Urban Area Transit Strategy:
A Component of the 2050 Regional Transportation Plan

Lessons Learned from Peer Regions

December 2009

Prepared by:

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EXECUTIVE SUMMARY

With the preparation of the 2050 Regional Transportation Plan (RTP), the San Diego Association of Governments (SANDAG) is seeking a new and innovative vision for transit that will result in a more significant role for transit in addressing the region’s mobility, land use, and sustainability goals. To help guide development of a new transit strategy, a review has been conducted of other regions that have successful transit systems, relatively high levels of transit use, and unique transit services or facilities. These areas offer examples of how transit has been applied successfully, and provide a point of reference or a standard from which comparisons can be made.

Three regions that might be considered “benchmark” cities for San Diego were researched in some detail. These cities are:

- Portland, Oregon
- Sydney, Australia
- Vancouver BC, Canada

Seven additional “comparison cities” are highlighted because they have characteristics similar to San Diego or provide examples of unique transit applications that have helped raise the profile of transit in their regions. These cities are:

- Brisbane, Australia
- Bordeaux, France
- Denver, Colorado
- Los Angeles, California
- Melbourne, Australia
- Minneapolis, Minnesota
- Seattle, Washington

Appendix A contains comparative data for U.S. cities to help provide a point of reference for San Diego.

Overarching Themes and Considerations for San Diego

Several overarching themes emerged from the benchmark and comparison cities evaluation, many of which may be appropriate for consideration as SANDAG develops the 2050 Transit Strategy. The overarching themes found as part of the case study review are presented on the left side of the following table and their potential applicability to San Diego is presented on the right.

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1 This document contains technical corrections made in late December, after the initial report was formally released earlier that month. These corrections are reflected in track-changes mode.
Overarching Theme | Considerations for San Diego
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The “success” of transit did not happen overnight. | San Diego embarked on an innovative new transit strategy in the early 1980s with the opening of the region’s (and nation’s) first urban rail transit line since WWII from downtown San Diego to the International Border. Over the next 25 years, the region expanded the rail network to provide a backbone transit infrastructure and service network, to one that now includes 75 miles of light rail (San Diego Trolley and Sprinter) and 40 miles of commuter rail (Coaster). Between 1975 and 2005, transit ridership increased 150 percent while regional population increased approximately 75 percent. As the original regional rail program nears completion (the 11-mile Mid-Coast corridor between Old Town and University City is the only remaining rail extension in the Regional Transportation Plan), the regional transit strategy has shifted to a multi-modal, shared right-of-way approach (transit on managed lanes and arterial streets). Looking to the experiences of the case study regions, San Diego may need to develop a new “dramatic strategy” for transit for the next 30-40 years – one that combines past, present, and future strategies to recapture the transit momentum experienced in the 1980s. The new strategy will need to include a stronger connection between transit investment and land use policies to achieve SANDAG’s vision for a larger transit mode share in the urban core, and key corridors and communities.

Transit success depends on regional plans and visions that guide the integration of land use and transportation. | SANDAG’s Regional Comprehensive Plan and Smart Growth strategy have established a hierarchy of centers that are designed to be supported by transit, as well as policies for integrating land use and transportation. Development of a new regional transit strategy should draw heavily on the policies and goals in the Regional Comprehensive Plan for both the region and specific corridors/communities. To achieve success, agencies, transit providers, and stakeholders must work together towards agreed upon transit and land-use goals.

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**Overarching Theme** | **Considerations for San Diego**
---|---
**Regions use a variety of tools to achieve transit success.**
Regions used a variety of policy, regulatory, and financial tools that contributed to the success of transit in these regions. Tools were modified or new tools added when they were no longer effective for encouraging ridership or investment along transit corridors. SANDAG and the region already have a variety of policy tools to support transit as defined in the Regional Comprehensive Plan and Smart Growth strategy. Additional policies and tools found in the peer regions/cities that promote and support existing and future transit services for consideration by SANDAG include: improvements to the pedestrian environment, urban growth boundaries, cooperative agreements between public agencies and private developers, tax incentives to foster transit oriented development, parking maximums or limitations, and legislation requiring commute trip reductions by major employers.

