AIM - Austin Intermodal Transit Center

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AIM - Austin Intermodal Transit Center  
by  
Nathan Bicak  
A Terminal Project  
Presented to the Faculty of  
The College of Architecture at the University of Nebraska  
In Partial Fulfillment of Requirements  
For the Degree of Master of Architecture  
Major: Architecture  
Under the Supervision of Professor Mark Hoistad  
Lincoln, Nebraska  
May, 2010
This project challenges the definition of a multi-modal transportation center. The intention is to transform the currently accepted model of train station, bus depot, or light-rail platform into an equally utilitarian place that takes on a greater social function as a destination space. Clear spatial roles and definitions will emerge to determine the necessary programmatic spaces for passenger needs, for economic success, and what kinds of spaces are necessary to engage the project in a more social discussion. This last issue will become tantamount to the success of the project…
How can a multi-modal center influence positive change; serve more social functions than simply being a hub for the collection and distribution of people movement; and become an iconic destination space in an urban environment?
My interest in this project grew out of a semester spent abroad in Hannover, Germany, where mass transportation is a natural part of daily life. One of the most compelling observations I made during my time in Europe was not the fact that rail travel dominates the modes, but that transit centers dominate the urban environment. They are centers of activity. Local, regional, and international train access is concentrated and easily reached by foot. One can step off a train and catch a taxi, rent a car, or rent a bicycle to tour the city. Often transit hubs are positioned in city centers, surrounded by multiple types of retail, grocery stores, public markets, art museums, and other public spaces. The European model for the transit center suggests that it is much more than simply a hub for people movement, but also a destination in the urban landscape.

The way in which people move through cities in our country is about to change dramatically. Traffic congestion, crude oil depletion, and urban sprawl all indicate that individual automobile traffic is not sustainable. Mass transit is the wave of the future. As mass transportation modes begin to reemerge, architects will play a key role in the transformation of our urban landscapes. Transit centers must be more than hubs of people movement and must engage the existing urban fabric in a more social way.
This project will propose a new intermodal/multimodal center for the city of Austin, Texas that will serve both transit needs as well as social functions. Through research and programming it will become evident what types of spaces are necessary to carry out the latter.

Austin is currently in the process of researching and engineering a mass transit system for its ever-growing transportation needs, specifically a light-rail system. In the late 1960s Austin’s population was roughly what Lincoln’s is today, about 250,000 people. The greater Austin area now totals more than two million people. Through the course of this growth, little has been done to institute an energy efficient, reliable, and convenient means of moving Austinites around the city.

Establishment of Need – Transit Woes

The main transportation corridor currently running through Austin is Interstate 35. Greater Austin can be defined as the metropolitan population occupying the zone primarily concentrated along this corridor from Round Rock, Texas in the north to Buda, Texas in the south. The majority of Austin’s population lives north and west of the Downtown district, stretching up toward Round Rock. This concentration of population living north of the downtown zone is what gives Austin the majority of its transportation troubles. Car traffic on Interstate 35 north of downtown is often backed up for miles during rush hours in the morning and evening. A look at the Austin American Statesman traffic report website illustrates this point excellently. At any given time there are several accidents, construction delays, and major congestion areas to watch for. It has become increasingly evident in recent years that individual car travel is no longer the answer for personal mobility in the Austin area.
Current Transit Systems and Proposals for Austin

It is important to explore the transit, traffic, and mobility issues that currently exist in the city of Austin. A few important issues for this research subject are the means of transportation currently in use in the city, any proposals for transit means, and the urban geography of Austin. This last issue will focus on the establishment of regions, neighborhoods, districts and other basic adjacency relationships within the city. There also exists a unique opportunity with the timing of this project to review the research of the city and its consultants regarding light-rail as a means of inner-city transit.

Austin does currently have a metropolitan bus system. Speaking from personal experience and first hand accounts from Austinites, this service is not as efficient or easy to use as it should be. While the bus system is generally on time, one often has to wait 30 minutes or more for a bus to arrive. In addition, the area served by these buses is limited. While the bus system is convenient for getting around the Downtown district, the University district and a few surrounding neighborhoods, it is a much different situation in outlying areas. One must often travel two or more miles in order to find a bus stop or a “Park and Ride” hub.

There currently exists a proposal for a mass transit rail system for the city of Austin. This system is being called “All Systems Go” and will be a street train system. The first line that will open is the Capital MertoRail and will run from Leander, Texas to the Downtown Austin Convention Center. Press tours of the line were given in February of 2009 and the line was set to open by late March 2009. As of May 13, 2009 the Capital MetroRail line was not yet open for public use. Allsystemsgo.capmetro.org cites extensive safety testing, schedule testing, and other necessary passenger-free runs as the reasons for this delay. As of this time, the tracks, trains and operators are all in place and running, the service is just not yet available for public use.

The initiative behind the red line (the Capital MetroRail line) is that it will open and operate as the sole train artery for the city. Eventually, expanded local and express bus services, MetroRapid bus service, and new park and ride lots and stops will function in support of the MetroRail line. Investigation is being done by the city to propose that the Capital MetroRail line extends further south through Austin and that there be more regional train service implemented.
Perhaps most relevant for the design solution portion of this project will be to look at what Austin has chosen to do for train and bus stops along the lines. Little information is available regarding the design and function of the train and bus stops and photos of the completed downtown stop show that the station is little more than a series of awnings over a stretch of sidewalk. The following comes from the Austin Downtown Development website and is the sum total of information regarding the facilities that are to exist with the new system:

What’s New?
- The South Central Transit Center, located at Congress and Ben White, is currently under construction and scheduled to open this summer.
- Construction at the Pavilion Park and Ride has begun to expand parking by 86 spaces and to ease traffic flows with a new “buses only” entry and exit.
- Leander Station, located on U.S. 183 in Leander, opened in 2007 and currently offers Express bus service to Downtown Austin. It will serve as the first rail stop on Capital MetroRail.

What’s Next?
- Construction will begin this summer on the Howard Station, located at Howard Lane and Mopac. This rail station will also serve as a Park and Ride.
- We are working on land acquisitions for a Park and Ride location in Oak Hill and in South Austin along, I-35.

