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**Massachusetts Department of Transportation**

# Highway Operations Center Traffic Desk - Using Crowdsourcing Applications for Traffic Incident Management



# Highway Operations Center Traffic Desk (17Q3)

## Using Crowdsourcing Applications for Traffic Incident Management



# Overview

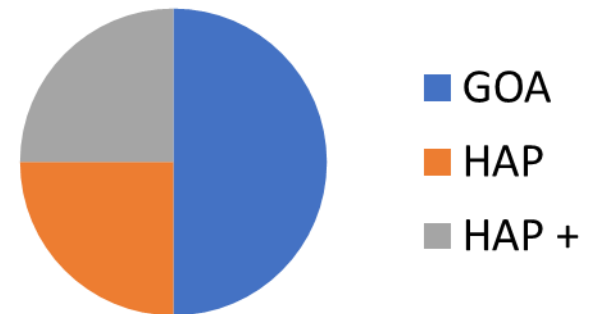
- MassDOT Highway Operations Center
  - Statewide Ops
  - Roads and tunnels
- Conducted a year-long Crowdsourcing Pilot to understand if and how Social Media can be leveraged for Event Detection to compress the TIM Continuum and support safe-quick clearance.
- Phase 1: 10-mile segment of road.
- Phase 2: Five, 10-mile segments of road.
- Monitored Waze, Radio, Twitter Deck, TV, News Sites, others.
- HOC Operators, no automation, did not hire staff, utilized the Connected Citizen Program.



# Quantitative Lessons learned from the pilot

- 614 detected events between 1 Aug 2016 and 6 Sept 2017
- Phase 1 (10 mi.) one new incident per hour!
- 90% of pilot Waze earliest channel of detection for social media channels on observed routes for low level events.
- 40/60 split between Crashes and Hazards Icons
- Phase 2 (50 mi.) diminishing returns: 1 per hour

## What we found and worked



# Qualitative Lessons learned from the pilot

- Waze supplements traditional methods of detection
  - Requires patrons to be active reporters
- Waze works but has limitations and challenges
  - Missing key map icons such as Mile Makers, Exit #'s and cross street names.
  - We don't own it
  - Cannot deploy it
  - What is under the hood?
  - Will they one day charge for it?
- The CCP interface has limitations to the geographic area an Operator can monitor.
  - Must automate with machine learning to be successful at a larger scale.
- Only detects low level events.
- High GOA rate. Must be able to understand the “watershed” moment.
- The life cycle of a Waze event? What does the 40/60 really mean?

# Life Cycle of a Waze event

PM Commute  
Time  
Crash (-) 1 min

Speed  
55mph



Life is good, no reports



# Life Cycle of a Waze event

Time  
Time of Crash

Speed  
55mph



Patrons react to crash, most likely do not report as they maneuver and are not directly impacted.

# Life Cycle of a Waze event

Time  
(+) 2-5 Min  
Crash

Speed  
35-  
45mph



Patrons begin to be impacted, the most active users will report, but speeds are too high to understand the event, many users will not report due to low impacts, they will be “lurkers”



# Life Cycle of a Waze event

Time  
(+) 5-10 Min  
Crash

Speed  
15-  
25mph



Patrons report heavily now since there are large impacts, speed drops sub 20mph, patrons can discern that the event is a crash, not a DMV, **this is the time of detection!**

# The Way Forward...

- Develop Pilot 3, focus on understanding automation:
  - Filters
  - Trigger points
  - Machine Learning
  - Test under camera to better understand GOA-watershed.
  - Review MassDOT RTTM Go-Time data to search for incident throughput patterns and early event indicators
- Share 1.0 Lessons Learned with municipalities and venues to leverage small scale CCP use.
- **Consider integration into ITMS**



# Questions?

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