

Data and Bicycling:

We're drowning in "big data" but does any of it tell us what we need to know?

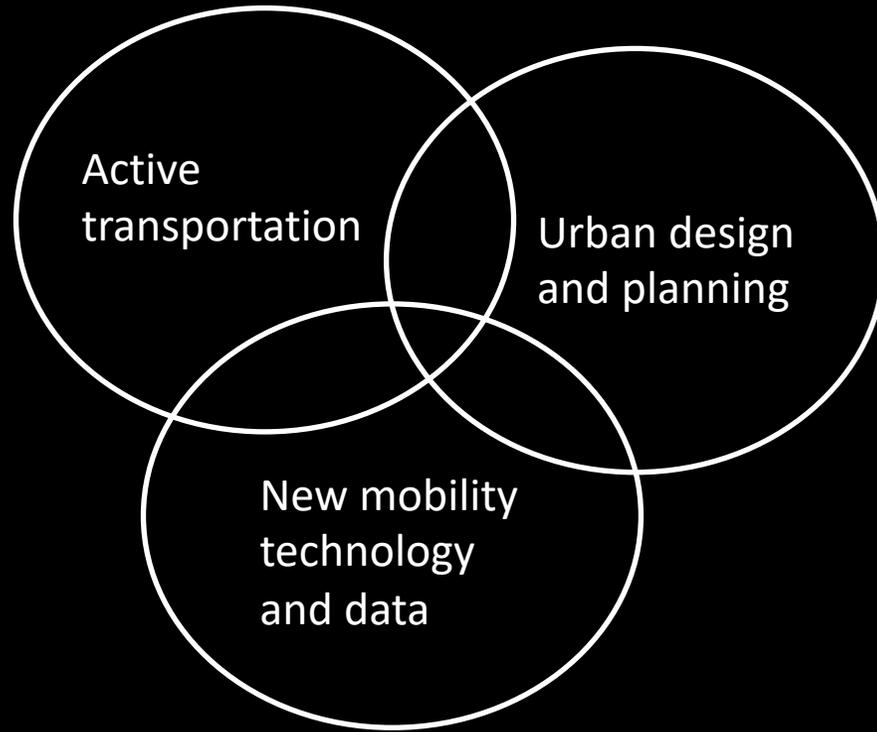


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**DEN NASJONALE
SYKKELKONFERANSEN**



**Smaken av sykling
Hamar 12.-13. september 2022**



About me:

- Urban Planning Scholar
- Cycling Advocate
- Practicing Planner
- Statistical Consultant
- Cyclist and Father



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At OsloMet I teach:

