Data tools for Walking, Biking and Safe Routes to School Decision Making

Safe Routes to School National Partnership

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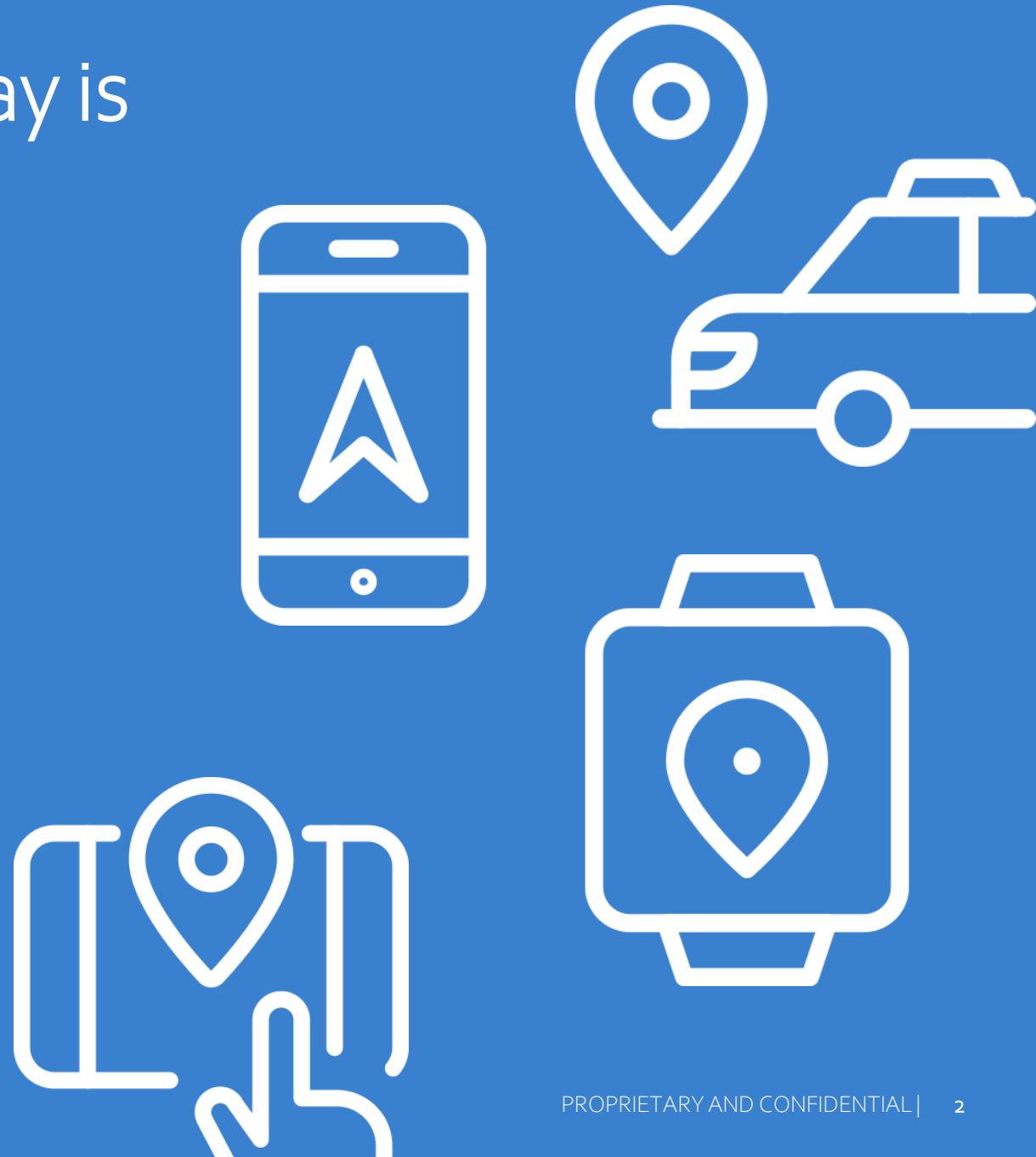
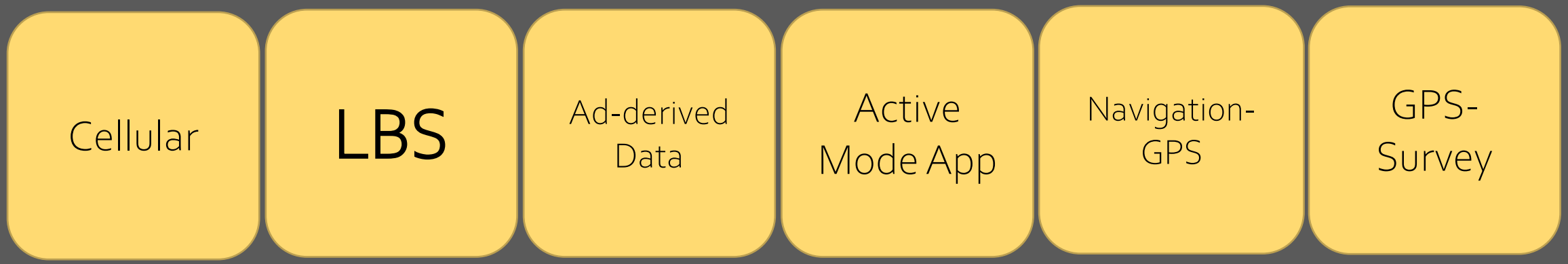
Transportation Behavior Today is Changing Rapidly

