

Center for Urban Transportation Research (CUTR)

CUTR Board Room

February 8, 2022 | 1:00pm – 3:00pm

§334.065, Florida Statutes – Center for Urban Transportation Research

- 1) *There is established at the University of South Florida the Florida Center for Urban Transportation Research*
- 2) *The center shall be a continuing resource for the Legislature, the Department of Transportation, local governments, the nation's metropolitan regions, and the private sector in the area of urban transportation research*
- 3) *An advisory board shall be created to periodically and objectively review and advise the center concerning its research program*

Board Members:

- Ysela Llort, Chair, CUTR Advisory Board and Principal, Renaissance Planning Group, Inc.
- Jon Martz, Vice Chair, Director of Government and Public Affairs, Enterprise Holdings Company
- Kimberlee DeBosier, Director of Operations, WGI, Inc.
- Jean W. Duncan, Administrator of Infrastructure and Mobility, City of Tampa
- Dane Eagle, Secretary, Florida Department of Economic Opportunity (FDEO) / Scott Rogers
- Sonny Holtzman, Principal, The Holtzman Group
- Ram Kancharla, Vice President Planning and Development, Port Tampa Bay
- Vacant, Member, Florida Transportation Commission (FTC)
- Kevin J. Thibault, Secretary, Florida Department of Transportation (FDOT) / Brad Thoburn, Assistant Secretary
- Shawn Hamilton, Secretary, Florida Department of Environmental Protection (FDEP) / Chris Shahl
- Joseph Waggoner, Former Executive Director, Tampa Hillsborough Expressway Authority (THEA)
- Thornton J. Williams, Managing Partner, Williams Law Group, P.A.

Ex Officio Members:

- Lisa Bacot, Executive Director, Florida Public Transportation Association (FPTA)
- Ralph Yoder, Executive Director, FTC

CUTR Leadership:

- Fred Mannering, Ph.D., CUTR Executive Director
- Lisa Staes, CUTR Associate Director
- CUTR Program Directors

Agenda:

Welcome and Introductions

- Chair, Ysela Llort

Topic #1: Approval of Minutes CUTR (Appendix A)

(5 minutes)

- Chair, Ysela Llort

Topic #2: FDOT Update

(10 minutes)

- District 7 Secretary, David Gwynn, P.E.

Topic #3: CUTR Updates

- Executive Director
- Associate Director Activities
- NICR Updates

(15 minutes)

- Fred Mannering, Ph.D., CUTR Executive Director
- Lisa Staes, CUTR Associate Director
- Xiaopeng Li, Ph.D., NICR Director

Topic #4: CUTR at TRB

(10 minutes)

- Lisa Staes

Topic #5: CUTR TRB Presentations – Part 1

- A Longitudinal Study of the COVID-19 Pandemic Impact on Activity Travel Using Connected Vehicle Data
- Securely Sharing and Visualizing Connected Vehicle Analytics: THEA CV Pilot Performance Evaluation Dashboard

(35 minutes)

- Sisinnio Concas, Ph.D.
- Vishal Kummetha, Ph.D. Postdoctoral Scholar
- Omkar Dokur, Ph.D. Candidate

BREAK

(5 minutes)

Topic #6: CUTR TRB Presentations – Part 2

- Evaluation of Dynamic Envelope Pavement Marking to Improve Motorist Stopping Behaviors at Highway-Rail Crossings

(20 minutes)

- Pei-Sung Lin, Ph.D.

Topic #7: 2022 Florida's Transportation Hall of Fame Awardee

(10 minutes)

- Chair, Ysela Llort
- Jon Martz, Committee Chair

Topic #8: CUTR Advisory Board Officer Selection – Nominating Committee Appointments

(5 minutes)

- Chair, Ysela Llort

Topic #9: CUTR Advisory Board Business

- CUTR Advisory Board Officer Selection – Nominating Committee
- Other CUTR Business

(5 minutes)

- Chair, Ysela Llort
- Members

Adjourn

CUTR Advisory Board Meeting

Tuesday, February 8, 2022 | 1:00 – 3:00pm

CUTR Board Room
(and Microsoft Teams)

Agenda

- Welcome and Introductions
- Approval of Minutes
- FDOT Update
- CUTR Updates
- CUTR at TRB
- CUTR TRB Presentations – Part 1
- Break
- CUTR TRB Presentations – Part 2
- CUTR Annual Award Event/Transportation Hall of Fame Awardee
- CUTR Advisory Board Officer Selection Process
- CUTR Advisory Board Business

Welcome and Introductions

Chair, Ysela Llort

Approval of Minutes



FDOT Update

David Gwynn, P.E., Secretary, FDOT District 7

CUTR Updates

Dr. Fred Mannering, CUTR Executive Director

Lisa Staes, CUTR Associate Director

Dr. Xiaoping Li, NICR Director

CUTR Executive Director Updates

- UTC Recompete
- SB 1160 – UF “CUTR Equivalent”
- College of Engineering Budget Updates
- Journal of Public Transportation
- Institute of Applied Engineering Updates

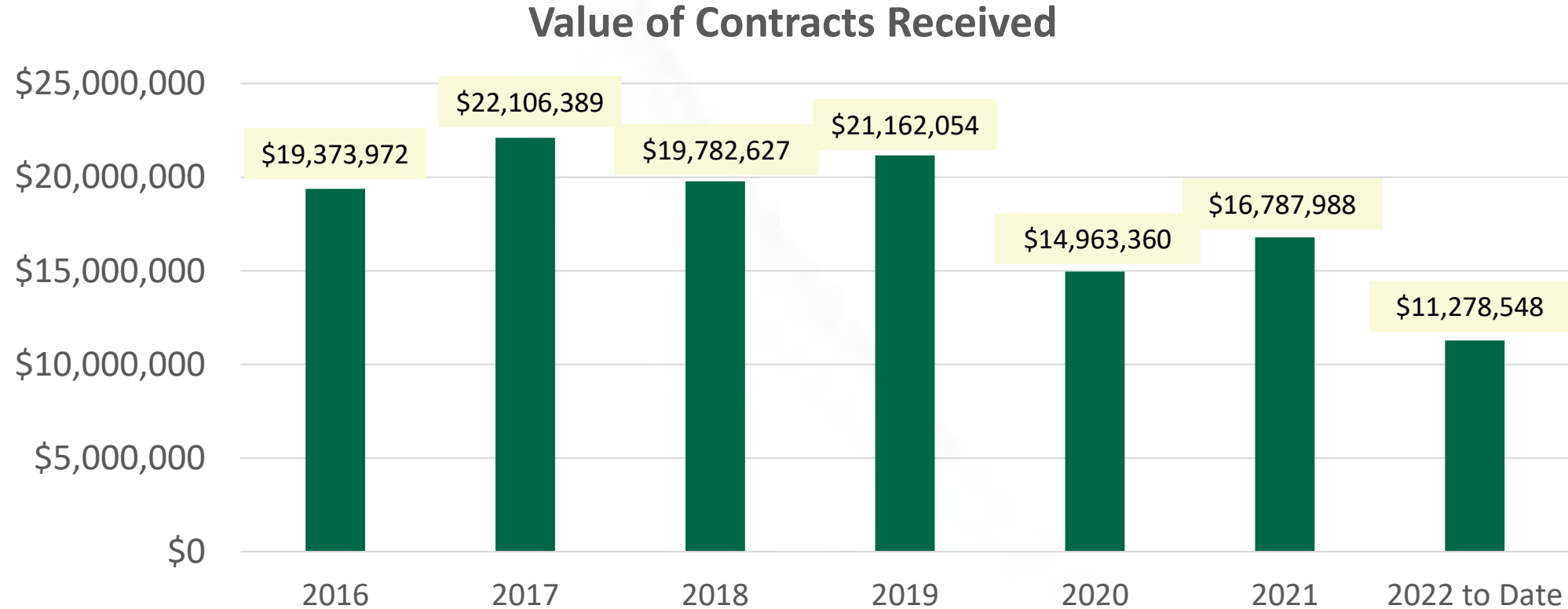
Associate Director Activities

- CUTR Internal Standing Meetings
- Ongoing Sponsored Research and Office of Research and Innovation Meetings/Correspondence
- Transportation Research Board 2022 Annual Meeting
- CUTR/ENSCO TRB Annual Meeting Reception
- TEAM FL Meeting – Orlando
- CUTR Strategic Plan Update – Initial Activities
- Research Project Management Activities
- Business Development Activities

CUTR Budget Update (FY 2016 – 2022)



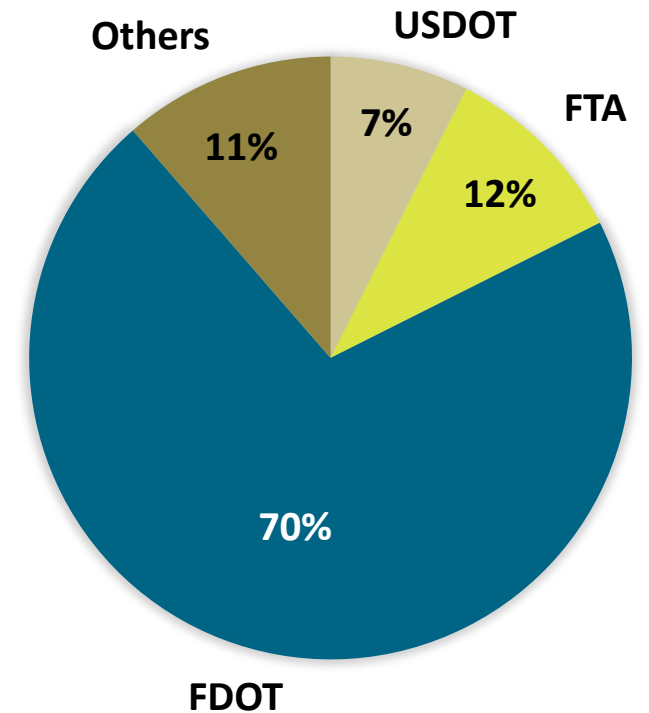
Research Funding (FY 2016 – YTD 2022*)



(*State Fiscal Year – July 1 through June 30)

Award Details (FY 2016 – YTD 2022)

	USDOT	FTA	FDOT	Others	Total
FY 2016	\$1,393,300	\$2,106,835	\$13,892,216	\$1,981,621	\$19,373,972
FY 2017	0	\$3,409,692	\$15,465,523	\$3,231,174	\$22,106,389
FY 2018	0	\$1,283,423	\$16,903,034	\$1,596,169	\$19,782,626
FY 2019	0	\$4,395,344	\$14,835,282	\$1,931,428	\$21,162,054
FY 2020	\$2,609,409	\$843,561	\$9,458,098	\$2,052,292	\$14,963,360
FY 2021	\$2,443,750	\$2,107,672	\$9,853,865	\$2,382,701	\$16,787,988
FY 2022 – Jan 31, 2022	\$2,718,734	\$500,000	\$7,191,528	\$838,286	\$11,278,548
FY 2016 - 2022	\$9,165,193	\$14,646,527	\$87,599,546	\$14,043,671	\$125,454,937



CUTR Update: National Institute for Congestion Reduction (NICR)



UNIVERSITY of
SOUTH FLORIDA

Research Project Update

- Year 3 RFP was sent out on 11/19/2021

Feb 14, 2022	Complete Proposal and Budget Submission Deadline
Feb. 15 – Mar. 4, 2022	Proposal Review, Feedback, and Task Orders Drafted (Short Duration Projects selected and begin)
Mar. 7 – April 1, 2022	Projects Selected; DMP's and T2 Revised Plans Due; Office of Grants Review; Notice of Award Materials Completed
April 4, 2022	Projects Begin
June 30, 2023	Latest date for project completion; Final research reports are due two months before this date.

2021 UTC Student of The Year

Carly Venditti



Texas A&M University

National Institute for Congestion
Reduction (NICR)

C-Venditti@tti.tamu.edu

Bio

Carly Venditti is a second-year Master of Urban Planning student at Texas A&M University, focusing on housing and community development. Her previous professional experience includes time with a community development corporation in Waterbury, Connecticut, as well as a full year of community outreach experience with a regional planning agency in southeastern Massachusetts. Carly aims to work specifically with cities struggling with post-industrial development issues or in an urban policy think-tank setting. In her free time, Carly enjoys bouldering, listening to music, and playing with her dog, Bowie.

Degree and Graduation Date (or Anticipated Date)

M.U.P. (Master of Urban Planning) from Texas A&M University, May 2022

B.A. in Political Science and Hispanic Studies from Wheaton College (MA), May 2020

Preferred Career after Graduation

Carly will seek a career in the public sector.

Broad Research Interest Area

Transportation planning; transportation policy

Specific Research Area

Housing, equity/access

2021 CUTC Awards



- **Brian Staes**, University of South Florida
- Milton Pikarsky Memorial – Masters Thesis “Diagnosis of Freeway Bottlenecks During the Mass Evacuation for Hurricane Irma on Florida’s Turnpike Mainline”

2021 CUTC Awards



- **Qianwen (Cami) Li**, University of South Florid
- Neville A. Parker (MS/ME) – Science & Technology
- Report “Trajectory Planning for Autonomous Modular Vehicle Docking and Autonomous Vehicle Platooning Operations”

Seminars – Webcast Series

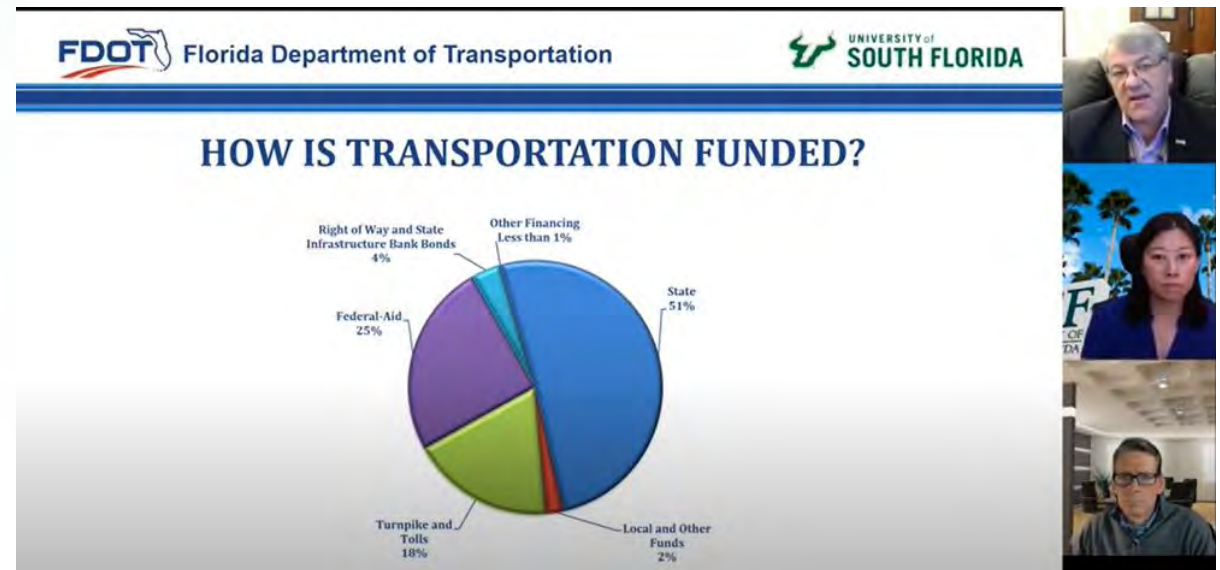
- Thursday 12-1
- 18 webcast series in 2021
- Mostly NICR scholars showcases



<https://nicr.usf.edu/research/nicr-webcast-series/#1607979235477-49c3464a-441b>

Seminars – Friday Graduate Student Seminars

- Friday Transportation Seminar Series (12-1)
- 12 seminars completed in this Fall
- Ms. Jean Duncan on 9/17 (<https://www.cutr.usf.edu/2021/11/125777-3-3-4-6/>)
- Secretary Kevin Thibault 11/12 (<https://www.cutr.usf.edu/2021/11/125777-3-3-4-6/>)



