Automated Vehicle 4.0 Guidance Overview and Comparison with International Regulatory Approaches to Autonomous Vehicle Development

Washington State Transportation Commission
February 19, 2020
Ensuring American Leadership in Automated Vehicle Technologies | Automated Vehicles 4.0 Guidance

DOT Unveils Updated AV Guidance at CES 2020

U.S. pushes light regulations for AI, in contrast to Europe

USDOT’s Automated Vehicles 4.0 Seeks “Unifying Theme” Across Federal Government

U.S. Pushes Voluntary Guidelines for AV Industry

U.S. Secretary of Transportation Elaine Chao addresses the guidelines for AVs at CES 2020 in Las Vegas on Jan. 9, 2020.

USDOT’s Automated Vehicles 4.0 Seeks “Unifying Theme” Across Federal Government

Richard Bishop

Transportation

A first rode in a self-driving vehicle in 2015. Hasn’t looked back.

The Trump administration rolled out new non-binding guidelines Wednesday for regulating driverless cars and trucks — its second move this week to advance a light-touch approach to tech regulation that contrasts with the strategy key European leaders are advocating.

A driverless car is displayed during a Google event in San Francisco in 2016. | Eric Risberg/AP Photo

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The Trump administration has unveiled updated guidelines for self-driving vehicles, saying it wanted to encourage innovation without compromising safety.
### Comparison of Guiding Principles

#### AV 4.0

- **Protect Users and Communities**
  - Prioritize Safety
  - Emphasize Security and Cybersecurity
  - Ensure Privacy and Data Security
  - Enhance Mobility and Accessibility

- **Promote Efficient Markets**
  - Remain Technology Neutral
  - Protect American Innovation and Creativity
  - Modernize Regulations

- **Facilitate Coordinated Efforts**
  - Promote Consistent Standards and Policies
  - Ensure a Consistent Federal Approach
  - Improve Transportation System-Level Effects

#### AV 3.0

- We will prioritize safety
- We will remain technology neutral
- We will modernize regulations
- We will encourage a consistent regulatory and operational environment
- We will prepare proactively for automation
- We will protect and enhance the freedoms enjoyed by Americans
AV 2.0
Focuses on SAE Levels of Automation
Automated Driving Systems (ADSs) – Levels 3-5
• Clarifies the guidance process and that entities do not need to wait to test or deploy their ADSs;
• Revises unnecessary design elements from the safety self-assessment;
• Aligns Federal Guidance with the latest developments and industry terminology;
• Clarifies Federal and State roles going forward.

Federal Automated Vehicles Policy
Introduces the concept of levels of automation
Divides the task of facilitating the safe introduction and deployment of HAVs into four sections:
• Vehicle Performance Guidance for Automated Vehicles
• Model State Policy
• NHTSA’s Current Regulatory Tools
• New Tools and Authorities
AUTOMATED DRIVING SYSTEMS

A Vision for Safety

U.S. Department of Transportation

NHTSA
Automated Vehicles 3.0

PREPARING FOR THE FUTURE
OF TRANSPORTATION
USDOT’s AV 4.0

Ensuring America’s Leadership in Automated Vehicle Technologies: Automated Vehicles 4.0

• Issued in January 2020

• A joint effort between:
  ➢ National Science & Technology Council
  ➢ USDOT

• Principle update focus:
  Align U.S. Government to ensure standardized Federal approach to AVs
U.S. Government Automated Vehicle Technology Principles

The White House and the U.S. Department of Transportation developed AV 4.0, building upon previous versions of Federal AV guidance, to coordinate efforts across the Federal government and provide high-level guidance to Federal agencies, innovators, and the public on the U.S. posture towards AVs. AV 4.0 establishes Federal principles for the development and integration of automated vehicles, consisting of three core focus areas: Prioritize safety and security, promote innovation, and ensure a consistent regulatory approach.

**Protect Users and Communities**
- Prioritize Safety
- Emphasize Security and Cybersecurity
- Ensure Privacy and Data Security
- Enhance Mobility and Accessibility

**Promote Efficient Markets**
- Remain Technology Neutral
- Protect American Innovation and Creativity
- Modernize Regulations

**Facilitate Coordinated Efforts**
- Promote Consistent Standards and Policies
- Ensure a Consistent Federal Approach
- Improve Transportation System-Level Effects
1. Prioritize Safety

• Address safety risks
• Enhance life-saving potential
• Strengthen public confidence
• Enforce existing laws to ensure no deceptive claims
2. Emphasize Security and Cybersecurity

