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R C S

Rochester Central Station

A Landmark Transit Station for Rochester New York

A Master of Architecture Thesis

By Bridget Carney

Rochester Institute of Technology
Golisano Institute for Sustainability
Department of Architecture

Spring 2015

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Acknowledgements

A special thank you to all those who contibuted to the success of this thesis project.

Jules Chiavaroli, Tom Trabold, and Howard Decker for your guidence, patience, and knowledge while serving on my thesis committee.

Stu Chait, Kim Kraft, and Richard Napoli for lending me your expertise and inspiration.

My Classmates for the discussions, pointers, and companionship throughout the process.

Thank you.

Preface

The following thesis was completed in partial fulfillment of a Master of Architecture degree at the Rochester Institute of Technology. The impetus for this project originated in my own desire to create change and spur revitalization in languishing urban locals. I am passionate about thriving urban neighborhoods with unique charater, integrated into a network of transit that connects to the rest of the city and beyond. This exploration of the untapped potential near downtown Rochester, New York is an attempt to visualize a small portion of the change that could occur in my hometown.

Abstract

The City of Rochester and the State of New York are exploring options for replacing the existing Rochester train station building with a modern new building that will improve access to the larger rail network, including a new high-speed rail, as well as improving logistics and usability for all types of building occupants. Although there is currently a design proposal completed by a local architecture firm contracted by the city, the design solution proposed in this thesis project will not adhere to the project description created by the City of Rochester. Instead, it will use the basic premise of a new station in the same location as the existing station and explore how an urban transit station can provoke change and development on the border of the regenerating downtown area.

Using the principles of transit-oriented development (TOD) in its design, the station will serve as the hub of its neighborhood and in some ways the city. According to the values of Rochestarians, TOD, station design, and sustainability, the design will be iconic to Rochester, a model for efficient and comfortable transit stations, and a leader in sustainable design.

Contents

Part 1

Introduction

Project Background

The project site is located in an industrial pocket on the north side of the downtown area. It is something of a 'no-mans land' sandwiched between the inner-loop and the train tracks. To the north of the project neighborhood, are urban renewal housing developments, followed by some of the poorer city neighborhoods. These neighborhoods are cut off from the rest of the city and the station by the railroad tracks. Residents must use the underpasses built beneath the elevated tracks to access downtown and beyond. To the south, across the inner-loop is the downtown area, which is undergoing the beginnings of revitalization with increasing population and development activity. Eastward, past Hudson Avenue and Chestnut Street are more low-income residential neighborhoods that are some of the most troubled in the city. Westward is the river and more industrial activity, including the Genesee Brewery.

The project is situated at the edge of city activity. It is just up the road from the newly opened RGRTA bus station on Clinton Avenue generating opportunities to easily connect to attractions and activities. The proximity also allows the new station to alleviate congestion at the new bus station; it can function as a secondary hub for the popular bus service.

Moving further out of downtown, there are four colleges and universities along with countless employers within commuting distance of the station. These represent a valuable opportunity on which the transit-oriented development can capitalize.

Guiding Question

How can an urban transit station provoke change and development on the border of the regenerating downtown area?

Introduction

Project Introduction

The City of Rochester needs a new station to house Amtrak and intercity bus services. This thesis seeks to present a conceptual exploration of a new transit station employing the principles of transit-oriented development. This project proposes an iconic modern design that is intermodal and large enough to accommodate future growth. The station's appearance will be impactful, a presence that acts as a gateway and landmark to the city of Rochester, clearly indicating the importance and centrality of transit. The design of the station is intended to help revitalize its surroundings and reconnect the area to downtown.

Project Mission

Electing to design a new transit station for Rochester, New York was a decision not lightly made. It was inspired by the potentially expansive impact the design could have on many scales, including the ability to reshape the future of the surrounding neighborhood. Using the principles of transit-oriented development, a new station could return people and economic activity to the neighborhood, spurring revitalization. The design proposed here is intended as a first step towards change.

7 Project Goals

The design of the station should...

Situate the station at the forefront of activity in Rochester for decades to come.

Remain true to the spirit rather than the appearance of the lost and lamented station designed by Claude Bragdon.

Serve as a landmark for the city and a gateway for travelers.

Impact its surroundings on three scales: urban, neighborhood, and site.

Catalyze redevelopment in the surrounding neighborhood and beyond.

Inspire curiosity in Rochester as a destination.

Encourage Rochestarians to use transportation modes other than personal automobiles

Introduction

Project Scope

This project has massive potential for change and impact, thus, the boundaries of both the physical site and the area of impact are very difficult to define; they are constantly blurred. Each decision made in the design ripples out imacting the neighborhood, the city, and beyond. The goal of the project is to create immediate change in the neighborhood by building a new transit station and then by its presence, to provoke greater change still. This is not, by any means a simple task to undertake. The ramifications of such an ambitious undertaking are widespread and long lasting. It is an architectural construction project, but also an infrastructre project, a redevelopment project, an urban planning project, and a futurist dilemma all rolled into one. The new station has a social, economic, and political agenda from the moment of conception. As such it is essential to limit the scope of work to make the task accomplishable for this thesis.

Introduction

Limitations of the Scope

The work of this project includes...

1. Historical research of the factors that influenced the existing urban conditions surrounding the project site.

2. Research and analysis of the existing urban conditions to determine the final project scope.

3. Research and analyze of the existing station conditions.

4. Identify climate factors for Rochester, New York and the subsequently determine appropriate sustainability strategies.

5. Research transit-oriented development and apply its principles to the design of a new transit station.

6. Present a conceptual visualization of the new transit station. This includes...

- Programming: determine the functions the station will house and the individual spatial requirements to assist with the design process.
- Station Space Planning: layout basic floor plans and traffic patterns for the station.
- Exterior Design: create a parti and model the appearance of the buildings on the site at the conceptual level of design.

7. Present strategies for the surrounding neighborhood based on the conclusions of transit-oriented development and the new station design.

Background

Historical Rochester Train Stations

The first New York Central Railroad station was built in 1853 on Mill Street near the falls and operated for 30 years.[1] In 1882, the two existing main line tracks and two new mainline tracks were elevated where they passed through downtown Rochester at a cost of $2 million. They were the only elevated tracks outside of New York City at the time and were only achieved after long negotiations and manipulations of the New York Central Railroad and the Vanderbilt family. Shortly after the track elevation, the second New York Central station was completed in 1883. This time the station was built on the East side of the river at the corner of St. Paul Street and Central Avenue.[2]

In the early 20th century, the second station was determined inadequate for the growing presence of the railroad in Rochester and in 1913, the third and largest New York Central station was built. It was constructed at the same location as the current station on Central Avenue between Clinton and Joseph Avenues. The station was designed by local architect Claude Fayette Bragdon and is commonly referred to as 'Bragdon Station'. The building was an architectural gem in Rochester, celebrated for its grandiose appearance and railroad theme details.

Figure 1 The First New York Central Railroad Station http://photo.libraryweb.org/

Figure 2 Demolition Begins for the new Central Station http://photo.libraryweb.org/

Figure 3 Old New York Central railroad station http://photo.libraryweb.org/

Background

However, the station was short lived. The rise in air and car travel, caused the railroads to suffer and as business decreased the station fell into disrepair and was sold to a private investor. It was closed off in sections and beginning in 1965 it was demolished in two phases. The station was lamented as a 'lost masterpiece' just a few short years later and its loss is still felt keenly today. [3]

There were several other railroads operating in Rochester in the 19th and 20th centuries, each with their own tracks and depots. Two of note and still standing are the BR&P station, now Nick Tahou's Hots and the Lehigh Valley station, now Dinosaur BBQ.

Historic Neighborhood Character

In the era of the third New York Central station or 'Bragdon Station', the streets of this neighborhood were lined with businesses eager to serve their customers, tourists brought by the many daily trains, and locals living and working nearby.

Many of the most interesting buildings still standing in the neighborhood are from before 1950 when train travel was in its golden age. They are the lucky survivors of the devastation that came with the exodus of businesses in the 1950s and 1960s. Many owners tore their buildings down in an effort to evade taxes or converted their property to parking lots in order to eek out a profit. The construction of the Inner Loop in 1965 only worsened the outlook for the neighborhood. People could now bypass the area all together, reaching destinations without ever passing through this once bustling marketplace. [4]

Figure 4 New York Central Railroad Station
http://photo.libraryweb.org/

Figure 5 Scene at 1964 Rochester, NY
http://photo.libraryweb.org/

Background

Existing Rochester Amtrak Station

The Rochester Amtrak Station was opened in 1978. The building is one-story tall with walls constructed of precast concrete panels. It has a flat, deeply cantilevered, metal clad roof that provides shelter over part of the platform on the north side of the station. The platform canopy itself is a remnant of the former New York Central Railroad station.[5]

The station operates 24 hours a day, seven days a week. It is approximately 8,000 SF and contains the following...

- Ticketing office
- Ticketing area
- Waiting area
- Baggage storage
- Private office/work area
- Restrooms
- Mechanical room
- Utility room

The waiting room has seating for 50 people, barely enough to accommodate one-way peak hour ridership. It is too small for the existing ridership of the station and access to it is not ADA compliant.

Three of the original fifteen tracks remain and serve passenger and freight trains. Only one platform remains in use.[6] It is a low-level platform making it a concern for the safety, effectiveness, and timeliness of passengers boarding.[7] Overall, the Rochester Amtrak station is outdated and overdue to be replaced.

Figure 6 Current Amtrak Station
www.democratandchronicle.com

Background

Existing Station Project

Currently, the city of Rochester is constructing a new ADA compliant, intermodal station, the Rochester Intermodal Transportation Center (RITC). It will serve many modes of transportation including, intercity rail, intercity busses, local busses, taxis, bicycles, cars, etc. The design accommodates the needs of a future high-speed rail line that is planned to pass through Rochester. It also has space for commercial and retail functions. The station design is aiming for LEED certification.[5]

Project Funding

The current project for construction of the new Rochester Intermodal Transit Center has secured $26 million in funding. This financing comes from several sources including HSIPR or the Federal Railroad Administration High Speed Intercity Passenger Rail, TIGER or the Transportation Investment Generating Economic Recovery Discretionary Grants, and city and state governments. In addition, New York State received a $154 million from the Federal Railroad Administration High Speed Intercity Passenger Rail (HSIPR) grant fund for rail improvements to help implement high-speed service along the Empire Corridor, some of which may be directed to improvements in Rochester. [19] Funding could also potentially be secured from other public ventures that may be housed in the new station, private developers, income from surrounding land rental, as well as urban redevelopment funds.

Figure 7 Rochester Station Rendering
www.governor.ny.gov

Context

Location

This project is located in Rochester, New York. Rochester is in Monroe County on the southern shores of Lake Ontario.

The site for the new station is 320 Central Avenue which is at the intersection of Joseph Avenue, Central Avenue, and Clinton Avenue in Rochester, NY. This location is on the north side of Rochester, just outside of downtown on the edge of the Upper Falls neighborhood.

The station site is situated in an established urban system. This includes street grid, developed proximate properties, historic buildings, and constructed boundaries. It is these very boundaries that define much of the area's character. To the north the site is bounded by the train tracks and to the south, it is bounded by the Inner Loop. On the west there are a few developed blocks of business and industry before the Inner Loop and train tracks converge to cross the Genesee River forming another boundary. On the east, again, there are a few industrial blocks that eventually transition to residences before the train tracks curve towards the south and create another boundary.

Figure 9 New York State Map Showing Monroe County Highlighted

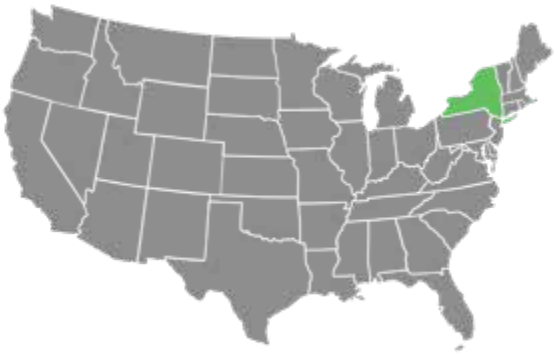


Figure 8 United States Map Showing New York State Highlighted

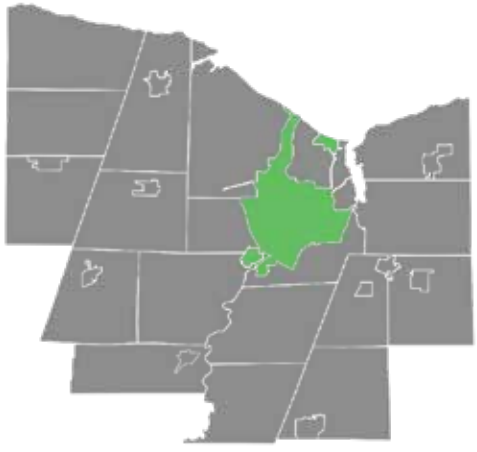


Figure 10 Monroe County Map Showing Rochester Highlighted

Context

Site Details

The construction of a new station generates the option of selecting a new and perhaps better location for a transit station; however, a transit station has many constraints on acceptable sites. Proximity to the tracks, proximity to highways, accessibility to customers, cost and condition of the land, the role of its surroundings, and ancillary costs must be carefully considered. In the case of this thesis, the site will remain at 320 Central Avenue.

The site at 320 Central Avenue is irregularly shaped and defined by the transportation infrastructure surrounding it. Clinton Avenue, Joseph Avenue, and Central Avenue determine three sides and the boundaries of the train tracks determine the fourth side. Below the approximate site dimensions are listed based on the length of frontage of the bordering streets/tracks (estimates made based on Google Earth imported to SketchUp).

Clinton: 183'
Joseph: 506'
Central: 431'
Tracks: 579'

The approximate site area is 159,186 SF.

Figure 11 City of Rochester Map Showing Upper Falls Neighborhood Highlighted

Context

Neighborhood Description

The Upper Falls neighborhood of Rochester, New York is significantly different than the rest of the city. The area ia a product of economic decline, massive infrastructure projects and urban renewal. It is clear, when seen from above, that the density of the city was severly interrupted by the changes forced here. This neighborhood is sorely in need of revitalization, in order to reintegrate it into the urban fabric of Rochester and hopefully help the area heal physically and economically.

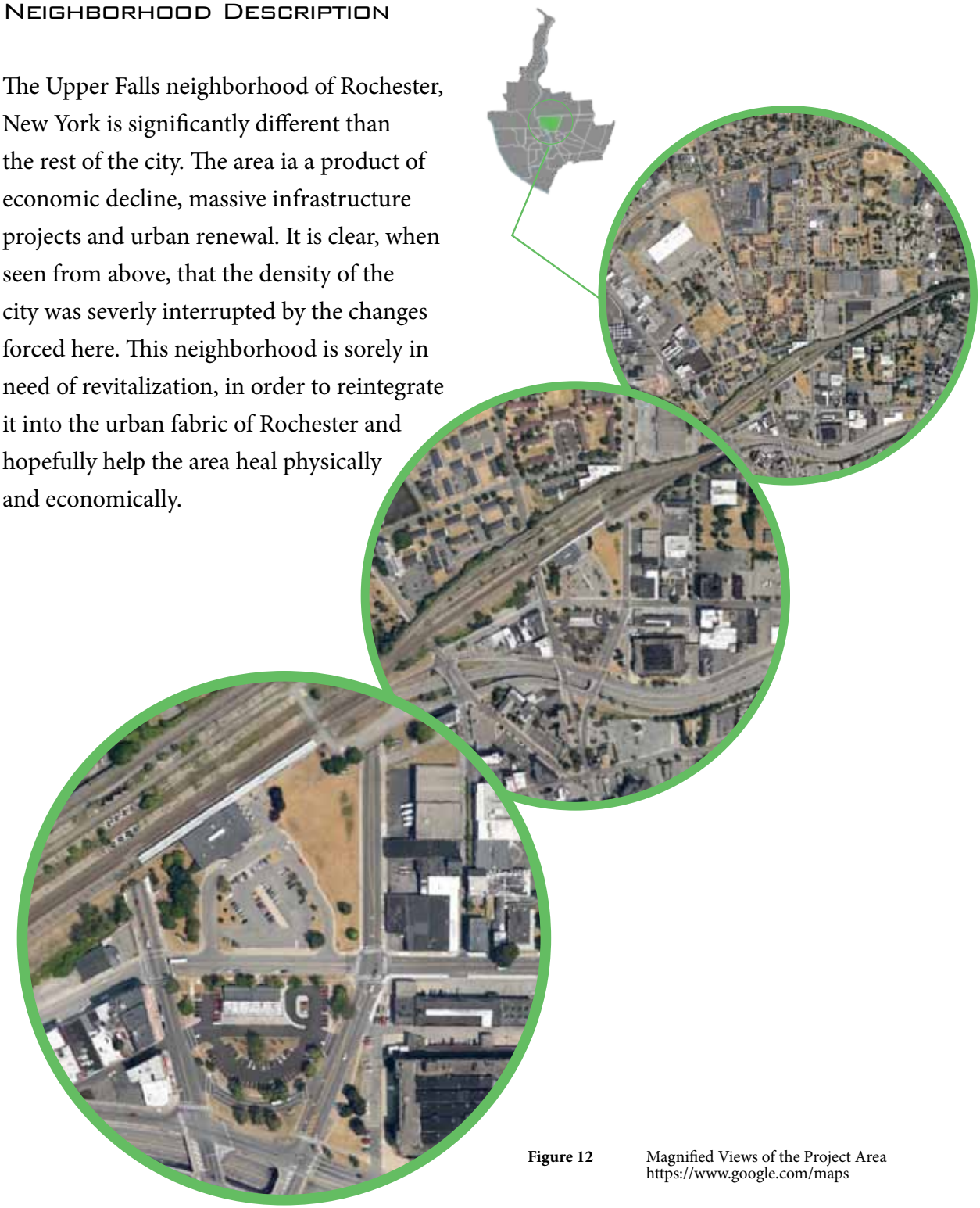


Figure 12 Magnified Views of the Project Area
https://www.google.com/maps

Context

The southern portion of the Upper Falls neighborhood is the area of primary concern for this project. The neighborhood is a buffer zone trapped between two transit arterials for the city of Rochester. The railroad tracks limit access to the north, the only points of connection are under railroad bridges and to the south the remnants of the inner-loop restrict city access to only a few bridges spanning the divide.

The station sits in the middle of a spit of land that divides the city. It segregates the population, a line of gentrification marking the point at which the transition occurs. Many of Rochester's low-income residents live to the north and downtown is filling with young business people and creative minds. The station design aspires to catalyze change and end the isolation created decades before by filling in the 'buffer zone' with buildings housing an appropriate mix of uses including employment and residential. It takes the first step toward revitalization by creating a desirable place where people want to live, work, and travel.

