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Business Development Strategies for Vehicle-Road Collaboration Products: A Case Study of a Leading Automotive Component Provider

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Abstract

The research objectives were 1) to explore the macro environment, industrial structure, and competitive landscape of China's Vehicle-Road Collaboration (VRC/V2X) industry, and 2) to evaluate the core competencies of the case company and propose appropriate competitive and business development strategies for achieving sustainable growth. The study employed a descriptive and analytical multiple-case design. The samples comprised the case company (a leading automotive component provider) and two benchmark enterprises (Baidu and Huawei). The instruments used were four established strategic frameworks: PEST analysis for macro-environmental assessment; the SCP-G (Structure-Conduct-Performance-Government) framework for industry structure evaluation; SWOT analysis for internal capability assessment; and a multidimensional scoring model (based on Simple Additive Weighting) for target city selection. The data were analyzed using systematic qualitative content analysis, strategic comparative analysis across the three cases, and expert validation through semi-structured interviews with a five-member panel (cumulative 75 years of industry experience, representing Huawei, Baidu, CSAE, Deloitte, and a top-5 Chinese OEM).

The findings revealed that 1) China's V2X industry was characterized by strong governmental support (20 pilot cities, RMB 1.6 trillion projected investment), 30–40% gross margins, and intense competition from technology giants (Huawei, Baidu); 2) the case company possessed distinctive strengths in automotive domain expertise, manufacturing capabilities, and OEM relationships, but faced a critical "Cloud-V2X Capability Gap" – the absence of a proprietary cloud platform and limited AI capabilities – which independent development would require 5–10 billion RMB and 3–5 years to address; and 3) the Partnership-led Growth Model, combining Market Infiltration (Beijing, Wuhan, Nanjing) with Lateral Entry (Chongqing, Changchun) through strategic alliances with local cloud service providers, represented the optimal and only viable pathway for sustainable growth, as unanimously validated (100% consensus) by all five experts.

Keywords: Vehicle-Road Collaboration, V2X, Business Development Strategy, Strategic Partnership, China Automotive Industry

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Introduction

The convergence of autonomous driving, intelligent connected vehicles, and new infrastructure initiatives has catalyzed the growth of Vehicle-Road Collaboration (V2X). V2X enables real-time information exchange among vehicles, infrastructure, and pedestrians.

China's V2X market has entered a period of explosive expansion. Industry reports indicate that the V2X equipment market exceeded RMB 15 billion in 2025 and is projected to surpass RMB 50 billion by 2030 (China V2X Industry Report, 2025). Roadside equipment investment surged 111.4% year-on-year, while vehicle-side equipment investment grew 115.8% year-on-year. In July 2024, MIIT announced 20 pilot cities under Joint Communication [2024] No. 181 (MIIT, 2024), consolidating national commitment to scaled deployment. Broader projections estimate the connected vehicle ecosystem at RMB 25,825 billion by 2030 (Connected Vehicle Market Forecast, 2025).

The C-V2X architecture—vehicle-side, roadside, and cloud-side—creates a 'Cloud-V2X' paradigm demanding cross-domain capabilities. Mid-tier providers face capability gaps in cloud and AI, and independent development would require RMB 5–10 billion.

The case company is a leading domestic automotive component provider with manufacturing capabilities and OEM relationships. The company now confronts the Cloud-V2X transition, demanding software-defined architectures and cloud connectivity—capabilities outside its existing competence base.

Existing V2X literature focuses on technical standards with limited enterprise-level strategic analysis. Systematic application of strategic frameworks to the V2X industry remains underdeveloped (Chen & Hwang, 1992).

This gap is consequential: without actionable strategic frameworks, mid-tier firms risk underinvesting in emerging capabilities or overextending into domains where incumbents possess insurmountable advantages.

This study makes three contributions. First, it extends the SCP-G framework to the V2X industry, showing how governmental intervention shapes structure and competitive dynamics. Second, it integrates MCDM methodology with qualitative case study research for emerging industries (Chen & Hwang, 1992). Third, it develops a partnership-led growth model as a pragmatic pathway for mid-tier firms lacking full-stack capabilities (Anderson & Gatignon, 1986).

The remainder of this paper is organized as follows: Literature Review examines theoretical foundations; Research Method and Design present the research design; Research Finding reports findings; Conclusion and Discussion synthesize strategic implications; and Suggestion presents recommendations.

