DESTINATION:Building a Foundation for Mass Transit

DEDICATED TO MY FAMILY FOR THEIR LOVE AND SUPPORT

DESTINATION: Building A Foundation for Mass Transit
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ABSTRACT

As architects we design and shape the buildings that fit into our cities. Urban designers and planners shape the spaces between those buildings and help determine where certain kinds of buildings should go. So are the architects and urban designers in control of the shape of our cities? Possibly. But when you look back at the past sixty years and ask that same question the answer you will find will most likely be the automobile. The automobile has been the most influential element in shaping American cities of the past sixty years.

What is the mobility of cities going to be like in the near future? Will oil hold out? Gas prices are going to go up. We are naïve to think that gas prices will stay this way forever. We are naïve to think that gas prices will remain consistent even for the next 10-20 years. They will go up and when they do people will no longer be able to afford their personal automobile(s).

Currently there is no alternative means of mass transportation in place that could even begin to handle the number of people that would have to use it. Sure there are mass transit systems set up in the major cities but what about the millions of other smaller cities scattered all over the nation?   Small bus systems that are highly in-efficient or nothing at all is what most of those cities boast as their mass transit options.

This thesis will look at ways to begin to integrate Mass transit systems into smaller cities and encourage the use of Walking and Biking in the Center City. This Thesis will also look at how to integrate a larger regional transit system into a local transit system and how that would affect the city. This Thesis will briefly touch on subjects of city zoning to help encourage growth and densification of the inner city and promote a more walkable city center.

Papers
From Place To Place

Does our choice of transportation affect how we experience destinations and waypoints? I am not interested in the distance limitations of the different modes of transportation. I am interested in how modes of transportation are used in close relation to the person. I am interested in how our choice of transportation affects our perception and experience of movement through space.

Consider a typical day. You step outside of your home and walk to your car parked in the driveway or on the street. You have destinations planned out and a general sense of how you are going to get to each of them. You start in one place (your home) then move through space to another place (your car). With the aid of this mode of transportation, you move through space to another place (a parking lot, for example) and from there move to your desti-nation. This is a typical short-medi-um range movement through space from place to place.

While you are in the automobile, your main focus and concern are on the immediate things around you, and most importantly, the things in front of you. You pass numerous things but you hardly notice them. Most of these things blur into the background and are quickly forgotten. However, there are key points along your route that are memorable. These points are typically intersections where you may find yourself stopped at a light or stop sign. The points of intersection where you have to make a directional decision are even more important. All of these points of intersection are waypoints, and they are important to our understanding of and orientation in the space we live (Lived Space).

The final point in the movement from place to place is reaching the destination. The parking lot is not the destination; it is a component

of the mode of transportation (the car). Though you may proclaim you are "here" when you park your car, you have not truly arrived at your destination. There is still a distance that must be traveled. The experience of arrival you get from parking in front of your destination or near it is distinguishable from the experience of reaching the destination itself.

The goal of this paper is to understand how different modes of transportation affect our perception of waypoints and destinations in our traversing of space from place to place. By studying the different modes of transportation, such as the automobile, train, airplane, bus, bike, and shoe leather (or rubber), I hope to show how each mode of transportation affects how we perceive and interact with our environment. This understanding will bring awareness to the importance of all the different modes of transportation and how each mode

should be given its due consideration.

In order to understand the importance of our body in the experience of place and the lived world around us it will be helpful to begin with a definition of *here* and *there* as well as a quick definition of *space* and *place*. Edward Casey said that the, "lived body is the vehicle of the here, its carrier." [1] We are always *here,* and *here* is always ourselves embodied in place. Casey has distinguished five forms of *here*; "Here in part" where points on our bodies are individual *heres*, "Here of my body proper" where *here* is experienced as your whole body stationary in place, "Here of my by-body" where *here* is experienced as something that moves with your body and by your body, "Regional here" which describes *here* as all the paces one could eventually move to, and "Interpersonal here" where *here* is understood to be a place embodied by another person or rather that

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1 Casey, Edward *Getting Back Into Place* (pg 51)

each person has their own *here*.[2] I, however, am only interested in his definitions of Here of my body proper, Here of my by-body, and Regional here. When I refer to the word *here* I mean *here* as the subject is embodied and stationary in a particular place. The word *there* will be used to simply indicate a space where the subject is not embodied. Space, as it differs from place, will be distinguished as the potential for embodiment and place will be distinguished as embodiment of space.

Our bodies are intrinsically tied to place and the here. So, how does our experience of place change when we use different modes of transportation? Casey had mentioned that our bodies are vehicles. Walking is a mode of transportation that is of the body itself and is therefore the purist mode of transportation. It is the mode of transportation that is firmly and directly connected with the ground. Walking is what I will call the base mode of transportation. When we are walking and moving through space from place to place we are in a direct relationship with the lived world around us. There are physical barriers and visual boundaries that are existing in the lived world around us that define the space and control our movements around and through them but there are no limitations incurred from the base mode of transportation that directly hinder us from moving through space other than the physical limitations of the body itself.

When we use a bicycle as our mode of transportation our limitations increase. We now take on the physical limitations of the bicycle as well as our bodies. We have been lifted off the ground and must be in motion to remain stable on this mode of transportation. Our motion and movement in space is confined to the bicycle. We have to keep our feet on the peddles or our butt on the seat and our hands

2 Casey, Edward *Getting Back Into Place* (pgs 52-54)

on the handle bars or we will lose control of the vehicle. The spatial boundaries that were visible when walking have not changed much. Our head position is relatively the same. There is no visual boundary implied by the bicycle. The bicycle is a machine that simply amplifies our bodily movements. The faster we peddle the faster the bicycle moves us forward. In that manner, the bicycle is a mode of transportation that is in direct relation to the body and spaces around us.

A car is not in direct relation to the body as we move through space. We do not feel the strain on our legs when we go faster or the relief when we slow down. The car is actually a place all its own. When we take position in it we separate ourselves from the place surrounding the car. We are now *here* in the car and the car is parked in the driveway. As we travel our *here* never changes. We are always *here* in the car. The car is what we use to move from place to place. But while we are moving in the car our place is in the car and everything outside the car is simply space. The car is an enclosed environment. We must view everything outside the car from a sitting position behind glass.

When we get into a car we are accepting the boundaries of that mode of transportation. We accept that we can only sit down while we drive. We accept that we are in an enclosed, separate environment and must look out through the windows. We accept that we can only travel where land has been cleared and roads and parking lots have been constructed. We accept that while driving we cannot do much of anything else.

When we are walking we have complete control of our movement forwards, backwards, sideways, up, and down. We are free to choose when to move and when to stop moving. We have the ability to change directions instantly. Our maneuverability is at

a maximum. All of these things are naturally associated with walking. It is a completely free mode of transportation.

On a bicycle, movement is only in the forward direction unless you are pushing yourself backwards with your feet. You cannot change directions instantly. Making a turn must be done with caution. If you are going too fast and you turn the handle too quickly you are going to cause an imbalance of motion and the ground will help you correct it rather quickly. The bike being a relatively slow moving vehicle is easily and quickly stopped or slowed down and easy to turn around once you are stopped or slowed down.

The personal car can move forwards or backwards. The subject maintains control of the vehicle through mechanisms built into the car. The subject chooses where to go and how to get there. The car is not controlled entirely by the road but it is directed to stay within its boundaries. Any time the car strays from those boundaries it appears out of place.

The bus has all of the range of movement a car does but it has an added limitation of size and needs wider roads to accommodate a larger turning radius. The only thing you control on a bus, if you are the rider, is which stop you get on the bus and which stop you get off the bus. The bus must follow the roads built for it much like the car. The bus provides many stops along a route so the

Forward Motion - www.flickr.com

Denver Light Rail Train Station: Flickr.com

choice and flexibility are still good. It is also flexible enough to be able to pick you up.

A train is bound to the tracks that control exactly where it can go. This means that it is tied to an exterior mechanism with predetermined limits. The train offers one advantage in that it is designed to travel at higher rates of speed. Other than that the train is very similar to a bus.

Consider being lost in a city you have never been in, which mode of transportation would you prefer to be using when you get lost?

If you get lost while walking through a new part of the city you have never been in, you can immediately stop where you are, take the time to look around and try to find some landmark by which you could orient yourself. If you can't read the street sign at least you have the ability to stop and try to match the letters to a street on a map. And there is always an opportunity to be social and simply ask someone for directions.

If you were lost on a bus or light rail train system you could get off at the next stop and look at a map or just ask the driver. You may have to sit and wait a little while until the right bus or train arrives but at least you know where you are and how to get to where you want to go. You feel secure knowing that the station where you are is a location marked and recognizable on a map. It never moves. It is a waypoint we use to

navigate through space.

A car is probably the worst mode of transportation you could be in. You have to try and find the street sign while maintaining speed and distance between cars, obeying traffic signals, and just keeping a general eye on the road. The fact that you haven't been there before means you haven't established waypoints. You may have been given directions by someone and not just a computer. They would have most likely told you to look for Joe's Diner on the corner or some other noticeable landmark for you to use as a waypoint and means of orientation. This gives you more comfort and security as you try to find your destination than a simple road map would. That is why Google has road views so that you can see a picture of what is there when you have to make a directional decision. Those pictures were taken from a car so that you could see exactly what it would look like when you arrived by car in the same place. But if

you accidently miss the road or the house, because you were going to fast or not able to pay attention, you still have to drive around the block or try to find some place to stop and turn around and then you have to find a parking spot.

Speed is a factor in the difference between the modes of transportation. Speed is an element of control. It is also an element of separation. The faster you go the less control you have and the less time you have to react to objects approaching you. It is harder to make a turn in a car or on a bicycle when you are going too fast. So it is natural that we feel safer and more in control at slower speeds. Speed also acts to separate us from place. Speed is a scale of time by which we pass through space. Casey, when talking about the here of my body proper, used an equation "Here = Body = Place."[3] Through the body we have a direct connection to place. The word place when we talk about

3 Casey, Edward *Getting Back Into Place* (pgs 52)

it seems to be a stationary thing. We go to a place, leave, and then later come back to the same place again.

When we acquire the use of a mode of transit that is outside our body we have separated our body from the place that exists outside the mode of transit. We get on a train at Station #1 and get off at Station #3. Where were we in-between Station #1 and Station #3? We were on the train.   The train itself is a place

Waypoint / Destination: www.flicker.com Notley – Gas Stations

because we are [t]here[4] on it and we are stationary as the train is moving. The speed of the train does not allow us proper time to associate ourselves with the space outside of the train.

All other space outside the train is simply viewed from the train almost as if it were a video. You see the world outside the train through the frame of the window.   The window and wall of the train seem to capture your peripheral sight and keep it in the train. So the only place you are truly experiencing is the space inside the train car itself. The only connection you have to where you just came from is the train and the waypoint (Station #2) you passed on the way to Station #3

Destinations and waypoints are a part of our everyday experiences. A Destination is a place where one plans to spend a reasonable amount of time in comparison to the time spent getting to that place.   A Waypoint is a point of stopping and

4 Casey's literary picture of *here* when referring to another person's location (pg51)

starting, a point of passing, or a point of identification or orientation. It is a point on the way to a destination. Waypoints are essential in mapping out our environment. Without them all we would have is starting point and destination and we wouldn't know how we got there. It is like being blindfolded and taken to a remote location.   You wouldn't know which way to go to get back to where you started. The question you need to ask is not, "where am I" but "where are the other places?" [5]

Our perception of waypoints and destinations changes when we use different modes of transportation. Have you ever driven to a location close to home and then also walked to the same location at a later date? How much more did you notice when you walked to your destination than when you drove? Walking to a destination allows one to have a more intimate interaction with the environment around you. There is a seamless transition from place to

5 Casey, Edward *Getting Back Into Place* (pgs 54)

Destination?: By Author

place. You leave your starting point, pass waypoints, and then enter your destination. For example, you leave your home (starting point) to go to the grocery store down the street. You leave through the front door closest to the sidewalk and then follow the sidewalk towards your destination. You know that your destination is in a certain direction. You know specific buildings or markings that you will pass. Some markings might be a neighbor's house. You remember a particular house because they have

dogs that bark at you when you walk by (signs of an intimate interaction with the environment). You stop by a friend's house on the way to see if they need anything from the store (This is a waypoint/destination). You leave your friends house and pass a point that you have estimated to be the midpoint of your journey. It could be symbolized by pretty much anything from a tree to a building. You cross a street at the cross walk, turn a corner, and you see your destination in the distance.   You walk up to the door of the store, open the door, and walk in. You have now arrived at your destination and can complete the tasks you set out to complete there.

You take the same trip with your car the next day. You go to your garage (waypoint) and hit the garage door opener then get in your car (intermediary place/ waypoint). You buckle up, put the car in reverse, and then turn and look over your shoulder as you back out onto the street. You are driving down the road and you pass the house with the dogs. The dogs don't bark because they don't see you. You probably couldn't hear them if they did. You come to a stop at the light on Main Street. Joe's diner is on the right corner. You turn left and pull over into a parking spot (mode of transit destination/waypoint) in front of the store. You put your car in park and then exit and lock your vehicle. You walk to the door of the store, open the door, and walk in. You are now at your final destination.

Because of speed the way-points for a car are going to be less detailed then they would be if you were walking. A bus or train would allow you more freedom to concentrate on something outside the window than a car would but it still won't allow for better detail of waypoints than walking would. Everything outside the window is constantly coming and going and only when you are stopped do things appear to take

their actual static form.

Consider now the hierarchy of the modes of transportation:

<u>Walking</u> - the base mode of transportation, in which we have complete control of our bodies and are never separated from place as we move through space.

<u>Bicycling</u> – our bodies are still directly connected to our movement through space but the increase in speed, lost aspects of control, and elevation off the ground limit our interaction with, and begin to separate us from, place. The bicycle limits our movements and we must remain actively engaged with the process of movement from place to place.

<u>Driving a Car</u> – You have direct control over the vehicle but there is no direct bodily experience of movement. You are separated from space outside of the vehicle and have accepted the place within the vehicle itself. The vehicle limits your movements and you must remain actively engaged with the process of movement from place to place.

<u>Riding a Bus or Train</u> – there is no direct control of movement through space. You are separated from space outside of the vehicle and have accepted the place within the vehicle itself. You have the ability to move within the space of the vehicle finding new place as the vehicle moves you from place to place.

No matter what mode of transportation we use we will always experience destinations and waypoints. The scale at which we recognize waypoints changes with the mode of transportation. Different modes of transportation have different unique destinations. The train has a train station. The bus has a bus stop. The car has a parking lot. The bike has a bike rack. But to the human, and the base mode of transportation, these places are just waypoints to the actual destination. We will always revert back to the base mode of transportation to get

us to our final destination.   In the base mode of transportation we feel complete and in tune with the environment around us more than in any other mode of transportation.

Base Mode of Transportation - Flicker.com Commons

Papers

Destination: Building a Foundation for Mass Transit

"If we are to address the application of sustainability to cities, we need to understand the forces that shape them…. These forces are obviously very complex."
– Kostoff (The City Shaped)

What are the forces that have shaped and continue to shape American cities today? America does not have a history of medieval warfare or a slow progression out of the middle ages into a modern society. We are a country of rapid growth and expansion stemming mainly from the industrial revolution.

The goal of this thesis paper is to understand transportation, and more specifically the automobile, and the complex role it has played in shaping American cities and in consequence shaping American societies. Today you can look around and see the implications and demands the automobile has had on our society whether it be the roads, parking lots, highways, or the businesses structured around the service of the automobile. All of these implications of the automobile affect the structures of our cities and the social behaviors within them. I want to know the details of how it has affected the social aspects of our cities as much as the physical and what we should be doing today to design a better integration of automobile, mass transit, and city society.

We are a race that has advanced quickly in the last few decades, but what are we advancing towards? What is our goal? What is our vision? It is time for a new forward thought; a thought that extends beyond today and into the distant tomorrow, a thought that does not limit itself to a 10-20 year plan. We need a vision of the future, something we can progress towards and measure our progression against.

HISTORY OF THE TRAIN
Invention / Infrastructure

Trains started making headway in America when the first railroad charter was granted to John Stevens in 1815. It took a little while to get going but by 1826 Stevens demonstrated the feasibility of the steam engine and soon other people were getting grants and starting to build railroads of their own. Railroads were immediately used to transport both goods and people across the nation. It was a much faster means of transportation then traveling by stagecoach and much safer too. Trains soon became the primary means of transportation over long distances. In fact that is about all they are good for. Trains are too much of a hassle to start and stop so often. Horses and wagons still made up the distance from the station to the hotel or your house outside of the city or town. With trains came permanent structures. A railway bed had to be constructed and Stations for public transportation as well as stations and building adaptations to the railways for the transportation of freight.

The telegraph which was invented and developed at along the same time as the train also assisted in the development of the railroads and general increase in quicker communication. By 1838 trains began to be released by telegraph. Now from a few locations you could control many locations and coordinate a more efficient and effective means of transportation. In order to aid with this new form of communication and quicker transportation the railroads established time zones in 1883. This allowed them to have a better understanding of what time of day it was in a distant location and to operate more efficiently.

