



Regulation and Commercialization of Autonomous Driving: Large-scale Operation Cases in China

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Starting from One Test Report



In July 2021, I signed my first test report for a self-driving passenger car of my career.

July 2021 · Passenger Car · China's First Highway Test Licenses.

1 It was a passenger car

And its challenge was China's expressways —a passenger car could drive on a Chinese highway by itself, at 100 kilometers per hour, with hands off the wheel.

2 The first enterprises in China to receive highway road-test licenses

The license meant it could legally drive on expressways in autonomous mode for the first time

3 In the years after, I watched many more vehicles “graduate” .

heavy trucks, city minibuses, delivery robots, and truck platoons... One by one, they moved from the test site to real roads.



My biggest lesson is this:

**the hardest problem in self-driving
is never in the code.**

CHAPTER I

L4's Development Path in China

Five Milestones from Closed Test to Nationwide Commercialization

Five milestones map the full path of China's L4 from closed-course testing to nationwide institutionalization



Back to 2017: A Fragmented Start

2017

The Pain: Every City Made Its Own Rules

Four cities, four different rulebooks:

Beijing **Shanghai** **Shenzhen** **Chongqing** Each had its own testing rules

Licenses not mutually recognized → repeated testing and applications

A vivid analogy:

"like driving to Shanghai with a Beijing license and taking the test again."

Like getting a Beijing driver's license but having to re-test in Shanghai.

Companies duplicated effort and lost efficiency, but everyone saw the opportunity of a new track.

2018

Turning Point: Three Ministries Worked Together

April 2018 • Joint issuance by three ministries

Jointly issued by:

MIIT

Ministry of Industry and
Information Technology

MPS

Ministry of Public Security

MOT

Ministry of Transport

"Road Test Management Specification for Intelligent Connected Vehicles (Trial)"

- ✓ A unified national L4 road-test "minimum standard"
- ✓ Ended fragmented standards and duplicated applications
- ✓ L4 legally took to public roads for the first time

Milestone 1 • Breaking the Ice: From Closed Courses to Open Roads

Milestone 1 • 2018: From Closed-Course Testing to Open Roads

Milestone 1 • 2018

Chapter 2 • The Development Path of L4 in China: Five Milestones

Key Message

The three ministries issued China's first unified L4 road-test framework, ending fragmentation and letting L4 legally drive on public roads for the first time.

1
2018

2020

2021

2022-23

2023-26

Key Facts

01 Joint issuance by three ministries

In April 2018, MIIT, MPS and MOT jointly issued the "Road Test Management Specification for Intelligent Connected Vehicles (Trial)", establishing a unified national top-level framework for L4 road testing.

02 Ending Fragmentation

Ending the chaos of "Beijing licenses not valid in Shanghai", a national "minimum standard" was set; companies no longer needed to re-apply and re-invest everywhere.

03 Leading companies obtained the first road-test licenses

Baidu Apollo, Pony.ai, and WeRide successively received the first batch of L4 road-test licenses in Beijing, Shanghai, Guangzhou and Shenzhen.

★ Why It Matters

L4 officially moved from labs and closed parks onto public roads — the first step of China's autonomous driving from "research project" to **"road participant"**.

Milestone 2 • 2020: From "Empty Testing" to "Passenger Demonstration"

Milestone 2 • 2020

Chapter 2 • The Development Path of L4 in China: Five Milestones

Key Message

Guangzhou opened piloted Robotaxi rides first; the "Dual Intelligence" pilot established the Vehicle-Road-Cloud route; L4 began serving real passengers.



Key Facts

01 Guangzhou opened piloted demonstration first

In 2020, Guangzhou first opened free Robotaxi rides to the public; for the first time, ordinary people could call a self-driving taxi on their phone.

02 Beijing defined the "test → piloted" upgrade path

In October 2020, Beijing issued rules that first clarified the formal upgrade threshold from "testing" to "piloted demonstration".

03 "Dual Intelligence" pilot launched • 16 cities first

MOHURD and MIIT started a "smart car, smart city" pilot with 16 cities. "Vehicle-road-cloud integration" became the national route. China does not only make the car smart. It makes the road and the cloud work together too.

★ Why It Matters

L4 moved from "empty test cars that only engineers cared about" to serving real people — **technology reliability and service feasibility were truly validated for the first time.**

Milestone 3 • 2021: From Free Rides to Commercial Charging

Milestone 3 • 2021

Chapter 2 • The Development Path of L4 in China: Five Milestones

Key Message

Beijing E-Town issued China's first commercial pilot licenses; L4 Robotaxis could legally charge passengers — from "technology" to "business".



Key Facts

01 E-Town issued commercialization rules
In November 2021, Beijing E-Town (BDA) issued the "Implementation Rules for Commercial Pilot Management of Autonomous Ride-Hailing Services", clarifying when charging is allowed.

02 China's first paid-service licenses granted
Baidu Apollo and Pony.ai received the nation's first commercial pilot licenses — For the first time, L4 could legally charge passengers.