**Regions generally experienced a shift in policy and investment toward transit over the past few decades.**
Regions moved toward transit as a tool for improving mobility and sustainability in response to public pressures related to sprawl, the environment, livable communities, and quality of life issues. These regions also made significant investments in permanent transit infrastructure, which not only improved transit, but also helped generate awareness and understanding of the transit system and spur transit-oriented development. The San Diego region is also experiencing similar pressures to contain sprawl, protect the environment, promote livable communities, and maintain and improve the quality of life. Through the Regional Comprehensive Plan, the San Diego region has made the policy connection between investments in transit and achieving these goals. Looking toward the future, new transit policies and strategies designed to increase transit mode share will need to understand the effects of regional highway investments and policies on the potential success of the transit investments and system.

**Local bus networks are essential for successful transit systems to provide efficient connections and access to the backbone system.**
To efficiently support higher frequency transit stations, feeder services are essential components of the transit system and, depending on the local geography, are often structured along grids or hub-and-spoke networks. San Diego's existing transit network leans toward hub-and-spoke structure with feeder buses connecting to rail based transit centers. However, many trips rely solely on bus transit. A new transit strategy will need to build off the existing rail transit investment, while also considering how best to serve key travel markets (origins/destinations, work trips, etc.) that may not be well served by existing bus/rail connections. The strategy will also need to define the role of local and feeder bus service in relation to the major transit infrastructure investments.
<table>
<thead>
<tr>
<th>Overarching Theme</th>
<th>Considerations for San Diego</th>
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<tbody>
<tr>
<td><strong>Parking requirements in transit-supportive communities are reduced.</strong></td>
<td>Abundant and inexpensive parking have proven to be key deterrents to transit use. A new transit strategy for the San Diego region should evaluate how parking policies (location, availability, and cost), particularly in the city center and urban core, impact transit use.</td>
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<tr>
<td>Most transit successful regions have coordinated parking policy with land use and transit policy. Parking strategies often differ between central and outlying areas.</td>
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<td><strong>Successful transit systems include a variety of transit modes.</strong></td>
<td>All regions include a combination of transit facility and service applications to create their transit networks and systems.</td>
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<tr>
<td>Cities and regions with successful transit have systems that include combinations of transit modes applied for the particular conditions, objectives and circumstances (i.e., heavy rail, commuter rail, light rail, bus rapid transit, rapid bus, local bus, streetcar, shuttles, electric bus, etc.)</td>
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<td><strong>Unique applications of transit have occurred in the central cities.</strong></td>
<td>Even cities with similar transit histories and land use characteristics as San Diego have invested heavily in innovative transit facilities and services in their central cities (transit malls, streetcars, underground bus terminals, fare free zones). These investments have proven highly successful in generating transit ridership, supporting the regional transit network, achieving land use objectives, increasing transit mode share, and contributing to the vitality of their downtown core. Many of these strategies may have applicability to downtown San Diego and other key activity centers.</td>
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<td>While all of the studied regions have a wide range of transit modes that provide area- and location-appropriate transit, these cities have also incorporated special applications of transit infrastructure, services, and policies in their downtowns in ways that raise the profile of transit, promote transit use, and support higher density environments.</td>
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BENCHMARK CITIES

For the benchmark cities, the project team asked a series of questions designed to provide insight into why transit works within the city and what supports the system to make it work.

1) Portland

When did the process begin?

The evolutionary process of becoming a transit city began over 25 years ago when the first light rail line was planned. In Portland, the first light rail line was, in part, an outgrowth of a citizen-led freeway revolt that ultimately resulted in the reduction of available land takings for transportation uses. With limited land to work with, TriMet focused on building partnerships and convincing others that transit-oriented development (TOD) was an essential tool to address current and future transportation needs. However, transit-oriented development was largely an afterthought during development of the first light rail line.

Fifteen years later, the creation of new walkable communities was a primary rationale for building the streetcar line that runs through downtown Portland. Many advocates consider the streetcar to be a housing and redevelopment tool; not just a tool for moving people out of their cars. Since the streetcar opened in 2001, over $3.4 billion in development and 10,212 residential units have been constructed along the route.

What is unique about the system?

The Portland story is about community-building and life-style choice more than a transit or TOD story. The Region 2040 Plan, the regional growth strategy and vision for the Portland Metropolitan region, identifies a series of centers that are focused around transit. As such, TOD is a means or tool to become a sustainable place, not an end in itself.