- Transport Policy
- Urban Mobility

Smart Mobility and Urban Analytics Master's Degree

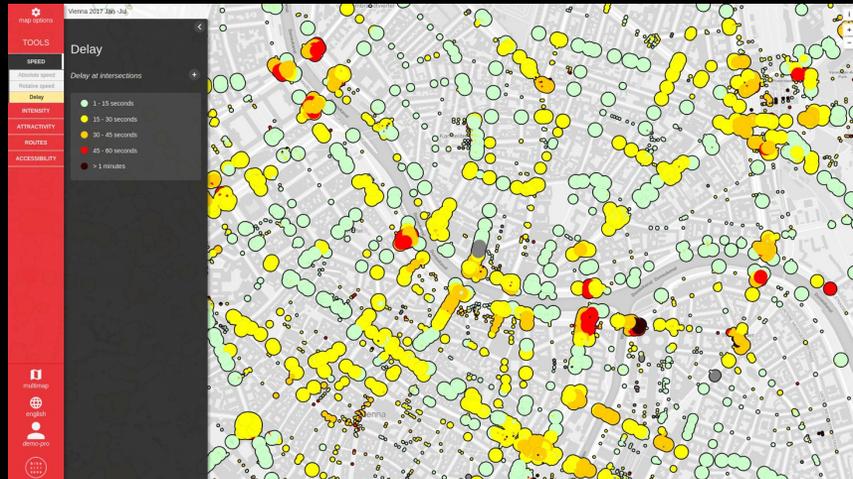
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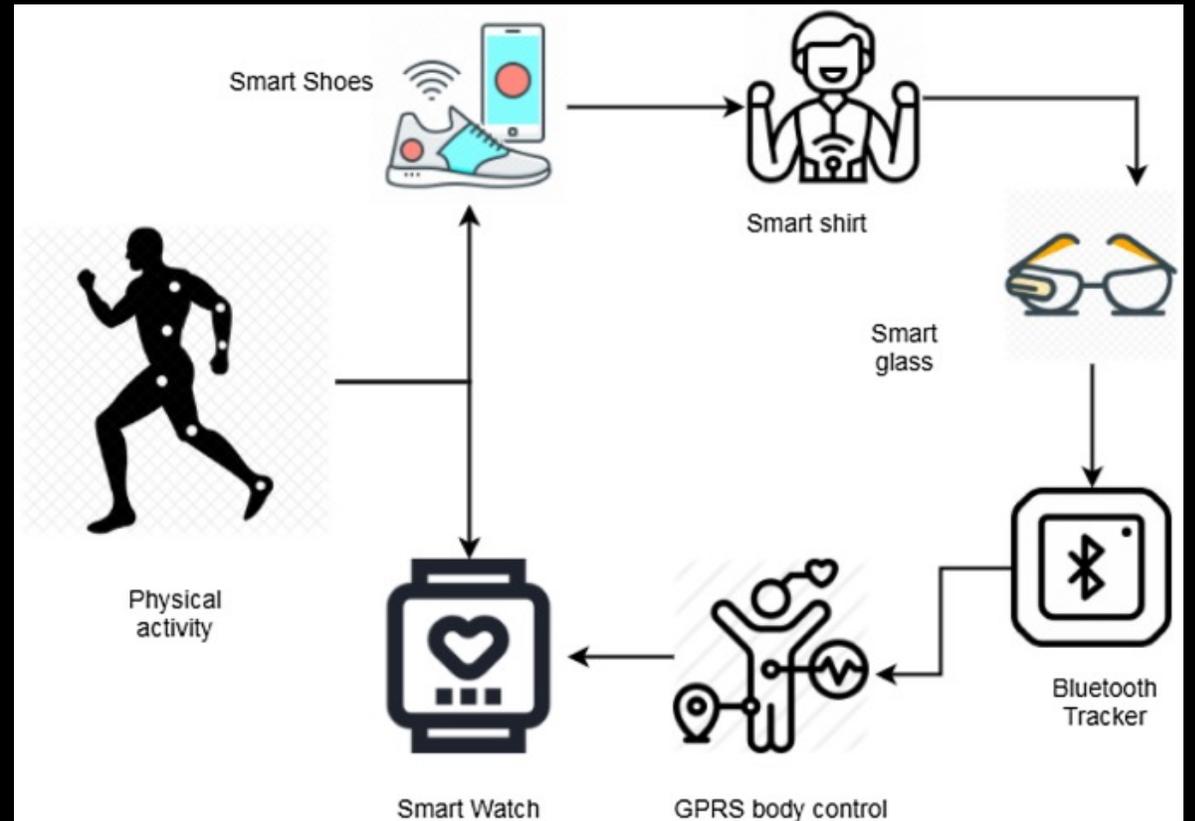
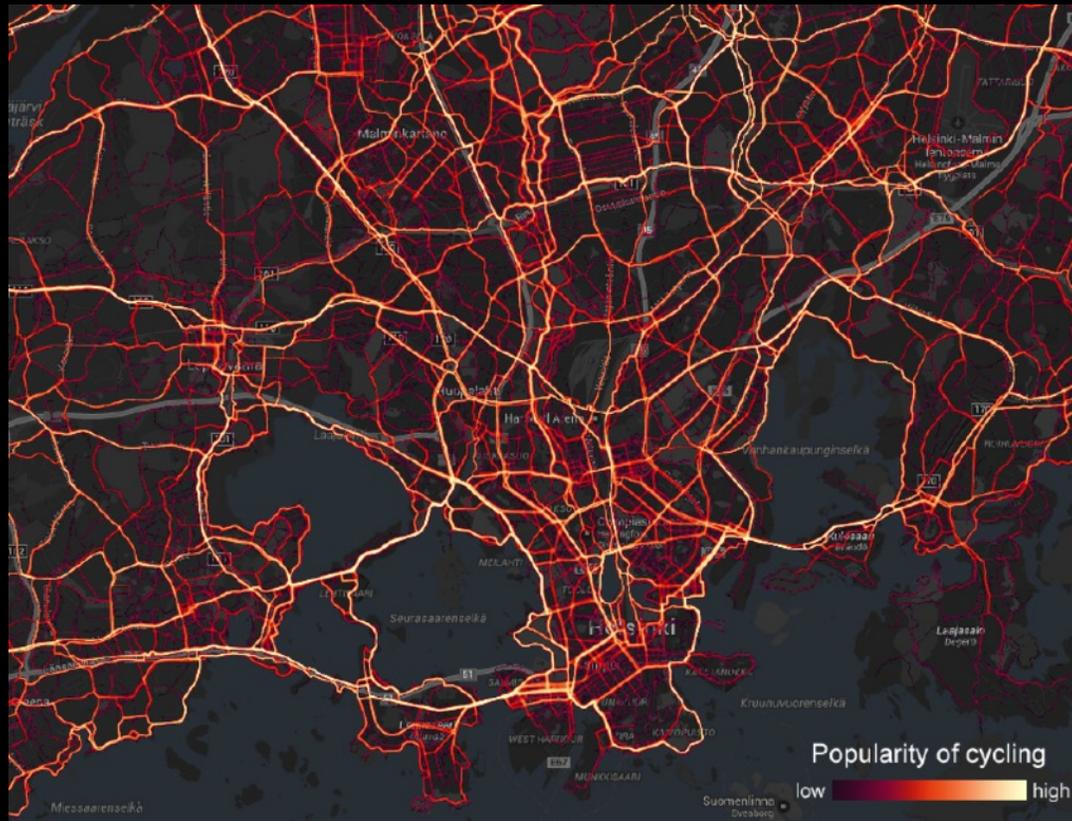
“Big Data” in Cycling?



