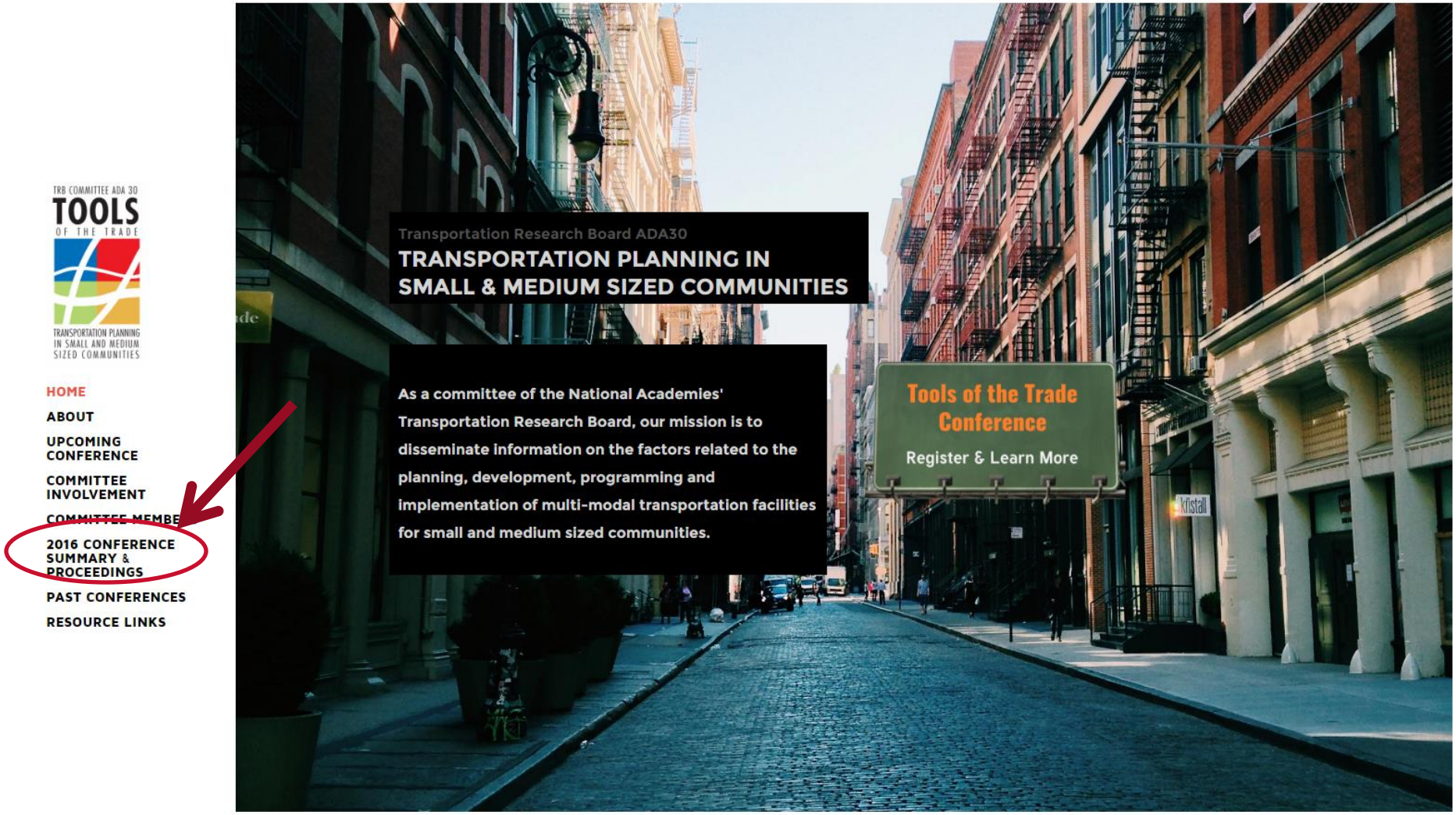
TRB Tools of the Trade Conference Summary of Presentations

Josh Corrigan (MAPA) and Jason Carbee (HDR)

OVERVIEW

- Transportation Research Board ADA30: Transportation Planning In Small & Medium Sized Communities
- Charleston, SC
- September 12-14, 2016
- **NOTE: Material presented is from other presenters' work. Please cite / copyright as appropriate**.

All Presentations Available at:



Workshop: Data Needs for Long Range Planning

Penelope Weinberger
Charlynn Burd
Jeremy Raw
Jasmy Methipara

Penelope Weinberger – CTPP Program

- Expect next CTPP (2012-2016) in 2018

- Training Materials:
  - AASHTO CTPP Website
    - ***http://ctpp.transportation.org/Pages/trainingresources.aspx***
  - E-Learning
    - ***http://ctpp.transportation.org/Pages/elearningmodules.aspx***
  - Recorded Webinars
    - ***http://ctpp.transportation.org/Pages/webinardirectory.aspx***

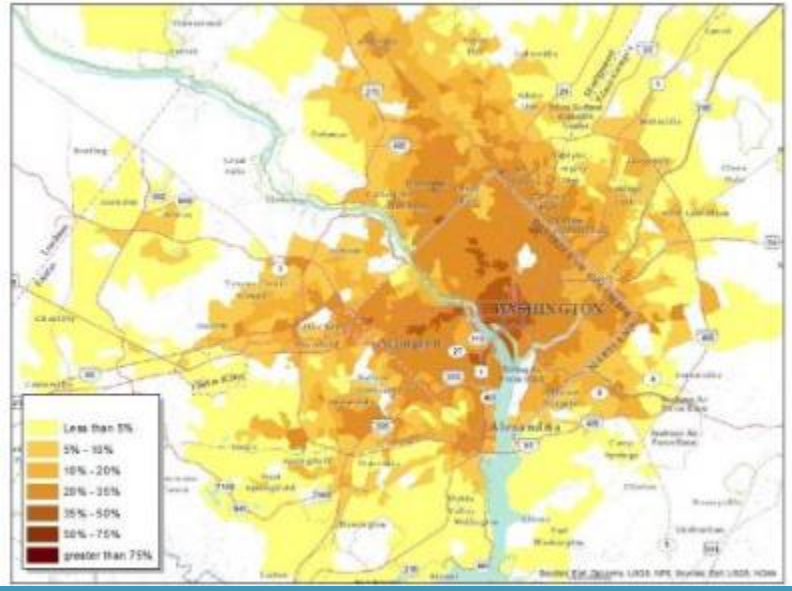
Charlynn Burd – ACS Program

- County-to-County Commuting Flows
  - www.census.gov/hhes/commuting/data/commutingflows.html
  - For years: 1990, 2000, 2006-10, 2009-13

- 2014 ACS Supplemental Tables released on FactFinder in late July
  - Available for selected geographies of at least 20K
  - Tables use prefix “K” for basic commuting tables:
    - K200801 Means of transportation to work
    - K200801 Travel time to work
- Shapefiles with Pre-Joined ACS Data
  - https://www.census.gov/geo/maps-data/data/tiger-data.html

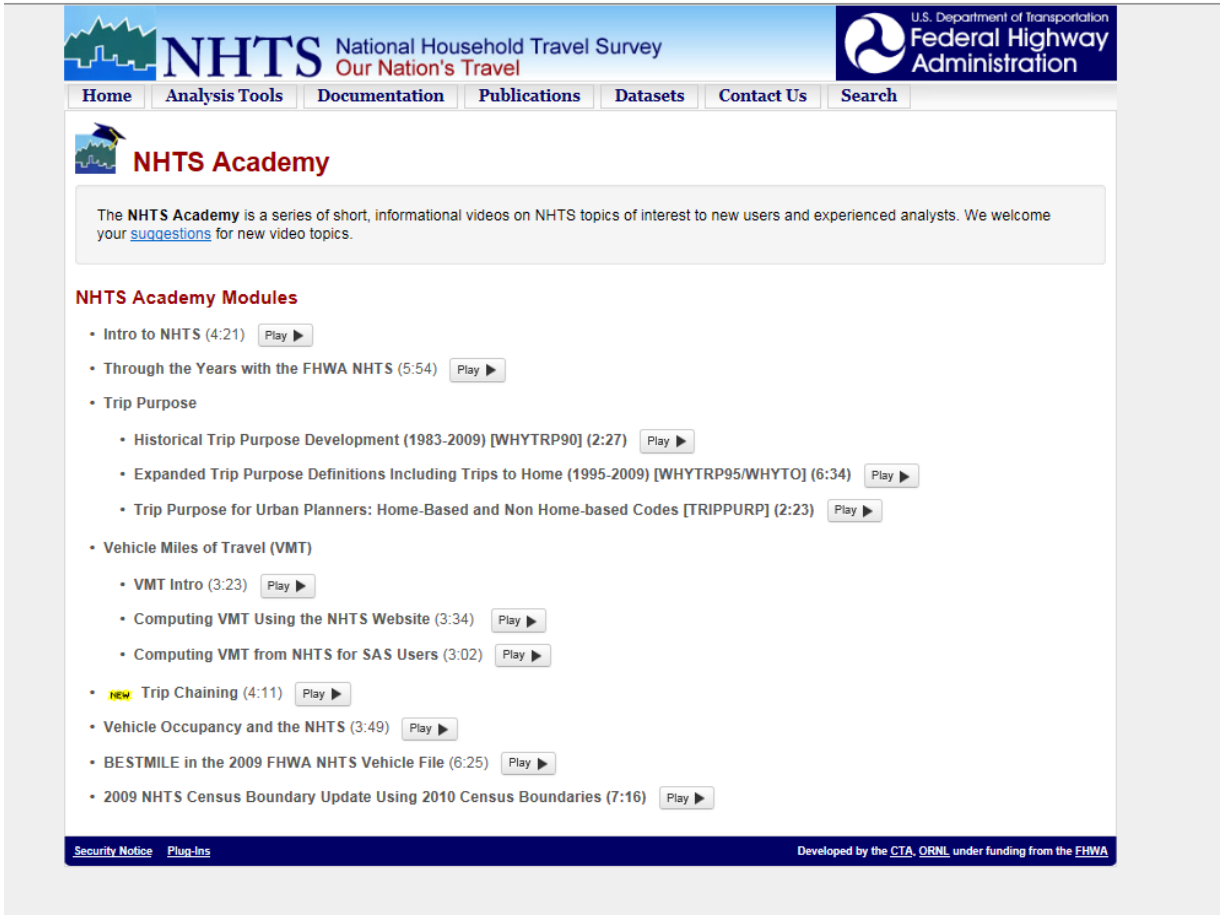
Jeremy Raw – FHWA Data Resources

- Topics Included:
  - National Performance Management Research Data Set (NPMRDS)
  - Highway Performance Monitoring System (HPMS)
  - Freight Analysis Framework (FAF):
    - Disaggregation of FAF data – Standard Methodology
  - HEP GIS (Web Portal for Planning Data)
  - Smart Location Database (from EPA)
    - https://www.epa.gov/smartgrowth/smart-location-mapping