To keep up with fast-changing travel behavior, we need data that:

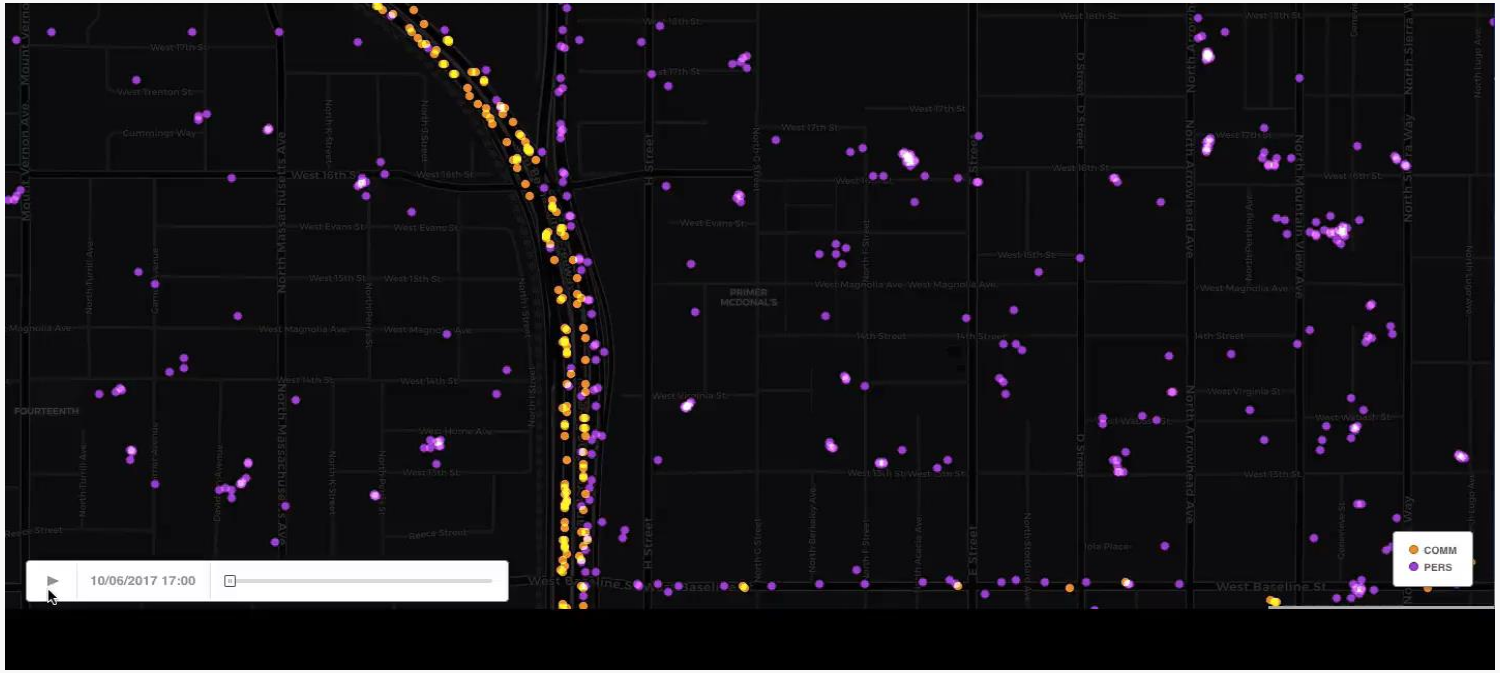
1. Describes Current Behavior
2. Measures Change Over Time
3. Is Diagnostic & Predictive



Big Data Can Help us Understand Travel Behavior more quickly and comprehensively



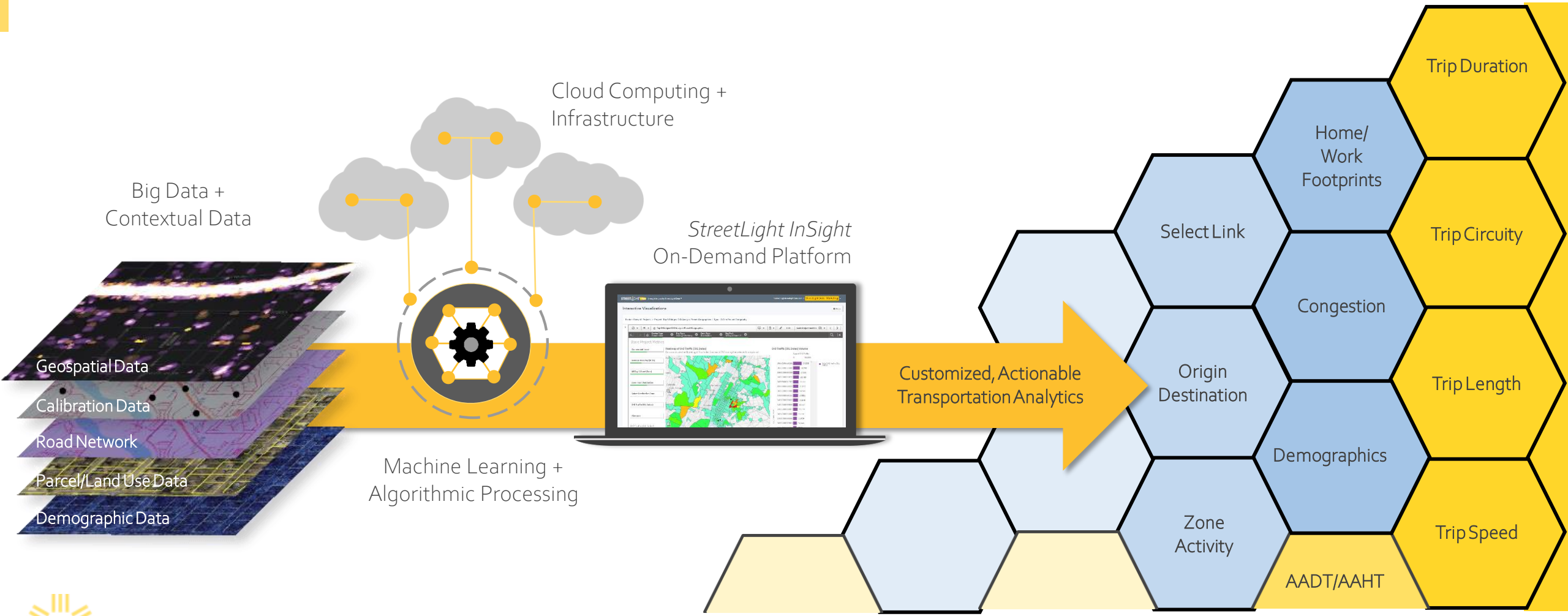
What Big Data are we working with?



