

CITY COUNCIL
CITY OF NEW YORK

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TRANSCRIPT OF THE MINUTES

Of the

COMMITTEE ON TRANSPORTATION

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October 28, 2016

Start: 10:14 a.m.

Recess: 1:00 p.m.

HELD AT: Council Chambers - City Hall

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Chairperson

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[sound check]

[pause]

[gavel]

CHAIRPERSON RODRIGUEZ: Good morning everyone and welcome to the Transportation Committee's hearing on the future of driverless vehicles in New York City.

My name is Ydanis Rodriguez and I am the Chair of the Committee and I've been joined by my colleagues, Council Members Garodnick, Menchaca, Constantinides? No, they are not here [sic].

We are here today because we know the car is undergoing a technological revolution and we want to know how this will impact our streets, our industry and what we should be doing as a city to best prepare.

Since the first Ford Model T rolled off the assembly line, advances in motor vehicle technology have progressed at rapid pace. Today motor vehicles are safer and more environmentally friendly than ever before. While this committee has sought to promote alternative modes of transportation, it is not lost on me that a personal car remains the preferred way to get around for over

1 a million New Yorkers. As technology evolves and
2 older models become obsolete, we know that our city
3 must be prepared with an understanding of how to
4 adapt with a technological shift to promote the best
5 public safety; this is why we recently heard an
6 important bill about how to encourage
7 environmentally-friendly electric vehicles with fuel
8 [sic] infrastructure. We hope that with the support
9 of The Speaker and our colleagues we can pass this
10 bill -- sponsored by Council Member Constantinides
11 and myself -- very soon. It is also why we are here
12 today, to learn from industry leaders and advocates
13 about what we can expect and what we need for
14 autonomous vehicles to become a reality, as well as
15 suggestions regarding regulation and safety.

17 The crash-avoiding technology installed
18 in driverless cars represents a major advancement and
19 one that is intriguing to this committee that has
20 placed such a focus on eliminating traffic deaths.
21 Driver distraction, negligence and recklessness
22 contribute to an unconscionable percentage of motor
23 vehicle-related injuries and deaths and if new
24 technology can help avoid crashes; that is a positive
25 prospect.

New York City must be prepared to embrace a future that is all but imminent; we cannot and will not be a city that stifles innovation nor suppresses market demand; however, we will search for a balance that places the public good at the forefront of our work and therefore, think carefully about how autonomous vehicles interact with our city and its millions of people.

Newly released federal guidance regarding driverless vehicles are a clear signal that we are getting closer to the future; however, many questions must be answered before we arrive:

What will autonomous vehicles mean for the thousands of people that work in existing industries, like the taxi and for-hire industry?

What are the prospects that goods will be transported by trucks with this technology?

How can we protect autonomous vehicles from life-threatening hacks into their systems?

Is there new infrastructure needed for these vehicles and who will be tasked with funding it?

What are the opportunities for New Yorkers to get some of these important jobs?

Are there issues specific to New York City not addressed by the federal guidance that our city should be prepared to regulate?

This hearing is intended to start that conversation; we are interested in hearing from all parties -- government, industry and advocates. Driverless vehicles will reshape the future of personal transportation and this committee wants to ensure that our goals are represented throughout this time of change.

Today we want to hear about what we have in store, how it will affect New York and how New York can hope to shape the entry of these vehicles onto our streets. We know that technology will drive our future and it is why I constantly seek to lift up STEM education in our city, especially in my district. I understand that our DOT and TLC have been considering this topic themselves and I am eager to hear their thoughts and ideas about this new technology.

Before we begin, I'd like to wish congratulations and best wishes to our Policy Analyst Jonathan Masserano, who is in Washington, D.C. today preparing for his wedding.

I would also like to thank the Committee staff here today -- Counsel Kelly Taylor; Policy Analysts Gafar Zaaloff and Emily Rooney; Finance Analyst Chima Obichere, as well as my staff -- Carmen de la Rosa (very soon Assemblywoman de la Rosa) and my Chief of Staff, Russell Murphy. Thank you.

And now I welcome testimony from the representatives from the Administration; I ask our Committee Counsel to please administer the affirmation.

COMMITTEE COUNSEL: Will you please raise your right hand? Do you affirm to tell the truth, the whole truth and nothing but the truth in your testimony before the committee today and to respond honestly to council member questions? [background comments] Thank you.

CHAIRPERSON RODRIGUEZ: Before we begin, I would like also to recognize Council Member Greenfield.

[pause]

MICHAEL REPLOGLE: Good morning Chair Rodriguez and members of the Transportation Committee. I am Michael Replogle, Deputy Commissioner for Policy for the New York City

1 Department of Transportation and I'm joined by Will
2 Carry, on my left, Senior Director for Projects, from
3 my team, and Jenna Adams, Director of Legislative
4 Affairs, also to my left. Thank you for bringing us
5 together to discuss the future of driverless vehicles
6 in New York City.
7

8 Automated vehicles (AVs) present
9 opportunities and challenges for our city. On the
10 positive side, automated vehicles may help us achieve
11 Vision Zero by reducing human error and risky
12 behaviors such as speeding and distracted driving.
13 AVs may also reduce congestion and overall vehicle
14 miles travelled by encouraging a shift from auto
15 ownership to shared-use mobility services. And AVs
16 may expand mobility by increasing travel choices in
17 neighborhoods underserved by our current transit
18 system.

19 That said, there are many complex
20 challenges that must be resolved before AVs are ready
21 for New York City. The technology is advancing very
22 quickly and all of us in government -- at the city,
23 state and federal levels -- need to make sure it's
24 safe and secure before we allow AVs on the most
25 complex street system in North America.

We also want to encourage the use of AVs that results in a more efficient transportation network; not one where thousands of empty vehicles might clog our streets. If introduced without appropriate transportation system management and policies, AVs may increase traffic volume, pollution and sprawl.

Finally, we need to consider the impact of automated vehicles on tens of thousands of New Yorkers who make their living by driving. It is important that government at all levels think through how these displaced drivers can continue to provide for their families. My colleagues at the Taxi and Limousine Commission (TLC) will discuss the potential impacts of AVs on taxi and for-hire vehicle (FHV) workers and address accessibility, another key topic.

Let me walk you through the current state of the industry nationally and then focus on New York City.

What are automated vehicles?

Over the past five years there has been tremendous momentum in the development of AV technology. Every week there is a news story about another major tech or auto company investing in this

technology or promising to be the first to have an AV on the market.

In 2016 alone, General Motors acquired Cruise Automation for \$1 billion and invested half a billion in Lyft, Google's test fleet passed two million miles of automated driving, and Uber introduced test AVs into Pittsburgh for for-hire service.

But what exactly is an AV? Well it's a broad term that encompasses everything from a car that may be able to drive itself on the highway but still requires a human driver, to a truly driverless car without a steering wheel or pedals.

The National Highway Traffic Safety Administration (NHTSA) has adopted automation levels used by the Society of Automotive Engineers (SAE). This SAE scale helps us to understand the kinds of vehicles we can expect to see in the next five years and those which may continue to come on the market in the longer term.

As you can see from the table on the board here to my left:

Under SAE Level 2, the driver is in complete control of the primary vehicle control elements.

With SAE Level 1, one or more of the primary control functions are automated, but these work separately. Cruise control is a common example of a Level 1 feature.

With SAE Level 2, multiple control functions are automated; relieving the driver of responsibility for some driving tasks, such as car parking, but the driver must actively monitor the driving environment and may need to resume control instantaneously.

SAE Level 3 marks the beginning of what we consider to be self-driving cars. The vehicle can perform parts of the driving task and monitor the environment in some conditions. The driver can disengage, but still needs to be ready to take control.

At SAE Level 4, the vehicle performs all driving and monitoring functions in certain environments, and will not need a human to resume control within those operational domains. The driverless function may be limited to freeways or,

for example, to streets with low traffic volumes or low speeds.

At SAE Level 5, the vehicle performs all driving tasks under all conditions that a human driver could possibly perform. This is full autonomy; these vehicles won't need a steering wheel nor will they need pedals.

Within the industry there is still significant debate on two key questions: (1) when are AVs likely to hit the market? And (2) what is the safest way for automation to be introduced? How this plays out will have a significant impact on our city.

This brings us to our next important question: who regulates AVs and what role do cities play as these regulations are being implemented?

Our laws and regulations at the city, state and federal levels were drafted with a human driver in mind. The process of adapting these laws to the reality of AVs is just beginning and will likely happen in two phases. In the first phase, currently underway, states are amending laws to allow for the testing of AVs on road and for the federal government to begin regulating AV safety. For AVs to become widespread there will need to be a second

phase of changes addressing a wide range of issues. These include liability and insurance, the rules of the road, and street design. Today I will focus on this first phase of changes.

Looking to our regulatory framework board, here to my left, the federal government's primary role is to regulate vehicle safety and to issue national standards for road design. NHTSA sets Federal Motor Vehicle Safety Standards, which dictate components included in vehicles and the safety requirements necessary to sell vehicles across the country. Using these standards, NHTSA intends to play an active role in determining AV hardware and software must operate.

To help guide the transition to AVs, this September US DOT and NHTSA released the "Federal Automated Vehicles Policy: Accelerating the Next Revolution in Roadway Safety." We commend US DOT for their careful consideration of these complicated issues, specifically the best practices the guidance outlines for the safe design, development and testing of automated vehicles prior to commercial sale, and operations on public roads. This safety guide is

crucial as we assess using AV technology in the five boroughs.

This guidance is currently voluntary -- meant to inform a developing regulatory framework to govern the testing and development of AVs.

While the federal government will regulate the vehicle itself, New York State will retain control over traffic laws, permitting and insurance requirements, driver licensing, and law enforcement. To assist state lawmakers in planning for AVs, the NHTSA document also includes a Model State Policy. It provides suggestions for how state agencies should distribute responsibilities for AV regulation, respond to applications to test and deploy AVs, and establish insurance and liability requirements.

It is important to understand that New York State will likely determine how and when AVs enter New York City, based on how the State chooses to permit and allow autonomous vehicles to be tested and operated.

NHTSA recommendations draw heavily from regulation developed by California and Nevada. They aim to foster national consistency as more states

1
2 implement regulatory frameworks. They recommend
3 first reviewing existing laws to identify obstacles
4 to AV testing and to deployment. As an example, our
5 State Vehicle and Traffic Law requires a person to
6 have at least one hand on the steering wheel when a
7 motor vehicle is in motion.

8 Though helpful, we believe the federal
9 guidance falls short in addressing the impact of AVs
10 on dense, urban environments like New York City.

11 NHTSA is seeking feedback on all sections
12 of the Federal Automated Vehicles Policy, and we
13 intend to submit comments affirming the importance of
14 AVs promoting safety, security, equity, and
15 sustainability in our transportation system. We will
16 also stress the necessity of regularly engaging
17 cities in federal and state conversations about AV
18 regulation, testing and deployment.

19 So what role might New York City play in
20 the AV discussion? Cities across the country are
21 responding to developing AV technologies in various
22 ways. Some, like Boston, San Francisco and
23 Pittsburgh, are engaging with universities, industry
24 and the federal government, inviting testing in an
25 attempt to shape the conversation around AVs.

Elsewhere, the Chicago City Council has proposed a ban on AVs, in order to ensure the vehicles don't drive on the city's streets until they have been thoroughly proven.

In thinking about AVs, I would like to discuss a few priorities for our city:

First and foremost is that we should be part of the conversation about these new laws and regulations. Our city is a dense, complex urban environment that will require extraordinary attention from the AV industry and regulators to create vehicles that will be safe for passengers of AVs as well as for pedestrians, cyclists, transit riders, and all of our other street users.

Second, more thought needs to be given to managing the transition to AVs. In the short term, the most likely type of AVs we will see will be Level 3 AVs, which require the driver to take control in certain conditions, sometimes fairly quickly. How this transition will be managed is a key safety question. How will a driver who is reading, napping or surfing the web going to be alerted that they need to take control? We know that driver inattention is

a key factor in crashes, how do we make sure that Level 3 AVs don't contribute to this problem?

This leads us to our third issue -- what kind of AV technology will work best in an urban environment? In terms of how AVs see the road, manufacturers are working with sensors and camera systems, radar, and detailed street maps to guide their vehicles.

Ultimately, we believe the safest AVs will be connected vehicles. Connected vehicles use technology to communicate with other vehicles and with infrastructure to prevent crashes, improve vehicle movement and reduce congestion and pollution.

New York City is already implementing connected vehicle technology. With US DOT, our agency completed the first year of a five-year pilot with technology installed on the FDR Drive and in over 250 intersections in midtown Manhattan and Brooklyn. These intersections are equipped with technology that communicates with over 8,000 vehicles enrolled in the pilot. The pilot also connects with our existing network of nearly 13,000 smart traffic signals that communicate wirelessly with our Traffic Management Center. We expect to move to citywide

implementation with the lessons learned from this pilot.

We also need to ensure that AVs cannot be hacked. The AV industry will need to secure its technology so operations can't be directed by external parties without the operator's permission. The technology also needs to secure personal information so it's can't be accessed without authorization.

Fourth, we want AVs to help us achieve our goals of creating a more sustainable transportation system. As the transition to AVs gets underway, we should advocate for an approach that leads to more efficient use of our streets. If AVs are introduced using the shared-use mobility model, they could reduce traffic volumes on our streets by encouraging ridesharing and better serve communities with the greatest need for additional mobility options.

With proper management, widespread AV use could lead to decreased personal ownership, which we know is a priority for you, Chair Rodriguez. That could reduce demand for parking, free up urban space

for other needs, whether for bus and bike lanes, parks and gardens, or more affordable housing.

Finally, AVs hold the potential for increased street safety, as the vast majority of crashes are attributed to human error. Achieving Vision Zero guides all of our work at New York City DOT and we're intrigued by the idea of vehicles that can be programmed to safely follow the speed limit and other traffic laws while interacting with other surface transportation. But at this time we don't have assurances that the technology is ready for the unique challenges of New York City, so we must take adequate time to test and evaluate.

In fact, there are two bills pending in Albany that would amend the Vehicle and Traffic Law to allow AVs to operate on public roads in New York. We urge this committee to tell your Albany colleagues that we need a full urban safety review before passing these bills. Instead, New York State should consider the guidance provided in the Federal Automated Vehicles Policy to form a task force, including relevant state and city actors, to evaluate the steps necessary to holistically plan for this important technology.

In closing, we are doing everything we can to stay actively engaged as this emerging technology unfolds. We plan on partnering with the Taxi and Limousine Commission and other institutions in coming months to discuss the opportunities and challenges for AVs operating in the unique environment of New York City. We will invite representatives from all levels of government, academic institutions and think tanks, industry leaders, and other stakeholders to gather information and discuss concepts to inform an emerging AV framework. We will keep this committee informed as the planning for these discussions moves forward.

Thank you again for inviting me to testify today and I look forward to answering questions after testimony from the TLC. Thank you very much.