NICR I-Corps Fall 2021 Workshop

- Held NICR Innovation Corps (I-Corps) Fall workshop for NICR faculty and students in Sept/Oct 2021
 - Patterned after NSF I-Corps - https://www.nsf.gov/news/special_reports/i-corps/
- Focused on “customer” needs via interviews with real-world stakeholders
- Ensures the results of research are transferrable to real-world via rapid iteration on ideas
 - Helps avoid “Valley of Death” for research
- 3 sessions approx. 2 hours each, plus interviews with project stakeholders in between
- Overall positive feedback:
 - *“I found the act of interviewing over multiple weeks extremely valuable, both in gaining increased comfort with the method, and using it as a tool for customer discovery. I now see how important it is”*

Tampa Bay Citizens Academy on Transportation

Proposed Solution

Initial solutions

- Identify all sidewalks in LMA eligible areas for CDBG funding

Preferred solutions

- Use funding uniquely available to East Tampa CRA for Planned and Requested sidewalks
 - Partner w/Housing & Community Development for CDBG funding to address High Priority Gaps
 - Use CRA funds to build "Requested" network
- Add 0.3 mi of Planned improvements to East Tampa to achieve 0.1% (0.36 mi total) of Planned Infrastructure improvements to align with planned sidewalks in the City overall
- Present the "request sidewalks" form at CRA Meeting to build a grassroots effort to address priorities
- GIS Dept. should update the sidewalks layer with "crosswalks" for more accurate analysis



Transportation Matters: Making Transit Better for Children & Families in Tampa Bay

Nicole M. Sutton, MPH, CPH, CHES
Florida Department of Health

Tewabech Genet Stewart, MS
Children's Board of Hillsborough County

December 08, 2023

Riya Jose Morales



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TRB Reception

- Featured with student posters and engagement with industry professionals



UTC Re-Competition

- Extension – Unlikely 😞
- RETRC Letter to OSTR requesting allowing NICR to compete even if the extension is granted
- UTC TRB Meeting
 - NOFO of the re-competition is in progress
 - One university can lead multiple proposals for National, Regional and Tier 1 UTCs, no more than one will be funded
- Letters of support in due course

Summary of IIJA Funding Opportunities

- <https://www.cantwell.senate.gov/imo/media/doc/Infrastructure%20Investment%20and%20Jobs%20Act%20-%20Section%20by%20Section%20Summary.pdf>
 - UTC program received \$95 million
 - FTA research funds increased 38% and FTA can depend on the fund (not separate appropriation) Nearly \$40 billion for transit infrastructure
 - USDOT has over \$100 million in new discretionary funds for research
 - ...

Thanks to NICR Staff



KRISTINE WILLIAMS, AICP
NICR Senior Program Manager
University of South Florida



SEAN BARBEAU, Ph.D.
Principal Mobile Software Architect for
USF Associate Director Technology Transfer
University of South Florida



PHILIP L. WINTERS
USF NICR Tech Transfer Assistant Director
University of South Florida



CHRISTINA VAN ALLEN
NICR Communications Officer
University of South Florida



REENA RATURI
NICR Fiscal Manager
University of South Florida



TAYLOR DINEHART
Graduate Student Researcher
University of South Florida

<https://nicr.usf.edu/>



Xiaopeng Li, Ph.D.
xiaopengli@usf.edu



CUTR at the TRB Annual Meeting

Lisa Staes, Associate Director

2021 CUTR Involvement



- **3** Standing Committee Chairs



- **2** Emeritus Committee Members



- **10** Presiding events



- **2** Lecterns



- **1** Workshop



- **5** Papers (under review or published)



- **4** Awards (includes UTC awards)



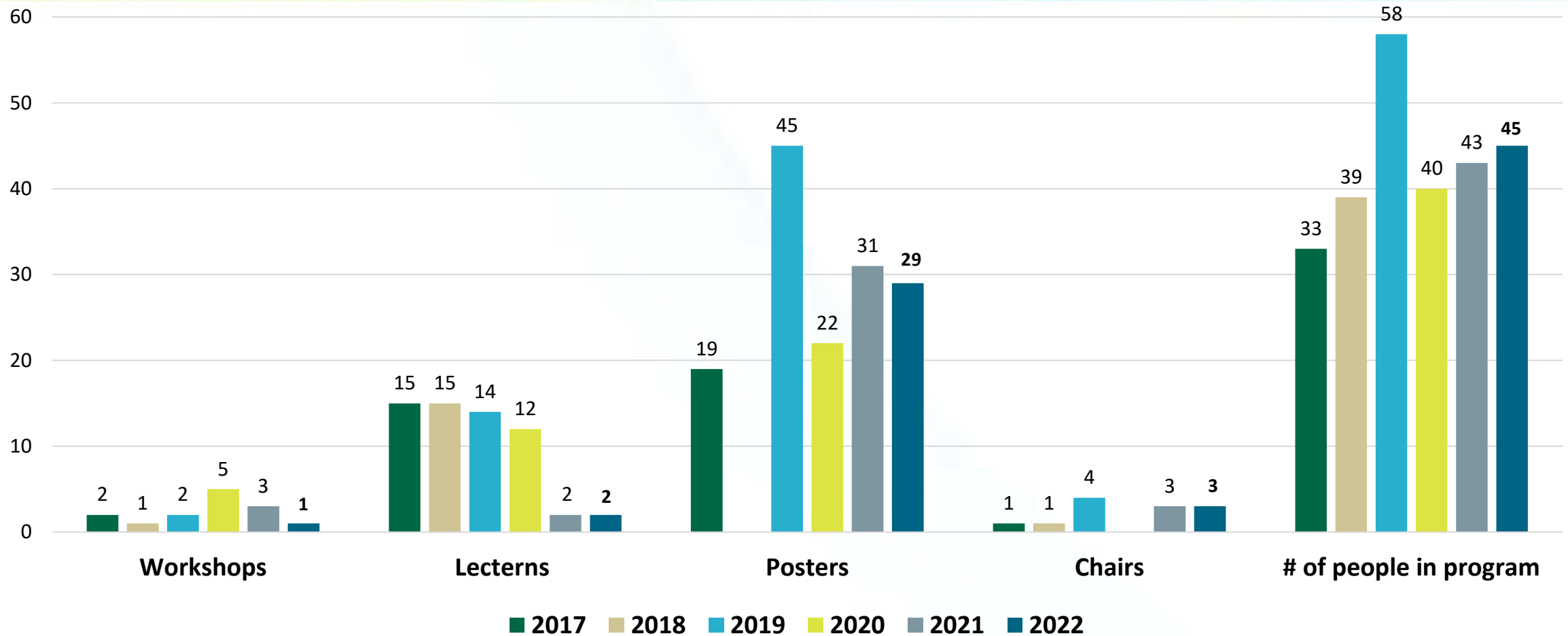
- **29** Poster Presentations



- **45** CUTR-ites in Program



2017-2022: CUTR at TRB



Awards

Zhiwei Chen, Ph.D.

Chinese Overseas Transportation Association (COTA) Best Dissertation Award– Science & Technology Award

“Designing Next-Generation Transportation Systems with Emerging Vehicle Technologies”

- Awarded to outstanding Chinese doctoral student for academic accomplishments during their doctoral studies



Awards

Brian Staes (OSU), Robert Bertini, Ph.D. (OSU), Nikhil Menon, Ph.D. (PSU), Eren Yuksel, Ph.D. (c)

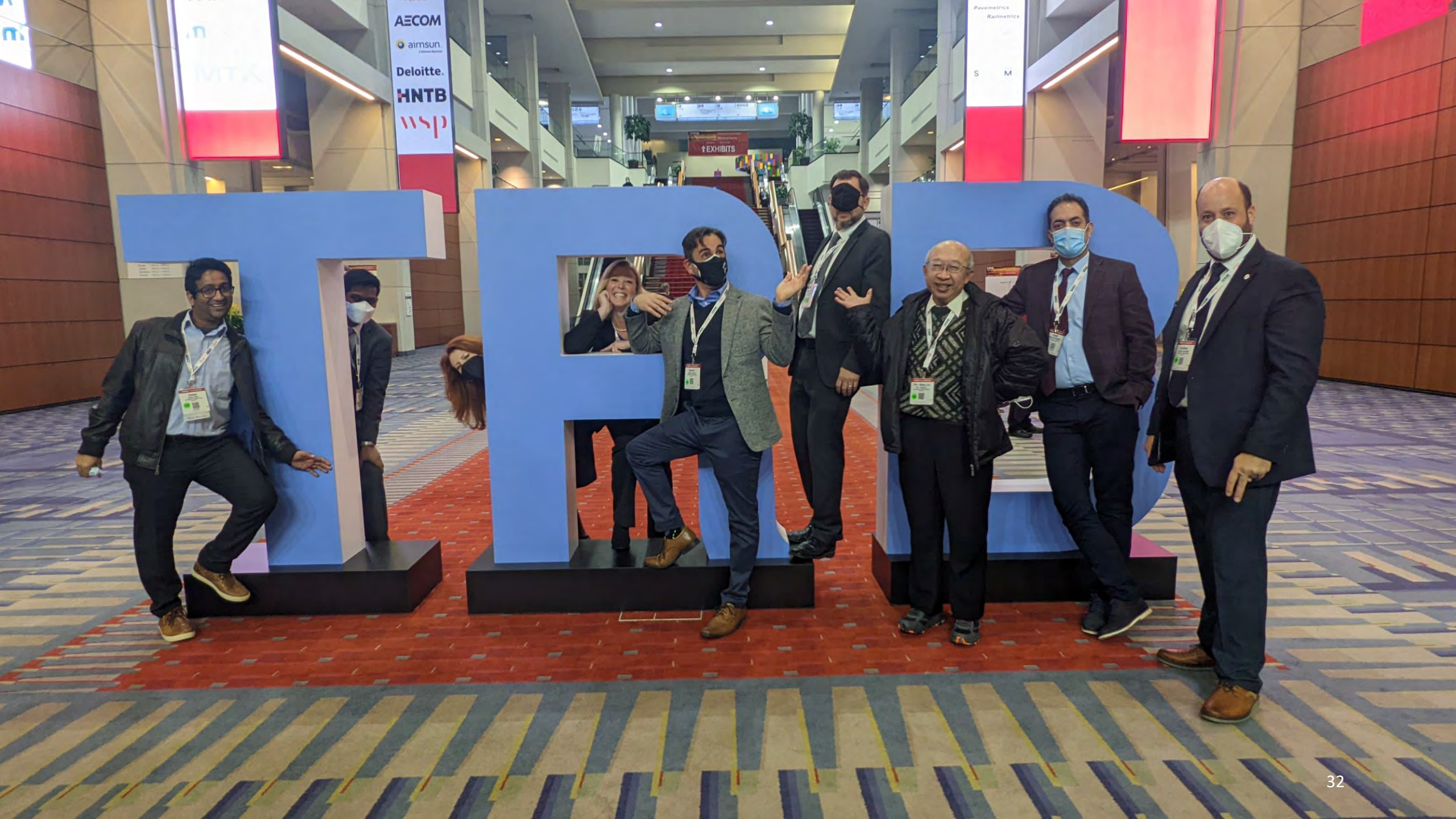
*2021 Young First Author Best Paper Awards –
Operations Section*

*“Examining Freeway Bottleneck Features During a
Mass Evacuation”*



CUTR/ENSCO/NICR TRB Reception





CUTR TRB Presentations

Introduction – Dr. Sisinnio Concas, Program Director – Autonomous-Connected Mobility Evaluation

- “A Longitudinal Study of the COVID-19 Pandemic Impact on Activity Travel Using Connected Vehicle Data” – Presenter: Dr. Vishal Kummetha, Postdoctoral Scholar
- “Securely Sharing and Visualizing Connected Vehicle Analytics: THEA CV Pilot Performance Evaluation Dashboard” – Presenter: Omkar Dokur, Ph.D. Candidate, COE

A Longitudinal Study of the COVID-19 Pandemic Impact on Activity Travel Using Connected Vehicle Data

Presented by

Vishal Kummetha, Ph.D.

Date: 02/08/2022

Authors:

- Sisinnio Concas, Ph.D. (ACME Program Director)
- Achilles Kourtellis, Ph.D.
- Vishal Kummetha, Ph.D.
- Mohsen Kamrani, Ph.D.
- Maysam Rabbani, Ph.D.
- Omkar Dokur, Ph.D. Candidate



Outline

- Overview
 - Aim
 - Objectives
- Brief Literature Summary
- Florida COVID-19 Timeline
- Methods
- Results
- Conclusions
- Questions?



Up to 1,000
privately owned
vehicles equipped
with onboard units



48 Roadside Units (RSUs)

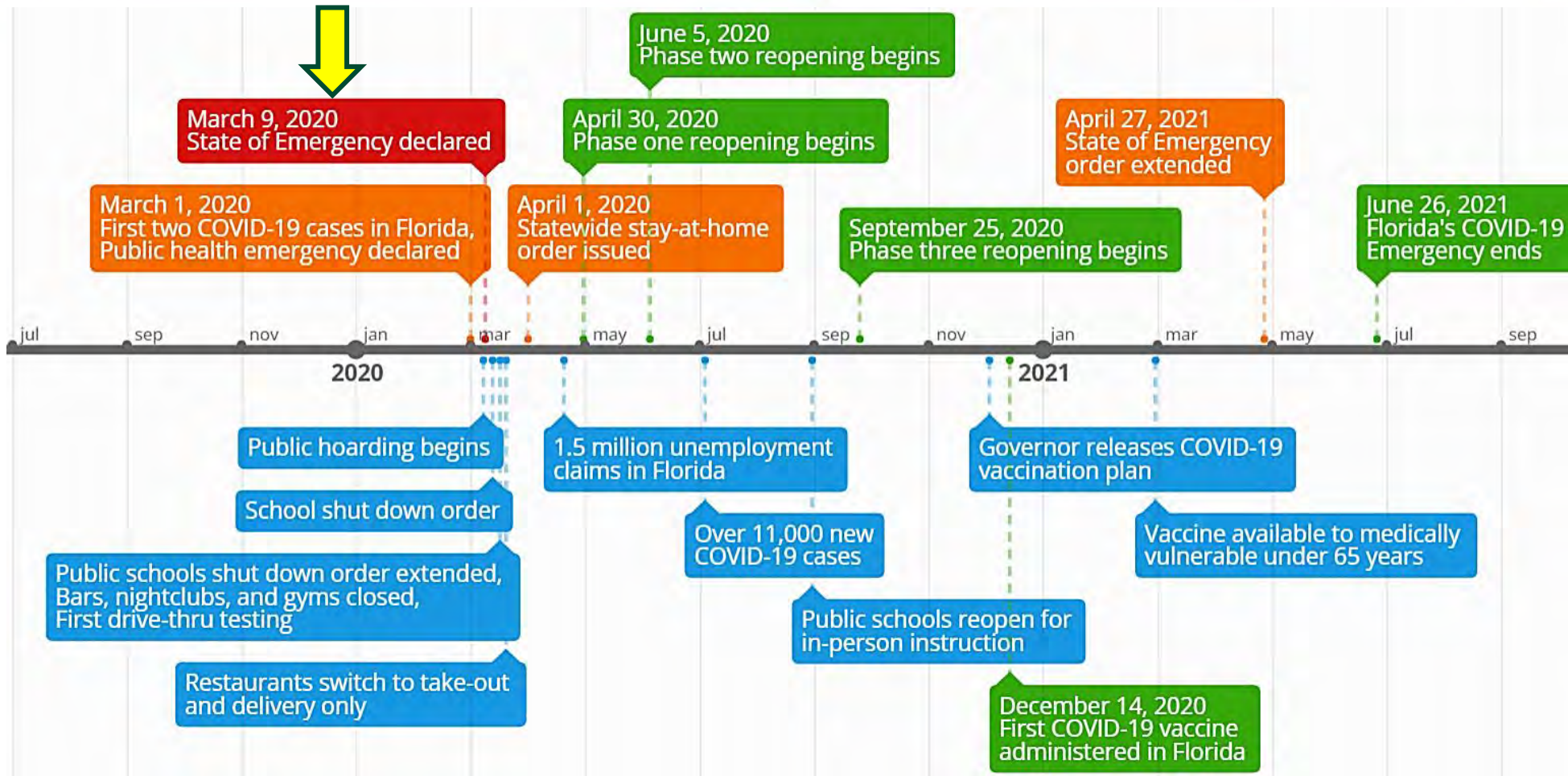
Overview

- As of January 31, 2022, the Centers for Disease Control and Prevention (CDC) reports the following World COVID-19 statistics:
 - 375 million people have been infected.
 - Local and international travel has been disrupted.
 - More than 5.6 million have succumbed.
- This study attempted to understand the short-term implications associated with the measures undertaken to contain the spread of COVID-19 while striving to retain economic activity and stimulate recovery.
- We combine high-frequency Connected Vehicle (CV) and land-use data to produce a comprehensive activity-travel database focusing on:
 - Personal vehicle (PV) trips;
 - Time spent at home; and
 - Spatial dispersion of personal vehicle trips;
 - Vehicle miles traveled (VMT).
 - Time spent traveling and on activities;

Literature Summary

- High-level review of scholarly works showed over 240 travel-related publications, with most being survey-based approaches.
 - Matson et al. (2021): Substantial shifts in travel behavior i.e., increased teleworking, e-shopping, home delivery, leisure trips.
 - Shibayama et al. (2021): Non-essential travel and ride-hailing use declined substantially.
 - Back and Hensher (2020): Overall trips reduced by 54% and Private Vehicle (PV) trips by 53%.
 - De Haas et al. (2020): 80% of respondents reported less activities outside home.
- Anonymized mobile phone and probe vehicle data studies also showed steep decline in activity-travel.

