



PEAKZONE

MobilityTech REPORT | VENTURE TRENDS

Lorenz Hartung | Elias Maier | Juell Woldegebriel

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MobilityTech Venture Report

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About PEAKZONE

Our Venture Experts



 **Lorenz Hartung**
CEO



 **Elias Maier**
Chief of Staff

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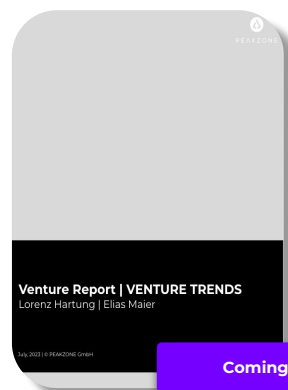
MobilityTech Report



Edge Computing Report



Robotics Report



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We have a strong corporate, startup and VC network

Startups we have worked with

Universities and Dealflow Partners

Corporates we have worked with

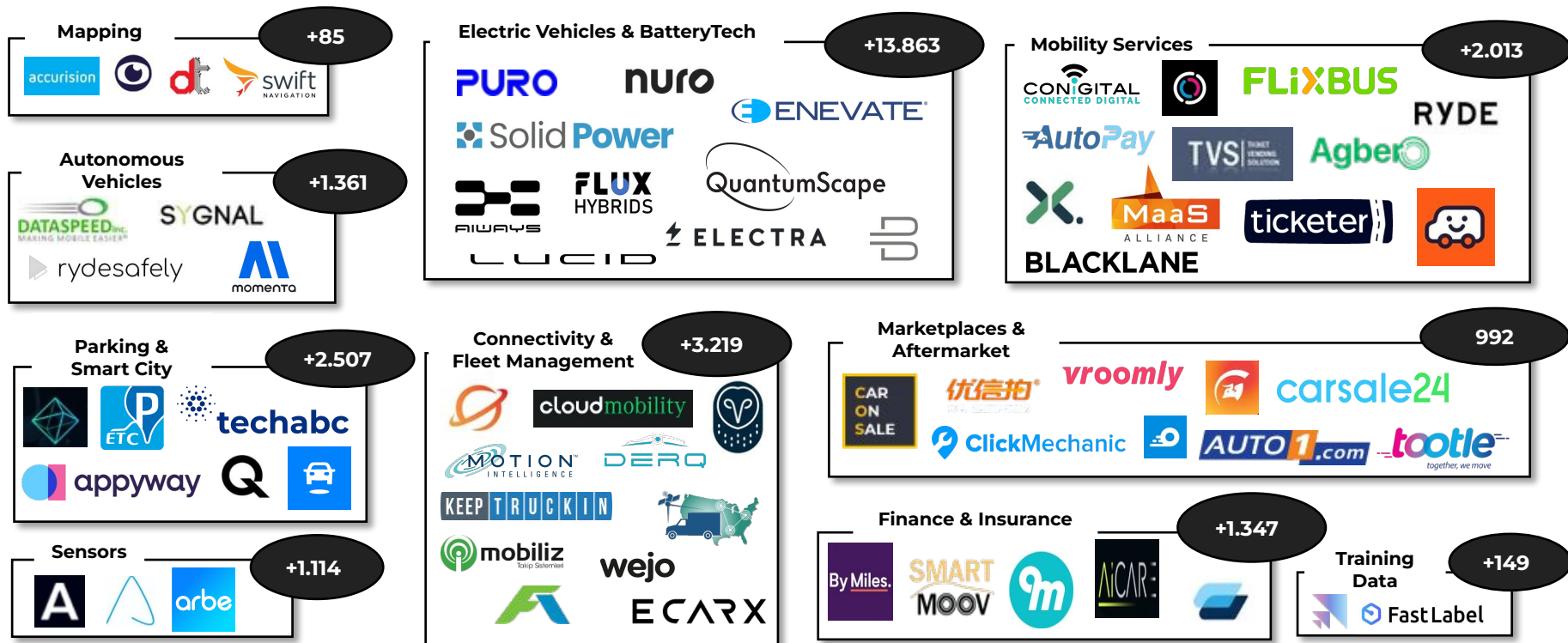
VC Funds that we have worked with



INTRO

MobilityTech Cluster
CASE
Transformation Timeline
Market Drivers

MobilityTech* is a broad market with many overlapping subsectors & adjacent markets

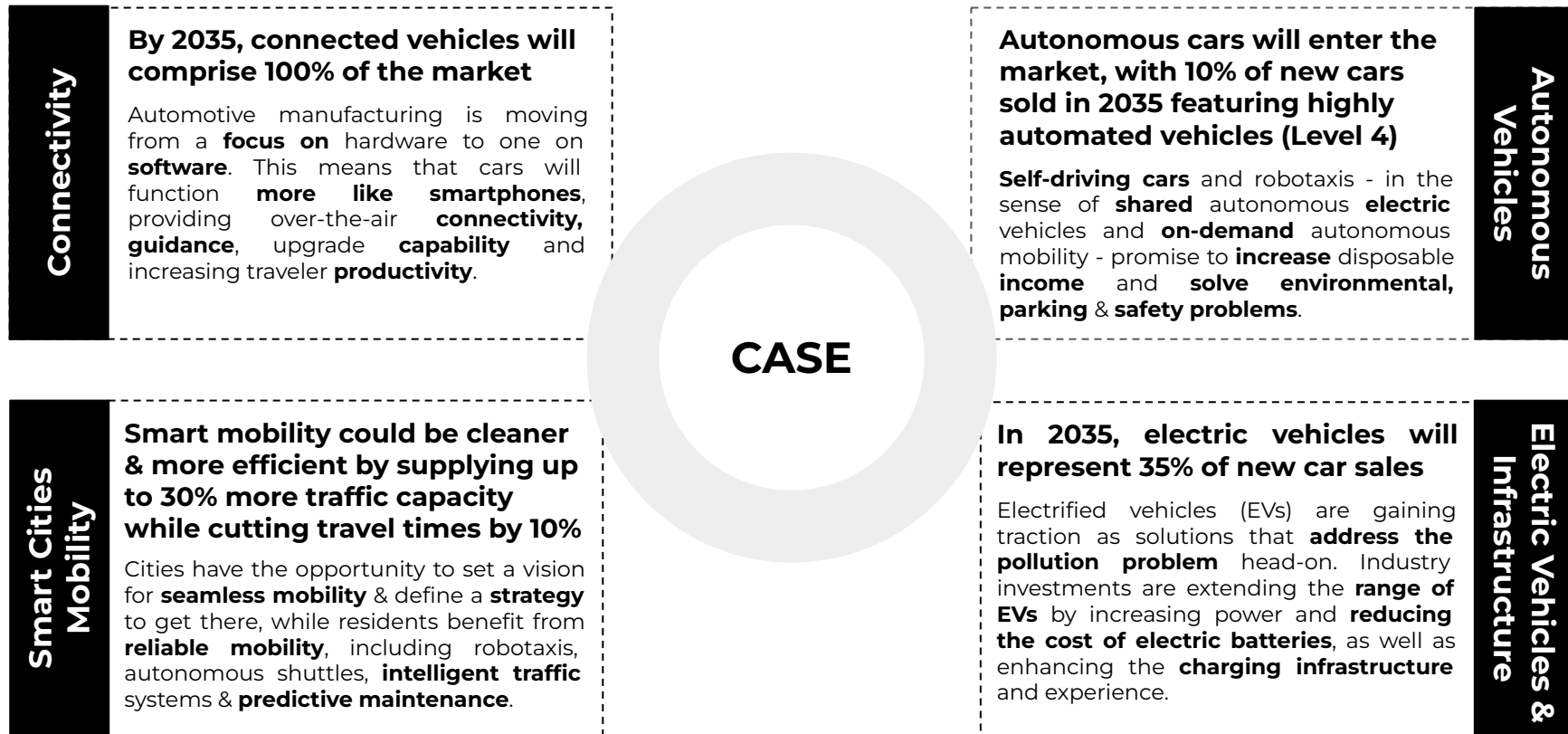


Take-away

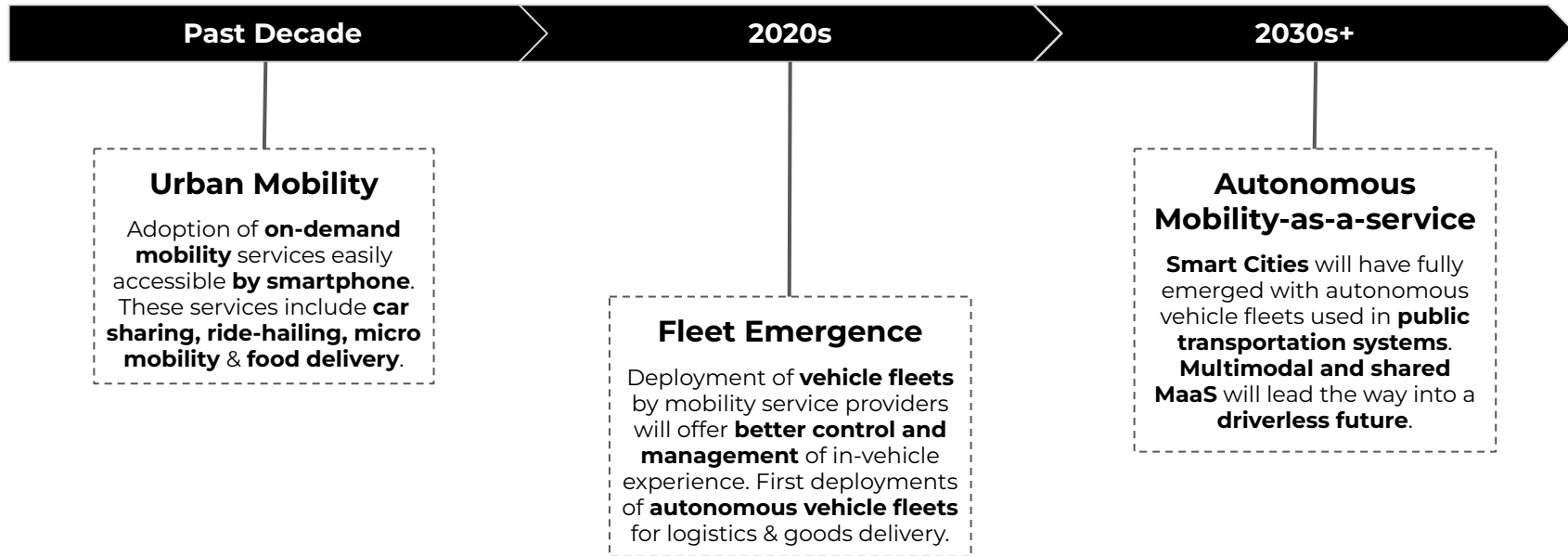
The MobilityTech market comprises over **81.000 startups in total**

*selected startups from each area; not all subsectors included

A combination of CASE shows greatest potential for disruption in the MobilityTech sector



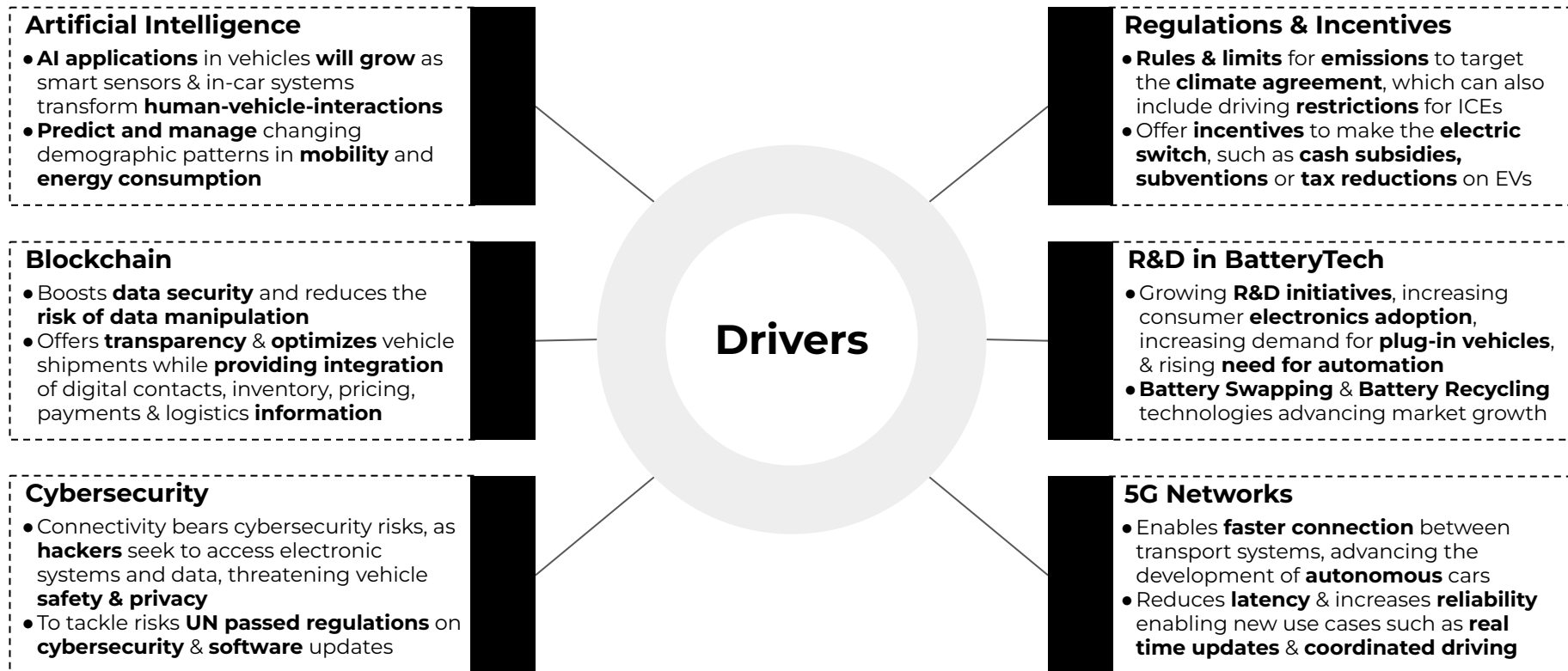
The Transportation Transformation will unfold in 3 stages



Take-away

- **Cities** play a crucial role in **driving innovation** and in **regulating** the next gen mobility market
- **Covid-19 slowed down the trends** in mobility for now - **consumers** rather use their **own vehicle** in fear of infection
- Different **regulations, urban infrastructures** and **transportation preferences** will lead to **geography-specific MaaS solution leaders** emerging rather than global ones

Regulatory & technological breakthroughs are strongly driving the MobilityTech market



SECTOR ANALYSIS

MobilityTech

Connectivity

Autonomous Vehicles

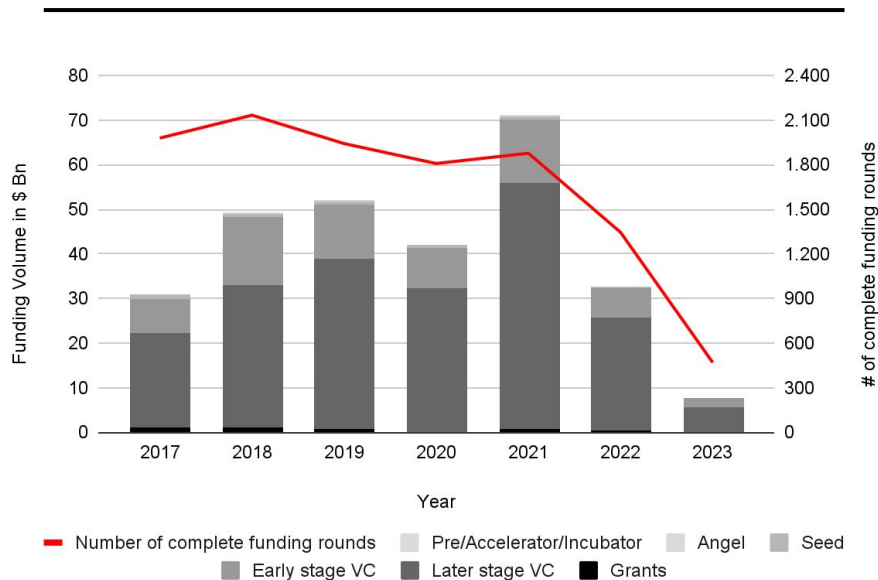
Smart Cities Mobility

Electric Vehicles

Accelerated rise of new technologies, sustainability policies, and changing consumer preferences are driving the market

Total funding Mobility Tech

Total funding & number of rounds, 2017-2023*



* as of 01.07.2023

Take-aways

- **\$286 Bn** overall **funding** within last 7 years
- Strong **rise in funding from 2017 to 2018** with a **continuous decline** following **after 2021**
- **2023** might see **lowest funding volume** in the past years with **only \$7.6 Bn in 469 rounds**
- Main focus on **later stage Series C+** startups - 2021 saw **\$55.4 Bn** invested in over **650 rounds**, with single investment rounds reaching **\$2.65 Bn** funding amount)
- The **Electric Vehicles segment** has been driving the market with **over \$20 Bn invested** over the **last 24 months**, while **Autonomous Driving** funding has **slowed significantly**

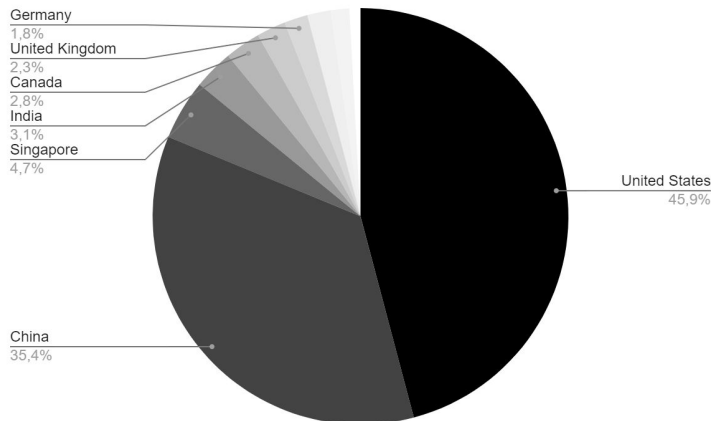
Notable Investors

- **Corporates:** Hyundai, Daimler, Continental, Bosch, Shell, Uber, Google, Intel, Ford, Toyota, Tencent, VW, BMW, Baidu, Delivery Hero
- **VC Funds:** Y Combinator, Sequoia, Techstars, 500 Startups, Qualcomm Ventures, BMW i Ventures, SoftBank Vision Fund
- **PE-Funds:** IDG Capital, Hillhouse Capital Group, Partech Partners, Warburg Pincus

APAC is attracting many startups and investors, positioning as a global leader in the Next Gen Mobility market

Startup distribution by location

by country in %

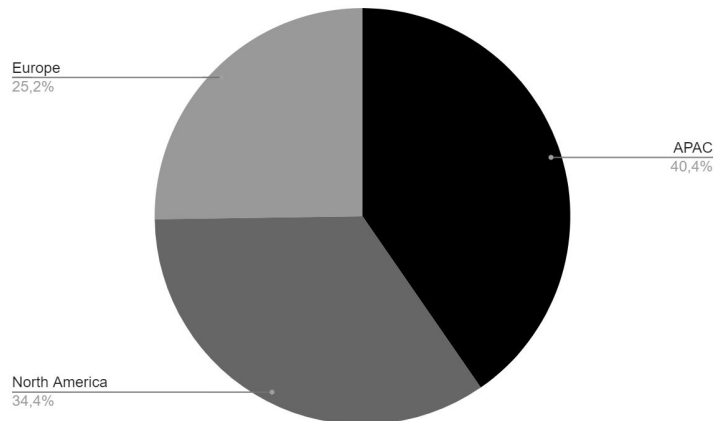


Take-away

- Startups mainly **located in California** with **access to funding & big tech players**
- **China** has developed a **leading role globally** in next gen mobility sector, **incentivizing startups** to settle there
- **Singapore ranks 1.** on the **Urban Mobility Readiness Index**, making it well positioned for innovation in **smart mobility & infrastructure**

