Transportation Performance Management Webinar Series

TPM Data and Data Visualization

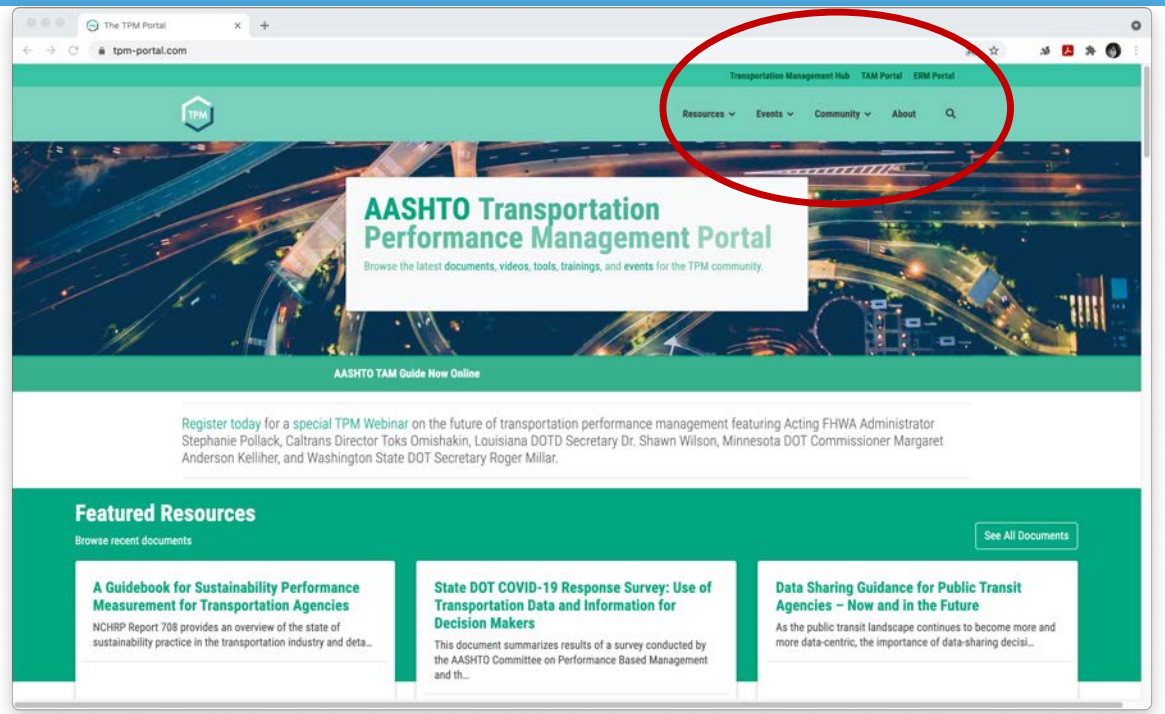
Sponsored by the TPM Pooled Fund
with support from AASHTO CPBM Leadership and FHWA

September 15, 2021

TPM Webinar 8

Transportation Performance Management Webinar Series

- Our TPM webinar series is held every two months, on topics such as communications, system performance management, data sources, and many more to come!
- Today is the 8th webinar in our bi-monthly series
- We welcome ideas for future webinar topics and presentations
- Use the webinar Q&A panel during the webinar
  - Submit questions for today's presenters
  - Submit ideas for future webinar topics



Find us on the NEW AASHTO TPM Portal
https://www.tpm-portal.com

AASHTO Welcome

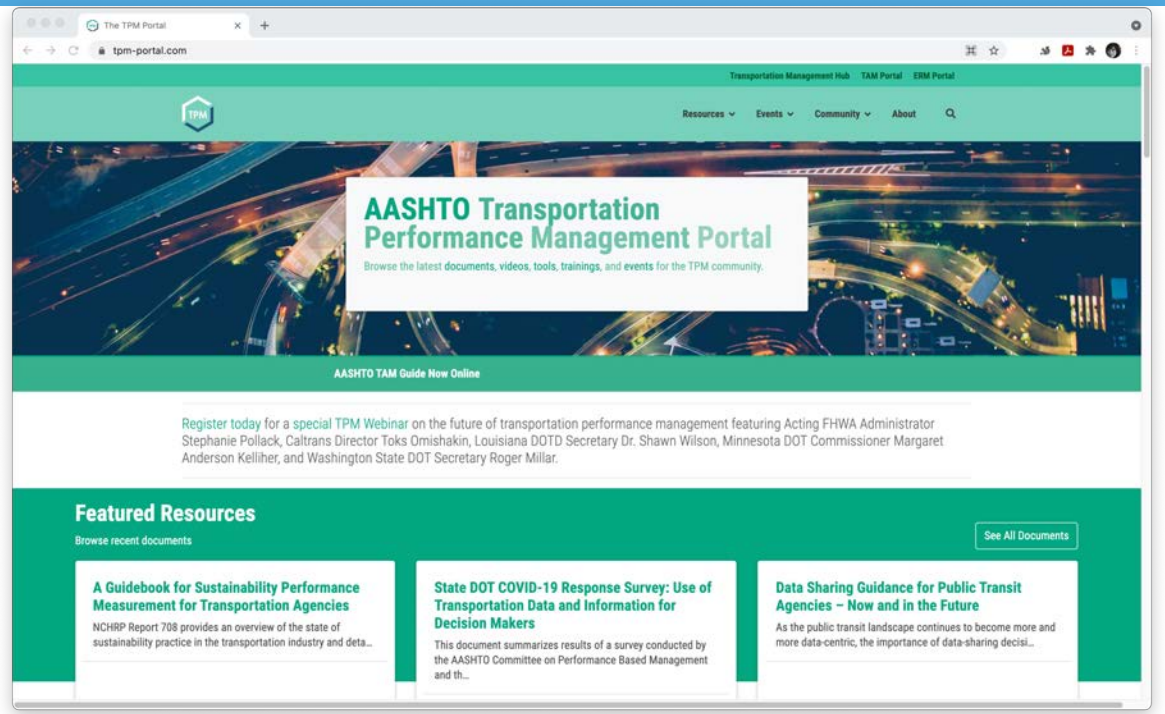
Matthew H. Hardy, Ph.D.

Program Director for Planning and Performance Management, AASHTO

mhardy@aashto.org

Upcoming Events and Visualization Resources

- Events
  - 2022 TRB Visualization Symposium
  - 2022 AASHTO Performance and Data Conference
- Visualization Resources
  - VizGuide
  - Communicating Performance Site



AASHTO TPM Portal
https://www.tpm-portal.com

Webinar Agenda

2:00 **Webinar Welcome and Introduction**
Matt Hardy, AASHTO on behalf of Christos Xenophontos, Rhode Island DOT

2:05 **AASHTO Welcome**
Matt Hardy, AASHTO

2:15 **FHWA Perspective and the TPM Dashboard**
Nelson Hoffman, FHWA

2:25 **How Do You Visualize Performance?**
Frank Broen, Metro Analytics

2:40 **UDOT's Visualization of Highway Performance Measures for Storytelling and Decision Support**
Ryan Bailey, Utah DOT

2:55 **WSDOT's Performance Data Visualization and Dashboards**
Sreenath Gangula, Washington State DOT

3:10 **Q&A and Wrap Up**
Matt Hardy, AASHTO and Hyun-A Park, Spy Pond Partners

FHWA Perspective and the TPM Dashboard

Nelson Hoffman

HIF-Transportation Performance and Asset Management Team

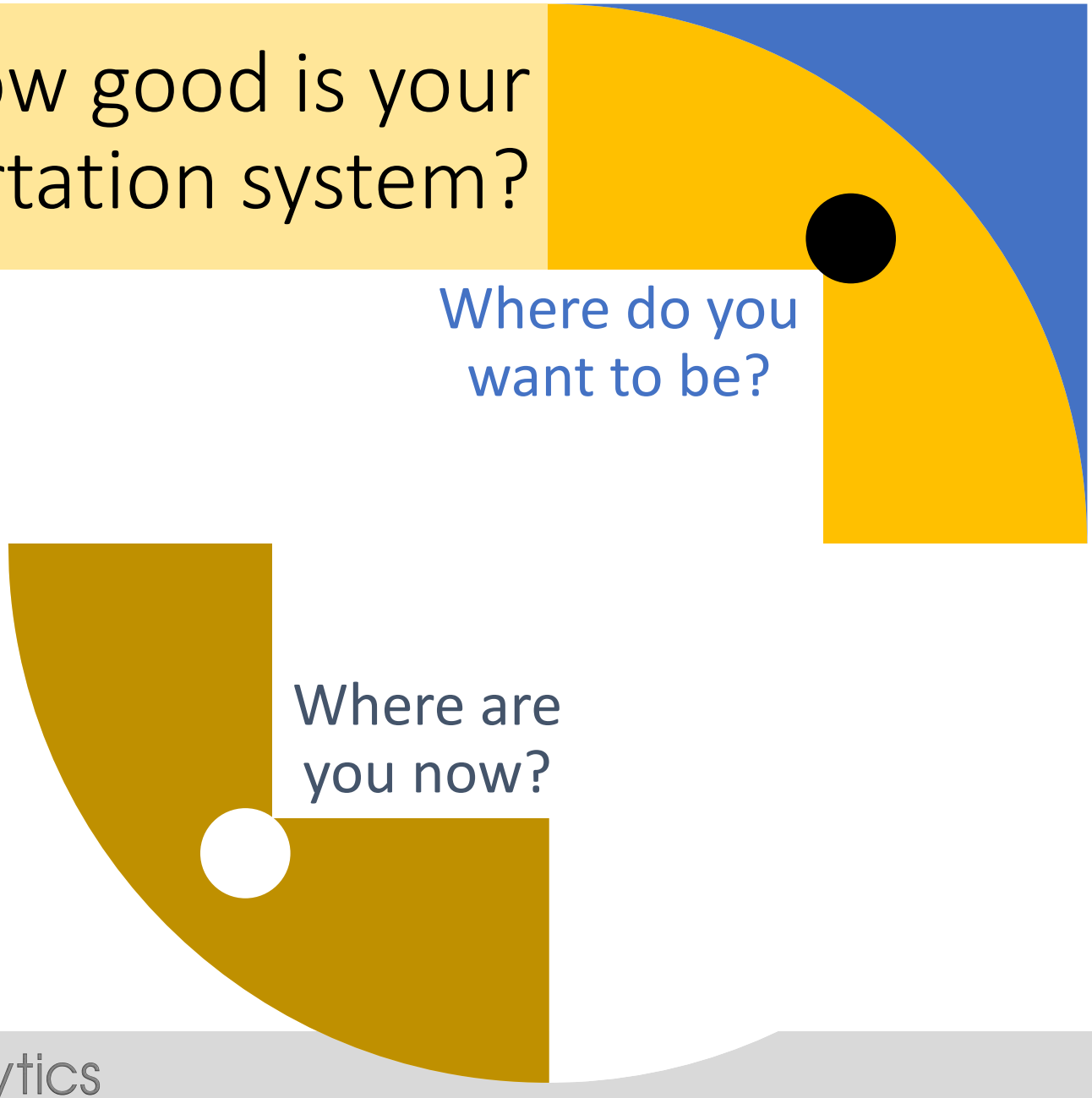
Nelson.Hoffman@dot.gov

How Do You Visualize Performance?

Frank Broen frank@metroanalytics.com

metro analytics
tomorrow's solutions today

How good is your transportation system?

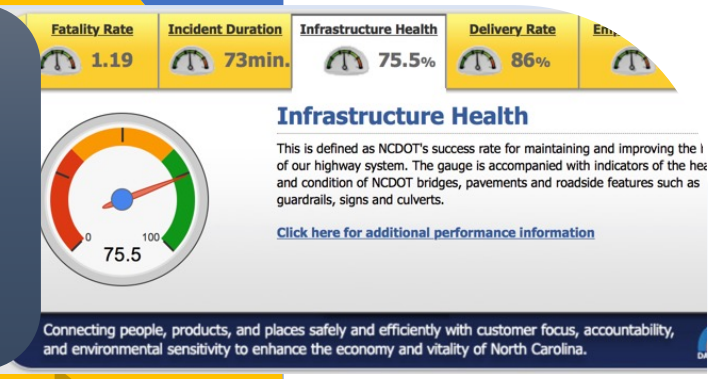


Communicating Data

MN

Score Card

Dashboard

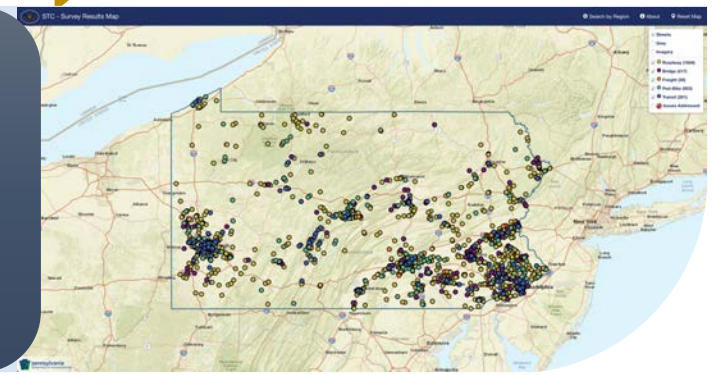


NC

NE

Report

Interactive



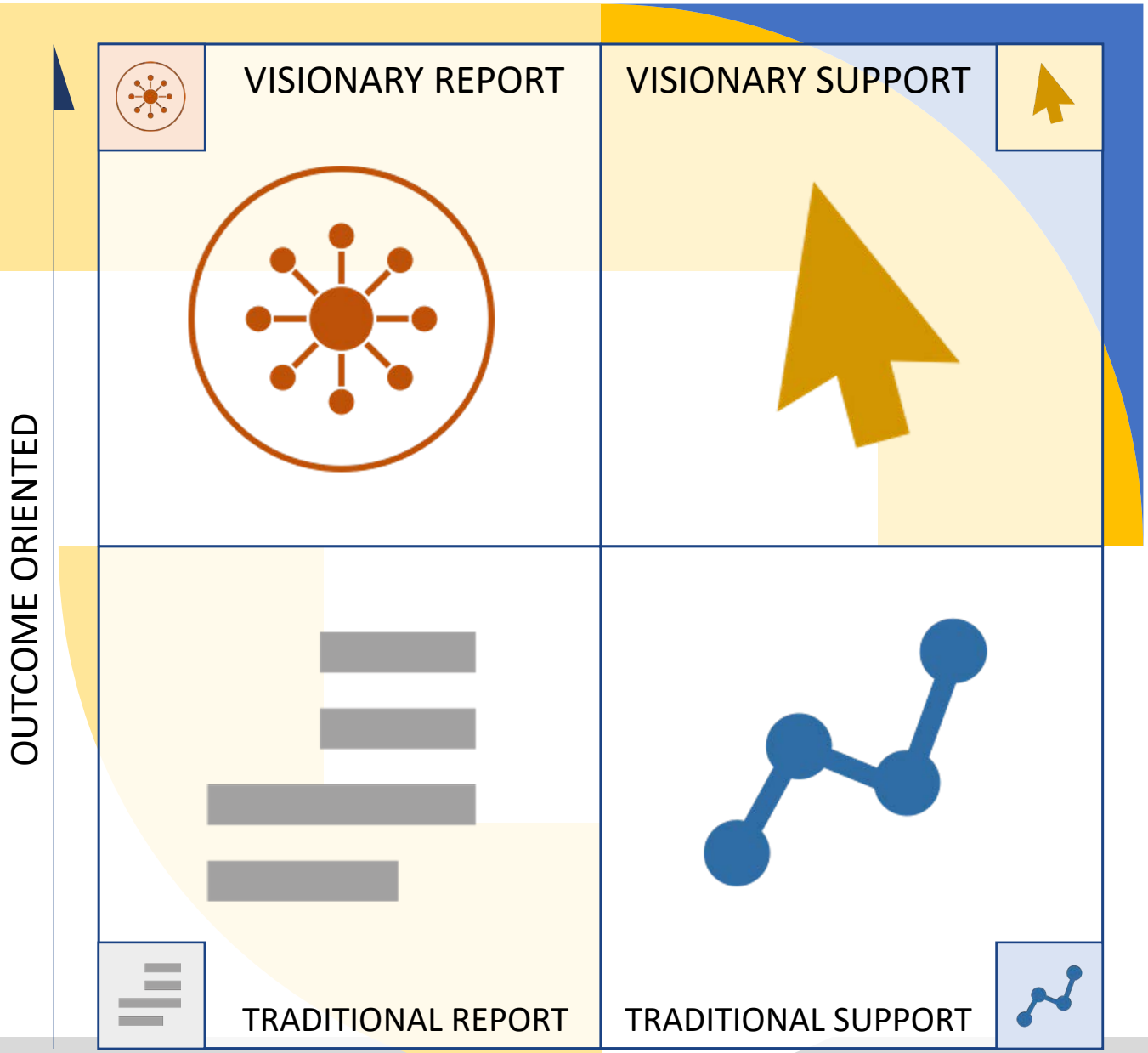
PA

traditional reports

visionary support

metro analytics
tomorrow's solutions today

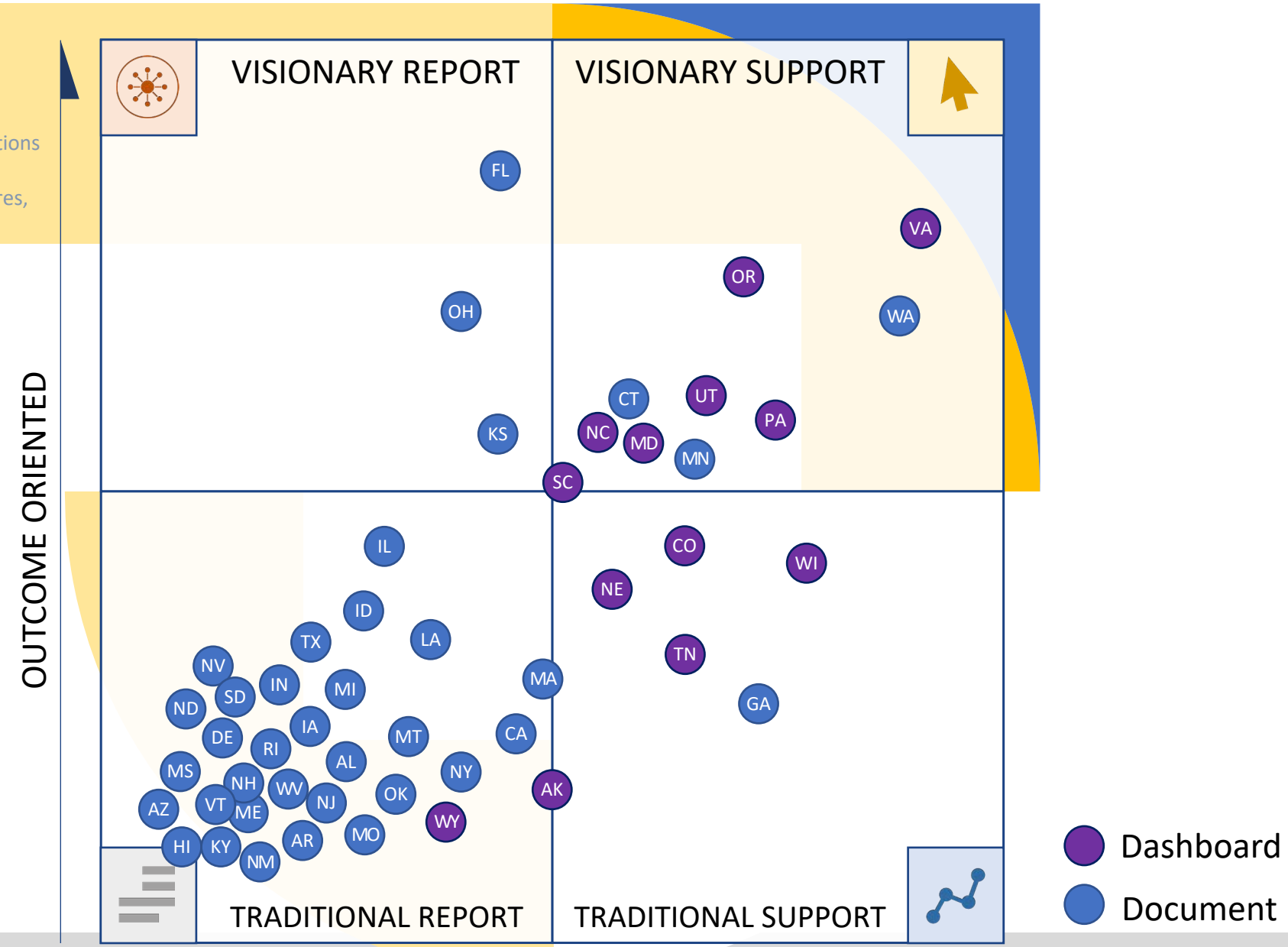
Gartner Magic Quadrant



metro analytics
tomorrow's solutions today

2015

NOTE: These are personal observations from a quick review. A more detailed analysis would address which measures, how detailed and context.



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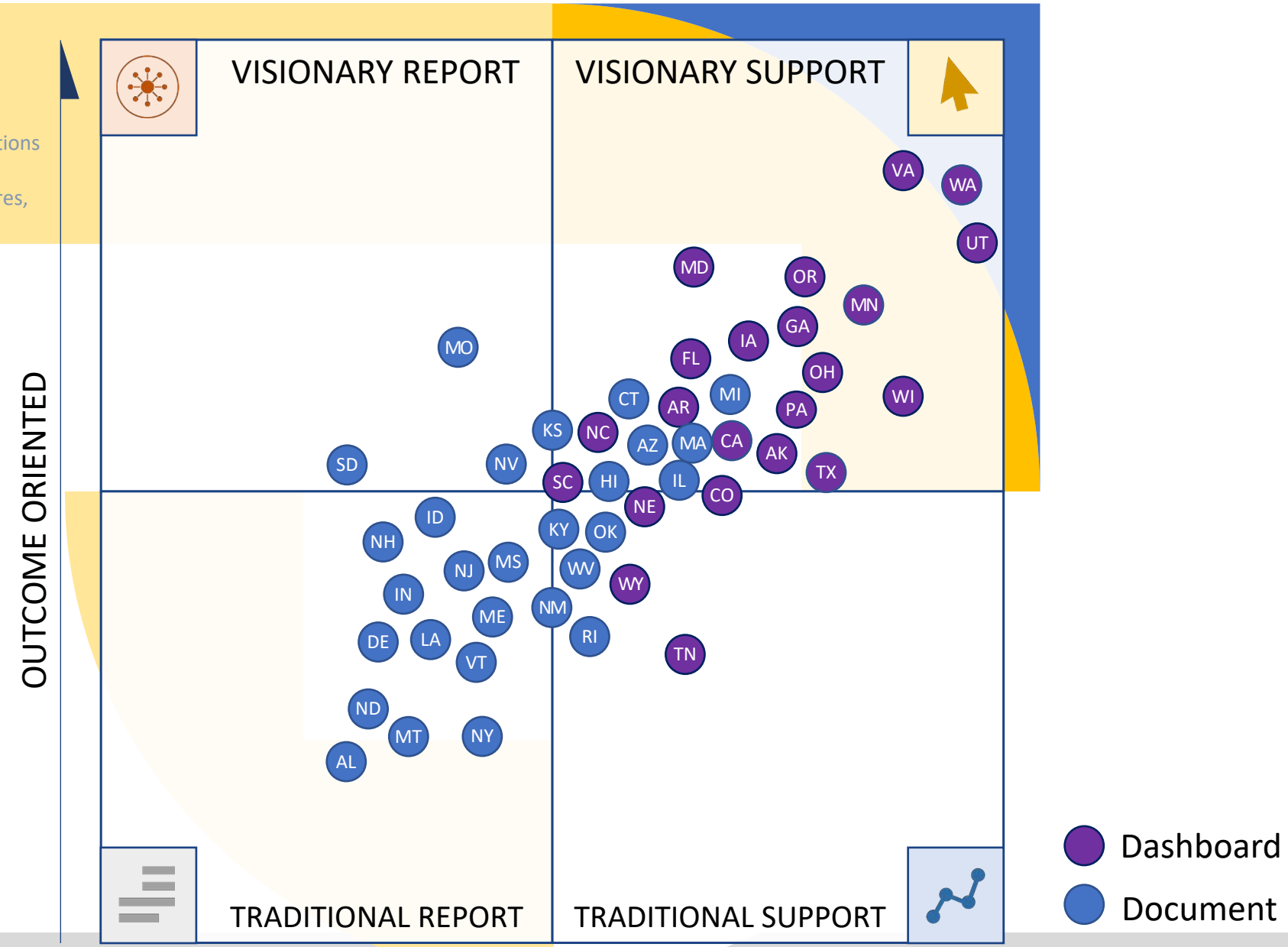
2020

NOTE: These are personal observations from a quick review. A more detailed analysis would address which measures, how detailed and context.



metro analytics
tomorrow's solutions today

VISUALIZING HIGHWAY PERFORMANCE MEASURES

NCHRP Project 20-05
Synthesis Topic 52-16

Preliminary Findings, Panel has not balloted

Frank Broen, PI frank@metroanalytics.com

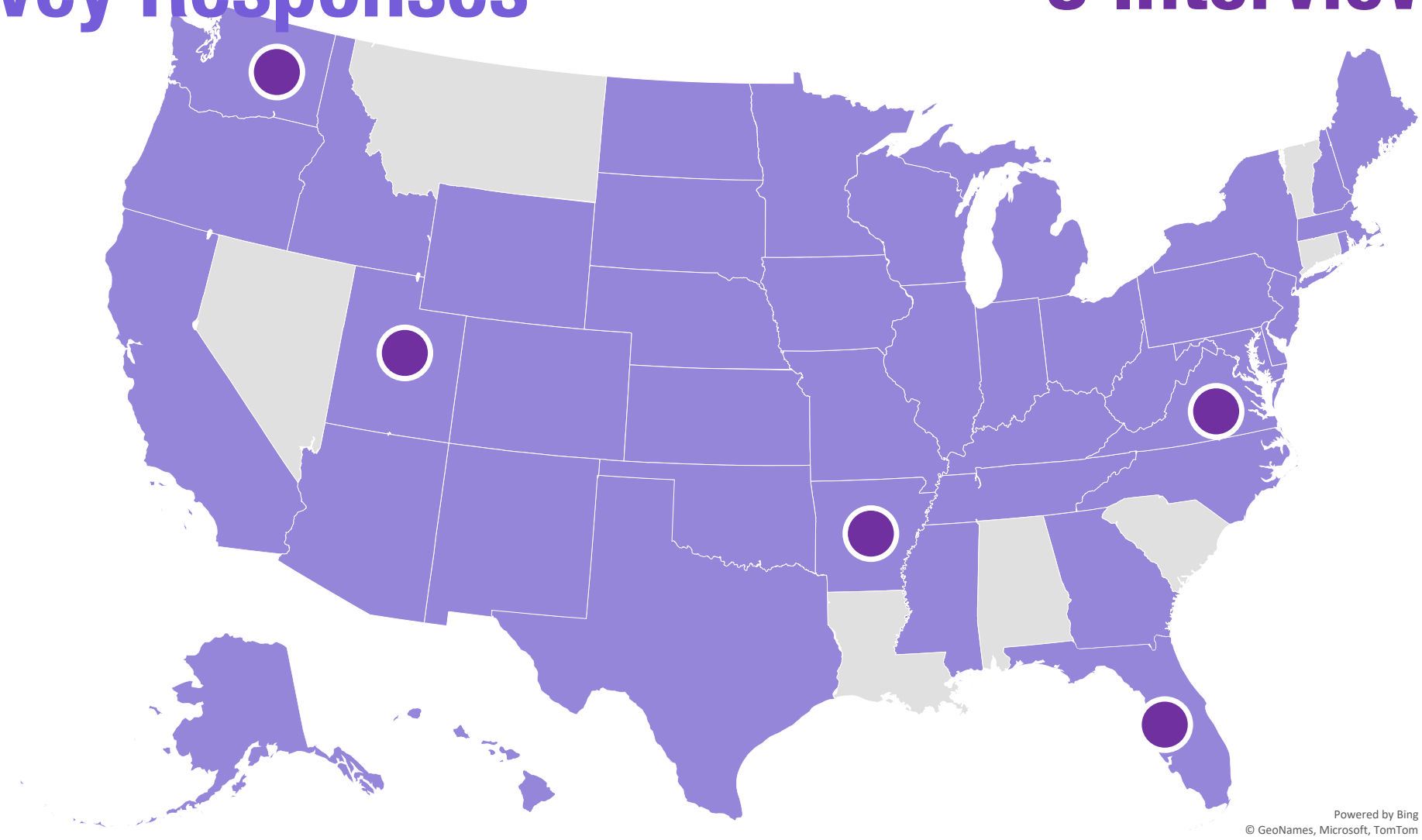
metro analytics

Objective

Document current practices and methods used by DOTs to visualize highway performance measures and how that information is being used for communication and decision support.