03 Beijing, Shanghai, Guangzhou, Shenzhen followed
Almost simultaneously, these cities opened commercial pilots, moving from "one-city breakthrough" to "multi-city momentum".

★ Why It Matters
For the first time, L4 moved from "money-burning tech demo" to "a business that can make money",
and its business model was truly validated for the first time.

Milestone 4 • 2022-23: From "Crewed" to "Fully Driverless"

Milestone 4 • 2022-2023

Chapter 2 • The Development Path of L4 in China: Five Milestones

Key Message

Wuhan/Chongqing first opened fully driverless Robotaxi operations; multiple scenarios scaled in parallel — L4 proved its value in replacing human labor.

2018

2020

2021

4
2022-2023

2023-26

Key Facts

01 Wuhan & Chongqing: first driverless paid operations

In August 2022, Chongqing and Wuhan opened commercial robotaxi services with no safety driver at all.
There was really no one in the car.

02 Tier-1 cities followed • multiple scenarios went live

In 2023, Beijing, Guangzhou, and Shenzhen followed.
Delivery robots, cleaning vehicles, minibuses, and mining trucks also entered commercial use.

03 Scale: 20+ cities / 3,000+ vehicles

By the end of 2023, 20+ cities were running L4 demonstration operations with over 3,000 vehicles — a visible operating network had formed.

★ Why It Matters

True driverless operation meant "removing the safety operator" made the cost-reduction logic work,
and L4's commercial value could be truly realized for the first time.

Milestone 5 • 2023-26: From Local Pilots to Nationwide Institutionalization

Chapter 2 • The Development Path of L4 in China: Five Milestones

Key Message

Access pilot + mandatory standard + road-traffic-law amendment fired together: L4 entered a new stage with national laws and standards.

2018

2020

2021

2022-23

5
2023-26

Key Facts

01 Nov 2023 • four-ministry access pilot
MIIT/MPS/MOT/MOHURD jointly issued the "Implementation Opinions on Access and Road-Use Pilot for Intelligent Connected Vehicles", bringing L4 into the national vehicle access framework for the first time.

02 Jul 2026 • first mandatory national standard
GB 44721-2026 was issued, China's first mandatory national standard for L3/L4, effective from July 1, 2027.
GB 44721-2026 《Intelligent and connected vehicle – Safety requirements for automated driving system》

03 Aug 2026 • road-traffic-law amendment • liability clarified
The Road Traffic Safety Law amendment was submitted for review, adding a chapter on "autonomous vehicles";
when the system is active, liability falls to the company — removing the last institutional hurdle.

04 Why It Matters
Access pilot + mandatory standard + road-traffic-law amendment fired together: L4 entered a new stage with national laws and standards.

China's Pattern for L4

Data for Road Rights

Every time business moves one step forward, regulation opens one more level.

Only those who drive safely can go far.

China's L4 Today: Four Numbers

20,000+

test & demonstration licenses issued

Test & Demo Licenses Issued

Source: China Autonomous Driving Scale-Application Blue Book 2026

57,000+ km

open test roads · 380+ test zones

Open Test Roads & Zones Nationwide

covering major cities nationwide

220M+ km

accumulated safe test mileage

Accumulated Safe Test Mileage

≈ 5,500 laps around the Earth

6+

major commercialized scenarios running in parallel

Commercialized Scenarios in Operation

Robotaxi · Mining · Port · Delivery · Minibus · Sanitation

CHAPTER 02

The Chinese Approach to L4 Regulation

The Chinese Approach to L4 Regulation

Central framework · local exploration

Pilots first · phased rollout

02

Access System: Three-Tier Progressive Licenses

Logic: Road test → Demonstration → Operation; each tier is gated by the safety data of the previous tier — Data for Road Rights

Tier	Permit Type	Core Rights	Key Requirements
L4 Tier 1 Entry level Learner's license	Road Test Permit Road Test Permit	Test on designated roads Safety operator required No passengers, no charging	Pass closed-course exam Submit test plan + insurance Drive in designated areas and time windows
L4 Tier 2 Facing the public Probationary license	Demonstration Permit Demonstration Permit	Carry passengers/goods for the public Free rides initially Safety operator gradually relaxed	Complete required road-test mileage No major at-fault accidents Pass passenger-safety assessment
L4 Tier 3 Commercial operation Full license	Commercial Operation License Commercial Operation License	Provide paid mobility services May apply for driverless operation Achieve a true commercial loop	Meet safe-operation mileage targets Remote monitoring capability qualified Accident rate below human-driver level

Design Essence

Controllable risk, step-by-step unlocking — a clear, predictable upgrade path instead of one impossible gate

Scenario-Based Rules · Three Lines of Safety · Clear Liability

Open scenarios by risk tier, back safety with three lines of defense, and remove the industry's biggest worry with a clear liability-transfer principle

01 Scenario Regulation

Scenario-based Regulation

Low risk · already driverless

Closed parks · mines · ports
Simple scenes, low speed, few people — first to profit

