Use of Crowdsourcing to Advance Operations

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There are 4 primary limitations in our typical approach to real-time monitoring:

1. Big gaps in geographic coverage.
2. Lags in timeliness of information.
3. Cost to build-out and maintain field equipment.

These limitations reduce the ability to efficiently and (cost) effectively operate the system.

Source: FHWA
Crowdsourcing: A Potential Solution

When integrated with an agency’s existing efforts, crowdsourcing helps agencies:

- Expand geographic coverage and resolution.
- Reduce time lags for real-time situational awareness.
- Reduce dependence on and cost associated with roadside sensors and systems.
- Overcome jurisdictional stovepipes.
- Implement proactive operations strategies.

Crowdsourcing is a proven lower-cost solution to improving safety and overall operations.

Source: Pixabay
What Exactly is Crowdsourcing?

Crowdsourcing is the practice of addressing a need or problem by enlisting the services of a large number of people via technologies. Crowdsourcing:

✓ Addresses a need or problem outside of an organization’s resources or means.

✓ Leverages the collective wisdom and unique insights of a crowd by distributing the workload across a large group.

✓ Uses technology and new forms of communication and interaction to document, share, and reflect on the world.
Sources of Transportation Crowdsourced Data

• Acquired from third-party providers.
• Collected from specially developed mobile apps.
• Extracted from social media platforms.

Data is sourced whenever and wherever people travel

Source: Pixabay
Crowdsourcing Applications in Transportation

Crowdsourced Data including:
- Third-Party Data
- Citizen Reports
- Social Media

Other Third-Party Sensor Data
ITS Field Devices
Partner Data
Service Patrol

TMC Operations:
- Manual Data Entry
- Data Integration
- ATMS/TIS Platform

Crowdsource Applications:
- Traveler Information
- Incident Management
- Freeway Traffic Management
- Arterial Management
- Road Weather Management
- Planned Events

Many other possible applications such as work zone management or performance assessment and reporting.
Utah DOT Citizen Reporter App

Utah DOT created App in 2013
• Trains DOT employees and citizen volunteers to use the app
• Collects road weather information from reporters
• Uses data for winter maintenance & traveler information

Outcome
• Highly accurate data on road conditions on highway and major arterial segments
• 1K+ ‘trained’ reporters

Source: Utah DOT
Delaware DOT App for reporting issues in real-time

A single source for all things traffic related

• Travelers can report roadway issues from potholes to non-functioning signal lights

• DelDOT shares the report to District-level maintenance crews

• Traveler can obtain real-time information and track the movement of snow plows

• They can also access other DOT services including transit information, advisories, and DMV information

Source: Delaware DOT
Kentucky Transportation Cabinet (KYTC) - Incident Detection

**Goal:** KYTC needed more timely incident detection across more roadways

**Action:** Created email alerts for use by TOC staff using combination of HERE and Waze data

**Effort:** Staff of 3 in-house, no dedicated staff

**Outcome:** Alerts clarify presence of events earlier than speed-based detection

- Alerts enable TOC staff to craft a quicker response
- TOC processes were improved to expedite/improve traveler information
- Integrated visualization supports a more effective after action review

Source: Kentucky Transportation Cabinet
City of Austin - Signalized Corridor Prioritization

**Background:** Historically signals were retimed on 3-year rotation with results measured using “floating vehicle” travel time runs
- Bluetooth on 53% of corridors; many with only 2 sensors
- Cameras and/or radar on 18% of corridors

**Goal:** Shift to a data-driven, needs-based schedule with more cost-effective method for measuring impact

**Action:** Purchased Crowdsourced data from third party

**Outcome:** More efficient allocation of resources for signal retiming based on need, and improvements in corridor performance

Source: City of Austin
Every Day Counts Round 5 (EDC-5)
Crowdsourcing for Operations Innovation

Innovation Goal:

To increase the number of agencies that use crowdsourcing to better operate the transportation system through new, cost-effective, and proactive operational strategies and applications.

The National Team will be helping 30+ States and local agencies with:

- Understanding operational gaps or needs
- Identifying the right application & data
- Fostering executive & technical buy-in
- Developing technical/programmatic skills
- Defining data management processes
- Navigating funding and procurement
- Assessing architecture approaches
For more information on EDC-5 Crowdsourcing for Operations, contact:

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