Shaping Green Infrastructure Networks in Philadelphia: Blueprints for Potentials and Possibilities

I. Purpose

As demand and activity continue to mount on the land, the need for green infrastructure networks becomes increasingly critical. While the benefits of green infrastructure have been documented in many urban environments, their implementation in Philadelphia has been minimal compared to the scale of the potential benefits. The goal of this project was to develop a strategy for implementing green infrastructure networks in Philadelphia, with the aim of illustrating the potential benefits and guiding future planning efforts.

II. Articulating a Green Infrastructure Supply and Demand Model

A Green Infrastructure Supply vs. Demand Surface

Interpolated Land Cover: Distribution of Existing “Greenness”

Quantification of Water Flow: Active Flow vs. Drainage Flow Areas

III. Mapping Optimum Connectivity Patterns

By using the supply and demand surfaces on a bases filled with data, a path-finding operation is executed to establish potential continuous green infrastructure networks through a cost allocation operation. These points are used to develop an optimum connectivity pattern as a weighted sum of the two surfaces. The result is a network that identifies the most favorable or the most in demand since they lie directly within the most active flow and the most visible supply network.

IV. Application Snapshots

The darker blue streets indicate the most favorable or the most in demand since they lie directly within the most active flow and the most visible supply network. Depending on where the open space lies, between 2-5 least cost paths are traced (2). These points and the selected open spaces form the inputs for least cost path and supply, are identified and marked as pale blue (demand) and red (supply) dots (1). Once the paths are traced, the cost allocation operation is performed from the paths over the supply and demand friction surfaces. These points and the selected open spaces form the inputs for least cost path and supply, are identified and marked as pale blue (demand) and red (supply) dots (1). The result is a network that identifies the most favorable or the most in demand since they lie directly within the most active flow and the most visible supply network.