TuSimple Investor Presentation

September 2023

Disclaimer

This presentation and any accompanying oral statements (together, this "Presentation") contain forward-looking statements. All statements other than statements of historical fact contained in this letter, including statements as to future results of operations and financial position of TuSimple Holdings Inc. and its subsidiaries (the "Company"), planned products and services by the Company or any of its subsidiaries, business strategy and plans of the Company or any of its subsidiaries, launch dates of products or services in the United States or in any other territory, expected safety benefits of the Company's autonomous semi-trucks, objectives of management for future operations of the Company, market size and growth opportunities in various global territories, competitive position and technological and market trends in various global territories, statements regarding strategies for the Company's Asia business, are forward-looking statements. Forward-looking statements are inherently subject to risks and uncertainties, some of which cannot be predicted or quantified. In some cases, you can identify forward-looking statements by terms such as "will", "expect," "plan," "anticipate," "intend," "target," "project," "predict," "potential," "explore" or "continue" or the negative of these terms or other similar words. The Company has based these forward-looking statements largely on its current expectations and assumptions and on information available as of the date of this letter. The Company assumes no obligation to update any forward-looking statements after the date of this letter, except as required by law.

The forward-looking statements contained in this Presentation are subject to known and unknown risks, uncertainties, assumptions and other factors that may cause actual results or outcomes to be materially different from any future results or outcomes expressed or implied by the forward-looking statements. These risks, uncertainties, assumptions and other factors include, but are not limited to, those related to the Company's restructuring plan including potential cost-savings, the company's ability to regain compliance with Nasdaq listing standards, autonomous driving being an emerging technology, the development of the Company's technologies and products, the Company's limited operating history in a new market, the regulations governing autonomous vehicles, changes in the Company's board of directors and senior management, the Company's dependence on its senior management team, reliance on third-party suppliers, potential product liability or warranty claims, the protection of the Company's intellectual property, securities class action litigation, strategic alternatives for the Company's U.S. business, and government or regulatory policies, inquiries and actions. Moreover, the Company operates in a competitive and rapidly changing environment, and new risks may emerge from time to time. You should not put undue reliance on any forward-looking statements. Forward-looking statements should not be read as a guarantee of future performance or results and will not necessarily be accurate indications of the times at, or by, which such performance or results will be achieved, if at all. It is not possible for the Company to predict all risks, nor can the Company assess the impact of all factors on its business or the markets in which it operates or the extent to which any factor, or combination of factors, may cause actual results or outcomes to differ materially from those contained in any forward-looking statements the Company may make.

You should carefully consider the foregoing factors and the other risks and uncertainties described under the caption "Risk Factors" in our Annual Report on Form 10-K for the fiscal year ended December 31, 2022, filed with the Securities and Exchange Commission (the "SEC") on September 7, 2023, and the Company's other filings with the SEC. These SEC filings identify and address other important risks and uncertainties that could cause actual events and results to differ materially from those contained in the forward-looking statements. This Presentation also contains estimates, forecasts and other statistical data relating to market size and growth and other industry data. These data involve several assumptions and limitations, and you are cautioned not to give undue weight to such estimates. The Company has not independently verified the statistical and other industry data generated by independent parties and contained in this Presentation and, accordingly, it cannot guarantee their accuracy or completeness. In addition, assumptions and estimates of the Company's future performance and the future performance of the markets in which the Company competes are necessarily subject to a high degree of uncertainty and risk due to a variety of factors. These and other factors could cause results or outcomes to differ materially from those expressed in the estimates.

TuSimple Investor Presentation

01
TuSimple Holdings at a Glance

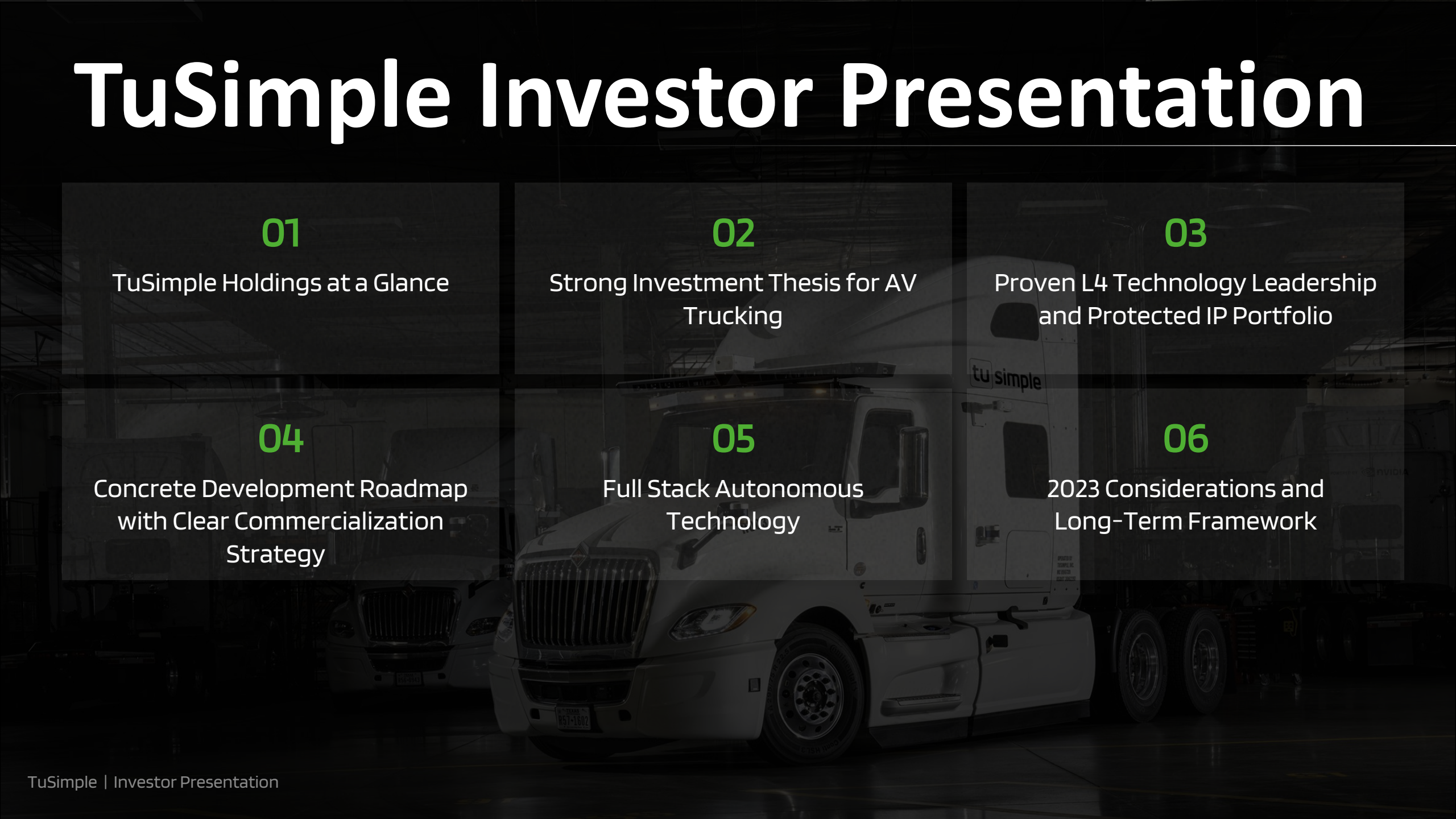
02
Strong Investment Thesis for AV Trucking

03
Proven L4 Technology Leadership and Protected IP Portfolio

04
Concrete Development Roadmap with Clear Commercialization Strategy

05
Full Stack Autonomous Technology

06
2023 Considerations and Long-Term Framework



01 TuSimple Holdings at A Glance

Our mission is to enable the most **safe, fuel-efficient** & **low-cost freight capacity** by developing the best L4 autonomous technology, hardware and go-to-market strategy

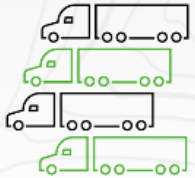
TuSimple Holdings at a Glance

Industry Leading Technology with Many Industry Firsts

People, Fleet, and Facilities

~800

US : ~250
APAC: ~550



~70

US: ~35
APAC: ~35

6 R&D Facilities

US: San Diego, Tucson
APAC: Beijing, Shanghai, Tangshan, Tokyo

Corporate Headquarters

San Diego, CA

Significant Accomplishments to Date

1st

World's First Driver Out[1] & First Driver Out in China

~590[2]

Growing Patents

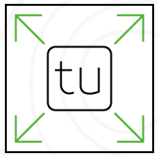
~10mm

Miles Driven[3]

Safety

Third Party Safety Audit[4]

Go-to-Market Strategy

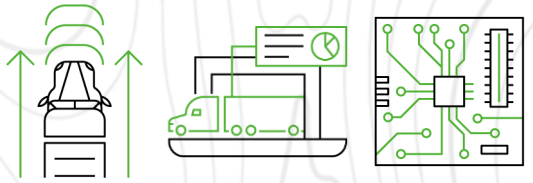


TuSimple

Freight Capacity

Carrier-Owned

Freight Capacity



ADS Core Capabilities

L2+/L3, SoC[5], AV[6] Data, Simulation, Offboard Toolchain

1. World's First Driver Out was done on open public roads in the U.S. in December 2021 2. As of June 30, 2023 3. Primarily Driver-In miles, 4. Passed an independent 3rd party (TÜV SÜD) safety audit with zero nonconformities 5. System on a chip 6. Autonomous Vehicle

One Holding Company, Two Distinct Businesses

Independent use cases (ODD[1]), and hardware ecosystems resulted in the need for separate engineering teams to pursue different product roadmaps

Shared	Common reporting, treasury, and compliance functions
Cost Savings	US utilizes data annotation services and procures hardware from APAC ops

