2015

Redefining Transportation Culture: a New Union Station for Los Angeles

Pawel Honc
Roger Williams University, phonc229@g.rwu.edu

REDEFINING TRANSPORTATION CULTURE

A NEW UNION STATION FOR LOS ANGELES

REDEFINING TRANSPORTATION CULTURE

A NEW UNION STATION FOR LOS ANGELES

PAWEL HONC | ARCH 613 GRADUATE THESIS STUDIO
MASTER OF ARCHITECTURE FALL 2014
ROGER WILLIAMS UNIVERSITY
SCHOOL OF ARCHITECTURE, ART, AND HISTORIC PRESERVATION
ANDREW COHEN - PROFESSOR

REDEFINING TRANSPORTATION CULTURE
A NEW UNION STATION FOR LOS ANGELES

Submitted in fulfillment of the requirements for the Master of Architecture degree:

Pawel Honc Date
Master of Architecture

Andrew Cohen Date
Thesis Advisor

Stephen White Date
Dean | School of Architecture, Art, and Historic Preservation

TABLE OF CONTENTS

ABSTRACT

From iconic stations like Grand Central in New York City to the small suburban commuter rail station, the architecture of transportation can have a large effect on the perception of a transportation system. Architecture can also play a large part in encouraging a changeover to more of a public transportation oriented culture. The planning of transit hubs and stations should be transit-oriented so that it can reach the most amounts of people. However, a changeover to a transit-oriented society would require a city like Los Angeles to overhaul their current transportation system by adding more lines, connections, and increasing station capacity. The opportunity exists in Los Angeles to create a new addition and master plan to revitalize and develop the Union Station area; blending new and old along with integrating a historic symbol with a brand new one and creating a new type of urban neighborhood in downtown Los Angeles. The new public transportation architecture typology will have to do more by encouraging its users to actually use the facility. Through the creation of a "destination" people will be motivated to come to the station for more than just travel, eliminating the notion of a bland passenger processing building. Also through the development and planning of a transit-oriented development, people will be encouraged to actively use the transit system on a regular basis. This type of building will be the central hub for the cities transportation system and along with that it will become a symbol for the whole transportation system of the city.

INTRODUCTION

PROBLEM STATEMENT - PROJECT STATEMENT - ARCHITECTURAL INTENTIONS

01

"Transportation's vital importance to the U.S. economy is underscored by the fact that more than $1 out of every $10 produced in the U.S. gross domestic product is related to transportation activity. This includes all aspects of transportation, including the movement of goods and the purchase of all transportation-related products and services as well as the movement of people." - U.S. Department of Transportation

"Traffic congestion, especially at rush hour, is a problem in many of the country's larger cities. A 2009 study found that traffic congestion costs the US almost $87.2 billion." - Texas A&M Transportation Institute

INTRODUCTION

Transportation is an important factor in almost every person's daily life. It effects the way we get to work, get groceries, go on vacation, and more. Going beyond the way we get around, transportation is also an important economic factor. The architecture of transportation is an important factor especially in regards to the public transportation industry. From iconic stations like Grand Central in New York City to the small suburban commuter rail station, the architecture of transportation can have a large effect on the users perception of the transportation system. Public perception of a transit system can have a large ridership impact. The most iconic transit "brands" tend to conjure up positive feelings. These kinds of impacts can lead people to want to pay more for a ticket or even wait more for their transport to arrive.

Compared to the rest of the United States, Los Angeles has a large imbalance of people who use cars compared to people who use public transportation. This sort of imbalance cannot be sustained forever. Architecture can play a large part in encouraging this changeover to more of a public transportation oriented culture. The problem is currently the way that cities are planned. Most cities are not planned around a public transportation system and in the case of Los Angeles, with its later development; it was planned around the automobile. A changeover to a public transportation oriented society needs to happen because if the United States and cities like Los Angeles continue on its course of reliance on automobiles, many negative factors will continue and start to further emerge. Congestion and gridlock will continue to get worse in cities affecting both commute time and have impacts on economic factors and additionally our country will continue on its course of polluting the environment.


Highland Pa
Southwest Museum
Heritage Square
Lincoln/Cypress
Chinatown
Downtown
Los Angeles
Union Station
Civic Center
7th Street/
Metro Center
Pershing
Square
Pico
Grand
San Pedro
(Street Running
North of 37th St.)
Washington
37th Street/USC/
Exposition Park
Vernon
Slauson
Slauson
Florence
Firestone
Manchester
103rd Street
Imperial/
Wilmington
Avalon
Harbor
Freeway
Compton


405

PROBLEM STATEMENT

California leads the nation in energy efficiency standards and promoting zero-emission vehicles and pays a lead role in environmental protection; however it is the 12th largest emitter of carbon dioxide worldwide. The percentage of population using public transportation in Los Angeles in lower than other large U.S. cities such as Chicago and New York, but similar to or higher than other western U.S. cities such as Portland and Denver. This goes back to the development of Los Angeles during the time of the automobile. The city is more reliant on the automobile, rather than public transportation when compared to the eastern US cities. Currently in Los Angeles, 82% of people commute by car, 14% by transit, 3% by walking and 1% by biking. This is an extremely high figure for people commuting by car when compared to other cities. In cities such as New York upwards of 55-60% of people commute by public transit. New York City is a leader in the public transportation sector, with a large majority of workers commuting by public transit. The key factor to this success is its well-developed public transportation system. Other cities that do fairly well with public transportation are cities such as Boston, San Francisco, and Washington DC, which all have numbers of people commuting by public transit in the 30-40% range.

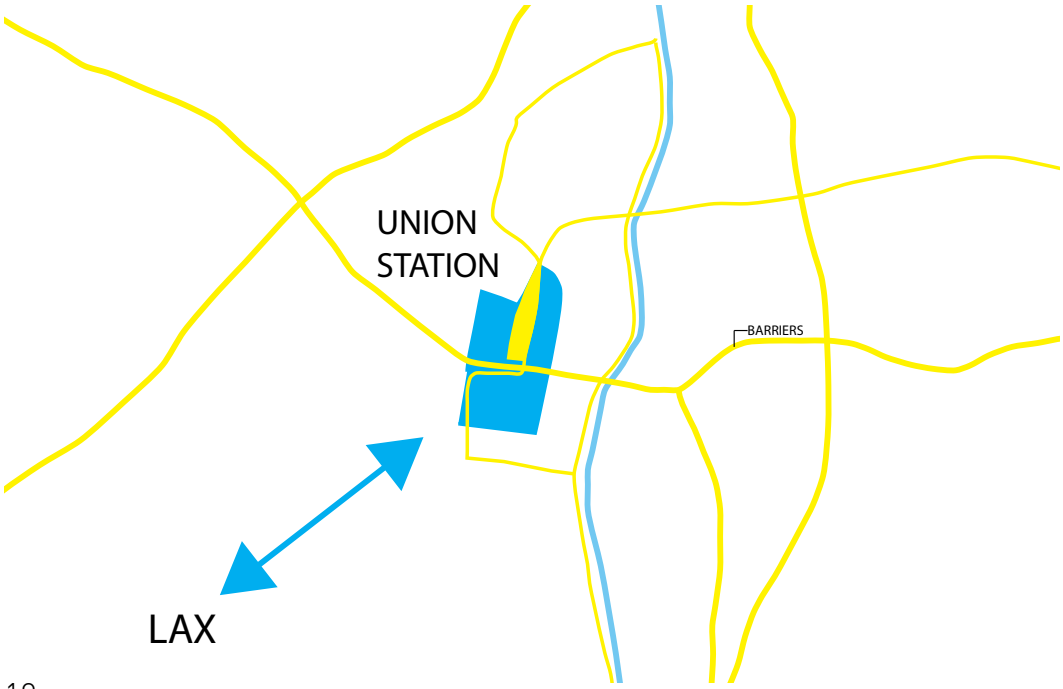
Several factors hinder Los Angeles' ability to increase public transportation numbers. To this day, a large part of Los Angeles remains pedestrian unfriendly. Many of its sidewalks remain in disrepair and are difficult to navigate. Also, despite LAX being one of the largest airports in the world based off of passenger volume, LAX lacks a direct connection to rail terminals.

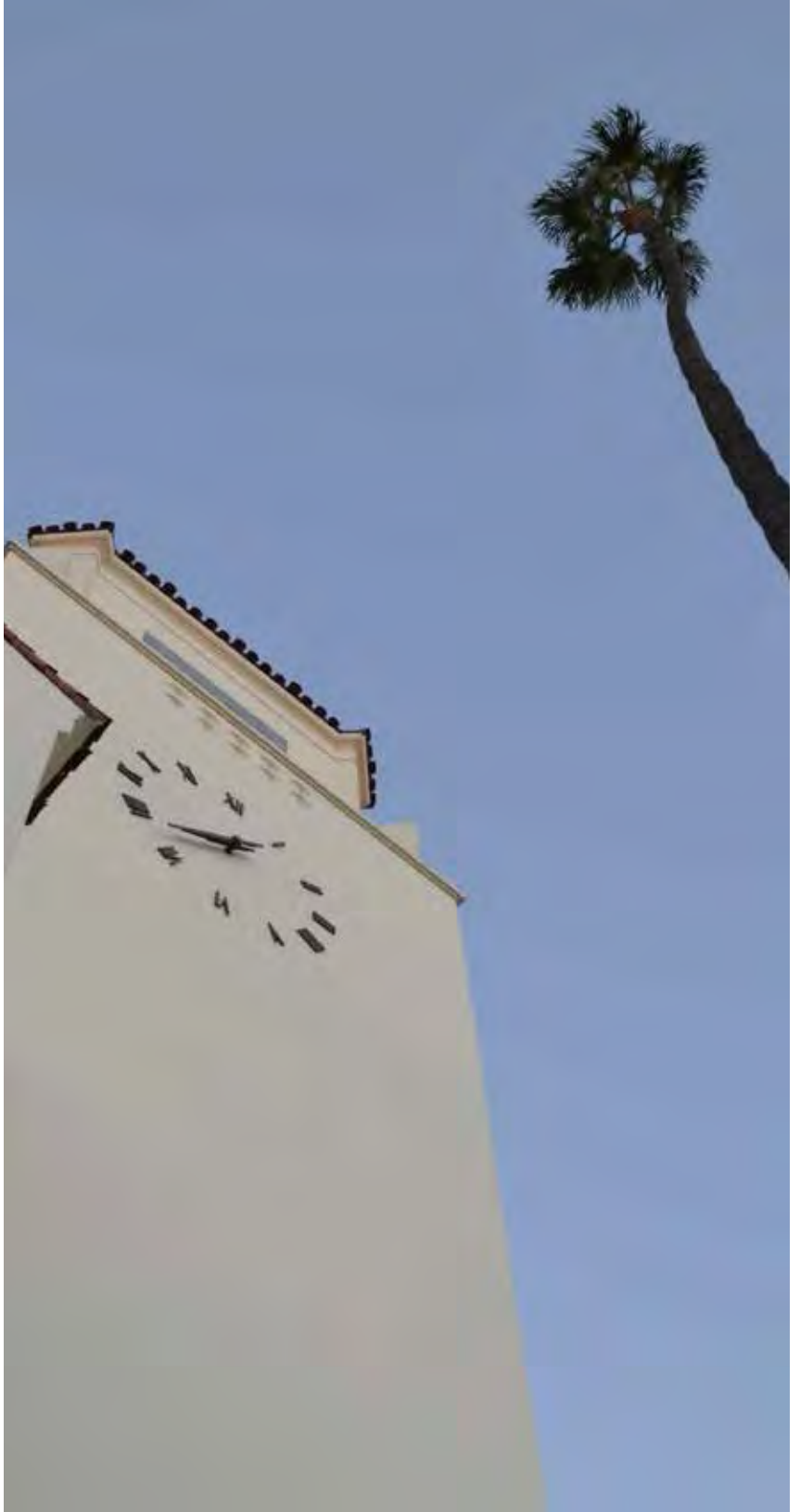
MAJOR U.S. CITY COMMUTE PATTERNS (2008)

	POPULATION	COMMUTING BY PUBLIC TRANSIT	COMMUTING ALONE BY CAR
NEW YORK CITY	8,337,000	55%	23%
WASHINGTON DC	632,323	38%	37%
SAN FRANCISCO	825,863	34%	39%
BOSTON	636,479	33%	40%
PHILADELPHIA	1,548,000	27%	50%
CHICAGO	2,715,000	27%	51%
HARTFORD	124,893	21%	57%
SEATTLE	634,535	18%	54%
PORTLAND	603,106	12%	62%
MIAMI	413,892	12%	70%
LOS ANGELES	3,858,000	11%	67%

Source: American Community Survey

Another factor in hindering Los Angeles' ability to increase public transportation numbers is planning. The city was planned around the automobile with large freeways dividing the city into impassable sections. For example, the Los Angeles Union Station is bordered by the Hollywood Freeway on the south. While this does allow easy access for people approaching the station by automobile, it does provide a significant barrier to pedestrians trying to get to the station. The planning of transit hubs and stations should be transit-oriented so that it can reach the most amounts of people. This amount of people commuting by car in a city like Los Angeles leads to major gridlock. A changeover to a transit-oriented society would benefit people by reducing gridlock, therefore reducing negative economic factors caused by commute times. However, a changeover to a transit-oriented society would require Los Angeles to overhaul their current transportation system by adding more lines and connections and increasing station capacity. Overall, there is need for a new and expanded Union Station in Los Angeles.






Atlantic
M


UNION STA

CAR VS TRANSIT COMPARISON

TYPICAL MONDAY MORNING COMMUTE AT 8:00AM

SOURCE: GOOGLE MAPS

ANAHEIM TO LOS ANGELES UNION STATION

TRAIN: 45 MINS

VIA AMTRAK PACIFIC SURFLINER

CAR: 1 HR 10 MINS

VIA FREEWAY

TIME SPENT IN TRAFFIC: 40 MINS

NORTH HOLLYWOOD TO LOS ANGELES UNION STATION

METRO: 29 MINS

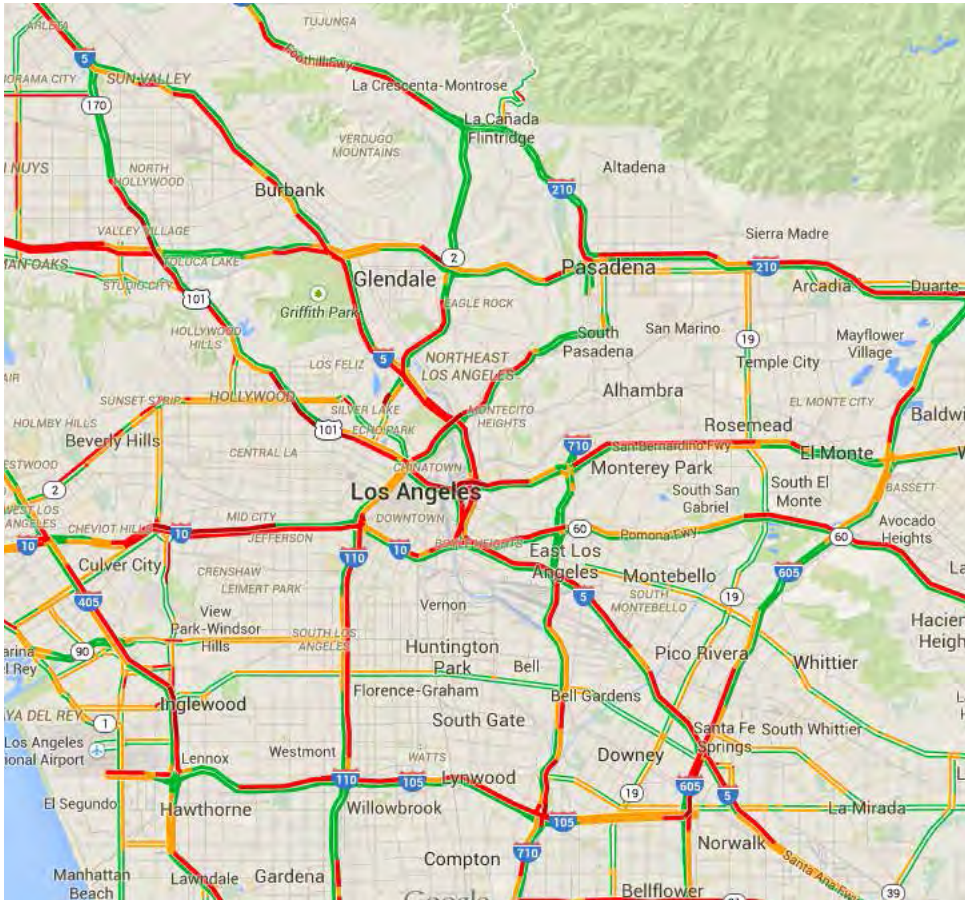
VIA METRO RED LINE

CAR: 49 MINS

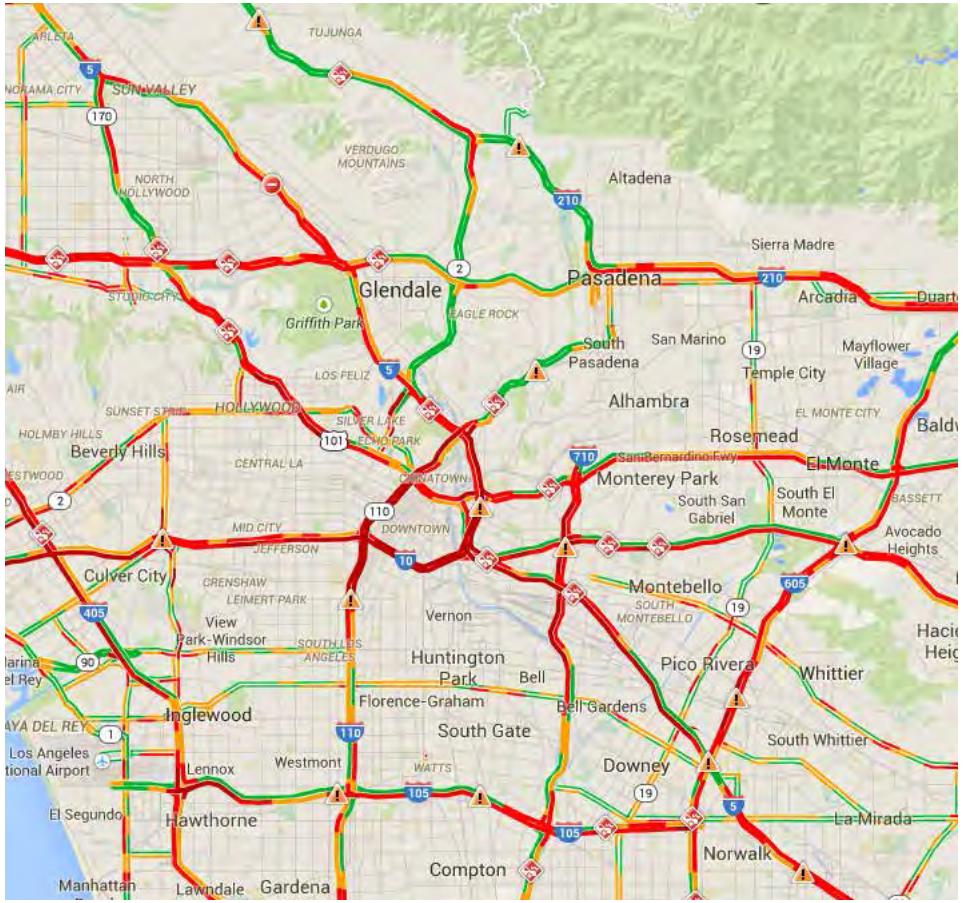
VIA FREEWAY

TIME SPENT IN TRAFFIC: 33 MINS

TYPICAL MONDAY COMMUTE AT 8:00AM



TYPICAL THURSDAY COMMUTE AT 6:00PM



SOURCE: GOOGLE MAPS TRAFFIC DATA

PROJECT STATEMENT

THIS THESIS WILL EXPLORE NEW WAYS OF THINKING ABOUT TRANSPORTATION-ORIENTED ARCHITECTURE IN THE FUTURE, BOTH ON A BUILDING SCALE AND ON A URBAN SCALE.

"There is more change coming in the upcoming 10 years than in the past 50 years."

"1.24 million road fatalities worldwide last year."

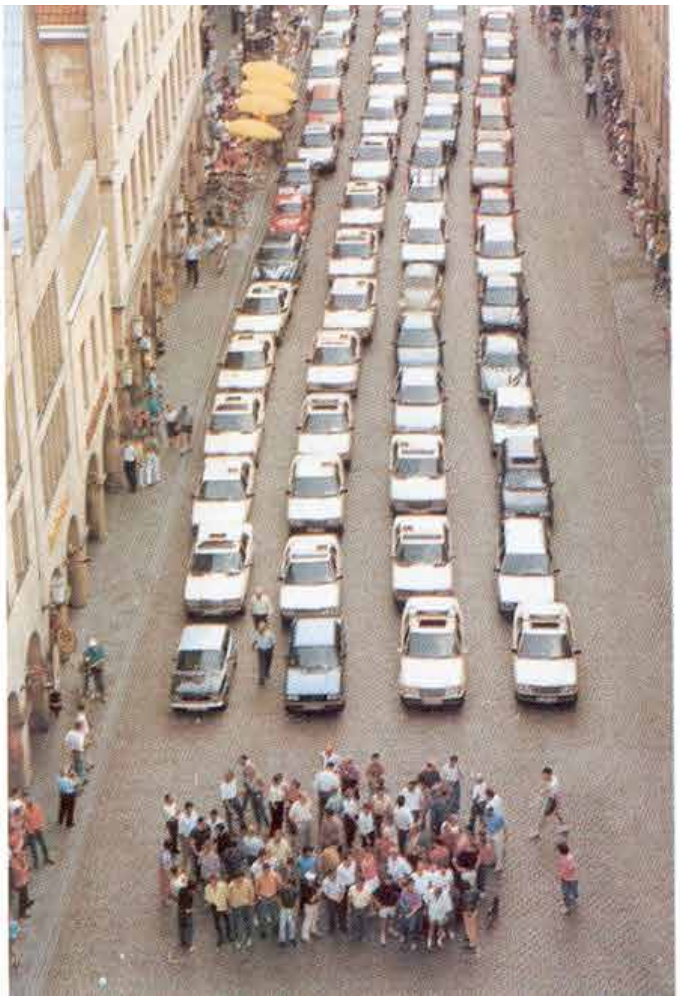
"Cars sit 94.8% of the time"

"31% of public space is occupied by transportation (sidewalks, roads, rail, etc.) [in Washington D.C].

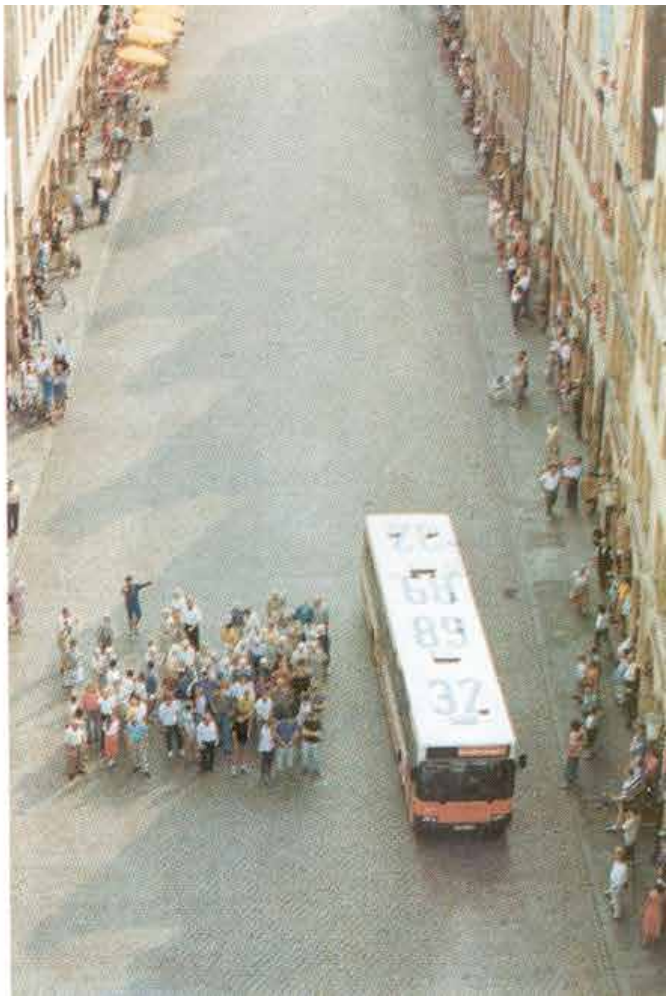
"Every death in the [Chicago] roadways costs $4 million dollars."

Source: **Gabe Klein**
Former Transportation Commissioner for Chicago
Former Transportation Director for Washington DC
BSA Lecture: The Future of Transportation: A Practical Approach

BY BIKE



BY CAR



BY BUS

SPACE REQUIRED TO TRANSPORT 60 PEOPLE

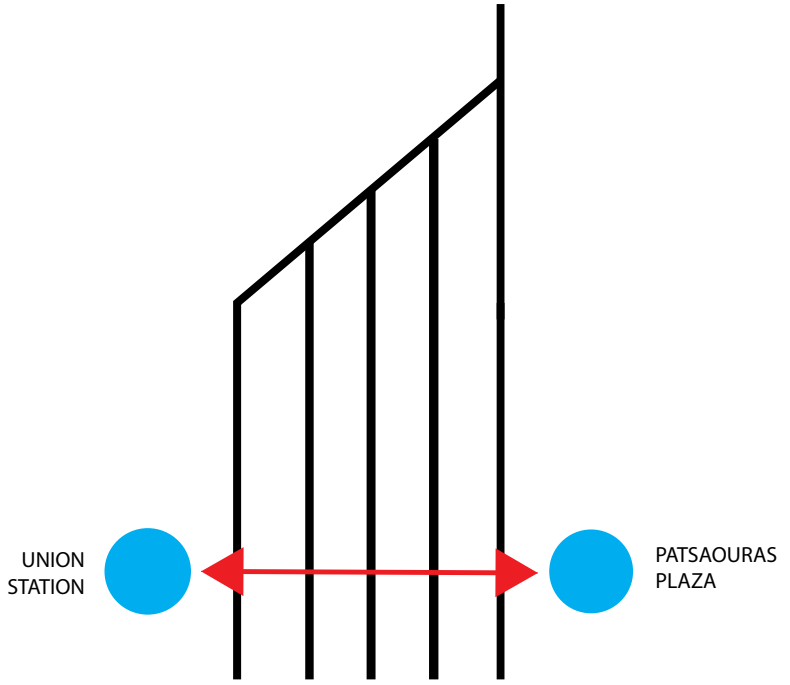
IMAGE: MINDD.EU

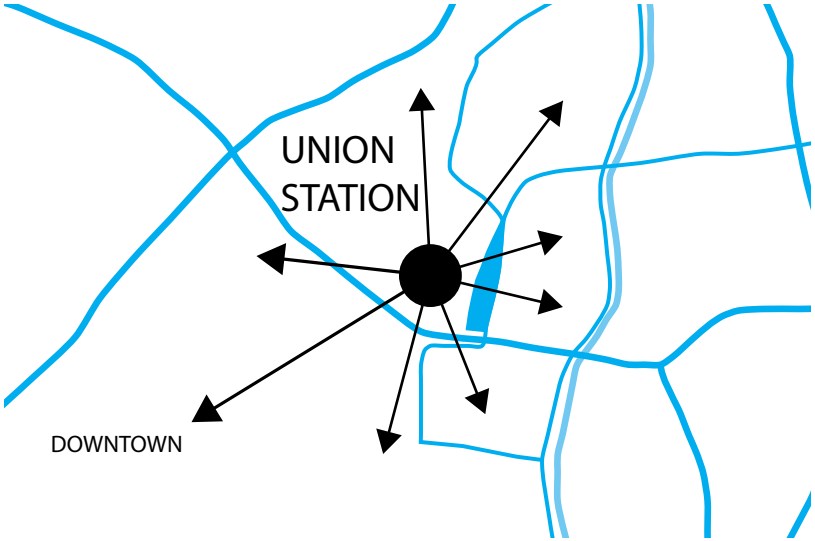
PROJECT STATEMENT

A traditional transit hub serves the purpose of moving and processing passengers. A new type of transit center would be one that is actively used at all hours of the day, one that people could spend an extended period of time in and come to not only for travel. The first key is motivating people in the city to start using the public transit system more often. The main station will be one that refines the current notion of public transportation architecture.

The Master Plan and new transit hub will shape Los Angeles' premier destination for transit users, residents, and visitors. The master plan will be one that creates a transit-oriented society. This master plan will include the inter-modal transit hub, which acts as the focal-point for the master plan, the new LA Country Metro HQ, offices and civic space, housing, a hotel, retail and public green space. The master plan will both revitalize and re-develop the area as well as make connections to the neighboring areas of the city. It will take the two existing, separate transit areas and merge them into one integrated Los Angeles Inter-modal Union Station.

The existing Union Station will not be demolished but instead used as an anchor for the new transit station. The historic architecture will be preserved and integrated with the new modern architecture. The functions inside the existing Union Station may change, but the building as a whole will be preserved providing a unique contrast between the old and the new architecture. The need is evident to expand the existing Union Station to a new modern facility that will be able to handle larger amount of riders along with a new high speed rail connection and a rail link to the airports. Metro predicts that the amount of riders will double by the year 2040.





"Metro predicts that by 2040 the number of travelers handled by the terminal (Los Angeles Union Station) will grow from about 70,000 a day to 140,000." - LA Times

The inter-modal transit hub itself will be more of a mixed-use building than just a pure transit station. It will incorporate multiple modes of public transportation including Bus Rapid Transit, Light Rail lines, Metro access, and a High Speed Rail Terminal. In addition to buses and trains, bikes and bike sharing will be a large component to motivate people to live healthy and commute to the train stations in a different and sustainable way. The building itself will become a destination acting as an integral part of the development, blending transportation with retail, wellness facilities, meeting areas, and social program such as cafes, restaurants, and bars.

The inter-modal transit hub will not only become a link to the whole city, but also to the rest of the state of California and the country as well. The new station will allow people to come in from many parts of the country with the new direct link from LAX. Not only will there be a link to the rest of the country but there will be direct access to the rest of the state of California through the new high speed rail system that will be implemented. The station will include a high-speed rail terminal that will allow commuters to get to other parts of California quickly, directly from downtown Los Angeles.

The new Los Angeles Union Station will become the symbol for the new transportation system in the metropolitan area. Along with the re-development of the station and the surrounding area, new modes of transit will be established. This endeavor is being undertaken to transition Los Angeles from being an automobile oriented city to one where the majority of commuters take the public transportation systems offered. The goal of the new transportation system and station is to reach as many people as possible in order for the system to be well utilized. Along with this, the goal of the new Union station transit-oriented development is to become the model for new planning in cities.

IMAGE: LA METRO AUTHORITY

PROJECT THEMES

The themes that will be explored will involve investigating new transportation planning in cities. Transportation in cities will be explored to determine whether or not it can be more efficiently planned in order to be well utilized. Along with planning new public transportation architecture will be explored. Essentially the new public transportation architecture will have to do more by encouraging its users to actually use the facility. Through the creation of a "destination" people will be more motivated to come to the station for more than just travel, eliminating the notion of a bland passenger processing building. Also through the development and planning of a transit-oriented society, people will be encouraged to actively use the transit system on a regular basis. This type of building will be the central hub for the cities transportation system and along with that it will become a symbol for the whole transportation system of the city. In addition to this, the transportation system will be uniquely branded and easily identifiable, something that sticks in one's memory. Public perception of a transit system can have a large ridership impact. The most iconic transit "brands" tend to conjure up positive feelings.

A theme of modern architecture vs historical architecture will also be explored. The new architecture of the Union Station and surrounding neighborhood will be one that is influenced by the historical context but will be completely modern. Through the new Master Plan and new Union Station, people will be living in close proximity to the transit hub and therefore be less reliant on an automobile. The close proximity and ease of use of the transportation system will encourage people to use it. All of these items can contribute to a reversal of an automobile oriented society like Los Angeles.

IMAGE: URBAN STREET DESIGN GUIDE

TRANSIT-ORIENTED DEVELOPMENT

PERCEPTION OF TRANSIT

THRESHOLD

HISTORICAL CONTEXT

MULTI-MODAL HUB

SYSTEM BRANDING

CONNECTIONS TO CITY

DENSITY

URBAN PLANNING

FLEX STREETS

RAPID TRANSIT

INTEGRATING PUBLIC SPACE

CONTEXT

OVERVIEW - HISTORY - ENVIRONMENT- TYPOLOGY

02

IMAGE: GOOGLE EARTH

OVERVIEW

Los Angeles is the largest city in the state of California and the second most populous city in the United States, after New York City. The greater Los Angeles Area region is one of the most populous metropolitan areas in the world, containing 13 million people. Los Angeles is a global city with many strengths such as business, international trade, entertainment, culture, media, fashion and many more. The city is one of the most substantial economic engines within the United States with the third largest gross metropolitan product (GMP) in the world. Within the city limits is Hollywood, which leads the world in the creation of motion picture production, television production, video games, and recorded music. The city of Los Angeles has also hosted the Summer Olympic Games, twice, in 1932 and 1984.

The city of Los Angeles is usually regarded as a very auto-oriented city. According to the Texas Transportation Institute, which publishes an annual Urban Mobility Report, ranked Los Angeles road traffic as the most congested in the United States in 2005 as measured by annual delay per traveler. Even with the congestion in the city, the mean travel time for commuters in Los Angeles is shorter than other major cities. The travel time for work commutes is similar to those of San Francisco and Washington DC. There is currently no direct rail connection to the airport terminals in the city, with only private bus companies shuttling from LAX to Union Station. Also the city is generally pedestrian unfriendly with many sidewalks falling into disrepair and the large amount of automobiles making it difficult to walk across the city.

IMAGE: BLOG.ISO50.COM

IMAGES: FOTOLIA.COM

HISTORY

Spanish governor Felipe de Neve founded Los Angeles on September 4, 1781. It became part of Mexico in 1821 following the Mexican War of Independence. In 1848, at the end of the Mexican-American war, Los Angeles and the rest of California were purchased, therefore becoming part of the United States. In 1848, the gold discovered in California brought thousands of miners in. During the Gold Rush years in Northern California, Los Angeles became known as the "Queen of the Cow Counties" due to its role in supplying beef and other food to hungry miners in the north. The city quickly was enveloped in lawlessness due to the temporary absence of a legal system. Los Angeles came to be known as the "toughest and most lawless city west of Santa Fe." The averages for homicide rates between 1847 and 1870 were 10 to 20 times the annual murder rates for New York City during the same time period.

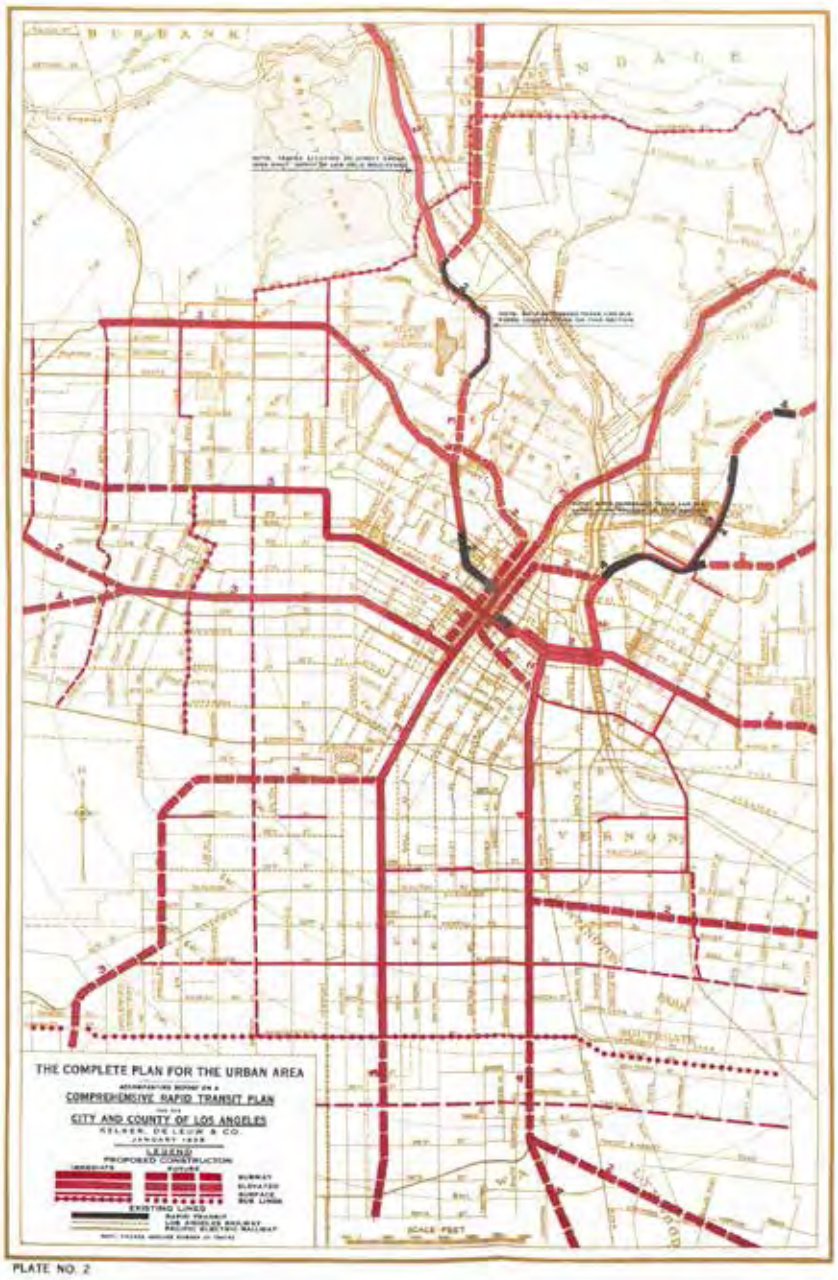
Railroad arrived in the city in 1876 when the Southern Pacific Line was completed. Oil was discovered in 1892 and by 1923 those discoveries helped California become the country's largest oil producer. By 1910 there were already 10 movie companies operating in Los Angeles and by 1921, more than 80 percent of the worlds film industry was concentrated in the city. The city grew from a village of 5,000 in the 1870's to over 100,000 by 1900. In the 1930's and 40's the federal government stepped in and paved the beds of the Los Angeles River and its tributaries in order to control floods. By the 1950's, Los Angeles was an industrial and financial giant created by war production and migration. Los Angeles was continuing to spread out, especially with the development of the San Fernando Valley and the building of the freeways in the 1940's. When the local street car system went out of business, Los Angeles became a city built around the automobile with all of the social, health, and political problems that this dependence produces.

IMAGES: LOS ANGELES PUBLIC LIBRARY

HISTORY

The urban sprawl of Los Angeles became a notable feature of the town and the pace of the growth accelerated in the first decades of the 20th century. This is also the time when General Motors most urban regions in North America to shut down their light rail street car systems and replace them for more flexible but polluting and inefficient bus systems. This drastically changed growth and travel patterns in the city in subsequent years and contributed to the severe air pollution events that Los Angeles became famous for.

A subway system, developed and built through the 1980s as a major goal of mayor Tom Bradley, stretches from North Hollywood to Union Station and connects to light rail lines that extend to the neighboring cities of Long Beach, Norwalk, and Pasadena, among others. Also, a commuter rail system, Metrolink, has been added that stretches from nearby Ventura and Simi Valley to San Bernardino, Orange County, and Riverside. The funding of the Los Angeles County Metropolitan Transportation Authority project is funded by a half cent tax increase added in the mid-1980s, which yields $400 million every month. Although the regional transit system is growing, subway expansion was halted in the 1990s over methane gas concerns, political conflict, and construction and financing problems during Red Line Subway project, which culminated in a massive sinkhole on Hollywood Boulevard. As a result, the original subway plans have been delayed for decades as light rail systems, dedicated busways, and limited-stop "Rapid" bus routes have become the preferred means of mass transit in LA's expanding series of gridlocked, congested corridors.



IMAGES: LOS ANGELES PUBLIC LIBRARY

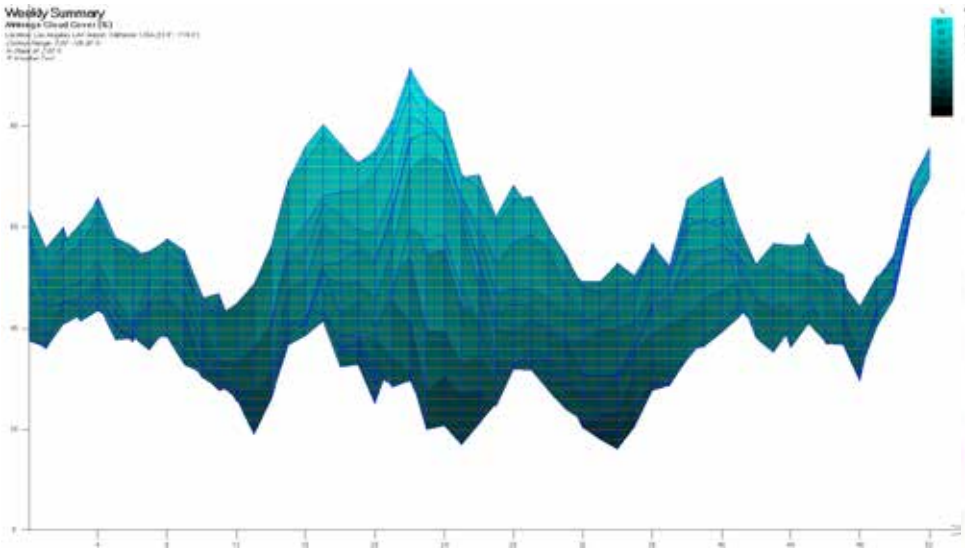
ENVIRONMENT

Los Angeles is irregularly shaped and covers a total area of 502.7 square miles. The city is both flat and hilly with the highest point in the city is over 5,000ft all the way down to sea level. The city is subject to earthquakes due to its location on the Pacific Ring of Fire. Major earthquakes have hit the Los Angeles area in the past causing death and damage.

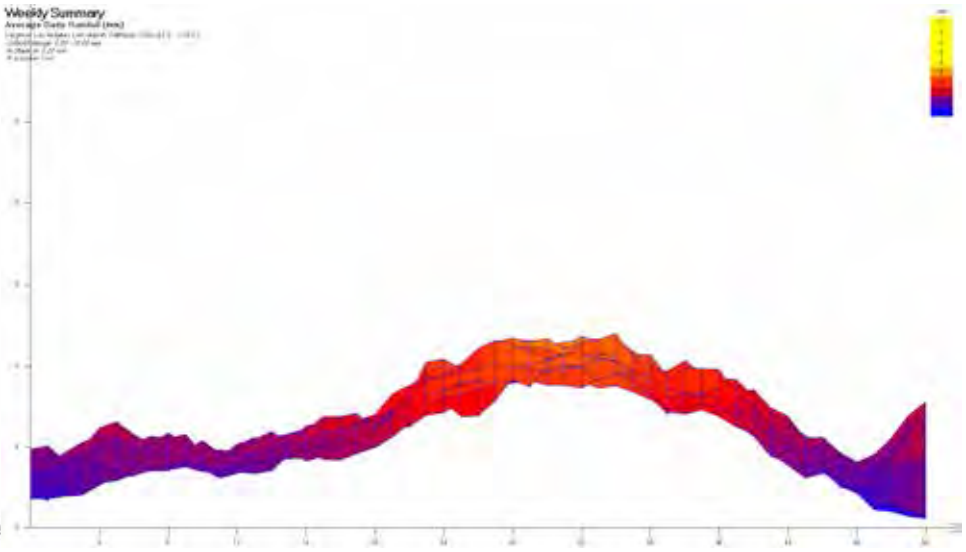
Los Angeles has a subtropical-Mediterranean climate. The city receives many days of sunshine throughout the year with only an average of 35 days with measurable precipitation annually. The average annual temperature in downtown is 66 degrees F during the day and 57 degrees F at night. In the coldest month, January, the temperature typically ranges from 59 to 73 degrees during the day and 45 to 55 at night. In the warmest month – August, temperatures typically range from 79 to 90 during the day and 64 at night. The area is subject to phenomena typical in a micro-climate, which causes extreme variations in temperature within close proximity to each other. The average July maximum temperatures range from 75 at the Santa Monica Pier and 95 in Canoga Park. Downtown Los Angeles averages around 15 inches of precipitation annually, with most of it occurring during the winter and spring.

Due to geography, Los Angeles' heavy reliance on automobiles, and the Los Angeles/Long Beach port complex, Los Angeles suffers from air pollution in the form of smog. The whole area is prone to atmospheric inversion, which holds in the exhaust from polluting sources. Many cities rely on rain to clear smog, but Los Angeles only receives 15 inches of rain each year so pollution accumulates over many consecutive days. The issue of air quality in Los Angeles has led the state of California to become the leader in regulating pollution by mandating low-emission vehicles. Smog is expected to diminish in the coming years due to the aggressive steps to reduce it. Even though conditions are improving the American Lung Association's 2013 survey ranks the metro area as having the nation's worst smog.

