
ALICE VENTURES
STRATEGIC INTELLIGENCE

Smart Steering Wheels in Chinese Automotive

A 2025–2030 Market Analysis

Confidential Client Report
Data Update · February 2026

Table of Contents

1. Executive Summary	3
2. Methodology	4
3. Technology Taxonomy	5
4. Market Size and Growth	6
5. Capital Expenditure Implications	7
6. Unit Economics by OEM Tier	8
7. Procurement Cycle Timeline	9
8. OEM Sourcing Decision Criteria	10
9. Monetization Pathways for New Entrants	11
10. Vehicle Model Deployment Matrix	12
11. OEM Profiles — Top 10 Leaders	13–14
12. Tier-1 Supplier Landscape	15
13. Feature Adoption Trends	16
14. Regulatory Environment	17
15. Predictions and Strategic Outlook	18
Appendix: Sources and References	19–20

OEM COVERAGE UNIVERSE — 12 CHINESE OEMS EXAMINED

BYD · Mass-Market	NIO · Premium	XPeng · Technology
Li Auto · Family	Geely / Zeekr · Multi-Brand	Chery / Exeed · Export
Great Wall / WEY · Mass-Premium	SAIC / IM Motors · State-Backed	Dongfeng / Voyah · Aspirant
Changan / Avatr · Partnership	HiPhi · Ultra-Premium	Hongqi · State Luxury

TIER-1 SUPPLIERS ANALYZED

ZF Friedrichshafen · Germany	Joyson Safety Systems · China
Toyoda Gosei · Japan	Autoliv · Sweden
Bethel Automotive Safety · China	Changchun Faway · China
Kostal Group · Germany	Takata (Joyson) · China

SECTION 1

EXECUTIVE SUMMARY

The Chinese automotive industry is undergoing a rapid transformation of the steering wheel from a purely mechanical input device into a sophisticated, sensor-laden human-machine interface. The market for advanced smart steering wheels in China is projected to grow from **\$1.2 billion in 2025** to **\$8.7 billion by 2030**, representing a compound annual growth rate of **48%**.

This growth is driven by three converging forces:

- **Regulatory mandate:** DMS regulations requiring capacitive sensing in all new vehicles by 2028
- **Autonomous driving:** L2+ and L3 systems that require reliable driver-state detection
- **Competitive pressure:** Intense differentiation through premium cockpit experiences

Our analysis of 12 Chinese OEMs reveals a clear tiering: **technology-first players** (XPeng, NIO) are deploying biometric and display-integrated wheels, while **mass-market leaders** (BYD, Geely) are driving feature democratization at aggressive price points.

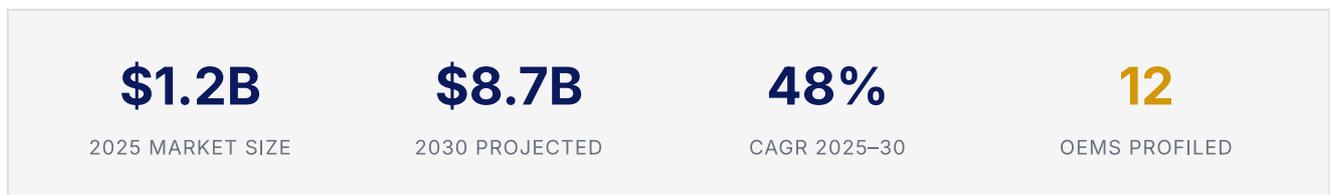
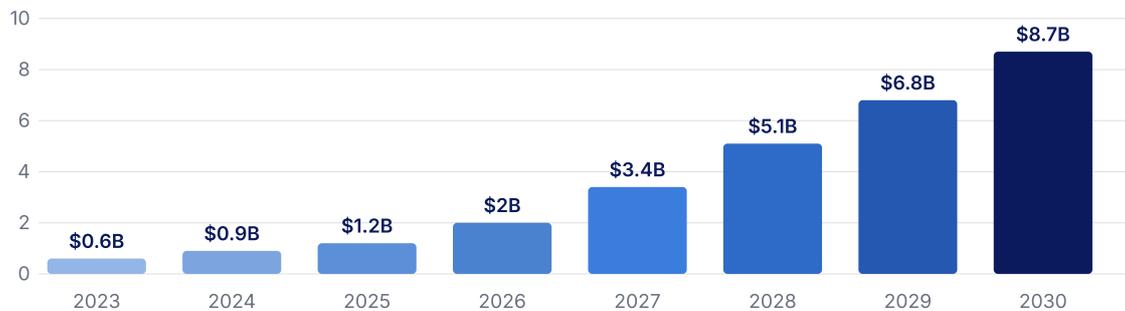


EXHIBIT 1 — CHINA SMART STEERING WHEEL MARKET, USD BILLIONS



SECTION 2

METHODOLOGY AND DATA SOURCES

This report synthesizes data from publicly available sources including market research firms, OEM announcements, supplier filings, regulatory publications, and industry conferences. Our methodology centers on triangulation of quantitative market forecasts, qualitative OEM strategy analysis, and supplier ecosystem mapping.

