CONSTELLATIONS AND ANTI-CORRIDORS

by

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Submitted to the Department of Architecture
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Requirements for the Degree of Master of Science in
Architecture Studies

ABSTRACT:

To perceive the many stars in the sky, corridic logic would force one to view one star at a time, one after the other in a linear order. An anti-corridic logic, on the other hand, is non-linear and permits constellations to emerge: many stars can be perceived at once and the imagination can link them into any desired figure.

The space of corridors is linear: rooms are perceived and passed in a fixed sequence of one space following another. The space of anti-corridors is non-linear: rooms are dispersed into a field. Many spaces can be perceived at once and one can pass through them in any order. Desired constellations can emerge.

Airports and intermodal hubs typically follow corridic logic. An airport/intermodal hub that is anti-corridic disperses all spaces into a field of options whereby individuals with different itineraries can perceive and move through a field of spatial choices resulting in ideally perceived and desired spatial constellations. This thesis proposes a prototype for an anti-corridic airport/intermodal hub.

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Title: Associate Professor of Architecture and Urbanism

CONSTELLATIONS
AND
ANTI-CORRIDORS

"Architecture is dead, and will never come to life again; it is destroyed by the power of the printed book..."

Victor Hugo, Notre-Dame de Paris[1]

"The Greeks have left us the most perfect examples of shot design, change of shot, and shot length (that is, the duration of a particular impression). Victor Hugo called the medieval cathedrals "books in stone". The Acropolis of Athens has an equal right to be called the perfect example of one of the most ancient films.

Sergei M. Eisenstein, Montage and Architecture[2]

"I call architecture frozen music."

Johann Wolfgang Von Goethe[3]

[1]Hugo, Victor. Notre-Dame De Paris. Boston: Little, Brown, and Company, 1888.
[2]Eisenstein, Sergei. "Montage and Architecture." Assemblage, 1989: 110-131.
[3]Goethe, Johann Wolfgang Von, and Johann Peter Eckermann. Conversations of Goethe with

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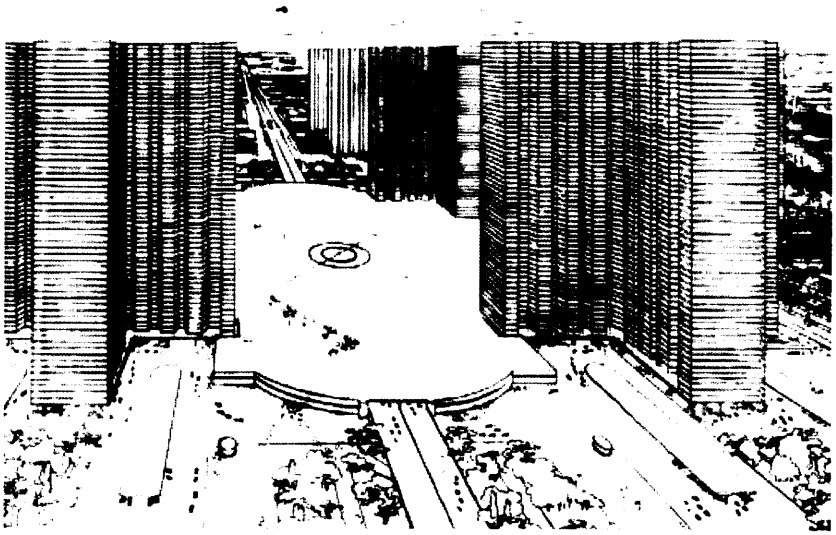
INTRODUCTION



1.1 The airport at the center of Le Corbusier's Ville Contemporaine 1922. Le Corbusier Le Grand. New York: Phaidon, 2008.

Constellations and Anti-Corridors emerged out of an interest in the idea of architecture as temporal art. Architecture has a rich history of being identified as a temporal art: Goethe called it frozen music, Victor Hugo called it the book of stone, and Sergei Eisenstein responded to Hugo by calling it the first film ever made.[1] These metaphors crystallize theses about a universal aspect architecture: that it is a time based medium. This thesis began from an interest in knowing more about the science and rational design processes underlying these conceptual metaphors.

Temporality and sequence also cut straight to the core of architecture and urban design's relationship. If we adopt any of the metaphors describing architecture as a temporal art, such as architecture "as cinema," then urban design can be considered the relationship building of individual architectures, or individual films, to one another into a larger anthology or series.

Temporality is also important because of how it fits into the larger idea of architecture's autonomy. Architecture's autonomy resides in the ability of structure to re-present, speak, and communicate an idea and deliver information. This idea can be delivered in two ways: through the ideal manifestation of the drawing or by the perception of built architecture as it unfolds over time. Controlling how an architecture idea is unfolded and perceived over time is equivalent to being in control of it's autonomy.

In order to investigate this temporal aspect of architecture, this thesis asks: how can design be highly responsive and sensitive to the sequential movement and perception of people in space? And is there an existing field of design knowledge, technique, or formal language of time?

The thesis begins with identifying architects and writers who led research programs in this subject. An initial classification of the field is made which is followed by the extraction of useful concepts, principles, and techniques that are applied and tested through a design project in a relevant contemporary context (appendix A).

Transit spaces are an important yet highly overlooked contemporary civic space. The spaces of religious ritual in the pre-modern world are paradigmatic spaces of sequence and are exemplified by the Panathenaic procession at the Acropolis in ancient Athens. [1] One can argue that these ancient religious processional spaces have a contemporary counterpart in the form of our ordinary secular spaces of transit and commuting. The numbers speak for themselves: a medium sized airport can handle 10-30 million people annually which is equivalent to the population of multiple cities occupying a single space in one day. Le Corbusier, for instance, recognized the civic importance of the transit hub by locating it at the center of the Radiant City. (fig.1.1) This sig-

[1] Hugo, Victor. Notre-Dame De Paris. Boston: Little, Brown, and Company, 1888.
Eisenstein, Sergei. "Montage and Architecture." Assemblage, 1989: 110-131.
Goethe, Johann Wolfgang Von, and Johann Peter Eckermann. Conversations of Goethe with Johann Peter Eckermann. Da Capo Press, 1998.

[2] The acropolis had a profound influence on modern architecture beginning with Auguste Choisy, Le Corbusier, and Sergei Eisenstein. Each were drawn to the cinematic aspect of the space.

naled a paradigm shift in the architecture of the city: the monumental civic gates at the perimeter of the traditional European walled city become internalized and central to the modern machine city which is now a node in an inter-regional and inter-national network of global cities.

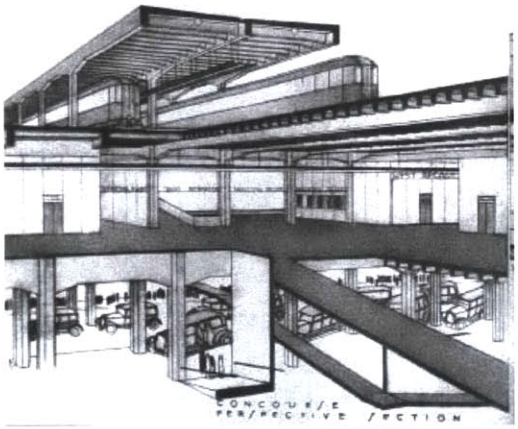
The idea of the transit hub as a node within a global network of flows is crucial to the design concept of this thesis proposal. The design attempts to articulate the difference between "spaces for passing through" from "places to be in." [3] Or in other words, it distinguishes between fast spaces and slow spaces. The former refers to spaces where it is important to move from A to B quickly, directly, and smoothly. The latter, on the other hand, is a space for the flâneur. It is a space for stopping, slowing down and spending time leisurely. It is about meandering and exploring a space for the sake of enjoyment or curiosity.

On the one hand, a transit hub must be seen from a systems engineering perspective that attempts to optimize speed and flow. From this highly functional perspective, the hub is conceived as an electric circuit and people are ions forming currents. Design is a matter of optimizing people's speed as they try to pass from A to B with the least amount of resistance. The hypothetical ideal of this model is a superconductor which has zero resistance - it is a pure space of speed and passage. People, however, are not ions and are not rational. They desire to slow down, stop, and meander. This thesis proposes a design that is simultaneously a kind of optimized superconductor as well as a place that recognizes the human desire for slowness and the unexpected. It provides a spectrum of conditions that spans between *spaces to pass through* and *places to be in.*

The two ends of this spectrum are represented by Richard Neutra's Rush City and the Victorian Railroad Stations of the nineteenth century.(fig.1.2,1.3) The Victorian railroad station is best known for symbolizing the new civic gate of the industrial city. More importantly, it is also known for being an important urban destination. The station contained under its great roof an intense mixing of people and activities and was nothing less than a microcosmic city in itself. While Neutra probably would have celebrated the urbanity within the Victorian railroad station, in Terminals?-Transfer! (1930), he attacks these station types for being designed as terminals or stopping places rather than high speed transfer spaces. [4] Neutra proposes his Rush City as an ideal space for the modern "smooth and continuous" traffic flows of the new type of transfer space of the twentieth century: the airport.

The design proposal of this thesis seeks to articulate and reconcile these two interdependent extremes of speed and slowness. Rush City is an important precedent because it expresses the systems engineering perspective that attempts to speed up and smooth out the physical and virtual flows of modernity that are continually spreading throughout the globe. This emphasis on transfer and speed over the opposite - places for being in and slowing down - makes Rush City exemplary of the "non-places" that are symptomatic of "super modernity." (fig.1.4) Because there are both utopian and dystopian aspects to non-places and places, fast and slow spaces, this thesis proposes a design for a hub that suspends these two extremes in tension.

[3]Sennett, Richard. The Fall of Public Man. New York: W. W. Norton & Company, 1974.
[4]Neutra, Richard J. "Terminals?-Transfer!" The Architectural Record, 1930: 99-104.



1.2 A section of Richard Neutra's Rush City. A multi-layered transfer space. Neutra, Richard J. "Terminals?-Transfer!" The Architectural Record, 1930: 99-104.

1.3 Grand Central Station. Pearman, Hugh. Airports: a Century of Architecture. Laurence King Publishing, 2004

1.4 An endless corridor in Rosler, Martha. *In the Place of the Public.* Cantz Verlag, 1999.

CONSTELLATIONS

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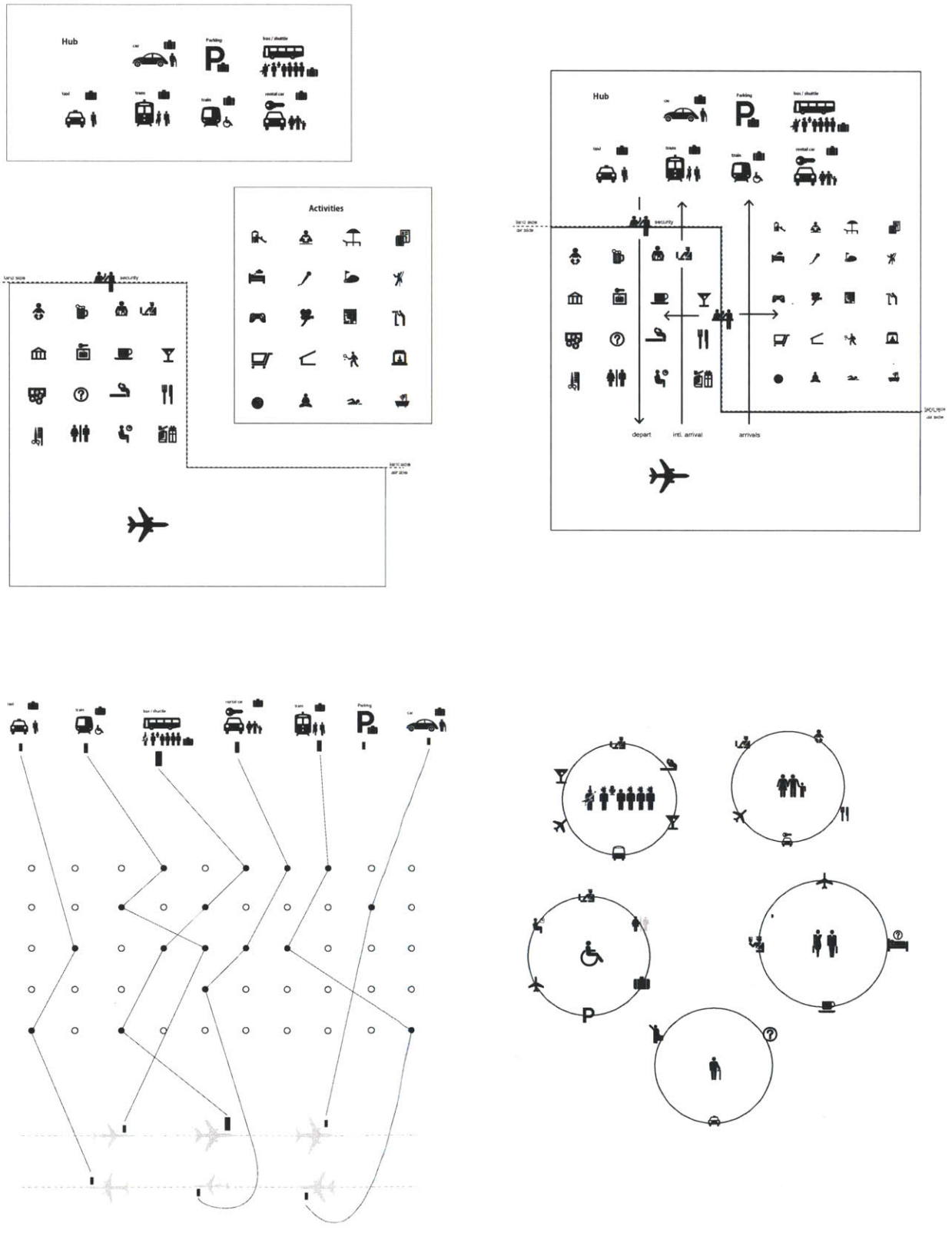
The design proposal of *Constellations and Anti-corridors* emerges from the following diagrams that speculate on the ideal organisation of a hub. (fig 2.1) There are three primary parts to a hub: the standard necessary activities of the airport terminal building, the intermodal hub, and secondary civic activities that make the hub a civic destination or *place to be in* and not just a *space to pass through.*

The design proposal is based on interconnecting the three parts into a single ying-yang like figure which not only allows for interconnection among all the spaces but also establishes a sense of the hub as a single work of civic architecture.

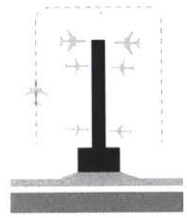
Typically the space of medium and large sized airport hubs can be very difficult to navigate. Simply transferring from bus to plane or from plane to train can easily be overly complicated and take a lot of time. One can imagine an ideal situation where instead of navigating through a complicated landscape in search of particular places, those places can instead be brought directly to the person. Or in other words, an ideal way of moving through the hub would be to simply say exactly where or what you need to do and somehow, magically, you would be taken there.

This design proposal is based on the idea of being able to navigate easily and freely through a complex landscape in a kind of personally customized sequence. This hypothetical model is radically different than any other pre-exisitng airport-intermodal hub and can be measured to perform better than conventioinal types.

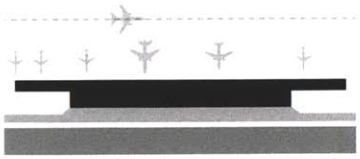


2.1 Diagrams of movement concept. The three parts of the hub are connected into one figure. Hypothetically, individuals and groups are able to move through the space in ideal sequences.

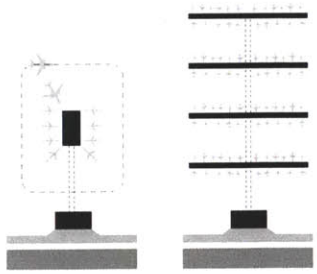
Consider the most complex area: the airport terminal. Terminal typologies have been dominated by linear or corridic types which has resulted in extremely long walking distances. (fig. 2.2, 2.3) The distance from one's car to plane in a small airport can already well exceed normative walking distances. Medium or large scale airports must rely on a system of mechanized people movers. The problem with linear people movers however is that they are inefficient: to move 500 feet one may need to travel 1,500 feet and make frequent stops. The fact that airports around the world are expanding their shopping areas are exacerbating these already too long walking distances.