44 Survey Responses

5 Interviews



Information gathered

Performance Measures

- PM1, PM2, PM3
- DOT performance measures
- highway network reliability measures

Techniques

- dashboards
- story maps
- maps
- real time operations
- infographics
- interactive visualizations

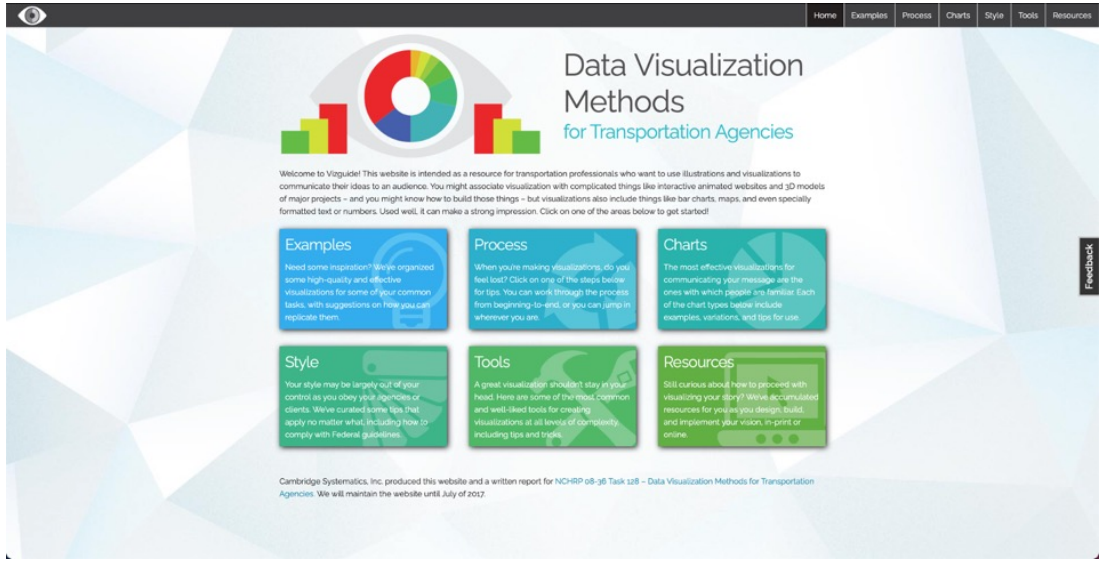
Processes

- Strategies for different audiences
- Governance
- Staffing
- Other resources
- Software tools
- Evaluating effectiveness
- Examples
- Challenges and constraints

Lit Review

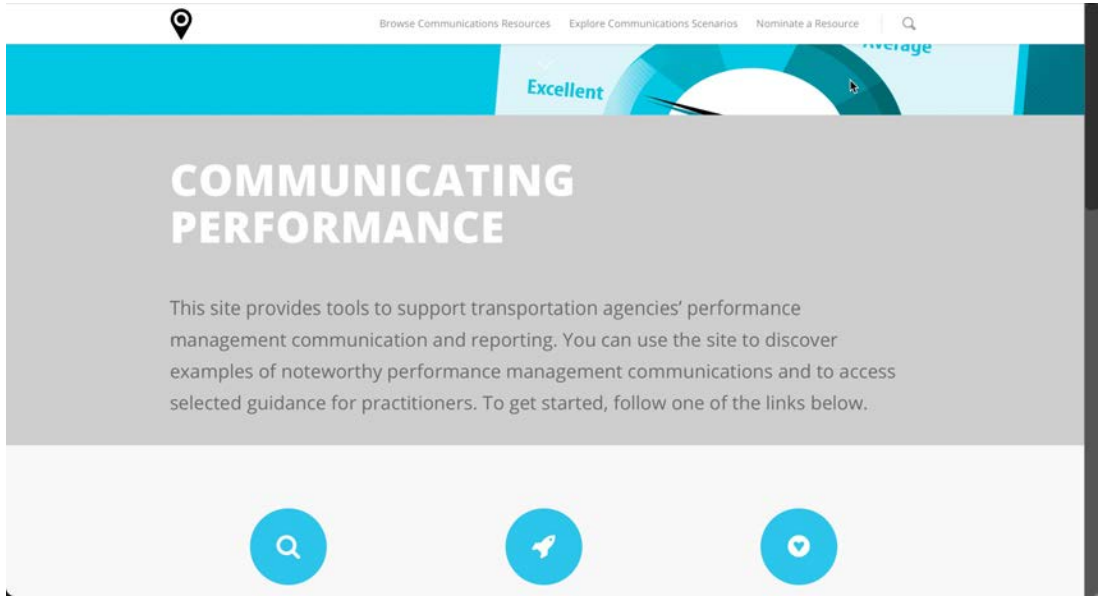
Vizguide.camsys.com

NCHRP 08-36

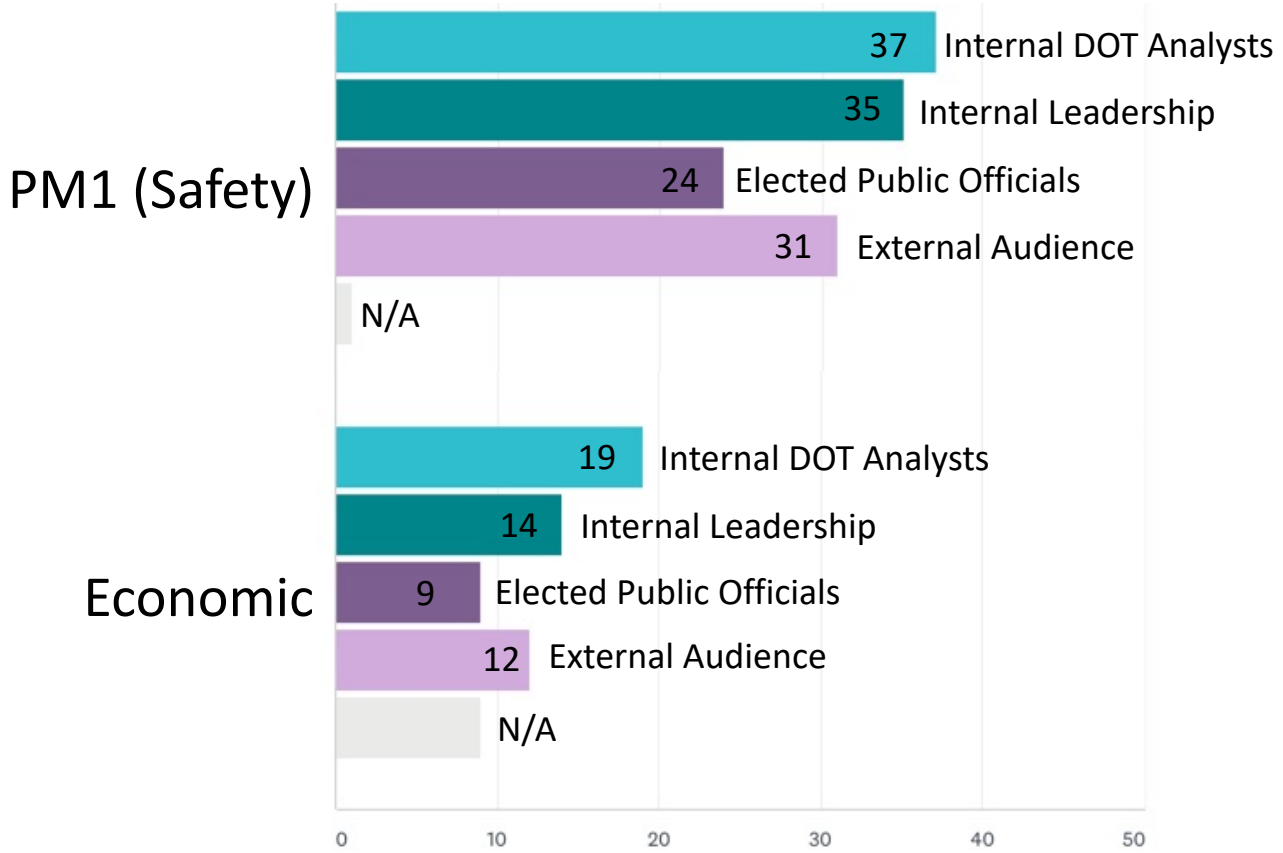


communicatingperformance.com

NCHRP Project 20-24(93)B(02)



Survey Results



Survey Results

	INTERNAL DOT ANALYSTS	INTERNAL LEADERSHIP (DECISION MAKERS)	ELECTED PUBLIC OFFICIALS	EXTERNAL AUDIENCE	TOTAL RESPONDENTS
Charts - Simple	43 (98%)	44 (100%)	27 (61%)	27 (61%)	44
Charts - Complex	31 (97%)	26 (81%)	10 (31%)	10 (31%)	32
Infographics	25 (78%)	27 (84%)	22 (69%)	21 (66%)	32
Dashboards	36 (95%)	34 (89%)	19 (50%)	25 (66%)	38
Story Maps	13 (76%)	15 (88%)	9 (53%)	10 (59%)	17
Videos	5 (45%)	5 (45%)	6 (55%)	10 (91%)	11
Maps	38 (90%)	36 (86%)	25 (60%)	30 (71%)	42
Publications	27 (79%)	28 (82%)	23 (68%)	27 (79%)	34
External Interactive visualizations	14 (64%)	13 (59%)	14 (64%)	20 (91%)	22
Internal Interactive visualizations	21 (91%)	22 (96%)	5 (22%)	7 (30%)	23

Survey Results

DOTs visualize Performance Measures to:

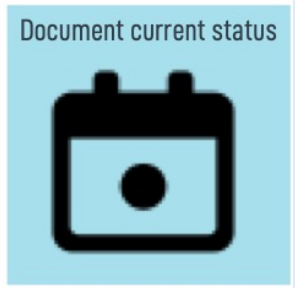
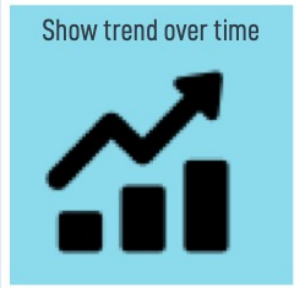
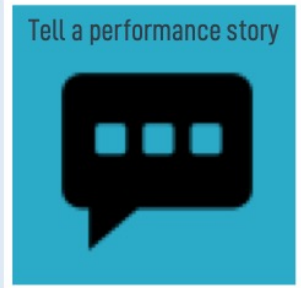
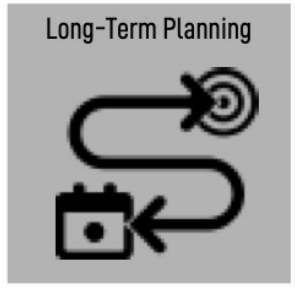
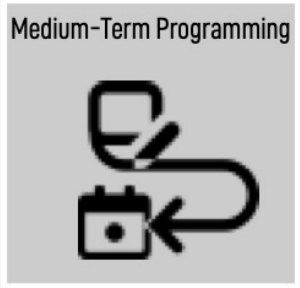
Document current status		Show trend over time		Communicate progress towards a target		Help tell a performance story	
Support a policy		Inform Long-term Planning		Inform Medium-Term Planning		Inform Day-to-Day Operations			

Figure 13 Purposes of Visualizations

DC https://ddot.dc.gov/pavedc

DDOT Paving Plan

An interactive map of DDOT's paving work for Washingtonians to track our progress as we enhance the safety of the roadway and improve the ride comfort of the road surface. DDOT is prioritizing paving non-residential streets during the COVID-19 response to minimize disturbance to residents during the Stay Home Order.

View the map on your mobile device

d. delivers

Overview | Roads | Sidewalks | Alleys | Markings | Roads Paving Progress

Road Paving Progress Swipe Map

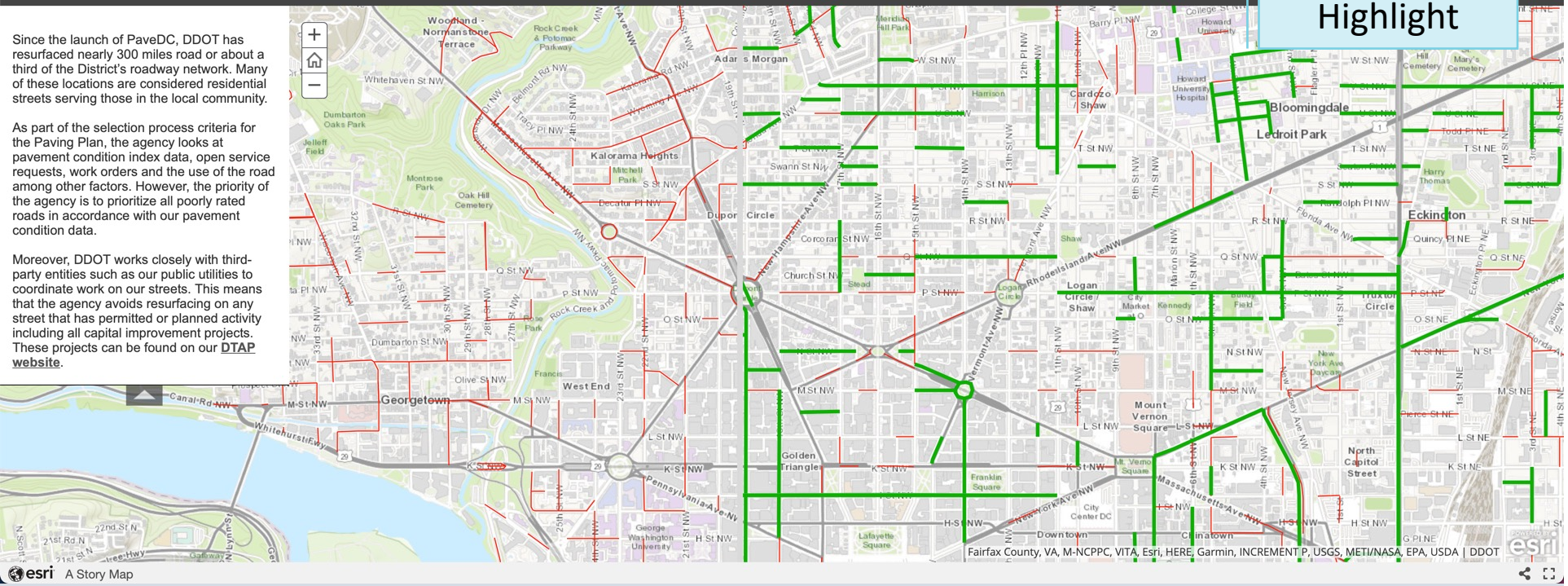
A swipe map compares roads in poor condition before PaveDC and the roads that has been resurfaced since the launch of PaveDC

See Performance Highlight

Since the launch of PaveDC, DDOT has resurfaced nearly 300 miles road or about a third of the District's roadway network. Many of these locations are considered residential streets serving those in the local community.

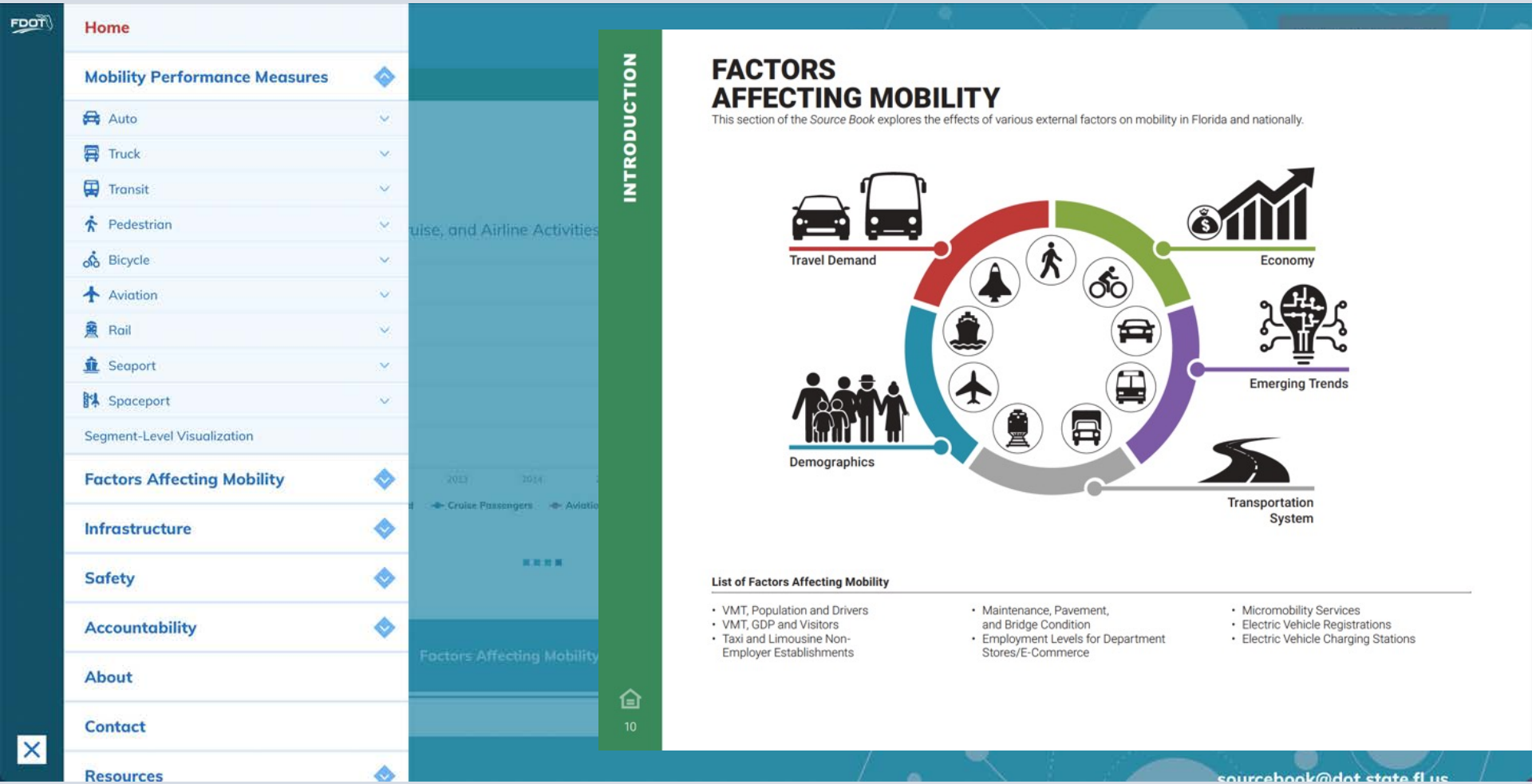
As part of the selection process criteria for the Paving Plan, the agency looks at pavement condition index data, open service requests, work orders and the use of the road among other factors. However, the priority of the agency is to prioritize all poorly rated roads in accordance with our pavement condition data.

Moreover, DDOT works closely with third-party entities such as our public utilities to coordinate work on our streets. This means that the agency avoids resurfacing on any street that has permitted or planned activity including all capital improvement projects. These projects can be found on our DTAP website.



Document current status | Show trend over time | Progress towards a target | Tell a performance story | Support a policy | Long-Term Planning | Medium-Term Programming | Day-to-Day Operations

FL Multimodal Mobility Performance Measures



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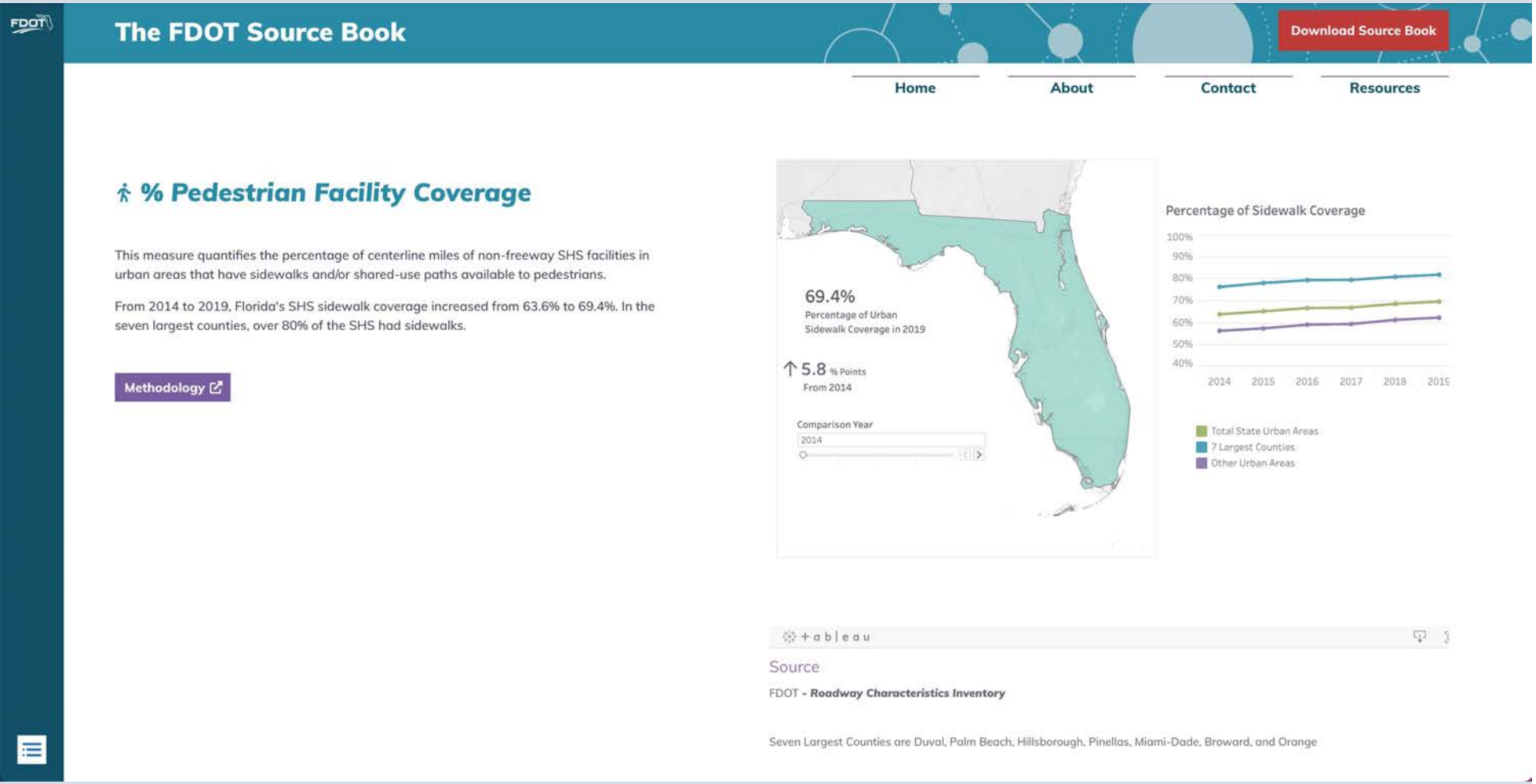
FL



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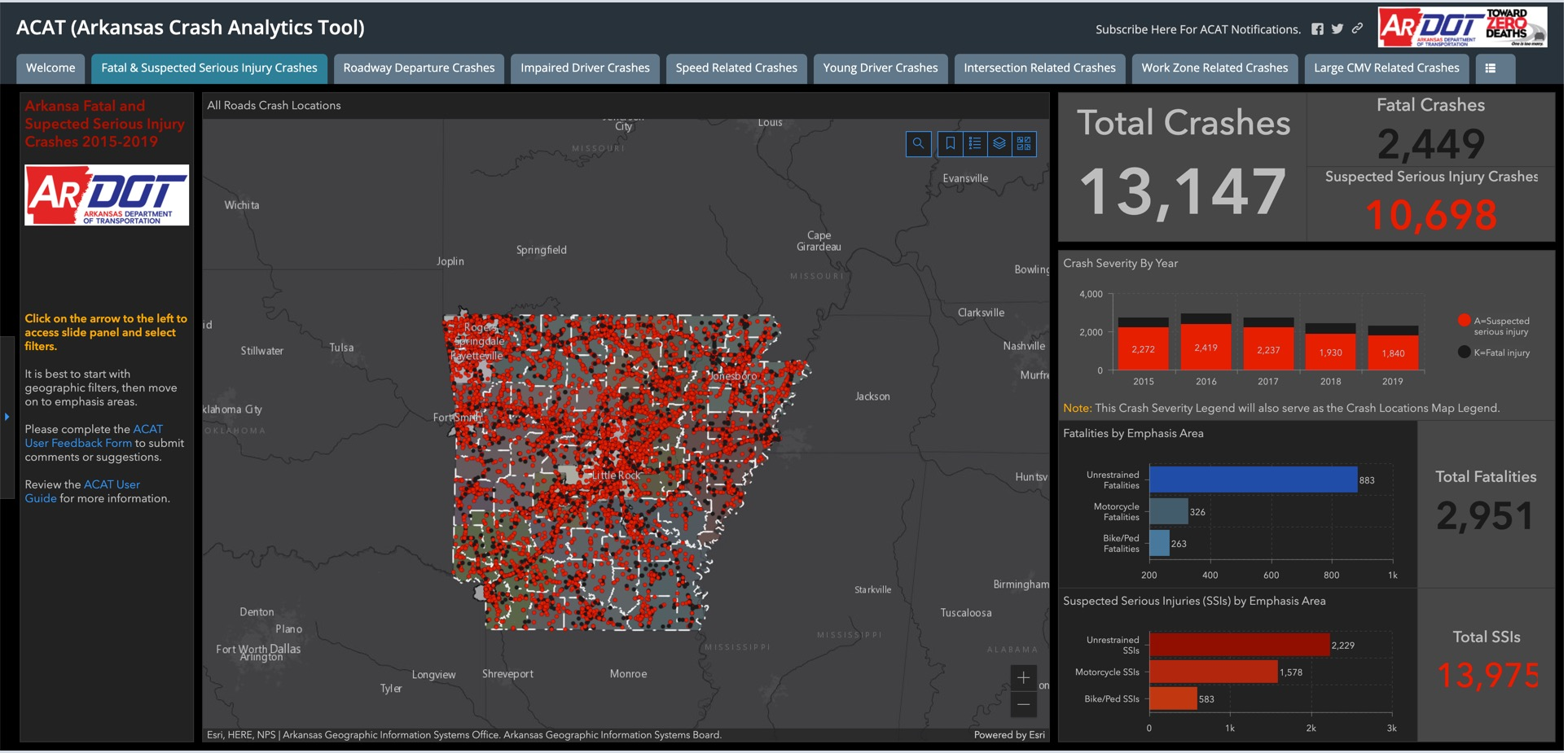
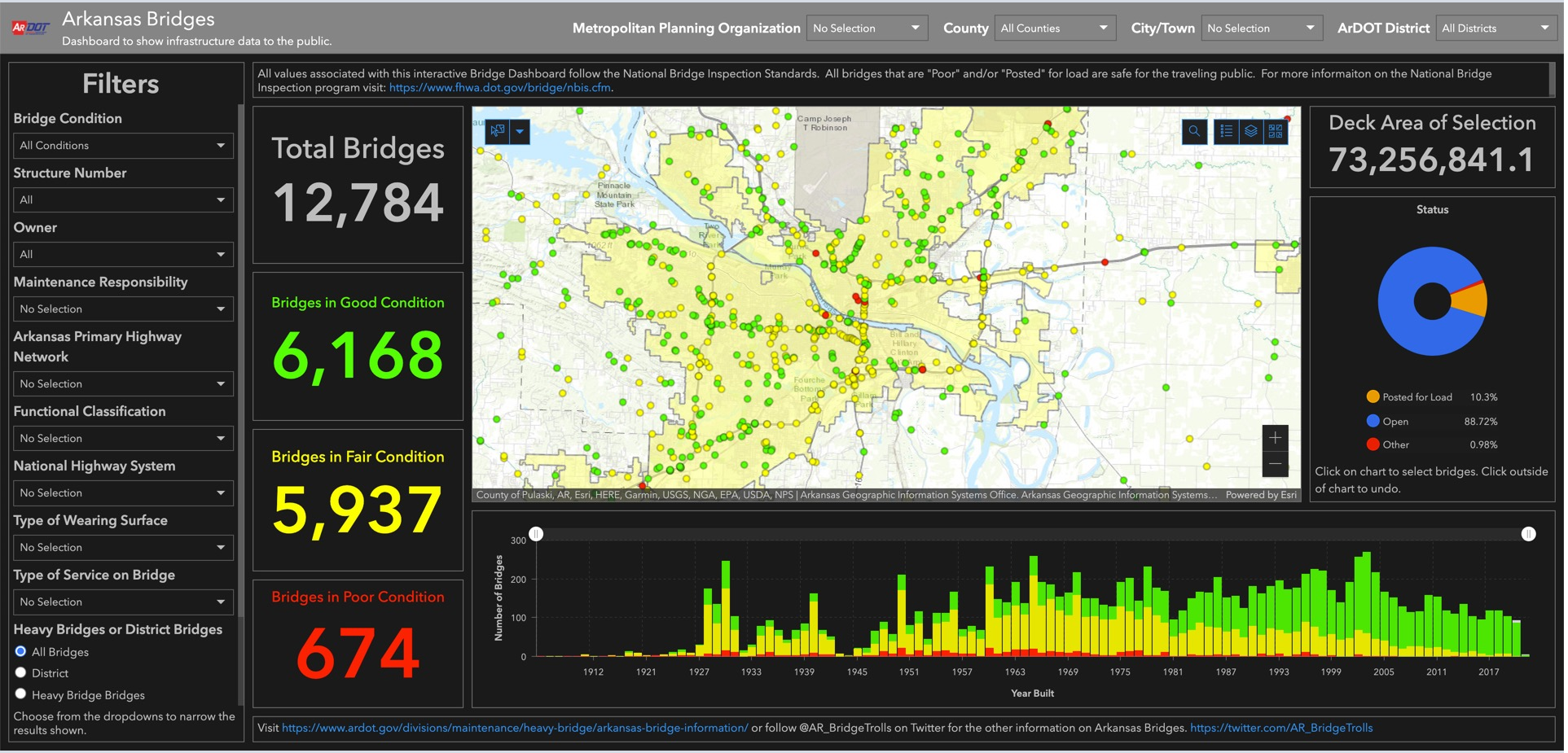


