A Case for Direct Vision

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SPEAKERS

Don Fisher, Kate Fillin-Yeh, Dave Braunstein , Keith Kerman, Eric Englin

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D **Dave Braunstein** 00:03

That's our cue, get started here. Welcome everybody to this session. It's called a case for direct vision. My name is David Bronstein, and I'm the president of together safe roads, I like to thank Transportation Alternatives for hosting, as usual and incredible conference. I've personally attended the conference for the past four years. And always, always appreciate the content. It's just an incredible opportunity to learn about what's happening in the space and, and bring that into our work together for safe roads. So just real quickly, as I said, my name is David Bronstein President together for safe roads, we are a global road safety coalition. So we're a group of businesses that have chosen to get involved in road safety initiatives for the betterment of society. And we partner far and wide with cities and other organizations who are also involved in the space trying to add value in our efforts to save lives. So it's our pleasure to be here today hosting this session on direct vision, which is not a topic I think, that is talked about often enough in our circles. And we hope that this will be a robust discussion about that, and you'll leave the session, being convinced that direct vision is in fact, an issue that we need to address with more in a more systematic way. So just for background, now, what we're going to talk about today is truck design, essentially and visibility. And it shouldn't be that trucks are designed supposedly, but in fact they are and cab designs are something that we we are going to talk a lot about today. And our premise is that of private and public sector fleet leaders come together, we could make high vision cab designs a universal standard around the world. So we would like to pose that challenge to everybody today to try to get involved in in some new efforts to make direct vision a more more of a global standard. So with that said, I would like to introduce our panelists today. Joined by Kate fill in the from NACTO. Kate is the Director of Strategy NACTO. And there she leads a variety of strategic and programming initiatives and programs that help cities address climate change. And she also oversees Naxos guidance on key safety topics such as legal downsizing, speed limit setting and bike lane design standards. She also manages Naxos efforts to advance racial and economic equity through better bike share partnership. And she helps snack those 91 member cities developed guidelines for regulating share micro mobility, and she's also involved in managing the organization's agency accelerator programs help cities structure themselves to success. So welcome Kate. Our second panelist is Keith Kerman, Keith, many of you are probably familiar with who's the chief fleet officer and Deputy Commissioner of the Department of citywide administrative services in New York City. Keith is he was appointed to his position in October 2011. He operates helps to operate the city's large municipal fleet, which has currently has over 30,000 vehicles and 80,000 fleet operators and 2000 staff engaged in the fleet service. For those who don't know annually in New York City spends nearly a billion dollars in fleet operations, including acquisitions, repair fuel services and collisions claims. He leads York City's fleet representation efforts on Mayor de Blasio his vision zero initiative to eliminate traffic fatalities in New York City focusing on fleet and driver safety. Under Keith leadership, New York City has trained almost 70,000 drivers in defensive driving installed over 59,000 vehicle safety systems including surround cameras,

pedestrian collision warning systems and backdrop backup alarms. This also includes near North America's largest truck side guard rollout as well as the largest North American telematics program for municipal fleet. He also has managed the city's partnership with the federal fleet with the D O. T. The volti Center, which had resulted in publication of a study about vehicle side guards as well as the city's first safely Transition Plan and the updated safely transition plan that came out recently. Welcome Keith. And last but certainly not least, we are joined by Dr. Don Fisher is a principal technical adviser to both the center at the United States D O. T. Don, prior to becoming principal technical advisor served as affected fellow wolfy sound for two years. Dr. Fisher joined the University of Massachusetts Amherst in the fall of 1982. He became the head of the Department of Mechanical industrial engineering in 2009, and served in that capacity until August of 2015. at UMass Amherst, Dr. Fisher was a principal investigator or CO principal investigator on over $31 million of research funding. Dr. Fisher's current research interests are in human factors and surface transportation, especially vulnerable road users, automated vehicles distraction and training. While toward the center. He has done research project sponsored by the FMCSA. It's a, the FRA and the FTA. Welcome done. So without further ado, I'm going to turn it over to Kate, who's going to kind of set the stage for our discussion. And, you know, she's going to sort of give us the background on why we're having this discussion today. Over to you, Kate.

K Kate Fillin-Yeh 06:19

Hey, thank you so much. I'm really excited to be here. Can we get some slide? Awesome. So very exciting to be here. As Dave mentioned, my name is Caitlin A. I'm the strategy director at NACTO. And we represent the transportation departments and the transit agencies in about 91 cities across North America. So topic here today is the dangers that large trucks pose to people biking to people walking, and how direct vision and sort of other high vision truck designs can help change that. But I just wanted to set the stage with a little bit of basic context. This is 2017 fatality data nationally. large trucks are disproportionately dangerous. They're about 4% of the vehicles that are moving on the roads. But they're 7% of pedestrian fatalities. 11% of cyclists fatalities. 12% is of a car occupants fatalities. So again, they are disproportionately injuring and killing people on our roads. And the obvious question is why. And so they're a couple of different factors at play here. One is that the size basically means that they can't move or as easily around things in their past, their weight means that they stopped slower even when they do see things. But sort of even before we get to those two factors, the kind of limited visibility that drivers have from the driver's seat of a conventional cab means that those drivers have a longer reaction time than the average driver. And that those seconds can cost can cost lives. And that brings us, of course, to the conversation here of direct vision. So as sort of the direct vision itself is a vehicle design standard. It was developed by Transport for London to measure exactly how much a driver can see from the cab of their truck. And so it's a road safety tool that they're at least in London, implementing via a star rating system is one to five TfL currently requires trucks operating in the greater London area to have at least one star. And then they're slowly progressively increasing that requirement over time. So the two stars are required by 2024, etc. To allow fleet operators to phase in those upgrades. What that means for London for the streets in Greater London is that it's taking it from trucks that look something like this, although I will admit that this is not London, to trucks that look a lot more like this. So I want to call attention to a couple of those key design features that are at play here. One is we're talking about a cab over design, which means that the driver themselves is closer to the front of the truck, they don't have that long bodily nose thing in front of them that blocks addition, the driver's seat is substantially lower, which gives them substantially better visibility, particularly for things that are directly in front of them or over to their sides. And actually, incidentally makes getting into the truck easier. It's easier for folks, which is a whole other interesting conversation about the role that the labor and labor sector can play in encouraging this technology to exist. And then the last thing and by far not the least is the expanded windows on that front. And on that side, which again, substantially increased visibility. So as I said, here's the view from the outside. Here's the view from the inside of the tracker with a direct vision, which kind of I think says it all, but it's really a fantastic you know, view or just the full panorama of of the street that you're seeing when you're driving from from one of these vehicles as opposed to a conventional vehicle. Does it work? Does it increase visibility and some of the other safety strategies that we've got things like cameras, mirrors hunters? The short answer is yes, direct vision does work. It substantially increases visibility versus the conventional calves. And it's actually substantially better

