

# Sustainable Transport System - Singapore's Experience

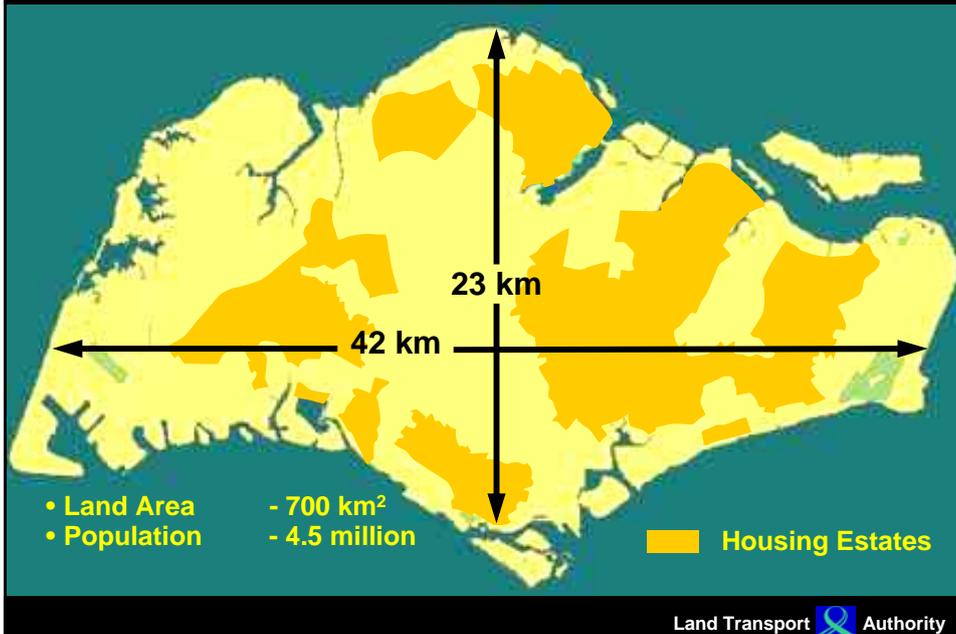
George Sun  
Deputy Director (Research & Statistics)  
Land Transport Authority, Singapore

*Asian Mayors' Policy Dialogue for  
the Promotion of Environmentally  
Sustainable Transport in Cities  
23 – 24 April 2007  
Singapore Expo*



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## SINGAPORE



## Road Transport

Road Network - 3,200 km

Expressway Network - 150 km

Vehicle Population - 800,000

Car Population - 470,000



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## Public Transport

MRT : 109 km, 67 stations



Buses : 300 routes, 3,200 buses



Taxis : 23,000



LRT : 29 km, 43 stations



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## Outline of Presentation

- Background
- Integrated Planning
- Transport Demand Management
- Public Transport
- Meeting Diverse Needs
- Protect the Environment
- Future Directions

## Early Singapore

- Severe Traffic Congestion
- Rising travel demand
- Unreliable bus services



## Integrated Planning - State & City Plan (SCP)



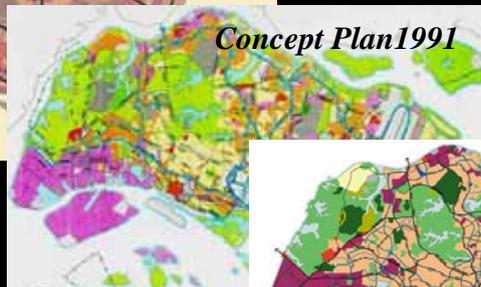
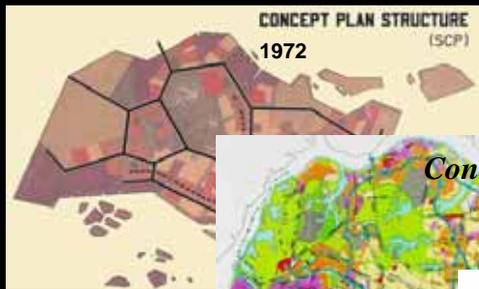
- SCP Concept Plan 1972
- Blueprint to guide physical development

- Developments in ring pattern around Central Catchment
- Road and rail network connect developments around the island



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## Integrated Planning



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## Integrated Planning - Sustainable Transport

- LTA signed UITP (*Union Internationale de Transport Public*) full charter on sustainable development in 2005
- 3 broad sustainability pillars
  - social
  - economic
  - environmental

### LTA to sign charter on public transport

It seeks to build a sustainable land transport system that meets present needs

By SAMUEL LEE

THE Land Transport Authority (LTA) will sign the International Association of Public Transport (UITP) Full Charter on Sustainable Development today at the UITP's 56th World Congress in Rome.

