

Urban Mobility Mapping

AWARD OF DISTINCTION
IN URBAN AND
LANDSCAPE DESIGN
ALSO SEE PAGE #6.



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Based on the concept of a rhizomatic composition developed by Gilles Deleuze and Felix Guattari, the Urban Mobility Mapping exercise takes the idea of an organism composed of a series of automated elements, which are intimately connected and dependant on each other, and yet can manage to maintain the idea of a complex and continuously mutating entity.

In this same manner, urban-programmatic behaviors can be approached as a series of complex situations, capable of being descifrated through mapping procedures. The main purpose behind these exercises is to try to understand stationary and movement flows and to be able to use these patterns as a basis for urban and architectural design.

In order to do so, a series of digital tools are used as a means of defining the morphology and inherent structure of the study. These tools are used as an abstract means of development and representation, shifting from an analytical approach to an operative one.

The two main tools used in this exercise are Metaballs (spheres that dynamically change their appearance depending on the proximity of other entities of the same kind and their attraction radius) and Particles (entities that can be used to map the flow of behavior and dynamic interactions).

The first is an entity capable of calibrating the design of an open surface (urban sheet) or a closed envelope (architectural object). The second is used as a flow simulator, capable of representing smooth or abrupt interactions between diverse elements and forces.

In both cases, certain parameters must be previously set. Specially with the use of metaballs, these parameters can determine the type of operation, analysis and formal result, as well as the programmatic characteristics of the object. In order to define such programmatic conditions, these shape-shifting spheres can be separated in two areas:

Static Programmatic Space: The amount of constant people that the entity can hold in its interior. For more people, the diameter of the metaball increases.

Variable Attraction Radius: The capacity of the entity to hold a larger number of people, activities, or transitory situations. Two or more metaballs may share attraction radius, deforming each other and giving way to hybrid spatial and formal configurations.

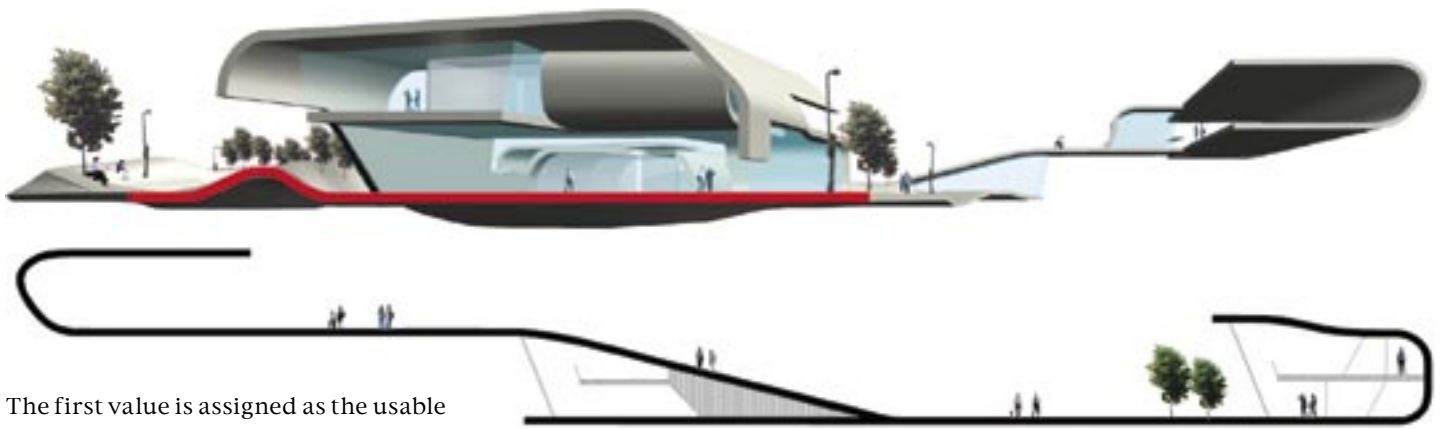
By setting these parameters, two exercises are made:

1. URBAN MOBILITY MAPPING

One of the most highly traveled avenues of Chile, the Paseo Ahumada, was used as the context for this mapping exercise. The exercise takes place at the most chaotic time of day, between 7 and 8 pm (when everyone leaves their office and walks towards the subway), for a period of 5 consecutive days. A total of 30 people are mapped daily, obtaining an average map of flows at the end of the week.

By following (stalking) each person and assigning a singular path to each one, a series of individually extruded lofts are created. Afterwards, an average of 30 behaviors are selected and visualized as a complex and interlaced surface.

