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Written Testimony of

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House Committee on
Energy and Commerce

Subcommittee on Digital Commerce and Consumer Protection

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Self-Driving Cars: Road to Deployment

Dear Chairman Latta, Ranking Member Schakowsky, and distinguished members of the Committee:

Thank you for offering us the opportunity to submit this written statement on this critical topic. My name is Robbie Diamond and I am the founder and CEO of Securing America's Future Energy (SAFE). For over a decade, SAFE has worked to strengthen America's national and economic security by reducing our oil dependence in the transportation sector to lessen our nation's resulting exposure to the destructive impacts of oil price volatility. In 2006, SAFE formed the Energy Security Leadership Council (ESLC), a nonpartisan group of business and former military leaders in support of long-term policy to reduce U.S. oil dependence. The ESLC is co-chaired by Frederick W. Smith, Chairman, President and CEO of FedEx, and General James T. Conway, 34th Commandant of the U.S. Marine Corps (Ret.).

SAFE's mission is to end the United States' extreme reliance on oil as a matter of national and economic security. This strategic commodity is bought and sold on an unfree global market under the influence of the Organization of the Petroleum Exporting Countries (OPEC), its member nations and other national oil companies (NOCs), which control over 90 percent of the globe's proven crude reserves. The cartel's activity over the last two years alone demonstrates its ability to manipulate the market to meet the political aims of its most powerful members, often to the detriment of American interests.

Oil powers more than 92% of the United States' massive transportation sector. Solving the challenge of oil dependence will require the sum of America's ingenuity on both the supply and demand side of the equation. Since our founding, we have advocated for policies that would leverage a combination of market forces and American innovation to address our oil dependence, including but not limited to expanding domestic energy production. Today, we address a prominent emerging technological innovation, autonomous vehicles (AVs). It is broadly recognized that AVs offer an opportunity to revolutionize transportation, reduce the 35,000 annual fatalities on our roads, offer improved access to mobility for underserved populations, and promote economic growth. Perhaps less recognized is the potential for AVs to drive adoption of advanced fuel vehicles such as electric vehicles, fuel cell vehicles, and others, to end oil's monopoly over the transportation sector. With this statement, we offer our perspective on the link between AVs and national security, and how Congress can aid industry by clearing obstacles to the deployment of AVs, thereby expediting the economic, social, safety and security benefits they portend.

This hearing is timely. AVs have grown over the last several years from a futuristic concept studied in university laboratories to a source of massive private sector investment and public interest. This fact motivated SAFE's own work, and included in this submission are the findings of our Commission on AV Testing and Safety, led by Major General Mark Rosenker, former chairman of the National Transportation Safety Board, Admiral Dennis Blair, Paul Brubaker, Robert Lange, and Cuneyt Oge.

We look forward to 2017 as a key transitional year when AV technology continues to mature and become more accessible to members of the public. At this critical juncture, it is essential to continually update our public officials on this rapidly developing technology, identify key policy issues that can impact its deployment trajectory, and find opportunities for Congress to effectively reduce regulatory barriers that could impede AVs and their resultant benefits.

Energy Security and the Autonomous Vehicle Opportunity

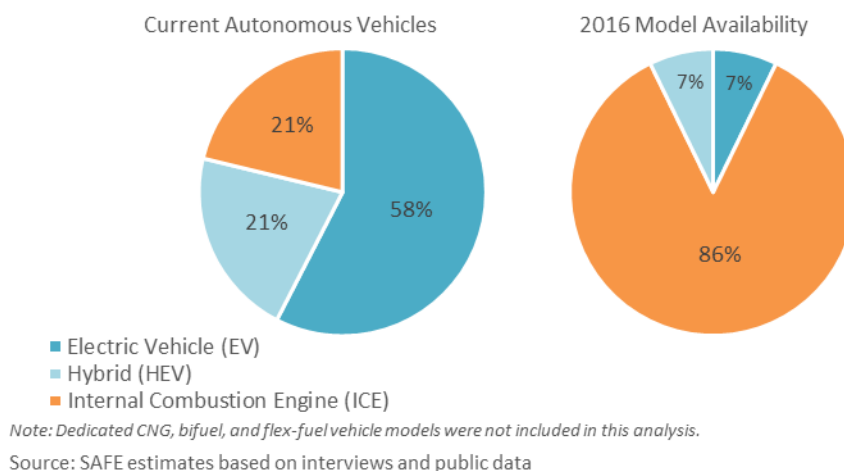
Because the United States has essentially no control over oil price volatility nor the foreign actors that create or manipulate its fluctuations, the United States' best approach to ending our oil dependence rests

