



THEA CV PILOT – PREPARING FOR CV IN COMMUNITIES

FAV Summit : **BRINGING CONNECTED VEHICLES TO YOUR TOWN**

Walk. Ride. Drive. *Smarter.*



CAN A LOCAL AGENCY PREPARE FOR PARADIGM SHIFTING TECHNOLOGY?



- “Contract for CUTR study “Tampa Bay: An Automated Vehicle Catalyst?” (THEA Board action 6/24/13)
- THEA hosted multiple AV/CV Summits in Florida & to support the State’s initiatives
- Participating in FDOT’s Statewide initiative by being on working group, bring local and tolling perspective
- Actively marketed Test Bed
 - Audi was the first to test in Florida on facility the week of July 21, 2014
- USDOT CV Pilot
 - THEA lead the Tampa CV Pilot and paid all local matches to bring this technology to Tampa.
 - Created a public/private partnership team on US DOT Pilot Deployment
- Next Steps – How do we create transportation solutions?

LOCAL AGENCIES CAN LEAD INITIATIVES THAT BENEFIT CUSTOMERS, CONSISTENT WITH NATIONAL AND STATEWIDE INITIATIVES.

THEA STRATEGIC OVERVIEW

Mission

Our mission is to provide safe, reliable, and financially-sustainable transportation services to the Tampa Bay region while reinvesting customer-based revenues back into the community.

Vision

Our vision is to lead, partner, and implement safe, economically-sound, and innovative multi-modal transportation solutions for our Tampa Bay community.

Provide THEA customers with the safest, most efficient drive possible.