Investors location

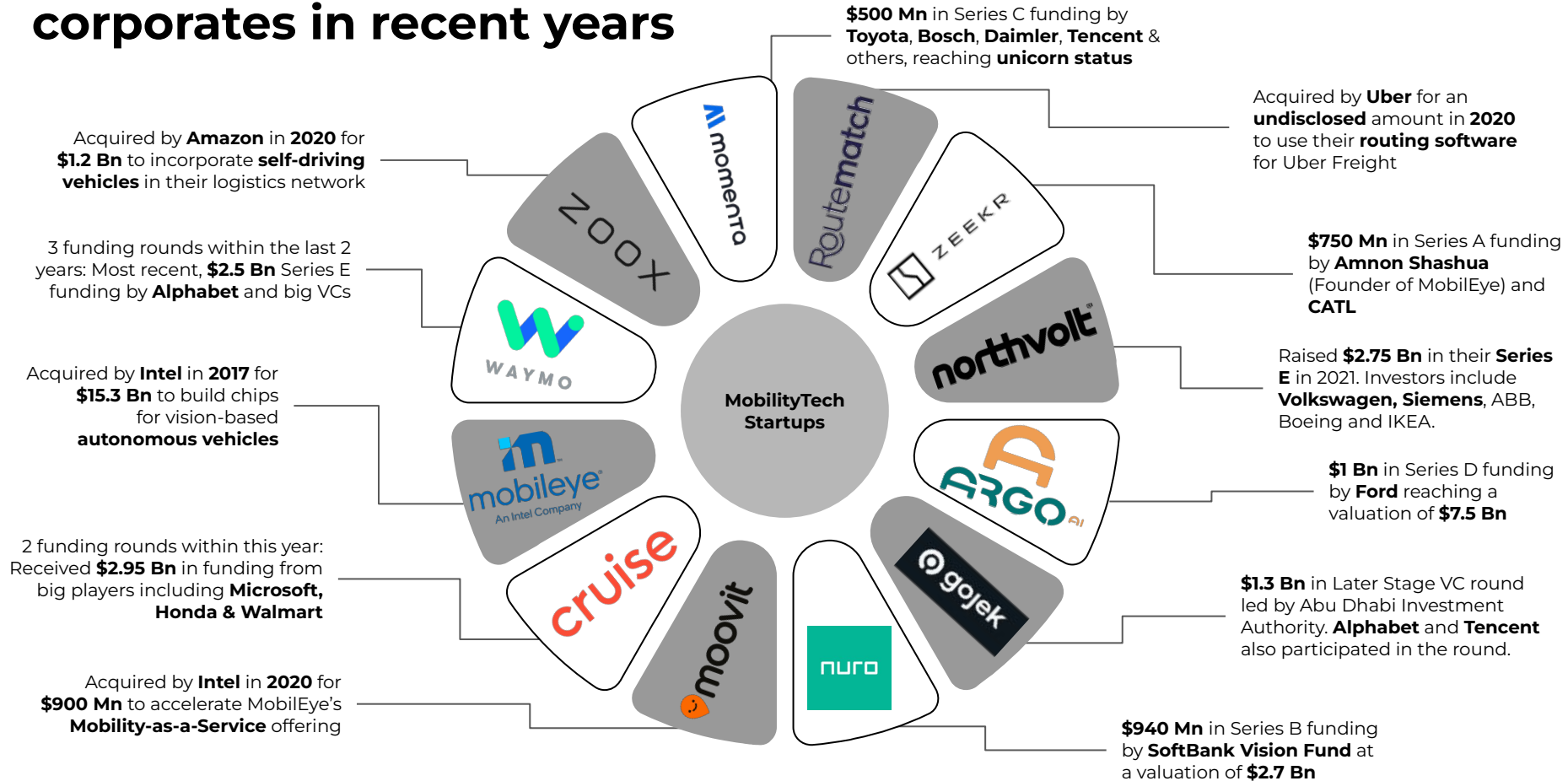
by country in %



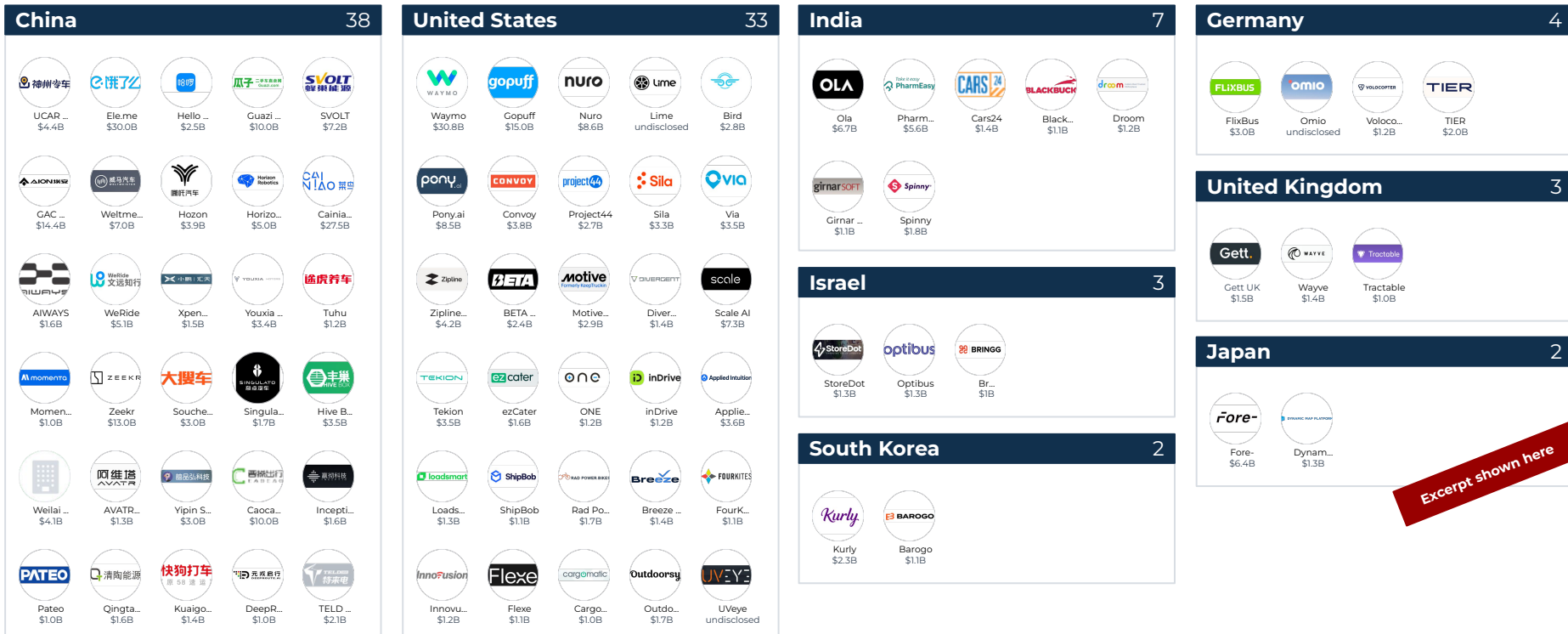
Take-away

- **Investment incentives** in APAC due to **governmental regulations & investments in infrastructure** promoting **new mobility technologies**
- Major **VC funds** (Y Combinator, Sequoia, etc.) are backing mobility startups from **North America**
- In Europe, the **UK government** is a strong investor in **Smart Mobility, Smart City & Autonomous vehicle** startups

Major investments & acquisitions made by OEMs and large corporates in recent years



Unicorns mainly occur in Electric and Autonomous Vehicles due to governmental incentives attracting large investments



Take-away

- While there have always been **many startups** in the **electric vehicle market** reaching unicorn status **every year**, in **2018** we notice many **smart mobility unicorns** coming up, with a shift towards **autonomous vehicle** startups reaching unicorn status from **2019 onwards**
- Many unicorns went **public via SPAC** shortly after reaching unicorn valuation, due to the **faster and easier** public offering process

Excerpt shown here



Governmental strategies & policies differ locally and incentivize electrification & automation of vehicles



- **Strictest** global emission **guidelines** including **EV to reach net zero emissions**
- Deployment of **connected and automated mobility** through policy initiatives like **5G cross-border corridors & cooperative intelligent transport systems**
- EU targets have to be **implemented by member states** incl. **incentives** like subsidies, subventions & tax reductions for supplier & consumer
- **NOR, ISL, SWE, NL** with high efforts and already high rewards in EV sector



- **Ministry of Transport** will steadily advance the **popularization of autonomous driving** applications, and the integration of **traffic infrastructure, transportation services and energy networks**
- Strategy focusing on **regulations to push sales** of PHEV, BEV & FCEV
- Drafted new laws which would allow **testing of autonomous vehicles** on highways **for the first time**
- Investing billions (¥) in **charging infrastructure development**
- **Leading global race** to build smart cities



- **Lagging far behind** other major EV markets
- Trump administration stopped efforts of the Obama administration to set **emission targets**, therefore **no overall US strategy or policy**
- With Biden administration, an **increase in efforts can be expected** (e.g. return to Paris Climate Agreement)
- Biden announced to spend up to **\$174 billion** to drive the **switch to electric vehicles** by lowering the cost of EVs through **tax credits, incentives and rebates**

Take-away

- Overall, efforts in next gen mobility is largely **driven by governmental regulations & incentives**
- Starting from the same point & intention, regions **differ in implementation strategy & enforcement**
- **Europe** leading the charge into **EV mobility**, while **China & US** focusing strongly on **Autonomous Driving** and **Urban mobility**

Major players driving pivotal change in industries such as automotive, tech & energy



Disruptor

- BEV OEM over the complete value chain of electric vehicles
- Disrupted the complete automotive powertrain market & triggered the EV hype

Tech Giant

- Waymo offers tech-enabled self-driving technology for mobility
- Achieved the world's first fully self-driving trip on public roads in a car without a steering wheel or pedals

Alphabet



Disruptor

- Developer & provider of EVs
- Development of battery technology and manufacturing of new energy vehicles (NEV)
- Producer of non toxic iron phosphate batteries

Energy Network

- Energy revolution company: world's leading cloud-enabled EV charging station network
- It designs, develops and manufactures hardware & software solutions and integrates the chargers with cloud-enabled services

-chargepoint+

DAIMLER

Mainstream OEM

- Investment of €70 bn to accelerate the transformation towards electrification and digitization
- Strategic cooperation with Bosch regarding autonomous driving

Metamorphosis

- High investments in renewable & low carbon energy, hydrogen and new decarbonization technologies
- Recently took 33.3% stake in BMW/Daimler EV charging venture Digital Charging Solutions



First Mover

- Pioneer in developing PHEV & FCEV (since 1990s) and showed long breath in R&D
- Prius: first mass produced hybrid car 1997
- Mirai: first mass produced FCEV in 2002

Logistics & Supply Chain

- Partnerships with other high tech companies and automakers to boost the development of smart mobility
- "The Joint Innovation Base" (Alibaba Cloud Innovation Center & BMW Startup Garage)

阿里巴巴 
Alibaba.com™

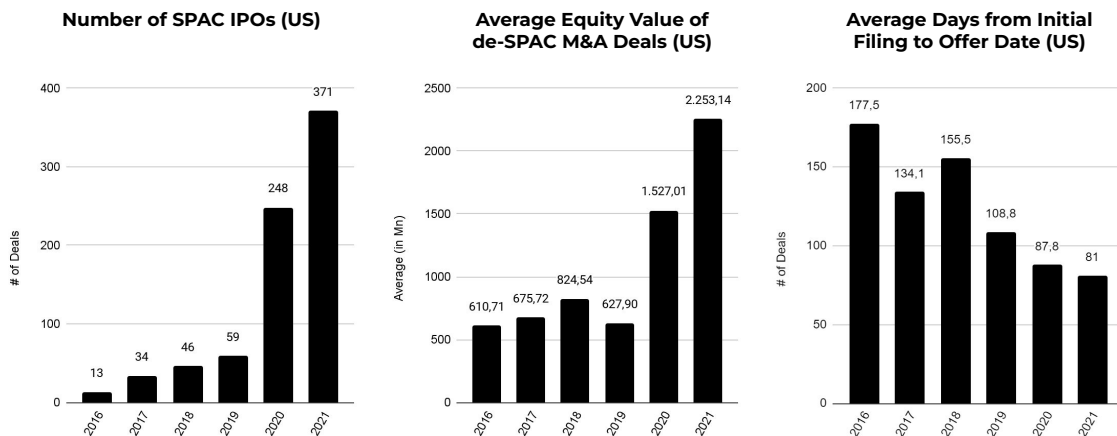
An increasing number of SPACs up until 2021 has accelerated exit volume in the MobilityTech market

SPAC

- A Special Purpose Acquisition Company (SPAC) files for an **IPO first**, and then has **two years** to find a target company to acquire through a “Reverse Merger”
- For the target company, this means an **earlier exit**, more **time for management** instead of fundraising efforts, and often higher valuation by **removing underpricing** of traditional IPO
- Mobility sector is a **capital-intensive business** - raising capital via SPAC means **less shareholder dilution** or **giving up less equity** in comparison to VC funding
- The **SPAC process** allows startups to use **revenue projections** to entice investor demand, which the **SEC doesn't allow** to do in the **IPO process**
- As of August 2020, SPACs held about **\$60 bn** of capital (across 100+ SPACs) & made up **81 out of 111 US IPOs**

Overall Special Purpose Acquisition Companies

from 2016 to 2021



Take-Away

- SPACs dominate EV market as they **promise earlier exits** and **higher valuations** than IPOs
- Average **equity value** more than **3X from 2016**, while **average days** from filing to offer date was **reduced by half**

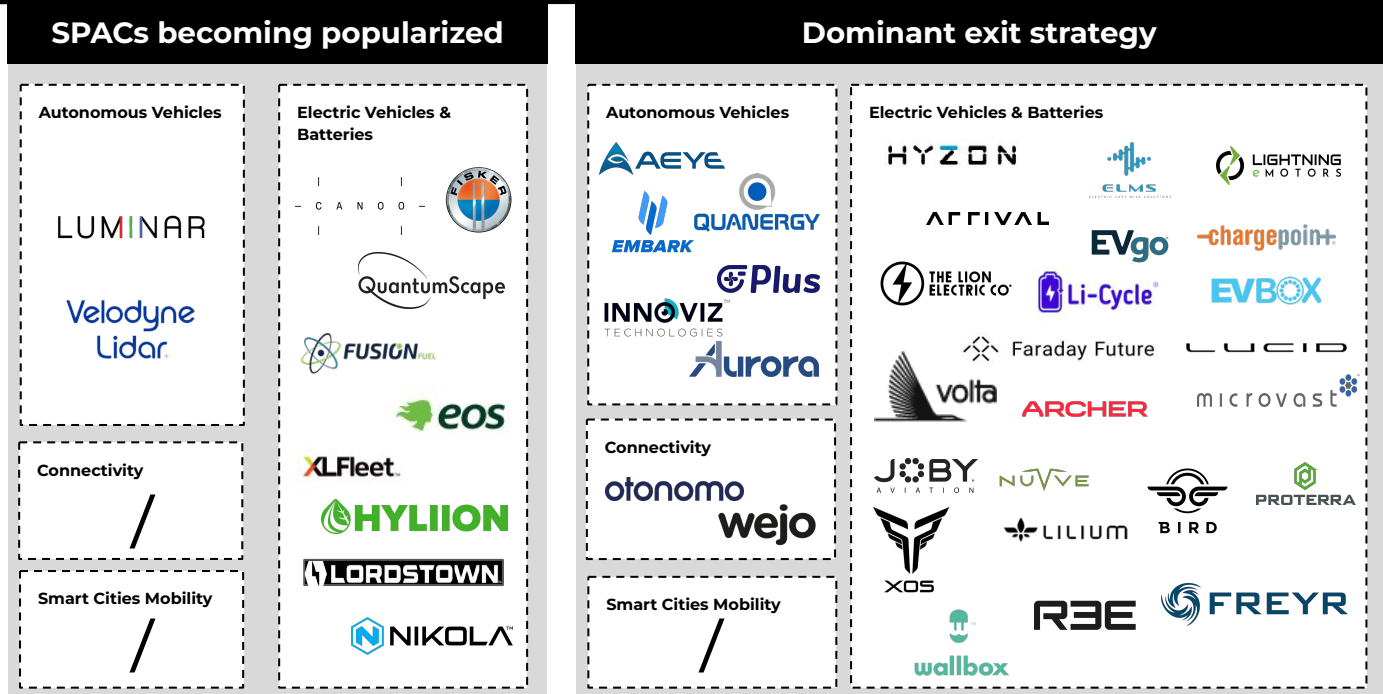
SPACs were an increasingly dominant exit strategy especially in the Electric Vehicles market from 2018 - 2021

2018

2020

2021

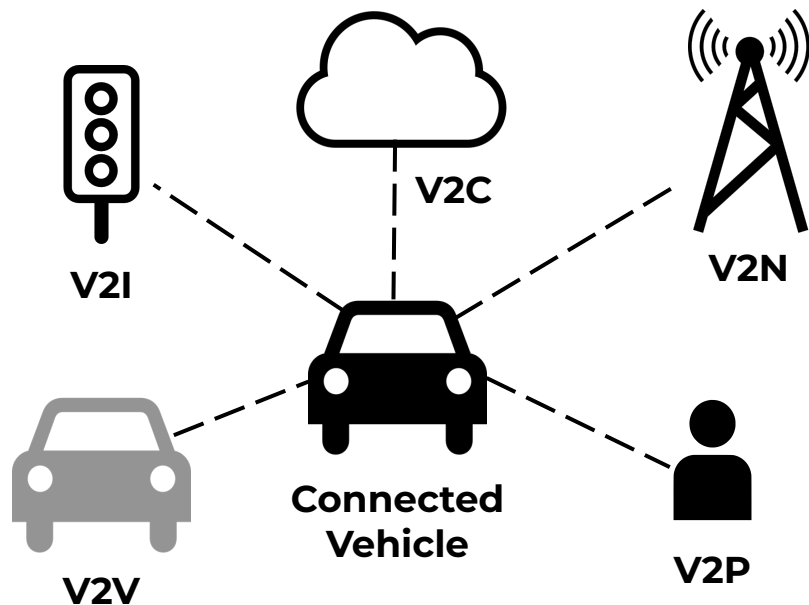
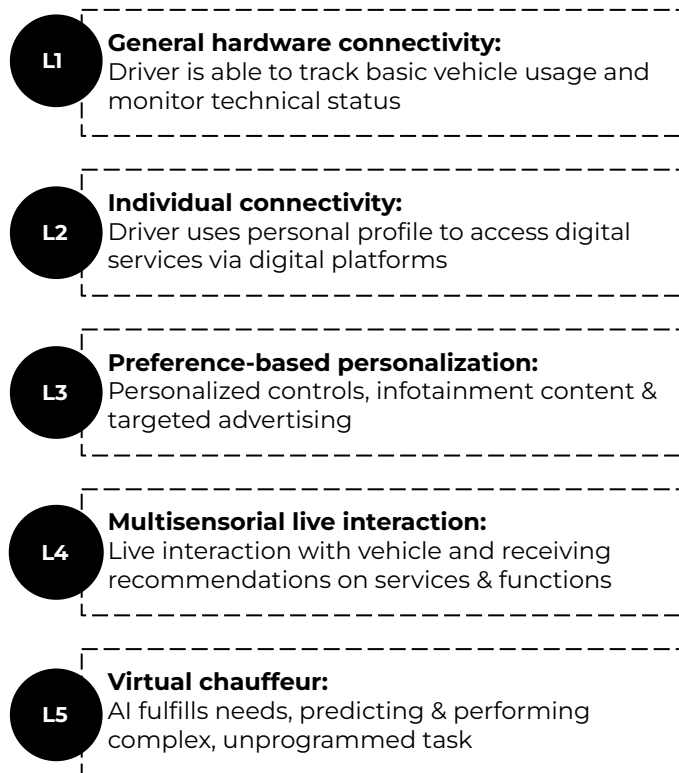
From 2018 on, overall **105 SPAC** mergers, but **only one** within **Next Gen mobility** market



Connectivity

Introduction
Fleet Management
Connected Car Data Platform
Advanced Driver Assistance Systems

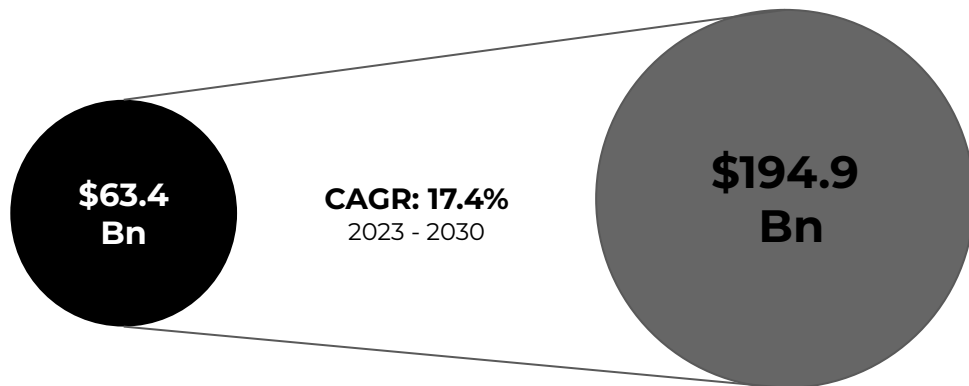
5 levels of Connectivity enriching consumer experience & widening potential for new business opportunities



Take-away

- **By 2030, 45%** of global new car sales could be at **level 3 or above** in connectivity
- **Shift** from a mere **mode of transport** to a **multimedia environment**

By 2025 more than 75% of all new cars sold will be connected in one way or another



Market Trends

- **Technological advancements** in **sensors, processors & GPS** for real-time data collection & analytics
- **Governments mandating** various Advanced Driver Assistance Systems (**ADAS**) and **safety** features
- **Data** being stored in **connected clouds**

Market Driver



Regulations
& Incentives



AI



5G



Cybersecurity



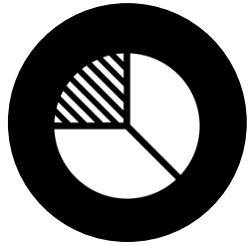
Blockchain

Take-away

- **China** exhibits the **highest growth** regarding **adoption rate** of connected vehicles, number of **digital customers & highest level of innovation** in this area
- **Artificial Intelligence, blockchain & 5G** will combine to enable sophisticated customer services, while **cybersecurity** will determine acceptance of connected vehicles
- The market can be divided into the subsegments **Vehicle Telematics, Infotainment, Safety & Security** and **Data Platforms**