Affects on the City and Society

When the railroads from the east and the railroads from the west were connected on May 10th 1869 in Promontory Summit, Utah, the world witnessed the beginning of a change of thought. This marked a significant acceleration of movement and a new form of public mobility. You could now travel from the East Coast to the West Coast in a week when it used to take more than six months. This brought new resources to the cities in the mainland of the United States and allowed for faster and further distribution of goods to more places.

But what changed the most was this new dependence on the railways. The railroads were first built to connect cities already in existence in order to aid in the quicker transportation of goods and people. All of a sudden small cities started popping up along the railways. A new form of development started to take place. No longer were people just interested in the natural resources located in the area they were interested in how people and supplies were going to get there. The railroad was a simple answer. The railway was pretty much the only way to get to these cities. Roads and other modes of transportation weren't developed enough.

Probably the greatest affect this change in transportation had on society was a change in societies understanding and awareness of time. All of a sudden transportation started having time schedules. People could be more exact with when they would be arriving. There were fewer surprises which meant a more reliable means of transportation. You could now travel almost as fast as the sun could move from one horizon to the next. The distance between cites had grown dramatically shorter and will continue to do so as transportation continues to advance.

HISTORY OF THE TROLLEY
Invention / Infrastructure

Before trolley cars there were Omnibuses which were cars with metal wheels pulled by horses on metal tracks. In 1876 the Cable car was invented which replaced the horse with a cable system that ran along one of the rails in the road and would use a motor to pull the cars along the tracks. But in 1888 the electric streetcar was fully integrated into the city of Richmond, West Verginia. All of the streetcars were now run by electricity on overhead cables that provided electricity to the cars through a pole and trolley which is eventually how the Trolley car got its name. Major cities all over the nation soon began to introduce Trolley cars as their main source of public transportation.

Affects on the City

The suburbs of the major cities in America saw a tremendous growth when trolleys were introduced into the cities. Many of the trolley lines would extend out beyond the city limits allowing people the opportunity to work in the city and live in the country. Most of those types of suburbs were still more tightly packed then we see today. Soon trolley car technology grew and trolley lines were extended in-between cities. All of a sudden trolley cars were competing with railroads and steam engines. Because trolleys were driven by electricity and were a lot lighter they could get up to speed a lot faster. They could travel up to almost 100mph. Because of all these things they could make more stops along the routes and still have a faster time than steam engines.
"The trolley has caught up the people who had settled down to solid city life and is carrying them off with enthusiasm into the byways of the country, where the steam car had no means of carrying them.

The trolley as the "people's automobile" indicates that the trolley was seen as something that classes of people excluded from automobile ownership could enjoy. At the same time, this label signals the trolley's inferiority in the eyes of those who owned an automobile – and the trolley's eventual abandonment. (Fotsch pg23)

The automobile will hurry this tide countrywide with accelerating speed" (Fotsch 22)

Affects on Society

Stemming from this idea of expansion along the railways in places far from other places; the trolley took that idea and localized it. This system was at first just a means of expansion and growth for the city; another form of public transportation. But it soon became a means to escape from the city without fully sacrificing the luxuries of living in the city. The city suburbs saw large growth spurts when the trolley took over their public transportation. This was the first sign of what would soon become urban sprawl. The thing that is interesting to note about the trolley at this time is that it was a socially integrated service showing no distinction of class. All of society used the trolley. It was a great equalizer. But when the automobile

started to become popular the view of the trolley changed.

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HISTORY OF THE CAR
Invention / Infrastructure

Cars aren't good for much without the vast network of roads to support them. When Ford invented the assembly line and then made it possible for the blue collar man to own an automobile there all of a sudden grew a need for roads in which to drive all of these automobiles. The initial road improvements, that spanned the country, were done by a General Roy Stone who was quoted

"The trolley has caught up the people who had settled down to solid city life and is carrying them off with enthusiasm into the byways of the country, where the steam car had no means of carrying them. The automobile will hurry this tide countrywide with accelerating speed" (The Independent 1903a: 1162). [Fotsch pg. 22]

to say, "Good roads are the highway to wealth." (Slater).   He was a general in the civil war and the first roads he was set to improve were roads not for automobiles but for the use of bicycles. But He was the one that helped lay the foundations for our roads today. In 1916 congress passed the federal aid road act to give the states funding to improve road conditions. But WWI started and this bill wasn't able to be utilized. A couple other bills were passed in the early to mid 20th century that began to establish our American Highway systems. But it wasn't until President Eisenhower's Federal Aid Highway Act of 1956 (lobbied for by the automakers) that adequate funding was acquired and the highways truly started to form a complete network of roads. 99% of the 42,800 miles of interconnected road system were built by the end of the 1980's. It was said to be the, "greatest public works project in history." (Slater).

Affects on City

Now we have a new mode of transportation to base the development of our cities off of. Just as when the train tracks went down cities popped up so too where the highways went down small substation waypoints started being built up. We needed gas stations and other amenities to help support the vast network of roads and highways. Pretty soon where these small substations popped up little towns started to form. People wanted to locate their businesses closer to the highways for easier access. Cars became more and more popular and congestion started to take place in the inner cities. Roads had to be widened and places to park cars had to be created. It wasn't the car that gave us the grid system of our cities but it was the car that turned those road systems into almost impassable barriers.

Affects on Society

The car was, at first, a form of mobility for the elite only because they were the only people who could afford to purchase one. It was a rough form of transportation at first because the proper infrastructure was not laid out to provide the comfortable ride we experience today. Not as rough as the horse though which was the only other long distance personal form of transportation prior to the automobile. But soon the commercial enterprise took over. Cars became affordable for the middle class. The commercial enterprise began to demand proper infrastructure to help increase demand for their product. And people started buying them like crazy.

But the infrastructure of the automobile did more than just provide a place to drive your new car. The Interstate highway road systems, which connected all of the major urban cities of 50,000 people or more, became a means of division and segregation among the cities. It remains so today. Unintentional as it may be, it has become a major source of separation of social class and race in major urban cities. This is evident by the shocking difference sometimes of one side of a major street to the other. On one side there could be an upper middleclass suburb and on the other a rundown ghetto. This is most evident in Detroit, Michigan, today.

THE CAR CULTURE
Big Problem Small Cities

Cars are everywhere. Almost every family in America has at least one automobile. If you don't have an automobile or one you can at least share then you won't be able to do much or go many places unless you happen to be in one of the few cities with extensive, dependable public transit. Even with dependable local transit you are still dependant on the automobile to travel outside

of the city. Otherwise you become dependent on other people who have cars to help you get to the places you need to go. The automobile is so integrated into our society that if you were to pull it out you would be pulling out the very foundations of many commercial businesses. Businesses that have based their enterprise on the notion that cars would always be there and everyone would have one.

This problem is applicable to almost anyone living almost anywhere in the United States. It doesn't matter if you are in a large city like Los Angeles or a smaller city of no national standing at all. In fact it is even more important to own an automobile in a smaller city where there is little or no option at all for public transportation.

Today we find the automobile integrated into every corner of our society. Unless you are in a larger city you can't even go from town to town without a car. Passenger trains have long stopped going to the smaller towns. No one rides horses anywhere anymore. You either have a car or you stay home and walk five miles out of town to go get food at the local Wal-Mart. How many contradictions did you find in that previous sentence?

Big box stores and malls have taken over most of the retail infrastructure in America today. There are practically no small town shopping centers that would be able to support even a small community and provide food and basic living necessities. This is evident by the lack of grocery stores in smaller communities. The main grocery stores are going to be big box stores. And I can almost guarantee you that there are no grocery stores that do not have large parking lots that are at least the same size as the footprint of the store itself. Every store and building built today has to have a parking lot. It is demanded by building codes everywhere

except in the dense inner areas of the major cities in America. The car is so mobile, companies have looked for cheaper land outside of the small towns and cities for places to build their stores. This immediately isolates people who do not have an automobile because the stores were designed for people with automobiles only. This is probably the biggest transportation problem in American cities today because it is going to be the hardest thing to change and integrate into a more diverse mobile city. It is the most difficult because you have to have an established, reliable means of mass transportation before you can begin to address how to cut down on the space use for parking or the proximity of those large box stores to the main residential and downtown areas. We first must provide an adequate alternative means of transportation to the places people already go.

The car is so much more complex than any other form of transportation. Why? The car is personal. Today the car is looked at as an extension of the home and even an extension of the person to whom it belongs. It has fallen into the category of personal identity; along with music, iPod color, and general fashion. It has been the majority of the marketing focus for automobiles. If you are a tough guy, with needs for power, get a truck with lots of horse power. If you are a young adult who is very active then you would buy a sports car to go with your personality. The problem of the car culture does not only affect the large cities but it also affects the smaller cities and even the small towns. How do we start to integrate transportation methods into the smaller cities? Is it possible? Is it the best thing to do? How can we at least begin to minimize the impact and control of the automobile on the smaller cities?

"Public transportation spending carries more potential to stimulate long-run economic growth than does highway spending" – David Aschauer of Bates College (The cost of the car culture)

These are the questions we need to be asking if we really want to make our cities sustainable. We cannot switch directly and solely to mass transportation. There must be a gradual integration of both into the medial fabric of the city. But how do we address the cost of maintaining both a road network and a network of mass transit systems such as high speed and light rail systems? Hopefully with the use of mass transit systems there will be less use of the roads which will cause less damage and the roads will not have to be replaced or repaired as often.

Ideas Toward a Change of Thought

"…Ideal designs are best considered in conjunction with the social and historical context from which they emerge." (Fotsch 192)

This quote from Fotsch is the reason for the historical background of this thesis paper. At the end of his book Fotsch said this about how we should begin to tackle the problem of transportation in our cities,

"In his list of principles to follow when combating fascism in everyday life Michel Foucalt writes, 'Prefer what is positive and multiple, difference over uniformity, flows over unites, mobile arrangements over systems. Believe that what is productive is not sedentary but nomadic' (1983: xiii). In this sense, rather than attempting to stabilize mobility, my goal has been to destabilize it-not to create stasis but to fuse movement with critical reflection." (Fotsch 193).

Another quote which I will use to help explain what needs to be done in cities is a quote from Kevin Lynch.

"A city is a multi-purpose, shifting organization, a tent for many functions, raised by many hands and with relative speed. Complete

"Public transportation spending carries more potential to stimulate long-run economic growth than does highway spending" – David Aschauer of Bates College (The cost of the car culture)

specialization, final meshing, is improbable and undesirable. The form must be somewhat noncommittal, plastic to the purposes and perceptions of its citizens." (Lynch 91)

Therefore, from my readings and research I have come to realize that there isn't any complete answer or solution to redesigning the means of transportation in our cities, so I came up with a list of what has influenced transportation, the shape of the city, and our societies. The first influence of a major shift in transportation was speed. This change in mobility also brought with it a more conscious awareness of time. Speed and efficiancy is now directly related to time in how we think about transportation and is today the primary concern for transportation in our cities. The second influence of a major shift in Transportation is convenience. The trolleys had the greatest impact on this idea. People in major cities just had to go down to the street and hop on a trolley headed in the desired direction of travel and pay a minimal fee and they could go wherever they wanted. The third is Cost. When the depression hit people were looking for every possible way to save money. Busses began competing with the fares of the Trolleys and pretty soon more people were using busses and trolleys were on the decline. Convenience was another factor of the Trolleys demise as well. Busses could go anywhere there was a road and trolleys were confined to the train tracks. The fourth factor is Leisure. All of a sudden there was a unique opportunity to take a train or a trolley or your car out into the countryside to enjoy some peace and quiet and to get away from the city life for a little while. The poorer middle class use to ride the trolley cars to the end of the line and then just stay on and ride it right back into the city. The fifth factor is Personal freedom. This came into play when

the automobile first became a feasible option for the masses. All of a sudden one could have the freedom to move out into the country anytime he wanted and not be tied down to bus or trolley schedules or limited to the extent of the train tracks. The car soon became the epitome of all five factors which just increased its popularity and which in turn has become the demanding influence on the growth of our cities today.

The question is how do we use these five factors of transportation to encourage the use of a wider range of mobility in cities today?

There are several overall contributing factors that if we can make an effort to improve will most likely have a positive impact on our social interaction and use of mass transit systems. One of the first factors we could use to help increase use and appreciation for mass transit systems is to increase opportunities for social interaction among all classes of society. This can be done at the interchanges of the transit systems. Another factor would be to increase the sense of security on public transit systems and in the stations. This has to be done with the structure and design of the layout itself. Cameras and gates do not provide a sense of security; in fact, all they do is contribute to the awareness of social disorder. A third contributing factor is well marked way-finding. The easier it is for people to know where they are in the system, and which vehicle will take them to where they want to go, the more popular and convenient the system becomes. The fourth factor I have come up with is Flexibility / diversity. Any system of mass transportation if it is going to be successful must be flexible and diverse. The fifth factor is Identity. Cars are personal and they are the same no matter where you go in America. Mass transit is an opportunity for Cities to make a name for themselves and to carve out their own unique identity.

We need to be careful to use the infrastructure of the mode of transportation to help connect cities together with other cities and with the different and individual parts of the city itself. Division of the city is the least desirable influence we could have on a city. It is hard to say how a system of transportation will influence a city. But we know that gas prices will not stay low for much longer and we cannot continue to encourage sprawl by limiting our means of transportation. We need to start building and encouraging other means of transportation. We will never be rid of the car and it should not be our intention to do so. We must focus on integrating the automobile and other modes of transportation into the city fabric so that they encourage each other and provide multiple options of travel.
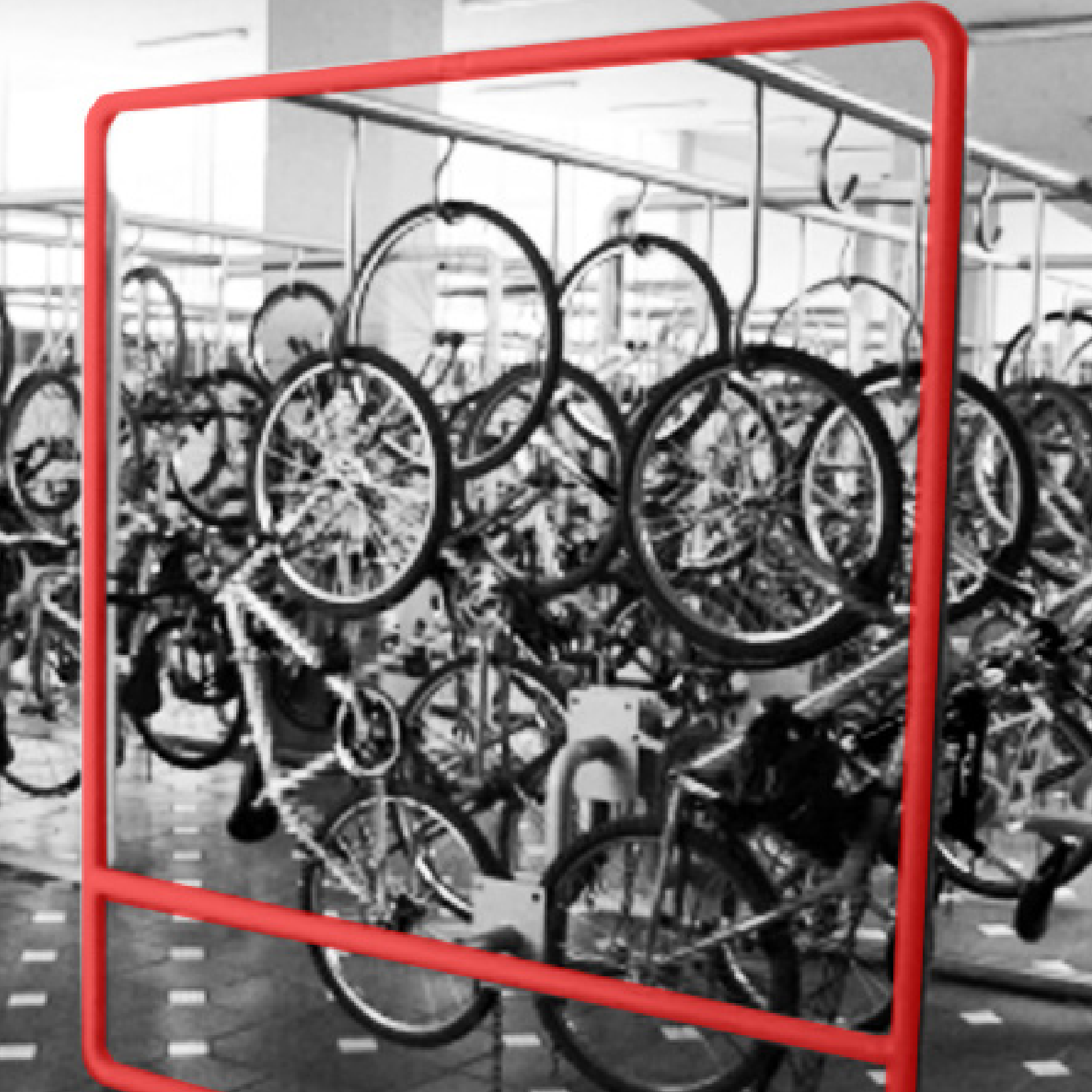
Precedents

Bogota, Colombia

Bogota is a third world city according to living standards and the other things that the rest of the world uses to measure such standings. But Bogota has made a name for itself. It has been recognized as a world city by World Cities Study Group and Network out of the United Kingdom. Bogota is the capital district of Colombia. The population of Colombia is estimated to be around 7,304,384. Including the metropolitan area, the estimated population is 8,566,926.

