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China Next Winners – Autonomous driving: China leads on scale, cost, and adoption. Can it go global?



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This report is part of a series on China Next Winners in which we identify the next generation of industries and corporate winners in China.

China's next winners? Autonomous driving players are emerging as strong contenders. China combines the world's largest EV fleet, the fastest ADAS adoption, intense competition, and a rapidly maturing local supply chain, positioning it to lead global autonomy in deployment scale, cost reduction, and commercialization.

China leads global L2+ adoption and is likely to be first to scale L3 deployment. China L2+ penetration reached 22% of new vehicle sales in 2025 vs. 6% in the U.S. and 1% in Europe. Regulatory momentum is accelerating, with China granting the first L3 road-access permits to Changan Deepal SL03 and BAIC Arcfox Alpha S in Dec 2025, introducing mandatory ADS safety standards (GB 44721-2026) in Jul 2026, and a 2030 roadmap supporting scaled deployment of autonomous-driving systems in Sep 2026. As the new rules take effect from Jul 2027, we expect broader L3 commercialization approvals to follow. Momenta expects the Audi E7X with L3 capabilities to launch in 2027.

China's autonomous driving ecosystem enjoys a significant cost advantage, because of a rapidly maturing supply chain. Pony's Gen 7 robotaxi costs c.US$40k today, with further reductions to US$33-34k by year-end 2026, estimated to be roughly US$50-60k below Waymo's latest Ojai platform. Lower deployment costs enable larger fleets, faster data accumulation, and more rapid model iteration, creating a powerful competitive flywheel.

Domestic competition intensifies, seeking growth abroad. A key challenge facing China's autonomous driving players is the highly competitive domestic market and the resulting uncertainty around monetization, making overseas expansion an increasingly important growth avenue. While regulatory approvals and geopolitical constraints remain top investors' concerns, players such as Pony.ai and WeRide are steadily expanding their robotaxi presence across the Middle East, Europe, etc.. At the same time, regulatory progress, including Momenta's Germany-wide L4 testing approval, is of strategic importance. Beyond robotaxis, Chinese ADAS players are also advancing internationally, with XPeng targeting a wider global rollout of its driver-assistance capabilities by Q4 2026.

L4-dedicated approach leads on proven safety today, but AI may rewrite the race. Advances in AI are accelerating development cycles and narrowing technology gaps, potentially making leadership harder to sustain. Meanwhile, L2+ players such as Tesla, XPeng, and Momenta are extending into robotaxis, challenging L4-focused operators like Waymo, Pony.ai, and WeRide. A key debate is whether the bottom-up, L2+ first approach can close the gap to L4-dedicated autonomy. Its advantages include larger real-world data sets, lower hardware costs, and a self-funded model through vehicle sales. By contrast, L4-dedicated systems prioritize safety via richer sensor suites and greater redundancy, with proven driverless deployments already in operation. While L4 retains a clear lead in demonstrated safety today, advances in AI could gradually narrow the gap, and allow the L2+ first bottom-up approach to catch up over time.

See the Disclosure Appendix of this report for required disclosures, analyst certifications and other important information. Alternatively, visit our Global Research Disclosure Website.

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BERNSTEIN TICKER TABLE

Ticker	Rating	Cur	28 Sep 2026 Closing Price	Price Target	TTM Rel. Perf.	Cur	Reported EPS 2025A	Reported EPS 2026E	Reported EPS 2027E	Reported P/E (x) 2025A	Reported P/E (x) 2026E	Reported P/E (x) 2027E
1211.HK (BYD)	O	HKD	77.70	130.00	(54.1)%	CNY	3.58	4.12	5.50	18.6	16.2	12.1
002594.CH (BYD)	O	CNY	83.35	114.00	(49.4)%	CNY	3.58	4.12	5.50	23.3	20.2	15.2
175.HK (Geely)	O	HKD	16.17	25.00	(38.4)%	CNY	1.67	2.09	2.29	8.3	6.6	6.0
2333.HK (Great Wall-H)	M	HKD	7.39	10.00	(82.2)%	CNY	1.16	0.98	1.25	5.4	6.5	5.1
2238.HK (GAC)	M	HKD	2.54	2.00	(49.8)%	CNY	(0.85)	(0.74)	(0.15)	(2.6)	(2.9)	(14.0)
LI (Li Auto)	M	USD	11.50	14.50	(70.0)%	CNY	1.13	(5.24)	1.08	68.3	(14.7)	71.2
2015.HK (Li Auto)	M	HKD	45.74	57.00	(81.4)%	CNY	0.57	(2.62)	0.54	69.2	(14.9)	72.2
9866.HK (NIO)	M	HKD	28.44	39.00	(76.8)%	CNY	(6.85)	(1.73)	(1.03)	(3.6)	(14.1)	(23.7)
NIO (NIO)	M	USD	3.58	5.00	(66.4)%	CNY	(6.85)	(1.73)	(1.03)	(3.5)	(13.9)	(23.4)
600104.CH (SAIC)	M	CNY	10.77	12.00	(63.9)%	CNY	0.89	0.72	0.85	12.2	15.1	12.7
1810.HK (Xiaomi)	O	HKD	25.86	35.00	(69.9)%	CNY	1.62	0.89	1.29	13.6	24.9	17.2
9868.HK (XPeng)	M	HKD	39.10	71.00	(84.0)%	CNY	(0.60)	(2.40)	(0.29)	(55.9)	(13.9)	(116.8)
XPEV (XPeng)	M	USD	10.12	18.00	(72.8)%	CNY	(1.20)	(4.80)	(0.57)	(56.8)	(14.2)	(118.6)
ASIAX			1,978.05									
SPX			7,743.41									

