Special Strategies Session

July 15, 2021
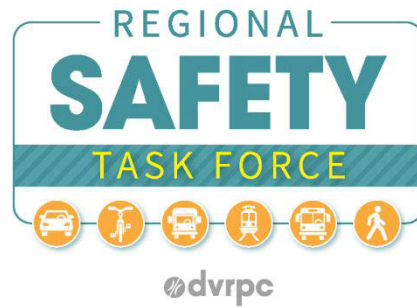1pm

CONNECT WITH US! @DVRPC #RSTF #VISIONZERO

Housekeeping

- Number of attendees

- Meeting recorded

- Use Chat feature for questions and to relay technical issues

- Mic and video features enabled for breakout groups

Opening Remarks

- **Sharang Malaviya, P.E.,** Traffic Safety Supervisor, PA Department of Transportation

RSTF Goal:

To reduce roadway crashes and eliminate serious injuries and fatalities from crashes in the Delaware Valley

Share the conversation!

Use **#rstf** during today's meeting, and
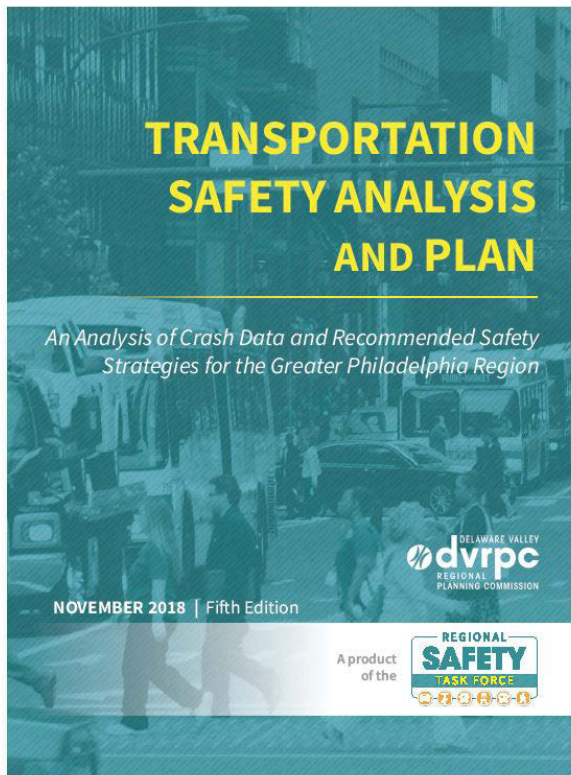
tag **@DVRPC**

Keynote Presentation

- **Jeff Shaw,** Federal Highway Administration

Strategies Sessions

- **Kevin Murphy,** Manager, Office of Safe Streets, Delaware Valley Regional Planning Commission

REGIONAL
SAFETY
TASK FORCE

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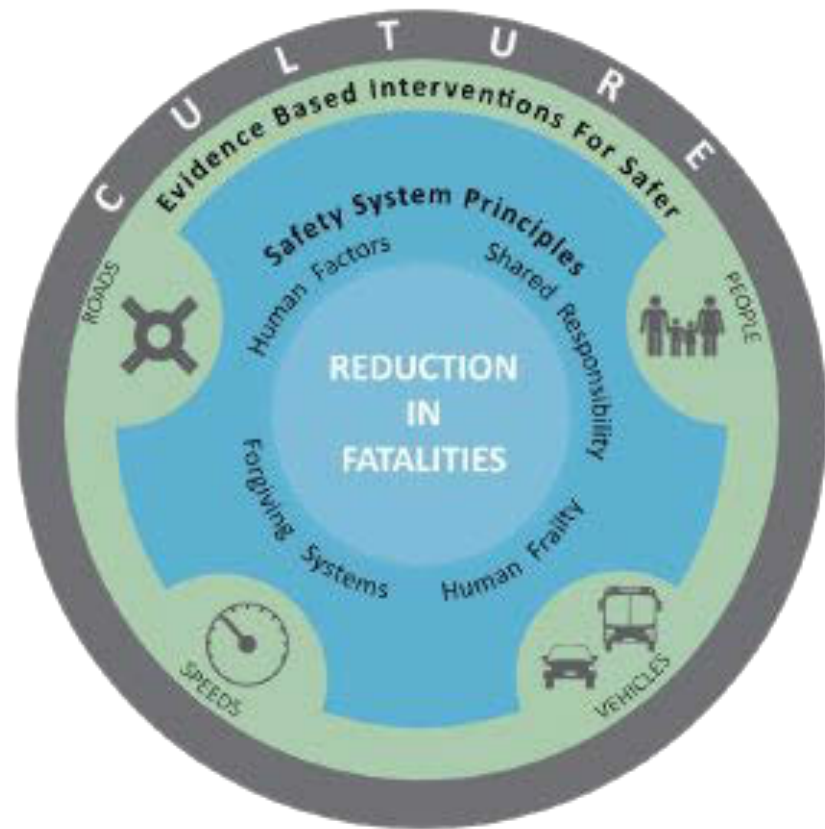# TSAP & the Emphasis Area Approach

