**Metrans Project 00-12**

# Freeway Bus Station Area Development: Critical Evaluation and Design Guidelines

## A Case Study of (I-110) Harbor Transitway Stations


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# Abstract

Transit centers can become more than just a place for transportation. They can serve as destination places that accommodate a diversity of uses and activities which promote transit ridership. Their location, quality of design, supporting amenities, and other development attributes can influence ridership. In this project, we use Harbor Transitway as a case study to assess the place based qualities of freeway transit centers with respect to amenity mix, appearance, access, comfort, convenience, security, business development opportunities, and pedestrian and park-and-ride linkages. In addition, we identify transit user needs and perceived gaps in services through surveys and interviews to develop broad performance measures of station area interface with the neighborhood and transit user needs. Our research suggests that Harbor Transitway station areas are not used efficiently or effectively. Some of the major problems cited by transit users include irregularity in bus service, inconvenient bus transfers, insufficient public amenities, lack of public art, narrow sidewalks, unsafe crosswalks, high noise levels, poor station area maintenance, insufficient lighting, and perception of insecurity of waiting alone at the station. To increase transit ridership, we make design recommendations and suggest strategies to improve linkage between land use, transportation, and surrounding communities.

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# Chapter 1: Introduction

## 1.1 Project Objectives

The central idea behind this project is to examine how freeway transit centers can become more than just a place for transportation but also become a setting for community destination and a place that accommodates a diversity of activities and uses and thus promotes transit ridership. Six freeway transit centers operating along Harbor Transitway (I-110) and two more under construction form the basis of research for this project.

The objectives of the project are to:

- Document and research typology of freeway bus stops/transfer centers in terms of design, amenities, public services and activities that respond to transit user and community needs;
- Critically evaluate amenity mix, appearance, access, comfort, convenience, security, business development opportunities, and pedestrian and park-and-ride linkages, along freeway bus stops on the Harbor Transitway; and
- Identify opportunities for improvement in delivery and management of transit center services in addition to potential for joint development activities and/or mixed use.

Our research approach is evaluative in nature serving two purposes: (1) assessing "place-based" qualities of freeway transit centers, and (2) identifying transit user needs and/or gaps in services. As a methodology, we have adopted visual reconnaissance, surveys, and interviews to develop broad performance measures of station area interface with the neighborhood and transit user needs. Based on the research and analysis, we have developed design guidelines and recommendations to improve freeway bus station area development, service delivery, and linkages to the neighborhood. It is our contention that with proper design and incentives, freeway transit centers can serve as catalysts for neighborhood renewal, promote community interaction, foster entrepreneurship and economic development, and make communities accessible and convenient.

## 1.2 Methodology

Our research approach is evaluative as six freeway transit centers have already been built and two are under construction on the Harbor Transitway.[1] We have developed a broad set of performance indicators to evaluate place-based qualities and transit user needs. For each transit center, we have measured the following key attributes: uses and activities; user comfort; overall image and convenience; access and linkages, and sociability. Based on this research and strengths and weaknesses in design and service provision, we have identified recommendations

[1] Freeway transit centers currently in operation on Harbor Transitway include: (1) 37th Street (2) Slauson (3) Manchester (4) Harbor - this connects with I-105 and the Green Line (5) Rosecrans and (6) Artesia. Under construction: (1) Carson Street and (2) Pacific Coast Highway.

to integrate freeway transit centers in the larger urban fabric offering many positive opportunities for the surrounding community.

The report is organized into four sections.

**Literature Review**: In the first section, we present background information on transit friendly streets, transit oriented development, and design strategies to support livable communities. The project makes reference to the METRANS sponsored study of *Highway-Oriented Transit System: A Comprehensive Land Use/Transportation Strategy to Improve Transit Service Delivery*, various Transit Cooperative Research Program (TCRP) and Transportation Research Board (TRB) reports, and studies carried out by California Department of Transportation (Caltrans), Southern California Association of Governments (SCAG), and Los Angeles County Metropolitan Transportation Authority (MTA).

**Design Evaluation:** The second section discusses performance measures to determine the desirability and user perception of freeway bus stations on the Harbor Transitway. A field reconnaissance was carried out with a complete visual documentation of the transit centers. Each transit station was rated according to the design criteria such as accessibility, station area maintenance, landscaping, cleanliness, noise protection, and ridership. The methodology is an adaptation of strategies for creating livable places conducted by TCRP in *The Role of Transit in Creating Livable Metropolitan Communities* (TCRP Report No. 22).

**Transit User Perception:** In the third section, we discuss results of a survey regarding transit user perception of uses and activities, comfort and image, access and linkages, and sociability around station areas.

- *Uses and Activities*: Perception of transit users and/or community related to current uses and activities and what they would like to see there in the future. The premise is that transit can contribute to overall activity and enhance livability other than providing mobility.
- *Comfort and Image*: User perception of transit center safety, cleanliness, and attractiveness.
- *Access and Linkages*: Transit center user responses involving attitudes, patterns, accessibility problems and opportunities, and suggested improvements to the system.
- *Sociability*: The identification of transit centers that integrate other uses and where socializing and community activities take place naturally.

**Recommendations and Strategies**: The last section provides recommendations to increase ridership on the Harbor Transitway. We propose design and land use strategies that support transit friendly development and measures to improve user perception and experience of transit stations.

# Chapter 2: Literature Review

Transit-oriented development (TOD) is one solution proposed by planners to alleviate problems of congestion, air quality, and the lack of affordable housing. According to the California Department of Transportation, "The forces driving America's TOD renaissance include: escalating traffic congestion; increasing the attractiveness of sites close to rail; an increased trend of Americans moving back into America's cities; demographic changes underpinning an expanding market for higher density mixed-use communities; increased support for smart growth and the strategies necessary to implement it; changes in Federal Transit Administration policies for transit 'joint development' and an emphasis on transit supportive land uses in funding recommendations for new rail starts; and finally, more transit agencies are starting to realize they are in both the community-building and the people-moving businesses".[1] While rail may be the norm, Bus Rapid Transit (BRT) is gaining popularity in major metropolitan cities such as Boston, Charlotte, Cleveland, Los Angeles, and Miami combining the quality of rail transit and the flexibility of buses. BRT can operate on exclusive transitways, HOV lanes, expressways, or ordinary streets. A BRT system combines intelligent transportation systems technology, priority for transit, cleaner and quieter vehicles, rapid and convenient fare collection, and integration with land use policy.[2]

In its broadest sense, TOD encourages the best use of existing or proposed transit systems by developing or redeveloping land near transit stations with a variety of high density mixed uses (Boarnet, 1997). This concept can be applied along existing transit lines or in conjunction with new major mass transit investments. Typically TOD efforts begin with the latter.

Physical land assets and land acquisition powers place transit agencies and local governments in a unique position to leverage private investment for TOD. For example, local governments have the power to assemble land for development around transit stations through land banking, eminent domain, condemnation, or redevelopment takings. Similarly, transit agencies possess large amounts of land tied up in surface parking lots and peripheral land holdings, which can be offered to developers at reduced rates. Together, local governments and transit agencies can arrange large, inexpensive tracts of land that allow developers to reap economies of scale and allow an acceptable return on investment. For example, in California, BART and local redevelopment agencies have negotiated with developers to build apartments on or near existing parking lots at several different stations (Cervero, 1994c).

Likewise, tax incentives and institutional factors also provide opportunities for local governments to promote TOD. Tax-exempt financing, zoning variances, redevelopment powers, density bonuses, and impact fee credits are all tools and incentives local governments have at their disposal to promote development in conjunction with land acquisition (Cervero, 1994c). Similarly, legislation passed in the early 1990s created an institutional environment conducive to TOD. This legislation stresses careful coordination between transportation and land use systems. For example, on the federal level, the Intermodal Surface Transportation Efficiency Act (ISTEA)

[1] California Department of Transportation, *Statewide Transit-Oriented Development Study: Factors for Success in California*, 2002

[2] Accessed from http://www.fta.dot.gov/brt/, July 1, 2002.

and air quality regulations stress the importance of increasing transit ridership. ISTEA also requires state departments of transportation to assess land-use and transportation decision in relation to one another (Cervero, 1994c).

At the state level, AB 471 requires all cities and urban counties to prepare a Congestion Management Plan. A key component of the plan requires local governments to assess how their land use decisions affect regional transportation systems. Furthermore, stringent state air quality requirements, similar to federal ones, require non-attainment areas to closely integrate land use and transportation planning. Other state legislation directly targets transit-oriented development. The Transit Village Development Act, passed in 1994, allows cities and counties to designate quarter-mile-radius transit redevelopment districts around stations (Cervero, 1994c). This legislation provides density bonuses and tax breaks to developers as an incentive to develop in these areas (Knack, 1995).

Recently, the California Department of Transportation has taken a comprehensive look at the 'state-of-the-practice' of TOD in California and across the United States. Recommendations regarding potential state level strategies to encourage broader implementation of TOD emerged from an extensive research and public participation process that lasted over a year. The *Statewide Transit-Oriented Development Study: Factors for Success in California* (2002) identified promising strategies to assist in overcoming TOD implementation barriers, and categorized them in two broad areas: state policies and practices and state funding for planning and implementation.

Some of the key strategies under state policies and practices include:

- Improved coordination of land use and transportation planning at local and regional levels;
- Sale of state owned land near major transit stations to facilitate TOD;
- Examination of state environmental review requirements for TODs and identify opportunities to reduce barriers;
- Better data collection and improved assessment of travel and economic impacts of TOD for analysis and decision making; and
- Information dissemination, outreach, and technical assistance to promote TOD implementation.

The study indicates that there is a strong real estate market outlook in California for TOD, which is further supported by favorable demographic trends in major metropolitan areas. However, developers encounter difficulty in obtaining private financing to implement TOD projects and public funding is rather scarce. The process of obtaining development financing tends to get complicated in the mixed-use aspect of many TOD projects and adds significantly to project costs. Affordable housing component within TOD can also be very complex, as it typically requires multiple funding sources with varying requirements. To complicate the situation, local jurisdictions are often unprepared or lack the necessary funding to prepare TOD plans or lack the ability to provide effective financial incentives for the development of a quality TOD.

To help overcome these barriers the study recommends the following strategies and actions for planning and implementation:

- Providing funding and financial incentives to local jurisdictions to help prepare plans and adopt ordinances that facilitate development and implementation of TOD;
- Providing funding to develop a variety of TOD demonstration projects.
- Allowing local governments to change laws and use 'tax-increment financing' to spur development around major transit stations even though station area is located outside existing redevelopment area;
- Making state transportation funds for TOD more flexible; and
- Promoting the "Location Efficient Mortgage" program and making it more widely available.

Successful TOD strategy requires planning very early in the project development process regarding decisions on alignment, where to put stations, and the layout of transit facilities. Increasing transit market share is also critical to the success of any TOD or the sustainability of a transit system. TCRP Report 27, *Building Transit Ridership: An Exploration of Transit's Market Share and the Public Policies that Influence It* identifies a roadmap for increasing transit market share by adopting strategies and public policies for various transit submarkets.

**Exhibit 2.1: Strategies to Increase Transit Ridership or Market Share**

| Category | Type | Strategies |
|---|---|---|
| Service improvements | General | Increased route structure<br>Increased frequency<br>Dynamic scheduling<br>Increased speed<br>Improved security<br>Improved comfort<br>Increased capacity |
| | Suburb to suburb | High-occupancy vehicle lanes and facilities<br>Transportation demand management programs<br>Suburban activity centers |
| | Suburb to central city | Feeder services<br>Fare integration<br>Service Coordination<br>Unitickets<br>Station parking provisions |
| | Within central city | Core services |
| Information to customers | Real time information services | Location<br>Schedules |
| | Low technology | Tailored schedules<br>Bus stop information |
| | Medium technology | Computerized information systems<br>Kiosks |
| Marketing and promotion | | Fare incentives<br>Education<br>New resident promotion<br>Image advertising<br>Cooperative promotions |
| Public policy changes | | User side subsidies<br>Parking pricing/regulation<br>Local area bus services<br>Fuel/carbon taxes<br>Dedicated operating support<br>Land use policy<br>Local area bus services |
| Road pricing | | Various |

Source: *TCRP Report 27 - Building Transit Ridership: An Exploration of Transit's Market Share and the Public Policies that Influence It*, National Academy Press: Washington D.C., 1997, p. 8.

Most of the recommended strategies in the broad category areas of service improvements (general and suburb to central city), information to customers (real time information services and

medium technology), and marketing and promotions, if adopted, are likely to increase transit share in the Harbor Transitway.

To achieve a higher transit market share, transit systems must focus on service concepts to maintain existing markets and expand into new markets. The following Exhibit 2.2 illustrates how transit can be: (1) faster or more direct for the traveler (2) more convenient for the traveler (3) cheaper for the traveler and (4) feasible and practical for the traveler.

**Exhibit 2.2: Transit Service Concepts**

| Making Transit | Making Transit | Making Transit | Making Transit |
|---|---|---|---|
| **Faster And More Direct** | **More Convenient** | **Cheaper** | **Feasible** |
| HOV Lanes<br>Busways<br>Park and ride facilities<br>Express/Limited Stop Service<br>Priority Bus Traffic<br>Route Restructuring<br>  Interlining<br>  Suburb-to-suburb service<br>  Crosstown service<br>  Suburban transit centers<br>  Facilitating transfers<br>Light Rail<br>Heavy/Commuter Rail<br>Low Floor Buses | Route Deviation Services<br>Flex Routes<br>Route Extension/Turn Back<br>Late Night Request-a-Stop<br>Service Routes<br>Community Bus Service<br>Downtown Loops/Circulators<br>Taxi Substitution<br>Public Dial-a-Ride<br>Use of Smaller Transit Vehicles<br>“Smart” Card/ Fare Boxes | Fare Incentives<br>Transfer Policies<br>Vanpool/ Carpool Subsidy | Reverse Commute<br>Feeder Routes<br>Service to Large Employers/ Universities<br>Park and Ride Facilities<br>Guaranteed Ride Home<br>Childcare Facilities<br>Concierge Services<br>Travel Training Programs<br>Transit Familiarization Programs<br>Marketing and Advertising<br>Joint Development<br>Transit Supportive Neighborhoods |

Source: *TCRP Report 28 - Transit Markets of the Future: The Challenge of Change*, National Academy Press: Washington D.C., 1998, p. 36.