It is important to point out that the South Central Transit Center at Congress and Ben White is rather large and a hub for several bus lines. However, much like the Downtown Station, the South Central Transit Center is little more than a parking lot filled with lettered awnings indicating which bus line stops at each. There seems to be no proposal to utilize this stop with the planned train system. There also seems to be a focus on expanding existing “park and ride” stations by adding more stalls to the parking lots. It seems this doesn’t take any more cars off the roads but only further encourages vehicular travel.
Initial Research Ideas

Case Study One: Curitiba, Brazil

The second phase of research will look at precedents and models of what other cites (both national and international) have done to deal with mass transit issues. One such precedent is Curitiba, Brazil. This is a city that has anticipated its public transit needs and acted on the intentions of an urban master plan established years ago. Curitiba is also uniquely relevant when investigating mass transit in Austin because the two cities have grown at nearly the same rate and to the same size over the late five decades.

Curitiba found that the answer to its mass transit question was with large buses. These buses all run on the street level, generally in a transportation corridor along with cars, bicycles, and pedestrian traffic. It is the establishment of these unique corridors and their routes that will be most beneficial to explore to determine if similar idea could be employed in Austin.

Case Study Two: The German Rail System

A great deal of significant observation and information gathering will also be possible during my Summer 2009 session spent in Germany and traveling throughout Europe via trains and other public transportation. The train system in Germany is notoriously on time and reliable. Another interesting element when researching trains in Germany is that each main train station incorporates at least two kinds of train travel: regional and inner-city. More often than not the hauptbahnhof (main train station) within a city is also a hub for bicycle rental and catching city buses. For example, in Berlin the hauptbahnhof is the arrival point of both international and German train lines, regional trains, the inner-city subway system, the bus system, automobile rental, and bicycle rental. These notions could fit with a proposal for Austin because regional trains could access outlying communities such as Round Rock, Georgetown, Pflugerville, and Buda; while neighborhoods and districts within Austin-proper might better be serviced by a more closed-network inner city system. Furthermore, a central station could house a bicycle rental station and better means (than automobiles) to transport individuals throughout the city.
The Design Solution

The architectural design for this project will include a central hub or station, whether it becomes a train station, bus station, or a hub for some other type of mass transit "vehicle". Another element of the architectural design for this project will be the secondary nodes (transit stops). The appeal of these is that it will may become important to focus not so much on the context of each transit stop site, but on the constants analogous to each site. The central hub will require an architectural solution exceptionally dependent to its site.
# Research and Analysis

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precedent research - transit centers
Euralille, Rem Koolhaas, 1988-1995

Euralille is...
“based on the hypothesis that the perception of Europe is going to change completely under the dual impact of the trans-Channel tunnel and the extension of the high-speed train network. If this hypothesis is borne out, Lille, as the receptacle of a great many typically modern activities, will gain considerable importance”

-Rem Koolhaas

Station
Euralille is composed of two railway stations: Lille-Flanders (TGV and regional lines) and Lille Europe (international high speed service). Lille-Europe was the existing station and Lille-Fladers was designed and built as a part of the Koolhaas led project. Euralille acts as a major connector to Brussels (25 minutes), Paris (1 hour) and London (2 hours). In addition to the new TGV station, the project also included the TGV line, a new metro underground line and station, a new rapid-tram stop, the reconstruction of the motorway bypass next to the TGV line, a new road viaduct, and underground parking for 6,100 cars. On average, 70,000 passengers a day pass through Lille-Flanders and 8,000 pass through Lille-Europe.

Site
The site that Euralille sits on is well over 100 hectares and was previously undeveloped and under used due to pending military rights. The state “donated” the land to the city of Lille for one franc. The site is positioned between lower-density residential neighborhoods and the historical center of Lille. Before the building of the new station and other elements, the dynamics of the neighborhood were fairly low, typical for an area with an obsolete train station. There were some shops, services, moderate quality housing, and some tertiary development along its borders.

Criticism
Even though Lille succeeds wildly as a national and international train hub, it is not without criticism. One main point for evaluation has been that pedestrian connections to, from and through the area are somewhat lacking. Neighborhoods to the east are difficult to reach on foot from the station complex, as is the new congress and exhibition center. Transfers from one station to another are complicated and time consuming.
New Development
Lille’s geographic positioning as well as the development of the train stations have given rise to an international business center in Lille. Many of these elements are conveniently located between the two train terminals in Centre Euralille. Centre Euralille, a triangular prism connecting the new station and the old station consists of offices, services, shops, culture, housing, public facilities, and open spaces. Some of these include a multifunctional performance space, a hotel, an international business school, a hypermarket, and 130 boutique stores.

The Cite des Affaires encompasses the new TGV station and the three towers above it. They include a World Trade Center, business services, restaurants, exhibition halls, a four star hotel and parking. The World Trade Center is a pivotal piece in the development strategy of Euralille, its main benefit being that “business leaders can meet partners and establish business relationships with the whole world” right at the station site. The oval congress center some distance from the stations is called Lille-Grand Palais. It contains 18,000 sq m of diversified congress space with meeting rooms, events halls, three auditoria (for 1,500, 500, and 350 people), exhibition space, and catering facilities.

The Congreexpo
The Grand Palais, or Congreexpo, is the centerpiece of the project. The building combines exhibition spaces, a concert hall and meeting rooms. Each program has its own zone in the building, arranged so that the interfaces create new programmatic opportunities. In an east-west direction these zones are autonomous, while in the north-south direction they are connected. The large amphitheatre-like auditoria are placed back to back, to form a bridge, leaving below a large reception space. One large exterior wall is built of thin corrugated plastic flecked with tiny pieces of aluminum. This surface creates a hard, reflective shell on the outside, but from the interior the wall is translucent. The building flows with subtle curves, similar to other works by Koolhaas. The main entry hall has a sharply sloped concrete ceiling. On the exhibition hall ceiling, slim wood slats bow at the center. A staircase to the second floor zigzags upward, while the polished steel side wall slopes inwards, creating a wobbly mirror image of the stairs.
Tokyo International Forum, Rafael Vignoly, 1994

This project is the winning entry for an international competition held in 1989 to design a comprehensive facility for cultural information on the site of the old Tokyo City Hall. The complex contains four auditoriums, conference facilities, reception facilities, an exhibition hall, a culture information center, service facilities, and a district heating and cooling plant.

