

# ADAS In Commercial Vehicles

Q2'20 Pulse

## What's inside ?

1. Activities of 4 key **commercial vehicle manufacturers** in ADAS and higher autonomy
  - Tesla, Daimler Trucks, Traton and Volvo Trucks

Activities of 4 key **emerging players** in autonomous CVs

- Embark, TuSimple, Nikola Motors, Einride

2. **Regulations** impacting autonomous CVs in the U.S & EU
3. **Future outlook**



MOBILITY INDUSTRY  
INSIDER

Image: Daimler Freightliner Inspiration Truck

FutureBridge

# THEMES AND KEY TAKEAWAYS IN ADAS in CVs

Today, we are seeing vehicle automation quickly becoming available throughout the commercial vehicle market with significant interest and investment by the players.

ADAS functionalities such as adaptive cruise control (ACC), automatic emergency braking (AEB) and lane keeping assist (LKA) are accelerating for commercial vehicles. Truck platooning is anticipated to be one of the next technologies to commercialize in this space.

Higher levels of promise to improve driver safety and commercial fleet efficiency, but technological challenges and regulatory barriers still exist.

## Themes covered in this scope



### Activities of 4 key commercial vehicle manufacturers in ADAS & higher autonomy

- [Tesla](#)
- [Daimler Trucks](#)
- [Traton](#)
- [Volvo Trucks](#)



### Activities of 4 key emerging players in autonomous commercial vehicles

- [Embark](#)
- [TuSimple](#)
- [Nikola Motors](#)
- [Einride](#)



### Regulation impacting autonomous commercial vehicles in the U.S and EU

- National standard for autonomous trucking in the [U.S](#)
- [EU](#) Roadmap for Truck Platooning



### Future outlook

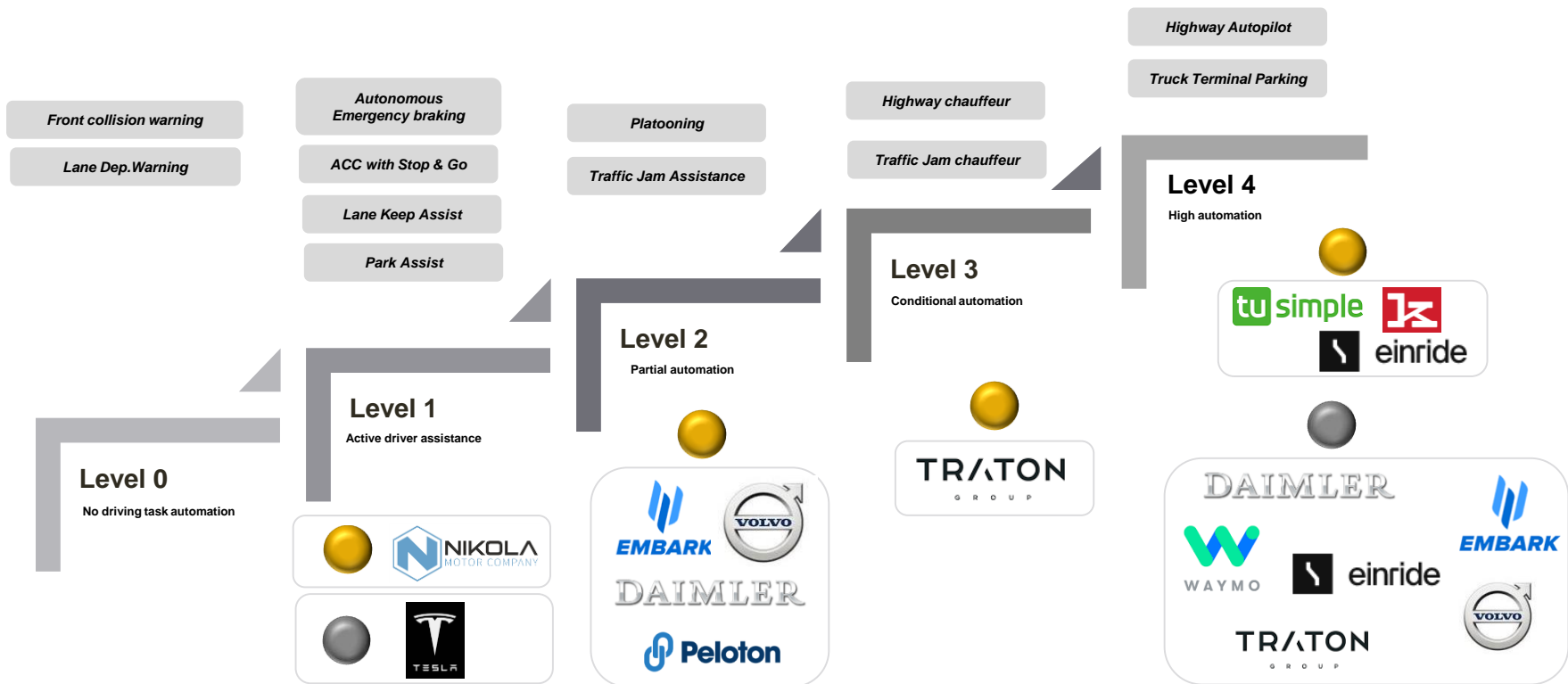
- Rise in capacity of freight overloads
- Focus on safety first with driver assist
- Need for clean, power efficient tech
- Adoption of next-level platooning
- New legal and insurance framework