To maintain transit ridership among current riders in the face of emerging societal trends or to attract new riders from groups less reliant on public transit, it is necessary to adopt specific service concepts that meet the actual needs of current or potential riders. These service attributes sought by current market groups are shown in the following Exhibit 2.3.

**Exhibit 2.3: Potential Service Options Matched to Market Groups**

| Market Group | Potential Service Options | Market Group | Potential Service Options |
|---|---|---|---|
| **Women** | Child Care facilities | **College and Graduate Students** | Flex Routes |
| | Reverse Commute | | Route Extension |
| | Joint Development | | Route Restructuring |
| | Transit Supportive Neighborhoods | | Guaranteed Ride Home |
| | Night Request Stops | | Child Care facilities |
| **Black, Hispanic, Asian** | Fare Incentives | **High School Students** | Feeder Routes |
| | Community Bus Service | | Flex Routes |
| | Joint Development | | Joint Development |
| | Transit Supportive Neighborhoods | | Community Bus Service |
| **People Without Cars; HH Income < $15,000** | Fare Incentives | **People Aged 65+** | Low Floor Buses |
| | Suburban Transit Centers | | Transit Supportive Neighborhoods |
| | Marketing and Advertising | | Flex Routes |
| | Joint Development | | Neighborhood Loops |
| | Transit Supportive Neighborhoods | | |

Source: Adapted from *TCRP Report 28 - Transit Markets of the Future: The Challenge of Change*, National Academy Press: Washington D.C., 1998, p. 37.

For public transit to play an effective role in improving the livability of communities, it must become an integral part of community life and have a more direct link to the idea of "place".[3] In the following section, we discuss design and traffic management strategies to create livable communities.

- *Place Making Approach*: Place making approach means assessing the needs of a community and then basing improvements on these assessments. Improving maintenance and management of a public space, upgrading security, or establishing a special event or vending program are all strategies for improving a place.

- *Implementing Transit Friendly Streets*: In general, transit-friendly street projects involve the careful and balanced allotment of street space to meet pedestrian needs—encouraging a lively, active public space while maintaining appropriate space for transit service, deliveries, parking, bicycles, and other vehicular movement. Adding or relocating crosswalks, providing traffic signals, widening sidewalks, and adding streetscape amenities are some of the design improvements typically used in these projects.

  a) *Sidewalk Widening*
  City sidewalks are not just thoroughfares for pedestrians; they function as social places where people gather to talk or to meet friends and to watch other people. Although a sidewalk may be wide enough to accommodate pedestrian movement, it may not be wide enough to simultaneously accommodate seating, trees, bus shelters, and other appropriate amenities that support social activities.

  b) *Provide Amenities for Pedestrians and Transit Riders*
  When transit amenities are located on sidewalks, they are usually part of a range of "street furniture," so named because they make a street more pleasant and comfortable to use. In addition to bus shelters, amenities can include seating (on benches or planter ledges), trees, telephones, light fixtures, trash receptacles, and information kiosks; clocks, fountains, sculpture, drinking fountains, banners, and flags are sometimes provided as well. The sale of food and other items can also help stimulate activity on the street, as part of store displays, either in movable pushcarts boarding areas at bus stops. Curb extensions help create large enough bus stop and landing areas to accommodate wheelchairs and other passenger-related amenities, as well as retail, displays, and outdoor cafes or in permanent stands. Therefore, food vending can be considered an amenity as well. Although amenities can make a street more comfortable and active, their mere presence will not ensure that they will be well used. Careful attention to design and location is important. Bus shelters (without walls or with short canopies) often afford little protection from the sun, rain, and wind and provide few places for people to sit or lean while waiting. Seating may go unused if it is situated too far from areas of activity or if it is facing the wrong way.[4]

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[3] *TCRP Report 33 - Transit-Friendly Streets: Design and Traffic Management Strategies to Support Livable Communities*, National Academy Press: Washington D.C., 1998.
[4] *TCRP Report 33 - Transit-Friendly Streets: Design and Traffic Management Strategies to Support Livable Communities*, National Academy Press: Washington D.C., 1998.

Besides improvement in street design and traffic management there have been innovations in amenities that increase transit ridership. These include:

- Automatic voice announcements of upcoming stops.
- Bi-level commuter buses to boost ridership and increase bus capacity while improving passenger comfort.
- Introduction of a new system at bus shelters using mist to keep waiting passengers cool.
- Inclusion of a public park around station area where noontime concerts and ongoing community cultural events may be staged.
- Bus terminals with bike lockers and racks, a bike police patrol office, trees, and restrooms, and space to accommodate some joint development for food establishments, day care, and dry cleaning service.

Well-designed amenities may improve passengers experience and attract ridership. People react positively to amenities designed to improve their transit experience. Passengers especially appreciate these when basic service characters such as frequency, efficiency, safety and reliability are perceived by passengers to be well under control.[5]

In the next section, we describe stations on the Harbor Transitway and their place-based qualities. A field reconnaissance was carried out with a complete visual documentation of the transit centers. We also develop a rating scale to analyze station area design characteristics.

[5] *TCRP Report 46 - The Role of Transit Amenities and Vehicle Characteristics in Building Transit Ridership: Amenities for Transit Handbook and The Transit Design Game Workbook*, National Academy Press: Washington D.C., 1999.

# Chapter 3: Design Evaluation

## 3.1 Harbor Transitway Stations

There are six transit stations located on the Harbor Transitway (I-110) where bus riders can transfer from local to express bus service and where local buses become express and enter the Transitway (Exhibit 3.1). The names of these stations are as follows:

Currently in operation:

1. 37th Street Station
2. Slauson Transitway Station
3. Manchester Transitway Station
4. Harbor Freeway/I-105 Transitway Station
5. Rosecrans Transitway Station
6. Artesia Transitway Station

Under construction:

1. Carson Street Transitway Station
2. Pacific Coast Highway Transitway Station

These stations are located within the grade separated HOV (High Occupancy Vehicle) network, which allows buses to pick-up and drop-off passengers without leaving the HOV network. All stations have 'Park-and-Ride' lots, where transit patrons can park their cars to board regional express bus service. The patronage volume of each station can be determined to some extent by observing the number of cars in the parking lot.

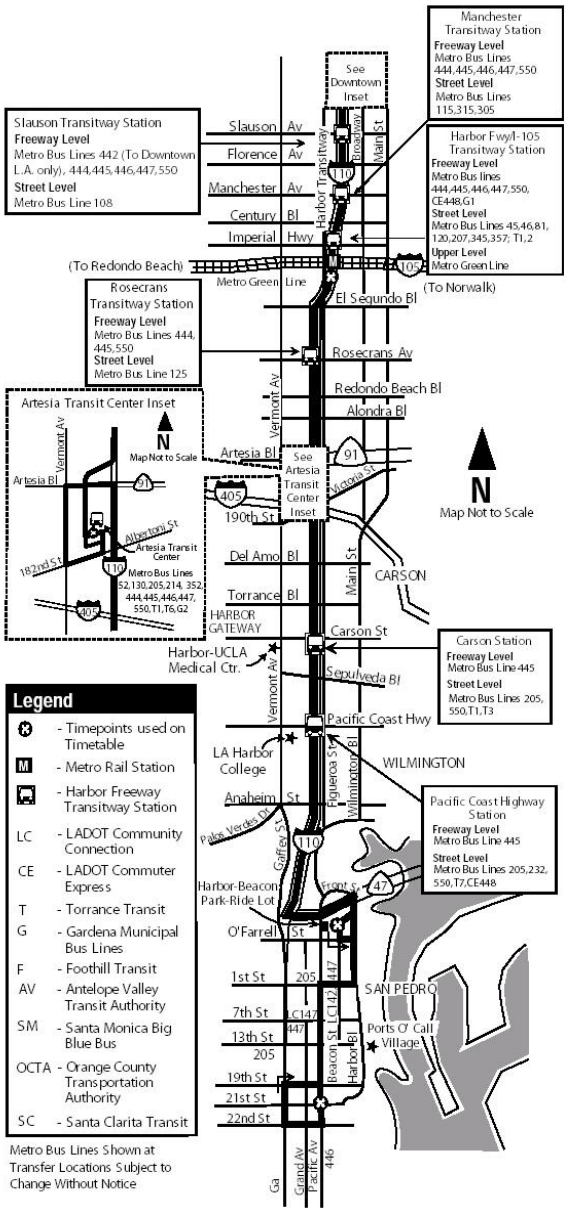



Exhibit 3.1: I-110 Transit station locations
(http://www.mta.net/metro_transit/timetables/images/445.pdf)

## 3.2 Physical Characteristics and Station Area Development

In general, all transit stations on the Harbor freeway reflect a certain consistency in their design throughout the system, though each station has some distinct features that distinguishes it from others. With the exception of Artesia station, which is located away from the freeway, stations are generally very noisy (70 to 90 decibels[1]) for the users who have to wait for buses on open platforms next to traffic lanes on both sides. There are no adequate sound barriers to insulate users from the freeway noise.

There is no proper pedestrian oriented signage leading to any of these transitway stations, though there are a lot of signboards indicating directions to the automobile driver for 110 Freeway. Hence, it takes a transit dependent person significant effort to reach these bus stations. Entrances to 37th Street, Slauson, and Manchester station are located above the street level. Harbor Freeway/I-105 and Rosecrans stations are located below the street level. Artesia station is located away from the freeway at the intersection of Vermont Avenue and West 182nd Street. The following section discusses physical characteristics and the surrounding neighborhoods of these stations.

Figure 3.1: View of 110 Freeway from 37th Street Station

Figure 3.2: Views of 1-110 Freeway and 1-105 Freeway at the 110/105 interchange

[1] Adapted from R. Tolley and B. Turton (1995) Transport Systems, Policy and Planning: A Geographical Approach, Burnt Mill, Harlow Essex: Longman Scientific & Technical, p. 279.

## 3.3 37th Street Station

37th Street station is located near the University of Southern California and Exposition Park (Exhibit 3.2). It has two levels connected by staircases and elevators. The lower floor is directly linked to the street level where passengers enter the station and the upper level is at the freeway where passengers board the buses. The station is well designed in modern architectural style (Figure 3.3).

The main feature of the bus station is the arched canopy, which is fabricated from steel with light green fiberglass. The canopy protects the passengers from direct sunlight and rain. Gridiron railings are set around the stairwells to prevent children from falling down (Figure 3.6). There is green-colored iron fencing set on the low height wall separating the bus station from the freeway, which shields the passengers from the fast moving traffic (Figure 3.7). The bus station has a 12" high platform that safeguards passengers from the bus lane and also serves as a convenient platform to board bus.

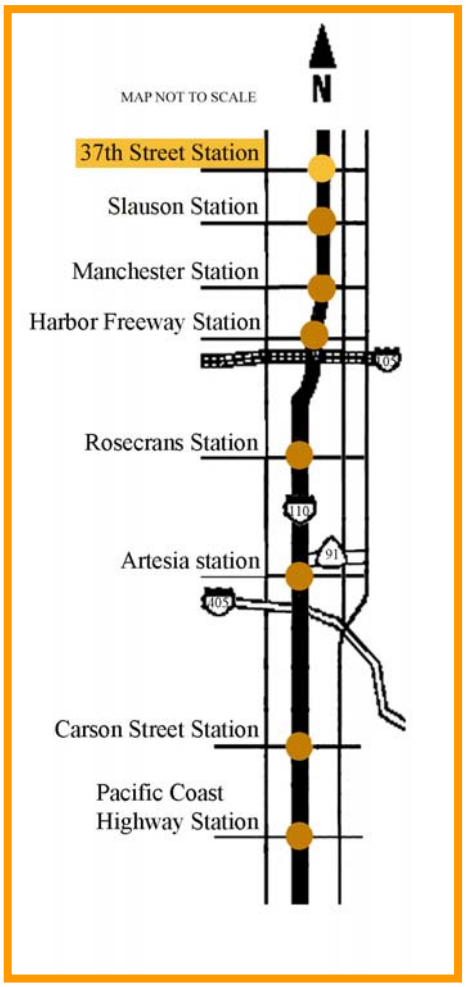



Exhibit 3.2: Location of 37th Street Station on the Harbor Transitway

Figure 3.3: 37th Street Station

The station has a big signboard with “M” symbolizing “Metro” set on top of the elevators. The use of yellow and green color on the canopy makes the bus station stand out from its surroundings. People can sit on the marble bench between the iron columns or check the transit freeway routes and schedules provided at the station. There are other public facilities like telephones and garbage bins for the convenience of the passengers. During the night, the lighting system under the freeway bridge and along the platform directs the way.

The neighborhood around this station is primarily institutional. The station shares its boundary on the east with Department of Motor Vehicles (DMV). University of Southern California is located on the western side of the station (See Figures 8 and 9). There are no signs that lead to the station from the university neighborhood. Besides, passengers have to cross many traffic signals and narrow sidewalks, which are uncomfortable and dangerous, especially for seniors, youths, mothers with kids, and other transit dependent population.

