



Crowdsourced Data for Traffic Operations

Jeff Adler



OPEN
ROADS



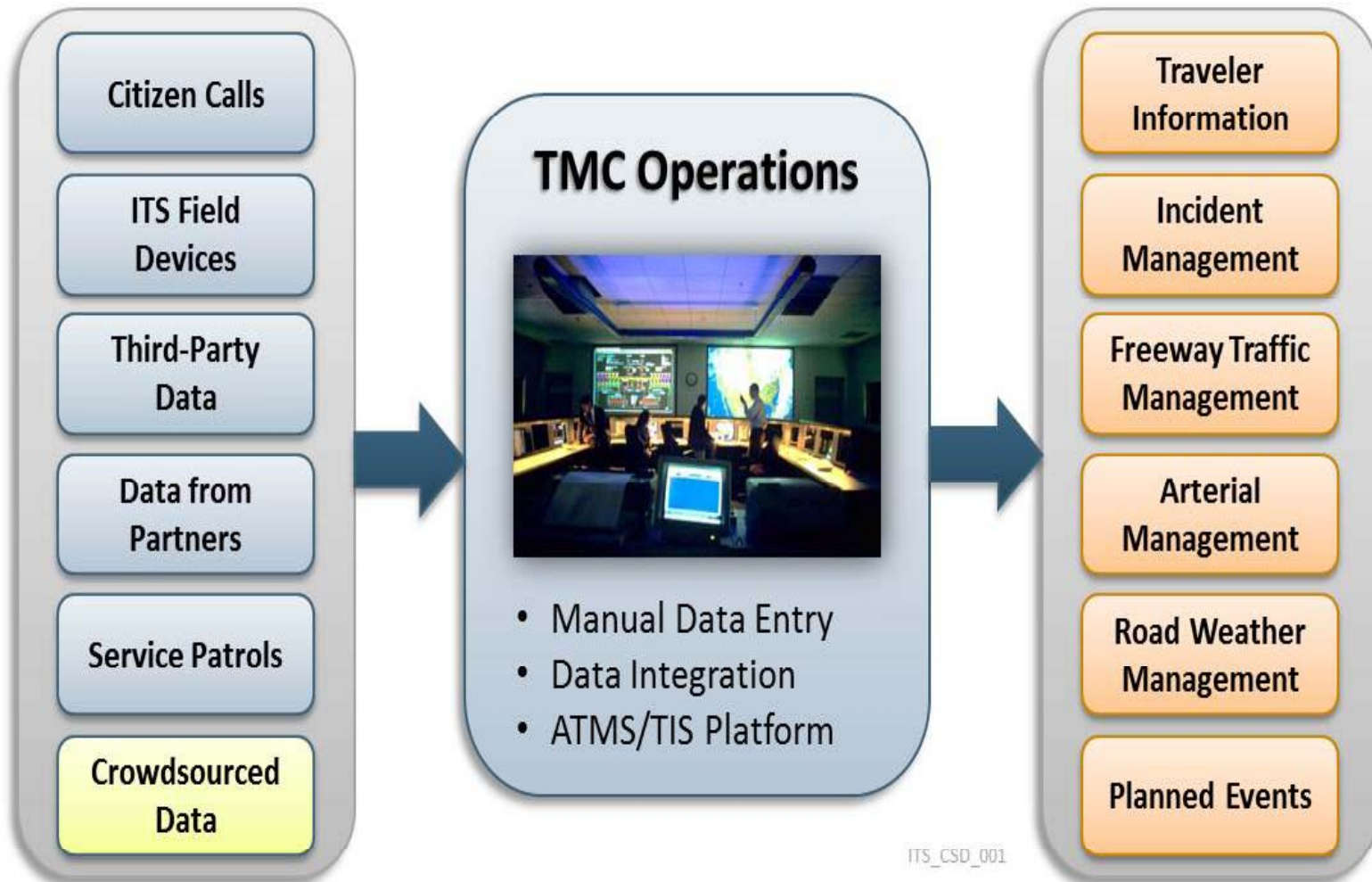
Acknowledgements

- Jimmy Chu, FHWA Office of Operations
- TMC Pooled Fund Study
- Our Partners Noblis and Kimley-Horn

