ALICE VENTURES

MARKET INTELLIGENCE REPORT

Software-Defined Vehicle Deployment Analysis

Global OEM Landscape & Competitive Positioning

CONFIDENTIAL · FOR INSTITUTIONAL CLIENTS ONLY

Publication Date: February 2026

Prepared by: Alice Ventures

EXECUTIVE SUMMARY

The automotive industry stands at an inflection point in its transition toward Software-Defined Vehicles (SDVs). Our analysis of capital allocation, architectural readiness, and organizational transformation across 15 major global OEMs reveals a bifurcated market. A small cohort of SDV-native manufacturers commands structural advantages. A mid-tier group is racing to close capability gaps. Legacy players are struggling with fundamental architectural debt.

Key Findings

> Aggregate SDV Investment (2023–2025E): USD $127 billion across major OEMs.

> SDV-Native Leaders: Tesla, BYD, and NIO demonstrate integrated software stacks with over-the-air capability exceeding 85% of vehicle functions.

> Fast Followers: Volkswagen Group, Mercedes-Benz, and GM are deploying $3–5 billion annually in catch-up investments.

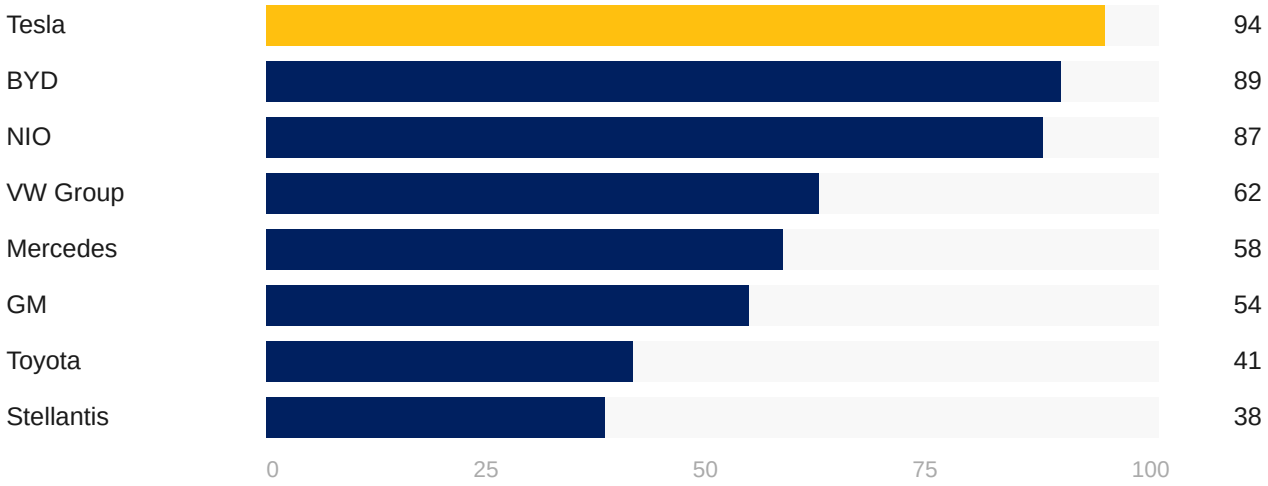
> Structural Laggers: Toyota, Honda, and Stellantis face 4–6 year architectural deficits despite recent capital commitments.

> The competitive moat is widening. SDV-native players achieve 40–60% lower incremental feature costs and 3–5x faster iteration cycles. Traditional OEMs betting on hardware refresh cycles to close gaps fundamentally misunderstand the compounding nature of software-defined advantage.

The SDV Maturity Index that follows captures this stratification across architectural, operational, and commercial dimensions. Detailed methodology appears in Appendix A.

SDV Maturity Index · Overview

Proprietary scoring 0–100. See Appendix A for methodology.



How to Read the Index

Scores aggregate five weighted dimensions: architecture (30 pts), software stack (25 pts), OTA capability (20 pts), organizational readiness (15 pts), and business model (10 pts). The 50-point threshold marks the transition from legacy electronic-electrical platforms to SDV-capable architectures.