Medium risk · steady progress

Robotaxi · delivery · transit
Restricted-area operation; safety operator gradually reduced

High risk · cautious opening

Highway freight · full urban areas
High-speed, complex mixed traffic — still strictly regulated

Principle: easy first, hard later; openness matches risk

02 Safety Oversight

Three Lines of Defense

Enterprise primary responsibility

- 1 Vehicle design, test validation, safety-operator staffing, emergency plans — the enterprise is the first responsible party

Government platform oversight

- 2 Cloud platform monitors operation data in real time, 24/7 monitoring and remote takeover

Insurance backstop

- 3 Mandatory insurance + additional commercial coverage, ensuring accident compensation is always covered

Three layers: enterprises prevent, government monitors, insurance compensates

03 Liability Determination

Liability Framework

Manual driving mode

Manual Driving Mode

Driver Driver bears liability

Consistent with current traffic laws

System engaged (autonomous mode)

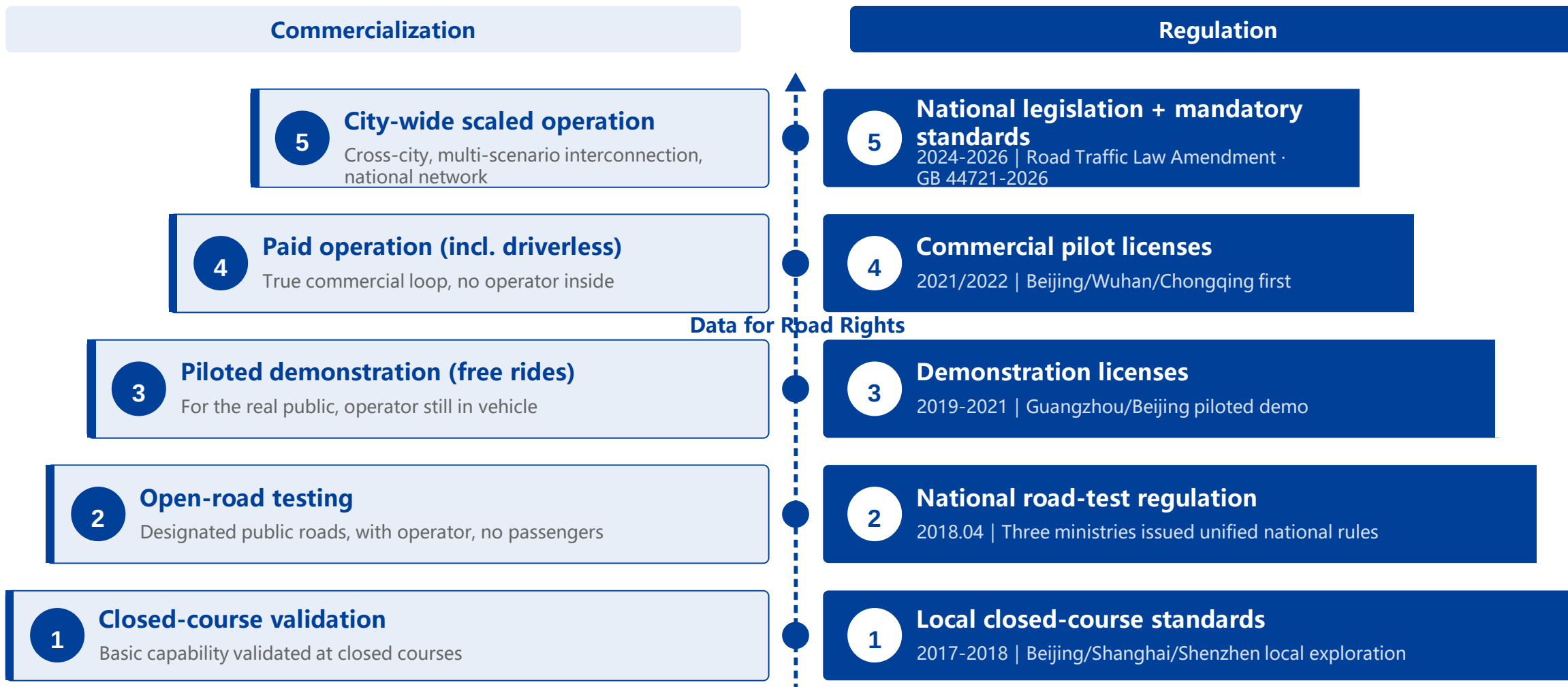
Autonomous driving mode

Autonomous Driving Mode

Company Liability transfers to the vehicle manufacturer/importer

Clarified in the law amendment, removing the biggest legal gray area

Regulation & Commercialization: Two Sides of the Same Ladder



Conclusion: Regulation neither brakes nor accelerates — it paves the road; wherever commercialization goes, rules follow, and safety data is the "key" to the next level

Why Has China's L4 Moved So Fast?

