

CAT Coalition

Strategic Initiatives Technical Working Group

April 25, 2019 Webinar

Notes and Summary of Discussions

Summary of Action Items

1. *By May 15, 2019, Working Group members are asked to send Dean any resources (or links to resources) related to the Fleet Challenge (e.g. resources related to mounting or installing on-board units (OBUs), on-board applications, or establishing Basic Safety Message (BSM) broadcasts). These resources will be included in the Connected Fleet Challenge website.*
2. *The Strategic Initiatives Working Group will continue discussions and activities to establish relations with other CAT/CAV related associations, committees or working groups and consider how to broaden the perspective of this group.*
3. *Initial outreach will be conducted with the SAE On-Road Automated Driving Committee and NCUTCD V2X Subcommittee. Any Strategic Initiatives WG members who are active in these groups are asked to inform Blaine of their connection.*
4. *Members are asked to email Blaine Leonard or Dean Deeter with any suggestions for other CAT/CAV related groups to be considered for outreach and coordination.*

Welcome

Blaine Leonard (Utah DOT and Chair of the Strategic Initiatives Working Group) welcomed everyone to the webinar. Approximately 46 members and guests joined the webinar. A list of those in attendance is provided at the end of these notes.

SPaT Challenge and Connected Fleet Challenge Update

Blaine reported to members that this working group is planning to conduct three webinars during the summer and fall of 2019. The webinars will continue updates and information sharing on the SPaT Challenge. Additionally, the webinars will announce the Connected Fleet Challenge to a wider audience and share resources identified to date.

The first webinar will be scheduled for early July. Blaine explained that the roles of this working group in the Connected Fleet Challenge are to:

- Identify resources to include on the Connected Fleet Challenge Website;
- Present content during the SPaT/Fleet Challenge webinars; and
- Provide input to the Fleet Challenge web pages of the overall CAT Coalition Website.

Blaine reminded members that we are assembling resources for the following four resource areas:

- **Resource Area #1:** Existing OBU Procurement Documents
 - Note: These could include any examples of Requests for Proposals or Scopes of Work that could assist agencies as they procure the devices and communications equipment to be located on vehicles.
- **Resource Area #2:** OBU Mounting Lessons Learned
 - Note: These could include any descriptions of lessons learned in mounting OBUs, antennas, or other vehicle-based components.
- **Resource Area #3:** BSM Information
 - Note: These could include any documents or summaries of approaches to equip vehicles with the capability of broadcasting the Basic Safety Message (BSM).
- **Resource Area #4:** Overviews of potential on-board applications
 - Note: These could include any reports or other documents describing on-board applications installed on fleet vehicles (e.g. Red-light Violation Warning, Transit Signal Priority, Snowplow Priority).

Blaine shared a calendar view of the schedule for assembling resources and posting them to the Fleet Challenge website prior to the July webinar.

Adam Hopps and Joe Averkamp introduced the Fleet Challenge web pages (still in development with a live launch scheduled for June, 2019), indicating that the final website will include a map of the United States that displays locations participating in the Fleet Challenge. Sort features on the website will allow visitors to search by vehicle type (e.g. if an agency is deploying on-board units on transit vehicles, they could select to view other deployments that have deployed on-board units on transit vehicles).

Action Item:

- ***By May 15, 2019, Working Group members are asked to email Dean any resources (or links to resources) related to mounting or installing on-board units (OBUs).*** Examples of resources include documents describing procurement or installation of OBUs, documents describing OBU applications, documents describing BSM deployment experiences, and lessons learned.

CAT Coalition Update

Blaine shared the organization chart for the CAT Coalition (Figure 1 below), and explained that the coalition has three primary focus areas:

- Programmatic & Strategic Activities;
- Planning, Scenarios, & Resources; and
- Infrastructure & Industry.

The Strategic Initiatives Working Group is in the Programmatic & Strategic Activities focus area, and Blaine will be coordinating with the chair of the Policy, Legislative and Regulatory Working Group (Jennifer Toth, Maricopa County DOT) to ensure the working groups within this focus area are aligned.

Blaine noted two areas of feedback from the CAT Coalition Leadership Team to the Strategic Initiatives Working Group:

1. Consider broadening membership to expand the participation to new areas (e.g. transit, emergency response, etc.); and
2. Consider and discuss Mobility as a Service (MaaS) and Mobility on Demand (MOD) and the role of each of these in CAT.

The group discussed the concept of broadening membership. There was a comment that there are many other groups with formal CAT/CAV activities within their groups. Therefore, rather than attempting to include their members in our working group or coalition, perhaps the best approach is to coordinate with these other groups. Blaine agreed and asked if there were suggestions of how best to coordinate with other groups. Options that were discussed include:

- Inviting other groups to present to this working group and offering to present to theirs;
- Conducting a joint webinar between two (or more) related groups;
- Cross reporting – where individuals who are members of both groups provide updates.

Some external groups that were identified for possible coordination include the SAE On-road Automated Driving Committee and the NCUTCD V2X Subcommittee.

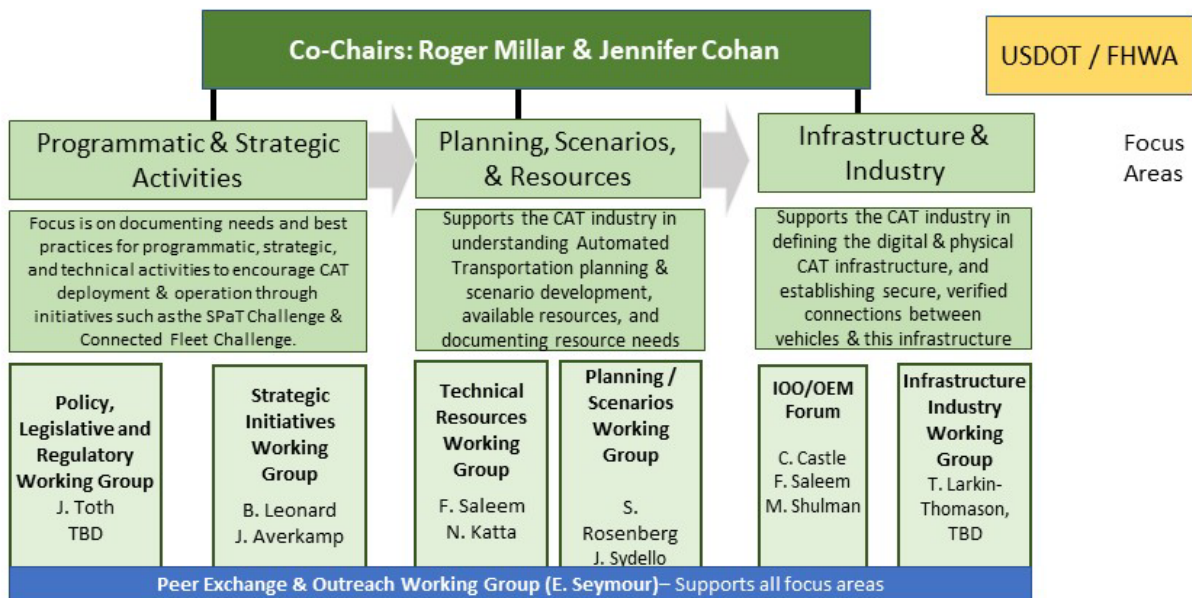
Blaine asked members to consider other CAT/CAV related committees or working groups that would be beneficial to establish a connection with and requested that members email himself (bleonard@utah.gov) or Dean (deeter@acconsultants.org) with any ideas.

