

The Evolution of Singapore's Private Vehicle Policies

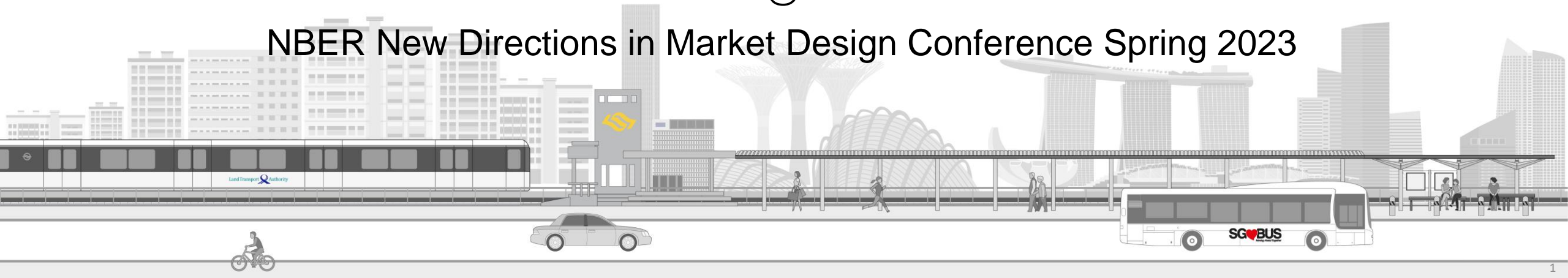
Presentation by Dr Waiyan LEONG

Chief Transport Economist

Land Transport Authority of Singapore

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NBER New Directions in Market Design Conference Spring 2023

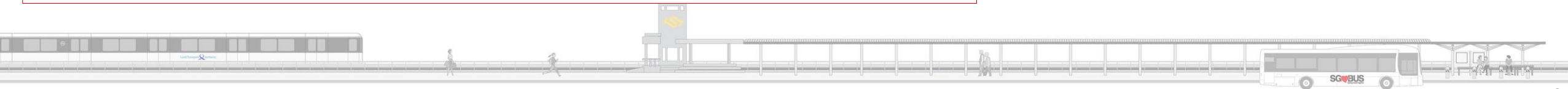
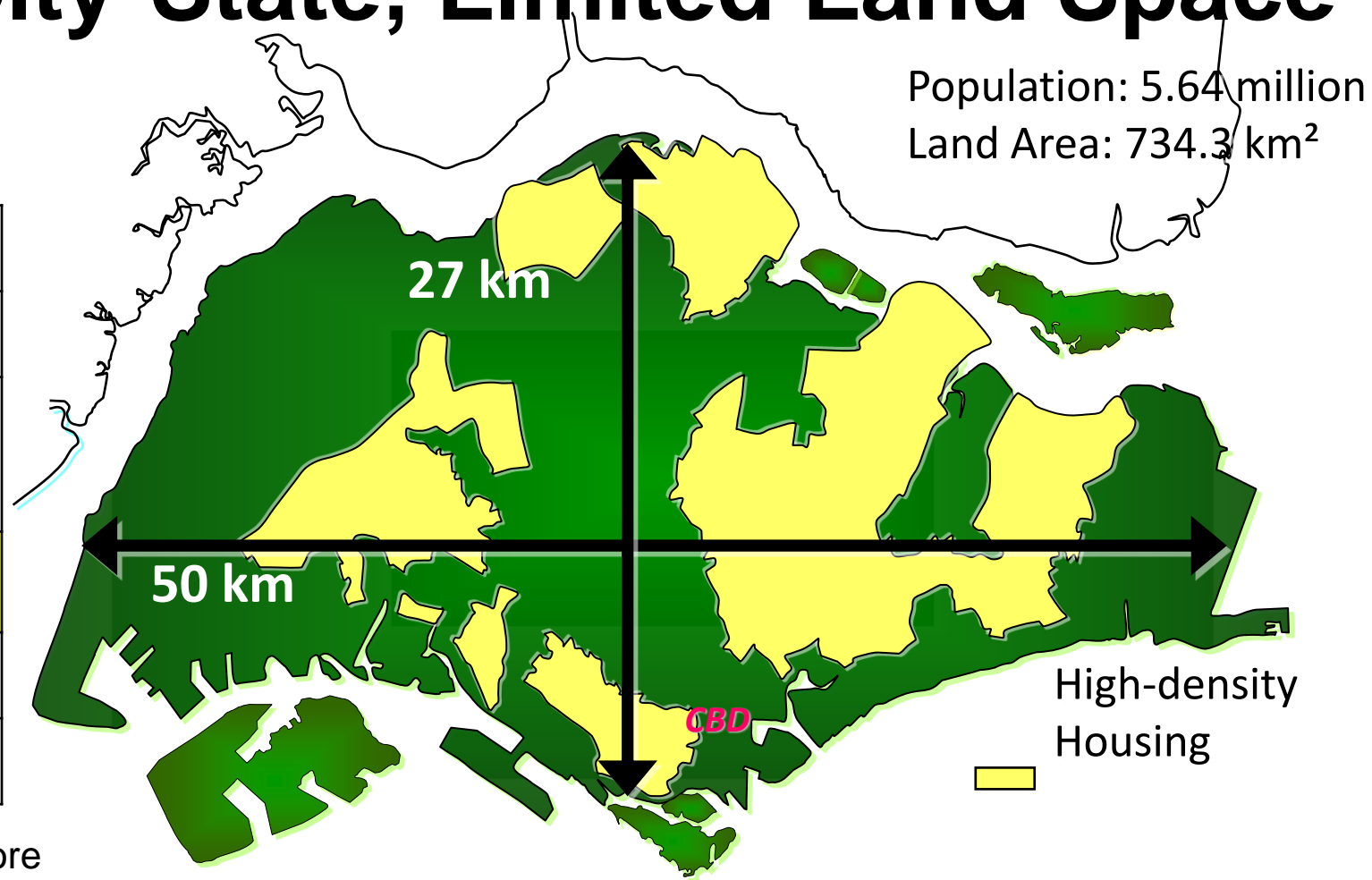