2018 TSAP

AASHTO Emphasis Areas
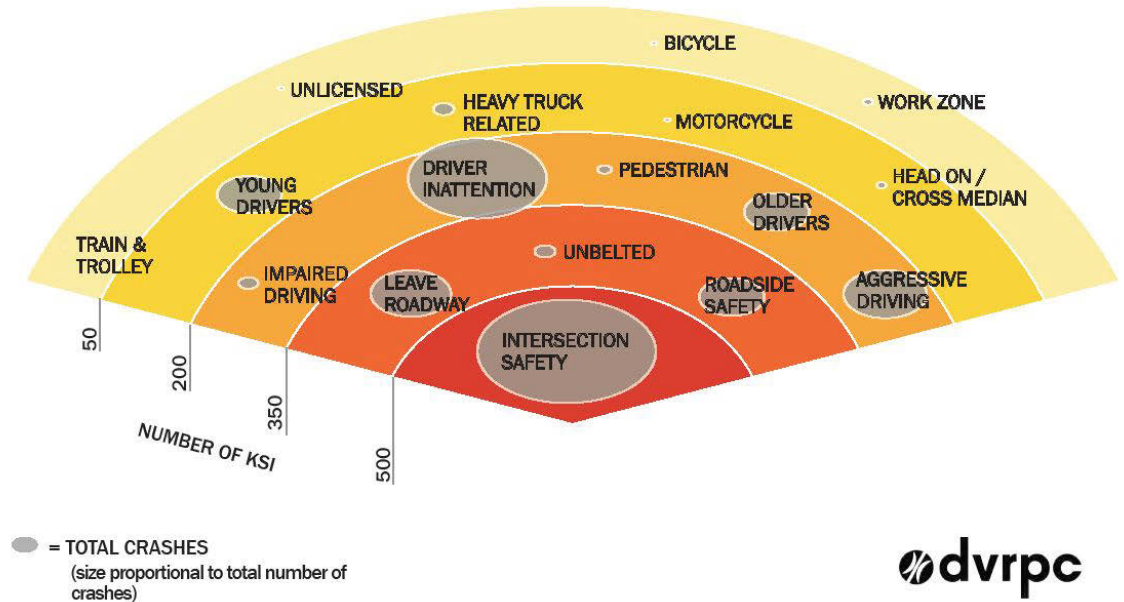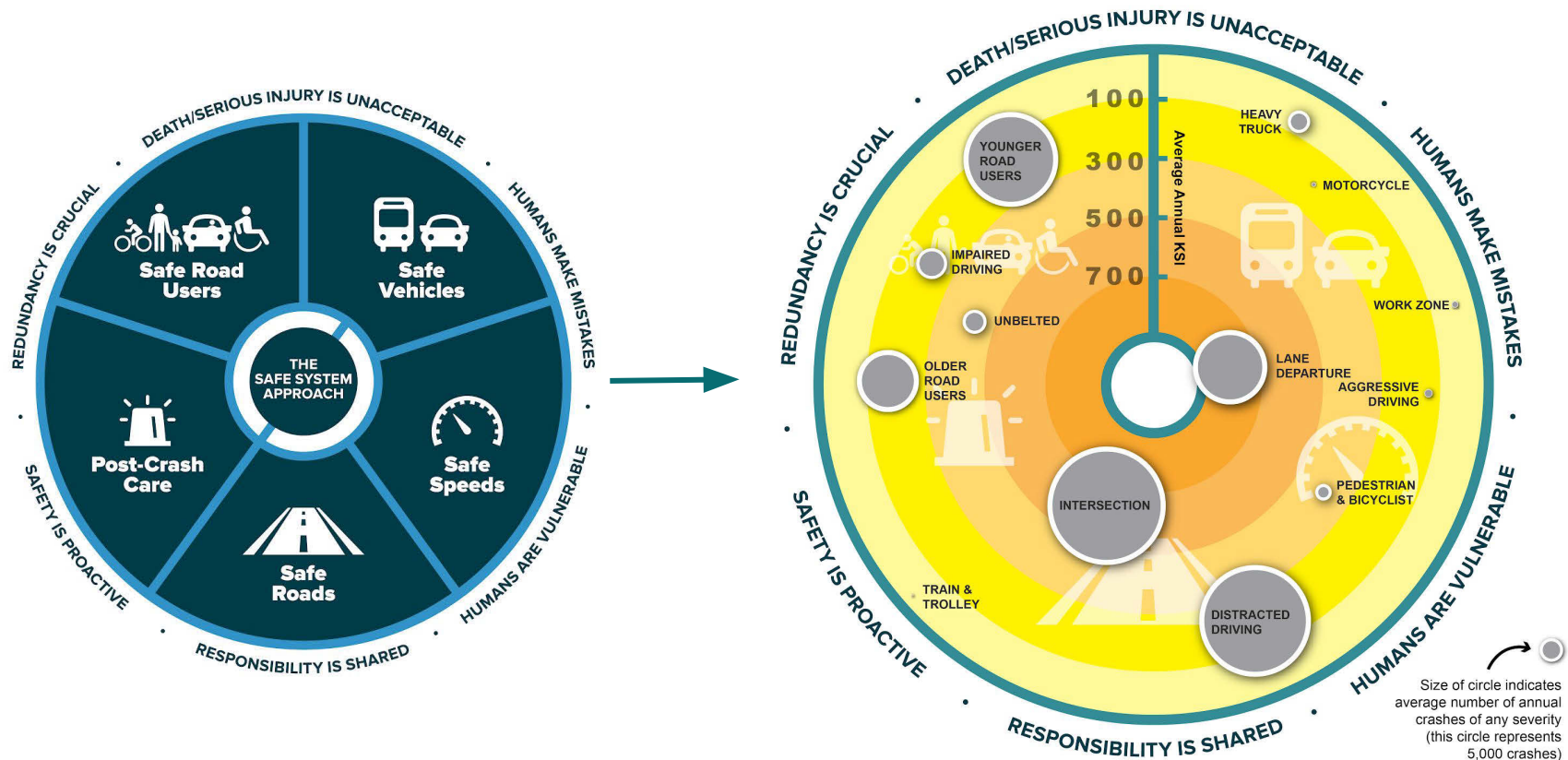
RSTF 2020: Year of Traffic Safety Culture

