



November 22, 2016

National Highway Traffic Safety Administration
1200 New Jersey Avenue, SE, West Building
Washington, DC 20590-9898

Docket No. NHTSA-2016-0090

Dear Administrator Rosekind,

Apple is pleased to provide the following comments on the proposed Federal Automated Vehicles Policy (Policy), published by the Department of Transportation and the National Highway Traffic Safety Administration (NHTSA). Apple believes this Policy will be fundamental to ensuring the safety and public acceptance of automated vehicles¹ while providing a flexible path for innovation.

Apple uses machine learning to make its products and services smarter, more intuitive, and more personal. The company is investing heavily in the study of machine learning and automation, and is excited about the potential of automated systems in many areas, including transportation.

Executed properly under NHTSA's guidance, automated vehicles have the potential to greatly enhance the human experience—to prevent millions of car crashes and thousands of fatalities each year and to give mobility to those without. It is vital that those developing and deploying automated vehicles follow rigorous safety principles in design and production. Such principles should not, however, inhibit companies from making consequential progress; there is no need to compromise safety or innovation.

Apple affirms that, in order to best protect the traveling public and keep up with the pace of innovation, NHTSA should expedite requests for exemption and interpretation and petitions for rulemaking. NHTSA and Congress should also continue to explore new tools and authorities like those outlined in Section IV of the Policy—including expanded exemption authority—with the goal of fostering innovation, improving regulatory flexibility, and encouraging the development of life-saving technology.

¹ Defined as vehicles equipped with one or more systems that automate all or part of the driving task.



Apple commends NHTSA for including ethical considerations in the Policy.² Because automated vehicles promise such a broad and deep human impact, companies should consider the ethical dimensions of them in comparably broad and deep terms. At least three areas require attention: (1) as described in the Policy, the implications of algorithmic decisions for the safety, mobility, and legality of automated vehicles and their occupants; (2) the challenge of ensuring privacy and security in the design of automated vehicles; and (3) the impact of automated vehicles on the public good, including their consequences for employment and public spaces. Apple strongly affirms the need for thoughtful exploration of the ethical issues described above and in the Policy. Such exploration should draw on inputs from industry leaders, consumers, federal agencies, and other experts on issues of ethics, technology, and public policy.

Apple agrees that companies should share de-identified scenario and dynamics data from crashes and near-misses.³ Data should be sufficient to reconstruct the event, including time-series of vehicle kinematics and characteristics of the roadway and objects. By sharing data, the industry will build a more comprehensive dataset than any one company could create alone. This will allow everyone in the industry to design systems to better detect and respond to the broadest set of nominal and edge-case scenarios. Apple looks forward to collaborating with other stakeholders to define the specific data that should be shared.

Data sharing should not come at the cost of privacy. Apple believes that companies should invest the resources necessary to protect individuals' fundamental right to privacy. Apple supports NHTSA's privacy principles,⁴ and believes the industry should refine the Consumer Privacy Protection Principles⁵ to be more aligned with the Policy. Apple urges NHTSA, industry partners, and relevant federal agencies to continue to address privacy challenges associated with the collection, use, and sharing of automated vehicle data. Apple encourages collaboration with privacy experts beyond the automotive industry.

² *Federal Automated Vehicles Policy*, page 26.

³ *Federal Automated Vehicles Policy*, page 18.

⁴ *Federal Automated Vehicles Policy*, page 19.

⁵ <http://www.autoalliance.org/auto-issues/automotive-privacy/principles>.



Apple also strongly endorses the following guidelines outlined in the Policy:

- That NHTSA and the industry explore Computer Aided Engineering analysis and other simulation methods, such as Human Body Models, as viable means to validate crashworthiness where traditional physical test methods may be limited;
- That companies employ a range of hazard and threat analysis methods to identify and mitigate potential safety and cybersecurity issues early in development and as technologies evolve⁶; and
- That the Federal Government maintains sole authority over the safety of motor vehicles and motor vehicle equipment—including automated driving systems—and that states adopt NHTSA's Model State Policy to avoid policy proliferation and inconsistencies that may prevent or delay deployment.

Apple also urges NHTSA to work with international bodies such as UNECE, G7, and OECD towards adopting a harmonized approach to automated vehicles.