O - Outperform, M - Market-Perform, U - Underperform, NR - Not Rated, CS - Coverage Suspended

Source: Bloomberg, Bernstein estimates and analysis.

INVESTMENT IMPLICATIONS

We rate BYD, Geely, and Xiaomi Outperform, and XPeng, Li Auto, NIO, Great Wall, GAC, and SAIC Market-Perform.

DETAILS

This report is part of a series on China Next Winners in which we identify the next generation of industries and corporate winners in China.

Please note this report mentions companies that are not covered by Bernstein, including Changan (000625.SZ), BAIC (1958.HK), Momenta (6880.HK), Pony.ai (PONY.US / 2026.HK), WeRide (WRD.US / 800.HK), Tesla (TSLA.US). Waymo is not publicly listed.

China's next winners? Autonomous driving players are emerging as strong contenders. China combines the world's largest EV fleet, the fastest ADAS adoption, intense competition, and a rapidly maturing local supply chain, positioning it to lead global autonomy in deployment scale, cost reduction, and commercialization.

RELATED RESEARCH HIGHLIGHTS:

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CHINA ALREADY LEADS GLOBAL L2+ ADOPTION, AND WILL LIKELY BE FIRST TO DEPLOY L3 AT SCALE

China already leads global L2+ adoption, with penetration reaching 22% of new vehicle sales in 2025 vs. 6% in the U.S. and 1% in Europe. Chinese consumers are highly receptive to new technologies, making advanced L2+ NOA features increasingly essential for EV owners. (Exhibit 1 - Exhibit 2)

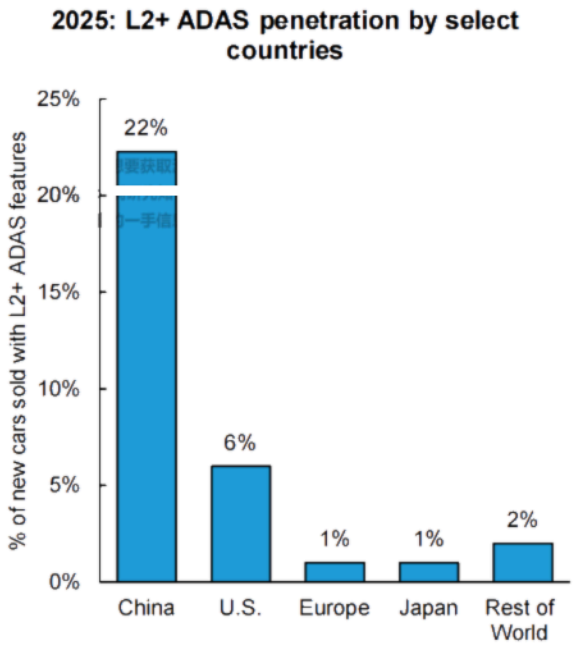
We also expect China to be among the first markets to achieve meaningful L3 deployment at scale, supported by ongoing regulatory progress and accelerating OEM launches.