The Singapore statutory board said sustainable transportation is an aspect of global sustainability which involves meeting present needs without reducing the ability of future generations to meet theirs.

It said it recognises the social, environmental and economic principles of sus-

tainable development as a strategic objective. "We are committed to our two key thrusts — to improve the public transport system and optimise the road network," said LTA chief executive Yam Ah Mea.

"We will continue to implement policies and projects that help us to provide a land transport system that meets the needs and demands of a dynamic and growing city with a population that will increasingly expect higher standards in service and infrastructure," Mr Yam said.

LTA said the cornerstone of its land transport strategy is providing an attractive public transport system. To ensure sustainable mobility into the long term, it will also manage demand for private transport through ownership and usage restraint.

As transport planning should be inte-

grated with land use planning for a sustainable outcome, LTA added that it works with planning agencies to develop integrated land use and transport plans.

The UITP Charter on Sustainable Development was launched in Madrid in 2003. It sets out the commitment by the UITP and its members to ensure that the three principles of sustainable development — social, economic and environmental — are embedded into their activities, and that the development of the public transport sector remains sustainable in terms of its social, economic and environmental impact.

Currently, there are 33 signatories to the Full Charter. Beside LTA, other signatories include transport bodies from London, New York and Hong Kong.

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## Managing Private Transport Demand

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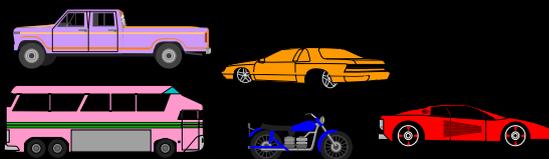
## Initial Demand Management Measures



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## Vehicle Quota System (VQS)

- Introduced in 1990
- Mechanism to control vehicle growth
- Certificate of Entitlement (COE)
  - valid for 10 years



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## Vehicle Quota System (VQS)

- Open bidding exercise on the Internet
- Twice a month

COE Open Bidding

[Refresh]

OCTOBER 2004 1st Open Bidding Exercise has ended on 06/10/2004 16:00 hrs

Results for OCTOBER 2004 1st Open Bidding Exercise

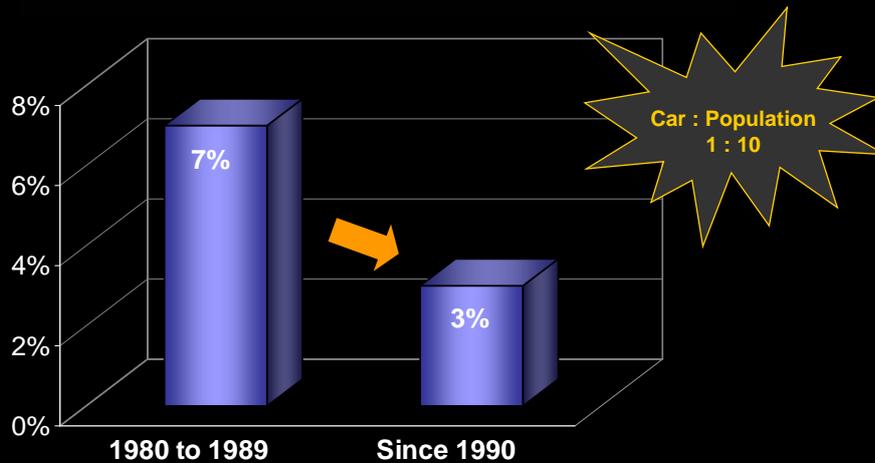
Category	Quota	QP(%)	POP(%)
A Car (1600cc & below) & Taxi	2,523	23,001	
B Car (Above 1600 cc)	1,145	23,001	
C Goods Vehicle & Bus	878	8,300	
D Motorcycle	507	652	
E Open	1,340	22,000	