Action Items:

- The Strategic Initiatives Working Group will continue discussions and activities to establish relations with other CAT/CAV related committees or working groups and will consider how to broaden the perspective of this group.
- Initial outreach to the SAE On-Road Automated Driving Committee and NCUTD V2X Subcommittee will be conducted. Any Strategic Initiatives WG members who are active in these other groups are asked to inform Blaine of their connection.
- Members are asked to email Blaine Leonard or Dean Deeter with suggestions for other CAT/CAV related groups to be considered for outreach and coordination.

Figure 1: Organization Chart for the CAT Coalition – April 2019

The CAT Coalition Today



ITE Mobility as a Service (MaaS) Initiative

Blaine introduced Jeff Lindley to speak about ITE’s MaaS Initiative. Blaine noted that we will be inviting ITS America to present on their Mobility on Demand (MOD) Initiative during our next webinar.

Jeff Lindley provided background on ITE’s MaaS Initiative, indicating that the effort has only recently begun after the announcement in December 2018. There is now a Steering Committee and a Technical Working Group.

Jeff’s slides with additional details are included in the attachment to this summary.

V2I Applications – Transit Signal Priority using V2I Communications

Blaine presented the benefits that both UDOT traffic operations and local transit operations are experiencing through the deployment of transit signal priority applications that is supported by V2I communications.

Blaine presented a high-level summary of the benefits that transit riders are receiving, including approximately a 6-7% increase in route reliability with only minor negative impacts on delays to traffic on other approaches with transit signal priority operational. A copy of the presentation is attached to this webinar summary, with graphics containing details of the findings.

Close

The next webinar is scheduled for Thursday, July 25, 2019, at 2pm Eastern.

TWG 1 April 25, 2019 Webinar Participants

- Blaine Leonard (Chair)
- Adam Hopps
- Barbara Staples (Noblis)
- Bob Dockemeyer (Aptiv)
- Christian Kulus
- Cliff Heise
- Curtis Thompson
- Dave Miller
- Dean Deeter
- Doug Hohulin
- Galen McGill
- Gary Duncan
- Gary Strack
- Hideki Hada
- James Chang
- Jeff Bergsten
- Jeff Lindley
- Jeff Stewart
- Jeremy Schroeder
- Jesus Ruiz
- Jianming Ma (TxDOT)
- Jim Harkness
- Jim Misener
- Joe Averkamp (Co-Chair)
- Joerg' Nu' Rosenbohm
- Joey Yang
- John Lower
- Justin Chan
- Ken Yang (AECOM)
- Kent Kacir
- Lev Pinelis (Transurban)
- Liana Mortazavi (Panasonic)
- Mike Schagrin
- Mohammed Hadi
- Osayamen Omigie
- Patrick Son
- Peter Thompson
- Pierre R
- R Mukai
- Ray Derr
- Robert Dingess
- Shah Imran
- Shane McKenzie
- Stephen Mensah
- Susan Catlett
- Tom Kern
- Tom Timcho

CAT Coalition
Strategic Initiatives TWG – April 25, 2019
Webinar Agenda

1. Welcome
2. SPaT Challenge & Connected Fleet Challenge Update
3. CAT Coalition Update
4. ITE Mobility as a Service (MaaS) Initiative Overview
5. V2I Applications – Lessons Learned
 - Transit Signal Priority using V2I Communications



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**SPaT Challenge & Connected
Fleet Challenge Update**



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Outreach Webinar Plan

- Plan is to conduct a minimum of 3 SPaT Challenge / Fleet Challenge Webinars
 - 10 Webinars have been conducted to date. These will be #11, #12, #13.
- These webinars will:
 - Introduce the Connected Fleet Challenge and Resources Available
 - Enable Updated Presentations on the SPaT Challenge
- Plan for Webinar #11 is on the following slide

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Webinar #11

- Target Date: Late June/Early July, 2019
 - Fleet Challenge Topics:
 - ❖ Overview of Fleet Challenge
 - ❖ Overview of the tracking site for the Fleet Challenge
 - ❖ Fleet Challenge resources available on the site
 - ❖ Asking attendees who are starting the Fleet Challenge to self-report
 - SPaT Challenge Topics:
 - ❖ Large deployments where SPaT broadcasts were integrated with OBU applications, what was the motivation?
 - ❖ 3 pilot sites (2 with SPaT) obstacles and how have they overcome?

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Strategic Initiatives WG Role in the Webinars

Identifying as many Connected Fleet Challenge Related Resources as Possible.

- Resources Areas Identified by the Strategic Initiatives WG:
 - Resource Area #1: Existing OBU Procurement Documents
 - Resource Area #2: OBU Mounting Lessons Learned
 - Resource Area #3: Basic Safety Message (BSM) Information
 - Resource Area #4: On-board Applications

Possible speakers for the webinars (sharing Fleet Challenge progress or SPaT Challenge progress)