## Key Takeaways

- Players are focusing on **Level-4 technologies** that take over on the highways, aiming at improving safety and gaining greater fuel efficiency. e.g. from platooning.
- **Collaborative business models** and **investments** could accelerate L4-L5 capabilities in the near future and find use cases in last-mile delivery, construction and mining areas
- Players like **Embark** plans to skip **Level 3** and go straight to **Level 4**, while **TuSimple** has ambitious plans to scale up Level 4 freight network by **2021**
- **Hydrogen** powered autonomous trucks could gain traction and fuel the freight chain
- Currently, **no federal regulation** on autonomous trucking technology exists in **the U.S.** which raises concerns over the need of design variants among states
- **EU** is developing platooning technology and relevant standards for **multi-brand platooning**
- As trucking moves **70%** of all goods in the U.S, **automation in trucking** has a good potential to scale the freight delivery operations
- Two-truck [platooning](#) system aims to reduce the fuel consumption for lead truck by **4.5%** and rear truck by **10%**

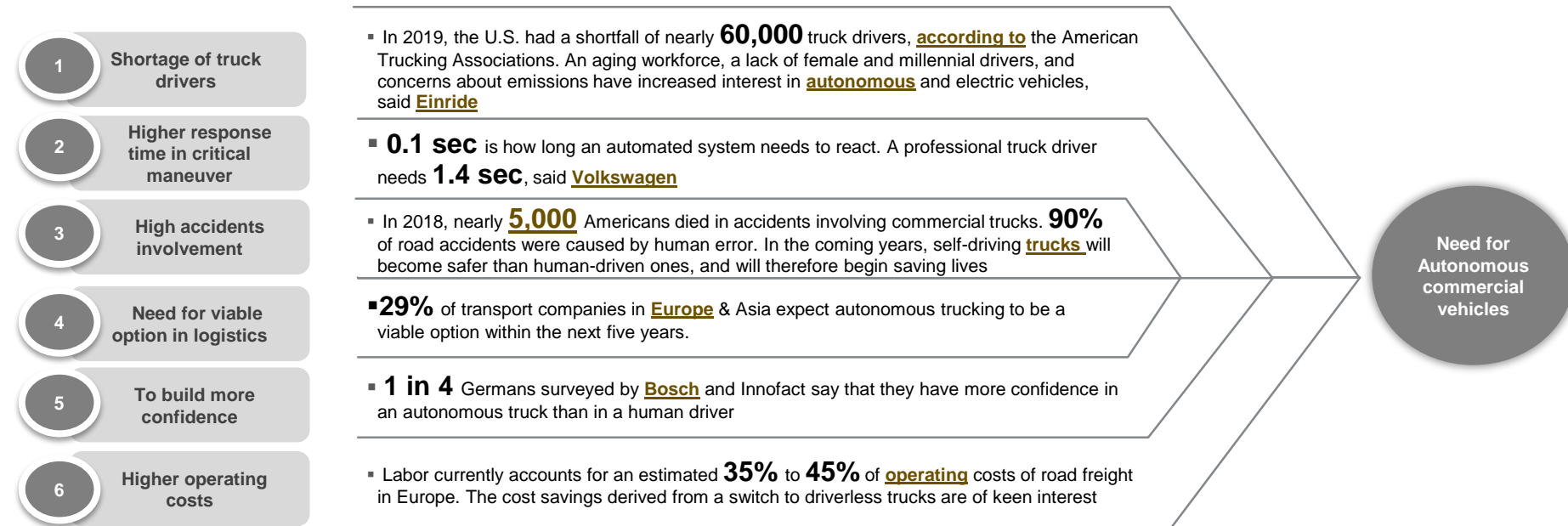
# Autonomy in Commercial Vehicles Transportation

Several enabling technologies for ADAS & autonomy are in planning or deployment phase. One of the key automation strategies here will be the deployment of truck platoons.



## Need for autonomous commercial vehicles

Shortage of truck drivers & enhanced safety requirements are critical for the future of Commercial Trucks. There is need for ADAS to shift from accident mitigation to prevention. Players will look for more cost-effective solutions in the future.



