Advantages and Disadvantages of MAC Address O-D Survey Data Collection

June 5, 2018

Jill Juhlke, C.E.T., MITE

paradigm TRANSPORTATION SOLUTIONS LIMITED 20 YEARS

Overview

Oxford County, in Southwestern Ontario:

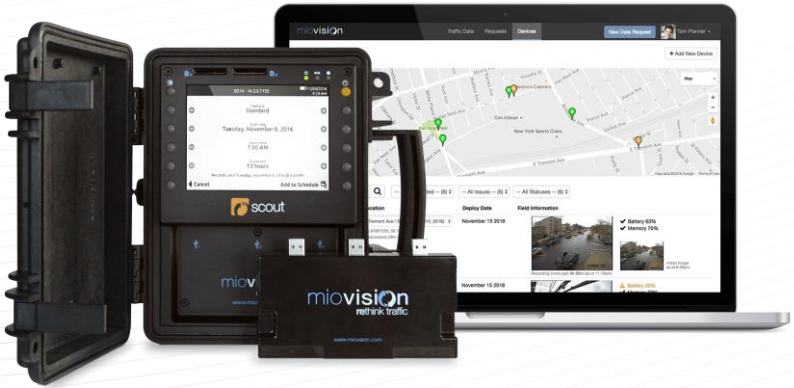
- **110,862 Residents**
- **2,040 km^2**
- **Five rural municipalities**
- **Three urban municipalities**
- **Progressive in sustainability and investment in new and emerging technologies**
- **O-D survey required as part of TMP update**

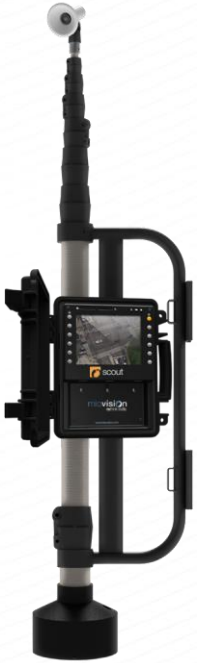
Background

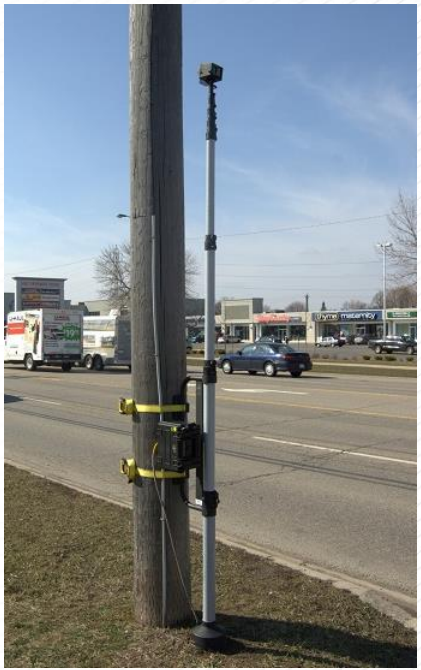
- Oxford County is strategically located
- Most residents live within three lower-tier urban municipalities
- Modest increase in population is expected by 2036
- Several major employers
- Home to largest outdoor agricultural trade show in Canada
- O-D survey was required to help refine forecasting model and identify where future transportation improvements may be required

Data Collection Methodology

- **Miovision Scout data collection cameras**
- **Connected adapters**

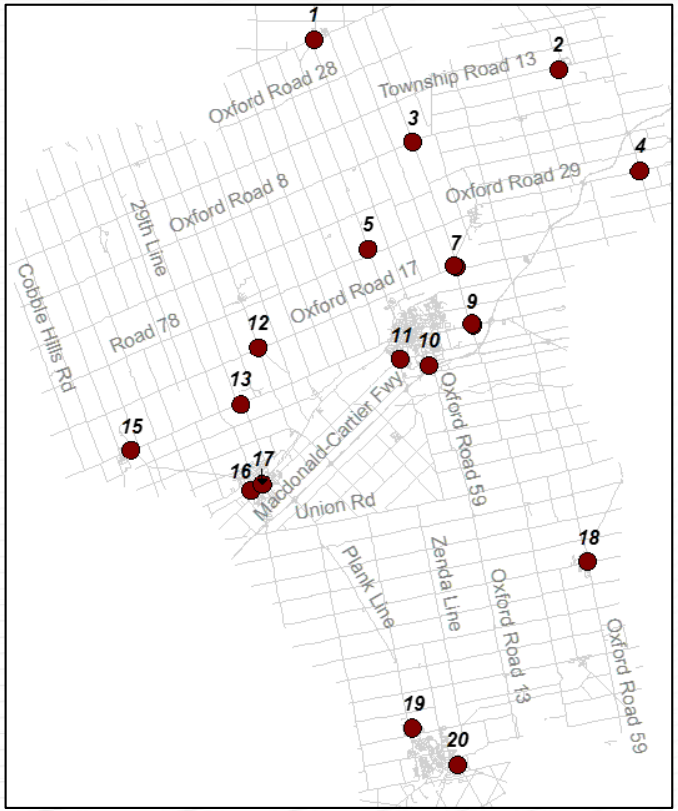






paradigm TRANSPORTATION SOLUTIONS LIMITED 20 YEARS

Data Collection Methodology



- 20 stations
- 2-day data collection period
- 10 hours per day
- PM peak period analyzed

Advantages of MAC Address O-D Data Collection

- Data collection is not weather dependent
- Initialization requires less planning and preparation
- Longer data collection periods
- Less expensive than traditional survey methodologies
- Theoretical sample rate is 100%
- Consistency throughout survey period
- Passive versus active

paradigm TRANSPORTATION SOLUTIONS LIMITED 20 YEARS

Disadvantages of MAC Address O-D Data Collection

- Data is limited to device trips
- Data is limited to the number of vehicles passing through a survey station
- Data collection should not span multiple days
- Cannot control sample rate

Analysis

- A total of 32,132 vehicles passed through survey stations
- A total of 12,760 MAC addresses were recorded
- Final data set had 447 MAC addresses
- O-D matrices contained 164 trips (Day 1) and 243 trips (Day 2)
- Sample rate not calculated

Data Translation – Device Trips to Vehicle Trips

- **Data expansion**
  - 8,661 device trips on Day 1
  - 6,945 device trips on Day 2
- **Application of auto occupancy factor**
  - 6,542 device trips Day 1
  - 5,246 device trips Day 2
- **Adjustment for rate of cell phone ownership**
  - 5,724 vehicle trips Day 1
  - 4,590 vehicle trips Day 2

Recommendations

MAC address data capture is recommended for a variety of applications including:

- Projects in smaller geographic areas
- Locations where traditional survey methods are unsafe or too costly
- Where long-duration data collection is required
- When the technology can also be used in conjunction with or as a supplement to other O-D survey methods

Recommendations

MAC address data capture is not currently recommended when:

- When supplemental trip information is needed
- Only passenger vehicle trip information is required
- A target sample rate is required
- Peak hour (versus peak period) data is required
- Data regarding auto occupancy and number of Bluetooth devices per vehicle is not available to translate device trips to auto trips

Summary

- Potential for other uses
- Technology can be improved and expanded

paradigm TRANSPORTATION SOLUTIONS LIMITED 20 YEARS

Questions?

paradigm TRANSPORTATION SOLUTIONS LIMITED 20 YEARS