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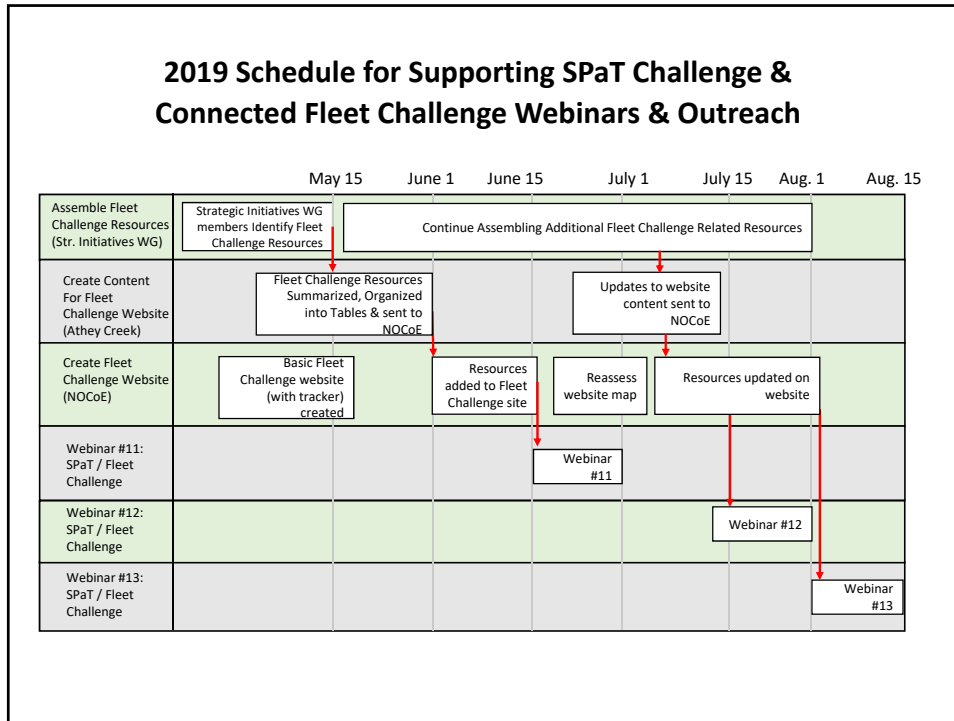
Schedule

- We want the Connected Fleet Challenge website to be functioning and have a 'critical mass' of resources before the initial webinar
 - We'd like volunteers who identify resources to introduce these on the upcoming webinars (if you are available and interested)
- The following slide describes the planned schedule and roles
- **Goal is to identify as many resources by May 15th as possible!**



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Connected Fleet Challenge Outreach

Volunteers include:
 Joe Averkamp, Hideki Hada, Hossam AbdelAll, Sean Laffey

Joe and Adam Hopps will update on progress and current approach to the Outreach / web presence

Live website demonstration



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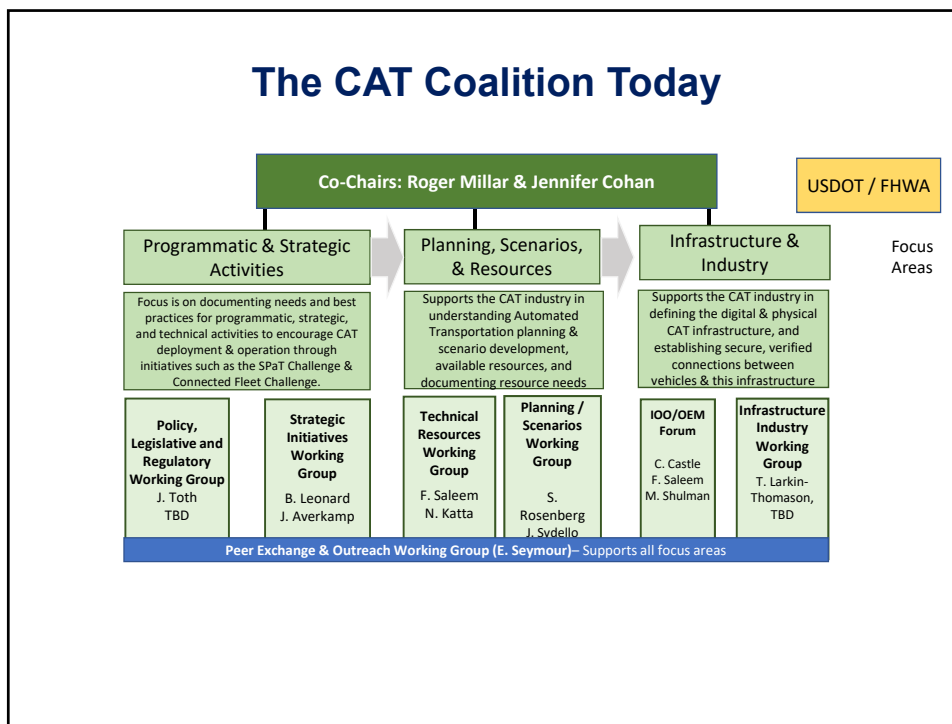
CAT Coalition Update

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Coalition Status

- New Coalition Co-Chairs
 - Roger Millar, WSDOT
 - Jennifer Cohan, DeIDOT
- Coalition is 5 months into Year 2
- Current Organization Chart on the Next Slide

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Coalition Input to this WG

- Consider Expanding Membership
 - Are there other associations, agencies, companies, individuals that would benefit from this group (e.g. transit, emergency responders)?
 - Brief open discussion today, also email any suggestions
- Introduce and discuss MaaS & MOD.
 - How do these relate to CAT?
 - Presentation from ITE today & ITS America on a future webinar

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ITE MaaS Initiative

Jeff Lindley, ITE



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Maas/MOD Definitions

“Mobility as a Service (MaaS): MaaS emphasizes mobility aggregation, smartphone and app-based subscription access, and multimodal integration (infrastructure, information, and fare integration). MaaS tends to emphasize the integration and convergence of passenger mobility services, mobile devices, real-time information, and payment mechanisms.”

Mobility on Demand (MOD): an innovative transportation concept where consumers can access mobility, goods, and services on demand by dispatching or using shared mobility, courier services, UAVs, and public transportation solutions. Passenger modes facilitated through MOD providers can include shared modes, public transportation, and other emerging transportation solutions (e.g., aerial taxis). Goods delivery facility through MOD can include app-based and aerial delivery services (e.g., drones).

Mobility on Demand Operational Concept Report

www.its.dot.gov/index.htm
Final Report – September 2017
FHWA-JPO-16-611



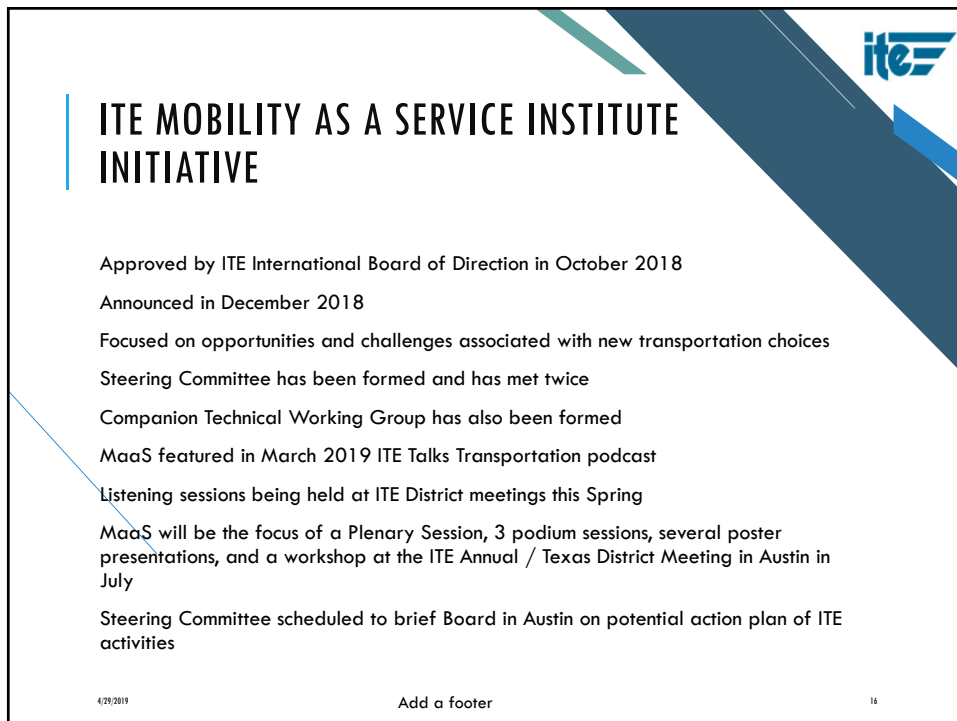
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ITE MOBILITY AS A SERVICE INSTITUTE INITIATIVE