than a lot of the intellectuals that We often try to shift into the market, drivers use a direct division cab or a stopping. According to TFLs data about twice as fast as those relying solely on cameras, or mirrors, there should be other things that they have to keep looking around and checking. And the other interesting thing is that they do so even when they're distracted. So a distracted driver in a direct division cab tends to outperform of the driver who's paying attention. In a conventional truck, again, the ability just to look and see, as opposed to having to check five different mirrors in order to look and see as a pretty substantial, there's a substantial difference there in visibility, and then reaction time and then safety. Before I want to move on, I actually want to call attention to a kind of a seemingly innocuous policy choice that I think anchors the safety benefit of the dress vision standard. And that is who TfL shows to us as the typical person that a driver has to be able to see in order to get that one star rating. We all know that when you build a model, you get lots of options. And the really blunt reality is that most often the sort of typical choice when we're trying to build a who can AC model is definitely we're doing the United States, as you sort of pick your standard six foot tall guy as a design user, and I call it a day. But taking somebody who is definitely nowhere near six feet tall, there are a lot of people who aren't six feet tall, you know, half of all guys, you know, most women, kids, even wheelchairs, all sorts of things. And so TfL shows, and this is there was a fifth percentile Italian female, because, quote, If the head and shoulders of the smallest European female can be seen, then the whole adult population of Europe can be seen. So this is a targeted universalism approach to road safety. And what it means is that 99% of the population of Europe of the adult population of Europe can be seen by a driver, even in that one star vehicle, and they're only going to get better and more stringent on those restrictions. And that's great. It's an equity approach. And that's one that's really sort of sits at the heart of vision, zero philosophy, that essentially says, we need to design for safety for everyone. And that means starting with, starting with the most vulnerable population. And I think it's important to underscore that because it needs to stay core to whatever we end up doing here in the United States. So now, what lots of things to do. The sort of conundrum we face right now is that there are lots of companies out there that make direct vision tabs and retrofit options, you know, like, like, window retrofits into doors. But these are typically not easily for sale in the United States. So here's an opportunity, I think, for us to make a bunch of changes. One of the first things to say is that NITSA, who is the federal agency, who is responsible for vehicle design standards in the United States, is currently accepting comments on their safety research portfolio. And this would be a great time for everyone to tell them to study direct vision comparatively, for both trucks for SUVs so that we can actually start talking about what a national vehicle standards around vision would look like. I can drop the link into the chat or see somebody can drop a link into the chat. I think I've lost it. So yeah, so anyway, they're accepting comments on their research portfolio. The second thing, and I think Keith is going to talk about this substantially more, so I'm not going to is it city governments have a really important role here to play. As he said, There is a ton of money that city governments use each each year to buy vehicles, and that is purchasing power that we can use to drive the market to make sure that these vehicles are available, not just for for government fleets, but for every vehicle running on the streets. And then the last thing to say is that we as citizens have a huge role, of course, in asking and asking everyone's to do these things to really think about visibility, and to use their dollars wisely in ways that can influence safety for all of us. I'm going to wrap up here on a chart of firetruck design. That is a report that NACA developer Developer Center a few years ago, and we were looking at firetruck design looking at direct vision, vision and looking at vehicle downsizing. The columns in white are the vehicles that are available in the United States. The columns in blue are the vehicles that are available in Europe. And if it's not readily obvious, the short answer here is that there is a lot of better stuff on the market than what we currently use. Vehicle downsizing, of course, is a different topic than direct vision, but they are clearly related small vehicles tend to have better vision. And there are also some other really important clear parallels here. Namely, that there are really easy ways to change the vehicles that operate on our streets to make our streets safer. And then this is a really important part. There are other better vehicle designs that are currently on the market today that we are not using in the United States. And we should be. So again, this is our time, ask your government to use their purchasing power to drive that market toward better and safer trucks, emergency vehicles. And also again, submit your comments to NITSA because they need to hear from us that there are things that we want them to study, like direct vision that can help create a national direct vision standard for the United States. So with that, I am going to wrap up, let me see if I can drop this into the chat. And I will hand this over to.

