CONTEXTUAL TRANSIT

JEFFREY PERRY
MASTERS OF ARCHITECTURE
THE UNIVERSITY OF DETROIT MERCY
SCHOOL OF ARCHITECTURE
ARCH 5100, 5110, 5200 AND 5210
WILL WITTIG, ASSOCIATE PROFESSOR
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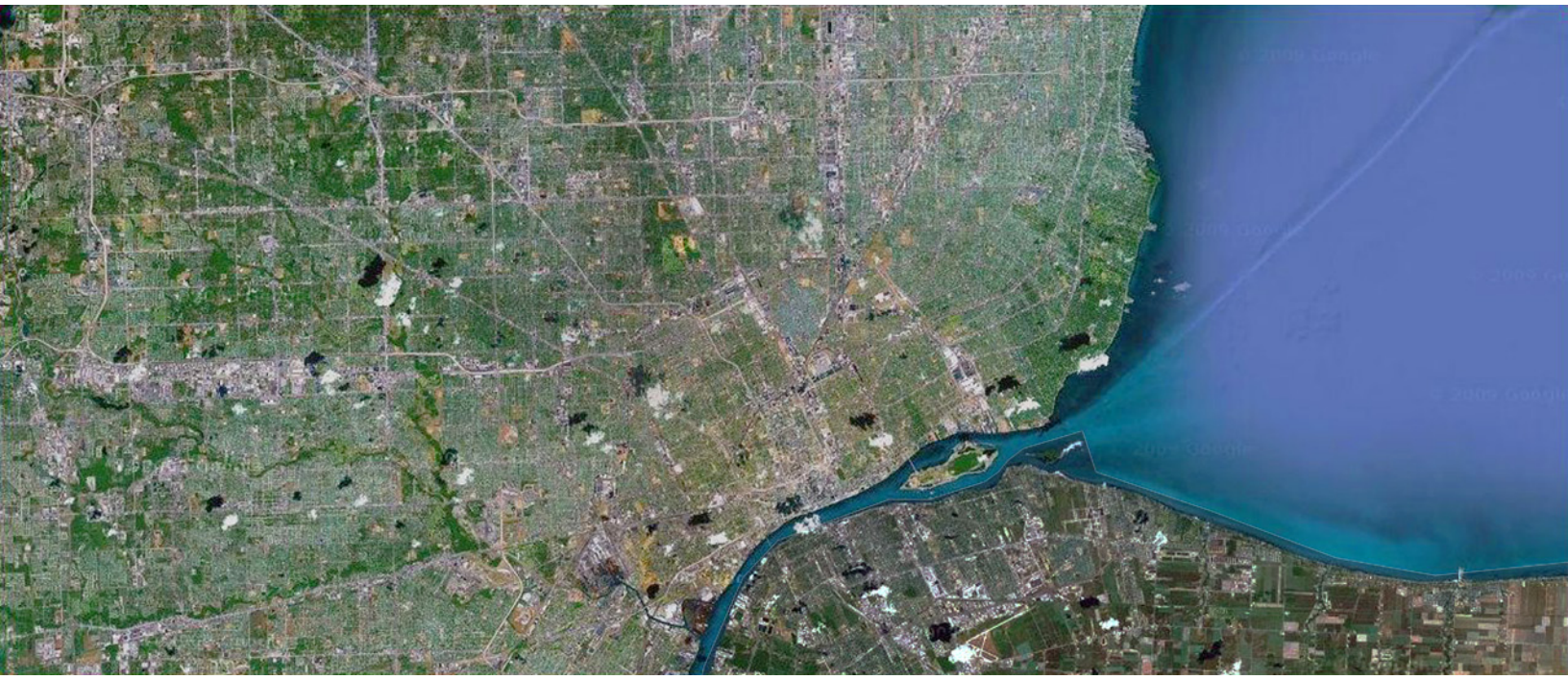
Abstract

Over the last one hundred years Detroit has risen to become one of the most populated cities in American with the help of the automobile industry and has since become a deteriorating city losing population constantly as the "Big Three" try to reestablish themselves. Since the first rejection of a subway system that occurred in the early 1920's and the abandonment of the surface trolley system in the 1950's the city has been struggling to implement an efficient way of travel throughout the city. Currently people only have three ways to get from point A to point B: by using human power, taking an untimely bus, or driving a car. The problem is that a good majority of the population in Detroit do not have their own means of transportation, and with the cutting of the current bus lines citizens have no way of traveling around this once great city. Fortunately, a plan is in place to begin the process of bringing mass transit back to the city of Detroit. The first stage is the M-1 rail, a light rail system that will begin at Hart Plaza and continue north 3.4 miles along Woodward Avenue to the New Center. Future additions of the line will eventually continue out to Pontiac. Future lines of an expanded transit system following Gratiot, Grand River, Warren and Jefferson Avenue are being considered as well as a possible commuter lines connecting the city of Detroit with the cities of Ann Arbor, Pontiac, Port Huron and Toledo. This development of transit is important to the resurrection of Detroit. There are some key factors that need to be considered when developing the stations along these lines, such as the user group of the stations, the needs of local residents, and above all security. In order to start this recovery the city will need to attract people back into Detroit, while also responding to key needs of it's citizens. So the question is whether Detroit, which is in such a state of disarray, can afford for these transit stations to just be a basic shelter that only serves as part of the infrastructure system? In order for these stations to fulfill their potential value to the city, each station should become its own destination. By doing so, not only would the building fulfill the basic requirements for mass transit, getting people from point A to point B safely and effectively, but the major capital investment at each station could also be seen as an opportunity to create a network of destinations that respond carefully to the neighborhoods within which they are located. Each station will have a different context so integrating it into the neighborhood will be of great importance. In order for the stations to become successful destinations the sense of arrival must be present. If the rider does not feel that they have completed their journey the sensation that the station is also a destination will be lost.

Each of these stations is responsible for facilitating the transfer the passengers from point A to point B safely and effectively, but the goal of each station is to encourage a second wave of development. In order to spark this second wave there is a need for these stations to respond to their immediate surroundings. The reason for this is to allow citizens to experience the city and the characteristics of its surroundings. This balance between the larger system and the local surroundings is of great importance because if either goal is unfulfilled the stations will not function as intended.



Aerial view of Detroit and surrounding suburbs

Thesis Paper

With the addition of an effective and efficient form of mass transit the city of Detroit will be able to promote new economic growth, while also catering to its citizens and the surrounding suburbs. The city of Detroit is currently in a state of economic emergency. With rising deficits Detroit has had to lay off of city workers and provide minimal services for its citizens. Among the city services that are comprised is the city's bus system which has recently been reduced to prevent the growth of this deficit.

At its peak Detroit held a massive population of approximately 1.8 million citizens with a density of approximately 12.6 thousand people per square mile. Today, the city houses merely nine hundred thousand people, with only about 6.3 thousand people per square mile leaving the city sparse and its density spread out. With the lack of funding available to run the city, services that are offered are hard to get out to the citizens because of the lack of density of the city. This condition coupled with the fact that the state of Michigan is also experiencing a recession leads to the need to revitalize the city of Detroit. Without a large city's support the state will have no chance for recovery.

Among other problems with the city, there has been a lack of connection between the city and its surrounding suburbs. People from the suburbs do not travel to the city to spend the day, but rather come to the city for a specific event and then return back to their respective suburb. Introducing a form of mass transit in the city would create new opportunities for the city to grow. One of the many opportunities that would be created is the chance to keep visitors in the city. Rather than spending only a few hours to see a baseball, hockey, or football game visitors would be more apt to stay within the cities boundaries. Suburbanites who usually commute to the city daily or Detroiters who commute to the suburbs daily could also utilize this economically friendly and efficient mode of transportation. This would help decongest other forms of transportation such as freeways allowing for a potentially safer and timelier way of traveling. Also, more people would consider living in the city. This would develop more movement through out Detroit and opportunities for new businesses along the newly developed paths. Given that some of the key areas of the city such as Downtown, Corktown, and Midtown are geographically separated there becomes a need for connectivity to allow the city to thrive and redevelop the core of the city.

Although the city of Detroit has not had a form of mass transportation other then its bus system since 1956, the city actually has a rich history of mass transportation. This began in the early 1860's, when in 1862 the Detroit City Railway was formed and by 1863 the first horse drawn trolley cars began servicing Jefferson Avenue, with Woodward Avenue and Michigan Avenue following suit. All of the lines converged at the intersection of Woodward Avenue and Jefferson Avenue. The horse drawn trolley car service lasted twenty-nine years until the integration of the new electric trolley cars which started service in 1892. The first route to be turned over to electric trolley cars was again Jefferson Avenue followed by Woodward Avenue and Michigan Avenue. The interurban trolley car service from Detroit began to grow, helping to create and serve several suburban areas in the coming years. In 1901

the Detroit United Railway was formed and consolidated several independent interurban operations. Between 1919 and 1920 the first regional transportation plan was prepared by the Detroit Rapid Transit Commission which proposed a multimodal system. Detroit's Mayor James Couzens vetoed a proposed subway system in 1920. In 1922, the city took over the streetcar operations creating the Department of Street Railway. At this point Detroit had the largest municipal owned transit system in the world. The first buses rolled down the city streets for the first time in 1925. In 1931 the Grand Trunk Western Railroad began service from Detroit to Pontiac with trip times as fast as 45 minutes each way. In 1933 the city voters approved a subway plan but the state advisory board refused to recommend construction to the federal government. This was an example of politics getting in the way of the advancement of the mass transit system. The peak year for transit in Detroit was 1945, when there were approximately 492 million riders. Riders had their choice of streetcars, buses or commuter trains during this time period. In 1951, transit took a huge hit in the city as there was a strike lasting nearly two months. Ridership would never recover leading to the streetcar service coming to an end in 1956 after 93 years of service and the last streetcar running down Woodward Avenue.

The years that followed after the dissolving of the streetcar system are filled with only a few key dates in history. Many of the major undertakings involve the changing of names and ownership over the mass transit system. Along with this was the development of the People Mover in 1976, which was constructed at 87 million dollars a mile after President Gerald Ford offered 600 million dollars to build rail transit system in Southeastern Michigan. Due to local and regional politics this was the only project that was developed. In 1997, the Michigan Department of Transportation planed to reestablish the commuter rails from Detroit to Ann Arbor and Pontiac, but the 2 million dollars per mile of track was considered to be too expensive. Recently a new event in Detroit's mass transit history has taken place with plans to establish the M-1 Rail, a light rail system that is intended to run along Woodward Avenue from Heart Plaza 3.4 miles north to the New Center. Also the Southeastern Michigan Council of Governments (SEMCOG) has received earmarks from federal funding to help finance the Ann Arbor to Detroit commuter rail service.

An analogous architectural situation are chain franchises which have become predominate in today's culture and generally lack a sense of local identity. This can be seen in the Starbucks, McDonalds and Pizza Huts of the world. If one was to analyze a set of sixteen chain franchise storefronts one would come to realize that the location of each store would be unknown. These buildings do not display any form of information to convey exactly where the store is located. This is what creates this lack of regional or local identity, one can identify which chain franchise the building belongs to but it is typically impossible to tell what type of context the building is located in. The fact that one could walk down the street and see a building with green awnings and logo or a giant yellow M can help the consumer recognize the services that are being offered, but this lack of response to local context affects

how people and how they experience a place. How can someone experience a place when all of the places are the same?

This thesis is exploring how a building that is primarily part of a larger infrastructure system can respond to the local conditions. For this exploration light rail stations in the city of Detroit will be utilized as the subject. In addition to the station responding well to the local conditions, there is a second goal of incorporating secondary programs to further demonstrate the character of each location. This allows for the stations to act as themselves not just a point of transfer.

In order to do this type of exploration a stage must be set to enable one to fully explore the question at hand. A future SEMCOG plan for mass transportation in Detroit projected for 2050 (with some logical alterations) will be used as the context to design several stations in very different conditions. The use of this future plan will also allow the project to simulate the process of designing a number of stations that would have to be inserted into the already existing fabric.

