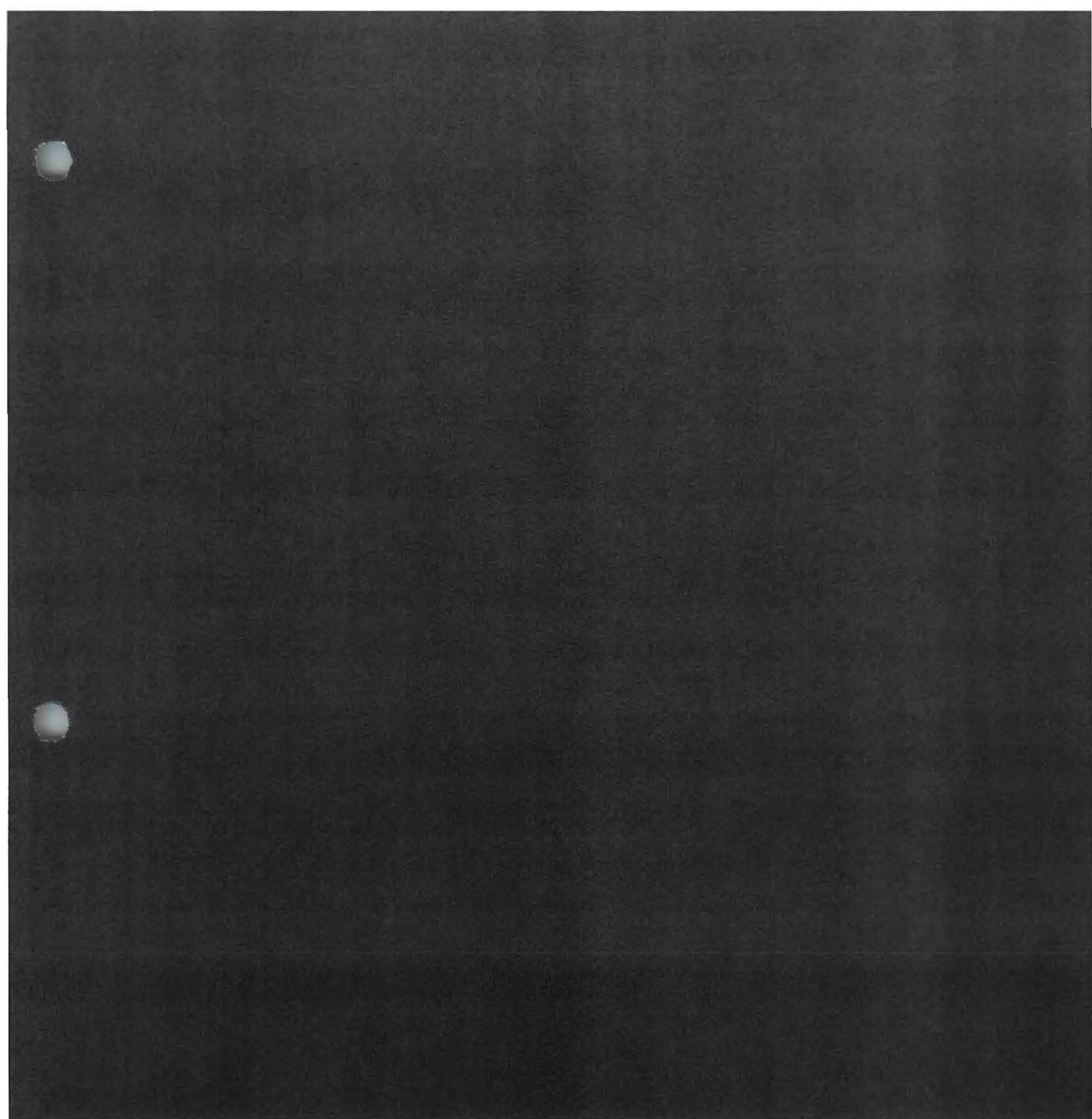


Research • • • • •



*Multimodal Mass Transit Hub for
Columbus, Ohio*

An Honors Thesis (LA 404)

by

David Heilman

Thesis Advisor
Chris Marlow

A handwritten signature in black ink, appearing to read "Chris Marlow", written in a cursive style.

Ball State University
Muncie, Indiana

May, 2012

Expected Date of Graduation

May, 2012

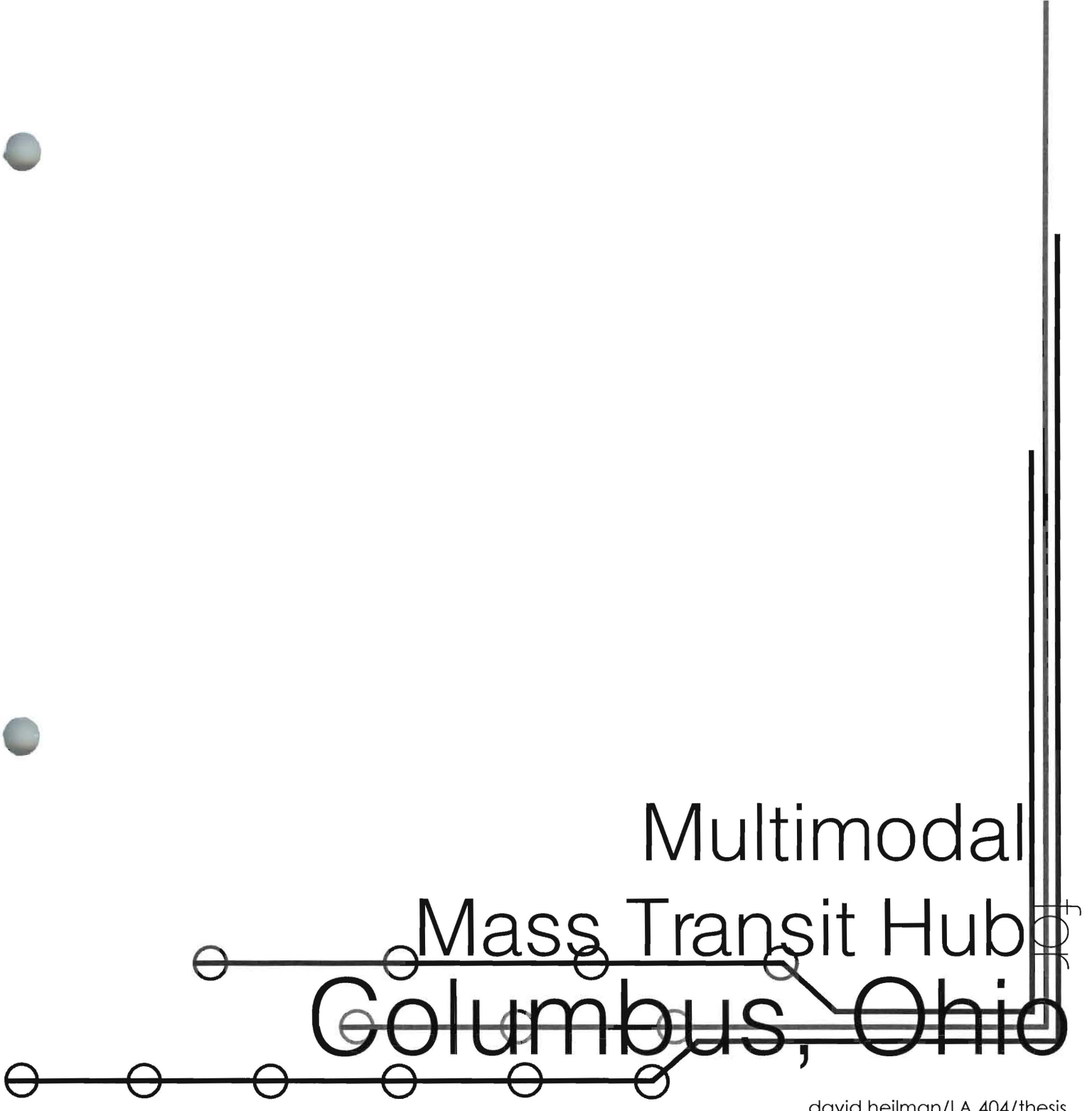
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Abstract

This project reveals the potential of a mass transit hub for the city of Columbus, Ohio. The mass transit hub will sit on a 90-acre plot of land just west of the downtown area and will include retail and office space, housing and ample park space to service those living on the site and residents of the surrounding neighborhoods. The proposed light rail lines will branch out of the transit hub, alleviating some of the dependence on the automobile while improving the general welfare of Columbus through economic, social, and cultural catalysts.

Acknowledgements

I would like to thank my professors, John Motloch and Carla Corbin for their persistent guidance throughout this project. I would also like to thank Chris Marlow, my mentor, for pushing my design beyond the ordinary. Without his expertise, this project would have been half as good. And lastly I would like to thank my fellow studio mates for making these last five years unforgettable.

An abstract graphic representing a transit hub. It features two horizontal lines with circular nodes. The top line has five nodes, and the bottom line has six nodes. A vertical line on the right side connects the two horizontal lines, with a small 'T' symbol at the intersection. The text 'Multimodal Mass Transit Hub' is positioned above the top line, and 'Columbus, Ohio' is positioned below the bottom line, with the text overlapping the lines and nodes.

Multimodal Mass Transit Hub Columbus, Ohio

david heilman/LA 404/thesis

Aknowledgements

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Abstract

This project reveals the potential of a mass transit hub for the city of Columbus, Ohio. The mass transit hub will sit on a 90-acre plot of land just west of the downtown area and will include retail and office space, housing and ample park space to service those living on the site and residents of the surrounding neighborhoods. The proposed light rail lines will branch out of the transit hub, alleviating some of the dependence on the automobile while improving the general welfare of Columbus through economic, social, and cultural catalysts.

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Introduction

The growth patterns of the United States in the last 60 years has been driven by the Interstate and the 'American Dream' of living in a suburb. The Federal Housing Administration (FHA) guaranteed segregated neighborhoods outside of the city limits as the population exploded in the 50s and 60s (Kirkman, 125). This became known as 'white flight': leaving the inner city to be occupied by minority groups. With more and more people moving away from the city center, downtowns began to lose their sense of identity. Entertainment and businesses also ran for the suburbs, creating voids in the fabric of the city center—and only recently has this trend began its reversal.

As more and more people move farther and farther away from their jobs, they have become more reliant on the interstate system. This has put a huge strain on the roads, the economy and the environment. City planners, in their attempt to alleviate congestion and traffic jams, build wider highways at the cost of taxpayer money and the environment. According to the Texas Transport Institutes annual mobility report, Americans spend 646 million hours stuck in traffic at the cost of 13.7 billion dollars to the economy. While these numbers are staggering, it explains the ineffectiveness city planners short-term fix of widening highways. In theory, the more lanes devoted to traffic, the faster it will move, thus allowing workers to get to work in less time. However, no matter how many extra lanes are added to every highway, the problem of wasted time and lost money will still exist--the demand will always outpace the supply unless there is a radical change in the way



“Americans spend 646 million hours stuck in traffic at the cost of 13.7 billion dollars to the economy.”

people think.

This shift in mindset would factor in the acceptance and use of mass transit, while moving populations back into the downtown region. This in no way is an end all to the problem stated above, but one possible long-term solution that has the potential to change America's dependence on the car. Mass transit coupled with urban development can serve as a catalyst to help cities improve their social and economic standing. When planned properly, mass transit can bring residents to jobs, universities, hospitals, courthouses and other public amenities while urban development brings thousands of people back into the downtown area. Again, mass transit is not the sole solution to relieving dependence on the automobile, but when acting in conjunction with other sustainable living practices, it can begin to unsettle the status quo. It is the goal of this project to accomplish this for the city of Columbus.

Problem

The trend in development for the last sixty years has been to grow out and use up as much space as possible. Urban sprawl, as it is called, has caused numerous issues. Some of these issues include; reliance on cars, congestion, the building of interstates, extreme amounts of pollution, and the decentralization of cities. Highways do serve good purposes, but they have become the focal point of transportation and invite the idea of urban sprawl. With this, downtown areas suffer immensely and business and residents move away, creating this vacuum that is filled with vacant lots and crime. Zoning has been a significant challenge to mass transit developers because most up the suburban zoning limits the potential space in which a mass transit system could be built. For this reason, highways were built, with little room for any other mode of transportation. And with tens of thousands

of people commuting daily into the city of Columbus, this creates huge congestion problems, and is an environmental concern. Cars sitting in traffic do nothing but put pollutants in the air, and waste the time of the driver—time that could be spent at work putting money into the economy. With the current land use patterns and zoning restriction, Columbus will continue to develop around the car, which will be an ineffective use of the land. However, if the city were to begin rezoning and make mass transit its focus, the city could be a more vibrant, exciting place to live. This however, would require that the city center would have to become much more dense in order to support a multi-modal mass transit system. Thus, bringing residents back into the downtown would become a major step in the right direction to help support mass transit.

Hypothesis

With the research I will gather, I believe that it is possible to create a multi modal mass transit system that can reduce the reliance on the vehicle while bringing residents back into the downtown area creating a vibrant, unique community.

Literature Review

Urban sprawl is a way of life here in the United States. Looking back, there are two major influences that directed the development of urban form: the first one being the interstate highway system, and the second one being the Federal Housing Administration. Highways could be viewed as, 'an automobile subsidy' (Kirkman, 125). Essentially, the public is supporting the private auto makers by using their own tax dollars to demand highways they can use to commute to work and travel long distances easily and quickly. The FHA in the 1950s and 60s, 'guaranteed racially segregated suburban development, but also provided mechanisms for regulating the quality of the housing supply and the form of subdivisions' (125). With this much power, the FHA could determine lot size, house size, and distance of the subdivision from the city. With individuals having the ability to live 30 plus miles away from work, yet being able to commute to work in less than an hour, they will pack up and move out of the city limits. As millions of people across the nation adopt this idea, reliance on the car becomes even greater. More cars equal more pollution, also putting a larger strain in the interstate systems. Cities around the world such as Los Angeles and Beijing are constantly under smog, created mostly by the exhaust of cars. Americans also spend an average of 34 hours a year stuck in traffic, and a cost of \$808 per person per year (AUTOPIA, 2011). Now multiply that number by roughly 310,000,000 (the population of the U.S.) and you get some staggering numbers.

Mass transit is one of the possible solutions to the growing problem of congestion and poor circulation in and around cities. Multi-modal mass transit, which can consist of rail, light rail, bus, car, bike, and pedestrian, has the potential to offer better connections throughout the city. Those that live outside the city limits can travel into the city for work (assuming they work in the city), or play—all depending on what activity they are doing. In the case of central Ohio, a mass transit system could also create stronger connections between Columbus and smaller towns in close proximity or smaller cities 20-30 miles away.

One question that requires close consideration: where do these mass transit lines run, specifically rail, and how will they affect the neighborhoods in which they bisect? A study was done in Phoenix, Arizona because a new rail line was proposed to run through the city, connecting three very distinct neighborhoods. The researchers wanted to know what affect the rail line would have on each neighborhood's 'household growth.' Researchers, from Routledge Taylor and Francis Group used a simulator called **“Where do these mass transit lines run, specifically rail, and how will they affect the neighborhoods in which they bisect?”** that 'simulates the

behavior of individual agents such as households, businesses, developers and governments' (Journal of Urban Technology, 95-96). With this program, the researchers were able to predict what and how much influence the light rail line would have on these three neighborhoods. Some of the qualitative data entered into the database was: GIS overlays, individual parcel characteristics, employment, non-residential space and general diagnostics. Some of

the results were surprising. When the simulator was put to work, two of the three neighborhoods saw a 15-19% increase in the number of households built or occupied in the seven years after the light rail line went in over no rail line (103-105). Zone three however, which consists of a majority of student housing for Arizona State University, saw a significant decrease in households. This could be attributed to 'new up-market developments that push out the lower-income student population and make room for higher income families who prefer slightly larger quarters' (105).

From this urban simulator that compares the effect of a light rail train being built versus not being built, it is clear that mass transit has a positive effect on neighborhoods. As the line is built, people will desire to move closer to the rail. This is because the train will offer ease of transportation and circulation. It is the same principle that drives planners to build subdivisions close to highways. In essence, the highway is being switched out for a rail line.

This could also be true for BRT (Bus Rapid Transit) lines. BRT is a system in which lanes are dedicated buses only, which allows them to travel faster and reach more people in a shorter period of time. Bogota was one of the first cities to incorporate a BRT system. It has been so successful in reducing congestion and pollution that their system has become the standard to which every other city's BRT system is measured up to. If either a BRT line or rail lines were put through a neighborhood much less a city, there would be no doubt that the population density would increase.



It is however, important to point out that mass transit needs a certain population density to maintain the system. Despite the fact that the simulator suggested housing occupation would jump, it still might not be enough to support the entire system. According to Afshin Shariat Mohaymany and Ali Gholami, professors at Iran University of Science and Technology, a high capacity transit system would need 25,000 passengers an hour (Multimodal Feeder Network Design Problem: Ant Colony Optimization Approach, 323). This number would not apply to light rail line or BRT routes, but it is conceivable that a larger system or high speed rail line would be needed in Columbus, Ohio as a main thoroughfare. Does Columbus have the ability to support a system that will require 25,000 people to commute daily by train or bus? The answer right now is no. Yes, there are many more jobs located within the city limits of Columbus, but it is not smart to believe that everyone would stop driving and start commuting to work via mass transit. Thus, infill and increasing population density within the city must be addressed first to allow for a multi-modal mass transit system to be successful.

Understanding where in the city population density can be increased can be achieved with the use of arcGIS. This software can look at vacant lots, population density, open space, poverty and multiple other factors that would influence the proper use of infill and new development. Coupled with UrbanSim, arcGIS offers the best opportunity to create a regional plan for a multi-modal transportation system that will effectively service Columbus and the surrounding region.

An interesting counterpoint to this is the idea that a mass transit system will itself increase the density of a city. At stops, especially where multiple types of transportation are brought together, nodes are created. These nodes suddenly become a place where hundreds, if not thousands of people come into close contact with their surroundings. In essence, they are forced to, because this is where the train or bus runs. There is no alternative route. In a 2010 article, Yan Li, a research fellow at the Center for Assessment and Development of Land and Real Estate, claims that a, 'MRT (Mass Rail Transit) [node] can affect its surrounding area within 400 to 800 meters' (Journal of Urban Planning and Development, 244). This means that for at least 1200 feet, businesses, restaurants, and housing are going to be in direct contact with the people who get on and off the transit at the stop. New housing can go in, and maintain a high level of occupancy. Restaurants and other businesses will stay in business due to the constant support of the transit lines. Metaphorically speaking, mass transit serves as a lifeline to these businesses — bringing people and money directly to them. And with the scope of this lifeline extending as far as 2400 feet, these nodes could be thriving mini cities. With the proper mixed-



“These nodes suddenly become a place where hundreds, if not thousands of people come into close contact with their surroundings.”

use plan, population density and business could skyrocket.

It will be difficult to find a balance between creating infill to support the mass transit system, and realizing that the system itself will spawn the growth of a city. Both must be incorporated into the design to be successful. Leave out infill, and the system may collapse due to lack of ridership. Rely too much on infill, and you lose the freedom of letting people decide what is best for them and to what proximity to the mass transit system is best for their individual situation. But with a relatively good balance of both, it is possible to conceive a plan could be successful.

Case Study 1

Hiawatha Line, Minneapolis, MN

One of the case studies I reviewed was the Hiawatha light rail line that was incorporated into Minneapolis, Minnesota. This light rail line is 12 miles long and consisted of 19 stops. The reason that I chose this for a case study was because of the economic and socioeconomic numbers that the article laid out as the effects the light rail line had on the surrounding neighborhoods. In one finding, housing prices jumped up 20% for the houses within a half mile of the rail line—which translates into an increase of \$47.1 million in housing value for both single and multifamily housing (Rail, 34). Expected new construction rates were 183% higher than what could be expected if the rail line did not exist (34).