1. Piers

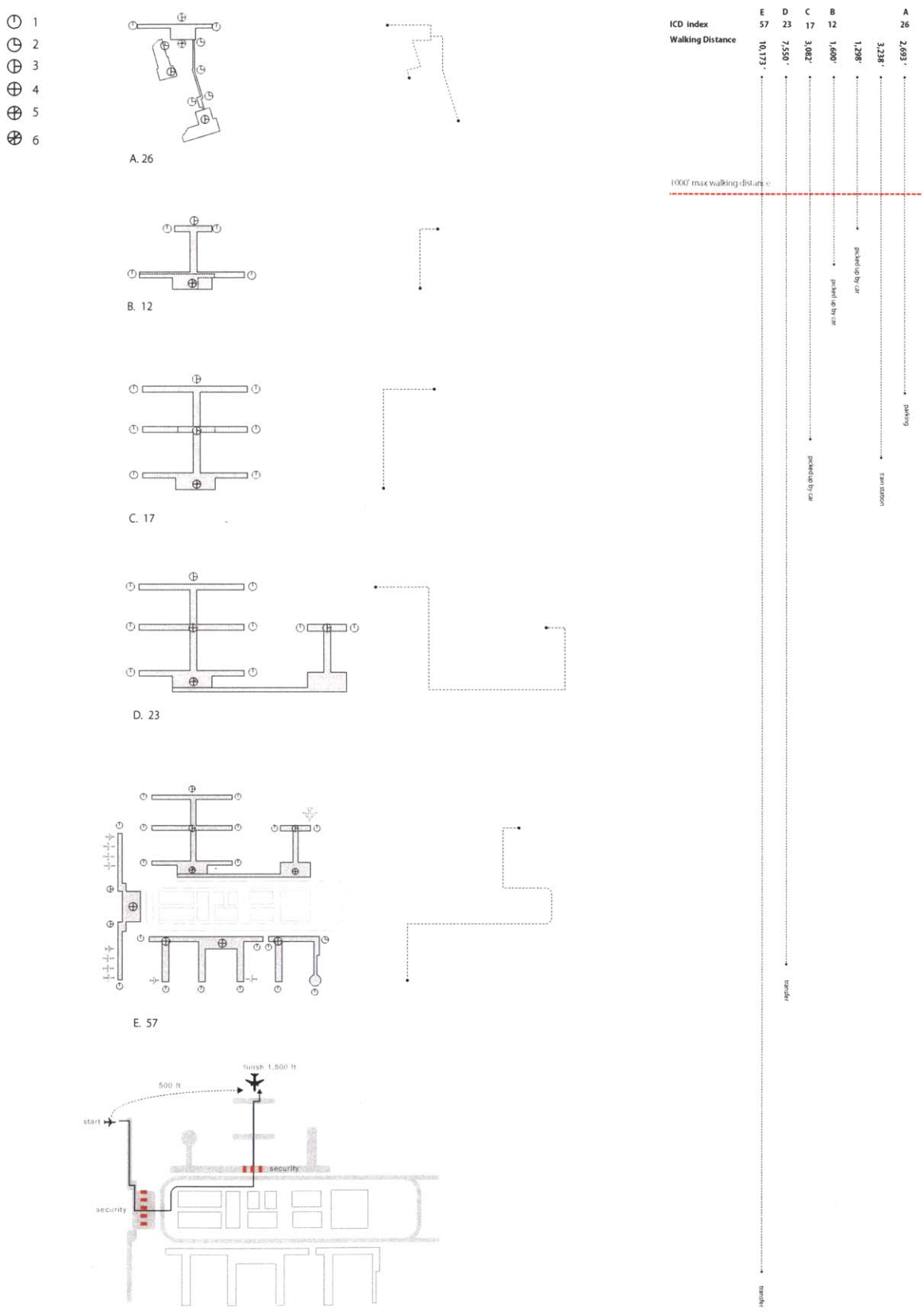


2. Linear "drive in gate"



3. Satellites

2.2 Dominant linear terminal types. Light grey represents roads and dark grey parking areas.



2.3 Analysis of the walking distances and ICD indexes in small to large sized airports.

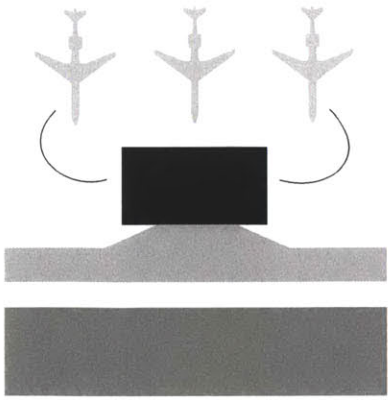
The dominant linear-corridic type has resulted in another problem: high ICD indexes (interconnection density indexes).[1] (fig 2.3) An ICD index is a measure of the amount of turning options one has at a particular node within a spatial network. High ICD indexes pose at least three problems. First, many of the people occupying an airport are unfamiliar to the space. The less options and decisions to make, the easier, more comfortable, and faster navigation will be. Second, a high ICD index results in a high number of choices for turning direction and consequently a high amount of signage to help guide people along. Third, is that corridors often end up crossing corridors for no clear reason and result in meaningless junctions (fig.2.4). Louis Kahn's greenway principle or the plan of Baroque Rome, at least suggest a principle of making meaningful intersections. (principle 4 Appendix A)

[1] Werner, Steffen, and Paul Long. "Cognition Meets LeCorbusier - Cognitive Principles of Architectural Design." Edited by Wilfried Brauer, Christopher Habel, Karl F. Wender and C. Freska. Spatial Cognition III (Springer), 2003: 112-126.

2.4 View of a corridor intersecting a corridor in Rosler, Martha. *In the Place of the Public.* Cantz Verlag, 1999.

The most intelligent and advanced terminal typology in terms of sequence performance is a hybrid of two types: the "pure naked" type and the transporter type (fig 2.5, 2.6).

The pure naked type describes what Le Corbusier admired about the earliest airport terminals. The buildings were small and modest and did not compete with the beauty of the aircraft. This absence of building effectively maximizes the raw, sensorial event of flying. One can walk directly on the tarmac, see the overwheling size of the airplane, hear the sound of the engines, feel the wind and weather on the face. The brute fact of the machine is experienced in a way that no other terminal building type can provide.

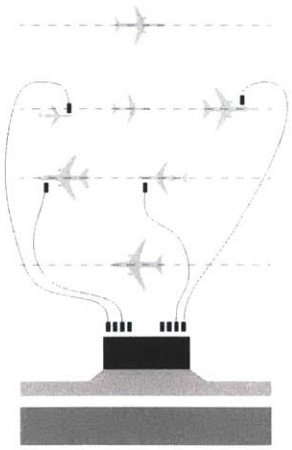


2.5 The Pure naked terminal building type. Light grey represents roads and dark grey park-

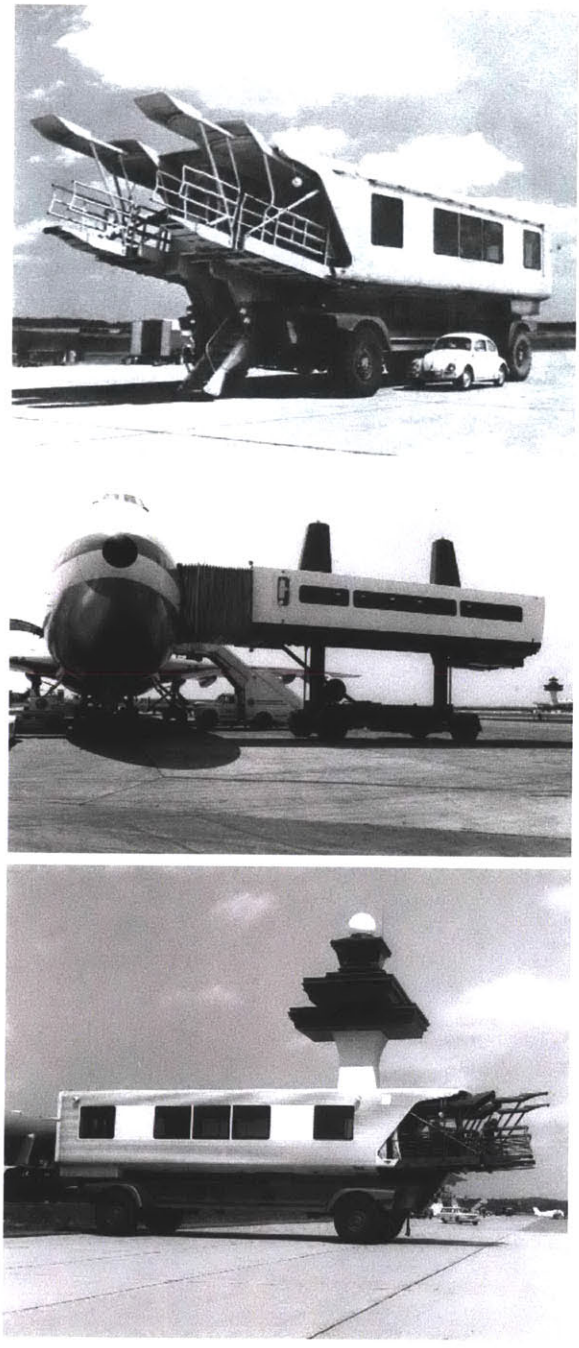
2.6 The raw experience of the plane on the tarmac. (unknown source)

The second type is the transporter type. (fig 2.7) It is a kind of large scale version of the pure naked type and can accommodate much larger numbers of people. Instead of walking to the plane, as in the pure type, people are taxied to the plane. Taxis are large and fit up to 100 people. (fig. 2.8) Using transporters eliminates the need for a terminal building that competes with the aircraft .

The idea of upgrading these two types is based on the following reasoning: if the airport is no longer a walkable building but more like a city where people are taxied by machines, why not speed up this evolution? Why not completely automate and mechanize the airport-intermodal hub and let it be a city?



2.7 The transporter terminal building.



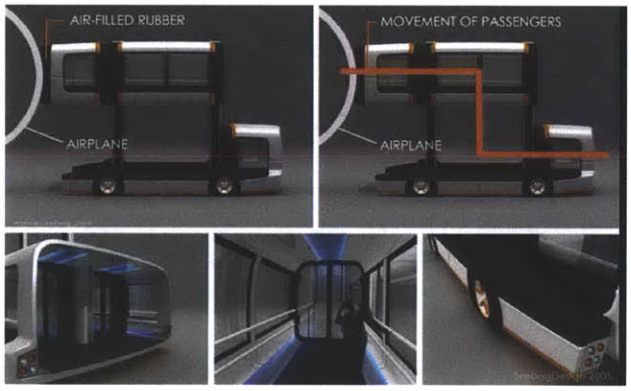
2.8 The mobile lounges used at Washington Dulles Aiport. virtualtravelog. February 23, 2003. http://www.virtualtravelog.net/2003/02/the-mobile-lounges-at-dulles-international-airport/ (accessed May 22, 2012).

The design concept of this thesis is based on upgrading the mobile lounge concept, pioneered by Eero Saarinen at Dulles airport, with twenty-first century technology. Digital automation, artificial intelligence, swarm robotics, augmented reality, and other technologies can be collaged together to create a fleet of smaller, more comfortable and flexible mobile lounges which will replace the older idea of the transporter as a big bus that centralizes everyone together. (fig. 2.9-2.12)

2.9 Google's driverless car. June 24, 2011. http://inhabitat.com/google-succeeds-in-making-driverless-cars-legal-in-nevada/ (accessed May 22, 2012).

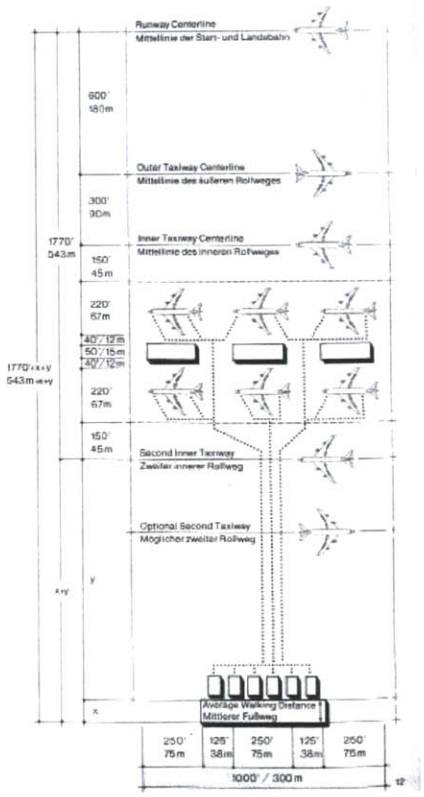
2.10 Mobile lounges currently used at Heathrow Airport. ultraglobalprt. January 5, 2012. http://www.ultraglobalprt.com/heathrow-pod-featured-gadget-show/ (accessed May 22, 2012).

2.11 Example of augmented reality Google glasses. Bilton, Nick. Google Begins Testing Its Augmented-Reality Glasses. April 4, 2012. http://bits.blogs.nytimes.com/2012/04/04/google-begins-testing-its-augmented-reality-glasses/ (accessed May 22, 2012).

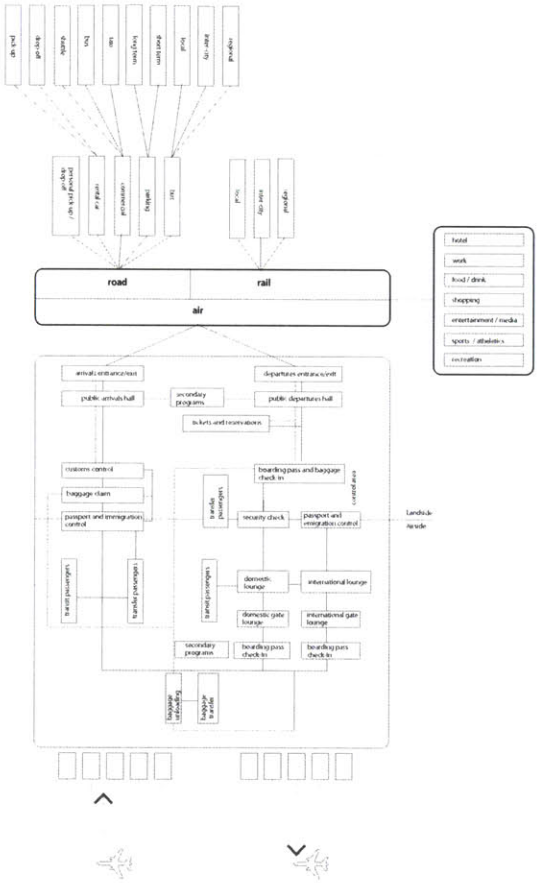


2.12 The Skylift concept by Hannes Seeberg. A driverless, elevating mobile lounge. coroflot. March 15, 2012. http://www.coroflot.com/seebergdesign/skylift (accessed May 22, 2012).

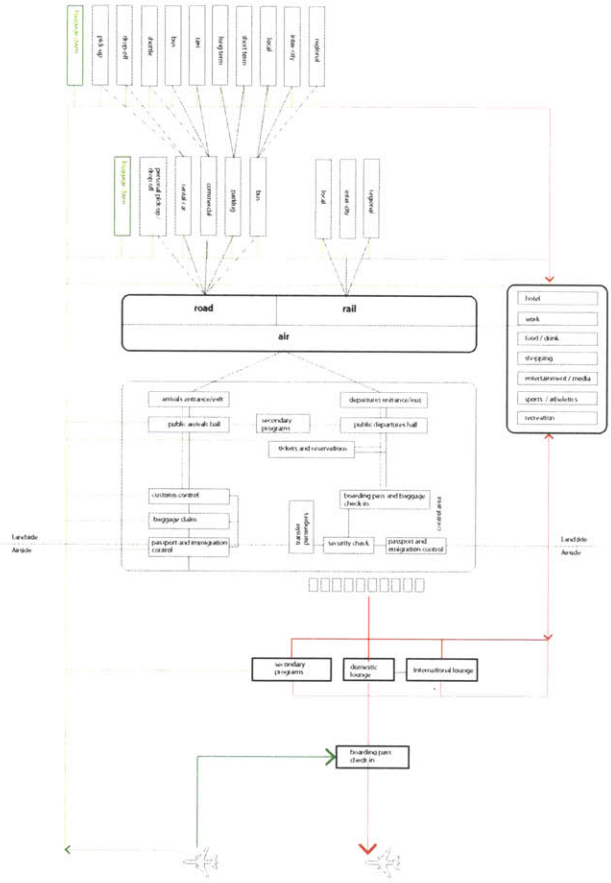
The standard transporter type diagram can be rewired and slightly modified to accommodate a fleet of smaller mobile lounges. (fig. 2.13-2.15) The mobile lounges do not need to be restricted to the airport but can be used to taxi people throughout the civic intermodal hub. Because individuals have different itineraries, they can use the lounges to move through the field of spatial choices based on their ideal sequences. For instance, as one exits a plane and steps onto the tarmac they will enter into a personal mobile lounge which they can command to deliver them straight to their car, the train station, the baggage claim, a restaurant, a particular hotel, and so forth.