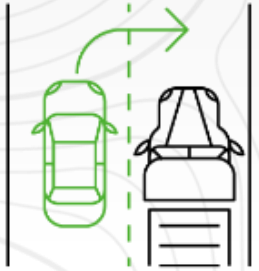
Structure Today | One Holding Company Two Distinct Operations

	US	APAC
Stand-alone	Stand-alone HR systems, enterprise applications, and communication tools	
	Stand-alone end-markets, functional teams, source code, and data repositories	

Development Tailored to Current Use Case Application

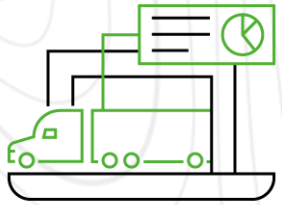
Medium to Long Haul Route	vs.	Port-to-Terminal Connection Route
On highway		Port drayage
Traditional Class 8 Trailer		Chassis over engine trucks

Key Development Differences

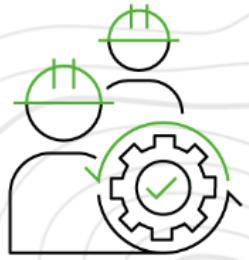


Operational Design Domain
Traffic patterns
Driving behavior
Port drayage vs. US on-highway

Hardware Ecosystem
Tier I supplier base
Sensor selection and availability
US Class 8 vs. chassis over engine



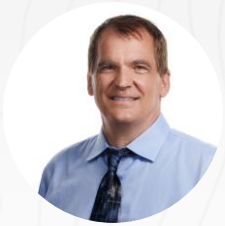
Training Data
Object properties
Other road user behavior



Engineering Teams
Source code base
Data repositories

1. Operational Design Domain

U.S.: Team Led by Seasoned Technology Leaders



Robert Rossi
SVP, Co-Head Technology

- 40+ years of experience in technology
- SVP Engineering of Autonomous Driving, TomTom
- Group Program Manager, Microsoft
- Founder and Chief Engineer, multiple startups
- 2 patents issued

Jing Zhu
SVP, Co-Head Technology

- 30+ years of experience in technology
- General Manager, VIP.com
- Chief Technology Officer, Shanda Online
- Senior Director of Engineering, Yahoo
- 8 patents issued

Adrian Thompson
VP, Systems & Safety Eng.

- 30+ years of experience in technology
- Director of Systems Engineering, Waymo
- Head of Systems Engineering and Test, Uber ATG
- Director of Systems Engineering, L3

Graham Taylor
VP, Hardware

- 25+ years of experience in technology
- Senior Engineering Manager, Zoox
- Senior Engineering Manager, Jamco
- Head of Engineering, B/E Aerospace

Tom Wang
VP, Software Engineering

- 25+ years of experience in technology
- Director of Engineering, DeepMap
- Software Architect and Lead, Apple
- Software Architect, EMC

Note: Patents issued refers to lifetime issued patents (both in force and expired)

APAC: Experienced Management Team

Jianan HAO
Head of China

- Company founding member and overseeing R&D activity and operations
- Over 10 years research experience in parallel & distributed computing
- Former Research Scientist at Temasek National Laboratory

Naiyan WANG
CTO

- Overseeing AV full stack development
- Renowned expert in computer vision and deep learning with over 50 papers published with more than 17,000 citations
- 1st place in 2D Detection / 3rd place in 3D Detection of the first Waymo Open Dataset Challenges in 2020
- Co-founder and early developer of open-source deep learning framework MXNet
- Google PhD Fellowship candidates in 2014 (one of only 4 selected in China)

Haiquan LI
VP of Engineering

- Lead TuSimple APAC engineering organization
- Over 8 years R&D experience in autonomous truck software /hardware and system integration
- Lead APAC hardware selection (including the TDC), evaluation and production process

Nan WU
Head of Japan

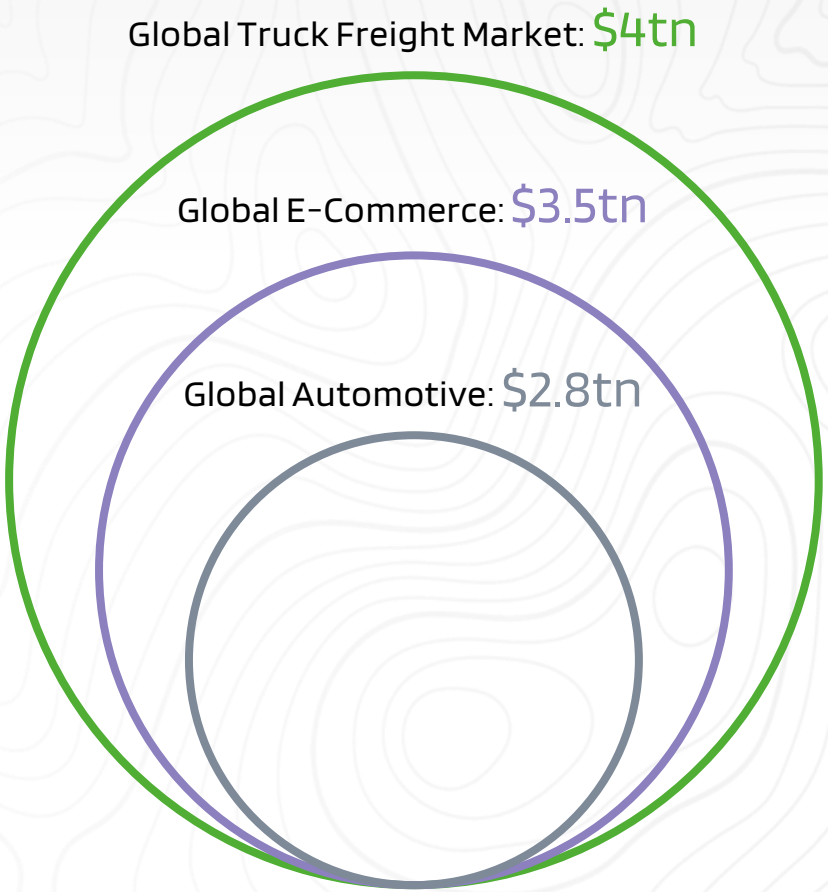
- Over 13 years R&D experience in autonomous driving
- Previously served as Assistant Researcher, Lecturer, Senior Researcher, and Visiting Associate Professor at Waseda University
- Over 80 patents granted and more than 260 patent applications submitted in the field of autonomous driving

02 Strong Investment Thesis for AV Trucking

Large TAM With Secular Growth Drivers

An opportunity to revolutionize a traditional market with industry leading technology

Global Truck Freight Market (TAM[1])



Regional Freight Industry TAM[2]

United States		$800bn
APAC		$1.6tn
Europe		$400bn

1. American Trucking Association (ATA) 2. Armstrong & Associates

The Need for Autonomous Trucking Remains

US

~3 million Class 8 semi-trucks in the US[1]

+70% of all freight in the US transported by trucks[2]

APAC

~8 million heavy-duty trucks in China[3]

~1.2 million large-size trucks in Japan[4]

INCREASED DEMAND FROM E-COMMERCE TRENDS FACED WITH A GROWING SHORTAGE OF DRIVERS & SAFETY ISSUES

Diminishing Supply

- U.S. shortage of 78,000 drivers[2]
- China drivers declined from 21 million to 17 million 2018 to 2020[5]
- 45% of Japan's drivers were aged 50 or older[6]

Increasing Demand

- Rising e-commerce penetration
- Same or next-day shipping trends

Safety Impact

- 94% of all accidents are due to human error[7]
- 47% increase in fatalities involving semi-trucks from 2009-2020[7]

THE TUSIMPLE OPPORTUNITY

US

- Reduced costs: Labor makes up ~43% of per mile cost structure[8]
- 10% of the nation's trade corridors account for moving nearly 80% of all transported goods[9]

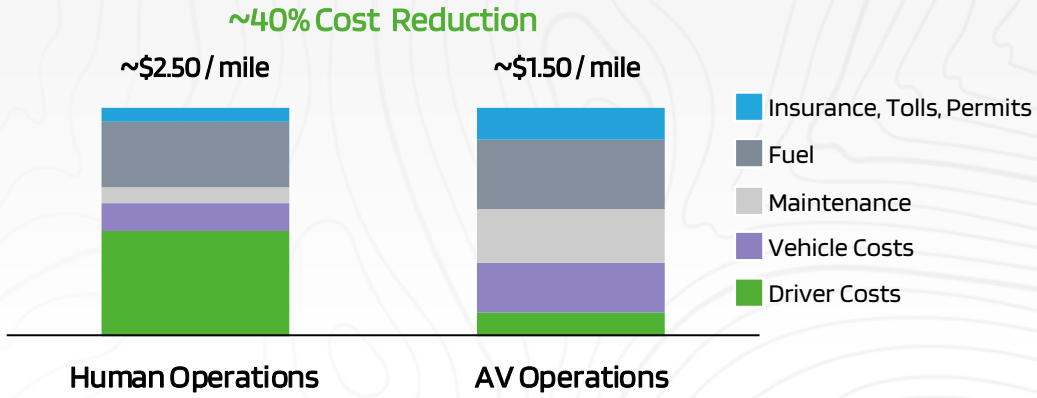
APAC

- China: Middle mile accounts for ~60% of total freight market[3]
- Japan: 50% of total long-haul transportation in freight corridor that connects Tokyo, Nagoya and Osaka[10]

1. FMCSA: 2022 Pocket Guide to Large Truck and Bus Statistics 2. ATA 3. China National Bureau of Statistics 4. Japan Trucking Association 5. Ministry of Transport of China 6. Japan's Ministry of Internal Affairs and Communications 2022 report 7. National Highway Traffic Safety Administration. 8. ATRI 9. Freight Analysis Framework (Bureau of Transportation Statistics and the Federal Highway Administration 10. Japan's MLIT and JTA

Demonstrable Value Proposition

AV Operating Cost Structure Advantage[1]



Autonomous Vehicle Cost Elements[2]