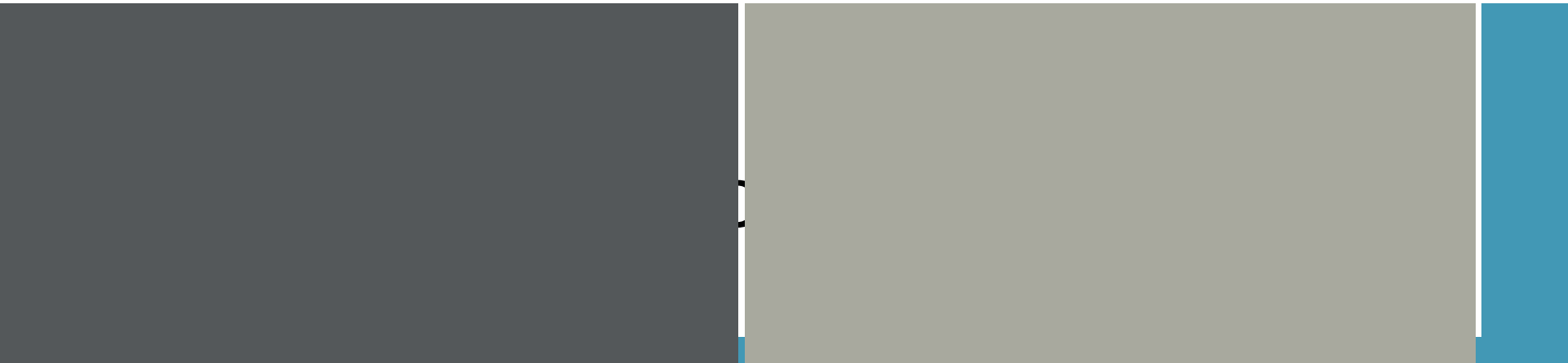


Jasmy Methipara – NHTS

- NHTS Academy
  - http://nhts.ornl.gov/academy.shtml



C2: Advances in Data Collection & Analytics



Innovative Analysis Methods of Mobile Phone Data in the Best Travel Demand Modeling Practice in Kentucky

Yang Han, PhD, PE (The Corradino Group)

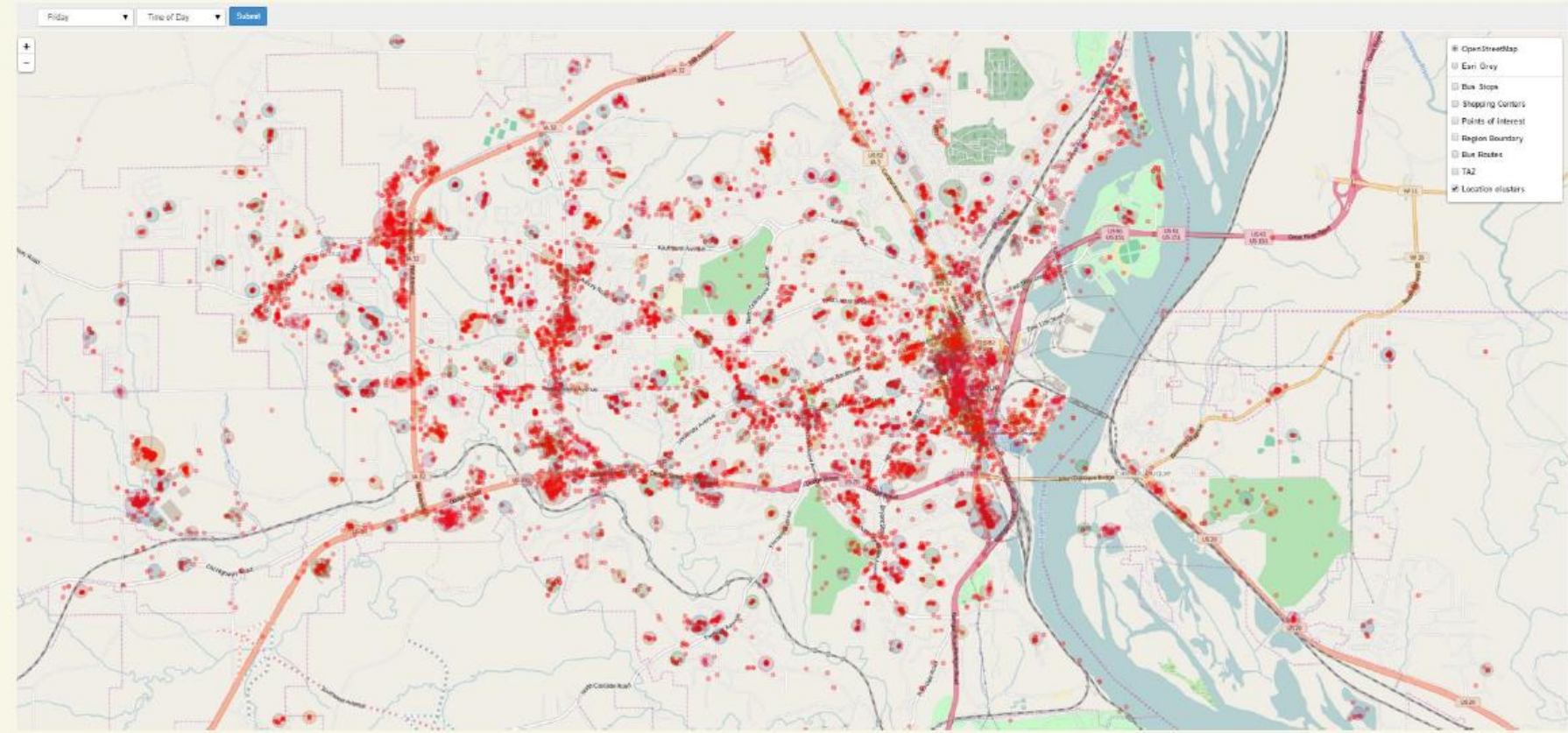
- AirSage Data to Support All 3 Steps of Regional Models
- Subarea Assessment of Data Completeness
- Findings:
  - Intrazonal Trip Generation was High
  - Trip Rate results “choppy” by Region – Factor by Purpose and Area Type to Correct
  - Trip Distribution – Gravity Model Calibration Function and ODME
  - Time-of-Day / Directional Factors – AirSage seemed reasonable
- Note: AirSage assumes Trip Purpose by pattern only. Some HBW trips might be “habitual” HBO trips.