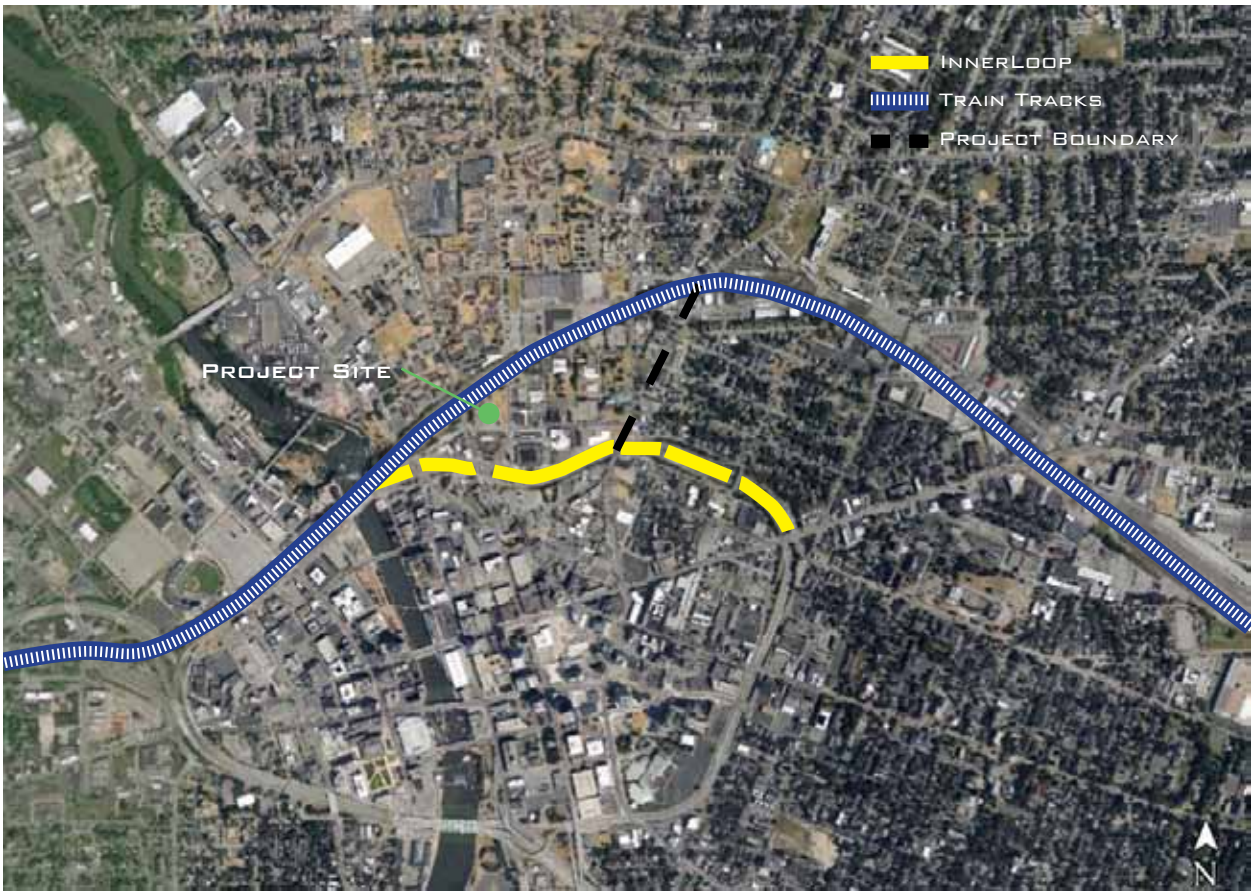


Figure 13 Physical Barriers Surrounding the Project Site
https://www.google.com/maps

Context

Part of achieving a desirable location is an analysis of the surroundings. In the immediate vicinity of the project site are a variety of buildings, many of which have been repurposed. These buildings vary in appearance and attractiveness from a neoclassic giant that formerly served as the United Stated Postal Service hub for Rochester to an assortment of former industrial buildings. The following images show the assortment of building character and quality in the neighborhood.

Figure 16 Surroundings to the west of the site
https://www.google.com/maps

Figure 14 Surroundings to the northwest of the site
https://www.google.com/maps

Figure 17 Surroundings to the south of the site
https://www.google.com/maps

Figure 15 Brick building to the west of the site
https://www.google.com/maps

Figure 18 Surroundings to the east of the site
https://www.google.com/maps

Context

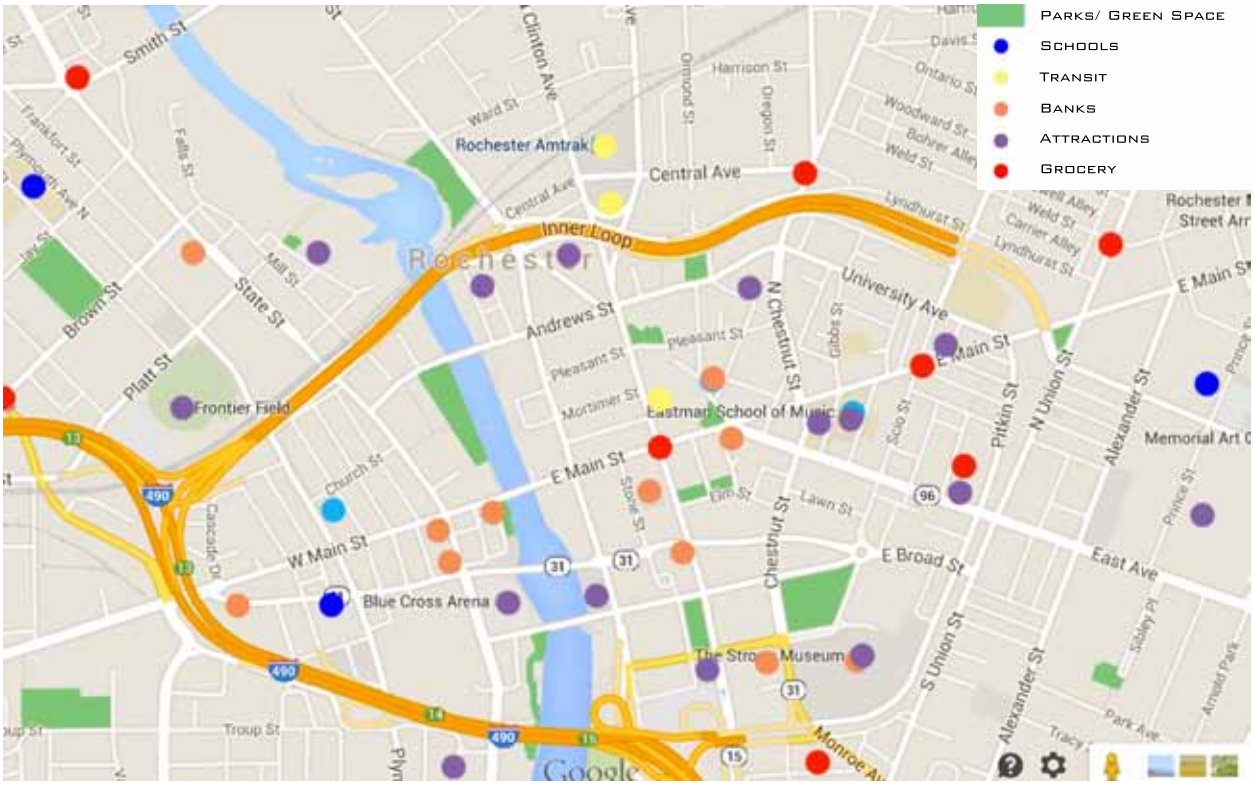


Figure 19 Downtown Amenities
https://www.google.com/maps

Amenities

In the vicinity of the transit station there are relatively few existing amenities. Most of these businesses are located in the downtown area to the south, across the Inner-Loop. The city blocks adjacent to the project site have very little of what is desired in a working or residential area. There are no banks, few shops and restaraunts, no schools, no grocery stores, attractions, or other essential amenities.

Currently, the neighborhood around the project site consists mostly of light industry, studio space, creative businesses, and low income housing. This area has been neglegted from a development standpoint; there has been very little investment or development in decades and much of its character is still remenescent of the neighborhoods past.

Context

Climate

Climate is another influential factor to consider. The climate analysis was completed with EnergyPlus Weather data (EPW) in combination with Climate Consultant 6 and Autodesk Vassari.

Location: Rochester, New York USA
Coordinates: 43.2°N, 77.6°W
Elevation: 516-526 ft.[10]
Climate Zone: 6a, temperate[11]

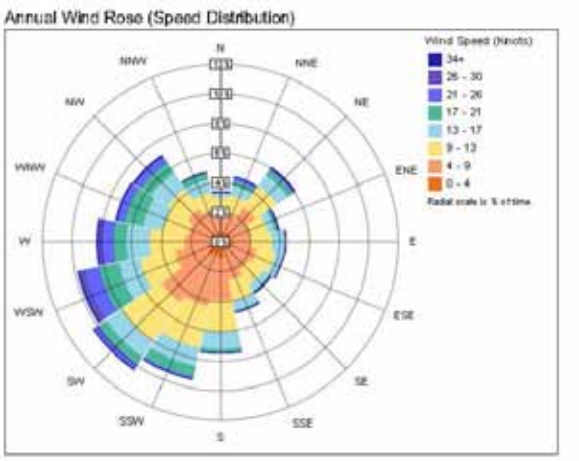


Figure 20 Annual Wind Rose-Rochester, NY
Autodesk Ecotect

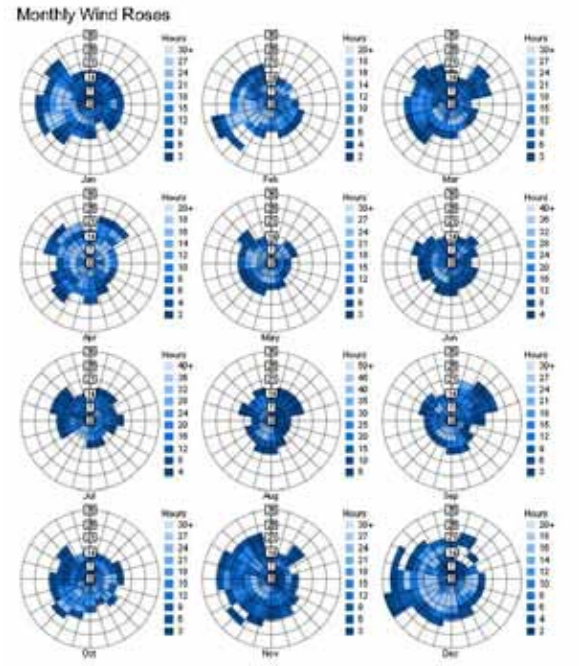


Figure 21 Monthly Wind Rose-Rochester, NY
Autodesk Ecotect

Wind

Wind Direction: 230° - 300°[12]
In general, the prevailing winds in Rochester come from the westerly directions. The wind blows from South to Southwest approximately 27% of the year, most frequently at speeds of 4-17 knots. The wind blows from the West-Southwest to the Northwest approximately 32% of the year, most frequently at speeds of 4-26 knots. The remainder of the year winds blow from other directions at speeds generally less than 13 knots. Typical wind speeds range from 4-13 knots.[13] The strongest winds blow from the West-Southwest reaching speeds of 35 knots, but total less than 33 hours per year. [13]
Prevailing wind direction varies from month to month. April and September have winds from the Northeast, often reaching speeds of 20 knots.[13]

Context

Temperature

Between 2000 and 2014 the average mean temperature for Rochester, NY was 49°F, while the average maximum temperature was 94°F and the average minimum was -3°F. Within a single month, the typical temperature range varied within 20°, or +/- 10° from the monthly mean.[14] Rochester averaged 6352 heating degree-days, 631 cooling degree-days, and 2759 cooling degree-days.[15, 16]

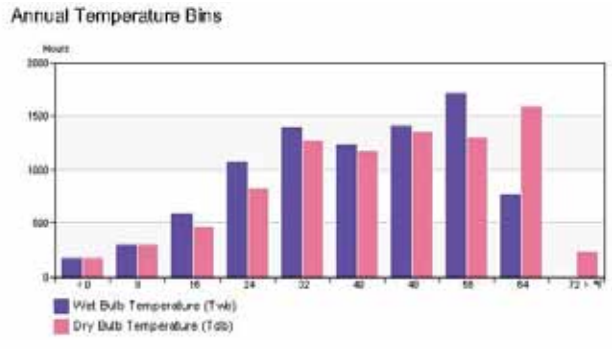


Figure 22 Annual Temperature Bins-Rochester, NY
Autodesk Ecotect

Solar

Mean cloud cover ranges from approximately 55% in June to 88% in December. Annually, mean coverage is about 69%.[17] The sun angle at noon on the summer solstice is 70.2° and 23.4° on the winter solstice.

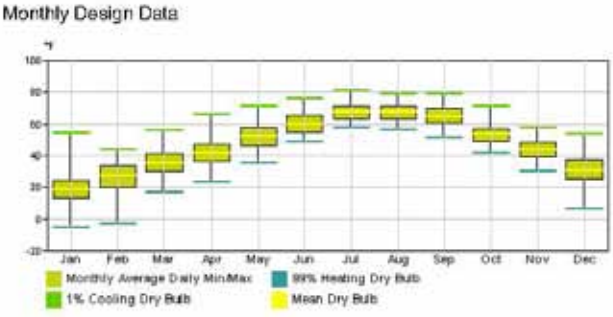


Figure 23 Monthly Design Data-Rochester, NY
Autodesk Ecotect

Precipitation

The average annual precipitation in Rochester, NY between 2000 and 2014 was 35.39 in. with an average daily maximum of 2.03 in. and a daily minimum of 0.00 in. On average it precipitated 168 days annually. Over the same time period, the average annual snowfall was 102.3 in. with an average daily maximum of 10.4 in. and a daily minimum of 0.00 in. On average it snowed 65 days annually. [18]

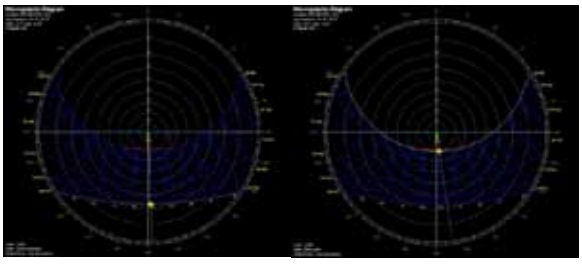


Figure 24 Stereographic Diagrams-December & June 22nd
https://www.nyserda.ny.gov/

Rochester

Cooling Degree Day

	2014	2013	2012	2011	2010	2009	2008	2007	2006	2005	2004	NORMAL
January	0	0	0	0	0	0	0	0	0	0	0	0
February	0	0	0	0	0	0	0	0	0	0	0	0
March	0	0	5	0	0	0	0	0	0	0	0	1
April	0	1	6	3	9	9	12	2	0	0	2	5
May	37	70	71	44	68	12	6	66	47	0	30	32
June	147	106	152	102	106	42	170	171	126	207	54	109
July	145	258	300	302	278	74	222	158	313	251	116	209
August	123	147	184	158	198	161	110	222	178	244	97	162
September		58	62	77	63	17	65	83	29	70	56	54
October		9	6	1	0	0	2	33	0	23	0	4
November		0	0	0	0	0	0	0	0	0	0	0
December		0	0	0	0	0	0	0	0	0	0	0
TOTAL		649	786	687	722	315	587	735	693	795	355	576

Figure 25 Table of Cooling Deegree Days for Rochester, NY
https://www.nyserda.ny.gov/

Rochester

Heating Degree Day

	2014	2013	2012	2011	2010	2009	2008	2007	2006	2005	2004	NORMAL
January	1372	1071	1068	1333	1263	1416	1068	1085	909	1338	1480	1263
February	1221	1064	959	1131	1102	1003	1113	1250	1020	1099	1154	1117
March	1149	976	548	965	773	903	1029	914	894	1093	812	958
April	565	551	578	557	377	557	390	612	507	566	579	582
May	192	176	126	229	207	268	319	237	231	392	223	266
June	29	60	48	32	47	81	25	35	35	38	123	69
July	7	9	0	0	6	32	1	10	0	2	10	17
August	19	11	7	7	9	22	22	12	15	1	35	25
September		174	146	87	155	140	116	88	112	51	75	154
October		367	369	416	440	521	476	248	445	378	455	447
November		820	762	574	748	679	767	795	566	634	713	741
December		1131	888	925	1198	1143	1063	1105	802	1143	1102	1089
TOTAL		6410	5499	6256	6325	6765	6389	6391	5536	6735	6761	6728

Figure 26 Table of Heating Degree Days for Rochester, NY
https://www.nyserda.ny.gov/

Context

Climate Based Design Strategies

Top 20 Design Strategies for Rochester, NY as suggested by Climate Consultant [12]

1. Maximize south facing windows for solar heat gain in the winter; appropriately shade them to prevent gain in the summer.
2. Use double pane, low-E glazing for all non-south facing openings.
3. Lower the internal nighttime temperature.
4. Take advantage of heat gain from lights, occupants, and equipment by making buildings tight and well insulated.
5. Right-size buildings to avoid wasting heat and energy.
6. Use the thermal properties of tile or slate on floors to manage internal temperatures.
7. Use high efficiency heaters or boilers.
8. Extra insulation may be cost effective and improve occupant comfort.
9. Create sunny, wind-protected outdoor spaces to increase usable days spent outside.
10. Reduce air conditioning use by using fans to circulate air.
11. Natural ventilation and night flushing can reduce the need for air conditioning.
12. Organize the floor plan so that the winter sun penetrates the most used spaces through out the day.
13. Trees should not be planted in front of passive solar windows.
14. Locate storage or garages (unoccupied spaces) toward the coldest or least insulated side of the building.
15. Orient the building to prevailing winds to take advantage of natural ventilation.
16. Window overhangs or shades can help manage heat gain in warmer months.
17. In colder climates use a pitched roof, vented to the exterior with a well -insulated ceiling below.
18. Protect from cold winds with wind shields or dense plantings.
19. Maximize vertical height between air inlet and outlet to produce/maximize stack ventilation.
20. Maximize morning heat build up in climate responsive buildings with low mass, tightly sealed, well insulated construction.

Feasibility

Examination of the project feasibility is essential. This section will study the practicality of constructing a new train station for Rochester, New York. The new station will replace the existing Amtrak Station on the same site, located near downtown Rochester at the intersection of Clinton Avenue, Joseph Avenue and Central Avenue. This study focuses on the growth potential of the new station and the opportunities it presents

- The existing station is inadequate to meet the needs of travelers and trains alike
- The station is too small to handle to predicted growth of ridership
- The unpleasantness of the station is itself a deterrent to train travel
- It cannot accommodate the high-speed line that is planned for the Empire Corridor
- A new station is an unparalled opportunity to ocreate change and lasting impact on the city of Rochester

Modest predictions forcast that ridership will at least triple over the next 20 years.

Feasibility

Amtrak Service

Amtrak operates approximately 140 trains per day in New York State, transporting 12 million travelers.[19] Eight of these trains stop at the Rochester Amtrak Station daily.[20] These include service from 3 routes: Empire, Maple Leaf, and Lakeshore Limited.[19]

Growth

After a period of decline, the regrowth of interstate train travel in the United States reached record levels of ridership in 2013 with 31.6 million passengers.[21] Amtrak expects that number to continue to grow as it has over the previous 10 years, especially since more high speed routes will be added across the nation, including along the Empire Corridor.[21]

Figure 28 Phasing Plan for High-Speed Rail in the USA
http://www.america2050.org/

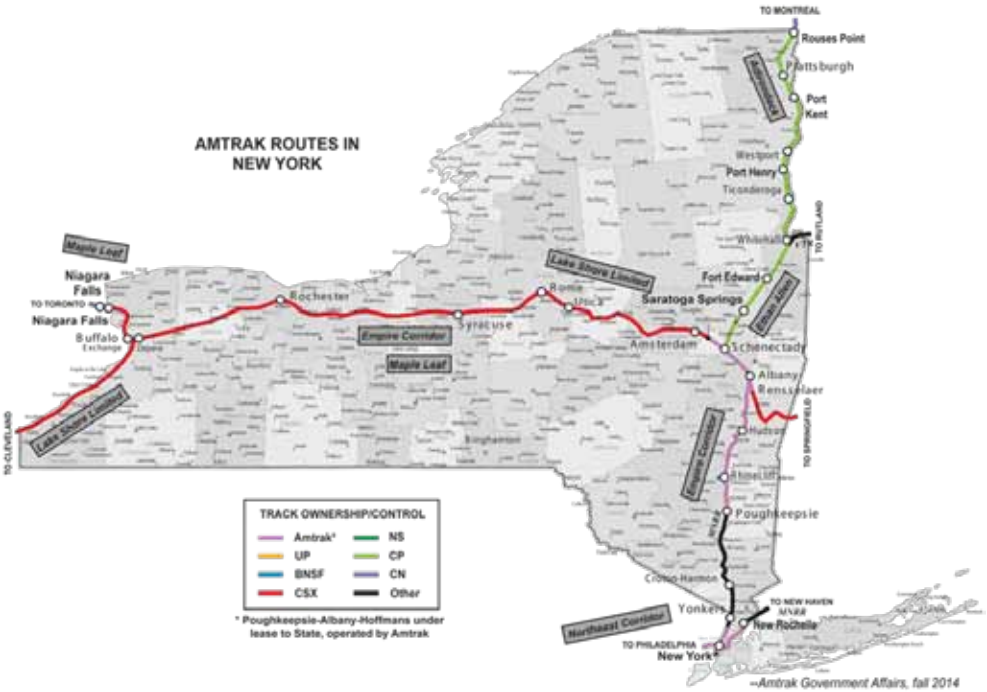


Figure 27 Amtrak Service in New York State
http://www.amtrak.com/

Feasibility

In 2012, station usage in New York State increased 5.1% from 2011.[22] In 2013 it increased by another 0.7% and in 2014 by an additional 4.3%.[23, 19] Over the three year period of 2012, 2013, and 2014 station usage in New York State increased by an average of 3.4% annually. It is essential to factor in this growth potential as it supports the feasibility of a new station and aids in determining the proper size of the replacement.

