



COMMONWEALTH of VIRGINIA

AUTONOMOUS DRIVING WORK GROUP

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Autonomous Driving Workgroup

[2025 Va. Acts ch. 498 \(HB2627\)](#) & [2026 Va. Acts ch. 738 \(HB1124\)](#)

August 20, 2026 Virtual Meeting

Minutes – DRAFT

Meeting date, time, and location:

Thursday, August 20, 2026, 3 pm
all virtual meeting (see additional details below)

Workgroup convened by:

Deputy Secretary of Transportation Laura Schewel

Workgroup members present:

Delegate David Reid
Delegate Jackie Hope Glass
Delegate Briana Sewell
Senator J.D. “Danny” Diggs
Virginia State Police (Major Ron Maxey)
Virginia Department of Motor Vehicles
(Assistant Commissioner Patrick Harrison)
Virginia Department of Transportation
(Assistant State Traffic Operations Engineer Mena Lockwood)

Workgroup members absent:

Senator Lamont Bagby
Senator Kannan Srinivasan
Delegate Terry Austin
Delegate Jason Ballard

Attendee Information and Meeting Summary:

This was an all-virtual meeting conducted by electronic communications means, in accordance with FOIA and the remote/electronic participation policy adopted by the Workgroup at [its May 22, 2026 meeting](#). The specific electronic communications means used was a Microsoft Teams Town Hall, accessible via a link posted with the agenda on [this meeting's Commonwealth Calendar page](#). No participation by any member of the Workgroup or the public was disapproved.

The meeting started at approximately 3:01 pm.

When the meeting began, Teams showed approximately 40 attendees. That increased to 59 attendees by 3:14, and there continued to be more than 50 attendees until the meeting concluded.

Teams does not identify attendees unless they use the “raise hand” feature, and only “Ross” (understood by staff at the time to be Ross Grogg of Kemper Consulting, representing Auto Alliance) did so. A few other persons identified themselves when using the Q&A feature; their questions and comments and given identification were repeated audibly during the meeting and appear in the transcript below.

After a welcome from Deputy Secretary Schewel, and in accordance with the posted agenda, the meeting proceeded with the following two presentations, which were given by Dr. Noah Goodall of the Virginia Transportation Research Council (VTRC):

- Automated Driving Systems Safety Approaches
- Update on Recent NHTSA Activities

Copies of the presentations are available online as noted below.

There were pauses for questions and comments from attendees during and after the presentations, but there was no designated public comment period.

There were no votes taken during this meeting.

The meeting concluded after approximately 47 minutes.

Links and Notes

The agenda was posted on August 14, and the presentations were added on August 19, on the [this meeting's Commonwealth Calendar page](#). They continue to be available to view or download from the “Agenda” link there.

The video recording of the meeting has been posted in [the Autonomous Driving Workgroup Meetings playlist](#) at youtube.com/@VDOTLIVE.

The automated transcript generated by Microsoft Teams is below, with limited, post-meeting staff edits shown.

Written comments may be provided at <https://publicinput.com/autonomousdriving>.

The next and final in-person public meeting will take place on August 28, with information to be made available at [its Commonwealth Calendar meeting page](#).

Autonomous Driving Workgroup virtual meeting-20260820_190255UTC-Meeting Recording

August 20, 2026, 7:02PM

47m 20s

SL Schewel, Laura (GOV) 0:11

OK.

I think we are a go.

HJ Heslinga, Joshua (VDOT) 0:16

Yes, good afternoon everyone, hopefully.

You're all successfully joined and seeing us.

It shows we've got 40 attendees at the moment.

If you wish just a reminder for the attendees if you wish to be identified in the list of people who are here and allow us to potentially recognize you when we pause for questions and comments, then you need to use the raise.

Hand button or feature?

And there's some other helpful tips in the instructions that came along with the meeting.

So with that, I will hand it over to Deputy Secretary ~~shul~~ Schewel to get us started here.

SL Schewel, Laura (GOV) 1:03

Hi everyone.

Thanks for taking the extra time to attend this extra virtual session, and as you know, our legislation that enables us asks us to finish holding meetings by the end of August. So we wanted to make sure we had time to fulfill, discuss everything and since we had a lot of safety questions, we wanted to hold this special session on safety.

We're so glad you're here.

Dr. Goodall will be presenting the majority of the meeting.

As Josh said.

I think we'll wait maybe till the end of the first presentation.

And then go back through questions relating to that and then go through the second presentation, the goals of today are to be purely informational.

We will not be asking for any votes, we will just be sharing information about general research, some new developments coming out of the federal government and background on staff recommendations relating to safety.

So with that, Noah, take it away.

GN

Goodall, Noah. (VDOT) 1:53

And then I get my screen up here.

OK.

Thank you.

I'll be talking about the automated driving system safety approaches that we've been developing last few last few weeks.

Just to give a background to the agenda here, first I'll kind of introduce what we're going to be talking about and then provide a review of some recent major studies and automated autonomous vehicle safety.

Not comprehensive, but just a few major studies that have come out in the last year or so and we'll discuss how to compare the safety of babies with human drivers.

And then go through some of our staff recommendations.

I'll try to pause after each of these sections to see if there's any questions, but otherwise we'll just power through. So for the background for why we're here as part of HUV-HB 2627 VTRC, which is ~~the vdo~~ VDOT's research wing, which I'm a part of.

I was asked to describe safety frameworks and benchmarks for automated vehicle deployments, so things like comparison to human driving.

Benchmark selection data collection needed to support these kinds of analysis.

