



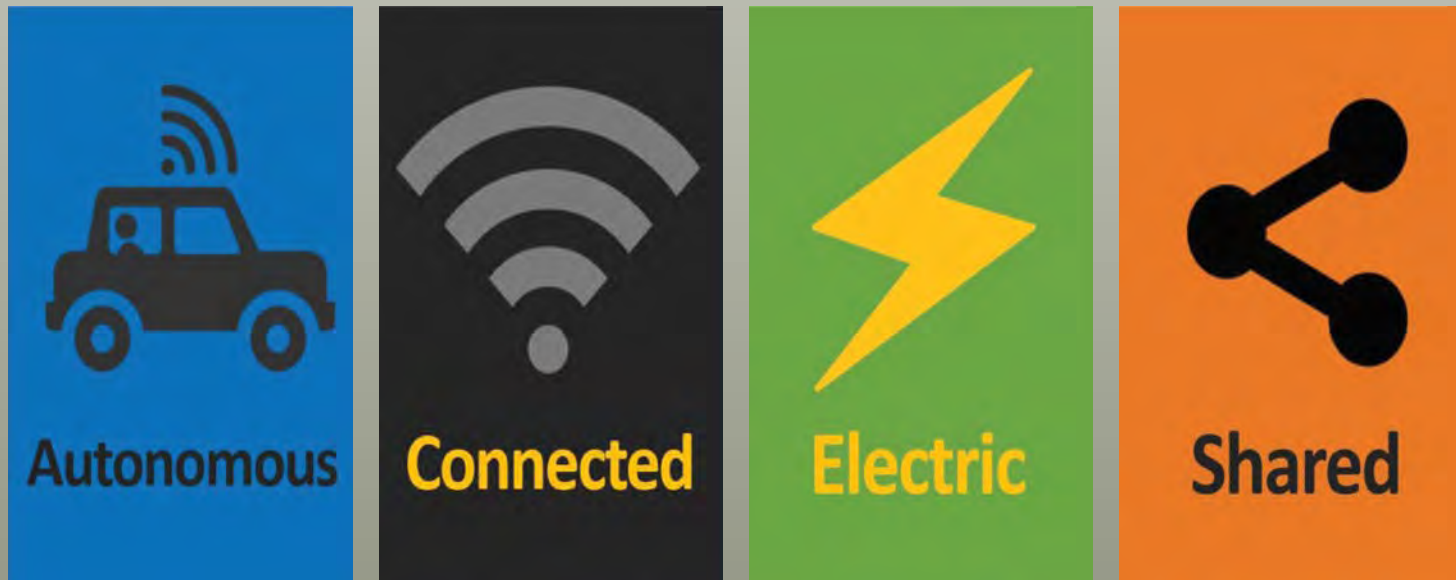
Washington State Transportation Commission
October 17, 2017