- On December 15, 2025, China's MIIT granted the first L3 road-access permits to the Changan Deepal SL03 and BAIC Arcfox Alpha S, marking a shift beyond testing approvals.
- Regulatory momentum continued on July 30, 2026, when MIIT released GB 44721-2026 (or Link to Infographic). China's first mandatory national safety standard for automated driving systems, effective July 1, 2027.
- On September 9, MIIT also unveiled its 15th Five-Year Plan for Intelligent Connected New Energy Vehicles (LINK), outlining a 2030 roadmap for scaled deployment of autonomous-driving systems across highways, urban expressways, and selected urban-road scenarios, with a stated objective that autonomous-driving-equipped vehicles should materially outperform human drivers on safety by 2030.

With the new regulatory framework scheduled to take effect on July 1, 2027, industry expectations are rising for broader L3 commercialization approvals. Momenta expects the Audi E7X, equipped with its L3 ADAS solution, to launch in 2027. While L3 could create new monetization opportunities through software subscriptions, we remain cautious on the pace of consumer

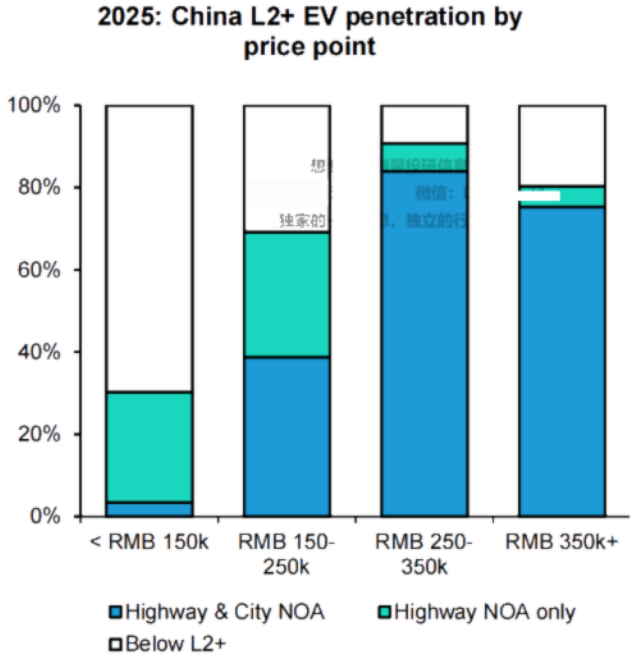
adoption.

EXHIBIT 1: **China has established a clear lead in L2+ ADAS adoption, reaching 22% penetration in 2025, well ahead of the U.S. (6%), Europe (1%), and Japan (1%)**



Source: Gasgoo, World Economic Forum, and Bernstein analysis

EXHIBIT 2: **Chinese consumers are highly receptive to new technologies, making advanced L2+ NOA features increasingly essential for EV owners**

