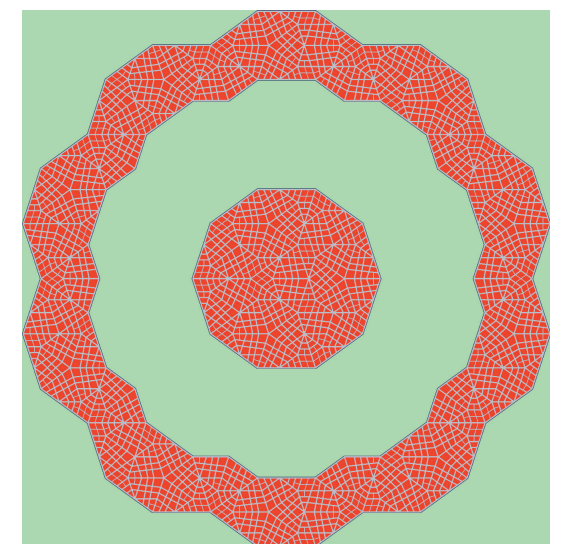
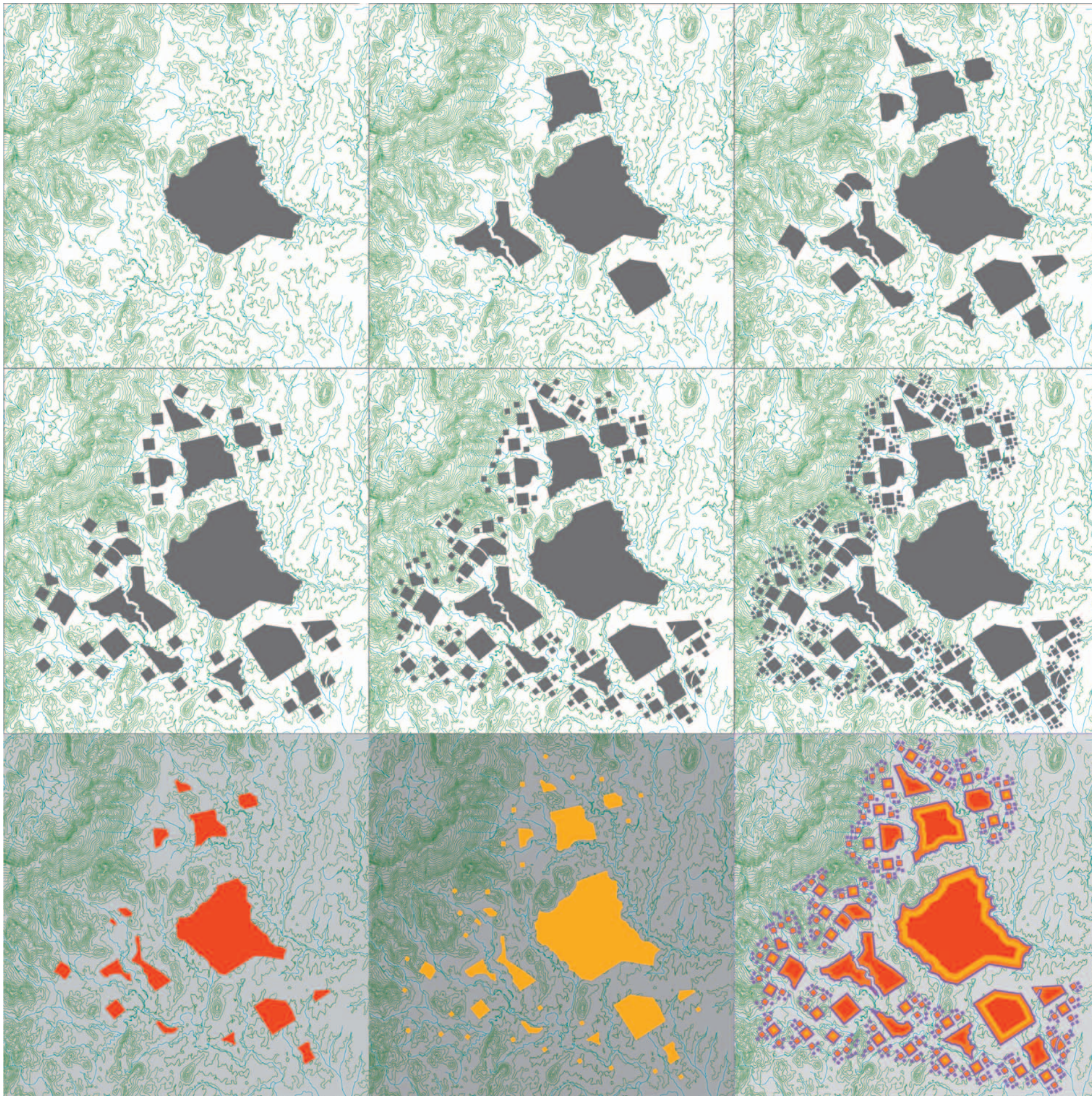