And then a specific operational or environmental areas of concern, that's the broader goal. The goal for today is to share the details behind our staff recommendations on safety standards and data and to answer any working group questions.

And just to kind of give a broader view of the general evaluations that have been done.

There's still a bit of an open question as to the safety of automated vehicles.

There's a lot of data and second point in certain directions, but it's difficult to say with pure confidence.

Whether they're safe, the human drivers overall and I'm using this quote from David Kidd, the Insurance Institute, Highway safety, the Insurance Institute, just kind of research think tank from February.

But that said, a good ~~Ave~~-AV driving in the right circumstances is probably significantly safer than humans.

It's hard to say overall, but in certain circumstances the right technology is probably is. Not all off systems have demonstrated they're good enough, and some circumstances aren't yet appropriate.

Right. Certain types of weather, certain types of environments that might still be too difficult.

So the more purpose this working group the opportunity here is to create permitting and data collection frameworks so that we can allow these good systems to drive in the right circumstances while allowing industry to continue to grow their technology and to grow into more circumstances, more scenarios where.

They can drive effectively.

We think this is possible. I think the data's there.

We have clear definitions of safer.

We have good benchmarks and the models and guides from other States and national organizations.

Are out there support this kind of effort?

So I'm going to go straight into here the review of a few major recent studies of autonomous vehicle safety, just to see kind of what is out there.

One big one that came out just last month from IIHS, the Insurance Institute of Hwy. Safety looked at the crash rates of Waymo compared to human benchmarks. This is always tricky to find a benchmark that's the same.

What they did was they used police reported crashes, which we have many databases out for human drivers isolated by city.

They also looked at Waymo. Now Waymo reports all kinds of crashes to the standing general order to the to ~~nitza~~-NHTSA a lot of those are lower severity than a human crash, like a crash that would be reported to police, even though in the same severity some crashes that.

Humans must report to police.

~~Weimo~~-Waymo might report more just because it's higher profile and people are videoing these things when they get into crashes, so a lot more get reported.

So what they did is they went through all the Waymo crashes.

With the research team.

And try to identify which ones were likely to have been reported. Had they been human driven and use that as their standard and the way they their results here are shown in this table, the PRS police reported.

So police reported crashes per MVMT.

That's million vehicle miles traveled. And so you see the standard there and Phoenix is 1.1 for way MO for humans 4.63 they can go a little further and go into injury crashes.

So about .25 for Lamos and 1.33 for.

Human driven.

And just as a comparison to see how many miles ~~Weymouth~~-Waymo has driven in these cities, it's 28.2 million vehicle miles traveled in Phoenix.

Going down the list, that's the one that's been the longest. Austin's the newest only point 6,000,000.

So 600,000, so you get an idea of the types of statistics where we'll generate when you have, you know, the standard general order crash data and you have miles travel. And So what we'd like to be able to do first I want to give credit to.

Waymo for making this data available.

We don't have this from every manufacturer, but also to be able to show similar sets stats for Virginia's regions, do this competent analysis and Virginia studies where we have operations.

And to point out a few other interesting trends in this way, most don't always drive in the same way that a human might drive and or they might not crash in the same way.

So what we can see here?

Waymo's, the percentage of women's crashes in these low speed limit environments under 25 miles an hour, 48% of their crashes are in those roads with those kinds of speed limits, 45% between 30 and 40.

I'm sorry, less than or equal to 25 and 30 and 40 compared to 7.6% and 31 percent. Of human drivers.

So much more. ~~Weibo~~-Waymo crashes in these low speed roads.

Same thing with different issue with light conditions.

We most are much more often to be crashing in the dark, probably because they're much more often be driving in the dark.

We don't have that data, but we know there are operating as robo taxis. They put out another study about six months ago, less than that three months ago showing, yeah, they, they're actually driving more at night and and got a late night.

Just more like a taxi service than your typical driver is.

And so we see those trends as well.

Another thing I wanted to point to this is a different paper from Waymo they put out last year when they hit 56.7 million miles autonomous driven. And this looks at breaking down those crash rates. Human compared to the ads compared to that's way automated driving.

System by very specific types.

Crashes with a cyclist.

Crashes with a motorcycle ~~V2B~~-V2V vehicle to vehicle.

So these kind of all these subtypes within there?

So what's interesting here is you see the human driven crash rates typically higher than the automated driving system, but what's important is these two right columns to me is these are the certainty you can show here. And so this is on the left, the 2nd to last Col. There.

Is the range of percentages improvement you're gonna get.

Is it range of percentage reduction?

So it says -97%. That means it's possibly it's a 97% reduction.

And looking at cyclists and you go to the right, the next one is -41%.

So the possible improvement here is 97% to 41%.

That's our confidence interval.

We're somewhere in there.

It's a pretty big range.

Most of these it's on both ends of this range.

It's better than you would expect than average. And so that's an improvement, but in some you see, let's see V2V backing could be 100% better or it could be 87% worse, right?

That's the confidence interval we have there.

The reason is we don't have enough mileage and those crashes are very, very rare.

So as we accumulate more miles, as we do more testing, you can make more precise claims about whether this is safer or not safe as a human driver.

So like I said, the the more rare the event, the more mileage you need to make these claims. The more mileage you have, the more specific types of claims you can make.

And we can understand kind of where it's performing well or it's not as we accumulate these miles.

I'll pause for any questions at this point before I jump into the next section.

I can't really see the screen, so if I can read them off to me that'd be great.

HJ Heslinga, Joshua (VDOT) 9:59

Yeah, we don't.

