CITY OF SIGNAL HILL

General Plan

CIRCULATION ELEMENT

Updated December 2009

Prepared by the City of Signal Hill in collaboration with RGP Planning & Development Services

ACRONYMS & ABBREVIATIONS

AB	Assembly Bill
ADT	average daily traffic
AQMD	South Coast Air Quality Management District
AQMP	Air Quality Management Plan
ATCS	Adaptive Traffic Control System
Caltrans	California Department of Transportation
CARB	California Air Resources Board
CIP	Capital Improvement Program
CMP	Congestion Management Program
EPA	Environmental Protection Agency
ICU	intersection capacity utilization
ITS	Intelligent Transportation Systems
LOS	level of service
LRTP	Long-Range Transportation Plan
Metro	Los Angeles County Metropolitan Transportation Authority
MPO	Metropolitan Planning Organization
PCH	Pacific Coast Highway
ROW	right-of-way
RTP	Regional Transportation Plan
RTIP	Regional Transportation Improvement Plan
SB	Senate Bill
SCAG	Southern California Association of Governments
SHMC	Signal Hill Municipal Code
SRTP	Short-Range Transportation Plan
TDM	Transportation Demand Management
TEU	twenty-foot equivalent unit
V/C	volume-to-capacity
VMT	vehicle miles traveled

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I. INTRODUCTION

A. Purpose and Scope

The purpose of this Circulation Element is to establish guidelines and policy direction for the development and maintenance of a comprehensive transportation system for the city of Signal Hill. The Circulation Element works in tandem with the other elements of the Signal Hill General Plan and with regional transportation planning documents to plan for the long-term development, maintenance, and enhancement of the area's circulation system. This document:

- Evaluates regional transportation connections and influences;
- Creates a citywide plan for an efficient, multimodal transportation system;
- Establishes policies, plans, and programs that encourage the use of alternatives to the single-occupant auto for most trips, thereby reducing vehicle miles traveled (VMTs) and attendant air pollution and greenhouse gas emissions; and
- Creates a direct, clear link with the policies, plans, and programs of the Land Use Element of the General Plan in particular, and with all other Signal Hill General Plan elements in general.

In addition to evaluating regional and citywide connectivity, Signal Hill's transportation system must provide efficient access to and from all parcels and accommodate essential utilities, including water, sewerage, gas, electricity, communications, and storm drainage. It is imperative that the city have a comprehensive circulation plan to accommodate the effective transport of persons, goods, and utility services within and through the community. This circulation system is created by the efficient use of roadways, sidewalks, paths, trails, and utility easements.

The Circulation Element recognizes that transportation routes and utility services play an important role in shaping the physical development of the city. Roadway and utility systems are part of the architecture of the community and provide a relatively permanent foundation for shaping substantial portions of it. The Circulation Element also offers opportunities for a variety of transportation means, such as driving, public transportation, biking, and walking.

Signal Hill's traffic circulation system is well established and is not anticipated to change materially over time. New urban development is anticipated to occur on vacant oil field areas and to a lesser extent on

infill lots in established neighborhoods through redevelopment. The Circulation Element anticipates that the automobile will remain an important mode of travel for most trips, with the exception of certain commute trips, and that congestion of many of the city's roadways will increase. Much of the current and anticipated traffic is associated with pass-through trips, which are vehicles traveling through Signal Hill to get to other destinations outside of the city. To counteract the negative impacts of a continued increase in auto usage, goals, policies, and implementation measures have been incorporated into this document which when implemented, will encourage the use of alternative modes of transportation (walking, bicycling, public transit, etc.). Additionally, an analysis of transit-oriented development opportunities is provided to help guide future development of General Plan and zoning standards. Signal Hill's access to a well-developed bus system and the Blue Line light rail service and the potential for transit-oriented development will assist in reducing the number of miles driven by community residents.

Many city roadways are already experiencing reduced efficiency, especially in peak commuting hours. Further development of bus and light rail systems serving the southern part of Los Angeles County may slow the rate at which these roadways become congested, but will likely account for only a fraction of the ever-growing vehicular travel demands on the road system. In addition, as the population and the economy of the Signal Hill area grows within the context of the larger regional economy, travel demands on the existing circulation system due to our dependence on the automobile will also increase, resulting in further congestion. Therefore, the need to incorporate alternative means of transportation besides the single-occupancy vehicle becomes increasingly important to the long-term strategy of maintaining an efficient and effective circulation system.

