Transportation Disruption & Disaster Statistics (TDADS)
STEERING COMMITTEE MEETING

May 16, 2019

Webcast and Audio Information

- This is a **virtual meeting** experience
  - **Please mute your line** until you are making a comment or asking a question (press *6 to mute/unmute individual phone lines)
  - Please do not place call “on hold” as your hold music will be heard by the group
- **This web meeting is being recorded**
- **Meeting materials will be available to participants after the web meeting**

Make Comments & Ask Questions

We encourage EVERYONE to participate……

VERBALLY

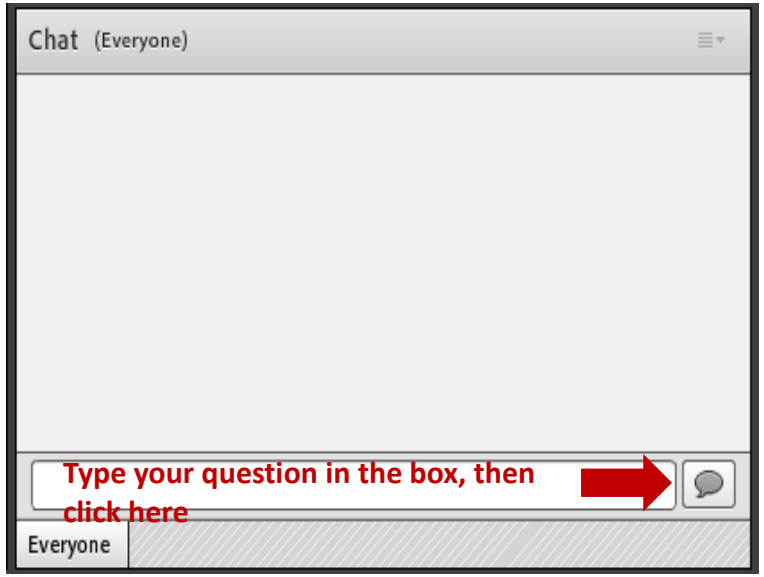
- Please give your name and agency before asking your question (at least the first time)
- Keep your line muted when not asking a question

IN THE CHAT BOX

- You may pose your questions using the chat box

POLLING QUESTIONS

- Periodically we will ask for your input through interactive polls



While you are not speaking….
Please confirm you are
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For your phone line - press *6

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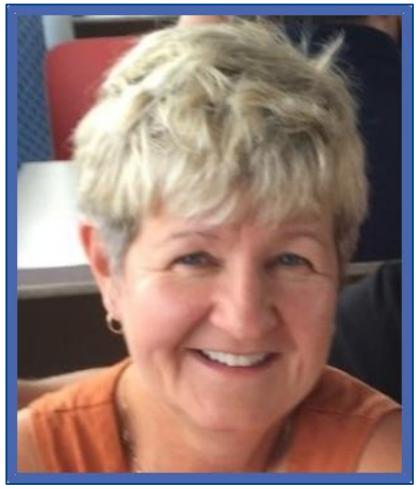
Mute your computer

Thank
You!

Welcome & Introductions

Denise Markow, PE, I-95 Corridor Coalition



Agenda

Welcome & Introductions	Denise Markow, I-95 Corridor Coalition
Background & Objectives	Patricia Hendren, I-95 Corridor Coalition
Overview and Preliminary Results & Interface Designs	Mark Franz, UMD CATT Laboratory
Wrap Up	Denise Markow, I-95 Corridor Coalition

Today's Speakers

Patricia Hendren, PhD
I-95 Corridor Coalition
Executive Director

Denise Markow, PE
I-95 Corridor Coalition
TSMO Director

Mark Franz, PhD
UMD CATT Lab
Lead Transportation Analyst

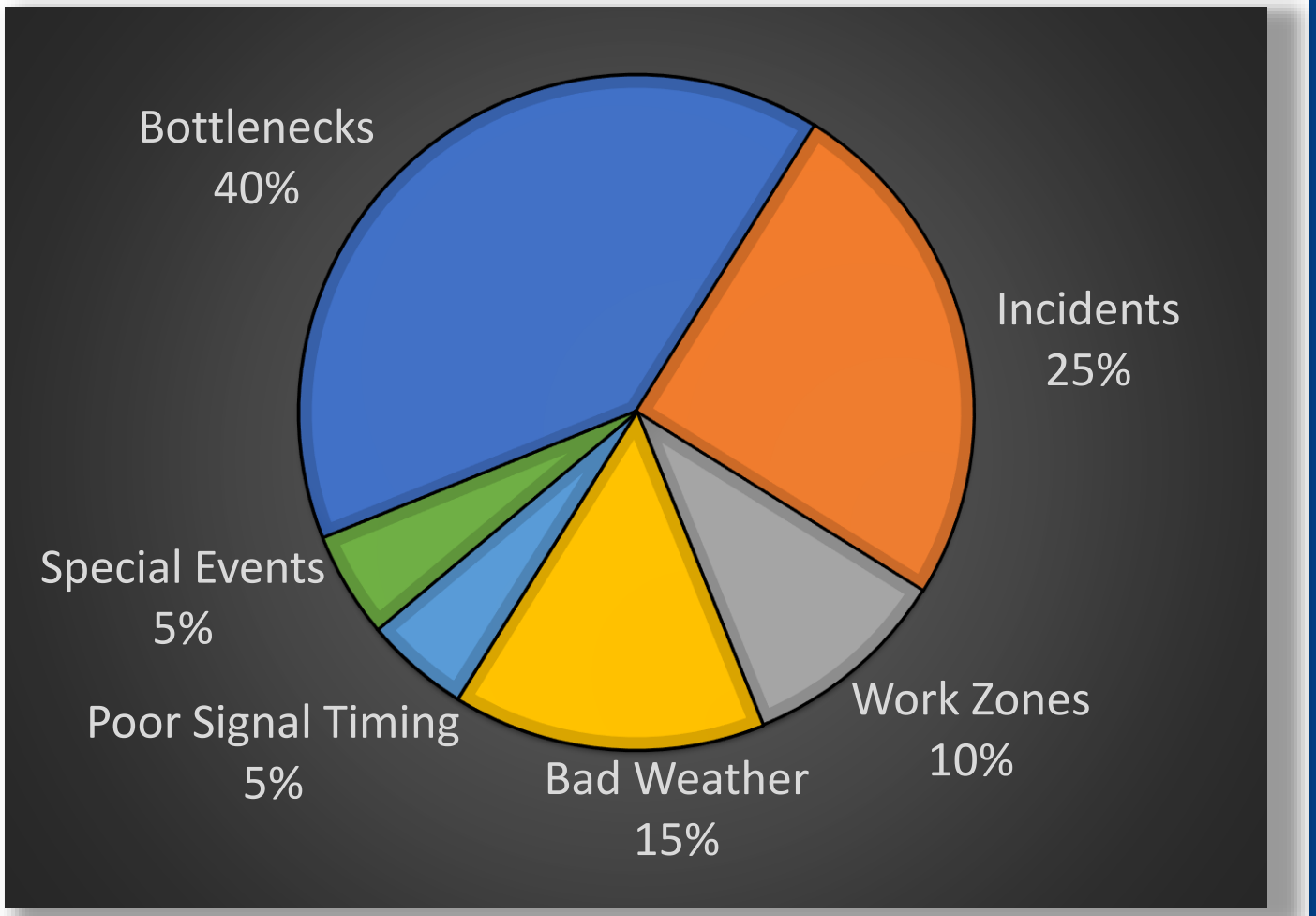
Ignacio Tous
UMD CATT Lab
Lead Data Scientist

