

RITIS Causes of Congestion - Identifying & Quantifying the Causes of Congestion for the Heartland

➤ Data-driven mobility insights from the CATT Lab

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Today's Topics

Web App Link

- National, State and County App:

<https://go.umd.edu/congestion>



ITS Heartland

CATT LABORATORY

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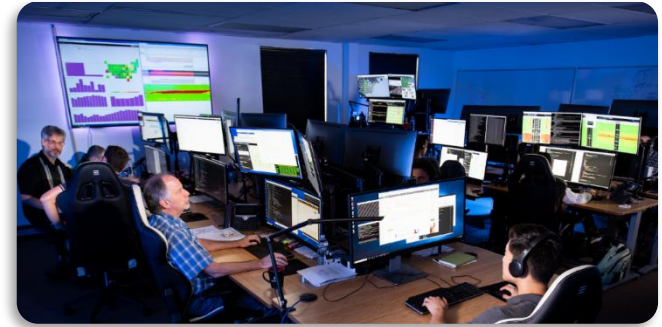
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CATT Lab (Who we are)

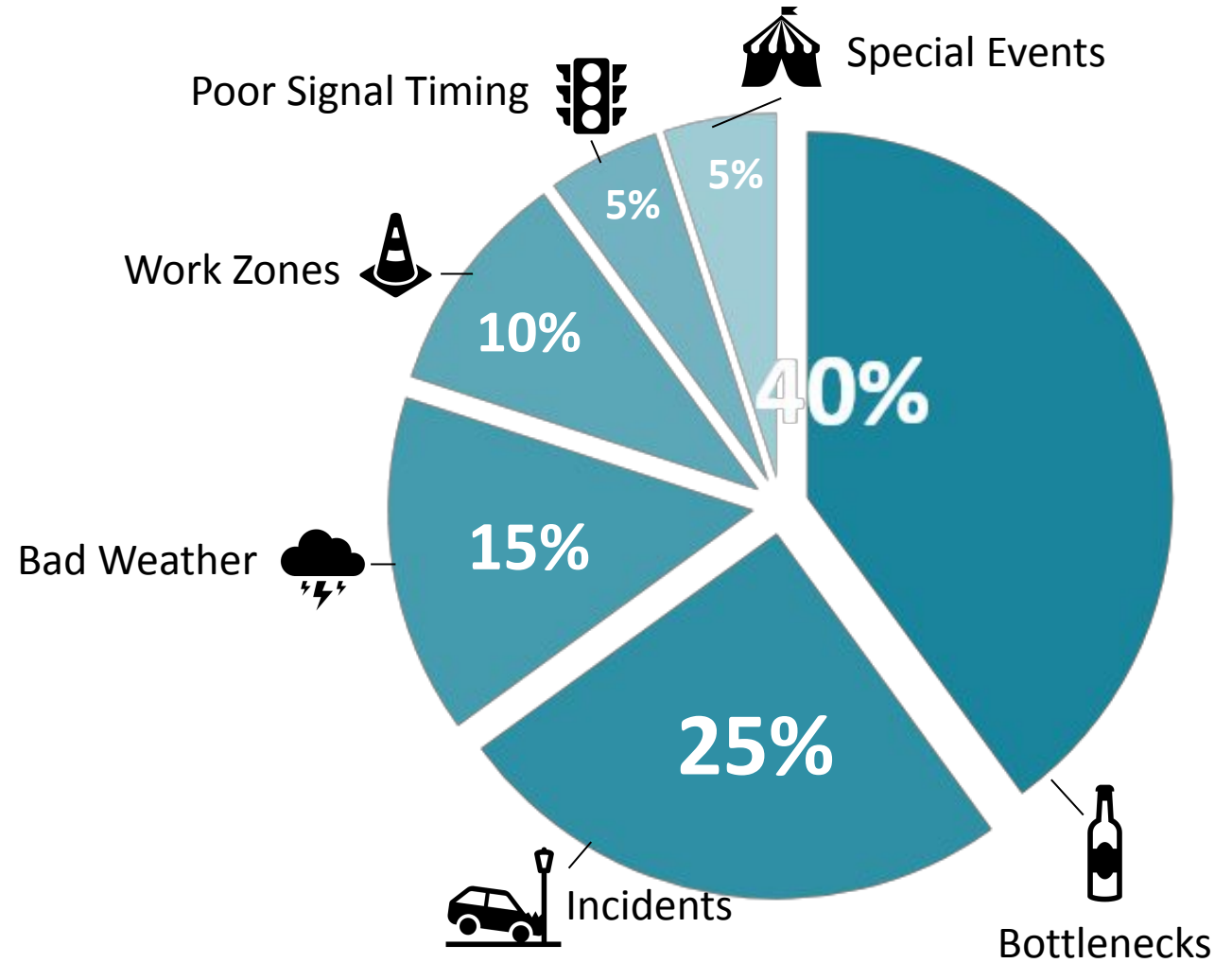
- The CATT Lab operates the world's largest mobility-driven data archive and analytics platform
- We are the industry leader of applied big-data analytics for transportation applications (operations, planning & research)
 - Mobility big data analytics
 - Information/data visualization
 - Mobility research
 - Data science
 - Performance management



Moving Past Old Assumptions

The congestion pie chart was:

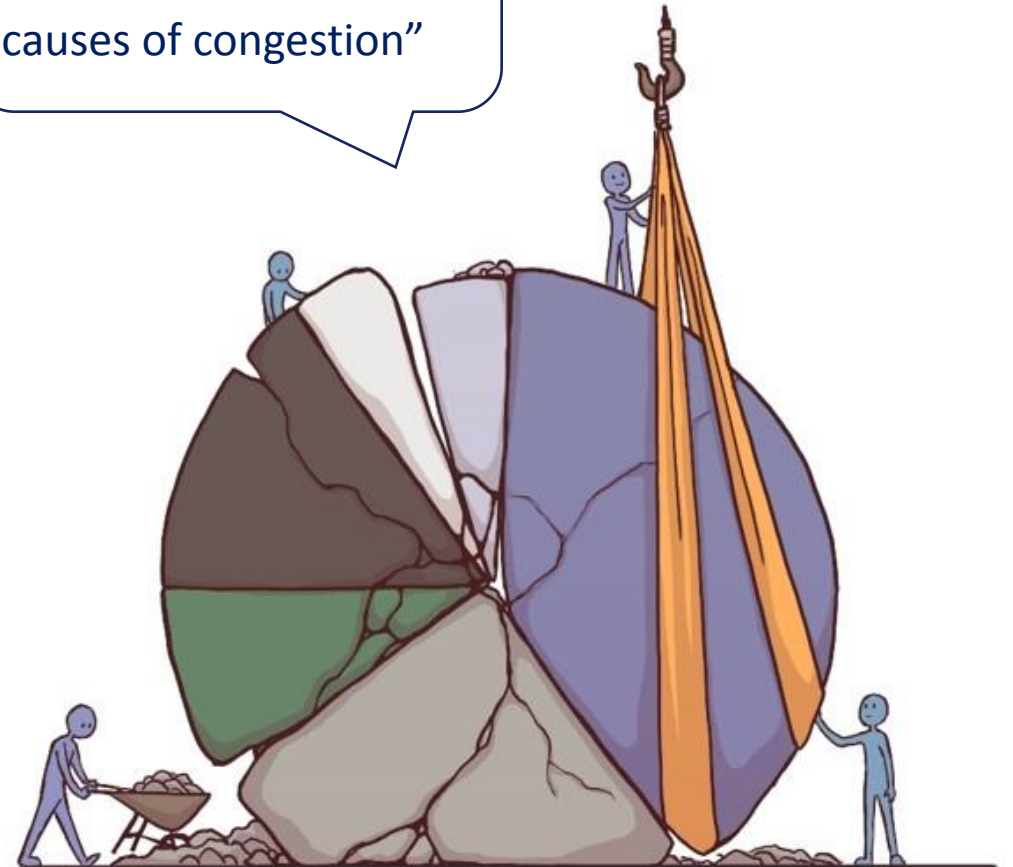
- A national statistic
- 17+ years old
- Largely modeled
- In a nutshell... outdated