Singapore: Densely Populated, Highly Urbanized City-State, Limited Land Space

Land Use	Proportion (%)
Housing	15%
Industry & Commerce	13%
Roads	12%
Others	60%
Total	100%

Source: Ministry of National Development, Singapore

Disclaimer: These are my personal reflections, and do not necessarily reflect that of Singapore's Land Transport Authority



Challenge: Limited Scope to Increase Road Capacity Without Compromising Security, Liveability and Economic Development



Katy Freeway, US



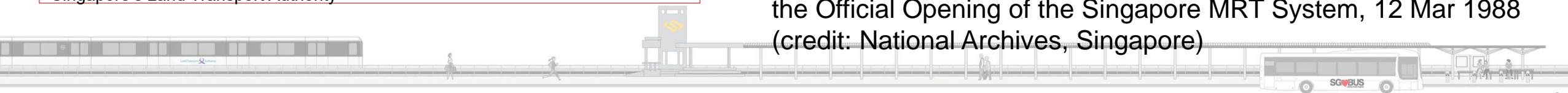
Comparison for carrying capacity of commuters between public transport, bikes and cars

We cannot expand our road network indefinitely given our land constraints.

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We also need to restrict access to and usage of private cars.

Excerpts from speech by Founding Prime Minister Lee Kuan Yew at the Official Opening of the Singapore MRT System, 12 Mar 1988 (credit: National Archives, Singapore)



Managing Private Transport Demand: Combination of Hard Ownership & Usage Measures

% of Car Owning Households
US vs. Singapore

US	Singapore
92%	35%

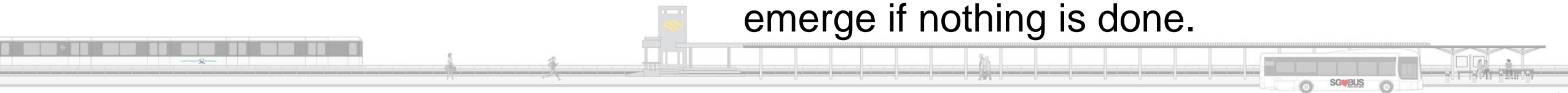
Source: Forbes, ChannelNewsAsia

Allowing more Singapore households to own a car is a luxury we can ill afford.