As each successive light rail line developed, it became clearer that the addition of transit alone was not enough to spur development and increase ridership. A clear strategy and tools were needed to realize the construction of a higher density mix of uses near transit investments. The strategy involves coordination among various agencies, each playing a different role consistent with its overall mission:

- TriMet – seeks to focus growth next to transit because of the evidence supporting the theory that the more people who can walk to transit, means more people who will use transit. TriMet has no special TOD tools or sources of funding, but TriMet does do the following: select rail alignments that support TOD; modify station locations to facilitate supportive development; fund local government planning to encourage implementation of supportive policies; write-down land costs to get better design/density/affordability in TODs; turn park-and-rides into TODs; and invest savings from rail construction to create TODs.
Metro – oversees the implementation of Region 2040, act as the Metropolitan Planning Organization responsible for identifying existing and future transportation project and program expenditures, sets the regional plan for expanding transit, and manages the Portland metropolitan region’s urban growth boundary. In addition to its transportation planning role, Metro has a TOD program that is dedicated to the development of TOD centers and corridors as part of an aggressive strategy to implement Region 2040. The program operates through a series of cooperative agreements between Metro and local jurisdictions and utilizes agreements with private developers (primarily for site acquisition). In the past, the program has focused on projects that might not otherwise be developed on a given site without additional subsidy.

Portland Development Commission (PDC) – is the urban renewal and economic development arm of the City of Portland. PDC funds projects that are green, support the community and transit, pay prevailing wages, and meet minority and disadvantages business goals. PDC also uses tax abatement and developer agreements to support projects. It has funded several TODs in the City of Portland.

In addition, the private sector is asked to be a partner, as well as be innovative – in return, the public sector seeks to reduce the risk for their private sector partners. For example, when the streetcar was built in the Pearl District, a developer agreement was signed by the developer and the City of Portland (PDC) that addressed housing density, housing affordability, parks, and infrastructure. The developer contributed funding and donated right-of-way for needed infrastructure (streets, streetcar, utilities, and park) within the development and committed to develop at higher housing densities to coincide with certain public improvements to be provided by the City, such as the removal of a structure crossing the abandoned rail yards, construction of the streetcar, and a neighborhood park. The City formed an urban renewal district to allow for tax-increment financing in order to fund its obligations.

Throughout the years, these partnerships have spurred more than $9 billion in development, consistent with transit-friendly land use plans along Portland’s 44 miles of light rail and 4 miles of modern streetcar. These partnerships have resulted in residential and employment growth occurring within walking distance of transit. As a result,

- Portland area residents travel about 20 percent fewer miles than residents in other large U.S. metropolitan areas;
- Portland residents are twice as likely to commute to work using transit and seven times more likely to commute by bicycle than the average metropolitan resident in the U.S.;
- Over 8 in 10 of TriMet’s riders are choice riders, meaning they have a car available for the trip or choose not to own a car; and
- Portland has the second lowest rate of spending on transportation costs of the 28 largest U.S. metropolitan areas. Residents spend about 4 percentage points less of their total household budgets on transportation than other Americans, about 15.1 percent compared to 19.1 percent nationally.
**Have freeway/highway investment strategies changed over time?**

Over the years, more federal funds have been sought for transit than previously. The Draft 2035 Regional Transportation Plan identifies approximately 32 percent of the federal priority funds for transit capital and 47 percent for roads and bridges, which includes new street connections to transit or for walking and biking.

**What is the share of downtown employment in the region?**

Approximately 8 percent of the region’s jobs are in the central business district.
Exhibit 1  Portland MAX Light Rail Network
2. Sydney

When did the process begin?

Over the past three decades metropolitan planning strategies for Sydney have contained policies which sought to promote development and growth in designated centers within the metropolitan area of Sydney, as well as policies that restrict office and retail activities outside of the centers. The 2005 New South Wales Metropolitan Strategy, “City of Cities – A Plan for Sydney’s Future,” continues the “centers” policy of concentrating activities in a hierarchy of “strategic centers” that includes the city of Sydney, five designated regional cities, areas of high value economic activity designated as specialized centers, and major centers that are areas of civic, shopping and recreational activity. The Strategy explicitly recommends concentrating activities in centers on or near public transport in order to achieve a range of benefits. Improving transport between Sydney’s centers and the transportation sustainability of centers are key supporting objectives. While the accompanying transportation strategies included a commitment of resources to rail and other public transport investments and were premised on research that indicates a centers-based urban form requires upgraded public transport links that provide more efficient connections than automobiles, the key elements of the strategies have not always been delivered.

