Current CAT/CAV Initiatives in the States

Survey Results Describe:

- Agency CAT/CAV Capacity and Organization
- Agency CAT/CAV Funding and Financing
- Agency CAT/CAV Deployment and Partnerships

CAT COALITION
Working Group on Policy, Regulation, and Legislation (PLR)
June 2019

CAT/CAV Funding Initiatives in the States Survey Results

April 2019

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1.0 Summary

A key goal of the CAT Coalition's Working Group on Policy, Regulation, and Legislation was to understand how state and local DOTs are funding their respective CAT activities and the general scale of funding they are investing.

After examining other surveys conducted by AASHTO and ITE and fall 2018, the WG agreed that the questions that members wanted answered had not been asked before. The working group developed draft questions and refined the questions after testing with a few volunteer states. The survey targeted state DOTs on CAT/CAV Capacity and Funding Approaches in the States, and it was administered in April 2019.

The survey consisted of three, key sections:

1. Agency Capacity and Organization Section
2. Agency Funding and Financing Section
3. Agency Deployment and Partnerships Section

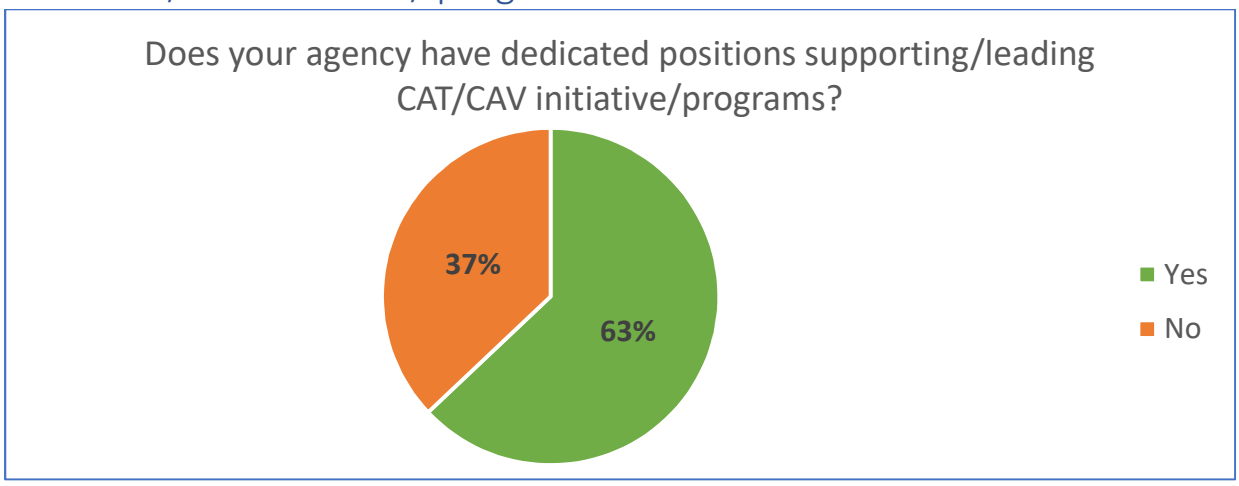
This document presents the results of the survey. Each section includes the survey question, a summary of results, and detailed information identifying the responding agencies and their responses. In some cases, detailed survey information for more than one question is included within a single table. This is often used for survey responses such as "Other (please specify)."

2.0 25 State DOTs and 2 Local Agencies responded to the survey (27 total)

2.1 Contact Information

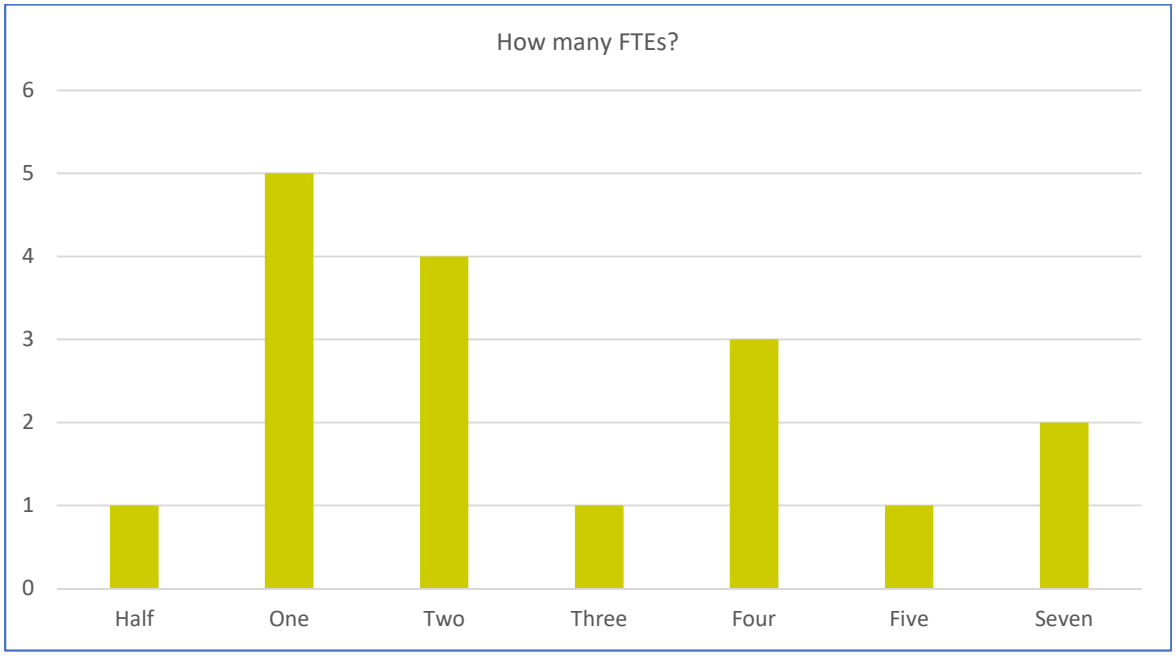
Name	Company	State	Email Address	Phone Number
Val Rader	AKDOT&PF Central Region	AK	val.rader@alaska.gov	907-269-0646
Marty lauber	Arizona Department of Transportation	AZ	mlauber@azdot.gov	602-712-2229
Bernard Soriano	California DMV & DOT	CA	bernard.soriano@dmv.ca.gov	916-952-0080
Eric Hahn	City of Vancouver	WA	eric.hahn@cityofvancouver.us	360-487-7702
Gene Donaldson	Delaware	DE	gene.donaldson@delaware.gov	302-222-5907
Raj Ponnaluri	Florida DOT	FL	raj.ponnaluri@dot.state.fl.us	850-410-5616
John Hibbard	Georgia DOT	GA	jhibbard@dot.ga.gov	470-255-0655
Jeff Marker	Idaho Transportation Department	ID	jeffrey.marker@itd.idaho.gov	208-334-4475
Donna Matulac	Iowa Department of Transportation	IA	donna.matulac@iowadot.us	515-239-1192
Joyce Taylor	MaineDOT	ME	joyce.taylor@maine.gov	207-592-7810
Carole Delion	Maryland Department of Transportation	MD	cdelion@mdot.maryland.gov	410-545-5646
Joseph Sagal	Maryland DOT-SHA	MD	jsagal@mdot.maryland.gov	410-582-5605
Collin Castle	Michigan DOT	MI	castlec@michigan.gov	517-636-0715
Jay Hietpas	Minnesota DOT	MN	jay.hietpas@state.mn.us	651-503-2850
Tracy Larkin Thomason	Nevada Department of Transportation	NV	tlarkin@dot.nv.gov	775-888-7440
Kody McCarthy	NH DOT - TSMO	NH	kody.mccarthy@dot.nh.gov	
Linda Sitz	North Dakota Department of Transportation	ND	ldsitz@nd.gov	701-328-1986
Jenna Adams-Kalloch	Oregon Department of Transportation	OR	Jenna.ADAMS-KALLOCH@odot.state.or.us	503-986-4325
Mark Kopko	PennDOT	PA	markopko@pa.gov	717-783-1903
Roger J Cohen	PennDOT	PA	rogecohen@pa.gov	717-787-0786
Julia Gold	RI Dept. of Transportation	RI	julia.gold@dot.ri.gov	401-563-4665
Ahmad Jawad	Road Commission For Oakaland County	MI	ajawad@rcoc.org	248-858-7250
Veda Nguyen	TDOT	TN	veda.nguyen@tn.gov	615-532-0421
Darran Anderson	Texas Department of Transportation	TX	darran.andersontxdot.gov	512-305-9508
Blaine Leonard	Utah DOT	UT	bleonard@utah.gov	801-887-3723
Virginia Lingham	VDOT	VA	virginia.lingham@VDOT.virginia.gov	804-692-0455
Anne Reshadi	Wisconsin Department of Transportation	WI	anne.reshadi@dot.wi.gov	414-227-2149
Daniela Bremmer	WSDOT	WA	bremmed@wsdot.wa.gov	360-705-7953

