

F/PRIME

# State of Robotics

Investment trends 2020-2024



# State of Robotics – Key Stats & Methodology

1500+

Companies  
analyzed

\$70B

Raised  
since 2020

10%

Investment  
CAGR

26

Private  
Unicorns

8

Public Cos  
with Mkt Cap  
> \$500M

20

Acquisitions  
> \$250M

## Methodology

- Analysis consisted of extracting all companies listed in Pitchbook which raised in aggregate of at least \$3M from 2020-2024 and which appeared to be related to AV and robotics; those companies were then individually tagged with the use case, or those that were not relevant to the category were filtered out.
- Geographic coverage focused on North America, Europe, and Israel.
- Companies focused exclusively on space, manned flight, electric vehicles, and semi-conductors were excluded from the analysis.

# Summary

**The venture capital market for robotics saw a significant rebound in 2024, with investments more than doubling and approaching all-time highs of 2021.** The primary driver of the investment surge was mega-rounds above \$50M across a few specific companies and sectors. These investments were concentrated in select companies seeing significant scale up in commercial operations across the AV, defense and logistics sectors, and emerging companies at the leading edge of AI advancements focused on humanoids and robotics foundation models.

**The AV sector saw a bifurcation between the perceived winners and everyone else.** Waymo saw a significant scale up of commercial operations, and newer generations of AV companies built on more modern AI tech stacks continued to raise significant capital. At the same time, many heavily funded players saw continuing product delays, leading to strategic pivots and restructuring, or a shut-down as in the case of Cruise.

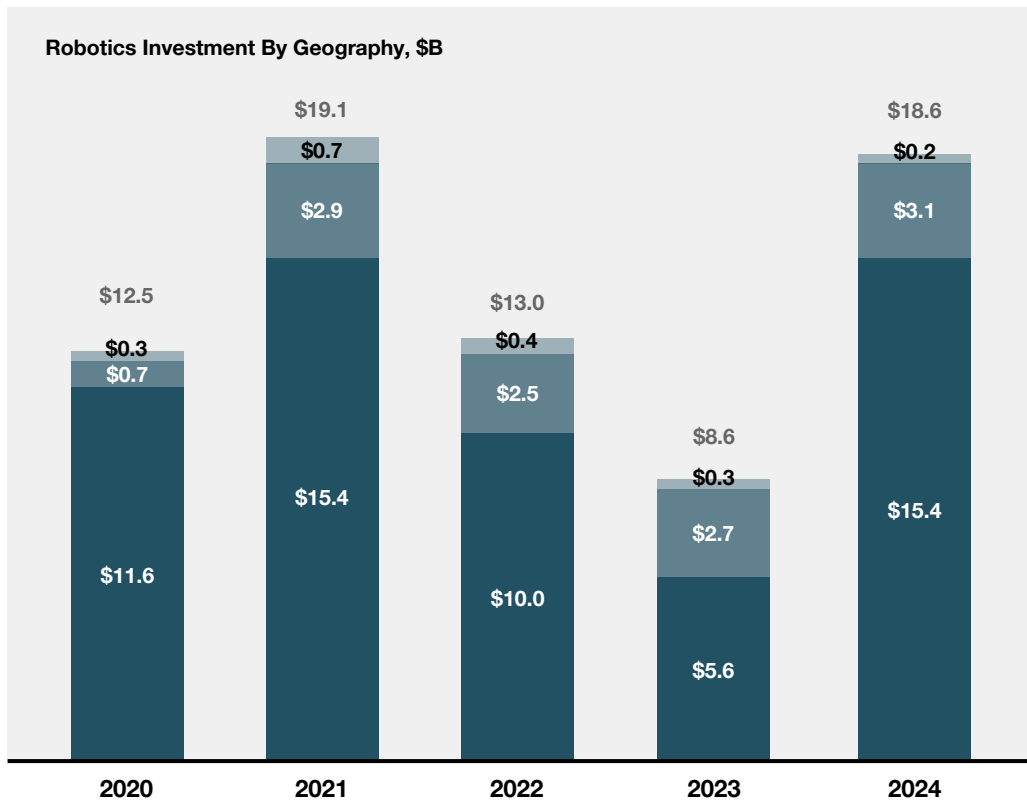
**Vertical robotics saw a 30% year-over-year growth in investments, surpassing previous highs of 2021 and 2022.** Much of the activity was driven by large funding rounds in the defense and logistics sectors, led by Anduril. Amongst other verticals, agriculture was a bright spot with investments reaching an all-time high of \$500M+.

**Early and mid-stage funding rounds continue to be subdued.** Early-stage rounds (\$2.5-\$15M raised) declined by 25% year-over-year, while mid-stage rounds (\$15-50M raised) were flat year-over-year, though down 30% from 2022 highs.

**There continues to be significant value locked in private unicorns - \$100B+ of aggregate value based on last round valuation.** However, there are signs of a thawing exit market with the 2024 public listings of Pony.ai and Serve Robotics and 6 M&A exits of \$250M+ in the last two years.

**Several public robotics companies saw strong market performance in 2024 with market caps growing 50%+ in many cases.** However, the number of public companies with market caps of \$500M+ continues to be small, with only eight such companies. At the same time, China has evolved as a successful parallel market for robotics. In China, there have been five IPOs in the last two years, and seven companies have market caps of \$1B+.