Background & Objectives

Patricia Hendren, PhD, I-95 Corridor Coalition

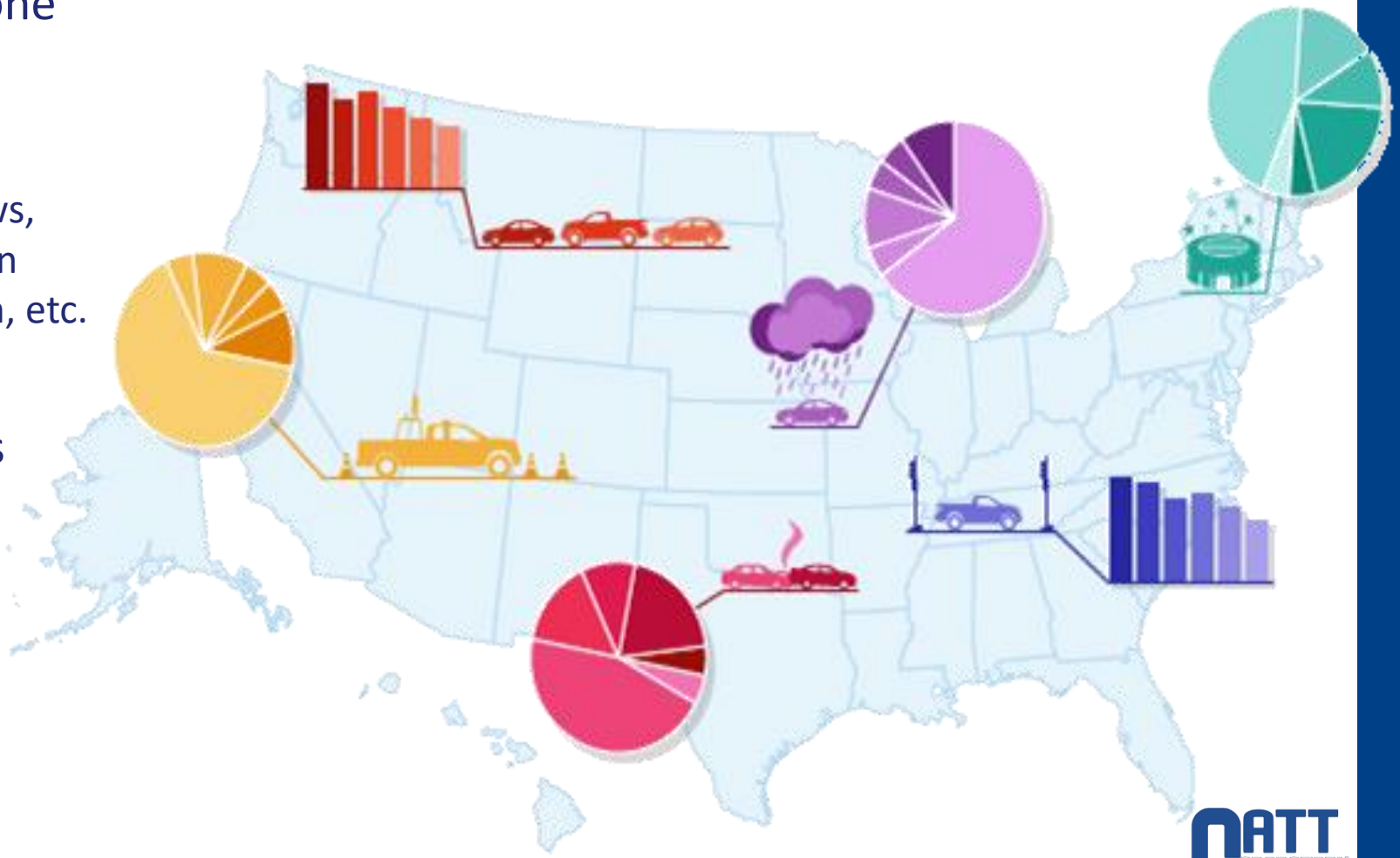
Causes of Highway Congestion "The Pie Chart"

- National statistic
- 14+ years old
- Largely modeled
- Still used extensively for BIG investment and spending decisions



Getting to the root causes of congestion…….

- One stat can’t represent everyone
- Many regional factors:
  Climate, demographics, policies, laws, infrastructure conditions, population density, technology, roadway design, etc.
- Wise decision-making demands current and regionally-relevant information.



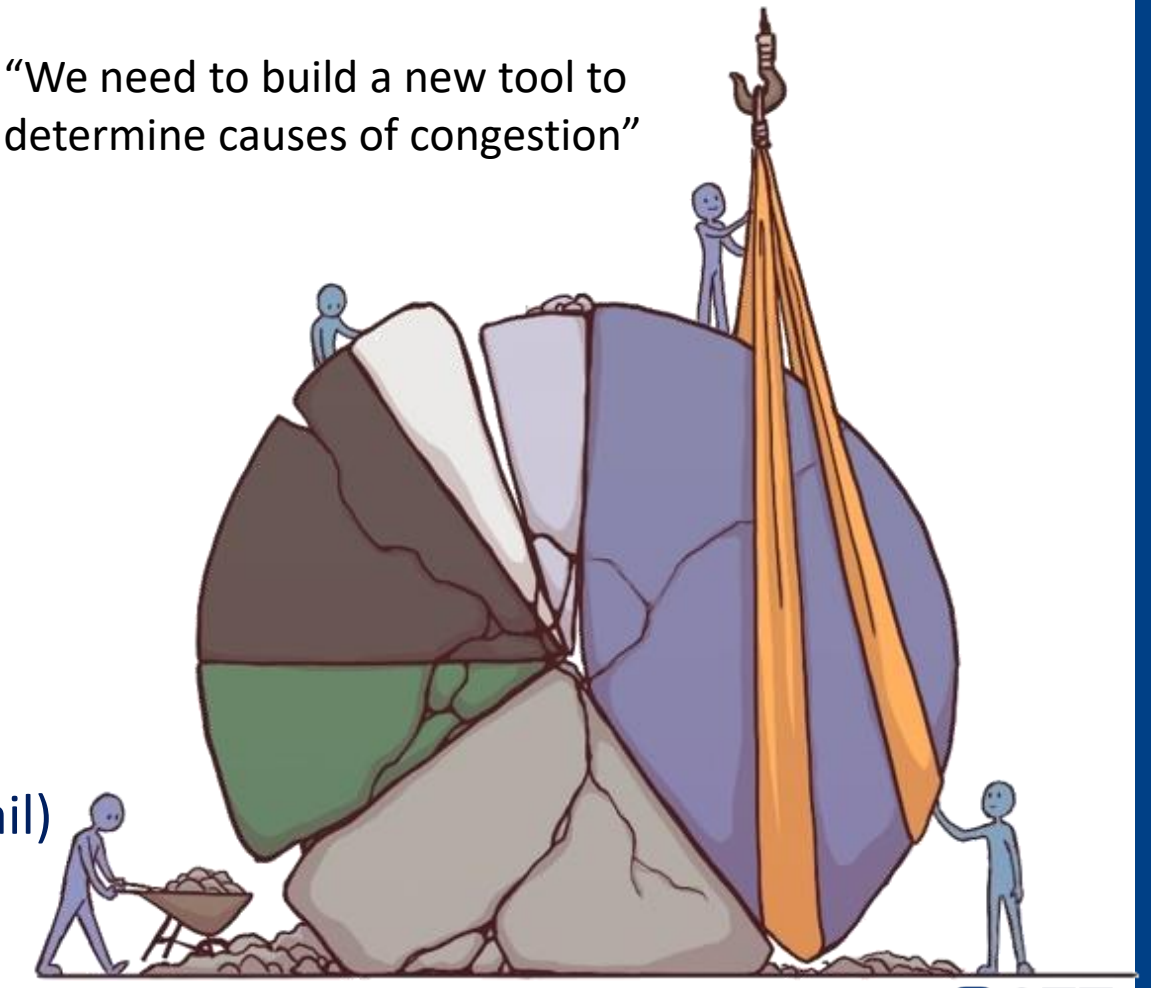
The Solution: Transportation Disruption & Disaster Statistics (TDADS)

The Bureau of Transportation Statistics selected the I-95 Corridor Coalition in partnership with the CATT Lab to create the TDADS Program. TDADS is envisioned as a national system that contains data, statistics, dashboards, tools and visualizations for use in the analysis and understanding of multimodal interstate and inter-regional transportation system disruptions.

