The Bigger Picture

Using Big Data to Determine Effects and Benefits after Project Implementation

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ITE WESTERN DISTRICT ANNUAL MEETING
MONTEREY 2019 CALIFORNIA
Harbouring the Future of Transportation

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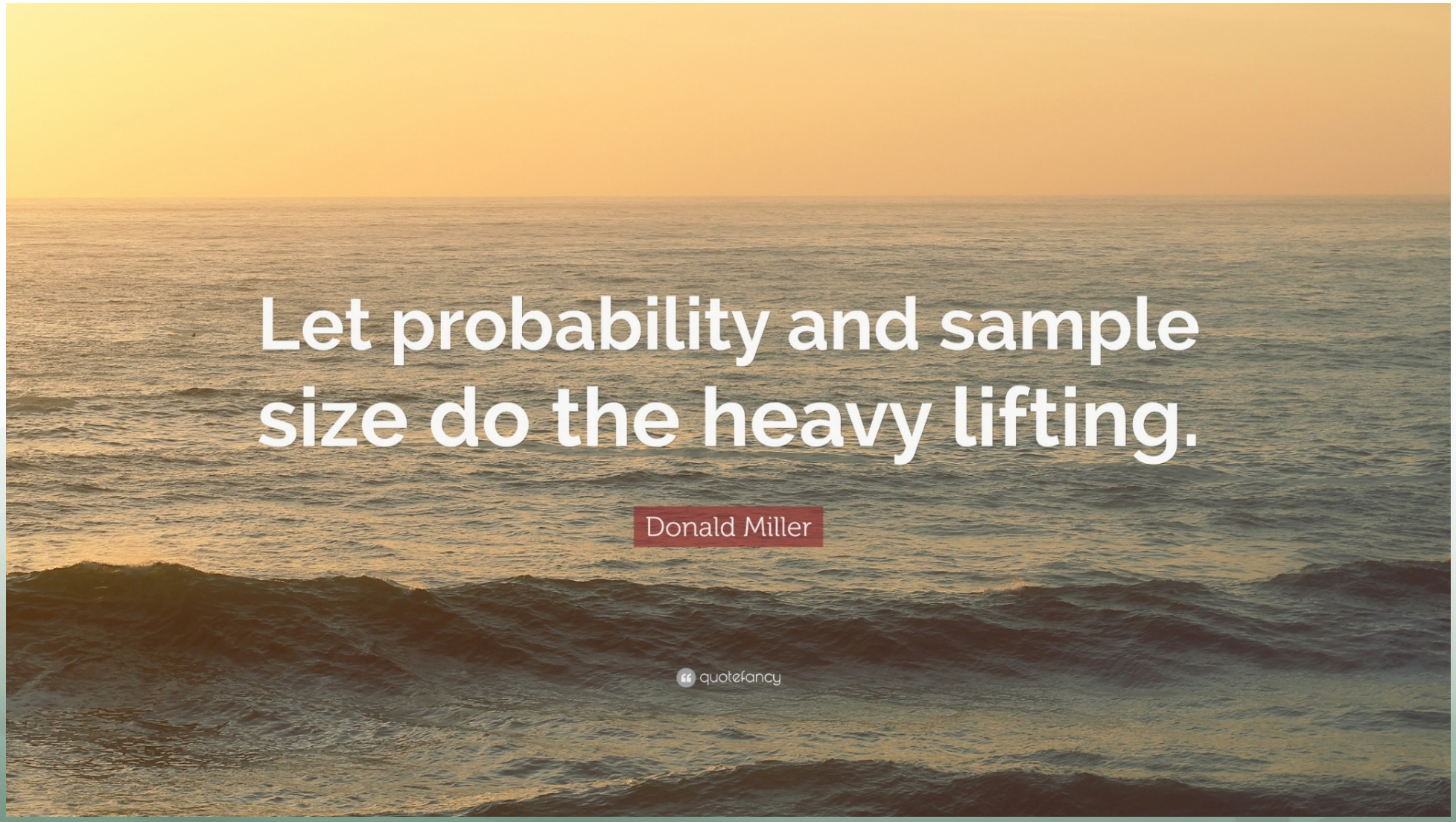
Let probability and sample size do the heavy lifting.
Donald Miller
quotefancy

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Many Ways to Justify Projects

- Multimodal safety
- Multimodal accessibility
- Enhancing comfort
- Community character
- Balancing needs and convenience for all users
- Planned system buildout
- Cost effectiveness

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Responding to the Community

How did the project affect the neighborhood?

What happened on parallel routes?

Will there still be a benefit in the future?

Did we use our resources wisely?

How long will the benefit last?

What should we do next?