In the 1990’s, study began on a network of transitways that would link the region’s residential areas to the employment areas in the outer suburban ring around Sydney’s central business district.

What is unique about the system?

In 2005, 80 percent of Sydney’s population lived within 30 minutes by public transit of Sydney, a designated regional city, or a designated major center. Over 70 percent of employees in the Sydney central business district use public transit to and from work. This is the highest mode share in Australia and is comparable with Manhattan in New York City.

The Liverpool to Parramatta line of the Western Sydney Transitway Network is an example of how people’s behavior can change when they are given high quality, frequent transit service. The rapid transit corridor is approximately 19 miles (30 km) long, running from Liverpool to Parramatta on an exclusive busway network. The intent of the line was to improve travel in the outer suburban ring (not into downtown Sydney) and improve access from residential suburbs to suburban employment centers by providing an alternative to the automobile. Originally planned as a fully integrated network, with a mix of dedicated trunk corridor and feeder services, only the trunk corridor services have been developed, which includes 35 stations and approximately five-minute headways during the morning and evening peak. Even without full build-out, the corridor has proven to be successful and has seen a 20 percent annual increase in ridership growth since it opened in 2003. Approximately 20 percent of the transit riders in the corridor previously traveled by automobile.
Have freeway/highway investment strategies changed over time?

In the last decade, a considerable number of toll-road facilities have been developed and constructed under public-private partnership agreements and have, in part, been to complete the existing road network. In the last five years, there has been a shift away from freeways and toll-roads to transit infrastructure due to a change in policy at the Federal level.

What is the share of downtown employment in the region?

The central business district has approximately 12 percent of the region’s employment.
Exhibit 3        Sydney CityRail Network
Exhibit 4 Liverpool to Parramatta Line - Western Sydney Transitway Network

Proposed 90km network strategy
3. Vancouver BC

When did the process begin?

The 1975 Livable Region Plan created a vision of transit-oriented growth. In 1996, the Livable Region Strategic Plan and the Transport 2021 Long-Range Plan were adopted. Both call for more compact development, complete communities, and TOD. The Livable Region Strategic Plan key strategies are:

- Protect the green zone (watersheds, farmlands, conservation areas, parks and other natural assets)
- Build complete communities
- Achieve a compact metropolitan region
- Increase transportation choice.

The Regional Town Centers in the Livable Region Strategic Plan focus employment growth closer to where people live and where transit service is most available. The Vancouver region also encourages infill development and protects their "green zones" through the use of an urban growth boundary.

What is unique about the system?

The urban design and density that supports transit have been part of Vancouver’s story for decades due to its topographical and geographic constraints of water and mountains. The density in Vancouver is one of the components that make the transit system work. Social bonus zoning allows extra density in housing developments in exchange for public amenities, such as cultural facilities, parks, schools, and affordable housing, built by the developer. Developers appreciate this approach because they have found that the value of their projects increases with improved public amenities. The social bonus zoning has resulted in greater diversity in housing, both in housing types and demographics, and has also resulted in a vibrant public realm that includes greater walkability and a mix of uses. Public amenities ultimately included in developments are selected and managed by the City of Vancouver through a development agreement.

There are two transportation planning decisions that have greatly influenced how the citizens of Vancouver travel within their city. First, Vancouver is the only major city in North America that does not have a freeway within its boundaries. In the 1970’s, as a result of the “Livable Region Plan,” a proposed freeway grid system was abandoned in favor of more sustainable transportation systems. Second, the only bridge from downtown across Burrard Inlet is the three-lane Lions Gate Bridge – there are no discussions of replacing or widening the bridge. These two decisions have resulted in an acceptance by residents of alternative transportation options, but the city has also been designed to be walkable, bikeable, and provide a high level of transit service. Within the City of Vancouver, buses generally run on the grid system, but outside the city boundaries, most buses operate on a hub-and-spoke system along feeder routes that connect with SkyTrain, SeaBus, or West Coast Express. There are also express bus routes that travel directly to downtown Vancouver or other regional centers.
Another component of the Livable Region Strategic Plan is the prohibition of surface off-street parking in many of the regional town centers. This limitation has prompted developers to orient projects to transit facilities in order to avoid constructing more expensive structured or underground parking, as part of the proposed development. This limitation in use of available land for parking or auto-based needs can lead to the development of public amenities, such as parks, pedestrian and bike connections, and further development.

