Development of a Localized Traffic Simulator

Smarter traffic management with evidence-based decision support system
The Problem

Solving the traffic congestion puzzle

**Congested**
Perennial, inconvenient, costly traffic jam

**Ineffective**
Need for robust traffic management solutions

**Heuristic**
LGUs resort to trial-and-error implementation

**Unequipped**
LGUs lack the capability to evaluate traffic schemes
Local Traffic Simulator

LocalSIM is a microscopic traffic simulation software designed to be used by road and traffic engineers of LGUs as a decision support system for traffic management.
Effective

○ Enable traffic managers of LGUs to have evidence-based traffic analysis and evaluation of alternative schemes

Efficient

○ Minimize the need for trial-and-error implementation of traffic management schemes
LocalSIM

Driver behavior and movement simulation with animation

Features:
- Conflict Area Management
- Traffic Control Systems
- Dynamic Traffic Demand
- Dynamic Traffic Routing
- Spatial Measures of Performance
Scenario Analysis

The fast software simulation is utilized to compare multiple alternative schemes.

Base Case
Actual scenario is replicated in the system for comparison

Alternative #1
Phase pattern is modified from split-phasing to concurrent

Alternative #2
Cycle time is reduced to minimize intersection stop delay
Scenario Analysis

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Scenario Analysis

The fast software simulation is utilized to compare multiple alternative schemes.

- **Base Case**: Actual scenario is replicated in the system for comparison.
- **Alternative #1**: Phase pattern is modified from split-phasing to concurrent.
- **Alternative #2**: Cycle time is reduced to minimize intersection stop delay.
Benchmarking with MMDA Case Study

<table>
<thead>
<tr>
<th>Measure of Performance</th>
<th>Base Case</th>
<th>New Phase Pattern</th>
<th>Shorter Cycle Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>Network Travel Time</td>
<td>2 min 32 sec</td>
<td>2 min 36 sec</td>
<td>2 min 21 sec</td>
</tr>
<tr>
<td>Average Delay</td>
<td>1 min 26 sec</td>
<td>1 min 26 sec</td>
<td>1 min 7 sec</td>
</tr>
</tbody>
</table>

- Reducing the traffic signal cycle time from 240 seconds to 180 seconds will improve the average travel time of all vehicle movements by 7% and **reduce the average delay by 23%**.
Traffic Management Schemes

- Traffic Management Schemes
- Truck ban
- Exclusive truck lane
- Exclusive motorcycle lane
- Lane or road closures
- One-way
- Speed restrictions
- Geometric improvements
- U-turn scheme
Traffic Management Schemes

- Number-coding (UVVRP)
- Bus stop segregation
- Bus loading area
- Traffic signal control
- Turning restrictions
- Grade separation
- Stop/yield control
- Driving behavior of Filipino road users
- Practical and visual traffic flow analysis of road network
- Scenario analysis of traffic management schemes
- Output assessment metrics
- Inexpensive

LocalSIM
○ Driving behavior of Filipino road users
○ Practical and visual traffic flow analysis of road network
○ Scenario analysis of traffic management schemes
○ Output assessment metrics
○ Inexpensive

LocalSIM

Smarter way of managing traffic!
ITS Lab is a multidisciplinary group under the University of the Philippines National Center for Transportation Studies that aims to unify academic efforts in the field of intelligent transport.

The group currently focuses research and development in the following:

- Traffic Management System
- Traveler Information System
- Vehicle Control System

Hilario Sean O. Palmiano, DEng
Laboratory Head
Past and Ongoing Projects

Development of a Localized Traffic Simulator (LocalSIM)
Project Leader: Hilario Sean O. Palmiano, DEng

Cyber-Physical Transportation System (CPTS)
Project Leader: Adrian Roy L. Valdez, PhD

Maritime Transportation Information System (MARIS)
Project Leader: John Justine S. Villar, PhD

Implementing Agencies

Cooperating Agencies

Cooperating Agencies
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Thank You

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