Bruce Agnew, Cascadia Center
Scott O. Kuznicki, Transpo Group



The Future of Transportation

A C E S



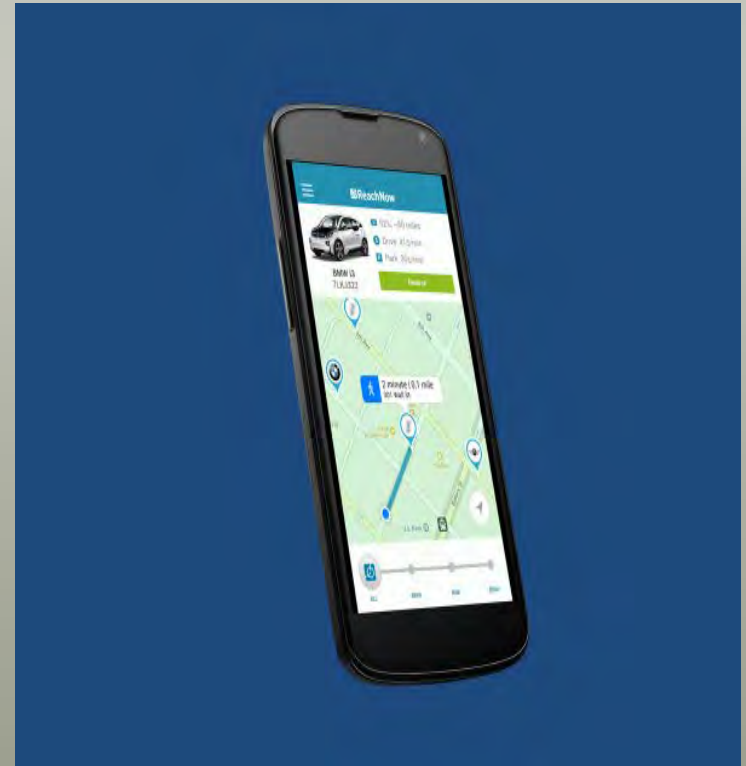
The Future of Mobility is *Now*

ACES transportation

will be safer,
smarter, cleaner,
less congested, and
with better access for all

*“The mix of sharing,
electric, and
driverless cars could
disrupt everything
from parking to insurance,
oil demand and retail.”*

*Professor Tony Seba, Stanford
(Bellevue Chamber, Oct 10th, 2017)*





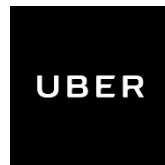
City of Bellevue

Intelligent Transportation Strategy

Goals

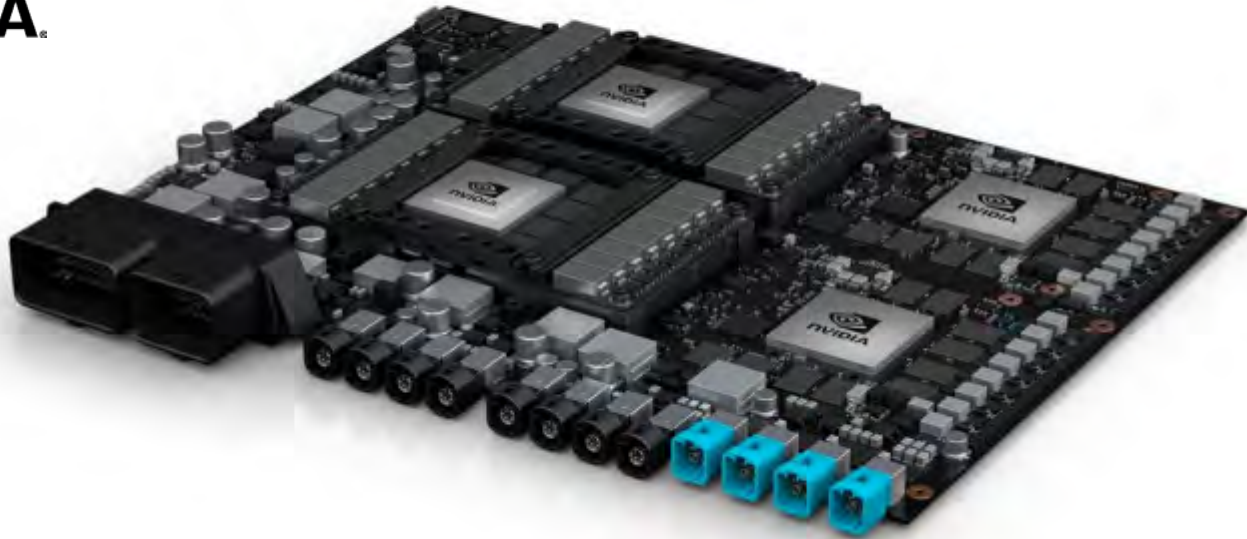
- Make Bellevue a global leader in every element of ACES.
- Enable people who live, work, and/or play in Bellevue to travel where, when, and how they want in a safe, efficient, inexpensive and reliable manner.
- Use new and emerging technologies to solve transportation problems of today and tomorrow.
- Make Bellevue less congested, safer, cleaner, and more attractive to business than ever before.

Global Resources in Puget Sound



Convergence of Tech

 **Pegasus**
NVIDIA.



Automation Leads to Autonomy



- Stability Control
- Adaptive Cruise Control
- Automatic and Emergency Braking
- Lane Departure Warning
- Automated Parking
- Optical VLD machine vision
- “Telematics” and constant connectivity

ACES is Accomplishing Now

DISCOVERY
INSTITUTE

CASCADIA



Seminar Series

AUTOMATED – CONNECTED – ELECTRIC – SHARED

THE FUTURE OF MOBILITY IS NOW

*Autonomous Shuttles for
Local Mobility*

Mercer Island Community and Event Center

10:30 a.m. to 12:30 p.m.