**Have freeway/highway investment strategies changed over time?**

The Livable Region Strategic Plan calls for limiting the amount of new highway infrastructure and increasing the supply of transit services across the region. No expansion of the highway network is proposed into the city of Vancouver and a planned major highway expansion project in BC's Lower Mainland to Highway 1 from Langley to Vancouver is currently experiencing public opposition. Investments by TransLink (the regional transportation authority responsible for regional transit, cycling and commuting options), are required to support the Livable Region Strategic Plan.

In addition to the Livable Region Strategic Plan, the City of Vancouver adopted a Transportation Plan in 1997 that emphasized limiting overall road capacity to 1997 levels by not expanding the grid system, but instead providing more comfortable walking and biking environments, increasing the use of transit, calming traffic in neighborhoods, and maintaining an efficient network for goods movement. After 10 years, vehicle trips entering Vancouver have decreased 10 percent, bike trips have increased 180 percent, walking trips have increased 44 percent and transit trips have increased by 20 percent.

**What is the share of downtown employment in the region?**

Approximately 9 percent of the jobs in the Vancouver region are located in the central business district.
Exhibit 5  Vancouver TransLink Map
COMPARISON CITIES

In addition to the three benchmark cities, seven comparison cities that are similar in size and demographic and/or geographic characteristics to San Diego were studied because they have transit components that are worth understanding, particularly in their central areas.

1. Brisbane

Brisbane’s transit system is managed by the TransLink Transit Authority and consists of CityTrain, Brisbane’s urban rail network of 10 suburban lines and three interurban lines (237 miles), the CityCat ferry system, local bus service, and a busway network. The decision to develop a busway instead of expanding the existing rail system was due to a debate over the expansion of the Pacific Motorway (freeway) from six to eight lanes. The expansion was opposed by a large segment of the community and the Brisbane City Council desired an alternative that focused on people carrying capacity (versus auto carrying capacity). However, the corridor was not included in any future plans for a rail extension and contained relatively low-density development. The busway concept was designed to address the dispersed transit needs of this corridor, fill the gaps between existing rail lines, and further complete the public transportation network. The busway provides a dedicated facility that allows suburban bus routes to access the busway at key locations, providing more point-to-point travel from local bus stops and avoid auto traffic congestion on the motorway. More than half of the bus routes using the busway begin their service in the adjoining suburbs before traveling express to the central business district.

The South East busway was the first section to open and has been operational since 2001. The Inner Northern Busway began service in 2008, creating a core section of the busway system that runs from the Royal Children’s Hospital to Queen Street. There are over 19 miles of transit lanes with 17 stations (stations include electronic bus information, security, and bicycle facilities) on dedicated roadways. Both rail and bus systems converge in the Brisbane central business district; the Roma Street station includes platforms for the busway and CityTrain services at the same level. Expansions of the busway are currently being constructed or planned, including the Eastern and Northern Busway, Northern Busway and Boggo Road Busway.
Exhibit 7 Brisbane Queensland Rail and Busway Network
Exhibit 8  Brisbane Translink Busway Network

TransLink busway network

Key

- rail network
- existing busway network
- future busways
- proposed busways

Please note: this map is not to scale and indicative only
2. **Bordeaux**

Bordeaux's public transit system consists of three tram (streetcar) lines, 72 bus routes that all connect to the tramway network and electric bus shuttle in the city center, and a boat shuttle on the Garonne River. The tram network connects Bordeaux with surrounding suburban areas. The first phase of the network consists of a 24.5 km (approximately 15 miles) network and 53 stations. The second phase will extend the three lines a total of 20 km (12.5 miles) and incorporate an additional 28 stations and eight park-and-ride lots.

Many downtown streets and plazas along the tram lines have become pedestrian areas with limited car access – pedestrian mobility is supported by an electric shuttle bus (la navette du centre-ville) in the downtown core that has no set stops. The city of Bordeaux implemented the Urban Project to improve the center city environment for pedestrians and cyclists and established principles of pedestrian-friendly environments in their Street Code document for improved streetscapes and pedestrian connectivity. The city also established car-free zones and pedestrian-only days within the center city. Bordeaux has seen a dramatic increase in the number of cyclists since these measures have been enacted.
Exhibit 10  la navette du centre-ville Route Map (electric shuttle bus)
3. Denver

The Regional Transportation District (RTD) manages and coordinates public transportation in the greater Denver area (eight of the twelve counties) and provides service on 140 local, express, and regional bus routes, six light rail lines (totaling 35 miles), and nearly 80 park-and-rides. In 2004, voters approved FasTracks, a light rail, bus, and commuter rail expansion project that will serve neighboring suburbs and communities. It will add 122 miles of new commuter and light rail, 18 miles of bus rapid transit service, 21,000 new parking spaces at rail and bus stations, and enhance bus service within the eight-county district.