TDADS: Overview

1. Upgrade the ancient “pie chart”
   - ✓ Across entire U.S.
   - ✓ Using the nation’s best data
2. Evaluate regional factors
3. Create interactive, easily-accessible tool in the hands of decision makers
4. Expand analysis to other modes (e.g., Air and Rail)
5. Practitioner Steering Committee guide ALL work

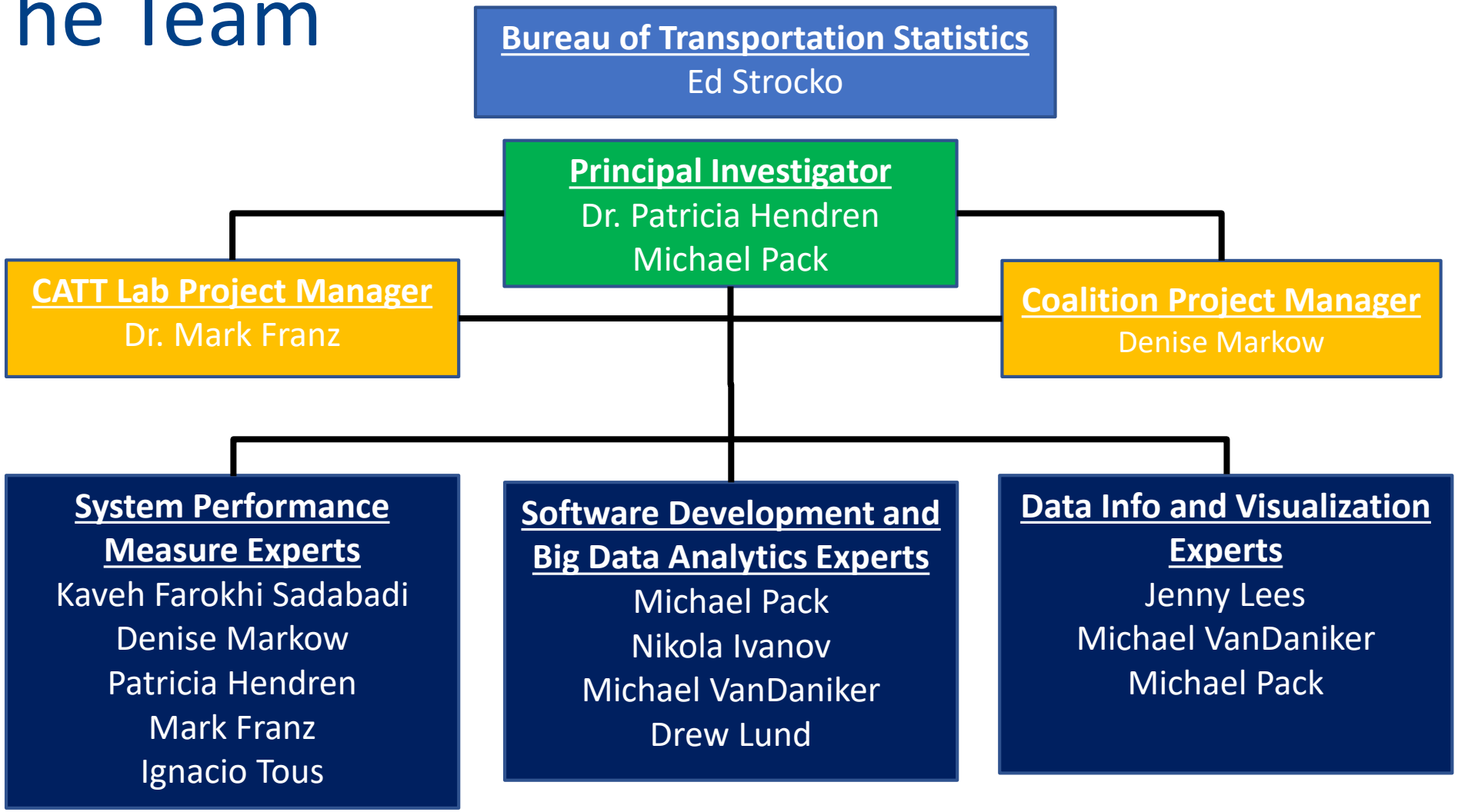
“We need to build a new tool to determine causes of congestion”



TDADS - Project Objectives

- ✓ Develop and promote the use of an online tool for transportation analysts to **access, analyze and visualize data** for monitoring and evaluating transportation network disruptions and disasters
- ✓ **Adjust operational strategies** to focus on larger sources of disruptions
- ✓ Help the **freight industry** manage operations and reduce costs
- ✓ Compare neighboring state results to identify **best management practices to share**
- ✓ **Make the case for TSMO** through quantifying the benefits of reducing the effect of disruptions
- ✓ Provide federal guidance for **informed national level decisions** related to the performance of the transportation network
- ✓ **Improve communication** with the public, policy makers, the media, and other stakeholders

The Team


Bureau of Transportation Statistics
Ed Strocko
Principal Investigator
Dr. Patricia Hendren
Michael Pack
CATT Lab Project Manager
Dr. Mark Franz
Coalition Project Manager
Denise Markow
System Performance Measure Experts
Kaveh Farokhi Sadabadi
Denise Markow
Patricia Hendren
Mark Franz
Ignacio Tous
Software Development and Big Data Analytics Experts
Michael Pack
Nikola Ivanov
Michael VanDaniker
Drew Lund
Data Info and Visualization Experts
Jenny Lees
Michael VanDaniker
Michael Pack

Steering Committee Role:

Guide the development of TDADS to ensure the tool is useful to practitioners:

- Assess the terminology and the definitions that will form TDADS foundation (e.g. how do we best define disruptions?)
- Identify and prioritize the causes of disruption that will be used to build the tool
- Provide feedback on preliminary results
- Assess the feasibility of expanding TDADS to a multimodal tool
- Advance the use of TDADS in the transportation field

Invited Steering Committee Members

AASHTO	DVRPC	Montana DOT	Rhode Island Statewide Planning
Alabama DOT	Florida DOT	MWCOG	South Alabama Regional Planning Commission
Arkansas DOT	Georgia DOT	Nebraska DOT	South Carolina DOT
Baltimore Metropolitan Council	Iowa DOT	Nevada DOT	South Dakota DOT
Birmingham MPO (AL)	Kansas DOT	New Hampshire DOT	South Jersey Transportation Planning Organization
California	Louisiana DOT	New Jersey DOT	Tennessee DOT
California DOT	Maine DOT	New York State DOT	Texas DOT
City of Charlotte, NC	Maryland DOT - SHA	North Carolina DOT	University of Alabama
Connecticut DOT	Massachusetts DOT	North Dakota DOT	University Of Maryland CATT Lab
Connecticut Metropolitan COG	Michigan DOT	Ohio DOT	Vermont AOT
Delaware DOT	Minnesota DOT	Oklahoma DOT	Virginia DOT
District DOT	Mississippi DOT	Pennsylvania DOT	Washington State DOT

Overview and Preliminary Results & Interface Designs

Mark Franz, PhD, University of Maryland CATT Laboratory

TDADS Framework

Recommended Terminology		Potential Data Sources	Definition	Details
Disruption		• Probe data	A sustained interruption in the flow of traffic that results in travel delay.	• Time and location of an event that causes a speed drop of at least 60% of the reference speed that is sustained for at least 5 minutes. This location is the head of a traffic queue.
Disruption Sources	**Recurrent Disruption**	• Probe data	A predictable and regular pattern of interruption in traffic flow that results in travel delay.	• Disruption pattern that is predictable in both space and time and is observed on a regular basis • Typically caused by surge in demand near or above the capacity of the corridor
	Incidents	• DOT data • FARS • Waze • CAD	Interruption in traffic flow caused by an unplanned in-road or roadside obstruction that results in travel delay.	• Disabled vehicle • Crash/Incident • Emergency roadwork • Road obstruction
	Bad Weather	• NWS Radar	Interruption in traffic flow caused by inclement weather conditions.	• Rain • Snow • Visibility reduced (fog)
	Work Zones	• State or Agency provided • Waze	Interruption in traffic flow caused by a planned construction or maintenance project/activity.	• Planned work zones
	Special Events	• Holidays & Travel Days	Interruption in traffic flow caused by a scheduled occasion.	• Before, on or after major holidays
	***Poor Signal Timing**	• DOT asset management records/maps	Interruption in traffic flow caused by improperly timed traffic signals.	• Delay incurred at signalized intersections
	Unclassified Disruption	• Probe data	Interruption in traffic flow with no discernable cause.	• TBD

*Note that the inclusion of the “Poor Signal Timing” category is under evaluation

Poll Question #1 - Sources of Disruption

1 Do you agree with the proposed six sources of disruption to define our national pie chart?

___ **Yes**

___ **No**

___ **Not Sure**

Poll Question #2 – Additional Details for Sources of Disruption

2

Of the sources of disruption, which category would it be beneficial to have additional details or breakdown, *in the future*?