The Circulation Element recognizes the city's entrepreneurial past and promotes an environment intended to help the City deal effectively with future growth and development, as projected in the 2001 General Plan Land Use Element through 2025.

B. Regulatory Framework

The Circulation Element is one of seven elements mandated by the State of California as part of every General Plan. A Circulation Element provides policy direction for the location and extent of transportation linkages that offer potential for multi-modal use and for the reduction, to the extent

feasible, of adverse environmental consequences. Government Code Section 65302(b) requires that the General Plan include:

> *A circulation element consisting of the general location and extent of existing and proposed major thoroughfares, transportation routes, terminals, any military airports and ports, and other local public utilities and facilities, all correlated with the land use element of the plan.*

Furthermore, State guidelines recommend that the Circulation Element address coordinated land use and circulation relationships, circulation efficiency and safety, protection of environmental quality and equitable use of economic and natural resources.

Toward those ends, the Signal Hill Circulation Element addresses streets, highways, parking, transit, bicycle and pedestrian facilities, trails, railroads, and airports. In addition, the Element addresses utility infrastructure, including petroleum and natural gas pipelines, electrical transmission, and distribution lines; communications systems; sewer and sanitary waste systems; solid waste collection; water acquisition, storage, and distribution; flood and drainage control; and stormwater pollution.

Recent Legislative Mandates

Several recent legislative mandates imposed by the State of California impact the content of this Circulation Element. Of particular importance are:

- Assembly Bill (AB) 32, the Global Warming Solutions Act of 2006;
- Senate Bill (SB) 375 of 2008; and
- AB 1358, the California Complete Streets Act of 2008.

AB 32

AB 32 requires California to reduce its total greenhouse gas emissions to 1990 levels by 2020. This measure was preceded in 2005 by Executive Order S-3-05, which required an 80 percent reduction in greenhouse gas emissions from 1990 levels by 2050. Both of these State requirements will be partially implemented through new goals, policies, programs, and implementation measures at the local level. As

the guiding document for decision-making in Signal Hill, the City's General Plan must provide direction for the City in reducing the community's greenhouse gas emissions.

A range of actions may be taken to reduce greenhouse gas emissions and comply with State requirements. These include, but are not limited to:

- Providing sidewalks and bicycle facilities to encourage pedestrian and bicycle travel in lieu of motor vehicle use;
- Enhancing public transportation services, including the creation of park-and-ride facilities, to encourage the use of public transportation in lieu of motor vehicle use;
- Encouraging mixed-use development, to allow individuals to live closer to workplaces, retail stores, restaurants, and other daily activity areas to encourage pedestrian and bicycle travel;
- Encouraging green building practices, which reduce the environmental impact of renovations and new construction by reducing energy and water use, reducing the release of harmful emissions, incorporating sustainable materials in construction, reducing heat island impacts, reducing stormwater quality and quantity impacts, as well as other improvements; and
- Increasing use of alternative energy systems, such as solar panels or wind turbines.

SB 375

SB 375 requires each federally-designated Metropolitan Planning Organization (MPO) in California to develop a "sustainable communities strategy" to reduce greenhouse gas emissions from automobiles and light trucks. The MPO serving Signal Hill, the Southern California Association of Governments (SCAG), is working with the California Air Resources Board (CARB) to develop greenhouse gas reduction targets for automobiles and light trucks. The sustainable communities strategy is part of the Regional Transportation Plan (RTP), a long-range planning document developed by SCAG. Subregional councils of governments (COGs) within the SCAG area may prepare the sustainable communities strategy or alternative planning strategies to establish a development pattern for the region. This pattern, when integrated with the transportation network and other transportation measures and policies. This will reduce greenhouse gas emissions and, if feasible, achieve targets set by CARB. Signal Hill is one of 27 member cities in the Gateway Cities COG; this subregional COG may

elect to prepare a sustainable communities strategy or alternative planning strategies to meet the requirements of SB 375.

SB 375 also creates a streamlining process for transit priority projects containing at least 50 percent residential use at a minimum density of 20 dwelling units per acre and located within ½ mile of a major transit stop or high-quality transit corridor. Future planning actions taken by the City of Signal Hill will take into consideration the need to minimize motor vehicle use in order to meet the targets of this legislation.

