Integrating FSUTMS & Land Use Forecasting Analysis Tools

presented to
Land Use Subcommittee

presented by
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Agenda

• Purpose of Evaluation
• Systems Evaluated
• Assessments
• Findings
• Recommendations
Purpose of Evaluation

• Assess Land Use Model Platforms vs. Potential to Meet MTF Objectives
  – On-going FDOT Research Efforts
  – A Rule-Based Model
• Evaluate by “Real World Testing”
  – Documentation
  – Data Development Requirements
  – Ability to Integrate with a FSUTMS Model
  – Output Usability

Systems Evaluated

<table>
<thead>
<tr>
<th>Land Use Model Name</th>
<th>Current Development Status</th>
<th>Currently Ready for Full FSUTMS Integration</th>
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</thead>
<tbody>
<tr>
<td>Interactive Growth Model, aka IGM</td>
<td>Web-based, proprietary</td>
<td>No due to web-based interactive nature of design.</td>
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<tr>
<td>Steve Rename</td>
<td>Stand Alone PC Compiled Program (C++)</td>
<td>Yes as it operates with ASCII files and on a local host machine.</td>
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<tr>
<td>LandSYS</td>
<td>Draft Stand Alone PC Compiled Program (MATLAB)</td>
<td>Not yet as User Interface is not fully developed and methods not fully tested.</td>
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<tr>
<td>CommunityViz</td>
<td>Proprietary ArcGIS Extension</td>
<td>Not yet due to interactive nature of software design and lack of a fully exposed API.</td>
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Assessments

- IGM
  - Dropped Due to Web-based Design, Proprietary and Lack of Documentation
- Steve Rename
  - Tested Using Current Statewide Model
- LandSYS
  - Tested Using Developer Datasets (Orange County)
- CommunityVIZ
  - Tested Using Hillsborough County Parcel Data

Steve Rename

- Pros
  - Quick and easy to run
  - Stand-alone application
  - “Real World” implementation with statewide model
- Cons
  - Limited documentation
  - No diagnostic reporting
**LandSYS**

- **Pros**
  - Small-scale geography
  - Estimated based on Local Data
  - Incomplete design due to lack of data

- **Cons**
  - No “Real World” application
  - Partially developed User Interface (UI)
  - Limited documentation
  - No diagnostic reporting

**CommunityVIZ**

- **Pros**
  - Full ArcGIS Extension
  - Full documentation
  - Fully developed interactive user interface

- **Cons**
  - No way at present to automate execution
  - Data structures would be challenging for anything the size of a regional model or larger
Findings

- Steve Rename and LandSYS have been developed and sponsored by FDOT and as such, FDOT owns rights to the intellectual property.
- The two operate at differing levels of geography (zones for Steve Rename and parcels/grid cells for LandSYS) offering planning partners a choice to meet whichever level they are most comfortable operating.
- Both can be used as stand-alone applications, in a full FSUTMS feedback design, or interactively. This will allow easy migration of these models from the PC to “the cloud.”
Recommendations

• Continue FDOT Research & Development Efforts on Steve Rename and LandSYS with a Focus on “Critical Path” to Usability:
  – **Documentation** - both models will need to have their technical specifications and data requirements fully documented.
  – **User Interface** - Both models require additional development efforts on their user interface. Steve Rename uses a control file that is not editable in the user interface and LandSYS does not have a fully functional interface.
  – **Diagnostic Reporting** - Neither model produces diagnostic reports necessary for model verification, validation, calibration or debugging.
  – **“Run” Reporting** - Neither model produces user-friendly reports that describe how the model runs, what parameters were used, and summaries of inputs and outputs.
  – **Standardized Data Structures** - Both models require significant user effort preparing input data. Given the disparity of data availability and quality around the state, coming up with useful standardized pre and post-processors will significantly reduce model development time and effort.