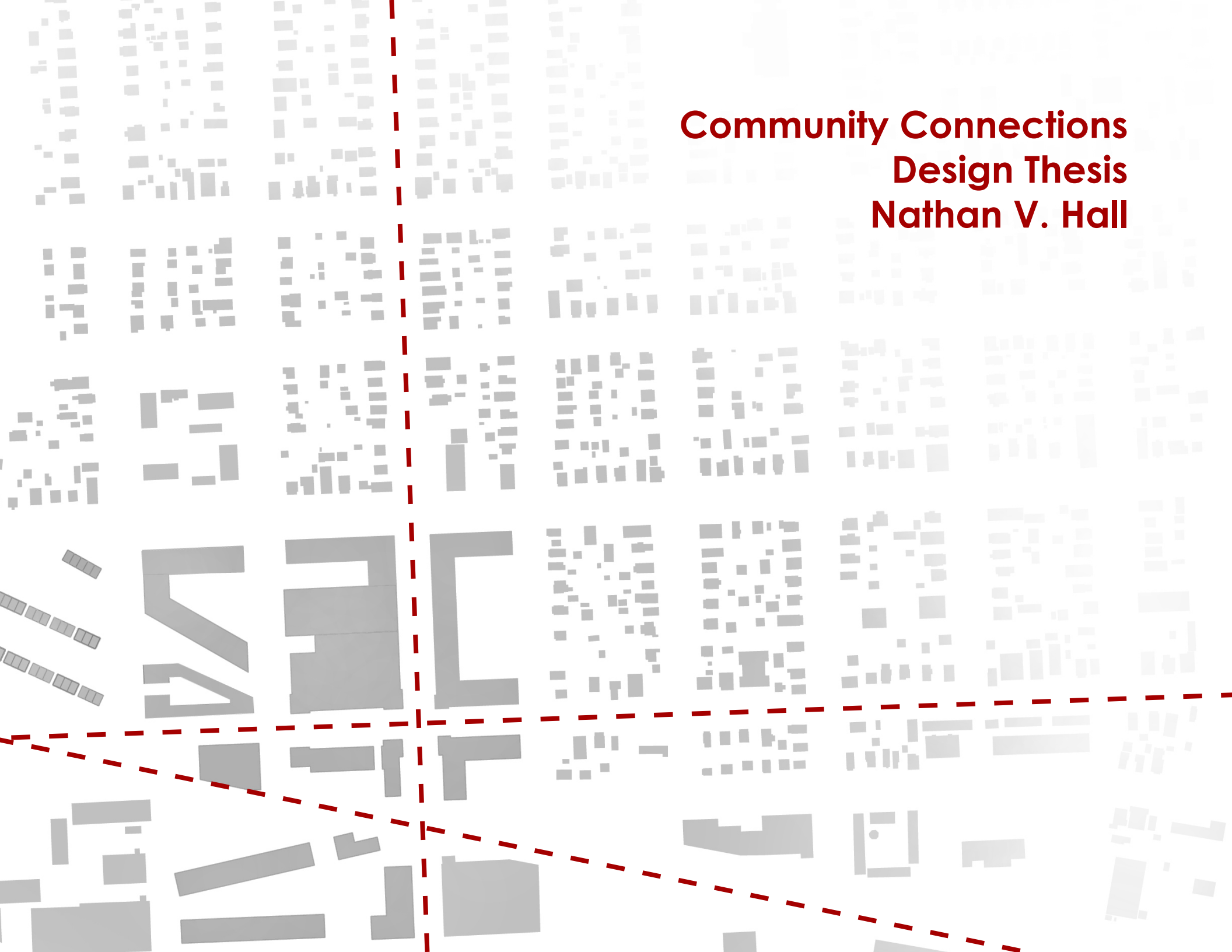

Community Connections
Design Thesis
Nathan V. Hall

Community Connections

A Design Thesis Submitted to the
Department of Architecture and Landscape Architecture
of North Dakota State University

By Nathan V. Hall

In Partial Fulfillment of the
Requirement for the Degree of
Bachelor of Landscape Architecture

Primary Thesis Advisor

Thesis Committee Chair

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Abstract

A university community in the Midwest will need to increase in density to accommodate an expanding population. This design thesis examines how density and growth can be accomplished while improving the quality of life for the inhabitants. If the city continues to rely on private automobile use and un-strategic development it will become a congested and fail to be a livable community. A strategy that will tie transit and development together will allow this area to increase in density and maintain a high quality of life.

Keywords: growth, density, transit-oriented design

Problem Statement

How can a community balance increasing density needs with issues of livability

Project Typology

Transit Oriented Design

Claim

Environmental Designers and planners can implement an effective transportation system to alleviate the problems associated with higher density and make a community more livable.

Actor: Environmental designers, transportation planners
Action: Implementing transit systems
Object: Communities

Premise 1: Urban designers and planners need to design communities where mass and pedestrian transit are accepted and convenient means of navigating a community.

Premise 2: Alternative transit systems are popular with the public if they are shown how it fits into their neighborhood and lifestyle. This is demonstrated by the success of Hiawatha light rail line in Minneapolis that was at 129% of expected ridership in 2010. (Doyle, 2011)

Premise 3: Communities will fail if they continue to grow on the terms of personal transportation.

Theoretical Premise/Unifying Idea

An approach to community transit that focuses on all methods of transportation and how the neighborhoods connect will allow the community's population density to increase without sacrificing quality of life.

Project Justification

Without a comprehensive view of transit and design our communities will become clogged with traditional methods of transit, travel times will increase and neighborhoods will become isolated.

Proposal

Narrative

Throughout my life, I have experienced high-density environments. Traveling throughout Europe and large U.S. cities I saw how mass transit works. How ordinary people live among each other in relatively confined private and public spaces. I experienced what it was like to go for months using only public transit. I walked to get my groceries and to school. I never felt like my life was compromised due to the high-density environment.

After each of these experiences I would return to the upper Midwest and once again drive to accomplish simple daily tasks. I began to wonder if the medium sized cities that I have lived in would ever abandon the pattern of sprawl that had consumed them since the middle of the century. Could they ever come to use the methods of transit that are used in Europe and that they once used themselves? With an expanding population and limited land the answer may be coming.

User/Client Description

The major client for this project is the City of Fargo, ND. Other clients may include the Metropolitan Coalition Of Governments and/or other major institutions such as North Dakota State University.

The users of this site include anyone who occupies the north Fargo area as a resident, commuter, or visitor.

Residents: Whether student, elderly, or family resident groups demand a livable environment. They want a predictable transit system that is easy to get to. They want shopping and other amenities to be close by. They want a variety of housing types that are comfortable and have easy access to parks that are suited for both Frisbee and sandboxes.

Commuters: This group wants easy access in and out of the neighborhood but also wants have retail and other amenities along their route.

Visitor: When visitors arrive on the site they want to be able to find their way easily, have their safety assured, and have a nice place to rest.

Major Project Elements

The project will include a transit system (potentially rail) that can accommodate the growing university population and other residents. This transportation will need to be efficient and focus on the areas of population it will need to serve. Included in this system will be neighborhood transit stops complete with suitable community gathering space.

It will include a built environment of mixed-use neighborhood structures and park environments that serve the local residents in all of their diversity.

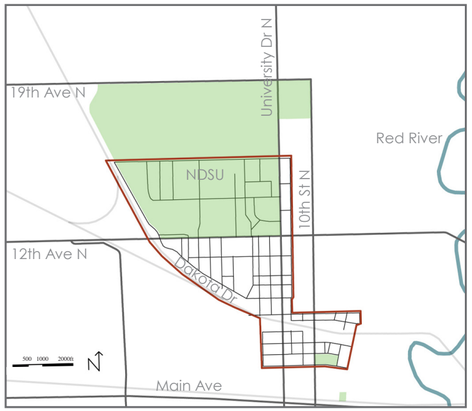
All of these spaces will need to be connected by an accessible pedestrian environment. There will be a need for sidewalks, bicycle routes, and safe intersection crossings.

Site Information

Region: The upper-Midwest is not an area of defined boundaries but for the purposes of this document it will include North Dakota, South Dakota, and Minnesota. This region is located in the geographic center of the North American continent and thus features extreme seasonal temperature fluctuations. The landform varies from flat to rolling and features woodlands in the east and plains in the west.

City: The metropolitan area of Fargo is positioned along the Red River of the North and is the crossroads of nationally important railroads and highways. The economy is diverse and includes agriculture, manufacturing, technology, healthcare, and education. The city is known for its low cost of living and low unemployment rate.

Site: North Fargo is comprised largely of older residential neighborhoods. It is bordered by the Red River on the east and north, railway on the south, and an interstate on the west. The major economic assets in this area include North Dakota State University, Sanford Medical Center, Hector International Airport, Government offices, and a variety of retail centers. The area has a large student population associated with the university. The specific site is the south section of NDSU, the private property that surrounds it, and a northern section of downtown. This 600 acre site is going to be impacted in a significant way by the university population in the coming years and decades.



