

عام - Public

وزارة النقل والخدمات اللوجستية
Ministry of Transport and Logistic Services



المواصفات السعودية
Saudi Standards



Autonomous Vehicles (AVs) Deployment Roadmap

Agenda

1. National Strategy and Directions Towards Autonomous Vehicles

2. The Autonomous Mobility Overview

3. Regulation, Scalability and Infrastructure Readiness

4. Key Progress To Date

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The AI Supreme Committee and the NTLS, aims to position KSA at the forefront of the AI revolution, with autonomous mobility as a key focus and a core pillar of the NTLS.

AI Supreme Committee — Strategic ambition

2030 Targets

Top 15

globally in AI adoption

>20,000

data and AI specialists in the workforce

Top 10

globally in the Open Data Index

>300

data and AI startups

Top 20

globally in peer-reviewed data and AI publications

~75 Billion SAR

in cumulative investments attracted into data and AI

Priority sectors

Mobility

Government

Education

Healthcare

Energy

National Transport & Logistics Strategy (NTLS)



Position KSA as a global logistics and mobility hub

1

Improve local, regional and international **connectivity of trade & transport networks**



Enhance financial and economic sustainability

2

Optimize transport assets' total cost of ownership to ensure fiscal sustainability



Enhance livability across the Kingdom

3

Minimize the rate of transportation accidents and fatalities

4

Improve **mobility and reduce travel time**

5

Minimize sector's negative environmental impact and reduce energy consumption

6

Capture new mobility modes and leverage new technologies relevant for T&L



Improve performance of public entities

MoTLS leads **autonomous mobility execution**, coordinating regulators, cities, and ecosystem partners to **accelerate national deployment**

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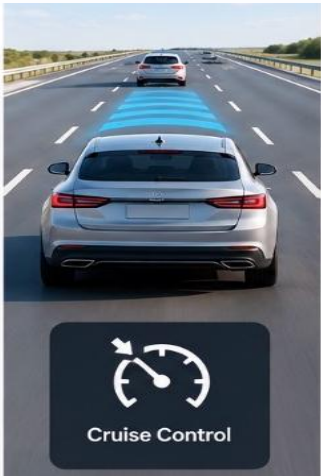
The industry is focused on bringing L4 to scaled commercialization, while L5 will bring universal autonomy in the future

1990s–2000s Early driver assistance	2010s Growing automation	2020s Conditional automation	Today Driverless in defined areas	Future Full autonomy
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L1

Driver Assistance

Partial assistance (Car assists with either steering or speed)



Driver in control

L2

Partial Automation

Steering + acceleration/braking



Driver remains responsible

L3

Conditional Automation

Vehicle drives under defined conditions



Self driven vehicle, but driver must react in 10 seconds if needed

L4

FULLY DRIVERLESS, limited to controlled zones

Driverless within defined ODD



Autonomous in specific areas/conditions, but not on all roads or situations (e.g., pick-up/drop-off in safety areas), only geofenced areas

L5

Full Automation

Autonomous driving in all conditions



No driver required

Deploying both technologies in parallel drives innovation and safety, while avoiding single operator dependency risk

Multi-sensor based



Uses **multiple sensors (LiDAR, radars)** and high definition (HD) maps to navigate

pony.ai WeRide WAYMO apollo

Vision based



Uses **cameras** and AI trained models (no sensor or HD map needed)

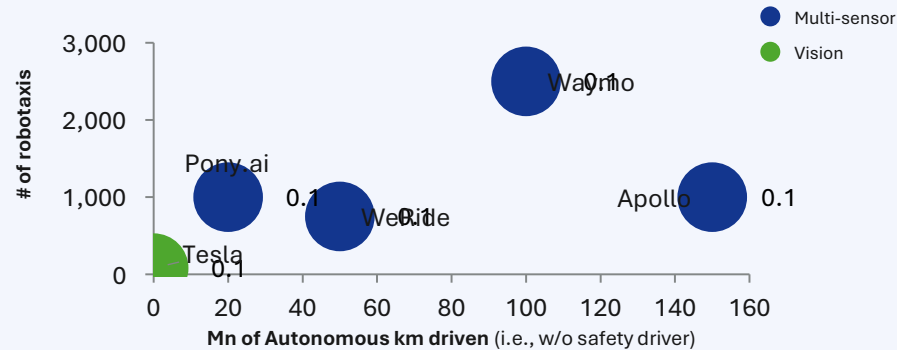
TESLA

Description

Infra. requirements

Common requirements (incl. 5G, charging infra., and depot with cleaning, maintenance areas, and the remote operations center)