This can be applied to my site for a few reasons. One is the added value light rail lines bring to neighborhoods. Because passenger rail lines have this effect, it will help boost the economic value of struggling neighborhoods in Columbus. Light rail lines also encourage infill and occupancy of housing close to the track. With over 5,000 vacant lots in Columbus, there is the possibility that hundreds of these lots could be reoccupied or have housing rebuilt on the site. This could have the potential to boost the pride residents of neighborhoods and the city have towards where they live.



Case Study 2

Phoenix, AZ



Another case study I reviewed was the light rail corridor that was put in Phoenix, Arizona. I used this case study for similar reasons as the previous one. The light rail line was going to travel through three neighborhoods, and residents and the local government wanted to know the effects on the housing market this would have on those neighborhoods. A group of researchers Routledge Taylor and Francis Group used UrbanSim—a simulator that takes into account hundreds of variables to determine what impact a light rail line could have on a city. (It is important to note that the simulator looked at the housing industry for the 7 years after its completion: we are still in the midst of those seven years, so there are no 'real' numbers to compare to the simulator.)

The study predicted a 15-19% increase in built or occupied housing near the rail line—similar numbers to what was recorded in Minneapolis. This is because people want to live near the rails and rail stations where they have access to jobs, business and entertainment with fast, reliable transportation at their disposal. Light rail also has the ability to take residents to pivotal points of interest within the city such as universities, libraries and courthouses.

“Light rail has the ability to take residents to pivotal points of interest within the city such as universities, libraries and courthouses.”



Case Study 3

Sacramento Rail Yards

A third case study I looked at is Sacramento, California's approach to mass transit. In an effort to expand their mass transit lines, they have designed and began construction on a mass transit hub. The site Sacramento is looking at is 244 acres—about three times as large as the site I am looking at. But what they want to do with the site is more than just to create a mass transit hub. The designers want the site to become a destination. There will be entertainment of all kinds, active and passive recreation to name a few. The site will also be a leader in sustainability in the area, and thousands of new residents will live in the hundreds of single family and mixed-use housing going on the site.



This case study is important because I would like to model their design principles onto my site. Because the site in Sacramento is three times as large as the site in Columbus, I will have to scale it down to appropriately fit my site. But this case study lays down in specific detail what I would like to do on my site—providing a well thought out blueprint that will deliver extraordinary results for the city.

“But what they want to do with the site is more than just to create a mass transit hub. The designers want the site to become a destination.”



Assumptions & Delimitations

Assumptions:

- I) The city of Columbus is willing and able to develop and build a mass transit hub.
- II) The city of Columbus has the funding to do a project of this scale.
- III) The people of Columbus are interested in supporting a mass transit hub both financially and with ridership.
- IV) People have the desire to move back into and live in the downtown district.
- V) The appropriate public entities will conduct feasibility studies to ensure the validity of such a project.
- VI) Zoning laws would change to allow for portions of the project to be built.

Delimitations:

- I) Mass transit systems will not include high-speed rail, air or water transportation.
- II) Further expansion will not be considered in the design process.
- III) A plan to extend mass transit to all neighborhoods in the Central Ohio region will not be designed.
- IV) Funding sources will not be explored.
- V) This project will not do a feasibility study.

Definition of Terms

BRT (Bus Rapid Transit): Travel lanes devoted solely to buses to allow for faster travel times.

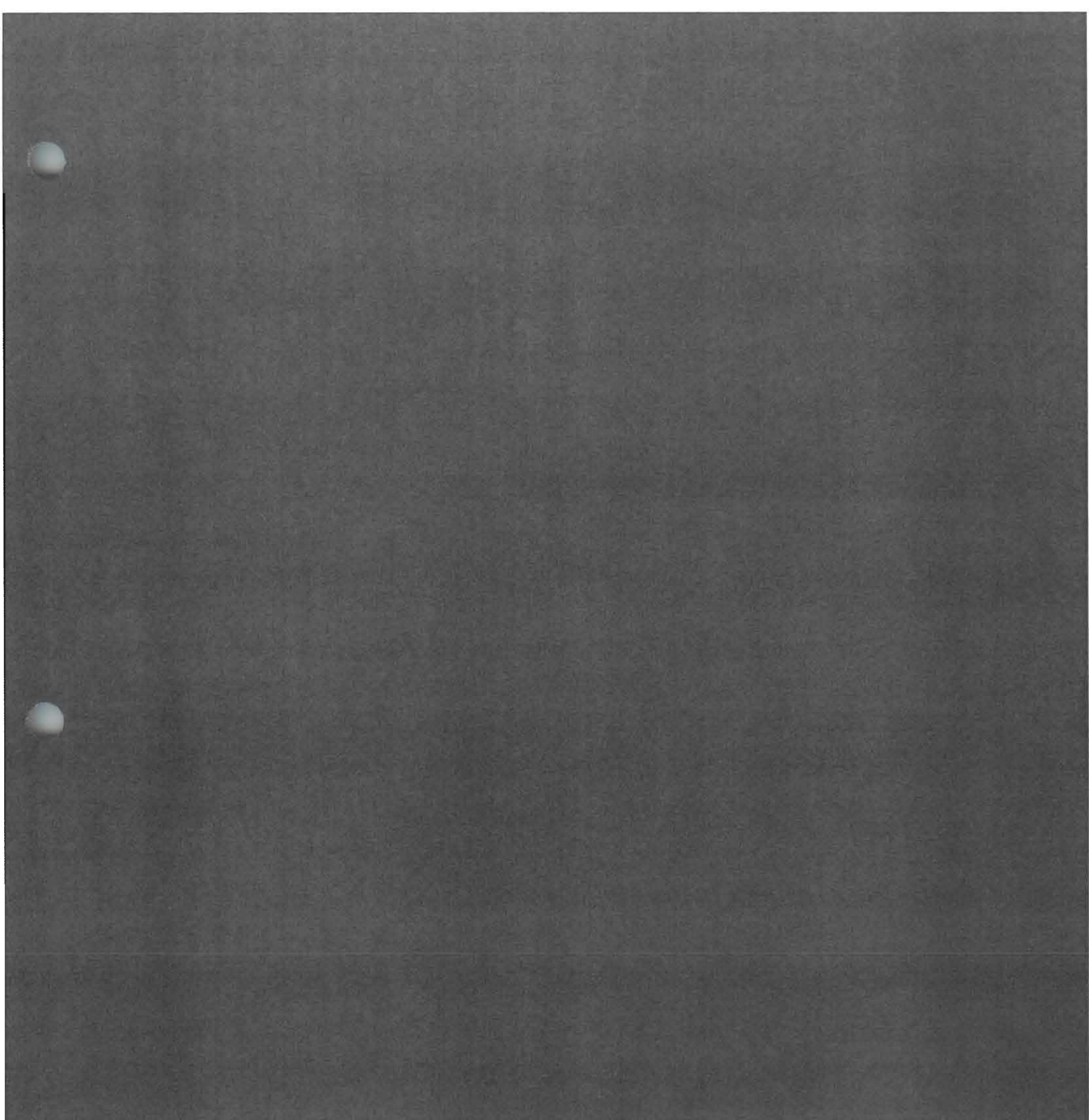
Light Rail: A transportation system using trains to service a metropolitan area.

Mass Transit Hub: A site or location that unites multiple forms of transportation to create a vibrant and active people space. The site may include businesses and other public services as this project aims to do.

Multi Modal Transit: Bringing multiple forms of transportation together.

Urban Sprawl: Uncontrolled spread of housing development away from urban centers.

Analysis. ○ ○ ○ ○



Scope

This project proposes the integration of a mass transit hub in the heart of Columbus, Ohio with 8 transit lines alleviating the dependence on the automobile while revitalizing the city through economic, social, and cultural catalysts. The new urban development in which the station will be located will include housing, commercial and office space while offering ample open space for a variety of recreational activities.

Site Selection

When choosing a site for the project, there were a few key considerations that had to be made. The first consideration dealt with a question that was raised in the literature review. How will the proposed transit lines affect the neighborhoods they run through and the city as a whole? To be most effective in promoting infill and urban density, the site must be near downtown (to increase urban density) while having easy access to the surrounding neighborhoods (promote infill). There is one site in Columbus, Ohio that fits the bill perfectly.



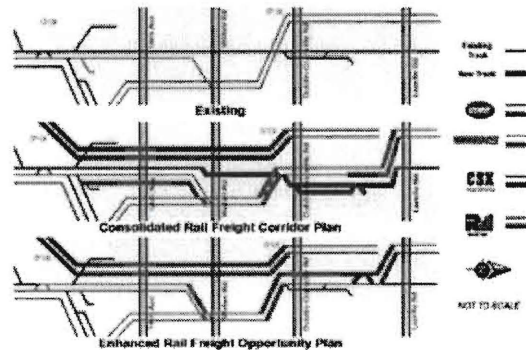
This site, situated on the Olentangy River, is a vacant 90-acre plot of land adjacent to the Arena District and just minutes from the heart of downtown Columbus. Situated only a mile from The Ohio State University, the site is located on prime real estate.

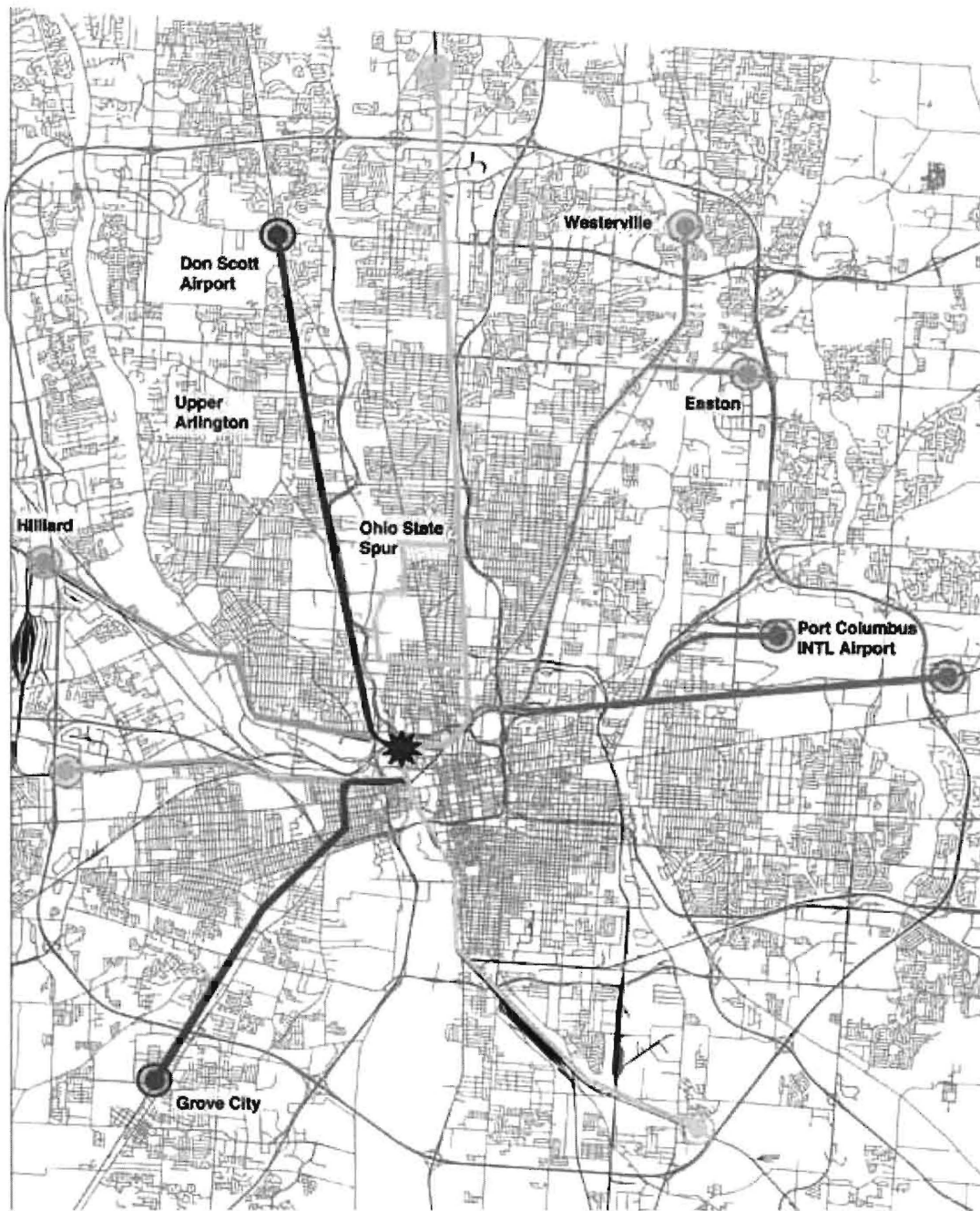
Rail lines are the deal breaker that make this site the obvious choice for a mass transit hub. As seen in the image to the right, there are 3 rail lines that bisect the site. These 3 rail lines branch out to

reach the rest of the city. With an extensive light rail plan needed, there is no doubt that using existing rail lines is the obvious and most cost effective choice when considering where the transit lines will go.



Over the past two decades, the Mid Ohio Regional Planning Commission (MORPC) has worked in conjunction with the Central Ohio Transit Authority (COTA) in developing potential light rail corridors for the city of Columbus. Although this ambitious plan has met various types of resistance over the years, it stands as the basis for the rail corridors I have proposed. Like previously stated, the rail corridors that have been proposed use current rail right of ways. They would thus either have to share the right of way with freight or propose redirection of the freight corridors. The diagram below offers a visual aid as to how this problem would be solved--the red line (COTA) being the new transit lines.





Proposed Light Rail Corridors

 Multimodal Transit Hub

Based on studies done by COTA and MORPC

Goals and Objectives

I Design a mass transit hub that serves as a home base for an extensive transit system

- a)** Design a multi modal mass transit station that allows for seamless transfers between transportation modes (light rail, bus, car, bicycle)
- i)** Design a large plaza adjacent to the station
- b)** Develop 8 transit routes that connect the transit hub to the surrounding neighborhoods and suburbs of Columbus, Ohio
- c)** Design a patterned transit stop that will serve as a model for all transit stops in the system

II Connect the residents and users of the site to nature through open space and access to the Olentangy River

- a)** Create an attractive waterfront that is conscious of natural systems while inviting users and residents to interact with the Olentangy River, much like North Bank Park just east of the site
- b)** Develop a network of open spaces and recreational facilities that meets the needs of residents and users creating a unique and flourishing urban environment
 - i)** Allocate 2.5 acres for venue space that can be utilized as a farmers market, art shows, and other events
 - ii)** 15-20 acres of land for development of a wetland*
 - iii)** Create a succession of gardens that offer users a variety of experiences
 - iv)** Allocate space for a great lawn with moveable furniture
- c)** Locate park space to be accessible by the greatest number of people
- d)** Utilize rooftops for private business/residential open space
- e)** Ensure safety in open spaces through visibility and exceptional lighting

*Due to the scope of this project, a hydrology test was not done. If further research is done and concludes that a wetland is not possible on this site, then a detention pond with aesthetic value could replace the wetland.

III Use sustainable practices in the creation and development of open spaces and built environments

- a)** Encourage high-density development
- b)** Use of grey water technologies, reduction and cleansing of runoff through swales, permeable pavement and green roofs
- c)** Centralized parking: once an individual parks their cars, they have the ability to walk anywhere without having to get back in their car

IV Create a cultural and commercial hub for Columbus, Ohio

- a)** Create a dynamic mixture of retail, office space, entertainment and housing developments
- b)** Provide multiple forms of living units (flats, mixed use, single family, multiple family) for a wide variety of income brackets, including low income
- c)** Provide office space for small family owned businesses to large corporations in a wide variety of fields (health services, grocery, insurance, banking, technology, and research)
- d)** Utilize existing buildings on south edge of site for urban agriculture
- e)** Design proper transition in building height and types to the Arena District
- f)** Maintain current architectural styles in respect to the history of the site

V Develop circulation patterns that encourage walking and bicycling

Vi: Vehicular

- a)** Park once (see III:c)
- b)** Incorporate on street parking and traffic calming techniques

Vii: Pedestrian/Cyclists

- a)** Connect walkways and bicycle routes to trails and pathways outside of site to encourage exploration of the city
- b)** Include bike lanes in every road layout on site

Inventory/Analysis: City Wide Context



1"=3 miles

Cities/Towns

Points of Interest

Interstates

Rivers

Inventory/Analysis: City Wide Context

I) With nearly all points of interest and cities/towns north of the site, it makes sense to align most of the rail corridors to the north.

II) OSU and downtown district are the two nearest locations that deserve rail corridors because of their importance to the city.

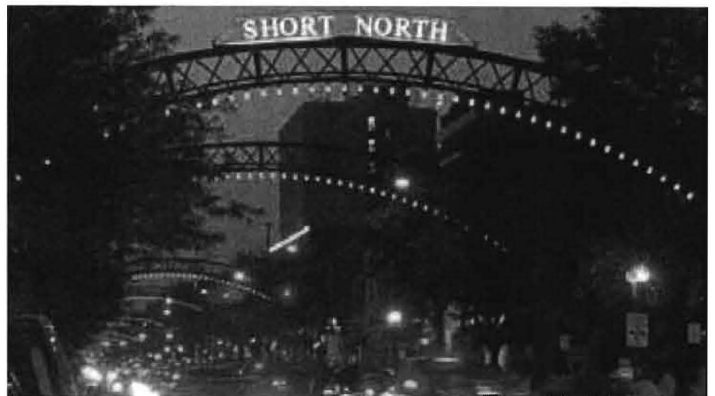
III) The Short North District, highlighted in blue, draws young adults and progressive thinkers: those that would use mass transit to its fullest potential.

IV) Port Columbus International Airport is a destination that must be serviced by the rail corridors. The more connections there are between transit types the less reliance individuals have on vehicles.

V) Don Scott Airport is owned by OSU and very small, but officials and students of the university could use the transit connection to reach the airport.



North Bank Park

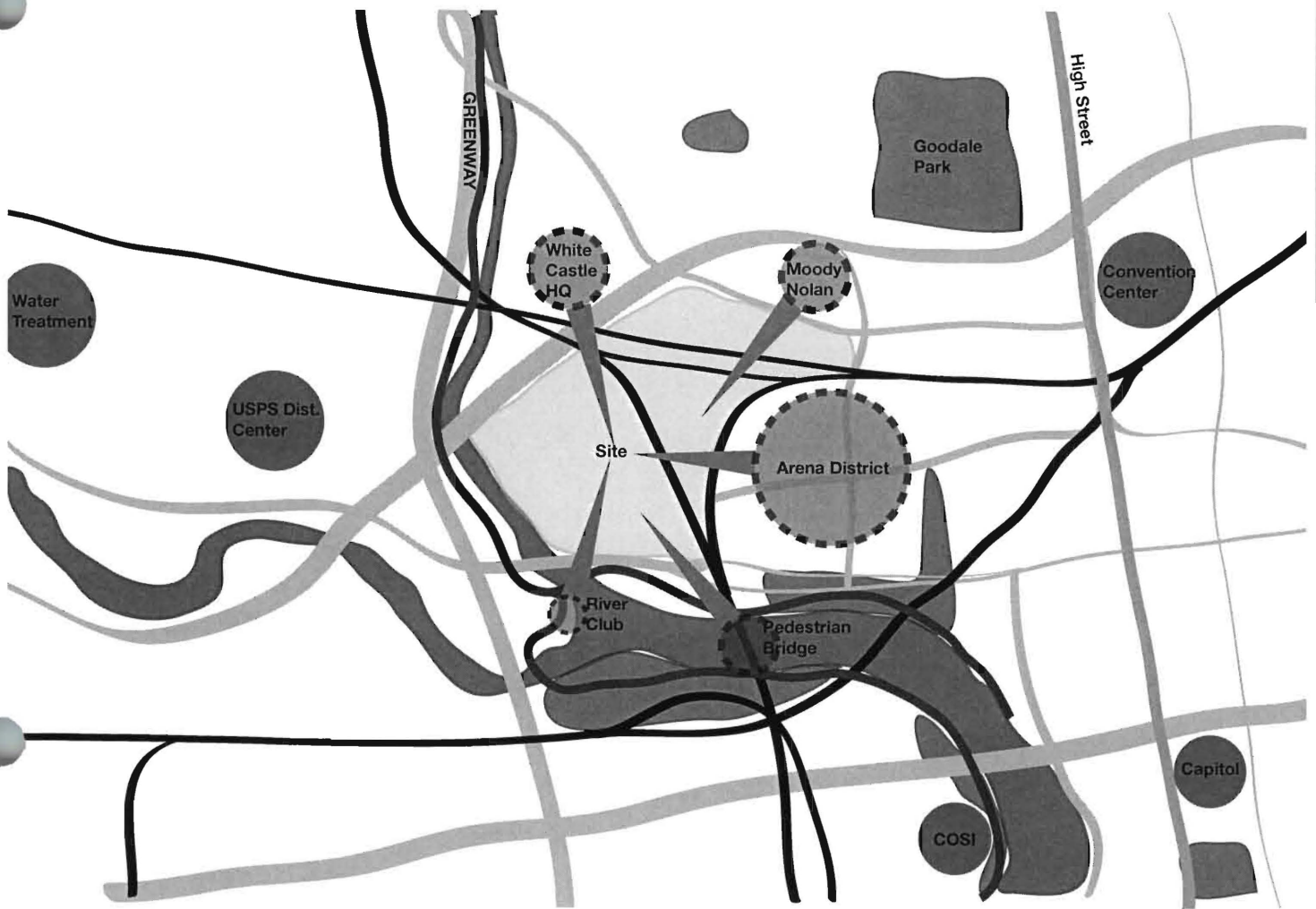


Short North District



Port Columbus INTL Airport

Inventory/Analysis: Local Context



N 1"=1250'

Inventory/Analysis: Local Context

I) Most foot travel coming from off the site will come from the Arena District. It becomes important then to make the 'hub' of the site as close to the district as possible.