Government stewardship + Vehicle-Road-Cloud Integration + mega-market and rich scenarios — three forces behind "China speed"

1

Government "Builds the Stage"

Proactive Government Stewardship

Rules are not delayed until technology matures — advance and refine in parallel, using "pilots" to leave room for companies to explore.

Two-tier division of labor

Central sets direction; local issues rules and builds infrastructure

Government is neither a "blocker" nor a "bystander", but the "stage-builder" of rules and infrastructure — helping companies run steadily and far.

Institutional supply runs ahead of industry

2

"Vehicle-Road-Cloud Integration"

Vehicle-Road-Cloud Integration

China chose a distinctive technical route: vehicle intelligence + road intelligence + cloud intelligence, working as one integrated system.

Vehicle • onboard perception & decision-making

Roadside • radars/cameras/edge computing

Cloud • global dispatch/oversight/data aggregation

Shifting perception and decision pressure from the vehicle to road and cloud — cheaper, more efficient, safer.

Not loading every problem onto the vehicle's AI

3

Huge-Market

Mega-Market & Rich Scenarios

China has the world's richest deployment scenarios:

- › World's largest auto market (30M+ units per year)
- › Busiest logistics network (40%+ of global road freight)
- › Largest urban population (more than Europe + North America)
- › 6+ scenarios in parallel (Robotaxi/trucks/mining...)
- › Complex weather and road conditions (-30°C to +45°C)

Virtuous cycle

Massive scenarios drive technology iteration

- data accumulation feeds technology upgrades
- lower costs cover more scenarios

03

CHAPTER III · CASE STUDY

Case Study: Beijing E-Town

Beijing E-Town: A Top-Down Government-Led Model

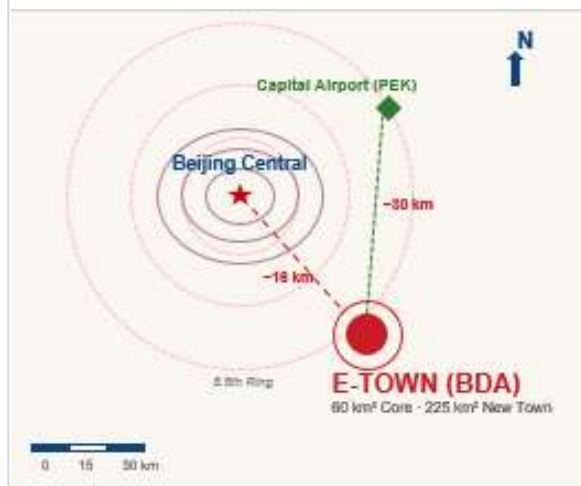
A top-down, government-built full-scenario autonomous driving demonstration zone

World's first networked cloud-controlled high-level autonomous driving demonstration zone · 600 km² · full coverage of 8 scenario types

Where is E-Town?

Beijing Economic-Technological Development Area (BDA) — Beijing's National-Level ETDZ & World's First V2X-Based High-Level Autonomous Driving Demonstration Zone

LOCATION MAP



FOUR LEADING INDUSTRIES

- **High-End Auto & Intelligent Vehicles**
2025 output ¥311.3B · +17.4%
- **Next-Generation Information Technology**
2025 output ¥188.2B · +19.3%
- **Robotics & Intelligent Manufacturing**
2025 output ¥82.0B · +5.1%
- **Biotechnology & Big Health**
45% of Beijing's sector output

EVOLUTION OF E-TOWN

- **Aug 25, 1994**
National-level ETDZ approved by the State Council (10 km²)
- **Jan 26, 2019**
Beijing unifies planning of E-Town New Town (225 km²)
- **Sep 2020**
World's first V2X-based high-level AD zone launched
- **Apr 10, 2021**
China's first ICV Policy Pioneer Zone approved

E-TOWN AT A GLANCE

Beijing's Premier High-Tech & Autonomous Driving Hub

¥401.2B

GDP (2025)

+10.7% YoY

60 km²

Core Demo Zone

225 km² New Town

102

Fortune 500 Co.

157 investment projects

2,131

High-Tech Firms

incl. 14 unicorns

~16 km

to City Center

~30 km to Capital Airport (PEK)

World's 1st

V2X Demo Zone

est. Sept 2020



WHY E-TOWN? National-Level ETDZ + World's First V2X Policy Pilot Zone + 40+ AD Leading Enterprises = Unique **"Double-Policy Overlay"** for L4 commercialization

Demonstration Zone Roadmap: From 1.0 to 4.0

Phased Rollout · "Small Steps, Fast Iteration" in 3–6 Month Cycles



Iterative Rollout Principle

Each phase sets measurable milestones; policy innovation and technical validation advance together — proven models scale to larger areas, then to other cities.