We don't have any just yet, but if folks do have questions, we'll probably continue with the next section here.

GN Goodall, Noah. (VDOT) 10:01

Thanks.

HJ Heslinga, Joshua (VDOT) 10:06

If you do have questions, you can either put them in the written Q&A or you can raise your hand.

GN Goodall, Noah. (VDOT) 10:12

Yeah. And if they come in the Q&A, I'll just give them the next stop here.

OK, how to compare the safety of ABS-ADS with human drivers? OK, so when you're evaluating safety, there's a lot of ways to do it.

There are different types of events you could try to measure.

You could try to measure crashes.

That's kind of the first one people think of that gives you a lot of information about how often things are crashing.

Those are fairly rare though, so you can expand that to look at things that are more

specifically crash surrogates.

These are things that are probably leading indicators of crashes.

They probably scale with crashes.

Maybe, maybe not.

But typically they do.

And they're things that aren't quite crashes but might lead to them in the future.

So things like near misses. You'll have a lot of those for every crash.

Hard breaking that's up in California starting to track. So if a vehicle's breaking very, very hard, that might be a leading indicator of crash risk.

And so it's something you might want to catch.

And then you can expand that even further and get look into non crash related events.

So events that aren't crashes that don't may not may not have anything necessarily to do with crashes, but something you might want to record.

As well as it may be a safety issue. So unanticipated takeovers right when the vehicle has some kind of failure and needs human assistance. That's something you could collect as well.

So this is the main event types.

Within that, there's different other kinds of attributes you may want to collect.

So one is the crash rates, right?

So crashes per vehicle, miles traveled, VMT that will require you to collect vehicle miles travel.

You can get into some event subtypes, not just crash, but what was the crash severity?

Was there an injury?

Did an airbag deploy?

Airbags are in more severe crashes.

It's pretty steady benchmarks. That's something we can do there as well.

Prevalence right offenses occur per mile.

Not just up to crashes, but in any of these issues. And then you can also we could be collecting benchmarks at the same time, right?

How often does this type of thing occur?

And the comparison.

Population, human driven population and then supplemental data like metadata.

Additional data around these events.

So where are they occurring?

What time of day are they occurring?

What are the weather conditions?

What are the like conditions in these situations so we can better understand, you know if if they're occurring more than you would expect in a certain set of conditions that set of conditions may be the issue.

Another thing that that when trying to compare an ADS crash rate to human driven is to control for similar conditions.

So ideally the AB-AV safety, the AB-AV crash rate would be compared to a benchmark that's as similar as possible.

So there's a bunch of ways to do this.

You don't have to do them all, but you can do what you can.

One is passenger cars being compared to other passenger car crash rates.

Passenger cars crash at different rates then say a tractor trailer on freeway. If you don't have professional drivers.

Those are driving very differently in different styles in different places.

Crash rates in the region in question, right?

Cities have different crash rates and other cities states have different crash rates. In other states, the variations sometimes are very small, sometimes they're quite large.

Looking at similar roads, one nationally rule of thumb, non freeways have about double the crash rate of freeways per mile. Freeways are very.

Controlled environments.

You can do a lot of high speeds without a lot of interactions.

So that's another one of AB's-AVs never going on a freeway.

Maybe we exclude the human driven freeway crash rate from that analysis.

Moving on to for AB's-AVs operating commercial passenger carriers like a ride hailing service.

The ride ride hailing service might be a good proxy.

The issues with that are we don't have a lot of data on ride hailing crash rates.

We have none in Virginia because we don't collect that.

We have some preliminary all crash rates in San Francisco.

We would have the any time a vehicle gets in even a very, very minor crash. We have some data from a study that was done a couple years ago.

We don't have that for any other cities.

We have injury rates in New York City, but there's some questions about that as well.

The actually the the definitions of injury they use there, but we don't have it in Virginia.

So it's a tough one to use.

But the reason you want to use that is because the ~~red~~-ride hailing is kind of operating in a similar way as a robo taxi.

Lots of curb pull ins.

Lots of pickups, lots of surface streets driving.

Kind of late nights where there's truck drivers on the road.

So kind of matching up those styles of driving.

Moving on.

So with performance targets, one thing to consider is the driver's impairment.

Now there's we know that drivers crash less than they're not impaired, and we have a good idea of how much less they crash. And that's from an ITA study that most of us run out of. Virginia Tech Transportations Institute, called National Institute Driving study, where they put cameras.

In the cars and put cameras outside looking outside the cars and they were able to measure every single crash that happened.

But they were also able.

To somewhat tell.

How the drivers were acting as if the drivers were driving extremely aggressively or if they were visibly drunk, they weren't taking blood samples, but the driver looked like they were drunk, right?

If the driver's clearly distracted looking down their phone, and so they were able to find that with drivers who didn't do those things.

So drivers that were sober, cautious and attentive, they crashed about 33% less on a per mile basis.

So that's another standard we could use because those are things that we shouldn't be doing anyway.

Several of them are driving impaired is illegal.

Driving aggressively can be illegal.

Abstraction is illegal, and so one argument is to use that potential benchmark there.

Another possible benchmark.

It's going beyond the crash of the average driver is based on some public surveys. There was one study that peer reviewed journal asking people how often do you think cars crash and how often do you think an AV should crash?

For you to be feel comfortable with it and the general answer is about 80% lower was kind of what people were preferring as a possible benchmark.

That's about five times lower crash rate and links to the studies are below there.

When you, after establishing a benchmark, another thing you'd want to understand is how many miles do we need to drive.