An external plaza cuts through the middle of the site, with the glass hall on one side and the auditoriums on the other. The exhibition hall is actually located underground. The glass hall with its conference pieces is separated from the auditoriums by the plaza, and is linked to it at three levels by means of bridges. The basement concourse is the primary means of access to each part of the building. The building is largely closed to the outside, excluding noise and vibration from the surrounding neighborhood. Conversely, the building is open as much as possible to the quite central plaza.
precedent research - Tokyo
Stockholm City West, Stockholm, Sweden, 1994-present

Stockholm City West is a project that has been underway for a great many years. The primary focus of this project is not necessarily on the rail station, this piece has been operational for about two decades. The important and relevant issues with this project have to do with developing the urban fabric around a train station that already exist. This is similar to the situation in Austin, although perhaps inverted. In the case of Austin, some of the development exists (an exhibition space, a performing arts center, residential and commercial zones, and hotels) and now a transit center must be positioned within these existing elements.

Stockholm City West is a project that has been underway for a great many years. Unlike Utrecht, this is not due to relatively poor relationships between interested parties, in fact the municipality of Sweden has taken a very proactive role in the project. The execution of this project has been difficult for a couple reasons: 1) the area surrounding the train station was called (in Stockholm’s 1996 draft structure plan) “the only strategic area for urban multi purpose redevelopment in the whole inner city”. Furthermore, 2) the best place for this to occur is over the top of the existing rail lines. This second factor could also apply to Austin, as one possible location for some of the program to occur might be over Town Lake.

Station
Stockholm’s main train station Vasa Terminal and World Trade Center complex were designed and constructed between 1979 and 1989. The urban and regional rail systems converge at the station, where the underground and a regional system meet. A bus terminal connected to the station is the departure point for long-distance routes, buses to the ferries that sail to the island of Gotland, and for buses to the airport. The station is also directly linked to an urban motorway bypass.

The terminal-WTC complex contains 45,000 sq m of office space, shops, hotels and restaurants. The complex occupies 1.5 hectares, providing a total of 60,000 sq m of space. This extra space includes a conference complex, an auditorium with 180 seats, meeting rooms for 8-50 people, and a 850 sq m exhibition hall.
Neighboring Development
The station lies next to the Norrmalm district, which is the business and shopping core of not only Stockholm but also the surrounding city region. In theory, the station area serves as an entrance to central Stockholm, a meeting point as well as a travel center.

The second phase of the project (the un-built piece that is proposed to cover the existing rail lines) is a congress center. This is to include a 35,000 sq m hotel and 25,000 sq m congress centre directly next to the World Trade Center. Roughly 125,000 sq m of office space are proposed on adjoining sites. It is also possible that a completely different scheme might be adopted in which a housing would occupy the space on top of the tracks.

Criticism
Much like Lille, pedestrian and bicycle connections to the station from its surroundings are weak. Additionally, while Stockholm is well connected in terms of transport networks, the station is not yet completely integrated with the existing city centre. This problem is manifest in the many obstacles that impede a free flow of pedestrian traffic between the station and the city.

These criticisms aside, the station has been the object of the environmental programme, a nationwide effort of the Swedish railways to enhance the experience of train travel. Stockholm Central station is a pleasant public square enjoyed by a diverse public. The adjacent bus terminal could easily be mistaken as an airport lounge.

A commissioned design study by Priestman Architects
These are Priestman Architects’ studies for 90,000 sq m of offices, hotel and conference center, with open public space linking to main bus terminal and rail station, to be constructed above working main rail lines. The project is part of a wider urban renewal initiative in Stockholm involving plans to develop over the railway lines for a mixture of uses, to reconfigure the lake side environment, and to develop many public use buildings.

In their scheme, public open space is intended to contribute as a setting and immediate address for the hotel and conference center, as well as a catalyst for urban activities. The conference center is intended to have flexible use, accommodating 2,000 people in the largest hall.
Utrecht Project, 1988-present

The Utrecht Centrum Project has a long and storied history. Initial reports and studies began as early as 1988 and an initial masterplan was developed in 1993. However, this masterplan has gone through several iterations and the project is yet to be completed. This is due in part to the nature of the project. Utrecht is in the center of The Netherlands and is the second busiest railway station in the country, after the completion of the new station it will likely be the busiest. For this reason the federal government has been very selective over the years as the project has developed. In addition, the project has required a unique collaboration between these government officials, railway owners, and private developers.

Station (The Public Transit Terminal)
The Utrecht Public Transport Terminal will in the future be the hub of the public transport system in the centre of the city. By 2020, the terminal must be able to handle 360,000 passengers per day. This will be a system that houses all different transit systems under one roof.

The new transparent interconnection spans train, bus and tram platforms. It is the main junction for the streams of travellers. On the ground floor, the hall will be given recognizable entrances on both sides. Bus stops and taxi stands will be located on the east and west sides of the terminal. The terminal of the express tram will be on the west side of the station. There will be a safe and logical pedestrian route through the terminal for the 89,000 commuters that come into the city center each day. There will be 17,500 parking places for bicycles.

Additional Development
Planned along with the Public Transit Terminal will be a 4 star hotel with 250 rooms and 200 residences. In addition is a project called Library++ which will be 120 apartments, public services and offices. A megacinema is planned that will house 18 theatres with 4,700 seats. Four new concert halls are being added to an existing structure to form the Music Palace, which will eventually contain five halls and seat more than 5,000 people. An 11 story casino is also planned as a part of the project. Lastly, a network of street and canal renewal initiatives is underway to connect these different elements.
The Vredenburg square will form a link between the old city centre and the station area. It will be an important meeting place for people that go shopping, go to a concert in the Music Palace or visit the market. All sides of the square will be used, attempting to integrate it into the existing and new urban fabric.

Things to take away from this soon to be built project
This project has had a long history primarily because there were so many different parties and agendas to please. This being the case, a list of directives was established each time the masterplan was revised. As things changed, the following issues remained the same from scheme to scheme. Subsequently, they are applicable to a multi-modal station in Austin, and probably anywhere.

- The project must be multi-functional
- The public spaces must not be dominated by large-scale facilities
- The impact of traffic on the quality of public spaces must be seriously considered
- Natural features must be protected
- Noise caused by trains must be controlled so as to not marginalize neighboring residential districts
In 2008, the St. Louis Gateway Transportation Center, a $26.4 million state-of-the-art intermodal facility in downtown St. Louis, opened to serve Amtrak, Greyhound, light rail, and city buses. The opening of the glass and steel facility marked the end to the temporary buildings Amtrak passengers used for 30 years. Gateway has high ceilings and large, multicolored windows and features a 24-hour operation.