II) Foot traffic will also come from the Moody Nolan design firm, White Castle Regional HQ, and the River Club. Creating safe road crossings for these users is important.

III) To bring users of the greenway on the south side of the river to the site, it is imperative to add a pedestrian bridge to the existing rail bridge.

IV) Although the distribution center for the post office is close to the site, workers would not be able to access it due to the two highways that intersect the area.

V) The site sits on prime real estate on the river, and would serve as a green connector from Goodale Park to North Bank Park.



Arena District

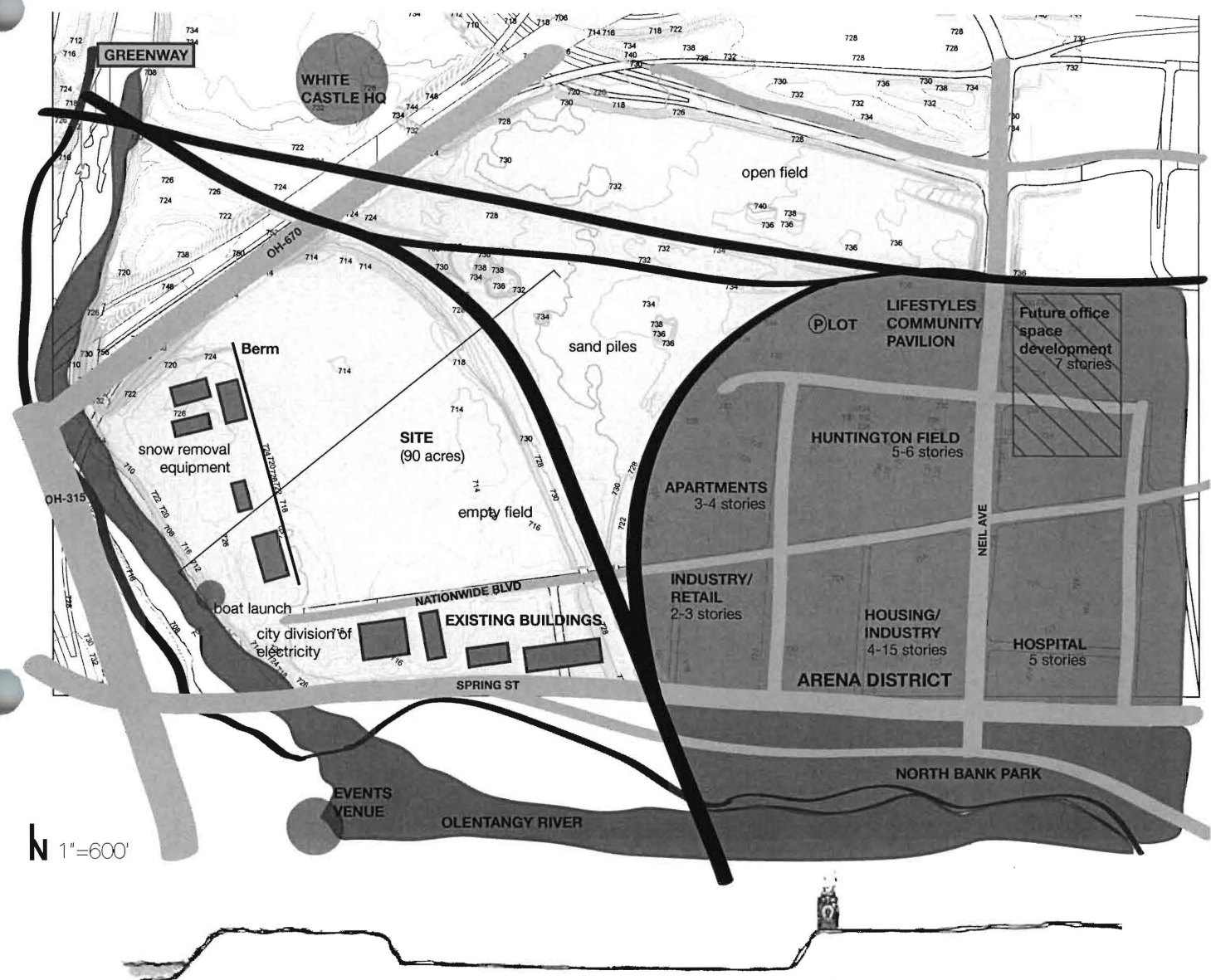


Scioto Greenway



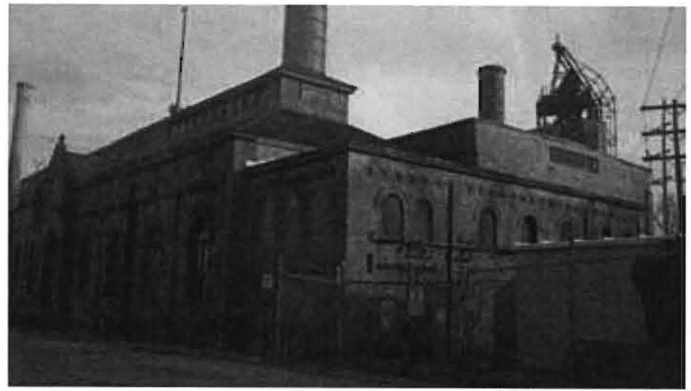
Olentangy River

Inventory: Immediate Context



Inventory: Immediate Context

- I) Many of the structures existing on site have little architectural value, except for a few on the southern edge of the site.
- II) The scale of the Arena District scales down near the eastern edge of the site.
- III) The one public boat launch in the downtown area on the Olentangy River is on the site.
- IV) The Scioto Riverwalk runs close to the site, but does not come in contact with the site.
- V) The middle of the site (as seen in the section) sits in a man made depression. The berm to the west is 10-12' high and to the east it is 14-16' high.
- VI) Most of the site now sits vacant. There is storage for snow removal equipment to the east and a storage field for equipment and sand to the west. The buildings on the south side are occupied by the Columbus Division of Electricity.



Existing Structure



Boat Launch



Open Field



'Storage Field'

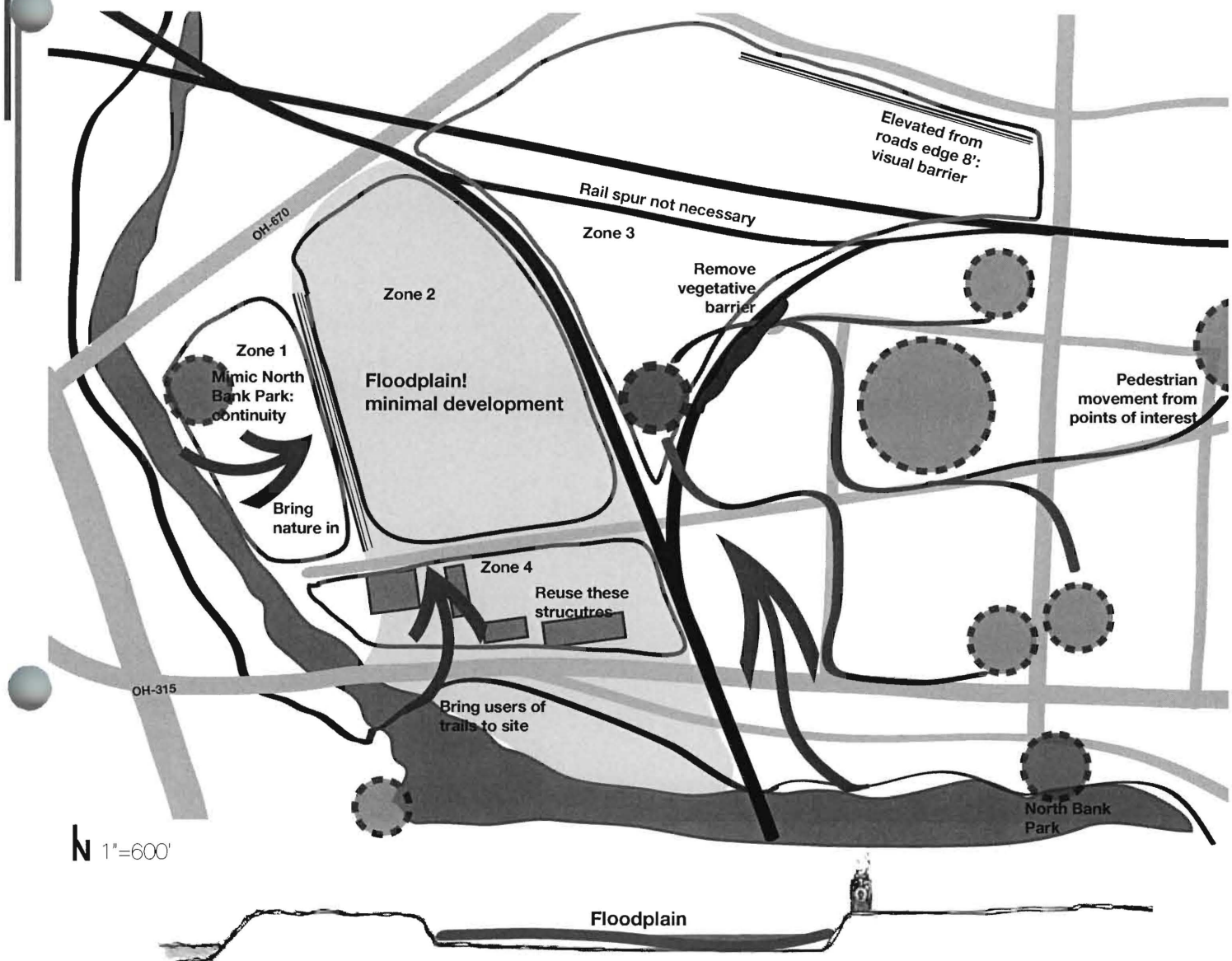


City Skyline



Existing Berm

Analysis: Immediate Context

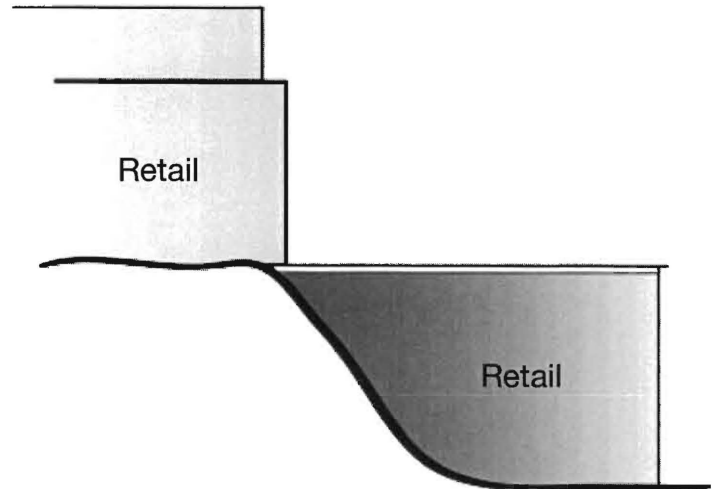


Analysis: Immediate Context

- I)** Zone 2 sits in a floodplain. Because of the risk of flooding, it is best to keep development in this zone to a minimum.
- II)** To create a sense of continuity along the riverfront, development of a 'built' waterfront is necessary. Mimicing North Bank Park is one way to do this.
- III)** The Scioto Riverwalk will bring cyclists and walkers down along the rivers edge, and bringing those trail users into the site through pedestrain friendly pathways is imperative.
- IV)** To increase the connection between the Arena District and the new development, all vegetation along the eastern track should be removed.
- V)** In order to commemorate the history of the site, the buildings in zone 4 will be maintained to serve as retail or urban agriculture space.
- VI)** The majority of the pedestrain movement will bring people to the southern intersection of the rail lines, making this space a major node of the site.
- VII)** The 10'-12' berm that exists between zone 1 and zone 2 creates a unique design challenge. Berm could be utilized as an overlook or two story retail.
- VIII)** This rail spur is unnecessary: remove to enhance development.



North Bank Park



Precedent Studies



◀ **Biltmore Estate:** The transitions between the large formal garden and the smaller fountains/spaces are an excellent example of moving a person from a large scale space to a more intimate setting.

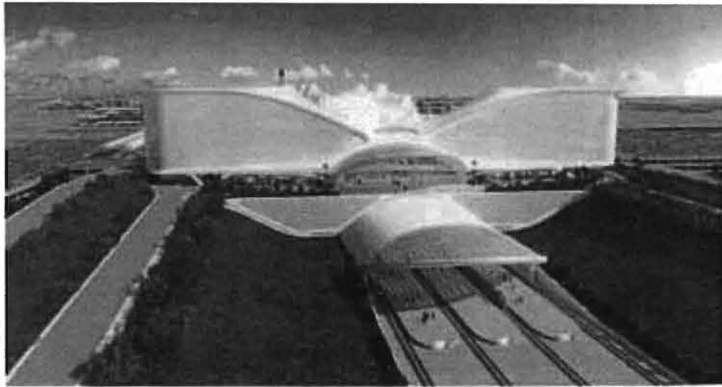
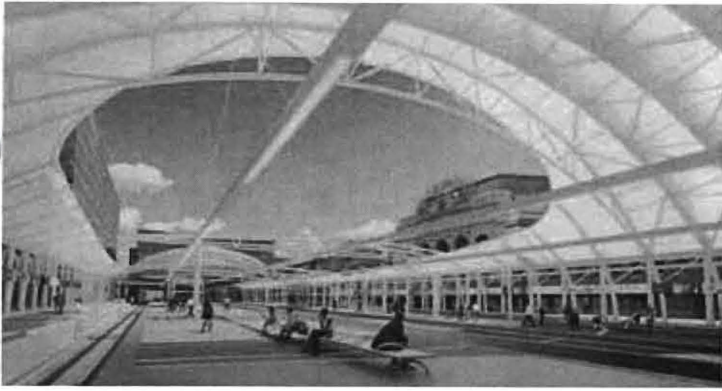


◀ **Bryant Park:** The premier example of an urban park. This park has nearly every program feature I wish to include in my park design. Small changes in elevation and movable seating create numerous possibilities for personal settings, while also functioning as a space for large gatherings.



▽ **Mill Race Park:** This park is a good example of a 'built' waterfront while maintaining and restoring nature--a perfect blend that creates a unique user experience.





△ **Union Station:** The plan for this new transit station in Denver, Colorado is bold. The station is very open, yet can become a landmark for the city. I wish to create a similar effect with the design of my station.



△ **Residential Tower:** To boost the density of the site, a residential tower or towers similar to the one pictured above can be located on the site.



△ **Transit Stop:** Possible template for transit stops.



△ **Factory Dwelling Unit**

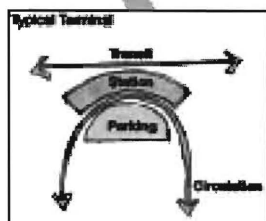
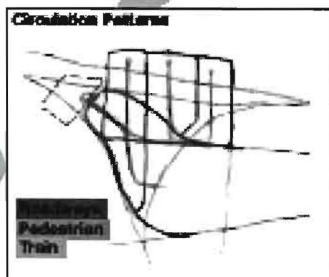
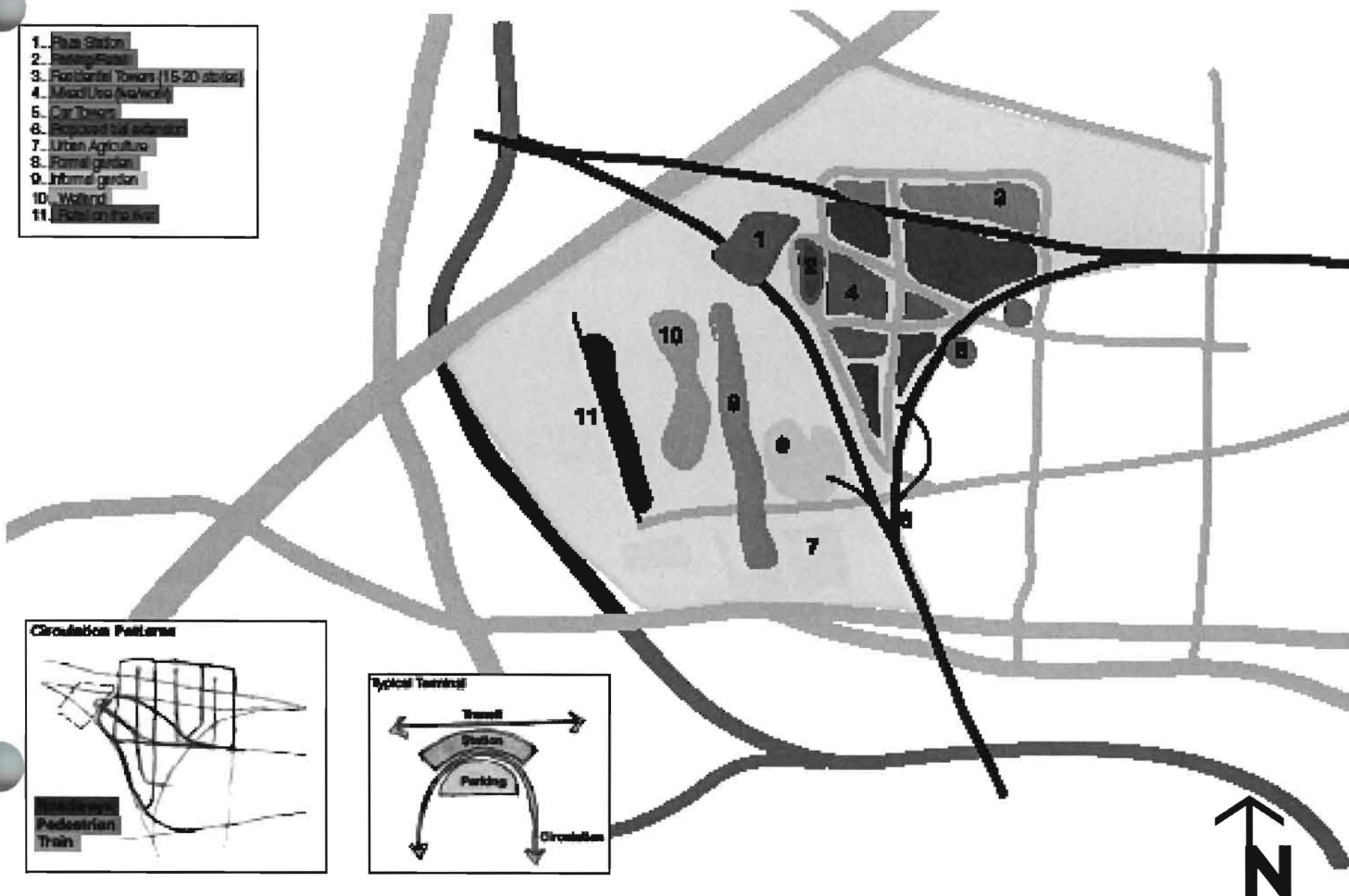


△ **Example of mixed use development**

Playing by the Rules

Concept 1 

1. Plaza Station
2. Parking Plaza
3. Residential Towers (15-20 stories)
4. Mixed Use (Retail/Office)
5. Car Towers
6. Expanded rail extension
7. Urban Agriculture
8. Formal garden
9. Informal garden
10. Wetland
11. Forest on the hill



Building heights are the same as those found in the Arena District to create continuity, then step up to the station, creating a landmark piece.

