

# THE LONG ROAD TO LEGALIZE ADB IN THE UNITED STATES

Michael Larsen General Motors





- Early 2000s: Adaptive Frontlighting allowed under UN regulations
  - Bending Light, Town light, Motorway Light, Country Light, & Adverse Weather Light
- The US National Highway Traffic Safety Administration (NHTSA) provided Interpretations that “swiveling” headlamps are allowed under FMVSS 108
  - This followed NHTSA’s tradition of enabling new technologies without necessarily requiring updates to FMVSS 108 i.e., allowing technologies that were not originally envisioned
- The main components of AFS were allowed in the US immediately
  - Parts of AFS were allowed in the United States, also helping to speed up the adoption in Europe ... the AFS “Fast Track”
- In support of the NHTSA interpretations, the SAE Lighting Group created SAE J2591<sup>®</sup> Adaptive Forward Lighting, which helped “fill in the blanks” in the regulation
  - SAE J2591<sup>®</sup> was published September 2002



- 2011: Adaptive Driving Beam allowed under UN regulations
- SEP 2011: Request for Interpretation was submitted to NHTSA by an OEM, with a proposed rationale for why ADB was already allowed under FMVSS 108
  - Similar to what was done 10 years earlier for AFS
  - This was the start of the legalization of ADB in the United States
- JAN 2012: Rochester DVN workshop, discussion between the SAE Lighting Group and NHTSA
  - Re-established a cooperation between SAE and NHTSA to work on “issues of mutual interest”
- APR 2013: SAE Lighting Systems Group presented ADB to NHTSA in Washington DC
  - NHTSA requested a recommendation from SAE for how ADB might be regulated under FMVSS 108
  - APR 2013: the original OEM who submitted the interpretation request submitted a Petition to NHTSA to officially allow ADB in the US under FMVSS 108
    - Indicated that NHTSA was not going to give a favorable response to the 2011 Interpretation Request



- SEP 2013: NHTSA requested the use of European ADB vehicles to study the performance of ADB at their test facility
  - Request presented at a GTB meeting that occurred in conjunction with 2013 ISAL
  - Vehicles were provided, and research was conducted by NHTSA at the Vehicle Research and Test Center 2014-2015
  
- AUG 2015: NHTSA publishes their findings in the report “Adaptive Driving Beam Headlighting System Glare Assessment”
  - DOT HS 812 174 - On-road evaluation of European ADB systems for Glare
  
- SAE J3069<sup>®</sup> Adaptive Driving Beam was published June 2016
  - Industry’s recommendation for how to regulate ADB under FMVSS
  - Result of work from 2014-2016



- AUG 2017: NHTSA published their Timetable – 12/00/2017  
Action: Notice of Proposed Rule Making (NPRM)
- SEP 2017: NHTSA published VW's petition to exempt the Audi A7 from FMVSS 108 to allow ADB
  - Petition has still not been answered
- DEC 2017: NHTSA updated their NPRM Timetable – 06/00/2018
  - New US Presidential Administration
  - Typically, when the US Presidency changes party (Democrat to Republican), activities at NHTSA are put on hold for about 6 months



- SEP 2018: Transport Canada updated CMVSS 108 to allow ADB
  - Allowed under SAE J3069<sup>®</sup> or UN Regulations
    - ADB is allowed in Canada today
- OCT 2018: NHTSA published their ADB NPRM “NHTSA-2018-0090”
  - NHTSA’s ADB requirements were substantial, and did not follow SAE J3069<sup>®</sup>
  - Proposal required dynamic test track evaluations of 34 driving scenarios
    - Including straight and curved roads at different speeds
  - Glare is to be measured continuously over all the testing scenarios
    - Each scenario tested against any car, semi truck, or motorcycle sold over the past 5 yrs
    - No glare is allowed for any duration over 0.1 seconds
  - During the comment period, over 150 comments were provided to NHTSA
- FEB 2020: NHTSA published their Final Rule Timetable – 10/00/2020



- AUG 2020: The Auto Innovators submitted their findings from the testing of 4 ADB vehicles following the NHTSA's NPRM
  - Testing conducted 2019-2020 using 4 ADB vehicles from European and Japanese OEMs
  - These vehicles were tested against 4 stimulus vehicles
    - Car, Light Duty Truck, Heavy Duty Truck, and a Motorcycle
  - The report is available through the ADB docket NHTSA-2018-0090, as are all the other public comments to NHTSA's NPRM
- The effort confirmed the impression that the NPRM tests are substantial, and the requirements are stringent



- As of this presentation, the ADB Final Rule has not been published
  - NHTSA target was October 2020
    - New US Presidential Administration and COVID
    - Again, typically when the US Presidency changes party (Republican to Democrat), activities at NHTSA are put on hold for about 6 months
  - We are hopeful that the final ADB rule will be published soon, perhaps before this effort reaches its 10-year anniversary