*"We are the pioneer for automated trucks. With the formation of our global Autonomous Technology Group, we are taking the next step, underscoring the importance of highly automated driving for Daimler Trucks, the industry and society as well. With the new unit, we will maximize the effectiveness of our automated driving efforts and the impact of our investments in this key strategic technology."* ~ **Martin Daum** – Member of BOM of Daimler AG for Trucks & Buses

## 01

# Commercial vehicle manufacturers activities in ADAS and higher autonomy

## Upcoming Trend

- Trial and roll-out of Level 4 autonomous vehicles, with increase in number of variants offering specific requirements
- Collaborative business models are gaining traction between players to scale their autonomous capabilities
- Investments will fuel to accelerate Level 4 – Level 5 capabilities in the near future where players will be seen offering autonomous capabilities in last-mile delivery, construction and mining areas

## Players in our coverage

*Below players are selected as they hold the largest share in commercial vehicle sales globally*



DAIMLER



Commercial Vehicles

TRATON GROUP



## What do we see happening

- Dominant players like Daimler, VW, Volvo are investing heavily in their autonomous technologies in commercial vehicles segment. Few of them have started dedicated business units for ACVs
- Players are focusing on technologies that take over on the highways, improving safety and gaining greater fuel efficiency
- Several other players are expanding their technological capabilities through collaborative business models to develop smart and secure solutions for logistics and transport

# Summary of OEMs activities in commercial vehicles

With L2 capabilities at present, plans to trial & roll-out L4 with focus on safety and increase number of autonomous variants

Parameters selected for competitive analysis



DAIMLER



Commercial Vehicles

TRATON GROUP



ADAS functionality

Plans to offer 'Autopilot' capabilities in Semi trucks in 2021



Offers L2 capabilities with Active Drive Assist & Detroit Assurance 5.0



Offers L3 capabilities in Australia mine. Testing of L4 vehicles on the German Autobahn



Offers L2 capabilities with Active drive assist platform. L4 testing for Vera in geo-fence area



Number of CV models offering L2

1 – Semi, which is offered in two variants of 300 & 500 miles range



Total 3 models which includes Freightliner Inspiration Truck, New Actros, Fuso Super Great Trucks



Total 3 models which includes MAN, Scania & Caminhões e Ônibus



Total 3 models which includes Vera, FMX trucks, VNL 670 model tractors



Safety aspects

Emergency call services, forward collision warning, emergency braking



Active Brake Assist 5, Sideguard Assist, Proximity control assist, Crosswind assist



MAN aFAS Driverless safety vehicle



Active drive assist platform [VADA 2.0](#), with driver awareness support



Collaborative business models



Future Outlook

Plans of commercialization of Semi trucks by 2021, with 1,00,000 trucks to be produced in a year



Ambitious plans to roll-out Mercedes-Benz future truck 2025, with L4 capabilities



Solid investment plans of €1B in R&D by 2025, aiming for L5 capabilities by 2022



Roll-out of full Self-driving [FMX](#) trucks in the future,





## OEM activities in commercial vehicles (1/4) : Tesla

Semi's production is delayed until 2021. Tesla plans to commercialize with autopilot functionality and offer at least 500 mile range

Source : [Tesla](#)

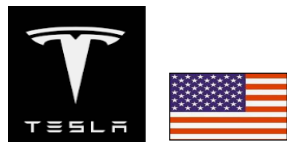


Image: Tesla Semi

Tesla Semi comes with an 'Autopilot' function to help provide assistance with semi-autonomous and safety for truckers

Trial Since	2017
Commercialization	2021
Variant Name	Semi

Future plans

**100,000**  
trucks to be produced in a year



Image: Driver Cabin view of Tesla Semi

### Tesla Semi Autopilot

Semi will use a range of cameras and sensors to help the computer systems onboard the truck to monitor its surroundings >>

Lane Keep Assist

Forward collision warning

Emergency braking

Emergency services call

Active steering assist

Not exhaustive list

### Orders received for Tesla Semi



### Cost vs range of Tesla Semi

**\$150,000** 300 mile range

**\$180,000** 500 mile range

**\$200,000** Limited edition 'Founders series' model

### Company claims

**\$200,000**

Saving the operator fuel costs of over a two-year period >>

**\$1.26**

Total cost per mile of Tesla Semi as compared to a diesel truck of \$1.51 >>

**<2 Kwh**

Per mile less energy consumption

### Press Release

**Tesla Semi Production is delayed until 2021 – electric truck now 2 years late >>**

**electrek**

### Range of Tesla Semi

**500 miles** at maximum load at highway speed is what Musk has promised, saying that **80 % of routes are less than 250 miles anyway** -- which means trucks can go out and back without charging >>



### FutureBridge Analysis

**ADAS functionality**



**Number of CV models offering L2**



**Safety aspects**



**Collaborative business models**



**Future Outlook**



● = Strong Capability

○ = No capability

# OEM activities in commercial vehicles (2/4) : Daimler

With collaborative business models, increase in investments, Daimler aims to roll-out L4 autonomous capabilities in the near future

Source : [Daimler](#)



Image: Fuso Super Great Trucks

## ADAS Availability



Image: Freightliner Inspiration Truck



Image: New Actros

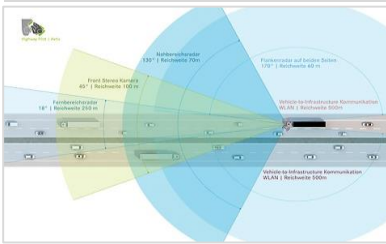
Trial Since	2014
License received	2015
Variant Name	Semi