Document current status | Show trend over time | Progress towards a target | Tell a performance story | Support a policy | Long-Term Planning | Medium-Term Programming | Day-to-Day Operations

IANCE MEASURES

AR

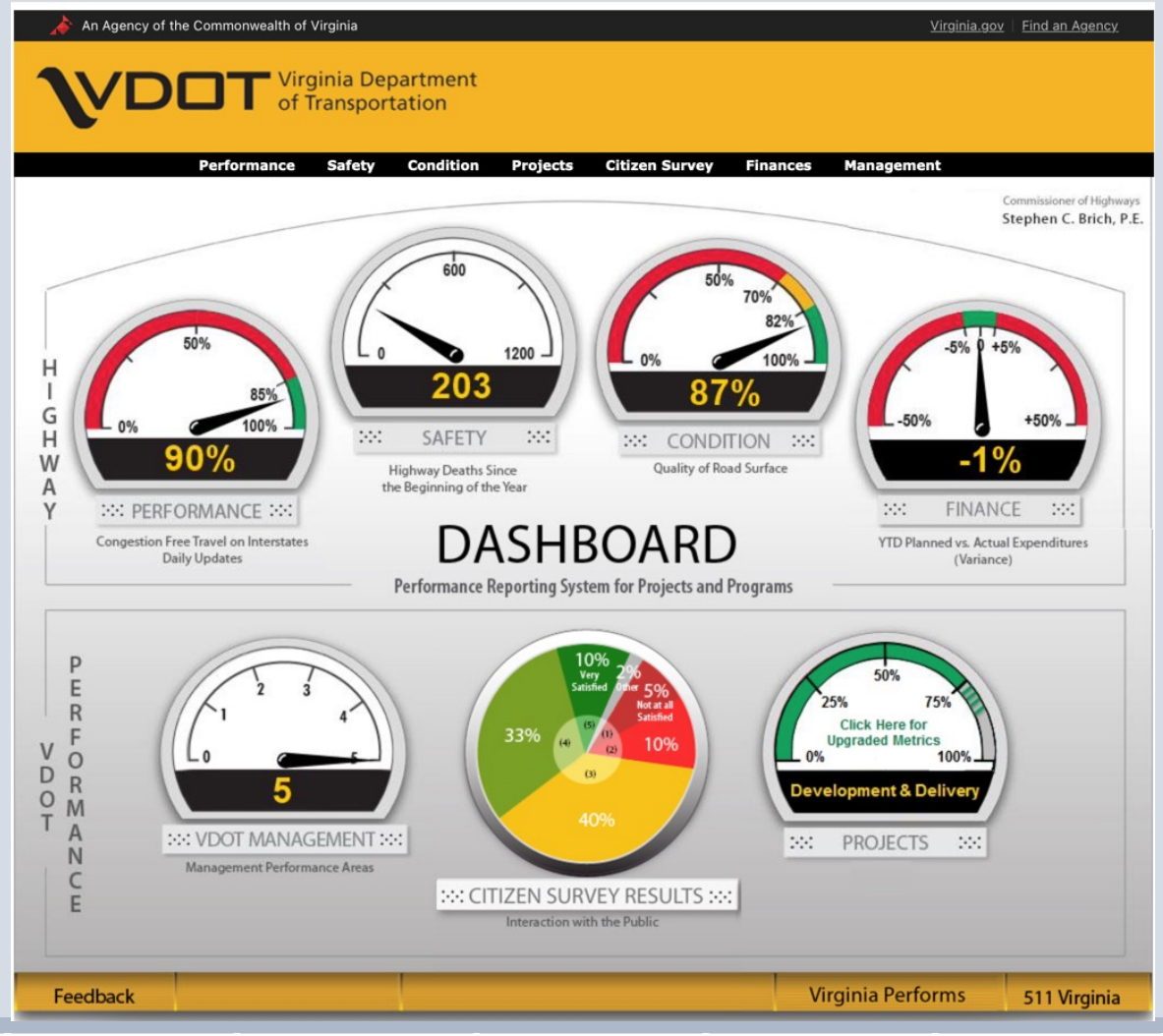


Document current status | Show trend over time | Progress towards a target | Tell a performance story | Support a policy | Long-Term Planning | Medium-Term Programming | Day-to-Day Operations

IANCE MEASURES

VA

dashboard.virginiadot.org/default.as



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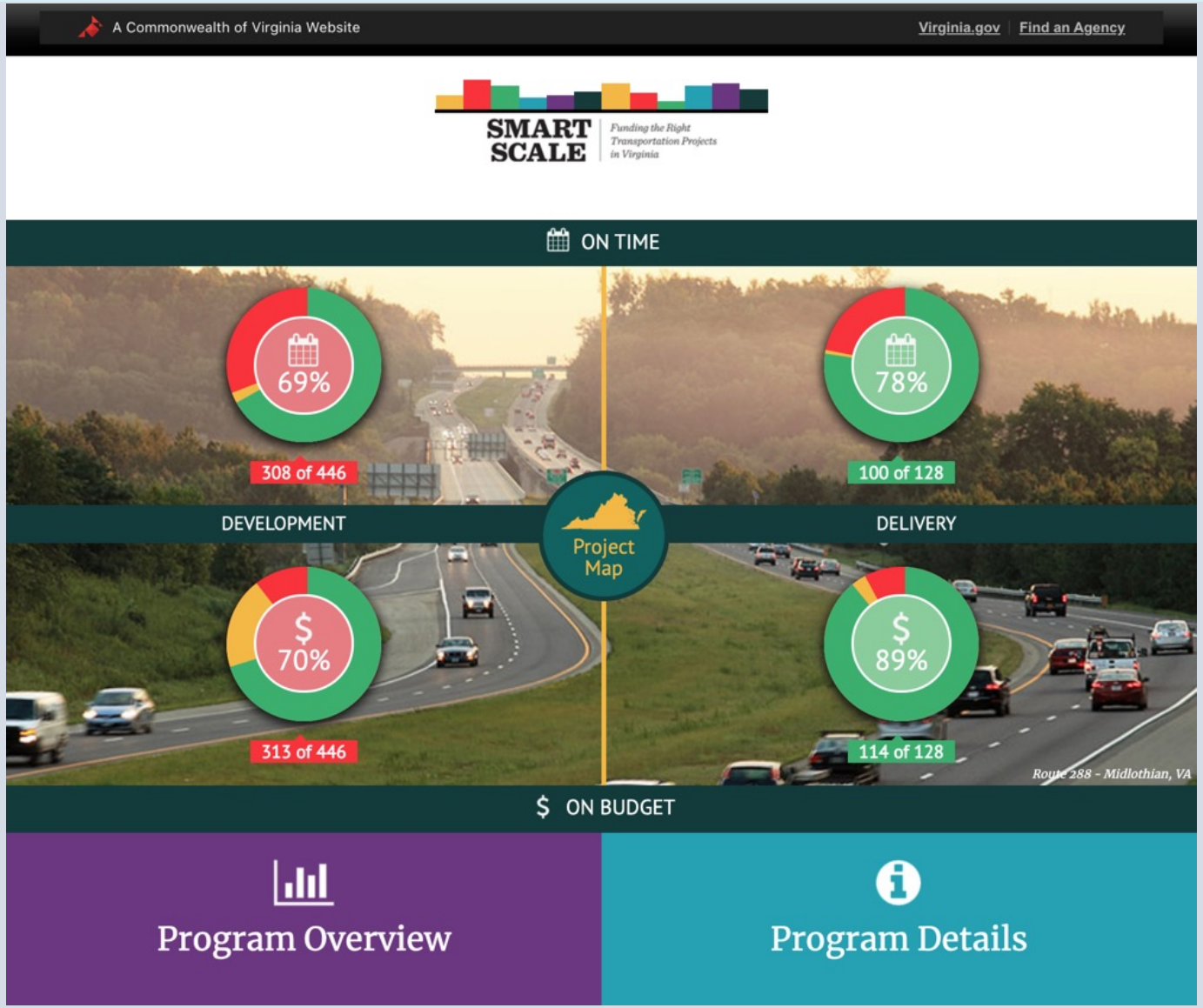
IANCE MEASURES

VA

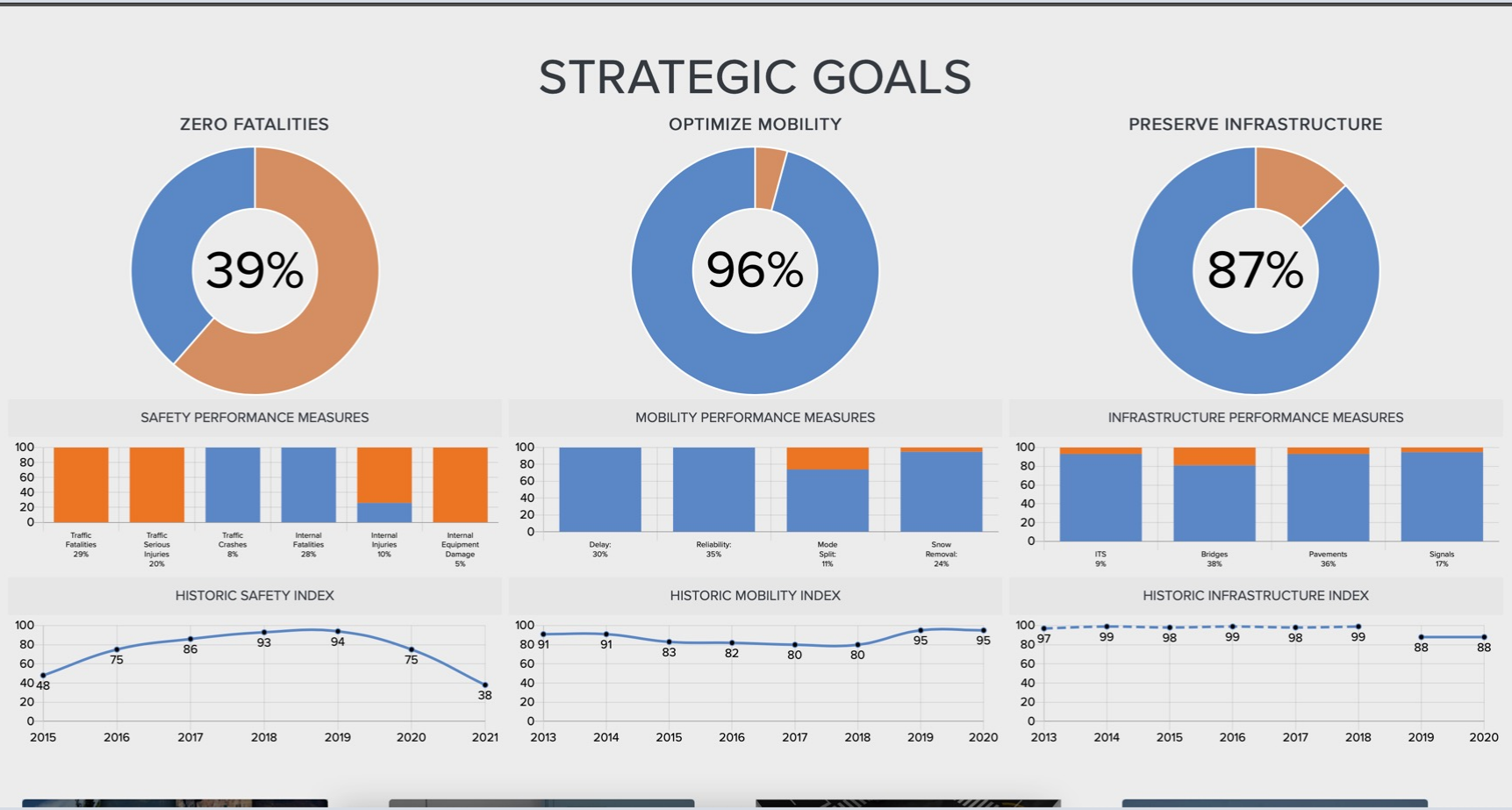


Document current status	Show trend over time	Progress towards a target	Tell a performance story	Support a policy	Long-Term Planning	Medium-Term Programming	Day-to-Day Operations

UT

www.udot.utah.gov/strategic-direction/

STRATEGIC GOALS



Document current status | Show trend over time | Progress towards a target | Tell a performance story | Support a policy | Long-Term Planning | Medium-Term Programming | Day-to-Day Operations

IANCE MEASURES

UT

www.udot.utah.gov/strategic-direction/

Document current status | Show trend over time | Progress towards a target | **Tell a performance story** | Support a policy | Long-Term Planning | Medium-Term Programming | Day-to-Day Operations

...IANCE MEASURES

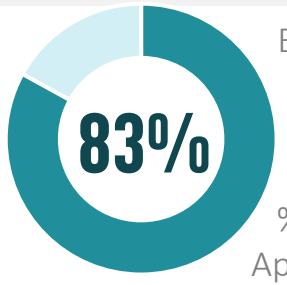
WA

GNB 80
December 2020

Gray Notebook

IANCE MEASURES

Bar Chart

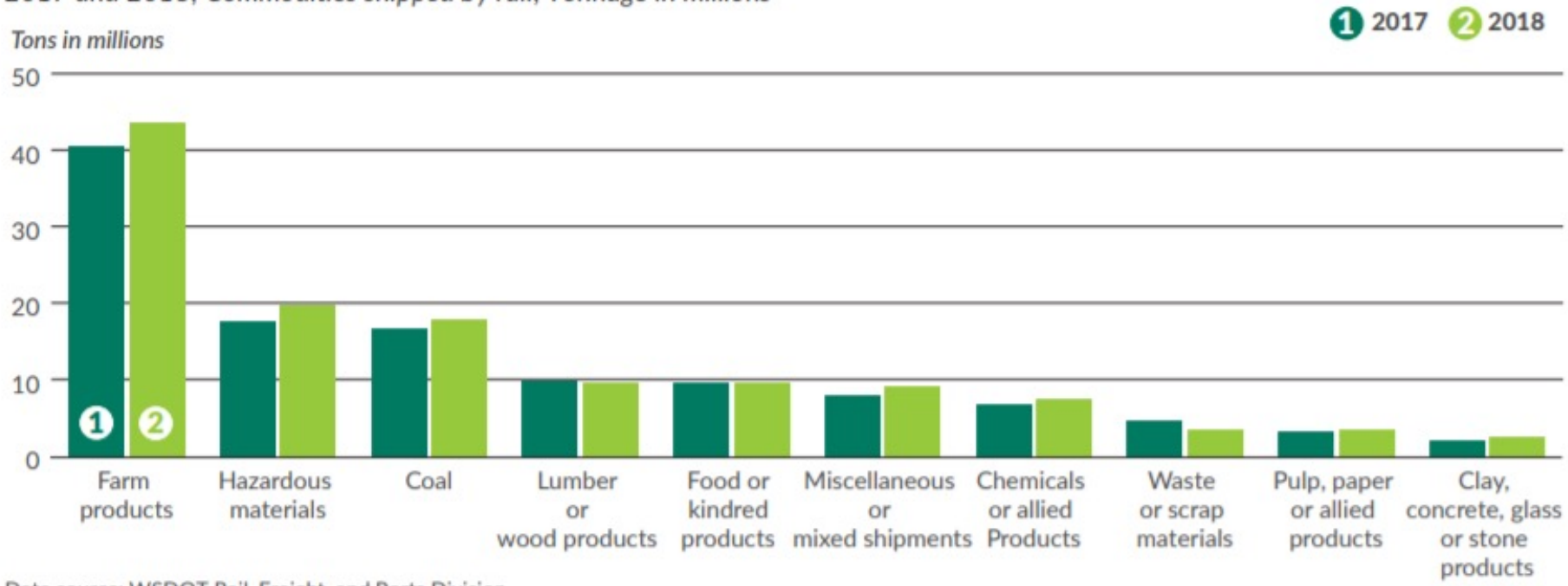


Bar Chart

% used in Appendix 3

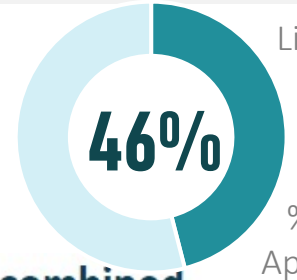
Farm products continue to make up largest share of freight shipped by rail in Washington state in 2018

2017 and 2018; Commodities shipped by rail; Tonnage in millions



Data source: WSDOT Rail, Freight, and Ports Division.

Line Chart

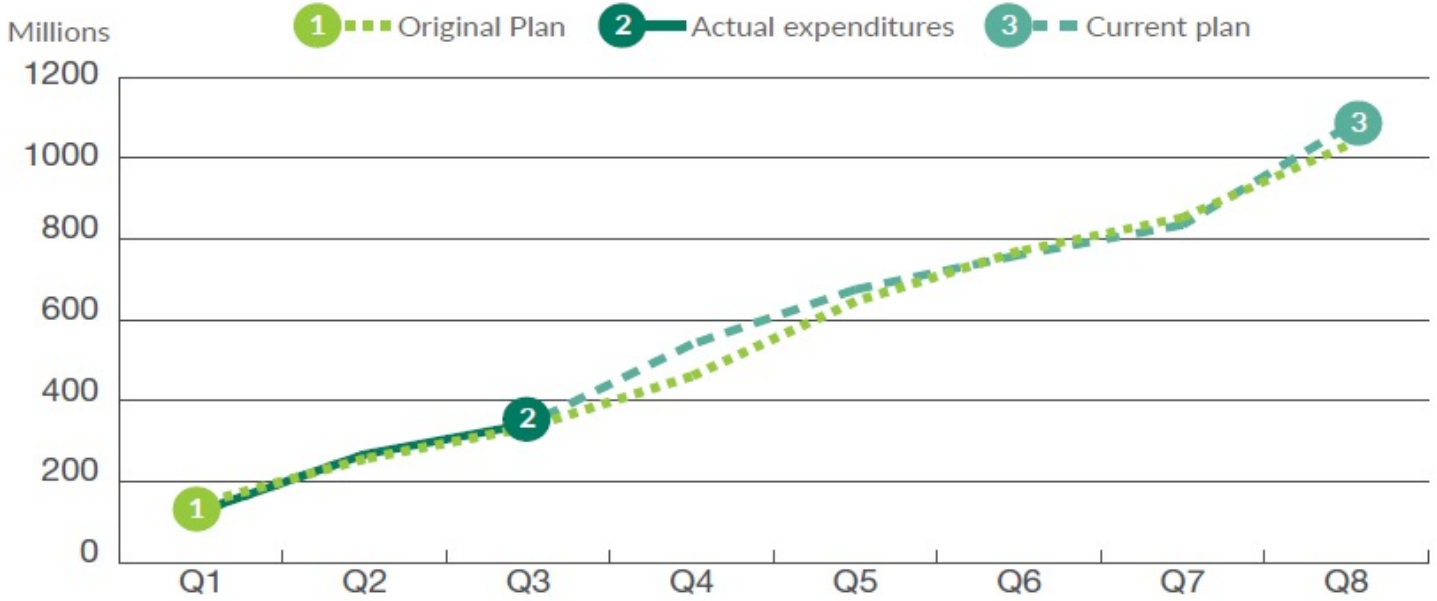


Line Chart

% used in Appendix 3

Cumulative Pre-existing Funds improvement and preservation combined cash flows during the 2019-2021 biennium slightly higher than planned

Quarter ending March 31, 2020; Planned vs. actual expenditures and current plan; Dollars in millions



Data source: WSDOT Capital Program Development and Management.

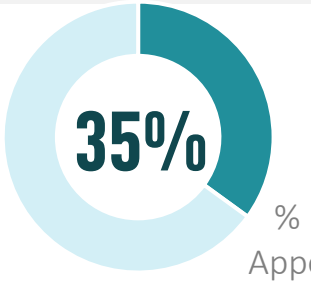
Note: Q3 refers to the third quarter (January through March 2020) of the 2019-2021 biennium, which runs from July 2019 through June 2021.

Table

WSDOT advertises 115 PEF projects during the 2019-2021 biennium

Advertisement status	Quarter[1]	Cumulative[2]
Advanced[3]	0	0
On time	29	85
Emergent[4]	13	17
Early[5]	1	3
Late	9	12
Total projects advertised	**52**	**115**
Delayed within the biennium	29	65
Deferred out of the biennium	0	0
Deleted	1	4

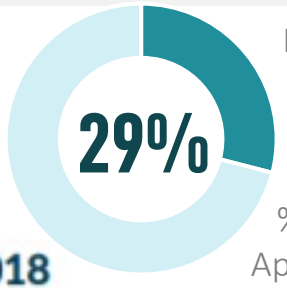
Data source: WSDOT Capital Program Development and Management.