Friday, October 20th, 2017

FREE EVENT · NO RSVP REQUIRED · ALL ARE WELCOME

ACES is Accomplishing Now

ACES Legislative Caucus

HOSTED BY **INRIX, October 20th, 2017**

- Expand transportation electrification initiatives
 - Metro's Proterra electric fleet
 - WSDOT grant program for charging station network
 - Leverage private funding and solar capacity
- Support flexible electric van pools on I-405 corridor to provide mobility to lower income workers on Eastside (City of Bellevue lead)
- Support curb management in cities to support shared mobility services and seamless last-mile connections to conventional transit services
- Promote transit partnerships with private providers for first-mile/last-mile connections to encourage transit use
- Modernize 1991 Commute Trip Reduction Act to accelerate technology

ACES is Accomplishing Now

ACES Legislative Caucus

HOSTED BY **INRIX, October 20th, 2017**

- Accelerate expansion of I-405 between Bellevue and Renton to provide critical link between tech hubs in Bellevue and Renton and commerce centers in Kent Valley
- Harmonize statewide business licensing for shared mobility services and reduce barriers to shared ride services
- Collaborate with Microsoft's Cascadia Innovative Corridor to support Madrona's I-5
 - featured at PNWER Winter meeting in Victoria, BC, on November 7th
- Leverage Governor Inslee's Task Force to show coordination between Legislature, WSTC, FHWA, and Congressional delegation

ENSURE WASHINGTON STATE IS READY FOR NOW

Governor Inslee's Task Force

“Light Touch” toward AV regulations
Fostering innovation from our strong private sector



Toward Zero Deaths . . . Sooner

*“Automated vehicle safety technologies signal the next revolution in roadway safety. We see great potential in these technologies to save lives—**more than 30,000 people die on our roads every year and we can tie 94 percent of crashes to human choice**—transform personal mobility and open doors to communities that today have limited mobility options.”*

*National Highway Traffic
Safety Administration*

Toward Zero Deaths . . . Sooner

*“Cars of the future need
roads of the future”*

Reema Griffith
Washington State
Transportation Commission

Autonomous cars need good roads
and technology infrastructure

- Pavement markings and delineation
- Smooth, clear pavement
- Traffic signing that is uniform and properly placed
- Active mapping systems
- Low-latency communications systems

Beyond Good to Excellence

“Achieve superior competence in your strategic areas of focus and obtain confidence from the ACES community.”

The **WSDOT Maintenance and Preservation Budget** is a critical driver for a uniform state of good repair.



Pavement markings, pavement conditions, and traffic signing must be maintained to ensure that machine vision systems have the best possible information for efficient and safe operations for human drivers and self-driving transport.

This is a 20-year commitment to both worlds.

Beyond Good to Excellence



WSDOT's profiled markings are LIDAR-compliant and benefit human drivers, too.

Invest more in consistency rather than more in width.

BRITISH COLUMBIA

VANCOUVER
SURREY
BELLINGHAM
EVERETT
BELLEVUE
SEATTLE
KENT
TACOMA
OLYMPIA



WASHINGTON





A Driverless I-5 in 25 Years?

- Maximize utility of HOV network while extending and improving it
- Ensure capacity expansion serves only efficient and environmentally-responsible technologies
- Coordinate with other needs on I-5, including capacity and seismic retrofits
- Transform corridor for the movement of people and goods