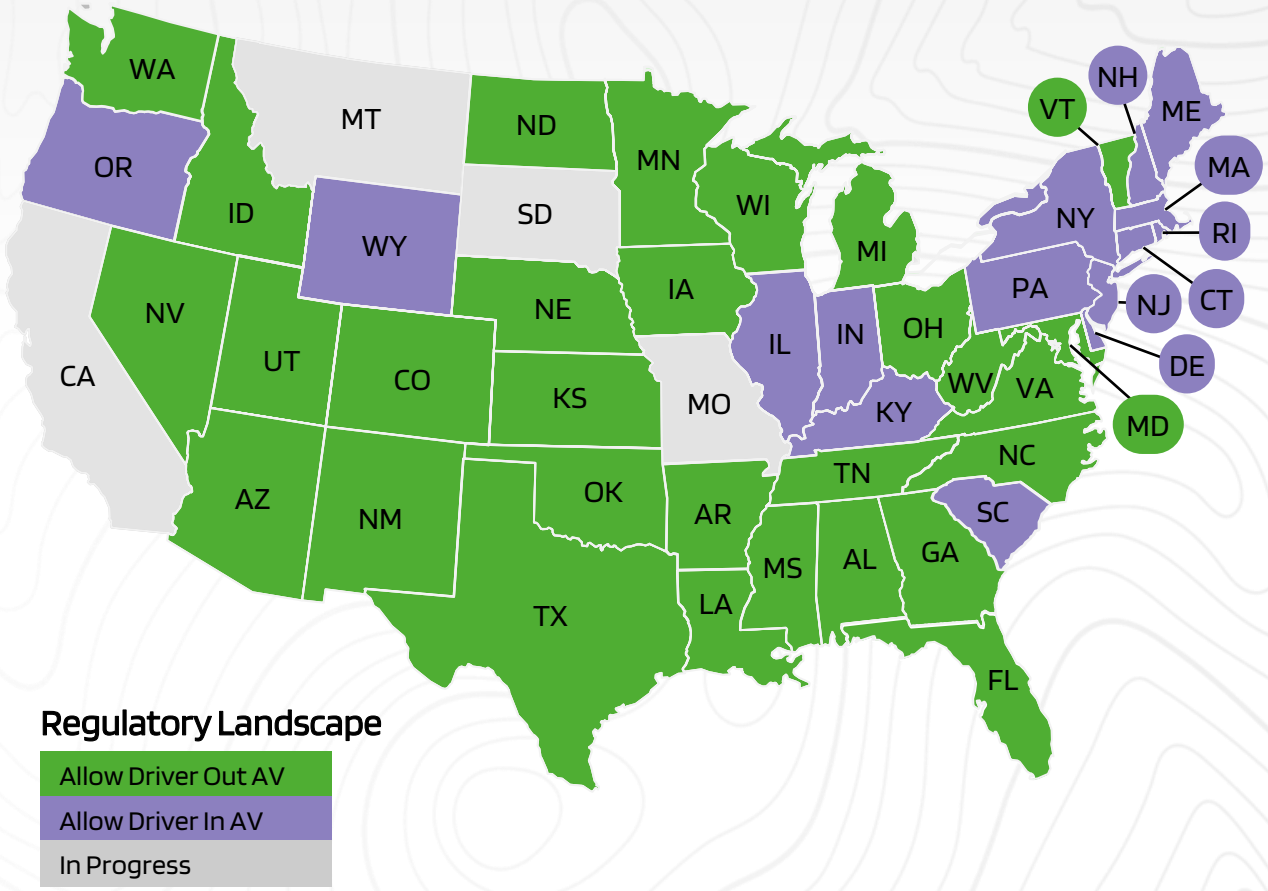
- Driver Costs
  - Elimination of human driver wages and benefits once operations are driverless
  - Addition of data transmission and storage, remote monitoring, and mapping maintenance costs
- Vehicle Costs
  - Costs for the base vehicle along with sensors, compute, and other hardware
- Maintenance Costs
  - Base vehicle maintenance along with incremental AV technology maintenance, calibration, and AV rescue
- Fuel Costs
  - 10%+ reduction in fuel cost from more efficient autonomous driver
- Other
  - Slight increase in insurance; tolls, and permits do not change

Reduced Operating Costs Drive ROI for the Customer: Single Class-8 Truck Case Study

750k – 1.25mm Lifetime Miles[3]		Human Operated Rate per Mile		Total Cost
	X	~$2.50	=	~$1.9 – 3.1mm
		Potential Net Savings per Mile		Potential Net Savings
	X	$0.35 - $0.55[4]	=	~$262 – 687k

1. Based on company data in the U.S. 2. Does not include any expected terminal costs, drayage costs, development costs, and non-cash accounting costs (e.g., depreciation and amortization) 3. Assumes five-year life of truck. 4. Assumes cost of driver as $1.00 per mile; does not incorporate incremental capex associated with higher purchase price of TuSimple L4 truck; assumes virtual driver cost per mile is $0.45 - $0.65

U.S. Regulatory Environment Paving the Way for Autonomy



Regulatory Landscape

- Allow Driver Out AV
- Allow Driver In AV
- In Progress

44 states
Allow Driver In AV

29 states
Allow Driver Out AV

Momentum towards allowing for testing and deployment of ADS-equipped commercial trucks:

- ▲ Kansas (2022) passed legislation
- ▲ West Virginia (2022) passed legislation
- ▲ Mississippi (2023) passed legislation
- ▲ California (2023) held an AV workshop to discuss potential regulations
- ▶ California bill (AB 316) prohibiting autonomous vehicles over 10,000 pounds from operating without a driver is in process

APAC Regulatory Environment Supportive of Autonomous Freight Capacity

Regulatory Environment in China and Japan

China

- Shanghai first city in China to pass legislation to allow L4 fully driverless testing of autonomous trucks
- Clear strategic development goals set for AV industry by 2025, promoting all around development framework and L4 AV commercialization
- Regulatory rules issued to set industry standards for AV vehicles, road tests, infrastructure, etc.

Japan

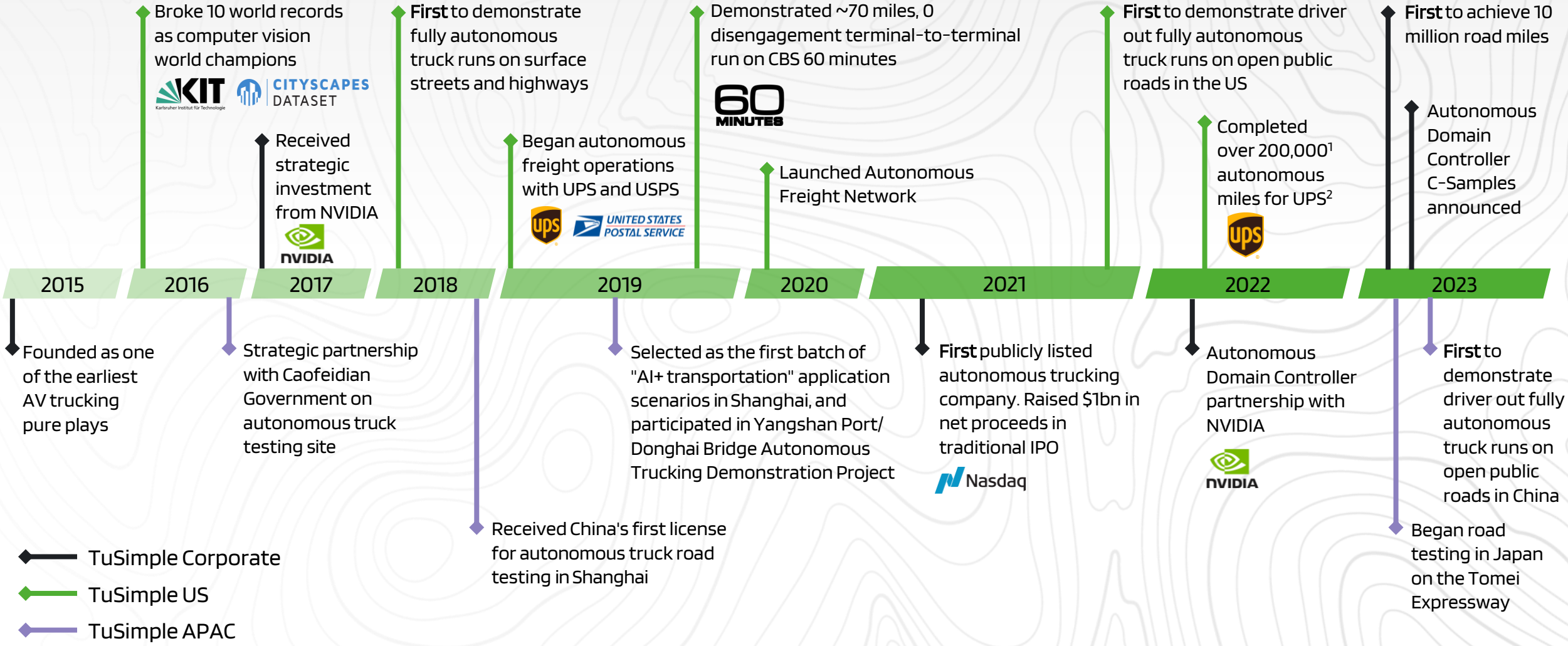
- Autonomous truck testing allowed on most highways and local roads
- Government announced plans to launch a self-driving lane on some sections of the New Tomei Expressway by 2024
- Government has set targets for commercial operation of L4 fully autonomous trucks by 2026

Source: literature research

03 Proven L4 Technology Leadership and Protected IP Portfolio

A History of Industry Firsts

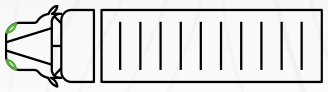
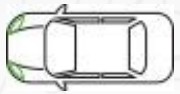
tu simple