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Building a Post-Project Story

- Multimodal collision data
- Observed compliance rates
- Floating car speed data
- Multimodal counts
- Transit ridership
- User surveys of comfort
- Sales tax receipts

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Limitations of Traditional Data

- Sample size
- Effort intensive
- Cost concerns
- Focused on immediate area
- Area-wide effects
- Near-term versus Long-term effects

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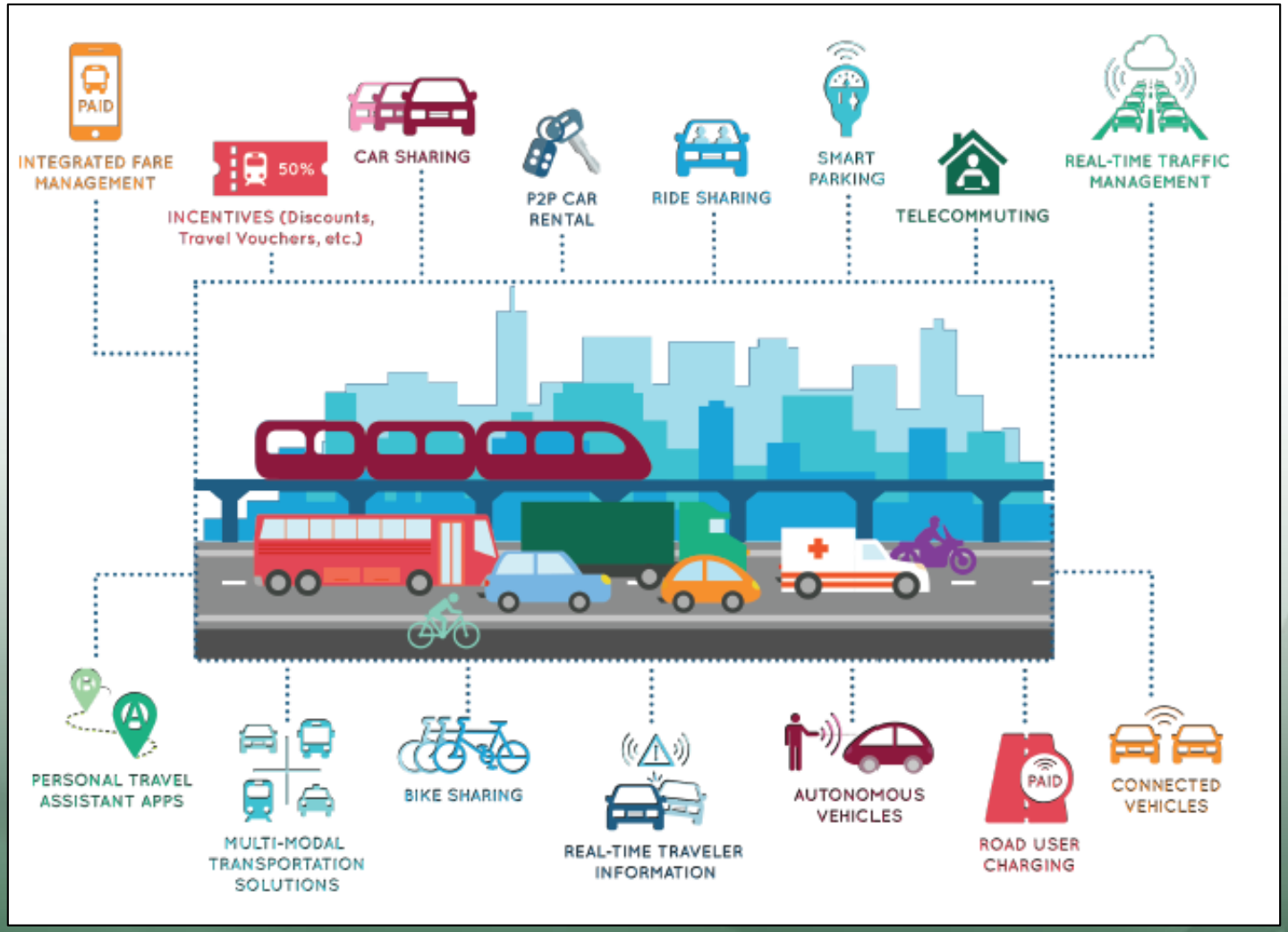
A Transportation Revolution…



