Peloton

California Transportation Commission

May 19, 2016

Jonny Morris
External Affairs & Public Policy Lead

Peloton Technology:

Our Company

Peloton Team

Dr. Josh Switkes
CEO
VW/Audi, Tula, Stanford University

Dave Lyons
Chief Innovation Officer
Tesla, IDEO, Glacier Bay

Steve Boyd
VP External Affairs
White House, PBS News Hour, Clean Economy Network

Chuck Price
VP Engineering
Broadvision, Yahoo!, Oracle

Chris Gerdes
Former Principal Scientist
USDOT, Stanford CARS, Freightliner

Board of Directors

Rodney Slater
Former US Sec. of Transportation

Ralph Eschenbach
Developer of first commercial GPS

Mark Lydon
Managing Director Intel Capital

Ken Arnold
Band of Angels, True Global Ventures

Investors

Peloton

VOLVO
Volvo Group Venture Capital

DENSO

UPS

NGP NOKIA GROWTH PARTNERS

intel Capital

MAGNA

LOCKHEED MARTIN

Castrol innoVentures

Lytx

SAND HILL ANGELS

birchmere VENTURES

band OF ANGELS

Background on Platooning

Platooning: Worldwide Activity

EU Platooning Challenge - 2016

ENERGY ITS – Japan 2009-12

SARTRE – EU (Sweden) 2009-Present

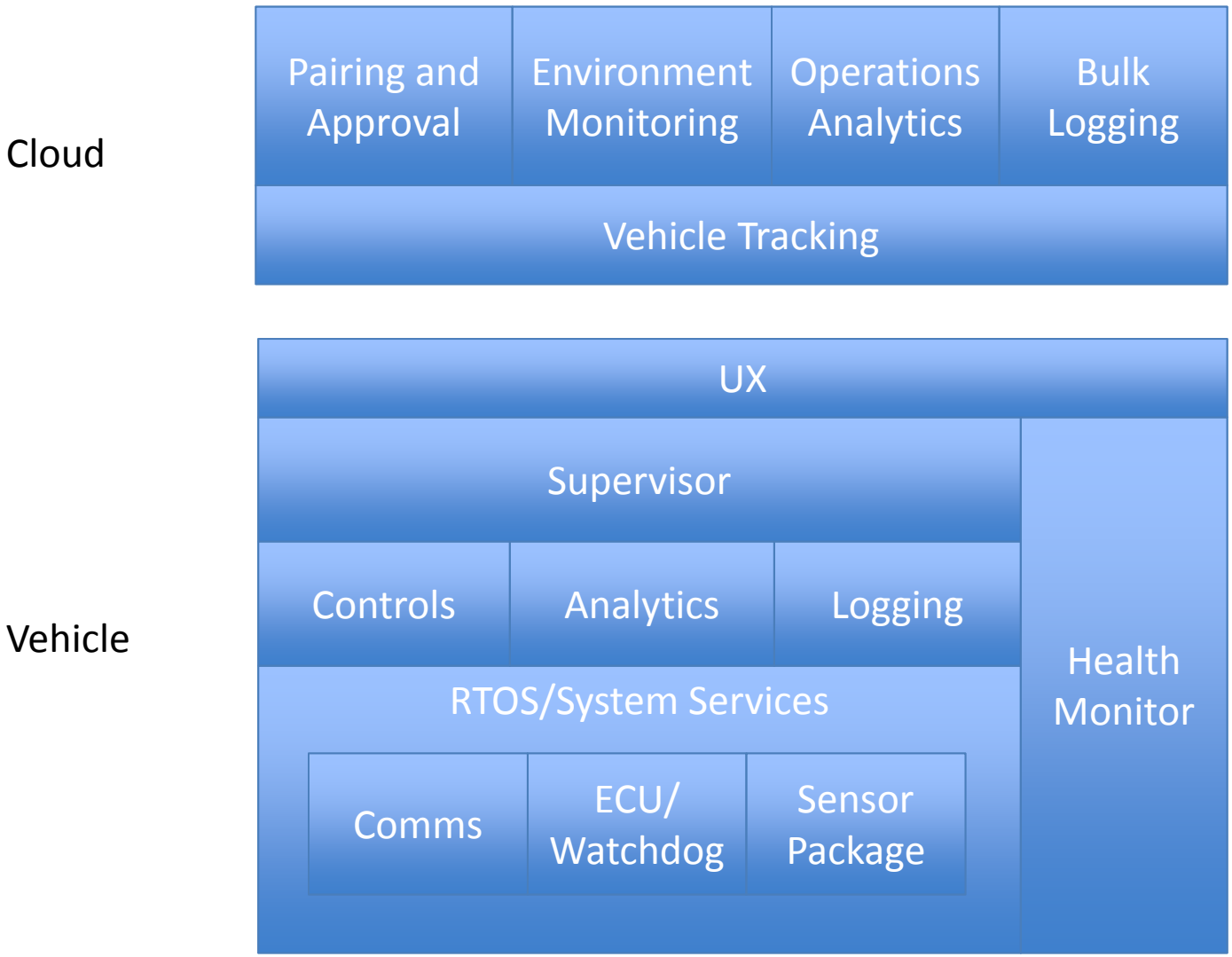
PIT – Canada 2009

KONVOI – Germany 2005-09

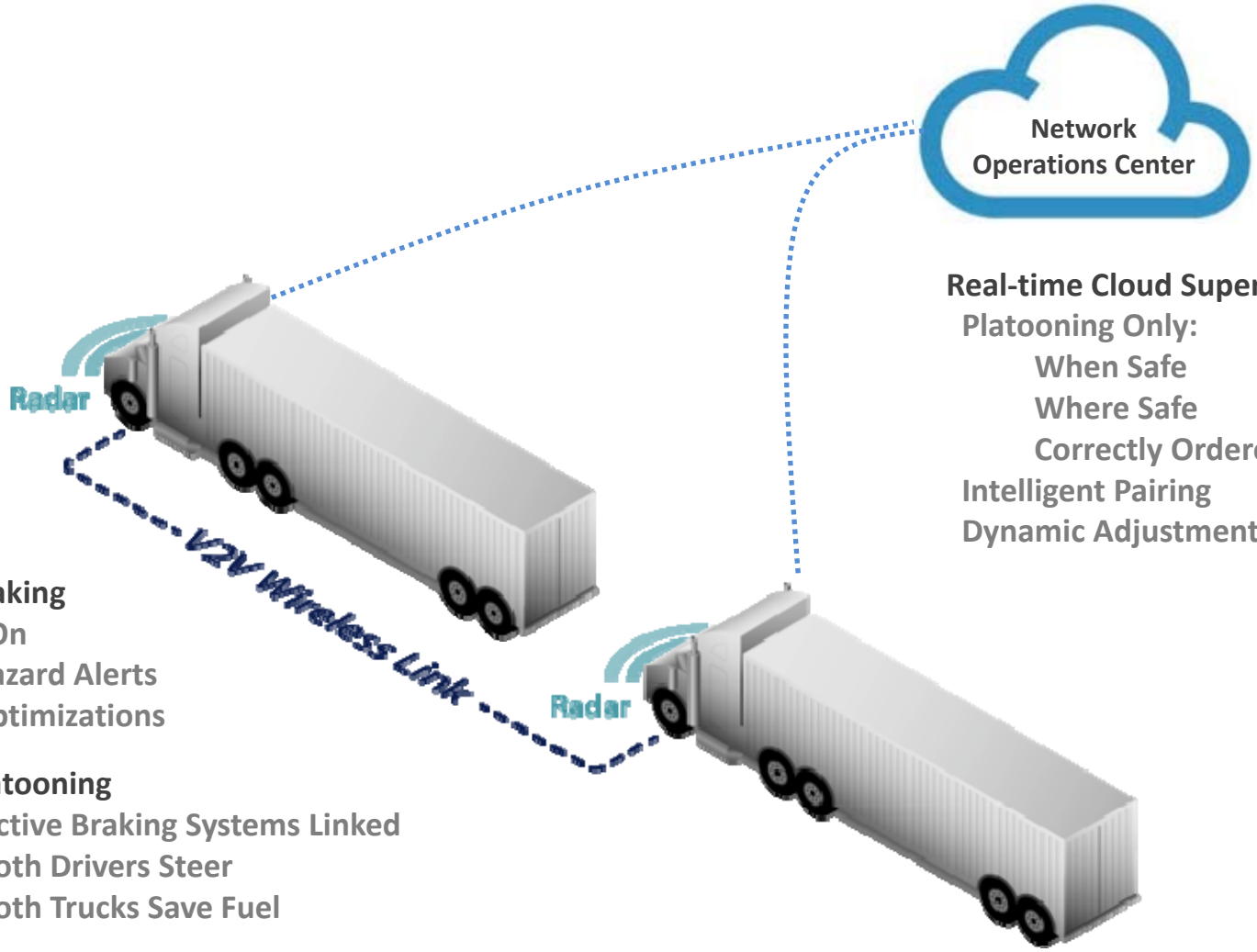
PATH – US ’90s and ongoing

Technology of Truck Platooning

Peloton Core Technologies



Connecting Trucks



Real-time Cloud Supervision
- Platooning Only:
  - When Safe
  - Where Safe
  - Correctly Ordered
- Intelligent Pairing
- Dynamic Adjustment to Conditions

