ESCAP
Economic and Social Commission for Asia and the Pacific

Regional Policy Guidebook on Autonomous Vehicles in Asia and the Pacific

Transport Division

9-10 September, Bangkok, Thailand

Background and Purpose

Background

Developed by ESCAP's Transport Division as a major output of a regional research project supported by the Korea-ESCAP Cooperation Fund (KECF), launched in March 2025.

01 **To Understand the Technology**

What are autonomous vehicles, how do they work, and where are they being applied?

02 **To Learn from Current Practice**

How are autonomous vehicles being governed, tested and deployed in countries already advancing their use?

03 **To Translate Lessons for the Region**

What opportunities do autonomous vehicles offer Asia-Pacific countries, particularly developing countries, and what conditions are needed to realize them?

Why this Guidebook, why now?

Autonomous vehicles are no longer only a future concept. For policymakers, the question is shifting from “what is the technology?” to “how should we prepare?”

Technology is Maturing, Market Deployment Accelerating

Advances in autonomous driving technology, combined with strong private-sector investment, are moving AVs from testing towards broader real-world and commercial deployment.

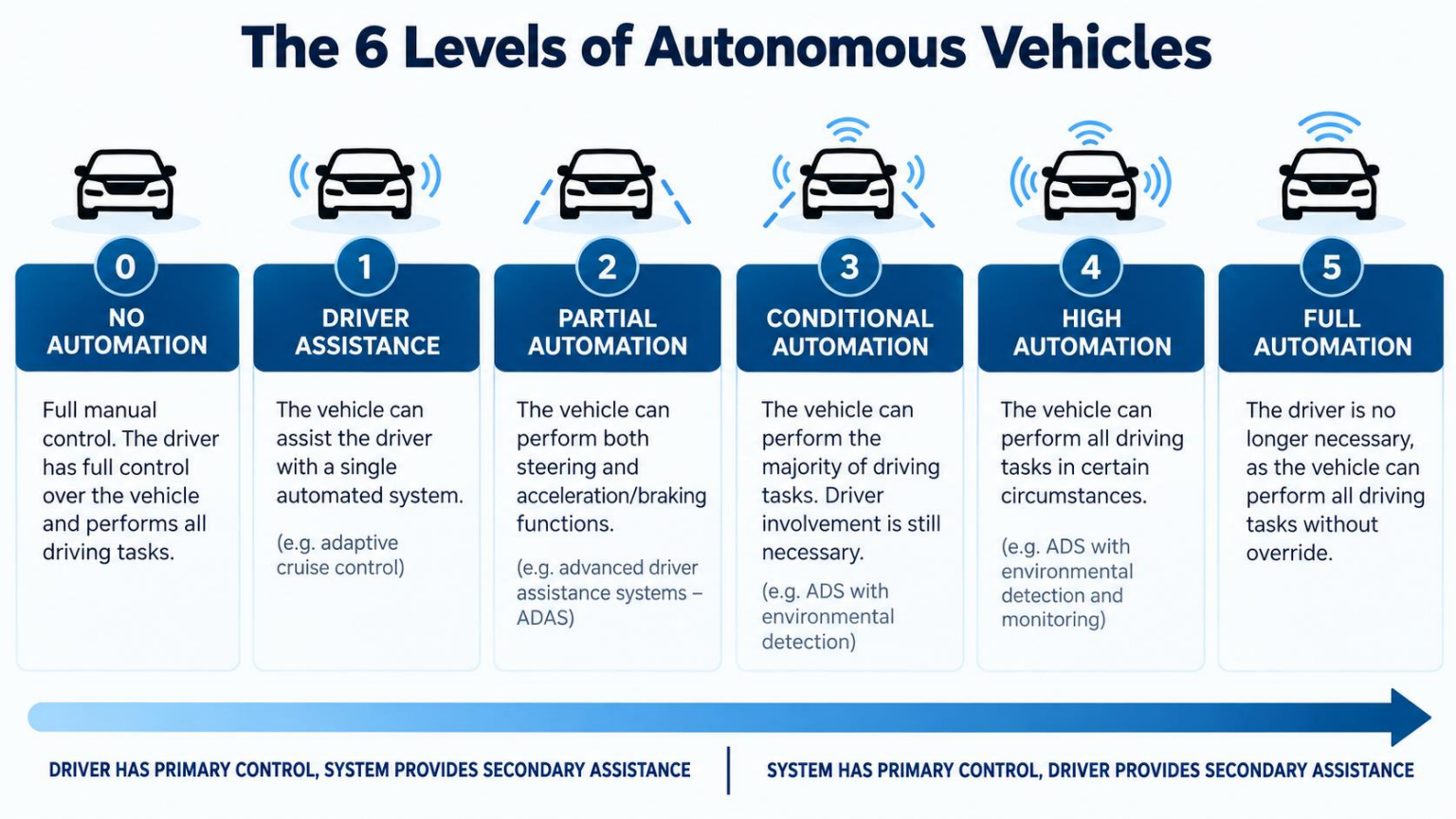
Potential Benefits Appear

AVs may offer important opportunities for road safety, mobility access, low-emission solutions, logistics efficiency and public service delivery, although the scale and relevance of these benefits will vary by context.

