LAND USE MODEL UPDATE

Planning and Land Use Advisory Committee
Meeting #1 – July 31, 2014
Presentation Outline

- Introduction and Background
- Land Use Model Function
- Study Design
- Data Collection
- Next Steps
Why Are We Here?

- Updating the Land Use Model
  - Integration with Regional Travel Demand Model and Future Long Range Planning Efforts
  - Estimate the Impacts of Land Use on Transportation Investments

- To be approved by the MPO Policy Board and Departments of Transportation for use in Travel Forecasting

- Need input and support during the development of the Land Use Model update
Background

- Current MPO Travel Demand Model
  - National/Regional/Sub-County Economic and Growth Forecast
  - Allocation to TAZ Level
  - Expert Panel Delphi Sessions
- Imagine 2040 (Previously called Imagine 2035)
  - MPO Developed CommunityViz Land Use Model
  - Regional visioning and scenario planning process
  - Used in the 2040 Long Range Transportation Plan
Imagine 2040

- Imagine 2040 was a Regional Visioning and Scenario Planning Exercise
- Public Outreach was a critical component to:
  - Identify Community Values to guide the goals and objectives of the Land Use Model
  - Develop the suitability factors through focus groups
    - Business and Development Focus Group
    - Community and Civic Focus Group
    - Government Focus Group
    - Planning Department Focus Group
  - Generate Place Types for the region based on the existing land use and comprehensive plans of jurisdictions in the MPO area
  - Imagine growth visions, alternative scenarios and development tradeoffs through the Chip Game
Current Land Use Model Update

- Shelby County
- DeSoto County
- Crittenden County
- Tunica County
- Tate County
- Fayette County
- Tipton County
- Marshall County

Legend
- State Boundary
- County Boundary
- Current Model Boundary
- Updated Model Boundary
What is CommunityViz?

• Land Use Planning Modeling Tool
  • Evaluates different land use scenarios
  • Environmental, economic, and social impact analysis

• GIS-based analysis and 3D modeling
  • ArcGIS Extension
  • “Visualize, Analyze, Communicate”

• Integration with Regional Travel Demand Model
How does the Land Use Model work?

• **Place Types**
  - General categories of land use
  - Character of an area
    - Land use, density, building height, street pattern, etc.
  - Rural, suburban, and urban places

• **Suitability Factors**
  - Helps predict where new growth is likely to go

• **Growth Allocation**
What CommunityViz Can and Can’t Do?

**CAN DO:**
- Micro, meso or macro scenario analysis
  - Regional planning/comprehensive planning
  - Corridor analysis
  - Site redevelopment
- Determining land suitability
  - Environmental constraints
  - Current/Future Infrastructure location
- Build-out analysis
  - Determine future growth potential
- Cost-benefit comparison
- Dynamic outputs

**CAN’T DO**
- Turn bad data into good data
- It can forecast future development, but it can’t predict it
- It can’t account for everything
- Replace key decision-making processes
Timeline

Data Collection

Study Design

Model Development

Model Validation

ETC and TPB Meeting (August)

PLUAC Meeting #1 (July)

PLUAC Meeting #2 (September)

PLUAC Meeting #3 (October)

Transportation Policy Board Approval (November)

Training
STUDY DESIGN

Assessment of Current Land Use Model
Current Limitations

- Regional TDM integration
- Data uniformity
- Data size/run time
- Redevelopment
- Scenario planning
Dis-integrated modeling

- Five sub-models across the Greater Memphis Region
- Four separate model runs/analyses
- Difficult to model regional systems
Data uniformity

- Parcel-based polygons
- Varying shapes and sizes
- Difficult to allocate placetypes
Data uniformity

- Difficult to display data across the region
Data size and run time

• Many records = large files
• Many records = long run time
  • 420,000 records * 20 attributes = 8.4 million calculations
  • 420,000 records * 40 attributes = 16.8 million calculations
  • 420,000 records * 80 attributes = 33.6 million calculations
Redevelopment

• Growth is allocated to vacant land
• What about redevelopment?
  • Intensification of existing places
  • Example: Mid-town
Scenario Planning

- Explore the “what if’s” of a region’s future
  - Analytical process for developing a shared, long-term vision of a community
- Considers the tradeoffs between different development scenarios or policy decisions
- Re-frame local growth questions
- Answer what, where, when & how development occurs within a more sustainable region
Scenario Planning

• Changes in capacity
  • Placetype designations
  • Character, type and amount

• Changes in demand
  • Driven by suitability score

• “Black Box” approach to scenarios

• Big picture visioning capability is desired
I-269 Allocation

Placetypes

Suitability

Employment Allocation
Model Enhancements

- Grid framework
- Integrated regional model
- Redevelopment
Grid Framework

• Uniform polygon structure.
• Uniform data visualization.
• More precise application of placetypes.
• Examples: PlanET, Imagine Central Arkansas, DeSoto Discovery.
PlanET