Active Braking
- Always On
- Cloud Hazard Alerts
- Cloud Optimizations

Platooning
- Active Braking Systems Linked
- Both Drivers Steer
- Both Trucks Save Fuel

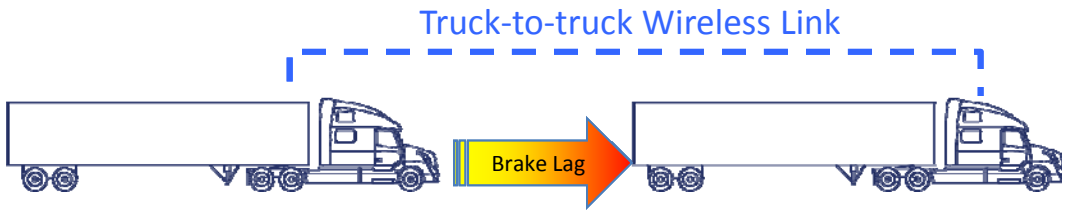
The Platooning Experience

Platooning & Following Distance

- Under ordinary conditions, proper following distance must allow for a following driver to perceive and react to the lead vehicle. This is in addition to the brake response lag in the braking system.

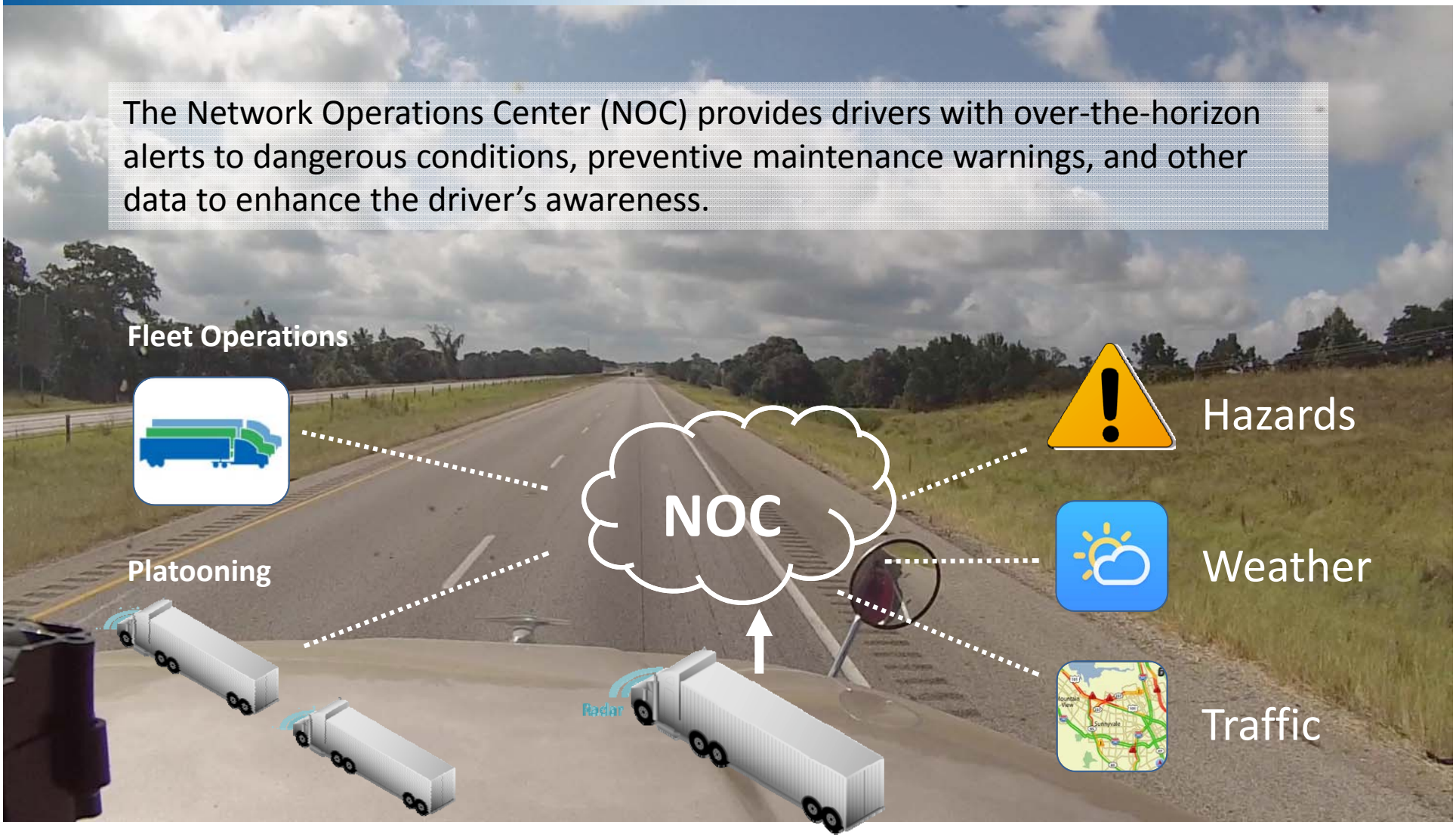
- With radar-based collision mitigation systems, driver perception and reaction are not necessary before the following truck brakes, but the following truck radar must detect the lead truck slowing before it can start to engage the following truck's brakes.