QP - Quota Premium  
POP - Pressing Quota Premium

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## Vehicle Quota System (VQS)

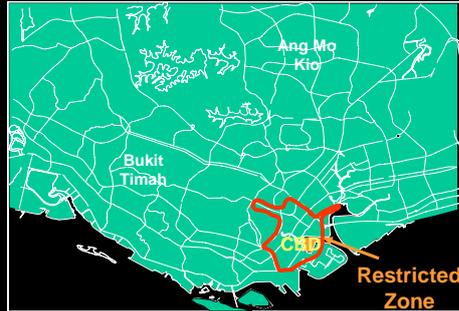
Average Growth in Private Car Population (p.a.)



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## Area Licensing Scheme (ALS)

- Implemented in 1975
- Reduced traffic entering the Restricted Zone (RZ)



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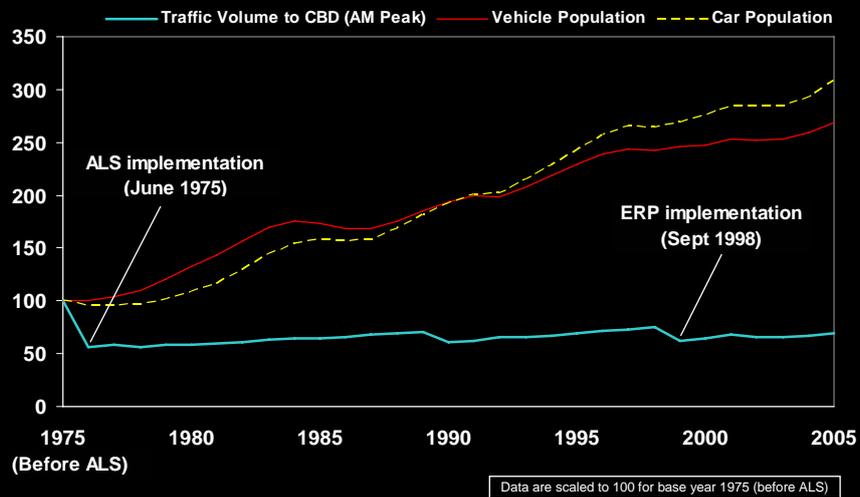
## Electronic Road Pricing (ERP)

- Implemented in 1998
- Replaced manual ALS



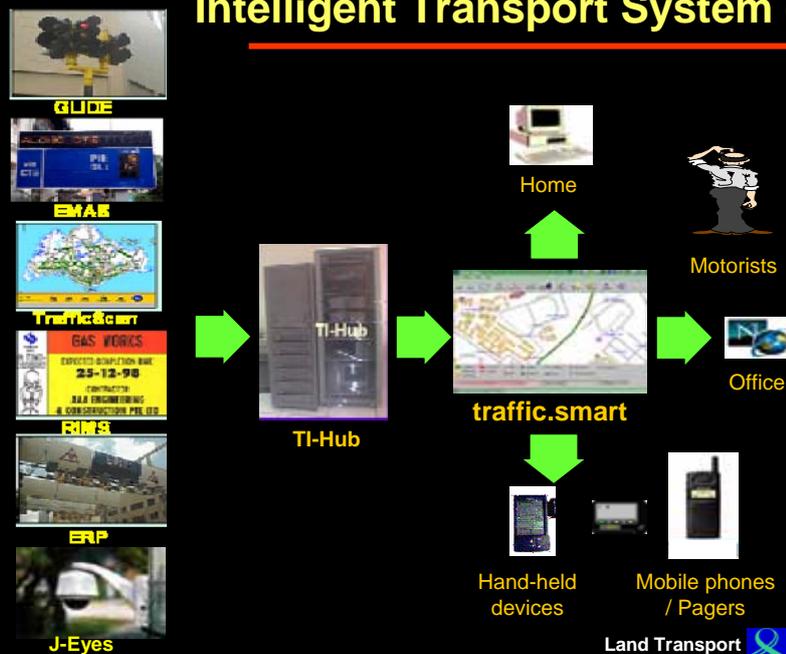
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## Effect of ALS / ERP



