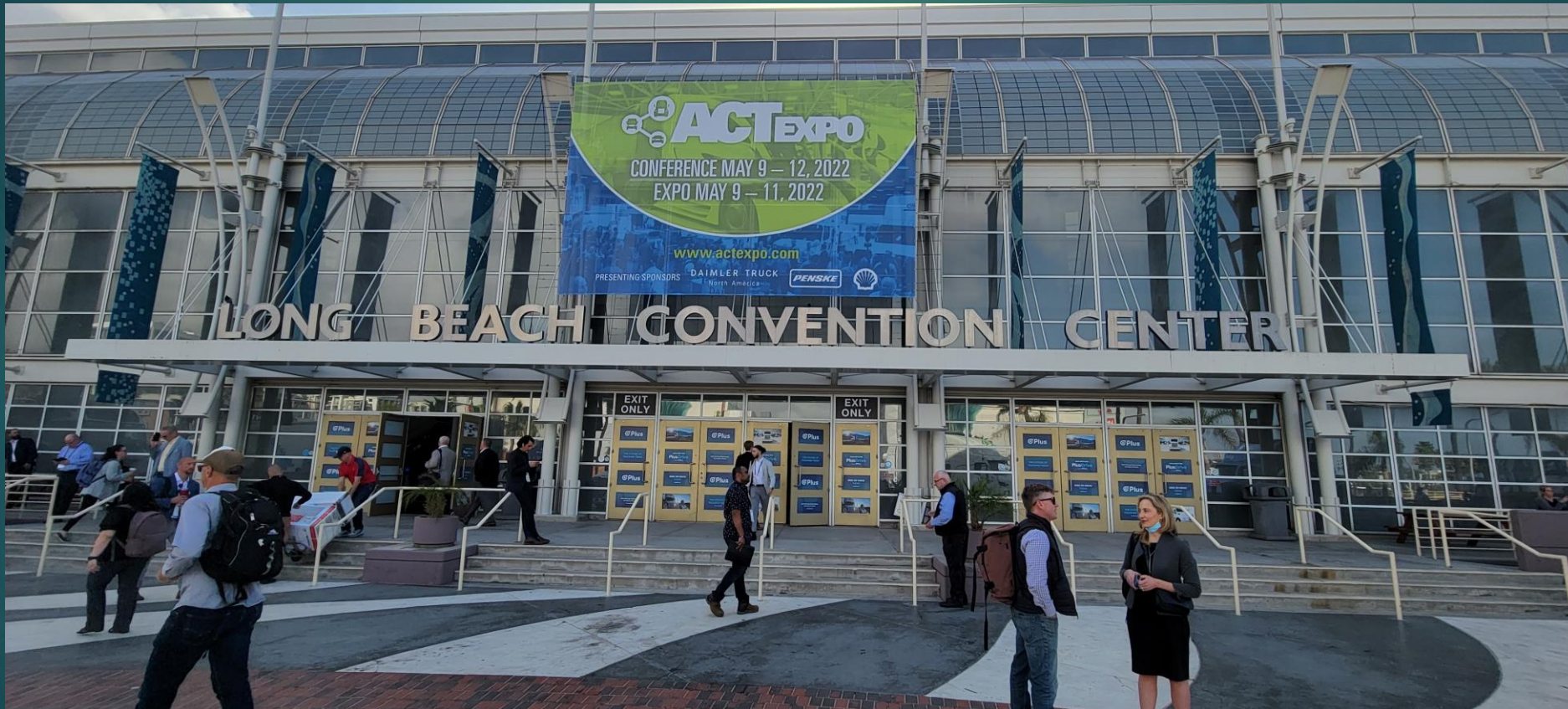




Autonomous & Connected Platooning Vehicles

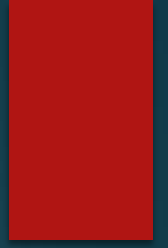
Autonomous Vehicles



CMV Autonomous Implementation

- ▶ Level 1 – Assisted Sensory (driver assistance)
- ▶ Level 2 – Feet Off (partial automation)
- ▶ Level 3 – Hands Off (conditional automation)
- ▶ Level 4 – eyes Off (high automation)
- ▶ Level 5 – Brain Off (full automation)