Mobile device data from ~23% of US and Canadian adults and ~12% of commercial truck trips.

Video shows a subset from Oct 8th, 2017 in San Bernardino, California.

StreetLight InSight turns Big Data into actionable transportation analytics on demand



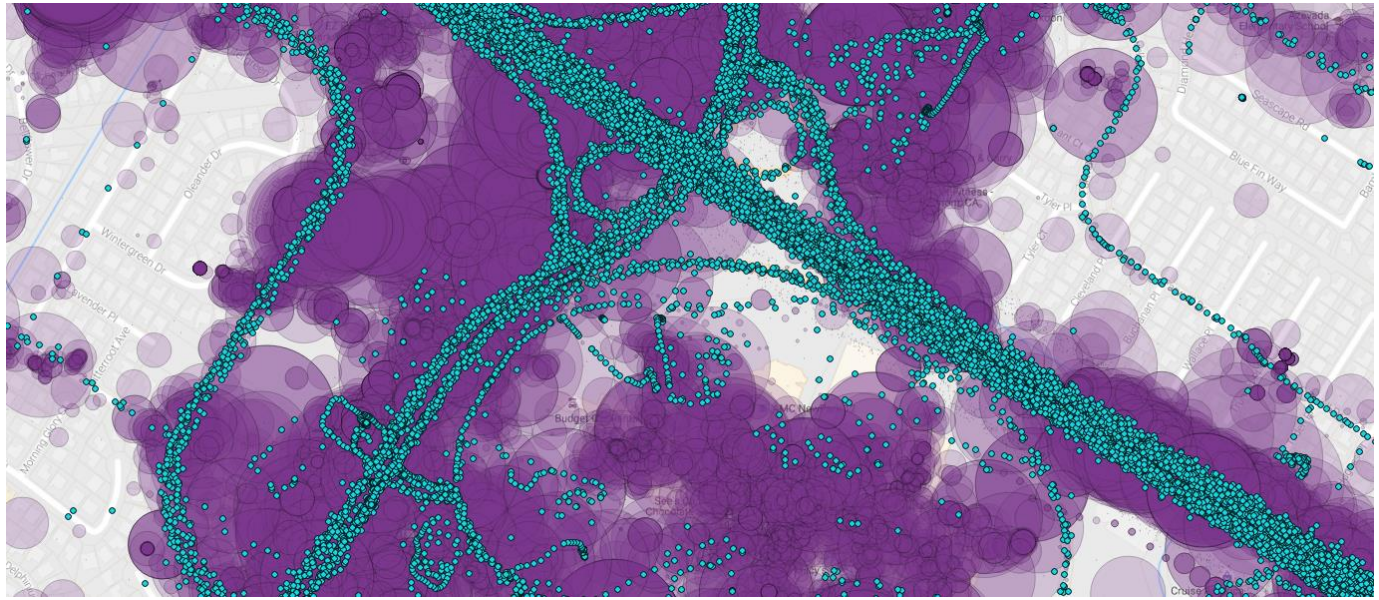
Our Goal:

Be as accurate as a temporary count or survey –
but available everywhere, affordably, in a few minutes, with frequent updates

Location data from mobile devices can show when, where, and how people move

Key Behaviors:

1. Accurate
2. Precise
3. Comprehensive
4. Anonymous



Note: This image shows a filtered subset of data to improve visibility. The data is from Sept 2016 in Fremont, CA.

Navigation-GPS Location
Circle enlarged for visibility

LBS Data Location
Circle radii vary: they accurately reflect the spatial precision of each unique data point