1. As of September 30, 2022. 2. UPS North America Air Freight (NAAF)

Only Player to Complete Driver Out in the US

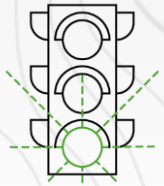
Autonomous Vehicle Landscape[1]

Complexity / ODD[2]	AV Trucking	Robotaxi
	 More Complex Vehicle More Defined ODD[2] 40 Ton Average Weight 200 Meter Braking Distance	 Less Complex Vehicle More Expansive ODD[2] 2 Ton Average Weight 100 Meter Braking Distance
Driverless	tusimple No Teleoperations	WAYMO ONE cruise
Safety Driver	Aurora kodiak WAYMO VIA[3]	Aurora[4] Motional ZOOX

U.S. Driver Out Program Highlights

0
Disengagements

112
Intersections



28
Traffic Lights

101
Lane Changes

34
Emergency Lane Vehicles Encountered

~7,000
Cars or Trucks Detected

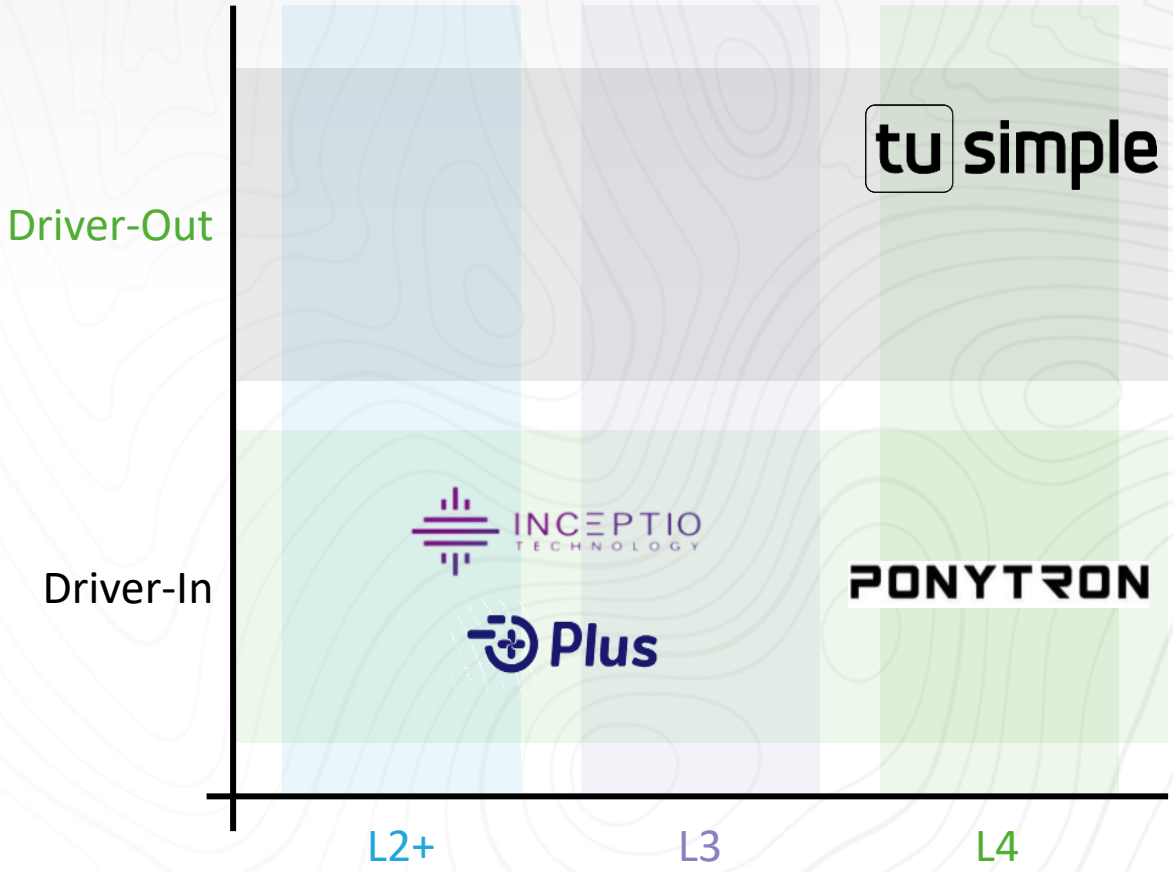
8
Pedestrians Passed on Local Surface Streets

- ✓ No human in the vehicle
- ✓ No human Intervention
- ✓ Operated entirely by TuSimple's Autonomous Driving System (ADS)
- ✓ 7 total missions
- ✓ 80 mile runs between Tucson & Phoenix, AZ metro area per mission
- ✓ Lasting 1hr and 20min each
- ✓ In total over 550 miles driven
- ✓ On open public roads
- ✓ Including surface streets, on and off ramps and highways

1. Illustrative competitors only 2. Operational Design Domain 3. Waymo Via AV trucking development paused 4. Aurora focused primarily on trucking today

...and Only Player to Complete Driver Out in China

Autonomous Trucking Landscape[1]



China Driver Out Program Highlights

0
Disengagements

236
Lane Changes

~12,000
Cars or Trucks Detected

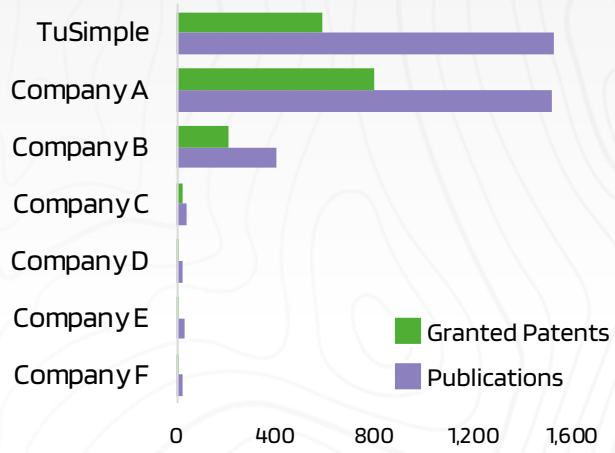
1.6km
Distance traveled with reduced visibility from fog

- ✓ No human in the vehicle
- ✓ No human Intervention
- ✓ Operated entirely by TuSimple's Autonomous Driving System (ADS)
- ✓ 11 total missions
- ✓ ~62 kilometer runs included Yangshan Deep-water Port and Donghai Bridge
- ✓ Lasting 45 minutes each
- ✓ In total over 600 kilometers driven
- ✓ On open public roads
- ✓ Including traffic signals, on and off ramps,, partial lane closures, fog, and crosswinds.

1. Illustrative competitors only

Intellectual Property – A Leader in AV Trucking IP

Worldwide Patents and Applications[1]



- TuSimple's industry leading patent portfolio of 590+ global patents[2]
- TuSimple is the world's most inventive trucking focused AV company[3]
- TuSimple has IP spanning across the entire autonomous trucking ecosystem

Sample Patents

Semantic Segmentation
(US9953236B1)
Core AI & Data

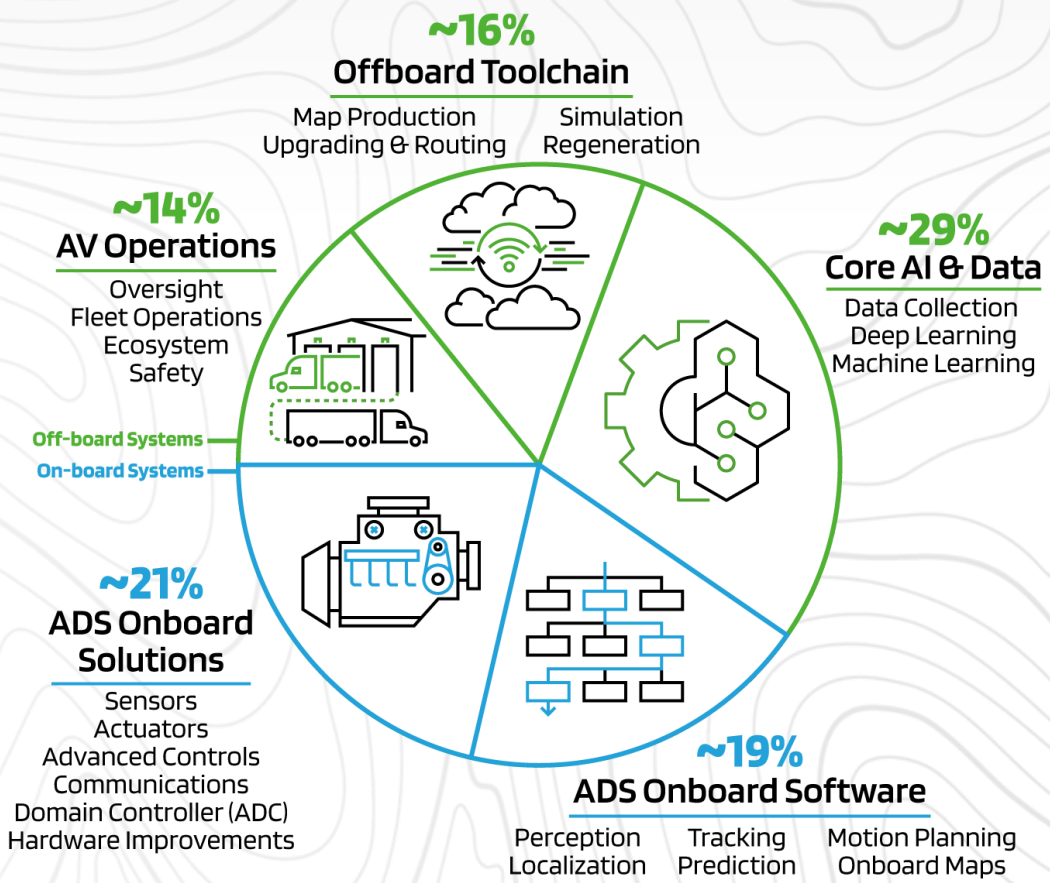
- Using dense upsampling convolution to semantic segmentation
- Process for receiving an input image, producing a feature map from the image, then producing a semantic label map after a few operations