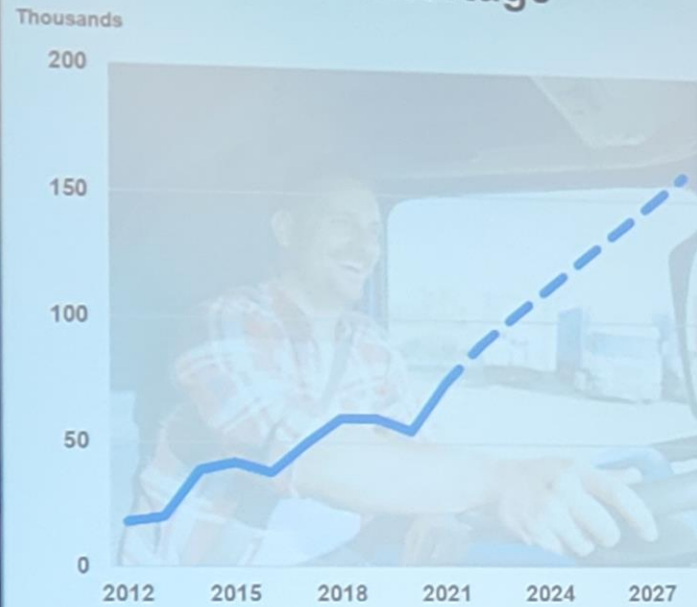


What Do Autonomous CMV's Do For Commerce?

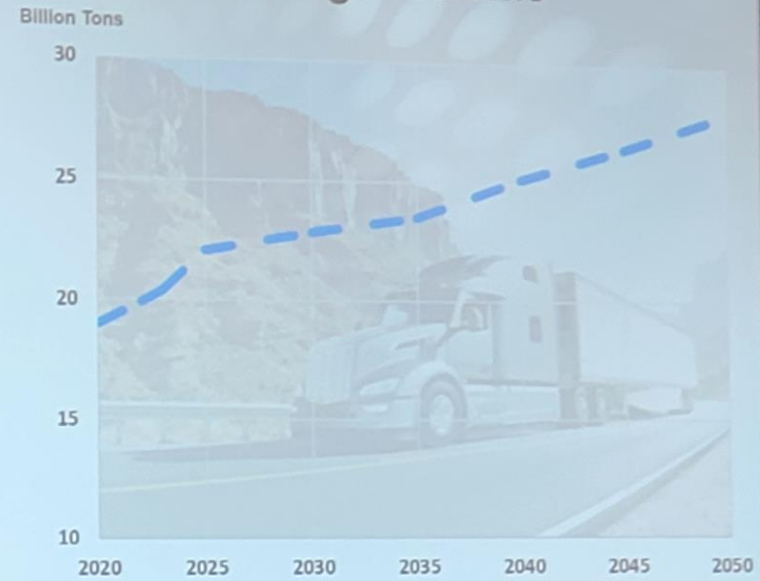
- ▶ Provides a solution for the growing driver shortage
- ▶ Allows uninterrupted movement of freight
- ▶ Opens our bogged down supply chain
- ▶ Reduces crashes involving CMV's
- ▶ Lowers cost at the register

Driving Autonomous

Driver Shortage



Freight Volume



Obstacles For Deployment

- ▶ Lack of knowledge/understanding (public trust)
- ▶ Legislation (federal/state)
- ▶ Opportunities to test in varying terrains
- ▶ CMV Enforcement
- ▶ Infrastructure

What Are Developers Asking For?

- ▶ Opportunities to move from testing to deployment
- ▶ Responsible legislation
- ▶ Harmonized legislation amongst jurisdictions

They Are Already Here!

- ▶ The testing used Embark-powered trucks traveling on a 60-mi round trip route on public roads between Clinton and Missoula, Montana, in varying winter weather situations. In addition to on-road testing, the company developed a comprehensive weather model using over 8 billion historical weather data points (dating back over 10 years for all major U.S. routes) to analyze the impact of snow at a lane level across the U.S.