Dubuque Smarter Travel

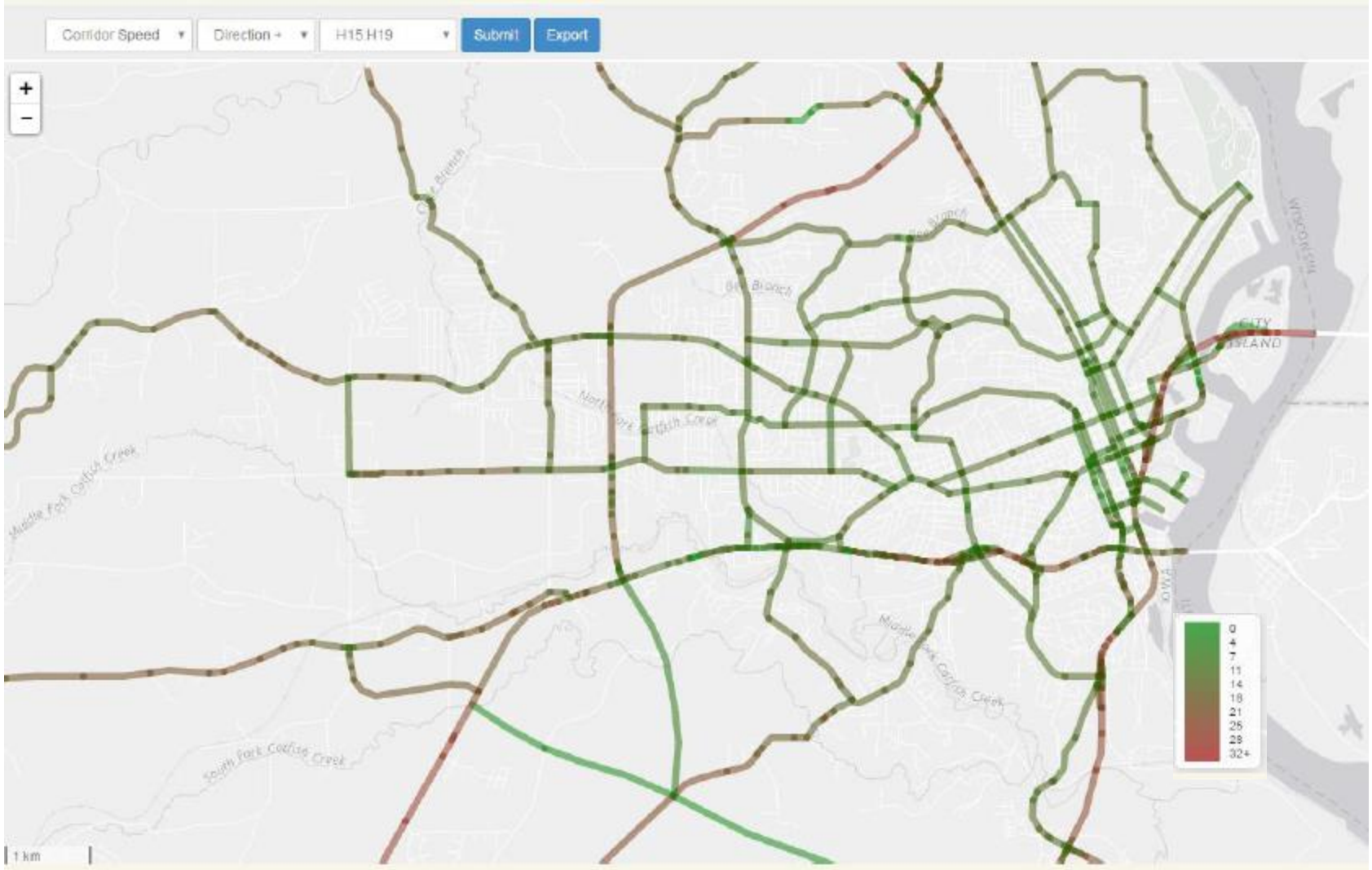
Chandra Ravada

- IBM / MPO Collaboration on Integrated Survey Approach
  - Smart Phone + Travel Diary = Better Data
- Project Outcomes: 1) Transit Route Optimization, 2) Adjust Signal Timing, Reduce Accidents, Resource Planning, etc.
- 750 Participants: 2015 – 2017
  - 14 days of Smart Phone App
  - 3 days of travel survey
  - $50 compensation
  - Survey Tied to Land Use Mapping

Dubuque Smarter Travel
Trip Locations



Dubuque Smarter Travel
Corridor Speeds

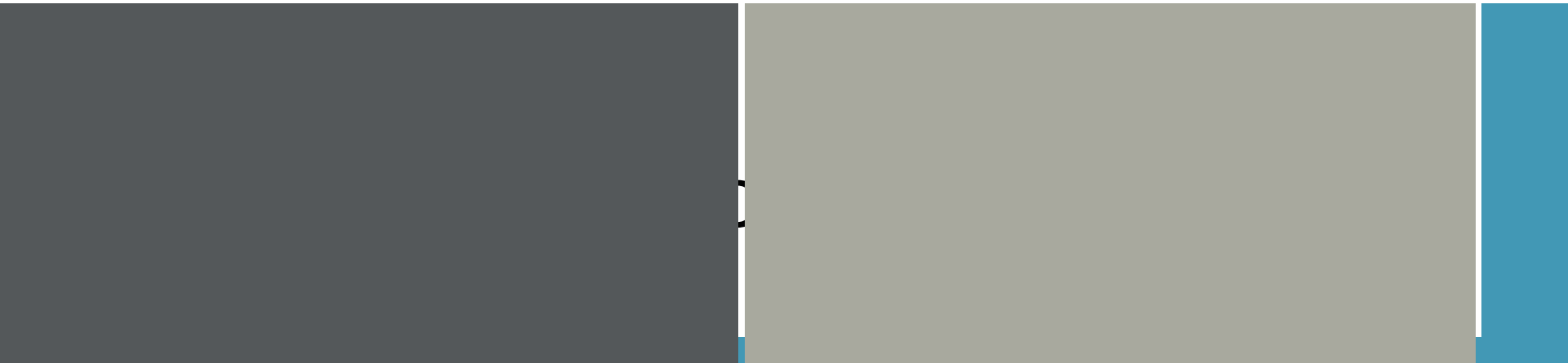


Alternate Methodologies for Origin-Destination Data Collection

Robert Schiffer, Stantec

- Polk County FL TPO
- Pros and Cons of Various Methods:
  - Tag Matching with High Speed Videotaping of License Plates
  - Positioning of Bluetooth Readers to Match Devices
  - Tracking of Anonymous Cellular Data (AirSage)
  - Truck GPS Tracking (ATRI)
  - Aerial Tracking of Vehicles (SkyComp)
  - GPS Data Extraction (StreetLight)
- Approach Selected for Polk County:
  - AirSage for Passenger Vehicle Flows
  - ATRI for Commercial Truck Flows
  - $35,000 budget

A2: Performance-based & Scenario Planning



- Slides were a good overview of scenario planning
- Scenario planning basics
  - Considers and analyzes alternative possibilities or futures
  - Considers a range of options to identify a path forward
  - Can be:
    - Predictive – in response to trends
    - Normative – seeking a desirable future condition
    - Exploratory – what if? scenarios (automated vehicles, scare resources, etc)
- Presentation set the stage for a number of detailed scenario planning presentations at the conference

Integrating Public Priorities and Project Prioritization

- Integrate 8 planning factors (14 criteria) into your visioning

EXERCISE: RANKING AND SCORING CRITERIA

Task 2. Please use the following chart to score each individual criterion once again – based solely on your personal preferences. Circle the appropriate number for every criterion based on the following scale:

5	Extremely Important
4	Very Important
3	Important
2	Not Very Important
1	Unimportant

CRITERIA					
Improve Safety	5	4	3	2	1
Improve Security	5	4	3	2	1
Protect the Environment	5	4	3	2	1
Reduce Congestion	5	4	3	2	1
Promote Efficiency	5	4	3	2	1
Support Economic Development Goals	5	4	3	2	1
Support Land Use Goals	5	4	3	2	1
Increase Connections	5	4	3	2	1
Improve Access	5	4	3	2	1
Connect Modes of Travel	5	4	3	2	1
Conserve Energy	5	4	3	2	1
Improve Quality of Life	5	4	3	2	1
Increase Multi-modal Options	5	4	3	2	1
Preserve Right of Ways	5	4	3	2	1

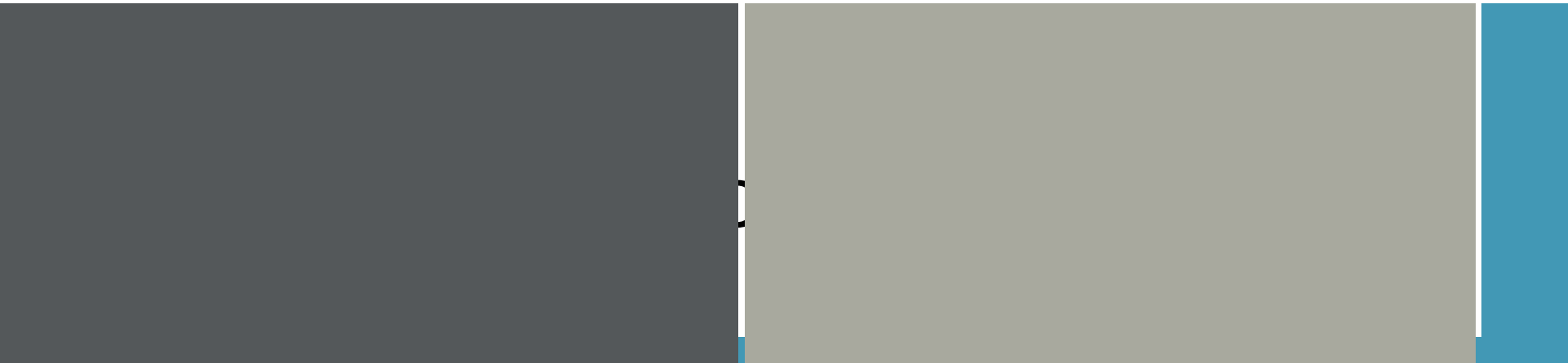
ALLIANCE TRANSPORTATION GROUP

Scenario Planning Application of Models

What can be considered using models?

- *Land Development*
  - *Population grows in areas that are not anticipated*
  - *Employment happens in unexpected ways (e.g., location, size or type)*
- *Project development*
  - *ROW acquisition*
  - *Environmental clearance*
  - *Funding availability*
- *Externalities*
  - *Bridge failure*
  - *Regularly occurring, non-recurring congestion*
  - *Construction happens*
- *Project Types/Characteristics*
  - *Added capacity (lanes, C/Ds, Managed Lanes)*
  - *Modify intersections*
  - *Modify transit characteristics (headways, stop locations, rail/bus, park & ride locations, etc.)*

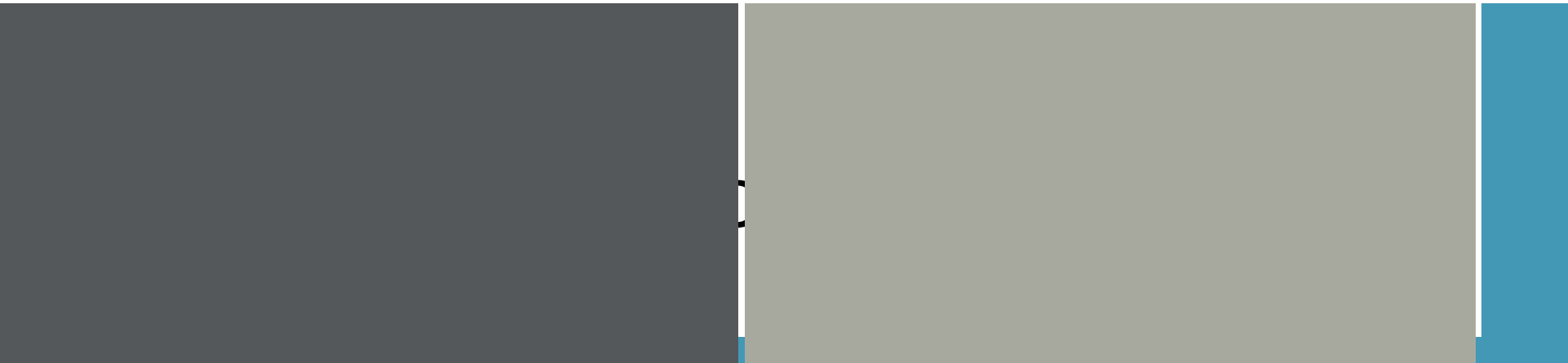
C3: MPO Caucus



- Mostly concerned with rules proposed by FHWA concering boundary consolidation between adjacent MPOs
  - Additional issues for bi-state MPOs

