

Singapore: a case study

Professor Tony May
Institute for Transport Studies
University of Leeds

Singapore: a case study

- The development of a “world class transport system”
- Based on an international audit conducted for the Land Transport Authority in 1997
- And updates to 2003
 - See *Transport Reviews 24(1) 2004I*
- But note that developments since then may not have been fully reflected

The Land Transport Authority

- Formed in 1995
- Responsible for
 - Policy
 - Planning and transportation
 - Vehicle and transit licensing
 - Projects and engineering
 - Contracts and process
 - Corporate services

Other Agencies

- Two private PT companies
- Public Transport Council (fares, services)
- Traffic Police (enforcement, safety)
- Urban Redevelopment Agency (land use)
- Ministry of Environment (pollution)
- But a city state with only one tier of government responsible for transport

Singapore's Land Transport Policy

- Pre 1972
 - Unreliable bus services
 - Pirate taxis
 - Poor traffic management
- 1972 Strategy based on a UNDP study
 - network of expressways
 - comprehensive traffic management
 - restraint of car use in Central Area
 - restructuring of bus services
 - investigation of Mass Rapid Transit

Trends in transport demand

Year	1970	1980	1990	1995
Population (millions)	2.01	2.28	2.71	2.99
No. of cars	142600	153300	272500	345400
Cars/person	0.07	0.07	0.10	0.12
Motorised trips/per person/per day	n.a.	1.19	1.37	1.67
Percentage by car	n.a.	13.6	16.1	20.2

Trends in transport supply

	1972	1999
Road length (km)	1000	3100
Expressway (km)	0	149
Bus operators	11	2
Buses	3730	3300
Rail (MRT) (km)	0	83
Stations	0	49
Light rail (km)	0	8
Stations	0	14

Singapore's Land Transport Policy

- 1996 White Paper Mission
 - To provide Singaporeans with a world class transport system
 - To develop an effective transport network: integrated, efficient, cost-effective, sustainable
 - To support a quality environment: optimal use of transport
 - To encourage commuters to choose the most appropriate mode

Objectives and Indicators

- Equity not mentioned, but implicit
- No explicit priorities; though efficiency is in practice dominant
- Few performance indicators, except for congestion (80% free flow) and mode split