AVERAGE CLOUD COVER

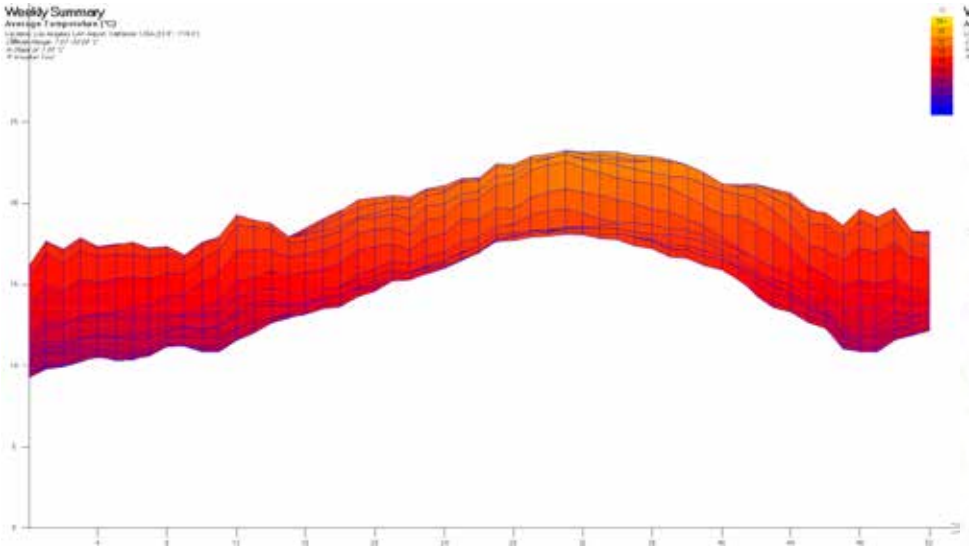


AVERAGE DAILY RAINFALL

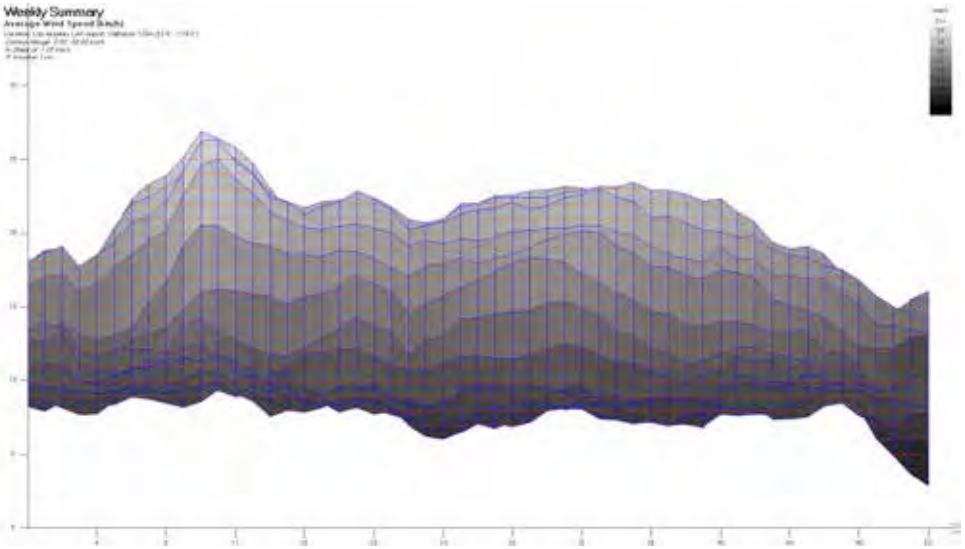


SOURCE: AUTODESK ECOTECT

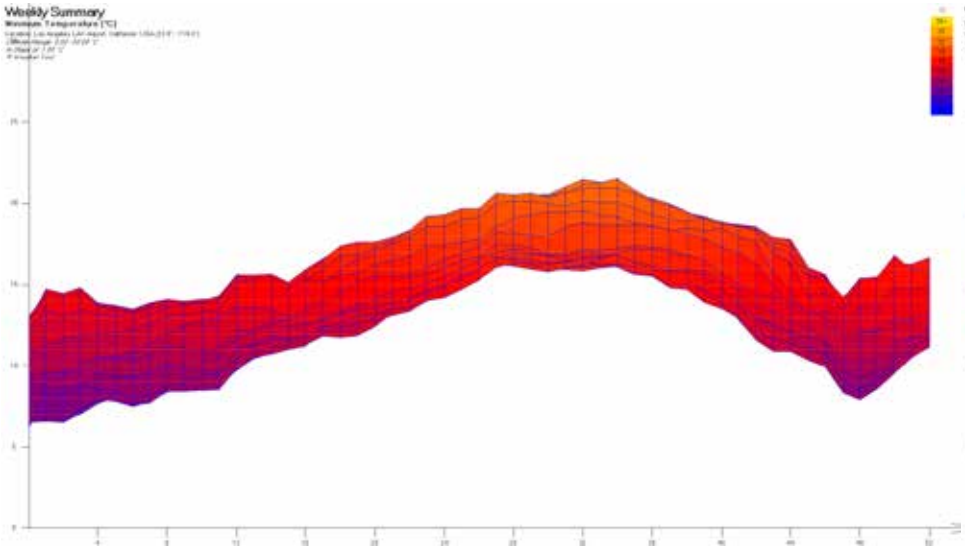
AVERAGE TEMPERATURE



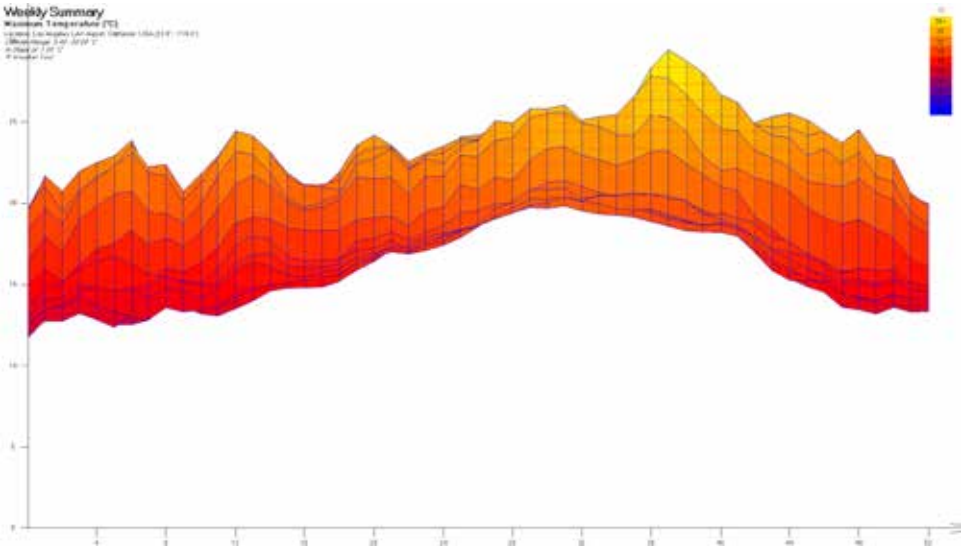
AVERAGE WIND



MINIMUM TEMPERATURE

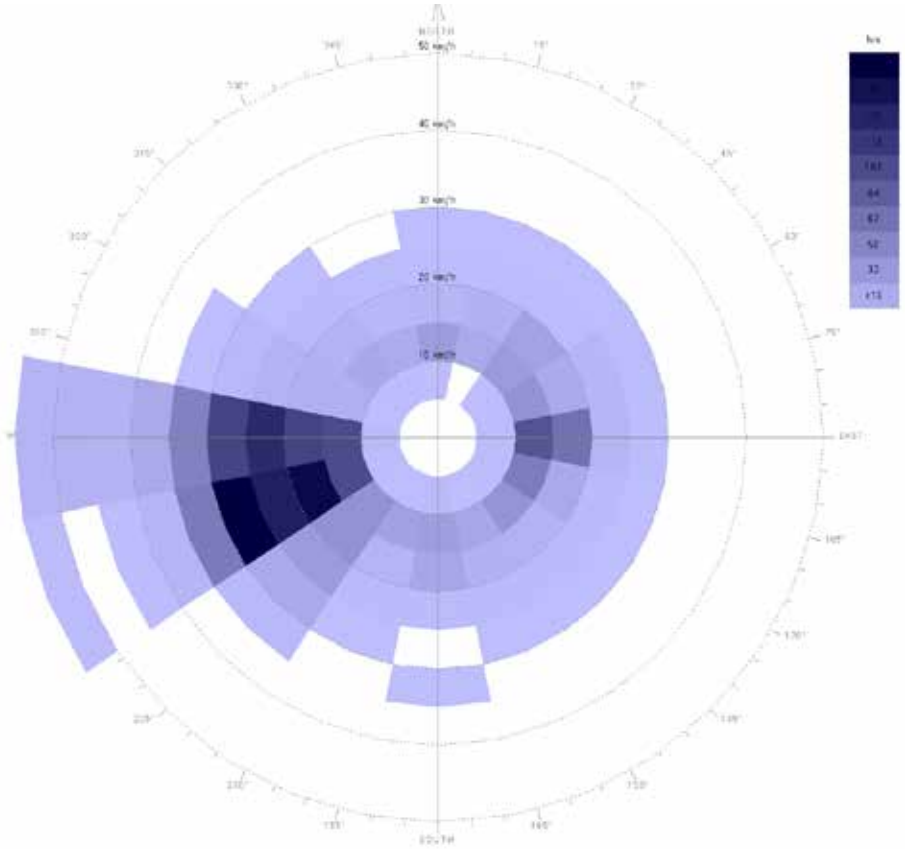


MAXIMUM TEMPERATURE

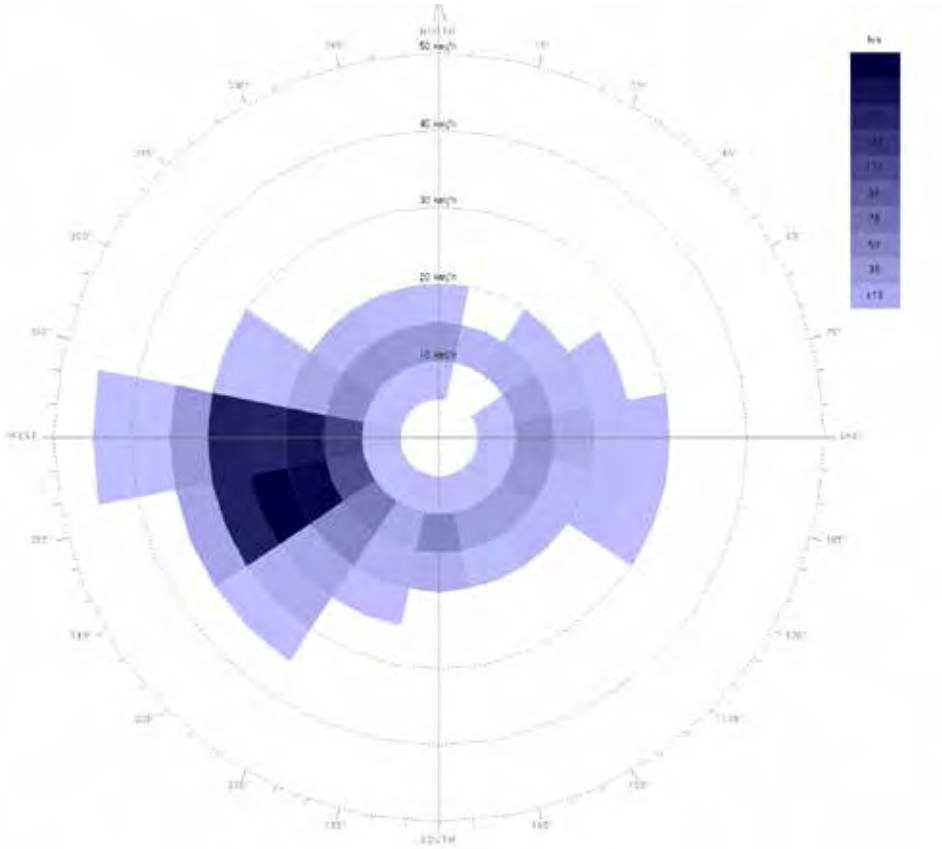


SOURCE: AUTODESK ECOTECT

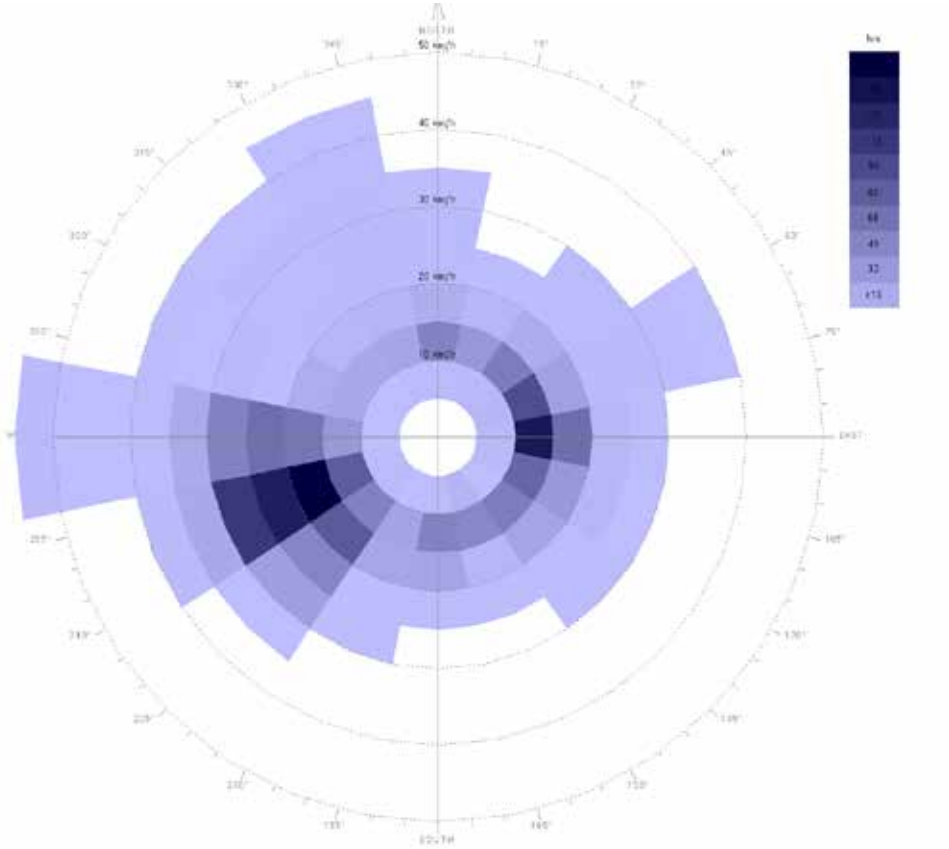
WIND - SPRING



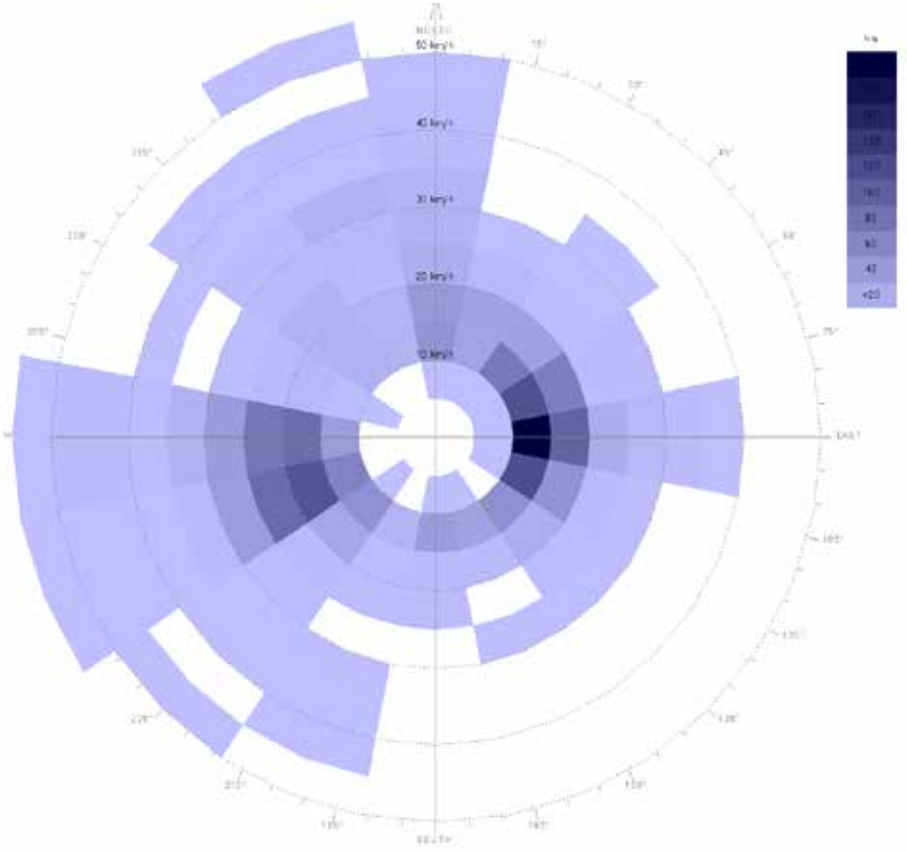
WIND - SUMMER



WIND - FALL



WIND - WINTER



SOURCE: AUTODESK ECOTECT

CITY DISTRICTS

The city of Los Angeles is divided into over 80 districts and neighborhoods. Generally, the city is divided into the following areas: Downtown Los Angeles, East Los Angeles and Northeast Los Angeles, South Los Angeles, the Harbor Area, Greater Hollywood, Wilshire, the Westside, and the San Fernando and Crescenta Valleys.

The Los Angeles Union Station is located in the Downtown neighborhood in the Central L.A. Region of Los Angeles County. The Central LA region contains a population of 836,638 spread out over 57.87 square miles and divided into 26 neighborhoods. The density for the region is 14,458 people per square mile with the densest neighborhood being Koreatown. 81.4% of households are renters.

The Downtown neighborhood of the Central L.A. region contains Bunker Hill, the Civic Center, fashion district, industrial district, jewelry district, Little Tokyo, Old Bank District and skid row. The population of the neighborhood is 34,811 in 2008 based on L.A. Department of City Planning estimates. The daytime population of 207,440 greatly exceeds the regular population according to SCAG estimates. The density of the neighborhood is 4,770 people per square mile, which is among the lowest densities for the city of Los Angeles. The neighborhood is highly diverse for the city of Los Angeles. The median household income is low for the city of Los Angeles just coming in at $15,003 based on a 2008 estimate.

IMAGES: WIKIPEDIA

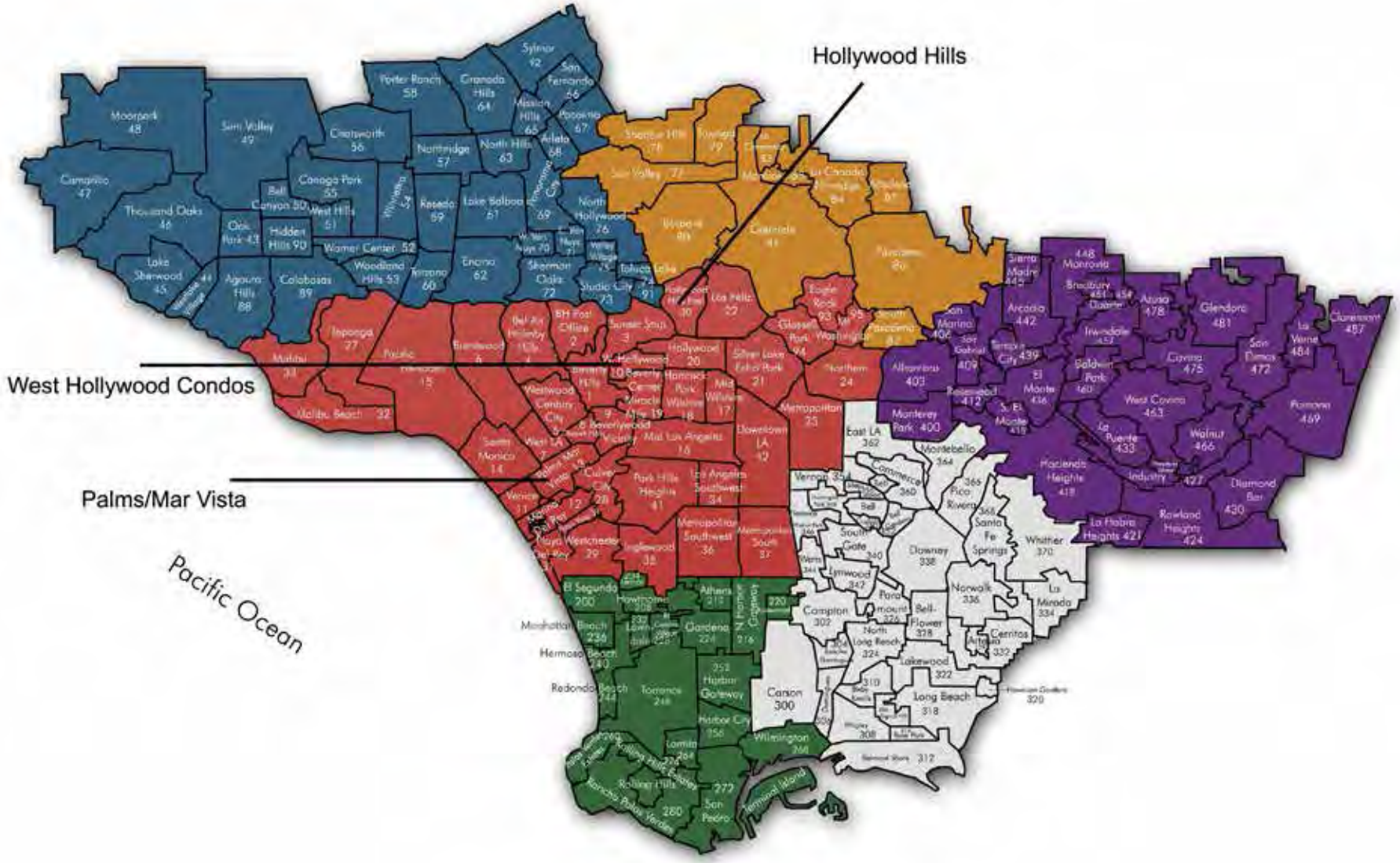


IMAGE: MAPS.LATIMES.COM

NEIGHBORHOOD COMMUTE COMPARISON

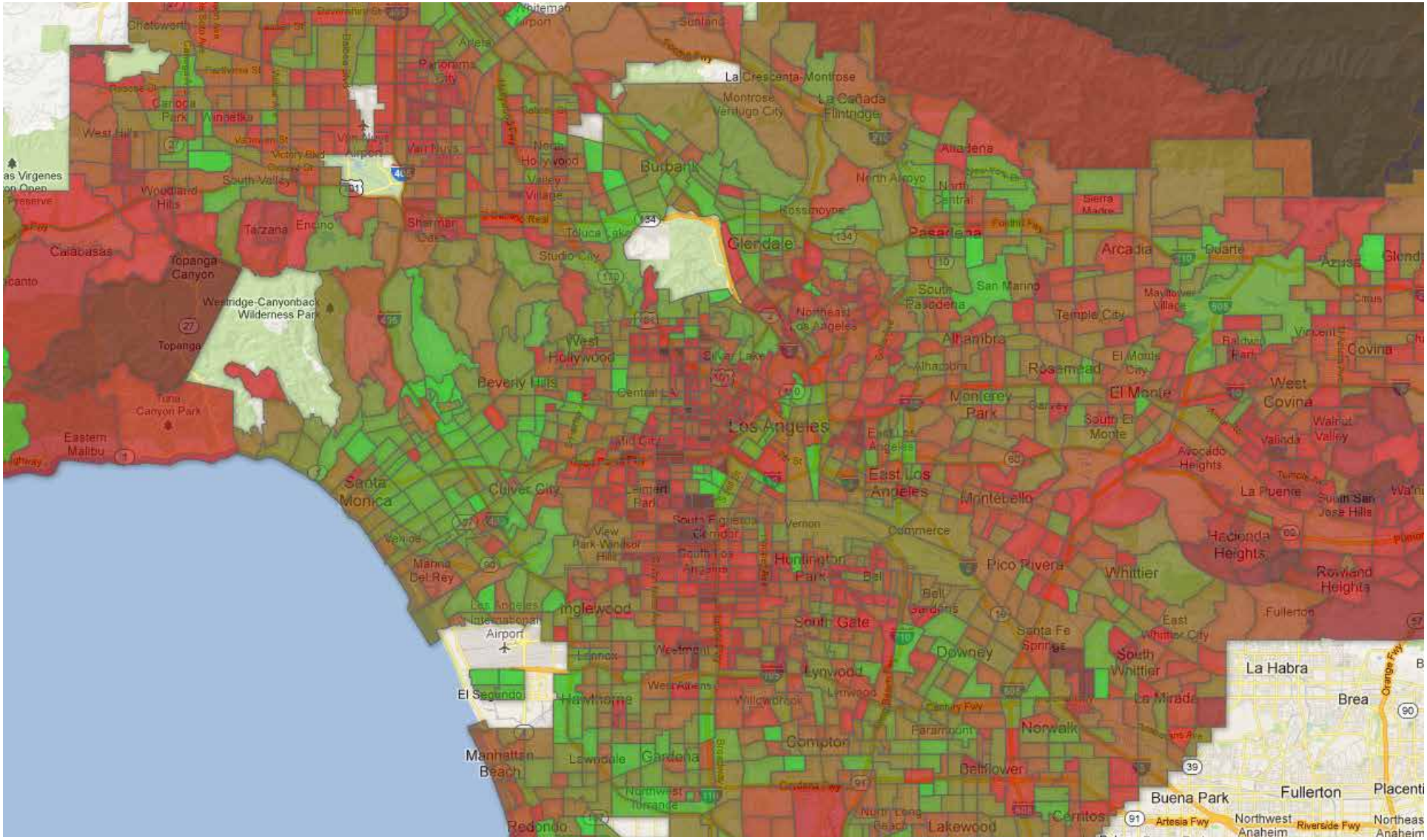


IMAGE: LA.CURBED.COM

NON-CAR COMMUTERS BY NEIGHBORHOOD

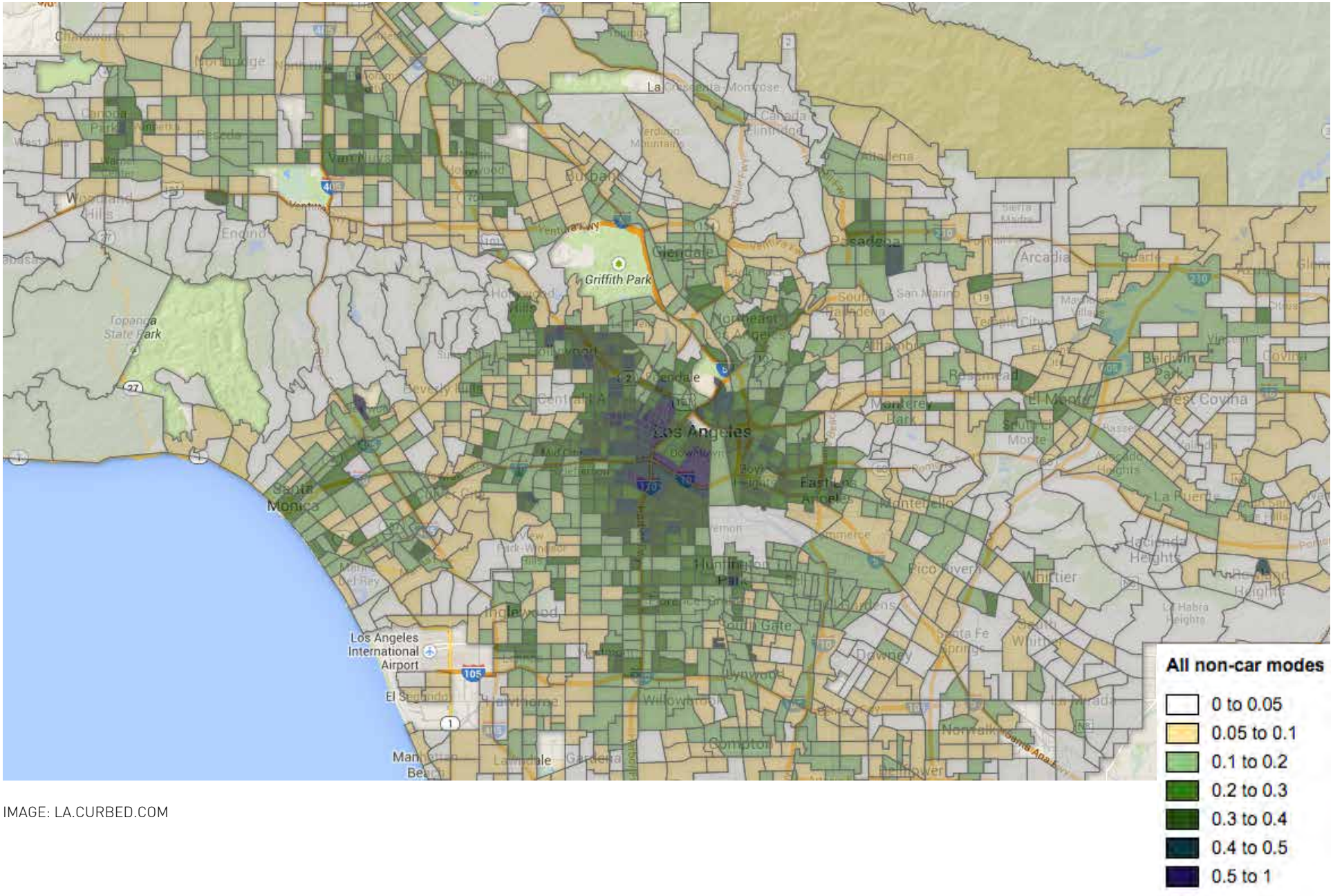


IMAGE: LA.CURBED.COM

PROGRAM

CLIENTS & USERS - PROGRAM OUTLINE - AREAS

03

CLIENT

The **Los Angeles County Metropolitan Transportation Authority** (LACMTA or MTA; branded as Metro) is the California state-chartered regional transportation planning agency (RTPA) and public transportation operating agency for the County of Los Angeles. The agency develops and oversees transportation plans, policies, funding programs, and both short-term and long-range solutions that address the county's increasing mobility, accessibility and environmental needs. The agency is the primary transit provider for the City of Los Angeles providing the bulk of such services while the City of Los Angeles Department of Transportation (LADOT) operates a much smaller system of its own Commuter Express bus service to outlying suburbs in the city of Los Angeles and the popular DASH (Downtown Area Short Hop) mini-bus service in downtown and other neighborhoods in the city of Los Angeles. The MTA has its headquarters in downtown Los Angeles.

The Los Angeles County Metropolitan Transportation Authority operates the third-largest public transportation system in the United States by ridership with a 1,433 mi² (3,711 km²) operating area and 2,000 peak hour buses on the street any given business day. Metro also designed, built and now operates 87.8 miles (141.3 km) of urban rail service. The authority has 9,200 employees, making it one of the region's largest employers.

Metro
Los Angeles County
Metropolitan Transportation Authority

IMAGE: LA METRO AUTHORITY

USER GROUPS

CITY COMMUTER

STATE TRAVELER

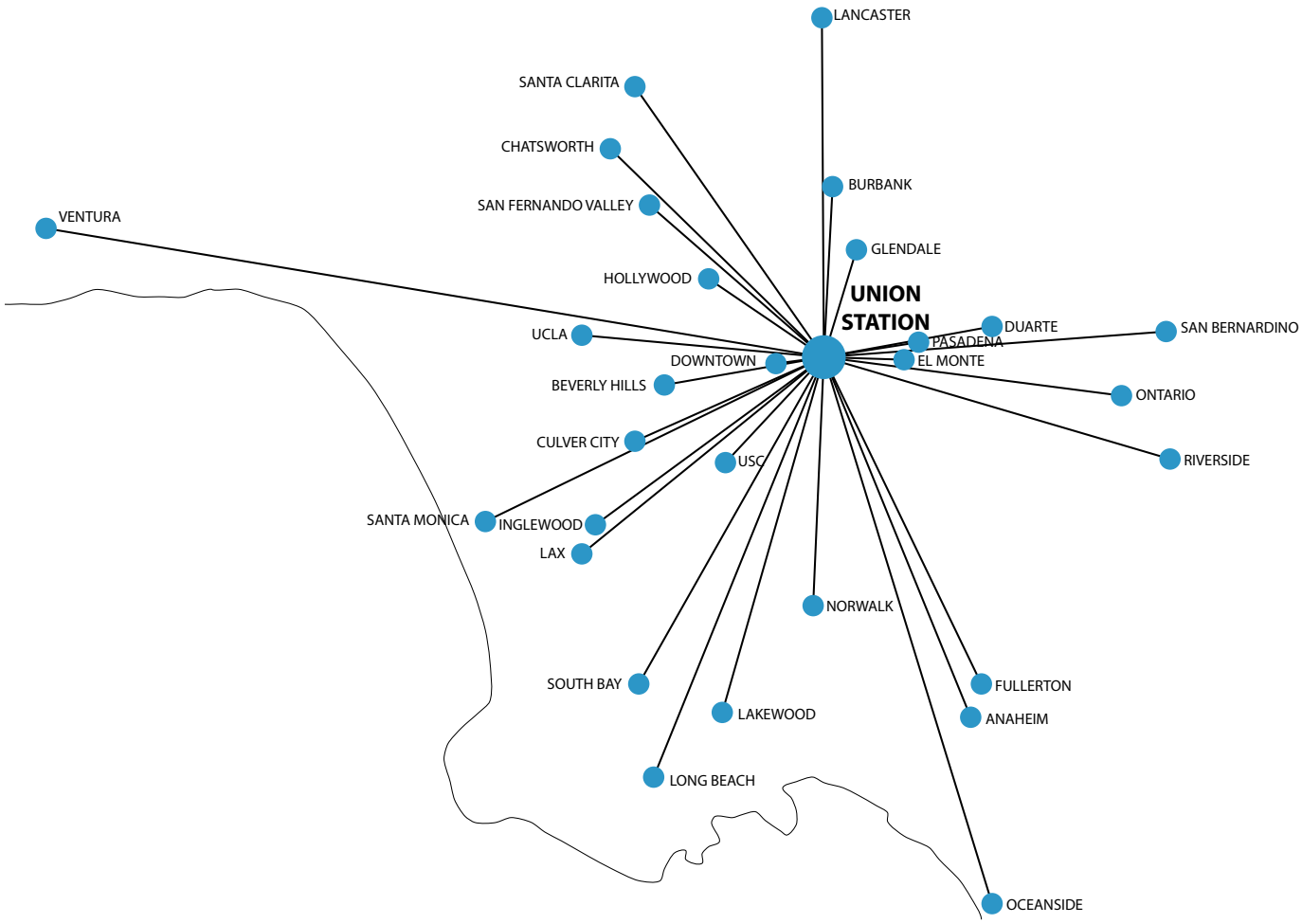
OUT OF STATE / INTERNATIONAL TRAVELER

RESIDENT

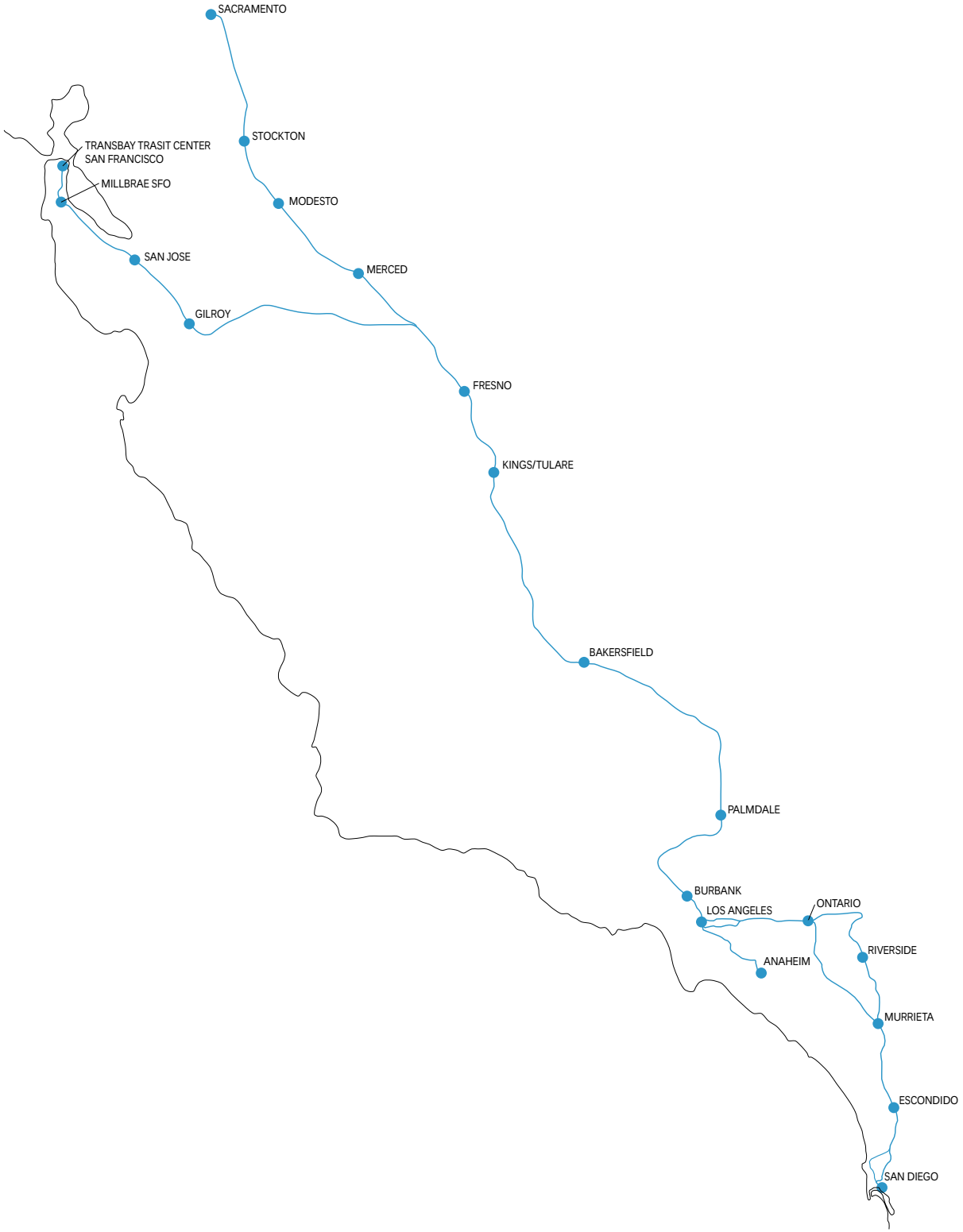
VISITOR

CITY COMMUTER

The Los Angeles city commuter will be able to make use of the new facilities at Union Station. Whether they are coming in from the outskirts of the city or are living in the new housing in the transit-oriented development around Union Station. A commuter coming in from the outskirts of the city would either take the new Bus Rapid Transit (BRT) lines or Light Rail connecting them directly to Union Station. From there they are given multiple options, a commuter can connect to other BRT or Light Rail lines or transfer over to the metro. There is also the option to use the bike-sharing program as an alternative to the many rapid transit lines.



STATE TRAVELER

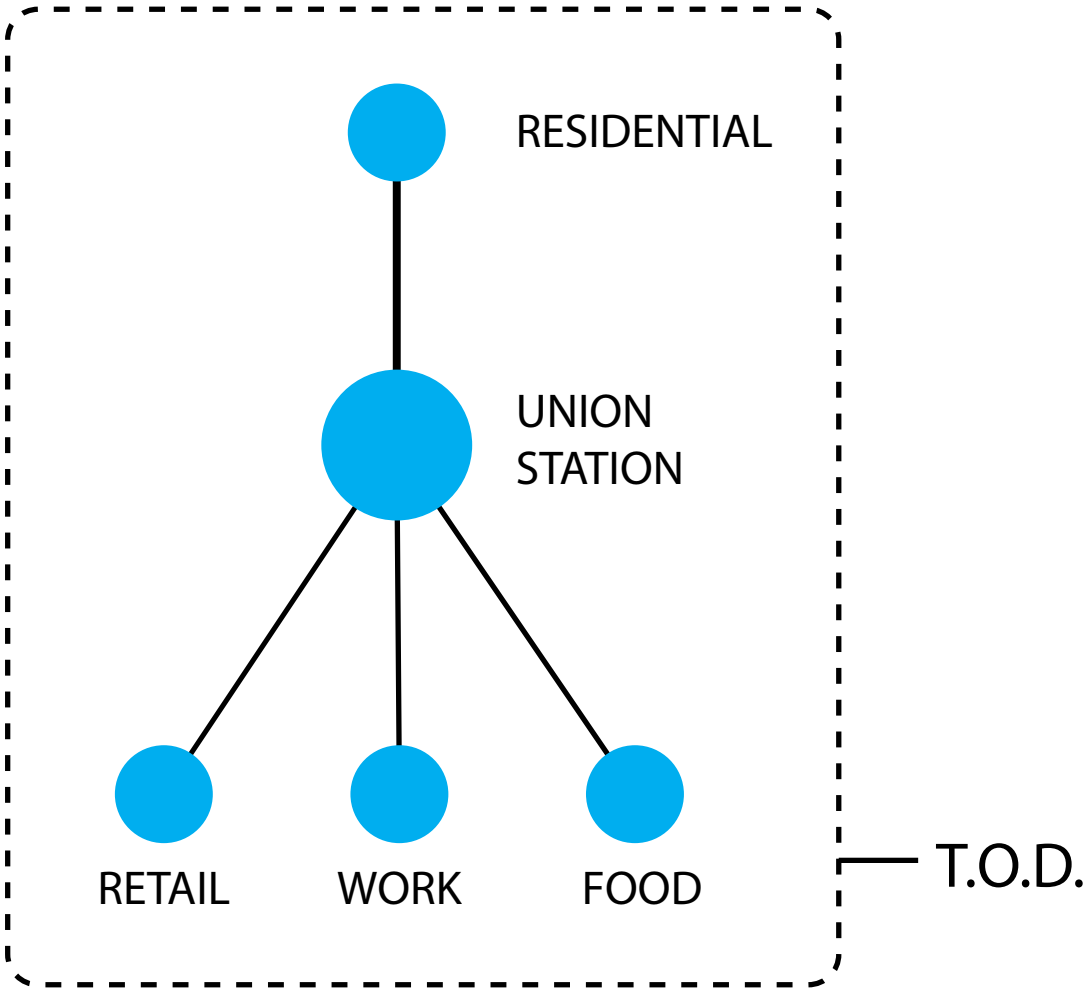


The new high-speed rail terminal at the Los Angeles Union Station will enable travelers to get to other parts of California in decreased times. The high-speed rail line will connect Los Angeles to Northern California and decrease travel time to cities already connected by rail such as San Diego. The high-speed rail will allow travelers to get to other cities in California in times similar to an airplane but without all of the hassle of going to the airport. Travelers will be able to go directly to Union Station in downtown Los Angeles and from there be able to catch a high-speed train to Northern and Southern destinations in California. The new Union Station will have many similar amenities that are found in an airport. Travelers that are inbound to Union Station will have the option to connect to the local Los Angeles transit, connect to the airport, or rent a car or bike. Travelers that are connecting at Union Station will have food options available to them while they wait. Travelers that are stopping over at Union Station for a longer period of time will have a full service hotel available to them.

LONG DISTANCE TRAVELER

One of the new connections that will be established is a direct rail link to Los Angeles International Airport. This rail line will depart directly from Union Station and take travelers directly to the Los Angeles International Airport terminal. The connection will enable residents and visitors of Los Angeles to travel freely in between the two transportation hubs with ease and without worry of traffic on the freeway. A traveler coming into Los Angeles International Airport will be able to disembark their plane, collect their luggage and proceed directly to the rail terminal within the airport. From there the traveler may take a direct train to Union Station where they have further potential connections. Once in Union Station, if continuing further, travelers have the opportunity to transfer to rapid transit or take the high-speed rail.

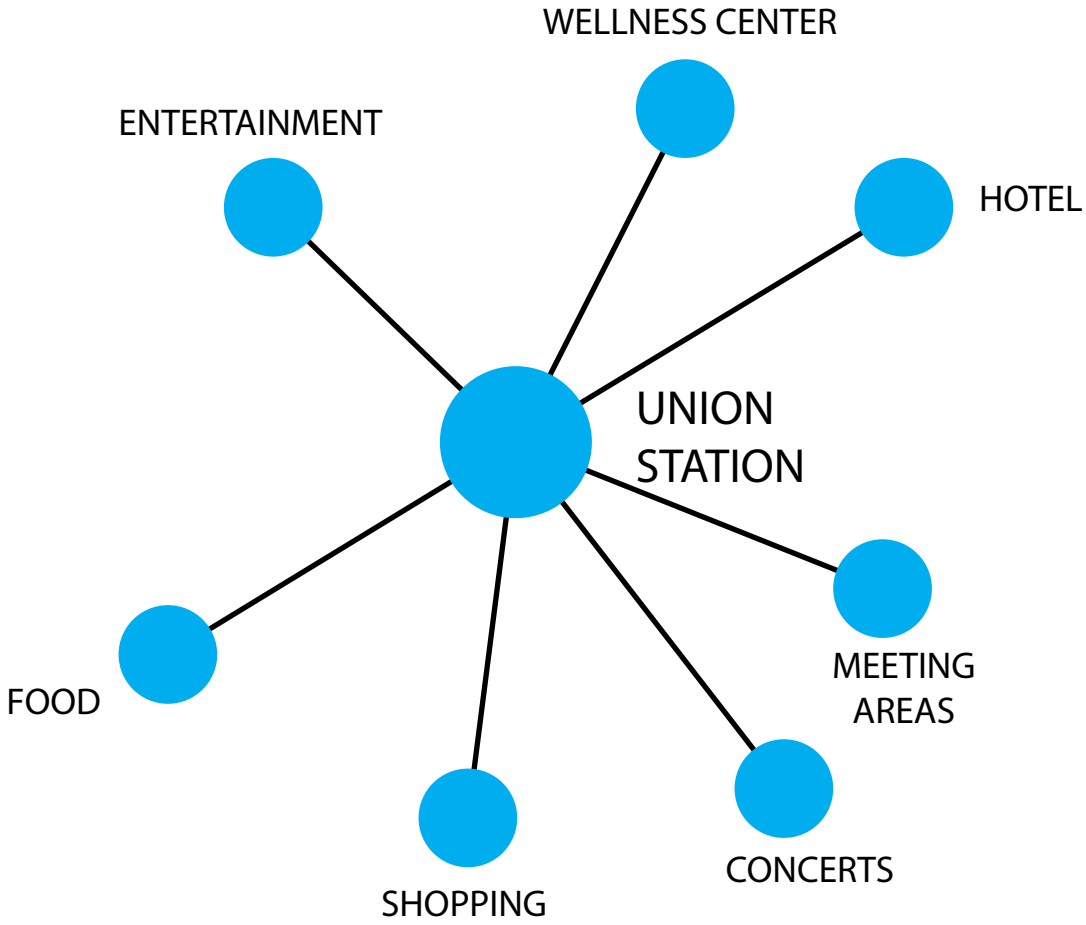
RESIDENT



The new transit-oriented development will include multi family housing. This housing will provide residents the opportunity to live in a public transit oriented society in where they do not necessarily need to own a vehicle. In the Union Station Transit-Oriented Development, all of the necessities will be close so that residents may reach them by foot. Residents will be able to commute to work using public transit, with the main hub of the city, Union Station being right at their backdoor. Being located at the central transit will allow residents to commute and travel using the transportation system of Los Angeles with local transit, high speed rail, and air being accessible via Union Station.

VISITOR

The new Union Station will become a destination for visitors and residents alike. The area will have a full service hotel, retail shops, and social destinations. The goal of the new Union Station is for it to become a destination and not just a bland transit station. Union Station will become a place for residents and visitors of Los Angeles to come shop, eat and be entertained. Visitors to Los Angeles will have the option to stay in a hotel that is almost located nearby Union Station. The entire transit oriented development will be connected by a public green space. The area will be free of cars except for the parking garage and the perimeter, where the drop off zones will be located. The public green space will be an area where pedestrians can walk freely without having to worry about cars. This green space will be home to social events and outdoor eateries. Many people will be able to come to Union Station for dinner and socializing during the day or at night. Visitors and residents alike will be able to explore restaurants, bars, shops, and even be able to utilize a wellness facility.




UNION
STATION


TRAXX
TRAXX

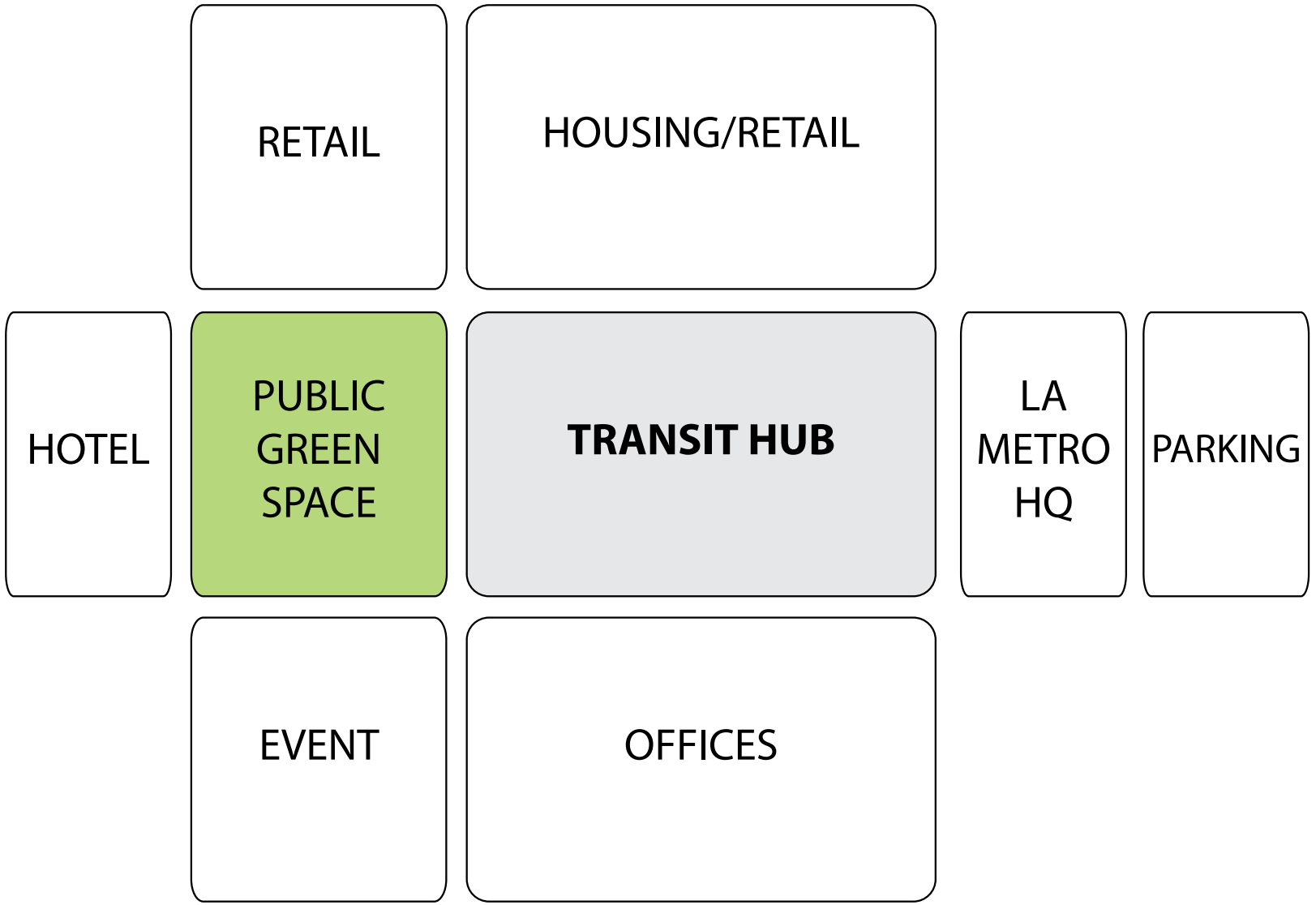
PROGRAM OUTLINE

The scope of the project is on two different scales, a master planning scale and a building scale. The goal of the master plan is to incorporate transit-oriented planning around the new Union Station. With this in mind, connections to the station will be made and strengthened with the neighborhoods. The master plan will include multiple types of program ranging from housing, retail, to transit elements.

The new Union Station will become a true inter-modal transit station. There will be multiple types of transportation creating links to the city, rest of the state, country and international destinations. The transit hub will allow travelers and commuters to transfer between different types of transportation methods quickly and efficiently. There will be cafes, restaurants, and bars to serve these travelers and commuters but will also bring people in from the neighboring areas for more of a social atmosphere. There will be a hotel for short term visitors and housing for residents of the area. There will be retail shops integrated within the station/development. Interconnected with the mixed use program will be a main hall, which will house the ticketing offices and departure/arrival points to the various transportation platforms. The purpose of the building and master plan is to not only serve as a transportation hub but to go beyond that and become a space that all different kinds of people may use on a regular basis. The goal of the new Union Station is to integrate seamlessly with the nearby areas allowing easy access whether it is on foot, by car, by rail, or even by flying.

MASTER PLAN ELEMENTS

INTER-MODAL TRANSIT HUB
LA COUNTY METRO H.Q.
OFFICES
HOUSING
HOTEL
RETAIL
MARKET
EXHIBITION SPACES
EVENT SPACES
CONCERT HALL
PUBLIC PLAZAS
PUBLIC GREEN SPACE
PARKING


RETAIL
HOUSING/RETAIL
HOTEL
PUBLIC GREEN SPACE
TRANSIT HUB
LA METRO HQ
PARKING
EVENT
OFFICES

PROGRAM OUTLINE

PROPOSED PROGRAM

TRANSIT HUB

ENTRANCE AREA
WAITING AREAS
FIRST CLASS LOUNGE
PUBLIC RESTROOMS
TICKETING AREAS
TICKETING OFFICE
SELF SERVICE TICKETS
CUSTOMER SERVICE OFFICE
CAR RENTAL
BIKE SHARE
CAFE
MEETING SPACES
RESTAURANTS / BARS
RETAIL
CONVENIENCE STORES
OUTDOOR PUBLIC PLAZA

TRANSIT PLATFORMS

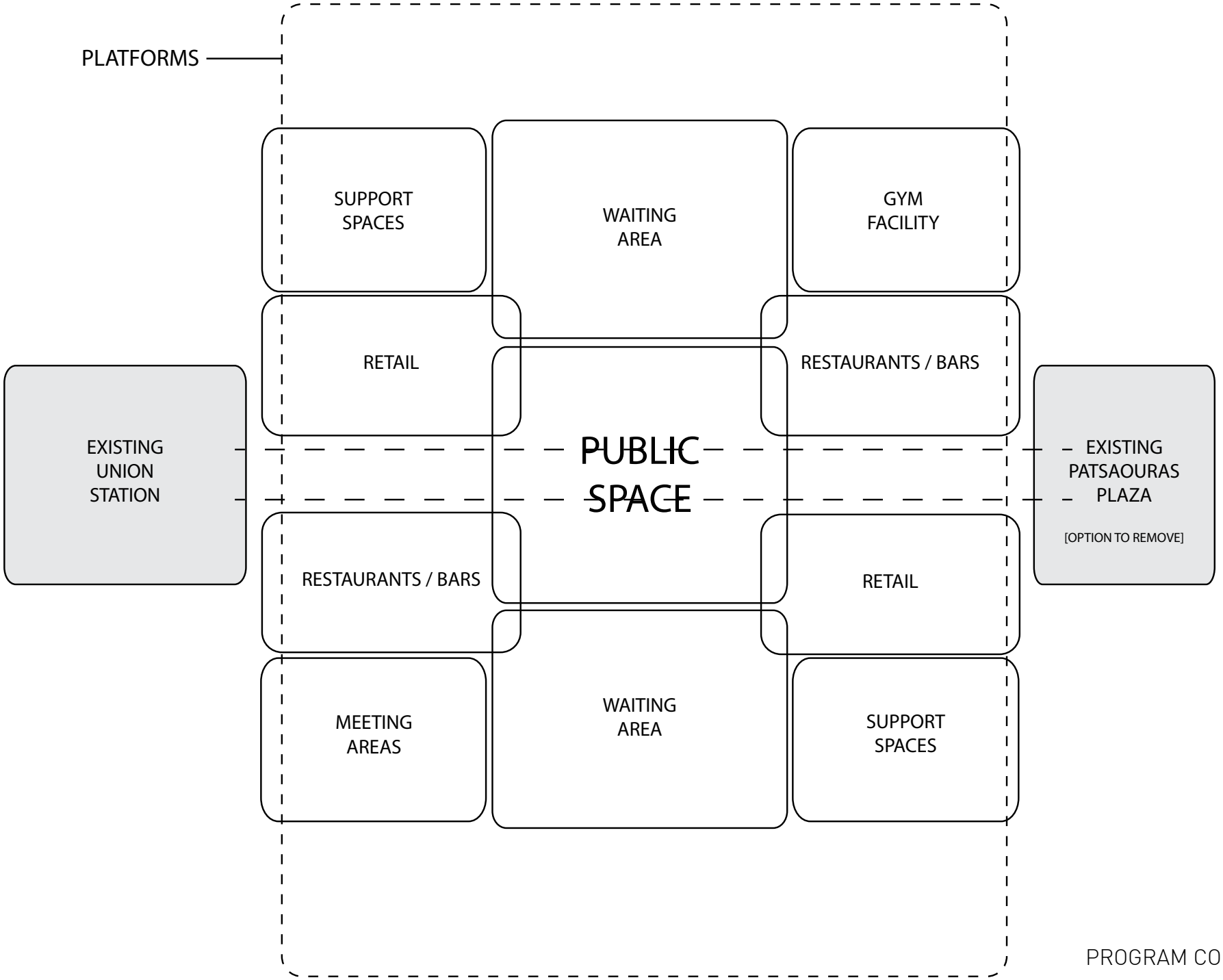
BUS RAPID TRANSIT PLATFORMS
LOCAL BUS PLATFORMS
LIGHT RAIL PLATFORMS
METRO PLATFORMS
AMTRAK PLATFORMS
METROLINK PLATFORMS
HIGH SPEED RAIL TERMINAL

SERVICE COMPONENT

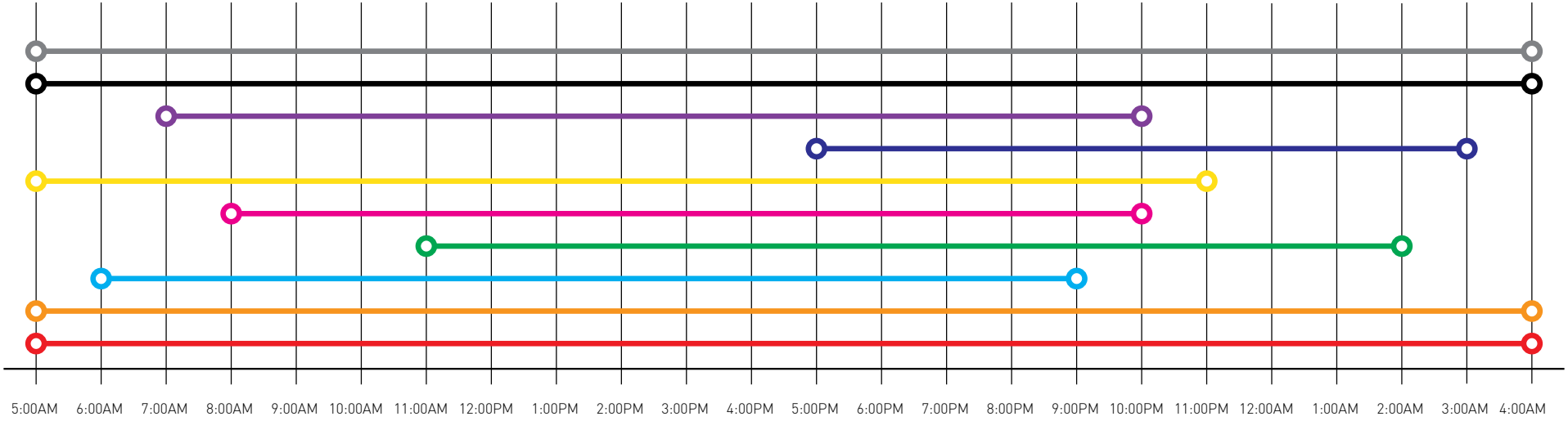
BAGGAGE OFFICE
BAGGAGE CLAIM
STORAGE
EMPLOYEE ROOM
EMPLOYEE RESTROOM
SECURITY OFFICES
SUPPORT OFFICES
CREW BASE AREA
COMMUNICATIONS & DATA ROOMS
SUPPORT OFFICES

EXISTING TERMINAL: 161,000 SF
NEW TERMINAL ADDITION: 100,000 SF

[NEW TERMINAL ADDITION SQUARE FOOTAGE DOES NOT INCLUDE SERVICE COMPONENT OR PLATFORMS]


PLATFORMS
SUPPORT SPACES
WAITING AREA
GYM FACILITY
RETAIL
RESTAURANTS / BARS
EXISTING UNION STATION
PUBLIC SPACE
EXISTING PATSAOURAS PLAZA
[OPTION TO REMOVE]
RESTAURANTS / BARS
RETAIL
MEETING AREAS
WAITING AREA
SUPPORT SPACES

DAY IN THE LIFE OF UNION STATION



- CONVENIENCE STORES
- FOOD, OTHER
- COLLABORATIVE SPACES (BUSINESS AREAS)
- SOCIAL / CONCERTS / PUBLIC EVENTS
- GYM FACILITY
- RETAIL
- RESTAURANTS / BARS
- CAFES
- STATION OPERATING HOURS
- TRANSPORTATION SERVICE

The new Union Station and surrounding area will a 24 hours a day 7 days a week destination. Transportation service will also run 24/7 with service running less frequently at night and more frequently during the busy commute times. While the station as a whole will remain open 24/7, not everything in the station will be open all night long. The goal of the station is for something to be open at any moment, so there will be limited retail store or food options open at night. During the early morning hours, cafes will open up to serve commuters, travelers, and residents. As the morning progresses and the station is bustling with the morning commute rush, all of the retail shops will open up as well as the meeting areas. The station will not only be a place for commuters to go to for travel but will also become a location where people can meet up for business or leisure as well. The station will offer meeting areas where conferences and meetings can take place. During the late morning and early afternoon hours, the restaurants and bars will open up and by lunch time the station will be fully open. Some of the food options will stay open all night and operate 24/7 to serve late night visitors to the station. As the day progresses the station will see steady traffic until the evening commute starts when the station will become rather busy again. As commuters and travelers pass through the station they can stop at a restaurant or a bar to grab food and drink or explore many of the retail options. They may also step out of the station and explore the Union Station neighborhood, which is alive with energy. As the commute ends and the evening sets in, the station and surrounding area becomes a social hotspot. Many of the restaurants, bars, and shops are bustling with people. People are socializing outdoors in the public green space linking the whole neighborhood together. There are concerts and events to keep people entertaining both outdoors and indoors. Many of the restaurants and bars are open late into the night, keeping the station and surrounding neighborhood alive with people. As the nightlife and socializing dies down, there are still some shops open as well as some food options. Late night or early morning travelers still pass through the station. Overall the Union Station is alive with people and energy 24 hours a day.