Presentation to CAT Coalition Strategic Initiatives Working Group
April 25, 2019

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ITE MOBILITY AS A SERVICE INSTITUTE INITIATIVE

- Approved by ITE International Board of Direction in October 2018
- Announced in December 2018
- Focused on opportunities and challenges associated with new transportation choices
- Steering Committee has been formed and has met twice
- Companion Technical Working Group has also been formed
- MaaS featured in March 2019 ITE Talks Transportation podcast
- Listening sessions being held at ITE District meetings this Spring
- MaaS will be the focus of a Plenary Session, 3 podium sessions, several poster presentations, and a workshop at the ITE Annual / Texas District Meeting in Austin in July
- Steering Committee scheduled to brief Board in Austin on potential action plan of ITE activities

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ITE MAAS INITIATIVE STEERING COMMITTEE

Johanna Zmud, TTI (Chair)	Kip Strauss, HNTB
Susan Shaheen, UC-Berkeley	Alec Knowles, WSP
Jay Kim, Los Angeles DOT (NACTO)	Arjan Van Andel, PTV
Christopher Darwent, City of Vancouver BC	Eric Rensel, Gannett Fleming
Randy Rutsch, City of Boulder CO	Michael Flynn, Sam Schwartz
Rachel Hiatt, San Francisco County Transportation Authority	Ryan Westrom, Greenfield Labs
Brian Welch, Denver Regional Transportation District	Bill Schwartz, Nelson\Nygaard
David Swallow, Southern Nevada Regional Transportation Commission	Prachi Vakharia, StearDavie Gleave (SAE)
Crystal Mercedes, MetroPlan (Orlando, FL)	Erin Toop, WSP
Burt Tasaico, North Carolina DOT	Amy Ford, ITS America

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SOME INITIAL ISSUES

MaaS vs MOD vs TaaS vs ??

What is included (and what isn't)?

What potential activities is ITE particularly well suited to lead?

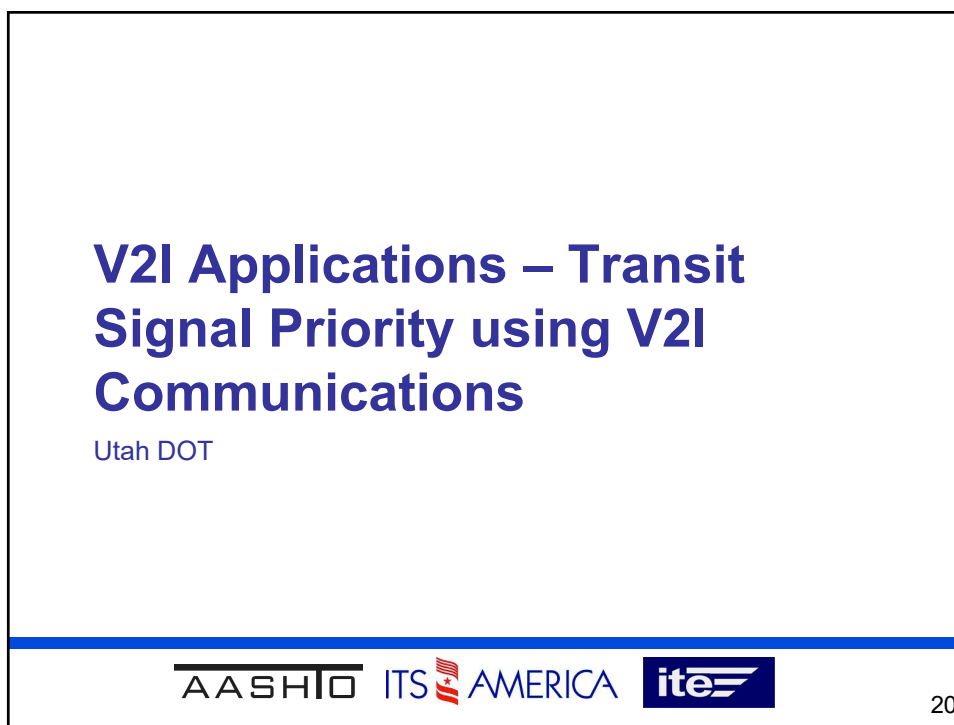
More to come!

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CAT Coalition Strategic Initiatives Working Group • April 25, 2019

V2I APPLICATIONS: OPERATIONS AND ANALYSIS OF THE REDWOOD RD TRANSIT PRIORITY SIGNAL PROJECT






Blaine Leonard, P.E. UDOT Transportation Technology Engineer
Jamie Mackey, P.E. UDOT Freeway Operations Manager



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Utah DSRC Project

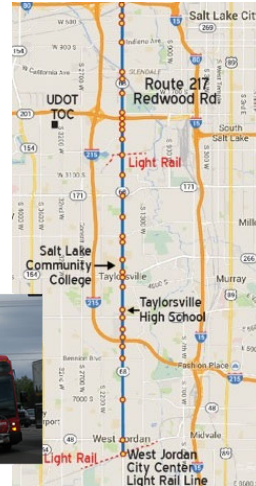
- Meet the SPaT Challenge
- Establish DSRC corridor
- Connected Vehicle Application: Transit Signal Priority
 - Redwood Road
 - MMITSS Software (Utah Version)
 - Conditions: Lateness, % Occupancy
 - Goal: Increase transit reliability (86% to 94%)



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Redwood Rd DSRC Corridor

- 11-mile urban arterial corridor
 - Commercial / Retail
 - Residential
 - College / High School
- UDOT-owned corridor
- 30 signalized intersections (400 S to 8020 S)
- 5 to 7 lanes
- ADT: 18,000 to 40,000
- Two light rail crossings
- Frequent bus stops (~6/mile)
- DSRC on 24 intersections
 - Lear and Cohda