with the widespread adoption of vehicles that can use alternative fuels, providing U.S. consumers and businesses fuel choices beyond oil. Yet, plug-in electric and other alternative fuel vehicles have thus far achieved only a small share of total vehicle sales.

SAFE believes that autonomous vehicles will likely accelerate and drive the adoption of EVs. Importantly, we believe this transition will occur as a result of consumer choice and does not require government mandates or market interference. This belief is rooted in observing current industry developments, as well as our own modeling that demonstrates that AVs are likely to be advanced fuel vehicles, particularly electric or hybrid. Already, AVs being built and tested today disproportionately use electric or hybrid powertrains. This trend is particularly compelling when compared to the current sales penetration of electric vehicles—about 1% (or 3% if hybrid vehicles are included). As shown below, 58% of autonomous vehicle platforms are built over an electric powertrain, while a further 21% utilize a hybrid powertrain. By comparison, in the larger vehicles market, only 14% of domestically available 2016 models were either electric or hybrid.¹

There are several explanations for the disproportionate representation of electric and hybrid vehicles in the AV testing space. One contributing explanation held by vehicle engineering experts is that a “symbiotic link” exists between AVs and vehicle electrification. This is partly because it is somewhat easier today to build an AV on top of a more modern, electrified vehicle system.

Autonomous Vehicles by Powertrain Type



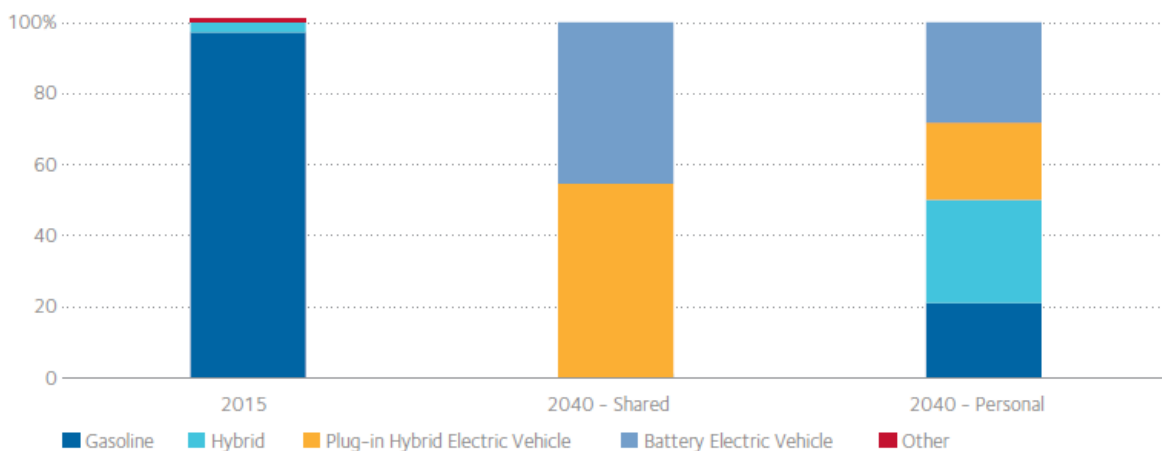
Our engagement with OEMs, technology companies, stakeholders and outside experts lead us to believe that this trend will continue. Many within industry anticipate that future vehicles will predominantly operate on advanced fuels due to overarching technological, economic, and regulatory trends. These trends are magnified by AVs, which are likely to benefit from and spur the further growth of a significant shared, on-demand business model for transportation.