Figure 3.4: Sidewalk leading to the 37th Street station has been recently widened

Figure 3.5: Platform level view of the station

Figure 3.6: Staircase and elevators leading down to the street level

Figure 3.7: Fencing separates the station from the freeway

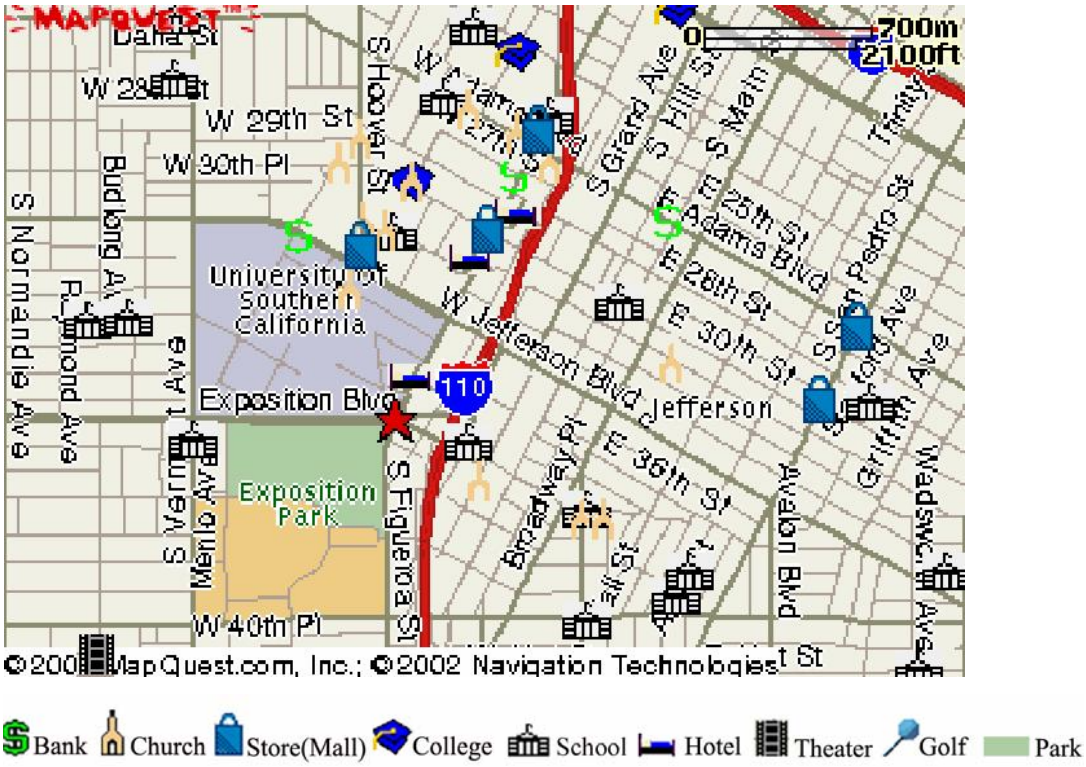



Exhibit 3.3: Map showing the location of various businesses around the 37th Street station
Map provided by www.mapquest.com

## 37th Street Station

Figure 3.8: 37th Street Station shares it eastern boundary with DMV

Figure 3.9: Neighborhood on the west side of this station is primarily institutional

## 3.4 Slauson Station

Slauson station is located at the intersection of Slauson Avenue and 110 Freeway. It is next to the 37th Street station on the bus route heading south on the Harbor Transitway (Exhibit 3.4). A glass canopy pedestrian bridge across the freeway linking the bus station to the street level makes this station unique. The large horizontal dimension of the bridge and the use of latest construction techniques make the station significantly identifiable (Figure 3.10).

The staircase, which leads to the pedestrian bridge, forms a part of the flexible circulation system that provides passengers with easy and safe access to the station. Apart from this, the architectural design of the station is similar to 37th Street station. In order to reach the station from the street level, bus patrons need to cross a freeway exit ramp. Although a pedestrian crossing is demarcated, yet the fast vehicular traffic exiting the freeway makes the pedestrian access to station unsafe (Figure 3.12). A railroad track passes under the freeway bridge on the northern side of the street (Figure 3.13). Hence, the station can only be accessed from the opposite side of the street. The walkway near the railroad tracks is not paved and prevents people from walking near the tracks.

The neighborhood around the station is mainly a mix of low density residential and commercial retail developments (Figure 3.14). Most of the houses are single-family units with visible signs of neglect and deferred maintenance. The neglected condition of the housing stock suggests that this is a low-income neighborhood with little incentive to reinvest. Light fencing has been used to separate these houses from the rail tracks. Some of the houses are located very close to the freeway without enough setbacks (Figures 3.15 and 3.16). Most of their windows have been closed with wooden planks apparently to block off the noise and dust. On the southeast side of the station, just across the freeway ramp, is a repair garage. The repair garage discharges wastewater that makes the immediate surroundings visually unpleasant. On the other side of the street, behind the railroad tracks are light industrial buildings (Figure 3.17). Lot sizes are generally small and narrow. The station has two park and ride lots, though one of them is scarcely used.

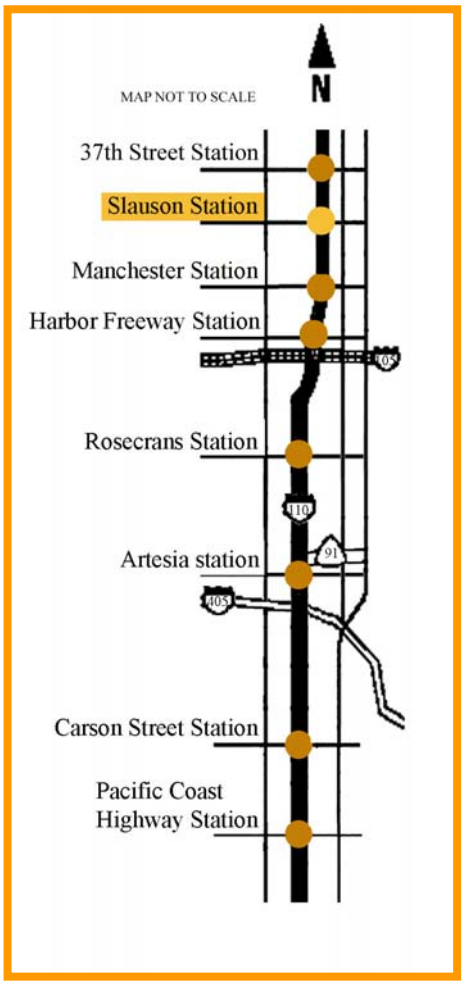



Exhibit 3.4: Location of Slauson Transitway Station on the Harbor Transitway

Figure 3.10: Platform level view

Figure 3.11: Stairs at the street level leading up to the freeway station

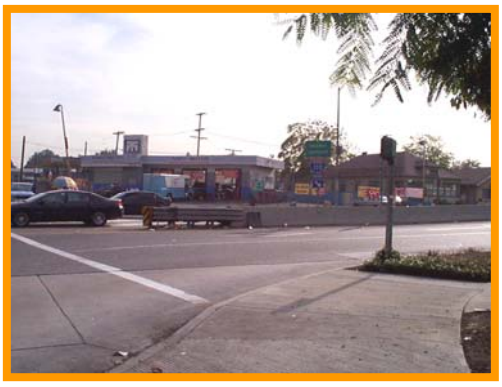


Figure 3.12: Pedestrians have to cross the road near the exit to the freeway

## Slauson Transitway Station

Figure 3.13

Figure 3.14: Neighborhood around this station is primarily residential and commercial


Figure 3.15: Neighborhood on the western side

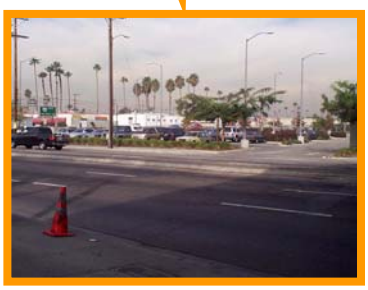


Figure 3.16: Park and Ride lot

Figure 3.17: Neighborhood on the eastern side


Exhibit 3.5: Map showing the location of various businesses around Manchester Transitway Station
Map provided by www.mapquest.com

## 3.5 Harbor Freeway/I-105 Transitway Station

The Harbor Freeway/I-105 Station, a multi-modal station, has a different design approach as compared to the other stations on the Harbor Transitway. This station has three levels instead of two. The first level is the freeway bus station. The second level is the street and the uppermost level houses the Metro Green Line Station. Hence, the street level is above the freeway level in this case.

The location of the transit station below the street gives it a very dull and dark appearance. There is no facility to protect passengers from noise and winds, especially during night and inclement weather conditions. Some effort has been made to make the station look more attractive. There are green colored tiles on the walls, which make the place look a little brighter (Figure 3.18). Public seating is made of black stone shaped like a sculpture and is different from other stations.

This station seems to be the most widely used station along the Harbor Transitway. One of the reasons is the presence of Metro Green Line, light rail that runs between Norwalk and Redondo Beach. It operates in the middle of the I-105 Freeway until Aviation Boulevard where the line turns south and continues on its own elevated structure. One can find a lot of people at this station during the day. Here, many transit dependent people change their modes of transport from train to bus and vice versa. In addition to elevators and staircases for vertical movement of passengers, this station also has escalators (Figures 3.19, 3.20 and 3.21). However, elevators are used more often as compared to the staircases and escalators. The second floor has some passenger services such as telephone boxes, newspaper stands, and ticket machines, though a small number of people actually use them.

This station is prone to vandalism. There are a lot of scratches and graffiti on the elevator walls, and sometimes, waste paper, litter, and trash is strewn here and there. The neighborhood around this station comprises mainly of low to medium density residential and commercial properties. There is a vast stretch of unused land adjacent to the station. This vacant lot provides a buffer space between the immediate residential neighborhood and the station. The residential area has equal lot sizes and looks well

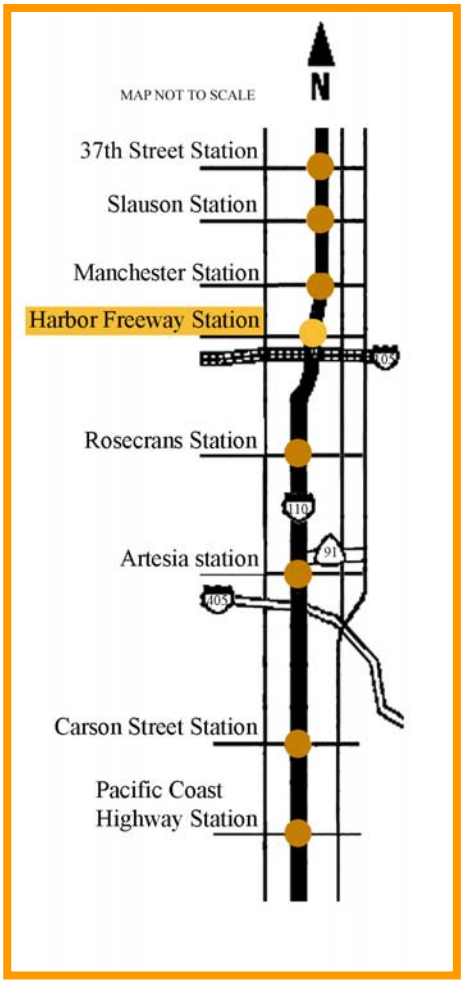



Exhibit 3.6: Location of Harbor Freeway/I-105 Transitway Station on the Harbor Transitway

Figure 3.18: Platform Level View

maintained. There is a small convenience shopping center on the northwestern side of the station comprising of small neighborhood restaurants amongst other facilities to serve the community living nearby.

Figure 3.19

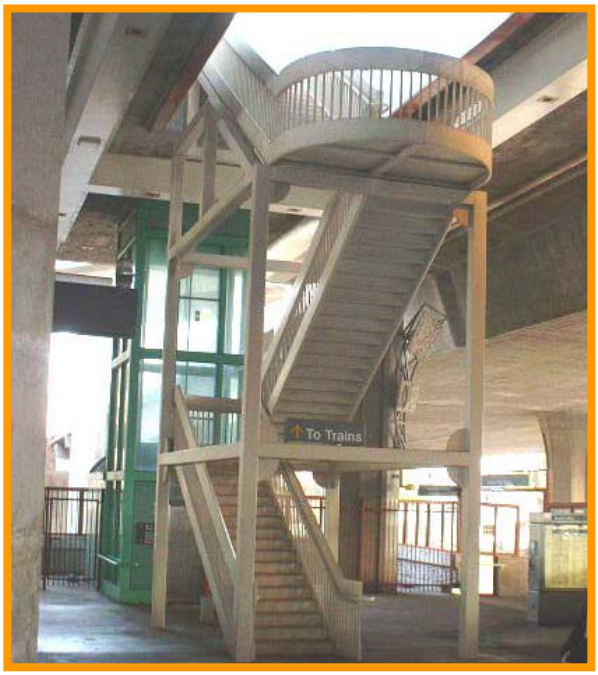



Figure 3.20

Figure 3.21: Vertical circulation system on the second floor of the station

Figure 3.22: Neighborhood on the northwestern side

Figure 3.23: Residential neighborhood on the western side

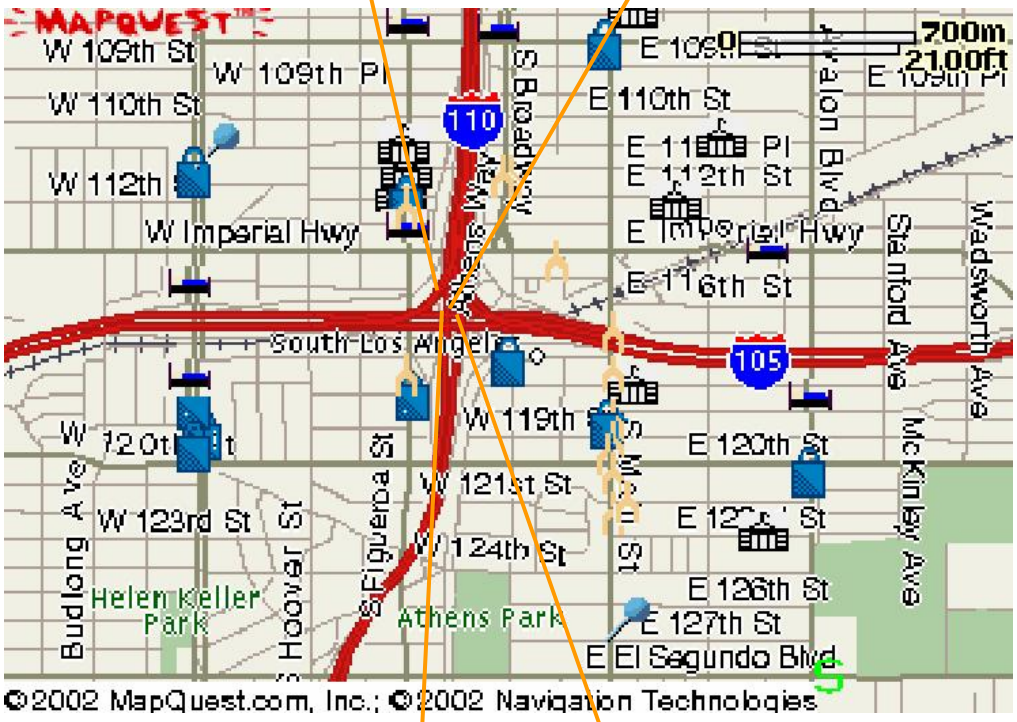



Figure 3.24

Figure 3.25: Park and Ride lot

Bank Church Store(Mall) College School Hotel Theater Golf Park

Exhibit 3.7: Location of various businesses around Harbor Freeway/I-105 Transitway Station
Map provided by www.mapquest.com

## 3.6 Rosecrans Transitway Station

Rosecrans Station is distinct from other stations because of its two-story high archway at the entrance. Like Harbor/I-105 Station, the station is located below the street level. The waiting area is more spacious than Harbor Station. Without carefully devised design and decoration, Rosecrans Station looks dull even during the daytime. The tunnel type design of the station makes it susceptible to strong winds blowing through it at all times (Figure 3.26).