Market Sizing

Aggregated forecasts from IHS Markit, Frost & Sullivan, MarketsandMarkets, and CATARC. Chinese smart steering wheel market scoped to include capacitive sensing, haptic systems, biometric modules, integrated displays, and gesture recognition hardware/software.

Company Analysis

Derived from OEM press releases, investor presentations, auto show demonstrations (Beijing, Shanghai, Guangzhou), patent filings, and supplier partnership announcements from 2023–2026.

Regulatory Framework

Information on DMS mandates (GB/T standards), UN R79 steering regulation, and EU AI Act implications gathered from MIIT publications, SAE-China, and CATARC regulatory analyses.

Predictive Modeling

Forecasts based on current OEM investment trajectories, stated product roadmaps, DMS regulatory timelines, and competitive dynamics between vertically integrated and partnership-based OEMs.

A total of **22 primary and secondary sources** were consulted, all listed in the Appendix. Discrepancies in market size estimates between sources are noted and contextualized throughout the report.

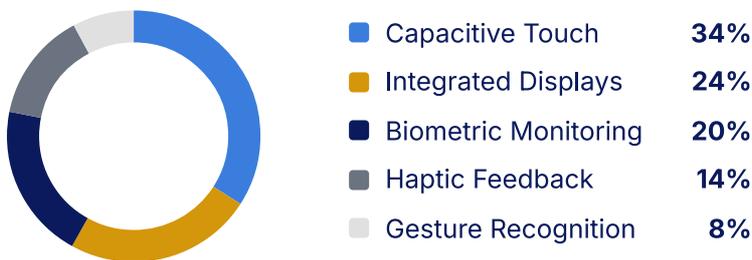
SECTION 3

SMART STEERING WHEEL TECHNOLOGY TAXONOMY

The modern smart steering wheel integrates five distinct technology layers, each at a different stage of maturity and cost optimization.

Technology Layer	Key Components	Maturity	Cost Impact	2025 Penetration
Capacitive Touch Sensing	Projected capacitive sensors, copper flex PCBs	Mature	\$8–15 / unit	38% of new vehicles
Haptic Feedback	ERM motors, linear resonant actuators, piezo	Growth	\$12–25 / unit	18% of new vehicles
Biometric Monitoring	PPG heart rate, galvanic skin response, SpO ₂	Early	\$20–45 / unit	12% of new vehicles
Integrated Displays	1.2–2.1" OLED/AMOLED, flex PCBs, touch	Emerging	\$35–80 / unit	8% of new vehicles
Gesture Recognition	ToF sensors, IR cameras, edge AI processors	Nascent	\$25–55 / unit	3% of new vehicles

EXHIBIT 2 — FEATURE REVENUE SHARE, 2025



Source: Alice Ventures analysis; teardown data, supplier interviews, IHS Markit

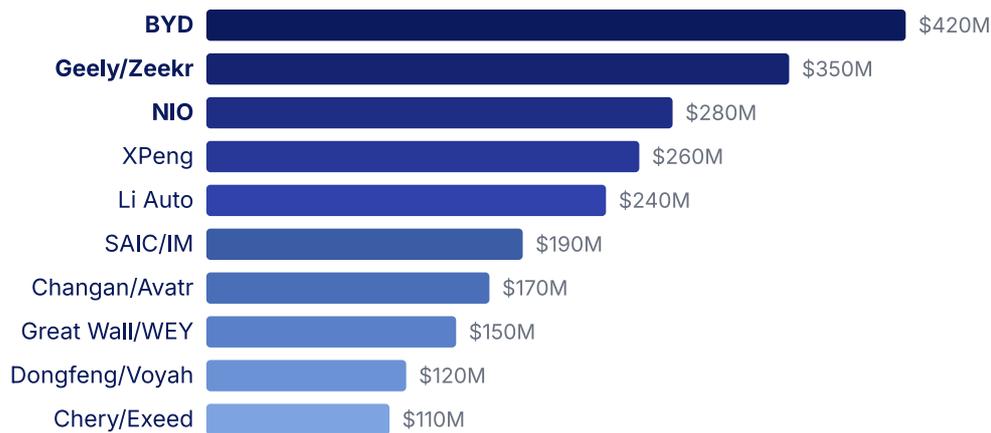
SECTION 4

MARKET SIZE AND GROWTH PROJECTIONS

The China advanced steering wheel market is segmented into three tiers based on feature complexity and average selling price. The **premium tier** (biometric + display) is the fastest-growing segment.

Market Tier	2025 Size	2030 Projected	CAGR	Key Drivers
Premium (Bio+Display+Haptic)	\$0.25B	\$2.8B	62%	L3 autonomy, premium differentiation
Mid-Tier (Capacitive+Haptic)	\$0.45B	\$3.4B	50%	DMS mandates, ADAS expansion
Entry (Basic Capacitive)	\$0.50B	\$2.5B	38%	Regulatory compliance, cost reduction
Total Market	\$1.2B	\$8.7B	48%	—

EXHIBIT 3 — OEM ANNUAL SMART COCKPIT STEERING INVESTMENT, USD MILLIONS (2025 EST.)