- Final Report — February 2015
Publication Number: FHWA-JPO-14-165
– http://ntl.bts.gov/lib/54000/54800/54829/Crowdsourced_Data_Report_-_Final_508_Version.pdf

- T3Webinars: http://www.pcb.its.dot.gov/t3_webinars.aspx

TMC Data Processing





Study Purpose

- What sources of social media and crowdsourced data are being used for TMC operations?
- What are the best opportunities for integrating crowdsourced data from social media to support TMC TSM&O activities?
- How can agencies use SWOT Analysis to strategize projects for integrating crowdsourced data into their real-time operations?
- What measures of effectiveness can be used to provide a value proposition for assessing the return on investment?

Crowdsourcing and Social Media



- Extracting Data from Social Media



- Third-Party Crowdsourced data



- Specialized Apps

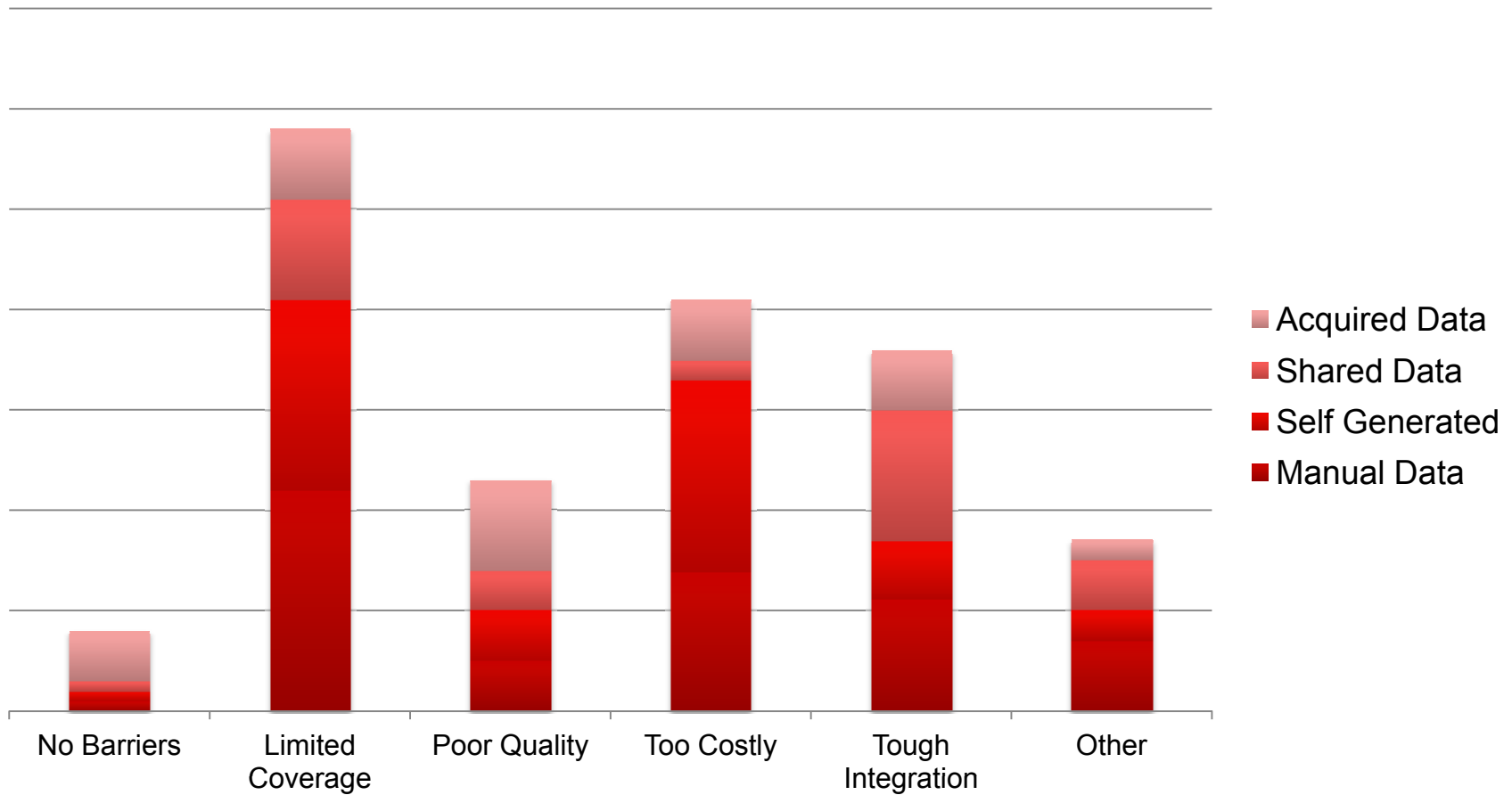




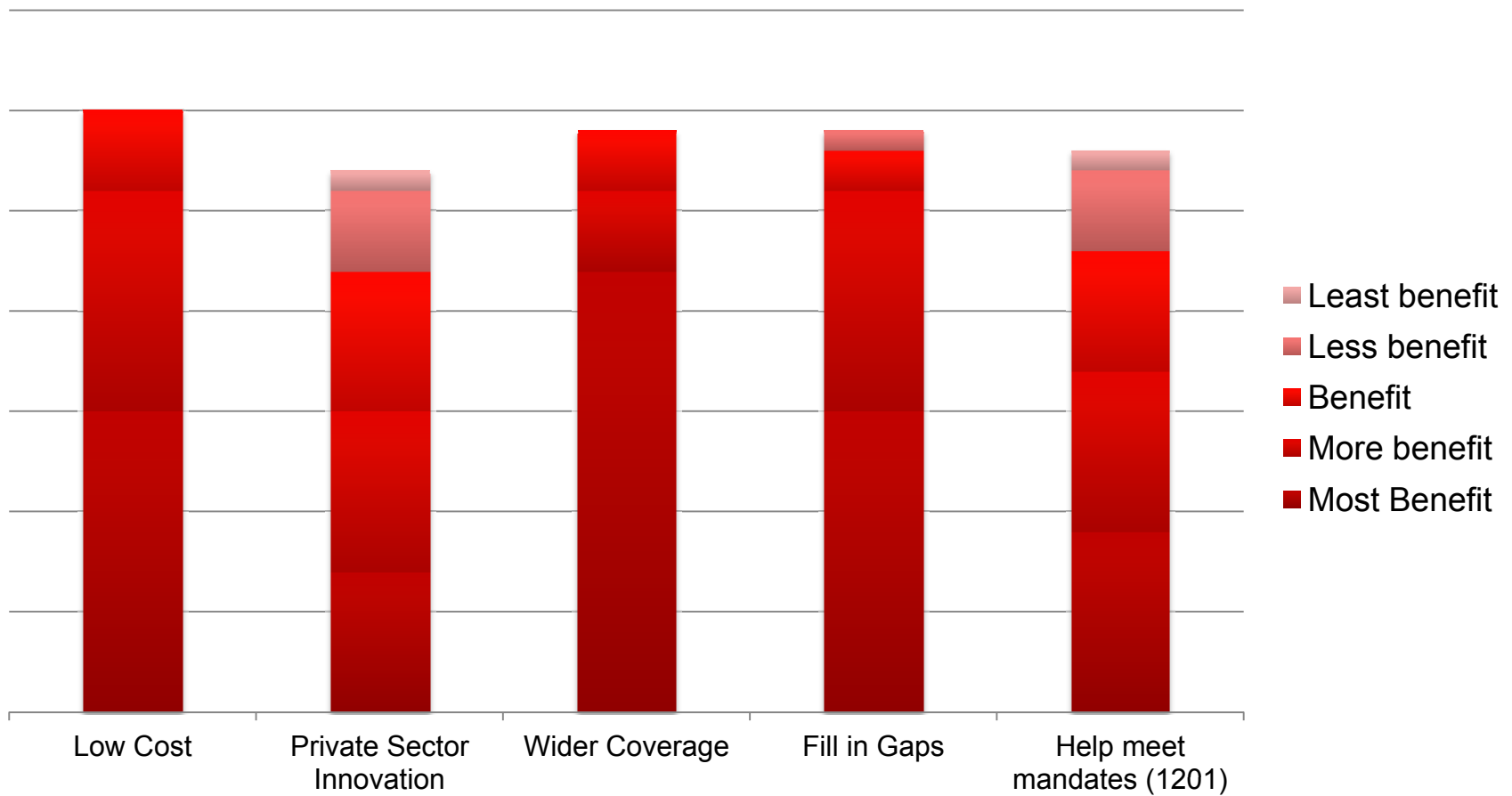
State of the Practice

- **Data from 3rd Party Provider**
 - Very commonly used
 - Competitive environment
 - Growing features
- **Social Media Monitoring and Engagement**
 - Commonly used to disseminate information