Three tiers emerge with minimal ambiguity. Scores above 80 reflect closed-loop continuous deployment. Scores between 50 and 70 indicate credible transition programs with execution risk. Scores below 45 signal architectural debt that capital alone cannot resolve.

I. MARKET CONTEXT & DEFINITION

Defining the Software-Defined Vehicle

A Software-Defined Vehicle represents a fundamental architectural shift. The vehicle moves from distributed, hardware-centric systems to centralized compute platforms where functionality is primarily determined by software. Four core characteristics distinguish SDV architectures from their predecessors:

- Centralized architecture: Migration from 100+ ECUs to 3–5 zone controllers or central compute.
- OTA capability: Continuous feature deployment and improvement post-production.
- Hardware abstraction: Software development decoupled from specific hardware suppliers.
- Data monetization readiness: Vehicle as platform for services and continuous revenue.

Investment Taxonomy

Our analysis segments SDV spending across four categories. Each represents a distinct capability layer; underinvestment in any one undermines the others.

Platform Architecture

Central compute, zone controllers, ethernet backbone.

Software Development

In-house OS, middleware, application layer capabilities.

Organizational Transformation

Talent acquisition, agile processes, DevOps infrastructure.

Ecosystem & Partnerships

Cloud services, developer platforms, software talent acquisition.

The Architectural Transition

The industry transition from legacy distributed architecture to centralized software-defined platforms is occurring across four distinct phases. SDV-native manufacturers operate two to three phases ahead of traditional OEMs. The architectural gap compounds over time, because each iteration cycle for software-native manufacturers generates training data, capability improvements, and cost reductions unavailable to hardware-refresh-dependent competitors.

SDV-native leaders (Tesla, BYD, NIO) operate at Phase 4. Structural laggers remain at Phase 1–2.

Why Phase Position Matters

Phase position is not merely a snapshot of current capability; it is a leading indicator of cost structure for the decade ahead. A manufacturer at Phase 4 deploys new features through software updates with marginal incremental cost. A manufacturer at Phase 1 must amortize feature deployment across hardware cycles measured in years.

> The compounding effect. A two-phase gap in 2024 translates to a four-to-six year capability gap by 2028, because the trailing manufacturer must complete two full hardware redesign cycles to reach the architecture the leader already operates today.

II. GLOBAL SDV INVESTMENT LANDSCAPE

Aggregate Capital Deployment (2023–2025E)

Total committed investment across major OEMs has reached $127 billion for the three-year period, representing 18% of aggregate R&D budgets. This marks a dramatic reallocation away from traditional powertrain development.

INVESTMENT BY REGION

Region	Investment	% of R&D	Lead Allocators
Greater China	$42.3B	24%	BYD, NIO, Geely, Great Wall
Europe	$38.7B	17%	Volkswagen Group, Mercedes, BMW
North America	$31.2B	16%	GM, Ford, Tesla (maintenance)
Japan / Korea	$14.8B	12%	Toyota, Honda, Hyundai

> Key observation. Chinese OEMs allocate proportionally higher R&D to software (24% versus 15% Western average), reflecting both greenfield advantage and national priorities around automotive software sovereignty.

Investment Intensity vs. Maturity

Our proprietary SDV Maturity Index reveals minimal correlation between spending and actual capability. Organizational and architectural barriers cannot be overcome through capital alone.

OEM	Investment	Maturity	Efficiency
Tesla	$4.2B	94	22.4
BYD	$8.1B	89	11.0
NIO	$3.6B	87	24.2
Volkswagen Group	$13.4B	62	4.6
Mercedes-Benz	$9.2B	58	6.3
GM	$8.8B	54	6.1
Toyota	$7.3B	41	5.6
Stellantis	$4.9B	38	7.8

Efficiency Ratio = Maturity Score / Annual Investment ($B).