Source: Alice Ventures estimates; company filings, industry interviews

SECTION 5

CAPITAL EXPENDITURE IMPLICATIONS

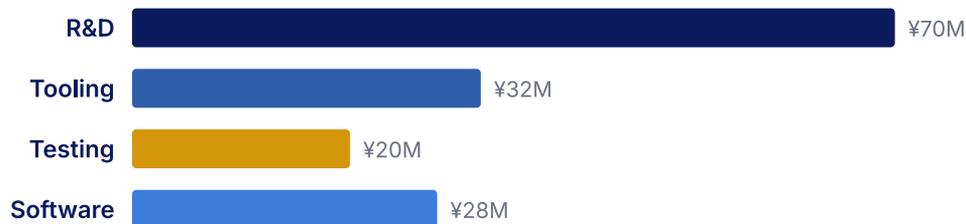
Deploying smart steering wheel technology requires significant upfront capital investment across R&D, tooling, testing, and software. The CapEx burden varies dramatically by OEM tier and feature ambition.

CapEx Category	Premium Tier	Mid Tier	Entry Tier	Notes
R&D (sensors, algorithms)	¥60–80M	¥20–35M	¥5–10M	Bio + display R&D is 3× basic
Tooling & Manufacturing	¥25–40M	¥10–20M	¥4–8M	Mold, injection, flex PCB lines
Testing & Certification	¥15–25M	¥8–12M	¥3–6M	DMS, ISO 26262, UN R79
Software & Integration	¥20–35M	¥7–13M	¥3–6M	HMI, ADAS handoff, OTA
Total Program CapEx	¥120–180M	¥45–80M	¥15–30M	Over 24–36 month cycle

ROI Timeline Analysis

Premium	Mid-Tier	Entry
3–4 years	2–3 years	1.5–2 years
Requires 50K+ units/yr at ¥3,500+ ASP. NIO and XPeng currently below threshold.	Breakeven at 120K+ units/yr at ¥800 ASP. Geely and Li Auto well-positioned.	Breakeven at 300K+ units/yr at ¥350 ASP. BYD achieves this within first year.

EXHIBIT 4 — CAPEX BREAKDOWN BY CATEGORY, ¥ MILLIONS (PREMIUM TIER)



Source: Alice Ventures estimates; OEM and supplier interviews, industry benchmarks

SECTION 6

UNIT ECONOMICS BREAKDOWN BY OEM TIER

Understanding per-unit cost structures is critical for evaluating smart steering wheel program viability. We analyze BOM cost, ASP, and margin across three OEM tiers.

Metric	Premium Tier	Mid Tier	Entry Tier
BOM Cost (per unit)	¥2,200–2,800	¥550–800	¥280–380
ASP to OEM	¥3,400–4,200	¥850–1,100	¥400–500
Gross Margin	32–35%	28–31%	24–27%
Contribution / Vehicle	¥1,100–1,400	¥280–320	¥110–130
Breakeven Volume (annual)	50,000+	120,000+	300,000+
Breakeven Timeline	3–4 years	2–3 years	1.5–2 years
Feature Scope	Bio + Display + Haptic + Gesture	Capacitive + Haptic + DMS	Basic Capacitive + Heated
Representative OEMs	NIO, XPeng, IM Motors	Geely, Li Auto, Changan	BYD, Chery, Great Wall

Key Unit Economics Insights

Volume is King

BYD's ability to deploy basic capacitive sensing across 3M+ vehicles annually gives it a per-unit cost advantage of 40% vs. premium players.

Software Margin Upside

OEMs developing in-house software (XPeng, NIO) retain 15–20% additional margin. OTA-updatable haptic profiles create recurring revenue.

Display Premium

Integrated OLED displays add ¥800–1,200 to BOM but command ¥1,500–2,000 ASP premium. Zeekr achieves 38% gross margin.

DMS Compliance Floor

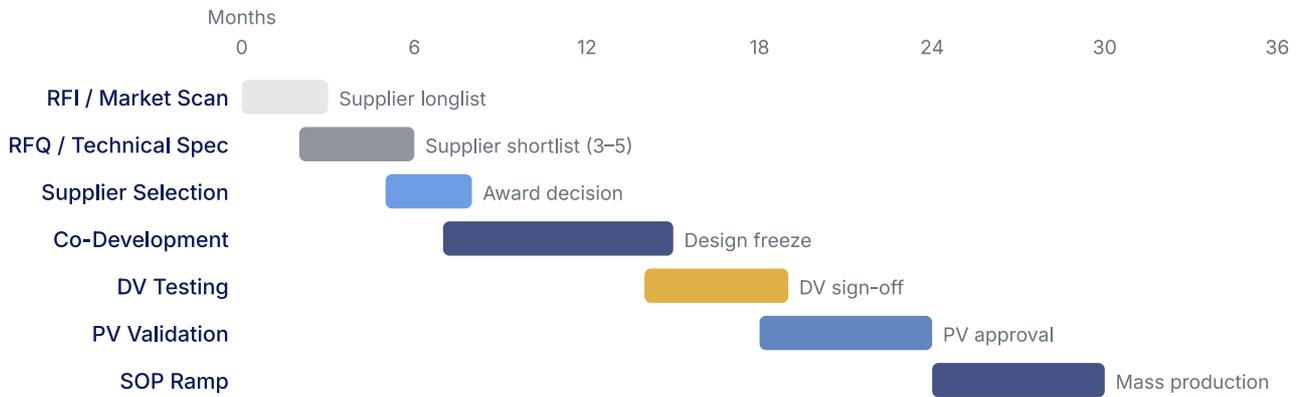
The 2028 mandate creates a guaranteed minimum market of ¥280–380 per vehicle across ~25M units annually.