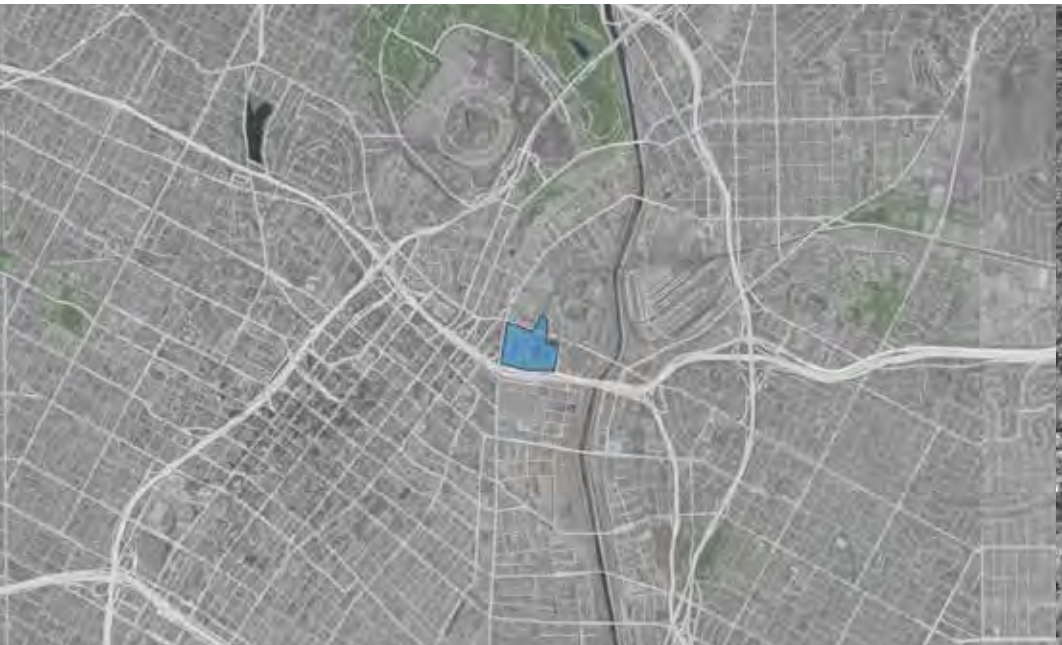
SITE IDENTIFICATION

OVERVIEW - EXISTING CONDITIONS - ANALYSIS

04

UNION STATION

LOS ANGELES, CALIFORNIA

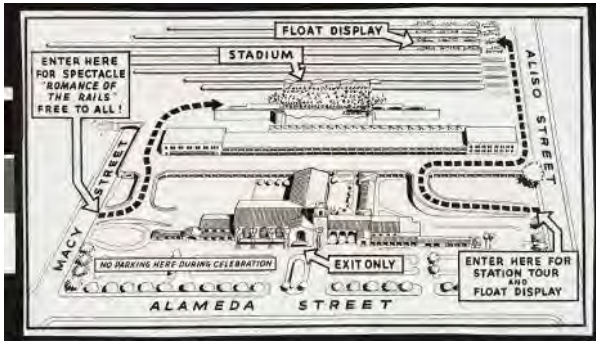


The site chosen for this thesis is the Union Station in Los Angeles, California. The criteria for site selection was not only the physical site itself but one of the main considerations was the city itself. The selection of the city was very important due to the ideas behind the thesis. The ideas of the thesis are to create and transform the transportation culture within the city; therefore a city like New York City that has a well-established transportation system and high ridership percentages would not make sense. On the other hand, Los Angeles is a city that came about in a different time period than New York City. Los Angeles was primarily planned around the automobile with wide streets and freeways and less public transportation planning. Because of this, Los Angeles has gained a reputation to be a very automobile reliant city. This reliance on the automobile combined with the need for expansion and additional development at the existing Union Station drove the decision for the site selection. There is a need to expand the Union Station in Los Angeles due to the fact that rider trips are expected to double by the year 2040. The site poses challenges due to its existing location within downtown Los Angeles and the infrastructure surrounding the site. The station is also in need of additional transportation lines and connections. Future plans call for introduction of high-speed rail and a connection to Los Angeles International Airport. There is a need to expand and develop the existing Union Station to fit these future needs.

HISTORY

The Los Angeles Union Station opened in 1939. The station is an example of Art Deco and Mission/Spanish Revival architecture and was designed by John Parkinson and Donald Parkinson. The station is on the National Registry of Historic Buildings. A union station was recommended for the city as far back as 1911 as a part of the earliest known transit study for Los Angeles. The coming about of Union Station was a long political battle that resulted in Supreme Court hearings and many battles between groups of the city's political, business, and media forces. What began in 1916 as an attempt to improve the city's railroad stations had evolved in 1926 into a major controversy over the nature of the city's public transit system.

In the 1920's, traffic in downtown LA was horrible, public transportation was growing less desirable since streetcars were at-grade and did not help people get around any faster. Many different designs were proposed for the Los Angeles Union Station before the final design was ever selected. Some included a terminal modeled on the Union Station in Washington, DC. The cities existing and separate railroad companies lobbied against the proposal for the Union Station as it would force them to integrate into one station. Many of the cities newspapers also formed sides, some siding with and some against. The Los Angeles Examiner used crude racial images in frightening the public out of voting for a union station between Chinatown and Little Mexico. As a counter, the Los Angeles Times responded by running a series of front page articles about the evils of elevated railroad lines. On one side of the issue stood the railroad companies and four of the city's six daily newspaper and on the other side stood the City of Los Angeles and the Los Angeles Times who were for the Union Station.



IMAGES: LA METRO AUTHORITY

HISTORY

In 1926, Los Angeles citizens went to the polls to determine their choice between a vast network of elevated railways or a union station to consolidate the different railroad terminals. With an issue before them that had polarized the city like no other in its history, voters approved the union station concept 61.1% to 38.7%. The location, which was a separate ballot, was much more narrowly approved for the Central Plaza site that the station currently is on. The 60% voter turnout was the largest to date for a city election in Los Angeles despite the fact that no candidates appeared on the ballot. By the time the Union Station opened in 1939, the public embraced the idea of a central terminal and over 500,000- people turning out for the Opening Day parade. To put this in perspective, the city's 1940 census population was just over 1,500,000. However, only two years after its opening, World War II began. The station served as a major hub for troop movement during the second World War. When it ended, the combination of affordable jet travel and a national interstate system left many of the nations rail stations, included the Los Angeles Union Station, in the shadows of their former glory.

The station's historic 161,000 square foot terminal was placed on the National Register of Historic Places in 1980 and the station was restored in 1992. In the 1970's, the increased use of Amtrak and expansion of local and regional rail revitalized the station as a major transportation hub. In 2011, Metro purchased Union Station. This was done to ensure the agency can make the needed investments to enable the facility to accommodate greater increases in ridership resulting from transit projects as well as the anticipated arrival of high speed rail in the future.

1939 UNION STATION OPENS

1971 AMTRAK BEGINS OPERATING FOUR LONG DISTANCE TRAINS FROM UNION STATION
COAST STARLIGHT
SOUTHWEST CHIEF
SUNSET LIMITED

1982 TEXAS EAGLE

1992 METROLINK STARTS OPERATIONS IN UNION STATION

1993 METRO RED/PURPLE LINE OPENS

1995 PATSAOURAS TRANSIT PLAZA OPENS, SERVING BUS OPERATIONS

2003 METRO GOLD LINE BEGINS SERVICE

2006 LAX FLYAWAY BEGINS OFFERING SERVICE TO UNION STATION

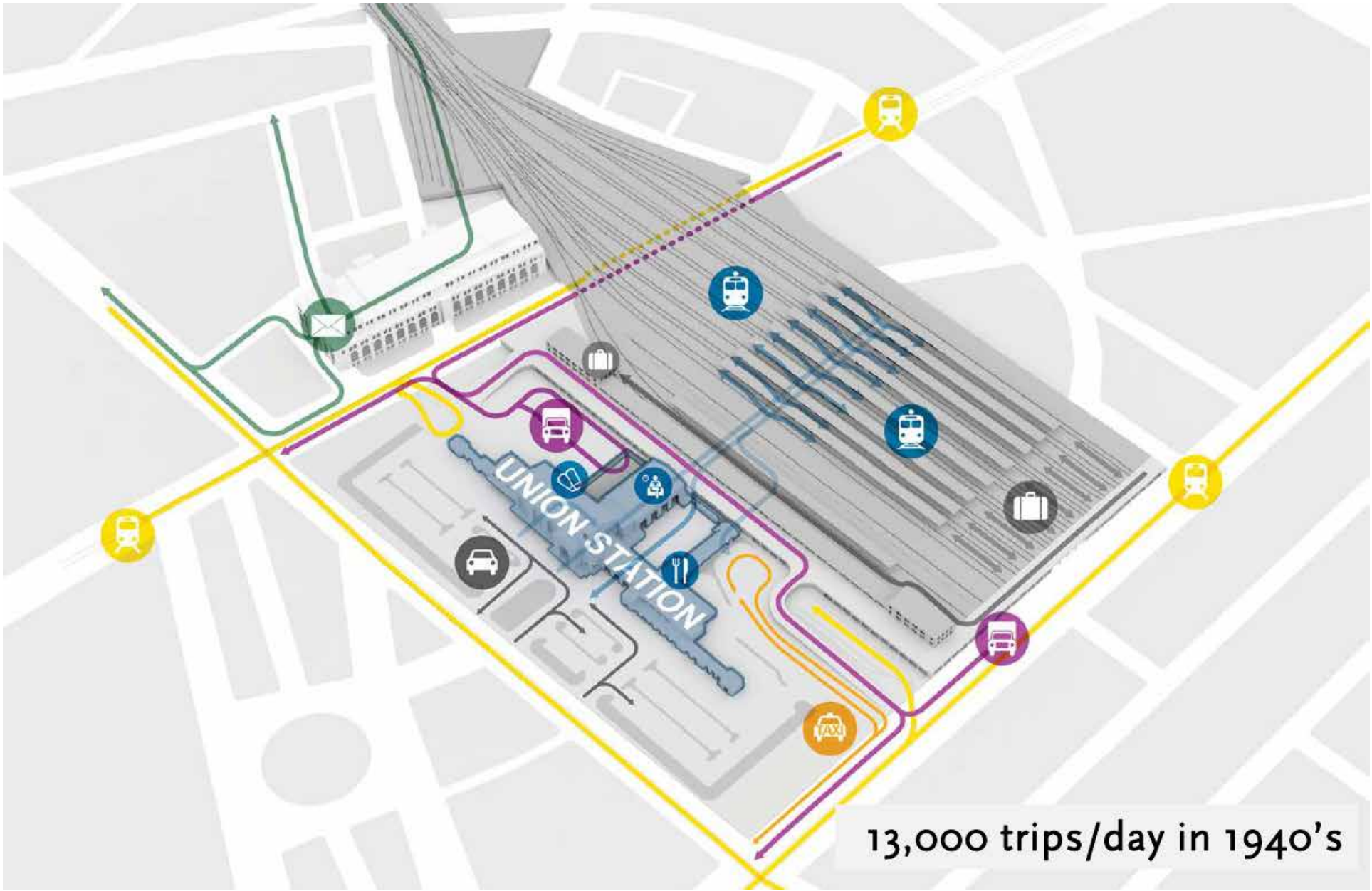
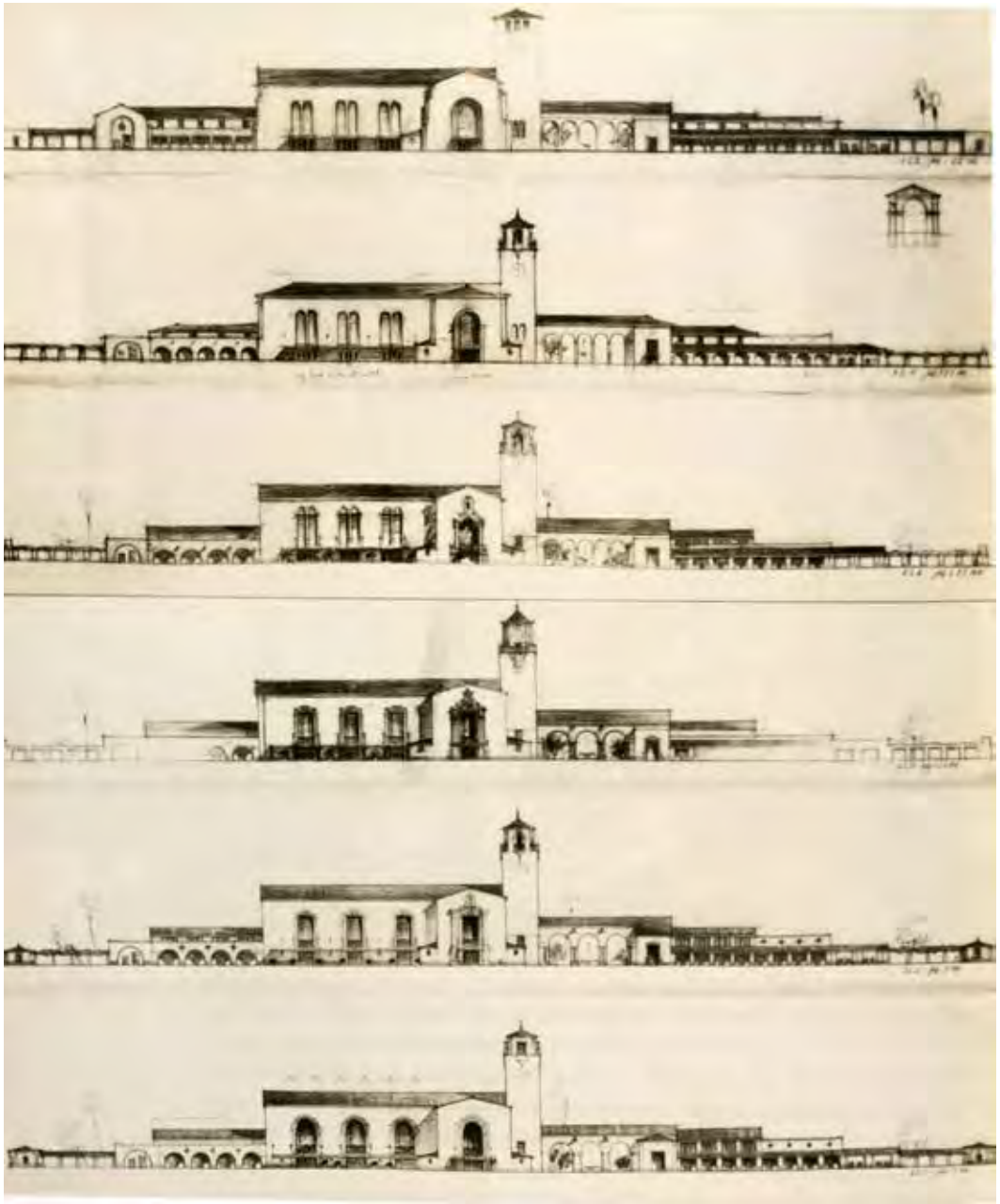
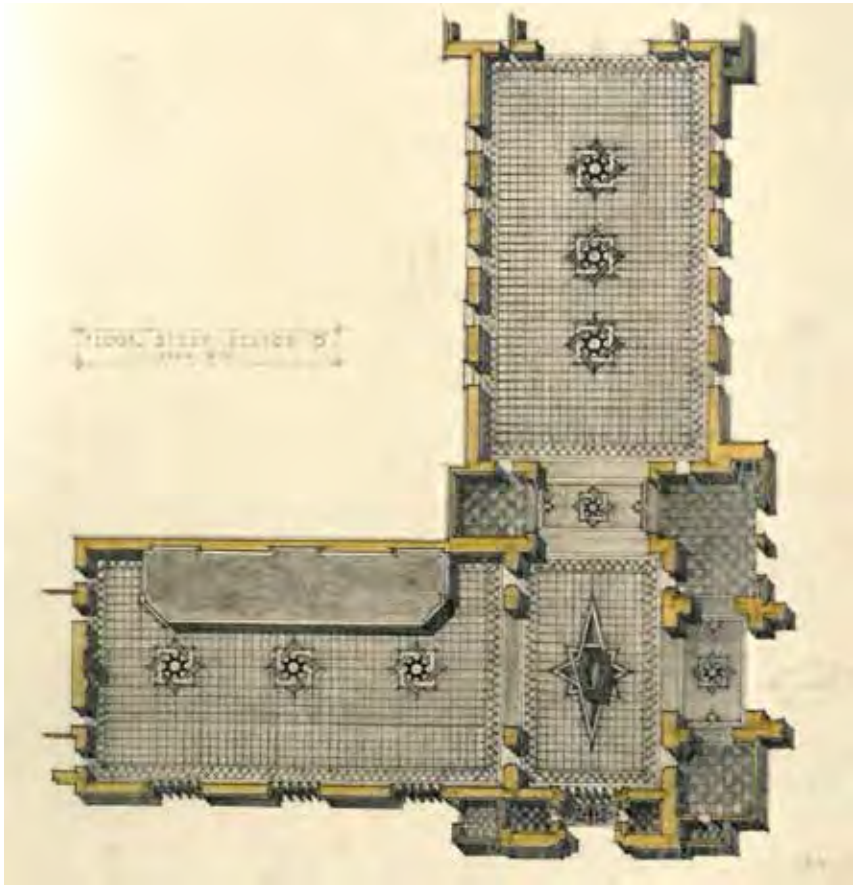
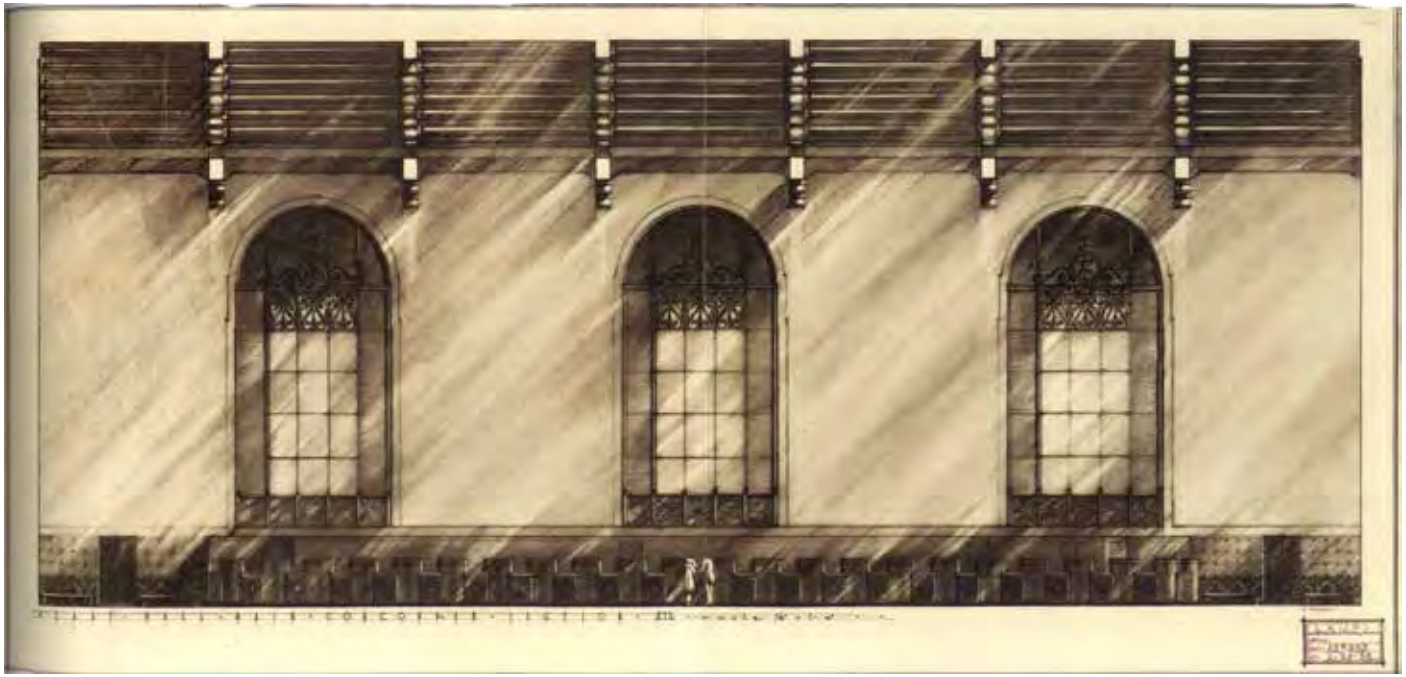


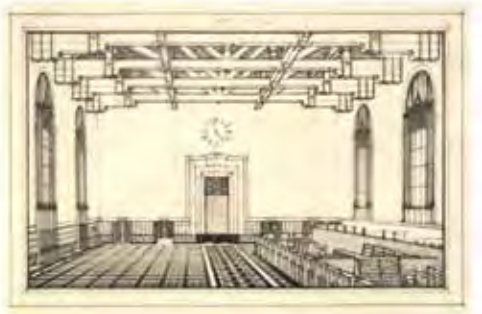
IMAGE: LA METRO AUTHORITY

ORIGINAL DRAWINGS









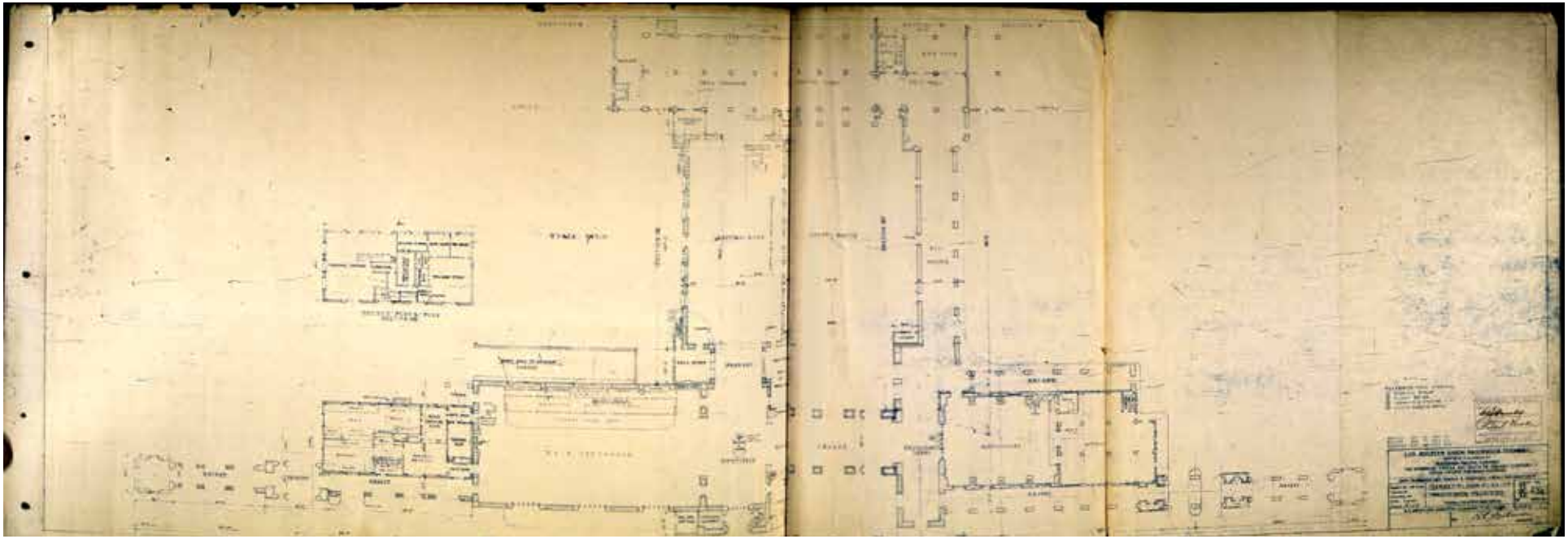


IMAGE: MUSICANT - LOS ANGELES UNION STATION

SITE ANALYSIS

The Los Angeles Union Station is a vital inter-modal transportation center that serves as a hub for Amtrak intercity passenger rail; Metrolink commuter rail; and Metro rail and Metro bus services. The architecture of the Union Station is influenced by Los Angeles' personal history and heritage and therefore results in a combination of Spanish Colonial, Mission Revival and Art Deco designs. The waiting rooms are adjoined by enclosed garden patios and courtyards that enhance the waiting experience. The material palette is also very unique with terracotta filed floors and inlaid marble strips and walls that are clad with travertine marble and early models of acoustical tile.

The majority of connections made in Union Station are to the Metro Red and Purple lines, with the Red Line having the highest amount of users. Behind that Metrolink and Amtrak combined are the next highest use group with the Metro Gold Line closely following behind. Bus use is relatively high, but is spread out through the station amongst the Patsaouras Plaza, El Monte Busway and Alameda stops.

The site is surrounded by a series of separators. The tracks, being at grade, are a large site separator. They completely separate one side of the site from the other side with the only access being an underground tunnel. Another large separator that borders the site is the 101 Freeway. The 101 Freeway runs to the south of the station and tracks. Currently the tracks stop at the 101 Freeway creating a dead end condition. The freeway also separates the Union Station from the rest of the city making it less appealing to get to by foot.

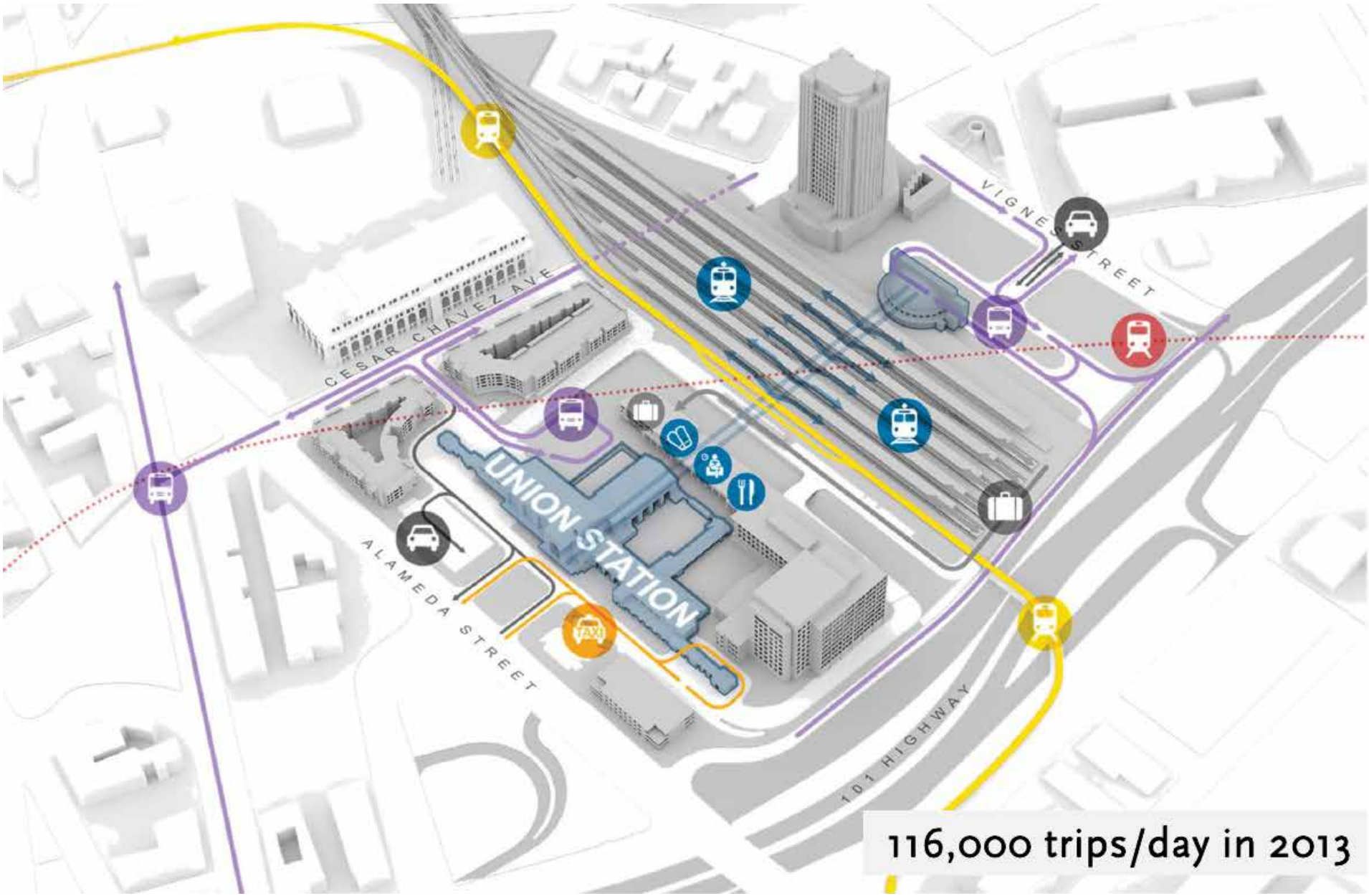


IMAGE: LA METRO AUTHORITY


LOS ANGELES
UNION STATION
HISTORIC
TERMINAL

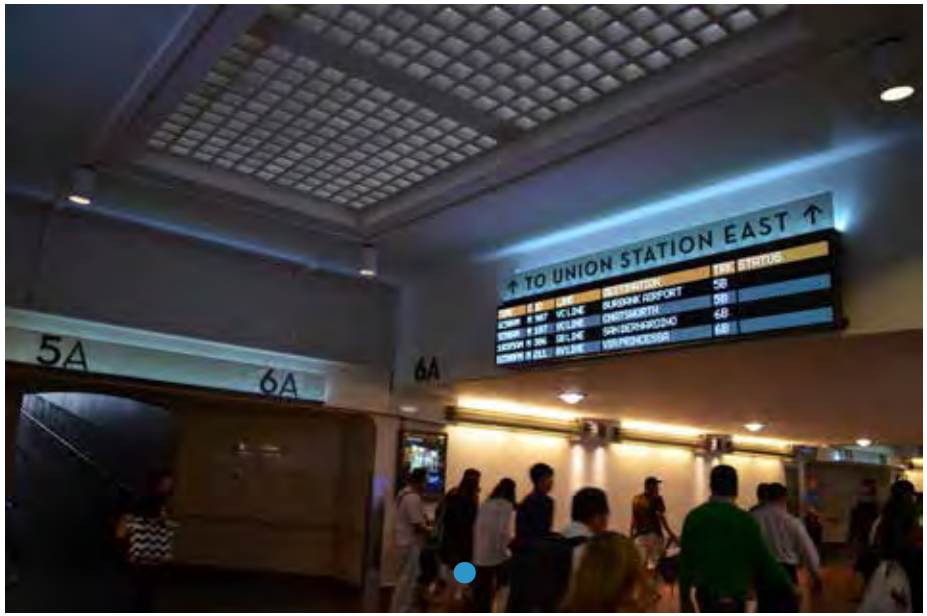
The main waiting room of the Los Angeles Union Station. This room forms the main axis of the Union Station, connecting the entrance to the concourse and access to the tracks. The flooring is made up of terracotta tiles.

The original ticket lobby area. This is now closed off to passengers and visitors to the Union Station. On the right is the original ticket counter for the Union Station. This room features a 62 foot high ceiling and 110 foot counter.

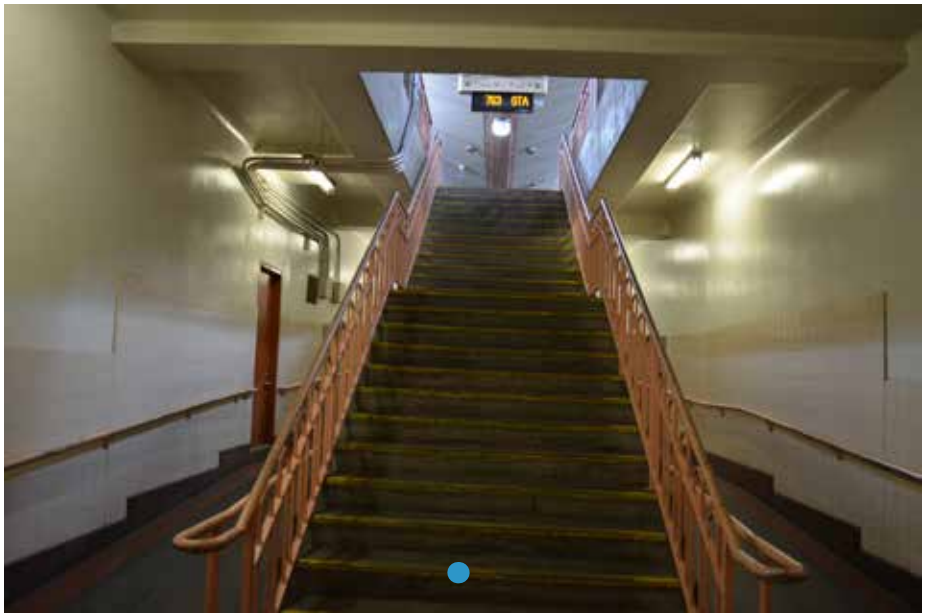
The concourse area of the Union Station. This area houses food and retail spaces for the Terminal along with baggage services, rental car and ticketing services. Off of the concourse is the hallway to access the tracks as well as Metro Access

ACCESS TO TRACKS

The main hallway providing access to the tracks of the Los Angeles Union Station. The hallway stretches from the Historic Union Station terminal to the East Portal and Patsaouras Transit Plaza.



The hallway provides access to the Metro Gold Light Rail line, Amtrak long distance trains, and Metrolink Commuter lines. The picture shown above is an example of the new sign-age in place.



The hallway currently stretches underneath the current track configuration and provides access to the tracks from below. There is currently only one staircase serving each track platform.

Handicapped access to the platforms is provided via this narrow ramp shown above. There is currently no elevator access to the tracks.

UNION STATION EXTERIOR


UNION

UNION STATION INTERIOR


Metro
1A
2A


Amtrak Services
Rental Cars
Restrooms
Busway/Alameda
Taxi


To North Hollywood
To Wilshire/Western

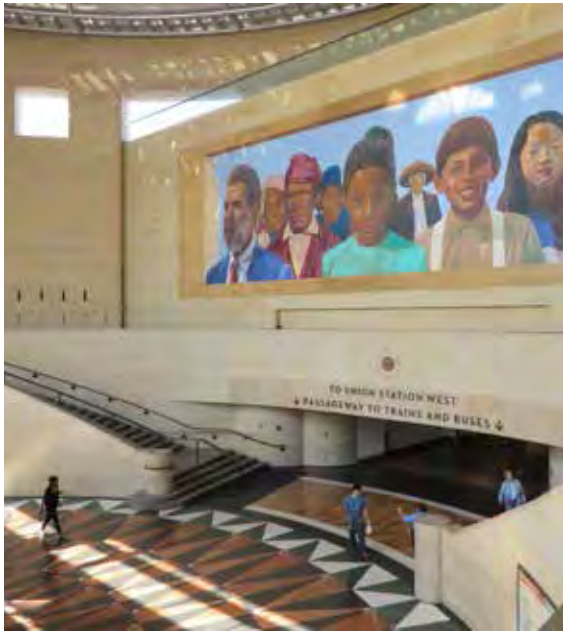
PATSAOURAS TRANSITPLAZA &GATEWAYCENTER

Main hallway connecting the East Portal to the Historic Union Station Terminal. The East Portal is on the same level as the hallway providing access to the tracks.

The main space of the East Portal. The East Portal provides a connection to the tracks and Union Station West along with bus services and the Metro Red and Purple Lines.

The below-ground portion of the Patsaouras Transit Plaza. This area connects directly with the East Portal. Access to the bus platforms is provided via elevators and stairs.

UNION STATION EAST AREA



SURROUNDING AREA

The Los Angeles Union Station is surrounding by a variety of different architectural typologies and uses. The Union Station is bordered immediately by the Mozaic Apartments, Metropolitan Water District headquarters, and the Metro Transit headquarters building. Currently, in addition to the transit uses present on the site the next main use is office space.

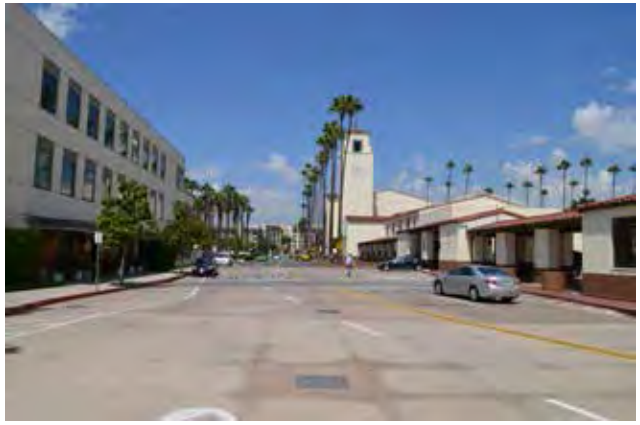
Further away from the immediate site are buildings such as the Twin Towers Correctional Facility and Metro Bus Maintenance Facility (which is currently under construction). The area directly northeast of the site near the correctional facility is a run down neighborhood housing many different bail bond offices. The site is bordered on the south by the 101 freeway.

To the west of the site is one of the most historical spots in all of Los Angeles. Olvera Street is home to one of the oldest buildings in Los Angeles. This street is a rather large tourist attraction featuring many different restaurants and shops. To the north-west of the Union Station is the Terminal Annex, which houses the United States Postal Office. This building is also on the National Registry of Historic places along with the Union Station terminal.

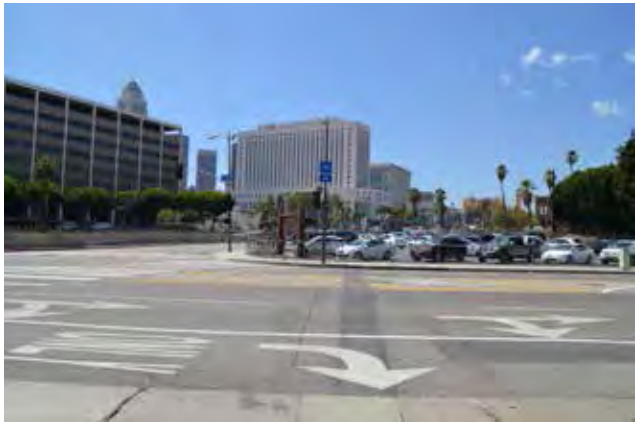

UNION STATION
UNION STATION
CHAVEZ VIGNES
UNION STATION EAST
Metro
Amtrak
Metrolink
Patsaouras
Bus Plaza

UNION STATION SURROUNDING AREA


















UNION STATION SURROUNDING AREA





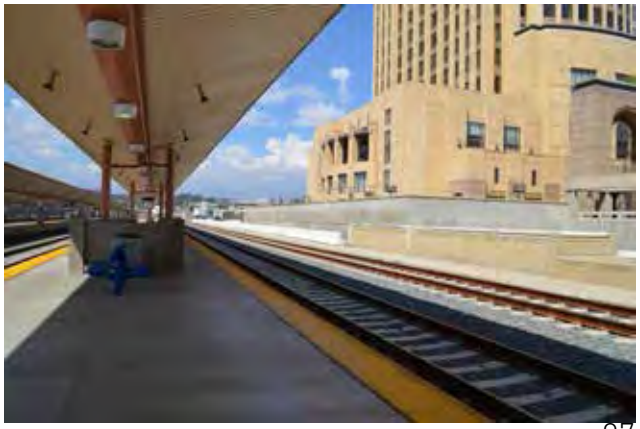




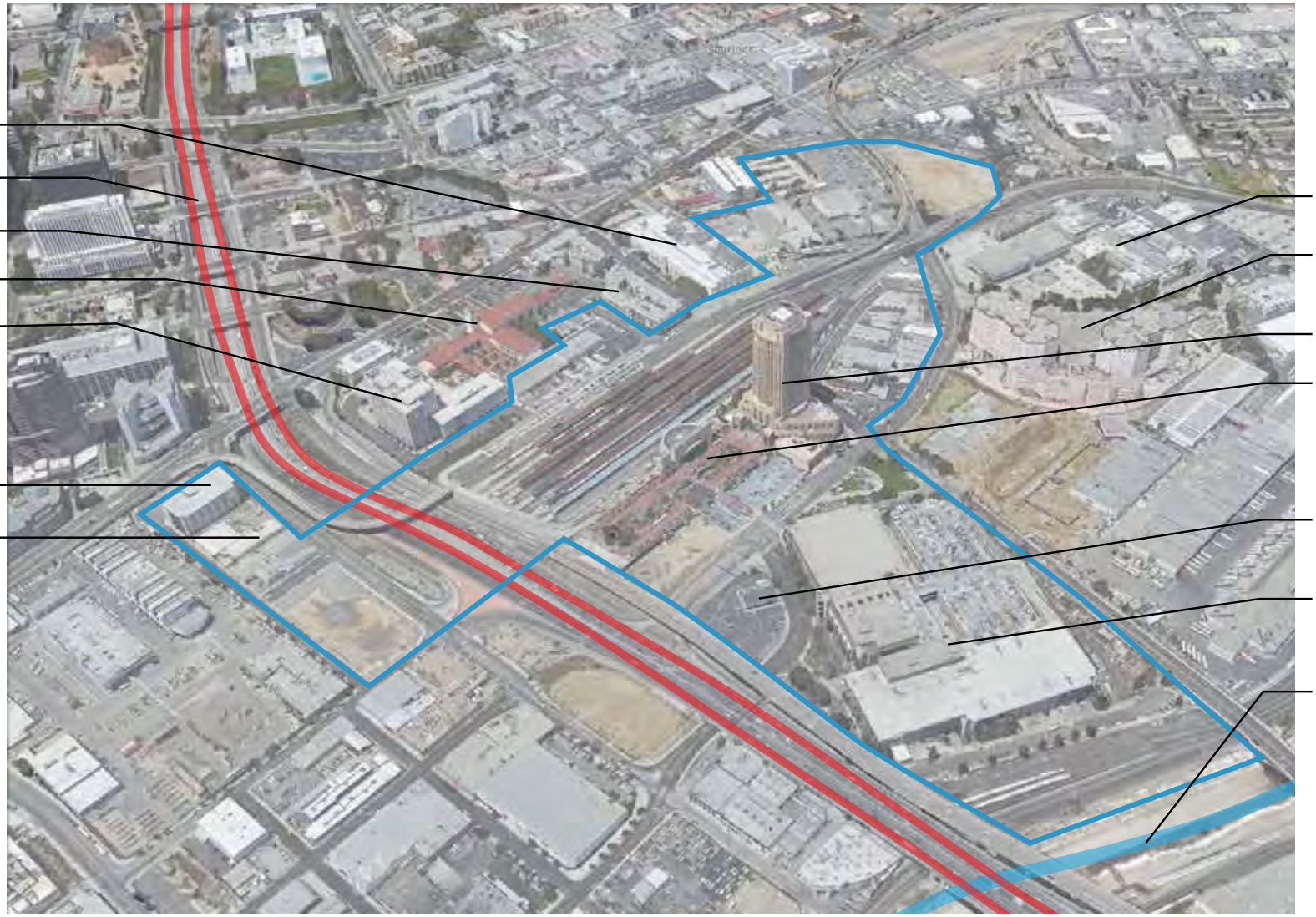


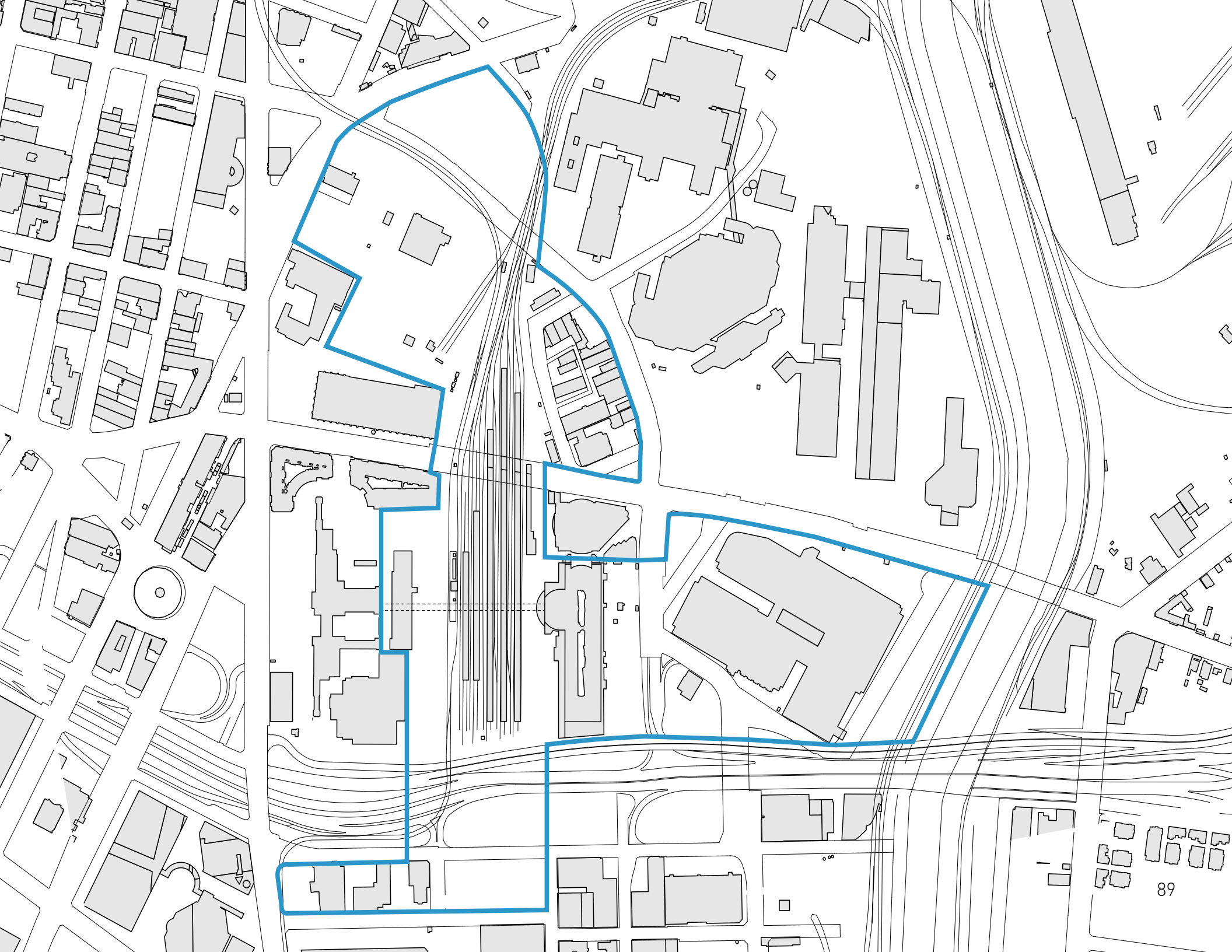




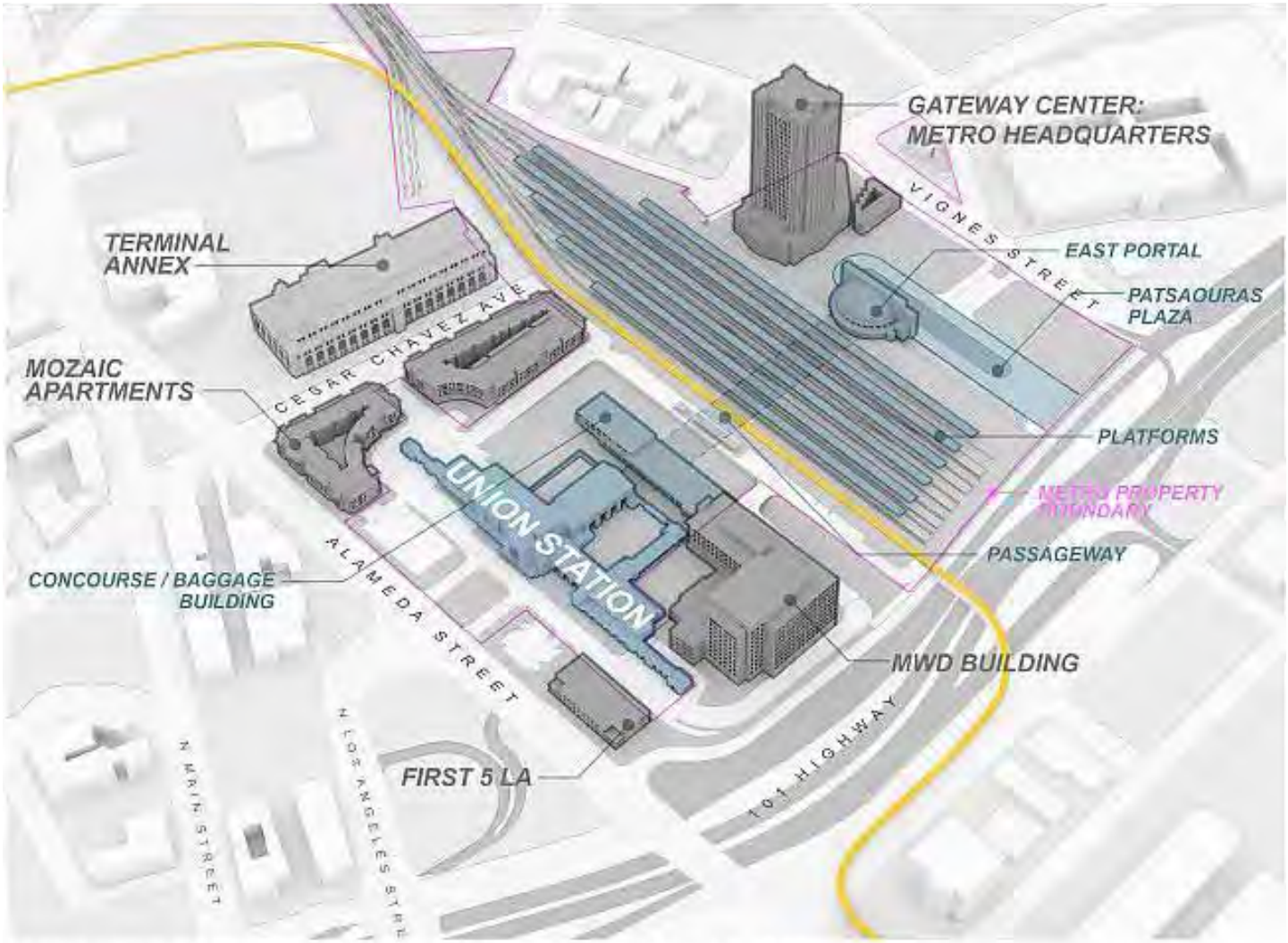

WELCOME TO
880


SITE EXISTING CONDITIONS



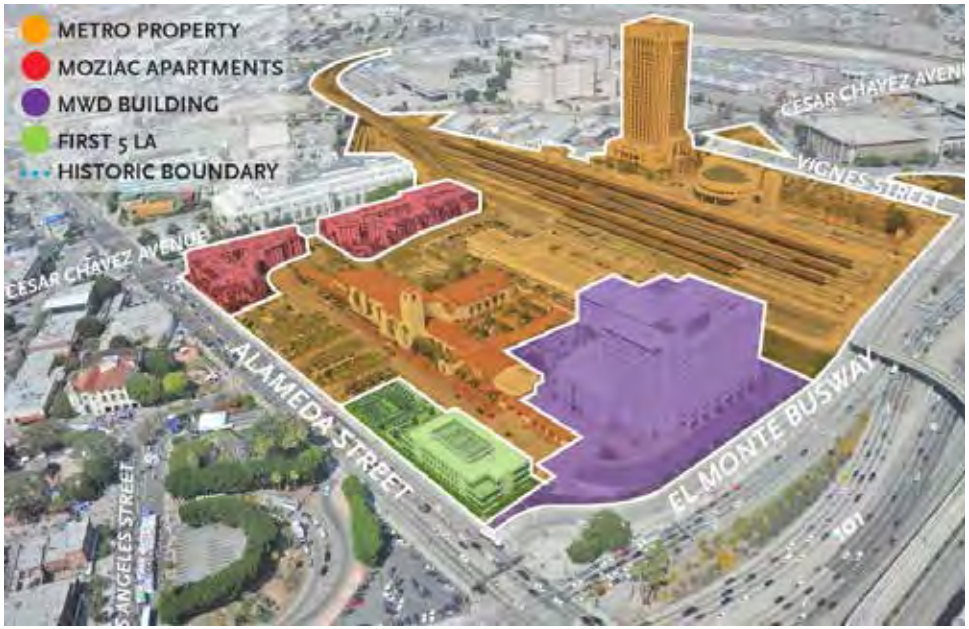


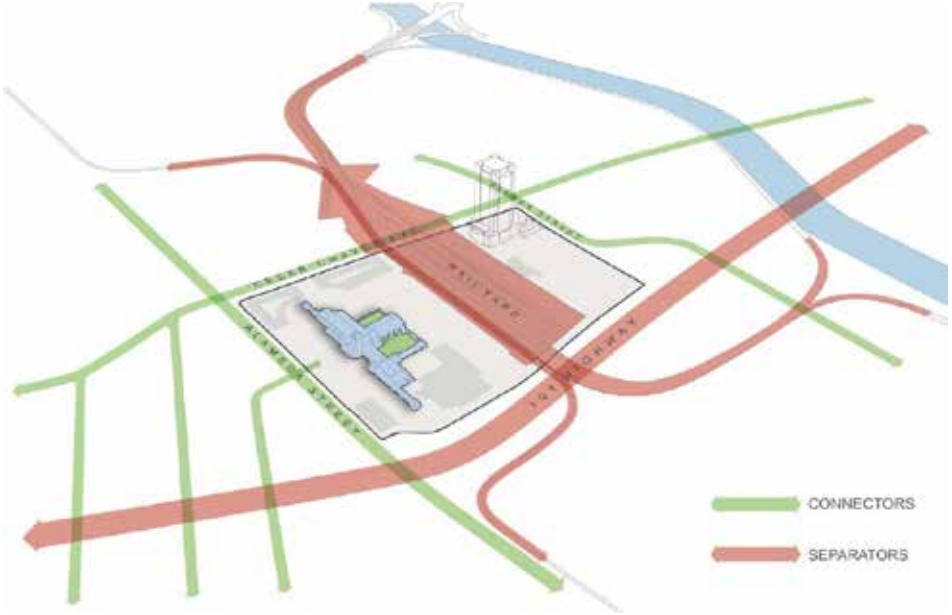
SITE ANALYSIS



AERIAL VIEW OF EXISTING CONDITIONS AND ADJACENT PROPERTIES

IMAGE: LA METRO AUTHORITY



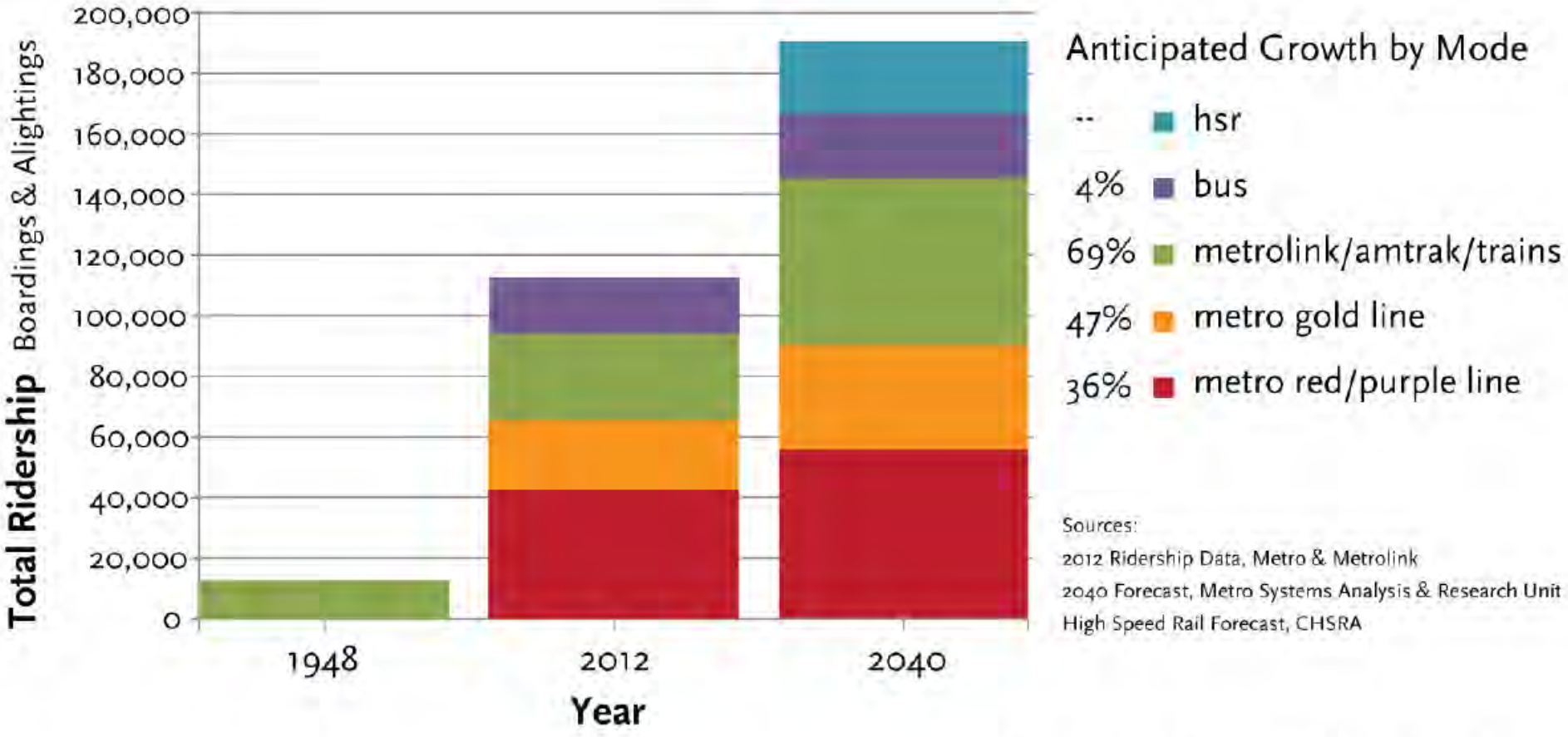


IMAGES: LA METRO AUTHORITY

FUTURE GROWTH

The Union Station grew from 13,000 trips a day in the 1940's to 116,000 trips a day in 2013. The station is expected to grow to upwards of 190,000 trips per day in 2040. This is due to anticipated growth of each transit mode along with the introduction of high speed rail. The Metrolink and Amtrak trains are expected to see the largest growth in usage with a 69% increase in use. High speed rail will bring an additional 20,000 trips a day by 2040. Bus use is anticipated to stay relatively the same with only small growth, but if Bus Rapid Transit is introduced, this may change. With future planning and expansion of the transportation system in Los Angeles this number may even grow larger.