K Keith Kerman 15:34

Okay, thanks, Kate. And thanks, David wasn't sure if we're gonna do a transition there, but I'll just get going. So I'm Keith Kerman, the chief fleet Officer for the City of New York and a deputy commissioner over the Department of city wide administrative services. It's good to be back with transportation alternatives and visions your cities have presented many times. And they really are great forums and a great chance to stay focused on safety. So Kate, gave a great lead in to this topic. I'm going to talk about what we're doing, and a little bit more about the development of the marketplace. So we run the largest municipal fleet in the United States, we have 30,000 vehicles that are operating every day in the city. We've been part of Vision Zero for all eight years, trying to focus on fleet on fleet safety, and vehicle design. We've had four core elements of our kind of vision zero effort, I'm mostly talking about the first one improving the design of vehicles. And trucks, we really want to be a partner to do t as DoD tries to redesign the roadways in the streets, we want to focus our efforts on the vehicles themselves and trucks themselves. Sometimes you can make changes to the vehicles stock more quickly than you can to the roadways. Since there's a very standard replacement cycle for vehicles. We also look at changing driving behaviors, driving performance through data we do operate. And I'll talk a little bit more about the largest public telematics program in the United States of life tracking of vehicles. And of course, partnering far and wide. Partner today is about that. So working with the United States Department of Transportation, both Bay center who you'll hear from right after me, we developed a safely transition plan. And this is not just a document for our fleet, it's kind of a mandatory document for our fleet it guides and structures, our fleet acquisitions and our buying to make sure that safety is first and foremost and required. It's also a model for other fleets, other public fleets, other commercial fleets. And we really need that and I'm going to go into a little bit more why. But we've looked at safe design for the full scope of our fleet. And we operate 160 types of vehicles, we have a very, very complicated fleet, and there's just something operating of every type. So if we can make moves to safety, everyone can because we're operating something of everything. We've already implemented about 63,000 safety improvements to the fleet, backup cameras, surround truck cameras, telematics truck side guards, which I'll talk a little bit more heated mirrors, Driver Alert systems. I mean, we're pushing every place we can push, obviously have to prove technologies, make sure they work. We're trying to move the marketplace. I'm going to talk a little bit more about that because things like intelligent speed Assist is something we're trying to develop. But we really need to see more options. This is the formal safely transition plans a public document, we broke into three tiers. Tier one is what we mandate where the market provides it. And so some things forward collision warning, automatic emergency braking are required in sectors and we do not bid a new contract for vehicles without lease items being there. And Eric Richardson who's part of the conference today, part of his job every time a city agency tries to buy a vehicle or truck, he there's a checklist to he make sure this checklist is implemented. Tier Two, our best practice technologies, things that we are out in the market we think are viable. We're not ready to mandate them, but we're implementing them. So one One example is car cameras. We have telematics and all the vehicles. We are piloting cameras. We haven't mandated that but we're really interested in the potential for for cameras. And then tier three are exploratory technologies. What should we be trying out? What should we be testing what's new in the marketplace? Intelligent speed assistance is one we're really focused on and I wish we could make more progress. This is kind of just a schematic of what we've been investing in. But I want to talk about side guards for a moment one because it's in the news, but two because it's a precursor to the topic of the day, which is the Hikvision trucks. So we launched the truck side guard initiative in 2014. We did a report with us do T vo pay. At that point, no one ever heard of a truck side guard in North America. We didn't have any vendors for truck side guards in North America. We have built this program we now operate the largest sidecar program in the US we have over 4000 vehicles with side guards. We've got every agency done except sanitation, which is 75% done and moving along, um, the our largest trucking operation. We've extended that to the commercial waste fleet. We the City Council just passed a new law within the last few weeks to extend that to contractors of the city, over 5000 potentially impacted city contractors. And we're very excited about implementing that law. So we're moving in creating a side guard industry. What's important here is we had to create this industry going backward. Kate mentioned there were no truck side guards, suppliers, no one you know, while these are standard in Europe, they're very uncommon to non existent here. So we had to create the marketplace we had to literally explain to vendors what truck sidebars were and we wanted them, we had to certify them to how to install them, we now have four to five truck installers and four to five different side guards the actual physical barrier in place. So we're now in a

position to grow this initiative. Right, but we had to create the marketplace for it. That's, you know what, now as we get into high vision, one of the challenges. So going into, we know the visual obstructions for trucks are incredibly difficult. You know, in fairness, it's a tough job to be a truck truck operator. These are critical roles, they're getting us our goods and services are picking up our garbage, they're performing absolutely on fire response roles that we all need in the city. And it's it's not an easy job, and these obstructions are real. So part of what we want to do is make it easier. One thing we announced earlier in the year, we're doing trucks around cameras. And we're installing them on trucks, we're about 1000 trucks with them now. And we're continuing to do those installs every day. And that's a simple camera to try and provide a vision of all around the truck. And so that's one additional tool that we're rolling out. When we in, there's some more links here that you can look at on that initiative. But now getting into the better way to approach it is high vision trucks, eliminating these visual obstructions up from there can be 25 to 30 foot line of sight. When you operate a truck as a normal hided driver, you simply cannot see around you, right. And we obviously have mandated mirrors, truck mirrors, around the trucks. But you know, that is the mirrors are not the easiest to work with. Right? It's certainly important tool. But you know, monitoring the mirrors and seeing around them is really a way to kind of mitigate the fundamental problem, which is the engine is blocking your view. And so we went, and we did work with us do T bow pay on this subject as part of our safely transition plan. So we've already announced it's our policy to procure Hikvision trucks, we know we want them, we know it safer. We've lived this. And we announced that back in November 2018. And certainly some of some of our fire trucks or sanitation trucks are versions of Hikvision. Now, I'm not perfect versions. But here's the big challenge. And Kate mentioned to it. And this is actually really what I wanted to leave you all with. We know this is a safer truck. Interestingly enough, as we make the transition also to electrification. Electrification offers a new opportunity to redesign the truck. You don't have an engine and a transmission. So it doesn't have to be in front as it is in a conventional truck. A lot of electric trucks, the battery packs are under the undercarriage. They're in different parts to the sides. They're in different parts of the truck. So interestingly enough, electrification offers a redesign opportunity to also mirror in with high vision. Here's a high vision truck company that operates as much in Europe as in North America, who presented at our fleet show a couple weeks ago. Really nice sightlines similar to what is being implemented in in London. The big challenge we have now is we know we want these trucks, we need to see the truck industry moving to supplying that. So in that's why I want to tell a side third story because it's the same story, but a much harder challenge because now we're not talking about a retrofit technology is simple technology combined. We're talking about the redesign of the truck itself. But we know it can be done. Many of the manufacturers most I would daresay, who sell in Europe sell here too. So it's not like they don't know how to supply a truck that has high vision, it's that they're not hearing the demand from their customers in North America in the States. And that's what we need to change. And that's what we need all of your help to do. We're a big fleet operation, but we're not that big. We're not going to change the design of trucks throughout the US alone, we're in a need every time a Volvo a Freightliner a mack call him out and afford a GMC when they go in and meet with corporate in public fleets. When they hear from you all and from the advocacy community, they need to hear that we want high emission trucks, they know how to make them, they're already selling them. They're not selling them here. So and this is a basic common sense thing to remove these these difficult visual obstructions to make it easier to be a truck operator in the city. So that's what we're really asking all of you, Volpi is going to come up, they're going to talk more about the engineering and their analysis on on high vision, but we already know it. Why do we know it? And this is I'll leave you a reminder of why this matters. I've been in city government for 28 years, and we've gone through a number of these horrific truck events. We had one this week, we had actually not had a sanitation truck, major collision, and well over a year and a half. But you know, the risk of there and we had one on Tuesday, um, really horrific event. We've seen these events before. And we wonder how could it happen? How could two children in the slide I'm talking about be hit by these trucks. And I, I spent a lot of time on these specific events and what happened and, and I know the details of how it happened. And fundamentally the truck drivers couldn't see the children. I mean, the reality is, these were not people who set out to do these things, or whatever it imagine million years have wanted them to happen. This is about visual impairment, they, you know, 25 to 30 feet is a lot of a lot of distance. And when you're doing a truck operation, and there are different reasons each event happened in different sightlines. But fundamentally, they had no concept that these events were going to happen because they could not see them. And so high vision trucks really could solve not every problem, but they could really dramatically make it easier for truck operators operate. And and you know, I think a

lot of these events would never happen. Not every event, but not a huge percent would not happen if we had a so thank you for for listening and pushing and prioritizing this issue. And I will leave it over either to David or directly to Donald. Yeah, done. You can take over a year or two.