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…and a Data Revolution

First
Cellular Data

Then
GPS Data

Now
Wi-Fi Data

airsage

INRIX

CUEBIQ

STREETLIGHTDATA

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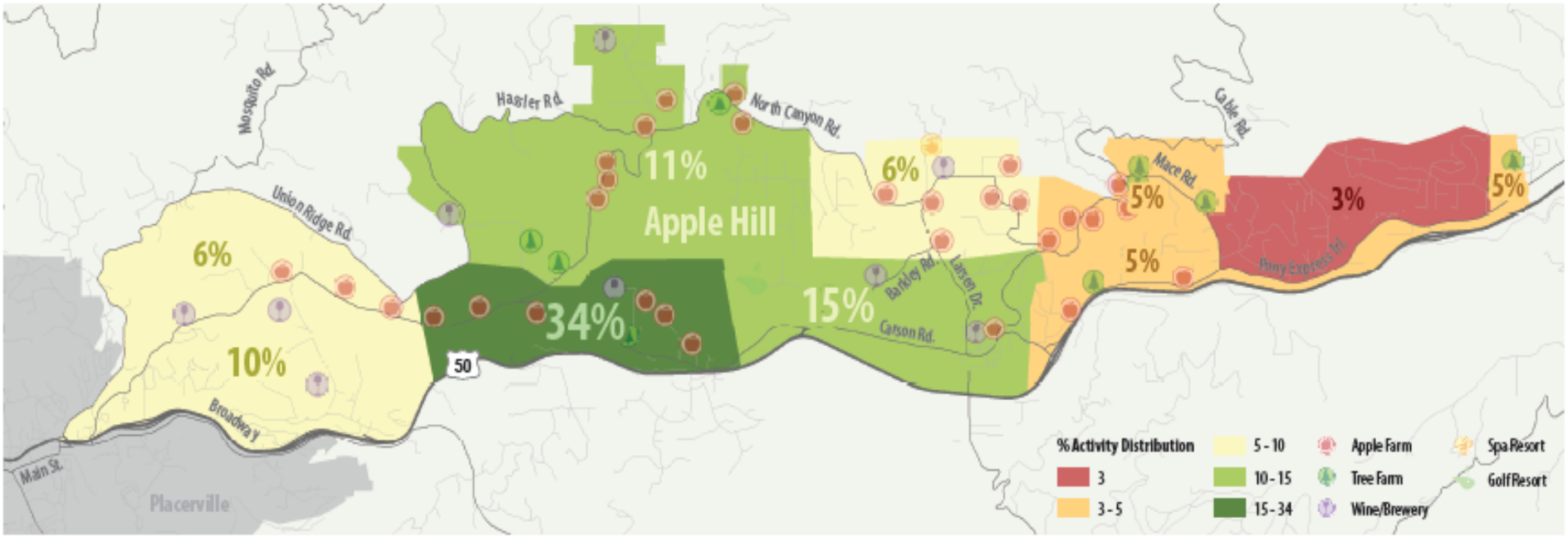
Early Adoption of Big Data

APPLE HILL ORIGIN AND DESTINATION DATA: SEPTEMBER - OCTOBER 2014



"Where do people want to go?"

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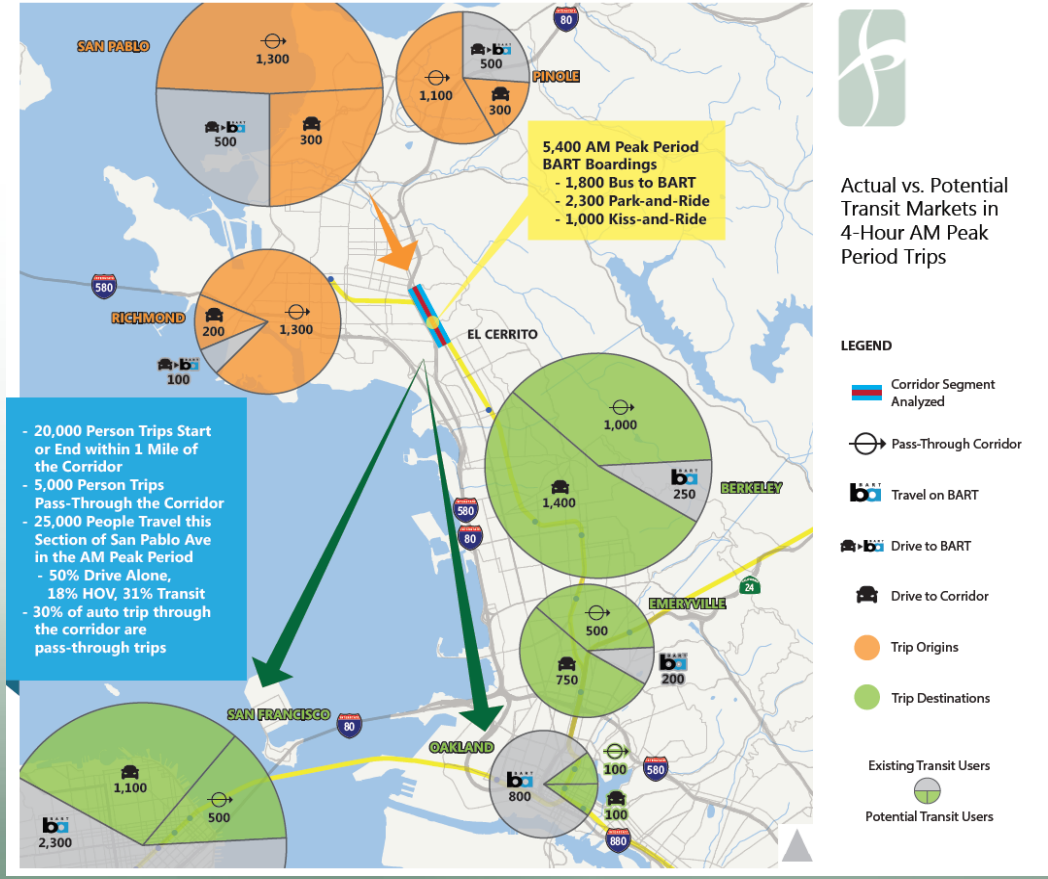
Early Adoption of Big Data