Florida COVID-19 Timeline

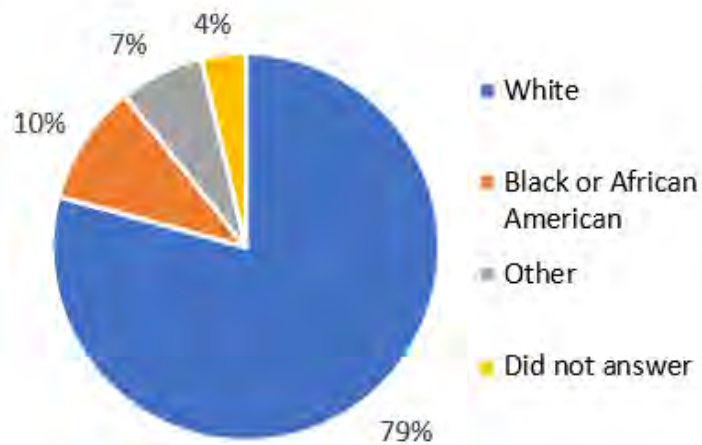


- Florida was one of the first states to experience the initial wave of the pandemic.
- 120 million domestic and international tourists entering the state in 2019

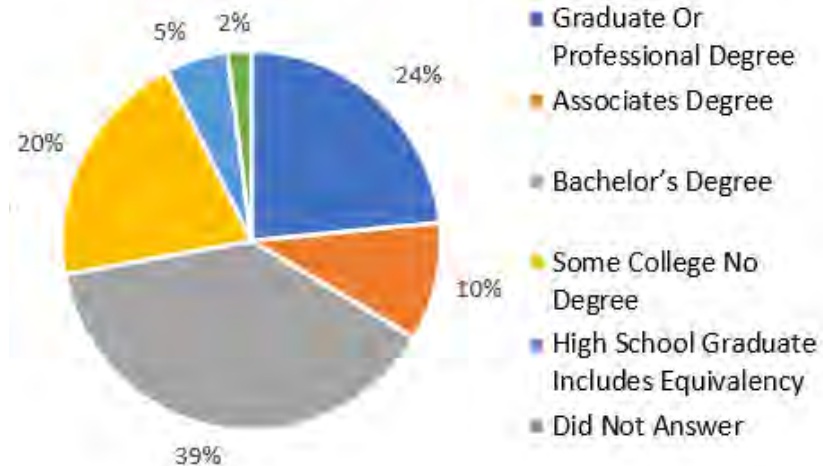
Methods

- Study panel, n = 308 drivers. (Unbalanced panel due to unequal travel days)
 - Mean age 48.5 ± 13.2 years.
 - Females: 46.4%, Males: 53.4%

Race



Education Level



Household Income



Methods

Generation of Activity-Travel Data

BSM Data Processing

Append all transmitted BSMs by each vehicle.

Declare dataset as panel data using:

- Group ID;
- Vehicle ID; and
- time = day

Fuse with Land-Use Database

Utilize county property appraiser data to assign each BSM to either a parcel or road network.

Assign land-use and identify points outside of parcels (i.e., on the road network)

Identify Activities

Adopt a rule-based approach to identify engine state.

Identify major anchors:

- Home;
- Work; and
- Activities lasting more than 3 minutes

Identify instances of:

- speed ≤ 1.5 mph;
- duration ≤ 120 seconds

Classify

Classify activities by type and identify trips between activities.

- School;
- Shopping;
- Medical; and
- Other (all other land-uses)

Generate Activity Dataset

- PV Trips;
- Chained PV Trips;
- Dwell Time;
- Travel time in PV;
- VMT; and
- Activity Space

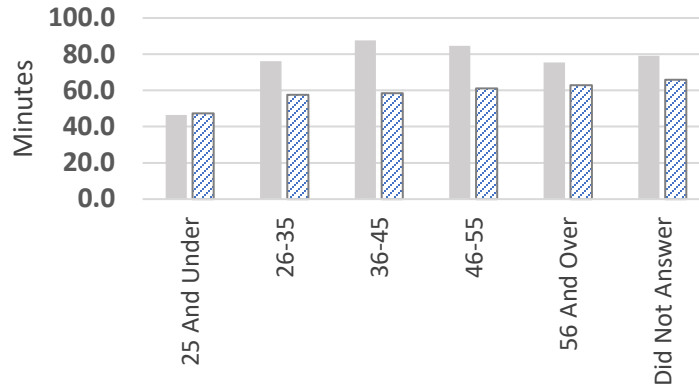
- Short- and long-term personal vehicle (PV) travel behavior of the same individuals is analyzed from Jan 2019 to Jun 2021.
- Ground truth confirmed from 2 research vehicles of Authors.



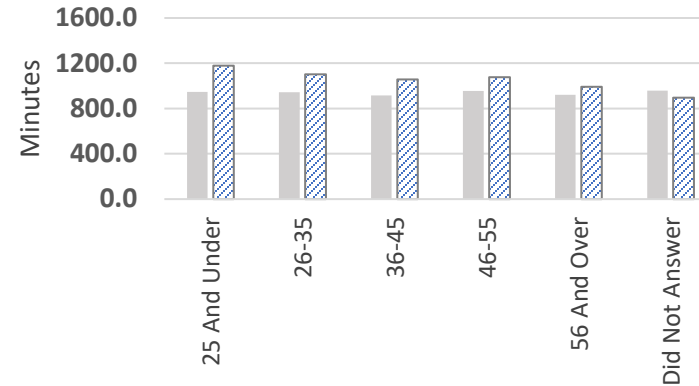
Impact Across Travelers

Age Group

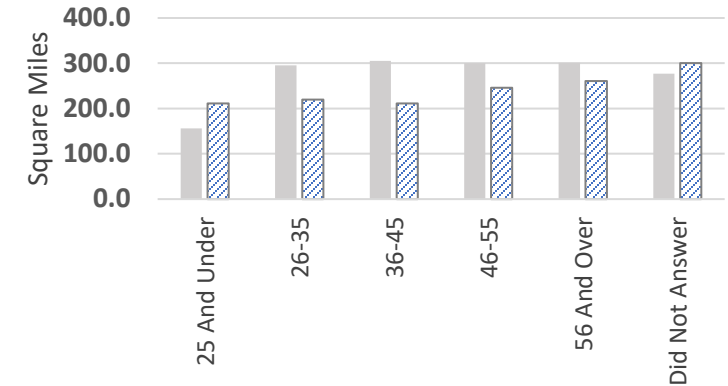
Travel Time in Personal Vehicle



Time at Home

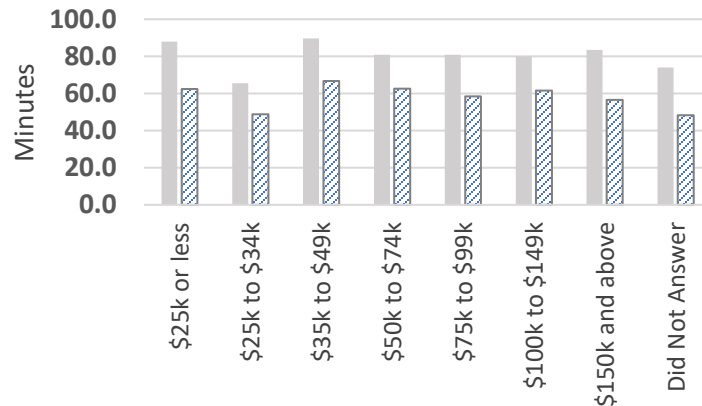


Activity Space

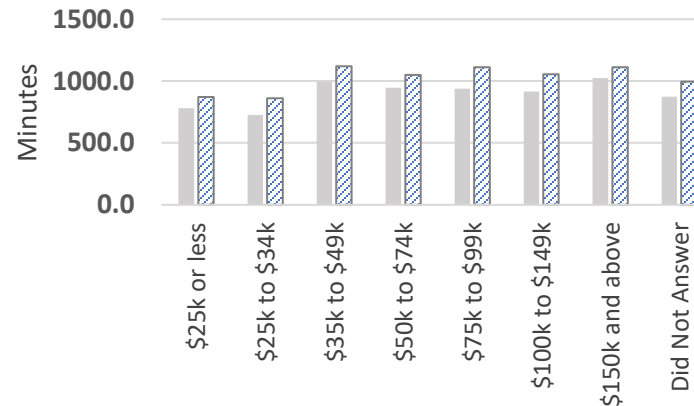


Income

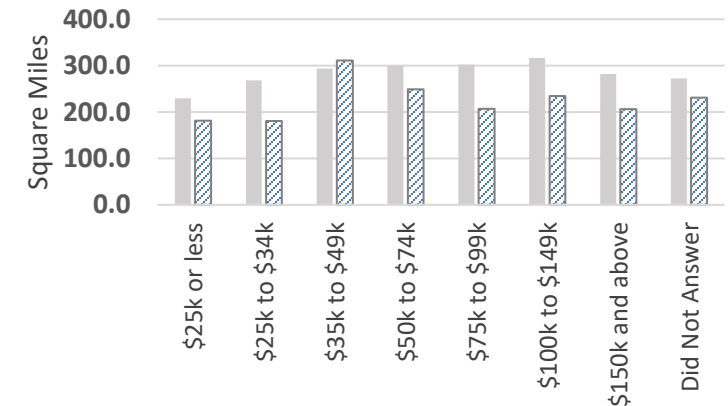
Travel Time in Personal Vehicle



Time at Home

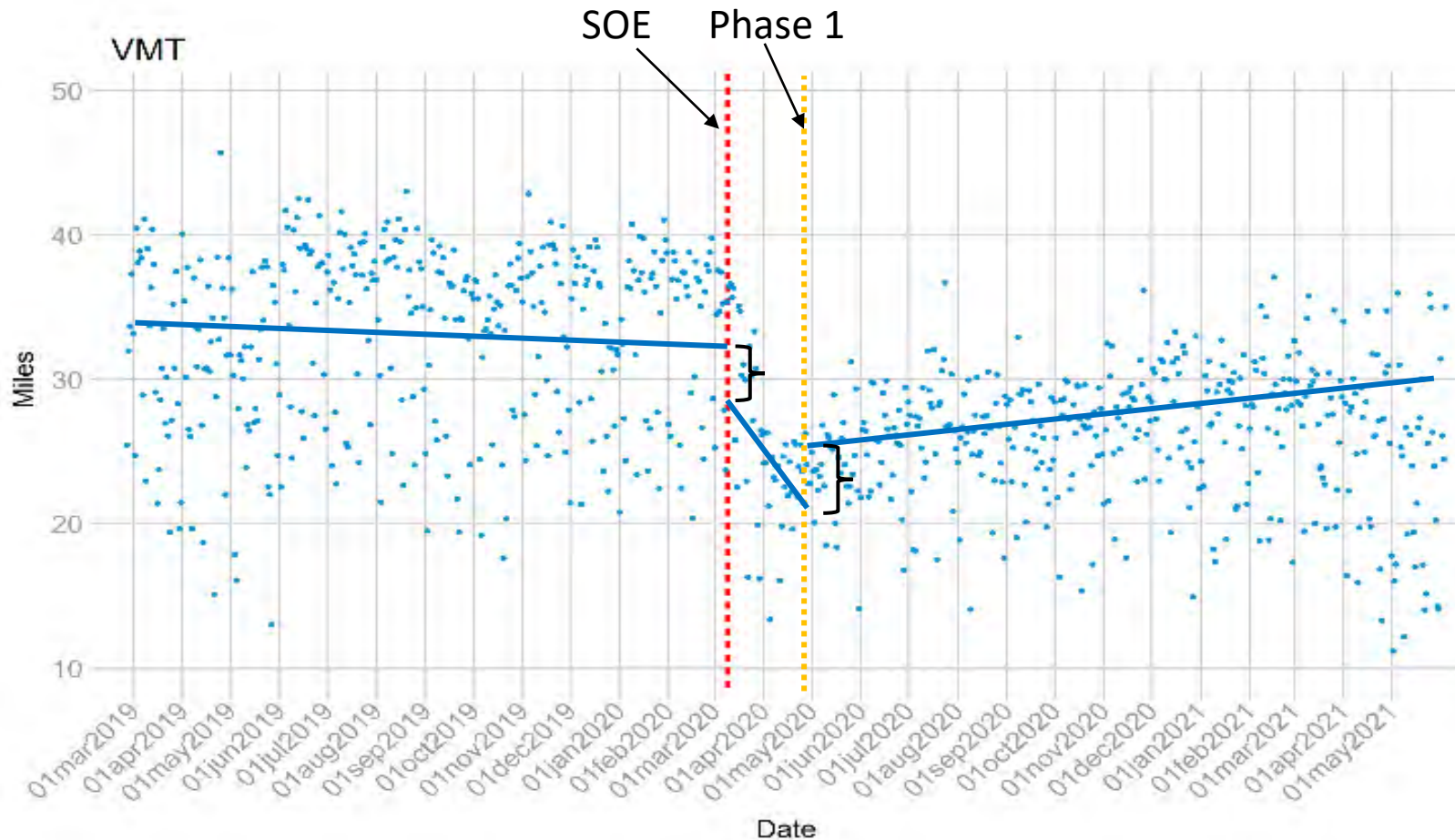


Activity Space



■ Before ■ After

Interrupted Time-Series Analysis (ITSA)



$$Y_{it} = \beta_0 + \beta_1 T_{it} + \beta_2 SOE_{it} + \beta_3 SOE_{it} T_{it} + \beta_4 Phase1_{it} + \beta_5 Phase1_{it} T_{it} + \beta_6 Z_{it} + a_i + \epsilon_{it}$$

Where,

- Y_{it} is the outcome variable observed in day t over the analysis period for each individual i ;
- X_{it} is a dummy indicator representing the beginning of the SOE (pre-pandemic period is 0, otherwise 1);
- T_{it} is time measuring days since the beginning of the analysis period;
- $X_{it}T_{it}$ is an interaction term; Z_{it} is a vector of controls (e.g., weather); and ϵ_{it} is the error term

ITSA Results

Variable	PV Trip Count (1)	PV Travel Time (2)	Time at Home (3)	Activity Space (4)	VMT (5)
Time Trend (T)	0.0000104	0.0141***	0.0519	-0.116***	0.000653
SOE (09 Mar 2020)	-0.0220	-9.268***	22.69**	42.55***	-2.048***
Phase 1 (30 Apr 2020)	-0.0229	8.597***	-52.95***	16.68	3.871***
SOE* T	0.00188***	-0.302***	2.598***	-0.464	-0.148***
Phase 1 * T	-0.00205***	0.311***	-2.772***	0.533*	0.155***
Constant Term	1.663***	50.09***	1187.3***	187.2***	5.773***
Observations	58443	58443	58443	58443	61236
R-squared	0.102	0.359	0.179	0.214	0.463

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Results

Date	Timeline	PV Travel Time (minutes)	Time at Home (minutes)	Activity Space (sq. miles)	VMT (miles)
Jan 1, 2019, to Mar 8, 2020	Baseline Pre-COVID-19	74.0	942.7	289.6	32.8
Mar 9, 2020	SOE Declared	79.1	961.5	247.5	33.0
Apr 30, 2020	Reopening: Phase 1	54.9	1,121.5	260.0	23.3
Jun 5, 2020	Reopening: Phase 2	55.9	1,116.5	258.1	23.7
Sep 25, 2020	Reopening: Phase 3	58.5	1,102.8	252.8	24.6
Jun 26, 2021	SOE Ends	64.1	1,074.4	241.8	26.5

- PV trips reduced by 4.8%,
- VMT decreased by 23%,
- Time away from home decreased by 24.8%,
- Time spent on at-home activities increased by 13.3%, and
- Spatial dispersion of activities decreased by 21.2%.