III. SDV-NATIVE LEADERS

Tier 1: Structural Advantage Holders

Three manufacturers demonstrate end-to-end SDV capabilities with proprietary full-stack control. Tesla, BYD, and NIO each combine in-house silicon or compute, proprietary operating systems, and fleet-wide OTA deployment. This combination produces compounding advantages that legacy OEMs cannot replicate through capital deployment alone.

#1 Tesla · The Reference Architecture

MATURITY SCORE	ANNUAL SDV INVESTMENT	SOFTWARE ENGINEERS
94 / 100	$1.4B	~6,000 FTE

Tesla remains the definitional SDV-native OEM. Vertical integration extends from silicon design (HW4.0 compute platform) through OS, middleware, and application layer. The result is a closed-loop improvement system unmatched in the industry.

- Full-stack control: Proprietary OS, neural network training infrastructure, and inference silicon.
- OTA deployment: 100% of vehicle functions updatable, with bi-weekly fleet-wide releases.
- Data advantage: 5+ million vehicles generating 160 petabytes annually of real-world driving data.
- Marginal cost structure: Incremental feature deployment cost approaches zero. FSD price increases represent pure margin expansion.

> Strategic assessment. Tesla’s lead is temporal rather than permanent, but the compounding advantage of continuous improvement creates widening competitive distance. Legacy OEMs targeting Tesla’s current capability will find Tesla three to four generations ahead by the time they achieve parity. Vulnerability: vertical integration means physical assembly constraints limit scaling more than software does.

III. SDV-NATIVE LEADERS (continued)

#2 BYD · Vertical Integration at Scale

MATURITY SCORE	ANNUAL SDV INVESTMENT	SOFTWARE ENGINEERS
89 / 100	$2.7B	~4,500 FTE

BYD combines vertical integration with manufacturing scale unmatched globally. Semiconductor fabrication, battery cell production, and software development are all in-house.

- Proprietary compute: BYD-Nvidia co-designed central platform, 95% functional centralization.
- OTA maturity: 87% of vehicle functions remotely updatable across 2023+ vehicles.
- Battery-software integration: Range improvements of 8–12% versus hardware-only solutions.
- Developer ecosystem: 1,200+ third-party developers on the DiLink platform.

> Strategic assessment. Software amortization across three million-plus annual units creates cost structures legacy OEMs cannot match. International expansion remains constrained by China-optimized stack architecture.

#3 NIO · Services-First Architecture

MATURITY SCORE	ANNUAL SDV INVESTMENT	SOFTWARE ENGINEERS
87 / 100	$1.2B	~3,000 FTE

NIO architected vehicles as service delivery platforms from inception. Software enables subscription revenue, battery swapping orchestration, and lifestyle ecosystem integration.

- Centralized SOA: Service-oriented design enables third-party integration and continuous deployment.
- Advanced ADAS: NAD operates on proprietary compute with 89% highway autonomy capability.
- Premium digital services: 67% subscriber attach rate at $680 annual ARPU.
- Revenue mix shift: Software services grew from 3% (2021) to 12% of total revenue (2023).

> Vulnerability: R&D amortization across 160,000 annual units versus BYD’s three million creates structural margin pressure. Path to profitability requires dramatic scaling.

IV. FAST FOLLOWERS · THE CATCH-UP COHORT

Tier 2: Massive Investment, Mixed Execution

Three legacy OEMs demonstrate credible SDV strategies with substantial capital backing. Volkswagen Group, Mercedes-Benz, and General Motors are each deploying $3 to $5 billion annually. Outcomes diverge sharply based on organizational design and partnership architecture.

#1 Volkswagen Group · Betting the Company

MATURITY SCORE	ANNUAL SDV INVESTMENT	SOFTWARE ENGINEERS
62 / 100	$4.5B	~10,000 (CARIAD)

Volkswagen Group treats SDV transformation as existential. The creation of CARIAD as a standalone software unit represents the most ambitious reorganization attempt among traditional OEMs. Execution has lagged ambition.

- E³ architecture: Common electrical architecture planned across 10+ brands and 40 million vehicles by 2030.
- VW.OS deployment: Proprietary OS launching 2025 (delayed from 2023) with the MEB+ platform.
- Rivian partnership: $5.8B investment (2024) to accelerate software development and access North American expertise.

