

**MINUTES OF THE
SENATE COMMITTEE ON GROWTH AND INFRASTRUCTURE**

**Eighty-second Session
February 15, 2023**

The Senate Committee on Growth and Infrastructure was called to order by Chair Dallas Harris at 3:31 p.m. on Wednesday, February 15, 2023, in Room 2144 of the Legislative Building, Carson City, Nevada. The meeting was videoconferenced to Room 4412E of the Grant Sawyer State Office Building, 555 East Washington Avenue, Las Vegas, Nevada. [Exhibit A](#) is the Agenda. [Exhibit B](#) is the Attendance Roster. All exhibits are available and on file in the Research Library of the Legislative Counsel Bureau.

COMMITTEE MEMBERS PRESENT:

Senator Dallas Harris, Chair
Senator Pat Spearman, Vice Chair
Senator Julie Pazina
Senator Scott Hammond
Senator Ira Hansen

STAFF MEMBERS PRESENT:

Kristin Rossiter, Policy Analyst
Vicky Lind, Committee Secretary

OTHERS PRESENT:

Tracy Larkin Thomason, Director, Nevada Department of Transportation
Anand Nandakumar, CEO, Halo.Car

CHAIR HARRIS:

We will open today's meeting with a presentation by the Nevada Department of Transportation.

TRACY LARKIN THOMASON (Director, Nevada Department of Transportation):

The Nevada Department of Transportation (NDOT) provides, operates and preserves a transportation system that enhances the quality of life, safety and economic development in Nevada.

Refer to pages 3 and 4 of our presentation ([Exhibit C](#) contains copyrighted material. Original is available upon request of the Research Library.) for NDOT departmental breakdown and maintenance districts.

In addition to maintenance, quality control, and management of construction projects, NDOT is providing oversight to the high-speed rail project that will provide electric rail transportation between Las Vegas and the Los Angeles area.

The Department works closely with first responders in emergencies such as fires, earthquakes, floods and landslides. Our maintenance stations serve as staging areas for coordinating first responders and NDOT personnel as they prepare to return surface roads, highways and land back to their original usability.

President Joe Biden's Administration has provided direction to the states to develop electrification plans to include providing electric vehicle charging stations every 50 miles within the State. Due to Nevada's expansive rural areas, this will be a challenge. We want to ensure the grid will be able to support vehicle charging stations while ensuring the safety of the customers at those stations.

On pages 11 to 26, [Exhibit C](#), are details of NDOT budgeting, project prioritization, and details of current challenges.

SENATOR HAMMOND:

In reference to your vacancy rates graph on page 26, [Exhibit C](#), I agree that filling vacancies in State agencies has proven extremely challenging for everyone. Speak specifically to what you and your Department are doing to encourage employment applications, particularly from the younger workforce.

MS. LARKIN THOMASON:

During the eighty-first Legislative Session, we initiated legislation for part-time student positions. The positions were intended for 16- to 18-year-old students who would fill positions working in NDOT building facilities, perhaps as diesel mechanics or in radio communications. There are limitations to the positions that are available as these students are not allowed to drive or operate heavy equipment. The legislation passed, and we have initiated 16 positions. An advertisement has been placed for a position in Tonopah and there are five additional positions available in each district. The student is required to

work with their high school to obtain credits or complete their General Education Degree. They are allowed to work from the time they are 16 until 6 months after they graduate. Our intent is to skill them in a trade and familiarize them by working in different positions within the Department. We are hoping this will give the student enough experience to apply for a full-time permanent position.

In addition to the part-time high school positions, we are looking at developing an engineering program for certification in various technical positions. We realize our workforce needs are changing and, as a result, we are building relationships with colleges to assist us with developing training for technical positions within our Department.

SENATOR HAMMOND:

Have you been successful in retaining the students you have hired?

MS. LARKIN THOMASON:

The Department is just now implementing the program, bringing the students on board. The Department had to coordinate with school districts for its requirements for the new program.

