Bike Sharing as Active Transportation

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Active Living Research Conference

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FEHR PEERS

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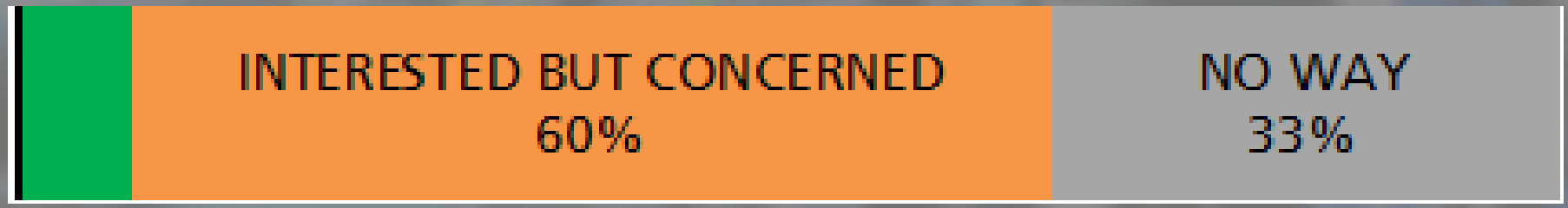
What We Do

What We Do



Strong & Fearless <1%

Enthused & Confident 7%

Bike Sharing

"**individuals use bicycles** on an **as-needed** basis without the **costs** and **responsibilities** of bike **ownership**…"

Four Generations

User Experience

- 3-speed
- Quick-adjust
- Heavy (durable)

Where is Bike Sharing?

Denver B-cycle – Denver, CO

Nice Ride – Minneapolis / St. Paul, MN

- Boston
- Boulder
- Madison
- Miami
- Spartanburg, SC

Capital Bikeshare – Washington D.C.

BIXI – Montreal, Quebec

- New York
- Chicago
- Los Angeles

- Monterey?
- Santa Monica?
- San Diego?

Bike Sharing Benefits

- Increased mobility
- Cost savings
- Lower implementation costs
- Reduced traffic congestion
- Reduced fuel use
- Increased use of transit
- Greater environmental awareness
- Increased physical activity and health benefits

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Ridership Forecasting

- Feasibility or Implementation Study
  - Station size/location and system scope
  - Supports financial analysis
- System Expansion
  - Locate stations to serve most riders

Three U.S. Systems

Denver B-cycle – Denver, CO

Nice Ride – Minneapolis / St. Paul, MN

Capital Bikeshare – Washington D.C.

Ridership Forecasting Model

capital bikeshare

DENVER B cycle

NICE RIDE

Regression Model
Density
+ Demographics
+ Network Effects

→ Ridership

?

Demographic Variables

- Significant relationships:
  - Population
  - Retail Jobs
  - Alternative Commuters
  - Graduate Degree
  - Median Income
  - Non-White Population (negative)

A Caveat on Income and Race

- Income and Race variables included to explore empirical relationship with ridership
- Low-income or majority non-white areas should not be excluded
- May require additional outreach or programs targeted to specific needs