> CARIAD has become a cautionary tale. ID.3 software issues delayed launches by 12+ months. The Rivian partnership represents tacit acknowledgment that in-house development alone cannot close the gap within required timeframes.

IV. FAST FOLLOWERS (continued)

#2 Mercedes-Benz · Premium Positioning

MATURITY SCORE	ANNUAL SDV INVESTMENT	SOFTWARE ENGINEERS
58 / 100	$3.1B	~5,500 FTE

Mercedes pursues SDV capability to defend premium positioning rather than chase volume scale. The strategy concentrates investment on high-margin optional features and subscription services for affluent customers.

- MB.OS platform: Proprietary OS launching 2024 in the EQS successor, consolidating four legacy OS systems.
- Level 3 autonomy: DRIVE PILOT commercially deployed in Germany and California.
- Subscription services: $1,200+ annual revenue per connected vehicle, the highest among legacy OEMs.

> Mercedes' focused approach on premium segments may prove more sustainable than Volkswagen's bet-the-company scale play. Lower volume targets reduce organizational complexity, and premium customers provide a higher-margin sandbox for SDV experimentation.

#3 General Motors · American Ambition

MATURITY SCORE	ANNUAL SDV INVESTMENT	SOFTWARE ENGINEERS
54 / 100	$2.9B	~7,000 FTE

GM combines internal development (Ultifi platform) with strategic partnerships (Google, Microsoft) to accelerate SDV capabilities while managing capital efficiency. The hybrid approach trades development speed for partial loss of differentiation.

- Ultifi platform: Linux-based vehicle OS with centralized architecture, launching across the Ultium EV platform 2024–2025.
- Super Cruise expansion: Hands-free highway driving across 22 models (2024), the largest deployment among US OEMs.
- Software revenue target: $20–25B annual by 2030 (up from $2B in 2023).

> GM demonstrates pragmatic realism through selective partnership. Risk: if critical software layers remain externally controlled, GM's vehicles risk becoming undifferentiated Google delivery platforms.

V. STRUCTURAL LAGGERS · ARCHITECTURAL DEBT

Tier 3: Late Movers Facing Existential Challenges

Three major OEMs demonstrate insufficient SDV progress relative to market trajectory. Toyota, Honda, and Stellantis combine architectural conservatism with investment levels that, while substantial in absolute terms, fail to close compounding capability gaps.

#1 Toyota · The Innovator's Dilemma

MATURITY SCORE	ANNUAL SDV INVESTMENT	SOFTWARE ENGINEERS
41 / 100	$2.4B	~4,200 FTE

Toyota's global dominance in hybrid powertrains creates organizational resistance to SDV disruption. The company treats software as feature enhancement rather than architectural foundation.

- Architecture persistence: Current vehicles maintain 80+ ECU architectures with limited centralization roadmap.
- OTA limitations: Only 30% of vehicle functions remotely updatable in 2024 models, versus 85%+ for SDV natives.
- Supplier dependency: Continued reliance on Denso, Aisin, and Continental for core electrical architecture.
- Arene OS timeline: 2026 launch places Toyota six-plus years behind SDV-native leaders.

> Prognosis. Without radical acceleration, Toyota risks premium segment erosion, forcing retreat to value segments where software differentiation matters less.

V. STRUCTURAL LAGGERS (continued)

#2 Honda · Subscale and Slow

MATURITY SCORE	ANNUAL SDV INVESTMENT	SOFTWARE ENGINEERS
39 / 100	$1.8B	~2,800 FTE

Honda combines Toyota's architectural conservatism with scale disadvantages. Annual production of 4.5 million units provides insufficient amortization base for competitive SDV investment.

- Partnership dependency: GM Ultium platform adopted for North American EVs, ceding architectural control.
- No proprietary OS: Reliance on supplier ecosystems with no announced central compute platform.
- Sony-Honda Mobility: The Afeela brand (2026 launch) effectively concedes that in-house SDV development cannot meet market timelines.