2.13 Transporter type diagram. Blankenship, Edward G. The airport: architecture, urban integration, ecological problems. Pall Mall Press, 1974.



2.14 The standard transporter diagram connected to an intermodal hub and secondary activities.

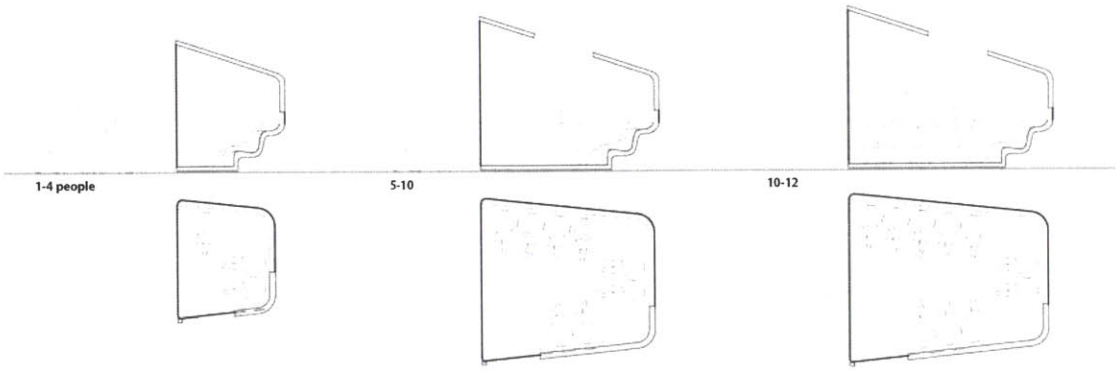


2.15 The proposed new transporter diagram is based on a flexible fleet of individual mobile lounges that can now move around the entire territory of the hub.

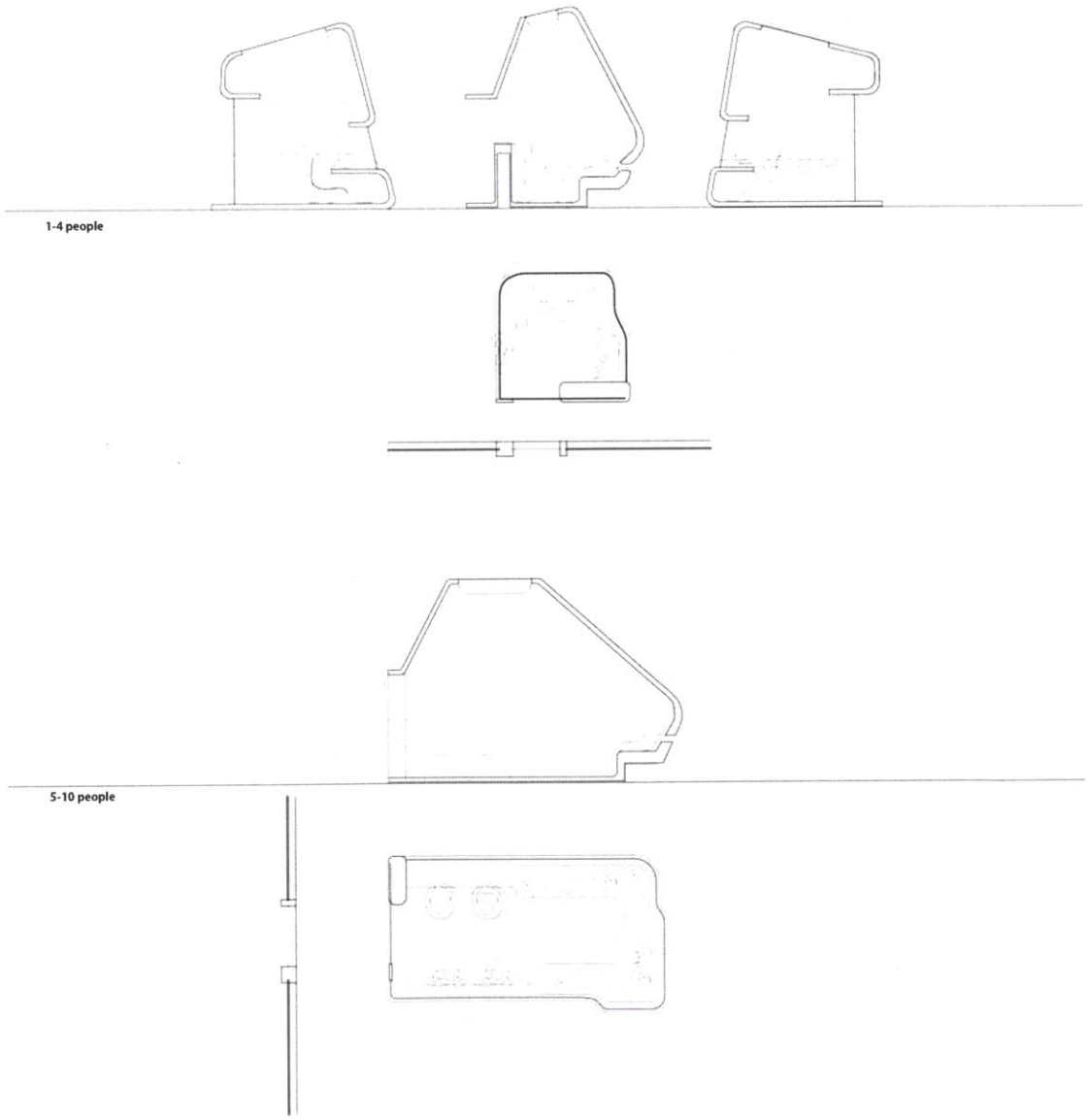
It is not the scope of the thesis to design the lounges in detail, but rather to use the concept of a flexible individual fleet of lounges to support the ideal concept diagram and to catalyze a new kind of architectural and urban organisation. An extension of this thesis research would consist of designing these lounges in detail. This thesis proposes that the lounges be conceived not as a vehicle or a car but rather as a work of architecture on wheels. If Le Corbusier's tiny Cabanon were put on wheels, would it still be considered architecture?

2.16 (Right) Concept sketch for the mobile lounges. There are two main types: lounges for civic hub users and employees (above) and lounges for air passengers (below). These two types break down further into subtypes. They are sized for 1-4 people, 5-10 people, and the lounges can platoon together to accommodate large groups such as a football team.

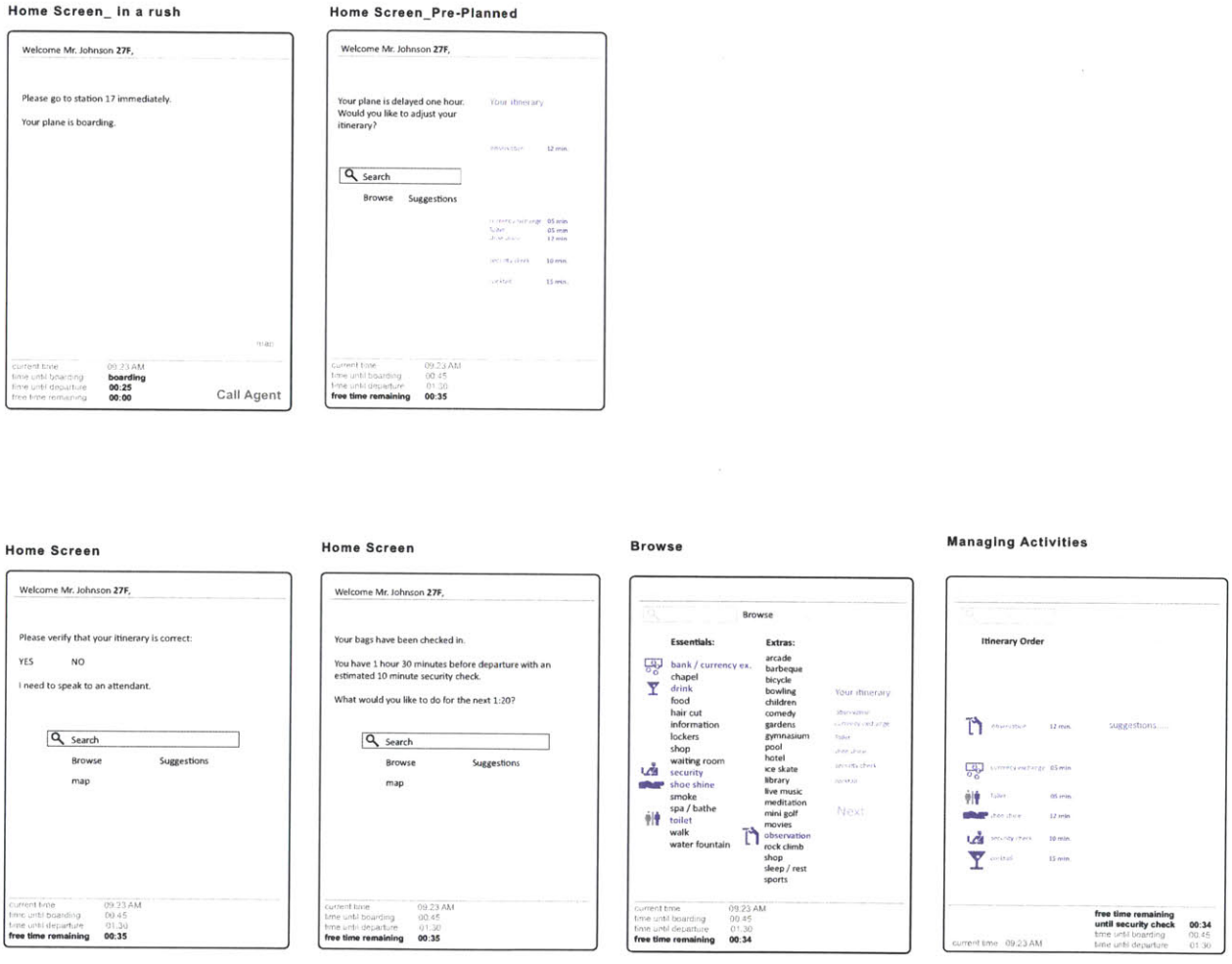
Civic hub users + employees



Air passengers



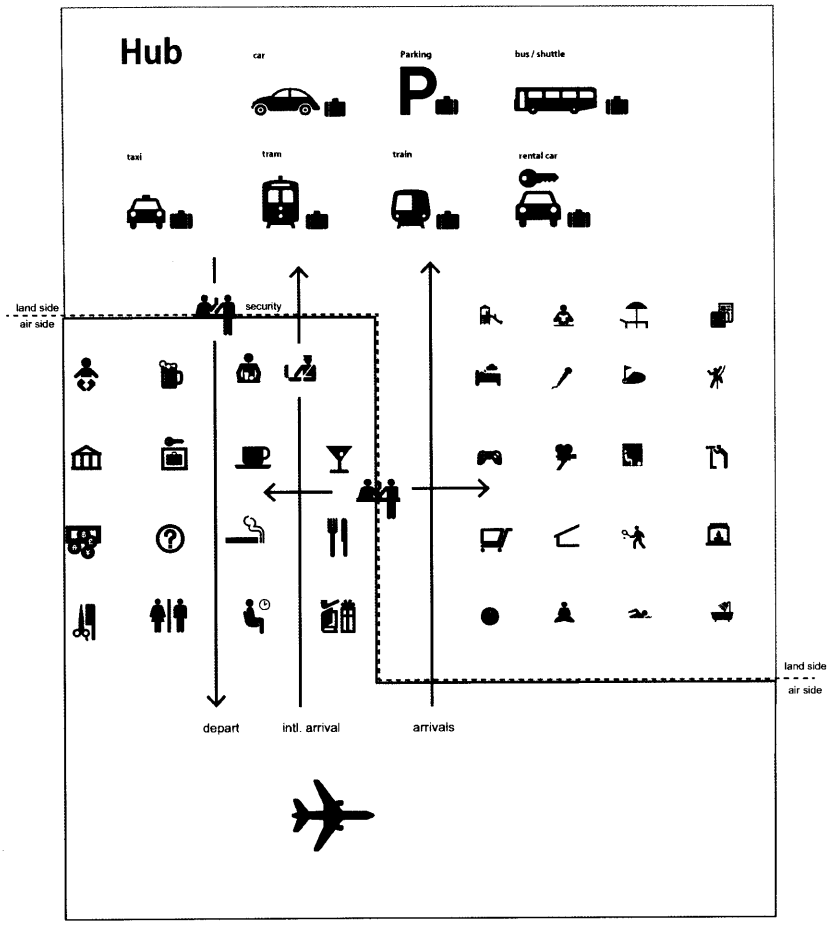
In an elevator, one pushes buttons to move vertically. With a mobile lounge, one interfaces with a simple software that can run on any device, to tell the lounge where they want to go or what they want to do. "Take me to my car!", "I would like to find the best spot to watch the planes take off and land", "is there any place to go swimming during my three hour delay?" Apple already uses *Siri* which is an intelligent personal assistant and knowledge navigator. A mobile lounge performs just like *Siri* but is also a spatial navigator that can move from one place to another. The software continually updates the traveller with their flight and travel information and can make recommendations on what to do in the hub.



2.17 Sketch of the user interface to command a mobile lounge. Interacting with the interface is the priimary means of navigating the airport-intermodal hub. An interface such as this could be accessed through an augmented reality device such as Google glasses.

DRAWINGS

This section develops the ideal hub diagram into a fully working scheme. The scheme is based on the concept of the hub as a field or digital menu of spaces which an individual or group can navigate in a customized sequence by using a mobile lounge-personal navigator. This section shifts focus to smaller scales and examines critical moments in architectural sequences. It examines formal languages that speak about the different types of movement, speeds, and rhythms spanning the extremes of fast and slow space.