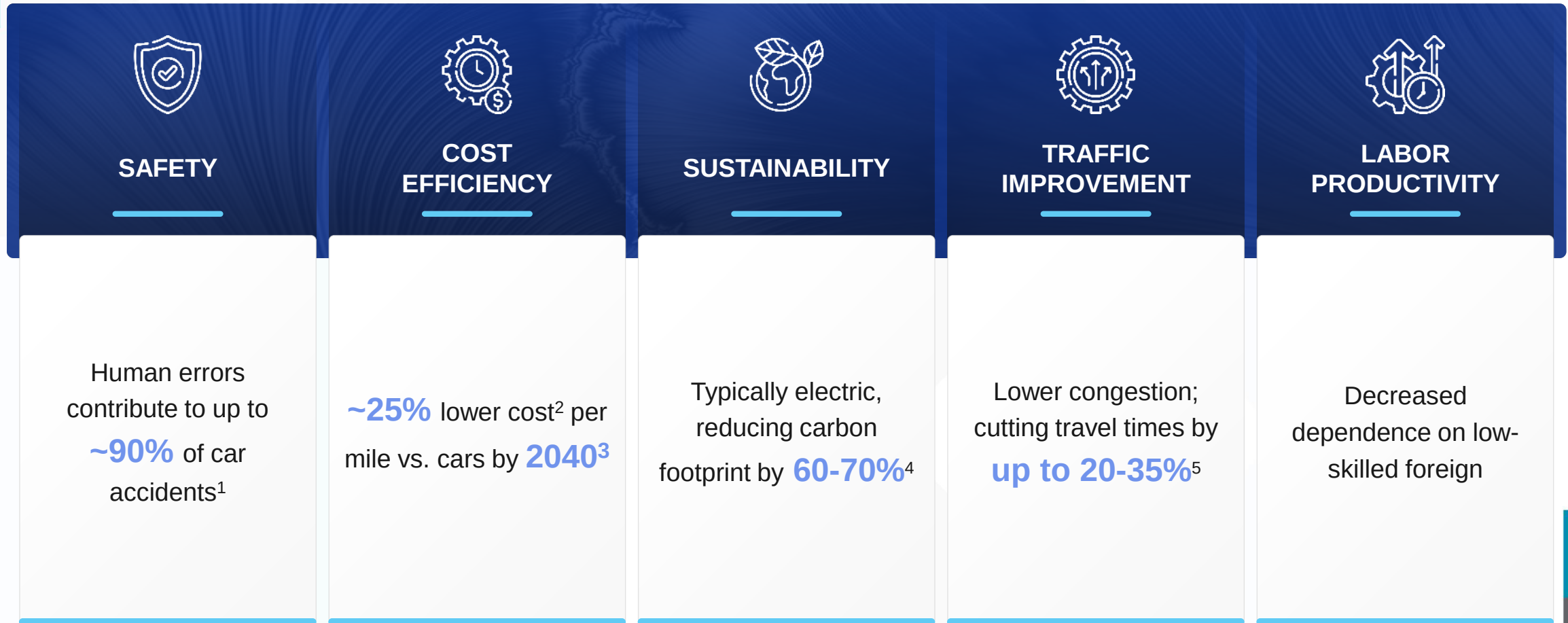
Technology maturity



Key takeaways

- With ~6,200 robotaxis globally, **no clear market leader** has emerged, making it **essential to keep tech and operator options open**
- Multi-operator model** is optimal to ensure **access to innovation** while enhancing **system resilience**
- City-level expansion could be considered case-by-case**, allowing operators to be switched over time under **common infrastructure standards**