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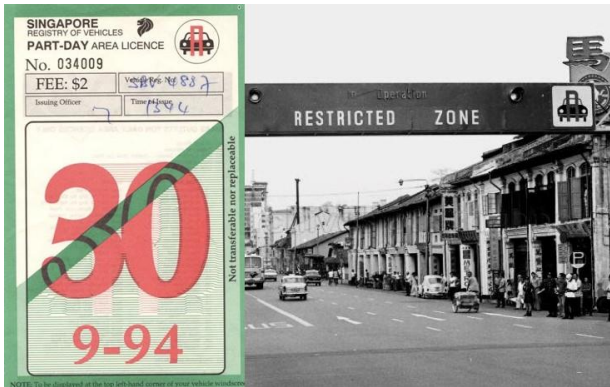
With radial land use patterns and tidal nature of traffic flows between the CBD and suburbs, congestion hotspots will emerge if nothing is done.



Vehicle Usage Measures – Congestion Pricing via Area Licensing Scheme (ALS)



Sale of paper license



ALS gantry where paper licenses were needed to enter “Restricted Zone”

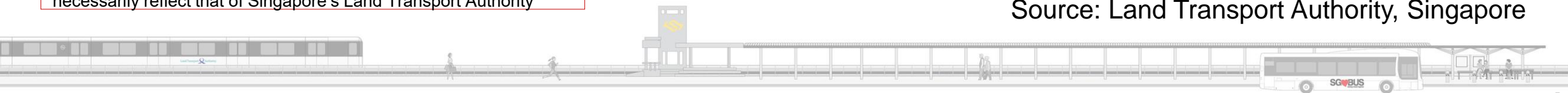


Manual enforcement

- ALS implemented in 1975 as price mechanism to discourage car usage into congested parts of CBD, designated as “Restricted Zone” (RZ).
- Immediate 44% decrease in no. of motor vehicles entering RZ during restricted hours.
- Shortcomings include inflexibility to respond to time-varying demand and labour-intensive enforcement.

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Source: Land Transport Authority, Singapore



Vehicle Usage Measures – Congestion Pricing via Electronic Road Pricing (ERP): Current & Future

Current ERP Gantry



Where?

Location Info

How Much?

Time Info

Tariff Table

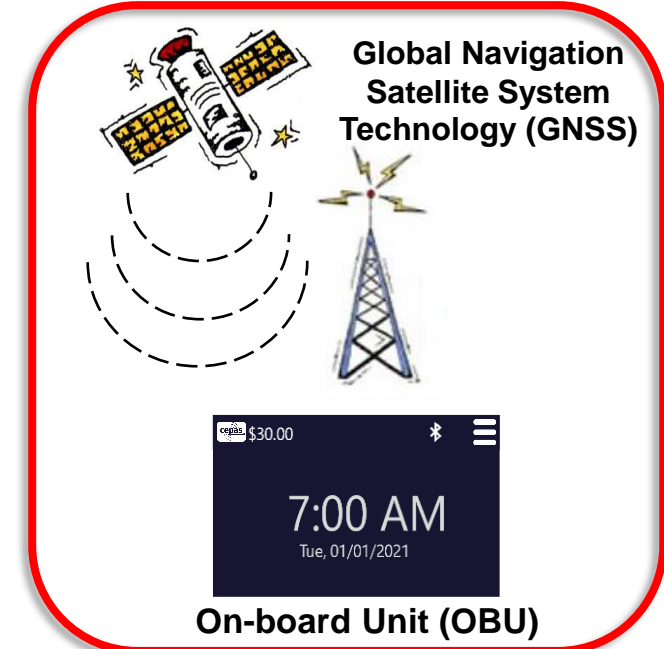
Enforcement

Make Payment

Identifier

Deduction

Next-Generation ERP System

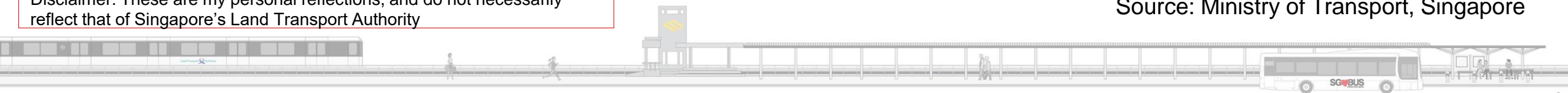


- Allow variable and per-entry charges to better reflect marginal external costs of each car trip, and encourage motorists to choose the most optimal time, route and transport mode for their journeys.
- ERP rates are reviewed quarterly and changes published ahead of implementation to allow motorists to make informed trip decisions.