___ **Recurrent Disruption**

___ **Incidents**

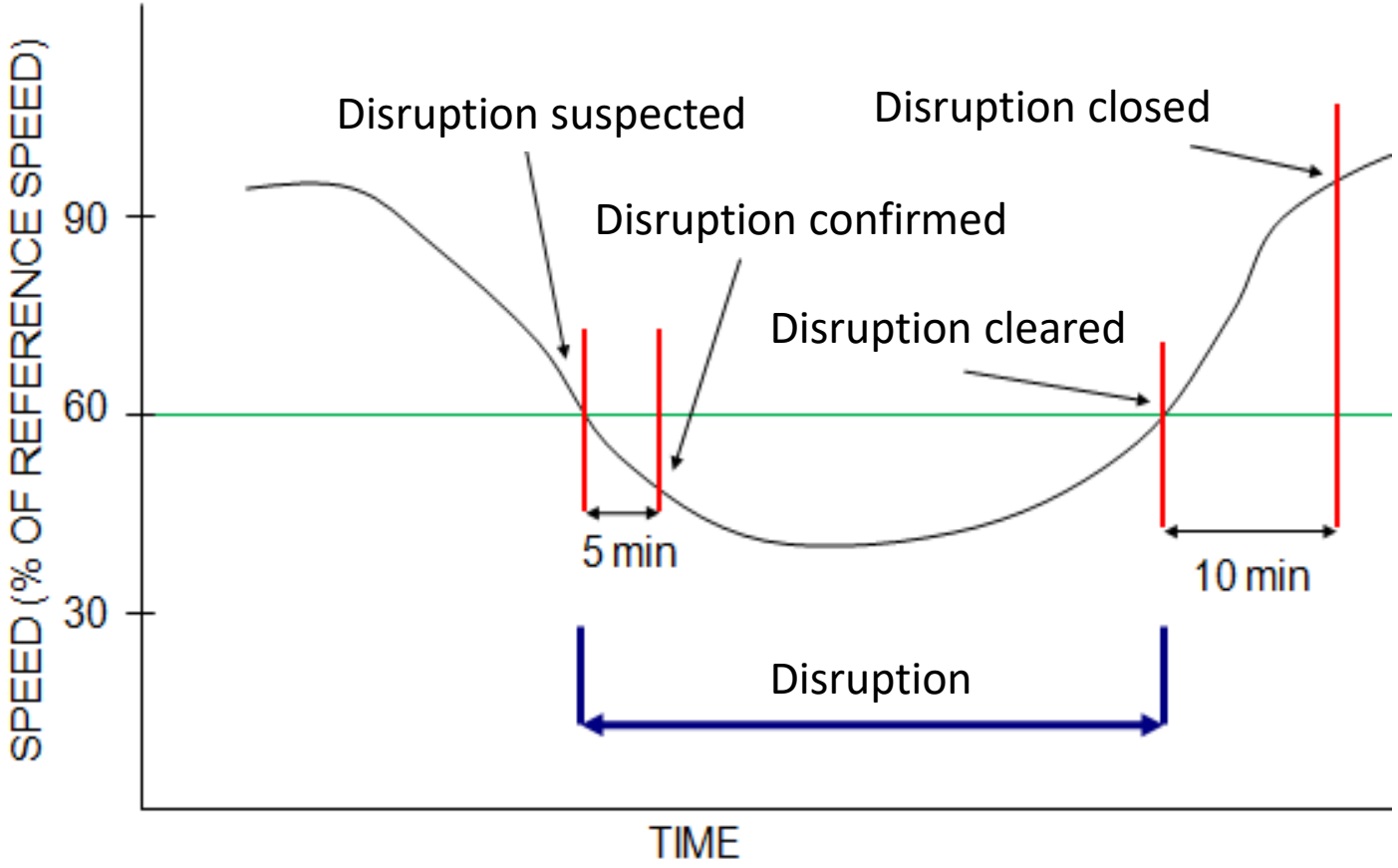
___ **Bad Weather**

___ **Work Zones**

___ **Special Events**

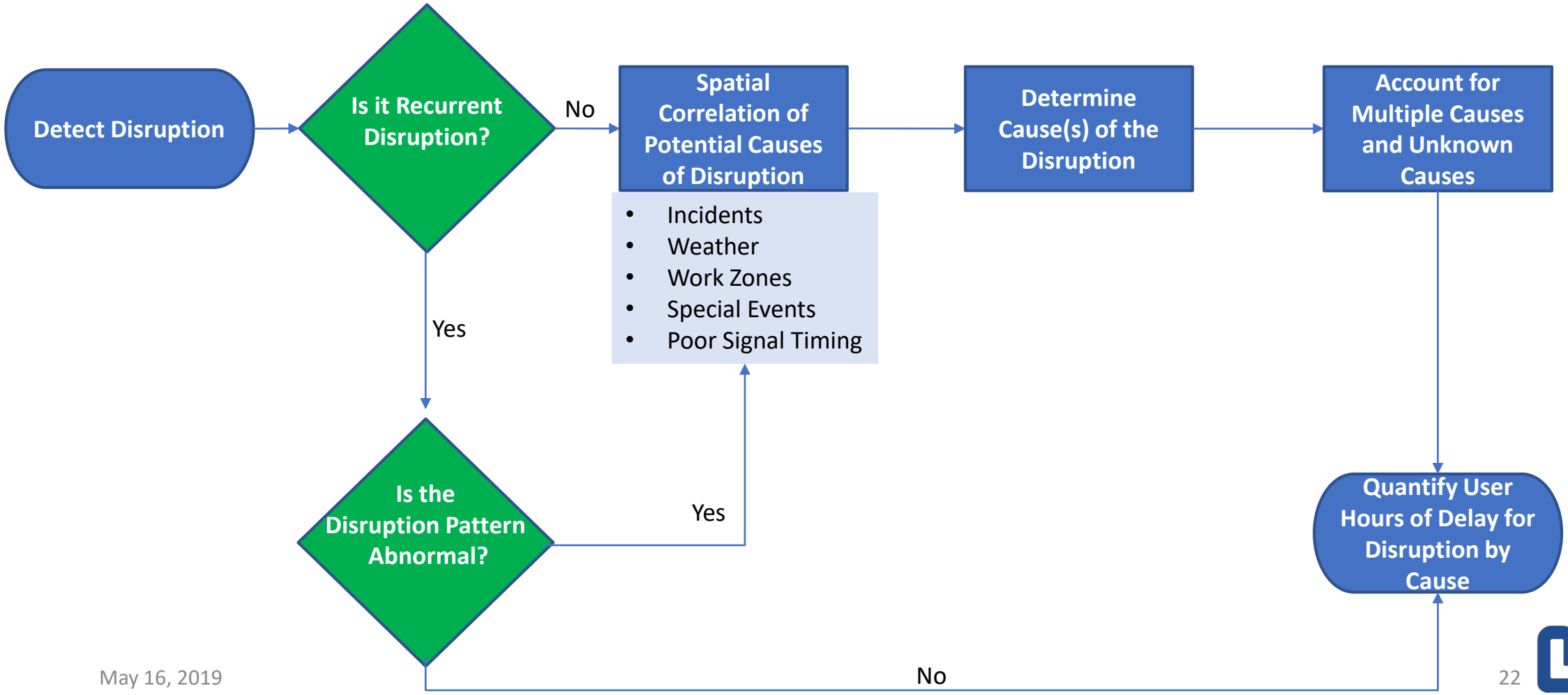
___ **Poor Signal Timing**

Defining Disruption