Lane Bias Maneuver
(US20230139551A1)
Onboard Software

- Implement lane bias to avoid a vehicle
- Control device detects a vehicle from sensor data, comparing lateral distance to threshold distance
- Lane bias performed to reach threshold distance if necessary

TuSimple Patent Portfolio

One of the largest organically developed patent portfolios in AV trucking – 589 patents in total[2]



1. As of June 30, 2023: TuSimple research utilizing PatSnap. 2. As of June 30, 2023 3. Measured by global patent asset originated

04 Concrete Development Roadmap with Clear Commercialization Strategy

Clear Strategy to Commercializing First Autonomous Lane

Building on prior achievements, a clear and achievable roadmap in the U.S. and APAC to be first to launch commercial autonomous freight operations

Driver Out Pilot ▶	Expanded Safety +	Increased Reliability +	Improved Cost Effective =	Commercial Launch
Customer-Focused	Commercial launch must meet the rigorous demands of a shipper, including a minimum "level of service" & "freight capacity" reliability threshold & clear line of sight on cost-per-mile that is competitive with human drivers			
Initial Driver Out Pilot *Proof of Technology*	✓ Completion of Driver Out Pilot Safety Case ✓ Completion of Driver Out Pilot	✓ One trip per week ✓ U.S. Operate in nighttime ✓ China Operate in daytime	x Non-scalable AV operations (survey vehicle, chase vehicle, pre-trip & post-trip costs)	**Feature Complete + Redundancy**
Initial Commercial Launch *Proof of Business Case*	▪ Completion of Expanded Driver Out Safety Case ▪ Completion of 3rd Party Audit[1]	▪ Multiple round trips per day ▪ Operate in nighttime and daytime ▪ Operate in dynamic construction zones	▪ Remove survey vehicle ▪ Remove chase vehicle ▪ Reduce miles between returning to MRC ▪ Improve AV operations	**Repeatable Ops + Improved Cost Efficiencies**

1. Audited U.S. operations o SAE standard J3018 and AVSC AV Testing best practice. Audit performed on operations; ADS functionality safety audit in progress

Two Progressive Business Models

Accelerate path to scale with TuSimple Capacity, handling testing and maintenance, before full earnings potential is achieved with Carrier-Owned Capacity

Business Models applicable to U.S. and APAC

TuSimple Capacity

Ready to commercialize today

- TuSimple **enables automated freight routes**
- Strategic route-by-route expansion where TuSimple controls the outcome
- Fastest path to market and critical for industry adoption

Carrier-Owned Capacity

Long-term business strategy

- TuSimple enables OEMs to **manufacture autonomous trucks**
- Required to sell to third-party customers
- Dependent on OEM and hardware supply chain timelines

Freight Users

$ / mile Freight Rate

Capital Light Method
Uses Shared Terminals
Leverages Shared AFN[1] Terminals

Value Proposition

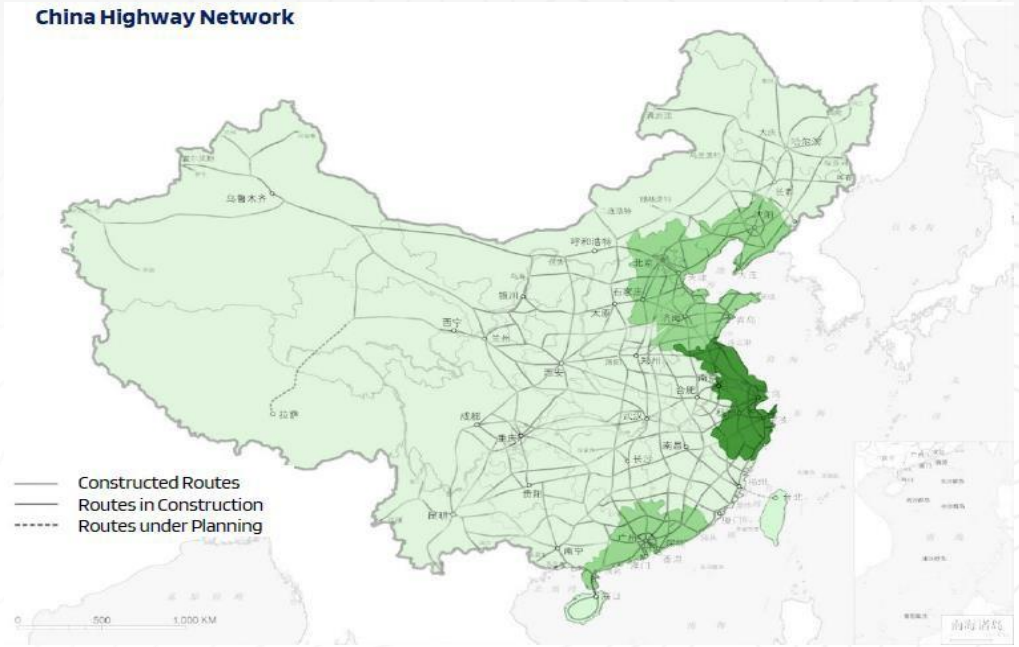
$ / mile Subscription Fee

Upfront Investment with Payback < 1 year
Controls Own Capacity
Uses Own Terminals

1. Autonomous Freight Network

AFN Rollout and Expansion Plan

AFN Covering Major Shipping Routes in China



- Flexible business models adapted to local environment in China to maximize commercialization potential
- Beginning in the east and building out AFN covering major shipping routes in China

Short term Mid term Long term

AFN Targeted Expansion in the U.S.

- Targeting expansion throughout the Sunbelt leveraging existing mapped routes by TuSimple across high-traffic freight routes including the "Texas Triangle"
- Once a route is mapped, the route can be automated with autonomous trucks dynamically updating the map as necessary
- Texas Triangle (Dallas, Houston, San Antonio, Austin) is highly trafficked by truck freight and well-suited to automation
- Illustrative development plan considers route in autonomy friendly jurisdictions

U.S. Development Roadmap and Plan

Commercialization roadmap strategically aligned with overall industry readiness

	Immediately Actionable: 2023 – 2026	Within Range: 2027 – 2029	On the Roadmap: 2030+
Primary Focus	▪ Mature ADS technology for commercializing initial freight lane ▪ Freeze complete ADS onboard software and hardware for contract upfitter *Arizona+*	▪ Expand self-operated AV fleet ▪ Freeze complete ADS onboard software and hardware for OEM production programs *Texas Triangle+*	▪ Scale AFN density and coverage ▪ Enable launch of OEM production vehicles *Sunbelt+*
Ecosystem Development	*Development of AV-ready redundant base truck platforms & components*	*Continued hardware maturity and optimization*	*Scaled production of integrated OEM produced AV trucks*
Number of Driver Out Trucks	10s	100s – 1,000	10,000s
Progressive L4 Revenue Models	TuSimple Capacity	TuSimple Capacity	Carrier-Owned Capacity

★ Initial Commercial Launch

APAC Development Roadmap and Plan

Commercialization roadmap strategically aligned with overall industry readiness

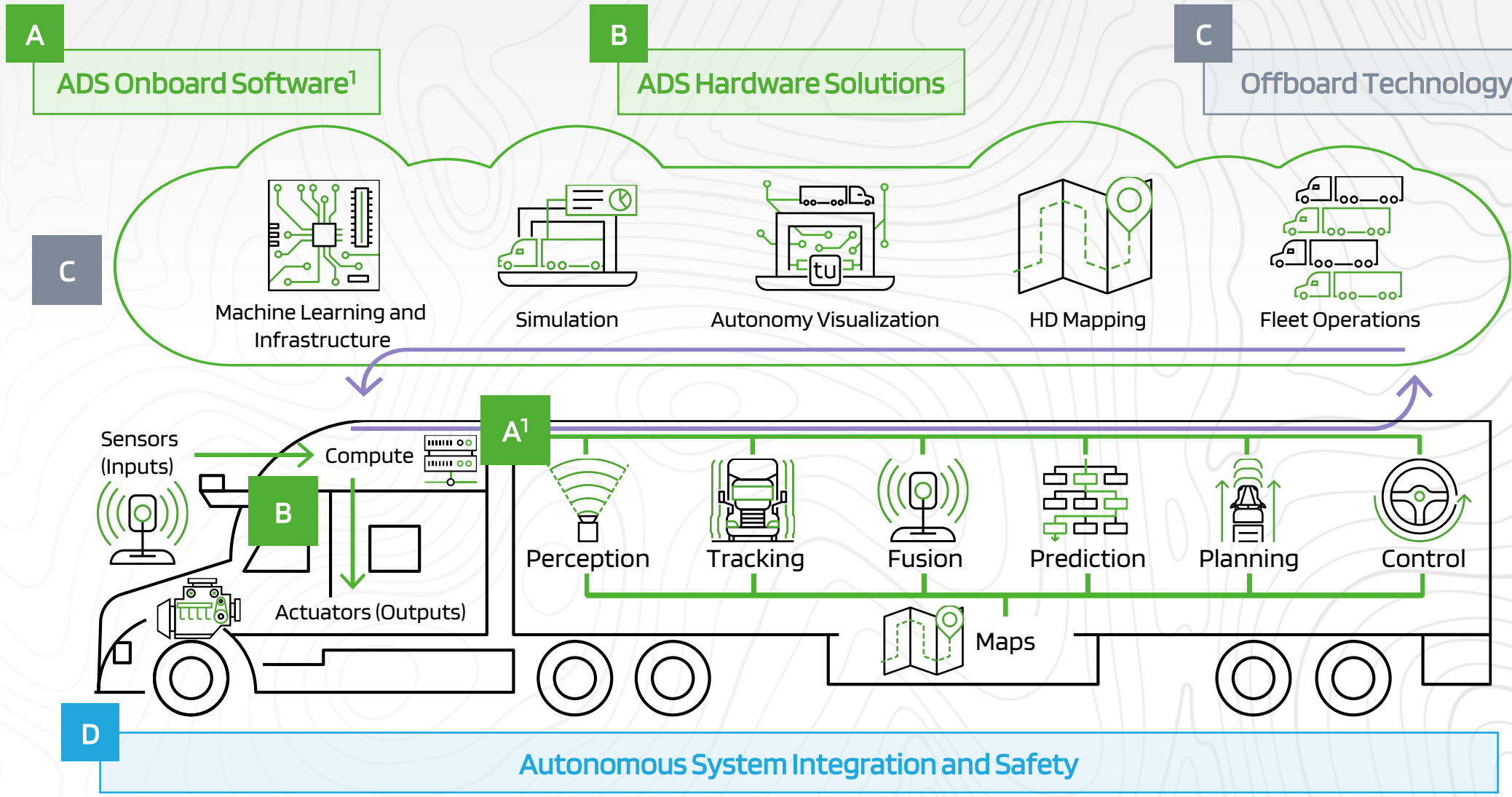
	Immediately Actionable: 2023 – 2026	Within Range: 2027 – 2029	On the Roadmap: 2030+
Primary Focus	▪ Enhance L4 technology; iterate through road tests in China and Japan to prove reliability for commercial applications ▪ Validate Driver Out operation capabilities with several pilots	▪ Build AFN in selected routes and regions with highest commercialization potential[1] ▪ Expand self-operated AV fleet	▪ Scale AFN density and coverage ▪ Enable launch of OEM production vehicles
Ecosystem Development	*Build the first L4 trucking lane along Donghai Bridge of Shanghai*	*Continued hardware maturity and optimization*	*Scaled production of integrated OEM produced AV trucks*
Number of Driver Out Trucks	10s	100s	1,000s
Progressive L4 Revenue Models	TuSimple Capacity		Carrier-Owned Capacity

