

GROUP 4

# Implications of Driverless Cars



Supply Chain | Transportation | Technology | Automation



# Meet the Team



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# Agenda

- 
1. Shipping Industry
  2. Key Benefits
  3. Implementation
  4. Challenges

# SHIPPING INDUSTRY | HIGH TRUCKING COSTS

## JOBS > DRIVERS

- Shortage of semi-conductors & drivers
  - Increase truckers wage
- Supply chain: backlogged ports & high transportation costs
- Feb-March: Transportation costs rose 6.5%
  - Rose final prices for customers



# THE TRUCKING INDUSTRY

1

Low  
Wages

2

High Risk

3

Paid Per  
Mile

4

Restrictions

5

Unfair  
Fines

\*US experiencing a shortage of more than 80,000 drivers\*

# Key Benefits

01

## LABOR COSTS

- Labor costs account for approximately 75% of trucking costs
- Throughput capped by legal restrictions; 11 hours per day allowed
- Driverless can therefore operate with twice the output at a quarter of the cost

02

## FUEL EFFICIENCY

- Optimal cruising speed of 45 mph
- Drivers paid by the mile & therefore drive fast
- Platooning technologies usable by fleets

03

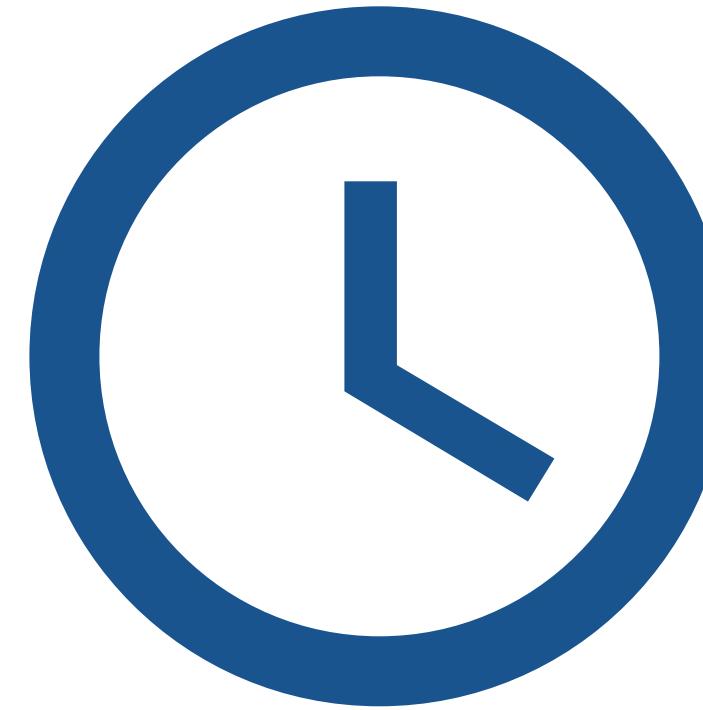
## SAFETY

- Trucking accidents cause more deaths in a year than last 50 years of airline
- Truckers among highest rate of workers killed on the job

# COVID IMPACTS



**Lockdowns**



**Warehouse Wait  
times**



# Real World Implementations



# Tesla

Few years ago, Tesla had planned to deliver (EV) autopilot trucks. The eventual goal is to employ a platooning feature for Tesla trucks to autonomously follow each other and have only the lead truck controlled fully by a human driver. However, release date has been delayed for years. ( Uber, VOLVO)

# Embark Trucks



**10%**

BETTER  
FUEL EFFICIENCY

**300%**

ANNUAL PER  
TRUCK REVENUE

**40%**

REDUCTION  
IN DELIVERY TIME

## INNOVATIVE SOFTWARE

automotive-grade **self-driving software** that can transform any fleet into an autonomous one. They are working with the trucking industry to seamlessly integrate self-driving technology into their operations.