Conclusions

- The number of personal vehicle trips made to reach work and non-work activities is reverting to pre-COVID-19 trends.
- Travel time and VMT in PVs are steadily increasing.
- Initially expected to reach pre-COVID-19 levels by early/mid 2022.
- The spatial dispersion of activities, after increasing during the opening phases, seems to stabilize at levels prior to SOE.
- CV datasets provide unique and unparalleled level of analytics.

Questions?



Thank you!

Securely Sharing and Visualizing Connected Vehicle Analytics: THEA CV Pilot Performance Evaluation Dashboard

Presented by
Omkar Dokur, Ph.D. Candidate

Date: Feb 8, 2022

Omkar Dokur, Ph.D. Candidate
Sisinnio Concas, Ph.D. (ACME Program Director)
Mohsen Kamrani, Ph.D.
Achilleas Kourtellis, Ph.D.
Vishal Kummetha, Ph.D.



Contents

- Background to the THEA CV Pilot
- THEA Dashboard
 - Architecture
 - Performance Tab
 - Measurement Tab
 - Mobility Performance by Use Case
 - Behavioral Response Assessment
 - Warning Profile Visualization
 - Warning Profile Assessment
 - Data Privacy and Dashboard Security
- Conclusions and Future Work



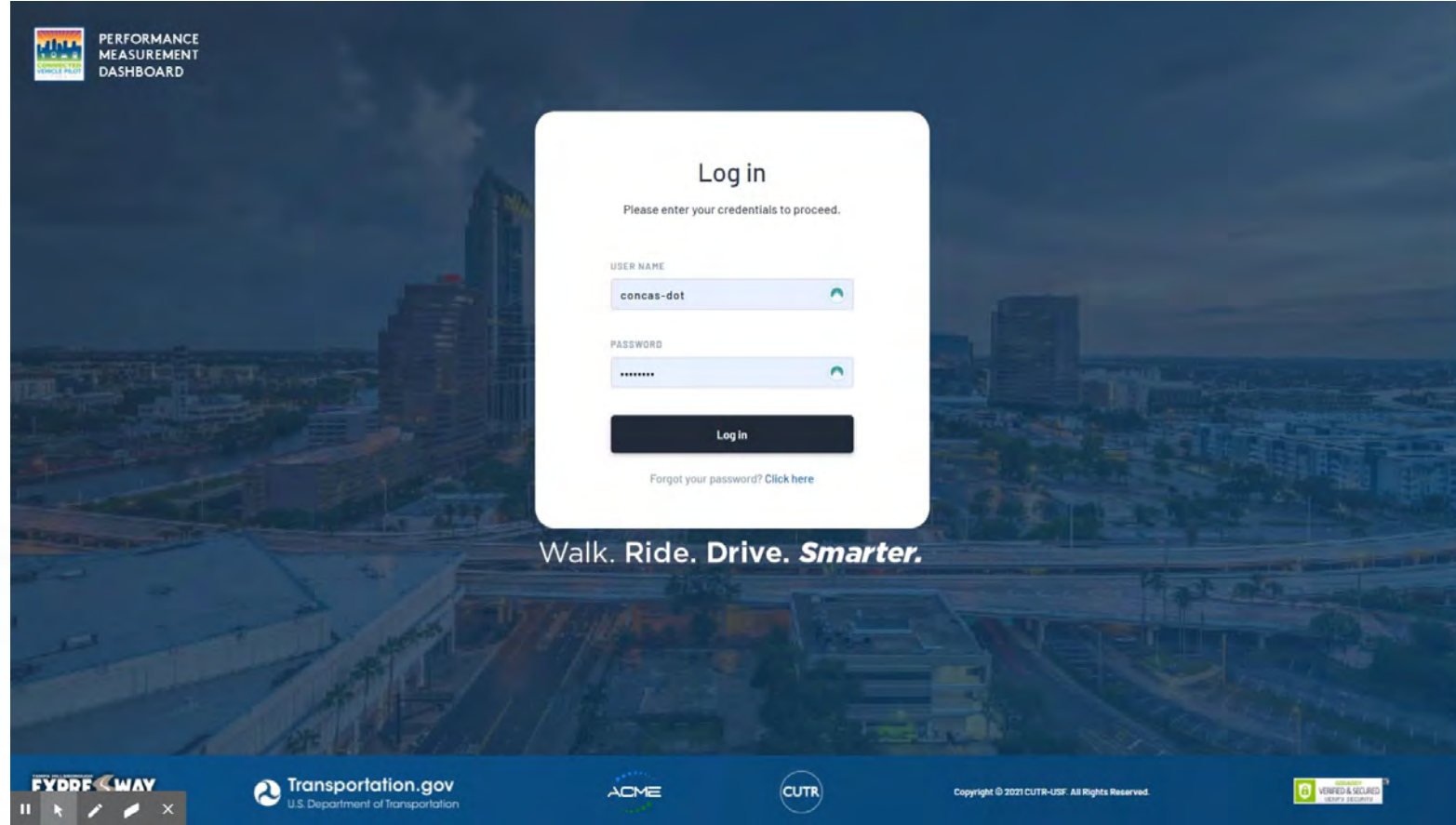
Background

- USDOT initiated the connected vehicle (CV) Pilot deployment program
- 1 of 3 ongoing USDOT CV Pilots
- CV technologies – V2I, V2V, and V2X
- 1 square mile
- 48 Roadside Units
- More than 1000 volunteers
- Large amount of data
- Need for a dashboard



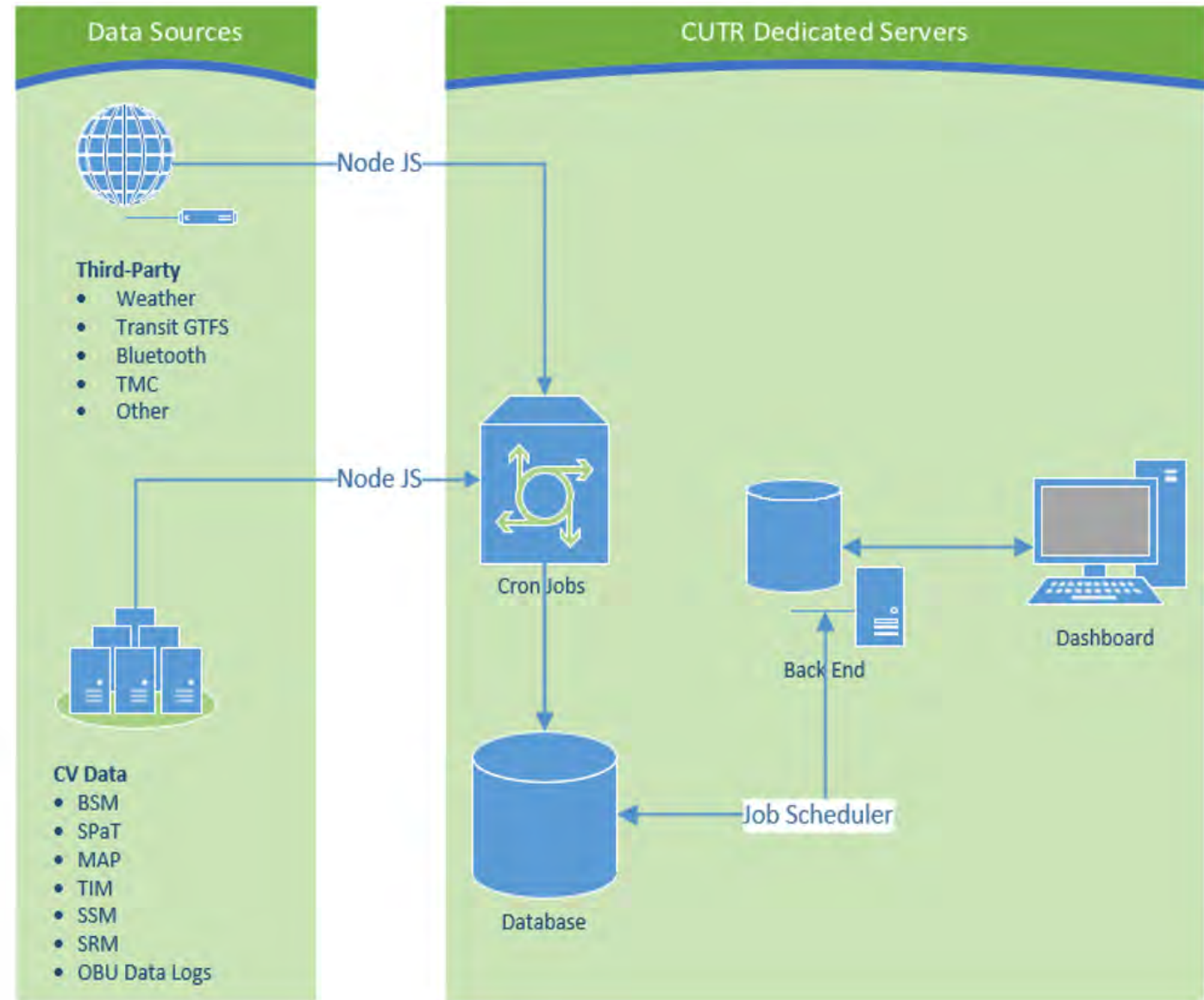
Need for Dashboard

- 16+ Billion observations database
- Multiple stakeholders
- USDOT management
- USDOT analysts
- Independent evaluators
- Near-real time reporting
- Downloadable reports
- Custom queries
- V2V and V2I false positive assessment
- Overall impact evaluation