D Don Fisher 28:08

And I'll share my screen to get us started here. Okay, great. Thanks. Thanks, sir. Yeah. We're going to try and do a two step. I'm going to speak then Eric's gonna speak then I'll share my screen. Hopefully it all works out for your patient as we go through. I'm sure it's gonna work. Great. Thanks. Okay. I want to thank both Kate and Keith for their powerful examples. Why direct vision is so necessary and addition, examples of countermeasures. We want to talk about how to optimize those countermeasures. Countermeasures exists for existing fleets. There simply isn't the money to go out and purchase a whole brand new fleet of direct vision high vision vehicles, what can one do with the View app we're going to describe that will make most effective countermeasures for existing fleets. The app we're going to strike describe can also help a purchasers fleet managers or select among different high vision vehicles, high vision better than low vision, but not all high vision vehicles are necessarily created equally. So I want to turn the floor over to Eric, a colleague from the Volpi center, who will present you with the View app which I think can help you again, decide what countermeasures are best to take with one tool help you decide what account manager best to take with existing fleet. And second, when you purchase a new fleet vehicles, what new fleet vehicle might be the best one to purchase. Eric go for it.

E Eric Englin 30:04

Perfect. Yeah, so just sharing here, this is the view app just as a quick overview. Other others on the call have talked about direct vision. And the whole purpose of the View app is to be able to understand for specific vehicles, or potentially for entire fleets, what your visibility and direct vision looks like. And the View app has different ways for you to visualize and understand some of those direct vision or visibility standards that I'm going to run through as well. And the idea behind this is that it's also connected to a database. So when different entities, different agencies enter their vehicles, they're adding to our shared knowledge of specific vehicles, and what their visibility looks like. So this is a way for us to be able to crowdsource out this information and get a much better set of data at the end of it. So just to quickly run through the View app, this has been a few years in the making. It started out in 2018, where the Volpi center works with Olin College, to think about more of the theory of what a visibility score would look like. And from 2019 to 2020, we put this into more of a spin out web application. And a way it place where you can go on to anybody around the world can go on to add in their vehicles and get some kind of output. Over the last year, we've been getting a lot more user feedback in trying to get more agencies like New York City do T involved and have them start using this and bringing it into their fleet management, and different decision making. And along with that, we wanted to have more better visualizations, and capture more data. Looking beyond, we're going to keep doing a lot more of that process more iterating and understanding what different agencies are looking for and how it can be most useful. But I wanted to share my screen really quickly just to go through the actual app, hit some of the high points. Is that coming through for everyone? Or am I still sharing the presentation? I can see see vehicle blind, you'll see what does that see vehicle blind zones with the kids in front? Okay, so it is showing. So this is the actual view app here. The main purpose is to be able to add vehicles. So if you are an agency you want to go on this is the main page where you would add a specific vehicle. And what that really looks like is you sit in your driver's seat, you take a panoramic picture, you get a couple of measurements, and then you enter it in and you get a score. And so this there's a process for this, we have some information on here. But we are definitely happy to have any kind of meeting with any agency that is interested and would want to go through a little bit more what it looks like to enter a vehicle into this database. I in going over to the visualized page. So right now we have about 100, a little over 100 entries. And this is a graph showing the different visibility scores. So when you enter into the database, you'll get a visibility scores starting point in this shows on the y axis, the overall visibility, it's a percentage from zero to 100%. And then on the x axis down here are the different body classes. So each dot represents a vehicle that was entered. So this one

that I'm hovering over is a Kenworth t 100. Also a mack granite. So each of these is a different entry. And we have a lot in the commercial truck, and a fair number in the SUV in the passenger as well. And this table is connected to a URL. This figure is connected to this table beneath where you can do more searching. For instance, if you wanted to look at, say a seagull, you can see these are all of the Dennis Eagle entries that we've done. And you can also go to details to look at specific visuals that come out of this. And the one last thing to plug in with this is that on this specific age with the more detailed visuals, you can get all of these by a number of different users. We know that this tool could be used for a lot of have different specific issues and problems. And so we wanted it to be as widely used as possible as applicable to as many groups as possible. But you end up getting a visualization on what it frontline, some looks like what a passenger blind some looks like, and how many in this case, elementary school children fit in there. And then this is an overhead photo of where blind zone where elementary school children would be fitting into these points on so relatively striking 126 elementary school children fitting into the blind zone of the den a seagull, which is a high visibility truck, lower visibility trucks have a much higher number. And it starts to be even more striking. And you realize just how difficult the problem is. But I'll leave it at that. I think I'll hand it over to Don to continue sharing. But the general idea is that this tool is out there, it's freely available. And we at the copy center are happy to have any follow on conversations for different cities that might be interested in looking at their own fleet, and adding some of that information into this database.