SHARE WITH
HOV

NOW

DEDICATED
LANE IN EACH
DIRECTION

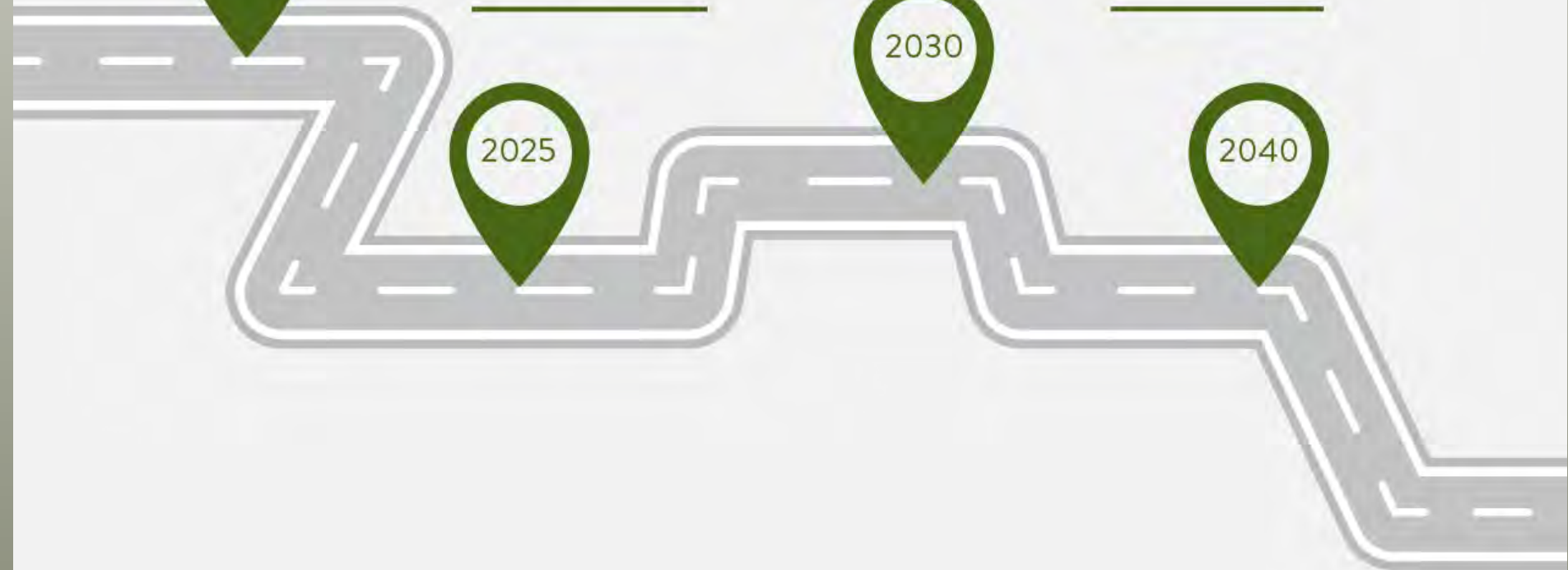
2025

MAJORITY OF
LANES DEDICATED
TO AVS (ONE LANE
AVAILABLE FOR
NON-AVS)

2030

EXCLUSIVELY
AVS

2040





Flexibility

- Build out the capacity that is needed to relieve congestion and maximize throughput
- Consider market economics in pricing and preferential use schema
- Find new ways to use road capacity without sacrificing safety and flexibility
- Maximize investment in network

Moving People and Goods



Efficiency Gains

- Fuel consumption
- Labor costs
- Shift Work
- Utilization of labor



Reliability Gains

- Less environmental impact
- More options for movement
- Fewer crashes
- Continuous operation/drayage