SECTION 7

PROCUREMENT CYCLE TIMELINE ANALYSIS

The procurement cycle for smart steering wheel systems spans **24–36 months** from RFI to SOP — notably compressed vs. European OEMs (36–48 months), reflecting China's speed-to-market culture.

EXHIBIT 5 — PROCUREMENT GANTT CHART (TYPICAL 30-MONTH CYCLE)



Key Decision Gates

Gate	Timing	Key Criteria	Decision-Maker
Supplier Longlist	Month 3	Technical capability, patent portfolio, presence	Procurement + Engineering
Award Decision	Month 8	Total cost, co-development, DMS roadmap	VP Engineering + CPO
Design Freeze	Month 15	Feature lock, BOM final, ISO 26262 ASIL	Program Director
DV Sign-Off	Month 19	Durability, EMC, haptic, sensor accuracy	Quality + Safety
SOP Approval	Month 30	PPAP, yield >98%, OTA verification	Plant Director + CEO

SECTION 8

OEM SOURCING DECISION CRITERIA

Chinese OEM procurement teams evaluate smart steering wheel suppliers against seven weighted criteria. Our analysis reveals a clear emphasis on **technical capability** and **cost competitiveness**.

Criterion	Weight	Domestic	International	JV / Hybrid
Technical Capability	25%	7.2 / 10	9.1 / 10	8.4 / 10
Cost Competitiveness	20%	9.0 / 10	5.8 / 10	7.5 / 10
Quality & Safety (ISO 26262)	18%	6.8 / 10	9.3 / 10	8.0 / 10
Supply Chain Resilience	12%	8.5 / 10	6.2 / 10	7.8 / 10
Co-Development Flexibility	10%	8.8 / 10	6.5 / 10	7.6 / 10
DMS Regulatory Compliance	10%	7.0 / 10	8.5 / 10	7.8 / 10
IP & Patent Portfolio	5%	5.5 / 10	9.2 / 10	7.0 / 10
Weighted Score	100%	7.6	7.8	7.9

Strategic Implications

JV / Hybrid models score highest overall: Partnerships like ZF + local integrators combine international quality with domestic cost and agility advantages. This model is growing fastest.

Domestic suppliers win on cost and speed: Bethel and Faway offer 30–40% cost savings and 2× faster co-development cycles, preferred for entry and mid-tier programs.

International suppliers retain quality premium: ZF, Autoliv, and Toyoda Gosei command premium pricing justified by ISO 26262 ASIL-B/C depth and global patent portfolios.

DMS compliance is becoming table stakes: As the 2028 mandate approaches, DMS capability shifts from differentiator to minimum requirement.

SECTION 9

MONETIZATION PATHWAYS FOR NEW ENTRANTS

The smart steering wheel market presents five distinct monetization pathways for new entrants, each with different capital requirements, margin profiles, and time-to-revenue characteristics.

Pathway	Revenue Model	Margin	Time to Rev.	Capital Req.	Scale
OEM Tier-1 Supply	Per-unit hardware	24–32%	24–36 mo	¥50–180M	★★★★★
Technology Licensing	Per-unit royalty	65–80%	12–18 mo	¥10–30M	★★★★☆
Aftermarket Retrofit	Direct-to-consumer	35–45%	6–12 mo	¥5–15M	★★☆☆☆
Data-as-a-Service	Subscription / API	70–85%	18–24 mo	¥15–40M	★★★★☆
White-Label Platform	Platform fee	40–55%	12–24 mo	¥20–50M	★★★☆☆

Pathway Analysis

- **OEM Tier-1 Supply:** Highest barrier, highest volume. Requires ISO 26262, automotive-grade manufacturing, 24+ month qualification. BYD and Geely most accessible due to volume and dual-sourcing.
- **Technology Licensing:** Highest margin, fastest path for IP holders. License sensor algorithms or haptic software to existing Tier-1s. Key targets: Joyson, Faway, and Bethel.
- **Data-as-a-Service:** Biometric and driver behavior data for insurance (UBI), fleet management, health monitoring. Regulatory clarity on data ownership (PIPL) is the primary barrier.
- **Aftermarket Retrofit:** Lowest barrier, limited scale. Smart wheel kits for fleet DMS compliance before 2028 mandate. Limited by vehicle-specific fitment and safety certification.
- **White-Label Platform:** Configurable software + hardware reference platform. ECARX (Geely subsidiary) is the benchmark — single codebase serves multiple brands.