Tracking the bicycle
and engaging the
bicyclist



Drawing conclusions about what people are doing and where they are going....

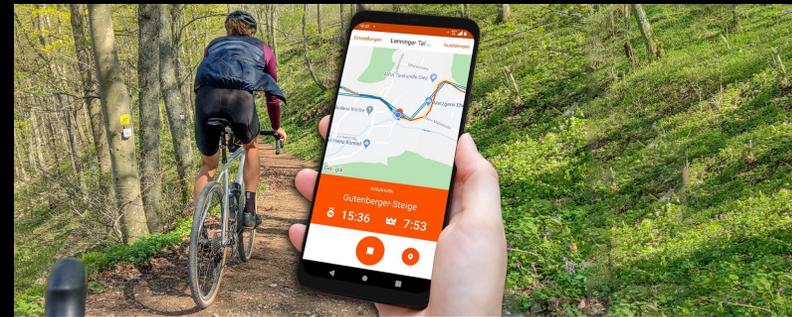


What good is all this data?

What can we learn from it, and does it help us reach our goals?

Some examples from my academic work

1. Surveying bicycling behavior
2. Community engagement about bikesharing
3. Measuring bicycling during the pandemic



”Dangerous” bicycling behaviors?

- Online survey
 - Hypothetical scenarios
 - Attitudes
 - Multi-modal behavior
- 18,000 responses (global)
- Fascinating insights into behavior and motivation
- Concerns
 - Enthusiastic responses
 - Enthusiastic respondents
 - Biased population
 - Subjective outcome

Please answer the questions below based on how you normally drive...



Please think about how you normally ride a bike and answer the questions below...