"How can we change traveler behavior?"

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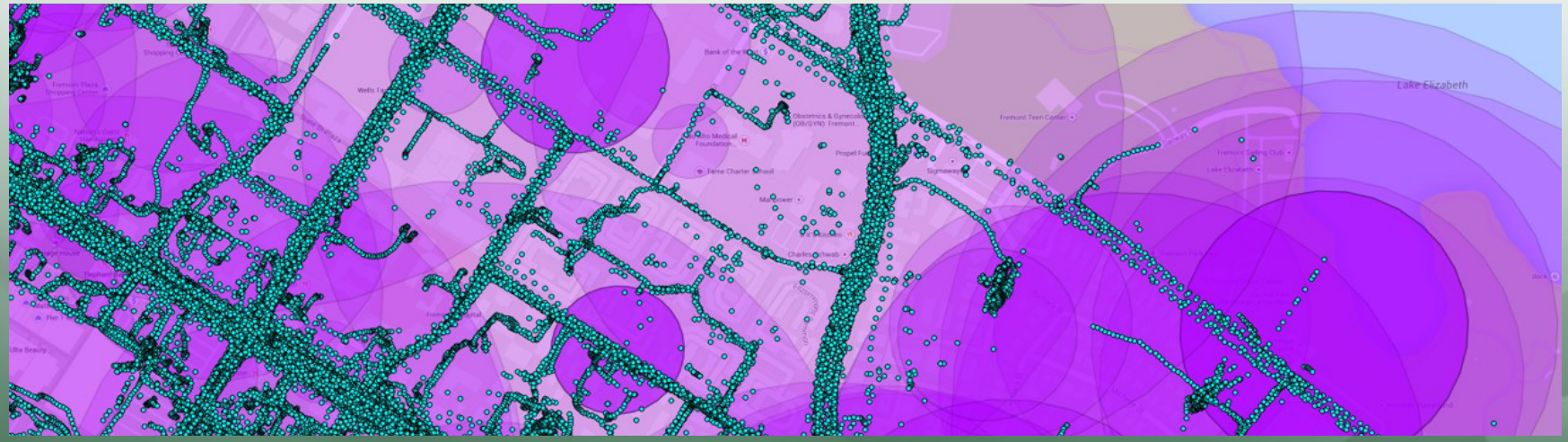
Better Big Data

- Sample sizes increasing
- Longer history of data
- Cost of data generally decreasing
- Customization and flexibility of analysis
- Improving spatial resolution



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Big Data for Complete Streets

Before the Project:

- Determine underserved markets in corridor
- Determine the magnitude of change needed
- Identify and prioritize improvements

After the Project:

- Consistency between data collection methods
- Higher sample size increases confidence
- Identify near-term/long-term benefits
- Identify corresponding improvements

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Case Study 1:
Identifying Future Opportunities

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Case Study 1:
Traveler Choice: Before Project

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Case Study 1:
Traveler Choice: Project Near-Term

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Case Study 1:
Traveler Choice: Project Far-Term