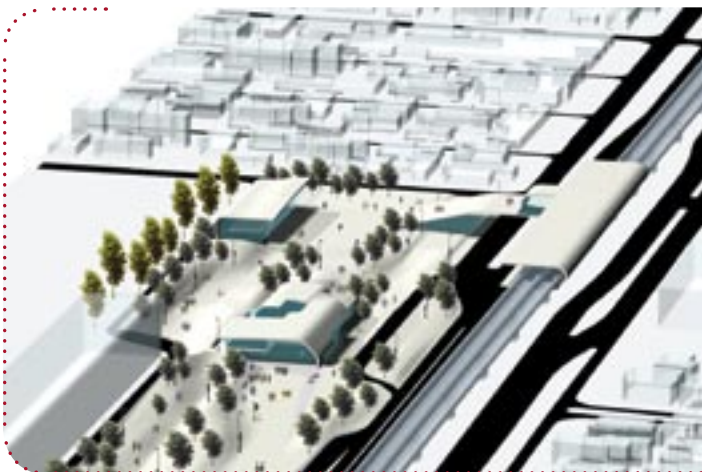
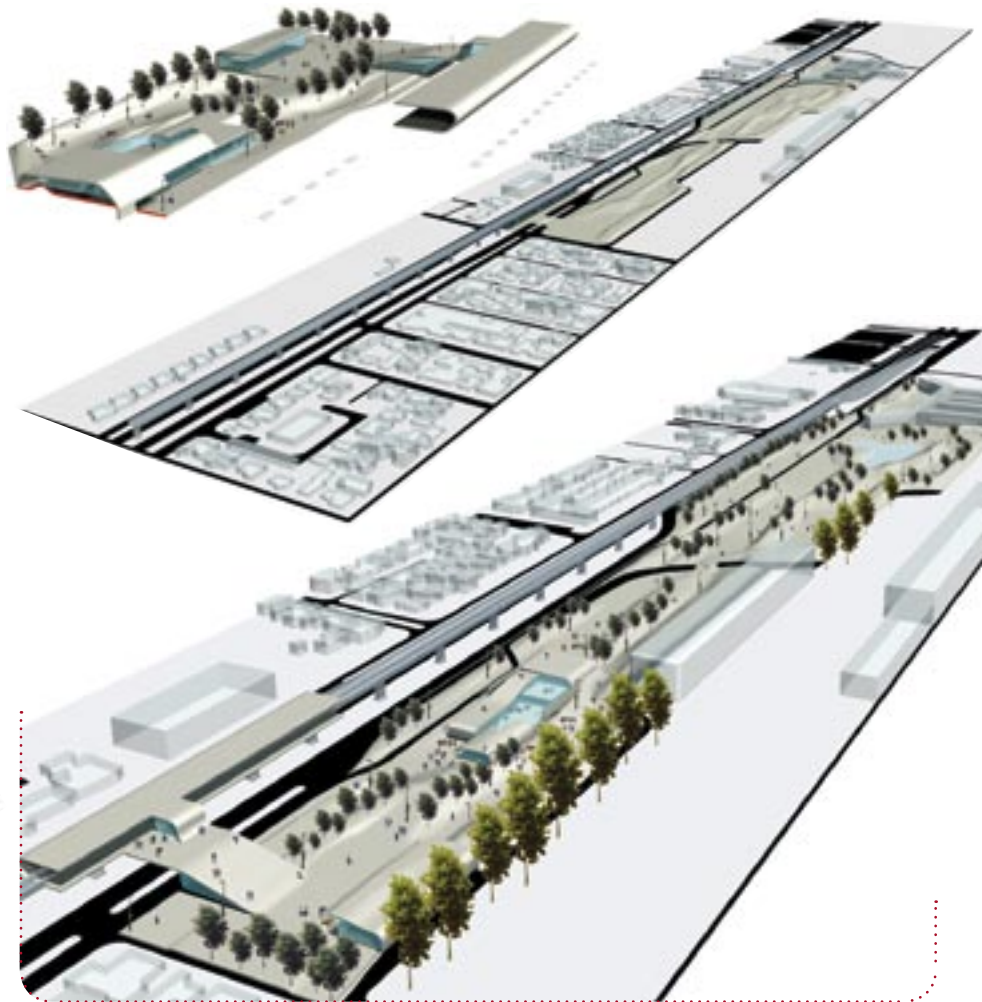
For the second part of this exercise, metaballs are used as a means of mapping people in a stopped stance. A value is assigned to each individual, both the Static Programmatic Space and the Variable Attraction Radius.



The first value is assigned as the usable amount of space for a single person, while the second value represents the interaction between two or more people. Afterwards, the two mapping exercises are overlapped, displaying a formally complex set of entities that represent both alternating paths of movement and buffer zones.

The third part of this exercise uses two different tools: Contours and Nurbs Surfaces.

Operating over the overlapped surfaces, a sequence of parallel sections are created, which are then re-traced using Nurbs Curves. These new paths are then converted into a singular and striated surface, one capable of assimilating the mapping exercise in its shape. This new surface can then be adopted as the starting point for an urban intervention, one that can express free-form human movement in both the analytical process and formal conception.



2. PROGRAMMATIC DATA DESIGN

Following a procedure similar to the first exercise, this second one focuses on the operational and more formal approach that maintains the conceptual analysis based on free-form entities, such as metaballs.