Project Emphasis

The project will need to address the implementation of a transit system and how it connects key locations in key neighborhoods. There will need to be some idea of how the transportation organization will practically function. However, the primary focus will be on the on these key neighborhood areas and how they can be redeveloped to better connect to the system, to accommodate larger numbers of people, and to increase livability.

Plan for Proceeding

Research Direction: Research will be conducted in the areas of urban growth management, transit oriented design, historical context, site analysis, and programming.

Design Methodology: The design process will be guided by a mixed approach of quantitative and qualitative data. Quantitative data will involve gathering statistical information on transit ridership and population. Qualitative will involve gathering from direct site interaction, interviews, and archival searches. A concurrent transformative strategy will be followed with the guidance of the theoretical premise. The data will be integrated and analyzed periodically throughout the research process.

Documentation of the Design Process:
Any paper work will be scanned and included with digital work files. All files will be backed up after every major completion date or every two weeks, whichever is more frequent. The final document will be available digitally to the public in the NDSU digital repository. The final presentation will be in a digital format.

Studio Experience

2nd Year

Fall Semester 2008 Kathleen Pepple

Teahouse Project
Halverson Park

Spring Semester 2009 Mark Lindquist/Dominic Fischer

Cold Smoke
Weathering Winnipeg
Fargo One-Way Corridors/Urban Open

3rd Year

Fall semester 2009 Stevie Famulari

Defiant Gardens
Downtown Zoning Analysis
Regent, ND Tourism Design

Snow Sculpture Symposium

Spring Semester 2010 Kathleen Pepple/Jay Kost

South NDSU Neighborhood Redevelopment

UTTC Campus Plan

4th Year

Fall Semester 2010 Jay Kost/Niki Carlson

Duluth Postindustrial Master Plan

Spring Semester 2011 Paul Gleye

Blois Design Charette

Lille Streetscape and Park Solution

5th Year

Fall semester 2011 Dominic Fischer

Ecosystems Management

Unifying Idea Research

Introduction
Human settlement has always been determined by transportation. The prosperity of a city is determined not only by the goods and services it can produce, but by how efficiently it can move these items. Wherever transportation is easier due to water, rail, or street routes a settlement will likely be established and grow. Historically, towns are founded at the crossing of railways and rivers or at interstate entrances. Many times the ease of transportation may overrule the other practical considerations of settling that piece of land. Just as the availability of transportation determines the initial placement of cities, it also influences the development of the city itself. William Lieberman writes in the Charter of the New Urbanism giving this historical characterization of transportation within the American city:

> Until the end of the first World War, travel within America's urban areas was primarily on foot or by public transportation. To [have access to] public transit was a highly regarded attribute for real estate, as it minimized walking distance. More intense land uses, such as shops, schools, and workplaces, tended to be located around transit stops. Residential densities generally were highest along the streets served by streetcars and buses, tapering to lower densities as the distance from stops increased. With the advent of the automobile, the relationships between transit and land use weakened, as more people switched to auto travel, fewer were affected by the length of the walk to public transportation. Newer suburbs were laid out primarily with the needs of motorists in mind, and very different patterns of density and location prevailed (Lieberman, 2000, p. 101).

Importance of Multimodal Transit
The automotive-based style of development has continued to the current day. Authors Cynthia Girling and Ronald Kellett state in Skinny Streets and Green Neighborhoods, "The preponderance of metropolitan area growth of the past fifty years was concentrated in the suburbs (50 percent), while central city population (30.3 percent) declined" (Girling & Kellett, 2005, p.1). The suburbs remain a desirable place to live. Quarter- to half-acre lots are common. Garages contain two to three stalls and engulf the front of the typical suburban house as if to signify the cultural importance of the household's vehicles. There are multiple reasons why the car is no longer subjected to a position next to the garbage in the back. One is the expense and therefore status of purchasing and running motor vehicles. Operating one or more vehicles is often the most expensive household cost outside of housing itself. The obvious choice would be to eliminate or reduce the number of cars owned by a household or reduce the overall vehicle miles traveled. To maintain mobility a household would supplement its travel in personal vehicles with foot travel or public transit. However, many households live in neighborhoods that have been developed without the consideration of mass transit, especially those developed since the Second World War. In these low-density neighborhoods, walking simply may not be a realistic option. William Lieberman points out the desirable densities for viable public transit:

> In most communities, at least 18 homes per acre is ideal within a half-mile walk of rail or bus stations, while 12 units per acre is a reasonable minimum density within one-quarter mile of a bus stop. For more suburban, single-family neighborhoods, five to seven units per acre is the lowest viable density for a bus route (Lieberman, 2000, p. 102-103).

Mixture of Uses
The lack of alternative transportation options in the typical city is not only due to density but also the segregation of uses. It is not uncommon for someone who lives in a Midwestern city to travel several miles between different districts to accomplish simple daily tasks. The authors of The Smart Growth Manual provide a description and opinion on districts:

> Districts are large areas dominated by a single function. They can be justified or unjustified. Justified districts include civic, medical, and college campuses; large or noxious agricultural and industrial facilities; transportation depots and terminals; and specialized entertainment zones such as Disney World. The rest are principally the unjustified districts created by unnecessary single-use zoning. They include housing subdivisions, apartment complexes, shopping centers, and business parks – developments that cause social fragmentation and traffic congestion (Duany, Speck & Lydon, 2010).

To merge these uses (residential, office, and retail) is one of the fundamental planning principles of the Congress of the New Urbanism. The suggestion is not to invent an entirely new form of development, as has been attempted for the past several decades, but rather to return to a form of development that was common practice early in the twentieth century.

Rather than zoning uses into separate districts of the city, this strategy forms the different districts into mixed-use zones. At the center of every zone is a commercial core that contains community needs such as retail shops, restaurants, entertainment facilities, and professional offices.

What makes this form of development unique from current methods is the inclusion of residential into the upper stories of the commercial structures. This approach is also unusual in terms of how it relates to the street. Unlike many developments, buildings have very little setback from the street with only enough distance to allow for a sidewalk and some diagonal parking. However, the sidewalks are often wide but not so wide that they will feel empty in ordinary circumstances. Peter Calthorpe recommends that street trees be planted in abundance and the opportunity for café seating and street furniture is taken into account. Altogether it is recommended that maximum distance between the facade and curb in the commercial center is no more than twenty feet (Calthorpe, 1993, p.79).

The strategy employs several stories of apartment housing above the commercial buildings of the core. This class of housing generally appeals to non-family households or anyone that does require personal green space but does value close proximity to retail and transit. Both the baby boom generation (now rapidly becoming empty nesters) and those that are classified as "echo boomers" (those aged 24-34) find this lifestyle attractive (Dittmar, & Ohland, 2004, P. 11). Both are looking for exciting urban locations with social and entertainment opportunities not typically found in the suburbs.

But for some the transition from the suburbs to a dense neighborhood core may be too dramatic. For anyone with this emotion or simply anyone who would like more privacy or a little green space the first ring around the commercial core is lower density residential.

The density is still very high by typical standards but may offer some private green space and take the form of townhouses or rowhomes. The density continues to taper in a radius from the core and eventually becomes single-family homes on small lots. These homes offer the highest amount of private green space in exchange for less convenience to the commercial center of the community, although these homes also are, theoretically, within walking distance to the downtown center. This is something very appealing to younger generations. Research uncovered in The New Transit Town has found that fifty-seven percent of the echo boomers "preferred small lot housing and that fifty-three percent felt that an easy walk to stores was an extremely important determinant in housing and neighborhood choice" (Dittmar, & Ohland, 2004, P. 11).

Parks and Civic Spaces

Though many older and younger members of the population desire more compact development, many do not. Some will always prefer to maintain a large property far from any transit system, and this option will continue to be made available to them. Others may simply be skeptical of living in proximity to so many other people. The idea of compact living rouses images of a city dressed in concrete where they will be forcibly separated from anything that exhibits more chlorophyll than a houseplant. The reality is less dramatic. If a compact, transit-oriented community is well designed and adhering to the principles of the New Urbanism it will feature a variety of public green space. These parks and plazas will be as diverse as the people and needs they serve.

The high-density dwellers in the core of community who don't demand any private green space may want connections to recreation paths and tennis courts but don't see any need for a playground. The medium density dwellers may be able to have some plants on their patio but want access to a public garden and a place to take their dogs. Those living in single-family homes have the yard they desire but have sacrificed its size for having a well-kept park within safe walking distance for their children. Back at the center of the community is a small plaza and gathering spaces for everyone who travels to the core for shopping or use of the transit station. Few of these public spaces need to be very large. Peter Calthorpe writes:

> Small and frequent parks should be dispersed throughout residential areas to provide auto-free destinations for children within a TOD [Transit-Oriented-Development]. Too often, parks are aggregated for marginal savings in maintenance costs, and become too remote to be safe for foot or bike access. One to four acre sites can easily accommodate a useful range of active and passive uses for a variety of age groups (Calthorpe, 1993, p.91).