3.0 Does your agency have dedicated positions supporting/leading CAT/CAV initiative/ programs?



State	Agency	Yes	No
AK	Alaska DOT&PF - Central Region		1
AZ	Arizona DOT	1	
CA	California DMV & DOT	1	
DE	Delaware		1
FL	Florida DOT	1	
GA	Georgia DOT		1
ID	Idaho Transportation Department		1
IA	Iowa DOT	1	
ME	Maine DOT		1
MD	Maryland DOT	1	
MD	Maryland DOT-SHA	1	
MI	Michigan - Road Commission for Oakland County		1
MI	Michigan DOT	1	
MN	Minnesota DOT	1	
NV	Nevada DOT	1	
NH	New Hampshire DOT - TSMO		1
ND	North Dakota DOT	1	
OR	Oregon DOT	1	
PA	Pennsylvania DOT	1	
RI	Rhode Island DOT	1	
TN	Tennessee DOT		1
TX	Texas DOT	1	
UT	Utah DOT	1	
VA	Virginia DOT	1	
WA	Washington - City of Vancouver		1
WA	Washington State DOT	1	
WI	Wisconsin DOT		1
	Total	**17**	**10**

3.1 The number of FTEs dedicated to the agency's respective CAT/CAV Program ranged from ½ FTE to 7 FTEs



State	Agency	Half	1	2	3	4	5	6	7
AZ	Arizona DOT		1						
CA	California DMV & DOT								1
FL	Florida DOT		1						
IA	Iowa DOT	1							
MD	Maryland DOT		1						
MD	Maryland DOT-SHA		1						
MI	Michigan DOT					1			
MN	Minnesota DOT								1
NV	Nevada DOT			1					
ND	North Dakota DOT			1					
OR	Oregon DOT			1					
PA	Pennsylvania DOT					1			
RI	Rhode Island DOT				1				
TX	Texas DOT						1		
UT	Utah DOT					1			
VA	Virginia DOT		1						
WA	Washington State DOT			1					
	Total	**1**	**5**	**4**	**1**	**3**	**1**	**0**	**2**

4.0 In most agencies the CAT/CAV program is embedded in TSMO/Operation/ITS types of divisions. “Where is the program located in the organization /reporting structure?

State	Agency	Where the program is located
AZ	Arizona DOT	TSM&O - Systems Technology Group
CA	California DMV & DOT	DMV: Autonomous Vehicle program and Legal DOT: Planning and Modal program
FL	Florida DOT	Central Office / FDOT Head Quarters Traffic Operations
IA	Iowa DOT	Office of Traffic Operations - Operations Bureau
MD	Maryland DOT	Under the Operations branch of the organization
MD	Maryland DOT-SHA	Operations
MI	Michigan DOT	TSMO/Region
MN	Minnesota DOT	CAV-X Office Reports to the Operations Division Director
NV	Nevada DOT	Planning /Traffic Operations
ND	North Dakota DOT	Reports directly to the Director of NDDOT
OR	Oregon DOT	Office of Innovation in the Director's Office
PA	Pennsylvania DOT	Reports to the Executive Deputy Secretary
RI	Rhode Island DOT	Planning Division
TX	Texas DOT	Strategic Planning Division
UT	Utah DOT	Traffic Management / Operations
VA	Virginia DOT	Office of Strategic Innovation
WA	Washington State DOT	Within Traffic Operations

5.0 Who leads your CAT/CAV program?

State	Agency	Name	Email	Phone Number
AZ	Arizona DOT	Marty Lauber	mlauber@azdot.gov	602-712-2229
CA	California DMV & DOT	DMV: Bernard Soriano DOT: Prakash Sah	Bernard.Soriano@dmv.ca.gov prakash.sah@dot.ca.gov	916-952-0080 916-227-8008
FL	Florida DOT	Raj Ponnaluri	raj.ponnaluri@dot.state.fl.us	850-410-5616
IA	Iowa DOT	Adam Shell	Adam.shell@iowadot.us	515-239-1650
MD	Maryland DOT	TBD	TBD	TBD
MD	Maryland DOT-SHA	Subrat Mahapatra	smahapatra@sha.state.md.us	410-582-5605
MI	Michigan DOT	Collin Castle	castlec@michigan.gov	517-636-0715
MN	Minnesota DOT	Jay Hietpas	jay.hietpas@state.mn.us	651-503-2850
NV	Nevada DOT	Tracy Larkin Thomason / Sondra Rosenberg	tlarkin@dot.nv.gov / srosenberg@dot.nv.gov	775-888-7440
ND	North Dakota DOT	Linda Sitz	ldsitz@nd.gov	701-328-1986
OR	Oregon DOT	Jenna Adams-Kalloch	Jenna.ADAMS-KALLOCH@odot.state.or.us	503-986-4325
PA	Pennsylvania DOT	Mark Kopko	markopko@pa.gov	717-783-1903
RI	Rhode Island DOT	Julia Gold	julia.gold@dot.ri.gov	401-563-4665
TX	Texas DOT	Darran Anderson	darran.anderson@txdot.gov	512-305-9508
UT	Utah DOT	Blaine Leonard	bleonard@utah.gov	801-887-3723
VA	Virginia DOT	Virginia Lingham	virginia.lingham@VDOT.virginia.gov	804-692-0455
WA	Washington State DOT	Ted Bailey	BaileyTe@wsdot.wa.gov	360-705-7286

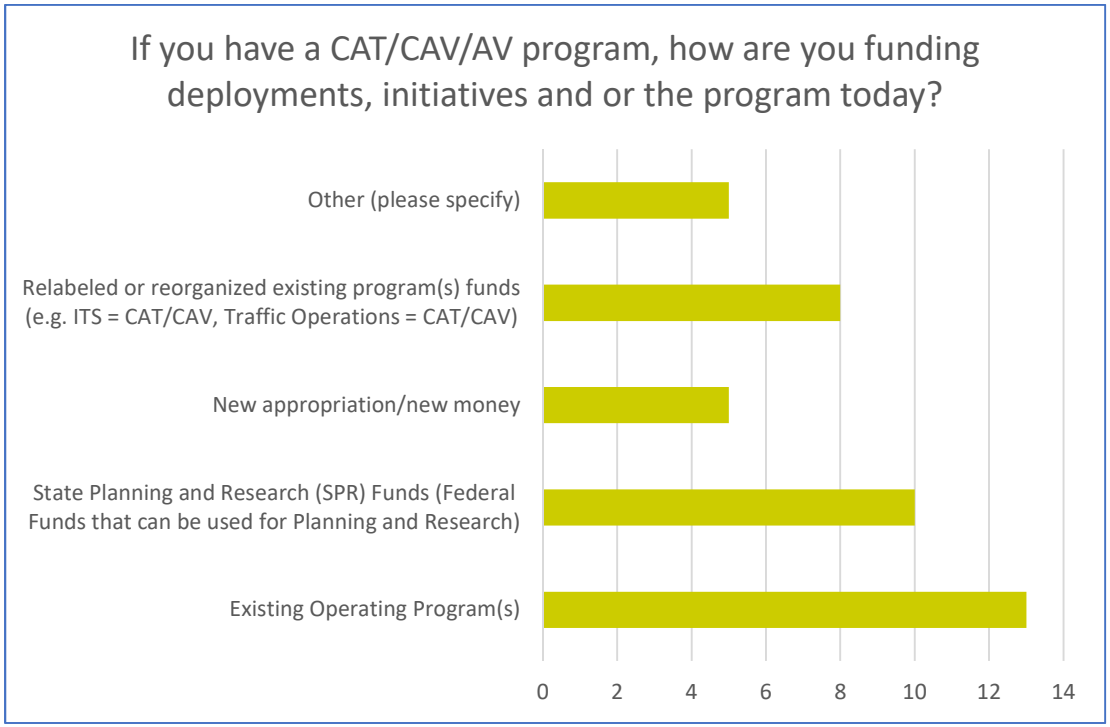
5.1 What was this person's previous position in the agency?

State	Agency	Previous Position
AZ	Arizona DOT	New Hire - Private and Public Transportation Experience
CA	California DMV & DOT	Bernard Soriano - Deputy Director Prakash Sah - Supervising Engineer
FL	Florida DOT	State Arterial Management Engineer
IA	Iowa DOT	Transportation Planner - Systems Planning Office
MD	Maryland DOT	The position was just advertised and will be filled within a month
MD	Maryland DOT-SHA	Division Chief, Innovative Planning - Office of Planning and Preliminary Engineering
MI	Michigan DOT	Connected Vehicle Specialist
MN	Minnesota DOT	State Traffic Engineer
NV	Nevada DOT	varies
ND	North Dakota DOT	Planning and Asset Management as well as risk assessments
OR	Oregon DOT	Came from New York City Department of Transportation
PA	Pennsylvania DOT	Advance Vehicle Technology Manager
RI	Rhode Island DOT	n/a
UT	Utah DOT	ITS Program Manager
VA	Virginia DOT	n/a, hired for this position.