Entrance to the station has been provided from both sides of the street. Hence, bus riders do not need to cross the street to reach the station. This makes the station quite pedestrian-friendly. Staircases directly link the freeway station to the street. But, it is an uncomfortable experience to walk down the staircases because of their steep slope. Besides, the sidewalks leading to the stations are narrow and without any protection from the bus lane. The main entrance to the station is through a huge gateway; there are two more small gateways on the opposite side of the street (Figures 3.27 and 3.28). On the southwest side of the station, park-and-ride lots are situated. More design emphasis has been laid on the entrance to this station.

On the eastern side of the station, the neighborhood is mainly industrial in nature. There is a mix of commercial retail and office areas with low density residential nearby (Figures 3.29 and 3.30). There is a grocery store located near the station. Again, just like other stations, there is no proper signage leading to the station.

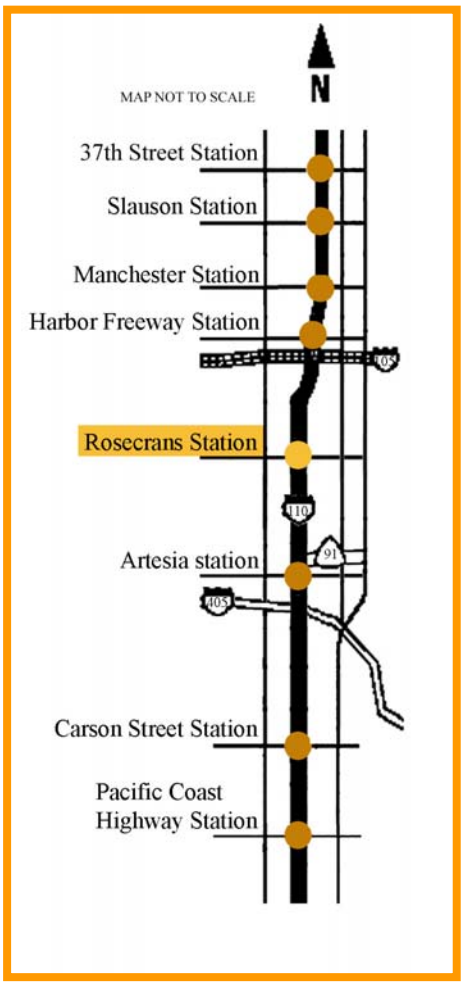



Exhibit 3.8: Location of Rosecrans Transitway Station on the Harbor Transitway

Figure 3.26: Rosecrans Station

Figure 3.27

Figure 3.28

Figure 3.29: Neighborhood on the eastern side

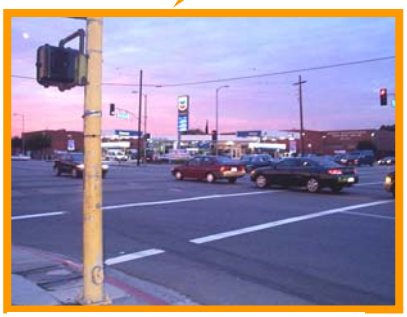



Figure 3.30: Neighborhood on the western side

Figure 3.31: Park and Ride lot


Exhibit 3.9: Map showing the location of various businesses around the Rosecrans Transitway Station
Map provided by www.mapquest.com

## 3.7 Artesia Transit Station

The Artesia station is the largest station of the entire system and the only station that has just one level. It is located near the exit to I-110 Freeway on Artesia Boulevard, where I-110 and I-91 Freeways pass overhead. Since this station is located away from the freeway, there is less problem of noise from the high speeding vehicles. This station has a common platform for freeway buses and for buses running on local arterials.

This station has a number of bays for buses running on many different routes and the waiting areas are separated from each other. The canopies on the platform create a coherent image of the entire transit system by using the same material, color, and architectural design. With strategic placement of trees and other landscaping elements, a lot of effort has been put in to make the surroundings look pleasant.

The main platform has a small structure with two rooms, an office and an attached restroom (Figures 3.32 and 3.33). This structure has restricted access as was evident from the locked entrance door. Bright colored façade of this structure makes it stand out from its drab surroundings. The entrance gateways to the parking lots have large bright colored clocks on the top, though these never show accurate time (Figure 3.34). There are more canopies and benches due to the large spread of the station.

The neighborhood is mainly industrial in nature (Figure 3.35). On the southern side of the bus station there is a departmental store located across the street (Figures 3.36 and 3.37). These structures have high fencing along their boundaries and have separate parking lots. On one side of the departmental store is a huge storage area facing the bus station which makes the surroundings unattractive. On the western side of the station are a recycling and a storage plant. Some houses nearby are screened off. This has been done to ensure privacy and to prevent noise pollution.

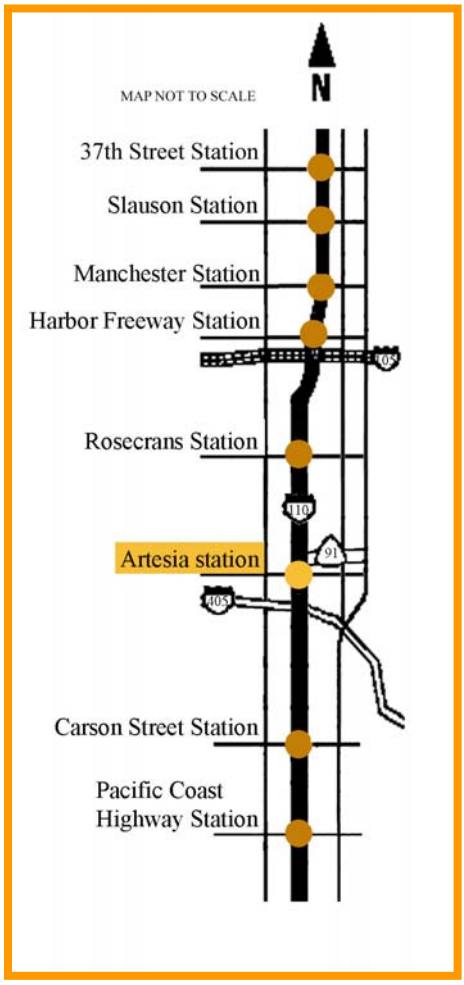



Exhibit 3.10: Location Artesia Transitway Station on the Harbor Transitway

Figure 3.32: Artesia Transitway Station

Figure 3.33

Figure 3.34: Entrance to the parking lot

Figure 3.35: Neighborhood on the south side is commercial mainly comprising of a departmental store and storage units

Figure 3.36: Neighborhood on the west is industrial

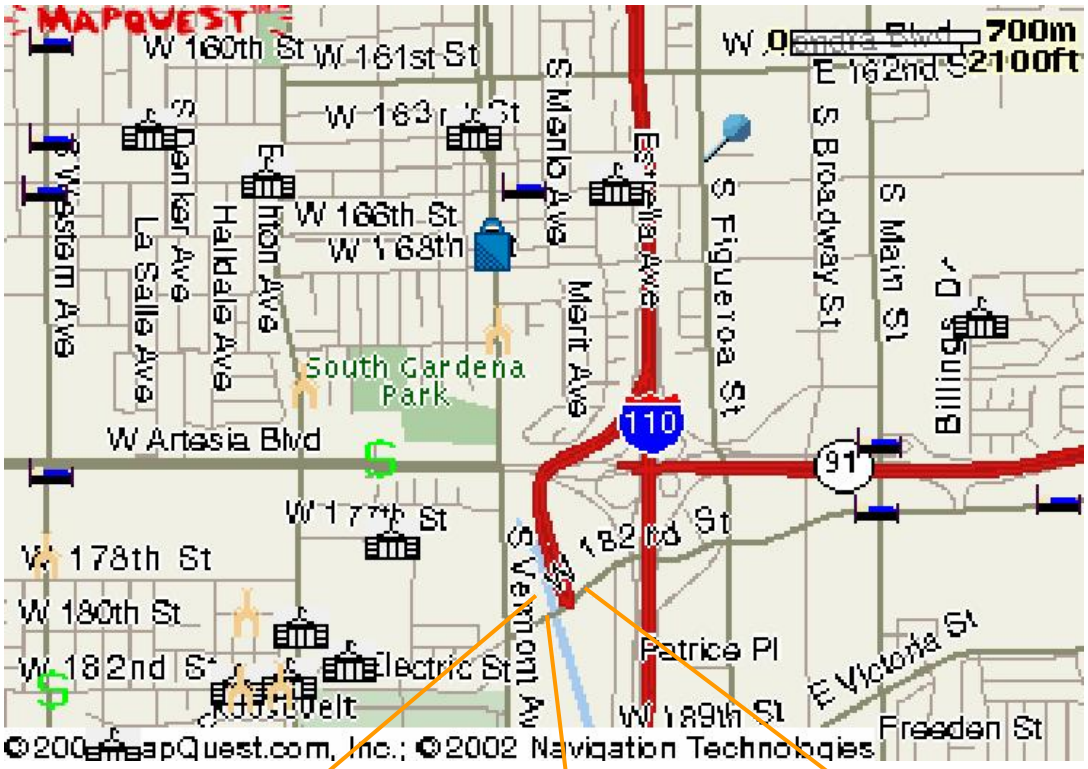



Figure 3.37

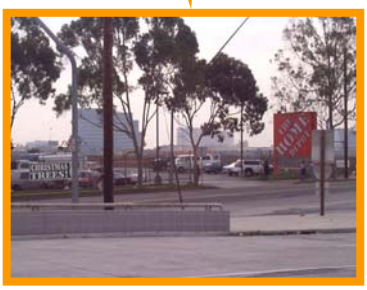


Figure 3.38

Figure 3.39

Bank Church Store(Mall) College School Hotel Theater Golf Park

Exhibit 3.11: Map showing the location of various businesses around Artesia Tranitway Station
Map provided by www.mapquest.com

## 3.8 Rating Scale

We have developed a rating scale to evaluate the relative performance of stations based on environmental design criteria such as noise protection, landscaping, cleanliness, ridership, station area maintenance, and pedestrian access to the station (Exhibit 3.12). Each criterion has been given equal weight of 5 points – 1 being the lowest (poor) to 5 being the highest (outstanding). The ratings have been developed after visiting the individual stations repeatedly, at different times of the day, and at different times of the week. To corroborate our findings, we also present photographic evidence to supplement this subjective rating.

**Exhibit 3.12: Concept Rating Matrix**

| Freeway Station | Noise Protection | Landscaping | Cleanliness | Ridership | Station Area Maintenance | Pedestrian Access to the Station | Totals |
|---|---|---|---|---|---|---|---|
| **37th Street** | 2 | 1 | 4 | 2 | 4 | 2 | **15** |
| **Slauson** | 2 | 2 | 4 | 3 | 4 | 2 | **17** |
| **Manchester** | 2 | 1 | 4 | 3 | 4 | 3 | **17** |
| **Imperial/I-105** | 2 | 4 | 2 | 5 | 2 | 4 | **19** |
| **Rosecrans** | 2 | 2 | 3 | 3 | 3 | 4 | **17** |
| **Artesia** | 3 | 5 | 4 | 5 | 3 | 3 | **23** |

Legend:

1 Poor
2 Below average
3 Average
4 Above average
5 Outstanding

Artesia ranks as the "best" station on the Harbor Transitway while 37th Street station ranks the lowest with respect to environmental design criteria. Imperial/I-105 ranks as number two while Slauson, Manchester, and Rosecrans stations are tied for number three.

The following figures show comparisons between different stations based on their scores mentioned in the Concept Ratings Matrix.