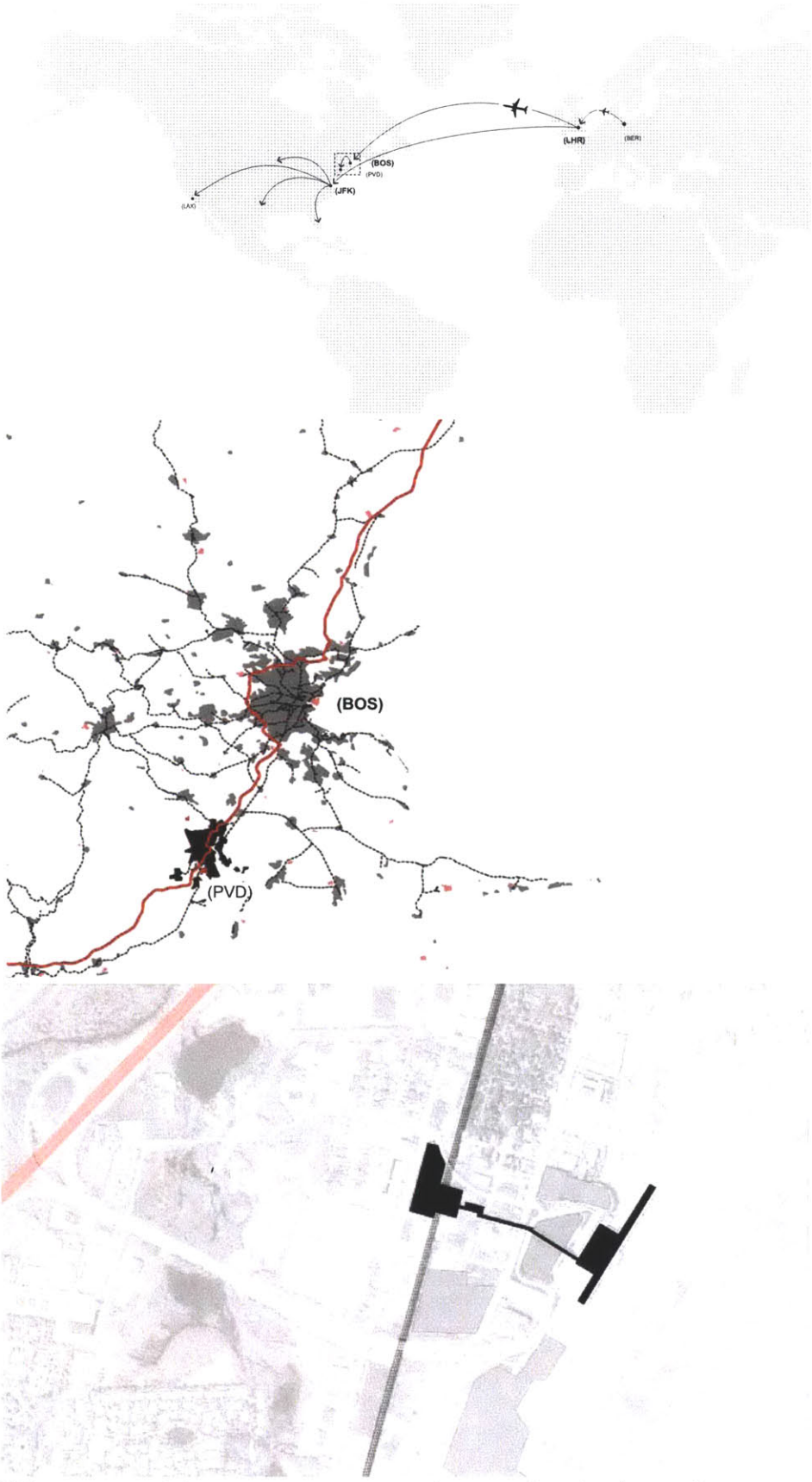


3.1 The menu of spatial options in the hub.

SITE

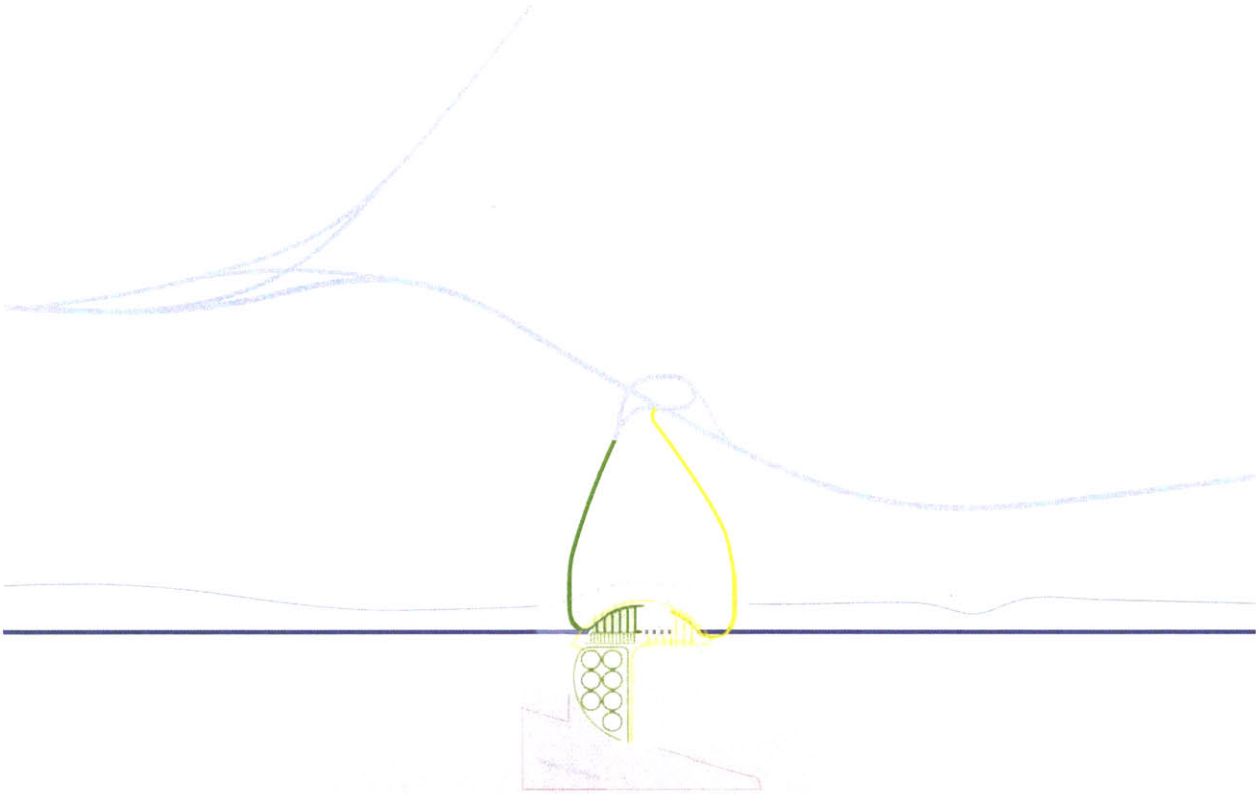
Logan Airport in Boston will soon reach its maximum capacity of annual aircraft passengers and will need to call on a nearby regional airport to handle the overflow. Theadore Francis Green Memorial State Airport (T.F. Green) lies six miles south of Providence, Rhode Island and is currently being studied by the state to expand from a small intermodal hub into a large hub that can compete with Logan Airport. TF Green is very well suited to take on this new growth and become a major intermodal hub airport because of the convergence of primary air, rail, and road at the site (the regional Amtrak, commuter rail, and interstate I-95). It is already an active intermodal hub but it will need to expand from its current 7 million passengers to 14 million by 2020.[1] There are also at least a million commuters passing through the train station annually. The design proposal is sized for 14 million air passengers in 2020 and one million annual commuters.

[1] RI Statewide Planning Program. Transportation 2030. Providence: RI State Planning Council, 2008



3.2 Drawings of the site at an international, regional, and urban scale.

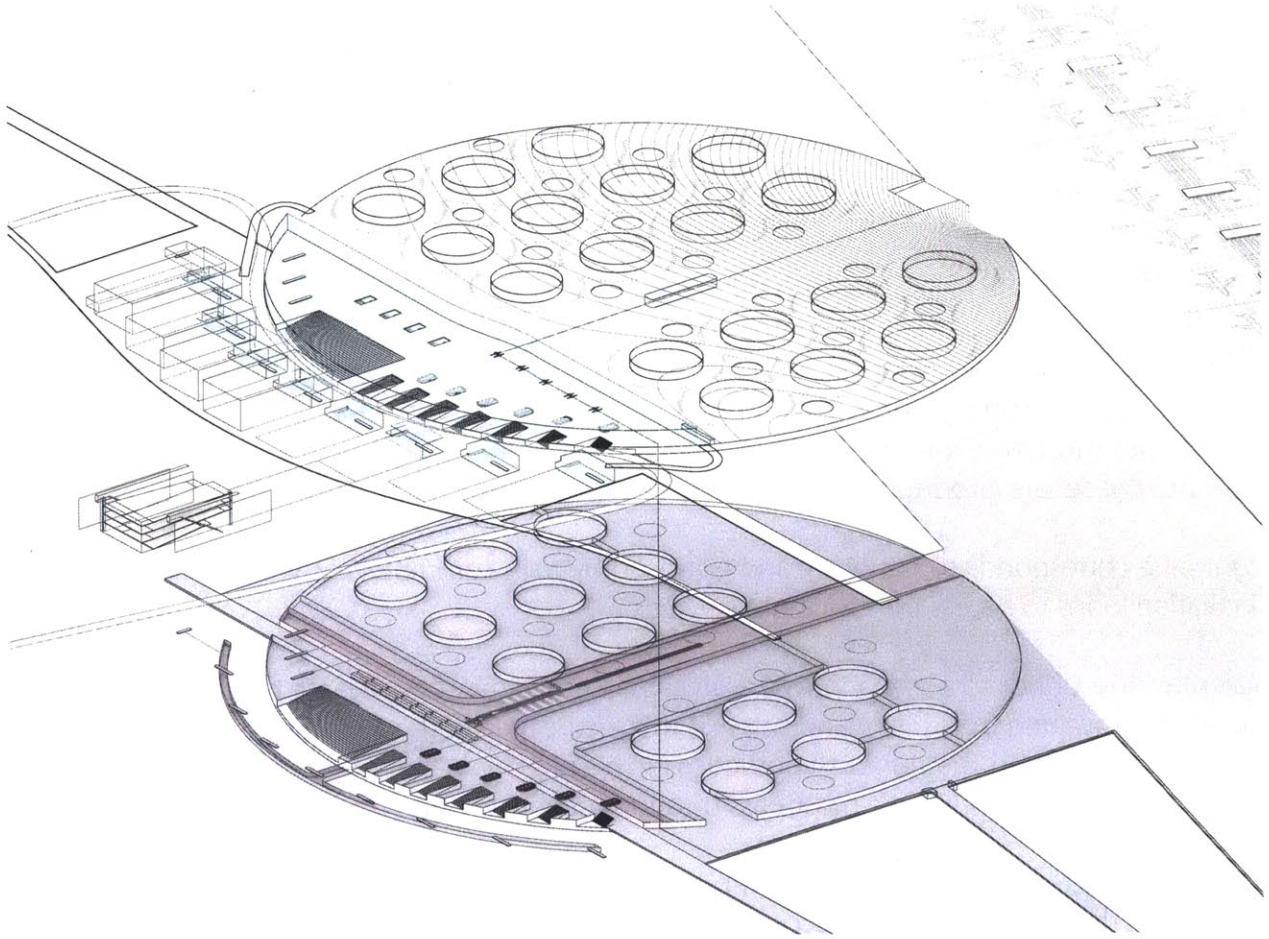
The hub is a node within an inter-regional and inter-national network. A circle is found to be the ideal shape because it is anti-corridic. It has no direction or corners and connotes a singular destination or stopping point rather than a space of transfer or flow.



3.3 Diagram of the hub connecting with road, rail, and airport.

The circular plan is extended vertically to become a very thin cylinder. The top surface of the cylinder slopes from the airplane tarmac at level zero upwards eighteen feet for the train station to fit underneath on the other side. The raising of the circle establishes a mega-plinth that establishes a common ground of participation and provides a sense of a collective space and overall civic order. The underside serves as a service level that is only used by employees, baggage handlers, and logistical operations. The upper side serves as the passenger, commuter, and civic hub level.

Parking structures for 18,000 cars line the side and next to them is the large lobby that contains check-in areas, the train station, security checkpoints, and baggage claims. This is also the area where one checks into a mobile lounge to access the grid of cylindrical activity nodes on the plinth.



3.4 Drawing of the main elements of the hub.

Sequences and Scenarios

The sequences within the hub can be divided into entry, exit, transfer, and waiting scenarios. The plan is roughly divided into two halves by the security line in red. On the left is the secure airport area in green and on the right, in light blue, are the activity nodes of the non-secure civic hub.

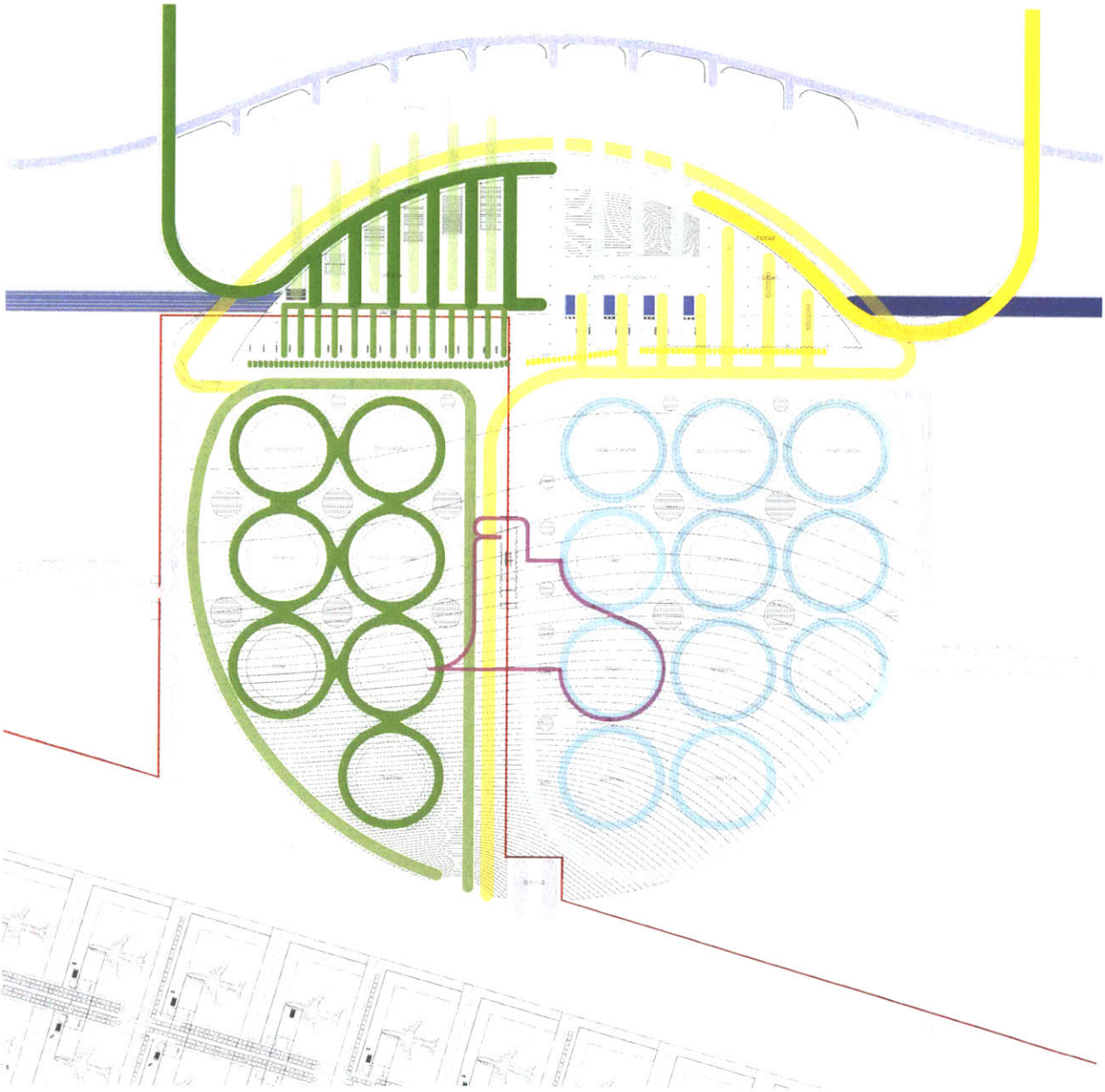
Green corresponds to the sequence of entry to the airport by car and the circulation loops that mobile lounges follow througout the airport.

Yellow corresponds to exiting the airport by mobile lounges. When exiting, one can command a lounge to deliver one to the train station, car pick-up area, or any of the eight parking structures which each have their own bag claim areas. One can also be taxied to any of the civic hub nodes, such as the the shopping area, media/entertainment area, childrens area, and so forth. The mobile lounges must pass through a security checkpoint on the upper left side of the hub to enter back into the secure airport.

Light blue corresponds to the entry and exit used by train commuters as well as the pattern of circulation loops to access the civic hub activities.

Majenta corresponds to a scenario where an air passenger may have a large block of free time to spend while waiting for a plane and can exit the secure area of the airport on the left and enter the civic hub area on the right. Hypothetically, this passenger can go for a swim, go to a spa, watch a film, and so forth. One must pass through security to enter back into the secure airport.

Grey, at the bottom of the circular hub, represents the point where baggage service vehicles enter and exit the baggage spine to access the airfield.