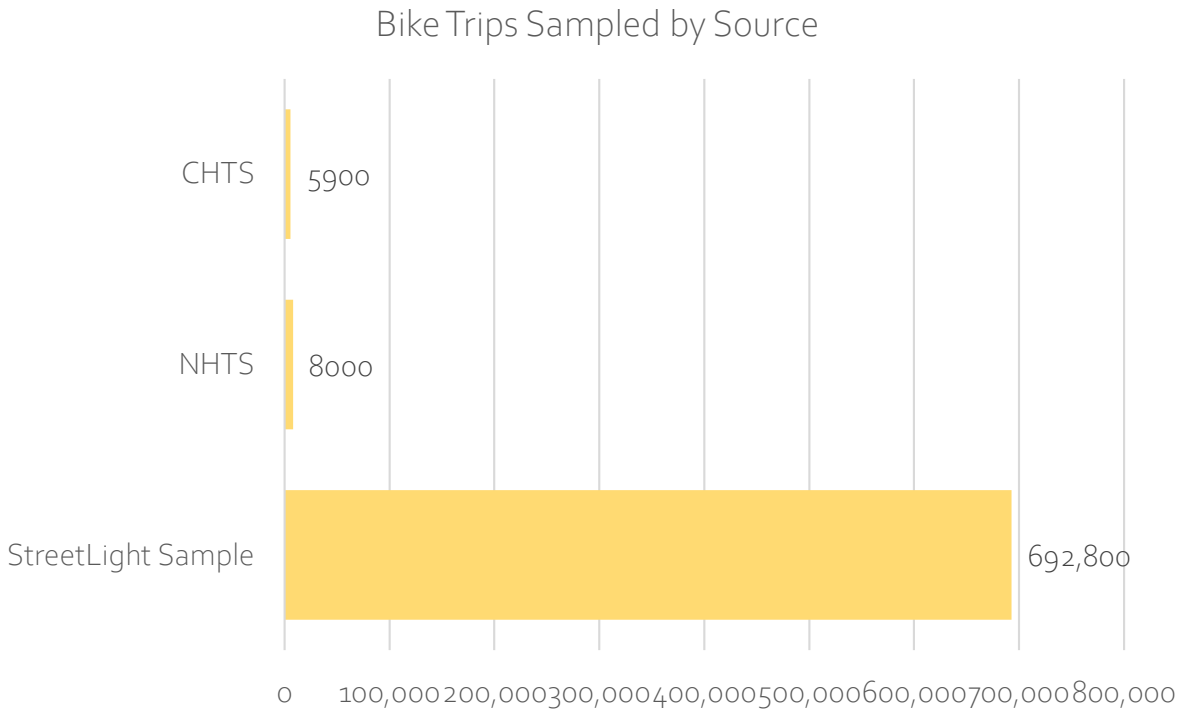
How modes are determined

Training a Random Forest Classifier

Training Data Sources
Caltrans Travel Survey (NREL)
Atlanta Regional Travel Survey (NREL)
Mid-Region Travel Survey – Albuquerque (NREL)
Southern Nevada Household Travel Survey (NREL)
Capital Bikeshare

Validation – Compare to NHTS/CHTS Surveys (Bike Only)

StreetLight's nationwide sample (for May 2017) is 86 times larger than NHTS!



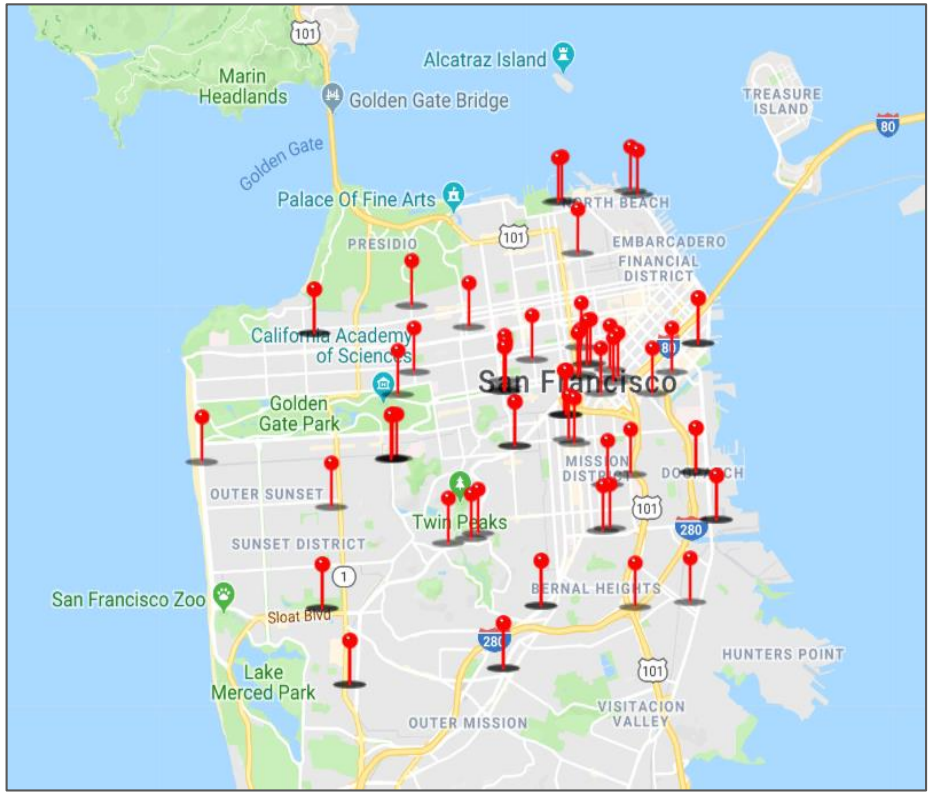
StreetLight's average trip distance are shorter than surveys, especially NHTS

Average Trip Length from Different Sources

Mode	NHTS (miles)	SL – Nat'l (miles)	CHTS (miles)	SL – CA (miles)
Bicycle (all)	2.38	1.51	1.50	1.32
Bicycle (>300m)		1.57		1.37