SECTION 10

VEHICLE MODEL DEPLOYMENT MATRIX

Specific vehicle models mapped to smart steering wheel features, tier classification, and primary supplier.

OEM	Model	Tier	Cap.	Hap.	Bio.	Disp.	Gest.	Supplier
BYD	Han EV	Mid	•	•	—	—	—	Joyson
BYD	Denza N7	Prem	•	•	•	—	—	Joyson
NIO	ET7	Prem	•	•	•	—	•	ZF
NIO	ES8	Prem	•	•	•	—	—	ZF
XPeng	G9	Prem	•	•	•	—	•	Joyson
Li Auto	MEGA	Prem	•	•	•	—	—	T. Gosei
Geely	Zeekr 001	Prem	•	•	•	•	•	ZF
Geely	Galaxy E8	Mid	•	•	—	—	—	Faway
SAIC	IM L7	Prem	•	•	•	•	—	ZF
Changan	Avatr 11	Prem	•	•	•	—	—	Bethel
Changan	Deepal S7	Entry	•	—	—	—	—	Bethel
Dongfeng	Voyah Dream	Prem	•	•	•	—	—	T. Gosei
Chery	Exeed Sterra	Mid	•	•	•	—	—	Autoliv
GW	WEY Blue Mtn	Mid	•	•	—	—	—	Faway
GW	Tank 700	Mid	•	•	—	—	—	Kostal
Hongqi	E-HS9	Prem	•	•	•	—	—	ZF

• = Feature present — = Not available. Source: OEM press releases, auto show data, supplier announcements

SECTION 11

OEM PROFILES — TOP 10 LEADERS

01 BYD

MASS-MARKET LEADER

INVESTMENT
\$420MKEY MODELS
Han EV, Seal, Tang, Denza
N7AUTONOMY
L2+SUPPLIER
Joyson Safety

- Capacitive sensing standard on 90%+ of 2025 lineup
- DMS-integrated grip sensors for fatigue monitoring
- OTA-updatable haptic profiles across drive modes

+ Unmatched volume drives cost leadership
+ Vertical integration in electronics

– Feature sophistication lags premium peers
– Standardization limits differentiation

02 NIO

PREMIUM INNOVATOR

INVESTMENT
\$280MKEY MODELS
ET7, ET5, ES8, EC7AUTONOMY
L2+ / L3 targetSUPPLIER
ZF

- PPG heart rate and SpO₂ sensors in grip area
- NOMI AI activation via wheel squeeze gesture
- Electrochromic indicator ring for mode status

+ Premium positioning justifies higher cost
+ Deep NOMI integration creates unique UX

– Low volume limits scale economies
– Profitability pressure constrains budgets

03 XPeng

TECHNOLOGY-FIRST

INVESTMENT
\$260MKEY MODELS
G9, P7+, X9, G6AUTONOMY
L3 / L4 targetSUPPLIER
Joyson Safety

- Multi-zone capacitive sensing for hand position
- XNGP handoff via progressive haptic escalation
- Ambient light ring synced with autonomy confidence

+ Tightest ADAS-wheel integration in China
+ AI-first approach enables predictive monitoring

– Complexity increases failure modes
– Premium pricing limits addressable market

04 Li Auto

FAMILY-FOCUSED

INVESTMENT
\$240MKEY MODELS
MEGA, L9, L7, L6AUTONOMY
L2+SUPPLIER
Toyoda Gosei

- Heart rate and skin conductance sensors in grip
- Mind GPT proactive safety suggestions
- Family mode with personalized comfort per profile

+ Family safety narrative resonates in market
+ Strong profitability funds sustained R&D

– Medical-grade biometric accuracy difficult
– Regulatory classification unclear

05 Geely / Zeekr

MULTI-BRAND

INVESTMENT
\$350MKEY MODELS
Zeekr 001, 007, Galaxy E8AUTONOMY
L2+ / L3SUPPLIER
ZF / Faway

- Zeekr 001: 1.7" OLED display in steering hub
- ECARX platform for unified smart wheel UX
- Tiered deployment from basic to full smart

+ Multi-brand amortizes R&D efficiently
+ ECARX enables rapid cross-brand deployment

– Brand complexity increases supply chain burden
– Cannibalization between Zeekr and Geely

06 **Chery / Exeed**

EXPORT CHAMPION

INVESTMENT
\$110MKEY MODELS
Exeed Sterra, Tiggo 9, iCAR
03AUTONOMY
L2+SUPPLIER
Autoliv / Bethel

- Premium leather wheel with heart rate sensor
- International variants tuned for EU UN R79
- Dual-zone heating with per-profile memory

+ Export focus accesses higher-margin markets
+ Competitive pricing enables rapid share gains

– Smart features less advanced than NIO/XPeng
– EU tariff headwinds for Chinese imports

07 **Great Wall / WEY**

MASS-PREMIUM

INVESTMENT
\$150MKEY MODELS
WEY Blue Mountain, HAVAL
H6, Tank 700AUTONOMY
L2+SUPPLIER
Faway / Kostal