## Fractal Deformation

Pure fractal geometry rigidly determines and recursively delineates that elements prescribed at one scale must exist at all other scales. Proportionality of elements sizes also conforms to the strictures of fractal mathematics.

The introduction of stochastic variables provides the required flexibility to adapt a fractal distribution of urban regional elements (cities, towns, etc.) to complex topographic, geologic, hydrologic i.e. environmental structures and also to the distribution of attractive or detractive features i.e. human spiritual desirability attributes of a regional landscape. Each attribute corresponds to the domain of a unique random field(s) deforming the fractal morphology of its urban regional figure-ground footprint on the landscape. Deformation forces emanate from values ascribed by people to the aggregation of the many variables from all of the random fields. Fractal geometry also holds an ascribed value to which the summation of the others is compared. In summary, integration of greater values across entire regional landscapes foreshadows the distribution morphology of the urban footprint including the boundaries defining the perimeter of each individual settlement in that footprint.



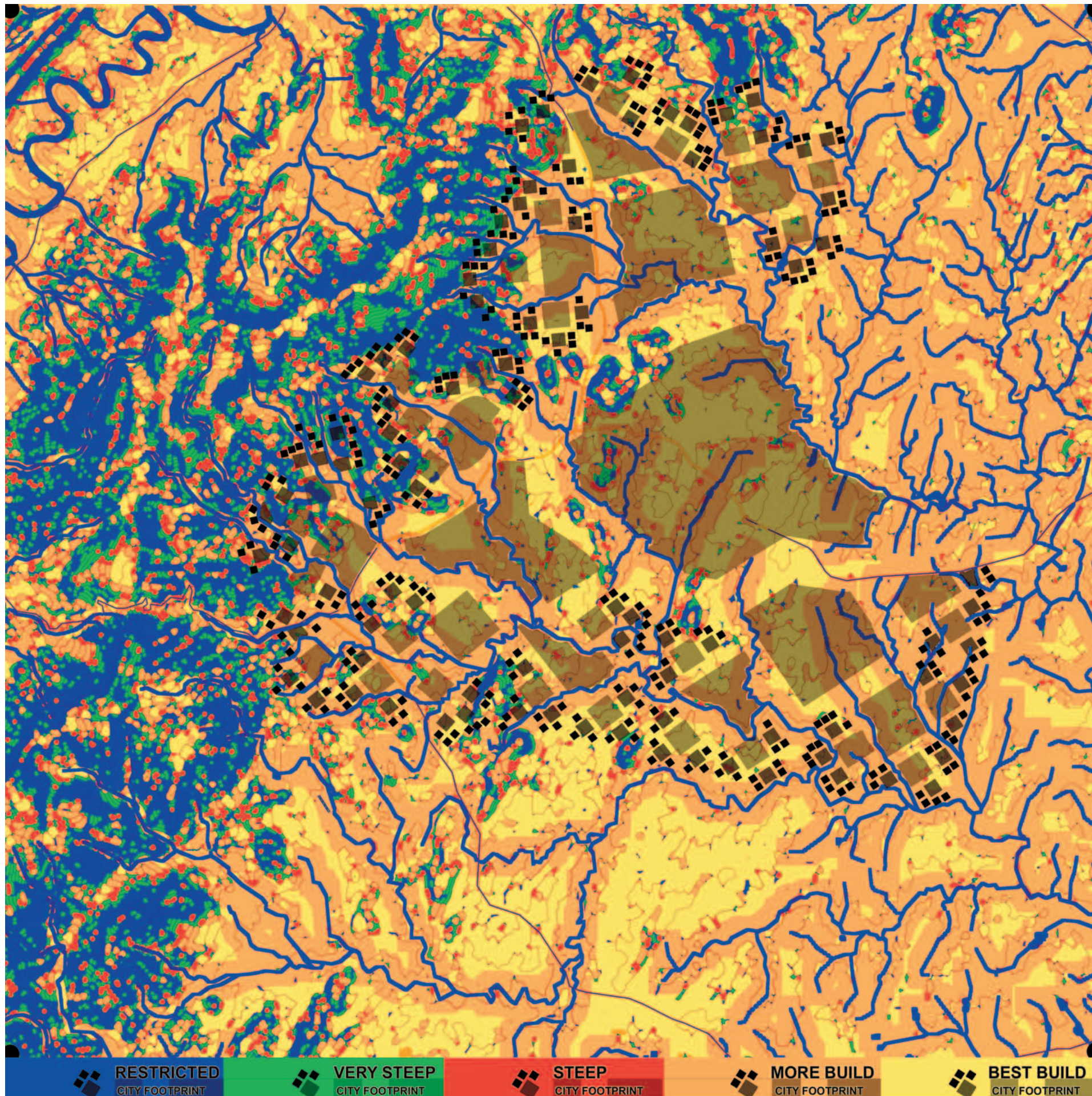


## Urban Density

Urban population density measures the number of people in a given unit-area of the urban footprint. e.g. per square mile, or per square acre. Selected densities measure number of people per area for given functions as well. Urban population density analysis ineffectively addresses a fundamental cycle of human behavior. Lacking a theory linking this behavior to the physical design of modern cities results in one of the most vexing and universal problems: the enormous daily human waste of commuter traffic. The daily human cycle of sleep-rest followed by waking activity supports the most massive and important urban dynamic: dwelling and working. This cycle more nearly defines the life of a city than any other design consideration. Urban population density analyses can be augmented to increase by design of cities the accommodation of this basic human cycle