Nationally ridership has increased from 28.7 million passengers to 31.6 between 2010 and 2014. That represents an almost 10% increase.[21, 24] Between the years 2000 and 2011 ridership on long distance routes increased by +13%, on regional corridors ridership increased by +72%, and on the Northeast Corridor ridership increased +30%.[25] These statistics show that the growth in ridership on the Empire Corridor at 4.3% is modest relative to the country as a whole.

In 2014, the Amtrak Station in Rochester, NY had an annual ridership of 136,691.

At the Rochester Station in particular, in contrast to the regional trend, alightings and boardings have decreased annually since 2012. The reasons for this decline are unknown, but possibilities include the outdated station, unpleasant neighborhood, proximity to the Rochester International Airport, and the ease of car travel in the area. All of these are obstacles the new station seeks to overcome.

Rochester Station annual boardings and alightings

- 2014: 136,691 [19]
- 2013: 141,576 [21]
- 2012: 144,703 [22]

The addition of high-speed rails must also be taken into account for when planning for growth, however, there is no comparable system in the US. The northeast corridor, connecting Boston to Washington, D.C. is the only operational high speed line in the U.S. and is too different a market from the Empire Corridor for reasonable comparison. It can only be assumed that the result of adding high speed trains will be significant growth.

Feasibility

Growth

In an attempt to predict future usage, current ridership is extrapolated using growth percentages of 1%, 2.5%, 5%, 10%, and 15% over time periods of 5, 10, 20, and 30 years. Due to the transition train travel is undergoing in the United States and the accompaning uncertainty, ridership growth is very difficult to predict. As expected, the results vary drastically, ranging from 143,664 at 1% growth over 5 years to over 9 million at 15% growth over 30 years. These figures are at opposite extemes of the predictive model and so neither is the ideal number to work with.

Reasonablly, a new station would need to meet usage needs with few alterations for at least the next 20 years. Currently, growth along the Empire Corridor is apporximately 4.3% annually: thus, a modest growth rate of 5% is very safe to assume. The resulting growth at 5% over 20 years is an annual train ridership of 363,683.

This figure is a fairly safe prediction of growth for several reasons. First, it assumes very little change in growth, which would take very minimal effort to achieve. Second, it does not account for any changes as a result of improvements to the Rochester station and its surroundings. Third, it does not account for the additional service of a highspeed line, which when operational, would make the 15% growth rate far more likely.

Percent Growth	5 Years	10 Years	20 Years	30 Years
1%	143,664	150,992	166,789	184,239
2.5%	154,654	174,977	223,985	286,719
5%	174,457	222,656	362,683	590,771
10%	220.143	354,542	919,589	2,385,177
15%	274,935	552,992	2,237,159	9,050,554

Figure 29 Table of Predicted Ridership Growth

Feasibility

Interstate Bus Service

The interstate bus system in the United States is a direct competitor of train travel and increasingly regional air travel. Service providers are competing for customers, particularly business and luxury pleasure travelers by reaching more destinations, adding new amenities, offering flexible ticketing, and improving the quality of experience.[26]

3-5% conservative annual growth estimate.

Growth

Intercity bus service is divided into two categories, traditional bus lines (Greyhound, Peter Pan, and Trailways) and city-to-city express operators (BestBus, BoltBus, MegaBus). Over the past decade intercity bus services have nearly doubled in size, averaging an increase in daily operations by approximately 2.1%. Growth of city-to-city express lines accounts for much of the growth with a 3.9% increase in daily trips. Ridership growth is conservatively estimated at 3.0%-5.0% based on growth in schedules and reported revenues. Ridership is estimated because intercity bus service providers do not publish actual figures[26] Because there are no hard ridership numbers reported, the growth of bus ridership will be assumed to match that of train ridership.

Feasibility

Airline Service

Customers of the Rochester International Airport are some of the customers that the new transit station would aim to attract. In 2013 the airport had 1,222,055 [27] enplanments compared to the train stations 141,576. [21] Of the Rochester Airport's top ten destinations, five are within 400 miles or along the planned high-speed route from New York City and Chicago. These are the passengers that could reasonably take a train or bus instead of a plane.

On a daily (weekday) basis 607 passengers fly to these destinations paying on average $361.[27] Therefore, those 607 passengers represent $219,127 in potential revenue for Amtrak and the bus carriers at the new transit station. Annually, these 607 daily passengers total 157,820 potential riders.

Yearly total = 607 *(5*52) = 157,820

Increasing the likelihood of these passengers using trains (or buses) rather than airplane is each stations accessibility and proximity to residences and businesses. The transit station is located in downtown Rochester, where it is equally accessible from all corners of the Rochester area, whether it be by car, bus, taxi, bike, walking, etc.

On average, 607 passengers fly daily to destinations within 400 miles.

Feasibility

Local Bus Service

The Rochester Genesee Regional Transportation Authority operates the RTS bus service in Rochester, New York. In 2013-2014 RTS had an annual ridership of 17,194,927. This represents growth of more than 3.1 million passengers since 2005. RTS currently operates 451 buses on 40 fixed routes to serve the community.[28] Recently RGRTA and RTS opened a new transit center on Mortimer Street between Clinton Avenue and St. Paul Boulevard. The center acts as a hub for RTS with 30 bus bays that can accommodate 100 buses per hour.

The stations capacity was limited by the physical constraints of the site it was built upon and as ridership grows, the station will be less and less able to handle volume.[29] Located just a few blocks north, the new transit station is within walking distance of the RTA bus hub. There are also several bus routes that pass by in all directions at regular intervals. The Mortimer Street Station is easily accessible from the transit station, making connections and transfers to and from each station realistic.

Figure 30 RTS Bus Service in the Vicinity of the Train Station
https://www.myrts.com/

Feasibility

Additional Growth Potential

The construction of a new transit station increases the potential growth in ridership. Though uncalcuable, the growth prompted by the station design to follow should be considered.

The redevelopment of the surrounding neighborhood will bring residents (potential passengers) into closer proximity, thus making them more likely to use all forms of transit represented at the station.

Proximity is an essential factor to the growth of the transit station. Employees working in the station complex or nearby will pass the station often, keeping it fresh in their memory as a travel option. It is an easy option for those on business travel, who can easily connect to the station from work, with little imtermediary travel.

Strong connections to the city and beyond ensure easy access for students at local colleges (in addition to city residents). Whether they are traveling home at the holidays, journeying to nearby cities for leisure, or connecting to larger airports in bigger cities, the Rochester station will compete with the other options for business.

Feasibility

Transit Initiatives

The success of the new Intermodal Transit Center is interconnected and reliant upon many of the other improvements and projects the city has planned. As an intermodal hub, the station functions as a community asset, meaning that as the community surrounding the station grows and improves, the station itself will grow and improve. The City of Rochester is studying and developing transit strategies to improve access to intermodal transit services. As these strategies develop, usage of the area and the station will increase. Below are a few of the new transit options the city is considering (in addition to the bus, shuttle, train, and taxi services already offered throughout the city).

Bike Plan

In January 2011, Rochester, NY published a bike plan in response to the ever-growing number of cyclist in the city. The plan focuses on the development of on-road routes and facilities to compliment Rochester's already robust off-road network. This network of on-road bike routes will only become more important and popular as downtown development increases. The roads around the Rochester train station are scored as "C" or "D" levels of bicycle service, indicating much needed improvement.[30] The Rochester Bicycle Master Plan prioritization map indicates that the surrounding streets are at varying priority levels. Clinton Avenue is classified as meeting the expected level of service and Joseph Avenue is in Tier II or the second most urgent tier. [30] The remaining streets were not included. The area of the train station therefore was destined to receive some minimal attention to improve bicycle transit, while still leaving plenty of room for improvement.

Feasibility

The construction of a new intermodal transit station heightens both the need and priority for improved bicycle facilities in the nearby vicinity. Growth of the station, surrounding neighborhood, and downtown itself will increase traffic of all varieties, making bicyclist comfort and safety even more important. Increased bus, car, and taxi traffic in particular prompts the reexamination of the strategy surrounding the station. Thus, the design of the station will consider the development of a separate bike boulevard for additional protection and ease of travel to the more economical and flexible striped or buffered lanes for bicyclists.

Figure 31 Bike Scores for the Roads Around the Station
http://www.cityofrochester.gov/bikeplan/

Circulator Buses

In March 2011, Rochester, NY published a feasibility study examining the potential for a new network of circulator buses in downtown Rochester.[31] If the bus system were to become a reality, these buses would travel a series of short routes, looping around downtown. As well as connecting visitors and downtown residents to more of the city sans cars, the intention is to alleviate businesses concerns about on site parking. The buses would allow commuters to park in one of the under utilized garages further from their destination and then take the bus for the remainder of their trip.

Feasibility

The circulator buses and the intermodal transit center would be mutually beneficial. The station would be a stop on the route, adding an additional mode of transportation to the station and from the station out to downtown. The circulator would be a convenient, inexpensive, frequent manner of traveling to the station to depart on a trip or patronize a nearby business. Arriving travelers could easily catch one of these buses to a local attraction, business, or hotel, with less potential confusion about routes than if they used an RGRTA bus, which have a much more complex network. Because these buses would transport people from within the downtown area, they would reduce the need for parking, both long-term and short-term.

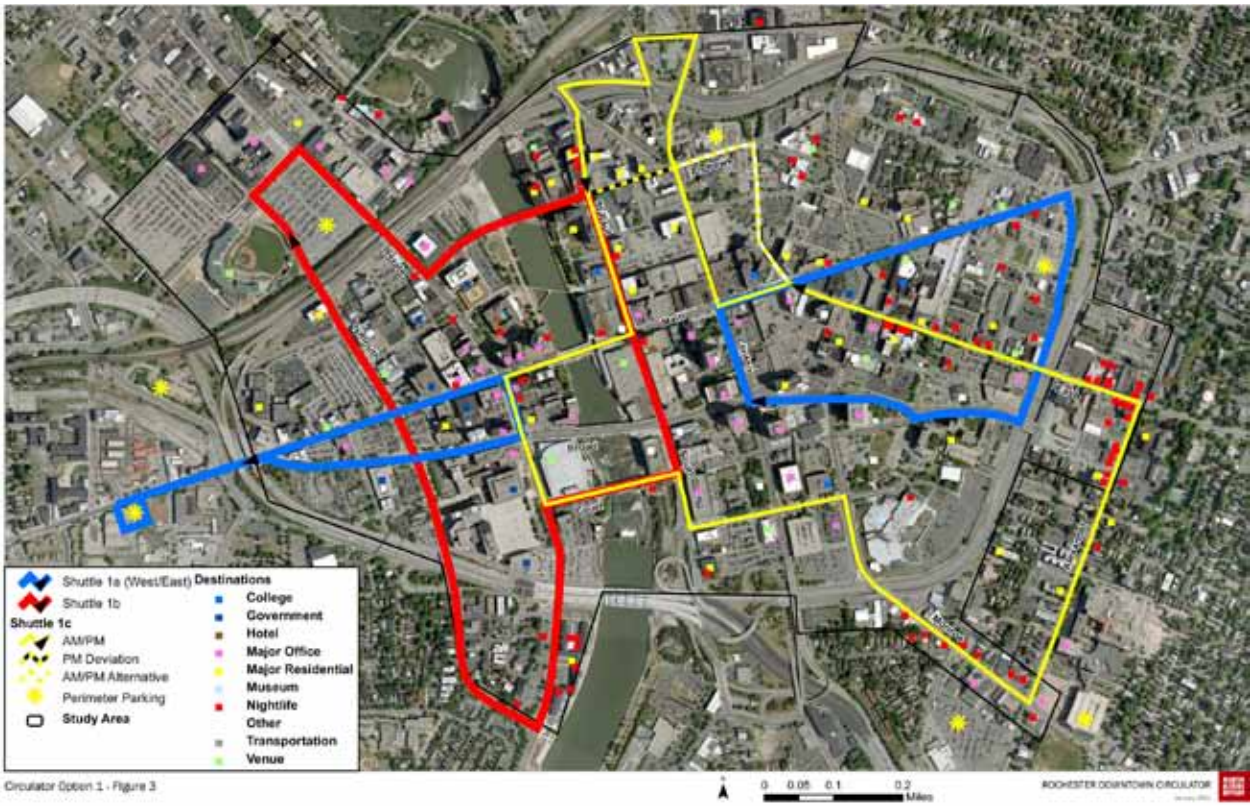


Figure 32 Potential Route for a Circulator Bus
http://www.cityofrochester.gov/circulator/

Literature Review

The New Transit Town: Best Practices in Transit-Oriented Development [32]

Hank Dittmar and Gloria Ohland

The New Transit Town is a detailed break down of transit-oriented development in the United States. This book describes all the features that make these developments successful including walkability, density, multi-modal transit, public transit, mixed-use, connectivity, parking, place making, zoning, variety, and balance. The chapters outline how these elements succeed, fail, and why.

The authors present strategies for making TOD successful from the economic perspective as well. Funding strategies, barter opportunities, tax credits, and cooperative efforts are outlined, all of which are mutually beneficial for the community and developer.

This book is quite optimistic about transit-oriented development and its future in the United States, perhaps justifiably so, as it provides data to back up its optimism. The authors qualify their positivity by stating that most of the TOD projects completed thus far are lacking because they fail to adhere to the spirit of TOD in all aspects. The case studies were somewhat helpful, although more illustrative of shortcomings than successes.

Overall, this resource was invaluable for its detailed descriptions of all facets of TOD and how to implement them. The book was an indispensible education in transit-oriented development that will guide much of the later design work.

Literature Review

Intercity Rail and Transit-Oriented Development: Making Connections, Building Communities
The Center for Transit-Oriented Development[25]
Sarah Kline, Elizabeth Wampler, and Chris Yake, Reconnecting America

This guide was published to highlight the ways in which transit-oriented development (TOD) applies to locals with intercity rail rather than the more traditional model focused around intracity rail. This intercity rail model shares many of the goals and methods of the traditional TOD model, including equitably improving access to jobs, reducing car dependence and the related emissions, supporting economic development near transit, and catalyzing community revitalization. It also stresses the importance of selecting the appropriate mix of uses, walkability, place-making, and the inclusion of public spaces, while avoiding too much or too visible parking and neighborhood gentrification.

According to this guide, the station in Rochester, New York is classified as a commuter station with annual ridership falling in the range of 100,000-500,000. Thus, the appropriate TOD opportunities are mixed-income residential, and station-oriented retail and services, with the possibility of employment and entertainment depending on the specific neighborhood. The station already has the advantage of "front door" access to the city and the design and development plan must take advantage. Creating a multimodal hub will make navigating the city easy for both visitors and locals alike.

Literature Review: TOD Approach

Transit-Oriented Development

Transit-oriented development is walkable, mixed-use development around existing transit stations. The principles behind TOD are improving quality of life, reducing household transportation costs, and creating stable mixed-income neighborhoods.

The formal practice of TOD is relatively new and there are not many truly successful examples. However, as it is implemented progressively around the country, lessons are learned and improvements are made. The greatest challenge to implementing TOD in the United States is supplanting the automobile's central role in American culture. The oldest, densest cities are where TOD works most naturally. In less dense areas it is simple to continue to depend on the car and thus implementing TOD is more complicated.

The good news is that more and more frequently people are questioning the suburban, bedroom community model prevalent across the nation. Home buyers and renters are placing greater value on walkability with shops, activities and jobs nearby. Also, many no longer want the expense, responsibility, or hassle of car ownership and are looking to switch to public transit. Transit-oriented development has the potential to significantly alter the manner in which American cities function if it is successfully applied.

Key Attributes

- Promote walkability with safe, beautiful, pedestrian friendly streets. Create an easily navigable network of walkways to make walking faster and more convenient than driving. The pedestrian must be the priority.
- Design multi-modal streets with protected bike lanes where possible and provide safe and secure storage at destinations. Cycling should also get preference over cars, but should be secondary to pedestrians.
- Mixed-use and high density are essential to TOD. Density should match or exceed the highest density of the community, being greatest closest to the station and decreasing with distance. High density improves location efficiency and internal trip capture, both of which reduce driving and make the development more successful.
- High quality public transit is the backbone of transit-oriented development. It must be frequent, fast, and reliable in order to conquer the car.
- Do not surround the station with

parking. Parking lots act as barriers between transit and the public; they should be structured above or below ground, located behind buildings and away from the pedestrian realm. Parking should be paid to discourage driving.

- The range of influence around a transit station is approximately 2,000 feet or half a mile radius. This is the area that is walkable from the station and therefore, all the essential features should be located within this zone to make them conveniently located, encouraging users to forgo driving.
- Adding amenities such as daycare, bike parking, and car sharing services encourages reduced driving.
- Place-making is an essential consideration in TOD projects. The character and attractiveness of the neighborhood will determine its ultimate success and must match its intended purpose. Create interesting space that people want to spend time in.
- There should be plenty of variety throughout the neighborhood. The area should be multi-modal; residents and users want a variety of transit options. There should also be variety in homes, jobs, shops, etc. A balance of options makes the development project more stable and more desirable.

Other Keys to Success

- It is essential to consider the neighborhood character when selecting the mix of uses. If it is primarily residential, the services and shops should support the needs of residences. If it is primarily employment, then professional services will be crucial.
- Streamlining the zoning process to favor transit-oriented development projects makes them more attractive to developers and more successful in the long term. The zoning regulations should favor...
  - Active, walkable streets
  - Building intensity and scale
  - Careful transit integration

  It may also help to customize the zoning to reflect the specific goals of a specific project.
- Including low-income housing, parks and public spaces, reusing buildings with character, and including community use spaces can help a project secure addition funding or tax credits, alleviating the massive financial burden. In all cases, coordination with the local government is critical.

Literature Review: TOD Approach

TOD in Rochester

The Rochester Station project area is in a unique position, sitting in a buffer zone between downtown and the northern residential neighborhoods. The mix of uses in the development and in the neighborhood should reflect this transitional character by housing both employers and residences with the services needed by both. The retail should make a point of catering to those employees commuting to neighborhoods without TOD.

As with all TOD projects, the anchor is public transit. In the case of this thesis it is the Rochester Station, including interstate trains, interstate buses, and local buses. Typically, the most successful TOD projects are connected to local light rail station and although it has been discussed, Rochester no longer has a local rail network, and there is no plan to have one reinstalled. Therefore it is imperative that the transit options Rochester does have remain excellent and continue to grow in popularity.

Following the strategies of transit-oriented development, the ancillary uses in and around the station should be…

Community

It is important for community members to have a stake in such an important building. Creating space for their use gives a sense of ownership and brings in visitors who may otherwise not use the station. Meetings, events, and educational opportunities can be hosted in an accessible and functional location. The addition of community space can also be useful to the developer as a bargaining tool for municipal and government funding or to the government as a tool in incentivized zoning.

Employment

Creating jobs is a vital function of transit-oriented development and smart for the economic growth of the city. Adding employment space in the station makes it easily accessible and locates jobs close to residents in the TOD neighborhood, one of the primary goals of transit-oriented development.