CHAIRPERSON RODRIGUEZ: [background comments]

BILL HEINZEN: Okay. Good morning Chairman Rodriguez and members of the Transportation Committee. I am Bill Heinzen, Deputy Commissioner for Policy and External Affairs at the New York City Taxi and Limousine Commission. With me today is

1 Rodney Stiles, our Assistant Commissioner for Data
2 and Technology. My remarks today will be brief;
3 we've been very privileged to be meeting with DOT --
4 I think you just heard from Michael's testimony --
5 we've learned a tremendous amount from them and we're
6 very grateful for the opportunity to be working with
7 them and for the opportunity to speak with you today
8 to talk to you about our thinking about automated
9 vehicles and the for-hire vehicle market. I'm just
10 going to use the broad term for-hire vehicles today;
11 I will be speaking generally about yellow, green,
12 black cars, liveries, but rather than break it out
13 each time, I'm just going to say for-hire vehicles.
14 As you know, we regulate other for-hire sectors,
15 including commuter vans, paratransit, luxury
16 limousines, and these sectors may present their own
17 unique set of issues in relation to automated
18 vehicles and of course we will evaluate those
19 potential impacts within those sectors as well.

20
21 As you've heard this morning from DOT,
22 automated vehicles at various levels are already a
23 fact of life in the United States, although not at
24 the fully automated level. Additionally, the federal
25 government has expressed its strong support for a

regulatory framework that accommodates continued testing of automated vehicles, as well as their deployment as soon as feasible from a safety standpoint.

It may be several years before automated vehicles function on a for-hire basis in New York City, but they are currently being tested and serving as taxis in a limited number in Pittsburgh, albeit with driver engineers behind the wheel, ready to regain control of the vehicle. It is therefore not too early for us to spot some of the key issues that automated vehicles may pose for the TLC as a regulator of 95,000 vehicles and 150,000 drivers. Consistent with our agency mission, these issues include safety, accessibility, driver welfare, and accountability.

Vehicle safety standards and inspections are a key part of the TLC's licensing process and crucial to the safety of passengers, drivers and other New Yorkers on the road. Whether tomorrow's for-hire transportation is a connected vehicle with enhanced safety features that allow a driver to monitor its proper performance and assume control if necessary, or a fully driverless model, our interest

1 in providing transportation that is safe for
2 passengers, pedestrians, and other road users remains
3 paramount. And that is no different from today, when
4 we perform a 200-point vehicle inspection, and those
5 vehicles that do not meet our equipment safety
6 standards are not allowed to provide for-hire
7 service. Because many of these vehicles are in
8 constant use and carry passengers, the TLC's
9 inspections are more frequent than the State's
10 standards for noncommercial automobiles. By
11 monitoring evolving technology, the TLC will of
12 course continue to address safety concerns.

14 On accessibility, technological progress
15 obviously should not stop or reverse the gains the
16 City has made in accessible for-hire vehicle service.
17 Any system for regulating automated for-hire vehicles
18 must ensure access for any New Yorker or visitor who
19 uses a wheelchair and who needs assistance entering
20 and exiting a vehicle. New York City has made great
21 progress in improving accessibility in key segments
22 of our licensed vehicles, particularly Yellow and
23 Green Boro cabs. As you know, in the next few years
24 50% of Yellow taxis will be wheelchair accessible,
25 and at least 20% of Green Boro taxis must be

1 accessible. As the Council is also aware, we are
2 working to bring real accessibility to the rest of
3 the for-hire vehicle market, but we know that the
4 black car and livery markets have failed so far to
5 provide equivalent service to New Yorkers with
6 disabilities, particularly those who use wheelchairs.
7 The advent of automated vehicles will factor into the
8 City's goal of wheelchair accessibility across our
9 regulated sectors.
10

11 Although it is obviously too early to
12 know future technology with any certainty, we
13 understand that automated vehicles may also increase
14 accessibility for some passengers with disabilities.
15 For people with visual impairments or limited
16 mobility, automated vehicles have the potential to
17 provide safe, efficient mobility with a mainstreamed
18 network. But for New Yorkers who use wheelchairs, we
19 see two broad areas of concern: services and
20 products. On the service level, many people who use
21 wheelchairs require the driver to assist them in
22 entering and exiting the vehicle and in being secured
23 within it. It is currently unclear how this need
24 would be met by automated vehicles, particularly if
25

for-hire vehicles are in fact driverless, with no human monitoring or attendant.

Similarly, when it comes to the products themselves, that is, the vehicles, the challenge will remain exactly what people with disabilities face today: ensuring an adequate supply of fully-accessible vehicles to provide safe, on-demand transportation. We know from experience that this challenge will not be met by the private market, because service providers and car manufacturers will not voluntarily provide accessible vehicles.

Whatever the level of automation, government must require a sufficient supply of fully-accessible vehicles to address the basic rights of people with disabilities, and it must implement and administer delivery of an accessible for-hire transportation network. For that reason, it is vital that any federal or state regulatory scheme for automated vehicles does not prevent or impede the City's accessibility framework in the for-hire vehicle markets.

In terms of driver welfare, the TLC licenses over 150,000 drivers and that number increases every day, fed by growing customer demand

1
2 for an unprecedented variety of for-hire service
3 providers, and of course also by the driver
4 incentives that are widely advertised throughout the
5 city.

6 Most of these drivers are independent
7 contractors who rely on driving as their primary
8 source of income to support themselves and their
9 families. And while some autonomous vehicle
10 technology may help TLC-licensed drivers do their
11 jobs more safely and efficiently in the short-term,
12 there is a real potential for a displacement of
13 workers. At the federal level, President Obama has
14 acknowledged that there may be job loss, and he has
15 spoken of the need for job retraining. On the local
16 level, the TLC will monitor the rate of change as we
17 explore with our sister agencies how best to meet the
18 needs of our driver licensees, possibly including
19 identifying other training opportunities and
20 transition services, but of course at this point it
21 is simply too early to tell. Identifying new
22 employment opportunities and providing transition
23 assistance for drivers should also be a priority in
24 the private sector, whose increase in popularity has
25

fueled the historic influx of drivers into the New York City market.

Finally, on accountability, any regulatory system requires information to ensure accountability, and it would be impossible to evaluate or plan for these changes without consistent and reliable data streams. There must obviously be consistent and precise mapping of New York's unique urban terrain prior to intensive testing or introduction of automated vehicles. But in addition to that data, which will be crucial for safety and city planning, the TLC currently collects trip data from our regulated industries, and that data yields information for us, for other City agencies and also for other data consumers about traffic and commuting patterns, as well as informing our regulations, which are designed to protect passengers, ensure accessibility and consumer protections like fare transparency, and also to ensure basic services like locating lost property. The fundamental need and utility of this data and consistent collection will remain, regardless of advancements in technology. Indeed, new operating technology will likely lead to new data streams, and new metrics to gauge safety,

accessibility and consumer satisfaction, among other things.

These are some of the major issues the TLC believes automated vehicles will present to New York City, and which must be addressed so that New Yorkers continue to enjoy local protections for safety, consumer protections, accountability, and access for all in the City's for-hire vehicle industry.

Thank you very much for giving the TLC the opportunity to speak with you today, and we look forward to discussing this with you further.

CHAIRPERSON RODRIGUEZ: Thank you and before I ask a few questions, and my colleagues will be asking other questions too, I would like to say that it is my intention, and the intention of Council Member Dan Garodnick, to have a conversation with The Speaker with a plan to create a working group so that we can continue conversations with the participation of the private sector, the academic entities, and also the Administration, so I hope that this is something that also we can have conversation with the Administration and see how we can join forces together in that direction, and that it is important

1 to put our city in the forefront. As my standard for
2 whatever I do is, what is it I would like to leave
3 for my children and other children -- I have a 9- and
4 a 3-year-old -- I hope that when they reach my age
5 they can say that they were part of the generation
6 that they were raised, making our city one of the
7 first ones leading when it comes to technology. So
8 that's my aspiration in that direction.

10 How do you see New York City competing
11 with other cities throughout the nation to be the
12 leading one when it comes to the AV initiative?

13 MICHAEL REPLOGLE: Well I think we have a
14 great potential in New York City with our Vision Zero
15 initiative, which is the centerpiece of this
16 administration's transportation policy, to find ways
17 that AVs can be introduced in ways to help advance
18 Vision Zero. We also are in the lead in the United
19 States in connected vehicle technology at the city
20 level; our connected vehicle pilot is the largest of
21 any in the United States, with 8,000 vehicles, and we
22 expect to learn a lot from that experience, which
23 will lay a good foundation for ensuring that AVs, as
24 they're introduced, can rely on a sound backbone of
25 connected vehicles and connections between vehicles

and the infrastructure for obtaining safety and street efficiency.

CHAIRPERSON RODRIGUEZ: But should we have any concern that -- and of course, New York's IT, our city has one of the leading forces throughout the nation, that when you read about all those articles in the last couple of days -- China already working with a plan when they will come out with a new autonomous car -- and in the case of New York City, do we have to wait for the State to authorize us to, giving us the pre-entry, or there's something that... has the City started a conversation asking the State to authorize us to be a leading force throughout the state and throughout the nation when it comes to working with the private and academic institutions to be more aggressive when it comes to putting a plan together and creating some incentive for the private sector to say we want to work with you, the City of New York, to be one of the leading forces when it comes to bringing autonomous vehicles to our city?

MICHAEL REPLOGLE: You know again, a key part of autonomous vehicle introduction will I think rely on connected vehicle technologies and we're

1 working actively with many of the leading companies
2 to test those connected vehicles now in New York
3 City. I recently had the opportunity to go out to
4 the test track out in Queens where these companies
5 were showing off their technologies and was told by a
6 couple of the vendors, when I was out there, that in
7 fact New York was the leading platform for testing
8 these technologies. So we look to remain in the
9 forefront of testing these things, but we still do
10 need the state framework in order for AVs to find
11 larger use in the city.

13 CHAIRPERSON RODRIGUEZ: How is the DOT
14 collecting the data with the connected vehicle pilot
15 deployment program, as you mentioned? Will you share
16 this with the public and how much data has been
17 collected; what data is collected; what is the use of
18 those data?

19 MICHAEL REPLOGLE: Yeah, we're just at
20 the beginning of the second phase of testing; the
21 first phase was having a number of these companies
22 offer the technology to show what can be done --
23 Cordell Schachter, who's in the second row there, is
24 our Chief Information Officer, and I could invite him
25

to offer some further details on how we're working with industry in that pilot.

CHAIRPERSON RODRIGUEZ: You know what would you like to see in terms of federal and state regulatory action, and do you think that the City has regulatory authority here, and do you think that there would need to be any provision, a specific one, applicable to New York City when it comes to this initiative?

MICHAEL REPLOGLE: No, I think the federal framework really relies on the states to provide the key regulatory foundations for dealing with the insurance issues, the vehicle traffic law reform issues, and so the City's legal authority, as you see from the legality of automated vehicles, the federal and the state are the dominant players in setting the rules of the road. Indeed, the Vehicle Traffic Law in New York State requires that any motor vehicle operated on our roads; that the driver must have one hand on the steering wheel to operate that vehicle, and that's something that can only be changed at the state level. And really, before we jump in, we need a holistic framework at the state level that provides input from New York City. We do

1 have concerns that the federal guidance that was
2 issued last month really has very little regard to
3 the specific challenges of automated vehicles
4 operating in cities; there's a lot of discussion of
5 setting industry standards for vehicle manufacture
6 and for the state guidance, but very little on
7 cities, so we are seeking a seat at the table with
8 the City and believe that it's important for the
9 State to convene a task force with the City on
10 autonomous vehicle policy and framework so that we
11 can move this discussion forward most expeditiously.
12

13 CHAIRPERSON RODRIGUEZ: Right. We have a
14 lot of safety and congestion issues related to
15 freight and shipping vehicles; could the automatic
16 truck help alleviate some of these issues and has DOT
17 working with DCAS already been working to bring new
18 technology that also helps to alleviate that
19 situation?

20 MICHAEL REPLOGLE: I'm sorry; I didn't
21 catch the first part of your question on...

22 CHAIRPERSON RODRIGUEZ: We've been
23 dealing with a lot of congestion when it comes to
24 trucks delivering in our city; is DOT working with
25 DCAS, working on bringing new technology with the

private sector so that we can reduce the level of congestion that those freight vehicles represent in our streets?

MICHAEL REPLOGLE: We are right now looking at different policies that we could use to help develop a more effective and efficient freight system; DOT has started work on a five-borough freight plan, which we hope to deliver by the end of next year, and we will be looking at various regulatory strategies and other ways in which we can manage truck traffic, encourage things like off-hour deliveries, freight consolidation, and more efficient truck routes through the city to protect livability and the environment. And I think, you know in terms of the technology with automated vehicles, the technology for automated vehicles will start with long-haul trucks; in fact we saw just in the last few weeks, an autonomous truck driven across some of the western states to deliver cases of beer, and I think these are the kinds of applications we'll see first in the freight sector. Within New York City, a lot of our challenges are the last mile of delivery, getting things from a distribution center to shops, and those often require a human to actually move the

freight off the truck, so I think there will be a different set of issues presented by those technology issues.

CHAIRPERSON RODRIGUEZ: Great. As we design and build or upgrade our city infrastructure, what do you consider we should be considering to lay the ground floor for this technology? Are we ready when it comes -- and of course, like, we are not ready, you know this is a new idea, but there's gonna be dollars involved in upgrading our infrastructure; has DOT, starting with your team, to put a look on if we are or when we as a city get into the autonomous vehicle, what challenges do we face when it comes to upgrading the infrastructure; do you see partnership from the private sector also to help to cover the costs of upgrading the infrastructure?

MICHAEL REPLOGLE: Yeah, I think the... You know we have already, as part of our connected vehicle pilot, equipped 13,000 smart traffic signals with the technology that can communicate with the 8,000 vehicles in that pilot; we're working on putting additional sensors on roadways, on the FDR Drive and other places. Over time, as this technology unfolds, there will be other technological

needs to make connected vehicles work well as a piece of supporting autonomous vehicles that will create some demands on our infrastructure; how that gets paid for has yet to be worked out. Right now we're doing this under a federal pilot program.

CHAIRPERSON RODRIGUEZ: So what, you believe that technology that has been installed so far, with help from the United States Department of Transportation in grants and other funding, have the capacity to be upgraded in the future and be part of what we need when it comes to sustain and support autonomous vehicles running throughout the City of New York?

MICHAEL REPLOGLE: Yes, indeed, we've entered into the connected vehicle pilot in order to become and sustain a position of leadership in this field.

CHAIRPERSON RODRIGUEZ: Great. Still have some questions, but I'd like to, first of all, recognize Council Members Chin, Miller, Levin, Constantinides; now I have Council Member Daniel Garodnick, who has questions [sic].