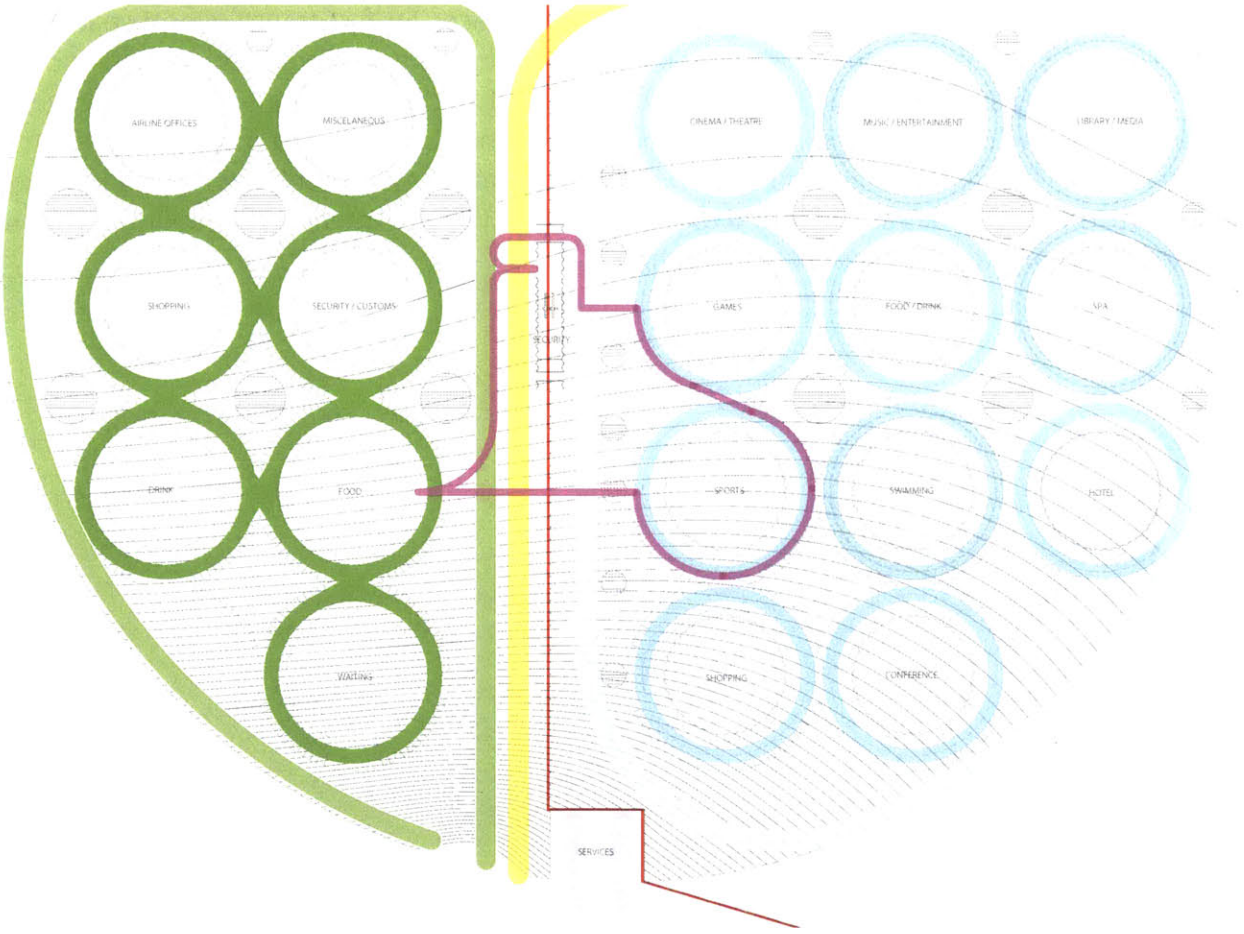


3.5 Diagram of the types of circulation paths through the hub.

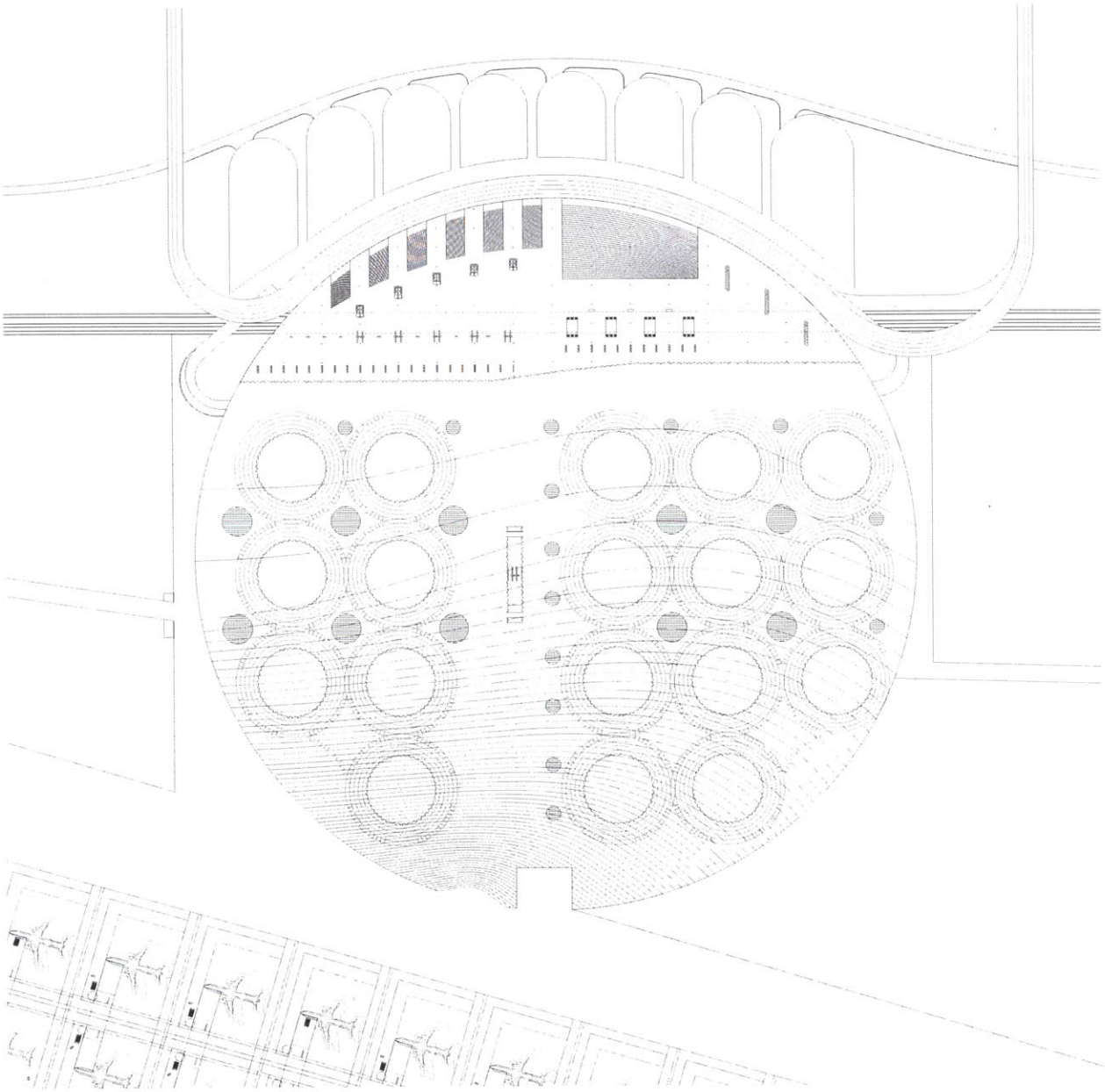
The overall plan shows each node containing a single thematic program. (fig. 3.5) For instance, one node is dedicated to security, another to food, another to shopping, and so forth. It is easy to see this thematic grouping as creating isolated monocultures, but when considered from the perspective of the traveller it can be useful. For instance, one may exit a plane, step into a lounge and desire to eat, shop, or go for drinks but without specific requirements for what kind of food or shop they want to visit. A mobile lounge can at least deliver them to a general food node that serves as a kind of food court, or the shopping node which serves as a market with many choices. However, if one does have an exact restaurant or shop they want to go to, they can also be delivered directly to it because all of the activities are located along the perimeter wall where the lounges drop off and pick up people.

An important area of design that remains to be studied deals with the randomization of grouping activities. An alternative to the thematic grouping strategy would be to completely randomize how all of the activities are grouped. This would result in what is commonly considered urban qualities: diversity, variety, juxtapositions, cross-programmings. Randomizing would also help introduce what Richard Sennet calls strangers, disorder, and jolts into the microcosmic city that is the hub -- conditions which are vital for cities.[2] This thesis proposal has not explored the randomization of activites but it remains a highly relevant alternative.

[2]Sennett, Richard. The Fall of Public Man. New York: W. W. Norton & Company, 1974.

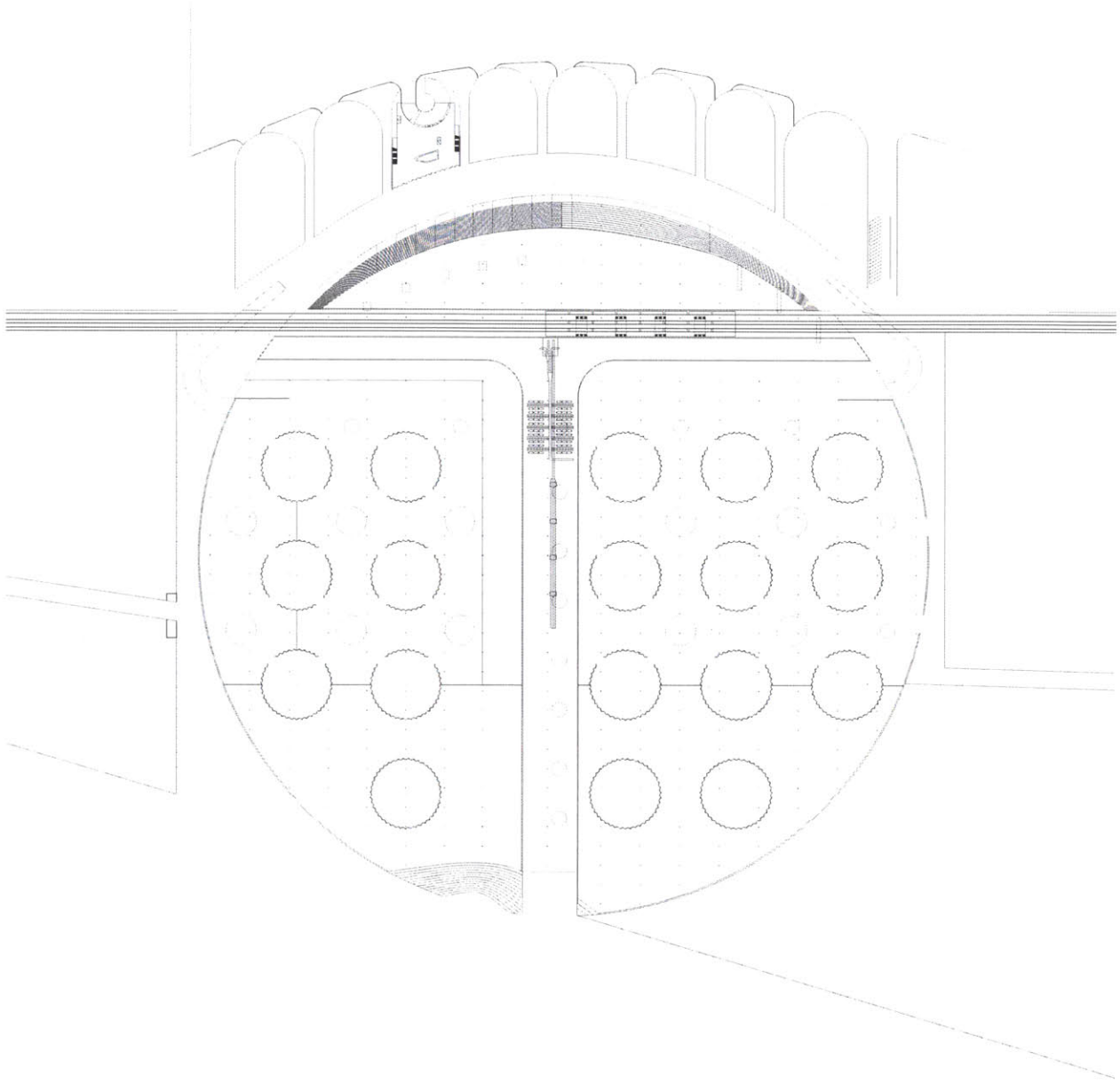

AIRLINE OFFICES
MISCELANEOUS
SHOPPING
SECURITY / CUSTOMS
DRINK
FOOD
WAITING
SECURITY
CINEMA / THEATRE
MUSIC / ENTERTAINMENT
LIBRARY / MEDIA
GAMES
FOOD / DRINK
SPA
SPORTS
SWIMMING
HOTEL
SHOPPING
CONFERENCE
SERVICES

The top level passenger plan is articulated in terms of spaces for fast transfers and spaces for slower lingering and meandering. Most spaces within the hub are categorized as fast, transfer space: the parking structures, the mega lobby, the airfield, and the interstitial space bewtween the circular activity nodes. The only spaces that are for slow lingering and meandering are the activity nodes. These nodes are laid out on a grid and are accessible only by mobile lounges. The interior of these nodes are intended to provide small walkable interiors that counteracts the largely dominating fast spaces of flow in the hub.



3.6 Passenger level plan

The intention of having an underside service level is to simplify the top passenger level. The bottom level service plan consists of a central service spine for baggage handling which connects to the train station and eight parking structures. It also consists of areas for basic logistical operations such as storage, delivery access, mechanical space, and so forth. All nodes on the top level have a dedicated service underside.



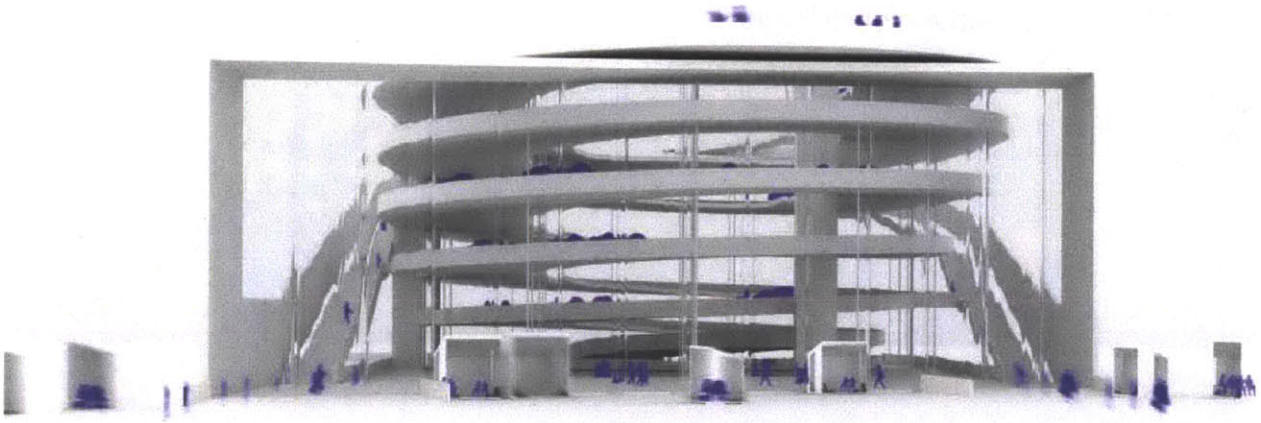
3.7 Service level plan

Modal Transfer

The parking garage is a critical threshold into the airport-intermodal hub. In this design proposal for a new airport at T.F. Green, it is assumed that 66% of air passengers, and most commuters and employees will enter and exit the hub through the parking structure.

The parking structure is a fast and slow space. The streamlined movement of the parking ramp and stairs is what Neutra would call a "smooth and continuous space of transfer."[3] This sense of fast space slows down at the ground floor where the structure transitions into a more vertical, static and volumetric space. This taller space serves multiple purposes. It contains a check-in area for departing passengers and a baggage claim for returning passengers. There is a very large corrugated glass wall that interfaces with the lounges that are delivering returning air passengers, employees, and civic hub users back to their cars. At the top is a space of spectacle from where the everyday drama of the hub can be observed.

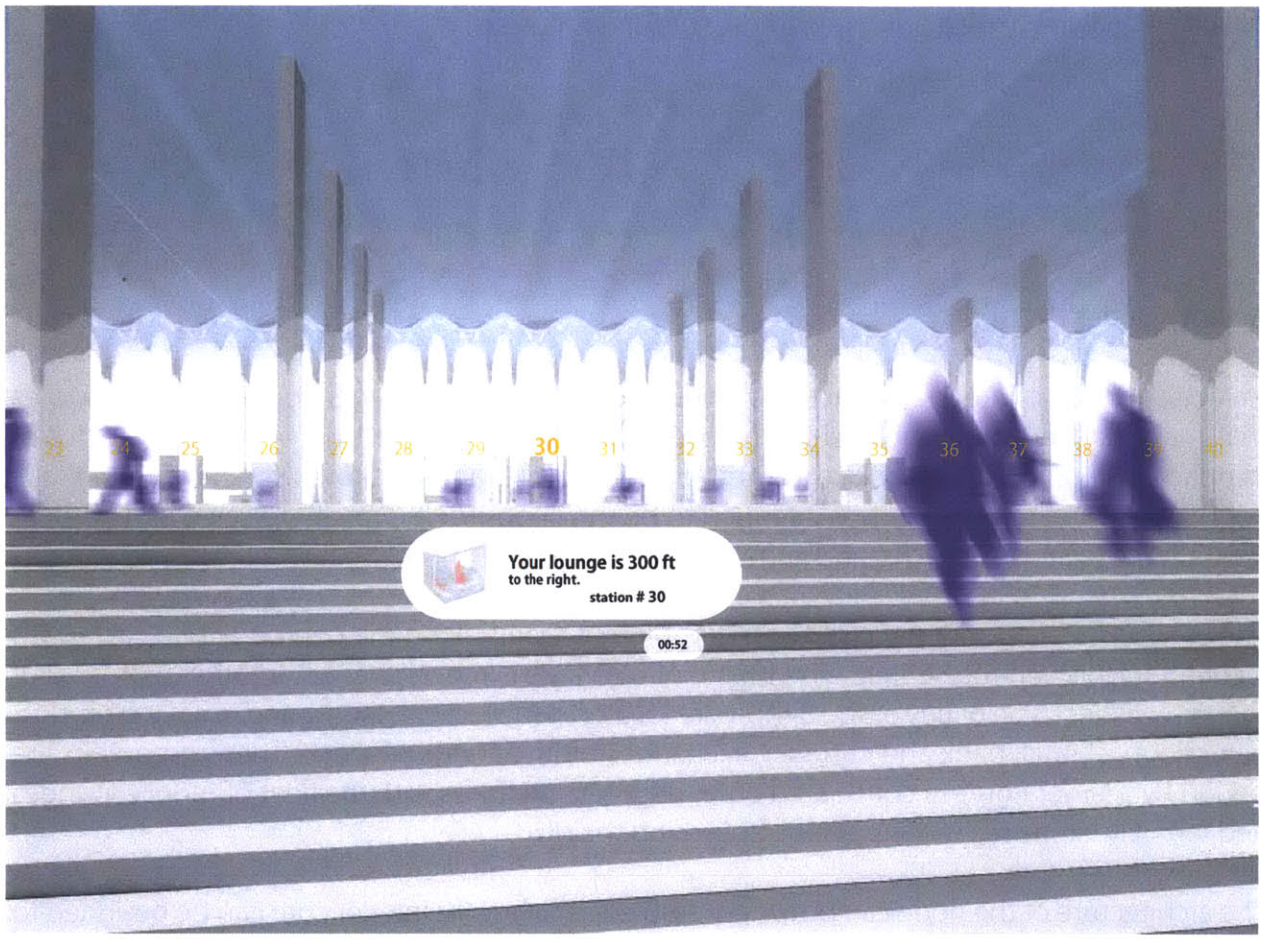
[3]Neutra, Richard J. "Terminals?-Transfer!" The Architectural Record, 1930: 99-104.