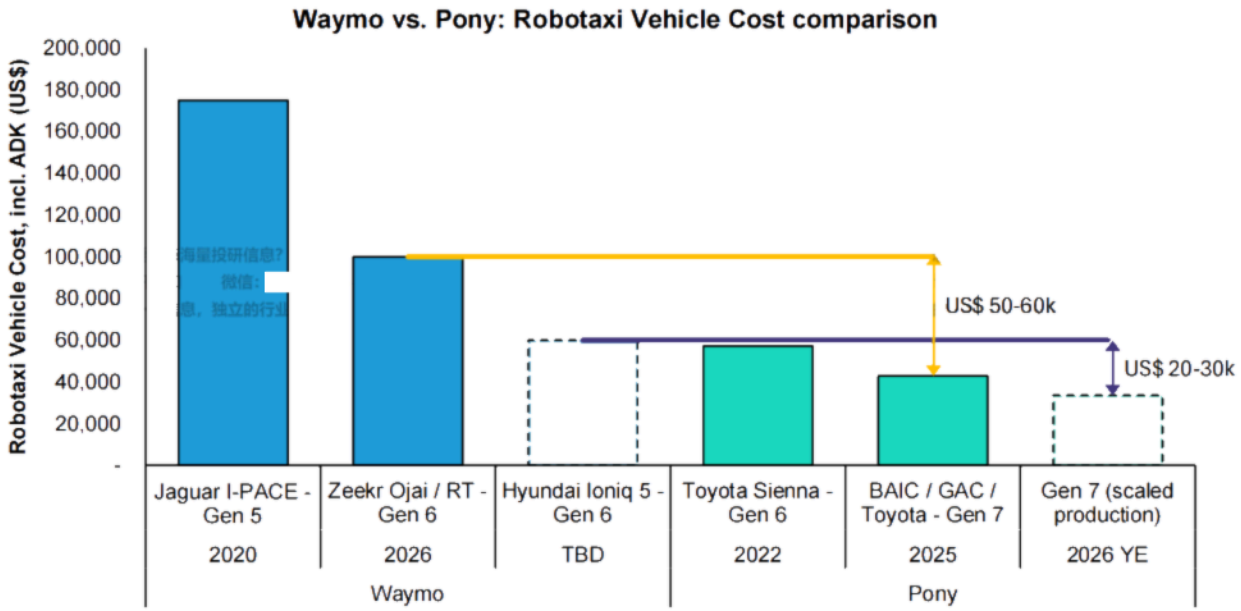


Source: Gasgoo and Bernstein analysis

CHINA'S AUTONOMOUS DRIVING ECOSYSTEM ENJOYS A SIGNIFICANT COST ADVANTAGE

China's autonomous driving ecosystem enjoys a significant cost advantage, because of a rapidly maturing supply chain. Pony's Gen 7 robotaxi costs c.US$40k today, with further reductions to US$33-34k by year-end 2026, estimated to be roughly US $50-60k below Waymo's latest Ojai platform. Lower deployment costs enable larger fleets, faster data accumulation, and more rapid model iteration, creating a powerful competitive flywheel. (Exhibit 3)

EXHIBIT 3: **China's robotaxi enjoys a significant cost advantage vs. U.S. peers; we estimate Pony's Gen 7 costs c.US $40k, roughly US$50-60k lower than Waymo's Ojai**



Pony is using BAIC Arcfox Alpha T5, GAC Aion V, and Toyota bZ4X for their Gen 7 robotaxis.
Source: Company disclosures, Bernstein estimates and analysis

DOMESTIC COMPETITION INTENSIFIES, SEEKING GROWTH ABROAD

A key challenge facing China's autonomous driving players is however, the highly competitive domestic market and the resulting uncertainty around long-term monetization. Intense competition is likely to compress returns, increasing the importance of overseas expansion as a growth avenue. However, **international deployment brings its own challenges**, as expansion efforts remain subject to regulatory approvals and geopolitical constraints, which could limit the global reach of Chinese autonomous driving companies. That said, there has been encouraging progress on the overseas front. Both Pony.ai and WeRide have continued to expand their robotaxi footprints, particularly in the Middle East, while also pursuing opportunities in other international markets. Although deployment volumes remain relatively small today, the geographic expansion is notable. Outside China:

- **WeRide** operates across the UAE, including Abu Dhabi and Dubai, as well as Saudi Arabia, and is testing or preparing for broader deployment in Singapore and several European markets, including France, Switzerland, and Slovakia
- **Pony.ai** has launched operations in Doha, Qatar and most recently in Zagreb, Croatia, while announcing or testing deployments in markets including Dubai, Singapore, South Korea, and Luxembourg

Beyond commercial deployments, Chinese autonomous driving companies are also making regulatory progress in Europe.

- **Momenta** recently received Germany-wide KBA approval for L4 urban road testing on July 29, 2026. While this does not yet constitute an operating license, it is significant because it removes the need for city-by-city testing permits, representing an important step toward broader deployment in Europe.

Outside of robotaxis, Chinese ADAS players are also making progress internationally.

- **XPeng** has already begun delivering ADAS-equipped vehicles in Europe and is conducting public-road testing in Germany. The company is targeting a broader global rollout of its advanced driver assistance capabilities by 4Q26, highlighting the increasing ambition of Chinese players to export not only vehicles, but also their software and autonomous driving technology stacks.

BOTTOM-UP VS. TOP-DOWN AUTONOMY: CAN L2 ULTIMATELY EVOLVE INTO L4? AI LOWERED TECH BARRIER

Advances in AI are accelerating development cycles and narrowing technology gaps, making leadership positions potentially harder to sustain. As a result, the traditional divide between L2+ ADAS providers and L4 robotaxi operators is beginning to blur. Historically, autonomous driving players have followed two distinct development paths:

- **Bottom-up:** Start with L2/L2+ driver-assistance systems deployed in consumer vehicles, accumulate real-world data at scale, and gradually advance toward L3 and L4 autonomy.
- **Top-down:** Target L4 autonomy from the outset, initially operating within geofenced Operational Design Domains (ODDs) before expanding coverage and reducing costs to enable broader commercialization.

As AI capabilities improve, these paths are increasingly converging. Formerly L2+-focused players such as **Tesla, XPeng, and Momenta** are extending their technology beyond assisted driving into robotaxi applications, directly competing with established L4 operators such as **Waymo, Pony.ai, and WeRide**. The key question for the industry is whether the bottom-up approach can successfully bridge the gap from advanced driver assistance to commercially scalable L4 autonomous driving.

