

Intelligent Freight Systems for Sustainable Cities

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Outline

- Problems & Challenges
- CityLink
- Recent government studies
- Environmental Management Systems
- Research projects
- Case study: operator performance

Intelligent Freight Systems

Those that are:

Clever

- successful in coping with new situations & solving problems

Alert

- fast in perceiving & understanding problems & finding answers to challenges

Sustainable Cities

Freight systems affect the economic prosperity & liveability of cities

Prosperity and liveability are *related*

Both are vital for sustainability

Problems

- Noise
- Emissions (Particulates & GHG)
- Congestion
- Safety
- Vibration

Challenges

Intelligent Fleet Management

- Vehicle mix: innovative technologies
 - eg. LEV's
- Operation: higher utilisation
 - eg. co-operation
- Maintenance: reduce impacts
 - eg. EMS

CityLink

Southern & western inner city bypass in Melbourne

Links key radial routes to help form a freeway network

Electronic Toll Collection (ETC), eTag

CityLink

Effects

- Goods movement during peak periods
- Reduced travel times
- Improved safety
- Increased reliability of travel times
- Warehouse location: S E Corridor

Cities quickly develop around & in response to their useful infrastructure - M.G. Lay

eTag Applications

Current

- Toll collection
- Travel time data

Potential

- Automatic vehicle location
- Congestion pricing
- Port processing

Recent Government Studies

State

- Transport, Distribution & Logistics Audit
- Victorian Freight & Logistics Strategy

Federal

- Freight & Logistics Action Agenda
- Fuel tax inquiry
- Freight Council

Key Themes

Importance of freight & logistics

Poor understanding of urban goods movement

Integration

- modes, land-use & transport

Environmental capacity

Quality certification

Pricing of externalities

Recent Policy Initiatives

Indirect environmental tax

no rebate (18c/l) for diesel trucks < 20t (in metro areas)

Green star rating system

emissions & fuel consumption of LCV

National environmental protection

diesel with visible emissions

penalties - maintenance & repair

Vehicle Routing & Scheduling

- Dynamic
 - GIS & GPS
- Intramodel
 - truck sharing
 - load splitting
- Fleet Selection
- Environmental performance
 - GHG, fuel consumption,...

e-Commerce (B 2C)

In low density cities (eg. Melbourne & Sydney)

- Number of distribution centres
- Type of distribution centres
 - regional, local, ...
- Pick-up points
 - fuel stations
 - post-offices



E Plus Scheme

Environmental operator performance rating

Rating

Achievement

e

auditable maintenance &
waste disposal procedures

e⁺

+ auditable purchasing
strategy & low emission fuels

e⁺⁺

+ optimisation software & task
fit audit tools

source: Hassall

Environmental Score Card

Criteria defined & weighted for total score

Categories

- Fuel consumption (type & rates)
- Disposal policies (eg. oil, batteries, ...)
- Maintenance program (auditable)
- Infringements & crash history

weightings based on cost, health & environmental values ...

source: Hassall

Case Study

Large urban road operator (1996-2001)

(incl. e-Commerce: B2C)

Outcomes

-14% # vehicles & -7.4% fuel consumption

Explanations

- Fleet mix: more larger vehicles
- Diesel vans replacing petrol LCV's
- Fleet optimisation tools
- Consolidation of distribution centres