# Embark Trucks

Partnership with the nation's leading shippers and carriers



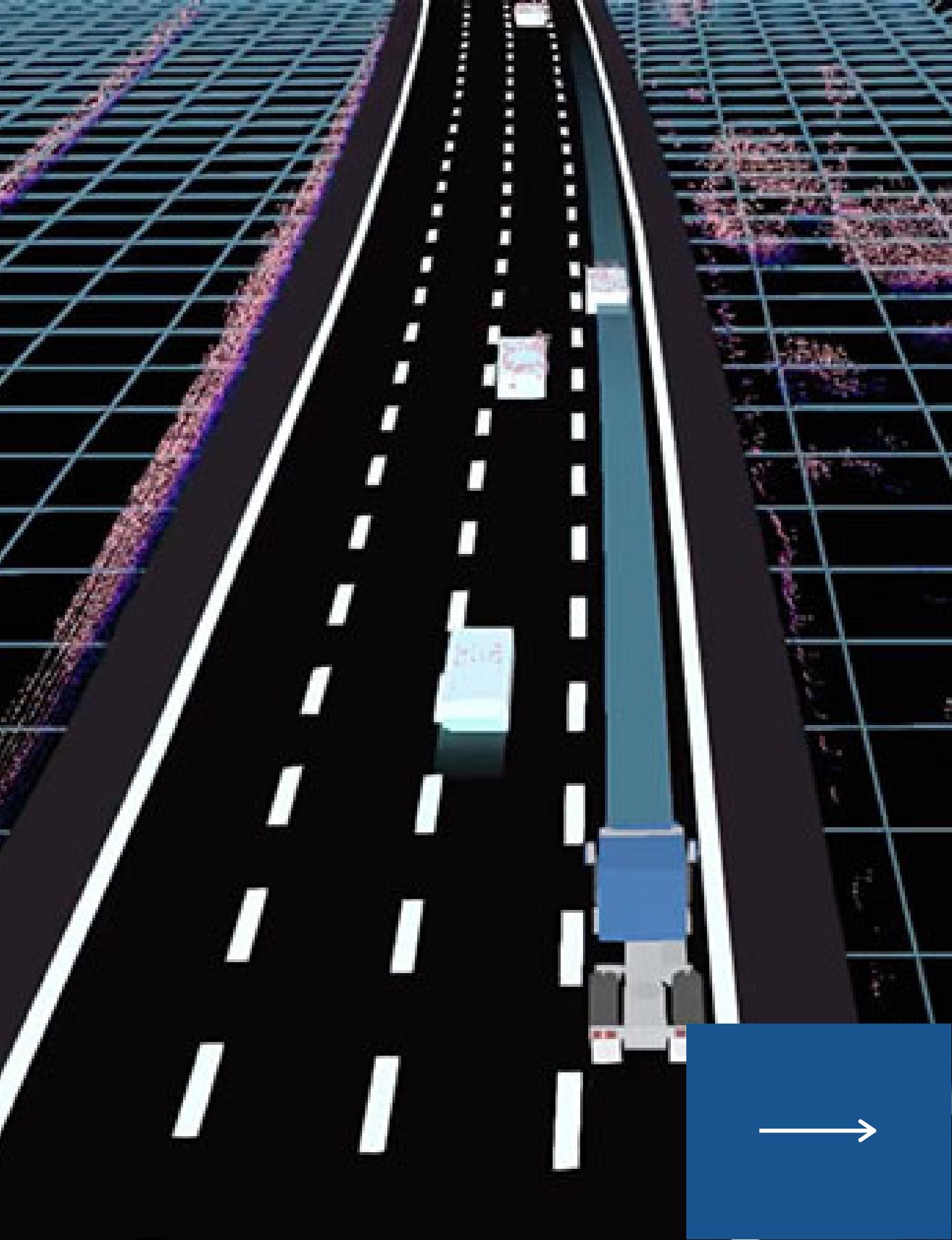
**SWIFT**



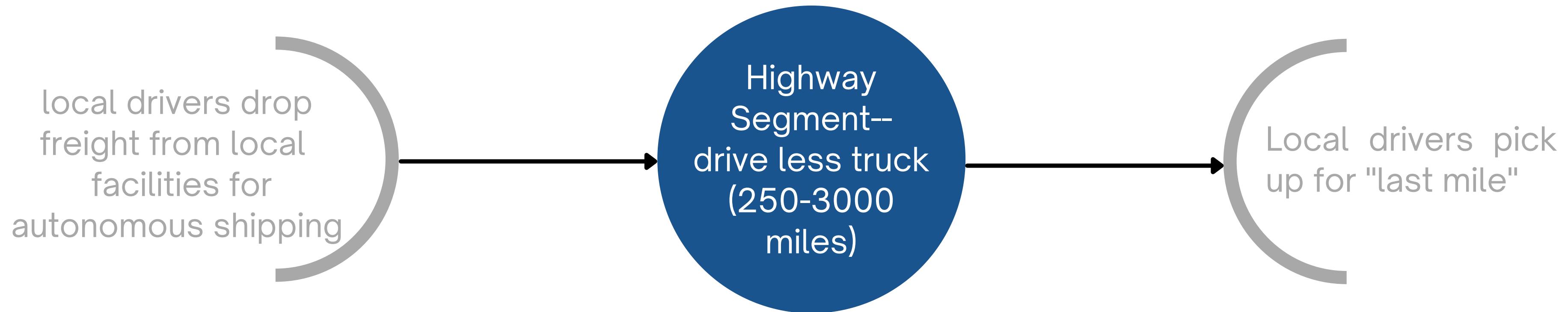
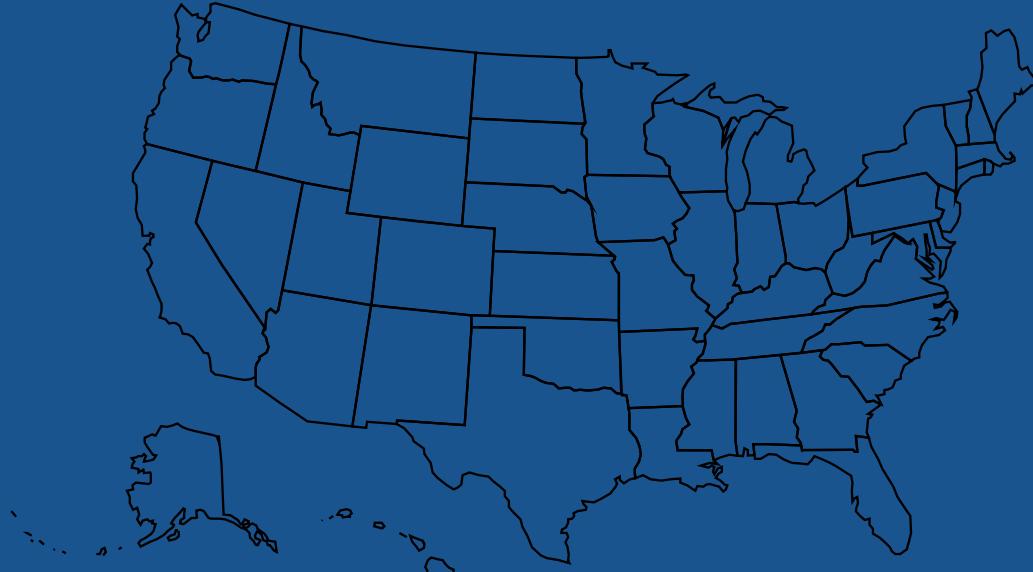
## NATIONWIDE NETWORK OF TRANSFER POINTS

2024+ They plan to cover sunbelt across Southeast to Southwest, and rolling out 90B miles.

After 2026 they plan to expand all 48 states, and 300B total miles.