New ADS CMV Inspection Program

- ▶ On Sept. 22, at the Commercial Vehicle Safety Alliance (CVSA) Annual Conference and Exhibition, in Rapid City, South Dakota, the CVSA Board of Directors approved the launch of the Alliance's brand-new Enhanced Commercial Motor Vehicle (CMV) Inspection Program, an inspection standard and procedure designed to govern inspections of commercial motor vehicles equipped with automated driving systems (ADS) – also referred to as autonomous or driverless vehicles.

CVSA Enhanced Commercial Motor Vehicle Inspection Standard *(for motor carrier operations)*



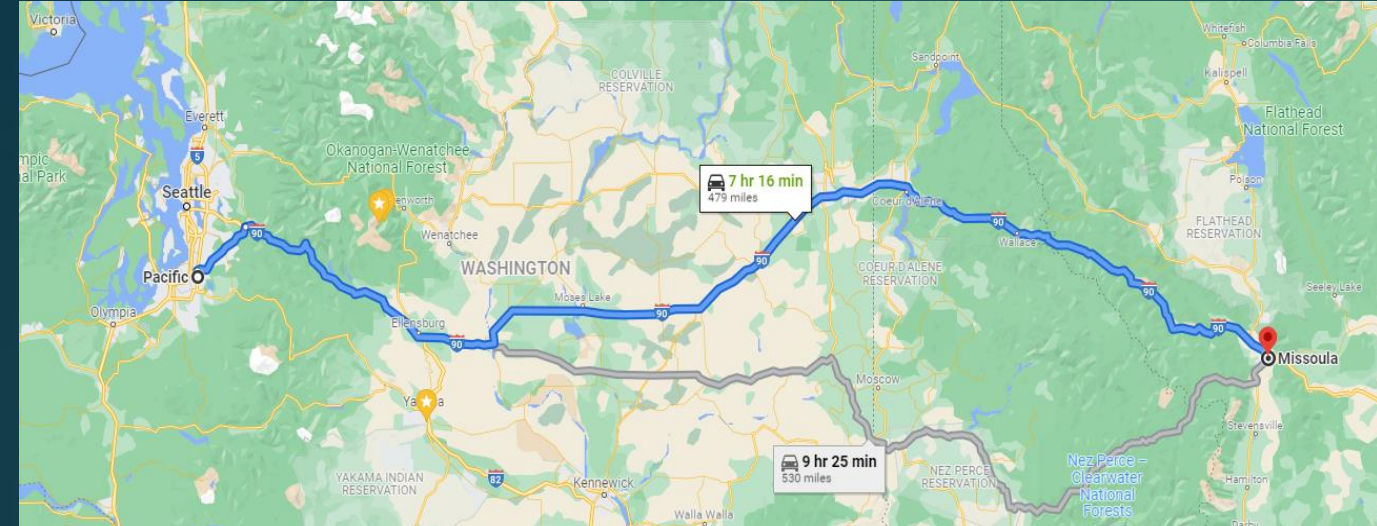
Tractor/Semitrailer
(Air Brake-Diesel/Gasoline)



June 2022 Edition

CMV Platooning (Road Trains)

- ▶ 2 or more autonomously connected vehicles 30 to 45 feet apart
- ▶ Various stages of testing
- ▶ Already happening in states such as MI, PA & OH (Smart Belt Coalition)
- ▶ Northwest Passage RFI for test route
- ▶ All 4-finalist included routes through Montana
- ▶ Vendors believe our statutes do not require them to get permission to test or deploy in Montana
- ▶ Many states are developing legislation to regulate autonomous connected CMV's



Fully Autonomous Solution to be Deployed in Phases

Fastest Path to Market Deployment at Scale
Massive Data Collection

Vast driving experience from convoying
accelerates solo driverless deployments

HUMAN-GUIDED AUTONOMYSM

PHASE 1
2 Drivers Taking Turns



Autonomous Relay Convoy™

2022

Cost Savings

30%

Applicability

50%

PHASE 2
1 Driver



Drone Follower™

2023

33%

75%

SOLO AUTONOMY

PHASE 3
No Driver



Hub to Hub

2024+

40%

91%

PHASE 4
No Driver



Dock to Dock

2025+

45%

100%

What Other States Are Doing

RCW 47.04.280: TRANSPORTATION SYSTEM POLICY GOALS:

(1) PUBLIC INVESTMENTS IN TRANSPORTATION SHOULD SUPPORT ACHIEVEMENT OF THESE POLICY GOALS:

(A) **MAINTAIN, PRESERVE AND EXTEND** THE LIFE OF PRIOR INVESTMENTS...