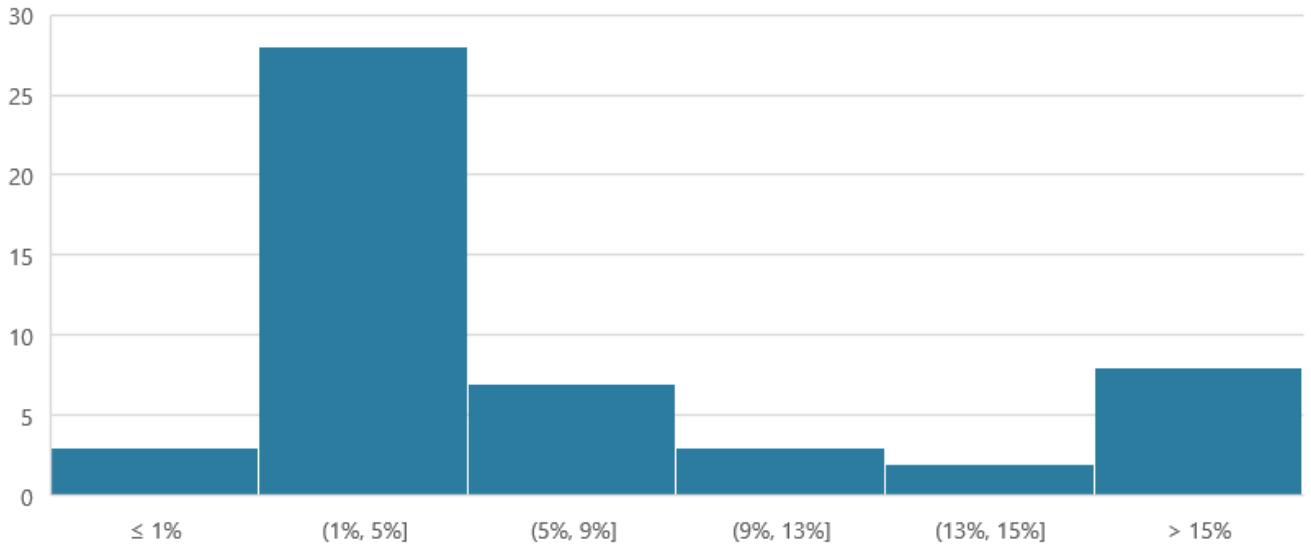
Validation – Compare to Permanent Counters (SFMTA)

Locations of SFMTA Permanent Bike Counters



Sample penetrations highly clustered between 1 and 5% with average 6.4%

Histogram of StreetLight Sample Penetration (All Day Types)



Origin of Bike Trips going to Jack London Square (average weekday-all day period)

