Brown, D. G. and D. T. Robinson 2006. Effects of heterogeneity in residential preferences on an agent-based model of urban sprawl. *Ecology and Society*

APPENDIX 1 - SOME Model Description and Pseudo Code

The SOME model code can be downloaded from the SLUCE project website at www.cscs.umich.edu/sluce. The model has been developed using the SWARM simulation libraries on a LINUX platform supported by the Center for the Study of Complex Systems (CSCS) at the University of Michigan. The SOME model has been integrated with DRONE, a computational tool for performing sensitivity analysis and batch processing. Specific details on DRONE and workstation setup are available at the Center for the Study of Complex Systems website at www.cscs.umich.edu. Please contact the authors with questions pertaining specifically to the SOME model and the CSCS system administrators for DRONE specific questions.

SOME Model Pseudo Code

INITIALIZATION

Set Parameters -> User Defined or Read from Parameter File (see example grpdNorm.ctrl).
Create the Agent World and Aesthetic Quality Grids.
Create agent lists for Residents and Service Center agents.
Place an initial Service Center agent in the middle of the grid.

EACH TIME STEP

```
For 1 to the defined number of residents to enter at each time step (specified by the user or file)
        Create a new Resident.
        For 1 to the number of locations to test
                Do Until a location is selected.
                        Randomly select a location (without replacement).
                        If the location is not occupied then
                                Select the location.
                        End if
                        If the number of queried locations is beyond the threshold then
                                Break out (the world is too full and the agent does not enter)
                        End if
                End Do
                Evaluate utility at that location (as specified in Equation 1).
                If it is the first location then
                        Store the location and utility as the best location.
                Else if it is not the first location evaluated by the resident then
                        If the current location utility > best location utility then
                                Set the best location to the current location.
                        End if
                End if
        Next Test Location
        Put Resident in the best location.
        Set Resident X,Y properties and utility values to those from the new location.
        Add Resident to the AgentList for Resident Agents.

        If the total number of residents in the world divided by the specified number of residents
                per service station minus the number of existing Service Centers is >= 1 then
```

```
                Select a random adjacent cell next to the last resident agent.
                Do until a location is selected for the Service Center.
                        To get a new location spiral outwards from the last resident
                        location, while checking for edge effects.
                        If the location is not occupied then
                                Select the location.
                        End if
                End Do
                Create a service center.
                Set Service Center X,Y properties to those from the new location.
                Add Service Center to the AgentList for Service Center Agents.
        End IF
Next Resident
```