(B) **SAFETY:** TO PROVIDE FOR AND IMPROVE THE SAFETY AND SECURITY OF TRANSPORTATION CUSTOMERS...

(C) **STEWARDSHIP:** TO CONTINUOUSLY IMPROVE THE QUALITY, EFFECTIVENESS, RESILIENCE, AND EFFICIENCY OF THE

TRANSPORTATION SYSTEM;

(D) **MOBILITY:** TO IMPROVE THE PREDICTABLE MOVEMENT OF GOODS AND PEOPLE THROUGHOUT WASHINGTON STATE,

INCLUDING CONGESTION RELIEF AND IMPROVED FREIGHT MOBILITY;

(E) **ECONOMIC VITALITY:** TO PROMOTE AND DEVELOP TRANSPORTATION SYSTEMS THAT STIMULATE, SUPPORT, AND ENHANCE THE

MOVEMENT OF PEOPLE AND GOODS TO ENSURE A PROSPEROUS ECONOMY; AND

(F) **ENVIRONMENT:** TO ENHANCE WASHINGTON'S QUALITY OF LIFE THROUGH TRANSPORTATION INVESTMENTS THAT PROMOTE

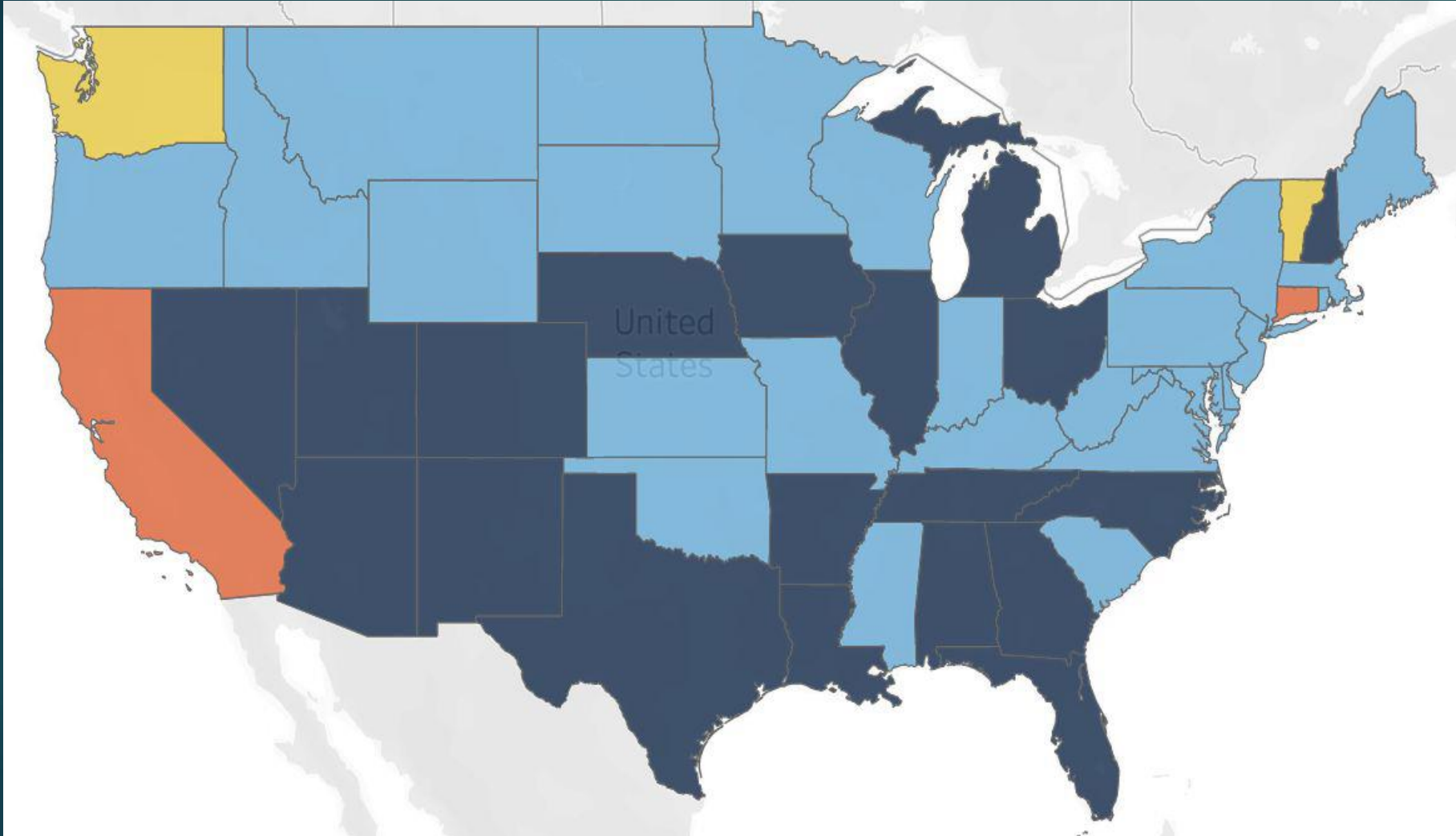
ENERGY CONSERVATION, ENHANCE HEALTHY COMMUNITIES, AND PROTECT THE ENVIRONMENT.