 - Growing number of agencies using as data source
 - Responsibilities shared between communications and operations
 - Structure of data published enhances value of data received
 - Some agencies using advanced monitoring tools
 - Small number doing advanced mining
- **Dedicated Collection**
 - Leverage existing systems
 - Small number of specialized apps

Perceived Issues with Current Data



Crowdsourced Data Value Assessment





TSM&O Activities and Crowdsourcing

Activity	Criticality	Social Media	Third-Party Data	Specialized Apps
Incident Management	Very High	Moderate	Very High	High
Traveler Information	Very High	Moderate	High	High
Work Zone Management	High	Moderate	High	Low
Special Event Management	High	Moderate	Medium	Low
Freeway Operations	High	Low	High	Low
Arterial Management	High	Moderate	High	Low
Road Weather Management	High	Moderate	Low	High
Managed Lanes	Low	Low	Low	Low
Maintenance Mgmt.	Low	Moderate	Low	Moderate

Traveler Information via Social Media



State Agencies	iOS	Android	Twitter	Facebook	Pinterest	Flickr	YouTube	RSS	Email/Text Alerts
Maine DOT									
Maine Turnpike									
New Hampshire DOT									
Vermont AOT									
Massachusetts DOT									
Rhode Island DOT									
Connecticut DOT									
New York State DOT									
NY State Thruway			 Transportation Alert						
			 NYS Thruway Info						
Port Authority of New York & New Jersey									
New Jersey DOT*									

<http://www.i95coalition.org/travel-information-apps/>

Iowa DOT — Engaging Citizens via Twitter



- Slowly evolved Iowa DOT's presence since 2008
 - 1 Twitter account -> 12 Twitter, 6 Facebook (511/traveler information accounts)
- Early December 2012 purchased Radian6 to monitor and engage
- December 2012 everything changed with 1 winter storm
- Started actively monitoring & engaging during normal business hours (Public Affairs office & Traveler Information coordinator) while ramping up for 24/7 coverage during bad storms.
- January 2014 started monitoring & engaging 24/7 with the help of our Statewide TOC.
- Twitter: 11,638 (511), 22,800 (IowaDOT)
- Facebook: 9,746 (511), 4,579 (IowaDOT)

Iowa 511 Twitter Feed



Statewide Iowa 511
@statewideia511

Traveler information issued by the Iowa DOT for all traffic alerts statewide in Iowa. Reports are removed once inactive.