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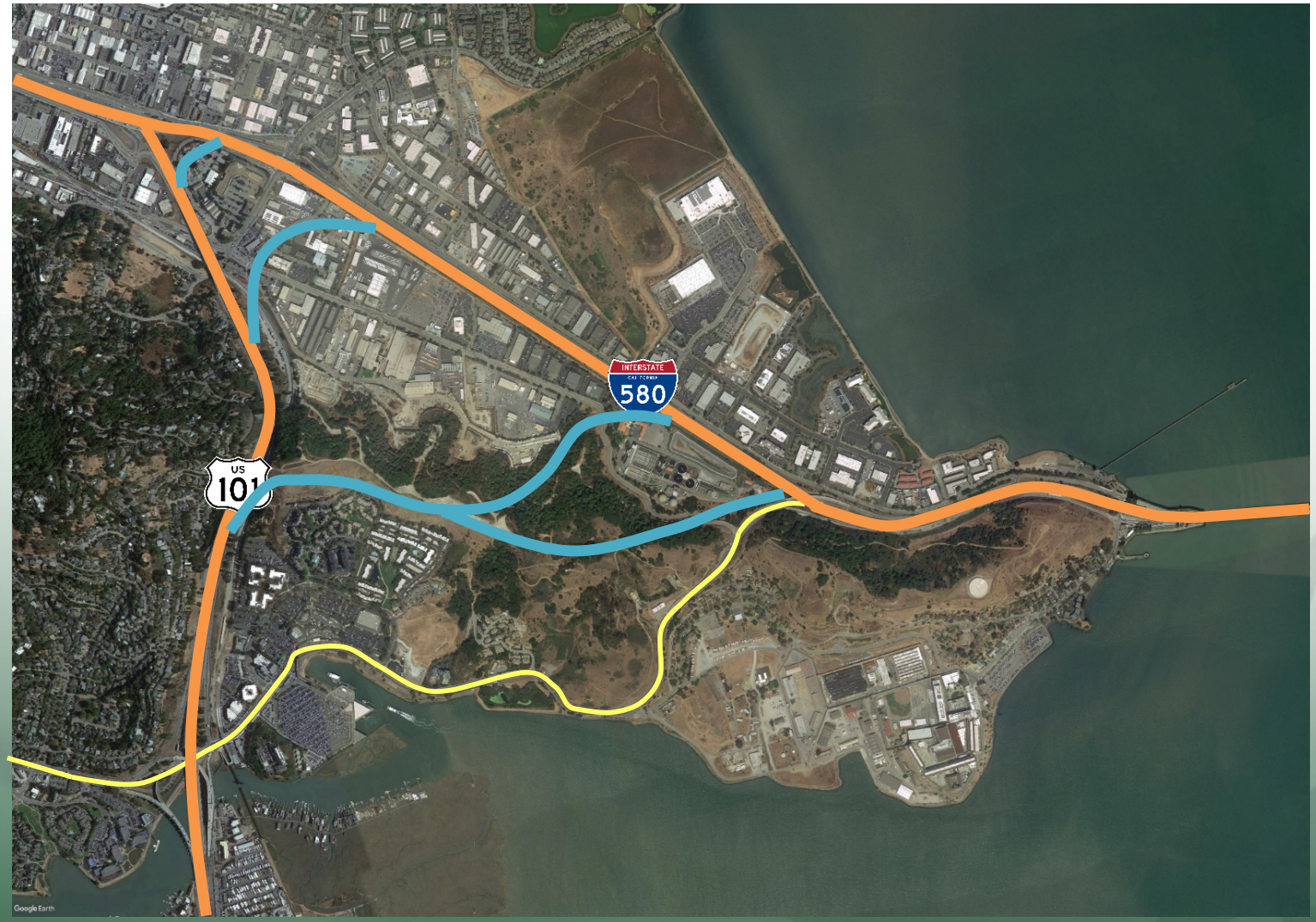
Case Study 1:
Defining the Next Project



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Case Study 1:
Defining the Next Project