3.8 Elevational perspective of a parking structure with baggage claim, check-in counter and mobile lounge interface.

Check-in Stations

After parking the car, being dropped off, or entering the hub by train, one enters the check-in lobby of the airport which is also the threshold one enters to access civic hub activities. As conventional face-to-face check-in counters are replaced by fast and easy to use digital check-in methods, this lobby will become a space of pure transfer from one mode (either train, car, taxi, bus) to another mode (the mobile lounge).



3.9 Perspective of entering the main check-in lobby. Text is written over the image to represent how augmented reality technology - such as Google glasses - can keep the traveler updated on their flight schedule and tell them where their mobile lounge is waiting for them. In this case, a mobile lounge can track the location of its user and know that station #30, at 3:35 for instance, is the ideal location and time to meet the user. One can also simply state a command to the mobile lounge such as "take us to the shopping area for 30 minutes and then the food court for another 30 minutes and then we would like to have a drink at a cocktail bar for the remaining free time before our flight." Ideally, everyone entering the hub would recieve a pair of Google glasses.

"I lean and loaf at my ease observing a spear of summer grass."

— Walt Whitman

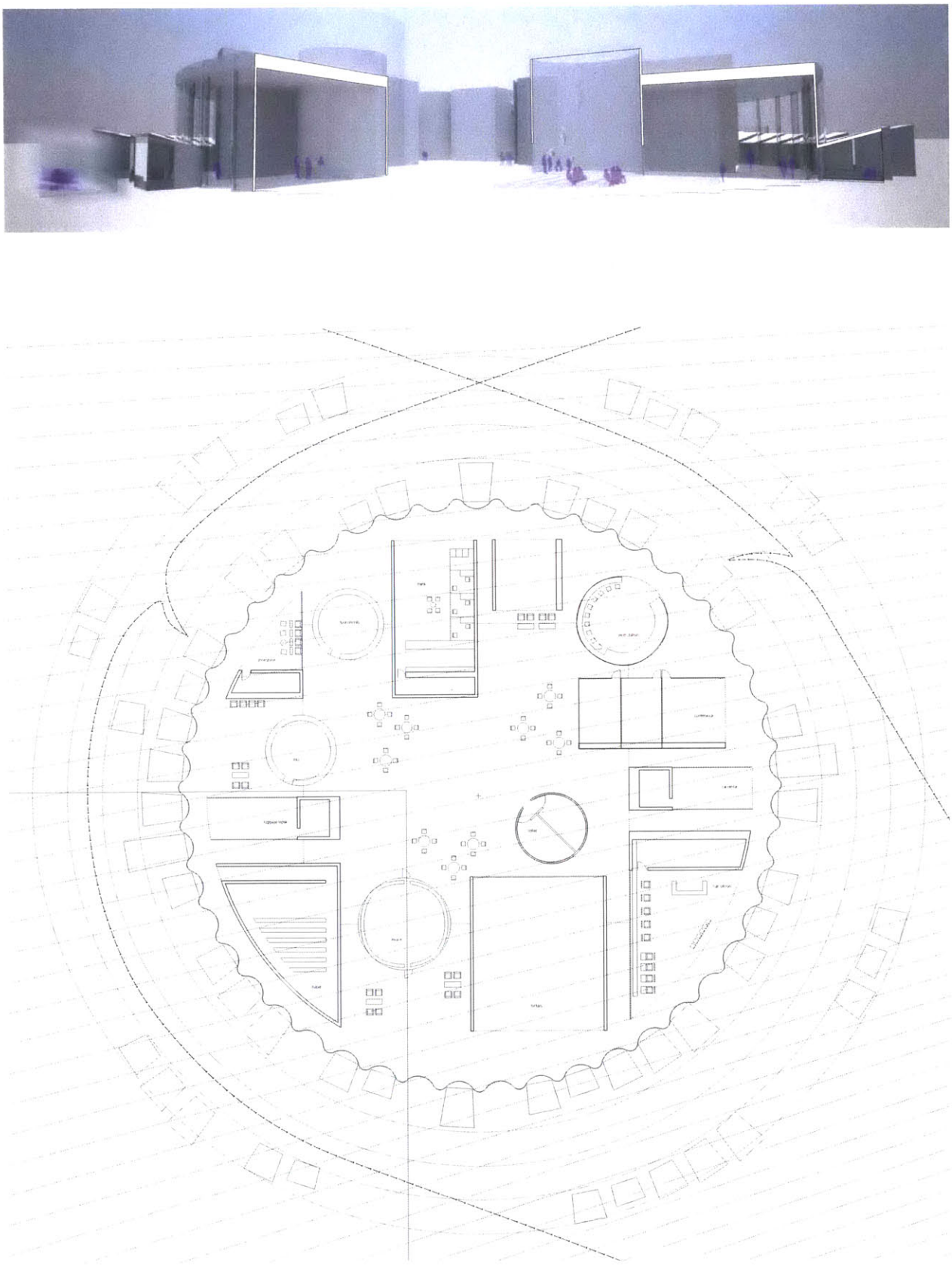
Activity Nodes

An activity node is intended to act as a singular space within the larger constellation of spaces that make up the entire hub. While the overall plan performs as a kind of superconductor of people transferring from one place to another which creates an almost overwhelming ubiquitous field of flows and traffic, a node is intended to be the opposite. It is meant to serve as a destination, a place to stop, meander, and linger.

The plan on the opposite page shows a grouping of rooms along the perimeter of a circle with a common space in the center. The theme of this node is miscellaneous. In other words, all of the miscellaneous acitvities of the airport are located here: lockers, shoe shine, smoking lounge, hair saloon, chapel, bank and currency exchange, information booth, etc. These groupings are bound by a larger figure, a corrugated outer ring that interfaces with the fleet of mobile lounges and formally expresses the larger idea governing the plan.

The architecture of the node can be further studied as to how its interior core can be designed to invite or draw one's attention into the center. A deep and ambiguous interior would provide the necessary conditions for the flaneur, the meanderer, and the explorer and would counterbalance the space of flow and rush on the outside. Architecture has an important purpose in this context: to create a dense field of unexpectedness and ambiguity that will cause people to slow down, stop, and linger. These desired effects imply a language of windows, transparencies, screens, and labyrinths.[4]

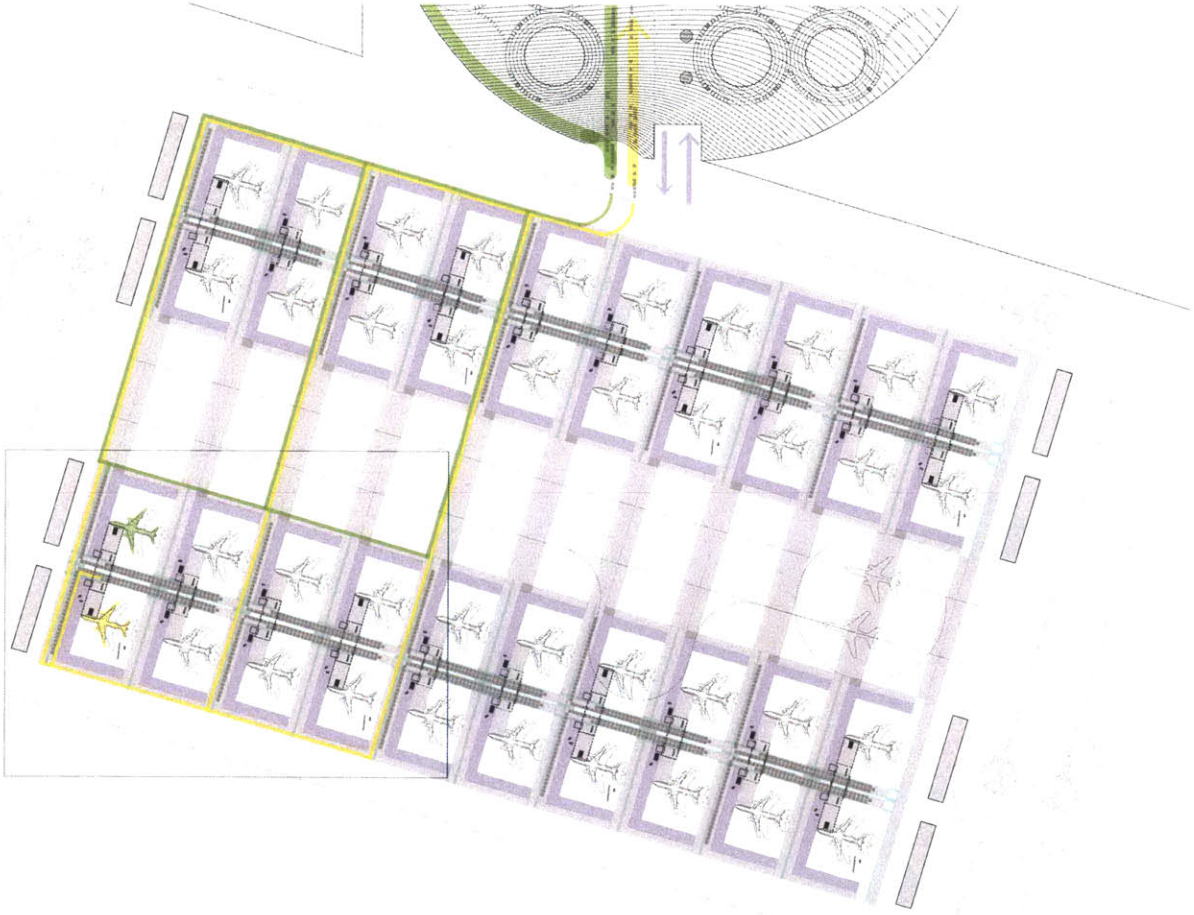
[4] Both Henri Lefevre and Dell Upton write about strategies for creating this unexpectedness or affecting one's regular routine. Lefevre, Henri. Rhythmanalysis: Space, Time, and Everyday Life. New York: Continuum, 2004. Upton, Dell. "Architecture in Everyday Life." New Literary History 33 (2002): 707-723.



3.10 Section perspective and plan of a grouping of airport activities

The airside plan follows the basic layout of a transporter scheme. It is designed to accommodate the peak hour in 2020 which is forecasted to have close to 4,000 passengers in the airport and on the tarmac. This equates to about 2,000 lounges in the airport at once.

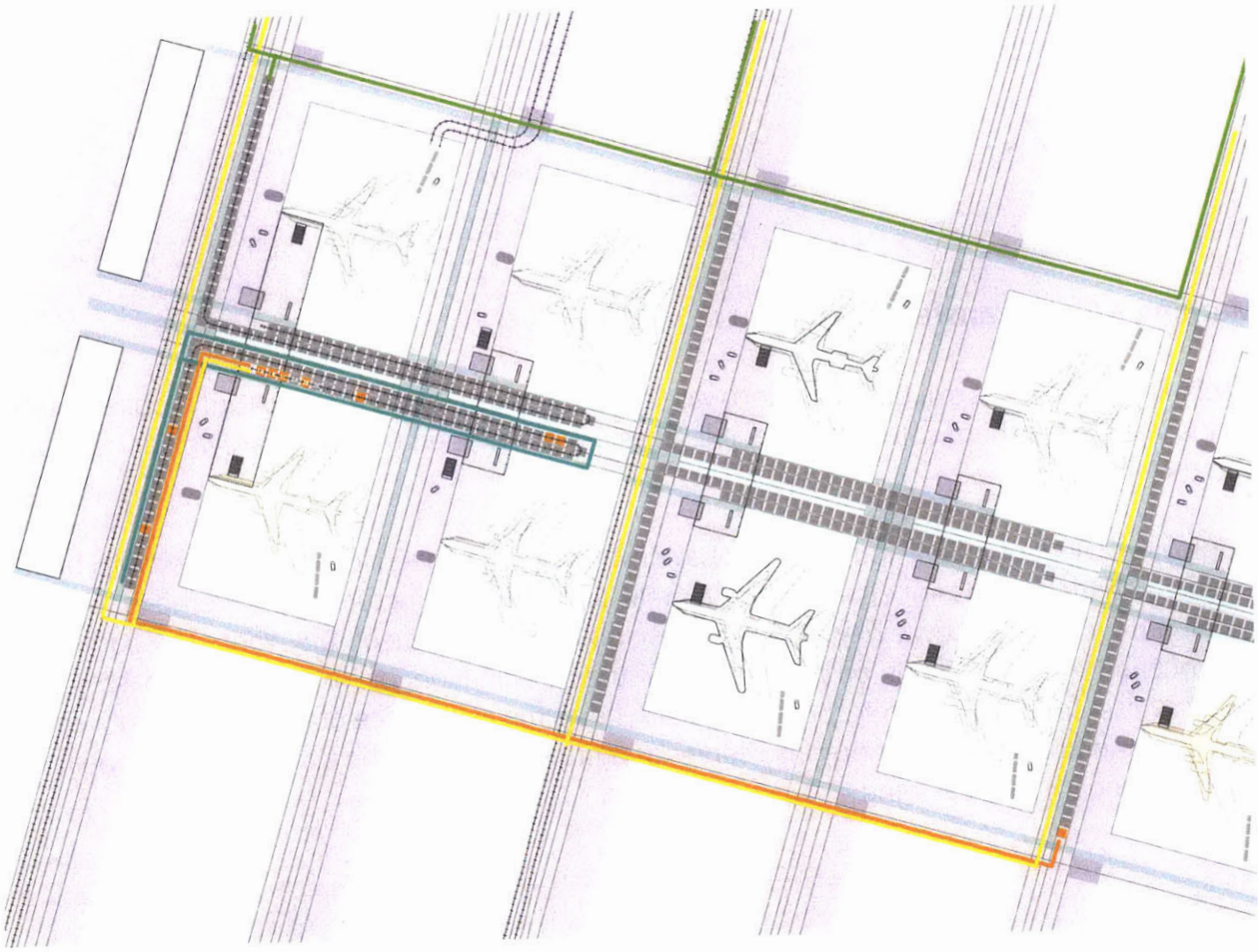
The idea of the plan is to provide open, interstitial spaces between planes so that the mobile lounges can circulate the tarmac. The lounges can use swarm intelligence to compute the optimal paths through the airfield to avoid traffic and interference with baggage carts, service vehicles, planes, and the ques of mobile lounges that form adjacent to arriving and departing planes. The drawing shows the circulation paths that lounges may take in the situation of a plane departing (green) and a plane arriving (yellow). Grey areas are designated for lounge circulation. The majenta area is for service vehicles, and cyan is for a mobile support staff that can serve the passengers in the lounges if they need any anything or have any emergencies.

