

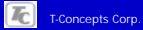


I-75/I-96 Ambassador Bridge Gateway Reconstruction Project in Detroit:

Large-Scale Highway Work Zone
Maintenance of Traffic

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Presentation Overview

- Ambassador Gateway Reconstruction Project
- Work Zone Mobility Concerns
- Gateway Simulation Project
- Lessons Learned



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Part I Ambassador Gateway Project



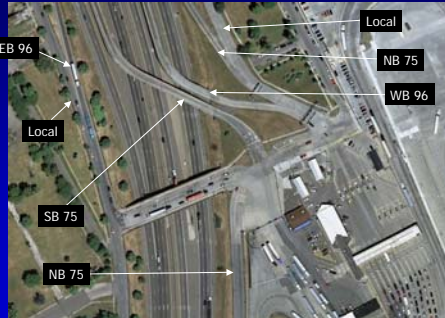
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Ambassador Bridge

- The Busiest Trade Crossing in North America
 - ⇒ 25% of All Surface Trade between US and Canada
 - ⇒ 7.3 Million Vehicles in 2008
 - ⇒ 30% of Heavy Trucks
 - ⇒ 9,000 Trucks per Day



Inefficient Access to/from the Bridge



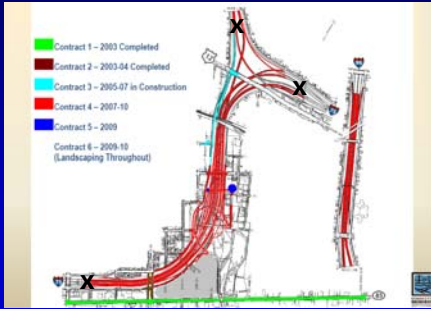
Gateway Reconstruction Project

(2003-2010)

- Direct Access to/from the Bridge
- Separate Ramps by Vehicle Type
- Local/Regional Economy Revitalization
- Construction Cost: \$170 Million



Construction Phases



Part II Work Zone Mobility Concerns



Gateway Work Zone Concerns

- What would be the level of congestion during the Contract 4 Phase?



Gateway Work Zone Concerns

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- How does it affect adjacent major corridors, such as I-94 and I-96?



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- What would be the level of congestion during the Contract 4 phase?
- 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?



Gateway Work Zone Concerns

- What would be the level of congestion during the Contract 4 phase?
- 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?



Part III Gateway Simulation Project



Gateway Simulation Project

(Sept. 2006 – Dec. 2007)

- Paramics-based approach to developing regional yet detailed work zone mobility plans
- The first showcase operational analysis in Michigan in accordance with the new Federal Work Zone Mobility and Safety Rule
- FHWA Work Zone Modeling and Simulation



Gateway MOTSIM Model

- Large-Scale Freeway Network
- Extensive Data Collection Plan
- Refined O-D Trip Tables
- Comprehensive Calibration/Validation Plan
- Operational Mitigation Measures

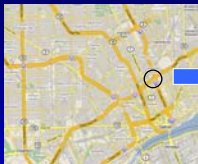


Large-Scale Paramics Network

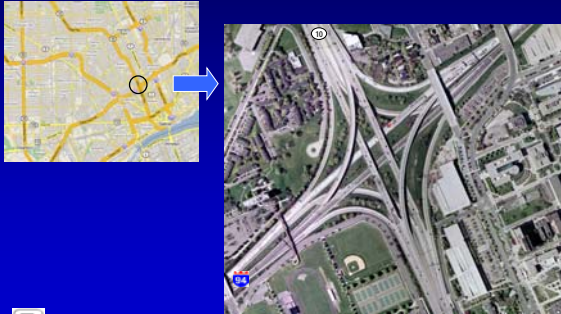
- Study Area: 12 mi x 18 mi
- Multiple Corridors Interconnected Together
- 100 Centerline Miles Combined
- 420 Zones



Complex Geometrics: I-94/I-75 System Interchange



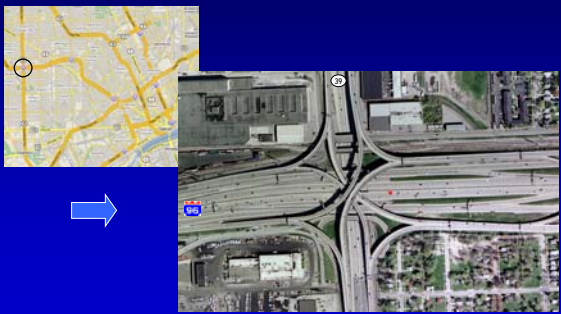
Complex Geometrics: I-94/M-10 System Interchange