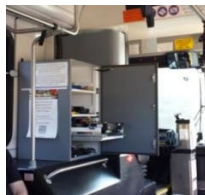


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Transit Signal Priority Infrastructure

On Board Equipment

- DSRC OBU
- “Beaglebone” Linux On-board Processor (OBP)
- Mounted in bus cabinet
- Antennas in/on bus roof



Roadside Equipment

- DSRC RSU
- “Beaglebone” processor
- Omni-directional antenna
- Ethernet cable to cabinet



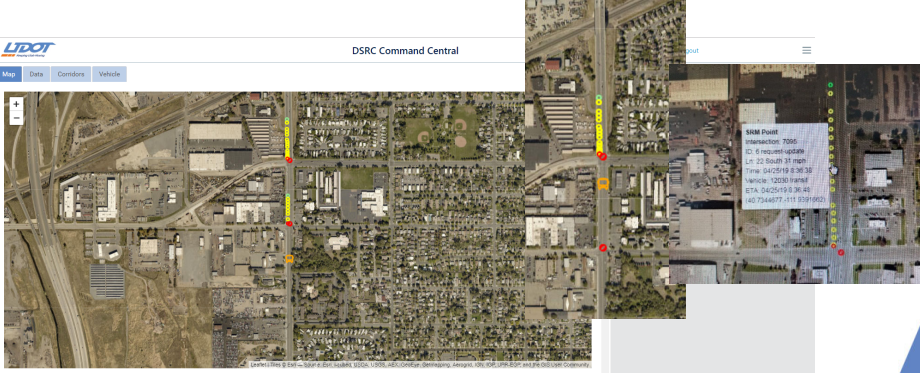
Traffic Signals

- Fiber Communication
- Intelight MaxView Central System
- Signal Controllers
 - Econolite ASC/3 & Cobalt
 - Intelight MaxTime



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Transit Signal Priority Monitoring



The screenshot displays the DSRC Command Central interface. At the top, the LIDOT logo is on the left, and the text "DSRC Command Central" is centered. Below this is a navigation bar with tabs for "Map", "Data", "Corridors", and "Vehicles". The main area is a satellite map of an urban area with a yellow line indicating a transit route. A red dot on the map represents a bus. A popup window is open over the bus, displaying the following information:

SRM Point:	
Intersection:	7305
ID:	9 request update
LT:	22 South St stop
Time:	04:51:19 @ 38.33
Vehicle:	12200 trailer
ETA:	04:51:19.36.45
Alt:	734477.111 8381963

The LIDOT logo "Keeping Utah Moving" is located in the bottom left corner of the interface.

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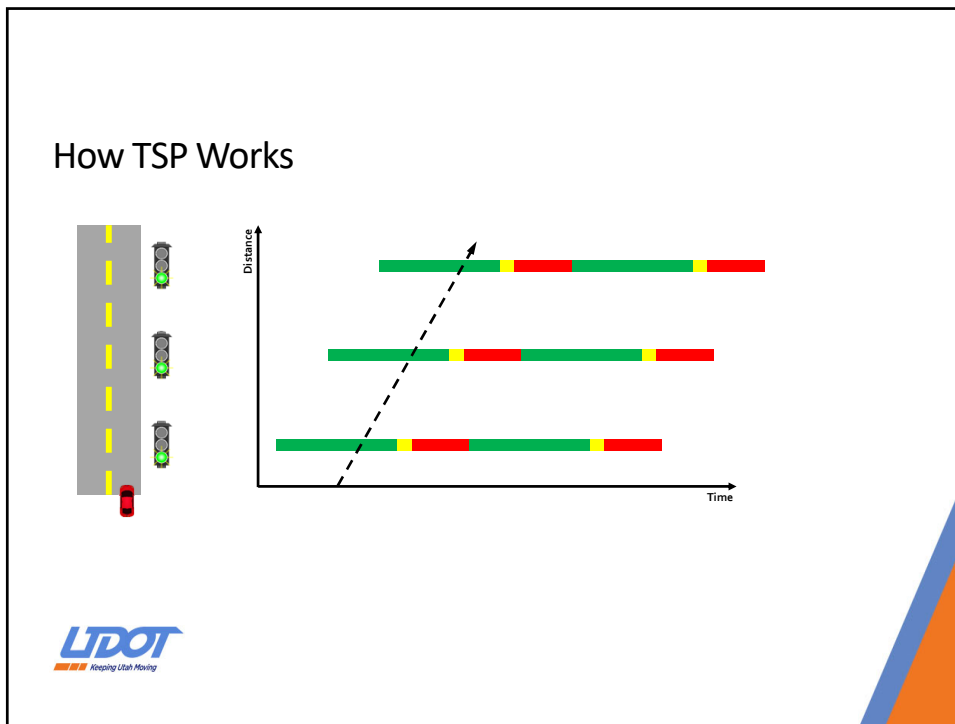
Transit Signal Priority Monitoring



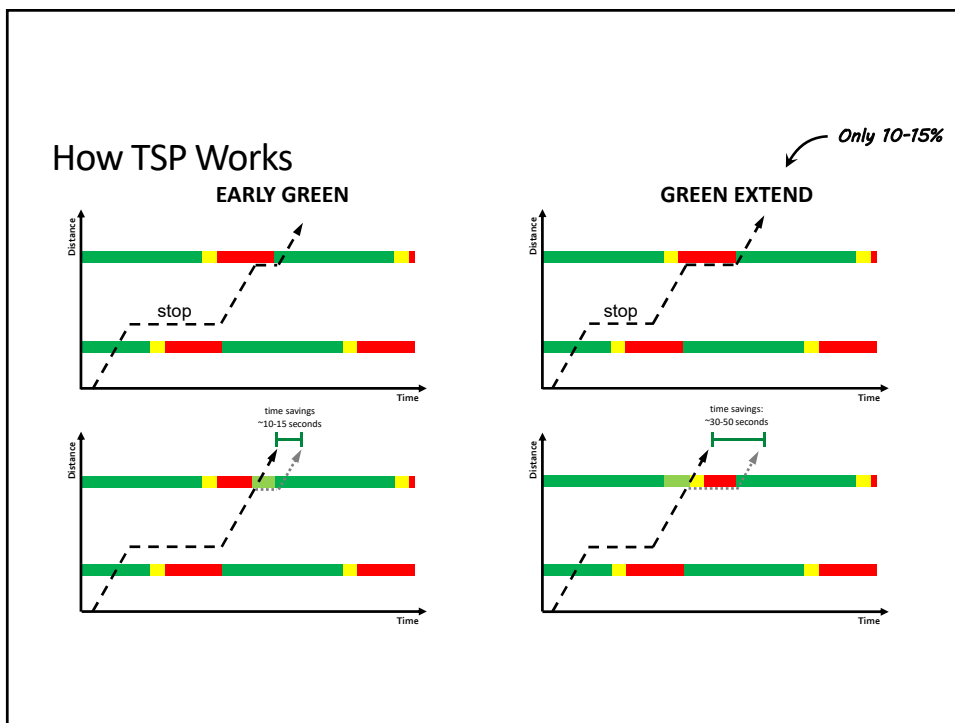
The screenshot shows a satellite map of the same urban area as the previous slide. A red dot on the map represents a bus. To the left of the bus, there are three circular indicators: a yellow circle, a green circle, and a red circle. The LIDOT logo "Keeping Utah Moving" is in the bottom left corner.