Do you come to a complete stop at stop signs?

Do you drive at or under the posted speed limit?

Do you use your turn signal to signal lane changes and turns?

Do you wear your seatbelt?

Do you talk on your cell phone while driving?

Do you ride a bike for fun/exercise?

Do you ride a bike to go places (as in, for transportation)?

Do you wear a helmet?

Do you come to a complete stop at stop signs?

Do you talk on your cell phone while riding?

Do you text while riding?

Do you bike while under the influence of alcohol or drugs?

On a narrow street with no bike lanes, do you ride in the middle of the lane to keep cars from passing?

When you were a child, how often did you ride a bike?



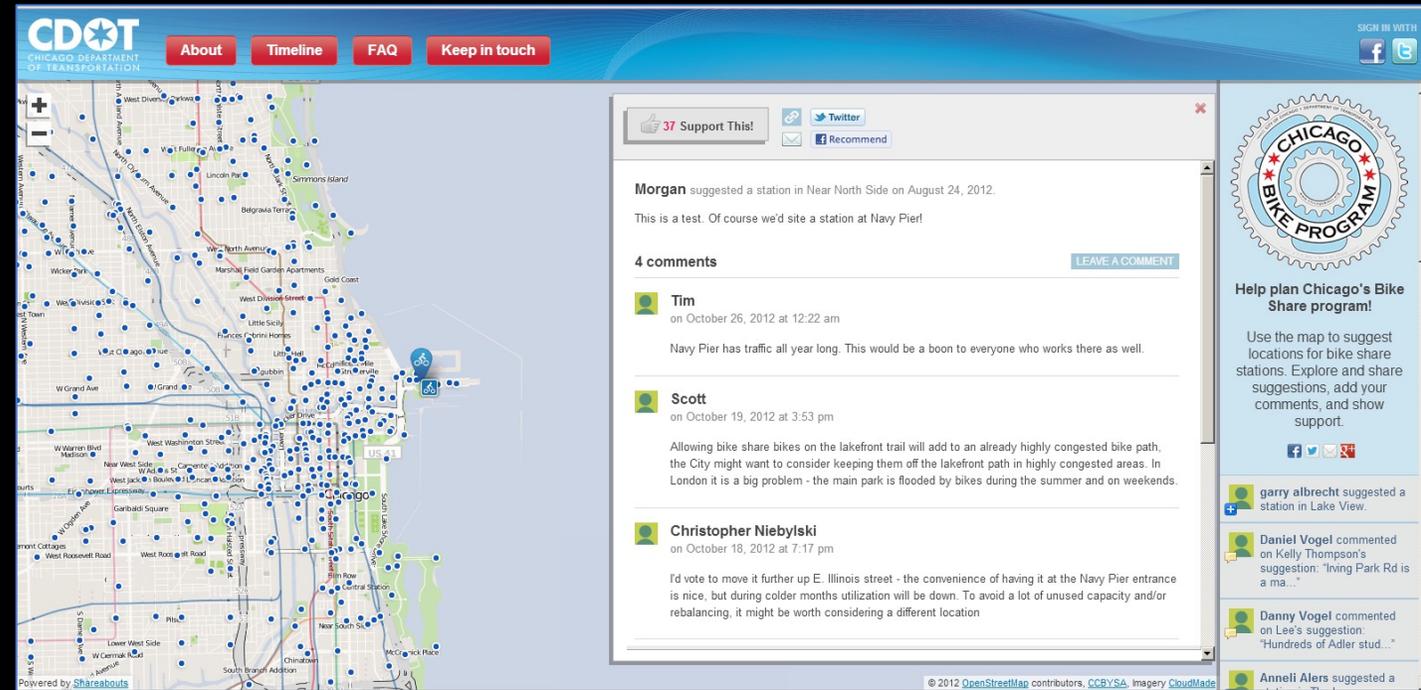
You are approaching the above 4-way stop sign on your bike and intend to go straight, but there is a car stopped across the intersection (facing you) without their turn signal on.