## Landscaping

Figure 3.40: 37th Street Station Score: 1

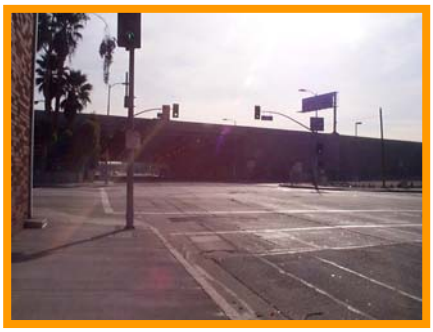


Figure 3.41: Slauson Station Score: 2

Figure 3.42: Manchester Station Score: 3

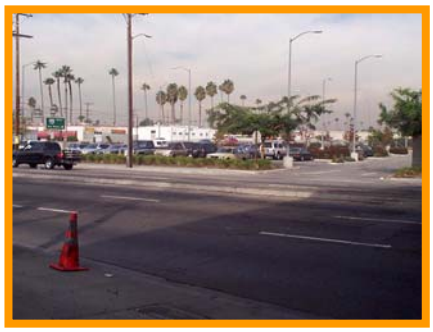


Figure 3.43: Imperial Station Score: 4

Figure 3.44: Rosecrans Station Score: 2

Figure 3.45 Artesia Station Score: 5

## Cleanliness and Maintenance

| | |
|---|---|
| Figure 3.46: 37th Street Station Score: 4 | Figure 3.47: Slauson Station Score: 4 |
|  |  |
| Figure 3.48: Manchester Station Score: 4 | Figure 3.49: Imperial Station Score: 2 |
|  |  |
| Figure 3.50: Rosecrans Station Score: 3 | Figure 3.51: Artesia Station Score: 4 |
|  |  |

## Pedestrian Access to Station

Figure 3.52: 37th Street Station Score: 2

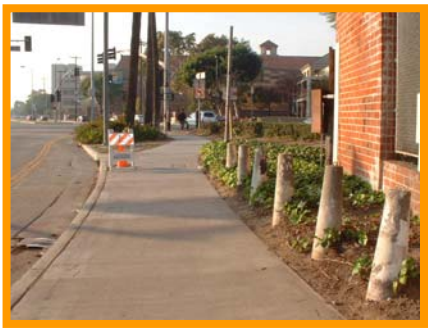


Figure 3.53: Slauson Station Score: 2

Figure 3.54: Manchester Station Score: 3

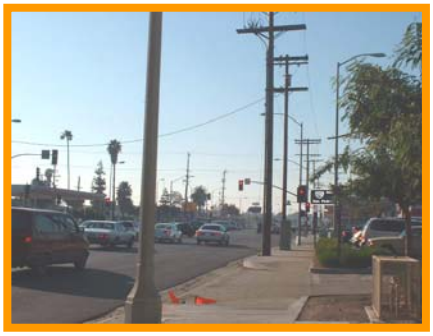


Figure 3.55: Imperial Station Score: 4

Figure 3.56: Rosecrans Station Score: 4

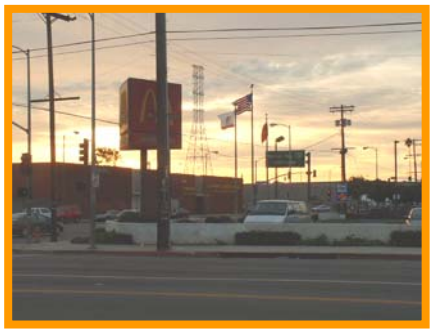


Figure 3.57: Artesia Station Score: 3

# Chapter 4: Transit User Perception

## 4.1 Objectives

We developed a survey instrument to better understand user perception of the freeway bus stations and user satisfaction with the facilities and services. The survey included a broad cross section of Harbor Transitway users. The survey collected data on the start points and ending points of travel, age group of user, gender, purpose of trip, access to the transit station, distance from the station, car ownership etc. The survey also looked at the various problems and difficulties faced by the commuters along with the services desired by the commuters.

## 4.2 Methodology

Approximately 250 commuters were asked to fill out a questionnaire form during different times of the day and at different times of the week. These questionnaires were distributed to the commuters at various transit stations on the Harbor Transitway. Respondents filled out the questionnaires on spot at the transit stations. Survey distribution and on spot collection was carried out over a period of three months, from September to November 2001. We received responses from 146 commuters. The survey instrument was prepared in both English and Spanish (See Appendix A and B). The results of the survey and the analysis complete with conclusions and recommendations have been tabulated in the next part of the report.

## 4.3 Origin Destination Map for Harbor Transitway

This map suggests that origins and destinations for most trips of survey respondents are concentrated in Los Angeles Downtown and Imperial/I-105 Transitway Station for bus transit on the Harbor freeway. The map indicates that there are more end-to-end trips rather than short intermediate trips on the Transitway.

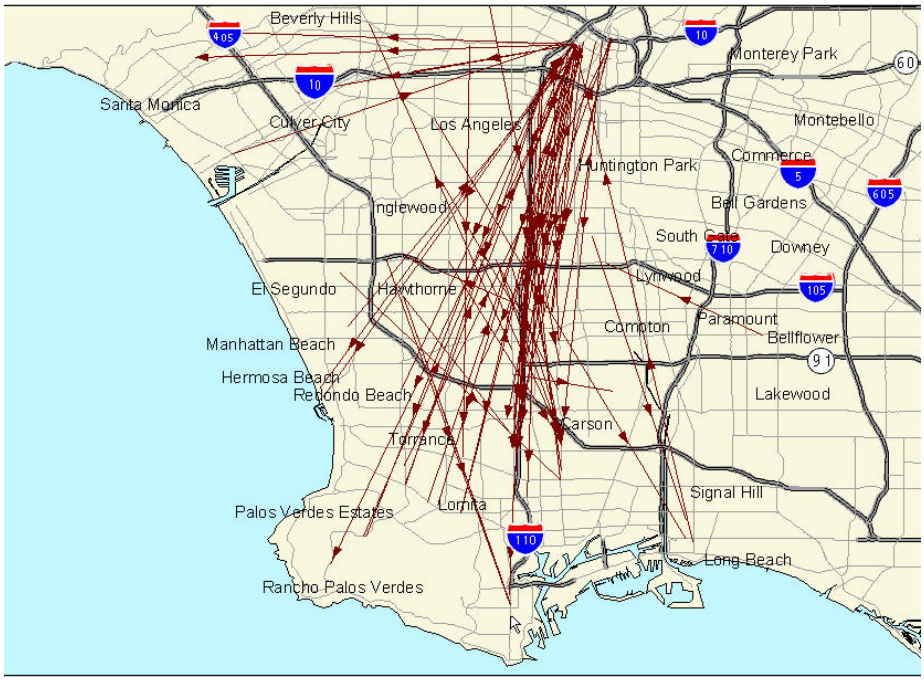



Exhibit 4.1: Origin Destination Map

## 4.4 Survey Findings

**Age Group of the Commuters**

The survey shows that two-thirds of the commuters on the Harbor Transitway are in the age group of 26 – 50 years. Of the rest, commuters in the age group of 16 – 25 years and 51 – 65 years form the next major group of users (Exhibit 4.2).

The commuters within the age group of 26 - 50 years also account for a large number of work-based trips, as supported by the data on trip purpose (Exhibit 4.4). Interestingly, the survey also shows that ridership of age groups 0 - 15 and above 65 years – the typical transit dependent age groups – is very low, forming only slightly more than 4% of the entire commuters. Seemingly, the Harbor Transitway is used as a conduit for work-based trips more than anything else.

The ridership profile of the commuters can give effective pointers to the MTA about how to target and market its services to better serve the ridership and communities living along the Harbor Transitway.

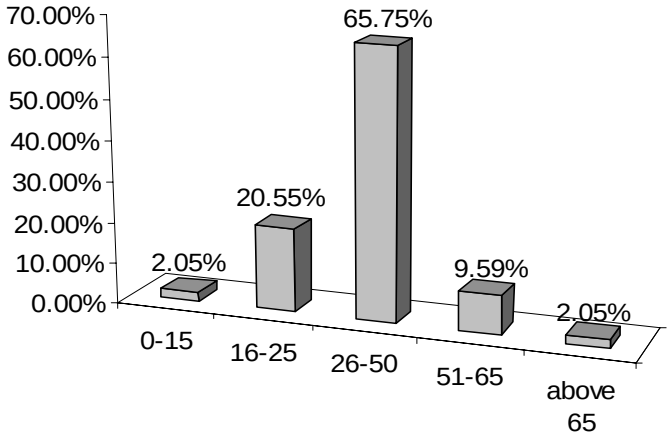



Exhibit 4.2: Age Group of Commuters

| **Age Groups** | |
|---|---|
| Age Group: 0-15 | 2.05% |
| Age Group: 16-25 | 20.55% |
| Age Group: 26-50 | 65.75% |
| Age Group: 51-65 | 9.59% |
| Age Group: 65 and above | 2.05% |
| | |
| **Survey Data** | |
| Number of People Surveyed | 146 |
| % of those Replied | 100% |

**Gender**

The survey shows that female commuters form a slightly larger share of the commuters, with a little over half of the total commuters (54.86%).

In view of the higher patronage of women, the Harbor Transitway may be able to attract an even larger share of women commuters by making the station safer and easier for them to use. Also requiring attention is the access to stations, park and ride facilities, cleanliness, lighting, and crime prevention, which improves the safety aspect of the otherwise desolate stations.

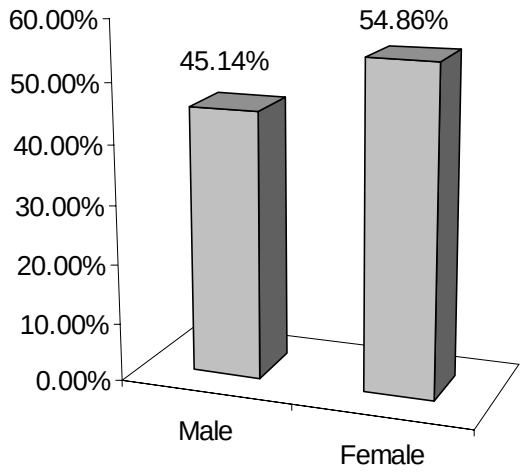



Exhibit 4.3: Gender of Commuters

| **Gender** | |
|---|---|
| Male | 45.14% |
| Female | 54.86% |
| | |
| **Survey Data** | |
| Number of People Surveyed | 144 |
| % of those Replied | 99% |

**Purpose of the Trip**

The survey shows that work based trips account for the major share of trips undertaken on the Harbor Transitway. The work based trips account for more than 80% of the entire number of trips undertaken on the Transitway whereas the non-work trips accounted for only 20% of the total share. This is further supported by the fact that most of the commuters on the Transitway are in the age group of 26 to 50 years, working age population.

As a result peak hours witness much more activity on the Transitway while at the other times the Transitway has relatively fewer commuters. This suggests that the Transitway is definitely not the preferred mode for leisure travel with most of the buses running at much below their capacity during off peak hours.

Repositioning of Harbor Transitway to attract more leisure trips/non-work trips as well as work trips would require an appraisal of the various problems and difficulties faced by the commuters which we discuss a little later in our survey.

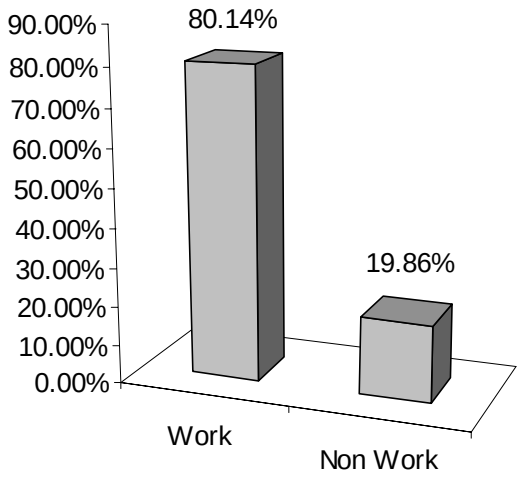



Exhibit 4.4: Purpose of Trip

| **Purpose of Trip** | |
|---|---|
| Work | 80.14% |
| Non Work | 19.86% |
| | |
| **Survey Data** | |
| Number of People Surveyed | 146 |
| % of those Replied | 100% |

**Access to Transit Station**

The survey shows that a large share of commuters (43.15%) takes bus to reach the transit station. The second large group of commuters walk (38.36%) to the transit stations suggesting their proximity to the station, whereas only approximately 18.5% of the commuters use the park and ride facility provided at the stations.

The commuters who access the Harbor Transitway by walking also form the major chunk of commuters who live within five minutes walking distance from the transit station. Except a few stations the park and ride facility is under utilized. None of the respondents had used bicycles for accessing transit stations, which also speaks of poor bike parking facilities at the station or poor bike paths on the local arterials feeding the transit station. The use of bikes holds promise for commuters living within a two to three mile radius.

Nevertheless, with commuters using bus transfer and walking as a major means to access the station, emphasis should be placed on creating pedestrian friendly access to the stations. In addition, if the park and ride facilities were utilized to their full potential, it would definitely add to the commuter share of the Transitway.

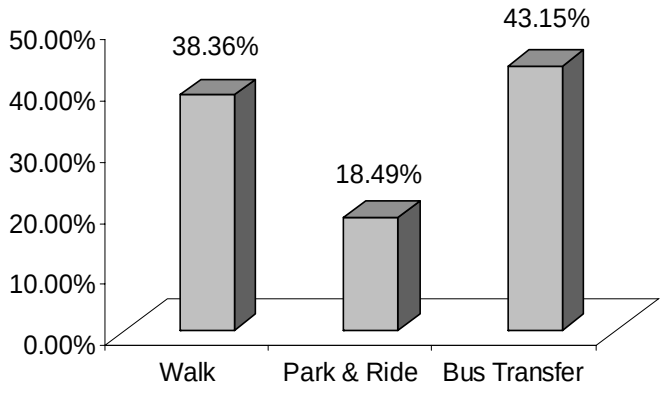



Exhibit 4.5: Modes of Access Used by Commuters

| **Access to Transit Station** | |
|---|---|
| Walk | 38.36% |
| Park and Ride | 18.49% |
| Bus Transfer | 43.15% |
| | |
| **Survey Data** | |
| Number of People Surveyed | 146 |
| % of those Replied | 100% |

**Distance from Transit Station**

The survey shows that nearly 30% of all commuters live within a half-a-mile radius of the transit station. The number of commuters decreases as the distance from the transit station increases. But the survey also sheds light on the travel patterns of commuters who are living at a distance of two to five miles from the transit station, who form a significant portion of the total users of the Transitway. These commuters are probably using bus transfers or the park and ride facility at the station. People living beyond two miles from the station area account for approximately 45% of the total commuter share.