- Five-county region
- 40-acre grid
Uniform data visualization

• PlanET
Uniform data visualization

- Imagine Central Arkansas
Integrated Regional Model

• One model run per scenario
• Regional systems modeling
• Less than 50,000 polygons (ideally closer to 30,000)
• Examples: PlanET; Imagine Central Arkansas
PlanET

- 30,000+ polygons
- One model
- Run times
  - Allocation: 2 hours
  - Indicators: 2-8 hours
Imagine Central Arkansas

- Four-county region
- 50,000+ records
- Run times
  - Allocation: 3-4 hours
  - Indicators: 4-8 hours
Redevelopment

• “Overwrite” existing development
• More intense OR less intense placetypes
  • Add new growth
  • Net out existing development
• Examples: PlanET, Southeast Area Corridor Study
PlanET redevelopment approach

- 20.8 acres are redevelopable
- 50% redevelopment rate for Mixed Use Corridor
- 50% of this polygon (10.4 ac) will redevelop as a MUC placetype.
Southeast Area Corridor Study

- Property values
- Non-residential
- Improved-to-property ratio
  - General Urban - < 0.75
  - Town Center - < 1.25
  - TOD - < 2.00
Growth Concepts

**Existing Conditions**
- Continuation of current trends.
- Growth in suburban areas and along major corridors.
- Single family subdivisions, some apartments.
- Car is primary form of transportation.

**Grow Everywhere**
- Growth in suburban and rural areas.
- Primarily single family subdivisions, large-lot rural.
- Car is primary form of transportation.

**Grow Corridors**
- Growth along highway corridors.
- Mix of suburban growth and new town centers.
- Primarily single family subdivisions.
- Car is primary form of transportation.

**Grow New Centers**
- Walkable mixed-use centers.
- Compact growth.
- Nearby neighborhoods.
- Mix of housing options.
- Mix of transportation options.

**Grow Cities & Towns**
- Mix of in-town reinvestment and new places.
- Walkable mixed-use centers.
- Compact growth.
- Nearby neighborhoods.
- Mix of housing options.
- Mix of transportation options.
GS&P modelled the different growth concepts using GIS tools. GS&P was able to use the model results to present a clear and telling picture of the long term implications of the growth concepts. The robust analysis addressed stakeholder concerns from a variety of perspectives, including housing, environmental, infrastructure, planning and economic development.
Impervious Surface

Existing Conditions

Grow Everywhere

Grow Corridors

Grow New Centers

Grow Cities & Towns

<table>
<thead>
<tr>
<th>Acres</th>
<th>Trend</th>
<th>Dispersed</th>
<th>Highway</th>
<th>Cities and Towns</th>
<th>New Centers</th>
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</thead>
<tbody>
<tr>
<td>Acres</td>
<td>15,300</td>
<td>16,100</td>
<td>14,800</td>
<td>13,100</td>
<td>12,200</td>
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</table>

Trend

Dispersed

Highway

Cities and Towns

New Centers

Growing cities and towns by focusing on:
- Grow Cities & Towns
- Grow Corridors
- Grow Everywhere
- Grow New Centers

Existing conditions with an existing impervious surface.
Grow Cities & Towns
Grow New Centers
Grow Corridors
Grow Everywhere

Existing Conditions
Unserved Water Demand

Trend
Dispersed
Highway
Cities and Towns
New Centers

Photo credit: Matt Swint
Land Use Designer
Group Input

• What model enhancements would you like to see?
• Grid framework?
• Integrated regional model?
• Redevelopment?
• Scenario planning?
• What else?
DATA COLLECTION
Data Collection

- Update existing model data where needed
- Obtain data for expanded areas
- Address Inconsistency or gaps in available data
- Simplify data where possible
Data Needs

- Land use/zoning maps
- Parcel data layer
- Water/sewer infrastructure and service areas
- Transportation Infrastructure (roads, transit, pedestrians)
- Civic buildings (e.g., libraries, museums, police stations, fire stations)
- Water bodies
- Conservation/open/protected areas
- Floodplains/floodways
- Other known local environmental constraints
- Park locations
Reviewing Data Coverage

- Currently in the process of reviewing data availability
Next Steps

- Engineering and Technical Committee Meeting (8/7/2014)
- Transportation Policy Board Meeting (8/21/2014)
- Complete Study Design
- Complete Data Collection
- Model Development
  - Planning and Land Use Committee Meeting #2 (Early September)
  - Planning and Land Use Committee Meeting #3 (Early October)
- Engineering and Technical Committee Meeting (11/6/2014)
- Transportation Policy Board Meeting (11/20/2014)
  - Approval of allocation
QUESTIONS?

Thanks for your time!