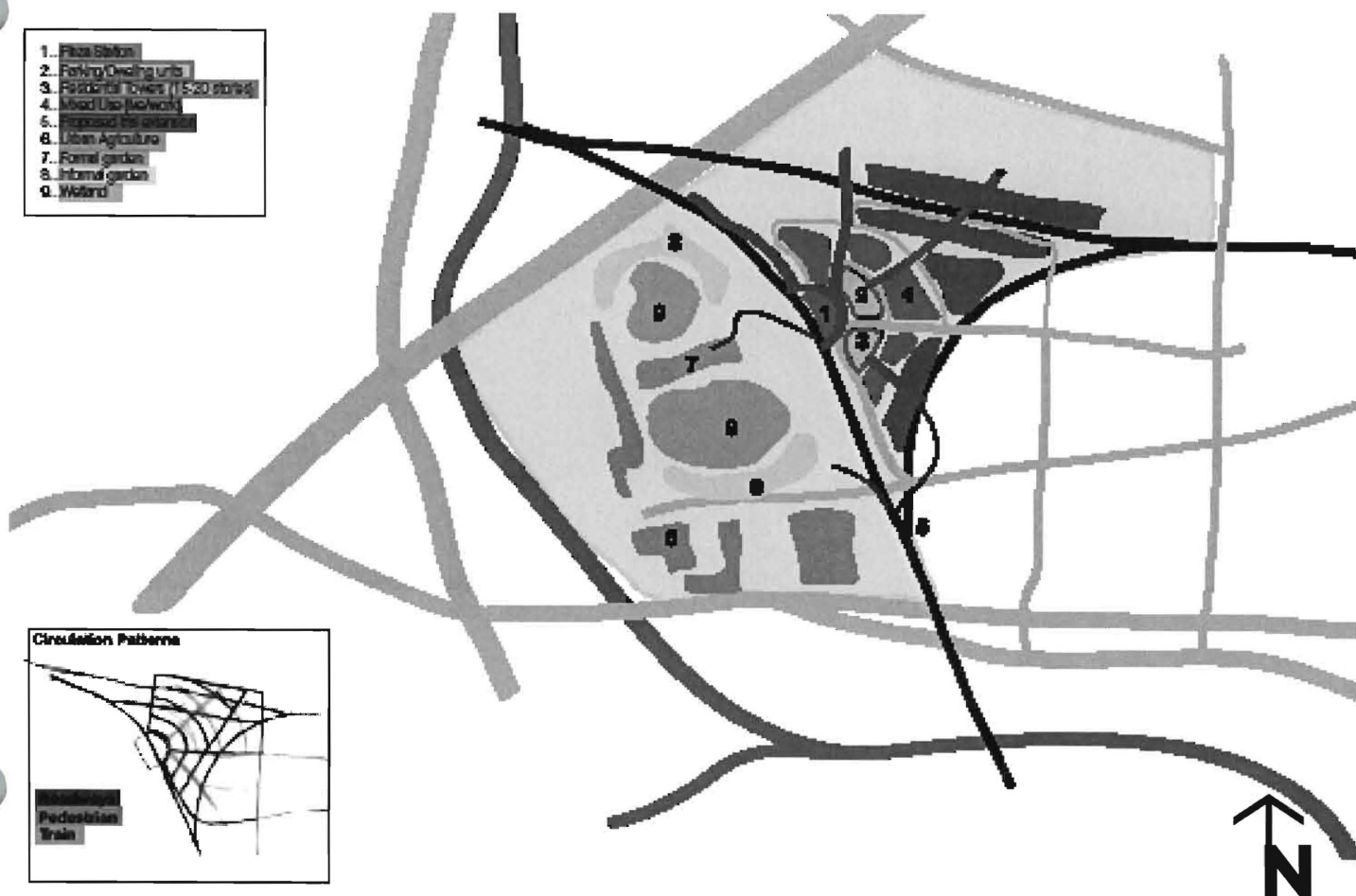


Sunburst

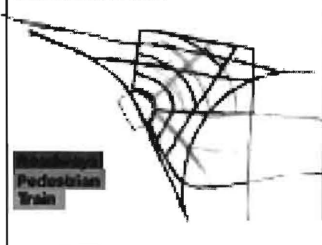
Concept 2



1. Plaza Station
2. Parking/Overlaid units
3. Residential towers (15-20 stories)
4. Mixed Use (work)
5. Proposed pedestrian
6. Urban Agriculture
7. Formal garden
8. Informal garden
9. Wetland



Circulation Patterns



A pyramid shape allows for the most activity to happen in the center of the site, stepping down to the station and the Arena District.



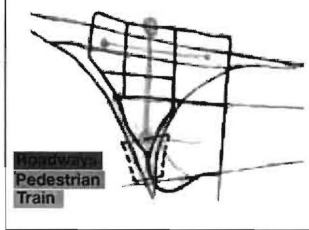
Pedestrian Oriented

Concept 3

- 1... Plaza Station
- 2... Residential Towers (15-20 stories)
- 3... Mixed Use (residential)
- 4... Car Towers
- 5... Gas works/factory playground
- 6... Formal garden
- 7... Informal garden
- 8... Wetland
- 9... Wetland
- 10... Wetland



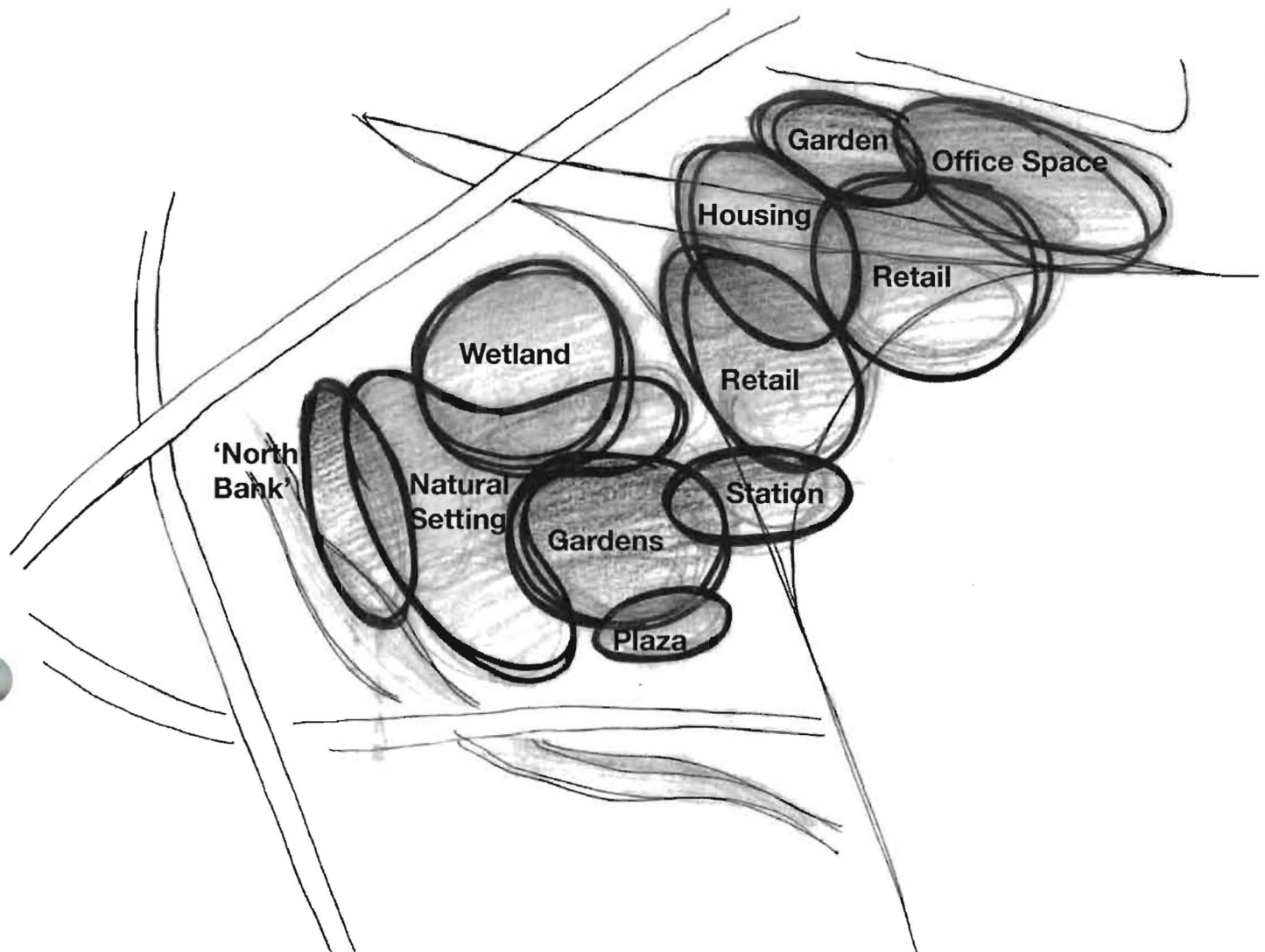
Circulation Patterns



With a centralized pedestrian corridor, lower building heights create a more human scale, with building heights stepping up as they progress away from the pedestrian axis.



Relationships Diagram

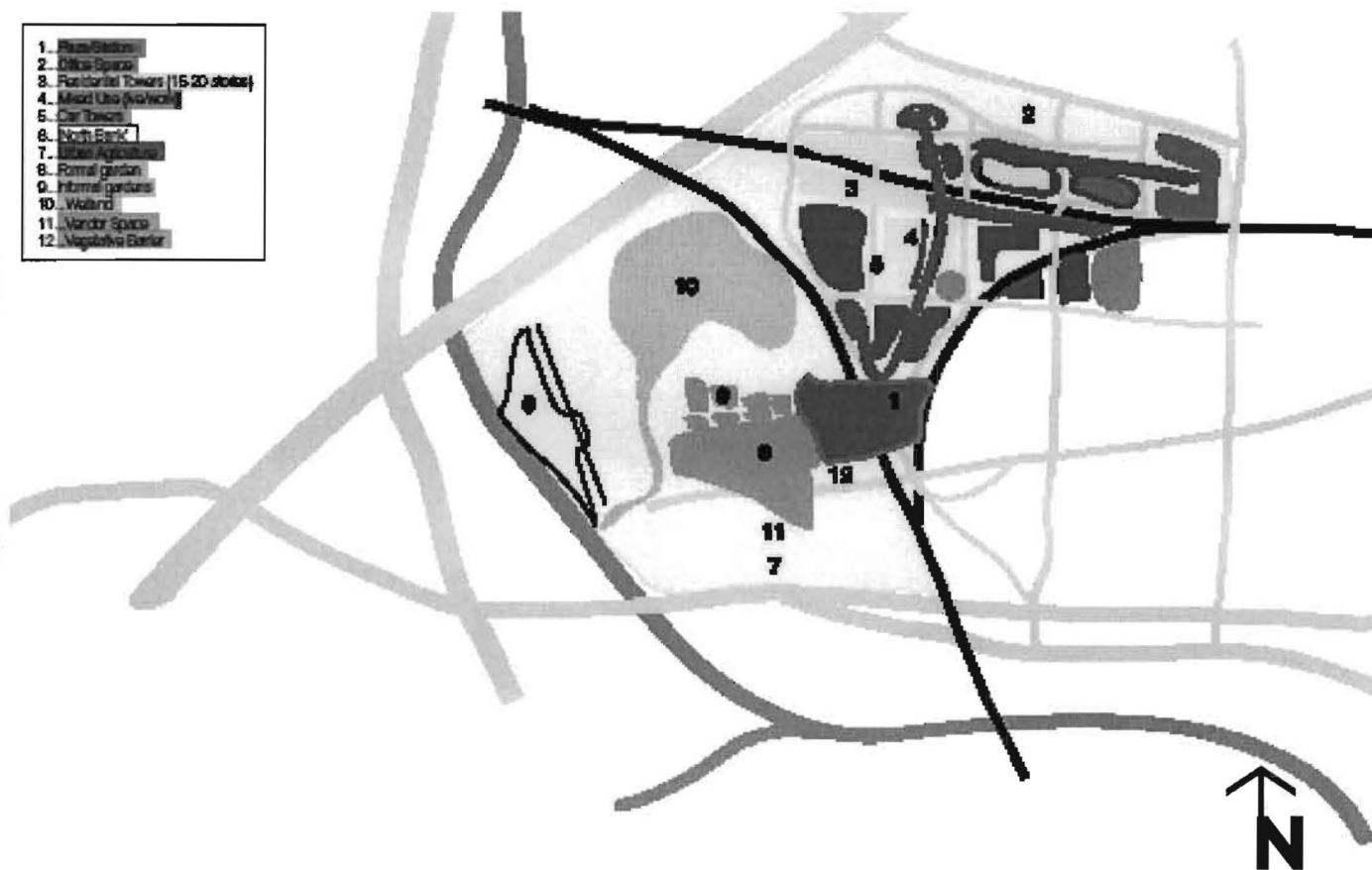


This bubble diagram shows the basic relationships of the programmatic elements for this concept. Concept three responds best to the analysis of the site, and will be the concept in which I explore further design.

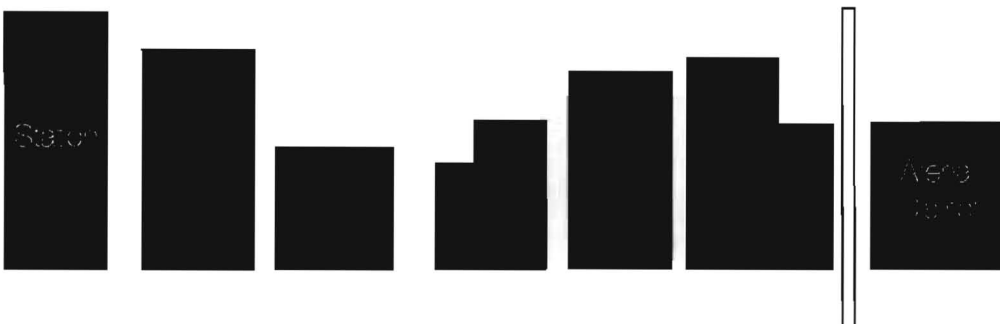
Pedestrian Oriented

Development

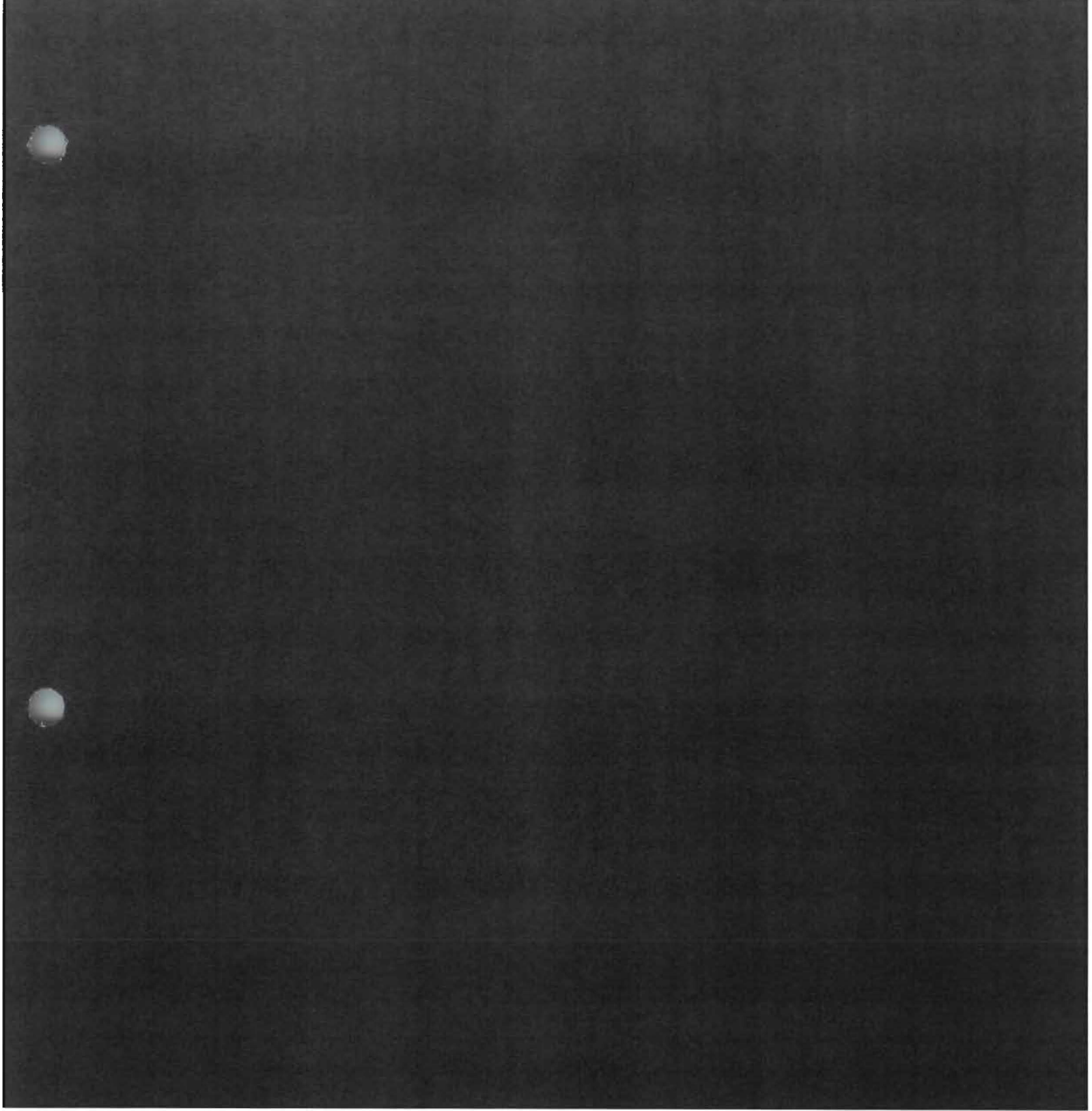
1. Mass Station
2. Office Space
3. Residential Towers (15-20 stories)
4. Mixed Use (retail)
5. Car Tower
6. North Bank
7. Urban Agriculture
8. Retail garden
9. Internal gardens
10. Wetland
11. Vendor Space
12. Vegetative Barrier



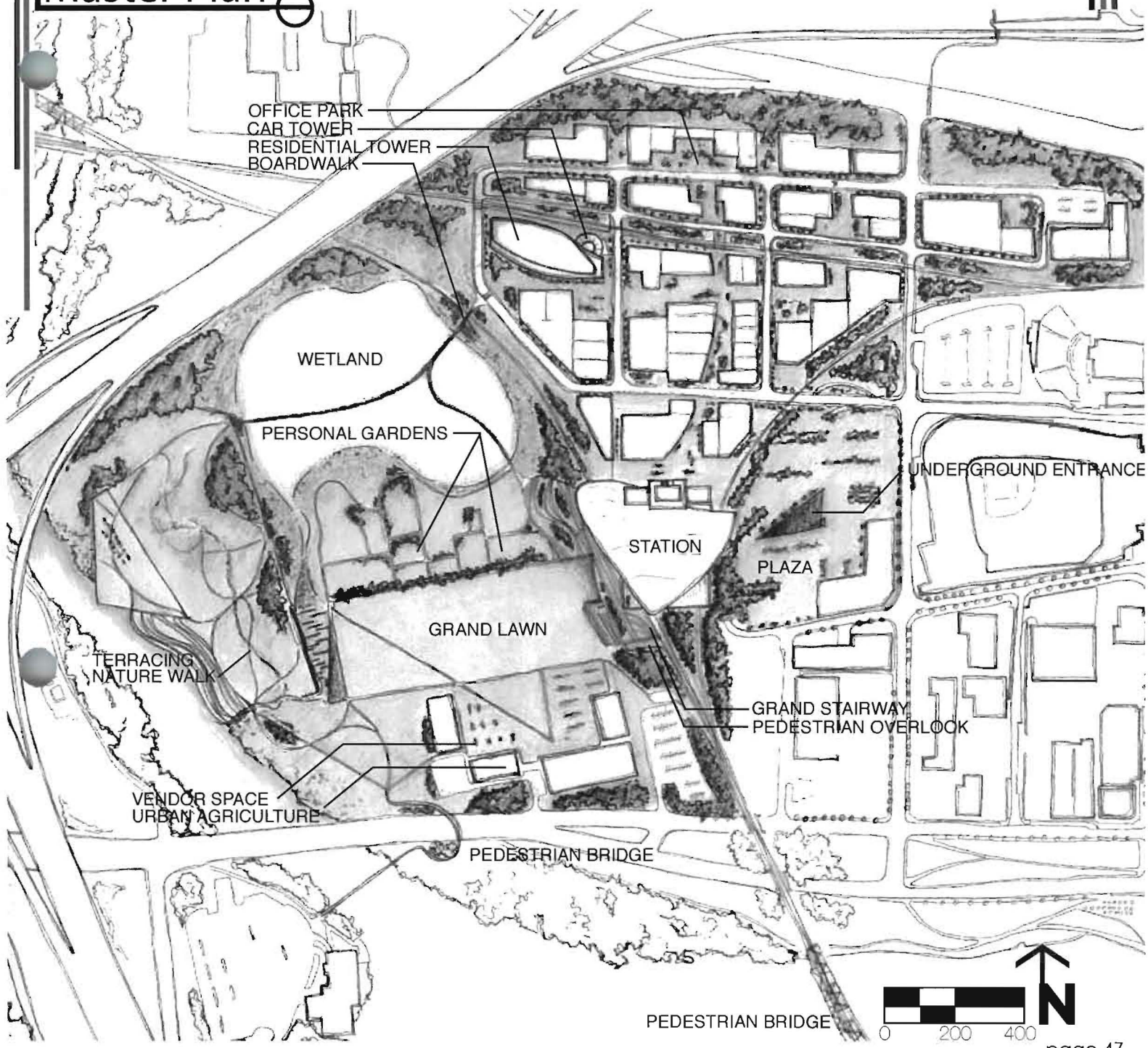
I went with this building configuration to create the most comfortable pedestrian experience along the pedestrian corridor.