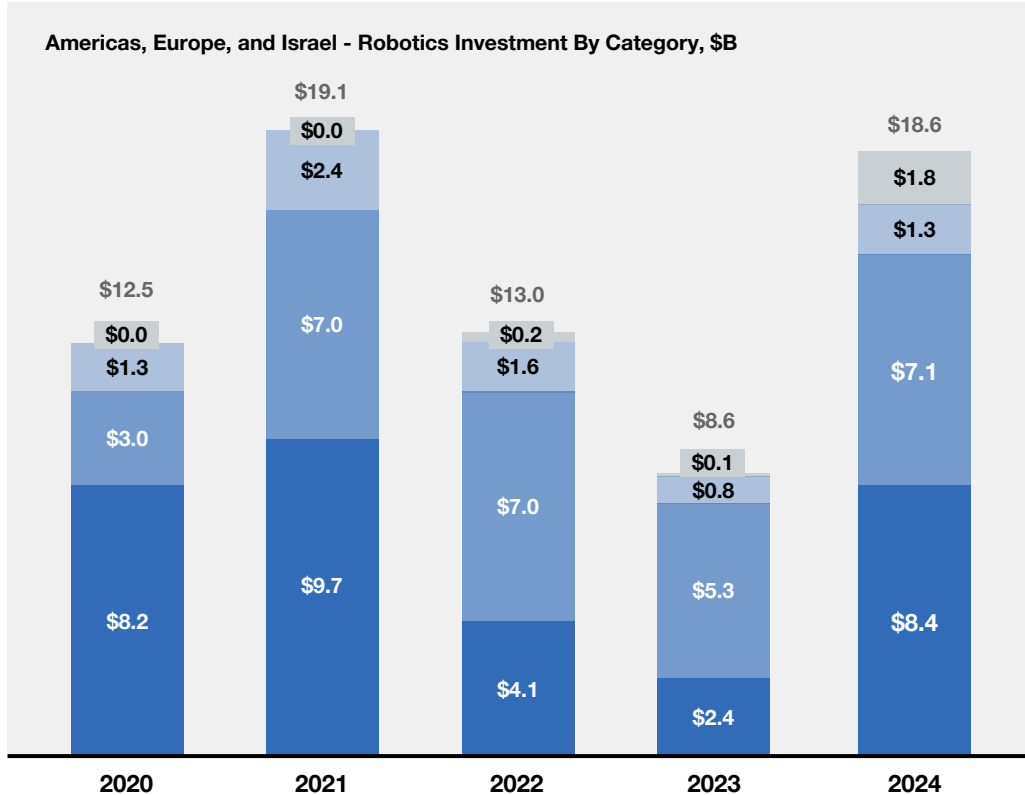
# Investment in Robotics rebounded in 2024 to near the all-time high of 2021



83%  
of investments  
go to companies  
in the Americas



# Most of the growth has been driven by investments in AV, Humanoids, and Robotic Foundation Models



## Total

## Humanoids + Foundation Models

Companies building robotics leveraging generative AI, either in humanoid form factors or as foundational models

## Enabling Systems

Companies building solutions to enable the development of AV and Robotics, including sensors, LiDar, Drones, and hardware/software components