Figure 4

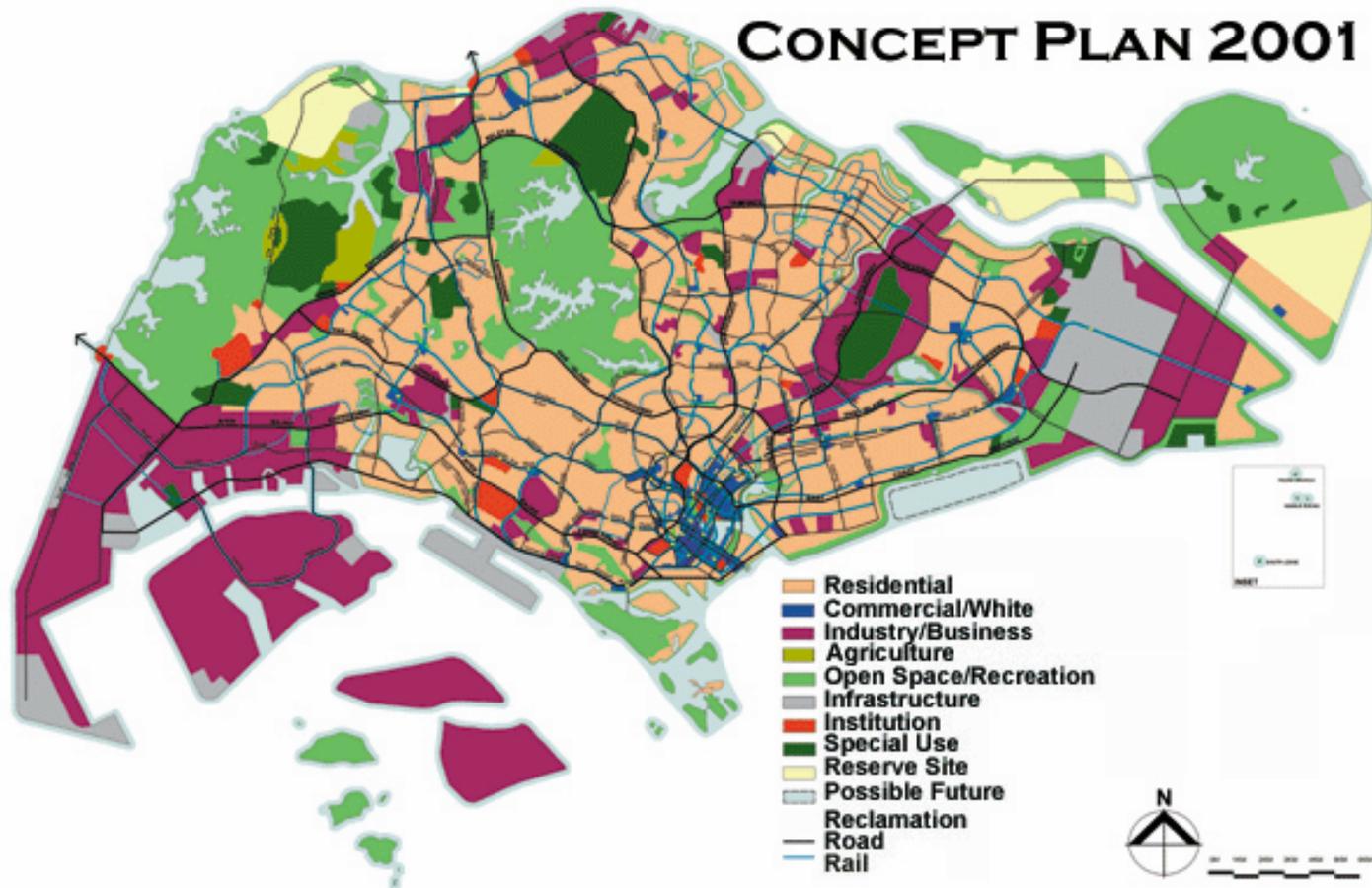
1996 Strategy

- Based on continuation and development of the 1972 strategy
 - Integrating transport and land use
 - Road network capacity maximisation, expansion
 - Managing demand for road use
 - Quality public transport choices
 - Information technology applications

Strategy Timescales

- Low cost measures: continued development
- Land use, infrastructure: five year plans
- Longer term Concept Plan
 - 2010
 - 2030
 - 2045
 - Plan X

The 2001 Concept Plan



Barriers

- Legal and institutional
 - few constraints
- Finance
 - not a major barrier
 - revenues exceed expenditure
- Political
 - public opinion largely supportive
but restraint implemented early (1975)
- Practical
 - availability of land
 - volume of construction activity

Land Use Control

- 1991 Concept Plan
 - decentralise commercial activities
 - focused on MRT stations
 - locate employment near housing
 - to reduce the need to travel
- Master Plan and Development Guide Plans
 - control use of all land
 - including links to PT, pedestrian routes

Land use control

- But housing is expensive
- So few people move when changing jobs
 - Around 15% of residents in many new towns work there
- And average journey lengths remain high



Road Infrastructure

- Current provision
 - 3100 km; 12% of land area
 - Eight expressways: 149 km; 55% of traffic
- Investment of around \$S1 billion every five years
 - new expressways
 - upgrading of existing roads and junctions
 - roads in new development areas