Design ◦ ◦ ◦ ◦



Master Plan



Systems

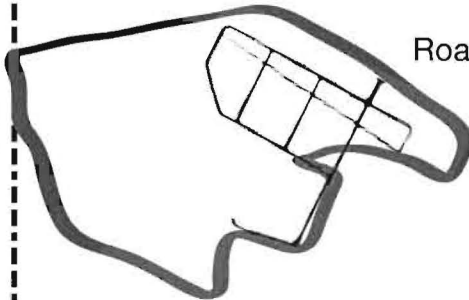
Figure Ground



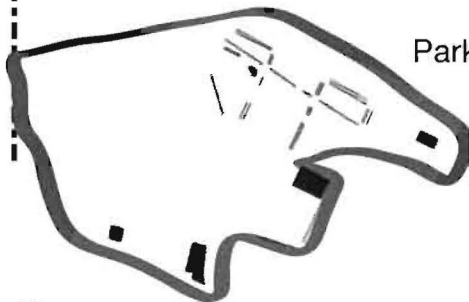
Zoning



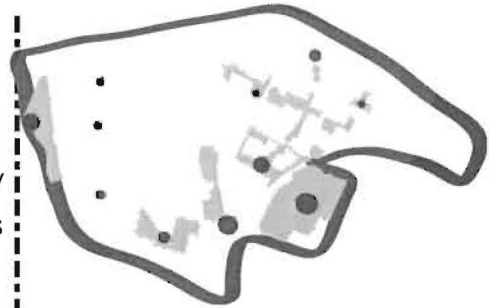
Road Network



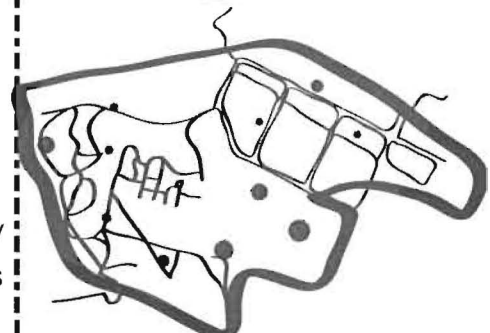
Parking



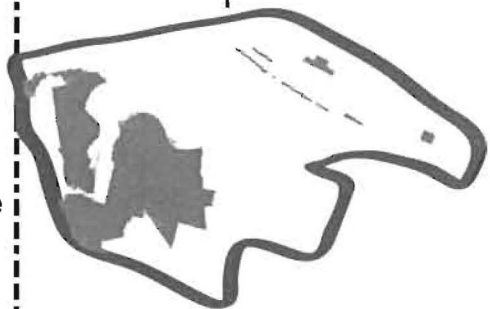
Plaza Space/
Pedestrian Nodes



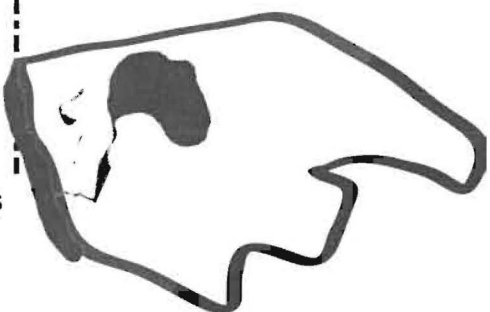
Walkways/
Pedestrian Nodes



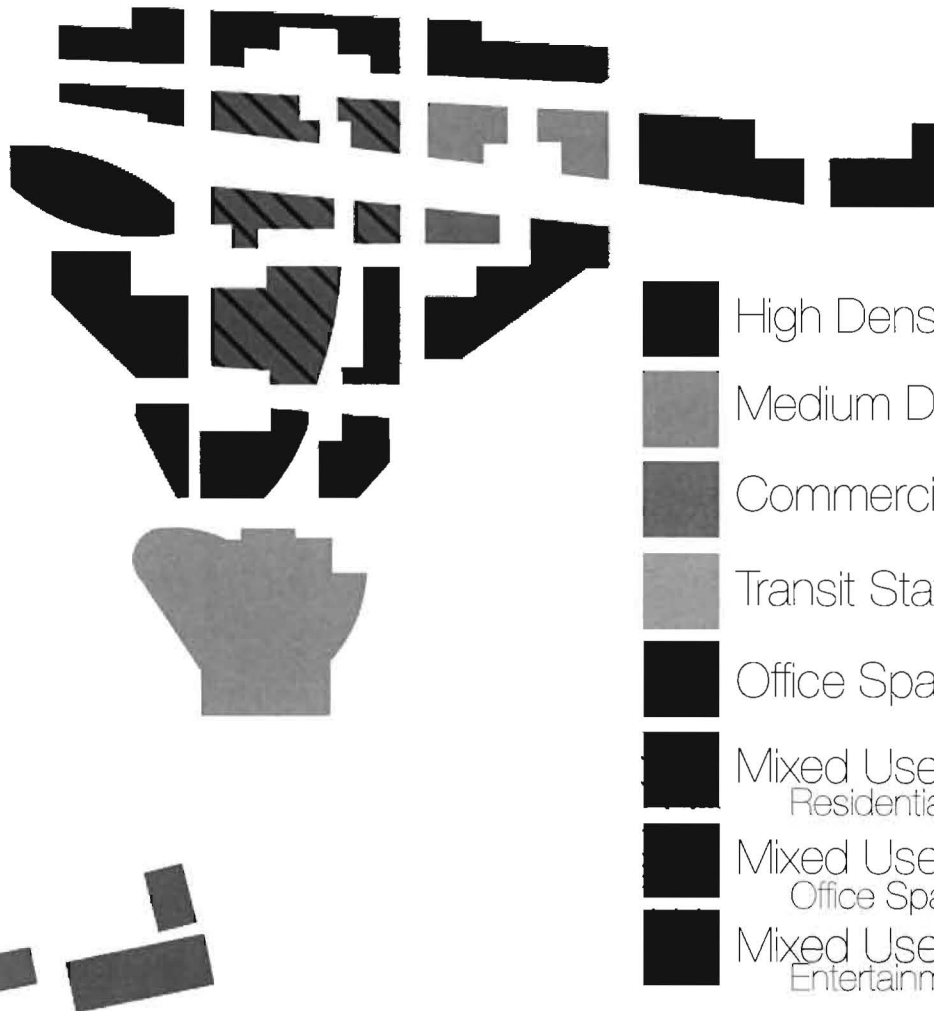
Greenspace



Water Systems



Building Program/Zoning



High Density Residential

Medium Density Residential

Commercial/Retail

Transit Station

Office Space

Mixed Use
Residential & Retail

Mixed Use
Office Space & Retail

Mixed Use
Entertainment & Retail

550 Dwelling Units

- 305 High Density
- 50 Condominiums
- 195 Apartments/Studios

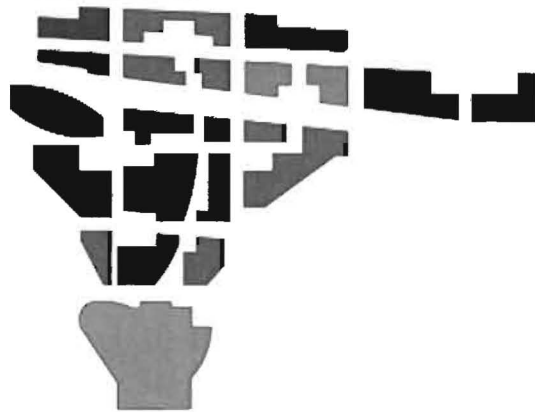
1,016,500 sq ft. Office Space

350,000 sq ft. Retail Space

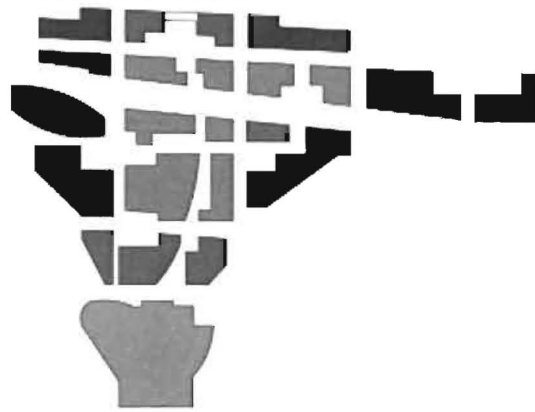
23,000 sq ft. Entertainment Space

Zoning

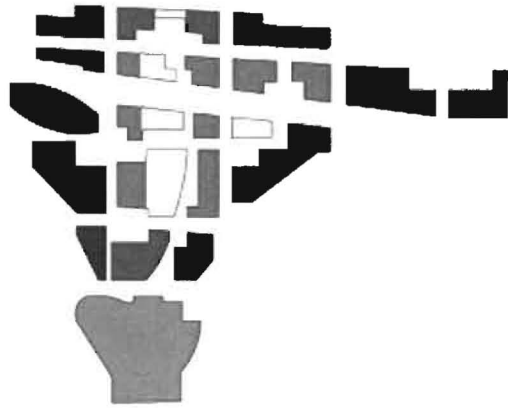
Ground Level



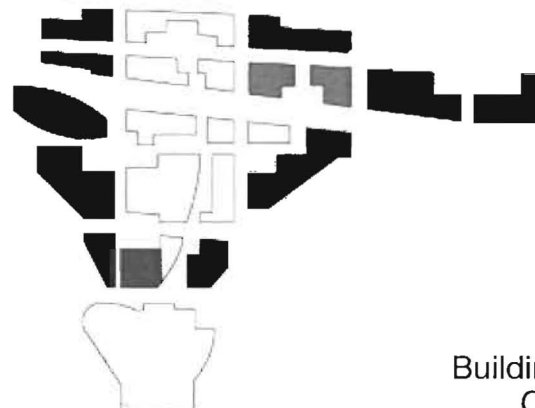
Second Floor



Third Floor



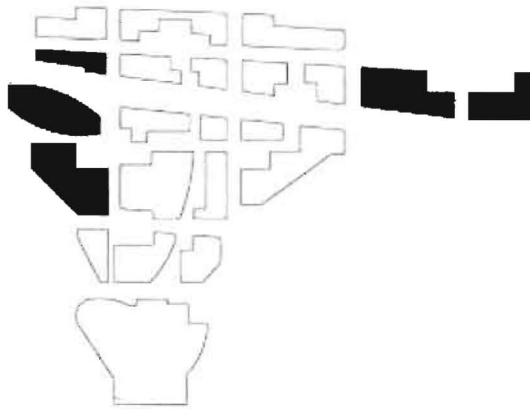
Fourth Floor



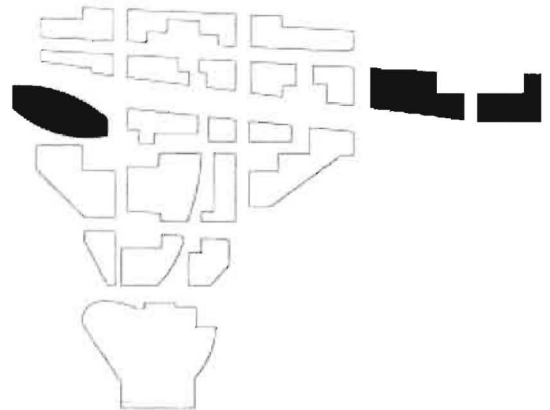
- Building Footprint ☐
- Office Space ☐
- Transit Station ☐
- Entertainment ☐
- Commercial/Retail ☐
- High Density Residential ☐
- Medium Density Residential ☐