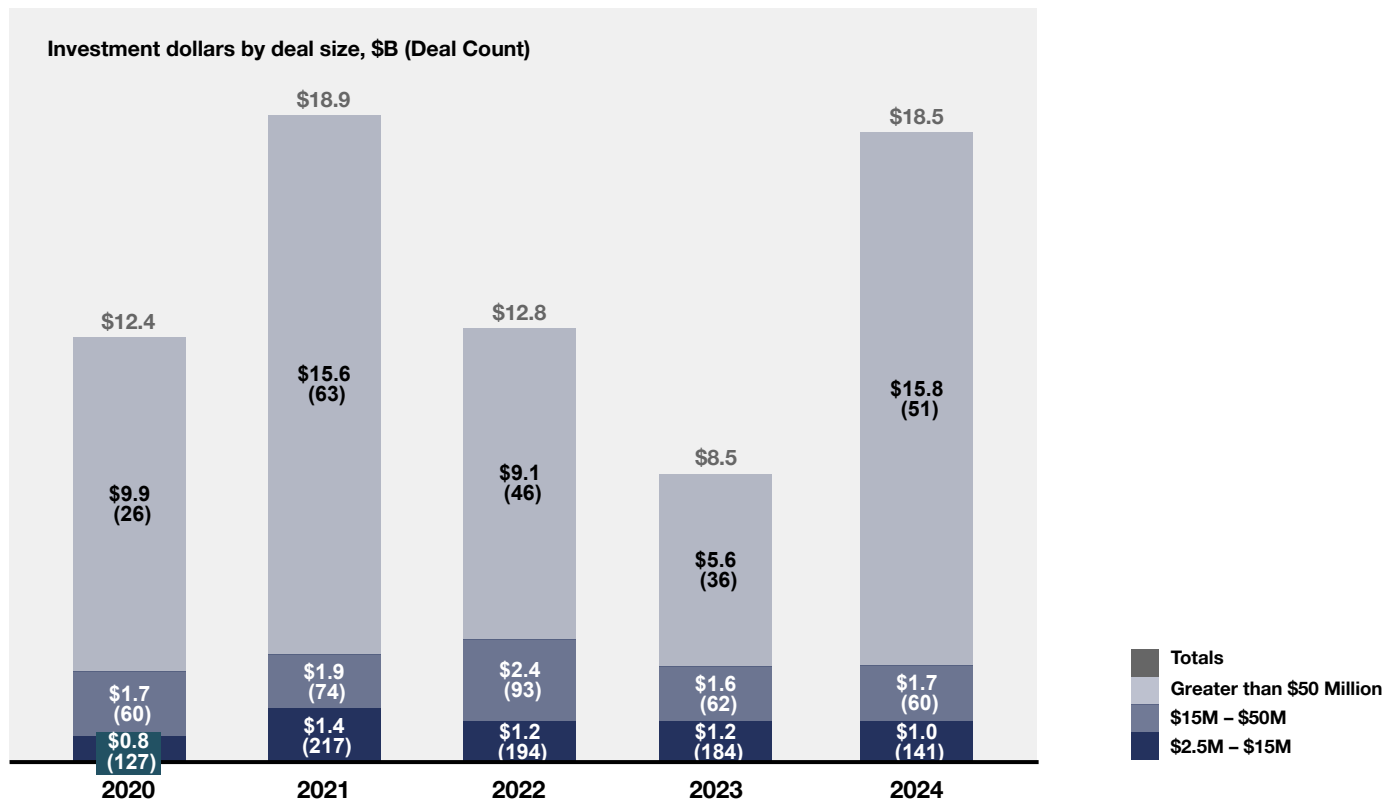
## Vertical Robotics

Companies building vertical-specific robotics across industries including logistics, medical, defense and security, manufacturing, agriculture, construction, and mining

## Autonomous Vehicles (AV)

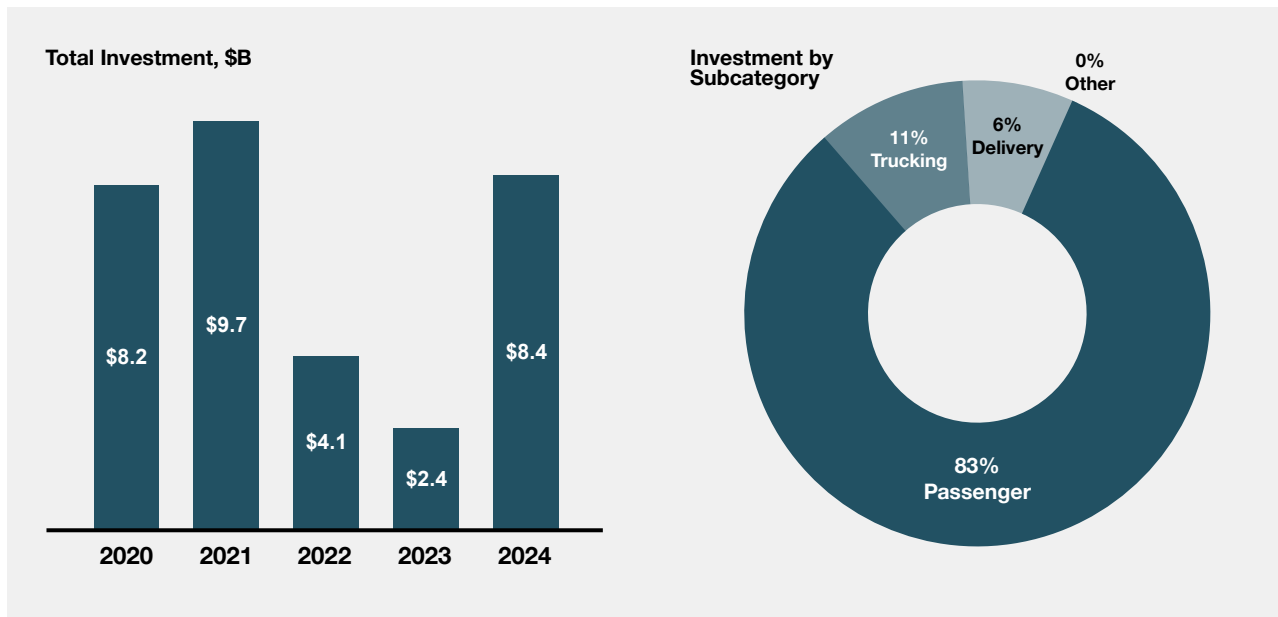
Companies building solutions for public road deployments across passenger vehicles, trucking, and delivery

All of the funding gains of 2024 have been for mega rounds of \$50M+; early and mid-stage rounds are flat or down from recent years









# Significant AV funding went to a few established companies in 2024

## Autonomous Vehicles - Americas, Europe, Israel



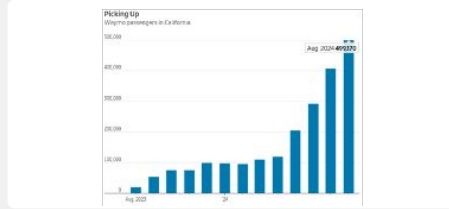
## Funding Rounds above \$100M, 2024

Company	Segment	Round Size
 WAYMO	Passenger	\$5.6B
 WAYVE	Passenger	\$1.0B
 cruise	Passenger	\$850M
 Motional	Passenger	\$448M
 waabi	Trucking	\$200M
 P3	Passenger	\$109M