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## Intelligent Transport System (ITS)



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# Public Transport

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## Travel Statistics

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**Daily MRT/LRT trips : 1.5 million**



**Daily Bus trips : 2.8 million**



**Daily Taxi trips : 1.0 million**



**Total PT Trips : 5.3 million (58%)**

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# Mass Rapid Transit (MRT)

- Maintaining a long-term view
- Costly Infrastructure
- MRT vs All-bus system
- First phase (67 km, 43 stations) completed by 1990



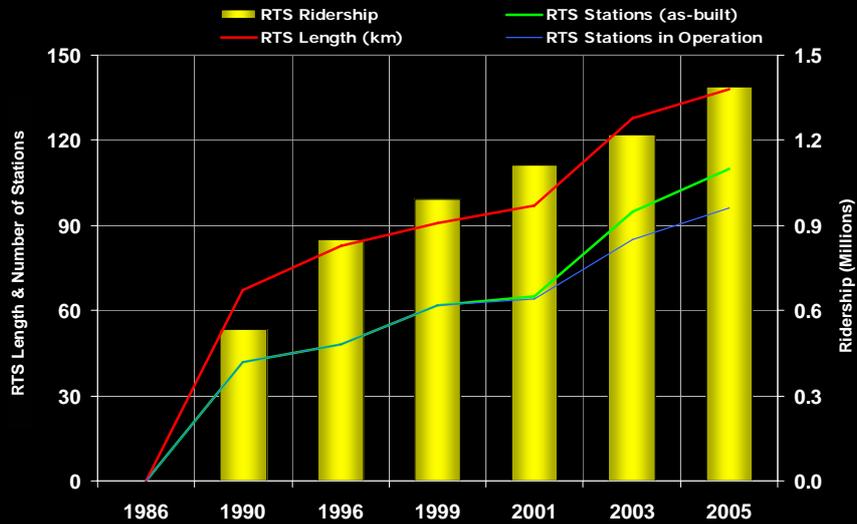
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# RTS Network Today



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## RTS Network & Ridership



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## RTS Under Construction

- Circle Line**
- 33 km
  - 29 stations with 6 interchanges

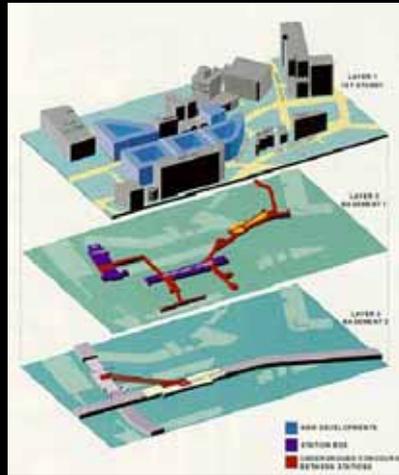


### Extension of E-W Line

- About 4 km
- Serves Jurong region

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## Integration with Developments



### Dhoby Ghaut Station

- Basement 3 : North-South Line
- Basement 4 : Circle Line
- Basement 5 : North-East Line



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## Evolution of Bus Services



Pre-1960s

1960s

1970s



1980s

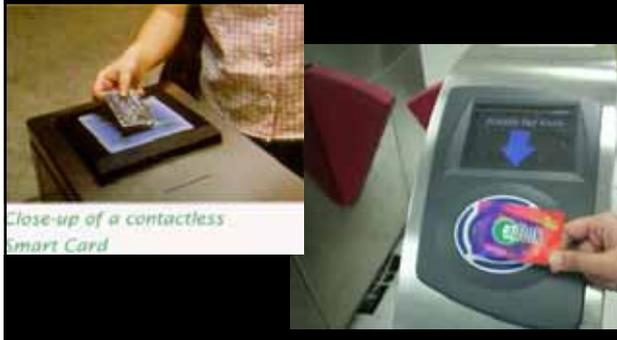
1990s onwards

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## Enhanced Integrated Fare System (EIFS)

- Implemented in 2002
- Contactless smart cards for RTS and public bus fares
- Non-transit applications. E.g. retail purchases