Advance Mobility Technology

Promote Tampa Bay



COMPARTMENTED STUDY AREAS - THEA PILOT DEPLOYMENT AREA



SOLVING REAL PROBLEMS – PILOT DEPLOYMENT ISSUES AND APPLICATIONS

RELATIONSHIPS

LOCATION

TRAFFIC STUDIES

USE CASE/NEED

PRIVATE SECTOR
INPUT

CV APPLICATIONS

REL at Twiggs Street

MORNING BACKUPS

V2V SAFETY
EEBL and FCW

Twiggs Street - Courthouse

PEDESTRIAN CONFLICTS
PEDESTRIAN SAFETY

V2V SAFETY
Vehicle Turning in Front of Bus

REL at Twiggs Street

WRONG WAY ENTRIES

V2I SAFETY
Pedestrian in Signalized X-
walk

Meridian Avenue

TRAFFIC PROGRESSION

V2I SAFETY
Mobile Accessible Pedestrian
Signal PED-SIG

BRT-REL to Marion Street

BRT OPTIMIZATION
TRIP TIMES
SAFETY

V2I SAFETY
IMA

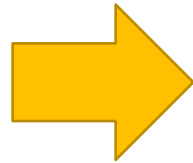
Channelside

STREETCAR/AUTO/PED/
BIKE CONFLICTS

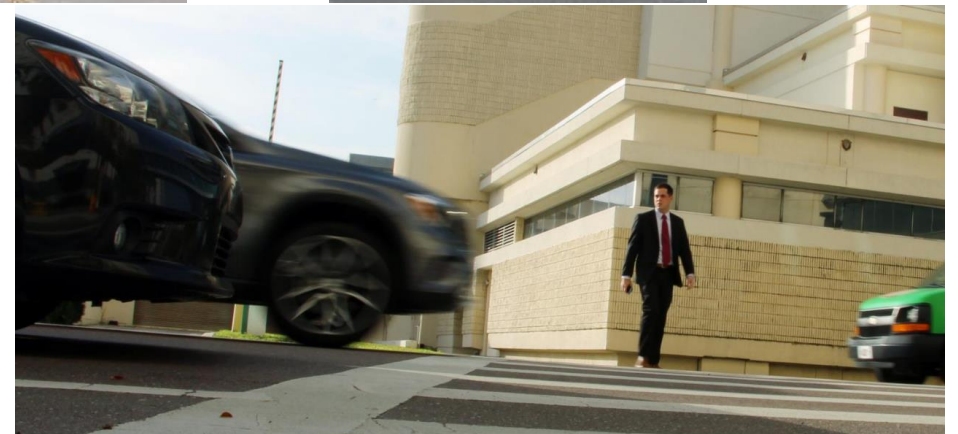