Zoning

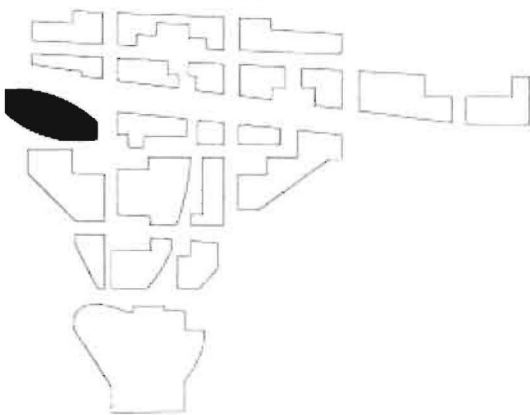
Fifth Floor



Sixth Floor

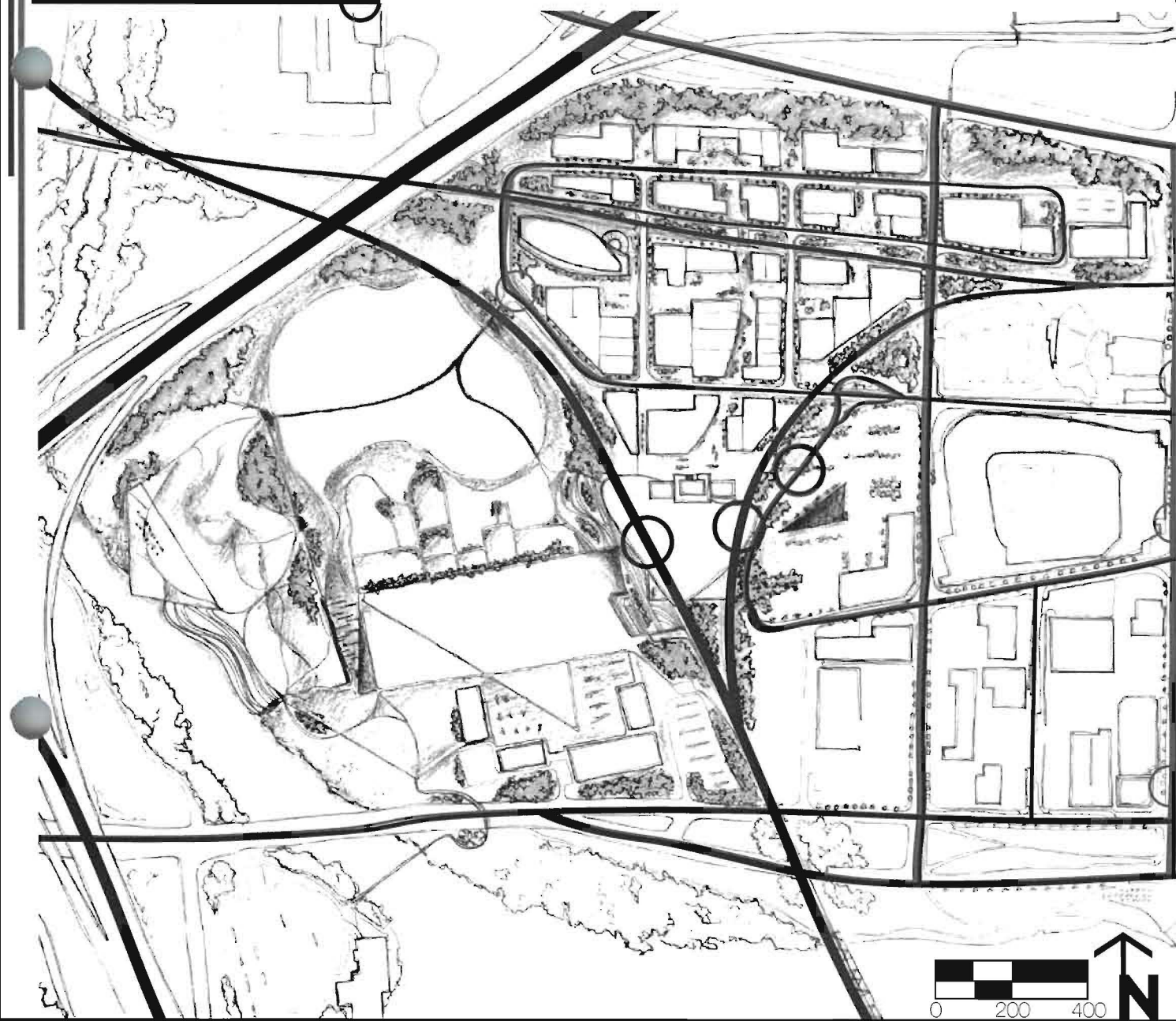


Seventh-Sixteenth Floors



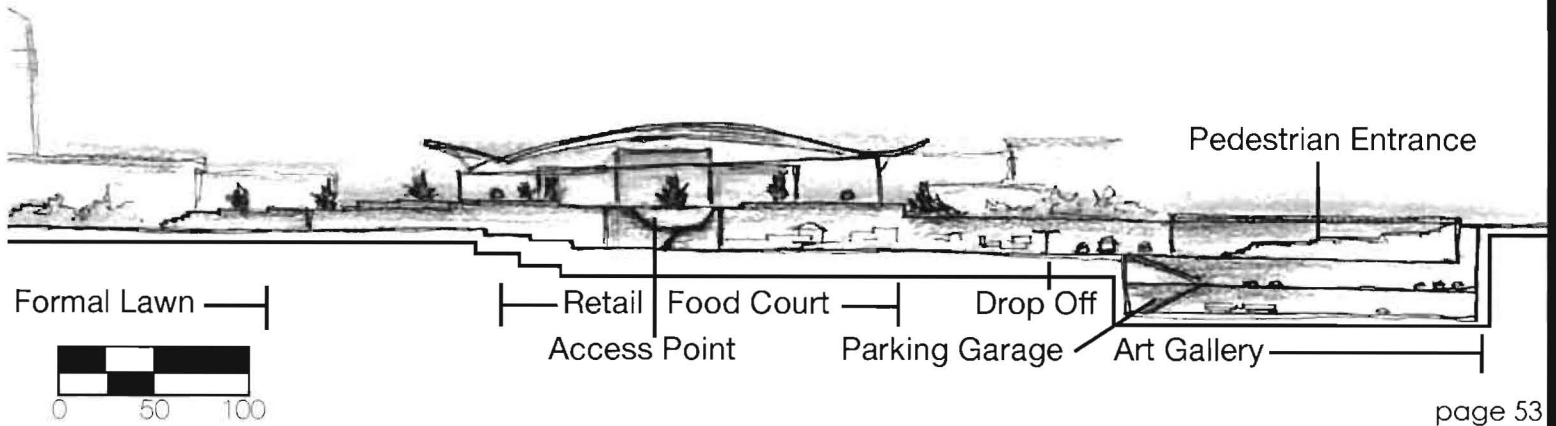
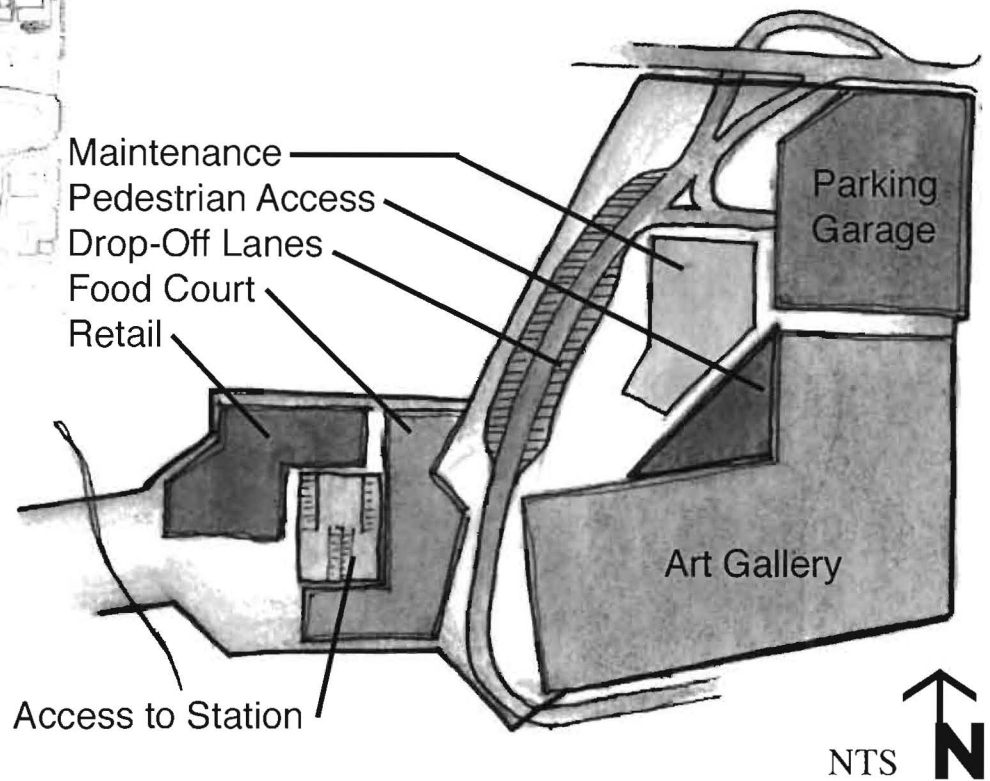
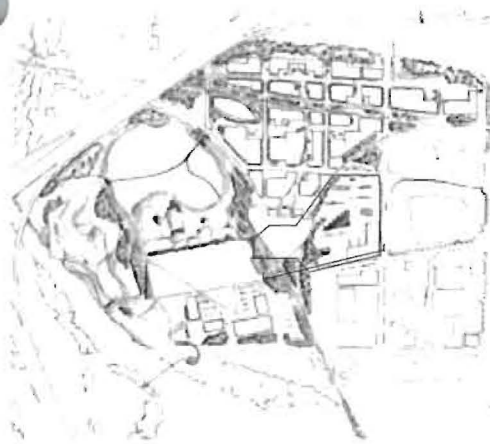
- Building Footprint ☐
- Office Space ☒
- Transit Station ☐
- Entertainment ☒
- Commercial/Retail ☒
- High Density Residential ☒
- Medium Density Residential ☒

Transit Modes

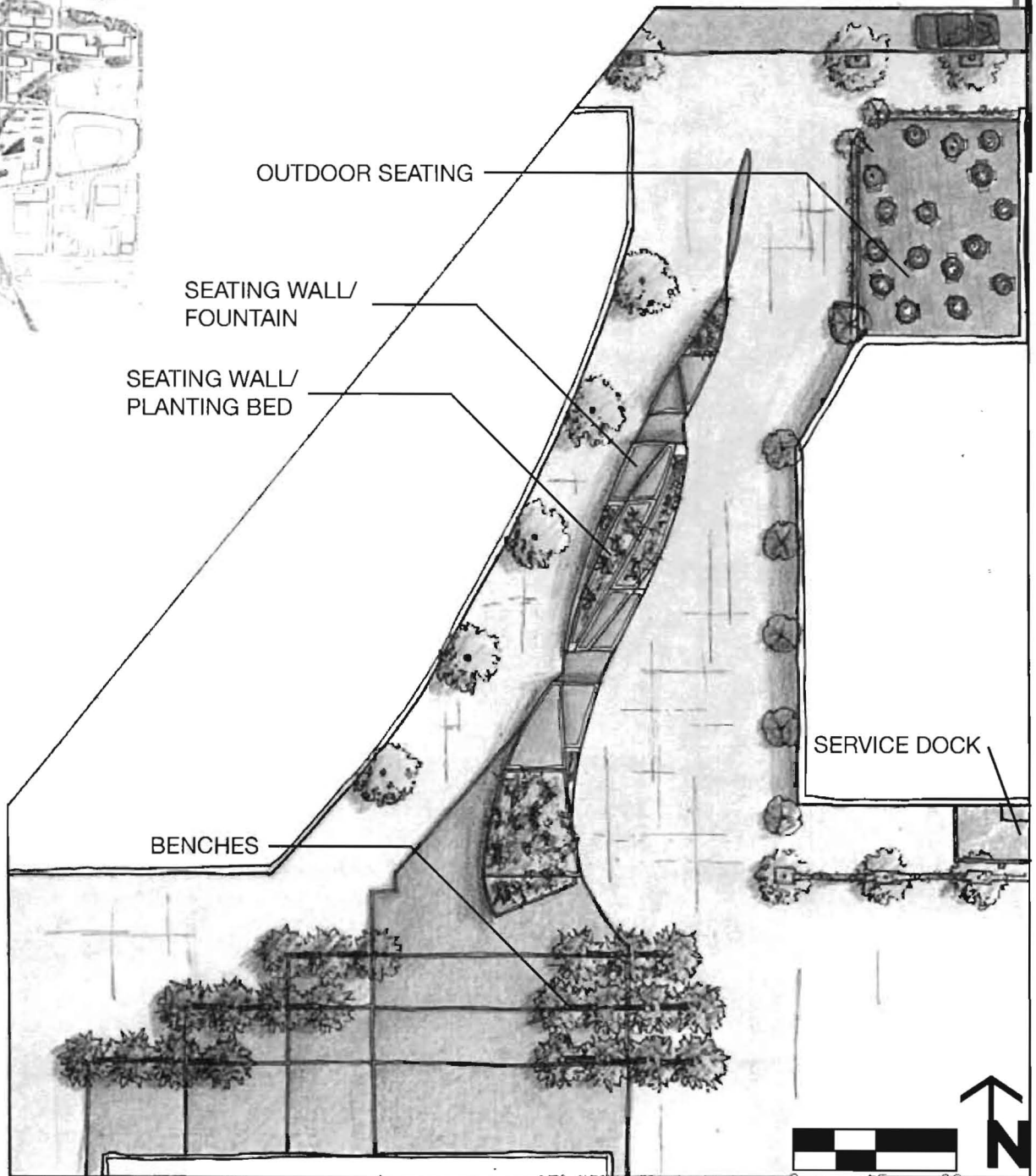


- Bus
- == Light Rail
- == Automobile
- Transit Stop/Dropoff

Underground



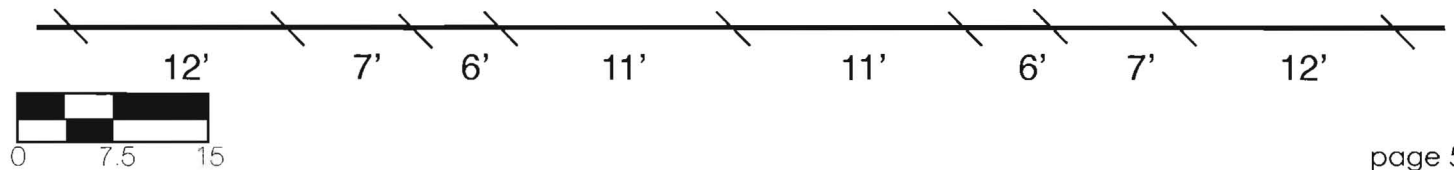
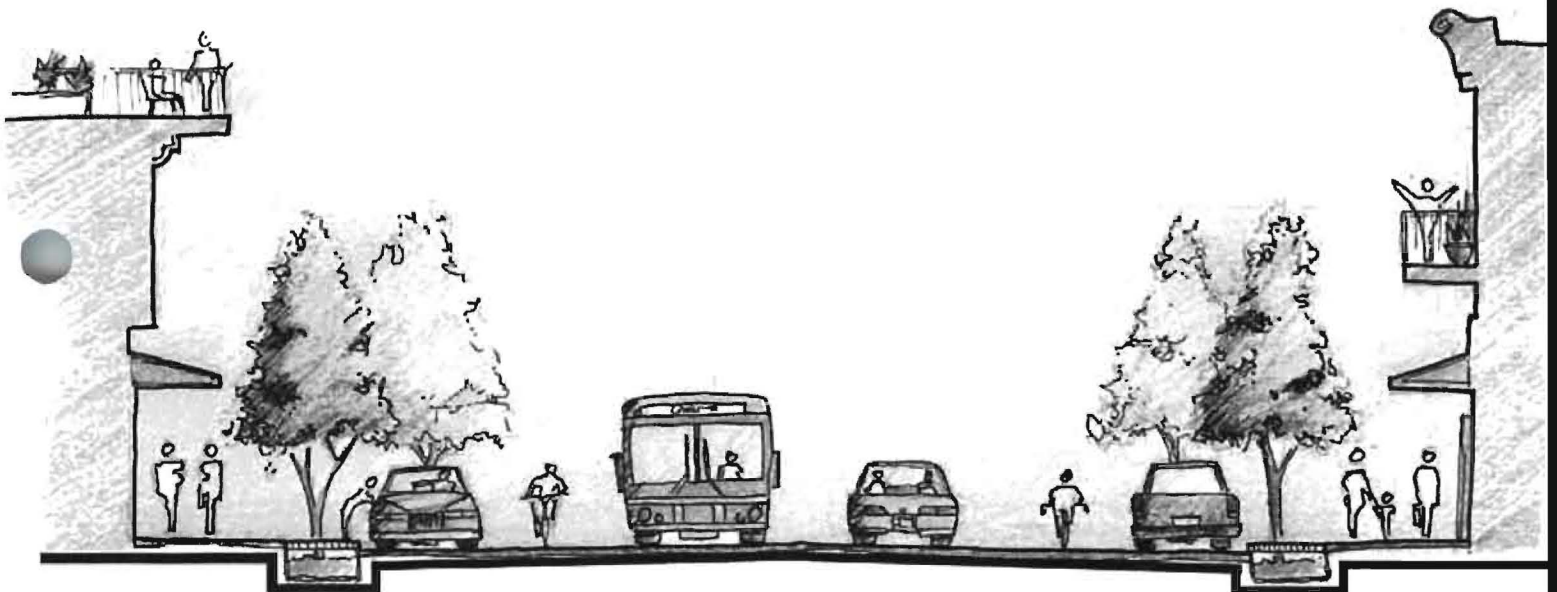
Station Plaza



Street View



A typical street section. All roads located on the site have two lanes of traffic as well as on street parking. Also located on all streets are 6' bike lanes in both directions. These bike lanes coupled with 12' of pedestrian walking space promotes a safe environment for bikers and walkers alike. On street parking helps alleviate the need for parking lots and or parking garages. Street trees cap off the street sections, bringing down the scale to a more human level while also creating separation from vehicular traffic.



A Day in the Life

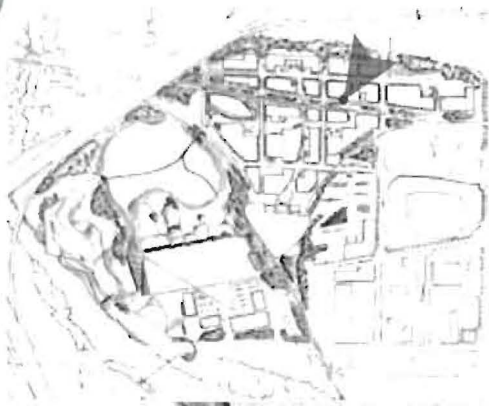


Meet the Heilman family. Mr. and Mrs. Heilman are recent graduates of Ball State University. David majored in Landscape Architecture and Katie earned a degree in Hospitality and Food Management. Originally from Columbus, David heard about the new transit development and jumped on the opportunity to be a part of this groundbreaking project.

David earned a job working for a landscape design firm in northwest Columbus. Katie maintains a successful food blog visited by 25,000 people a day.

This is a day in the life of the Heilmans...

Courtyard



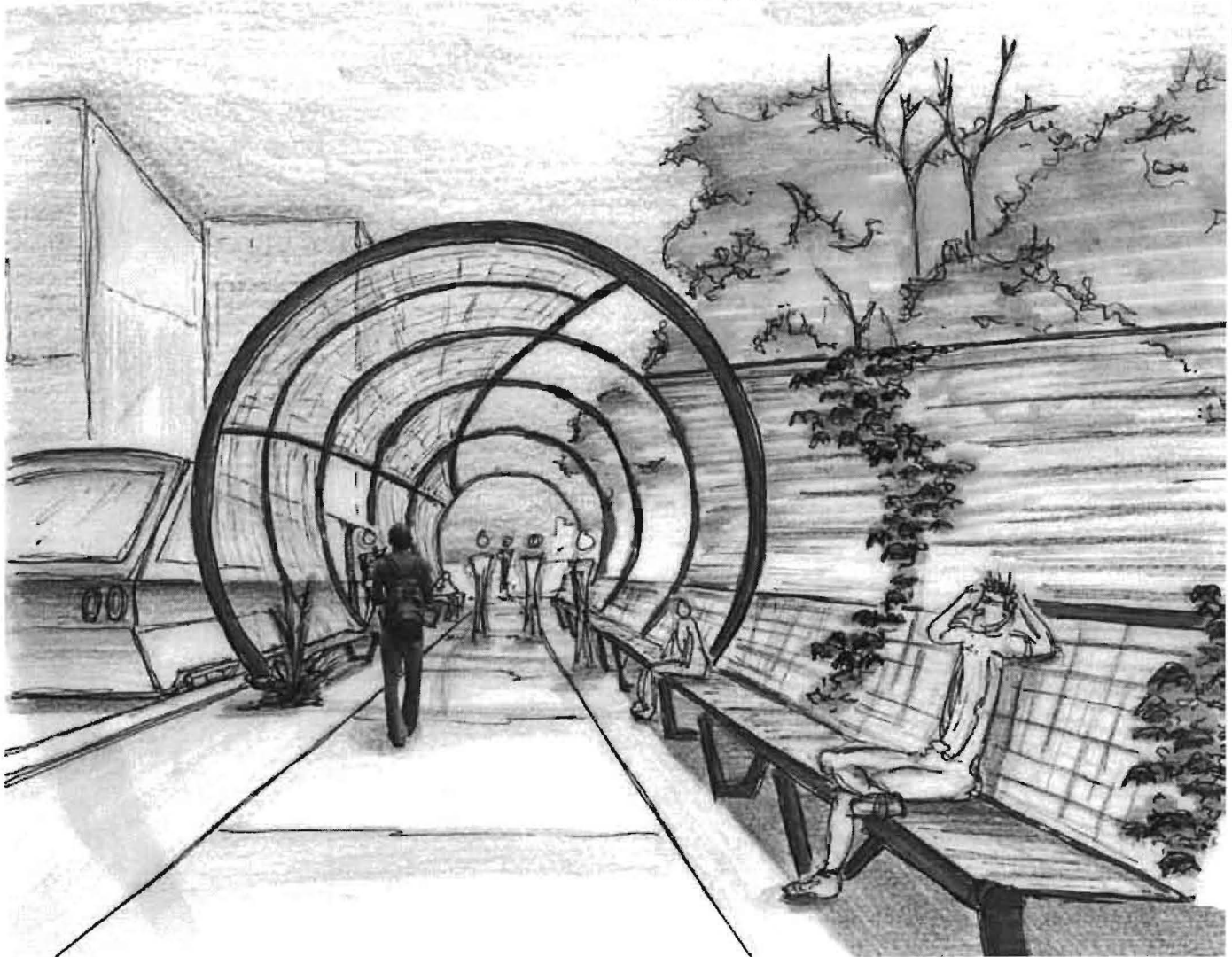
Friday Night: This is the apartment complex the Heilmans live in. A small courtyard provides the opportunity to relax by a small fountain or under a Maple tree during the hot summer months. David and Katie have just run to the grocery store located a block away for some hot dog buns. They have invited a neighbor over to grill out with them on their porch. Soon, dinner will be served!



Transit Stop

Saturday: David runs to the office located in northwest Columbus to put in a few extra hours on a project. He catches the red line early in the morning while trains are fairly empty. The transit stations

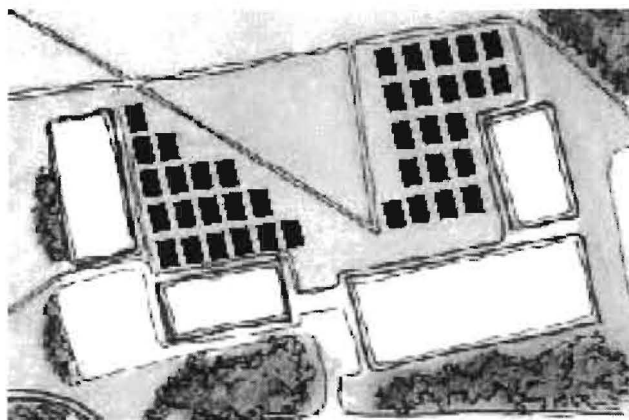
are uniform at every site except in color. The color of the transit stop is based on the transit line it serves. Since David is riding the red line, the stop is painted red whereas if he were to ride the yellow line, it would be painted yellow.