Bikesharing and Network Effects

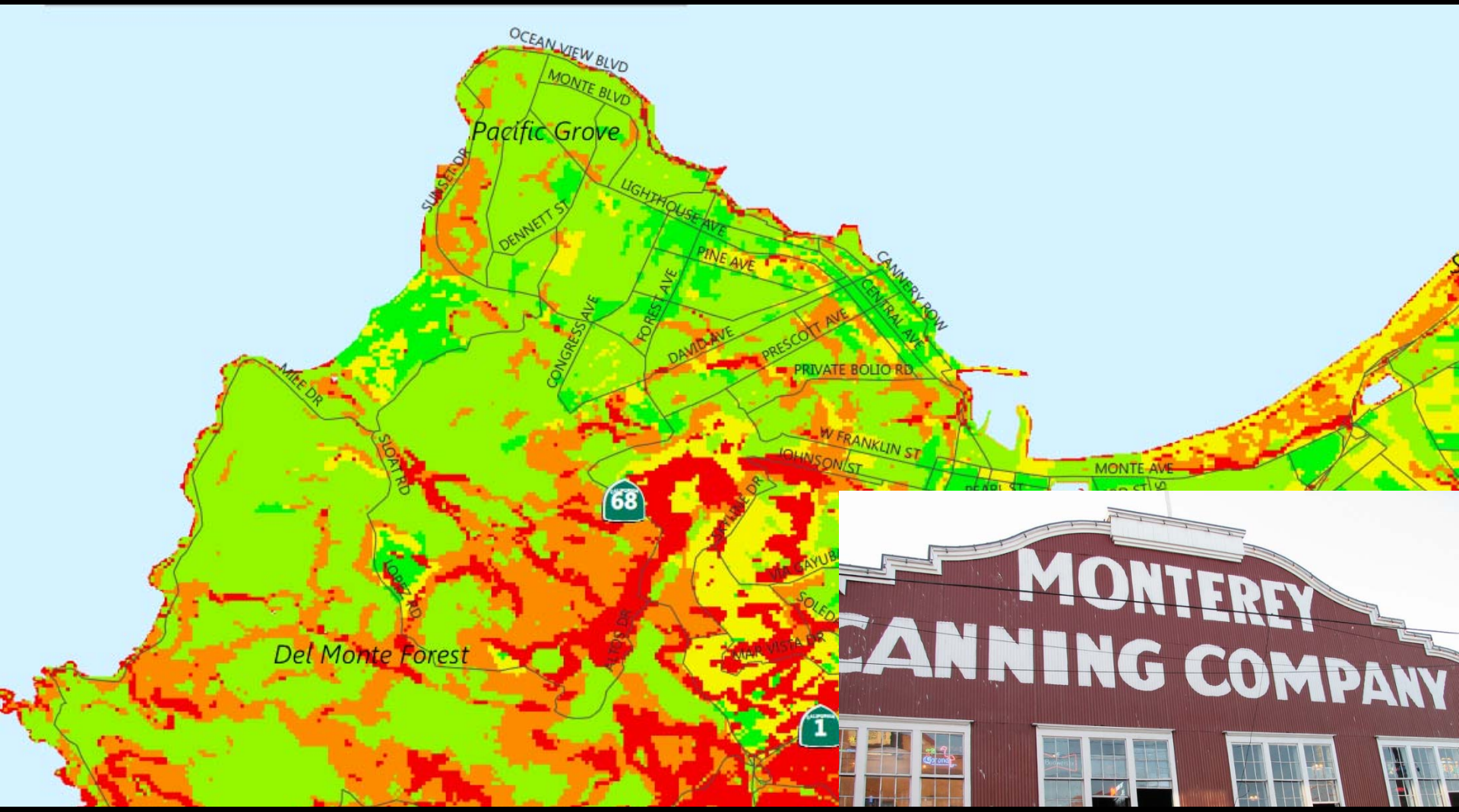
- Pick up and drop off at any station
- Approaching point-to-point travel
- System becomes more useful as more stations are added

Ridership Forecasting Model

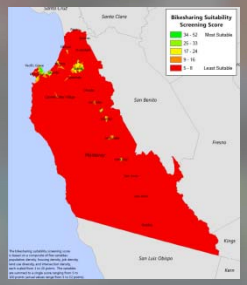
- Highest ridership in areas with high
  - Connectivity to other bikesharing stations*
  - Population and retail job density
  - Median income levels
  - Share of alternative commuters
- Race and income results should be interpreted with care
- Bike infrastructure warrants further research
- Caveat: results based on early-adopting users