In the recent past train stations have replicated the appeal of an airport; long corridors and commercial concourses in places that are out of the way. These stations were pretty much the same from one city to the next. This idea is elucidated in David Mouffat's article entitled "The Art of Modern Transit Station Design." He states that "Even where the designs of individual terminals might incorporate engineering excellence and the latest in architectural materials, they often spoke more of a new international uniformity of experience and expectation than any distinct sense of local pride or identity."[1] This statement supports the fact that stations in the recent past have chosen to excite people over the latest and greatest inventions rather then instilling the experience of a place that has its own identity. This lack of identity takes away from the experience of arriving and leaving into a city, not expressing the gateway the stations are supposed to be.

When speaking of how current stations should be design Mouffat states that, "Good stations need transparent, functional simplicity, and they need to integrate well into the urban fabric. He then continues on discussing certain TGV stations that have incorporated all or some of these criteria. Two examples cited are the Montparnasse station and the Avignon station which are both done by AREP. The Montparnasse station focused on opening up spaces to allow the patrons to know where they are going. This was done by cutting away the floors to open up spaces. The Avignon station deals with the harsh wind and heat of the Rhone Valley with double curved roofs allowing protection for the passengers from the elements. The station also incorporates a waiting area located on an indoor mezzanine that allows passengers to utilize a numbering system that aligns with the train cars to allow for easy access from inside the station.

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1 Moffat, David. (2004). The Art of Modern Transit Station Design [Dispatches].Places, 16(3)

The Stadelhofen Station in Zurich, Switzerland by Santiago Calatrava is another modern station that is designed closely to the criteria previously mentioned by Mouffat. Calatrava's challenge was to add a third track into an already existing station that rounded a hillside. The design involved excavating the existing hillside and then building the hillside back with a multileveled structure that restores the original walkways and banks while also leaving the station open with a naturally lit platform underneath the new track. The station, which is hidden from view as one approaches from the town center, offers surprising variety of perspectives of the city. This allows the rider to experiencing the city in a new and exciting ways.

In Arthur Schurr's article "Innovative Station Designs: Practical Makes Perfect," he explores a different set of criteria that modern stations must meet. With the use of a quote from Kenneth Griffin he explains that there are three key issues that modern stations need to consider. These issues include working more efficiently, creating meaningful station innovations and doing a better job of linking stations to the adjacent communities. When speaking of working more efficiently Griffin is talking about the use of more energy efficient developments. Schurr mentions the use of escalators that have a sleep mode and also regenerative braking to capture lost energy. When talking about innovation Schurr states, "For pure station innovation, there's a nexus between cleaner, more environmentally friendly designs that are also more secure. In strategic terms, that means lighter, more transparent structures, more natural light, better sight lines and a notably more minimalist look."[1] Stations must account for their environment impact, although trains are more environmentally friendly then other forms of transportation. All of these issues are important to tackle when designing stations, although one key issue that is not mentioned is security. In today's world, security is of one of the most important issues involved in public transportation and needs to be considered when designing public modes of transportation. Schurr also discusses how stations are employing ideas from the airline industry to promote the use of rails as a form of transit. An example of this is the fact that stations in Europe and Asia are now offering car rental services making the use of trains more appealing and efficient. This idea of incorporating car rental services leads the conversation to the second goal of this thesis.

The second goal of this thesis is to incorporate secondary programs to help demonstrate the character of each station's location and to help spark a second wave of development. Stations have the ability to extend and connect the life of the street by tying in secondary programs that are complementary to the existing urban fabric. In areas that include significant retail use, an ideal situation would be to allow for retail space to flow inside the station. This sets up a gateway into the city, introducing the rider to the areas characteristics as soon as he or she steps off the train. By adding secondary programs like the

1 Schurr, Author. (2005). Innovative Station Designs: Practical Makes Perfect. Mass Transit

previously mentioned retail space, this helps to establish the station itself as a new destination instead of just a transfer point. Local residents will set out to go to the station for other reasons than to use the mass transportation, which can be key in redeveloping areas that are in need of attention. With these secondary programs, more people will be brought to the station on a more regular basis; this in turn will help a second wave of development. Businesses spring up where they are needed; when more people are in a dense space there is a need to serve these people. In turn new developments will occur in an attempt to serve the consumers. An example of a station that incorporates secondary programs is the Tower City Station in Cleveland, Ohio. The station is located in the middle of the Tower City Station allowing access to the central shopping corridor during operational hours of the transit. Other secondary programs include the walkways that connect the station to the local sports arenas. A passenger can ride the trains to the Tower City Station and use the skywalk to reach the Quicken Loans Arena and Progressive Field without ever stepping foot outside.

Although transit stations need to be unique to the area where they are located, they also have to display some sort of identity that is recognizable to the general public. Each station will need to have the basic programming involved with transit stations. This includes but is not limited to waiting platforms, fare gates, and operator booths. It is important that all of these programs at least resemble each other to help prevent confusion for the patrons. An example of this can be witnessed in the M-1 Rail system that is currently in the development process. The overall theme of these stations is that each is to be designed off of the simple geometry of a cube. This cube is to be in the form of a tower that will help patrons notice the location of each of these stations. The ticketing booths are to be located within the wall of the cube like tower of theses stations allowing the patrons to recognize the process involved with the light rail system.

A train station is part of a larger infrastructure system, that is important to the ciy as a whole, and yet the way in which a station responds to local conditions is equally important in modern transit station design. It is the intent of this thesis to thoroughly explore this idea and prove that secondary programs can help incorporate these buildings into the already existing fabric.

Brief History of Detroit

In 1701, the French officer Antoine de la Mothe Cadillac, along with fifty-one additional French-Canadians, founded a settlement called Fort Ponchartrain du Détroit. France offered free land to attract families to Detroit, which grew to 800 people in 1765.[1] The region's fur trade was an important economic activity. Francois Marie Picoté, sieur de Belestre was the last French military commander at Fort Detroit surrendering the fort on November 29, 1760 to the British. After taking control of the fort British troops shortened the name to Detroit. Detroit passed to the United States under the Jay Treaty (1796). In 1805, fire destroyed most of the settlement. A river warehouse and brick chimneys of the wooden homes were the sole structures to survive.

From 1805 to 1847, Detroit was the capital of Michigan. As the city expanded, the street layout plan developed by Augustus B. Woodward, Chief Justice of the Michigan Territory was followed. Detroit fell to British troops during the War of 1812 in the Siege of Detroit and was recaptured by the United States in 1813 and incorporated as a city in 1815.[2]

Prior to the American Civil War, the city's access to the Canadian border made it a key stop along the underground railroad.[3] During the late 1800s and early 1900s, many of the city's Gilded Age mansions and buildings arose. Detroit was referred to as the Paris of the West for its architecture, and for Washington Boulevard, recently electrified by Thomas Edison. Strategically located along the Great Lakes waterway, Detroit emerged as a transportation hub. The city had grown steadily from the 1830s with the rise of shipping, shipbuilding, and manufacturing industries. In 1896, a thriving carriage trade prompted Henry Ford to build his first automobile in a rented workshop on Mack Avenue. In 1904 he founded the Ford Motor Company. Ford's manufacturing and those of automotive pioneers William C. Durant, the Dodge brothers, Packard, and Walter Chrysler reinforced Detroit's status as the world's automotive capital.[2]

With the introduction of Prohibition, smugglers used the river as a major conduit for Canadian spirits, organized in large part by the notorious Purple Gang.[4] Labor strife climaxed in the 1930s when the United Auto Workers became involved in bitter disputes with Detroit's auto manufacturers. The labor activism of those years brought notoriety to union leaders such as Jimmy Hoffa and Walter Reuther. The 1940s saw the construction of the world's first urban depressed freeway, the Davison and the industrial growth during World War II that led to Detroit's nickname as the Arsenal of Democracy.[5]

Industry spurred growth during the first half of the twentieth century as the city drew tens of thousands of new residents, particularly workers from the Southern United States, to

1 French Ontario in the 17th and 18th Centuries - Detroit, http://www.archives.gov.on.ca/ENGLISH/exhibits/franco_ontarian/detroit.htm, Archives of Ontario, July 14, 2008, accessed october 23, 2009

2 Woodford, Arthur M. (2001). This is Detroit: 1701–2001. Wayne State University Press

3 Blockson, Charles and Chase, Henry (April 2005). Detroit - Follow the North Star, The Guiding Light of the Underground Railroad. "American Visions."

4 Nolan, Jenny (June 15, 1999).How Prohibition made Detroit a bootlegger's dream town. Michigan History, The Detroit News. Retrieved on October 23, 2009.

5 Nolan, Jenny (January 28, 1997).Willow Run and the Arsenal of Democracy. Michigan History, The Detroit News. Retrieved on October 23, 2009.

become the nation's fourth largest city. At the same time, tens of thousands of European immigrants poured into the city. Social tensions rose with the rapid pace of growth. The color blind promotion policies of the auto plants resulted in racial tension that erupted into a full-scale riot in 1943.[1]

Consolidation during the 1950s, especially in the automobile sector, increased competition for jobs. An extensive freeway system constructed in the 1950s and 1960s had facilitated commuting. The Twelfth Street riot in 1967, as well as court-ordered busing, accelerated white flight from the city. Commensurate with the shift of population and jobs to its suburbs, the city's tax base eroded. In the years following, Detroit's population fell from a peak of roughly 1.8 million in 1950 to less than half that number today.

Renaissance has been a perennial buzzword among city leaders, reinforced by the construction of the Renaissance Center in the late 1970s. This complex of skyscrapers, designed as a city within a city, slowed but was unable to reverse the trend of businesses leaving Downtown Detroit until the 1990s.

In 1980, Detroit hosted the Republican National Convention which nominated Ronald Reagan to a successful bid for President of the United States. By then, nearly three decades of crime, drug addiction, and inadequate policies had caused areas like the Elmhurst block to decay. During the 1980s, abandoned structures were demolished to reduce havens for drug dealers with sizable tracts of land reverted to a form of urban prairie.[2]

In the 1990s, the city began to receive a revival with much of it centered in Downtown Detroit. Comerica Tower at Detroit Center (1993) arose on the city skyline. In the ensuing years, three casinos opened in Detroit: MGM Grand Detroit, MotorCity Casino, and Greektown Casino which debuted as resorts in 2007-08. New downtown stadiums were constructed for the Detroit Tigers and Detroit Lions in 2000 and 2002, respectively; this put the Lions' home stadium in the city proper for the first time since 1974.The city also saw the historic Book Cadillac Hotel hotel and the Fort Shelby Hotel reopen for the first time in over 20 years. The city hosted the 2005 MLB All-Star Game, 2006 Super Bowl XL, 2006 World Series and the NCAA Final Four in April 2009 all of which prompted many improvements to the downtown area.

The city's riverfront is the focus of much development following the example of Windsor, Ontario which began its waterfront parkland conversion in the 1990s. In 2007, the first portions of the Detroit River Walk were laid, including miles of parks and fountains. This new urban development in Detroit is a mainstay in the city's plan to enhance its economy through tourism. Along the river, upscale million dollar condominiums are going up, such as Watermark Detroit, some of the most expensive the city has ever seen.

