

# AV Comments to the Ohio House Transportation Committee

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Chairman Green, Ranking Member Sheehy, and Distinguished Members of the committee

On behalf of the nearly 15,000 Honda Associates employed in the great State of Ohio, I would like to thank you for the opportunity to share our vision for the future of Highly Automated Driving.

As you are no doubt well aware, Ohio is the heart of Honda in America. Since opening our first US motorcycle production facility in 1979 and automobile production in 1982, we have grown to have three full vehicle assembly plants in Marysville and East Liberty. This includes the Performance Manufacturing Center where the Acura NSX is built. We also have engine and transmission production facilities in Ana and Russells Point, a parts distribution center in Troy, and a major research and development center in Raymond. These facilities represent an 11.4 Billion dollar capital investment in the state. This is all in addition to the 450 dealers across Ohio selling Honda's and Acura's, as well as motorcycles, power-sports products, and power equipment including lawnmowers and generators.

We were invited here today to, "Educate the committee on the basics of AV/CV technology and predicted timeline of implementation." The short time we have this morning can only start to scratch the surface of these highly complicated technologies, but Honda is committed to work with this committee and the State of Ohio as we endeavor to create the future of mobility.

Already today, Level 1 automation has become prevalent on new vehicles. Technologies such as Honda Sensing and Acura Watch are available on nearly all cars we produce regardless of price point. Whether it is on the Acura MDX or the Honda Fit, the systems are available to consumers. This technology uses a fusion of radar and camera to keep a set speed and interval from a car detected in front and gently help the driver keep centered in a detected lane.

Nevertheless, as we look forward we need to understand the mobility needs of society. Cities as varied as Cincinnati, Toledo, and Youngstown; suburban areas such as Strongsville and Upper Arlington; and more rural areas such as those around Loudenville and Glenford : each offers its own unique set of needs and challenges.

Honda's vision for Automated Driving is to contribute to a "Collision-free society with the Joy and Freedom of Mobility for Everyone."

To achieve that goal, we want the driver, or operator, to have confidence and trust in their vehicle while also enjoying a high level of comfort and convenience during their trip.

Honda's automated driving road map dates back to the early 2000s when we were the first manufacturer to introduce Lane Keeping Assist and Collision Mitigation Braking Systems into production. These technologies have evolved dramatically over the last 15 years. The functionality has improved, and the cost has dropped, allowing us to "democratize safety" and deploy the technology to the vast majority of our fleet. Between

now and 2025 we are looking to introduce higher-level automated driving systems into production, helping us toward our goal.

How is this all going to work? Honda will achieve this through the complex integration of external sensors such as cameras, radars, and lidar, that can “see” around the vehicle; localization based on GPS and high definition mapping; driver monitoring to determine if the driver is properly engaged; a human-machine interface that keeps the driver engaged and aware of the automated driving system state; and vehicle control systems with high reliability and redundancies.

Our first step into highly automated driving will be with “Highway Driving” on limited access roadways, such as Route 33 running between Dublin and TRC in East Liberty. [I drive this on my commute from Upper Arlington to Honda every day and I am really looking forward to trying the system out when it is ready.] This system will help you merge from the ramp into traffic and will control the vehicle as it cruises down the highway, even if there is a traffic jam. Imagine, hands-free, relaxed driving where you might even be able to watch the morning news as the vehicle drives to work for you.

To move to a higher level of automation and solve the challenges presented by neighborhoods and city streets, we need to move into the realm of Artificial Intelligence. Current object detection and response systems are not enough for these complicated environments. The system not only needs to see the scene in front of it, but it needs to understand that environment and make risk-based decisions as it determines the vehicles path.

Some of the realities AI needs to be able to recognize include drivable space, other road users, including pedestrians and cyclists, and the challenge of driving in low visibility circumstances, such as nighttime.

The automated driving system also needs to identify risky scenarios and make real-time predictions about the actions other road users will take.

Getting technology to this level is going to take a lot of work, and Ohio is playing a critical role. We appreciate the approach Ohio has taken, allowing this technology to evolve before looking to regulate it, while taking an active role in ensuring that companies like Honda have the infrastructure we need develop this technology. Honda is relying upon many of the Ohio-based connected and automated vehicle projects to propel these innovations forward. We are active partners in the Columbus Smart City, US-33 Smart Corridor, and Marysville Smart Community. These programs are critical to the pre-deployment testing that is necessary before novice customers can be trusted to use the ADS, or should I say the ADS can be trusted to transport customers.

To conclude, Honda seeks to realize our dream of a “Collision-free society with the joy and freedom of mobility for everyone” in part through automated driving technologies that provide users a sense of confidence and trust. Honda will realize automated highway driving by 2020 and strive to achieve highly automated surface-street driving by 2025. The Smart Ohio programs are key to making these innovations a reality.

Thank you for your time today and please let me know if you have any questions.