- Safeguard against threats to security and public safety
- Work with industry to ensure prevention, mitigation and investigation of crimes and security threats
- Safeguard privacy rights, civil rights and civil liberties
- Develop and promote physical and cybersecurity standards
3. Ensure Privacy and Data Security

- Risk-based approach to data security and privacy
- Protect driver, passenger and third-party data
4. Enhance Mobility and Accessibility

- Ensure freedom for Americans to drive their own vehicles
- Approach envisioned mixed-fleet environment
- Protect ability for consumers to make mobility choices that best meet their needs
- Support additional options for accessing goods and services, allowing individuals to live and work in places that fit their families’ needs
- Expand access to mobility for all people, including those with disabilities and older Americans
5. Remain Technology Neutral

- Adopt flexible technology-neutral policies

- Allow the public—not the Federal Government or foreign governments—to decide the best solutions
6. Protect American Innovation and Creativity

• Advance pro-growth policies

• Protect economic prosperity and innovative competitiveness

• Protect and enforce intellectual property rights
7. Modernize Regulations

• Modernize or eliminate outdated regulations that impede development of AVs

• Promote consistent regulations across jurisdictions for seamless national/international operation

• Seek rules that are performance-based and as non-prescriptive as possible
8. Promote Consistent Standards and Policies

• Advocate for voluntary consensus standards and evidence-based and data-driven regulations

• Seek harmonization of technical standards and regulatory policies with international partners
9. Ensure a Consistent Federal Approach

- Proactively facilitate coordination of AV research, regulations and policies across the Federal Government

- Ensure Federal dollars used comply with Buy American
10. Improve Transportation System-Level Effects

- Focus on opportunities to improve transportation system-level performance
- Avoid negative transportation system-level effects from AV technologies
AV 4.0 Guidance Appendices

• Appendix A – U.S. Government Resources
• Appendix B – U.S. Government AV Contacts
• Appendix C – Automated Vehicle Fast Track Action Committee
• Appendix D – Development and Writing Team
• Appendix E – Acronyms
USDOT AV 4.0 Key Takeaways

• More of an affirmation of the government position than a new policy document

• Greatly increased emphasis on coordinating activities across Federal Government

• Focus on promoting choices in mobility options

• Directly addresses deceptive marketing and overstatement of capabilities

• Acknowledges the importance of the 5.9GHz spectrum and states USDOT’s strong support for preservation for transportation safety applications
AV Work Group Executive Committee

Government Representatives and Key Stakeholders from:
- Governor
- Four members from Senate
- Four members from House
- Insurance Commissioner
- DOL Director
- WSDOT Secretary
- WSP Chief
- Traffic Safety Commission Director
- State Chief Information Officer
- Transportation Commission Member
- Health Secretary
- Employment Security Director
- Labor & Industries Director
- Data, Technology & AV Testing
- Shared, Electric, TNC & Transit
- Automakers
- Local Governments
- Consumers/Traveling Public
- Environment
- Academic
- Underrepresented Communities
- Freight
- Labor

SUBCOMMITTEES

<table>
<thead>
<tr>
<th>Licensing</th>
<th>Safety</th>
<th>Infrastructure &amp; Systems</th>
<th>System Tech &amp; Data Security</th>
<th>Liability</th>
<th>Health &amp; Equity</th>
<th>Workforce</th>
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<td>DOL Lead Agency</td>
<td>WTSC &amp; WSP Lead Agency</td>
<td>WSDOT Lead Agency</td>
<td>State CIO</td>
<td>Insurance Comm.</td>
<td>DOH Lead Agency</td>
<td>ESD and L&amp;I Lead Agency</td>
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WSP
Two New Subcommittees Established
- Health & Equity
- Workforce

18 Additional Members Appointed to the Executive Committee
- State and Local Governments
- Private Sector & Non-Profit Organizations
- Academia