6.0 Most CAT/CAV Programs are funded out of existing programs:

6.1 If you have a CAT/CAV/AV program, how are you funding deployments, initiatives and or the program today?

Existing Operating Program(s), State Planning and Research (SPR) Funds (Federal Funds that can be used for Planning and Research), New appropriation/new money, Relabeled or reorganized existing program(s) funds (e.g. ITS = CAT/CAV, Traffic Operations = CAT/CAV), Other (please specify)



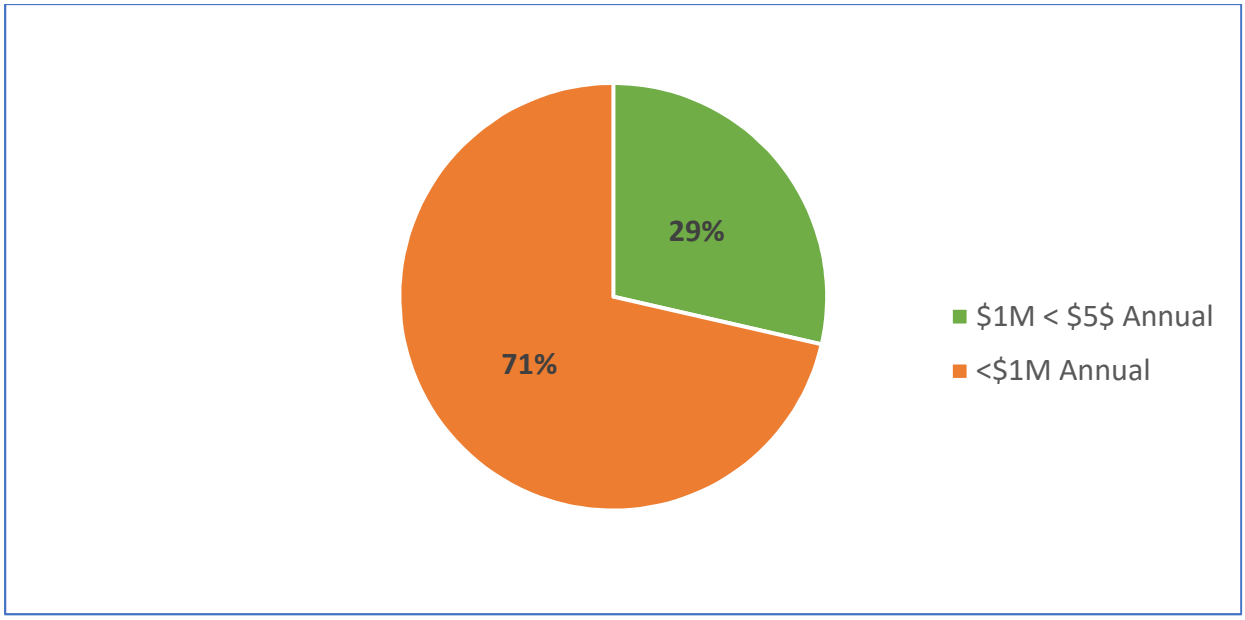
State	Agency	Existing Operating Program(s)	State Planning and Research (SPR) Funds (Federal Funds that can be used for Planning and Research)	New appropriation/ new money	Relabeled or reorganized existing program(s) funds (e.g. ITS = CAT/CAV, Traffic Operations = CAT/CAV)	Other (please specify)
AK	Alaska DOT&PF - Central Region					Funding network capacity improvements from Exiting Operating Programs
AZ	Arizona DOT		1			
CA	California DMV & DOT	1	1	1		
DE	Delaware	1	1		1	In the 2017 update to the Department's Integrated Transportation Management Strategic Plan CAT/CAV was defined as the next phase of the Department's existing transportation management program which includes ITS. As with the original ITS program we believe the use of CMAQ funds for CAV/CAT related equipment such as roadside units RSU's be considered as an allowable item.
FL	Florida DOT	1		1	1	
GA	Georgia DOT	1				
IA	Iowa DOT	1			1	
ME	Maine DOT	1				
MD	Maryland DOT		1		1	
MD	Maryland DOT-SHA	1	1		1	

State	Agency	Existing Operating Program(s)	State Planning and Research (SPR) Funds (Federal Funds that can be used for Planning and Research)	New appropriation/ new money	Relabeled or reorganized existing program(s) funds (e.g. ITS = CAT/CAV, Traffic Operations = CAT/CAV)	Other (please specify)
MI	Michigan - Road Commission for Oakaland County	1			1	
MI	Michigan DOT	1		1	1	
MN	Minnesota DOT				1	
NV	Nevada DOT	1	1			
NH	New Hampshire DOT - TSMO					
OR	Oregon DOT	1				
PA	Pennsylvania DOT			1		
RI	Rhode Island DOT		1			Grants
TX	Texas DOT	1	1			
UT	Utah DOT			1		Part of the Traffic Management Budget
WA	Washington - City of Vancouver					Do not have a CAT/CAV/AV program
WA	Washington State DOT	1	1			
WI	Wisconsin DOT		1			
		13	**10**	**5**	**8**	**5**

6.2 If funds come from an existing operating program(s), please name program funding source(s) if known.

State	Agency	If funds come from an existing operating program(s), please name program funding source(s) if known.
AK	Alaska DOT&PF - Central Region	Federal NHI
AZ	Arizona DOT	Not sure
CA	California DMV & DOT	DMV: Motor Vehicle Account DOT: SP&R II Funds
DE	Delaware	The Department uses state, STP and CMAQ funds as are FHWA approved.
FL	Florida DOT	ITS Program
GA	Georgia DOT	Existing Federal lump sum programs
IA	Iowa DOT	TSMO Program Budget - State Funding
ME	Maine DOT	Planning funds
MD	Maryland DOT	Grass roots effort until now, the funding was office based, such as operations used their contracts/programs to include CV research
MD	Maryland DOT-SHA	Federal/State Operations Funds for Operations and ITS
MI	Michigan - Road Commission for Oakaland County	CMAQ
MI	Michigan DOT	ITS/TSMO
MN	Minnesota DOT	Research and Planning Funds for DOT (State Fund)
NV	Nevada DOT	State Highway Funds
OR	Oregon DOT	-
PA	Pennsylvania DOT	N/A
TX	Texas DOT	Maintenance, TMS/ITS, IT capital, Construction capital
UT	Utah DOT	State money - traffic management
WA	Washington - City of Vancouver	N/A
WA	Washington State DOT	Traffic Operations Division & Strategic Assessment Division

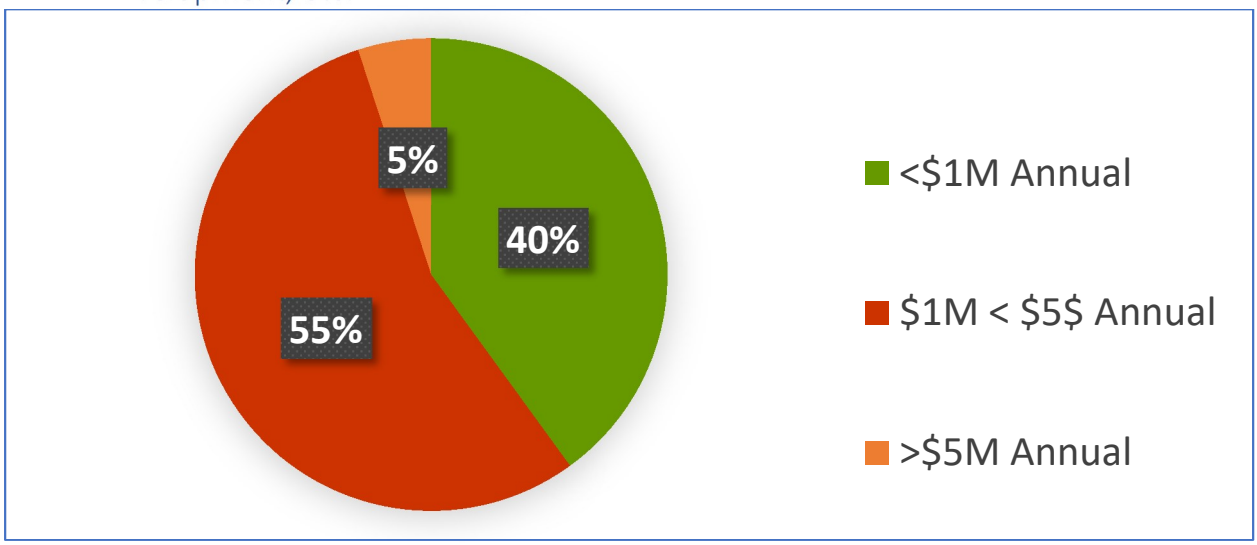
7.0 Operating Funds used for staffing, travel, consultants, etc.