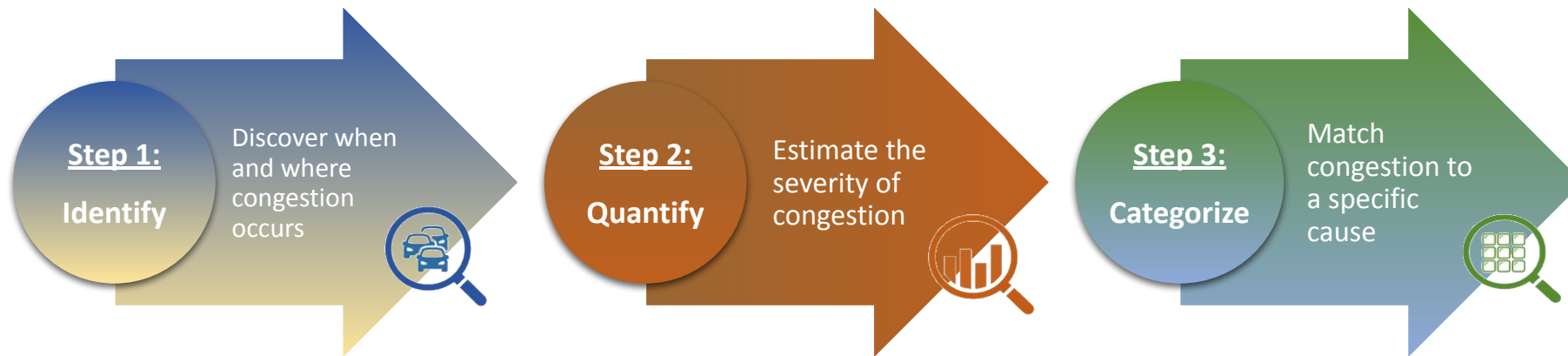
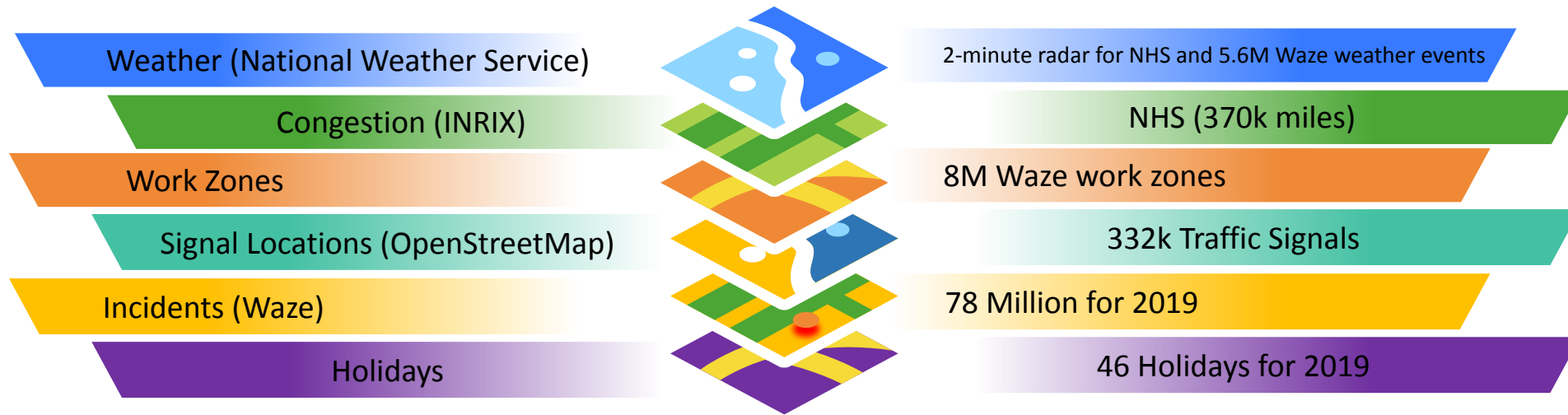
Objectives

1. Upgrade the outdated “pie chart”
 - Across entire NHS
 - Use consistent data sources
 - Develop research-backed methodology
2. Evaluate congestion causes
3. Create interactive, easily-accessible tool for decision makers
4. Open web-based solution

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



Data and Methodology Summary



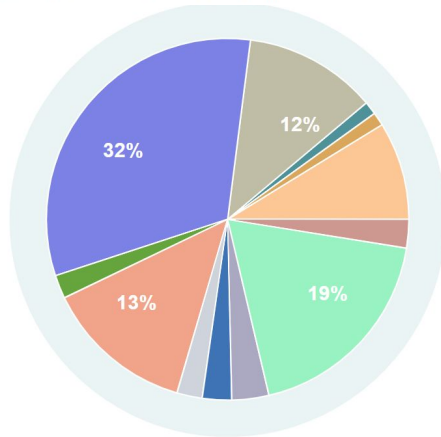
Results –2019 National vs 2004 National

Sources of Disruption Nationwide 2019

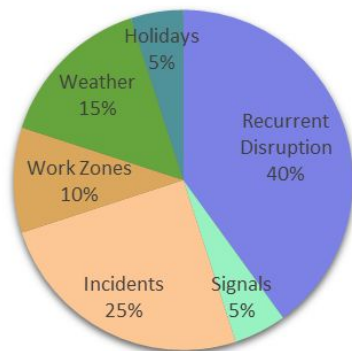
No weather radar data was included for the states of AK and HI