Subsectors of the Connected Vehicle market exhibit double digit growth over the coming years

Fleet Management



\$29.5 Bn

Market Size
2021 - 2030

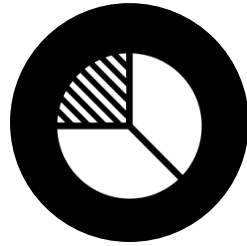
\$80.7 Bn



15.5%

CAGR
2021 - 2030

Connected Car Data Platform



\$9.95 Bn

Market Size
2021 - 2030

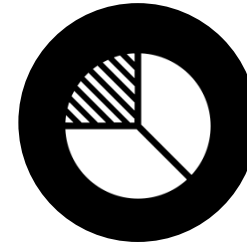
\$23.9 Bn



13.0%

CAGR
2021 - 2030

ADAS



\$27.75 Bn

Market Size
2021 - 2030

\$89.6 Bn



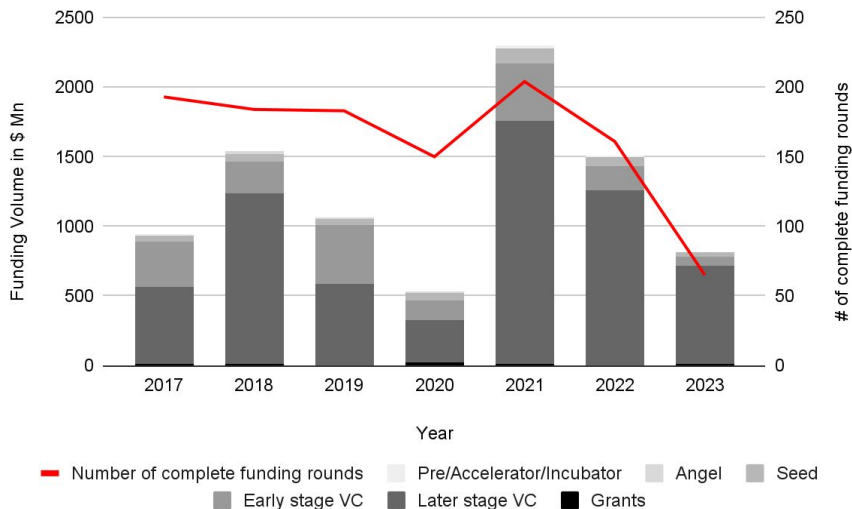
18.7%

CAGR
2021 - 2030

Fleet Management



Funding in Fleet Management rose by 4.5x in 2021 and then continuously declined with the overall venture market



of Companies
total / funded

2.827 / 749

of Acquisitions

368

of IPOs

22

Investment Volume
last 24 months

\$3.8 Bn

Notable Corporates:

Notable Exits:

Routematch
acquired by Uber
(undisclosed)
07/2020

Eroad
IPO
09/2020

Notable Investors:

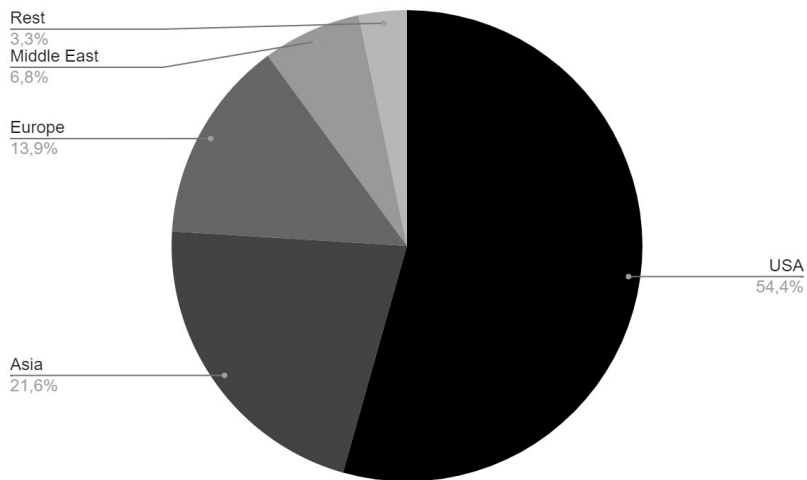
SEQUOIA VC Fund

GOV.UK
Government Wealth Fund

Fleet Management solutions find key use cases in the logistics and construction industries

Capital Invested by Global Region

by region in %



Top 10 Venture Rounds

by Funding Amount

Startup Name	Funding in Mn	HQ Location
Keking	\$1000.00	China
EquipmentShare	\$300.00	USA
EquipmentShare	\$290.00	USA
Sennder	\$240.00	Germany
EquipmentShare	\$226.08	USA
Motive	\$190.00	USA
Nauto	\$159.00	USA
Astera Labs	\$150.00	USA
EquipmentShare	\$150.00	USA
Motive	\$150.00	USA

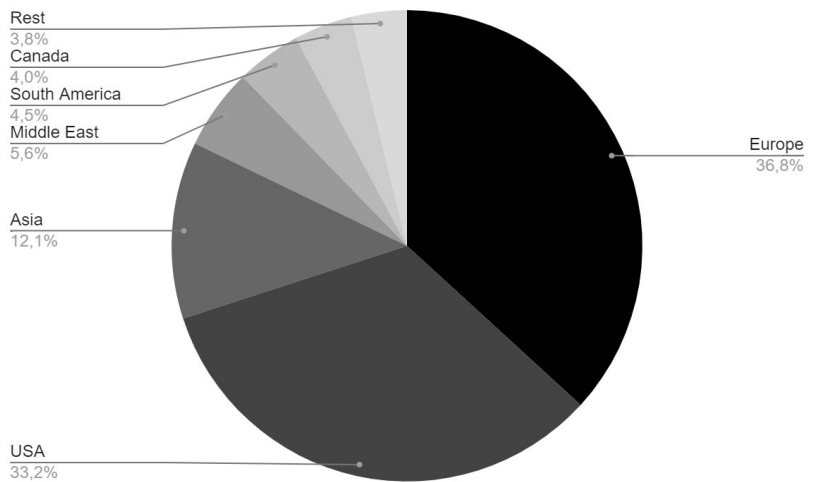
Take-away

- The **United States** dominates fleet management investments, representing **54% of the capital invested** and participating in **8 out of the top 10 funding rounds**.
- **EquipmentShare**, an American company, played a significant role in this observation, with **4 out of the top 10 funding rounds**, totaling approximately **\$966 million**.

Government funding is largely driving investments in Fleet Management in Europe

Deal Count by Global Region

by region in %



Take-away

- Despite the **USA** having **five of the top ten investors** in the sector in recent years, it's noteworthy that **Europe** has seen the **highest proportion of venture deals (36.8%)** flowing into fleet management.
- This suggests that in **Europe**, investments in the fleet management sector are distributed across **multiple smaller tickets** rather than being concentrated in a few large investments.

Top 10 Investors

by Deal Count

Investor Name	Deal Count	HQ Location
Plug&Play Tech Center	28	USA
Techstars	24	USA
500 Global	14	USA
Enterprise Lands	14	Ireland
Y Combinator	13	USA
Accel	12	USA
Bossonava	11	Brazil
LVenture Group	11	Italy
Innovate UK	10	UK
Insight Partners	10	USA

Platform Science

Search Field	Fleet Management (Trucks)
Location	San Diego, US
Year Founded	2014
Funding in \$ Mn.	\$300.77 Mn
Last Round & Stage	\$100 Mn Series C1 (04.2023)
Investor	Plug and Play, Daimler, Prologis, 8VC
Website	platformscience.com

Business Overview

- Centralizes **vehicle data**, Wi-Fi/Bluetooth connectivity, driver displays, software, and driver context into a **single platform**, enabling fleets to **optimize & scale** operations holistically
- Users can **monitor & analyze** their **driver & fleet performance**, manage **compliance** and receive **data-driven insights**

Use case & partners

- Eliminates **delays, costs** and **inconveniences**
- Drivers will need only an **authorized mobile device** to log into their telematics system
- **Strategic partnerships** with **Daimler, Samsung Electronics**, TeamViewer & Schneider

Similar Companies

- **Samsara** (2015, Series F (\$930 Mn), Andreessen Horowitz, Tiger Global Management, et al.)
- **Fleetmatics** (2004, Acquired (\$2.4 Bn), Verizon)

Business Overview

- Provides a platform on a **pay-per-use** basis where users can upload **job sheets, delivery addresses, drivers & vehicle information**
- Analyzes data & gives out **optimized route** for **dispatching** process
- View **drivers, routes & delivery status** through a central dashboard

Use case & customers

- Cutting **costs by 30%**, optimizing **efficiency by reducing planning time by 90%** and improving CO2-emissions **by 21%** in cargo logistics
- Customers include **CargoLine, Hartmann International**, Emons & Metro

Similar Companies

- **RouteMatch** (1999, Acquired (Undisclosed), Uber)
- **SimpliRoute** (2014, Series A (\$3.41 Mn), TheVentureCity, 500 Startups)

Smartlane

Search Field	Route Planning & Dispatching
Location	Munich, DE
Year Founded	2015
Funding in \$ Mn.	\$5.15 Mn
Last Round & Stage	\$5.09 Mn Series A (01.2022)
Investor	Freigeist Capital, MobilityFund, WERK1, Next Logistics Accelerator
Website	smartlane.de



PLATFORM
SCIENCE

Fleet
Management

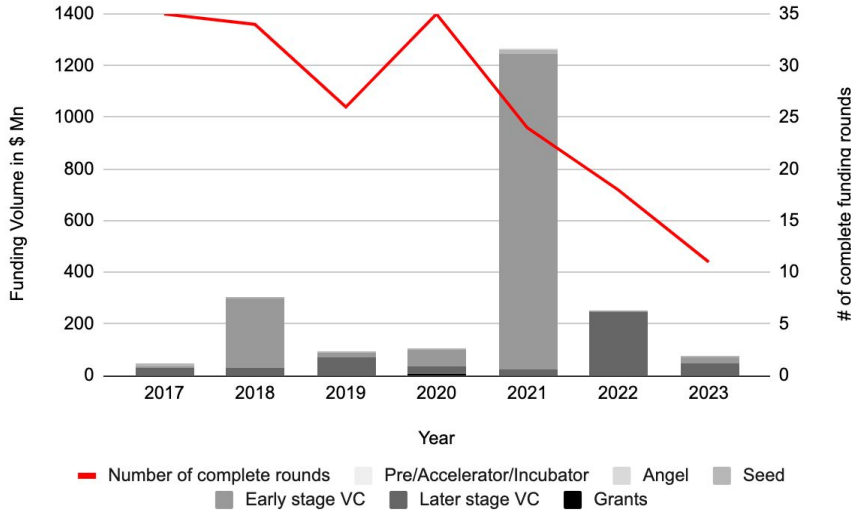
Fleet
Management



SMARTLANE

Connected Car Data Platforms

Many startups are still in early stages and corporates are seeking to make strategic investments



of Companies
total / funded

255 / 164

of Acquisitions

45

of IPOs

8

Investment Volume
last 24 months

\$1.6 Bn

Notable Corporates:

Notable Exits:

mobikit
acquired by Azuga (undisclosed) 03/2021

TELENAV
IPO 05/2010

Notable Investors:

PLUGANDPLAY
Accelerator

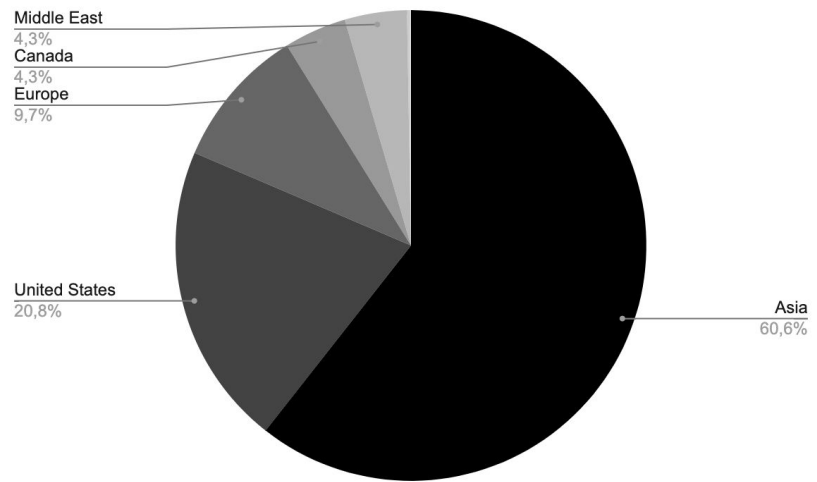
500 STARTUPS
VC Fund & Accelerator

Verizon Ventures
CVC

Almost 80% of startups in the sector are still in their early stages of development

Capital Invested by Global Region

by region in %



Top 10 Venture Rounds

by Funding Amount

Startup Name	Funding in Mn	HQ Location
Nanjing LingHang Technology	\$1196.27	China
Banma Network	\$234.00	China
Aurora Labs	\$63.00	Israel
INRIX	\$55.00	USA
HiveMQ	\$43.04	Germany
P97 Networks	\$40.66	USA
Motorq	\$40.00	USA
INRIX	\$37.00	USA
Nebula Link	\$31.48	China
Mojio	\$30.23	Canada

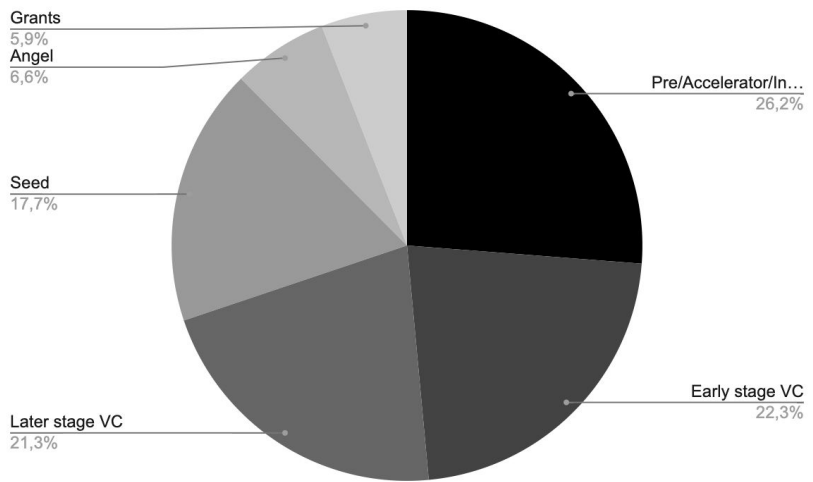
Take-away

- The **funding volume for Asian startups** is much **more concentrated** on individual startups, while in the **US and Europe many startups** are **raising many small funding rounds**
- **Aurora Labs** an **OTA update startup** working on **software defined vehicles** has entered **partnerships with Deloitte** and NTT, while also receiving **funding from Porsche, Toyota and LG**

Corporates are looking to identify strategic investment opportunities in early stages

Deal Count by Global Region

by region in %



Top 10 Investors

by Deal Count

Investor Name	Deal Count	HQ Location
Plug and Play Tech Center	13	USA
Techstars	7	USA
FM Capital	6	USA
Innovate UK	6	UK
Acorn Ventures	5	USA
Qualcomm Ventures	5	USA
August Capital	4	USA
Intel Capital	4	USA
Relay Ventures	4	Canada
Shell Ventures	4	Netherlands

Take-away

- **Major corporations**, especially semiconductor and chip producers, are **investing in the connected car** data platform segment. Porsche, Alibaba, Amazon and Shell are also key investors in the space
- **Well known investors** including **Andreessen Horowitz**, Alumni Ventures, **Venrock** and Earlybird find **attractive investments** in the segment as well

Connected Car
Data Platforms

Mojjo

Search Field	Cloud Data Platform
Location	Vancouver, CA
Year Founded	2012
Funding in \$ Mn.	\$101.95 Mn
Last Round & Stage	undisclosed (11.2022)
Investor	Bosch, Innogy, T-Mobile US, Kensington Capital, Amazon
Website	mojjo.io

Business Overview

- **Hardware-agnostic** connected car platform for **wireless network operators, automakers, and mobility services**
- Syncs with any standard telematics device to **collect OBD, acceleration, and location data** & makes it **available** to applications **via open APIs**

Use case & partners

- Use cases include **fleet management**, automated **parking payments**, car **maintenance**, and **real-time traffic updates**
- **Strategic partnerships** with **T-Mobile** for better **5G connectivity** & with **Bosch** for providing **connected mobility solutions for OEMs**

Similar Companies

- **Otonomo** (2015, SPAC, Bessemer, Dell Technologies Capital, Plug and Play)
- **Wejo** (2013, SPAC, General Motors, Hella Ventures, Palantir)

Business Overview

- Provides **AI-enabled remote software** for connected vehicles
- Uses **machine learning** to **analyze risks** and **changes in software functionality & behavior** of **in-vehicle software**
- Enables **updating software** in vehicles **wirelessly (OTA)**

Use case & partners

- Enables **detection of faults** at a line-of-code for **shorter development cycles** and quick updating for **fast prototyping**
- **Strong partnerships** with **Toyota & Porsche** for implementing repairing software solution within OEM's vehicles

Similar Companies

- **Avrios** (2015, Series B (\$26.3 Mn), Notion, Swisscom Ventures, LakeStar, Verve Capital)
- **Sibros** (2018, Series A (\$15.5 Mn), Moneta Ventures, Nexus Venture Partners, Twin)

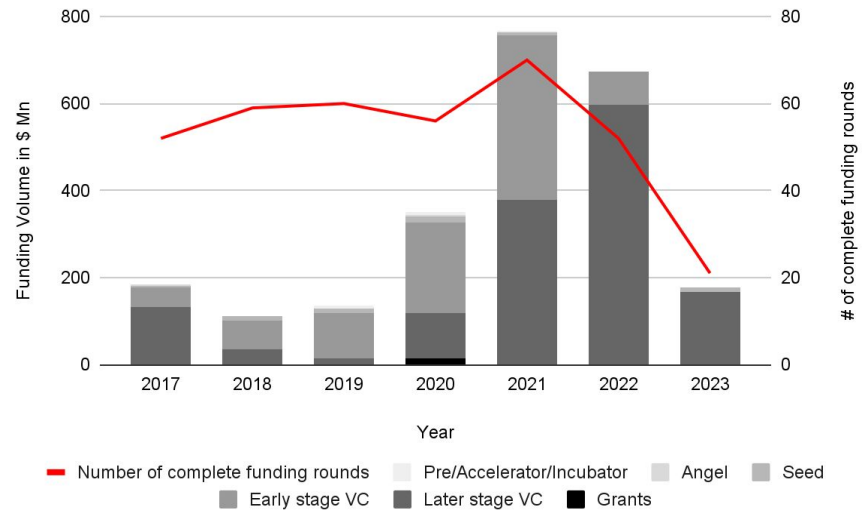
Aurora Labs

Search Field	OTA Platform
Location	Tel Aviv, IL
Year Founded	2016
Funding in \$ Mn.	\$97.1 Mn
Last Round & Stage	undisclosed (10.2022)
Investor	Toyota, Porsche, LG Technologies, Plug and Play
Website	auroralabs.com

Connected Car
Data Platforms

— ADAS —

Funding in the ADAS segment took off together with the autonomous driving hype and now focuses on later stages



of Companies total / funded

766 / 174

of Acquisitions

98

of IPOs

30

Investment Volume last 24 months

\$1.74 Bn

Notable Corporates:

Notable Exits:

DEEPMOTION acquired by **Xiaomi** (undisclosed) 07/2021

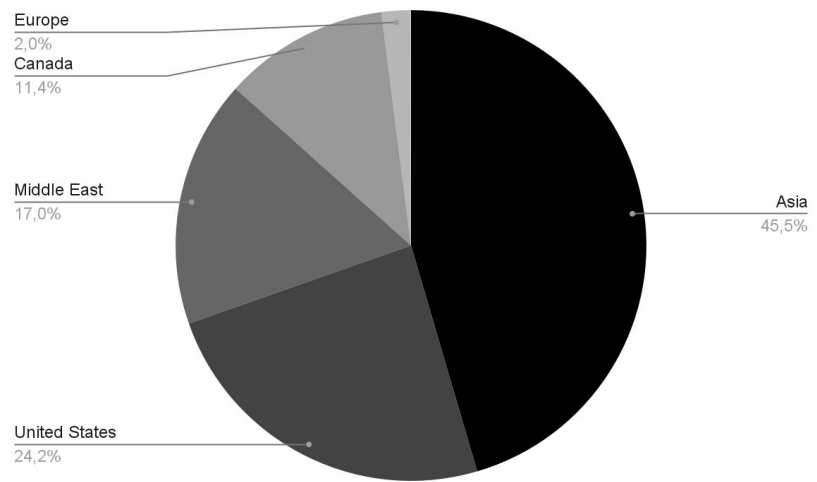
CARMEQ acquired by **Volkswagen** (undisclosed) 12/2020

Notable Investors:

Asian startups have received a majority of the funding due to fewer regulations for autonomous driving

Capital Invested by Global Region

by region in %



Top 10 Venture Rounds

by Funding Amount

Startup Name	Funding in Mn	HQ Location
Soterea	\$204.84	China
Applied Intuition	\$175.00	USA
LeddarTech	\$140.00	Canada
LeddarTech	\$130.00	Canada
Applied Intuition	\$125.00	USA
AutoBrains	\$120.00	Israel
FreeTech	\$100.00	China
FreeTech	\$100.00	China
Yi Technology	\$73.00	China
Geometrical-Pal	\$62.00	China

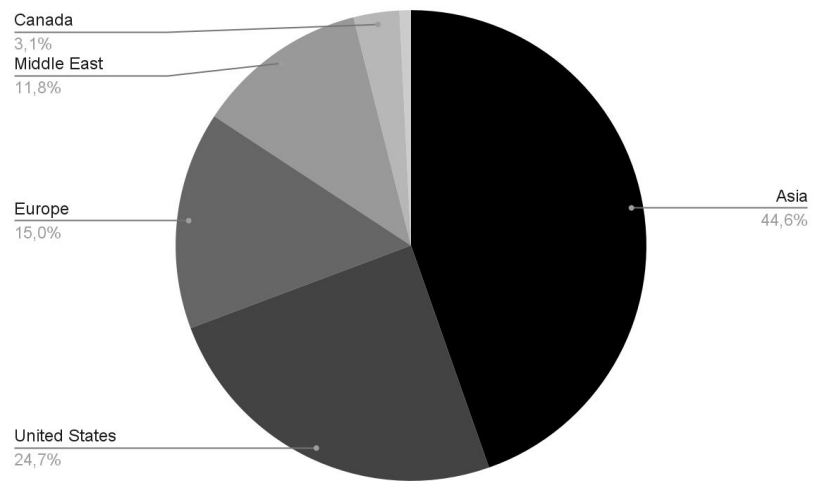
Take-away

- The **most startups - 46** - in the sector **were founded in 2016**, while **only 8 new startups** have emerged **since 2022**.
- Tel Aviv-based **AutoBrains** is **challenging MobilEye** for a **market leader** position in Autonomous Driving and **ADAS solutions**. The startup is **backed by** investors including **BMW, Continental** and **Knorr-Bremse**.