"Traffic safety culture encompasses the **shared values, assumptions, and beliefs** that influence road user behaviors and stakeholder actions."
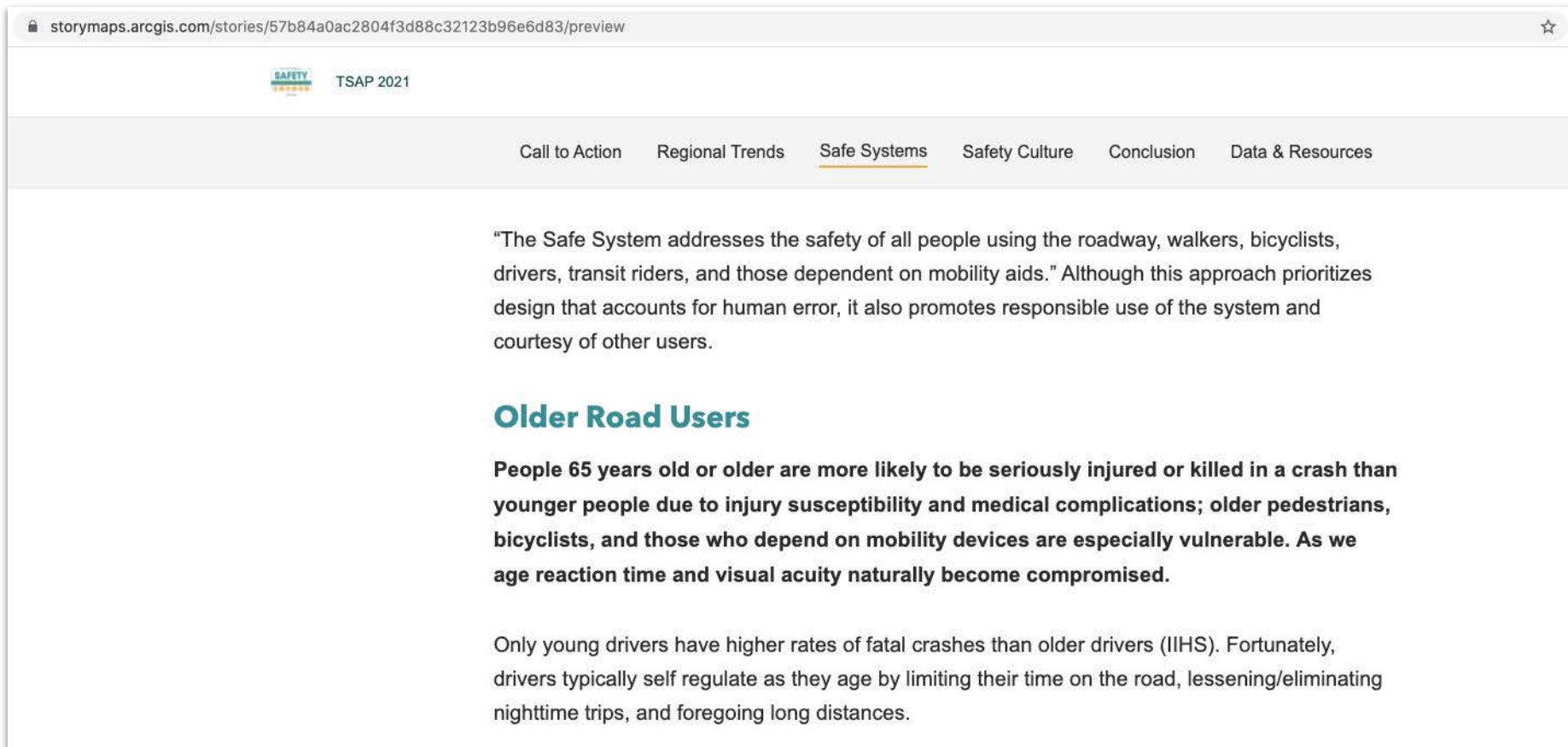
FHWA Compass

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2021 Transportation Safety Analysis & Plan

Based on a Safe System/Safety Culture framework...

2021 Transportation Safety Analysis & Plan

Presented as an online Storymap...

SAFETY · TSAP 2021

Call to Action · Regional Trends · Safe Systems · Safety Culture · Conclusion · Data & Resources

"The Safe System addresses the safety of all people using the roadway, walkers, bicyclists, drivers, transit riders, and those dependent on mobility aids." Although this approach prioritizes design that accounts for human error, it also promotes responsible use of the system and courtesy of other users.

Older Road Users

People 65 years old or older are more likely to be seriously injured or killed in a crash than younger people due to injury susceptibility and medical complications; older pedestrians, bicyclists, and those who depend on mobility devices are especially vulnerable. As we age reaction time and visual acuity naturally become compromised.

Only young drivers have higher rates of fatal crashes than older drivers (IIHS). Fortunately, drivers typically self regulate as they age by limiting their time on the road, lessening/eliminating nighttime trips, and foregoing long distances.

2021 Transportation Safety Analysis & Plan

With interactive crash maps by emphasis area...
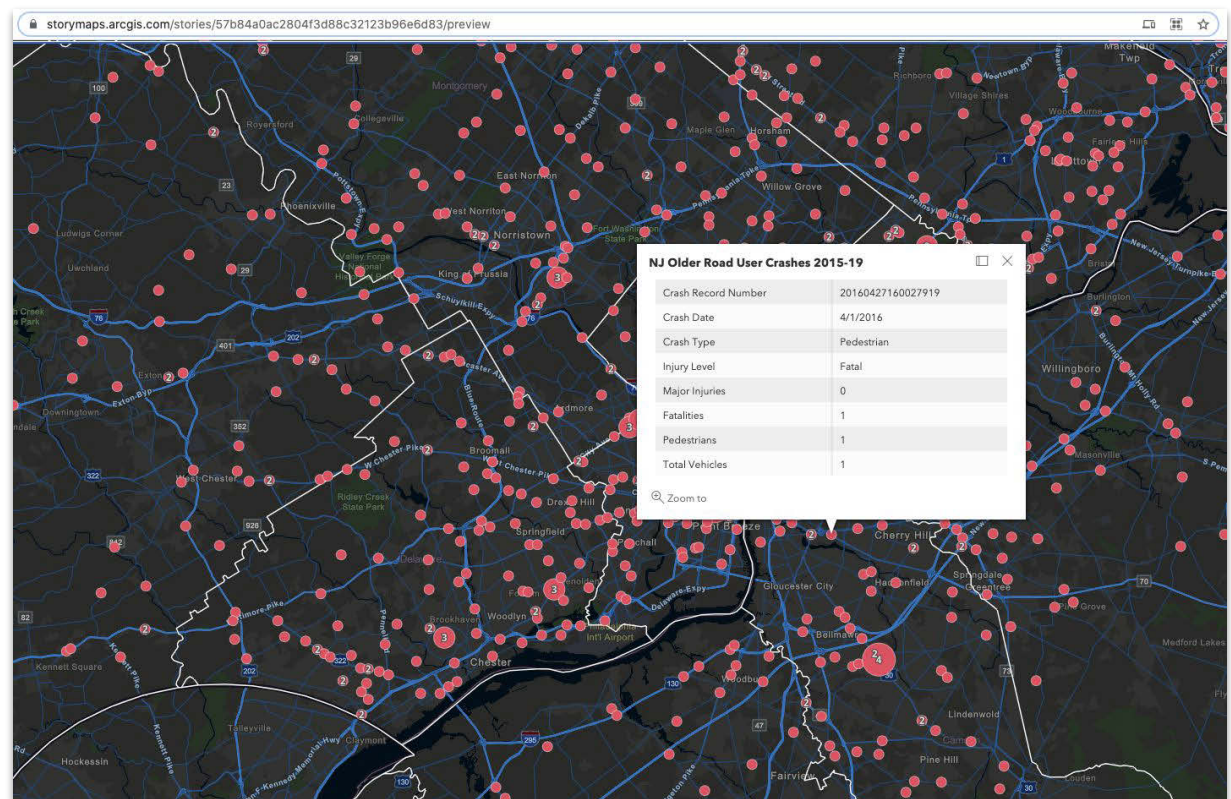
2021 Transportation Safety Analysis & Plan

And analysis by county...