\$45.84b User Delay Cost
1.75b Vehicle Hours of Delay

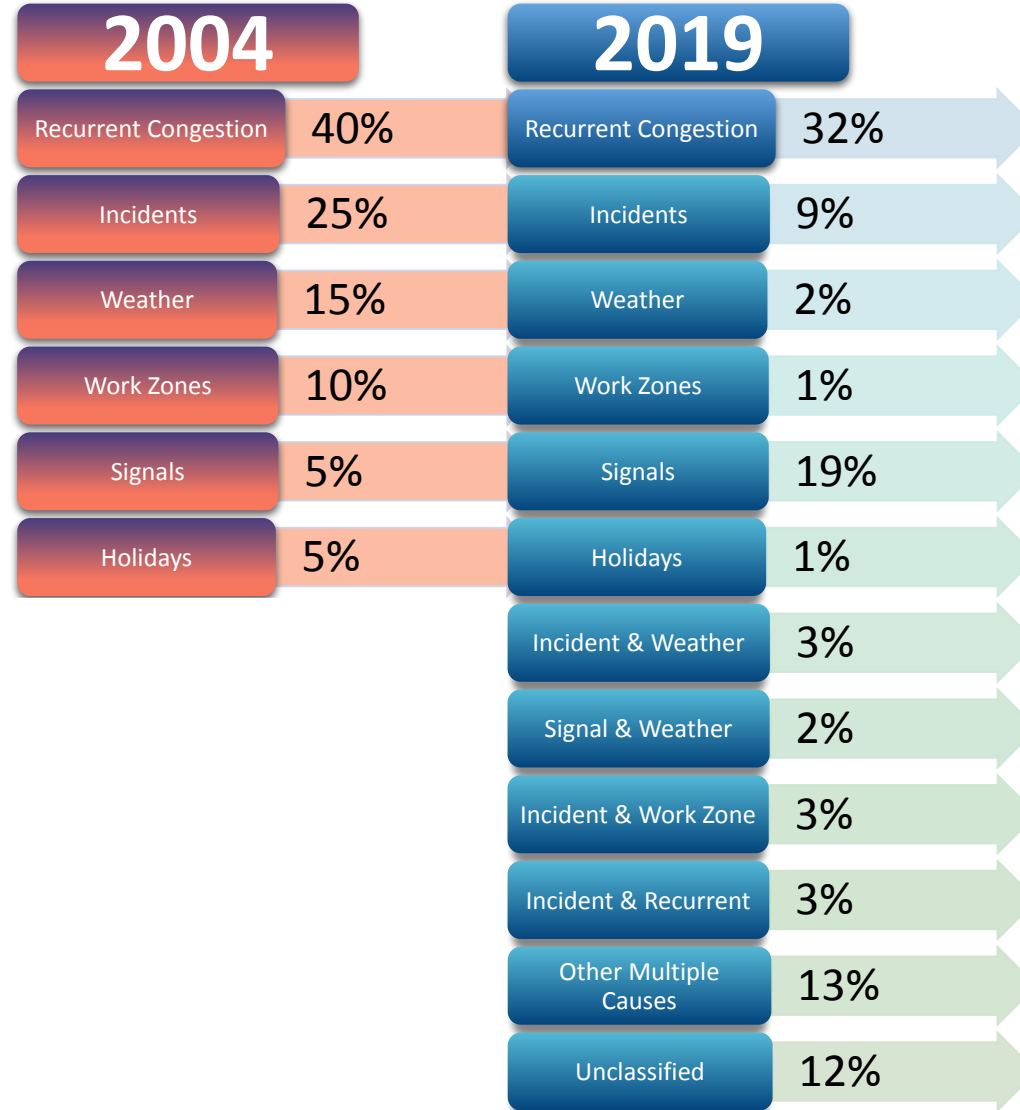
- Recurrent
- Incident
- Weather
- Work Zone
- Signals
- Holiday
- Incident & Weather
- Signal & Weather
- Incident & Workzone
- Recurrent & Incident
- Other Multiple Causes
- Unclassified



National Congestion Pie Chart (2004)

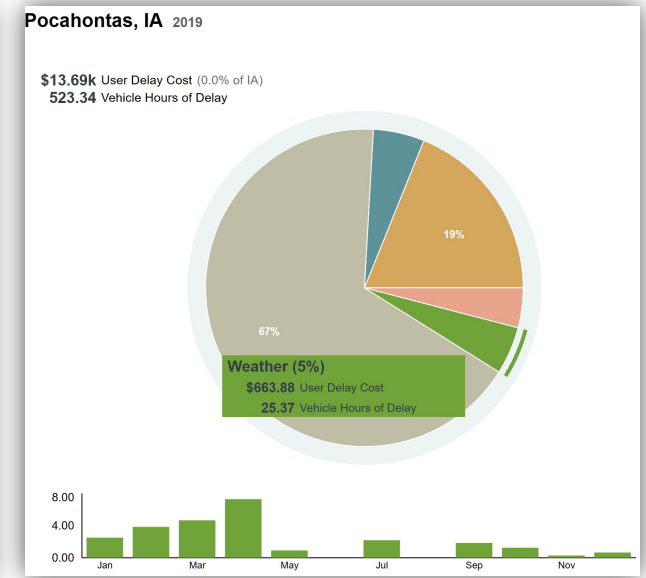
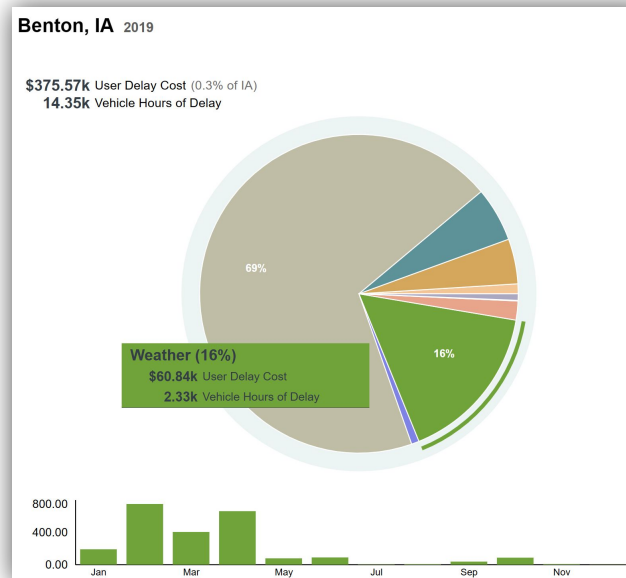
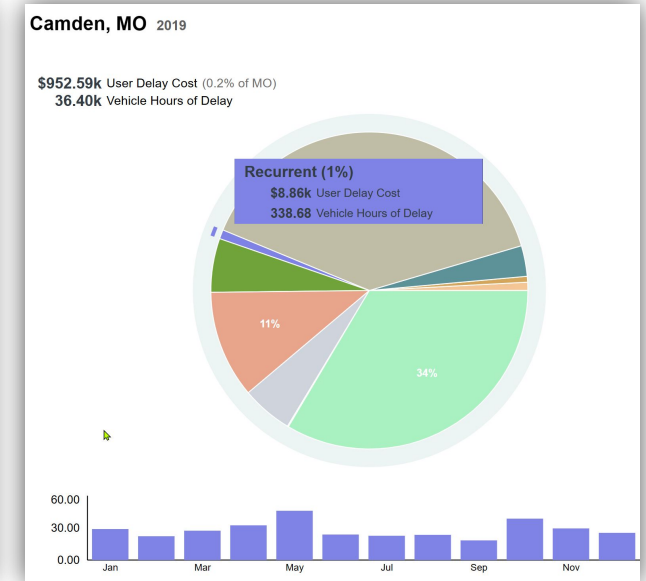
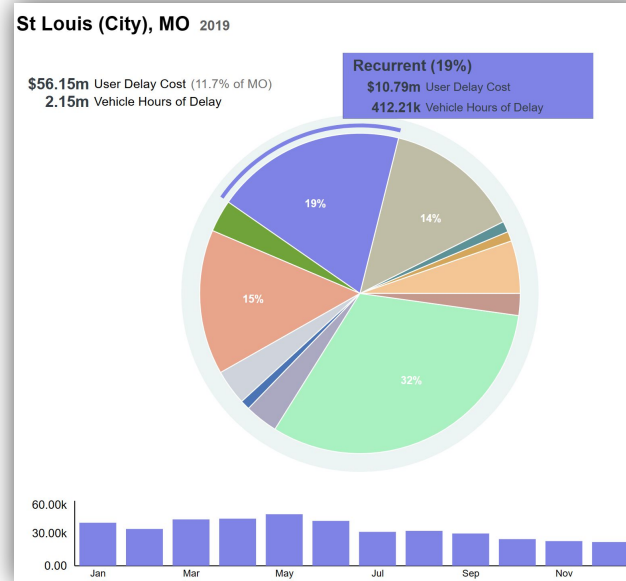