How many miles of data do we need to establish that safety?

And this is where the statistics comes in. I'm going to keep this very high level.

I'm not going to show you any math, but I will describe it. So in AB-AV company's crash route, crash rate is not always the whole story. I can give you a couple examples.

The first is because crashes are relatively rare events.

So if I drive 100 miles and I never crash once.

That does not mean I'll never crash. Ever.

Does not mean my crash rate is 0, right?

It means my crash rate is somewhere between zero and it's probably something higher because if, say, I drive one mile and crash does not mean I'm going to crash every single time. I might not crash again for 1,000,000 miles.

Likewise, if I drive a million miles and crash once and the next day, I crash again. That does not mean I just got twice as dangerous over that day.

It just, it's just how these rare events kind of come in irregular orders.

So the idea here is we can use statistics.

Six to estimate the crash rates even when there are a few crashes.

By getting out confidence.

That's our crash rate is between two different numbers, and the confidence can range, right?

We could say I'm 80% confident that this car scratch rate is lower than average.

I can't say it's 90% confident, 95% confident just using the statistics there, that you're

crashing less than the benchmark, the more confident you are, the more miles you need to show that. So I can give some examples of what these mileage counts would look like.

In real life now, there's a lot of numbers, but I'm gonna walk you through it pretty carefully here.

Let's just look at the 1st row there.

Injury plus fatal crash rate.

So that's our metric.

We're saying that's what we want to know.

We want to look at crashes that involve an injury or a fatality.

Per 100 million miles.

The rate there for the entire US is 95 injury or fatal crashes per 100 million miles.

And then I'm going to adjust it for model driving.

So I'm going to take it down 33%.

That's 64 now.

How many incident free miles do I need to drive to establish that we have a we have we have exceeded, we are safer than that model driving 33% reduction.

In to be 90% confident we'd have to travel 4.7 million miles with passengers in the car, and I'll explain that in a second to say that we are without any incident to establish 90% confidence that we're safer.

And to go 95% confidence it's 5.8 million miles with passengers with no injury or fatal crashes.

And you can just work your way down the row there and see all the different types of metrics we're using are using here.

We have police reported crash rate.

Now we have that crash rate is higher, it's 333 per 100 million miles.

But that means, contrarily, you need fewer crash free miles to establish that 1.3 million and 1.7 million for 90th and 95th percentile confidence.

Any crash rate is much, much lower, 200,000 miles or 300,000 miles.

And then I brought in just for comparison, the San Francisco ride hailing crash rate, which is very high 6490 per 100 million miles.

So you don't have to go by 50,000 or 60,000 without any crash, even a minor one, to

establish safe. Safer than that, what we'd like to do is do something like this in Virginia. And so I gave for comparison here.

The Virginia urban City of Richmond.

Their injury and fatal crash rate 149 per 100 million.

So you can see the miles you have to go with passengers without a fatal or injury crash to establish safety at different thresholds.

Virginia ~~Roberts-Buckingham~~ County and then I looked at Virginia, Urban police reported.

And Virginia Rural Police reported now these are just examples of urban Virginia. They range the cities in Virginia, have very different crash rates, rural areas in Virginia have very different crash rates.

But to give an example of a kind of mileage we might be talking about to kind of start to establish these kinds of safety.

And just so you can see what these look like, say we were to go with a 80% reduction in grass rates. The mileage increased substantially.

You can see I'll go back where we started before and choose that top row as a comparison.

It's 4.7 million and 5.8 million on that ~~Topper-top row~~ with injury and fatal crash rate for going 80% safer.

It's about, you know, four times as much. It's about 15.7 million. ~~Nineteen point, 19.4~~ million. So very, very high numbers.

Yeah, that's a lot of miles to travel without any incident.

Injury or fatal, and so they increase across the board here.

Other things we can look at without going beyond crashes, right?

Crashes have kind of already happened.

So if you want to look at preventive measures, things that might be, you might get more data and you might be able to accumulate data quicker, make a determination with fewer miles, you could look at crash surrogates, so events that might be precursors to crashes, so more common.

Than crashes.

That means you get more ~~cystical~~-statistical power.

That means you need more miles to make these kinds of terminations.

Automated vehicles can collect these things automatically.

So one example would be a near crash. I'm not unaware of any jurisdiction that currently collects this kind of data, but this would be something like two vehicles that they're continuing their trajectories. They would have had a crash within a certain time frame, say like half a second.

Right. That would be a near crash.

So that's, there are some definitions of literature, but this has not been done in any jurisdiction of my knowledge.

But that is the type of thing you could potentially collect.

Another one you could collect this hard breaking events.

This is something that California just introduced in their regulations recently and that their definitions on the right here in the blue box, they specifically define it as a total speed decrease of three meters per second or more, and then that deceleration rate has to exceed 5 meters per.

Second, per second for at least half a second, so that's that's their full and that you can read the whole thing there. When that happens, they get reported.

The California thinks these might be leading indicators of crashes or indications of other safety issues.

Now, there are definitely times when you want a hard break to avoid a crash.

I'm not trying to discourage that, and I don't think this is what this is doing at all, but collecting that data over time over a lot of events might be an indicator of some safety. Might be useful as a metric.

I do want to point out on the injury crashes 'cause that's a really common metric.

There are a few things that account for that.

1st is that these are common benchmark because they're much more frequent than fatal crashes. They tend to get reported to the police.

And so we have better data quality.