COUNCIL MEMBER GARODNICK: Thank you Mr. Chairman. I won't go too deep with the panel; I

know that we have an innovation panel coming next and I know everybody's very eager to hear from them too.

My question really relates to our perspective on all of this, because to me this is a very exciting opportunity all around; it presents obvious challenges in safety, jobs, etc., but it does not feel to me that New York is really leading when it comes to automated vehicles. You know even the notion that we should continue to support a law that would not allow even testing on public roads in New York State to me sends a message that, you know we're not really all that serious about the innovation. So I guess my question for you is; I understand that there are tracks to test the vehicles and things like that, but New York, and particularly New York City, is an environment which will require a high level of sophistication, a high level of testing, but until it is allowed for an automated vehicle to be tested on a public road in New York City, we wouldn't even be able to clear the FDR Drive and allow for a test in the middle of the night when nobody is around to be able to evaluate it. Am I understanding this correctly, because it seems to me that we want to be able to try, to test... I mean these vehicles, the

Level 2, Level 3, they're coming... they're here; it is time for these things. So what do you say to that?

MICHAEL REPLOGLE: Well we don't object to testing these vehicles in New York City; we do wanna make sure that testing in New York City is done well and correctly with New York City input to the framework for testing and safety.

COUNCIL MEMBER GARODNICK: Is your understanding of the State law that we would not be able to test an automated vehicle on a New York City road today?

MICHAEL REPLOGLE: Well I think you could with a driver sitting in the driver's seat, as we see and with, you know with a hand poised by the steering wheel...

COUNCIL MEMBER GARODNICK: Right, poised by the steering wheel. Well but -- I went and I visited an Audi dealership recently that was demonstrating a Level 2 or Level 3 vehicle that's coming online in, I think 2018, which is designed for traffic. I had always pictured an automated vehicle to be focused on say highway, because you know, the least complicated perhaps and I know how difficult it is to drive in a place like New York City, but this

1 is designated specifically for traffic conditions so
2 you can sort of lighten up and stop paying attention
3 during traffic and the moment that things clear up,
4 it gives you a bright, you know, notice that it's
5 time for you to take control. We wouldn't be able to
6 test that in New York City today, under New York
7 State law; isn't that correct?

8
9 MICHAEL REPLOGLE: Correct, we would not
10 allow legally a driver to become consciously
11 inattentive to the driving task in the environment
12 **[inaudible]**... [crosstalk]

13 COUNCIL MEMBER GARODNICK: And we
14 wouldn't... Now, but I guess really what I'm asking is;
15 shouldn't we allow a circumstance safely, under
16 controlled conditions, under the supervision of DOT,
17 for that to be able to be tested in New York?

18 MICHAEL REPLOGLE: Well I think we could
19 see testing, but again, with the driver poised by the
20 steering wheel. We're in agreement that this needs
21 to be done right; that we need to protect safety as
22 we do this; this technology can improve safety, but
23 the transition -- we have a concern of -- we've
24 witnessed things like the recent death of the Tesla
25 driver in North Carolina who was completely

1
2 inattentive and the system was not up to the task of
3 monitoring the environment he was in and he was
4 decapitated in a very severe crash with a tractor
5 trailer, and that's in a far less complex environment
6 than what we see on New York streets... [interpose]

7 COUNCIL MEMBER GARODNICK: No question;
8 the level of complexity I don't think should be
9 understated, but you know, without the ability to
10 test under controlled and safe conditions, New York
11 City will never see automated vehicles, Level 2, 3 or
12 any level, and an obstacle to doing that is, it seems
13 to me, that state law that you asked for us to
14 continue to ensure exists. Am I missing something?

15 MICHAEL REPLOGLE: We think that that law
16 should continue to exist until such time as the City
17 has a voice in setting appropriate state testing
18 regulations and standards for these technologies, in
19 the city and in the state. Right now the City has
20 had no voice in the federal regulations and the State
21 could well develop its own policies absent the voice
22 of the City, and we're concerned simply with being at
23 the table; we share your interest in seeing these
24 technologies develop and be tested in New York City
25 in a safe way.

COUNCIL MEMBER GARODNICK: Okay. So I guess then, if I were to finesse what the outcome of this conversation is, is that you would support a state law that allows New York City to be able to control the circumstances of testing [background comment] on our public streets; is that correct?

MICHAEL REPLOGLE: Yes.

COUNCIL MEMBER GARODNICK: Okay, I understand it better, thank you.

CHAIRPERSON RODRIGUEZ: Council Member Menchaca.

COUNCIL MEMBER MENCHACA: Thank you Chair and thank you panel, and really thank you for your testimony; it was thoughtful, I thought, and when I first saw the notice about this hearing, I thought, why are we talking about this; this is such a... so in the future and I couldn't be more wrong; listening to you and really kinda understanding the different frameworks and the impact it's gonna have on so many things that we take for granted in some ways, is an opportunity.

Thank you Mr. Heinzen for really focusing on the disability questions from our communities that are gonna need that to be at the forefront in

questioning; the job loss. I mean these are all things that we're gonna think about together; I wanna make sure that, like Council Member Garodnick pointed out, this is an opportunity to really step back and look at it, and I see two different paths here in this question. One, we can approach it with a lot of fear that kinda stops us and forces us to kinda create policy infrastructure that holds us back, or we can move with vision and inspiration that moves us away from just these realms that are currently here, but I would love to see a panel with the Department of Education here; I would love to see the figuring out what DYCD thinks about how we activate through the funding that we're putting out into our schools, where young minds can look at this and we can create constituencies right now in our elementary schools to think about this question. When I think about where we've come far in our Vision Zero, it's user-based recommendations, it's people who are on the streets, that are driving, that are in their cars, and on our bikes, and on our streets that are informing this and because this is all technology, what I don't want -- and we're gonna hear from our companies; I think Uber is here and Tesla's here, but we're gonna have an

opportunity here to engage as a city and so I'm hoping that the next time we have this conversation we have a broader panel think about it.

So with that said, I mean how do we do that as a city -- that interacts with state and federal -- how do we take the lead and really kinda broadening that scope and just wanna give you the opportunity to react to that.

BILL HEINZEN: We're taking a number of steps; I don't know if you would wanna talk about the engagement with the federal government and...

MICHAEL REPLOGLE: Yeah, I mean we... NHTSA has requested comments on their federal guidance and we are, over the next weeks, preparing input to that in order to try and raise the concern of cities that we need to have a seat at the table in defining appropriate standards for autonomous vehicle testing and development [background comment] and we're... [interpose]

CHAIRPERSON RODRIGUEZ: Can you share with the Council those comments that you are...

MICHAEL REPLOGLE: Certainly.

CHAIRPERSON RODRIGUEZ: Thanks. Sorry, Council Member.

COUNCIL MEMBER MENCHACA: No, I guess I'm... I think I just make a point; you don't need to respond to it necessarily, but I think this is an opportunity with such a... it's coming, we're gonna get here eventually; our kids might be mayor when that happens -- that's kind of a joke that we had earlier today, but it's on its way and I think this is an opportunity to really take it seriously in a way that we're really embedding this conversation at all levels and I'd love our young people to think about this and envision this with us; they come in without fear in so many ways and can help us design some of this in the future; that's the only point I wanna make.

There's a couple questions I have about the thoughts we have to think about when we're transitioning to driverless cars about things like driver's licenses, who has to be registered and what are the tests gonna look like; have you all thought about that?

MICHAEL REPLOGLE: Well I think it's a bit too soon to say what those requirements will be; they will be set at the state level by the Vehicle Traffic Law as it evolves to respond to this new

technology. Again, a reason for the City to be part of that discussion.

COUNCIL MEMBER MENCHACA: Okay. And then finally, just on the economics of all this; it'd be an interesting thing to kinda look at all the fees that we take in and where this kinda new fleet might be coming, and the questions I have are about corporation ownership of vehicles versus private and where we start shifting from corporations owning our cars on our street and individuals, and so again, we're in a vision moment right now, but these are the questions I have, as far as what responsibility the City has to shape this conversation.

BILL HEINZEN: And I think Councilman Menchaca, you've really identified several of the key issues, including the ownership structure and we do not have answers for that right now; obviously it's too early to predict.

In terms of your suggestion about involving other agencies, between the two you see here, I mean I think we obviously agree; I'm glad to hear that The Speaker and Chairman Rodriguez are hoping to convene a working group on this issue; obviously you've got the DOT A-team here, which is

1 all over automated vehicles; I have... at TLC we have a
2 group of like painfully young, intelligent policy
3 experts who love this issue and are doing -- looking
4 very closely at it; I know would love to be more
5 involved; to the extent that we can offer support to
6 the Council in terms of our thoughts, our research,
7 we would love to be involved in that; I think your
8 idea about getting agencies like DYCD involved, for
9 their agency expertise, but also based on their
10 better contact with the constituents probably than an
11 agency like TLC would have, I think it's a great
12 idea.
13

14 COUNCIL MEMBER MENCHACA: Thank you. And
15 the final... just the kinda final thought is -- and
16 we're gonna hear this from testimony in the future
17 I'm sure, that there's an understanding that
18 driverless cars, computers are safer, they're better
19 and that the issues on the road are people; people
20 are messing up on our streets, and I think it's an
21 interesting question to think about as we think about
22 infrastructure and creating infrastructure in our
23 streets to create zones where we're actually -- when
24 we think about a car-free New York, it's maybe not
25 car-free, it's people driving free New York. It's

really interesting and again, I think the places where we can get the most inspiration is in our schools, to get them ready for the jobs of the future to actually build this thing and design it, and allow New Yorkers to do it from the ground up, in partnership with maybe our big corporations but not letting them drive the conversation, letting us be at the driver's seat. Wow, okay. Thank you.

[laughter, background comments]

CHAIRPERSON RODRIGUEZ: Thank you Council Member. Before calling the next council member, following with the TLC, are there any existing TLC regulations that will prevent an autonomous vehicle from picking up a passenger in New York City?

BILL HEINZEN: Well one with the larger, the state law requirement that was mentioned about having to have one hand on the wheel; we have not currently authorized autonomous vehicles to pick up passengers...

CHAIRPERSON RODRIGUEZ: Okay.

BILL HEINZEN: or automated vehicles to pick up passengers, but I don't think there's anything in the regulations right now that would prevent automated vehicles from being used as for-

hire vehicles, assuming they've passed all the federal and state safety standards and traffic standards.

CHAIRPERSON RODRIGUEZ: Okay. Thank you. Council Member Reynoso.

COUNCIL MEMBER REYNOSO: Thank you Chair. Thank you to the panel for being here today; I think this is a very interesting topic on a Friday afternoon. I do... or Friday morning. I do wanna say, when I see our future -- you know, I'm not necessarily concerned about the jobs that we would be possibly losing from the drivers that won't be able to be inside their vehicles or driving these vehicles any longer; I actually wanna get to a place where we break our dependency of vehicles in general and have a more safe, reliable and fast public transportation system and that be the primary means of transportation for our public, and also, riding bikes and walking, encouraging that to happen, so for me, I'm torn between a new mode or way to put vehicles on the road as opposed to getting them off the road, and between that and the advancement in technology and that fact that I think we get to a place where we could depend more on technology to do everyday tasks

1
2 that currently do create jobs, but everyday tasks
3 that could be changed to doing something we love, we
4 care about, expanding the human experience, so I
5 **[inaudible]** a future that's a lot different from most
6 people.

7 But I do wanna say, when it comes to
8 building our public transportation system and the
9 role we have in making sure everyone gets an
10 opportunity to move around this city in a responsible
11 way, do you think that this... moving forward with this
12 technology supports that or actually moves us away
13 from that?

14 MICHAEL REPLOGLE: Well I think, you know
15 these autonomous vehicle technologies can also
16 provide support to public transportation and they're
17 being used in some settings, in buses, for example,
18 in London; they control the speed of buses so they
19 don't exceed the speed limit as part of their traffic
20 safety initiatives; they can also support better
21 ridesharing, where you're filling all of the empty
22 seats in vehicles, if managed appropriately. These
23 autonomous vehicle technologies could reduce the
24 number of cars by taking a smaller number of cars and
25 having them intensively used more of the time, with

1 all those seats in the vehicle filled most of the
2 time, and with the vehicles stored in parking spaces
3 a small part of the time rather than 95% of the time,
4 as they are now. So there is a promise, if managed
5 well, if regulated well, that these technologies
6 could free up a lot of urban land now devoted to
7 parking and to driving cars and indeed reduce
8 traffic, reduce parking and free up space for bike
9 lanes, bus lanes, gardens, parks, and affordable
10 housing through the City. So on the other hand, if
11 not well managed and regulated, these technologies
12 could lead to ghost vehicles, empty cars driving
13 around to avoid having to pay for parking after
14 dropping their owner off somewhere, so you know, this
15 could go in many different directions. Again, a
16 reason for the City to have a voice at the table in
17 helping to set the state and federal regulations.

18 COUNCIL MEMBER REYNOSO: I'm glad that
19 you're at the table when we're having this
20 conversation, because you do seem to have a great
21 understanding of how this can be beneficial and how
22 we can drive that conversation towards that side and
23 not necessarily towards owners going home and letting
24 their cars find a way to park itself. And I would
25

1 also encourage that in any way that we move forward
2 that we encourage or incentivize that any type of
3 opportunity for driverless cars to do work here in
4 the City of New York or to build that technology,
5 'cause we do need to do something to allow them to
6 come to the City to learn how to move around this
7 city of where we're gonna see them; that we
8 incentivize that it be electric vehicles only;
9 nothing outside of that, that if you're not fully
10 electric, that you are not allowed to even experiment
11 in the City of New York; we really have to start
12 moving towards freeing ourselves; again, of vehicles
13 in general, but if this is the way that we have to
14 go, that they at least be electric. But thank you
15 again for being here and I'm looking forward to what
16 this looks like in 20 years. Thank you.

18 CHAIRPERSON RODRIGUEZ: Council Member
19 Chin, followed by Council Member Miller.

20 COUNCIL MEMBER CHIN: Thank you Chair.
21 Good morning. When I saw this hearing topic, I said,
22 why are we exploring this issue; it's just like...
23 we're just kind of reading about it and I guess the
24 future might not be that far away and for someone who
25 doesn't know how to drive, who knows, I might be able

1 to get into a car one day. [laughter] But I think
2 it's good that, from your testimony, that you do talk
3 about thinking about consequences, 'cause right now,
4 I mean we have a lot of taxi drivers, livery drivers
5 that live and work in my district, so you're talking
6 about, you know, over 100,000 drivers right now, and
7 we start talking about this, they're gonna start
8 worrying, so I think that it's really important to
9 look at, you know, job training options; what kind of
10 jobs will be available with this type of industry.
11 But at the same time, I know that, you know, it's
12 good to have working groups and focus... people, you
13 know, to really think about and prepare, but at the
14 same time, we've still got a long way to go; I mean
15 we still have taxi cabs that are not accessible or
16 livery cars that are not accessible, so a large
17 population, like seniors, people with disabilities
18 are not being served right now. So I mean even with
19 the mobile apps, you know companies that have been
20 coming in, it still has to serve a large population,
21 people who don't have smartphones or don't know how
22 to use technology. So what does DOT and TLC, I mean,
23 how much time are you really spending right now to
24 looking at how to move forward with having all these

vehicles being accessible so that it could help, you know seniors, people with disabilities, parents with a baby carriage; I mean there's a lot of need out there that still has not been met.