Demand management

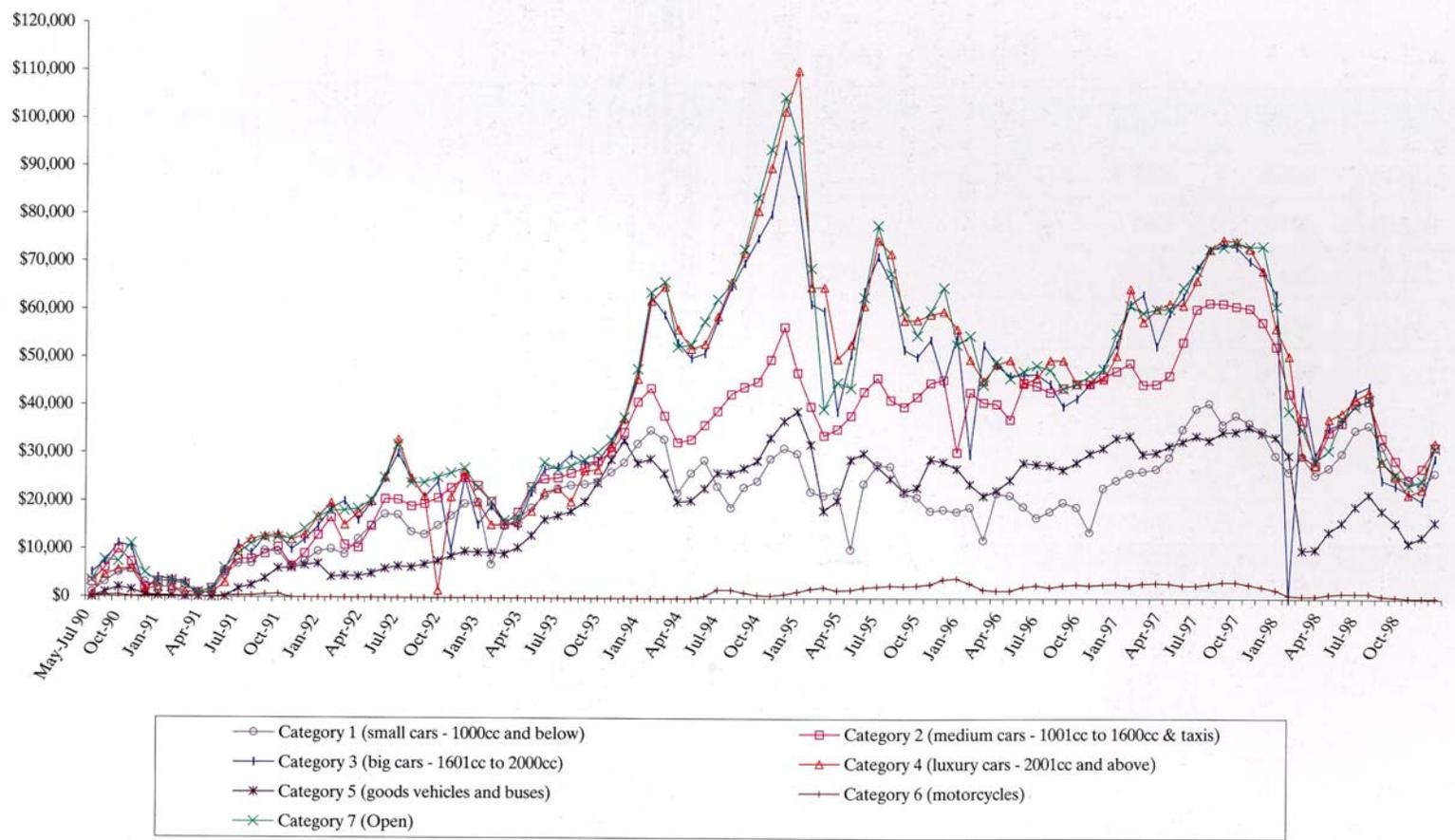
Taxes on ownership	1972	1998
Import duty	10% of OMV	45% of OMV
Registration fee	\$S15	\$S1000
Additional registration fee	Zero	175% of OMV
Annual road tax	10 c/cc	100 c/cc
Purchase price 1500 cc (1998 prices)	\$S22,000	\$S69,000

OMV = original market value

Demand Management

- Vehicle quota system
 - monthly quota based on 3% pa growth
 - Certificate of Entitlement bids against quota
 - around \$S30,000 for all sizes of vehicle
- Total vehicle fleet
 - projected to be over 1,000,000 by 1990
 - in practice under 700,000 in 1999

QUOTA PREMIUMS FROM MAY 90 TO DEC 98

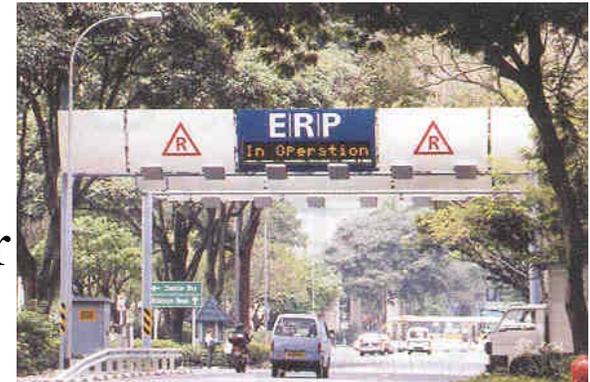


Demand Management

- Area Licensing Scheme
 - introduced in 1975
 - charges to enter city centre in am peak
 - several alternatives offered
 - car use reduced by over 40%
 - subsequently extended
 - to whole day plus Saturdays
 - to expressways

Demand Management

- Electronic Road Pricing
 - introduced in 1998
 - replaced ALS by gantries
 - with almost 700,000 vehicles equipped
 - and flexible charges
 - based on maintaining speeds
 - 20-30 km/h in centre
 - 45-60 km/h on expressways
 - plans to extend to additional cordons or charging