Iowa
511ia.org
Joined March 2011

Tweet to Statewide Iowa 511

193 Photos and videos

Tweets Tweets & replies

Statewide Iowa 511 @statewideia511 · 4h
US 65: Temporary four-way stop condition from I-80; US 6 to County Road S27 (Altoona). Delays. bit.ly/1vrJZAY

Statewide Iowa 511 @statewideia511 · 4h
IA 141: Left lane closed from IA 415 to IA 44 (near Grimes). bit.ly/1rMCmpC

Statewide Iowa 511 @statewideia511 · 5h
IA 22: There are alternating lane closures from County Road Y36 to I-280 (near Buffalo). Width limit in effect. bit.ly/1vc1vZJ

Statewide Iowa 511 @statewideia511 · 6h
I-80: Roadway reduced to one lane from Exit 46 - County Road M47 (1m E of Walnut) to Exit 75 - County Road G30 (1m... bit.ly/1vbG5Mj

Who to follow · Refresh · View all

- Transport. 4 America @T4...
Followed by TRB and others
- Energy Department @E...
- HUDgov @HUDgov

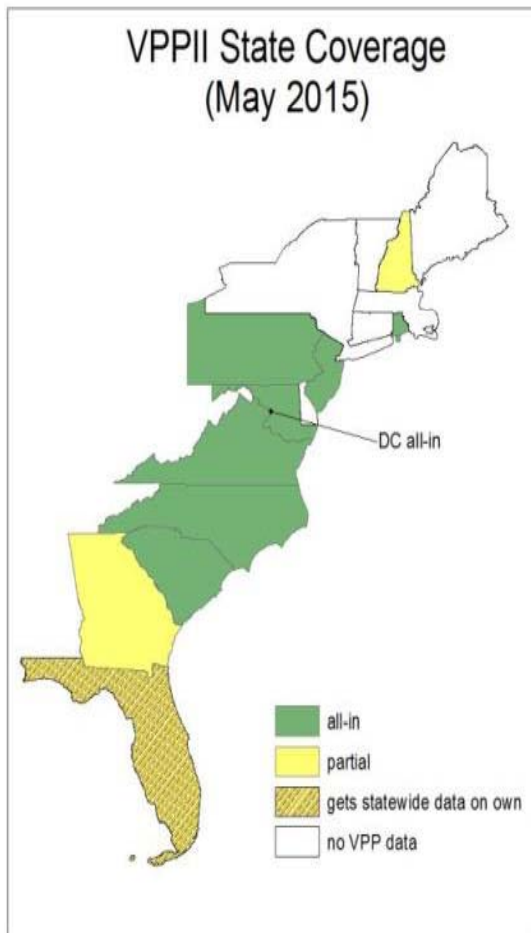
Popular accounts · Find friends

Trends · Change

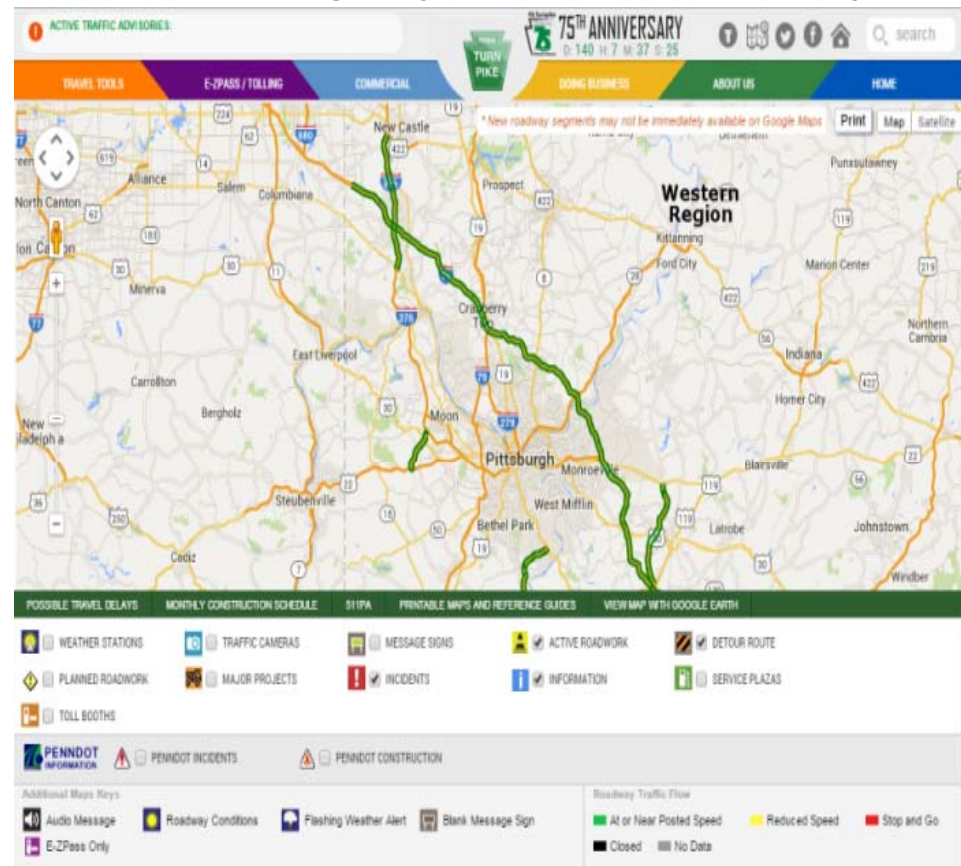
- #TruckWorthy
Promoted by Chevy Trucks
- #SOSNINJAS
- Ebola
- #1DProposal
- #MLBPlayoffs
- #Sens
- #RevoltNation
- Nick Jonas
- Joe Giudice
- Halloween