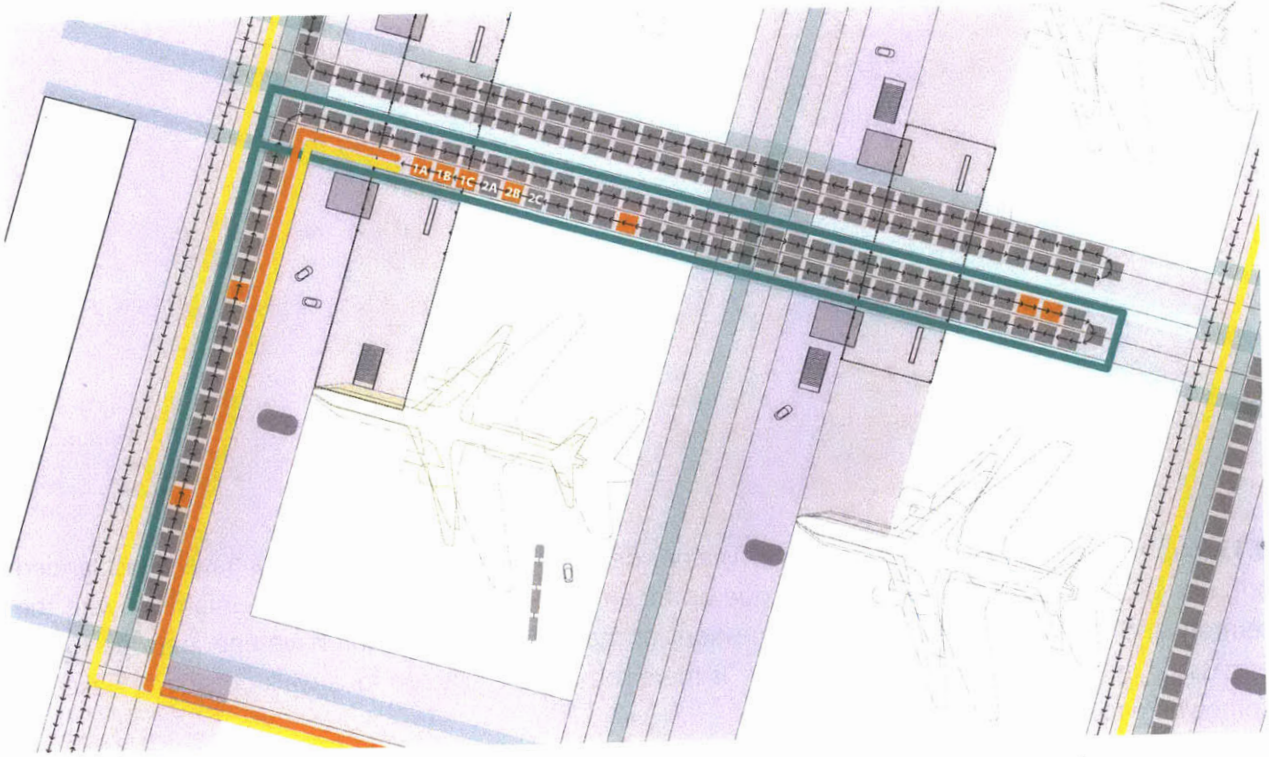


3.11 Plan of the airfield and a scenario showing a plane departing (green) and a plane arrivinig (yellow).

The mobile lounges que up in an order that corresponds to the order of passengers as they exit the plane. The first lounge will be 1A, followed by 1B, 1C, 1D, and so forth. If every passenger has a digital device to interface with the software, they can command the lounge to take them excatly where they need to or want to go. This system is very useful from the point of view of the traveler stepping foot in the hub for the very first time.

3.12 (right) Plan of a section of the airfield showing a plane departing (green) , a plane arrivinig (yellow), and a transfer from plane to plane (orange). Note that the lounges can que up in order according to the plane's internal seating arrangement. For instance, the orange lounges will pick up specific passengers who need to transfer planes in a rush. It is best if the order of people exiting the plane corresponds roughly to the queing of lounges.



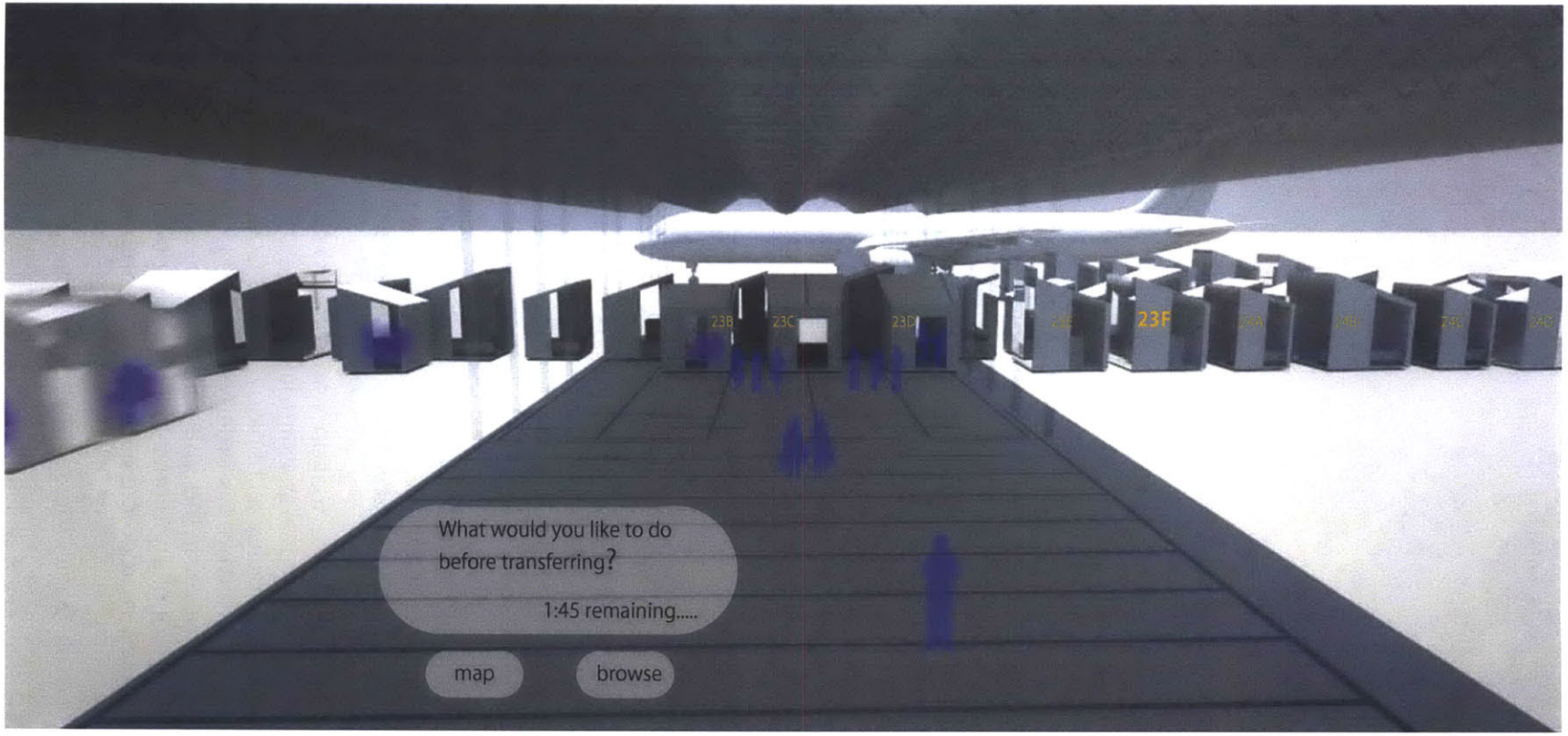

1A
1B
1C
2A
2B
2C

Marking a Civic Transfer

Deplaning passengers exit the plane and walk on the tarmac towards their custom mobile lounge that is waiting for them. Staff and the airline crew are also lined up to say farewell or help one into their lounge.

Employing a fleet of mobile lounges may have evaporated the need for a corridic terminal building but architecture has not dissapeared. A great, light weight structure floats overhead. Besides keeping the rain and snow away, it marks the symbolic importance of the event. The passenger has touched their feet firmly on the ground of their destination, or for transfering passengers, they have set foot in a new territory - one that reflects the experience of travel as being weightless, airy, and bright. The canopy also serves as a fitting home for the aircraft which appears to park underneath its great wings.

3.13 (right) Perspective of exiting the plane. The perspective shows a scenario where a traveler just landed and has 1:45 minutes before needing to que up for a transfer flight. The traveler is unfamilair with the territory and can simply ask the lounge questions or make a command: "do I have enough time to get a massage and make it to my next plane?." "Is there somewhere I can go for a walk outside?" "Take me somewhere to sit and people watch."


23B
23C
23D
23F
What would you like to do
before transferring?
1:45 remaining.....
map
browse

CONCLUSION

This thesis set out to research some of the science and rational design processes for approaching architecture as a temporal art. The early research was extremely rewarding and consisted of identifying a field of sequence knowledge and extracting principles, techniques, and concepts that can be applied in a range of design contexts. The hub was selected as a site to study this subject actively through design and with more productive constraints. The design of a hub caused an unexpected turn for the thesis and opened up new issues. These issues were unavoidable and seemed to carry very provocative implications. For instance, having studied the evolution of airport typologies, it became clear that the mobile lounge concept was the most obvious and provocative direction, even though it radically demanded that the thesis shift from its intended architectural focus to a more to technical and systems planning focus. [1] Nonetheless, the design of the hub not only opened up questions about speed, mobility, and perception in relation to architecture, it also resulted in a radical yet practical prototype for medium to large sized airport-intermodal hubs. One of the most successful aspects of the research is that the concept is not just specific for intermodal hubs but can be applied, with slight modification, to cities in general.

The design proposal achieves the following results:

1. *Connections among the airport, intermodal hub, and civic activities are improved.*

2. *Sequential efficiencies in the airport and intermodal hub are improved.* This is achieved by using a fleet of individual mobile lounges which allows individuals to optimize their own custom routes through the hub. The fleet also behaves using swarming logic and can optimize routes for speed and minimize bottlenecks.

3. *Long and undesirable walking distances are minimized while desirable walking areas are maximized.* The fleet of lounges eliminates long walking distances and brings people directly to the space of their interest which in most cases are intended to offer extensive internal walking spaces.

4. *Signage and navigation is simplified to an extreme.* The lounge serves as a hybrid between an intelligent personal assistant, knowledge and spatial navigator. If everyone entering the hub uses augmented reality technology, such as Google glasses, there will be little if no need for signage. Structure, however, is ordered in space to facilitate navigation by emphasizing directions and axes. However, in the internal core of the activity nodes, space and structure becomes intentionally ambiguous and unclear in order to pull one into the center. Here navigation is intentionally obscured in order to create temporary moments of getting lost.

[1] See Louis Kahn's Midtown Philadelphia plan as a precedent for a systems planning urban design project with architectural implications. Kahn, Louis. "Toward a Plan for Midtown Philadelphia 1953." In Louis I. Kahn: Writings, Lectures, Interviews, by Alessandra Latour, 28-52. New York: Rizzoli, 1953.

5. *The airport-intermodal hub is given a sense of civic form.* On a large scale, the mega cylindrical plinth provides a common ground and a sense of civic order encircling the hub. Locating many secondary civic activities in the hub makes it not just a space for passing through but also a place to be in i.e. a destination in itself. All spaces in the hub are treated equally. There is no reason why a place for parking a car should be treated less important than any other space. They are all part of the same continuous experience.

This design proposal was imagined from the perspective of the daily commuter, the aircraft passenger, the employee, and the users of the civic activities. From an economic perspective, a further extension of this research should look into how the proposal would affect the economic dynamics among airport owners, airline owners, and passengers. From an energy perspective, further research should attempt to measure if the use of a fleet of individual mobile lounges would consume less or more energy than the terminal building which it partially replaces. From a traffic engineering perspective, further research should look into the peak flows of the mobile lounges and what may be considered standard space requirements for this type of system. From a multi-disciplinary engineering perspective, further research should look into making an extremely compact, ecological, economical, and durable mobile lounge vehicle.

From an architectural perspective, further research should look into articulating a structural language that expresses the tension between fast and slow spaces and the spectrum in between. Development of the architecture should also provide spaces of spectacle, spaces to observe the airside and horizon, ways to introduce verticality into the scheme, and the randomization of activity groupings as a way of introducing urbanity into the scheme. The design can also be developed by providing an extended territory for the flâneur to walk and meander.

An underlying intention of the thesis was to make a pragmatic utopian design proposal for a local, ordinary, and everyday context. Springing from Henri Lefebvre's writings on the everyday, the thesis took a risk in dealing with the banal in the hopes of changing it.[2] The ordinary conventions of terminal buildings, baggage claims, check-in counters, security lines, parking garages, and so forth have been rethought in order to make a radical change to the status quo.

[2] Lefebvre, Henri. "The Everyday and Everydayness." In Architecture of the Everyday, edited by Steven Harris and Deborah Berke, 32-37. New York: Princeton Architectural Press, 1997. Lefevre, Henri. Rhythmanalysis: Space, Time, and Everyday Life. New York: Continuum, 2004.

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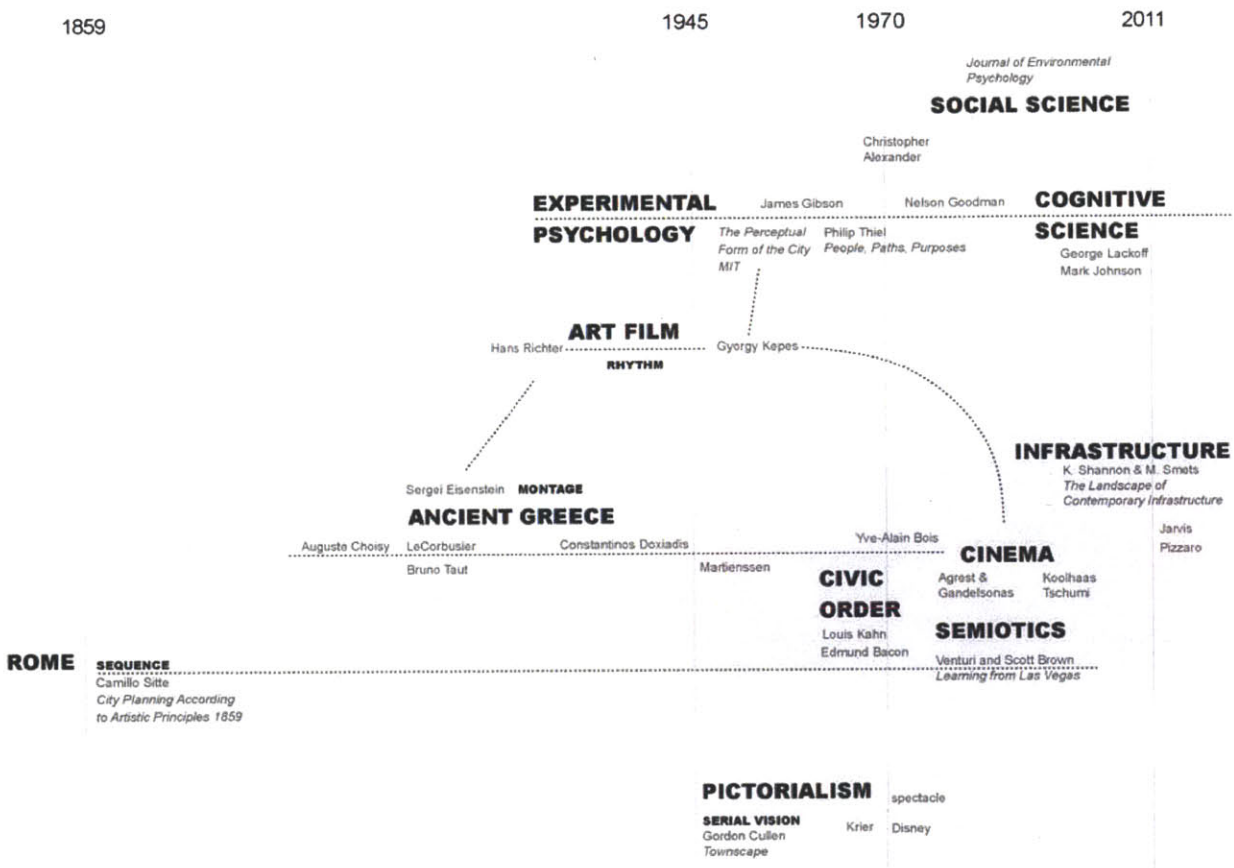
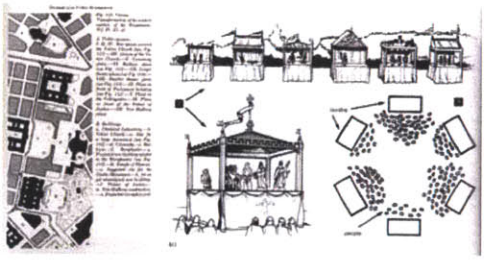
APPENDIX A

Identifying a Field of Research Programs on Temporality and Extracting Principles



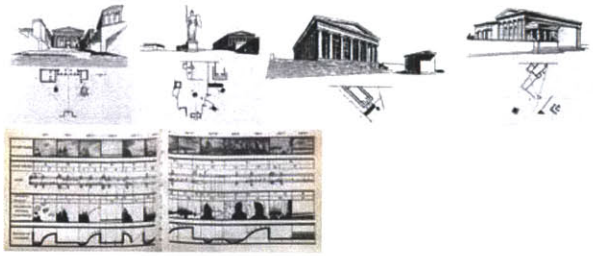
4.1 Map sketching out a field of research programs in sequence and temporality.