Percent of All Road KSI in that County in which Intersections were a Factor, 2016-2018

Intersection Crashes accounted for **35% of the people killed or severely injured** in crashes in Bucks County.

Legend: Average Number of KSI in which Intersections were a Factor, 2016-2018 | County Average KSI, 2016-2018
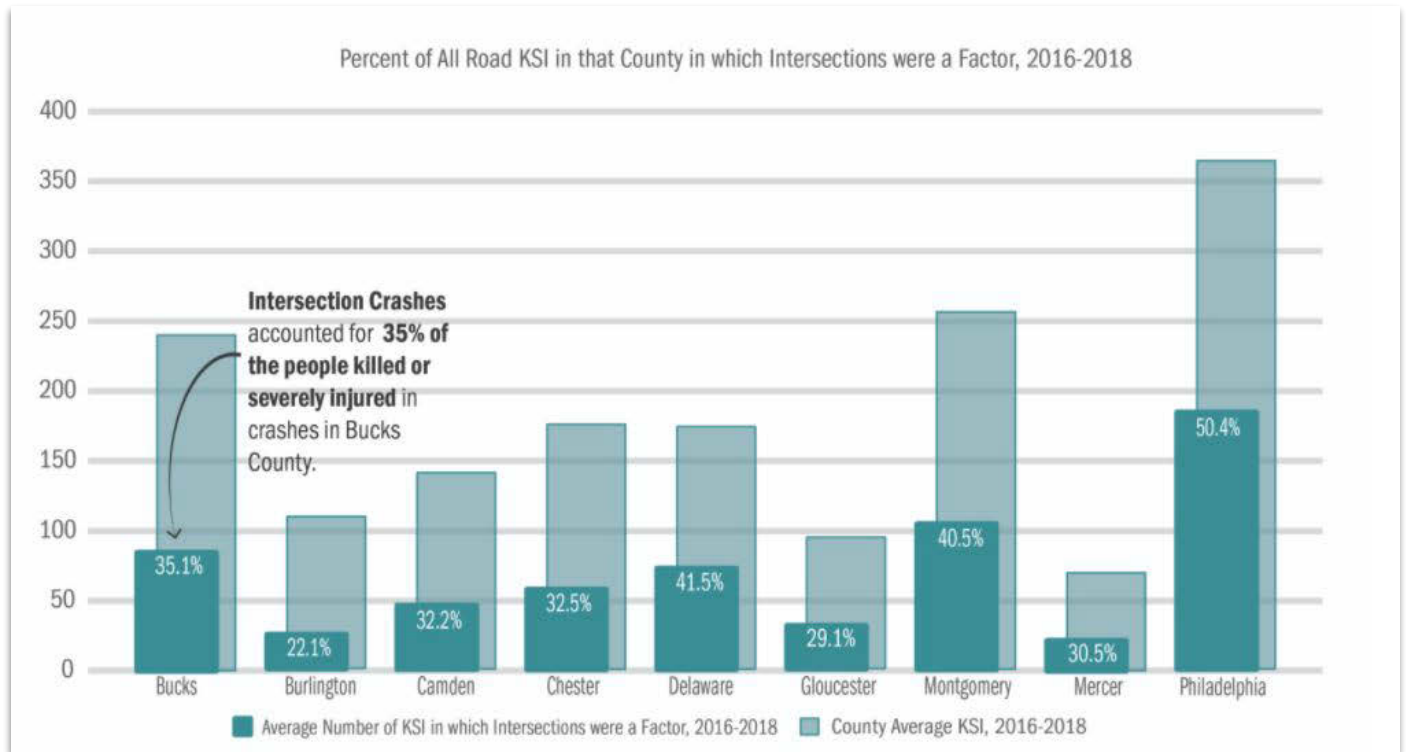
Safe System/Safety Culture Framework

DVRPC rethought strategies from the 2018 TSAP into the new framework

Emphasis Area	Strategy Name
Lane Departure	Promote Engineering Best Practices to Keep Vehicles on Roadway
Lane Departure	Analyze Lane Departure Data For Local Safety Program Candidates
Lane Departure	Incentivize Lane Departure Best Practices
Lane Departure	Encourage Preventative Lane Departure Technologies on the Roadway
Lane Departure	Pursue Clear Zones
Lane Departure	Promote Safety Benefits of In-Vehicle Lane Departure Technology

} Safety Culture (Internal Agency Culture)

} Safe Roads

} Safe Vehicles

REGIONAL **SAFETY** TASK FORCE

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Today's Sessions

Two 40-minute sessions, with four concurrent topics discussed during each session:

Session #1:

- Safety Culture
  - Focus: Public Engagement (Ped/Bike & Other Vulnerable Road Users)
- Safety Culture
  - Focus: Internal Agency Culture
- Safe Roads
  - Focus: Roadway Design & Operations
- Safe Speeds, Safe Vehicles & Post-crash Care

Session #2:

- Safe People
- Safe Roads
  - Focus: Planning & Analysis
- Safety Culture
  - Focus: Public Engagement (Promoting Safe Driving Practices)
- Safety Culture
  - Focus: Public Engagement (Impairment & Distraction)

Today's Sessions

During the sessions consider:

1. What is the **effectiveness** of the strategy to reduce fatalities and serious injuries?

2. For members of the RSTF (partners in planning, engineering, health, LE, advocacy, academia, etc.) how **difficult** is the strategy to pursue?

3. Does this strategy need further **discussion**?

    a. Should it be reworded or re-worked?

    b. Is it duplicative of another strategy?

4. Are there **new strategies** that should be added to the Safe System/Safety Culture category?

Mentimeter Demonstration

Closing Remarks

- **Patricia Ott, P.E., RSP,** Managing Member, MBO Engineering, LLC

Feedback and Next Meeting

- Please complete the meeting survey! The link for the survey is in the Chat

- Next meeting planned for Fall 2021, topic TBD

- Adjourn

Thank You!