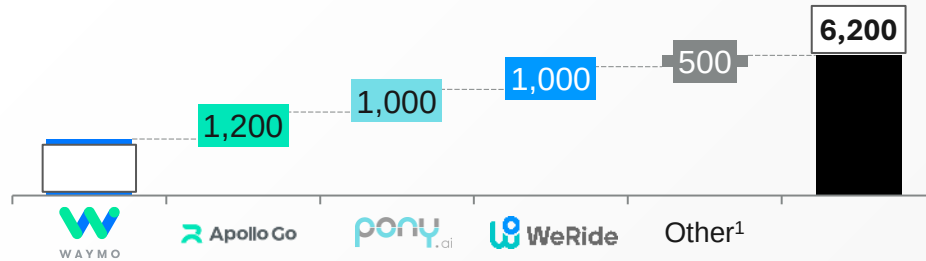
Autonomous vehicles are gaining traction globally due to several benefits



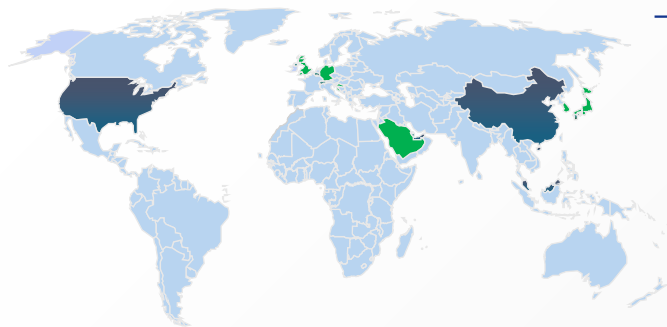
Robotaxi deployment is concentrated in the US and China, driven by the private sector, and focused on large, dense cities

Robotaxi deployment

DEPLOYMENT SCALE (# of robotaxis)



DEPLOYMENT FOOTPRINT



– Initial international deployments in Riyadh, Hamburg, Zurich, Zagreb, Dubai, Abu Dhabi, Doha, Singapore, Tokyo

- Commercial operations
- Operations testing

1. Incl. Tesla, MOIA, Zoox, Verne, AvRide, etc.
2. Source: Desktop research, operator engagement, expert interviews

KEY TAKEAWAYS



Deployments led by 4 major private-sector players, additional 10+ operators running early deployments



Operators are accelerating global expansion through cost optimization and the formation of strategic alliances (e.g., Uber x NVIDIA, Uber x Lucid x Nuro)

