The Theory Behind Work Zone Traffic Control

Work Zone Impact Analysis

2007 National Traffic Management and Work Zone Safety Conference

October 11, 2007
Paul Kelley
Work Zone Safety Coordinator
Traffic Engineering Division
What is Work Zone Impacts Assessment?

Overview of the Analysis Process

• Assess the work zone impacts and developing appropriate transportation management plans (TMPs) during project development.

• Monitor actual impacts during construction and making adjustment if necessary.

• Conduct performance assessments to track performance to improve work zone policies, procedures and practices.
Why Assess Work Zone Impacts?

- Traffic volumes and congestion are increasing
- Highways are approaching the end of their life-cycle
- More than 41,000 injuries and about 1,000 fatalities per year in work zones
- Traveler frustration with delays caused by work zones
Work Zone Impact Considerations

- Safety of Motorist/Pedestrians/Bicyclists and Highway Workers
- Mobility and Accessibility
- Constructability by building projects as effectively and efficiently as possible
Types of Traffic Analysis Tools

- Sketch – Planning Tools
- Travel Demand Models
- Analytical/Deterministic Tools
- Traffic Signal Optimization Tools
- Microscopic Simulation Models
- Mesoscopic Simulation Models
- Macroscopic Simulation Models
Specific Work Zone Analysis Tools

- QuickZone
- QUEWZ-98
- Construction Analysis for Pavement Rehabilitation Strategies (CA4PRS)
- Highway Capacity Software (HCS)
- Synchro
- ITS Deployment Analysis System (IDAS)
- Dynamic Network Assignment Simulation Model for Advanced Road Telematics for Planning (DYNASMART-P)
Traffic Analysis Tools
Traffic Analysis Tools

May 1998

developed by
Texas Transportation Institute
The Texas A&M University System

sponsored by
Texas Department of Transportation
in cooperation with
U. S. Department of Transportation, Federal Highway Administration

Press any key to continue.
Traffic Analysis Tools

CA4FRS can be incorporated with traffic simulation models, or even simple Highway Capacity Manual calculations, to maximize on-schedule construction production and minimize costs for the agency and road users (delay costs) during construction of long-life pavement rehabilitation and reconstruction projects. This integration is vital to achieving the three competing goals of longer-life pavement, accelerated construction, and less traffic delay during freeway reconstruction and rehabilitation projects. Use of CA4FRS and traffic capacity calculations also facilitates teamwork by engineers from traffic, construction, design and maintenance to arrive at an optimal solution.
Traffic Analysis Tools
Traffic Analysis Tools

**Synchro Studio 7**

- Synchro 7
  - Visualize full geometric layout
  - Edit all data directly on map sidebar
  - Multiple bitmaps for background
  - Integrate GIS, MSIG and SHP files (additional bitmap and custom shape files)
  - Control lane alignment, flow intersections
  - Use button and default template file for report, map, and network settings, standardized traffic parameters, screen appearances, and exports across your agency
  - Set median, crosswalk width, ramps, TWDL, lane alignment, and more for simulation
  - New combined data file format keeps all data in a single file
  - Detector templates allow for quick updates of detectors to agency templates
  - Detailed detector setting
  - Auto view, recover changes

- SimTraffic 7
  - Display of detector placement
  - Offset intersection view
  - Man-urn signals
  - Generate reports for a single intersection or zone
  - Percent simulated volume item in report
  - Density and occupancy on report
  - Report details by lane, by intersection
  - Graphical representation of TWDL
  - Update field values and acceleration tables
  - Static display for delays match INRIX Level of Service ranges
  - Option for “Enter Blocked Intersection” gridlock avoidance is optional on per movement basis
  - One click to 3D Viewer for 3D visualization

- 3D Viewer 7
  - Create a 3D scene directly from SimTraffic 7
  - Pan, tilt, rotate, and zoom the scene to view
  - Customize the scene with map setting and 3D scenery
  - Follow vehicle progression through roadways
  - See the traffic network from driver’s points of view
  - Make virtual tours of the scene
  - Generate digital video to use in presentations
  - A/V format: Display off the web or burn to a DVD

For more information and to download our Synchro Studio 7 demo, visit us at www.vdottrafficware.com

©2006 Synchro and SimTraffic are registered trademarks of TrafficWare Ltd. All rights reserved.
Traffic Analysis Tools

Intelligent Transportation Systems Deployment Analysis System
Traffic Analysis Tools
Traffic Analysis Tools

CORSIM

Traffic Software Integrated System
Traffic Analysis Tools

CORSIM Screen

Closed lane

“Rubbernecking”
References for Traffic Analysis Tools

http://ops.fhwa.dot.gov/trafficanalysistools/toolbox.htm
References for Traffic Analysis Tools

http://www.ops.fhwa.dot.gov/wz/resources/final_rule/wzi_guide/
References for Traffic Analysis Tools
References for Traffic Analysis Tools

Artificial Neural Network (ANN)

www.trb.org/news/blurb_detail.asp?id=7363
The Theory Behind Work Zone Traffic Control/Work Zone Impact Analysis

2007 National Traffic Management and Work Zone Safety Conference

Questions

Additional Information contact:

Paul Kelley
Email: Paul.Kelley@VDOT.Virginia.gov
Telephone: 804.786.8029