Marco Gorini, Transportation Planner
617-869-0225 | mgorini@dvrpc.org

Kevin Murphy, Manager, Office of Safe Streets
215-238-2868 | kmurphy@dvrpc.org

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Presentation Overview

1

Introduction

2

Safe System Overview

3

Safe System Intersections

4

Conclusion

The Safe System approach aims to eliminate fatal and serious injuries for all road users by:
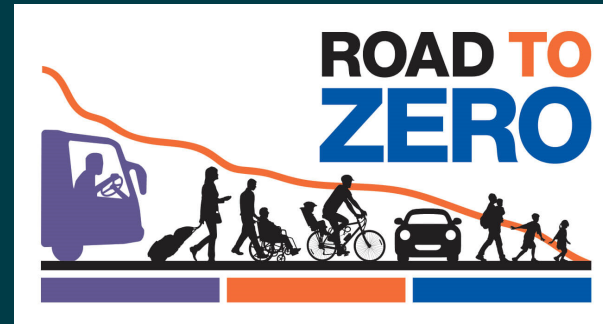
Accommodating human mistakes

Keeping impacts on the human body at tolerable levels

SAFE SYSTEM IN THE UNITED STATES

THE SAFE SYSTEM APPROACH

Source: FHWA

7
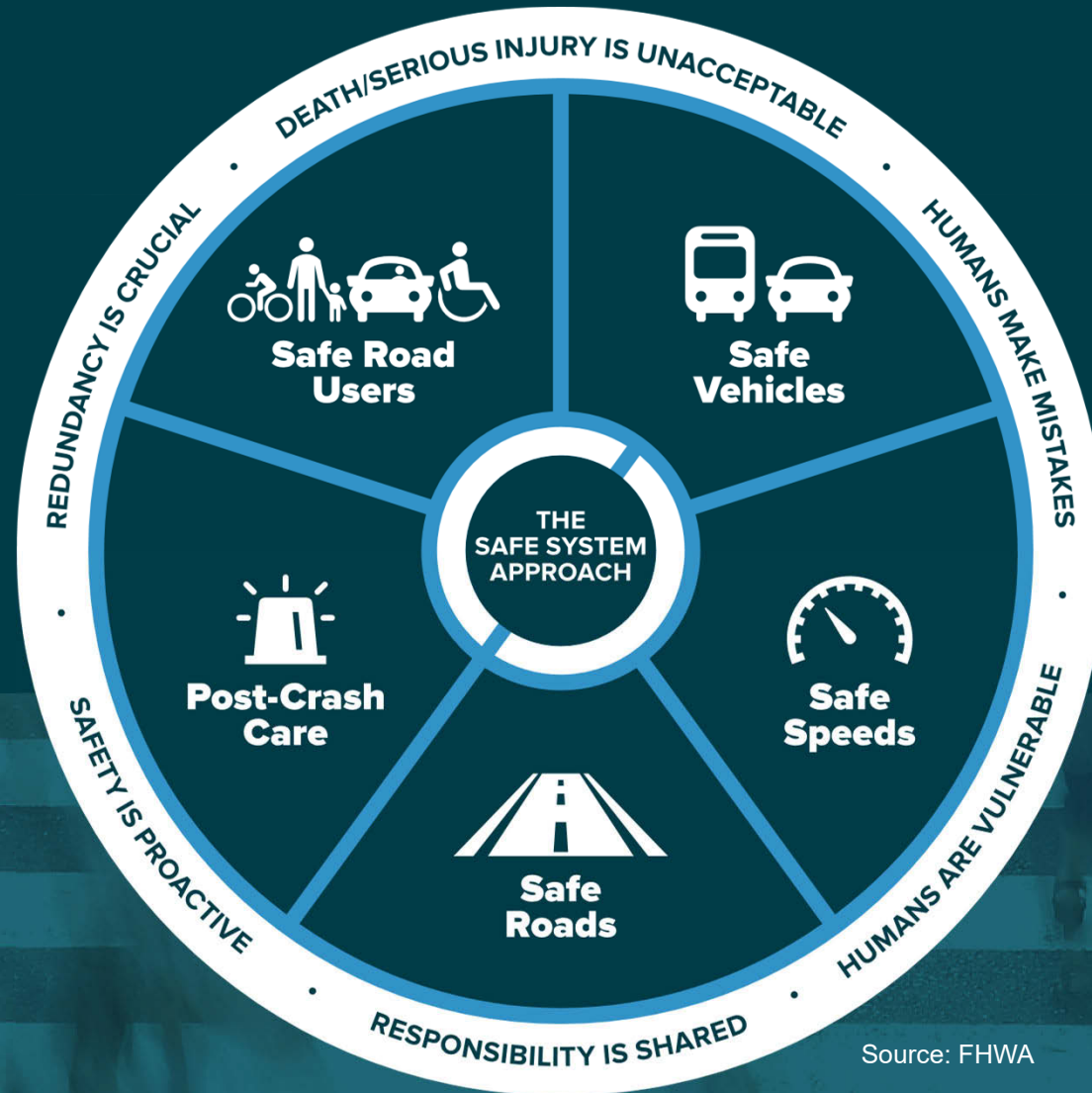
THE 6 SAFE SYSTEM PRINCIPLES

Death/serious injury is unacceptable

Humans make mistakes

Humans are vulnerable

Responsibility is shared

Safety is proactive

Redundancy is crucial

THE 5 SAFE SYSTEM ELEMENTS

Safe road users

Safe vehicles

Safe speeds

Safe roads

Post-crash care

WHERE ARE YOU ON THE SAFE SYSTEM JOURNEY?

Traditional approach   Safe System approach

Prevent crashes ⟶ Prevent death and serious injuries

Improve human behavior ⟶ Design for human mistakes/limitations

Control speeding ⟶ Reduce system kinetic energy

Individuals are responsible ⟶ Share responsibility

React based on crash history ⟶ Proactively identify and address risks

INTERSECTIONS AS A SS STARTING POINT

- United States is only at the beginning of our Safe System journey.

- Road infrastructure characteristics (e.g., geometrics, traffic operations & control) can be assessed from a *kinetic energy management* perspective.

- Need to "start somewhere", so why not intersection projects?

© VHB

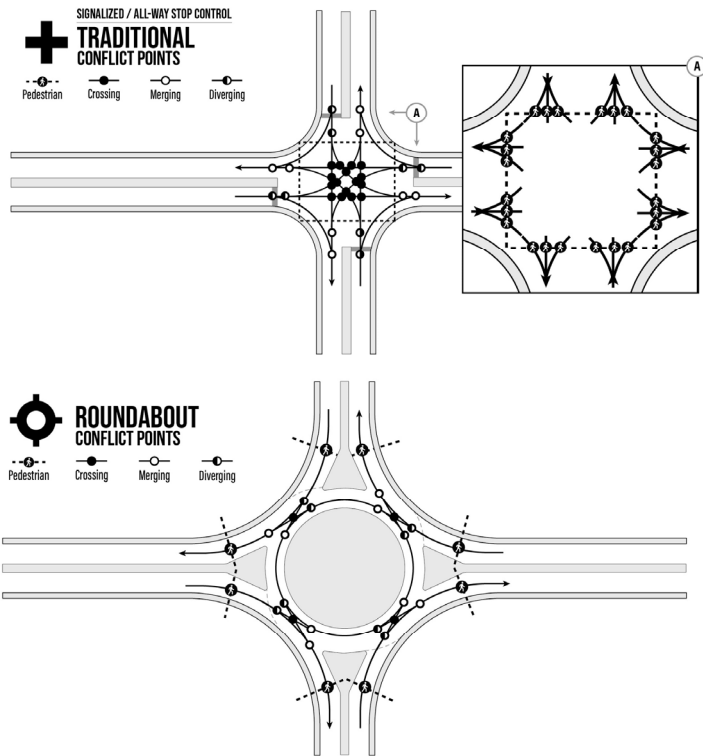# OBJECTIVE OF SS FRAMEWORK FOR INTERSECTIONS (SSI)