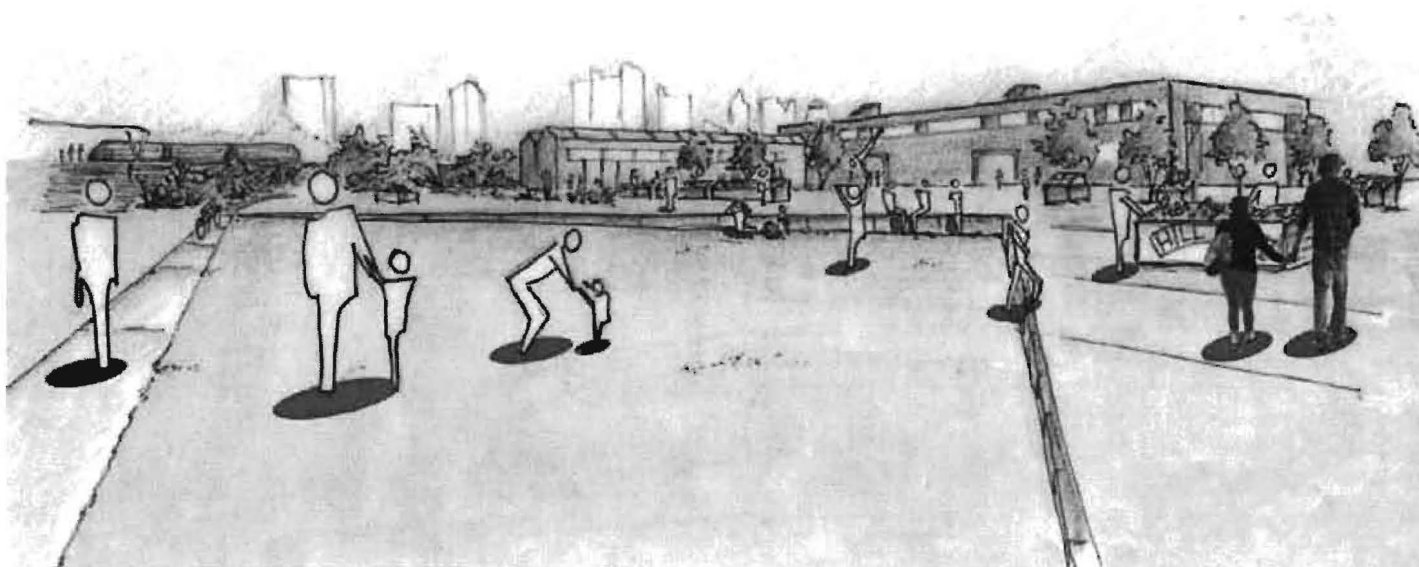
Farmers' Market



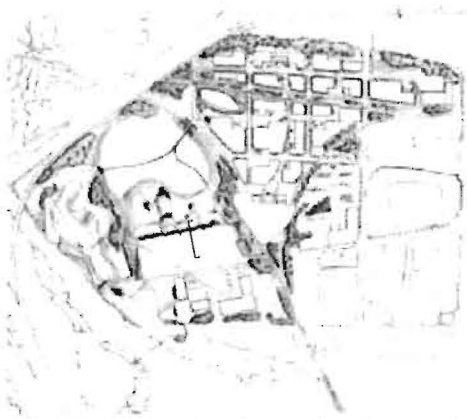
At about noon, David returns and the two decide to go to the farmers' market to get lunch. Not only is food grown on site in the old factories, but also brought in from local farmers. There are barbeque stands and many other unique vendors offering a variety of food.



Potential layout of farmers' market. In this layout, there are 38 vendor spaces measuring 12'x24'. There are also narrow driving lanes, allowing for the vehicles of the vendors to take produce directly to their lot. Other layouts are possible based on the events scheduled. Electrical hookups are available.

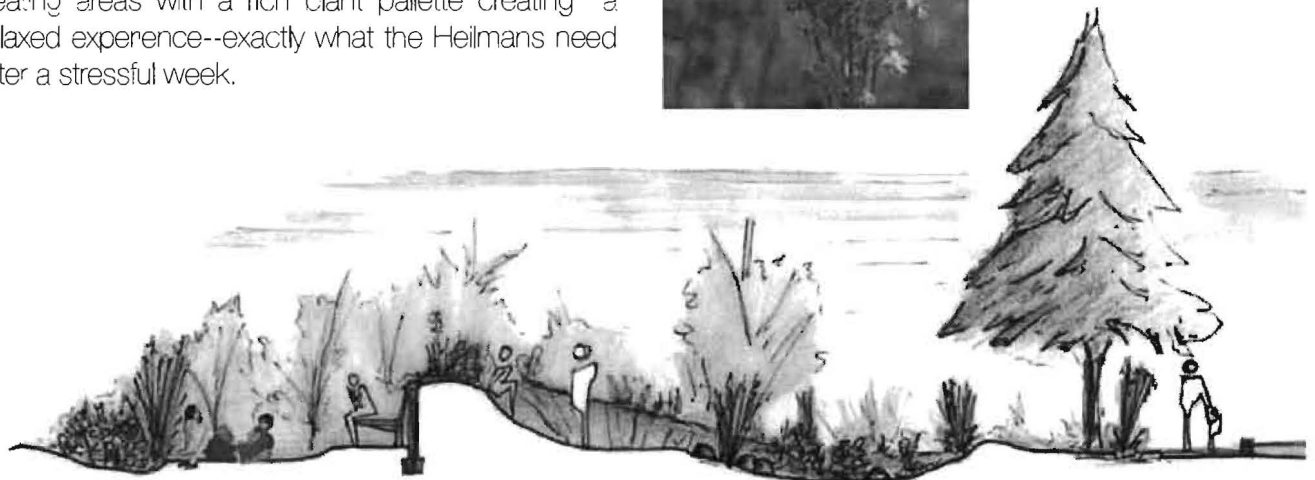
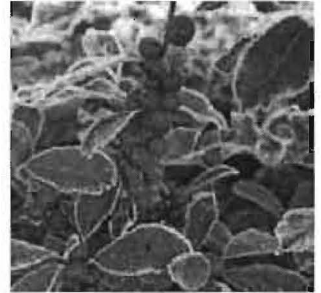


The Gardens

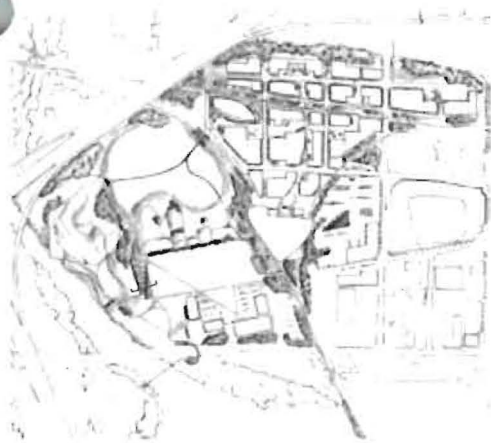


After grabbing lunch at the farmers' market, David and Katie head north to 'the gardens.' This space, separated from the grand lawn by a row of Eastern White Pines, offers a variety of different seating spaces with varying degrees of privacy. Their favorite garden, promptly named 'the rain garden', offers the most topography change of any of the gardens. These topography changes create smaller more private seating areas with a rich plant palette creating a relaxed experience--exactly what the Heilmans need after a stressful week.

Plant Palette

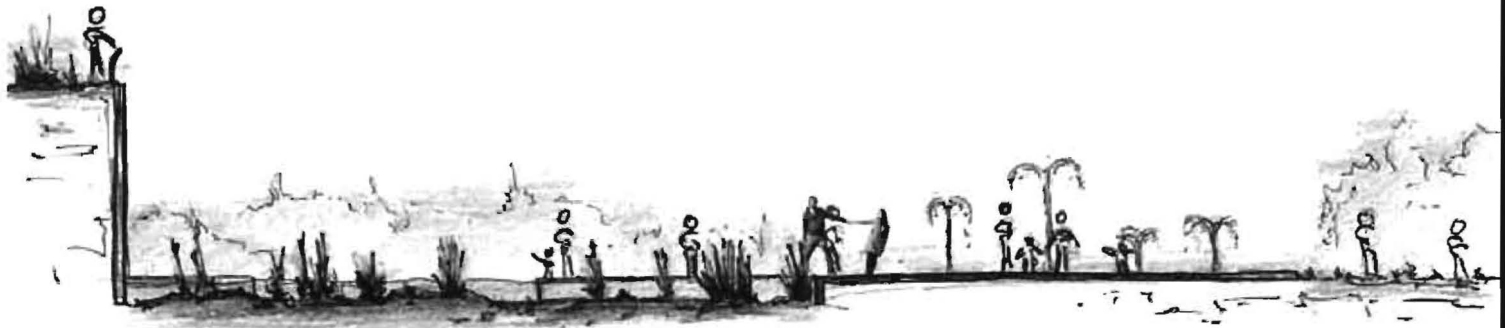


Playing in the Water



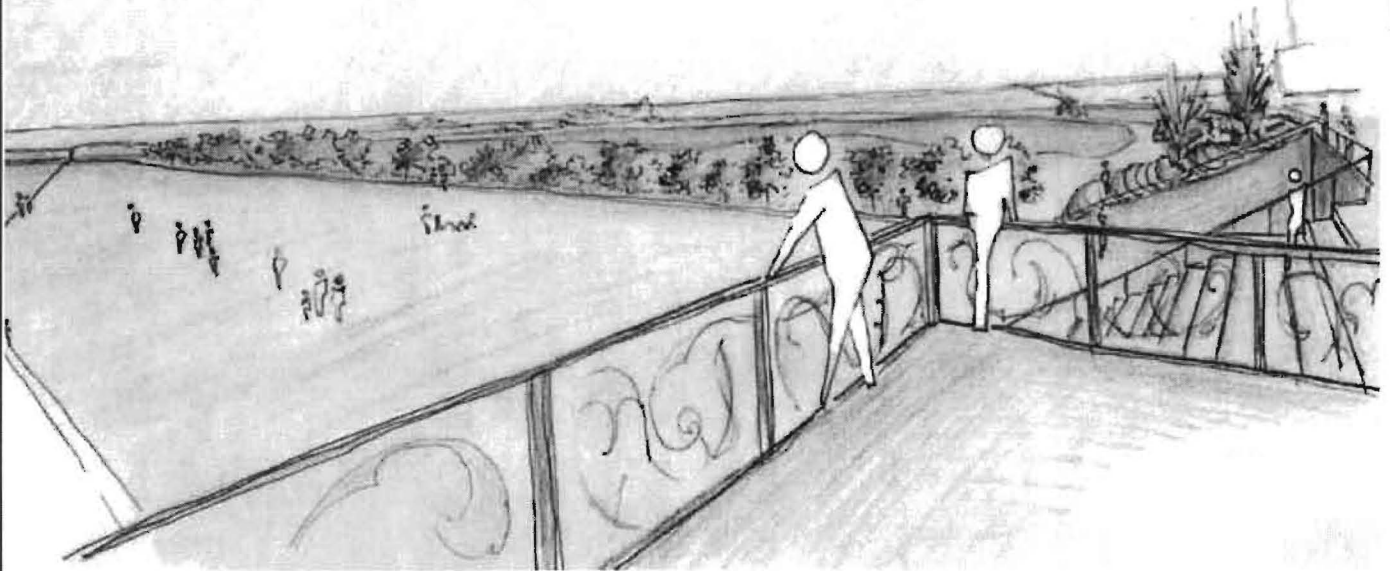
Needing to cool off in the hot summer sun, David and Katie head down to the water fountains. These fountains provide kids and adults the ability to cool off through water jets, fountains and misters. After walking through the misters, Mr. and Mrs. Hellman sit on the edge of the constructed wetland, watching the water slowly weave its way through the vegetation before it ends up in the Olentangy River.

Precedent Images

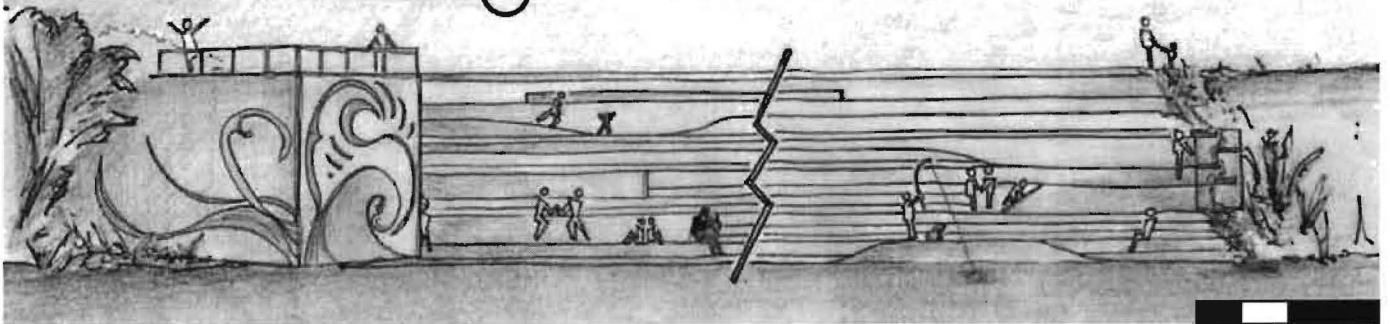


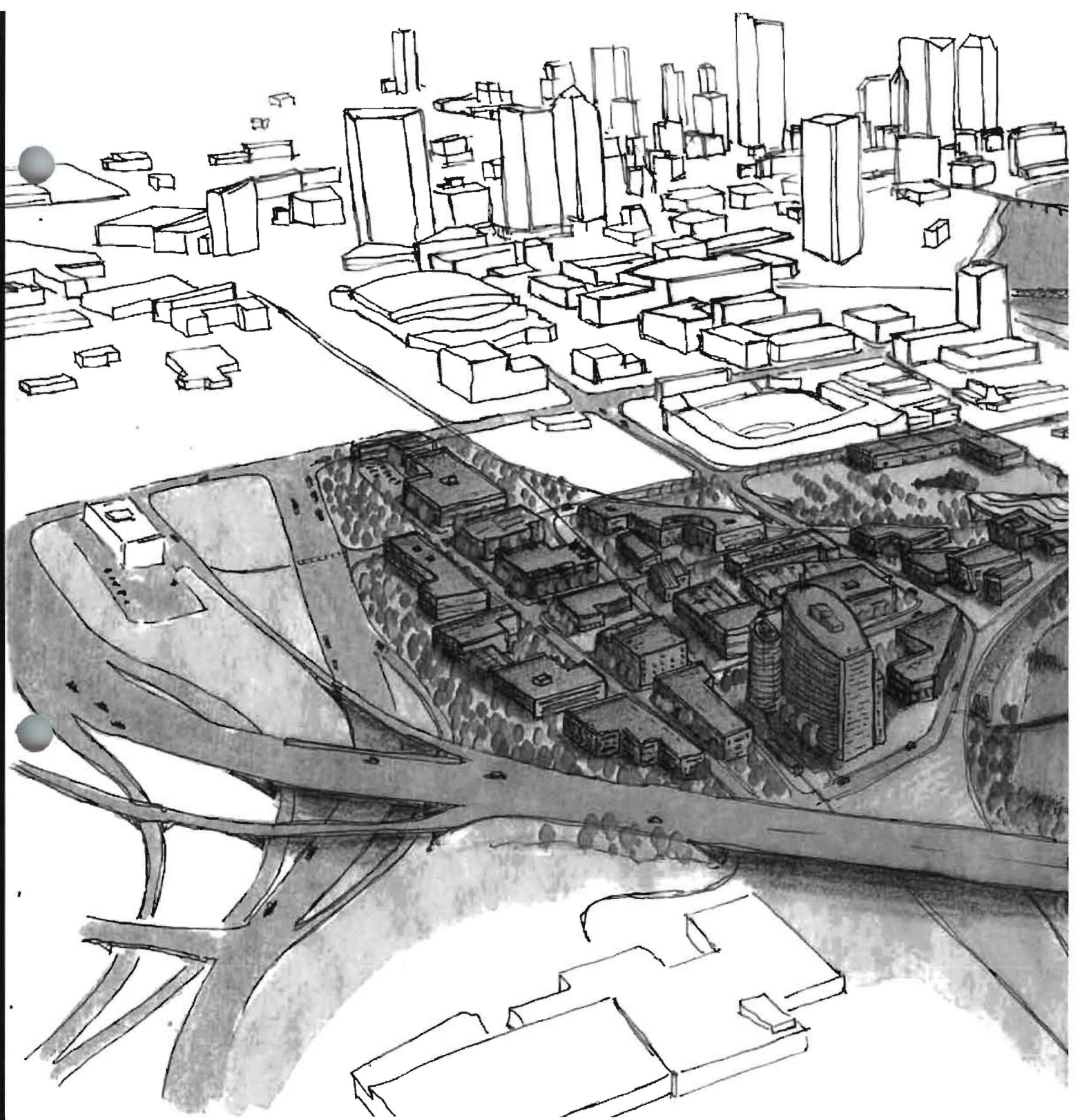
The Overlook

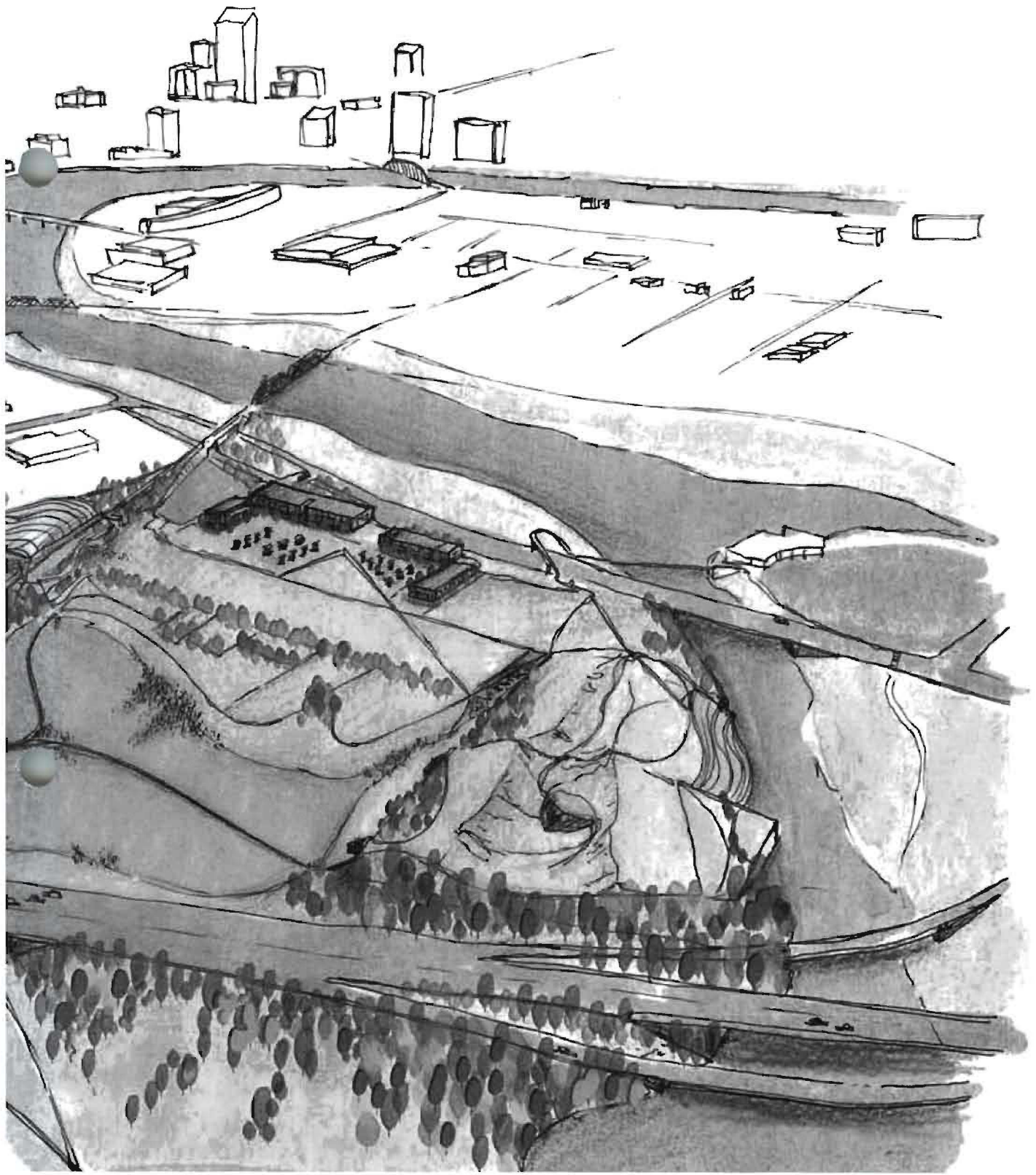
Biking is one of their favorite activities. With the extension of the Scioto Greenway through downtown, the Heilmans can travel for miles around Columbus, visiting multiple landmarks. On their way back home, they stop on the overlook located next to the station. From here they have an excellent vantage point of the grand lawn and wetland, but when they want to see the river, they head down to the river terracing to relax.