V2I SAFETY
End of Ramp Deceleration

MOBILITY
I-Sig

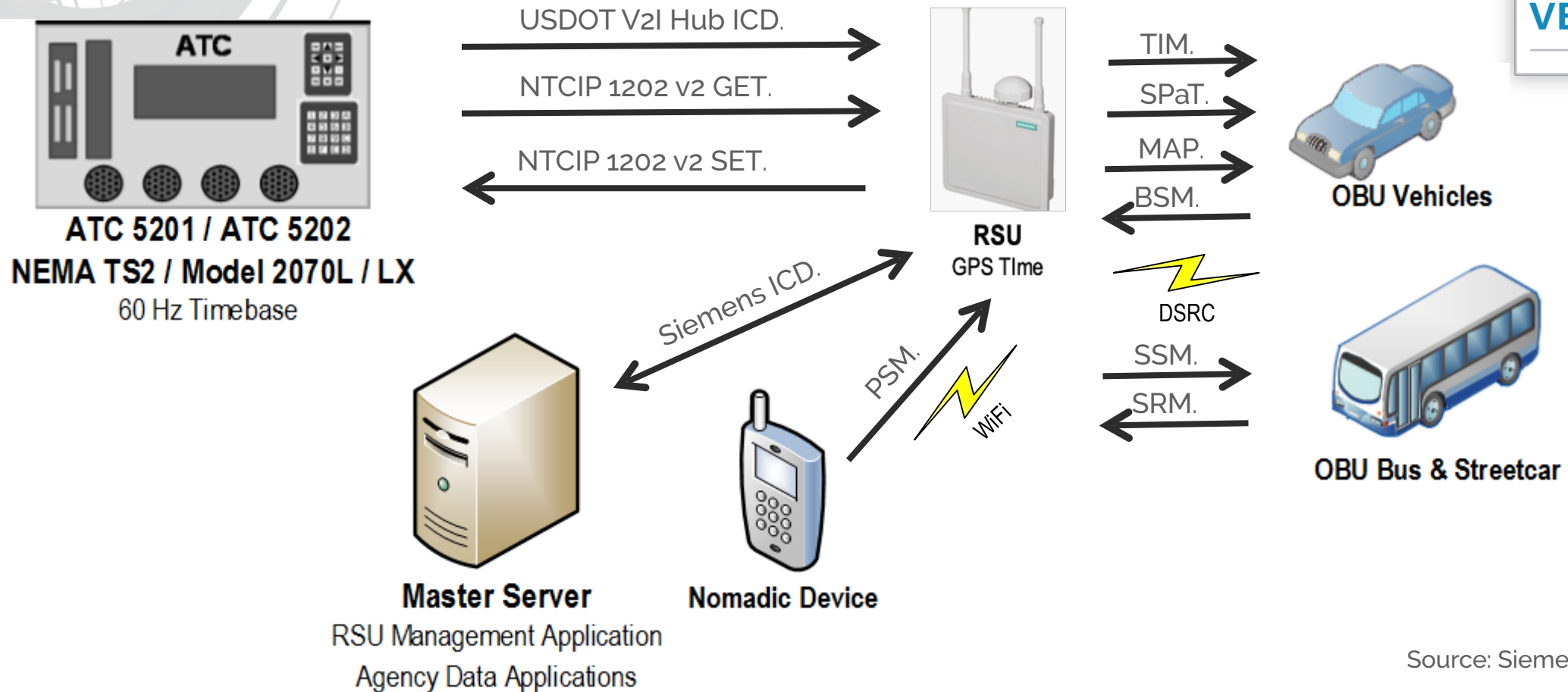
MOBILITY
TSP



FOCUS ON WHAT WE CAN CONTROL – INFRASTRUCTURE, PUBLIC TRANSPORTATION, SAFETY

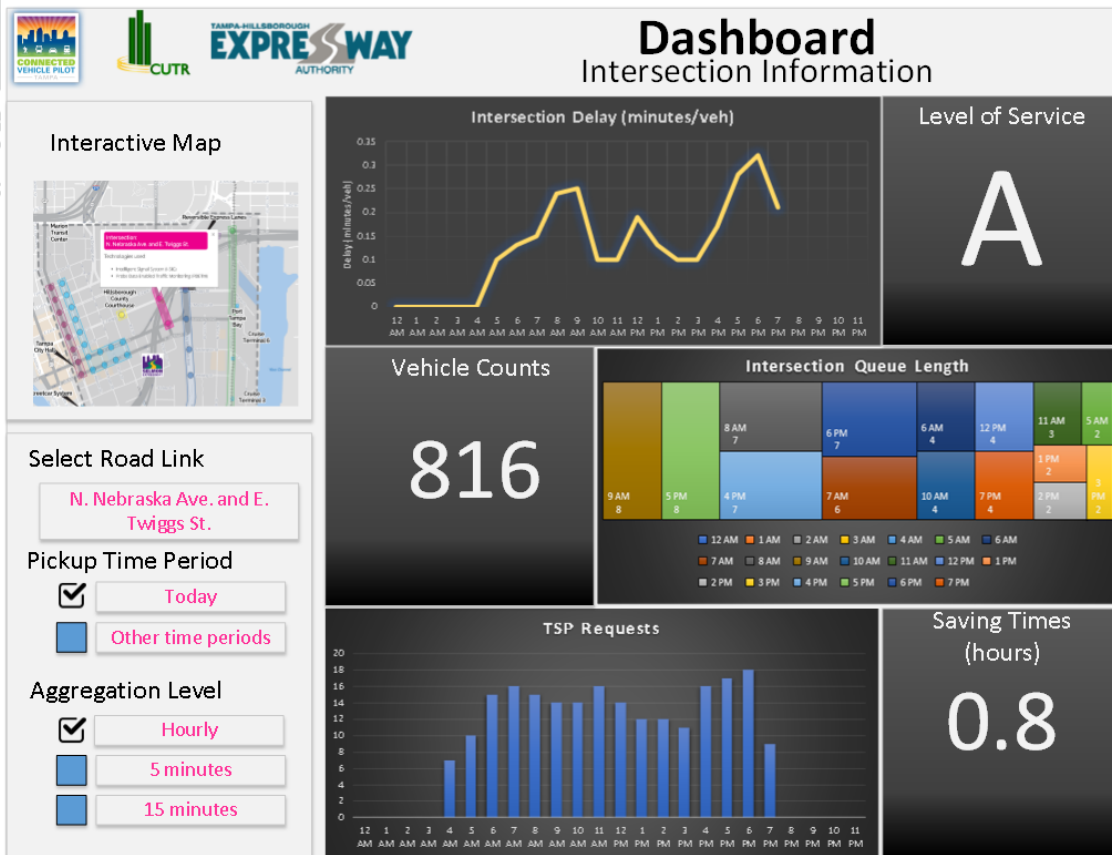


OPPORTUNITIES – ROLE OF INTEROPERABILITY



Source: Siemens Industry Inc.

STATUS – WHERE ARE WE NOW?

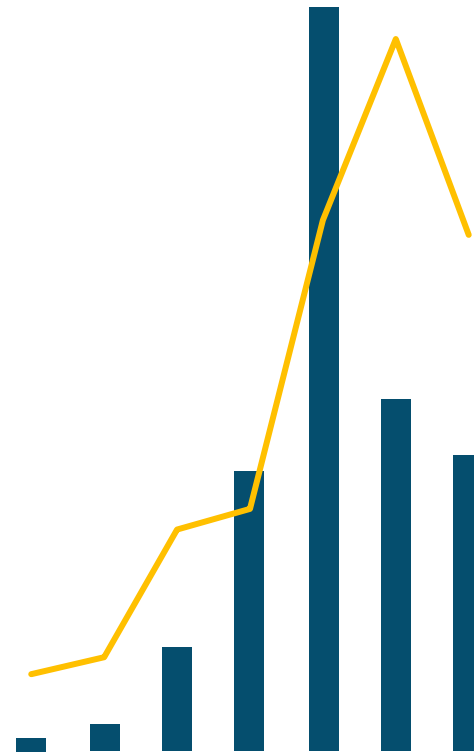


- CV deployment impact on travel will be reported on a Performance Evaluation Dashboard
 - Linked to Tampa CV Pilot website
 - Customizable reporting frequency (daily, weekday, monthly)
 - Downloadable custom queries
 - Performance measures algorithms, analysis tools available to select stakeholders
- Pre-post implementation participant surveys:
 - Overall effectiveness of the CV Pilot
 - Feedback on applications