★ Initial Commercial Launch

1. Dependent on regulatory approval of L4 commercial operation

05 Full Stack Autonomous Technology

Core Technology Architecture



Note: For the avoidance of doubt, the ADS Onboard Software is not housed onboard the trailer 1. Other onboard functions include localization, calibration, embedded software, and more.

Technology Architecture Overview

TuSimple's combined technology platform and organizational capability encompass the overarching requirements to support continuous, scalable freight operations

A ADS Onboard Software

- **Best-in-class long-range perception**, multi-modality sensor-fusion to comprehend the road environment
- **Robust prediction, planning, and control** functionalities designed for navigating through diverse traffic scenarios including construction zones
- **Proprietary embedded software** providing and optimizing embedded compute as well as proprietary sensing unit, along with other L4 hardware

B ADS Hardware Solutions

- **Proprietary ADS hardware solutions** for sensor suites, by-wire controls system, and compute platform
- **Camera-centric backbone** featuring custom layout design and packaging flexibly supporting multiple layouts and form factors
- **TuSimple Domain Controller (TDC)** developed from the ground up to serve as autonomous truck's centralized compute unit

C Offboard Technology

- **Holistic set of software tools** that covers the entire development cycle and accelerates the functionality iteration cycle
- **End-to-end simulation** to enable cost efficient, year-round testing
- **Scalable mapping** with low creation and maintenance
- **Autonomy visualization platform** supporting both development and deployment of AV operations

D Autonomous System Integration and Safety

- **Mature development platform** combining automotive processes and agile technology development (Safety Case framework, V&V framework)
- **Experience upfitting and integrating critical safety systems** including both software and hardware with OEMs
- **Thorough testing operations** that are key to providing validation, system confidence, and continuous improvement

Proven L4 Capable Onboard Software Technology

Solved critical autonomous trucking challenges with long range perception key for semi-trucks, planning and prediction enabling maneuvers, and control that optimizes fuel economy and driving performance

Onboard Software Components

Three differentiated and unified modules within onboard software that address the requirements of AV trucking

Perception, Tracking, and Fusion

Visualizing the road environment with robust long-range capabilities that address highway driving speeds and long stopping distance requirements

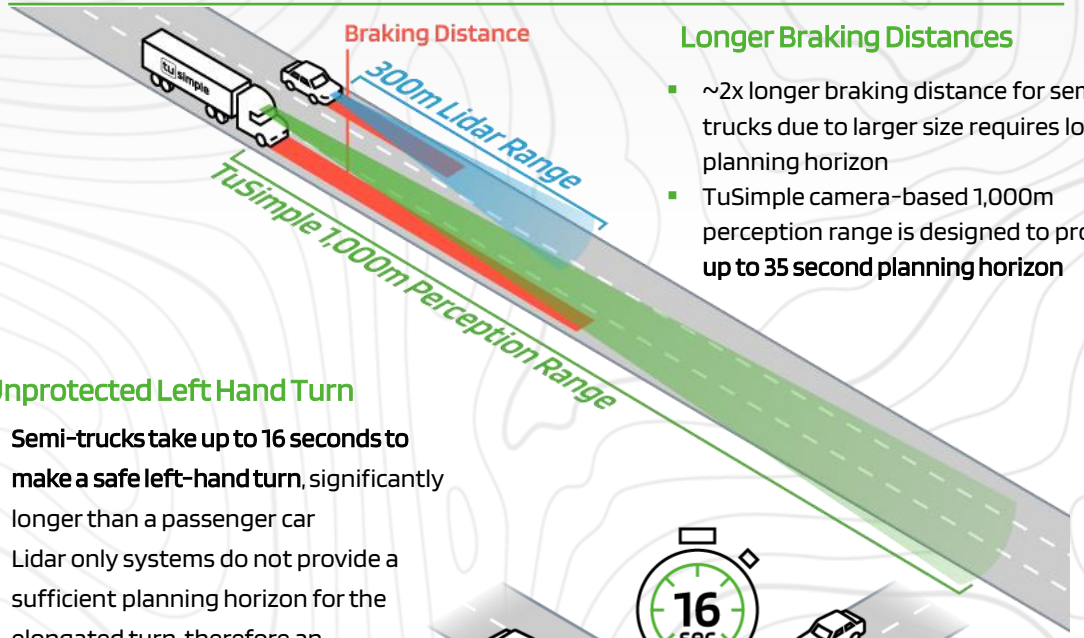
Prediction and Planning

Comprehends perception inputs to semantically represent environment constraints and generate feasible trajectories that obey driving rules to reach goals

Control

Software architecture with predictive control functionalities delivering smooth motion and superior driving performance

Benefits of Long-Range Perception

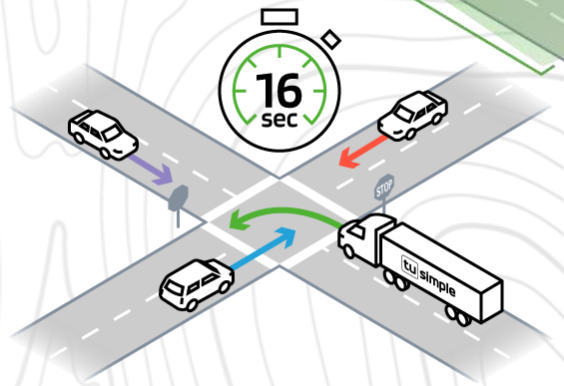


Longer Braking Distances

- ~2x longer braking distance for semi-trucks due to larger size requires longer planning horizon
- TuSimple camera-based 1,000m perception range is designed to provide **up to 35 second planning horizon**

Unprotected Left Hand Turn

- **Semi-trucks take up to 16 seconds to make a safe left-hand turn**, significantly longer than a passenger car
- Lidar only systems do not provide a sufficient planning horizon for the elongated turn, therefore an autonomous semi-truck will not be able to make a safe unprotected left-hand turn if exclusively relying on lidar



A

Prediction and Planning Capabilities and Highlights

Technology Highlights

Driving Features Supported	▪ Construction zones ▪ Traffic jams ▪ Road boundaries	▪ Emergency lane vehicles ▪ Emergency vehicles ▪ Vulnerable road users
Driving Behaviors Supported	▪ Lane change/cancel lane change ▪ Window chasing	▪ Overtake/retreat ▪ Lane bias ▪ Accepting merges
Vehicle Dynamics	▪ Articulated kinematics and road slope considerations for both Ego[1] and other vehicles	
Intersection Handling	▪ Handles intersections with global scene predictor with attention to non-compliant drivers ▪ Multiple-level inference for two close intersections	
Conditional Prediction and Turn Signal Usage	▪ Creates better interactions and decisions by communicating Ego's intent	
Navigation and Routing	▪ HD map integration informing localization and routing alternatives	
Decision-making and Behavior Hierarchy	▪ Ensures explainability and accountability such as accident mitigation and preference	
Unified Attention Mechanism	▪ Based on complete scene understanding for better resource allocation and overall system performance	

Capabilities and Maneuvers

Key Safety Scenarios

Lane Bias

Handling Aggressive Cut-in

Proactive Lane Change

Other Maneuvers Covered

- Highway merging / on-ramps
- Accepting merges
- Unprotected left turns
- Stoplight / intersection interactions
- Slow vehicle overtakes
- Retreat to safe following distance

Planning Behaviors Driven by Safety

- No premature decisions or pruning, all trajectories remain in consideration until the optimal trajectory is certain
- Proactive maneuvers help avoid dangerous road scenarios, e.g., a non-compliant vehicle fish-tailing and straddling or invading lane space
- Aggressive lane change abilities ("window chasing") used only when necessary
- Top level decision making defined quantitatively