© 2014 Twitter About Help Ads info

Integrating 3rd Party Crowdsourced Data



<http://www.i95coalition.org/projects/vehicle-probe-project/>



<https://www.paturnpike.com/webmap/PTCIE-2.aspx>



Florida DOT — Waze Integration

SUNGUIDE
Florida's Intelligent Transportation System

TRAFFIC INFO
511

FLORIDA'S SOURCE FOR TRAFFIC INFO
Home - Traffic - My Florida 511 - Construction Info - Emergency Info - TransIt/Airports - Links - Help - Newsroom

ALERTS:
Sunshine Skyway Bridge: please drive with caution due to high winds

Map | Incidents | Message Boards | Cameras | Estimated Travel Times | My Florida 511

Select a region

Zoom in by selecting from the left drop-down list or by double clicking on a region below on the map.

Legend

- Traffic Speeds / Estimated Travel Times
- Color Options
- ≥ 50 mph
- 30 - 49 mph
- < 30 mph
- Not Available
- Cameras
- Message Boards
- Incidents
- Construction
- Congestion
- Weather
- Other

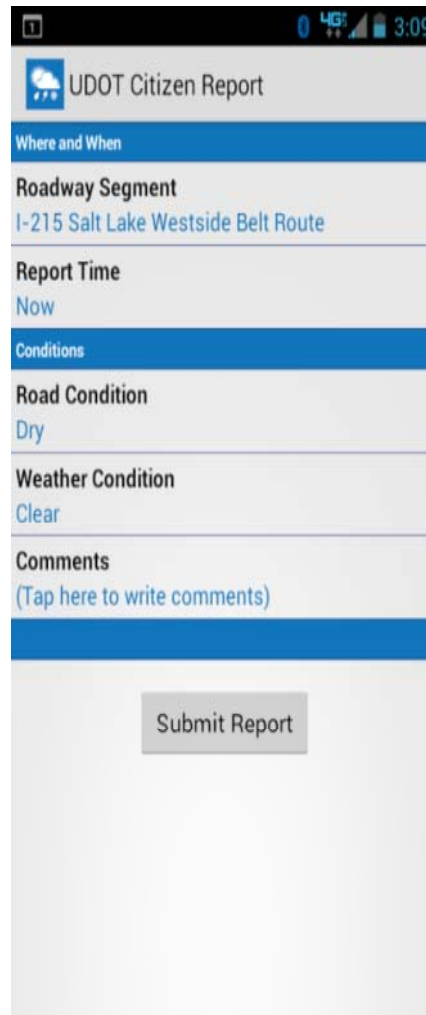
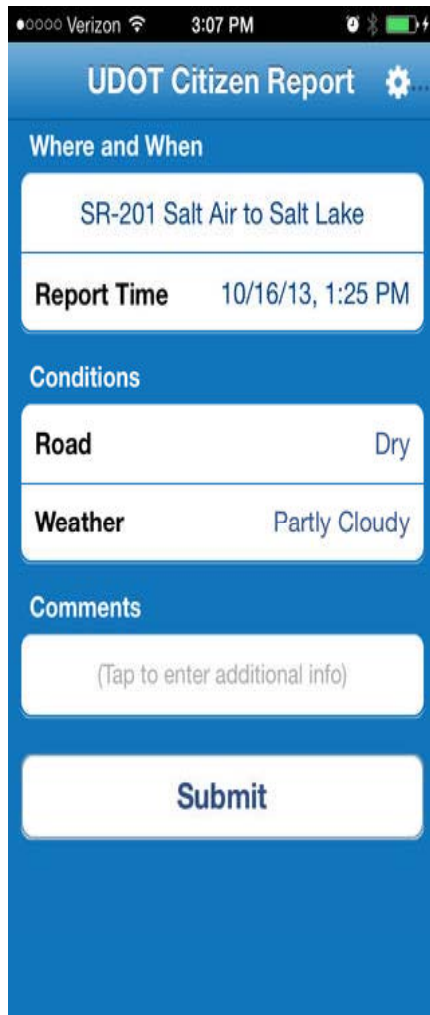
Data Last Updated: Thursday, February 26, 2015 4:40 PM

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FDOT

Utah Citizen Reporter App



SWOT Model Framework



Implementation Considerations Strengths & Weaknesses		
<p>Operational</p> <ul style="list-style-type: none"> • Staffing • Experience • Business Process • Culture • Training • Performance Measures 	<p>Institutional</p> <ul style="list-style-type: none"> • Social Media Policies • Social Media Staffing • Agency Culture 	<p>Technical</p> <ul style="list-style-type: none"> • Data Integration • Social Media Experience • Mobile App Development • TMC Infrastructure
Opportunities		Threats