- Transiting to “infrastructure-lite” Next Generation (nexgen) ERP system in future.
- Provides value-added services beyond congestion charging, such as real-time traffic information.

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Source: Ministry of Transport, Singapore



What Lies Ahead for Nexgen ERP to Support the Future Evolution of Road Pricing Policy?

Our congestion pricing framework is not likely to change in the near future...

Fewer than 1 in 4 ERP gantries in use today, even as rates at some locations go up



Lee Nian Tjoe
Senior Transport Correspondent
The Straits Times

UPDATED: Feb 13, 2023, 10:45am



Flexi-work becoming more common in S'pore despite shift to living with Covid-19



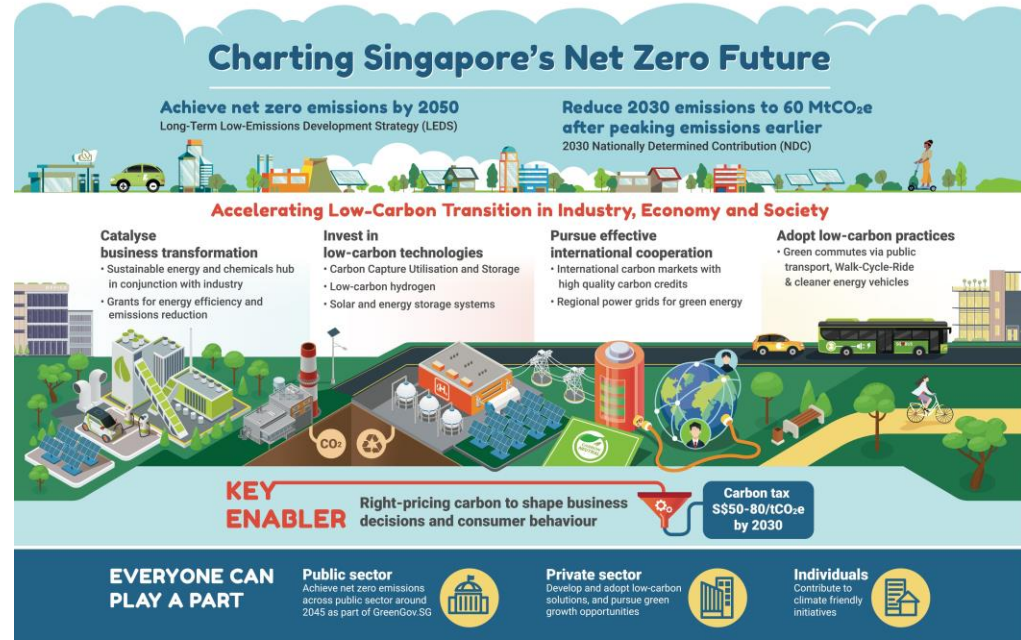
Choo Yun Ting
Business Correspondent
The Straits Times

PUBLISHED: Aug 1, 2022, 10:42am



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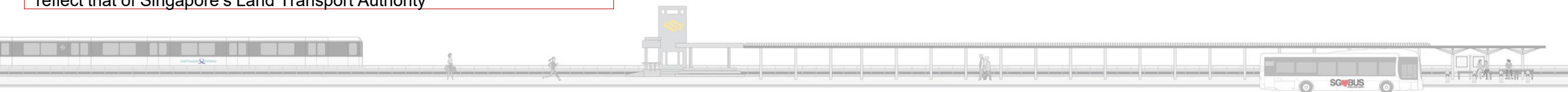
... but there are structural shifts beyond congestion pricing



NCCS
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SG GREEN PLAN

80% reduction in peak land transport carbon emissions by or around 2050

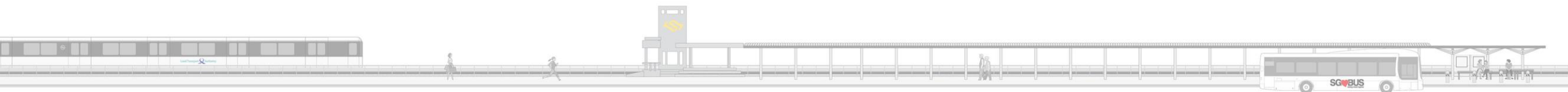


Personal Reflections on Possible Pricing Policy Frameworks in Future



- Distance-based charging not just for congestion management, but also to help meet climate targets?
- Differentially charging vehicles according to their emissions intensity?
- As a form of “shoulder pricing” in anticipation of road reclamation?
- Tradeable driving credits?