[Sources this section32, 25]

Case Studies: TOD

Mockingbird Station

Location: Dallas, Texas
Developer: UC Urban and Hughes Development, LP
Year: Phase One, 2001

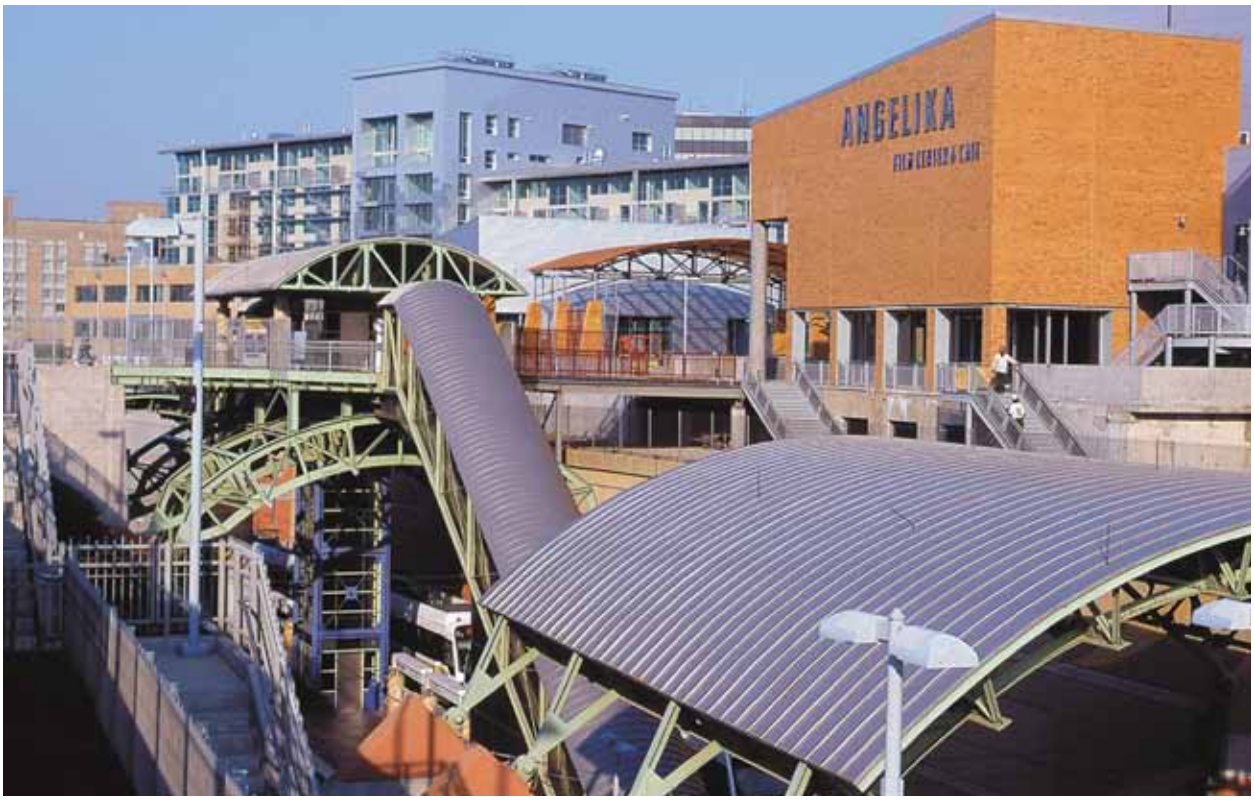


Figure 33 Mockingbird Station DART
www.dart.org

Mockingbird Station is a 10-acre mixed-use, transit-oriented development. The project is one of many new TOD sites in the Dallas area. The development site is a 700-foot wide trapezoidal plot, wedged between the Mockingbird Station rail lines and the Central Expressway. The area is quite affluent with a mix of college students and staff from the nearby Southern Methodist University and older, more sophisticated residents of the Park Cities neighborhood.

Developer Ken Hughes completed the initial phases of the project with no public funds; it was completely a private venture. The result is "the place to be seen" in Dallas. It has 211 loft apartments, 150,000 square feet of office space, a movie theater, 183,000 square feet of retail, six restaurants, a bank, a dry cleaner, a grocery store, as well as 90 additional shops of various kinds. All of these are within a five-minute walk.[32]

Case Studies: TOD

Mockingbird Station

Figure 34 Angelika Movie Theater
http://madisonmarquette.com/

Meeting the Goals of TOD

Hughes' project is a great success story for TOD. The community embraced the development, taking full advantage of all it offered, from shopping to living. It is easily accessible by car or public transit. Parking was shifted from the pedestrian realm with most of the 1,440 spaces placed underground. A great deal of thought went into how visitors would use and move through the spaces. Emphasis was placed on creating places people would enjoy and want to spend time in.[32]

The developer is working to address the drawbacks of the site, including the lack of a pedestrian emphasis. The access street for complex is being transformed into a boulevard with raised medians, traffic calming strategies, wide sidewalks, and landscaping. The extension of a nearby hiking trail will also improve pedestrian connectivity.[32]

Figure 35 Mezzanine Level Stairs
https://www.flickr.com/

Mockingbird Station

Usefulness

This projects highlights TOD oriented equally towards cars and public transit. This will be an important lesson for Rochester where the "car is king" and public transit has 'an uphill battle' to fight. The emphasis this project placed on place making is also a valuable lesson. In TOD projects it is essential that people want to be in the spaces. They must be a destination in order to be truly successful.[32]

Figure 36 Mockingbird Station Aerial View
http://dartdallas.dart.org/

Figure 37 Concept Drawing
http://bizbeatblog.dallasnews.com/

Case Studies: TOD

Pearl District

Location: Portland, Oregon
Year: Begun, Early 1990s

Figure 38 Pearl District, Portland, OR
http://www.matinrealestategroup.com/

The Pearl District is a $3.5 billion private TOD project located in Portland, Oregon, not far from the downtown area. The development includes 4,700 residential units, 16% of which are designated as affordable housing. It is located adjacent to a streetcar line, regional light rail and local busses that connect the neighborhood to the rest of the city. The Pearl District was well planned, with a clear vision and goals. Developers and the city worked in closely, mutually benefiting through cooperation to achieve their goals.[33]

Economically, the tax benefit of this project was astronomical. In 2000, the River District (including the pearl district) amounted to $623,000 in taxes, compared to $23.5 million by 2009.[33]

Case Studies: TOD

Pearl District

Figure 39 Jamison Square
http://www.pearldistrict.org/

Meeting the Goals of TOD

Recognizing the value of public transit to growing development, the project developers helped fund the streetcar line by contributing $700,000. Developers also contributed to mutually beneficial infrastructure and parks projects through monetary or land contributions. In exchange the developers were granted increased FARs. Other incentives that grant increased floor area ratios are the inclusion of prioritized uses including public facilities such as schools, day-care centers, libraries, and community centers.[33]

Figure 40 Bike Valet
http://www.pearldistrict.org/

In order to further its goals, the Pearl District implemented zoning that was unique within the Portland area. The regulations encourage dense building coverage to create a pedestrian oriented atmosphere. In addition, allowable uses ripple outwards, with mixed-use buildings at the center, surrounded by Central Employment, which includes light industrial and commercial.[33]

Case Studies: TOD

Pearl District

Figure 41 Townhomes
http://jewelofthepearl.com/

Lessons Learned

Cooperation between the local government and the developer is essential to TOD. Without the willingness to compromise and cooperate, meeting the goals of TOD would not be possible. For example, a developer purchases land and donates it to the city, which then builds a public park on the land. In exchange for the land the developer is allowed increased FAR and the park increases the value of the real estate. In this scenario, everyone is able to meet their goals because of flexible regulations and cooperation.[33]

Figure 42 Tanner Springs Park
http://www.pearldistrict.org/

Case Studies

Additional Form Studies

Figure 43 ARTIC- CA, United States
voiceofoc.org

ARTIC

The Anaheim Regional Transportation Intermodal Center is a LEED platimium station located in orange county, CA. The iconic shell structure is custom made of diagrid steel with two layers of ETFE stretched between the diamond shaped openings. [34]

Figure 44 Rotherham Central Station-United Kingdom
http://www.archdaily.com/

Rotherham Central Station

The redevelopment of this station was key to the plan to redevelop the town of Rotherham, UK. Aedas designed it to "became a catalyst for regeneration and investment" and to form a gateway to the town. The station achieved a BREAM accrediation of 'very good.' [35]

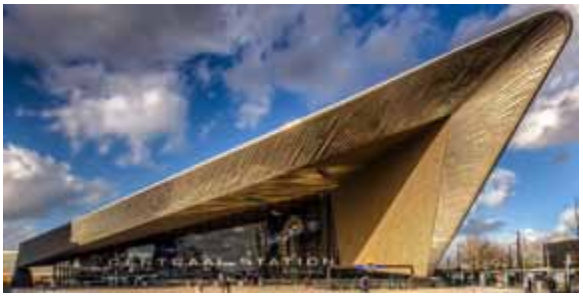


Figure 45 Rotterdam Central Station-Netherlands
http://www.archdaily.com/

Rotterdam Central Station

Located in Rotterdam, Netherlands, the new entrance canopy to the station opened in 2014. Clad entirely in stainless steel, it is an iconic gateway to the urban centre that unified the rail zone with the rest of the city. [36]

Part 2

Design Introduction

The following presents the design of the Rochester Central Station (RCS). The design is the result of in-depth research, intense exploration, and careful planning. The result is a station that meets the goals set for it.

The design is ambitious, taking on the goals of transit-oriented development and expanding from a train station to a mixed use intermodal complex. It has the challenging task of measuring up to its predecessors, designed by renown architects and beloved for their beauty. The design achieves this by remaining true to the spirit of their designs. It is modern, a product of its time and a landmark in its own right. The station shines as a beacon for revitalization and stands tall, a model of thriving development, among the other towers of downtown Rochester. The station is relevant to the needs of transit, travelers, and the community. It is designed for growth and change, so that it can evolve with the neighborhood, the city, and the region.

The form of the station is elegant and interesting. It is unlike any other building in Rochester, NY. It has the ability to inspire curiosity and thus, encourage use. The station design has personality and character that will engage the community, connecting them to the project and all that it contains.

The new station design capitalizes on the opportunity to contribute to the revitalization of the city. Through thoughtful design and careful planning it reconnects the divided halves of Rochester, filling in the underutilized land between the train track and the inner loop. Rochester Central Station is the first step in redeveloping the area. It is symbolic of commitment to continued growth and investment, a visual indication of change.

The design that follows is a conceptual plan and visualization of a new transit station and the surrounding area.

Zoning

Within the current zoning of Center City District-Base, a transit station and all the ancillary uses of this project are permitted on the project site.

The existing zoning requirements for the site are not overly restrictive and do not prevent most of the recommended strategies of transit-oriented development.

The site constraints are one of the few requirements in conflict with the goals of TOD and thus the design for this project. The maximum lot coverage specifies a large amount of open space within the site and the maximum height prevents any building taller than 5 stories, both of which are in opposition to the density and compact goals of TOD. The design for the Rochester Central Station would require variances for both of these zoning requirements. However, it is instead recommended that a special zoning district be created for the station project with customized zoning requirements that favor and promote TOD principles.

Existing Zoning

Zoning District

CCD-B: Center City District-Base [37]

Permitted Uses

All uses permitted except homeless shelter, sexually oriented businesses, uses not in a fully enclosed building, waste centers, and pawnbrokers. [38]

Intent/Goals of Zoning

1. Preserve desirable character
2. Promote diversity and variety
3. Promote street-level activity and uses
4. Create green streets
5. Enhance pedestrian circulation [38]

Site Constraints

Maximum Lot Coverage: <25% block length
<50% block depth
Maximum Height: 48 feet, 2-5 stories desired
Orientation: Parallel to Street
Setbacks: 10 feet maximum [37]

TOD Recommended Zoning

Active, walkable streets
Building intensity and scale
Careful transit integration

Program

Programmatic Needs

The program of the Rochester Central Station was carefully determined based on the project goals and the transit types it will house. The design must meet the functional needs of transit and well as the goals of transit oriented development. The station is a complex facility and its many facets must function cooperatively. What follows is a description of the station's desired character and spatial requirements.

Character

The Rochester Central Station is a public building and a gateway to Rochester, thus it is essential that the station building be of landmark quality and make a lasting, positive impression.

The station will be a product of its time, modern and elegant, sustainable and efficient. These are key descriptive terms...

- Light and transparency
- Modern and captivating
- Transition and flow

All the spaces for the different uses of the transit station should be unified by a common theme that visually connects to clearly form a single station. The physical form and appearance should be captivating, a landmark and beacon, indicating a center of urban activity and attracting customers. The interior spaces should then draw visitors inside, enticing them with bright, well lit captivating spaces that are modern and interesting.

Descriptions

Entry Hall: Just inside the main entrance should be the entry hall with the main counter for information and tickets opposite the entry doors. To the side of the counter should be space for self-serve ticketing. Access to the bus and train halls should be on either side of the entry hall.

Main Service Area: Most of the station service functions and staff areas will be located behind the ticket counter. This includes staff restrooms, offices, breakroom, storage, server rooms, the baggage area, equipment area, freight elevator, mechanical room, and communication room. This area should have direct access to the bus shelter.

Train Hall: Access to the train hall will be off the entry hall and lead underground to the train hall. The vertical circulation to both the main station and to the platforms should include stairs, escalator, and elevator. These will lead to a passageway ending a

Program

the train hall, which is where the waiting area with plenty of seating, restroom, and retail will be located. At the opposite end of the train hall the passageway will continue, leading to the vertical circulation to the platforms.

Train Platforms: There will be three platforms accessed via stairs, escalators, and elevator from the train hall below. The vertical circulation should be sheltered by simple structures on each platform.

Train Canopy: The train shed should be a simple evocative form that shelters and lights the platforms below.

Lower Service Area: Located below ground with the train hall, the lower service area will primarily be for shuttling checked baggage to the trains. Additional uses will include staff restrooms and storage.

Bus Hall: Access to the bus hall should be off the entry hall and lead to the bus shelter. It will house a large waiting room, restrooms, and access to the street facing retail.

Bus Shelter: Located just past the bus hall, the bus shelter should be visible to passengers waiting in the bus hall. Similar to the train shelter should be a simple evocative form that shelter and lights the bus bays below. The form should speak to the other forms throughout the station, but be distinct enough to stand out.

Tower: The tower should share much of its physical appearance with the rest of the station in order to clearly signify that it is part of the station. It should be significantly taller than any of the surrounding buildings and should rival the height of the tallest buildings in downtown. It should not however, be so tall as to dwarf those same buildings. The tower will be the most visible part of the transit station and will act as a beacon, marking its location in the city.

sources for program inofrmation[10.11]

Program

Spatial Needs	QTY.	SF/unit	SF (Proposed)
Entry Hall	1		4,000+
Information Kiosk	2	25	50
Stair/ Escalator to Train Hall	1		2,000
Passenger Concourse to Train Platform	1		5,800
Equipment Concourse to Train Platform	1		4,000
Stairs/ Escalators to Platforms	6	900	5,400
Mechanical/ Electrical Room	1		6,300
Secure Server Room	1		90
Secure Communications Room	1		80
Secure Storage	2	30	60
Waiting Rooms	2	4,200	8,400
Station Retail Spaces	2	500	1,000
Vending & ATM	2	50	100
Men's Restrooms	2	150	300
Women's Restrooms	2	150	300
Family Restrooms	2	60	120
Ticket Counter	1		250
Queue Space	1		250
Self-Serve Ticketing	4	65	260
Baggage Work Area	1		400
Equipment Area	1		900
Baggage Claim	1		350
Staff Offices	6	100	600
Staff Restrooms	2	60	120
Breakroom	1		420
Office Storage	1		190
Custodial Closet	2	40	80
Bike Storage	M		6,500
Bus Berths	10+	540+	24,500
Short Term Parking	10+	170+	4,200
Elevator	2+		164
Elevator Equipment Room	2+		130
Leasable Space	M		218,500
Street Oriented Retail Space	3	1,500+	5,450
Subtotal			301,264
Circulation (10% of Subtotal)			30,126
Expected Total Area			331,390

*M= Multiple: Exact capacity not determined

Figure 46 Chart of program spatial requirements

Concept & Process

The design process was difficult to navigate due to the complexity of the building and its circumstances. It was very important to progress step by step through the design process, which is described below.

Parti

The design parti is the guiding vision for a project. It encompasses the character and goals of the project and ensures a cohesive resulting design. In this project the parti was finalized after extensive exploration with mapping, diagraming, and sketching.

A transit station is a hub of activity, a gateway at which the paths of many travelers and modes of transit converge. People are welcomed by the building as they arrive and bid farewell as they depart. It is the first and last building they experience at their destination and it leaves a lasting impression.

At the Rochester Central Station, gateways and pathways are the guiding principles of the design parti. The station welcomes users to Rochester, framing their arrival as a carefully designed experience intended as a prelude to what awaits in the city beyond. It is organized as a pathway and each new space along it begins and ends with a gateway.

Figure 47 Concept Sketch 1

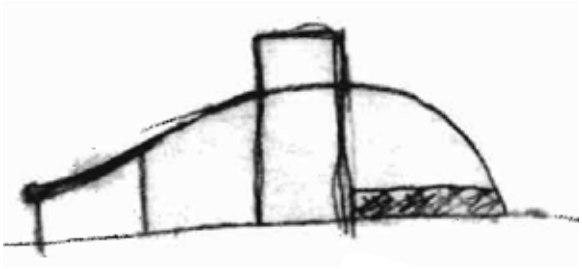


Figure 48 Concept sketch 2

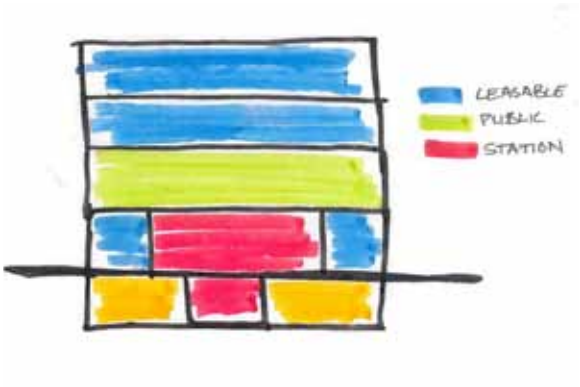


Figure 49 Diagram of layered building uses

Concept & Process

Site Mapping

The first step after identifying the necessary spaces and functions in the programming phase was to map out where they would be located within the site. It was important to consider how each piece of the site would relate to the immediate neighborhood and the city beyond.

This mapping process comprised many sketches that explored the different variations that were possible on the site. It began with determining the desired zones of where each major function should be located. Then, it began to focus in on the approximate building footprints, as it was essential to look at how different buildings would relate to eachother.

A building has a rippling impact that is strongest in its immediate area. How does the building shape influence pedestrian behavior? Does it shade the surrounding buildings too much? How tall is it compared to its surroundings? Is the building attractive? Do people want to be near it or does it intimidate? Considering these questions was crucial to having a well though out design solution for the RCS site.

Figure 50 Site Influences Sketch (showing: views-green, sun-yellow, axis-orange, wind-blue, traffic-red)