AB 1358

AB 1358 requires that, upon any substantive revision of the circulation element, the community's circulation plan be modified to plan for a balanced, multimodal circulation system. The circulation plan must be designed to meet the needs of all users of area roadways, defined to include motorists, bicyclists, pedestrians, children, persons with disabilities, seniors, movers of commercial goods, and users of public transportation.

A range of actions may be taken to encourage the use of multiple modes of transportation and comply with State requirements:

- The addition of sidewalks and curb cuts to encourage pedestrian circulation;
- The addition of bikeways to encourage bicycle use;
- Encouraging mixed-use development to allow residential uses in closer proximity to workplaces, retail, restaurants, and other daily activity areas; and
- Encouraging higher-density development in areas well-served by transit to reduce the need for motor vehicle use.

C. Relationship to Other Elements

The Circulation Element is closely related to other elements of the General Plan, particularly, the Land Use Element, as mandated by State Law. The Circulation Element must, at least, guide the support mechanisms for the development of land as specified in the Land Use Element and, conversely, may

dictate land use policies. For example, where the Land Use Element designates an area for high-density residential uses, the Circulation Element must guide the development of roadway, water, sewer, drainage and utility systems to accommodate the number of future residents anticipated in that area. Although not required, circulation plans should be coordinated with Caltrans master plans. From a regional planning perspective, the City of Long Beach Circulation Element should also be considered to achieve efficient traffic flow at the regional level.

The Circulation Element is also related to the Environmental Resources Element and Open Space/ Recreation Element by providing and preserving access to recreational amenities including hilltop viewing opportunities and to protect sensitive natural or habitat areas. The Circulation Element also serves to guide the design, location and construction of roadways and the infrastructure systems in ways that protect the environment and minimize potential pollution. For example, the urban runoff from paved surfaces is a primary source of pollution at California's beaches. Minimizing pavement area in the streets and incorporating water quality features to collect and clean storm water helps reduce pollution levels at nearby waterways and beaches.

Further, the Circulation Element is related to the Safety Element because it provides the minimum standards for the creation of safe and efficient evacuation routes that may be needed during emergency conditions. The Safety Element identifies the evacuation routes that may be necessary under various emergency conditions, such as fires, earthquakes or toxic waste spills, and serves as a guide to the development of roadways of adequate width and numbers of lanes to provide for emergency vehicle access and, if necessary, evacuation traffic.

Lastly, the Circulation Element is related to the Noise Element by way of the noise levels generated by the various components of the transportation system addressed herein. Maximizing the efficiency of the transportation system will result in a reduction of the noise that is generated by traffic of all types.

D. Element Organization

This document is organized into seven sections:

Section I, Introduction – a discussion of the purpose and scope, regulatory framework, and organization of this document.

Section II, Background – a discussion of the existing city of Signal Hill transportation network and the major entities involved in transportation planning for the area.

Section III, Traffic Analysis and Trends – a discussion of the major traffic generators in the community, the results of traffic studies and analyses providing current and project traffic data, and population and employment trends.

Section IV, Circulation Concept – a discussion of proposed circulation system development over the life of this Circulation Element, including an analysis of potential transit-oriented development opportunities.

Section V, Goals and Policies – goals and policies which will serve to realize the circulation concept.

Section VI, Implementation Program – a list of specific, practical action steps that, when implemented, achieve the goals and policies identified in Section V.

Section VII, Sustainability Matrix – a list of Circulation Element goals and policies that support statewide sustainability efforts, and reduction in climate change effects and greenhouse gas emissions.

II. BACKGROUND

A. Existing Transportation Systems

Signal Hill is located approximately two miles north of the Pacific Ocean in southern Los Angeles County. Signal Hill is completely surrounded by the city of Long Beach, and its transportation network is intertwined with that of its neighbor. Regional access to the city, depicted in Figure 1, *Regional Access,* is provided by freeways, especially Interstate 405 (I-405); arterial roadways; bus routes; a light rail line; two major seaports; and Long Beach Airport, which is located immediately northeast of Signal Hill.

The existing Signal Hill transportation system consists of roads of varying sizes and capacities; public transportation systems, including bus, light rail, and paratransit service; airports, and seaports. The network created by these systems serves two distinct and equally important functions: 1) to provide access to adjacent land uses, and 2) to facilitate the movement of persons and goods to, from, within, and through the city. The discussion below summarizes the existing state of Signal Hill's transportation system.