How do you proceed?

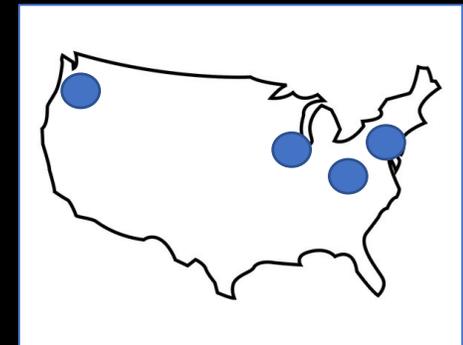
- Come to a complete stop at the stop sign before proceeding
- Slow down considerably and proceed through the intersection without coming to a complete stop
- Slow down a little and proceed through the intersection
- Continue through the intersection without slowing down much at all

Planning a bikeshare system

- Online survey
 - Bikeshare station placement
 - Feedback and “likes”
- 300/city responses
- Rich feedback on micro-site details and barriers
- Concerns
 - Enthusiastic respondents
 - Biased locations
 - Who is missed?

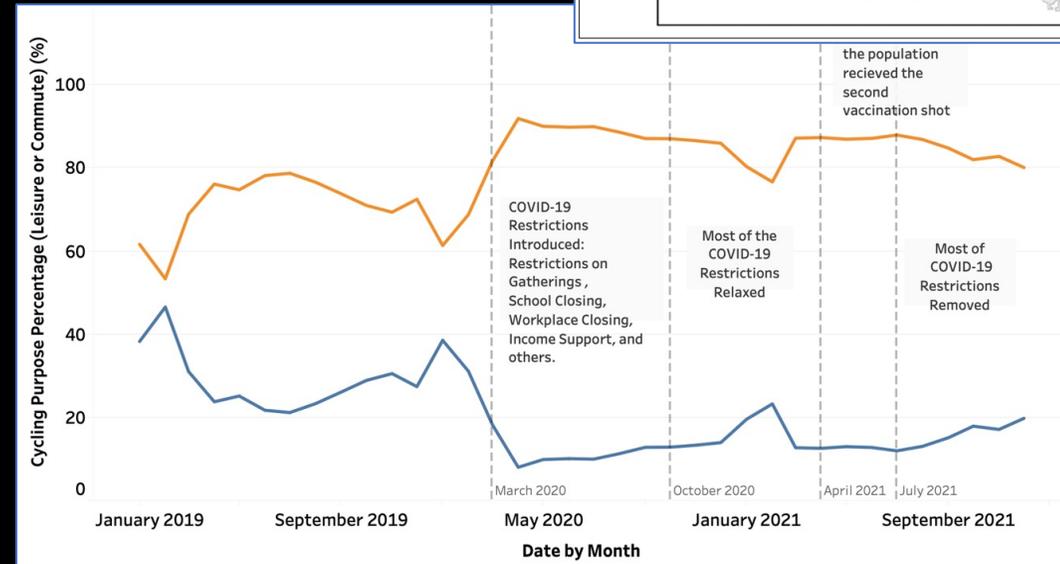
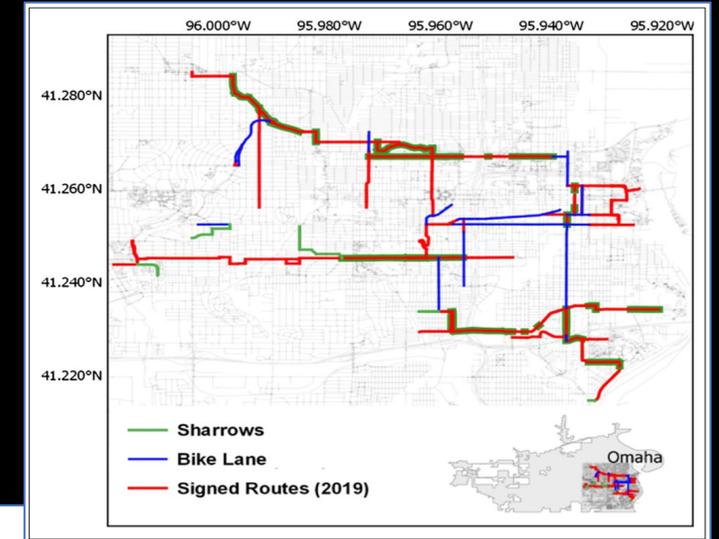


