Innovations in Travel Modeling Conference Recap

Steven LaBedz

Conference Overview

- Took place in Denver, CO (From May 1-4)
- Runs in even years (opposite of Applications in Modeling Conference)

Day 1: Sunday, May 1st

Workshop: Strategic Analysis Tools for Scenario Planning

- Eric Pihl from FHWA:
  - Supporting Performance-based planning programming through scenario planning
    - More effective public stakeholder participation
    - Target setting
    - Goals at FHWA
      - Devleoping a guidebook that will be released in the summer
      - Scenario Planning Program

Workshop: Strategic Analysis Tools for Scenario Planning

- Ken Snyder of PlaceMatters:
  - Synthesis of current practice in Strategic Modeling
    - Interviewed 26 MPOs, including MAPA
    - Motivation for research
      - Tools have been around since the 90s, but don't see widespread adoption of the tools
    - Normative scenario planning tools
      - Used to test impacts of changes to land use issues
    - All agencies said the investment of scenario planning was worth it

Workshop: Strategic Analysis Tools for Scenario Planning

- Maren Outwater of RSG:
  - Two Recent Scenario Planning Tools
    - Regional Models focused on quantitative accuracy where as strategic models focus on relationships and qualitative accuracy
    - Impacts 2050
      - Strategic Scenario Analysis Tool
      - Designed to be used when the future is uncertain
    - Feedbacks
      - Employment Sector
      - Land Use Sector
      - Transportation Supply
    - Pre-programmed scenarios
      - Momentum
      - Technology
      - Gentle Footprint
      - Global Chaos

Workshop: Strategic Analysis Tools for Scenario Planning

- Ben Gruswitz (DVRPC)
  - 2040 Plan “Choices and Voices” public engagement tool
- Brian Gregor (Oregon Systems Analytics)
  - In the planning cycle, there are many steps, so there are different models for different realms

Workshop: SHRP2 C20 Behavior-Based Freight Modeling

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- Moderator: Vida Mysore (FHWA)
  - Freight modeling tools and GIS necessary
  - By 2020 SHRP C20 Vision for Improved freight modeling and data will be characterized as:
    - Robust freight forecasting tools

Workshop: SHRP2 C20 Behavior-Based Freight Modeling

- Vladimir Livshits (Maricopa County Association of Governments)
  - Wanted a model with components that have never been used before
    - Firm synthesis, supply chain and tour based
    - Multi-modal freight model with nation-wide transportation networks
  - Used INRIX truck GPS data from Streetlight for light and medium trucks
  - Lessons Learned
    - Need strong FHWA support
    - Feasible development with an opportunity to take regional freight modeling to the next level
    - Need a strong team
    - Complex negotiations with data vendors
    - Final step would be to integrate this with MAG Travel Demand forecasting model

Workshop: SHRP2 C20 Behavior-Based Freight Modeling

- Arun R. Kuppam (Cambridge Systematics)
  - Firm Synthesis
- Zahra Pourabdollahi (RS&H)
  - Supply Chain Model
    - Freight generation
    - Used Roth & Peranson (1999) Market Clearing Algorithm
    - Used FAF data to calibrate model
    - MAG model looks like iTRAM

Workshop: SHRP2 C20 Behavior-Based Freight Modeling

- Chris Chritton (WisDOT)
  - Wisconsin SHRP2 C20 Supply Chain Modeling
    - Modify supply chain model R-Code developed for CMAP and develop necessary data for Wisconsin
    - FAF for OD data prep
    - Open Tour
  - Brian Ryder (BMC) and Colin Smith (RSG)
    - Maryland and Baltimore Study
      - Maryland State model expands to all of North America
      - Used travelling salesman algorithm to sequence stops
      - Mapping at TAZ Level is good for an MPO
  - John Gliebe (RSG) and Dick Walker (Metro)
    - Portland Freight Demand Modeling and Data Improvement Program
      - Regional Economy and network congestion questions
      - Land Use Impacts and Policy Analysis
      - Truck commercial and diary log with GPS tool

Day 2: Monday, May 2nd

Plenary: Opening Session

- Dr. Chandra Bhat (UT-Austin)
  - Promoting and Accelerating Collaboration Between Academia and the Practicing Profession: Opportunities and Pathway Forward
    - Public realizing more and more that transportation is a quality of life issue
    - Changes between Academia and public agencies/industry
    - Collaboration Benefits
    - Architectural model for collaboration

