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Outline

- Overview of Klang Valley Regional Highway Transport
- Existing ITS in Klang Valley Region
- Towards Integrated Network Operation with ITS
  - Institutional and Capacity building
  - Integrated Operation Issues
- Potentials of Network Operation Tools
  - Ramp Metering
  - Adaptive Signal Control
  - Emergency/Incident management
  - Route Guidance
  - Speed Enforcement
Overview

Rapid Urbanization and Industrialization in Malaysia

Large Regional Units Of Transport Demand Base

Growth of Private car and Truck traffic

Demand driven growth of a world class highway network

What’s next?
Overview: Klang Valley

- Home to about 5 million people with 2 million cars
- About 260 thousand trucks
- 24 major and many minor industrial estates/parks
- Two major sea ports, and several major distribution centers/warehouses
- About 300km of expressways within /or running through Klang Valley (KV-Roads-Is)
- City arterials feeding to/collecting from highways
- Two city councils DBKL, MPPJ and number of local councils
- Two public operation regulators and a number of private operators
- Some highways/sections are tolled
Overview: Klang Valley

- Passenger trips dominated by private cars (about 86%)
- Freight trips also dominated by truck trips (%?)
- Increasing demand outpaces whatever new supply
- Annual Congestion Loss of about RM10 bill in Klang Valley alone
- Annual Excess fuel consumption of 1900 mill litres
- Accident and air pollution problem are also major concerns
- Drivers need seamless travel between places
  - Irrespective of
    - Expressway/arterial/secondary roads
    - Administrative Jurisdictions
    - Road operators
    - Tolled/Untolled roads
- But our agencies/operators are constrained to consider that view
- Can ITS offer the platform for integrated seamless travel?
Existing ITS in Klang Valley Region

- **MHA TMC**
  - To manage and monitor highways
  - Connected to information gathered by Individual private highway operators
  - Uses CCTV, Vehicle detection stations and VMS

- **Individual Highway CC**
  - Owned by individual operators
  - Uses emergency telephone, CCTV and VMS boards
  - Connected to MHA TMC

- **KL ITIS**
  - TMC Mainly to manage KL arterials
  - Uses CCTV, AID cameras, GPS mounted probe vehicles, VMS boards
  - Interface with MHA TMC and Highway CCs not clear

- **Other ITS technologies**
  - ETC
  - EFC
  - Internet/SMS based transit/travel information
Integrated Network Operation with ITS

- Collaboration and Coordination of agencies
- Integration of Services provided by them
- A proactive network/corridor management focus
- Creation of consensus based on knowledge about the system
- ITS installations can provide the data for dynamic knowledge base
- Design and Implementation of dynamic analysis tools
- An effective interface for communications among agencies
How to bring agencies under one umbrella?

Options/Means

- Central/Regional Transport Commission
- Central ITS data repository
- Seamless data communication technologies
- Data rights and acts
- A virtual interface agency

CARTESIUS architecture

Consensus created under a win-win situation

Individual vs. societal benefits
Potentials of Network Operation Tools: Ramp Metering

- Higher Capacity Efficiency for the main corridor e.g. FH of PJ corridor
- Evaluation through heuristic (e.g. linear programming) approach or simulation model e.g. MITSIM, VISSIM PJ-Corridor
- Evaluation Study in Boston network showed 10.8% and 9.8% for ALINEA and FLOW algorithms
- Salt lake city: average mainline delay decreased from 151.2 seconds/veh to 97.2 seconds/veh
- Cost: Signal and sensors, 24 RM cost $5.75 mill
Potentials of Network Operation Tools: Adaptive Signal Control

- Increase Speeds and Decrease Total Traffic Delay
- Average and Variance of Bus Delays Decreased With Bus Priority At Signal

- Tucson, AZ system with bus priority option: Reduction of TPD of 18.5% on main line and 28.4% on cross streets

- City of Syracuse:
  - Vehicular delay 14-19% reduction
  - Fuel consumption 7-14% reduction
  - Speed 7-17% increase
  - Travel time 0-35% reduction
  - $8.3 mill for a network of 145 traffic signals
Potentials of Network Operation Tools: Emergency/Incident management

- To reduce non-recurring congestion
- Algorithm/Model installation for quick detection
- Logistics for quick response
- Utah salt Lake valley: IMT installation for 120 miles of freeway costing 0.6 mill plus 0.4 mill annual op cost
  - Results 12-36% reduction in incident duration

- Maryland CHART program saved about 47.6 million vehicle hours of delay in 1999 and 2000
- In a 450 miles long system several hundred million dollars in terms of time saved, reduced fuel consumption

- How much can be saved in 300km in KV?
Potentials of Network Operation Tools: Route Guidance

- To achieve close to optimum assignment
- To utilize the capacity of all routes in a corridor
- Need DRG model installation

- PJ corridor RG:
  - Involves multi-agencies
  - Tolled/Untolled roads PJ ALT RG

- M8 corridor of Glasgow, Scotland project showed 13% reduction in overall travel time
- Integrated RG strategy in San Antonio, Texas was 25% more effective than segregated RG
Potentials of Network Operation Tools: Speed Enforcement

- Auto detection of over speeding and recording of registration plate
- Speed and Lane Violation of heavy vehicles/lorries
- Amsterdam Case:
  - reduced the “overall accident rate” by 23%
  - “serious accident rate” by 35%
  - “secondary accident rate” by 46%
- Germany Case:
  - Accident Rate Fell By 20%
  - Estimated Payback Within 2 To 3 Years After Deployment
- A Lower Payback period for Malaysia??
Summary

- Institutional And Operation Level Collaboration Among Stakeholders
- Common Platform For Multi-agencies Collaboration
- Knowledgeable Agents Interfacing The Agencies
- Under such condition huge potential for ITS assisted network operation in KV
- But who takes the initiatives??
Thank You
Industrial estate and Highway network development in Klang Valley
SCHEMATIC OF A COLLABORATIVE OPERATION INTERFACE
Federal highway and adjoining arterials in PJ corridor
Alternative routes in PJ corridor