The screenshot shows the CDOT website with a map of Chicago displaying numerous blue dots representing bikeshare station locations. The map is part of a social media-style interface. On the right, there are navigation buttons for 'About', 'Timeline', 'FAQ', and 'Keep in touch'. Below the map, there is a comment section with 4 comments. The first comment is from Morgan, dated August 24, 2012, suggesting a station at Navy Pier. The second comment is from Tim, dated October 26, 2012, stating that Navy Pier has traffic all year long. The third comment is from Scott, dated October 19, 2012, discussing congestion on the lakefront trail. The fourth comment is from Christopher Niebylski, dated October 18, 2012, suggesting a location further up E. Illinois street. A sidebar on the right features the Chicago Bike Program logo and a call to action: 'Help plan Chicago's Bike Share program!'. It includes a link to 'LEAVE A COMMENT' and a list of other users' suggestions, such as 'garry albrecht suggested a station in Lake View' and 'Daniel Vogel commented on Kelly Thompson's suggestion: "Irving Park Rd is a ma..."'. The bottom of the page includes a copyright notice: '© 2012 OpenStreetMap contributors, CC BY-SA, Imagery © Mapbox'.



Bicycling through the pandemic

- App-based data
 - Strava fitness app
 - Hundreds of users, thousands of trips
- Highly-specific data
 - To-the-minute travel info
- Concerns
 - Proprietary (significant omissions)
 - Data cleaning
 - Biased user group