DATA GENERATION

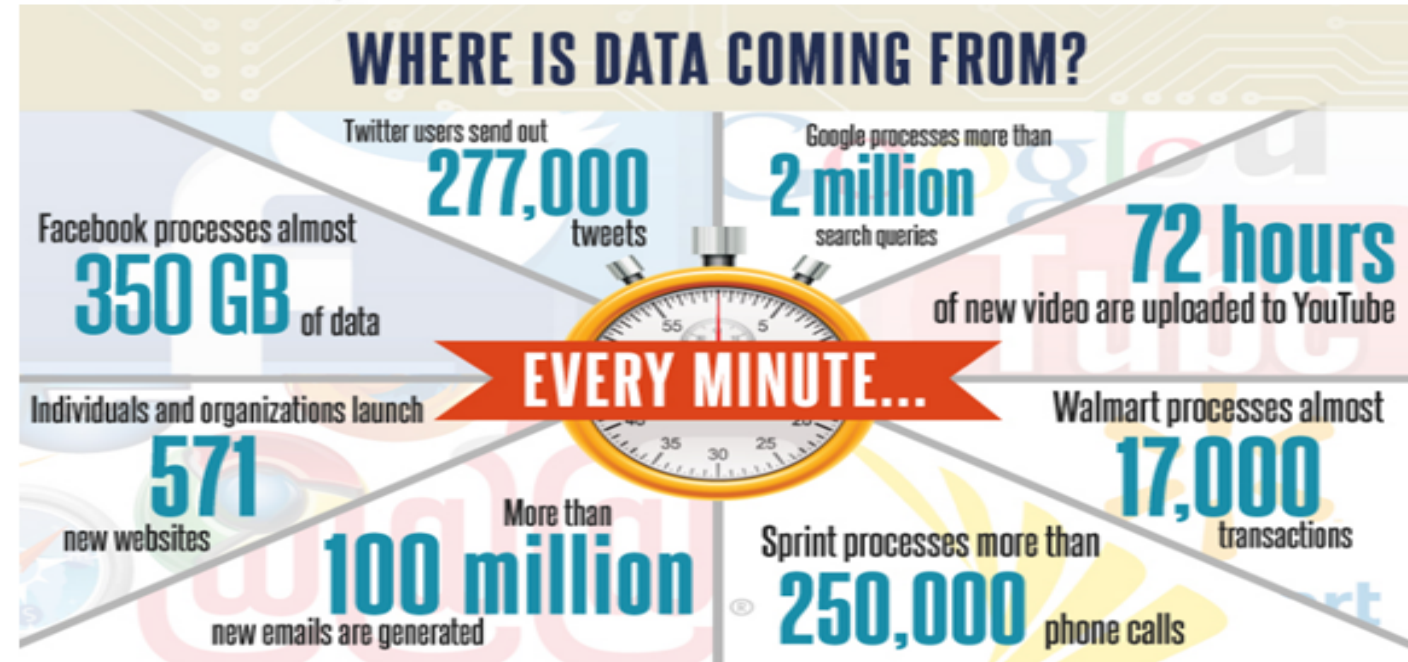


- Data collection Feb – Sep 23, 2018
 - 657 participants
 - 64,430 files
 - 146.8 GB of highly compressed data (uncompressed is 20+ times larger)
- Compiling comprehensive SQL database to process
 - ✓ BSM
 - ✓ SPAT
 - ✓ TIM
 - ✓ SSM
 - ✓ SRM
 - ✓ MMITTS
 - OBU Logs (in process)



Big Data

- 70B connected devices (2050)
- 2.8T sensors by 2019
- Autonomous Vehicles (L2)
80+ processors;
200+ sensors;
100M+ lines of code (GM)