D Don Fisher 36:20

Thank you, Eric. Um, clearly, blind zones are a problem. I noticed in the chat, that indeed, someone asked whether the SUVs had some direct Asian makes out there, I don't know, we that might be something we talk about later. But there's obviously a problem. And all of you are aware of the differences between the indirect visual aids like the side mirror and the 360 camera, on the one hand, and on the other hand, the direct visual aid, which of course is a lowered window, which allows you to see directly the bicyclist behind you, um, indirect vision aids are now many. And they include the crossover mirror the European class, six sideview mirror, they include the convex mirror, which allows you to see more broadly, they include this, what's looked down mirror proximity mirror, which allows you to see vehicles near you. They include this Fresnel mirror, which again allows you to see around obstructions. The question in these cases really is which of these various systems is better. Now, if you take it at face value, a system with mirrors or cameras is going to reduce the blind zone volume. But as both Kate and Keith said, The time it takes you actually to detect a vulnerable road user could be longer with the systems than perhaps it is a low vision cab without these mirrors, I mean, in one case, you can rock and roll to get the side view. And the other case, you have to sample lots of different mirrors. Not a lot is need is known about whether a low vision cab without these direct vision aids is going to give you better detection times than one with a low vision cab with these indirect vision aids. So how can the View app help you in this situation? Well, it may be hard to pick up here. But here you see the side visibility score is 83%. The front visibility score is 66%. Given that indirect vision aids create something of our problem, if we knew the crash risk was relatively low and the visibility score was 83%, we not might not put a crossover mirror in foot, we might be able to see well enough. But if that if it was a lot lower, if it was down around 66%, then we might put the crossover mirror in front. Similarly, if the side visibility were up around 83%, then we might not put it in the rearview mirror. Whereas if it was down around 66%, we might put in that rear view mirror. So because the View app gives you the different visibility scores or blinds on volumes, you can begin to decide about which of the countermeasures for existing fleet the way of indirect vision aids might be best. Well, now let's talk a little bit about direct vision. As Kate has already said, of the response time with direct vision, as opposed to indirect vision in a low vision cab With no indirect vision aids is about a second longer. And indeed, it's true that, in general, you want direct vision over indirect vision or low vision, but no mirrors whatsoever. But that doesn't mean all high vision cabs are created equal. So these are just example scores. But let's say this cab on the left, has 82% in front and 60% on the side, versus if you compare the front to front, here's 87 versus 82. Here's 83 vs 60. So the only point here is not that these are the scores in general for these vehicles, but these calves are going to differ in the amount of visibility they have to the front and the side. And you really do need some way of measuring that not just purchasing without thought given to the visibility volume on the sides and to the front. Perhaps even more important at one level is the relation between crash risk, and the blind zone violence of the blinds Oh, that buy him up around 100%, the crash rates might be

100%. If we're down around 0%, the crash risk might be zero. But notice this huge drop between 80% blind zone volume and 70% blind zone via whereas a smaller drop between 70 to 60%. When you're involved in a cost benefit analysis, you might be able to buy 100 trucks Hikvision trucks that brought you from 80 to 70. But only 10 trucks that bought you from 80 to 60. So you really do need to know something about the relation between the blind blind zone volume and the crash risk. So we want to do an experiment where that was the case. As many of you may know, it was surprising to me when I first discovered this, a front over crashes are really the most consequential. And here are two cases. In this case, you'll see that this individual in the red always was below the visibility of the driver. In other words, they were not above either the side window or the front window. In this second case, the pedestrian starts out and through the side window will be visible, but then gets hidden right there. So what do we want to do, we wanted to test case to the one you just saw, will the driver of a low vision truck who can see pedestrians crossing from the left it could be from right crossing from the left, notice that indeed, one of those pedestrians failed to continue crossing for whatever a high vision cab would be a situation where indeed, the driver and these cabs are stopped at the same place with respect to the crosswalk where the driver could see, as you can see that an individual a small individual misplace a boy and a red shirt had stopped. So when we did the actual analyses in a driving simulator, we found that only six out of 45 with the low vision cab detected the pedestrian, whereas 45 out of 45 with a high vision cab, and I'll end with this note. And indeed, it does what Eric and we have suggested can be done all along, it connects your visibility score with the likelihood that you'll strike a pedestrian. So here we see 33 36% Visibility score and a pedestrian detection of 13% whereas we see 78% Front visibility score and a pedestrian detection of 100%. So I want to end that EMI presentation saying that indeed, it's important, at least in our sense, that one have a standard which one can use to choose the counter measures in the existing fleet which have the side view front view 360 cameras do what and then when you're going out to push the purchase the high vision calves to decide which is going to have the most visibility and to connect all of that to crash risk because that's ultimately the bottom goal. So with that, I'll turn it back to Dave I think we're at two o'clock I think that's 15 minutes. Exactly. And Dave Well, you're up well done done. Thank you.

D Dave Braunstein 44:42

Great job to everybody. Actually that was we went from Super strategic okay outside into very practical on Keith side and now don you you gave us a lot of food for thought when it comes to the research. The evolving role search around direct business. So thanks to everybody for, for doing their part in this. I'm going to turn over to some questions that we got from the audience. Because we got some good questions here. I'm going to forego the the question just for a moment actually around SUVs because that question did come in as well. But let's start with the first one that came in from about busses. So the question is, trucks, the trucks with greater visibility seem to borrow a lot from design elements from buses, do standards exist? There that could make the transition easier? Does anybody any of the panelists know about any bus standards that we might be able to leverage in these efforts tohelp create higher visibility of cabs for other forms of trucks? If if the answer's no, we don't know. Then we then we will research right. And we can revert back to the audience on that.

D Don Fisher 46:15

We've got a we've got access to the standards. I'm drawing a blank on whether those are just four trucks. There is, as Alex says, the app bus standard. So uh, Alex, maybe you could drop into the chat what that standard is.

K Keith Kerman 46:37

Let me just say, the trucking industry, buses, garbage trucks, fire trucks know how to make cab over and variants as of high vision trucks. It isn't that we need to invent a standard. I mean, Donald mentioned absolutely correctly. Not every high vision is the same. Right. The Dennis Eagle picture I showed are much sharper sightlines than the

standard sanitation truck on the road today, even though the sanitation truck is a version of a high vision truck. It's absolutely not a conventional truck. So but so it isn't that you have to, you know, explain to the industry what these are they they're making them most of our fire engines are high vision. Most of our sanitation trucks are a version of high vision. But can I buy a rack truck today? a dump truck today? I most box fans today their high vision? No, because they're not in the marketplace? So. So you know, I think it's as much about saying we want high vision to be the standard for all truck design. The industry knows how to make them. They just need to start making them everywhere.

D Dave Braunstein 47:47

Right. That's a good point, Keith. I'm going to move to another question from the audience. It's another anonymous question for one off vehicle purchases. What's the premium for current currently for direct vision vehicles? Are there some statistics that we can share on harm reduction? Share those with local government if they're considering making a long term vehicle purchase? So I think Don, you touched on this statistics when you were talking about the the the blind zone volumetrics. Right. And the dramatic reduction in crashes when you move from I think it was 80% to 70%. Is that was that correct?

D Don Fisher 48:35

That was an example. Yes, we those are the statistics, we'd like to indeed gather. And there's some chance we can from an FMCSA, large truck causation study, but they haven't been gathered yet. And we do need to gather those the only place we can safely gather them now is on a simulator. And we'll continue to do such but we don't have any naturalistic studies.