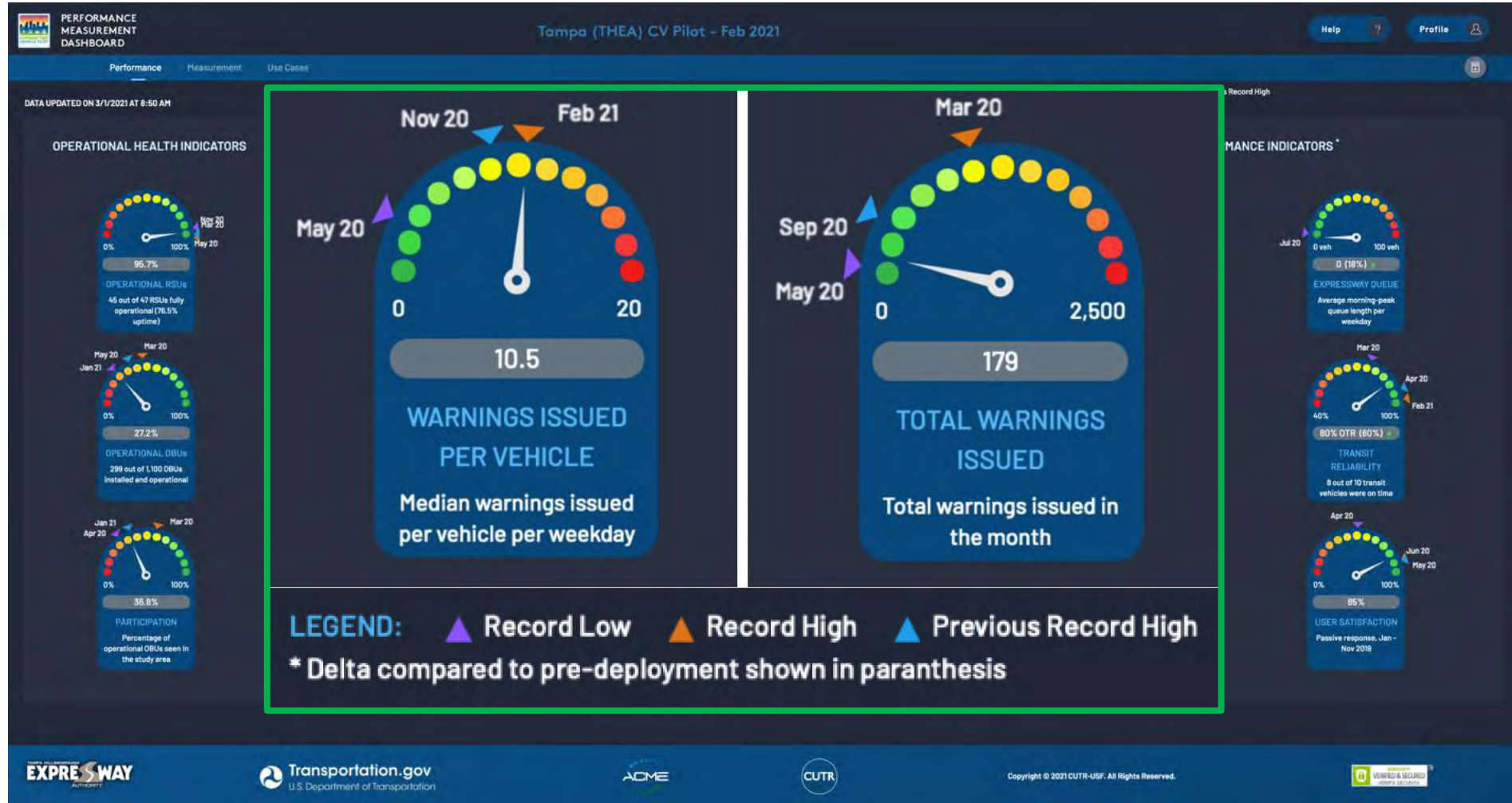


Architecture

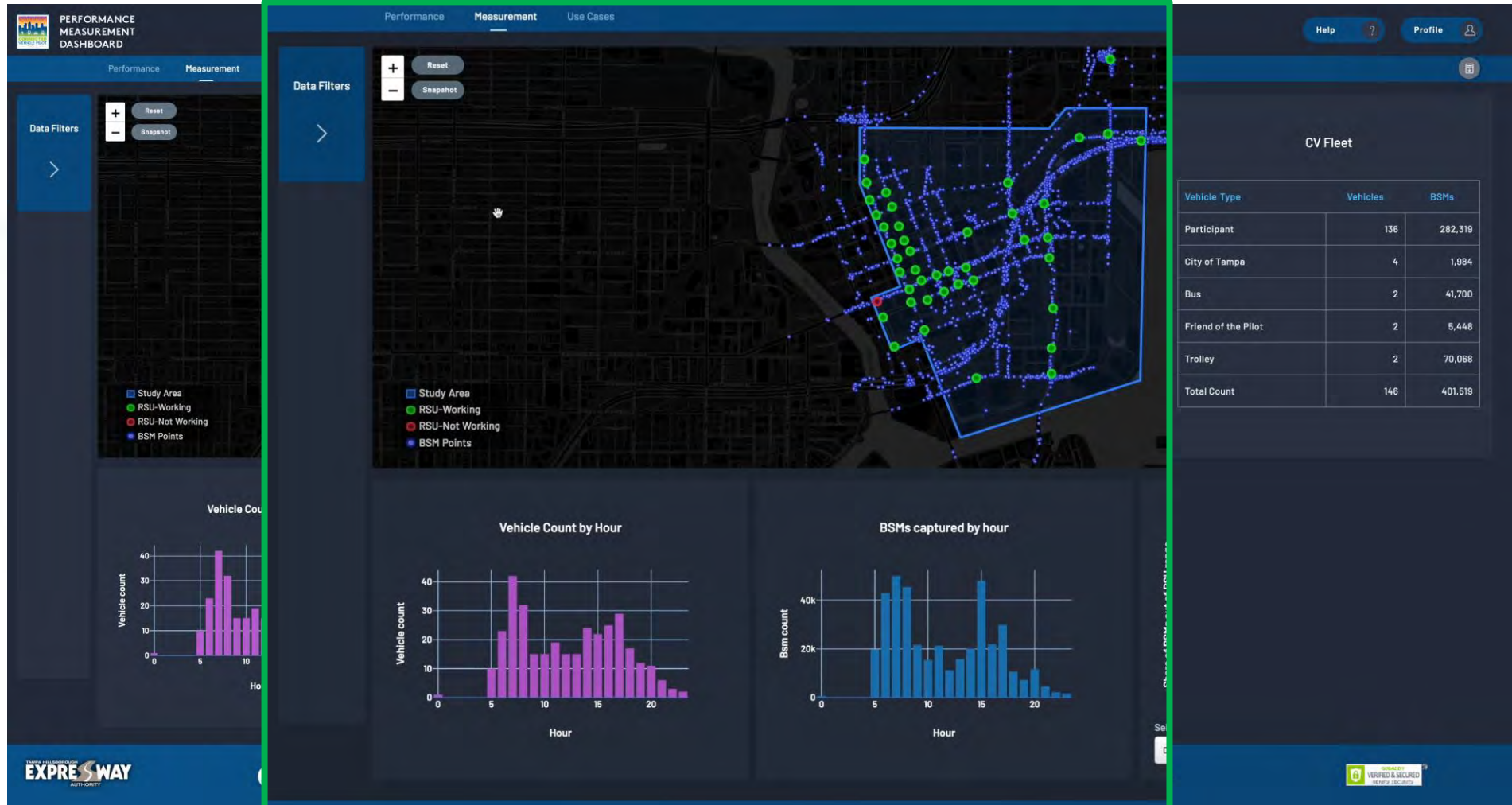
- Pilot data updated at 8 am everyday
- Job Scheduler processes that data
- MySQL database is used
- Backend provides data API
- Front end displays the dashboard



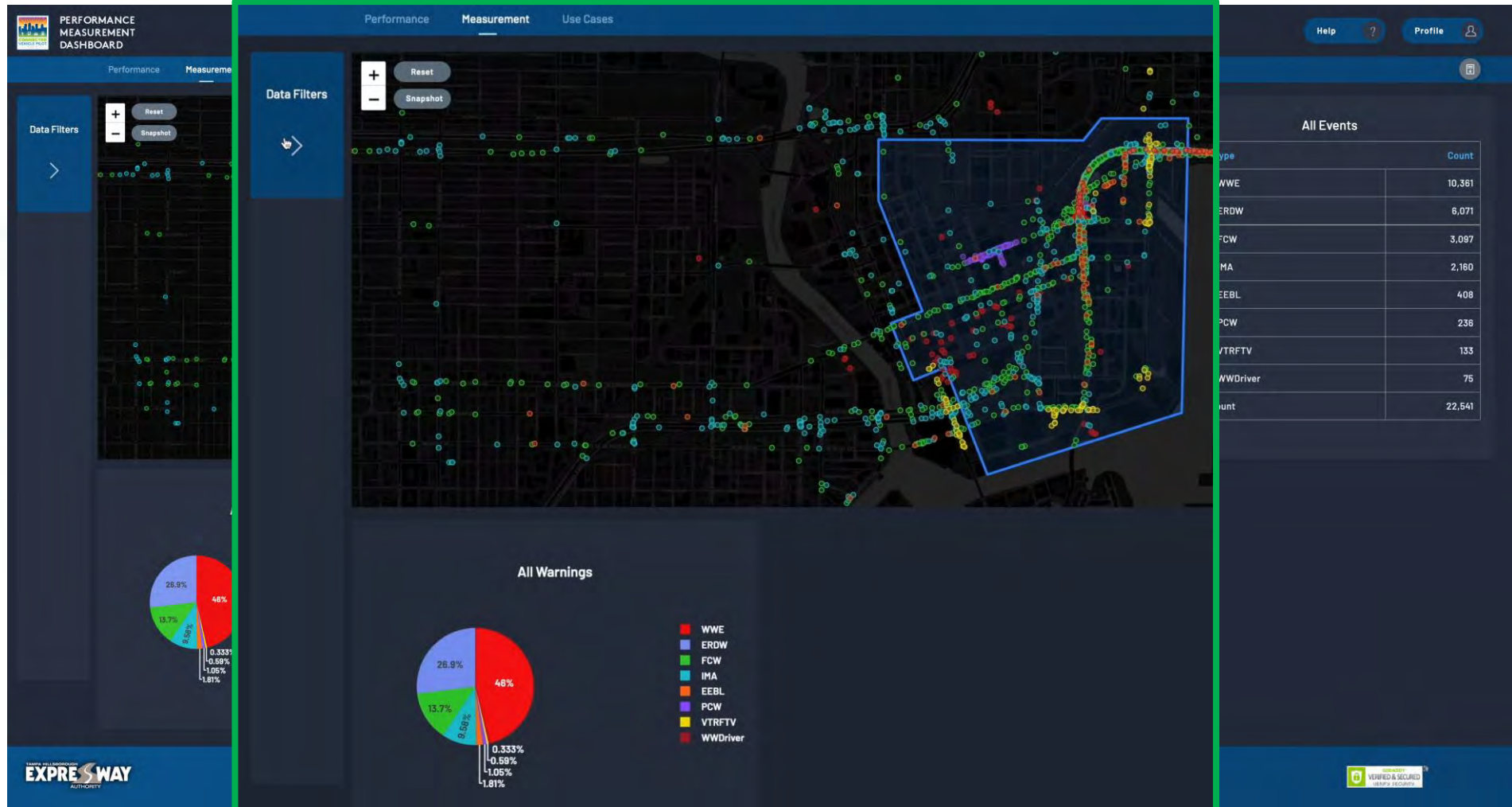
Performance Tab



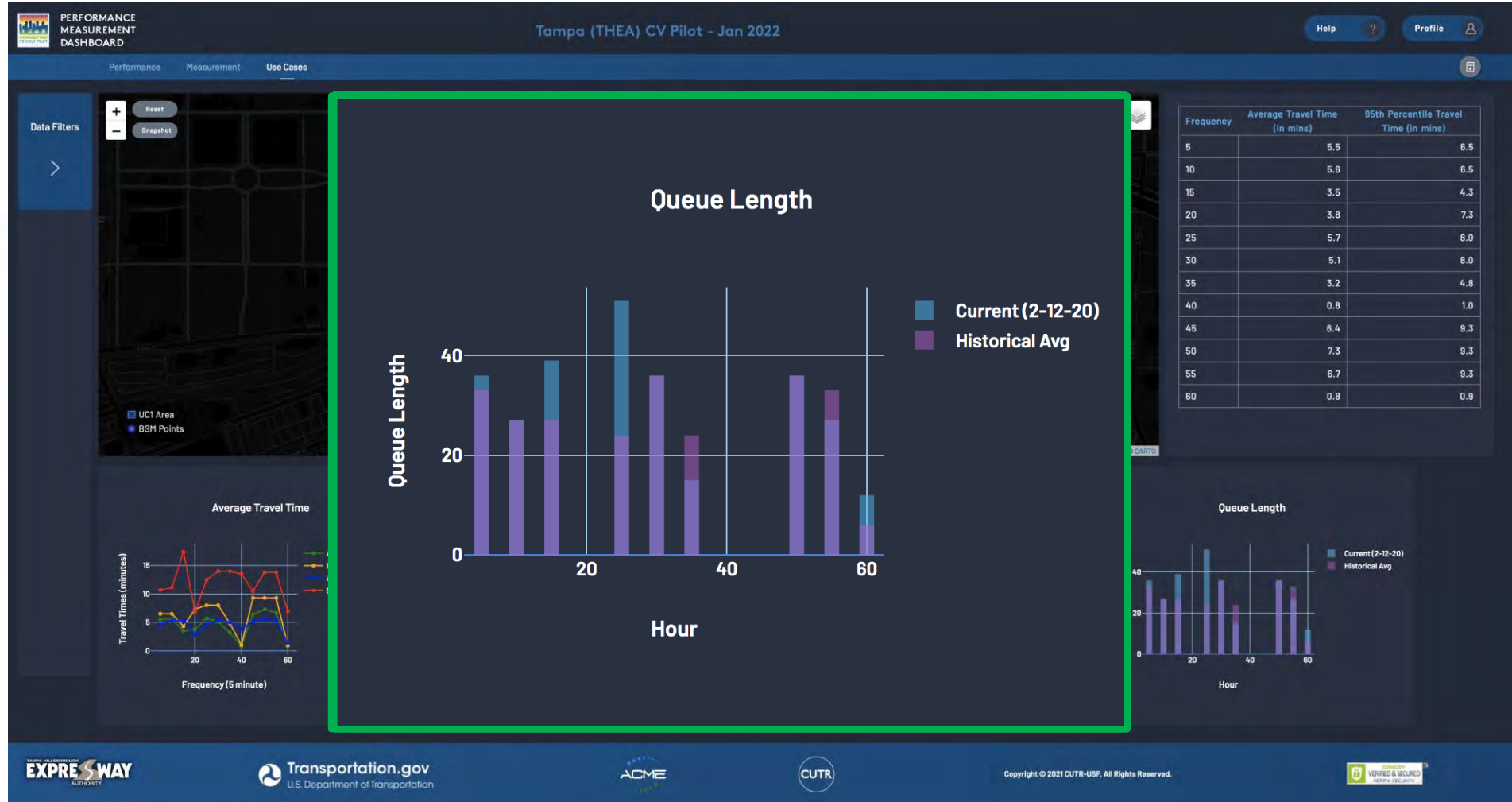
Measurement Tab - BSMs



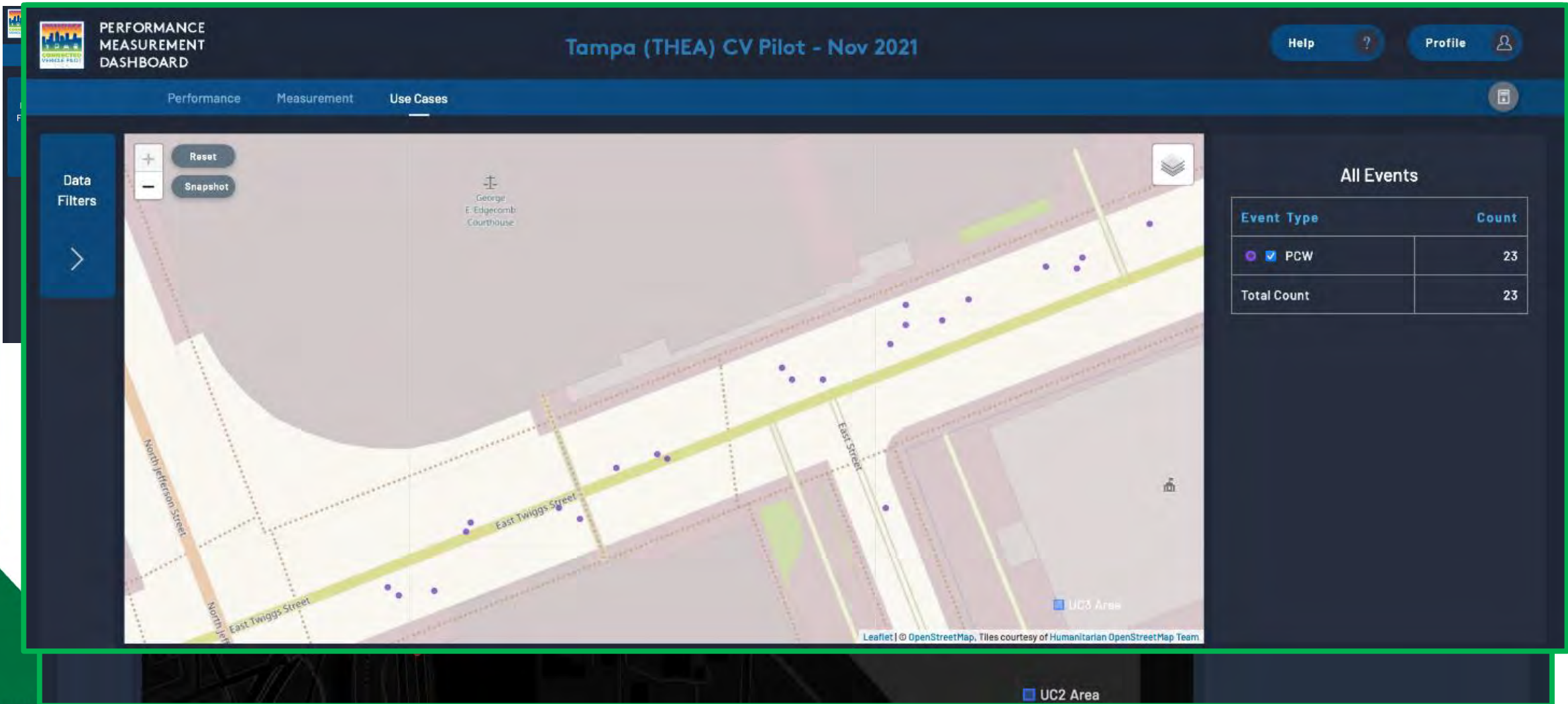
Measurement Tab – Safety Applications



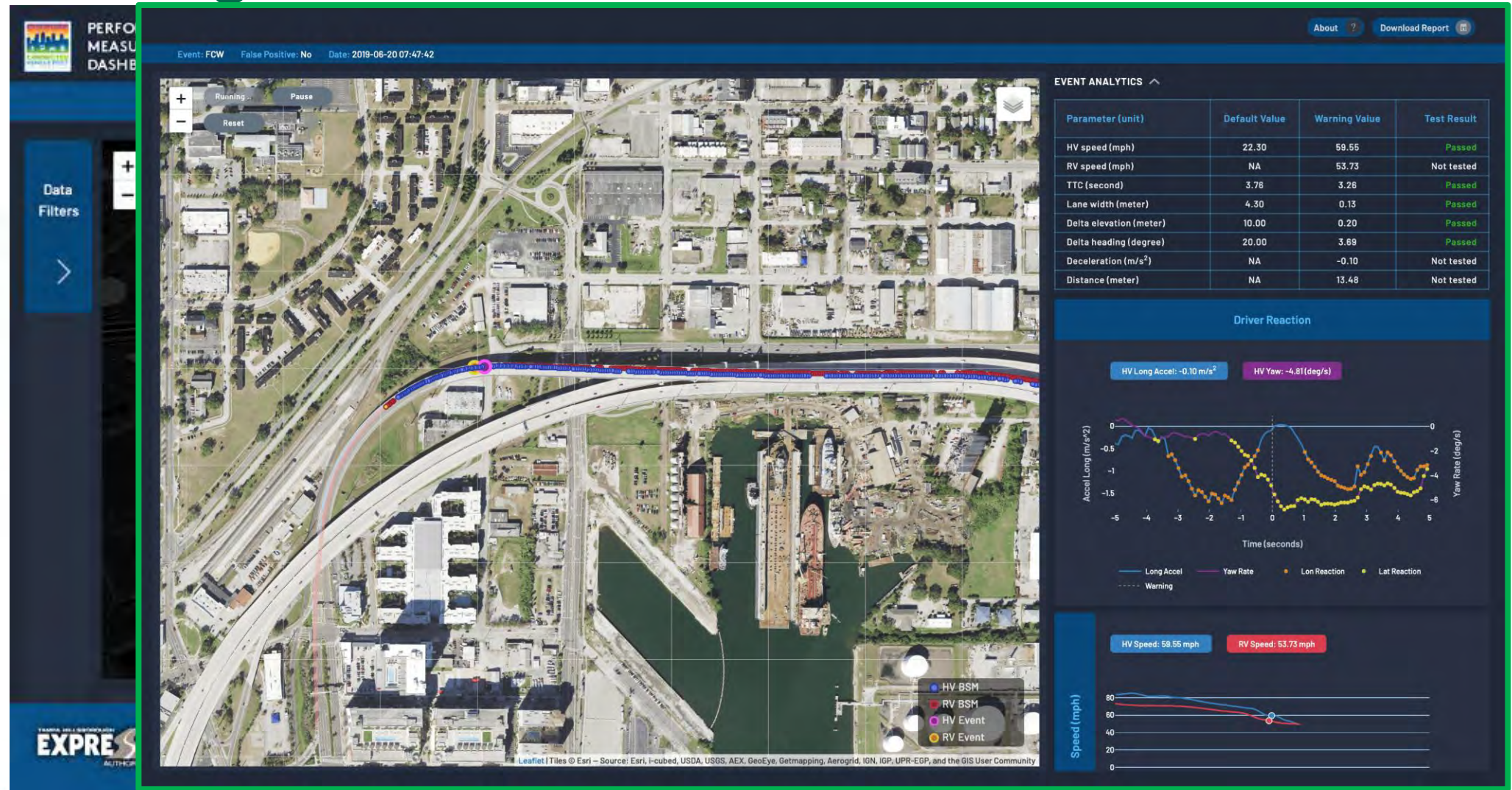
Mobility Performance by Use Case



Behavioral Response Assessment - Use Cases



Warning Profile Visualization



Warning Profile Assessment



Data Privacy and Dashboard Security

- Runs on HTTPS protocol 
- Uses SSL to encrypt the requests and responses 
- Secure login from the users 
- Data requests using authenticated tokens 
- Data encryption and decryption at each stage 
- Uglified and minified code 

Conclusions and Future Work

- Value added benefits
- Snapshot of the study
- Stakeholder needs
- Use case level analysis
- Warning Profile Evaluation
- Integrate visualization of OEM data from the phase 4 of the pilot
- Staple in future deployments



Thank You!