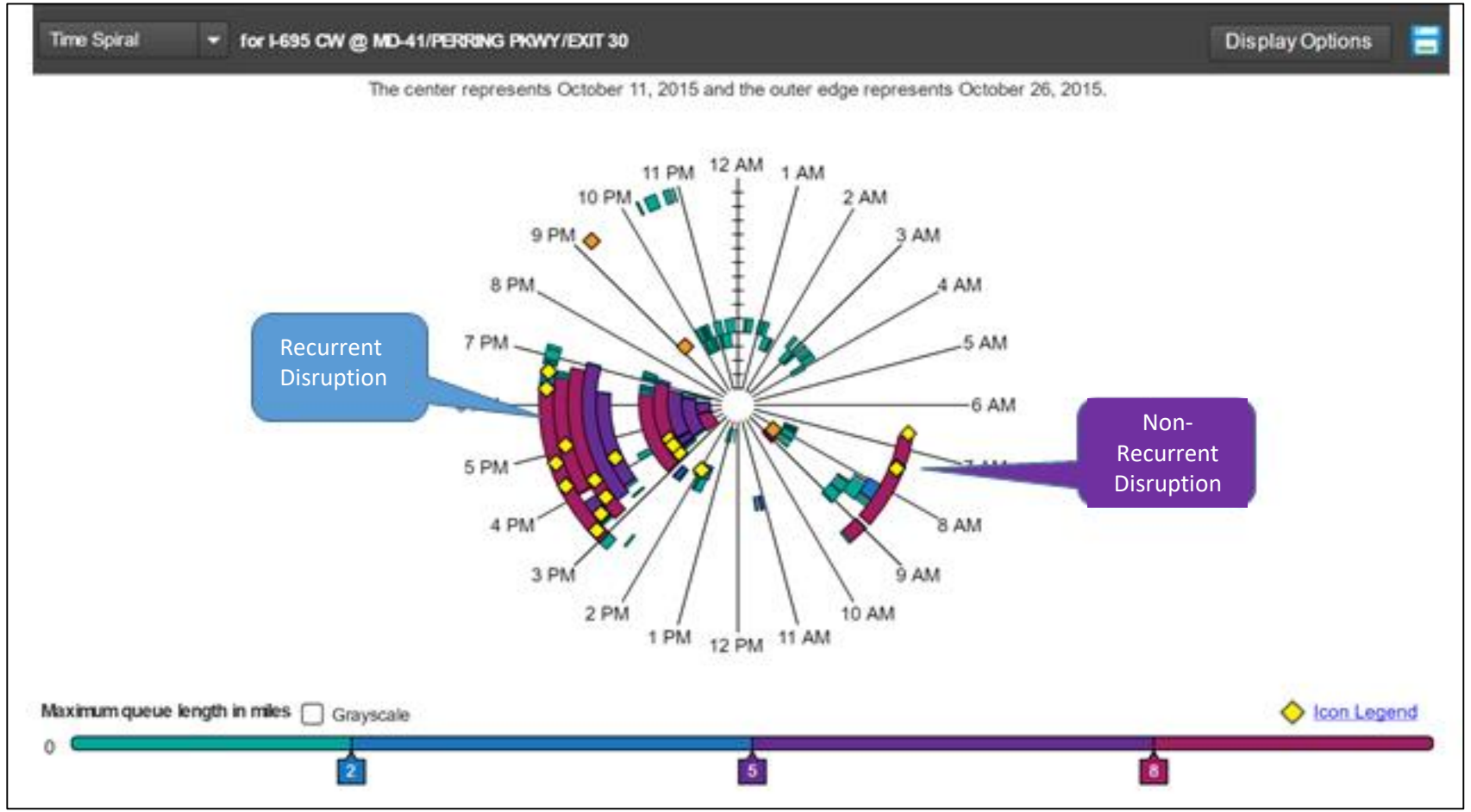


Lund, A., Pack, M.L., Plaisant, C., and Franz, M.L. Algorithms for Identifying and Ranking Bottlenecks Using Probe Data. Transportation Research Board 96h Annual Meeting. Washington, D.C. 2017.