This form of green space is small enough to be monitored by the surrounding residents. A neighborhood can have a sense of pride and ownership in this type of park.

Community Interaction

The ease of access to public transit and public spaces found in a community like the one just described offers interaction on a level that is impossible to achieve in a community based on private transportation and private space.

In the average postwar development, it is possible for someone to leave one's house in a car via an attached garage, drive to any part of the city one desires, buy groceries where no one knows their name, return home in the isolation of one's car, and quickly roll down the window to grab the mail as one pulls into the garage again, never having had a conversation with anyone. Some may desire this opportunity to never intact with neighbors. In a community based on transit and public spaces it would be possible to maintain this lifestyle and thus it will not be demanded from them. However, most people do desire social interaction and while they may live in a postwar development they satisfy their desire for interaction through their workplace or activities, which they attend by driving to another part of the city to reach. This, though, does not always work well for every segment of the population. It is noted, "While the affluent surf the Net and drive everywhere, their elderly parents and their young children are stranded in the random and attenuated urban environment that we have created" (Calthorpe, & Fulton, 2001, p. 36). This circumstance is also difficult for the lower classes that have limited access to personal transportation. In the transit-oriented community it is possible for everyone to have access to social well-being. The ability to walk to a nearby park, transit station, retail shop, or office creates many opportunities for chance encounters with one's neighbors. When neighbors encounter each other when in vehicles they are inclined to wave, but when they encounter each other on foot they are inclined to talk with one another.

Fiscal Responsibility

Despite the interest in environmental protection that many express, everything ultimately comes down to financial practicality.

There may be those who question the public support of compact developments and mass transit systems. However, it is the government that currently finances the expansion of roadways and utilities into undeveloped sections of forest and farmland. If the taxpayers receive an opportunity to support an infill development where there is existing infrastructure it can be seen as an investment and not a cost. When assessing future development goals for the Salt Lake City region it was found that, when "compared with a more compact alternative, low density sprawl will cost as much as an additional fifteen billion dollars in infrastructure and public services – approximately thirty thousand dollars for every new household" (Calthorpe & Fulton, 2001, p. 2). We have come to a time when we realize that it is no longer desirable or financially feasible to support low-density automotive-based design.

Summary

Transportation and development are intensely interrelated. We can see this truth throughout history and in all cultures. In the modern Midwest it remains true, although the automobile has allowed neighborhood scale development to become less related to other modes of transportation. Often, other transportation methods such as buses and streetcars have become unavailable to someone living in these modern developments. For many practical reasons, people today want to be less dependent on an automobile in their daily lives but are unable to do so because they live in a neighborhood that was not designed with the needs of foot travel or public transit in mind. Most residential property in the Midwest is within a suburban area.

These suburban style developments lack not only the density but also the arrangement to support a transit system. To find a solution to this problem we can look to the form of development used prior to the mass popularization of the automobile. This is the recommendation of the Congress of the New Urbanism. A modern community built around this recommendation would have a commercial core. This core would contain a mixture of uses unlike the segregated suburbs. This would allow less energy to be used on transport to and from different activities and daily tasks. A secondary use of the core is to provide residential facilities in high density. As we move out from the core there becomes less density. While the residents in the core would be housed in stacked apartments, the second ring out from the core would contain lower density housing, such as townhouses. The last ring of the neighborhood would be single-family housing on small lots to increase density. All of the neighborhood would be within walking distance to the core with some trading convenience for private green space and vice versa. The commercial core would have access to a mass transit system. With this density and arrangement accomplished it would be possible for citizens to travel on foot for many of their needs and use transit the rest. This solves the problem of making multiple modes of transit available to the population. However, the problem with automotive-based design was the lack of livability. Can this system provide more livability than lower density designs? For those that have spent their entire life in the suburbs the idea of living in a compact development in proximity to other people can seem claustrophobic. To really follow the policies given by the Congress of the New Urbanism is to create places that are not only efficient and walkable but places where people want to walk. All areas of the neighborhood should allocate adequate room and safety for pedestrians.

The commercial core shall have wide sidewalks and plazas. Parks too are a part of the community, offering different amenities that appeal to a diverse population. These public amenities offer residents the opportunity to interact with their neighbors in a way that would be very challenging in a typical suburban development. This is not an image of utopia but an example of something that is very possible and, in regard to the expense of maintaining sprawling infrastructure, very necessary.

Case Study: Excelsior and Grand

Project Type: Mixed-Use Neighborhood
Location: St. Louis Park, MN
Size: 16 acres
Designer: Damon Farber Associates

This 16-acre development was undertaken in a first-ring suburb of Minneapolis. The site is positioned adjacent to an arterial road and was formerly a derelict collection of obsolete suburban strip type buildings. The redevelopment has included several multi story, mixed use buildings that contain 88,000 square feet of retail space and 644 housing units (TOLD Development Company, 2009). The structures are typically four levels in height. At the center of the development is a community green that is heavily treed and features multiple seating areas and fountains. The green runs from the arterial street to a public park. During the redevelopment the surrounding public green space was restructured and bike and pedestrian connections were expanded. The site is along a proposed light rail line and multiple, existing bus routes (Paytonc, 2007). Private and public parking exist in abundance on the site but are located within courtyards formed by the buildings. This hidden parking has been criticized by some as being too hard to locate especially for those not from the area (Berg, 2008). A May, 2008 news article describes the residential units at the site as "pushing full occupancy, while retail has been good but less reliable" (Berg, 2008).

Transition of mixed-use to rowhome.(Hall, Nathan. 2009.)

Masterplan of Neighborhood, note relation to park space (Elness Swenson Graham Architects. n.d..)

Relation of Inner suburban location to Minneapolis (AC Johnson Photography. n.d..)

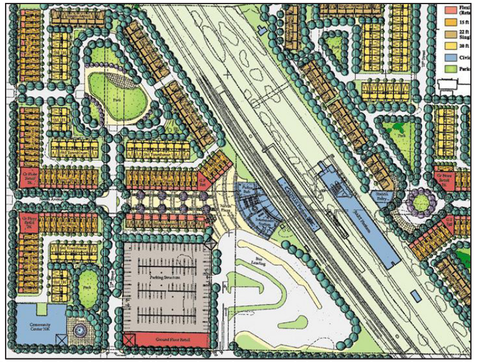
The Excelsior and Grand community is a great example of what is possible in the inner ring suburbs. While not an inner ring suburb, much of North Fargo does maintain a similar density and state of disrepair as the post suburban strip that Excelsior and Grand inhabits. While transit was not a major part of the project it goes to show just how popular and possible a higher density development that conforms to the New Urbanism standards can be. The similarity in culture and climate between suburban Minneapolis and Fargo should also be noted. Many of the individuals that live in Fargo as students or professionals are former residents of the Minneapolis metro area. The project is not located near any university campuses and is only affordable to those in the professional classes, meaning it commands a slight premium when compared with the typical housing costs in the area, but it is not unrealistic. When designing an addition to the North Fargo community, affordability will be a major factor due to the student population. However, the cost of the Excelsior and Grand was not inevitable, it was part of a plan to implement higher-end housing and public spaces to resist the crime that was becoming prevalent in poorer areas of the city (Berg, 2008). While much of the park space exists seemingly for the purpose of creating a lush and luxurious aura about the space, the connections to the community park offer an example of the importance of offering recreational green space in any design.

Case Study: Richmond Transit Village

Project Type: Transit-Oriented Neighborhood
Location: Richmond, CA
Size: 16 acres
Designer: Calthorpe Associates

Also known as Metro Transit Walk, the Richmond Transit Village rests on a site that was formerly a parking lot in a blighted urban area. The site itself is located at a major transit hub for local and long distance lines. Phase one of the project was developed on eight-acre stages with fifty percent of the housing being provided to moderate-income households (Olson Homes, 2012). Phase two of the project was slated to also contain residential townhomes and retail but was never undertaken. The planned retail at the site was reduced by thirty-four percent. There were 132 homes created essentially at the transit station. The residential buildings are townhomes, typically three stories in height. The retail is provided closest to the transit stop and an arterial roadway. The transit station is connected to the rest of the site, in part, by a pedestrian street (City of Richmond, 2006-2012). Much of the phase one plan by Calthorpe has been realized. The layout remains nearly the same with a small park forming the center of the residential area. However, a community center and smaller park did not make it to the final plans.

View of Park Space (Calthorpe Associates. n.d..)



The right side of this plan has yet to be developed
(Calthorpe Associates. n.d..)