State	Agency	<$1M Annual	$1M < $5M Annual
AK	Alaska DOT&PF - Central Region	1	
AZ	Arizona DOT	1	
CA	California DMV & DOT	1	
DE	Delaware	1	
FL	Florida DOT	1	
GA	Georgia DOT		1
IA	Iowa DOT		1
ME	Maine DOT	1	
MD	Maryland DOT	1	
MD	Maryland DOT-SHA	1	
MI	Michigan - Road Commission for Oakaland County	1	
MI	Michigan DOT		1
MN	Minnesota DOT	1	
NV	Nevada DOT	1	
OR	Oregon DOT	1	
PA	Pennsylvania DOT		1
RI	Rhode Island DOT		1
TX	Texas DOT		1
UT	Utah DOT	1	
WA	Washington - City of Vancouver	1	
WA	Washington State DOT	1	
		15	**6**

8.0 Level of Capital Funds Currently Invested:

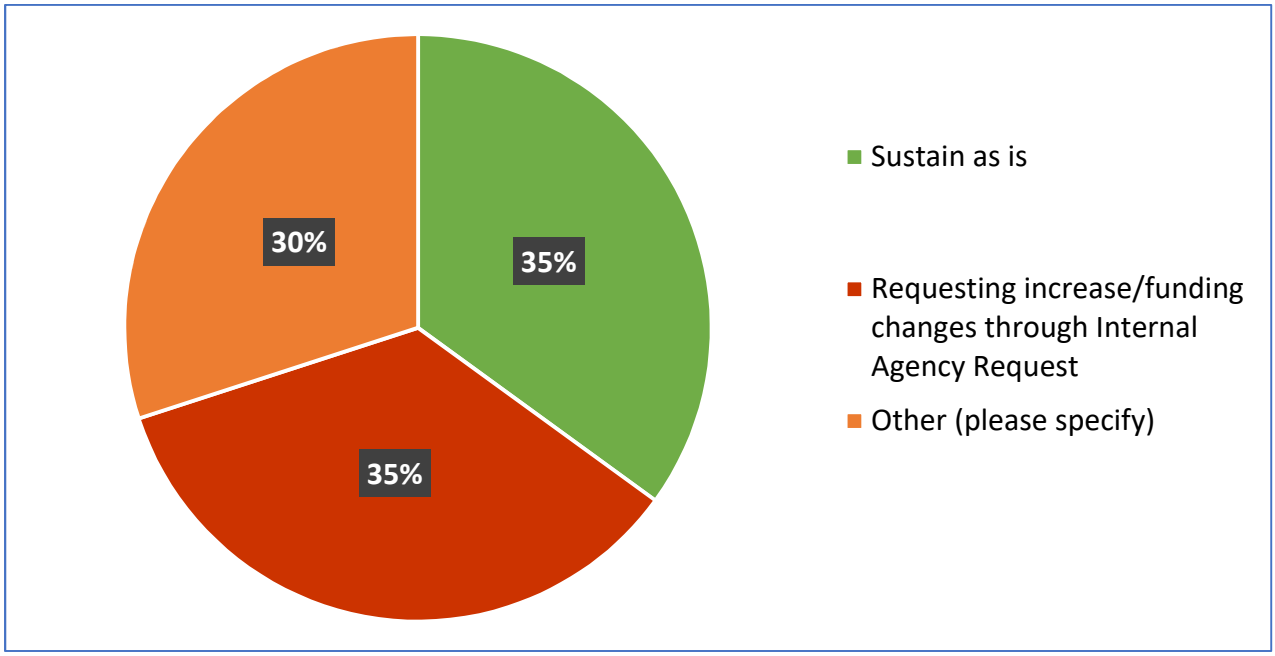
8.1 Capital Funds: used for field implementation, infrastructure, software development, etc.



State	Agency	<$1M Annual	$1M < $5M Annual	>5M Annual
AK	Alaska DOT&PF - Central Region	1		
AZ	Arizona DOT	1		
CA	California DMV & DOT	1		
DE	Delaware		1	
FL	Florida DOT		1	
GA	Georgia DOT		1	
IA	Iowa DOT		1	
ME	Maine DOT	1		
MD	Maryland DOT	1		
MD	Maryland DOT-SHA		1	
MI	Michigan - Road Commission for Oakaland County		1	
MI	Michigan DOT		1	
MN	Minnesota DOT		1	
NV	Nevada DOT		1	
OR	Oregon DOT	1		
PA	Pennsylvania DOT		1	
TX	Texas DOT			1
UT	Utah DOT		1	
WA	Washington - City of Vancouver	1		
WA	Washington State DOT	1		
		8	**11**	**1**

9.0 Sustained Funding:

9.1 What are your plans to sustain and/or increase either operating or capital funding?

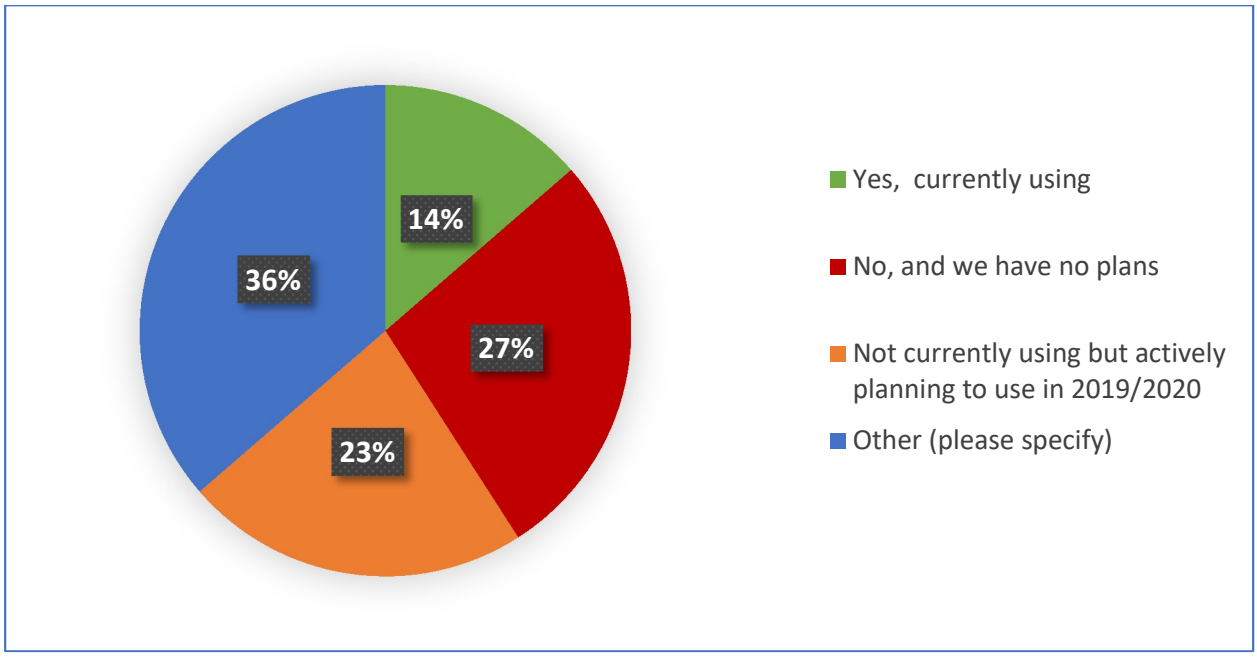


State	Agency	Sustain as is	Request increase/ funding changes through Internal Agency Request	Other (please specify)
AK	Alaska DOT&PF - Central Region			Put funding in STIP in 2021
AZ	Arizona DOT			Not sure, new hire
CA	California DMV & DOT	1		
DE	Delaware			As indicated the Department considers CAT/CAV a part existing programs with said programs reviewed through the normal capital projects process.
FL	Florida DOT	1		Sustain as is but seek FDOT leadership support with funding.
GA	Georgia DOT	1		
IA	Iowa DOT		1	
ME	Maine DOT	1		
MD	Maryland DOT		1	
MD	Maryland DOT-SHA		1	

State	Agency	Sustain as is	Request increase/ funding changes through Internal Agency Request	Other (please specify)
MI	Michigan - Road Commission for Oakaland County	1		
MI	Michigan DOT		1	
MN	Minnesota DOT			Requesting funds to maintain current levels
OR	Oregon DOT			unknown
PA	Pennsylvania DOT	1		
TX	Texas DOT		1	
UT	Utah DOT		1	
WA	Washington - City of Vancouver	1		
WA	Washington State DOT		1	
		7	**7**	**6**