D Dave Braunstein 49:02

So you see, you don't have that you don't actually have that data. Yeah, prove the the benefits quite yet.

D Don Fisher 49:10

And I think that's what we really do I need in order.

E Eric Englin 49:15

And I would say this could be a case for the View app could provide some value. I mean, you're thinking about risk. And so some of the visuals and some of the quantitative numbers from the View app could be a way for you to understand that risk. I know Don just had two data points in there, the high visibility cab and the low visibility, and there's a whole lot of other vehicles in the middle. But you can generally see that there's some type of correlation relationship, right? High direct vision, you're going to have a very a much lower chance probability of a pedestrian fatality or crash happening. low visibility, it's much higher, and there are a lot of things vehicles in between. So I think that's a case where the View app can come in to do a little bit of market research to understand what what does this actually look like, you know, what is the difference in some of the different options that you might be looking at? You know, high visibility, low visibility is an easy way to think about it. But it's really a big spectrum. And each vehicle is going to be unique.

D Dave Braunstein 50:24

Right?

D Don Fisher 50:25

And, Dave, I would only add, this would be a question to Keith, because the majority of crashes and urban areas are intersection crashes. And because one does have information on the vehicle, make and model, one could potentially begin to determine they're rare, and you'd have to aggregate across all the colonies, but it is those front of her crash intersections where you do have an opportunity to gather the data, begin to determine from naturalistic studies, field study, police reports, or whatever. What is the relation between the vehicle make and model and the actual likelihood of a crash? I don't know whether any effort has gone forth, either within New York City Fortunately, the crashes? So few that makes no sense within one city, but maybe around the maybe NACTO has some enough? I don't know.

K Keith Kerman 51:18

Yeah, I mean, we have looked. And we have a crash system that was actually developed in the first year of Vision Zero in 2014. And we do a lot of studying of the causality of collisions. You know, whether it's a turn collision, rear end collision, we actually have make model and year I can't say that we've, we've focused kind of on type, truck car SUV, I don't know that we've actually drilled down by make model year, but we could we certainly have all that data. I did also just want to come in the question also include this question about what's the premium? Yes, on this, there isn't necessarily, you know, this isn't like an electric truck. There's a premium on buying an electric truck, because the electric battery is incredibly expensive right now, maybe that changes. But right now that electric battery is extraordinarily expensive for truck and there's your premium, you want the truck, the batteries unbelievably expensive, you're going to have to pay more, this is a design choice, right? We're not paying a premium for the modified high vision of a sanitation truck right now. It's a design choice, and Mac offers that design choice there. Unfortunately, the design choice for high vision is not made. Certainly companies that are that are currently manufacturing, a conventional truck would have to retool their design, right, they'd have to redesign. They'd have to retool their manufacturing. But it isn't clear that that would inherently mean there would be an upfront cost to do that, for sure. But once you made that decision, and once you did that, there's no reason that a high vision truck is more expensive per se, than a conventional truck to build. So it's it's a, it's a design choice. And electric truck is more expensive to buy, because the core component is simply more expensive, there's no out, there's no way around it. I don't know that that is true here. It's a design choice. And we're trying to get them to make that design choice. And then every truck forward, they would just sell at normal price. But it would be safer.

D Dave Braunstein 53:23

Right? Okay, I think, yeah, please,

K Kate Fillin-Yeh 53:27

I'm just gonna sort of underscore what what Keith was saying the sort of goal here and the sort of focus on the purchasing power of government. And also the goal of it sort of coming in from both sides. It's the demand side, the purchasing power of governments, and it's the regulatory side, it's asking it to actually study this and start building that into the standards, they are requiring, it's trying to make it so that the market is just ubiquitously flooded with

only high vision vehicles. Like that should be the easiest cheapest thing to buy, because you're probably most often isn't the big, you know, you know, the the DHL is the FedEx is that have hundreds of 1000s of 1000s of trucks, whatever, you know, it's the, it's the, the company that has two trucks, and they're not really upgrading their fleet very often because they only are running two and like, you know, they're running in small urban areas. So those are the ones where you want to make it impossible for them to buy anything other than a direct ration truck the next time you buy it, because that's what the market has. And that's where the purchasing power of big companies and the government can force and drive that market to make that the most common easiest, cheapest thing out there.

D Dave Braunstein 54:30

Right. Okay. I will say that in speaking to some of our members who operate large fleets that they are, like Keith says as well frustrated, but the lack of supply and even one company that has 15-20,000 vehicles that they operate, which is tremendous, you know, fleet size, they have trouble convincing their partners to to make the investments and so it does have to be industrial wide which which, but but I really respect your point about, you know, there are many, many, many, the preponderance of fleet operators are actually operating very small fleets of not single vehicle fleets. And those those organizations, again, are definitely not going to have any purchasing power they have to go along with whatever the industry produces. So, it's a great point.

K Kate Fillin-Yeh 55:25

Yeah, I mean, I actually think the labor aspect is really interesting here, too. I mean, the trick with all of this is that it's gonna take all of the different sectors, you know, so there's a, there's an industry sector role, there's the people who are running trucks at a commercial level, there's the government, you know, but the interesting data, if you dig around at some of the videos, for example, that TfL has put out about, you know, from the driver perspective, what it's like to drive one of these trucks, universally, the drivers are like, this is great, my knees are no longer hurting, because I have to climb you know, six feet up into this truck, it's really easy to get in, it's really easy to get out, you know, there's so much more pleasant, all these different things. And so there's an entire labor play here that can be brought into this conversation. And this is not just again, this is going to take all of us to get these things to be market.

D Dave Braunstein 56:09

Well, and that raises another point that hasn't come up yet. But the whole idea that ergonomics and then you know, there's a whole aspect to you know, cutesy girly speak this too, is from from a workers compensation standpoint, and just keeping our employees and our staff healthy. There's huge benefits to be gained from having more ergonomically designed vehicles. And I know that a lot of fleet operators that we that we come in contact with are keen on ergonomics, but they haven't yet tied it to direct vision or or anything like that account design at that level. So it's interesting point. There was a question about industries that came up. And does Does anybody want to pause it? I have a thought on that. So in any in terms of public private partnerships, which companies or industries are the most, right for a ship to direct vision? Does anybody want to offer an opinion on that?