Especially Car Manufacturers and Tier 1 automotive suppliers are seeking strategic investments

Deal Count by Global Region

by region in %



Take-away

- A majority of the **largest funding rounds** were raised at the **peak** of the venture capital hype **in 2021**. Especially **companies offering** solutions to enable **autonomous driving** were **in high demand**.
- **109 out of 627 investors** in the ADAS segment are **Corporate Venture Capital funds** seeking to make strategic investments.

Top 10 Investors

by Deal Count

Investor Name	Deal Count	HQ Location
Plug and Play Technology	11	USA
BDC Capital	5	Canada
Techstars	5	USA
Andreessen Horowitz	5	USA
Baidu Ventures	4	China
Continental	4	Germany
Baidu Ventures	4	USA
OurCrowd	4	Israel
Quiming Venture Partners	4	China
BMW i Ventures	3	Germany



Envisics

Search Field	AR-enabled HUD
Location	Milton Keynes, UK
Year Founded	2017
Funding in \$ Mn.	\$102 Mn
Last Round & Stage	\$50 Mn Series C (02.2023)
Investor	Hyundai Mobis, GM Ventures, SAIC Capital, Tarsadia Investments
Website	envisics.com

Business Overview

- HUD projects **speed, safety** alerts, **turn** signals, and **pedestrian & navigation** alerts on the windshield
- Information can appear anywhere from **20 to 130 meters** in front of the car, giving the illusion that it's right on the road
- Uses brighter **colors** & higher **resolution**

Use case & partners

- Enables better **control** and an enhanced **driving experience** that **improves safety**
- Product is **40% smaller** and **50% more energy efficient** than conventional HUDs
- Working with a number of **OEMs and Tier-1 suppliers** to deploy their HUDs in new vehicles

Similar Companies

- **DigiLens** (2003, Series C (\$149 Mn), Continental, Samsung Ventures, Sony, Citi)
- **WayRay** (2012, Series C (\$98 Mn), Alibaba, Porsche, Hyundai, SAIC; Plug and Play)

Business Overview

- Features **vehicle sensing** for collision avoidance, autonomous **braking**, cruise control, **lane sensing** for lane assistance and lane departure warning, **pedestrian sensing**, **object sensing** and **traffic light** recognition
- **In-cabin sensing** technology is able to **analyze behaviors** of passengers & drivers

Use case & partners

- Provides **ADAS** solutions for **L1 and L2 autonomous driving** functions
- Strategic partnerships with major Chinese automotive companies like **Dongfeng, Shaanxi Automobile, BYD, and JAC**

Similar Companies

- **MobilEye** (1999, Acquired (\$15.3 Bn), Intel)
- **Light** (2013, Series D (\$186 Mn), GV, Softbank Vision Fund, Bessemer Ventures)

MiniEye

Search Field	AI-based ADAS
Location	Shenzhen, CN
Year Founded	2013
Funding in \$ Mn.	\$71.4 Mn
Last Round & Stage	\$15.16 Mn Series D3 (05.2022)
Investor	Microsoft Accelerator, CICC Alpha, Puhua Capital, Yuan Jing Capital
Website	minieye.cc



ADAS

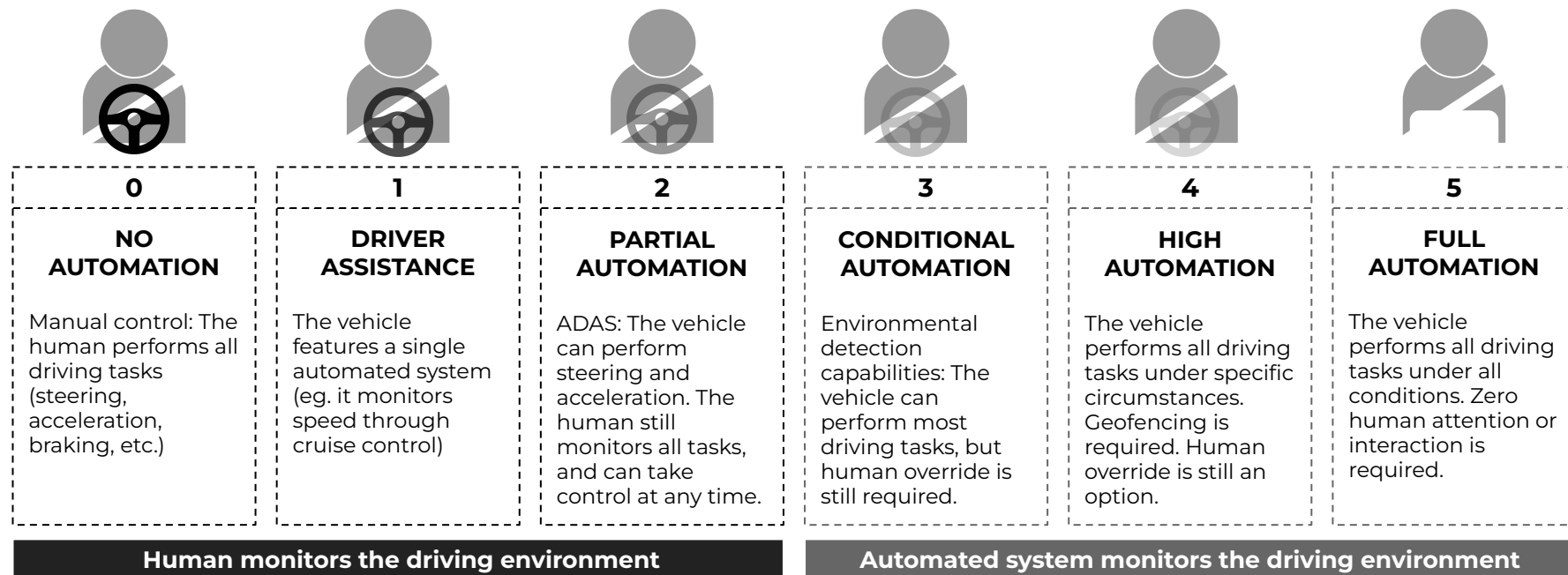
ADAS



Autonomous Vehicles

Introduction
Perception
Mapping
Training Data

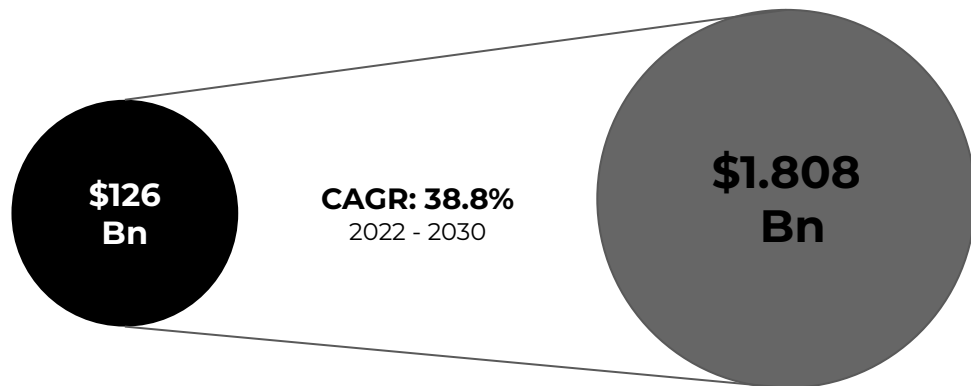
Autonomous Vehicles can be categorised into 6 levels of driving automation



Take-away

- **Currently**, the market is still dominated by **Level 0-2 automated vehicles**
- Although **Level 4 & Level 5** autonomous vehicles are **unlikely to reach** wide acceptance **by 2030**, there will be **rapid growth** for **Level 2 & Level 3 autonomous cars**
- Once **technological** and **regulatory issues** have been resolved, up to **15% of new cars sold in 2030** could be **fully autonomous**

Up to 15% of new cars sold in 2030 could be fully autonomous in a high-disruption scenario



Market Trends

- **Government initiatives** for **safer** more **sustainable** driving influencing the **adoption rate** of these vehicles
- Growing **safety concerns** & advancements in **AI & LiDAR** technologies have led to the **penetration** and **acceptance** of AVs

Market Driver



Regulations
& Incentives



AI



5G



Cybersecurity



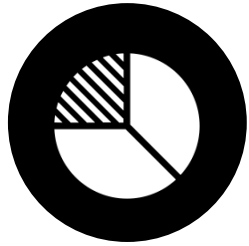
Blockchain

Take-away

- In 2022, **North America** had the **highest market share of 46%**, followed by **Europe & APAC**
- **Europe** is predicted to experience the **highest annual growth rate with 42.6%** for the autonomous car market in the coming years due to **shifting consumer preferences** towards **automated products** along with **rising adoption of autonomous vehicles**
- **Level 4** vehicles can operate in **self-driving mode**, but until **legislation & infrastructure** evolves, they can only do so within a **limited area** - known as **geo-fencing**

Autonomous Vehicle market growth fueled by Perception, Mapping & Training Data

Perception

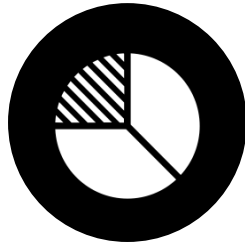


\$ 12.1 Bn

Market Size
2022 - 2030

\$ 22.05 Bn

Mapping

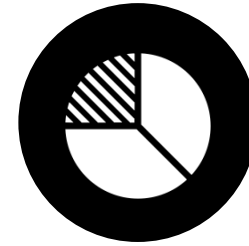


\$ 9.1 Bn

Market Size
2022 - 2030

\$ 25.3 Bn

Training Data



\$ 1.7 Bn

Market Size
2022 - 2030

\$ 8.1 Bn



7.8%

CAGR
2022 - 2030



13.7%

CAGR
2022 - 2030

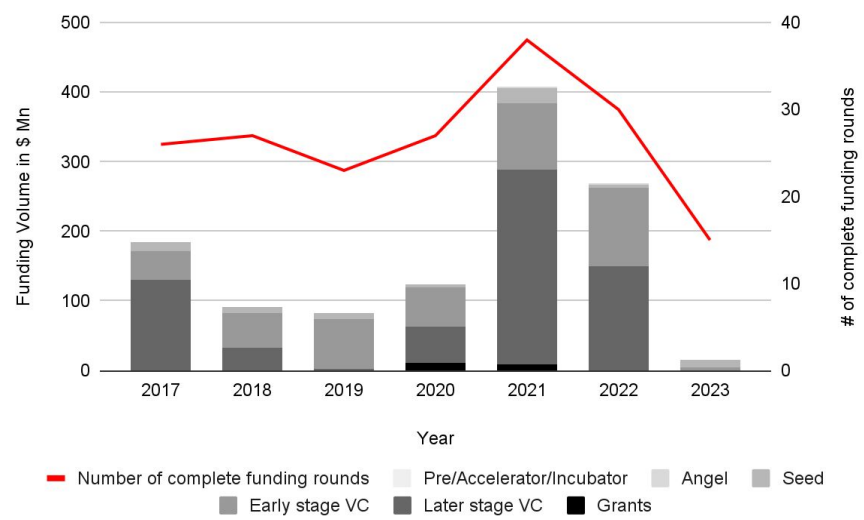


21.6%

CAGR
2022 - 2030

— Perception —

Perception technology requires large funding volume & deep technological know-how



of Companies total / funded

123 / 66

of Acquisitions

6

of IPOs

1

Investment Volume last 24 months

\$427 Mn

Notable Corporates:

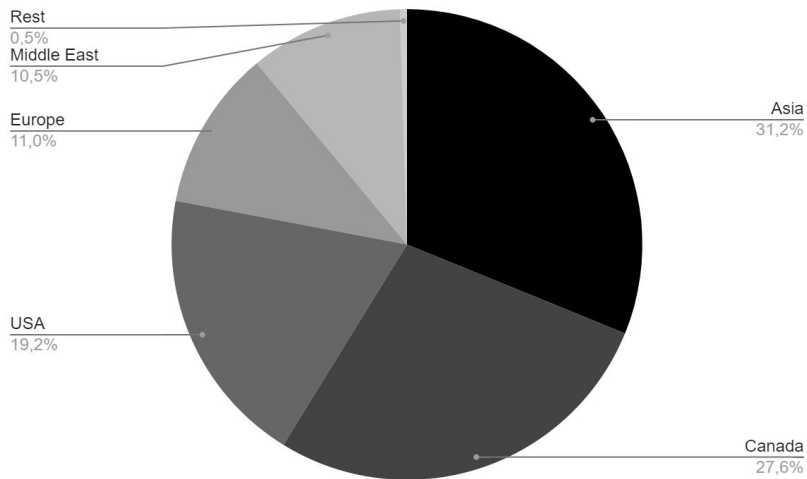
Notable Exits:

Notable Investors:

Canada Emerges as a Strong Contender in the Perception VC Market with LeddarTech's Leading Presence

Capital Invested by Global Region

by region in %



Top 10 Venture Rounds

by Funding Amount

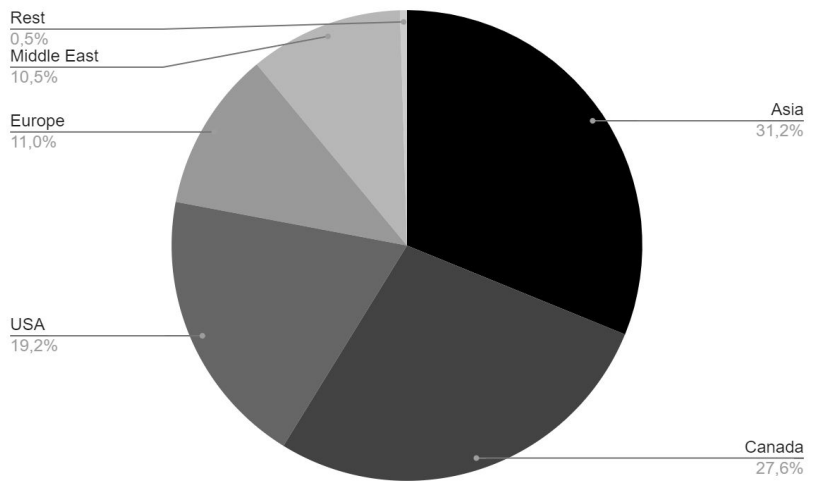
Startup Name	Funding in Mn	HQ Location
LeddarTech	\$140.00	Canada
LeddarTech	\$130.00	Canada
TriEye	\$74.00	Israel
Ambient.ai	\$52.00	USA
Recogni	\$48.90	USA
NextVPU	\$42.72	China
Minieye	\$40.01	USA
ZOHETEC	\$39.28	China
Malong Technologies	\$33.00	China
V7	\$33.00	UK

Take-away

- Besides the VC giants in Asia, **Canada** is currently emerging as a pioneer in the perception market, especially due to the **successful funding rounds of the company LeddarTech**. With their **\$130 million and \$140 million rounds**, they occupy the top two positions in the Top 10 Venture Rounds.

Global Investor Diversity Reflects Broad Interest in Perception Market and Emerging Opportunities

Deal Count by Global Region
by region in %



Take-away

- Among the top investors, there is a **diverse pool** consisting of traditional **VC funds** such as **Plug and Play Tech Center**, **corporate venture capital** divisions like **Toyota Ventures**, and **governmental organizations** such as the **European Commission**

Top 10 Investors
by Deal Count

Investor Name	Deal Count	HQ Location
YourNest VC	9	China
Amadeus Capital	6	UK
Plug&Play Tech Center	6	USA
Toyota Ventures	6	USA
SFC Capital	5	UK
Y Combinator	5	USA
BDC Capital	4	Canada
CAS Star	4	China
Bee Partner	3	USA
European Commission	3	Belgium

Cepton

Search Field	LiDAR-based Positioning Sensors
Location	San Jose, USA
Year Founded	2016
Funding in \$ Mn.	\$226.5 Mn
Last Round & Stage	\$100 Mn PIPE (01.2023)
Investor	Plug and Play, Koito Manufacturing, LDV Partners
Website	cepton.com

Business Overview

- Patented MMT®-based **lidar technology** enables reliable, **scalable** and **cost-effective** solutions that deliver **long range**, high resolution **3D perception** for smart applications
- Secured **industry's largest ADAS lidar series production** win with **Ford** paving the way for **mass-market adoption** of lidar technology

Use case & partners

- Lidar sensors enabling safety and **Level 4 autonomy** (Robotaxis, self-driving trucks, etc.)
- Used in **autonomous vehicles & smart cities**
- Partners include **Ford, NVIDIA, Bertrandt, Koito & dSpace**

Similar Companies

- LeddarTech** (2007, Series C (Undisclosed), OSRAM, Delphi Automotive, Go Capital)
- Innovusion** (2016, Series B (\$64 Mn), Temasek, Eight Roads Ventures, Weilai Capital)

Business Overview

- Enabling **real-time object recognition** for self-driving cars
- Develops **visual perception platform**, purpose built for autonomous vehicles, allowing vehicles to **detect small objects** at **long distances**, make **driving decisions faster** than humans with **minimal battery power**

Use case & customers


- Used in **autonomous** driving, drones & robots
- OEMs **will** have **perception capabilities** for **any level of autonomy**
- Enabling **chips** from **Continental** to perform **100 times better** through **cooperation**
- Partnering with **BMW, Toyota & Continental**

Similar Companies

- Cortica** (2007, Series C (\$20 Mn), Horizon Ventures, GEM Asset Management)
- BlinkAI** (2018, Seed (\$2.4 Mn), Plug and Play, MIT Startup Exchange)

Recogni

Search Field	AI-powered Perception Chips
Location	San Jose, US
Year Founded	2017
Funding in \$ Mn.	\$73.9 Mn
Last Round & Stage	\$48.9 Mn Series B (02.2021)
Investor	BMW i Ventures, Robert Bosch Venture Capital, Toyota AI Ventures, Continental
Website	recogni.com

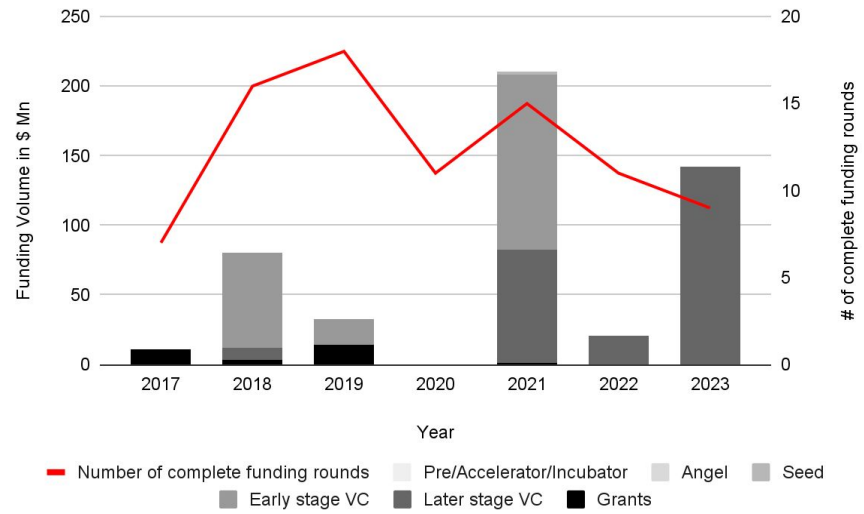
Perception Perception 



Mapping



Funding volume in the Mapping segment shows no clear investment trend but a few strategic investments



of Companies
total / funded

89 / 38

of Acquisitions

21

of IPOs

10

Investment Volume
last 24 months

\$352 Mn

Notable Corporates:

Notable Exits:

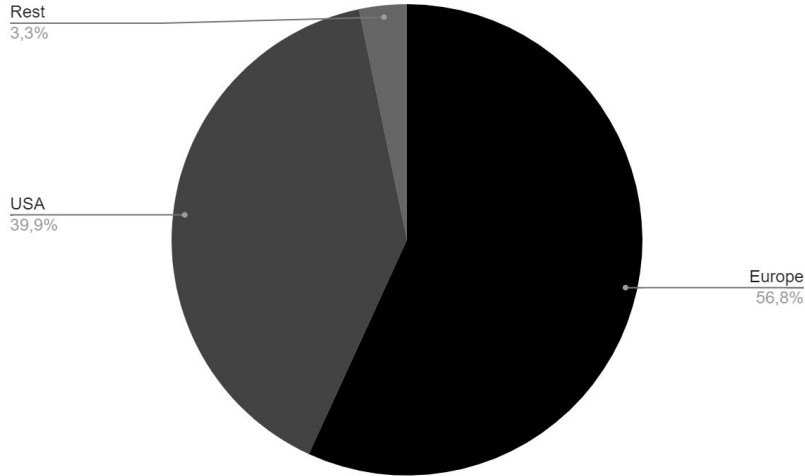
here
acquired by **BMW, Daimler, Audi**
(\$3.07 Bn)
08/2015

DEEPMAP
acquired by **NVIDIA**
(Undisclosed)
06/2021

Notable Investors:

Oxbotica is largely driving funding in the sector and has entered partnerships with ZF, Applied EV and BP

Capital Invested by Global Region
by region in %



Take-away

- The British company **Oxbotica**, founded in **2014**, stands out as a flagship mapping startup in the industry. With over **\$250 million in investments** and a **valuation of approximately \$725 million**, Oxbotica contributes to **Europe's** position as a **leading region in terms of invested capital**.