- WEY: Flat-bottom with capacitive touch pads
- Tank: Ruggedized smart wheel with off-road haptics
- HAVAL: Cost-optimized capacitive for DMS

+ High SUV volume provides cost amortization
+ Tank brand creates ruggedized niche

– SUV-heavy portfolio limits sedan innovation
– Technology gap vs. premium competitors

08 **SAIC / IM Motors**

STATE-BACKED

INVESTMENT
\$190MKEY MODELS
IM L7, IM LS7, MG CybersterAUTONOMY
L2+ / L3SUPPLIER
ZF / Joyson

- IM L7: Yoke with 2.1" AMOLED touchscreen
- Steer-by-wire with variable ratio and resistance
- MG Cyberster: Sport-tuned haptic racing wheel

+ State backing provides patient R&D capital
+ MG international brand enables global reach

– Yoke design faces acceptance challenges
– IM Motors volume below expectations

09 **Dongfeng / Voyah**

PREMIUM ASPIRANT

INVESTMENT
\$120MKEY MODELS
Voyah Dream, Free,
ZhuiguangAUTONOMY
L2+SUPPLIER
Toyota Gosei / Autoliv

- Hand-stitched leather with invisible sensors
- Huawei HiCar deep integration for voice
- Mengshi: IP67-rated reinforced haptics

+ Huawei partnership provides cutting-edge SW
+ Voyah premium positioning supports investment

– Huawei dependency creates strategic risk
– Volume below feature breakeven threshold

10 **Changan / Avatr**

PARTNERSHIP MODEL

INVESTMENT
\$170MKEY MODELS
Avatr 11, Avatr 12, Deepal S7AUTONOMY
L2+ / L3SUPPLIER
Bethel / Huawei

- HarmonyOS integration — wheel syncs cockpit
- ADS 2.0 handoff via multi-stage haptic alerts
- Deepal: Cost-effective capacitive for mass DMS

+ Huawei provides best-in-class ADAS integration
+ Changan volume enables technology trickle-down

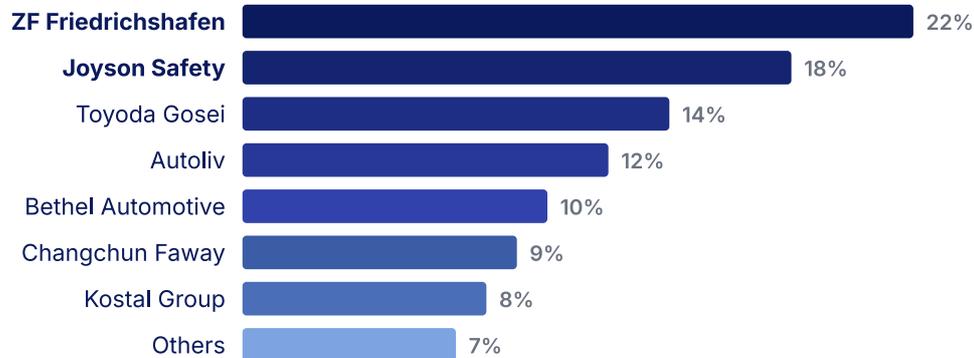
– Heavy dependency on Huawei for core tech
– JV structure may slow decision-making

SECTION 12

TIER-1 SUPPLIER LANDSCAPE

The smart steering wheel supply chain in China is dominated by a mix of international incumbents and fast-growing domestic players. **ZF and Joyson** together control over **40%** of the market.

EXHIBIT 6 — SUPPLIER MARKET SHARE, 2025



Key Supplier Profiles

ZF Friedrichshafen

Germany · 22%

Clients: NIO, Zeekr, IM Motors

Full-stack: steer-by-wire + sensors + haptics. \$2.7B global AI investment. Deepest ISO 26262 ASIL-C.

Joyson Safety Systems

Ningbo, China · 18%

Clients: BYD, XPeng, SAIC

Acquired Takata assets. Largest capacitive sensing supplier by volume. Cost leader.

Toyoda Gosei

Japan · 14%

Clients: Li Auto, Dongfeng/Voyah

Premium leather with invisible sensor embedding. Strongest in biometric grip modules.

Autoliv

Sweden · 12%

Clients: Chery/Exeed, Dongfeng

Global safety leader. Preferred for export-focused OEMs needing EU/US certification.

Bethel Automotive

Anhui, China · 10%

Clients: Changan/Avatr, Chery domestic

Fastest-growing domestic supplier. 40% lower cost. Rapidly building DMS sensor capability.