The survey provides a snap shot of the distribution of commuter share with respect to distance from the transit stations. The pattern, which emerges from the survey, might not be applicable to all the transit stations, but it definitely demands a closer look, with peaks at a distance of two to five miles and another at more than 10 miles.

This pattern in any individual case would be more likely a result of geographical or locational aspects of the communities around the transit station. A detailed analysis of user groups in each station area would be required to uncover this anomaly.

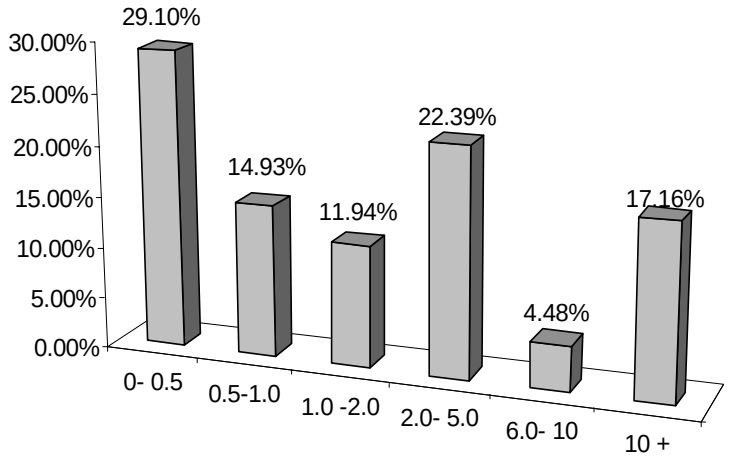



Exhibit 4.6: Distance from Transit Station (miles)

| **Distance from Station** | |
|---|---|
| 0 - 0.5 miles | 29.10% |
| 0.5 - 1.0 miles | 14.93% |
| 1.0 - 2.0 miles | 11.94% |
| 2.0 - 5.0 miles | 22.39% |
| 6.0 - 10 miles | 4.48% |
| More than 10 miles | 17.16% |
| | |
| **Survey Data** | |
| Number of People Surveyed | 134 |
| % of those Replied | 91.78% |

## Access and Distance Traveled to Reach the Stations

Exhibit 4.7 shows that of the people who walk in order to reach the stations, 60.4% (32 out of 53) walk less than a half mile. The percentage of people who walk to the station decreases as the distance increases. The exhibit also shows that of the people who park and ride to reach the Transitway stations, 37.5% (9 out of 24) travel between 2.0 - 5.0 miles to reach the station. None of the people who park and ride travel less than 0.5 miles to reach the stations. Out of all the people who use bus transfers to reach the Transitway stations, 33.3% (19 out of 57) travel more than 10 miles to reach the station. On the whole this data suggests that more people prefer to walk to the stations if they have to travel less than one mile to reach the stations. If the distance to reach the stations is more, people prefer to park and ride or take bus transfers.

### Walk/Non-Walk Comparison Between Various Stations

Exhibit 4.8 indicates that 7 out of 8 people (87.5%) at Manchester Station walk to the station, which is the maximum. Similarly, 1 out of 2 walk at 37th Street, 1 out of 3 at Artesia, 6 out of 13 in Downtown, and 6 out of 21 at Imperial Station (Imperial Station observations may indicate that there might be more people who use two modal choices, i.e. bus and train). Overall, out of the total 146 commuters, 38.4% walk to the stations.

**Exhibit 4.7: Access to the Stations and Distance Traveled to Reach the Stations**

| | Distance in miles | | | | | | |
|---|---|---|---|---|---|---|---|
| **Access** | **0-0.5** | **0.5-1.0** | **1.0-2.0** | **2.0-5.0** | **6.0-10** | **10+** | **Total** |
| **Walk** | 32 | 11 | 3 | 5 | 1 | 1 | 53 |
| **Park and Ride** | 0 | 5 | 6 | 9 | 1 | 3 | 24 |
| **Bus Transfer** | 7 | 4 | 7 | 16 | 4 | 19 | 57 |
| **Total** | | | | | | | 134 |

**Exhibit 4.8: Walk Non-walk Comparison Between Various Stations**

| **Count of Walk** | **Walk** | | | |
|---|---|---|---|---|
| **Place** | **0** | **1** | **Grand Total** | **Percentage of people who walk** |
| **37th St** | 1 | 1 | 2 | 50.0% |
| **Arco Plaza** | 1 | | 1 | 0.0% |
| **Artesia St** | 2 | 1 | 3 | 33.3% |
| **Downtown** | 7 | 6 | 13 | 46.2% |
| **Imperial Stn.** | 15 | 6 | 21 | 28.6% |
| **Manchester** | 1 | 7 | 8 | 87.5% |
| **(blank)** | 63 | 35 | 98 | 35.7% |
| **Grand Total** | 90 | 56 | 146 | 38.4% |

**Time Taken to Reach Station**

The survey shows that more than one-third of the commuters can reach the transit stations within five minutes of leaving home, and nearly 75% of the commuters can reach the transit station within 15 minutes of leaving their homes. Only 25.89% of the commuters take more than 15 minutes to reach the transit station (Exhibit 4.9).

Time taken to reach the station also provides an insight into the main commuter base, i.e. the ones living within 5 minutes distance from the station. There are around 36.61% of commuters living within 5 minutes walking or driving distance of the station, 26.79 % living within 6 - 10 min and 10.71% between 11 - 15 min driving or walking distance of the station. The declining commuter share is also consistent with the expectations.

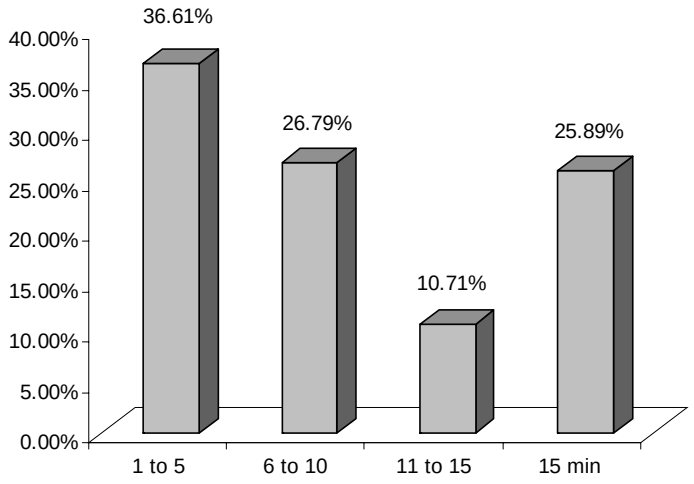



Exhibit 4.9: Time Taken to Reach Transit Station (minutes)

| **Time Taken to Reach Station** | |
|---|---|
| 1 to 5 minutes | 36.61% |
| 6 to 10 minute | 26.79% |
| 11 to 15 minute | 10.71% |
| Over 15 minutes | 25.89% |
| | |
| **Survey Data** | |
| Number of People Surveyed | 112 |
| % of those Replied | 76.71% |

**Number of Vehicles Owned**

The survey of the vehicle ownership pattern of the Harbor Transitway commuters shows that around one-fifth of the households do not own a car. The largest group of the commuters is made up by the households owning one vehicle in the family, followed by households with 2 cars. Families with 3 or more cars account for only 15% of the total commuters.

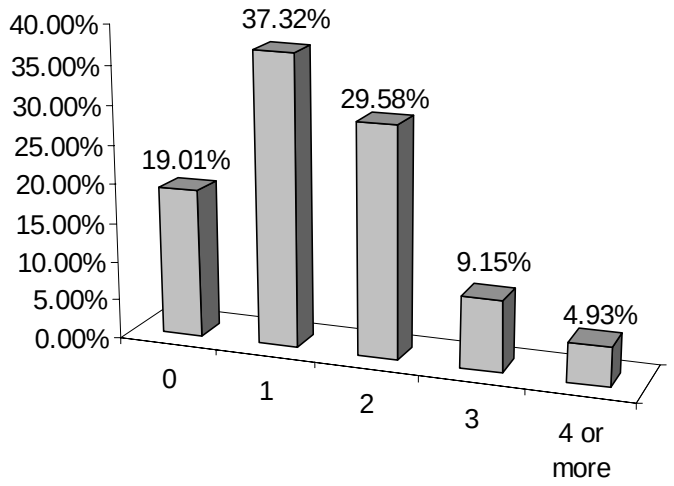



Exhibit 4.10: Vehicle Ownership of Commuting Households

| **Number of Vehicles Owned** | |
|---|---|
| 0 Vehicles owned | 19.01% |
| 1 Vehicles owned | 37.32% |
| 2 Vehicles owned | 29.58% |
| 3 Vehicles owned | 9.15% |
| 4 or more Vehicles owned | 4.93% |
| | |
| **Survey Data** | |
| Number of People Surveyed | 142 |
| % of those Replied | 97.26% |

**Access and Time Taken to Reach the Stations**

Exhibit 4.11 shows that of all the people who walk to the stations, 46.2% (24 out of 52) take less than 5 minutes to reach the stations. Of all the people who park and ride to reach the Transitway stations, 46.2% (6 out of 13) take more than 15 minutes to reach the station. And 44.7% (21 out of 47) of people who use Bus Transfers to reach the stations take more than 15 minutes. This data suggests that more people walk to the stations when it takes less than 5 minutes to reach to the stations, for anything more than that people prefer to park and ride or take a bus transfer.

**Exhibit 4.11: Access and Time Taken to Reach the Stations**

| Access | Time Taken to Reach the Stations (in minutes) | | | | |
|---|---|---|---|---|---|
| | **1 to 5** | **6 to 10** | **11 to 15** | **15** | **Total** |
| **Walk** | 24 | 18 | 8 | 2 | 52 |
| **Park and Ride** | 3 | 3 | 1 | 6 | 13 |
| **Bus Transfer** | 14 | 9 | 3 | 21 | 47 |
| **Total** | | | | | 112 |

**Access to the Stations and Number of Vehicles Owned**

Exhibit 4.12 shows that out of all the people who walk in order to reach the stations, 37.5% (21 out of 56) own one vehicle per household. Of all the people who park and ride to reach the Transitway stations, 50% (13 out of 26) own 2 vehicles per household. 43.3% (26 out of 60) of the people who use bus transfers to reach the Transitway stations own one vehicle per household. On the whole, this data suggests that people having less than or equal to one vehicle per household prefer to walk or take a bus transfer to reach the Transitway stations.

**Exhibit 4.12: Access to the Stations and Number of Vehicles Owned**

| Access | Number of Vehicles Owned | | | | | |
|---|---|---|---|---|---|---|
| | **0** | **1** | **2** | **3** | **4 or more** | **Total** |
| **Walk** | 14 | 21 | 17 | 2 | 2 | 56 |
| **Park and Ride** | 1 | 6 | 13 | 4 | 2 | 26 |
| **Bus Transfer** | 12 | 26 | 12 | 7 | 3 | 60 |
| **Total** | | | | | | 142 |

**Times Per Week Bus Used**

The survey shows that over 53% of the commuters use the Transitway more than 5 times a week. And commuters using it 2 – 5 times a week form the next segment of commuters (around 42%), whereas the commuters using it only once or less in a week account for just 5% of the total commuters (Exhibit 4.13).

Nearly 95% of the commuters use the Transitway more than twice a week. This finding from the survey can be directly attributed to the higher share of the work trips that the Transitway is attracting. With around 37% of households owning one car and another 19% owning not even one car, makes the Transitway a very viable option for these households.

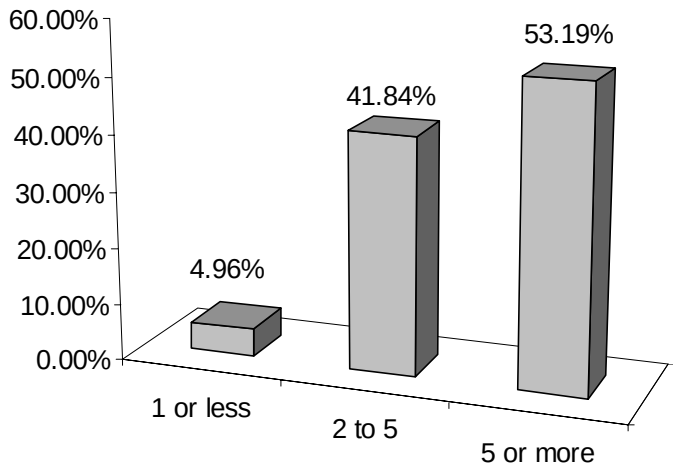



Exhibit 4.13: No. of Times per Week Bus Used by Commuters

| **Times per Week Bus Used** | |
|---|---|
| 1 or less times per week | 4.96% |
| 2 to 5 times per week | 41.84% |
| 5 or more times per week | 53.19% |
| | |
| **Survey Data** | |
| Number of People Surveyed | 141 |
| % of those Replied | 96.58% |

**Change of Buses**

The survey shows that over 65% of the commuters on the Transitway have to change buses to reach their destination and only 35% of the commuters don't have to change buses to reach their destination.