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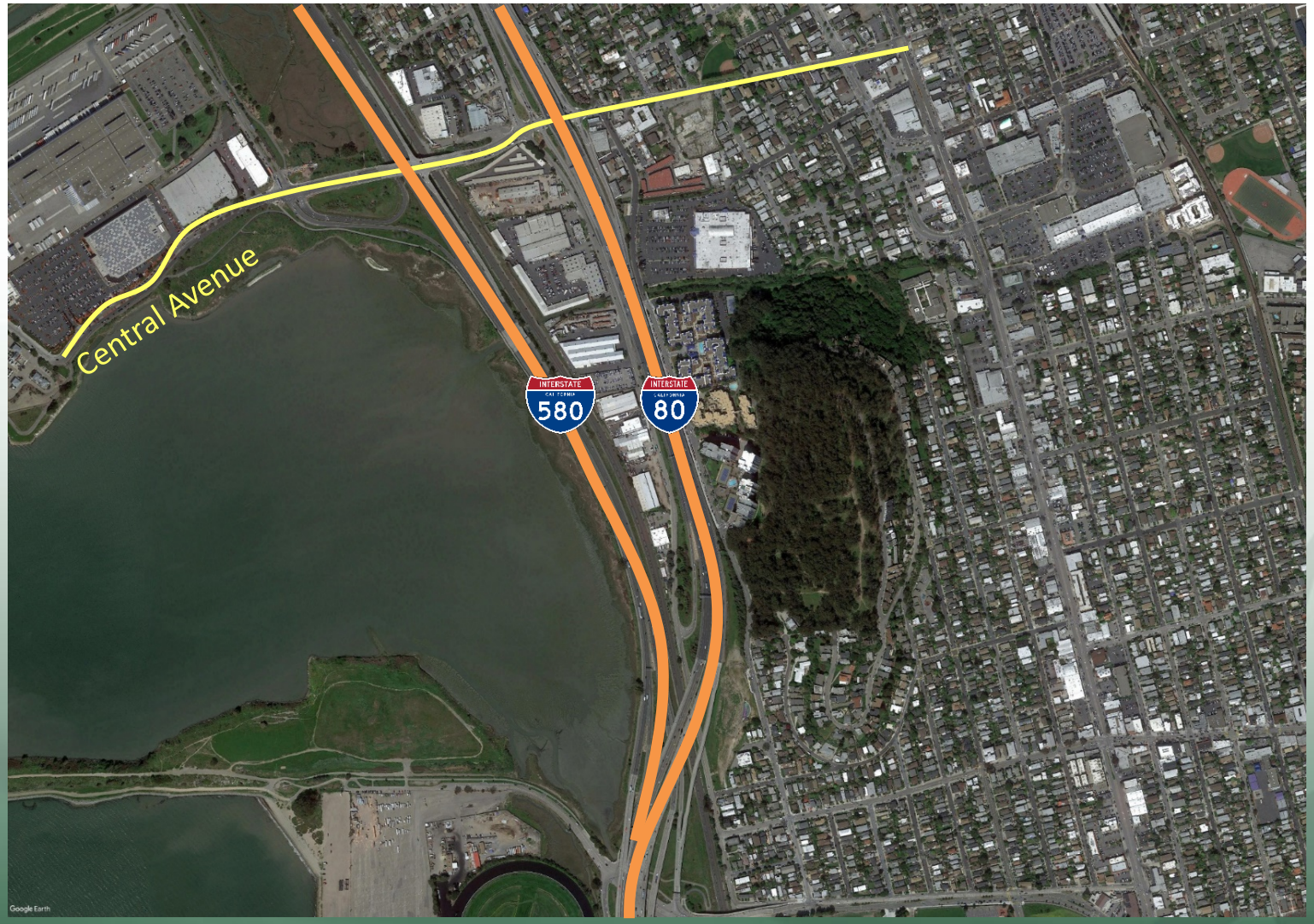
Case Study 2:
Isolating Strategy Effectiveness



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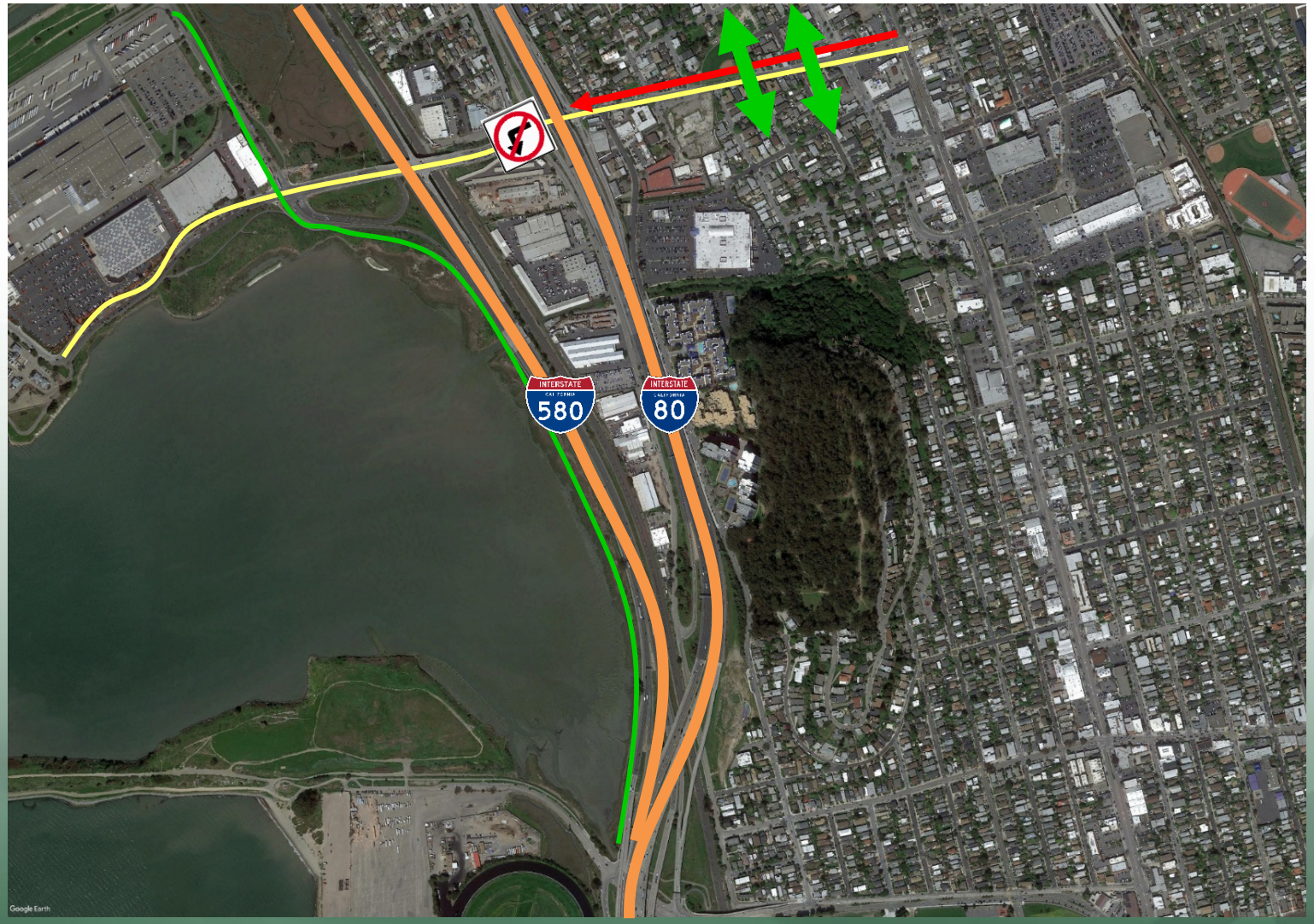
Case Study 2:
Isolating Strategy Effectiveness



