# Autonomous Vehicles (AV) for Road Transport

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Land Transport Authority

# Singapore


- **Small in Size** : 716.1 $KM^2$
- **Densely Populated** : 5.4 Million
- **Population Density** : 7,681 per sq KM
- **Vehicle Ownership** : 970,000
- **Land Used** : 12% on Roads

# Challenges

## Increasing Travel Demand

Comes from an increasing population, intensification of development and changing lifestyle.

## Shortage of Labour

Potential obstacle as we try to improve service delivery & cater for more on-demand PT services to meet changing travel patterns.

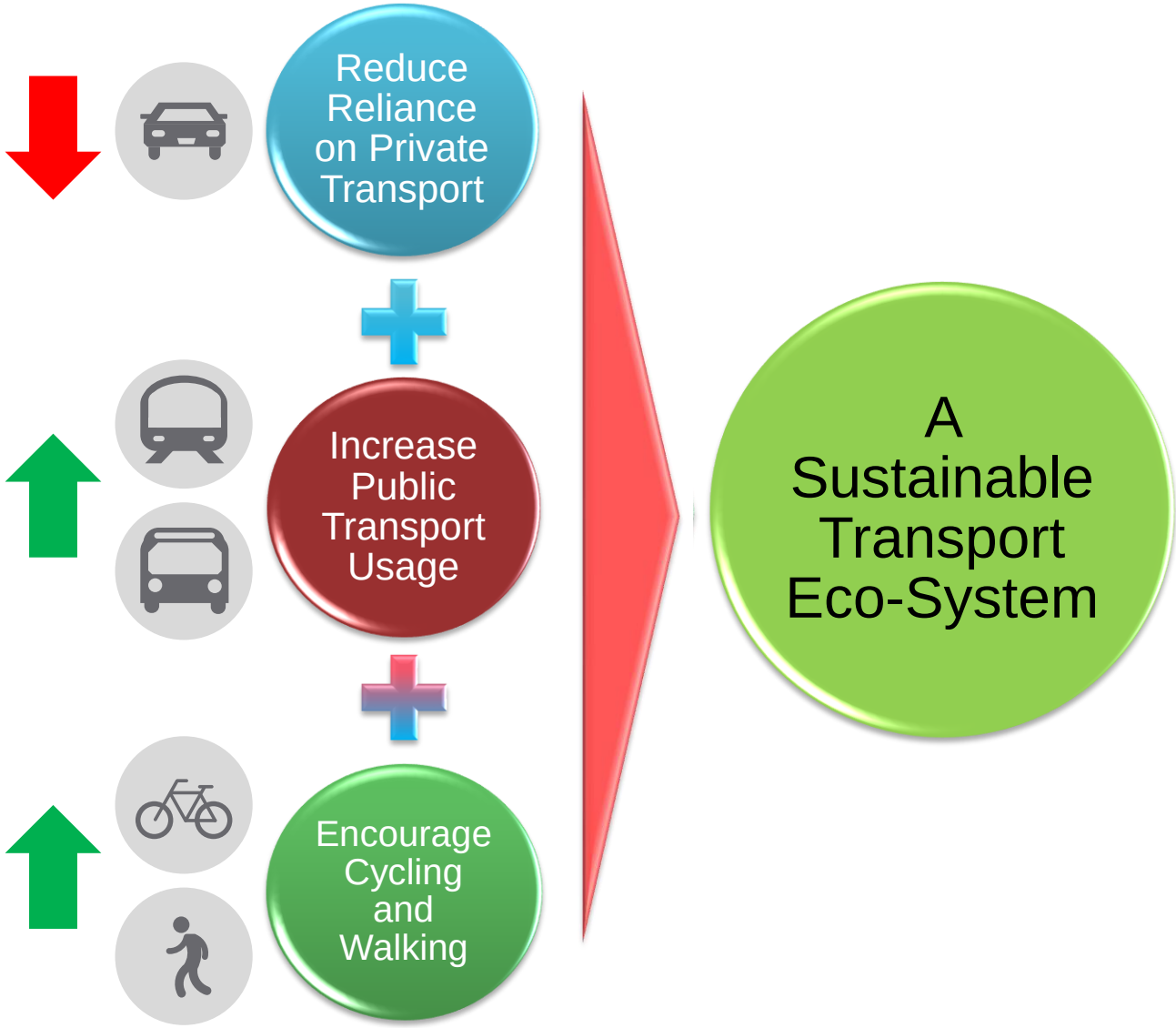
## Land Constraints

Roads and other land transport infrastructure takes up 12% of our total land area today (as compared to 14% which is devoted to housing), implying a clear need to optimize our road usage.

