AURIN What If?: Decision Support for Projections of Land Use Allocations

Marcos Nino-Ruiz, Christopher Pettit, Martin Tomko, Robert J. Stimson and Richard O. Sinnott
Australian Urban Research Infrastructure Network (AURIN), www.aurin.org.au
The University of Melbourne, 3010 VIC
Corresponding author: marcosnr@unimelb.edu.au
AGENDA

1. Introduction
2. Framework Architecture
3. Workflow example
4. Summary and conclusions
INTRODUCTION

“What If?”

Projects alternative future land use, population and employment patterns by allocating the projected land use demands to different locations on the basis of their relative suitability and certain allocation guidelines.
Projects alternative future land use, population and employment patterns by allocating the projected land use demands to different locations on the basis of their relative suitability and certain allocation guidelines.

1. Explore Current Conditions (Current): allows to see current land uses in the study area.
Projects alternative future land use, population and employment patterns by allocating the projected land use demands to different locations on the basis of their relative suitability and certain allocation guidelines.

1. **Explore Current Conditions (Current):** allows to see current land uses in the study area.
2. **Evaluate Land Suitability (Suitability):** determine the suitability of different locations for accommodating different land uses.

"WHAT IF?"
Projects alternative future land use, population and employment patterns by allocating the projected land use demands to different locations on the basis of their relative suitability and certain allocation guidelines.

1. **Explore Current Conditions (Current):** allows to see current land uses in the study area.
2. **Evaluate Land Suitability (Suitability):** determine the suitability of different locations for accommodating different land uses.
3. **Project Demand for Land (Demand):** prepare different scenarios projecting the future demand for different land uses.
Projects alternative future land use, population and employment patterns by allocating the projected land use demands to different locations on the basis of their relative suitability and certain allocation guidelines.

1. Explore Current Conditions (Current): allows to see current land uses in the study area.
2. Evaluate Land Suitability (Suitability): determine the suitability of different locations for accommodating different land uses.
3. Project Demand for Land (Demand): prepare different scenarios projecting the future demand for different land uses.
4. Project Alternative Futures (Allocation): project future alternative scenarios according to the given assumptions.
... Another component of the “AURIN federation”
✓ Loosely-coupled, RESTful, modular architecture!
REST web service interface with AURIN infrastructure
“WHAT IF?” WORKFLOW

Headers: content-type: application/json

```json
{
"POLYGON": "POLYGON((16984217 -2909268, 16984217 -
2906580, 16990000 -2906580, 16990000 -2909268, 16984217 -
2909268))",
"projectId": "2",
"scenario": "Suburbanization",
"landuse": "Residential",
"factor1": "slopes",
"rating1": "8.3",
"factor2": "Costal Wetlands",
"rating2": "2.3",
"CRS_ORG": "EPSG:900913"
"CRS_DEST": "EPSG:28356"
}```
Separation of concerns...
"WHAT IF?" ARCHITECTURE

1. "What if" request

2. Delegates "What If" Session

3. Web Service request

4. Get Info

5. Process Land Use Allocation

"What If" Controller

"What If" Analyser Service

Aurin Environment
“WHAT IF?” WORKFLOW

1. “What if” request

2. Delegates “What If” Session

3. Web Service request

4. Get Info

5. Process Land Use Allocation

6. Web Service notification

7. Publish Results
“WHAT IF?” SUITABILITY OUTPUT

<table>
<thead>
<tr>
<th>uaz_demonstration</th>
<th>ELU</th>
<th>GROWTH_1</th>
<th>GROWTH_2</th>
<th>SCORE_1</th>
<th>SCORE_2</th>
<th>SCORE_3</th>
</tr>
</thead>
<tbody>
<tr>
<td>uaz_demonstration</td>
<td>6559</td>
<td>1.0</td>
<td>4.0</td>
<td>2.0</td>
<td>-1.0</td>
<td>26700.0</td>
</tr>
<tr>
<td>uaz_demonstration</td>
<td>7180</td>
<td>41.0</td>
<td>4.0</td>
<td>2.0</td>
<td>-1.0</td>
<td>-100.0</td>
</tr>
<tr>
<td>uaz_demonstration</td>
<td>6942</td>
<td>91.0</td>
<td>4.0</td>
<td>2.0</td>
<td>-100.0</td>
<td>-100.0</td>
</tr>
<tr>
<td>uaz_demonstration</td>
<td>7073</td>
<td>1.0</td>
<td>4.0</td>
<td>1.0</td>
<td>-1.0</td>
<td>0.0</td>
</tr>
<tr>
<td>uaz_demonstration</td>
<td>6909</td>
<td>41.0</td>
<td>4.0</td>
<td>2.0</td>
<td>-1.0</td>
<td>-1.0</td>
</tr>
<tr>
<td>uaz_demonstration</td>
<td>7211</td>
<td>1.0</td>
<td>4.0</td>
<td>2.0</td>
<td>-1.0</td>
<td>19200.0</td>
</tr>
<tr>
<td>uaz_demonstration</td>
<td>6887</td>
<td>41.0</td>
<td>4.0</td>
<td>2.0</td>
<td>-1.0</td>
<td>-1.0</td>
</tr>
<tr>
<td>uaz_demonstration</td>
<td>6878</td>
<td>91.0</td>
<td>4.0</td>
<td>2.0</td>
<td>-100.0</td>
<td>-100.0</td>
</tr>
<tr>
<td>uaz_demonstration</td>
<td>7064</td>
<td>91.0</td>
<td>4.0</td>
<td>1.0</td>
<td>-100.0</td>
<td>-100.0</td>
</tr>
<tr>
<td>uaz_demonstration</td>
<td>7068</td>
<td>41.0</td>
<td>4.0</td>
<td>2.0</td>
<td>-1.0</td>
<td>-1.0</td>
</tr>
</tbody>
</table>
“WHAT IF?” ALTERNATIVE FUTURES

Scenario A: “Suburbanization”

Scenario B

Scenario C
“WHAT IF?” FUTURE PROJECTIONS

Scenario A: “Suburbanization”
CONCLUSIONS

• Seamlessly integrated with the greater AURIN platform

• Challenges in technological constrains and volatility of the environment

• Avoid a “Frankenstein” solution, rely on collaboration!
QUESTIONS?

Thank you for your kind attention
marcosnr@unimelb.edu.au