# Transfer Point Network



# ASSISTIVE TECHNOLOGIES



## CLOUD-BASED ENVIRONMENTAL DETECTION TECHNOLOGIES

Cloud communicates road safety data, helping first responders get to the incidents on time.



## THREE-DIMENSIONAL LIDAR SENSOR TECHNOLOGY

SEEVA Technologies: focus on keep the line of vision clear



## 3D TECHNOLOGY AND VR VISUALIZATION TOOLS

Ouster, Unity Technologies



## AUTONOMOUS TRANSPORTATION SYSTEM

AutoX



## AI TECHNOLOGY

powerful AI that can anticipate, detect and respond to real-time safety threats and road conditions



# TuSimple

A driverless long-haul success story

- In 2021, self-driving logistics company TuSimple successfully ran a proof-of-concept trucking route
- Carried a haul of watermelons from Tucson, AZ to Dallas, TX without any human intervention
- Trip took only 14 hours; would have taken over 24 for a human
- Cargo was in better shape being a day fresher

Some caveats:

- Texas is an ideal testing ground
  - Weather
  - Highway layout
  - Space

# Challenges



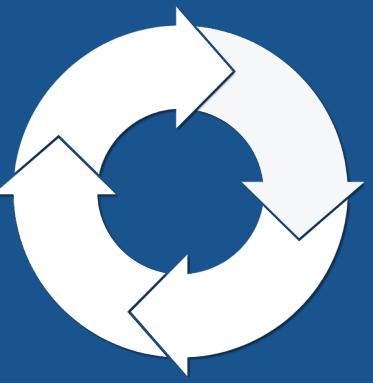
Auto Insurance  
and Repair



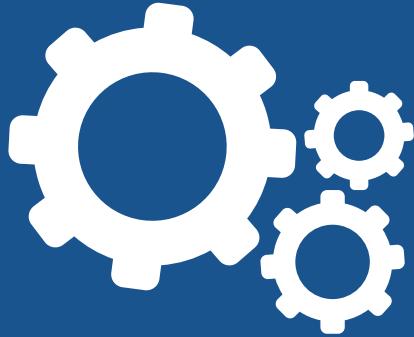
Regulations



Safety

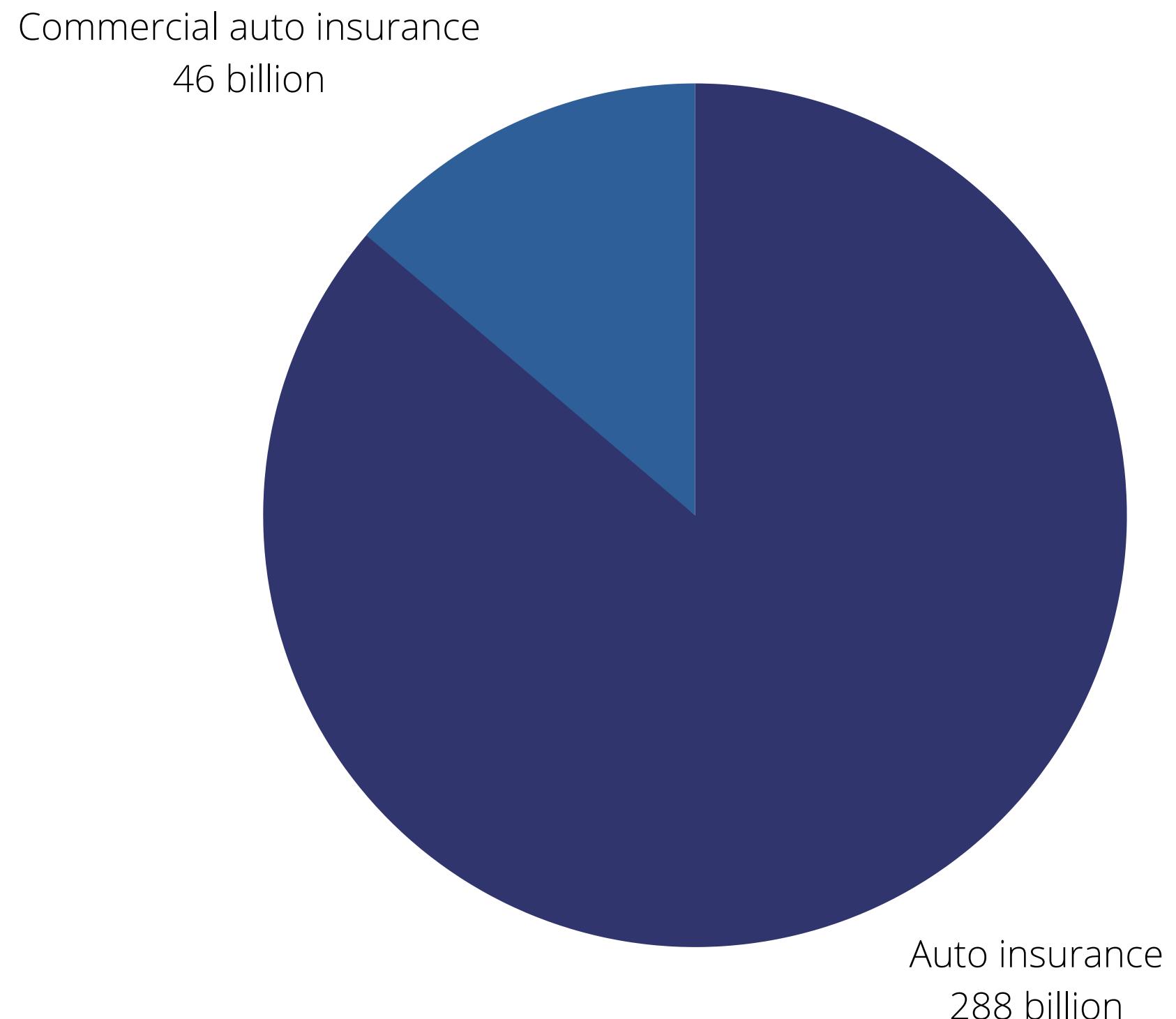


Implementation



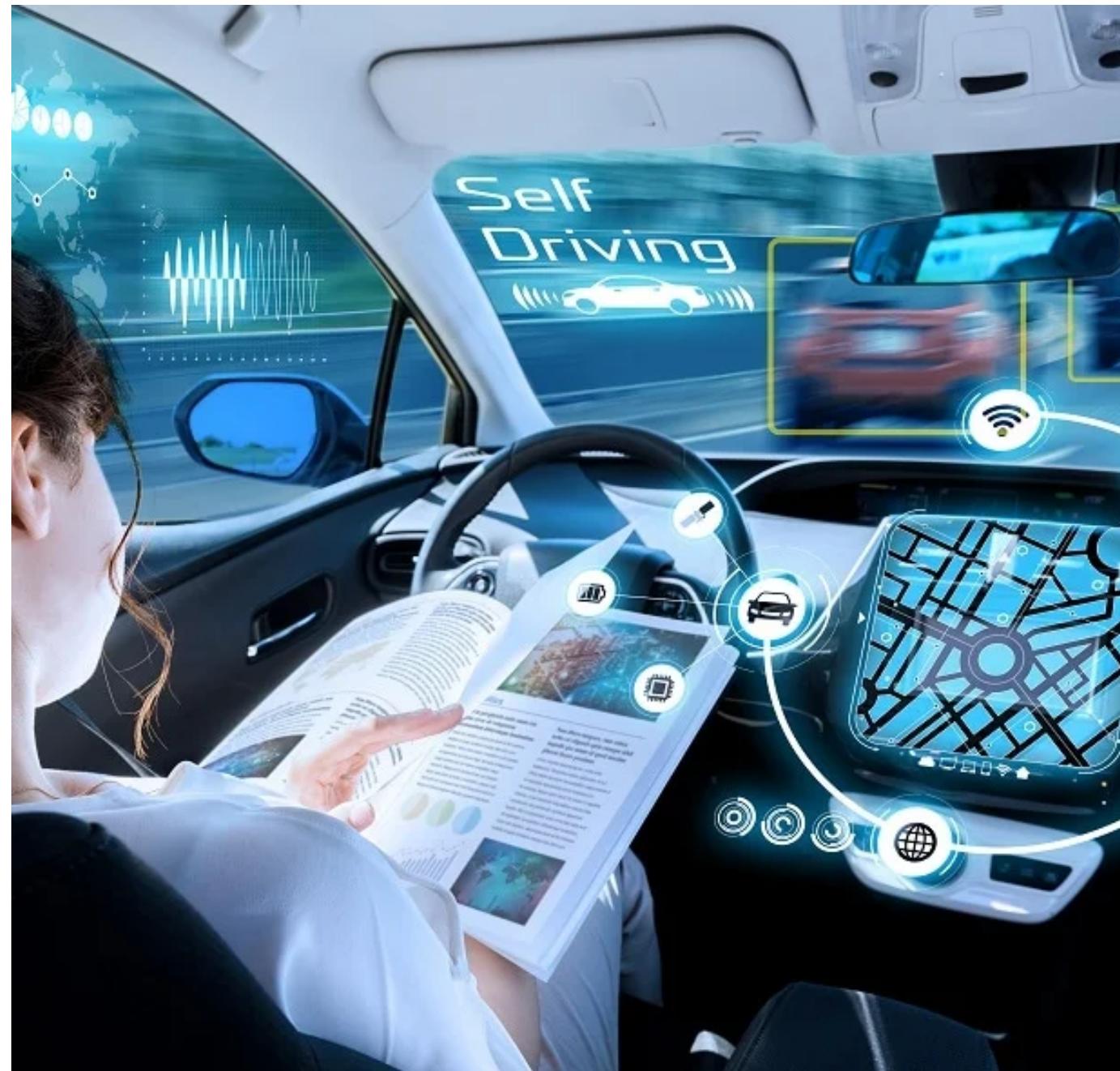
Operational

# Auto Insurance and Repair



- The commercial auto insurance industry is expected to take a hit, as systems become more robust and the human element from driving disappears.
- Skill shift in auto repair industry- will drive people out of jobs due to introduction of new tech, and will increase the overall cost of repair.

# Regulations



## NO CONCRETE REGULATIONS IN PLACE

There are no concrete regulations in place, it will become difficult to adapt to regulations when they are formed.

## ABSENCE OF UNIVERSAL REGULATION

Regulations for Autonomous Vehicles differ by states. This makes it extremely difficult to implement AutoPilot Systems.

## LIABILITY

Can lead to a clash of responsibilities between owner and manufacturers in the events of mishaps, which will need to be clearly defined in regulations.

# Safety



## CYBERSECURITY

Software Systems are prone to cyberattacks and adversarial attacks and attack on the AutoPilot Systems may turn out to be very fatal.



## HUMAN CRIMES

Almost 84% of cargo theft cases happen on trucks. Trucks running on AutoPilot Systems may become easy target for such crimes.