2,500,000,000,000,000,000
2.5 Quintillion bytes EVERY DAY

WHY DSRC CONNECTIVITY? BENEFITS OF CONNECTED VEHICLE COMMUNICATION



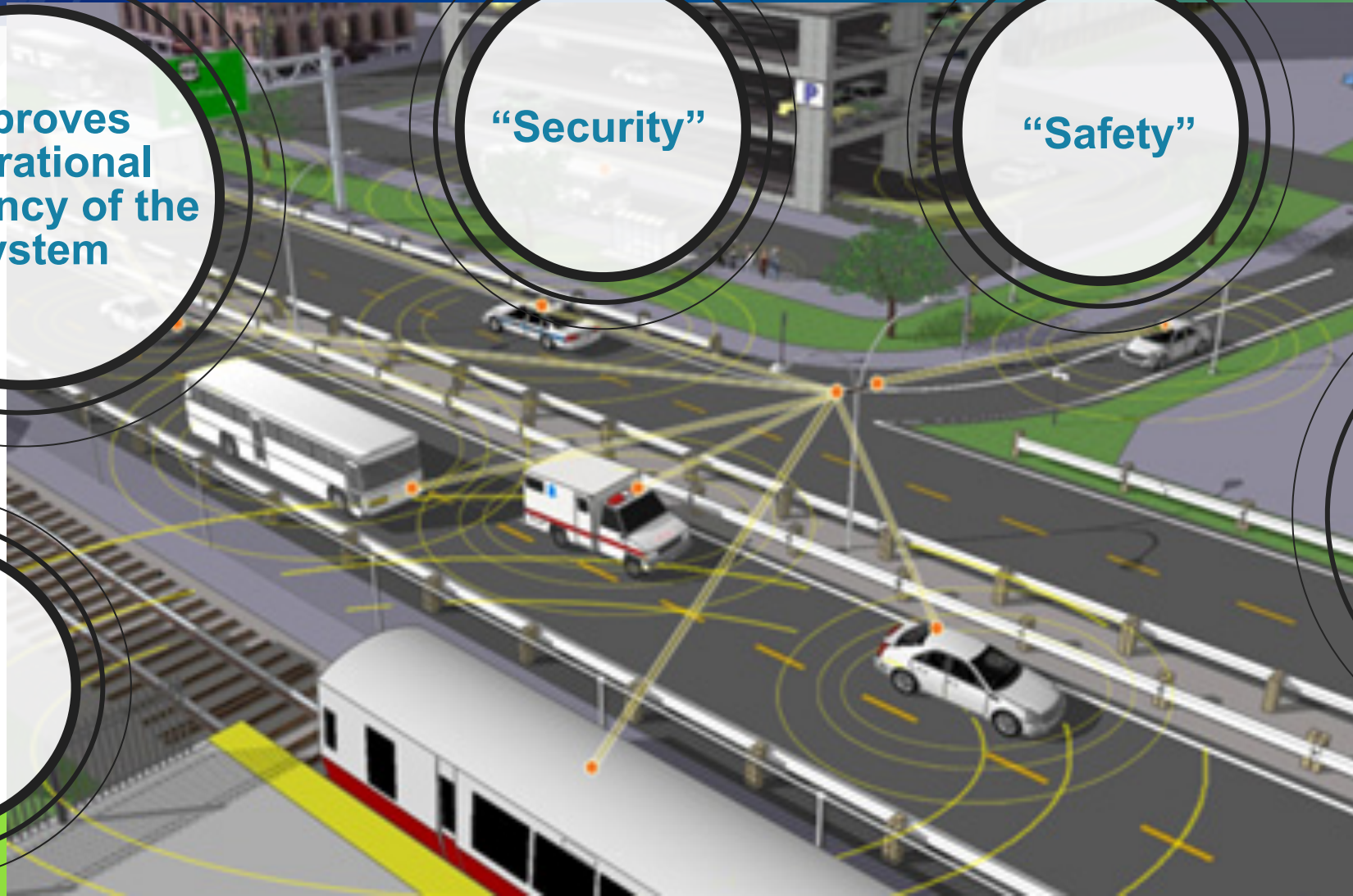
Improves
operational
efficiency of the
system

“Security”