Table

% used in Appendix 3

Pie Chart

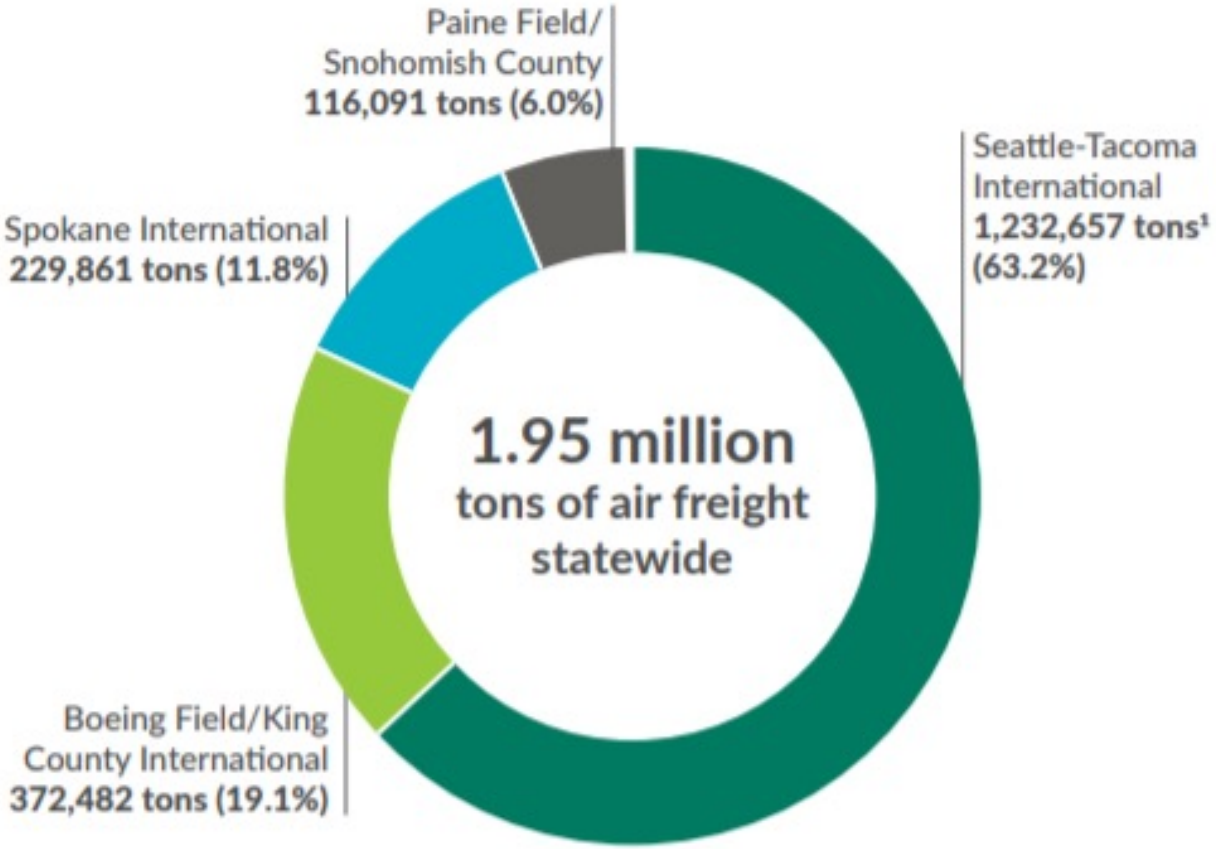


Pie Chart

% used in Appendix 3

Seattle-Tacoma airport moves majority of state's air freight in 2018

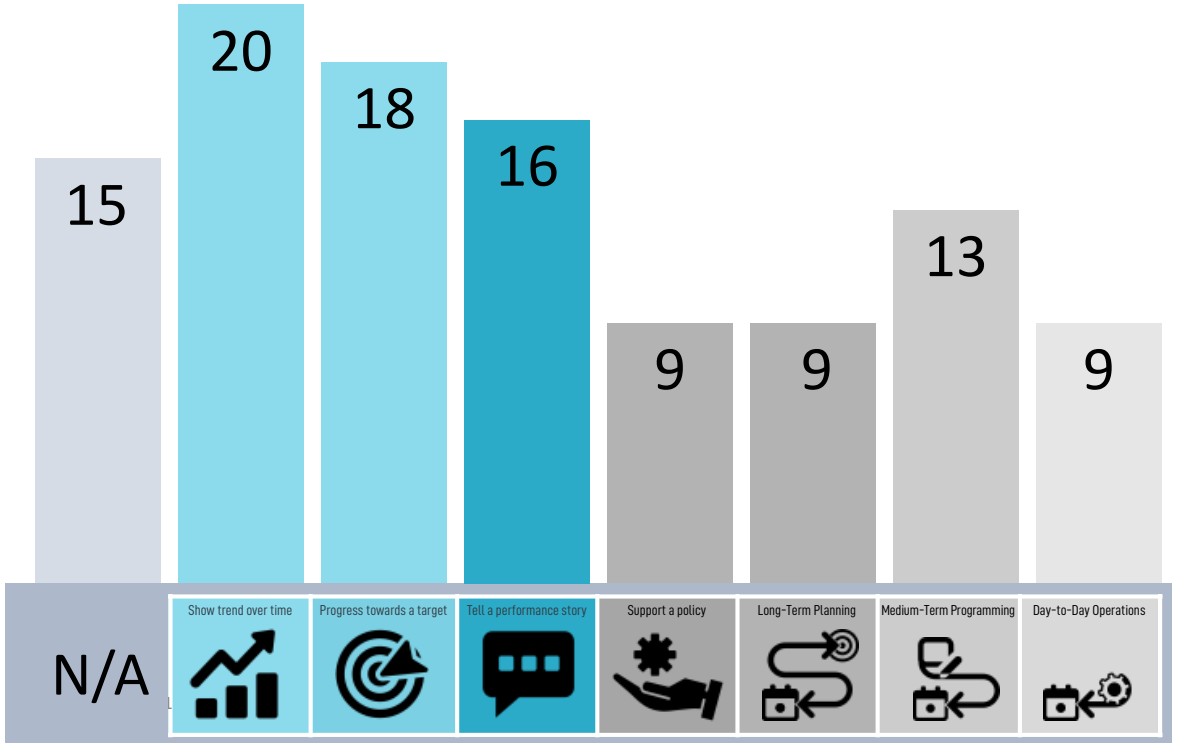
Tonnage and percentage share of air freight per airport in Washington state



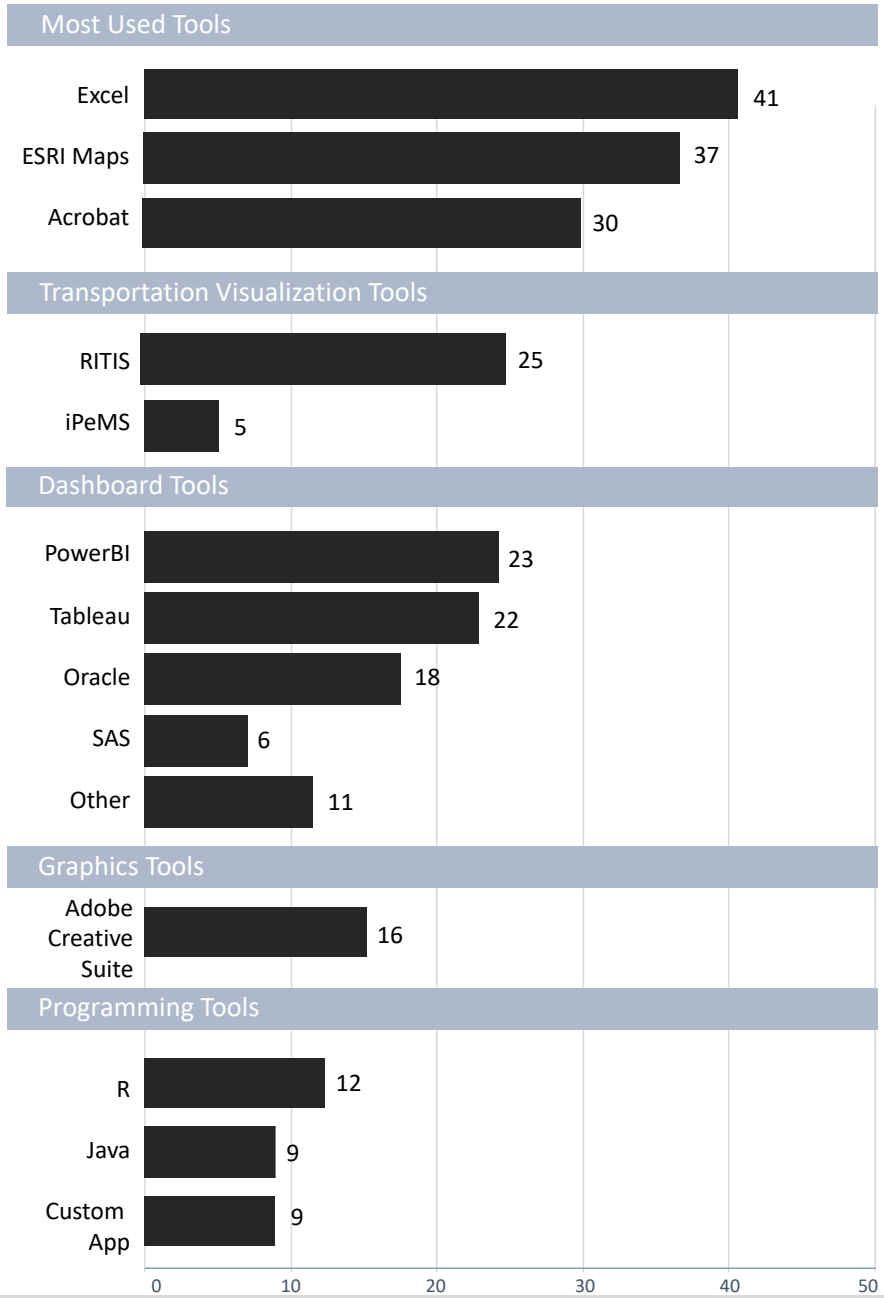
Data source: Federal Aviation Administration.

Internal Dashboards

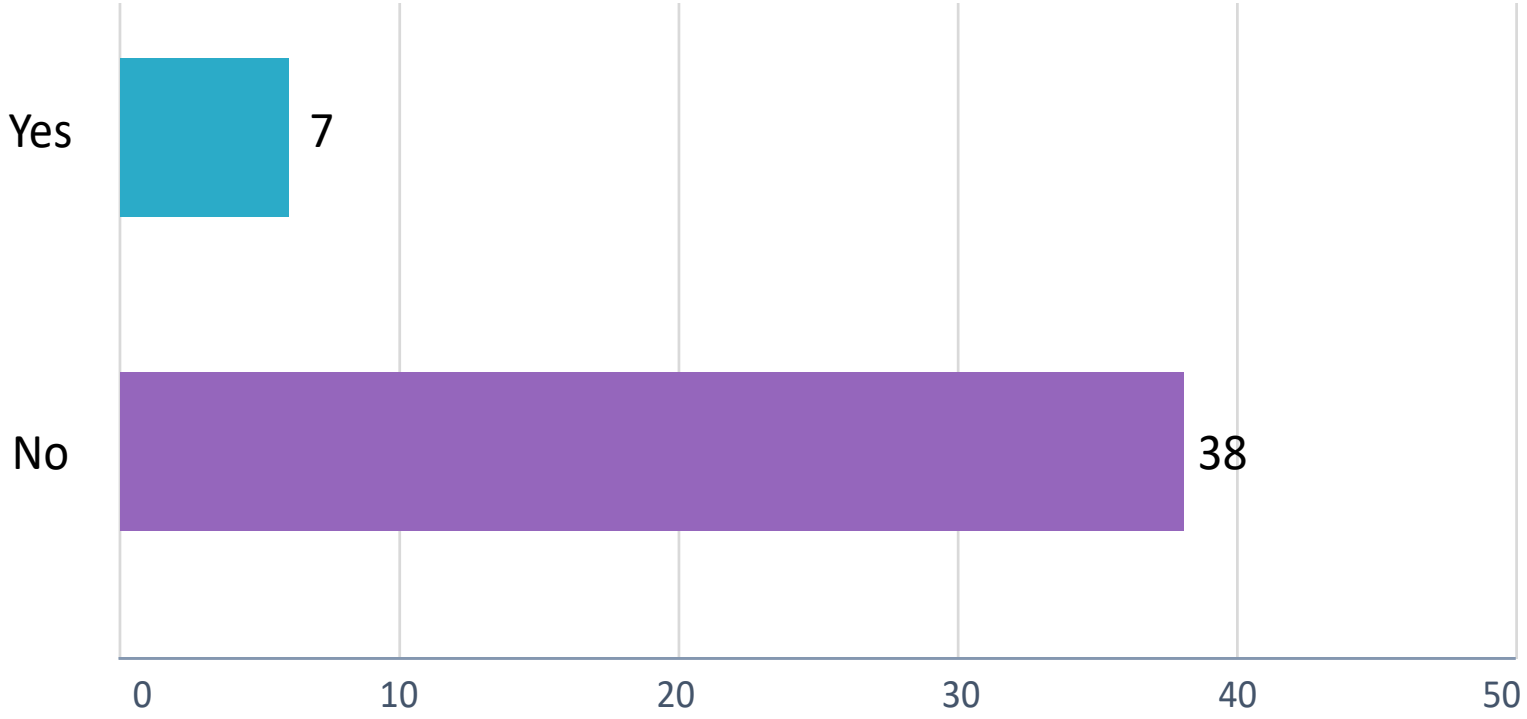
Is a dashboard used by analysts only available inside your agency?



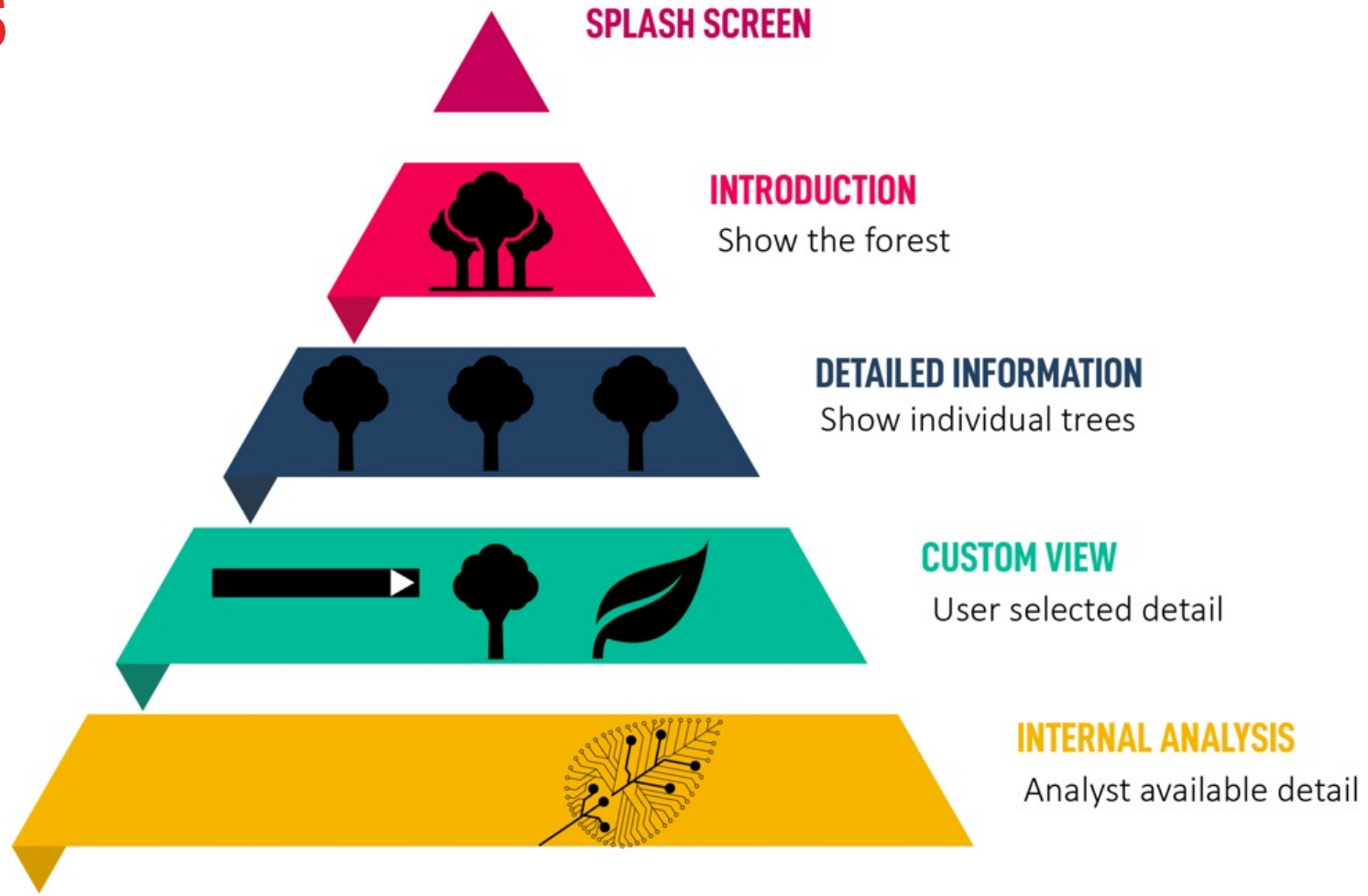
Visualization Tools



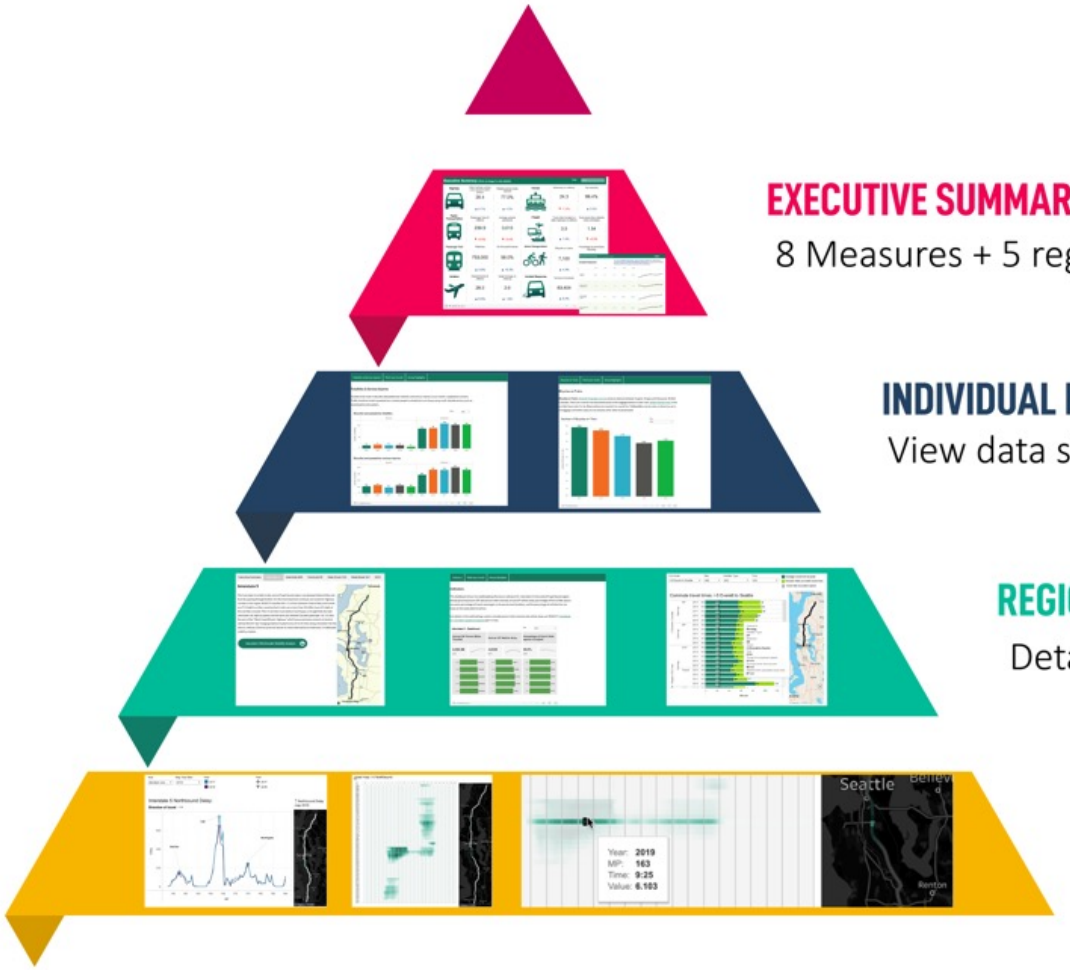
Do you have a method for evaluating the effectiveness of visualizations?



Dashboards


SPLASH SCREEN
INTRODUCTION
Show the forest
DETAILED INFORMATION
Show individual trees
CUSTOM VIEW
User selected detail
INTERNAL ANALYSIS
Analyst available detail

WSDOT Multimodal Mobility Dashboard



EXECUTIVE SUMMARY
8 Measures + 5 regions

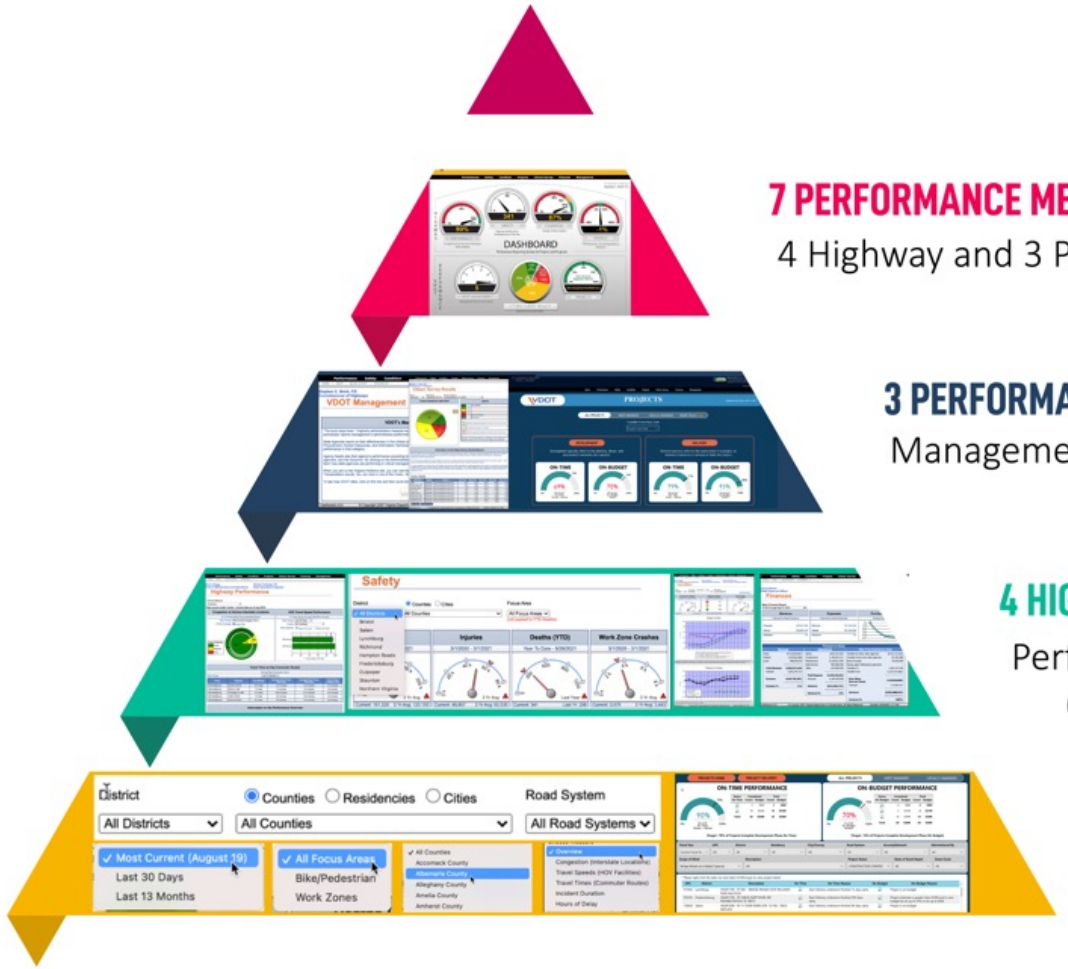
INDIVIDUAL MEASURE SUMMARY
View data sheets for each measure

REGION EXECUTIVE SUMMARY
Detailed info for corridors

DETAILED ANALYSIS
Heat maps and spot data

test.wsdot.wa.gov/wsdot/about/multimodal-mobility-dashboard/default.htm

Virginia Dashboard Performance Reporting System



7 PERFORMANCE MEASURES

4 Highway and 3 Performance

3 PERFORMANCE MEASURES

Management | Citizen Survey | Projects

4 HIGHWAY MEASURES

Performance | Safety
Condition | Finance

MORE DETAILED

Make selection

dashboard.virginiadot.org/

Utah Strategic Direction Dashboard

www.udot.utah.gov/strategic-direction/

UDOT Region 2 Mobility Dashboard

Region 1 Region 3 Region 4 Statewide

Capacity (Top 25) | Capacity (All Routes) | Bottlenecks (Top 25) | Bottlenecks (All Routes) | Construction or Completed

Rank: 2021 VHD per Mile VHD = Vehicle Hours of

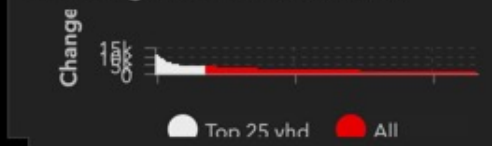
Data Updated

25 Route(s)

Vehicle Hours of Delay

VHD | VHD Top 25

% Change VHD 2020-21 (all routes)

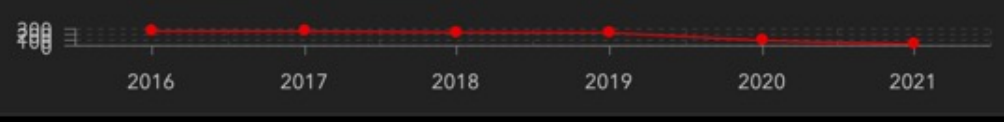


% Change

Speed Trend Weekday Median Speed

Speed Trend | Speed Range | Forecast Speed

Crash Trend



Top 25 Capacity Routes 2021 Vehicle Hours of Delay per Mile

Click on Route to update charts. Re-click to unselect.

EB 600 S (SR-270) I-15 to State St
Delay: 10,356 hrs Rank: 1 Funded
Project(s): ~

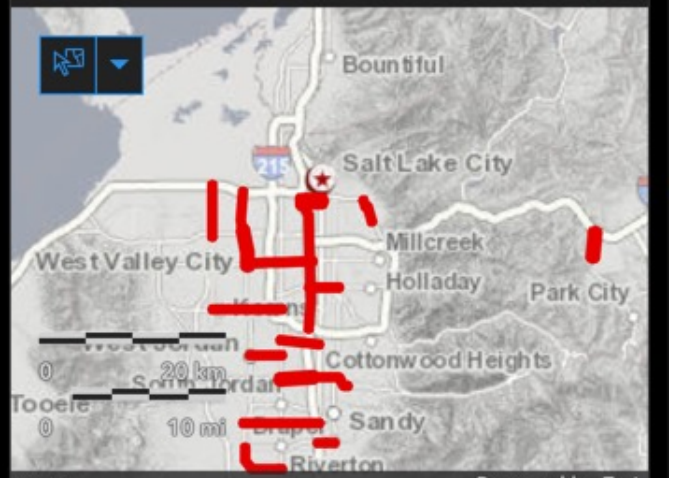
NB SR-224 Cove Canyon Dr to I-80 Kimball Jct
Delay: 10,143 hrs Rank: 2 Funded
Project(s): ~

WB 9000 S (SR-209) I-15 to Redwood Rd
Delay: 8,588 hrs Rank: 3 Funded
Project(s): ~

NB Bangerter Hwy 3500 S to SR-201
Delay: 8,294 hrs Rank: 4 Funded
Project(s): ~

VHD by Routes

Use selection tools to select Route(s) and update charts. Click X to unselect.