The incorporation of a transit oriented development will also spur an increase in ridership at Union Station. The increased density, housing, and offices will create an automobile-free friendly environment. With the new master plan, the current existing separators will be removed to allow for a more pedestrian and bike friendly atmosphere. The tracks will be covered by a platform and the 101 Freeway will be spanned by a bridge to allow for the growth of the transit oriented development to the south. This will connect the rest of the city back to Union Station and make it a much more pedestrian friendly area, further encouraging transit growth as well.



190,000 trips/day in 2040

IMAGE: LA METRO AUTHORITY

REGULATORY ENVIRONMENT 05

ZONING REGULATIONS - BUILDING CODE ANALYSIS

ZONING

Site Information

Property Name:	Union Station Depots #1 and #2
Property Address:	800 and 810 North Alameda Street
	The City of Los Angeles, CA
Property Size:	38.32 Acres or 1,669,341 Square Feet +/-
Existing Use:	Train Station

Current Zoning of Property:

(ADP, M3-1, [Q]M3-1 and Subareas ADP-80/4.2, ADP-400/4.2, ADP-550/4.2) Alameda District Specific Plan, Heavy Industrial District, Historic Subarea, Mixed Use/Office Subarea and Transit/Office Subarea.

Zoning Information

ZI-2427 Freeway Adjacent Advisory Notice for Sensitive Uses
ZI-2358 Los Angles River Revitalization Master Plan
ZI-1117 MTA Project
ZI-2129 East Los Angeles State Enterprise Zone

Parking Requirements

As per Permit Approvals 1,975 Parking Spaces.

Total Parking Spaces Required:
1,975 Total Parking Spaces.

Total Parking Spaces Existing:
2,774 Total Parking Spaces.

Zoning Code Requirements

Minimum Lot Size: No Requirements.
Minimum Lot Width: No Requirements
Minimum Open Space: 1.7 Acres

Survey Sheets 11, 12 and 13 Parcel A Maximum Density:
4.2 (FAR) Floor Area Ratio (86,346.2 Building Square Feet ÷ 621,454 Lot Area Square Feet = 0.139 (FAR) Floor Area Ratio)
Survey Sheets 11, 12 and 13

Parcel A Maximum Building Height: 80 Feet
45 Feet fronting Alameda Street located on the Union Station Site (Sheet 11 only).
Survey Sheets 6, 7, 8, 9 10 Parcels D, C, B Maximum Density: 4.2 (FAR) Floor Area Ratio (18,711 Building Square Feet ÷ 1,459,447 Square Feet = 0.012 (FAR) Floor Area Ratio).
Survey Sheets 6, 7, 8, 9 10 Parcels D, C, B Maximum Building Height: 400 Feet.
Survey Sheet 10 Parcel B Maximum Density: 4.2 (FAR) Floor Area Ratio (Currently no buildings or development is located in this area to qualify).
Survey Sheet 10 Parcel B Maximum Building Height: 550 Feet.

Setbacks: Front: Side: Rear:
Required: Not Required. Not Required. Not Required.

IMAGE: ZIMAS.LACITY.ORG

HISTORIC TERMINAL

Historical Registrations

National Register Designation

Los Angeles Union Station Passenger Terminal

Location: 800 North Alameda Street

Date Listed: 11/13/1980

City of Los Angeles Designation

Monument No: LA-101

Name: Los Angeles Union Station Passenger Terminal and Grounds

Location: 800-850 North Alameda Street and 357 Aliso Street

IMAGES: WATERANDPOWER.ORG

ALAMEDA DISTRICT SPECIFIC PLAN

The Alameda District Specific Plan is intended to:

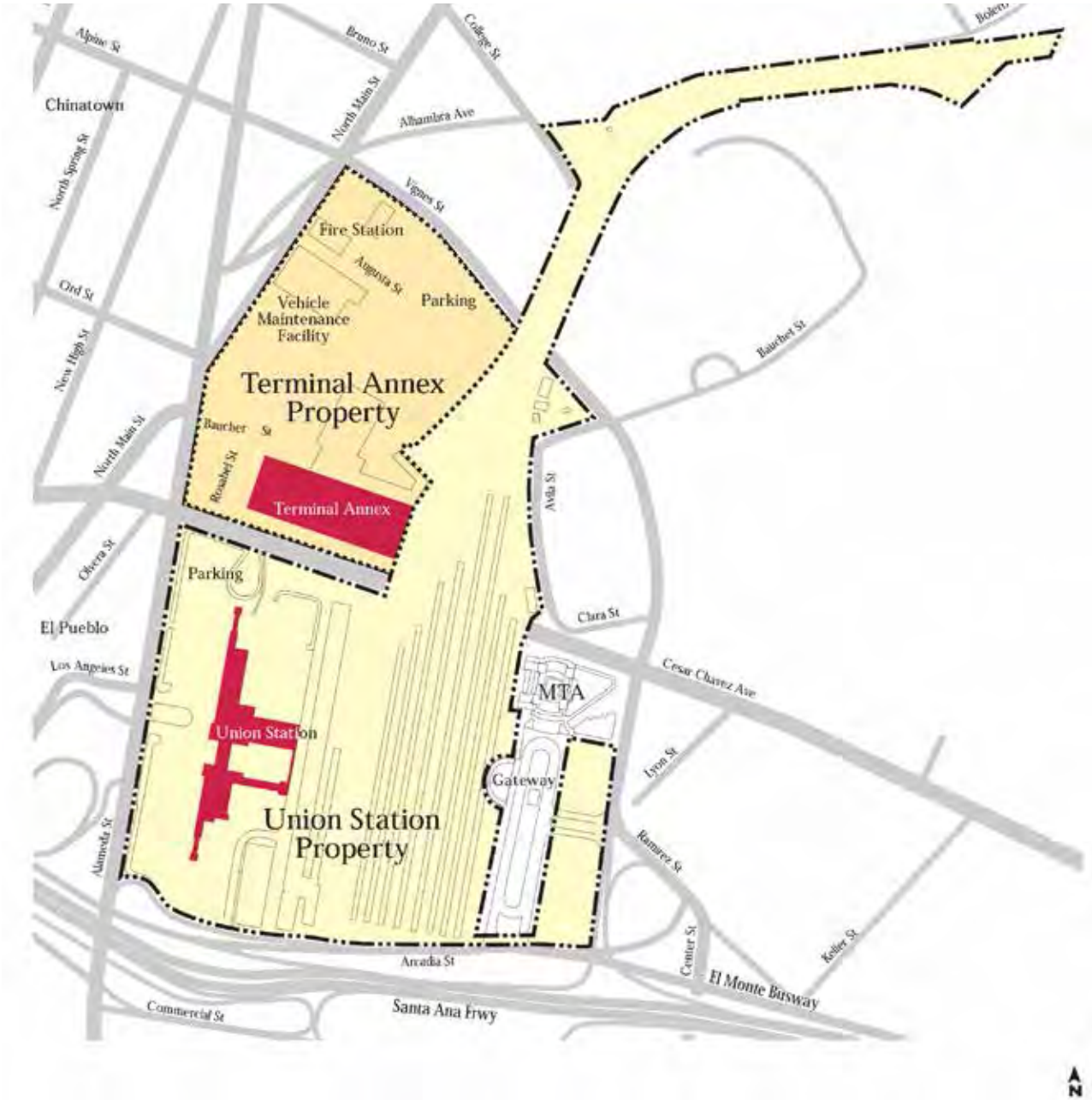
A. Provide regulatory controls and incentives for the systematic and incremental execution of that portion of the General Plan which relates to this geographic area and to provide for public needs, convenience and general welfare as the development of such area necessitates; and

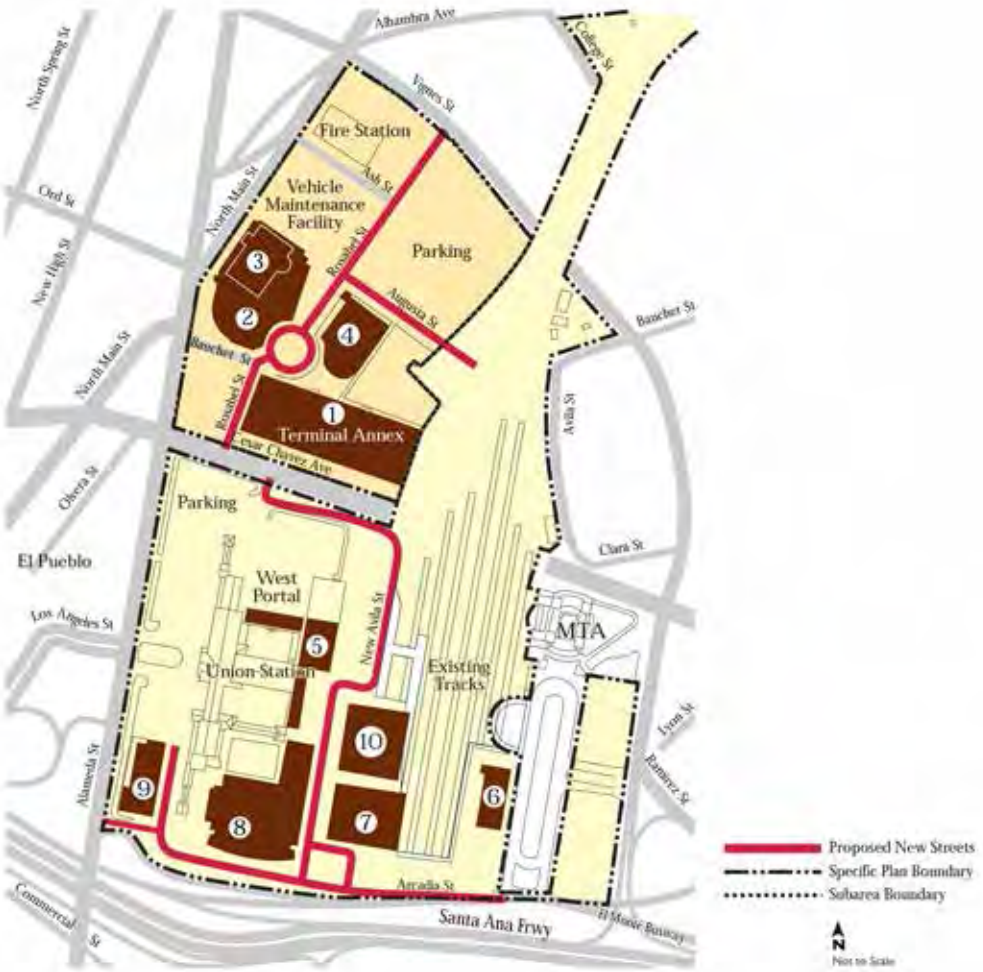
B. Assure orderly development and appropriate capacity of public facilities for the intensity and design of development by establishing general procedures for development within the Specific Plan area; and

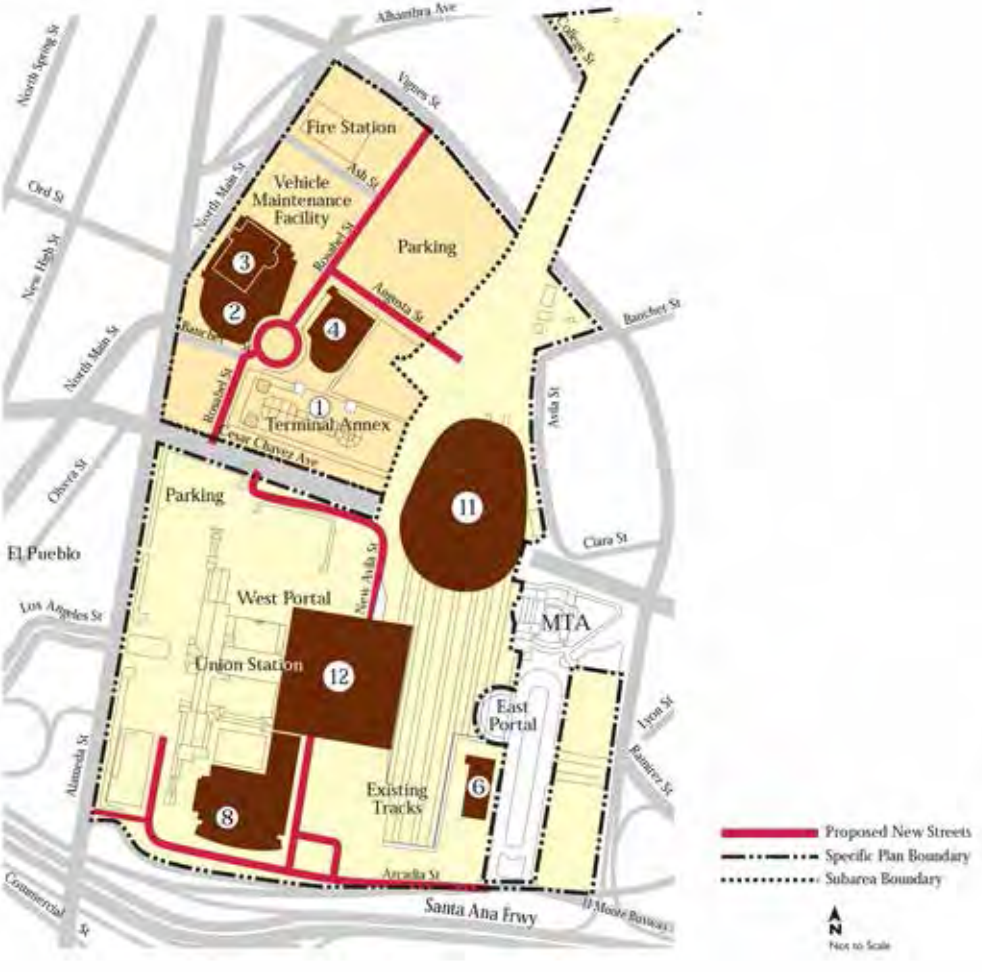
C. Provide continued and expanded development of the site both as a major transit hub for the region, and as a mixed-use development providing office, hotel, retail, entertainment, tourism, residential and related uses within the Specific Plan area, in conformance with the goals and objectives of local and regional plans and policies; and

D. To expand the economic base of the City, by providing additional employment opportunities and additional revenues to the region.

Images and text from Alameda District Specific Plan June 1996




Alhambra Ave
College St
Vignes St
Fire Station
Ash St
North Spring St
Ord St
Vehicle Maintenance Facility
North Main St
Parking
Rosabel St
Augusta St
New High St
Banchet St
Bauscher St
Avila St
Terminal Annex
Cesar Chavez Ave
Olvera St
Parking
El Pueblo
Clara St
West Portal
Los Angeles St
New Avila St
MTA
Union Station
Existing Tracks
Lyon St
Alameda St
Ramirez St
Arcadia St
Commercial St
Santa Ana Frwy
El Monte Busway
Proposed New Streets
Specific Plan Boundary
Subarea Boundary
N
Not to Scale


Alhambra Ave
College St
Vignes St
Fire Station
Ash St
North Spring St
Ord St
Vehicle Maintenance Facility
North Main St
Parking
Rosabel St
Augusta St
New High St
Banchet St
Bauscher St
Avila St
Terminal Annex
Cesar Chavez Ave
Olvera St
Parking
El Pueblo
Clara St
West Portal
Los Angeles St
New Avila St
MTA
Union Station
East Portal
Existing Tracks
Lyon St
Alameda St
Ramirez St
Arcadia St
Commercial St
Santa Ana Frwy
El Monte Busway
Proposed New Streets
Specific Plan Boundary
Subarea Boundary
N
Not to Scale

BUILDING CODE ANALYSIS

CURRENT UNION STATION OCCUPANCY TYPES:

G-1, B, A-2, A-3, S-4

ANTICIPATED MAJOR FUTURE OCCUPANCY TYPES:

A-2, A-3, B, M

Assembly Occupancy, standing space:	5 sf net
Assembly Occupancy, unconcentrated seating:	15 sf net
Business Areas:	100 sf gross
Mercantile Occupancy, basement and grade floor	30 sf gross

OTHER OCCUPANCY TYPES:

Accessory storage areas, mechanical eq. room	300 sf gross
Passenger Terminal	
Baggage Claim	20 sf gross
Baggage Handling	300 sf gross
Concourse	100 sf gross
Locker Rooms (employees)	50 sf gross
Parking Garages	200 sf gross

EGRESS	MAXIMUM TRAVEL DISTANCE	
OCCUPANCY	UNSPRINKLERED	SPRINKLERED
A	200'	250'
	400' for open air seating with combustible const.	300'
B	200'	300'
M	200'	250'

MAXIMUM COMMON PATH OF EGRESS TRAVEL	LARGEST AREA WITH SINGLE EXIT	MINIMUM DOOR WIDTH	MINIMUM CORRIDOR WIDTH	MINIMUM STAIR WIDTH
30' for assembly fixed seating with 50 or more occupants 75' for others	49 occupants	Min: 32" net clear Max: 48" nominal	44" serving more than 49 occupants 36" serving 49 or fewer	44" serving more than 49 occupants 36" serving 49 or fewer
75' unsprinklered 100' sprinklered or for unsprinklered areas with less than 30 occupants	49 occupants	Same as above	Same as above	Same as above
75'	49 occupants	Same as above	Same as above	Same as above

PRECEDENT ANALYSIS

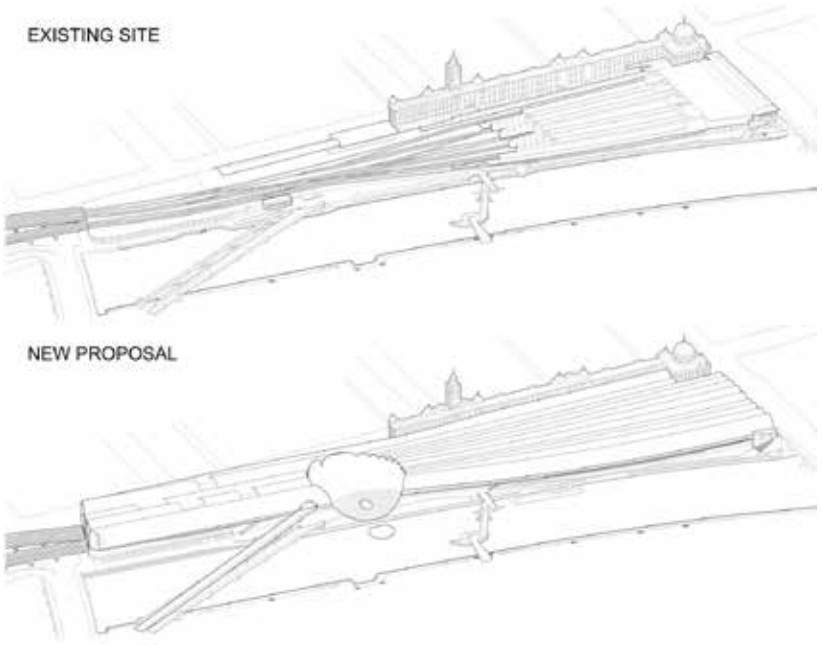
FLINDERS - DUS - ROTTERDAM - LIEGE

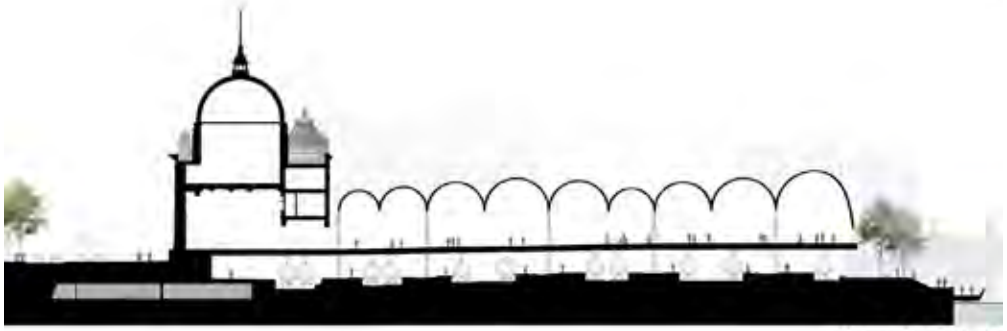
06

FLINDERS STREET STATION
HERZOG & DE MEURON / HASSELL

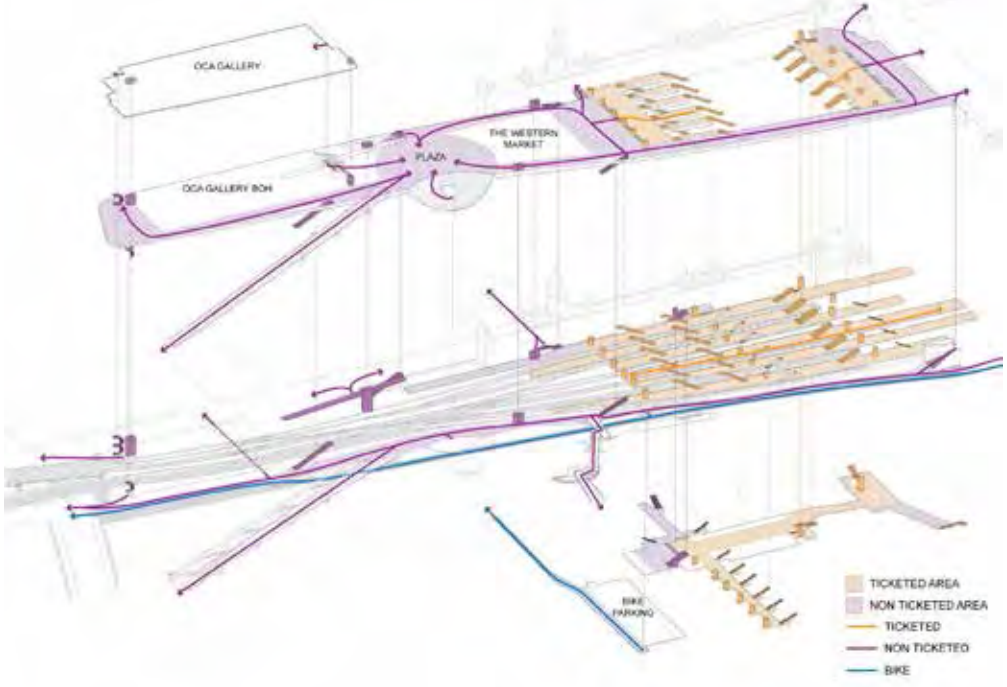
The linear form of the existing Flinders Street Station was determined by the original layout of the tracks. The building separates the city from the railway and from the river. The proposal respects this very specific linear nature and use of the site as a strong marker and element between the city grid and the river, but provides an urban response in this key location through public access and use of the entire site, affording various connections across the site and diverse public functions. The proposal underscores the civic nature of a train station by complementing it with cultural and public functions rather than purely commercial activities.

IMAGES:
ARCHDAILY





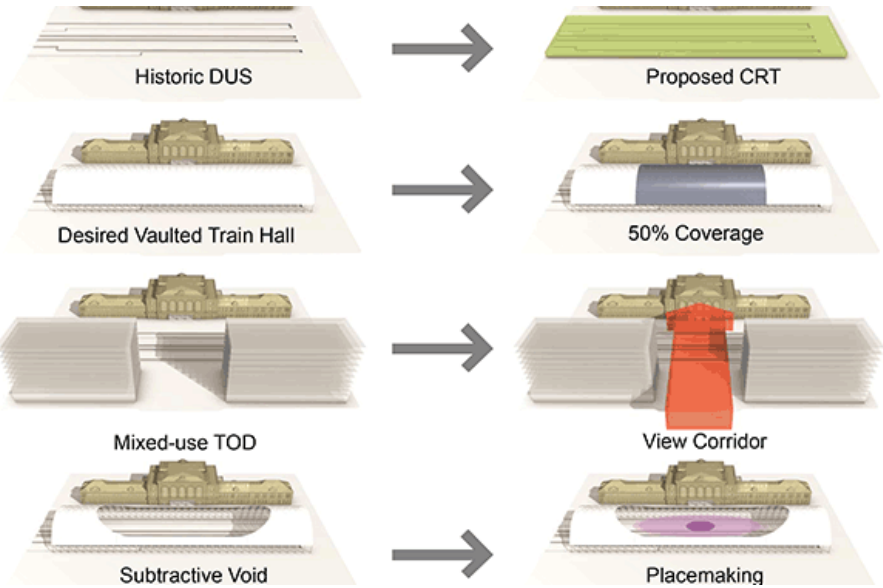
Cross Section 1

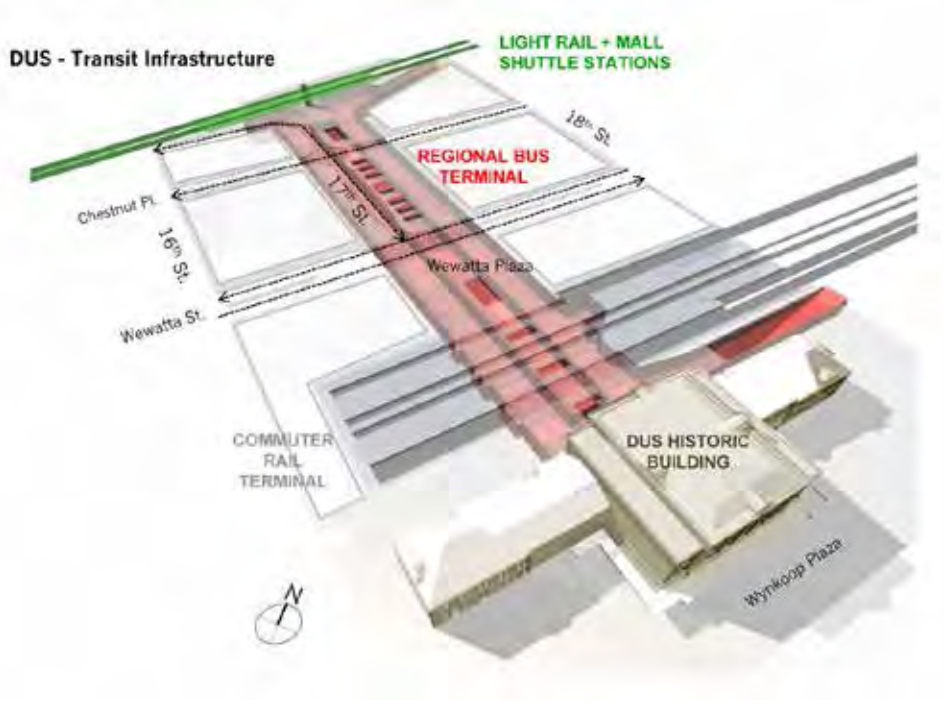


DENVER UNION STATION
SKIDMORE, OWINGS, AND MERRILL

Denver's historic Union Station, located in the central business district, has served passengers for more than a century. The Beaux Arts terminal, along with a neighboring rail yard, will become a multi-modal transit hub featuring Amtrak service, new commuter rail to the Denver International Airport, light rail, buses, and taxis. Shops, restaurants, and a boutique hotel will enliven the historic terminal, built in 1914. New elements to the site include an underground bus station, an eight-track commuter-rail platform covered by a steel-and-fabric canopy, a relocated light-rail station, landscaping, and significant improvements to surrounding streets.

IMAGES:
DENVER UNION STATION MASTER PLAN
DENVER UNION STATION PROJECT AUTHORITY
SKIDMORE, OWINGS, & MERRILL


Historic DUS
Proposed CRT
Desired Vaulted Train Hall
50% Coverage
Mixed-use TOD
View Corridor
Subtractive Void
Placemaking


DUS - Transit Infrastructure
LIGHT RAIL + MALL SHUTTLE STATIONS
REGIONAL BUS TERMINAL
18th St.
17th St.
16th St.
Chestnut Pl.
Wewatta St.
Wewatta Plaza
COMMUTER RAIL TERMINAL
DUS HISTORIC BUILDING
Wynkoop Plaza
N


TRACK 2
TRACK 1

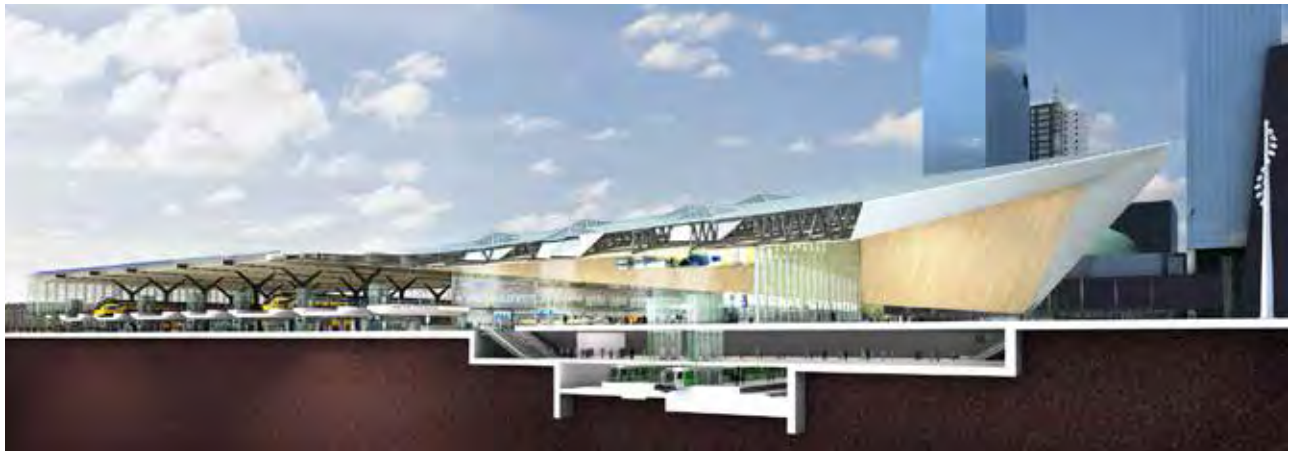

UNION STATION
UNION STATION
UNION STATION

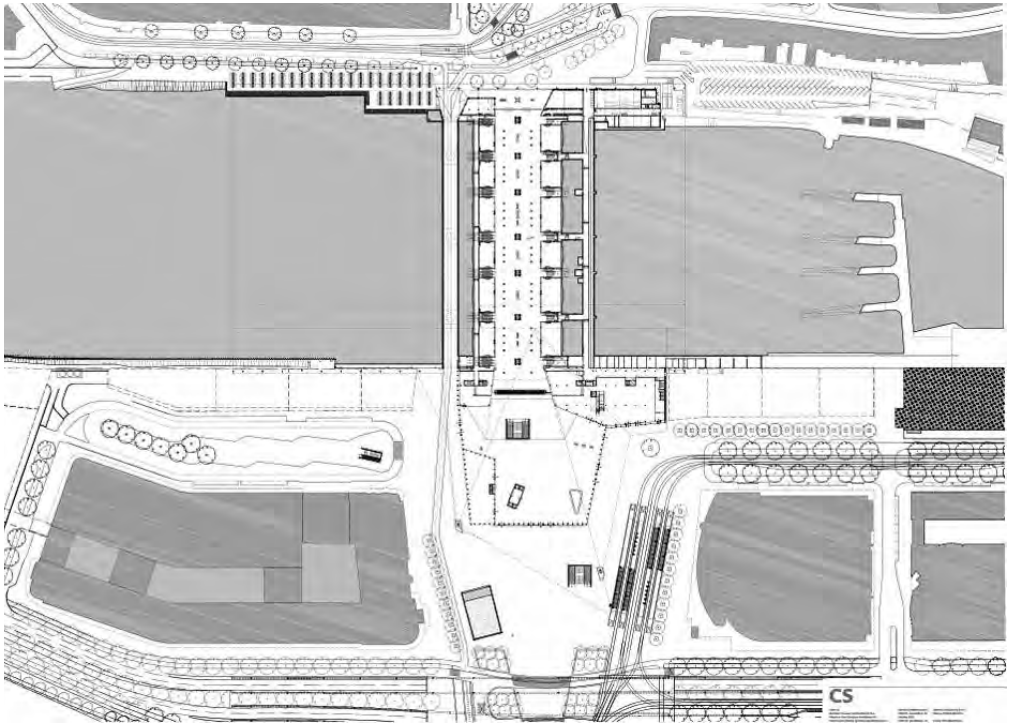
ROTTERDAM CENTRAAL STATION

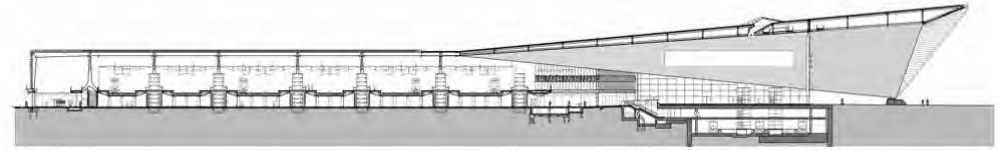
BENTHEM CROUWEL ARCHITECTS, MVSA ARCHITECTS & WEST 8

Rotterdam Centraal Station is one of the most important transport hubs in The Netherlands. After being re-designed, Rotterdam Centraal now has the appropriate structure and dimensions for the urban landscape; it is in balance with the heights that characterize the city and simultaneously reflects the human scale. The city of Rotterdam is drawn to the new station via the compaction of the small-scale urban texture surrounding the public transport terminal. This finer urban texture with new sight lines and a mixture of living and working will dramatically improve the quality of life and the environment of the station area.

IMAGES:
DEEZEEN MAGAZINE




CS

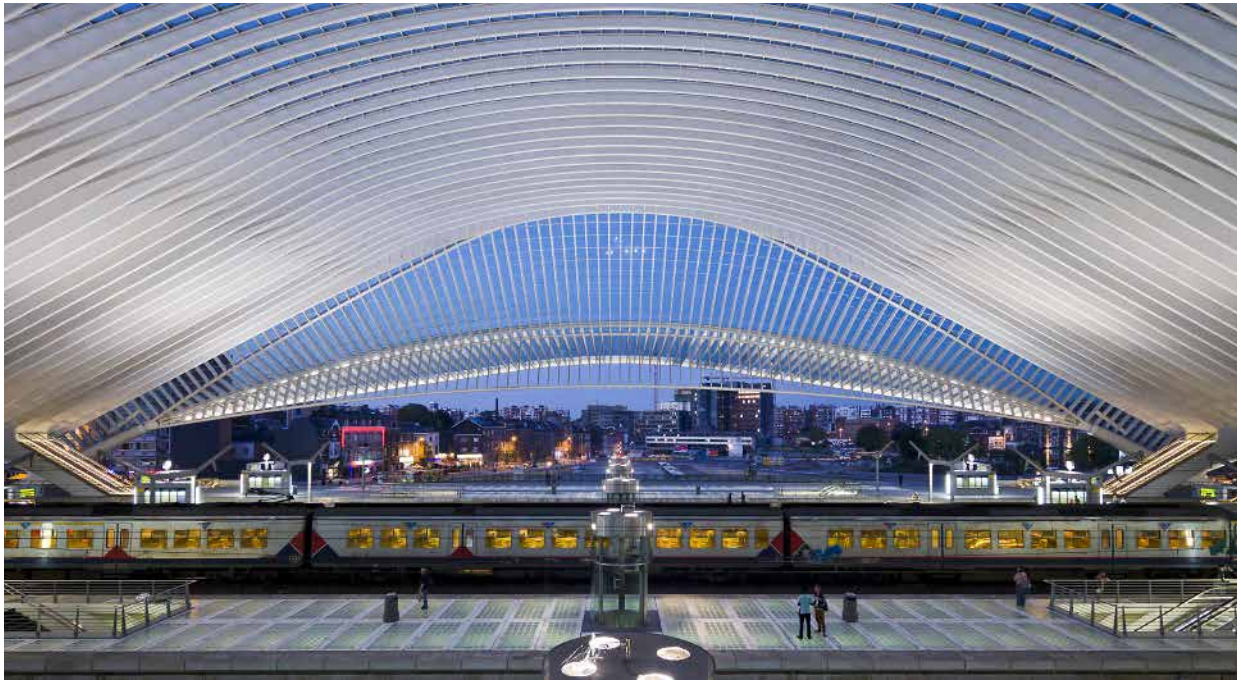


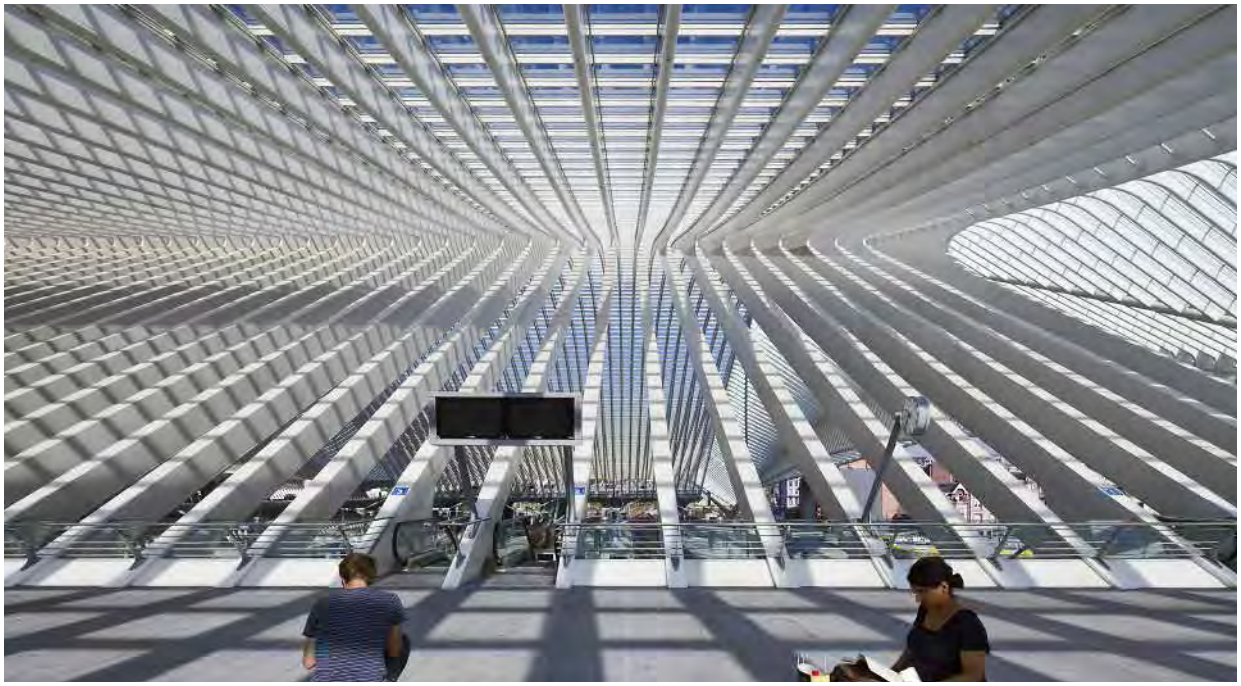

CENTRAAL STATION

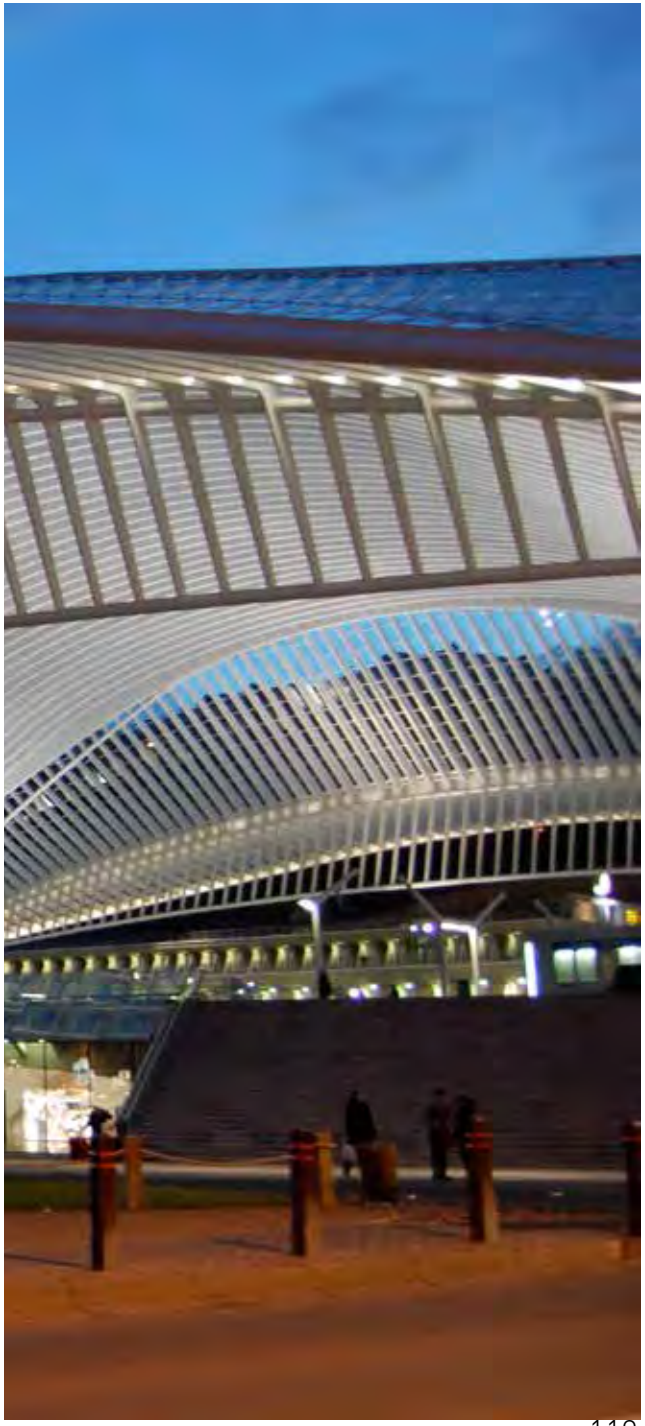
LIEGE TRAIN STATION
SANTIAGO CALATRAVA

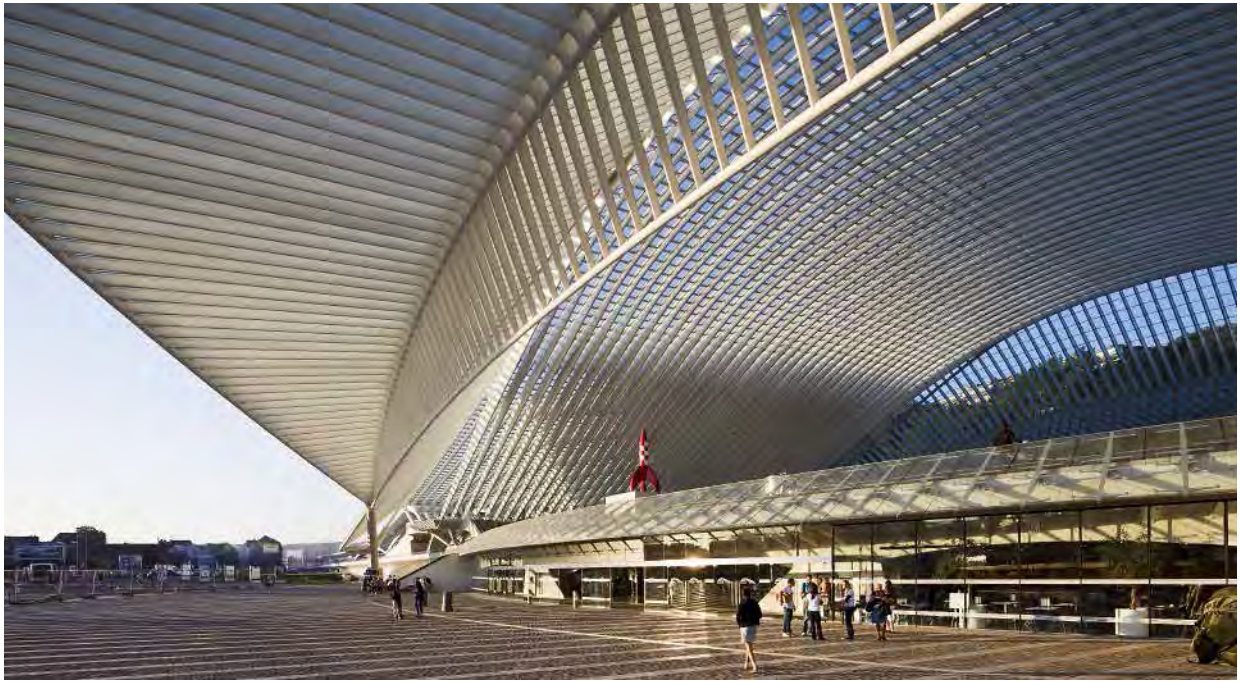
The Liege train station is a train station designed and engineered by Santiago Calatrava. It is one of the most important transit hubs in all of Belgium. It has become a symbol of renewal of the city of Liege. The design is monumental, expressive, airy, and transparent. The project was marked by transparency and dialogue between two different neighborhoods, one being residential and the other urban. The station creates a connection across the tracks that were put there in the 19th century. The tracks created a division in these two neighborhoods and the station makes an effort to repair it. The station does not have any traditional facades so the connection between the city and station is very strong. This station has completely transformed the urban street scape of Liege.

IMAGES:
YANNICK WEGNER
DEEZEEN MAGAZINE









DESIGN FRAMEWORK

TRANSIT ORIENTED DEVELOPMENT GUIDELINES

07

TRANSIT ORIENTED DEVELOPMENT
INTRODUCTION

The first step in designing the Union Station addition and Master Plan was to set up a framework that would drive the design. This framework would inform the density and requirements for the site; requirements that are necessary to sustain a transit-oriented development in an urban environment. There are many different types of transit-oriented developments, from urban centers to suburban neighborhoods. The requirements for these different types of transit-oriented developments differ greatly. The urban downtown transit-oriented development typology that would be necessary for a location like the Union Station in Los Angeles requires a high density and a large land mix use to create a successful transit oriented development. A successful mix of uses will create a location that is active all hours of the day and not just during the day during typical office business hours. A successful urban T.O.D. will also have a variety of transit modes to create an inter-modal node.

TOD TYPE:	URBAN DOWNTOWN
MINIMUM DENSITIES:	60+ DWELLING UNITS/ACRE
RESIDENTIAL TOTAL SF:	5,750,000 SF
PROJECT AREA:	104 ACRES
AVERAGE DWELLING UNITS / ACRE:	70 UNITS
POPULATION DENSITY:	MIN 135 PERSONS/ACRE
EMPLOYMENT DENSITY:	MIN 1000 JOBS/ACRE
MIN. FLOOR AREA RATIO (FAR):	MIN 10.0
MIN. BUILDING HEIGHT:	12 OR MORE STORIES
MIN. LOT COVERAGE:	80%
MIN. HOURS OF "SIGNIFICANT" ACTIVITY:	18 HOURS
AVERAGE JOBS/HOUSING RATIO:	10 JOBS : 1 DWELLING UNIT

TRANSIT ORIENTED DEVELOPMENT GUIDELINES BY TYPOLOGY

TOD TYPE	LAND-USE MIX	MINIMUM HOUSING DENSITY	HOUSING TYPES	SCALE	REGIONAL CONNECTIVITY	TRANSIT MODES	FREQUENCIES	EXAMPLES
Urban Downtown	Primary office center Urban entertainment Multifamily housing Retail	>60 units/acre	Multifamily Loft	High	High Hub of radial system	All modes	<10 minutes	Printers Row (Chicago) LoDo (Denver) South Beach (San Francisco)
Urban Neighborhood	Residential Retail Class B commercial	>20 units/acre	Multifamily Loft Townhome Single family	Medium	Medium access to downtown Subregional circulation	Light-rail Streetcar Rapid bus Local bus	10 minutes peak 20 minutes offpeak	Mockingbird (Dallas) Fullerton (Chicago) Barrio Logan (San Diego)
Suburban Center	Primary office center Urban entertainment Multifamily housing Retail	>50 units/acre	Multifamily Loft Townhome	High	High access to downtown Subregional hub	Rail Streetcar Rapid bus Local bus Paratransit	10 minutes peak 10–15 minutes offpeak	Arlington County (Virginia) Addison Circle (Dallas) Evanston (Illinois)
Suburban Neighborhood	Residential Neighborhood retail Local office	>12 units/acre	Multifamily Townhome Single family	Moderate	Medium access to suburban center Access to downtown	Light-rail Rapid bus Local bus Paratransit	20 minutes peak 30 minutes offpeak	Crossings (Mountain View, CA) Ohlone-Chynoweth (San Jose, CA)
Neighborhood Transit Zone	Residential Neighborhood retail	>7 units/acre	Townhome Single family	Low access to a center	Low	Local bus Paratransit	25–30 minutes Demand responsive	
Commuter Town Center	Retail center Residential	>12 units/acre	Multifamily Townhome Single family	Low	Low access to downtown	Commuter rail Rapid bus	Peak service Demand responsive	Prairie Crossing (Illinois) Suisun City (California)

SOURCE: THE NEW TRANSIT TOWN

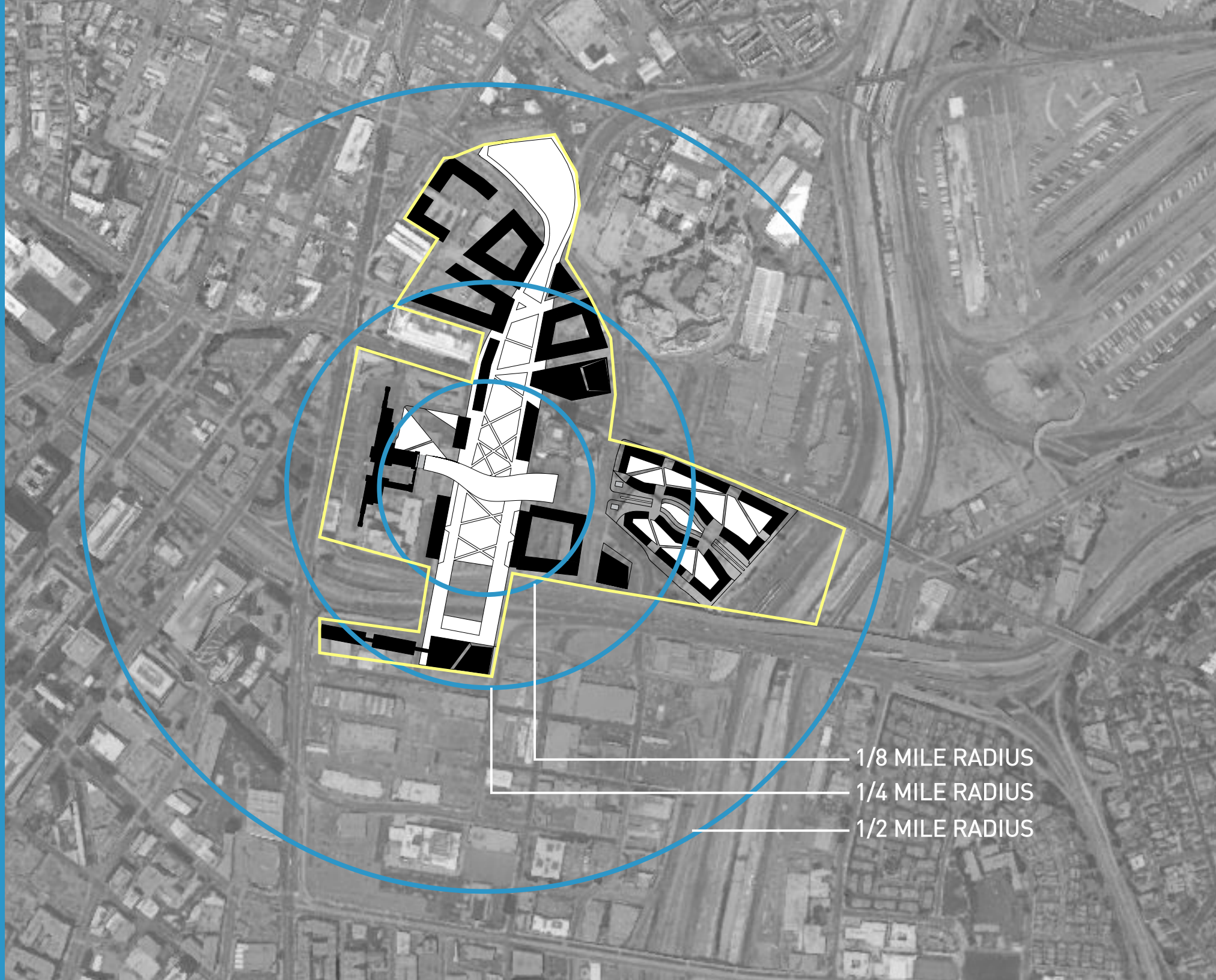
TRANSIT ORIENTED DEVELOPMENT

DENSITY

One of the most important factors in a successful transit oriented development is density. A successful transit oriented development will have an appropriate density within a certain radius of the main transit node. The maximum comfortable walking distance radius for a transit oriented development is approximately one half of a mile, although this distance can be made slightly longer if comfortable walking conditions are present. The transit oriented development at Union Station does not exceed a distance of one half of a mile away from the main transit terminal. Most of the development and the highest density will fall within a quarter mile radius of the Union Station terminal. Many of the proposed buildings will be integrated into an elevated greenway and urban plaza, which will provide a vehicle free zone for pedestrians to reach Union Station.