As the late bus traveled south (to the right), it requested priority (yellow and green circles) and got back on schedule

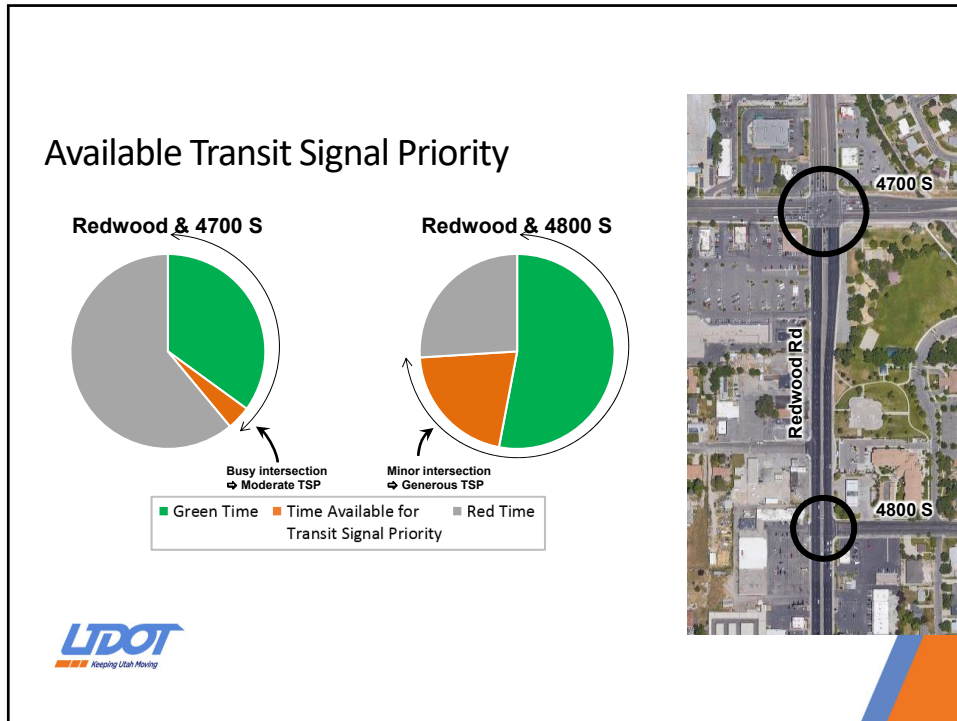
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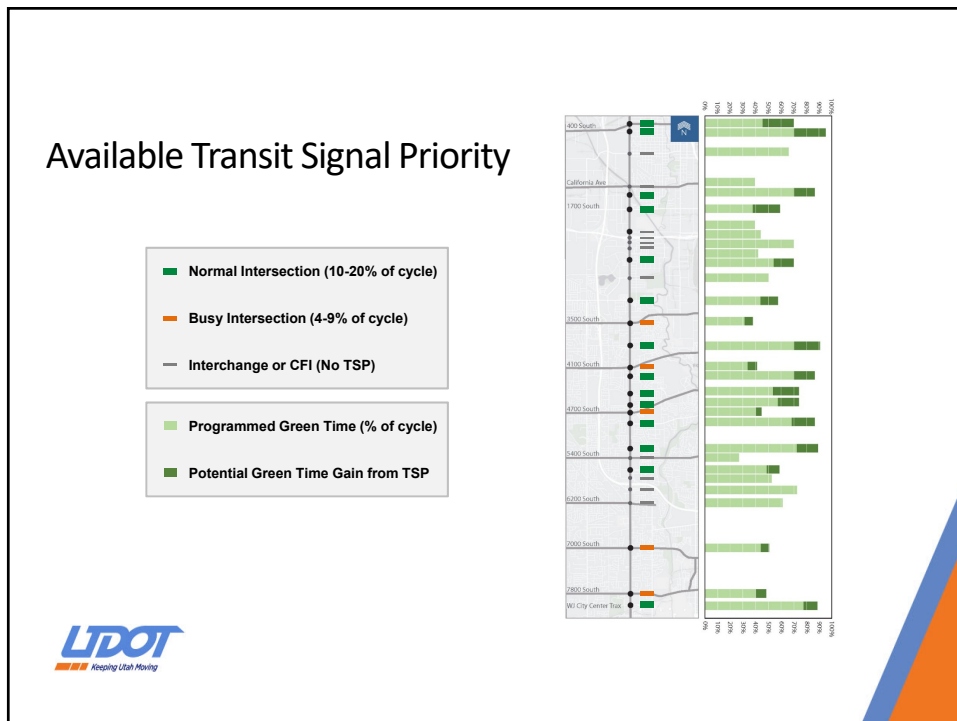
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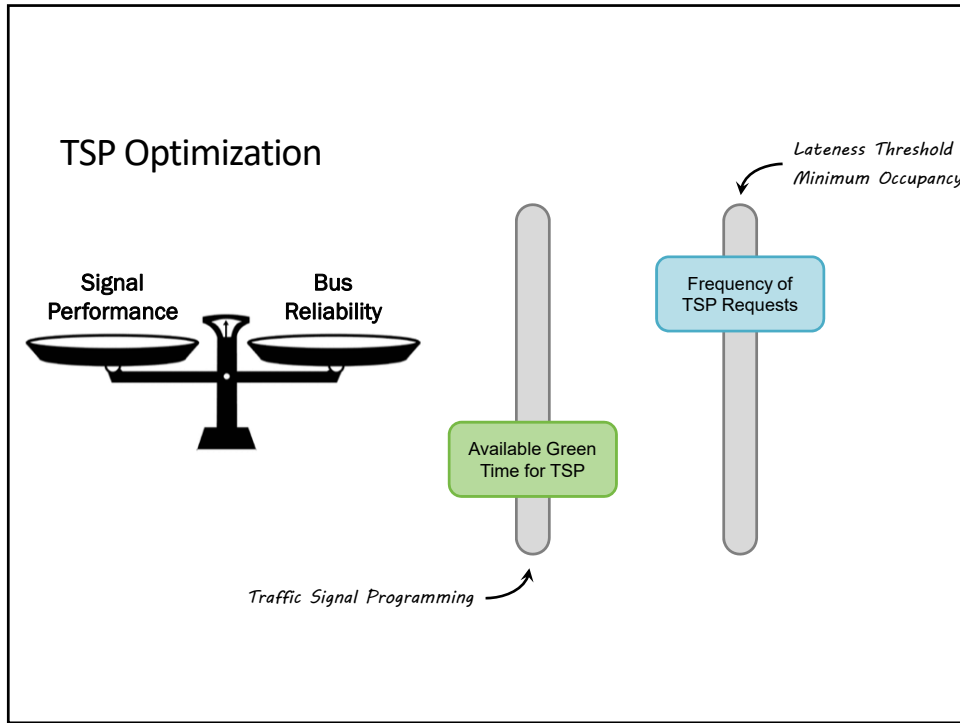
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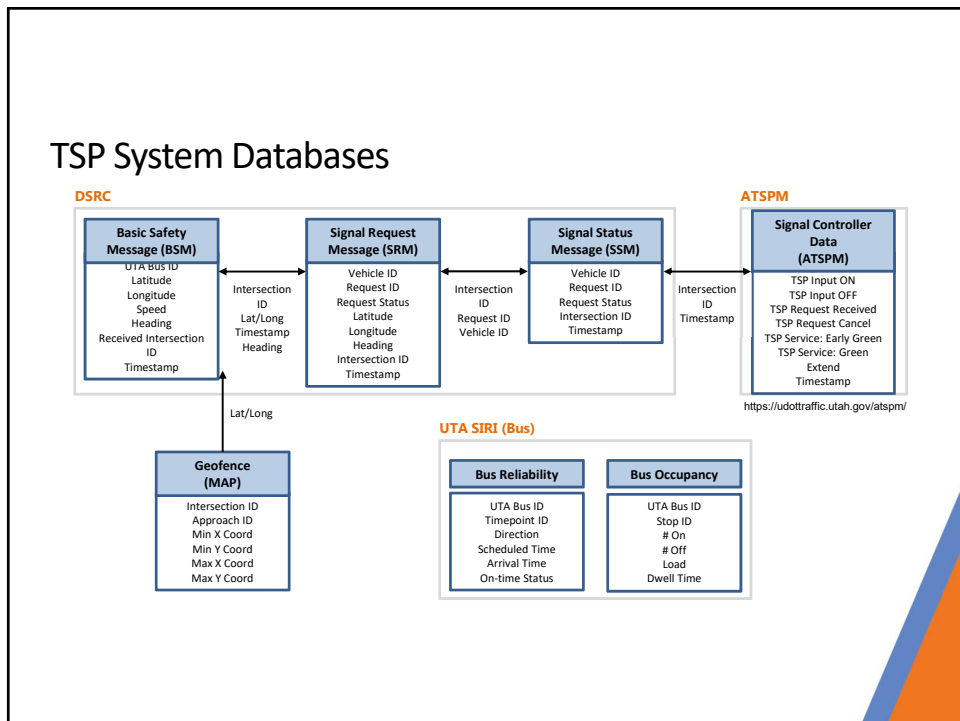
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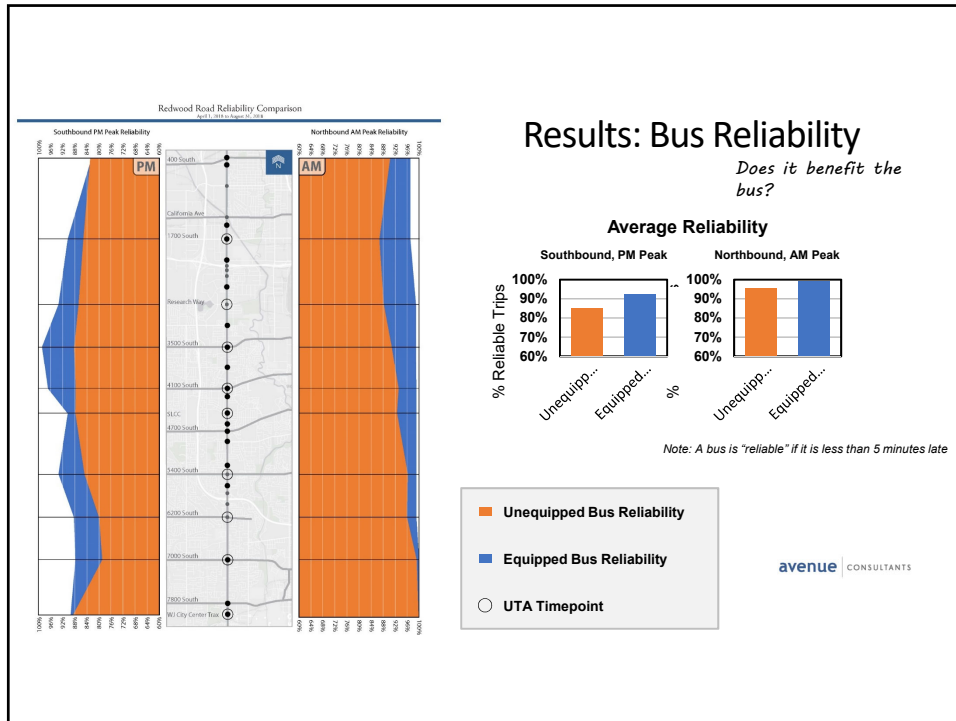
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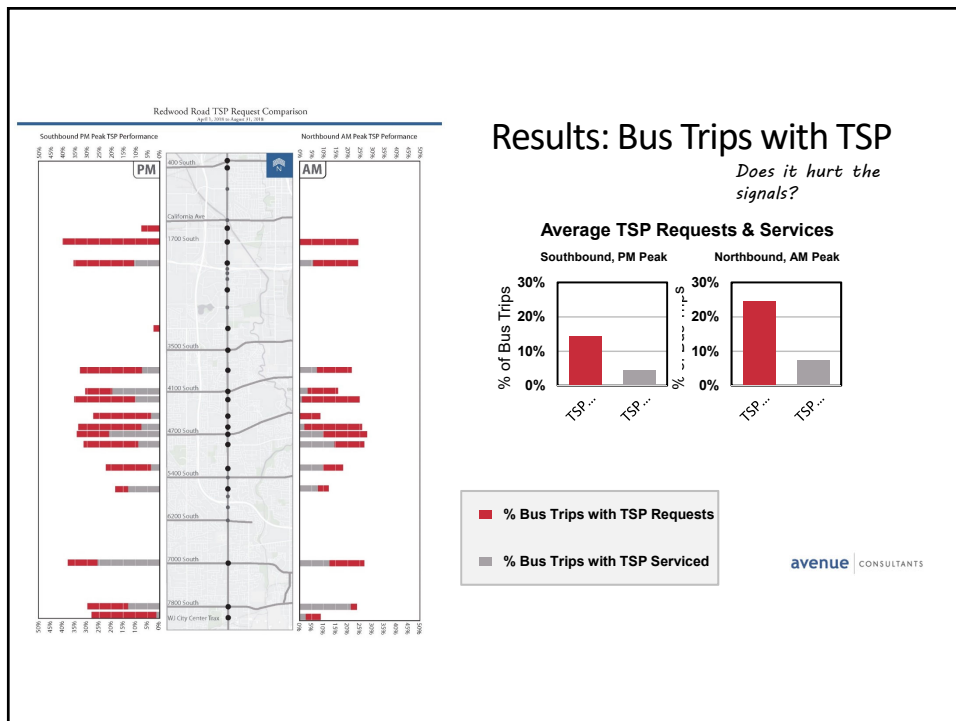