■ Recurrent Disruption ■ Signals ■ Incidents ■ Work Zones ■ Weather ■ Holidays



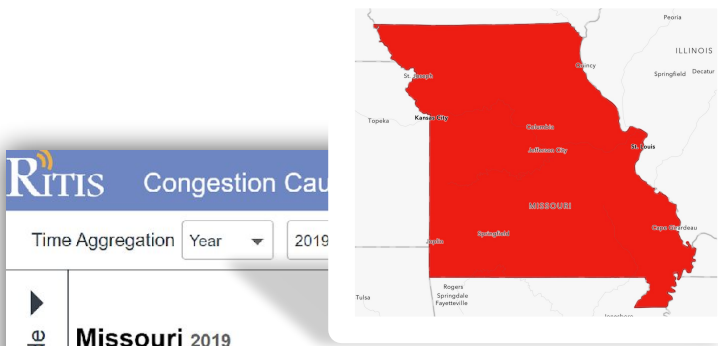
Causes of Congestion – Use Cases

- Causal variations in congestion between urban and rural areas
 - St. Louis (City), MO vs.
 - Camden County, MO
- Illustrate how weather impacts traffic flow
 - Benton County, IA vs.
 - Pocahontas County, IA



Missouri - Annual Pie Charts with Monthly Recurrent Congestion

- Recurrent
- Incident
- Weather
- Work Zone
- Signals
- Holiday
- Incident & Weather
- Signal & Weather
- Incident & Workzone
- Recurrent & Incident
- Other Multiple Causes
- Unclassified



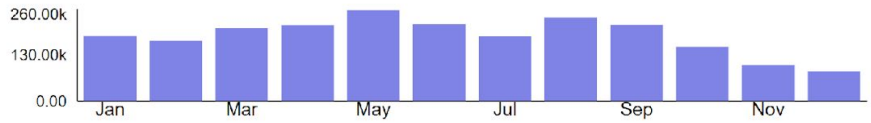
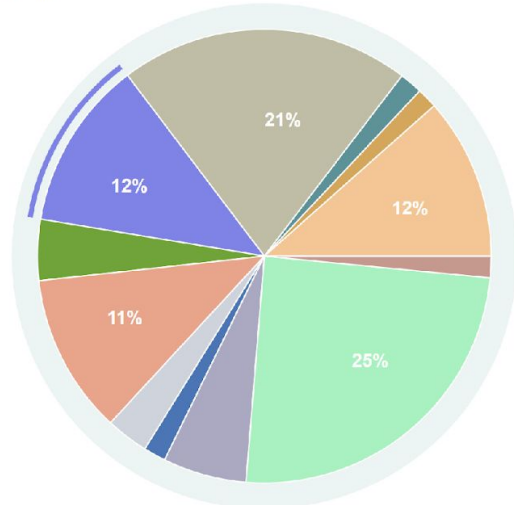
RITIS Congestion Cause

Time Aggregation Year 2019

Nationwide

Missouri 2019

\$480.79m User Delay Cost (1.0% of US)
18.37m Vehicle Hours of Delay



m (NHS)

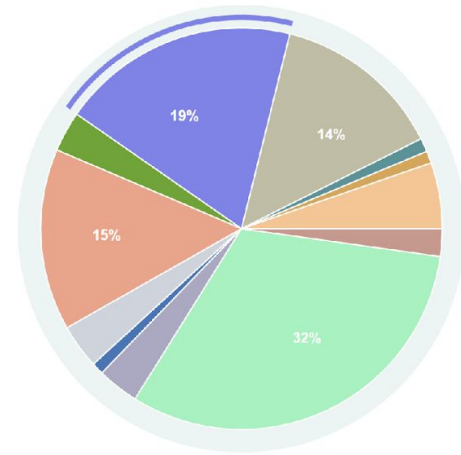
View C

View States



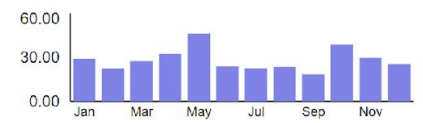
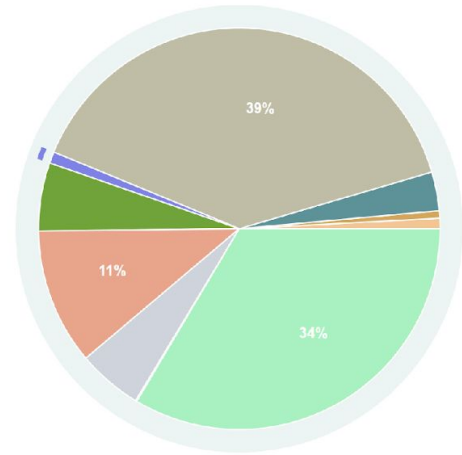
St Louis (City), MO 2019