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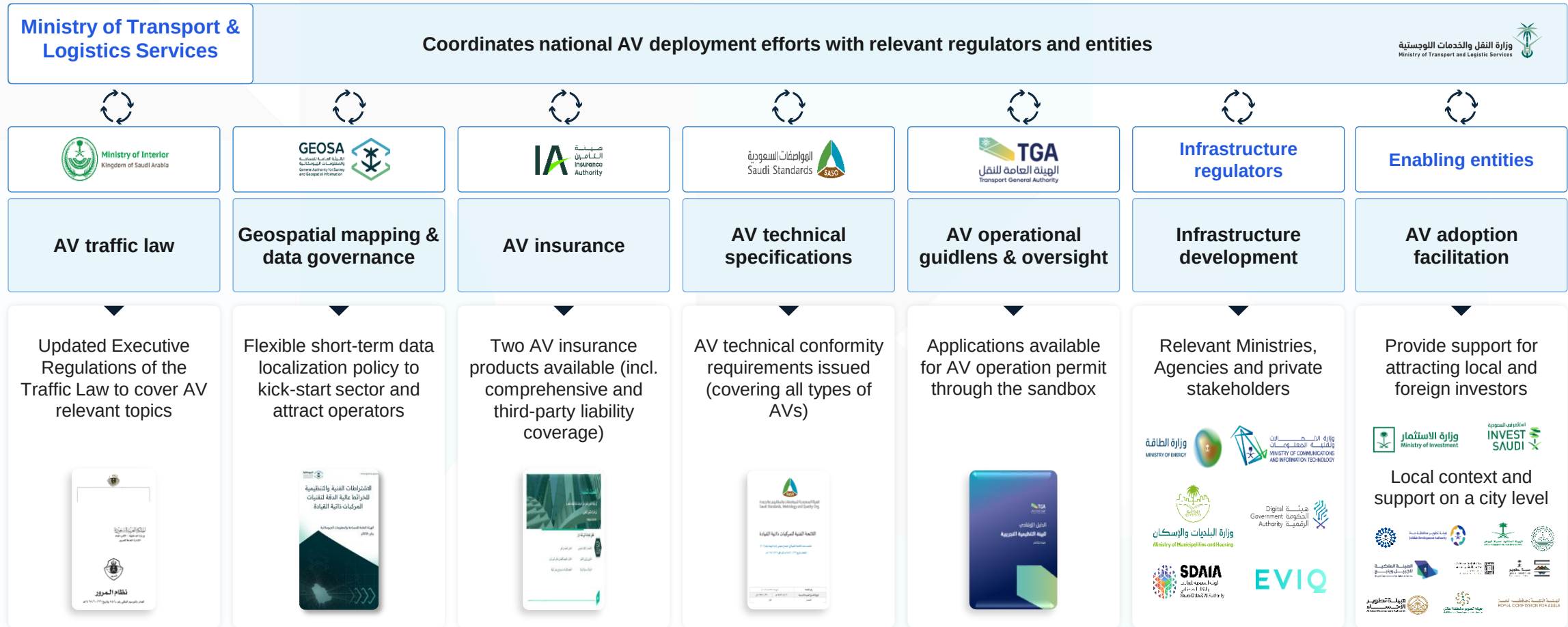
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KSA's AV regulatory framework and stakeholder ecosystem address end-to-end requirements to support early adoption

KSA's AV stakeholder ecosystem



Saudi Technical Regulation for Autonomous Vehicles



01

Autonomous Driving & Functional Safety

Safe performance of automated driving systems, including system failures and operational risks.

02

Cybersecurity

Protection of vehicles and systems against cyber threats, including cybersecurity management requirements.

03

Software & OTA Updates

Governance and secure management of vehicle software and over-the-air updates.

04

Connectivity & Communication

Connected vehicle technologies, communications, navigation and intelligent transport systems.

05

Vehicle Technical & Safety Requirements

Core safety systems including braking, steering, lighting, tires, warnings and other components.

Six areas every self-driving vehicle must prove

Each area rests on international standards adopted by SASO

Definitions & data

SAE J3016 Automation levels

ISO 19157 Map data quality

ISO/IEC/IEEE 15288 Life-cycle steps

Fails safely

ISO 26262 Car electronics fail safe

IEC 61508 General electronic safety

SAE J3187 Finds hazards in design

Drives safely

ISO 21448 Safe even without a fault

ISO 34502 Scenario-based testing

IEEE 2846 How other road users act

Cybersecurity

UN R155 Cyber management system

ISO/SAE 21434 Secure design and testing

UN R156 · ISO 24089 Safe remote updates

Approval & records

EU 2022/1426 Driverless system approval

UN R157 Automated lane keeping

UN R160 Black-box data recorder

Vehicle basics

UN R94 · R95 Crash protection

GSO ECE 13H Braking performance

ECE R100 Electric battery safety



Strong digital, energy, and transport foundations are available in KSA to support scalable mobility deployment

ACTIVATION ENABLERS

01



CONNECTIVITY 5G

#1 globally in digital & telecom readiness¹



>98% population coverage with 5G



02



DATA CENTERS

Major data center providers incl. Alibaba, Oracle, Huawei already live



Microsoft Azure and AWS expected to be live by end 2026



03



ROAD QUALITY

5.8 road quality score², putting KSA in top 15% countries and providing a strong base for safe autonomous and EV deployment

