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
- 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
- Training

- PLUAC Meeting #1 (July)
- PLUAC Meeting #2 (September)
- PLUAC Meeting #3 (October)
- ETC and TPB Meeting (August)
- Transportation Policy Board Approval (November)
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.
Grow Cities & Towns
Grow New Centers
Grow Corridors
Grow Everywhere

Existing Conditions

Unserved Water Demand

- Unserved Water Demand
- Existing Conditions
- Grow Everywhere
- Grow Corridors
- Grow New Centers
- Grow Cities & Towns

Bar Chart:
- Trend: 49,200
- Dispersed: 63,000
- Highway: 51,500
- Cities and Towns: 25,200
- New Centers: 25,000
Land Use Designer

- Create Features
- Indicators
- Net New Employment: employees 177,982
- Net New Commercial Employment: employees 35,550
- Net New Industrial Employment: employees 11,772
- Net New Office Employment: percent 128.631
- Net New Population: units 295,514
- Net New Dwelling: units 117,115
- New Employment - Knox: employees 130,640
- New Employment - Anderson: employees 15,910
- New Employment - Blount: employees 19,450
- New Employment - Union: employees 2,121
- New Employment - Loudon: employees 9,634
- New Population - Knox: people 184,083
- New Population - Anderson: units.person 13,252
- New Population - Blount: units.person 59,630
- New Population - Union: people 8,891
- New Population - Loudon: people 29,543
- Dispersed vs Highway: Cities and Towns vs New Centers

Memphis MPO
Metropolitan Planning
Strengthening Region
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!