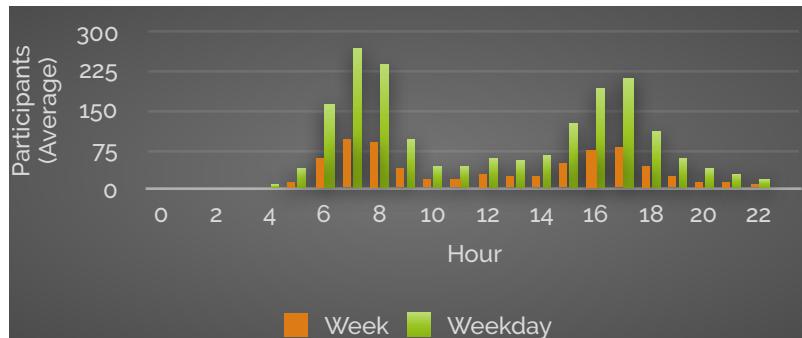
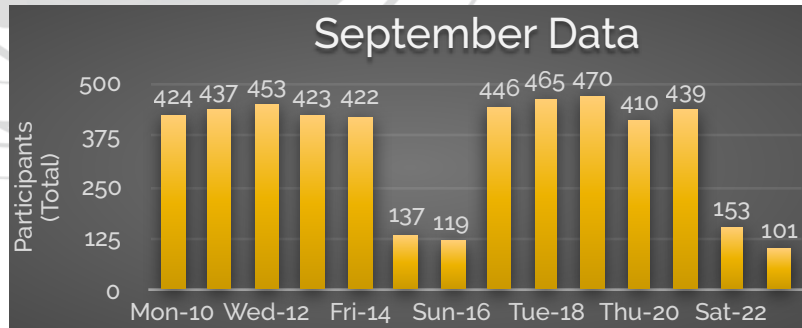
“Safety”

Track
Record

Ability for all
residents to
experience
benefits of
technology...



BENEFITS – TRAVEL DATA

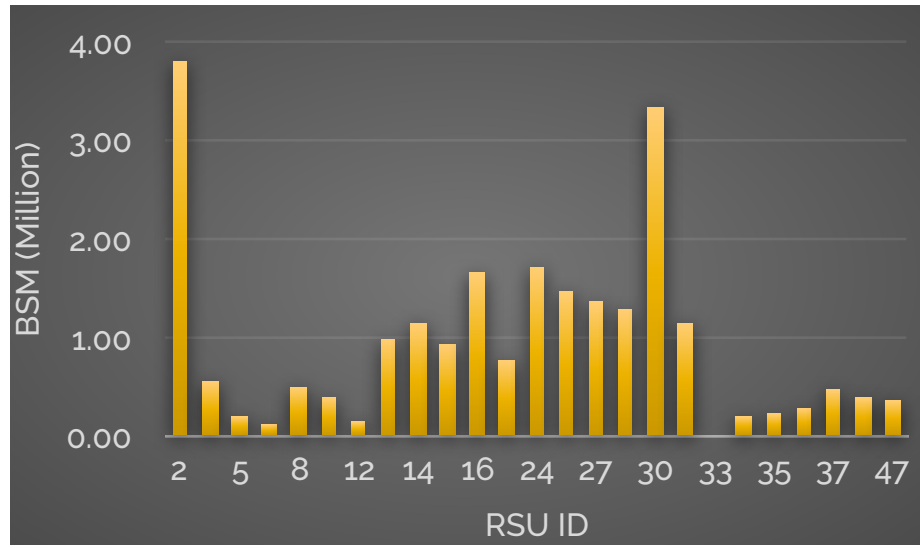


- Average of 1.7 million BSM/day
- About 0.9 million BSM/RSU
- Weekday travel patterns with a.m. and p.m. peak periods
- Up to 270 participants per hour on average at a.m. peak hour