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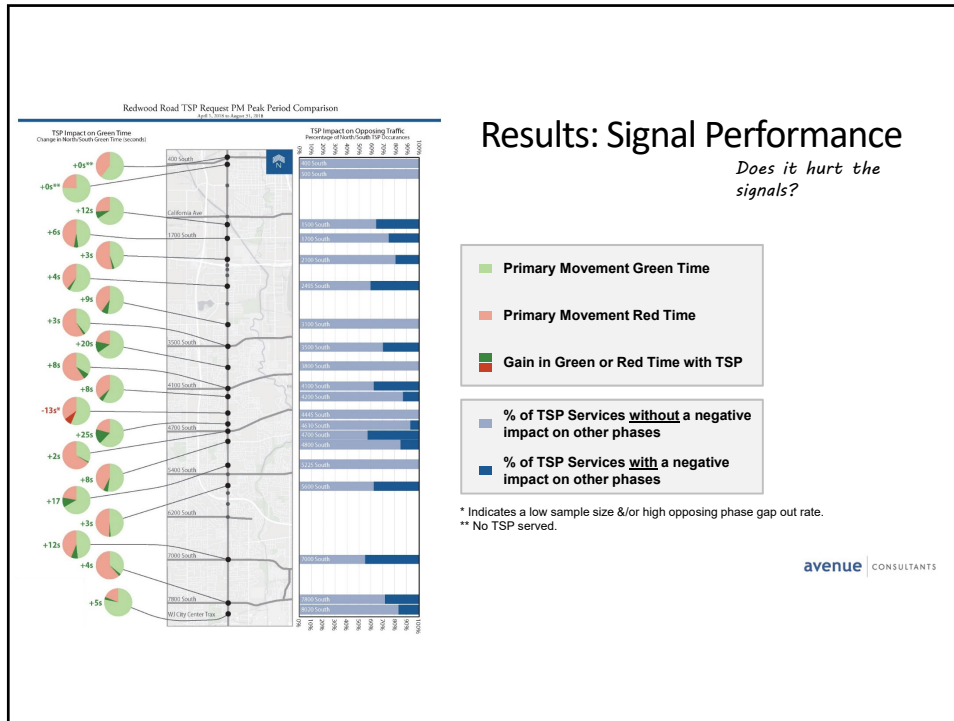
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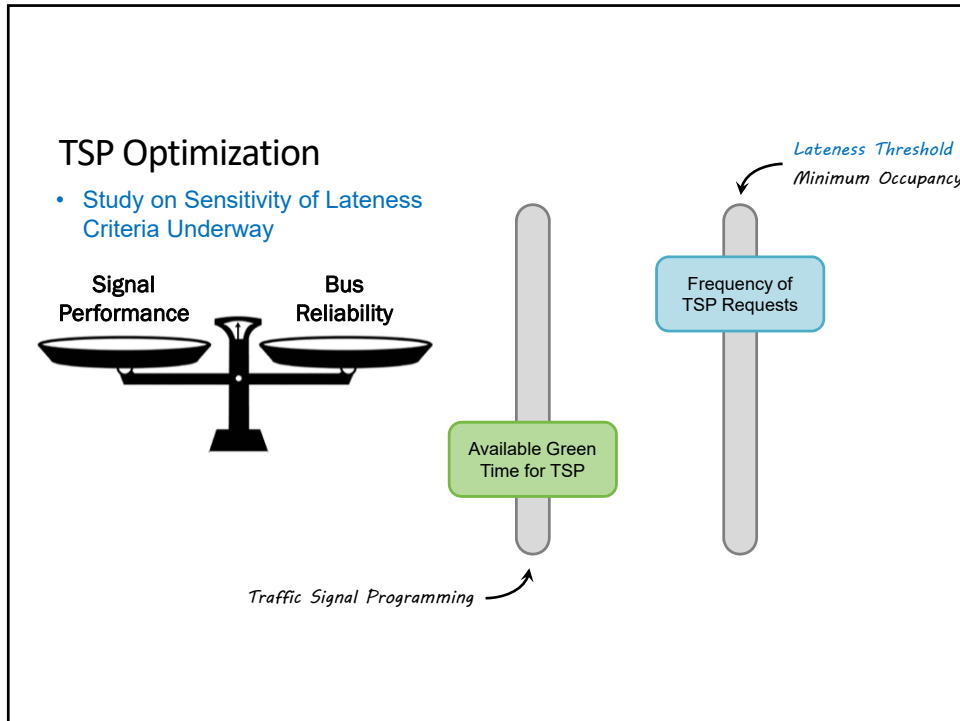


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RESULTS

Average Reliability	Southbound PM Peak			Northbound AM Peak		
	No TSP	TSP	Benefit	No TSP	TSP	Benefit
Along Route	85%	91%	+6%	93%	99%	+6%
End of Route	89%	89%	0%	90%	97%	+7%

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Provo-Orem BRT (UVX)

- 10.5-mile arterial corridor
 - Commercial / Retail
 - Residential
 - Two large universities
- DSRC on 47 signalized intersections
 - Owned by UDOT and City of Provo
- DSRC on all 25 articulated buses
- Frequent service during peaks
 - (6-min headways)
- Operational December 2018
- Study of effectiveness Fall 2019

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Connected Vehicle Snow Plow Pre-emption Project

- Snow Plow Pre-emption Project
 - Salt Lake Valley – 5 corridors
 - 55 Additional Intersections
 - 46 Snow Plows
 - Operational March 2019
 - Currently developing metrics



Next Strategic Initiatives TWG Webinar

- this group:
 - July 25th, 2019 2:00 PM Eastern