Bogota has made a name for itself for many reasons but the one I am interested in is their transit system called Transmilenio. It is a Bus Rapid Transit (BRT) system. They have been using this system since 1999 and have continued to expand it. The BRT system stretches out along two major road ways, one going generally north and south and another one going generally east and west. The west section now connects to the airport.

Bicycle Sotrage Facility at BRT Station - www.treehugger.com/files/2008/01/light_rail_or_brt.php

029

Bogota, Colombia

There are actually many systems integrated into the BRT system. There is a general bus system that runs into the surrounding areas and picks up passengers and then brings them to a BRT station. The buses that do this are smaller buses and they are all green. They are called the "Feeder" buses because they feed the main lines of the BRT. The Feeder busses are free to use. You only have to pay when you use the BRT system. And the fee is a straight fee no matter where you are going. This helps encourage the use of the system.

There is also an extensive, well defined Bike route that goes throughout the city and acts as a supplemental means of transportation through the city. The marking of these routes specifically for bikes helps to encourage their use by giving the people an open awareness of them and at the same time a sense of permanence. This shows that the city is looking out for

the people and striving to address the problems faced in that area.

They have done many things to market the system as a viable alternative means of transportation and encourage the use of the system. The feeder busses are one thing. The name "Transmilenio" is another. It is supposed to refer to Transitioning into the new millennium as a way to look forward to the future and give people new hope. The busses are different colors to distinguish their purpose. The feeder busses are Green and the BRT busses are Red.

The bus systems are all owned privately and they get paid not by how many people they pick up but by how many miles or kilometers they cover. So the private owners are encouraged to go out into the far areas to pick up passengers and bring them back to the main routes. It is currently the most efficient way to travel in Bogota.

Denver, Colorado
Station Typologies

Colorado is leading the way in America for mass transit and Denver is the central hub of their new regional transit system. Colorado is designing and building a regional transit system in the Denver metro area that will connect all major cities in that area. They are using an integrated system of bus, light-rail, and heavy-rail transit and even a small section of Bus Rapid Transit (BRT) between Boulder, Colorado, and Denver, Colorado. For the light-rail lines in Denver, the city has established a set of criteria for where to locate stops. They call this system Station Typology. They have identified the station types by their proximity to downtown, who will use the station, and the different building types in that area. This information helps determine what sort of amenities will be located adjacent to the station and how they should address the general siteplan layout.
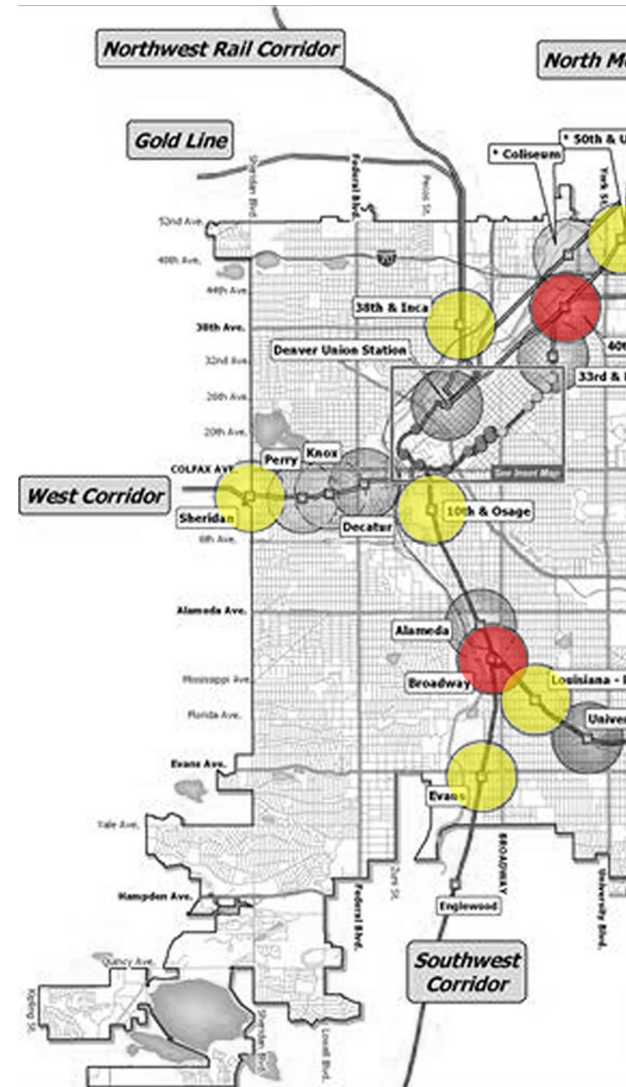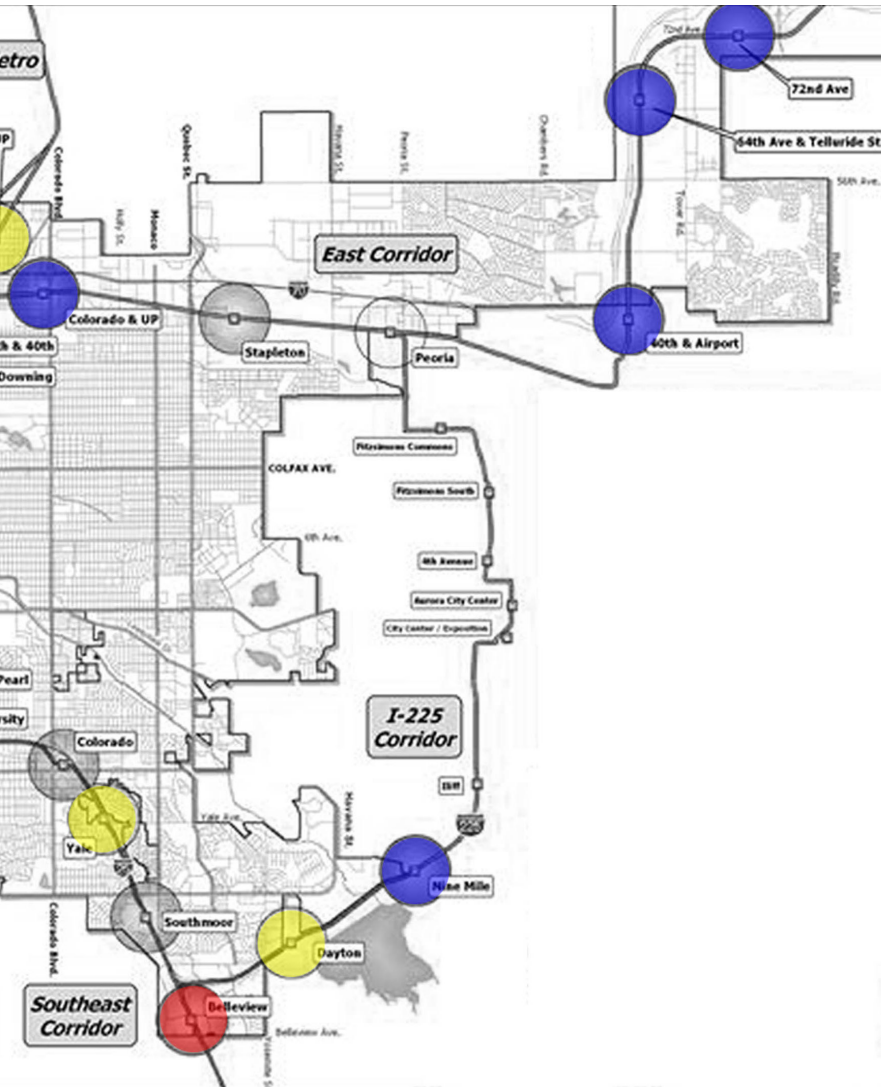
Area in Detail ● Campus ● Downtown ● Main Street

☐ **Station** " * " One of two stations will be selected

━━━ Rail Line - Planned

━━━ Rail Line - Existing

─── **Enhanced Transit Corridors**

Main Street
Urban Neighborhood
Urban Center
Major Urban Center

Campus
Downtown
Commuter Town Center
Multi Jurisdictional
-adjacent to Denver

Station Area Typology

Denver, CO – USA

Denver, Colorado
Integrated Systems

Denver is also trying to integrate other systems together with their new light-rail transit. They have built "Park n' Ride" stations that allow commuters to park their cars right at the light rail station or a bus stop and it is free for those who live in Colorado. The "Park n' Ride" system is very important in how the new light-rail is viewed by the public. It is important that the system be looked at as an alternative and supplemental system right now and that people not look at the system as something that is trying to replace the automobile.
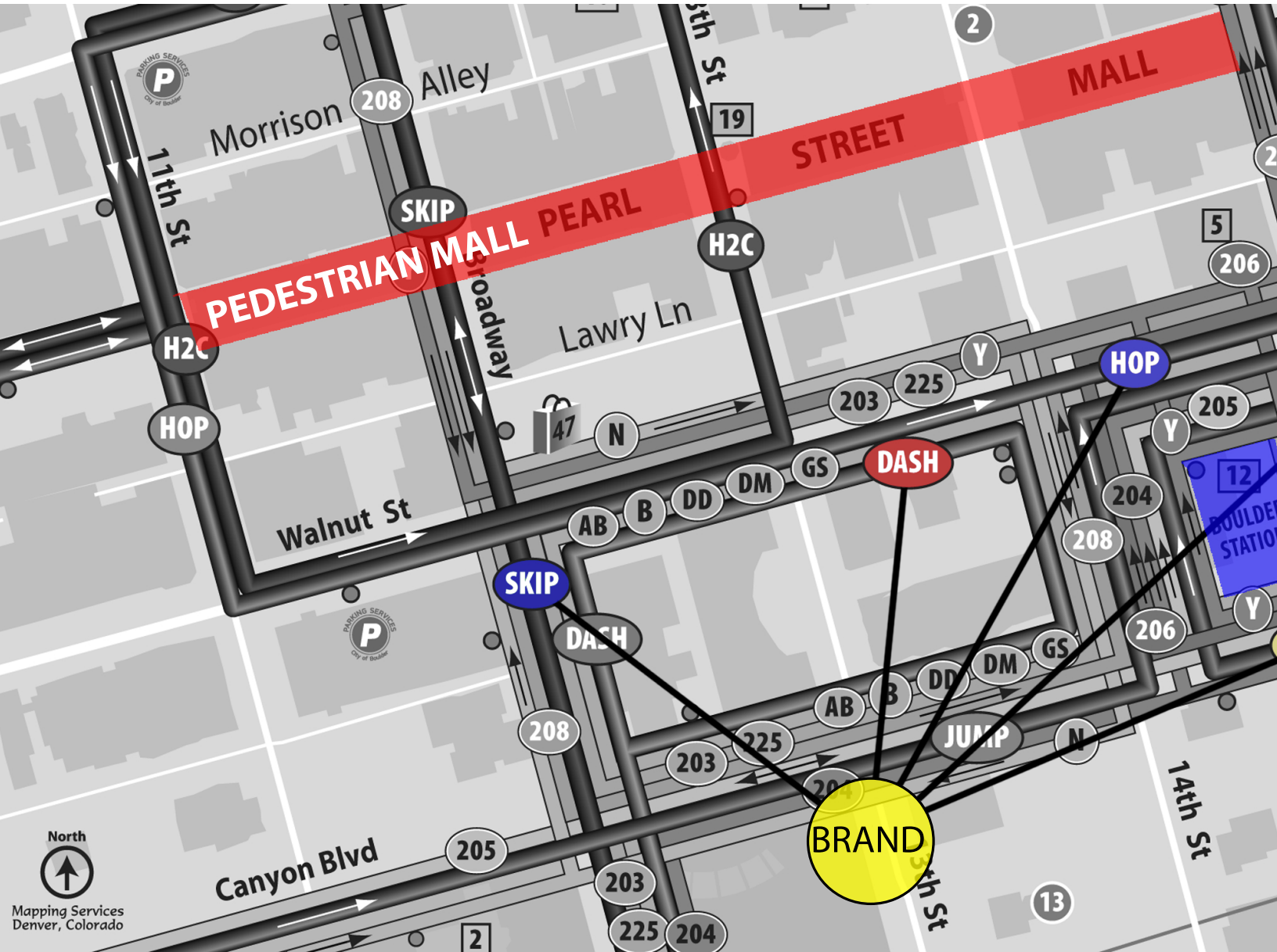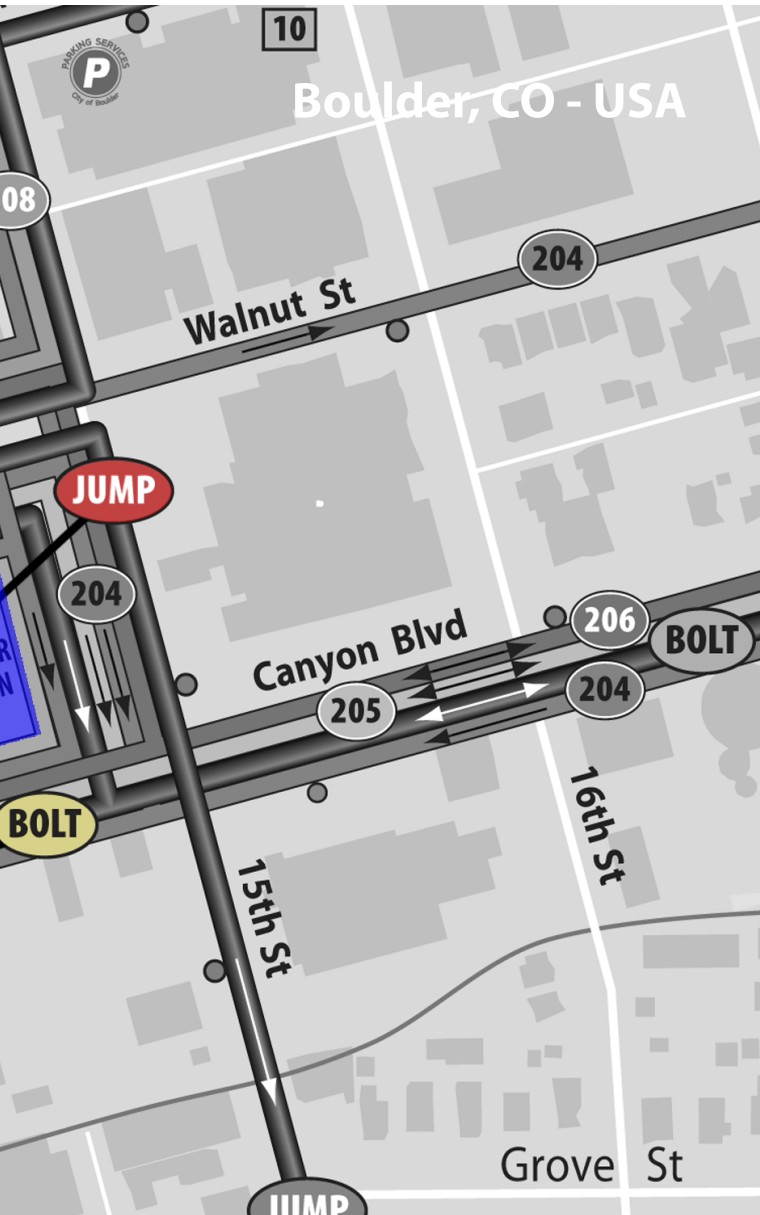
Boulder, Colorado
Marketed Promotion

In Boulder, Colorado they are using verbal association with thier bus systems to help people quickly associate what the bus does and where it goes with its name. They have named their bus routes Hop, Skip, Jump, Dash, and Bolt. It is a sort of branding for the bus system. Each name is associated with how many bus stops it skips, or doesn't skip, before it gets to the next one. The only thing they haven't done is visually promote and market the bus names on the side of the bus and possibly also associate the name with a color for even easier recognition.