Beijing E-Town: the world's first networked cloud-controlled high-level autonomous driving demonstration zone

600 km²

full-zone coverage

Full-zone V2X Coverage

The entire E-Town development zone

1600+

smart signalized intersections

Intelligent Signalized Intersections

All equipped with radar, cameras and edge computing units

35 / 1,500+

test OEMs · test licenses

Licensed OEMs / Test Licenses

Baidu, Pony.ai, WeRide and other leading firms cluster here

60M+ km

cumulative test mileage (≈1/4 of national total)

Cumulative Test Mileage (≈25% of China)

From closed courses to open roads, accumulating massive safety data

1M+ trips

passenger service orders

Passenger Service Trips

Open to the public for daily mobility

Full coverage of 8 commercialized scenarios

Robotaxi · delivery · transit · sanitation

airport shuttle · park logistics · auto valet · highway platooning

Model: Top-down · Government-Built

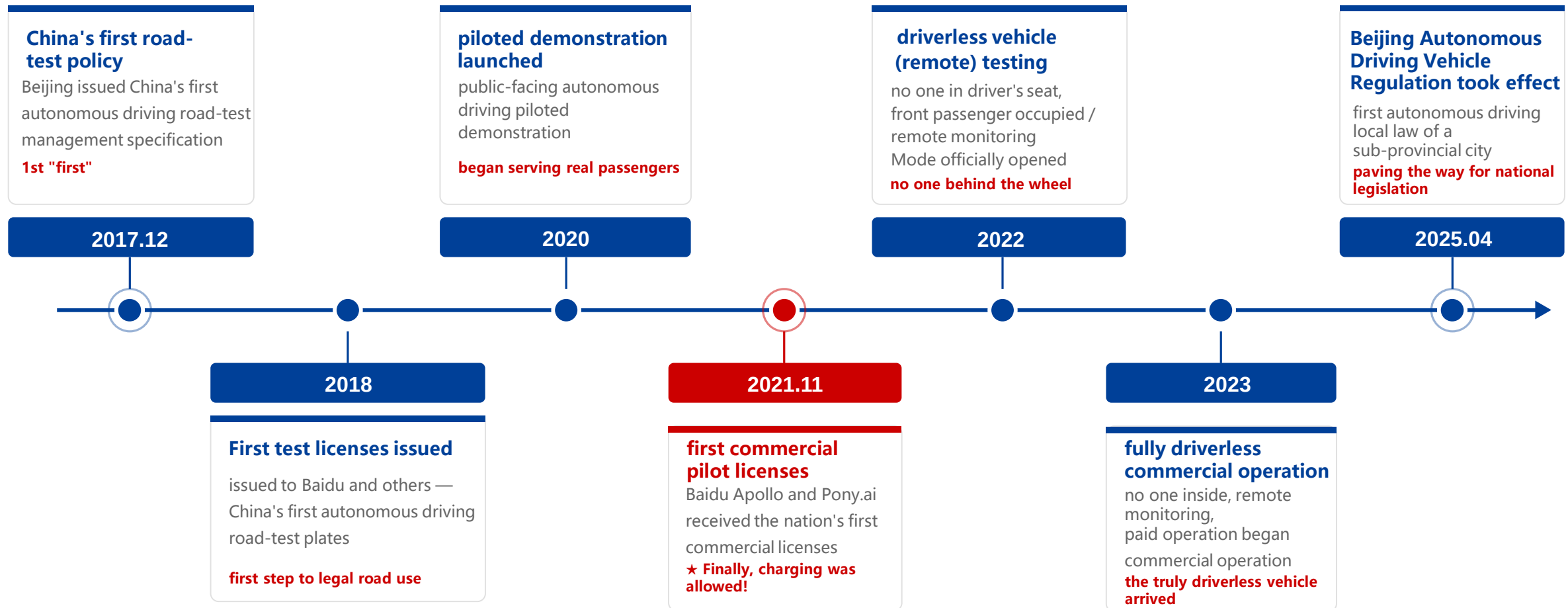


Core of the E-Town model: government-enterprise collaboration

Government doesn't just issue licenses — it invests and builds:

- Upgraded 1,600+ intersections with roadside sensors
- Built a cloud platform streaming all vehicle data in real time
- Issued supporting policies and data rules so companies can focus on operations

Policy First: Beijing Took Almost Every "First"



Pattern: Every policy breakthrough happened first in Beijing → other cities quickly copied it → the "test bed" effect

Policy Document System: E-Town's "2+5+N"

Doc ① · Master Design

Beijing ICV Policy Pilot Zone Master Implementation Plan

Sets direction: how to build the zone, what to pilot first

Doc ② · General Management Measures

Beijing ICV Policy Pilot Zone ICV Management Measures

Sets rules: how vehicles/testing/demos/operations are managed

Five vehicle-category rules (scenario-based: open one by one as they mature)

Passenger cars

implementation rules

Robotaxi / passenger test vehicles
piloted demo & paid operation
opened first

Buses

implementation rules

autonomous minibuses
park/scenic-area shuttles
steady progress

Trucks

implementation rules

smart heavy trucks / platooning
highway freight
pilot breakthrough

Work vehicles

implementation rules

autonomous sweepers / delivery vehicles
operation on specific roads
scenario-based opening

Operations & services

implementation rules

mobility platforms / operators
service standards & safety
full-process oversight

2 top-level documents + **5** vehicle-category rules + **N** supporting policies (data, insurance, mutual test recognition, etc.)