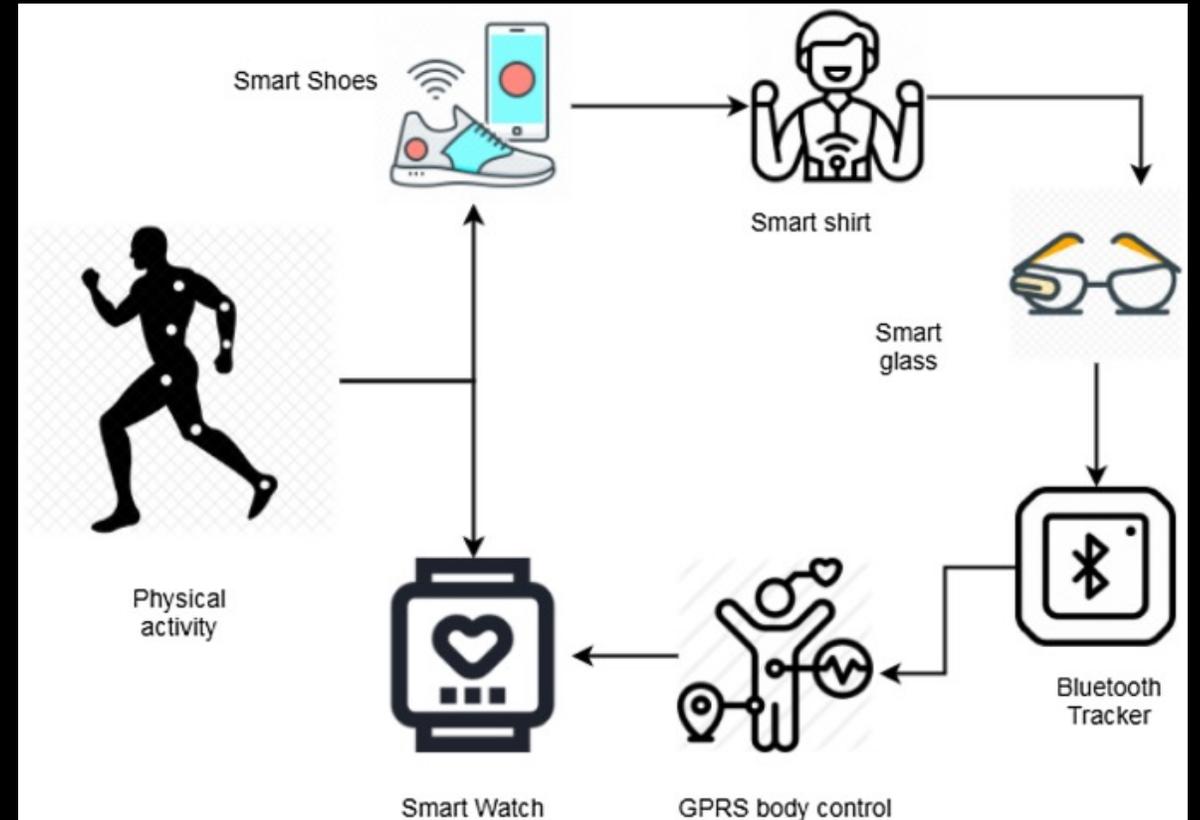
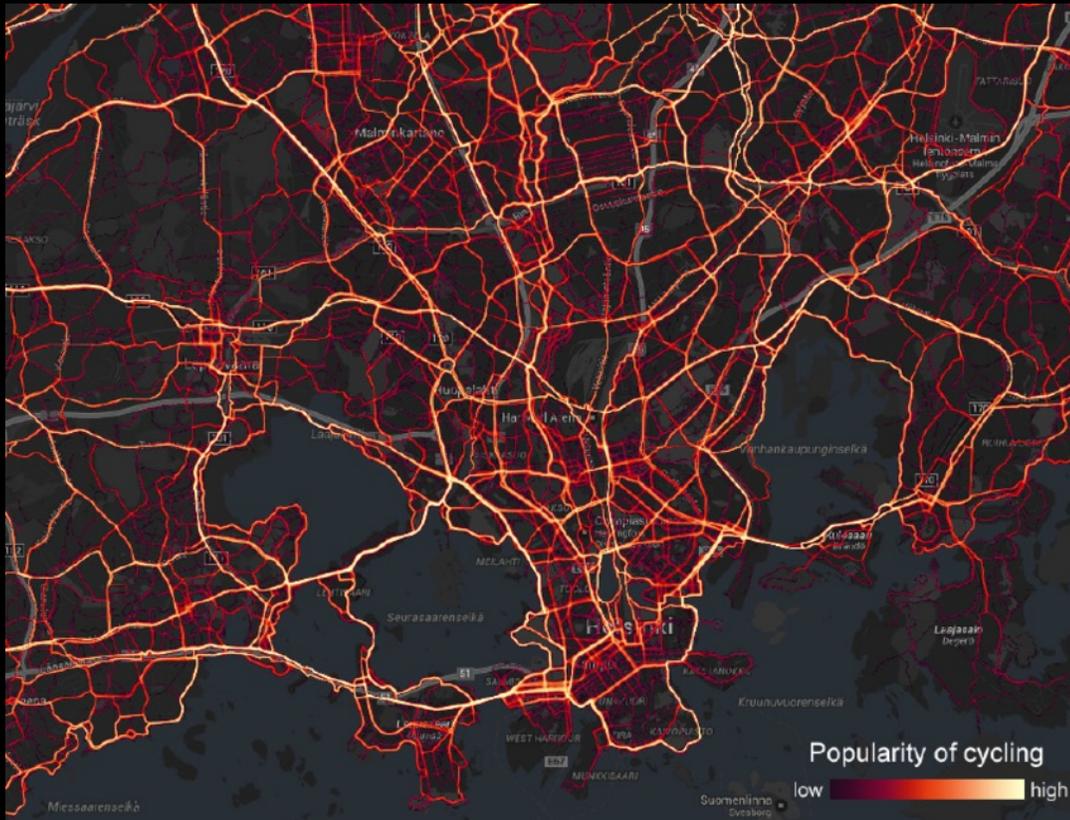