10.0 Innovative Financing:

10.1 Is your agency using innovative financing/Public-Private Partnership -P3 opportunities right now?



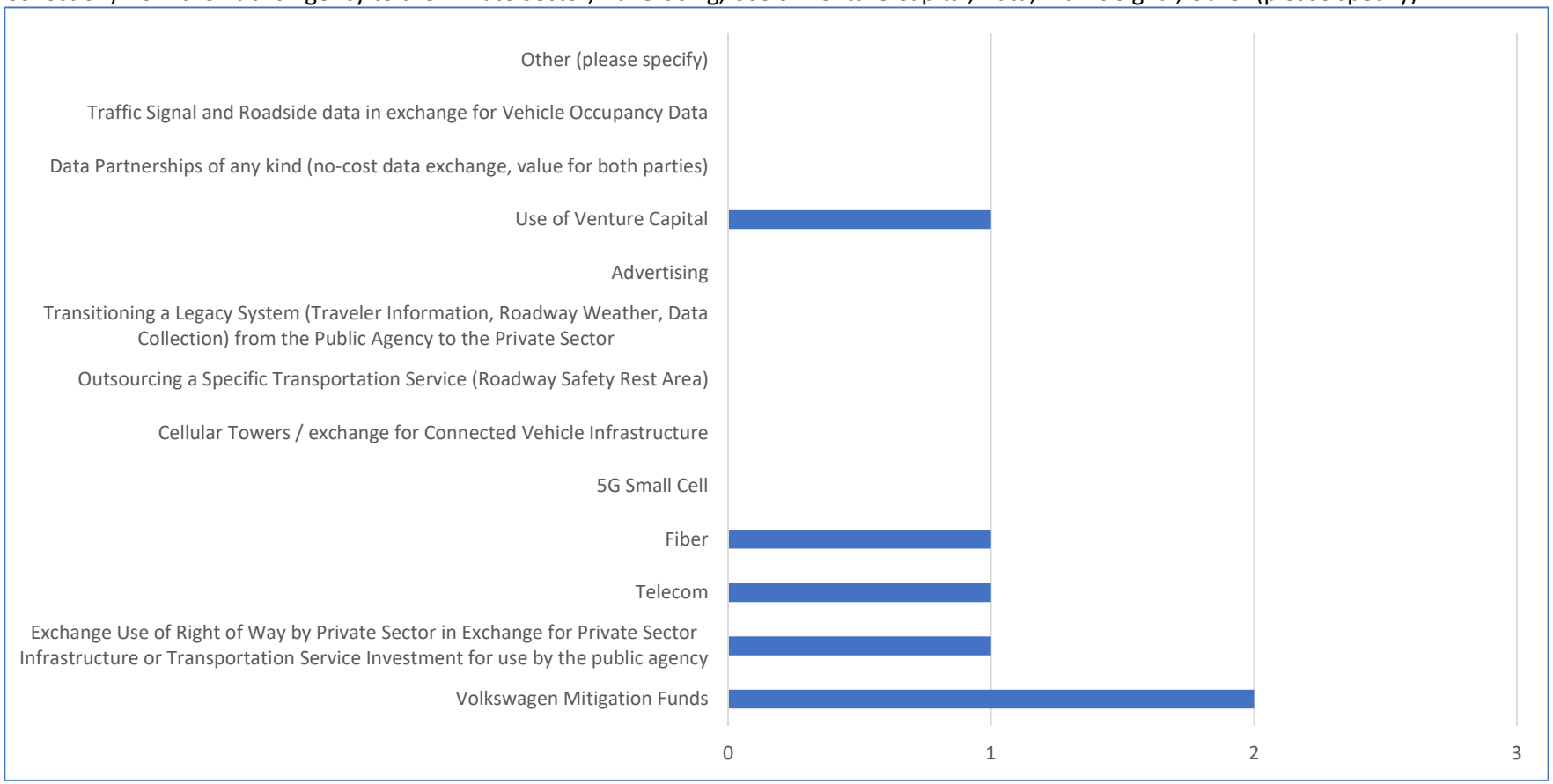
State	Agency	Yes, currently using	No, and we have no plans	Not currently using but actively planning to use in 2019/2020	Other (please specify)
AK	Alaska DOT&PF - Central Region				PPP with SPaT Apps Developers, Connected Signals, Live Traffic
AZ	Arizona DOT				Considering using P3 opportunities
CA	California DMV & DOT		1		
DE	Delaware				If the question pertains to CAT/CAV at this time the response would be no.
FL	Florida DOT			1	
GA	Georgia DOT			1	
IA	Iowa DOT		1		
ME	Maine DOT		1		
MD	Maryland DOT			1	
MD	Maryland DOT-SHA				Not currently. May in years past 2020

State	Agency	Yes, currently using	No, and we have no plans	Not currently using but actively planning to use in 2019/2020	Other (please specify)
MI	Michigan - Road Commission for Oakaland County			1	
MI	Michigan DOT			1	
MN	Minnesota DOT				Not currently using, but have P3 legislation if opportunity arises
NV	Nevada DOT		1		
OR	Oregon DOT				unknown
PA	Pennsylvania DOT				exploring
RI	Rhode Island DOT	1			
TX	Texas DOT				Not, but discussing
UT	Utah DOT	1			
WA	Washington - City of Vancouver	1			
WA	Washington State DOT		1		
WI	Wisconsin DOT		1		
		3	**6**	**5**	**8**

11.0 Current Use of Innovative Financing:

11.1 If your agency is currently using "innovative financing" / "Public Private Partnership -P3" opportunities right now, please check all those that apply.

Volkswagen, Exchange Use of Right of Way by Private Sector in Exchange for Private Sector Infrastructure or Transportation Service Investment for use by the public agency, Telecom, Fiber, 5G Small Cell, Cellular Towers / exchange for Connected Vehicle Infrastructure, Outsourcing a Specific Transportation Service (Roadway Safety Rest Area), Transitioning a Legacy System (Traveler Information, Roadway Weather, Data Collection) from the Public Agency to the Private Sector, Advertising, Use of Venture Capital, Data, Traffic Signal, Other (please specify)



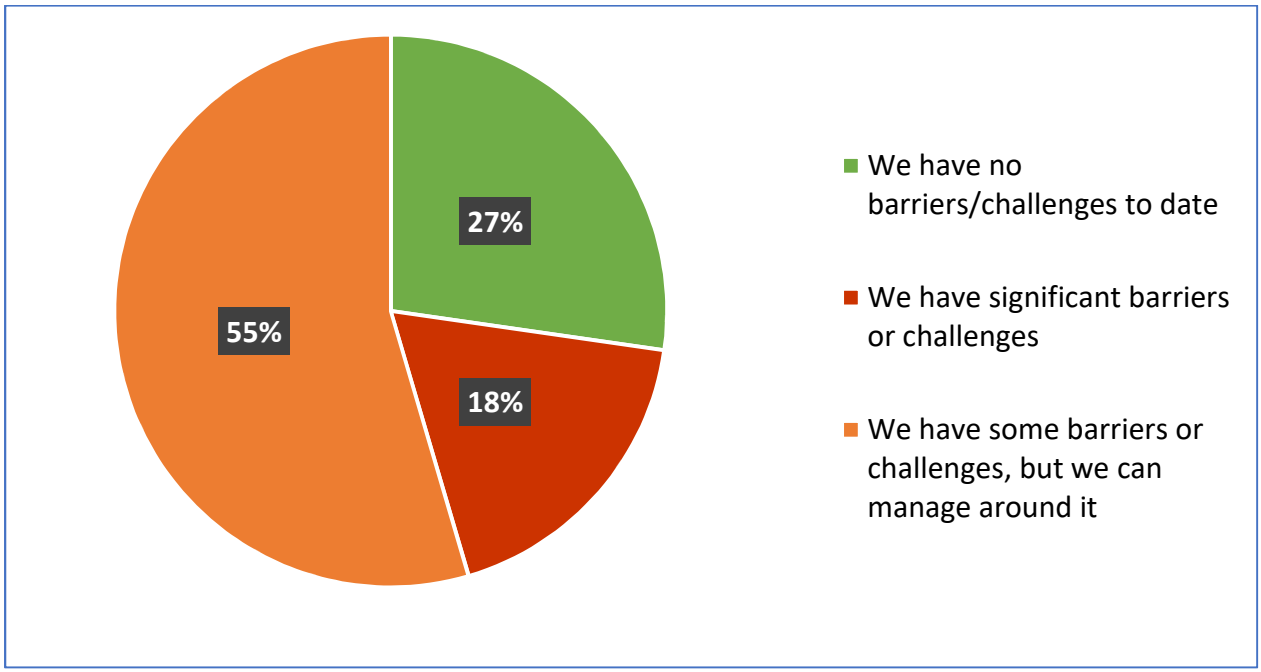
State	Agency	Volkswagen Mitigation Funds	Exchange Use of Right of Way by Private Sector in Exchange for Private Sector Infrastructure or Transportation Service Investment for use by the public agency	Telecom	Fiber	5G Small Cell	Cellular Towers / exchange for Connected Vehicle Infrastructure	Outsourcing a Specific Transportation Service (Roadway Safety Rest Area)	Transitioning a Legacy System (Traveler Information, Roadway Weather, Data Collection) from the Public Agency to the Private Sector	Advertising	Use of Venture Capital	Data Partnerships of any kind (no-cost data exchange, value for both parties)	Traffic Signal and Roadside data in exchange for Vehicle Occupancy Data	Other (please specify)
RI	Rhode Island DOT	1	1								1			
UT	Utah DOT	1			1									
WA	Washington - City of Vancouver			1										
		2	**1**	**1**	**1**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**0**