Boulder, CO - USA

DASH

HOP
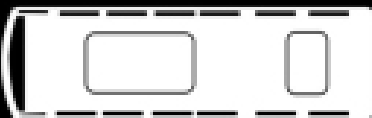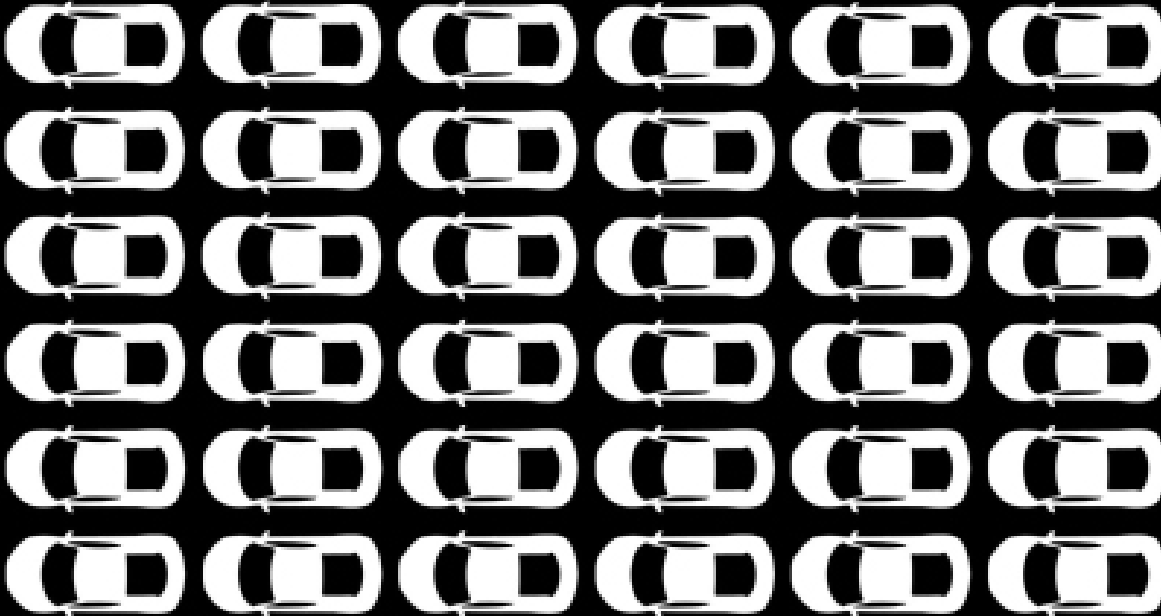
This is a diagram of the area that is required for 40 individual people to move from one locationi to another with the use of the four different modes of transportation, walking, biking, driving, and bus riding. Only the immediate area is illustrated but actually the area for each one is a magnified even more by the space required to opporate each mode of transportation. Each person needs their own personal space while riding a bike or walking and cars and busses must provide for adequate space between vehicles relative to their speed.

This photo is of a parking lot for cars right after they get off the shipping freights in the seaports. With this photo I am wondering if the personal automobile is the only way to provide transportation for the future. I am asking if this is the only way or are we going to start providing viable alternatives to this machine that entraps us?
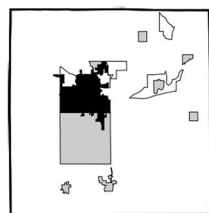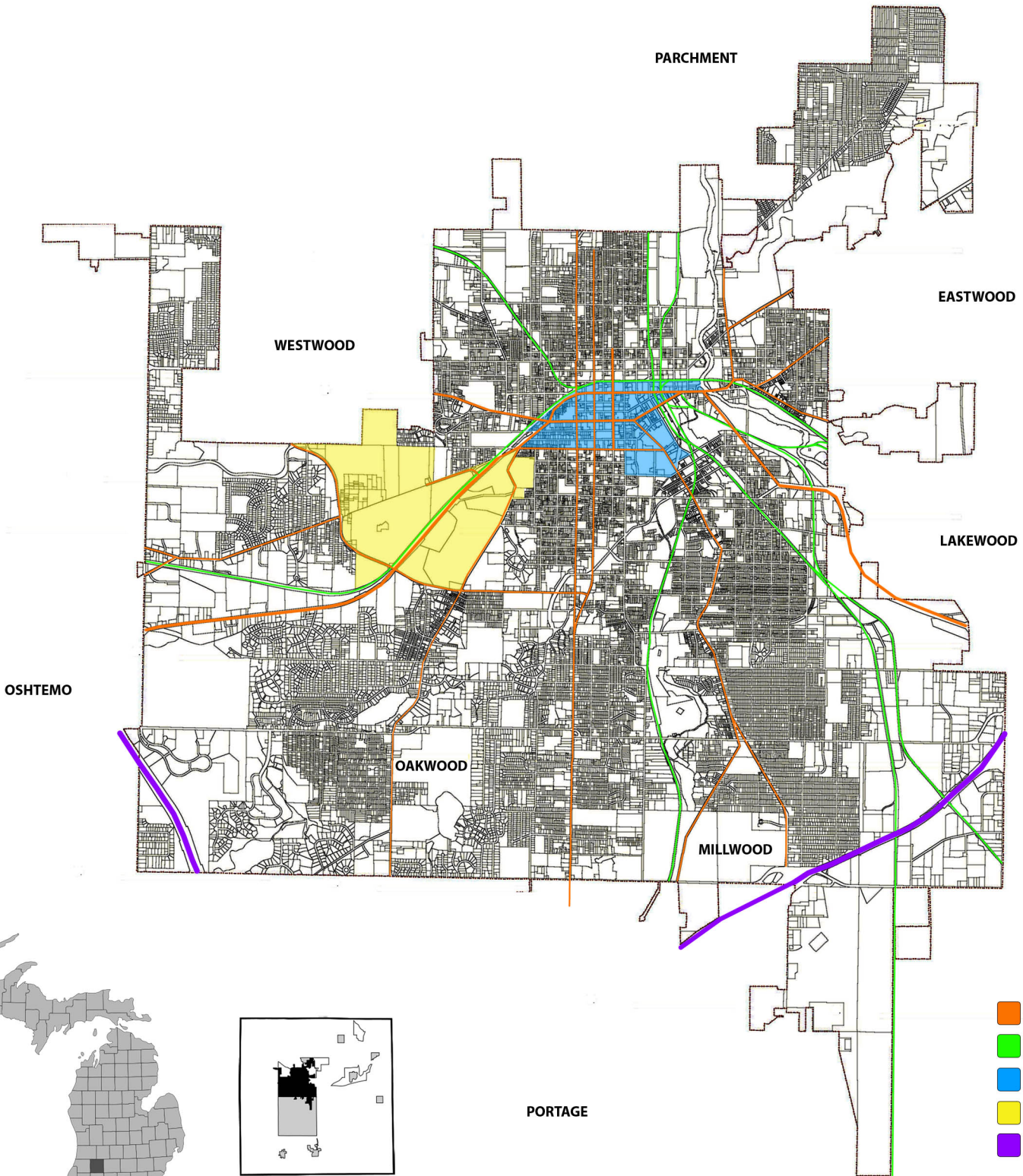
This photo is of an old shopping mall. This photo shows how long we have been thinking this way. The thought that we are doing because of the automobile we can put up these large shopping malls with oceans of asphalt for parking.

After thought

No Place

PARCHMENT

EASTWOOD

WESTWOOD

LAKEWOOD

OSHTEMO

OAKWOOD

MILLWOOD

PORTAGE

MAIN ROADS

RAILROADS

CBD

WMU

HIGHWAYS

0   FEET   4500

Site(s) Studies

Kalamazoo, Michigan - Central Business District (CBD)

When deciding what city to use for my thesis I wanted to choose a city that wasn't too big and that wasn't too small. I wanted to be able to show how mass transit systems could begin to be implemented successfully into the smaller cities. So I chose Kalamazoo, Michigan because it was close and I would be able to go to the site and observe first-hand how the current bus system operated and how they have considered the implementation and integration of the system into the transportation network of the city.
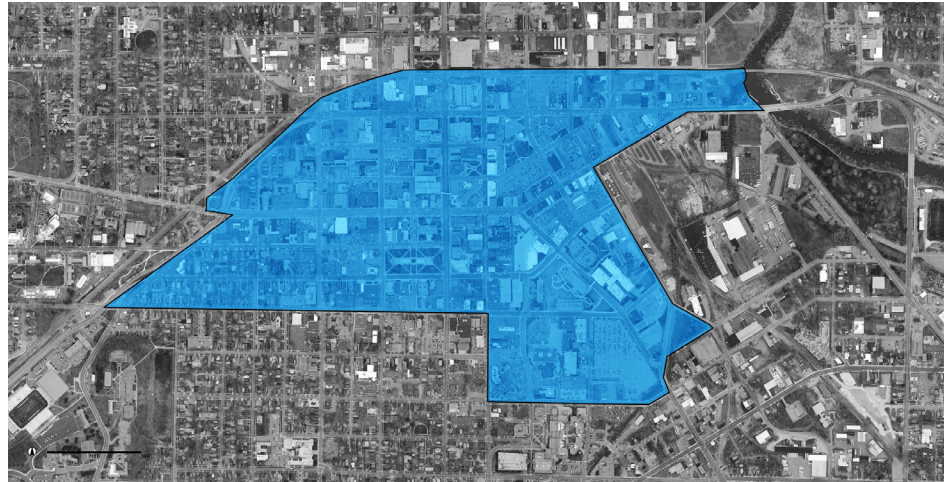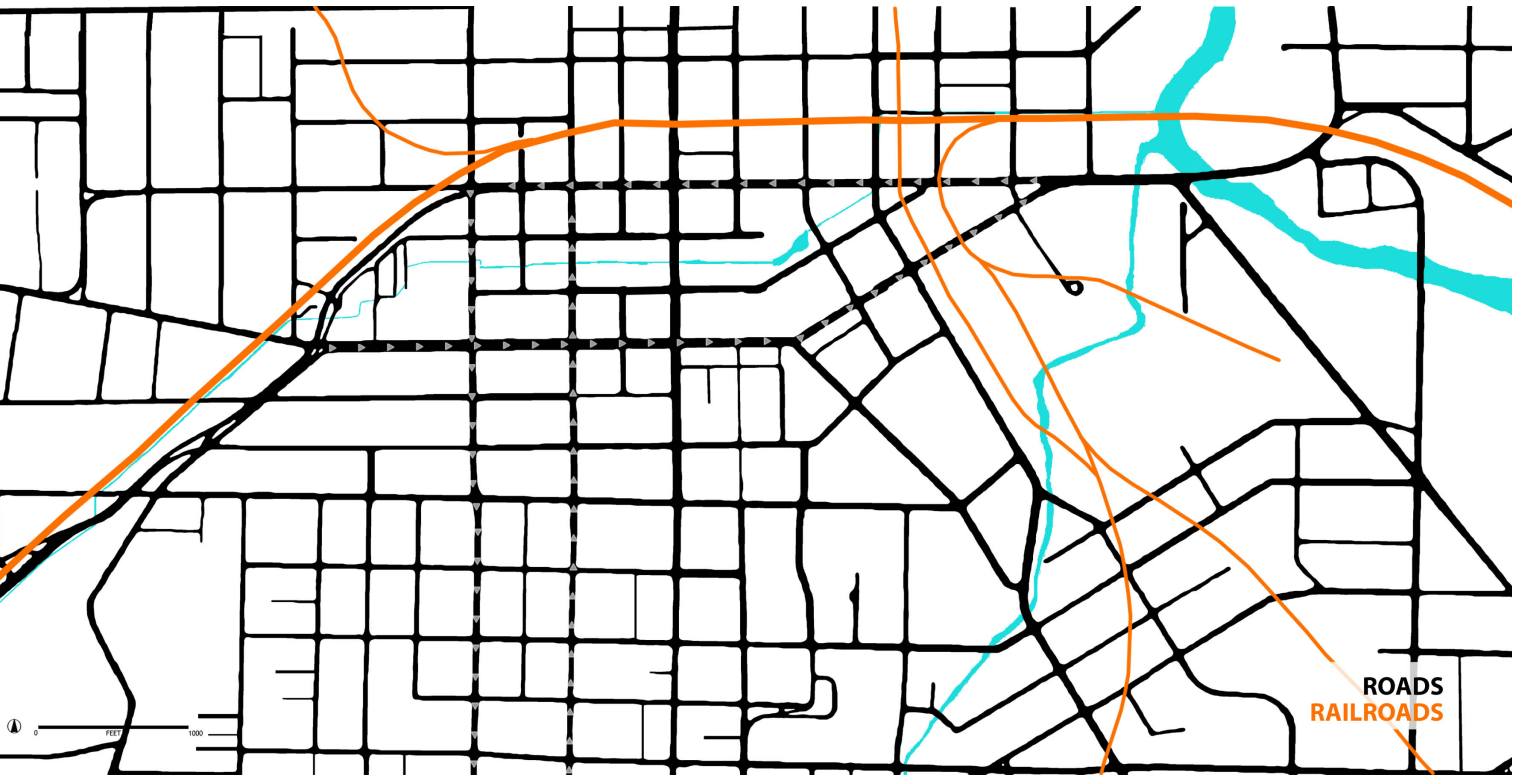
ROADS
RAILROADS

CBD Roads and Railroads

This image shopw the one way streets in downtown Kalamazoo, MI as well as the Major roads in the ares. Many of the old heavy rail lines have been converted to walking or biking trails. The main rail that goes through Kalamazoo, is being looked at as an option for an extension of the Highspeed train system that is being concidered for the midwest region of the United State.

1 RAVE THEATER
2 ART INSTITUTE
3 TRANSIT HUB
4 RADISSON HOTEL
5 LIBRARY
6 BRONSON HOSPITAL
7 BRONSON PARK
8 ARCADIA FESTIVAL PLACE

PEDESTRIAN MALL
CIVIC BUILDINGS
CHURCHES
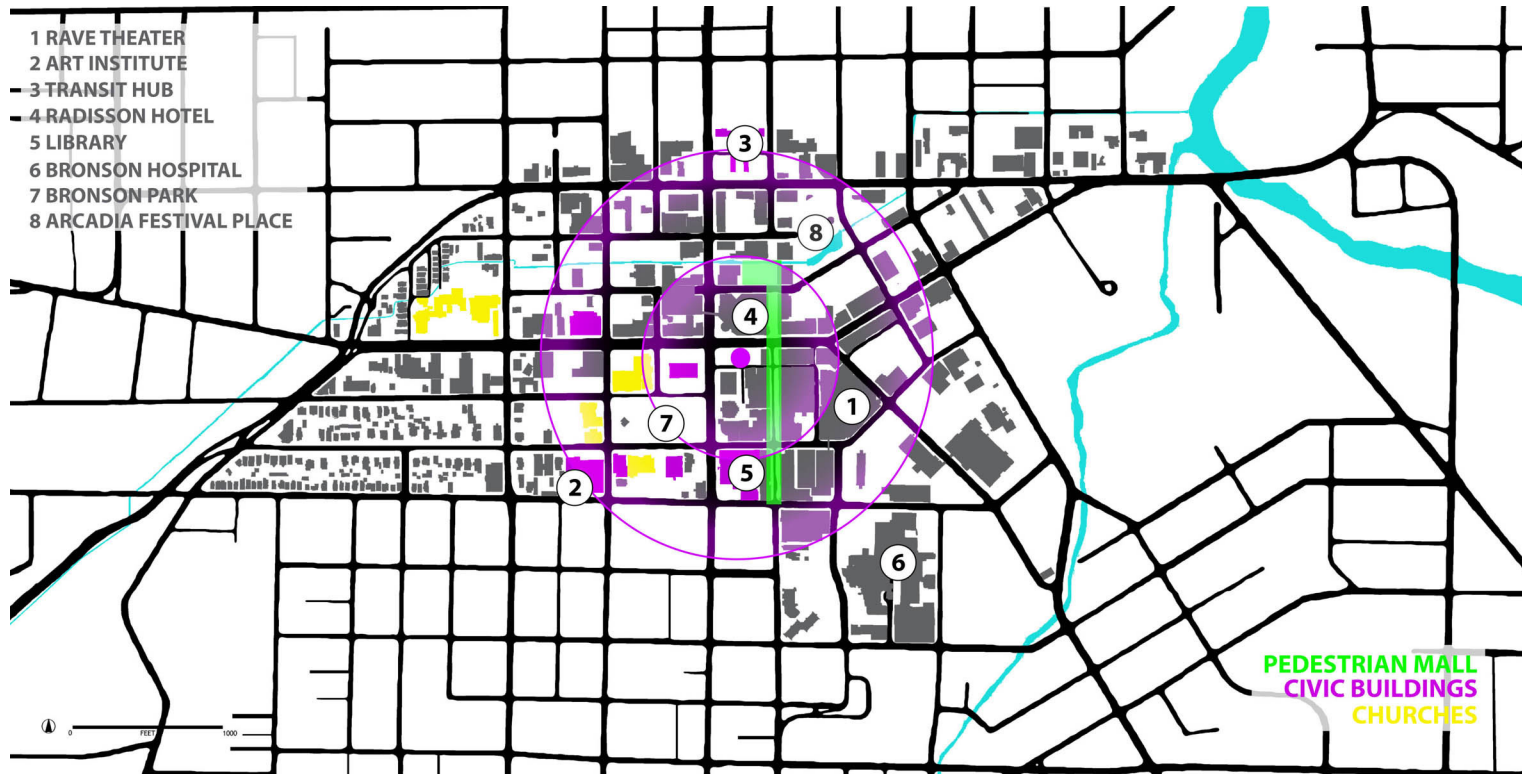
CBD Interests and Attractions

