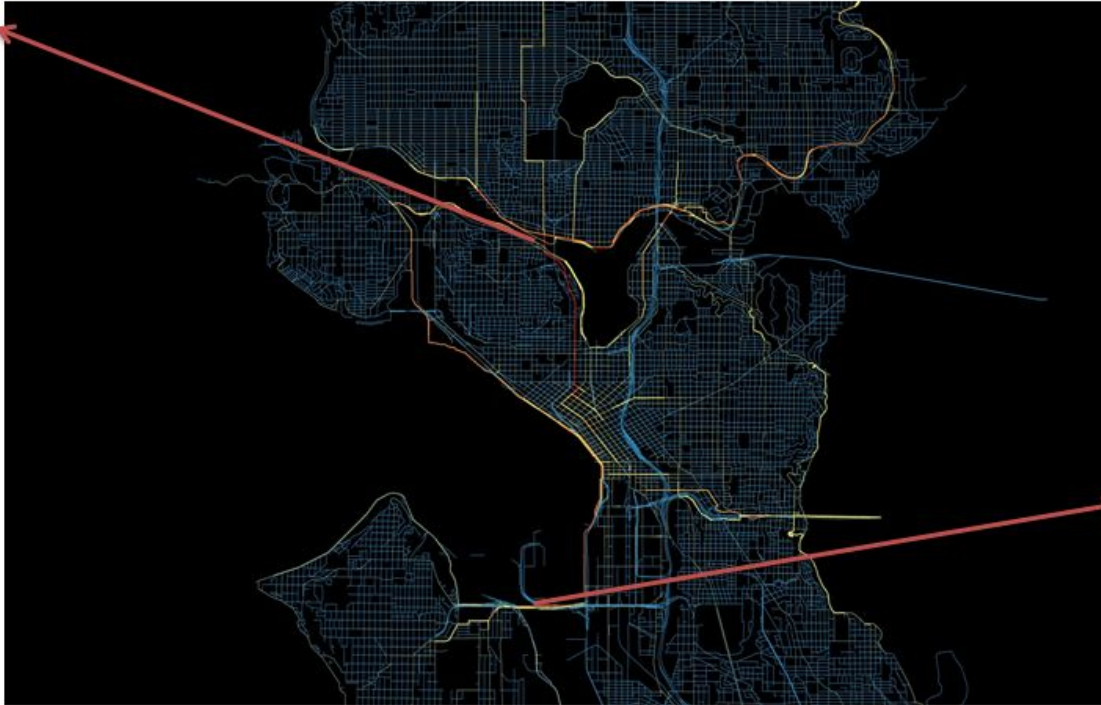
## Seattle, Washington

- Strava Metro's use and impact is multiplied when used in conjunction with an established counting program
- Counting programs show saturation at a single point, and dilute from there
- Strava Metro shows the rest of the network



# Bike Count Correlation

Fremont  
Bridge  
Bike  
Counter

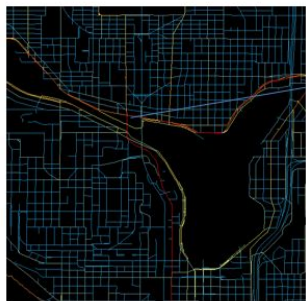


Spokane  
Street  
Bike  
Counter

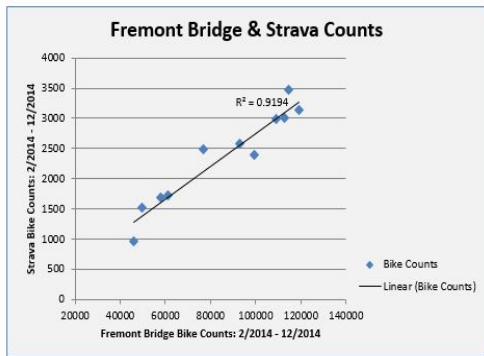
# Bike Count Correlation

## Seattle, Washington

### Fremont Bridge Bike Counts



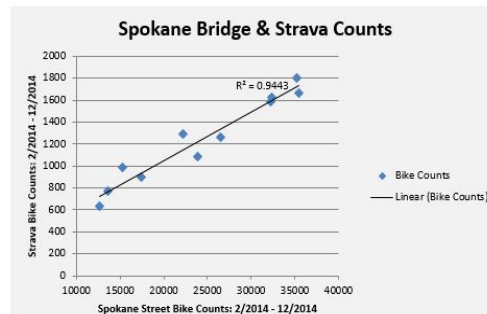
Strava: 25,980  
Fremont Counter: 939,386  
Percent of Strava to Population: 2.77%  
R2: 0.9194