> Prognosis. Honda likely retreats from volume segments where SDV capability becomes table stakes, focusing on motorsport heritage and niche enthusiast segments.

#3 Stellantis · Conglomerate Complexity

MATURITY SCORE	ANNUAL SDV INVESTMENT	SOFTWARE ENGINEERS
38 / 100	$1.6B	~3,500 FTE

Stellantis represents the most complex SDV challenge. Fourteen brands, inherited architectures from three merger entities (FCA, PSA, Opel), and minimal software heritage combine to create the deepest structural debt in the industry.

- Architecture fragmentation: Five separate electrical architectures across the brand portfolio.
- STLA deployment: Common architectures will not fully deploy until 2027–2028.
- Multi-partner complexity: Amazon, Foxconn, and BMW partnerships create integration risks.
- Late OTA: First comprehensive OTA capability planned for 2026 model year.

> Prognosis. SDV transition costs may force divestiture of subscale brands, consolidating around four to five core nameplates with sufficient volume to justify development investment.

VI. COMPARATIVE ANALYSIS

Leaders vs. Laggers: Structural Differences

The gap between SDV-native leaders and traditional laggers extends beyond current capability. The differences are structural, affecting time-to-market, unit economics, and the ability to learn from deployed fleets.

TIME-TO-MARKET: NEW FEATURE DEPLOYMENT

OEM Tier	Average Time	Process
SDV Native	2–6 weeks	Agile sprint, cloud validation, OTA push.
Fast Followers	6–12 months	Waterfall development, model year rollout.
Structural Laggers	18–36 months	Hardware refresh cycle dependency.

DEVELOPMENT COST: NEW SOFTWARE FEATURE

OEM Tier	Cost per Feature	Amortization Base
SDV Native	$1.2–3.5M	Entire fleet via OTA.
Fast Followers	$8–15M	New model year production.
Structural Laggers	$18–35M	Single platform / generation.

DATA UTILIZATION

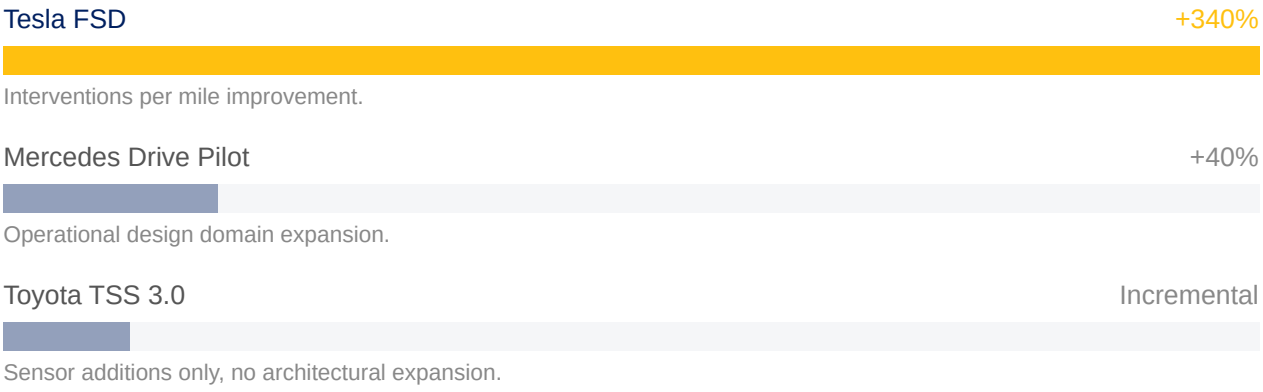
OEM Tier	Fleet Data Collection	Closed-Loop Improvement
SDV Native	95%+ vehicles	Bi-weekly model updates.
Fast Followers	40–60% vehicles	Quarterly improvements.
Structural Laggers	<25% vehicles	Annual model refresh.

VI. COMPARATIVE ANALYSIS (continued)

The Compounding Advantage

SDV-native OEMs operate on fundamentally different improvement curves. Traditional product development cycles create linear capability progression. Software-defined architectures enable exponential improvement through continuous deployment, because every fleet interaction generates training data that feeds the next release.