Research Objectives

This research is guided by two primary objectives. RO1 examines China's V2X industry through PEST, SCP-G, and benchmarking. RO2 evaluates competencies and proposes strategies through SWOT and SAW.

Literature Review

1. Vehicle-Road Collaboration: Concepts and Technologies

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Vehicle-Road Collaboration (V2X) enables real-time information exchange among vehicles, infrastructure, and pedestrians. C-V2X operates in PC5 (sidelink) and Uu (network) modes. The industry is transitioning from standalone RSU hardware toward integrated Vehicle-Road-Cloud architectures.

The industry is transitioning from standalone RSU hardware toward Vehicle-Road-Cloud architectures, with roadside computing at 13.38% of investment (Yin et al., 2024).

2. Strategic Management Frameworks

PEST decomposes environments into Political, Economic, Social, and Technological dimensions (Johnson et al., 2008). In V2X, the political dimension is prominent as government procurement is the primary demand source during pilot deployment.

SCP-G extends the classical SCP model, incorporating government intervention (Bain, 1959). In China's V2X industry, government creates structure through licensing, making SCP-G more predictive.

The Resource-Based View (RBV) contends that advantage derives from VRIN resources (Wernerfelt, 1984; Barney, 1991). Teece et al. (1997) extended RBV through dynamic capabilities. The cloud/AI capability gap is a severe challenge for mid-tier providers.

Porter's (1985) framework of generic competitive strategies—cost leadership, differentiation, and focus—provides the final theoretical anchor. In the V2X context, extreme R&D requirements render pure cost leadership or broad differentiation impractical for mid-tier firms, suggesting focused strategies leveraging partnership-based differentiation as the most viable path.

3. Business Development and Market Entry Strategies

Market entry mode selection is critical in emerging industries. Anderson and Gatignon (1986) categorize entry modes along a commitment-control continuum. In the V2X sector, partnerships between hardware and cloud providers represent a theoretically grounded response.

For systematic target market selection, Multi-Criteria Decision Making (MCDM) methodologies offer structured frameworks for evaluating alternatives across multiple dimensions (Hwang & Yoon, 1981). This study adopts the Simple Additive Weighting (SAW) method for its computational transparency and direct interpretability.

In conclusion, the literature suggests that China's V2X industry is shaped by technology, policy, infrastructure, resources, and strategic positioning. PEST and SCP-G show that government procurement, pilot projects, standards, and licensing strongly influence early market formation. RBV and dynamic capabilities indicate that hardware advantages alone are insufficient as the industry moves toward Vehicle-Road-Cloud integration. In my view, mid-tier V2X firms should avoid direct competition with leading platforms. A more feasible path is to focus on specific regions or application scenarios and build partnership-based differentiation with cloud providers, AI firms, automakers, and local governments.

4. Positioning and Research Gap

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Despite substantial scholarly attention to V2X technologies, systematic review reveals significant gaps at the intersection of strategic management and the V2X industry. Table 1 summarizes the positioning of prior research.

Table 1: Positioning of Prior Research on V2X Industry Analysis

Dimension	Technical Standards & Protocols	Policy & Industry Studies	Enterprise Strategy & MCDM
Representative studies	Stratview Research (2024); China-ICV Platform (2025)	MIIT (2024); China V2X Industry Alliance (2024-2025)	Chen & Hwang (1992); Wang et al. (2022)
Primary focus	DSRC/C-V2X communication performance	Policy system evolution	Generic MCDM methodology
Level of analysis	Technology / protocol	Industry / sector	Methodology / general application
V2X-specific strategic content	None	Limited	Indirect
Enterprise-level strategic integration	Absent	Absent	Absent
Key limitation	No connection to competitive strategy	Macro-level focus without firm-level analysis	Generic application without V2X contextualization

No prior study integrates strategic management frameworks with MCDM-based target market selection in the V2X context. This study addresses this gap by combining macro-environmental analysis, industry structure assessment, competitive positioning, and market prioritization into an integrated framework validated by experts.

Research Method and Design

1. Research Design

This study adopts a qualitative case study methodology following Yin's (2018) criteria, appropriate for understanding complex, context-dependent processes.

The study employs a multi-case design with the case company as the focal case and Baidu (AI-cloud) and Huawei (full-stack ICT) as benchmarks. The case company

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represents a typical mid-tier provider—a profile shared by numerous firms in China's automotive supply chain.