- A platooning system creates a near-instantaneous link, allowing a following truck's brakes to engage even *before* the lead truck begins to slow. This allows for a safe platooning following distance to be smaller than under ordinary conditions. The truck with the longer stopping distance is always put in the front position.



Enhanced Awareness

The Network Operations Center (NOC) provides drivers with over-the-horizon alerts to dangerous conditions, preventive maintenance warnings, and other data to enhance the driver's awareness.



Platooning Benefits

Facts on the Ground

- US Freight Trucking: **$700 Billion in Revenues**
  - Fuel Cost: **$100+ Billion**
    - **33%+** Operating Costs
  - Accident Cost: **$90+ Billion**
  - Industry Net Profit: **3%**

- Preventing Accidents
- Saving Fuel
- Improving Decisions

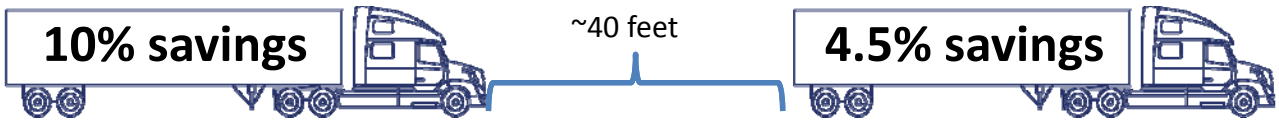
=

Enhanced
Fleet Economics
& Safety

Platooning accelerates the payback period for collision mitigation and advanced safety technology

Platooning Benefits

In addition to **improving individual and paired truck safety all the time**, public benefits of platooning include:



- **Fuel savings/Range Extension** (Independent test, 7.5% avg for both trucks)
- **Emissions reduction** (Corresponding GHG & Criteria Pollutants)
- **High quality data generation** (for fleets and govt)
- **Increased infrastructure efficiency**
- **Economically viable** (Fleet Payback Period <1 year)
- **Potential low-speed applications** (Platoon Signal Priority)

Partners & Engagement

Government Engagement

Federal (USDOT: NHTSA, FMCSA)

- No federal limitations to platooning
- Two USDOT projects (Auburn Univ. & CalTrans/PATH) to demonstrate platooning, establish best practices, and create pathway to deployment
- More projects coming → encouraging progress

States (State DOTs)

- No numeric following distance limitation in majority of States: "reasonable and prudent" standard
- Working with growing number of States to hold trials via administrative approval or legislation

Funded Projects with:

Collaboration

- **Industry Standards & Best Practices:** ATA/TMC, SAE, etc.
- **AASHTO and CVSA:** dialogue, best practices, harmonization
- **Collaboration on Demonstrations**
  - UT (Nov'13), NV (May'14), MI (Sept'14), FL (private test) (Apr'15), CA (Nov'15), UT (Nov'15), TX (Dec'15)
  - Potential upcoming California demos
- **Setting stage for Fleet Trials in 2016**
  - Administrative approval: TX, NV, MI, AL, NM
  - Legislation passed or in process: UT, CA, FL, MO
  - High interest & discussions: AZ, IA, WI, AR, TN, OK, OR, WA, others

Thank You

Jonny Morris
External Affairs & Public Policy Lead
jonny@peloton-tech.com