PROJECT	DEVELOPER	DATE COMPLETED	LAND USES	TRANSIT	FINANCING	PARKING	RESIDENTIAL DENSITY
Arlington County Virginia	County plans Various private	As of 2000	17.9M sq.ft. office 3.0M sq.ft. retail 21,581 housing units	Heavy-rail Bus	Public/Private	(see pg. 142, this volume)	
Mockingbird Station Dallas, TX	Ken Hughes	2000	214,000 sq.ft. residential 183,000 sq.ft. retail	Light-rail Bus	Private	1.0/bedroom 3.23/1,000 gross sq.ft. retail	24 units/acre
Addison Circle Addison, TX	Columbus Realty Trust Post Properties	Phase 3 in 2002	1,800 apts. 86 condos 6 town homes 115,000 sq.ft. retail 342,000 sq.ft. office	Bus Light-rail planned	Public/Private	Phase 1: 1/bedroom Phase 2: 0.3/bedroom Phase 3: 1/bedroom 3.7 spaces/1,000 gross sq.ft. retail 3.2 spaces/1,000 gross sq.ft. office	100 units/acre
Mercado San Diego, CA	MAAC Landgrant Richard Juarez	Apartments in 1993	138,000 sq.ft. residential 144 apts. 118,000 sq.ft. retail	Light-rail Bus	Public/Private Affordable LIHTC	1.5 /unit 3.5/1,000 gross sq.ft. retail	32.7 units/acre
Lindbergh Atlanta, GA	Carter & Assoc.	Phase 1 in 2003	388,000 sq.ft. residential 1M sq.ft. office 330,000 sq.ft. retail	Heavy-rail Bus	Public/Private	2.2/1,000 sq.ft. commercial less than 1 per bedroom	
Ohlone Court Santa Clara County	Bridge Housing	1997	135 units	Light-rail Bus	Public/Private Affordable	1.5/1.8/2.0 spaces for 1/2/3 bedrooms	22.1 units/acre
Ohlone-Chynoweth Commons Santa Clara County	Eden Housing	2001	194 units	Light-rail Bus	Public/Private Affordable	same	26.6 units/acre
1 Pearl Avenue Santa Clara County	Cilker Orchards	2003	182 units	Light-rail Bus	Private	same	41.4 units/acre

SOURCE: THE NEW TRANSIT TOWN


1/8 MILE RADIUS
1/4 MILE RADIUS
1/2 MILE RADIUS

TRANSIT ORIENTED DEVELOPMENT

PARKING

Although the main purpose of a transit oriented development is to create a community that provides an alternative lifestyle choice to traditional vehicle use, one cannot ignore the automobile's importance in society today. In order to create a successful transit oriented development one must integrate automobile parking. When planning for the Los Angeles Union Station transit oriented development, several different successful existing transit oriented development were studied. The Arlington Corridor transit oriented development was used as an example for parking due to the great success Arlington County has had as a transit oriented development leader in the country. The total parking count was calculated off of the different uses proposed on the site. The existing immediate site has about 4000 spots with about 75% of those being regularly utilized. Within the greater context of the site, there are about 9000 spots. The 4000 existing spots were factored into the total needed.

RESIDENTIAL USE:	7280 SPOTS
OFFICE SPACE:	3000 SPOTS
HOTEL:	175 SPOTS
MIXED USE / RETAIL:	1800 SPOTS
EVENT / EXHIBITION:	800 SPOTS
TOTAL:	13055 SPOTS
CURRENT ON SITE:	4000 SPOTS
ADDITIONAL SPOTS NEEDED:	**9055 SPOTS**

PARKING PRECEDENTS

LAND USE	ARLINGTON R-B CORRIDOR SITE PLAN & ZONING PRECEDENTS	FAIRFAX COUNTY, VA
Commercial Office–R-B Corridor	1 space/580 sq.ft. of gross floor area (GFA)	1 space/385 sq.ft. of GFA for projects over 125,000 sq.ft. 1 space/333 sq.ft. of GFA for projects between 50,000 sq.ft. and 125,000 sq.ft.
Commercial Office–Rosslyn	1 space/1,000 sq.ft. of GFA	*
Hotel–R-B Corridor	1 space/2 hotel rooms	1 space/hotel room plus additional spaces for other ancillary uses
Restaurants–within 1,000 feet of Metro	No requirement if there are less than 200 seats	*
Retail–within 1,000 feet of Metro	No parking required for the first 5,000 sq.ft. of GFA	*
Grocery Stores–within 1,000 feet of Metro	No parking required if this is not the primary site use and it is under 15,000 sq.ft. of GFA	*
Retail–beyond 1,000 feet of Metro	1 space/580 sq.ft. of GFA	1 space/200 sq.ft. of GFA on average
Multi-family apartments and condominium units	1.125 off-street spaces per dwelling unit for the first 200 DUs, 1 space for each unit over 200	1.6 off-street spaces per dwelling unit
Townhouses	2 spaces for each dwelling unit and 1/5 space per DU for visitors	2.3 spaces per dwelling unit
Single-family detached units	1 off-street space per dwelling unit	2 off-street spaces per dwelling unit

* Indicates no comparable zoning category for Metro accessible sites.

SOURCE: THE NEW TRANSIT TOWN

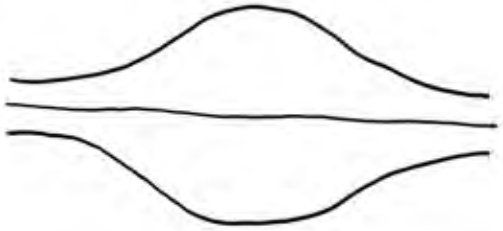
DESIGN

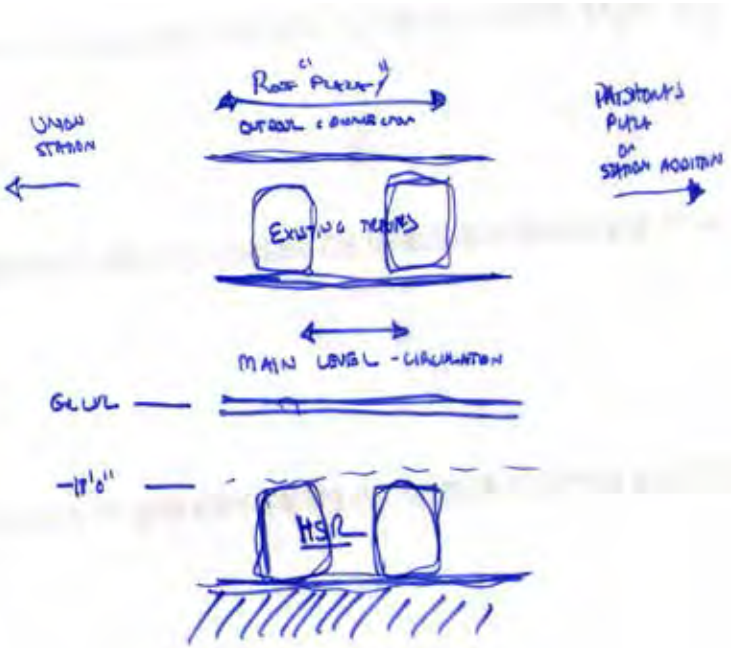
PROCESS - MASTER PLAN - GENERATIVE PROCESS - BUILDING

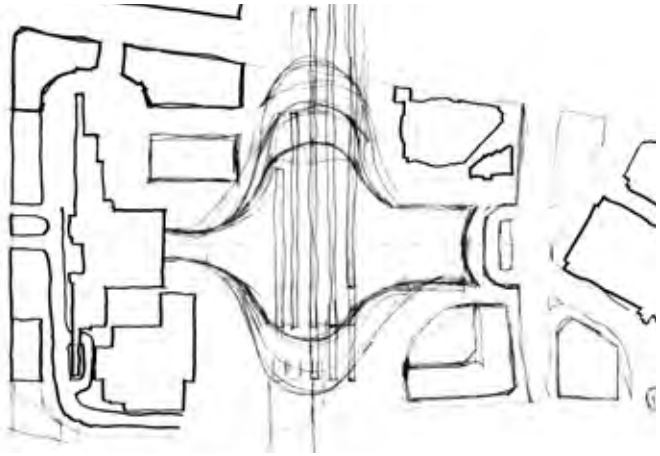
08

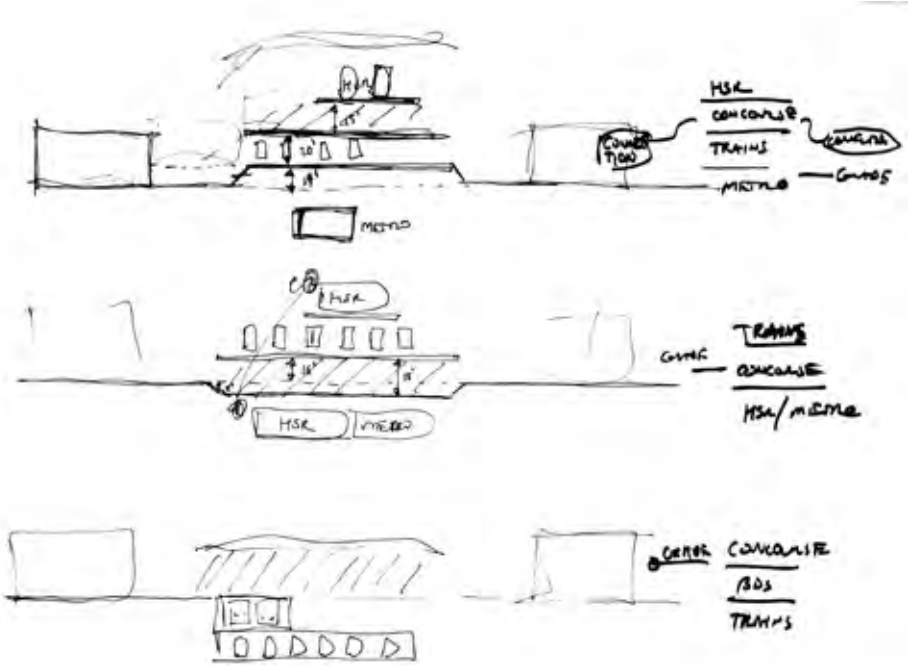
DESIGN PROCESS

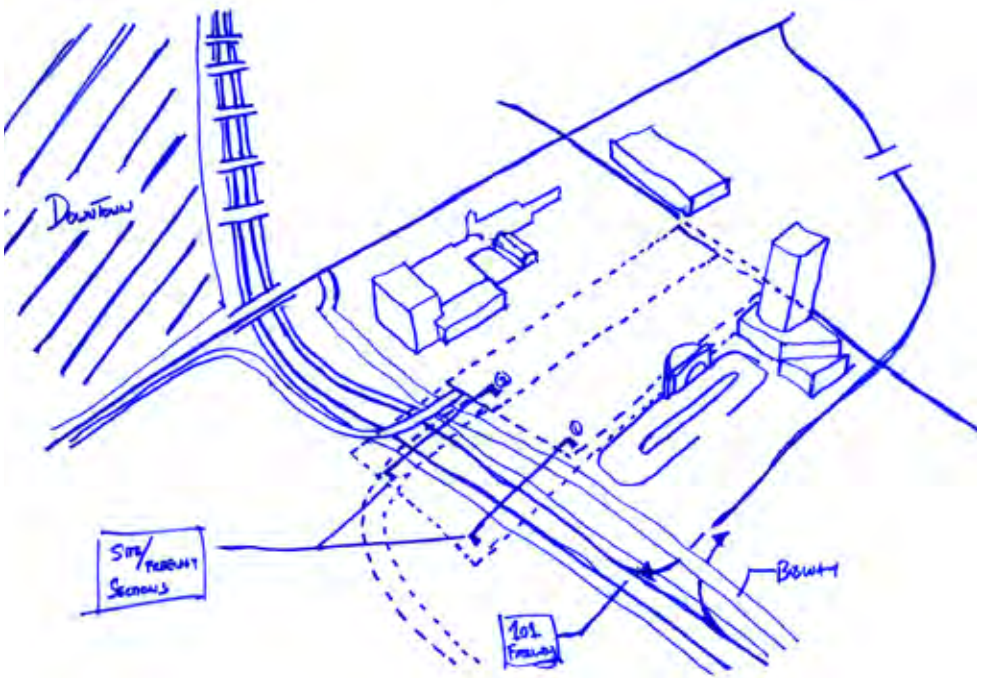
Several different design approaches were studied and tested as alternatives for the addition to the Union Station. One of the main goals that drove the design was to create an addition that connected and created a new concourse around the existing tracks. Beyond this goal, there were many different options that could have been undertaken. Two different connections to the tracks were studies, one maintaining the current configuration and creating a larger concourse below the tracks and the other being one that created a new concourse up above the tracks and did away with the old hallway below the tracks. Different forms for the station were studies as well, from grand gestures to more subtle designs, In terms of transit configuration, changes were proposed to the current track layout along with an extension over the 101 freeway to do away with the dead end track configuration. Several different options were also studied in terms of preserving the existing East Portal and Patsaouras Transit Plaza.

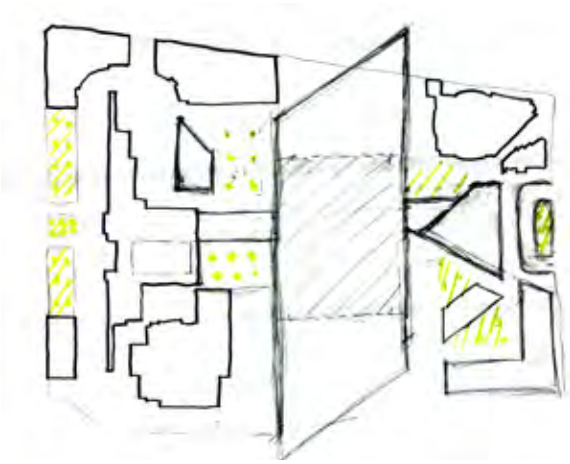


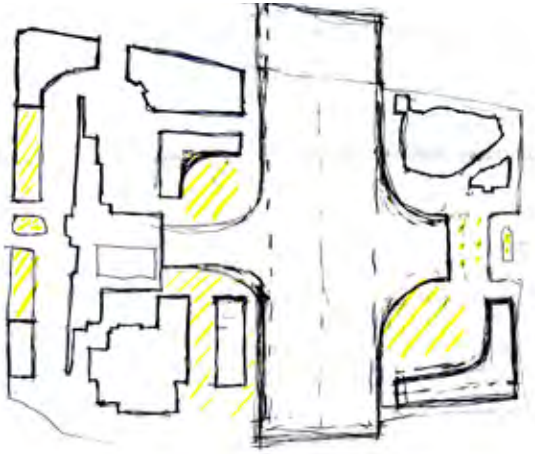





HSR
CONCOURSE
TRAINS
METRO
TRAINS
CONCOURSE
HSR/METRO
CONCOURSE
BDS
TRAINS

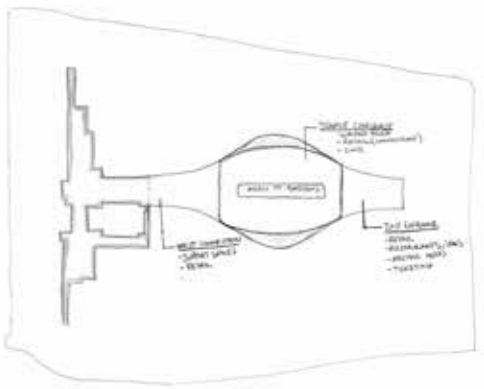

DOWNTOWN
SITE/FREIGHT
SECTIONS
BRIDGE
101
FREEWAY

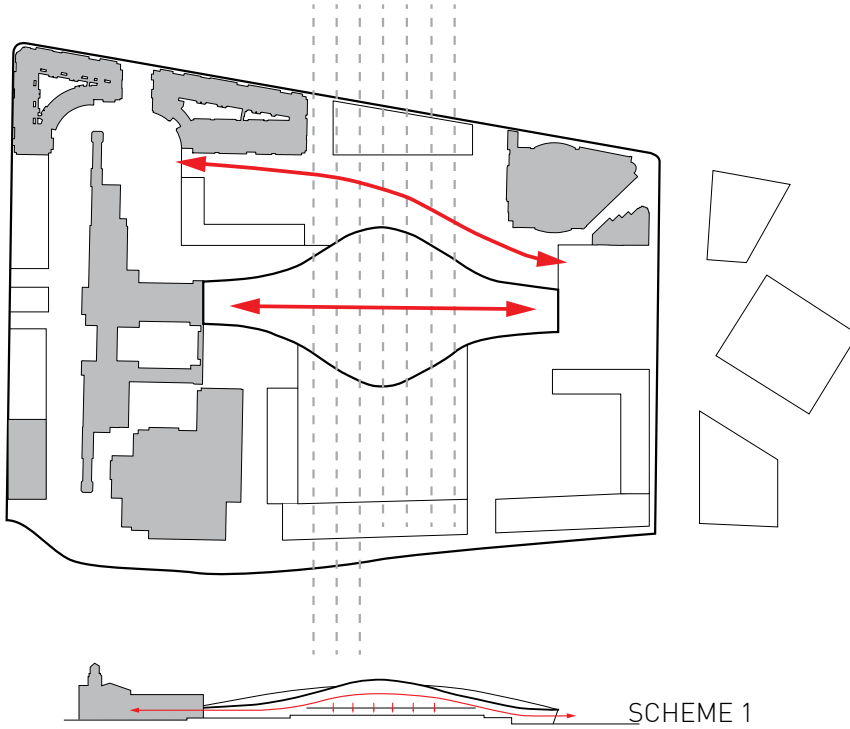




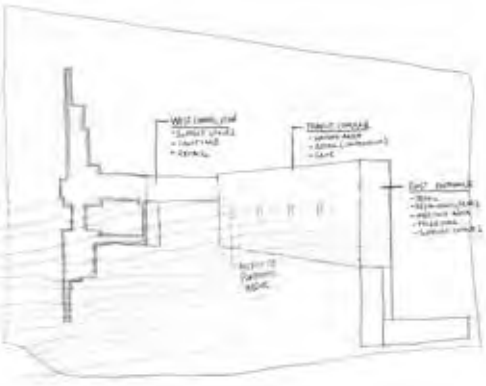
DESIGN PROCESS

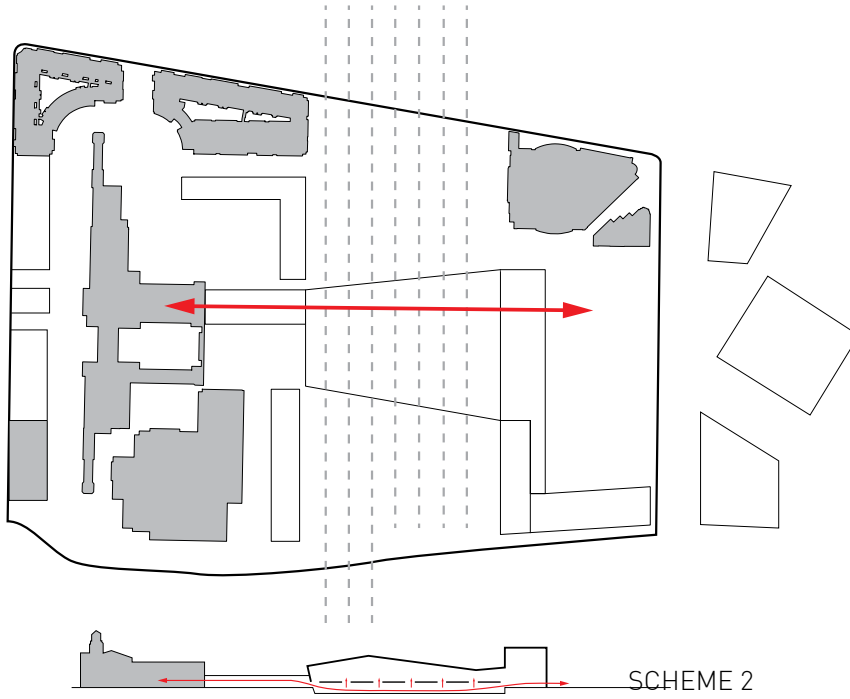
After the initial studies there remained two potential schemes. It was decided that due to the many existing issues present at the Patsaouras Transit Plaza and East Portal, the plaza and portal would be demolished and relocated in a different form. The two schemes present at the schematic stage tested out both track configurations. The first scheme presented a station that was a large gesture above the tracks, connecting one side of the site to the other. Along with the station, a platform was proposed to be built above the tracks. The purpose of the platform was to create a new outdoor urban plaza for Los Angeles. This platform would be an integral part of the Master Plan proposal with several other proposed buildings feeding into it. The second scheme was a below track station configuration with a larger covering that would be located above the below ground concourse area. The east end of the station would feed into one of the proposed buildings for the Master Plan. The option that was chosen to proceed with was Scheme 1.



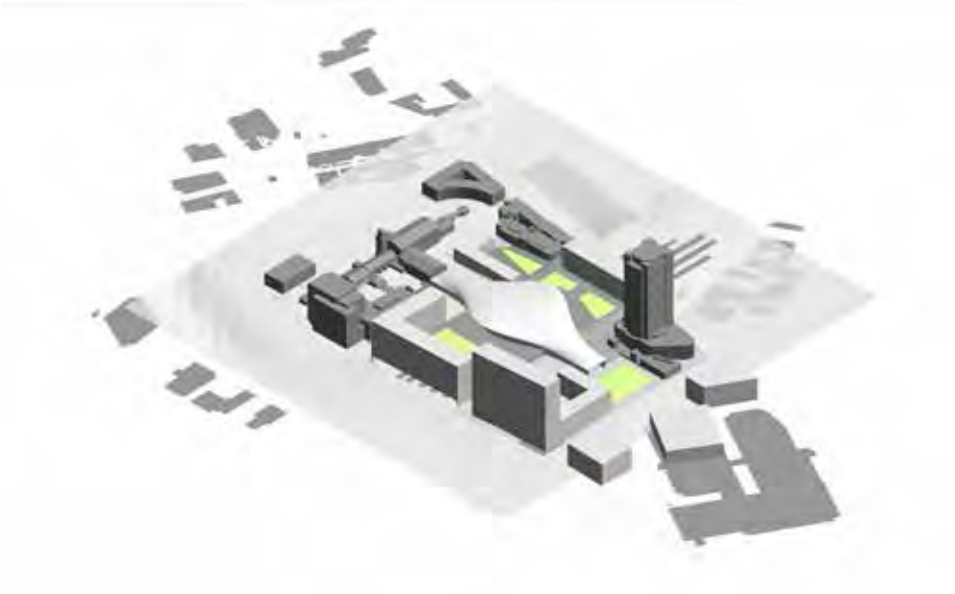


SCHEME 1





SCHEME 2

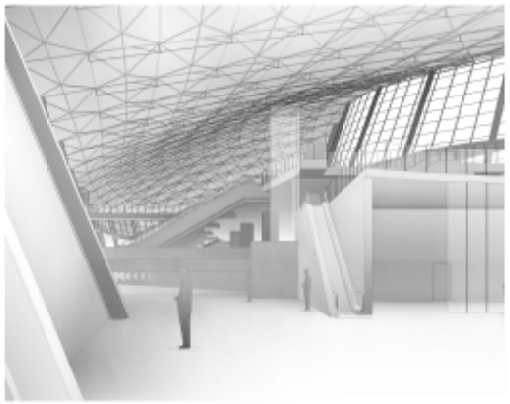


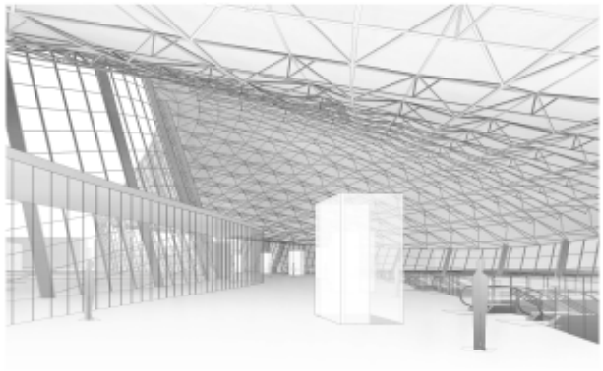
SCHEME 1

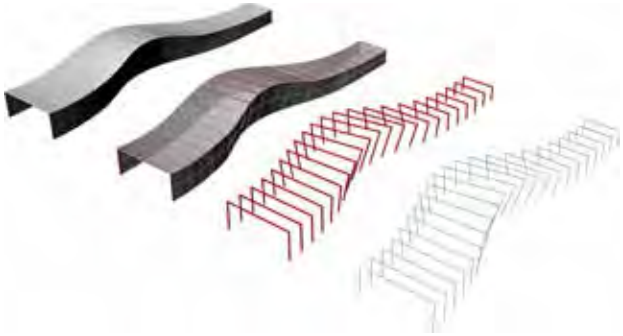
SCHEME 2

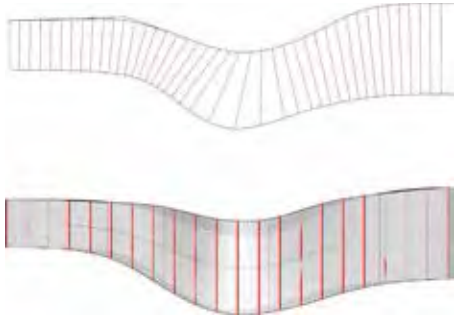
DESIGN PROCESS

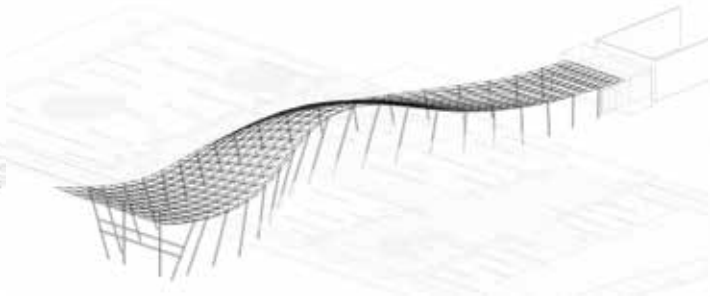
After the schematic stage of design, full efforts turned to exploring an addition to Union Station that would be located above the tracks. Along with the building form, options for the Master Plan were explored. Variations for the platform design above the track and different proposed building were explored to see what would create the most successful urban planning in terms of creating a transit oriented development along with a destination for Los Angeles. Several different options were explored for the building form. The result was a building form that was directly generated by site factors. The form is one that connects to the existing Union Station respectfully, climbs the tracks to create a new concourse and waiting area up above them, responds to a proposed public plaza, and creates a new entrance condition on the east side of the site. At this point, the Master Plan was also expanded to create a new residential development that connected to the Los Angeles river.

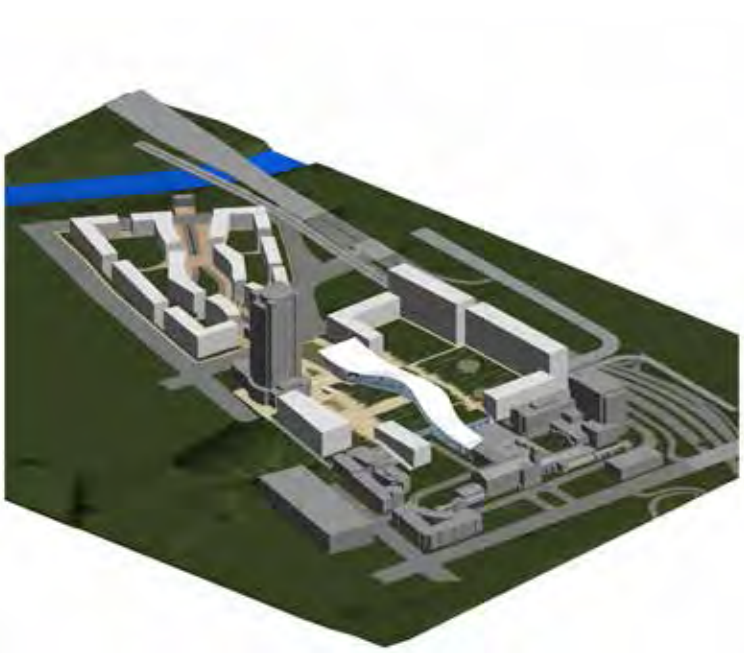


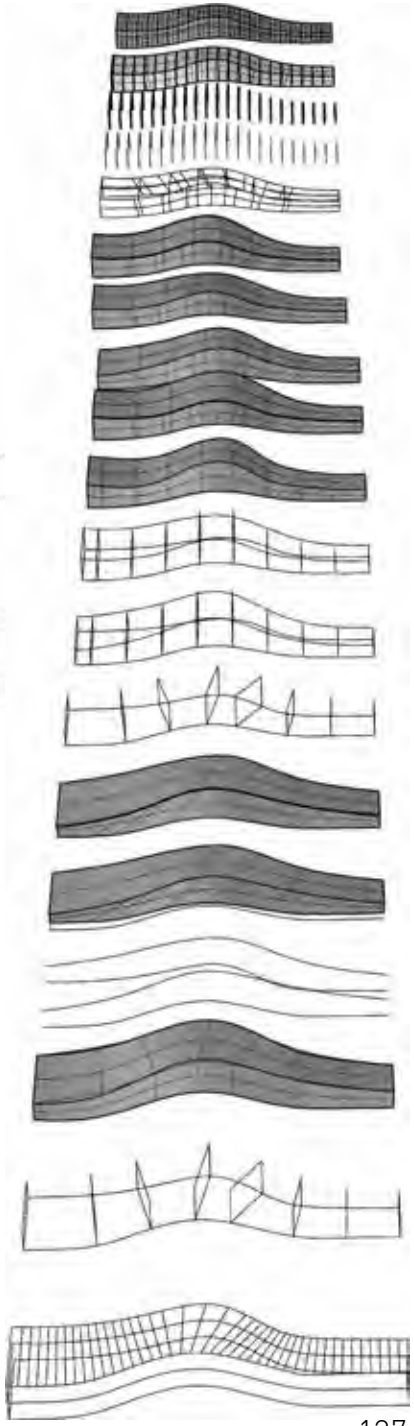






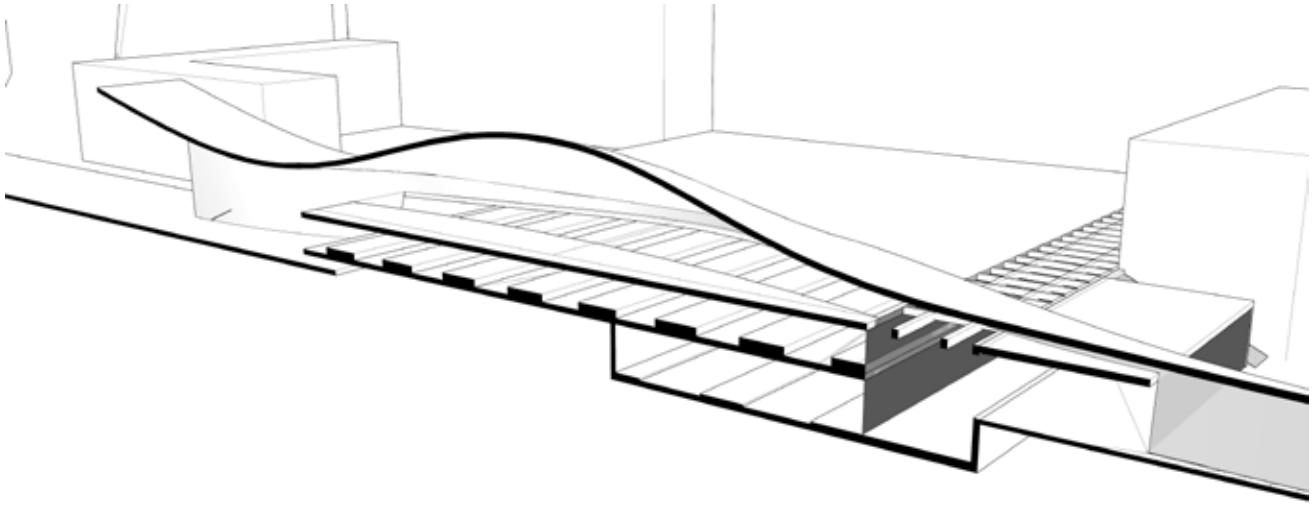


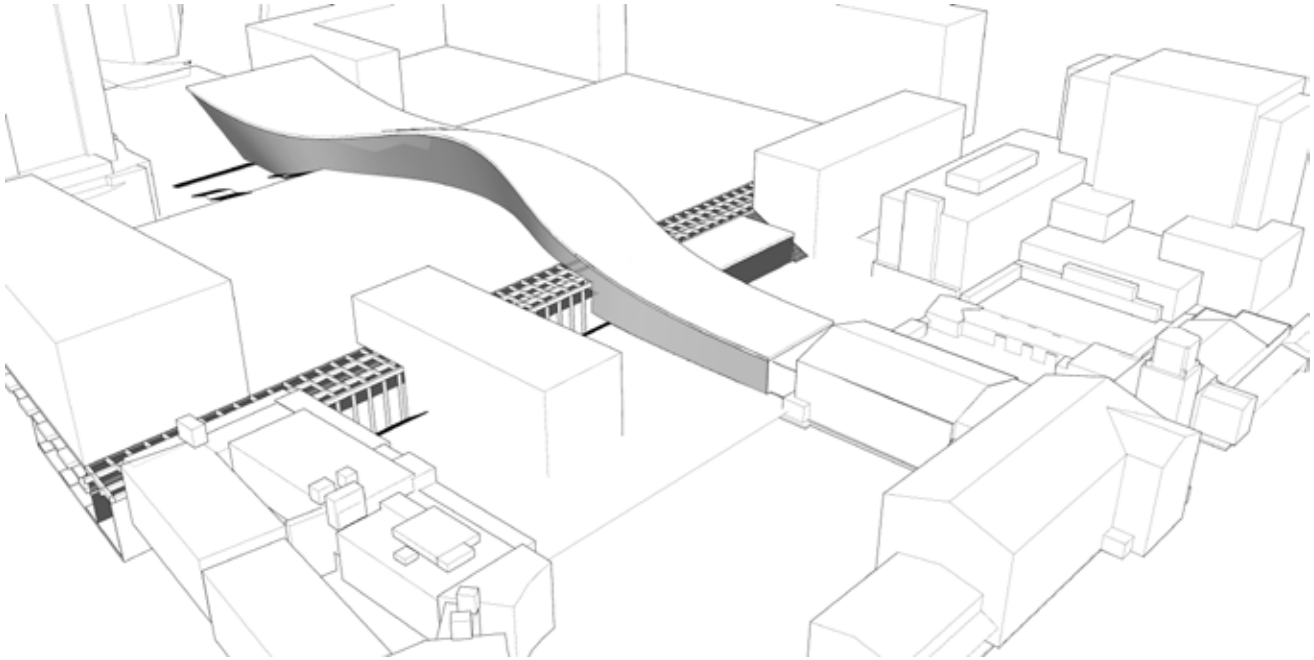


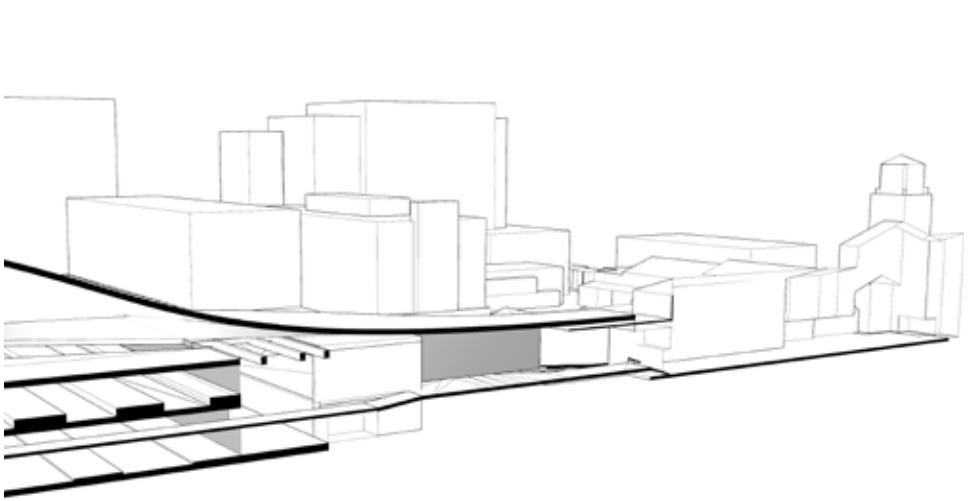


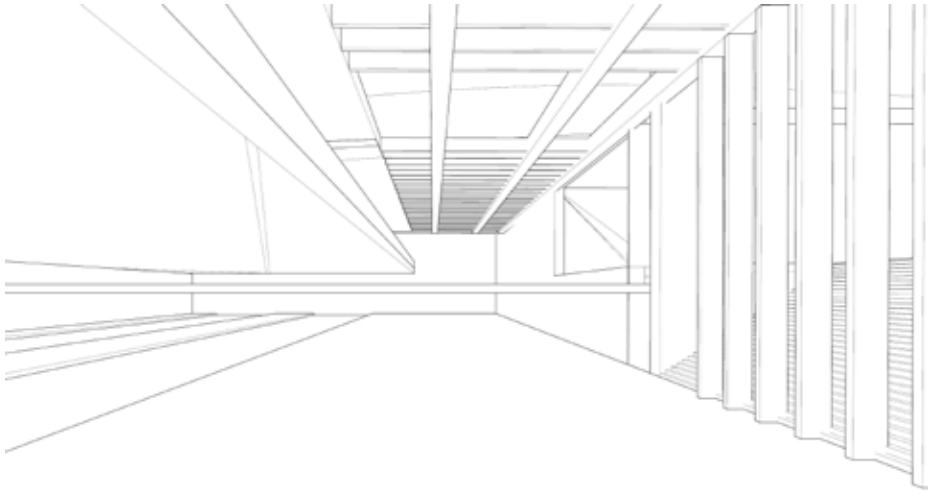
DESIGN PROCESS

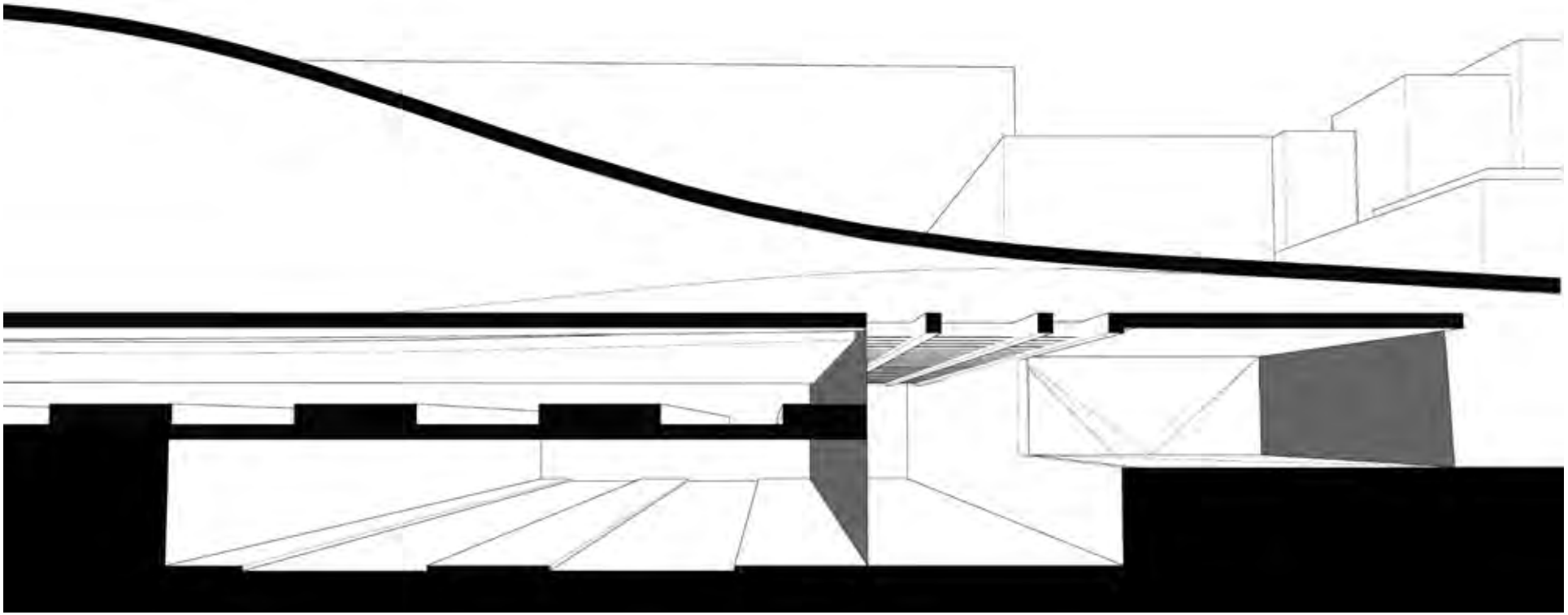
After criticism received during the Midterm review, several revisions were made to optimize the form. The track configuration was adjusted in order to accommodate a "slot" being created adjacent to the bus platforms. The purpose of this slot was to provide for an area for circulation to the bus platforms along with allowing for more sunlight to reach these bus platforms, which are located slightly underground. Initially there was an idea to let the top of the slot be a trellis-like structure, but this was later changed to be solid in order to provide shelter in the case of rain to those accessing the bus platforms. Changes were also made so that this area could be used to circulate to the main administrative and service component of the Union Station addition, which was re-located to one of the proposed buildings of the Master Plan. This relocated allowed the form of the Union Station addition to purely be used for transit related purposes.



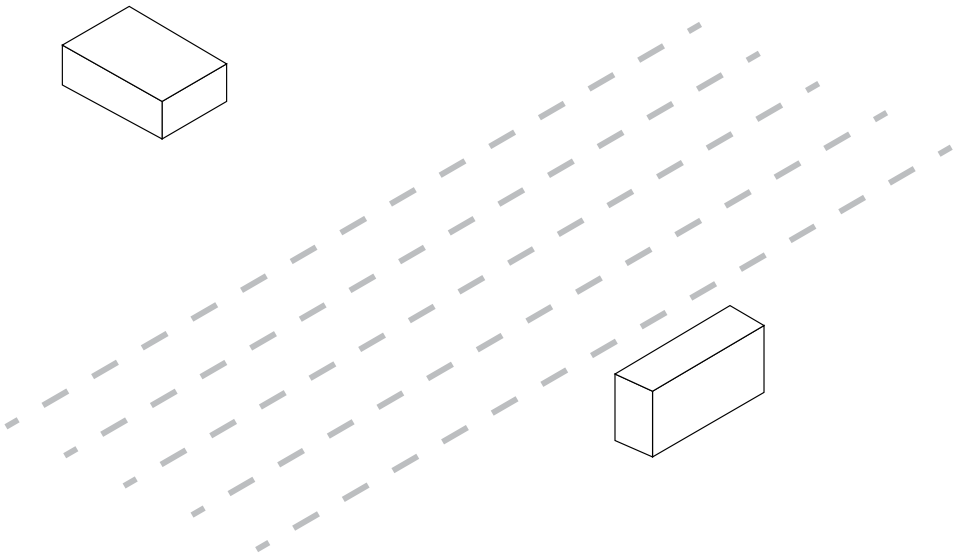


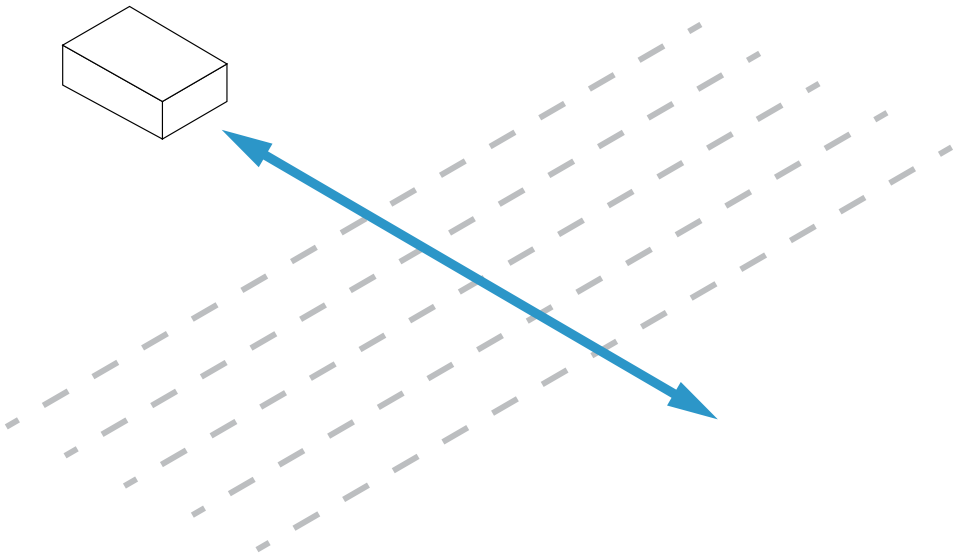


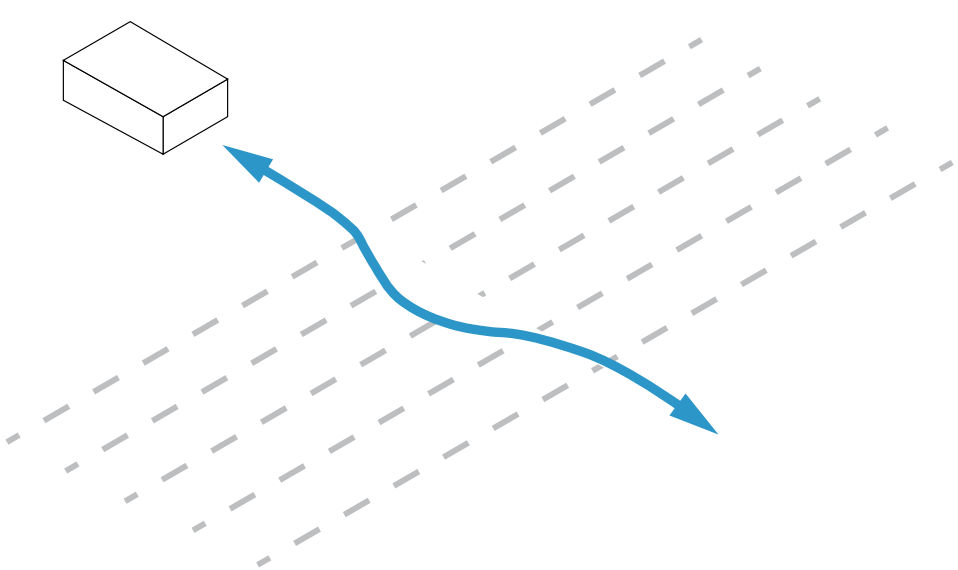




GENERATIVE PROCESS







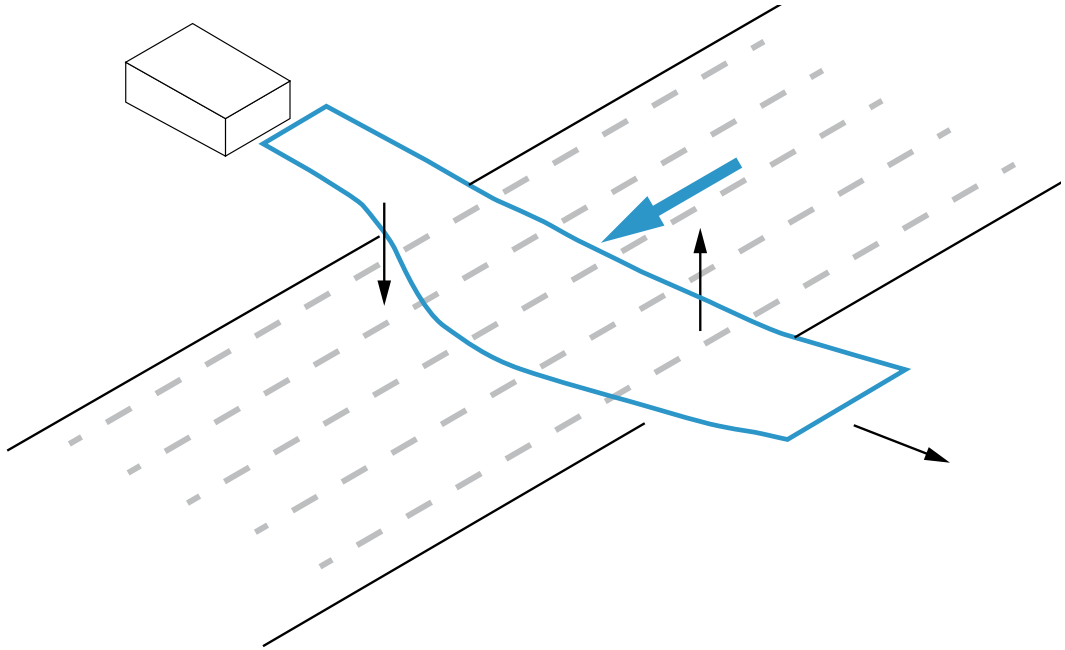
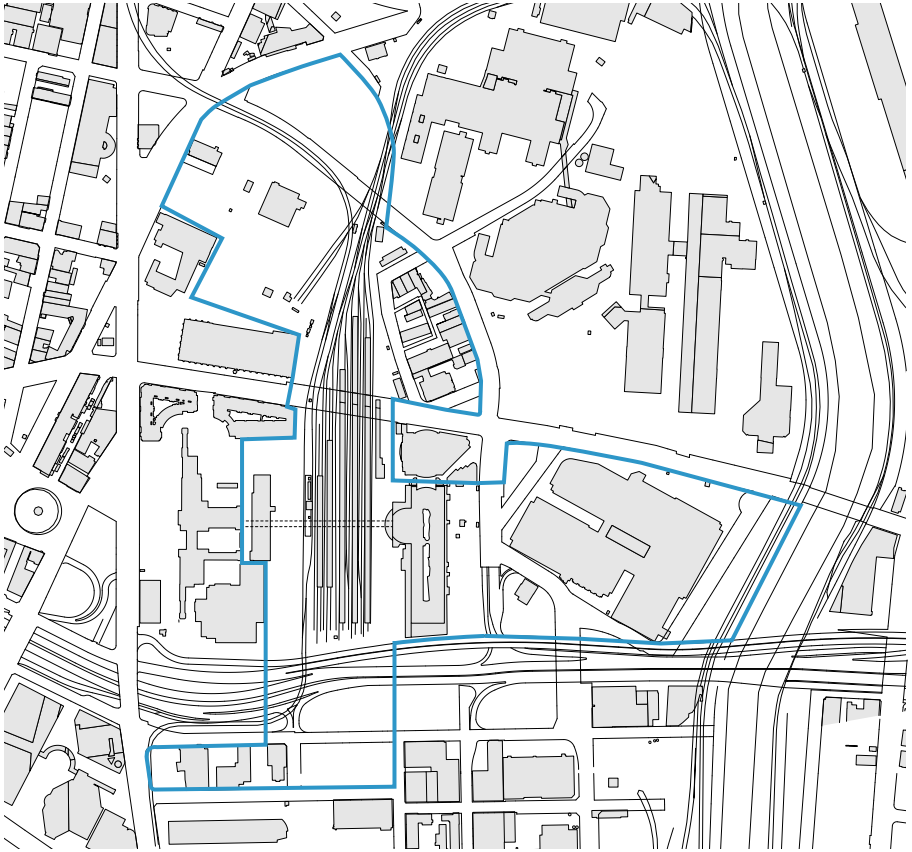
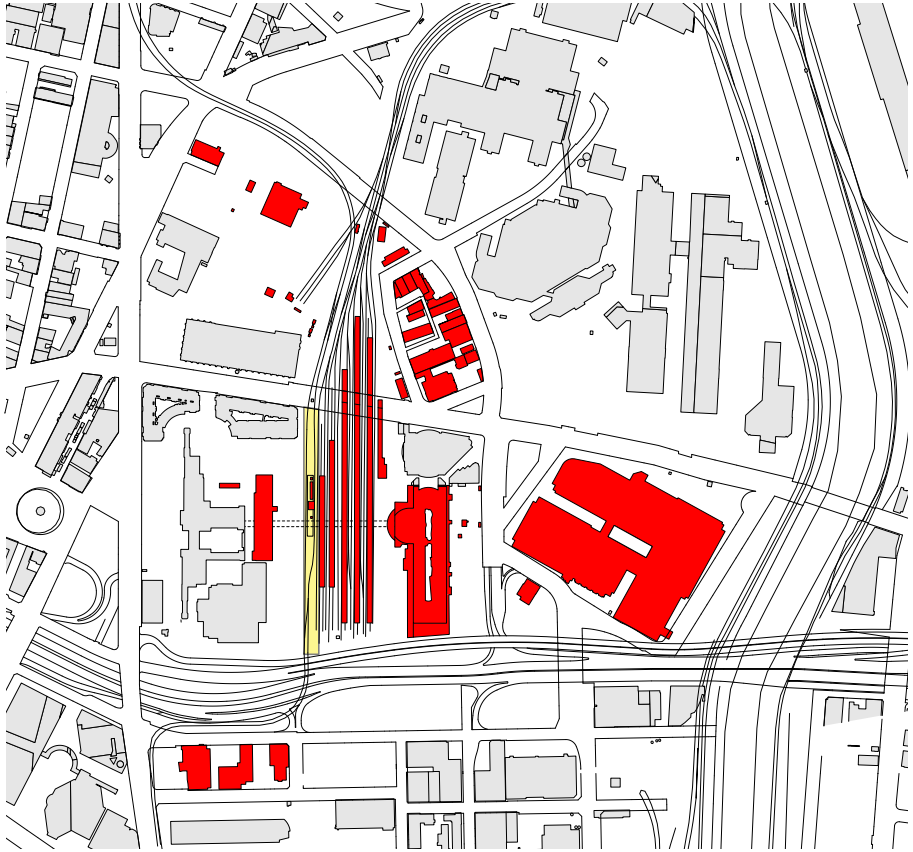


IMAGE: LA METRO AUTHORITY



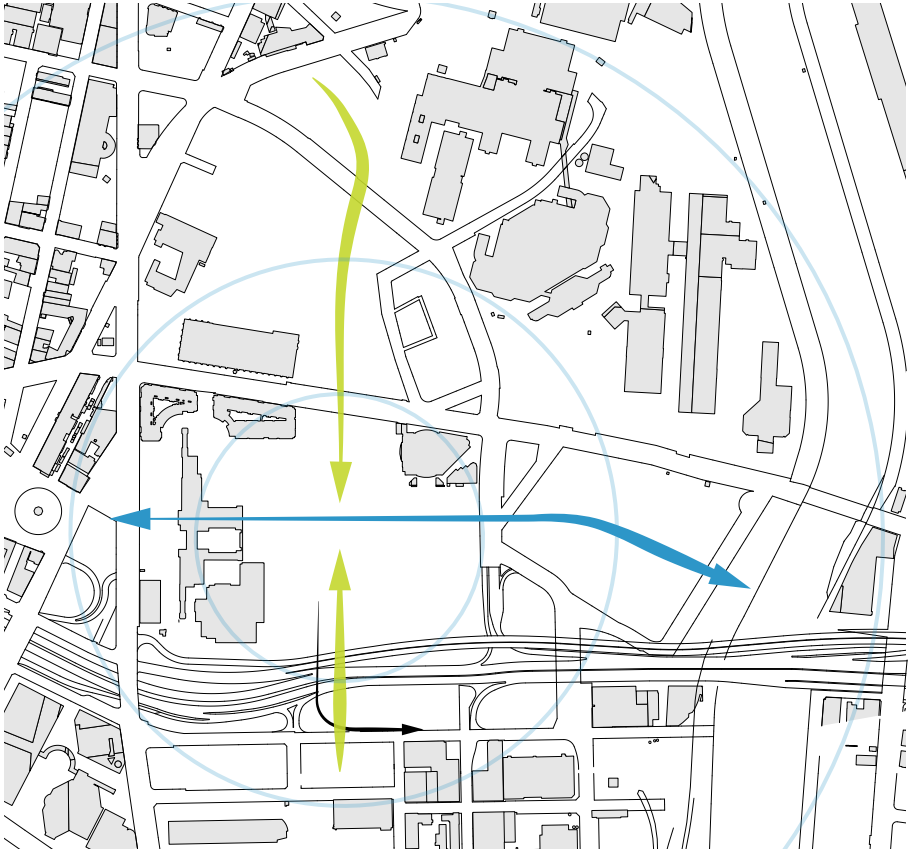
EXISTING CONDITIONS

In addition to the Union Station, the site currently houses the Metropolitan Water District HQ, the Metro transit HQ, the Patsaouras Transit Plaza, the Mozaic Apartments, the Piper Technical Center, and bail bond brokers



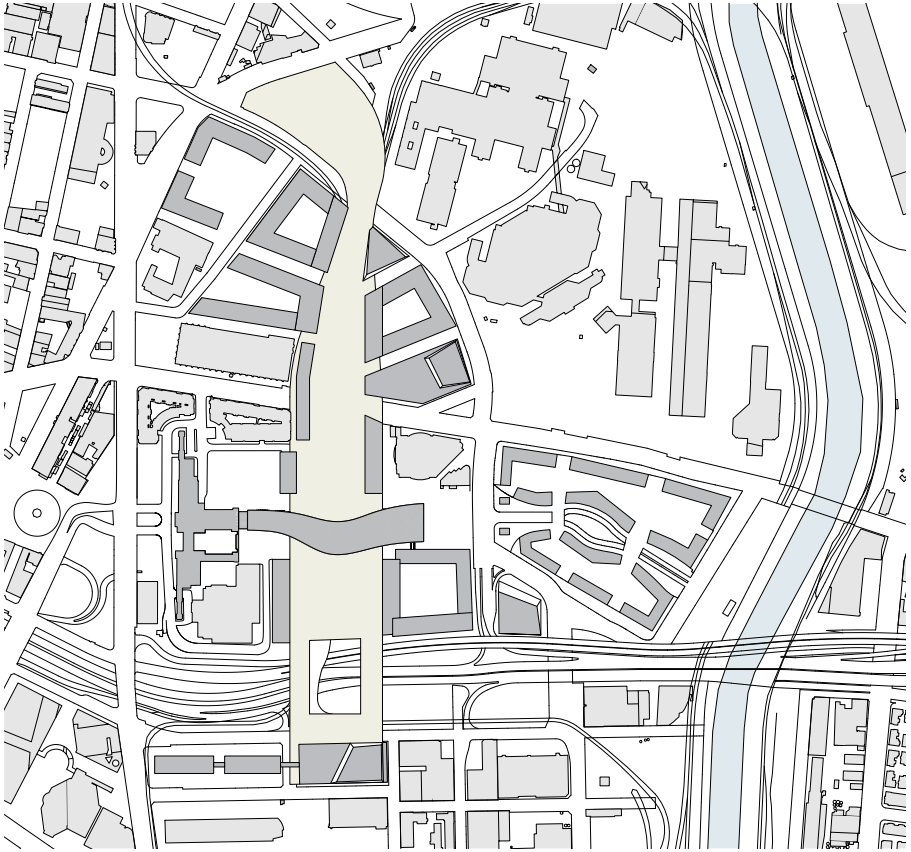
RELOCATION | EXCAVATION

Several buildings on the site will be relocated to a new location. The existing Patsaouras Transit Plaza will be demolished due to several issues that exist with the site. The Piper Technical Center will be relocated to a new high rise building.