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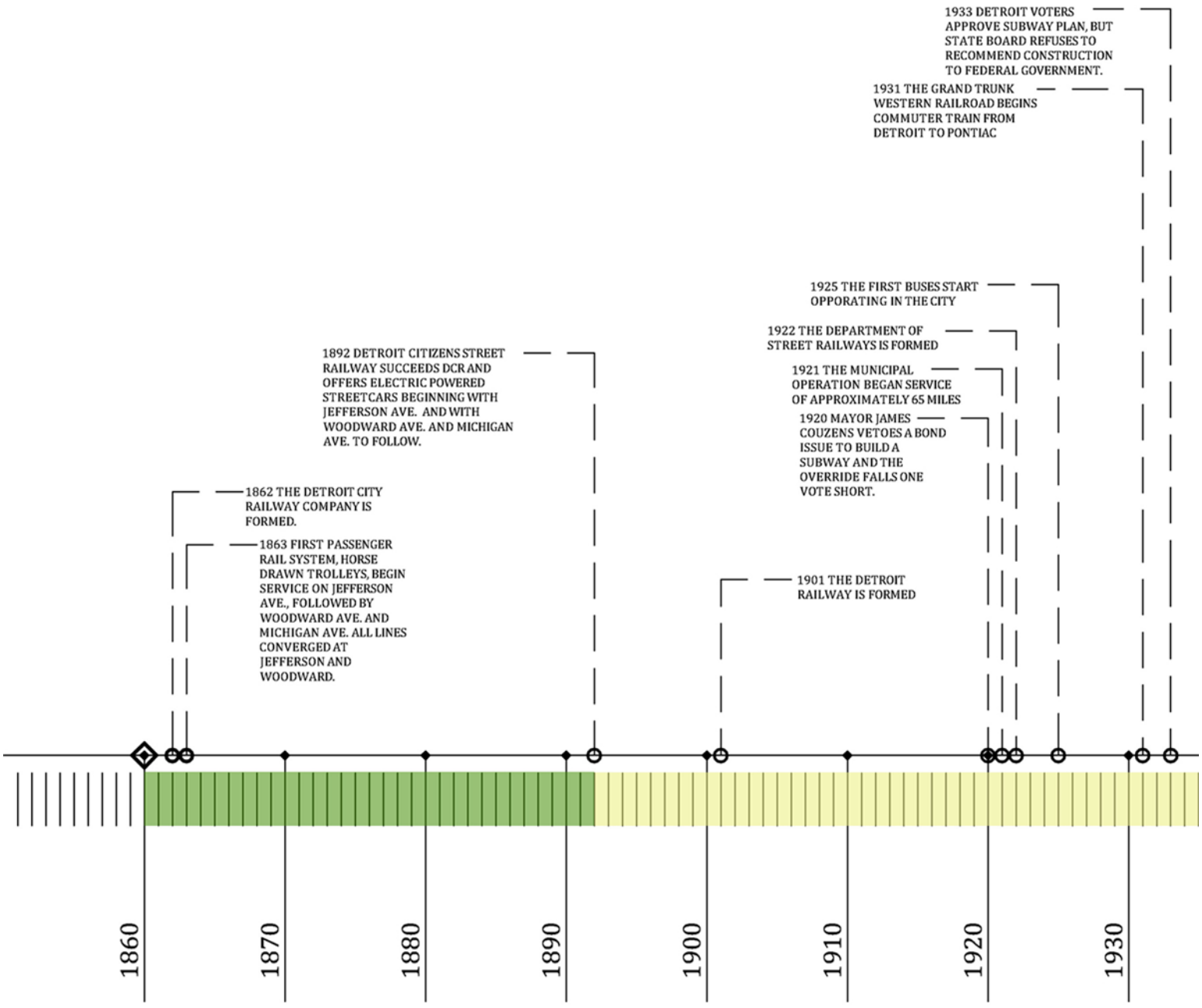
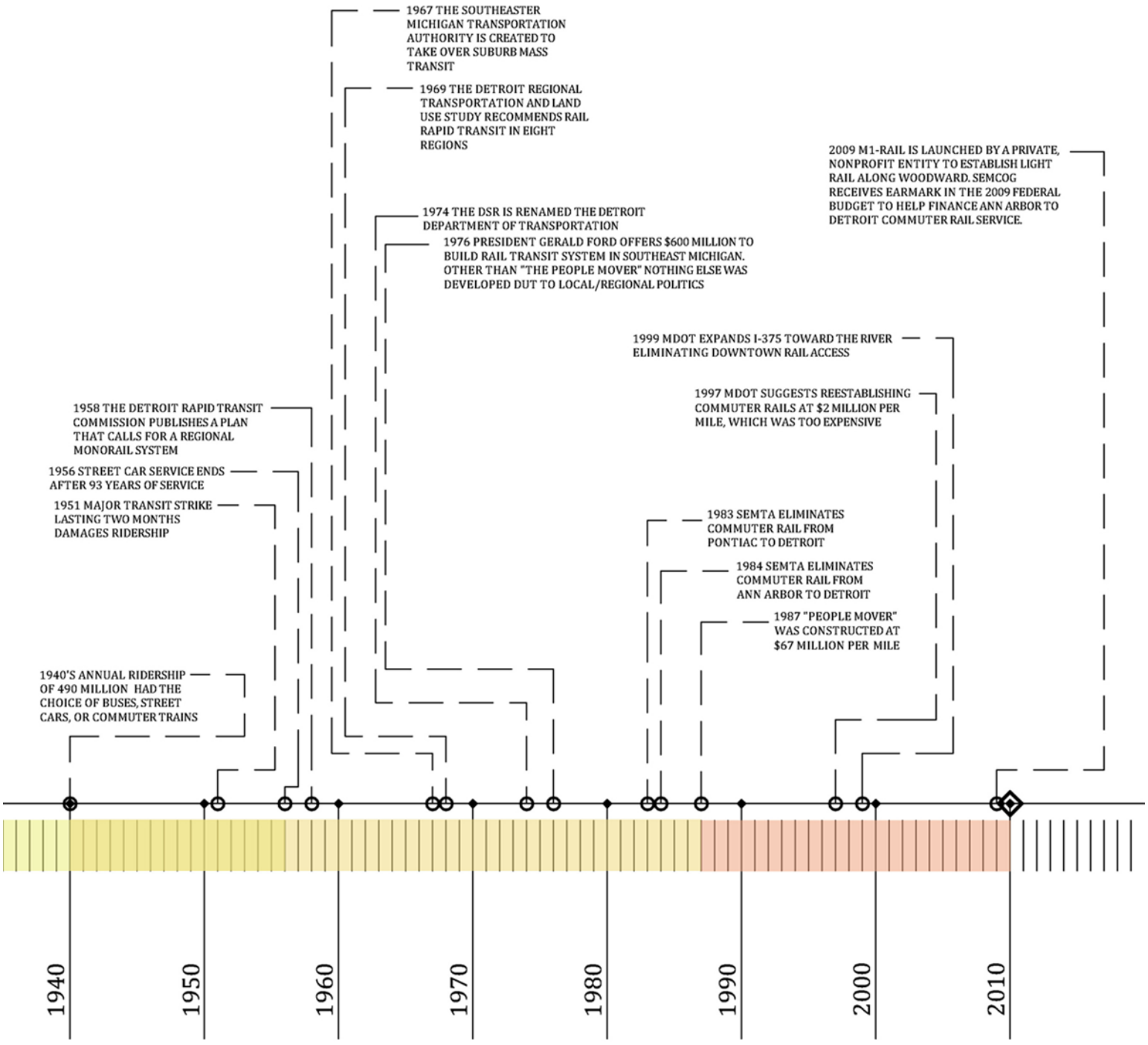
1 Baulch, Vivian M. and Patricia Zacharias (February 11, 1999). 1943 Detroit race riots. Michigan History, The Detroit News Retrieved on Ocotber 23, 2009.

2 Government stuggles with vacant buildings.Detroit News, June 20, 2001.

City of Detroit,Michigan

History of Mass Transit
1860-2010




1967 THE SOUTHEASTER MICHIGAN TRANSPORTATION AUTHORITY IS CREATED TO TAKE OVER SUBURB MASS TRANSIT
1969 THE DETROIT REGIONAL TRANSPORTATION AND LAND USE STUDY RECOMMENDS RAIL RAPID TRANSIT IN EIGHT REGIONS
2009 M1-RAIL IS LAUNCHED BY A PRIVATE, NONPROFIT ENTITY TO ESTABLISH LIGHT RAIL ALONG WOODWARD. SEMCOG RECEIVES EARMARK IN THE 2009 FEDERAL BUDGET TO HELP FINANCE ANN ARBOR TO DETROIT COMMUTER RAIL SERVICE.
1974 THE DSR IS RENAMED THE DETROIT DEPARTMENT OF TRANSPORTATION
1976 PRESIDENT GERALD FORD OFFERS $600 MILLION TO BUILD RAIL TRANSIT SYSTEM IN SOUTHEAST MICHIGAN. OTHER THAN "THE PEOPLE MOVER" NOTHING ELSE WAS DEVELOPED DUT TO LOCAL/REGIONAL POLITICS
1999 MDOT EXPANDS I-375 TOWARD THE RIVER ELIMINATING DOWNTOWN RAIL ACCESS
1997 MDOT SUGGESTS REESTABLISHING COMMUTER RAILS AT $2 MILLION PER MILE, WHICH WAS TOO EXPENSIVE
1958 THE DETROIT RAPID TRANSIT COMMISSION PUBLISHES A PLAN THAT CALLS FOR A REGIONAL MONORAIL SYSTEM
1956 STREET CAR SERVICE ENDS AFTER 93 YEARS OF SERVICE
1951 MAJOR TRANSIT STRIKE LASTING TWO MONTHS DAMAGES RIDERSHIP
1983 SEMTA ELIMINATES COMMUTER RAIL FROM PONTIAC TO DETROIT
1984 SEMTA ELIMINATES COMMUTER RAIL FROM ANN ARBOR TO DETROIT
1987 "PEOPLE MOVER" WAS CONSTRUCTED AT $67 MILLION PER MILE
1940'S ANNUAL RIDERSHIP OF 490 MILLION HAD THE CHOICE OF BUSES, STREET CARS, OR COMMUTER TRAINS
1940
1950
1960
1970
1980
1990
2000
2010

Chicago Transit Authority

The 'L' is the rapid transit system serving the city of Chicago and some of its surrounding suburbs. It is operated by the Chicago Transit Authority (CTA). It is the second largest rapid transit system in the United States, after the New York City Subway, and the third busiest rail mass transit system in the United States. Chicago's 'L' is one of only four heavy-rail subway systems in the United States that provide 24-hour service on at least some portions of their systems. The oldest section of the 'L' started operating in 1892, making it the second-oldest rapid transit system in the Americas after New York. The 'L' has been credited with helping create the densely built-up city core that is one of Chicago's distinguishing features.[1]

The 'L' consists of eight rapid transit lines laid out in a spoke-hub distribution paradigm focusing transit toward a central loop. Although the 'L' gained its nickname because large parts of the system are elevated,[2] only 56.4 miles of the 106.1-mile system is elevated. Of the remainder, 35 miles of it are at grade, and 11.4 miles are underground.

On average 658,524 people ride the 'L' each weekday, 419,258 each Saturday, and 315,240 each Sunday.[3] Annual ridership for 2006 was 195.2 million, the highest since 1993. However, the CTA multiplies actual riders by roughly 1.2 to count riders who transfer between lines, putting the total number of riders at about 162.7 million. In a 2005 poll, Chicago Tribune readers voted it one of the "seven wonders of Chicago,"behind the lakefront and Wrigley Field but ahead of Willis Tower, the Water Tower, the University of Chicago, and the Museum of Science and Industry.[4]

While visiting Chicago and utilizing the 'L' it become evident that the system itself is effective and efficient at getting patrons from point A to point B, but none of the stations take into consideration the context in which it is located. One problem I found with the designs of these stations is that they are not enclosed except for the stations that are located below ground. Patrons are forced to wait outside in the cold and windy weather; after all it is called the 'Windy City'. With this information it is evident that the design of the stations for this study will need to incorporate some type of enclosure. There only three types of station in the transit system, the underground station, the elevated station, and the road side station. Each of these stations consists only of a long platform that serves the trains going in both directions. Ample space must be considered in the design of these stations; the 'L' stations will be used to determine the size of the platforms for this study.

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1 Cudahy, Destination Loop

2 McClendon, Dennis. ""L"". Encyclopedia of Chicago. Retrieved October 23, 2009.

3 "Rail Ridership by Branch and Entrance: July 2006". Chicago Transit Authority. Retrieved October 22, 2009.

4 Leroux, Charles (2005-09-15). "The People Have Spoken: Here Are the 7 Wonders of Chicago". Chicago Tribune (Tribune Company). Retrieved October 24, 2009.

Typical ‘L’ station platform.

Another long cooridor that was always present in the stations.

Bike station found at one of the stations. Of all the stations that were stopped at this is the only station taht included another mode of transit.

