REGIONAL CONFERENCE ON AUTONOMOUS VEHICLES IN ASIA AND THE PACIFIC

Perspectives from a Nascent, Interested Country

Opportunities, Priorities and Questions for Autonomous Mobility — the View from Bhutan

United Nations Conference Center, CR-4, Bangkok, Thailand
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Country Presentation | Kingdom of Bhutan

COUNTRY CONTEXT

Bhutan at a Glance

A small Himalayan kingdom whose development philosophy shapes how it will approach every new technology, including AVs.

38,394 km²

Total land area — landlocked, sandwiched between India and China.

~760,000

Population, dispersed across steep and mountainous terrain

60%+

Forest cover constitutionally mandated — a floor, not a ceiling

#1

The world's only carbon-negative country

Gross National Happiness

Bhutan's guiding development framework weighs wellbeing, culture and environment alongside economic growth. Every technology choice — AVs included — is expected to serve this balance, not just efficiency or GDP.

TRANSPORT SECTOR TODAY

Road-Dependent, Mountain-Constrained



~18,500 km of roads

national network, including ~2,650 km of national highways — only around 60% paved



One primary east-west artery

the 713 km Lateral Road links Phuentsholing to Trashigang through steep passes — mostly single-lane



No railway yet

road transport carries ~95% of freight; Bhutan's first rail link (to Gelephu) is only now being planned with India



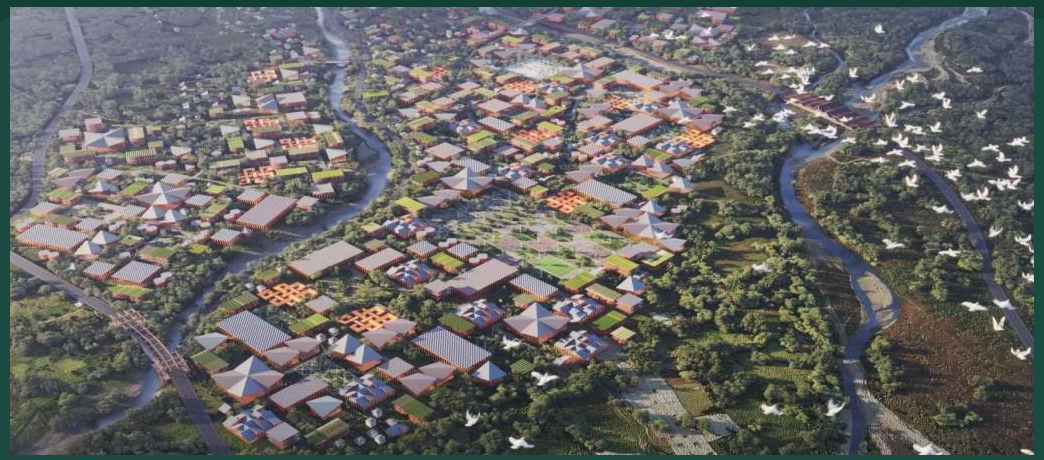
Rising congestion & risk

a fast-growing vehicle fleet is straining Thimphu's streets, while monsoon landslides and hairpin curves raise accident risk on highways

THE FOUNDATIONS BHUTAN BRINGS

A Clean-Energy, Greenfield Advantage

Two national assets give Bhutan an unusual head start for embedding autonomy-ready systems from day one.



Abundant Clean Hydropower

Bhutan's electricity comes overwhelmingly from hydropower, with surplus exported to India. A future fleet of autonomous vehicles could run on truly zero-emission power — a rare advantage globally.



Gelephu Mindfulness City

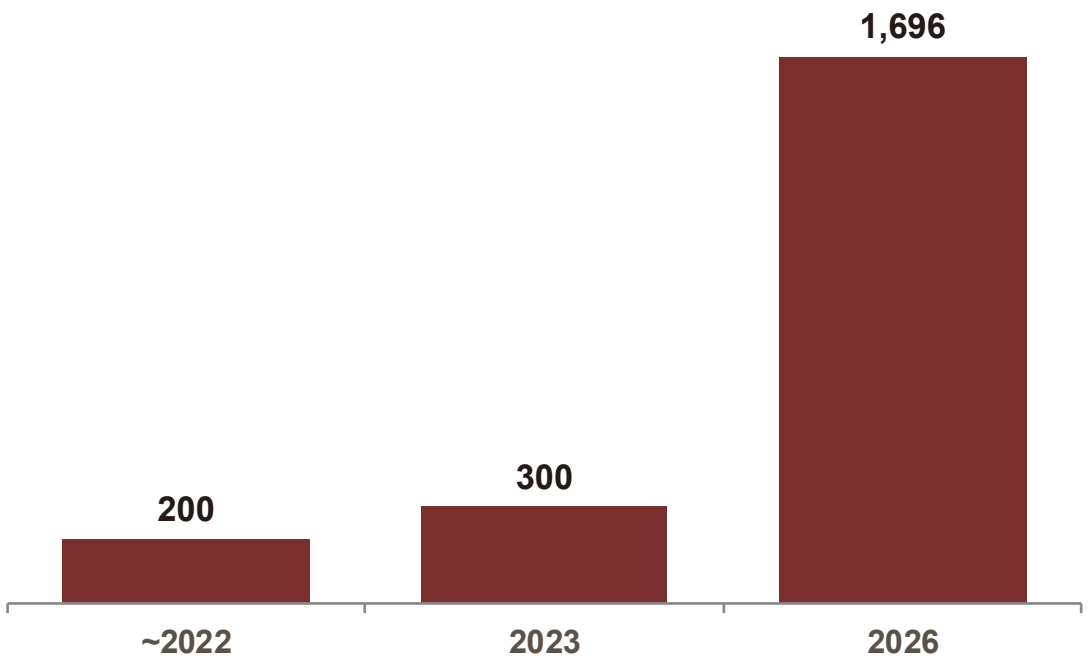
A planned 1,000+ km² Special Administration Region on the India border, designed from a blank slate with fibre/5G infrastructure, a smart grid, and 'green mobility' in the masterplan — a natural sandbox for AV-ready infrastructure before it's ever retrofitted.