\$56.15m User Delay Cost (11.7% of MO)
2.15m Vehicle Hours of Delay

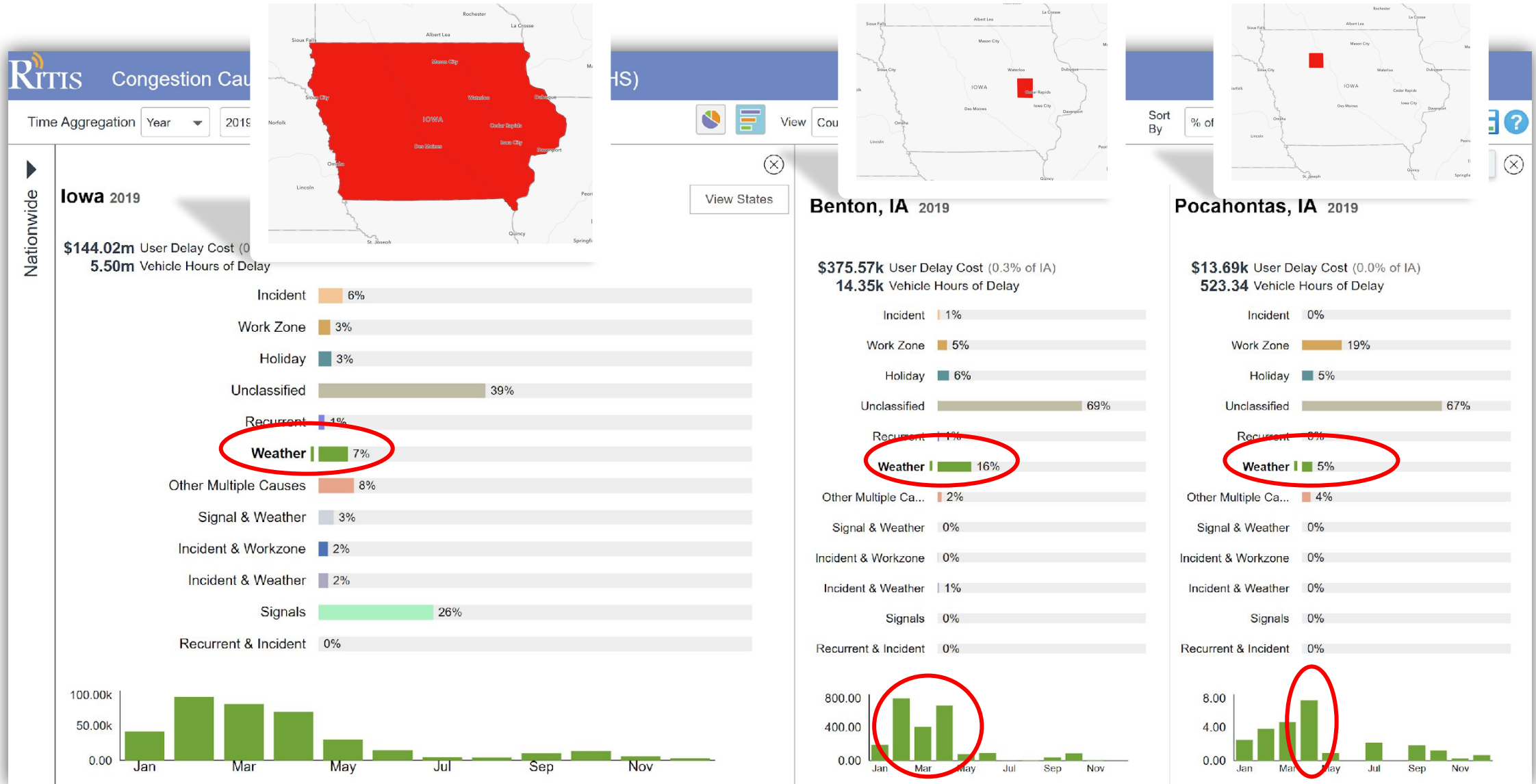


Camden, MO 2019

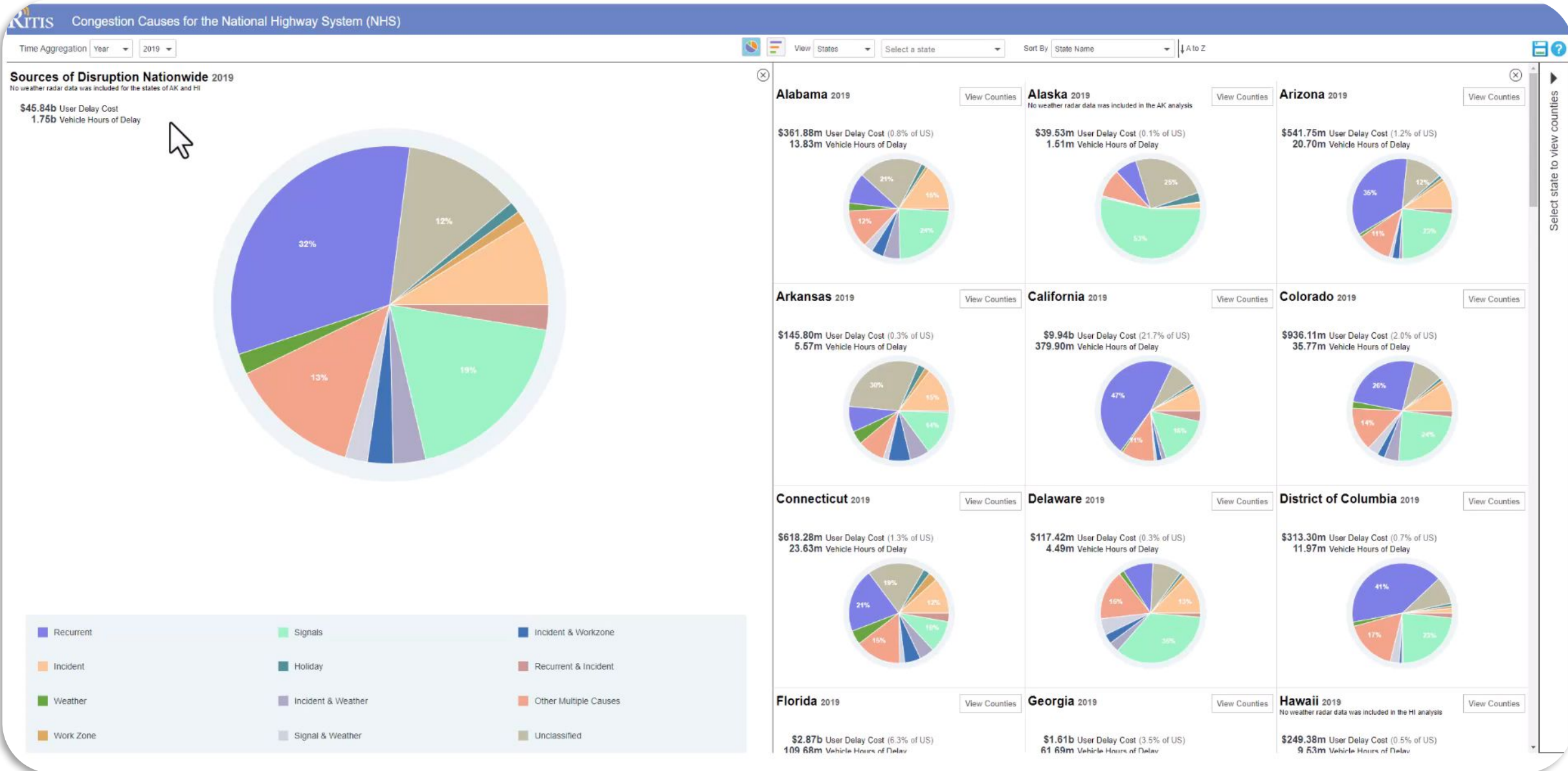
\$952.59k User Delay Cost (0.2% of MO)
36.40k Vehicle Hours of Delay