What the "2+5+N" system means:

Top-level documents set direction and rules, category rules implement them by scenario, and supporting policies fill gaps — within the national system of "central framework, local rules", the pilot zone built a replicable, scalable local institutional template.

Who Manages and Approves: E-Town Governance & Qualification Process

Enterprises (applicants)

- ① Submit application (vehicles, plans, qualification materials)
 - ② Submit/revise materials per feedback
 - ③ Pass closed-course exam + expert defense
 - ④ Accumulate safe operation mileage after qualification
 - ⑤ Meet technical conditions, apply for driverless upgrade
- Every upgrade requires data and passing exams

Autonomous Driving Office (government coordination)

Beijing High-Level Autonomous Driving Demonstration Zone Work Office (under the Municipal Economy & IT Bureau)

Five working groups coordinate:

- Zone expansion
 - Financing support
 - Policy innovation
 - Test & evaluation / coordination, etc.
- Review → evaluate → issue permit notices

Beijing Vehicle-Network Technology (regulator)

- Receives applications/revisions
 - Reviews and gives feedback
 - Issues permit notices; companies obtain qualification
 - All vehicle data streamed in; platform-based oversight
 - Violations → permit revoked, operation suspended
- "Make regulation visible and enforceable"

Qualification ladder: Data for Road Rights, unlocked step by step

Road test permit

Operator in driver's seat · no passengers
starts with a passed closed-course exam

Demonstration licenses

piloted rides · free initially
operator gradually moves back

Commercial pilot licenses

paid operation
safe mileage achieved

driverless permit

Driver seat → front passenger seat
→ none
remote monitoring as backstop

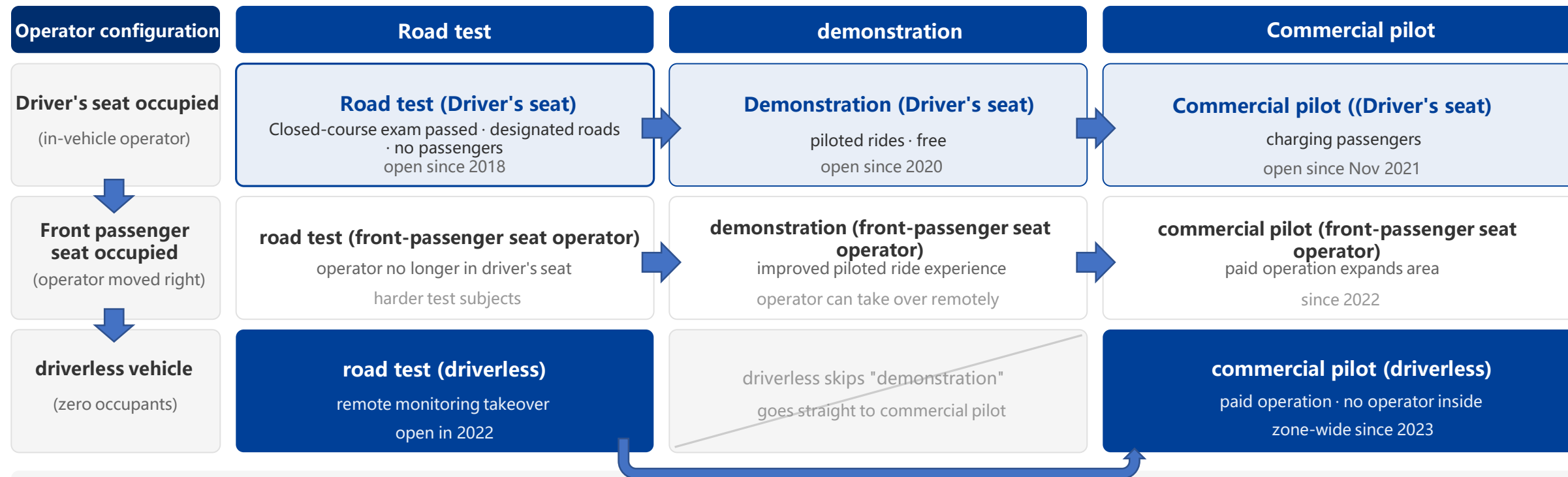
fully driverless

paid operation
scaled replication

Every upgrade requires a new closed-course exam, expert defense, and sufficient accident-free operation mileage — jointly gated by the government, regulators and test engineers.