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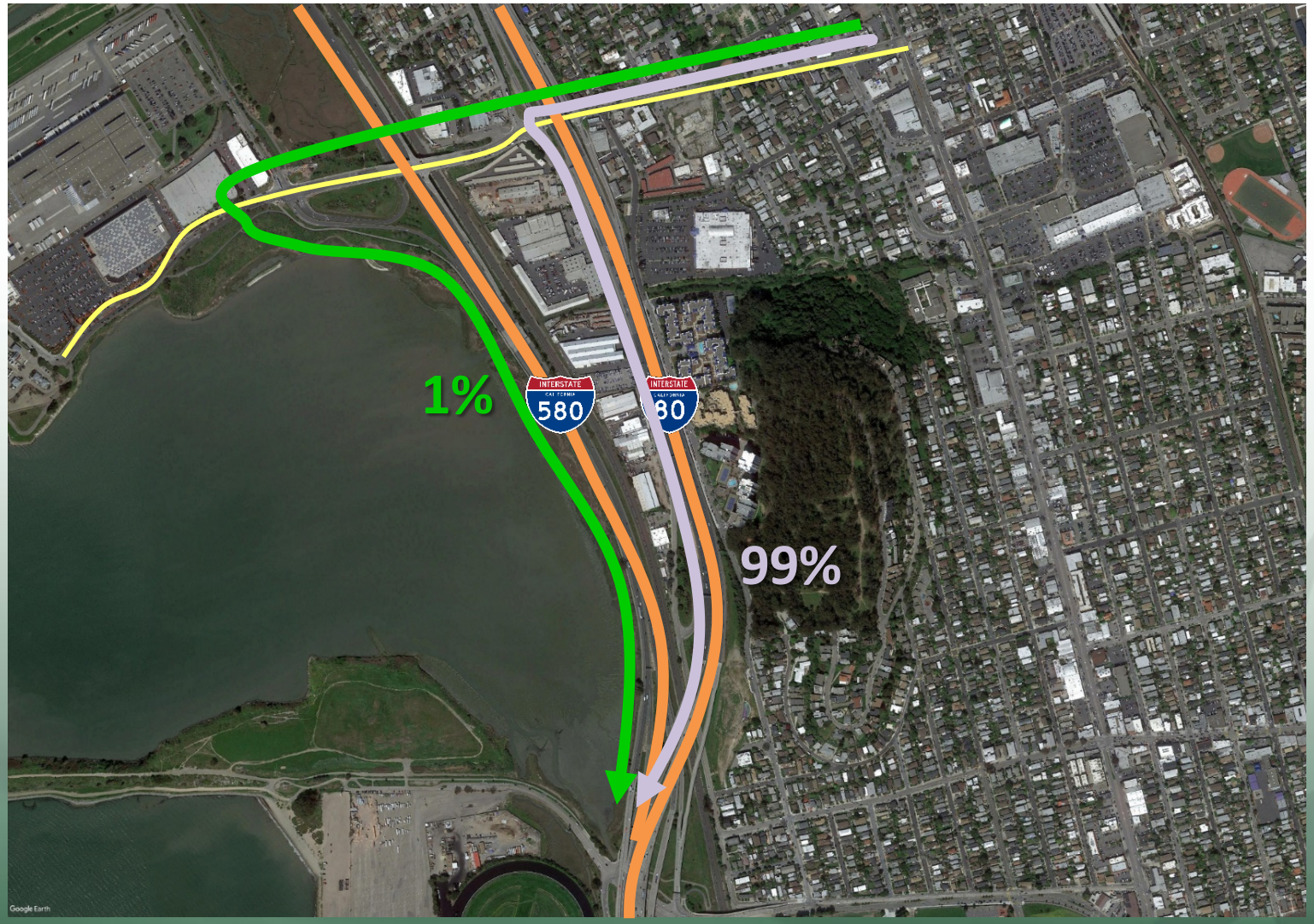
Case Study 2:
Traveler Choice: Before Project