The Richmond Transit Village demonstrates how transit and development are interconnected. It is unlikely that such a project would have taken place without the implementation of a community transit station. The lack of completion on the original plan can be blamed more on the housing market than the plan itself, although it does demonstrate the dynamics of implementing master plans. It reminds the designer that the plan should remain adaptable. Flexibility is required when designing something that has a long implementation process and a long lifespan. Plans produced for north Fargo can lay out a phasing process to make implementation an easier process. The lack of demand for retail seems to be a common problem for many developments and should be something that is carefully analyzed when designing on the neighborhood scale in north Fargo. The density of the townhome community serves as an example of what subsidized housing can look like in the post-tower block age. The community park relates well to the neighborhood. Overall, the development is a livable environment. The townhouse is a commonly used residential structure throughout Fargo. While townhouse developments in Fargo center on automobile travel, it is a form of housing that people are relatively comfortable with. A design implementation in Fargo could rely on this residential form heavily to increase density and create an attractive option for local renters and buyers. The Southern California climate is much milder than in North Dakota but if a North Fargo development had a proximity to transit similar to that in Richmond that shouldn't be an issue.

Case Study: Alameda Market

Project Type: Transit Oriented Neighborhood
Location: Denver, CO
Size: 75 acres
Designer: School of Architecture, University of Miami

This project is a proposal of what development along Denver's light rail could look like. The site is currently a mix of big box retail and parking lots (D4 Urban, 2010-2012). Due to this configuration the site is not utilizing its prime location along the light rail line (Abanks, 2010). The idea is transform this representation of the automobile centered community into a beautiful picture of the mixed-use community with ample public spaces and urban agriculture facilities. The project has been taken on by a developer that has maintained the general plan with less agriculture and more square footage (Abanks, 2010). Open space is at just over ten percent of the total land area (D4 Urban, 2010-2012). These open spaces, both green and otherwise, are spread out throughout the development. The minimums for the green spaces are never higher than two acres each (D4 Urban, 2010-2012). While the idea is to break from the current form of transportation the plan is formed on the historic grid pattern and extends the neighboring street patterns into the site.

Plan View of Alameda
(University of Miami, School of Architecture. n.d.)

While originally an academic proposal known as Alameda Market, the project has become a serious development plan for the local government and a private developer. The project demonstrates how ready and willing the population is to move away from the development forms of the recent past. It represents the 'build it and they will come' mentality, with the tracks being put into operation long before the development of surrounding neighborhood infrastructure. At this point it is best to judge the project on its reception and perceived practicality rather than the fact that it remains un-built. Projects of this magnitude and complexity can take decades to be realized even in positive economic times.

This project can serve as an example for what Fargo can do with its array of surface parking. With the implementation of a transit line there could be heightened focus and demand for mixed-use development along its path of influence. The use of the historic street grid is something of importance and relevance to the North Fargo community. Attempting to implement a huge project such as this provides benefits but also demonstrates the lessened chance of them being accomplished. When designing anything in Fargo there should be care taken to implement a phasing process.

Summary

All of the projects discussed are mixed use developments with varying relations to transit. They all represent the possibility of higher density, transit oriented communities to maintain or elevate livability.

The case studies that were examined represent an attempt to flee the typical plan of community development. All are mixed use communities in areas that have previously been dominated by automobile traffic. Green space is utilized throughout but not in large parcels. There is a focus on pedestrians, with resources devoted to features such as pedestrian streets and widened sidewalks. All of the built projects have had difficulty finding demand for retail space. The projects have all been planned on gray-fields near large urban areas. All are in areas in need of urban renewal.

The studies are different from one another in scale. The Richmond Transit Village is less than ten acres and the Alameda Market is over forty acres. The density and type of structures provides distinction. Some of these communities focus on low- to mid-rise dwellings while Richmond uses townhomes heavily. Richmond has the primary objective of providing low-income housing while Excelsior and Grand has the goal of providing up-market housing. They include the classifications of non-built, partially built, and fully inhabited.

The cases discussed are examples of the role that transit can play in solving urban development issues. Whether stimulating growth by attracting poor or rich residents, all of the developments sought to distance themselves from the automobile oriented status quo. The studies are from a wide variety of climates and geographical regions. All of the projects created disproportionally high amounts of residential space and had difficulty finding occupants for retail space. The residential communities sacrificed buildable pieces of land to build green space that added to the livability of the neighborhoods. All of the projects are essentially neighborhood plans that vary in size from 10 to 40 acres. All of the projects faced setback of one kind or another. A developer backed out of the Excelsior and Grand Project, Richmond Transit Village was never fully completed, and Alameda Market has yet to be built. However, this is often the case with many development projects. Incorporating transit into a project simply adds another layer of complexity to the project.

North Fargo is an area of economic growth, not decline, but the issue is controlling that growth and using it to shape the environment into a livable community. It currently has a similar density and setup to what the neighborhood of Excelsior and Grand previously had. North Fargo has largely lower-density dwellings with commercial strip structures along arterial roadways. It could serve the student population with affordable housing such as Richmond Transit Village while appealing to persons of a northern climate like Excelsior and Grand. If transit is determined and implemented early in the process it can create great interest in development as it did in the Alameda project.

Historical Context

In the year 1864, Abraham Lincoln was President, and an act of Congress created the Northern Pacific Railroad Company. The railroad was charged with constructing a rail line between Lake Superior and Puget Sound. It was widely thought that where the new railway crossed the Red River the next great city west of Minneapolis and St. Paul would rise. However, there was a rumor that the Red River Valley would become a sea of water every spring and thus an expedition was sent by the railroad to search for the highest embankment. In 1871, the surveying party believed they had found the highest embankment at the spot that would later become Moorhead, Minnesota (Caron, 2004).

The announcement of the crossing point led to two small communities on the west side of the river, in the Dakota Territory. One located on the banks of the river and a tent town located at what is currently the intersection of Broadway and Main Avenue in downtown Fargo. The latter was the headquarters of the Northern Pacific engineers. The community included the engineers' families and the accompanying army officers. Originally named Centralia on February 14, 1872, the name of the site was officially changed to Fargo to honor a financial backer of the railroad and partner in the famed Wells-Fargo Express Company (Caron, 2004).

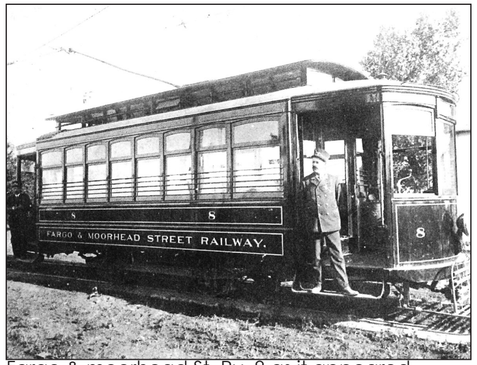
The Northern Pacific Railroad bridge across the Red River was completed in June of 1872. Westward expansion of the railway continued but was not completed for several years. In addition to the railway, steamboats were also an important means of regional transportation. They were utilized throughout the latter half of the 1800s as part of a supply chain connecting Winnipeg and Minneapolis/St. Paul. In 1882, the St. Paul, Minneapolis and Manitoba Railway (later renamed the Great Northern Railway Company) built a new line that crossed the Red River just five blocks north of where the Northern Pacific tracks crossed. These rail lines came to form the northern and southern boundaries of downtown. In 1884 a rail line running 117 miles south to Ortonville, Minnesota was completed and provided regional freight and passenger service (Caron, 2004).

The city of Fargo grew and developed into a proper city throughout the rest of the 1800s. It quickly developed into a trade hub of the region and supplied the many immigrant farmers that streamed into North Dakota. In 1882 the Congregational Church founded Fargo College as a nonsectarian Christian college, located on the southern end of Island Park. At the northwestern reaches of the city was North Dakota Agricultural College. Founded in 1892, NDAC was a state institution formed by an act of the state legislature. The development of Fargo took a tragic turn when fire struck in the summer of 1893. The fire started in the downtown business district and ended with the destruction of a majority of the homes and businesses in the city of 6,000. The growth of the city did not stop but it did usher in a new period of development when every building in the downtown was built of brick (Caron, 2004).

In 1904, the Fargo and Moorhead Street Railway Company came into operation. Attempts to run horse-drawn streetcars in previous years had failed. The streetcars used in the new century were powered by electricity supplied via overhead lines. The streetcar system included three lines that extended to both the Fargo and Moorhead sides of the Red River. The system was comprehensive and stretched across most of the city. North Dakota Agricultural College on the very northwestern edge of the city was connected to Fargo College in the southeast via streetcar. Each car featured electric lighting and hot water heaters (Caron, 2004).

While the streetcar was an effective form of transportation, there was a new phenomenon being introduced to the nation and region. 1904 was also the year the first automobile dealership opened in Fargo. While some individuals of the town had cars since 1899 it remained a transportation method for the wealthy, but only for a short while. "The Fargo Forum reported on June 24, 1909 that there were over 125 automobiles in daily use in Fargo. There were 87 cars licensed for private-use with the remaining 40 or so being livery cars at garages and dealer stock" (Caron, 2004). In 1914, the Ford Motor Company opened an assembly plant on the northern end of downtown (Springer). By 1930 there was one motor vehicle for every four people in North Dakota. In 1937 the last streetcar ran in Fargo (Coomber).