One issue is that if you're comparing against an automated vehicle without a driver, they're often driving empty for a good portion, and so AB-AV with nobody in it. No one can be injured.

So their injury rate.

Risk is 0.

So you'd want to be able to control for that by looking at maybe only counting miles where someone's in the car, or maybe only looking at the. Excuse me, the injury rates of other vehicles in the in the incident.

Another thing to consider is that late model vehicles and most ABS-AVs are fairly new vehicles have about 3 times lower injury rates in a similar crash.

I need to confirm that number.

I've seen that in the literature a few times.

Due to safety features, so something else to consider.

And then moving on to the non crash events.

So events of safety implications beyond crashes.

This would be something like the vehicle takeover.

I'm calling it so any vehicle that required a test driver, remote operator or someone else to proceed California and their new updated rules requires both driverless and vehicles of safety driver to report these on a monthly basis.

So that's anytime the vehicle kinda gets stuck and needs.

A remote operator, a human, someone to kinda assist it.

So they're by doing that, they're capturing all kinds of events. They're capturing remote operator events. The duration of These Things, lane blocking incidents when the vehicle stops in the lane, any kind of unsafe stopping and it's collecting that first responder interactions is often when the first responder is.

There, if the vehicle cannot proceed.

OK.

Good spot for a pause here. Yes, I'll place you.

HJ **Heslinga, Joshua (VDOT)** 24:13

No. Yeah. Let's pause for a minute.

SL **Schewel, Laura (GOV)** 24:13

Yeah, we have a few quote. We have a few questions.

So I'll start with Delegate Reed's-Reid's questions and I know we have a raised hand.

So on going back to the slide reporting on Waymo, does the crash reporting distinguish between a crash caused by the off or someone crashing into an off, say, rear ending?

GN Goodall, Noah. (VDOT) 24:33

Yeah, the studies have all treated them all the same.
Because fault is, you know, sometimes it's obvious.
Sometimes it's not, so the vehicle's fully stopped.
Sometimes it's easy, but a lot of times even getting rear-ended getting struck from behind can seem like it's the person's fault unless you stopped in an unusual place.
So you stopped very unexpectedly for no reason.
So no, they they it does not consider fault in those things.

SL Schewel, Laura (GOV) 24:57

All right, delicate. ~~Reed-Reid~~ also asked:
What's currently required to be reported to ~~nitza~~NHTSA? I think we get to that in in a slide or two.

GN Goodall, Noah. (VDOT) 25:02

Yeah. Yes, that's that's next section.

SL Schewel, Laura (GOV) 25:06

All right.
Ross, did you have a question?
She allowed to come off mute Josh.

HJ Heslinga, Joshua (VDOT) 25:18

I believe he's off mute.
Let's see if.
Well, I'm not hearing him if he's talking.

SL Schewel, Laura (GOV) 25:33

No. If you type into the Q&A section.

HJ Heslinga, Joshua (VDOT) 25:34

There there is a little bit. Yeah, there is a little bit of a delay too.

SL Schewel, Laura (GOV) 25:39

Hmm.

HJ Heslinga, Joshua (VDOT) 25:40

On these meetings. So.

That's possibly involved here too.

SL Schewel, Laura (GOV) 25:51

OK.

Give it a minute.

And then folks, if you type into the Q&A, we'll be sure to see. Thanks.

Right now, why don't we do the next section and then hopefully there'll be more questions at the end.

GN Goodall, Noah. (VDOT) 26:10

Sure, absolutely backed up there and make it back to where it was.

Here we go, OK.

So moving on to our staff recommendations.

In terms of data, we'd like to collect, here's a table.

This is a lot to read, but I'll summarize it quickly.

Data required and other jurisdictions, and so we're looking at the federal, which is ~~nitsa~~ NHTSA requires in the stand general order that all states are doing all I'm sorry now all states are doing it and AV in any state must report this data to the federal government a lot.

Of it is redacted.

States cannot get this directly from ~~nitza~~ NHTSA.

Except in its redacted form, we've asked for unredacted data.

We we are not allowed to get that. So we have to collect that separately.

And then California goes a bit further collisions.

They're collecting similar data.

They're getting the unreacted SGO, and they're also collecting miles. The exposure, the ~~BMT~~VMT miles and the admitted regulations are doing disengagement reports, performance relevant system failures and breaking events.

And then we Pennsylvania is another state that's doing some interesting things, which I'll cover in the next slot.

HJ **Heslinga, Joshua (VDOT)** 27:20
Hey, Noah.

GN **Goodall, Noah. (VDOT)** 27:20
Yes.

HJ **Heslinga, Joshua (VDOT)** 27:21
Sorry to interrupt you.
I am currently seeing the staff recommendation slide.
I don't know if that's what others are ~~saying~~seeing too.

GN **Goodall, Noah. (VDOT)** 27:28
Oh, you are my my mistake.
It's great.

HJ **Heslinga, Joshua (VDOT)** 27:31
So make sure that's advancing with you.

GN **Goodall, Noah. (VDOT)** 27:32
There we go. OK.
Thank you for telling me that.
Alright, must have been clicking the wrong thing.

HJ Heslinga, Joshua (VDOT) 27:35

Sure.

GN Goodall, Noah. (VDOT) 27:36

Yeah. So that is what we're looking at there.

I'll move on to the next slide.

This repeats a lot of this, so this is what we would recommend.

In yellow, here is the ~~Mitsis~~-NHTSA's standing general order. These types of crashes.

So to describe the crashes that are getting reported here, it's fatal crash, hospital, tree injury, vulnerable Rd. user strike with AAB-AV actually hits a person.