Exhibit 11 Denver Light Rail Transit System
Within the central business district, the 16th Street Mall is a pedestrian and transit mall running 1.25 miles from Union Station (Wewatta Street) to Civic Center Station (Broadway). Since its opening in 1982, the Mall has become the city’s busiest transit artery and a premier public space. Originally, from Market Street to Broadway, the Mall was extended in 2001 to Wynkoop Street and then to Union Station in 2002 with the completion of the Central Platte Valley (C line) light rail extension. The FREE MallRide, a free high-frequency electric shuttle bus service operated by RTD runs the length of the Mall. The frequency of service is very high, with buses approximately every 1-2 minutes during rush hour. The total travel time from Union Station to Civic Center Station is approximately 11 minutes. Stops are located at every intersection. The FREE MallRide connects to other RTD transit: light rail at Union, 16th/California and 16th/Stout Stations; and bus service at Civic Center and Market Street Stations. The connecting bus services enter below grade bus stations at these locations.
4. Los Angeles

The Los Angeles County Metropolitan Transportation Authority and several other agencies operate the region’s bus, heavy rail, and light rail lines throughout Los Angeles County. Since the 1980s, the region has undergone a fundamental refocusing of its transportation policy from freeways to transit. Los Angeles has invested heavily in transit over the past 20 years, beginning with Measure Proposition A in 1980, which provided a half-cent sales tax specifically for transit, Measure C in 1990, another half-cent sales tax of which at least 40 percent is dedicated to transit (the remaining is for highways and roads), and Measure R in 2008, the most recent half-cent transportation sales tax of which at least 65 percent is dedicated to transit. The combination of the three sales tax measures results in an approximately one-cent sales tax for transit. All measures enacted an additional half-cent sales tax for transit and highway projects. The percent dedicated to transit increased under each measure, with 65 percent dedicated to transit under Measure R. Transit service in the Los Angeles area includes light rail (Blue, Green, and Gold lines), heavy rail subway (Red and Purple Lines), BRT guideway (the Orange Line, El Monte Busway, and Harbor Transitway), and 20 Rapid Bus projects, tying rail and bus together into a backbone system in a relatively short time. In addition, MetroLink provides commuter rail service within and between Los Angeles, surrounding counties and many suburban areas, and an extensive local bus network supports the backbone system.

Downtown Los Angeles is the hub of the city's rail transit system and on the northeastern edge of downtown, the Los Angeles Union Station (known as the "Last of the Great Railway Stations") serves as the region's main transportation hub. However, the region includes a number of non-downtown serving rail and bus facilities, particularly the Metro Rapid bus services, which now operate on a 450 mile network, complementing light and heavy rail transit throughout Los Angeles County.
Exhibit 13  System Map of Los Angeles Metro (LRT), MetroLink (Commuter Rail), and Orange Line (BRT Guideway)
Exhibit 14  Los Angeles Metro Rapid (Arterial Bus) and Rail System Map
5. Melbourne

Public transportation in Melbourne includes train, tram (streetcar), and bus networks. MetTrain, the rail network, consists of 16 suburban lines that feed into City Loop, a partially underground one-way loop that is serviced by five stations. Melbourne’s tram network has 29 routes and 250 km (155 miles) of double track, approximately 80 percent of which shares surface roads with other vehicles and users. In addition, Melbourne has a bus network of approximately 300 routes that are provided by about 50 privately-owned bus companies under a franchise system. Melbourne also has a fare free transit service (CityCircle) within the downtown area.

Unlike other cities post World War II, Melbourne did not abandon its tram system. Because of the long history of trams in the central area, Melbourne has retained a strong focus on compact development in the central business district. Also contributing to the high central business district densities is the City's reluctance to connect the core and lower density suburban areas with high capacity freeway links. When the 1969 Metropolitan Transportation Plan proposed that a 500-kilometer freeway network would be needed within 15 years to avoid citywide gridlock, the Committee for Urban Action did not want a freeway to take over the city and mobilized against the proposal in order to preserve the unique design of the inner city from “imposing freeway structures.”