Sisinnio Concas, Ph.D.
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Autonomous & Connected Mobility Evaluation
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For Further THEA CV Pilot Information

Visit theacvpilot.com



TAMPA HILLSBOROUGH
EXPRESSWAY
AUTHORITY



DEPARTMENT OF TRANSPORTATION
UNITED STATES OF AMERICA

Access to CV data



Questions?



Thank you!



Break

5 Minutes

CUTR TRB Presentation

*Recognition of Paper Team and Presentation – Dr. Pei-Sung Lin,
Program Director – ITS, Traffic Operations and Safety*

- “Evaluation of Dynamic Envelope Pavement Markings to Improve Motorist Stopping Behaviors at Highway-Rail Crossings”

Evaluation of Dynamic Envelope Pavement Marking to Improve Motorist Stopping Behaviors at Highway-Rail Crossings

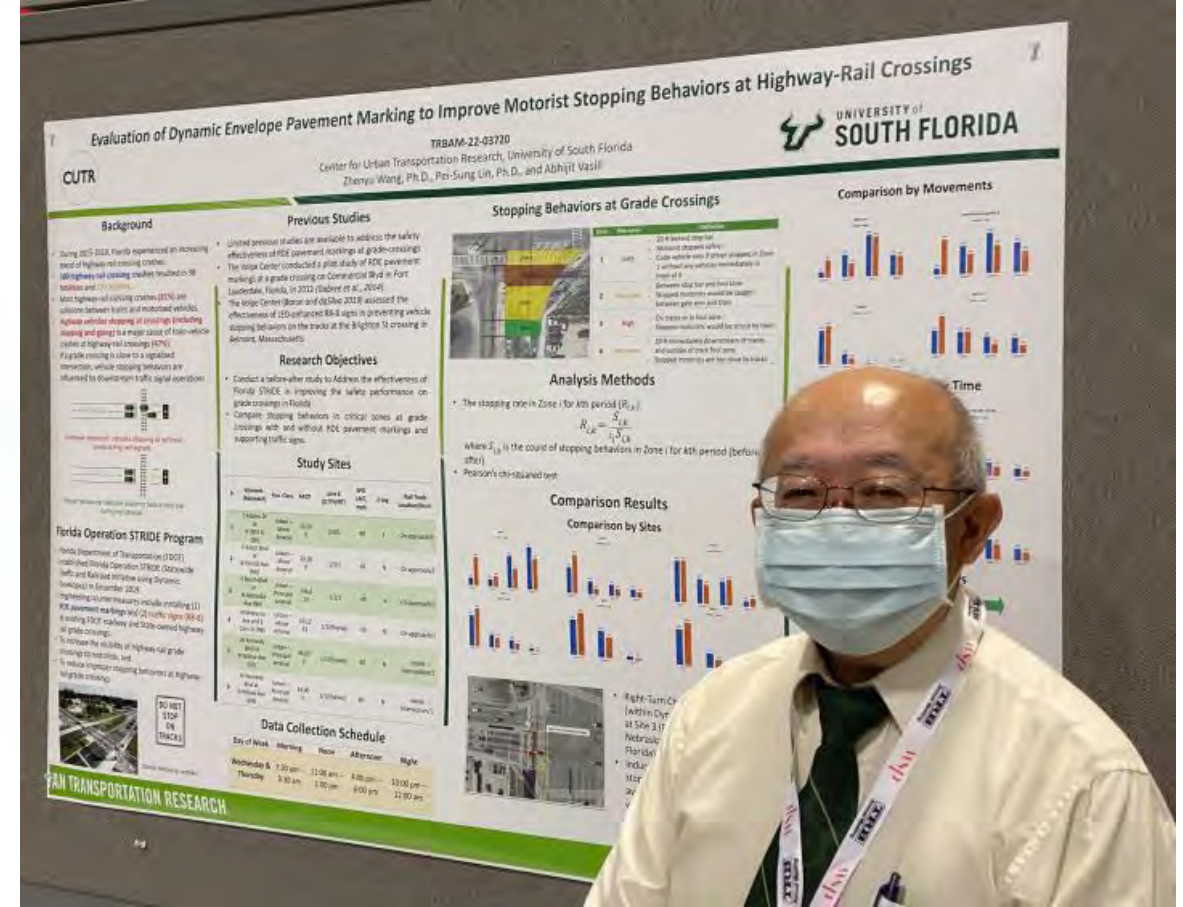
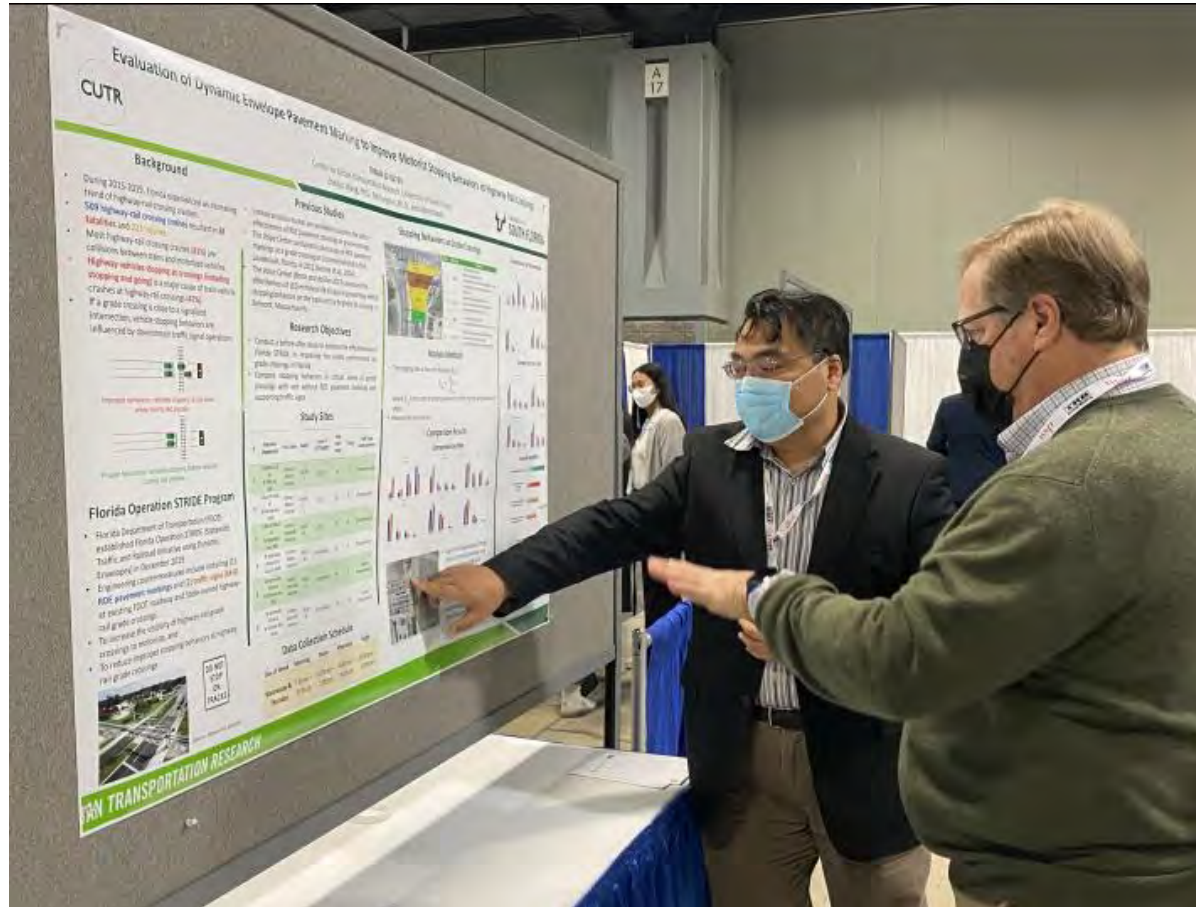
Dr. Pei-Sung Lin, P.E., PTOE, FITE
Dr. Zhenyu Wang

Center for Urban Transportation Research
University of South Florida

CUTR Advisory Board Meeting

February 8, 2022

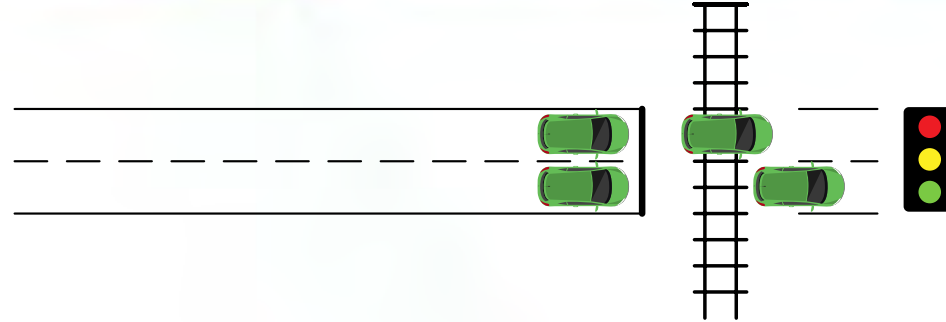
TRB Poster Presentation



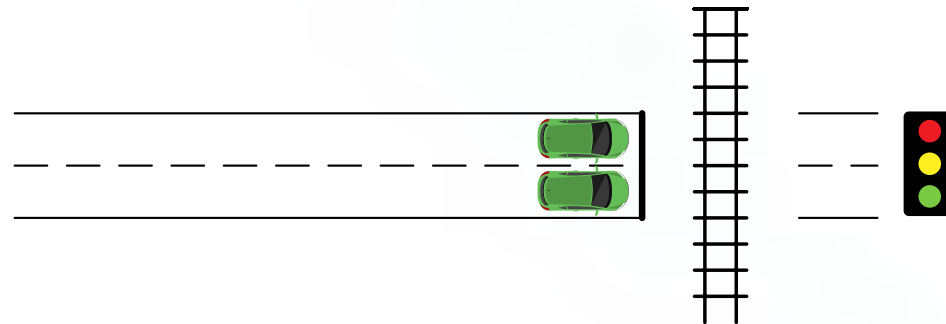
Background

- During 2015-2019, Florida experienced an increasing trend of highway-rail crossing crashes.
- **509 highway-rail crossing crashes** resulted in **38 fatalities** and **223 injuries**.
- Most highway-rail crossing crashes (**81%**) are collisions between trains and motorized vehicles.
- **Highway vehicles stopping at crossings (including stopping, or stopping and going)** is a major cause of train-vehicle crashes at highway-rail crossings (**47%**).
- If a grade crossing is close to a signalized intersection, vehicle stopping behaviors are influenced by downstream traffic signal operations.

Stopping Behaviors at Highway-Rail Crossings



Improper behaviors: vehicles stopping at rail track areas during red signals



Proper behaviors: vehicles stopping before stop bar during red phases

Florida Operation STRIDE Program

- FDOT established Florida Operation STRIDE (Statewide Traffic and Railroad Initiative using Dynamic Envelopes) in December 2019.
- Engineering countermeasures include installing (1) **Railroad Dynamic Envelope (RDE) pavement markings** and (2) **traffic signs (R8-8)** at existing FDOT roadway and State-owned highway-rail grade crossings.
- The goals were to increase the visibility of highway-rail grade crossings to motorists, and reduce improper stopping behaviors at highway-rail grade crossings.

Railroad Dynamic Envelope Pavement Marking

Florida DOT To Invest \$60M In Rail Crossing Improvements

editor@ashto.org December 13, 2019 0 COMMENTS



(Photo: FDOT)



(Source: Hanson Inc. website)



MUTCD R8-8

Research Objectives

- Conduct a before-after study to assess the effectiveness of Florida STRIDE in improving the safety performance at grade crossings in Florida.
- Compare stopping behaviors in critical zones at grade crossings with and without RDE pavement markings and supporting traffic signs.