280 - <372.67

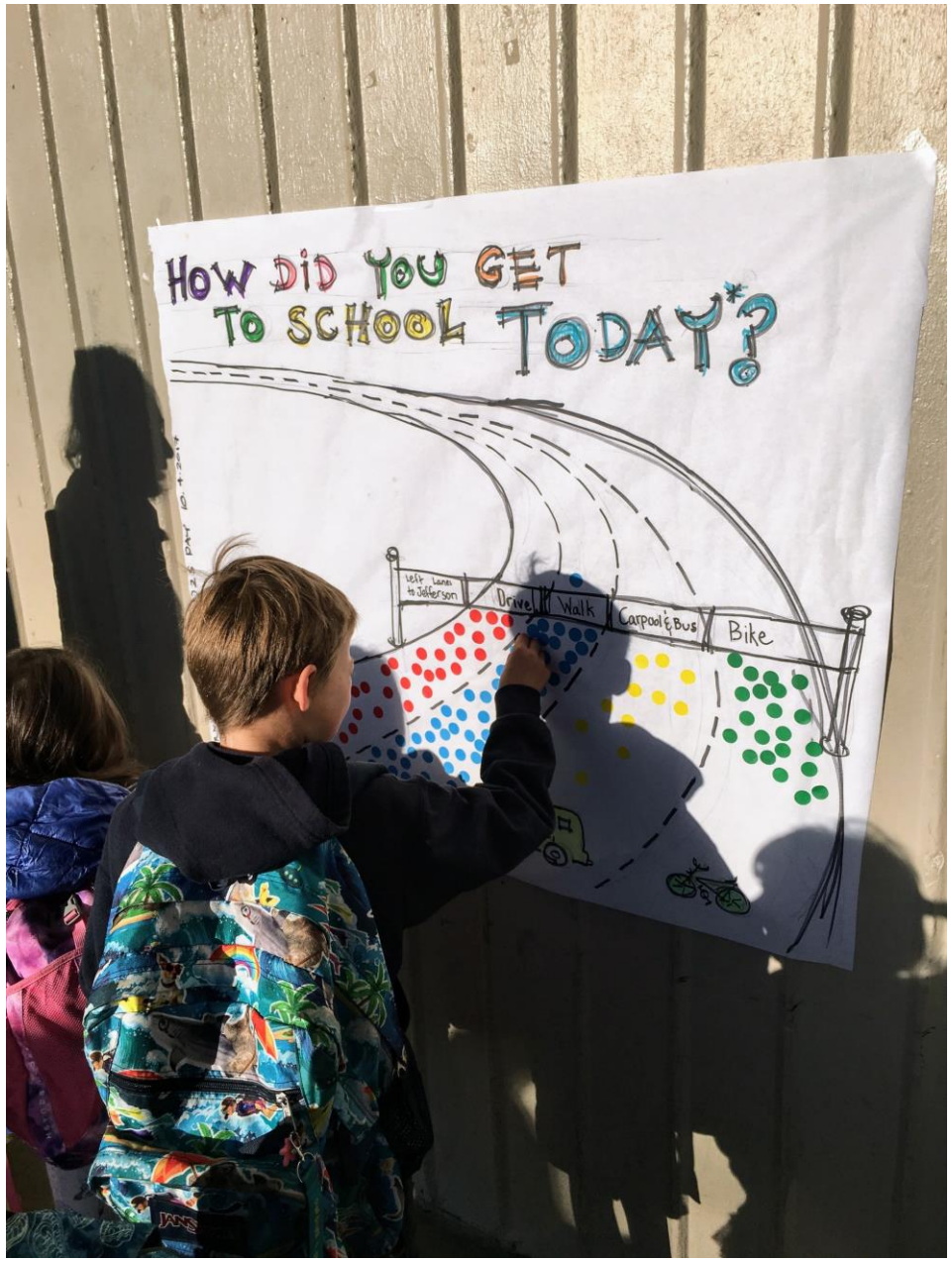
187.33 - <280

94.67 - <187.33

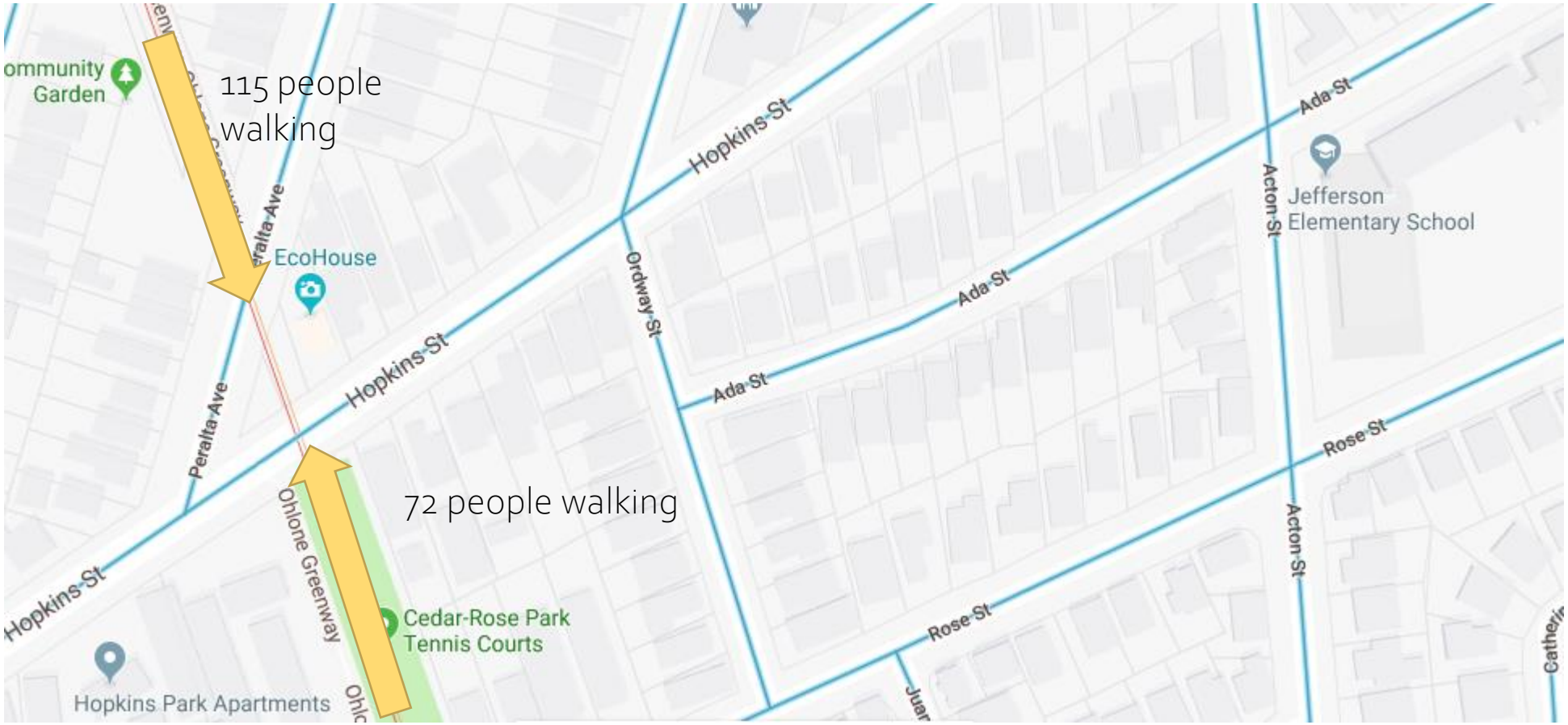
2 - <94.67

Activity near schools