BILL HEINZEN: And Council Member Chin, you talk... when you say these vehicles, you mean the existing vehicles on the road today or automated vehicles?

COUNCIL MEMBER CHIN: No, I mean... I'm talking about the existing vehicles now... [crosstalk]

BILL HEINZEN: Today, yes...

COUNCIL MEMBER CHIN: I mean what's... in terms of plan, going forward, to really have everything accessible so people don't have to like wait [sic]... [crosstalk]

BILL HEINZEN: So we spend a lot of time on this and we are in the process of implementing certain plans and we also are well underway in other sectors. In the yellow market, 50% of the yellow cabs must be wheelchair accessible by 2020; in the green we're looking at 20-30% over the next few years; that comes from the State law, the street HAIL law that created the Green Boro taxis. For the black and livery markets, as I said, it's been a struggle,

1 there is an equivalent service requirement in our
2 rules; when we have done testing, those companies
3 don't do very well in providing equivalent service
4 for people in wheelchairs, people who cannot simply
5 fold up their wheelchair and put it in the trunk but
6 who need the actual wheelchair to be lifted into the
7 body of the trunk. We're working right now on a plan
8 that we have been discussing and that we've spoken
9 about to increase accessibility in the black car in
10 every markets; we'd be happy to talk to you about it
11 more; we think that the way to go is to require that
12 a fixed percentage of all trips need to be dispatched
13 in wheelchair-accessible vehicles so that we create
14 not only the greater supply of wheelchair-accessible
15 vehicles, but that we create a critical mass of those
16 vehicles on the road so that rather than having to
17 wait several hours or as with Access-A-Ride, 24 hours
18 in advance; you can get accessible service in a black
19 or livery car or a green or yellow taxi, you know
20 within a service time that is consistent with what
21 other passengers can get and consistent with civil
22 rights and basic human dignity that you don't have to
23 wait forever and that those cabs are out there, those
24 cars are out there.

COUNCIL MEMBER CHIN: Yeah, I think that would be very important, 'cause I mean that is really using technology right now to kind of assist customers and at the same time, also using what technologies are available to make the cars safer so that -- I mean so it's not waiting just for the future... [interpose]

BILL HEINZEN: Right.

COUNCIL MEMBER CHIN: but as soon as there is technology available, that we could use it to help the drivers so that they could be able to drive safely and that's something that we should really continue to talk and to work towards, and also I think, from DOT, it's great that you are looking at all these issues and also about, you know, the environment, so my colleagues were talking about electric cars, I mean that's something that we also should work towards now with the fleets that we have so that we can help clean up the environment.

MICHAEL REPLOGLE: Well I think we agree that as automated vehicles are introduced, it is an opportunity to also encourage a move towards electrification of the fleet. But again, the City

needs to have a place at the table in that discussion to help facilitate those kinds of transitions.

COUNCIL MEMBER CHIN: Definitely; I think we all look forward to working with you to make sure that the City has a say, 'cause we don't want just to allow the State to dictate, so I think going forward the City Council will continue the participation. Thank you. Thank you, Chair.

MICHAEL REPLOGLE: Thank you.

CHAIRPERSON RODRIGUEZ: The City... can we say that the City is also behind -- and of course, I'm not blaming the Administration; I'm blaming, in this case, the MTA for -- when we look at other cities, and we will hear from the private sector, sharing about how other cities, you know, from Finland to Japan to Singapore, they already have autonomous buses in the street [sic], and as we know, the City was missing a few members on the board of the MTA and knowing that the DOT, Commissioner Trottenberg, she was like a strong voice advocating for the City's interest; now we have three members. Are those members that we have at the MTA Board in the City, have they -- and of course, like I know that we were not prepared to ask questions of the

1
2 MTA, but since this is about autonomous vehicles and
3 buses are important [sic], knowing that when it comes
4 to the buses it's a joint coordination between the
5 MTA and the DOT, but is there, as far as you know, is
6 there any conversation also making buses autonomous
7 as we also have other cities in the world?

8 MICHAEL REPLOGLE: I don't believe the
9 MTA is exploring that at this time. You know, the
10 MTA still has... you know we could... you know there are
11 opportunities for labor savings in operation of
12 subways, for example, that we haven't taken advantage
13 of, you know for various labor reasons, so.

14 CHAIRPERSON RODRIGUEZ: [background
15 comment] other cities, that they already are using
16 autonomous buses.

17 MICHAEL REPLOGLE: I don't know of fully
18 autonomous buses in any city; I think there may be
19 some tests in some places. In many cases these
20 technologies are being used for driver support
21 technologies, to help make the operation of buses
22 safer and easier. For example, in helping to give
23 advance warning of pedestrians that are crossing to
24 the -- you know a warning comes to the driver -- this
25 is something we're looking at, for example, connected

1 vehicles, our pilot test, is taking some of these
2 technologies to provide better support for drivers to
3 help them be safer in their operation. And I think
4 there may be opportunities that we'll pursue there.

5 CHAIRPERSON RODRIGUEZ: Okay. Council
6 Member Miller.

7 COUNCIL MEMBER MILLER: Thank you
8 Mr. Chair. Wow. I'm gonna kinda piggyback on my
9 colleague, Council Member Chair's [sic] concern. How
10 many folks are employed in the transportation industry
11 here within the City of New York now?

12 BILL HEINZEN: I can tell you from our
13 small agency that we license approximately 150,000
14 drivers.

15 COUNCIL MEMBER MILLER: And within the
16 industry, who would that include specifically?

17 BILL HEINZEN: Yellow, green, black,
18 livery, commuter van, paratransit.

19 COUNCIL MEMBER MILLER: So as we talk about
20 truck traffic, the Chairman mentioned operating City
21 buses and others; how many would you estimate --
22 'cause you guys are obviously spending a lot of time
23 on this and a lot of resources; how many folks within
24 the industry potentially would be impacted?
25

1
2 BILL HEINZEN: I cannot even begin to
3 predict, Councilman.

4 COUNCIL MEMBER MILLER: How big is your
5 focus group between the agencies there? I know you
6 said that you have a team of folks working on this;
7 how large is that team and how much time and resources
8 have you allocated thus far?

9 MICHAEL REPLOGLE: Well we have an
10 interagency working group of six or either people
11 working on this, but I think, you know, to get to your
12 question, I think, you know, there are a lot of people
13 employed in transportation labor and indeed, we do
14 have a very strong interest in understanding...
15 [crosstalk]

16 COUNCIL MEMBER MILLER: But have you
17 evaluated how many people potentially would be
18 impacted by this, in your many hours... [crosstalk]

19 MICHAEL REPLOGLE: Because we're... well
20 we're not... we're not looking at automation of those
21 jobs right now, so that's -- no, we haven't looked --
22 we're concerned right now on the TLC impacts; we don't
23 see automation of buses happening.

24 COUNCIL MEMBER MILLER: Okay. So there
25 was... I see, based on your testimony, that the State

1 law prohibits the testing of the vehicles within the
2 city limits; you've mentioned in the outer boroughs,
3 and specifically you said Queens, that there was
4 testing going on; that's obviously in a controlled
5 environment; what's going on there?

7 MICHAEL REPLOGLE: No, when I referred to
8 the pilot testing, that's connected vehicles and
9 that's basically giving alerts to the driver of a
10 vehicle, whether it's a taxi or a bus or a private
11 care, that there might be another vehicle approaching
12 that the driver can't see... [crosstalk]

13 COUNCIL MEMBER MILLER: So we know those
14 technologies exist, as you stated...

15 MICHAEL REPLOGLE: but it relies on the
16 driver...

17 COUNCIL MEMBER MILLER: Yeah and as you
18 mentioned, that the MTA and others do have such
19 technology that they provide on some level now and I'm
20 sure, [background comment] but I'm talking
21 specifically; you mentioned that there was some
22 testing being done; what kind of testing; is it
23 actually driving; is it in a parking lot; it's
24 obviously off street, right...? [crosstalk]

1
2 MICHAEL REPLOGLE: Yeah, it's... it's... no,
3 the tests, some of those are being done on test tracks
4 [background comment] and some of them being done on
5 city streets to support the drivers; these are not
6 autonomous vehicles, these are connected vehicles...
7 [crosstalk]

8 COUNCIL MEMBER MILLER: Okay, so even that
9 level there -- let's just say Queens -- has it been
10 done in the Flushing area or downtown Jamaica area?

11 MICHAEL REPLOGLE: The connected vehicle
12 pilot covers a significant part of the city -- the FDR
13 Drive and then intersec... about 8,000 or 13,000
14 intersections... [crosstalk]

15 COUNCIL MEMBER MILLER: So... So...

16 MICHAEL REPLOGLE: where we have traffic
17 signals.

18 COUNCIL MEMBER MILLER: the reason why I
19 mentioned Flushing and Jamaica is 'cause those are two
20 of the top five congested areas [background comment]
21 in the City of New York; have vehicles been tested
22 there?

23 MICHAEL REPLOGLE: Yes; I mean the 8,000
24 vehicles are circulating around the city... [interpose]

25 COUNCIL MEMBER MILLER: So...

MICHAEL REPLOGLE: Again, we're just beginning the phase to test.

COUNCIL MEMBER MILLER: because here's what I find just a bit ironic; in these areas which are deemed by the federal government to be extreme transportation desert, there has not been comprehensive transportation studies around congestion; around efficiency at all done by the DOT and so I think that we're either putting the cart before the horse or we're prioritizing this industry and this new technology over what currently exists. So again, have we studied this technology in those areas and if so, at what expense to the current ridership and how would this or do you perceive this to impact communities such as Southeast Queens where the commute from City Hall to those areas are two hours; how would this help?

MICHAEL REPLOGLE: The pilot tests are for connected vehicle technology; is not aimed specifically at reducing congestion, it's focused more on traffic safety and the actual phase two testing is just getting started; it will happen as part of this ongoing -- we have another four years of this pilot... [interpose]

COUNCIL MEMBER MILLER: Has there been a traffic safety study done in Southeast Queens?

MICHAEL REPLOGLE: Yes, we... in fact, as part of our Vision Zero Action Plan, which was done in 2014, we've looked at all five boroughs and developed separate borough-level Vision Zero Traffic Safety Plans, focusing on trying to understand where the most incidents of serious injuries and fatalities due to road crashes occur and then... [crosstalk]

COUNCIL MEMBER MILLER: There has been a traffic safety study... [crosstalk]

MICHAEL REPLOGLE: Yes.

COUNCIL MEMBER MILLER: specifically done in Southeast Queens?

MICHAEL REPLOGLE: Most certainly. Yes, every part of the city.

COUNCIL MEMBER MILLER: Okay, 'cause I toured with the Commissioner last week and I just missed it; I have yet to see it; I'd love to see it; I would also love to know that equitable resources are being spent on communities in particular that are not transportation rich, that lack transportation alternatives in particular around infrastructure. I'm concerned that in order for this to work that

1 there has to be infrastructure investment and I would
2 like to first see that infrastructure investments are
3 made for communities that are presently being
4 deprived transportation options, because again, it
5 appears that we're putting the cart before the horse
6 in doing so and then my number one concern would be,
7 obviously, the displacement of hundreds of thousands
8 of workers that exist within an industry, 'cause
9 we've seem to be kinda cavalier about that. I
10 remember having a hearing a little more than a year
11 ago by some of these same industry folks saying that
12 they were going to create jobs and employment
13 opportunities within these same inner city
14 communities and targeting members for not being
15 supportive and a year later they're coming back and
16 saying that they're gonna remove jobs; I find that to
17 be the ultimate, you know...

18
19 MICHAEL REPLOGLE: Well we certainly know
20 that -- we're monitoring the future landscape on all
21 of these things and monitoring developments closely;
22 we recognize how hard it is to lose a job and we
23 recognize driving cars and buses offers a good living
24 to many New Yorkers and we wanna make sure that we do
25 what we can to protect the interests of those jobs

and to protect safety, that's the number one priority that we have is traffic safety and we will get you a copy of the Vision Zero Action Plan... [crosstalk]

COUNCIL MEMBER MILLER: For the record, I'd love to see it; I know right now, as we speak [background comment] there is a Vision Zero enforcement going on in my district and I would love to have been there, but I thought that this was that important for me to be here today, but that was only at my request and I will tell you that my community and other communities have not equitably received -- we've had nineteen accidents at one location and it wasn't until two months ago, when a school bus was involved, that it registered. So I don't know what kind of reporting is going on, and if the reporting is going on, at what point does it kinda kick in, that safety mechanism to kick in to say that we have to address this problem; is it after the third accident, the fourth, the fifth, the fifteenth; how do we get to nineteen if we have had a comprehensive safety study?

MICHAEL REPLOGLE: After every fatality that happens due to a road crash in this city, dozens

of people across our agency pay close attention...

[crosstalk]

COUNCIL MEMBER MILLER: I'm not talking about fatalities...

MICHAEL REPLOGLE: to what we can do to...

[crosstalk]

COUNCIL MEMBER MILLER: talking about accident.

MICHAEL REPLOGLE: try and forestall those from happening again.

COUNCIL MEMBER MILLER: We're talking about accidents.

MICHAEL REPLOGLE: Yeah. And so we are committed to making changes in infrastructure as well as changes in enforcement and regulation to protect safety across the city for every New Yorker.

COUNCIL MEMBER MILLER: Alright. Thank you.

MICHAEL REPLOGLE: Thank you.

COUNCIL MEMBER MILLER: Thank you Mr. Chairman.

CHAIRPERSON RODRIGUEZ: Council Member Garodnick, Menchaca... [interpose, background comment] I'm sorry, okay, for the next round, okay. So with

1 that, we're coming to the end to hear from the
2 Administration; again, this is only a beginning of a
3 conversation that we hope will bring all of us
4 together -- the Administration, the Council, the
5 private, and the academic entity -- hoping that we
6 can put New York City in the forefront when it comes
7 to bringing the innovation that we need related to
8 technology, not only about cars, but also buses;
9 hopefully MTA also will continue upgrading their
10 technology in the trains. In fact, this morning I
11 took the A train, the second stop on Diamond Street
12 the train was already full and the reason why that's
13 happening with the A train, it's not because there's
14 not enough trains, but yet it's because the MTA, they
15 have to upgrade their CBT, the signal that moves the
16 train quickly, so I think, again, I'm not advocating
17 to have more cars in the street; I am one of the
18 person who believe that we should have a plan to
19 review the numbers of New Yorkers who own cars; I
20 think that the market is there for New Yorkers, that
21 they don't need to have a car to know that there's
22 services; besides bicycles, besides ferry, besides
23 buses and trains that there's also cars; the private
24 sector's there to provide... supply the demand and I
25

1
2 hope that we again can see a reduction of people
3 owning cars in New York City, but this... again, thank
4 you for coming here, being prepared in this
5 conversation and I hope to continue working with you,
6 with DOT and the other agencies led by the Mayor that
7 I know that are looking to see how we can put our
8 city in the forefront of this initiative.

