

**Stakeholder Outreach Meeting** 

Presented by Jen Duthie January 31, 2012

## Network Modeling Center (NMC) -Outline

- A Research Center and a Resource
- Benefits of Dynamic Traffic Assignment (DTA)
- Applications of DTA
- NMC Present and Future

# A Research Center and a Resource

## Part of UT's Center for Transportation Research

**TRANSPORTATION ECONOMICS** Supply chain Innovative construction Workzone mobility Transportation funding Traffic simulation Freight planning and logistics ITS Safety **HIGHWAY DESIGN Transportation law and policy** Pavement management and performance Non-destructive testing Travel demand modeling Energy and environmental policy analysis **Network modeling** *Statistics* Traffic operations **MARKETING RESEARCH** Spatial analysis **MORE!** 

#### **NMC** Mission

• Further the state-of-the-art and state-of-thepractice in transportation network models



Benefits of Dynamic Traffic Assignment (DTA)

## **Choosing the Right Tool for the Job**

#### CAMPO Model

- Regional scale
- Large time interval

#### DTA

- Small area scale
- Small time interval

#### Microsimulator

- Local/Corridor scale
- Very small time interval

## Estimate Volumes and Congestion Over Time



## DTA outputs include:

- 1) volumes every six seconds
- 2) intersection delay
- travel time of each modeled vehicle

### How many vehicles switch routes?



## Provide Input to Microsimulation Model

DTA provides the flows and turning movements to assume for future years and different scenarios **Applications of DTA** 

### **Toll Roads**

#### Why use DTA for toll road analyses:

- Toll road usage depends partly on availability and quality of alternate routes
- Tolls can vary by time of day
- Allows for users to have different values of time
- Evaluate how toll affects conditions on toll road and rest of network



Photo of SR 91 (Source: Edward C. Sullivan, California Polytechnic State University, San Luis Obispo, CA)

#### Scenario Modeling for State Highway 45 Southwest

(Cautionary note: Environmental process is ongoing)

Source: Austin American Statesman http://www.statesman.com/news/local/hayscounty-has-new-vision-for-texas-45-1883167.html



#### SH 45 SW Modeled Area



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#### **Transit Evaluation**



#### **Transit Evaluation**

- Ongoing research:
  Use DTA to improve ridership predictions
  - Integrate with
    CAMPO model



- Ongoing research:
  Use DTA to improve ridership predictions
  - Integrate with
    CAMPO model
  - Define smaller analysis zones



### **Traffic Impact Studies**

- How large is the area impacted by a new development?
- Feedback with regional travel model to predict the impact of a new development
  - Define small zones within the subarea
- Dynamic predictions of congestion, turning movements (intersection LOS)



#### **Work Zones**

- To predict congestion, need to consider rerouting
- Use DTA to model long-term (assume equilibrium) or short-term (simulation) work zones
- Can provide users with information via electronic roadside signs
- May be helpful in determining road user cost (cost to contractor)

#### **Work Zones**



- Assume 4 to 2 lane closure along SH45 eastbound
- Long-term closure



#### Signal controlled late merge



#### **Work Zones**



#### Work Zones



### **Emissions Prediction**

- MOVES (MOtor Vehicle Emissions Simulator) updated MOBILE 6
- MOVES can take vehicle trajectories from DTA as input

Improvement over average measures

# **NMC Present and Future**

#### **NMC Present**

- Focus on dynamic traffic assignment
- Focus on Central Texas
- Funding primarily from TxDOT and CAMPO with smaller contracts with Williamson County and City of Austin
- Fostering close relationship with CAMPO modeling staff

### **NMC Future**

- Pushing the state-of-the-art and state-ofpractice in network modeling
- Become a hub for modeling knowledge and data in the region
- Expand geographical focus to Texas and beyond
- Continue close relationship with CAMPO modeling staff
- Train practitioners to use NMC-developed tools

# **More Information**

1) Visit our website: www.utexas.edu/centers/nmc

2) Email me: jduthie@mail.utexas.edu