- A technical basis by which practitioners can apply Safe System principles to inform intersection planning and design decisions.
- SSI version 1.0 focuses on alternatives screening (ICE Stage 1).

Source: FHWA

https://safety.fhwa.dot.gov/intersection/ice/

SSI METHOD OVERVIEW

Number of conflict points of type t

Exposure index

Severity

Nonmotorized Movement Complexity Factor

$$E_t = \sum_{i=1}^{n_t} \left[I_{i,t} * \mathrm{P(FSI)}_{i,t} * L_{1,i,t} * L_{2,i,t} \right]$$

Conflict Point Type
t = crossing, merging, diverging, or nonmotorized

Conflicting Traffic Complexity Factor

- SSI measures of effectiveness (MOEs) and SSI scores.

$$SSI_t = 100 \times \exp\left(-\frac{1}{z} \times E_t\right)$$

SSI score for conflict point type t.
t = crossing, merging, diverging, or nonmotorized.
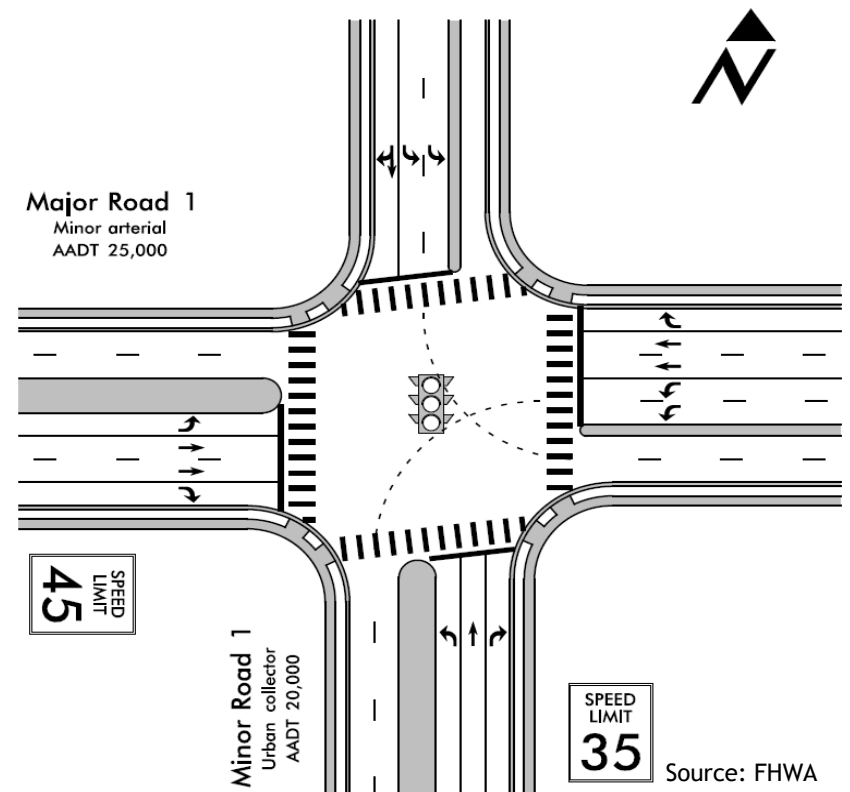
Factor to normalize scores between 0 and 100 (equals 1.37 x 10^7).

$$SSI_{int} = 100 \times \exp\left[-\frac{1}{z} \times \left(E_{crossing} + E_{merging} + E_{diverging} + E_{pedestrian}\right)/4\right]$$

SSI score for the intersection.

INPUTS FOR EXAMPLE SCENARIO 1

| Item	Input Value
Area type	Suburban
Functional classification – major	Minor arterial
Functional classification – minor	Collector
Design year AADT – major	25,000
Design year AADT – minor	20,000
Number of thru lanes – major	4
Number of thru lanes – minor	2
Traffic control type	Signalized
Posted speed limit – major	45
Posted speed limit – minor	35
Nonmotorized average daily traffic	2,400

Major Road 1
Minor arterial
AADT 25,000

Minor Road 1
Urban collector
AADT 20,000

SPEED LIMIT 45

SPEED LIMIT 35

Source: FHWA

SSI SCORE RESULTS FOR SCENARIO 1

Intersection Type	Intersection SSI Score	Conflict Type SSI Scores			
		Nonmotorized	Crossing	Merging	Diverging
2x1 Roundabout	52	8	93	98	100
MUT	44	10	52	83	88
2x2 Roundabout	42	4	90	98	100
Signalized RCUT	40	5	74	77	86
Bowtie	31	4	23	94	96
Quadrant Roadway	30	6	14	93	94
Jughandle	27	3	18	93	97
Signalized Traditional (existing)	**24**	**2**	**19**	**93**	**100**
Unsignalized RCUT	19	0	65	69	86
FDLT	10	0	32	91	97
PDLT	9	0	26	91	97