9 MICHAEL REPLOGLE: Thank you Chairman.

10 CHAIRPERSON RODRIGUEZ: Thanks... Thank
11 you... [crosstalk]

12 MICHAEL REPLOGLE: Thank you very much.

13 CHAIRPERSON RODRIGUEZ: So the next panel
14 is [background comment] Julie Samuels, David
15 [background comment] Strickland, Delaunay Claire,
16 [background comment] Will [background comment]
17 Nichols [sic], and Andrei Green... [background comment]
18 Greenawalt. So the next panel is the private sector;
19 hope that also they can bring some clarity on how are
20 we doing here and other cities in the world. [sic]

21 [pause]

22 CHAIRPERSON RODRIGUEZ: So the first one
23 who wants to start, just introduce yourself.

24 [pause]

25

JULIE SAMUELS: Go ahead. Thank you.

Good morning Chair Rodriguez and members of the Committee on Transportation. My name is Julie Samuels and I am the Executive Director of Tech:NYC. Tech:NYC is a nonprofit trade group that launched in May of this year with the mission of supporting the technology industry in New York by, among other things, increasing engagement between our industry and New York City government. It is also our goal to demonstrate to the growing technology industry at large that New York is the best place for technology and the companies that build it to grow and develop. We believe that New York's unique business ecosystem as a global center for so many industries, such as finance, media, fashion, art and real estate, will serve to strengthen the technology businesses that call New York home.

Self-driving cars represent one of the most exciting and promising developments emerging from the technology industry today. Self-driving car technology promises extraordinary benefits -- ranging from significantly improving human safety to dramatically reducing the massive carbon footprint of automobiles. Like any new technology with far-

reaching implications, there are undoubtedly concerns and considerations about how this technology will work and be used.

To best harness the promise of self-driving technology while ensuring it meets public considerations such as safety will require a consistent dialogue between industry and government. As a trade group that represents several companies interested in developing self-driving technology, we are pleased today to begin that conversation with this committee, and the City Council in general; a discussion that will undoubtedly continue in the months and years to come.

As we start this conversation, we also want to emphasize the importance of sending the right message to technology leaders nationwide that New York is a welcoming environment for the technology industry. The industry is, and will continue to be, a source of significant job growth in New York. Employment in the technology industry in New York increased 71% between 2004 and 2014. Notably, at a time when wage stagnation is so prevalent in the U.S., technology sector jobs in New York City pay more than one-third of the City's average private

sector salary. The growth and high wages of technology firms is particularly noteworthy for New York City at a time when city tax revenue is declining for the first time in several years. We believe it is important for lawmakers to think about how we attract the types of businesses that create jobs and generate economic development. A highly-visible issue like self-driving cars is important for the perception of New York as a tech-friendly city.

New York is a city unlike any other in the U.S. As a result of its individuality, self-driving cars present unique opportunities for New York that could improve many of New York's most significant day-to-day challenges.

First, pedestrian safety is an issue of paramount importance in New York. It is well known that Mayor de Blasio has made the pursuit of zero traffic deaths a primary focus of his administration through his Vision Zero initiative. Last year in New York City, more than 3,500 people were killed or severely injured in traffic crashes. While his number represents a significant improvement from years past -- much to the credit of the Mayor and

Commissioner Trottenberg -- we can all agree that we would like to see that number dramatically lower.

The National Highway Transportation Safety Administration (NHTSA), the federal agency charged with protecting the traveling public, tells us that 94% of automobile-related crashes can be tied to human choice or error. By reducing the element of human choice or error, self-driving cars can dramatically lower the deaths and injuries attributable to cars. In fact, in guidance documents that I will discuss more later, the federal government stated that "the automobile industry is on the cusp of a technological transformation that holds promise to catalyze an unprecedented advance in safety on U.S. roads and highways."

Next, self-driving cars promise significant improvements in New Yorkers' quality of life. New York is a place where space -- both on our streets and in general -- is at a premium. A future with self-driving cars means a significant reduction in car ownership and fewer cars sitting parked on our streets or in garages serving no purpose. Most cars sit unused for 22 hours a day, and there is no reason why we can't take land back from cars for beneficial

uses. Less on-street parking could mean extra dedicated and protected lanes for cyclists. And reducing our need for parking lots and parking garages means more land for parks and developing housing.

Reduced car ownership would also decrease the financial burden that cars have on their owners. The average car-owning family in New York spends over \$2,000/year on gas, insurance and repairs. This does not take into consideration costs that are particularly high in New York City such as monthly parking fees or parking tickets.

Finally, the reduced need for vehicles could significantly improve the city's air quality and our carbon footprint. A recent Community Air Survey issued by the City's Department of Health and Mental Hygiene indicates a strong correlation between high-traffic roads and highways and negative air quality in certain New York neighborhoods. And it's not just high-density roads that we should be concerned about -- in congested urban areas, about 40% of total gasoline use is by cars looking for parking. In addition to our own air quality, vehicle reduction will have a meaningful impact on our carbon

footprint and global warming -- roughly 13% of greenhouse gases nationally are attributable to passenger vehicles and light-duty trucks like SUVs, pickup trucks and minivans.

Tech:NYC supports a balanced approach for regulating self-driving cars. In September, as many of you probably know, President Obama published an op-ed that argues we must strike a balance in regulating self-driving cars. He stated that "regulation can go too far" at times, and "government sometimes gets it wrong when it comes to rapidly changing technologies." But at the same time "Americans deserve to know that they'll be safe today even as we develop and deploy the technologies of tomorrow."

To strike that balance, in September the federal government issued a Federal Automated Vehicle Policy. That policy outlines a 15-point Safety Assessment that sets a range of goals for manufacturers based on factors like object detection and response, crashworthiness, cybersecurity, human/machine interface, data-sharing and other factors. The agency states that the policy is by no means the final work on automated vehicles but an

effort to establish a foundation and a framework upon which future agency action will occur. We think this is a sensible approach.

The government's guidance document also provides model state rules in an effort to avoid a patchwork of inconsistent laws and regulations among states and jurisdictions, which could delay the widespread deployment of self-driving cars. In order to avoid interference and confusion, the agency encourages states and jurisdictions to allow it alone to regulate the performance of self-driving cars for now.

As a role for states and localities develops to regulate self-driving cars, Tech:NYC wants to be a partner with the City of New York to craft its laws and regulations that work for both the industry and the unique characteristics of New York. We look forward to working with this committee and the entire Council going forward.

CLAIRE DELAUNAY: Good morning Chair Rodriguez and distinguished members of the Council.

My name is Claire Delaunay; I am Director of Engineering at Uber Advanced Technologies Center

and co-founder of the startup Otto [inaudible] from beer delivery, autonomously.

I would like to thank the City Council and Chair Rodriguez for inviting me here today and to share Uber's vision about the future of transportation.

The promise of self-driving cars is core to Uber's mission of reliable transportation, everywhere for everyone. We cannot predict what the future will hold, but self-driving cars have the potential to make cities safer, cleaner and more efficient and more affordable. And the greatest potential of self-driving vehicles is safety.

Today, 1.3 million people across the globe die every year in car crashes; 94% of those accidents involve human error. Despite the work the City has done to implement Vision Zero, here in New York more than 250 New Yorkers are killed each year in traffic crashes. Another 4,000 are seriously injured. This is where self-driving technology can help save lives.

Computers can perceive better, calculate faster and react earlier, which means they can drive safer. Safety is built into our entire product

process; it begins in design, extends through testing and is continuously evaluated through real-world performance. Once self-driving technology becomes part of everyday urban use, accidents resulting in injuries or deaths can be drastically reduced.

While it won't happen overnight, self-driving will be an important part of the future of urban mobility. This is consistent with the goals of the Car Free NYC initiative, and I would like to thank Chair Rodriguez for his leadership on this issue.

An estimated 20% of the space in cities currently used to park the world's billion plus cars, a future with self-driving cars could mean less parking, which could mean more space for parks, playgrounds and other community uses. It could also mean cutting congestion, which wastes trillions of hours every year.

We know riders and drivers will have questions about what this technology means for them. But it's still early days.

Uber is running a pilot in Pittsburgh with a small number of self-driving Ubers, which have a safety driver in the front seat because they

require human intervention in many conditions,
including bad weather.

Even when the technology is more advance,
we believe there will still be a mix between self-
driving cars and human drivers.

I believe that the opportunities are
boundless and I look forward to sharing the progress
of this technology as we continue to refine it.
Thank you again for your time, and I welcome any
questions.

DAVID STRICKLAND: Thank you. Good
morning Mr. Chairman and members of the Committee;
it's an honor to appear before you today.

My name is David Strickland and I am the
Counsel to the Self-Driving Coalition for Safer
Streets, which is a coalition whose members include
Ford Motor Company, Google, Lyft, Uber, and the Volvo
Car Group. Prior to my involvement in the Coalition,
I was the administrator of the National Highway
Traffic Safety Administration from 2010-2014 and I
issued the first federal testing policy for self-
driving cars.

The purpose of the Coalition is to create
a mechanism for civic leaders, community organizers,

businesses, lawmakers, and regulators to work together to advance the deployment of fully autonomous self-driving vehicles in a safe and timely manner. The Coalition is working with a broad spectrum of stakeholders to make fully self-driving capabilities available to as broad a segment of the American population as soon as possible.

As governments grapple with the most effective way to address self-driving cars without compromising safety or inhibiting innovation, we welcome the opportunity to partner with state and local governing bodies to facilitate deployment and bring these potentially life-saving technologies to market. The Coalition applauds New York City for taking advantage of the opportunity to understand how self-driving cars have the potential to improve public safety.

Despite decades of success in reducing fatalities, we lost 35,092 people last year on the nation's roads. Here in New York City 230 people died in traffic crashes; 133 of those were pedestrians. At the national level it is even more frustrating to note that we are seeing an upward trend again in fatalities in 2016; it is 10% higher

than it was this time in 2015. While we must continue to make strides in crashworthiness and improving driver behavior, the future of occupant protection includes active safety and crash avoidance systems as new important tools in this fight. The Coalition strongly believes that self-driving cars have the potential to significantly transform and advance the personal safety of passengers and other road users from what we are currently experiencing.

As various active safety technologies continue to be deployed, it is imperative that we do not lose sight of the wide potential societal benefits self-driving cars may provide. Self-driving cars directly address driver awareness and error, can reduce congestion, and could provide the opportunity for millions of people to attain individual mobility that are currently foreclosed from driving. The potential benefits of self-driving cars have exceptional relevance in a market such as New York City, where they could help reduce traffic delays and address parking challenges.

As you are aware, NHTSA released a voluntary guidance regarding the testing and deployment of highly automated vehicles. The

Coalition supports NHTSA's effort to construct a novel regulatory approach that would promote the expeditious and safe introduction of fully self-driving cars as a means of improving safety and mobility. To that end, the Coalition encourages opportunities to collaborate with local, state and federal governments to ensure thoughtful and uniform testing and deployment, including public-private partnerships, which will be integral to the successful deployment of these vehicles. Early engagement, as exemplified by this Council's efforts, will ensure that the public sector's efforts are in sync with technology. For instance, the law on the books that keeps drivers with one hand on the wheel here in New York State effectively bans deployment of vehicles that do not require a human operator in the vehicle. This provision was added to New York's Vehicle and Traffic Law in 1967, long before the prospect of self-driving cars became a reality.

The Coalition appreciates the Council's proactive approach to understanding the future of self-driving cars and their potential to help your constituents in this amazing city. As the Council continues to explore this area, the Coalition looks

forward to serving as a resource concerning both technical and policy questions.

The Self-Driving Coalition for Safer Streets looks forward to working with the New York City Council towards making fully self-driving cars an immediate reality. We appreciate your interest in this area and welcome further collaboration moving forward.

Thank you very much and ready for questions at this time.

WILL NICHOLAS: Thank you and good morning. My name is Will Nicholas and I am a Government Relations Manager for Tesla. I want to thank Mr. Chairman and the Committee for allowing me the opportunity to describe Tesla's initiatives to create automated vehicle technologies that provide drivers more confidence behind the wheel, increase safety on the road and make highway driving more enjoyable and less fatiguing.

Tesla is an American technology and design company that solely manufactures and distributes electric vehicles. Founded in 2003 by five Silicon Valley engineers seeking to end the country's dependence on oil, particular foreign oil,

Tesla is committed to building exceptionally safe vehicles. Considering that an estimated 94% of all crashes are caused by human error, a solution for reducing crash frequency is to reduce that human error. While humans are not recognizably improving their driving skills, fully automated driving has advanced dramatically over the last decade. Therefore, Tesla believes automated vehicles can dramatically reduce both crashes and associated fatalities.

In October of 2014, Tesla began to build its cars with autopilot hardware -- a package including a front facing camera, radar and 12 ultrasonic sensors. Months later, software was developed and deployed over the year to Tesla's fleet, enabling the first active safety technologies. Today Model S and Model X owners enjoy available features like autosteer, auto lane change, autopark and summon. Tesla is continuously innovating to keep customers at the forefront of technology through the aforementioned over-the-air software updates and with the current feature set, Tesla Autopilot is still

classified as an SAE and NHTSA Level 2 automated system where the driver is responsible for and must remain in control of their car at all times.

In accordance with the commitment to remain at the forefront of the industry, Tesla announced last week that all vehicles in production, as well as the forthcoming Model 3, will be built with an updated hardware suite, equipping each Tesla with the hardware needed for self-driving capability, dependent on regulatory approval, at a level substantially greater than that of a human driver.

Eight surround cameras provide 360-degree visibility around the car at up to 250 meters of range. Twelve updated ultrasonic sensors complement this vision, allowing for detection of both hard and soft objects at nearly twice the distance of the prior system. Forward-facing radar with enhanced processing provides additional data about the world on a redundant wavelength that is able to see through heavy rain, fog, dust and even the car ahead. To make sense of all of this data, a new onboard computer with over 40 times the computing power of the previous generation runs the new Tesla-developed neural net for vision, sonar and radar processing

software. Together, this system provides a view of the world that a driver alone cannot access.

Before activating features enabled by the new hardware, Tesla will further calibrate the system using millions of miles of real-world driving to ensure significant improvements to safety and convenience. Availability of these features will be dependent upon extensive software validation and regulatory approval.

Tesla vehicles are compliant with today's laws in every region where registered. The Federal Automated Vehicles Policy are guidelines for developing and deploying automated vehicle technologies. We look forward to further collaboration with NHTSA on the guidance as we build together toward an automated driving future.