Some lessons from my academic work

1. We can learn a lot about the people who really care about bicycling
2. We can learn a lot about where, when, and how they currently ride
3. This leads to some biased conclusions about barriers to riding, and where to invest in infrastructure



Confirmation bias and Sampling bias



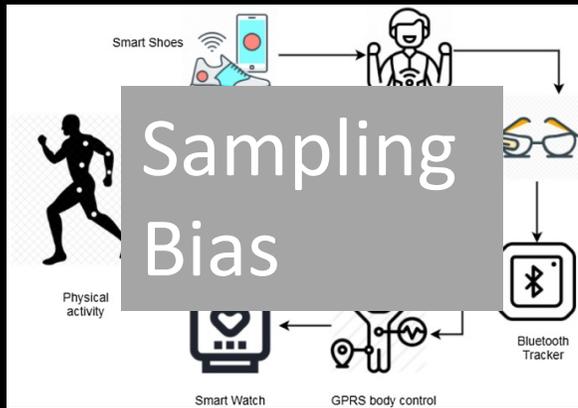


Confirmation Bias

Measuring facility volume at specific place and time

- Weather-dependent
- Purpose-dependent
- Safety? Demand? (i.e., the best option or the only option?)





A vast amount of information about an individual

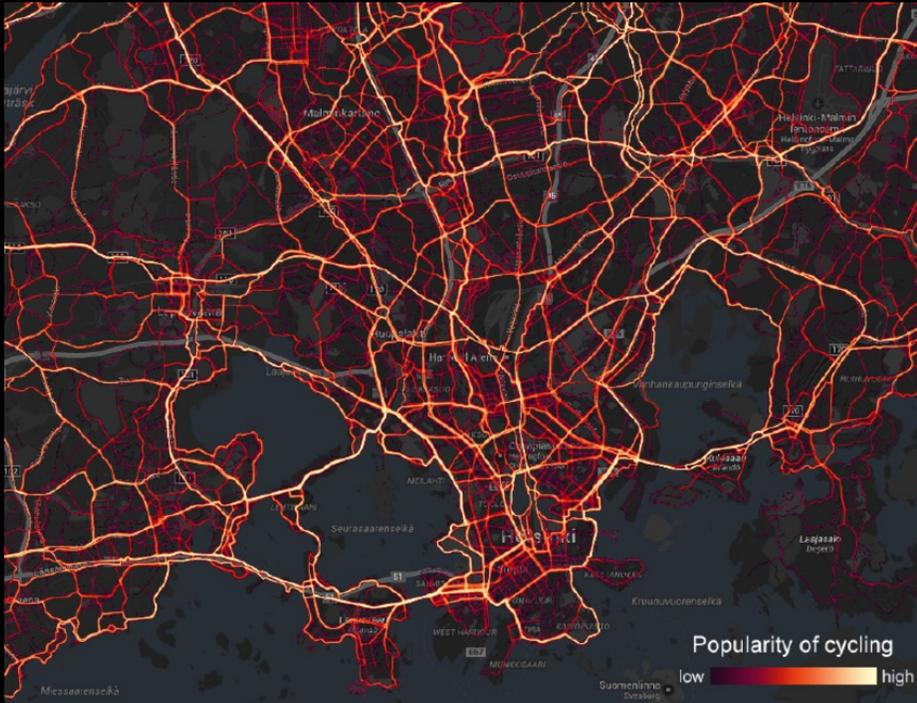
- Representativeness?
- Purpose and reasons for riding?
- Preferences and desires to increase their bicycling?



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Future recommendations



Where, when, why: Moving beyond bicycle data

- Identify the counterfactual (spatially)
- Scenario planning

Who and Why: Going Analog!

- Barriers to bicycling
- Myriad additional benefits for all

Some conclusions

1. Data is neither good nor bad, but it can easily be used incorrectly
2. The future of “big data” is about the counterfactual
3. The future of promoting bicycling is about *real* community engagement



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