Precedent Study

Stadelhofen Station, Zurich, Switzerland

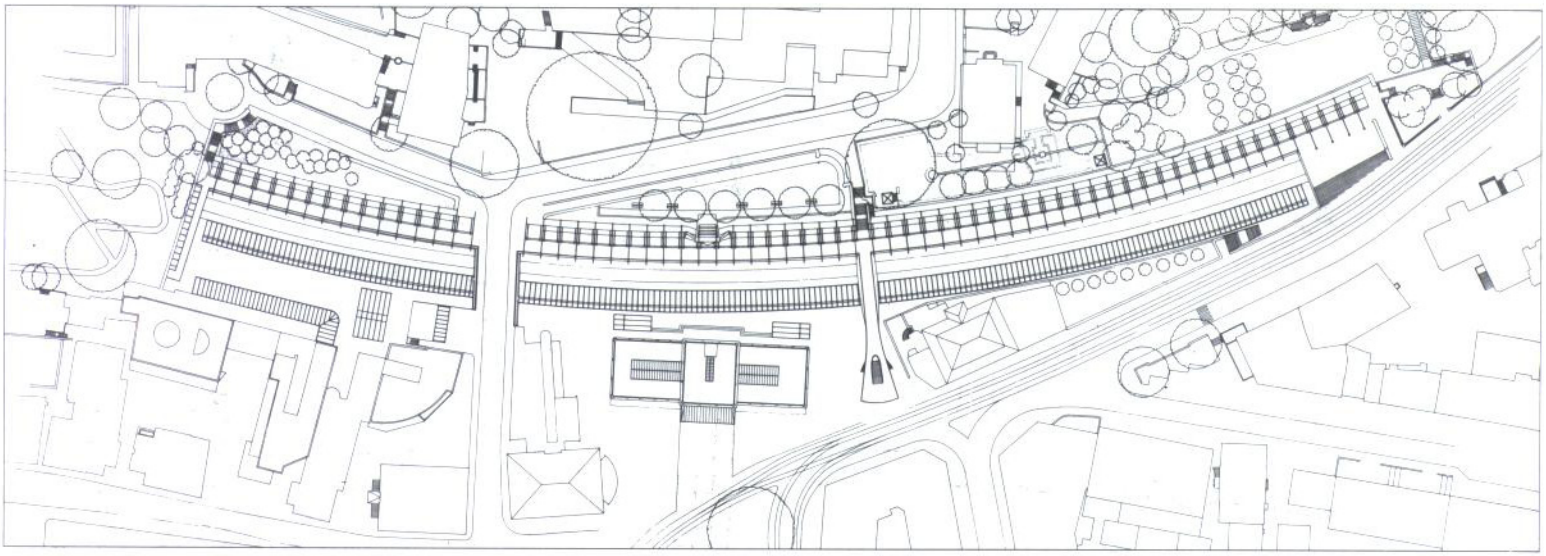
By Santiago Calatrava

The Stadelhofen Station in Zurich, Switzerland was originally built in 1894 and is a major transportation junction for the region. The original design consisted of a 300 meter terminal building that ran along the curved rail line which itself runs along a hillside into the town's center. In 1990, Santiago Calatrava received the commission to add a third track to the already existing train station. His design involved excavating the hillside, building the track and then using the structure as walkways while also replacing the hillside. The structure is made of reinforced concrete and steel used for supports and the roof structure. The addition by Calatrava can be split into four different sections; the train platform, the overhead walkway, the hillside level and the underground arcade. The upper most level on the eastern side of the station was the biggest aspect of Calatrava's design. The entire eastern side's structure is tied into the hillside. By undercutting and redefining the hillside Calatrava created an open platform that allows onlookers an opportunity to view the city in a new light. The underground arcade is full of shops and other attractions. The reinforced concrete beams allow natural lighting through the glass block on the platforms which creates a feeling of openness in an underground district. At each end there are stairs that lead back to the platform level. The most difficult part of designing the new station was the existing terrain. Calatrava had to design the station into the hillside. The plot both slopes and curves along more than one axis. An abrupt change of level from east to west, a gentle incline and then decline from north to south, and a sharp lateral curve in the tracks the whole way across the site add up to a geometrical nightmare or, as it turned out, a series of spatial opportunities.

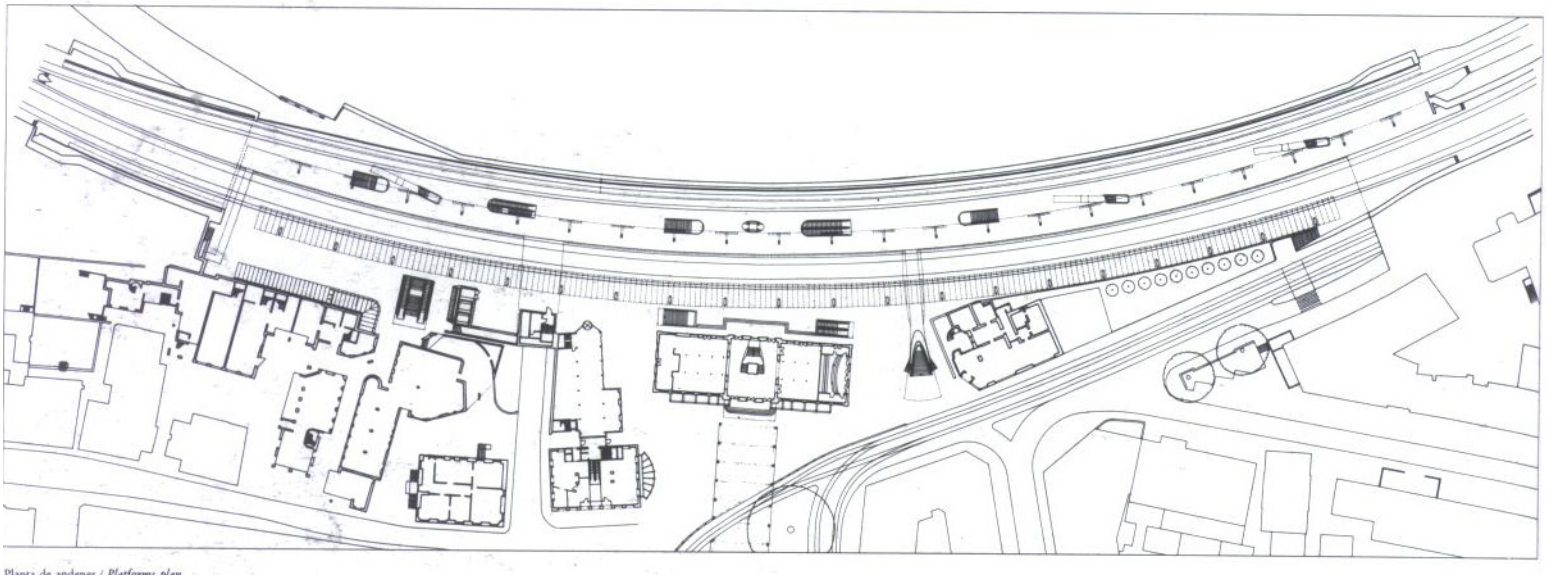
Site Plan

Image of the walking platform.

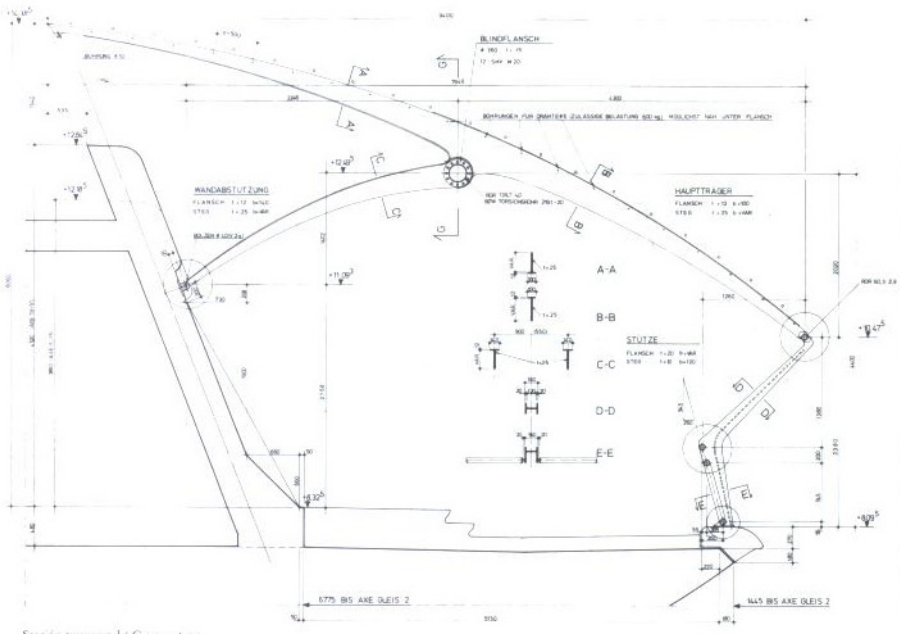
Aerial View of the Stadelhofen Station highlighted in yellow



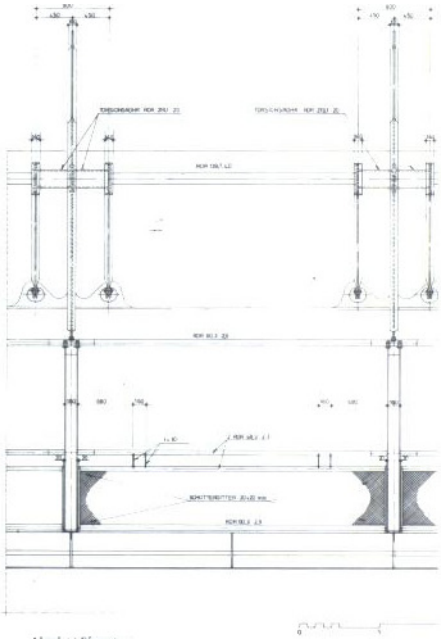
Roof Plan



Platform Plan



Cross Section through walking platform



Roof Plan

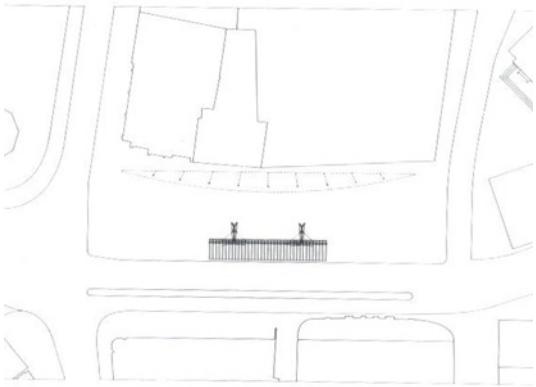
Image of walking platform

Precedent Study

Bus Stop,
St. Gallen, Switzerland
Bt Santiago Calatrava

The aim of Santiago Calatrava's design for the bus stop in St. Gallen, Switzerland was to construct a light, transparent structure, justified by by its location. This element if formed by a steel structure covered in reinforced glass and supported by L-angles attached to a length wise tube. The tube in turn has a conical granite piece on its ends wich serves as supports.

This precendent will be used as a sample to scale the design of these station platform roof structures. Though the station that are being developed in this study are much larger in proportion, the general structure can be scaled to generate a new, larger version of the orignal design.