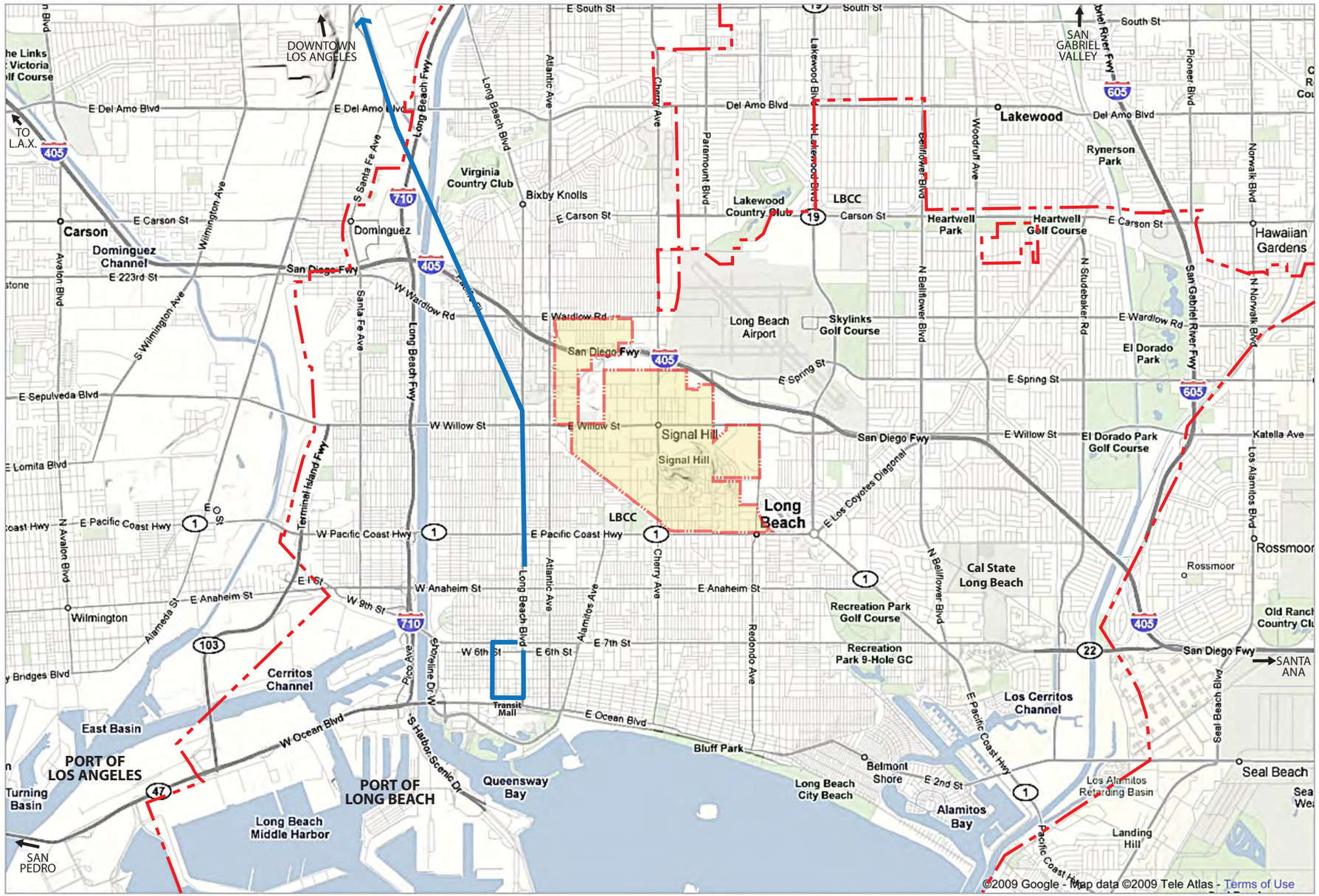
Roads and Highways

Signal Hill's roadway system is a critical component of the city's transportation infrastructure. According to the 2000 U.S. Census, almost 92 percent of Signal Hill residents used a motor vehicle to commute to work. Signal Hill roadways are used for both local and pass-through traffic between neighborhoods in Long Beach. Major north-south through routes include Cherry and Orange Avenues; major east-west through routes include Spring and Willow Streets and Pacific Coast Highway.