Historically, NHTSA has successfully promoted innovation by allowing safety technologies to be deployed, and then using data from their deployment to inform regulations. This approach encourages manufacturers to think and invest boldly, to collect data on new technologies, and to rapidly improve upon developing technologies. The approach has successfully ushered in the deployment and

1 adoption of many major advancements in vehicle
2 safety, including airbags, antilock brakes, and
3 electronic stability control. While we now know that
4 each of these technologies provides a safety benefit,
5 none of these technologies are inherently innocuous.
6 Rather, risks were associated with their initial
7 deployment. Fortunately, rather than being stifled
8 by premature regulations, these technologies each
9 benefited from an early period of unfettered
10 innovation.
11

12 Intelligent regulations can promote
13 safety by mandating technology-neutral safety
14 standards that raise the bar for all manufacturers.
15 However, such intelligent regulations can only be
16 drafted after being inspired and informed by safety
17 innovations. This also holds true for any eventual
18 regulations regarding automated vehicles. The
19 complex and rapidly evolving nature of this
20 technology currently makes it difficult to accurately
21 predict exactly what path forward will result in the
22 greatest safety benefits.

23 For cities like New York, infrastructure
24 improvements that are beneficial for human drivers
25 will also be beneficial for automated vehicles.

1 Tesla believes the best action cities can undertake
2 today to support the development and deployment of
3 automated vehicles is to invest in the road
4 infrastructure. Although Tesla plans to eventually
5 deploy automated vehicles that are capable of
6 operating on any roadway, in the short term, its
7 technology operates best on roads that are well
8 maintained. Cities are best served by filling
9 potholes, painting lines and fixing signage and
10 guardrails than anything else. These efforts will
11 not only benefit today's human drivers but will
12 prepare cities for the adoption of automated
13 vehicles.
14

15 Thank you for the opportunity to present
16 this testimony and I welcome any questions that the
17 Committee may have.

18 ANDREI GREENAWALT: Good morning Chairman
19 Rodriguez and other distinguished members of the City
20 Council. My name is Andrei Greenawalt and I'm the
21 Vice President for Public Policy at Via; appreciate
22 the opportunity to address you today on the subject
23 of driverless vehicles.

24 Via is an on-demand transit service that
25 utilizes cutting-edge technology to group multiple

passengers into vehicles along dynamically updated routes. Our company is headquartered in New York City, and each day we provide highly efficient rides to tens of thousands of New Yorkers who pay affordable, flat rates.

As we look to the future, it's clear that driverless vehicles will eventually transform the transportation landscape and provide significant public benefits, including saved lives, increased mobility for communities that need it, and reduced congestion and pollution.

Today I'd like to briefly make three points informed by our company's experience in New York. First, we believe New York City has the opportunity to be -- and should be -- a leader and innovator in this area. As you know, other cities are already working with private sector partners and organizations to test driverless vehicles. In the five boroughs, New York has a wide range of neighborhoods, street and traffic patterns, and transportation needs which present a variety of opportunities for pilot programs and experimentation. A successful program would fuel economic activity and further establish New York City as a leading global

city for technology and innovation. Also, by taking a proactive approach to the development of driverless vehicles and their use on city streets, New York could learn important lessons on how to make these vehicles work most effectively for the City, whether that be how to best oversee and regulate their widespread deployment or how their emergence should inform decisions about investments in infrastructure. This is far preferable to New York merely reacting to this technology and its implications once its development is more advanced and tailored to other cities.

Second, we believe the City should promote the use of driverless vehicles on a shared basis. Rather than private, individual ownership, we support a model in which driverless vehicles are a public resource with multiple passengers sharing each vehicle at any given moment. This is the best way to harness all of the benefits that driverless vehicles promise, and could drastically reduce congestion on City streets as well as the emission of harmful pollutants. Dynamic routing and technology that groups multiple passengers into vehicles in an efficient way that commuters and travelers enjoy is

not some dream on the horizon. It's here. Through our service, Via has demonstrated that we can transport New Yorkers to their offices, schools, homes, and other destinations with a high level of efficiency and aggregation, and we can do so at scale. By promoting a shared-use vision of driverless vehicles now, New York could be at the forefront of a new era of mobility that will move residents around a city more cheaply and efficiently.

Third, we will leave the timing predictions to others, but it's clear the widespread deployment of driverless vehicles is inevitable. While this has the potential for significant public benefits, we should all recognize the upheaval that it could cause for the large number of New Yorkers who are paid to drive vehicles. At Via we care deeply about the drivers who use our platform and their experience, feedback and input is a critical part of how we operate our business. As you consider the exciting, complex and challenging implications of driverless vehicles, we encourage you and other policymakers to begin discussing how best to support drivers who will be impacted by potential changes. For example, you could consider the creation of a

1 fund to help drivers save their earnings for the
2 future and programs to help drivers learn the skills
3 to transition to other work opportunities whenever it
4 is that driverless vehicles ultimately begin
5 displacing current vehicles. Thank you for your time
6 today and for your consideration of these remarks.

8 CHAIRPERSON RODRIGUEZ: Thank you. So
9 you looked at the private sectors like already is
10 doing the work; it's all about how to put the
11 partnerships together with private and public sector
12 together to be able to make our city like one of
13 those that can compete with others who already are
14 using autonomous vehicles, and in that direction,
15 what do you think the City has to put in place in
16 order to bring the incentives that the tech industry
17 needs in order to try and do like a pilot project
18 with a Level 3 autonomous vehicle?

19 DAVID STRICKLAND: Thank you for the
20 question Mr. Chairman. Really, the foundation of any
21 city looking to create an innovation platform is to
22 create a thoughtful, consistent regulatory regime
23 that does not at the same time stifle innovation.
24 The industry members that are testing, and testing
25 very safely, really do have exquisite risk assessment

1 regimes to make sure that the testing that happens on
2 public roads happens very safely, and having,
3 frankly, a flexible but thoughtful regulatory regime
4 to allow that testing and innovation is the
5 foundation I think of success, and I think that the
6 number of cities that have allowed testing already
7 have sort of shown some of that platform; those
8 cities that have allowed testing without drivers and
9 obviously with the assurances of how you're gonna
10 deal with interventions is very important and we need
11 to provide those assurances. But that's the reason
12 why you've seen a number of cities around the world,
13 as you've noted, seem to be doing more testing; they
14 have really given flexible regulatory regimes and
15 working with the industries that are testing it in
16 their cities and countries, whether it's Singapore or
17 whether it's Scotland or Sweden whether it's in
18 Beijing, China. Having that partnership between
19 government, and frankly, and the industry in being
20 transparent and collaborative is the reason why
21 you've seen that advanced testing. No one has gone
22 out and started using self-driving vehicles in a
23 public way yet; they're all in testing mode, and I
24 think for the United States, which is still, you
25

1
2 know, the most innovative market in the world, we
3 need to sort of follow that pattern of making sure
4 that there is a consistent, a flexible regulatory
5 regime.

6 JULIE SAMUELS: I would just add to that,
7 that to the extent we have that kind of regulatory
8 regime here and we can incentivize that kind of
9 testing here, you will also -- it goes without saying
10 -- incent those companies to bring employees here to
11 actually have a base, if not a headquarters here, and
12 that's, from Tech:NYC's perspective, one of the most
13 important things that we can think of. And I'd also
14 quickly say that if you went back and look at how the
15 Mayor of Pittsburgh talked about this after Uber
16 announced the plans there, I think he said it's the
17 difference between rolling out a red carpet and red
18 tape, and even having these conversations in
19 preparation to figuring out what the regulatory
20 scheme looks like is incredibly important because it
21 really does send a message to entrepreneurs, to
22 founders and technologists that New York welcomes
23 these experiments and these testing... welcomes where
24 we're going.

CHAIRPERSON RODRIGUEZ: From the engineer perspective, what are the challenges that our city faces or that we should address for this initiative?

CLAIRE DELAUNAY: So from the engineering perspective, I think autonomous cars are also boundless in terms of opportunities, but boundless in terms of challenges, so there are a lot of things that have to be laid down.

And to your question just before, what's extremely important is to be able to test and evaluate the technology and refine the technology in an array of conditions, as close as possible like to the deployment site, and every test, every month expand testing the technology at the location we want to deploy the vehicle would be a tremendous advantage for the deployment, because we cannot... like optimize the technology for **[inaudible]** location.

CHAIRPERSON RODRIGUEZ: Where do you see the public [sic] sector working in our nation -- in this case, everything is local therefore in our city -- to prepare the workforce that should be the one leading... to take those jobs and that, assuming, and it's a matter of time that we will see autonomous vehicles in the street, therefore we will be creating

1 like a number of jobs. As you know, last year more
2 than 80,000 individuals, they got a working visa to
3 come to work in the United States and now someone,
4 one of those recent immigrants -- I have not been
5 against someone who is an engineer in any other
6 places, if he or she can provide the talent that we
7 need -- I am down for we as a nation to recruit those
8 talents. My concern is that when you look at say
9 City of New York, as a former teacher for 13 years,
10 we also know that most of the students, they are not
11 even taking algebra when they are in 9th grade,
12 compared to those students who are more advanced that
13 in 5th grade they are already taking algebra. So
14 where do you see the City, especially from the tech
15 perspective, like your role, as a role of the
16 government to say we together can prepare the
17 workforce to fulfill those jobs that we will create?

19 JULIE SAMUELS: I think the City is
20 already making great strides in that regard with, for
21 instance, the CS for All, and what's interesting
22 about the CS for All program, of course, is that it
23 is a public-private partnership, so to the extent
24 that we are incentivizing more industry, more
25 companies; frankly, more economic development here,

1 we kind of increase the private half of that public-
2 private partnership, and what has -- I've been
3 working with the tech industry for many years in New
4 York and also in the Bay Area -- and what is apparent
5 is that these companies do want to engage in their
6 local communities in developing local talent and
7 supporting education efforts, whether it be directly
8 through the cities and the governing bodies that work
9 on that or through nonprofit MGOs who help develop
10 community groups and we've seen a lot of success in
11 New York with those groups. So to the extent we're
12 creating the need for those high-skilled workers and
13 to the extent we are creating the economic base of
14 the people who can help both push for that, as a
15 political matter, and help fund it, as a more private
16 matter, I think that all these things will come
17 together to increase the number of New Yorkers who
18 are getting the right education to fill what will be
19 really great jobs.

21 CHAIRPERSON RODRIGUEZ: I just hope that
22 in this continued conversation that I know that we
23 will have, together, we the Administration; again,
24 the universities, schools and you as the private
25 sector, you know, we need to be more accountable to

1 that, because especially, as you know, the culture in
2 the private sector is -- you know you want to put
3 people more accountable and I think that sometimes
4 for me, even frustrates me when I sit in a place and
5 we talk about all the resources that we put together
6 and however, we are always afraid to put numbers,
7 saying okay, this is the numbers of young people,
8 college that we together can prepare to fulfill those
9 seats. When I take, you know, my 9-year-old to a
10 robotic program, when I see that she's, in many
11 places, the only female and the only person of color
12 in those initiatives, so unless we start early
13 addressing that gap, you know, 25 years from now, if
14 we're alive, we will be part of that conversation
15 saying we're doing everything, everyone is doing
16 their part; however, the number will continue being
17 the same. So again, what I hope is that, as Carlos
18 was mentioning, that we need to look -- this is the
19 future, this is not anymore the future; this is the
20 present, probably one... I'm one of the few ones that
21 still has a Blackberry [laughter] and as people will
22 say, even those who will criticize the autonomous
23 vehicle, it's a matter of time, and I think that you
24 know, the investors, they are looking to get a good
25

1 return and that's fine for them to do good; that's
2 good for the City; the transportation entity, they
3 need their investments to improve transportation --
4 buses, cars, you know, trains -- and we, those in
5 government, have to be accountable for taking our
6 city to a better place when it comes to
7 transportation. So I know that all those questions,
8 it's not being more than bringing legitimate, lawyer
9 concerns, but you know, discussion on where are we
10 going and I believe that the City still has to do
11 better when it comes to taking the 8.5 million New
12 Yorkers into more technology and I just hope that,
13 you know, listening to all of those things and many
14 residents, members of our city, we have to sell this
15 as something that people should embrace. One of
16 those articles that was published in a magazine
17 yesterday about this issue, not only they're dealing
18 with infrastructure; they mention about data, but
19 it's about the educational piece and the educational
20 piece is not about the classroom; it is, how do we
21 persuade New Yorkers, in this case, our city, that
22 this is a good thing? What is a driver assisting
23 tool that be installed in [sic] those cars? How will
24 we be preventing that those autonomous vehicles will
25

not be ending up in the hand of a terrorist person who will use it for their own agenda to kill innocent people? So as you are doing the research, are you paying attention to those concerns that New Yorkers or residents of any other city will have when it comes to at the moment when we have those autonomous vehicles on the streets, how can we be sure that we do the best we can to prevent those vehicles not to be ending up in the hand of people who use it for another purpose?

CLAIRE DELAUNAY: So at Uber, we take the security very seriously, and like a year ago, a Jeep was hacked -- I don't know if you heard about it -- and Uber, we decided to hire these hackers to be able to actually try out the system we developed and constantly make sure that we are at the best of what we can do in terms of security.

I will also add that there is no like very easy way to hack into an autonomous car and like I would say the same -- it's as **[inaudible]** as an older car is; like you will have to open the hood and like cut the wire or you will have to like actually hack the computer or physically connect to the computer of the car; this is not as easy as like

hacking a phone, for instance. And so the same security that applies for regular cars applies also for autonomous cars.

DAVID STRICKLAND: Also, Mr. Chairman, I'm not sure if you're aware; the National Highway Traffic Safety Administration earlier this week issued new cybersecurity guidelines for the automotive industry; it's to basically set the basic principles to deal with what is foundational safety for cybersecurity and data protection. This arose out of the work of the industry, a thing called Information Sharing and Analysis Center (ISAC), which is where the industry actually shares cybersecurity threats with each other so that when an attack happens, and an attack will happen, the goal is to not only harden your systems to make sure that it isn't easy to get in, but also to identify the attack quickly so you can stop it. And so the federal government took its first steps today in harmonizing the industry on that point; it is gonna be a continuing work with, frankly, not only Uber, but frankly, every innovator and manufacturer across the industry to deal with that particular threat factor.

CHAIRPERSON RODRIGUEZ: ...City that we should look as a model? Like, I remember I did my last semester in '93 in Fordham University and the first thing that I was advised to have -- go and buy a bike, and there were bike lanes at that time, full bike lanes **[inaudible]**, and it took many years to start working with bike lanes, as many other cities -- Colombia, Mexico, **[inaudible]** and many places in Europe and Asia. Which is the city today that we can say they the role model, the one that we should, if we want to compete, this is the one, the top one for us to compete? **[inaudible]** there that we should be aiming to accomplish?