Current ADAS functionality – L2	
<a href="#">Active Drive Assist</a>	<a href="#">Lane Keeping Assist</a>
<a href="#">Detroit Assurance 5.0</a>	<a href="#">Platooning</a>

\*\*List not exhaustive

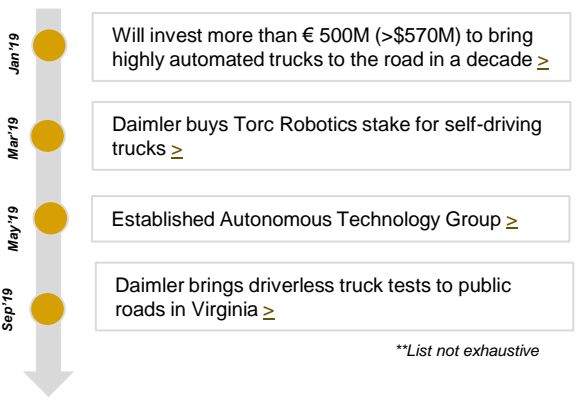
Current Safety functionality – L2	
<a href="#">Active brake assist 5</a>	<a href="#">Proximity Control Assist</a>
<a href="#">Sideguard assist</a>	<a href="#">Crosswind assist</a>

## Sensor Suite >>



**250m** – Long range radar  
**100m** – Stereo camera  
**70m** – Short range radar  
 \*\*Details not exhaustive

## Daimler's journey to L4 autonomous driving



## Press Release

**Daimler rolls back autonomous taxi plan, focuses on trucks >>**

**Transport Topics**

## Future Plans - L4

- [V2V communication](#)
- [Highway Pilot](#)
- [V2I communication](#)
- Ambitious Plans to roll-out Mercedes-Benz [Future Truck](#) 2025**



## FutureBridge Analysis

- ADAS functionality**
- Number of CV models offering L2**
- Safety aspects**
- Collaborative business models**
- Future Outlook**



# OEM activities in commercial vehicles (3/4) : Volkswagen

Traton Group has ambitious plans to roll-out L5 autonomous technologies by 2022 with plans of €1B in R&D by 2025

Source : [Traton Group](#)



Image: MAN Truck



Image: Scania Truck



Image: Caminhões Ônibus

Autonomous level

- L3 operation of a autonomous truck in an Australian mine >>
- L4 Testing autonomous safety vehicles on the German Autobahn >>
- L5 By 2022 >>

Commercial Vehicles

TRATON GROUP

Production facilities	29
Brands	3
Countries served	17
Revenue by 2025	€40B* <small>*estimated</small>

Commercial vehicle deliveries 2019 >>		
TRATON GROUP	242,000 vehicles	+ 4%

TRATON SE is a subsidiary of Volkswagen AG and a leading commercial vehicle manufacturer with its brands

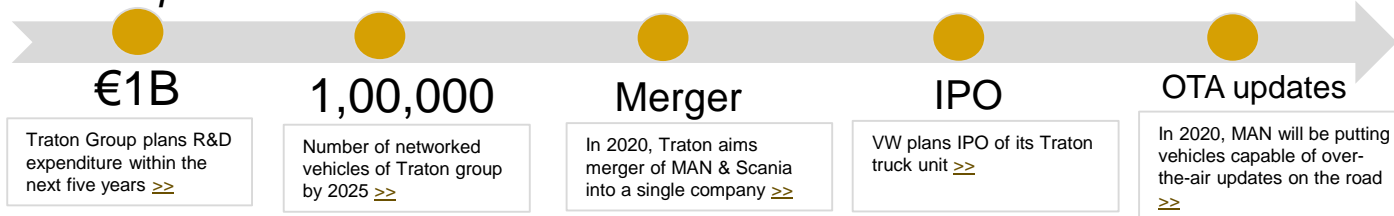


Future plans

	104,000 vehicles	+2%
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	99,500 vehicles	+3%
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	41,900 vehicles	+15%
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Press Release

**Ford, VW signs agreements for joint ventures on commercial vehicles, autonomous driving >>**

businesswire  
A BERSHIRE HATHAWAY COMPANY

Collaborative business models

**NAVISTAR** VW Traton unit submits buyout offer for Navistar >>

**Solera** To develop smart & secure solution for transport logistics

**ENVTCT** To localize a MAN heavy-duty truck in China >>



FutureBridge Analysis

ADAS functionality	
Number of CV models offering L2	
Safety aspects	
Collaborative business models	
Future Outlook	

# OEM activities in commercial vehicles (4/4) : Volvo

It is exploring autonomous solution in long distance transport, mining with its VADA 2.0 platform & has plans to add more AD functionalities



## ADAS Availability



Image: Vera truck



Image: FMX truck



Image: VINL 670 model tractors

## Press Release

**Volvo Trucks electric and autonomous Vera gets its first job**  
The pilot program for Vera will take place in Gothenburg, Sweden >>>



## Volvo Autonomous Solutions

Volvo Autonomous Solutions will constitute a new business area as of January 1, 2020. Its financial results will be reported as part of the Truck segment >>>