# Waymo is leading the way with commercial AV services, while several well-funded players continue to struggle

## Waymo is emerging as the winner...

Consistent rider growth



Partnerships

Waymo robotaxis to become available on Uber in Austin, Atlanta in early 2025

**TC TechCrunch**

Geographic Expansion

REUTERS

Alphabet's Waymo to expand ride-hailing services in Miami



## ...while others struggle with operational challenges

Delays

Aurora Innovation delays commercial autonomous truck launch to 2025

**TC TechCrunch**

Pivots

Nuro pivots to license self-driving tech to carmakers, mobility companies

**TC TechCrunch**

Restructuring

Motional cut about 550 employees, around 40%, in restructuring, sources say

**TC TechCrunch**

Shutdown

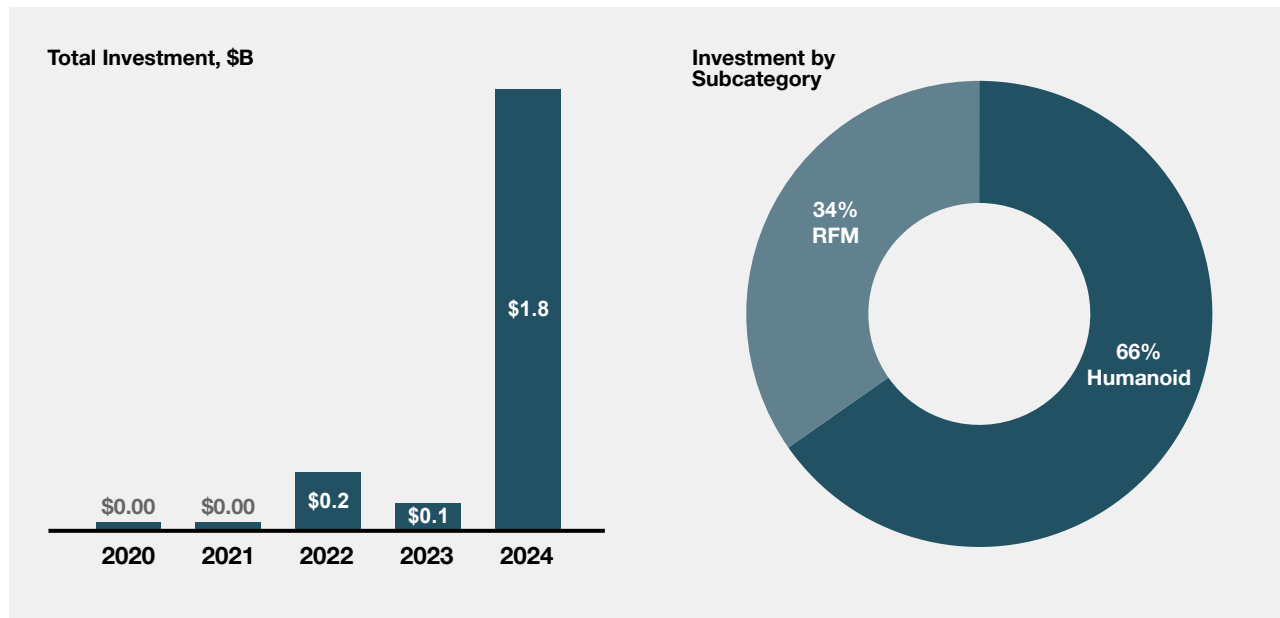
Cruise's robotaxi service will shut down as GM pulls its funding

**TheVerge**







# Investments in Humanoids and Foundation Models spiked in 2024, concentrated across a handful of companies

## Humanoids & Robotic Foundation Models - Americas, Europe, and Israel



### Funding Rounds above \$100M, 2024

Company	Segment	Round Size
 FIGURE	Humanoid	\$675M
Physical Intelligence (π)	RFM	\$400M
 SKILD AI	RFM	\$300M
 Agility Robotics	Humanoid	\$150M
 IX	Humanoid	\$100M

# Demos from Humanoid and Foundation Model companies illustrate the future potential of Robotics

Click each image to view



Boston Dynamics 



Agility  
Robotics



Physical Intelligence ( $\pi$ )