High Level Approach to Quantifying Disruptions

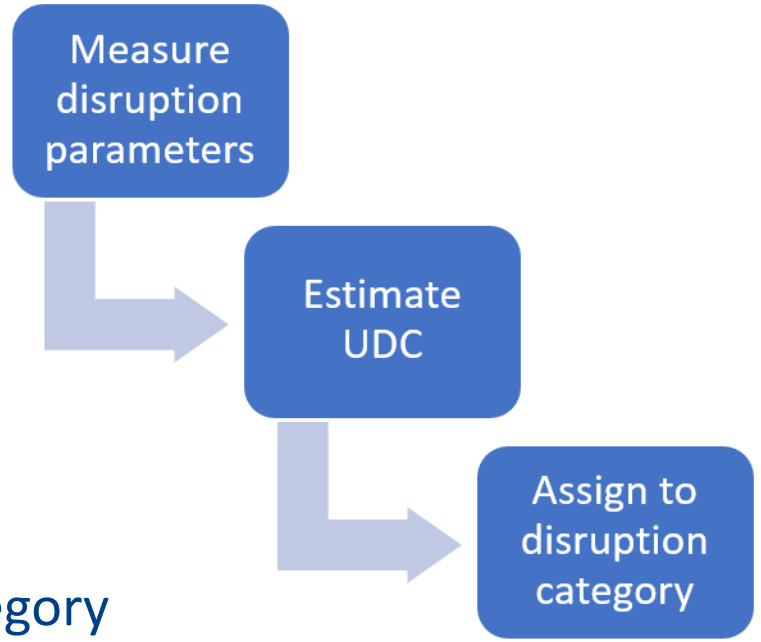


Recurring vs. Non-recurring

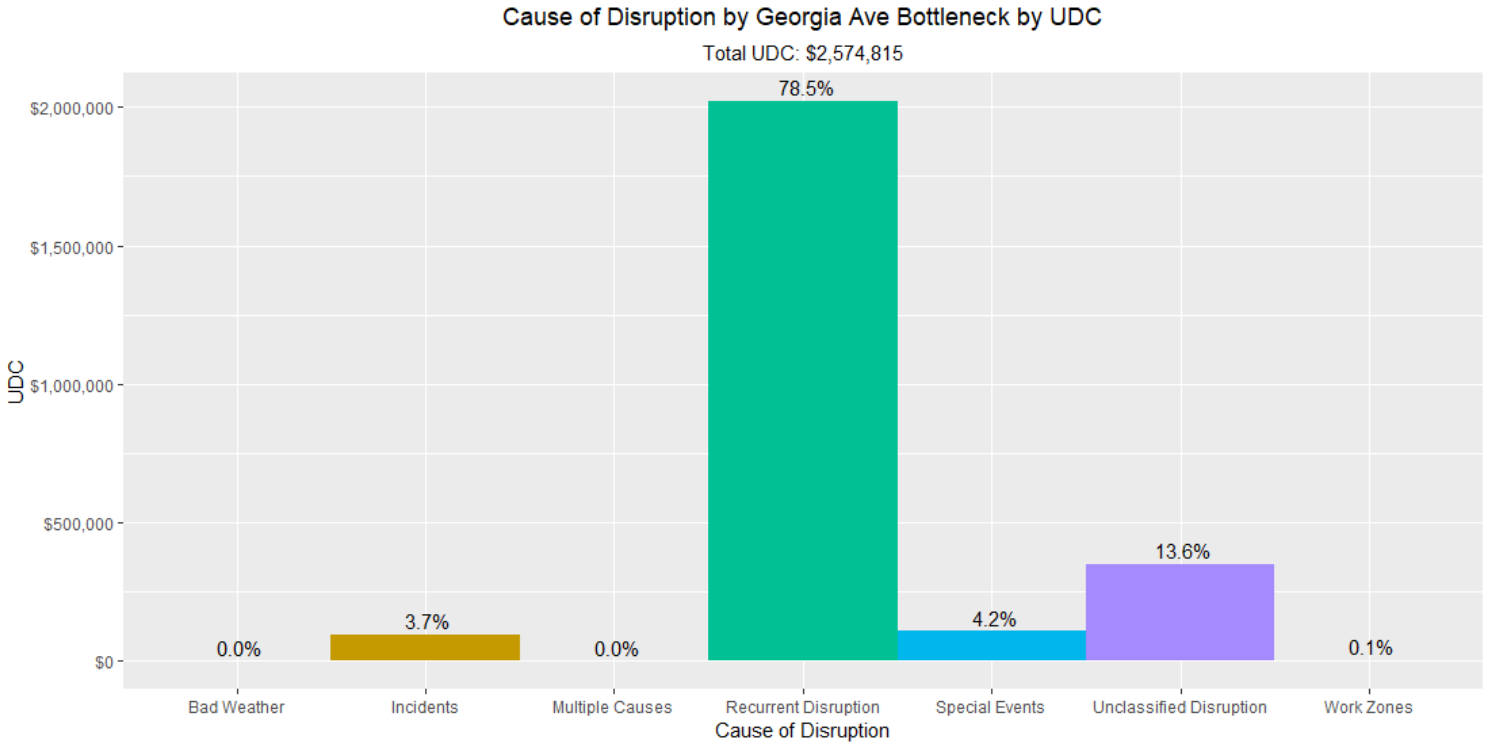


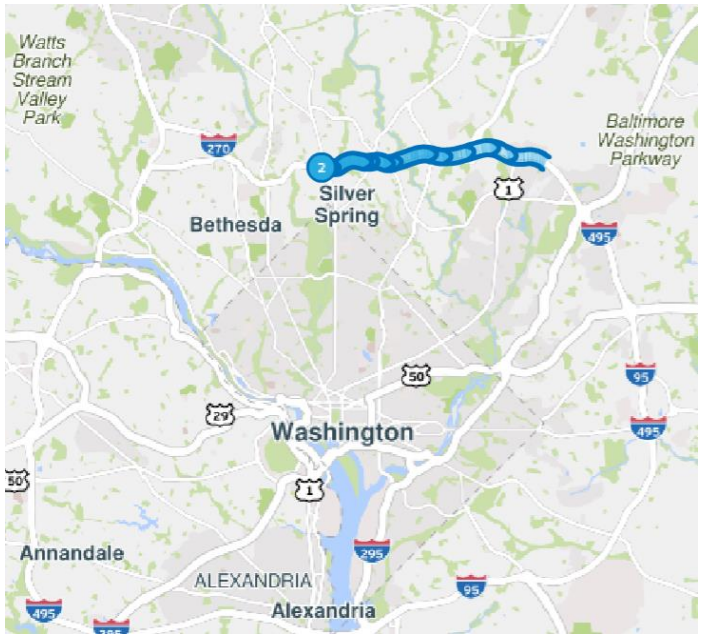
Quantifying Disruption: User Delay Cost (UDC)

- Convert delay to a dollar value
- Inputs/Assumptions:
  - Travel time delay
  - Traffic volume
  - Commercial vehicle percentage
  - Value of time passenger vehicles
  - Value of time commercial vehicles
- Assign UDC from each disruption to a disruption category
- Pie/Bar chart based on total UDC in each category