Truck Platooning



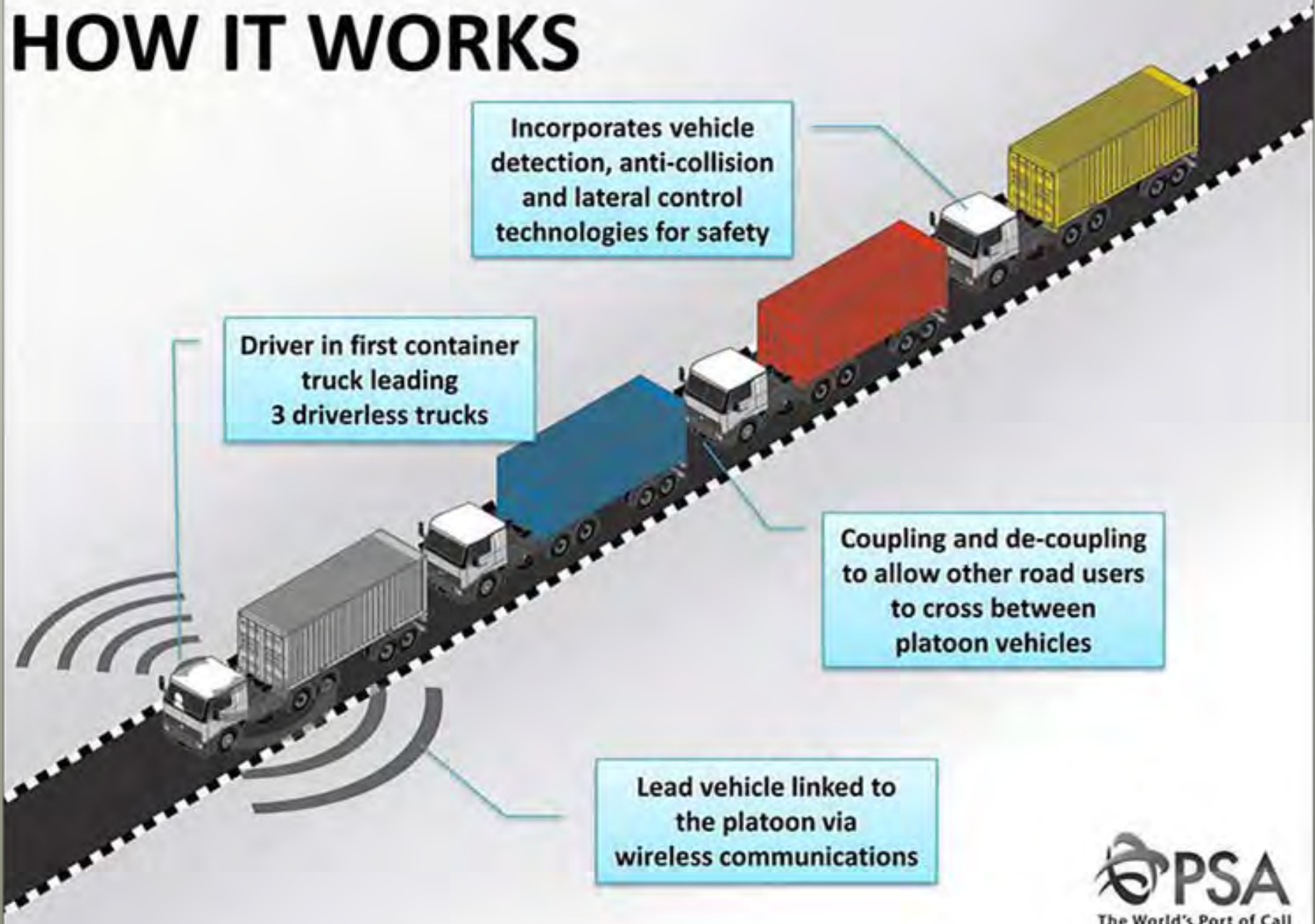
European Truck Platooning Challenge 2016

Creating next generation mobility

Lessons Learnt



HOW IT WORKS



Incorporates vehicle detection, anti-collision and lateral control technologies for safety

Driver in first container truck leading 3 driverless trucks

Coupling and de-coupling to allow other road users to cross between platoon vehicles


Lead vehicle linked to the platoon via wireless communications

NVIDIA is collaborating with PACCAR



NVIDIA.

PACCAR

The image shows the interior of a truck cab from the driver's perspective. The steering wheel is on the left, featuring a red logo. The dashboard is equipped with multiple analog gauges and a central digital display. A yellow emergency stop button is mounted on the dashboard. Through the windshield, a paved road curves through a landscape of bare trees and grass under a clear blue sky. A semi-transparent text box is overlaid on the upper portion of the image.

To bring AI-enabled autonomous driving

NVIDIA Drive PX 2

Oregon and Nevada Lead the Way



Autonomous and Electric Drayage

German automaker Daimler AG's trucks division said it would test on U.S. roads a new technology called "platooning", which allows large digitally-connected trucks to save fuel by driving close to each other in a row.

Portland, Oregon-based Daimler Trucks North America LLC said on Monday it received permission from the regional regulatory body, Oregon Department of Transportation, after successful trials in its proving ground in Madras, Oregon.

Reuters

September 25th, 2017

Autonomous and Electric Drayage



Autonomous and Electric Drayage

Zero-Emission Electric Drayage Trucks Coming to California

California's South Coast Air Quality Management District, which includes the ports of Los Angeles and Long Beach, announced that it would receive \$23.6 million from the state for a zero-emission drayage truck development and demonstration project in association with air-quality districts in the San Francisco area, Sacramento, San Diego and the San Joaquin Valley.

The project involves 43 zero-emission battery electric and plug-in hybrid drayage trucks serving major California ports, the district said, and demonstration trucks and charging infrastructure will be used in all five air districts.

Transport Topics
May 9th, 2016

Leadership

Resources

Energy

Results