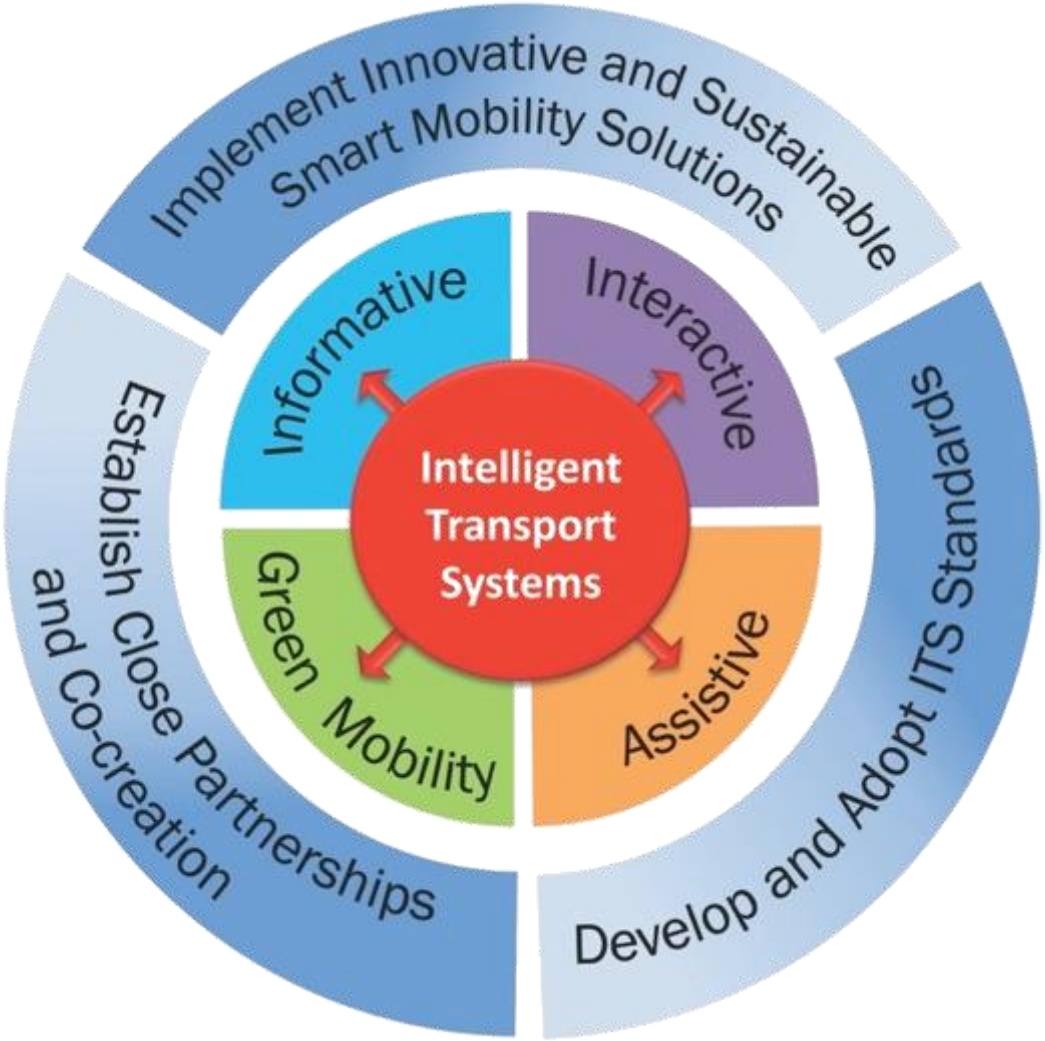
## Ageing Population

The need to tailor more personalized transport modes to suit ageing population's varying travel needs and road safety concerns for elderly drivers.

# Key to Sustainable Transport Eco-System



# Smart Mobility 2030 ITS Strategic Plan – AV Focus




**Assistive**

**Autonomous Vehicles**


Conduct R&D and trial on "live" roads

In-depth investigations on technology and human behaviour and implications to traffic operation, regulatory, legal, insurance

# Recent AV Trials in Singapore

1. **National University of Singapore – SMART – MIT**
2. **Nanyang Technological University**
3. **ST Kinetics Singapore**


# Value Propositions of AV Applications in Singapore

## Increase productivity

- Autonomous buses to tackle problem of labour shortage

## Increase road safety

- AVs enable ageing population to maintain freedom of mobility while ensuring safe driving

## Optimize road capacity

- Availability of autonomous lanes to facilitate shared vehicle scheme
- New freight movements and operations

## Enable new transport products & services in new towns

- Customized / on-demand PT services could be made available
- AV vehicle-sharing schemes to complement walking and cycling in new towns