Site Plan

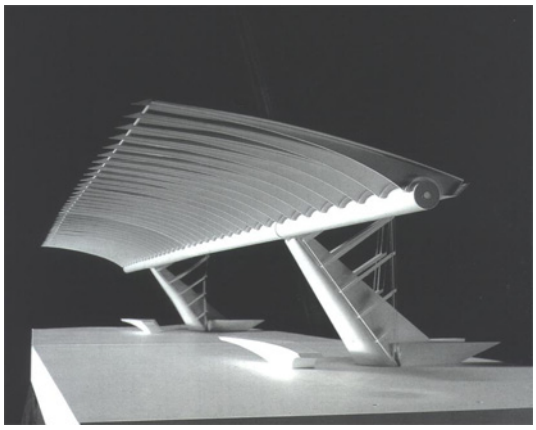


Image of the bus stop

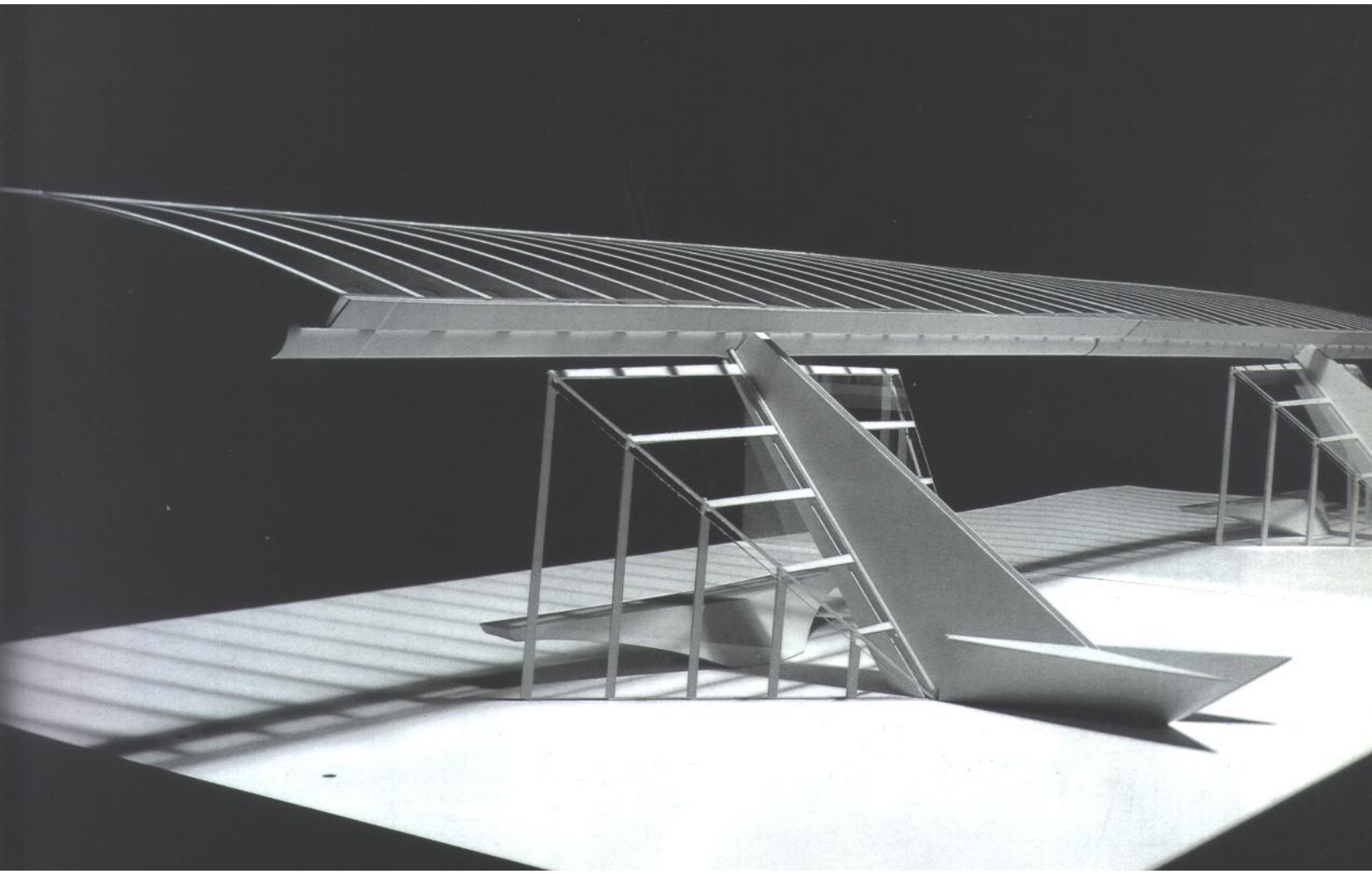


Image of the bus stop

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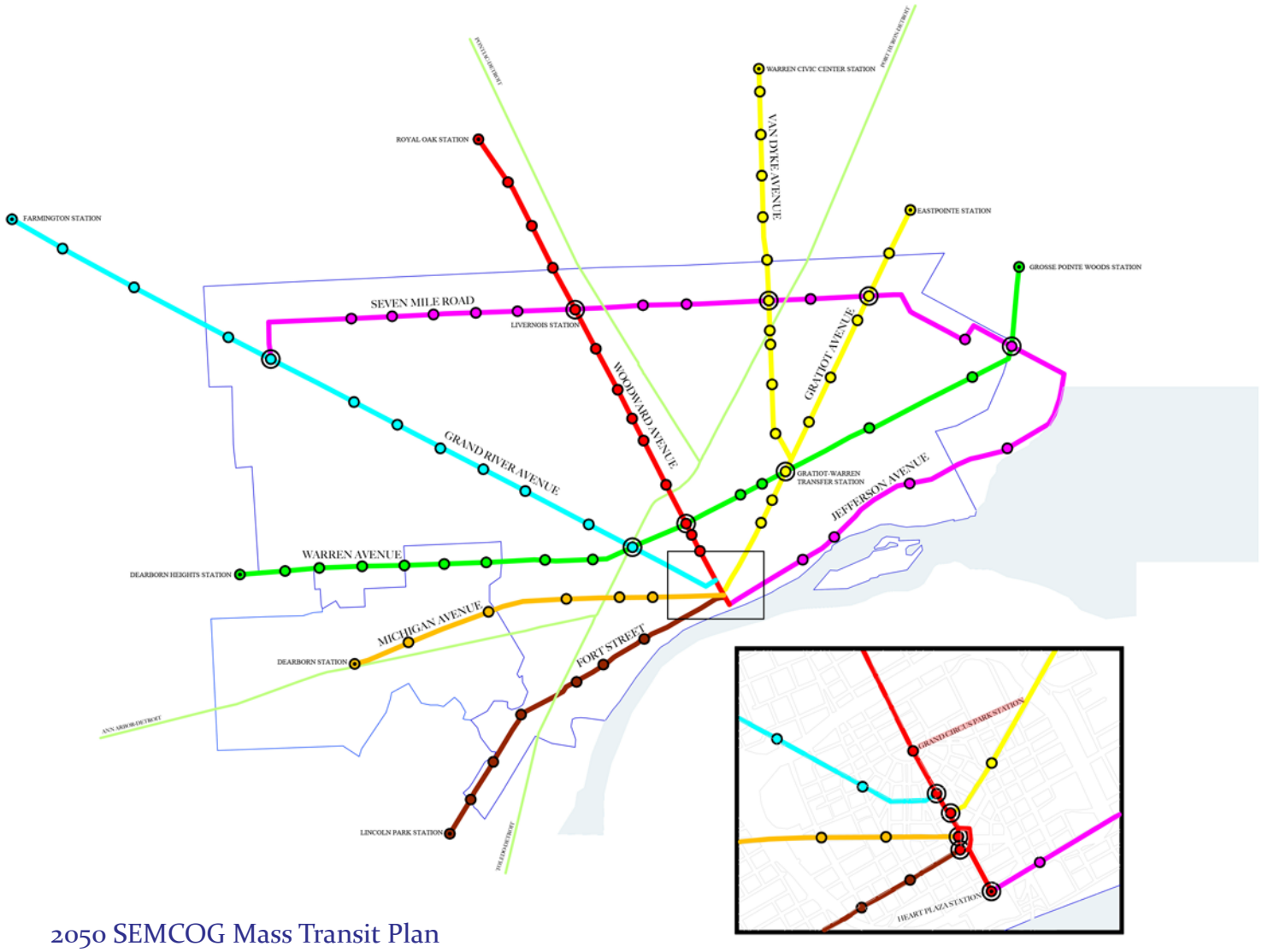
Site Selection

In order to fully explore of the question at hand, several distinct stations must be designed. First, however, a hierarchy of stations must be developed. Four sites will be presented, one site ideal for a terminus station, another for a transfer station and two other sites that will be intermediate stations. In order to design these stations in unique situations, the sites will be selected along the projected future routes designated by the South Eastern Council of Governments (SEMCOG). Each site will need to have different characterizing in order to fully explore the opportunities that each site brings to this study. The programs of each site will be similar, but with additional programming geared towards the needs and characteristics of each site. All of the stations will include a waiting area, ticket purchasing area and restrooms. Secondary programs will be inserted depending on each site. The context of these sites will determine what type of programs are needed and warranted for immediate surrounding area, allowing the station to also serve as destinations. Examples of these specific parts of the pr ogram could include study areas for nearby students, an art gallery, parking, retail and public spaces. Additional care will be taken when designing each station to fully develop the accessibility of current public services offered from the city.



2050 SEMCOG Mass Transit Plan

Transfer Station

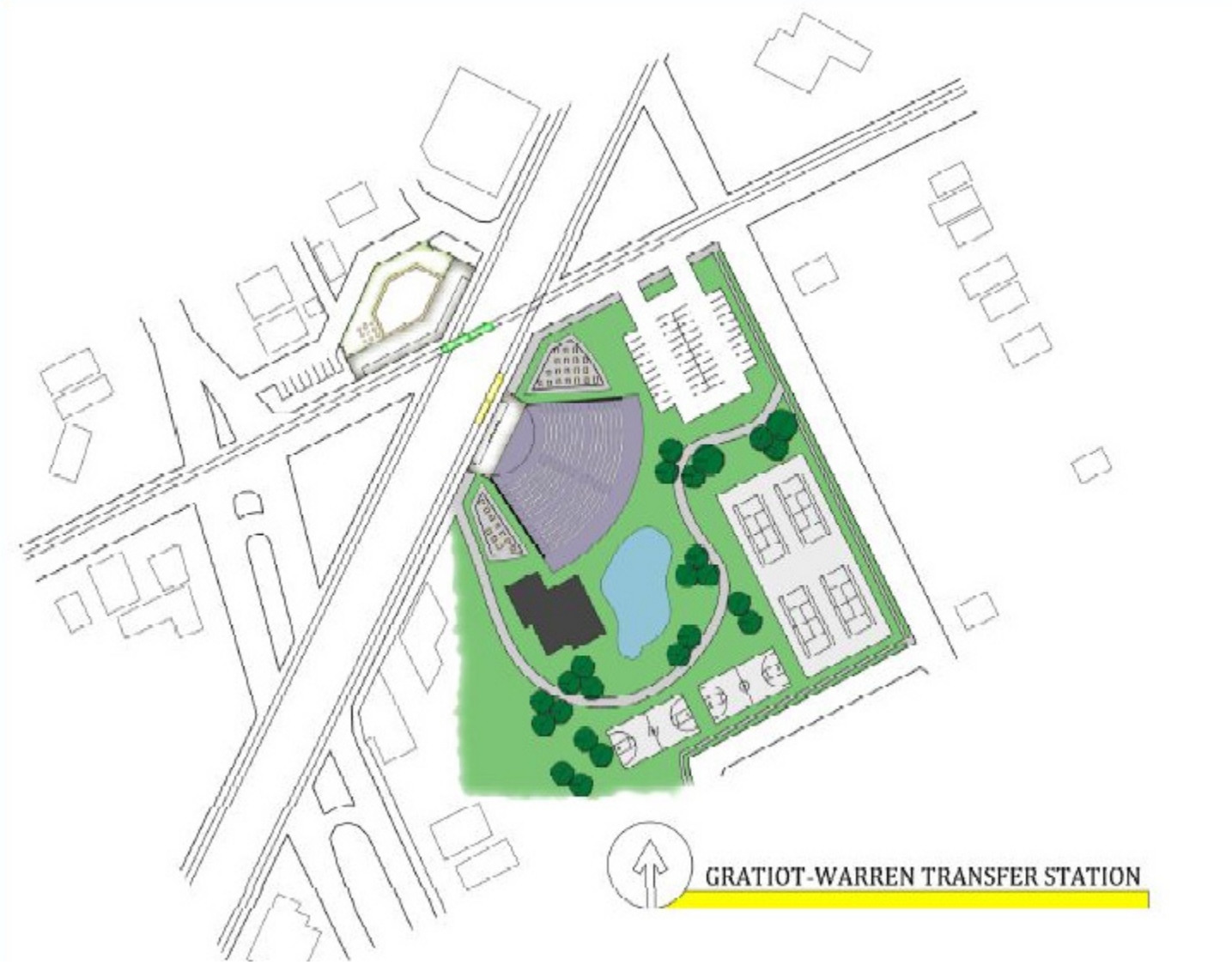
Gratiot Avenue and Warren Avenue Station

The proposed Gratiot-Warren transfer station is at the intersection of the Gratiot Avenue line and the Warren Avenue line. Currently on the site is the Dueweke Park which is currently in need of repair. This area is mainly residential with low density and some commercial buildings along Gratiot Avenue. The concept behind this station will be the redevelop the park to better suit the local neighborhood and to create a destination that citizens will want to travel to. The program for the station will include a new outdoor theater, pavilions, basketball and tennis courts and a new trail. The idea is that renewing the park will help spark the current development in the area while also providing needed services to the local community. To go along with the newly renovated park a sub shop is being proposed that will offer Detroit made products like Faygo pop, Bettermade chips, and Kowalski deli meats. This will display the commercial character that exists up and down Gratiot Avenue. Faygo pop is located to the south on Gratiot Avenue and Bettermade Chips is located north up Gratiot Avenue. The concept of adding more programmed space to the park could allow people to make a day of the park. One could go to the park, grab some lunch and then resume enjoying whatever activity they were participating in.