## Current ADAS offering

\*not exhaustive

Platooning

Forward collision warning

AEB

Lane departure warning

Highway departure warning

Active drive assist platform  
VADA 2.0

## Different autonomous transport solutions

\*\*List not exhaustive

2019



Vera will form part of an integrated solution to transport goods from a logistics center to a port terminal in Gothenburg, Sweden >>>

2019



Autonomous Volvo FH trucks will be used in commercial operation to transport limestone along 5 km stretch >>>

2018



In the Electric Site project, material handling in a quarry was automated and electrified. The result was a safer working environment and a reduction of operator costs by 40% and of CO2 emissions by 98 % >>>

\*Future updates

ACC with Stop& Go

Lane change support

## Collaborative business models

\*\*List not exhaustive

2019



NVIDIA

To develop the decision making system of autonomous commercial vehicles & machines >>>

2018



NORSK MINERAL

To provide commercial autonomous solution transporting limestone from an open pit mine to a nearby port >>>

2018



FedEx

Used (ADAS) technology to conduct on-highway truck platooning as part of ongoing research collaboration >>>



FutureBridge Analysis

ADAS functionality	
Number of CV models offering L2	
Safety aspects	
Collaborative business models	
Future Outlook	

## 02

## Emerging player's activities in autonomous commercial vehicles

### Upcoming Trend

- Players are inching towards L2 to L4 autonomous technologies and plan to offer highway pilot offerings in the near future, some are in the planning while others are in deployment stage
- Hydrogen powered autonomous trucks could gain traction and fuel the freight chain, as it is gaining interest from many OEMs and thus emerging players could provide breakthrough technologies
- Driverless commercial vehicles in closed geo-fenced areas is gaining interest. Plans in the future to scale up in open-highways

### Players in our coverage



### What do we see happening

- Focus on inching towards L4 from directly L2, currently few of them are offering platooning capabilities while others are planning to offer
- Players have ambitious plans to scale their autonomous freight network to multiple regions
- Roll-out of new electric and hydrogen powered autonomous trucks with region specific requirements
- Testing of driverless commercial vehicles in geo-fenced area, with no space for driver cabin

# Summary of Emerging Players

Advancement from L2 to L4, robust sensor capabilities, collaborative business models will help to accelerate for higher autonomy

Parameters selected for competitive analysis



## ADAS functionality

Offers Level 2 capabilities as of now



Offers Autonomous Freight Network allowing for L4 shipments



Offers 2 semi-autonomous variants Nikola Two in U.S & Nikola Tre in Europe



Capable of Level 4, the Einride Pod has no driver's cab, but can be remote controlled by a human operator



## Sensor suite information

5 – Camera  
3 – Radar  
2 – LiDAR



<=200m LiDAR  
<=300m Radar  
<=1,000m HD Camera



Several HD cameras combined with radar, sonar, computing software & hardware to provide 360° views



5 – 77 Ghz Radar  
1 – object & lane detection camera  
4 – scanning LiDAR  
4 – cameras for remote assistance



## Collaborative business models



## Funding

\$117M as last reported in Sep'19



\$298M as last reported in Sep'19



\$462M as last reported in Sep'19



\$32M as last reported in Sep'19



## Future Outlook

Plans to scale to Level 4 and offer ADAS functionalities like Highway Pilot



Have ambitious plans for expansion to 3 more regions in U.S by 2021 for autonomous deliveries



In 2021, to roll out of its Nikola Tre Class 8 truck. In 2023, launch of the Nikola Two Class 8 FCEV



Plans to roll-out full autonomous fleet by 2022-2023 in the U.S & EU



# Emerging Player (1/4) : Embarc Trucks

Focus on inching towards L4 from directly L2, plans to offer highway pilot autonomous capabilities in the near future

Source : [Embarc Trucks](#)



Image: Embarc trucks



Founded	2016
Funding*	<b>\$117M</b> <small>*Funding details as on Sep'19</small>
Fleet size	<b>13 trucks</b> <small>*Numbers by 2019 end</small>
Test miles	<b>2,400+</b> <small>*Indicated in 2018</small>



L2

L4

ADAS offering
<ul style="list-style-type: none"> <li>Adaptive Cruise Control</li> <li>Automatic emergency braking</li> <li>Blind spot detection</li> <li>Lane Keep assist</li> <li>Intelligent park assist</li> <li>Platooning</li> </ul> <small>*offered as of now</small>
<ul style="list-style-type: none"> <li>Traffic Jam assist</li> <li>Highway Pilot</li> </ul> <small>*planned for future with no release date</small>

Embarc is building self-driving truck technology to make roads safer and transportation more efficient >>



Embarc Trucks completed a coast-to-coast test drive of its self-driving semis



## Collaborative Partners\*\*



Embarc integrates its self-driving systems into Peterbilt semis, rather than building its own vehicles completely from scratch >>

Amazon is using self-driving trucks developed by Embarc to haul some cargo on the I-10 interstate highway >>

\*\*Collaborative partners list not exhaustive

## Sensor Suite >>

5 Camera  
3 Radar  
2 LiDAR



## FutureBridge Analysis

ADAS functionality	
Sensor suite information	
Collaborative business models	
Funding	
Future Outlook	