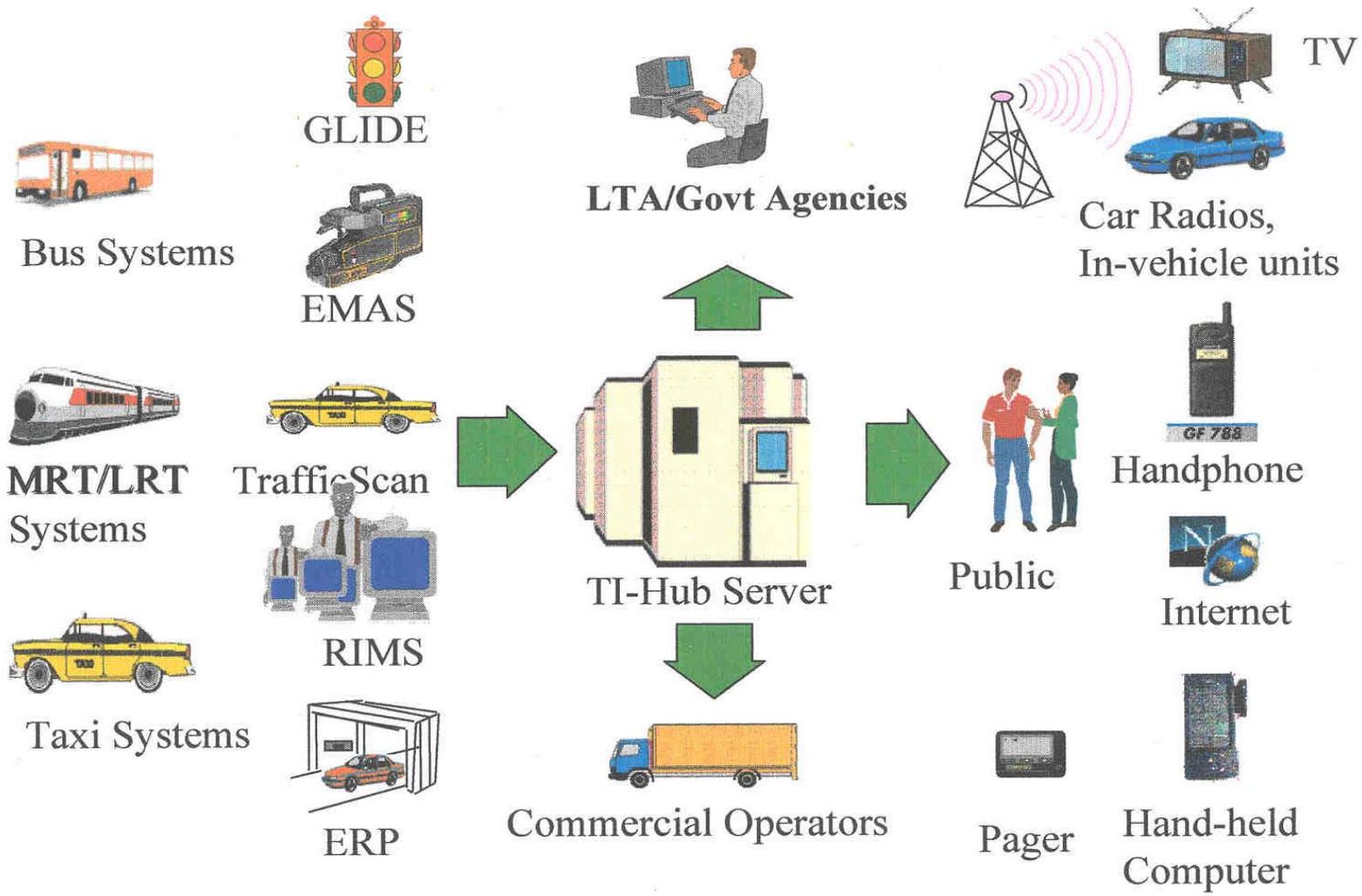
Public Transport

- Licensed, unsubsidised buses
 - standards specified, but some criticism
- Rapid Transit System
 - currently 100 km; heavy and light rail
 - \$S2 billion pa expansion programme
- Special bus, taxi services for niche markets
- Fares regulated and integrated
 - but reluctance to increase fares

Light rail developments and future plans



Integrated transport management



Integrated transport management

- GLIDE traffic signal control system based on SCATS: all 1750 signals
- Expressway Monitoring and Advisory System
- ERP information
- TrafficScan using GPS data on taxi travel times to review ERP charge levels
- Real time information in vehicles and at bus stops
- Journey planning information

Attributes of Success

- Long term, stable vision and strategy
- Integration of land use, demand management, roads and public transport
- Single tier of government
- No serious barriers to implementation
- Gradual implementation > public support
- Willingness to experiment with new ideas

Attributes of Success

- High quality planning tools
- Land use control avoids relocation response
- Extensive range of demand management
- Quality PT for main and niche markets
- Intensive application of information technology