### Spokane Bridge Bike Counts

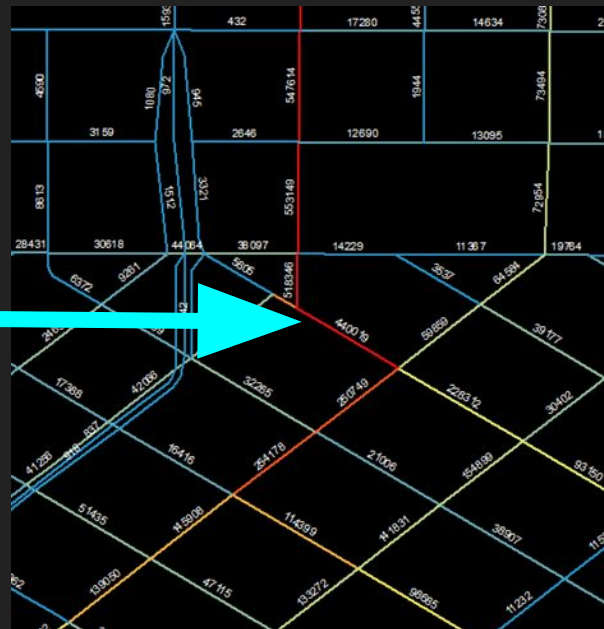
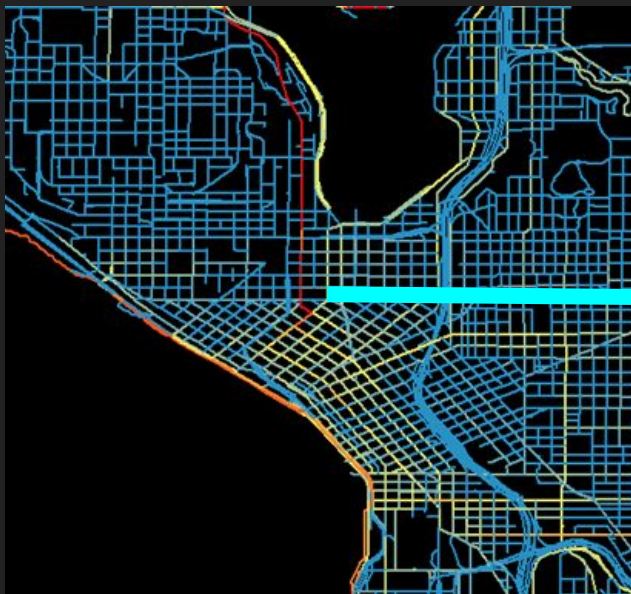


Strava: 13,602  
Fremont Counter: 266,850  
Percent of Strava to Population: 5.10%  
R2: 0.9443



# Bike Count Correlation

Seattle, Washington



16,297 bike trips x 27 (multiplier) = 440,019 bike trips in 2014

**63,253,198 bike miles traveled**



# Prediction

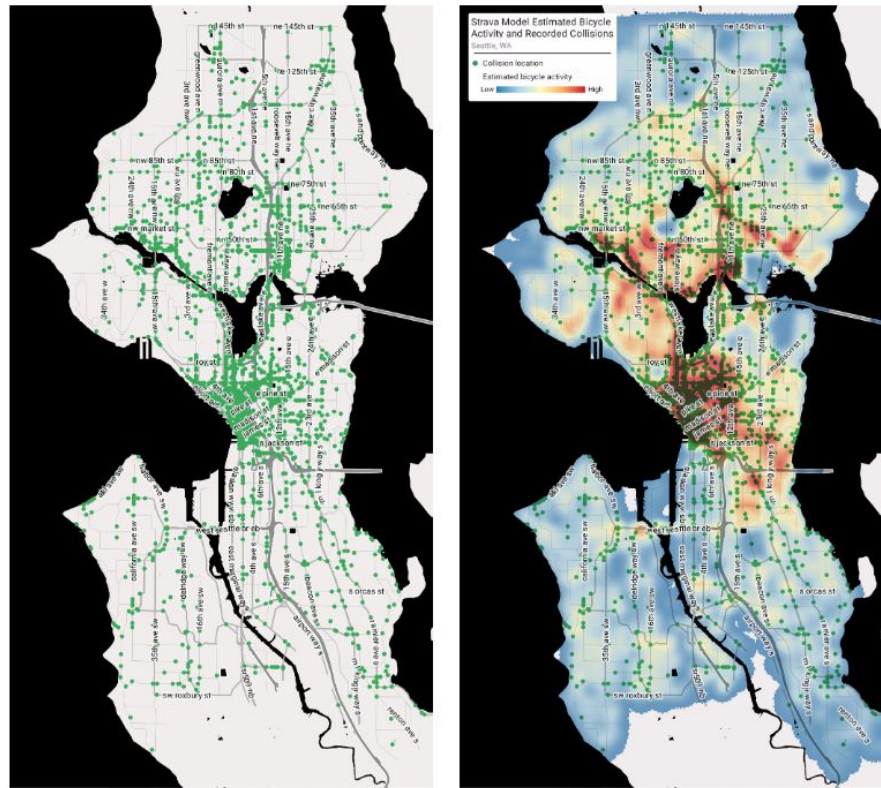
- Safety prediction modeling
- Building routing engines to isolate cycling habitat fragmentation
- Generate cycling traffic demand models