## Emerging Player (2/4) : TuSimple

It has ambitious plans to scale to three more regions in the U.S and widen its L4 autonomous freight network by 2021

Source : [TuSimple](#)



Image: TuSimple trucks

Current fleet

40 >>

As on Mar, 2020

Contracted customers

18

As on Mar, 2020

Autonomous trip each week

20

As on Mar, 2020

Sensor Suite >>

<=200m

LiDAR

<=300m

Radar

<=1,000m

HD Camera



TuSimple's Autonomous Freight Network allowing for L4 autonomous shipments

Currently operating in Phoenix, Tucson, El Paso

Future plans of expansion

San Antonio

2021

Houston

2021

Dallas

2021

Collaborative Partners\*\*

\*\*list not exhaustive

26 Mar'20 5 Mar'20



TuSimple expands autonomous trucking program with UPS >>



TuSimple, ZF partner to develop and produce autonomous truck technologies >>



tu simple  
UC San Diego

University of California San Diego study in its findings showed that autonomous trucks operated by self-driving startup TuSimple reduce fuel consumption of heavy-duty trucks by at least **10%** and up to **20%** >>

\$298M

Total Funding Amount received  
As on Sept, 2019



FutureBridge Analysis

ADAS functionality



Sensor suite information



Collaborative business models



Funding



Future Outlook





## Emerging Player (3/4) : Nikola Motors

Ambitious plans to roll-out new electric & hydrogen powered autonomous trucks by 2021- 2023 with region-specific requirements

Source : [Nikola Motors](#)



Image: Nikola trucks

Nikola offers both pure electric and also hydrogen electric powertrains to cover class 8 in transportation

### Future Plans >>

2021

The company expects to generate revenue with the roll out of its Nikola Tre Class 8 truck

2023

Launch of the Nikola Two Class 8 FCEV (fuel cell EV)



Nikola has nearly **\$14 billion** in pre-orders, which give some insights into how big the market for hydrogen-powered and electric trucks can become

### ADAS Availability



The fully-electric and hydrogen fuel cell electric day cab semi-truck. Available in North America >>



The fully-electric and hydrogen fuel cell electric cabover semi-truck. Available in Europe and North America >>

### Electric battery heavy trucks

Upto **300 miles** >>

### Hydrogen fuel cell trucks

Upto **750 miles**

### Orders for FCEV semi-trucks

**14,000 +**

### Refilling hydrogen powered trucks

**20 minutes**

### Sensor Suite >>

Several HD cameras combined with radar, sonar, computing software & hardware to provide 360° views

### Collaborative business model



CNH Industrial brands Iveco & FPT together with Nikola announce Nikola Tre production in ULM, Germany >>

\*\*List not exhaustive

### Press Release

*Can Electric Truck Company Nikola Become the Next Tesla After Going Public?*

*Phoenix-based Nikola goes public, possibly worth \$11 billion or more >>*



### Total Funding Amount



**\$ 462M**

As on Sept, 2019



### FutureBridge Analysis

#### ADAS functionality



#### Sensor suite information



#### Collaborative business models



#### Funding



#### Future Outlook



## Emerging Player (4/4) : Einride

Capable of L4, without no space for the driver on the board and has ambitious plans to offer full self-driving by 2022-2023

Source : [Einride](#)



Image: Enride trucks

Capable of Level 4 self-driving, the Einride Pod has no driver's cab, but can be remote controlled by a human operator >>

By **2022 - 2023**

Full autonomous fleets operating in EU & the U.S

200

[Fleet Size](#)

124

[Miles](#) it can travel autonomously with Nvidia Drive AI platform

\*\*Collaborative partners list not exhaustive

Collaborative business model



\*\*Collaborative partners list not exhaustive

### ADAS Availability



Image: Enride Pod



In 2019, the Pod became one of the first all-electric, self-driving transport vehicle to operate on a public road in Sweden. There is no space for the driver on the board >>

### Technical Specification

Loading capacity	15-18 pallets
Range per charge	130 – 180 km
Gross vehicle weight	26 tonnes
Payload	16 tonnes
Automated Charging	Yes

### Sensor Suite >>

5	77 Ghz radar sensors
1	Object and lane detection camera
4	Scanning LiDAR sensors
4	Separate cameras for remote operator assistance

### Press Release

*"A new type of vehicle being tested by Swedish start-up Einride and it could soon disrupt the transportation industry" >>*

**The Washington Post**

**\$32M**

Total Funding Amount received

As on [Oct, 2019](#)



### FutureBridge Analysis

#### ADAS functionality



#### Sensor suite information



#### Collaborative business models



#### Funding



#### Future Outlook



## 03

## Regulation impacting commercial vehicles

### Upcoming Trend

- Rise of zero-emission commercial vehicles and autonomous driving could accelerate the state's role in trucking technology development
- Multi-brand platooning with communication with infrastructure and other road users should be possible to drive across Europe on motorways