Down by the River

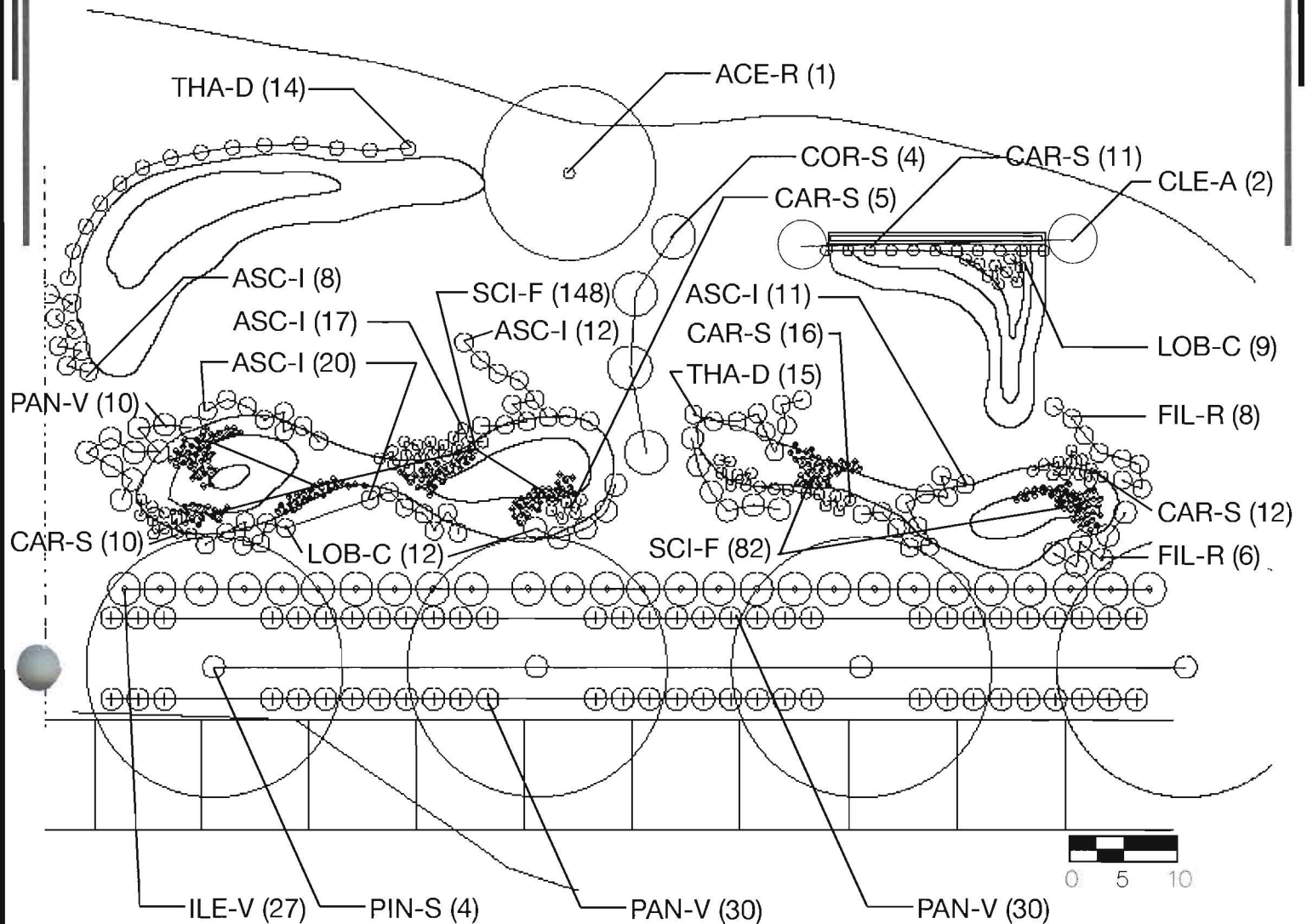






The Gardens

Planting Plan



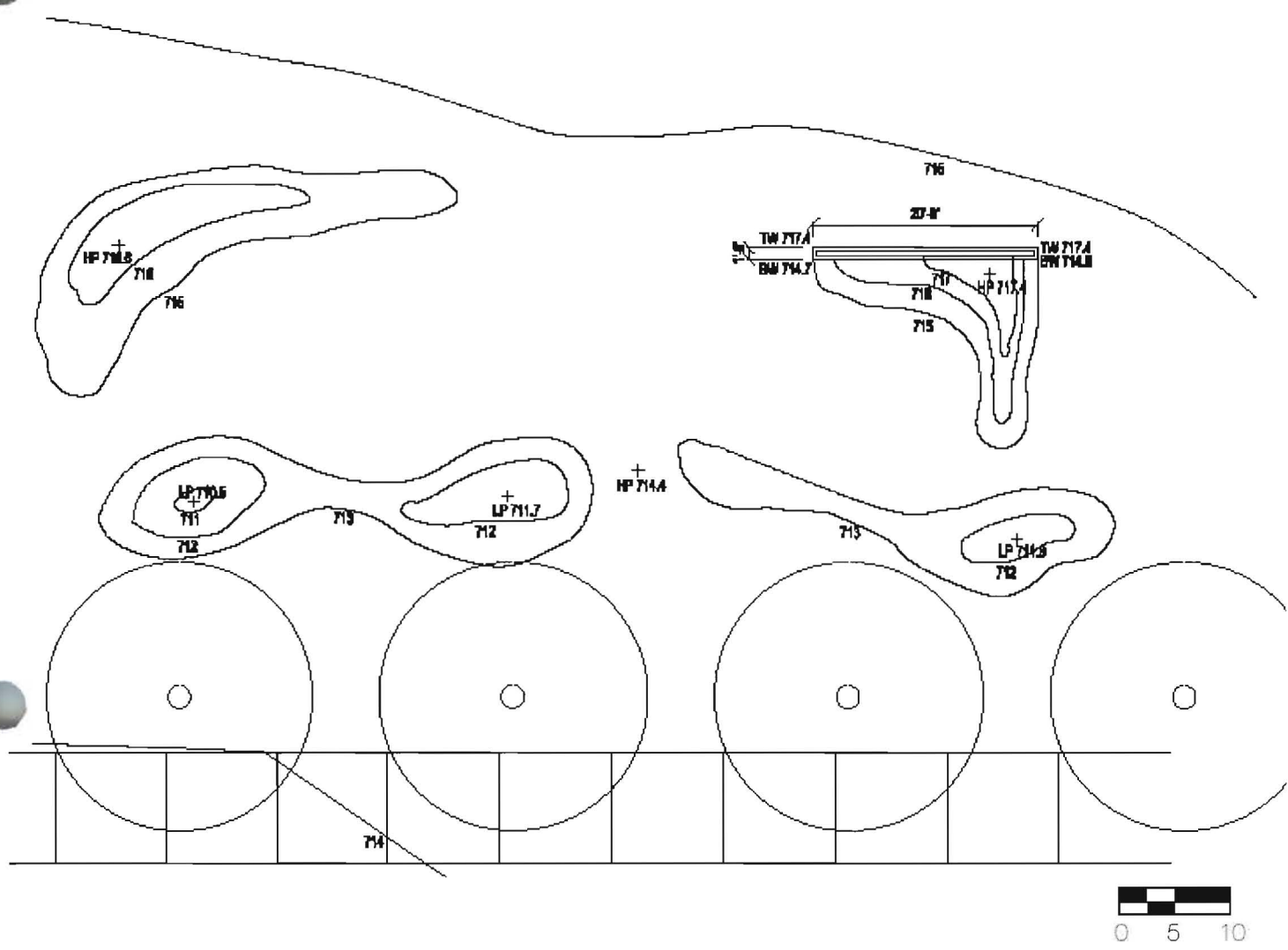
The Gardens

Planting schedule ⊕

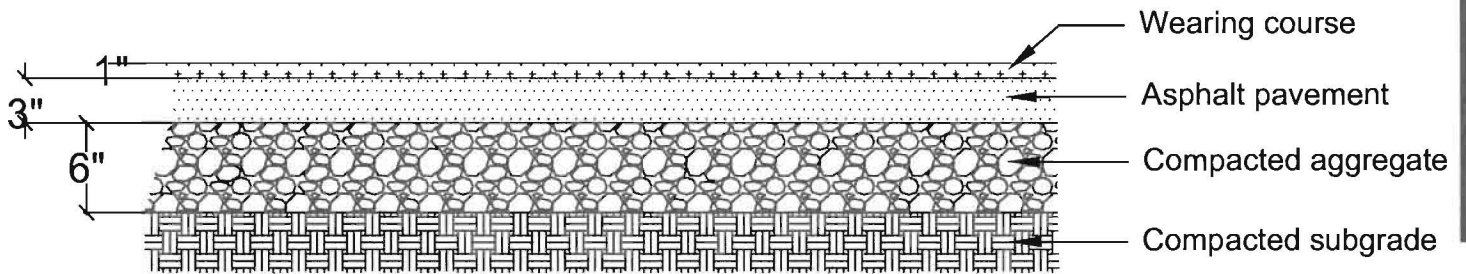
Key	Scientific Name	Common Name	Spacing	Size	Quantity
Shade Trees					
ACE-R	Acer rubrum	Red Maple		3" Cal.	1
Evergreens					
PIN-S	Pinus strobus	Eastern White Pine	30' o.c.	12'	4
Shrubs					
CLE-A	Clethra alnifolia	Summer Sweet Bush	per plans		2
COR-S	Cornus sericea	Red-Osier Dogwood	7' o.c.	1" Cal.	4
Evergreen Shrubs					
ILE-V	Ilex verticillata	Winterberry	per plans		27
Grasses					
CAR-S	Carex stricta	Tussock Sedge	per plans	No. 1	54
SCI-F	Scirpus fluviatilis	River Bulrush	per plans		130
PAN-V	Panicum virgatum	Switchgrass	30" o.c.	No. 1	70
Perennials					
ASC-I	Asclepias incarnata	Swamp Milkweed	per plans		20
FIL-R	Filipendula rubra	Queen of the Prairie	per plans		20
LOB-C	Lobelia cardinalis	Cardinal Flower	per plans		20
THA-D	Thalictrum dasycarpum	Tall Meadow Rue	per plans		29

The Gardens

Grading Plan



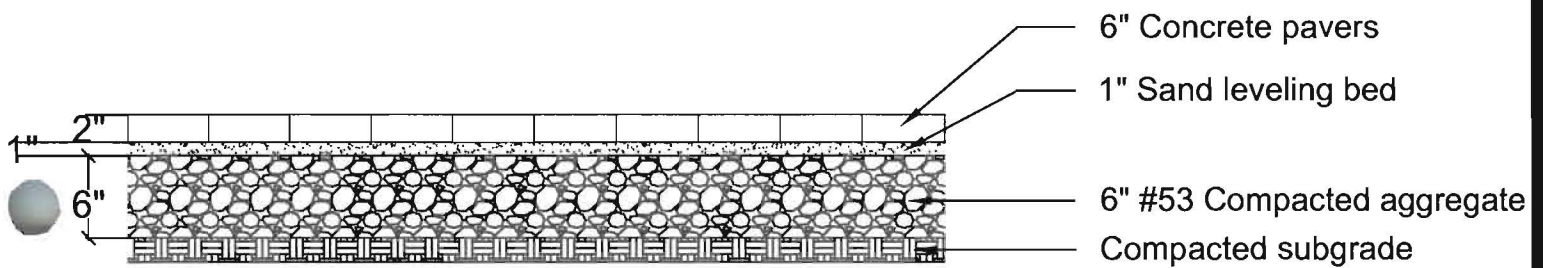
Details



D
1

Asphalt Road

NTS



D
2

Brick Unit Pavers

NTS

Details

$\frac{5}{16}$ "



Depth of saw joint to be 1/4 depth of slab thickness (1" min.)

Concrete pavement

$\frac{1}{2}$ "



Fill joint to within $\frac{1}{4}$ " of top

Full depth preformed joint filler

D
3

Saw Cut Joint

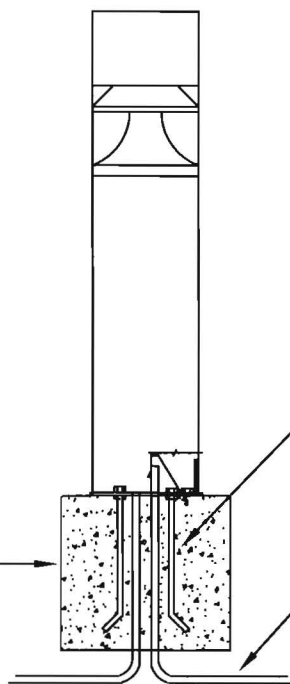
NTS

D
4

Expansion Joint

NTS

12" Dia x 24" concrete base



(3) 1/2" x 9" Anchor Bolts

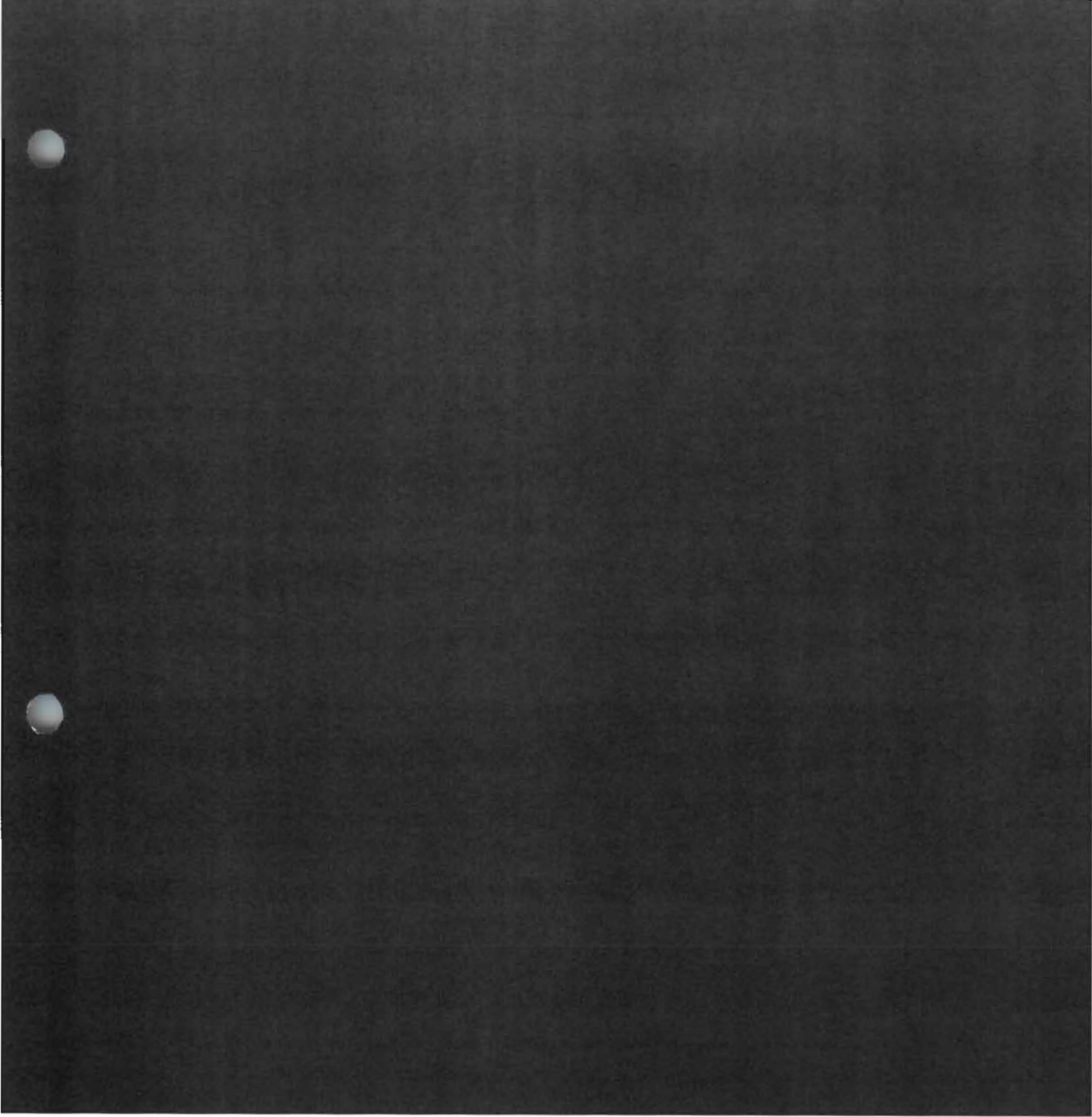
Conduit & wire: see site plan for circuit

D
5

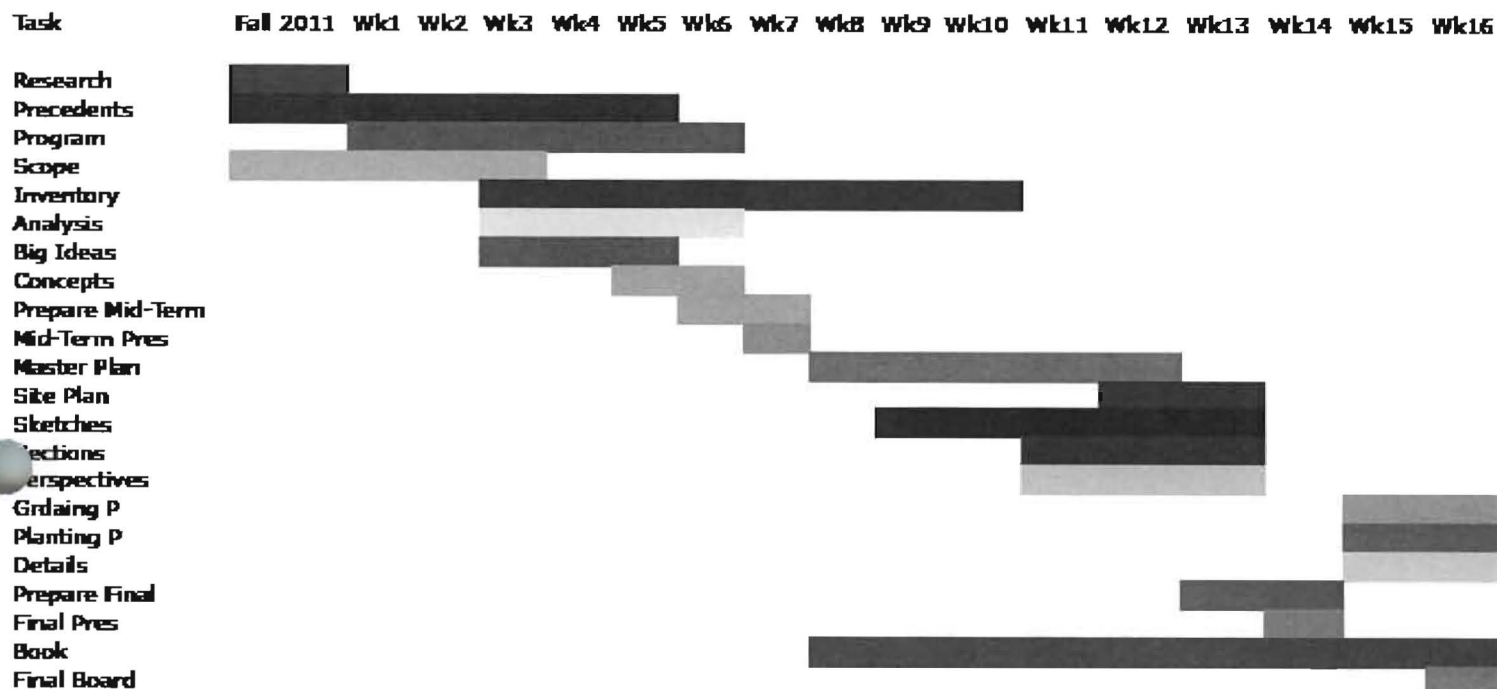
Light Bollard

NTS

Appendices ○ ○ ○ ○ ○



Timeline



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