THE BOTTOM-UP CAMP: L2+ FIRST, THEN SCALING TOWARD L4 THROUGH MASS-PRODUCTION PASSENGER VEHICLES

The bottom-up camp includes Tesla, XPeng, and Momenta, all of which leverage L2+ enabled mass-production vehicles to collect driving data, improve algorithms, and gradually expand autonomous-driving capability.

- **Tesla** continues advancing its Full Self-Driving (FSD) platform through end-to-end AI training. By August 2026, Tesla's supervised Robotaxi fleet in Austin, Dallas, and Houston had expanded to nearly 200 vehicles, accumulating more than 380,000 autonomous miles without major accidents, according to the company.
- **XPeng** is pursuing an autonomy roadmap similar to Tesla's. The company has adopted vision-only hardware strategy, i.e., with no LiDAR, similar to Tesla. It has been investing in its XNGP that leverages in house Vision-Language-Action (VLA) and World models. Its robotaxi fleet has completed approximately 2,000 passenger trips in Guangzhou, and management targets fully driverless operations by early 2027.
- **Momenta** has emerged as one of the leading third party ADAS solution providers, with 219 design wins across 26 OEMs, including 114 programs already in production, as of recently. The company expects L3 vehicle launches in 2027, subject to regulatory approval, while also expanding robotaxi and robovan operations across China and select international markets.

THE TOP-DOWN CAMP: STARTING WITH L4 DRIVERLESS OPERATION

The top-down camp includes Waymo, Pony.ai, and WeRide, all of which were founded with the explicit objective of achieving L4 autonomy and commercializing driverless mobility services.

- **Waymo** now completes more than 500,000 paid rides per week across 11 U.S. cities and is expanding internationally, including planned operations in Europe.
- **Pony.ai** had approximately 2,000 robotaxis in operation by 2Q26 and more than 1.5 million registered users in China. Through partnerships such as Uber, the company has also secured commitments for thousands of vehicles in international markets.
- **WeRide** operates a robotaxi fleet exceeding 1,800 vehicles and has obtained autonomous-driving permits across multiple international markets.

WHY THE BOTTOM-UP APPROACH COULD WORK

The bottom-up approach offers several potential advantages (Exhibit 4):

1. **Data scale**: Millions of production vehicles generate enormous volumes of real-world driving data every day. This creates a powerful data flywheel, enabling rapid collection of diverse driving scenarios and continuous model improvement. (Exhibit 5)

2. **Shared technology foundation**: Although L2 and L4 operate under different safety assumptions, they share many core technology building blocks, including perception, prediction, planning, and control. The emergence of BEV architectures, end-to-end neural networks, world models, and VLA frameworks has further narrowed the technology gap, allowing capabilities developed for L2 systems to serve as foundations for higher levels of autonomy.

3. **Hardware Economics:** Mass-market deployment lowers the cost of sensors, compute platforms, and vehicle electronic architectures. Bottom-up players generally target lower-cost hardware configurations than traditional robotaxi operators, potentially improving the economics of large-scale commercialization. (Exhibit 6 - Exhibit 10)

4. **Potentially more sustainable Funding Model:** Unlike pure-play robotaxi companies that often rely on external funding, bottom-up players can fund autonomous-driving investment through vehicle sales. This creates a self-reinforcing cycle of vehicle sales, data generation, product improvement, and further growth. (Exhibit 11 - Exhibit 12)

THE CHALLENGES FACING THE BOTTOM-UP PATH

Despite these advantages, several obstacles remain:

1. **Long-tail Scenarios**: L4 autonomy ultimately depends on safely handling rare edge cases, including unusual accidents, complex construction zones, and unpredictable road-user behavior. While bottom-up players have access to vast amounts of driving data, the challenge increasingly lies in identifying, labeling, and learning from these low-frequency but safety-critical events. Data abundance alone does not guarantee effective learning.

2. **Design philosophy:** L2 and L4 embody fundamentally different design architectures. The L4-dedicated and L2+ first bottom-up autonomous driving systems are optimized for very different objectives. L4-dedicated developers prioritize 1) safety above all else, followed by 2) passenger comfort and the ability to complete trips 3) efficiently within a 4) defined operating domain which they work to expand. In contrast, L2+ systems are designed primarily for consumer vehicles, where 1) cost is the top priority, followed by 2) broad usability across driving scenarios (ODD), 3) driving comfort, and minimizing driver intervention. 4) The human driver remains responsible and can intervene when necessary (i.e. serve as fall back / redundancy). As a result, L2+ solutions tend to emphasize affordability and scalability, while L4 systems prioritize robustness and safety for fully driverless operation.