WA State Regulatory Landscape:

- Prior to 2017: Governor's Office (Charles Knutson) met with the AG to discuss AV testing program approaches (Self Certification process was recommended)
- 2017: [EXECUTIVE ORDER 17-02](#) AUTONOMOUS VEHICLE TESTING & TECHNOLOGY IN WASHINGTON STATE AND AUTONOMOUS VEHICLE WORK GROUP
- 2017: DOL - Autonomous vehicles: [Self-certification](#) for testing in Washington state
- 2018: [SHB 2970](#) AUTONOMOUS VEHICLE WORK GROUP
- 2020/2021: [SB 5460](#) Implementing recommendations of the autonomous vehicle work group.
 - Testing requirements begin in October 2022
 - **Note: Auto Industry representatives are preparing modifications to this legislation that are planned to be introduced this coming session**

Questions

1. Do the AV Testing Requirements set in motion by [SB 5460](#) supersede [EXECUTIVE ORDER 17-02](#)?
2. Should [EXECUTIVE ORDER 17-02](#) be refined to more clearly delineate the line between testing and commercial deployments?



Dark Blue: State law explicitly allows L4 CMV Deployment

Light Blue: In absence of state law, federal law prevails, L4 CMV deployment allowed

Yellow: State law explicitly allows L4 CMV testing, deployment Questionable

Orange: State law explicitly prohibits L4 CMV deployment

61-8-329(2) MCA

- ▶ **Following too closely.** (1) The driver of a motor vehicle may not follow another vehicle more closely than is reasonable and prudent, having due regard for the speed of the vehicles and the traffic upon and the condition of the roadway.
- ▶ (2) A motor vehicle being driven upon a roadway outside of a business or residence district, including in a caravan or motorcade, whether or not towing other vehicles, **must be operated in a manner that allows sufficient space between each vehicle or combination of vehicles to enable any other vehicle to enter and occupy the space without danger.** This provision does not apply to funeral processions.

What's Next For Montana?

- ▶ Is our infrastructure adequate?
- ▶ Do we need legislation changes such as the following to close law (61-8-329(2) MCA)?
- ▶ What does this look like for Law Enforcement?
- ▶ Additional insurance requirements or Tort claim risks?
- ▶ Construction projects, pedestrians, animals, emergency road closures?
- ▶ Regional driving concerns?
- ▶ How do we ease public concern and get their buy in?
- ▶ What are the measures and standards for determining safe operations and assessing risks when deciding to go from driver present, to no driver on the following truck, to no driver at all (someday)

Questions?

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