SENATOR HANSEN:

First, I would like to compliment you on NDOT's maintenance stations. I spent the last two winters on the highway from Elko and Jerritt Canyon Gold Mine to Wild Horse Reservoir. Your staff from the North Fork maintenance station are typically right on point with treating the surface roads. Are those stations where you might place some of those part-time positions?

MS. LARKIN THOMASON:

The Department has 45 active maintenance stations. Our larger maintenance stations are typically in cities like Reno and Las Vegas. We do provide housing at our remote stations such as Cold Springs. We are looking at expanding housing options such as putting trailers at the maintenance stations. For the most part, they are full-time positions and staff are from the local communities.

SENATOR HANSEN:

The maintenance station in Austin, for example, is in my District and, as we all know, Austin is a very small town. The payroll that is generated by the existence of that station is a substantial part of the economy of that small

town. Again, I just want to compliment your staff on the excellent work they do in that area.

SENATOR PAZINA:

I do have a question regarding the emergency response services. Is there any specific training for those that are providing those emergency responses?

MS. LARKIN THOMASON:

Yes, there is. The Freeway Service Patrol (FSP) is in northern Nevada along Interstates 80 and 580. In southern Nevada, the FSP is along U.S. Route 95 and Interstate 15. Specific emergency response training for FSP staff includes hazardous materials training, cardiopulmonary resuscitation and community first aid. They also have training in basic automotive repair and traffic incident management.

SENATOR SPEARMAN:

With respect to transportation, Nevada is trying to coordinate the move to net zero, which is the balance between the amount of greenhouse gas produced and the amount removed from the atmosphere. As a result, there is much discussion regarding electrification, which is the conversion of a machine or system to the use of electrical power. There is \$8 billion currently appropriated for hydrogen fuel cells in the infrastructure bill. Does NDOT have any plans in the works for obtaining additional funding for hydrogen fuel cells? That is one part of my question. The other part is that the Regional Transportation Commissions, both in Las Vegas and in Reno, have hydrogen fuel cell busses and have additional ones on order. What are NDOT's plans to integrate that?

MS. LARKIN THOMASON:

We have not done much yet with hydrogen fuel cells; however, we are studying them. We are looking at them as part of a national freight network. Nationally, the network is needed for the larger fleets. We have not incorporated hydrogen fuel.

One reason we have not yet incorporated hydrogen fuel cells is because we are in the process of redoing our fuel stations across the State. This effort must be in coordination with converting vehicle fleets over to electric and hybrids in the interest of energy conservation. This has been a gradual process. The Department has looked at other energy-saving alternatives such as E85, also known as flex fuel, and natural gas.

SENATOR SPEARMAN:

Nevada already has a hydrogen fuel production plant. We need to be prudent in figuring out how we will utilize the product here in Nevada. I applaud NDOT in the utilization of hybrids. Now that we have had an introduction to hydrogen fuel cells, there is going to be a new component-workforce development. Staffing will be needed for the installation and maintenance of hydrogen fuel pumps. I wonder what that looks like in terms of integrating it into fuel resources. I have a bill, Senate Bill 165, for the creation of an Emerging Technologies Task Force because it seems that Nevada is behind in respect to training people for the jobs of the future. Have you given any thought to what that might look like in terms of workforce development?

[SENATE BILL 165](#): Revises provisions relating to businesses engaged in the development of emerging technologies. (BDR 18-878)

MS. LARKIN THOMASON:

In terms of workforce development, no I have not. As to the hydrogen fuel pumps, specifically, there has not been any workforce development. I agree we do need to develop our workforce for hydrogen fuel pump installation and maintenance. The Department has been concentrating on digital infrastructure, to include the network of fuel pumps and how we get data on their use. If you know that you are driving from Las Vegas to Tonopah and you want to utilize the charging station there, you plan ahead ensuring it is open and ready for use. I have been concentrating on the foundational part of connectivity and how we can bring those different sectors together so that as we build it, we are addressing the workforce development.