This image shows the proximity
of the site with the other
attractions in the area.
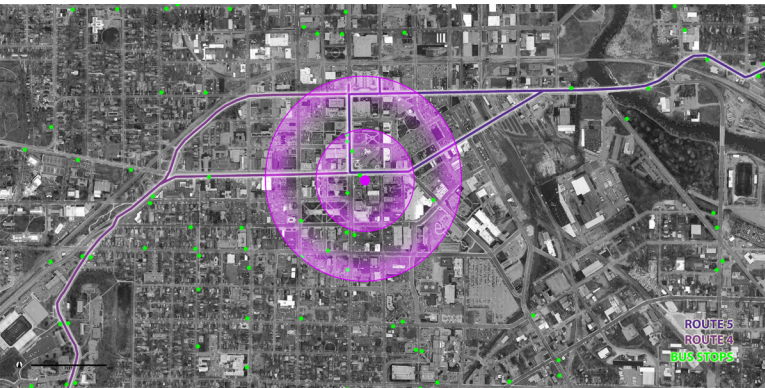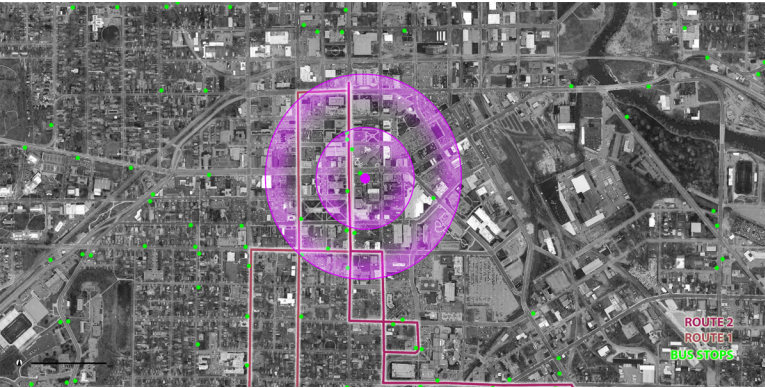
These Diagrams are mapping the different bus routes that go in and out of downtown Kalamazoo.
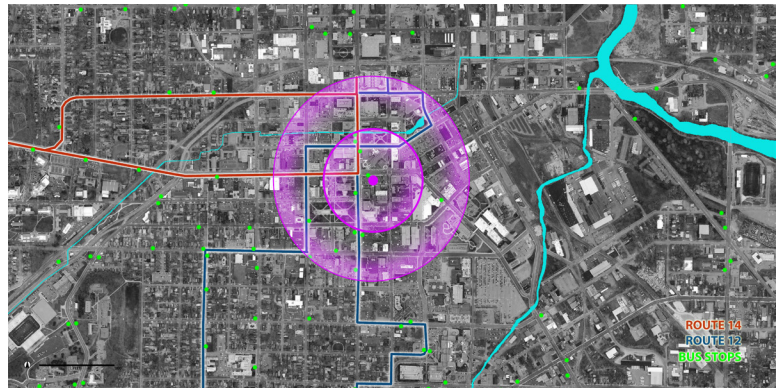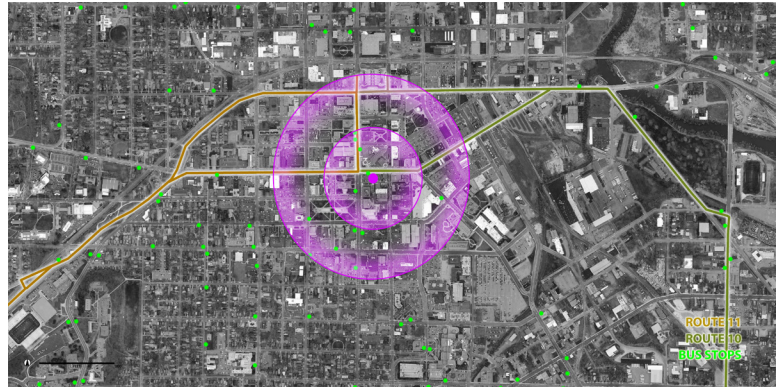
These diagrams are shwoing the relationship of the figure groudn to the area of parking lots and parking structures in the Central Business District of Kalamazoo. This is just comparign the space where the car given space to park. This diagram is not taking into account all the space required to opperate the automobile such as streets and driveways.

FIGURE GROUND

PARKING

PARKING
FIGURE GROUND
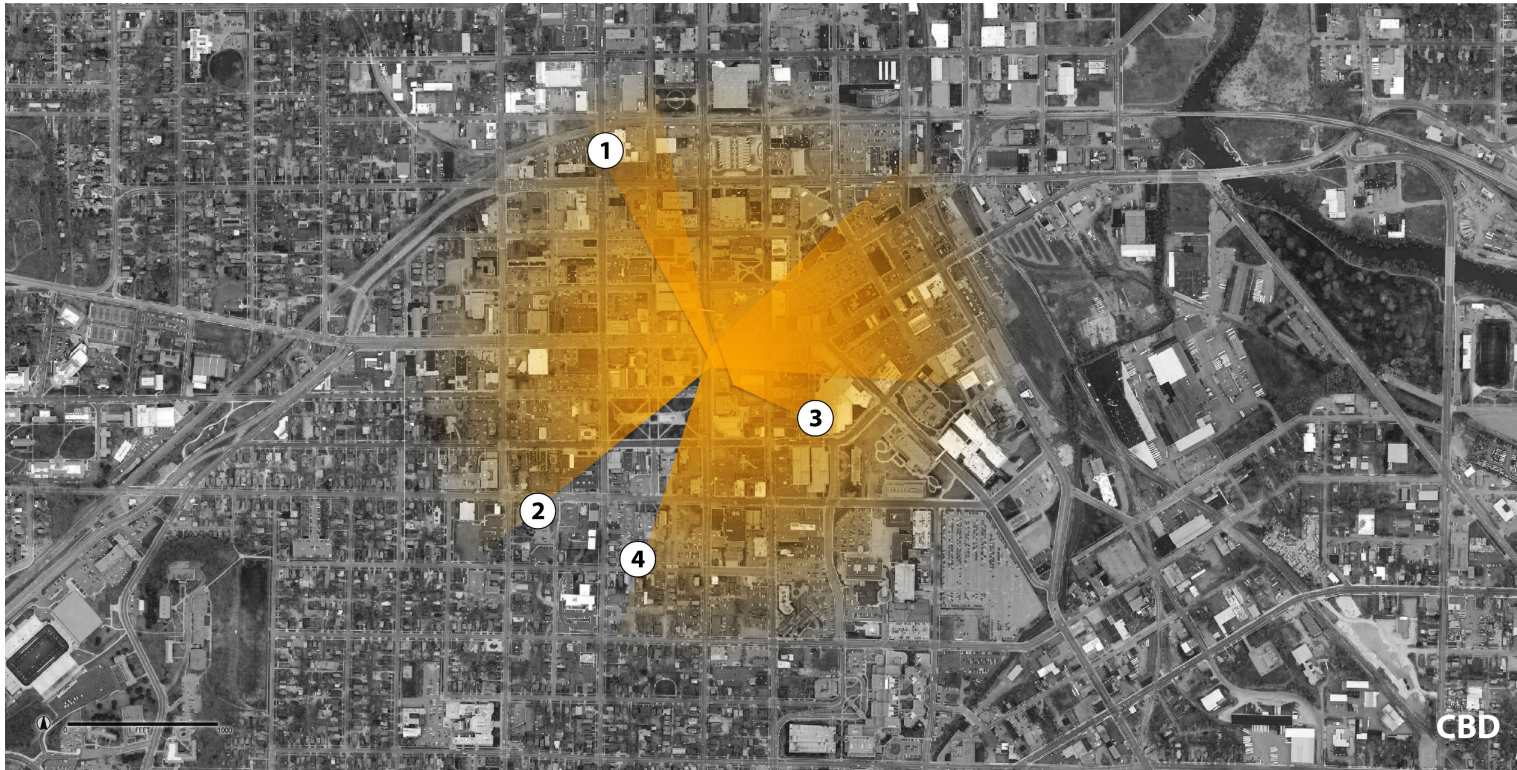
This is an arial map of the
CBD site showing the locations
from which I took the four (4)
panorams on the following
pages.

One (1)

This is a panoramic picture showing the view north across the site chosen. The Radisson hotel is the most prominant building in the downtown area and it is directly accross from the chosen site.

Two (2)

This is a panoramic picture whoing the view northwest from the intersection of Exchange St and Rose St. You can see the parking structure in the distance and just how prominant it is in the figure ground.

Three (3)

This is a panoramic picture from a small
alleyway just below Exchange St and behind
the office building, looking north across the
site towards the Radisson.

(4) Four
This is a panorama taken from the corner of
Rose and West Main looking southeast over the
site. Bronson Park is located to the far right of
the photo and leads to the library. The road to
the left leads further into downtown toward
the pedestrian mall and Arcadia Festival Place.

PARCHMENT

EASTWOOD

WESTWOOD

LAKEWOOD

OSHTEMO

OAKWOOD

MILLWOOD

PORTAGE

	MAIN ROADS
	RAILROADS
	CBD
	WMU
	HIGHWAYS

0   FEET   4500

Site(s) Studies

Kalamazoo, Michigan - Western Michigan University (WMU)

When deciding what city to use for my thesis I wanted to choose a city that wasn't too big and that wasn't too small. I wanted to be able to show how mass transit systems could begin to be implemented successfully into the smaller cities. So I chose Kalamazoo, Michigan because it was close and I would be able to go to the site and observe first-hand how the current bus system operated and how they have considered the implementation and integration of the system into the transportation network of the city.
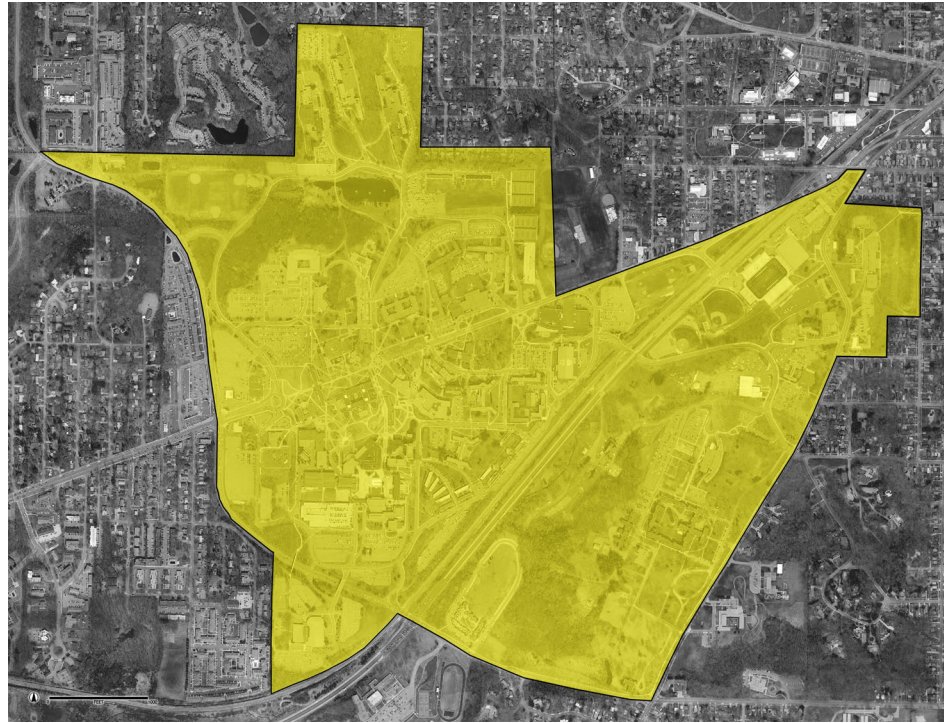
PARKING

These diagrams show the relation of area occupied by parking space and parking structures to the area occupied by built structures.

FIGURE GROUND

FIGURE GROUND
PARKING

CAFE
DINING
APARTMENTS
DORMATORIES

071

ROADS
RAILROADS

1 STUDENT REC CENTER
2 WALDO STADIUM
3 HAYMES FIELD
4 KANLEY TRACK
5 MILLER AUDITORIUM
6 HOCKEY STADIUM
7 BERNHARD CENTER
8 BOOK STORE

BROWN LINE

OAKLAND LINE

GOLD LINE

PARKVIEW LINE
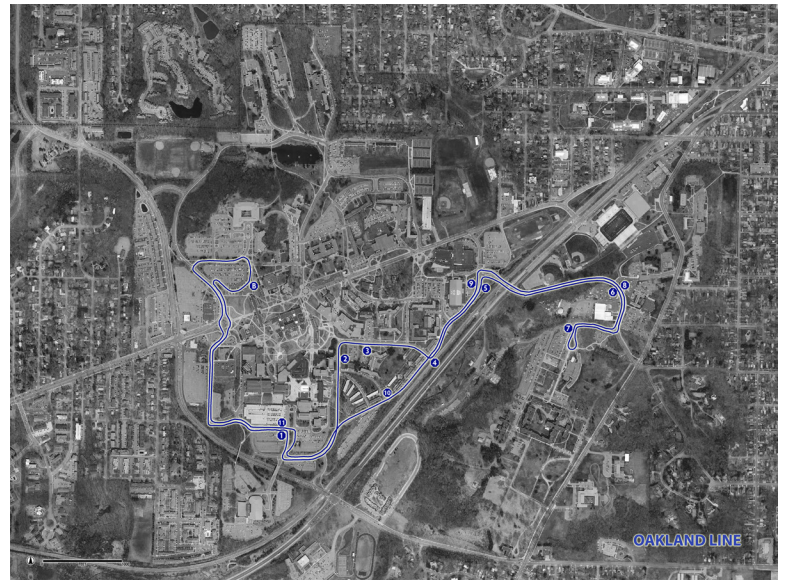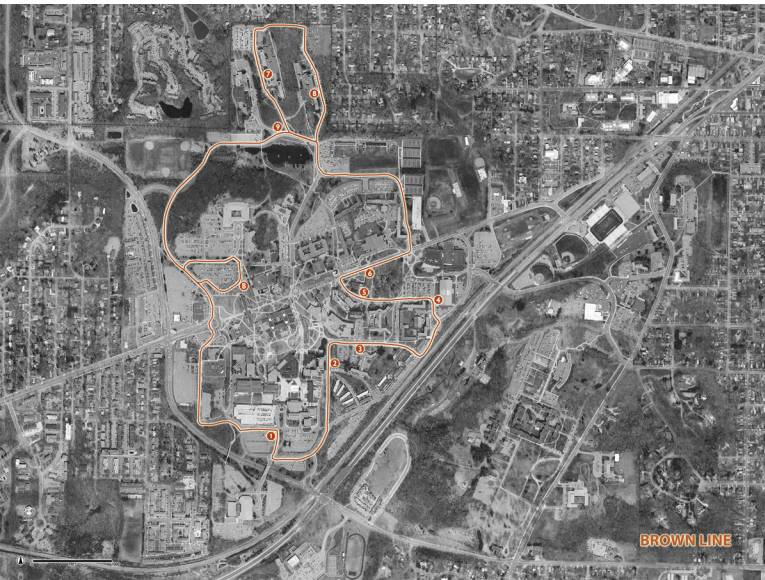
There are two bus systems that service the Western MIchigan University campus. The university has their own Bronco transit that circles the campus in opposite directions and then they have two other bus systems that service the eastern campus and the parkview campus. The city bus system only services a few areas on the campus. The mian stop, where the bus loops away from the main road, is an area I have indentified as a possible location for a Destination bus and bike stop.
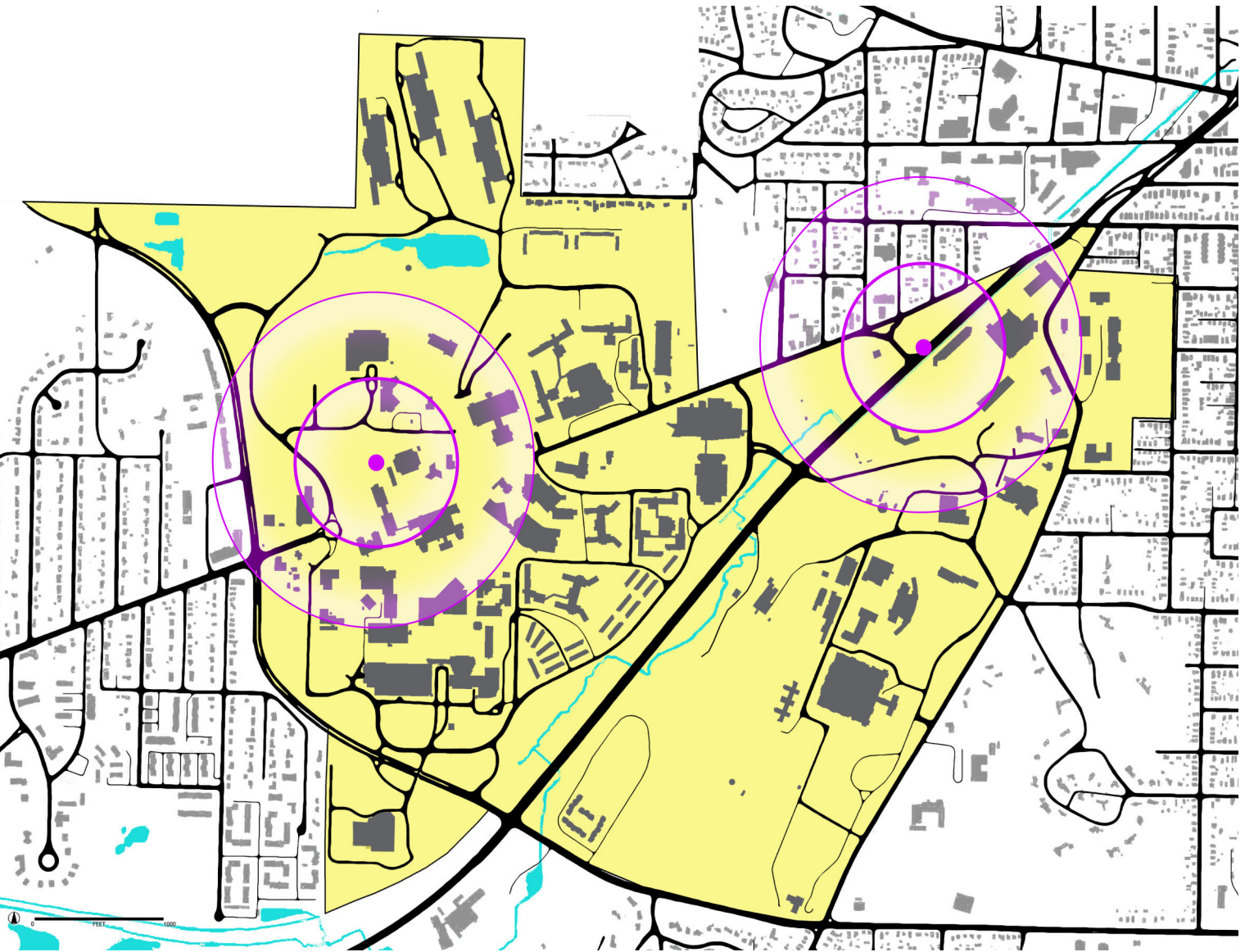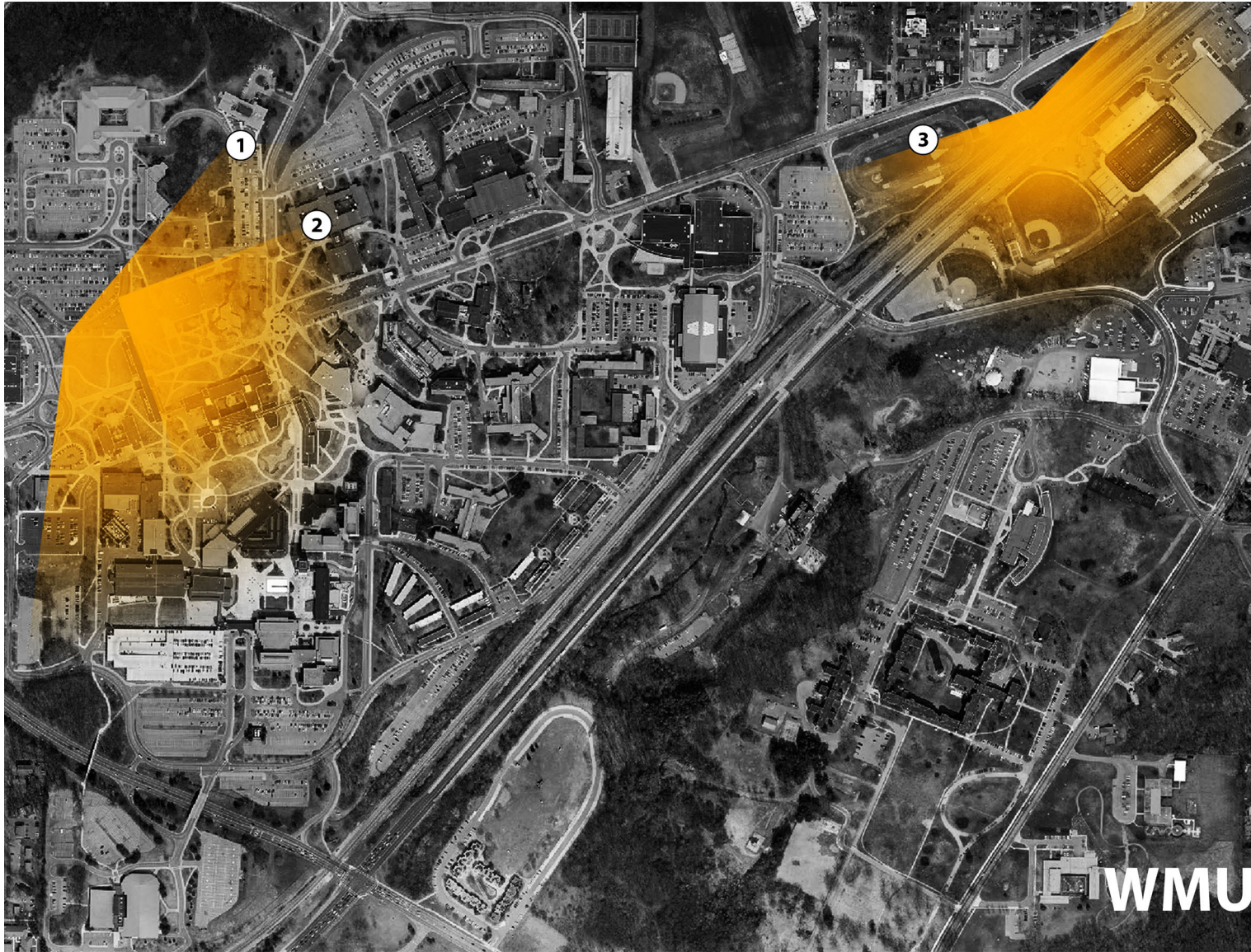
One (1)