Changchun Faway

Jilin, China · 9%

Clients: Geely (non-Zeekr), Great Wall

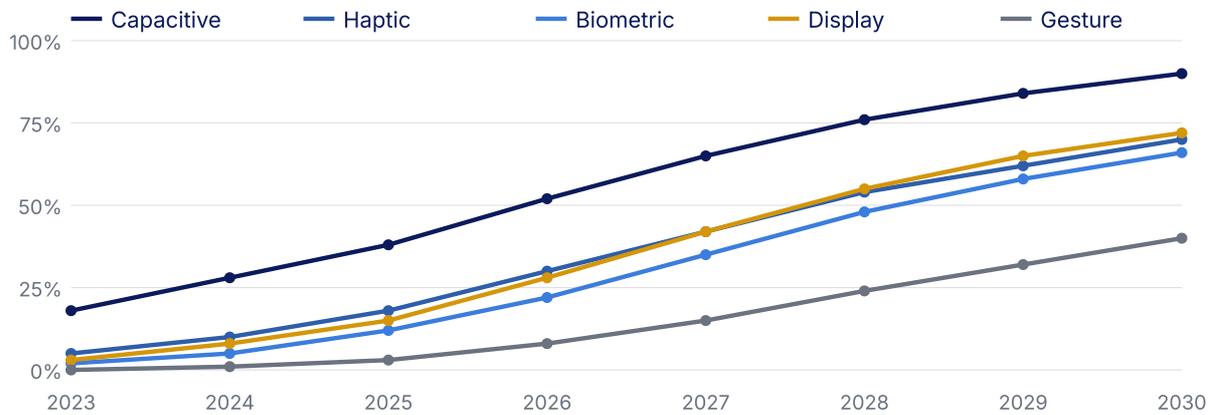
Largest domestic steering wheel manufacturer by volume. Cost-optimized heated + capacitive.

SECTION 13

FEATURE ADOPTION TRENDS (2023–2030)

Smart steering wheel feature penetration in Chinese new vehicles is accelerating across all five technology layers, driven by regulatory mandates and competitive pressure.

EXHIBIT 7 — FEATURE PENETRATION IN CHINESE NEW VEHICLES (%)



Key Adoption Drivers by Feature

Capacitive Touch → 90% by 2030: The 2028 DMS mandate is the single largest driver. Cost per unit has fallen below ¥15, making it viable for entry-level vehicles.

Integrated Displays → 72% by 2030: OLED hub displays are the primary premium differentiator. As panel costs decline 15–20% annually, mid-tier OEMs adopt by 2027–2028.

Biometric Monitoring → 66% by 2030: Heart rate and fatigue detection transitioning from premium to safety necessity. Insurance UBI discounts create consumer pull.

Haptic Feedback → 70% by 2030: Essential for ADAS handoff communication. As L2+ penetration approaches 80% by 2028, haptic alerts become a de facto safety requirement.

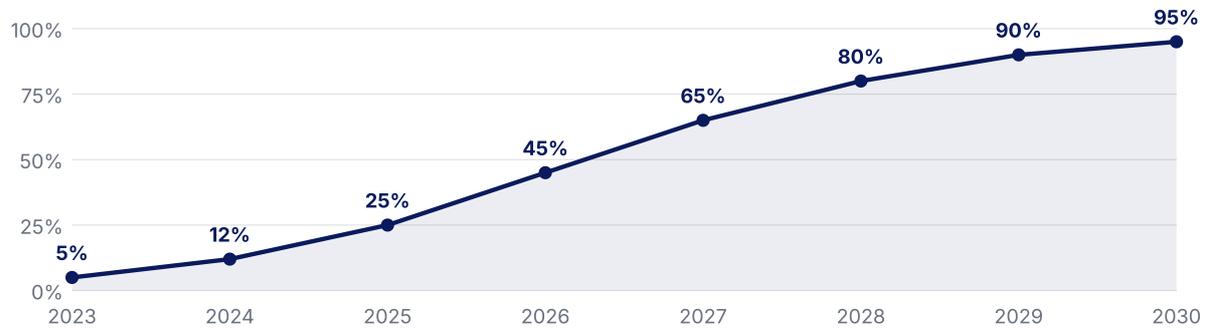
Gesture Recognition → 40% by 2030: Slowest adoption, limited by cost, accuracy, and unclear consumer value. Primarily premium (Zeekr, NIO) through 2028.

SECTION 14

REGULATORY ENVIRONMENT AND DMS MANDATES

China's regulatory framework for driver monitoring systems is the **primary catalyst** for smart steering wheel adoption. The phased GB/T standards create a predictable demand curve.

EXHIBIT 8 — DMS-CAPABLE STEERING SYSTEM PENETRATION MANDATE (CHINA)



Regulatory Comparison

Dimension	China	European Union	United States
DMS Mandate	GB/T phase-in 2025–2028	EU GSR: July 2024 (new types)	NHTSA: Under review
Scope	All L2+ new vehicles by 2028	All new vehicles (type approval)	No federal mandate yet
Steering Req.	Capacitive HOD required	HOD for L2, driver state for L3	Varies by state
Enforcement	MIIT type approval + CATARC	UN R79 + EU AI Act (high-risk)	FMVSS 108/111
Timeline Pressure	High — 2028 hard deadline	Moderate — phased by type	Low — voluntary

China's regulatory approach is the most aggressive globally, creating a **guaranteed floor demand** for capacitive-sensing steering wheels across approximately **25 million new vehicles annually** by 2028.