Top 25 VHD Map | Crash Map

Yearly Vehicle Hours of Delay Trend

VHD Trend | VHD Seasons | Legend for Crash Map

Video Link (if available)

Funded Projects

No data

VISUALIZING HIGHWAY PERFORMANCE MEASURES

NCHRP Project 20-05
Synthesis Topic 52-16

Preliminary Findings, Panel has not balloted

Frank Broen, PI frank@metroanalytics.com

metro analytics

UDOT's Visualization of Highway Performance Measures for Storytelling and Decision Support

Ryan Bailey
Utah DOT
Performance Manager
9/15/2021

Strategic Direction Website

Quick links from home page:

- Vision of the Department
- Mission Statement
- Strategic Goals
- Funding - Where we are spending the money
- Projects
- Tactical Measures

Highlighting UDOT:

- Road map:
  - Overview of mission, vision, values, strategic goals
- Getting to know UDOT:
  - PDF showing how we do business
- Director's message:
  - History of the site

UDOT Roadmap

MISSION

ENHANCE QUALITY OF LIFE THROUGH TRANSPORTATION

QUALITY OF LIFE FRAMEWORK

VISION

KEEPING UTAH MOVING

UDOT VALUES

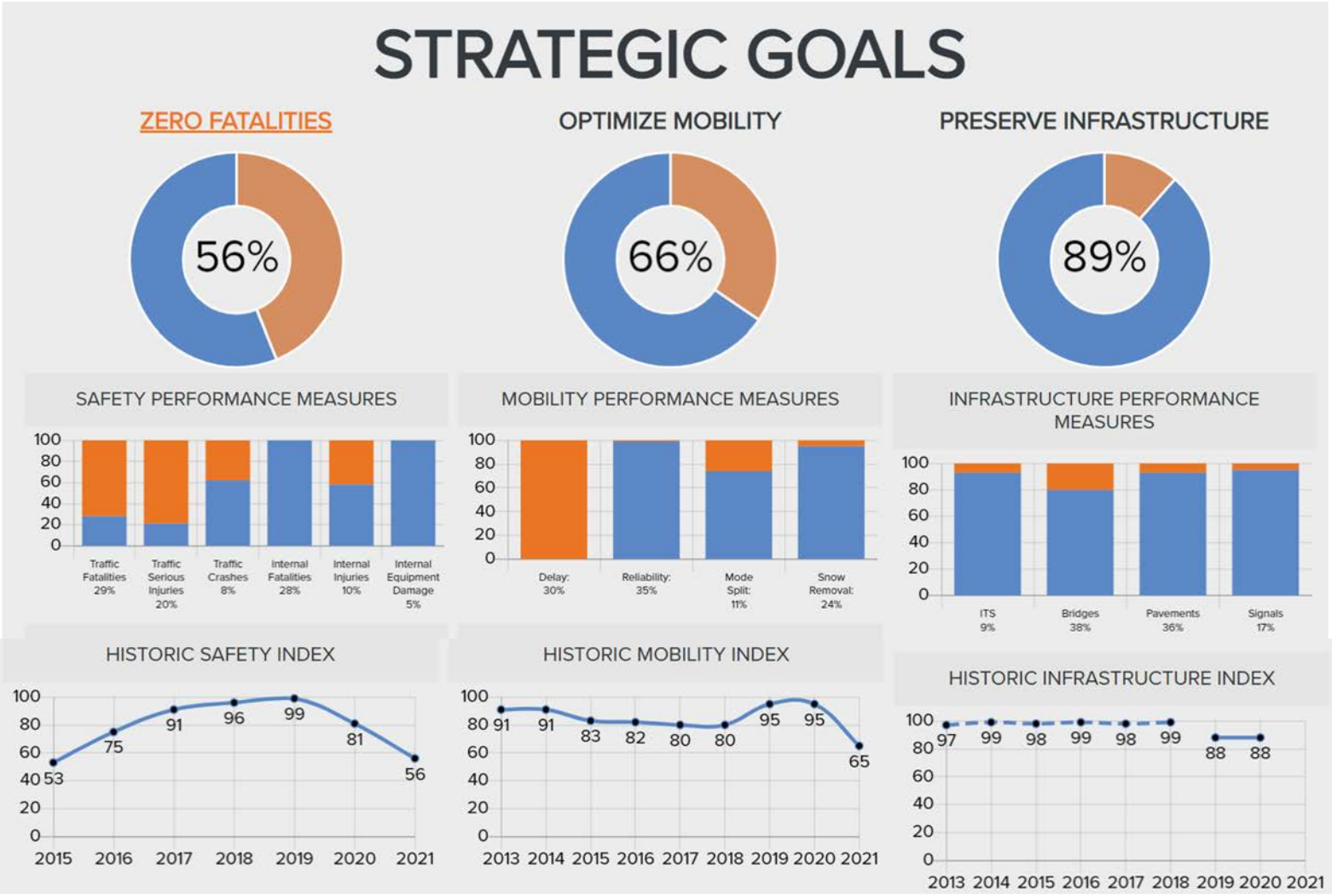
RESPECT | INTEGRITY | CARING

STRATEGIC GOALS

ZERO CRASHES, INJURIES AND FATALITIES | PRESERVE INFRASTRUCTURE | OPTIMIZE MOBILITY

UDOT Keeping Utah Moving

Strategic Goals

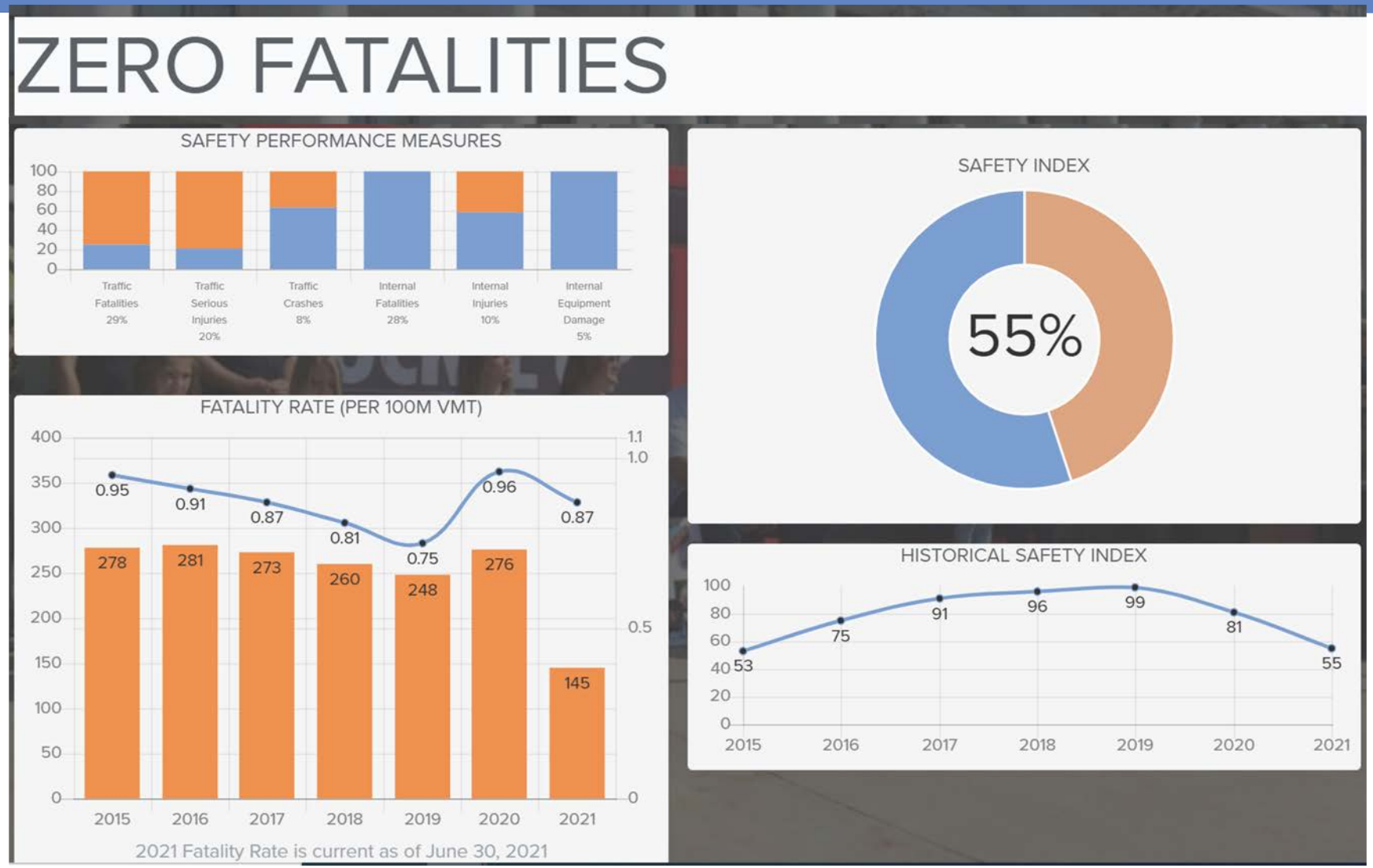


Three Strategic Goals:

- **Zero crashes, injuries, and fatalities**
  - Traffic Fatalities
  - Traffic Serious Injuries
  - Traffic Crashes
  - Internal Fatalities
  - Internal Injuries
  - Internal Equipment Damage
- **Optimize Mobility**
  - Delay
  - Reliability
  - Mode Split
  - Snow Removal
- **Preserve Infrastructure**
  - ITS
  - Bridges
  - Pavement
  - Signals

UDOT Keeping Utah Moving

Zero Fatalities - Part 1



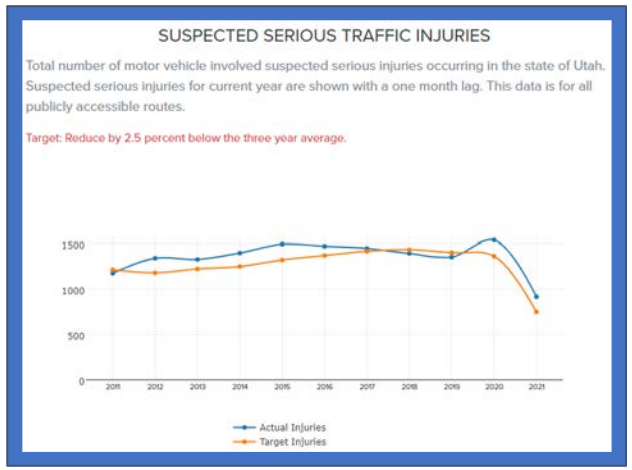
Highlights:

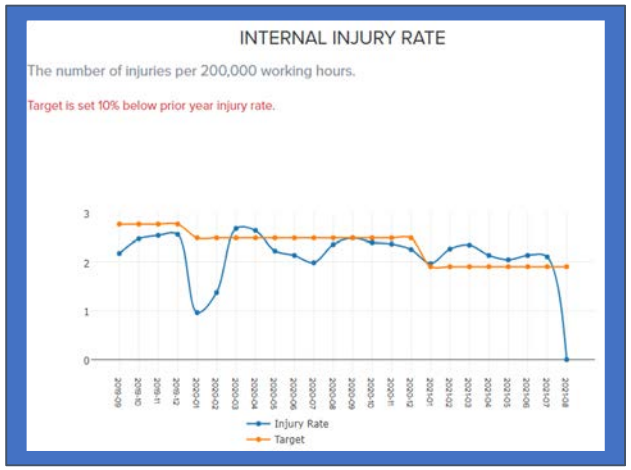
- **Strategies tabs**
  - **Infrastructure Improvement**
  - **Partnering**
  - **Employee Safety**
  - **Public Outreach and Education**

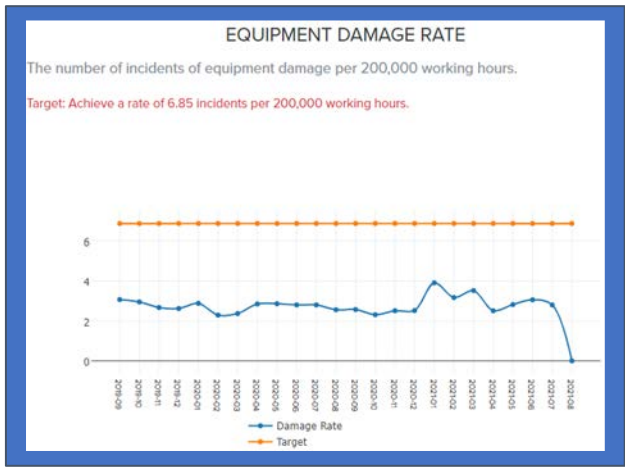
UDOT Keeping Utah Moving

Zero Fatalities - Part 2

- **Zero Fatalities Performance Measures**
  - **Graphs**
  - **Description of the measure and our current performance.**
  - **Targets**







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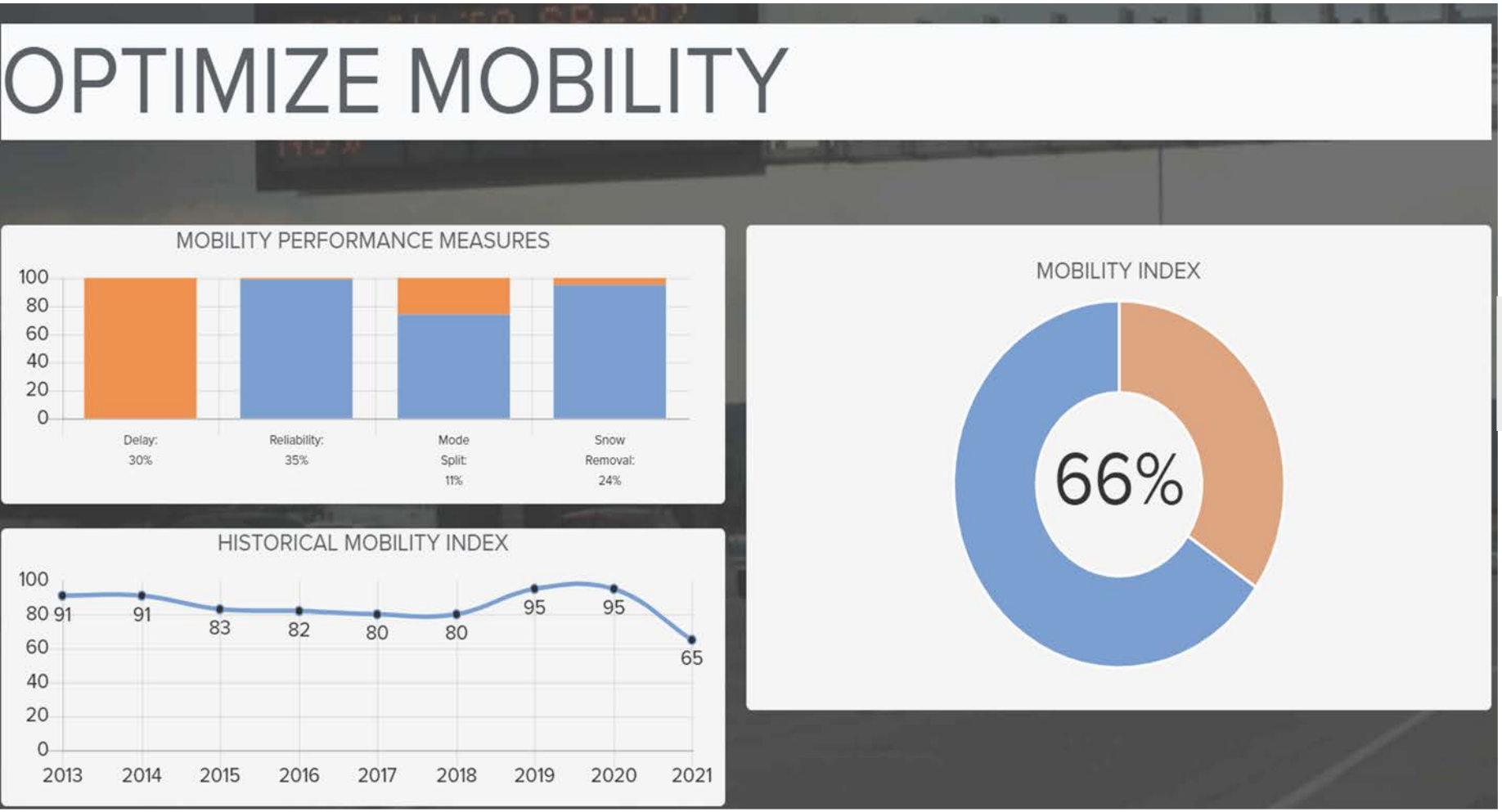
Optimize Mobility - Part 1



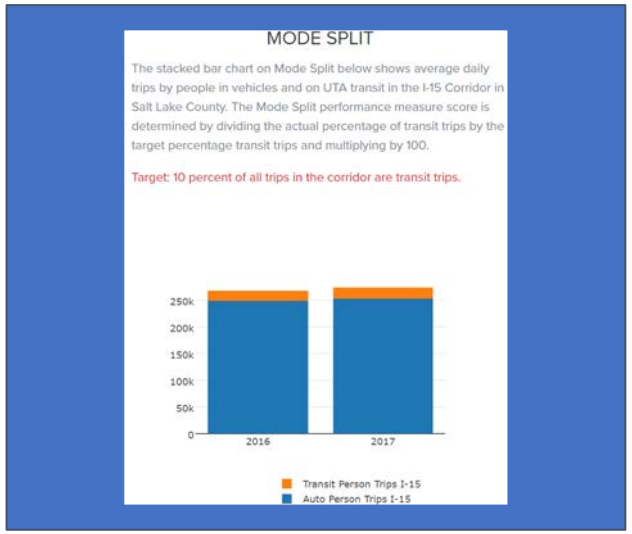
Highlights:

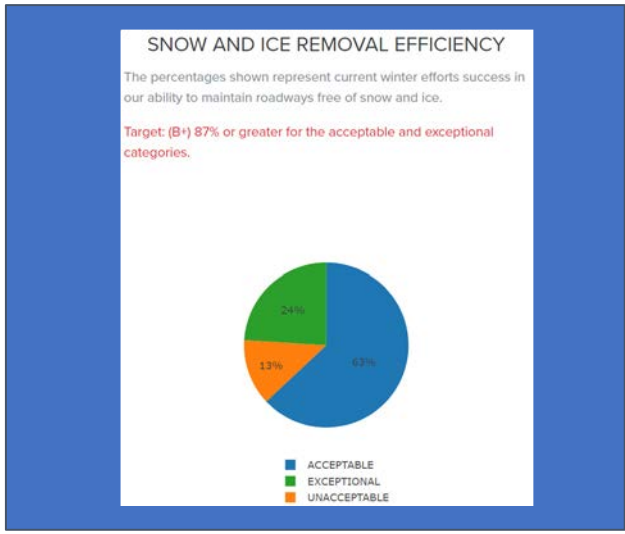
- **Strategies tabs**
  - **Capacity Improvements**
  - **Efficient Operations**
  - **Enable Travel Choices**

UDOT Keeping Utah Moving

Optimize Mobility - Part 2

- **Optimize Mobility Performance Measures**
  - **Graphs**
  - **Description of the measure and our current performance.**
  - **Targets**





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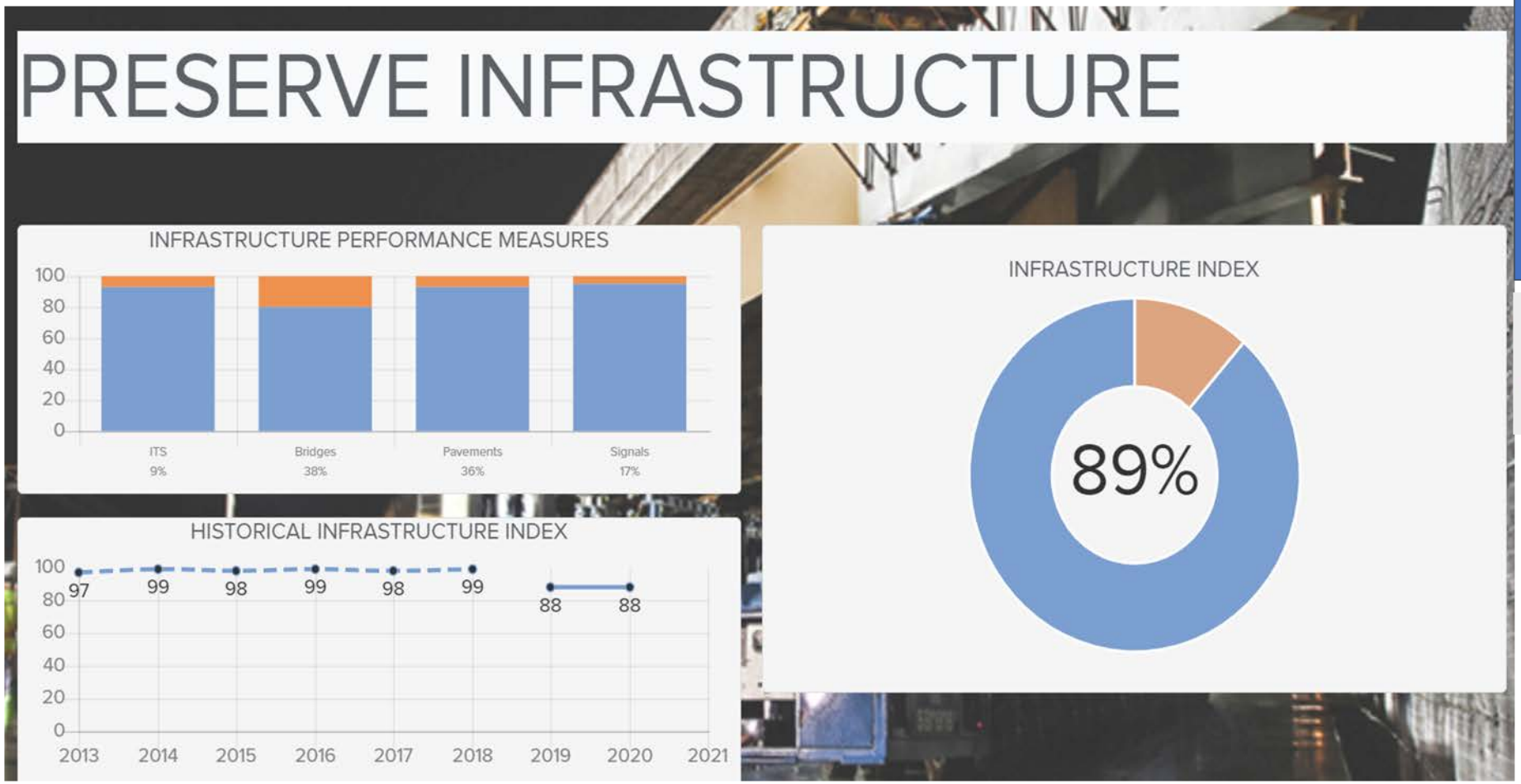
Preserve Infrastructure - Part 1



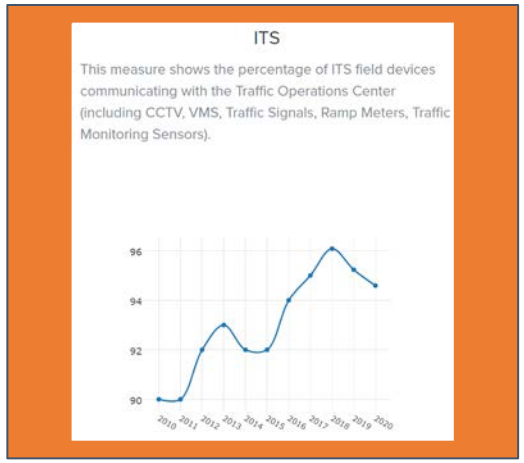
Highlights:

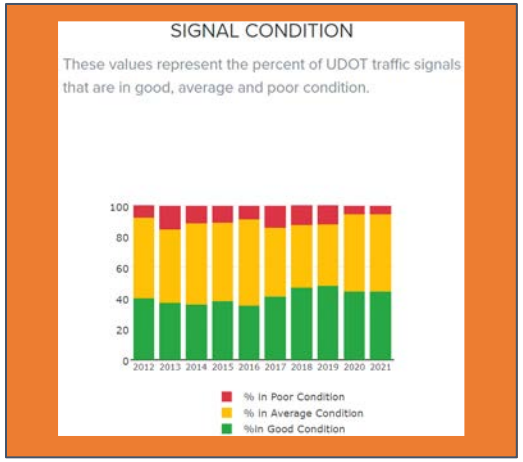
- **Strategies tabs**
  - **Pavement Management**
  - **Bridge Management**
  - **Signal & Intelligent Transportation Systems Management**

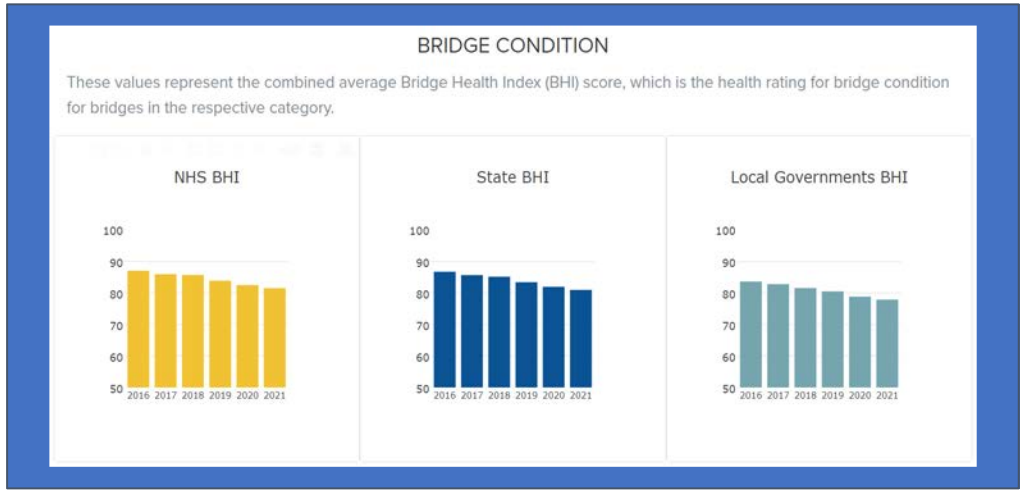
UDOT Keeping Utah Moving

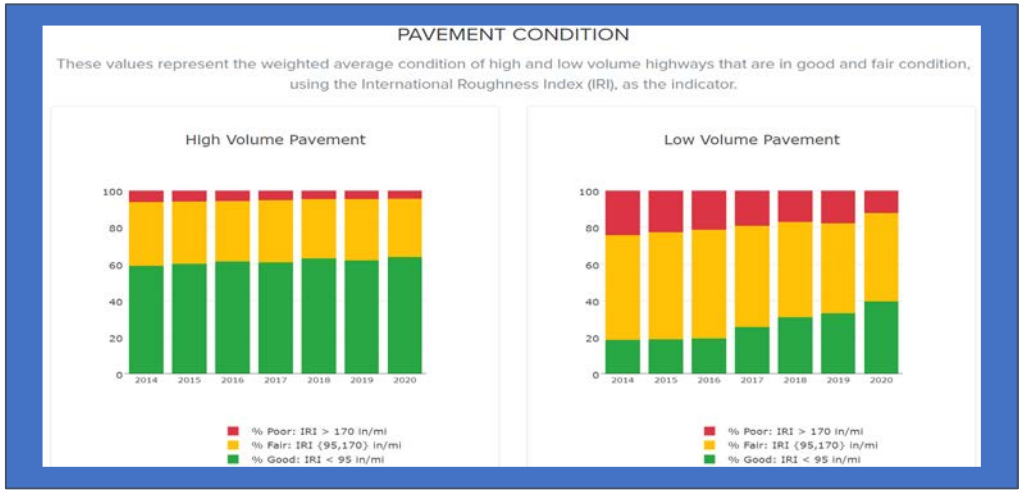
Preserve Infrastructure - Part 2

- **Preserve Infrastructure Performance Measures**
  - **Graphs**
  - **Description of the measure and our current performance.**
  - **Targets**



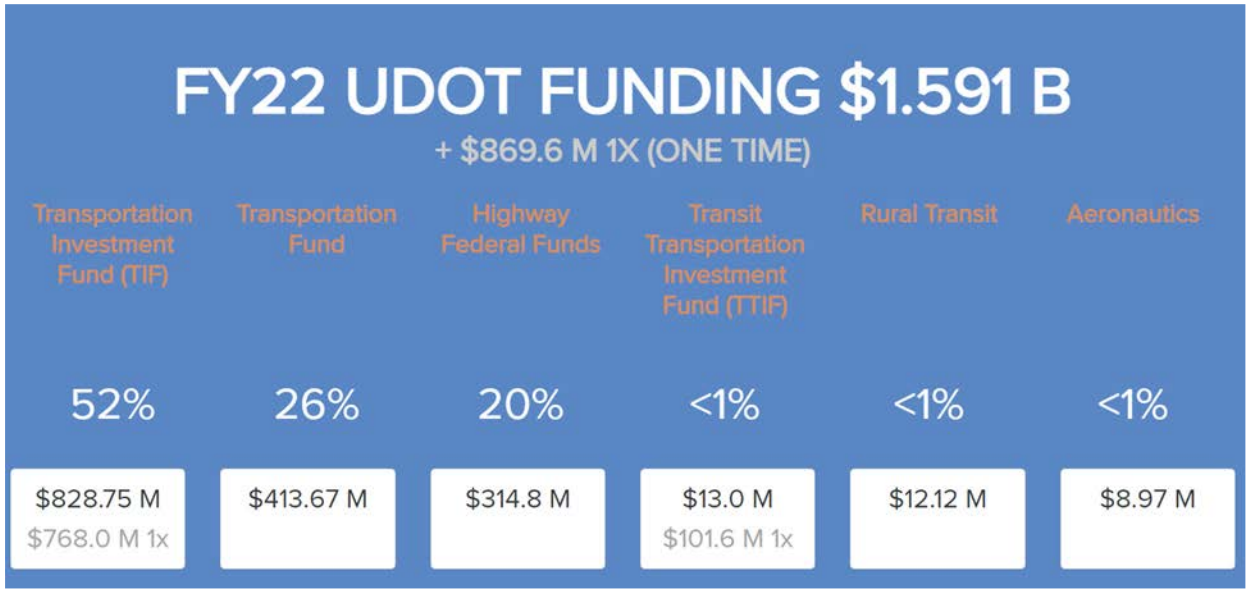






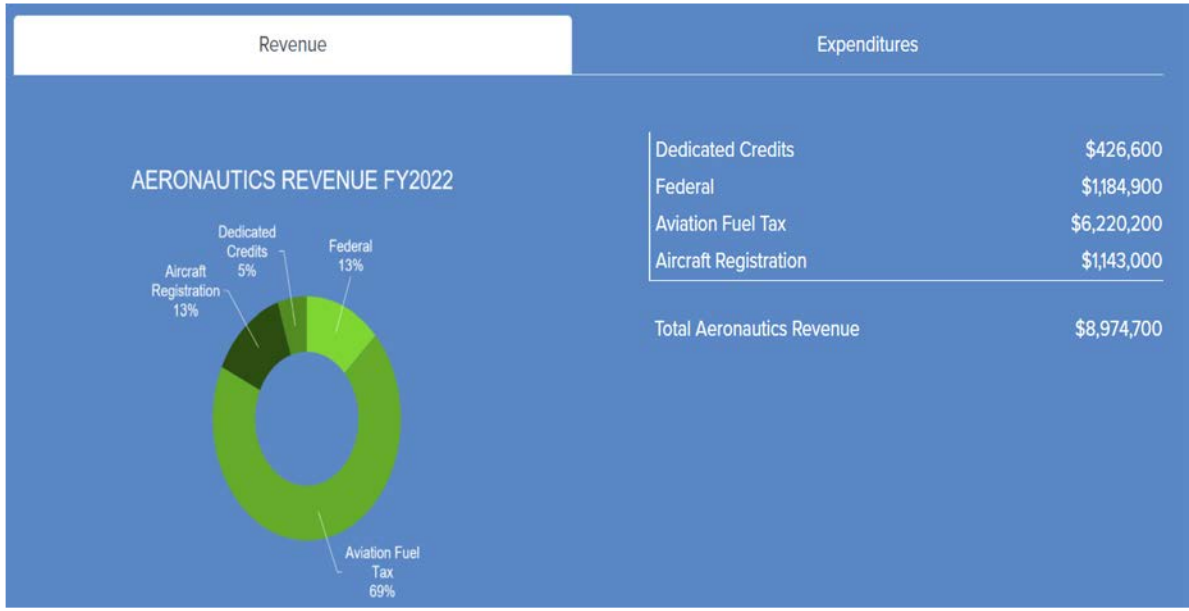
UDOT Keeping Utah Moving

Funding



- **Funding Tabs:**
  - **Transportation Investment Fund (TIF)**
  - **Transportation Fund**
  - **Highway Federal Funds**
  - **Transit Transportation Investment Fund (TTIF)**
  - **Rural Transit**
  - **Aeronautics**