Comparing the case company against these benchmarks illuminates capability gaps. The case company represents a typical mid-tier provider with manufacturing credentials but limited cloud/AI capabilities.

In response to the need for broader professional comparison, this study further incorporates expert group interviews with leaders from AI technology, cloud platforms, government policy, consulting, and automotive manufacturing. This addition helps compare the case company's strategic position from multiple industry perspectives.

2. Analytical Frameworks

Four frameworks constitute the core instruments: PEST, SCP-G, SWOT, and SAW. Their integration follows a logical progression from external context to market selection.

The four frameworks follow a logical progression from external context to market selection, ensuring comprehensive understanding.

3. Data Collection

This study uses secondary data from annual reports (2023–2025), industry reports, and academic literature. A five-member expert panel was convened to validate the findings, selected according to senior executive position, minimum ten years of experience, expertise in competitive strategy or technology policy, and knowledge of Baidu and Huawei (Table 2).

A five-member expert panel was convened for validation, including former Huawei and Baidu executives, a CSAE official, a Deloitte advisor, and an OEM VP, ensuring diverse functional perspectives (Table 2).

Table 2: Expert Panel Profile Summary

Expert Code	Background	Years of Experience	Core Expertise
Expert A	Former Strategic Planning Director, Huawei IAS BU	15	Technology strategy, full-stack ICT integration
Expert B	Former Senior Director of Apollo Ecosystem Partnerships, Baidu	12	AI-cloud platform strategy
Expert C	Deputy Secretary-General, ICV Branch, CSAE	18	Government policy analysis
Expert D	Chief Advisor for Intelligent Mobility, Deloitte China	14	Competitive strategy consulting

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Expert Code	Background	Years of Experience	Core Expertise
Expert E	VP of Intelligent Driving, top-5 Chinese automotive OEM	16	Automotive electronics, OEM procurement
	Total	75	
	Average Experience	15	Years

The panel spans 75 years (average 15 years per expert) across technology strategy, government policy, and automotive operations, including former Huawei and Baidu executives.

Although the expert panel comprises only five members, this sample size is justified through purposive sampling. The panelists are senior executives with direct expertise from top-tier competing firms (Huawei, Baidu) and policy-making bodies (CSAE), collectively possessing 75 years of professional experience (averaging 15 years per expert). Such a configuration ensures the highest degree of content validity and profound qualitative depth, which is consistent with established qualitative research practices where informational richness is prioritized over statistical generalisation (Guest et al., 2006). Furthermore, the 100% concurrence rate achieved across all validation dimensions indicates that data saturation was reached, thereby mitigating concerns related to sample size.

Data Analysis

Data analysis follows qualitative content analysis (Miles & Huberman, 1994). Secondary data is analyzed using the four frameworks, then validated through expert interviews. All dimensions achieved unanimous concurrence (100%).

Content analysis involves systematic coding of secondary documents according to the frameworks, followed by cross-document triangulation. Financial data from corporate reports are cross-checked against industry estimates, and policy interpretations are validated against multiple government sources.

Research Finding

Macro-Environment Analysis (PEST)

The PEST analysis examines the political, economic, social, and technological dimensions shaping China's V2X industry during the 2024-2025 deployment cycle.

Political. The macro-environment is favorable: 20 pilot cities (July 2024, MIIT, 2024), subsidies up to RMB 1 billion/region, and mandatory GB 45672-2025 standard from July 2027. The political dimension reveals government as the primary demand generator and architect of competitive structure. Commercial strategy cannot be separated from government relations.

Economic. The Vehicle-Road-Cloud Integration market is projected to grow from RMB 7,295 billion in 2025 to RMB 25,825 billion by 2030 (28.8% CAGR). Huawei's IAS revenue surged from CNY 4.6 billion (2023) to CNY 45.0 billion (2025, +878%), demonstrating explosive returns for full-stack providers, while standalone

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RSU hardware faces commoditization. Value creation is skewed toward integrated providers: Huawei's IAS revenue grew 878%, while standalone hardware faces commoditization. This reinforces the imperative to partner.

Social. 5G base stations reached 4.598 million by end-2024 (MIIT, 2024). ICV registrations exceeded 27.93 million. 50% L2/L3 penetration is mandated by 2030.

Technological. Cloud-V2X shifts value to software/cloud layers (MEC at 13.38%). The case company lacks cloud/AI capabilities. All experts (100%) confirmed this asymmetry.