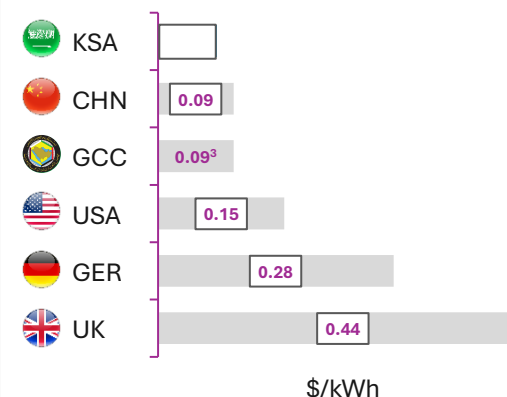


04



ELECTRICITY COST

Attractive industrial electricity rate supporting lower operating costs



1. ITU ICT development index 2025.; 2. Ranked from 1 (Very poor) to 7 (World-class), based on WEF 2023 report; 3. GCC average
Source: Desktop research

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Ministerial Engagement Is Translating Global Operator's Interest Into Tangible Deployment Opportunities In Saudi Arabia.

Excellencies Visited the USA and China



- H.E. Saleh Al-Jasser visited USA , meeting with mobility and technology companies in field on AV, including **Nuro, Aruora, Gatik and Tesla.**
- The engagements to **identify deployment challenges, operational constraints, and requirements for scaling up operations,**
- H.E. Ahmad Al-Suwaiyan visited China and met with **WeRide to scale autonomous mobility solutions to KSA** and assess deployment barriers, scalability requirements, and expansion considerations.



Key takeaways

- **Next-Generation Autonomy: Cybercab by tesla** represents a major shift toward purpose-built, fully driverless vehicles with no steering wheel creating significant future deployment potential.
- **Robotaxi Development:** Technologies remain at different maturity levels; **NURO with LUCID** is still emerging, with strong potential for a **scalable robotaxi platform.**
- **Mature Level 4 Deployment: Waymo demonstrates** that Level 4 robotaxi technology has reached **commercial maturity** and can scale across cities.
- **Autonomous Truck: Gatik (Middle-Mile)** demonstrates **strong readiness, Aurora** shows **growing technical maturity** for autonomous trucking across long-distance

Update On The Ongoing Engagement With Global AV (Robotaxi) Players To Fast-track Deployment (1/2)

		STATUS	KEY PROGRESS	CURRENT FOCUS
USA	LUCID nuro	Deployment planning	✓ HE level visited company in U.S., 2030 plans been shared	– Defining the detailed deployment plan , milestones to commence deployment activities.
	Tesla	Deployment planning	✓ HE level visited company in U.S, Data Exports exemption is under approval, agreed on Cybercab testing plan (Q3-2027)	– Commencing FSD²supervised activities in KSA
	ZOOX	Initial engagement	✓ Ongoing engagement and technical discussion to position KSA for Zoon.	– Complete their own assessment and share its deployment plan and targets.
	WAYMO	Initial engagement	✓ Multiple engagements conducted to explore KSA , (planning paused due to ME conflict)	– Company remains in market-scouting stage
EU	MOIA	Initial engagement	✓ Ongoing local partnership and customer negotiations	– Focus to set the local partnership and the deployment plan.
	verne TASARU [®] MOBILITY INVESTMENTS	Deployment planning	✓ Shared preliminary 2030 plans , ongoing discussion with SITE for data hosting in KSA.	– Defining the detailed deployment plan , milestones to commence deployment activities.
CHINA	WeRide	Ongoing operations	✓ Ongoing Riyadh operations, clarifying the requirement for vehicle importation to scaling deployment	– Expand operation by additional 10 Robotaxi
	pony.ai	Deployment planning	✓ Ongoing technical discussion , commencing operation ,	– Expand operation by additional 20 Robotaxi
	Apollo Go	Deployment planning	✓ Shared preliminary 2030 plans	– Defining the detailed deployment plan , milestones to commence deployment activities.

Status legend:

Explore and align potential deployment opportunities in KSA.