SITE CONCEPT

The new Site Plan will create two different axes. An east-west axis is be created to provide a connection across the tracks and from downtown to the LA River. A north-south axis is being created to provide a new outdoor space for Los Angeles along a connection across the 101 freeway.

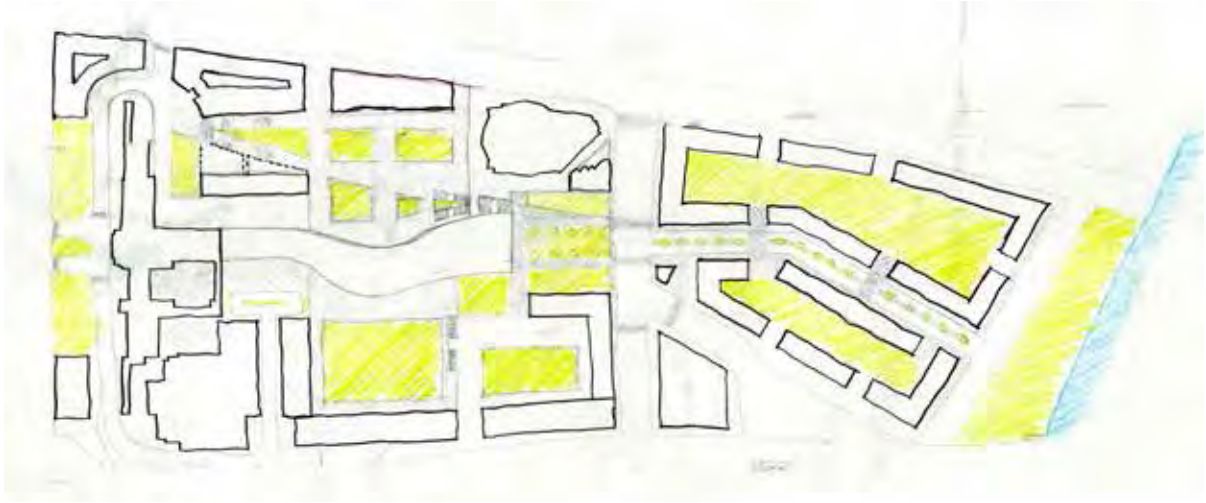


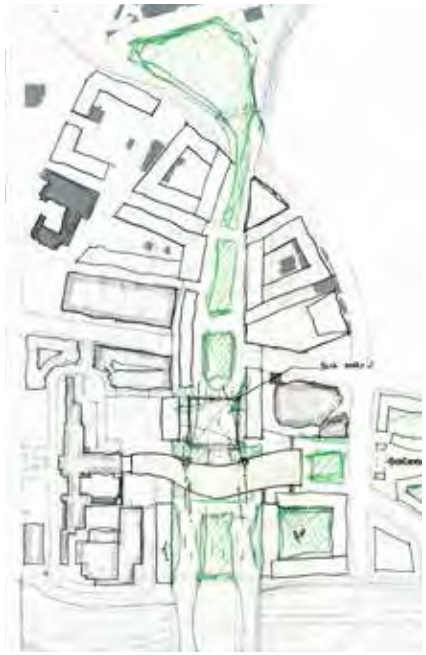
PROPOSED BUILDINGS

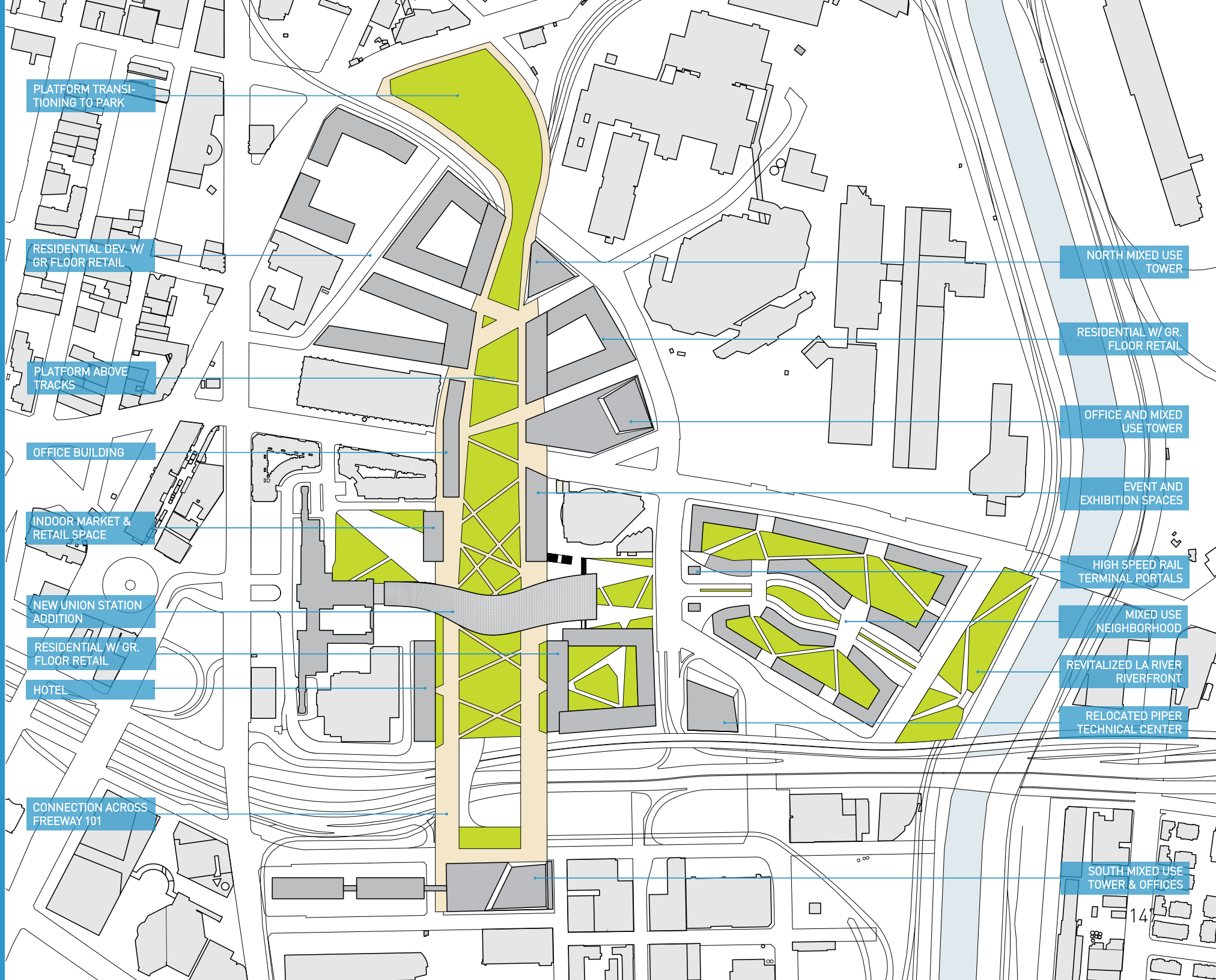
Several new buildings are being proposed on the site along with a platform to be built above the tracks. These new buildings will provide a mix of uses and achieve a certain density necessary to sustain a successful transit oriented development.

MASTER PLAN

The new Master Plan for the Los Angeles Union Station area will aim at revitalizing the area and bringing new life to it. The goal is to create a 24/7 destination and transit-oriented development to kick start a public transit movement in Los Angeles. The Master Plan address several of the issues that were present on the site and makes efforts to create a better solution. The new design will create a Union Station addition that is the iconic epicenter of the whole Master Plan, centralize all of the transit in one location, create a new streetfront connection on Vignes St, and create a new outdoor urban plaza and green space for Los Angeles. The Master Plan begins with the Union Station addition and from there works its way north until it culminates in a park that connects the platform to the ground level. On the south end the Master Plan proposes a connection across the 101 Freeway. On the east, a new residential development is planned in order to provide for a connection to the LA River. Currently plans are underway to revitalize the LA River and establish a new waterfront.





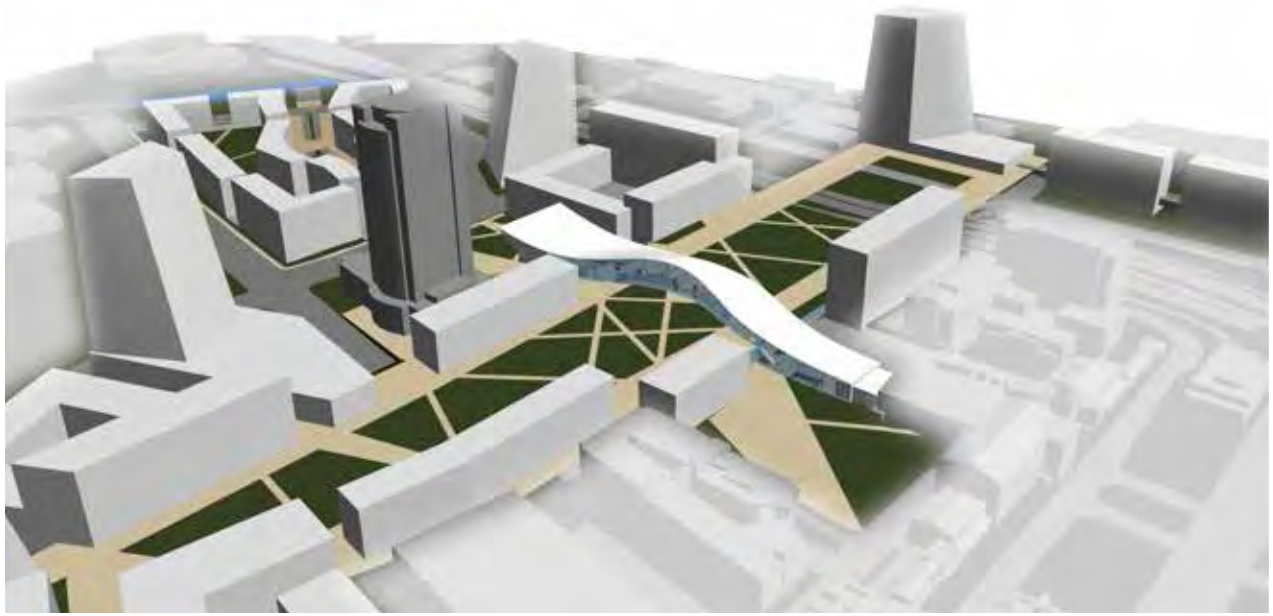

PLATFORM TRANSI-
TIONING TO PARK
RESIDENTIAL DEV. W/
GR FLOOR RETAIL
PLATFORM ABOVE
TRACKS
OFFICE BUILDING
INDOOR MARKET &
RETAIL SPACE
NEW UNION STATION
ADDITION
RESIDENTIAL W/ GR.
FLOOR RETAIL
HOTEL
CONNECTION ACROSS
FREEWAY 101
NORTH MIXED USE
TOWER
RESIDENTIAL W/ GR.
FLOOR RETAIL
OFFICE AND MIXED
USE TOWER
EVENT AND
EXHIBITION SPACES
HIGH SPEED RAIL
TERMINAL PORTALS
MIXED USE
NEIGHBORHOOD
REVITALIZED LA RIVER
RIVERFRONT
RELOCATED PIPER
TECHNICAL CENTER
SOUTH MIXED USE
TOWER & OFFICES

MASTER PLAN

The goal of the Master Plan is provide for a mix of uses in order to sustain a successful transit oriented development. The Master Plan will include a large amount of residential space, which will be in the form of multi-family housing. The next biggest category will be office space in order to achieve a proper job to housing ratio in the area. In addition to housing and office spaces, there will be mixed use, retail, exhibition, and event space to truly create a destination that is active 24 hours a day - seven days a week. The goal of the Master Plan is integrate transit seamlessly with other functions and truly set up a situation where an automobile is not a necessary commodity. This Master Plan is aimed at developing a new sense of thinking in Los Angeles, one that does not involve extensive use of the automobile, and one that will encourage a changeover to a transit-oriented society.

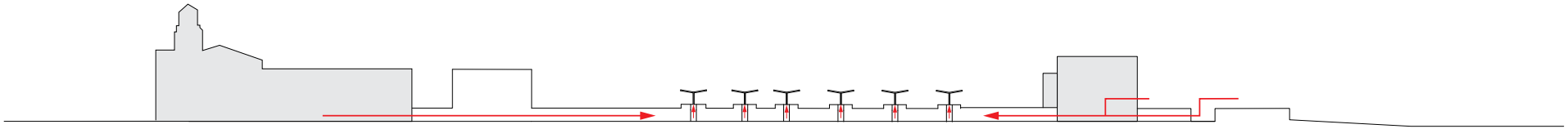
PROGRAM

UNION STATION ADDITION	100,000 SF
RESIDENTIAL	5,750,000 SF
OFFICE	3,000,000 SF
350 ROOM HOTEL	400,000 SF
MIXED USE / RETAIL	1,000,000 SF
MARKET	100,000 SF
EXHIBITION /EVENT	300,000 SF

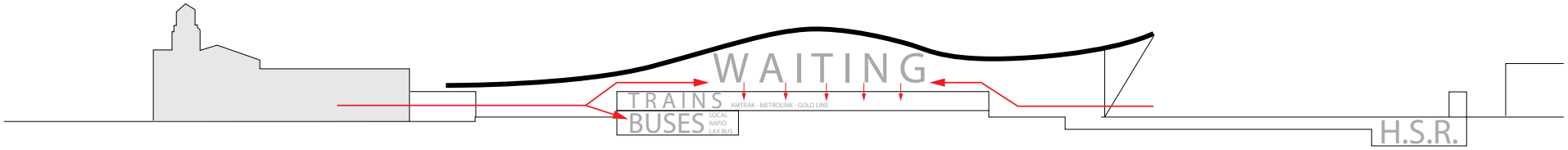


BEFORE / AFTER

The existing Union Station access the tracks from below through a small hallway. The Patsaouras Transit Plaza is located on the east side of the site. Currently the transit plaza creates a disconnect between the street level and the East portal. The Patsouras Transit Plaza has a multitude of issues that are present with the existing design. There is no separation between bus, vehicle, and pedestrian usage so there is a constant conflict between the modes. Also the configuration of the East portal does not necessarily allow for expansion of the station. The new design will create a concourse and waiting area that is located above the tracks. The trains will remain in the same location as they have been but the bus service will be re-located to a small area below the light rail lines. The east side of Union Station addition will provide access to the high speed rail terminal that is being proposed across Vignes St.



BEFORE



AFTER

LONGITUDINAL SECTION THROUGH SITE


VIEW SOUTH TOWARDS LA RIVER
CURRENT AERIAL VIEW

AFTER DEVELOPMENT

IMAGE: GOOGLE EARTH

VIEW TOWARDS LOS ANGELES DOWNTOWN

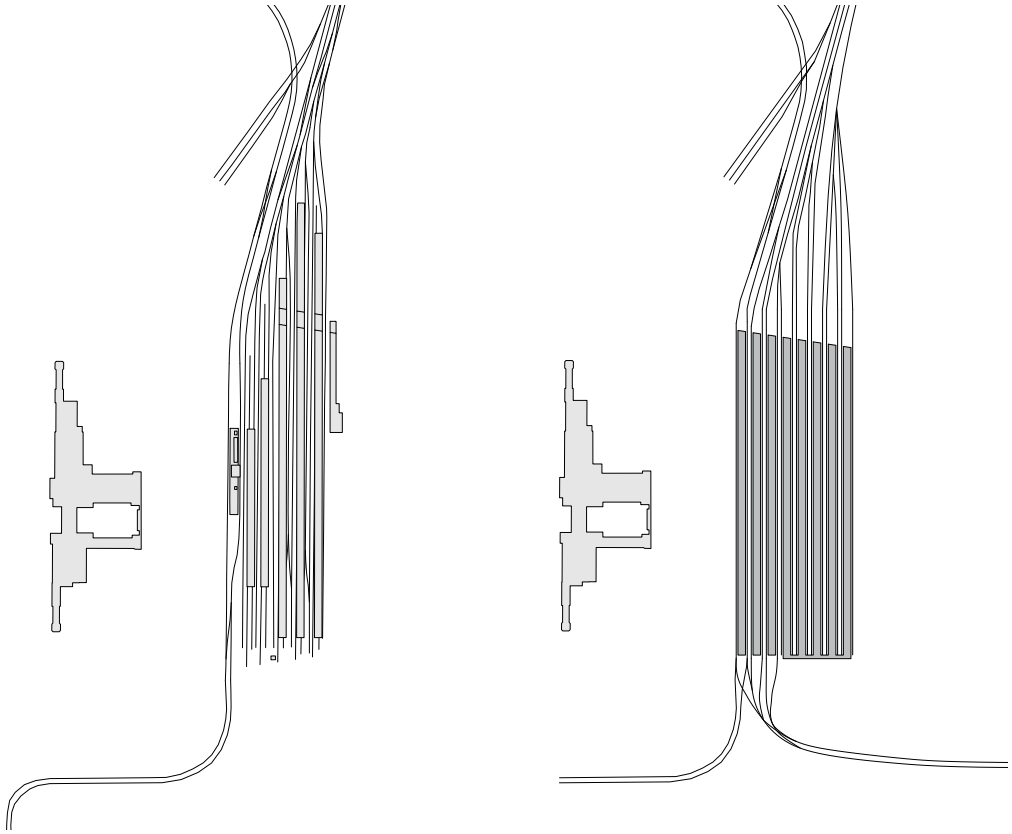
CURRENT AERIAL VIEW

AFTER DEVELOPMENT

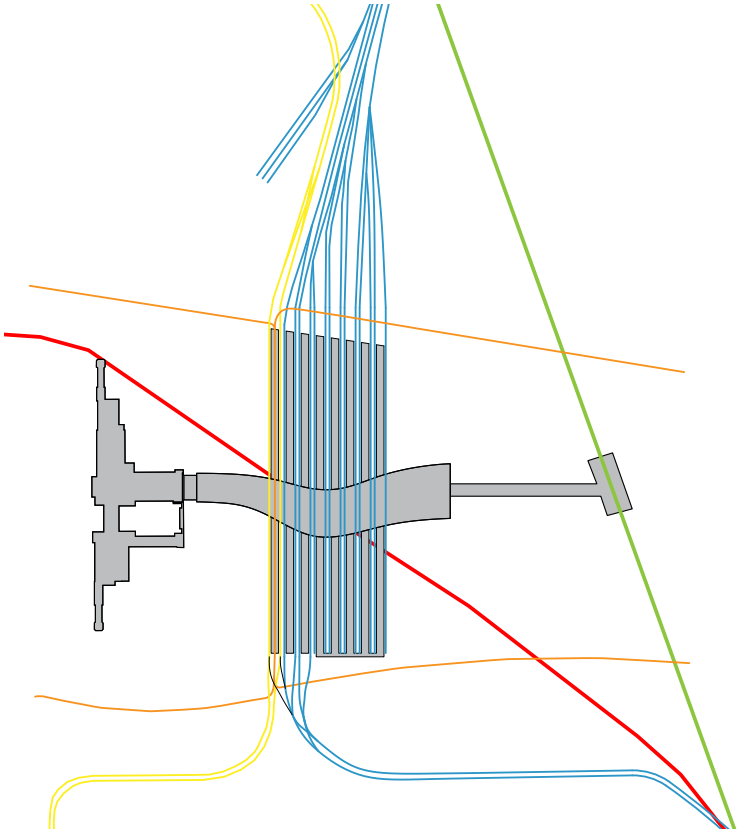
IMAGE: LA METRO AUTHORITY

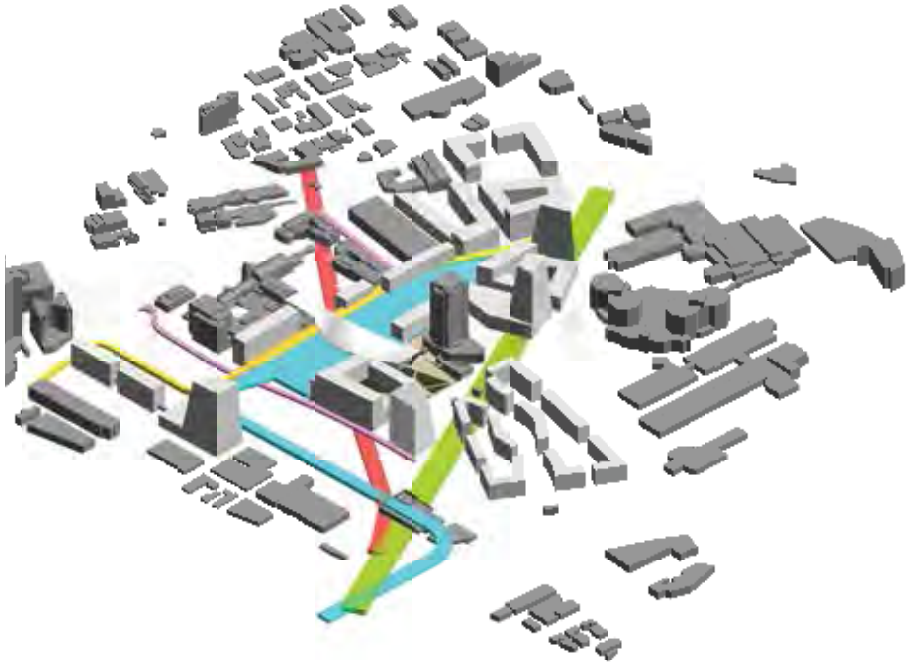
INFRASTRUCTURE

The existing infrastructure consists of a above ground rail station with covered platforms. Currently the Metro Gold Line, Amtrak, and Metrolink commuter rail lines utilize the rail station. Currently the station is in a dead end configuration; this causes many different delays and congestion because trains have to come in and out the same way along a narrowed track area. Many trains coming in have to back in to the station causing further delays. To help alleviate this issues, a run through tracks configuration is being proposed where 6 tracks continue on across the 101 freeway and curve to link back to the existing tracks along the Los Angeles River. The buses are being re-located from their existing location along the Patsaouras Transit Plaza and Cesar Chavez Avenue to a new location located underneath the light rail lines. This new configuration will allow for increased efficiency among the bus lines and a connection to the busway and the Cesar Chavez Ave tunnel. Previously buses had to go out of their way to go to Patsaouras Transit Plaza.



TRACKS | OLD VS NEW





METRO RED LINE

METRO GOLD LINE

RAIL

HIGH SPEED RAIL

BUSES

PROPOSED BUILDINGS

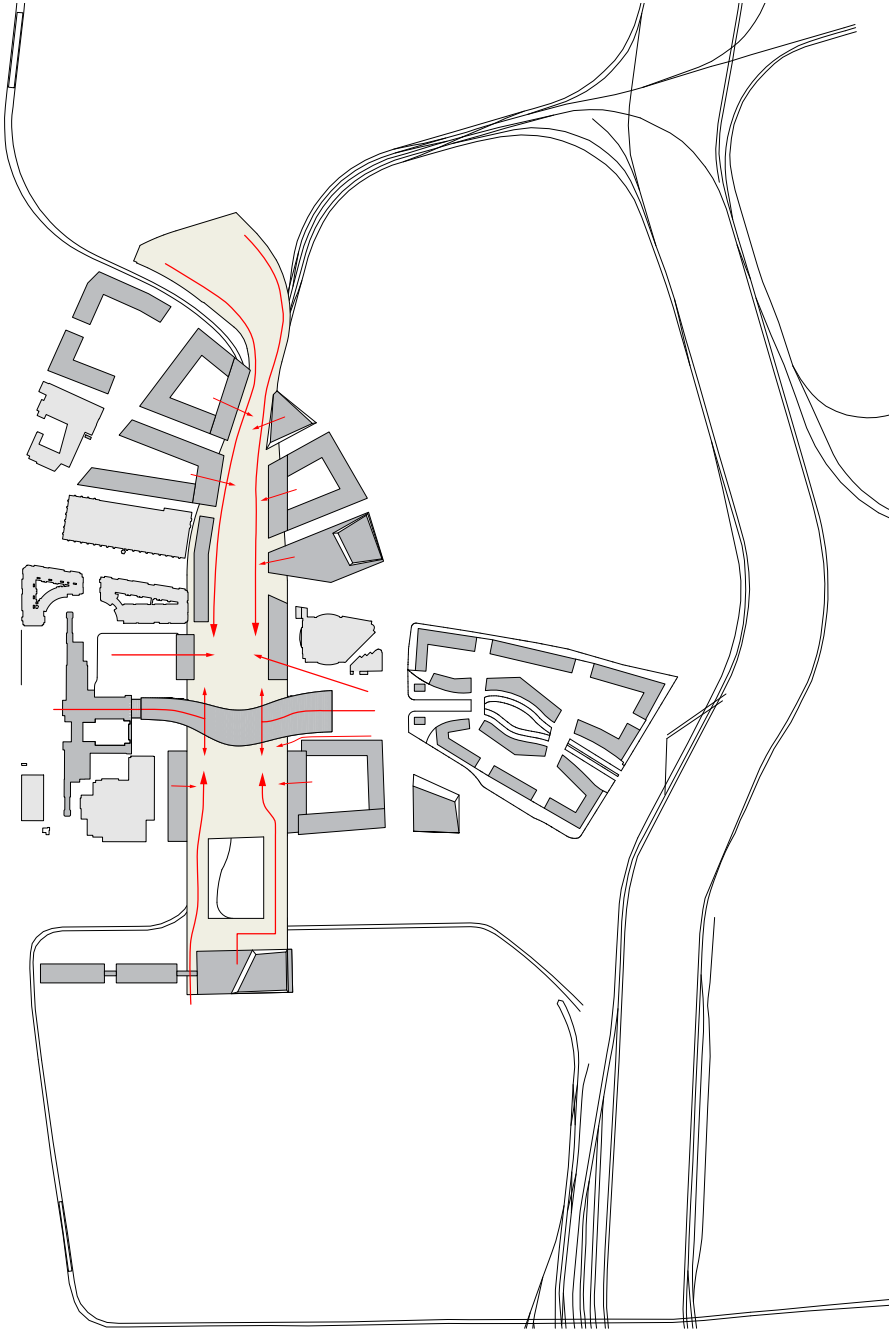
EXISTING BUILDINGS

PROPOSED INFRASTRUCTURE

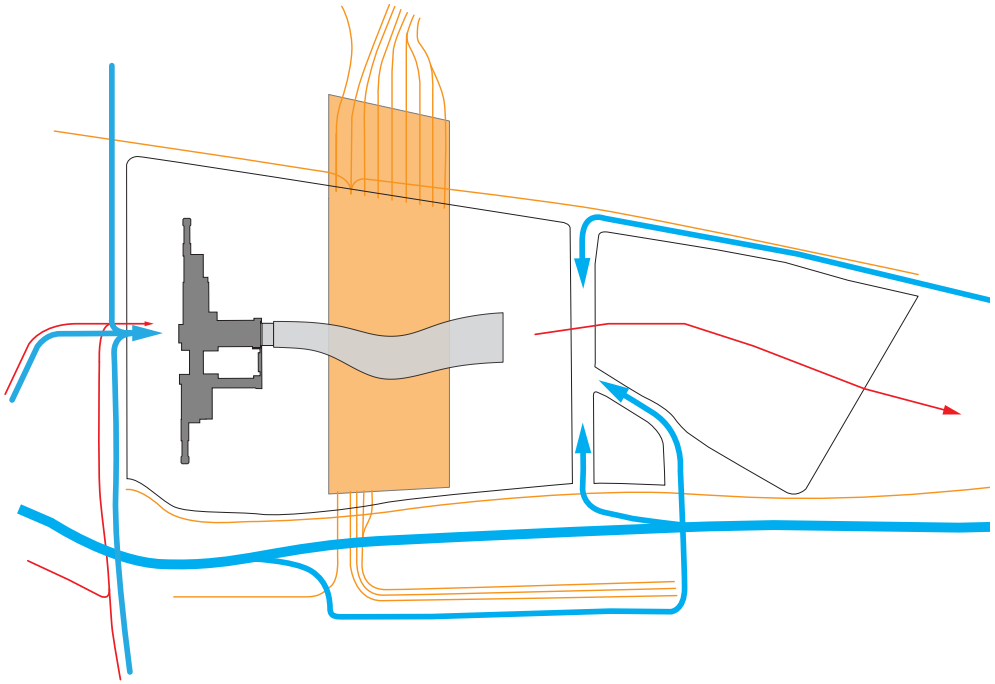
SITE ACCESS

The Los Angeles Union Station is located at the epicenter of a transit network that serves a metropolitan area of 17 million people. Through Union Station, the users of the transit system can access the Metro Gold, Red, and Purple lines, many different local and express bus lines, high speed trains, commuter rail trains, and Amtrak trains. Through connections, the entire transit network of Los Angeles is within reach. The site can also be accessed in different ways via foot or automobile. The 101 Freeway has an exit directly adjacent to the Union Station area which brings you right to the Union Station East entrance. By foot there are connections from downtown via bridges over the 101 Freeway. A new bridge is being proposed through the Master Plan which will provide pedestrian only access to the Union Station complex. Access to the proposed platform will be through many of the proposed buildings adjacent to the platform. In addition to this there will be direct outdoor access as well.

IMAGE: LA METRO AUTHORITY



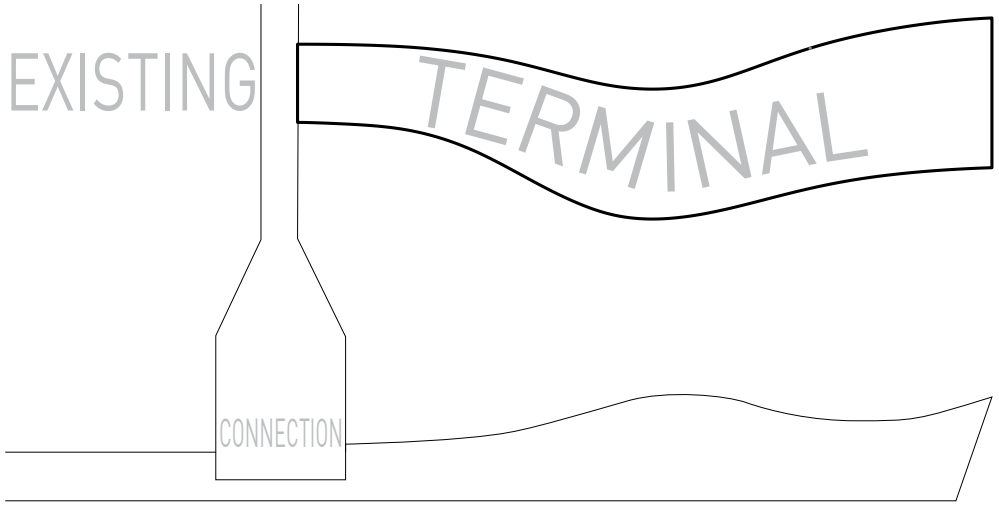
SITE ACCESS



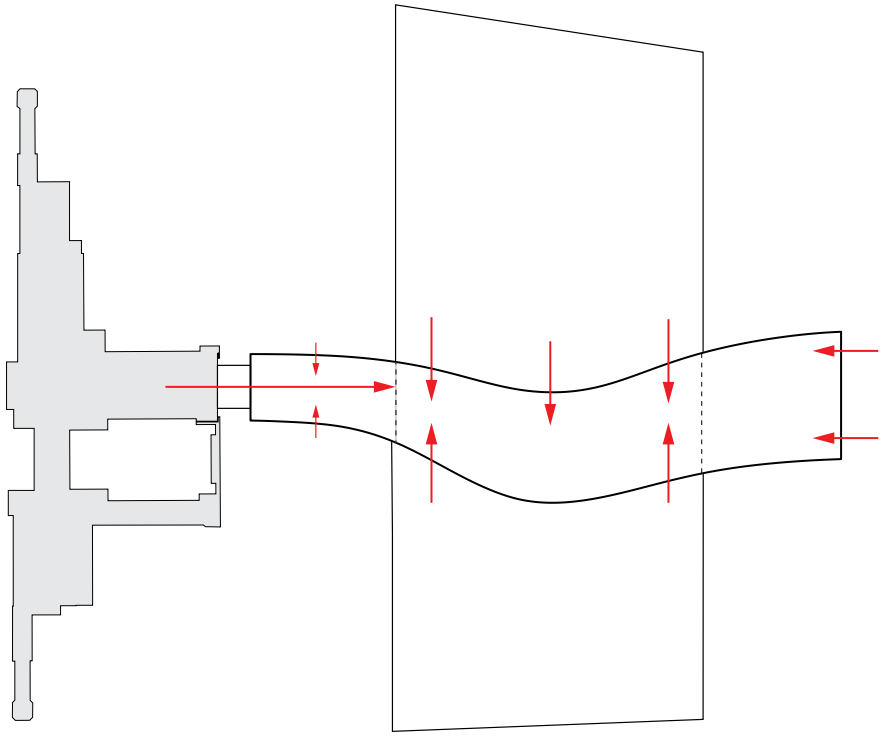
SITE CIRCULATION

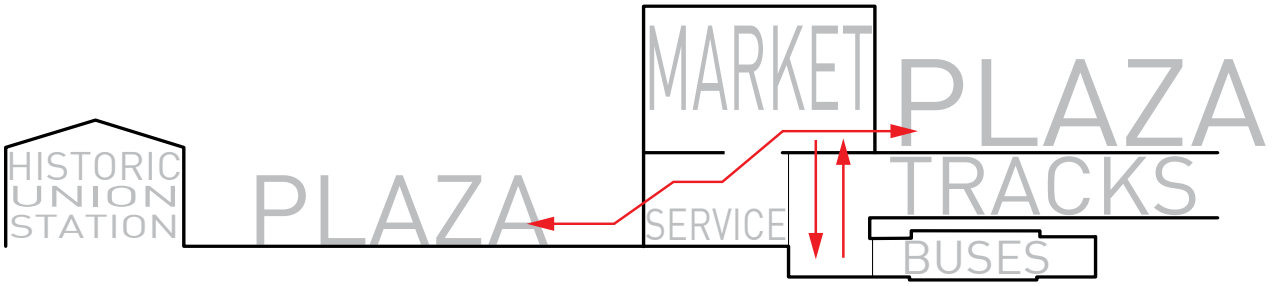
DESIGN CONCEPTS

The new Union Station addition is meant to become an icon for the transportation system of Los Angeles. Studies have proven that well designed transit facilities can lead to people being more willing to pay more for a ticket or even waiting longer for their transit to arrive. Many people have said that the existing Union Station, while a beautiful piece of architecture, is on a small scale for a city like Los Angeles. The goal of the new Union Station addition is to give Los Angeles the grand and large scale Union Station that it deserves while also integrating and preserving the existing Historic Union Station terminal. The proposed elevated plaza will be accessed through different ways. One of the major access points will be through a public market. This market will serve as a midpoint and circulation point to and from the plaza. The plaza will also be accessed from the Union Station terminal itself. The guidelines set forth for the proposed buildings on the site will ensure public program on the ground level accessing the plaza.

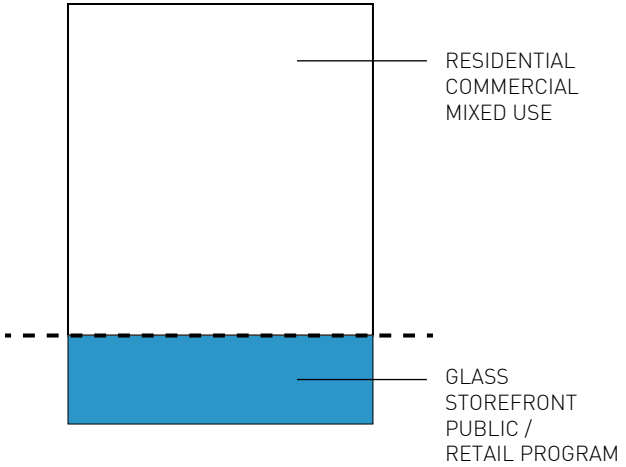


BUILDING CONCEPT





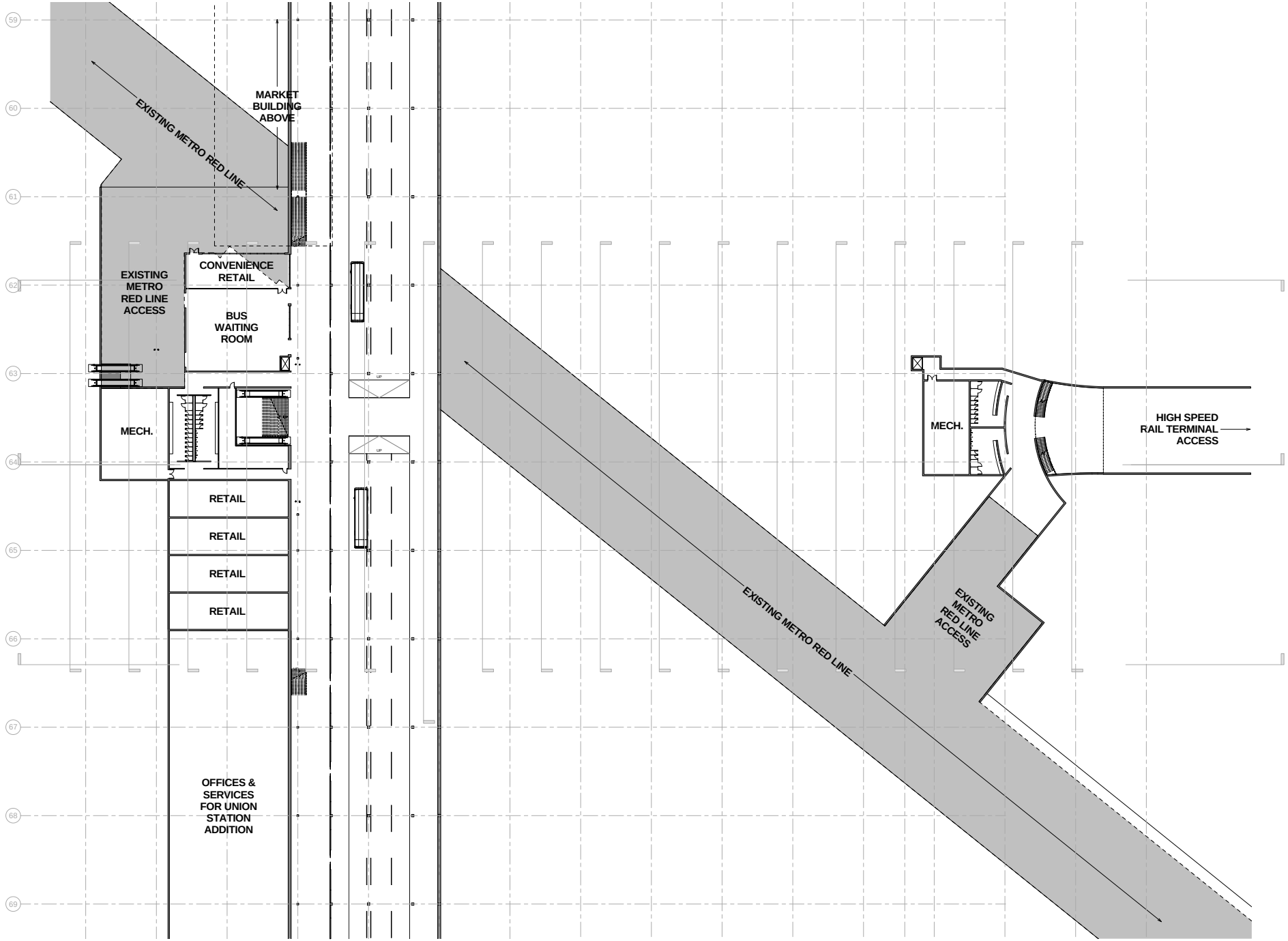
CONNECTIONS | ACCESS



PROPOSED BUILDING GUIDELINES

FINAL DESIGN

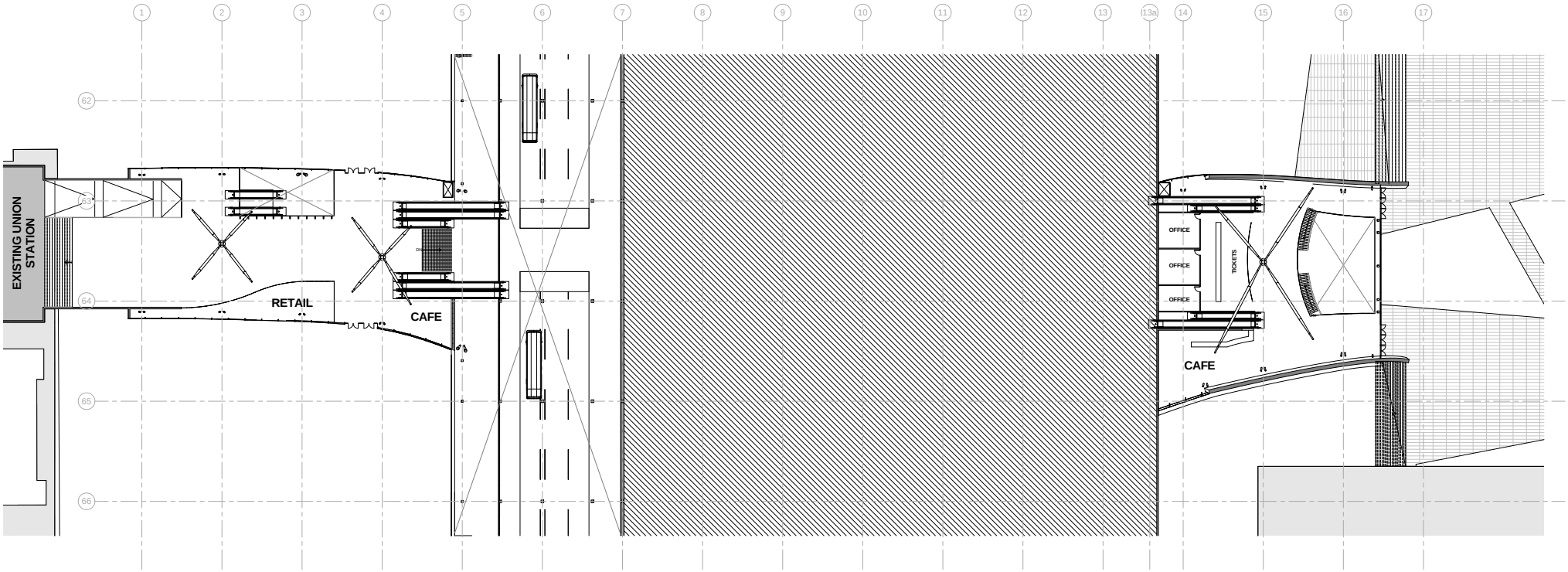
The final design of the building is one that has evolved over many different tests and iterations. The final form of the building responds to many different site conditions. The building connects to the existing Union Station respectfully. From there the building climbs the tracks to create a new concourse and waiting area. On the north side, in the center of the building, the form is raised to create a large glass facade that is also the terminus of the main north public plaza. This form of the building is also curved in response to this plaza. This plaza is intended to be the major public plaza since it houses the market and event/ exhibition program. On the south side the form of the building is lowered to avoid a large glass facade exposed to the sun. The form then curves back to form a new entrance condition on the side of the site, one that connects with the streetfront and the new residential neighborhood beyond. The materiality of the building is meant to be very simple and industrial-like with the materials of the plaza responding more to the local California material palette.