 FIGURE



TESLA



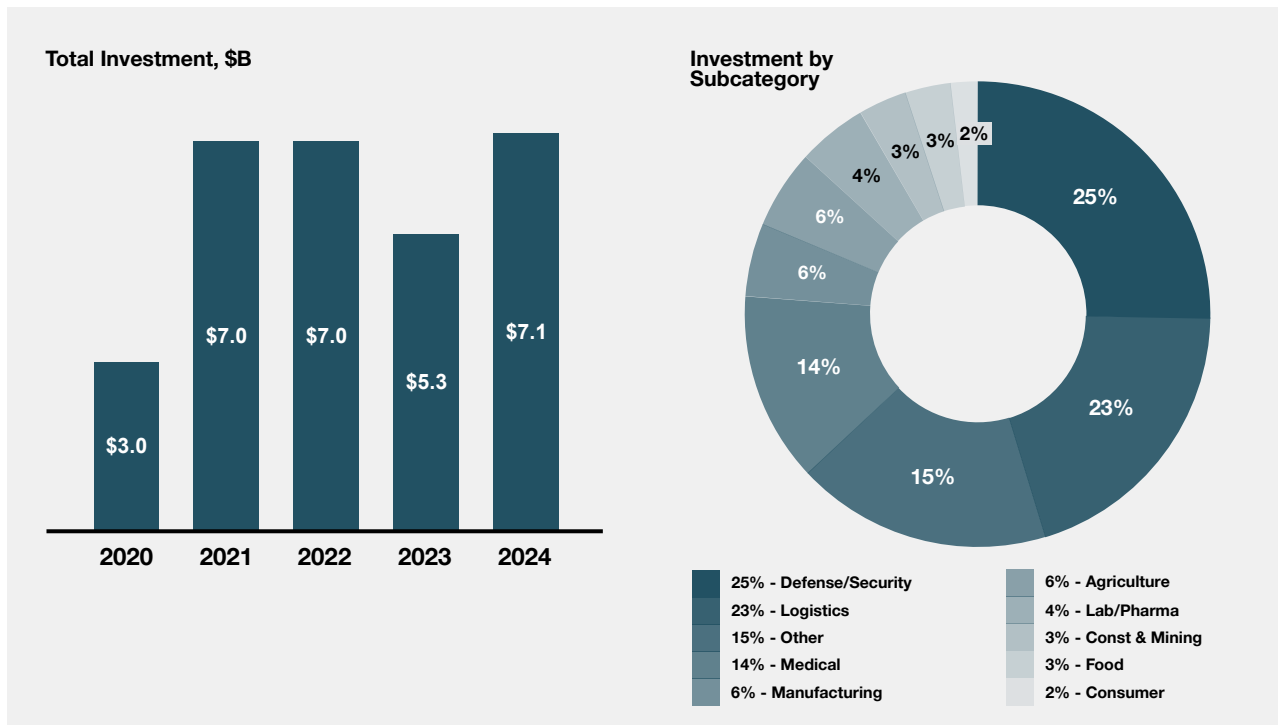
 SANCTUARY AI

F-PRIME

Source: F-Prime team analysis

# Defense and Logistics represent nearly half of investment in Vertical Robotics

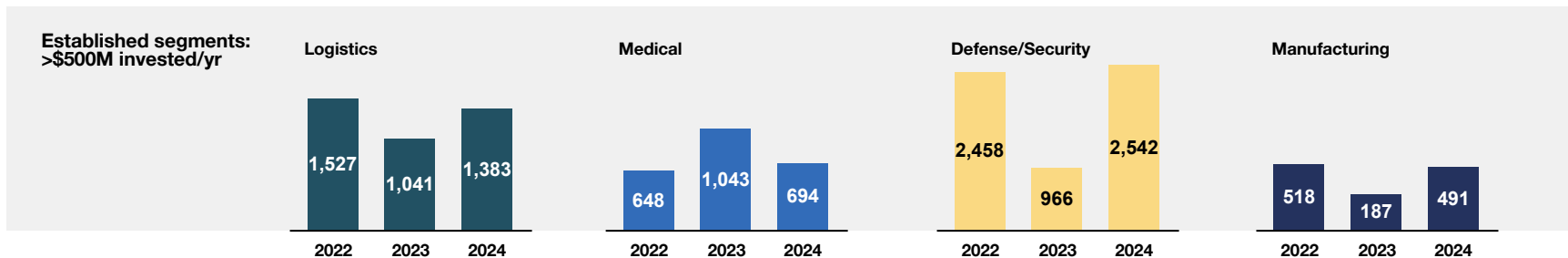
## Vertical Robotics - Americas, Europe, Israel



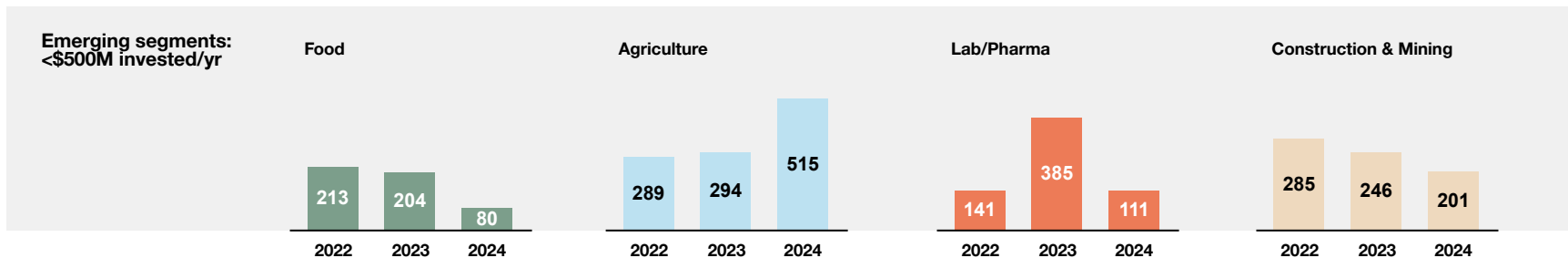
### Funding Rounds above \$100M, 2024

Company	Segment	Round Size
ANDURIL	Defense	\$1.5B
Helsing	Defense	\$484M
zipline	Logistics	\$350M
AMP ROBOTICS	Other	\$195M
SARONIC	Defense	\$175M
SAIEE	Consumer	\$150M
MONARCH	Agriculture	\$133M
Bright Machines	Manufacturing	\$126M
Skyports	Logistics	\$112M
AVYbotics	Other	\$111M
MMÍ	Medical	\$110M
nimble	Logistics	\$106M
Path Robotics	Manufacturing	\$100M
cobot	Logistics	\$100M