1. Ego denotes the TuSimple vehicle operating in autonomous mode

A

Precise Control Delivers Superior Driving Performance

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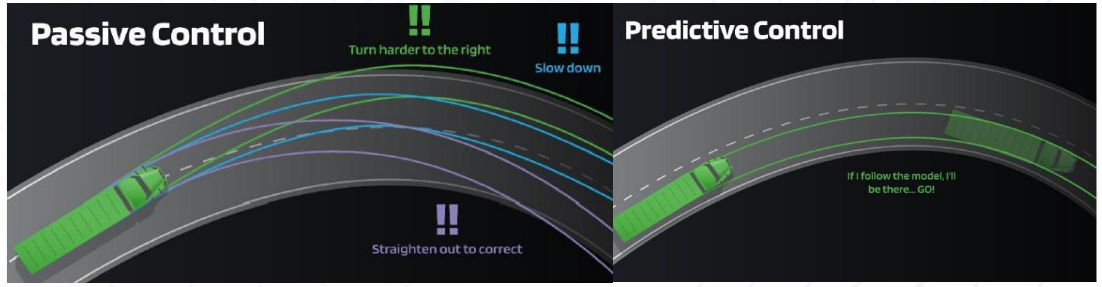
State of the art, predictive "all-in-one" optimal controller that can balance motion control/smoothness, minimize needed actuation, and maximize fuel economy

Predictive Control

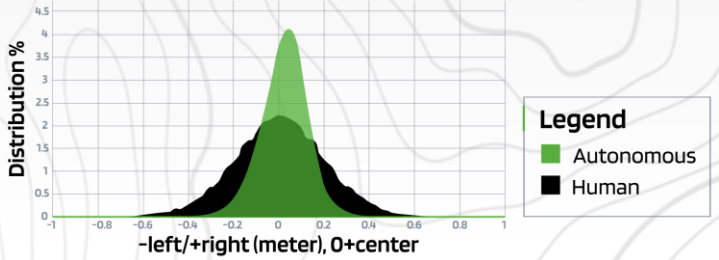
- Capable of both local and highway driving regimens
- Innovative "hybrid mode"
- Integration of control and novel uncertainty model estimator
- Measured control performance
- Integration of an optimal uncertainty/envelope tracker
- Proprietary, high-speed loop solver
- Enhanced fuel economy driving techniques
- In-house simulation environment matches real truck control responses in our system in loop (SIL) digital simulator enabling millions of scenarios testing



Autonomous Driver Control Improvements

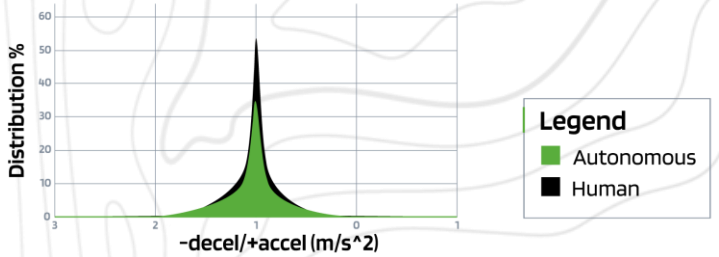
Lane Centering

- +/- 10.6" (3σ) lane centering performance far outperforms humans, leading to better safety outcomes



Throttle Control

- Smoother braking and acceleration lowers tire / brake wear



Fuel Economy

- 10%+ improvement in fuel economy in autonomous truck[1]
- More efficient braking (engine braking) and momentum conservation

Category	Manual MPG	Autonomy MPG	Percentage
Highway Cruise	7.54	7.97	5.75%
Front Vehicle Cut-In	10.63	13.50	27.00%
Slow Car Following	8.63	9.53	10.40%
...	...	...	...
Aggregated Highway	7.77	8.64	11.09%

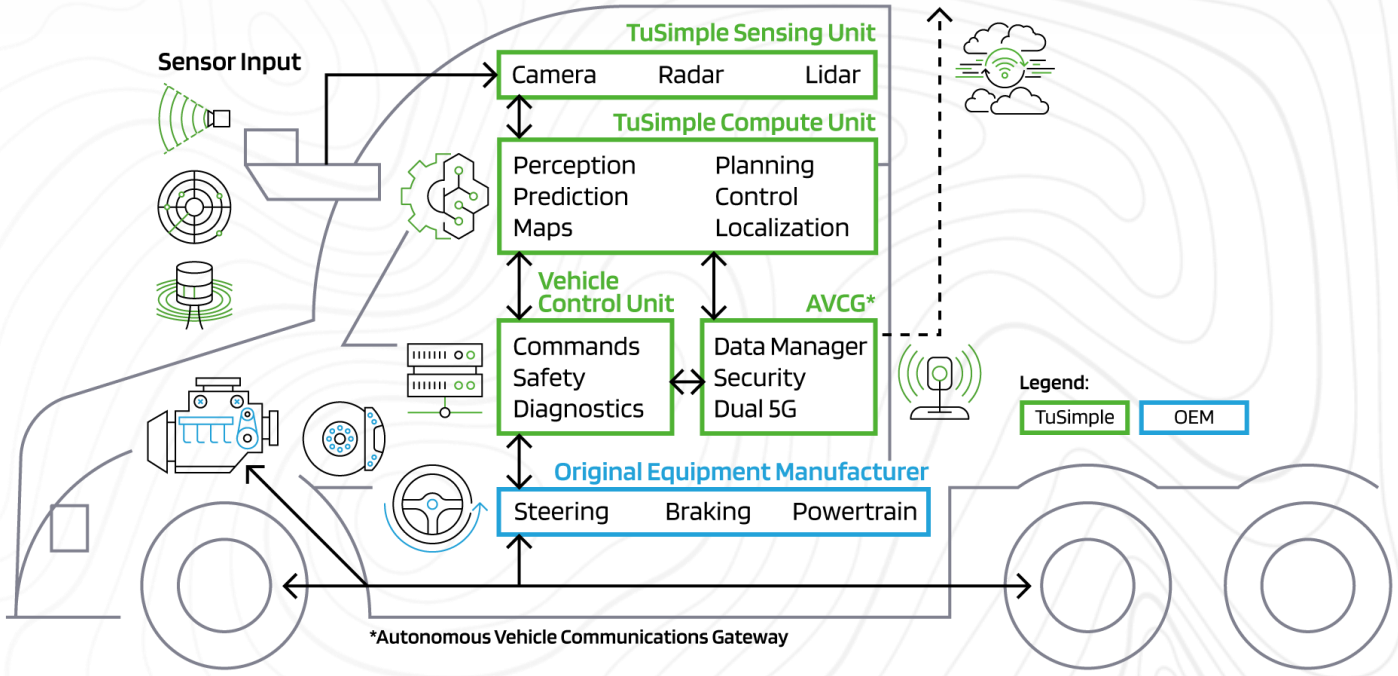
1. 6 months of testing with over 30k miles in autonomy mode (Speed range: 40mph – 80mph, Road grade : -4% to 4%, Vehicle weight: 16 tons to 35 tons) 2. Non-player character

ADS Hardware Environment

Focused development since inception on critical ADS enabling hardware through multiple generations

ADS Hardware Systems and Components

- Competitive advantage driven by in-house camera design that matches onboard software capabilities
- Leverages off the shelf sensors or components where possible to remain capital efficient and focused on core competencies
- Focused on software and hardware development of critical components that allow for reliable testing and scaled production



Compute and Communications

TuSimple Sensing Unit
Sensor pre-processing unit for all L4 sensors

Vehicle Control Unit
Auto-grade ECU[1] for direct command control of steering, powertrain, and braking

Autonomous Vehicle Communications Gateway
Ruggedized controller handles AV truck bi-directional communications

Ruggedized Compute Unit
Central computing unit for driving function and overall L4 orchestration

TuSimple Domain Controller
Ground up hardware design serves as autonomous truck's centralized compute unit

Sensor Suite

- Full suite of cameras, lidars, radars, GNSS, IMUs, microphones, rain / light detection, etc.
- Accurately capture environment in broad set ODD
- Multiple layouts for physical FOV[2], 360° coverage, and necessary redundancy

1. Electronic control unit 2. Field of view

B

TuSimple Domain Controller

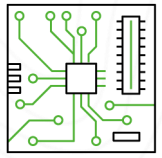
TuSimple Domain Controller ("TDC")

TDC Overview

- Partnership between **NVIDIA** and **TuSimple** announced in January 2022
- Ground up hardware design serves as autonomous truck's redundant centralized compute unit
- Enables TuSimple to provide fully integrated hardware & software autonomy solutions

Benefits of the TDC

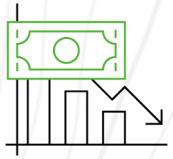
- Partnership with NVIDIA for the SOC reference design; it's fully proprietary hardware
- Proprietary designed system includes:



Better Integration

Low Power Consumption

Shorter R&D Cycles

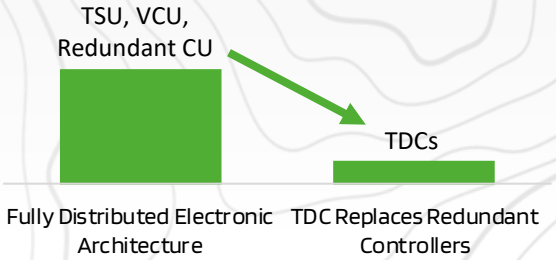


Lower End-User Costs

L4 Use Cases and Cost Efficiencies

The TDC replaces distributed compute units as an integrated redundant controller

- High functional integrity as integrated domain controller
- Reliable / robust backup to primary controllers



Additional Near-Term Revenue Opportunities

The TDC serves as the single integrated domain controller in L2+ / L3 system

- Integrated across sensing, computing, and vehicle control
- Distributed electrical architecture utilizing a multitude of ECUs is inefficient for computing and updating software
- Unified central domain controller is much more efficient
- Flexibility to provide the perception module only, perception and planning & control, or full system
- Can support L2+ / L3 features including highway assist and highway pilot functions

Offboard Infrastructure and Toolchain Enabling Development and Deployment

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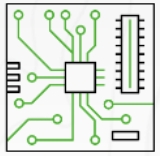
TuSimple's AV Development Toolchain is a holistic set of software tools based on real world experience that cover the entire autonomous driving development cycle and deployment of AV operations