Readiness is Uneven

Countries differ widely in regulation, infrastructure, institutional capacity, data governance and market conditions. Governments may need practical guidance on where to begin, what to allow, and how to manage risk.

What Are Autonomous Vehicles?



Autonomous driving is a spectrum, from driver assistance features to highly automated vehicles. This guidebook primarily focuses on Levels 3 and 4.

Understanding the Technology – cont'd

Autonomous Vehicles Take Many Forms – AVs are not one technology or one deployment model

The policy question is not simply whether a country is ready for AVs, but which use case, in which environment, and under which operating model



Robotaxi

Urban passenger mobility



Autonomous bus / shuttle

Public transport or feeder service



Small delivery vehicle

Last-mile delivery, closed-site operations



Freight / logistics

Autonomous truck or van



Closed-site operations

Port, airport or campus

Operating environment	Urban mixed traffic	Campus / industrial park	Dedicated route	Highway corridor	Port / airport / depot
Business / service model	Public service	Commercial mobility	Logistics operator	Public–private partnership	Research / demonstration

Different combinations require different rules, safety evidence, infrastructure needs, data arrangements and institutional responsibilities

Potential benefits are significant, but they are conditional on responsible deployment

Safer

Reduce crashes linked to human error where systems are proven safe within defined conditions.

More Inclusive I

Support older persons, persons with disabilities and underserved communities through new service models.

More Inclusive II

Expand first/last-mile options and complement existing networks in selected corridors or districts.

More Efficient I

Improve freight, delivery and controlled-site operations where routes and conditions are predictable.

More Efficient II

Support smoother driving, optimized fleets and more efficient use of transport assets.

Greener

AVs are primarily built on or retrofitted from EV platforms, while centralized fleet management enables coordinated off-peak charging at scale.

From technology to deployment: what needs to be in place?

Responsible AV deployment depends on a system of enabling conditions. These conditions matter as much as the vehicle technology itself

- Regulation
- Institutional capacity
- **Responsible AV Deployment**
- Safety assurance
- Cybersecurity
- Infrastructure readiness
- Data governance
- Public acceptance

Three National Approaches — One Field, Three Paths

CHINA

Iterative cycle: national direction, local experimentation, and feedback into national standards and rules.

National authorities provide strategic direction and increasingly harmonized rules and standards, while cities have played a major role in road testing, demonstration and commercial pilots.

REPUBLIC OF KOREA

Nationally coordinated framework

Central authorities set the legal, safety and certification framework; local governments run Pilot Operation Zones and adapt services.

UNITED STATES

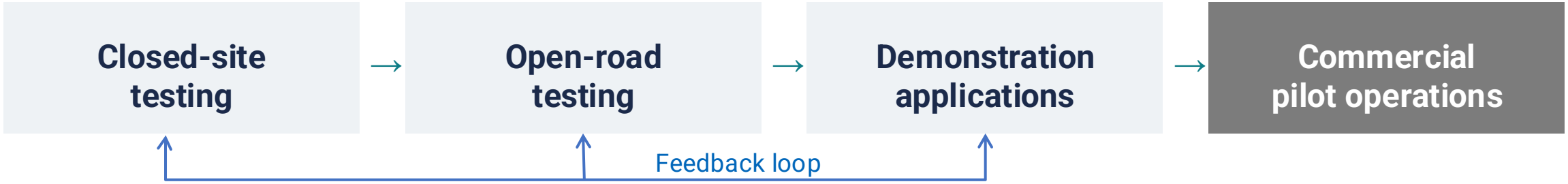
Decentralized, state-led model

Federal role: vehicle safety standards, defect investigation, recalls (self-certification). States lead operational regulation — highly diverse environment.

Different institutional systems have produced different governance models — there is no single model to copy

Under Different Governance Models, Some Common Practices Appear

- **Progressive Deployment, Not a Binary Choice--** Real-world operation is itself a source of regulatory learning, not only technology validation



The key regulatory question is not “is the vehicle autonomous?” but:

  - **Where, when, under what conditions — and for what service — is it permitted to operate?**

- **Safety Is Becoming a Full-Lifecycle Process--**From a one-time approval event to continuous oversight before and after deployment

Before deployment: structured, repeated validation

After deployment: continuous monitoring

Under Different Governance Models, Some Common Practices Appear – Cont'd

Liability Shifts from Driver-Centered to Multi-Actor

- **A more distributed model of accountability:**
  - Owners · fleet operators · manufacturers · ADS developers · software providers · remote personnel
- **Accountability increasingly depends on operational data:**
  - Reconstructing what the system perceived, which mode was active, compliance, remote intervention, software status
  - Evidence (logs, footage) formats and access rules should be standardized in advance

AV Governance Is Now a System-Level Issue

- Regulation extends beyond vehicles and traffic law to data, cybersecurity, software and remote operation

There is no single pathway to AV readiness

Build governance suited to national circumstances

01

AV governance develops incrementally alongside technology and operational experience — a complete framework is not a prerequisite for testing.