From Crewed to Driverless: The Robotaxi Qualification Ladder Matrix

New model enters zone → apply for road test → advance level by level (every path requires re-exams + safe mileage)



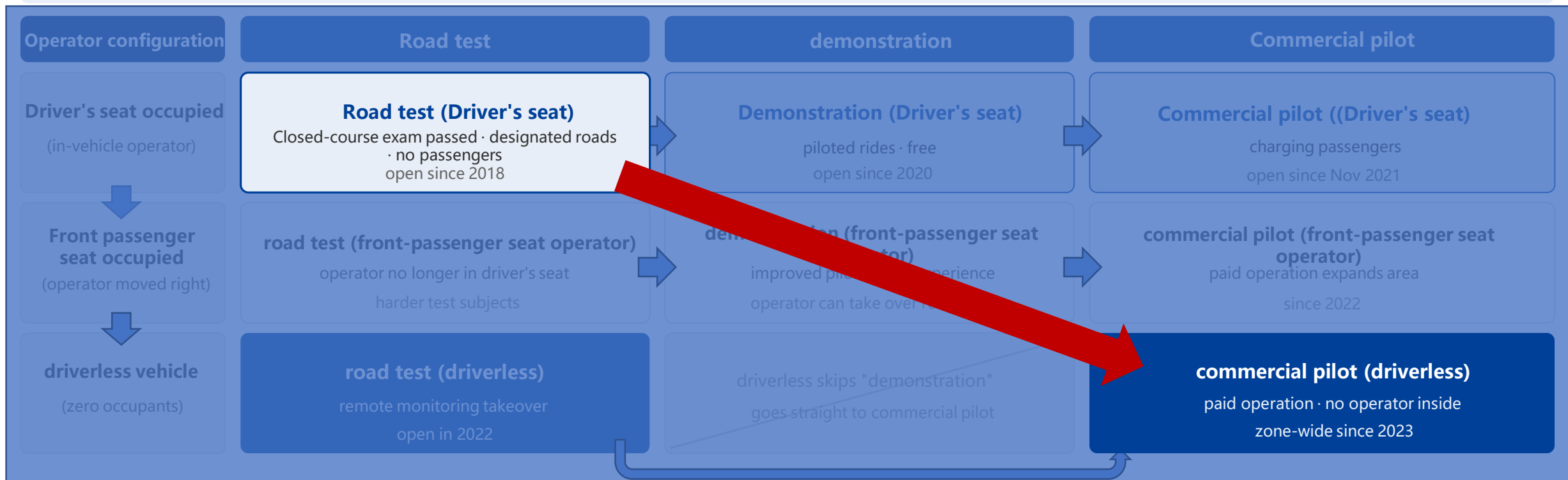
Every cell in this matrix is a step up — and every step up was earned by passing one more exam.

The operator moved from the driver's seat to the front passenger seat, then out entirely — at every step, the vehicle had to pass harder closed-course tests, and accumulate tens to hundreds of thousands of accident-free km, signed off by test engineers, before regulators unlocked the next cell.

This is "Data for Road Rights" — every upgrade was earned with real, hard-won safety data.

From Crewed to Driverless: The Robotaxi Qualification Ladder Matrix

In December 2024, the path got shorter : a safety driver in the driver' s seat → fully driverless, paid operation



It also got shorter because the bar is now written down in numbers :

A new model has to clear one hard gate: **240 hours** of operation with **zero critical disengagements**, **zero at-fault accidents**, and **zero traffic violations**. Its test area must also cover more than 90 percent of the operating zone.

So the path is shorter — but the bar is not lower. It is just clearer.

Safety Supervision System: Pre-Access • In-Operation • Post-Event

Pre-Access Review

PRE-ACCESS REVIEW

◆ 8-Item Network Access Review

8 categories of baseline materials: corporate qualifications, vehicle technical parameters, data security compliance, test-site records, and emergency response plans

◆ Closed-Course Testing

Must pass third-party testing at a nationally / Beijing-accredited facility and obtain a qualification report on autonomous driving functionality and performance

◆ Expert Review Meeting

A committee of experts in automotive, transportation, communications, and law conducts item-by-item hearings before issuing an access opinion

In-Operation Monitoring

IN-OPERATION MONITORING

◆ Real-Time Platform Monitoring

Regulatory devices upload 37 real-time operational data items (location, speed, control mode, takeover records); AI detects anomalies and issues alerts

◆ Geofencing Control

Restricts operations to the ODD and specified time windows; autonomous mode is automatically limited outside the range, preventing unauthorized departure

◆ Unannounced Spot Checks

Remote sampling via the platform plus temporary on-road inspections to verify safety officer status, equipment operation, and the authenticity of emergency response

Post-Event Handling

POST-EVENT HANDLING

◆ Instant Data Extraction

In case of violations/accidents, vehicle driving data, in-cabin records, and roadside video can be extracted with one click to fully reconstruct the incident

◆ Points-Based Penalty System

Drawing on mature traffic-management practices: violations accrue penalty points; once the threshold is reached, testing/operating qualifications are suspended or revoked

◆ Clear Liability Determination

When violations/accidents occur with the system activated, the vehicle manufacturer or operating entity bears liability in accordance with the law

SUPPORTING

Supporting Policies

Beijing Autonomous Driving Vehicle Regulations, effective Apr. 1, 2025

- Operators must establish safety monitoring platforms
- Data security sandbox · Insurance backstop · "2+5+N" policy framework