In the years following the Second World War, the federal highway system was conceived. This added to the already extensive amount of paved roads throughout the state and allowed the area to benefit from freight transportation by truck as it had benefited from rail transit throughout its history.



Fargo & moorhead St. Ry. 8 as it appeared when new. (Unknown. n.d..)

It was said: "The arrival of the Interstate highway system, which came in the 1960s and early 70s, was probably the biggest boost to the trade and distribution in Fargo-Moorhead since the arrival of the railroads a century earlier" (Springer).

Fargo once again found itself at the crossing of two major transportation routes, this time it was two interstates, I-29 and I-94. The interstates also affected transportation within the city. In fall of 1972, the affect that these new land routes would have on the development of the city became apparent with the opening of the West Acres shopping mall. The developer of the mall owned one of the largest retail buildings in the city and had wanted to build a retail center in downtown but the idea was rejected by the city. The mall became very successful and encouraged other retail growth in the formerly rural area. A local historian stated: "With Sears and deLendrecies moving, Fargo's retail shopping headed southwest, never to return to the once-busy streets of downtown" (Caron, 2004).

While the Fargo metro area has been expanding along the southwestern horizon, North Fargo and downtown have been experiencing their own changes.
Downtown has had a series of declines and has received multiple attempts at renewal. Federal aid has been given for a variety of projects in the 1960s, including the city hall, civic center, and library. This is also when the current day Bank of the West building and a senior high-rise were constructed.
In the 1970s, traffic-calming measures were installed along Broadway. While they were designed with the intent to make shopping more attractive and comfortable they proved to be extremely unpopular and were removed in the 1980s.

In 1999, North Dakota State Legislature enacted the Renaissance Zone act. This was to encourage investment in a specific area of the city by the use of tax exemptions and credits. The City of Fargo set up a Renaissance Zone in the most historic core and spent significant amounts of energy managing the plan. A Broadway streetscape project was also initiated that provided landscaping with modern and historic effects (Caron, 2004). This intervention to the downtown streetscape and structure through financial incentives has proved very successful and popular to date.

On the north side of town, opposite of all the post-interstate development interest, sits North Dakota State University. This institution has been perhaps the largest single factor in the modern success of the city. Thanks to the supposed misfortune of receiving the funding for an agricultural college over a mental hospital, Fargo has been influenced by generations of educated faculty and young people. Through the skill of ambitious leaders and students North Dakota Agricultural College has become North Dakota State University. The college had 83 students and three buildings in 1895 (Pates).

NDSU's current enrollment is over 13,000 students, with over 650 resident faculty members. NDSU offers over 100 undergraduate and approximately 100 graduate programs of study, with degrees awarded at the doctoral, master's, professional, and baccalaureate levels. Various undergraduate minors and certificate programs are also available. NDSU's research expenditures surpass $100 million annually. NDSU's main campus encompasses 104 buildings on nearly forty-one square blocks or 258 total acres, 5.8 miles of streets and 16.7 miles of sidewalks and has continued its expansion into downtown Fargo. In all, NDSU is located on 22,053 acres of North Dakota land (NDAC/NDSU History, 2010).

Those bragging rights pose challenges and strain to the capacity of the campus and of the town. The area surrounding the campus does not have the opportunity to sprawl like suburbs or the option of sustaining reliance on the car. Modern Fargo is a beautiful city with frequent blemishes. It seems as if the town is unaware of its own history. In a city built by water and rail there is very little acknowledgement of either. The vast majority of the town's geographic area has been influenced by the interstates. There are a few areas of the town that have been developed prior to the interstates and the area of the campus is one of them. The area has been more influenced by the railway and streetcars than by the introduction of the automobile. This campus community could be the example of how a modern Fargo could develop.

Goals for Thesis Project

Academic
My aspirations for this thesis project include developing a strong professional relationship with my thesis advisor. I intend to sharpen my oral, written, and graphic communication skills. Another goal is to develop skills of time management and pace myself in project deadlines, while maintaining a high quality of work. I intend to utilize my position as a student in the academic environment by employing the resources provided by the department. I aspire to spend time on research and the theoretical. I plan to utilize the library. I also have set the goal of learning as much as I can from those around the academic environment, both professors and my fellow students.

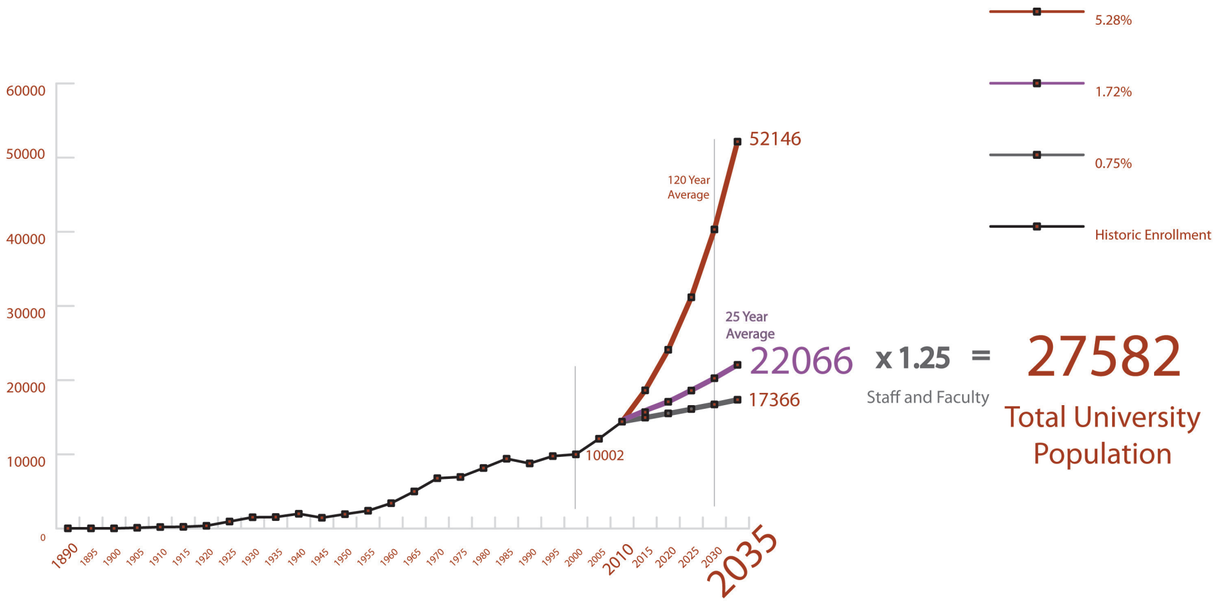
Professional
Over the course of this thesis project I put it upon myself to sharpen my skills of design and design representation as much as possible. I intend to become more efficient at computer aided drafting as well as hand and computer rendering and other skills that will provide benefit to a professional environment.

Personal
Since beginning my career as a design student I have made a conscious effort to set aside time for interests and relationships outside of my typical academic environment. I wish to keep this a priority while acknowledging that my professional and academic career cannot be entirely separated from my personal life. Everything within this project will relate to my life in some way and I hope that this thesis will open my eyes to the things I encounter daily.

Analysis & Design

The analysis consists of population projections that were made to examine what type of design is needed and what kind of population density to anticipate. The effectiveness of transportation options was detailed. To continue the analysis, the quantity and quality of public greenspace was examined. The quality of neighborhood structures was evaluated to determine their longevity and if they could become higher density areas in the future. It was then decided where the local transit stations would be located based on current and future destination points.

