The Bigger Picture
Using Big Data to Determine Effects and Benefits after Project Implementation

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Let probability and sample size do the heavy lifting.

Donald Miller
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
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?
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
Limitations of Traditional Data

- Sample size
- Effort intensive
- Cost concerns
- Focused on immediate area
- Area-wide effects
- Near-term versus Long-term effects
A Transportation Revolution...
...and a Data Revolution

First
Cellular Data

Then
GPS Data

Now
Wi-Fi Data

airrage
INRIX
CUEBIQ

STREETLIGHTDATA
“Where do people want to go?”
Early Adoption of Big Data

- 20,000 Person Trips Start or End within 1 Mile of the Corridor
- 5,000 Person Trips Pass-Through the Corridor
- 25,000 People Travel this Section of San Pablo Ave in the AM Peak Period
- 50% Drive Alone, 18% HOV, 11% Transit
- 30% of auto trips through the corridor are pass-through trips

“How can we change traveler behavior?”
Better Big Data

- Sample sizes increasing
- Longer history of data
- Cost of data generally decreasing
- Customization and flexibility of analysis
- Improving spatial resolution
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
Case Study 1:  
Identifying Future Opportunities
Case Study 1:
Traveler Choice: Before Project
Case Study 1:  
*Traveler Choice: Project Near-Term*
Case Study 1:
Traveler Choice: Project Far-Term
Case Study 1:  
Defining the Next Project
Case Study 1:
Defining the Next Project

How transformative can the improvements be?
Case Study 2: 
*Isolating Strategy Effectiveness*
Case Study 2: Isolating Strategy Effectiveness
Case Study 2: Traveler Choice: Before Project
Case Study 2:
Traveler Choice: Project Near-Term

17%

83%
Case Study 2:  
Traveler Choice: Project Far-Term
Case Study 3: 
Redistributed Trips
Case Study 3: 
*Redistributed Trips*
Case Study 3:  
Traveler Choice: Before Project
Case Study 3:
Traveler Choice: Project Near Term

25%
46%
15%
14%
15%
Case Study 3:
Traveler Choice: Project Far Term
Case Study 3:
Traveler Choice: Far Term vs. Before
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
Thank you!