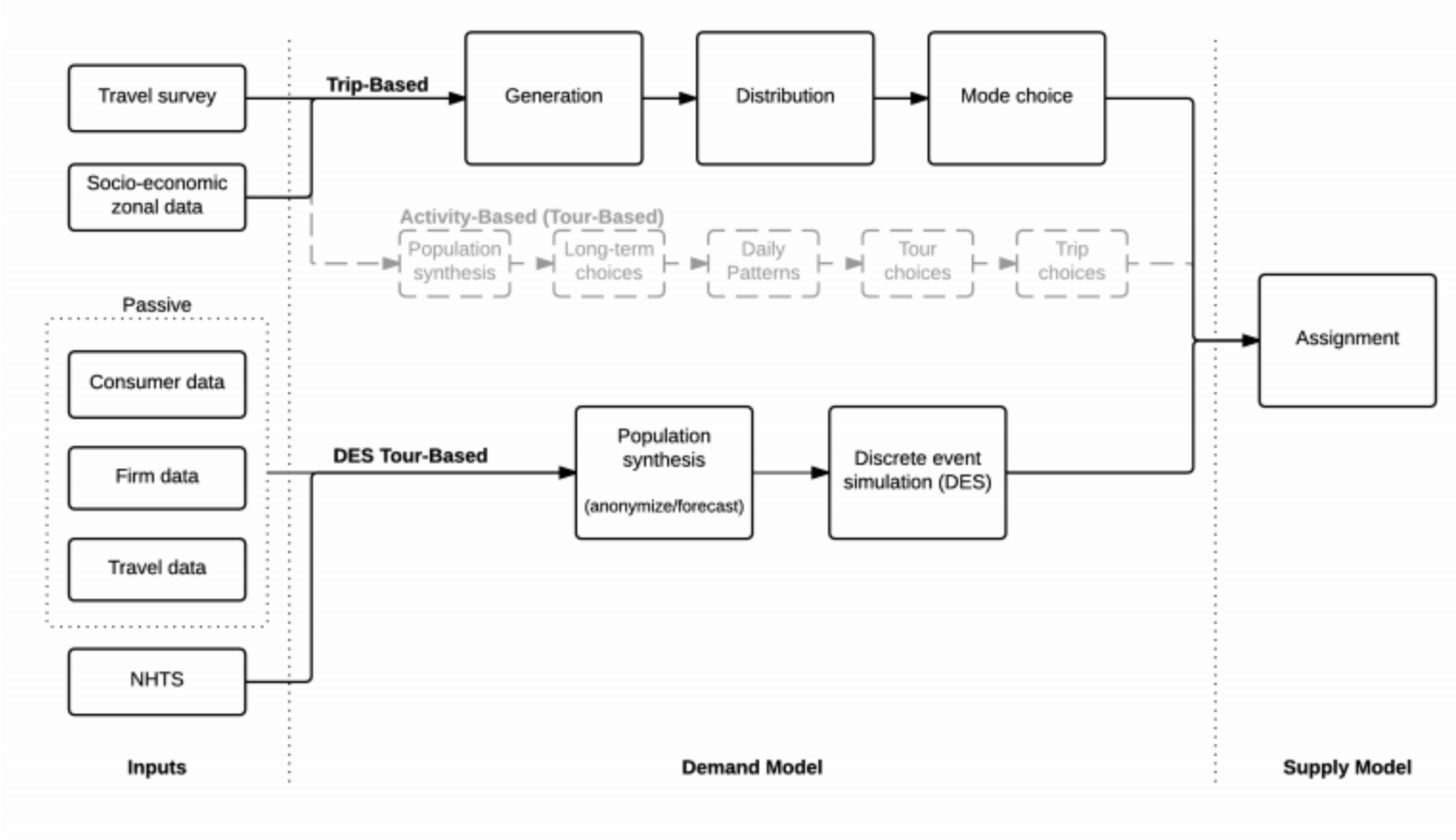
C4: Doing More with Limited Data Collection Budgets

Sept 13 AM



An Agile Tour-Based Model Built from Passive Data: A Case Study in Asheville, NC

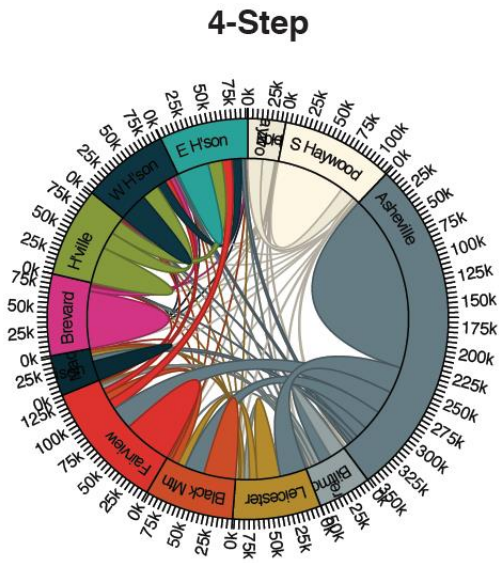
Josie Kressner, Transport Foundry

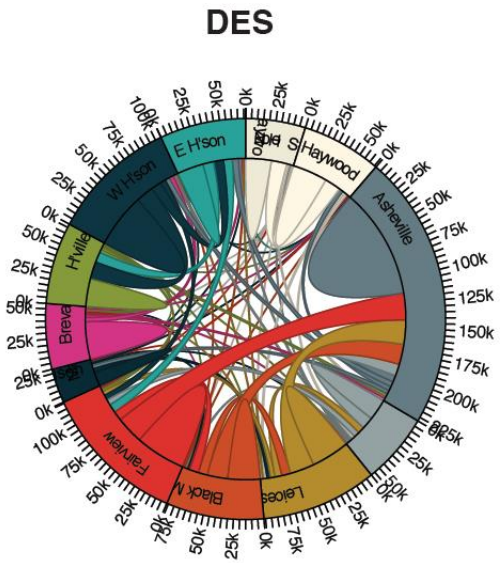


An Agile Tour-Based Model Built from Passive Data: A Case Study in Asheville, NC

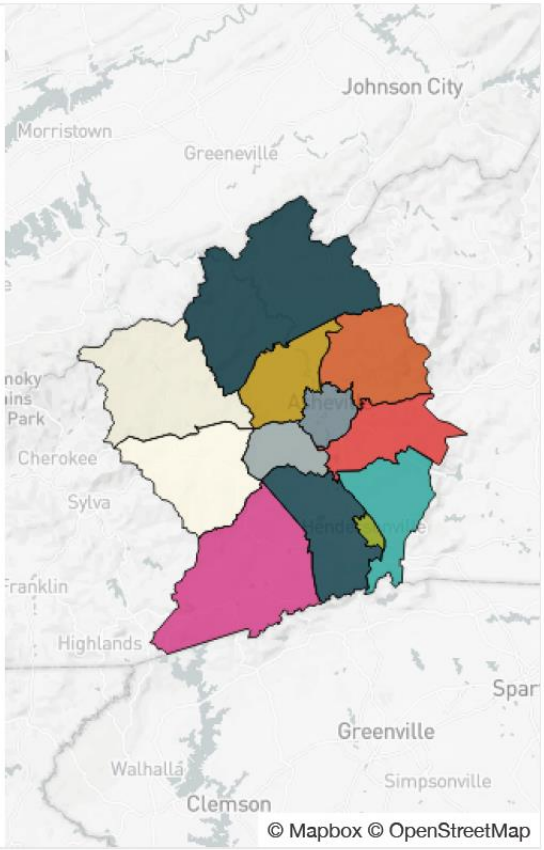
Josie Kressner, Transport Foundry

Trip Flows





http://projects.transportfoundry.com/tott/presentation_od.html



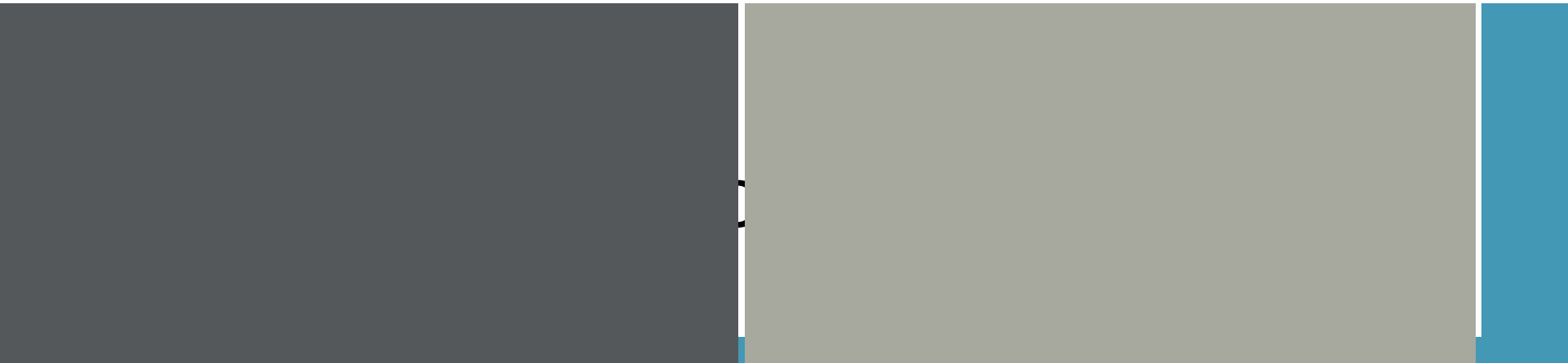
Big Data and Advanced Models on a Mid-Sized City's Budget: The Chattanooga Experience