SECTION 15

PREDICTIONS AND STRATEGIC OUTLOOK (2025–2030)**01 DMS Mandate Drives Universal Capacitive Adoption by 2028**

The GB/T DMS mandate will create a base market of approximately ¥7–9.5 billion annually for capacitive-sensing steering wheels. Every supplier must have a DMS-compliant product by 2027 to participate in 2028 model year.

02 Display-Integrated Wheels Become Standard on Premium by 2027

Following Zeekr and IM Motors, we predict NIO, XPeng, and Li Auto will all offer OLED hub displays by 2027. OLED costs declining 18% annually make integration viable above ¥250,000 vehicle price points.

03 Biometric Health Monitoring Creates New Insurance Revenue

By 2028, Chinese insurers will offer 8–15% premium discounts for vehicles with certified biometric DMS. This creates consumer pull supplementing the regulatory push.

04 Supplier Consolidation: Top 4 Will Control 70% by 2028

Capital intensity and DMS certification barriers will drive consolidation. ZF, Joyson, Toyoda Gosei, and one domestic champion (likely Bethel) will control 70%+ of the market.

05 Chinese Smart Wheel Tech Becomes Global Export Standard

By 2029, Chinese-developed systems will be deployed in Southeast Asia, Middle East, and Latin America. European OEMs will begin sourcing capacitive modules from Chinese suppliers, driven by 30–40% cost advantages.

Investment Thesis Summary

The convergence of regulatory mandates, autonomous driving requirements, and cockpit differentiation pressures makes this one of the most predictable high-growth segments in global automotive components.

APPENDIX: SOURCES AND REFERENCES

- 1 IHS Markit, "China Automotive Cockpit Electronics Forecast," Q4 2025
- 2 Frost & Sullivan, "Global Advanced Steering Systems Market Analysis," December 2025
- 3 MarketsandMarkets, "Automotive Steering Wheel Market — Global Forecast to 2030," 2025
- 4 CATARC, "Annual New Vehicle Technology Adoption Report," 2025
- 5 MIIT, "GB/T Driver Monitoring System Standards," 2024–2025
- 6 SAE-China, "Technical Requirements for DMS in Intelligent Vehicles," 2025
- 7 ZF Friedrichshafen AG, "Investor Day: Steering Technology Division," November 2025
- 8 Joyson Safety Systems, "Annual Report 2025: Smart Cockpit Components Division"
- 9 BYD Company Ltd., "Technology Day 2025: Intelligent Cockpit Strategy"
- 10 NIO Inc., "NIO Day 2025: Next-Generation Vehicle Platform"
- 11 XPeng Inc., "XNGP Technology Deep Dive: HMI Evolution," Q3 2025
- 12 Li Auto Inc., "Mind GPT Integration: In-Vehicle Health Applications," 2025
- 13 Geely / Zeekr, "ECARX Intelligent Cockpit Platform," Beijing Auto Show 2025
- 14 SAIC Motor / IM Motors, "IM L7 Steer-by-Wire Technical Specification," 2025
- 15 Changan / Avatr, "HarmonyOS Cockpit Integration Whitepaper," 2025
- 16 Autoliv Inc., "Annual Report 2025: China Market Strategy"
- 17 Toyota Gosei Co., "Biometric Steering Wheel Module Spec Sheet," 2025
- 18 Bethel Automotive Safety, "Company Overview and Product Catalog," 2025
- 19 Changchun Faway, "Annual Report 2024: Steering Division Performance"
- 20 Kostal Group, "Smart Steering Wheel HMI Solutions for Chinese OEMs," 2025
- 21 Grand View Research, "China Automotive HMI Market Report," 2025
- 22 RAND Corporation, "Regulatory Frameworks for DMS: Comparative Analysis," 2025

DISCLOSURES AND METHODOLOGY NOTES

Market Size Methodology

Market sizing is based on triangulation of forecasts from IHS Markit, Frost & Sullivan, MarketsandMarkets, and CATARC. The \$1.2B (2025) and \$8.7B (2030) figures represent central case estimates; bull and bear scenarios range $\pm 15\%$.

OEM Investment Estimates

OEM investment figures are Alice Ventures estimates based on publicly disclosed R&D budgets, cockpit/HMI allocation proportions, supplier contract values, and industry benchmarking. These are indicative estimates, not audited financial data.

Supplier Market Share

Based on reported revenue, disclosed OEM relationships, CATARC production volume estimates, and industry interviews. "Others" includes smaller regional suppliers and in-house OEM production.

Limitations

This report relies on publicly available information. Predictive statements are based on current trends; actual outcomes may differ materially. Chinese regulatory timelines are subject to MIIT revision. OEM roadmaps may change.

About Alice Ventures

Alice Ventures is a strategic intelligence firm providing research and advisory services to institutional investors, corporate strategy teams, and government agencies. Our automotive technology practice covers EV, autonomous driving, smart cockpit, and mobility ecosystems across North America, Europe, and Asia-Pacific.

For inquiries regarding this report or to commission custom research, please contact your Alice Ventures relationship manager.

© 2026 Alice Ventures. All rights reserved.

End of Report

ALICE VENTURES

STRATEGIC INTELLIGENCE

This document is confidential and proprietary. Unauthorized
distribution is prohibited.