# Conclusion



- The US Regulatory change process is slow
  - The update to allow ADB under FMVSS 108 has taken a decade
  - However, this amount of time is not uncommon for an update to FMVSS
    - The industry was hopeful that this optional technology with obvious safety benefits and minimal risk over semi-automatic beam switching (i.e. auto high beam) would be quicker
- Regardless, it seems the regulatory update process moves sequentially and requires about 2 years for each step
  - (1) Petition + (2) Research + (3) Industry Standards Review + (4) Notice of Proposed Rulemaking + (5) Final Rule = 10 years

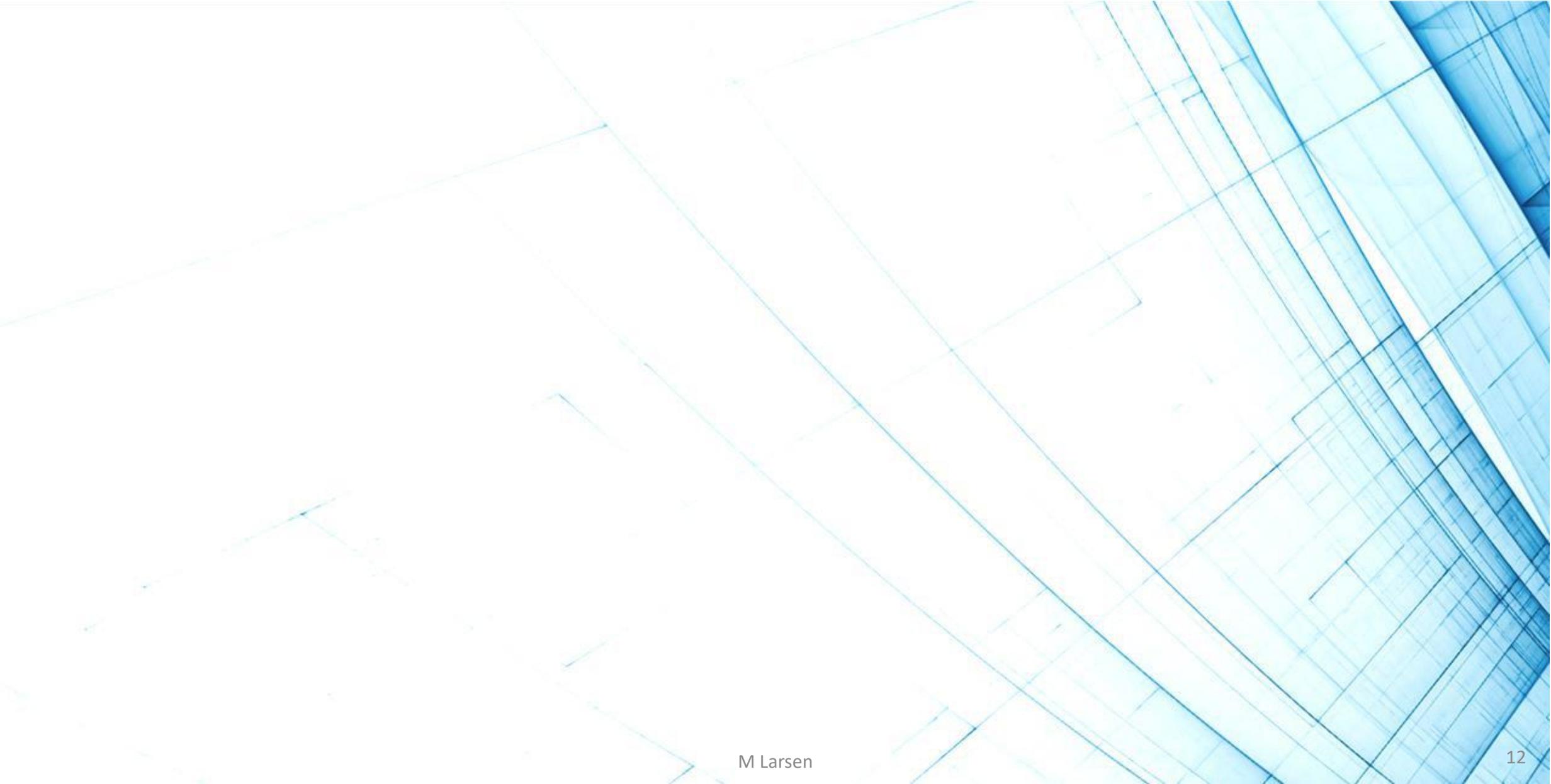
# Lessons Learned

- If possible, implementing new lighting technologies in the US through internal company interpretations is the quickest method
  - The interpretation may limit the extent of what can be done depending on what FMVSS 108 requires ...
  - But, if it is possible, this method will greatly speed up the time for implementation onto a vehicle
- If a NHTSA Request for Interpretation is determined to be the best solution, the request should be thoroughly discussed and vetted
  - Or else, the request may lead down a long and time-consuming path
  - And, the answer from NHTSA may have unintended consequences

# THANK YOU FOR YOUR ATTENTION

Michael Larsen General Motors





# THANK YOU FOR YOUR ATTENTION

Michael Larsen - [michael.larsen@gm.com](mailto:michael.larsen@gm.com)