The expansion to Urban Design of the concept and application of density can be accomplished in two ways. First, all population density analytical models should require construction of a corresponding physical model so that every variable in the mathematical model represents a component in the physical model. Analyses should then be conducted in the manner related to Theoretical Physics to be described later in this paper. Second, use of the concept of density in Urban Architecture should be linked to time.

In this plan the footprint of Fractal City emerges from a cognitive construction of pure visibility of environmental values. Distribution of urban density upon a region is defined and infused with nature.





## Multiscale Green Space

Fractal Garden City theory formulates the basic elements of built and un-built areas within an urban region. Un-built areas are called “green space” with built areas collectively referred to as “urban footprint.” In many ways, undisturbed nature outside urban boundaries and parks within cities behave identically. These are therefore not differentiated in Fractal Garden City theory. The third and most important formulation element derives from the first two, namely the boundary. Proper application of the theory requires careful establishment and stringent enforcement of boundaries.

Careful boundary delineation produces an urban footprint with a minimally negative environmental impact. Strict separation of city from natural green space establishes the identity of both.

Green spaces between the city nodes are as protected and managed as federal or state parks. No private development has ever been permitted, nor will it ever be permitted: with no exceptions. These interstitial green spaces provide all citizens with some important values. As parks, they allow ready year-round access to nature and recreation. As ecosystem, they provide clean water and air. Most of the reservoirs are located in the interurban space. As ecological management, continuous up-close study and monitoring of the parks boundary with the city nodes provides information vital to the environmentally favorable adjustments of the habits and behaviors of urban dwellers.