AI-POWERED PLATFORM

AI-Powered Platform Supervision

Operated by Beijing CheWang Technology · Closed loop: vehicle → platform → response

- Six dimensions: safety / efficiency / evaluation / management / emergency / data
- Three-dimensional oversight: tiered management of enterprises / personnel / vehicles

TRACK RECORD

Regulatory Track Record

35	Chinese & Int'l Companies	60M+ km
1,500+	Autonomous Driving Licenses	Test mileage (≈ 1/4 of national total) · Safety operations remain stable

Vehicle-Road-Cloud Integration: Beijing's Practice of the Chinese Approach

Core idea: Government doesn't just issue licenses — it builds roads, clouds and data platforms, connecting "smart vehicles" with "smart roads"

③ Cloud control platform

Real-time monitoring: all autonomous vehicle data streamed in, online 24/7

Data processing: 300TB+ of operation data daily, supporting oversight, dispatch and optimization

★ **"Data 20 Measures": compliant trading of operation data turns data from "cost" into "asset"**

② Network layer

5G/V2X private network:

low-latency vehicle-road-cloud communication ($\leq 20\text{ms}$ end-to-end) enabling real-time cooperative perception and dispatch

① Roadside layer



1,600+ smart intersections

Each intersection has mmWave radar, LiDAR and HD cameras, helping vehicles "see" blind spots
blind spots eliminated, per-vehicle hardware cost reduced



Edge computing units (MEC)

local perception processing at intersections, millisecond-level broadcasting live road conditions to nearby vehicles

V2X communication, early risk warnings



smart signal control + HD map coverage

traffic lights networked with dynamic timing; HD maps update dynamically across the full 600 km² zone
infrastructure as an "external brain", supplementing vehicle capability

In one sentence: vehicle + road + cloud intelligence = "smart vehicle" + "smart road" + "powerful cloud", working as one — the biggest difference from the single -vehicle-intelligence route

04

CHAPTER V · TAKEAWAYS AND OUTLOOK

China's Experience & Outlook

Four Replicable Lessons and the Road Ahead

Institutions First · Tiered Access · Collaboration · Scenario-Driven

while facing challenges honestly: cost, long-tail scenarios, standard harmonization

Four Replicable Lessons from China

Institutions First · Tiered Access · Collaboration · Scenario-Driven — transferable methodology from the case studies

01 · Institutions First

Rules follow practice; expectations stay clear

- Legislate before tech is perfect: pilot, evaluate, then finalize
- Central framework + local rules form a three-layer system: law—policy—standard
- Companies see how far they can go and invest long-term

Evidence: E-Town piloted first; in 2025 it became the Beijing Autonomous Driving Vehicle Regulation

02 · Tiered Access

"Data for Road Rights" — risk controlled at every step

- Road test → demonstration → commercial operation, unlocked level by level
- Every level: exam passed + safe mileage + traceable data
- Operator moves from driver's seat to front, rear, then out entirely

Evidence: E-Town's Robotaxi ladder matrix — every cell an "exam promotion"

03 · Government-Enterprise Collaboration

Government isn't just a gatekeeper — it builds roads and clouds

- Government: builds zones, upgrades intersections, builds cloud platforms, opens data
- Enterprises: technology, operations, commercialization
- Vehicle-Road-Cloud: shifting perception load from vehicle to road and cloud

Evidence: E-Town's 1,600+ smart intersections, zone-wide cloud platform, 120+ companies

04 · Scenario-Driven

Find your advantageous scenario; land it first, then expand

- Closed/semi-closed scenarios (mines, ports) profit first
- Urban Robotaxi is the "hardest scenario"; scaling is still underway
- Don't chase everything: niche cities go vertical and deep

Evidence: Take small steps forward, and improve through iterative processes

Three Future Trends

From pilots to nationwide, from single points to fusion, from "is anyone inside?" to "is it affordable?"

1

From "pilot cities" to "nationwide coverage"

E-Town Wuhan Chongqing → nationwide rollout

The road-traffic-law amendment adds an "autonomous vehicle" chapter; the mandatory standard takes effect in 2027 moving L4 from a few pilot cities to nationwide legality and scalable replication.

2

From "single scenarios" to "multi-scenario fusion"

Robotaxi Mining Ports Transit Logistics

same tech stack

One L4 tech stack (perception/decision/control) adapts to more scenarios; technology reuse rises and marginal costs fall — "one system, many profitable scenarios" becomes reality.

3

From "is anyone inside?" to "is it affordable?"

Past question:

"Is there still a human in the car?"

Future question:

**"Can costs break even?
Is the experience good?"**

Competition shifts from "can it be driverless?" to "can it make money and scale?" — commercialization enters deep water, competing on operational efficiency and user experience.

Back to July 2021 — the passenger-car highway autonomous driving test report, the first qualification report I signed

**My biggest lesson from these five years:
The hardest problem in autonomous driving
has never been in the code,
but in the rules.**

Technology decides how fast one vehicle can go; institutions decide how far and how safely ten million vehicles can run.

Thank You