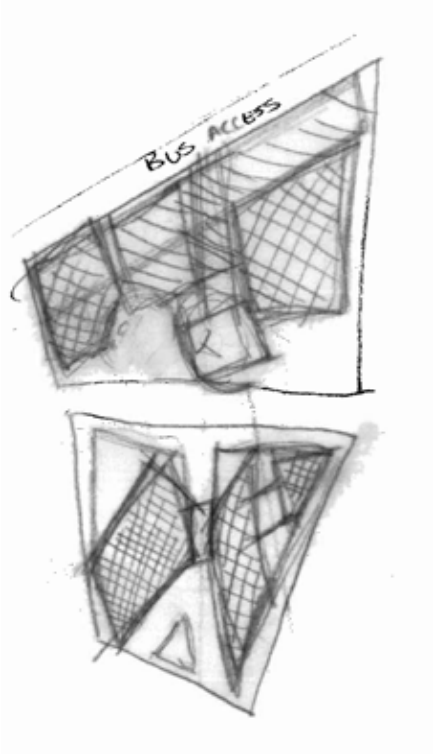


Figure 51 Site sketch

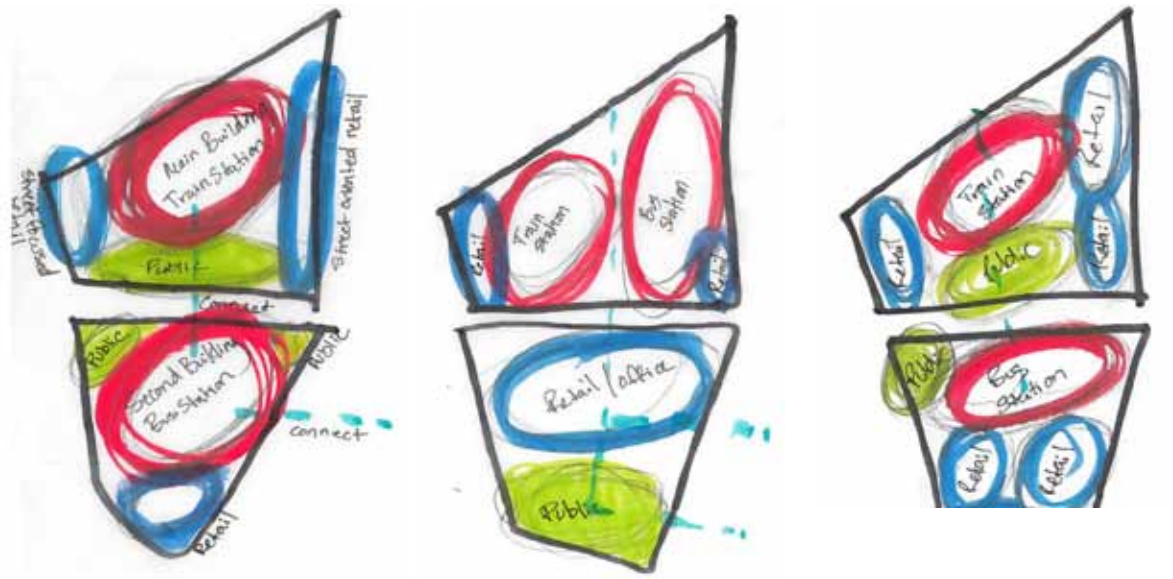


Figure 52 Site mapping bubble sketch samples

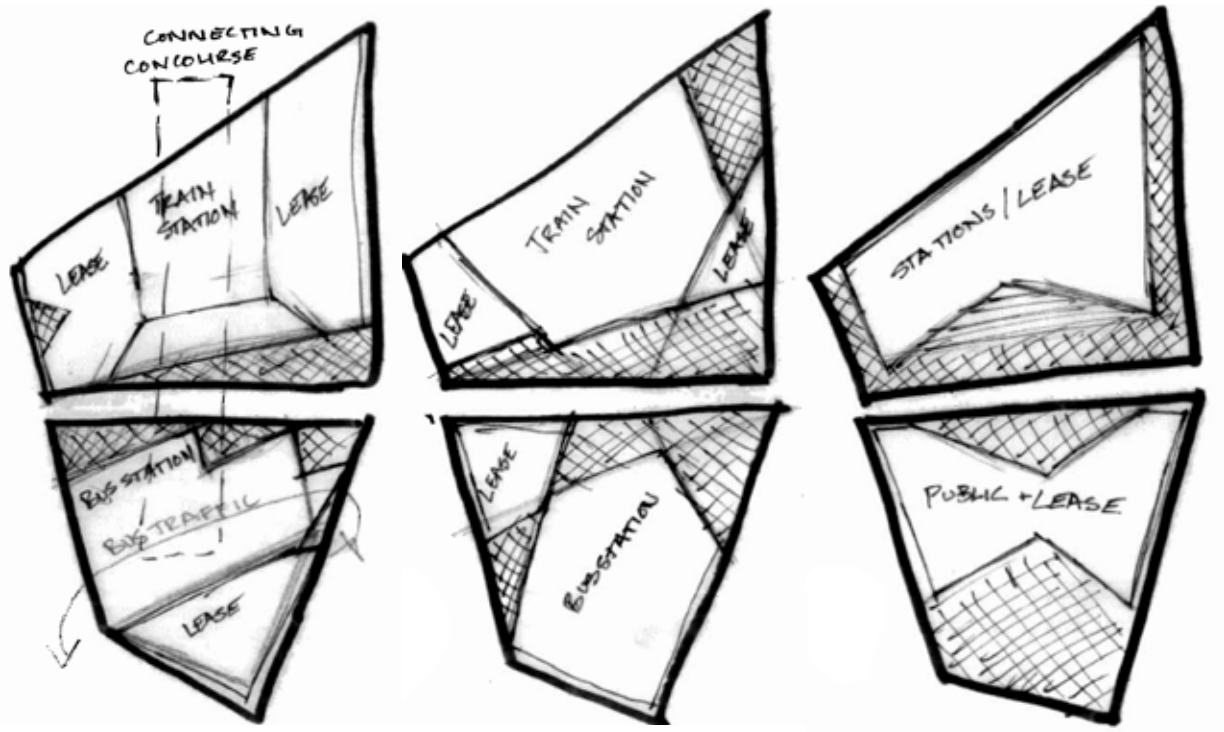


Figure 53 Site mapping line sketch samples

Concept & Process

Bubble Diagrams

The next step was to create bubble diagrams in order to determine a functional layout for all the essential spaces. Using the completed site mapping, each function of the station- train station, bus station, retail, and leasable space- was analyzed in further detail. Using the necessary functions and size requirements from the program, bubble diagrams were sketched that explored various possible configurations, taking into account important adjacencies and proximities.

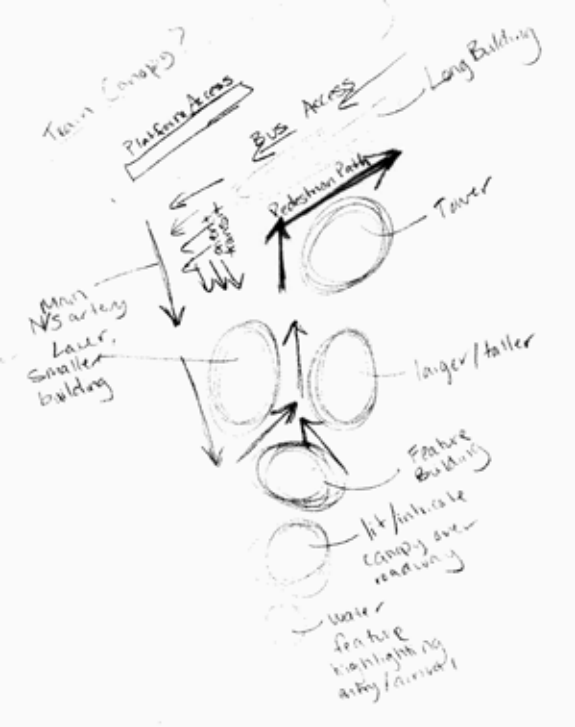


Figure 54 Bubble Diagram with descriptions

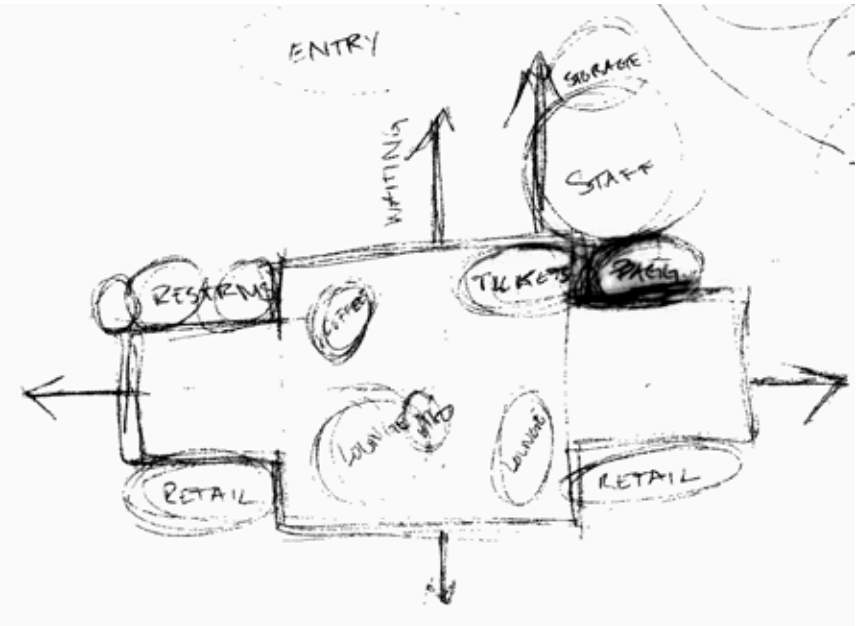


Figure 55 Train hall bubble diagram

Concept & Process

Sketching

After completing the initial exploration of space layouts, it was time to examine the aesthetics of the new station building. A great deal of time was spent sketching at various scales and levels of detail. These ranged from overall building shape, to site character, to structural details. Most of the choices regarding form are discussed elsewhere in this thesis.

The most important goal of each sketch was to unify form, function, and parti. In the end, the sketch of a single curved line was the inspiration for the station.

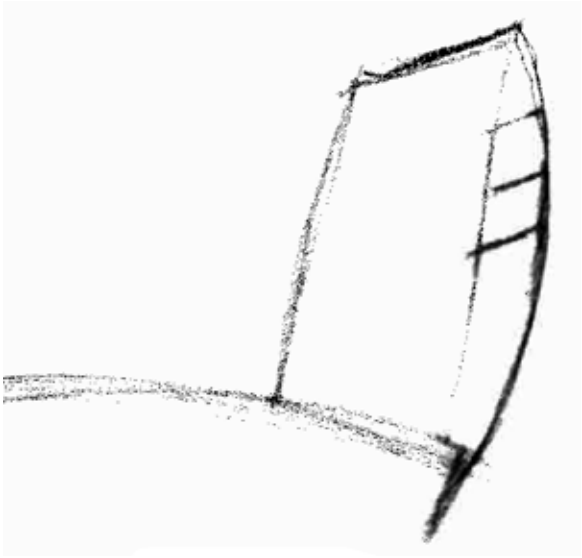


Figure 56 Tower concept sketch

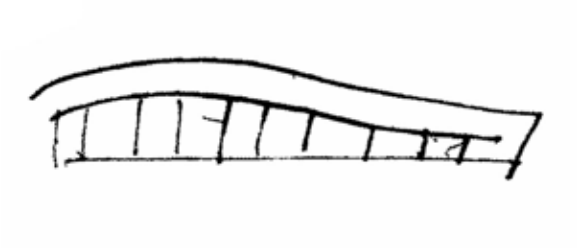


Figure 57 Entrance concept sketch

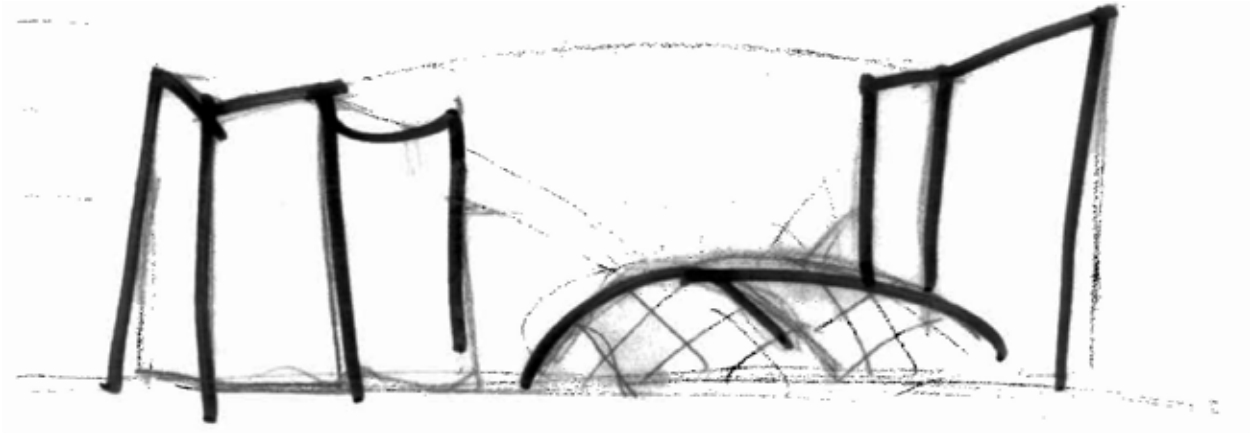


Figure 58 Station concept sketch

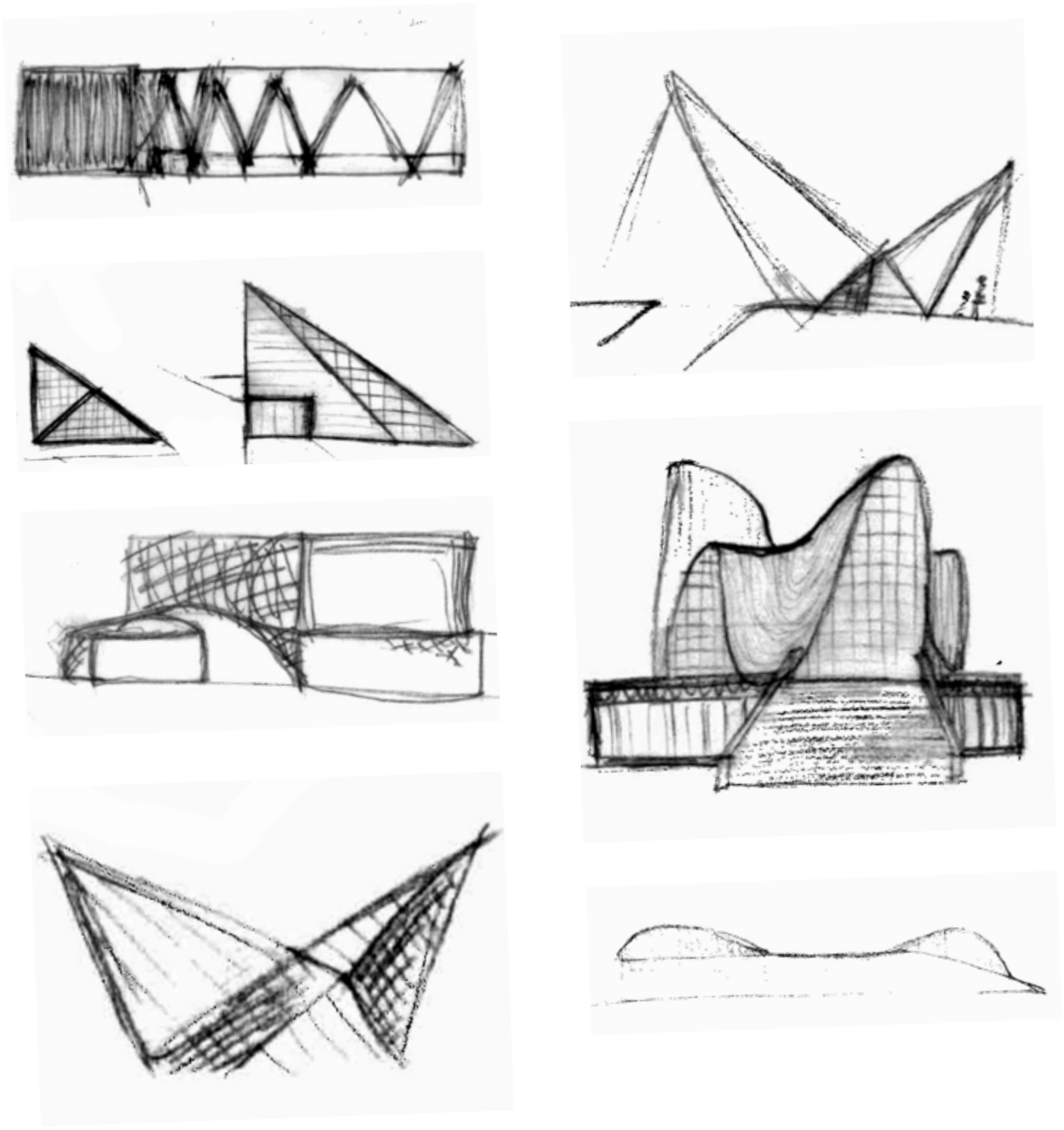


Figure 59 Collage of preliminary form sketches

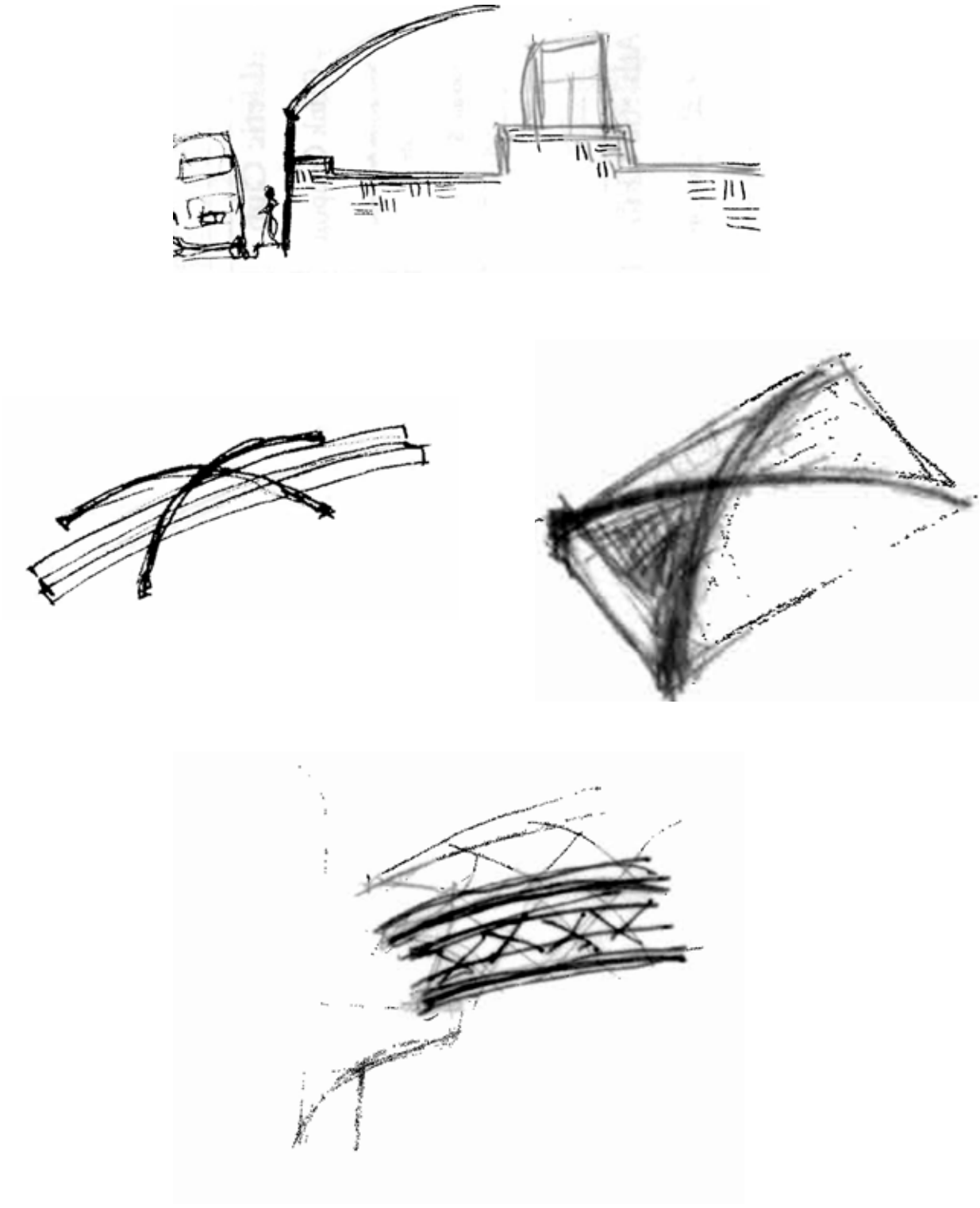


Figure 60 Collage of train canopy sketches

Design

The station is designed as a series of hubs, each of which houses one of the main station functions. These hubs are connected by pathways that guide users through the station, passing through gateways as they arrive and depart each main area.

The major hubs of the station are the entry hall, the bus hall, the bus shelter, the train hall, the train shelter, the tower, and the service areas. Each of these spaces has unique personality within the design of the station.

The main entry is grand, making an immediate impression on those who see it. The entry is framed by the southern most structural curve in the station roof. It is a black arch that visitors pass through, the first gateway. The starkness of the black sheathing around the frame paints a dramatic view of the station.

The bus hall is to the west of the main entry and continues the drama first experienced in the entrance. Above the hall six more curving structural members radiate across the roof; strong, organizing elements that frame the sky through the glass between them. The height, modern feel, and natural lighting create an impressive space.

The bus hall is alive with activity. It is not only the waiting area for bus service, but also, a sort of main hall for the station. People can freely cross this area when traveling between other spaces of the site; from retail shopping to offices in the tower, from community functions in the station to public transit, from bus service to train service, etc. In combination with the entry hall, it is large enough to be an active, public space.

At the rear of the bus hall is access to the bus shelter. The bus bays are clearly visible from the bus hall through the glass wall that separates them (and acts as a gateway to the buses). The bays are unconditioned space, sheltered by a glass canopy that lets plenty of natural light shine into this active space. The canopy is supported by curved concrete forms that are both functional and ornamental. These concrete structural members are distinct from the structural forms of the station roof in both material and shape. They feature a second curve that appears in other areas of the design to differentiate the area. The structural forms are also unified with the roof, because the roof structure arcs above, connecting to the tower and is visible through the shelter canopy.

Design

Opposite the bus hall on the east side of the entry hall, a grand stair leads down to the train hall, which is located below grade. The train hall celebrates the need to go under the train tracks to access the platforms by locating all of its services along the this subterranean route. The waiting rooms, retail spaces, information kiosk, restrooms, and platform access are all located in spaces designed to be beautiful, well lit, and grand. Visitors should not even realize they are underground.

At the far north end of this route, vertical circulation rises up to the train platforms where travelers are greeted by an impressive sight. Above them the curved structure of the shelter creates a diamond pattern by crisscrossing along the length of the platforms. The spaces between are filled with glass, facilitating visual connection through beautiful views to the station, the sky, and city.

On the southeast corner of the site, an eighteen storey tower rises above the station. The tower is a key feature both functionally and visually. Because the tower rises to such an awesome height, it is widely visible and acts a recognizable beacon marking the location of the station. The space within will be leased out to house businesses and offices that will bring people to the site. The dense concentration of employment and thus people is central to the success of the site as a transit-oriented development.