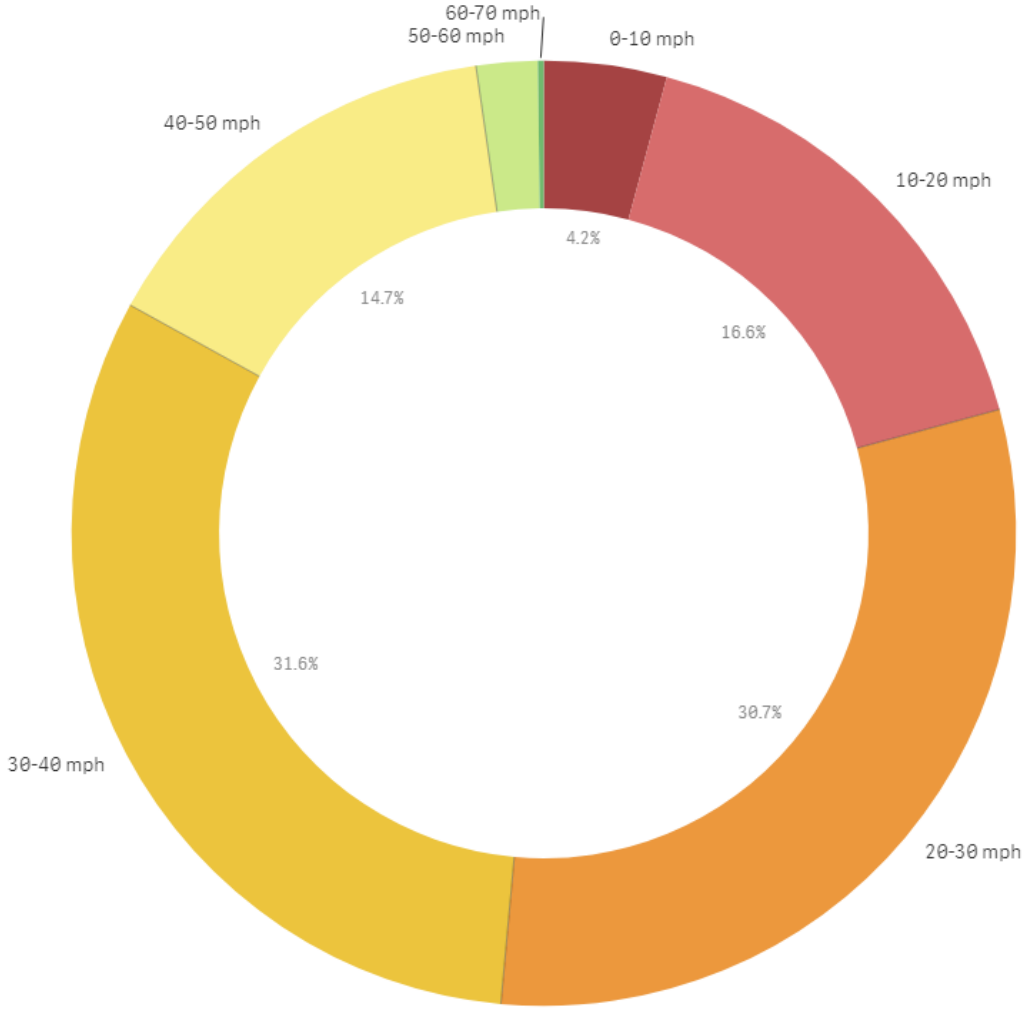
- 23% of the adult population
- Do not have data on children for privacy
- Can’t look at specific school locations



