Using Big Data to Measure Travel Behavior at Miami University of Ohio

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Agenda

I. Defining Big Data for Transportation
II. Using Big Data for the Miami University of Ohio
   I. The Challenge
   II. Analyzing with Big Data
   III. The Solution
III. Suggestions for Future Work
IV. Q&A
Big Data is a Meaningless Buzzword...
Mobile device data from ~23% of US and Canadian adults and ~12% of commercial truck trips
Data is Just a Cost Until You Put it to Work

1300+
Transportation Analyses Supported Each Month

StreetLight InSight®: The Only On-Demand Platform For Running Actionable Transportation Analytics
With the Right Processing Techniques, Big Data is Valuable and Useful
Miami University Campus Circulation Study

Creating a Data-Driven Toolbox to Inform Multi-Modal Transportation Decisions
Background and Driving Forces

2018: 600 new beds
2014: 700 new beds
1974: Western Campus
Competing Traffic Volumes
Issues Studied

1. Parking/Operations – One-Way Conversion
2. Safety/Operations – Three-Way Stop Control
3. Safety – Midblock crossing on major arterial
4. Safety – North Quad Expansion
5. Parking/Operations – Future 350-space garage
The StreetLight InSight Analysis

Understanding Existing Campus Travel Patterns
Cut-Through Versus Campus-Based Trips

AA% / BB%
AA = Campus Trips
BB = Cut-Through Trips
Origins of Campus-Based Traffic

43% Internal

10% 8%

10% 3%

8% 8%
Personal Versus Commercial Vehicle Trips

### Personal Trips
- Campus Trips: 47%
- Cut-Through Trips: 53%

### Commercial Trips
- Campus Trips: 83%
- Cut-Through Trips: 17%

### Monthly Fluctuation in Truck Traffic
- Oct '16: 47% (Red Highlight)
- Nov '16: 30%
The StreetLight InSight Analysis

Understanding Bike-Ped Travel
Distribution of Walking/Biking Distances
Bike/Ped Origin-Destination Patterns
The StreetLight InSight Analysis

Reallocating Parking Volumes
Admissions Center Parking Program

Previous Admissions Center

Visitors
Faculty/Staff
Meters

New Admissions Center
Hourly Volume Estimation

Hourly Entrance Rates by Parking Area

Estimation of Total Daily Arrivals by Parking Area

StreetLight Index, Total Daily Zone Traffic

- Visitors
- Faculty/Staff
- Meters
- Parking Count
Application – VISSIM Microsimulation

15-minute Traffic Count Data
• Vehicles
• Pedestrians
• Bicycles
• Buses

Used StreetLight Data to redistribute traffic volumes on campus
Project Takeaways
Study Outcomes

1. Analyzed and made recommendations for a handful of specific circulation issues

2. Created a comprehensive presentation of findings that serve as a “benchmark” for conditions on Miami University campus at that point in time

3. Provided the University with a comprehensive toolbox to address future programmatic decisions
Continuing Innovations with StreetLight Data
What else is now available for such projects?

• Location Based Services data now processed into “trips” – use for any type of “pass-through” analysis
• Additional analyses, including: AADT, Segment Analysis, and Traffic Diagnostics
• Include or exclude dates in any analysis; and even dig into individual day results
• Quickly analyze Ped and Bike behavior separately (coming soon!)
Thank you!

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