¹ Specifically, we conducted market research on AV models, either retrofitted or novel platforms, for which public information exists. For example, Uber Technologies has modified two vehicles as part of their AV fleet—a Ford Fusion hybrid, and gas-powered (ICE) Volvo XC90. To make as fair a comparison as possible, we compared this figure to the breakdown of electric, hybrid, or ICE models sold domestically in the 2016 model year. Although this number was 14%, the fleet penetration of electric and hybrid vehicles is considerably lower than that—around 3%, making the preponderance of autonomous advanced fuel vehicles even more noteworthy.

The current transportation system is extraordinarily inefficient. On average, only 4 percent of household vehicles are in use at any given time, and peak utilization is about 11 percent. Moreover, the vast majority of vehicle trips take place with just one or two passengers onboard and with several empty seats. Autonomous vehicles can address these inefficiencies by making a growing transportation mode—shared on-demand mobility—even more common and affordable. SAFE modeling shows that while most households will continue to own vehicles, shared on-demand AVs will rival—and eventually surpass—private vehicles as a mode of transportation.

SAFE modeling further demonstrates that the lower operating costs of EVs will prove a compelling proposition to owners of shared AV fleets, and that nearly all shared, on-demand AVs will be electric vehicles. As fleet operators seek lower marginal costs, they will gravitate toward cost-saving options such as cheaper, predictable electricity prices over volatile gasoline prices. Moreover, increased vehicle utilization rates of shared fleets maximize the importance of operating costs over the lifetime of the vehicle, while centralized fleet management and recharging hubs obviate concerns over the proliferation of charging stations.

New Vehicle Sales by Fuel Type



Note: Analysis does not assume existence of policies supporting AFVs and does not account for positive impact of duty cycle matching ("right-sizing").

Source: SAFE analysis

For these reasons, we, along with many other close observers, believe that the uptake of AVs will go hand-in-hand with the rise of advanced fuel vehicles. We further believe that AV adoption will be rapid, as they offer significant new value propositions to consumers.

Today's EVs do not, on their own, offer consumers a considerably different value proposition compared to an internal combustion engine (ICE) in getting from "point A" to "point B." The leap from a "standard" vehicle to an autonomous one is more analogous to the jump from traditional cell phones to today's ubiquitous smartphones—a transition which happened rapidly. Once proven safe, consumers are likely to quickly adopt this technology that promises more time with no driving, more freedom, more productivity, less congestion, no parking, and no refueling. As such, rather than needing encouragement through government action, we expect consumer choice to drive rapid adoption of AVs, which will naturally lead to energy security benefits through fuel diversification, in addition to the technology's myriad social benefits.

Policy Recommendations

Autonomous vehicles technology is largely here, and industry is preparing for deployment in the next few years. The potential impacts of AV technology are transformative and of enormous public interest. However, the technology's novelty creates a dynamic where the existing regulatory framework around the automotive industry is not fully in sync with what is needed to facilitate the deployment of AV as they become technologically ready. AVs are a technology which interfaces with federal, state, and local laws, many of which were designed when self-driving vehicles were not a remote possibility nor prospect.

SAFE has identified key principles that we hope will help inform any congressional action in this arena.

Over the next several years, AV technology is expected to evolve rapidly and will need policy support to enable experimentation with different potential business models, technology platforms, and roles in the transportation system. Congress has an important role in providing the "runway" this technology needs by offering AV developers flexibility and protections. This support may take the form of exemptions from current federal regulations that did not anticipate AVs.

Additionally, we recommend that Congress authorize pilot deployments of AVs in American communities. Industry is already deploying technology in parts of the country and we encourage this to continue. However, government can assist, encourage and expand the value of deployments by working with industry to target social good "use-cases" and by facilitating collaboration among stakeholders. Without such communities, we risk a scenario in which individual companies test their technologies in isolation and are ill prepared to "share the road" with competitors.