AUTONOMOUS DRIVING CAPABILITY PROGRESSION (2020–2024)



> By 2027, SDV-native leaders will operate five-plus generations ahead of laggers in autonomous capability, driver assistance, and predictive vehicle health. The resulting customer experience gaps will be too large to bridge through traditional development.

What This Means for Investors

The asymmetry between linear and exponential improvement curves is rarely visible in trailing financial metrics. By the time it appears in revenue, market share, or retained customer value, the gap has typically closed for years. Forward-looking investors track architectural and operational signals (OTA frequency, fleet data utilization, software talent ratios) rather than waiting for the lagging financials to catch up.

VII. STRATEGIC IMPLICATIONS

For Investors

Automotive investment theses must segment between SDV-capable and SDV-limited manufacturers. Traditional valuation metrics obscure software capability gaps that will determine long-term value capture.

RECOMMENDED VALUATION FRAMEWORK

SDV-Native Tier	Value as technology platforms. Apply software multiples (5–8x revenue for recurring software services).
Fast Followers	Discount traditional automotive multiples 20–30% for execution risk and margin pressure during transition.
Structural Laggers	Deep value opportunity if management acknowledges reality. Value traps if denial persists.

Thesis: The Services Inflection

OEMs demonstrating credible software revenue growth deserve valuation premiums. Monthly recurring revenue compounds more predictably than cyclical vehicle sales, and the multiple expansion that follows can dwarf the underlying revenue growth.

LEADING INDICATORS TO MONITOR

- Software revenue as a percentage of total (target: above 15% by 2027 for competitive position).
- Subscription attach rates on new vehicles (target: above 40% premium, above 25% volume).
- OTA deployment frequency (monthly or higher indicates mature capability).
- Proprietary software stack depth (full-stack control versus supplier dependency).

For OEMs · Strategic Options

Each tier faces a different strategic problem and a correspondingly different solution set. The actions that extend a leader's position would crater a lagger's, and vice versa.

LEADERS

Extend the Moat

Open application layers to third-party developers, creating platform lock-in beyond vehicle hardware. Monetize data and development tools.

FAST FOLLOWERS

Partner Strategically

Accept partnership-based acceleration while retaining architectural control of core differentiation layers. License proven platforms without ceding customer relationships.

LAGGERS

Transform or Consolidate

Three viable paths: radical partnership, portfolio rationalization, or strategic merger. Status quo is not viable.

For Suppliers · Navigating Disruption

Traditional Tier 1 suppliers face existential pressure as OEMs vertically integrate software and central compute. Three strategic paths remain viable:

- Retreat to commoditized hardware: Accept margin compression on sensors, actuators, and physical components.
- Pivot to specialized software: Develop point solutions (ADAS, battery management) that integrate with OEM platforms.
- White-label platform provider: Provide turnkey SDV architecture to subscale OEMs. Tier 3 laggers represent the addressable market.

Continental, Bosch, and Aptiv face strategic choices in 2024–2025 before the window closes on software pivot opportunities. The first two have signaled clear direction; Aptiv's positioning remains the most ambiguous in the current cycle.

VIII. MARKET OUTLOOK & SCENARIOS

SCENARIO PROBABILITY DISTRIBUTION

BASE CASE Continued Divergence (60% probability)

SDV-native leaders extend advantages through 2027–2030. Fast Followers achieve architectural parity three to four years behind leaders but stabilize competitive position. Structural laggers face market share erosion in premium segments, forcing portfolio consolidation.

- Premium market (vehicles above $50k) dominated by SDV-capable OEMs by 2028.
- Volume segments (below $35k) see delayed SDV adoption; traditional OEMs retain share through price competition.
- Industry consolidation: three to five major portfolio rationalization announcements by 2026.

BULL CASE Breakthrough Platforms (25% probability)

Open-source SDV architecture provides a credible white-label platform, allowing laggers to leapfrog internal development timelines. A major technology company announces a turnkey automotive OS platform with an OEM licensing model.