An airbag deployment or a crash in which a vehicle is towed away and other property damage crashes are reported monthly.

The timeline is one day for Fayette, Holidayfatality or injury.

Five days for a ~~tower~~-tow or airbag or monthly for anything else.

They're not collecting exposure.

No, not crash events.

And so we would like an unredacted copy. That way we can know currently as it's published by ~~Mitsai~~NHTSA, we don't know the precise location to any kind of real degree of certainty.

Sometimes we don't get the narrative of what happened around the crash.

We don't get any associated data files, so we request those things California those similar.

So that's the yellow.

The green is thanks for States and so these are we would like everything that California gets and some of the things that Pennsylvania gets. So this would be any collision on a public Rd. with property damage, injury or death.

Limits SEO.

Essentially, we'd like miles.

In the CSV format disengagement reports with ~~DDD~~.

DDT.

Sorry, did I have a driving task performance relevant system failures and hard breaking

events?

To the same standard. Also, individual collision reports annual report data published from not. Sorry, that's the public availability.

And then to Pennsylvania semiannual miles by roadway type and ZIP codes.

So that way we can actually get the mileage by like ~~Citi-city~~ and by like as a small a geographic error.

If you can so that we can make a correct comparison to a human during crash rate for that specific area.

Their draft rules are considering adding annual miles by Operation type, so the vehicle's in autonomous mode, but kinda who is assisting.

Is it a remote driver in the vehicle?

Is it a sorry.

Is it a driver in the vehicle?

Is a remote operator or is it no one, so we'd have it by separated out that way as well.

There's additional data required in other jurisdictions.

So along with this, we want to rely not just on the data we're collecting, Virginia, but if we see something in another state that seems important, we'd like to know about it so that we can address it.

An example I use sometimes is the.

Waymo was having issues in Texas with passing school buses at the Stop R Mount. If that happens in another state and we don't see it in Virginia, I'd still like to know about that and potentially act on it.

So if we could do some information sharing with other states through a few venues, we have established the ~~a~~Automated Vehicle Pooled ~~ed~~ Fund study, ~~Ashton~~AASHTO, American Association of Motor Vehicle ~~a~~Administrators, any informal groups, I think that would be a good way to kind of supplement these data and these.

Findings.

So as far as measuring safety comparisons for the pilot, we would recommend setting mileage targets using the any crash rate comparison with the operational design domain.

For the pilot, it's ensuring all portions of the operational design domain are piloted.

So this means that the pilot can be briefer if than if a police reported injury threshold

are used by using the all crash rate.

We can get to a conclusion much quicker than we can than using the.

Kinda more stringent police reported crashes or injury thresholds cause those events are so rare, if any particular circumstance fails, we can exclude that from the ODD.

Say the crash rate in the rain is not as strong as we'd like.

We can exclude that.

We can allow a few choices to make apples to apples comparisons. Set the right targets based on requested operational design domains. Looking at by ~~Bi~~locality, ~~urban~~-~~rural~~ highway-~~r~~non highway, ~~light~~ and dark.

And also the approval or disapproval would not be automatic.

Based on just the standard threshold, but staff use other context to finalize the permit.

One example would be if we're seeing a lot of really good data in other states, it can make a ton of miles. That could be a factor coming in here as well. Once the permitting is operational, then we move to the any crash in aggregate.

And then by relevant grouping, so ~~nice~~-night, intersections, rural versus urban locality.

Then we can add on police reported crash rate and injury comparisons to the publication once the operator has.

Reached 90% threshold of miles required.

So the idea here is as you can establish yourself with the all crash rate, which is a little, you can establish much quicker. We kind of move on to the more sophisticated kind of more precise police report and injury crash rates once we've accumulate the miles that can.

Start looking at those types of factors.

And then also the plans to adjust the weights for the injury level.

This is the ~~epdo~~-EPDO weight.

So this is where you take a fatal crash rate and accounts for like several police reported crashes.

Right. And so that way we can scale severity to one number and account for the no person miles.

So the next steps would be to update the options recommendation slides to accommodate information from this presentation.

The discussions today and the materials to be distributed before the August 28th

meeting.

OK. And that is the presentation I'll take any questions.

HJ Heslinga, Joshua (VDOT) 33:06

All right, so we have a we have a comment from Ross that I'll read and then we'll also see if we can successfully get him unmuted in a second.

And then we also have another question thus far.

So the comment from Ross was that we should be counting all miles driven, not just when there is someone in the car, because accidents can happen with other vehicles. If we're treating the ADS as a driver and scoring, it's driving.

It shouldn't matter if someone is in the car or not.

GN Goodall, Noah. (VDOT) 33:33

Yeah, absolutely.

HJ Heslinga, Joshua (VDOT) 33:34

So.

GN Goodall, Noah. (VDOT) 33:35

I I want to be clear that was only for the injury crash rates, because if there's no one in the car, they can't get injured.

So that was the thinking there and that's very, very late in the process. So in these early miles, we can count everything.

HJ Heslinga, Joshua (VDOT) 33:51

All right. So I'm gonna temporarily see if we can elevate Ross to his speaking level here while he's checking on whether that has worked for him.

Let me read the other question that we got in the chat, which is from Ben ~~Atu~~ATU Local 689.

What type of data is redacted and why is that the case?