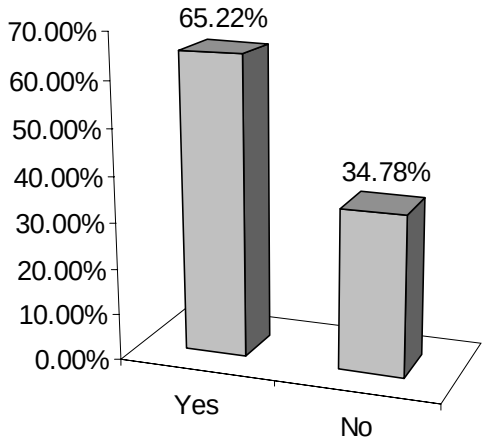



Exhibit 4.14: Change of Buses for Reaching Destination

| **Change of Buses for Reaching Destination** | |
|---|---|
| Yes | 65.22% |
| No | 34.78% |
| | |
| **Survey Data** | |
| Number of People Surveyed | 138 |
| % of those Replied | 94.52% |

**Distance Walked for Changing Buses**

The survey shows that nearly 48% of the commuters walk less than 1 block to change buses and nearly 35% walk between 1 and 2 blocks to change buses. But after 2 blocks the number of commuters walking to change buses reduces significantly and accounts for only 17% of the total commuters (Exhibit 4.15).

This is quite consistent with the expectations that the desire to walk for changing buses decreases with the increase in the number of blocks that the commuter has to walk. Nearly half of the people elect to walk less than a block in comparison to 5% of commuters who elect to walk 5 blocks.

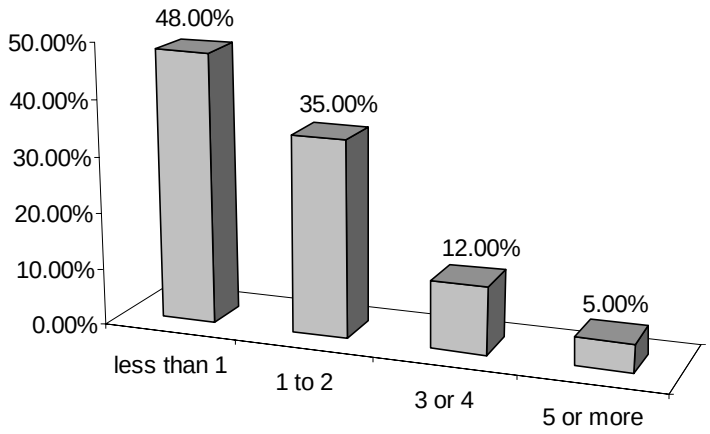



Exhibit 4.15: No. of Blocks Walked for Changing Buses

| **No. of Blocks Walked for Changing Buses** | |
|---|---|
| Less than 1 block | 48.00% |
| 1 or 2 blocks | 35.00% |
| 3 or 4 blocks | 12.00% |
| 5 or more blocks | 5.00% |
| | |
| **Survey Data** | |
| Number of People Surveyed | 100 |
| % of those Replied | 68.49% |

**Problems Faced by Commuters in Using the Transitway**

1. Irregular and unreliable frequency of bus service is cited as the biggest problem faced by the commuters with nearly 41.32% of respondents picking it up as the primary difficulty.

2. This was followed by poor noise protection at the station, with 28.10% of respondents selecting this as a major problem. The reduction of noise levels at the stations can definitely go a long way in attracting more commuters to the Transitway.

3. Poor station area maintenance came in as the third biggest problem (25%).

4. This was followed by the presence of trash on the station (21.5%).

5. The presence of homeless on the stations (17.36%) and insufficient lighting on the station (16.53%) accounted for the next two problems.

6. Unsafe crosswalks to the stations and gang activity were cited by around 14% of the respondents.

7. This was followed by unsafe parking (11.57%) and inconvenient bus transfers at stations (10.74%).

8. Next major problem encountered was the lack of adequate signage leading to the station (9.09%).

9. This was followed by drug dealing and other crimes on the station and unavailability of taxis on station (8.26%).

10. Issues like broken curbs, inadequate landscaping, unappealing approach to stations, and narrow sidewalks to stations were also cited by respondents as some of the other major problems.

**Exhibit 4.16: Problems or Difficulties Faced in Using the Transit Stations**

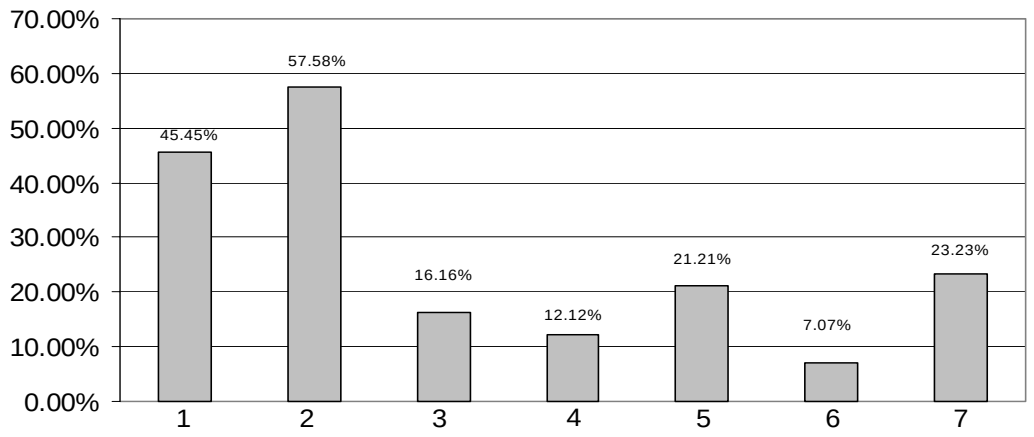
| No. | Problems/Difficulty in Using Transit Station | Percent Respondents |
|---|---|---|
| 1 | Irregular and unreliable frequency of bus service | 41.32% |
| 2 | Poor noise protection at station | 28.10% |
| 3 | Poor station area maintenance | 25.62% |
| 4 | Trash and litter | 21.49% |
| 5 | Homeless problem | 17.36% |
| 6 | Insufficient lighting | 16.53% |
| 7 | Unsafe cross walks to the station | 14.05% |
| 8 | Gang activity | 14.05% |
| 9 | Insecure and unsafe parking | 11.57% |
| 10 | Inconvenient transfer to other buses at the station | 10.74% |
| 11 | Unattractive signs and billboards | 10.74% |
| 12 | Lack of adequate signage leading to the station | 9.09% |
| 13 | Unavailability of taxis and shuttles at the station | 8.26% |
| 14 | Drug dealing | 8.26% |
| 15 | Unappealing approach to the station | 6.61% |
| 16 | Broken curbs/cracked sidewalks/potholes leading to the station | 5.79% |
| 17 | Inadequate landscaping | 5.79% |
| 18 | Weeds | 5.79% |
| 19 | Other crimes | 5.79% |
| 20 | Narrow sidewalks leading to station | 4.96% |
| 21 | Poor access for the disabled | 4.96% |

Survey Data:
Number of People Surveyed: 121
Percent of those Replied: 82.88%

The survey shows that nearly 57.5% of the commuters would like to have a coffee shop at the transit station with another 45% of the commuters displaying their preference for a newspaper stand. Nearly one-quarter of the respondents have also shown a desire for postal services at the station followed by around 21.21% of the respondents who prefer a grocery store, followed by neighborhood retail (16.16%) and day care (12.12%) with only 7.07% opting for a dry cleaning outlet (Exhibit 4.17).

Though providing a grocery store or neighborhood retail may not appear to be a viable option right now, a coffee shop and newspaper stand do sound very viable. And they certainly can generate some amount of activity on the transit stations.

**Exhibit 4.17: Services to Enhance Activities Around the Bus Stations**




| Services to Enhance Activity Around Bus Station | | |
|---|---|---|
| 1 | Newspaper stand | 45.45% |
| 2 | Coffee Shop | 57.58% |
| 3 | Neighborhood retail | 16.16% |
| 4 | Children day care center | 12.12% |
| 5 | Grocery store | 21.21% |
| 6 | Dry cleaning | 7.07% |
| 7 | Postal Service | 23.23% |
| | | |
| **Survey Data:** | | |
| Number of People Surveyed | | 99 |
| % of those Replied | | 67.81% |

# Chapter 5: Conclusions and Recommendations

## 5.1 Conclusions

The Harbor Transitway provides a vital link between downtown Los Angeles and the Los Angeles Harbor, as well as between the Century Freeway (I-105) and downtown Los Angeles. Based on current and expected ridership levels, we conclude that Harbor Transitway is being used in a less than optimal fashion considering that the project area has a large share of transit dependent population. The current land use and physical infrastructure makes these station areas unattractive, unsafe, and disconnected from the larger urban fabric. From our observations and survey analyses, we find several reasons why the transitway stations are not used efficiently or effectively.

1. **Service and Amenities**
   Bus service is irregular and the unreliable frequency contributes to a general distaste towards transit. Nearly two-fifths of the survey respondents cited irregularity in bus service as the biggest problem or "turn off" (mentioned in anecdotal interviews). Moreover, passengers usually have to wait for a long time at the stations due to inconvenient bus transfers. There are insufficient public amenities at the transit stations. Besides some basic services like benches, telephones, and trash cans, there are few amenities that can make the waiting environment seem less boring. Only the Harbor/I-105 station has newspaper boxes on the second floor. From the survey, we find that commuters desire retail services such as a place to get a cup of coffee or a newspaper or grocery at the transit station. The lack of public art - visual displays, murals, sculptures and/or exhibits, which could visually engage and stimulate the public, contributes to a dreary, monotonous, and lackluster experience.

2. **Design**
   The sidewalks leading to the stations are narrow and unsafe. Pedestrians have to cross freeway exit ramps to reach most of the stations putting them in unsafe crosswalks, if not dangerous conditions. Most of the stations look empty and forlorn, and provide little chance for people to interact with each other. The problem is compounded by inadequate pedestrian-oriented signage leading to the stations. Therefore, many people in the immediate vicinity may not be even aware of the existence of these stations. The waiting areas are not accommodated with sufficiently attractive features or amenities, such as art, sculptures, or landscaping. Noise levels are generally very high and nearly one-quarter of the commuters see this as a major problem. There is no infrastructure to shield transit passengers from this problem. Reduction of noise levels at the stations will go a long way in attracting more commuters to the transitway.

3. **Station Area Maintenance**
   Nearly a quarter of the commuters pointed out poor station area maintenance as a major problem. The homeless use transit station as a shelter and contribute to other maintenance problems such as trash, litter, graffiti, and vandalism. The messy conditions further render the stations as uninviting places and do not lend to a pleasant experience.

4. **Safety**
   Unsafe environment at the stations is another major concern for the bus riders. Most of the passengers are concerned about personal safety arising from crime, gang activity, and drug dealing. During nighttime, fewer people take the freeway bus because of insufficient lighting and the perception of insecurity of waiting alone at the stations. The safety issues also relate to the physical setting of the transitway stations—they are set apart with vast areas of vacant land or public right of way separating them from the immediate neighborhoods. The unavailability of taxis on stations, isolated park-and-ride lots, presence of vagrants, and neglected maintenance contributes to an overall perception of fear and paranoia.

5. **Travel Cost**
   Higher bus fare on the Transitway when compared to buses running on streets may be one of the reasons for low ridership. Certainly, this issue deserves more investigation. Many residents in the Project Area are in the lower income brackets, or on fixed incomes, or do not own cars. The minimum cost of taking the freeway bus is $1.35, with a transfer fee of $0.25. But for longer distances, the base fare may go up to $3.85. This is relatively quite high when compared to the base fare of $1.35 for buses running on arterial streets parallel to the freeway and may prove to be a financial impediment resulting in lower ridership.

## 5.2 Strategies to Increase Ridership on the Harbor Transitway

Stations on the Harbor Transitway have to improve links between land use, transportation, and surrounding communities. There is a need to modify land use patterns, street designs, and densities to favor transit and non-motorized transportation near the Harbor Transitway Stations. Near most of the stations, we observed single-family housing units within a walking distance and large sets of underutilized parcels catering to marginal commercial uses. To afford higher transit ridership, the neighborhoods should be able to support medium to high residential density.

- In general, land uses within walking distance of the stations should be planned at densities that provide enough transit riders to support a multitude of commercial uses so that many routine activities can be performed without using car. Pedestrian scale distances (radius of one-quarter to one-half mile around the stations) should have mixed-use development that includes shops, schools, activity centers, employment nodes, and a variety of housing types within each neighborhood. Offices along with public services including library, community center, and daycare could be placed near the stations in a dense and walkable setting. Other facilities may include groceries, take-out food, car repair, film developing, dry-cleaning, video rental stores, and travel agents. Higher employment densities, good pedestrian conditions, and attractive urban environments with shops and restaurants nearby are more likely to contribute to a transit-oriented development.

- Harbor Transitway stations should be provided with enhanced access and on-site community services. The mix of uses within each station area should strike a balance between satisfying market demand for different land uses and complementing the physical character of an area to generate the ridership necessary to support the type of transit service that is provided. Various features that we propose to increase ridership along the Harbor Transitway are:

1. The neighborhood around the stations should be designed for cycling and walking with adequate bike parking facilities. Pedestrian connections between transit stations and the neighborhood can be improved by building new sidewalks, widening existing sidewalks, and providing pedestrian oriented signage. Stations such as 37th Street, Slauson, and Manchester have poor pedestrian linkages that need improvement.

2. Provide landscaping and other scenic beautification within the context of street improvements such as design of new sidewalks, curbs, decorative paving, and street lamps. All transit stations with the exception of Imperial/1-105 and Artesia have poor landscaping and no street furniture to attract potential riders.

3. Reduce the amount of land devoted to parking and take advantage of the parking cost savings associated with reduced automobile use. There are large park-and-ride lots near the Manchester station that are not even half occupied. These lots should be put to a higher and best use. Joint development opportunities should be explored to accommodate both commercial development and parking required for transit station.