Vince Bernardin Jr., RSG

- Selected Activity Based Model (New to Region)
- No HH Survey until 2020
  - AirSage Data
  - Travel Time Data
  - Truck GPS / O-D Data
  - Traffic / Bike Counts
- AirSage Calibration Approaches:
  - ODME
  - Interative Screenline Fitting
  - Shadow Pricing
- Limiations:
  - AirSage Not Good at Trip Purpose
  - Counts for ODME used for Validation

	Trip-based	Hybrid	Activity-based
Spatial Resolution	zone	zone	block
Temporal Resolution	AM/PM/MD/NT	AM/PM/MD/NT	minute-by-minute
Demographic Resolution	zone	household	person
Randomness	analytic	analytic	simulation
Behavior			
Urban Form	no	yes	yes
Trip-chaining	no	yes	yes
Tours/Physically Possible	maybe	yes	yes
Inter-personal Interactions	no	no	maybe
Re-scheduling	no	no	some
Output	matrix	matrix	table
Software	TransCAD	TransCAD	TransCAD& Daysim
Programming	GISDK	GISDK	GISDK & C#
Runtimes	~2 hrs	~4 hrs	~5 hrs
Hardware	any desktop	high end desktop	high end desktop
Calibration Effort	least	intermediate	most
Cost (resident demand ONLY)	~$175k	~$225k	~$275k

B5: Data and Bicycle/Pedestrian Demand



A GIS Based Bicycle Facility Demand-Suitability Priortization Tool

Jeff LaMondia, Auburn University

- "Shortest Path" Between Origin and Destination Census Tract Centroids
- Based on Normalized Cycling Impedance for Each Road/ Path Segment:

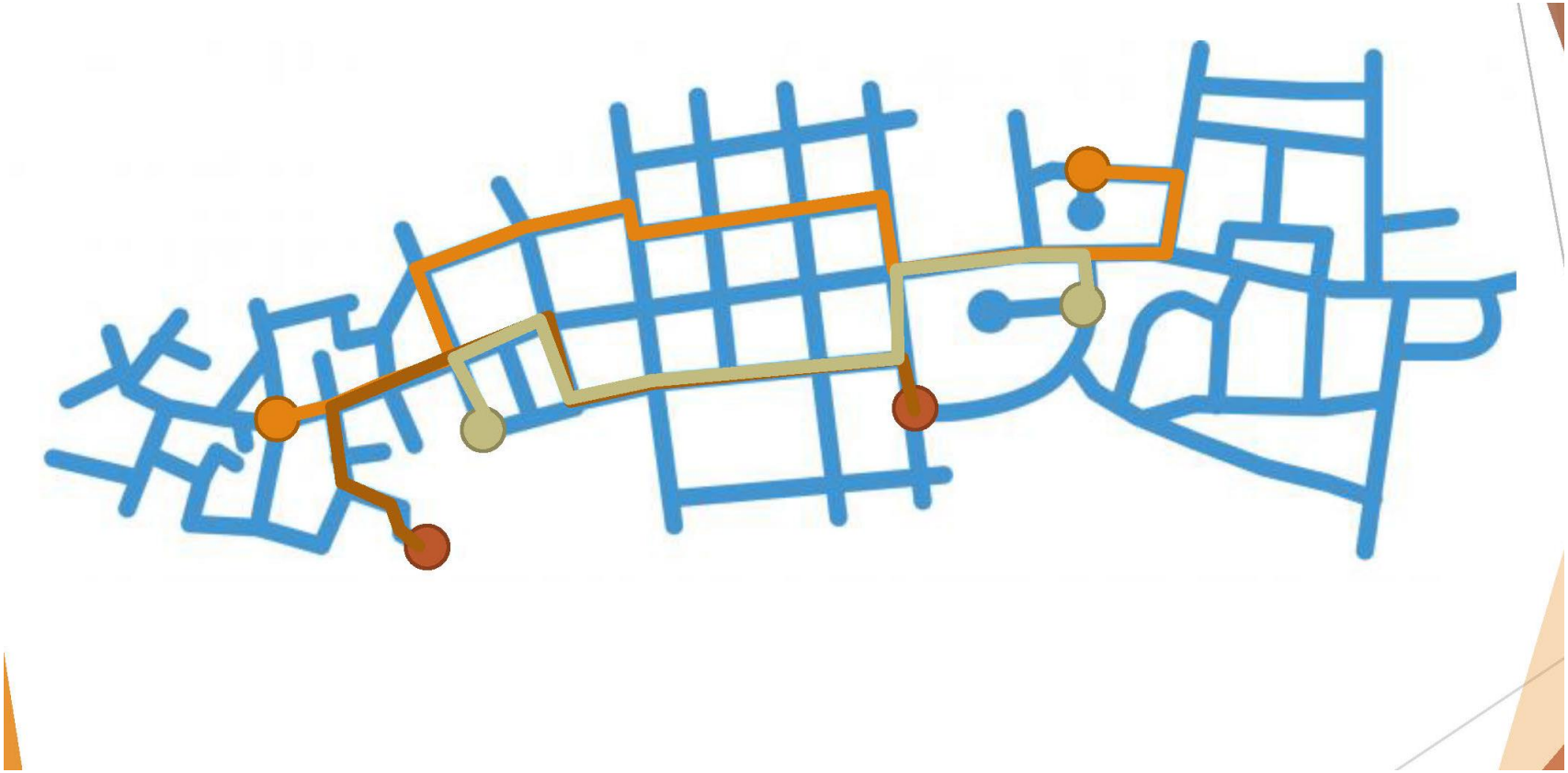
  Developed from cycling suitability survey, collected in Auburn AL (n=326)

- $$Impedance = \beta_d \frac{(d-d_{min})}{(d_{max}-d_{min})} + \beta_l \frac{(l-l_{min})}{(l_{max}-l_{min})} + \beta_v \frac{(v-v_{min})}{(v_{max}-v_{min})} + \beta_s \frac{(s-s_{min})}{(s_{max}-s_{min})}$$

Where d = distance traveled,
l = number of lanes,
v = traffic volume,
s = posted speed

A GIS Based Bicycle Facility Demand-Suitability Priortization Tool

Jeff LaMondia, Auburn University

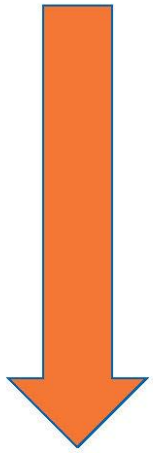


An Interim Synthetic Approach for Estimating Pedestrian Volumes in Smaller Communities

P. Ohlms & Z. Herrman, Virginia DOT

Methods

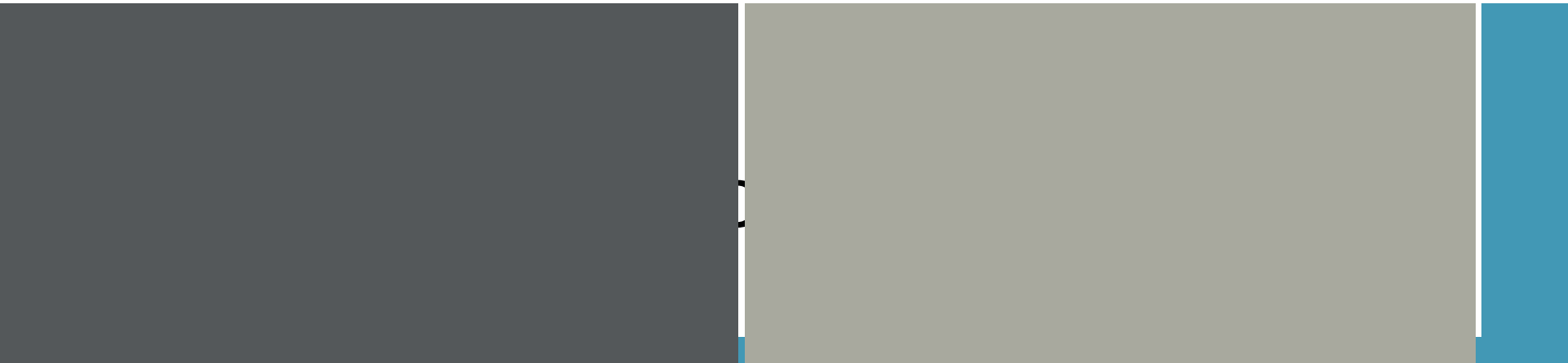
Increasing accuracy!