Given the urban context of the site, most of the parking will be handled off site. On the station site itself, there is one small parking lot intended for short term use when a traveler is dropped off or picked up. This lot is located at the back of the site, adjacent to the other transit pathways.

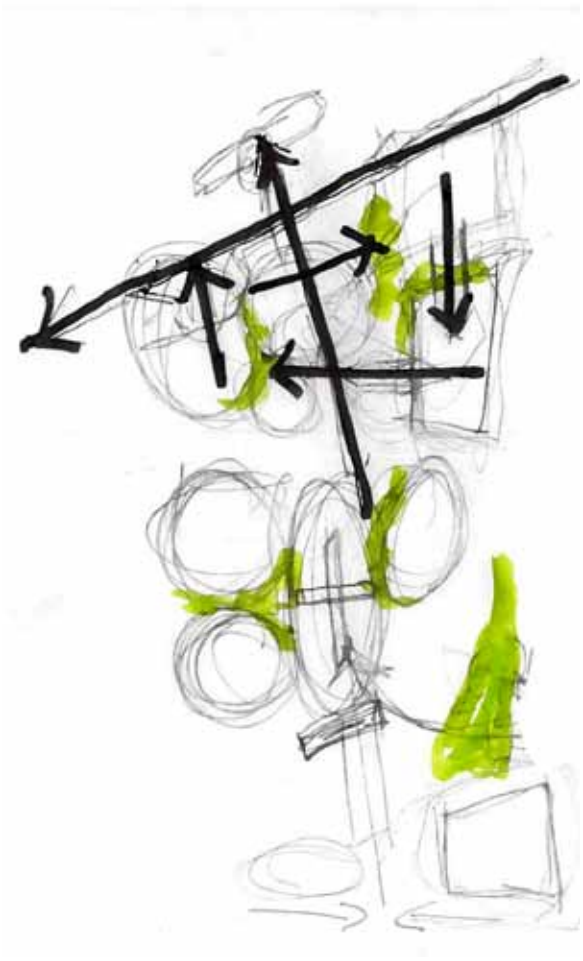
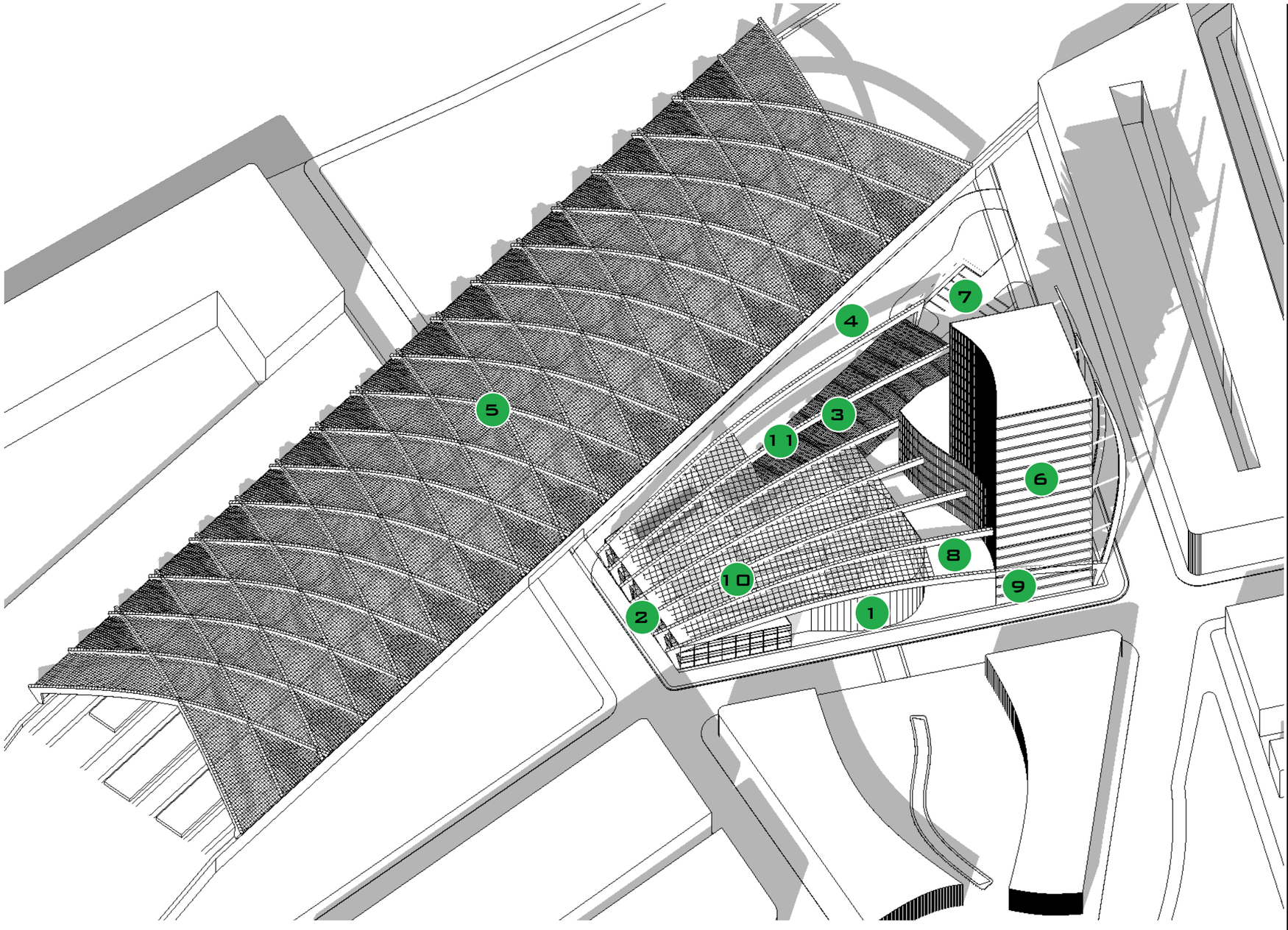


Figure 61 Site connections sketch



1. Station Entrance
2. Street Oriented Retail Space
3. Bus Canopy
4. One-Way Bus Loop
5. Train Canopy
6. Business Tower
7. Short-Term Parking
8. Pedestrian Walkway
9. Bicycle Storage
10. Bus Hall
11. Train HAll (Below Ground)

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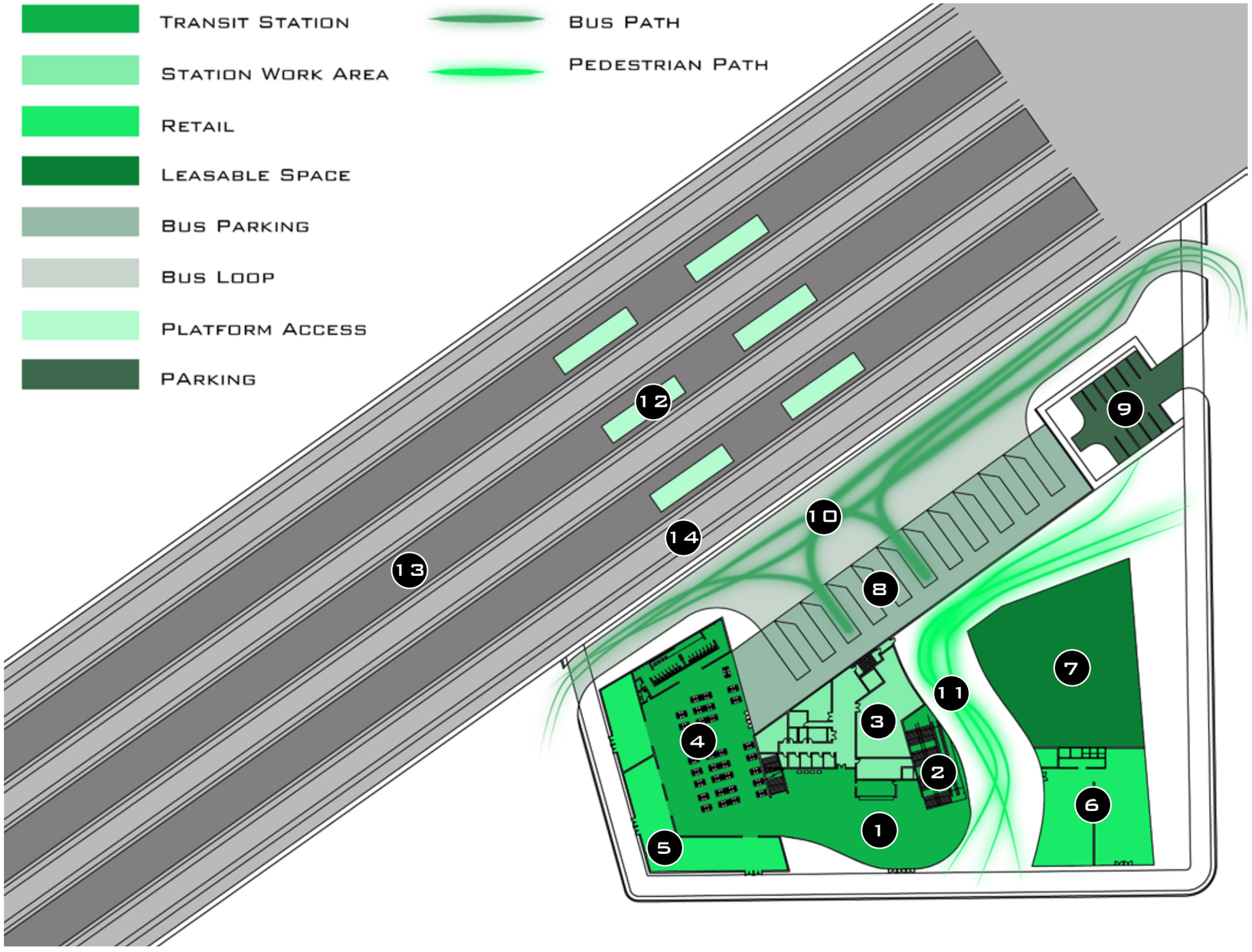
Site Features Map

Figure 62

Rochester Central Station

50 FT 100 FT 200 FT 400 FT



1. Entry Hall
2. Circulation to train Hall
3. Employee/ work area
4. Bus Hall
5. Retail
6. Bike Shop/ Storage
7. Leasable Space
8. Bus Bays
9. Short Term Parking
10. Bus Loop
11. Pedestrian Path
12. Platform Circulation
13. Platform
14. Main Line Tracks

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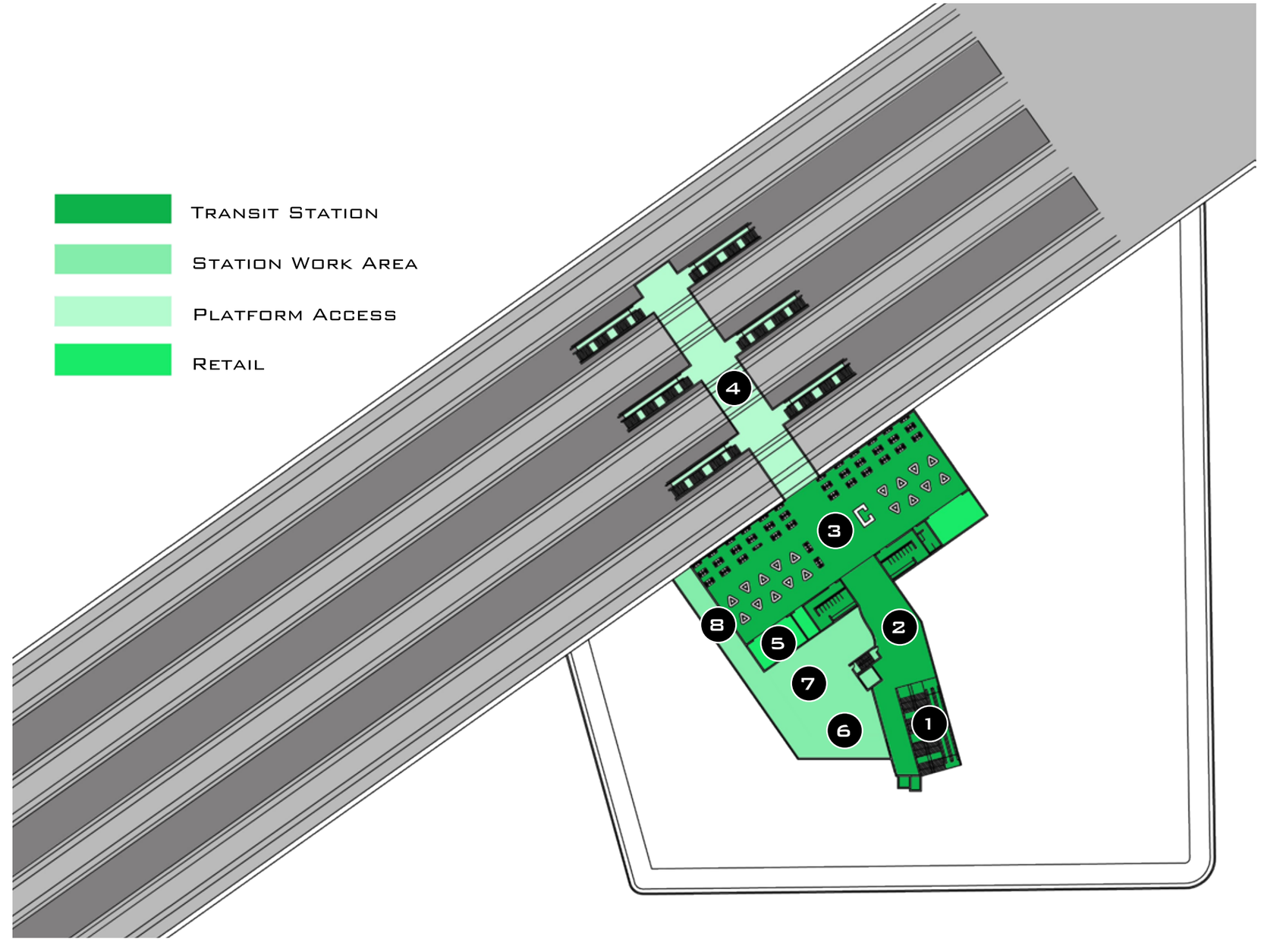
Level 1 Floor Plan

Rochester Central Station

Figure 63

170 FT

85 FT 340 FT



1. Circulation to train Hall
2. Entry Corridor
3. Train Hall
4. Platform Access
5. Retail
6. Mechanical Space
7. Luggage Area
8. Service Hall

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A Level Floor Plan

Figure 64

Rochester Central Station

170 FT

85 FT

340 FT

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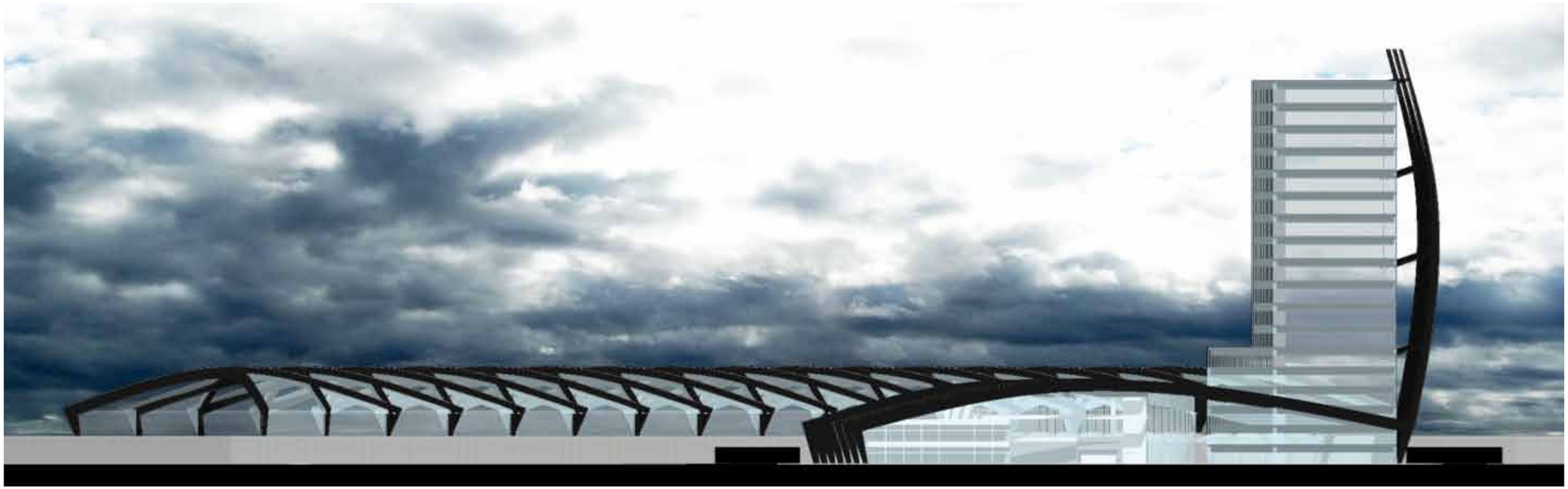


South Elevation

Figure 65

Rochester Central Station

150 FT

75 FT

300 FT

East Elevation

Rochester Central Station

Figure 66

150 FT

75 FT

300 FT

North Elevation

Figure 67

Rochester Central Station

75 FT

West Elevation

Rochester Central Station

Figure 68

150 FT

75 FT 300 FT

Bus Station Perspective Figure 69

Rochester Central Station

North Perspective

Figure 70

Rochester Central Station

South Perspective

Figure 71

Rochester Central Station

West Perspective

Figure 72

Rochester Central Station

Design

TOD and RCS

The design descisions for the Rochester Central Station were made with transit-oriented development in mind. The station is the center of activity in the neighborhood and it is the foundation upon which further growth and development will be focused. It was vital to make smart design choices, because they will have an expansive impact on the neighborhood and the city.

A dense site sets the tone for the neighborhood. The poject site is packed with over 330,000 SF of building area (excluding the train platforms and shelter) distributed between a multilevel station and an eighteen storey tower. This distribution, along with development in the surrounding community is intended to bring a mix of uses and users to the site in order to facilitate walkability, compactness, a balanced mix of uses, and trip-capture.

The project is well connected to its surroundings. There are open walk ways that connect the most direct routes to the station's surroundings. There are two pedestrian plazas that transverse the center of the station site and the adjacent site to south, connecting the surrounding neighborhood and improving access.

It is important to consider placemaking when layering the stations many uses into the site. Developing an emotional connection between the station and the community members is essential to drawing visitors in. The distinct and striking appearance of the station as well as functional and enjoyable spaces helps to ensure the future of the project. If people enjoy spending time in a place, it will endure and thrive.