CLAIRE DELAUNAY: So right now we are conducting an experiment with... a pilot project with Pittsburgh and I would say the best thing that you can do is work with us, just work with us and figure it out how to experiment better, because the key to all of... this problem of intelligent car is all about data, we need more data, we need to collect more data to try out more scenarios and be better at that. Now there is not like a golden thing that we can come up with just now and say all of us **[inaudible]** autonomous driving. But to the point of... Tesla

1 addressed before, like well... well-maintained, road
2 infrastructure is always better, as well as poor
3 human drivers and autonomous cars.

4
5 DAVID STRICKLAND: Mr. Chairman, in terms
6 of what is the best city that is conducting, so I
7 think my suggestion would be to frankly, have an
8 opportunity to talk to industry players that are
9 actually doing the tests. There is no best city;
10 there are elements in each testing site which are,
11 you know, thoughtful, positive and advantageous;
12 there are some that actually we have found issues
13 with going forward. I would also probably say, as
14 another general suggestion; the Department of
15 Transportation did a challenge called "The Smart City
16 Challenge," where they invited 40 cities to, frankly,
17 think about data and technology in terms of how you
18 innovate for the city of the future and they offered
19 \$40 million to the ultimate winner, which was
20 Columbus, Ohio. But with that there was a group of
21 several cities that put together several multimillion
22 dollar investment proposals on how to sort of build
23 towards the future of supporting innovation and
24 transportation and technology like self-driving; I
25 would say reach out to the folks that did that work

on the Smart City Challenge; I think that you would probably get a really good foundation of ideas to think about for New York City as well.

CHAIRPERSON RODRIGUEZ: Which other nations are we competing? Come on, don't be politically correct. Come on. [laughter]

DAVID STRICKLAND: Uh no...

CHAIRPERSON RODRIGUEZ: Is Germany... who... which other countries do we... do we look at...? [crosstalk]

DAVID STRICKLAND: I... I... I am... I [inaudible] other find [inaudible] panelists in terms of who knows. It's testing that's going on around the world, but I will say this... [interpose]

CHAIRPERSON RODRIGUEZ: Sorry... [background comments] like we wouldn't com...

DAVID STRICKLAND: Uh no, com... I will tell you; the competition is strong, but it's also very different, because United States is probably the most very driving terrain probably on planet Earth, so even if you're doing testing in these other countries, it's not gonna replicate what we do here, which is the reason why testing here is so, so important. That being said, let's just be blunt,

1 countries that have top down national governments
2 that don't have a federal system, it's easy for them
3 to make changes in laws quickly to do stuff; that's
4 the reason why you see China leaning in so hard and
5 heavy in the testing; they don't have to worry about
6 state and local governments the way that we do. So
7 they can make changes in law very quickly, they can
8 take, you know, different approaches very quickly,
9 but that doesn't mean that they're gonna be better,
10 it just means that they have... at government level
11 they're more efficient. We have the opportunity here
12 in the United States, as we've seen in our testing
13 regimes, to produce, frankly, the technology that is
14 influencing the rest of the planet. The gun started,
15 so to speak, when Google had done its testing on
16 Lombard Street in San Francisco in 2010; there had
17 been testing going on for decades, you know when labs
18 across every manufacturer; it became in the
19 mindshare, here in the United States, and everybody
20 else is following. So again, you can take bits and
21 pieces from other governments on how they do it, but
22 they can't replicate what we do here, so we still
23 have that opportunity and that frankly, I see the
24 advantage.
25

CHAIRPERSON RODRIGUEZ: Council Member
Menchaca.

COUNCIL MEMBER MENCHACA: Thank you
Chair. And thanks to everybody in this panel. I
think, in just listening to your not only work on
multiple different sectors, from nonprofit and
private sector, you're clearly invested in this for a
lot of different reasons. And I wanna start with
just -- it's a little subtle, but it's important to
note. Miss Samuels, you kinda testified a lot; in
fact, when we're done, I wanna sit down and talk with
you about some of that work -- I think out of
everyone you're really focused in bringing this into
our schools and without kinda prompting that, you
brought that in. But there's one thing that I, I
mean I have to say, in your testimony, you talked
about the Administration and the Mayor and his Vision
Zero initiative, I think what's important is that
this is not necessarily connected just to the Mayor
or his administration; this is a movement, and so I
think language is important to talk about that in a
way that -- this is more than just one person in the
City as a leader; it's important, but this is coming
from the ground; this is really... the Vision Zero

concept, which is, this is very integrated, is important. So I think we should talk about it in that way as a movement of people in a city. And I think about the model that you're injecting yourselves into, when we think about... and the Chair started and reminded us of the Model T Ford and how that came out and just revolutionized everything, and if we could think about that moment in time in the history of the country, of the world and what it took for that one inventor to do this work, and now we're trying to invent something new in a whole different way where so many people can interact, including our classrooms in our city and I just wanna hear more about how -- 'cause I heard the vision, the vision is there, and again, Julie, you kind of nailed it, but from the companies -- what is your role in that -- and I'm thinking about Uber, less Tesla, but more interacting with Uber and some of the other conversations we've had in this room where so much money went into lobbying us on some other things that we were discussing; a lot of money went into that; haven't seen a lot of money go into schools. Talk to us a little bit about, as a private sector, what

you're doing on this concept of engaging a movement and not necessarily a for-profit bottom line.

CLAIRE DELAUNAY: So I would like to say something about the engineering aspect, because this is really what I care about, and I would say I almost -- sorry -- don't care if it's Uber or anybody else. What's very important is that what this private sector is doing right now is pushing the technology much farther and for a lot of different reasons it's very important that we target the future, not the intermediary [sic] step, but we -- especially in transportation, look at the progress we made on medicine, on physics, on molecular physics, autonomy, and when you look at how we do transportation nowadays, it's still very, I would say primitive in a lot of different regards, right? And so I think what's amazing about the effort the private sector is creating is that they inject they money to actually let engineers engineer and redesign the transportation and that seems this is key to like safety and efficiency in the future.

COUNCIL MEMBER MENCHACA: And I'm interested in engineering too, but -- I don't know if

anybody else wants to kind of hit that question as well.

[background comment]

JULIE SAMUELS: I could quickly say that Tech:NYC -- to make a quick plug for my organization -- has only been around for about six months, but as we continue to grow, I think a lot of what you're talking about -- increased civic and philanthropic engagement -- is something that we will be helping the community at large organize, so stay tuned.

COUNCIL MEMBER MENCHACA: Thank you. And again, this is what I wanna work with you and I think the Committee wants to as well.

So let's go to the next thing, on a kind of more specific thing. Where are we gonna land first, and I think Tesla's point was kinda made very, very clear about infrastructure and road infrastructure and developing that. Do you have a sense about... can you give us a texture about what that looks like, an example of that? Because my main question is; are we gonna first see... What are we gonna see first; areas where you essentially remove the human driver and just have vehicles interacting with each other 'cause we've built the

1 infrastructure, and if you can imagine areas like
2 Lower Manhattan where no more people will be driving
3 things and people will be driven, because we have the
4 infrastructure, and so there will be no human error
5 because there will be no humans and so... I mean is
6 that where we land first or are we really gonna
7 perfect this concept of driverless cars interacting
8 with humans, and so I'm just kinda curious if you
9 have a sense about what that looks like and examples
10 of what the infrastructure you're talking about is.

11
12 WILL NICHOLAS: Indeed; thanks for the
13 question.

14 Although the premise for these
15 conversations is certainly based in the future, I
16 think that there will be some time in which the
17 technology is developed, not only on the private
18 side, but also in the public sector's or the
19 consumer's perception as well. Without an education
20 on this technology, I don't think it will be broadly
21 adopted, and I think, as the Department of
22 Transportation categorized, you know how the
23 technology will be developed and right now Tesla is
24 safely at a Level 2, where you know drivers are
25 indeed in control of the vehicle, but are benefited

1 by active technologies that can help you stay in your
2 lane and not the thing in front of you, so on and so
3 forth, and I think that as we continue to collect
4 data and conduct experimentation, the human and
5 technology elements will combine themselves to a
6 place where there is confidence in the technology
7 that can further and further take over and make
8 decisions in conjunction then for the human driver.
9 So I can't say that there's a place in this city --
10 in which I live and love -- will take place first,
11 but I think that it is important for this Council and
12 for the other agencies to keep in mind that as the
13 cars begin to equip themselves with the hardware and
14 the software to collect that data, it's important
15 that they continue to allow kind of a safe
16 experimental zone so that the companies that are
17 developing this technology can examine that and make
18 qualified decisions as to what comes next.

19
20 ANDREI GREENAWALT: Just to touch on your
21 previous question for one second. I grew up in New
22 York City and my first job after college was working
23 at a nonprofit here, running an afterschool program
24 for kids here, so I feel like personally invested in
25 the issues you raised, and just on behalf of beer

1 [sic], which is, you know, we're a bit smaller than
2 Uber and Lyft and the other guys and we're still
3 growing, but we're a member of Julie's group,
4 Tech:NYC, and we look forward to helping out in any
5 way we can on that front.
6

7 And I just wanted to make one point on
8 infrastructure, which is: I think this is -- you've
9 hit on one reason why it's so important that New York
10 be a leader on this front in terms of testing and
11 experimentation, because the infrastructure needs of
12 a Pittsburgh are not gonna be the same as the
13 infrastructure needs of a New York. Infrastructure
14 needs in Manhattan are gonna be different from
15 Queens, they're gonna be different from the Bronx,
16 from Brooklyn; from Staten Island, and so I think
17 getting out there and getting to a point where these
18 vehicles are being tested in the real world, in New
19 York, is critically important, and what better way to
20 inspire our kids than seeing these pilot programs in
21 the different boroughs.

22 COUNCIL MEMBER MENCHACA: Agreed.

23 Agreed. Help me understand what happens in this kind
24 of race toward evolution and technology, the creation
25 of this technology and the merger, and this is

1 Council Member Reynoso's point on buses and trains
2 and where is that line do you see -- we asked the
3 City that earlier, but where do you see that and do
4 you see any real stops and lines in the sand here or
5 do you really see this kind of embedded into
6 everything that is transportation, so there really is
7 no -- and I love just the vision that Council Member
8 Reynoso was kind of putting out there, this kind of
9 truly public transportation for everybody.

10
11 COUNCIL MEMBER REYNOSO: Right.

12 DAVID STRICKLAND: This is actually --
13 you know, Andrei and I both had the pleasure of
14 serving in the Obama Administration, so this is
15 something that's probably near and dear to both of
16 our hearts; a thing called "livable communities,"
17 really thinking about how we plan for not only
18 organizing the civic landscape but how do we actually
19 convey transportation in the most efficient and
20 thoughtful way to support all modes -- pedestrianism,
21 bicycling, public transit -- and one of the key
22 issues is the last mile problem -- when you have
23 trains and buses that can get you only to a certain
24 point -- and in some communities you may have,
25 especially if you have folks that have disabilities

1 or children that may not necessarily be able to, you
2 know, deal with a three-quarter-of-a-mile walk to a
3 bus stop -- self-driving has the opportunity to solve
4 those last mile issues, and in terms of being able to
5 actually get a person from point A to point B without
6 there being, frankly, a disincentive to actually use
7 public transit. So frankly, you know, the vision of,
8 frankly, of the Coalition and our members and
9 frankly, I think everybody working in the self-
10 driving space, that this is going to be
11 supplementary; there's gonna be lots of different
12 models and business uses for self-driving vehicles,
13 but I think the greatest opportunity is to solve the
14 last mile issue, which I think is a core to what,
15 frankly, you know, the Obama Administration has
16 invested eight years of work into and I think that
17 this technology actually really does sort of connect
18 that last technological gap.

20 COUNCIL MEMBER MENCHACA: And for Uber,
21 on that question, the last mile, or really, the TLC
22 testified to their focus on New Yorkers who have
23 limited mobility, visually impaired New Yorkers, and
24 in your kind of work, how do you solve that issue,
25 engineering perspective [sic] might?

CLAIRE DELAUNAY: So I think the premise of an autonomous car is really about modularity. One of the big problems right now, for why it's so hard to match like executable [sic] conception [sic] to the demand is because somehow we have to fix the... not necessarily accessible conception with the accessible conception, and the demand and the physical shape of the vehicle accommodating like bus [sic] needs is different also and somehow this is hard to match because we also have like a limited number of drivers. So what autonomous vehicles provide is modularity; it allows us to remove all this compliance [sic] and just say that when you want transportation, you order it, you order it on your phone and you say what kind of shape your vehicle should be -- is it one, three people; six people; zero [sic] people; it can be anything, and you order this mobility exactly to the location you are at one point in time and it brings you to another location to your destination, so basically this modularity is key. And it's very funny because we created this kind of modularity everywhere, like in the TV, in the way we consume, into the way we receive goods, but somehow the transportation is still pretty much

1
2 archaic, because we don't have access to all these
3 features [sic].

4 COUNCIL MEMBER MENCHACA: Thank you for
5 that. And I just wanna give you last, there's a
6 student government group right now at one of my
7 schools in the district and -- PS 310 -- and I'm
8 gonna just... the three... I already retweeted it in my
9 Twitter, but actually all of them, the three examples
10 are three young girls; one of them says: I am a true
11 leader who would work for you -- this is not about
12 you, in this, but they're [laughter] making speeches
13 -- the second one: I don't seek change, I am change,
14 and then finally: I wanna be president of the United
15 States; most important, I want my voice to be heard.
16 And so this is who we're talking about, they're in
17 our classrooms right now, doing this, engaging and
18 there's this connection that needs to happen in order
19 for us to fuel it the way we wanna fuel it, the way
20 it should be fueled; this is a movement. Thank you.

21 CHAIRPERSON RODRIGUEZ: Council Member
22 Reynoso.

23 COUNCIL MEMBER REYNOSO: Alright. So I
24 wanna speak to another concern, I guess, with the
25 overall movement towards like expansion technology

1 and really moving towards what I think is the future,
2 or what we all know as the future of this world. It
3 seems like corporations are no longer investing in
4 human capital, right; that if you look at where money
5 is going in the top companies in -- on Wall Street,
6 for example or that are bidding high -- they're all
7 moving away from human investment or human capital
8 and moving towards something that eliminates that,
9 whether it's McDonald's removing the people that take
10 orders, for example, with machines; whether it's Uber
11 and the idea of moving away from drivers, and it
12 seems like all the work that we have to do related to
13 human capital has now fallen on these corporations'
14 philanthropic and charity arms, right, and that's not
15 necessarily where we wanna be as a society, I think,
16 and it seems that what we're gonna end up doing is
17 having government counter that and be the way to
18 figuring out a way that we can allow for human
19 capital or the human portion of this movement to
20 still be accounted for. And I don't necessarily
21 think we want to play that role, I mean I don't think
22 you guys want that role to be played, you wanna be
23 able to be a part of that conversation, but we're not
24 there just yet, and it seems like when you start

1 moving forward in the City of New York, and probably
2 anywhere else, you're gonna end up having -- this is
3 gonna be a fight regarding jobs, that's what it's
4 gonna be. No one's gonna disagree with the
5 opportunities that technology is gonna pose on our
6 communities and our city, they're gonna talk about
7 jobs above all as the bottom line and you're gonna
8 have to be able to respond to that in a responsible
9 way. And I do wanna say that whatever you guys do at
10 a very local level is gonna be the way that we are
11 able to contract that or have that conversation, and
12 it means what -- has Tesla come to a local school in
13 the City of New York and said you know what, we're
14 gonna have a pipeline starting in elementary school
15 so we can have, you know, a class of engineers from
16 today for the future so those jobs are there, 'cause
17 what we know for sure is that there's the lack of
18 diversity in a lot of these jobs, jobs that have to
19 come from overseas and the opportunity from children
20 here, for example, in the City of New York and where
21 or not those are the jobs that they're gonna be
22 having, right. We don't know that and I guess your,
23 again, your charity arm is gonna have to take hold to
24 that and really start talking about what this means
25

you and is gonna be big for us. So I guess this is just a warning and thank you guys for being here; I

1 think this has been very good for a lot... to have here
2 and for me especially.