Apple suggests that, to protect safety while supporting innovation, NHTSA amend or clarify its position in two areas: exemptions for testing internal development vehicles on public roads and the Safety Assessment Letter (Safety Assessment) process.

Exemptions for Controlled Testing of Internal Development Vehicles

The Vehicle Safety Act requires companies to certify vehicles to Federal Motor Vehicle Safety Standards (FMVSS) before first sale.⁷ It also recognizes circumstances that may warrant an exemption from some FMVSS. To Apple's knowledge, the exemption process⁸ was intended for, and remains focused on, the sale of new motor vehicles to the public—not on the safe and controlled testing of development vehicles on public roads. However, the Policy suggests that companies must seek an exemption for public road testing of internal development vehicles not fully compliant with FMVSS.⁹

Both Congress and NHTSA have long recognized that manufacturers need to conduct limited and controlled testing on public roads. In fact, Congress recently enacted a provision in the FAST Act explicitly allowing established manufacturers to test on public roads without pursuing exemptions from FMVSS.¹⁰ But the FAST Act does not provide the same opportunity to new entrants.

⁶ Apple endorses the safety hazard analysis processes outlined in Report No. DOT HS 812 285.

⁷ 49 U.S.C. § 30112(a).

⁸ 49 U.S.C. § 30113.

⁹ *Federal Automated Vehicles Policy*, page 12.

¹⁰ 49 U.S.C. § 30112(b)(10).



To maximize the safety benefits of automated vehicles, encourage innovation, and promote fair competition, established manufacturers and new entrants should be treated equally. Instead of applying for exemptions, all companies should be given an opportunity to implement internal safety processes summarized in a Safety Assessment. This is the most efficient and effective way to ensure that development vehicles are designed and operated with a level of safety equivalent to best practices and FMVSS and will not be used by the general public.

While NHTSA does not have the ability to amend the FAST Act, it can amend the Policy to state that exemptions are not required for the controlled testing of internal development vehicles on public roads, provided they will never be used by the general public. This would create a fair environment for all companies to make progress toward automated vehicles. Meanwhile, Congress should consider amending the FAST Act.

Safety Assessment Submission Process

Apple supports NHTSA's request that companies document their compliance with all 15 guidelines of the Policy by submitting a Safety Assessment. NHTSA expects companies to provide the Safety Assessment "at least four months before active public road testing"¹¹ and to submit a new Safety Assessment in the event of any significant updates that change the basis for compliance.¹² Apple believes that NHTSA can better achieve its goals by making minor revisions to the Safety Assessment provisions of the Policy.

As written, the Safety Assessment provision of the Policy could be interpreted as requiring pre-approval by NHTSA prior to testing. This could result in a testing black-out period while NHTSA reviews the Safety Assessment. If NHTSA does not intend for the Safety Assessment to be treated as a pre-approval, Apple suggests that NHTSA clarify this provision.

In addition, Apple expects companies may add functionality or change a particular design or function multiple times within a four-month period. This rapid iteration should not require multiple Safety Assessments, which would be a significant administrative burden for both NHTSA and companies.

¹¹ *Federal Automated Vehicles Policy*, page 16.

¹² *Federal Automated Vehicles Policy*, page 17.



In light of these considerations, Apple proposes the following process for submitting a Safety Assessment consistent with NHTSA's expectations for safety and transparency. This proposal is specific to testing of internal development vehicles; Apple assumes there will be a separate Safety Assessment process for deployment, including testing with members of the public.

- Prior to submission of the Safety Assessment, companies discuss with NHTSA a test plan and acceptance criteria that may include multiple levels of functionality.
- Companies document the agreed-upon test plan and acceptance criteria, including the planned timing for public road testing, in the Safety Assessment.
- Companies notify NHTSA when they start public road testing or change the test plan.
- NHTSA may question a Safety Assessment at any time.

Apple appreciates the opportunity to comment on the Policy. Apple commends the Department of Transportation and NHTSA for facilitating a national conversation about the safe and ethical development and deployment of automated vehicles. Apple looks forward to collaborating with NHTSA and other stakeholders so that the significant societal benefits of automated vehicles can be realized safely, responsibly, and expeditiously.

Sincerely yours,

A handwritten signature in blue ink, appearing to read "Steve K", is located below the "Sincerely yours," text.

Steve Kenner

Director of Product Integrity, Apple