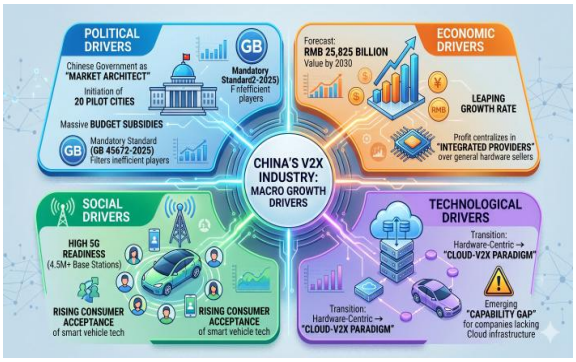


Figure 1. PEST Macro-Environment Analysis Diagram
Note. This figure was generated with the assistance of ChatGPT/OpenAI image generation tool and was further edited by the author for academic presentation.

Industry Structure Analysis (SCP-G)

SCP-G confirms governance-led mechanism. The Chinese government acts as Market Architect. All experts (100%) validated G→S→C→P.

Market Bifurcation. full-stack orchestrators (Huawei, Baidu) versus hardware suppliers. Procurement favors turnkey solutions.

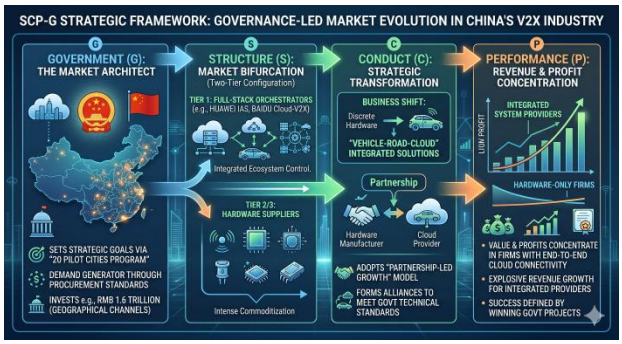


Figure 2. SCP-G Industry Structure Flowchart
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Competitive Positioning (SWOT)

The SWOT analysis evaluates internal capabilities against external market conditions.

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Strengths: R&D and manufacturing capabilities, automotive experience, OEM cooperation, ICV commitment, and certifications.

Weaknesses: No cloud/AI (W1, W5 confirmed by 100%), limited collaboration, inflexible processes.

Opportunities: 20 pilot cities create concentrated demand; the GB 45672-2025 standard generates replacement demand; cloud partnerships offer capability augmentation.

Threats: Tier 1 vertical integration; RSU commoditization; policy uncertainty; rapid technological evolution.



Figure 3. SWOT Competitive Positioning Matrix

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Target Market Selection

Target city prioritization employs SAW with four criteria validated by all five experts (100%) (Hwang & Yoon, 1981): Government Relations (40%), Urban Industrial Potential (30%), Partners (15%), Competition (15%).

Weighted Score = 0.40 x GR + 0.30 x UIP + 0.15 x P + 0.15 x C

Government Relations (40%) captures municipal commitment. Urban Industrial Potential (30%) reflects industry concentration. Partners (15%) measures cloud provider accessibility. Competition (15%) assesses full-stack presence.

Table 3: Multidimensional City Scoring Results

City	Gov. Relations (40%)	Urban Potential (30%)	Partners (15%)	Competition (15%)	Weighted Score	Rank
Beijing	95	90	85	75	89.00	1
Wuhan	90	85	80	80	85.50	2
Chongqing	92	80	72	85	84.35	3
Nanjing	88	82	78	82	83.80	4
Shanghai	85	88	90	65	83.65	5

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City	Gov. Relations (40%)	Urban Potential (30%)	Partners (15%)	Competition (15%)	Weighted Score	Rank
Shenzhen	82	85	88	60	80.50	6
Changchun	78	72	68	88	76.20	7

Beijing ranks first (government relations 95, RMB 99.4 billion). Wuhan second (RMB 170 billion). Chongqing third (government 92). Shanghai and Shenzhen score highly on partners and urban potential but are penalized by intense competition from Huawei and Baidu headquarters presence.

Shanghai and Shenzhen score highly on partners and urban potential but are penalized by intense competition from Huawei and Baidu headquarters presence. These cities represent advanced but contested markets where partnership-based entry may face resistance from incumbents with established municipal relationships.

Changchun ranks seventh (competition 88). Shanghai and Shenzhen penalized by Huawei/Baidu competition.