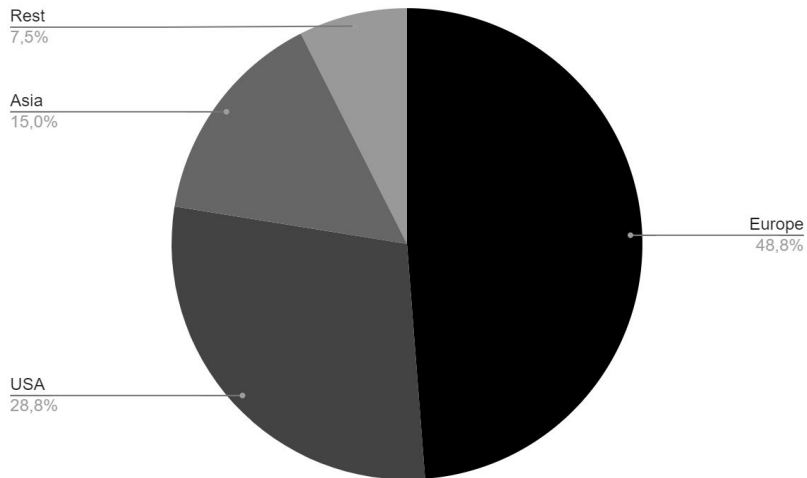
Top 10 Venture Rounds
by Funding Amount

Startup Name	Funding in Mn	HQ Location
Oxbotica	\$140.92	UK
Kodiak	\$125.00	USA
Oxbotica	\$67.98	UK
Kodiak	\$40.00	USA
Oxbotica	\$18.16	UK
Unified Compliance Framework	\$16.50	USA
TheBrain Technologies	\$16.00	USA
Oxbotica	\$15.84	UK
Oxbotica	\$14.00	UK
Oxbotica	\$13.73	UK

Tier 1 automotive supplier ZF, insurance company AXA and tech giant Tencent stand out as investors in the segment

Deal Count by Global Region

by region in %



Take-away

- Similar to the invested capital, **Europe** also proves to be a **global leader in the number of funding rounds conducted**. The **UK's government-backed investor, Innovate UK**, and the **British VC fund, IP Group**, emerged as the top players with a combined total of **7 deals in the mapping sector**.

Top 10 Investors

by Deal Count

Investor Name	Deal Count	HQ Location
IP Group	4	UK
Innovate UK	3	UK
AXA XL	2	USA
Battery Ventures	2	USA
ZF Ventures	2	Germany
BP Ventures	2	UK
CRV	2	USA
Lightspeed Venture Partners	2	USA
Tencent Holdings	2	China
Halma	2	UK

Dynamic Map Platform

Search Field	3D Mapping
Location	Tokyo, Japan
Year Founded	2016
Funding in \$ Mn.	\$334.47 Mn
Last Round & Stage	undisclosed (09.2021)
Investor	Mitsubishi Electric, Japan Infrastructure Initiative
Website	dynamic-maps.co.jp

Business Overview

- Provider of high-precision **3D map data** (HD maps) for **nationwide expressways, motorways** and other **general roads**
- Gathers **data from satellites**, creates **point clouds with a mobile mapping system**, records **geographic objects** from point clouds, and integrates the data to create 3D maps

Use case & customers

- **Contribution to Honda's Level 3 autonomous driving vehicle "Legend"**
- Many **automobile manufacturers** as customers, such as Suzuki, Subaru, Toyota, Mazda, Nissan, Mitsubishi and Honda

Similar Companies

- **GeoDigital** (2005, Series A (\$5.79 Mn), GM Ventures, Meyer Ventures, Mertz Holdings)
- **3D Planeta** (2018, Seed (\$1 Mn), New Brunswick Innovation Foundation)

Business Overview

- Provides a **cloud-based custom map building platform** for developers to include mapping in their applications
- Wide application fields for automotive industry: **ADAS + HD maps, vehicle data analytics, in-care navigation, augmented reality**

Use case & customers

- Mapbox powers location for more than **2 million live location developers**
- In-car navigation, mobile companion apps, augmented reality, ADAS + HD maps, vehicle data analytics
- **Customers** include Porsche, BMW & Uber

Similar Companies

- **GeoSlam** (2012, Series A (\$6.88 Mn), Frontier Development Capital)
- **Kaarta** (2014, Series A (\$7.79 Mn), Innovation Works, Greensoil PropTech Ventures)

Mapbox

Search Field	Cloud-based Mapping Platform
Location	San Francisco, US
Year Founded	2010
Funding in \$ Mn.	\$359.55 Mn
Last Round & Stage	undisclosed (03.2021)
Investor	Thrive Capital, SoftBank Vision Fund
Website	mapbox.com



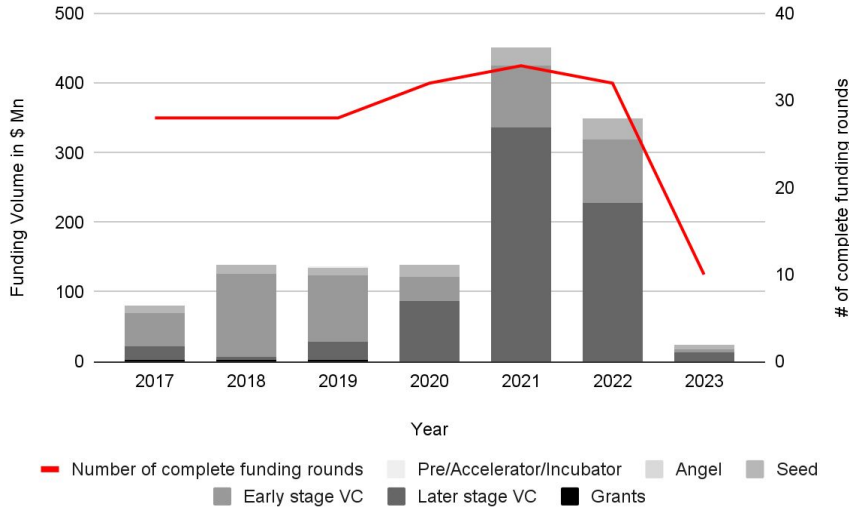
Mapping

Mapping



— Training Data —

The Training Data segment showed highly inflated deal sizes and valuations in 2021 and 2022



of Companies
total / funded

119 / 89

of Acquisitions

7

of IPOs

5

Investment Volume
last 24 month

\$622 Mn

Notable Corporates:

Notable Exits:

acquired by **Uber**
(\$27.2 Mn)
 06/2019

acquired by **dSPACE**
(\$2.8 Mn)
 06/2019

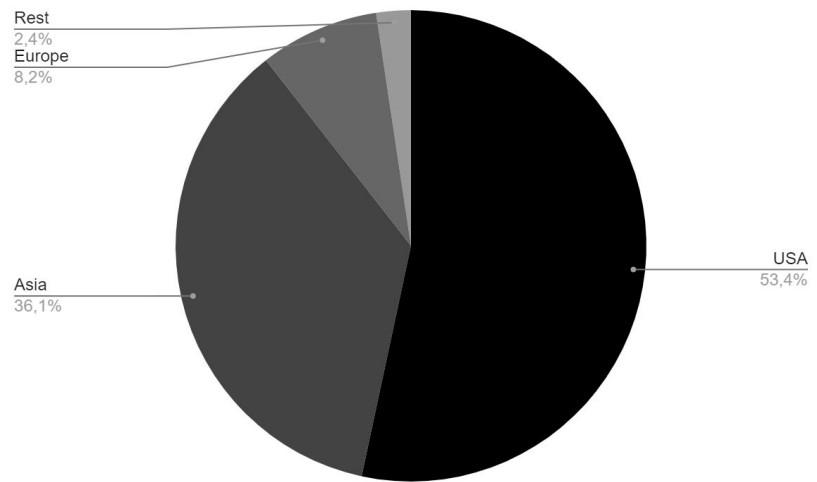
Notable Investors:

CVC

CVC

USA Dominates Training Data VC Market with Over Half of Invested Capital and Majority of Funding Rounds in Top 10

Capital Invested by Global Region
by region in %



Top 10 Venture Rounds
by Funding Amount

Startup Name	Funding in Mn	HQ Location
Labelbox	\$110.00	USA
AI Medical Service	\$63.89	Japan
Defined.ai	\$50.50	USA
VoxelCloud	\$50.00	USA
Labelbox	\$40.00	USA
StradVision	\$39.45	South Korea
StradVision	\$43.67	South Korea
Waytous	\$30.84	China
StradVision	\$26.34	South Korea
Heartex	\$25.00	France

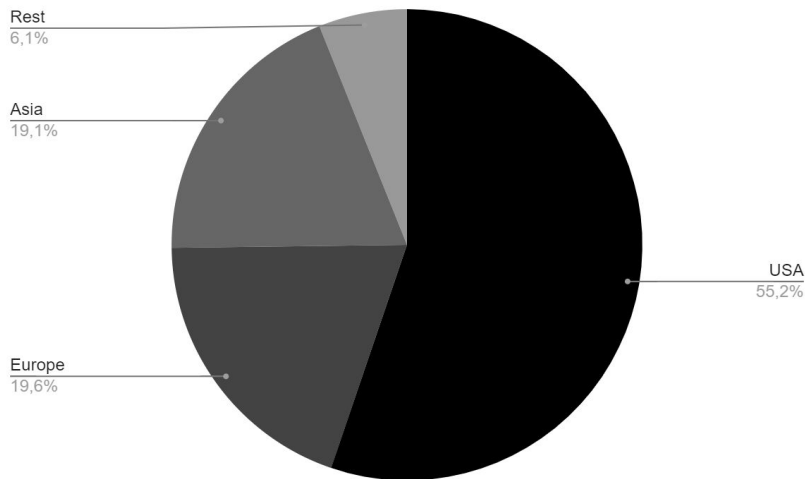
Take-away

- In the field of training data, there is a noticeable **diversification of regions** when it comes to the largest funding rounds.
- In retrospect, there has been a significant **increase in the median deal sizes** in the training data sector, with a **rise of 82.3%** from \$900.000 in 2020 to \$5.07 million in 2022.

Beyond American Dominance: Emerging Markets like Europe Pose Future Competition to the US

Deal Count by Global Region

by region in %



Top 10 Investors

by Deal Count

Investor Name	Deal Count	HQ Location
Y Combinator	19	USA
Techstars	5	USA
Andreessen Horowitz	4	USA
First Round Capital	4	USA
Gradient Ventures	4	USA
Kleiner Perkins	4	USA
Bynd Venture Capital	3	Portugal
Foundation Capital	3	USA
HPI Seed Fund	3	Germany
In-Q-Tel	3	USA

Take-away

- While there is still a **strong dominance of the USA** among the top 10 investors (80%), **Europe is emerging as a growing market**, accounting for approximately 20% of the deals. Notable investors like Andreessen Horowitz, Y Combinator and Kleiner Perkins are contributing to growing innovation in the sector.

Tactile Mobility

Search Field	Vehicle Road Dynamics Data
Location	Haifa, Israel
Year Founded	2012
Funding in \$ Mn.	\$47 Mn
Last Round & Stage	\$27 Mn Series C (10.2021)
Investor	Porsche Ventures, Startup Autobahn, The Group Ventures
Website	tactilemobility.com

Business Overview

- Creates a **digital twin** of each vehicle, clarifying vehicle **health & efficiency** including: grip level, braking efficiency, tire health, weight estimation, fuel consumption, engine & more
- **Datasets** from each **vehicle are uploaded** to the **cloud** and continuously crunched, using **big data methodologies** and **machine learning**

Use case & customers

- Use cases in **vehicles, insurance & suppliers**
- Tactile Mobility's data is used in **more than 67 cities** around the world
- Partners include **Porsche & BMW** to integrate Tactile Mobility's solution into their vehicles

Similar Companies

- **RoadCloud** (2014, Seed (\$1.4 Mn), Business Finland, Icebreaker)
- **Annotell** (2018, Series A (\$8.16 Mn), MobilityXlab, Stena Sessan)

Business Overview

- Provides a **3D environment** generation software offering configurable, detailed & **scalable simulation** environments for **autonomous vehicle simulation**
- Enables users to plug content into simulation solutions to **generate entirely new cities** or **tweak details** on single city street corners

Use case & partners

- Used in **ADAS** solutions, **Level 4 & 5 of autonomous driving** & object **tracking**
- Composed of veterans from the world's top graphics & AI companies, such as Apple, Pixar, and Microsoft
- **Partners** include Toyota Research Institute

Similar Companies

- **Scale** (2016, Series E (\$325 Mn), Accel, Index Ventures, Y Combinator)
- **Samasource** (2008, Series A (\$14.8 Mn), Salesforce Ventures, Ridge Ventures)

Parallel Domain

Search Field	AI-enabled Simulation Software
Location	Palo Alto, US
Year Founded	2017
Funding in \$ Mn.	\$43.5 Mn
Last Round & Stage	\$30 Mn undisclosed (10.2020)
Investor	Toyota AI Ventures, Foundry Group, Calibrate Ventures, RRE Ventures, Costanoa Ventures
Website	paralleldomain.com



Training
Data

Training Data



Smart Cities Mobility

Introduction
Traffic Management
Public Transport Management
Digital Twin (Smart Cities)

Cities, corporates & startups must work together in order to provide seamless Smart Mobility solutions



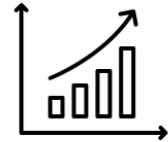
With **new infrastructure & policies**, autonomous vehicles are able to drive closer together



Shared AVs largely replace fixed-route buses and private cars



Electric vehicles are encouraged through policies such as priority parking and provision of charging stations



Taking advantage of autonomous operations and **predictive maintenance**, trains run faster and more consistently



Intelligent **traffic lights** minimize wait times; smart parking makes finding a space more efficient



Commercial **deliveries** are shifted to off-peak hours; parcel lockers are installed for daytime pickups



Some **parking areas** are reclaimed for public spaces

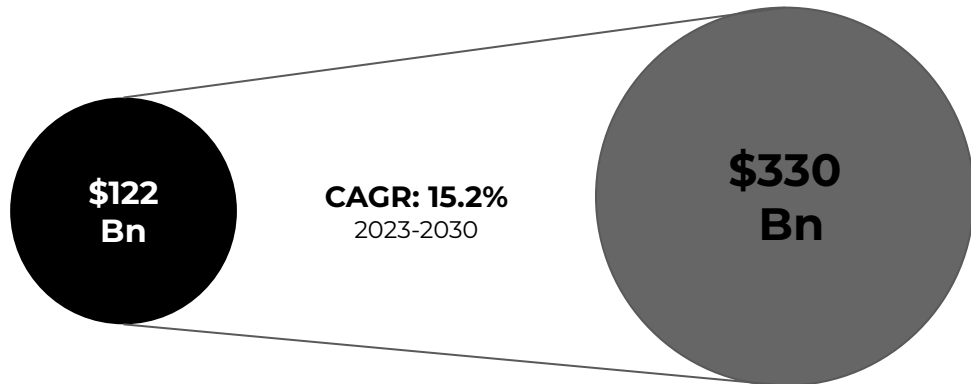


Bikesharing & e-scooters improve last-mile options to the train stations

Take-away

- Through **effective regulation & incentives**, cities encourage the use of **shared AVs** while controlling the size and composition of the AV fleet to achieve availability, efficiency, affordability, convenience, and sustainability, or some combination in cities
- **Intelligent traffic systems** helped **reduce congestion & travel times** in several cities including Buenos Aires & Mumbai by **up to 20%**

Government initiatives for building better infrastructure & transport systems are propelling market growth



*Smart Transportation Market shown here

Market Trends

- Increasing demand for **sustainable transport**, rising **urban population** and growing **government initiatives**
- Governments focus on **reducing** greenhouse **emissions** & traffic **congestion**
- Growing **adoption of IoT** and automation technologies to enhance city mobility

Market Driver



Regulations
& Incentives



AI



5G



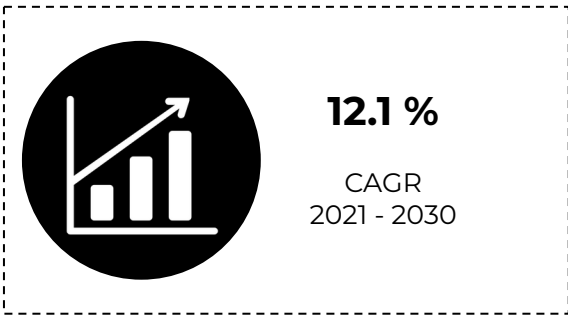
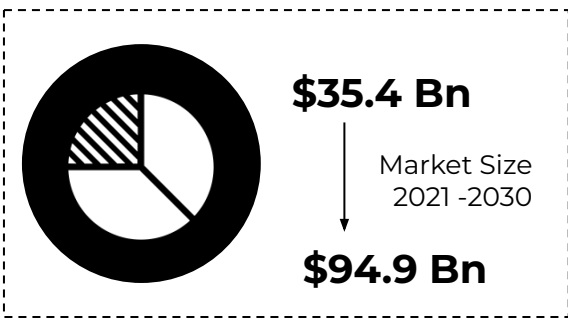
Cybersecurity

Take-away

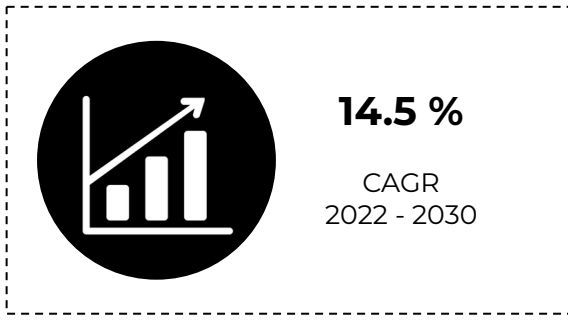
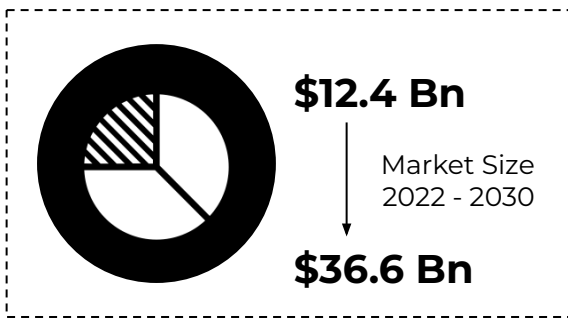
- **Planning a smart city** that delivers effective and equitable **urban mobility solutions** is one of the **most pressing problems** for cities throughout the world
- Increasing **government smart city initiatives** in **APAC region**, exhibiting growth of **39.4% annually** over the forecast period
- Most common **problem for commuters** is the large **traffic congestion** in cities, which many initiatives are trying to solve
- European Innovation partnership is aiming to **reduce energy consumption** in major European cities

Connectivity, AI & renewable energy will significantly impact the nature of transportation & urban development