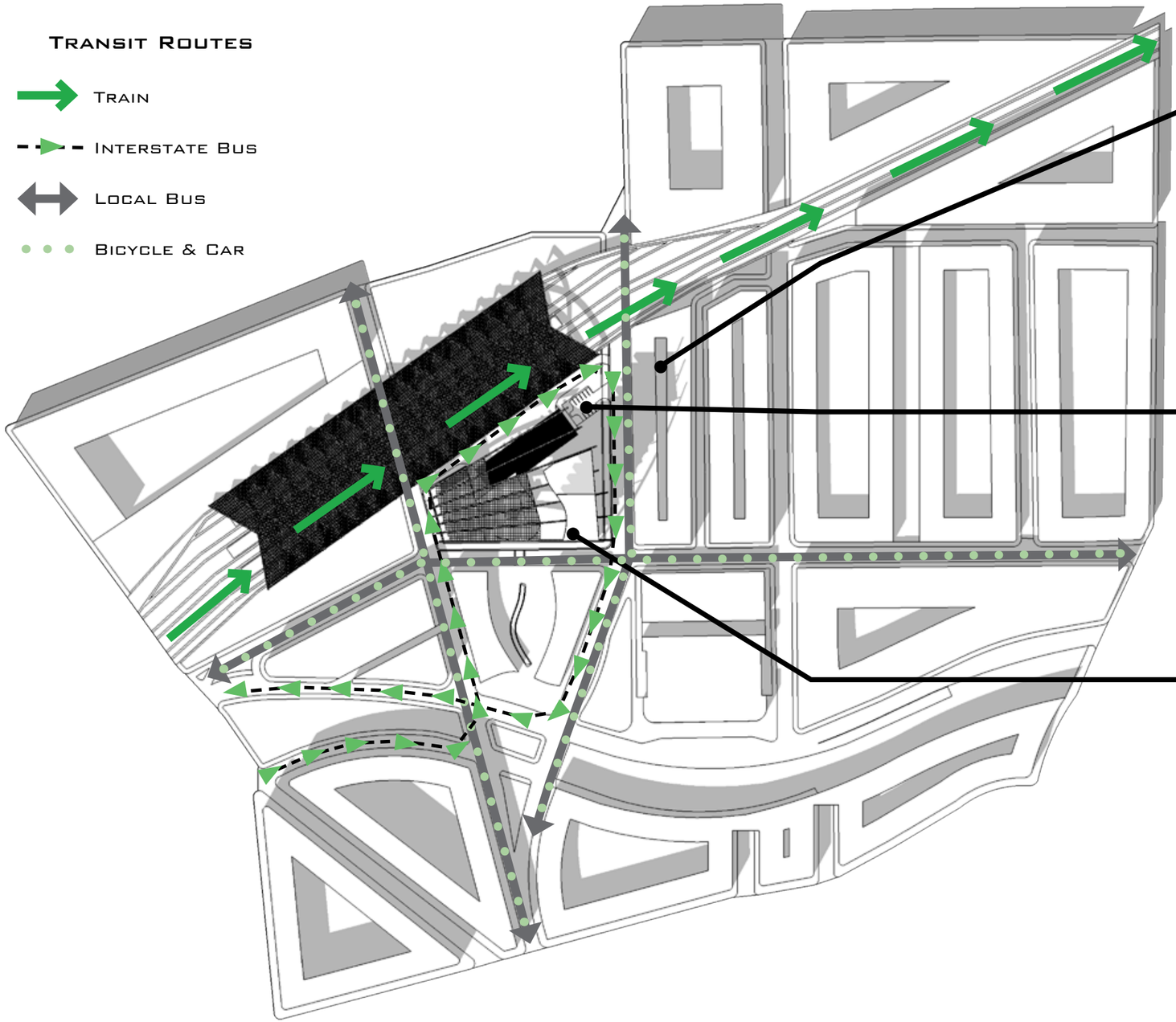
The pedestrian, followed by mass and public transit are favored over the automobile. Access and convienence are prioritized for passenger, walkers, and bicyclists. Parking has been shifted to the perifery of the site and much of it has been removed to a shared facility away from the neighborhood streetscapes.

Design

Connections & Interactions

The site is split into two zones, the transit zone and the pedestrian zone. The train tracks form the northern site boundary and it is because of their location that the transit zone is located on the north side of the site. This zone includes all of the motorized transit units, or in other words, the trains, buses, and cars that will move through the site. Orientation of these transit elements is determined by the position of train tracks. The tracks are a fixed boundary for both the project site and for a large part of the city and are a logical organizing axis for the site. Immediately adjacent to the tracks, but located at street level is the bus loop used by intercity buses to access the parking and loading area under the bus shed. Northeast of the bus shed is the only on site parking lot for cars. These three areas form an artery that carries the life-blood of the station, transit, through the site.

The pedestrian zone is located on the western, southern, and eastern sides and is aligned to the streets that create the site boundaries. It is important to note that the transit zone is well separated from the pedestrian zone. While both zones are essential to the site, each has an optimal location. When designing around the principles of transit-oriented development, the pedestrian takes precedence along the streets and transit should be located behind buildings away from the pedestrians. This separation creates a safer, more attractive, more accessible site flow.



Parking Garage

Short-Term Parking

Bike Storage

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Transit Flow Diagram

Figure 73

Rochester Central Station

Design

Organizing Curves

A product of the sketching phase, two distinct curved lines are the primary organizing elements throughout the project. They appear and reappear, containing and defining spaces, providing clearly recognozable visual identity to the new station.

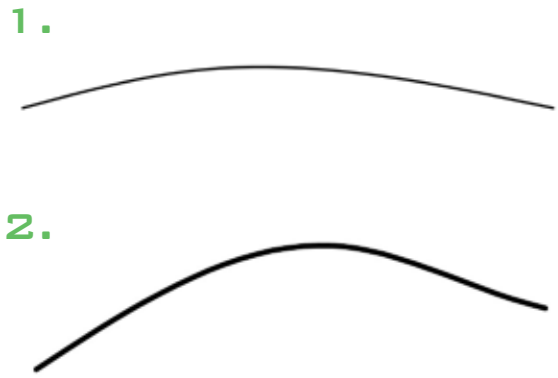


Figure 74 Organizing Curves

In the structural elements the curves are implemented separately and repetitively. Curve one is the primary curve, forming the major roofs including, the bus hall, the train shed, and the ribs of the tower. Curve two is the secondary cure and encolses spaces beneath the primary curve such as, the train hall, the bus shed, and the pedestrian walk way. In doing so, the each curve become a gateway that visitors travel through.

These curves also function in the horizontal plane or, in other words, in the plan view of the building and site. Walls and glass, walkways, benches, and water follow the curves. They organize and unify space within the station.

Design

Structure

The building's structure forms 'gateways' throughout the station that greet visitors, comnunicating to them the character and vitality of the neighborhood and the city beyond.

Visitors experience the 'gateways' along pathways that connect the main station spaces. Thus as a traveler arrives at the station and each destination within, they are greeted again and again by the arching 'gateways' visitors will come to identify with the Rochester Central Station.

The 'gateways' are the structure and the ornament of the station building. They form a series of shells or canopies under which all the station funtions are contained creating a sense of visual organization.

In many places, the curves overlap, forming crossed lines that reference the 'X' that denotes a railroad crossing. Just as the rails and roads intersect at a railroad crossing, transit and urban-life intersect at the Rochester Central Station, thus it is fitting that throughout the station this significant junction is marked again and again as the lines formed by the structure of the station shell intersect.

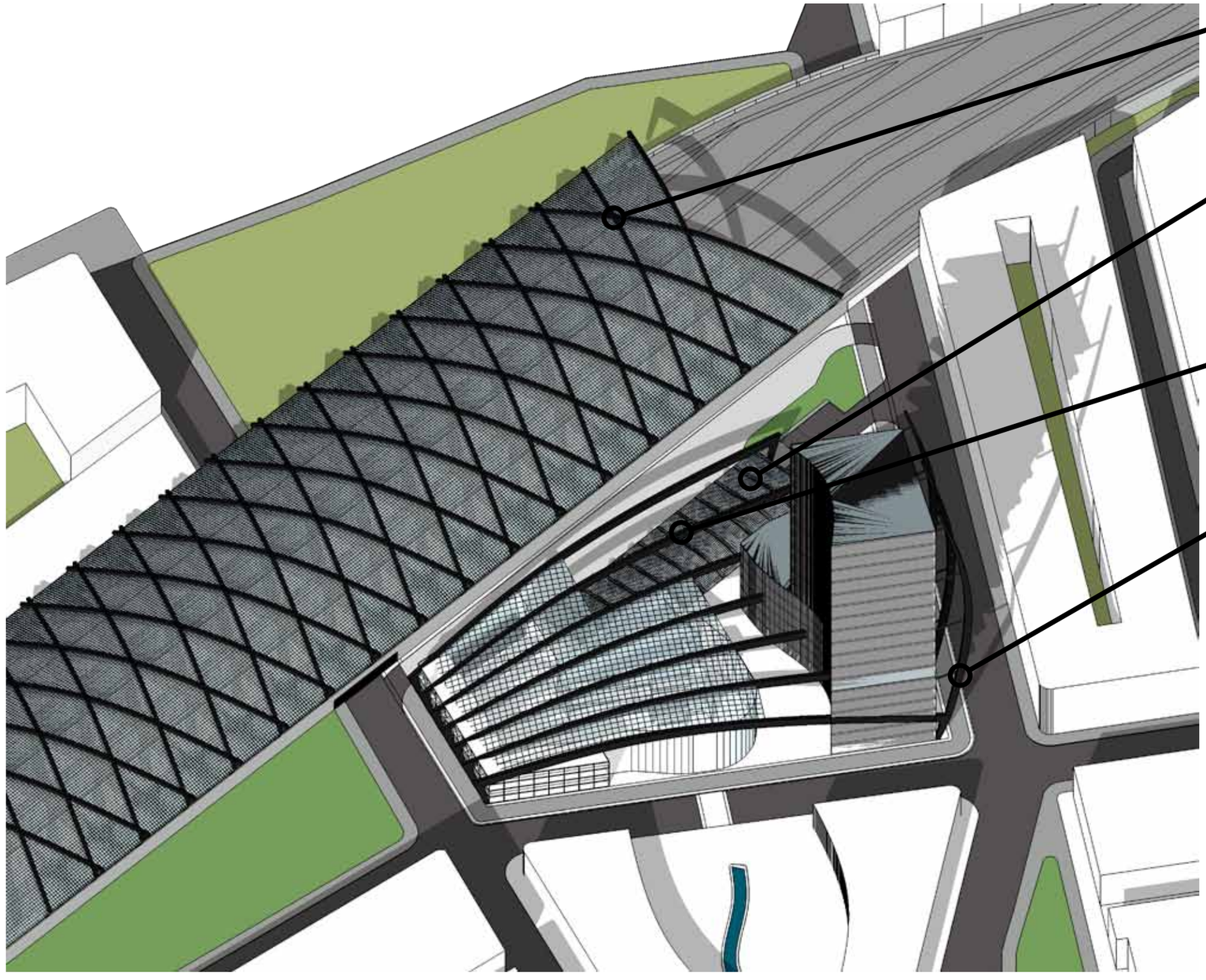
Structure as... Gateway

Structure as... Ornamentation

Structure as... Organization

Structure as... Symbolism

Structure as... Identity



Structure & Curves

Rochester Central Station

Figure 75

Design

Axis

The axis of the site and the station were carefully determined after thorough alnalysis of the site and its surroundings. See the figure that follows.

Axis 1: Transportation (Red)

The main transportation arteries around the site define the first set of axis. They are the existing constraints that define the current shape of the project site and the surrounding sites. Transportation is the fundamental purpose of the station and, thus, the transportation axis is the primary axis of the design. All of the spaces with the site were placed based on their relationship with this axis.

The train and train platform follow the east-west axis at the northern end of the site and consequently the vehiclular artery for buses was aligned parallel to it. The buildings, align to the edges of the site to align with the north-south axis in the southern portion of the site. Aligning the buildings to the streets and sidewalks is essential to prioritizing the pedestrian and restoring the urban charater of the neighborhood.

Axis 2: History (Blue)

A line following along the south side if the site and connecting to the adjacent site- that of the second New York Central Station located across Clinton Avenue along the train tracks- forms the second set of axis.

Fittingly, these axis determine the location of the main structural members of the station. Beginning at the south edge of the site, each axis rotates five degrees to the north from the location of the previous axis.

Axis 3: Public Spaces (Green)

There are two open public spaces on either side of the transit station and the third axis runs between them. If this axis were extended out into the city beyond, it would point in the direction of the intersection at East Avenue and Main Street. By locating open public along this axis, views to downtown were preserved.

This axis created the angle of the western-most arch of the train shed. Rotating a second arch 50 degrees clockwise from the original completed the repetitive “X” structural form of the shed.

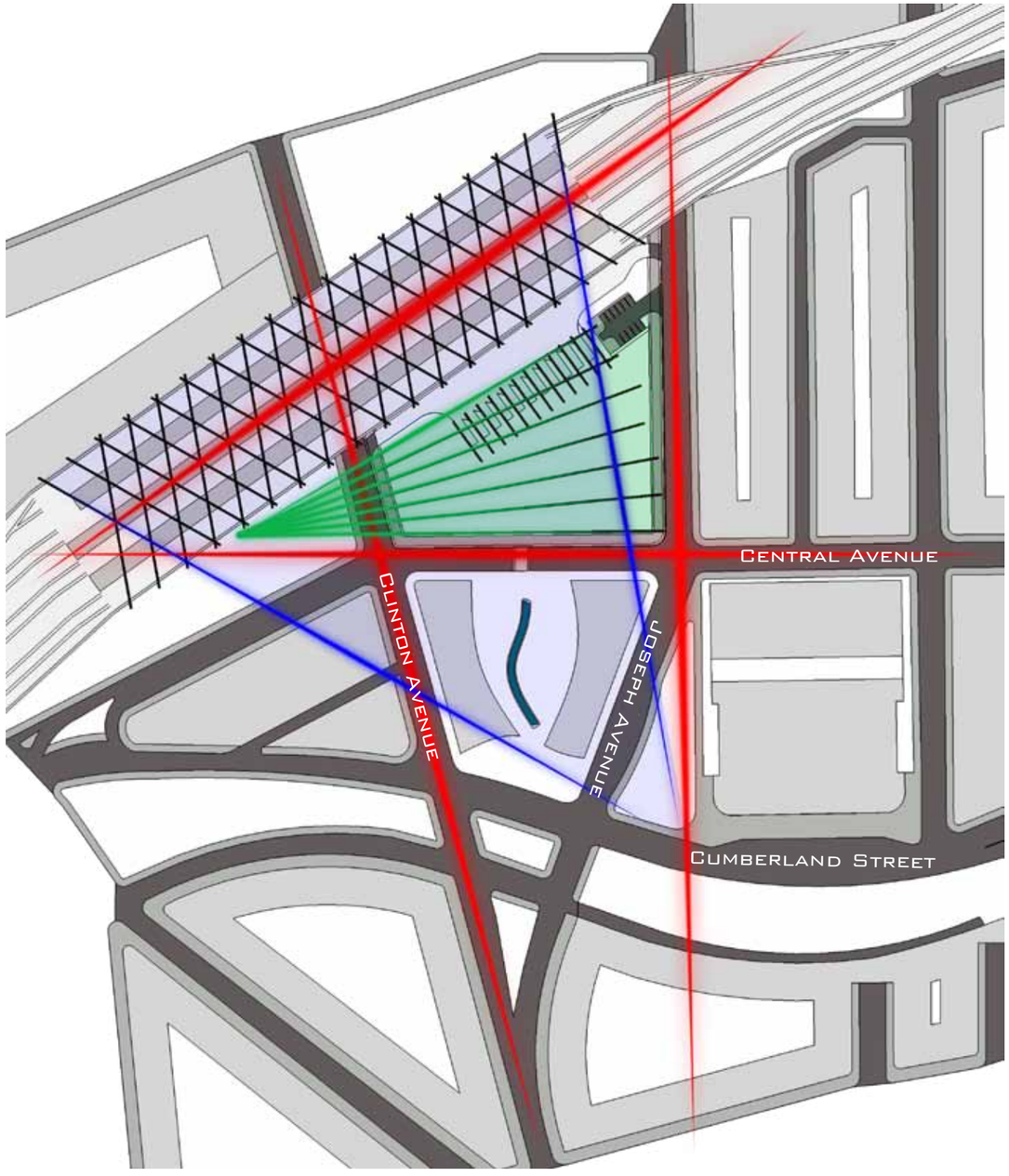
Consequences

Theses axis lend importance to the spaces around the site and though they are not included in the scope of design work for this thesis, their thoughful, quality design is essential.

Primary Site Axes

Train Canopy Axes

Station Axes



Red: Primary site axes
These axes are defined by the surrounding streets and the train tracks. The buildings and circulation pathways align to these axes.

Blue: Train canopy axes
The structural forms at each end of the train canopy align to these axes, which originate in the new public park near Cumberland Street. The orientation of these axes create 'X' shaped pattern that repeats along the length of the train platforms.

Green: Station Axes
The seven major structural members of the station originate at the south end of the site. The first arched member matches the primary axis that follows Central Avenue. The structural pieces that follow radiate out to the north. Each one is rotated five degrees from the previous.

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Site Axes

Figure 76

Rochester Central Station

Materials

The materiality of the station is a very important consideration in the design of the Rochester Central Station. The materials will help define the areas personality and atmosphere, which are important aspects of placemaking. Travelers, workers, residents, customers, and employees all need to find the station and proximity enjoyable and beautiful. It must make the positive and desirable first impression of a modern, clean, and busy station. The primary materials are described below.

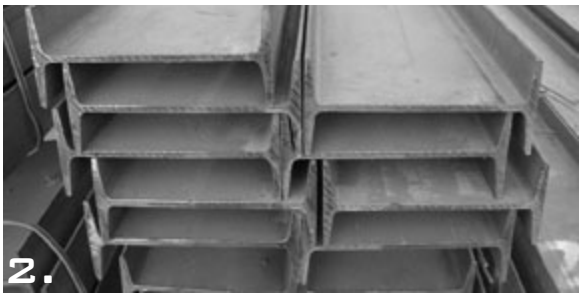
1. Concrete

The primary structural material is reinforced contrete. All the walls throughout the station are concrete both below and above grade level. In addition, the structural forms supporting the bus canopy, train hall roof, and the retaining walls around the train tracks are reinforced concrete.

2. Heavy Steel

Much of the remaining structure within the station is heavy steel. The structural members of the roof above the the bus station and the train canopy, as well as the entirety of the tower and retail structures are constructed of heavy steel.

Figure 77 Station materials (continues on next page)



Materials

3. Metal Cladding

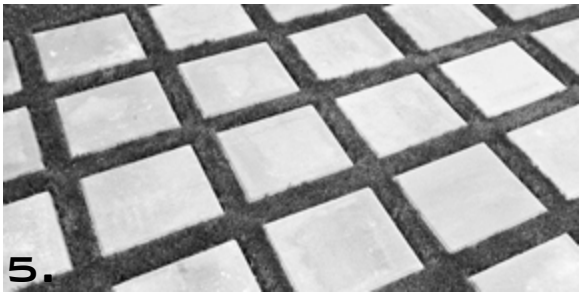
The heavy steel structural members of the curving station roof are clad in a textured, black metal sheath. This skin protects the structural steel and the color creates a solid, striking visual effect. These radiating, black clad, structural arms are the basi

4. Steel Tube

The glass sections between the main steel members of the roof will be divided into smaller sections by round steel tubing that will provide both aesthetic interest and structural support.

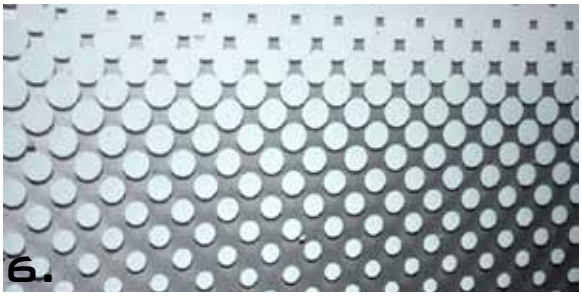
5. Grass and Pavers

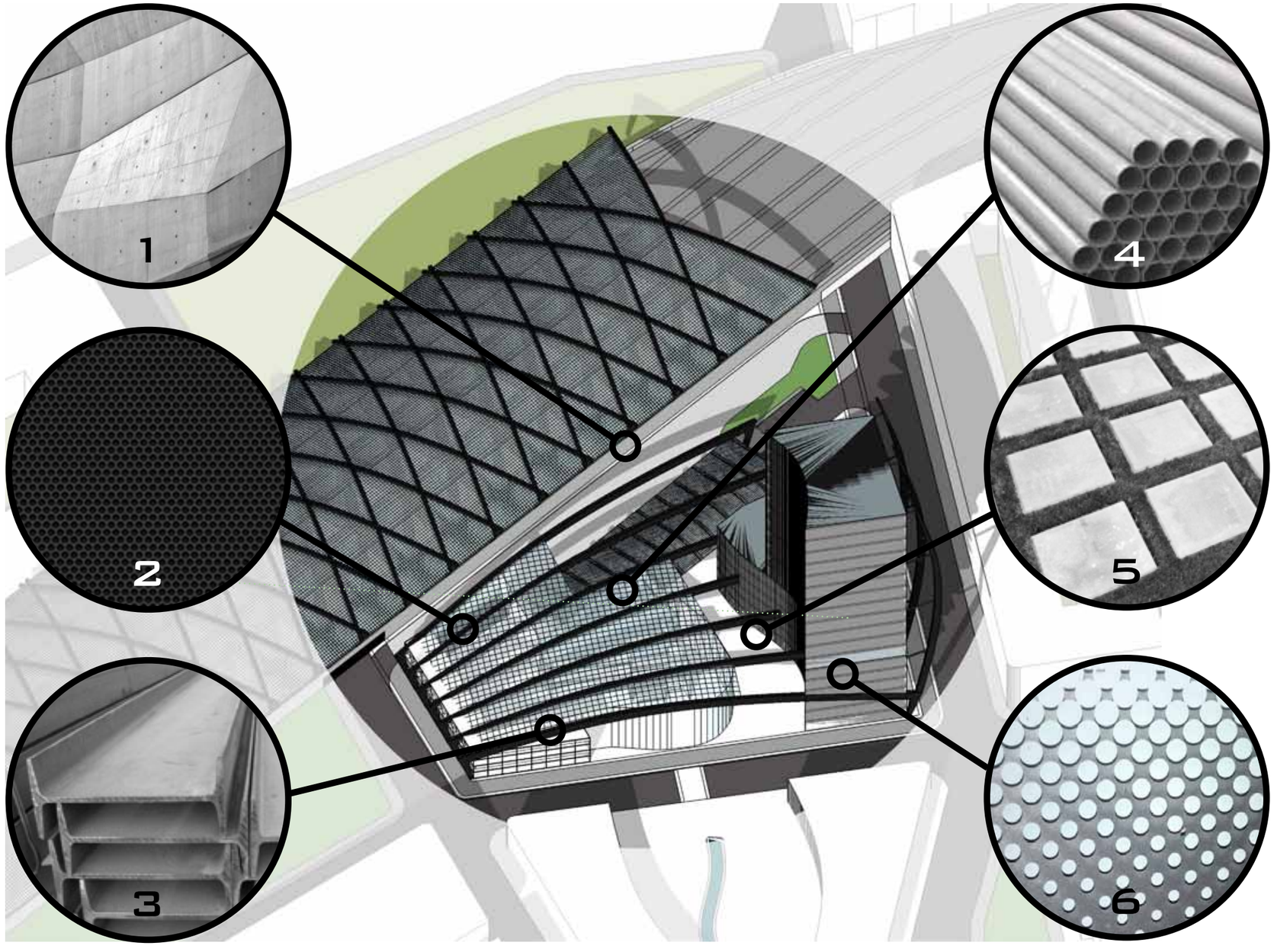
The pedestrian walkway between the tower and the station has spaced pavers instead of continuous paving. This design choice allows water to permeate the site and filter into the watertable.