The city's roadway system consists of seven classes of roads or highways, as shown in Table 1, *Signal Hill Roadway Classifications.* The Interstate class of roadway is constructed and maintained by the California Department of Transportation (Caltrans), and is not an official City classification.

City of Signal Hill
GENERAL PLAN

Circulation Element
December 2009



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City of Signal Hill Boundary

City of Long Beach Boundary

Metro Blue Line

Figure 1
Regional Access

TABLE 1 **Signal Hill Roadway Classifications**

Type of Roadway	Typical Right-of-Way (ROW)
Interstate	Varies (Caltrans ownership).
Principal Arterial	100-110' ROW; four travel lanes with painted or raised median.
Minor Arterial	80' ROW; four travel lanes with painted median.
Collector Street	60'-70' ROW; two travel lanes and two parking lanes. May include a painted median.
Local Street	60' ROW; two travel lanes and two parking lanes. Reduced width permitted for some private streets.
Alleys	20' ROW; varies in some neighborhoods, with narrower widths permitted in some areas.

The design and operation of each street is determined by the importance placed on its functions. Streets that have a mobility and/or regional access function have more lanes, higher speed limits and fewer driveways. Where access to properties is required, streets will have fewer lanes, lower speeds, parking and more frequent driveways to serve abutting properties. The Circulation Element describes the City's plan for the development of this network of streets and highways and other key elements of the traffic circulation system. Figure 2, *Roadway Classifications*, depicts the hierarchy of the circulation system roadways based on the classifications above.

The City's official roadway classification system includes six designations (not including the Interstate classification). The names assigned to these designations have been updated from previous Circulation Elements, with the new nomenclature based on standards established by the Federal Highway Administration (FHWA) Functional Classification system, as shown in Table 2, *Updated Roadway Designations*. The modified names for roadway classifications improve the City's eligibility for federal highway funding, and simplify the process of obtaining such funds.

The Principal Arterial classification in this General Plan is equivalent to the "Other Principal Arterial" classification in the FHWA system. With the updated roadway classifications, the Secondary Modified Highway category has been eliminated. Roads within that category have been reassigned to the Minor Arterial or Collector Street categories, as appropriate.

The standards for the development of roadways are included in the following definitions:

TABLE 2 **Updated Roadway Classifications**

Previous Circulation Element Designation	New Circulation Element Designation
Major Highway	Principal Arterial
Secondary Highway	Minor Arterial
Secondary Modified Highway[1]	
Local Collector Street	Collector Street
Local Street	Local Street
Alley	Alley

[1] *All roadways previously classified as Secondary Modified Highways have been re-classified as Minor Arterials or Collector Streets, as appropriate.*

Interstate

The San Diego Freeway (Interstate 405 or I-405) crosses the northern portion of Signal Hill. The highway is owned and maintained by Caltrans. In the Signal Hill area, the I-405 currently consists of ten travel lanes, including eight mixed-flow and two carpool lanes. The freeway has an average daily traffic (ADT) of 289,000 vehicles.

The I-405 is one of the major access routes to Signal Hill but is also a major traffic generator that affects traffic flow within the city. The freeway interchanges with the Long Beach Freeway (I-710) approximately three miles northwest of Cherry Avenue, with the San Gabriel Freeway (I-605) approximately five miles southeast of Cherry Avenue, and with the Garden Grove Freeway (State Route 22 or SR-22) approximately 7.5 miles southeast of Cherry Avenue. Full freeway access is provided at Atlantic, Cherry, and Orange Avenues, and Lakewood Boulevard. Northbound I-405 access to the city for traffic oriented south on Cherry Avenue is provided at Temple Avenue. This circuitous access to Cherry Avenue increases traffic levels on Temple Avenue and Spring Street and is confusing to motorists.

The 2003 Short-Range Transportation Plan (SRTP), prepared by the Metropolitan Transportation Authority (Metro), recognizes the I-405 as a "congested corridor" in the Signal Hill area, and identifies the Cherry and Atlantic Avenue ramps as "hot spots" with recurring heavy traffic congestion. These designations make this freeway corridor a higher priority for future improvements; however, no major improvements are currently funded.

