



# User Group 2009

2009 North American User Group Meeting, 5th October, Newark, NJ

## Venue

Hilton Newark Airport, 1170 Spring Street, Elizabeth, New Jersey, 07201-2114

## Agenda

- 09.15 – 09.30 Registration
- 09.30 – 09.45 Introduction
- 09.45 – 10.30 *Large Scale Microsimulation Modeling of Proposed Truckways within The Regional Toronto Freeway System*  
University of Toronto
- 10.30 - 11.15 *I-75/I-96 Ambassador Bridge Gateway Reconstruction Project in Detroit: Large-Scale Highway Work Zone Maintenance of Traffic*  
T-Concepts
- 11.15 – 11.30 Coffee
- 11.30 – 12.15 *Multi-modal model of Lower Don Lands in Toronto*  
Arup NY
- 12.15 – 13.15 *Update from Paramics*
- 13.15 – 14.15 Lunch
- 14.15 – 15.00 *TBC*  
AECOM
- 15.00 – 15.45 *Toronto - Gardiner Expressway Study*  
Jacobs Engineering Group
- 15.45 - 16.00 Coffee
- 16.00 – 17.10 *Pushing the Boundaries: Achieving Reality in Complex Paramics Networks*  
Halcrow
- 17.10 – 17.20 Closing remarks

## Presentations and Presenters

We've listed below the confirmed presentations for this User Group Meeting, this was correct at the time of publication.

### ***Large Scale Microsimulation Modeling of Proposed Truckways within The Regional Toronto Freeway System***

Asmus Georgi, University of Toronto  
Toronto, Canada

This project assesses the impact of exclusive truck facilities on urban freeway performance. A large scale regional microscopic traffic simulation model is developed for AM and PM peak hours and is used to model two alternative truckway configurations in the Greater Toronto Area (GTA), including a truck only highway and a truck lane conversion on Highway 401. Demand inputs to the microsimulation model are generated by a regional transportation demand model which provides OD matrices for light, medium and heavy trucks and passenger cars. Plug-ins are developed to represent a truck only lane in the simulation. The simulation model is successfully calibrated to reflect observed road counts, and to produce realistic congestion patterns. The effect of infrastructure changes on travel distances, travel times, exclusive truck lane usage, and travel speeds are assessed. Microscopic simulation allows queuing formation/dissipation and bottlenecks to be represented, and allows for separate analysis of truck and car performance. Addition of a 4-lane truck only highway results in greater travel time improvements for trucks, and sometimes results in shifting of traffic bottlenecks

on Highway 401 to downstream locations. Conversion of a freeway lane on Highway 401 results in increased congestion for passenger cars, but improved travel speeds for trucks. Both scenarios show truck facility usage ranges from 100 to 800 trucks per hour per direction.

## ***I-75/I-96 Ambassador Bridge Gateway Reconstruction Project in Detroit: Large-Scale Highway Work Zone Maintenance of Traffic***

Do Nam, T-Concepts  
Madison Heights, MI

T-Concepts was chosen by the Michigan Department of Transportation (MDOT) to analyze traffic impacts from the I-75/I-96 Ambassador Bridge Gateway reconstruction project. The I-75/I-96 Ambassador Bridge Gateway Maintenance of Traffic Simulation (Gateway MOTSIM) was the first project in Michigan to develop systematic consideration and management of work zone impacts in accordance with the new FHWA Work Zone Mobility and Safety Rule.

The Ambassador Bridge connects Detroit, Michigan to Windsor, Canada, and ranks as the busiest commercial crossing on the U.S.-Canada border with about 10,000 heavy trucks in a day. As part of the Ambassador Bridge Gateway reconstruction, the I-75 mainline, carrying over 150,000 daily traffic, had been completely closed from February 2008 to July 2009.

T-Concepts developed a large-scale simulation model in order to analyze system-level as well as local-level work zone impacts. The study area limits and roadways were strategically selected to be large enough to capture impacts on regional traffic patterns and detailed enough to address changes in local traffic patterns. The model encompasses 25 miles of I-75, 18 miles of I-94, and 13 miles of I-96 freeway corridors, as well as over 100 miles of arterials. In total, the Gateway model had 440 zones and 2 peak periods — AM (6:00-9:00) and PM (3:00-7:00) — consisting of 1.4 million passenger vehicle and heavy truck trips.

This presentation intends to demonstrate how the Gateway MOTSIM model was effectively utilized to address MDOT concerns, including the following:

- What would be the level of congestion during construction?
- How does it affect adjacent major corridors, such as I-94 and I-96?
- How can we mitigate work zone impacts?
- Can we quantify effectiveness of mitigation measures?
- How do we ensure they will work?