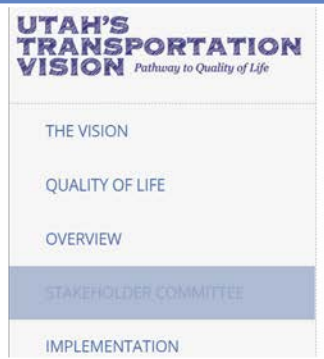
- **Revenue Tab:**
  - **Shows where the funding is from.**
- **Expenditures Tab:**
  - **Shows how we are spending our allocated funds.**

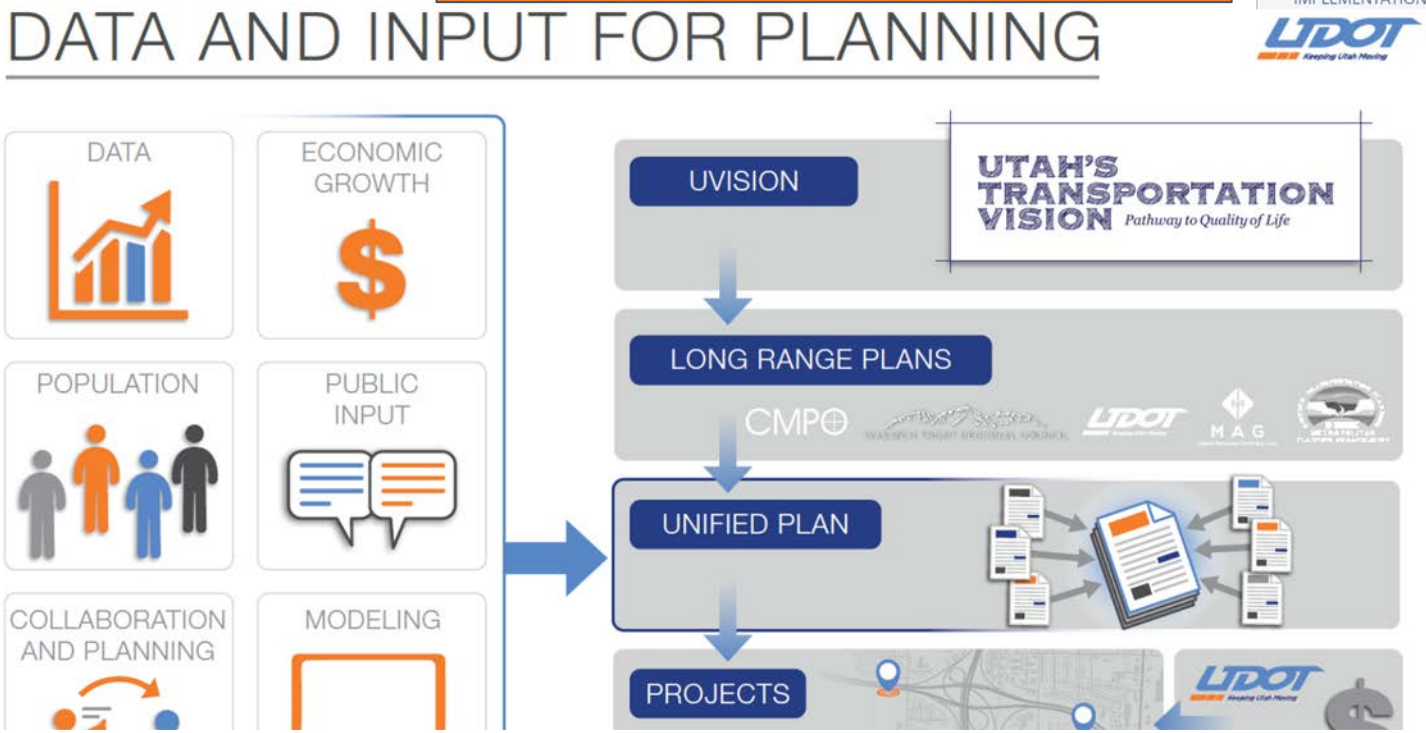


UDOT Keeping Utah Moving

Projects

- **Projects Page:**
  - Link to the Project App
  - Project UVision
  - Graphs and Charts of Projects
  - Overview of Funded, Future, and Planned Projects



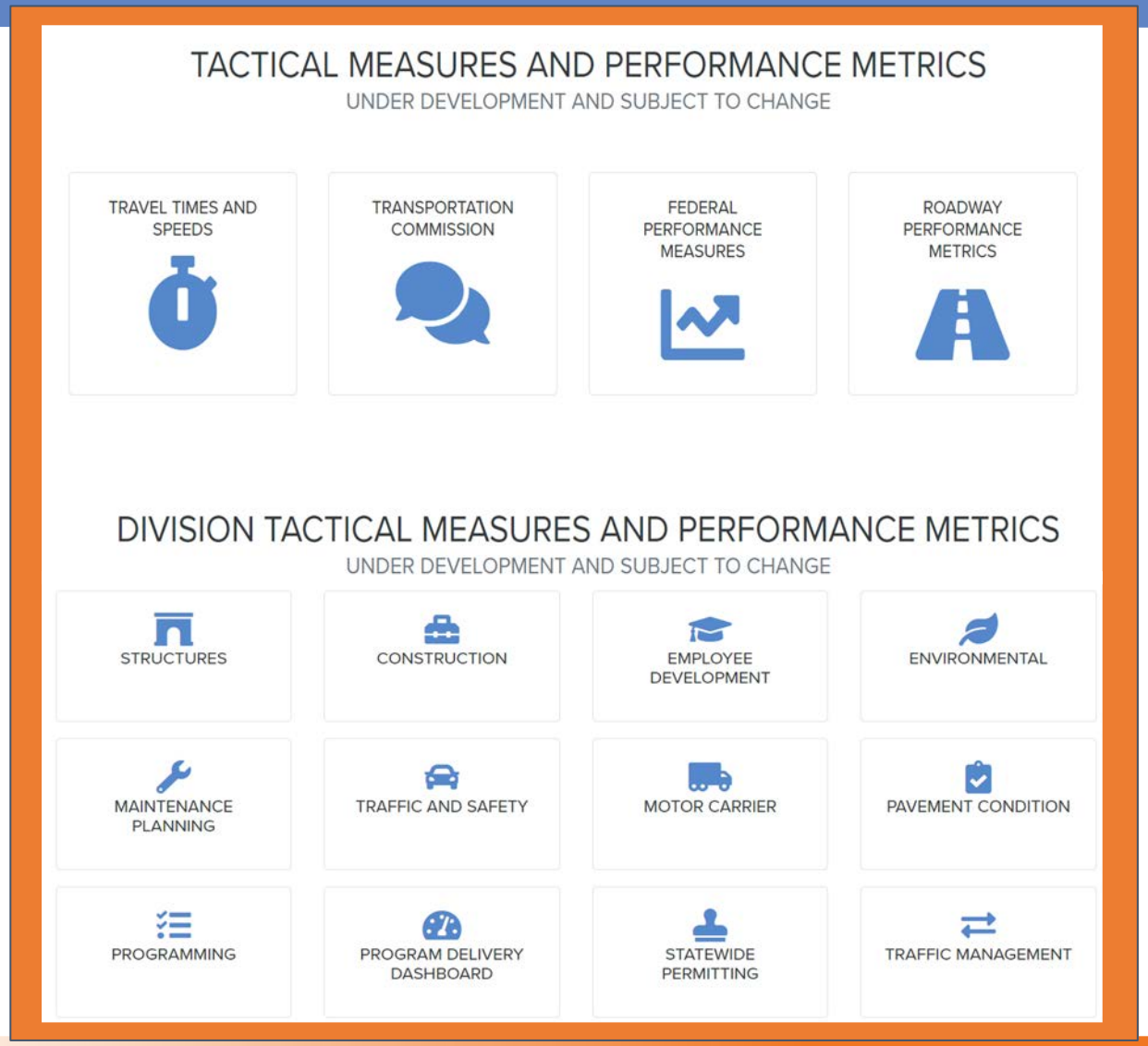


Tabs in the Project App:

- **UVision**
  - Describes Utah's Transportation Vision
- **Unified Plan**
  - Highways, Transit, Active Transportation, Corridor Preservation
- **Programs**
  - STIP Program - Funding
- **Prioritization List**
  - All Projects with Scores
- **TIF**
  - Map of all Projects Funded Through TIF
- **Funded Projects**
  - GIS Map of all Projects
- **Construction Projects**
  - GIS Map of all Projects

UDOT Keeping Utah Moving

Tactical and Division Measures

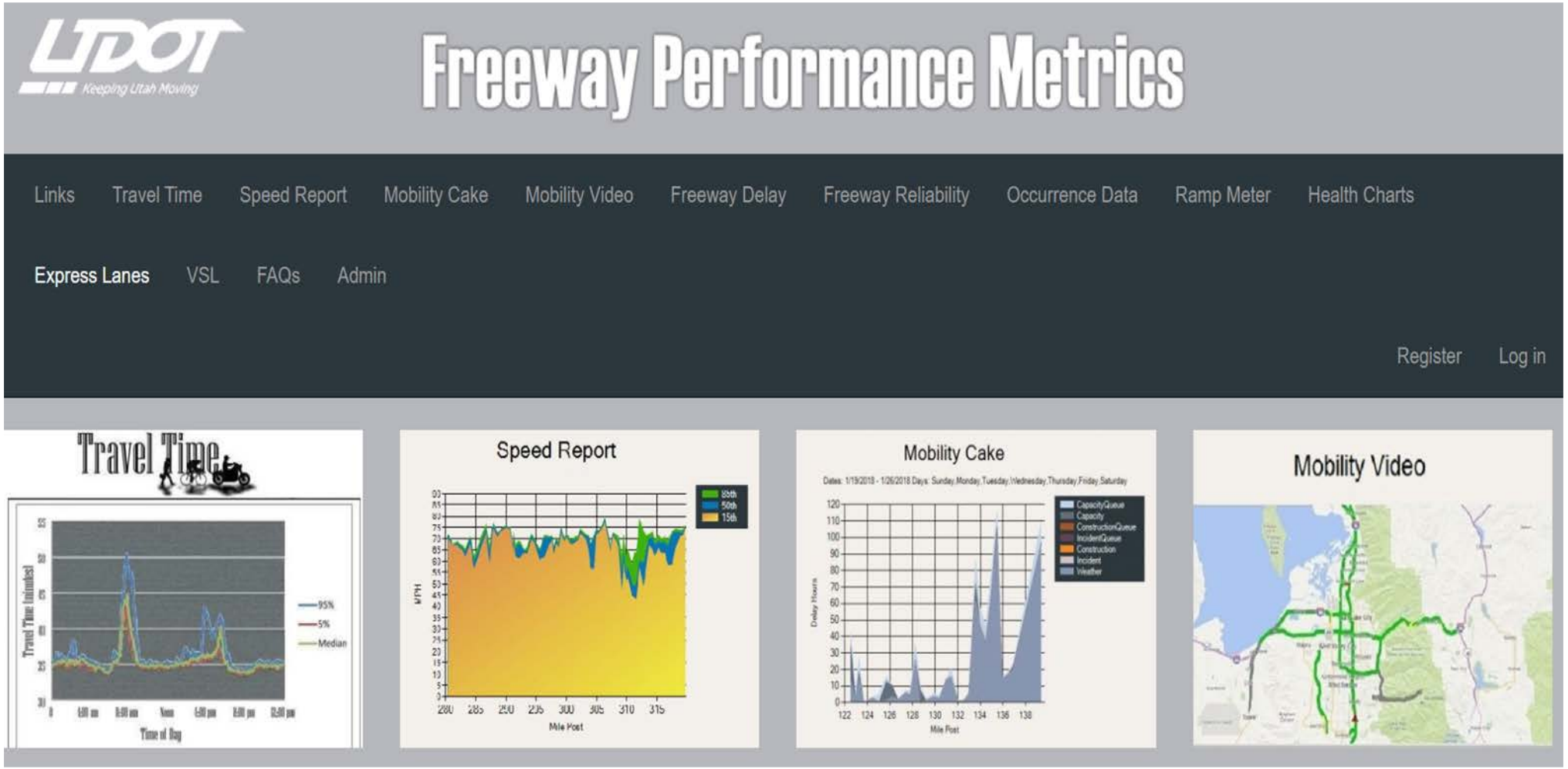


UDOT Keeping Utah Moving

Tactical and Division Measures

UDOT Keeping Utah Moving

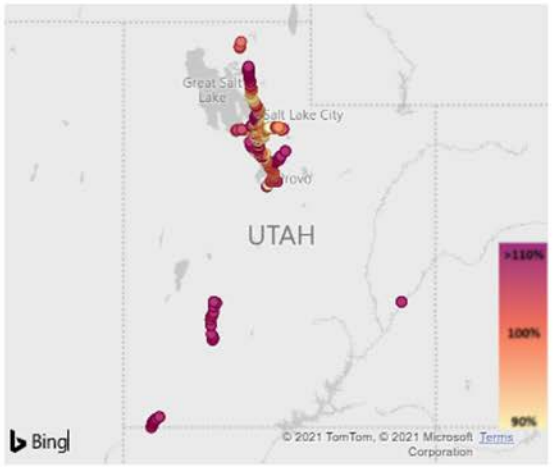
Tactical and Division Measures



Tactical and Division Measures

2020-2021 Traffic Volume Trends | Highways and Freeways

Number of Stations | 753



Year-to-Date | Total of all days in 2020 or 2021 compared to all days in 2019 to the current date.
Selected Month | Average of 2020 or 2021 volume divided by 2019 volume for selected month.
7-Day Rolling Average | percentages are calculated using a rolling average of the previous 7 days. All filtered sites are weighted based on volume. Volumes include mainline general purpose lanes only.

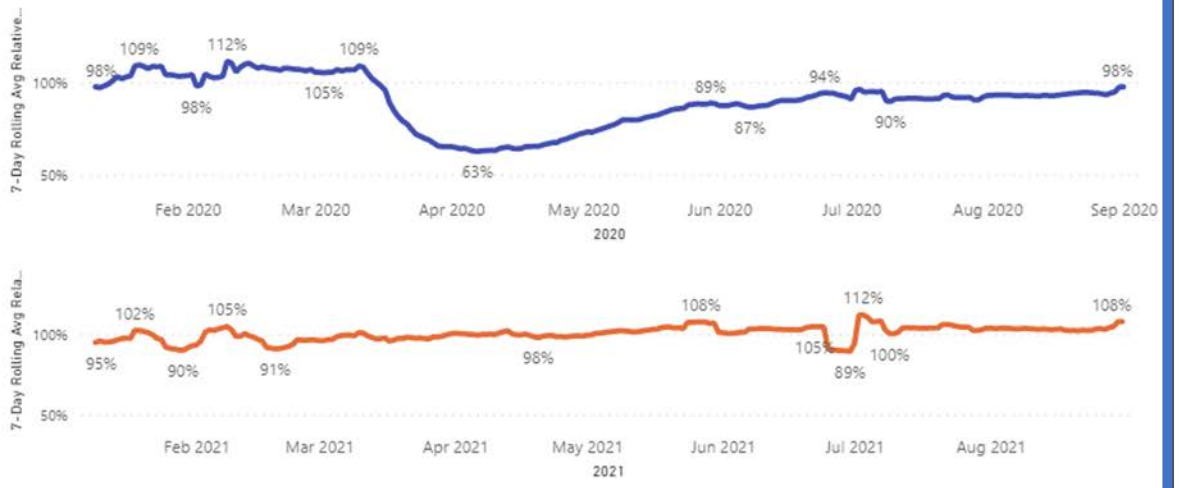
Metrics | 2020-2021 Relative to 2019 7-Day Rolling Average

	All Days	Weekdays	Weekends	Most Recent 7-Day Average
2020	90%	90%	88%	98%
2021	101%	100%	104%	108%

20-21 Selected State Route Traffic Volume Relative to 2019 | 7-Day Rolling Average

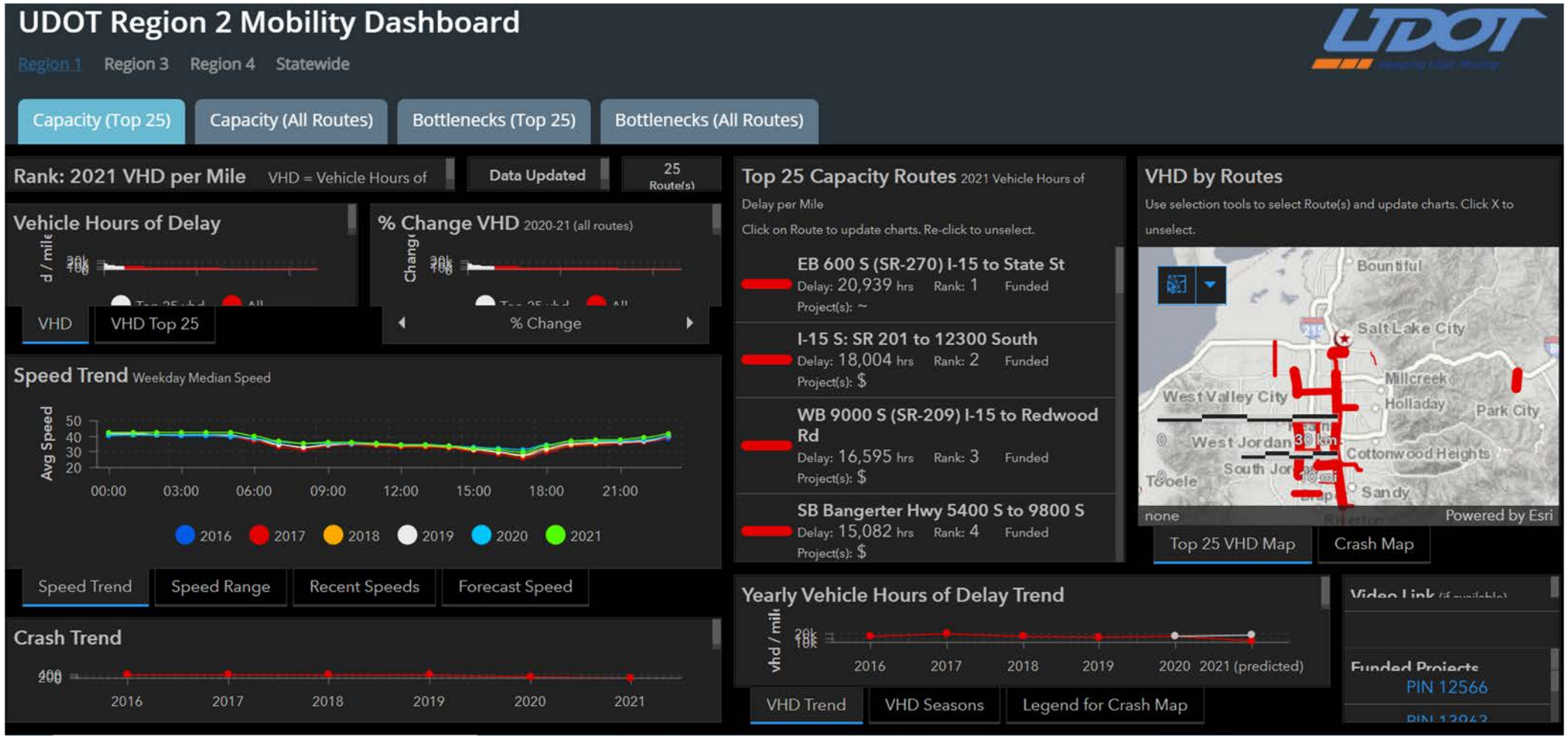
Region: All | County: All | Route: All | 1/9/2021 – 8/31/2021

Multiple Stations Selected



UDOT Keeping Utah Moving

Tactical and Division Measures



Tactical and Division Measures

Program Delivery Dashboard

The Program Delivery Dashboard (PDD) is utilized to evaluate the delivery of roadway projects in three different areas: schedule, budget, and scope.

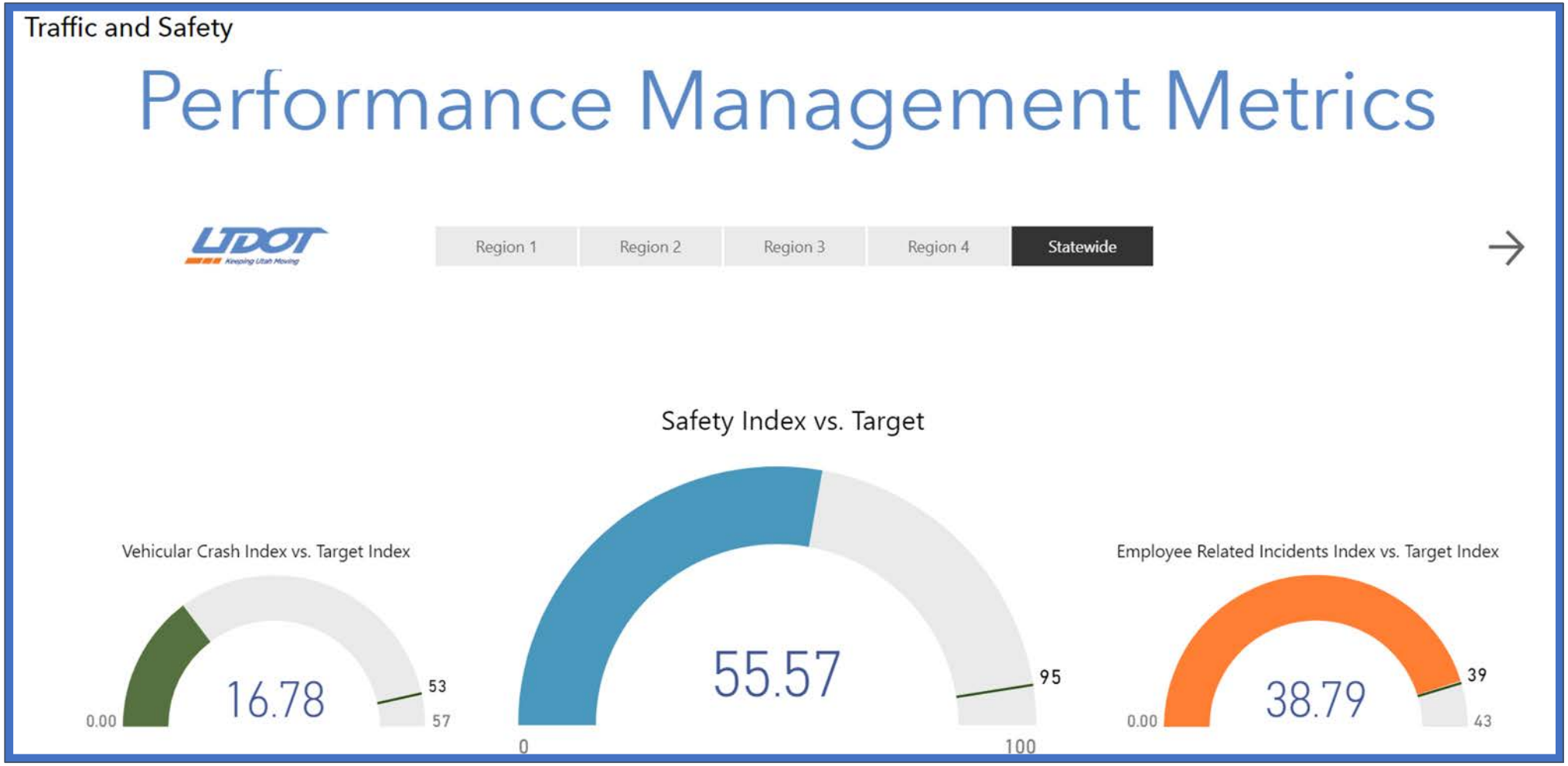
Preconstruction Advertising Status

8	14	119	141
Past Due	To Advertise Within 60 Days	Advertising Date More Than 60 Days Out	Total Projects

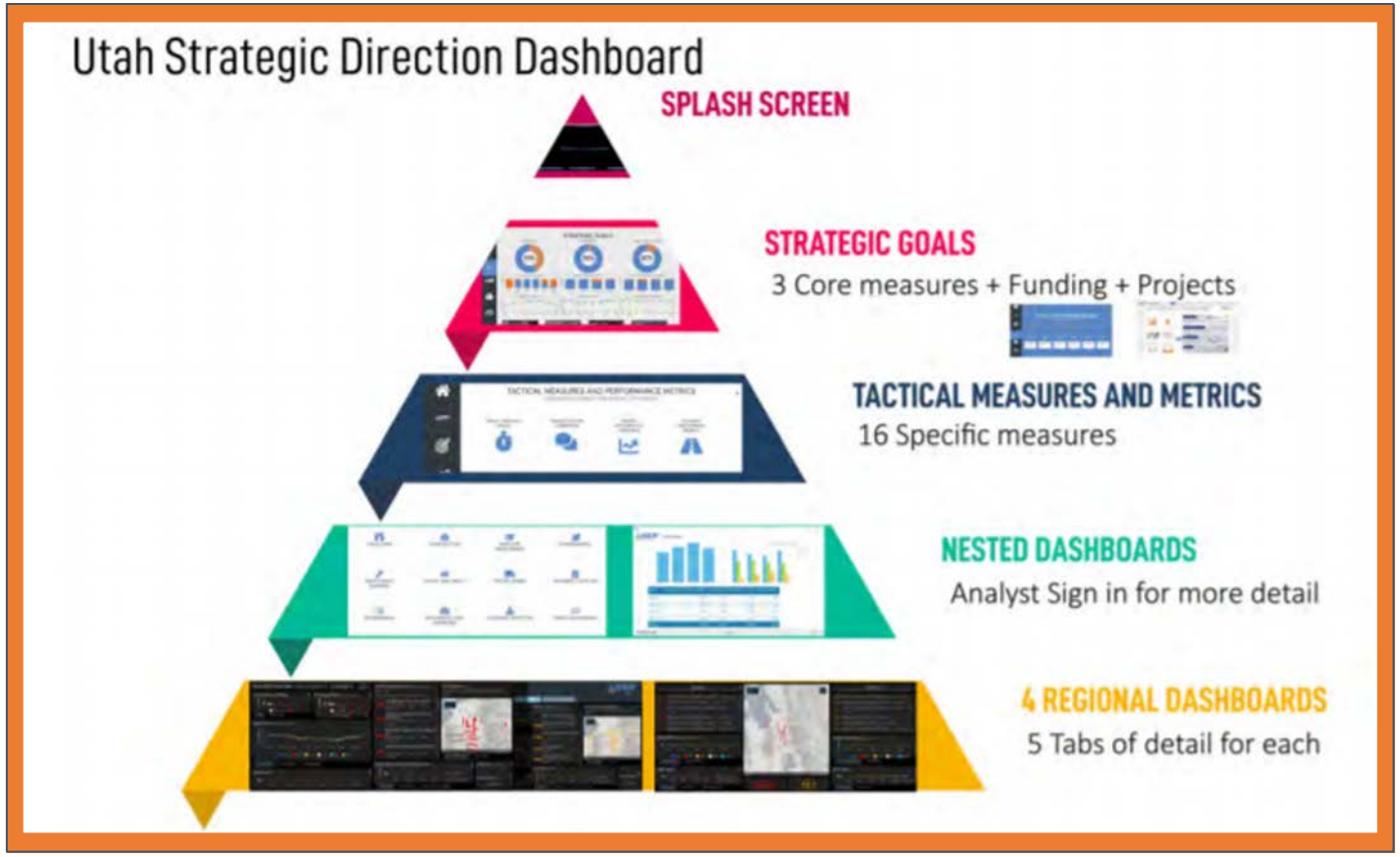
UDOT Keeping Utah Moving

Tactical and Division Measures

TRAFFIC AND SAFETY



Strategic Direction Website SWOT Analysis



Strengths

- Easy to use site with visualizations and metrics
- Group and Division participation

Weakness

- Lacks a uniformed flow
- Need to incorporate performance measures throughout

Opportunity

- Learn best practices from other states
- Implement best practices to improve the site layout and development

Threat

- Time and resources required to improve the site
- Metrics displayed are not meaningful

UDOT Keeping Utah Moving

Ryan Bailey
Utah DOT
Performance Manager
rbailey@utah.gov

WSDOT's Performance Data Visualization and Dashboards

Sreenath Gangula, P.E., PTOE
Assistant Director, Performance Management
Transportation Safety and Systems Analysis Division
Washington State Department of Transportation

Roger Millar, Secretary of Transportation

Amy Scarton, Deputy Secretary of Transportation

How data visualization works

- The Washington State Department of Transportation has been using its data to tell the agency's performance stories for two decades.
- The Gray Notebook tells these stories to a varied audience – includes everyone from the Governor and legislature to executives, cities, counties, tribes and the general public – by using performance journalism to explain complex topics and issues in easy-to-understand terms.
- The GNB primarily uses well-written text balanced with vetted data, which is visualized through charts, graphs and infographics to better reach its readership.
- The GNB's secret is analysts' collaboration and coordination with agency programs on the articles. It gets discussions going and breaks down silos as needed to ensure performance (both positive and negative) is reported accurately and transparently.