BENEFITS – BSM AND RSU: STUDY AREA



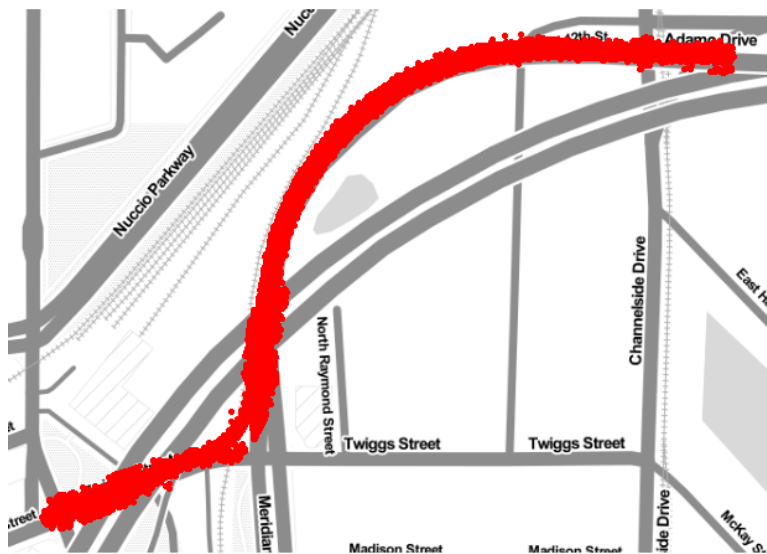
- Some RSU receive more BSM than others
- Coverage of entire study area ensured



BENEFITS – BSM AND MOBILITY

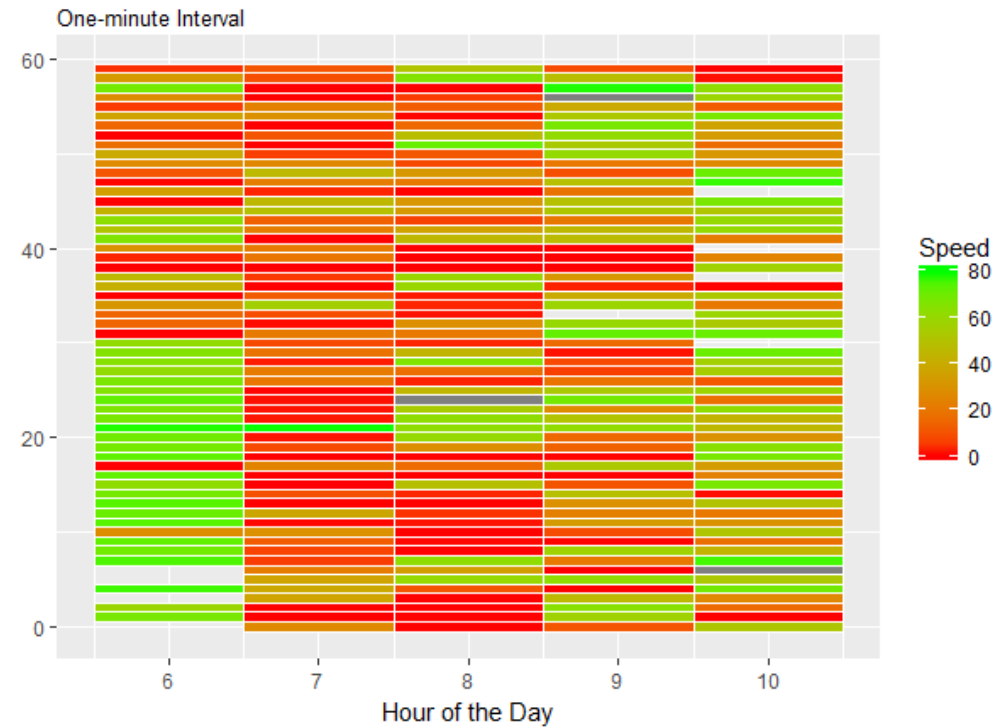


- RSU collected BSM allow generating mobility performance measures by Use Case
- Cluster analysis of events to spot areas prone to accidents



BSM Density

Time-Series Heatmap



WHAT WE KNOW NOW -

- Solidified Standards Earlier
- Obtain a Better Understanding of “Available” Applications' Maturity
- Obtain a Better Understanding of Vendors' Depth and Resources
- Device Certification Process From Vendors
- Complete Integration Testing Before Private Vehicle Installs Begin
- Identify the Need to Use Traditional ITS Devices as Part of Solution Earlier
- Contracting – Fixed Fee and “Experimental Sole Source” way to go
- Cross functional coordination is absolutely critical
- Importance of face to face progress meetings
- OBUS - DON'T DO IT!!! Hire auto professionals to manage!





**CONNECTED
VEHICLE PILOT**
— TAMPA —



U.S. Department of Transportation