This panoram shows a view of the main stop
for all of the bus routes, the schools and the
cities. The main building in the forground
acts as a gateway into the campus. It spans
over what was once a road that bisected the
campus.

Two (2)

This is evidence of how much thought is
actually put into the bus stops. This could
be a major entry point for the school but it is
treated as something below standard.

Three (3)

This panorama is showing the view of the second site that I identified as a loaction for a permnet Bus and Bike stop. This location would also have a bridge that crossed Stadium drive. There is only one entrance to the Stadium and you have to cross the very busy road to get to it. A bridge would signify permanance and be a gateway into Westerns campus.

This site is a crossing point for all bus routes into and out of downtown. I drew this quick sketch to show the general location of the bus stops (in yellow) and what would be the bike racks (in red). The blue represents the location of the mixed use building.

Sketches

Three (3) Initial Sites

I chose three initial site that I knew were high activity sites that could be used as Destinations for activity. These sites have high potential for use and expantion. They are all located in higher density areas and or high traffic areas.

These are preliminary sketches of what I was initially thinking of putting in the three differnt sites. The red in the following picture represents a location to store bikes out of the rain and snow. The yellow represents the bus stop structure. and the blue in
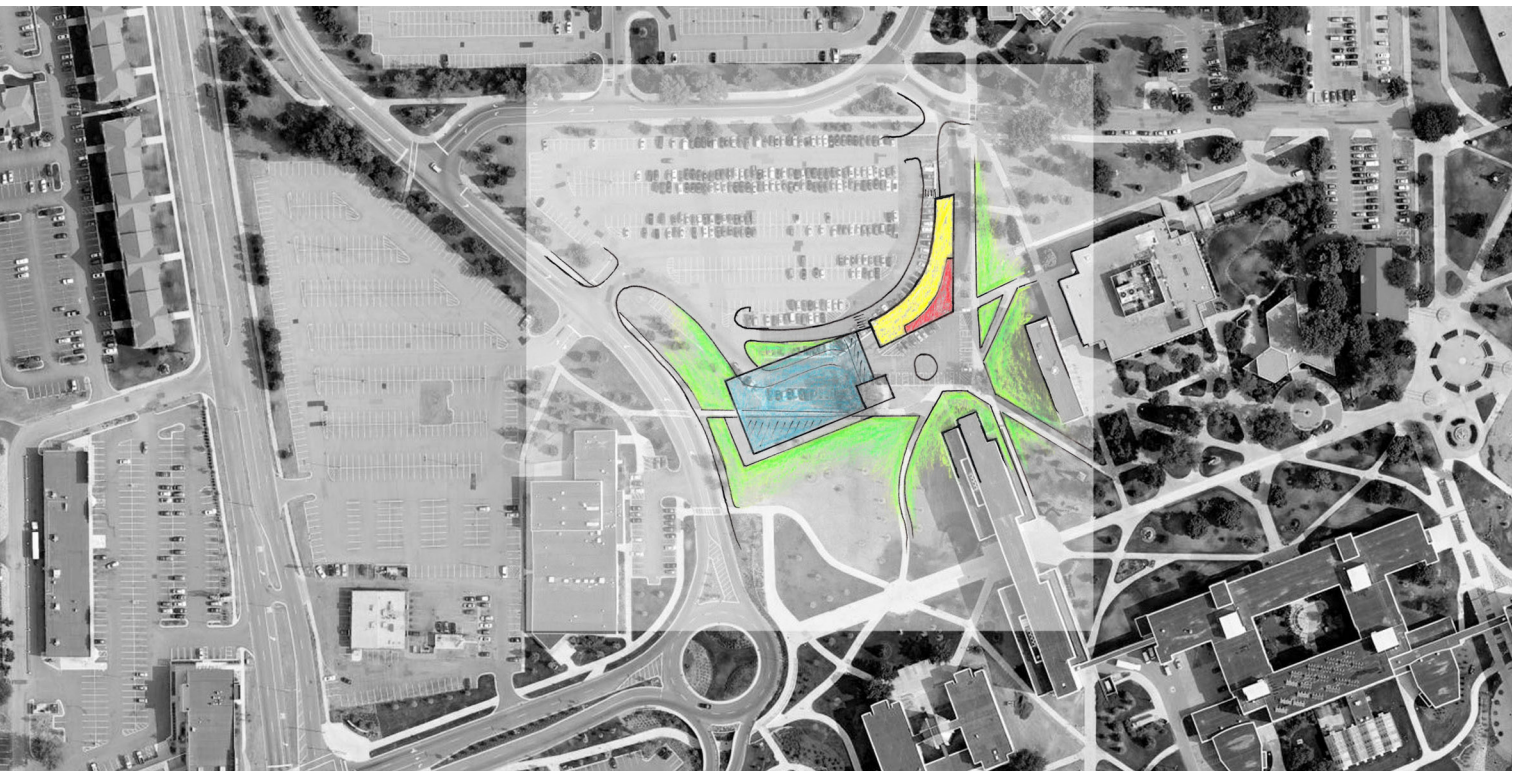
the first image represents a mixed use parking garage that would be used as a bike rental and storage facility.

SITE 1
Western Michigan University
Main Campus Bus Stop
Kalamazoo, MI

Rankin St

Campus Point Mall

S.Howard St.

W Michigan Ave.

1/64"=1'
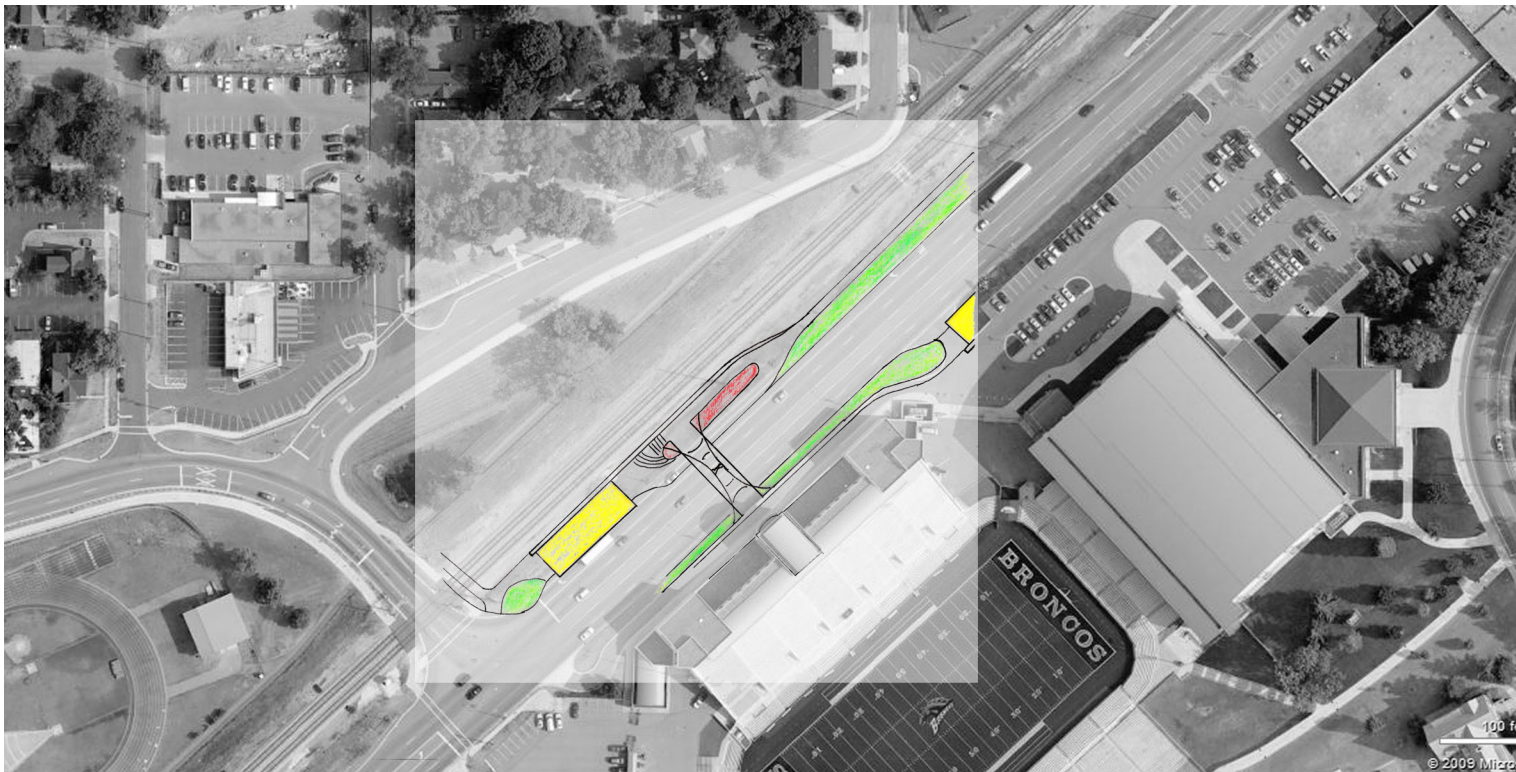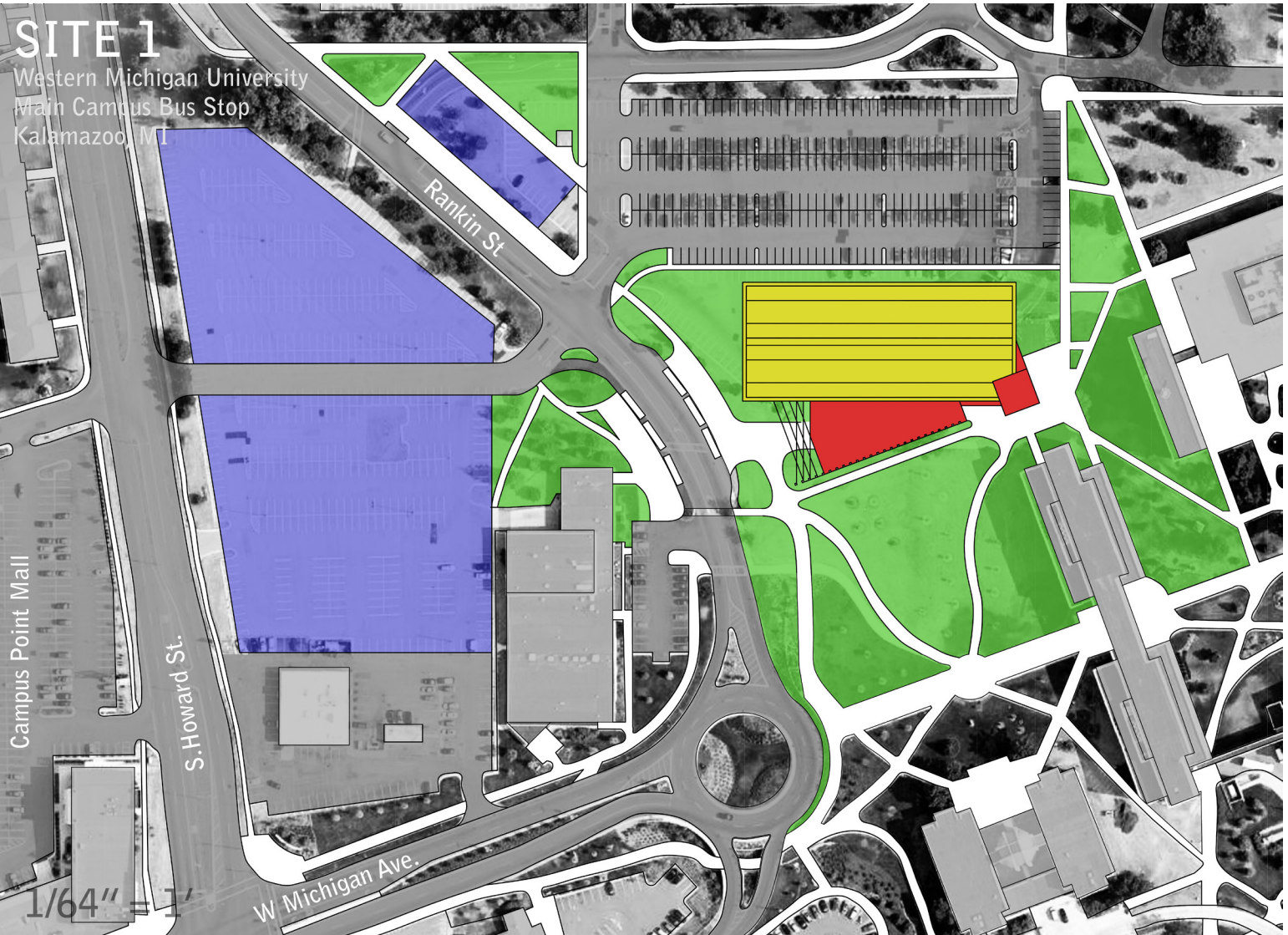
SITE 2
Western Michigan University
Waldo Stadium Bus Stop
Kalamazoo, MI