Confirmed intent (targets and timeline) and ongoing roll-out planning

Commence operations and expand service coverage

1. tesla not sharing their plan for the FSD Supervised as per their strategy, however, the Cybercab plans depending on the performance of the FSD Supervised

2. Source: MoTLS, Operators

Update On The Ongoing Engagement With Global AV (Freights) Players To Fast-track Deployment (2/2)

		STATUS	KEY PROGRESS	CURRENT FOCUS
KSA	HUMAIN	Deployment planning	✓ Fast-tracked planning with HUMAIN; Imported one semi-truck	– PoC commencement.
	Aurora	Initial engagement	✓ Shared initial 2035 deployment plan	– Partnership negotiations under discussion with HUMAIN and Aramex
USA	kodiak	Initial engagement	✓ Executive session conducted, expressing interest to expand into KSA	– Technical sessions to advance deployment and explore potential partnerships in KSA.
	Gatik	Initial engagement	✓ HE level visited company in U.S, to market and position KSA, ongoing negotiation to company entrance KSA	
EU	VOLVO	Initial engagement	✓ Executive session conducted, expressing interest to expand into KSA	
	einride	Initial engagement	✓ Executive session conducted, expressing interest to expand into KSA	
CHINA	INCEPTIO TECHNOLOGY	Initial engagement	✓ Technical session to express deployment interest	– Start testing and validation – Continuous technical sessions to support planning
	NEOLIX AI	Deployment planning	✓ Imported 5 Autonomous delivery trucks in KSA (3 iMile, 2 noon	
	Zelos	Deployment planning	✓ Official visit to KSA and MoU with Abdul Latif Jameel for PoC deployment	

Status legend: Explore and align potential deployment opportunities in KSA.

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Commence operations and expand service coverage

Ongoing AV deployments showcase ecosystem readiness and encourage global players to scale operations

Initial Riyadh and Madinah deployment is marketing AV sector potential to global operators through rapid scale-up of 6 initial routes with plans for 4 new zones and 2 additional routes



Initial deployments

5 routes in Riyadh¹



1 route in Madinah



Ecosystem

Tech.

Ops.

Platform

Key figures

5k+ passengers

42k+ km

2.5K+ trips

0 incidents

Satisfaction²

+80% very positive user experience

+85% increase in user trust in AVs



Expansion plan

4
New
zones

A

Diriyah¹

C

Al Olaya District

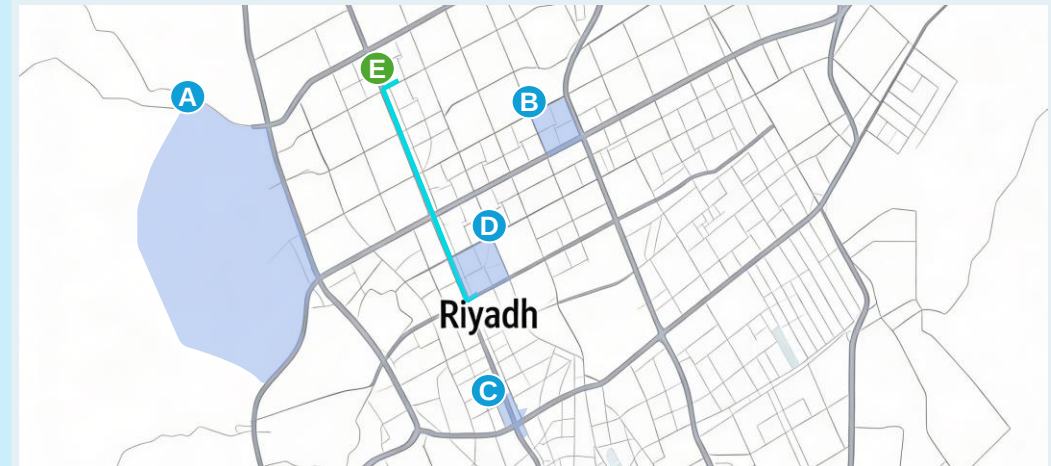
2
New
routes

E

Faisaliah Tower
Riyadh Gallery

A

Diriyah New
Internal Route





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Thank you!