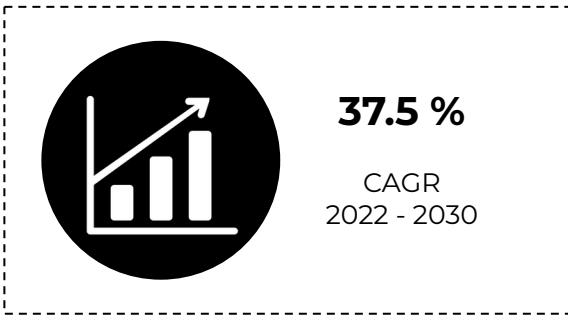
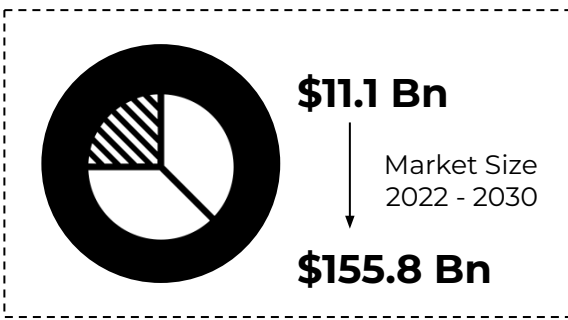
Traffic Management



Transport Management

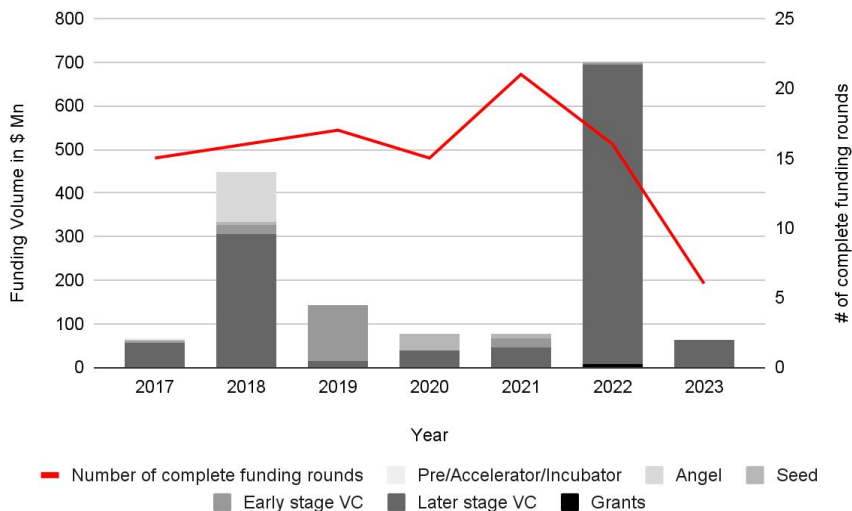


Digital Twin (Smart Cities)



Traffic Management

Single investment rounds are driving funding volume in the sector leading to volatility in funding over the years



of Companies
total / funded

203 / 73

of Acquisitions

52

of IPOs

8

Investment Volume
last 24 months

\$820 Mn

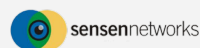
Notable Corporates:



Notable Exits:

PTV GROUP

acquired by Porsche
(\$338 Mn)
06/2017



IPO
05/2007

Notable Investors:



Digital Ventures
CVC

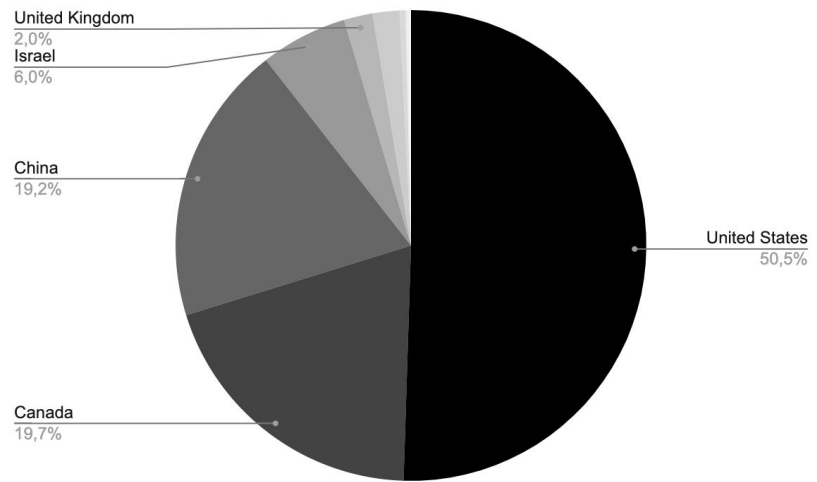


Government
Wealth Fund

Single large investment rounds in leading companies in the Traffic Management segment are driving funding volume

Capital Invested by Global Region

by region in %



Top 10 Venture Rounds

by Funding Amount

Startup Name	Funding in Mn	HQ Location
The Boring Company	\$675.00	USA
YITU	\$300.00	China
Miovision	\$260.00	Canada
The Boring Company	\$120.00	USA
The Boring Company	\$112.50	USA
Miovision	\$91.64	Canada
YITU	\$55.16	China
NoTraffic	\$55.00	Israel
Lacuna	\$30.00	USA
YITU	\$30.00	China

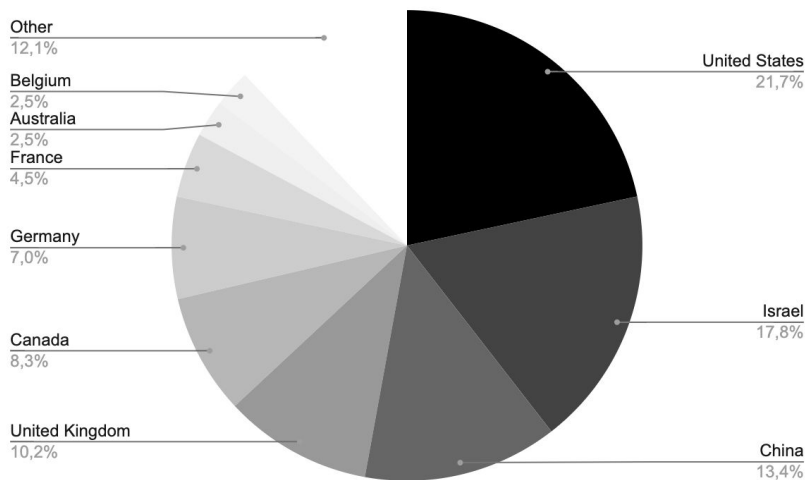
Take-away

- Because the **traffic jams in major US cities annoyed Elon Musk**, he decided to found his own startup to tackle the problem. **The Boring Company digs underground tunnels** in order to allow traffic to flow more freely. Major projects have been undertaken in Las Vegas.
- Canada-based **Miovision** has used its most recent **\$260 million funding** round to **acquire GTT** and thus further **accelerate inorganic growth**.

Governments, public investors and VCs are working together to enable innovation in Traffic Management solutions

Deal Count by Global Region

by region in %



Top 10 Investors

by Deal Count

Investor Name	Deal Count	HQ Location
EIT KIC Urban Mobility	5	Spain
Innovate UK	5	UK
Gaorong Capital	4	China
Hiventures	4	Hungary
Sequoia Capital China	4	China
Yunfeng Capital	4	China
2B.VC	3	Israel
National Science Foundation	3	USA
Next Gear Ventures	3	Israel
North First Ventures	3	Israel

Take-away

- Prominent investors including **Sequoia Capital China and Yunfeng Capital** are looking to **solve traffic congestion problems** in the ever-growing cities of China.
- **European investments** are once again largely **driven by public and government investment organizations** such as EIT, the European Commission, ESA, and Innovate UK.



NoTraffic

Search Field	AI-based Traffic Management Platform
Location	Tel Aviv, Israel
Year Founded	2017
Funding in \$ Mn.	\$80.4 Mn
Last Round & Stage	\$55 Mn Series B (06.2023)
Investor	Vektor Partners, Nielsen Ventures, Next Gear Ventures
Website	notraffic.tech

Business Overview

- Aims to reduce **traffic congestion**, **emission** and **city spending** & improve **road safety**
- **AI-enabled traffic management solution** tracking all road users, integrating sensor data, accurately **predicting arrival times** at **intersections** and autonomously setting the timing of **traffic light systems** maximizing the traffic flow

Use case & partners

- In Redlands, California, achieved 59% **cost savings**, **emissions reduction** by 11 tons & eliminated 900 hours of **traffic delay** in a 2 month project period
- Actively **partnering** with several **cities** and **universities** to make city mobility smarter

Similar Companies

- **Xtelligent** (2015, Pre-Seed (Undisclosed), Los Angeles Cleantech Incubator)
- **Wintics** (2017, Seed (Undisclosed), Ardian, Le Village by CA)

Business Overview

- Offers a **planning collaboration software** that enables transportation engineers & planners to **manage their traffic data**
- Services include **performance measuring** of transport networks, **video-based** real-time recognition for advanced **V2I integrations** & **traffic studies and reports** through the portable or permanent data collection tools

Use case & partners

- Helps cities **save costs** & reduce **traffic congestions**
- Recently **acquired Traffop** for their Automated Signal Performance Metrics software solution
- Partnered with **several cities** including **Chicago & Atlanta**

Similar Companies

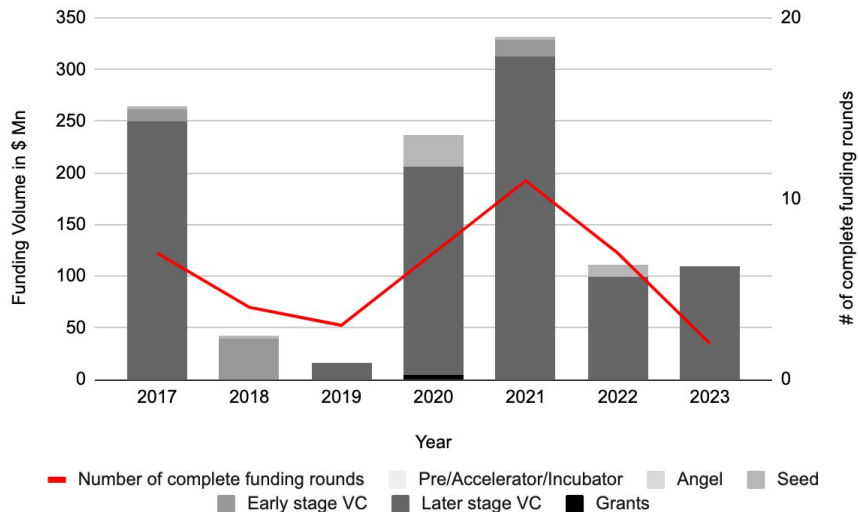
- **Vivacity Labs** (2015, Series A (\$6.96 Mn), Mobeus, London Co-Investment Fund)
- **StreetLight** (2010, Series D (\$15 Mn), Plug and Play, Deutsche Telekom)

miovision

Search Field	Traffic Data Collection and Management Solution
Location	Kitchener, CA
Year Founded	2005, launched Smart Traffic Platform in 2017
Funding in \$ Mn.	\$394.01Mn
Last Round & Stage	\$260 Mn PE Growth (04.2023)
Investor	TELUS Ventures, Comerica, HarbourVest Partners
Website	miovision.com

Public Transport Management

Investors focused on later stage startups looking to fund local leaders in Public Transport Management



of Companies
total / funded

33 / 15

of Acquisitions

8

of IPOs

2

Investment Volume
last 24 months

\$561 Mn

Notable Corporates:

Notable Exits:

acquired by **Ford**
(Undisclosed)
01/2018

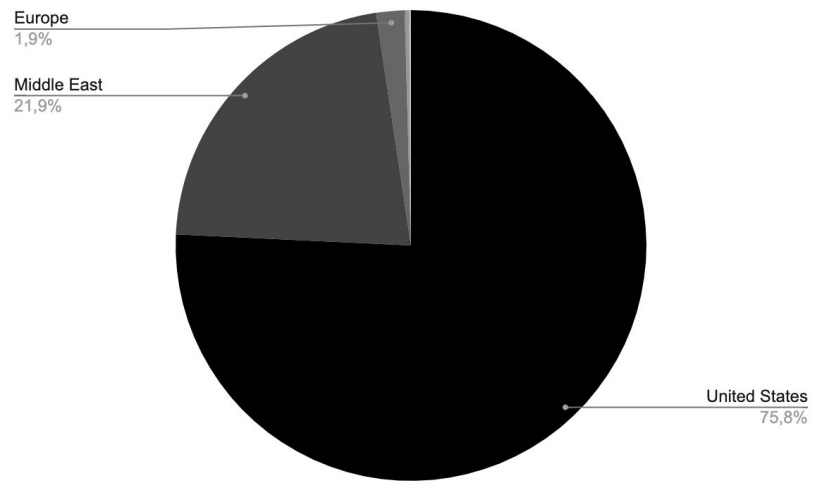
Notable Investors:

Verizon Ventures
CVC

Alibaba Group
阿里巴巴集团
Corporate

Transit optimization startup Via has built an end-2-end transportation infrastructure for agencies and cities

Capital Invested by Global Region
by region in %



Top 10 Venture Rounds
by Funding Amount

Startup Name	Funding in Mn	HQ Location
Via	\$250.00	USA
Via	\$200.00	USA
Via	\$130.00	USA
Via	\$110.00	USA
Optibus	\$107.00	Israel
Optibus	\$100.00	Israel
Via	\$100.00	USA
Via	\$60.00	USA
Optibus	\$40.00	Israel
Lacuna	\$30.00	USA

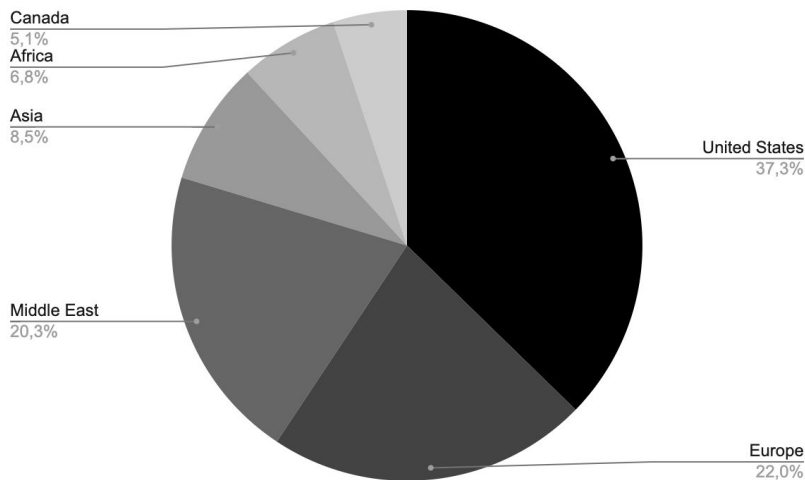
Take-away

- Top funded startup **Via helps public transportation agencies, municipalities and school districts optimize fixed bus routes, strategize placements of new bike lanes, plan paratransit and school bus services, and holistically incorporate private on-demand ridesharing services** into a city's entire transportation ecosystem. They recently signed a partnership with Uber.

Corporate Venture Capitalists are funding the segment instead of public investors

Deal Count by Global Region

by region in %



Top 10 Investors

by Deal Count

Investor Name	Deal Count	HQ Location
83North	6	UK
RiverPark Ventures	5	USA
Ervington Investments	4	Cyprus
Goodwill Investments	4	Netherlands
Pitango VC	4	Israel
Elemental Excelerator	3	USA
Exor	3	Netherlands
Hearst Ventures	3	USA
Planven Entrepreneur Ventures	3	Switzerland
Plug&Play Tech Center	3	USA

Take-away

- Several **Corporate Venture arms** including Hearst, Ford, Toyota, Alphabet, Tencent, Bosch and many more are **investing in the space**. On the other hand public investors rarely invest in the space.
- From the **top 10 investors 7 solely invested in the startup Via** with follow-on investments over the years. The **other 3 invested in** the startups **Swiftly** and **WhereIsMyTransport**.

Optibus

Search Field	Public Transport Management
Location	Tel Aviv, Israel
Year Founded	2014
Funding in \$ Mn.	\$262.5 Mn
Last Round & Stage	\$100 Mn Series D (05.2022)
Investor	Insight Venture Partners, Bessemer Venture Partners, Alibaba, Verizon Ventures
Website	optibus.com

Business Overview

- **Models transit networks** at the most granular level – generating quality schedules & **giving insights** for planning and scheduling decisions
- Plan, design and create **routes** and **schedules** that enable the **transportation network**
- Optimization for **charging times, locations** and minimum **battery levels** for electric vehicles

Use case & customers

- Used in **450 cities** assisting the largest **transportation operators** worldwide
- Customers include **Metropoline, FirstTransit, Keolis, Maya Tours, Avanza Group** & more to manage data, scheduling and road planning

Similar Companies

- **Moovit** (2012, Acquired (\$900 Mn) Intel)
- **FanZone** (2014, Series A (\$6.2 Mn), Olive Tree Ventures, TheTime VC)

Business Overview

- Uses fact-driven data to **anticipate demand**, digitally conduct the **use of streets and curbs**, and to **manage policy dynamically**, with **insights** that show what works best
- Offers **insights** into where and how **curbs** are used, parking **reservation times** & enable automated **enforcement** and **modelling of future usage**

Use case & customers

- Helps **cities** and **airports** improve **traffic flow** and **safety**, by making better use of fixed public infrastructure
- Customers include several **cities** including **Los Angeles, Seattle & Miami**

Similar Companies

- **Inrix** (2004, Series E (Undisclosed), Porsche, Intel Education Accelerator)
- **Near** (2012, Series D (\$100 Mn), Sequoia Capital, Cisco Investments, JP Morgan)

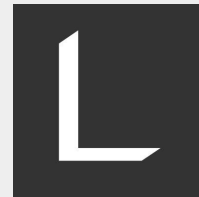
Lacuna

Search Field	Mobility Management Software
Location	Palo Alto, US
Year Founded	2018
Funding in \$ Mn.	\$52.92Mn
Last Round & Stage	\$4.95 Mn Debt (09.2022)
Investor	Xplorer Capital, Lauder Partners, Playground Global
Website	lacuna.ai



Public
Transport
Management

Public
Transport
Management



Digital Twin (Smart Cities)

Immense.AI

Search Field	Transportation Simulation
Location	London, GB
Year Founded	2016
Funding in \$ Mn.	\$4.73 Mn
Last Round & Stage	\$4.6 Mn Series A (05.2019)
Investor	Amadeus Capital, Global Brain, 31Ventures
Website	immense.ai

Business Overview

- Platform enables **rapid testing** of strategic and operational decisions for **global transportation** in the **digital world** - taking away the risk of expensive assumptions and sunk costs
- Data-driven virtual worlds** act as **digital replicas** of real-world transportation, infrastructure and mobility systems

Use case & partners

- Used in **fleet management, infrastructure operations** & regional **transportation planning**
- Helps **public authorities** and **mobility service providers** make better decisions
- Partners include several **cities, Ford, Addison Lee, Cruise & HERE**

Similar Companies

- Lacuna** (2018, Series A (\$33.5 Mn), Xplorer Capital, Lauder Partners)
- Zero Gravity** (2019, Unfunded)

Business Overview

- Product UrbanAI allows users to **create a digital twin** and enhance **autonomous navigation** in urban mobility applications
- Features an **analytics dashboard** and data aggregator platform for the city to digitize the process for **smart mobility, energy, and environmental services**

Use case & partners

- Building a **city digital twin** that facilitates the transparency of **land usage, mobility state** of urban areas in the past, present and future
- Partnering with several **cities** & the **European Space Agency**

Similar Companies

- Immense** (2016, Series A (\$4.6 Mn), Amadeus Capital, Global Brain, 31Ventures)
- SKIALabs** (2019, Unfunded)

Zero Gravity

Search Field	Satellite Imagery-based Smart City Modelling
Location	Espoo, FIN
Year Founded	2019
Funding in \$ Mn.	\$0.06 Mn
Last Round & Stage	\$0.06 Mn Accelerator (08.2019)
Investor	undisclosed
Website	zerogravity.fi



Digital Twin

Digital Twin

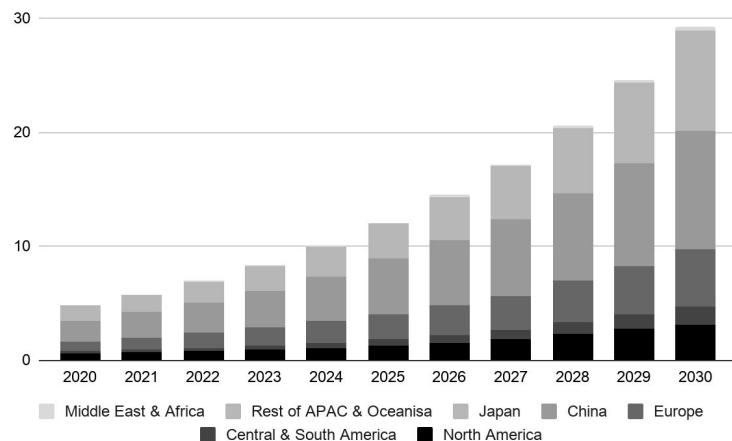
Electric Vehicles

Introduction
EV-as-a-Service
Charging Stations and Network
Battery Management Systems

BEV and PHEV showing significant growth rates with China being the top purchaser of Electric Vehicles