Locations should be selected through a competitive bidding process and enable the testing of AV technology in a variety of contexts and use-cases (e.g. commercial vehicles, utility for the disabilities and elderly communities, services for rural communities, and synergies with public transportation systems in urban areas). To successfully work with leading technology providers, Congress should consider putting in place an alternative liability framework for these deployments, as it has successfully done several times for other industries.

To begin moving towards a more stable and sustainable regulatory framework for AVs, Congress should establish an interagency task force on AVs that integrates the necessary perspectives. Lastly, as a baseline and target, we believe that AVs should be allowed on U.S. roads once they are as safe as the average human driver, and Congress can support the R&D necessary to create metrics to verify compliance with that standard.

Commission on AV Testing and Safety

To support the transition to AVs, SAFE has maintained an active policy research agenda. For example, our Energy Security Leadership Council published a *National Strategy for Energy Security* that detailed the role of AVs in advancing energy security and identified the policies necessary to advance those goals. In January, SAFE published a white paper entitled *Self-Driving Cars: The Impact on People with Disabilities* which estimated that individuals with disabilities would see 2 million new job opportunities because of enhanced mobility through AVs, and that better access to medical care would save \$19 billion in annual health care expenditures, mostly through public entitlement savings. A number of additional research efforts are underway. The goal of our work is to shine a spotlight on the benefits that AVs will

bring, and ensure that the broad benefits of the technology are strongly considered in any policy discussion.

In particular consonance with the theme of today’s hearing “Self-Driving Cars: The Road to Deployment,” we would like to present the findings of our sponsored Commission on Autonomous Vehicle Testing and Safety. We formed the Commission to identify key risks to the deployment of AVs and the steps industry can take to mitigate those risks. As noted, the Commission is chaired by Major General Mark Rosenker, former chairman of the National Transportation Safety Board. Other members were Admiral Dennis Blair, Paul Brubaker, Robert Lange, and Cuneyt Oge.

The Commission identified two critical threats to the deployment of autonomous vehicles—public acceptance and regulatory risk—and offered industry-focused solutions to help mitigate each.

Public Acceptance: It is expected that once a certain technological threshold is met, autonomous vehicles will be safer than human drivers. However, it is impossible to eliminate all accidents entirely. As we have already seen with crashes involving autonomous and semi-autonomous vehicles, individual incidents can overtake even the most compelling statistics on safety and reliability, especially when there is loss of life. The Commission expressed concern whether public support for AVs—which public opinion polls show is currently mixed—can survive the inevitable negative attention that will stem from early accidents as the technology continues to improve.

Regulatory Risk: Regulation of emerging technology is always challenging, but autonomous vehicles face two exceptional obstacles. The first is that vehicles are regulated by a complex network of national, state, and local laws. The second is that AVs function based on highly sophisticated computer algorithms, or software. These technologies stress current regulatory frameworks, which are designed to test and approve more limited safety technologies such as seatbelts, airbags, or basic collision warning systems. The broad deployment of AVs will depend on finding new approaches to the verification and certification of safety.

To address these risks, the Commission offered a series of recommendations aimed specifically at defining a leadership role for industry. A subset of the Commission’s recommendations include:

- Creating an industry-wide policy statement defining the minimum acceptable safety standard for AVs. A reasonable standard would be to allow AVs on the road once they are as safe as the average human driver.
- Incorporation of redundant safety measures in the vehicle, including DSRC-based V2X communications
- Companies should create a staged, safety milestone plan for AVs, including public disclosure of achieved milestones.
- The formation of a technical data consortium to accelerate AV learning and safety through shared, anonymized information.
- Research and development to support the formulation of objective, practical, quantitative metrics for measuring AV safety, which are necessary to ascertain whether AVs meet safety goals.

Because of the relevance and stature of the Commission’s work, we include their entire report as a part of this statement.

Thank you for the opportunity to submit this statement for the record. We look forward to continuing to work with the Committee as it engages in the critical work of ensuring the proper future role of AVs in protecting and aiding the American consumer.