<ul style="list-style-type: none"> • Achieving TSM&O Objectives • Overcome Data Deficiencies • Improve Institutional Cooperation • Social Media Monitoring Tools • Humanizing DOT • Gamification and Incentivizing Citizens 		<ul style="list-style-type: none"> • Data Quality • Data Validity and Credibility • Data Privacy • Data Ownership • Distracted Driving • Emerging Innovations

Example SWOT Analysis — UDOT



<i>STRENGTHS</i>	<i>WEAKNESSES</i>
Progressive Agency Project Champion Strong technical foundation Strong training focus at UDOT	Limited experience working with Citizens Designing mobile apps Processing data from citizens
<i>OPPORTUNITIES</i>	<i>THREATS</i>
Improve Road Condition Reporting Motivated Citizen Base Mobile technologies	Data Accuracy Internal Networking “Hands Free” laws



Measures of Effectiveness

- TMC Resources
 - Monetary costs associated with social media activities
- Agency Reputation
 - Measure the reach of social media outlets
 - Assess user confidence
- Ability to Meet TSM&O Objectives
 - “Before and after” assessment of key metrics
- Data Effectiveness
 - Crowdsourced data reliability and quality
 - Reduced latency



Summary and Conclusions

- Agencies seeking for newer, and less costly data sources to improve TSM&O Activities
- Crowdsourced data looks appealing but agencies need to understand the direct and indirect costs
- SWOT analysis is a useful tool to help agencies assess their capabilities and readiness to plan and execute crowdsourced data projects
- Agencies operating TMCs should embrace projects that are best suited to their strengths and provide the best opportunities for success.
- New MOEs are needed to provide a value assessment and generate return on investment

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Leading the way in Intelligent Transportation Systems