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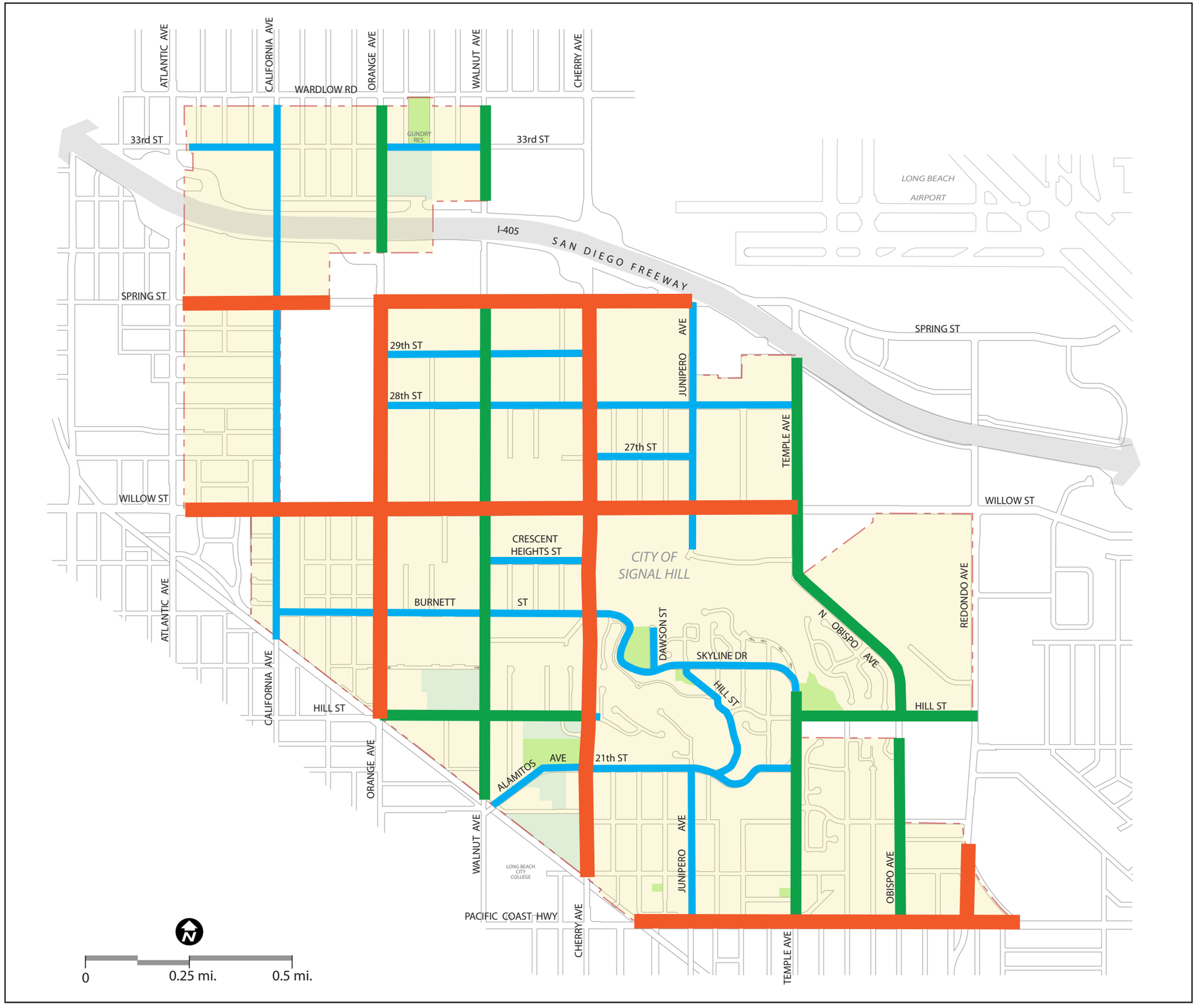


- Freeway
- Principal Arterial
- Minor Arterial
- Collector
- City of Signal Hill Boundary

Figure 2

Roadway Classifications

Principal Arterial

Principal Arterials (equivalent to the FHWA's "Other Principal Arterial" classification) are important city and intercommunity routes. Principal Arterials have a minimum 100- to 110-foot right-of-way width with four moving travel lanes and a painted or raised median. Four roadways have been identified as Principal Arterials: Cherry and Orange Avenues and Spring and Willow Streets. These roads serve traffic both within Signal Hill, and traffic passing through the city. Cherry and Orange Avenues connect the primarily residential, industrial, and airport-oriented land uses in Long Beach north of Signal Hill with residential, commercial, and recreational areas near the ocean. Spring and Willow Streets likewise connect Long Beach neighborhoods located east of Signal Hill with those to the west. Principal Arterials support the heaviest traffic volumes of all the roadway classifications, and can support a maximum ADT of 33,000 vehicles at a Level of Service (LOS) D.