4. Establish a range of complementary land uses within the station area. Different land uses serve different needs and help to support and generate different kinds of trips. Stations that attract trips during peak and off-peak hours generally serve many trip purposes providing access to work, shopping, recreation, and other activities. Intensify activity and land use around transit stations; the increased activity could result in increased tax revenues and new entrepreneurial opportunities.

5. Establish an employment node close to station facility. An employment base around station area is a means to attract transit riders. Job sites provide regular daily destination at specific periods each day where reliable and frequent transit service can be concentrated.

6. Redesign stations to reduce noise impact and accommodate a variety of uses. Enclosure should be provided to shield commuters from loud noise, and amenities such as coffee shops, newspaper stand, and restrooms should be provided. This will transform the station from a mere waiting area into a social space.

7. Public/private partnerships should be encouraged to support station area development. State and local government should support land use policies that promote mixed use and high-density development around transit facilities and provide tax credits and other financial incentives to leverage private sector investment.

8. Encourage infill and/or redevelopment of underutilized land near station areas. Underdeveloped or underutilized parcels, like those near Imperial/I-105 station should be identified within the station areas as potential opportunities for new development. An infill strategy cultivates the efficient use of land and can be a way of increasing density gradually near stations.

# Chapter 6: Implementation

Station area design and development is challenging especially when it is located next to a busy freeway. In the case of Harbor Transitway, all of the stations except Artesia station are located on the freeway. Station area design and its interface with the community are critical for efficient and effective utilization of transit. Each station area neighborhood is unique and requires context-based design solutions or strategies for effective and seamless integration of land use and transportation. Some of the strategies required are more systemic in nature while others require local knowledge, expertise, and participation.

As mentioned before, the lack of maintenance and cleanliness, and neglect creates uninviting space and threatening environment for bus stops. With little information on bus schedules or headways, these bus stops can become hostile places. Our survey results show that transit users have expressed their dissatisfaction with the place based qualities of these transit centers and associated gaps in services. Some of the issues are related to design and access, such as narrow sidewalks, unsafe crosswalks, lack of public art, and insufficient public amenities. These issues demand solutions that can be cost intensive. There are other problems, however, that are service related such as irregularity in bus schedule and inconvenient bus transfers or maintenance related such as poor station area maintenance, insufficient lighting, and perception of insecurity. Service improvements and station area maintenance are recurring costs, yet they remain keys to improving the overall image of the station areas.

We recommend the municipalities to better maintain station areas by enforcing regular supervision to remove any debris, litter, and graffiti. Municipal funds for maintenance can be supplemented by generating advertisement revenue by leasing space to private businesses; plenty of vacant wall space is available in the station areas. Also, station area maintenance can be supported by adopting a station area BID (business improvement district), once businesses start establishing in the station area neighborhood. Spaces around freeway transit centers offer many positive opportunities for the surrounding community: bus stops can become welcoming gateways or provide places for information about local attractions. By creating places where people come together, freeway transit centers can create focal points for a variety of activities, as well as links to the larger regional transit system. Freeway transit centers can become the staging area for employee commuter vans, park-and-ride lots, or taxi stands. They can also act as a catalyst for neighborhood scale joint-development. With proper design and incentives freeway transit centers can attract a variety of activities and service establishments, including small scale retail such as, coffee shops, newsstands, open-air fresh produce, video store rentals, day care centers, and bank branch offices. Local businesses can partially support the maintenance of the station area while the increased foot traffic will support these businesses. Partnerships with local nonprofits or artist organizations should be encouraged to showcase local talent by displaying public art on these bus stations.

We have observed that local bus stops are located farther away from freeway transit centers and a majority of local bus lines fail to make direct connection with freeway

transit center to enable passenger transfers. The inability to make a smooth transition from local transit to regional transit is a major obstacle preventing higher ridership. Service improvements (better connectivity, frequency, and transferability) will increase public's reliance on transit. In addition, the use of new technologies such as electronic timetable information on the stations will provide predictability and added comfort to commuters who feel insecure in these rather isolated locations.

The immediate community surrounding these transit stations is exposed to noise from the freeways and air pollution ($NO_x$, $CO_x$, and $PM_{10}$), major factors that impede development in these station areas. Mitigating measures such as walls, buffers, water elements, and landscaping and vegetation should be integrated to minimize the impacts of both noise and air pollution. New buildings should incorporate the latest sound proofing technologies while older developments should be retrofitted to minimize the impact of freeway noise. A variety of creative public-private financing mechanisms should be explored to soundproof communities including and not limited to bond and tax-increment financing (TIF) at the local level, grants and below market interest loans at the state and federal level. Air pollution is a much more daunting problem with no easy solution. However, it is our expectation that air pollution will drop as we continue to integrate low-emission and hybrid-fuel vehicles in private and public fleets. Consequently, living in close proximity to freeways will not be as challenging.

We recommend the development of an intermediary layer such as a specific plan for station area neighborhoods. Such a strategy will allow for better integration of land use and transportation, infrastructure, and other City assets. Specific plan will also clarify land use mix, density, incentives, parking, and pedestrian and bike linkages to the station area. Specific plan can help bring focus and resources to development in the area, as well as engage the community in the planning process. It can also offer new incentives such as density bonuses, reduced parking requirements, location efficient mortgages to spur development and promote private sector investment. The City and MTA should undertake demonstration joint-development projects in these station area neighborhoods, similar to transit-oriented developments around rail stations. Adopting a TIF mechanism in a quarter-mile radius around bus stations can facilitate public-private partnerships and serve as a catalyst for new development.

The City of Los Angeles is nearly built out and there is very little vacant land for new development. Our analysis suggests that station area sites are currently underutilized with greyfields, vacant lots, and/or underutilized commercial space. As such, they are prime sites for infill development. A favorable factor supporting the concept of infill is the tremendous demand for housing, both market-rate and affordable. Mixing residential and commercial uses in the station areas creates an opportunity to alleviate housing demand, achieve a jobs-housing balance, increase transit ridership, and establish a population base that supports existing retail and services. Such a strategy creates a "win-win" outcome for public and private sector alike.

# Chapter 7: Appendix

**A: Harbor Transitway Bus Rider Survey**

**B: Harbor Transitway Bus Rider Survey (Spanish version)**

# H A R B O R  T R A N S I T W A Y
# B U S  R I D E R  S U R V E Y

***Dear Rider:*** *Adequate bus service is desired for access and mobility. Bus stations and services can contribute to overall activity and enhance livability of our communities. The National Center for Metropolitan Transportation Research (METRANS) is studying the performance of bus stations along the Harbor Transitway. The purpose of this survey is to determine user satisfaction with freeway bus stations. You can assist us in this research effort by taking a few minutes and answering the following questions. Your answers to the survey will be kept confidential. We appreciate your time and concern.*

**1. Where did you get on the bus?** Indicate closest intersection or address. ----------St. & ----------St.

**2. What is you final destination?** Indicate closest intersection or address. ----------St. & ----------St.

**3. What is your age?** ☐ 0-15 ☐16-25 ☐ 26-50 ☐ 51-65 ☐ More than 65

**4. What is your gender?** ☐ Male ☐ Female

**5. What is the purpose of your trip today?** ☐ Work ☐ Non-Work

**6. How do you access the transit station?** ☐ Walk ☐ Park & Ride ☐ Bus Transfer ☐ Bicycle

**7. How far do you live from the transit station (miles)?** ☐ 0–1/2 ☐ 1/2 – 1 ☐ 1 - 2 ☐ 2 – 5 ☐ 6-10 ☐ 10+

**8. If you walk, how long does it take you to reach the transit station (minutes)?**
☐ 1-5 ☐ 6-10 ☐ 11-15 ☐ 15+

**9. How many vehicles does your household own?** ☐ 0 ☐ 1 ☐ 2 ☐ 3 ☐ 4 or more

**10. How many times per week do you ride the bus?** ☐ 1 or less ☐ 2-5 ☐ 5 or more

**11. Do you have to change buses to reach your destination?** ☐ Yes ☐ No

**12. If you have to change buses, how far do you have to walk for transfer (number of blocks)?**
☐ Less than 1 ☐ 1-2 ☐ 3 or 4 ☐ 5 or more

**13. What problems or difficulties do you face in using the freeway bus and station (tick all that apply)?**

- ☐ Narrow sidewalks leading to the station
- ☐ Unsafe crosswalks to station
- ☐ Unavailability of taxis and shuttles at the station
- ☐ Poor station area maintenance
- ☐ Poor noise protection at the station
- ☐ Broken curbs/cracked sidewalks/potholes leading to the station
- ☐ Inadequate landscaping
- ☐ Homeless problem
- ☐ Gang activity
- ☐ Other_____
  _____
- ☐ Irregular and unreliable frequency of bus service
- ☐ Inconvenient transfer to other buses at the station
- ☐ Lack of adequate signage leading to the station
- ☐ Unappealing approach to the station
- ☐ Insufficient lighting
- ☐ Insecure and unsafe parking
- ☐ Poor access for the disabled
- ☐ Unattractive signs/billboards
- ☐ Trash and litter
- ☐ Weeds
- ☐ Drug dealing
- ☐ Other crimes

**14. What kind of services will contribute to enhancing the overall activity around bus stations?**

- ☐ Newspaper stand
- ☐ Coffee shop
- ☐ Neighborhood retail
- ☐ Other services_____
- ☐ Children day care center
- ☐ Grocery store
- ☐ Dry cleaning
- ☐ Postal service

Thank you for completing the survey.
If you have any questions regarding this survey, please contact Deepak Bahl at (213) 740-9491.

**H A R B O R  T R A N S I T W A Y**
**E N C U E S T A  P A R A  P A S A J E R O S  D E  B U S**

***Estimado Pasajero de Bus:*** *Un servicio de bus adecuado es deseable para tener accesibilidad y movilidad. Estaciones y servicios de bus contribuyen a que haya mas actividad y vitalidad en nuestras comunidades. El Centro Nacional para Investigaciones sobre Transporte Metropolitano (METRANS, por sus siglas en inglés)esta estudiando la eficiencia de las estaciones de bus a lo largo del Harbor Transitway. El propósito de esta encuesta es determinar la satisfacción del usuario con las estaciones de bus en los freeways. Ud. puede ayudarnos en esta investigación tomando unos pocos minutos de su tiempo y respondiendo a las siguientes preguntas. Sus respuestas en esta encuesta se mantendrán absolutamente confidenciales. De antemano le agradecemos su tiempo e interés.*

1. **¿En donde se subió Ud. a este bus?** Indique la intersección o dirección más cercana. ----------St. & . ----------St.

2. **¿Cuál es su destino final?** Indique la intersección o dirección más cercana. ----------St. & ----------St.

3. **¿Cuál es su edad?** ☐ 0-15 ☐ 16-25 ☐ 26-50 ☐ 51-65 ☐ Mas de 65

4. **¿Sexo?** ☐ Masculino ☐ Femenino

5. **¿Cuál es el propósito de su viaje hoy?** ☐ Trabajo ☐ No relacionado con trabajo

6. **¿Cómo llega Ud. a la estación de transito?** ☐ Caminando ☐ Park & Ride ☐ Pase de Trasbordo ☐ Bicicleta

7. **¿Que tan lejos vive Ud. de la estación de transito (en millas)?** ☐ 0-1/2 ☐ 1/2–1 ☐ 1-2 ☐ 2–5 ☐ 6–10 ☐ 10+

8. **¿Si Ud. camina, cuanto tiempo se gasta en llegar hasta la estación de transito (en minutos)?** ☐ 1-5 ☐ 6-10 ☐ 11-15 ☐ 15+

9. **¿Cuantos autos hay en su casa?** ☐ 0 ☐ 1 ☐ 2 ☐ 3 ☐ 4 o más

10. **¿Cuantas veces por semana viaja Ud. en bus?** ☐ 1 o menos ☐ 2-5 ☐ 5 o más

11. **¿Tiene Ud. que hacer cambio de buses para llegar a su destino final?** ☐ Si ☐ No

12. **¿Si Ud. tiene que hacer cambio de buses, que tan lejos tiene que caminar para hacer este cambio (en numero de cuadras)?** ☐ Menos de 1 ☐1-2 ☐ 3 o 4 ☐ 5 o más

**13. ¿Que problemas o dificultades encuentra Ud. cuando utiliza las estaciones y los buses localizados en los freeways (marque todo lo que corresponda)?**

- ☐ Andenes estrechos hacia la estación
- ☐ Cruces peatonales peligrosos hacia la estación
- ☐ No se consiguen taxis o minibuses en la estación
- ☐ Mal servicio de mantenimiento en el área de la estación
- ☐ Mal protección contra el ruido en la estación
- ☐ Bordes de las aceras rotos, andenes resquebrajados, y baches en el camino hacia la estación
- ☐ Jardines inadecuados
- ☐ Problema de gente sin vivienda
- ☐ Actividades de pandillas callejeras
- ☐ Otros_____
  _____
- ☐ La frecuencia del servicio de buses es irregular y no confiable
- ☐ Los transbordos hacia otros buses en la estación no son convenientes
- ☐ Falta de avisos adecuados señalando en donde esta la estación
- ☐ El camino hacia la estación no es agradable
- ☐ Iluminación insuficiente
- ☐ Parqueo inseguro y peligroso
- ☐ Mal acceso para lisiados
- ☐ Avisos y vallas no muy atractivas
- ☐ Basuras
- ☐ Hierbas y malezas
- ☐ Trafico de drogas
- ☐ Otros crímenes

**14. ¿Que otro tipo de servicios contribuirían a aumentar en general la actividad alrededor de las estaciones de bus?**

- ☐ Puesto de periódicos
- ☐ Cafetería
- ☐ Local comercial
- ☐ Otros servicios_____
- ☐ Guardería infantil
- ☐ Almacén de abarrotes
- ☐ Tintorería
- ☐ Servicio Postal

Gracias por completar esta encuesta.

Sí Ud. Tiene alguna pregunta relacionada con a esta encuesta, por favor contacte a Deepak Bahl en el teléfono (213) 740-9491

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