11.2 If your agency is not currently using but actively planning to use "innovative financing" / "Public Private Partnership -P3" opportunities in 2019/2020, for what type of service, deployment, investment will they be used? (list 2 or 3 examples, if any)

State	Agency	Type of service, deployment, investment used
AZ	Arizona DOT	For the creation of a TIM center with CAV Test Bed
CA	California DMV & DOT	N/A
FL	Florida DOT	Any field deployment with CAV infrastructure.
GA	Georgia DOT	Broadband deployment on Interstates
MD	Maryland DOT	Freight truck parking and CV information systems
MD	Maryland DOT-SHA	Fiber, deployment
MN	Minnesota DOT	None currently programmed, exploring fiber optic
OR	Oregon DOT	To be determined
TX	Texas DOT	Checked above

12.0 Grant Application Barriers:

12.1 In relation to pursuing Federal (or other) Grant Opportunities, what are your top barriers/issues/challenges in being able to develop and submit a competitive proposal?

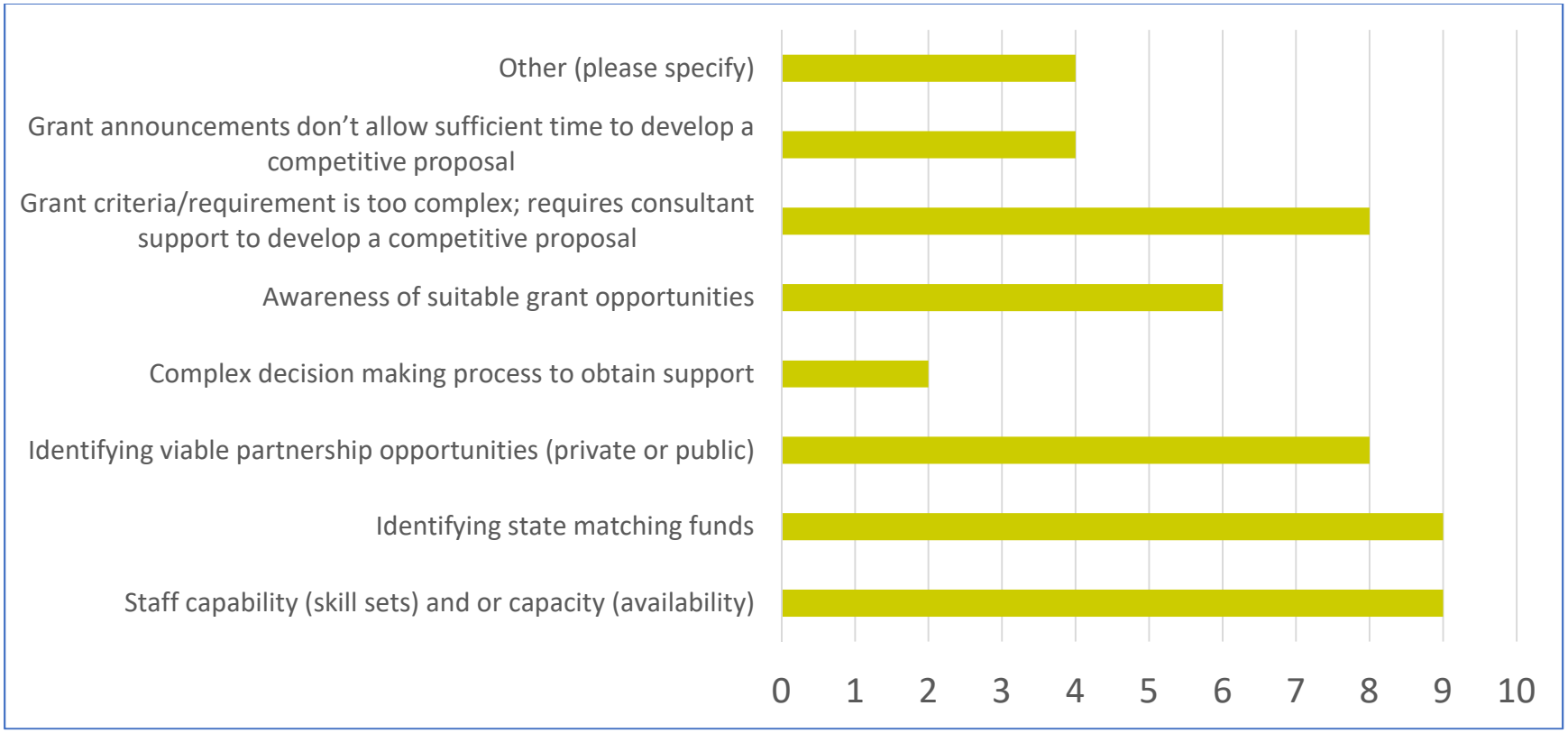


State	Agency	We have no barriers/ challenges to date	We have significant barriers or challenges	We have some barriers or challenges, but we can manage around it
AK	Alaska DOT&PF - Central Region	1		
AZ	Arizona DOT		1	
CA	California DMV & DOT			1
DE	Delaware	1		
FL	Florida DOT	1		
GA	Georgia DOT			1
IA	Iowa DOT			1
ME	Maine DOT	1		
MD	Maryland DOT		1	
MD	Maryland DOT-SHA			1
MI	Michigan - Road Commission for Oakland County			1
MI	Michigan DOT	1		
MN	Minnesota DOT			1
NV	Nevada DOT			1
OR	Oregon DOT	1		

State	Agency	We have no barriers/ challenges to date	We have significant barriers or challenges	We have some barriers or challenges, but we can manage around it
PA	Pennsylvania DOT			1
RI	Rhode Island DOT			1
TX	Texas DOT			1
UT	Utah DOT			1
WA	Washington - City of Vancouver			1
WA	Washington State DOT		1	
WI	Wisconsin DOT		1	
		6	**4**	**12**

12.2 Please list your top barriers, if any. Check all that apply.

Staff capability (skill sets) and/or capacity (availability), Identifying state matching funds, Identifying viable partnership opportunities (private or public), Complex decision making process to obtain support, Awareness of suitable grant opportunities, Grant criteria/requirement is too complex; requires consultant support to develop a competitive proposal, Grant announcements don't allow sufficient time to develop a competitive proposal, Other (please specify)



State	Agency	Staff capability and/or capacity	Identifying state matching funds	Identifying viable partnership opportunities	Complex decision making process to obtain support	Awareness of suitable grant opportunities	Grant criteria/requirement is too complex	Grant announcements do not allow sufficient time to develop a competitive proposal	Other (please specify)
AK	Alaska DOT&PF - Central Region	1	1						
AZ	Arizona DOT		1	1		1			
CA	California DMV & DOT	1	1						
DE	Delaware								The Department reviews grant advertisements and determine if Department program objectives, funding requirements, etc. then a decision is made to submit proposal or not. The key is does the grant facilitate/enhance Department programs/objectives.
FL	Florida DOT		1	1					
GA	Georgia DOT		1				1		Federal "strings" which are attached add complexity and add cost. Federal requirements are often niche focused and don't help advance the state of the art.
IA	Iowa DOT	1				1	1	1	
MD	Maryland DOT		1				1		Grants lack the ability to support systems (like deploy backhaul) which our state needs but can't

State	Agency	Staff capability and/or capacity	Identifying state matching funds	Identifying viable partnership opportunities	Complex decision making process to obtain support	Awareness of suitable grant opportunities	Grant criteria/requirement is too complex	Grant announcements do not allow sufficient time to develop a competitive proposal	Other (please specify)
									get funding to assist with new technology deployments
MD	Maryland DOT-SHA	1	1				1		
MI	Michigan - Road Commission for Oakaland County				1	1	1		
MN	Minnesota DOT			1		1		1	
NV	Nevada DOT	1					1		
PA	Pennsylvania DOT			1					Establishing partnerships prior to competitive procurement
RI	Rhode Island DOT	1		1			1		
TX	Texas DOT	1	1	1	1	1		1	
UT	Utah DOT		1	1					
WA	Washington - City of Vancouver	1				1			
WA	Washington State DOT	1		1			1	1	
		9	**9**	**8**	**2**	**6**	**8**	**4**	**4**

13.0 Current CAV/CAV Deployments (funded):

13.1 What CAT/AV/CAV deployments are currently underway, have been implemented or are funded to be implemented near term? Check all that apply.