## ***Multi-modal model of Lower Don Lands in Toronto***

Varanesh Singh, Arup  
New York, NY

The Lower Don Lands is a proposed 300 acre development just east of Downtown Toronto. The project's goal is to promote a sustainable community where transit, walking and biking are convenient and safe modes of transportation. To ensure the transportation system meets these goals, Arup is performing various analyses including the development and use of a multi-modal microsimulation model of the larger study area. The presentation will cover the model development, use of various multi-modal performance measures and lessons learned.

## ***Update from Quadstone Paramics***

Ewan Speirs, Quadstone Paramics

New product news including details of some key features in the soon to be released Paramics 6.7 and UAF 1.2. In addition, development roadmap information for the next major version (v7.0) and details of the newly formed Product Steering Group which allows visionary users of the Paramics tools to shape future development plans at the earliest stages of the development process.

## **TBC**

Timothy Oketch, AECOM  
Ontario, Canada

We investigated impacts associated with constructing a new road between a major state university and an east/west corridor bypassing the local downtown. We looked at three intersection configurations where the new road would join the network, and compared traffic volumes, overall VMT, VHT, and air quality between these and the baseline case.

## **Toronto - Gardiner Expressway Study**

Adam Lanigan, Jacobs Edwards and Kelcey  
Morristown, NJ

The Frederick G. Gardiner Expressway is an elevated freeway that runs along the south edge of downtown Toronto, ON adjacent to Lake Ontario. Redevelopment of former industrial land to the south of the Gardiner has stirred interest in removal or redesign of a portion of the roadway to allow a 'reconnection' between the redeveloped land and the city's downtown, as the elevated roadway is seen as a barrier.

As part of the larger \$6 million study, a Paramics model is being created of downtown Toronto in the vicinity of the Gardiner Expressway. Arup's recently completed Lower Don Lands model is acting as the starting point for the model, which will expand this model outwards to roughly double its current size. The model will be used to test various alternatives for the future use of the Gardiner and gauge its impact on the surrounding area's traffic operations.

This presentation will detail the preparations necessary for tackling a large urban model and examine the various project issues that we are likely to deal with as work progresses and our proposed solutions to them.

## ***Pushing the Boundaries: Achieving Reality in Complex Paramics Networks***

Chris Wilson, Simon Kinnear, Halcrow  
Australia

After almost 10 years experience in the application of Paramics, the presenters will outline their experiences in the development of some of the more unusual and complex models built during those years. In doing so, the presenters will highlight some of the techniques developed to model complex traffic conditions including data preparation, network build, matrix estimation, and the judicious use of plug-ins. Case examples to be discussed follow.

## **Downtown Sydney Model**

Halcrow have developed a Paramics model that covers the downtown district of Sydney, Australia and includes an area of approximately 2sq miles between the Sydney Harbour Bridge, The Opera House and Central Station to the south. This district contributes about 7% to the economy of Australia and the effect of congestion here causes the greatest impact to the Australian economy which is why the state government utilises Paramics to quantify impacts of network or land use changes in the downtown district.

The State Roads Authority (RTA) has developed its own successful signal control system that is required to be reflected in the models accurately. This is why the 130 signalized intersections are connected to the adaptive signal control logic using SCATSIM making it the largest application of this technology in the world.

As well as accurately reflecting the adaptive signal timings, pedestrian crossing delays to vehicles and bus stopping activity on over 150 bus routes. There is also an accurate representation of the 35,000 vehicle trips that either pass through the area or access the 120 downtown parking stations.

The primary difficulties in modelling adaptive signal control technology to grid networks is the alternative routing that can exist on a network and this is largely determined by the granularity of the matrix together with the disaggregation of the zoning system adopted.

## **Downtown Sydney UAF Model**

Using the downtown Sydney model as the basis for coding 4 discrete areas of pedestrian activity in the Urban Analytics Framework (UAF) it was possible to examine the effects of pedestrian flow as part of Metro rail planning exercise. These pedestrian volumes were determined from surveys undertaken during the busiest weekday periods with a combined volume of almost 150,000 pedestrians being considered.

## **Sydney Harbour Bridge Lane Control Model**

A third element to the development of Paramics models for Sydney was the need to accurately reflect the influence that the Sydney Harbour Bridge crossing has on the feed of traffic into the downtown area.

Approximately 250,000 vehicles per day cross the harbour and because of limited lane capacity, involves the use of reversal lanes to manage rush hour traffic demand.

Due to continuing growth in traffic demand, a Paramics model was required to optimize the lane management. This in turn would have a significant influence on the movement of traffic into and out of the downtown which needed to be quantified.

Reversal lanes are not easy to model in Paramics and hence the modelling process involved the development of plugins to successfully replicate the process.