Entry and exit at rail stations



Bus boarding & alighting



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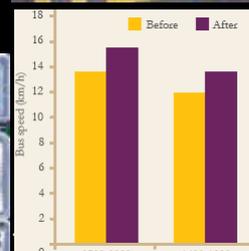
## Promotion of Public Transport

- Improve public transport
  - Full-day bus lanes
  - Bus priority signals
  - Premium bus services
- Education
  - Green Transport Week
  - e-Game & Youth outreach



Want to do your part for the environment?  
Take public transport

GREEN TRANSPORT CASUAL



# Planning of New Downtown



## Meeting Diverse Needs

## Diverse Needs

	去年	今年
票证卡收费系统	6.7 (72%)	7.4 (82%)
安全和保安	6.7 (72%)	7.1 (77%)
步行到车站所需时间	6.2 (65%)	6.7 (72%)
能否直达目的地或转乘	6.1 (64%)	6.6 (71%)
巴士状况和舒适度	6.5 (70%)	6.6 (72%)
服务资讯	6.6 (70%)	6.6 (70%)
司机服务态度	6.3 (68%)	6.5 (70%)
车程时间	6.0 (63%)	6.4 (69%)
巴士班次	6.1 (64%)	6.4 (69%)
班次或拥挤情况	5.7 (59%)	6.0 (65%)
等候巴士时间	5.4 (57%)	5.7 (61%)
整体满意度	6.4 (70%)	6.8 (75%)

- Consultation and surveys to understand changing needs
- Land Transport Review
  - Focus Group discussions
  - Portal [www.talk2lta.gov.sg](http://www.talk2lta.gov.sg)
  - email [land\\_transport\\_review@lta.gov.sg](mailto:land_transport_review@lta.gov.sg)
- Regular customer satisfaction surveys

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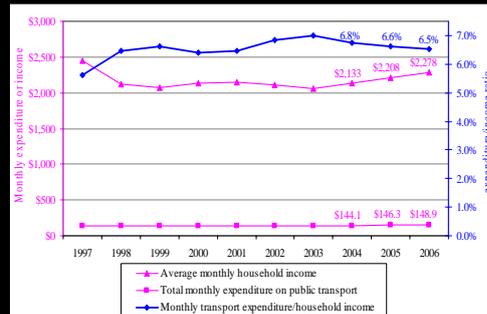
## Diverse Needs

- Pedestrian facilities
  - Sheltered walkways
  - Covers over pedestrian overhead bridges
- Cyclist facilities
  - Park connector (cycling tracks)
  - Bicycle parking at MRT stations



## Diverse Needs

- Public Transport Council regulates fares
- Affordability indicator
  - Public transport expenditure as % of household income of a typical family



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## Mobility-Challenged and Elderly

- RTS station upgrade
  - Government investment: S\$80 million
  - Fitting ramps, elevators, handicap toilets
  - All stations are barrier free now



Elevators



Tactile guides



## Mobility-Challenged and Elderly

- **Barrier Free Access**

- 40% buses will be wheelchair-accessible by 2010
- Barrier free access to all road and commuter facilities in 5 years



## Transport Safety & Security

- **Safety Plan and Initiatives**

- 5-year Road Safety Action Plan since 2003
- e.g. enhanced school zone, safety bollards

- **Public Transport Security**

- CCTV and alert systems
- Terror attack response drill



# Protect the Environment

## Protect the Environment

- Adopt policy, goals and programmes



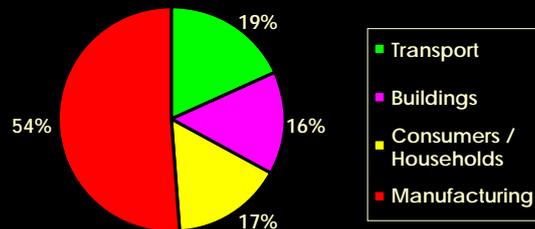
Environmental Impact Study Committee

Noise and Vibration Committee

# Emissions from Transport

- **Environmental concerns**
  - Air pollutants CO well within USEPA standards
  - Greenhouse gases such as CO<sub>2</sub> contribute to global warming