02

Institutional arrangements matter as much as individual regulations: Clear cross-agency responsibilities, effective coordination, and a meaningful role for local governments.

03

Early-stage AV policy is not a disadvantage — international experience is growing and can inform proportionate national approaches, with room for flexible adjustments.

04 **Ask not “Is the country ready for AVs?” but:**

> **“Which form of automation can serve which specific transport need — under what operating conditions and safeguards?”**

For many countries, a staged, evidence-based pathway can create value while managing risk

1

Understand

Build a common understanding of AV concepts, applications and limits.

2

Identify use cases

Start from transport needs, service gaps or controlled operating environments.

3

Establish enabling conditions

Clarify rules, institutions, safety evidence, data and cybersecurity arrangements.

4

Pilot carefully

Use controlled pilots within defined operational boundaries, monitoring and public communication.

5

Evaluate, learn and scale

Scale only where evidence supports safety, value and operational viability.

If adapted to national priorities and circumstances, this technology can create value for developing or less developed countries.

Four Messages for Policymakers

Start with the transport problem

AV deployment should respond to identifiable mobility, safety, logistics or public-service needs.

Readiness is broader than roads

Regulation, institutions, safety assurance, data, cybersecurity, operations and public acceptance all matter.

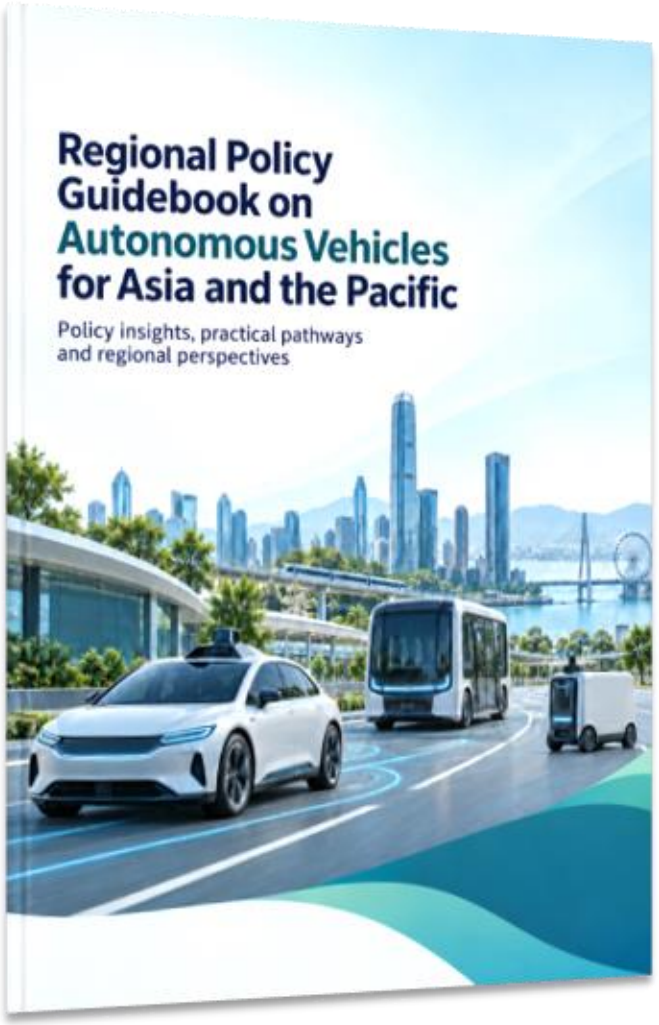
Move progressively

Interest does not need to lead directly to large-scale deployment. Controlled pilots and selected use cases can be a practical starting point.

Use cooperation early

Knowledge-sharing and partnerships can help countries prepare, even before AV deployment becomes widespread.

The objective is not to deploy AVs everywhere, but to enable the right applications, in the right environments, with the right safeguards.



How the Guidebook was Developed

Primarily drafted by national experts based on stakeholder consultations and publicly available information, and subsequently edited by ESCAP, drawing on findings from fact-finding missions and comprehensive stakeholder consultations

Target Audience

Policymakers in the region who are beginning to consider autonomous vehicles, with limited or no prior knowledge of the technology

Purpose

The Guidebook does not advocate a single policy model or promote the technology itself. It aims to:

- Present international experiences and market developments
- Identify common policy considerations across countries
- Highlight lessons to support evidence-based policymaking in the region

To be formally launched at a special event during the Fifth Ministerial Conference on Transport in November

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