GN Goodall, Noah. (VDOT) 34:12

Yeah. So my understanding is the federal government has very broad confidential business information rules. So companies can redact a lot of stuff. And this is from a Supreme Court decision from about 2-3 years ago. So anything that might harm their business interests is redactable. And it if it goes further than that, things that are might lead to person identifiable information. So some of the specific details of the crash, like which day of the month that occurred, which hour of the day, and kind of which area of the world or which, which Rd. it was on. If you knew that you might be able to piece together kind of what? Specifically, what crash it was from police reports you could figure out who the other party was. They're trying to hide that other things are to protect the business. So what? Sometimes what version of software it was on can be redacted and some things about the narrative can be redacted. If the company wishes to do that. And that's again, that's the data you get from [netsa](#)NHTSA. We can ask for an unredacted copy of that and get all that on our own.

HJ Heslinga, Joshua (VDOT) 35:10

Hey, I think we lost Ross for a minute, so he may still be having issues there.

Apologies for that.

We do have a couple other.

Questions or comments?

1st is from Emma Cleveland.

Did you look into how the ads or off manufacturer can be given a citation for running a light, interfering with a public safety official, et cetera. Just as a human driver would?

GN Goodall, Noah. (VDOT) 35:38

Yeah, the enforcement part of it was out of my purview on this.

I've lived a different part of this effort.

HJ Heslinga, Joshua (VDOT) 35:44

OK.

And then we have a a question comment from Kevin Davis.

Can you possibly elaborate on what you mean by fault being difficult to determine as a retired crash investigator in the head of California's crash reconstruction MAIT program for several years, crash caused is rarely in question.

Further, the notion that a vehicle, even if breaking hard, could be partially at fault in a crash, which it seems was being suggested when rear-ended, is not supported in any crash investigation.

Suppose that I'm familiar with.

GN Goodall, Noah. (VDOT) 36:21

Yeah, I I guess I do want to look at legal fault, but I guess there are.

There have been issues of cars that are kind of breaking.

At high speeds for something, say a, say a shadow in the road, that the vehicle might interpret that this is I guess this is rare.

But this is having a vehicle might interpret as a object, right?

So vehicle could slam on springs very, very hard in the center of the road while, like legally the vehicle's tracking behind might be a fault. I'm not sure we would still say that the excessive.

Breaking for nothing would be a dangerous act, and it's something we want to discourage.

So by not considering fault, we kind of we get out of we don't have to deal with those kinds of issues. It would require a lot of fault termination for a lot of crashes because we're looking at very small crashes that are occurring a lot.

So it gets us around that and that's why I think a lot of the safety studies have not considered fault.

Generally, they're just good call crash rate.

HJ Heslinga, Joshua (VDOT) 37:13

All right.

And then Delegate ~~Reed~~ Reid had a further question.

Will there be model language for how we articulate crash policy objectives?

Provide guidelines for what we'd like to achieve and then allow the agency to draft operational regulations.

SL **Schewel, Laura (GOV)** 37:30

We can certainly make that an option that you can vote for next week.

HJ **Heslinga, Joshua (VDOT)** 37:37

And that's all in the Q&A at the moment. So and we're now.

SL **Schewel, Laura (GOV)** 37:39

Wait, there was one more.

From ATU, did you look into how the ADS or AB manufacturer can be given a citation for running a light?

HJ **Heslinga, Joshua (VDOT)** 37:48

I got, yeah, we got that one.

SL **Schewel, Laura (GOV)** 37:50

OK.

Good. OK, great.

HJ **Heslinga, Joshua (VDOT)** 37:51

I'm gonna start.

I'm gonna start archiving them out of the thing so that we don't hit them twice.

SL **Schewel, Laura (GOV)** 37:54

Perfect. Perfect.

HJ **Heslinga, Joshua (VDOT)** 37:58

But I think we're we're at about 3:40. So probably about time to move to the the second presentation.

GN **Goodall, Noah. (VDOT)** 38:05

OK.

We'll kick it over there.

Let me just get that up.

OK.

So this is.

I just want to give a rundown of recent ~~NHT's~~ NHTSA activities.

They, for the sake of A5 part plan a couple days ago and so it's one of the let Members know kind of what's going on in that front.

Just to recap, in case you're not familiar ~~and it says~~ NHTSA is the National Hwy. Traffic Safety ~~a~~ AAdministration.

So the USDOT agency focused on vehicle safety regulations.

Kind of three big announcements.

They had two recent publications they published in the Federal Register on automated driving systems.

I'll discuss both of those and then they announced a program to develop ~~AB~~ AV performance standards.

So the first thing in the public in the public, the Federal Register was updating and expanding guidance on safety, development and deployment of automated driving. So over the years, ~~Nitza~~ NHTSA has published 4 guidance documents on automated vehicles.

This I have a screen shot here of the second one this this was the last one that addressed audit safety.

It was "automated driving systems 2.0 a vision for safety."

Was written in 2016, published in 2017.

So it's about about 10 years out of date at this point.

And so they are proposing to provide up an update to this.

This is proposing a detailed technical document, greatly expanding that document and addressing 15 aspects of automated vehicle safety.

So the idea would remain a guidance document.

This would not be mandatory.

It would still be voluntary guidance.

The language they're using is "guidance is not legally binding" conformity.

Conformity is "entirely voluntary."

I think the idea is this would eventually inform things in the Federal Motor Vehicle safety standards that might inform more strict regulations, but for now to be a voluntary effort. Currently they publish a list of chapters and they're requesting comments on the proposed chapters, so I'm listing them here.

I won't run through them all for ~~Tom's time's~~ sake. I will say I put the ones in Gray.

Are generally vehicle design focus, so it would not be relevant to the states, but the ones in black would have relevance to state efforts.