- Catalyst: A major technology company (Google, Apple, Huawei) announces a turnkey automotive OS platform.
- Catalyst: Breakthrough in development tools reduces SDV engineering labor by 60% or more.
- Implication: Laggers close the gap two to three years faster; commoditization risk for current leaders.
- Implication: Value capture shifts from OEM software to platform providers.

BEAR CASE

Regulatory or Cybersecurity Event (15% probability)

A major vehicle cybersecurity incident triggers regulatory intervention, slowing SDV deployment and favoring conservative architectures.

- Catalyst: A high-profile ransomware attack disables 100,000 or more vehicles simultaneously.
- Catalyst: An OTA software update causes safety-critical failure, triggering regulatory investigation.
- Catalyst: A major market implements prescriptive architecture requirements limiting OTA scope.
- Implication: Two to three year pause in aggressive OTA deployment. Increased compliance costs favor scaled OEMs.

Probability-Weighted Read

The base case carries the dominant 60% weight because the structural drivers (architectural debt, organizational lag, and the compounding nature of fleet data) are durable. The bull case is real but contingent on a single platform-level event that the leaders themselves have incentive to resist. The bear case is the scenario most underweighted by current OEM equity prices, given that the cybersecurity attack surface is expanding faster than industry-wide hardening.

> Strategic read. Investors should weight base case outcomes heavily but track bull-case catalysts continuously. A turnkey OS announcement from a top-three technology platform would invalidate large portions of the current bifurcation thesis within 12–18 months.

IX. CONCLUSIONS

The Software-Defined Vehicle transition represents the most significant architectural disruption in automotive history. It is more profound than electrification and more structurally challenging than the transition to lean manufacturing in the 1980s.

Definitive Findings

01 **The gap is widening, not closing.**

Despite massive capital deployment by legacy OEMs, SDV-native leaders demonstrate accelerating advantage through continuous improvement cycles unavailable to hardware-refresh-dependent manufacturers.

02 **Money alone cannot bridge capability gaps.**

Organizational transformation, talent density, and architectural decisions made five-plus years ago determine current competitive position more than recent investment commitments.

03 **Three distinct tiers have crystallized.**

The industry has stratified into SDV-native leaders on exponential improvement curves, fast followers making credible progress at massive cost, and structural laggers facing existential choices.

04 **Business model transformation separates winners.**

OEMs treating SDV as feature enhancement miss the fundamental point. Software architecture enables services revenue, data monetization, and post-sale value capture that dwarfs one-time hardware sales.

05 **Consolidation is inevitable.**

The industry cannot support 15+ major OEMs each investing $3 to $5 billion annually in duplicative SDV development. Portfolio rationalization and strategic partnerships will accelerate 2025–2027.

IX. CONCLUSIONS (continued)

Investment Implications

The automotive sector requires complete reunderwriting. Traditional metrics (production capacity, dealer networks, brand heritage) diminish in importance. Software capability, data assets, services revenue, and talent density now determine long-term value.

> Investors maintaining positions in structural laggers (Toyota, Honda, Stellantis) without explicit management acknowledgment of the challenge and a credible partnership or pivot strategy face deteriorating risk-adjusted returns.

> Conversely, market pessimism toward certain fast followers (Mercedes-Benz specifically) appears overdone. Premium positioning creates customer tolerance for SDV experimentation and revenue-generating subscriptions that volume brands cannot replicate.

For OEM Management

The window for strategic options narrows rapidly. By 2026, architectural decisions become locked-in for the following decade. OEMs without credible SDV roadmaps by end-2024 face irreversible competitive disadvantage.

The choice is binary. Transform into software companies that manufacture vehicles, or accept commoditization as vehicle hardware providers for others' software platforms.

There is no middle path.

APPENDIX A · METHODOLOGY

SDV Maturity Index Construction

Our proprietary scoring system (0–100) evaluates OEM SDV capability across five weighted dimensions. Scores are derived from OEM public disclosures, supplier interviews, teardown analysis, regulatory filings, and proprietary Alice Ventures research.