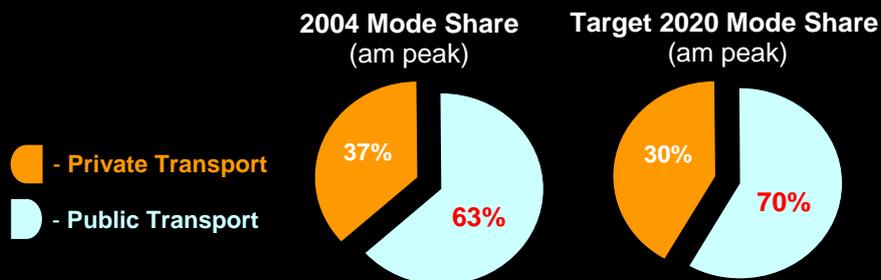
CO<sub>2</sub> Contribution by Sector (2004)



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# CO<sub>2</sub> Emission

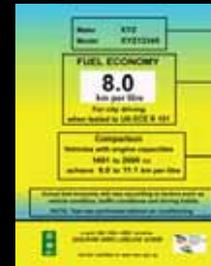
1. **Promote mass and non-motorised transport**
  - Increase Public Transport modal share
2. **Manage vehicle growth rate and congestion**
3. **Encourage green vehicles and alternative fuels**



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## CO<sub>2</sub> Emission

- Encourage green vehicles and alternative fuels
  - Green vehicle rebates increased from 20% to 40% of OMV (*open market value*)
  - New diesel vehicles must comply with Euro IV standards
  - Voluntary Fuel Economy Labeling Scheme
- Regulation and enforcement on emission and noise level from vehicles

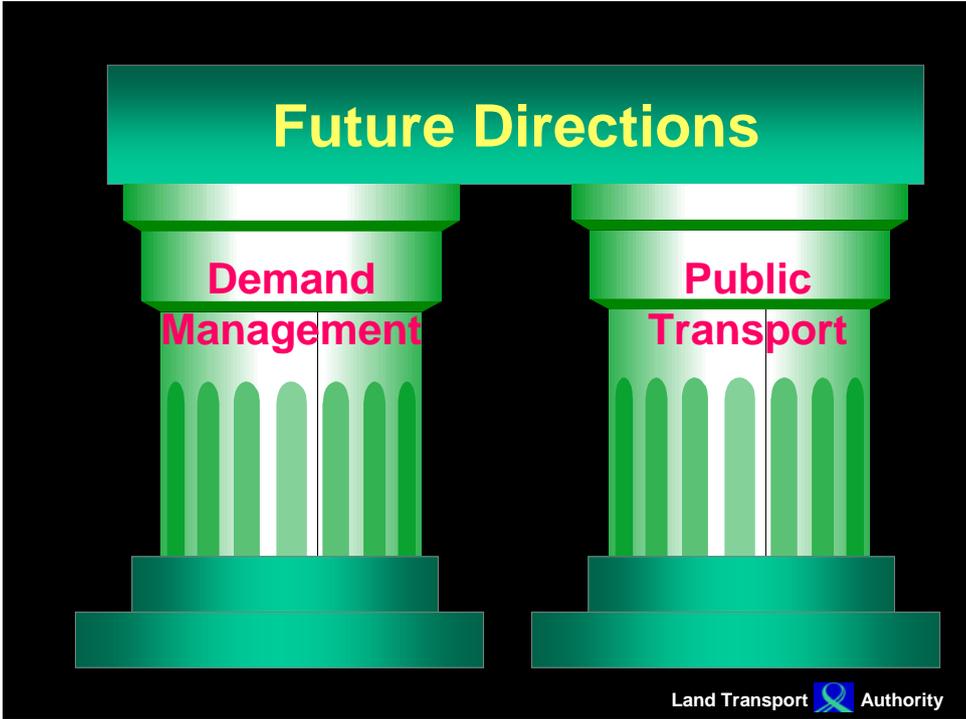


## Noise Reduction

Block screening with non-sensitive developments



Shielding with earth mound, dense tree planting



# Conclusion

*Long term integrated planning*

*Improve public transport*

*Integrated development*

*Regulate vehicle growth*

*Meet diverse needs*

*Protect environment*

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**Thank You**

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