# In addition to established verticals, agriculture has started to attract more investment



Highest funded private companies, 2020-2024

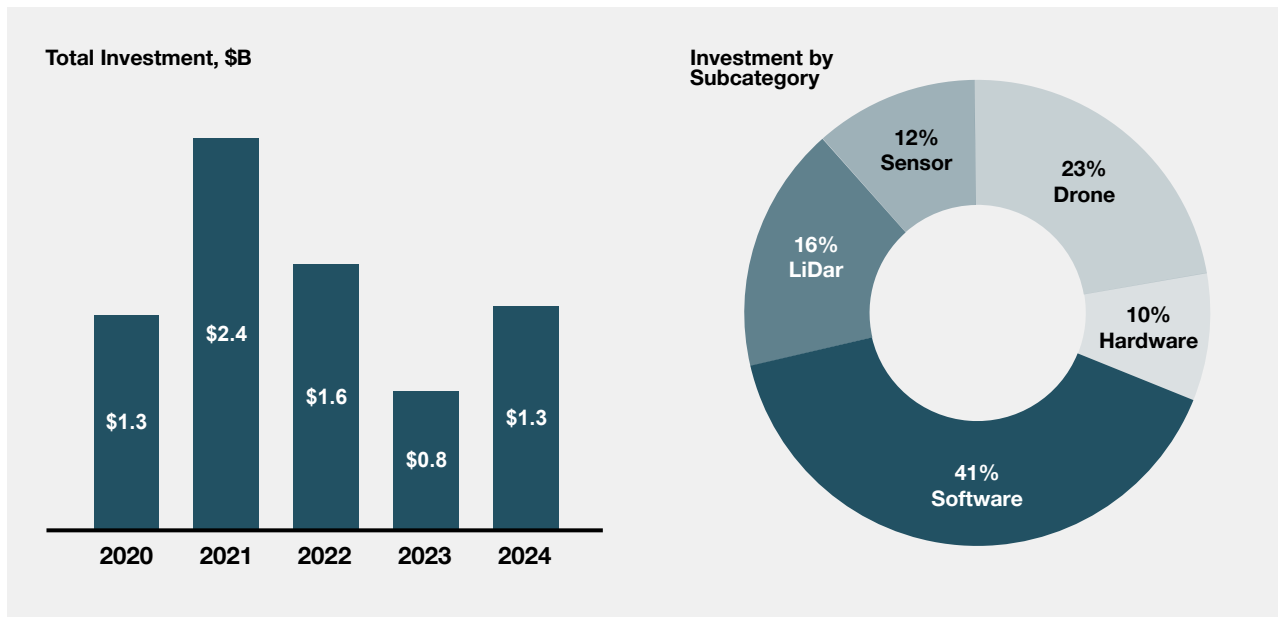


Highest funded private companies, 2020-2024



# Investments in Enabling Systems are a small niche within Robotics

## Enabling Systems - Americas, Europe, and Israel



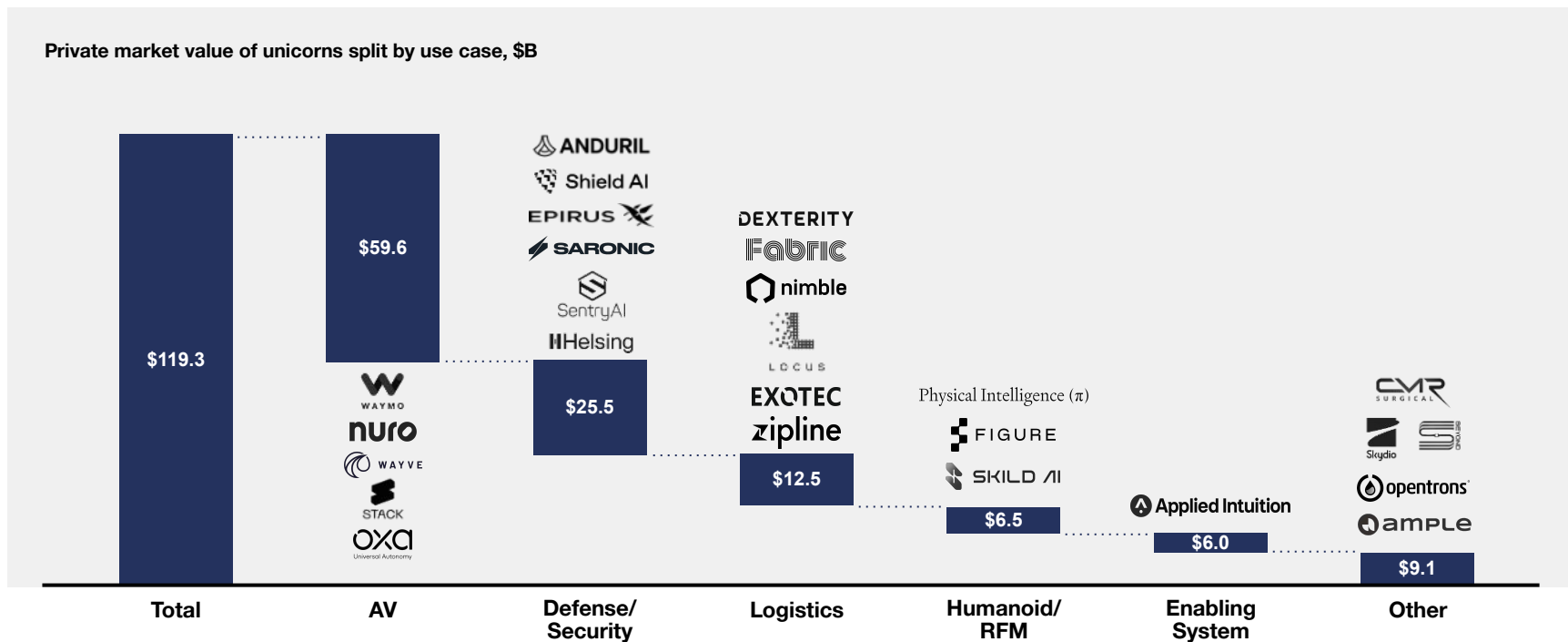