# Implementation



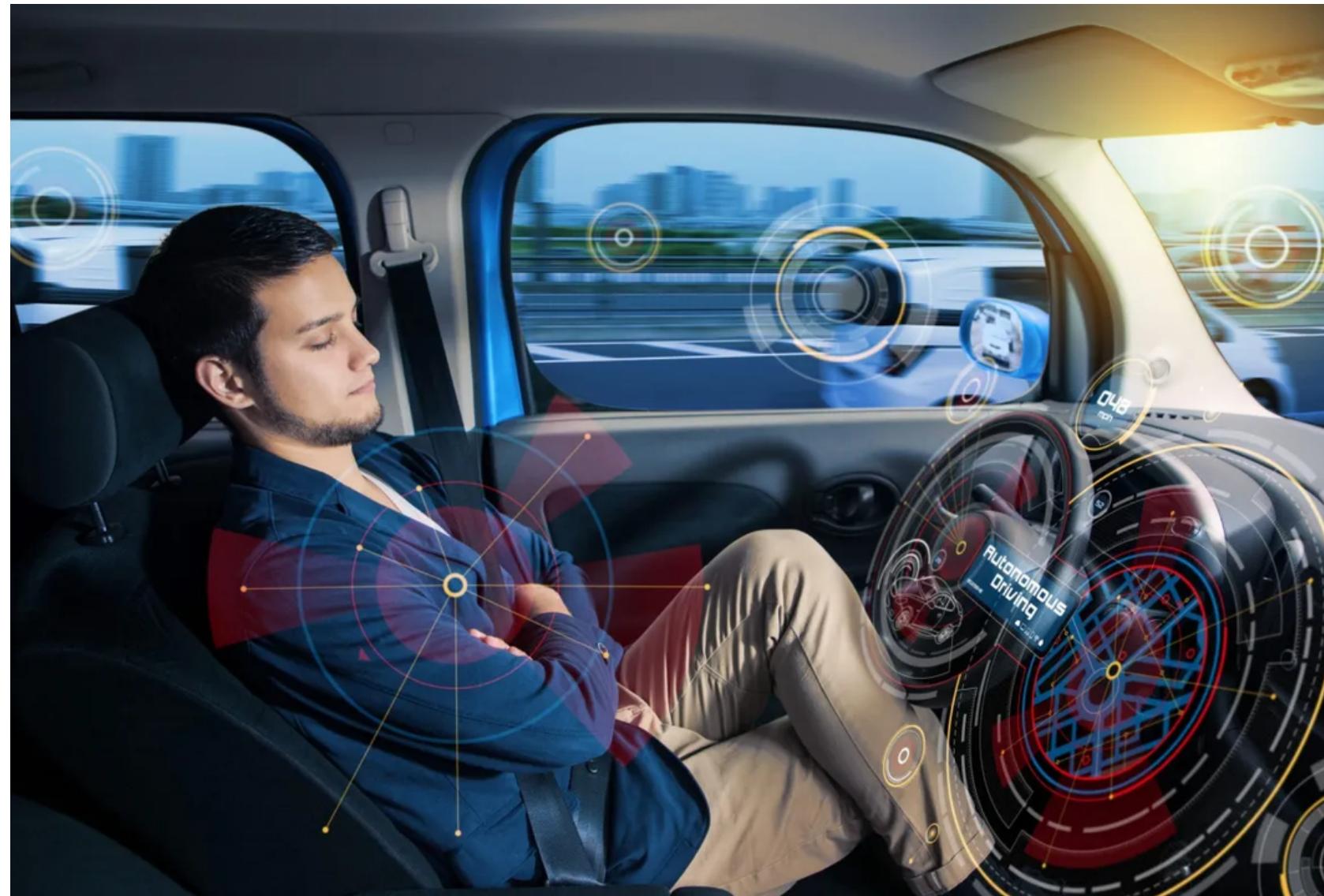
## COMPLEX SOCIAL INTERACTIONS

Driving requires complex social interactions which may be very difficult for AI to understand and reciprocate

## REFUELING/CHARGING

Autonomous vehicles may not be able to refuel or charge itself and would often need human interaction

# Operational



## ADDITIONAL COSTS

- Some states need an operator to be present in Autonomous vehicles which may not be a feasible option given the money is spent on both human resources and AutoPilot Systems.
- Tracking and managing driverless vehicles in case of system faults will increase overhead costs in terms of locating and shipping the vehicles.

# Thank you



# Resources

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# Resources

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