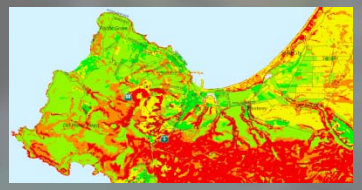
Applications: Santa Monica

Applications: Monterey



Demand Estimation



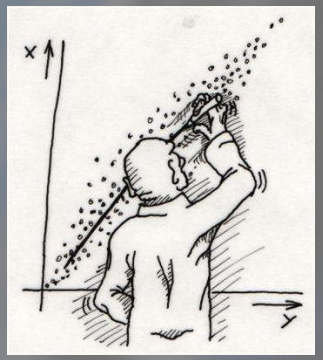


Countywide demand screening

Ridership suitability analysis

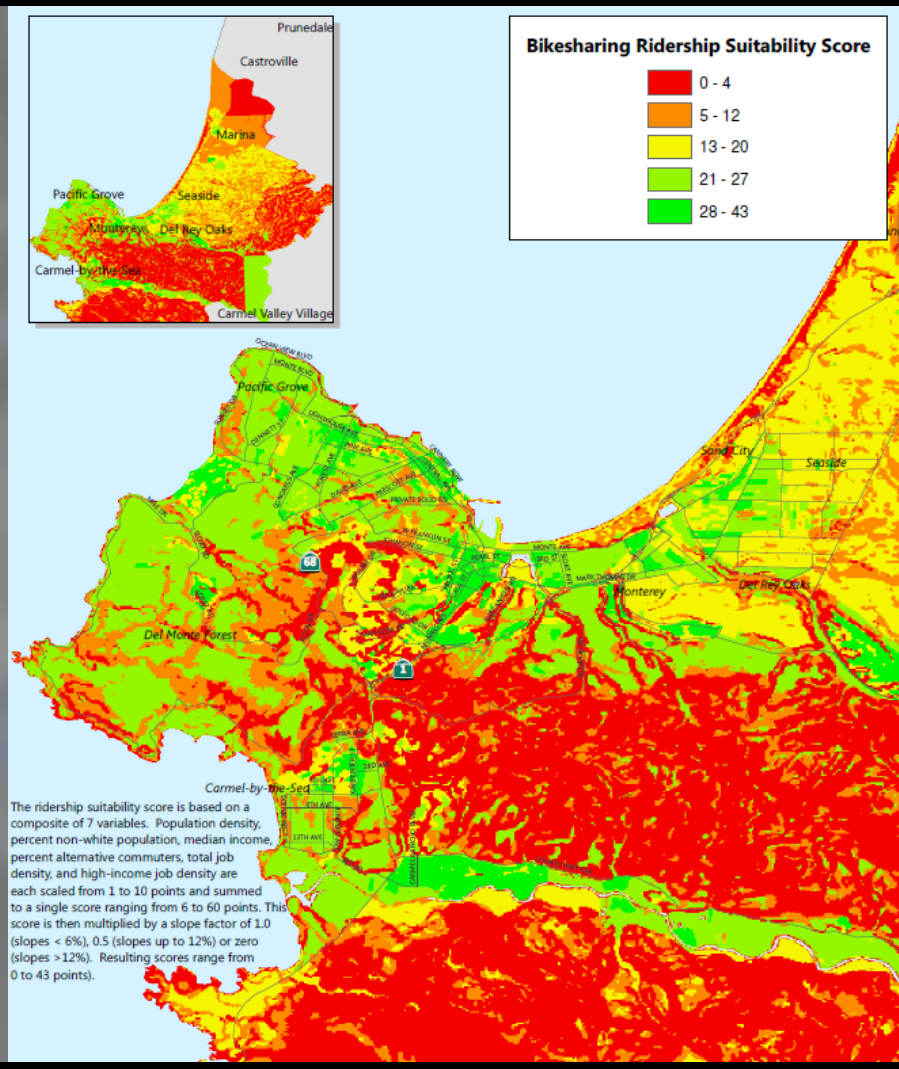
Site selection

Demand modeling



Ridership Suitability Analysis

- Goal: maximize ridership
  - Demographic factors
  - Job and population densities
  - Slope



Site Selection

Locate stations:

- In a contiguous **network**
- Near **bike facilities**
- Along flat or gently rolling **terrain**
- Near **institutions**
- Near **dense** commercial and residential areas
- Near **attractions**
- To connect with **transit**

Monthly Ridership Scenarios

	Base Scenario	Low Scenario	High Scenario
Total	3,027	1,568	5,842
Station Average	126	65	243
Station Minimum	96	50	185
Station Maximum	280	185	540

Questions?

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