Preliminary Results: I-495 Outer Loop at Georgia Ave. March 2018





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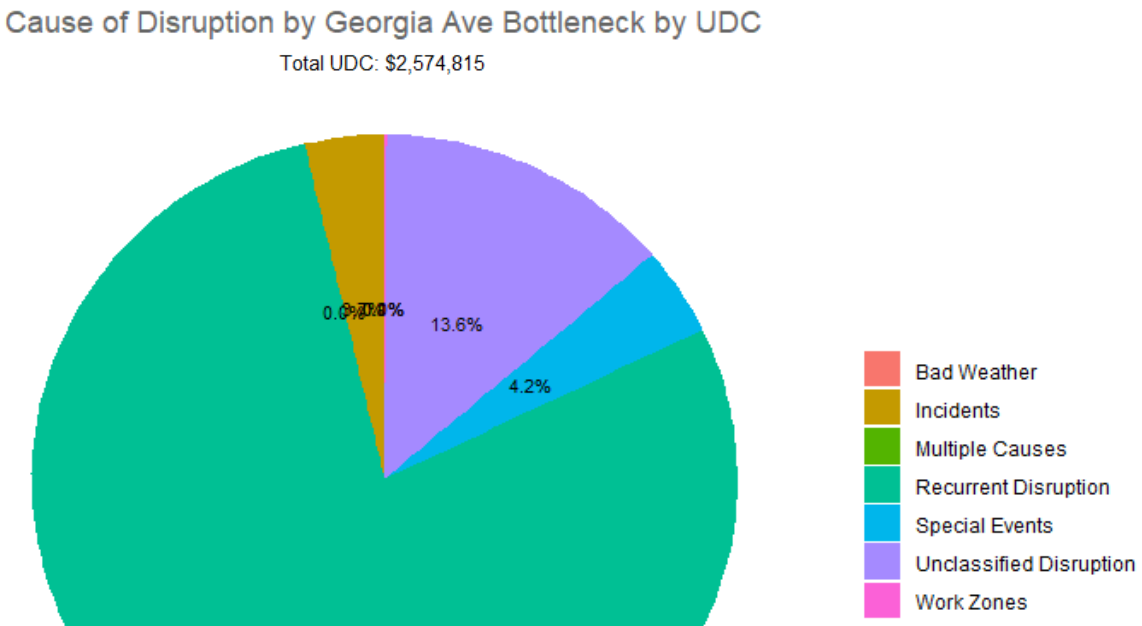
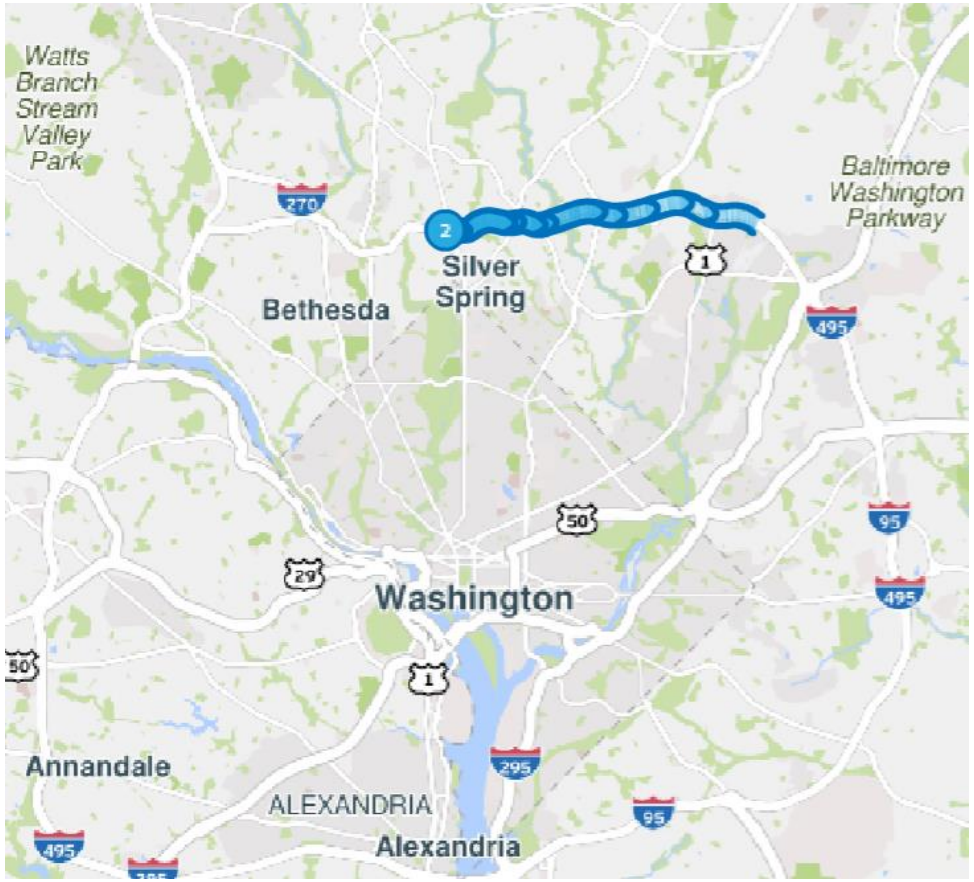
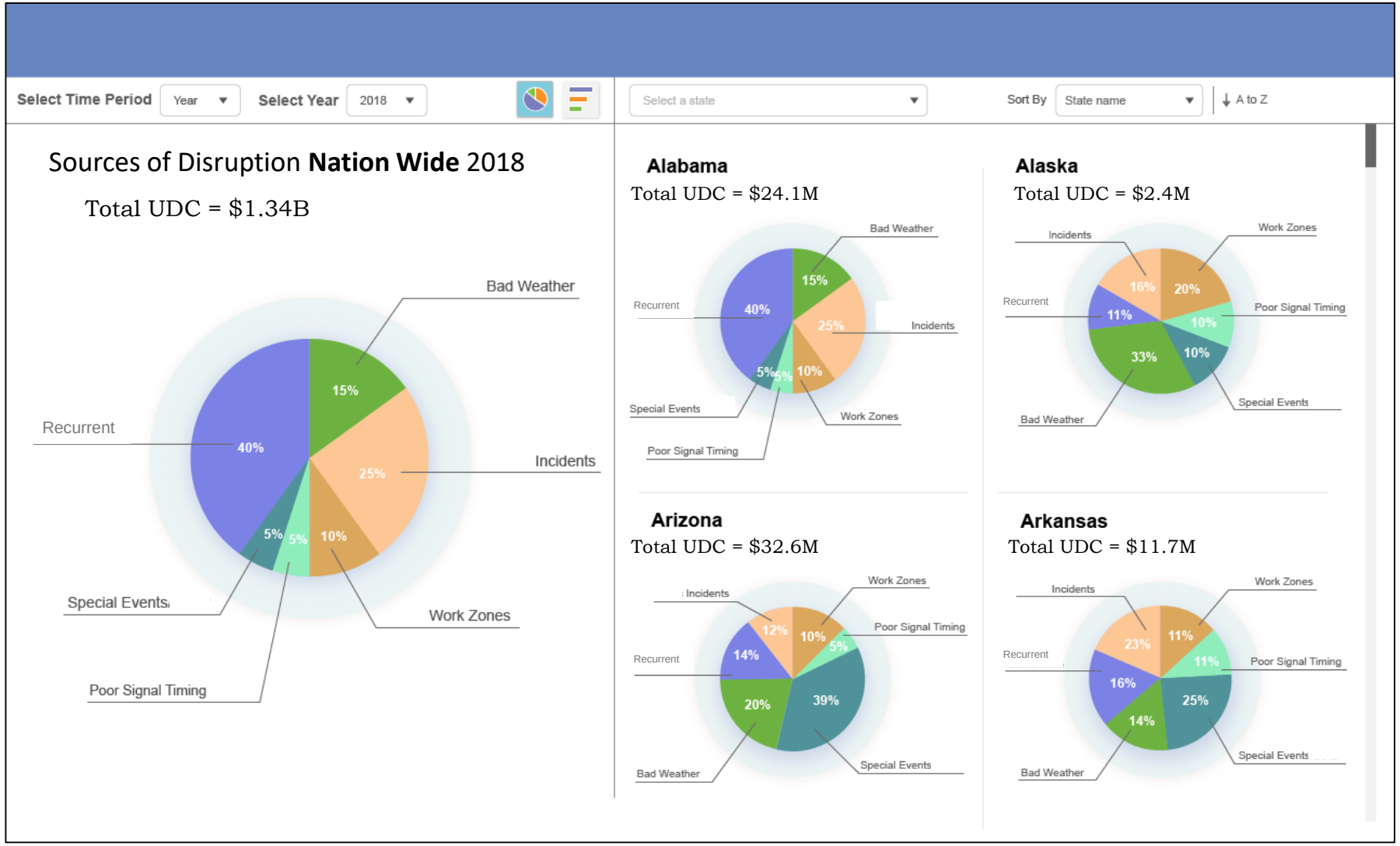