Iowa - Annual Bar Charts with Monthly Weather Congestion



Demo of National Web App

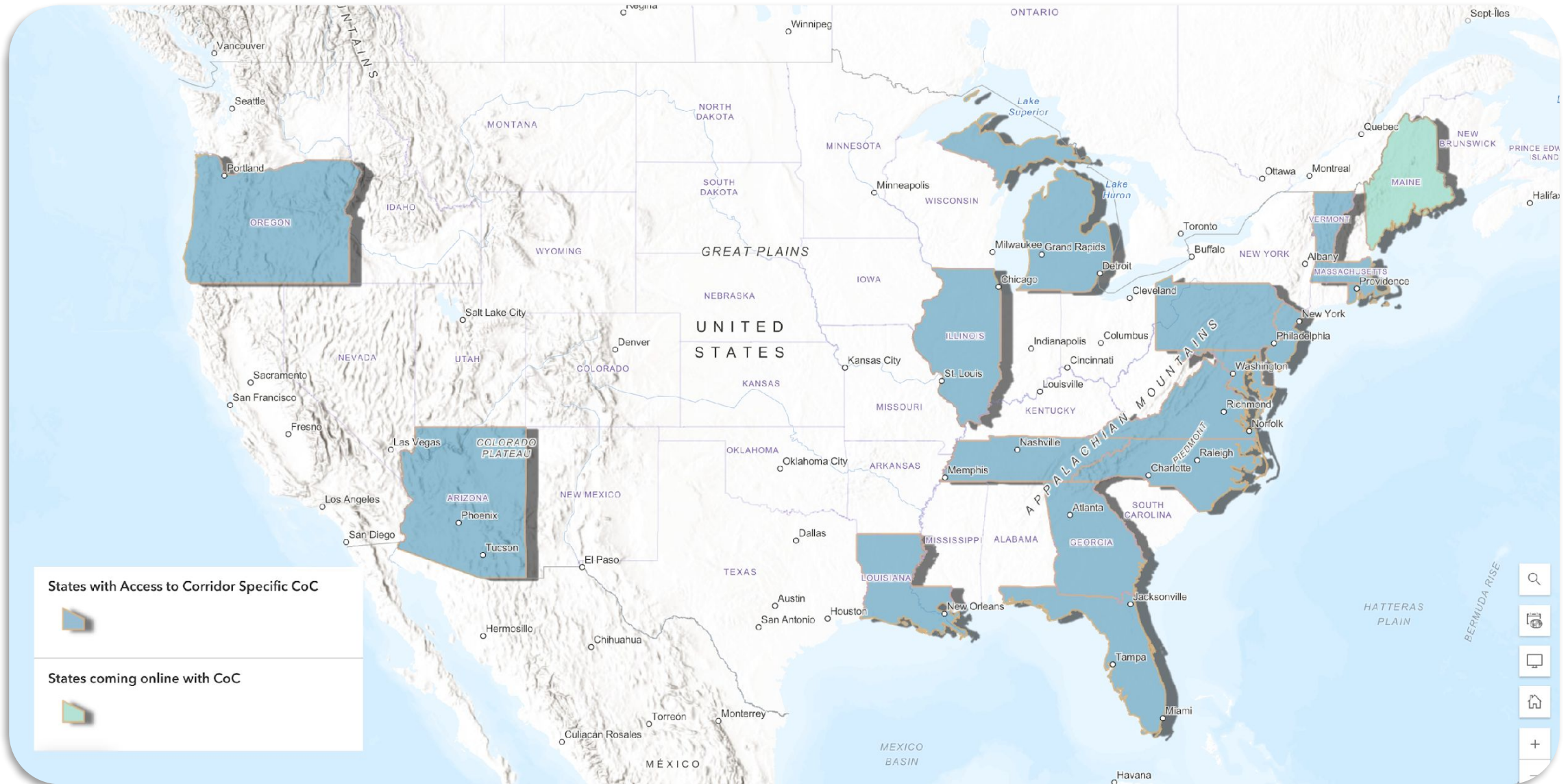


Other Potential Use Cases

- Justification of continued funding for various operational strategies and/or requesting additional funding for new countermeasures related to a "Cause"
- Did the new transit line reduce recurrent congestion?
- Did the increased road plowing decrease delay during seasonal snow events?
- Did Safety Service Patrol (SSP) staging reduce incident induced delay?
- How much delay occurs at signalized intersections in rural regions?
- Does inclement weather make work zone delays more severe? If so, by how much?



CORRIDOR SPECIFIC Analysis



CORRIDOR SPECIFIC Analysis - (Missouri)

1. Select roads

TMC segments from INRIX

Road	Region	Segment codes	Map	Saved
Regions: Oregon				
Directions: All				
Zip Codes: Example: 20742, 20904				
Road Classes: State Route				

+ Add region

Your selected roads: Remove all

- US routes in Oregon (1,561 TMC segments)
- State routes in Oregon (3,092 TMC segments)

Show segment IDs Save as segment set

2. Select a date range to analyze

08/01/2023 - through - 08/31/2023

3. Select days of week

Sun Mon Tue Wed Thu Fri Sat

4. Select one or more times of day

12:00 AM - 12:00 PM - 12:00 AM

6:00 AM 9:00 AM

12:00 AM - 12:00 PM - 12:00 AM

3:30 PM 7:30 PM

+ Add another time of day

5. Choose the average hourly cost for passenger and commercial vehicles

Passenger vehicles: \$ 22.39

Commercial vehicles: \$ 100.49

6. Provide a title for this report (optional)

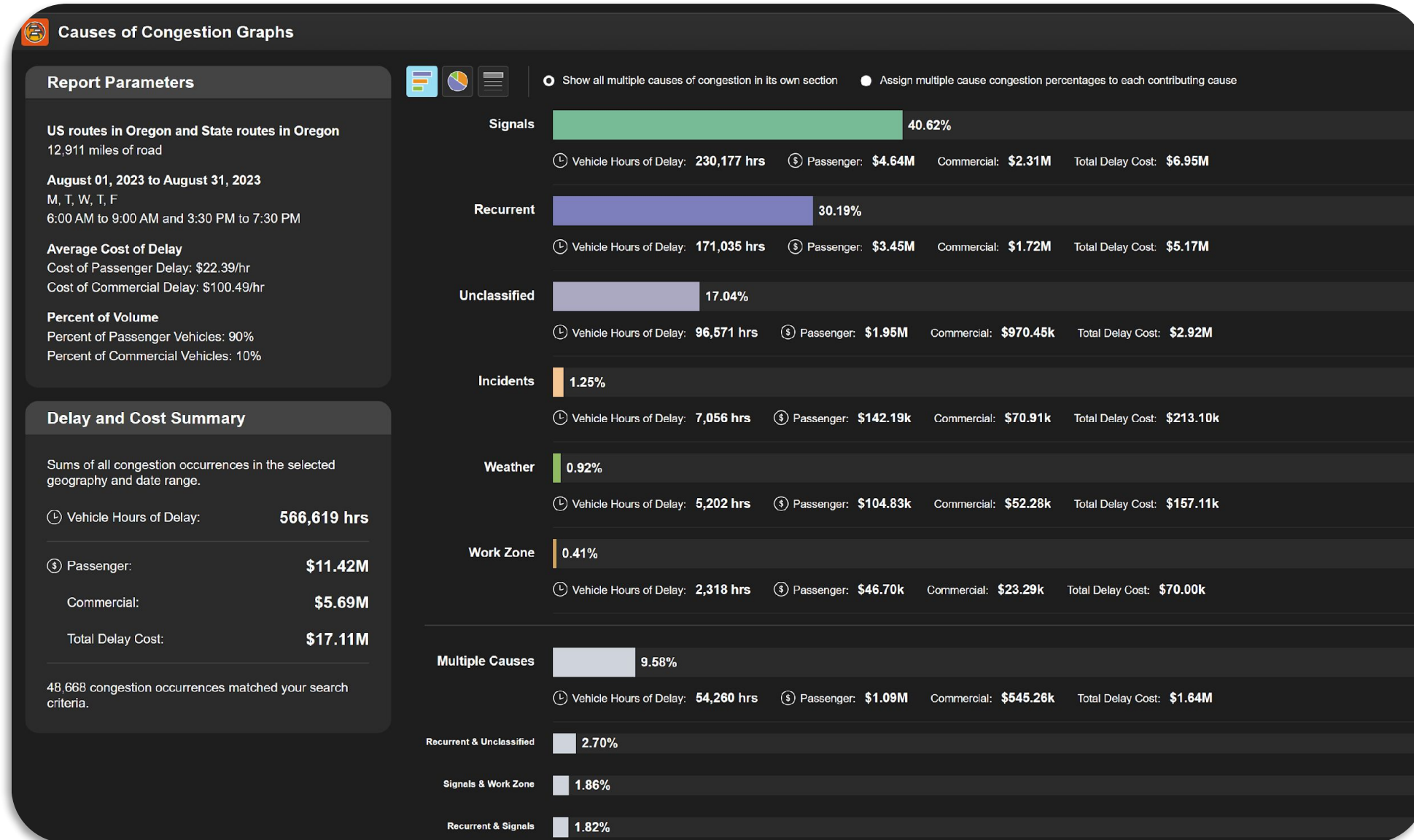
Enter a title for the report that will appear in the results page and My History