BUILDING BLOCKS FOR AVS

Bhutan's EV Momentum Is the On-Ramp

Bhutan has spent a decade building the policy, fleet, and infrastructure experience that autonomous mobility will eventually need.

Registered Electric Vehicles



2035 EV Roadmap

Target: 70% of all vehicle sales — including government fleet, taxis and public transport — to be electric by 2035

Charging network scale-up

75 stations today; government plan for one charging station per 15 EVs by 2030, now run by Bhutan Power Corporation

Fiscal incentives & industry ties

EVs are exempt from import duty and VAT; Bhutan has worked with Nissan and local partner Thunder Motors since 2014 on EV assembly

Sources: UNDP Bhutan; BBS / National Assembly reporting, 2025-26

RELEVANCE

Why Autonomous Mobility Matters for Bhutan

Road safety on hazardous terrain

Steep gradients, hairpin bends and monsoon landslides make Bhutan's mountain highways demanding to drive — and a strong case for driver-assist and autonomous safety systems.

A thinning pool of professional drivers

Freight and passenger transport rely almost entirely on roads; remote, high-altitude routes are increasingly hard to staff.

A tourism model built on quality, not volume

Bhutan's high-value, low-impact tourism policy is a natural fit for quiet, zero-emission autonomous shuttles at flagship sites.

A once-in-a-generation greenfield city

Gelephu Mindfulness City is being planned now — a rare chance to design AV-ready roads and digital systems in rather than retrofitting them later.

OPPORTUNITIES

What Bhutan Sees as the Opportunity

A ready-made national testbed

Pilot low-speed autonomous shuttles inside Gelephu Mindfulness City as it is being built, integrated with its planned smart grid and digital backbone.

Genuinely zero-emission fleets

Pair AVs with Bhutan's hydropower-based grid for a mobility system that is autonomous and carbon-negative at the same time.

Fewer accidents on high-risk corridors

Advanced driver-assistance and, eventually, autonomy could reduce crashes on Bhutan's single-lane mountain highways.

A small, agile policy sandbox

A small vehicle fleet and centralized governance let Bhutan test regional AV standards and regulations quickly, feeding lessons back to larger neighbours.

CONCERNS & CHALLENGES

The Honest Constraints We Face

Terrain that outpaces current AV tech

Steep gradients, hairpin curves, narrow single-lane roads, and seasonal landslides are a hard test for today's sensors and mapping.

Connectivity & mapping gaps

Mobile coverage and high-definition road data thin out fast beyond Thimphu, Paro and the main highway corridor.

Small market, high unit cost

A population under a million means limited economies of scale to attract private AV investment on commercial terms.

No regulatory framework yet

Liability, insurance, safety certification and cross-border vehicle standards for AVs do not yet exist in Bhutanese law.

PRIORITIES

Bhutan's Priorities Going Forward

A deliberately staged path — build the foundation, pilot small, then scale.

1. **Keep building the EV & charging base**

   Treat the 2035 EV Roadmap as the foundation autonomy will sit on top of.

2. **Pilot low-speed shuttles in controlled settings**

   Start inside Gelephu Mindfulness City or on tourism/campus routes, not open highways.

3. **Draft an AV-ready regulatory framework**

   Address liability, insurance and safety certification before deployment, not after.

4. **Invest in mapping & connectivity**

   Prioritise HD road data and network coverage on priority corridors, tied to the Gelephu masterplan.

5. **Anchor every step in Gross National Happiness**

   Judge success by safety and wellbeing gained, not only by efficiency or novelty.

WHAT WOULD HELP

What Bhutan Is Seeking from This Conference

As a nascent, interested country, our need is less about vehicles and more about knowledge, standards and partnership.

South-South knowledge exchange

Learn directly from other small and mountainous economies at a similarly early stage of AV thinking.

Technical assistance on mapping & sensors

Support to adapt HD mapping and sensor calibration to extreme mountain road geometry.

Help drafting a legal & regulatory framework

Model liability, insurance and safety-certification frameworks Bhutan can adapt rather than build from zero.

Access to regional pilots & financing

Pathways to join or co-finance regional AV pilot programmes, including within the Gelephu Mindfulness City development.

Capacity building for engineers & regulators

Training for the technical and regulatory workforce Bhutan will need well before deployment.

A continuing regional dialogue

Forums like this one, sustained over time, so standards are shaped together rather than adopted after the fact.



Tashi Delek

Thank you

A small country, a clean grid, a city being built from scratch, and a philosophy that puts wellbeing first — Bhutan's distinctive on-ramp to autonomous mobility.

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