Complex Geometrics: I-94/I-96 System Interchange



Complex Geometrics: I-94/M-39 System Interchange



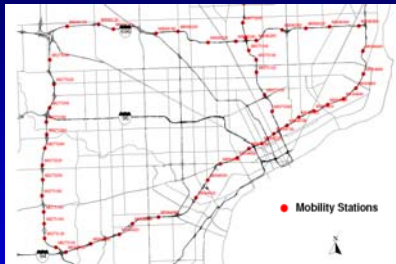
Network Coding Quality

Red lines show geometry which is included in the model

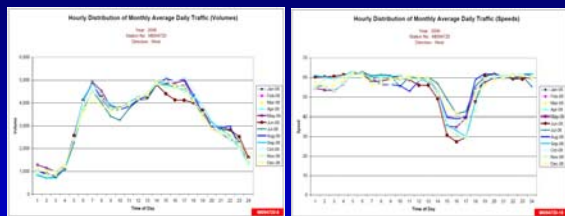


I-94/I-96 Interchange

MDOT Freeway Surveillance System



Time-of-Day Traffic Data Plots



Volumes

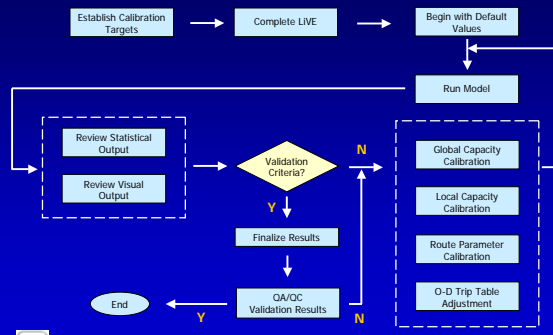
Speeds

Strategic Traffic Movements

- Freeway Traffic to/from the Bridge
- Freeway Traffic to/from Local
- Freeway Traffic to/from Downtown
- Freeway Through Traffic

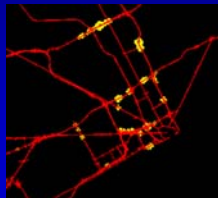


Calibration/Validation Process

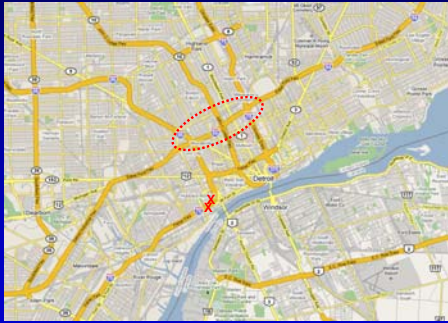


Various Recommendations

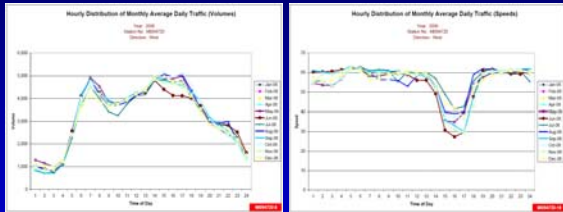
- Detour Routes
- Corridor Improvements
- Local Intersection Improvements
- Innovative Low-Cost Operational Capacity Improvements



Critical Work Zone Mobility Area



WB I-94 Traffic Flow between I-96 and M-10



Volumes

Speeds

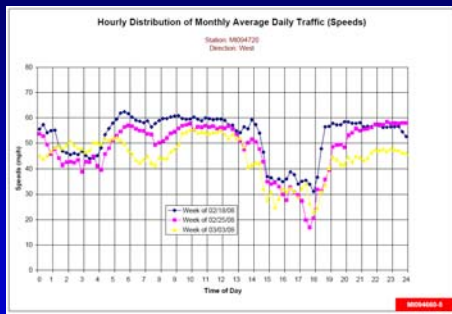
M-10 Ramps Critical for I-94



Gateway Closure Events

- Feb. 25, 2008
 - ⇒ I-75 Mainline Closed & M-10 Ramps Closed
- Jul. 14, 2008
 - ⇒ I-75/I-96 Interchange Closed & M-10 Ramps Reopened
- Sept. 8, 2008
 - ⇒ I-75/I-96 Interchange Reopened & M-10 Ramps Closed
- Jul. 2, 2009
 - ⇒ I-75 Mainline Reopened & M-10 Ramps Reopened

Impacts of M-10 Ramps Closures



Lessons Learned

- Microsimulation is the right analysis technique for operational analysis
- Microsimulation needs high quality of traffic data
- Microsimulation requires good understanding and some tweaking for success



I-75/I-96 Ambassador Bridge Gateway
Reconstruction Project

Questions ?