4' 8' 16' 32' 64' 128'

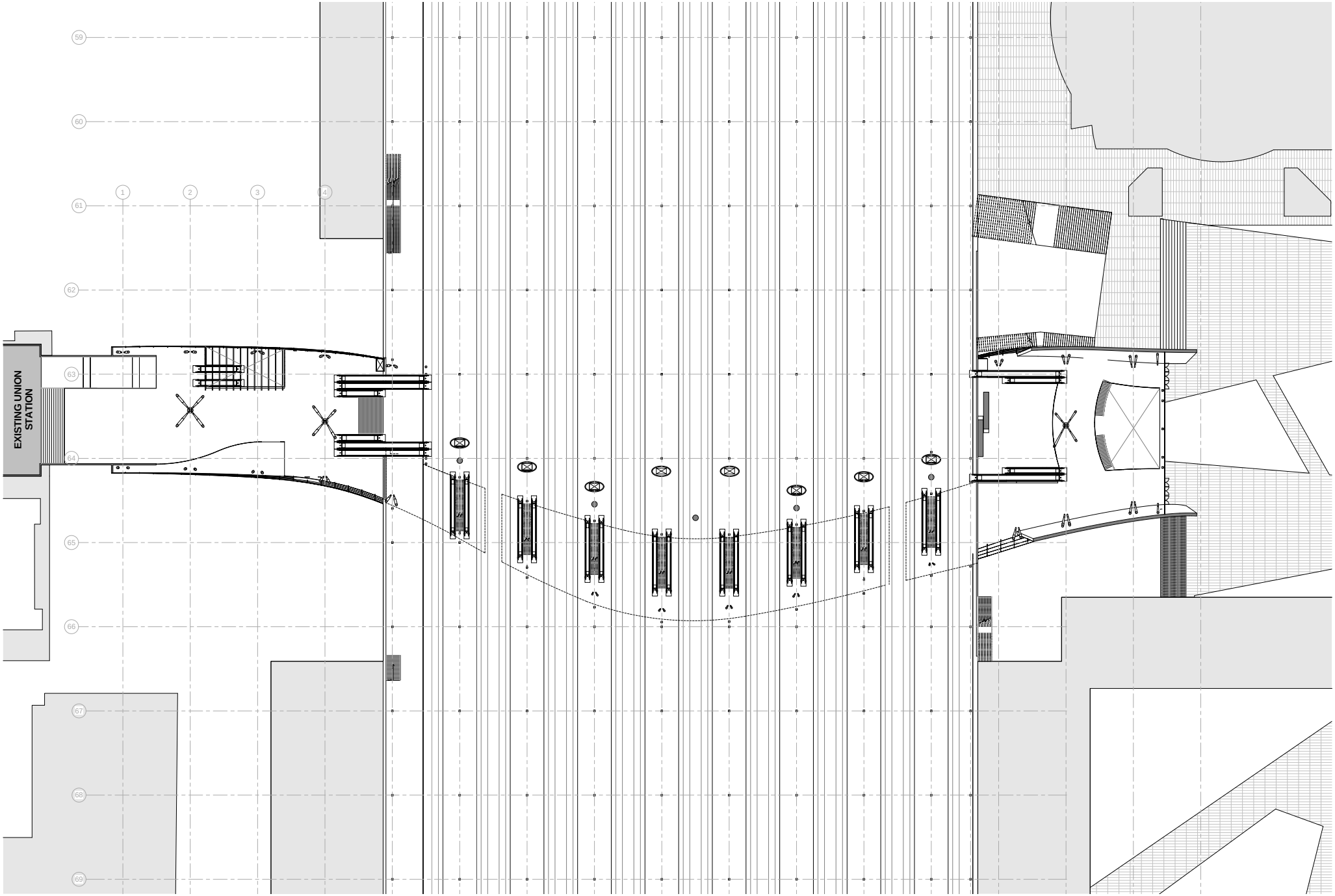
BUS PLATFORM PLAN

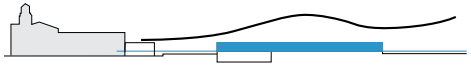

UNION STATION EAST

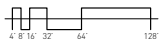


GROUND LEVEL PLAN

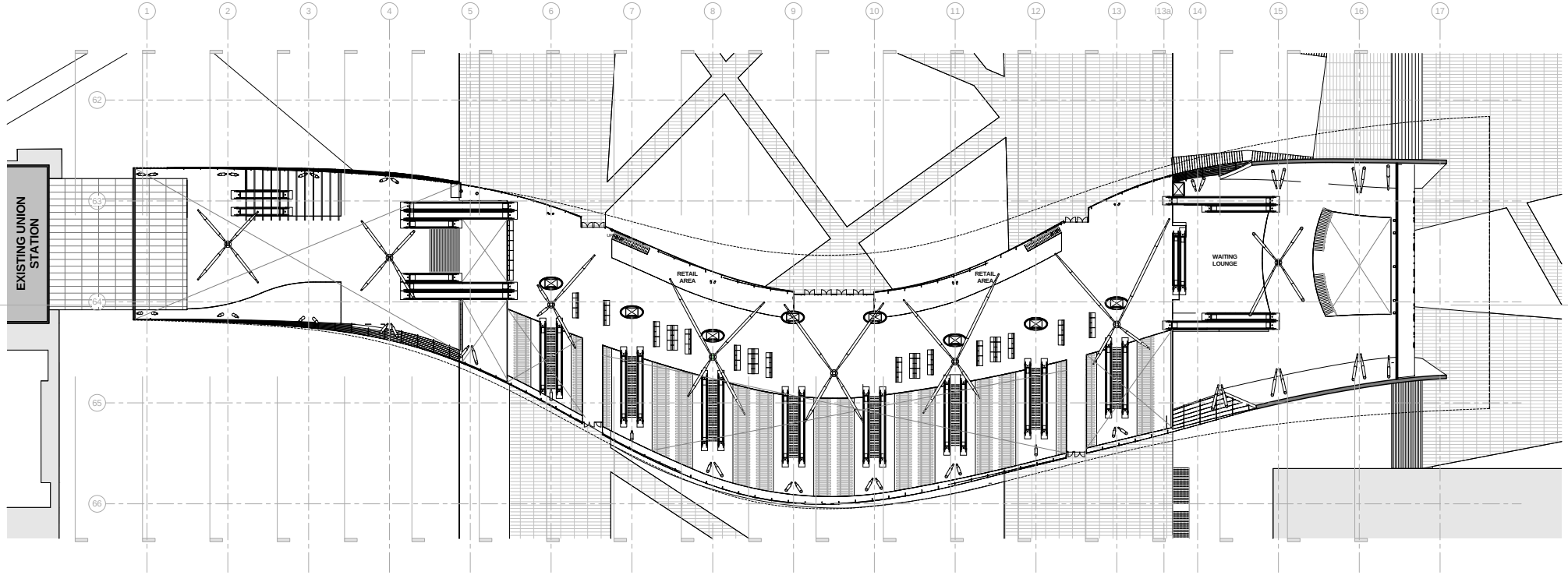

Metro
Union Station

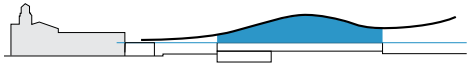


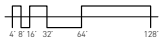




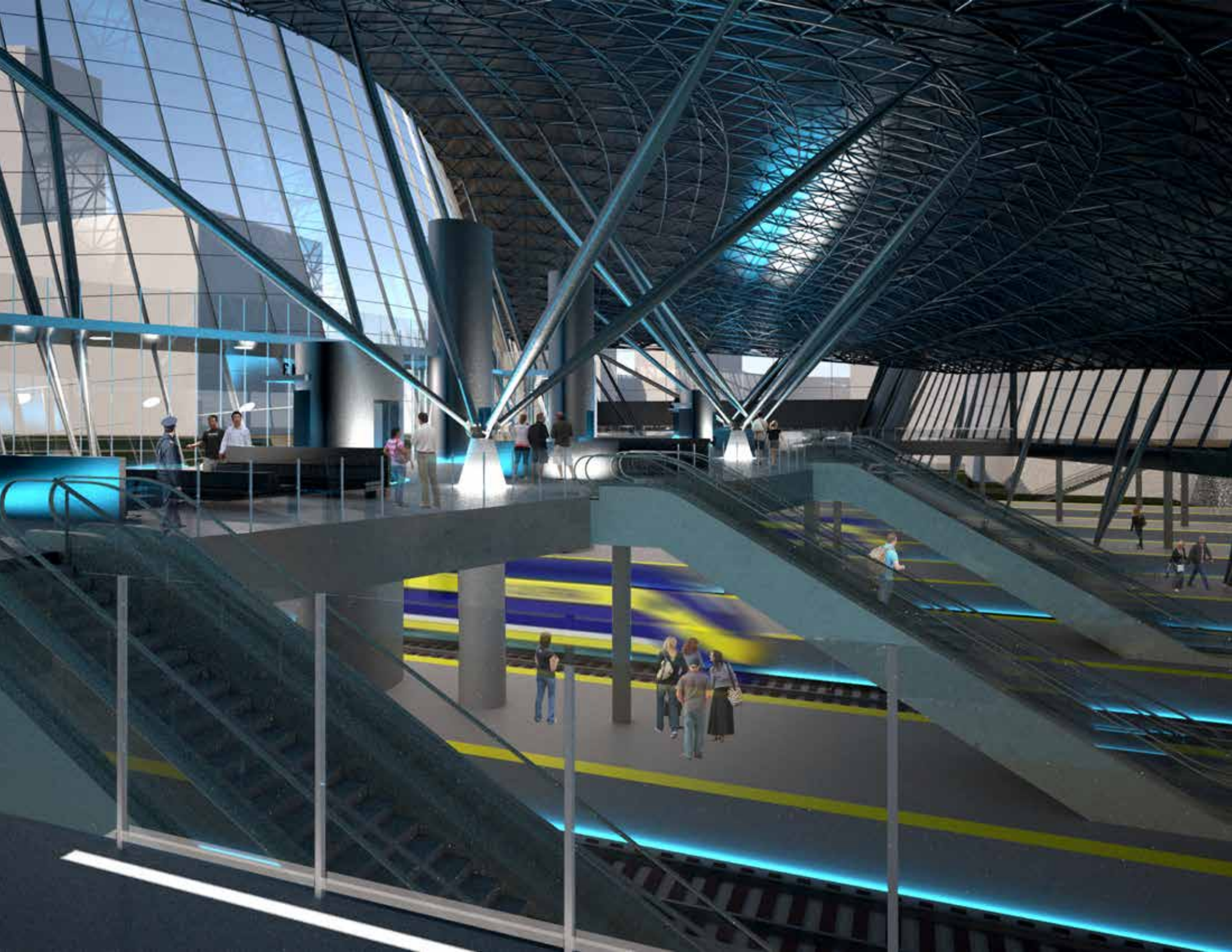
TRACK PLATFORM PLAN

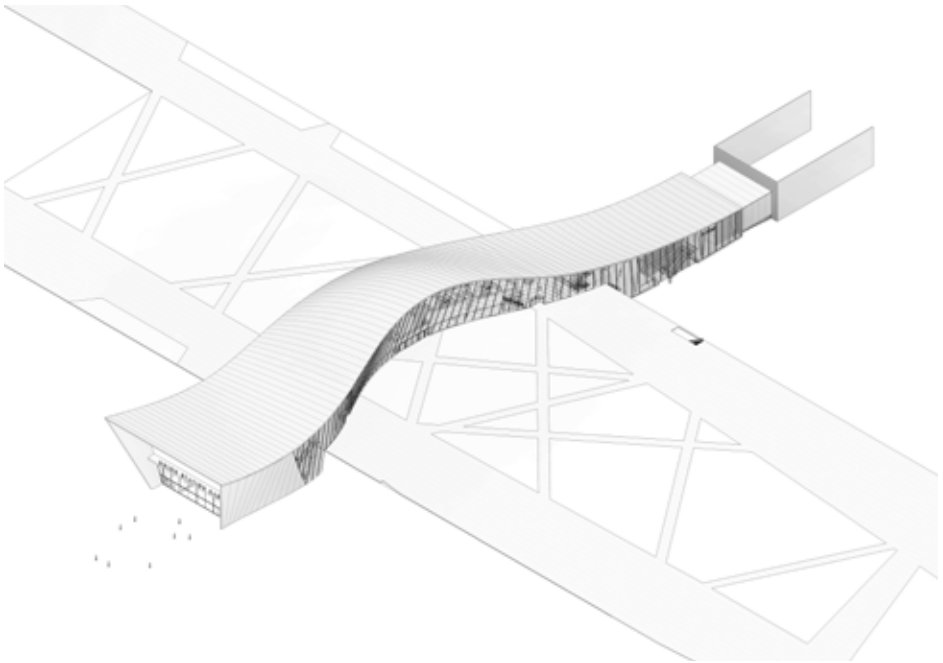




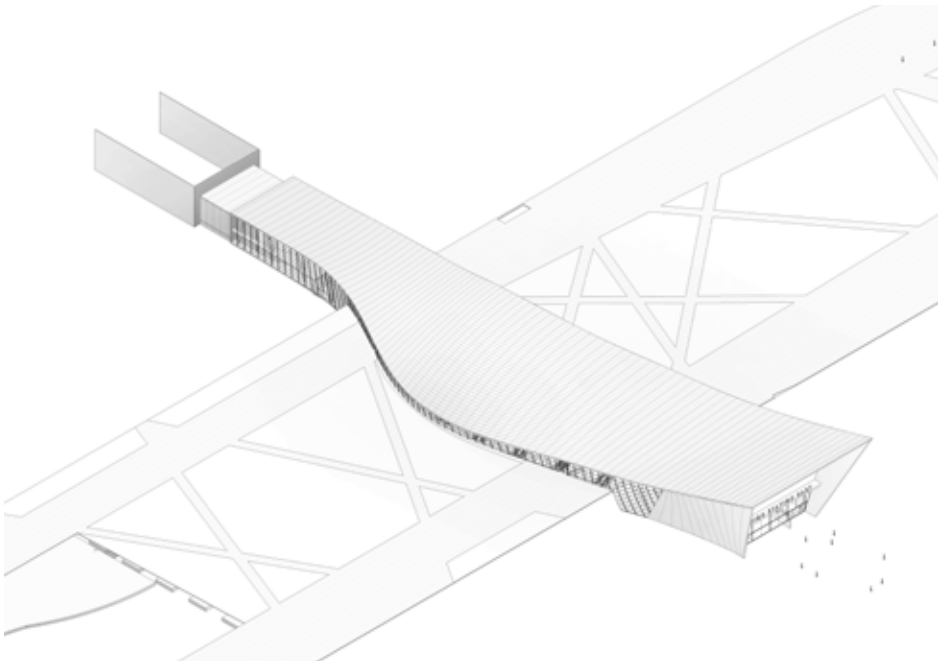


CONCOURSE PLAN

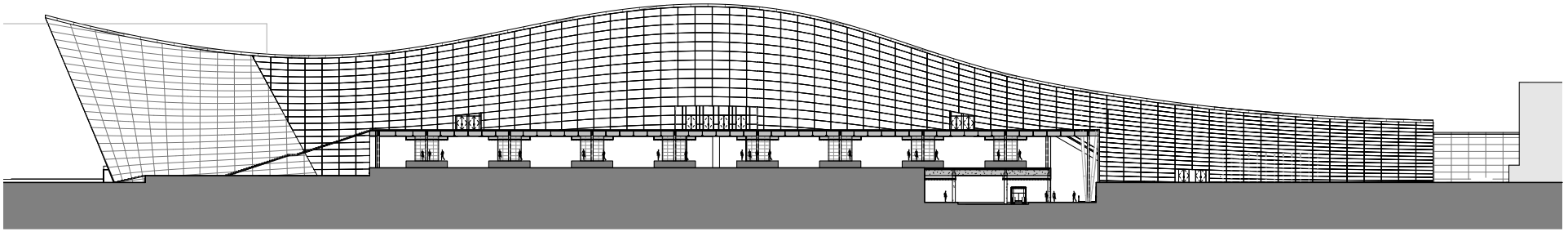




NORTHEAST AXONOMETRIC

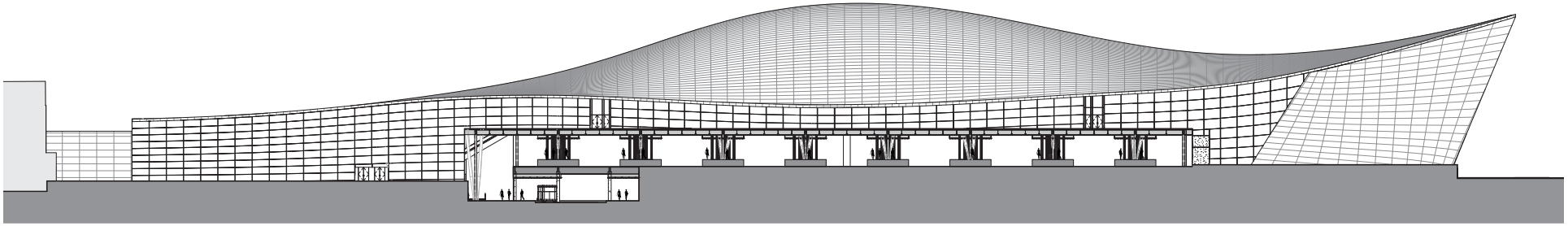


SOUTHEAST AXONOMETRIC



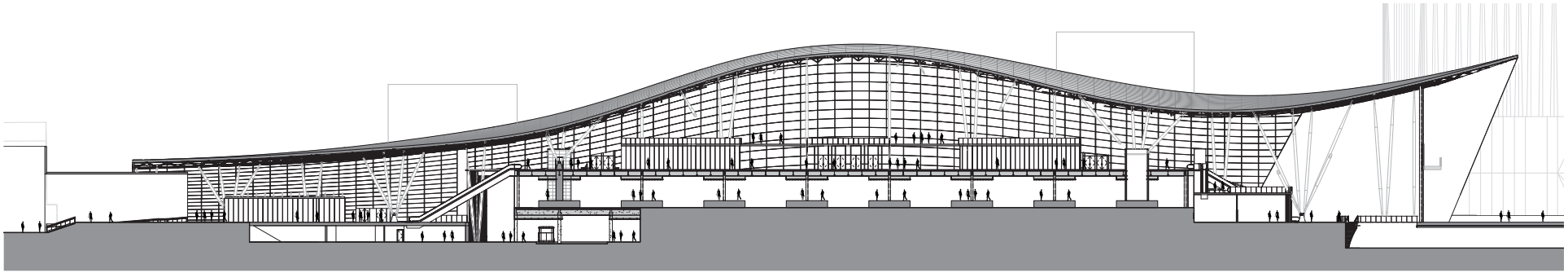
4' 8' 16' 32' 64' 128'

NORTH ELEVATION



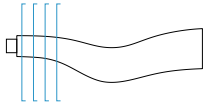
4' 8' 16' 32' 64' 128'

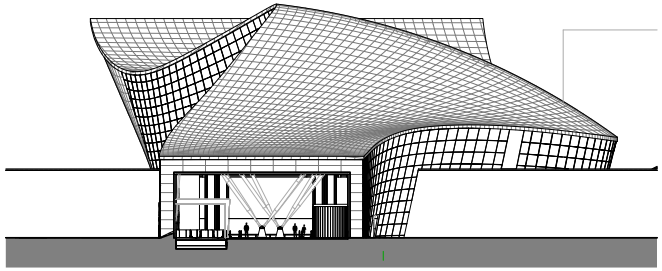
SOUTH ELEVATION

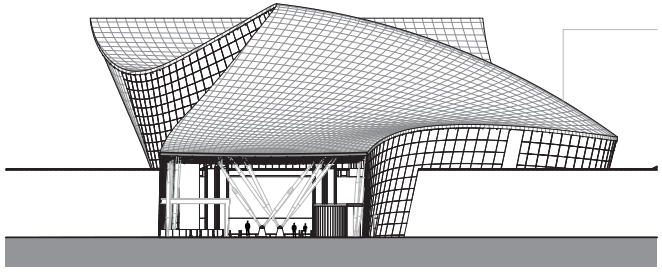


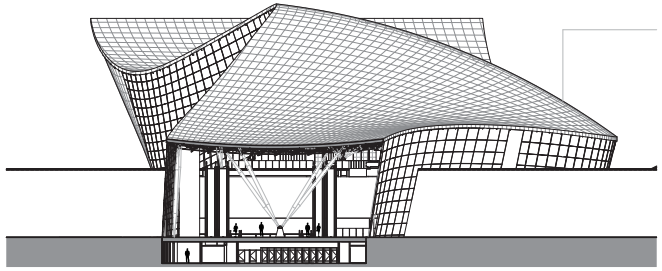
4' 8' 16' 32' 64' 128'

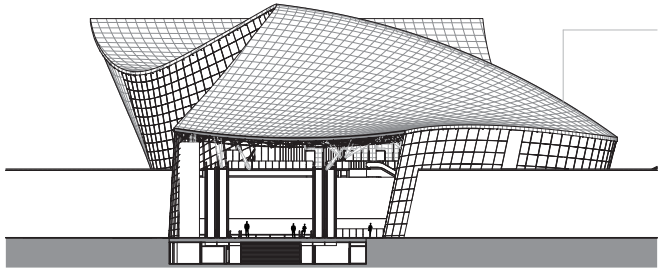
LONGITUDINAL SECTION

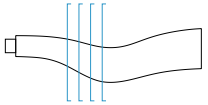


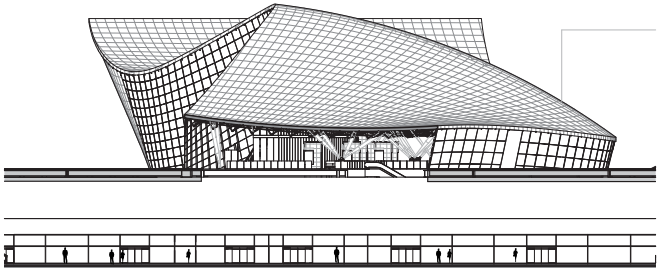


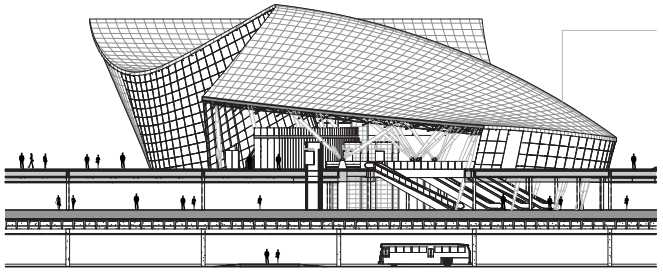


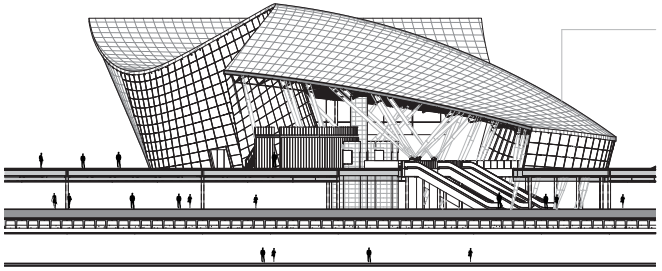


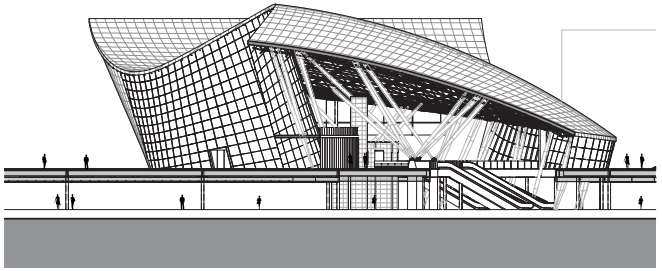


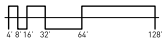


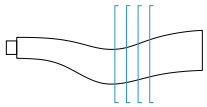


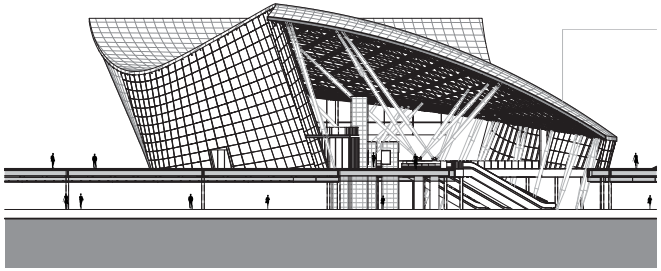


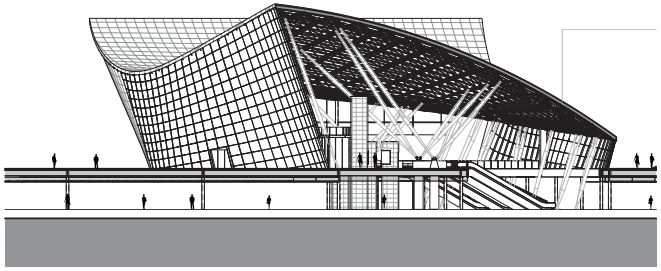


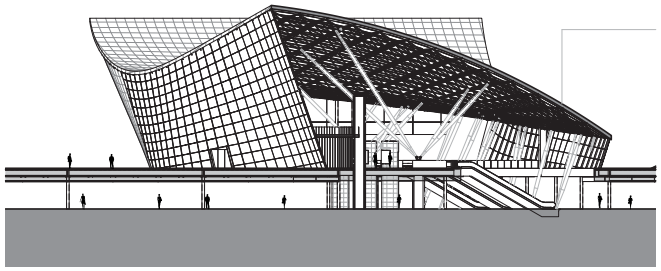


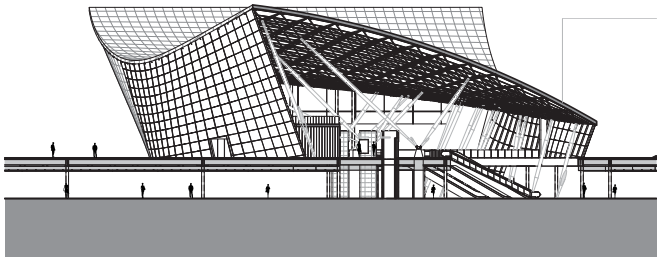

4'
8'
16'
32'
64'
128'

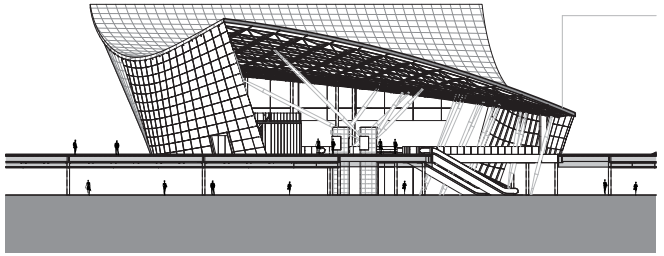


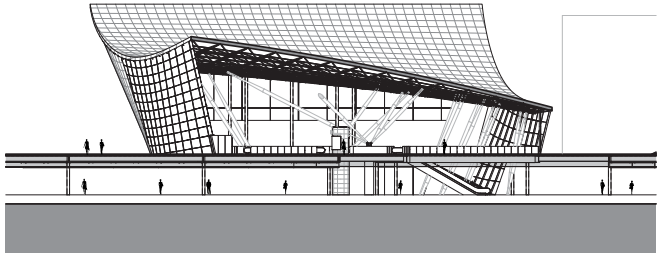


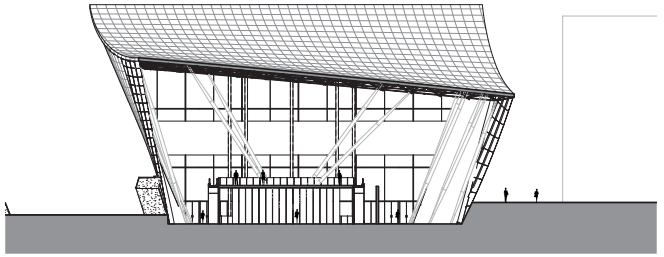


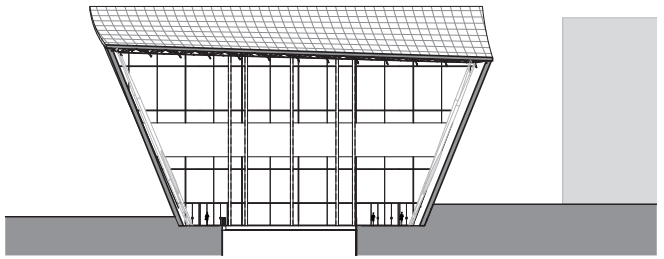


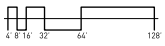




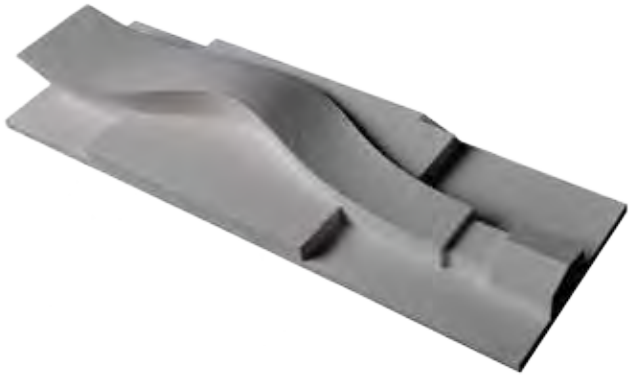


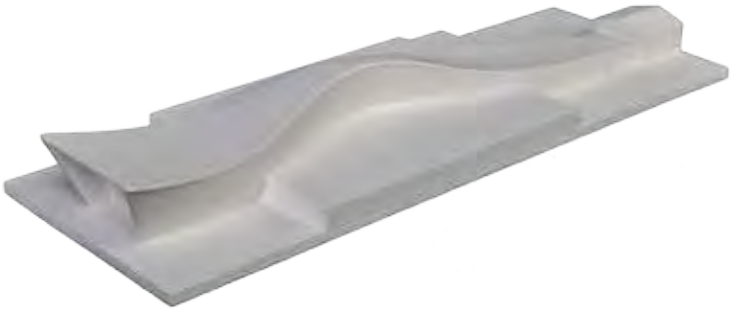





4'
8'
16'
32'
64'
128'

PHYSICAL MODELS





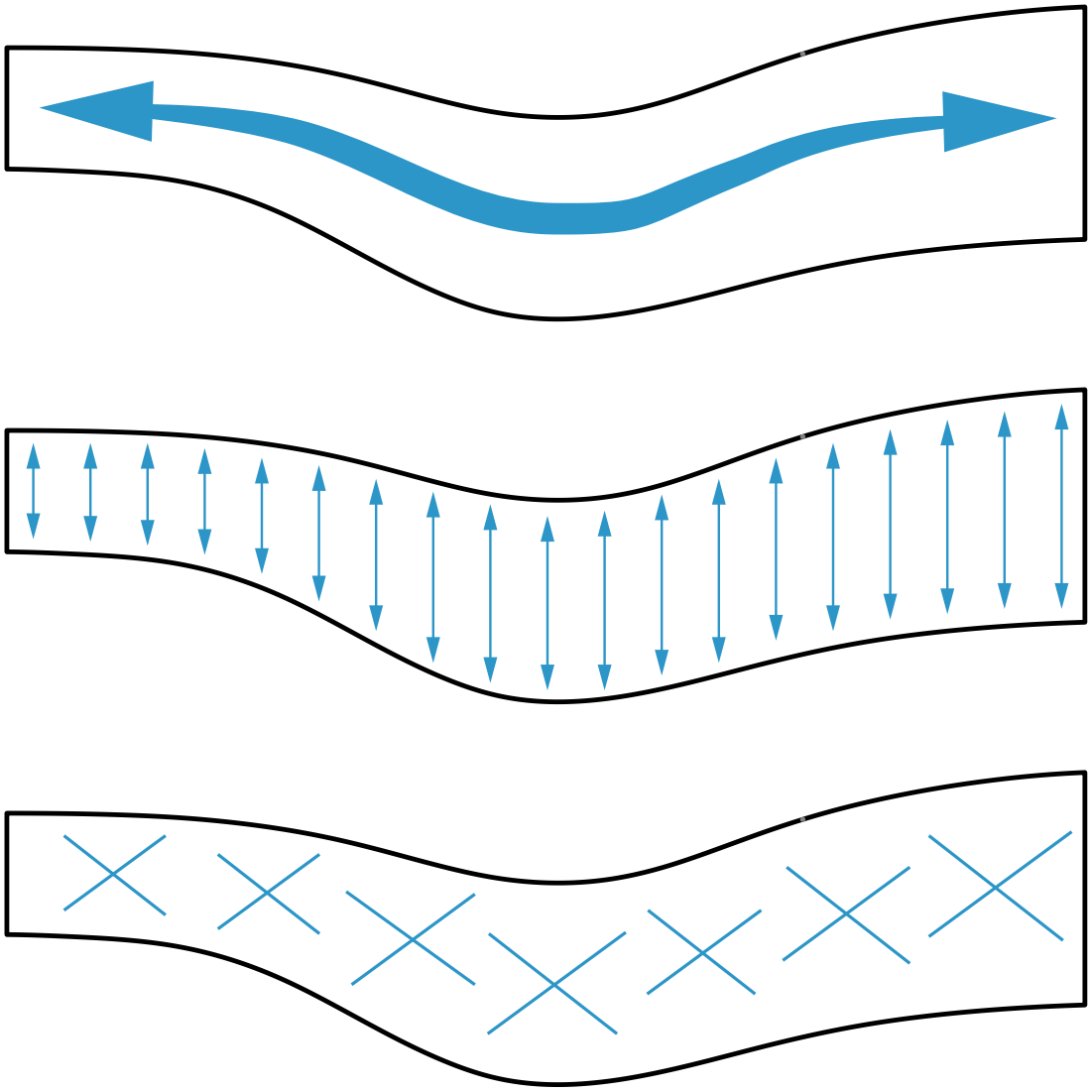
TECHNICAL SOLUTIONS

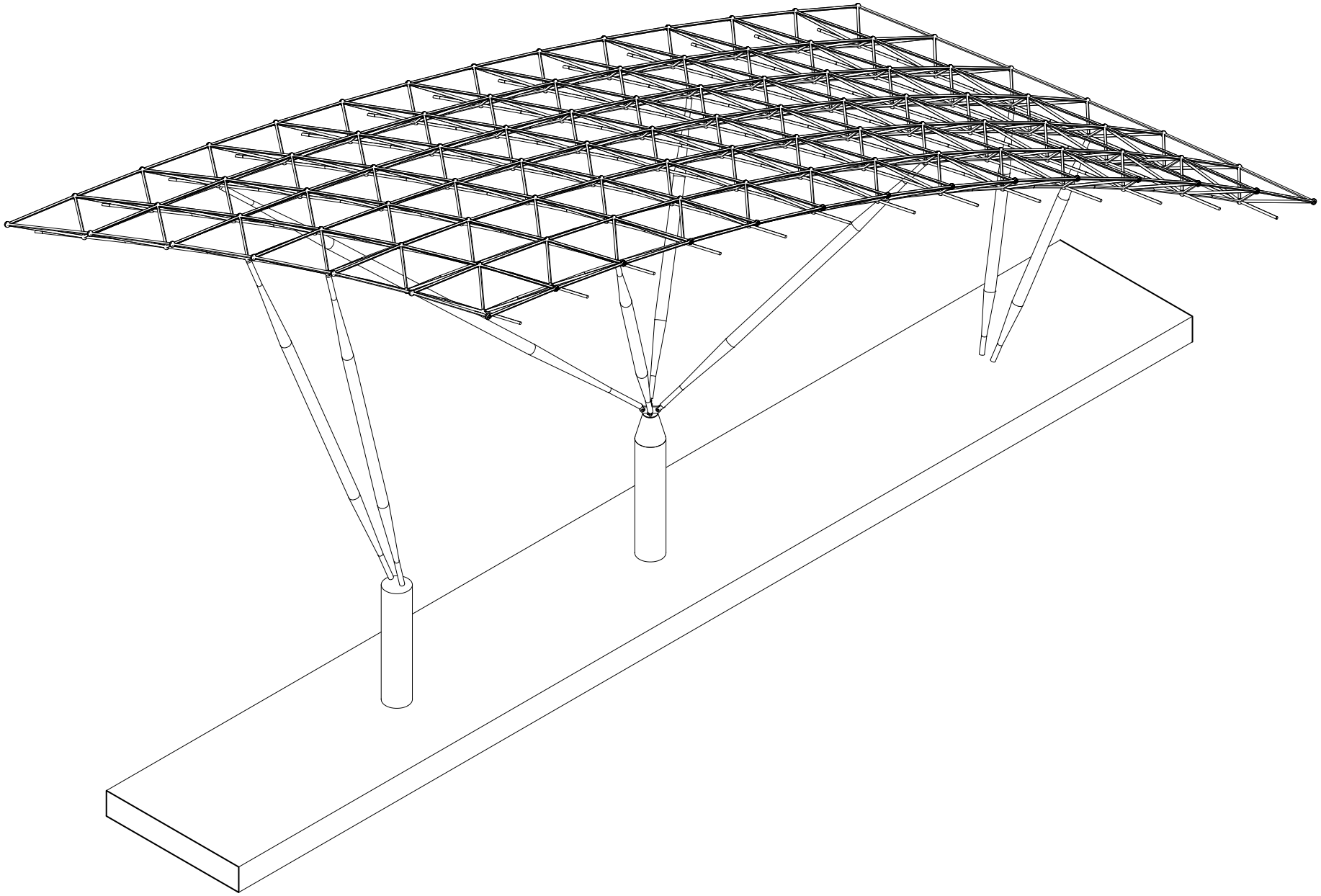
STRUCTURE - SEISMIC - OCCUPANCY - PARKING

09

STRUCTURAL SYSTEM
CONCEPT

With such a free-form and curvilinear form, a structural system had to be devised that would work with the form and not take away from it. The intention of the space was to be as open as possible, to allow for the form to flow freely without interruption. In order to allow for this a space frame system was devised to frame the roof of the building. The space frame would flow with the form of the building, allowing it to take on forms that would not be possible with a conventional framing system. It was decided that the system would be structured on the short axis of the building with columns lining the glass facade. Due to the large spans present, additional support was necessary in the center of the form. These supports took the form of tree columns. These columns were sculpted in "cigar" columns, round columns with tapered ends. These columns added an interesting sculptural element to the building and worked with the form.





STRUCTURAL SYSTEM
PRECEDENT

Extensive research was done on structural systems that supported forms similar to the one present for the Union Station addition. The Heydar Aliyev Cultural Center by Zaha Hadid uses a space frame as its main structural element. The challenge was to construct a building that could seal out all of the elements and bear high wind and seismic loads without relying on interior supports columns. The building was engineered using a mathematically based computer analysis. The main structure of the building is a mix of reinforced concrete, steel frame structures, and composite beams and decks. The space frame is composed of a special steel tube and nodes system (MERO-TSK). A special light weight curtain panel system was used as the cladding for the building. This allowed the building to read as a continuous volume.

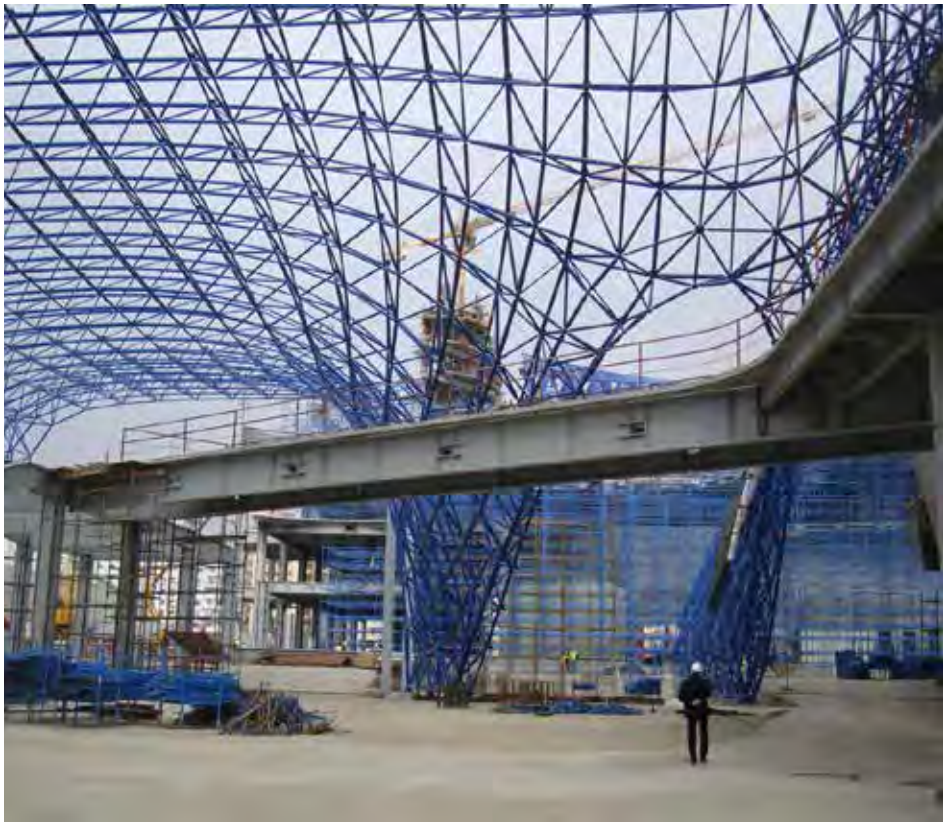
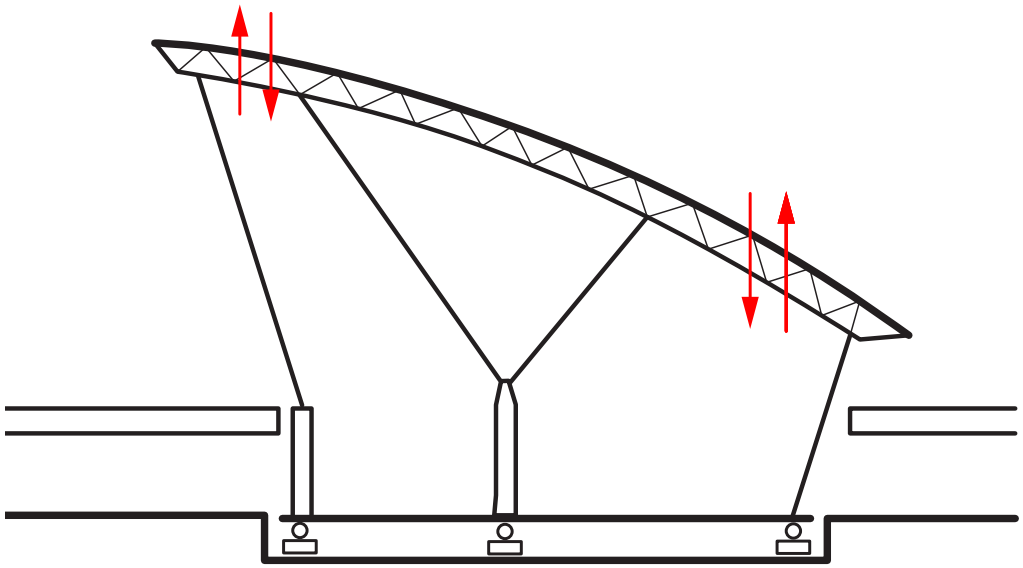


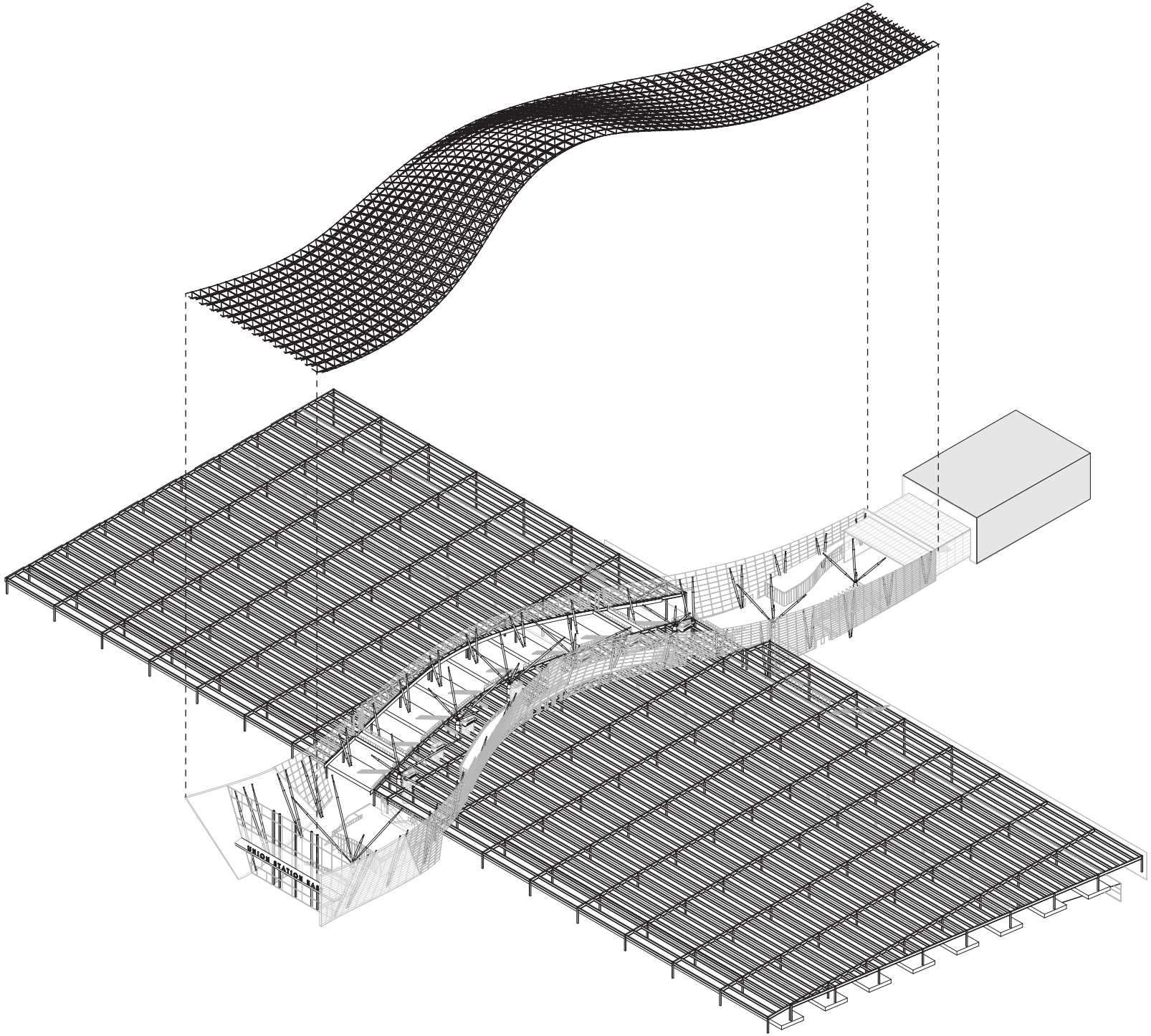
IMAGE: BUILDIPEDIA

STRUCTURAL SYSTEM
BUILDING

Since the building is located in Los Angeles, California - a seismically active zone - special care had to be taken in order for the building to be seismically isolated. The Union Station addition itself is seismically isolated from everything else. It relies on its own structural system, independent from the elevated platform. The steel columns present in the building sit on a concrete base. The concrete base and columns sit on isolators and dampers that isolate the building in the case of an earthquake. This allows for the building to move and flex during an earthquake, minimizing damage. The Union Station is separated from the adjacent platform structure through movement joints.



STRUCTURAL & SEISMIC ISOLATION


UNION STATION BAR

STRUCTURAL SYSTEM
PLATFORM

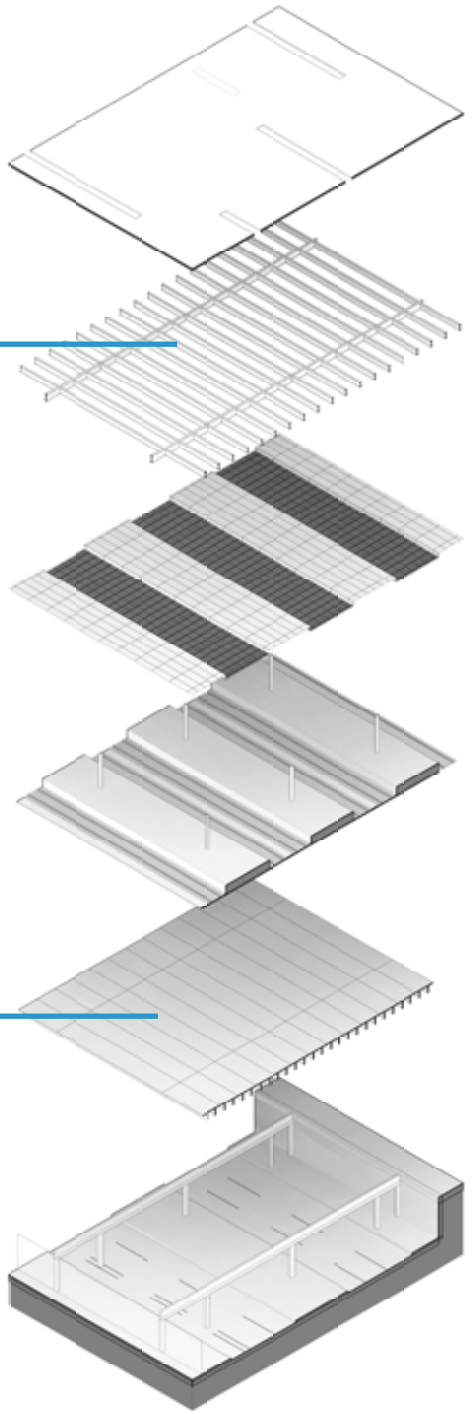
The elevated platform, train platforms, and bus platforms are made up of a traditional framing system. The elevated platform is supported through a steel framing system while the bus platform level is supposed through precast concrete structure due to the heavy load of trains. All of the proposed buildings on the platform would have an independent structure from the platform itself. Research was done into precedents like the Hudson Yards development in New York City to see how similar situations handle this structurally. The platform structure would be similar to Hudson Yards with steel spanning above the tracks and buildings having their own independent structural system.

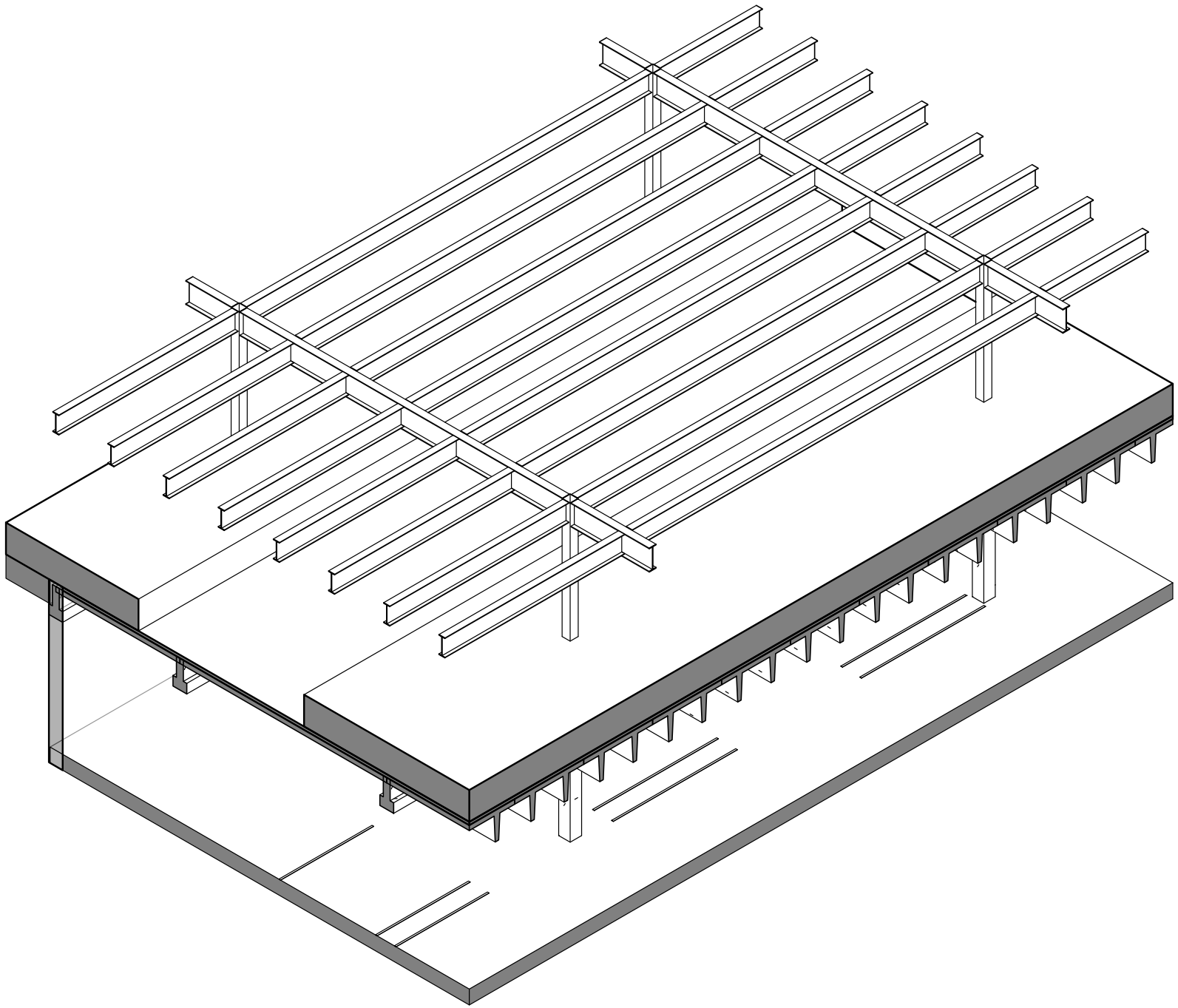
TRAIN PLATFORM LEVEL

STEEL STRUCTURE
4" CONCRETE SLAB ON 2" METAL DECK
W36 STEEL GIRDERS
W30 STEEL BEAMS
SUSPENDED METAL BLADE CEILING
SUSPENDED METAL PANEL CEILING
HSS14 STEEL COLUMN
CONCRETE PLATFORMS

BUS PLATFORM LEVEL

PRECAST CONCRETE STRUCTURE:
5" CONCRETE TOPPING SLAB
PRECAST CONCRETE DOUBLE TEES
INVERTED CONCRETE T-BEAMS
PRECAST CONCRETE COLUMNS
CONCRETE PLATFORMS





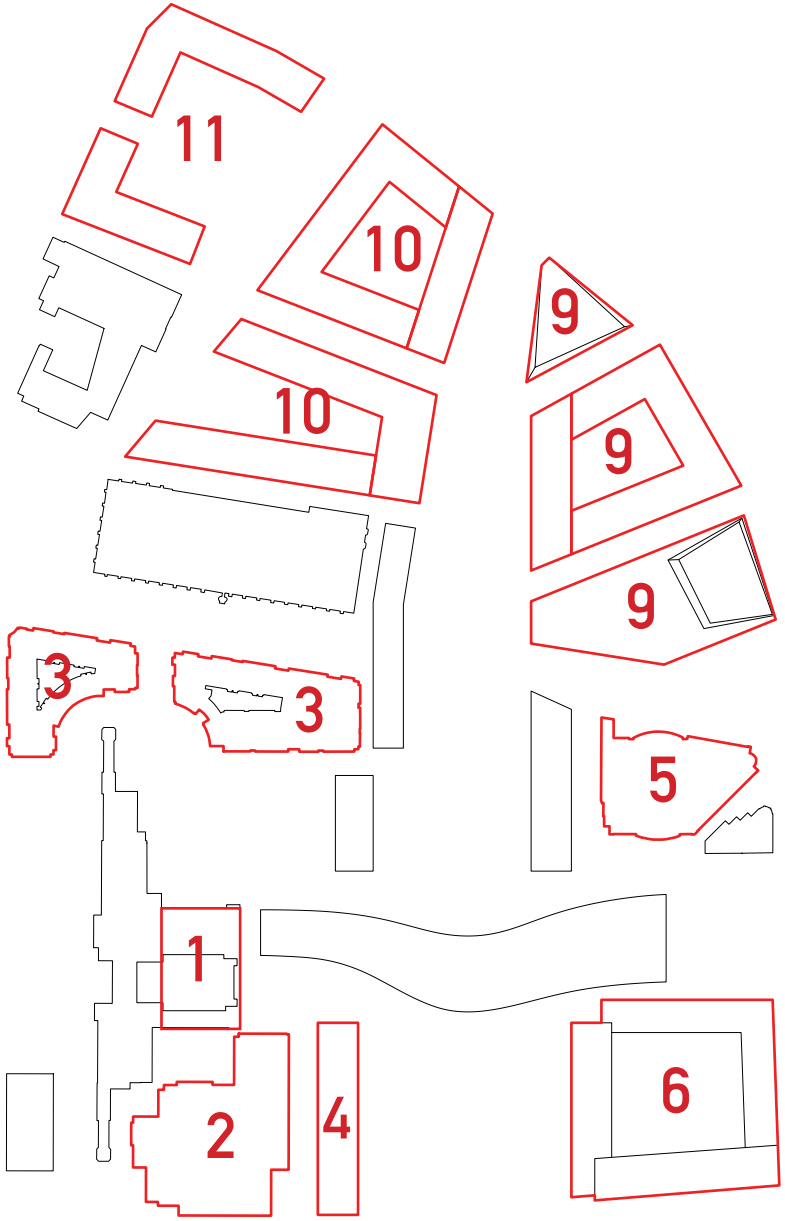
PARKING

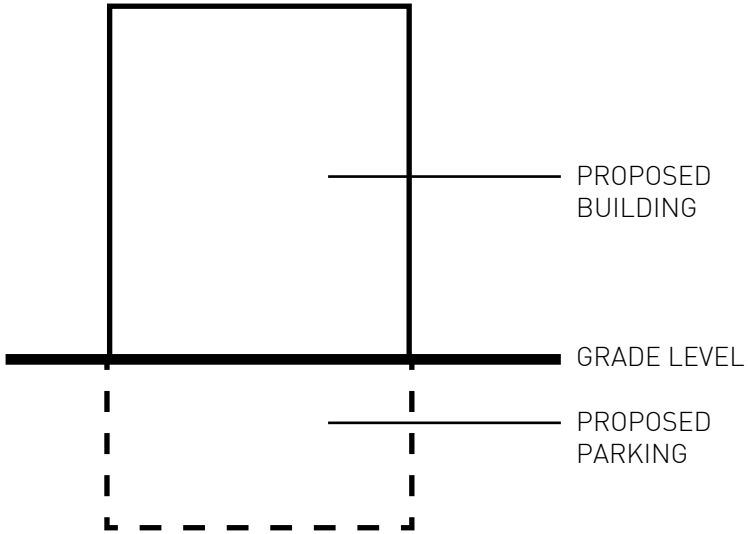
Even though the goal of the Los Angeles Union Station transit-oriented development is to reduce dependence on the automobile, it cannot be ignored completely. When planning for parking, transit-oriented development parking guidelines were used which typically call for much less parking than normal. All of the proposed parking spaces would be located underground. The number of spots needed is based directly off of the uses present on the site along with the gross square footage of those uses. The result is a need for 13,055 spots, The proposed parking scheme calls for 13,900 spots, providing some extra leeway.

