A DEMONSTRATION OF TRANSIT SIGNAL PRIORITY (TSP) EVALUATED UNDER VISSIM ENVIRONMENT

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Why Transit Signal Priority (TSP)?

50 people
V=3 km/hr

50 people
V=70 km/hr
How TSP works?

Minimize \{ \text{Bus Travel Time} \\
\{ \text{Person Bus delay} \\
\{ \text{Person vehicle delay} \\

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How it modifies Traffic Light?

Non-prioritized approach

Prioritized approach

No Modification

SB    NB    EB    WB

Early Green

SB    NB    WB

Min TSP green interval
Adjustable Green extension time on non-prioritized approach
Green interval on prioritized approach
All red interval
Amber interval

CHECK IN DETECTOR

CHECK OUT DETECTOR

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One of Region of Waterloo Designated TSP Corridor

University at Laurier

University at Albert street

University at Phillips street

University at King street

Transit Routes

13
8
12
7-D
9
iXpress
University at Albert
Check in and Check out Detectors

Check In detector
52, 53

Check Out detector
62, 63

Check In detector
52, 53

Check Out detector
62, 63
Traffic Lights at University at Albert

- 11 sec Green arrow University avenue
- 47 sec Green University avenue
- 8 sec Green arrow for Albert street
- 32 sec Green Albert street

Twelve Movements
Twelve Traffic Signals
Pedestrian actuations
VISSIM Model

iXpress on University Avenue

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ViSSIM Model

iXpress Check in at Detector 53

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VISSIM Model

iXpress Checkout at Detector 63

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### SC 5 Signal Times Table

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**Early Green**

- Early Green
- Normal Time: 32 Seconds
- Reduced 16 Seconds

**Transit Checks**

- Transit Checks In
- Transit Checks Out
Early Green

In the image, there is a simulation interface showing traffic signals and their changes. The diagram highlights the effects of reducing and increasing green times on transit checks.

- **Reduced 16 Seconds**: Indicated by a red box, showing a decrease in the green time from 103 to 86 seconds, resulting in a shorter wait for vehicles.

- **Increased 16 Seconds**: Indicated by a blue box, showing an increase in the green time from 103 to 120 seconds, allowing more time for vehicles to pass through.

- **Normal Time 32 Seconds**: Indicated by a green box, showing the standard green time of 120 seconds, which is not altered in this simulation.

The diagram also shows the transit checks in and out for different signal groups (SG), with numbers indicating the duration of each phase. The goal is to analyze the impact of these time adjustments on traffic flow and efficiency.
EXAMPLE OF VEHICLE ACTUATED PROGRAMMING (VAP) CODE (C++)
Institute of Transportation Engineers
University of Waterloo- Student Chapter

http://www.civil.uwaterloo.ca/transportation/ITE

Comments
Questions

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