SENATOR SPEARMAN:

The last couple of sessions, we have talked about vehicle miles traveled and how to recapture the revenue that is lost while we are promoting electric vehicles. I support electric vehicles, but hydrogen fuel has a built-in mechanism to get that revenue because a tax is included in the price of the fuel. That is something to keep in mind.

CHAIR HARRIS:

Next on our agenda we have Anand Nandakumar, CEO and founder of Halo.Car.

ANAND NANDAKUMAR (CEO, Halo.Car):

Our company was started in San Francisco prior to my relocating to Las Vegas, Nevada. The company currently employs 30 people. The vision is to transition the world from gasoline cars to all electric. In general, cars today are privately owned and 41 percent of carbon emissions are coming from passenger cars. The transition from gasoline powered cars to all electric has been slow and there are reasons that it has been slow. First, the cost of electric vehicles is high. On average, an electric vehicle costs \$40,000. Only a small percent of the general population can afford a vehicle of that price. Second, even if you can afford it, you then need to retrofit your house with an adequate charging infrastructure. For those who do not own their home or who live in an apartment complex, this would prove difficult.

Halo delivers all-electric rental cars to its customers remotely and, when the customer is done with the rental, we remotely pick it up and drive it to the next customer's location or back to our headquarters. Think of it as a ride-share and car-share combination. It is convenient for our customers because he or she has car privacy space. In addition, it is convenient, affordable and accessible for our customers.

Our highly skilled employees have been well trained in Las Vegas. They are locally hired and complete internal certification prior to driving the vehicles remotely. Our Las Vegas headquarters is where our employees sit and remotely drive our cars to be delivered to a customer. Once it is delivered, our customers take over the operation of the vehicle. When the customer is done with the rental, we will again connect back to the car and bring the car back to our charging and cleaning stations.

Page 6 of the presentation ([Exhibit D](#)) on Halo.Car has more information on remote piloting.

Prior to developing Halo in 2019, I oversaw the perception division of a rideshare for self-driving cars. Autonomy is great but it is going to take another 15 years for self-driving cars to be ready and commercially viable. My mission for Halo is to assist the world in converting to all-electric vehicles. In 2020, I had the first prototype of this vehicle working by literally sitting in the car with a video game box controller, trying to operate the car from within the vehicle. Then in 2021, we started road testing, and the Nevada Department of Motor Vehicles (DMV) issued us our first permit to commercially start this operation.

I am proud to be working closely with the DMV. Nevada has been progressive in terms of regulating and working closely with electric vehicle technical companies. My previous experience in California proved to be difficult to work with regulators.

Pages 10 to 13 of [Exhibit D](#) provide details for how and where Halo operates in the Las Vegas area.

Our goal in Las Vegas is to reach stage four, which will enable us to get a vehicle to a customer at the lowest cost. At that point, we will have thousands of electric vehicles accessible and operating across the State.

SENATOR HAMMOND:

Great presentation: we have been looking at this concept since I began working in the Legislature in 2011. I would like to hear your vision on what might happen when there are driverless electric vehicles on the road, being remotely piloted, and then there is a vehicle accident. The police are summoned to take a report. What does that look like once the officer arrives and there is no driver in the driverless vehicle?

MR. NANDAKUMAR:

The rule in our company, the culture of the company, is to be transparent with law enforcement. We share our vision and operational procedure with law enforcement proactively. Every one of our cars has bidirectional audio, enabling a live agent to speak with anyone, including law enforcement, who approaches the vehicle. Our fleet is fully insured nationwide, even when being piloted remotely.

SENATOR HAMMOND:

Is there a picture of the person who is remotely driving the vehicle on display within the vehicle or is it just audio enabling communication? This concept is fascinating to me, and I think it is a good idea to start thinking how we are going to educate the public on driverless vehicles.

MR. NANDAKUMAR:

We do not have anything within the car displaying the picture of the remote driver. If law enforcement pulls a vehicle over, the remote driver immediately engages in an audio conversation. You and any members of the Committee are welcome to come to Las Vegas to look at how these vehicles operate.