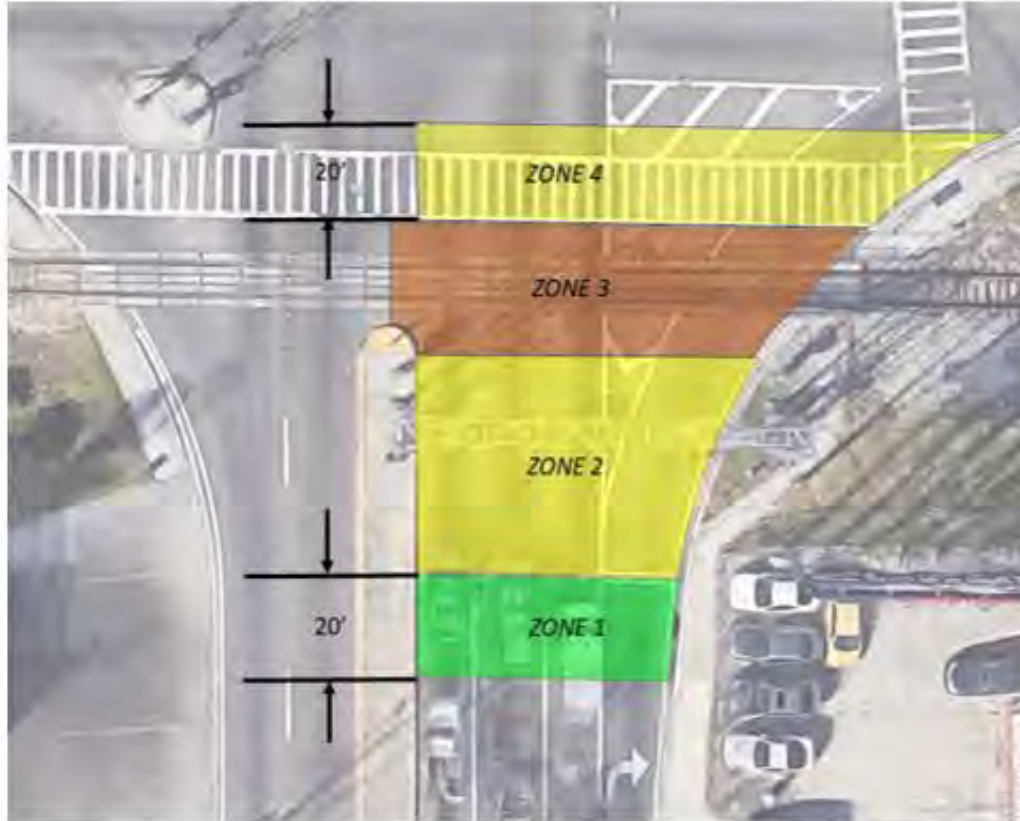
Study Sites in Tampa Bay Area

#	Intersect. (Approach)	Fun. Class.	AADT	Lane # (LT/TH/RT)	SPD LMT, mph	3-Leg	Rail Track Location/Num.
1	E Adamo Dr at N 39th St (SB)	Urban – Minor Arterial	13,500	2/0/1	40	Y	On approach/3
2	E Busch Blvd at N Florida Ave (NB)	Urban – Minor Arterial	29,500	1/3/1	45	N	On approach/1
3	E Busch Blvd at N Nebraska Ave (NB)	Urban – Principal Arterial	106,013	1/2/1	40	N	On approach/1
4	N Nebraska Ave and E Cass St (NB)	Urban – Minor Arterial	101,563	1/1(Shared)	35	N	On approach/1
5	W Kennedy Blvd at N Willow Ave (EB)	Urban – Principal Arterial	34,000	1/1(Shared)	40	N	Inside Intersection/1
6	W Kennedy Blvd at N Willow Ave (WB)	Urban – Principal Arterial	34,000	1/1(Shared)	40	N	Inside Intersection/1

Data Collection Schedule

Day of Week	Morning	Noon	Afternoon	Night
Wednesday & Thursday	7:30 am – 9:30 am	11:00 am – 1:00 pm	4:00 pm – 6:00 pm	10:00 pm – 12:00 am

Stopping Behaviors at Grade Crossings



Zone	Risk Level	Definition
1	Safe	• 20 ft behind stop bar • Motorist stopped safely • Code vehicle only if driver stopped in Zone 1 without any vehicles immediately in front of it
2	Moderate	• Between stop bar and foul zone • Stopped motorists would be caught between gate arm and train
3	High	• On tracks or in foul zone • Stopped motorists would be struck by train
4	Moderate	• 20 ft immediately downstream of tracks and outside of track foul zone • Stopped motorists are too close to tracks

Analysis Methods

- The stopping rate in Zone i for k th period ($R_{i,k}$)

$$R_{i,k} = \frac{S_{i,k}}{\sum_i S_{i,k}}$$

where $S_{i,k}$ is the count of stopping behaviors in Zone i for k th period (before or after)

- Hypothesis Testing - Use Pearson's chi-squared test to compare the stopping rates before and after the implementation of RDE.

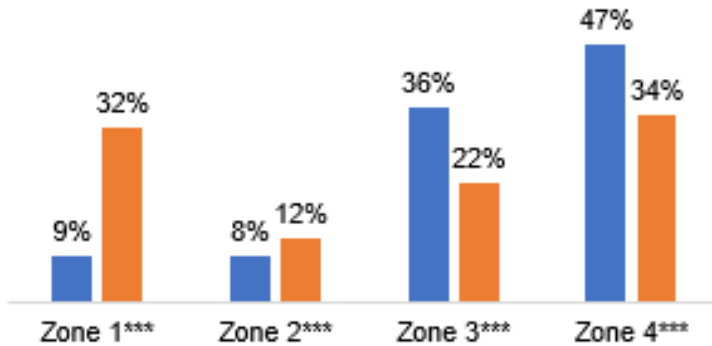
H_0 : Before Stopping Rate at Zone i = After Stopping Rate at Zone i

H_a : Before Stopping Rate at Zone i $\neq$ After Stopping Rate at Zone i

Results of Comparison by Sites

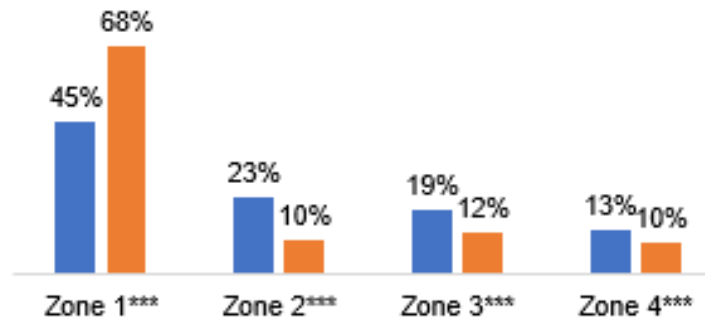
Site 1

■ Before ■ After



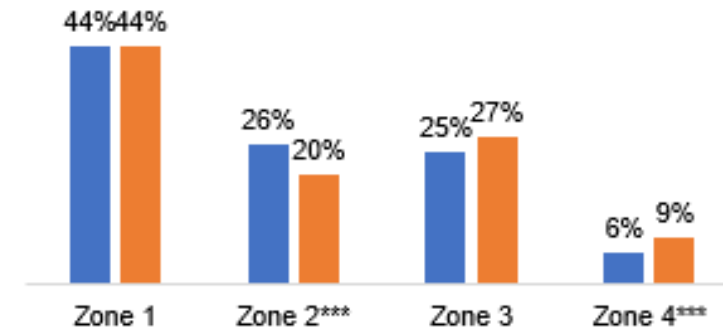
Site 2

■ Before ■ After



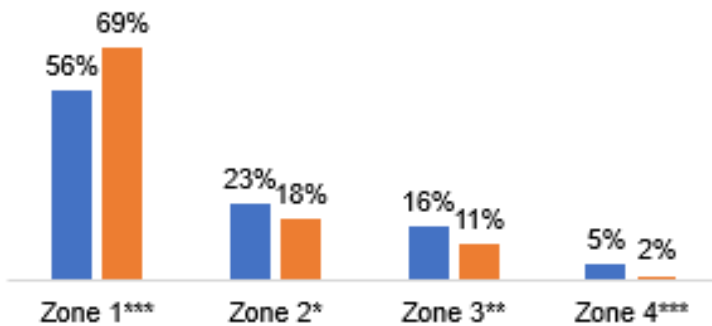
Site 3

■ Before ■ After



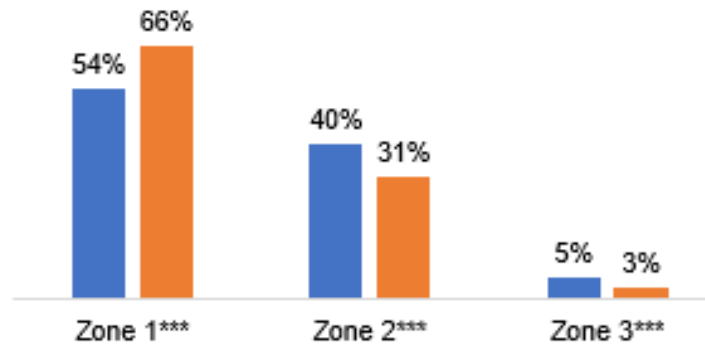
Site 4

■ Before ■ After



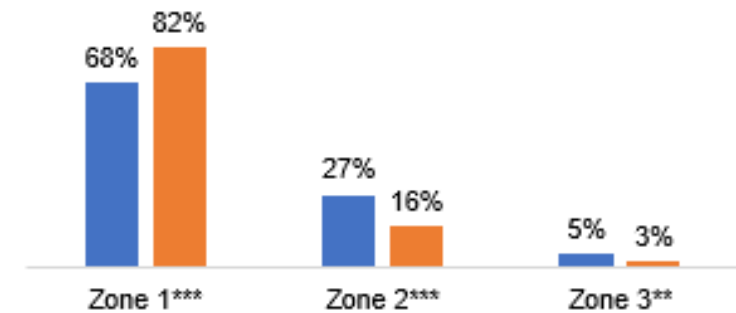
Site 5

■ Before ■ After



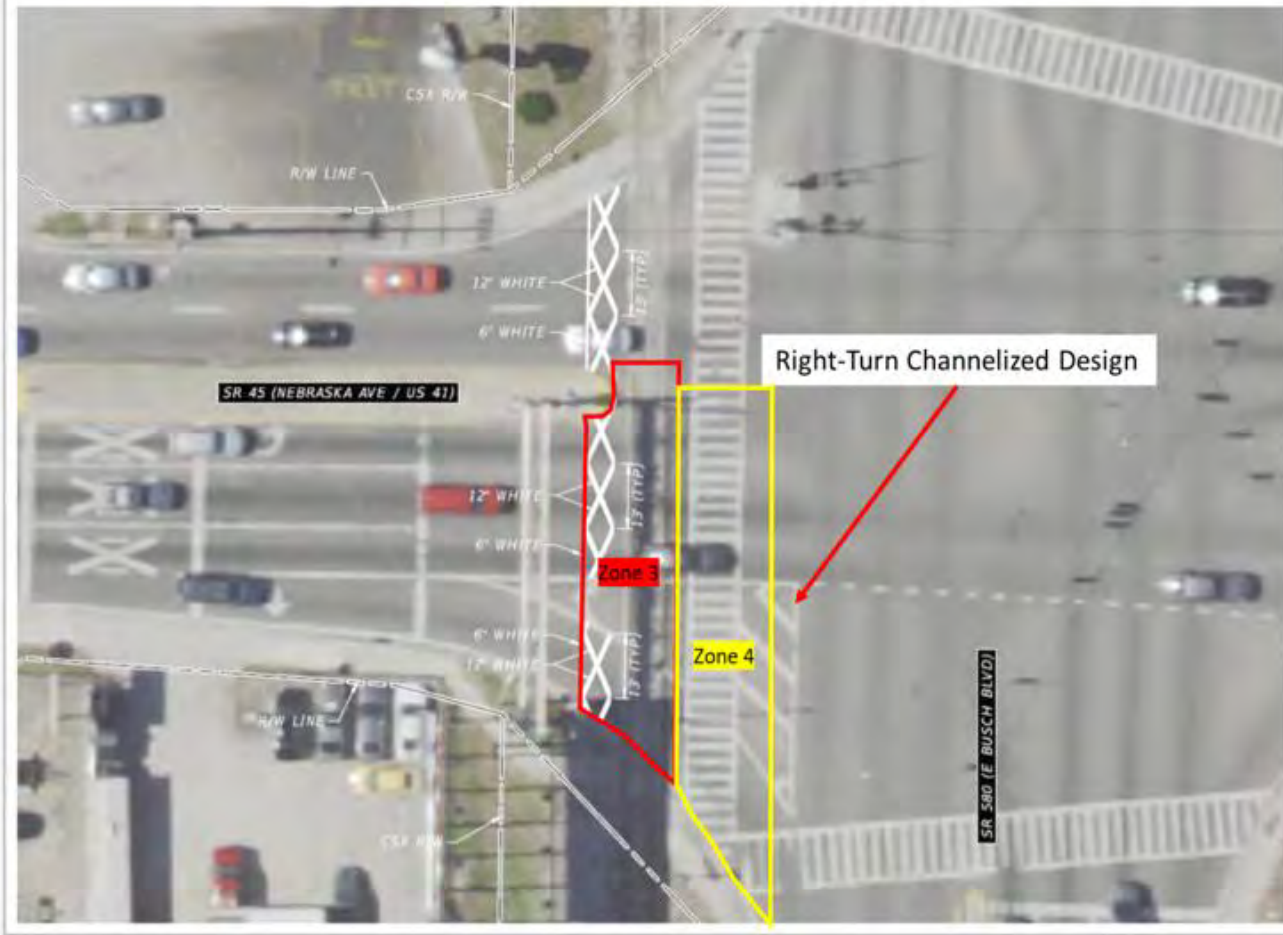
Site 6

■ Before ■ After



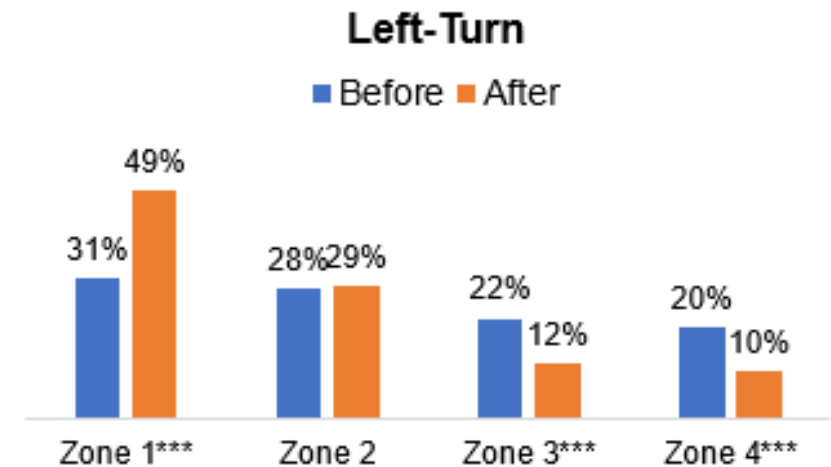
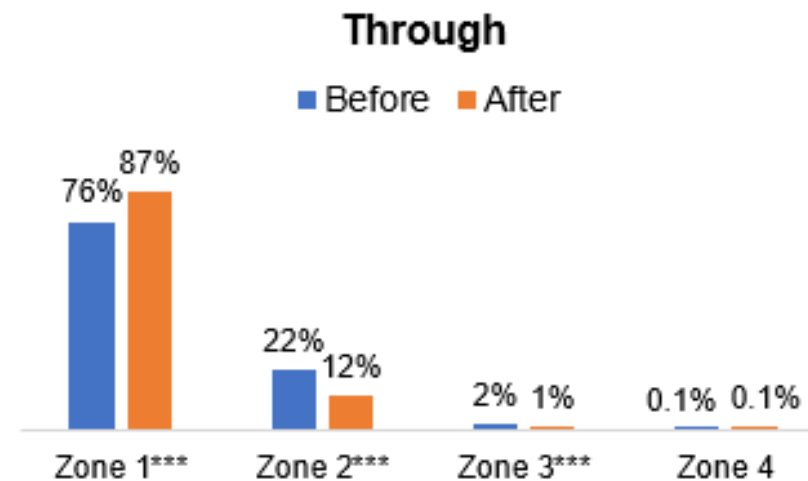
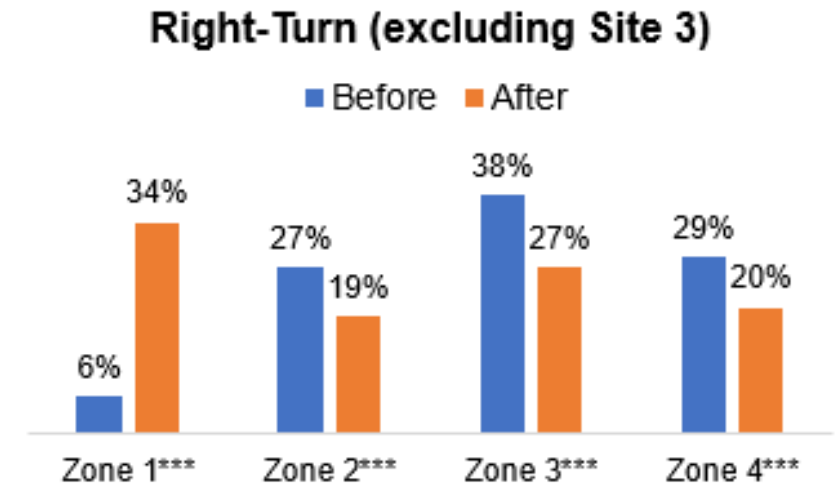
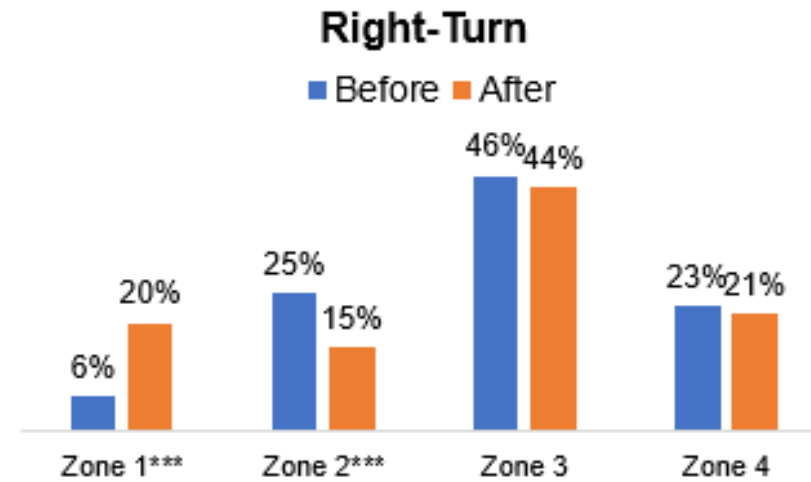
*** 99% significance; ** 95% significance, * 90% significance

Right-Turn Channelization at Site 3



- A right-turn channelization existed (within Dynamic Envelope area) at Site 3 (E Busch Blvd at N Nebraska Ave [NB], Tampa, Florida)
- Induces right-turning motorists to stop at Zone 3 or Zone 4 to seek available gaps in conflicting traffic when they see a red signal.