**Background**

The City of St. Louis needed a centrally-located transportation center serving multiple modes of transportation: train, light rail, bus and taxi/pedestrian into one urban location. The center was to take the place of Union Station since its rail lines closed in the late 1970s. A temporary transportation center was created nearby as the plans for the Gateway Transportation Center moved along.

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**St. Louis Amtrak factsheet**

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**Gateway Station**

430 S 15th St  
St. Louis, MO 63103-2607  

**Population served by this station**

- Within 25 mi: 2,115,385  
- Within 50 mi: 2,665,168

**1st congressional district**

Wm. Lacy Clay (D): (202) 225-2406

**Amtrak presence at this station**

**State Supported** (220,109)  
Lincoln Service - Multiple trains daily  
Missouri - Multiple trains daily  
**Long Distance** (45,914)  
Texas Eagle - Daily service
KAI provided architectural and plumbing and fire protection engineering services for this 35,700 s.f. multi-modal building. The building provides facilities for train (Amtrak) and bus (Greyhound) in a single 700-foot long structure. A MetroLink light-rail station, a local bus transfer station and a taxi stand are all immediately adjacent to the building to the east. The new building has come to be known as Multimodal due to its efficient linking of multiple modes of transportation.

The long, linear configuration of the building is not only a direct response to the site conditions (under an existing highway), but is also reflective of its purpose of moving people from one place to another and from one mode of transportation to another. The concept of movement is expressed not only in the building’s flowing linear plan and angled facades, but also through the use of vibrantly colored glass in rhythmic patterns on the building facades.
Denver Union Station, SOM (masterplan), 2004-present

Multimodal station goals
Develop a public transportation facility that will:
_ Serve as the hub of the regional transportation system.
_ Ensure that all modes function together to optimize the efficiency of each mode for system wide efficiency.
_ Provide connections for all transportation modes into and throughout the Denver region.
_ Increase transit ridership and use of other forms of public and private transportation and alternative transportation modes.
_ Provide increased ground transportation options to the traveling public.
_ Accommodate all ground passenger modes, both public and private, to the greatest extent feasible on the site.
_ Create a system of mode transfer and way-finding orientation that allows for simple and efficient movements and connections for travelers.
_ Support major activity centers and destinations in the region by providing easy access and seamless connections.
_ Provide transportation options and uses at Denver Union Station that are consistent with the Metro Vision Regional Plan.
_ Provide the opportunity for connections to and between local, regional, statewide, and national transportation systems and networks.

Track Facts
_ Amtrak platforms must be 1,540’ long, assuming 18 car, three-locomotive trains.
_ Commuter and intercity train platforms must be 970’ long
_ LTR trains need 360’ platforms, assuming four car trains, as well as 50’ long tangent zone on either end

Commercial Facts
_ 130,000 sq feet of retail/commercial space, including a specialty-food market, entertainment, street-level specialty retail, and transit-oriented retail

| Passengers using this station, 2003-2008 (arrivals and departures) |
|--------------------------|--------------------------|--------------------------|--------------------------|
| 2003                     | 117.5                    | 120.1                    | 123.9                    | 114.8                    | 119.2                    | 125.1                    |

| Quick recap, 2008 (arrivals and departures) |
|--------------------------------------------|-----------------------------------------|-----------------------------------------|
| Passengers                                | Coach/Business                          | First/Sleeper                           | Total                      |
| 101,567                                    | 23,568                                  | 125,135                                  |                           |
| Average trip                              | 659 miles                               | 1,047 miles                              | 732 miles                  |
| Average fare                              | $74.00                                  | $251.00                                  | $108.00                    |
| Average yield, per mile                    | 11.9†                                   | 74.0†                                    | 14.7†                      |

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<td>Long Distance (125,135)</td>
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<td>California Zephyr - Daily service</td>
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Vision Plan

- HORIZONTAL CIRCULATION
- TRANSIT SUPPORT SPACE
- ADDITIONAL CARRIERS
- SUPPORT PROGRAMS
- VERTICAL CIRCULATION
- RETAIL OR COMMERCIAL

precedent research - Denver
Pioneer Courthouse Square, Portland, Oregon, 1986

Pioneer Courthouse Square has been called "Portland's living room" in reference to its enhanced civic role as a place for the public to gather in and use. Its modern design includes public art, amenities, flowers, trees, walls and stairs designed for sitting on. It is the scene of frequent events, and includes a coffee shop, food vendors, and the information center for Tri-Met (regional Portland's transit agency), which was the key agent of the square's successful redevelopment.

The square's modern design incorporates public art, flowers, trees, walls and ample stairs that do double-duty as seating areas. It is the scene of frequent events, enhanced by a coffee shop and food vendors, and also serves as a hub for buses and light rail.

Pioneer Courthouse Square is one of the first in a new generation of public squares. No longer just passive green spaces, these squares are designed to be programmed and used by the public.

The square has become the city's place of pride and a focal point for all kinds of community activities. The revitalization of the downtown is testimony to the square's profound impact on the livability of Portland.

The creation of this much-loved public space in downtown Portland cannot be separated from the fundamental role played by Tri-Met, the city's transit agency. Planned concurrently with the new Metropolitan Area Express (MAX) light rail system, Pioneer Square was an idea that dated back to the 1950's, when the site was a parking lot. Tri-Met leveraged its funding for transit stops and an information center and helped to make the Square financially possible.

With extraordinary public support, the Square was built to be "Portland's living room," a center for the life of the city. Funded in part by the residents of Portland, the Square has continued its tradition of citizen participation with thousands of community events held over the past decade. With the opening of the light rail system in 1986, Pioneer Courthouse Square became both the city center and the bustling hub of transit for buses and light rail.
26,000 people pass by the Square each day, and thousands more visit the Square directly.

Single most visited site in Oregon's most visited city

Hosts over 300 events each year that range from large-scale concerts to cultural festivals

Square Visitors: 9,500,000
TriMet Regional Rides: 95,700,000
Automobiles: 6,387,000
TriMet Ticket Customers: 102,000

1 city block
roughly 250’ x 250’
62,500 sq ft

precedent research - Portland
Waterplace Park and the Riverwalk linked to it have a welcoming, well-thought-out design, which has become a focal point of the overall revitalization of Providence's downtown area. But what really makes these great places is the wealth of activities they host. Between the annual Convergence art festival, the WaterFire installation which runs on selected nights most of the year, the Summer Concert Series, and long-term installations of public art, there's always something going on.