3. **Hardware Debate:** Whether vision-only sensor stack without LiDAR(s) can support full L4 autonomy remains one of the industry's most contentious questions. While Tesla and XPeng advocate camera-led approaches, most current L4 operators continue to rely on multi-sensor redundancy involving lidar, radar, and cameras.

4. **Commercialization and Regulation:** Even if L4 technology becomes viable, large-scale commercialization will depend on issues beyond technology, including regulations, liability frameworks, insurance, fleet operations, and consumer acceptance. L4-dedicated players argue that L2+ first players won't arrive at the same safety records.

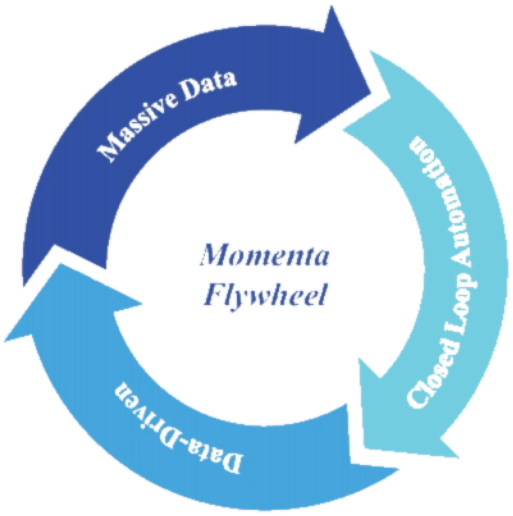
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EXHIBIT 4: **A key industry debate is whether autonomous driving can be achieved through incremental L2-to-L4 progression**

	Why It Will Work	Why It Won't Work
Data	Massive data flywheel enabled by millions of production vehicles.	Most data comes from routine driving; Valuable edge cases remain sparse and costly to label; Suboptimal driving behavior data from human drivers may bias the model.
Algorithms	L2 and L4 share much of the same perception, prediction, and control stack.	L2 assumes human supervision, while L4 must operate without human fallback, creating architectural transition challenges.
Hardware	Mass-market deployment drives rapid hardware cost reduction and scale advantages.	Camera-only approaches adopted by some players remain controversial for enabling system-level redundancy.
Funding & Business Model	Vehicle sales generate cash flow that can continuously fund R&D and model iteration.	N.A.
Leading players	Tesla. Xpeng, Momemta	Waymo, Pony.ai, WeRide

Source: Bernstein analysis

EXHIBIT 5: **According to bottom-up L2-first players, the progression to L4 can be achieved with the autonomous driving data flywheel: more vehicles on the road generate more real-world driving data, enabling faster and continuous model iteration, improving performance and reinforcing the competitive advantage over time**



Massive Data

Extensive and high-quality real-world driving data, covering abundant corner cases

Closed Loop Automation

A highly standardized and automated data loop architecture, supported by a rich set of proprietary infrastructures

Data-Driven

Fully data-driven end-to-end big model, with reinforcement learning feature

Source: Momenta

EXHIBIT 6: **The bottom-up, L2-first approach is generally built around a lower-cost sensor suite, primarily by reducing reliance on LiDAR, the most expensive sensor in the stack; However, debate remains over whether L3 and L4 vehicles, given the associated liability transfer and redundancy requirements, will ultimately require additional LiDARs**

Number of sensors	Bottom-up approach			Top-down approach			
	Tesla HW4	XPeng GX	Momenta R7	Waymo Ojai	Pony.ai Gen 7	WeRide GXR	Baidu Apollo Go
Camera	8	11	11	13	14	11	12
Ultrasonic radar	0	12	12	n/a	n/a	n/a	12
Millimeter-wave radar	0	3 - 7	3	6	4	n/a	6
LiDAR	0	0	1	4	9	4	8
Total*	8	26-30	28	23	>30	>20	40

Total sensor counts may not equal the sum of disclosed sensors, as some components have not been specified by the companies.
Source: Autopost, Sina news, Company websites, Bernstein analysis and estimates

EXHIBIT 7: **Top-down, L4-focused players such as Waymo and Pony.ai equip their vehicles with a full stack of sensors...**



Source: Company website and Bernstein analysis

EXHIBIT 8: **... making their hardware architecture more sophisticated but also considerably more costly**