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Vehicle Ownership Measures

They complement vehicle usage measures in controlling vehicle population in Singapore.

Taxes and Import Duties

- Introduced in 1950s as an ad valorem duty on vehicle's open market value.
- Import duties on cars and stiff road taxes were also introduced.

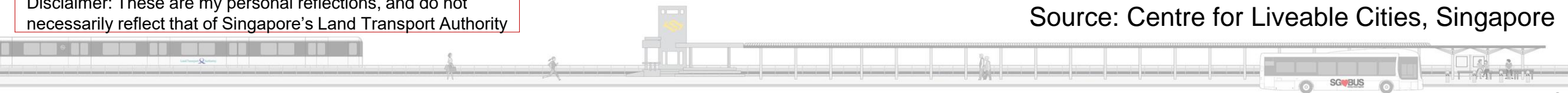
But car population continued to rise!
Hence, introduced:

Vehicle Quota System: Certificate of Entitlement (COE)

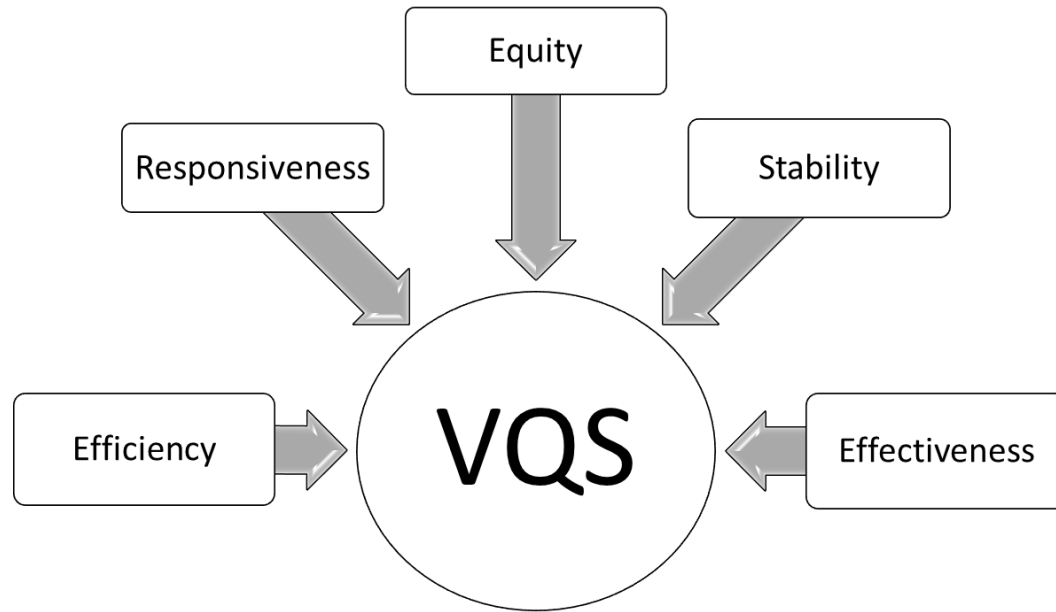
- Introduced in 1990 to limit number of vehicles at a level "below that a free market in vehicles would create". (Excerpts from Singapore Centre for Liveable Cities publication – Transport: Overcoming Constraints, Sustaining Mobility, 2021)
- Control vehicle growth rate that could be sustained by our road network. Annual growth rate for cars and motorcycles has been 0% since 2018.
- COEs are allocated through an auction mechanism.