WaterFire
The most unique event that takes place at Waterplace park is called Waterfire. A series of small fires are set out in the river throughout the summer months. This event includes spectators on boats and gondolas. Thanks to innovative thinking on the part of one local artist, the river hosts a unique event and becomes the centerpiece of the plaza and riverwalk area.

Size
The area is composed of two zones: the corridor of river walk area and the square. The corridor is roughly 50’ wide and stretches down the river 950’. The public square is a space of roughly 65,000 square feet.
Before the creation of the Pike Place Market, local Seattle area farmers sold their goods to the public in a three-square block area called The Lots, located at Sixth Avenue and King Street. Most produce sold at The Lots would then be brought to commercial wholesale houses on Western Avenue, which became known as Produce Row. Most farmers, due to the amount of time required to work their farms, were forced to sell their produce on consignment through the wholesalers on Western Avenue.

As consumers and farmers grew increasingly vocal in their unhappiness over the situation, Thomas P. Revelle, a Seattle city councilman, lawyer, and newspaper editor, took advantage of an 1896 Seattle city ordinance that allowed the city to designate tracts of land as public markets. The area of Western Avenue above the Elliott Bay tideflats and the area of the commission food houses had just been turned into a wooden planked road, called Pike Place, off of Pike Street and First Avenue. Through a city council ordinance vote, he had Pike Place designated temporarily as the city’s first public market on August 5, 1907. The market was established with a “meet the producer” attitude. The market operates 7 days a week, except for Christmas, New Years, and Thanksgiving. Merchants set their own hours, with most opening around 8 am.
One of the Market's major attractions is Pike Place Fish Market, where employees throw three-foot salmon and other fish to each other rather than passing them by hand. When a customer orders a fish, an employee at the Fish Market's ice-covered fish table picks up the fish and hurls it over the counter top, where another employee catches it and preps it for sale.

Pike Place Market celebrated its 100 year anniversary on August 17, 2007. Today the market is home to 240 year round businesses; 190 crafts people and 120 farmers who rent table space by the day; 500 residents; and 240 street performers and musicians.

The Market began on a boardwalk adjacent to the 3-story Leland Hotel. The Leland was incorporated in 1907 by engineer John Goodwin into the Main Arcade. In 1914–1915 he and architect Andrew Willatsen extended this complex further into the Fairley Building. The complex was rehabilitated in 1977 by George Bartholick. The North Arcade (1911 and 1922, John Goodwin) constituted a major northward extension of the Main Market, extending it 1,200 feet to the northwest and adding 160 covered stalls. The Main Arcade and North Arcade buildings are the primary home of the farmers market activities; these are the facilities that host farmers and crafts people.

The entire Market sits on 7 acres of land. The Main Arcade Building and North Arcade building are more than 2,000 feet long and have over 300 different stalls for merchants and farmers.
Reading Terminal Market, Philadelphia

This public market occupies the old train shed at Reading Station for the Reading Railroad train line that used to run through Philadelphia. Reading Terminal Market is an enclosed public market found at 12th and Arch Streets in downtown Philadelphia. Over 80 merchants offer fresh produce, meats, fish, groceries, ice cream, flowers, baked goods, crafts, books, clothing, and specialty and ethnic foods. Every space in the market is rented out; three of the vendors are descendants of original market merchants.
The Reading Terminal Market occupies the ground floor and basement levels of the Reading Terminal's former train shed, now part of the Philadelphia Convention Center. Market stalls occupy the ground floor with entrances on Filbert Street to the south, Twelfth Street to the West, and Arch Street to the North. The stalls are arranged in a grid pattern with an open area in the center with tables and seating.
High Speed Rail and Austin

Austin is in the Texas Triangle of emerging Megaregions in the United States. Geographically, this area is defined by the region enclosed by Ft. Worth/Dallas, San Antonio and Houston. In 2000, this region had over 15 million occupants and projections say the region could grow by another 10 million people over the next 40 years.

In April of 2009, the Economic Stimulus Plan allocated $8 billion for the creation of a High Speed Rail (HSR) network for the country. In addition, $5 billion was allocated for the project from the federal budget. The Texas Triangle’s designation as a megaregion puts the region high on the list for implementation of a high speed rail system. Some plans (such as the one proposed by America 2050) suggest that parts of the system begin as soon as 2015.

As this project moves forward, each city in the Texas Triangle needs to prepare to receive the HSR network and integrate existing transit modes and corridors with it. Inevitably, this will mean the construction of new stations and tracks within each city.
Amtrak is the national passenger rail service provider. Amtrak currently provides service to over 500 destinations in 46 states and transports over 25 million passengers annually. The busiest stations in the country are New York, Washington D.C., Philadelphia, and Chicago (over 1 million passengers embarking or disembarking).

Austin is service by the Texas Eagle service which runs daily between Chicago and San Antonio and three times weekly has a connection from San Antonio to Los Angeles. From the Austin Station, at 7pm each evening a train departs for San Antonio and at 9:30am each day, a train heads north for Chicago.
incorporating Amtrak

Amtrak national rail map
Austin is currently in the process of putting together a street-train and light rail system. The red-line runs from Leander in the North to the downtown station at 4th and Congress. This is currently the only completed line, with tracks and trains in place, but passenger travel has not yet begun.

According to these maps, the purple line would run directly through part of the site selected for this project. In addition, the proposed urban rail alignment plan also includes a line that would run down Riverside drive to the Long Center. The Long Center/PEC and Zilker Park have been identified by the city as major destination places along the transit route.

Austin has elected to implement a street train system, as opposed to a subway, elevated rail, or monorail system. The two diagrams here express the two primary conditions that street trains create: a system that shares road space with car traffic, or a dedicated line.
The Palmer Events Center

The PEC is a 131,000 square foot multi-use events center, and part of a 54-acre cultural park on the shores of Lady Bird Lake. The facility’s architecture suggests a “Pavilion in the Park” with its asymmetrical shade roof extending beyond the exterior walls, creating a wrap-around terrace. The second story balconies offer views of the downtown skyline and Lady Bird Lake.

The PEC houses two exhibition halls, lobbies, five meeting rooms, pre-function space, and support areas. The kinds of events that happen here are: public consumer shows, trade shows, conferences, conventions, receptions, banquets, concerts, society balls, dances, and sporting events.

Inside there is 70,000 square feet of exhibit space that can be divided into two halls of 45,000 and 25,000 square feet. The meeting rooms on the second floor have a combined square footage of 5,000 square feet. The PEC also features a 1,200-car parking garage, with entrances off of Riverside Drive and Barton Springs Road.