K Keith Kerman 57:15

Box? I mean, certainly box vans, right. So if there's anywhere we see this massive increase in truck travel, and there has been a huge increase in truck mileage in the United States, it's all tied to delivery of goods. And no, it's internet buying, right? We're changing the whole mode of how we shop, we go online, and then a truck delivers us stuff all day long. And so box vans, which are now ubiquitous, and all of our lives and all of our neighborhoods, would be a

great area to have have high vision. Um, I just wanted to mention something about just that issue, a truck travel. Part of it is about your perspective. If you really fear conventional truck design, if you're in a crowded city, if your main focus is my is traveling the nation's interstate highways, then guess what, the convention of design isn't as big an issue, right? You're not, you're just driving on highways with other vehicles. It's inside cities. But here's an interesting catch. A high vision truck is incredibly more safe, more safe to drive within a city. But it's just as easily easy to drive on interstate highway. Right? So if you've got a conventional truck or high vision truck in a work just fine on an interstate highway, but a high vision truck will actually keep people safe when it gets to the last miles in a city a conventional truck walk.

D Dave Braunstein 58:41

Right? Yeah. I going back to the question of industries as TSR we have a very strong relationship with the National waste recycling Association, who we've started engaging on this topic. And I think the waste management industry is one that I think is very interested in this. I know that in many city environments, there are often or I shouldn't say often, but there are a lot of incidents that involve the waste industry of one sort or another. And I've been very encouraged in talking with the National waste and recycling Association about about what they want to do as an industry. So I look forward to working with them on on this topic as well. Let's see. Let's see. Okay, here's another question. We have a lot of questions coming on. How are we doing for time, by the way, we 230 to 15 I have lost? I think we have till 230 Right.

D Don Fisher 59:46

I think you're right did Yes.

D Dave Braunstein 59:48

All right. Great. So I think one question came in the city has a plan to make all trucks high vision and MTA bus has been high vision for years other plans to do the same for the school bus fleet, especially with the city's acquisition largest school bus contractor. I guess my question is for you Keith.

K Keith Kerman 1:00:13

Yeah, so we're certainly looking at school bus design as well. And I think where the opportunity will come. And I mentioned this earlier, is, as you probably know, the city council passed very recently a law to electrify the school buses, and to go to an all electric school bus fleet by 2035. So, there is a lot of opportunity, and we are absolutely looking at safety design, as we look to the future of school by saying, which will be not just hopefully safer, but electric. And, and one thing about electric electric trucks is it offers an opportunity to redesign the truck anyway, right. So you're gonna have an all new trucks doc, you're going to have a redesigned differently engineered and manufactured trucks doc. So we're definitely looking at that issue. Not all school bus, electric options now or high vision. So that's still an area to push, even for electric school bus operators. But but there's really an opportunity to do that. Because electric again, you don't have a conventional engine and transmission in the first place. So there's a lot of opportunity to redesign that.

D Dave Braunstein 1:01:27

Great. Nobody else have a point of view on school busing or busing? Okay, we are I'm going to go off the menu here

from high vision for a little bit because the question came in, and I think could be interesting for the audience than the last is about speed governors. So the question is, Can you say more, but the path for speed governors to move from tier two to tier one. And why this only applies to GWV of greater than 10,000 pounds? Anybody want to comment on speed governors? I know, Keith, you've spoken about sea speed governors, I don't know if anybody else in the call on the panel has has a point of view on path for speed governors. Okay,

K Keith Kerman 1:02:20

now, I'll comment on if no one else wants. I mean, you know, the traditional speed governor, and I'm not going to tell you I'm versed on every variant of speed governor's that might be on the marketplace. But the traditional speed governor offered us concerns because it would be kind of based like the truck de sell the truck treat D rates, if you get to 60 miles per hour or something like that. We have to be careful about that our trucks are involved in emergency response. We have all kinds of situations where you may have to accelerate from a moment for safety. I live in the Upper East Side and you try and get on the FDR the 96th Street entrance, anyone who's ever driven that knows, if you aren't accelerating really fast, you are in danger, because you got no window and you have to kind of hit the accelerator to make sure you're safely on the car. So there are these kind of moments. What we want is intelligent speed assist, we want to use technology and speed governing so that vehicles as they are going above the speed limit in any particular area. Right are being slowed down automatically not stop but slow down automatically. Intelligent speed Assist is getting a lot of momentum in your in some places being mandated. And we are working with vol pay to develop initial pilot program with intelligence fetuses. But no, we're struggling somewhat on getting viable manufacture Spybot.

D Dave Braunstein 1:03:45

Okay. Okay. All right. I'm going to turn to some of our other questions. I want to get Kate involved again, on the topic. So, Kate, we were preparing for this couple things came up. And since your areas very much focused on urban planning and, and whatnot, can you maybe talk a little more about some of the actions that you recommend that can make direct vision policy robust area focus for urban planners specifically?

K Kate Fillin-Yeh 1:04:19

Yeah, I'm happy to I mean, I think in terms of the, the tracks themselves, so much of this, you know, no pun intended, is sort of the Seeing is believing. You know, so one of the things that we we hear from the NOC diversities all the time is how valuable it is to have them actually physically seeing these trucks and vehicles getting a chance to sit in the cab. I chatting with a DOT director of a city who he and his fire chief ended up in, I believe Belgium, on a study tour in the sort of land before COVID. But they were wandering around in the streets looking around at things and fire station happened to be open, and the fire chief went in and got all excited and gotten to this very excited conversation with with the fire department there and suddenly was sitting in the cab of this tiny fire truck. And that's not the type of fire truck that he and his department are using, and was so excited about it and so enthused to see how much better it was to like actually have the experiences. And so that's sort of bringing bringing the vehicles to, to the United States to really let people see and feel them, I think is a big way to sort of bring it more into the conversation. The other thing, and again, this is sort of a sidestep from direct vision, and a little bit more into the larger conversation about downsizing is that there's a pretty big connection in sort of road design. You know, what I think Keith mentioned at the beginning is like, you know, one of the things about vehicle design is that it's something that we can do an incredibly near term, you know, in the grand scheme of road design, and you can't redesign every single street in America overnight. You know, but one of the things we know with downsizing is that as our vehicles get smaller, and if we can really push them, you know, that way, how we design our roads can get better. So much of the time, right now we're designing roads for the biggest possible vehicle that might come down there, it's sort of the

day after Thanksgiving theory of a street design, which means that all the rest of the time when that one day truck isn't there that one time everybody else is on a road that encouraged them to drive faster and drive less well. You know, so there's a really big connection there. In terms of all of these conversations about the vehicle, we use the design vehicle to use for for our streets, and then how we how we set up our roads. And so some of those are the sort of pieces of the puzzle. But again, it's multi sector, and it's sort of everybody pulling together to to get us where we need to go.