# Crash Analysis

## Seattle, Washington

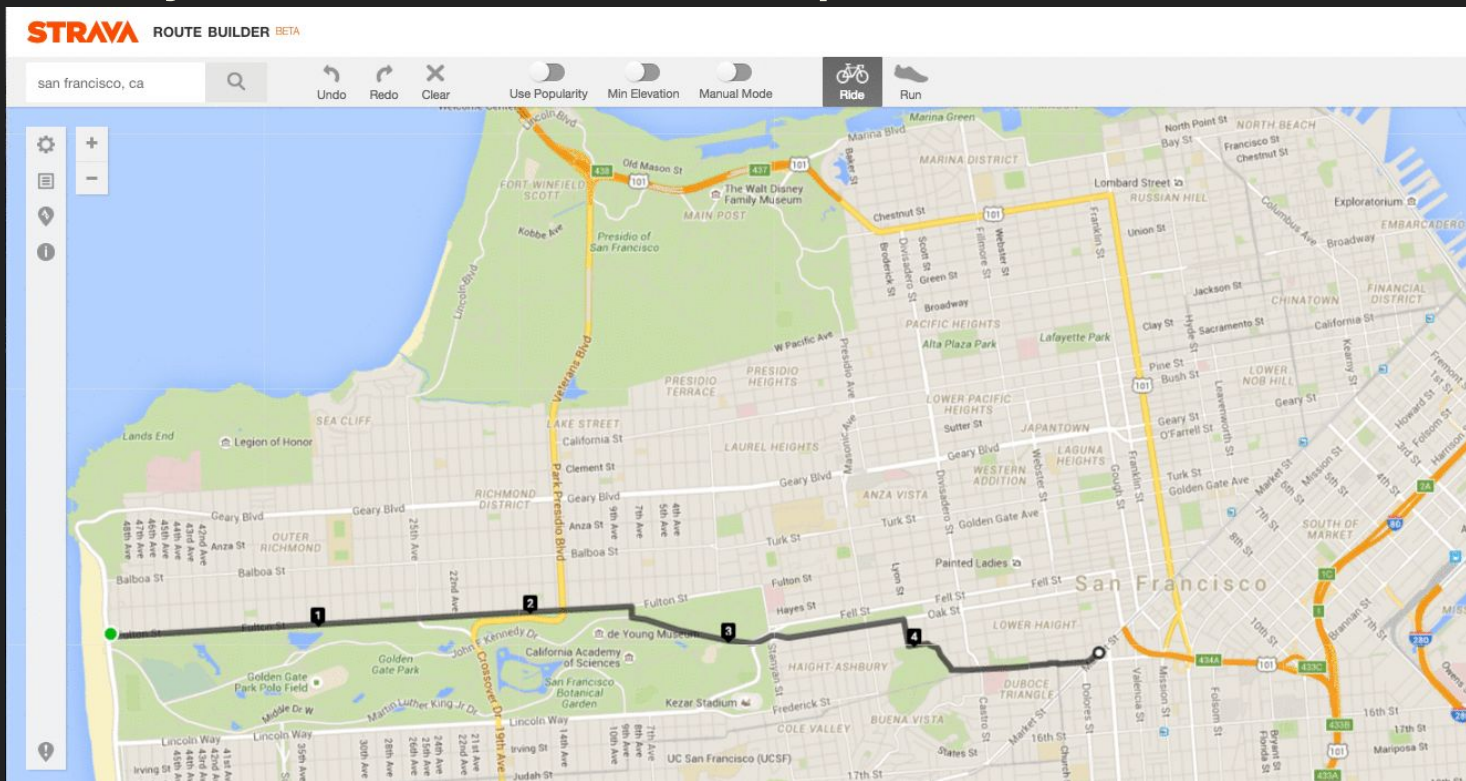
- Overlaid Strava Metro data with crash data
- Created a model of dangerous infrastructure characteristics
- Prioritized improvements

FIGURE 11: BICYCLE CRASHES AND BICYCLE VOLUME ESTIMATES



# Routing

Use and safety instead of road class and speed



# OD Demand Modeling

## Washington, DC

- Morning commutes to the city center

Starting_Polygon	Ending_Polygon	Count_Activities_Before_Noon	Count_Activities_After_Noon	Count_Total_Activities
18	146450		1	1
18	146502		4	4
24	29786		1	1
24	101268	1		1
24	151569	1	1	2
25	2739	1		1
25	15571		1	1
25	53168		1	1
25	54397		1	1
25	73827	1		1
25	75851		2	2
25	78139		1	1
25	94485	1		1
25	121738		1	1
27	15702	1		1
31	61284	1		1
42	299	2	4	6



**Thank you!**