Crossing locations

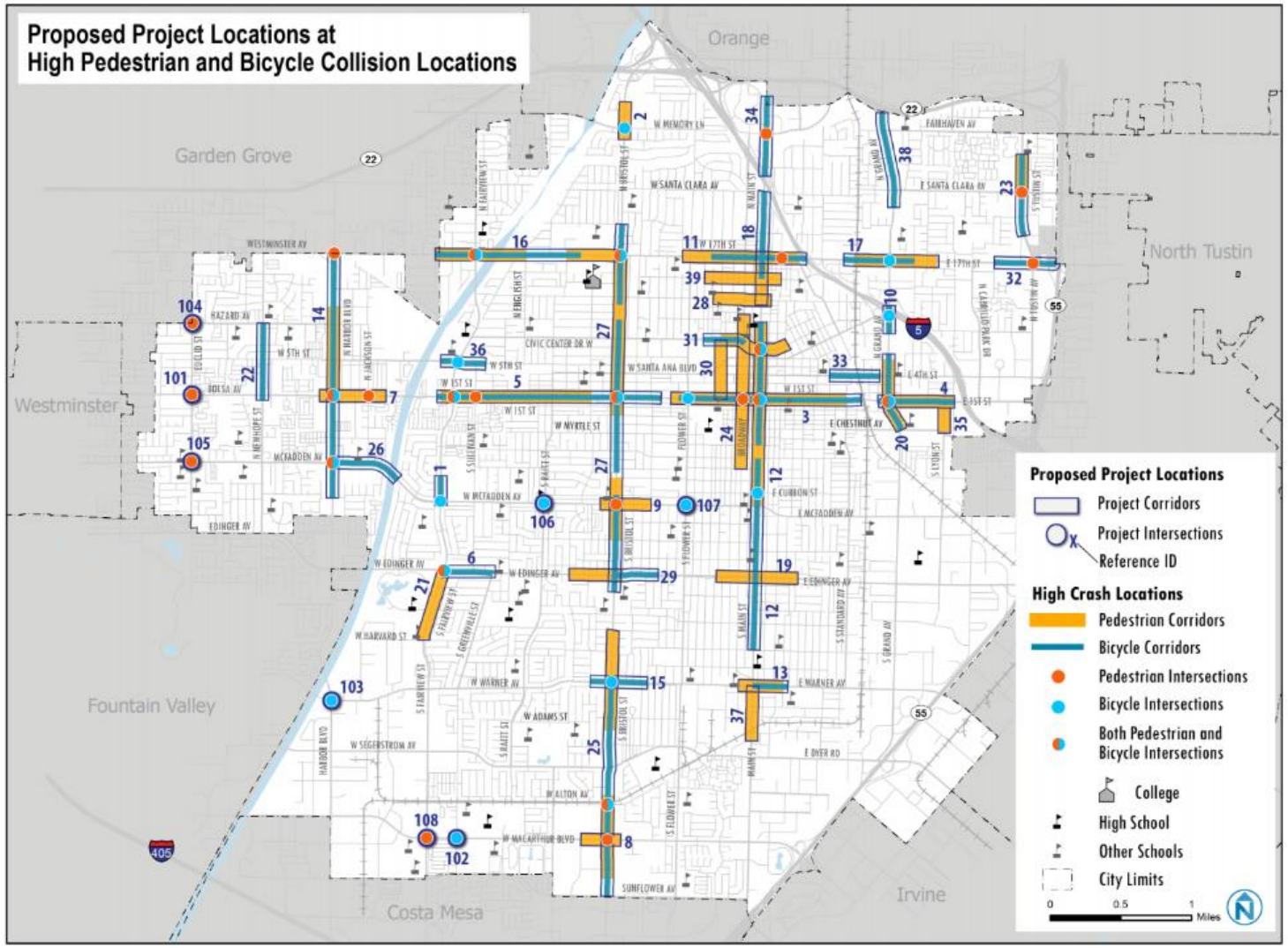


How data can help inform decisions

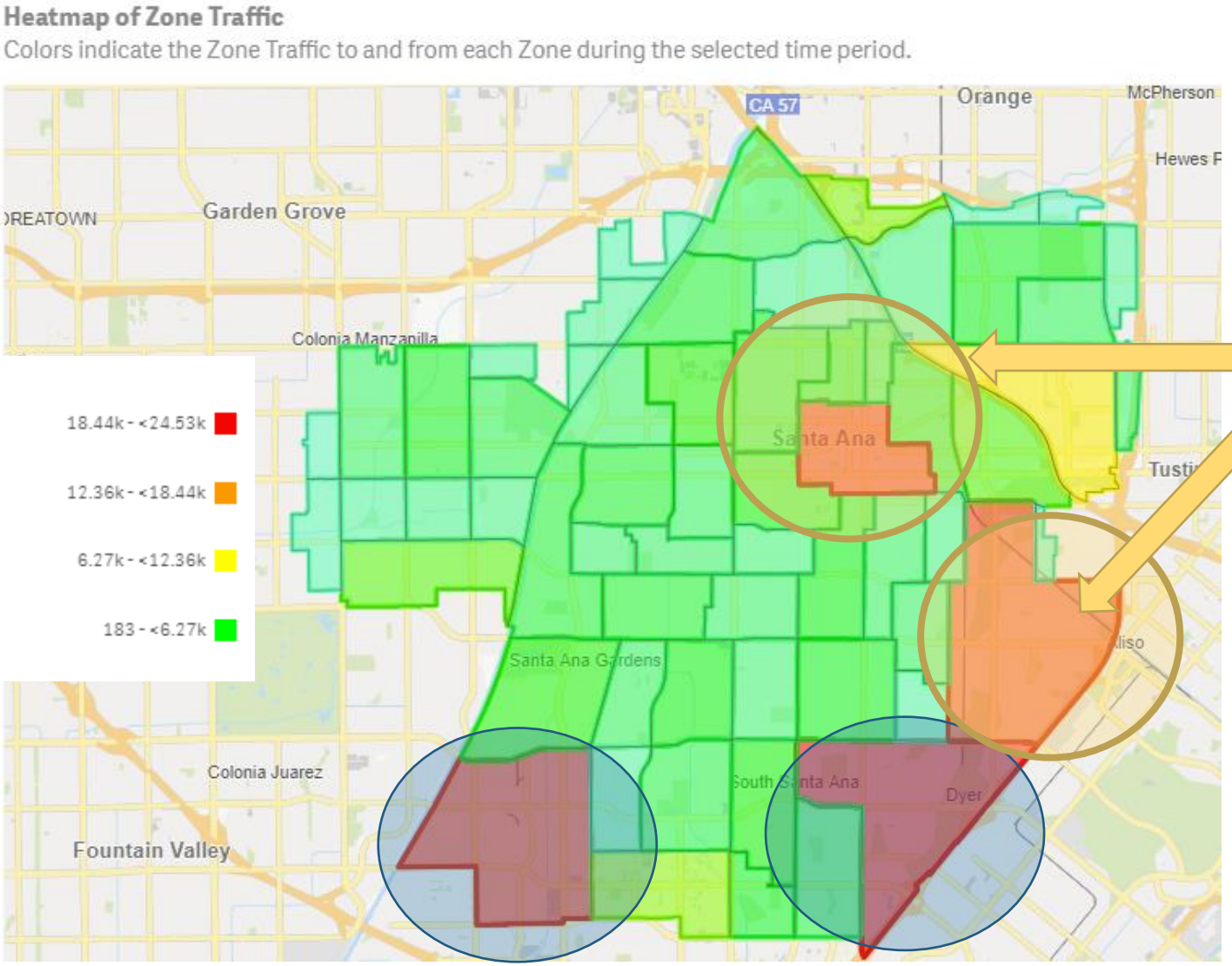


Vista, CA

Collision Data Helps Prioritize Safety Improvements



Density of Pedestrian Trips in the City of Santa Ana



High Pedestrian Activity and Collisions

STREETLIGHT DATA

Big Data for Mobility

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