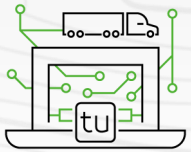


1 Machine Learning Infrastructure

- Self-supervised active learning data pipeline
- Fast and scalable model training
- Large and elastic simulation workloads

2 Simulation

- Proprietary simulation toolchain
- End-to-end simulation
- Enable year-round testing across robust scenarios
- Automatically detects safety events within simulation

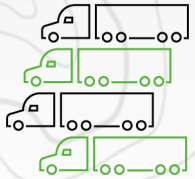


3 Autonomy Visualization

- Display and interact with the ADS
- Customizable workspace for every scenario
- Cloud replay and fast tagging of events
- Advanced plotting and direct measurement features

4 HD Mapping

- Scalable, automated nationwide mapping
- Low creation and maintenance costs
- Low latency updates
- High accuracy (5cm)



5 Fleet Operations

- Efficient deployment for AV testing and operations
- Scalable, low-cost AV fleet management
- Vehicle-to-cloud communication for remote monitoring
- User-friendly autonomy visualization – supporting different functions

Petabytes of Data
Managed on Platform

Robust Validation
On Path to L4 Autonomy

Holistic Interface
Development & Deployment

~11,400+
Miles of HD Mapped Routes

All-in-one Platform
Key Functionalities Provided

D

Every Aspect of System Development Informed by Safety

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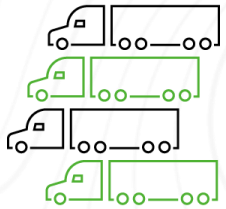
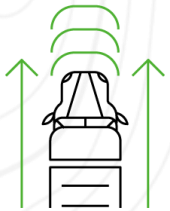
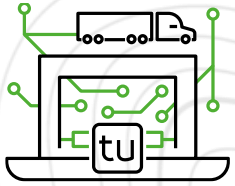
Complexity of autonomous vehicle operations necessitates a safety case that is designed to ensure adequate safety margins and that supporting operations are safe while addressing AI-specific challenges

What is Being Made Safe?

Trucks	Autonomous Driving System	Remote Data Infrastructure	Fleet Operations
▪ Base truck platform(s) ▪ Truck hardware modifications	▪ Compute hardware ▪ Sensors ▪ Operating system and middleware ▪ Autonomy stack ▪ Diagnostics and remote communications bridge	▪ Software development and deployment tools ▪ Remote monitoring software and network	▪ Fleet maintenance ▪ Test fleet operations ▪ Revenue fleet operations

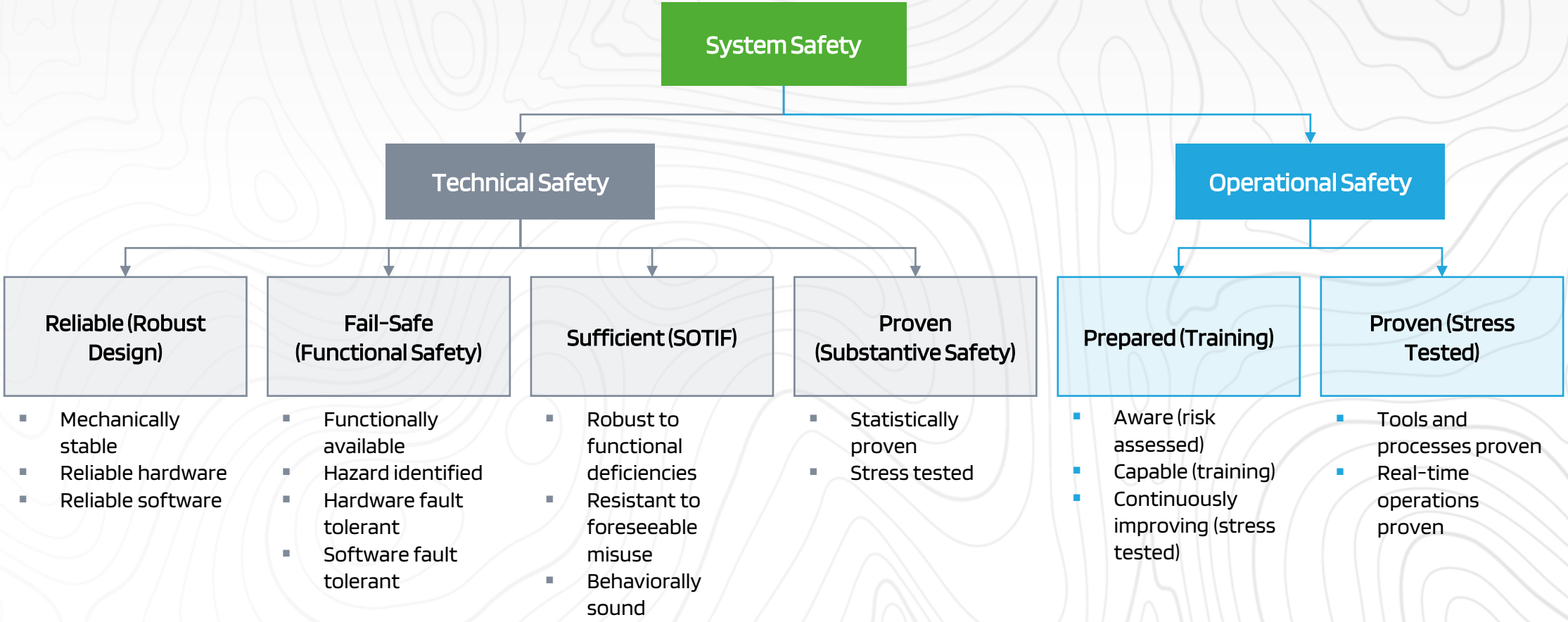






The TuSimple Safety Case

Structured arguments that define specific safety objectives, clearly state all assumptions, provide rationale, directly link evidence to impacted claims, clarify effectiveness of mitigants, and understand residual risk

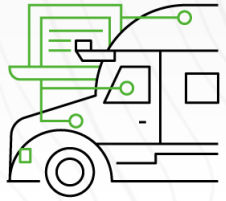


Autonomy Solutions to Drive Industry Forward

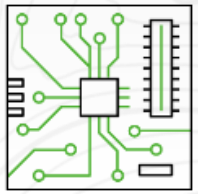
Combination of modular technology stack, development know-how, and proprietary domain controller enables use cases outside pure L4 autonomy

Trends Driving Mobility Today

Automated Driving



Software Defined Vehicles



Connected Mobility

Demand Challenging Requirements

- Large dataset processing from multi-modal sensor suites
- Solve for complex computing with demands for cost efficiency and centralization
- Outperform multiple ECU[1] architecture with better power, cost, and maintenance efficiency
- Overcome challenges in hardware-software integration

Illustrative Use Cases & Plug-Ins

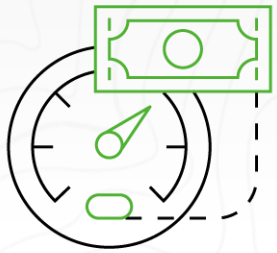
- L2 & L3 ADAS all-in-one modules for passenger and commercial vehicles
- Offboard toolchain and simulation as a service
- White-labeling and contracted development
- Licensing and outsourcing of individual modules (e.g., perception or control)
- Development and sales of SoC products
- Low-cost automotive grade controllers for mining, ports, and warehouses

1. Electronic control unit

06 2023 Considerations and Long-Term Framework

2023 Key Considerations

TuSimple ended 2022 with ~$995mm in Cash and Short-Term Investments; Refined 2023 Strategy Reduces Revenue and OpEx While Protecting our Balance Sheet

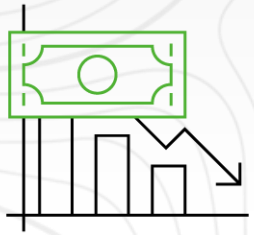


Revenue

- Intentional reduction of loss-making freight capacity
- Reduce geographical footprint to match AV commercial launch roadmap

OpEx

- Greater than $120 mil. of annualized cash comp savings expected from restructuring[1]
- Additional OpEx savings expected from company-wide improved efficiency



Capital Expenditure

- Reduced fleet size focused on testing
- No new operational facilities beyond Arizona nor IT hardware investments

2023 Cash & Short-Term Investments

- OpEx and CapEx savings expected to drive cash spend decrease while still funding technology development
- Improved management and yield generation of idle cash

1. Includes December 2022 and May 2023 restructurings

Focusing on What it Takes to Win

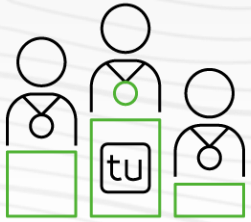
tu simple

Striving to Create shareholder value through building on our technology leadership, setting a concrete development roadmap, and creating near-term monetization opportunities

1

Investment Thesis for AV Trucking Remains Strong

2



Proven L4 Technology Leadership

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One Holding Company, Two Distinct Businesses

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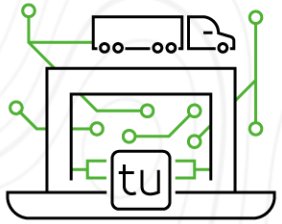

Concrete Development Roadmap with Clear Commercialization Strategy

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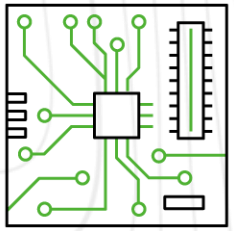

Modular Technology Stack Enables Near-Term Monetization Opportunities

Long-Term Framework

Substantial Revenue and Network Scaling opportunity has not changed

TuSimple technology remains industry leading and we continue to believe we will capture market share

Initial focus on commercial launch TuSimple Capacity, path to positive cash flow with ~500 trucks

Launch of Carrier Owned Capacity required to scale to tens of thousands of trucks

Timing: Factors impacting timeline provided at 2022 Investor Day

- Dependent on OEM development timeline to launch Carrier Owned Capacity
- Supply chain partners focused on near-term opportunities: EV and L2+ ADAS


Thank You