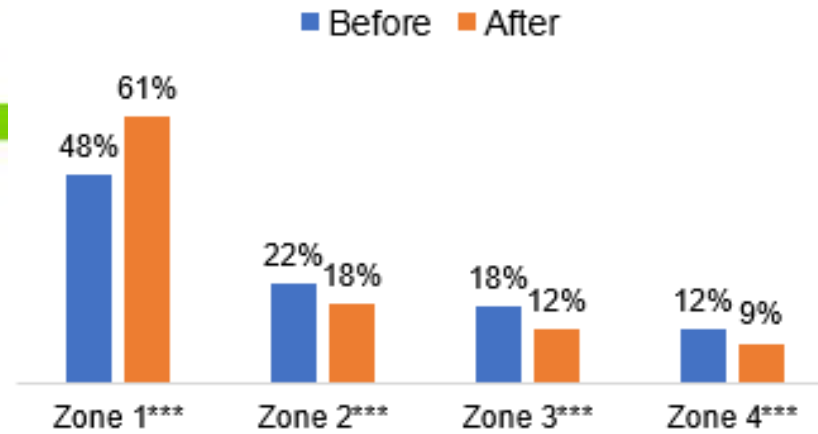
Results of Comparison by Movements



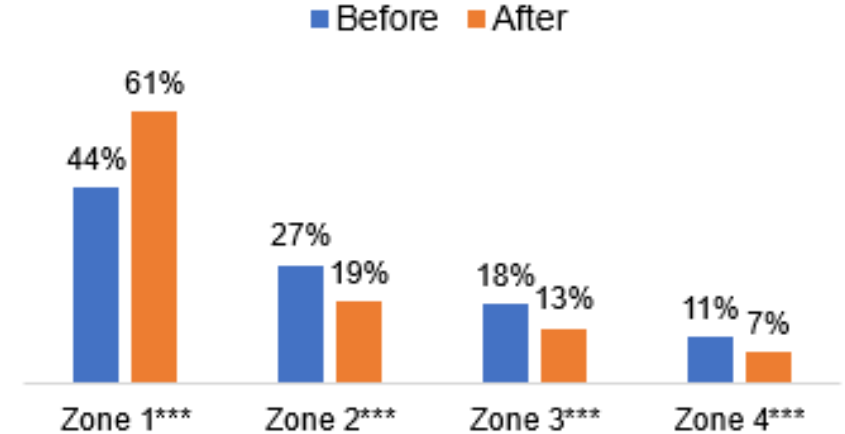
*** 99% significance; ** 95% significance, * 90% significance

Results of Comparison by Time

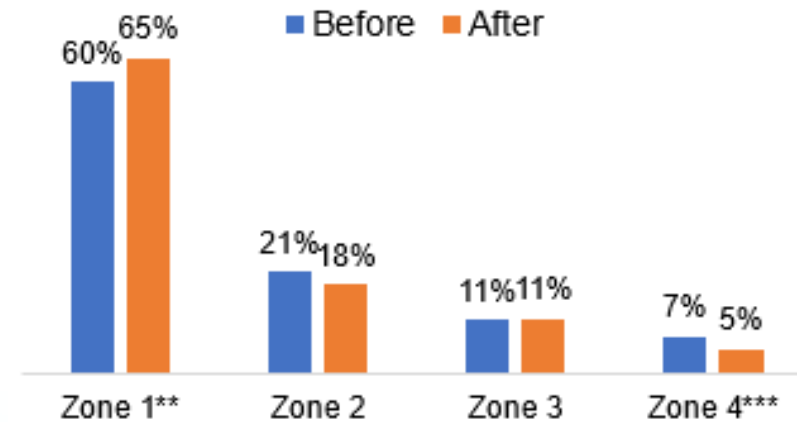
Morning (7:30 AM - 9:30 AM)



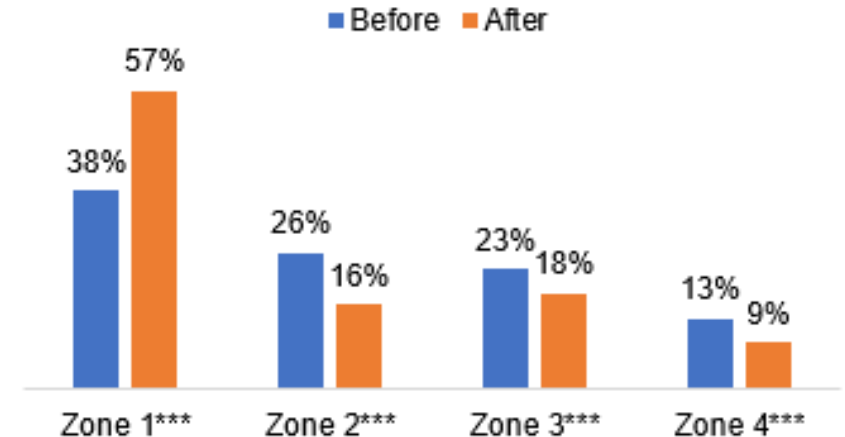
Noon (11:00 AM - 1:00 PM)



Night (10:00 PM - 12:00 AM)



Afternoon (4:00 PM - 6:00 PM)



*** 99% significance; ** 95% significance, * 90% significance

Overall Benefits

Safe Stopping (Zone 1)

Increased by 20%

Most Dangerous
Stopping
(Zone 3)

decreased by 8%

Moderately-Dangerous
Stopping (Zone 2)

decreased by 7%

Moderately-Dangerous
Stopping (Zone 4)

decreased by 5%

Excluding Site 3

Conclusions and Recommendations

- **Implementations of Railroad Dynamic Envelope (RDE) pavement markings and traffic sign - “DO NOT STOP ON TRACKS” (MUTCD R8-8) significantly improved the safety performance at grade crossings on urban major and minor arterials.**
- **It is recommended to avoid right-turn channelization within RDE areas or use No Turn on Red operations at downstream signalized intersections.**
- **It is recommended to improve the visibility of RDE pavement markings and traffic signs to motorists at night** via improving street lighting level.
- It is recommended to relocate the traffic signs if blocked by obstacles.
- It is recommended to add flashing beacons to the traffic signs.



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Florida's Transportation Hall of Fame Awardee Selection Committee

Jon Martz, Transportation Hall of Fame Committee Chair

CUTR Advisory Board Business

CUTR Advisory Board Officer Selection Process

Bylaws – Article 5: Officers

Section 1: Presiding Officers

The officers of the Board shall be a Chair and a Vice Chair.

Section 2: Election

The officers shall be elected annually at the second scheduled meeting of the calendar year of the Board.

- A nominating committee shall be formed consisting of three members of the Board to recommend to the Board, a slate of officers for election. The Chair of the Board shall not be a member of the nominating committee.
- Once elected, the officers are eligible for re-election to their elected position for no more than six consecutive years. If elected for six consecutive years, a new slate of officers shall be presented to the Board for election, subsequently.
- If the vice chair has held the position of vice chair for six consecutive years, the vice chair is eligible for election to chair at end of six years if the Board so desires.

Action Item: CUTR Advisory Board Officer Selection Nominating Committee Appointments

Advisory Board Member Updates

- Other Board Items

Adjourn

APPENDIX A



Center for Urban Transportation Research (CUTR) Advisory Board Meeting

Minutes for Meeting: Tuesday, November 9, 2021 · 4:00–5:30 PM EST

University of South Florida Marshall Center

- Call to Order: Meeting called to order by Thornton Williams at 4:25 PM
- Roll Call

Advisory Board members and Designees (P = Present on Teams, T = Telephone, A = Absent)

	Name	Title	Organization	Designee(s)	
P	Kevin J. Thibault	Secretary	FDOT	Brad Thoburn Liz Stutts	Statute
P	Dane Eagle (A)	Executive Director	FDEO	Scott Rogers (P)	Statute
A	Shawn Hamilton	Secretary	FDEP	Chris Stahl (A)	Statute
A	Vacant	Member	Florida Transportation Commission		Statute
A	Lisa Bacot	Executive Director	Florida Public Transportation Association		
P	Kimberlee DeBosier	Director of Operations	WGI, Inc.		
P	Jean Duncan	Administrator, Infrastructure and Mobility	City of Tampa		
P	Sonny Holtzman	Principal	The Holtzman Group		
P	Ram Kancharla	Vice President Planning and Development	Port Tampa Bay		
P	Ysela Llort, Chair	Principal	Renaissance Planning Group		
A	Jon Martz, Vice Chair	Director, Government and Public Affairs	Enterprise Holdings Company		
P	Joe Waggoner	Executive Director	THEA		
A	Thornton Williams	Managing Partner	Williams Law Group, P.A.		
A	Ralph Yoder	Executive Director	Florida Transportation Commission		

Guests

- Fred Mannering, Ph.D., CUTR Executive Director
- Lisa Staes, CUTR Associate Director

CUTR Program Directors

- Martin Catala
- Xiaopeng “Shaw” Li
- Chanyoung Lee
- Victoria Perk
- Kristine Williams

Other Guests

- Amanda Carpenter, FDOT
- Rob Gregg
- Dennis Hinebaugh
- Steve Polzin
- Madeline Richard, USF College of Engineering
- Arunima Bagui, USF
- Sean Barbeau, USF
- Jodi Godfrey, USF
- Jana Huss, USF
- Jason Jackman, USF
- Achilleas Kourtellis, USF
- Stephanie Lewis, USF
- Xiaobing Li, USF
- Bill Mayer, USF
- Yu Zhang, USF

Welcome and Introductions: Chair Ysela Llort**Approval of Minutes (in Board Packet Appendix A : Chair Ysela Llort**

- Motion to approve minutes by Ram Kancharla
- Motion seconded by Kimberlee DeBosier
- Motion passed

Topic #1: Recent Retiree Recognitions

- Martin Catala, Jodi Godfrey, and Victoria Perk honored their former Program Directors on their achievements and recent retirements from CUTR.
- Rob Gregg, Dennis Hinebaugh, and Steve Polzin were honored for their years of service and commitment to CUTR and their contributions to the field of transportation.

Topic #2: FDOT Update: Secretary Kevin Thibault, P.E., FDOT Secretary

- Secretary Thibault spoke about the JOBS Act and its impact on Florida including a possible \$600M per year allocated for Florida’s highways. Currently, Florida is waiting on guidance from FDOT.
- Formulas for funding concerning bridges will change based on the bridges within the state of Florida. Secretary Thibault estimated there will be \$245M for bridge funding. He is currently

meeting with leaders throughout the state to discuss community involvement and their visions for transportation.

- Florida ports are ready to assist with the supply chain. Many Savannah deliveries are being diverted to Florida (Jacksonville).
- Safety is still a major concern. Education is the key to changing behavior, and FDOT is focused on the November/December holiday travel including impaired driving.
- AASHTO's Annual Meeting was held in San Diego, CA from October 26 to October 29, 2021. There were many discussions concerning the JOBS Act; there are still states that cannot match funding. Due to the SASHTO Annual Meeting's success in Orlando, FL, AASHTO will hold their 2022 Annual Meeting in Orlando from October 18 to October 24, 2022.
- Ram Kancharla asked about programs rollouts and time frames. Secretary Thibault replied that the program rollouts would still take a few more months, but he anticipates future programming will occur much faster.

Topic #3: CUTR Updates: Fred Mannering, CUTR Executive Director; Lisa Staes, CUTR Associate Director; Xiaopeng Li, NICR Director

- Dr. Mannering reported the University of South Florida's College of Engineering is supporting a new system and reevaluating systems and bills. To prepare for future funding and UTCs, he is coordinating weekly meetings with other universities to establish partnerships. CUTR is wanting to plan now rather than wait until announcements. Dr. Mannering noted that even if CUTR is not awarded projects, planning for collaborations is a great networking opportunity for CUTR.
- Associate Director Lisa Staes reported CUTR still holds weekly meetings with the center to touch base with staff. Currently, CUTR is planning to co-sponsor a TRB reception with ENSCO during the annual meeting in January. Ms. Staes gave a summary of her involvement with TRB's Standing Committee on Transit Safety and Security; they are currently making their annual plan. For the CUTR budget, Ms. Staes reported CUTR would like to expand contracts and grants, including the value of proposals submitted. Sponsorships are mostly FDOT, but they also include projects from USDOT and FTA, as well.
- Dr. Li reported NICR's Y2 project contracts are completed. Some Y2 projects are just now starting as Y1 projects begin to wrap up and enter the publication phase. NICR has received 5 completed final reports, but more projects are anticipated to end spring 2022. TBCAT, a new project through NICR, began in fall 2021. This 8-week course teaches members of the community the basics of transportation. For NICR's output, there are three papers, but Dr. Shaw believes those numbers will increase as more papers are submitted. The NICR webcast continues each Thursday with speakers from various NICR projects. The Friday Transportation Seminar Series will continue into spring 2022 with a new line up of speakers. Jean Duncan spoke to students on 9/17. The NICR Student Council held a workshop for students. The 3.5-hour interactive lecture featured international speakers and lectures. NICR students also participated in the 2021 Automated Road Transportation Symposium. Ysela Llort suggested recent CUTR retirees speak at the Friday Transportation Seminar Series.
- Dr. Mannering, Ms. Staes, and Dr. Li all thanked the CUTR Advisory Board.

Topic #4: USF/CUTR/FDOT Strategy: Jodi Godfrey, CUTR Senior Research Associate

- Jodi Godfrey led the discussion about how the field can attract more students to transportation. Ms. Godfrey suggested student interest opportunities; supporting FDOT and other transportation industry employees advance their careers; industry/student engagement; summit/working groups.

Ms. Godfrey would like other universities to support this mission and join to promote transportation as a career path.

- Secretary Thibault offered transportation expands to fields outside of engineering, as well. FDOT needs many other professionals to assist with transportation and technology. He questioned how to attract these technology fields to transportation.
- Dr. Li spoke about ITS America workshops and similar conversations.
- Kimberlee DeBosier offered her support and suggested reaching out to the Florida Engineering Foundation for funding and partnership in the future.
- Ms. Llort suggested offering writing services for students.

Topic #5: 2021 Transportation Achievement Awards: Lisa Staes, CUTR Associate Director

- Ms. Staes gave a brief overview of awards event to follow. She reported \$69.5K in sponsorships for the year; however, the number could change depending on checks still processing.
- Ms. Staes and the CUTR Advisory Board congratulated Sonny Holtzman on his selection as Florida's Transportation Hall of Fame nominee. Mr. Holtzman made brief remarks.

Topic #6: CUTR Advisory Board: Ysela Llort, Chair

- Ms. Llort congratulated Mr. Holtzman and thanked the CUTR Advisory Board for their continued efforts throughout the last year.

Ysela Llort ended the meeting and directed the board to take a group photograph.

Meeting adjourned at 5:40 PM EST.