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Source: Centre for Liveable Cities, Singapore



Principles of the Vehicle Quota System (VQS)



Five Principles of VQS

Different Categories of VQS

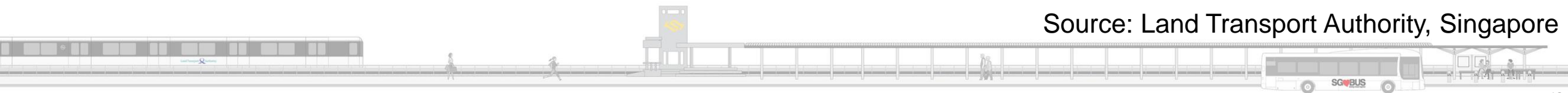
Category A	Mass-Market Cars ¹
Category B	Luxury Cars ²
Category C	Buses and Goods Vehicles
Category D	Motorcycles
Category E	Any type of vehicle except motorcycles

¹ "Non-fully electric cars with engines up to 1,600 cc and Maximum Power Output up to 97 kW (130 bhp); and fully electric cars with Maximum Power Output up to 110kW (147 bhp)"

² Cars with engine capacity above 1,600cc or maximum power output above 97kW

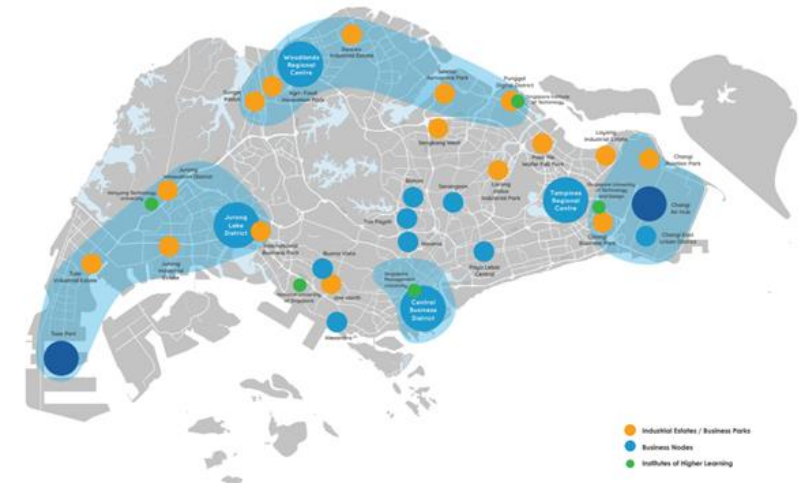
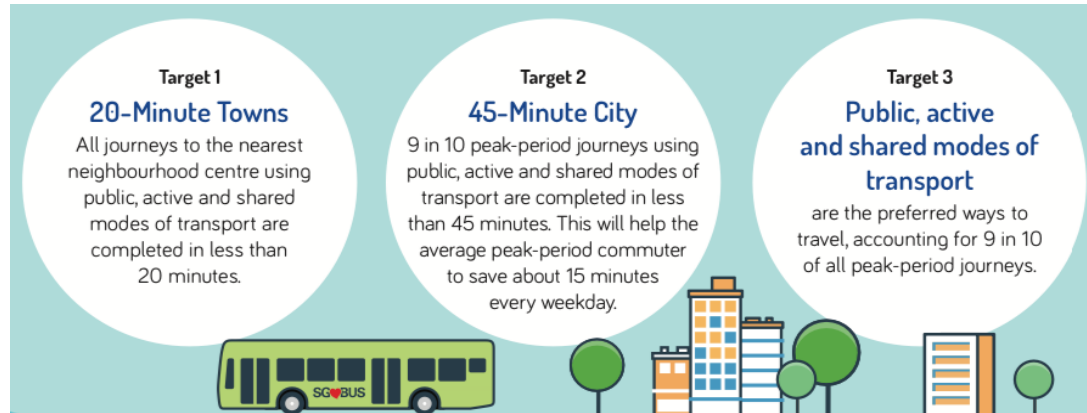
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Source: Land Transport Authority, Singapore



Multi-Pronged Approach for a Resilient and Sustainable Land Transport System

1. Transform Singapore into a car lite society
2. Polycentricity to bring jobs closer to homes

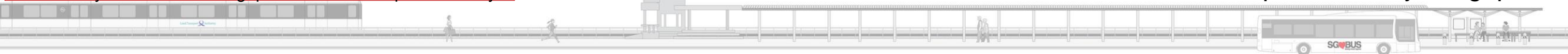


3. Facilitate sustainable transport and green commutes



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Source: Land Transport Authority, Singapore



Thank You!

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Reference materials are available on request