Infographics share highlights

PERFORMANCE HIGHLIGHTS reported for the quarter ending December 31, 2020

Over the next 10 YEARS with current funding levels WSDOT will be unable to preserve pavement on ramps, lower-level freight corridors and roads with speed limits below 45 mph

1 Connecting Washington project completed during the sixth quarter of the 2019-2021 biennium

23 PERCENT of WSDOT's passenger vehicle fleet was Electric Vehicles in 2020

68 PERCENT of highway maintenance targets met in 2020

$19.6 MILLION in economic benefit provided by WSDOT's Incident Response teams clearing 10,000 incidents during the quarter

9 PERCENT decrease in travel volumes on state highways from 2019 due to response to the COVID-19 pandemic

Infographics share highlights

PERFORMANCE HIGHLIGHTS reported for the quarter ending September 30, 2020

292 BRIDGES

owned by WSDOT are currently over 80 YEARS OLD

106

stormwater **treatment facilities** were constructed by WSDOT in fiscal year 2020

$20.5 MILLION

in economic benefit provided by WSDOT's **Incident Response** teams clearing 11,254 incidents during the quarter

6

additional **Connecting Washington** projects and contracts completed by WSDOT during the fifth quarter of the 2019-2021 biennium

35 PERCENT

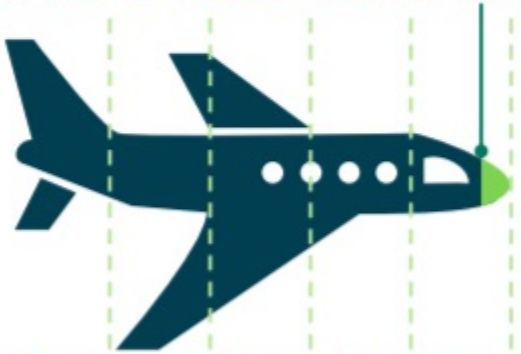
decrease in **Thanksgiving Day travel** volumes on state highways from 2019 due to response to the COVID-19 pandemic

59 PERCENT

farebox recovery rate by **WSDOT-sponsored Amtrak Cascades** in fiscal year 2019

Construction projects completed with **Nickel** or **Transportation Partnership Account** funds **383**

WSDOT SURPASSED ITS 95% GOAL



FOR REGISTRATION COMPLIANCE WITH 6,733 WASHINGTON AIRCRAFT RENEWED

Always keeping our state's policy goals in mind

Statewide transportation policy goals

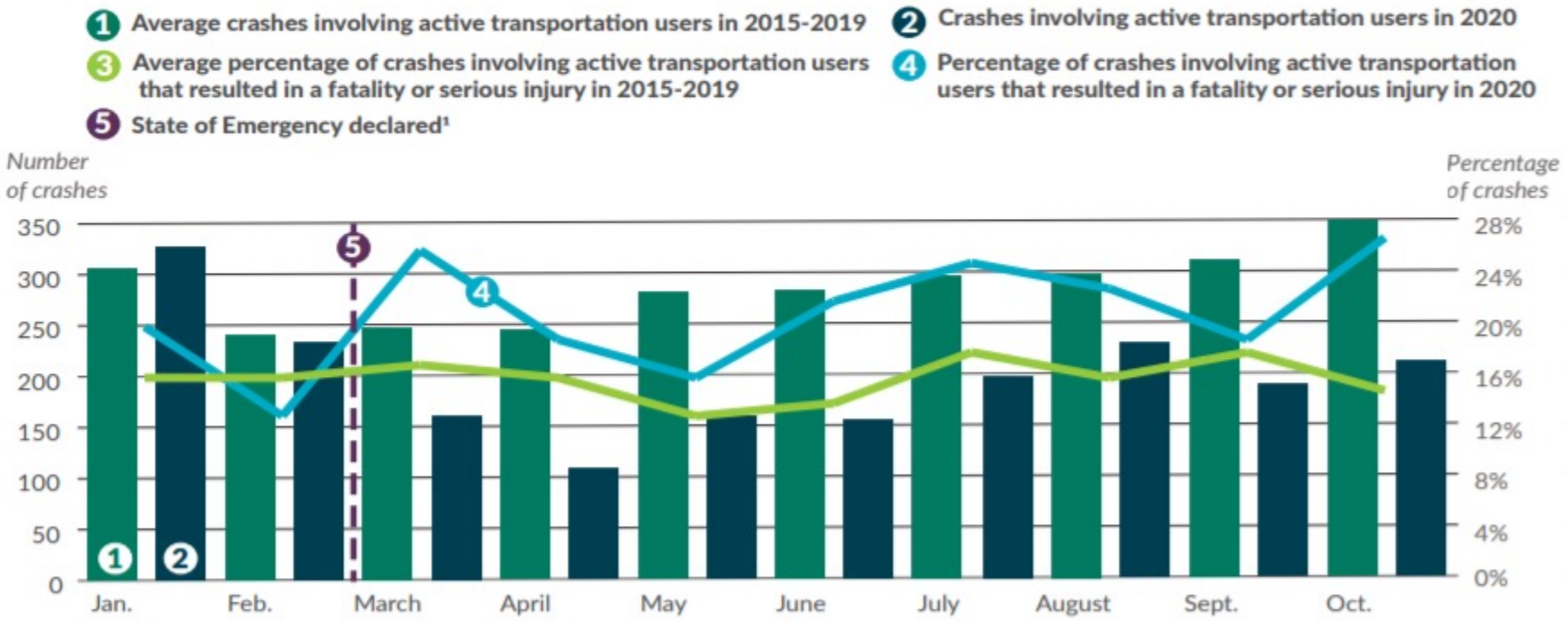
Laws enacted in 2007 established policy goals for transportation agencies in Washington (RCW 47.04.280). Throughout its editions, WSDOT's Gray Notebook reports on progress toward the six statewide transportation policy goals that include:

- **Safety:** To provide for and improve the safety and security of transportation customers and the transportation system;
- **Preservation:** To maintain, preserve, and extend the life and utility of prior investments in transportation systems and services;
- **Mobility:** To improve the predictable movement of goods and people throughout Washington, including congestion relief and improved freight mobility;
- **Environment:** To enhance Washington's quality of life through transportation investments that promote energy conservation, enhance healthy communities, and protect the environment;
- **Economic Vitality:** To promote and develop transportation systems that stimulate, support, and enhance the movement of people and goods to ensure a prosperous economy; and
- **Stewardship:** To continuously improve the quality, effectiveness, and efficiency of the transportation system.

Visualizing Safety

Total crashes involving active transportation users decline during the pandemic, but a higher percentage resulted in a fatality or serious injury compared to pre-pandemic average

2015-2019 average and 2020; Crashes involving active transportation users by month; Percentage of crashes involving active transportation users



Data source: WSDOT Transportation Data, GIS and Modeling Office.

Notes: Due to data processing times, the most recent available monthly crash data is for October 2020. **1** Gov. Jay Inslee declared a State of Emergency due to the COVID-19 pandemic on February 29, 2020.

GNB 79
Sept. 2020

Visualizing Safety

WSDOT's agency-wide RIR and DART rates improve between 2019 and 2020

2016 through 2020; Recordable incident rate and days away, restricted or transferred rate for every 100 full-time employees per year

Recordable Incident rate[1]	2016	2017	2018	2019	2020	1-year % change[2]	5-year % change[2]
WSDOT	4.3	4.3	4.3	3.8	3.5	-10.5%	-20.9%
WSF[3]	5.4	5.9	7.0	7.1	7.0	-1.4%	+29.6%
Agency-wide[3]	4.6	4.7	5.0	4.7	4.4	-6.4%	-4.3%
DART rate[1]							
WSDOT	1.6	1.7	2.4	2.1	1.9	-9.5%	+18.8%
WSF[3]	3.6	3.7	5.1	4.8	4.9	+2.1%	+36.1%
Agency-wide[3]	2.2	2.3	3.1	2.8	2.7	-3.6%	+22.7%

Data source: WSDOT Office of Human Resources and Safety.

GNB 80
Dec. 2020

Visualizing Safety

Fauntleroy toll booth ticket seller employee Lawrence Grohall wears a face mask behind sneeze guard extends selfie stick credit card reader to a customer. WSF Eagle Harbor Maintenance Facility staff built and installed customized Plexiglas sneeze guards for all ferry tollbooths and WSF information technology team designed and implemented the self-swipe credit card reader attached to a selfie stick. Read more about WSF's COVID-19 response on the WSDOT Blog.

GNB 80
Dec. 2020

Visualizing Preservation

WSDOT has 130 load restricted or load posted bridges

June 2016 through June 2020; Number of bridges with weight restrictions

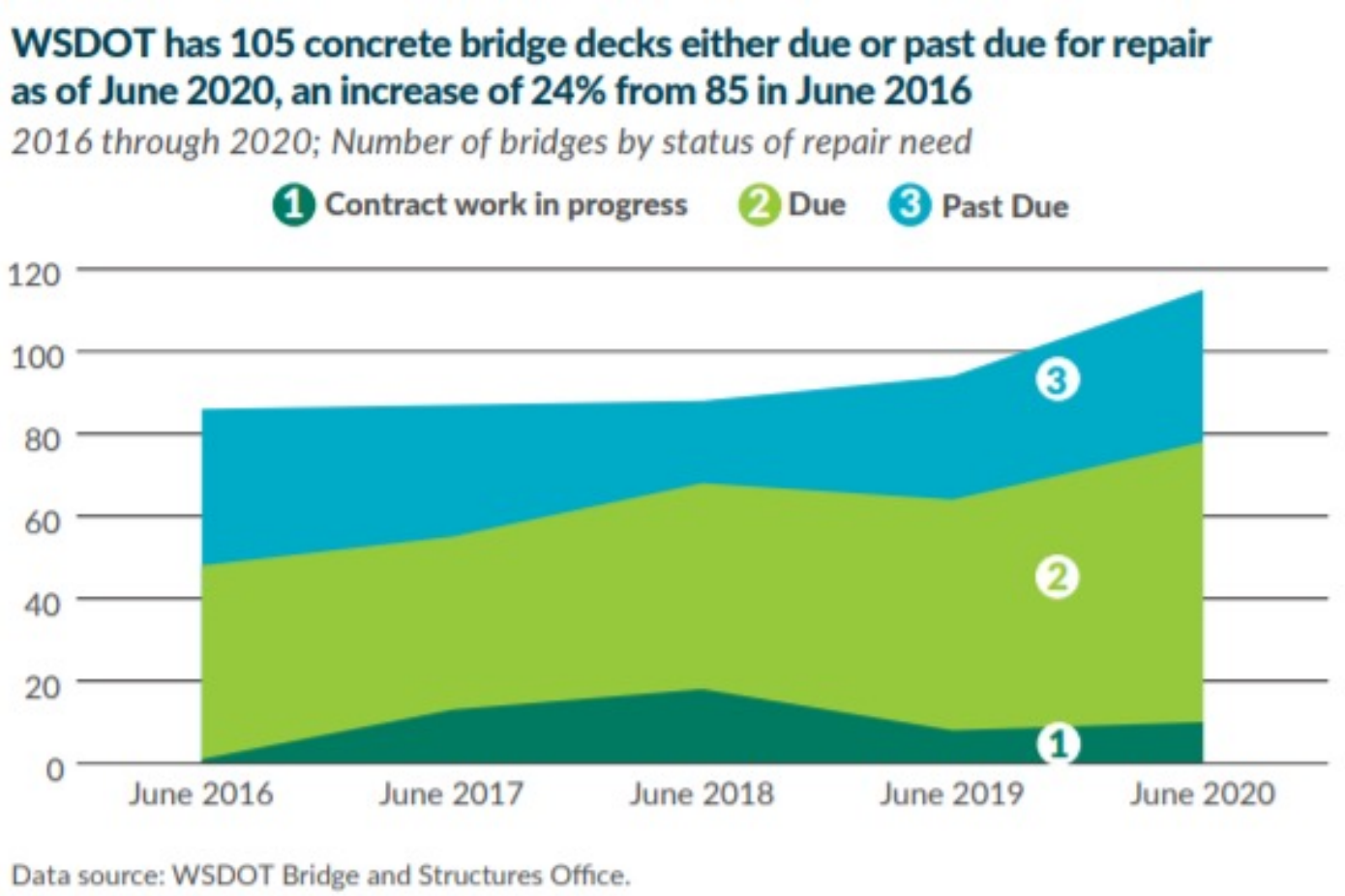
	June 2016	June 2017	June 2018	June 2019	June 2020
LOAD RESTRICTED[1]	118	105	109	102	118
LOAD POSTED[2]	8	14	11	9	12
TOTAL	**126**	**119**	**120**	**111**	**130**

Data sources: WSDOT Bridge and Structures Office, WSDOT Local Programs Office.

Notes: **1** A "load restricted" bridge cannot be legally used by an overloaded truck. **2** A "load posted" bridge limits the allowable weight of trucks to below typical legal weights.

GNB 79
Sept. 2020

Visualizing Preservation



GNB 79
Sept. 2020

Percentage of WSDOT's pavement in very poor condition decreases between 2015 and 2019

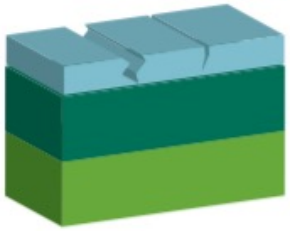
Actual values for 2015 and 2019; Characteristics of pavement at each condition; Percentage of lane miles and vehicle miles traveled (VMT) by condition category

WHAT DRIVERS SEE	WHAT IS HAPPENING	2015	2019	Trend[1]	Desired trend
GOOD/VERY GOOD	By lane miles	76.4%	75.5%	↓	↑
	By VMT[2]	75.2%	76.3%	↑	

This pavement is in good condition with minimal deterioration

Road users experience a smooth road with minimal cracks, ruts or potholes

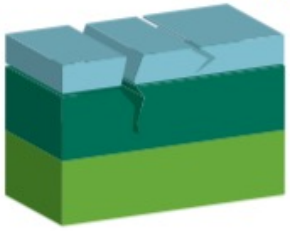
FAIR	By lane miles	16.7%	17.5%	↑	N/A[3]
	By VMT[2]	17.8%	17.7%	↓	



It is most cost-effective to resurface or repair a road when it is in fair condition. The surface of pavement in fair condition shows wear, but the underlying structure is undamaged

Preventive preservation (maintenance and rehabilitation) repairs at this stage can maximize the road's service life

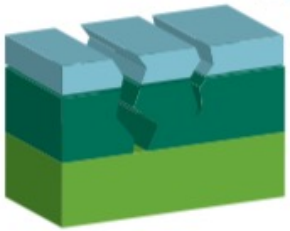
POOR	By lane miles	5.1%	5.3%	↑	↓
	By VMT[2]	5.4%	4.7%	↓	



Restoring a road in poor condition to good condition costs 1.5 to 2 times more than restoring a road in fair condition to good condition because of the damage to the pavement's underlying structure

Roads in poor condition cause morewear on vehicles and higher fuel use

VERY POOR	By lane miles	1.8%	1.8%	–	↓
	By VMT[2]	1.6%	1.3%	↓	

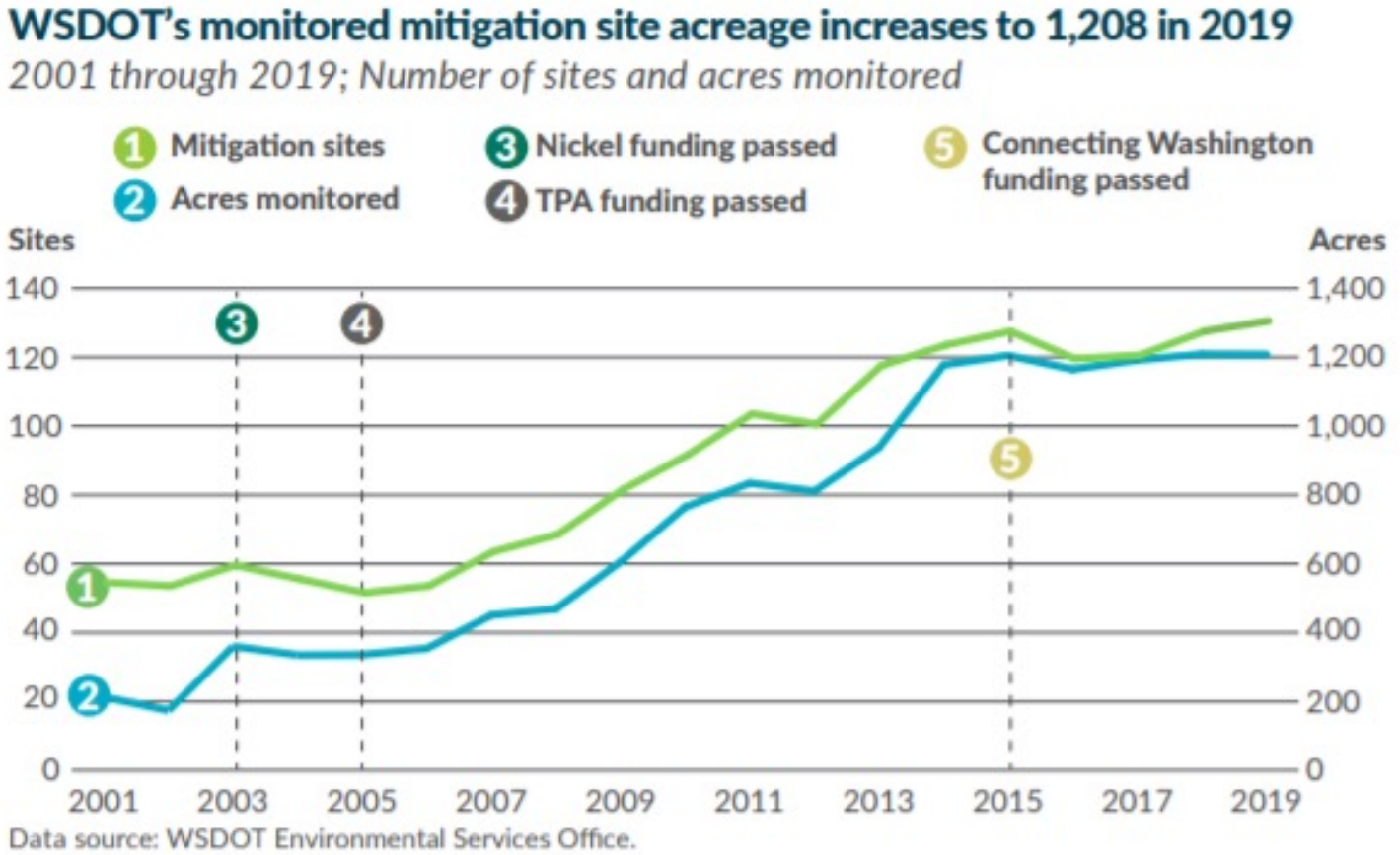


Repairing pavement in poor condition costs 3 to 5 times as much as repairing pavement in fair condition, because deep pavement failure requires reconstruction

Roads in very poor condition require reactive repairs to hold them together until reconstruction, which is not a good strategy for minimizing costs over the life of the pavement

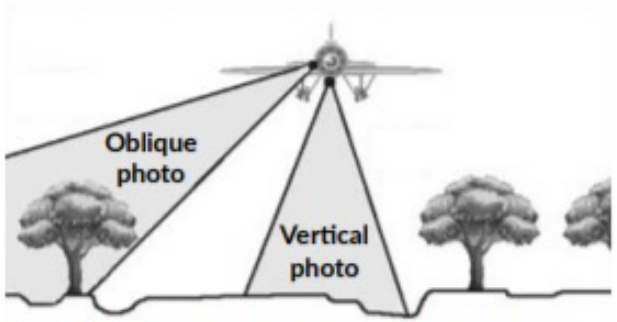
GNB 80
Dec. 2020

Visualizing the Environment



GNB 77
March 2020

Visualizing the Environment

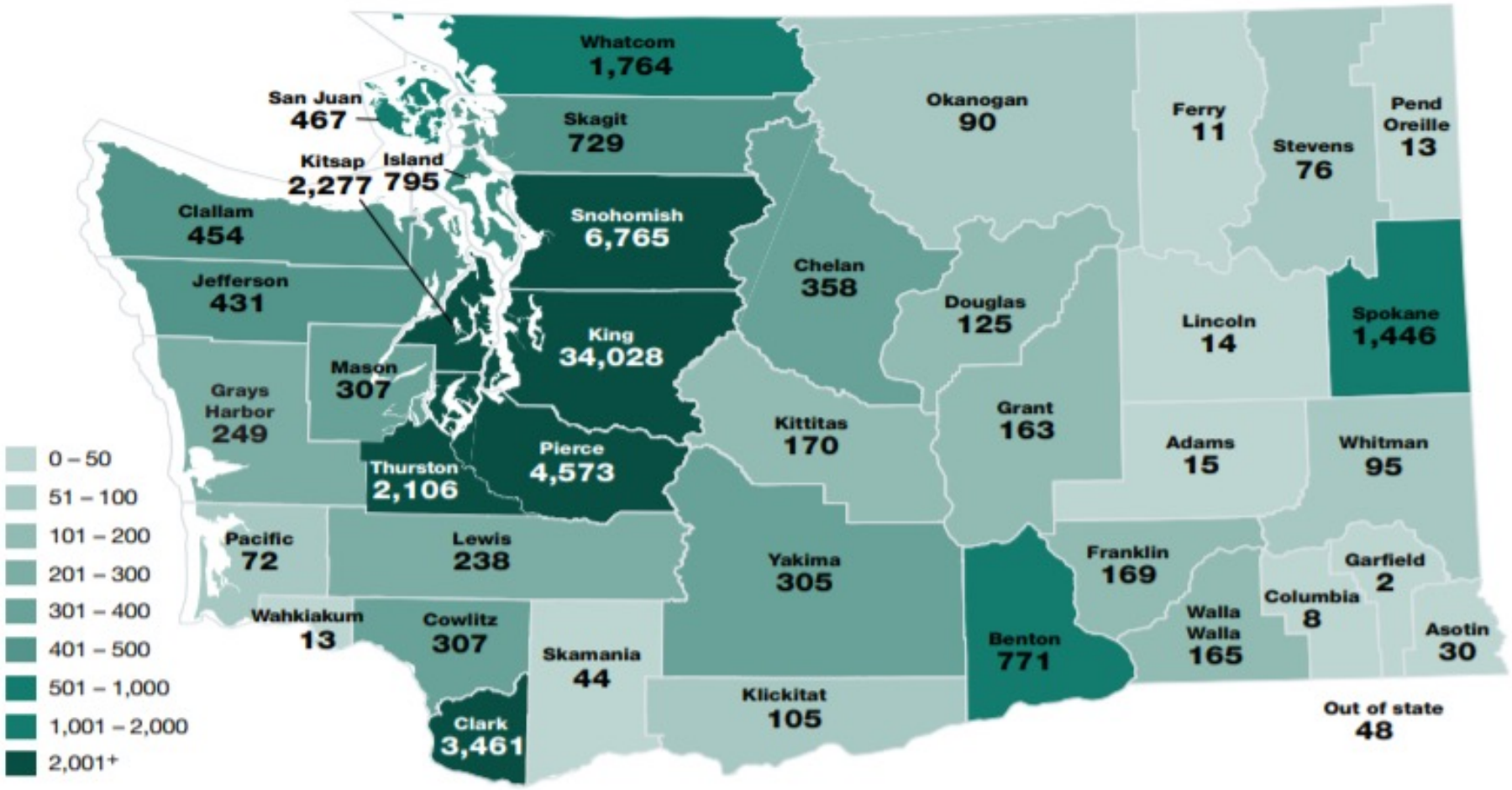


Above: Oblique aerial photographs are taken from precise points in the sky and result in repeatable, low-cost and high-quality data.
At right: A vertical aerial photograph of a WSDOT project site.
Below and below right: Oblique aerial photographs of the same project site, gathered using drones.