SENATOR HAMMOND:

On a personal note, there has been discussion of a family member losing a driver's license. Do you envision the company reaching a point where a car can be rented, but then driven by the remote driver on behalf of the person who rented the vehicle?

MR. NANDAKUMAR:

Currently, there are two reasons we do not provide this service. The first is that the liability is too high. The second is that it is currently not cost effective to remotely drive customers around. However, autonomy could play a part in our business at some point. Halo's mission is to bridge the gap between where the cars are today and where autonomous cars need to be in the future. There are many people today who refuse to get into a fully autonomous vehicle simply because they are unfamiliar with them. The first step to getting to autonomous vehicles could be by educating people. This is a part of the implementation of automation and that is how we plan to assist in that implementation.

SENATOR PAZINA:

This really is fascinating. My question is when the car is being remotely piloted, is the vehicle relying on Wi-Fi technology? How are they connected?

MR. NANDAKUMAR:

Each vehicle is equipped with access to the three major wireless networks. It uses all three networks simultaneously. It took us three years to obtain this patent. The use of all three networks ensures a perpetual unbreakable connection. There is also a machine-learning model that runs in the vehicle that routes the Wi-Fi packet in a unique way to obtain the strongest network as the primary network. The secondary network then replicates it, making it reliable and thus redundant. A large research project we are working on with one of the wireless networks is identifying a way to drive these vehicles on 5G. As a technology, 5G is important to us as it drops the latency when we push a data packet into the network. Latency is important as it enables our remote drivers to feel as if they are inside the vehicle while they are driving it.

SENATOR HANSEN:

This truly is fascinating technology. As we know, Elon Musk has been working on something similar regarding driverless vehicles and every time there is an accident with one of those vehicles, it makes national news. Is Las Vegas

literally the testing ground for Halo and are there similar technologies in other cities or nations?

MR. NANDAKUMAR:

Halo is the first ever to launch a remotely driven car on public roads with actual paying customers. Las Vegas is the first chapter for us. We are commercializing now, not testing. We have been testing for two years. The company was founded four years ago and the technology that we have been building has gotten to a point where it is mature enough for us to get to a predictable zone.

SENATOR HANSEN:

It is all fascinating because you realize we may be looking at the future Henry Ford. In 50 years, people may be looking at you like we look at Elon Musk now. You are on the same level. You are on the cutting edge in Clark County. I look forward to seeing how this technology evolves in the next few years.

SENATOR SPEARMAN:

I, too, am intrigued by the technology. A question I do have is what happens if you have a medical emergency while in one of your vehicles?

MR. NANDAKUMAR:

Our vehicles are retrofitted with many sensors and six cameras that go across the car providing full 360-degree visibility. Detecting a medical emergency within the vehicle is difficult. The vehicle does contain an emergency button that can be pushed by the driver if he or she is having an emergency. Otherwise, we can detect the way the vehicle is operating. If we detect sporadic acceleration or emergency braking, we can remotely connect to the vehicle and contact 911 dispatch if necessary. In addition, every 30 seconds the camera records video outside the car and uploads it to our cloud service. This information can then be shared with law enforcement and insurance companies as necessary. The facts presented by the video can be valuable when accidents or incidents happen.

Senate Committee on Growth and Infrastructure
February 15, 2023
Page 10

CHAIR HARRIS:

Having nothing further to come before the Senate Committee on Growth and Infrastructure, we are adjourned at 4:25 p.m.

RESPECTFULLY SUBMITTED:

Vicky Lind,
Committee Secretary

APPROVED BY:

Senator Dallas Harris, Chair

DATE: _____

EXHIBIT SUMMARY				
Bill	Exhibit Letter	Introduced on Minute Report Page No.	Witness / Entity	Description
	A	1		Agenda
	B	1		Attendance Roster
	C	2	Tracy Larkin Thomason	Overview of the Nevada Department of Transportation
	D	6	Anand Nandakumar	Halo.Car