Aerial View of the site highlighted in yellow

Current Figure Ground

Current Figure Ground with second wave of developement



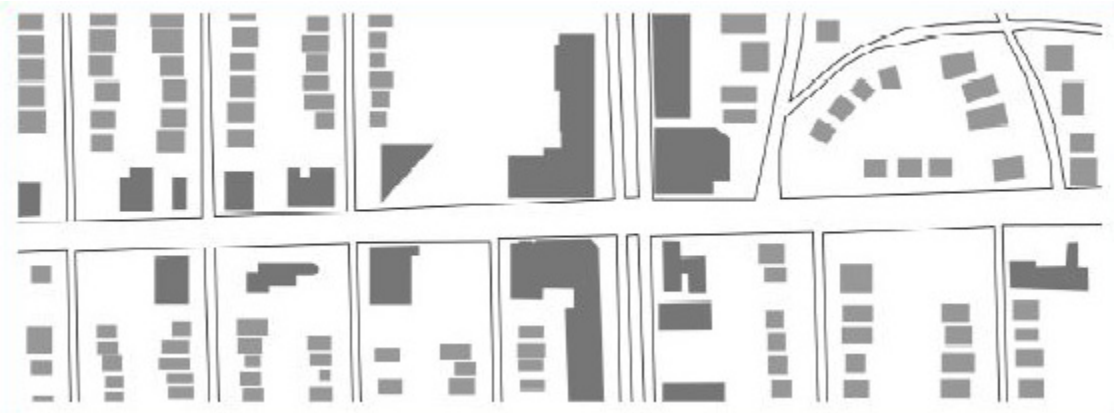
Preliminary proposal for station at Gratiot Avenue and Warren Avenue. The program includes outdoor theater, basketball courts, tennis courts, walking trail, and parking on the south site and a subshop on the north site.

Intermediate Station

7 Mile Road and Livernios Avenue Station

The proposed 7 Mile Road and Livernois Avenue station is located in a district that is rich in art and fashion surrounded by residential neighborhood of average density. There are multiple art galleries along with many stores dedicated to shoes, clothes, and other fashion related products. One might not notice this at first glance because the stores are spaced out starting from Outer Drive and going south on Livernois Avenue until Clarita Avenue. In order to give light to this the proposed station will restore the original storefronts along the site. These storefronts will be filled with local art and fashion from around Detroit demonstrating the sense of identity that already exists in this area. Currently a tutoring center exist on the site that is run by a local church so the program will include a new tutoring/child care center along with a public art gallery on the north side of seven mile. On the south side of seven mile the station's program will include a coffee shop and a bookstore to reconnect with the preexisting shopping district. The concept of this station is to integrate the local identity while also offering local amenities that the neighborhood needs.

Aerial View of the site highlighted in yellow

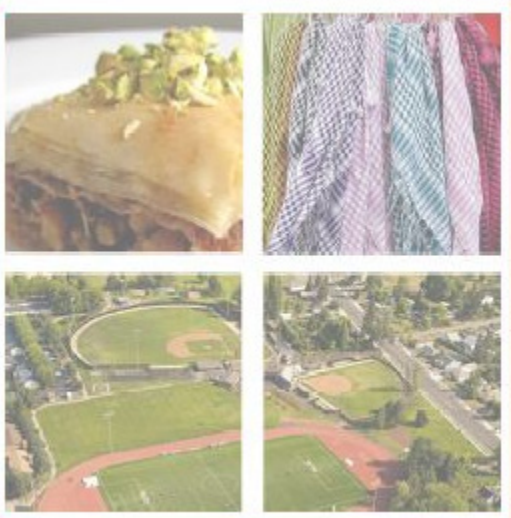


Current figure ground at the 7 Mile Road and Livernois Avenue intersection

Above: Prelimanary proposal for station at 7 Mile Road and Livernios Avenue. Program of north site to consist of turtuoring center and art gallery and the south site program is to include a coffee shop and book store.
Left: Steet Analysis along Livernios Avenue

Terminus Station

Dearbron Station



The Dearborn Civic Station is a terminus station located on the Michigan Avenue Route. This will be a park and ride station for both the proposed light rail system and the existing Amtrak station that is located to the south of the site. To the west of the site is the Dearborn Police Station along with the District Court and to the east is the Ford Community and Performing Arts Center. The concept of this station will be to connect the two stations with a pathway that will also tie into the community center. Dearborn is a very ethnically diverse community, so the proposal includes a shopping/recreation intervention that will feature ethnic stores and restaurants that will display some of the characteristics of Dearborn. Also outdoor recreational facilities will be added to the program to draw on the characteristics of the nearby community center. The idea is that one could travel on the Amtrak line from the airport and stop at the Dearborn Amtrak Station and then transfer to the rail line making travel without a car more feasible and eliminating the need to park vehicles at the airport. Theprogramming of seating and viewing areasinto the shopping area will create more of a connection with the recreational part of the program.

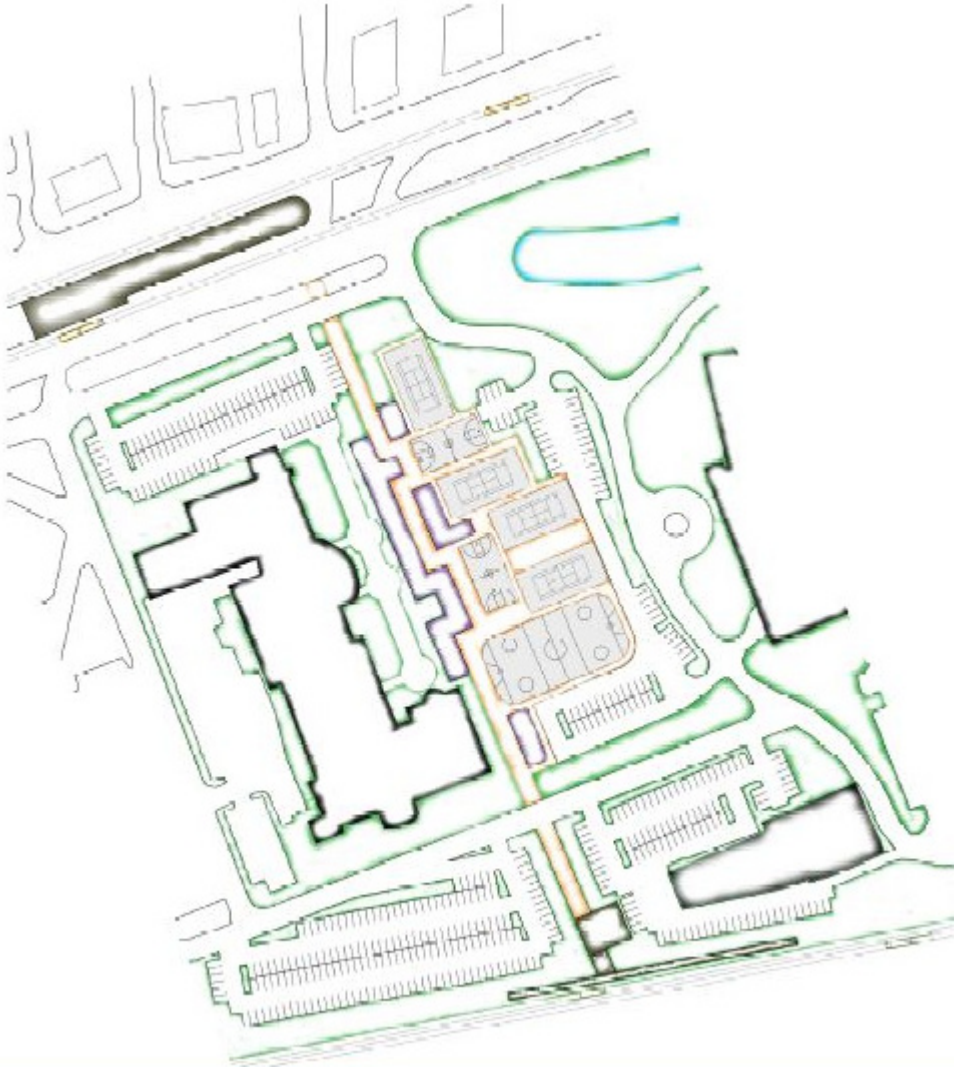
Aerial View of the site highlighted in yellow

Current figure ground at the Dearborn site along Michigan Avenue

Panoramic of the existing site looking west down Michigan Avenue.

Panoramic of the existing site looking north from existing Amtrak Station.

Panoramic of the existing site looking east towards the Henry Ford Community and Performing Arts Center.



Prelimanary proposal for station in Dearborn along Michigan Avenue. Program to include shopping/restaurant intervention along with hockey rink, basketball courts and tennis courst.

Intermediate Station

Grand Circus Park Station



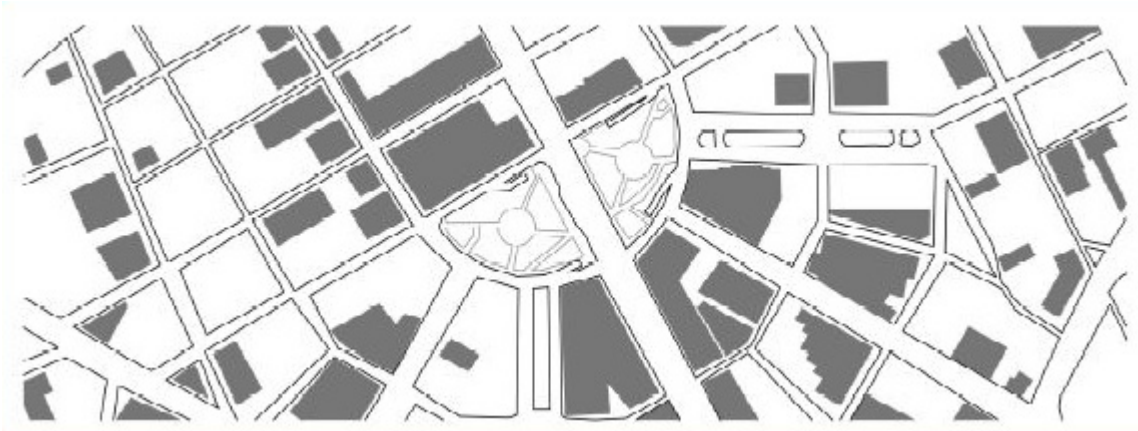





Grand Circus Park is a 5 acre semi-circular park divided down its center by Woodward Avenue, Detroit's main thoroughfare. The park was established in 1850 as part of Augustus Woodward's plan to rebuild the city after the previously mentioned fire of 1805. Grand Circus Park acts as a gateway between Detroit's theatre district and its financial center and is located four blocks north of Campus Martius Park and is bounded by Adams Street and Park Avenue. The grounds include antique statuary and old-fashioned water fountains. Its eastern half is anchored by the Alger Memorial Fountain, designed by Henry Bacon, and capped on its north western edge with a statue of William Cotter Maybury. The parks western half is anchored by the Edison Fountain and capped on its north eastern edge with a statue of Hazen Pingree. Notable buildings that encompass the park are the David Broderic Tower and the David Whitney Building on the south, the Kales Building, formerly Adams Theater, and Central United Methodist Church on the north and Comerica Park and the Detroit Opera House on the East.