In the mid-1980’s, an effort was made to strengthen the region’s core through the adoption of the “Central City Plan” that focused on infill development in the established areas and creating “green wedges” between the urban and rural areas. This plan transformed Melbourne’s central city through urban design and planning, including the implementation of height limits, design standards and public amenities, private investment, and new land uses in the central city. The addition of a designated urban growth boundary within its Melbourne 2030 Plan also strives to focus growth within the central city.
Exhibit 16  Melbourne Tram (Streetcar) Network
Exhibit 17    Melbourne Free City Circle Service
6. Minneapolis

Metro Transit is the transit service provider in the seven-county region surrounding Minneapolis and St. Paul, providing service on approximately 130 routes, the Hiawatha Line light rail, and the Northstar commuter rail line. In addition to these more traditional transit services, Minneapolis has over 250 miles of bus-only shoulders in the metro area. The bus-only shoulder concept provides more reliable service and faster transit travel times in congested corridors, which is designed to promote and increase transit ridership. The Metropolitan Council is currently undertaking a project that is assessing opportunities to ‘right size’ their highway system by analyzing future infrastructure scenarios that range from traditional highway expansion infrastructure investments to various scenarios utilizing lower-cost/high-benefit projects that could include investment in managed lane facilities, pricing strategies, and other operational strategies. In addition, Minneapolis has an urban service area boundary, which is not a strict growth boundary, but a framework to direct development to areas with existing roads and sewers to efficiently use existing infrastructure.

Running through downtown Minneapolis is the Nicollet Mall – a pedestrian and bus transit mall that, in addition to Hennepin Avenue, is considered the cultural and commercial heart of the city. In addition to serving many Metro Transit bus routes, Nicollet Mall also connects to the current and future light rail system. The Hiawatha light rail line connects downtown Minneapolis to the airport and the Mall of Americas, crosses the Nicollet Mall at one end, and the planned Central Corridor line to downtown St. Paul will also include a stop on Nicollet Mall.
7. Seattle

Sound Transit is the provider of regional express bus, commuter rail, and light rail service in the greater Seattle and Puget Sound region. The City of Seattle is the primary focus of transit service in the region and accommodates multiple modes of transit through the use of a transit tunnel and dedicated street right-of-way through the downtown. The Downtown Seattle Transit Tunnel (DSTT) runs underground, the length of downtown Seattle, approximately 2.1 miles from Ninth Avenue and Pike Street to Fifth Avenue South and South Jackson Street. The tunnel opened for service in 1990 and has recently been retrofitted to accommodate Sound Transit’s new light rail service, which commenced operation in 2009. Seventeen bus routes and the light rail line operate in the tunnel and serve a total of five tunnel stations.

During reconstruction of the DSTT for light rail use, Third Avenue through downtown was designated as a transit only street during the morning and evening peak hours. These operational designations are currently being maintained even though reconstruction of the tunnel is complete, providing transit priority and facilitating transit travel through downtown. In addition to Third Avenue, both Second and Fourth Avenues include dedicated transit lanes from approximately Stewart Street to Washington Street on Second Avenue and from Yesler Way to Pike Street on Fourth Avenue (about 12 city blocks in length). Downtown Seattle also has a Ride Free Zone, where fares are not required for anyone traveling with the designated downtown travel zone.

In 2007, the City of Seattle opened service on the South Lake Union Streetcar, which runs from Westlake Center in downtown to and through the newly redeveloping neighborhood of South Lake Union immediately north of the downtown area. Infill development is encouraged in Seattle and the surrounding region through the use of an urban growth boundary.
Exhibit 20  Sound Transit Regional Transit System
### Appendix A – Comparative Demographic Data