### Funding Rounds above \$100M, 2024

Company	Segment	Round Size
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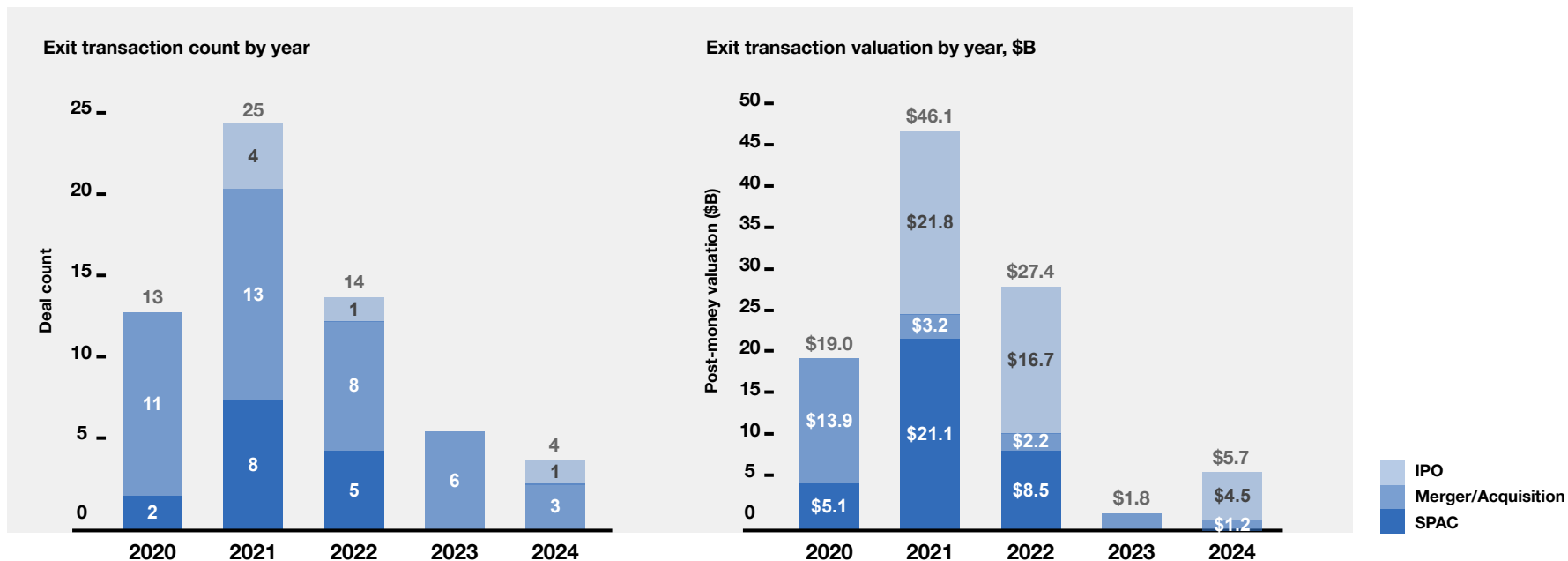
 Skydio	Drone	\$400M
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 Applied Intuition	Software	\$250M
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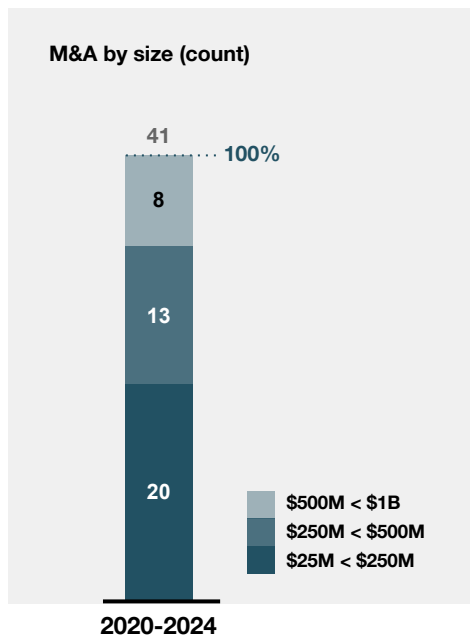
There is \$100B+ of private market value in Robotics, largely driven by the AV sector