RELATIVE EXPOSURE, AVERAGE *P(FSI)*, AND AVERAGE COMPLEXITY ADJUSTMENT RESULTS FOR SCENARIO 1

Intersection Type	Relative Exposure (Relative to Existing)				Average *P(FSI)*				Average Complexity Adjustment			
	NM	Cross	Merge	Diverge	NM	Cross	Merge	Diverge	NM	Cross	Merge	Diverge
2x1 Roundabout	1.00	1.00	1.51	1.49	0.33	0.00	0.00	0.00	1.83	0.92	0.99	1.00
MUT	1.25	0.84	2.58	2.88	0.33	0.04	0.01	0.00	1.04	0.84	0.77	1.00
2x2 Roundabout	1.00	1.00	1.51	1.49	0.33	0.00	0.00	0.00	2.44	1.22	1.15	1.00
Signalized RCUT	1.22	0.19	3.31	3.25	0.28	0.09	0.01	0.00	1.73	0.84	0.77	1.00
Bowtie	1.25	0.94	2.46	2.43	0.34	0.04	0.01	0.00	1.84	1.68	1.01	1.00
Quadrant Roadway	1.00	1.34	1.57	1.77	0.27	0.04	0.01	0.00	1.84	1.34	0.96	1.00
Jughandle	1.07	1.11	1.28	1.20	0.29	0.04	0.01	0.00	2.08	2.00	1.23	1.00
Signalized Traditional (existing)	**1.00**	**1.00**	**1.00**	**1.00**	**0.29**	**0.04**	**0.01**	**0.00**	**3.15**	**2.03**	**1.53**	**1.00**
Unsignalized RCUT	1.22	0.19	3.31	3.25	0.31	0.09	0.01	0.00	3.06	1.21	1.11	1.00
FDLT	1.00	0.89	1.00	1.00	0.32	0.04	0.01	0.00	4.37	1.30	2.01	1.00
PDLT	1.00	0.96	1.00	1.00	0.32	0.04	0.01	0.00	4.74	1.70	2.12	1.00
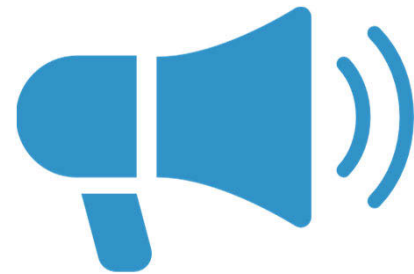
Safe System Materials

Find more resources at: <u>safety.fhwa.dot.gov/zerodeaths</u>

Zero is our goal.
A Safe System is how we get there.

Questions?

For More Information:

Jeffrey Shaw, P.E.
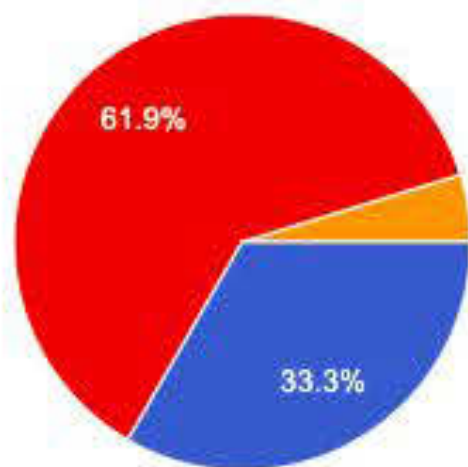FHWA Office of Safety
jeffrey.shaw@dot.gov

SURVEY HIGHLIGHTS:

RSTF Special Strategies Session

July 15, 2021

# What at today's meeting met, exceeded, or didn't meet your expectations?

- Jeff Shaw's presentation (3x)
- "The diversity of attendees in my breakout room forced us to rethink several of the strategies."
- "I liked the mentimeter and being able to collaborate with colleagues on setting the course for safe systems. it was a good discussion with the right amount of focused questions"
- "The approach for conducting the group sessions presented a new informative experience."
- "I liked the voting part of the meeting."

- "Agenda was too aggressive for time allotted"
- "I thought the polling questions were difficult because there were too many moving variables associated with each question."
- "Our group did not know when to transition to the second topic, so we had a very short time with the second survey set."

- "Background pre-meeting would be nice to help prepare and have an understanding of the strategies providing input on"
- "I suggest follow through on the Safe Roadway breakout group to contextually the issues and potential solutions. Also, clarify what it meant when asking "implementation difficulty.""
- "All the surveys became a bit much. I would have rather used that time for more discussion."
- "Smaller groups so everyone can speak."

How relevant and helpful do you think it was for your job?
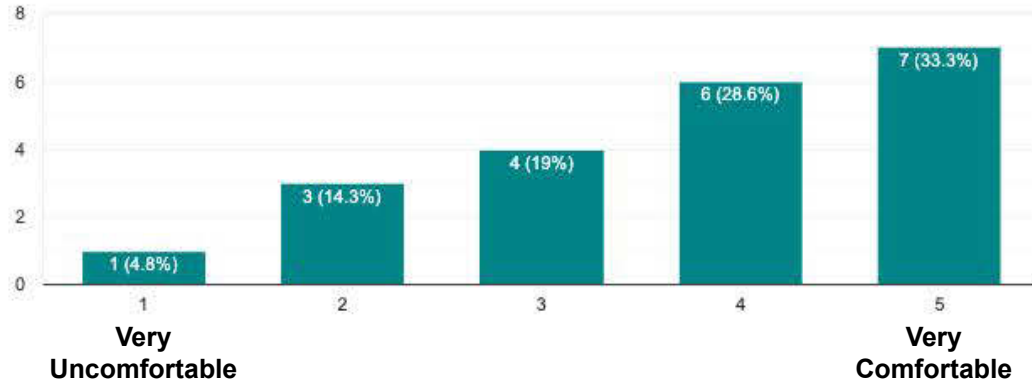
21 responses

