

Appendix 2:
SOME Pseudo-class templates for “Mr. Potatohead” generic ABM/LUCC modeling
framework
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I. Information/Data classes:

1. Landscape Representation
Structure (Functionality)
 - *Realism
 - Theoretical
 - Real-world
 - *Spatial data structure:
 - cell-based (raster, hex, etc.)
 - *Parcel structure
 - Fixed
 - *Agent holdings
 - One parcel per agent
 - More than one agent (or parcel) per cell possible
 - *Decision-making units
 - Single decision/land use per parcelData Layers/Themes
 - *Land ownership and/or use (Agent Occupancy)
 - Aesthetic quality: based on terrain, water features, and land cover
 - Service Center Occupancy
2. Other spatial data inputs (potentially, GIS functionality)
 - Network models
 - Transportation
 - Neighborhood effects
 - fixed-radius for calculation of neighborhood density
 - Distance to service centers
3. Institutional/Political rules and constraints
 - *Land tenure rules: agents and service centers have occupancy rights
 - Zoning for density
4. Potential Land Uses
 - Residential
 - Service centers
 - Open space

III. Demographics classes:

1. *Agent class

- Residential
- Service Center (job and service provider)

*Agent decision model (function)

- *Calculate payoffs
 - Utility based on aesthetics and distance to service centers
- *Decision strategy
 - Utility maximizing, but with incomplete information

Internal characteristics (Data)

- Residential preferences

2. Demographic dynamics (functions)

- In-migration

V. Land exchange class

1. Acquirers of land
 - Parcels they hope to acquire, sampled randomly
 - Parcel accessibility (I.2)
 - Neighborhood effects (I.2)
 - *Institutional rules and constraints
 - Land-tenure rules (I.4)
 - Biophysical suitability/capability
2. Exchange rules
 - Event sequencing/triggers for land transfers
 - In-migration (SLUCE)
 - Allocation mechanism
 - Agent occupies chosen parcel (SLUCE)

VI. Model operation class

1. Model initialization

- *Initial landscape structure (I.1)
- Transport networks and initial accessibility/travel costs (I.2)
- Neighborhood effects (I.2)
- *Institutional rules and constraints (I.4)
- Initial input from external biophysical and socioeconomic models (II)
- *Agent types, numbers, and preferences (III)

2. Temporal Dynamics

- *Discrete time, synchronous agent actions
- Number of iterations
 - Variable, depends on number of agents to allocate
 - Discrete events