Source: Company website and Bernstein analysis

EXHIBIT 9: **By contrast, bottom-up L2-first players generally use fewer (or no) LiDARs or camera-only solutions ...**



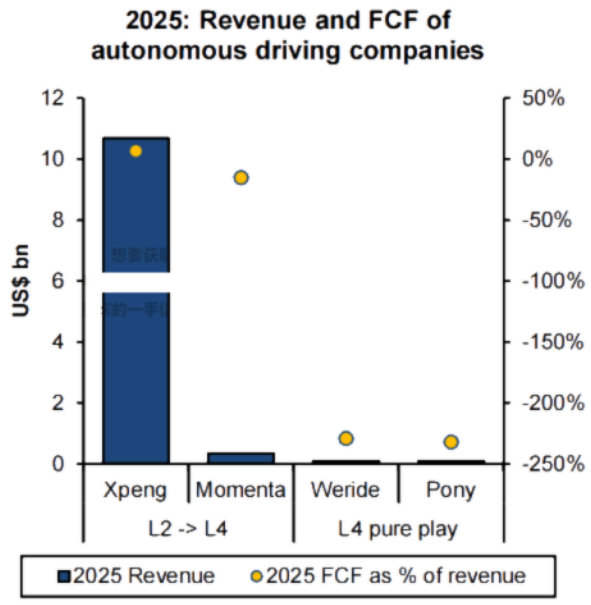
Source: Company website and Bernstein analysis

EXHIBIT 10: **... to keep hardware costs low and make mass-market deployment more economical**



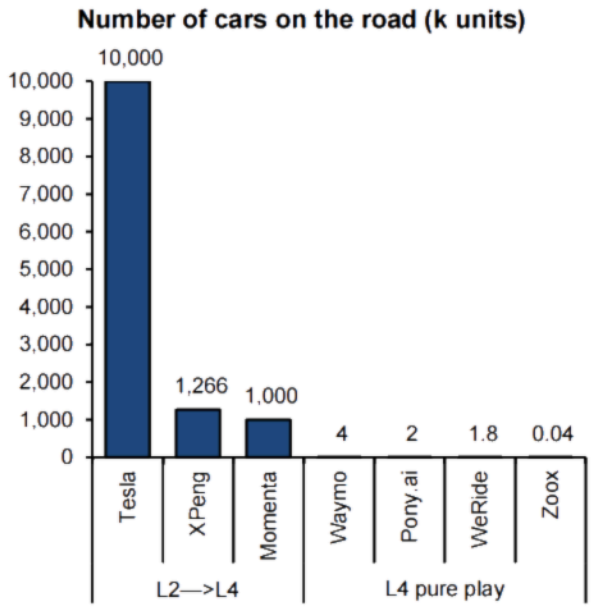
Source: Company website and Bernstein analysis

EXHIBIT 11: **Bottom-up L2 players delivered substantially higher revenue and stronger cash flow in 2025 ...**



Source: Bloomberg and Bernstein analysis

EXHIBIT 12: **... and have significantly more vehicles on the road**



Source: Company reports, Robotaxi tracker, and Bernstein analysis

OUR VIEW : L4-DEDICATED APPROACH LEADS ON PROVEN SAFETY TODAY, BUT AI MAY REWRITE THE RACE

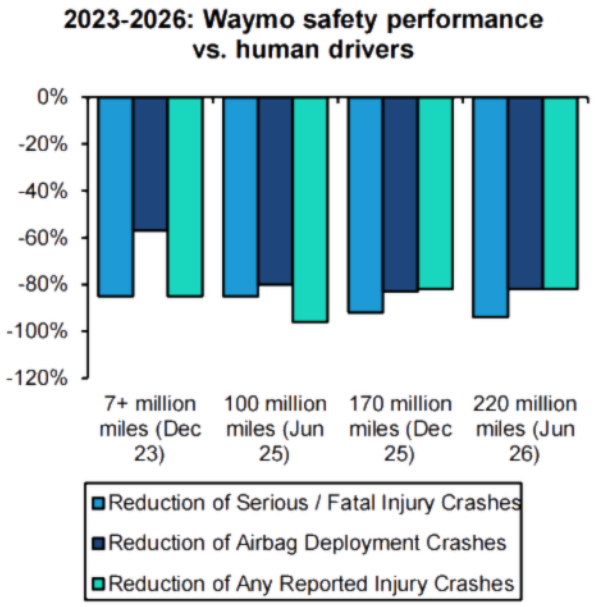
We do not believe there is sufficient evidence today to conclude that the L2+first, bottom-up approach can achieve safety levels comparable to L4-dedicated systems. Publicly available data in China remains limited. Even among established L4 robotaxi operators, meaningful safety comparisons are difficult due to the lack of standardized, publicly reported safety metrics. The challenge is even greater for L2+ first players such as XPeng and Momenta, which have yet to scale driverless robotaxi operations to a comparable level. The U.S. data is also inconclusive. Based on NHTSA's crash reporting data (LINK), comparisons between Waymo and Tesla do not provide a definitive answer. Tesla has reported fewer accidents over a similar period, but it also operates a significantly smaller robotaxi fleet. A per-vehicle comparison is likewise imperfect, as Tesla's deployment is currently limited to a much narrower ODD and has accumulated substantially fewer autonomous miles. In addition, safety drivers may still be present in parts of Tesla's fleet, further complicating comparisons. While crash data must be reported, it is often unclear whether the autonomous system, another road user, or a human operator was responsible for a given incident. As a result, the industry simply does not yet have enough large-scale, comparable driverless operating data to determine whether the L2+-first pathway can ultimately match the safety performance of L4-dedicated players.