7. Notes (optional)

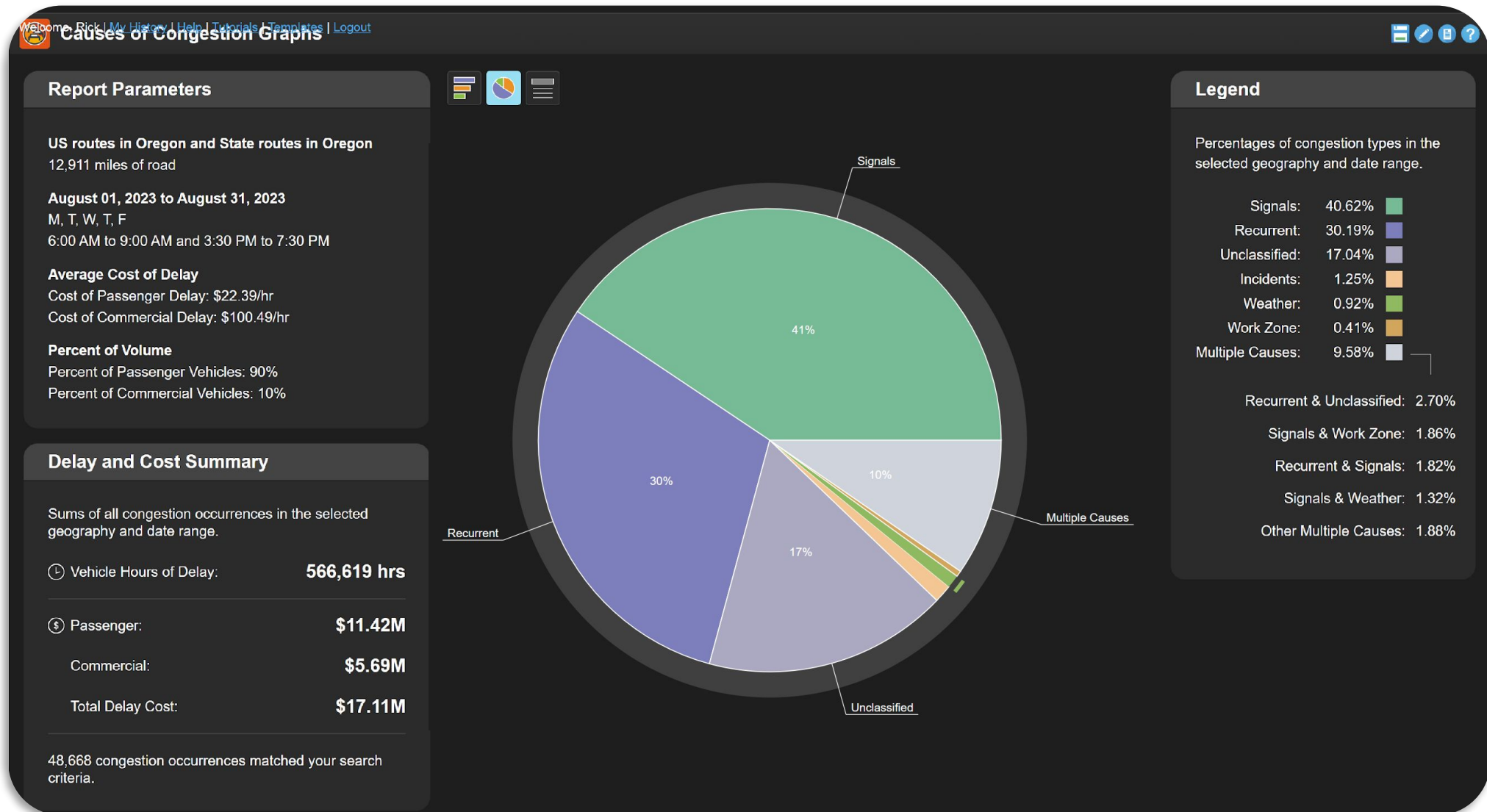
+ Add notes

The map displays a network of roads in Missouri, with major highways and state routes highlighted in blue and black. The map includes labels for major cities like Seattle, Tacoma, Spokane, Boise, and various national forests and rivers.