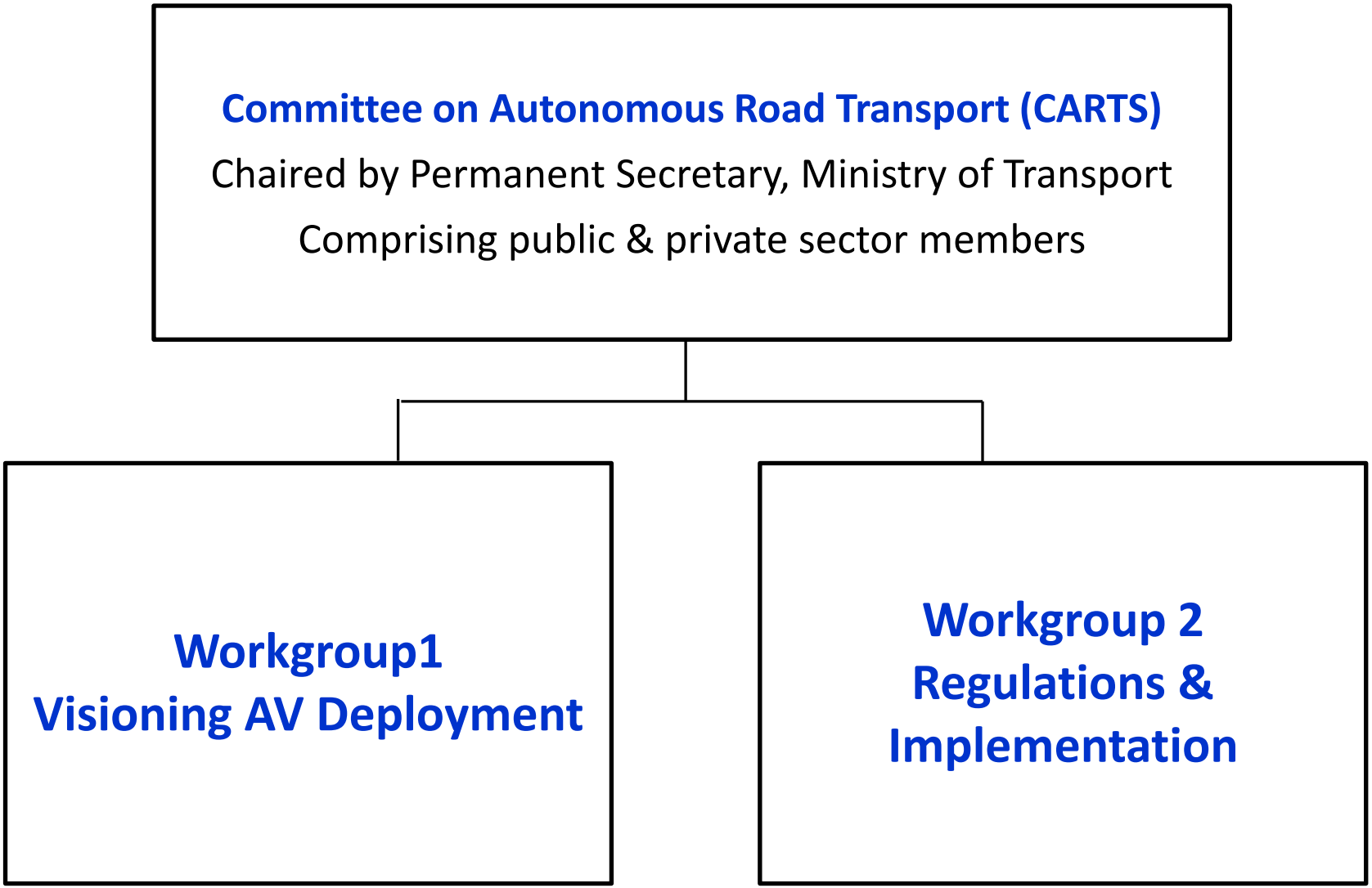
## Increase R&D Value-Add

- Singapore is a Living Laboratory and is ideal for conducting test-bed for AV development and deployment

Autonomous Vehicles for Road Transport

# COMMITTEE ON AUTONOMOUS ROAD TRANSPORT FOR SINGAPORE (CARTS)

# Structure


Committee on Autonomous Road Transport (CARTS)
Chaired by Permanent Secretary, Ministry of Transport
Comprising public & private sector members
Workgroup1
Visioning AV Deployment
Workgroup 2
Regulations &
Implementation

# Objective of CARTS

To take a holistic approach in charting the strategic direction of **AV-enabled land mobility concepts**, moving Singapore towards being a **sustainable and liveable city**

# AV Possibilities for Land Transport System

**Driverless bus** for a mass transport service that operates on fixed routes and scheduled timings. This can alleviate Singapore's heavy reliance on manpower.

Driverless bus

AV pods/car-sharing for "Car-lite" oriented town

**New mobility system** for intra-town travel in future residential developments using a network of customised and demand-responsive shared vehicles.

V2V/V2I communication

"Platooning" of AVs and autonomous freight

**Integration of AVs** to prepare regulation and infrastructure for the deployment of AVs and explore applications which can enhance traffic management

# Autonomous Vehicle Test-bed @ one-north

**one-north, a place where idea grows, is at the forefront of future mobility research and developent for Singapore**

**The tests at 'one-north' will help to facilitate the wider deployment of AVs on Singapore roads and the review of our traffic regulations to ensure safety and security.**

**Interested companies or parties can apply to try out their R&D works starting early2015.**

*Artist impression of one-north*

jtc
Breaking New Ground

Land Transport Authority
We Keep Your World Moving

# Thank You

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