Currently this urban park is underutilized and simply has been forgotten by the local community. In order to bring the community back through the site a pedestrian bridge is being proposed to connect the two quarter-circles allowing the public to flow from the People Mover station to Comerica Park and Ford Field with ease. This is also an opportunity to funnel the traffic down Woodward Avenue to where the current redevelopment is occurring. The program for the east station is to include a produce shop/bakery to provide services to the high density residential buildings that are located around the park. The west station is to include a coffee shop and potentially a restaurant, another amenity that is ideal for the current location. Reestablishing the utilization of the park is of great importance, so in order to create more opportunity for social events and activities to occur the hardscape currently on the site will be increased in the proposal to allow for this to take place. Also, since space is limited on the site, the space under the pedestrian bridge will be utilized to display art instillations by local artist.

Aerial View of the site highlighted in yellow



Current figure ground at Grand Circus Park.

Panoramic of the existing site looking east towards Comerica Park and the Detroit Opera House.

Panoramic of the existing site looking west at Woodward Avenue.

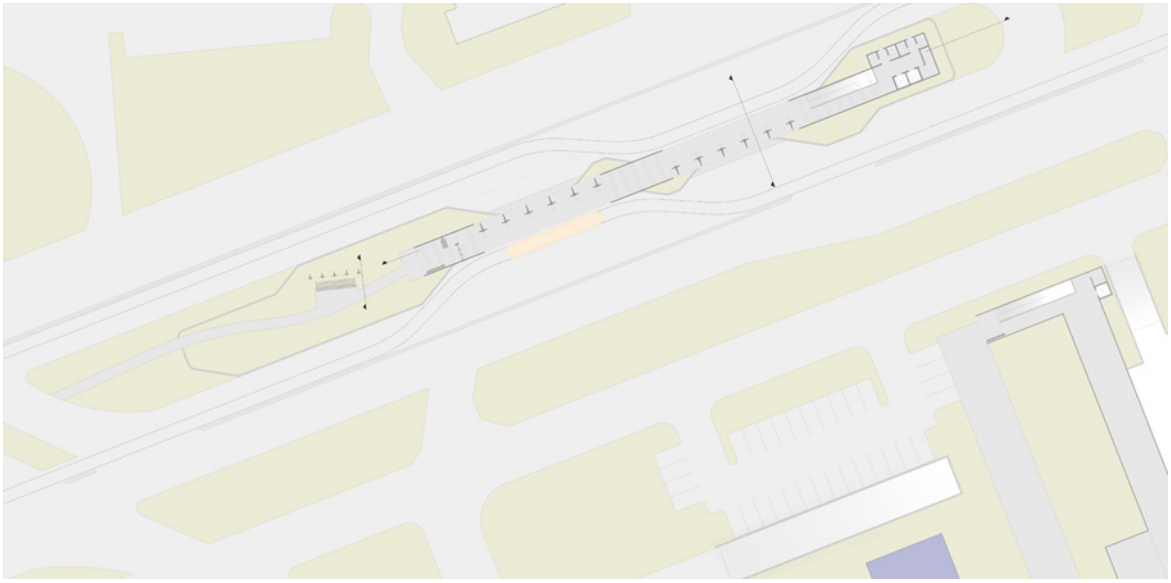
Panoramic of the existing site looking east towards the existing People Mover Station.

Prelimanary proposal for station at Grand Circus Park. Program to include produce market on east site and a coffee shop on the west site.

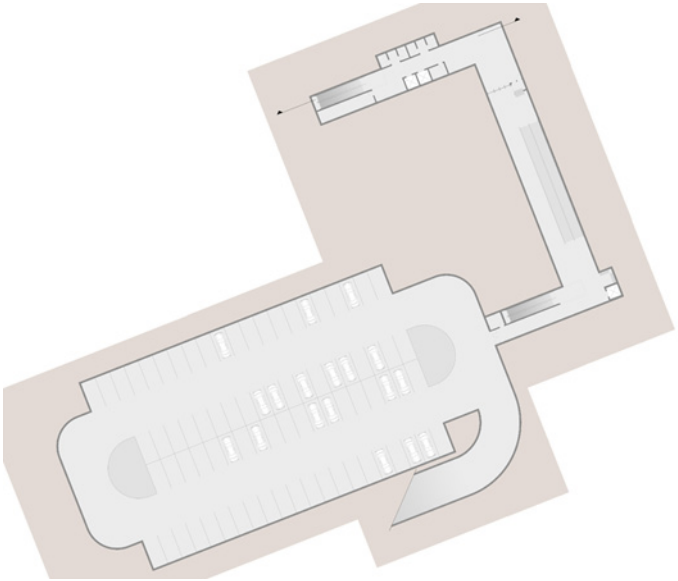
Final Site Selection

After analysis of all four of the sites, two sites have been selected for further development. The two sites that have been selected are the Dearborn Station and the Grand Circus Park Station. Each station is to be developed to the same degree and then analyzed to determine what the next step in this process.

Dearborn Station



First Floor Plan



Foundation Plan

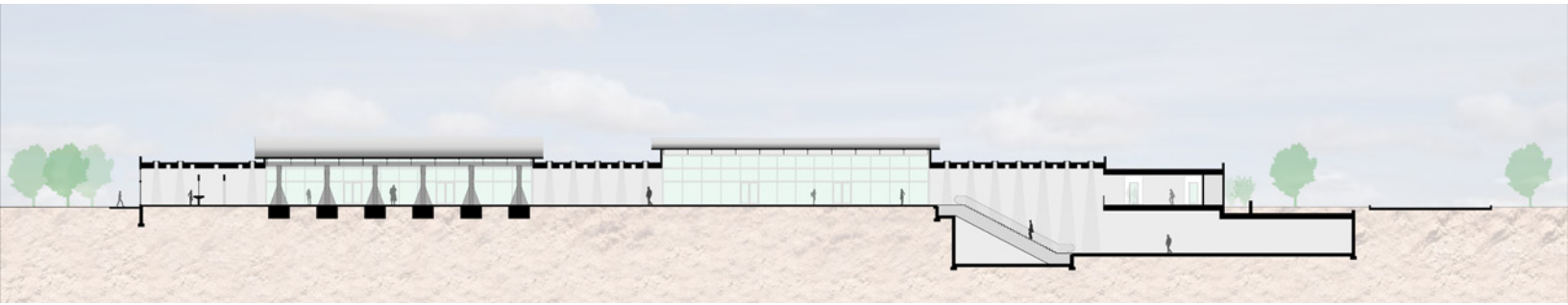
Section Through Bike Shelter

This station will be a multimodal terminus station of the Michigan Avenue Route. The program of the station consists of an arrival and a departure platform, 14 inches off the ground, an arrival and departure platform for buses, an underground parking structure that will house zip cars along with additional parking, a bike shelter, two security booths, along with restrooms and other mechanic/service spaces. In the three sections of the station dedicated to the movement through the spaces, skylights will be used to replicate the rhythm of movement through each of the spaces.

In response to the fact that the Dearborn station is located in the middle of Michigan Avenue, which allows for a forty five mile per hour speed limit, the entire station will be enclosed, with the previously mention replication of the roof structure. In order to allow for signature of the stations to be visible from the outside I am proposing a glazed façade that will allow the roof structure to stand out from the building.

Dearborn Station

Section through Platform



Section through Station

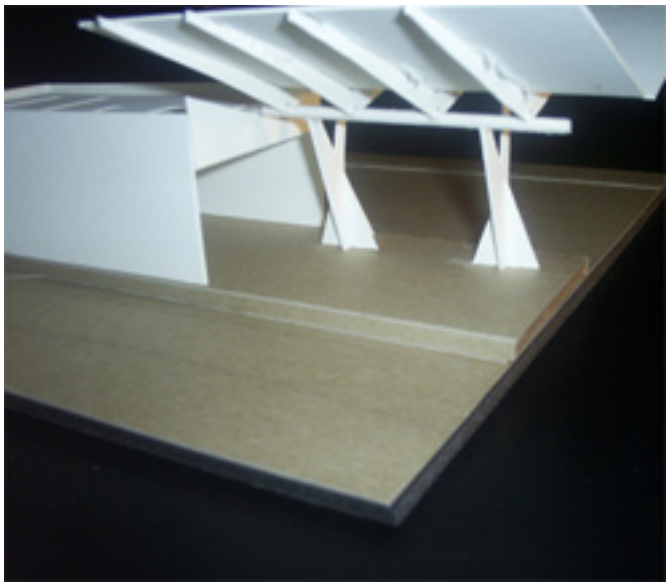


Image of a model displaying the roof framing of the platform.

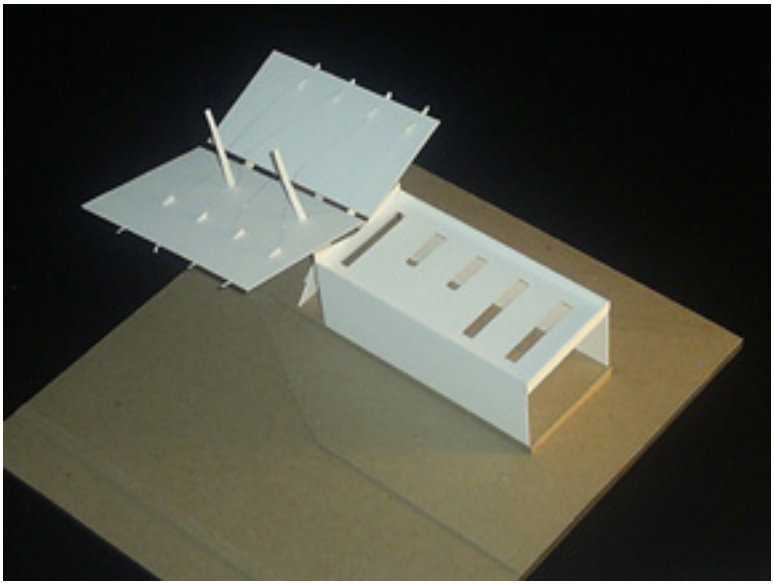
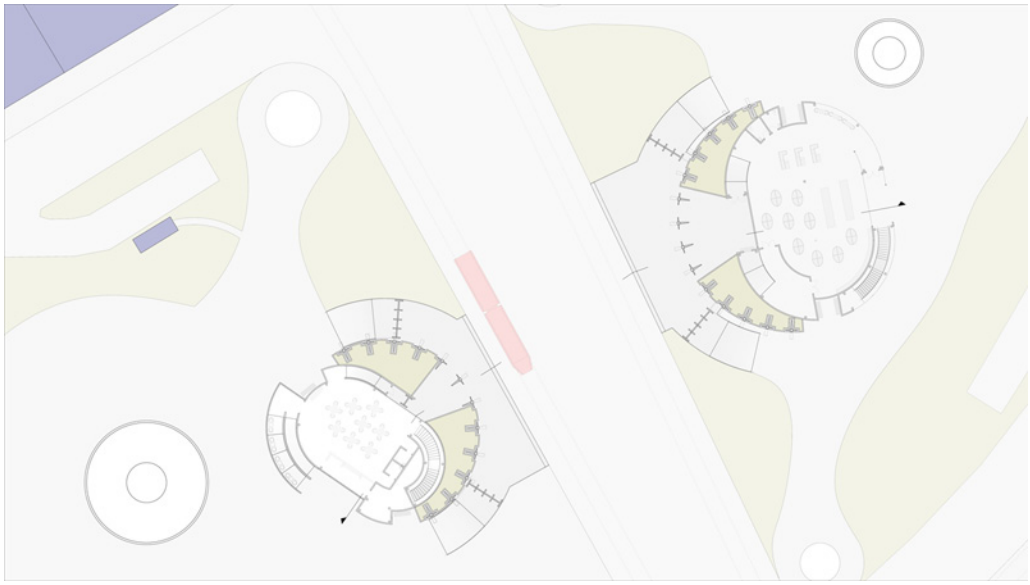
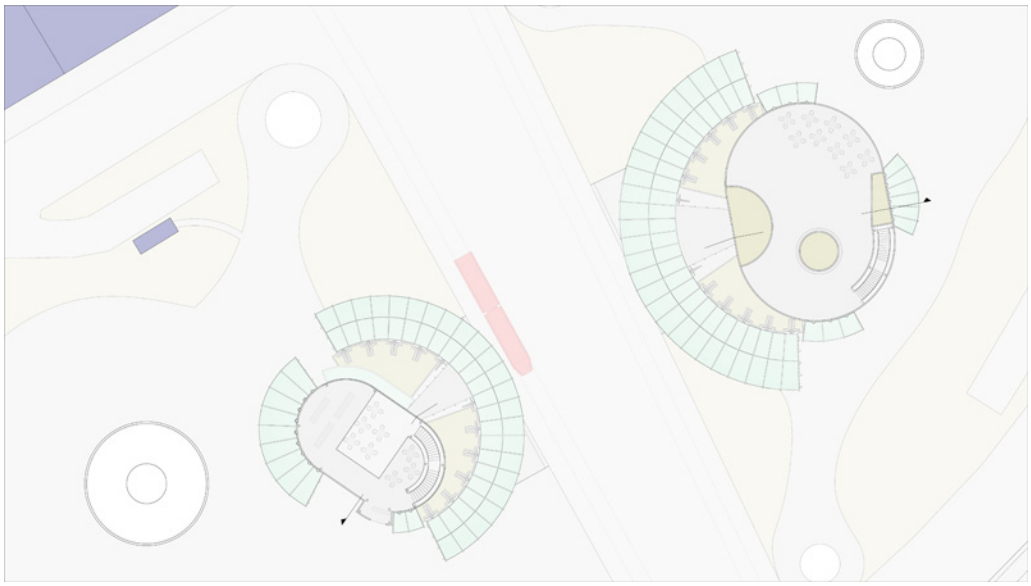


Image of a model displaying the roof of the station.