The Sunmart site is a destination point that was designed in greater detail to serve as an example for the rest of the infill areas. It was given mixed-use layout of structures to serve and house the growing population. It also provides usable greenspace, access to transit and will be conducive to pedestrian movement.



x 1.25 = 27582

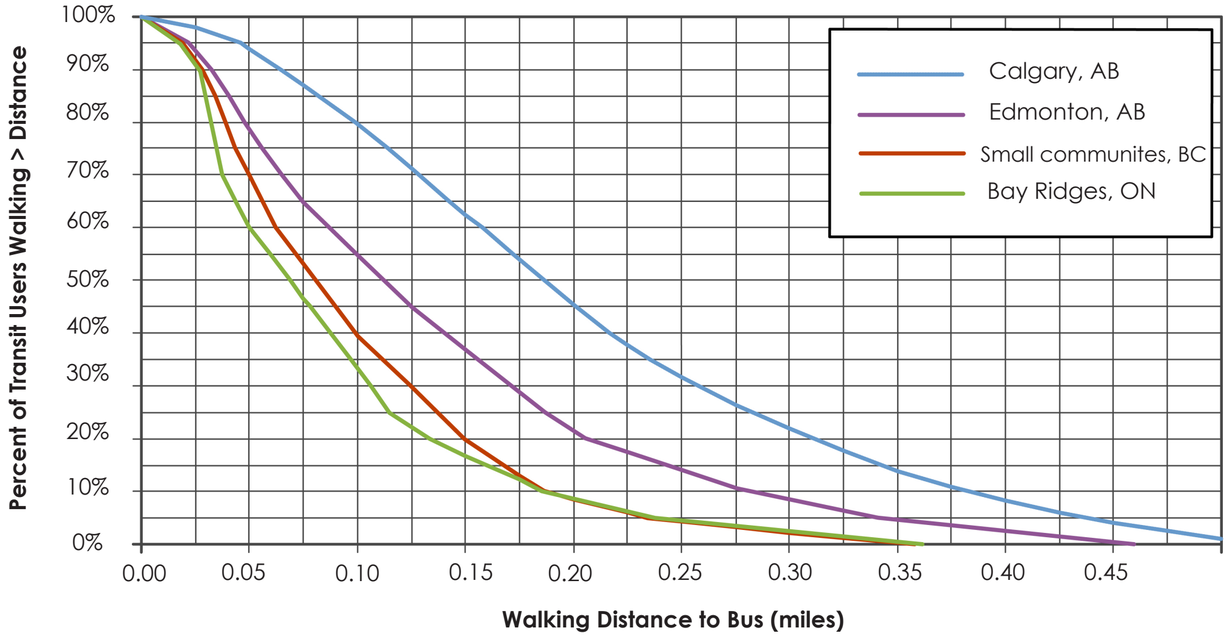
Staff and Faculty

Total University Population

This graph illustrates the historic growth of North Dakota State University. Also provided are several projects of what future enrollment numbers could be. If the 25-year average continues to the year 2035 the overall population of the university would be 27,582.

Historical Enrollment Data provided by the Office of the Vice President for Student Affairs, NDSU Enrollment Reports: http://www.ndsu.edu/registrar/reports/

The distance between the two campuses of North Dakota State University is one mile. Because of this distance it can be determined that transportation between these two location will be a high priority in any design intervention.



To determine how far apart transit stops should be, research was found on how willing colder climate transit users are to walk to a bus stop. A quarter or half mile is often quoted as an appropriate bus stop radius but this research illustrates how a smaller radius is more desirable.

Transit Capacity and Quality of Service Manual - 2nd Edition
http://www.trb.org/Main/Blurbs/153590.aspx

Example A

Start point: Dakota Drive

Route 32: 8:16
Transfer: 8:21
Route 33: 8:31
Arrive: 8:40

Total: 24 Min

Destination: Barry Hall

Example B

Start point: Living Learning Center

Walk: 8:36
Route 13A: 8:45
Arrive:8:55

Total: 19 Min

Destination: Renaissance Hall

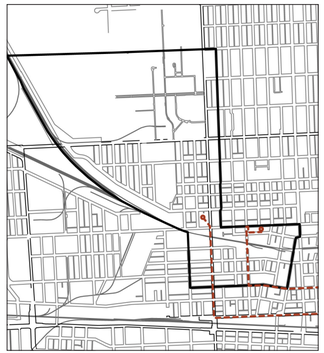
Example C

Start point: Sunmart

Route 13B: 9:22
7 Ave N: 9:36
Arrive: 9:38

Total: 16 Min

Destination: 6th Ave N



When the current transit system is examined in further detail a much more complex and disappointing picture is found. Upon further inspection, the time that it takes an individual to travel between key points of the site is exceptionally long. This issue can be attributed to a disconnect between development and transit.

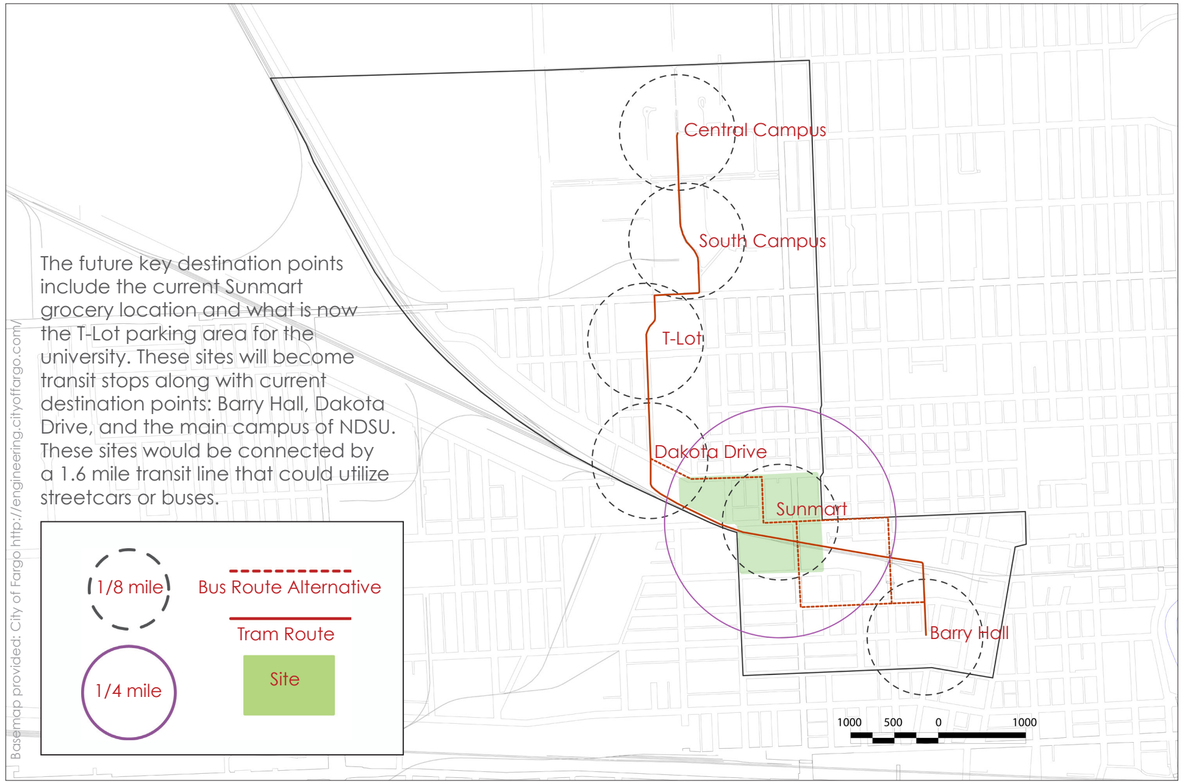
Parks and Greenspace

There is a variety of park spaces available to inhabitants of the site. However, the only city park that exists on the site is a large, overwhelming area of turf with little design or passive function. This is in contrast to the smaller usable sites that are maintained by the university.

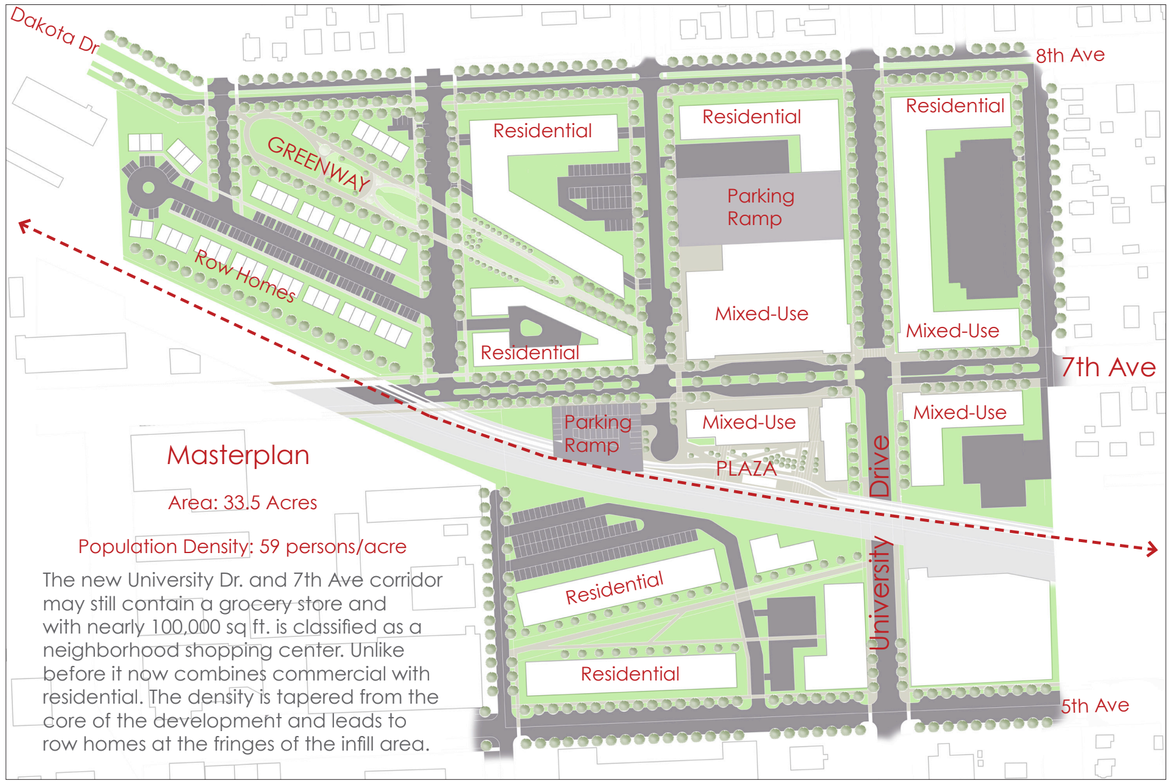
High density refers to high-density residential as well as commercial and institutional properties. Low-density refers to single-family homes. A property is considered stable or unstable based on its condition and perceived length of continued use.