Truck Platooning: SAE Level 1 Driver Assisted, other; Transit: First mile/last mile connections; Transit: Low-speed AV shuttles; Transit: Automated bus braking and pedestrian detection; Electrification: Expanding/building the electric vehicle charging network; Worker Safety: Autonomous roadway construction zone safety trucks; Signing and Striping: Roadway machine readable signing and striping; Use of aerial drones for maintenance and asset management functions; Connecting traffic signal timing information to vehicles -SPAT; Open data/data sharing applications or projects; Other (please specify)

State	Agency	Truck Platooning: SAE Level 1 Driver Assisted, other	Transit: First mile/last mile connections	Transit: Low-speed AV shuttles	Transit: Automated bus braking and pedestrian detection	Electrification: Expanding/building the electric vehicle charging network	Worker Safety: Autonomous roadway construction zone safety trucks	Signing and Striping: Roadway machine readable signing and striping	Use of aerial drones for maintenance and asset management functions	Connecting traffic signal timing information to vehicles -SPAT	Open data/data sharing applications or projects	Other (please specify)
AK	Alaska DOT&PF - Central Region					1			1	1	1	
AZ	Arizona DOT									1	1	Smart Work Zone applications - Pilot projects
CA	California DMV & DOT	1								1		
DE	Delaware			1					1	1	1	AI/machine learning based application(s) to integrate/enhance existing and planned integrated transportation management system capabilities to include CAT/AV/CAV.
FL	Florida DOT	1		1			1	1		1	1	
GA	Georgia DOT							1	1	1	1	
IA	Iowa DOT									1	1	
ME	Maine DOT					1			1	1	1	
MD	Maryland DOT									1		

State	Agency	Truck Platooning: SAE Level 1 Driver Assisted, other	Transit: First mile/last mile connections	Transit: Low-speed AV shuttles	Transit: Automated bus braking and pedestrian detection	Electrification: Expanding/building the electric vehicle charging network	Worker Safety: Autonomous roadway construction zone safety trucks	Signing and Striping: Roadway machine readable signing and striping	Use of aerial drones for maintenance and asset management functions	Connecting traffic signal timing information to vehicles -SPAT	Open data/data sharing applications or projects	Other (please specify)
MD	Maryland DOT-SHA								1	1	1	
MI	Michigan - Road Commission for Oakaland County						1	1		1	1	
MI	Michigan DOT	1		1			1	1	1	1	1	
MN	Minnesota DOT			1			1	1		1	1	Minnesota CAV challenge allows opportunities for industry to submit innovative ideas
NV	Nevada DOT			1		1			1	1	1	AI use for accident prediction and stationing of incident management vehicles. Also AI facilitating incident identification and accelerated (12 min) response time.
OR	Oregon DOT								1	1		
PA	Pennsylvania DOT	1					1	1		1		Testing and training facility
RI	Rhode Island DOT		1	1								

State	Agency	Truck Platooning: SAE Level 1 Driver Assisted, other	Transit: First mile/last mile connections	Transit: Low-speed AV shuttles	Transit: Automated bus braking and pedestrian detection	Electrification: Expanding/building the electric vehicle charging network	Worker Safety: Autonomous roadway construction zone safety trucks	Signing and Striping: Roadway machine readable signing and striping	Use of aerial drones for maintenance and asset management functions	Connecting traffic signal timing information to vehicles -SPAT	Open data/data sharing applications or projects	Other (please specify)
TX	Texas DOT		1	1					1	1	1	Multiple cities deploying first/last mile solutions, SPAT, AV pilots. Industry fully able to deploy and operate. Multiple AV freight operating on our highways at different SAE levels, state and MPOs working with industry to do data sharing solutions, drones in use in TxDOT
UT	Utah DOT			1					1	1	1	
WA	Washington State DOT					1			1	1		
		4	**2**	**8**	**0**	**4**	**5**	**6**	**11**	**19**	**14**	**6**

13.2 Please briefly describe the deployments you selected in the previous question.

State	Agency	Deployments selected in the previous question
AK	Alaska DOT&PF - Central Region	Charging Stations, SPaT/Data, Drones for maintenance
AZ	Arizona DOT	CV Test Bed with SPaT and MAP data, Travel Time information sharing, Smart Work Zone pilot projects.
CA	California DMV & DOT	Tested automating truck speed and spacing in conjunction with vehicle-to-vehicle communications to see its effect on throughput capacity and reduce aerodynamic drag, with fuel consumption savings and carbon emissions reductions. Deployed DSRC radios on 15 intersections to broadcast SPaT, Geographic Information Description and differential GPS correction. Also accept Basic Safety Message (BSM) from equipped vehicles. In process of deploying Transit Signal Priority on Valley Transport Authority (VTA) buses on their route 522 using DSRC.
DE	Delaware	Fully automated shuttle RFP advertised in final stages of award at time of this writing. Department has a mature UAV (Drone) program to include policy, training and operations. Implementing SPaT program in four areas of state. Have had a extensive data sharing program as part of the Department's Transportation Management program for approximately ten years and continue to enhance, most recently to include Google Cloud services.
FL	Florida DOT	https://www.fdot.gov/traffic/ITS/Projects-Deploy/CV/Connected-Vehicles.shtm
GA	Georgia DOT	RSU deployment at 1,700 signals in metro Atlanta Robust pavement marking program Drone usage is at District levels for maintenance support; also some proof of concept in incident management/response
IA	Iowa DOT	We are partnering with Iowa State University in the SPAT challenge. Work on this will be getting underway soon. Iowa has an open data portal to share data outside the agency. We are currently working on work zone data to improve the quality of this data.
ME	Maine DOT	Working with other groups to build an electric charging network. Established a drone policy on when and who uses it. Won a build grant to change signal systems in one county to upgrade to connected. Looking at data on origin and destination trips.
MD	Maryland DOT	Upgrading and improving signal structures to be CV ready - 20 signals being readied for DSRC deployment this year or early 2020.
MN	Minnesota DOT	Low Speed Automated Shuttles - Winter weather testing & public demonstration in 2018, long term (12 month) deployment currently in development. Automated Trunk Mounted Attenuator project is currently scheduled for 2019/2020 deployment SPaT Corridor constructed on TH 55, includes 22 signals on urban arterial freeway. Includes snow plow priority Rural connected vehicle corridor in development on Highway 52. Will include DSRC along 90 miles. Enhanced AV pavement markings being installed on I-94 just west of Minneapolis/St Paul. Includes recommendations from MUTCD Subcommittee on CAV (6" markings, 20' lane skips, wider gore area markings, skips at ramp exits. Partnering with 3M to test new markings designed for CAV. Adding portal for 3rd parties to obtain signal timing information within MnDOT network. Working with a consortium of transit agencies to

State	Agency	Deployments selected in the previous question
		develop automated buses (40' in length) Working on testing truck av technology, assess impacts to pavements at MnROAD test facility, and automate MnROAD truck on low volume roadway.
NV	Nevada DOT	Las Vegas- I year pilot of autonomous shuttle on city streets, now implementing 4 aV shuttles connecting downtown area with medical center. Aptiv /Lyft partnership providing autonomous MaaS on LV strip. Use of predictive analysis and real time information to identify incidents and accelerate response with appropriate incident management vehicles. Drones used in maintenance inspections.
PA	Pennsylvania DOT	54 connected intersections with plans to add an additional 205 plans to pilot an autonomous TMA Pavement markings on major freight routes PennSTART facility
RI	Rhode Island DOT	The Little Roady Autonomous Shuttle pilot is testing the deployment of an autonomous first-last mile solution in Providence RI. www.littleroady.com
TX	Texas DOT	Willing to describe later
UT	Utah DOT	TSP using CV, snow plow pre-emption using CV, additional CV application development, AV shuttle deployment pilot, data analytics and sharing platform.