Conceptual Interface Design



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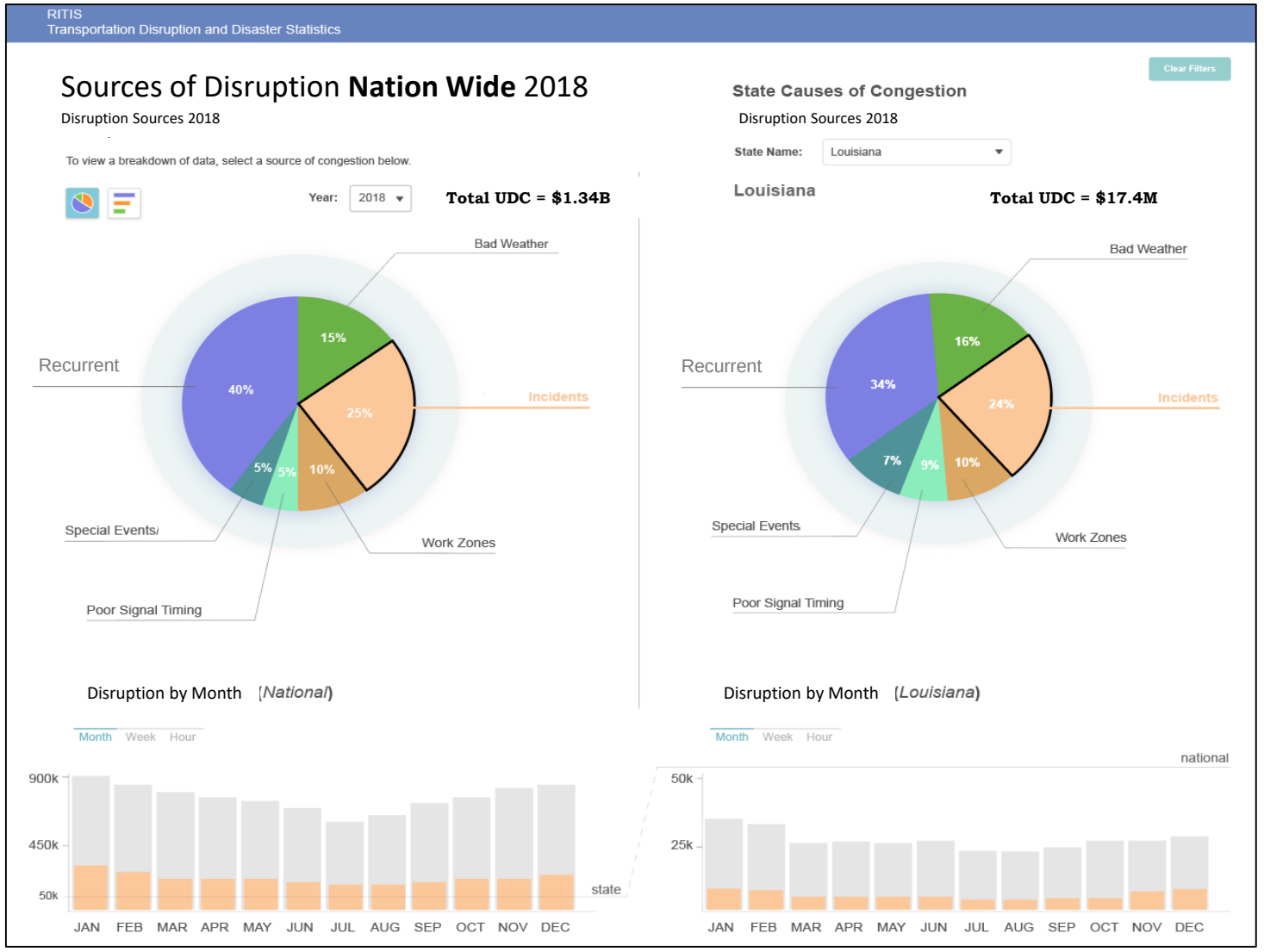
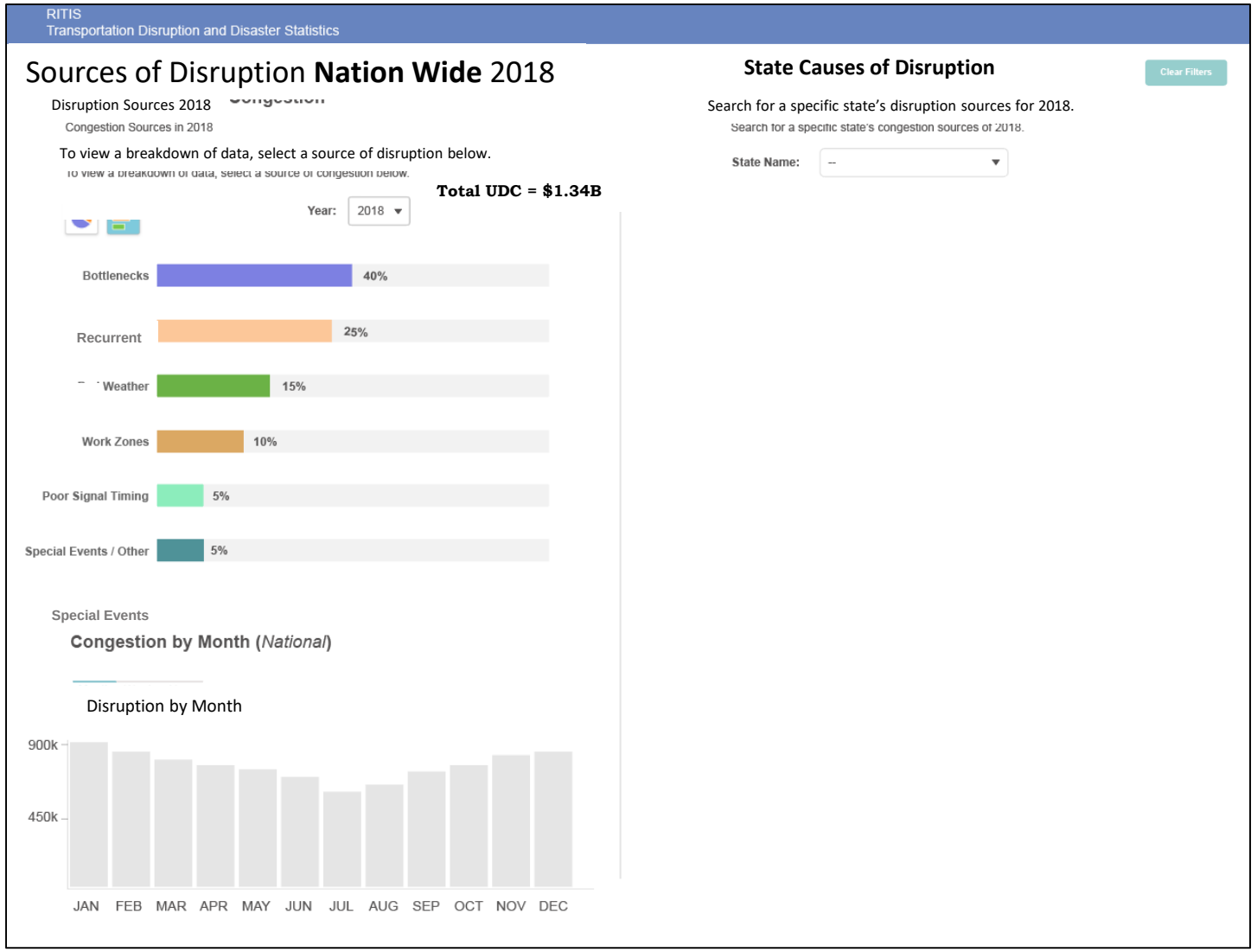


Conceptual Interface Design



Poll Question #3 - Sources of Disruption

3

What visualization of the TDADS results is the most useful for your organization?

___ **Pie Charts Only**

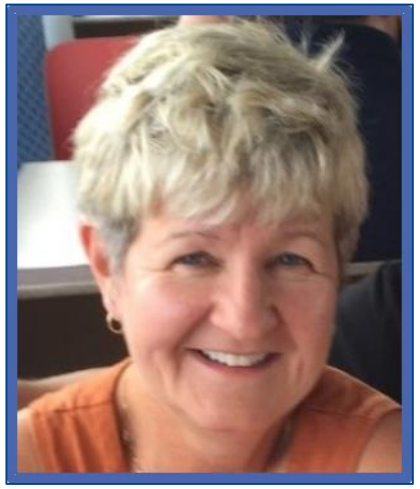
___ **Bar Graphs Only**

___ **Pie Charts & Bar Graphs**

___ **Other**

Wrap Up

Denise Markow, PE, I-95 Corridor Coalition



In Summary: Understanding the Problem

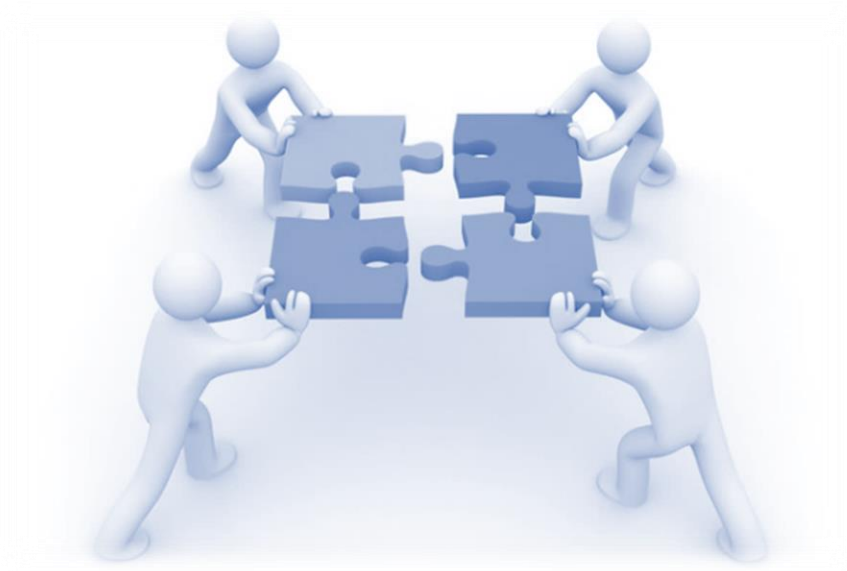
It is critical that transportation agencies understand the underlying causes of disruptions in order:

- ✓ To target the correct strategies to mitigate resulting delays
- ✓ To gain clarity about the role of recurring versus non-recurring delay
- ✓ To have the ability to assess the effectiveness of the applied strategies

And there will be challenges for creating a comprehensive tool

- Base Line of non-disrupted performance must be established
- Data Limitations – not all disruptions are reported consistently
- Quality Control – new data feeds will need to be used such as NWS or WAZE

Questions?



In Closing….

Thank you for joining today

For Additional Information, please contact:

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Director, TSMO

I-95 Corridor Coalition

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dmarkow@i95coalition.org