- Preliminary Stage: Data acquisition and synthesis
- Stage 1: Estimate pedestrian volume based on ADT alone
- Stage 2: Incorporate population density
- Stage 3: Incorporate speed limit, and number of lanes

VDOT

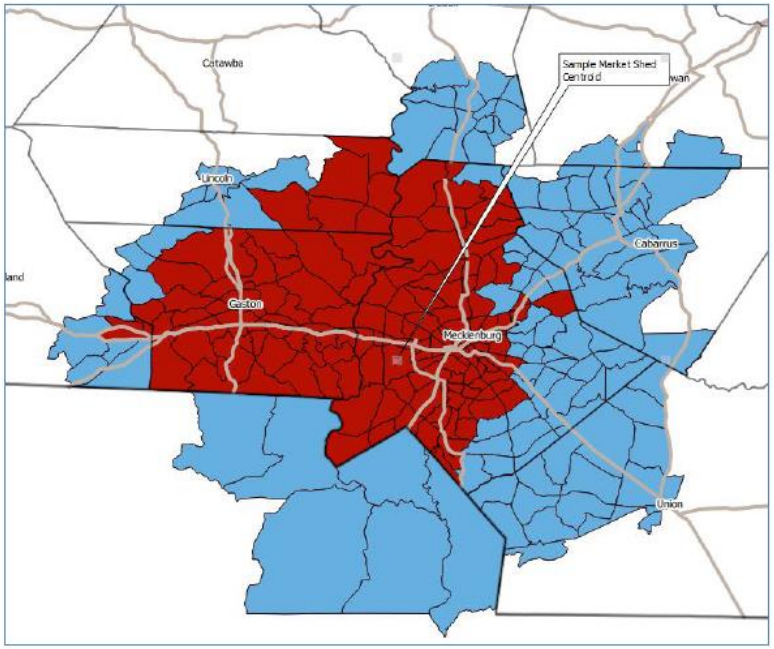
C6: Freight & Logistics



Measuring Freight Accessibility in Small & Medium-Sized Communities

Chandler Duncan, Economic Development Research Group

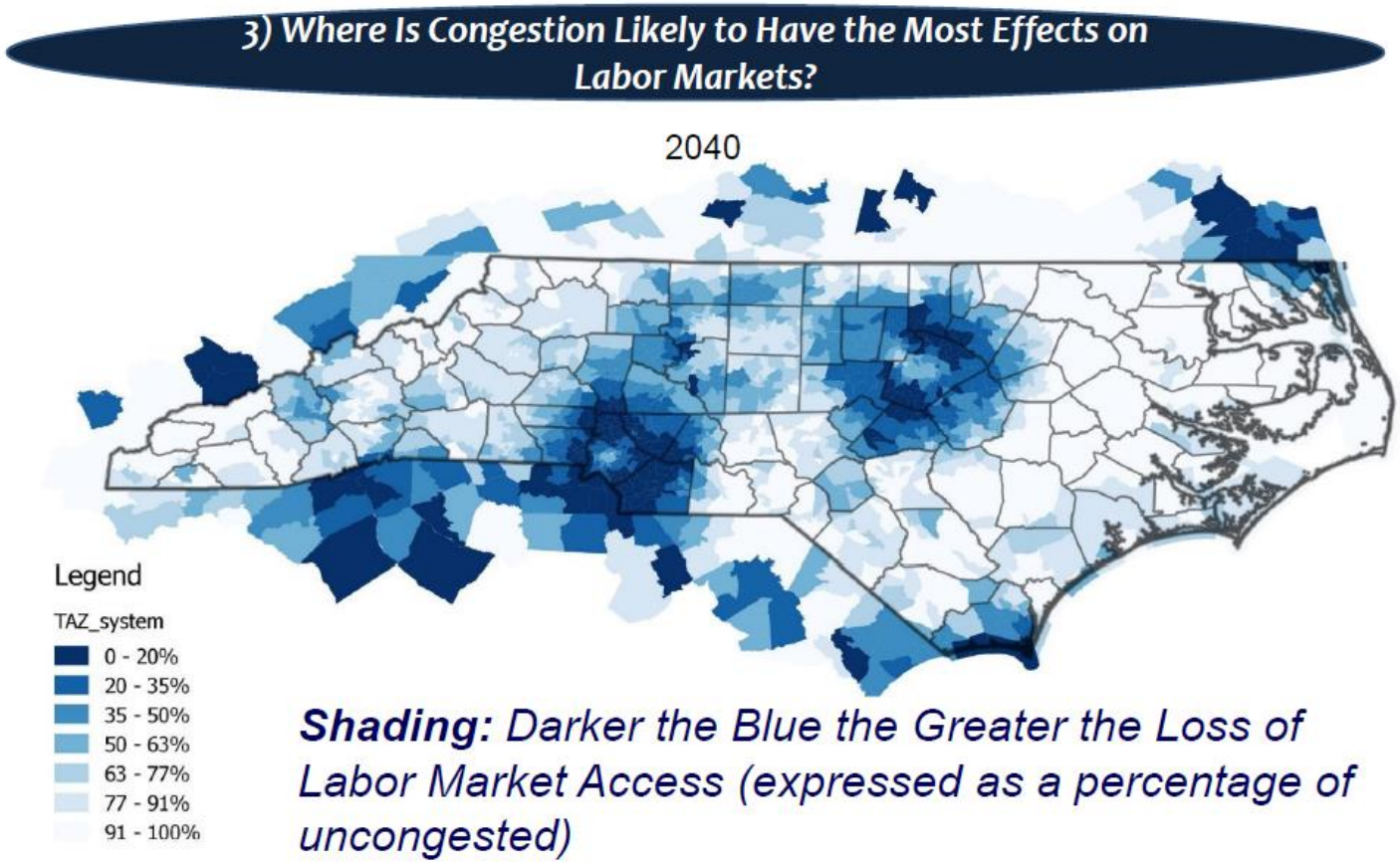
- Identified Performance Measures for Regional Freight:
  - Delivery Radius (180 Minutes)
  - Workforce Accessibility (40 Minutes)



Shading:
Red: *Existing Labor Market (40 minute drive) in 2040*
Blue: *Forfeited Labor Market (40 minute drive) in 2040 due to congestion*
Lines: *Major highways*

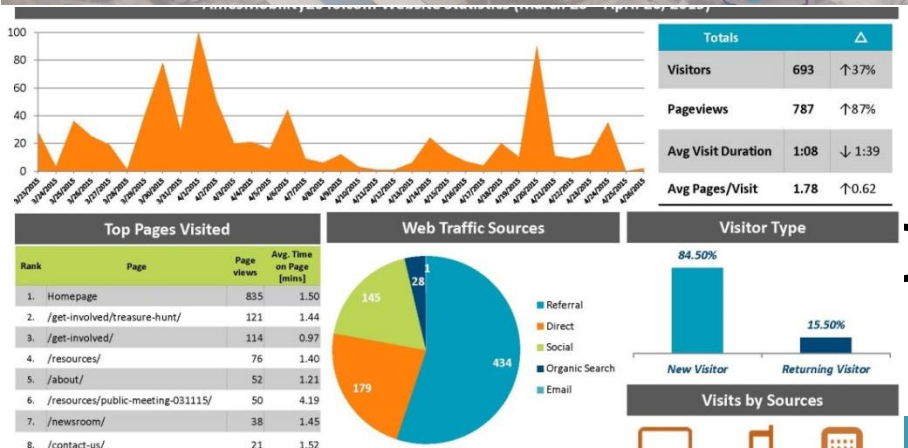
Measuring Freight Accessibility in Small & Medium-Sized Communities

Chandler Duncan, Economic Development Research Group



Performance-Based Assessment of Community Engagement Techniques for Long Range Transportation Plans

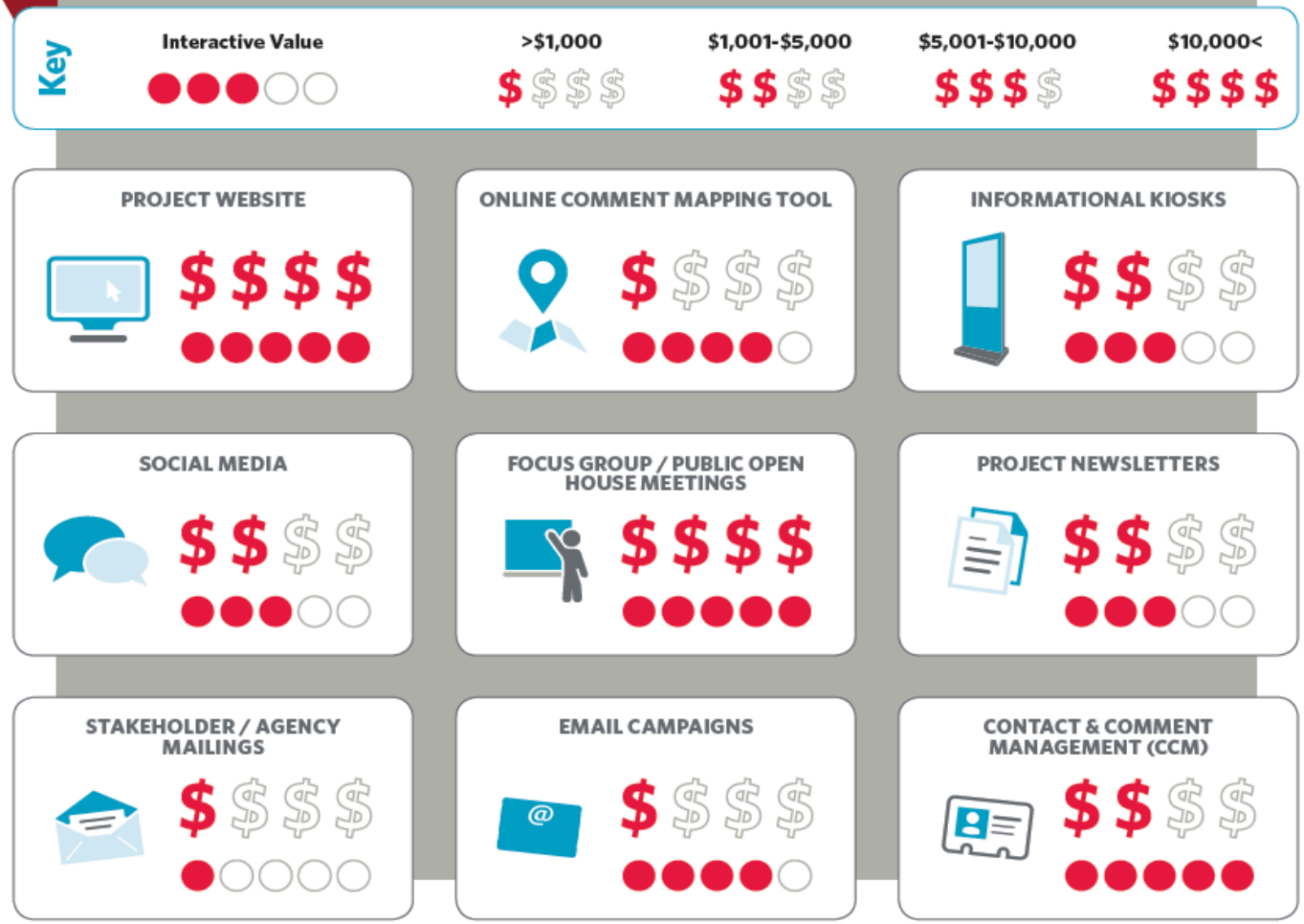
Jason Carbee and Theresa McClure, HDR



HOW TO MEASURE?