# The lack of exits the last two years has been an industry headwind



# M&A is slowly recovering with several \$250M+ exits the last two years







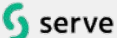


## M&A exits above \$250M, 2023-2024

Company	Acquisition Value	Date	Acquirer	Segment
CLEARPATH ROBOTICS	\$609M	October 2023	Rockwell Automation	Logistics
Velodyne LiDAR	\$600M	February 2023	OUSTER	LiDar
GHOSTROBOTICS	\$400M	April 2024	LIG Nex1	Defense
Dedrone	\$500M	July 2024	AXON	Defense
BERKSHIRE GREY	\$375M	July 2023	SoftBank	Logistics
AERODOME	\$300M	October 2024	flock safety	Security



## Several public companies in the sector have seen strong market performance; recent public listings indicate a thawing of the IPO market





Company	Market Cap (12/31/2024)	LTM Revenue	LTM Revenue Growth	ETM/LTM Revenue	LTM EBITDA Margin	12 Month Stock Performance	Segment	IPO Date
 INTUITIVE	\$185.9B	\$8352M	17%	23.1x	34%	1.5x	Medical	June 2000
 symbotic	\$14.1B	\$1.9B	44%	5.9x	-3%	0.5x	Logistics	June 2022
 Aurora	\$10.8B	NA	NA	NA	NA	1.4x	AV	November 2021
 pony.ai	\$5.0B	\$84M	17%	70.7x	-150%	1.2x*	Logistics	November 2024
 PROCEPT <sup>®</sup> BIOROBOTICS	\$4.4B	\$200M	72%	21.2x	-51%	1.9x	Medical	September 2021
 AutoStore	\$3.3B	\$613M	0%	6.3x	40%	0.5x	Logistics	October 2021
 OUSTER	\$608M	\$105M	51%	4.5x	-52%	1.6x	LiDar	March 2021
 serve	\$594M	\$2M	692%	NM	NA	4.3x*	Delivery	April 2024

\*Performance vs IPO date

Note: Only includes Americas, Europe & Israel; companies with market cap >\$500M.

Source: Pitchbook, F-Prime team analysis

# China has evolved as a parallel market for robotics, with multiple scaled public companies and an active IPO market

Company	Market Cap (12/31/2024)	LTM Revenue	LTM Revenue Growth	ETM/LTM Revenue	LTM EBITDA Margin	12 Month Stock Performance	Segment	IPO Date
 Horizon Robotics	\$6.1B	\$291M	296%	NA	-81%	0.9x*	AV	October 2024
 roborock	\$5.5B	\$1.4B	31%	3.4x	22%	1.1x	Cleaning	December 2019
 WeRide	\$3.9B	\$52M	-16%	88.9x	NA	0.9x*	AV	October 2024
 ECOVACS ROBOTICS	\$3.7B	\$2.2B	0%	70.7x	6%	1.1x	Cleaning	May 2018
 UBTECH	\$3.1B	\$176M	30%	17.9x	-93%	0.6x	Humanoid	December 2023
 HESAI	\$1.8B	\$274M	16%	5.4x	-19%	1.6x	LiDar	June 2023
 robosense	\$1.7B	\$237M	134%	6.0x	-38%	0.7x*	LiDar	January 2024

# Future outlook

**The pace of advancement in robotics is accelerating.** More companies are starting to see significant commercial scale, and technological advancements are transforming the capabilities of robotics solutions. These changes are re-kindling investor excitement for the sector, and it is also leading many technology heavy weights such as Tesla, Meta, Google, and Apple to invest in the sector.

**With all the excitement, the robotics sector is also bound to experience a hype cycle, as initial enthusiasm eventually gives way to realities of deploying real-world solutions.** However, as we are seeing in the AV sector, timelines and capital needs are uncertain, but the prize at the end can be significant. Those companies that are best able to maintain commercial momentum, integrate rapidly changing AI advancements, and find patient and supportive investors, can build transformational businesses in robotics.

**The ongoing re-opening of the M&A and IPO markets will be a significant tailwind for the sector.** As investors and founders see more liquidity, it will continue to create a virtuous cycle of company creation and exit. We are already seeing some of this as many highly experienced founders launched new robotics businesses in the last year.

**As AI transforms the world around us, Physical AI is one of the largest and most untapped market opportunities in venture capital today.** The application of modern AI is enabling never-before-imagined capabilities for robotics. The future in robotics is destined to exceed our expectations.

# About F-Prime

We create and invest in healthcare and technology companies that impact lives all over the world. We have over 200 companies in our portfolio including 23 that we started. Our global portfolio is spread across the US, Europe, and Asia.



## State of Robotics team



**Sanjay Aggarwal**  
Venture Partner



**Betsy Mulé**  
Senior Associate



Learn more  
about F-Prime:

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[Robotics Roundup](#)

Email:

[stateofrobotics@fprimecapital.com](mailto:stateofrobotics@fprimecapital.com)



# F-Prime Technology Team



Abdul Abdirahman  
Principal



Amrit Ramesh  
Data Scientist



Betsy Mulé  
Senior Associate



David Jegen  
Managing Partner



Gaurav Tuli  
Partner



Henry Trapnell  
Industry Networks Director



Jillian Enos  
Financial Sr. Director



Quinten Dol  
Marketing Manager



Rachel Feely-Kohl  
VP, Community & Platform



Rocio Wu  
Principal



Sanjay Aggarwal  
Venture Partner



Sarah Lamont  
Senior Associate



Shervin Ghaemmaghami  
Operating Partner