Myths of Dynamic Assignment (DTA)

session on
Advanced Traffic Assignment Subcommittee

presented by
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Outline

- Start by making a case for DTA and defining it in the context of the tools we have available to us
- Then describe options for implementing DTA and recognize that the process need not be all encompassing

Trends in our industry


- Distinction between demand focus and supply focus is going away and instead we recognize the interconnectedness of these decisions
- Distinction between engineering focus of supply and planning focus of supply is merging
  - This is where DTA comes in

Types of Assignment Methods


- Static assignments [***macroscopic***] – good for long range regional forecasting where the methodological flexibility is consistent with assumptions
- 'Engineering" assignment [***microscopic***] – high degree of precision and certainty. No feedback to demand and no system convergence
- Dynamic Traffic Assignment [***mesoscopic***] – blends high level of specificity with convergent/calibration criteria

Why we need DTA


- Macroscopic – does not represent queuing or throughput constraints (impact of delay on downstream intersections)
- Microscopic - is limited in its ability to analyze effects such as oversaturation, queue spillback, dynamic routing, or peak spreading.

Advantages of DTA – Cost and TOD

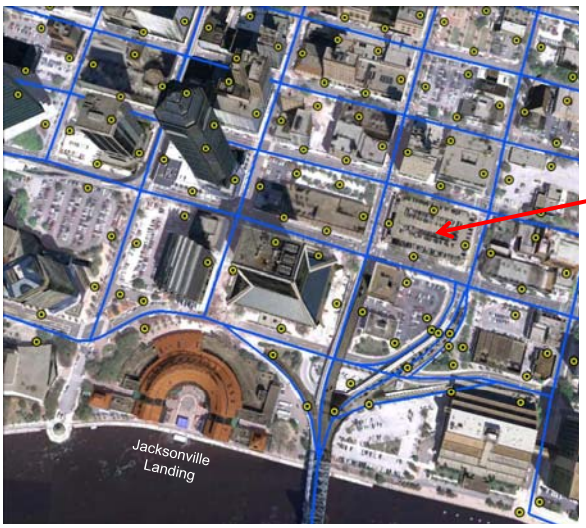

- Better time of day (TOD) representation in supply
- Better TOD and cost feedback to demand.
- Ability to segment population by income
- Ability to represent reliability in less abstract measures

Dynamic network analysis models seek to provide a more detailed means to represent the interaction between travel choices, traffic flows, and time and cost measures in a temporally coherent manner.

Network Fidelity

- Clear tradeoff between convergence and data accuracy.
- Varying degrees of network fidelity and integrity based on the type of policies and need for accuracy.
  - High data accuracy: Merge, number and type of lanes
    - Can take 6-8 months to develop a corridor
  - Lower data accuracy: Viability of a tolled facility
    - Can take 6 months to develop an entire region

Increased network & loading integrity



Block-face Activity Locations in Downtown Jacksonville

Another example

Residential Activity Locations in Clifton, FL

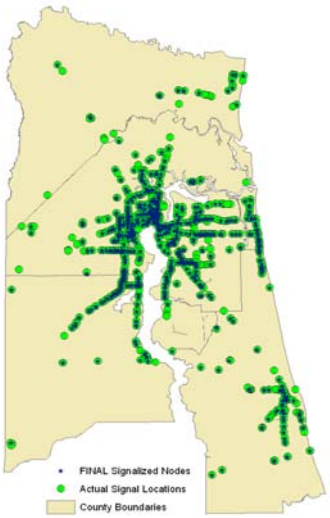
8 activity locations representing
15 individual households (parcels)

Data Integrity

- Data integrity v. required quality of results
- Challenge is one of automating the capture of data and processing so that it is consistent with model needs
- Synthesizing data where it does not exist or is too hard to develop

Traffic Signal Locations

- Automated Tools can be used to generate traffic signal locations and timing/phasing plans
- Produced 877 signals out of 815 actual traffic signals in the 4-county Jacksonville region.
- These were manually checked and changed where needed using the automated results as a starting point
- Default phasing/timing are used; no available electronic data



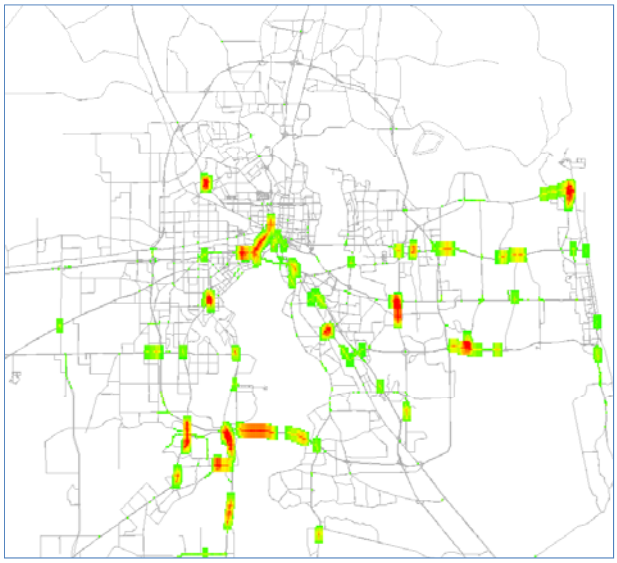
Assignment Validation Data

- 190 ITS sensor and loop detectors on I-95 and I-295 collect data at 5-minute intervals
- Count data from portable detectors is available for hundreds of other locations at 15-minute intervals
- Counts contain vehicle class and distribution of vehicles by speed bin

Results

- Simulation of cars shows realism
- Ability to represent time of day impacts (some problems are just 15 minutes – is this worth an investment)
- Ability to show meaningful graphics such as “heat plots”

Jacksonville, FL Congestion Heat Plot



Conclusion


- Need to clarify distinction between Microscopic and Mesoscopic (DTA)
- Need to identify the level of detail needed in the DTA and possibly consider a staged approach to development
- Need to continue looking into the integration of demand and supply.

For more information…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