OVERALL INTERACTION VALUE ASSESSMENT

TOOLS OF THE TRADE



Interaction Value Index (IVI):

is value assigned to a communication tool to measure it's effectiveness at soliciting public engagement with a project. Each tool is evaluated on the quality and quantity of participation.

ECT ÷ B = IC

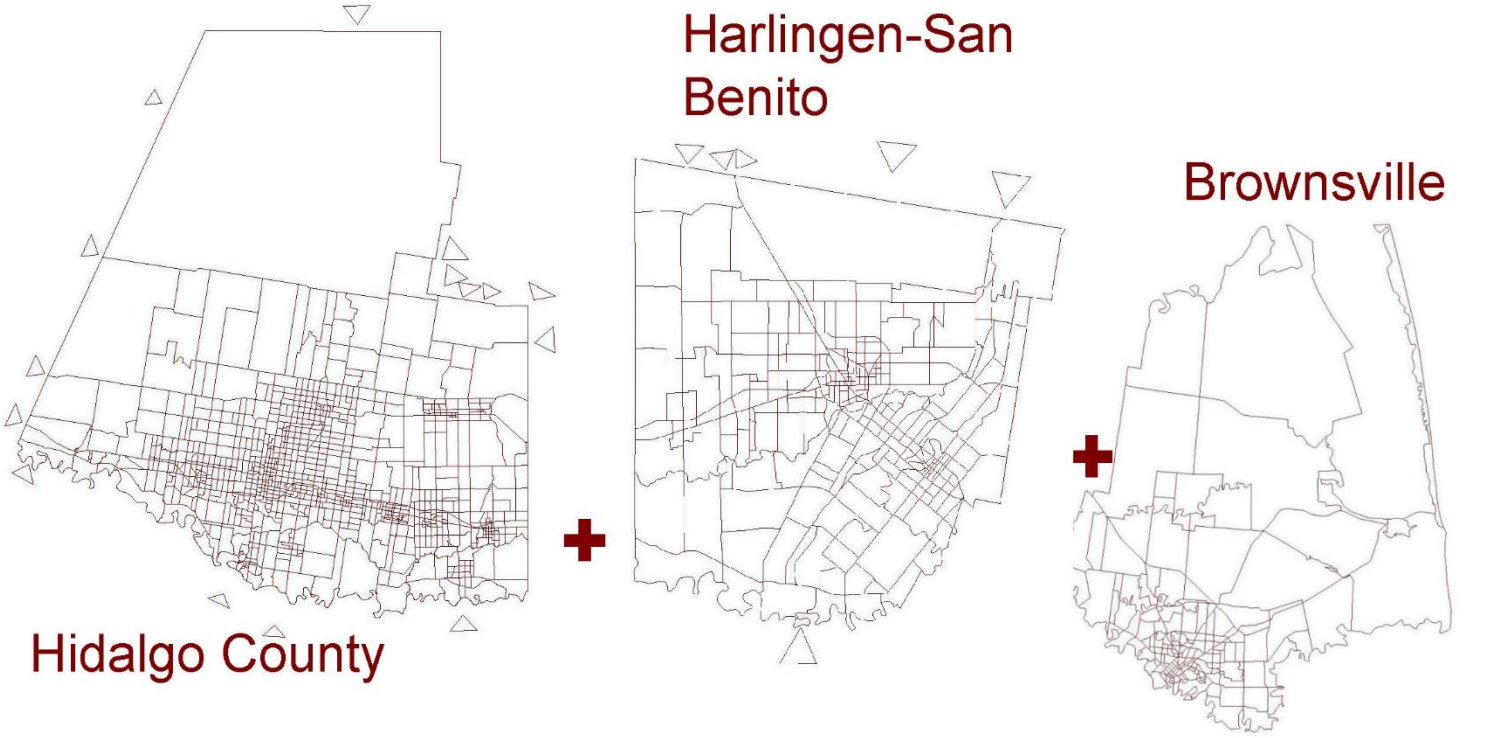
ECT = Estimated Cost of Tool
B = Benefits
IC = Interaction Cost
IV = Interaction Value

*IV is subjectively assigned

C7: Travel Demand Modeling

Challenges Associated with Creating a Combined Regional Model for Three Small-to Medium Sized MPOs

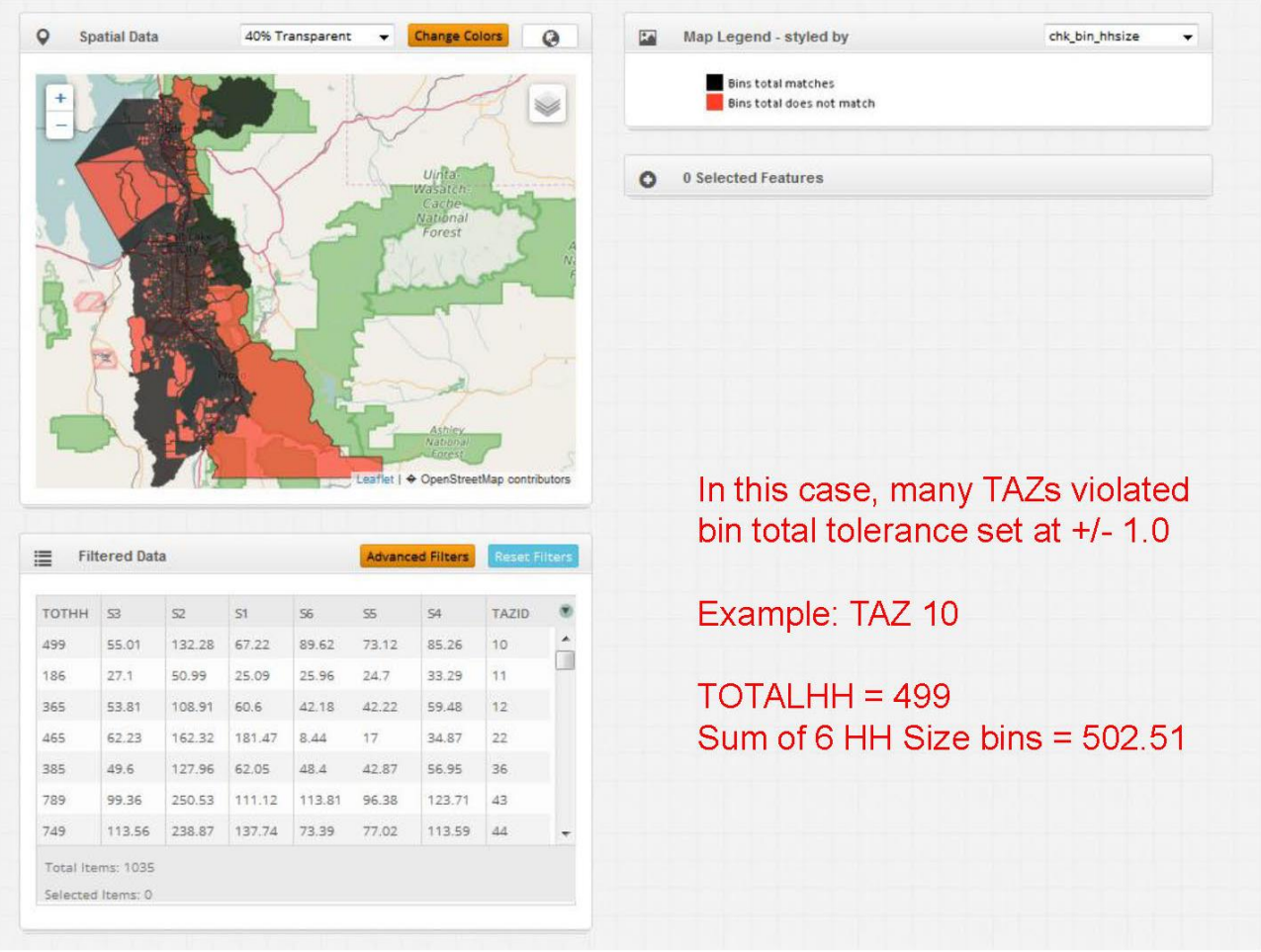
K. Hall, Texas A&M Transportation Institute