6. Glass

A large porportion of the station and tower are clad in glass, including the many walls and most of the roofs and canopys. Appropriate types of glass are used in the many glazed areas of the project. Frit glass is employed in the north facing glass and the bus canopy, while photovoltaic integrated glass is used on south facing glass, the station roof, and the train shelter.





1. Concrete
- Raised Track Bed Retaining Wall
- All Solid Walls
-Bus Canopy Structure

2. Black Metal Casing
- Cladding Around Exposed Steel

3. Heavy Steel
- External Structural Members
- Internal Retail, Station, & Tower Structure

4. Steel Tube
- Intermediate Roof Structure
- Retail Storefront

5. Grass & Pavers
- Pedestrian Walkway

6. Glass
- Tower Windows
- Station Roof
- Train Canopy Glass
- Bus Canopy Glass

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Materials

Figure 78

Rochester Central Station

Sustainability

Opportunities to implement sustainability strategies abound in the Rochester Central Station Project. Below are descriptions of all three facets of sustainability. It is important to remember that each is closely interconnected to all other and cannot be successful in isolation. The benefit of desiging based on the principles of transit-oriented development, is that sustainabily is, in many ways, built in.

This project seeks to redevelop and reinvigorate the train station and its surrounding neighborhood; thus, it essentially seeks to reestablish the social and economic sustainability of the area (and less directly the environmental sustainability.)

Social Sustainability

Social sustainability is greatly affected by the built environment and thus the Rochester Central Station has great potential to both help or harm the social sustainability of its neighborhood. The following definition by Berkeley Group captures the essence of what the RCS tries to accomplish through transit-oriented development.

"Social sustainability combines the design of the physical environment with a focus on how the people who live in and use a space relate to each other and function as a community. It is enhanced by development that provides the right infrastructure to support a strong social and cultural life, opportunities for people to get involved, and scope for the place and community to evolve." [41]

In acting as the foundation and catalyst for growth and redevelopment in the area, the station seeks to help the area by creating social connection within the community. Inherent to this is 'placemaking,' or desiging spaces that people develop an emotional connection to and enjoy spending time in. These are places with character, amenities, services, and security.

"The continuing ability of a city to function as a long-term, viable setting for human interaction, communication and cultural development." [40]

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Sustainability

Economic Sustainability

The new transit station must be able to persist, remaining an economically viable area of the city in order to be economically sustainable. This means that the area must attract businesses, customers, employers, employees, etc. A cultural ecosystem must develope and sustain itself into the future. Fundamentally, by following the tenants of transit-oriented development, enconomic sustainability should be realized.

In order to acconplish a healthy economy in the station neighborhood, the proper mix of uses is essential. The station provides a framework and a foundation that must be expanded and built upon. There must be healthly businesses to provide employment and nearby residences where employees and customers will reside. The amenities and services necessary for each of these user groups will need to move within walking distance to serve the needs of the community.

Environmental Sustainability

There are many strategies that could be implemented during both the construction phase and the use phase of the station buildings. This section will focus on the strategies impacting the use phase.

1. Wind Harvesting

Wind turbines could be installed above the platform canopy to capture the energy from the prevailing winds. Additionally, with proper engineering, turbines could also be installed between the tower and the external structural members that run the height of the building.

2. Geothermal

During the construction phase, an extensive geothermal system could be installed under the station building to help with heating and cooling the buildings on site.

3. Integrated Photovoltaics

Due to the substantial amount of glass in the station design that will receive direct sunlight, photovoltaics itntegrated into the glass would be a prime opportunity for energy capture. The areas with the greatest potential are the station roof, the platform canopy, and the south facing glass of the tower.

Sustainability

4. Natural Ventilation

The station is located and shaped well to take advantage of natural ventilation from prevailing winds and air pressure. The installation of vents or louvered glass in the roofs and walls would facilitate air circulation and decrease energy consumption.

5. Thermal Mass

The combination of glass and concrete construction allows the project to take advantage of solar heat gain from thermal mass. Heat from the sun sould pass through the glass roofs and walls, be absorbed into the exposed concrete walls and floors, and then be released was needed, helping to regulate the internal temperatures throughout the day and night.

6. Daylighting

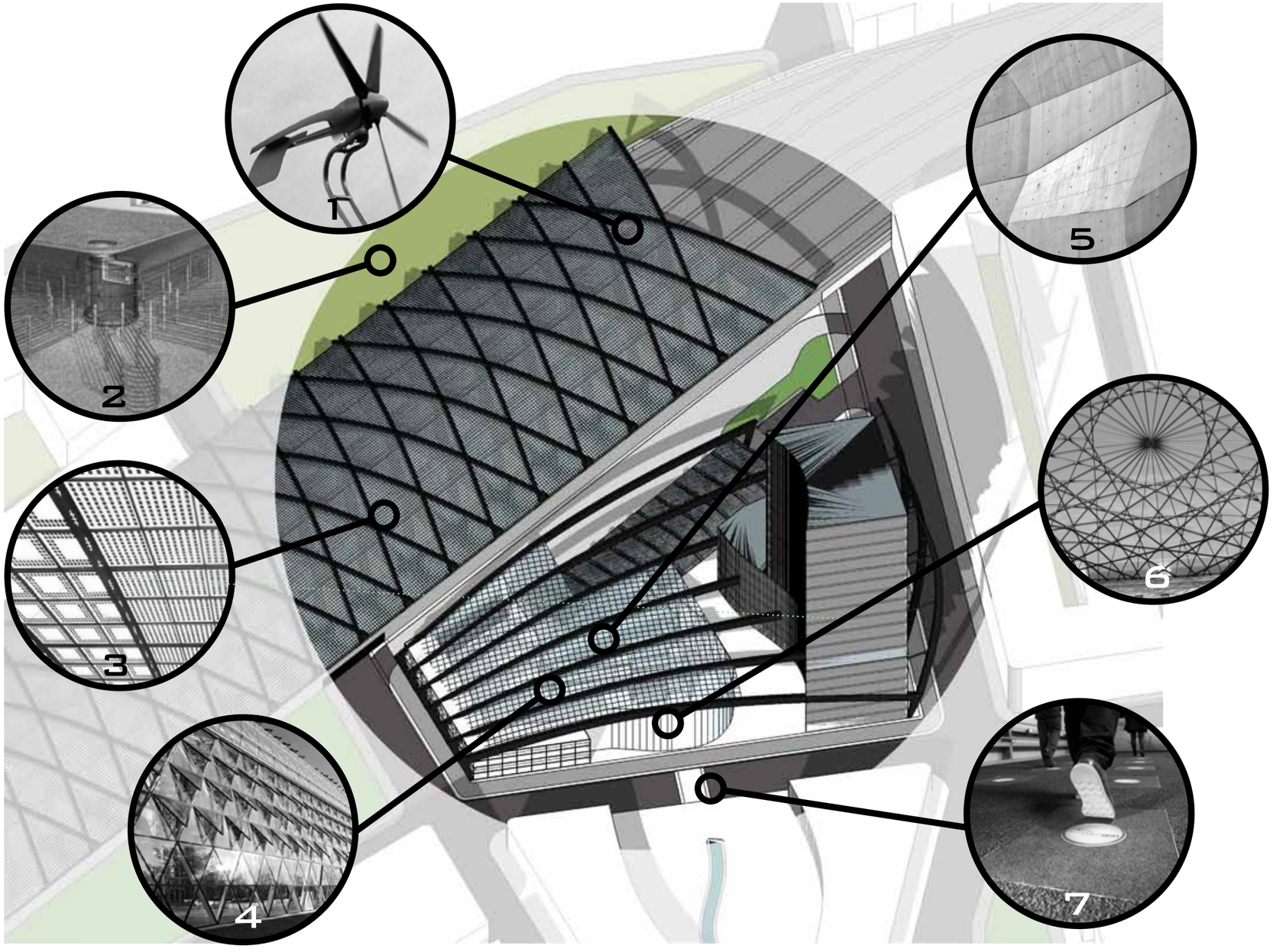
In addition to the other benefits mentioned previously, the generous amount of glass in the station creates a great opportunity to take advantage of natural daylighting, in order to reduce the energy load of artificial lighting and the associated cooling needs. Specifically, the glass roof in the station and the glass walls of the tower will facilitate high quality lighting throughout the project.

7. Piezoelectric Energy

The predicted volume of human and vehicular traffic concentrated into one small area of the city, makes the station a superior location to deploy piezoelectric technology that will harvest the energy from movement and vibrations.

8. Other

Additional strategies would include permeable paving, rain gardens, rain-water harvesting, vegetated roofs, automated systems, etc.



1. Wind Harvesting
2. Geothermal
3. Integrated Photovoltaics
4. NAtural Ventilation
5. Thermal Mass
6. Daylighting
7. Peizoelectric

Sustainability Strategies

Rochester Central Station

Figure 79

New Neighborhood

Transit-oriented development is a large-scale process and successful implementation is achieved through many projects, covering a large urban area. It is thus essential to look beyond the boundaries of the project site and to take a more encompassing approach to planning.

The Rochester Central Station is no exception, it is the first step toward redevelopment and reinvigoration, but it cannont be effective in isolation. In order for the redeveloped station to be truely successful, the surrounding neighborhood must also be redeveloped. The two are interdependent and neither can be successful without the other.

The neighborhood is defined as the wedge of land between the the inner loop and the train tracks from the river to Hudson Avenue. This area falls into the stations range of influence, which is the distance most people are willing to walk to transit and amenities, or approximately half a mile.

The neighborhood around the station is the essential to the success of the Rochester Central Station as a transit-oriented development and the redevelopment design complements the goals of the station design and transit-oriented development.

Description

The neighborhood is characterized by connected city blocks that are filled with mixed use buildings that rise three to five storeys above street level creating a dense, compact neighborhood, without overcrowding. Building up instead of out brings people, transit, and businesses into closer proxmity to the benefit of all.

The buildings are stratified and each layer has a recommended function. The

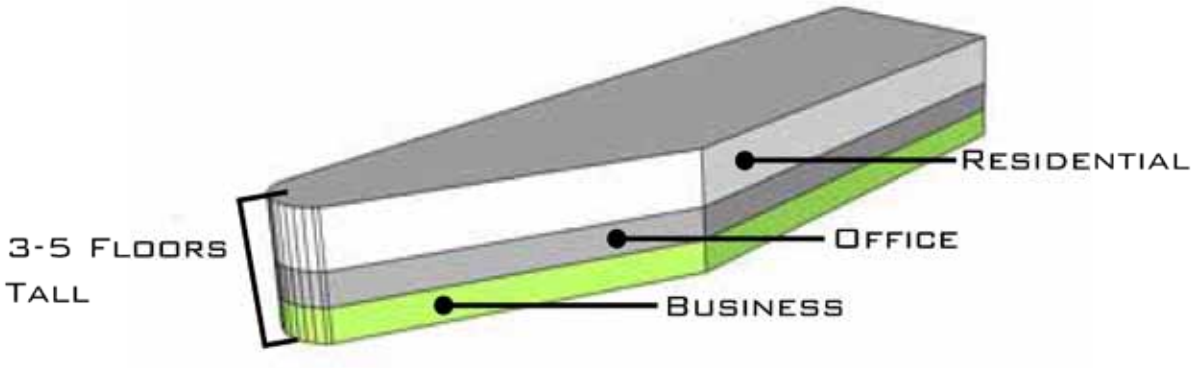


Figure 80 Stratification of uses in buildings surrounding the station

ground level is designated for retail shops, restataunts, and services, i.e. banks. The second level is designated for offices and business that do not rely on direct access from the street. Levels three through five are residential apartments and condominiums.

It is very important to place the right mix of uses in the area. Meeting the needs of the community within the range of influence creates a more successful neighborhood, ensuring internal trip capture. This means that by providing the desired services and amenities within the half mile range, people can walk and bicycle to their destinations, reducing the need for personal cars. It also reduces the need for people to leave the neighborhood, increasing its financial wellbeing. This neighborhood is a combination of residential, employment, and travel, so the mix of uses is designed to complement and includes grocery stores, pharmacies, restaraunts, dry cleaners, child care, office suppliers, mail and shipping services, concienence stores, gyms, banks, etc.

Parking for the neighborhood is located in three areas. There is structured parking across from the station where Joseph Avenue passes under the train tracks, off-street parking lots located behind the buildings toward the center of the city blocks, and limited amounts of paid street parking.

Moving parking from the more traditional locations at the front of buildings, de-emphasizes and discourages the use of personal vehicles in the neighboorhood. It prioritizes the pedestrian and declutters the streetscapes for more a beautiful city.

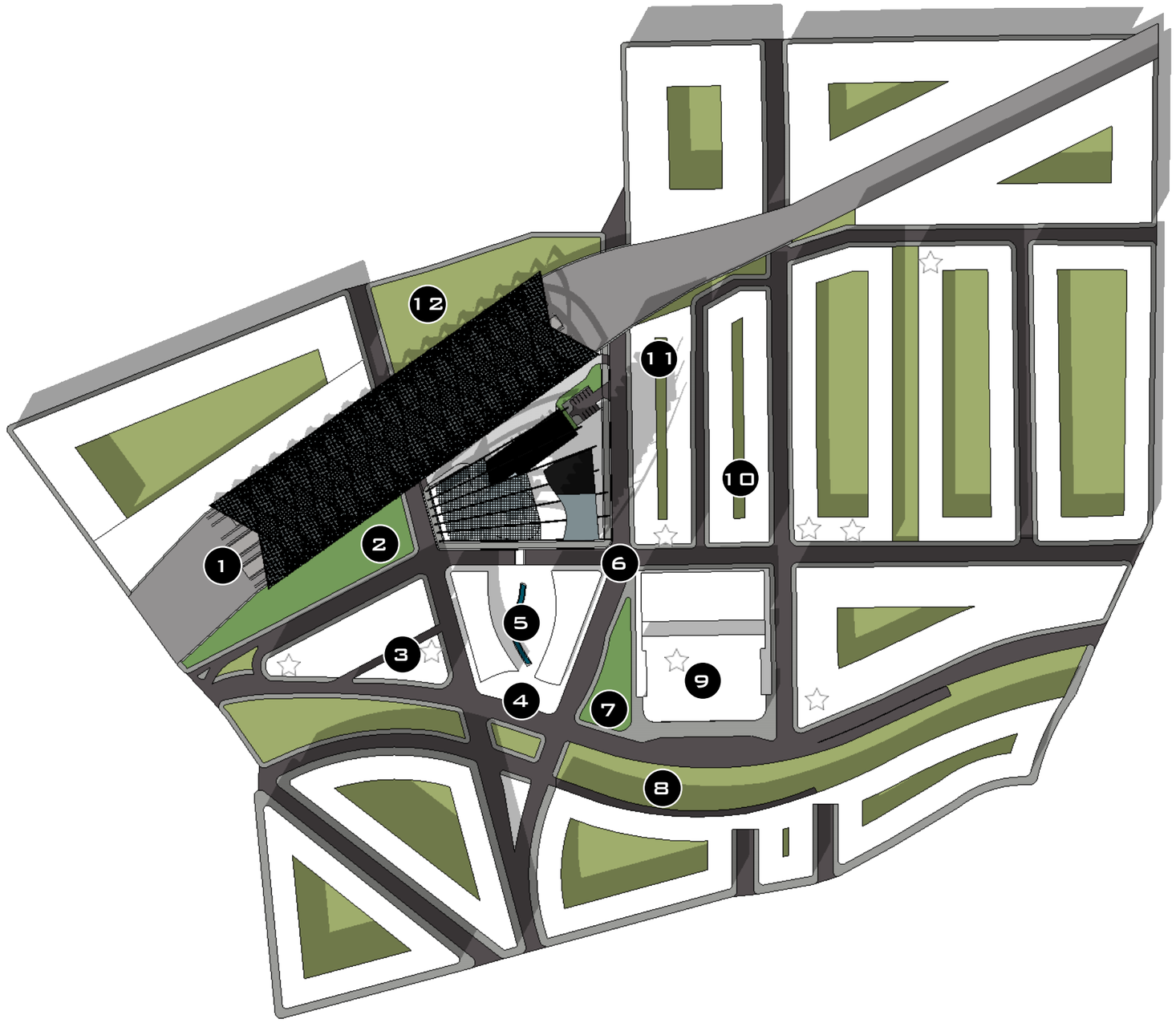
Beauty, character and placemaking are important considerations in the neighborhood design. Buildings and exterior spaces must be attractive and there should be variety in their forms and aesthetics. In this thesis, the designing neighborhood buildings was not included, only their locations and character. It does however, identify several existing buildings that should remain, potentially for repurpousing. Places such as the old post office building, churches, and a few architecturally interesting buildings will be preserved. These gems aid in neighborhood placemaking, adding variety, texture, and interest to the neighborhood, giving it depth, history, and context in the urban fabric of Rochester, NY.

Several parks and open space are strategicaly located around the station to empasize the public nature of the development, promote usage, and preserve views from and to the station. They can be used by all the residents and visitors, each of whom can enjoy the physical and emotional benefits of green space.

New Neighborhood

Placemaking is an important aspect of transit-oriented development. Quirky, fun areas, public art, and interesting architecture, all play a part in neighborhood personality. Streetscapes with warmth, personality, and pedestrian friendly features will help ensure the success of the neighborhood. If people enjoy spending time in these spaces, they will continuously be in use.

Figure 81 Street character collage



1. Train Tracks
2. New Park
3. New Pedestrian Street
4. Sculpture Garden
5. Fountain
6. streets with separated bike lanes
7. New Park
8. Inner Loop Park
9. Historical ★ Buildings
10. Filled in Blocks with peripherial parking-lots
11. New Public Parking Garage
12. Site Reserved For Future Station Expansion

BRIDGET CARNEY

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Neighborhood Diagram

Figure 82

Rochester Central Station

150 FT 300 FT 600 FT 900 FT

Conclusions

Rochester Central Station is the first step in redeveloping part of the city into a vibrant transit friendly neighborhood. It is symbolic of commitment to continued growth and investment, a visual indication of change.

The design presented in this thesis takes a drastic and somewhat optomistic approach to the future of transportation in Rochester, NY. It visualizes what could be, in a reinvigorated and redeveloped transit neighborhood on the edge of downtown.

The design shown is a good start to transforming a small section of the city in a transit-friendly sustainable neighborhood, however it is far from a perfect result. As with most design work, the process of improving and expanding may continue indefinitely.

Looking Forward

The city is an urban ecosystem and it must change over time. In fact, in order for this project to be truely effective it must do just that, change. The station must grow and evolve to constantly improve at meeting the needs of the community and its citizens.

Some of this growth would be to expand on important areas of consideration that were not included in the scope of this thesis. They include designing features for the nodes where axis meet within the site, desiging visually striking and enjoyable parks and green spaces, creating more enjoyable and beautiful railroad track underpasses, planning for the future expansion of the station as transit use grows, and expanding the reach of transit and transit friendly neighborhoods further into the city.

Resources

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