GNB 77
March 2020

Washington's total registered plug-in electric vehicles top 63,000

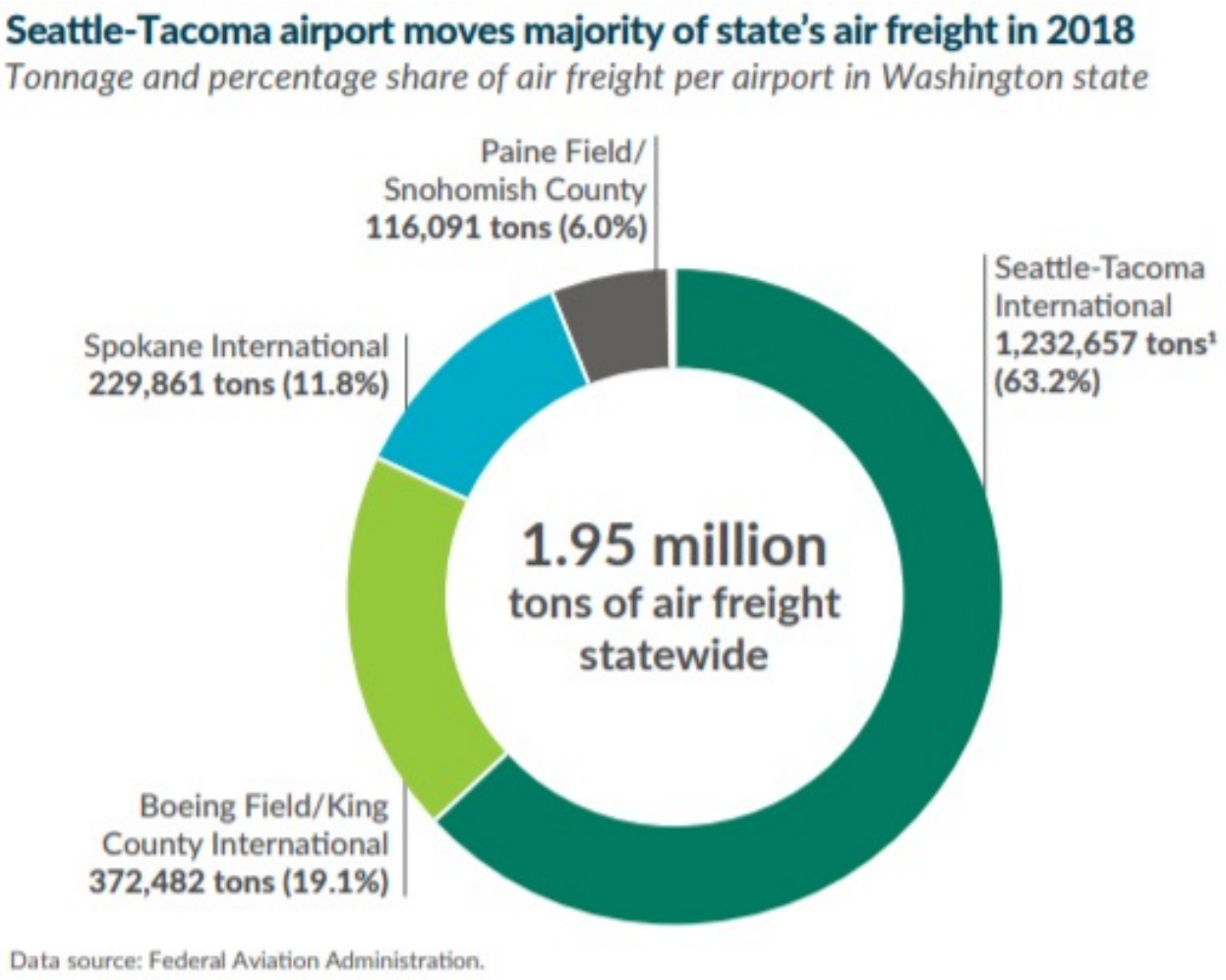
Number of plug-in electric vehicle registrations by county; As of December 31, 2020



Data source: Washington State Department of Licensing.

GNB 80
Dec. 2020

Visualizing Economic Vitality

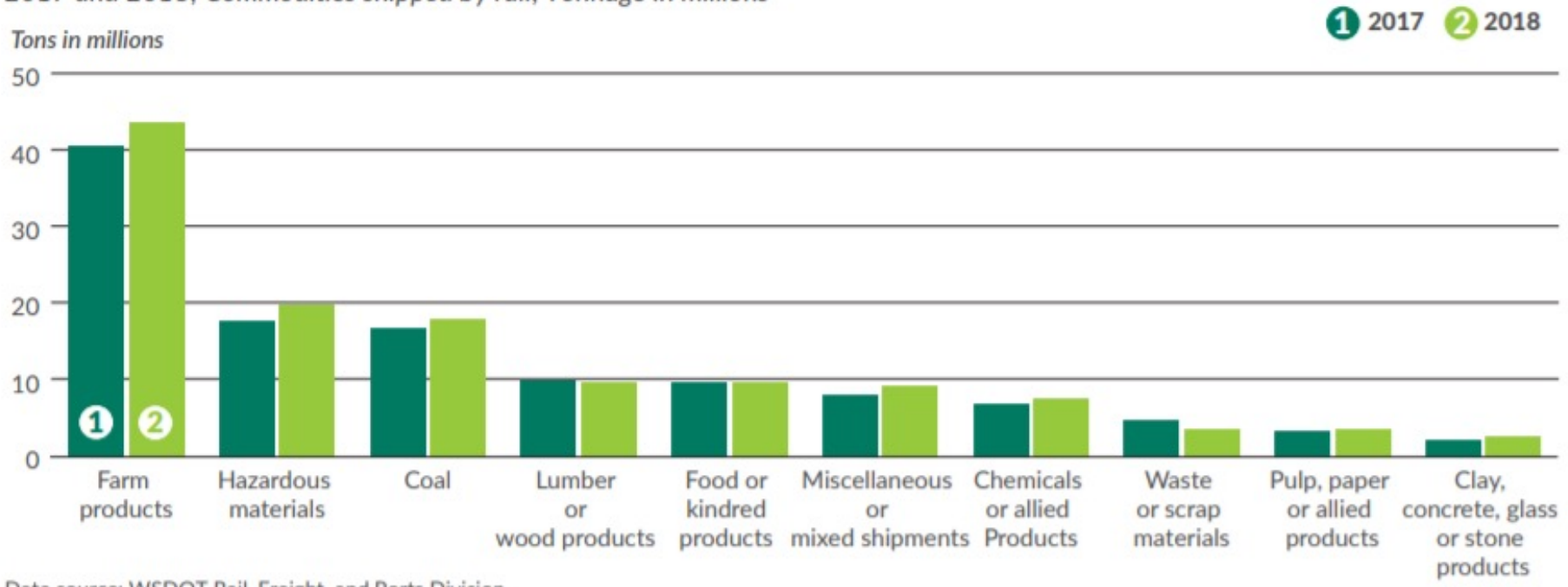


GNB 78
June 2020

Visualizing Economic Vitality

Farm products continue to make up largest share of freight shipped by rail in Washington state in 2018

2017 and 2018; Commodities shipped by rail; Tonnage in millions



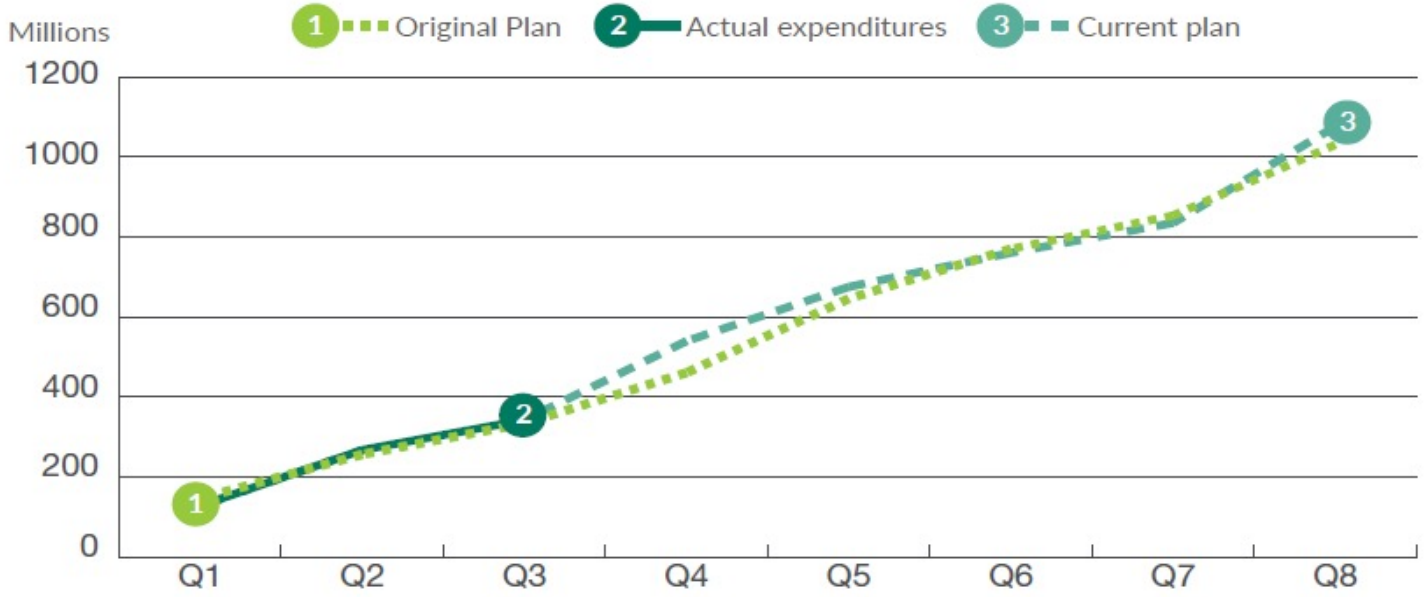
Data source: WSDOT Rail, Freight, and Ports Division.

GNB 78
June 2020

Visualizing Stewardship

Cumulative Pre-existing Funds improvement and preservation combined cash flows during the 2019-2021 biennium slightly higher than planned

Quarter ending March 31, 2020; Planned vs. actual expenditures and current plan; Dollars in millions



Data source: WSDOT Capital Program Development and Management.

Note: Q3 refers to the third quarter (January through March 2020) of the 2019-2021 biennium, which runs from July 2019 through June 2021.

GNB 77
March 2020

Visualizing Stewardship

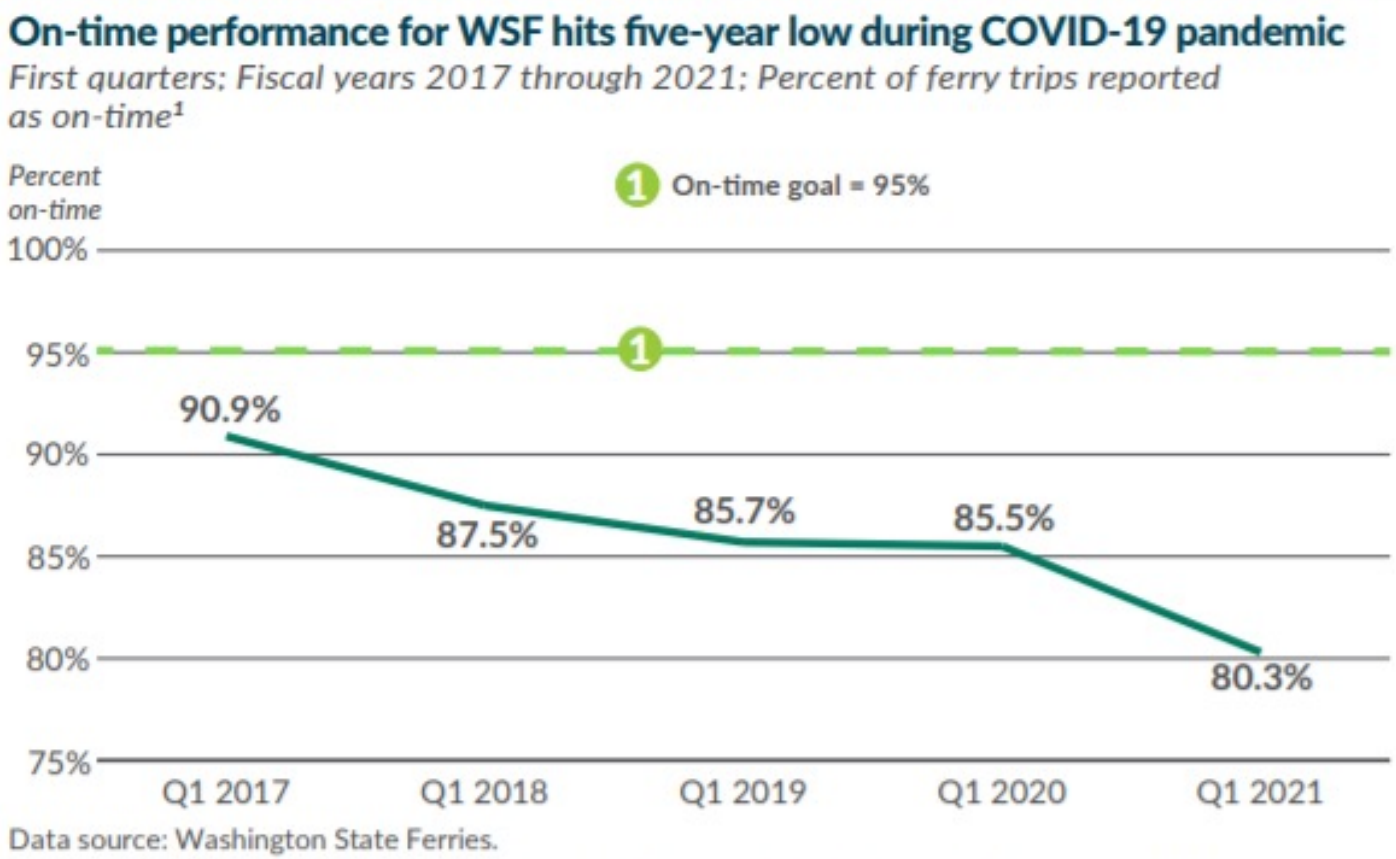
WSDOT advertises 115 PEF projects during the 2019-2021 biennium

Advertisement status	Quarter[1]	Cumulative[2]
Advanced[3]	0	0
On time	29	85
Emergent[4]	13	17
Early[5]	1	3
Late	9	12
Total projects advertised	**52**	**115**
Delayed within the biennium	29	65
Deferred out of the biennium	0	0
Deleted	1	4

Data source: WSDOT Capital Program Development and Management.

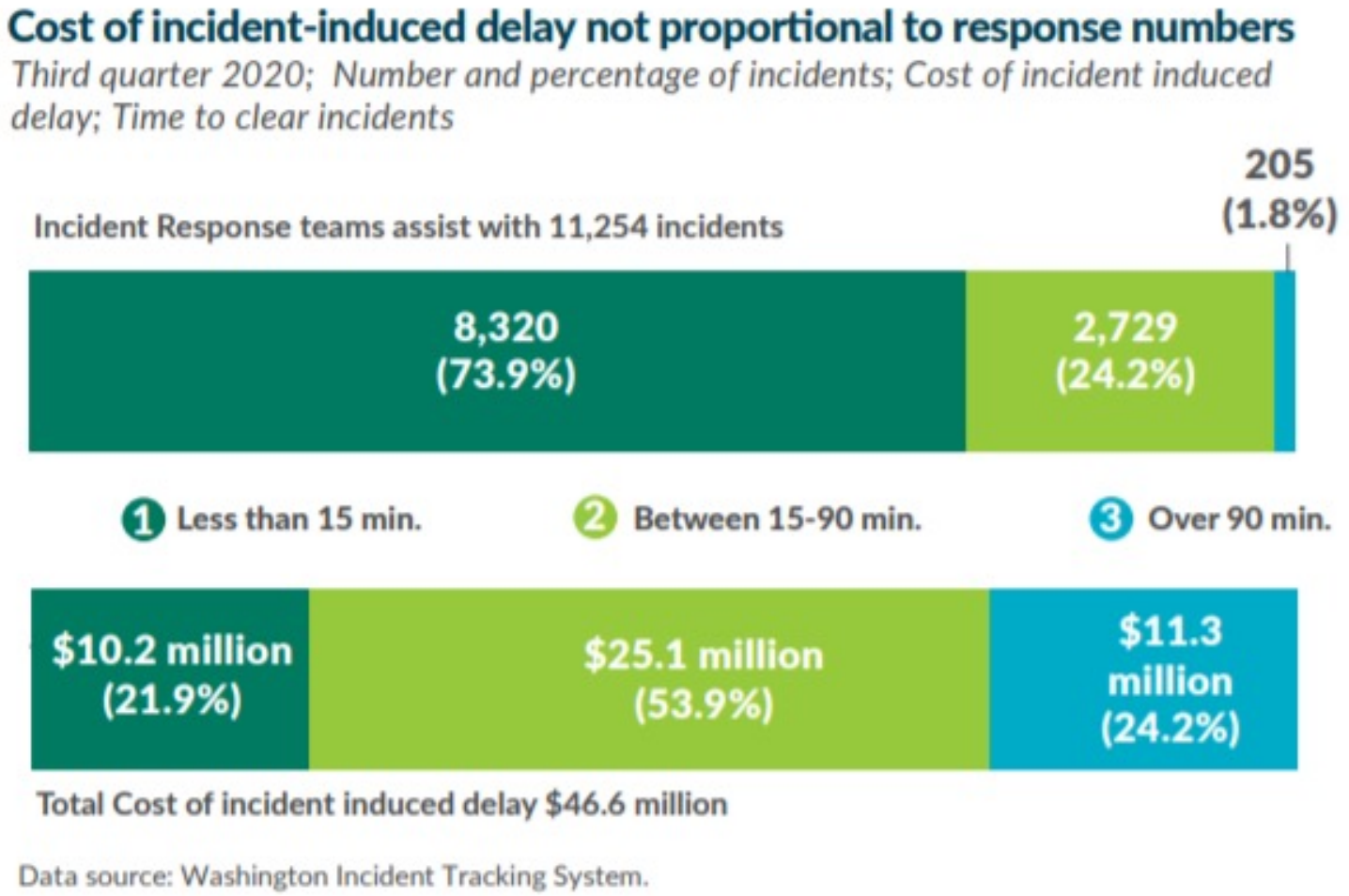
GNB 77
March 2020

Visualizing Mobility



GNB 79
Sept. 2020

Visualizing Mobility



GNB 79
Sept. 2020

Pandemic furthers need for dashboards

Fast, fact-based, data-driven decisions

We had already been working to move the Gray Notebook and the Multimodal Mobility Report (formerly the Corridor Capacity Report) to an online dashboard format when the pandemic hit, but progress was slow.

When called upon, our office made the jump to lightspeed and responded with a WSDOT first: the COVID-19 Multimodal Transportation System Performance Dashboard

- Completed in ***three weeks***
- Decision-making tool for all transportation modes used at the highest levels of state government
- Governor recognized team with 2021 Extra Mile Award

Pandemic furthers need for dashboards

Fast, fact-based, data-driven decisions

State Highways	Toll Facilities	Ferries
Transit	Passenger Rail	Freight
Active Transportation	Safety	Aviation
Counties Data		

The COVID-19 dashboard provided immediate analysis of the latest travel changes

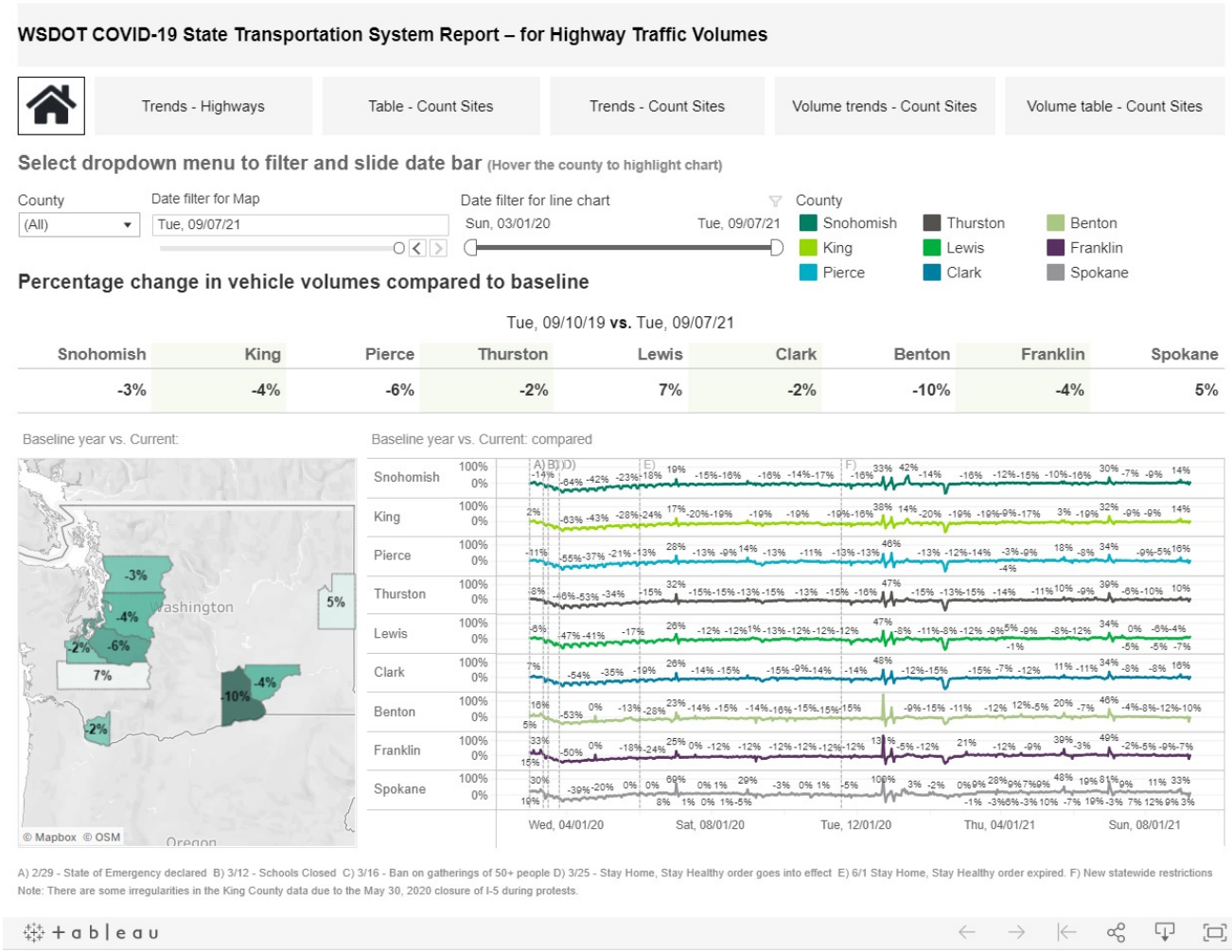
https://wsdot.wa.gov/about/covid-19-transportation-report/

Pandemic furthers need for dashboards

Fast, fact-based, data-driven decisions

The COVID-19 dashboard allowed immediate analysis of the latest transportation changes.

https://wsdot.wa.gov/about/covid-19-transportation-report/



Source: WSDOT Transportation Safety and Systems Analysis Division and WSDOT TRACFLOW (https://tracflow.wsdot.wa.gov/)

Note: Baseline is defined as volume number from the same weekday of the same month from the baseline year*. For example, Wednesday, April 3, 2019 would serve as the baseline for comparing the volume data from Wednesday, April, 1, 2020. *Baseline year is defined as March 2019 to Feb 2020. The dramatic increase shown for Thursday, July 2, 2020 is because the comparison day aligns with Thursday, July 4, 2019 and the holiday travel associated with that date. The increase shown for Wednesday, December 22, 2020 is because the comparison day aligns with Wednesday, December 24, 2019 and the holiday travel pattern associated with that date.

Dashboards serve our customers' needs

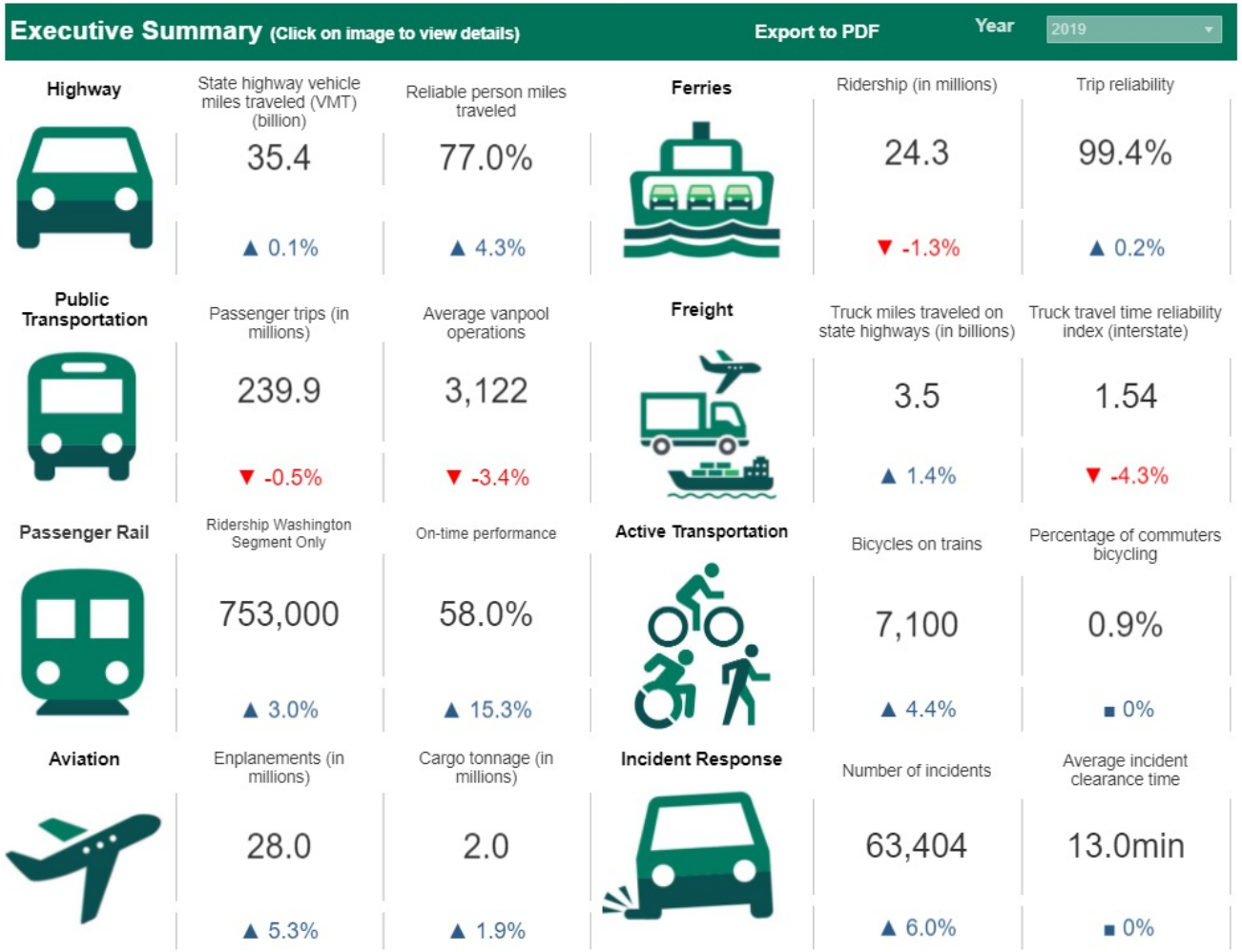
Accessible information for everyone

WSDOT's COVID-19 dashboard gave decision-making tools to the people who needed them most, including:

- Governor and Governor's office
- WSDOT Executive Team
- WSDOT Communicators
- JIC/EOC at Camp Murray
- Heads of state agencies
- County and local partners
- Media and public

https://wsdot.wa.gov/about/covid-19-transportation-report/

Multimodal mobility reporting moves to interactive dashboard



https://wsdot.wa.gov/about/data/Multimodal-mobility-dashboard/default.htm

Dashboard visualizations

WSDOT COVID dashboard updated daily
WSDOT - COVID-19 Multimodal Transportation System Performance Dashboard (wa.gov) (https://wsdot.wa.gov/about/covid-19-transportation-report/)

WSDOT Multimodal Mobility Dashboard (test site)
WSDOT - Multimodal Mobility Dashboard (wa.gov)
(https://wsdot.wa.gov/about/data/Multimodal-mobility-dashboard/default.htm)

WSDOT Accountability website - Gray Notebook, Corridor Capacity Report, MAP-21, and other reports.
WSDOT accountability | WSDOT (wa.gov) (https://wsdot.wa.gov/accountability/home)

For additional information contact:
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Transportation Safety and Systems Analysis Division
Phone: (360) 705 6888; Email: GangulS@wsdot.wa.gov

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