### Regions in our coverage



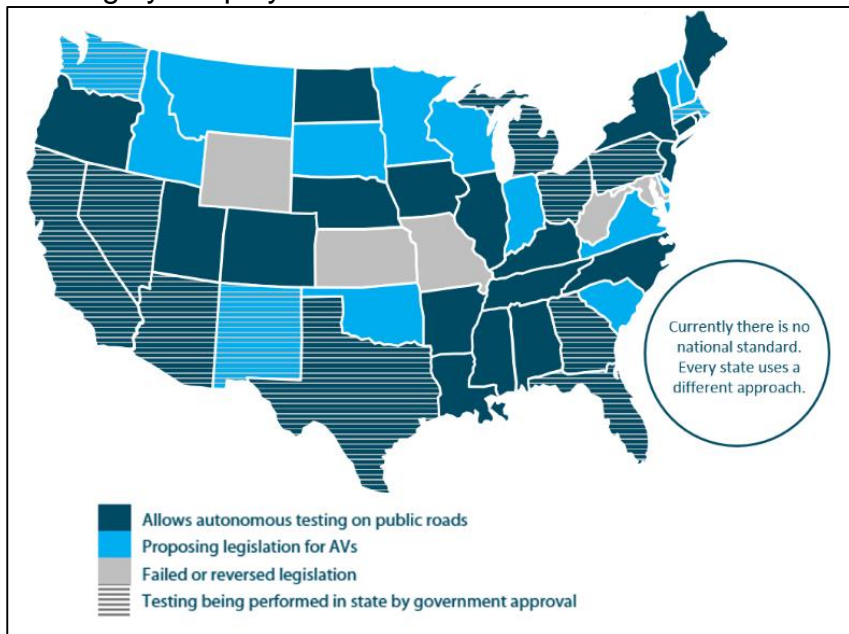
### What do we see happening

- Currently, no federal standard on autonomous trucking technology exists in the U.S, so every state varies in its acceptance of autonomous trucking technology
- California is becoming as preferred choice for the players for testing and developing higher automated driving technology for heavy-duty trucks
- EU is developing platooning technology and relevant standards for multi-brand platooning

# National Standards for Autonomous Trucking in the U.S



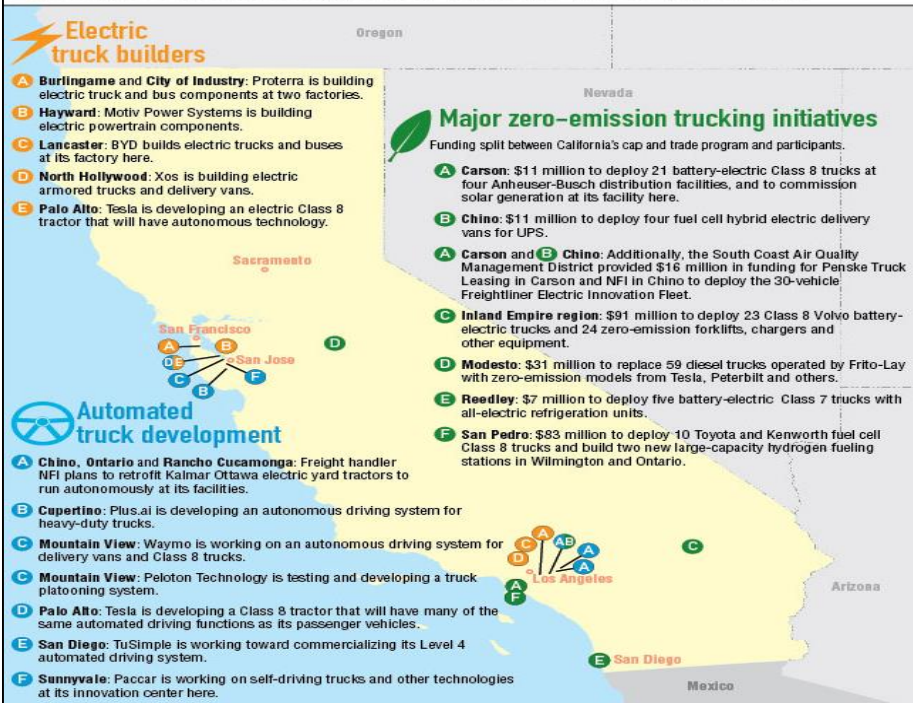
Every state in the U.S follows different approach for autonomous trucking, while California has become the preferred choice of testing by the players



- Currently, no federal standard on autonomous trucking technology exists in the U.S, so every state varies in its acceptance of autonomous trucking technology
- Several states have no proposed legislation, meanwhile states like Nevada, California, Texas, and Arizona are hotbeds for testing automated trucks

## California Becomes Epicenter of Emerging Truck Technology

### Electric and Automated Trucks in California



# EU Roadmap for Truck Platooning



This roadmap provides an overview of the steps that are necessary to implement multi-brand platooning (up to SAE level 2) before 2025

## Platooning Step-By-Step Introduction

STEP 1

Mono-brand platooning: trucks from the same brand form a platoon

STEP 2

Multi-brand platooning (upto SAE level 2) with the driver still ready to intervene