14.0 Future CAV/CAV Deployment Priorities:

14.1 What are your currently unfunded, near-term CAT/AV/CAV deployment priorities? Check all that apply.

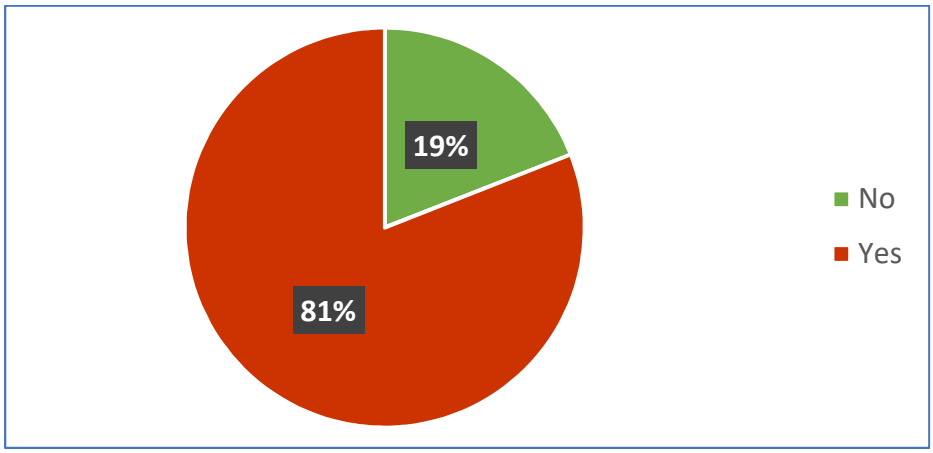
Truck Platooning: SAE Level 1 Driver Assisted, other; Transit: First mile/last mile connections; Transit: Low-speed AV shuttles; Transit: Automated bus braking and pedestrian detection; Electrification: Expanding/building the electric vehicle charging network; Worker Safety: Autonomous roadway construction zone safety trucks; Signing and Striping: Roadway machine readable signing and striping; Use of aerial drones for maintenance and asset management functions; Connecting traffic signal timing information to vehicles -SPAT; Open data/data sharing applications or projects; Other (please specify)

State	Agency	Truck Platooning: SAE Level 1 Driver Assisted, other	Transit: First mile/last mile connections	Transit: Low-speed AV shuttles	Transit: Automated bus braking and pedestrian detection	Electrification: Expanding/building the electric vehicle charging network	Worker Safety: Autonomous roadway construction zone safety trucks	Signing and Striping: Roadway machine readable signing and striping	Use of aerial drones for maintenance and asset management functions	Connecting traffic signal timing information to vehicles -SPAT	Open data/data sharing applications or projects	Other (please specify)
AZ	Arizona DOT									1		
CA	California DMV & DOT	1							1	1		
DE	Delaware											The Department is reviewing technologies listed to understand viability, maturity, facility, support requirements and etc.
FL	Florida DOT		1			1	1	1	1		1	
IA	Iowa DOT							1				
ME	Maine DOT					1	1		1	1	1	
MD	Maryland DOT						1				1	Emergency messaging for vehicles approaching dangerous known locations (like a tight curve, or bridge that might be iced)
MD	Maryland DOT-SHA						1					
MI	Michigan - Road Commission									1	1	

State	Agency	Truck Platooning: SAE Level 1 Driver Assisted, other	Transit: First mile/last mile connections	Transit: Low-speed AV shuttles	Transit: Automated bus braking and pedestrian detection	Electrification: Expanding/building the electric vehicle charging network	Worker Safety: Autonomous roadway construction zone safety trucks	Signing and Striping: Roadway machine readable signing and striping	Use of aerial drones for maintenance and asset management functions	Connecting traffic signal timing information to vehicles -SPAT	Open data/data sharing applications or projects	Other (please specify)
	For Oakaland County											
MN	Minnesota DOT											Priorities are currently funded
NV	Nevada DOT					1	1					
PA	Pennsylvania DOT		1	1							1	
TX	Texas DOT					1	1	1				
UT	Utah DOT						1	1				
WA	Washington - City of Vancouver									1		
WA	Washington State DOT						1	1		1	1	Potential MOD /MaaS applications/partnerships
		1	**2**	**1**	**0**	**4**	**8**	**5**	**3**	**6**	**6**	**4**

15.0 Public-Private Partnerships:

15.1 Are private or public (local, state) organizations partnering with you?



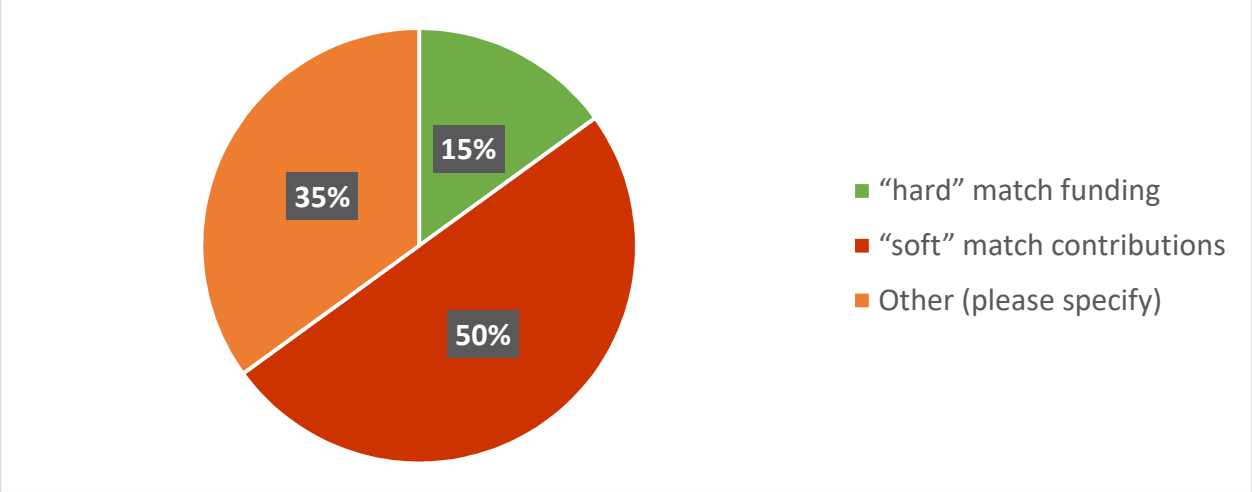
State	Agency	Yes	No
AK	Alaska DOT&PF - Central Region	1	
AZ	Arizona DOT	1	
CA	California DMV & DOT	1	
DE	Delaware		1
FL	Florida DOT	1	
GA	Georgia DOT	1	
IA	Iowa DOT		1
ME	Maine DOT	1	
MD	Maryland DOT	1	
MD	Maryland DOT-SHA	1	
MI	Michigan - Road Commission for Oakaland County	1	
MI	Michigan DOT	1	
MN	Minnesota DOT	1	
NV	Nevada DOT	1	
OR	Oregon DOT	1	
PA	Pennsylvania DOT	1	
RI	Rhode Island DOT	1	
TX	Texas DOT	1	
UT	Utah DOT	1	
WA	Washington – City of Vancouver		1
WA	Washington State DOT		1
	Total	**17**	**4**

15.2 If other organizations are partnering with you, what type of organizations are these?

State	Agency	Type of organizations partnering with
AK	Alaska DOT&PF - Central Region	Private application developers
AZ	Arizona DOT	Maricopa County DOT, The University of Arizona
CA	California DMV & DOT	1. Transit 2. Coalition of High-Tech companies
FL	Florida DOT	Industry, technology companies, universities
GA	Georgia DOT	Transit, county government
ME	Maine DOT	Department of Environmental Protection, Motor Vehicles, Efficiency Maine Trust, City of Portland, UMaine
MD	Maryland DOT	Private, Counties and MPOs
MD	Maryland DOT-SHA	Private companies and local governments, MPO's
MI	Michigan - Road Commission for Oakaland County	Private Consulting
MI	Michigan DOT	Data Providers, OEMs, Automotive Suppliers, etc.
MN	Minnesota DOT	3M and VSI Labs (AV testing firm) several cities for AV testing, and several counties and cities for SPaT and rural CV corridor applications.
NV	Nevada DOT	RTC, Cities, Counties, Universities
OR	Oregon DOT	We frequently work with local jurisdictions and Daimler.
PA	Pennsylvania DOT	Academia industry local governments associations sister agencies
RI	Rhode Island DOT	Municipalities transit authority state agencies
TX	Texas DOT	OEM, ITS, telecoms, universities, cities
UT	Utah DOT	Transit agency, universities

16.0 Types of Current Partnership Organizations:

16.1 If other organizations are partnering with you, how are they partnering?



16.2 If other organizations are partnering with you, how are they partnering? Other (please specify)

Table corresponding to PowerPoint slides 28 and 29

State	Agency	"hard" match funding	"soft" match funding	Other (please specify)
AK	Alaska DOT&PF - Central Region			We provide data to them
AZ	Arizona DOT			Cost and equipment sharing
CA	California DMV & DOT		1	
FL	Florida DOT		1	
GA	Georgia DOT	1		
ME	Maine DOT	1		
MD	Maryland DOT			Allowing us to learn from their deployments, supporting better deployments in our partners (like how to deploy correctly)
MD	Maryland DOT-SHA		1	
MI	Michigan - Road Commission for Oakaland County		1	
MI	Michigan DOT		1	
MN	Minnesota DOT		1	
NV	Nevada DOT	1	1	Both hard and soft matches

State	Agency	"hard" match funding	"soft" match funding	Other (please specify)
OR	Oregon DOT			Policy collaboration
PA	Pennsylvania DOT		1	Soft match and in-kind services
RI	Rhode Island DOT			Engagement of staff and partnership in the research
TX	Texas DOT		1	
UT	Utah DOT		1	
	Total	**3**	**10**	**7**