Unstable High Density | Unstable Low Density | Stable High Density | Stable Low Density

The unstable areas are most prone to change in the coming years and decades. The areas that have the highest potential to be redeveloped as key transit destination points are the unstable high-density properties and underused land.



The future key destination points include the current Sunmart grocery location and what is now the T-Lot parking area for the university. These sites will become transit stops along with current destination points: Barry Hall, Dakota Drive, and the main campus of NDSU. These sites would be connected by a 1.6 mile transit line that could utilize streetcars or buses.

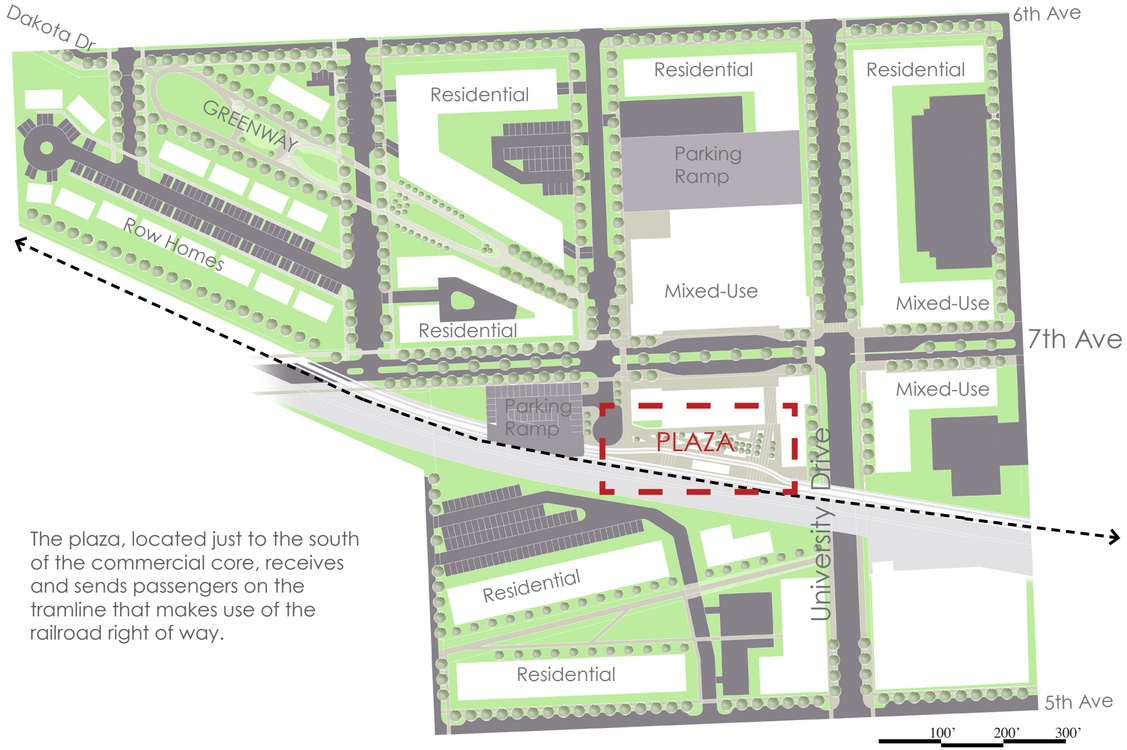


Masterplan

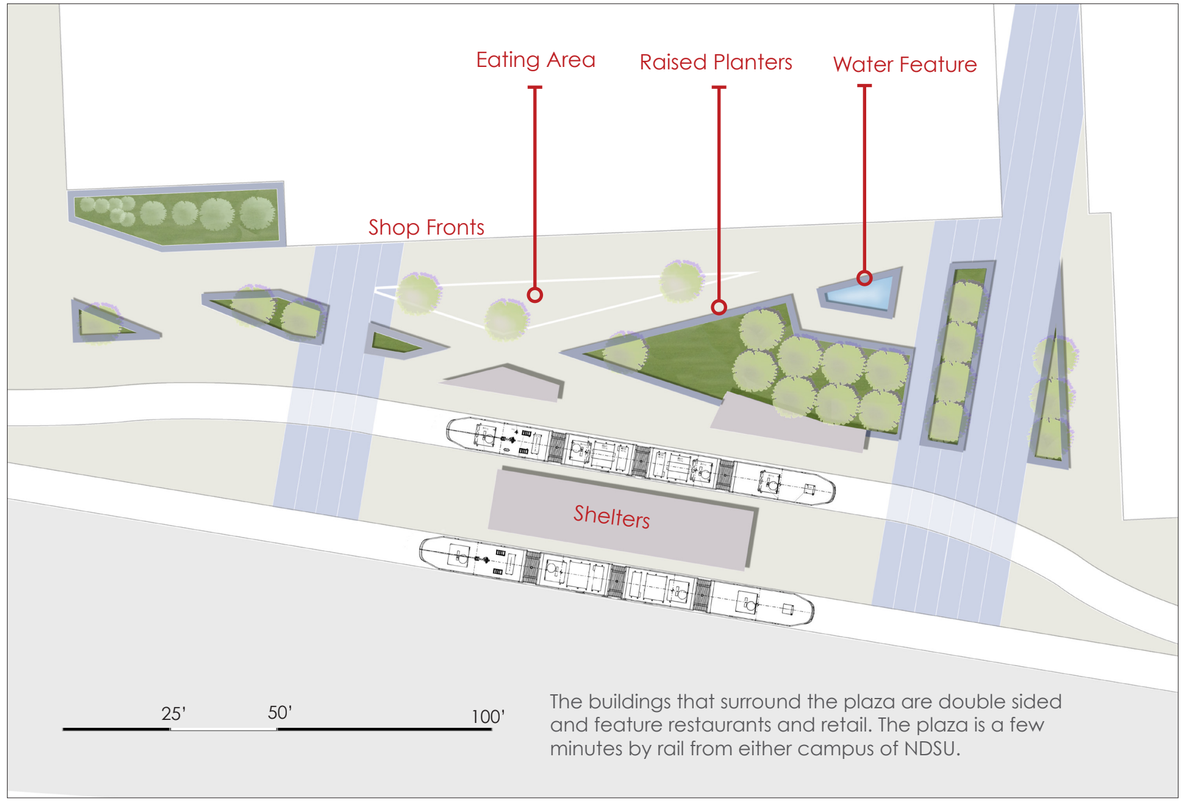
Area: 33.5 Acres

Population Density: 59 persons/acre

The new University Dr. and 7th Ave corridor may still contain a grocery store and with nearly 100,000 sq ft. is classified as a neighborhood shopping center. Unlike before it now combines commercial with residential. The density is tapered from the core of the development and leads to row homes at the fringes of the infill area.