**Urban Core Transit Strategy**

**US Comparison Cities: Transit and Demographic Information**

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<th>San Diego</th>
<th>Denver</th>
<th>Los Angeles</th>
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<td><strong>Urbanized Area Population (1)</strong></td>
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<td>2.3m</td>
<td>11.4m</td>
<td>2.4m</td>
<td>1.6m</td>
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<td>94.2m</td>
<td>717.4m (7)</td>
<td>88.9m</td>
<td>106.7m</td>
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<td>591.0m</td>
<td>538.0m</td>
<td>3220.2m (7)</td>
<td>444.6m</td>
<td>448.8m</td>
<td>1183.6m (9)</td>
</tr>
<tr>
<td><strong>Urbanized Area Population/Square Mile (density) (1)</strong></td>
<td>3419</td>
<td>3979</td>
<td>7068</td>
<td>2671</td>
<td>3340</td>
<td>2844</td>
</tr>
<tr>
<td><strong>Service Area (square miles) (1)</strong></td>
<td>782</td>
<td>499</td>
<td>1500</td>
<td>894</td>
<td>474</td>
<td>954</td>
</tr>
<tr>
<td><strong>Service Area Population (3)</strong></td>
<td>2.2m</td>
<td>2.0m</td>
<td>8.6m</td>
<td>2.4m</td>
<td>1.5m</td>
<td>2.7m</td>
</tr>
<tr>
<td><strong>Metropolitan Area Employment</strong></td>
<td>1.4m (6)</td>
<td>1.3m (10)</td>
<td>4.4m (10)</td>
<td>1.7m (10)</td>
<td>1.0m (10)</td>
<td>1.4m (10)</td>
</tr>
<tr>
<td><strong>Downtown Employment /Regional Employment</strong></td>
<td>5.6%</td>
<td>8% (11)</td>
<td>8.5% (12)</td>
<td>8.0%</td>
<td>8.1% (13)</td>
<td></td>
</tr>
<tr>
<td><strong>Auto Ownership Estimates (4)</strong></td>
<td>90%</td>
<td>86%</td>
<td>84%</td>
<td>80%</td>
<td>86%</td>
<td>84%</td>
</tr>
<tr>
<td><strong>Vehicles per Household (14)</strong></td>
<td>1.85</td>
<td>1.80</td>
<td>1.79</td>
<td>1.80</td>
<td>1.80</td>
<td>1.83</td>
</tr>
<tr>
<td><strong>Transit Annual Operating Budget 2008 (5)</strong></td>
<td>$271.7m</td>
<td>$374.8m</td>
<td>$1352.8m</td>
<td>$315.7m</td>
<td>$338.0m (8)</td>
<td>$657.4m</td>
</tr>
</tbody>
</table>

(1) 2008 National Transit Database Appendix D: 2000 US Urbanized Areas
(2) APTA Fact Book, Appendix B, Transit Agency and Urbanized Area Operating Statistics, Table 9
(3) 2008 National Transit Database
(4) Carfree Census Data Estimates
(5) 2008 National Transit Database, Table 12 (regional or major transit providers)
(6) SANDAG Regional Employment Data Year 2000
(7) Includes Los Angeles/Orange UZA and Metrolink
(8) Does not include Portland Streetcar, Inc.
(9) Includes WA State Ferries and Monorail
(10) Bureau of Labor Statistics 2009
(11) Denver Region Council of Governments
(12) Metropolitan Council data request (Minneapolis 2008)
(13) Puget Sound Trends, Puget Sound Regional Council, October 2009
(14) Demographia, MSA Vehicles per Household, 2008
Appendix B - References and Resources - In Progress

- Boddy, Trevor, “Vancouverism vs. Lower Manhattanism: Shaping the High Density City,” The Vancouver Sun, September 20, 2005
- Centre City Development Corporation, Downtown San Diego Complete Community/Mobility, September, 2008
- City of Vancouver Transportation Plan Update, October 2007
- City of Vancouver Information Sheet 2005
- Dick Fleming interview and powerpoint, November 2009
- Fleming, Dick, John Stott and Don Bletchly, “The Effectiveness of Bus Rapid Transit in Low Density Cities – A Review of Australian Experience”
- Gordon Price interview and powerpoint, November 2009
- Melbourne 2030 – Planning for Sustainable Growth
- Metro.kingcounty.gov
- Metro, Draft 2035 Regional Transportation Plan (Portland)
- Urban Transport Fact Book, October 2003
- www.bordeauxs.fr (translated)
- www.dse.vic.gov.au
- www.infotbc.com (translated)
- www.metlinkmelbourne.com.au
- www.metro.net
- www.metrocouncil.org
- www.metrostrategy.nsw.gov.au
- www.metrovancouver.org
- www.rtd-denver.com
- www.rtd-fastracts.com
- www.soundtransit.org
- www.translink.com.au
- www.vancouver.ca