Stadium Drive

W. Michigan Ave.

BRONCOS

1/64" = 1'

DESTINATION STOPS

INTERMEDIATE STOPS

WAYPOINT STOPS
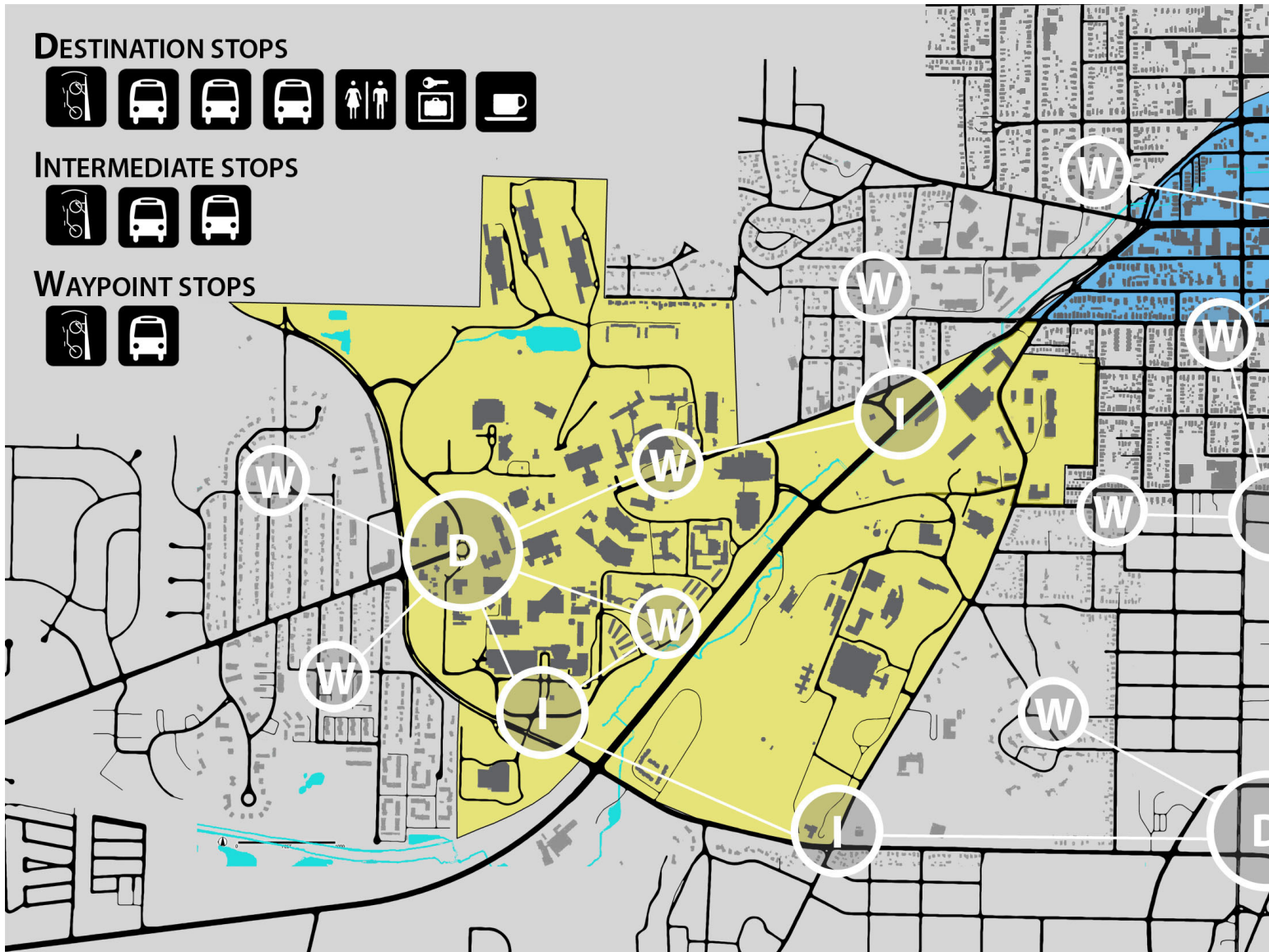
Solutions

Final Design
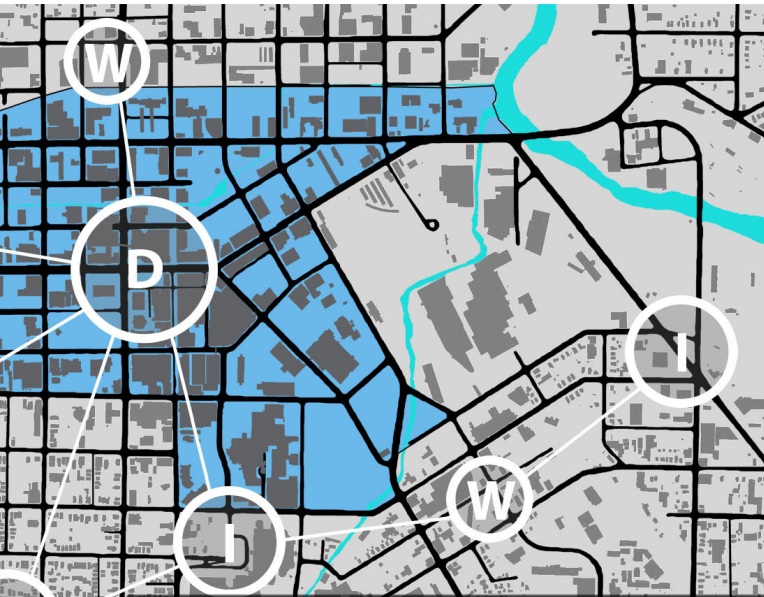
**INCREMENTAL PLAN TO
INCREASE PUBLIC TRANSPORTATION**

STEP I
Build designated bike routes on main roads
Install bike racks in public areas and downtown businesses
Increase awareness of alternative modes of transportation

STEP II
Increase efficiency of bus routes
Increase visibility of bus routes
Associate bus with route through color, shape, or both.

STEP III
Integrate bus with bike
Install bike storage and rental at ALL bus stops
Create Destination stops with shower facilities and other
attractions, along with a parking garage if applicable.

This diagram shows the main idea of how I want the bus stops and bike racks to work. By providing waypoints and destinations that have quick access to bike rentals and bike storage facilities it will give people smaller distances to travel between and hopefully make their perception of the distance from starting point to final destination more ennjoyable.

SITE PLAN

One of the main ideas behind
this project was to connect the
existing pedestrian mall located
to the east of the site, to
Bronson Park located to the west
southwest of the site.
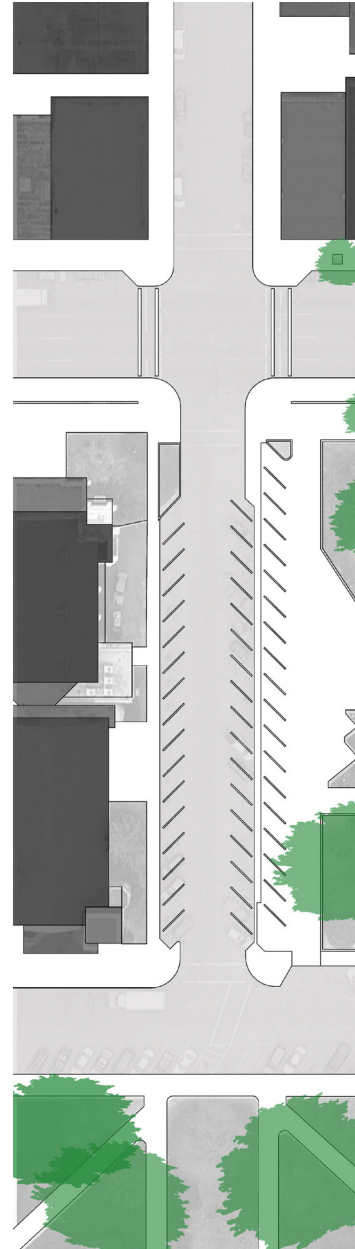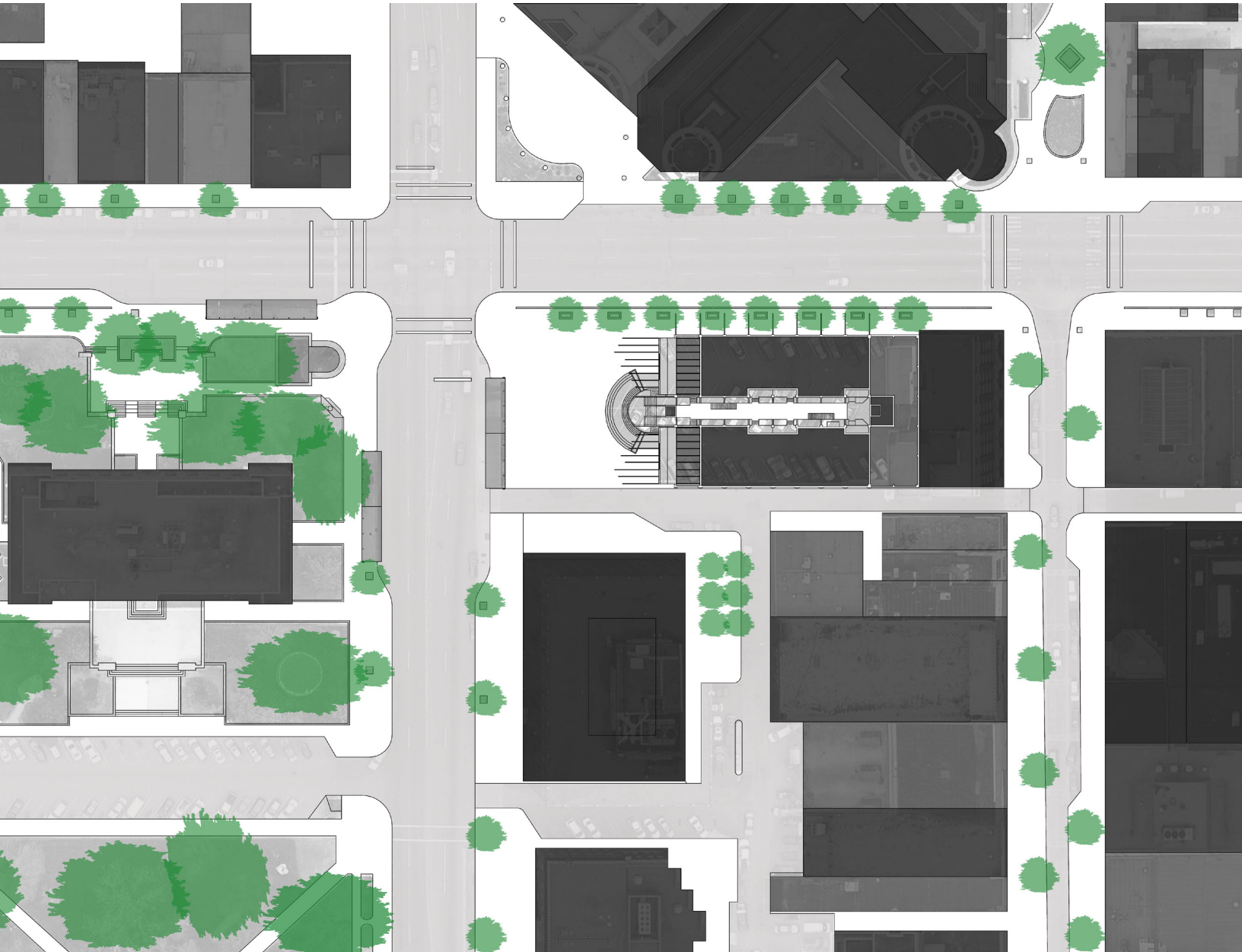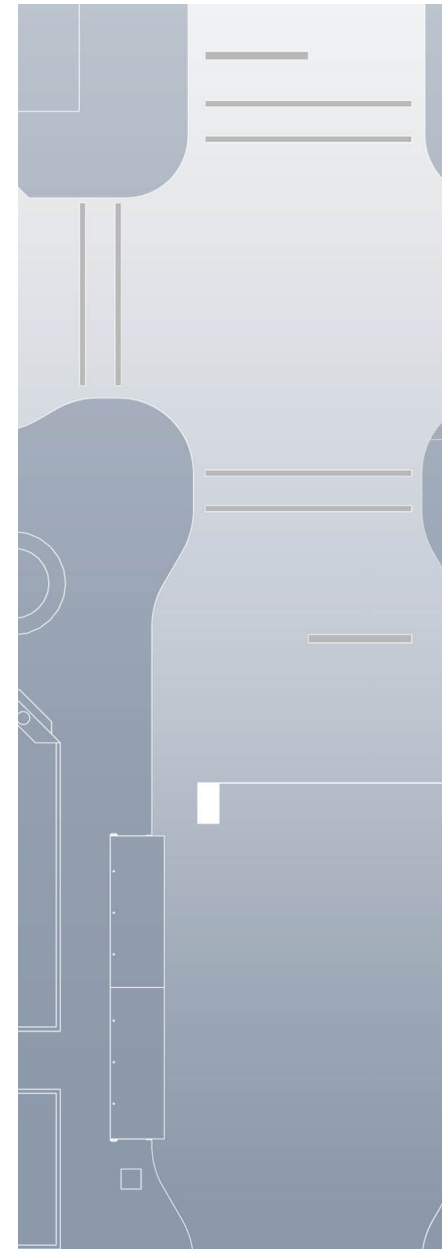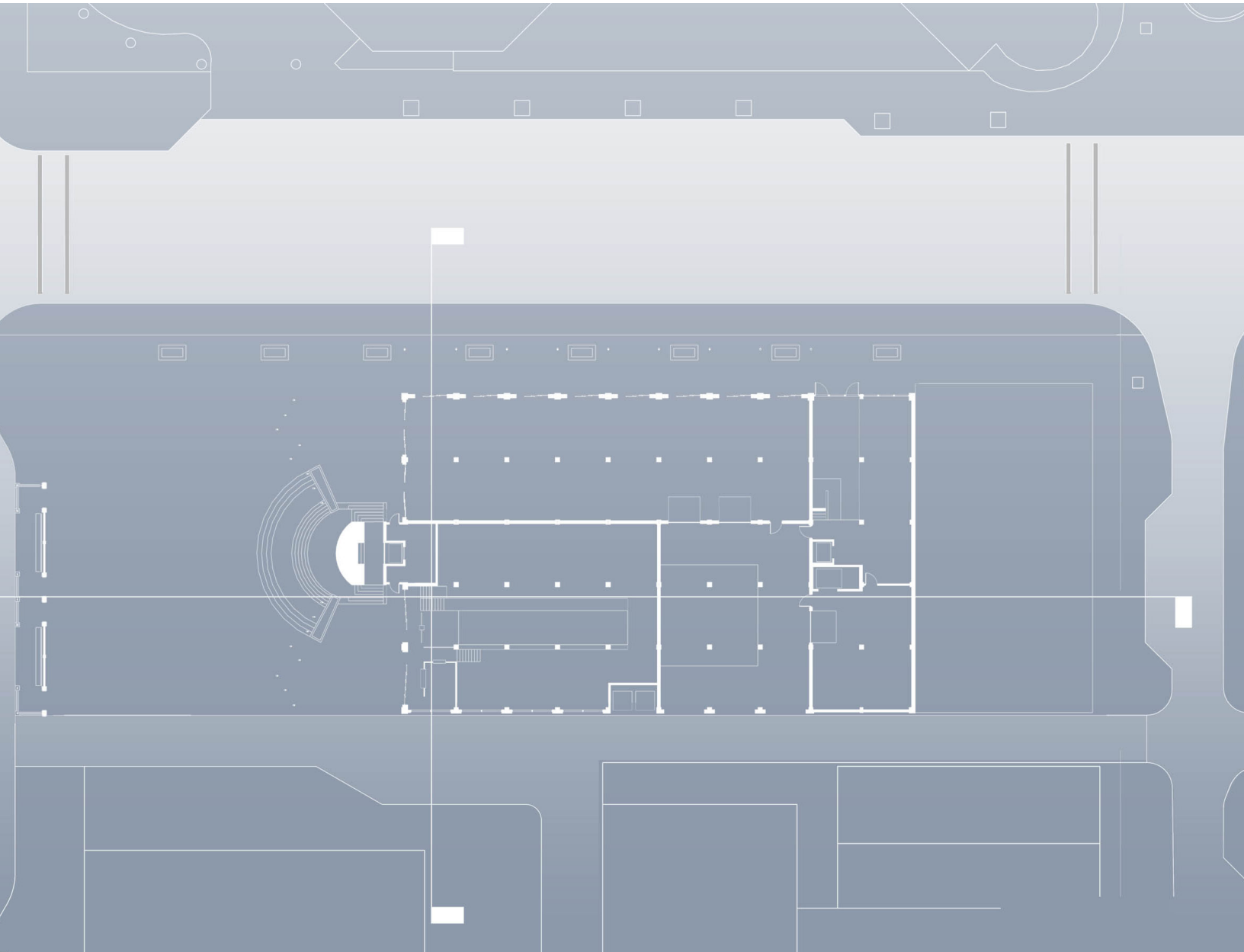
FIRST FLOOR PLANS