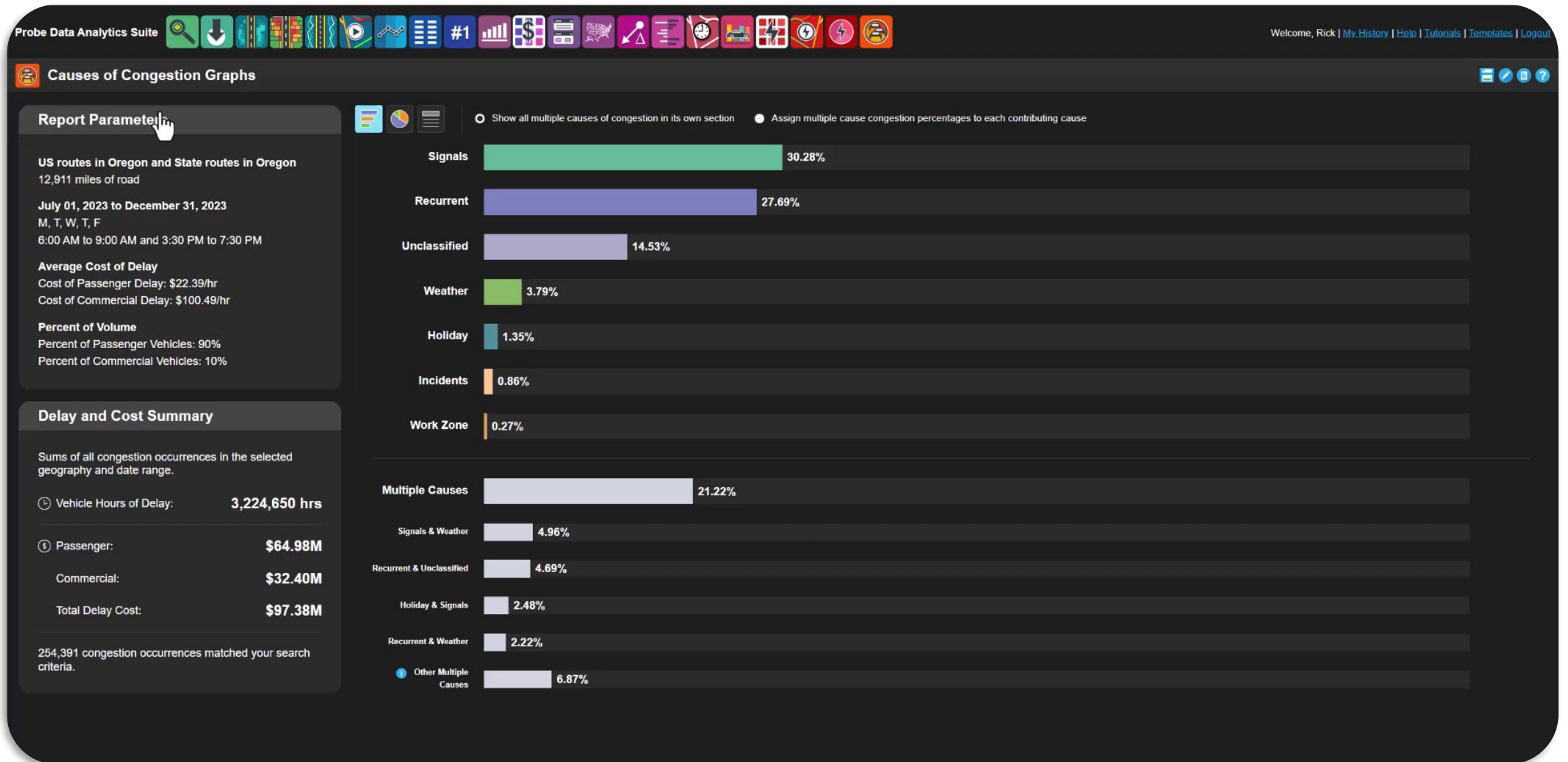
CORRIDOR SPECIFIC Analysis (Oregon)



CORRIDOR SPECIFIC Analysis (Oregon)

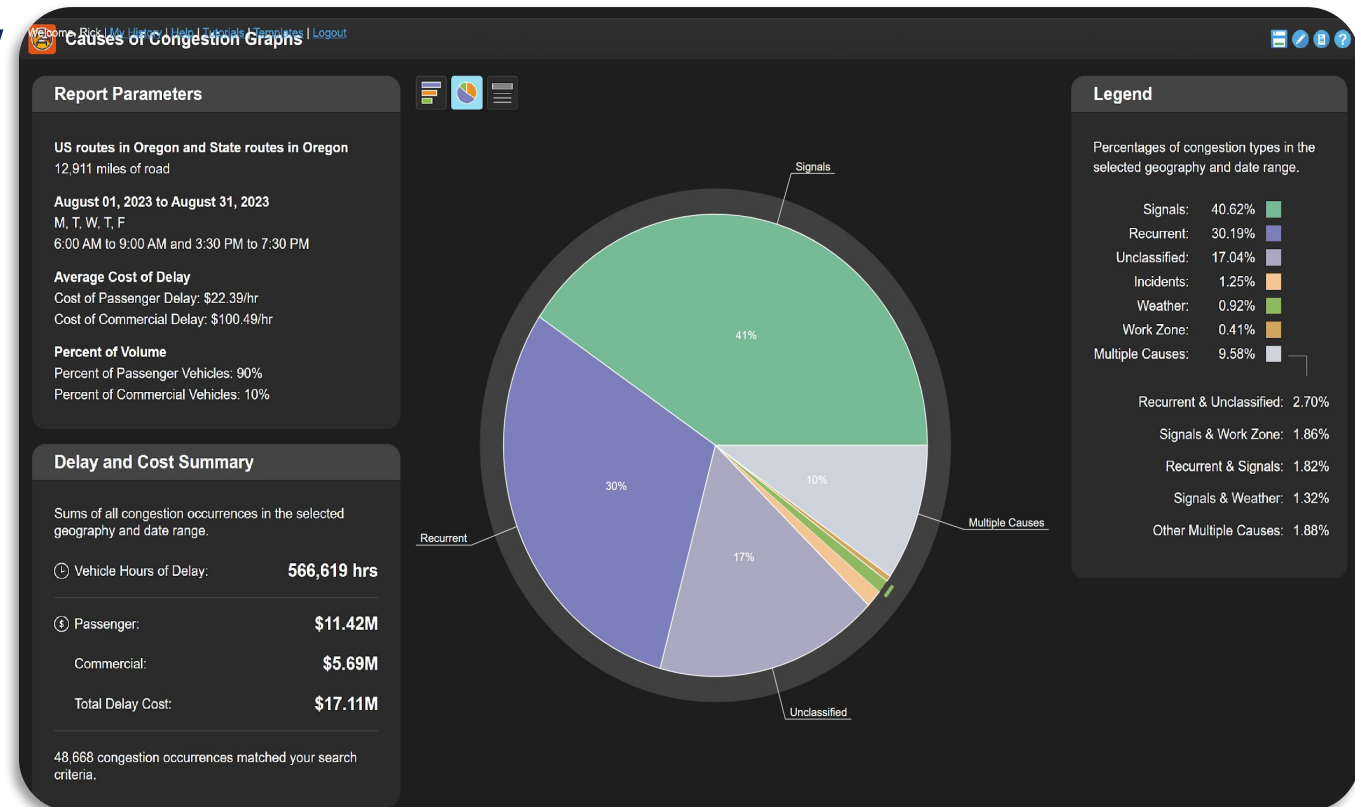


CORRIDOR SPECIFIC Analysis - Demo



Conclusions

- New Connected Vehicle probe data and crowd sourced content is delivering new insights to what factors impact congestion
- Open, web solution to explore national, state and local causes of congestion
- RITIS users have industry exclusive access to corridor-specific causes of congestion graphs
- Questions are welcome



Thank You!

Resource Links

- National, State and County App: <https://go.umd.edu/congestion>
- PDA Causes of Congestion Tool: <https://pda.ritis.org>
- Tutorial: <https://ritis.org/tutorials/videos/634641555>
- Help Page: <https://congestion-causes.ritis.org/help>



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