Global Electric Car Sales Forecast

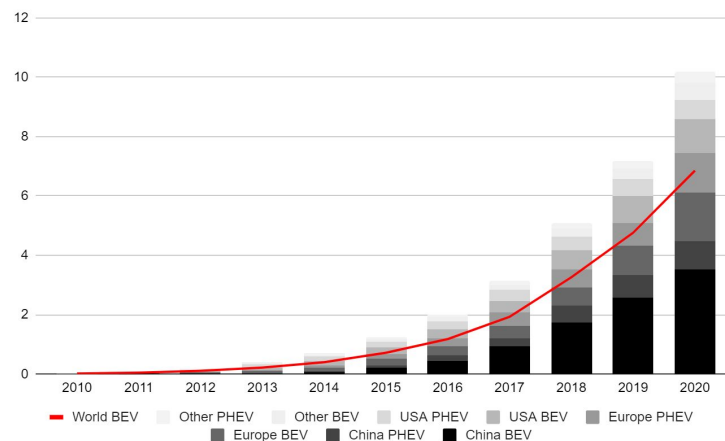
by region in million units



- **EV sales** continue **accelerating** over the coming decade from \$5 Mn to close to **\$30 Mn in 2030**, while **ICE sales** will **slow** down
- **China** with **constantly > 35%** share **major EV market** in sales, **Europe** around **18%** and the **US*** at **10%**

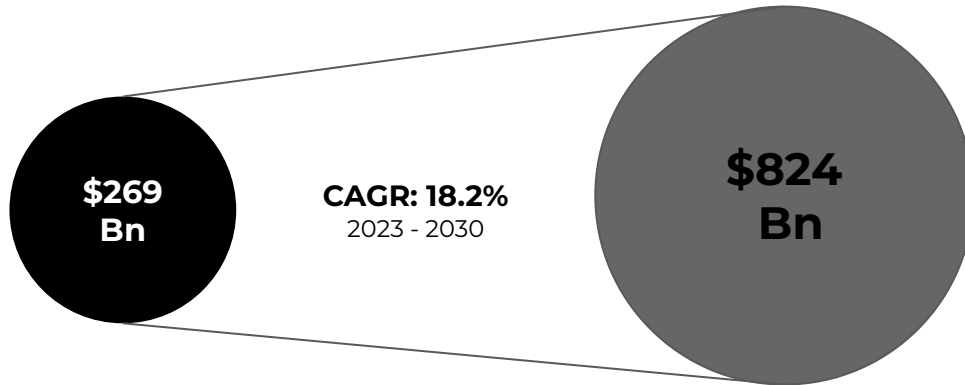
Global electric vehicle stock

from 2010 to 2020 by region (in million units)



- **Starting 2010 exponential growth** of electric vehicles to over **10 million** cars, with **BEV major technology** in front of PHEV
- In **2020** the **10 million EV stock** mark was crossed, up almost 50% from the previous year with **BEV alone crossing 6 million** in stock

Increasing demand for low-emission vehicles and government regulations & incentives supplement growth of EV market



Market Trends

- Electric cars most **mature segment** with **leaders** such as **Tesla and Nio**
- **Technological breakthroughs** in battery technology such as charging **speed** and battery **range**
- **Strategic shift to electric mobility** by **OEMs**, like VW, BMW, Ford and more

Market Driver



Regulations
& Incentives



R&D
Battery Tech



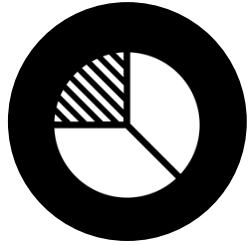
Blockchain

Take-away

- **Highest revenue** contributor is **APAC**, but **highest growth potential in North America** at an estimated **CAGR of 27.5%**
- **Electric vehicle outperforms** the conventional vehicle providing higher fuel economy, low **carbon emission & maintenance**, convenience of **charging at home, smoother drive**, and **reduced sound** from engine
- **Unavailability** of **EV charging infrastructure** has proved to be a **negative factor** for growth in the EV market
- **Manufacturing** of electric vehicle requires a **huge investment** which also affects the growth of the market

As Battery Technology advances, Charging Networks gain significant traction & EV adoption rate increases

EV as a Service



\$8.9 Bn

Market Size
2022 - 2030

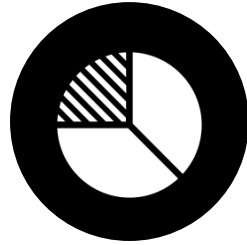
\$136.47 Bn



40.7%

CAGR
2022 - 2030

Charging Stations and Networks



\$16.3 Bn

Market Size
2022 - 2030

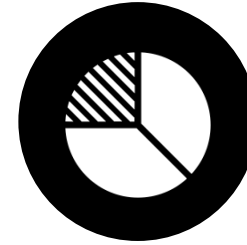
\$142.4 Bn



31.14%

CAGR
2022 - 2030

Battery Management Systems



\$56.19 Bn

Market Size
2022 - 2030

\$31.3 Bn



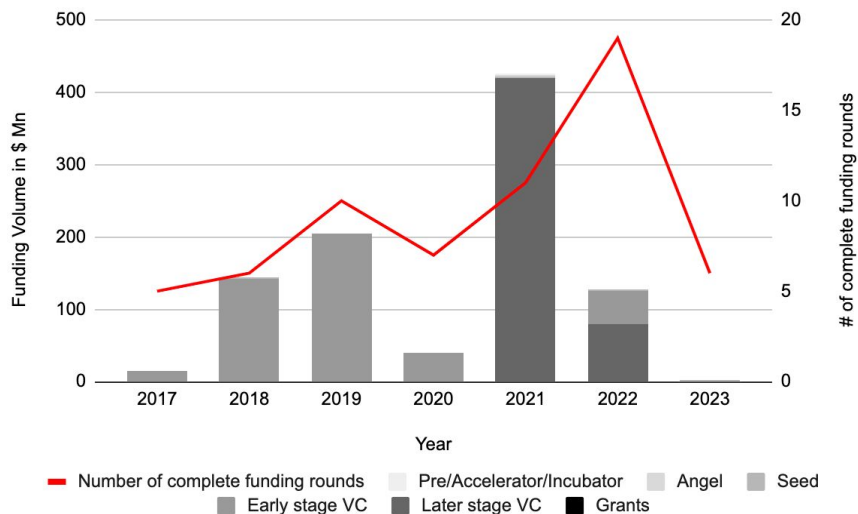
23.4%

CAGR
2022 - 2030

EV as a Service

(Rentals & Carsharing)

Electric vehicle rental provider Voi received the majority of funding volume in the segment over the last years



of Companies
total / funded

36 / 26

of Acquisitions

1

of IPOs

0

Investment Volume
last 24 months

\$550 Mn

Notable Corporates:

Notable Exits:

acquired by **Blink Charging**
(\$34 Mn)
04/2023

Notable Investors:

Balderton. **CREANDUM**

VC Fund VC Fund

imove

Search Field	EV Subscription Platform
Location	Bergen, NO
Year Founded	2018
Funding in \$ Mn.	\$24.5 Mn
Last Round & Stage	\$18.9 Mn Series A (07.2021)
Investor	AutoScout24, Norselab, Nysnø
Website	imove.no

Business Overview

- Online platform offering **subscription-based electric-car rental** services
- Users can fix the **delivery time, virtual keys** to unlock the vehicles and make **online payments**
- Offers a white-labeled **cloud-based system** for **fleet and business management** for car dealerships, manufacturers, leasing companies

Use case & partners

- **Flexible** electric **car rental** service, including **tyre changes, repair service**, and fully comprehensive **insurance**
- Strategic partnership with **AutoScout24** to **reach more potential customers** via the AutoScout platform

Similar Companies

- **Canoo** (2017, Series A (\$10 Mn), Yageo Corp., Small Business Administration, AFV Partners)
- **Borrow** (2017, Seed (\$100 K), Urban-X)

Business Overview

- **App-based aggregator** of EV ride-sharing services; includes Lyft, Lime, Scoot & Jump
- Users can **search for various e-mobility operators** providing electric scooters, kick-scooters, bicycles and cars, and **book the nearest available vehicle** through links redirecting to the respective app

Use case & partners

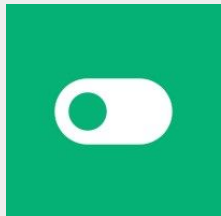
- Users **find and compare prices** of the best shared mobility providers
- Includes **over 160** different **operators in 500 cities** worldwide
- Danish **Innovation Fund** awarded Cogo with the **Innofounder grant**

Similar Companies

- **ZET** (2019, Unfunded)
- **Alride** (2020, Unfunded)

Cogo

Search Field	EV Ride Sharing Aggregator
Location	Frederiksberg, DK
Year Founded	2019
Funding in \$ Mn.	\$2 Mn
Last Round & Stage	\$0.81 Mn Seed (09.2022)
Investor	PreSeed Ventures, Pia Vemmelund
Website	cogoapp.io



EV as a Service

EV as a Service

Envoy

Search Field	EV as an Amenity
Location	Los Angeles, US
Year Founded	2016
Funding in \$ Mn.	\$82.01 Mn
Last Round & Stage	\$34 Mn M&A (04.2023)
Investor	Shell Ventures, Macquarie Group, Building Ventures, Los Angeles Cleantech Incubator
Website	envoythere.com

Business Overview

- Online platform that provides **on-demand electric vehicles as an amenity** to apartments, office buildings, and hotels
- **Reserve & access** vehicles, driver **insurance**, maintenance, electric vehicle **chargers**, electric fleet, **fleet maintenance**, **full-service** mobile app, customer **support**, and robust **analytics**

Use case & partners

- Equips **real estate owners and operators** with a new and innovative way to enhance the lifestyle of their tenants
- Envoy has **deployed 90 electric vehicles** at **45 residential communities** all **within** the city of **Sacramento**; they are **active in 6 cities** already

Similar Companies

- **Zipcar** (2000, Acquired (\$500 Mn), Avis Budget Group)
- **Skurt** (2014, Acquired (Undisclosed), Fair)

Business Overview

- Focuses on providing electric vehicle-as-a-service solution to **logistics companies**
- Facilitates deployment of electric vehicles into **logistics fleets** and provides **services** related to **route analysis** and offers **charging solutions**

Use case & customers

- Used in **zero emission logistic fleets**
- Customers include **IKEA, TNT, DPD, Slovak Post**, with more in parcel, postal, and other delivery companies
- Operating in **17 countries in the EU** while actively **partnering with Nissan**

Similar Companies

- **Buddee** (2014, Unfunded)
- **Expocart** (2015, Unfunded)

Voltia

Search Field	EVaaS for Logistics
Location	Bratislava, SK
Year Founded	2011
Funding in \$ Mn.	\$3.7 Mn
Last Round & Stage	\$3.7 Mn Series A (10.2015)
Investor	Neulogy Ventures, Janom
Website	voltia.com

voltia
Deliver Smart . Go Green

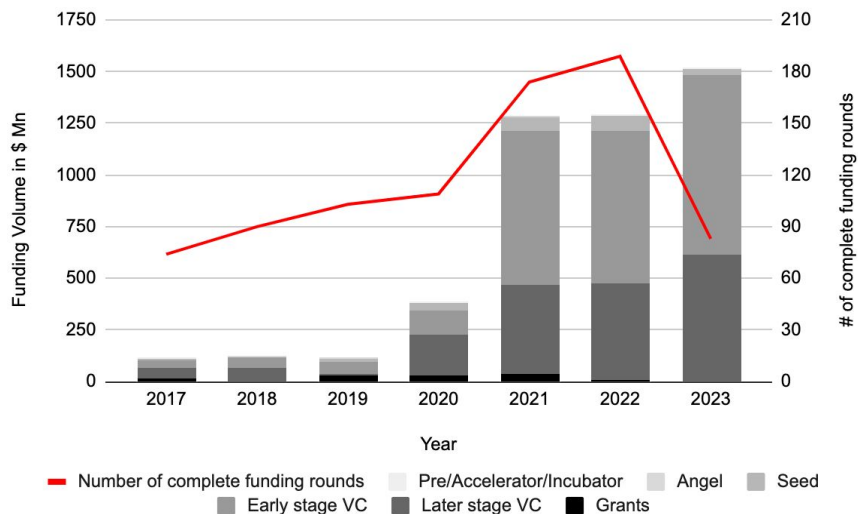
ENVOY

EV as a Service

EV as a Service

Charging Stations and Networks

Large funding volumes seen in Series C+ investments, as big players are looking for strategic partnerships



of Companies
total / funded

1.128 / 517

of Acquisitions

179

of IPOs

31

Investment Volume
last 24 months

\$4 Bn

Notable Corporates: SIEMENS

HYUNDAI | Bosch | DAIMLER | Tencent 腾讯 | KIA MOTORS

Notable Exits:

IONITY acquired by Hyundai Motor Company (Undisclosed, 20%) 09/2020

newmotion acquired by Shell (Undisclosed) 10/2017

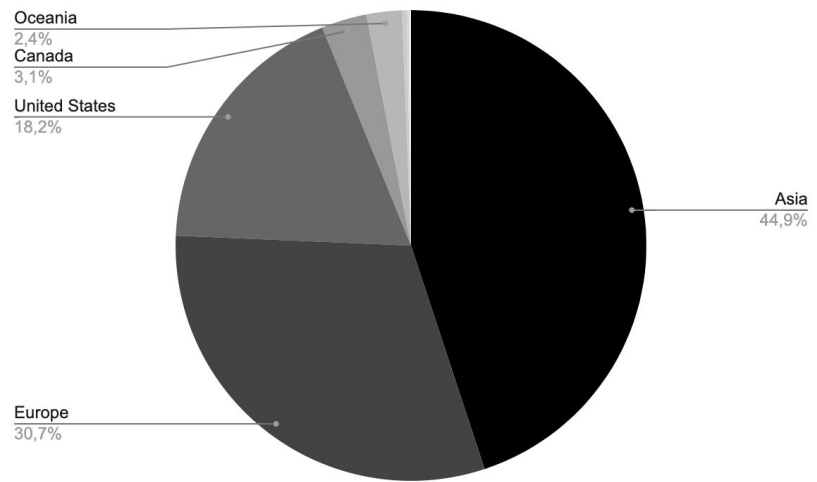
Notable Investors:

eit InnoEnergy | Funded by the European Union | QUALCOMM VENTURES

Accelerator | CVC

China's high EV adoption rate leads to high demand for charging solutions and infrastructure investments

Capital Invested by Global Region
by region in %



Top 10 Venture Rounds
by Funding Amount

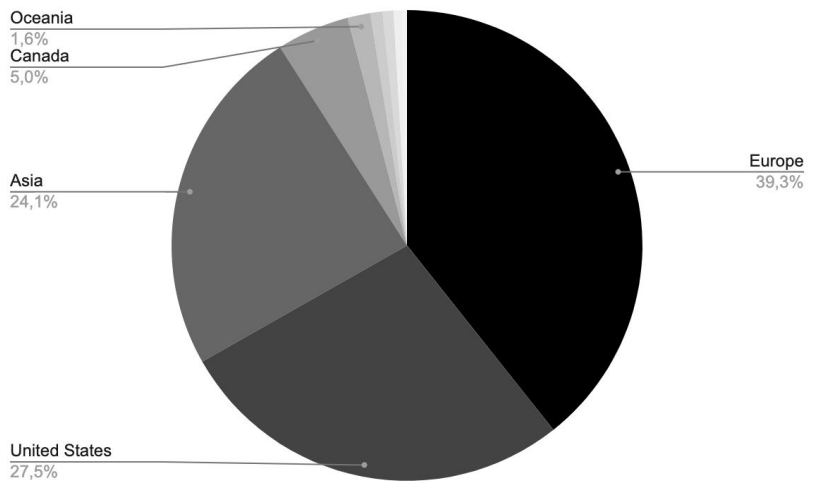
Startup Name	Funding in Mn	HQ Location
Zeekr	\$750.00	China
Zeekr	\$500.00	China
Electra	\$169.15	France
JOLT Energy	\$165.09	Germany
Qiyuan Green Power	\$148.00	China
Star Charge	\$125.13	China
Hype	\$113.01	France
Charge Zone	\$100.00	India
Zunder	\$98.48	Spain
GreenWay	\$96.25	Slovakia

Take-away

- The **top-funded startup**, Geely-backed electric vehicle brand **Zeekr** announced that as of March 2022, its **self-built charging stations** had been **launched in 20 cities across China**. Additionally the company has entered a **strategic partnership with Alphabet-backed Waymo** to **advance the development autonomous vehicles**

Government backing is essential to drive growth further in the charging station infrastructure segment

Deal Count by Global Region
by region in %



Take-away

- The **European Institute for Innovation and Technology** is heavily involved in **accelerating startups** in Europe. But also in the United States and UK government investors are driving forces of innovation
- Top **accelerator programs including Y Combinator**, Plug and Play Tech Center, and Techstars are **bringing forth the next wave** of charging infrastructure **startups**

Top 10 Investors
by Deal Count

Investor Name	Deal Count	HQ Location
Plug&Play Tech Center	20	USA
EIT InnoEnergy	14	Netherlands
EIT KIC Urban Mobility	13	Spain
LA Cleantech Incubator	13	USA
NYSERDA	11	USA
Innovate UK	10	UK
Techstars	9	USA
EIT Climate-KIC	8	Netherlands
Y Combinator	8	USA
APX	7	Germany



Jedlix

Search Field	Smart Charging
Location	Rotterdam, NL
Year Founded	2015
Funding in \$ Mn.	\$6.71 Mn
Last Round & Stage	\$6.71 Mn Series A (11.2021)
Investor	Renault
Website	jedlix.com

Business Overview

- Provider of **EV charging solutions** for **enterprises** and **government** facilities
- Develops and operates the industry's **most robust** and **flexible cloud-based platform** for the **management** of charging stations
- App enables drivers to easily **locate charging stations** and **pay for** charging

Use case & customers

- Efficiently **manage energy costs** for **fleet operations** through software tool
- Accurately **forecast EV charging** loads
- **Expanding charging network** to Canada
- Customers include **Verizon, Marriott, Audi & Dell Technologies**

Similar Companies

- **Virta** (2013, Series C (\$36 Mn), E.ON, Jolt Capital, JXTG Group)
- **Electriphi** (2018, Acquired (Undisclosed), Ford)

EV Connect

Search Field	Station Management IT
Location	El Segundo, US
Year Founded	2009
Funding in \$ Mn.	\$53.6 Mn
Last Round & Stage	\$ undisclosed M&A
Investor	Mitsui, Bonfire Ventures, Tech Coast Angels, Plug & Play
Website	evconnect.com



JEDLIX

Charging Station Network

Business Overview

- Developing solutions to **integrate EV charging** with **renewable energy production**
- Users indicate when they want their electric car to be **fully charged**, the app then **calculates** an **optimal charging plan**
- Takes available **capacity** on the **power grid**, **sustainable energy & price** into account

Use case & partners

- Connects the **real-time fluctuations** in **energy prices** with the **charging of the vehicle** and hence **provides financial benefits** to the driver
- Strategic partnerships with **Tesla, Renault, BMW** and **charge point operators**
- Integrated with **over 1.000 charging stations**

Similar Companies

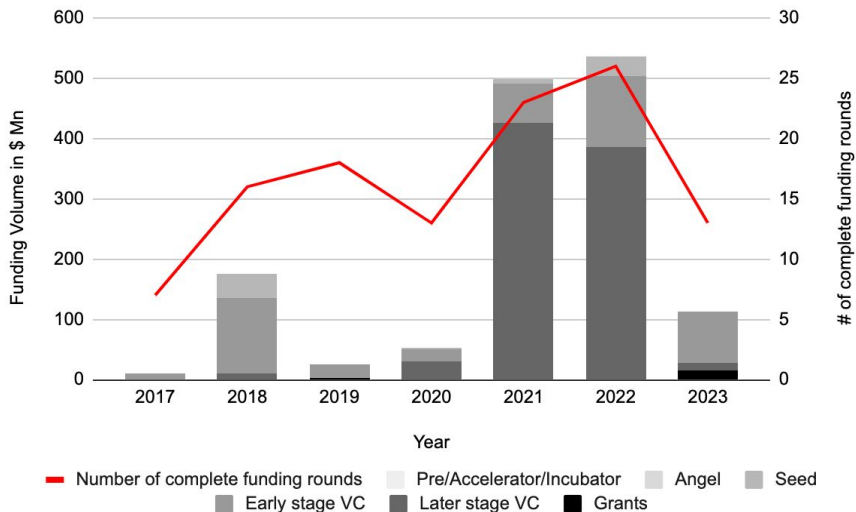
- **NewMotion** (2009, Acquired (Undisclosed), Shell)
- **EV.Energy** (2018, Series A (\$8.8 Mn), Energy Impact Partners, Clim8 Invest)

Charging Station Network

evconnect

Deep Dive:
Battery Swapping

Battery Swapping is a new trend in charging infrastructure, with high adoption rates in the APAC region



of Companies
total / funded

76 / 56

of Acquisitions

5

of IPOs

6

Investment Volume
last 24 months

\$1.1 Bn

Notable Corporates:

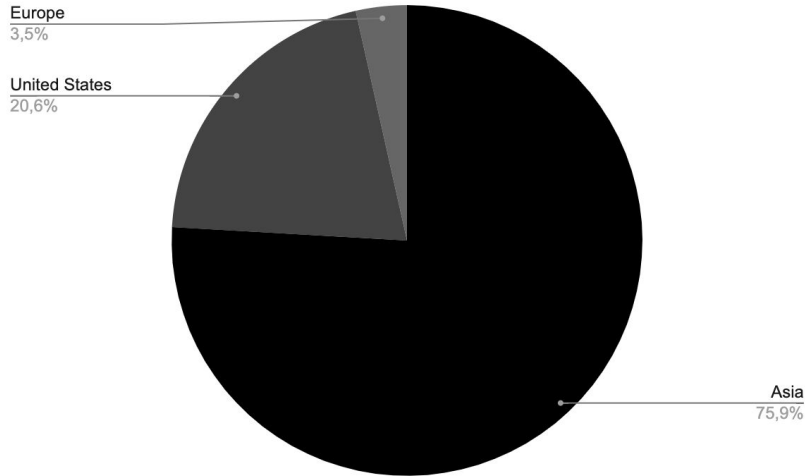
Notable Exits:

IPO
11/2007

Notable Investors:

Chinese companies dominate the Battery Swapping market due to high adoption rates in the country

Capital Invested by Global Region
by region in %



Top 10 Venture Rounds
by Funding Amount

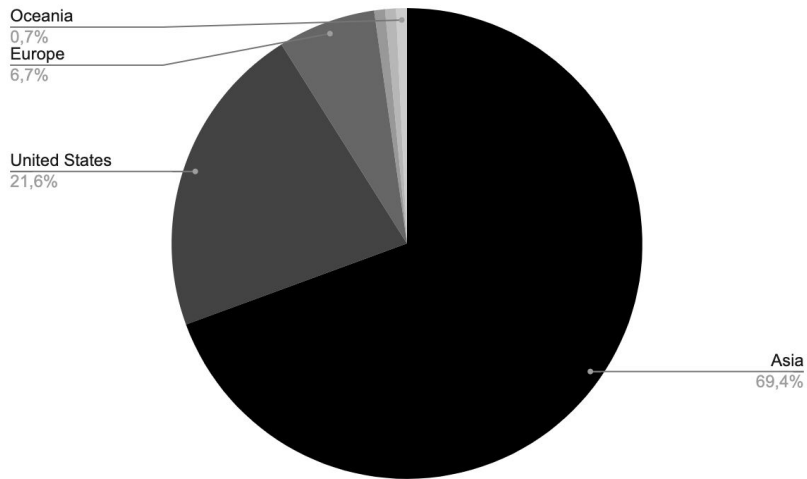
Startup Name	Funding in Mn	HQ Location
Farizon	\$300.00	China
Aulton	\$232.07	China
Ample	\$160.00	USA
Yulu	\$82.00	India
Oyika	\$74.03	Singapore
Langu Energy	\$46.11	China
Immotor	\$43.39	China
Yulu	\$40.12	India
Ample	\$34.73	USA
Battery Smart	\$33.00	India

Take-away

- **58% of startups** in the sector were **founded in the last 5 years**, but **no new startups** were founded **in 2022 and 2023**
- **VC Financing for Battery Swapping** startups **started to speed up from 2020** onwards.