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Case Study 2:
Traveler Choice: Project Near-Term

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Case Study 2:
Traveler Choice: Project Far-Term

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Case Study 3:
Redistributed Trips

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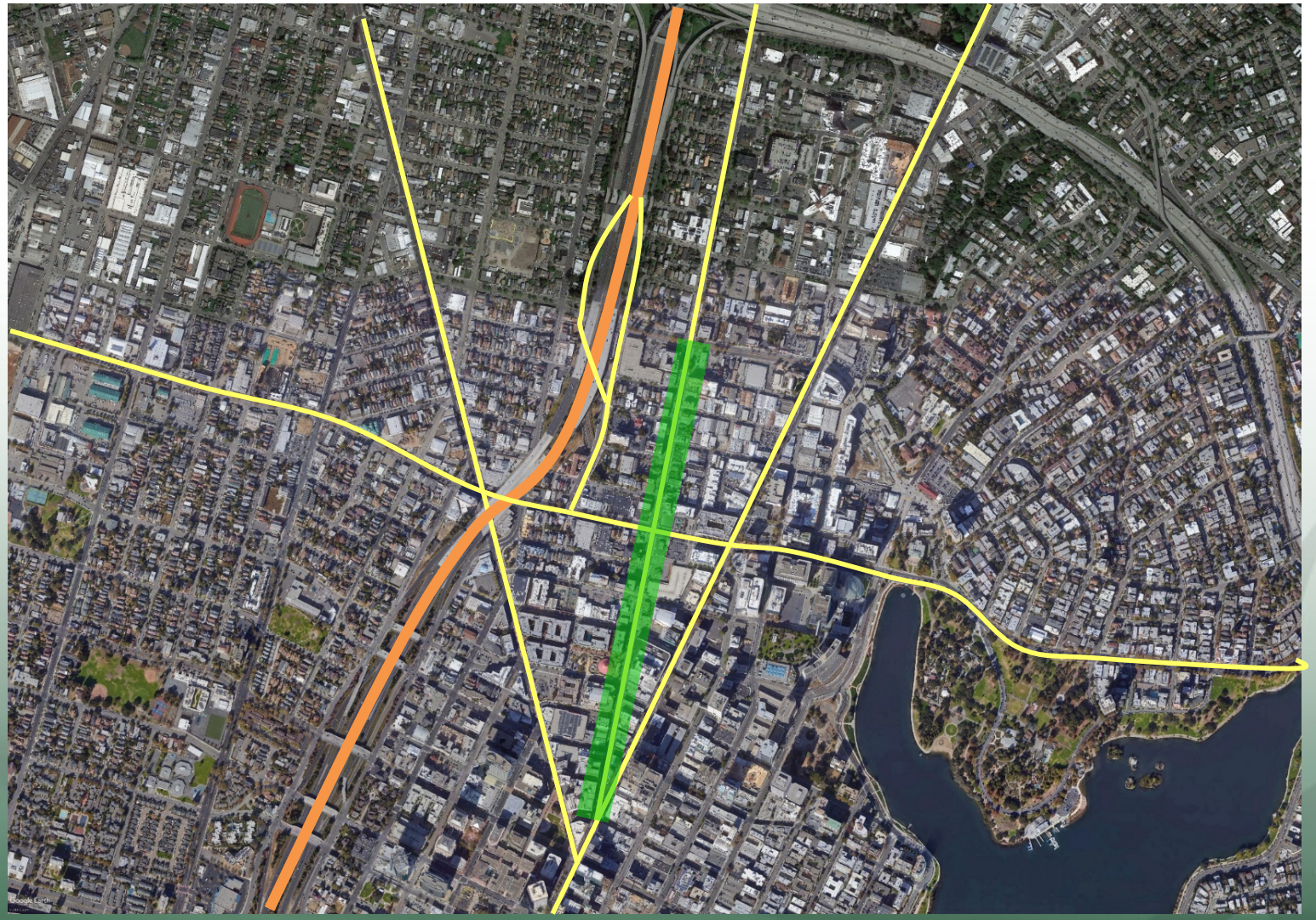
Case Study 3:
Redistributed Trips



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Case Study 3:
Traveler Choice: Before Project

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Case Study 3:
Traveler Choice: Project Near Term

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Case Study 3:
Traveler Choice: Project Far Term

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Case Study 3:
Traveler Choice: Far Term vs. Before

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A few closing thoughts…

- Big Data can be one piece of the project evaluation toolkit
- Sample sizes continue to grow, which lead to higher confidence
- Surprising results can happen
- More traditional data still valuable to ground-truth or confirm the story to be told

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Thank you!

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