D Dave Braunstein 1:06:42

Right. I love that point. I know you you've done a lot of work in in the downsizing areas. That's the right word. Maybe right sizing would be a better way to say. But yeah, that's great. Thanks, Keith. Over to you. Um, you talked a lot about side guards. We've talked a lot about side guards, just you and I and you know, when you think about the history of psi guards and create a mark for how long, you know, did it take for you to really create this market? Because I think it does exist now. You really, York City did a wonderful job there, how long from the time you like conceived of hey, we need to invest inside guards to the time when now they're, they're ubiquitous. They're ubiquitous, but they're, they're available at scale, to the point where nearly anybody could get one if they if they needed one.

K Keith Kerman 1:07:35

Well Anyone can now Yeah, for sure. So and I want to, again, thank Eric Richardson, who's our deputy who really led this effort. But we did the report in 2014. With Bo pay. And I think published in early 2015. We started installing our first side guards in 2015. Using a Canadian vendor, literally the only vendor in North America who knew what we were talking about. And they actually were designing it not for safety, they were designing it there actually recalled airflow, they were designing it for sustainability. But it had that safety component. I would say three to four years. You know, we went and got there are a number of manufacturers of side guards in Europe. And we got them to start kind of selling their side guards and making relationships with installers here in the States. We saw the prices go down by the way, we started with a 2500 to $3,000 side guard. And we're down to about 1800 to $2,000 per side guard because we have more vendors, and frankly, no offense to the original vendor, we have a way better side guard. So So I would say took three to four years to develop it. And again, that's what we're trying to do now on high vision. And there's a reason we kind of invite companies with high vision trucks to our shows and get them involved in our procurements. We're trying to do it, we'll be the first to say that high vision is going to be a tougher nut to crack because now you're talking about retooling the very design of the truck holistically. That's obviously a much bigger investment for a company than the sidecar.

D Dave Braunstein 1:09:12

Yeah, but it's helpful to know that in in a relatively short period of time, you can make a major impact in in a vehicle albeit retrofit in creating a market that's pretty extraordinary. So and Don over an hour to leave you and Eric out. But one of the things that I think the audience would benefit from knowing is like what information you guys see that's missing about vehicle blind zones, that would be really game changing for the federal government. Right. You know, what would really change the game to put some momentum on this?

D Don Fisher 1:09:51

We're we're we're forced to say as members of the federal government that any thing we say does not represent what the federal government actually actually concludes,

D Dave Braunstein 1:10:03

but you made a disclaimer. Now. Now you can, I can say,

D Don Fisher 1:10:07

Eric can speak more generally to my first point with until we know and can dramatically address the issue of what's the relation between the blinds on via or visibility score and crash risk. We don't have that eye popping statistic, we do have those pictures of the side the number of pedestrians that can be seen, so on and so forth. But I think that, you know, if the regulatory bodies are gonna see a cost benefit trade off, and they're always thinking about that, they really need to know how those costs will vary as a function of the blinds. And by the second thing, I think is we hear, I do not know, we hear that there's some real faith being placed in these 360 cameras, that give you a view of the world around you. And you're always going to, you're not going to have direct vision back, presumably. So you're always going to need some view back into the back sides. The question in part is, will these 360 cameras provide a benefit that the perhaps I can add to what a direct vision can add supplant? I don't know, we've got existing vehicle fleets out there. And we need to know about those 360 cameras, and I don't think anyone knows yet. And they may keep they may be holding up in part the development of the high vision cam, because they're thinking that maybe something like a 360 camera might give you what you want, again, a lot different than the mirrors and all of that it would be, you know, a display spatially compatible. Okay, I'll shut up, Eric.

E Eric Englin 1:11:52

Yeah, I mean, maybe the one other that I would be thinking about is, you know, right now we have it just sort of as high visibility, low visibility trucks, but I know in London, they have more of a star rating system, and they have a lot of their policies directed and based around that sort of more specific idea of what visibility means. And so I think for, you know, maybe a federal level way of thinking about is more research and more thought put into what different standards could look like whether a star rating system could be something that, you know, potentially could come to the US or it could look that way. I don't think that might be overstepping a bit for the federal government, but could be something that their research could support. Others looking into a model like that.

D Dave Braunstein 1:12:43

Yeah, yeah. And a question. Interesting question just came over in terms of star ratings, I think most of us are familiar with the new car standards, and I just type of activities. You know, it's possible if there's a role for the insurance industry to get behind high vision cabs, I think that was posed by one of our attendees. So I think that's a that's an excellent point. And at TSR, we do engage with a fair number of insurance companies and and I think that's something we take back to them.

K Keith Kerman 1:13:20

Are these are these safety ratings applied to trucks? So, you know, my understanding of safety ratings are they're far more extensive in institutionalized for light duty vehicles, and not for trucks. So that itself could be a place to look.

D Dave Braunstein 1:13:36

That's right. Yeah. So hey, we're up against time here. I'd like to thank transportation alternatives, again, for giving us this opportunity to have this discussion in their in their great conference, of course, panelists, Kate, Keith, air, Don, for joining and sharing your wisdom with the audience and with me. And I'd like to just close quickly with this is just the beginning. I think there's a lot of momentum around this country, in different industries in different sectors, for tackling this issue in a much bigger way. So as TSR, we are planning to do some surveying of many different constituents, but especially this audience, that that is that attends Vision Zero cities to see what your appetite is for getting involved and what kinds of interventions you would like to get involved with. And so we're, we are starting to think about how to organize around a much larger effort for direct vision. And we welcome everybody to join that because this is an issue that should not go away. This is something that could be a very substantive, meaningful intervention strategy in the grand scheme of road safety. So we welcome everybody's parts. Inspiration and certainly your time and listening today thanks so much and have a great rest of the conference thank you David

K Keith Kerman 1:15:09

thanks thanks everyone yep