Plenary: Opening Session

- Mike Lewis (Colorado DOT)
  - Expect Colorado to grow 50% in the next 25 years on population
  - Big Dig was culmination of 50 years of highway expansion
  - Growth increases but funding falls
  - CDOT's Road X Program
  - Eisenhower/Johnson tunnel highest vehicular tunnel in the world, ports at 11,000 ft
  - No longer building a system, we need to operate a system

Big Data (Across the Universe)

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- Arthur Huang (Tarleton University)
  - How Business Clusters and Destinations are connected: A Model based on Social Media Data
    - 2013 LEHD OD employment data was used
    - Points of interest data from LA County
    - How could business or check-in cluster effect Destination Choice?
    - Check-in clusters with more services and greater diversity of services are more attractive to visitors
    - Probably best for tourist areas

Big Data (Across the Universe)

- Vince Bernardin (RSG)
  - Integration of the National Long Distance Passenger Model with Tennessee Statewide Model and Calibration to AirSage Data
    - Version 3
      - Commodity Flow
      - Advanced trip-based
      - Incorporate new national long distance model
      - Long Distance Passenger Model
      - Possible trip length bias gives AirSage issues

Big Data (Across the Universe)

- Kanchana Nanduri (Caliper)
  - Using Archived Real Time Travel Speed Data for Model Calibration and Validation
    - Few MPOs collect travel time/speed data
    - Data Used
      - HERE Traffic
      - INRIX
      - Google Maps
        - » Custom application built by Caliper
        - » Similar point-to-point navigation
        - » Inbound travel times from TAZs to downtown average to AM
        - » Basically a way to extract OD data from Google Map's direction but on a massive scale

Big Data (Across the Universe)

- Josie Kressner (Transport Foundry)
  - Using Passive Data to Build an Agile Tour-Based Model: A Case Study in Asheville
    - Usability
      - Run time
        - » 50 Minutes for DES Model
        - » 4 Hours for DTA model
      - Platform agnostic
      - Universal applicability (no calibration “factors”)

Innovations with Transit Data (Why Don't We Do it in the Road?)

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- David Ory (MTC)
  - On the Expansion of Transit On-Board Surveys
    - Change subjective weights on each category
    - You can decide which target you want to meet
    - More complicated with bus
      - Automated Passenger Count data is big
      - Route level boardings
      - On-to-off surveys
      - System-level boardings

Innovations with Transit Data (Why Don't We Do it in the Road?)

- David Roden (AECOM)
  - Congestion Reduction Benefits of Transit Projects in Northern Virginia
    - Looked at Census JTW data for trip distribution
    - Transit capacity constraints
    - Park-n-Ride capacity constraints
    - Dynamic Toll Rates
    - Mode Choice impacts

Monday Afternoon Plenary

Monday Afternoon Plenary

- Patricia Hu (BTS)
  - 1991 ISTEA created the BTS
  - Major Components of BTS Mandate
    - Intermodal/Transportation Data
    - Air Travel and Aviation performance
    - National Transportation Library
    - Statistical Policy Coordination
  - Lots of BTS data for freight
  - Biggest Delay for aircraft (36.2%) is late arrival aircraft
  - As of Feb 2016, 2,655 bike share stations in 65 cities
  - National Transit Map Initiative

Tuesday, May 3rd

Unique Applications for Travel Models (Do you want to know a secret?)

- Daeyuhn You (Georgia Tech)
  - Accounting for Unique Aspects of Travel Demand Generated by a Large University in Travel Models
    - Objective: Model travel patterns for large university
    - Scope: Albuquerque metro, U of NM and CNMU
    - Travel Diary used for AZ State but not for UNM or CNMU
    - UNM/CNM zones treated as super university
    - Market Segments
      - Graduate student
      - Off-campus
      - Dorm-based
      - Non-Dorm
      - Faculty
      - Staff

Unique Applications for Travel Models (Do you want to know a secret?)

- Michael Riley (MTC)
  - Estimating User Accessibility Benefits with a Housing Sales Hedonic Model
    - Hedonic Model
      - Regression Model
        - » Decomposes the value of a home into its components
    - Newer and older homes are both “good”
      - Midcentury houses worth $170,000 less than pre-1940 houses, newer houses in between
    - Main drivers of price are size and neighborhood

Unique Applications for Travel Models (Do you want to know a secret?)