A matter of timing? If AI could bridge the gap. The bottom-up, L2+ first approach benefits from larger data scale, lower hardware costs, and a self-funded business model through vehicle sales. The top-down, L4-dedicated approach, meanwhile, prioritizes safety through greater sensing redundancy and has already proven commercial driverless operations. While both approaches have delivered meaningful progress, neither has conclusively demonstrated superiority as the long-term path to scaled autonomy. **With continued advances in AI, the bottom-up approach may ultimately narrow the gap in solving long-tail scenarios, potentially leading to convergence between the two.** Notably, our discussion focuses on algorithmic iteration and learning capabilities, rather than the separate debate over the necessity of LiDAR or other sensor modalities.

Regardless of their differing strategies, both approaches continue to face a common set of technical, operational, and societal challenges. Recent incidents involving autonomous vehicles operating in flooded roads highlight that even the most advanced systems can still struggle in extreme weather conditions, where perception, contextual reasoning, and decision-making remain difficult problems. These events illustrate that autonomous driving has not yet fully mastered certain long-tail scenarios that human drivers often navigate intuitively. At the same time, safety should not be assessed solely through crash statistics. Today, robotaxi generally lacks the ability to perform many of the community-safety functions traditionally provided by human drivers, such as yielding appropriately to ambulances and fire trucks, assisting intoxicated or incapacitated passengers, intervening in unsafe passenger behavior, or reporting suspicious activity.

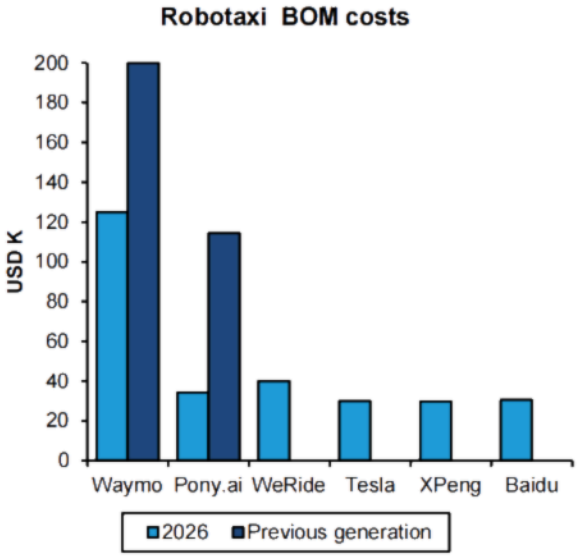
Notwithstanding these challenges, the trajectory of industry development over the past decade points to meaningful progress toward large-scale autonomous mobility. Autonomous driving systems have advanced significantly in capability, operational reliability, and commercialization scale. Robotaxi deployments have expanded from limited pilots to meaningful commercial operations, while autonomous-driving features have become increasingly sophisticated and widely adopted in consumer vehicles. Although important technical, regulatory, and societal hurdles remain, the industry is clearly moving closer to large-scale deployment. In our view, autonomous driving may now be entering the early stages of broader adoption, and we remain optimistic about its long-term prospects.

EXHIBIT 13: **Waymo has consistently demonstrated superior safety performance relative to human drivers, with steady improvements over the past four years**



Source: Waymo and Bernstein analysis

EXHIBIT 14: **Robotaxi companies in the leapfrog camp typically incur higher BOM costs than progressive players**



Source: Company disclosures, Bernstein analysis and estimates