1. Sequences are perceived and constructed by movement through discrete sensorial environments.



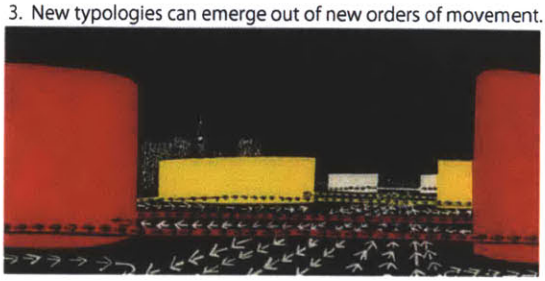
4.2 left Sitte, Camillo. City Planning According to Artistic Principles. Vienna, 1889. **4.3 right** Fraser, Neil. Theatre History Explained. Ramsbury: The Crowood Press, 2004.

2. Space and form is ordered relative to critical visual stages in plan, section, and perspective.



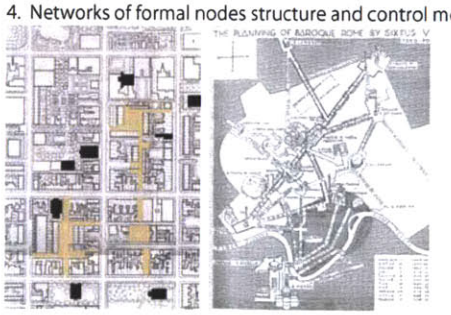
4.4 top Eisenstein, Sergei. "Montage and Architecture." Assemblage, 1989: 110-131. **4.5 bottom** Eisenstein, Sergei. Film Sense. Orlando: Harcourt Brace & Company, 1947.

3. New typologies can emerge out of new orders of movement.



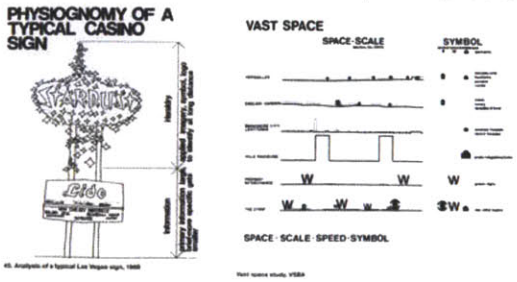
4.6 Kahn, Louis. "Toward a Plan for Midtown Philadelphia 1953." In Louis I. Kahn: Writings, Lectures, Interviews, by Alessandra Latour, 28-52. New York: Rizzoli, 1953.

4. Networks of formal nodes structure and control movement.



4.7 right Gideon, Sigfried. Space, Time, and Architecture. 1941.1953.

5. Architecture is information at various scales, textures, and clusters.



4.8 Robert Venturi, Denise Scott Brown, Steven Izenour. Learning from Las Vegas. Cambridge: MIT Press, 1977.

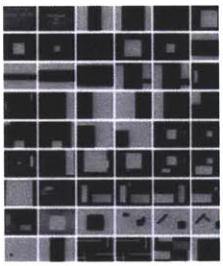
6. Pure notation serves as a score from which structure, form, and sequences can be derived.

5	2	3	1	4	6
3	4	2	5	6	1
2	6	4	3	1	5
4	1	6	2	5	3
6	5	1	4	3	2
1	3	5	6	2	4

	#5		#11		#17
	#6	#8			#18
#1		#9	#12		x
#2			#13	#14	
#3		#10		#15	
#4	#7			#16	#19

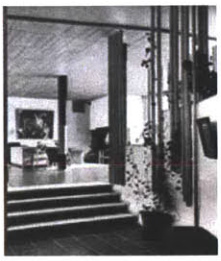
4.9 Wikipedia.http://en.wikipedia.org/wiki/Klavierst%C3%BCcke_(Stockhausen) (accessed May 24, 2012).

7. Formal and sensorial languages of opposites construct abstract narratives.



4.10 unknown source of still images from Gerhard Richters Rythmus 21

8. Take advantage of conceptual embodied metaphors in order to communicate.



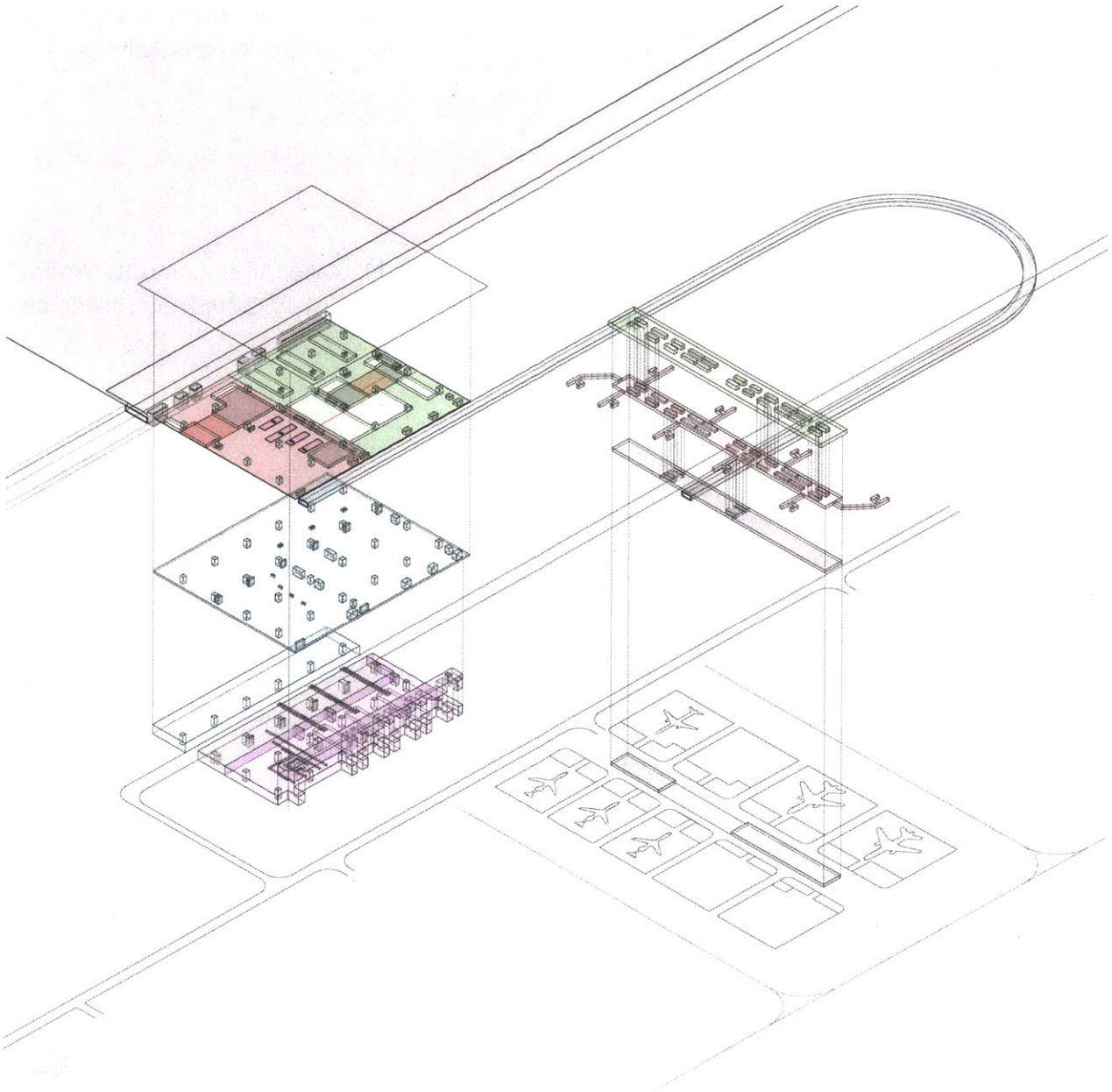
4.11 Aalto, Alvar. Complete Works . Vols. Vol. 1 1922-1962. Zurich: Artemis, 1963.

9. Architecture narratives emerge out of architecture's formal and structural autonomy.

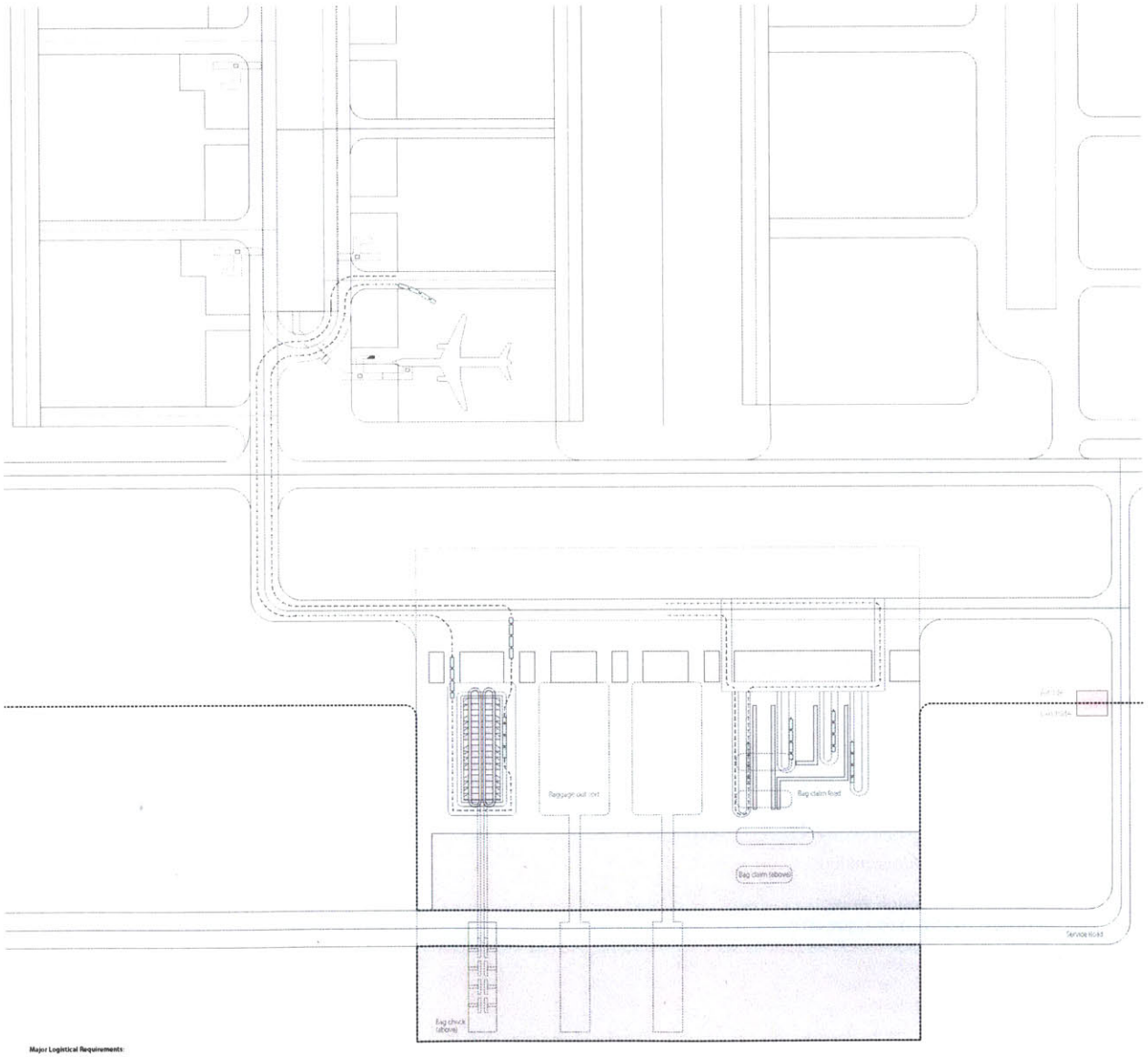
4.12 MOMA. October 20, 2011. http://www.moma.org/explore/inside_out/2011/10/20/to-collect/ (accessed May 24, 2012).

APPENDIX B

Study of Norman Foster's Stanstead Airport and TF Green Airport Metrics



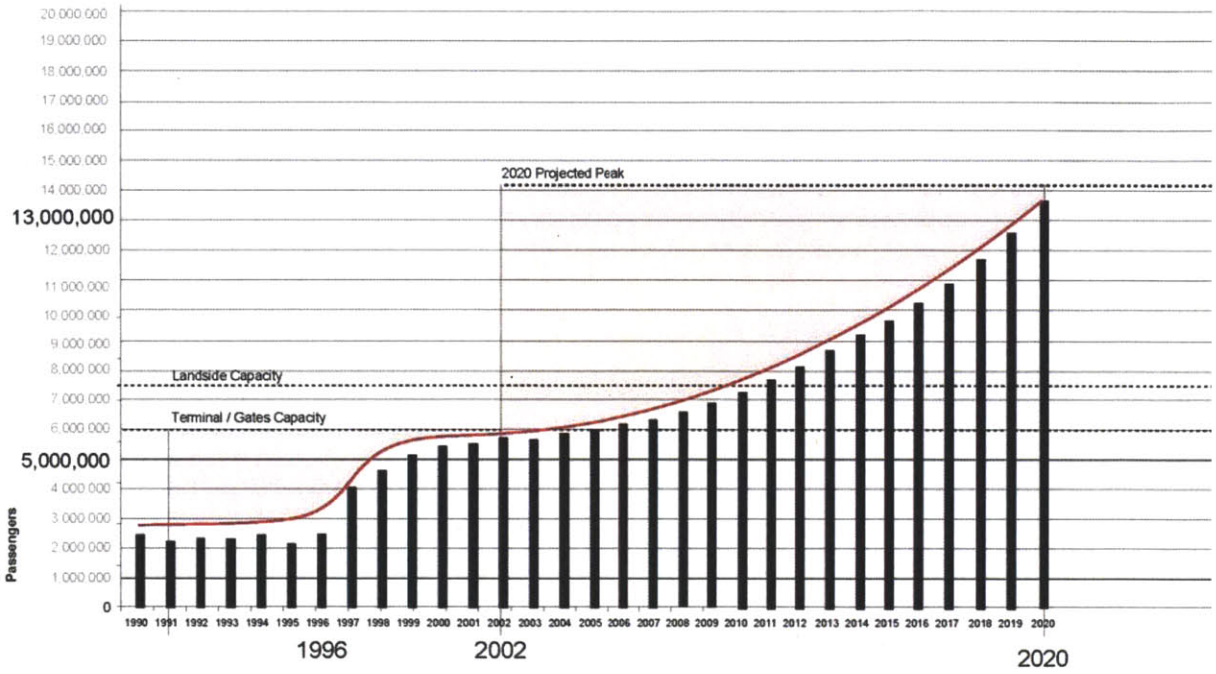
4.13 Drawings of Norman Foster's Stanstead airport.



Major Logistical Requirements:

1. Service roads for:
   1.1 baggage carts to airplanes
   1.2 for servicing aircraft and airfield (tugs)
2. Baggage sorting rooms
   2.1 for transfer from:
      2.1.1 conveyor belt to cart
      2.2.1 ULDs to carts

TF GREEN METRICS



14 million annual passengers in 2020
Assumption: 25% - 50% international flights
Average party size = 1.4 people
66% travel by car (average 1.8 people per car)

- 26% of these people are dropped off.
- The majority park in a garage

16% dropped off by fellow passengers who park.
Parking:
27% hourly, 19% daily, 33% weekly, valet = the rest
Check in:
Gate: 16%
Terminal: 84% > 33% @ curb + 66% @ ticket counter
Baggage:
69% : one carry on
8% : no carry on
30% do not check bags.
Average number of bags per passenger = 1.9
Origination:
60% in car
26% car rental
20% originate or terminate in a hotel
8% taxi
1% mass transit
Deplaning: Peak passengers: 971 on airside/hr
Enplaning: 971 on landside/hr
Rate of deplaning: 25 people/door/minute

Critical Passenger Volume Design Value:
Deplaning passengers going to baggage claim:
70% of 971 = 680
66% of 680 go to parking garages: 449
8 garages > 449/8 = 56 people per hour
to dock a parking garage bag claim =
<1 person per minute

4.14 (top) Forecasted passenger for TF Green airport in 2020.
RI Statewide Planning Program. Transportation 2030. Providence: RI State Planning Council, 2008.11

4.15 (bottom) Projected flow metrics for TF Greeen Airport in 2020.
Brown, Landrum &. "Master Plan Update T.F. Green Airport." Master Plan, providence, 2002.