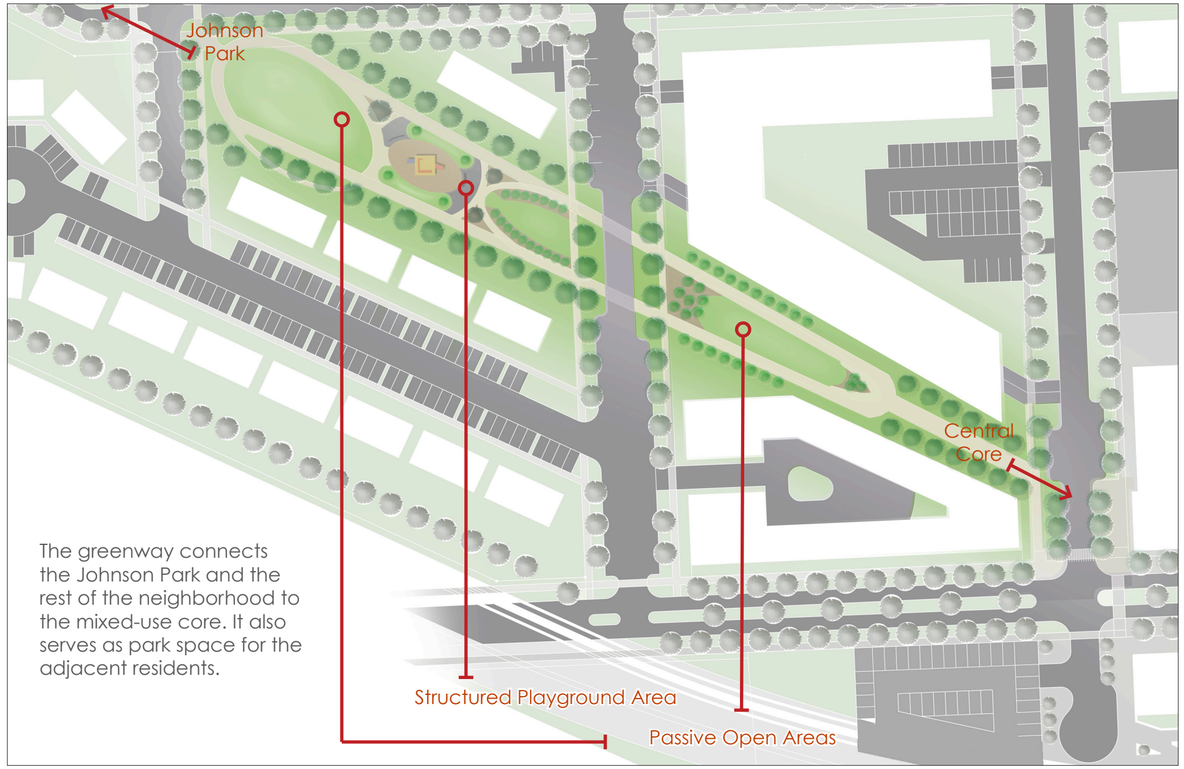
The plaza, located just to the south of the commercial core, receives and sends passengers on the tramline that makes use of the railroad right of way.



The buildings that surround the plaza are double sided and feature restaurants and retail. The plaza is a few minutes by rail from either campus of NDSU.

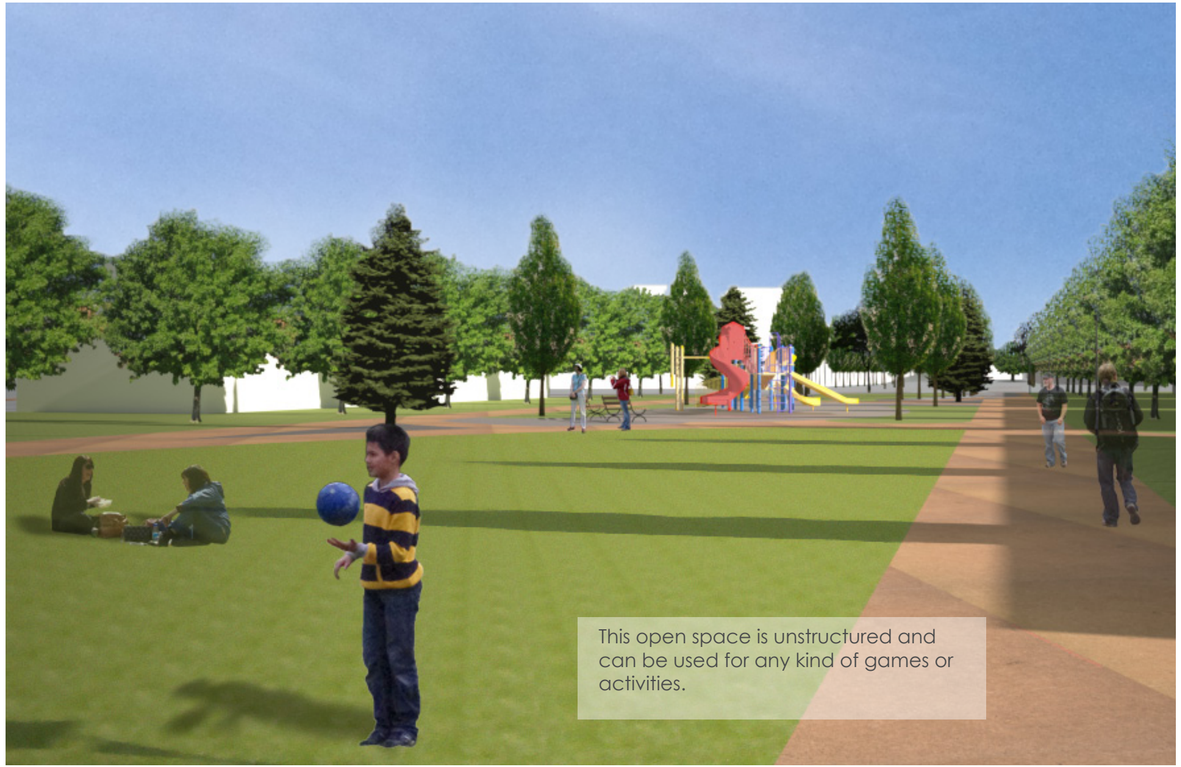
The plaza uses large timber posts, formed concrete, and other materials that relate to the railroad and the industrial past of the site.

The southern exposure of the site provides an inviting environment for passengers and local residents alike. Nearly the entire perimeter of the planting beds can flexibly serve as seating.

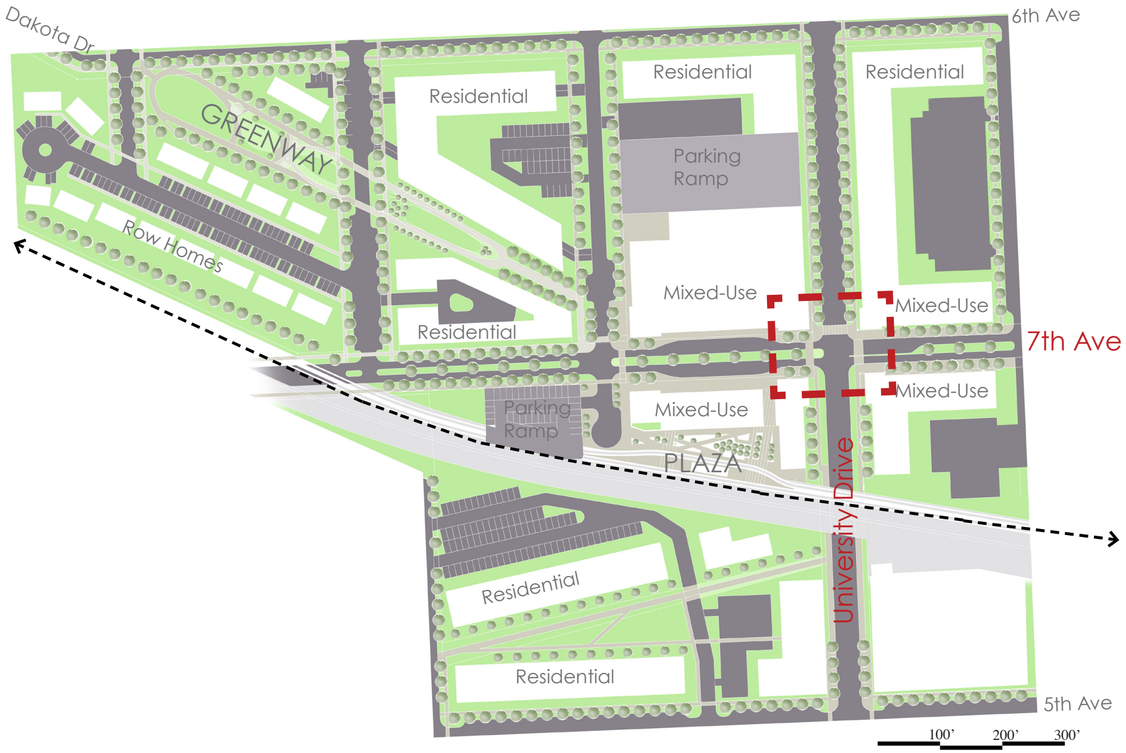


The greenway connects the Johnson Park and the rest of the neighborhood to the mixed-use core. It also serves as park space for the adjacent residents.

There are a variety of subspaces that offer a variety of scales and experiences.



This open space is unstructured and can be used for any kind of games or activities.


Dakota Dr
6th Ave
GREENWAY
Row Homes
Residential
Residential
Residential
Parking Ramp
Mixed-Use
Mixed-Use
Residential
7th Ave
Mixed-Use
Mixed-Use
Parking Ramp
PLAZA
University Drive
Residential
Residential
5th Ave
100'
200'
300'


The corner of University Drive and 7th Ave is now well defined by the mixed-use buildings that hold it in place. A green median is now in place of the center turn lane and the sidewalks are much wider creating a more comfortable pedestrian environment.
University Dr
7th Ave

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"From a little university on the plains called NDSU, you can see the world."