Not very — Very much
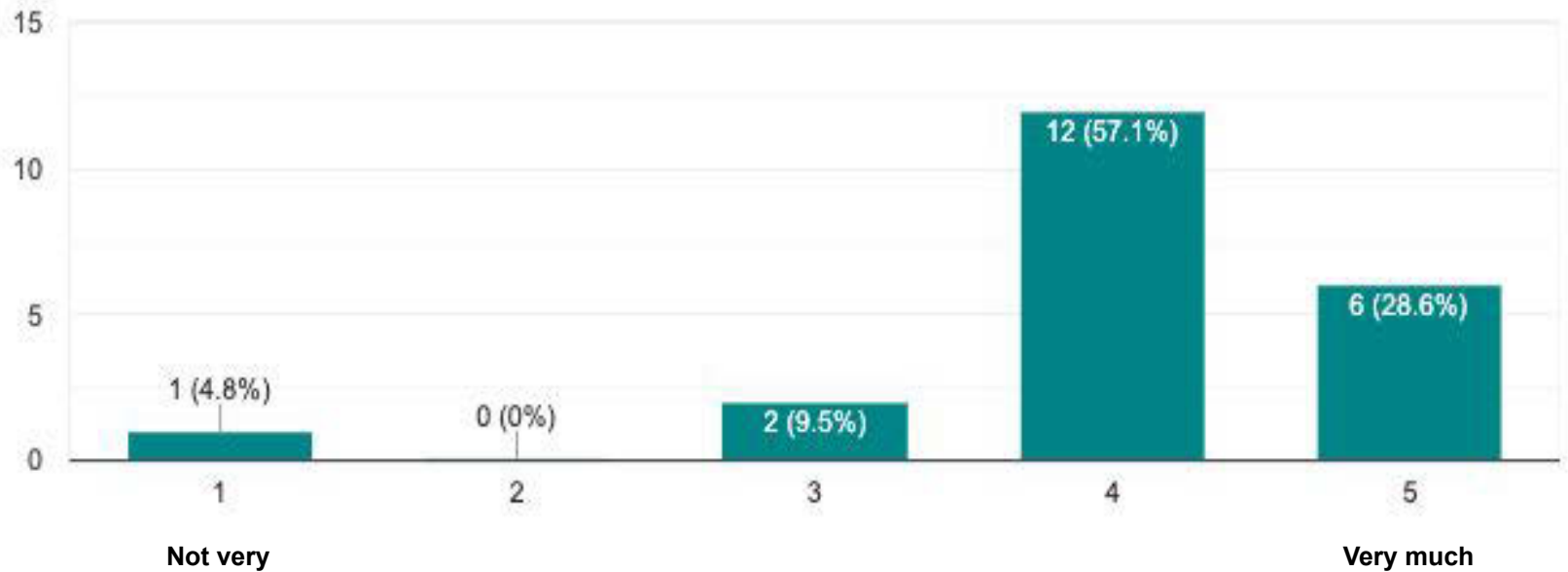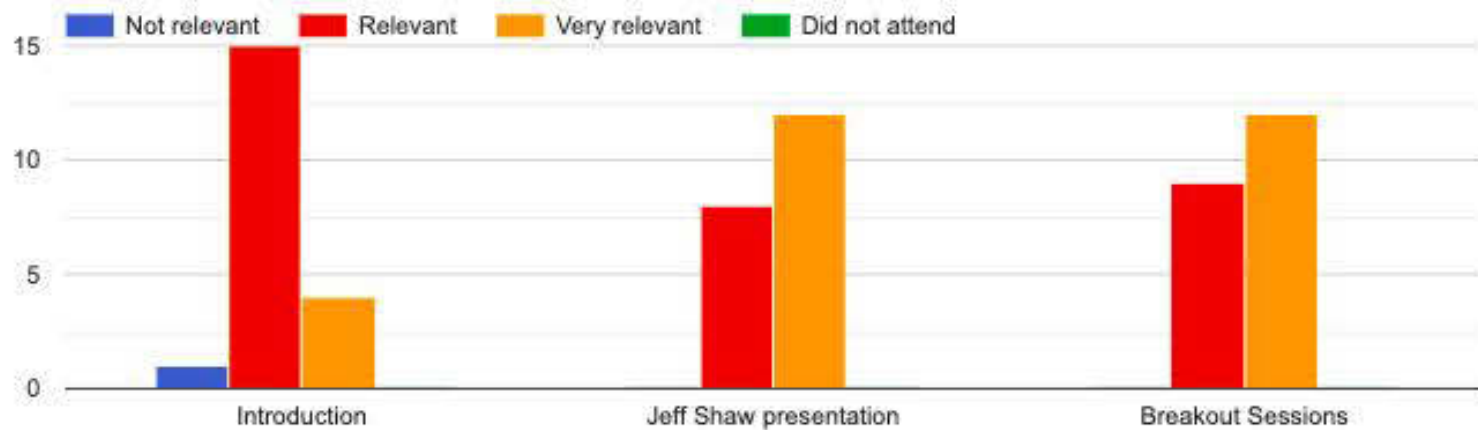
In-Person Meetings: How comfortable do you feel attending an in-person RSTF meeting of this group in the future?

21 responses

Very Uncomfortable   **Very Comfortable**

When would you feel comfortable attending an in-person meeting of this group?

20 responses
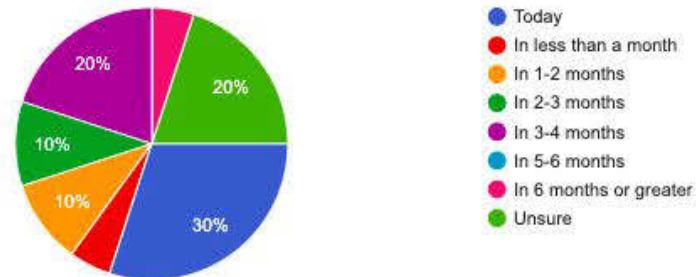
- Today
- In less than a month
- In 1-2 months
- In 2-3 months
- In 3-4 months
- In 5-6 months
- In 6 months or greater
- Unsure

Please provide any additional comments or suggestions that will make RSTF meetings more useful in the future.

RSTF-Specific Comments:

"I need more context about what the Plan was that we were giving input on. Primarily for DVRPC or RSTF? Pat clarified for all RSTF member. Also, because that we have so many different perspectives and institutions in the room - when we say this will be used by RSTF members - - - how?"

"I wish there was a technical guide for non road people (and maybe there is.) I'm learning so much and it's cool to bring back to groups I'm a member of. I like zoom meetings because I don't have to take the time to physically go there to attend."

"RSTF needs to take a long look at FHWA restrictions on communicating 'safety' and 'transportation' concurrently. If an organization is funded by CMAQ funds, then it is FHWA in PA that makes the decision that 'transportation' (i.e. PennDOT project info) and subjects like 'work zone safety' and road closures due to safety concerns cannot be communicated under CMAQ funded projects. As long as FHWA does not consider these topics as connected, and continue to treat them as mutually exclusive it will be difficult to maneuver around the rules and truly engage the community in both topics."

Please provide any additional comments or suggestions that will make RSTF meetings more useful in the future.

Comments Regarding Virtual/In-Person Environment:

Easier to attend on zoom

Calendar invites for regular attendees

Looking forward to getting back to the interaction of in-person meetings.

Virtual almost ensures my attendance, driving into the City becomes a biggest time commitment with conflicts possible.

The virtual meetings can be a norm, especially for individuals who have multiple meetings in a given day. I'm for in-person meetings, but it should be an option for those who have multiple meetings on the same day.

Please provide any additional comments or suggestions that will make RSTF meetings more useful in the future.

Miscellaneous Comments:

"The meeting was very productive. However, some strategies had a lack a clarity."

"Clarify what level of functional roads we are talking about."

"Keep getting those solid presenters. These topics require motivated, energized individuals to make real change. Data and figures are definitely important, but it's just as important to walk away feeling inspired to make a change."

"I appreciate the information sent in advance of each meeting."