Chinese companies dominate the Battery Swapping market due to high adoption rates in the country

Deal Count by Global Region
by region in %



Take-away

- Most **investors from India** have only been **active since 2017** and are **first time investors**
- **Top tier VCs** including the likes of Sequoia Capital, Andreessen Horowitz, and Kleiner Perkins **have not invested in this segment.**

Top 10 Investors
by Deal Count

Investor Name	Deal Count	HQ Location
Blume Ventures	5	India
GGV Capital	4	USA
growX Ventures	4	India
Huddle Accelerator	4	India
TransLink Capital	4	USA
Yunqi Partners	4	China
3one4 Capital	3	India
Asia Green Fund	3	China
Micelio	3	India
Shell E4	3	India

Immotor

Search Field	Battery Swapping (eScooter)
Location	Guangdong, CN
Year Founded	2015
Funding in \$ Mn.	\$115.77 Mn
Last Round & Stage	\$4.23 Mn Series C1 (05.2022)
Investor	Hyundai Motors, GGV Capital, Qualcomm, Mirae Asset Ventures, Idinvest Partners
Website	ehuandian.net

Business Overview

- Launched first Intelligent **Green Energy Platform** integrating **super batteries**, intelligent **self-service battery** exchange **stations**, energy management system, APP and **big data platform**
- Uses a power exchange system and **enables the rental** and **sharing** of **Li-ion batteries**

Use case & partners

- Used in **electric micro-mobility** registering a **daily** volume of **600.000 battery exchanges**
- Ranked among China's **TOP 5** Best New Energy and CleanTech Investments in **2020**
- Present in **over 60 cities** in **China**

Similar Companies

- **Yichangqi Network Technology** (2017, Series B (Undisclosed), Tencent, Plum Ventures)
- **Oyika** (2018, Series C (\$100 Mn), Yinson, Massa Group)

Business Overview

- Stations can **swap out** a vehicle's specially built **battery modules** and packs in **10 minutes**, being **3 - 10 times cheaper** than a **fast-charging station**
- Working with **five automakers** to build vehicles with **battery structures** that work with the company's **swapping stations**

Use case & partners

- Fully automated swapping technology with a focus on **ride-hailing, taxi, municipal, rental** and **last-mile delivery** companies
- Strategic partnerships with **Sally** (EV Fleet provider) & **Eneos** (Energy Corp.) for **expanding** the station network to **NY & Japan**

Similar Companies

- **Aulto New Energy** (2000, Series A (Undisclosed), Softbank Corp, Weilai Capital)
- **Leo Motors** (2007, Public)

Ample

Search Field	Battery Swapping (Cars)
Location	San Francisco, US
Year Founded	2014
Funding in \$ Mn.	\$275.73 Mn
Last Round & Stage	\$15 Mn Grant (02.2023)
Investor	Shell Ventures, Repsol Energy, Moore Strategic Ventures, VAS Ventures
Website	ample.com

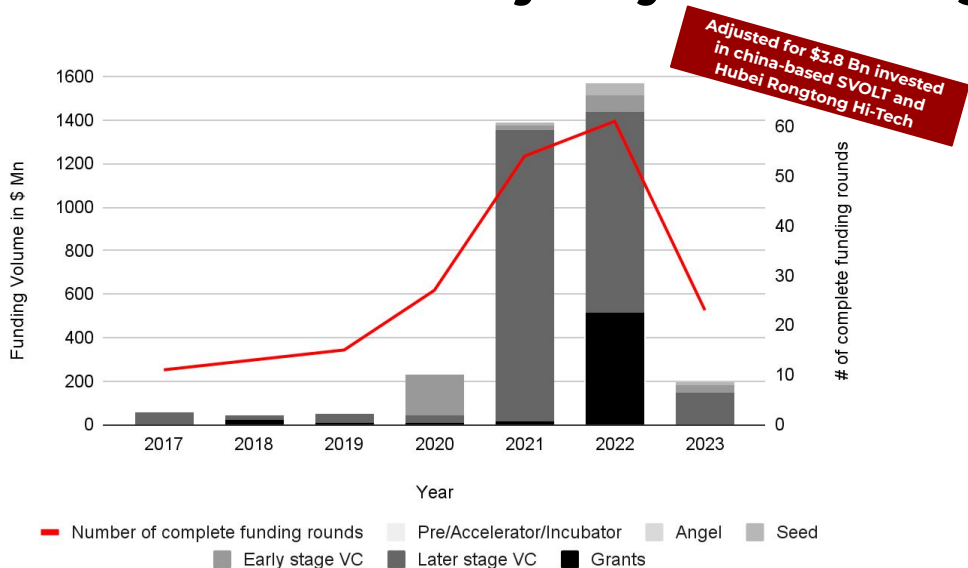
Battery Swapping

Battery Swapping



Deep Dive:
Battery Recycling

Chinese companies dominate the Battery Recycling market and receive the majority of funding



of Companies total / funded

211 / 86

of Acquisitions

39

of IPOs

15

Investment Volume last 24 months

\$2.4 Bn

Notable Corporates:

Notable Exits:

LiNiCo acquired by Comstock Mining (\$10.7 Mn) 02/2021

Li-Cycle SPAC 02/2021

Notable Investors:



Circunomics

Search Field Battery Recycling & Digital Twin

Location Mainz, DE

Year Founded 2019

Funding in \$ Mn. \$13.44 Mn

Last Round & Stage \$10.15 Mn Series A (03.2023)

Investor SAP.iO, Next Mobility Lab, TES-AMM

Website circunomics.com

Business Overview

- Provides an **end-to-end marketplace** that fully integrates **data management, certification, and tendering** to connect the entire **battery value chain**
- **AI-based** platform for supply chain **tracking & efficiency** as well as **lifecycle management**
- Real-time **data collection & certification** platform for **smart contracting**

Use case & partners

- Received support by **EIT RawMaterials** (Technology & Innovation body of the EU)
- **End-to-end solution** in the battery industry enables fully **circular business model**
- Increasing **efficiency & profitability** of reuse and recycling of **lithium-ion batteries**

Similar Companies

- **Redwood Materials** (2017, Series B (\$742 Mn), Goldman Sachs, Amazon, T. Rowe Price)
- **LiNiCo** (2020, Acquired (\$10.7 Mn), Comstock Mining)

Business Overview

- Developed a **patented multi-cathode processor** GLMC-1 that recycles li-ion batteries directly into **99.9% pure cathodes**
- **Speeds up** current **recycling processes** by more than **10 times** and **lowering costs** by more than **4 times**
- **Collection** and **proper treatment** of e-waste

Use case & partners

- In talks with all six of Singapore's main **e-waste recycling companies** and **major global e-recycling players** in Dubai and China to **supply GLMC-1** to their facilities
- Actively being **supported by Microsoft** and **Go Austria**, gaining access to startup mentors

Similar Companies

- **LiNiCo** (2020, Acquired (\$10.7 Mn), Comstock Corp.)
- **Redwood Materials** (2017, Series B (\$742 Mn), Amazon, Goldman Sachs, T. Rowe Price)

Green Li-ion

Search Field Battery Recycling

Location Singapore, SGP

Year Founded 2020

Funding in \$ Mn. \$36.11 Mn

Last Round & Stage \$20.5 Mn Series B (03.2023)

Investor HAX, TES-AMM, Entrepreneurs First, LiNiCo

Website greenli-ion.com



circunomics

Battery
Recycling

Battery Recycling



Deep Dive:
Charging Solutions



Virta

Search Field	Charging Station Management
Location	Helsinki, FIN
Year Founded	2013
Funding in \$ Mn.	\$140.57 Mn
Last Round & Stage	\$93 Mn Series C (04.2023)
Investor	Jolt Capital, E.ON, Helen Ventures, JXTG Group
Website	virta.global

Business Overview

- **Cloud-based management solution** for EV charging stations
- Provides whitelabel solution that **connects EV drivers, charging points, and energy system** in a scalable ecosystem
- Features include **cloud-connected charging devices, automated billing, energy mgmt** etc.

Use case & partners

- Named **fastest growing startup** twice in a row by Financial Times
- **Service** for **consumers** and **businesses**
- Helps **E.ON** to make **charging stations available** to EV users across Europe

Similar Companies

- **EV Connect** (2009, Series B (\$25 Mn), Mitsui, Plug and Play)
- **Greenflux** (2011, Series B (\$13 Mn), ICT, BOM)

Business Overview

- Develops advanced **battery charging technology** to enable electric vehicles to **charge in minutes** (ultra-fast charging)
- Uses **AI-based software algorithms and electronics to optimize charging** system in vehicles
- Goal is to **accelerate adoption of EVs**

Use case & partners

- Customers are **leading automotive and electronics manufactures**
- Technology can be **applied to vehicles, drones, electric tools** and similar

Similar Companies

- **Chargefox** (2017, Series A (\$8 Mn), Renewable Energy Agency, Greg Roebuck)
- **CaCharge** (2015, Series A (\$2.5 Mn), EIT InnoEnergy)

GBatteries

Search Field	Charging Optimization
Location	Ottawa, CA
Year Founded	2012
Funding in \$ Mn.	\$3.9 Mn
Last Round & Stage	\$3 Mn Grant (02.2020)
Investor	Airbus Ventures, Y Combinator, BDC, Plug and Play, MobilityXlab, 10x Group
Website	gbatteries.com



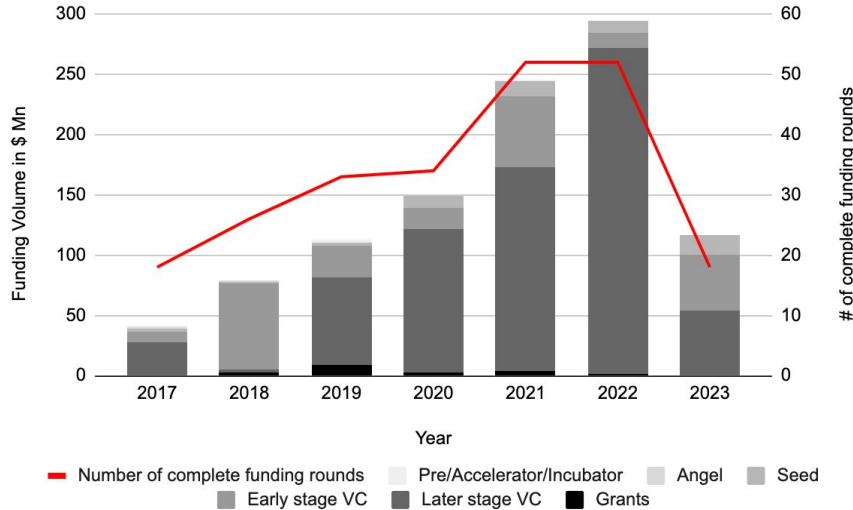
Charging
Solution

Charging
Solution



Battery Management Systems

Startups are mainly found in later stages as battery adoption & technology have advanced significantly



of Companies total / funded

217 / 138

of Acquisitions

46

of IPOs

24

Investment Volume last 24 months

\$656 Mn

Notable Corporates:

Notable Exits:

acquired by Sensata (Undisclosed, PE) 02/2021

IPO 05/2015

Notable Investors:

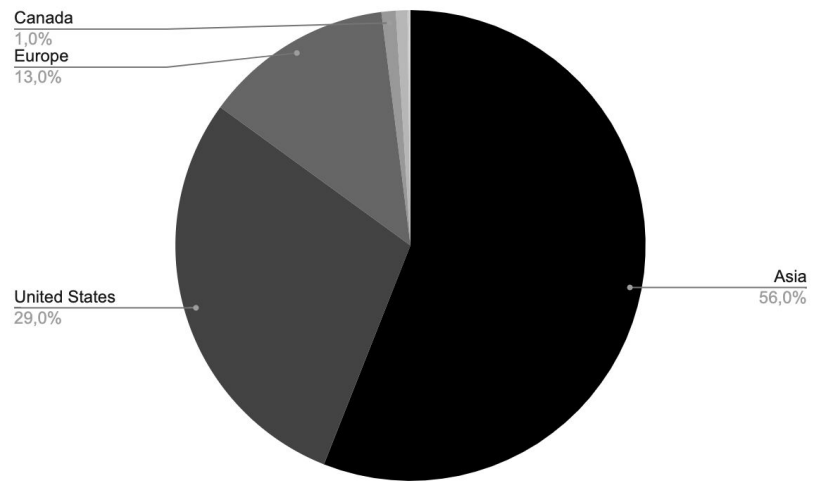
VC Fund

VC Fund

Accessibility of battery-powered vehicles in Asian countries is fueling funding growth

Capital Invested by Global Region

by region in %



Top 10 Venture Rounds

by Funding Amount

Startup Name	Funding in Mn	HQ Location
Ather	\$129.27	India
Ather	\$69.87	India
ZincFive	\$54.00	USA
TESVOLT	\$46.26	Germany
Immotor	\$43.39	China
Ather	\$35.18	India
Titan Advanced Energy Solutions	\$33.00	USA
ZincFive	\$33.00	USA
Ather	\$30.23	India
Immotor	\$30.00	China

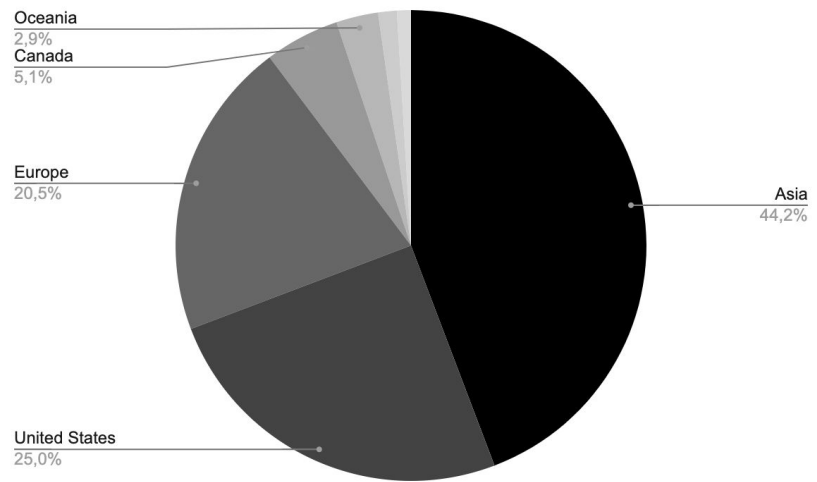
Take-away

- The company **Ather**, a **producer of two-wheelers** powered by a lithium-ion battery pack **with an integrated battery management system**, is **driving funding growth** in the segment
- **Most companies** are either **producers of vehicles or batteries** themselves and **additionally offer a battery management system**

Asian investors typically make single investments, whereas European & US investors tend to make multiple

Deal Count by Global Region

by region in %



Take-away

- In **Europe** a large part of **funding in the segment** is coming from **governmental or corporate investors** while in **Asia** many **private equity firms** are investing in the space
- **Top tier VCs** including the likes of Sequoia Capital, Andreessen Horowitz, and Kleiner Perkins **have not invested in this segment.**

Top 10 Investors

by Deal Count

Investor Name	Deal Count	HQ Location
Innovate UK	8	UK
GGV Capital	5	USA
Hero MotoCorp	5	India
Sachin Bansal	5	India
Clean Energy Finance	4	Australia
EIT Climate-KIC	4	Netherlands
Shell Ventures	4	Netherlands
European Commission	4	Belgium
IRAP	4	USA
Plug&Play Tech Center	4	USA

Twaiice

Search Field	Battery Digital Twin
Location	Munich, DE
Year Founded	2018
Funding in \$ Mn.	\$76.69 Mn
Last Round & Stage	\$30 Mn Series B (04.2022)
Investor	Coatue, Energize, Creandum, Cherry Ventures, Unternehmertum Venture Capital Partners
Website	twaiice.com

Business Overview

- Developer of a battery **digital twin** & a **predictive analytics software**
- Combines **deep battery knowledge & AI**
- Enables to determine the **battery's health**, and predict **ageing & performance**
- Design **future model** behaviour & operation conditions for optimum **battery life**

Use case & customers

- Is used to utilize **virtual testing, on-demand reports, battery management systems, predictive** battery diagnostics, and more
- Customers consists mainly of **energy and mobility** sector

Similar Companies

- **Ion Energy Labs** (2016, Seed (\$6.14 Mn), RiSo Capital, Climate Capital)
- **EV Battery Technologies** (2015, Public)

Business Overview

- Provides software solutions to improve **battery efficiency** and **battery health**
- Software automatically **collects, verifies** and **analyses battery data** and gives insights in for **optimizing** each individual battery
- Uses **machine learning** and **blockchain** technologies for its solutions

Use case & partners

- Enables customers to **reuse, repurpose**, and **recycle** their batteries, sending batteries back into the **circular economy** loop
- Strategic partnerships with **ABB, mobilityXlab**, and **Scania, VOI**

Similar Companies

- **Spiers New Technologies** (2015, Seed (\$2.8 Mn), i2E, Oost NL)
- **Gotion** (2014, Public)

Nortical

Search Field	Battery Efficiency Software
Location	Gothenburg, SWE
Year Founded	2019
Funding in \$ Mn.	\$1.36 Mn
Last Round & Stage	\$1.36 Mn Seed (10.2020)
Investor	Almi Invest, Norrskan Foundation, SynerLeap
Website	nortical.com



Summary

1.

Many larger investment rounds are going to only a handful of ventures as OEMs, Tier-1 suppliers & big tech companies are securing strategic partnerships through investing in & acquiring startups at early stages.

2.

Different countries are following different strategies regarding the future of mobility. While some concentrate efforts on emissions reduction, others focus on safer driving through vehicle connectivity & autonomy. Therefore we expect geography-specific mobility leaders to emerge, rather than global ones.

3.

We see the strongest opportunities for startups in areas within Electric Vehicles (esp. Battery Management Systems & Charging Infrastructure), Autonomous Driving (esp. Training Data & Perception solutions) & end-2-end Fleet Management solutions.

4.

Public and governmental engagement is crucial to driving the next generation of mobility and may significantly determine the trajectory of venture opportunities.

Summary

CONTACT DETAILS



Lorenz Hartung | CEO PEAKZONE GmbH

Sollner Str. 24h | 81479 Munich

e-mail: l.hartung@peakzone.io

phone: +49 176 4889 5000



Elias Maier | Chief of Staff PEAKZONE GmbH

Sollner Str. 24h | 81479 Munich

e-mail: e.maier@peakzone.io

phone: +49 176 4709 4134