Program
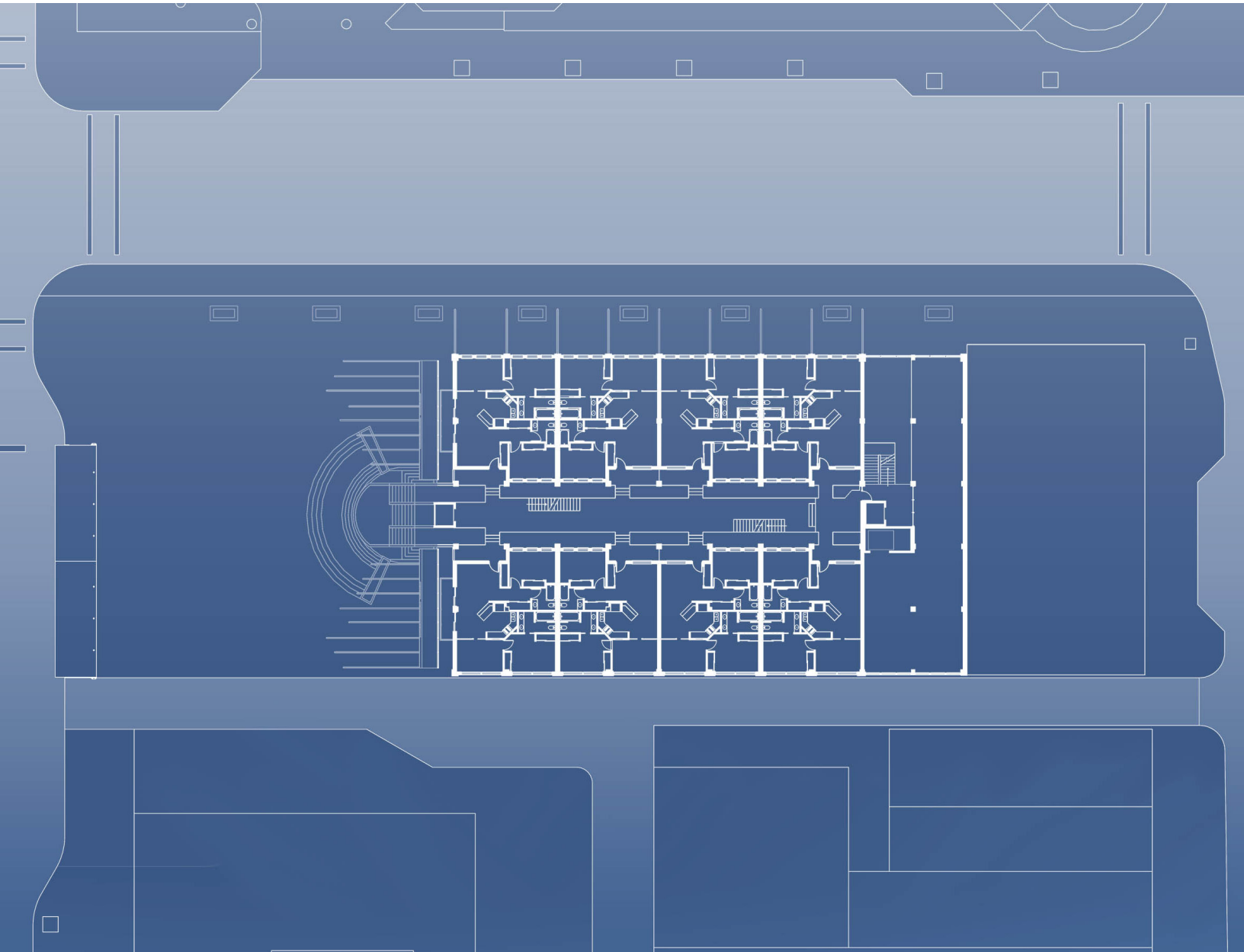
Food Market -   4,775 sq ft

Bike Storage -   4,300 sq ft

        2nd -   1,800 sq ft
      Bathrooms and shower -
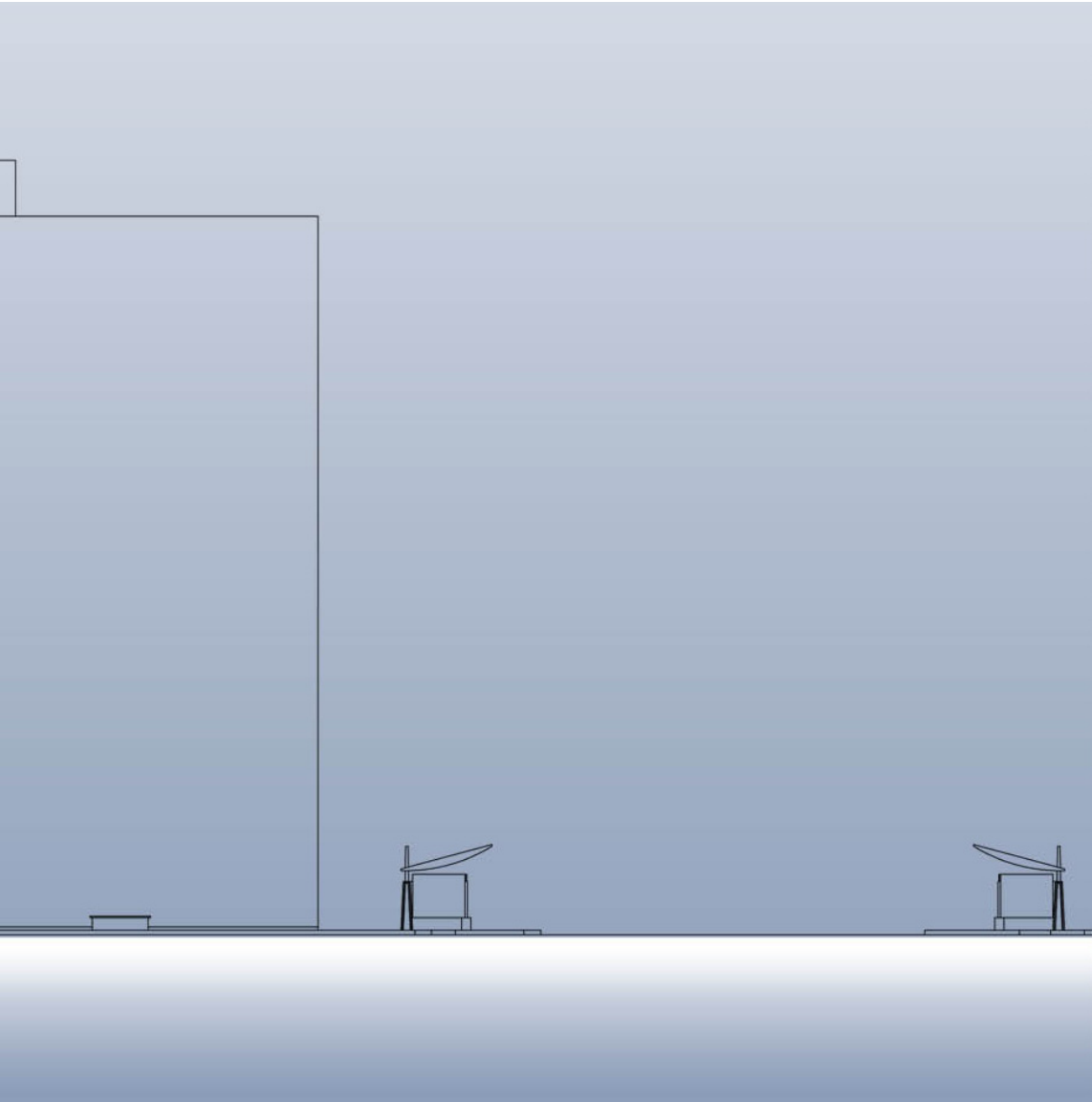   1,800 sq ft
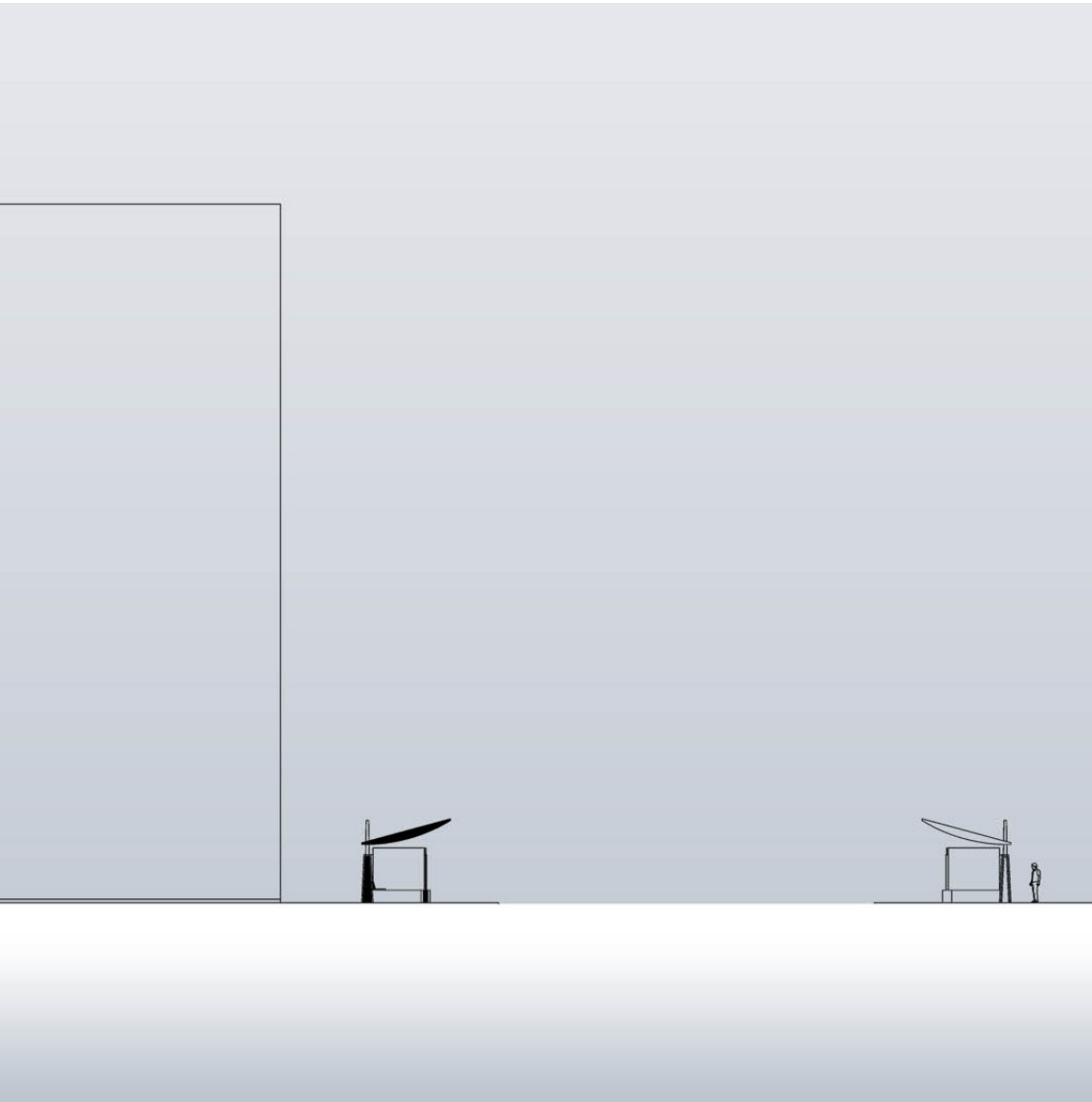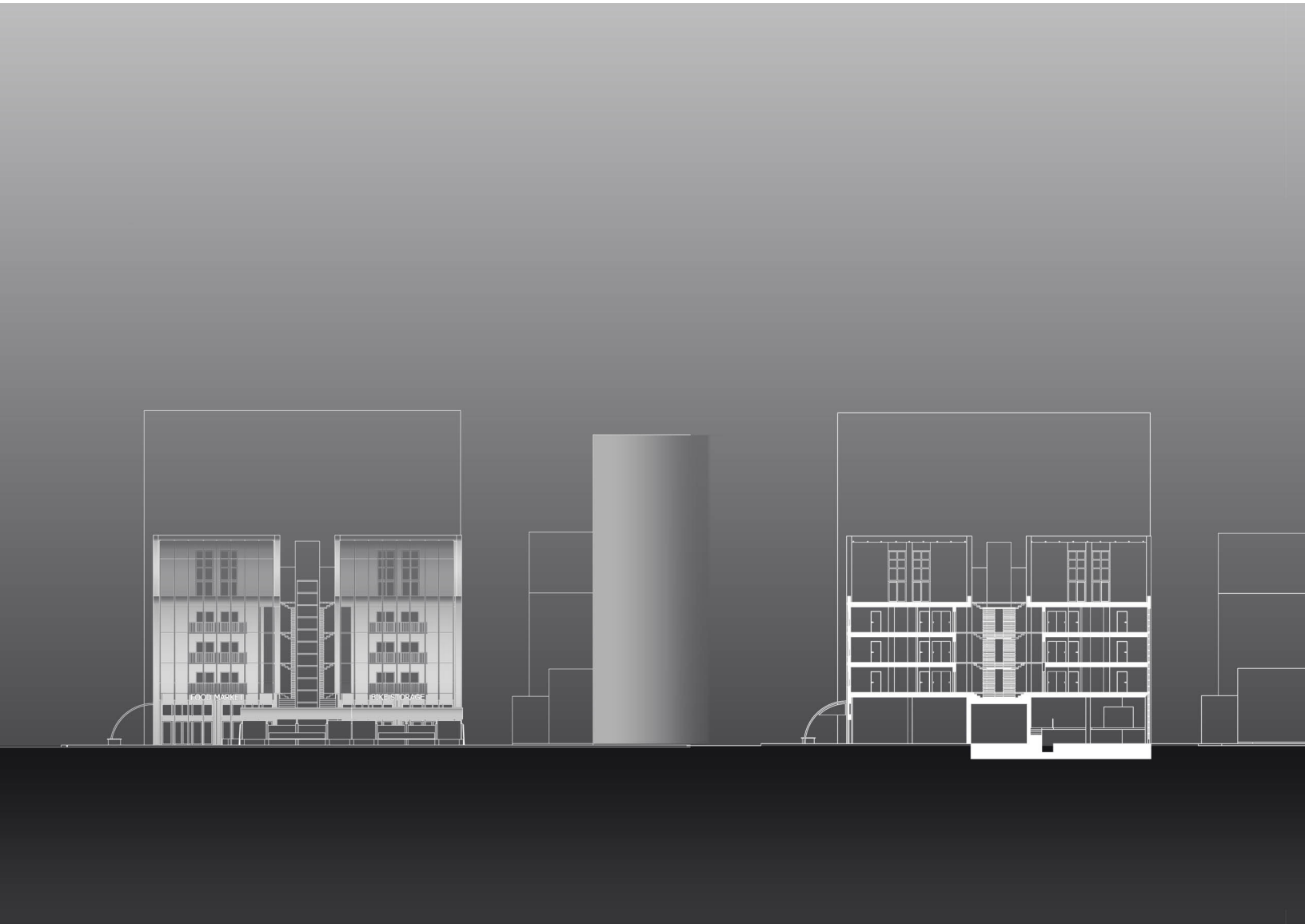
Retail Space   3,000sq ft

SECOND FLOOR PLAN

WEST SECTION + ELEVATION

Conclusion

This project can be interpretted many different ways and to some it may look like there is no real solution. Others still, may be able to dream a little more and envision a solution for themselves with this project as their starting point. Transportation is a really big issue that we as nation, state, and city need to address and soon. If mass transit is ever going to take root then it needs to be promoted as a new way not just an old way to move around the city. and there need to be adaquate facilities to support and promote the system.

When beginning to address transportation issues in small cities like Kalamazoo or even smaller you need to start small. Visible, designated space for Bikes only on the roads and or sidewalks will create a constant presence and promotion for the alternative means of transportation. Designated space, along with proper facilities and concideration for the bicyclist, will go a long way in promoting that mode of transit. And with that mode of transportation acting as a suplimental system, a bus or lightrail transit system will be able to opperate that much more effeciantly.

By creating destinations at major intersections for all systems and building plcaes of interest we can draw people to those lcations more easily in hopes that they will use those systems to get there.

Bibliography
From paper- Destination:Building a Foundation for Mass Transit

1.   Fotsch, Paul Mason. Watching the Traffic Go By.
        1st ed. Austin, TX : University of Texas Press, 2007. Print.

2.   Lynch, Kevin. The Image of The City. 14th ed.
        Cambridge, MA: M.I.T. Press, 1977. Print.

3.   Kostoff, Spiro. The City Shaped.
        London : Bulfinch Press, 1991. Print.

4.   Slater, Rodney E. The National Highway System: A Commitment to America's Future.
        http://www.tfhrc.gov/pubrds/spring96/p96sp2.htm