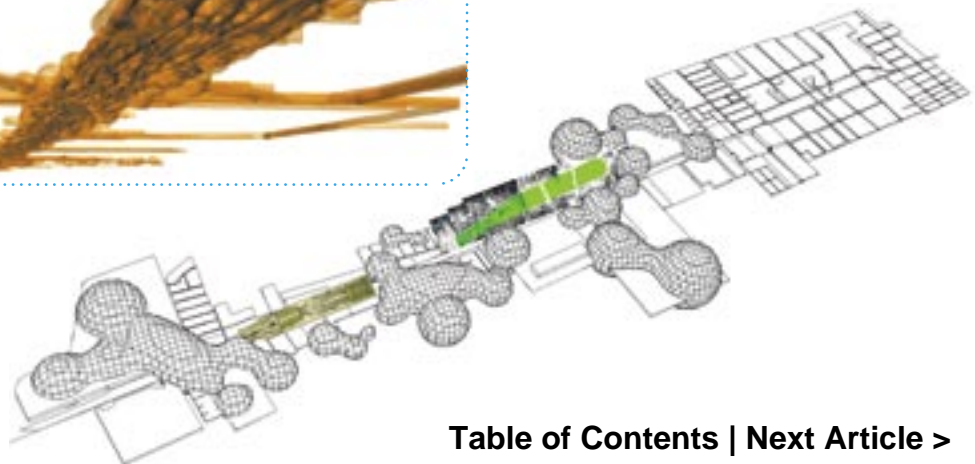
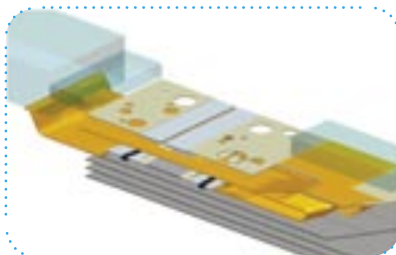
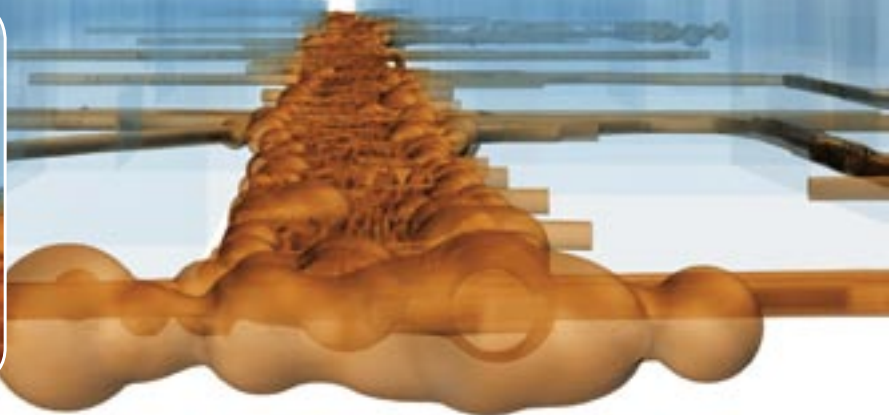
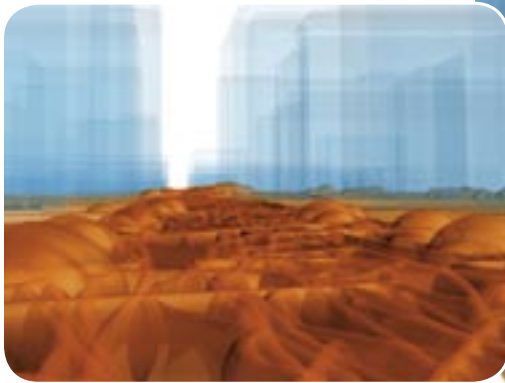
Defining a value for both the Static Programmatic Space and the Variable Attraction Radius, a strategy for urban design and a school project are developed. The main purpose of this strategy is to relate human mass to programmatic space. To do so, a chart is created, assigning each particular programme a static and a variable value.

Afterwards, each metaball that contains a certain amount of human mass, is placed and forced to interact with other entities of the same kind, resulting in endless iterations of conceptual form and diagrammatic spatial configurations.

Out of this iterative process the best stance is selected and used as the starting point for a formal intervention. These metaballs are then used to manipulate and deform the topographic layout of the project site. By means of the contours and nurbs tools, the topography is re-created, injecting a working approach to the new landscape.

A similar procedure is then used to design a small elementary school. After assigning only human values to each metaball, they are used to deform a static surface. These free form entities enter the same iterative process, until a certain stance is selected. Each programme of the elementary school is then related to the amount of children it holds, as well as to a close interaction between each programmatic cell. After the mapping exercise is developed, the project is traced by means of nurbs curves, loft, or c-mesh surfaces, borrowing data from the diagrammatic study.

An operative approach of this kind merges human intervention and behavior with a static field. The result can be described as a complex space defined by its own set of parameters, logic, and entities that compose it. This can be considered an approach for identifying and stratifying new agents and variables that reveal new tools and project complex instances of human and architectural interactions to the landscape.



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