STEP 3

Driver of a trailer truck can rest

STEP 4

Full autonomous trucks (starting with driver in the lead truck)

### Enabling technology

### Mono-brand platooning

- Multi-brand platooning
- Communication with infrastructure & other road users

### TECHNOLOGY

#### Truck manufacturers develop and introduce

European Truck Platooning Challenge demonstrated the technological feasibility of (monobrand) platooning and provided assessment of remaining barriers

Further development of platooning technology, testing and verification projects by truck manufacturers

Manufacturers take part in various test cases involving logistics operators to examine platoons in real-life conditions and develop the business case for truck platooning

Development of multi-brand platooning technology (H2020 research project funded by the EU), as well as standardization of communication protocols

### TIMELINE

2016

2017

2018

2019

2020

2021

2022

### POLICY

#### Regulatory changes and enabling policy measures required for platooning

Regulatory kick off: Declaration of Amsterdam

National authorities and the EU support and facilitate cross border testing across Europe

Review, adaptation and development of the required regulatory framework, as well as harmonizing it, at various levels:

- UNECE
- EU framework
- National traffic laws

Development of market incentives, such as toll and tax reductions, CO2 bonuses or flexibility in driving time, to stimulate the uptake of truck platooning

Market introduction of this technology will require permission to drive platoons on motorways across the EU, without needing any specific exemptions

## 04

# Future outlook in commercial vehicles



## Upcoming Trend

- Significant rise in capacity of freight loads is expected by 2028, which will further accelerate the need of automation in the trucking industry
- Need for clean, power efficient freight technologies is gaining interest among the players
- Advancements in ADAS functionalities like automated steering function can be a possibility
- Adoption of standard legal and insurance framework will help to accelerate the testing and faster commercialization of autonomous trucks



## Regions in our coverage



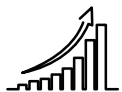
## What do we see happening

- Trucking moves close to 70% of all goods in the U.S, regions in U.S like California are becoming the epicenter for autonomous trucking technology
- The latest safety systems for commercial trucks already provide collision mitigation, adaptive cruise control and lane-departure warnings. In the years ahead, automated steering functions also will become available
- Trials of two-truck platooning system is on rise which aims to reduce significant fuel consumption



## Future Outlook: Activities in autonomous commercial vehicle segment

With increased capacity in freight loads, focus will be on safety along with power efficient technologies which will ride next generation of platooning



Rises in capacity of freight loads



Focus on Safety first with Driver-Assist



Need for clean, power efficient technologies



Adoption of next-level platooning



Requirement of new legal & insurance framework

### Future Outlook

- The American Trucking Association projects that **20.7 billion** tons of freight will be moved by trucks by **2028**, a 36% increase from what was projected for 2017

- In the years ahead, **automated steering functions** will become available. ADAS could be applied to virtually any on-road application without requiring any changes to fleet's existing business models.

- By **2030**, hydrogen and fuel cells could fuel approximately **3.0 million to 4.0 million** delivery trucks and vans globally

- Driverless trucks could hit the road as part of a truck platoon led by a manned truck. In this scenario, a single driver would operate the lead truck while one or more unmanned trucks automatically follow. This model would enable a single driver to **"drive"** two or three trucks at once

- The entire industry supply chain needs to evolve to meet technical and **legal** requirements. Platooning, for example, will require fast communication between other vehicles and infrastructure, which in turn will need much closer co-operation between OEMs, Tier 1 suppliers and government

Implications

- As trucking moves **70%** of all goods in the U.S., automation in trucking has a good potential to scale the freight delivery operations

Implications

- Over time, the evolution of ADAS could potentially give rise to highway pilot systems that may allow the driver to relinquish control of the vehicle

Implications

- The powertrain of a hydrogen-powered truck would only weigh about **1.8 to 2.1 tons**. This weight benefit of the hydrogen truck would enable it to carry more and heavier loads or reduce the consumption needed to run the truck

Implications

- Two-truck **platooning** system aims to reduce the fuel consumption for lead truck by **4.5%** and rear truck by **10%**

Implications

- Key questions will get addressed by a revised legal framework for (OEMs, suppliers, drivers), ethical concerns, and criteria that can be used to determine if the vehicle meets required safety standards

## » Other deliverables to read

### H1'20 ExL & TDD - ADAS

*This is a semi-annual coverage of industry activities....stay tuned...releasing last week of July*

#### What's inside?

1. Emerging trends in the autonomous driving area for last 6 months
2. Competition assessment & breakthrough technologies for cruise, park, and safety features
3. What self-driving cars are doing in midst of Covid-19 & its post-pandemic impact
4. Regulation governing the AD and ambitious plans of players to roll-out full self-driving capabilities

### June 2020 – ADAS Bulletin >>

#### What's inside ?

- Key activities in collaborative business models to accelerate Level 4 automated driving
- Release of AV TEST program by NHTSA to bring transparency to autonomous vehicle testing
- IIHS study stating self-driving vehicles could struggle to eliminate most crashes

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