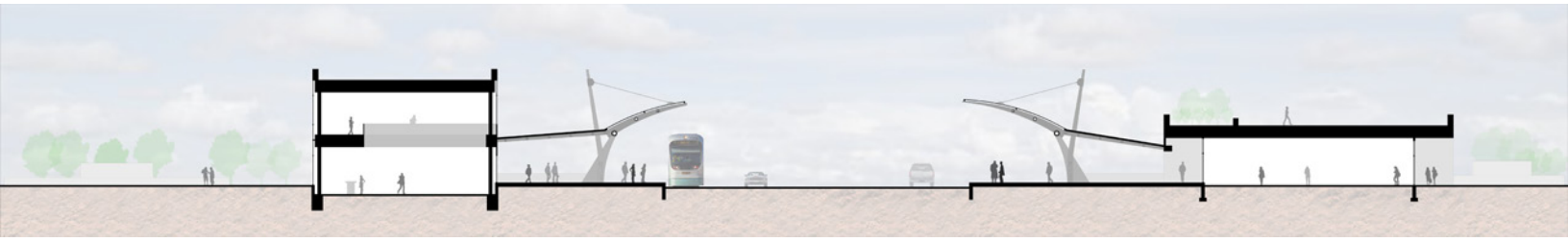
Grand Circus Park Station



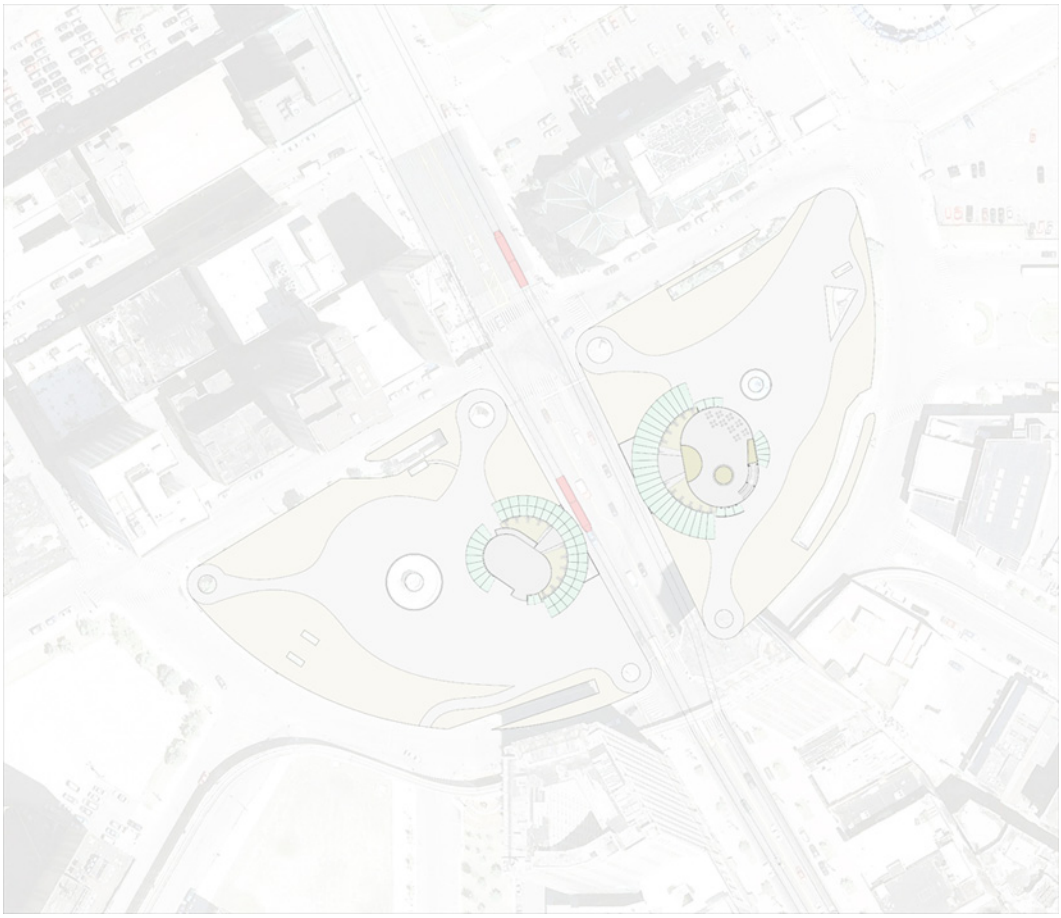
First Floor Plan



Roof Plan

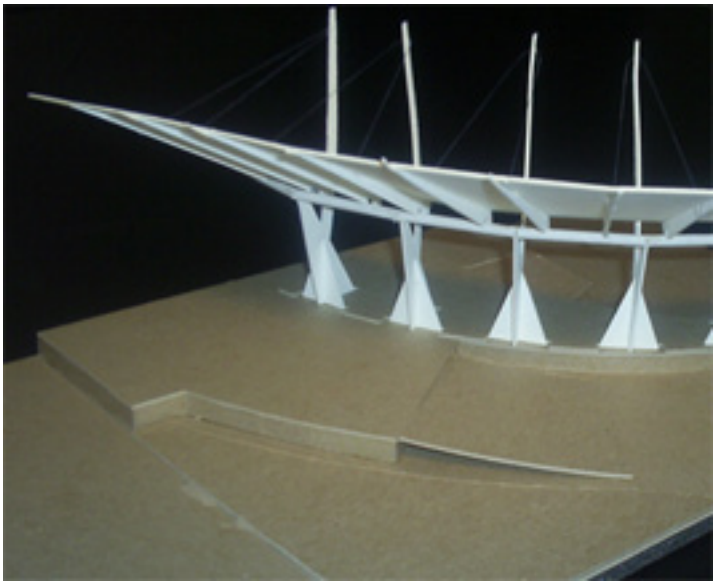


Section through both stations.

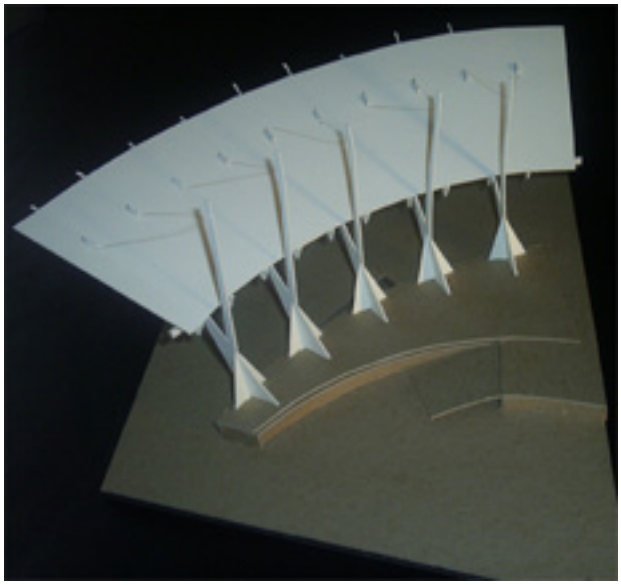


Site Plan with surrounding context.

Grand Circus Park Station



Model of roof canopy over east station



Model of roof canopy over east station

The east station program consists of the previously mentioned produce market and obviously includes a platform fourteen inches off the ground for arrival/departure, restrooms, a concession stand serving the platform, along with storage/mechanical spaces. The rooftop of this station will be accessible from the first floor and will consist of an open public space with gardens highlighting certain areas of the roof and includes seating areas for viewing the fountain and events such as the Thanksgiving Day Parade.
The west station program consists of a coffee shop/book store that sell books about Detroit. Other aspects of the station include a platform for arrival/departure, restrooms, and storage/mechanical spaces. The coffee shop will be lowered three feet into the ground to allow for a different perspective of the park allowing patrons to see new and unique views.

The stations will essentially be glass cylinders. In order to keep some continuity between each station the structure of the shelters will be replicated with some slight alterations, to allow non-regular patrons the ability to distinguish the stations from other buildings. These roof structures will resemble wings that stretch out to the sky. The impact of this light out stretched roof will be more dominant for these stations then others because of the openness of the platform and the length of the cantilevering structure.

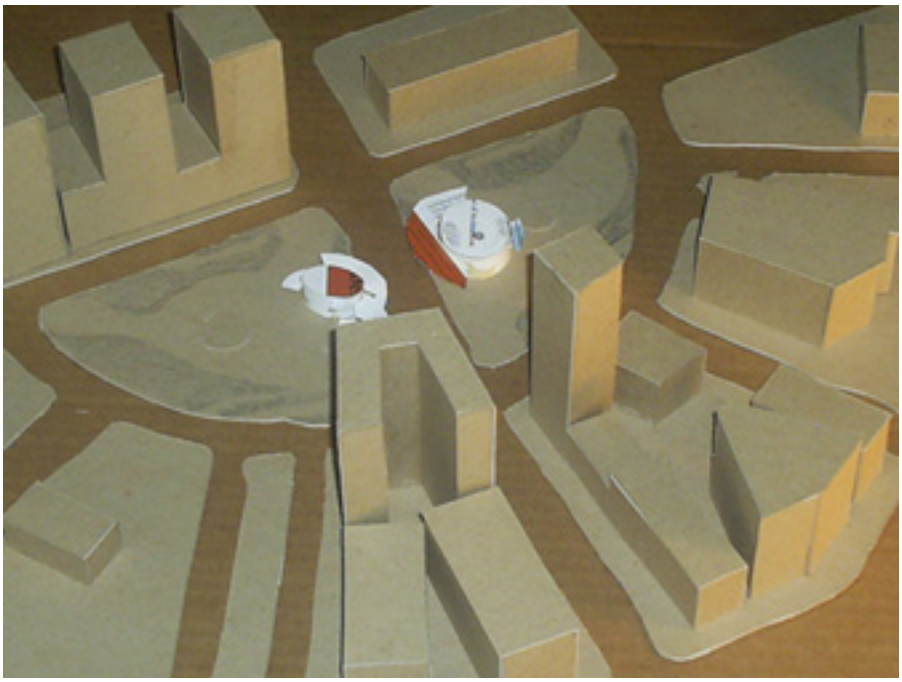


Image of a site model with study model of stations.

CONCLUSION

Detroit is a city of deteriorating buildings left with the character of the past. New designs need to accept this character and respond well to their surroundings. Through this study it had become evident that a building that is part of a larger infrastructure can respond well to local condition. Though there are still many questions to be answered these designs have displayed how these stations respond to the character of their surroundings and address needs of the city and it's citizens. In order for these hypothetical stations to achieve their full potential of an investment of this magnitude, simply duplicating stations over and over again will not cut it.