3 CHAIRPERSON RODRIGUEZ: Thank you.

4 WILL NICHOLAS: I have... [background
5 comment] I think you make a good point and just for
6 Tesla's sake, we'd like to grow in New York and
7 specifically in New York City and I'm not sure that
8 the Council knows, but you know we have significant
9 constraints in terms of our licensing and if we can
10 have any support from you in order to build and
11 invest more in this city and in the state, we'd be
12 very appreciative.

13 COUNCIL MEMBER REYNOSO: Just one more
14 thing, Chair; I just... Also, you guys talk about
15 needing to work in New York City because it's a
16 complex city and in order to get it done right you
17 would need to come in here and do some testing here,
18 which I agree with, but eventually I do wanna say
19 that I expect you guys to get rid of some of these
20 roads and replace them with parks in some of these
21 roads and replace them with public plazas. So these
22 roads that you're talking about that you need to get
23 into to test to make sure they work, if you achieve
24 the goal that I think I wanna see, for example, then
25

1 we wouldn't even have to worry about those roads, so
2 to just really put things in perspective in a larger
3 picture, half of these roads should be gone by the
4 time you guys are in there, so another thing that I
5 think is important. But thank you guys for your time
6 and for entertaining it.

8 CHAIRPERSON RODRIGUEZ: Thank you. How
9 do you see driverless technology lifting [sic] into
10 our diverse street culture that includes cyclists,
11 pedestrians, transit, and even horses? And how does
12 this defer from the city, in other words, testing has
13 gone on like the Silicon Valley and in smaller cities
14 such as [inaudible]; like, how do you... how are you
15 looking at New York City different from other places,
16 for example?

17 CLAIRE DELAUNAY: So the way an
18 autonomous vehicle works is that we have like the
19 [inaudible] where we collect true information and
20 distance [sic], so it can come from like laser, radar
21 kinda route, [inaudible] radar; there's a lot of
22 them. And secondly, like the [inaudible] is like how
23 we combine this information to come up with like a
24 representation that is convenient for a robot. For
25 instance, what is a pedestrian; what is a car. I

1 haven't seen any horse in Pittsburgh yet, but I'm
2 [laugh] pretty sure we can come up with a model to do
3 that. And finally, is like the activation, so
4 basically once we have a representation of this word,
5 what does the robot do about this information? And
6 to the point I was mentioning before, which is all --
7 the technology is all about data; if we never
8 **[inaudible]** before, we have to verify first that it's
9 safe and that we can handle this kind of **[inaudible]**
10 that's why it's so important to practice and to test
11 the technology **[inaudible]** comes a reality.

12 CHAIRPERSON RODRIGUEZ: [background
13 comment] focus on this committee and lowering car
14 usage, car ownership, and congestion on our streets.
15 Do you see driverless cars as a personal investment
16 or as a new type of transit without set routes?

17 DAVID STRICKLAND: Mr. Chairman; that
18 really is a \$64,000 question. Everybody's working
19 hard to build and to evolve and perfect the
20 technology. There's gonna be multiple use cases and
21 multiple business cases for this technology; whether
22 it is going to be rideshare, whether it's going to be
23 individual ownership, whether it's going to be as an
24 extension of transit, maybe being controlled by a
25

1 city or a municipality. I think the goal is to make
2 sure that the technology is thoroughly tested and
3 then deployed quickly and thoughtfully and frankly, I
4 think that the consumer market will evolve, you know
5 frankly, the winning uses for this technology, but I
6 think it's gonna be, frankly, an all of the above.
7 There will be a significant shift in some areas in
8 terms of possibly car ownership could change in
9 America, but we don't know that yet. But your
10 question's very -- frankly, that is the question and
11 I think everybody wants to make sure we have a
12 regulatory environment where all these possible
13 business opportunities, vectors and uses have an
14 opportunity to grow and compete and we figure out
15 which is the best use case.

17 CHAIRPERSON RODRIGUEZ: Great.

18 ANDREI GREENAWALT: I just wanna add, I
19 think... oh thank you. You know I think for New York
20 you don't wanna have a lot of individually owned
21 autonomous vehicles going around the city where
22 people get dropped off and then they have just let
23 their car kind of circle around because they don't
24 feel like parking [laughter] and it's just driving
25 around the city, causing additional congestion. So

1 at least from the perspective of our company, Via, we
2 think it's very important, as this gets tested and as
3 New York thinks about it; as you all think about it,
4 to really think about ways to encourage it to be a
5 shared public resource, because when you get multiple
6 passengers into the car and you're using up those
7 empty seats, then you actually get to reducing
8 congestion, reducing harmful pollutants, etc. So at
9 least from our perspective, we think that should be a
10 strong component of any plans New York has going
11 forward.
12

13 CHAIRPERSON RODRIGUEZ: Yeah. Will you
14 be open to be part of a working group if the Council
15 decided to put a working group together to collect
16 ideas and put some suggestions on this initiative?

17 [collective affirmations]

18 CHAIRPERSON RODRIGUEZ: Great. So thank
19 you and let's continue working together; I hope that
20 next year -- also, many of you joined us last year as
21 we put together a car-free day on Earth Day; 2017 is
22 gonna be a Saturday, so it's gonna be more convenient
23 than the one that we did on Friday last year, but..
24 [laughter] thank you, and again like, I think that,
25

you know, this is something that all of us should be working together. Thanks. [background comment]

The last panel -- Julia Kite, Transportation Alternatives; Osman Chowdhury, [background comments] and Alec Slatky.

[pause]

[background comments]

CHAIRPERSON RODRIGUEZ: You may begin.

[background comment]

JULIA KITE: Hello. Hello, good afternoon and thank you for convening this hearing. My name is Julia Kite and I'm the Policy and Research Manager for Transportation Alternatives, a 43-year-old membership-based nonprofit advocating for better walking, bike, and public transportation in New York City. We have also been at the forefront of New York City's Vision Zero initiative. The development and arrival of autonomous vehicle technology presents an unprecedented combination of opportunity and cause for concern, from our perspective as street safety advocates. There is still a great deal that is unknown about self-driving car technology, and many elements still need to be perfected. At the same time, we remain optimistic that by reducing the

capacity for human fallibility at the wheel, this technology could greatly reduce the number of injuries and deaths on our streets, but only if we have policies in place that are designed with the most vulnerable road users in mind.

We agree with the Policy Statement on Automated Vehicles issued by NACTO, the National Association of City Transportation Officials. It states that such policies must "promote safety for pedestrians, bicyclists, and transit riders, reduce the environmental impacts of vehicular travel, and rebalance the use of the right-of-way to devote less street space to cars, and more to people walking, cycling, and using public transit."

Protecting the most vulnerable road users must be the priority for any city managing automated vehicle traffic.

Autonomous vehicles must not simply become a more convenient, lower-effort version of status quo of driving. The technological advances that bring them into existence should be harnessed to shake up how we as a society understand cars and how automobile use impacts our city.

For example, connectivity with other vehicles and with so-called "smart infrastructure" like traffic signals, can allow for autonomous vehicles to drive closer to each other and move more efficiently through the city. Autonomous vehicles may also free up road space on our congested streets by reducing demand for parking and by facilitating car-sharing over private ownership. A University of Texas study indicates that one self-driving taxi can facilitate carpooling and replace roughly ten private cars. But in order to avoid repeating the mistakes of the past, where increased road capacity devoted to motor vehicles only led to more car usage and more congestion, and we believe that any road space freed up by these new efficiencies should automatically be dedicated to pedestrian, bicycle, and transit improvements. Failure to plan appropriately for this impact of autonomous vehicles may lead to worsening congestion and sprawl.

It's also important to recognize that, at present, autonomous vehicle technology is not focused on the unique road conditions of cities like ours. Protocols that suite rural driving, where one can travel for miles without encountering anybody, are

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A major safety concern [bell] relevant to New York City that manufacturers have yet to resolve is a form of what's called the "trolley problem," a scenario where it's impossible to avoid harm to at least one person in a collision. Simply put, what would an autonomous vehicle do if it had a choice between only two actions that would lead it to either crash into a pedestrian or crash into an object and injure the car's occupants. Recently, Mercedes-Benz announced that it will program its self-driving cars to prioritize saving the people inside the car in such a scenario, reasoning that the safety of the car's passengers is the only factor the automaker can control. This is [bell] despite the fact -- I'm sorry; one second -- This is despite the fact that car occupants are already better-protected; in crashes the pedestrian always loses; we're alarmed that Mercedes would make this statement, and we

1 reject the idea that autonomous vehicles should shift
2 the burden of safety onto pedestrians.

3 So in conclusion, driverless cars are
4 still cars; we support their development, but we need
5 to see the technology shaking up the status quo and
6 showing that it's compatible with Vision Zero.

7 Thank you.

8 ALEC SLATKY: Good afternoon. My name is
9 Alec Slatky; I'm here representing AAA Northeast,
10 which serves a membership of over 570,000 drivers in
11 New York City, 5.2 million region-wide.

12 I wanna thank you, Chairman Rodriguez,
13 for holding this hearing and Councilman Menchaca for
14 sticking around.

15 At AAA we're committed to educating our
16 members about this cutting-edge automotive technology
17 and we've conducted a lot of studies that examine the
18 benefits of certain advanced driver assistance
19 systems and there's immense cause for optimism, but
20 there's also cause for the same pause -- not to rhyme
21 -- cause for the same pause that DOT expressed
22 earlier, you know, just before -- let's not go from
23 no self-driving vehicles at all in New York State to
24 a total free-for-all, which is basically what the New
25

1
2 York State law that is much maligned, would have
3 done, and we opposed it because -- we read in the
4 memo -- oh, it's because people were getting tickets
5 for having self-parking technology and their hands
6 weren't on the wheel. I didn't buy that for a
7 second, and it was pretty much to advance this sort
8 of technology and now we have NHTSA's regulatory
9 framework, which is gonna help a lot.

10 But I wanna focus on a couple of studies
11 that we did which show potential but also cause for
12 concern.

13 You talk about rear cross traffic alerts,
14 I mean we know automatic parking for parallel parking
15 is definitely better than human, but for rear cross
16 traffic alerts, that's when you're in a parking lot,
17 you're backing out of a spot and there's supposed to
18 be a sensor that detects oncoming traffic that would
19 be in your way, and it failed to detect a passing
20 vehicle in 30% of tests; a bicyclist in 40%;
21 motorcyclists in 48%; and a pedestrian in 60% of
22 those tests. So there's still no substitute for an
23 engaged, attentive driver right now.

24 And additionally, with autonomous
25 emergency braking, we see these commercials where

1 drivers are distracted or inattentive for whatever
2 reason and then the car saves them from a rear end
3 collision by braking. There's some truth to that,
4 but it's not the whole truth, because we've done some
5 tests, and in systems that are designed to prevent
6 crashes, when there's a speed differential of under
7 30 mph, it avoided 60% of those crashes, which is
8 great to make up the gap when humans are fallible,
9 but certainly insufficient to trust with full
10 control.
11

12 And I do wanna just mention, you know
13 Councilman Menchaca, you had a good question about do
14 we think this is gonna be driverless vehicles only in
15 an environment or do we think it's gonna be combined
16 with human-driven vehicles and I think it's gonna be
17 the latter. I mean you take a look at our car
18 registration patterns today; we have over 200,000
19 vehicles registered in the City of New York that are
20 at least [bell] 16 years old, model year 2000 or
21 earlier. So the average age of a vehicle here in New
22 York is 8 years... there's gonna be a lot of mix, but
23 fortunately, the investments that you need to make as
24 a city are the same investments that drivers need
25 today, and that's infrastructure. I think the

gentleman from Tesla put it well -- we need to keep the level of resurfacing that the Council and the Mayor have committed to at a high level; I know the strategic plan talked about increasing lane markings and freshening those up; I think that is very important, making sure signs are clear, all those are gonna be vital for the future of these cars, but also for drivers today.

And then one last thing -- thinking long-term, while talking about removing the need for parking, there's gonna be more cars obeying the law; right now the city takes in \$650 million, just about, from parking fines every year; that's a lot of money in the City's budget that we're basically saying that may go away, and so I think it's important to start today to take those fines and also traffic fines and put them towards dedicated funds that enhance safety and mobility. And thank you for the opportunity to comment.

CHAIRPERSON RODRIGUEZ: Well with that, we've come to the end. Okay, again, this is a beginning of the conversation on the possibility to bring autonomous cars to New York City; of course, our business [sic] is to make the lives of cyclists

1 and pedestrians safer than ever, therefore, that's
2 our top priority and with that, it is so
3 unfortunately that this morning an 8-month-old baby
4 died when he was crushed by a driver in Queens, being
5 the last New Yorker who lost his life in the street.
6 So again, that's the most important, that's our
7 priority to make the streets safer especially for
8 pedestrians. We are open to any opportunity or
9 bringing [sic] innovation to our city, especially on
10 how drivers move around.
11

12 I want to invite everyone to also come to
13 the next hearing that this committee will have on
14 November 15, where we will be hearing many bills,
15 including some bills introduced by Council Member
16 Menchaca, myself and others. The topic of the next
17 hearing on November 15 will be Making Cycling and
18 Walker Safer and More Efficient in New York City.

19 With that... [background comments]

20 COUNCIL MEMBER MENCHACA: Thank you,
21 Chair. And I just wanna highlight a couple things
22 that I heard and on Twitter and some other messaging,
23 to really get the sense about the responsibility if
24 we're moving and shifting towards driverless cars and
25 making sure that we ask those questions and Julie,

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C E R T I F I C A T E

World Wide Dictation certifies that the foregoing transcript is a true and accurate record of the proceedings. We further certify that there is no relation to any of the parties to this action by blood or marriage, and that there is interest in the outcome of this matter.



Date November 29, 2016