PARKING COUNT

1	UNION STATION	1000 SPOTS
2	METROPOLITAN WATER DISTRICT HQ	1000 SPOTS
3	MOZAIC APARTMENTS	300 SPOTS
4	UNION STATION ADDITION / HOTEL	600 SPOTS
5	GATEWAY CENTER	1200 SPOTS
6	RESIDENTIAL COMPLEX	1600 SPOTS
7	PIPER TECHNICAL CENTER	800 SPOTS
8	RESIDENTIAL COMPLEX EAST	2000 SPOTS
9	RESIDENTIAL / MIXED USE	2000 SPOTS
10	RESIDENTIAL COMPLEX	1700 SPOTS
11	RESIDENTIAL COMPLEX	700 SPOTS
12	SOUTH TOWER COMPLEX	1000 SPOTS

TOTAL SPOTS: **13,900 SPOTS**
REQUIRED: **13,055 SPOTS**


11
10
10
9
9
9
3
3
5
1
8
8
6
2
4
7
12


PROPOSED
BUILDING
GRADE LEVEL
PROPOSED
PARKING

BIBLIOGRAPHY

ANNOTATED BIBLIOGRAPHY - CITATIONS - SOURCES

10

WORKS CITED

Arrington, G.B., and John Boroski. "Portland's TODs: Building Community on a Regional Scale." In Transit-Oriented Development in the United States: Experiences, Challenges, and Prospects, 355-379. Washington, D.C.: Federal Transit Administration, 2004.

Blow, Christopher J. Transport Terminals and Modal Interchanges: Planning and Design. Oxford: Elsevier, 2005. Print.

Castroni, Marco."A New Infrastructure, Los Angeles" 17 Apr 2009. ArchDaily. Accessed 02 Sep 2014. ←http://www.archdaily.com/?p=17645→

Cervero, Robert. The Transit Metropolis: A Global Inquiry. Washington, D.C.: Island Press, 1998.

Cervero, Robert, Nicole Witenstein, Janet Smith-Heimer, Ron Golem, Paul Peninger, Eric Nakajima, and Ener Chui. "Washington, D.C.: Model for the Nation." In Transit-Oriented Development in the United States: Experiences, Challenges, and Prospects, 229-260. Washington, D.C.: Federal Transit Administration, 2004.

Cityplanning.lacity.org,. 2015. 'Department Of City Planning'. Accessed January 15 2015. http://cityplanning.lacity.org/.

Curbed LA,. 2015. 'Mapping Los Angeles's Non-Car Commuters By Neighborhood'. Accessed January 15 2015. http://la.curbed.com/archives/2014/03

Dezeen,. 2014. 'Rotterdam Centraal Station Reopens After Renovation By Benthem Crouwel'. Accessed January 15 2015. http://www.dezeen.com/2014/03/22/rotterdam-centraal-station-benthem-crouwel-mvsa-architects-west-8/.

"Denver Union Station / SOM" 20 May 2014. ArchDaily. Accessed 10 Jun 2014. ←http://www.archdaily.com/?p=506815→

designboom | architecture & design magazine,. 2015. 'Herzog & De Meuron Flinders Street Station Wins Competition'. Accessed January 15 2015. http://www.designboom.com/architecture/herzog-de-meuron-propose-vaulted-flinders-street-station/.

Dispenza, Kristin, and Kristin Dispenza. 2011. 'Zaha Hadid'S Heydar Aliyev Cultural Centre: Turning A Vision Into Reality - Buildipedia'. Buildipedia.Com. Accessed December 18 2014. http://buildipedia.com/aec-pros/from-the-job-site/zaha-hadids-heydar-aliyev-cultural-centre-turning-a-vision-into-reality.

Dittmar, Hank, and Gloria Ohland. The New Transit Town: Best Practices in Transit-Oriented Development. Washington, D.C.: Island Press, 2004.

Encouraging Transit-Oriented Development: Case Studies That Work. United States Environmental Protection Agency, 2009.

Furuto, Alison. "The Flinders Street Station Winning Proposal / HASSELL + Herzog & de Meuron" 08 Aug 2013. ArchDaily. Accessed 02 May 2014. ←http://www.archdaily.com/?p=413042→

Fta.dot.gov,. 2015. 'FTA - Planning & Environment/NEPA - Transit-Oriented Development'. Accessed January 15 2015. http://www.fta.dot.gov/12347_6932.html.

Gerkan, Meinhard Von. Architektur Für Den Verkehr = Architecture for Transportation. Basel: Birkhäuser Verlag, 1997. Print.

Gipe, Andrew. 2014. 'VIDEO: Elegance In Motion At Calatrava'S Liège-Guillemins Railway Station In Belgium'. Archdaily. Accessed January 15 2015. http://www.archdaily.com/476994/video-elegance-in-motion-at-calatrava-s-liege-guillemins-railway-station-in-belgium/.

GIS-NET3 Planning and Zoning Information. 2015. Accessed January 15 2015. http://rpgis.isd.lacounty.gov/GIS-NET3_Public/Viewer.html.

Jones, Will. New Transport Architecture. London: Mitchell Beazley, 2006. Print.

Lapl.org,. 2015. 'Map Collection | Los Angeles Public Library'. Accessed January 15 2015. http://www.lapl.org/collections-resources/visual-collections/map-collection.

Librarian, Metro. 2011. '72 Years Ago Today, Union Station Is Born: The Story And Photos From The Citywide Fight Over A Central Rail Terminal'. Metro's Primary Resources. Accessed January 15 2015. http://metroprimaryresources.info/72-years-ago-today-union-station-is-born-the-story-and-photos-from-the-citywide-fight-over-a-central-terminal-public-transit-plan/1169/.

Metro.net,. 2015. 'Los Angeles Union Station Master Plan'. Accessed January 15 2015. http://www.metro.net/projects/LA-union-station/

Musicant, Marlyn, William Deverell, Matthew W. Roth, and Marlyn Musicant. Los Angeles Union Station. Print.

Nacto.org,. 2015. 'Urban Street Design Guide | NACTO'. Accessed January 15 2015. http://nacto.org/usdg/.

National Community Development Association. Transit Oriented Development in Boston. San Francisco, 2007

Pollack, Stephanie. On the Right Track: Meeting Greater Boston's Transit and Land Use Challenges. Boston: Urban Land Institute Boston District Council, 2006.

"Rotterdam Centraal / Team CS" 13 Nov 2013. ArchDaily. Accessed 02 May 2014. ←http://www.archdaily.com/?p=447649

Smith-Heimer, Janet, Ron Golem, Paul Peninger, Eric Nakajima, Ener Chui, Robert Dunphy, Mel Myers, and Shannon McKay. "TOD in Boston: An Old Story with a New Emphasis." In Transit-Oriented Development in the United States: Experiences, Challenges, and Prospects, 183-205. Washington DC: Federal Transit Administration, 2004.

Stevens, Phillip. "TOP 10 Transportation Hubs of 2013 - Designboom | Architecture & Design Magazine." Designboom Architecture Design Magazine TOP 10 Transportation Hubs of 2013 Comments. Designboom, 31 Dec. 2013. Web. 22 Apr. 2014.

Vincent, William, and Lisa Jerram. Bus Rapid Transit and Transit Oriented Development: Case Studies on Transit Oriented Development Around Bus Rapid Transit Systems in North America and Australia. Washington, D.C.: Breakthrough Technologies Institute, 2008.

Zimas.lacity.org,. 2015. ' ZIMAS '. Accessed January 15 2015. http://zimas.lacity.org/.

Page 3 Image: COMMONS.WIKIPEDIA.COM

Page 5 Image: THECARCONNECTION.COM

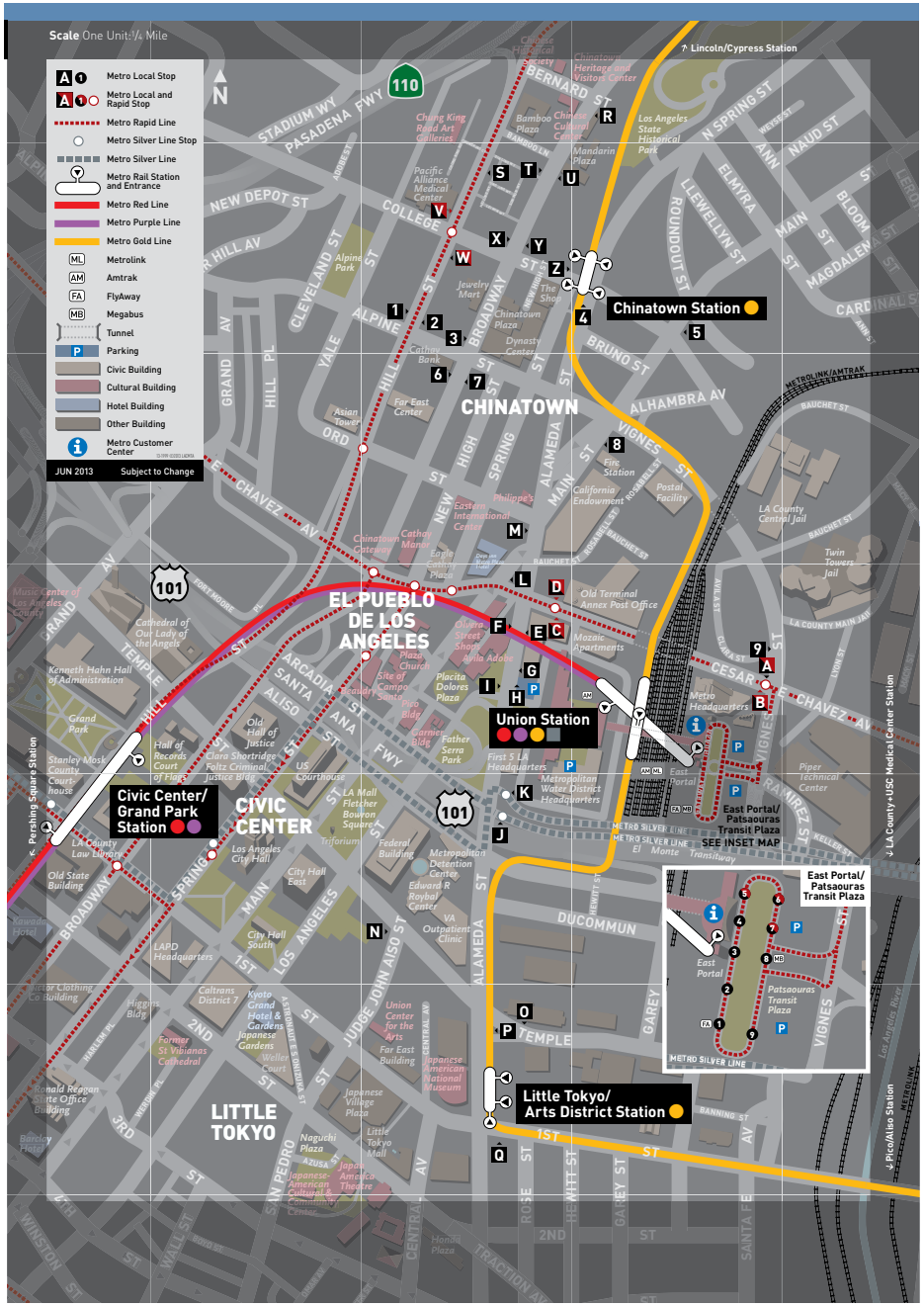
Page 7 Image: LA Metro Authority | Nat Geo. | Schoolofmoxie.com

APPENDIX

RESEARCH - ADDITIONAL INFORMATION - FINAL PRESENTATION BOARDS

11

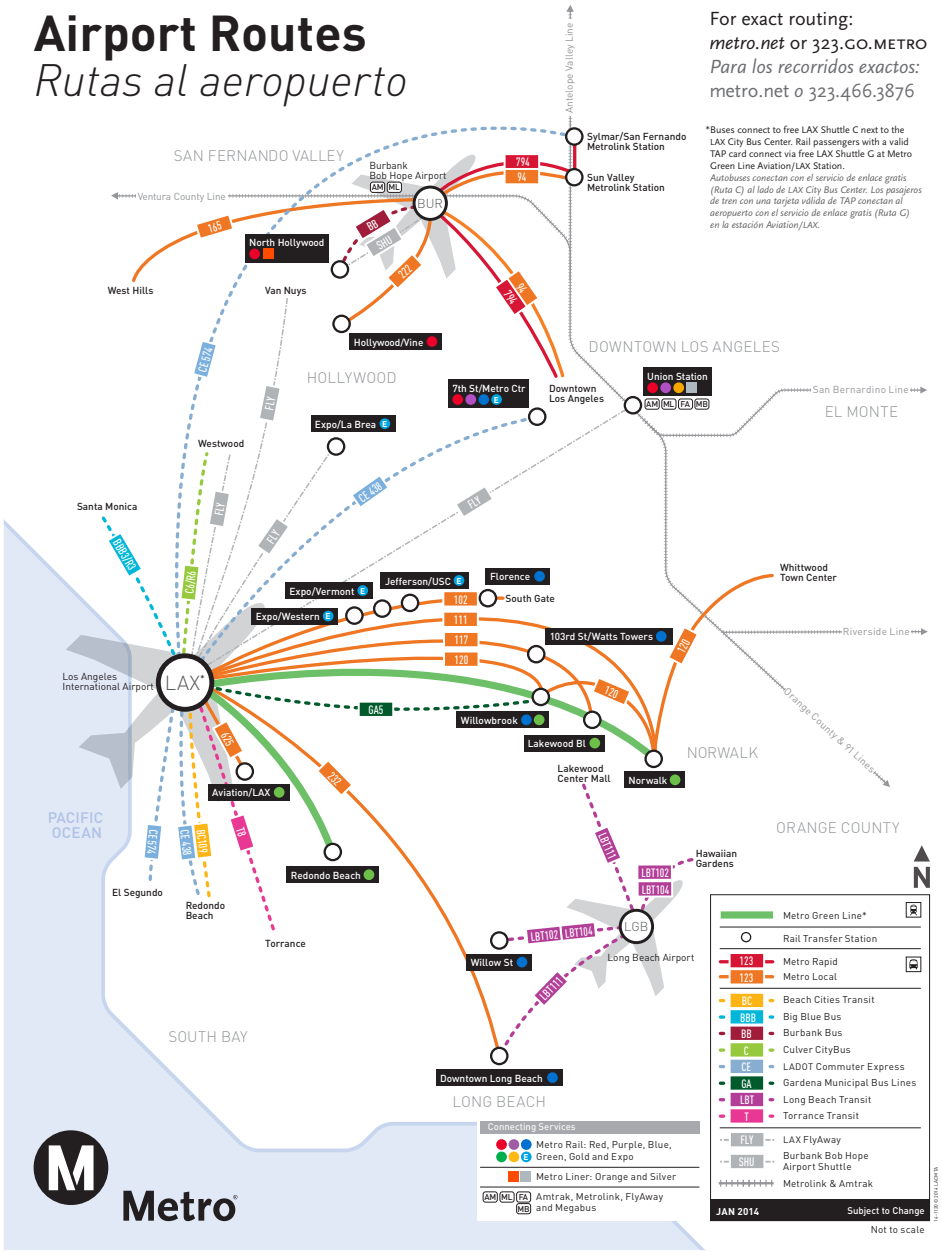
TRANSIT ROUTES



Airport Routes
Rutas al aeropuerto

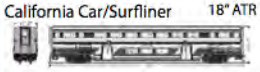
For exact routing:
metro.net or 323.GO.METRO
Para los recorridos exactos:
metro.net o 323.466.3876

*Buses connect to free LAX Shuttle C next to the LAX City Bus Center. Rail passengers with a valid TAP card connect via free LAX Shuttle G at Metro Green Line Aviation/LAX Station.
Autobuses conectan con el servicio de enlace gratis (Ruta C) al lado de LAX City Bus Center. Los pasajeros de tren con una tarjeta válida de TAP conectan al aeropuerto con el servicio de enlace gratis (Ruta G) en la estación Aviation/LAX.



AMTRAK INFORMATION

Passenger Cars

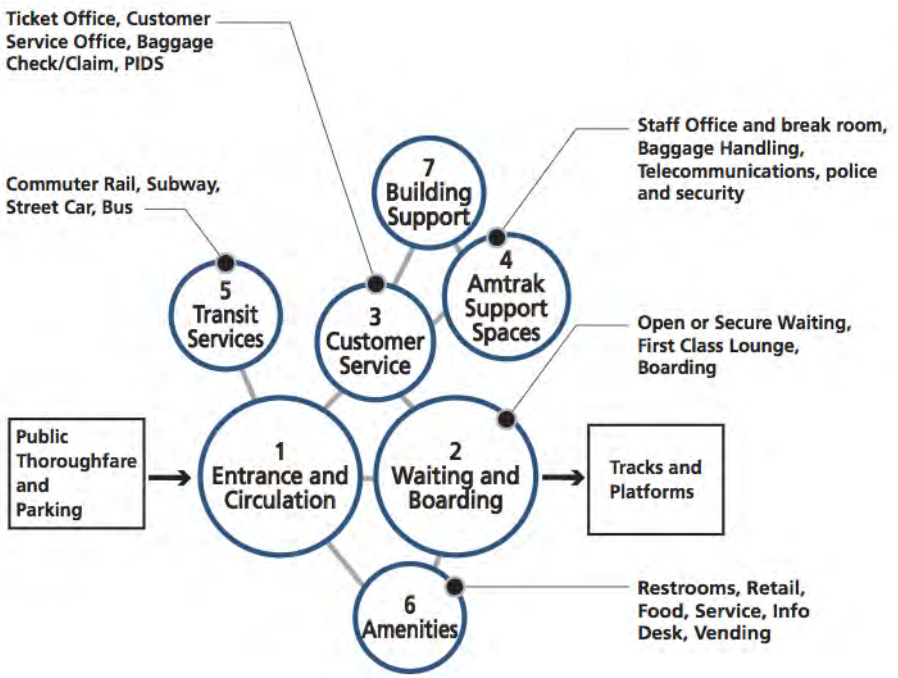
Name	Deck Height	Dimensions	Occupancy Per Car	Location Used	Other
Bi-Level Passenger Cars					
Superliner 	18" ATR	85'L, 16'H, 10'W	74 coach/ 40 sleeper	Long Distance Routes not out of New York or Boston	Variations include sleeper, diner, lounge, baggage, coach, arcade
California Car/Surfliner 	18" ATR	85'L, 16'H, 10'W	70 – 90	California	Provides extendable wheelchair lift. Two sets of automatic doors speed passenger boarding. Owned by the state of California.
Single-Level Passenger Cars					
Amfleet 	51" ATR	85'L, 13'H, 10'W	60–70	East Coast	Traps in vestibule enables car to serve low level platforms
Horizon 	51" ATR	85'L, 13'H, 10'W	60–70	Michigan, Missouri Wisconsin, Illinois	Traps in vestibule enables car to serve low level platforms
North Carolina Coach 	51" ATR	85'L, 13'H, 10'W	55–65	North Carolina	Traps in vestibule enables car to serve low level platforms, owned by NCDOT Rail Division
Viewliner Sleeper 	51" ATR	85'L, 14'H, 10'W	30	East Coast	Traps in vestibule enables car to serve low level platforms, extra windows for person in top bunk
Acela 	51" ATR	85'L, 14'H, 10'W	299 (Per Trainset)	Northeast Corridor	Only service with first class seating Tilts to go around curves faster
Talgo 	24" ATR	43'L, 11'H, 10'W	269 (Per Trainset)	Pacific Northwest	Tilts to go around curves faster. Provides extendable wheelchair lift and extendable step. Owned by the State of Washington.

Locomotives

Name	Type	Dimensions	Top Speed	Location Used	Other
Acela Power Car 	Electric	69' L, 14' H, 10' W	150 mph	Northeast Corridor	Fastest locomotives in the country
AEM 7 	Electric	51' L, 14' H, 10'W	125mph	Northeast Corridor, Keystone Corridor	
HHP 8 	Electric	65' L, 14' H, 10' W	125 mph	Northeast Corridor	
P-42 	Diesel	69' L, 14' H, 10' W	110 mph	Nationwide	Variation used in New York utilizes electric 3rd rail
F59 	Diesel	58' L, 15' H, 10'W	110 mph	California, Oregon, Washington, North Carolina, California	Owned by California, Washington, and North Carolina, which use specific paint schemes

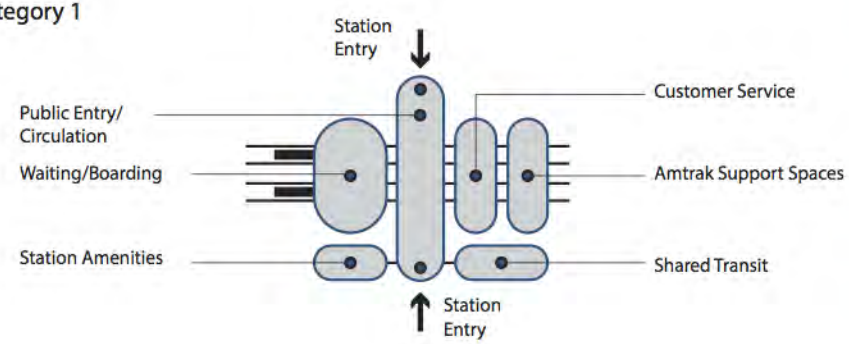
Sample Long Distance Train Consists

Long Distance Routes	Locomotives	Baggage	Diner	Lounge	Coaches/ Sleepers	Length (ft.)
Auto Train	2 Diesels	0	3	2	12 Superliner 34 Autocarrier	4303
California Zephyr	2 Diesels	1	1	1	5 Superliner	818
Capitol Limited	2 Diesels	1	1	1	6 Superliner	903
Cardinal	1 Electric/ 1 Diesel	1	1	0	3 Amfleet 1 Viewliner	575/579
City of New Orleans	1 Diesel	0	1	1	5 Superliner	664
Coast Starlight	2 Diesels	1	1	2	8 Superliner	1158
Crescent	1 Electric/ 2 Diesels	1	1	1	4 Amfleet 2 Viewliner	830/903
Empire Builder	2 Diesels	1	1	1	9 Superliner	1158
Lake Shore Limited	2 Diesels	2	1	1	6 Amfleet 3 Viewliner	1243
Palmetto	1 Electric/ 1 Diesel	1	1	0	4 Amfleet	575/579
Silver Meteor	1 Electric/ 2 Diesel	1	1	1	4 Amfleet 3 Viewliner	915/988
Silver Star	1 Electric/ 2 Diesel	1	1	1	4 Amfleet 2 Viewliner	830/905
Southwest Chief	2 Diesels	1	1	1	6 Superliner	903
Sunset Limited	2 Diesel	1	1	1	6 Superliner	903
Texas Eagle	1 Diesel	0	1	1	8 Superliner	919



AMTRAK INFORMATION

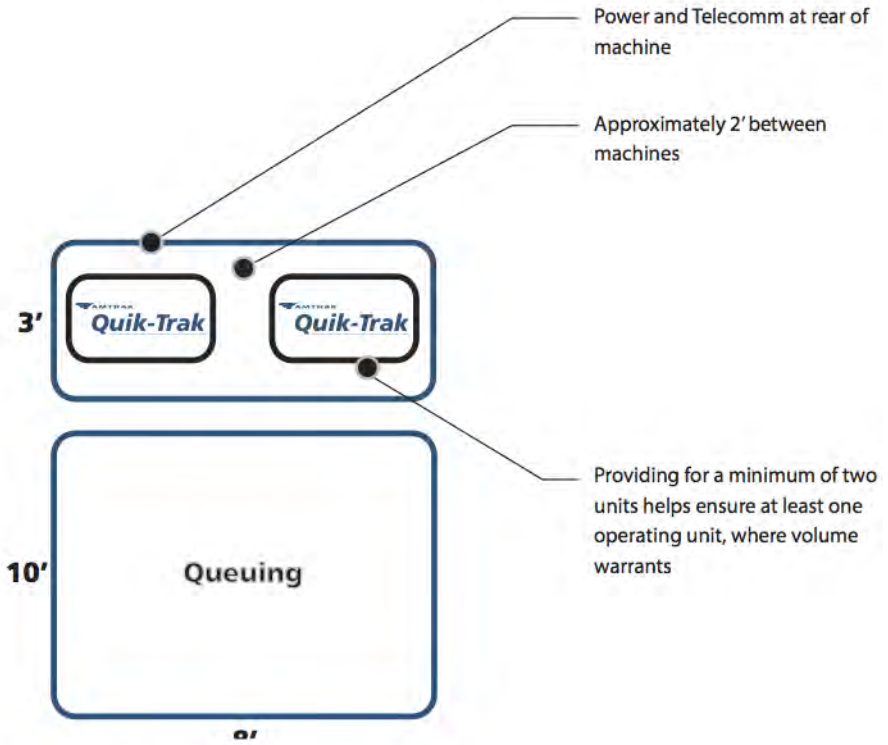
Category 1

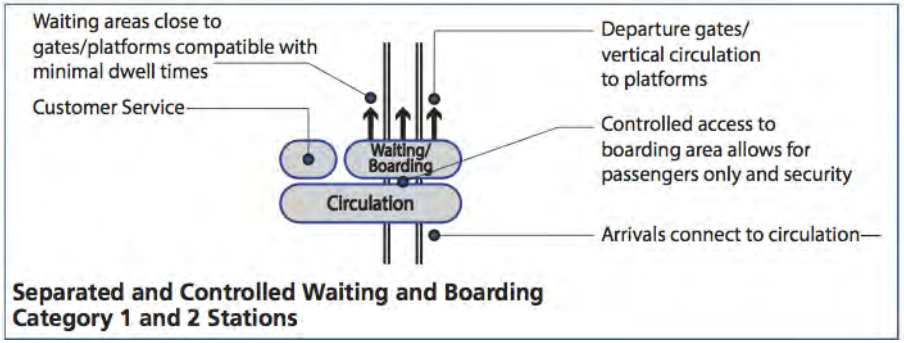


		Large	Medium	Caretaker	Shelter	Thruway Bus (Unstaffed)
Facility Structure Elements	Projected Annual Ridership Thresholds	Greater than 400,000	100,00 to 400,000	20,000 to 100,000	Less than 20,000	
	Platform	●	●	●	●	
	Platform Canopy	●	●	●	○	
	Sheltered Waiting Area	○	○	○	●	○
	Station Building	●	●	●		
Access & Wayfinding	Auto/Taxi Pick-Up/Drop-Off Lanes	●	●	●	○	
	Parking	○1	●	○	○	
	Rental Cars on Call	●	○	○		
	Rental Cars on Property	○	○			
	Transit and Bus Access	○	○	○	○	
	Taxi Access	●	●	○	○	
	Staff Parking	○1	●	○		
	Bicycle Racks	●	●	●	○	
	Station Signage (Amtrak Standards)	●	●	●	●	●
	Regulatory Signage (MUTCD)	●	●	●	●	●
Station Features & Functions	Restrooms	●	●	○		
	Drinking Fountains	●	●	○		
	Site Lighting	●	●	●	○	○
	Trash Receptacles	●	●	○		
	Trash Pick-Up/Snow Removal	●	●	●	●	
Customer Service — Ticketing & Baggage	Quik-Trak/e-Ticketing	●	●	○2	○2	
	Ticket Office	●	●			
	Passenger Boarding Assistance	●	●			
	Checked Baggage Handling	●	○			
Customer Service — Passenger Information	Passenger Information Display System	●	●	○2	○2	
	Pay Telephones	○	○	○	○	
	Information Counter	●				
	Customer Service Office	●				
Customer Service — Security	Emergency Platform Call Box	●	●	○2	●	
	Security Facilities on Site	●				
	Security on Call/Systems		●	○		
	Local Police Surveillance/Call Box			○	○	
	CCTV/Video Surveillance	●	○	○		
	Access Control/Card Readers	●	●	○		
Staff & Support Functions	Station Management Services	●	●			
	Passenger Baggage Assistance (Red Cap)	●	●			
	Ticket Agents	●	●			
	Package Express Handling	●	○			
	Staffed Information Counter and Ushers	●	○			
	Host/Greeter Staff			○		
	Janitorial Service/Dedicated Cleaning Staff	●	●			
Amenities	Restaraunt/Food Service	●	○			
	Vending Machines	●	●	○		
	Shops (News, Books, etc.)	○	○			
	ClubAcela or Metropolitan Lounge	○				

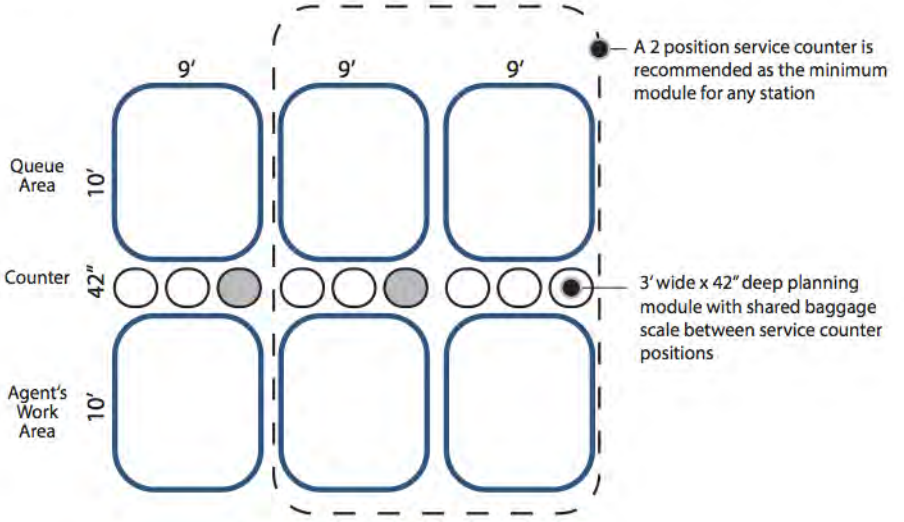
● Feature included for given station category
○ Evaluate based on site conditions

1 Evaluate based on site conditions and transit access
2 Include at discretion of state-sponsored agency on corridor routes or funding agency on other routes



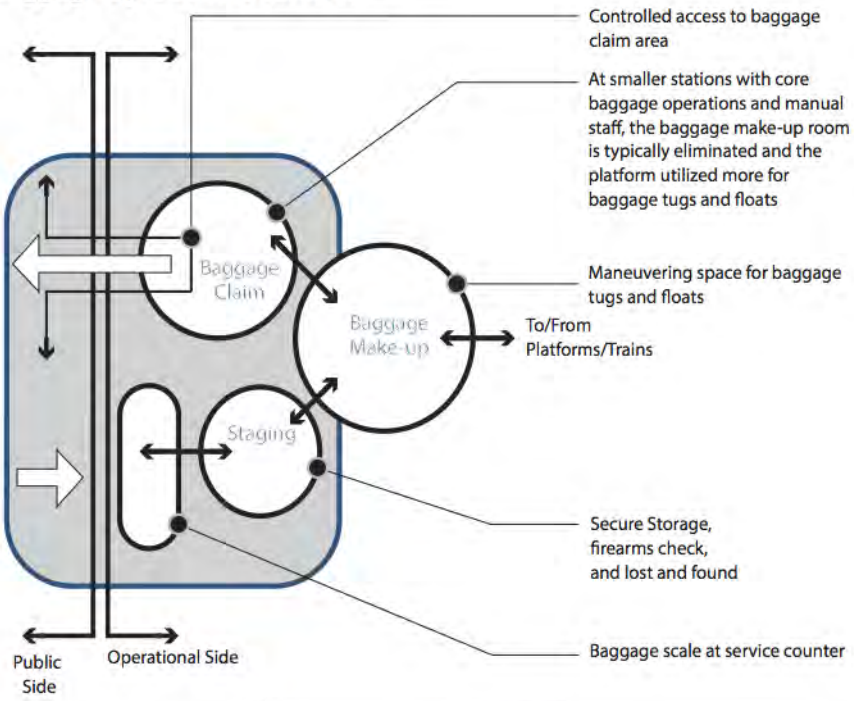


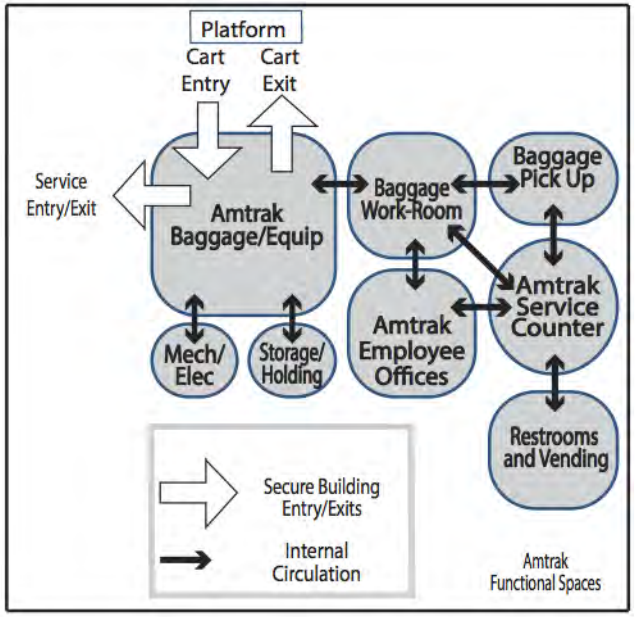
Separated and Controlled Waiting and Boarding Category 1 and 2 Stations

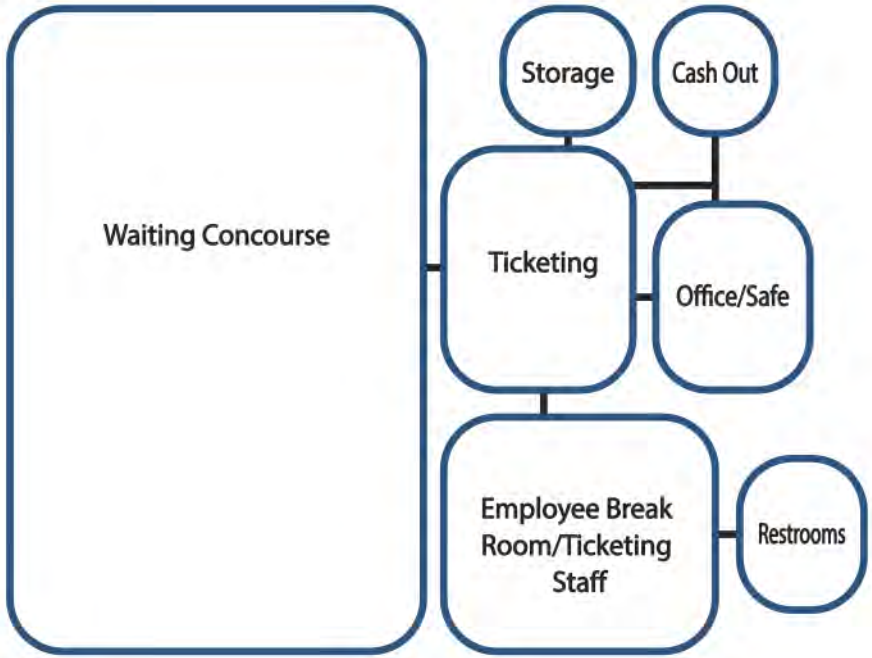


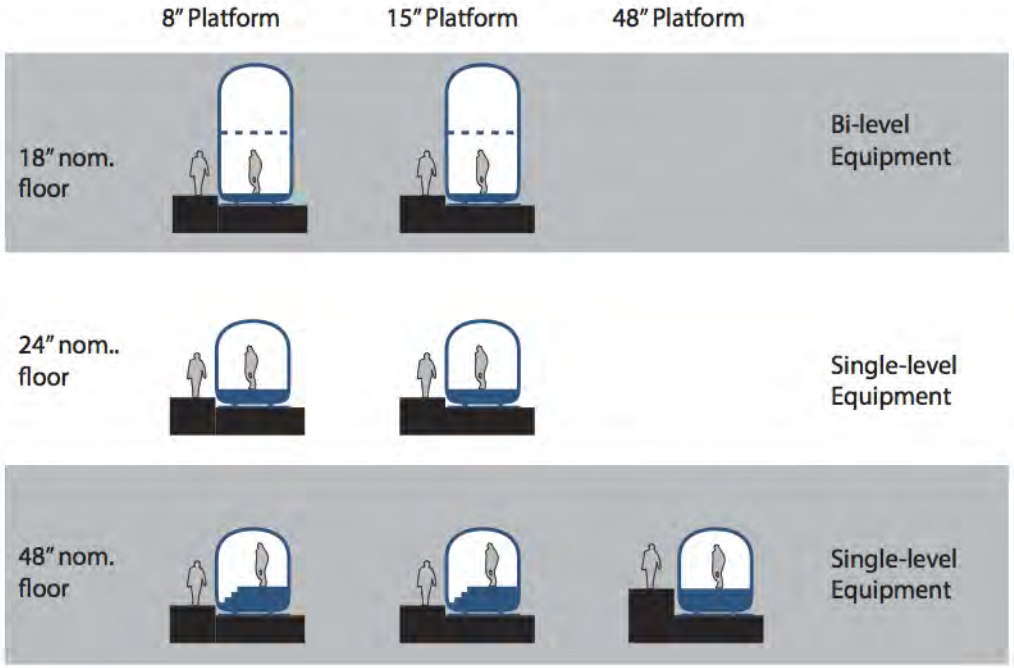
AMTRAK INFORMATION

5.12 Baggage Operation Overview







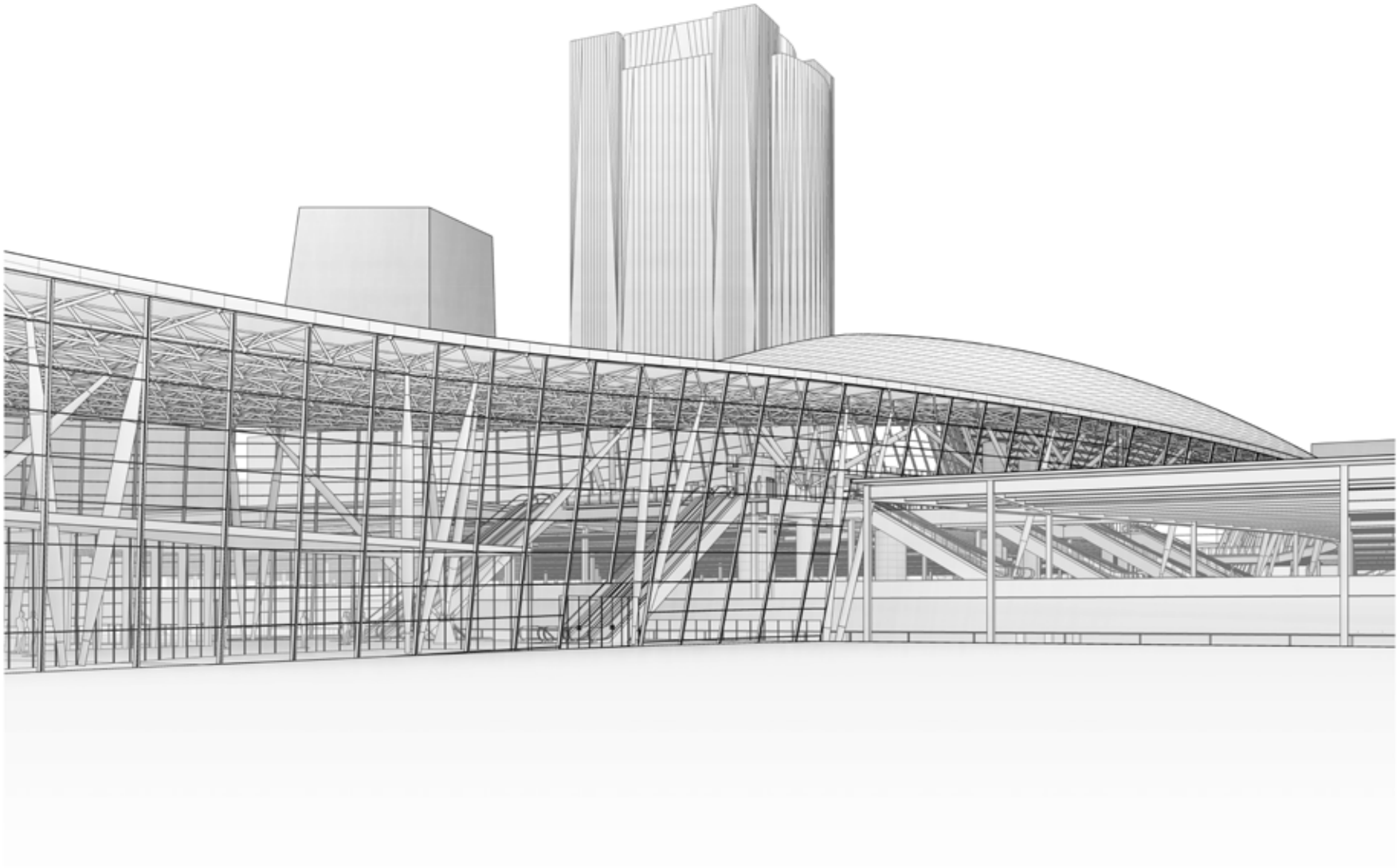


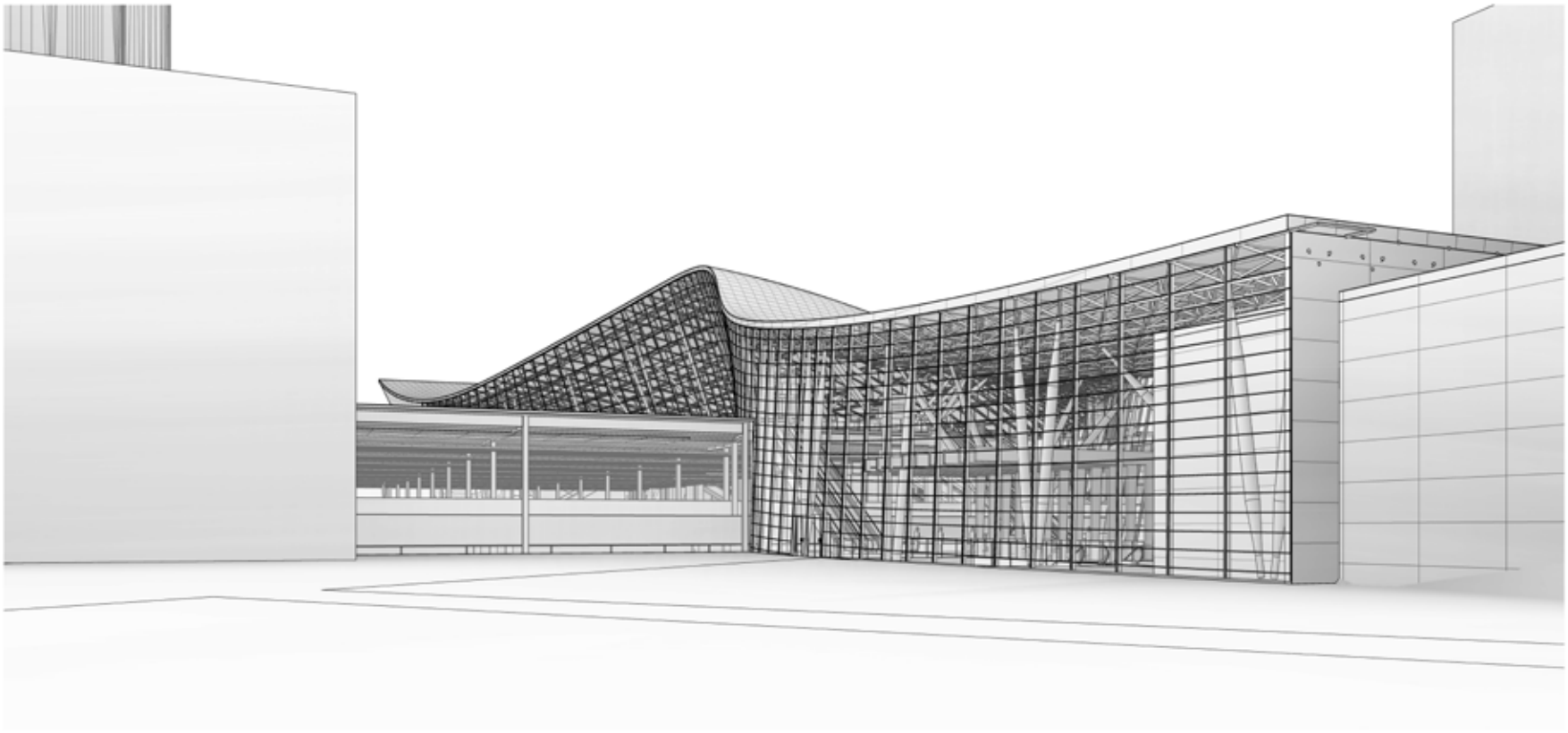
Service Type	Preferred - All Locations	Minimum - Off NEC	Minimum - NEC
Acela Express 1	700'	N/A	550'
Northeast Regional	1000'	425'	850'
State Corridor	700'	300'	700'
Long Distance	1200'	550'	850'

1 Platform lengths for High Speed Rail services will be modified to accomodate full length level boarding for lengthened Acela Expess and new HSR fleets.

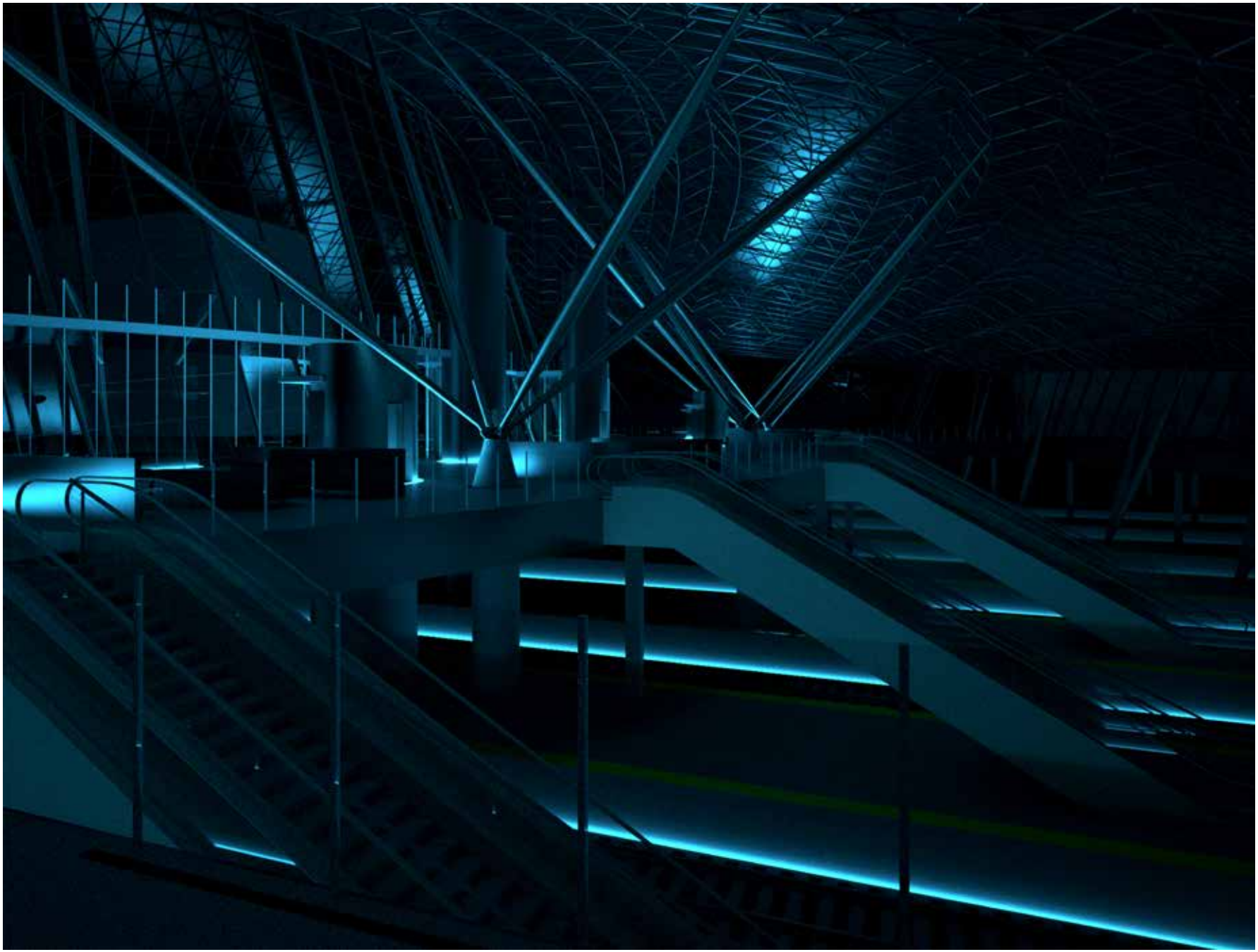
Platform	Preferred Width	Minimum Width	Live loading
Center Island	24'	20'	250 psf
Side w/Baggage Loadings	15'	12'	250 psf
Side w/Passenger Service Only	12'	10'	150 psf

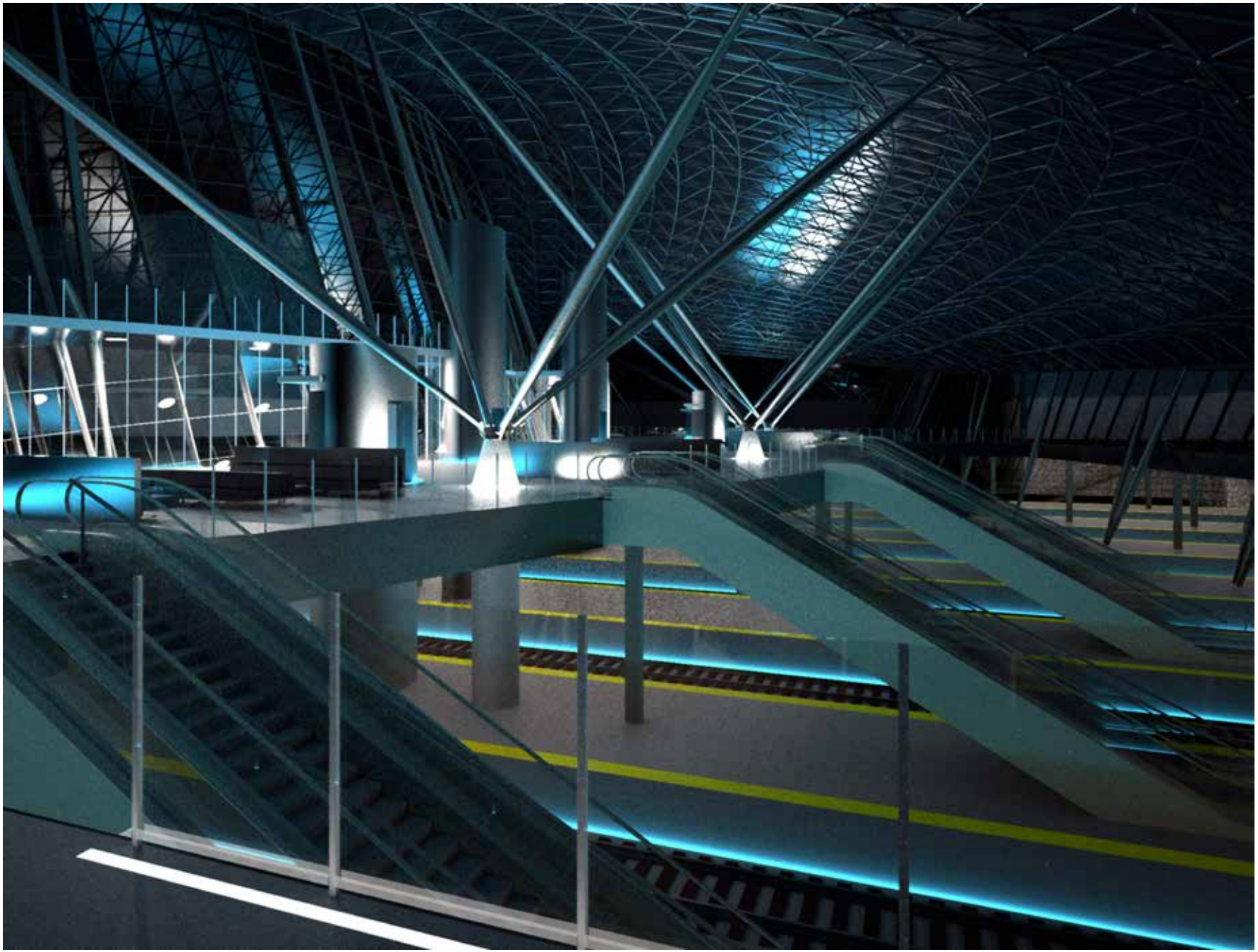
ADDITIONAL IMAGERY





ADDITIONAL IMAGERY





REDEFINING TRANSPORTATION CULTURE
A NEW UNION STATION FOR LOS ANGELES

PAWEL HONC | ARCH 613 GRADUATE THESIS STUDIO