Strategic Framework

Building upon validated analytical foundations, the study proposes a Partnership-led Growth Model operationalized through two complementary pathways.

Path A: Market Infiltration targets high-priority cities (Beijing, Wuhan, Nanjing) through cloud operator partnerships.

Path B: Lateral Entry targets adjacent markets (Chongqing, Changchun) with lower competition.

Table 4: Strategic Framework Summary: Partnership-led Growth Model

Dimension	Path A: Market Infiltration	Path B: Lateral Entry
Target cities	Beijing, Wuhan, Nanjing	Chongqing, Changchun
Entry logic	Leverage hardware expertise in high-priority markets	Exploit lower competition in underserved regions
Core capability	Automotive-grade RSU/MEC manufacturing	Reference installation + local partnership
Partnership focus	Cloud provider alliances	Local integrators + municipal government
Timeline	2024-2026	2024-2026
Expected outcome	Revenue growth, capability building, brand establishment	Market diversification, risk hedging, scale expansion
Investment intensity	High	Moderate
Risk profile	Concentrated but high-return	Diversified but lower per-market return

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All five experts (100%) affirmed the Partnership-led Growth Model, noting that independent cloud platform development would require RMB 5-10 billion and 3-5 years—a timeline exceeding the current pilot deployment window (Expert Panel, 2024).

The expert consensus is particularly notable given the diversity of functional perspectives represented. The unanimity of concurrence (100%) across all five validation dimensions—macro-environmental accuracy, industry structure validity, SWOT completeness, SAW appropriateness, and strategic feasibility—provides robust validation of the analytical conclusions.

Conclusion and Discussion

Findings: (1) The Cloud-V2X Capability Gap is the defining asymmetry; (2) SCP-G confirms governance-led market structure; (3) Partnership is the only viable pathway.

The Cloud-V2X Capability Gap is the primary competitive asymmetry. All five experts (100%) concurred that independent cloud development would require RMB 5-10 billion and 3-5 years—prohibitive for most component-focused enterprises and exceeding the 2024-2026 pilot window. This barrier renders partnership-based strategies the only viable pathway.

Second, the SCP-G analysis confirmed a governance-led transmission mechanism in which government intervention sequentially dictates market structure, firm conduct, and performance. The pilot program, mandatory standards, and procurement preferences collectively filter market participants toward integrated providers, reinforcing the urgency of partnership strategies.

Third, the Partnership-led Growth Model stands as the central pillar of the strategic recommendation. Partnering with established local cloud providers offers a sustainable pathway to overcome the Cloud-V2X Capability Gap without prohibitive capital investment. The SAW model prioritises Beijing (89.00), Wuhan (85.50), Chongqing (84.35), and Nanjing (83.80) as target markets, and the dual-pathway framework provides operational flexibility across market maturity levels.

The Partnership-led Growth Model derives its centrality from three structural realities: the RMB 5–10 billion investment barrier is insurmountable for mid-tier firms; local cloud providers possess proven infrastructure and government relationships; and partnership transforms a fixed-capital gap into a variable-cost arrangement. All five experts (100%) endorsed this model.

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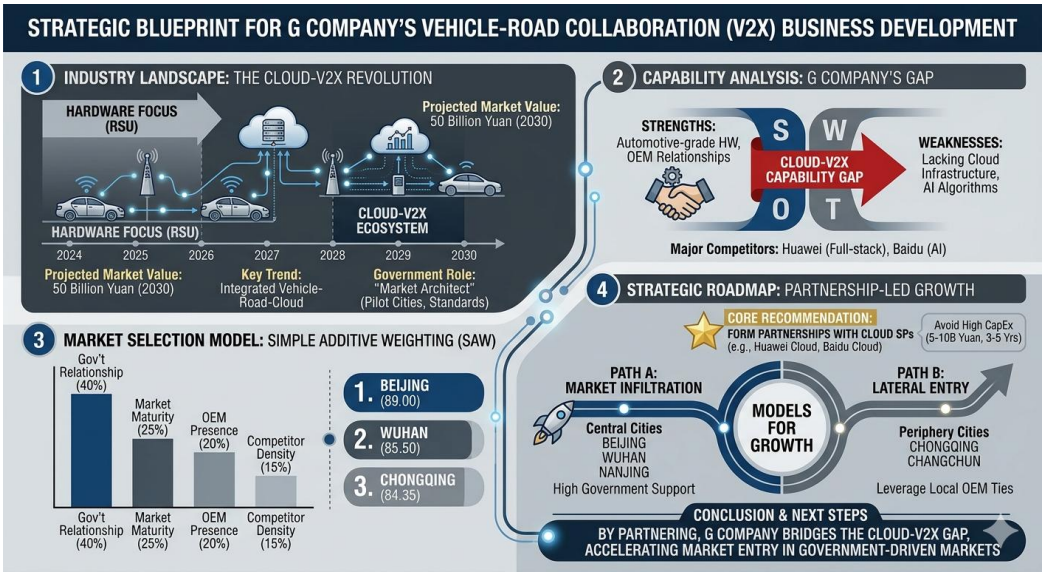