- Alex Bettinardi (Oregon DOT)
  - Estimated Impacts of Deteriorating Highway Conditions to Oregon's Economy
    - ODOT has a funding problem
    - Poor bridge and pavement conditions will cost money
    - Oregon's Statewide Integrated Model (SWIM)
      - Economy -> Synthetic Population -> Land Use Model -> Allocation -> Transport Model -> Assignment
      - By 2035, if no action was done, Oregon would lose 100,000 jobs and $94 billion in GDP

Unique Applications for Travel Models (Do you want to know a secret?)

- Tudor Mocanu (German Aerospace Center)
  - Petrol, Diesel, or Electric? An Extension of Passenger Transport Models for Differentiating Car Travel Demand
    - Impact of transportation on climate in 2050
    - Car differentiation is necessary
      - Propulsion system
      - Climate goals
      - Policy
    - Objective: Find a way to calculate differentiated car VMT for emission modeling

Modeling Changing Trends (I Should Have Known Better)

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- Peter Davidson (Transposition: Brisbane, Australia)
  - Modeling Autonomous Vehicles- Challenges and Results
    - 4s Model
      - Segmented, Stochastic, Slice, Simulation
    - No matrices, no skims, no zones, no centroid connectors
    - Built from open sources
    - Can get population data from different sources because there are no zones
    - AVs benefit those who are travelling further distances (which could lead to more sprawling development
    - Shared AVs (pay-as-you-go).
    - http://transposition.com.au/4s_model/index.html

Modeling Changing Trends (I Should Have Known Better)

- Peter Vovsha (PB)
  - Discrete Choice Models with Dynamic Effects: Estimation and Application in Activity-Based Travel Demand Framework
    - Need to account for the dynamics of these attributes
    - Disaggregate approach
    - Changes in auto ownership due to:
      - Number of adults in household
      - Household income level
    - Extrapolation may be unpractical for future forecast

Modeling Changing Trends (I Should Have Known Better)

- Mark Bradley (RSG)
  - The Transition from Diary-based to Smartphone-based Travel Survey Data Implications for Travel Demand Modeling
    - You need an app from Google or Apple
    - Always running in the background
    - Automatically records where you are going and figures where you start and stop
    - Reduces respondent burden but still have to fill out something's
    - Indiana and Seattle pilot studies
    - Most people fill out their trip survey within an hour of completing trip, some wait until the evening
    - 85-90% completed the 7-day survey

Modeling Changing Trends (I Should Have Known Better)

- Moderator: David Ory (MTC); Panelists: Stephen Lawe (RSG), Rick Donnelly (WSP|PB), Clint Daniels (SANDAG), Doug Rex (DRCOG), Eric Miller (University of Toronto, Greg Giaimo (Ohio DOT)
  - Discussion Session: Moving Innovation to Practice
    - Interactive cycle lets us come up with customizable solutions
    - Need to be able to move onto something new if what you are working on isn't working

Tuesday Afternoon Plenary

Tuesday Afternoon Plenary

- Kermit Wies (Retired, CMAP)
  - Innovative Travel Modeling
    - Other social sciences blame planning for a lot of problems
    - Grand metaphor: Social Physics
    - Trying to solve the great urban story through a very long story
      - Mobility
      - Environment
      - Economic
      - Political

Wednesday, May 4th

Lightning Talks: Future of Transportation and Active Transportation (Here Comes the Sun)

- Leah Flake (PSRC)
  - Who is willing to adopt AV technology? Trends in Public perception in the Puget Sound Region
    - 50% are not interested
    - Females more interested than males
    - People with hybrid or electric vehicles were more willing to own an AV
- Tim Padgett (Kimley-Horn)
  - When modes aren't enough: Calculating mode shift in Washington, DC
    - 50% non-auto mode share
    - Don't be afraid to look at things from a different perspective
    - Simplest solution may be the most elegant

Lightning Talks: Future of Transportation and Active Transportation (Here Comes the Sun)

- Anurag Komanduri (CS)
  - Last Mile Transit Access/Egress Provided by Bike Share Systems- Case Study from Chicago
    - Bike share actually replacing busses on some corridors
    - Lot of Uber travels intra-neighborhood
    - Rail adjacent bike-share stations have 30% more activity

The End