<table>
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<th>Facility Specifications</th>
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<td>Exhibit Hall 1-2</td>
</tr>
<tr>
<td>Exhibit Hall 1</td>
</tr>
<tr>
<td>Exhibit Hall 2</td>
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</tbody>
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* Seating available.
** Allows for 60x40 concert stage.
At the conclusion of precedent research, this programmatic report was generated as a means of synthesizing the research and concisely stating the necessary programmatic elements necessary to create a destination driven intermodal center for Austin.
Programmatic Report – Multi-modal Transit Center for Austin, Texas

In recent years Austin has quickly become a major player in the technology world with companies like Dell, AMD, and Samsung all establishing major headquarters in and around the Austin area. With the increase in jobs from these companies, Austin has grown, both in population and physical size, as remote housing developments continue to spring up further and further from the city center. The greater Austin area now totals more than two million people. Greater Austin can be defined as the metropolitan population occupying the zone primarily concentrated along this corridor from Round Rock, Texas in the north to Buda, Texas in the south. The majority of Austin’s population lives north and west of the Downtown district, stretching up toward Round Rock, Texas. The majority of new building is happening to the south. This concentration of population living north of the downtown zone is what gives Austin the majority of its transportation troubles. Through the course of this growth, little has been done to institute an energy efficient, reliable, and convenient means of moving Austinites around the city.
Scope

This project will focus on the design of a multi-modal transportation center for the city of Austin, Texas. This center will serve Austin, the region, and the nation. As a city train system is currently being implemented in the city of Austin, this project will focus on the development of this transportation center as a node for the collection and distribution process of local, regional, and national train passengers. Integral to this system is the consideration of places for passengers to wait for trains. As a second major part of this project, the multi-modal center will serve as a destination space for both rail travelers as well as the city of Austin in general. This will be accomplished in a few different ways. First, a market place will be designed for residents of the downtown district. Second, a large public plaza (primarily outdoor) will be designed adjacent to the center. Next, space needs to be allocated for commercial development to occur within the center. This is necessary to meet the service needs of travelers.

The design for this multi-modal center should focus heavily on the elements that make it a destination space. It should be thought of as a desirable destination space for the city of Austin that conveniently has a complex network of transportation systems running though it. It should strive to create an iconic identity while promoting mass transit and engaging the individual in the community.

In general, a railway station has a very different city dynamic than say an airport, the type of modal system we are generally most familiar with in this country. Rail stations are generally located within the urban fabric of a city rather than on it’s periphery. This tends to imply a broader array of uses and users, more non-transit related activities, and a complex overlapping of other transit types. This project, while integrating with the surrounding area, should seek to establish a “station neighborhood”. Especially unique to this project is that it seeks to implement a railway station within a relatively developed urban context.

The strength of a railway system usually lies in the trains’ abilities to run on schedule; the system’s performance. Additionally, a passenger judges a systems success based on the full door-to-door trip experience. Travel must be convenient, changing from one system to another must be expedient, and accessory services must be readily available. The latter of these two have direct impact on the design of the multi-modal transit center.
Local Train Hub
A city train system will set out to alleviate some of the traffic woes Austin currently faces. A large part of the multi-modal center design will revolve around the development of receiving and distributing points for city trains (ie platforms). Another thing to consider is that train travel is not an isolated experience. Rather, it is just a piece of the full package of the transit experience, a link in the full multi modal chain. Therefore, serious consideration should be given for how and where passengers arrive at the center and where and how they will wait for trains.

Regional and National Train Hub
Relative to other metropolitan areas in Texas, Austin is centrally located. There exists an opportunity to make Austin a hub for regional travel to destinations such as Dallas/Ft. Worth, Houston, and San Antonio. Austin’s central location within Texas also makes it a viable location as a connector for the southern region as well as the entirety of the United States. It should be considered that in addition to regional destinations, there also be non-stop trains to a variety of national destinations directly from Austin’s multi-modal center (Los Angeles, New York, or Seattle, for example). From the regional destinations previously mentioned it would be possible to connect to trains to further national destinations.

It is a separate train system that will exist for the handling of these regional and national journeys. Likewise, a separate (yet still integrated to the collection and distribution aspect as a whole) portion of the multi-modal center must serve these trains. Just as with local trains, these regional and national trains need point of entry and exit elements (ie their own zone within the center and platforms) as well as waiting and staging areas.

Heavy consideration must be given to the differences between these distinctive types of train travel and the impact that can have on design. Local train travel, regional train travel, and national train travel are three very unique systems. Just as an example: national trains travel a greater distance and for a longer period of time than local trains. The implications of this might be that the national trains staging areas need to be larger to accommodate passengers with more luggage.

Market
Within the past couple years a great deal has been done to promote urban living in downtown Austin. Several high-rise apartment buildings have been erected just on the north side of Lady Bird Lake and in the near south area of downtown. To serve the needs of residents moving to the downtown area, a public market will be planned in the transit center.
Public Plaza
A public gathering space will be designed adjacent to the multi-modal center as a destination space for the city of Austin. This place should serve as the quintessential meeting place in downtown Austin. Furthermore, this plaza must be integrated in such a manner that it both respects and enhances the high volume of recreational activities happening around Lady Bird Lake and in Zilker Park. This plaza should be designed with the following functions in mind: music festivals, food festivals, cultural and ethnic festivals, art exhibits, etc. The other important aspect of the plaza is that it should complement the Long Performing Arts Center and Palmer Events Center. The Palmer events center is a large convention space. The Long Performing Arts Center is a recently completed facility with one large concert hall, a black box theatre, and several smaller gathering rooms. Something both of these spaces lack is a large outdoor gathering space. The plaza should be a place where functions in either of these places can spill to the outdoors. It is the integration of this plaza, these events centers, and the multi-modal center that will measure the success of this project.

Commercial Development
Some amount of commercial development will be necessary in the center itself to meet the needs of travelers. Aside from the market previously mentioned, other necessary shops might include: coffee shops, restaurants and a deli, or a drugstore. For the sake of this project, it may be most appropriate to simply allocate space for these functions, and not necessarily design each shop.