Figure 4. Business Development Strategy Blueprint
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Integrated Strategic Model: Dual-Pathway Execution

The Partnership-led Growth Model is operationalized through two pathways derived from the SAW-based city prioritization results. Table 5 summarizes the framework.

Table 5: Integrated Strategic Model: Dual-Pathway Execution Framework

Dimension	Path A: Market Infiltration	Path B: Lateral Entry
Target cities	Beijing (89.00), Wuhan (85.50), Nanjing (83.80)	Chongqing (84.35), Changchun (76.20)
City profile	High-priority hubs with large project scale and strong government commitment	Regions with lower competitive intensity and emerging procurement pipelines
Entry logic	Leverage automotive-grade hardware expertise in government-led flagship projects	Exploit lower competition to establish reference installations with reduced resource commitment
Core capability	RSU/MEC manufacturing + cloud partner integration	Reference installation design + local partnership cultivation
Partnership focus	Cloud provider alliances (Huawei Cloud, Baidu Intelligent Cloud)	Local system integrators + municipal government relationships
Timeline	2024–2026 (pilot deployment window)	2024–2026 (pilot deployment window)

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Dimension	Path A: Market Infiltration	Path B: Lateral Entry
Expected outcome	Revenue growth, capability building, national reference credentials	Market diversification, risk hedging, operational experience
Investment intensity	High (dedicated partnership investment per city)	Moderate (scalable across multiple regions)
Risk profile	Concentrated but high-return	Diversified but lower per-market return

Path A: Market Infiltration targets high-priority hubs where government commitment justifies dedicated partnership investment. Beijing (89.00, government relations 95, 6,050 intersections) is optimal for national reference credentials. Wuhan's RMB 170 billion is the largest single V2X project. Nanjing (83.80) provides a balanced entry point.

Path B: Lateral Entry targets regions with lower competitive intensity. Chongqing (84.35) benefits from high government commitment (92) and manageable competition (85). Changchun (76.20, competition 88) offers an open market where automotive relationships provide an alternative entry pathway.

Market Archetype Classification

The SAW-based city prioritization results reveal distinct market archetypes requiring differentiated strategic approaches. Table 6 categorizes the evaluated cities according to their strategic characteristics.

Table 6: Market Archetype Classification of Target Cities

Archetype	Characteristics	Cities	Strategic Approach
National Flagship Hub	Highest government relations; largest project scale; national policy epicenter; intense competition from Tier 1 incumbents	Beijing (89.00)	Priorities flagship project participation; accept compressed margins for reference credentials; partner with top-tier cloud providers
Mega-Project Anchor	Very large single-project investment; strong government commitment; significant scale economics	Wuhan (85.50)	Leverage scale economics to offset partnership costs; target turnkey hardware procurement contracts
Balanced Growth Market	Strong government relations; moderate competition; diversified industrial base	Nanjing (83.80), Chongqing (84.35)	Steady market development with balanced resource allocation; build sustainable partnerships
Tech-Intensive Battleground	Highest partner availability; strongest urban potential; most	Shanghai (83.65),	Deferred priority; re-evaluate after establishing reference

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Archetype	Characteristics	Cities	Strategic Approach
	intense competition from Huawei/Baidu/ZTE headquarters	Shenzhen (80.50)	credentials in lower-competition markets
Traditional Automotive Gateway	Lower government V2X commitment; deep automotive manufacturing heritage; limited full-stack provider presence	Changchun (76.20)	Leverage existing automotive OEM relationships; emphasize hardware-plus-localization value proposition

This archetype classification provides a decision framework for resource allocation. The National Flagship Hub and Mega-Project Anchor categories represent immediate priorities, while the Traditional Automotive Gateway offers a complementary pathway leveraging the case company's automotive domain expertise. Each archetype requires tailored partnership approaches and investment intensity.