2019 Evolution of the Work Group

27 Subcommittee Meetings
2 Executive Committee Meetings
8 Recommendations Brought Forward
- 4 Policy Recommendations
- 3 Operational Recommendations
- 1 Recommendation Requiring Further Work
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<th>Recommendation</th>
<th>AV 4.0 Guidance</th>
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<td><strong>Liability subcommittee</strong></td>
<td>Enact legislation requiring self-certified (DOL) AV testing companies to maintain umbrella liability insurance no less than $5 million per occurrence for damages.</td>
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<td><strong>Infrastructure &amp; System s subcommittee</strong></td>
<td>Adopt 8 policy goals to enable the Infrastructure &amp; Systems subcommittee to continue work on the Washington State Department of Transportation (WSDOT) Cooperative Automated Transportation (CAT) Policy Framework and, as a next step, develop specific strategies.</td>
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<td><strong>Infrastructure &amp; System s subcommittee</strong></td>
<td>Encourage the development of a statewide CAT/AV Policy Framework that would integrate the WSDOT CAT policy goals along with policy goals developed by other subcommittees.</td>
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<td><strong>Health &amp; Equity subcommittee</strong></td>
<td>Conduct a Health Impact Assessment of AVs.</td>
<td>✔️</td>
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<td><strong>Safety subcommittee</strong></td>
<td>Establish new “Health &amp; Equity” subcommittee.</td>
<td>✔️</td>
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<td><strong>Executive Committee</strong></td>
<td>Establish new “Workforce” subcommittee.</td>
<td>✔️</td>
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<td><strong>Executive Committee</strong></td>
<td>Appoint a disabilities rights representative to the Executive Committee.</td>
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Recommendation
Automated Vehicle Listening Sessions
Artificial Intelligence (AI) Terminology Diagram
Society of Automotive Engineers’ Levels of Driving Automation

SAE J3016™ LEVELS OF DRIVING AUTOMATION

**What does the human in the driver’s seat have to do?**

*SAE LEVEL 0*
- You are driving whenever these driver support features are engaged – even if your feet are off the pedals and you are not steering.

*SAE LEVEL 1*
- You must constantly supervise these support features; you must steer, brake or accelerate as needed to maintain safety.

*SAE LEVEL 2*
- When the feature requests, you must drive.

*SAE LEVEL 3*
- These automated driving features will not require you to take over driving.

*SAE LEVEL 4*
- These features can drive the vehicle under limited conditions and will not operate unless all required conditions are met.

*SAE LEVEL 5*
- This feature can drive the vehicle under all conditions.

**What do these features do?**

- **These are driver support features**
  - These features are limited to providing warnings and momentary assistance.
  - Example Features:
    - automatic emergency braking
    - blind spot warning
    - lane departure warning

- **These are automated driving features**
  - These features provide steering OR brake/acceleration support to the driver.
  - Example Features:
    - lane centering or adaptive cruise control

- **These features provide steering AND brake/acceleration support to the driver**
  - Example Features:
    - lane centering and adaptive cruise control at the same time

For a more complete description, please download a free copy of SAE J3016: [https://www.sae.org/standards/content/J3016_201806/](https://www.sae.org/standards/content/J3016_201806/)
Comparison with International Regulatory Approaches
BENEFITS OF SELF-DRIVING IN THE EU

- Safer roads
- Protection of the environment
- Better accessibility
- Economic growth
- New jobs

Sources: EPRS, European Commission
Asia
Mass adoption of highly autonomous vehicles (AVs) in China will likely start in 2027.

Use cases and passenger-kilometers addressable by autonomous vehicles over time: 1% of passenger-kilometers traveled

**Phase 1, ~2023**
- Low speed
- Nighttime
- Peak hours
- Bad weather
- Rural
- Suburban
- Urban

**Phase 2, ~2027**
- Low speed
- Nighttime
- Peak hours
- Bad weather
- Rural
- Suburban
- Urban

90% Technology ready and early adoption of constrained Level 4 AV technology

**Phase 3, ~2032**
- Low speed
- Nighttime
- Peak hours
- Bad weather
- Rural
- Suburban
- Urban

100% Start of mass commercialization of Level 4 AV technology

Full adoption with penetration into rural areas

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1 Suburban area has less traffic and more simple driving conditions than urban area.
2 Driving speed no more than 60 kilometers per hour.

McKinsey & Company
Central and South America
Wrap up
Four Potential Future States of Mobility

1. Incremental change
   - Personal
   - Vehicle ownership
   - Extent to which vehicles are personally owned or shared:
     - Depends upon personal preferences and economics
     - Higher degree of shared ownership increases system-wide asset efficiency

2. A world of carsharing
   - Shared
   - Vehicle ownership
   - Extent to which vehicles are shared

3. The driverless revolution
   - Autonomous
   - Asset efficiency
   - A new age of accessible autonomy

Source: Deloitte Insights
SETH BLAKE @SethWageWar • Mar 4
Dude is straight snoozing going 75mph on the interstate, letting his @Tesla do the work. 😴 slee
NOW...

OMG, THERE'S
NOBODY DRIVING
THAT CAR!

THE FUTURE...

OMG, THERE'S
SOMEBODY DRIVING
THAT CAR!

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Questions?

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