Emergency responder interactions, safety cases, and remote assistance, things like that.

So that's all that's going on right here.

Much details about what would be in this, but they're just asking for guidance on the chapters.

Adequate. Are they missing some things? So yeah.

OK, so as far as the impact on this committee, the timing and the scope of this effort, the extent of the guidance still not clear?

Again, voluntary compliance.

And I will.

I will say that I think this effort is still valid because ~~NITZ-NHTSA~~ has recently rejected collecting automated vehicle mileage.

They had a prior thing in the Federal Register where they were asked that directly.

Gonna collect mileage and they they said no categorically.

So I think we're doing is not under undermined by this effort.

The second document they published was about ~~AB-AV~~ framework updates and requests for comments on interim guidance.

This was in the Federal Register at two parts to it.

The first part was requesting comments on ~~Nitza's-NHTSA's~~ interim guidance on general exemptions from the Federal Motor Vehicle safety standards, which I'll explain.

And then the second was just an update on this activities since they made a big off framework announcement.

Last year, so the general exemption interim guidance, what this is this has to do with some peculiarities of how ~~nitza-NHTSA~~ works.

So if you are a car that has been meets all the federal Motor vehicle safety standards and is like legal to drive in the US, you can put it on made driving system on that

without too many without any really any issues. Where are they? Where are things? Getting complicated. If your vehicle does not comply with the Federal Motor Vehicle safety standards.

So these are generally these purpose built kind of unconventional vehicles.

So vehicles without steering wheels.

Vehicles without really mirrors for the driver. Something you couldn't buy at a dealership.

So I'm using the ~~zux~~-Zoox photo here as an example.

This is this is what this kind of guidance would handle.

These are very hard to get approved to sell or manufacture in the US.

There's a couple ways around this.

One, but So what this is doing here is they're posting guidance for ABAV developers on what information to provide when applying, and then the. The idea here is that they would allow.

To manufacture these vehicles that are not in compliance with the federal legal safety standards, through kind of much more simple way you could apply for an exemption that'll help you know what's needed in the exemption.

And most importantly is you don't have to reapply every time you change anything about the vehicle or its operational design domain.

It's kind of almost not quite a blanket approval, but just a the approval can be modified throughout the process without restarting the entire application process again.

So the idea is just to make things a little simpler for these uncommon vehicles.

To get approved in the US.

The other activities they were kind of running an update on since last year. Last year they allowed domestic automated vehicles with these uncommissioned designs to be approved via the simpler import process.

Because it's actually a little easier to get these things imported from foreign countries, they said.

OK.

Let's use the foreign country rules and it also applies to domestic vehicles.

So they're talking about how that's been going.

They have revised the AV crash reporting standards under the standards in our order,

they eliminate certain low severity crashes. One that comes to mind used to be any contact with a vulnerable Rd. user.

A pedestrian was reported a lot of times. Pedestrians go up to an ABAV and kick it, and so they don't have to report that anymore.

It's only when the ABAV strikes a vulnerable Rd. user.

And then there are several other.

Revisions there they also initiate revisions to the Federal Motor Vehicle safety standards to address these standards that assume human drivers. So things about having river mirrors, having turn signals, trying to revise those.

To a lot to make them more adaptable to automate driving systems.

OK.

So that's the two things in the Federal Register.

The other announcement they made last month was about automated vehicle performance standards development.

They announced a partnership with SAE Formulary Society of Automotive Engineers.

Now it's just SAE as a industry, technology, ~~sensoria~~ consortia, ITC and so ~~NITZA~~ NHTSA will fund a three-year \$5,000,000 ~~niche-ascend~~ A2SCEND.

Sometimes it's called ~~A-to-send~~ ACSEND.

In some documents consortium and the idea here is that this group would gather data.

To accelerate the creation of AV performance standards and to create a single national standard for AV safety. And so it's kind of like if you hit these requirements, you would be considered safe. Two big important things. The extortion members have not yet been announced.

Is they've published about one paragraph on it and the administrator gave a speech at a conference about it.

So we don't have a lot of details about this yet.

The recommendations would still need to be adopted via administrative actions to become requirements, so this would just be kind of recommendations.

We start to go through the rule making process.

The timeline they gave, they thought they could have recommendations within a year and that would start going through the rulemaking process.

But you know, who knows if that timeline will happen? But that is the that was the other

stated goal there, and that is the updates from ~~Nitza~~NHTSA. I can take any questions anyone has now.

HJ Heslinga, Joshua (VDOT) 45:29

We don't currently have any in the chat.

I do want to make sure the work remembers who are present.

Feel free to unmute yourselves and ask anything you may want to ask while we're waiting to see if anything shows up.

While we're waiting a little bit next Friday the 28th will be the final in person meeting of the work group. We'll be back to the prior technology set up of public streaming by YouTube and then an in person meeting at ~~Vedas~~VDOT's Lockwood location. There is a ~~common~~.

Commonwealth Calendar page for that and keep an eye on that in the days between now and then.

For posting of the agenda.

And materials.

Still have nothing in the Q&A at the moment. We have had 50 some attendees watching throughout the event, so hopefully this has been successful for all those people.

SL Schewel, Laura (GOV) 46:51

Thank you all for coming, and please keep submitting your public comments before the meeting on the 28th. We really appreciate them.

HJ Heslinga, Joshua (VDOT) 47:01

All right. At the end of this event, teams does generate the recording and transcript that should be available to everybody when this ends.

And we look forward to seeing you next week.

● stopped transcription