Theoretical Implications

This study extends the strategic management literature in two directions. First, it applies SCP-G to emerging technology sectors with government-led market creation, identifying the Chinese government as 'Market Architect—a role beyond traditional regulation that creates demand, designs structure, and determines outcomes. Second, it demonstrates that SAW can be productively integrated with qualitative case study research for replicable strategic recommendations (Chen & Hwang, 1992).

Second, this study demonstrates that SAW can be productively integrated with qualitative case study research for replicable strategic recommendations (Chen & Hwang, 1992). The 40% weighting of government relations reflects context-specific prioritization that generic MCDM applications would not capture.

Practical Implications

For managers of mid-tier automotive component providers, strategic partnership with local cloud providers is the financially sustainable pathway. Partnership delivers immediate cloud access, transforms fixed capital expenditure into variable operational expenditure, and ensures regulatory compliance. The pilot deployment period represents a finite window; once full-stack providers consolidate positions, hardware-only suppliers may be structurally excluded.

Limitations

This study has three limitations. First, reliance on publicly available sources constrains the depth of internal strategic understanding. Second, the five-member expert panel, with each member possessing minimum 10 years of experience (average 15 years, totaling 75 years), does not permit statistical generalisation. Third, accelerating technological change means findings reflect the 2024–2025 deployment cycle.

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Suggestion

Strategic Recommendations

The study recommends adopting a strategic partnership model with cloud providers. Implementation consists of four phases: Identification (1–3 months), Negotiation (4–6 months), Integration (7–12 months), and Deployment (ongoing).

Table 7: Implementation Roadmap: Four-Phase Partnership Execution

Phase	Name	Timeline	Key Activities	Deliverables
Phase 1	Partner Identification	Months 1–3	Evaluate cloud partners on technical compatibility, market coverage, commercial terms; assess scalability, automotive experience, certification status	Shortlisted partner candidates; due diligence reports
Phase 2	Negotiation	Months 4–6	Negotiate hardware-software integration protocols, revenue sharing, joint certification, IP provisions; define SLA and governance structure	Signed partnership framework agreement
Phase 3	Integration	Months 7–12	Align product roadmaps; develop integrated prototypes; conduct pilot deployments at selected intersections	Validated integrated solution; operational workflow documentation
Phase 4	Deployment	Ongoing	Execute full-scale deployment; optimise based on operational feedback; adapt to evolving standards	Revenue-generating deployments; reference installations

This phased approach transforms the Partnership-led Growth Model from strategic concept to operational reality. The twelve-month timeline from partner identification to initial deployment aligns with the 2024-2026 pilot window, ensuring partnership-based market presence before pilot city procurement consolidates around established ecosystem configurations.

Managerial Recommendations

The provider should simultaneously execute market infiltration (Beijing, Wuhan, Nanjing) and lateral entry (Chongqing, Changchun). For infiltration, target

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flagship projects accepting compressed margins for reference credentials. For lateral entry, emphasize hardware-plus-localization with local integrators. Monitor SAW scores quarterly to update priorities as conditions evolve.

The dual-track approach balances revenue concentration in high-priority markets with portfolio diversification across emerging regions. Managers should monitor SAW score changes quarterly, updating city priorities as government commitments evolve and competitive landscapes shift.

Future Research Directions

Future research directions should consider both academic development and practical implications for future entrepreneurs. First, longitudinal studies should track how V2X partnerships evolve from 2024 to 2028, especially as the industry moves from pilot projects to wider commercialization. Such research would help explain how firms adjust their cooperation models, resource allocation, and competitive positioning during different stages of industry development.

Second, comparative research on different alliance models, such as hardware-cloud cooperation, OEM-led ecosystems, and government-platform collaboration, would help new entrepreneurs identify more feasible entry paths. In addition, quantitative studies on the financial outcomes of partnership-based strategies versus independent development strategies would provide stronger evidence for strategic decision-making, especially for start-ups and mid-tier firms with limited resources.

Third, future research should examine municipal government procurement criteria, including technical standards, data security, cost requirements, local service capability, and vendor reputation, because these factors directly affect market entry opportunities. Further investigation of policy evolution beyond the pilot phase would also clarify how subsidies, standards, licensing, and public-private investment may change over time. These studies would not only enrich academic understanding of V2X industry development, but also offer practical guidance for entrepreneurs seeking to enter intelligent mobility markets.

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