Texas A&M Transportation Institute

An Online Tool for Checking Travel Model Zone Data Consistency

J. Raw, FHWA



In this case, many TAZs violated bin total tolerance set at +/- 1.0

Example: TAZ 10

TOTALHH = 499
Sum of 6 HH Size bins = 502.51

C8: Travel Demand Modeling

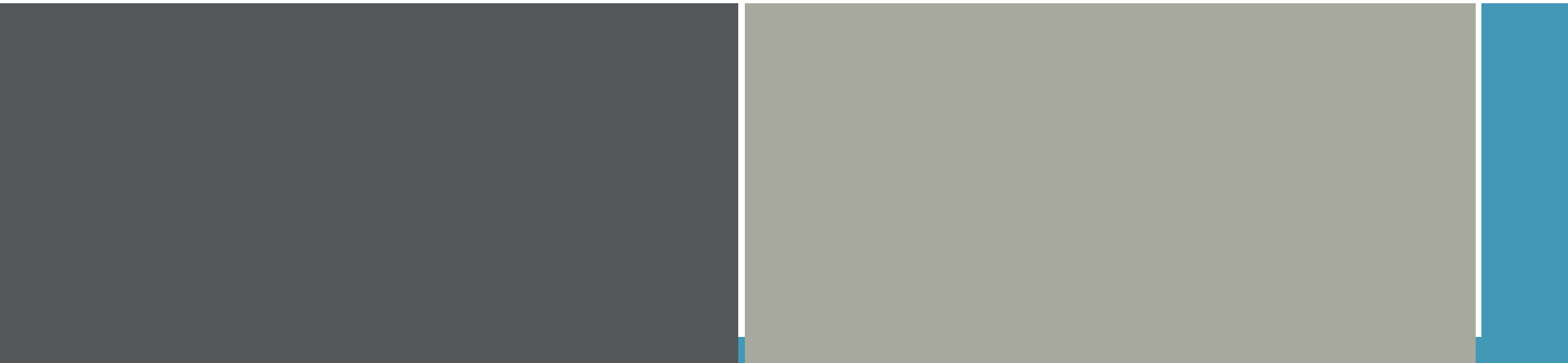
North Carolina Modeling Guidelines: The Next Generation and Beyond

Leta Huntsinger, Parsons Brinkerhoff

- Reasons for Standardization
  - Changes in scope and responsibility
  - Loss of institutional knowledge
- Enhancements
  - Updated household classification model
  - Special generators and special markets
  - Commercial vehicle model
  - External trip model
    - **Update to Modlin E-E model**
      - Update Regression Model Based on E-E Results of Statewide Model
  - Formula based capacity calculations
  - Graphical User Interface and Improved Reporting

- EE Model
  - Population (S)
  - Employment (S)
  - Area (S)
  - AWDT (L)
  - External volume (L)
  - Facility type: Interstate, Arterial, Local (L)

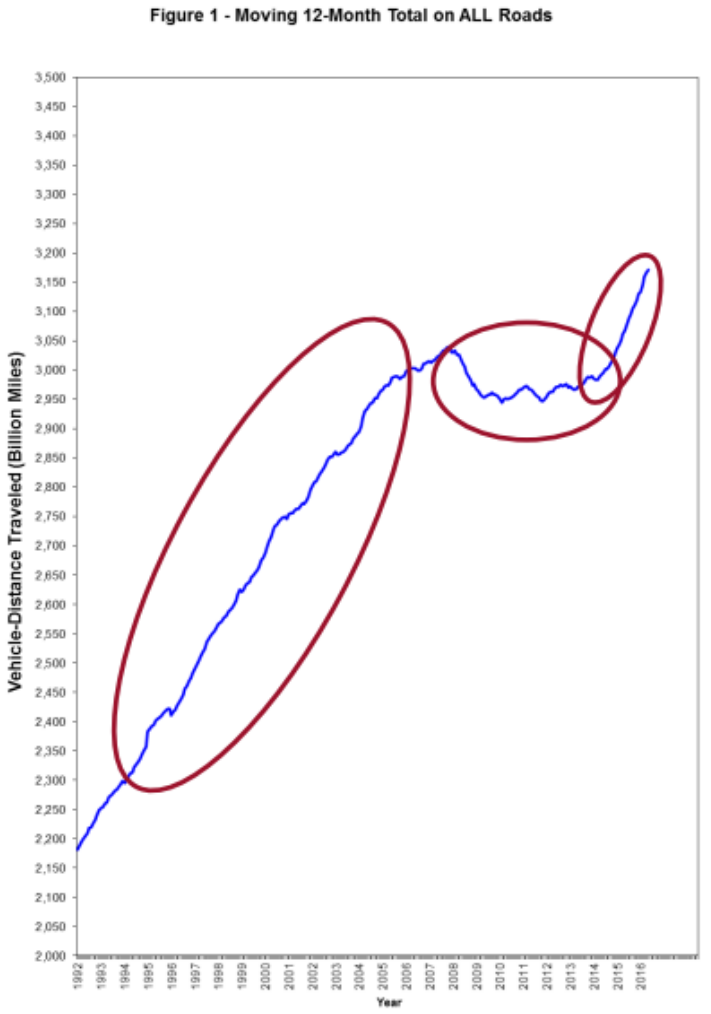
D8: Planning for Emerging Technology



The "Transportation Revolution" – How Do Planners Grapple with an Uncertain Future?

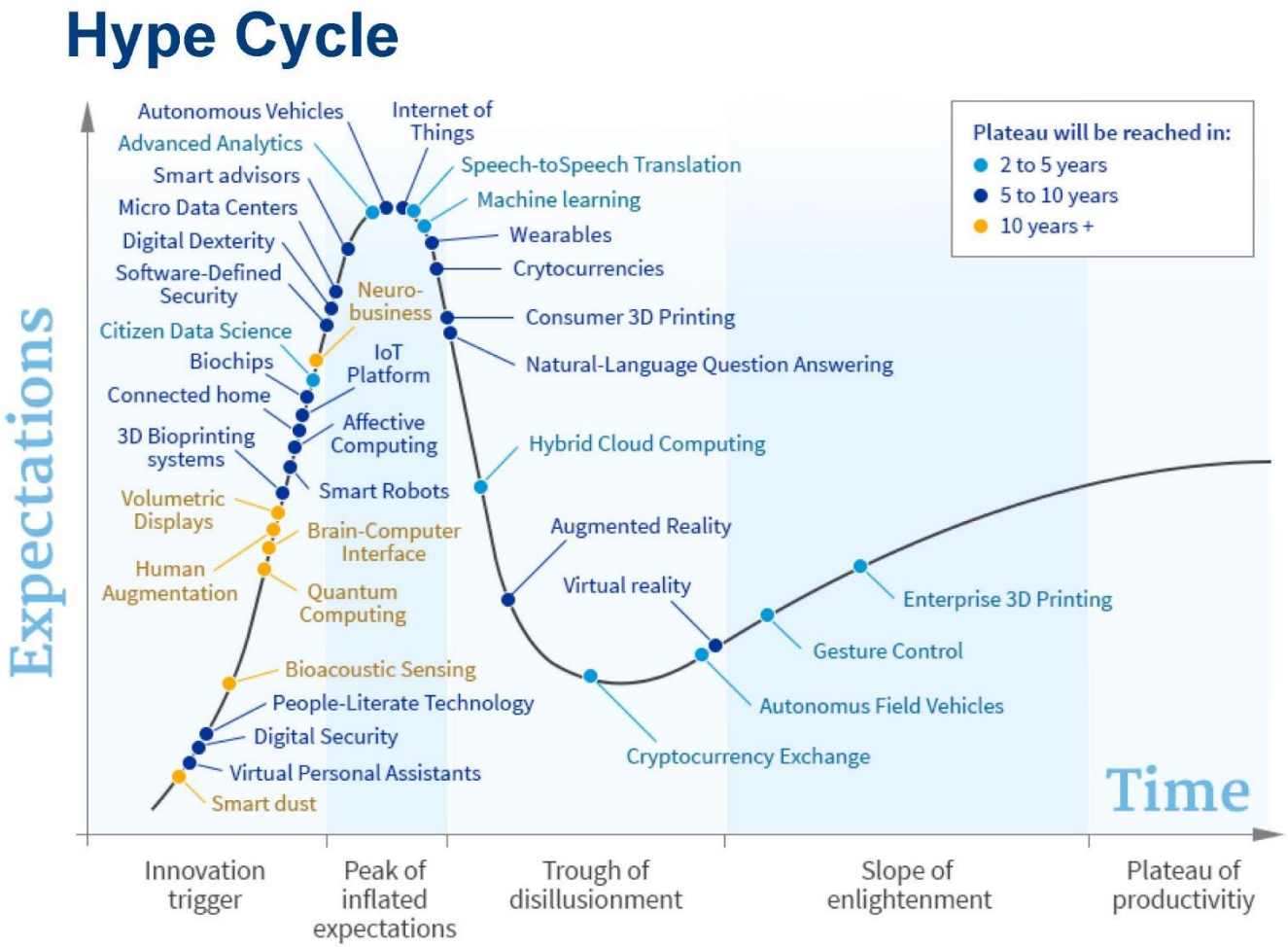
S. Gayle, RSG

- Changes in travel patterns will have impacts on:
  - Travel Demand
  - Infrastructure asset management
  - Safety
  - Operations
  - Sustainability
- New Tech
  - Mobility as a service
  - Autonomy and connection
  - 3D printing
  - Self healing pavement
- Scenario Planning is key



The Good and Bad News on Incorporating Automated and Connected Vehicles in Small and Medium-Sized Communities

J. Bittner, Applied Research Associates



The Good and Bad News on Incorporating Automated and Connected Vehicles in Small and Medium-Sized Communities

J. Bittner, Applied Research Associates

- **Trucking is going to be first**
  - Cost of service
  - Driver shortages
  - Distance and repetition
- **Capacity expansion will no longer drive the discussion**
  - Ribbon cuttings might be a thing for past
- **A new vehicle ownership model will emerge**
- **Transit providers will be disrupted – like taxi services**
  - Smart providers should partner now for on-demand services
- **2020 is the year for all of this**

2018 Conference

Kansas City, MO
September 12-14, 2018