Site
This project is sited just south of Downtown Austin, along the south shore of Lady Bird Lake in an area called Auditorium Shores. This site was chosen because of its close proximity to both the Palmer Events Center and The Long Center for Performing Arts, two facilities against which elements of the program can be leveraged. At this location, the center will also be able to take advantage of connectivity to surrounding green spaces such as Zilker Park, as well as the trails around the lake. In addition, the Amtrak line, future light-rail line, and a traffic corridor (Riverside Drive) all converge at the site.
proposed site - Auditorium Shores
The site for this project is located in central Austin, Texas. It is in a district called Auditorium Shores, along the southern shore of the Lower Colorado River, or Lady Bird Lake as it is known in Austin. Auditorium Shores is a 54 acre cultural park with a performance space and exhibition halls.
Site Location and Dimensions

The Long Center for Performing Arts and the Palmer Events Center currently reside in the southeast section of the site. Riverside drive is 60’ wide, 90’ including sidewalks and right of way. The total size of the site is roughly 3.65 million square feet. Excluding the existing buildings, the buildable area on the site is 2.74 million square feet.
Existing Character

The northern edge of the site is entirely waterfront. Across Barton Springs Road, directly to the south, is primarily residential. To the East and West are commercial zones. Across the lake to the Northwest is the Austin Power Plant building. The downtown zone to the North is known as the warehouse district, an area of recent focus for the city. There are several new high rise condos and old warehouse buildings converted into living and office spaces.
Green Spaces/Activity Zones

With the multitude of water recreation activities that take place on Lady Bird Lake (rowing, canoeing, kayaking, etc), it really functions as a “park on the lake”. In addition, a heavily used hike/bike trail runs around the entire lake.
Tree Canopy Estimates

The site lacks a great deal of tree cover when compared to neighboring Zilker Park and even surrounding residential neighborhoods. This makes the case that any outdoor spaces (ie plaza and market) must provide a canopy to shade from the relentless Texas sun.
Transit Corridors and VMU

Lamar Street, First Street, Barton Springs Road and Riverside Drive are all major transit corridors. To the South, West, and East of the site there is a considerable amount of Vertical Mixed Use development.
Priority Streets by Mode

This map, produced by the city, shows the mode of transportation that should be given priority on any given street in the downtown zone. The first phase of the Urban Rail will come into the site on the East along Riverside drive. An off-street, multi-use trail runs along the water, and one runs through the site in the western half. The existing Amtrak and freight line is also marked.
Circulation Patterns

The site is positioned between two major automobile corridors: Lamar Street and 1st Street. Riverside drive cuts through the site from east to west. Also indicated below is the location of the current Amtrak station (North side of Lady Bird Lake), the inset map is from Amtrak’s website. The “station” appears to be little more than a sidewalk next to some powerlines. This analysis was also key in determining the precise location where the transit center should be located. In the North-west corner of the site the Amtrak line, hike/bike trail and future light-rail line (on Riverside Drive) all converge. It is here where the transit center will be positioned.
the convergence of Riverside Dr., the bike trail, and the Amtrak line

hike/bike trail under Amtrak line
pedestrian crossing over Riverside Dr. directly east of the Amtrak line

hike/bike trail along Lady Bird Lake
from the center of the site looking west to the existing train track berm

from the center of the site looking east to the Palmer Events Center
looking north across Lady Bird Lake

Amtrak line from the west, downtown in the background

concrete pylon from the Amtrak train tracks, inspiration for design
Node and Place

As a beginning stage of conceptual design it was crucial to define the notions of node and place. It was also of great importance to assign node and place relationships to the programmatic elements established. From there a series of three dimensional diagrams emerged that began to help me understand the relationships between the program pieces as well as their overall role in the design scheme.
place [pleys]  noun : a space, area, or spot, set apart or used for a particular purpose. destination.

node [nohd]  noun : a centering point of component parts
activity interacting with node and place

node conduit

destinations along path
places along travel path

dedicated path between node and destination

collection and distribution
Masterplan Concept 1

In this scenario, the train line would run down Riverside drive and the station would be along and on either side of the tracks. The plaza is to the north to serve both the station and the PEC. Wrapped around the plaza to the south and west would be commercial development that would also be accessible from the street. Lastly, the market is next to the station on the water.
Masterplan Concept 2

In this concept, the line still runs down Riverside drive, but now the terminal occurs in two different pieces along it. The plaza remains in the same position as in concept 1, but now a piece of it crosses the tracks to connect to the market which is still as the water’s edge. Commercial is still found around the plaza to the west, and now another piece of commercial development emerges near the eastern terminal piece.
Masterplan Concept 3

In this concept, the transit line runs down Riverside drive, turns north on Lamar, continues UNDER the Amtrak line, and turns west down W 5th Street. The transit station is along Riverside and is UNDER the Amtrak station, which runs along the Amtrak line on the western edge of the site. The plaza is to the west of the PEC. The market is to the south and west of the plaza, locating it with easy street access for merchant loading and unloading. The commercial is located along Riverside drive, creating a buffer between the street and the green corridor along the lake.
schematic design
The schematic design phase of this project was an attempt to synthesize the information gathered during the research phase of the project and begin to create a piece of architecture driven by the elements designated as necessary for a destination driven multi-modal center. These early sketches and the resultant final schematic scheme (developed for the end of the fall semester) focus on a few key ideas:

1) The light-rail should be located along Riverside Drive (the location the city has already designated).

2) The Amtrak platform should be elevated above the light-rail location on the existing tracks.

3) Parking should be to the West of the existing heavy-rail track.

4) The plaza should be to the East of the heavy-rail track, extending toward the Palmer Events Center.

5) The market place should be integrated vertically into the scheme. The berm on which the heavy-rail tracks sit should be removed and the market should be created directly below the Amtrak tracks. This way the market can act as a filter between the parking lot and the plaza.
schematic sketches
schematic design - December 2009

- parking
- market stalls
- bridges to plaza
- drop off
- terminal
- concrete pylon

ground level
During design development the project began to take shape. One major decision that drove the design was to repeat five of the large concrete pylons that support the Amtrak line into the zone of the farmer’s market and transit terminal. These pylons designate a unique zone in which one can occupy the space directly under the train line. The parking lot and drop off zone developed to the West of the project and the public plaza took shape as an expansive green space with a stage on the East side of the building, catering to large outdoor performances. The farmer’s market took hold as a center piece space under the Amtrak line. The market acts as filter from the parking lot to the East through to the art gallery and plaza to the West. It was necessary to have the transit terminal as a separate piece to the South of the market so it could reach to the third level where the Amtrak platform is located.