DIMENSION WEIGHTS

SCORING CRITERIA BY DIMENSION

Architecture — 30 pts

Central compute deployment vs. distributed ECUs	0–10
Zone controller implementation	0–8
Ethernet backbone vs. legacy CAN/LIN	0–7
Hardware abstraction layer maturity	0–5

Software Stack — 25 pts

Proprietary OS vs. third-party dependency	0–10
Middleware and service-oriented architecture	0–8
Application layer ownership	0–7

OTA Capability — 20 pts

Percentage of vehicle functions remotely updatable	0–10
Deployment frequency and reliability	0–6
Rollback and safety validation processes	0–4

Organizational — 15 pts

Software engineering headcount ratio	0–7
Agile / DevOps adoption	0–5
Centralized vs. distributed development structure	0–3

Business Model — 10 pts

Software / services revenue as % of total	0–5
Subscription attach rates	0–3
Developer ecosystem / platform openness	0–2

Data Sources

- OEM public disclosures and annual reports
- Supplier interviews (primary research)
- Vehicle teardown and architecture analysis
- Regulatory filings and safety data
- Proprietary Alice Ventures research

APPENDIX B · SELECT COMPANY PROFILES

Tesla, Inc.

HEADQUARTERS	SOFTWARE ENGINEERS	VEHICLES IN OPERATION	OTA-CAPABLE FLEET
Austin, Texas, USA	~6,000 FTE	5.2M+ (2024)	100%

SDV Architecture

Proprietary HW4.0 central compute (250 TOPS inference), Full Self-Driving Computer, in-house Linux-based OS, vertically integrated from silicon to UI.

Key Partnerships

None for core SDV stack; component suppliers only.

> **Strategic Assessment**
>
> Definitional leader with a four to six year architectural lead versus legacy OEMs. Primary risk is commoditization if core SDV capabilities become licensable or replicable at scale.

BYD Company Limited

HEADQUARTERS	SOFTWARE ENGINEERS	VEHICLES IN OPERATION	OTA-CAPABLE FLEET
Shenzhen, China	~4,500 FTE	6.8M+ (2024)	72% (2023+ models)

SDV Architecture

BYD-Nvidia co-designed compute platform, proprietary DiLink OS, integrated battery management software, centralized architecture deployment across 2023+ vehicles.

Key Partnerships

Nvidia (compute), Horizon Robotics (ADAS), Baidu (mapping and cloud).

> **Strategic Assessment**
>
> Combines SDV capability with manufacturing scale advantage. International expansion is limited by software localization challenges and the China-optimized stack architecture.

Volkswagen Group

HEADQUARTERS	SOFTWARE ENGINEERS	VEHICLES IN OPERATION	OTA-CAPABLE FLEET
Wolfsburg, Germany	~10,000 FTE (CARIAD)	42M+ total	8% (MEB platform)

SDV Architecture

E³ architecture planned across brands, VW.OS delayed to 2025, partnership with Rivian for SSP platform acceleration across next-generation vehicle programs.

Key Partnerships

Rivian (joint venture, $5.8B), Bosch (middleware), Qualcomm (compute).

> **Strategic Assessment**
>
> Most ambitious legacy-OEM software transformation, and the most expensive cautionary tale to date. Execution credibility now hinges on MEB+ launch timing and the integration tempo of Rivian-derived architecture into the broader Group portfolio.

Coverage Note

Full profiles for the remaining twelve OEMs covered in this analysis (NIO, Mercedes-Benz, GM, Ford, BMW, Geely, Great Wall, Hyundai, Toyota, Honda, Stellantis, and Sony-Honda Mobility) are available to institutional clients via the Alice Ventures Intelligence Portal. Each follows the same structural template: headquarters, engineering headcount, fleet metrics, SDV architecture, key partnerships, and strategic assessment.

Updated profiles are published quarterly. Material developments (architectural commitments, executive transitions, strategic partnerships) trigger interim revisions distributed to clients on the day of publication.