The roofs of the terminal, market, and gallery each open away from the Amtrak line. To the East this reinforces the market as a filter. To the West the roofs provide an overhang for the second floor deck cafe. In combination with the concrete wall of the cafe and gallery, the roof to the West act as a backdrop for the stage. Additionally, a “green valley” for the train line to pass through is created by the roof forms.

The pedestrian bridge enters the building on the second level from the North. A large second floor deck above the gallery space allows visitors a view down to the farmer’s market and provides outdoor seating for a cafe.

The observation tower developed to the North of the terminal and market, positioned directly over the hike bike trail, the Amtrak line, and on the South shore of Lady Bird Lake. An observation deck 80 feet above the lake offers views over the green roofs of the transit center to the South and views of the downtown skyline to the North.
first level plan
  _market
  _terminal entry
  _gallery
  _stage
second level plan
- terminal waiting room
- cafe
- retail
- deck with pedestrian bridge access
character of the farmer’s market: slat ceiling, wooden stalls, corten light-wells, and concrete floors
defining the gallery space: poured concrete exterior walls, concrete floor, wood slat ceiling, and clearstory to the east
articulating the zone the pylons occupy: market off to the left, gallery entrance on the right
possibility of gallery space in the Amtrak waiting area: slat ceiling, concrete exterior walls, and a large curtain wall to the west
The hike bike trail that rings Lady Bird Lake runs directly under the pedestrian bridge, the bridge to the market roof, and the observation tower. Stairs and an elevator allow access to the observation deck from grade level.

The light-rail platform runs along Riverside Drive to the North of the plaza. The platform is accessible from AIM by crossing Riverside Dr on the pedestrian right of way directly East of the pedestrian bridge.

The plaza is a large green space that slopes down to the West. A stage platform on the East side of AIM provides an excellent venue for hosting any of Austin's major outdoor concerts and events. The exterior concrete walls of the gallery and retail spaces serve as the backdrop for the stage.

A passenger drop off adjacent to the terminal building allows for quick drop off and pick up of train travellers by car or taxi.

A portion of the site is a grass paver lot for overflow parking for events at both AIM and the Palmer Events Center. The lot can act as an extension of the green plaza when it is not in use as a parking lot.
The primary entry to the market is from the West. This facade is lined with live oaks that come nearly under the canopy of the building. These trees help shade the building from West sun and act as a natural filter for the open air market.
west elevation perspective
The farmer’s market serves as a unique destination space for the project. This element of the design provides a much needed permanent market place for the city of Austin. It is an open air community gathering place where long distance travellers can stroll as they wait for connecting transit, commuters can grab fresh produce after the work day, occupants of the neighboring event center can grab lunch between sessions, and residents of the surrounding neighborhood can have an outlet for fresh foods.

The gallery is another destination within the project. This space can host travelling art shows and serve as a featured stop on Austin’s monthly gallery opening night. The space features wood floors and 18 foot wooden ceilings. A clearstory to the southeast allows natural light into the space.

The terminal entry is an enclosed space that serves the necessary functions of the transit modes. It is here where travellers arrive, purchase tickets, pass through security and begin the progression up to the 3rd floor Amtrak platform.
1 gallery
2 farmer’s market
1 pylon corridor outside gallery
The second floor mezzanine features an expansive exterior deck. To the east the deck overlooks the stage and plaza, and provides views of downtown Austin and Lady Bird Lake to the North. The roof of the market peels up over a portion of the exterior deck, allowing for a view down to the activities of the farmers market.

On the mezzanine level are a cafe, coffee bar and convenience shop for travel amenities. These spaces are intended to enhance and support the activities of visitors to the transit center by offering a place to enjoy a meal or cup of coffee, as well as a place to purchase necessities for a trip.

A large waiting area occupies the second floor of the terminal building. This space features comfortable seating for extended waits, bar stools and tall tables, and a coffee and snack vendor. The space is clad with wood ceilings and wood floors to accent the raw quality of the concrete pylon that vertically penetrates the space. Both the stairs up and down from this space are of concrete to mimic the pylon they are positioned against.
second level perspectives
2 Amtrak waiting room
The observation deck towers 80 feet above Lady Bird Lake, showcasing views over Downtown Austin to the North and the beginning of the Texas Hill Country to the West. The tower is visible from long distances and serves as an iconic landmark, announcing the project from afar.

The Amtrak platform cuts through the building on the third level, sitting 42 feet above grade atop the existing concrete pylons. Integrating the platform in through the building and atop the pylons encourages occupants to be constantly aware of the primary function of the building: a destination space at the convergence of multiple modes of transit.

Access to the Amtrak platform is from the third floor of the terminal building. Additional seating is provided on this level for waiting and staging. The room also provides views over the plaza and Lady Bird Lake to Downtown Austin.
heading north on foot bridge
from the northwest
from the northeast
plan perspectives
looking north down platform

looking south down platform
view from the lake

retaining wall
market stalls

market light well
northeast aerial
The final presentation of the design work of this thesis project was well attended by both faculty and students and was roughly one hour in length. The comments regarding the research and design process were for the most part positive. The critics agreed that the farmer’s market, art gallery and outdoor performance space were good choices for creating a destination space for the city of Austin. The major criticisms of the project focused on the connectivity between the different transit modes and the lack of development for the light rail platform. Additionally, it was mentioned that the stage might be undersized for the size of performances that might occur. The question was asked if this project would have been more successful if it would have been located in the heart of Downtown Austin as opposed to across Lady Bird Lake. The goal of this project was to create a multimodal center that functions as a transit node but also creates destination spaces in an urban environment. Hopefully the successes and criticisms of this project add to the greater architectural discussion regarding transit centers and their role in our lives.

Jurors

Gail Peter Borden | University of Southern California
Brian Andrews | University of Nebraska visiting professor
Martin Despang | University of Nebraska
Dean Wayne Drummond | University of Nebraska
Mark Hoistad | University of Nebraska
Tim Hemsath | University of Nebraska

Location

Architecture Hall | University of Nebraska Lincoln

Date

April 2, 2010  1:30pm


America 2050

Amtrak: Routes, Schedules, and Standards

Austin Chamber of Commerce Transportation

Austin : Long Range Transit Plan

Austin Neighborhood Maps

City of Austin : Downtown Redevelopment

Denver : The Master Plan
Federal Highway Administration, Highway Statistics Annual, 2006

Federal Transit Administration

Great Public Spaces : Project for Public Spaces


NAPR : Railway Stats

Pioneer Courthouse Square : Portland, Oregon

Priestman Architects : Stockholm City West

Station Standards

Utrecht City Website