Minor Arterial

Minor Arterials serve traffic traveling to local destinations, tying together the various parts of the city and connecting it to nearby areas. Minor Arterials have a minimum 80-foot right-of-way width with four travel lanes and a painted median. These roadways support a maximum ADT of 12,500 vehicles at an LOS D.

Collector Street

Collector Streets collect local traffic from residential neighborhoods and commercial and industrial areas and feed the traffic to Minor and Principal Arterials. Collector Streets have a 60- to 70-foot right-of-way with two travel lanes and two parking lanes, where parking is feasible. Collector Streets with 70-foot rights-of-way may also include a painted median. This painted median increases roadway safety and improves efficiency by limiting the number of left-turning cars that queue in travel lanes; for that reason, the 70-foot right-of-way is preferred. However, where physical or environmental factors limit roadway width, a 60-foot right-of-way is permissible. Collector Streets generally carry fewer vehicles than Minor Arterials.

Local Street

The Local Street classification includes all roadways and streets not otherwise classified. These are generally 60-foot wide rights-of-way with two travel lanes and two parking lanes where feasible, but there

are several variations in roadway width. These variations are found in both older neighborhoods and in newer areas, particularly those with private streets. Local Streets are designed to serve individual properties and provide access from residential neighborhoods to Collector Streets. Local Streets include private streets owned and maintained by homeowners associations. Local Streets carry the lowest traffic volumes of all streets in the city; most traffic on these streets is accessing local destinations, rather than passing through. Through the specific plan process, the City has approved a variety of private street configurations, including rights-of-way less than 60 feet wide.

Alleys

The Alley classification consists of roadways which provide secondary access to parcels. The standard width of Alleys is 20 feet; however, in older neighborhoods, narrower roadways are common, with many 10- to 15-foot cross-sections.

Official Plan Lines Map

The Plan Lines Map displays the City's desired future right-of-way width for all roadways and alleys. The map describes the extent of right-of-way dedications required by the City as a condition of the issuance of building permits. Dedication consistent with the Plan Lines Map is required when the valuation of a building permit for new buildings and for paving of parking lots exceeds a certain valuation, which is adjusted annually. The Plan Lines Map shows the City's desired street plan but the specific timing or phasing of future roadway development is a function of the marketplace and the City's Capital Improvement Program. The map is not a part of the General Plan, and is maintained under separate cover by the Community Development Department.

Traffic Study Areas

Also shown on the Plan Lines Map are certain Traffic Study Areas that are crosshatched and designated with the letter "A." Traffic Study Areas generally consist of vacant land where the City will consider alternative circulation plans concurrent with requests for development entitlements. Roadways currently shown on the Plan Lines Map within Traffic Study Areas are often unimproved dirt roads, or unbuilt "paper" streets that were planned in the early 20th century but never implemented. In some cases, the roadways currently shown include severe grade changes and very long cul-de-sacs, and do not take into account circulation efficiency, property access, view corridors, or other features. A traffic study

and circulation plan will be required for the first development within any Traffic Study Area, as determined by the City Engineer, to analyze the proposed circulation system within the entire Traffic Study Area and its integration with the surrounding network. Such studies are often prepared concurrently with specific plans or other development project proposals to address topography, the intensity of development, and specific requirements for circulation facilities based upon traffic generated from the proposed project.

Within a Traffic Study Area the City may vacate existing right-of-way to improve overall circulation and to make land available for development. The land vacated by the elimination of unimproved or "paper" streets is returned equally to the adjacent property owner(s).

Scenic Routes

The City of Signal Hill has designated a series of roadways at higher elevations as a scenic route, as shown in Figure 3, *Scenic Route.* This route use the existing street system and provides a link between the Crescent Heights Historic District and the Alamitos 1 Well, a State Historical Monument, located at the northeast corner of Temple and Hill Streets. The entire route provides views of urban Southern California, the ocean, and the downtown Long Beach skyline, as shown in Image 1.

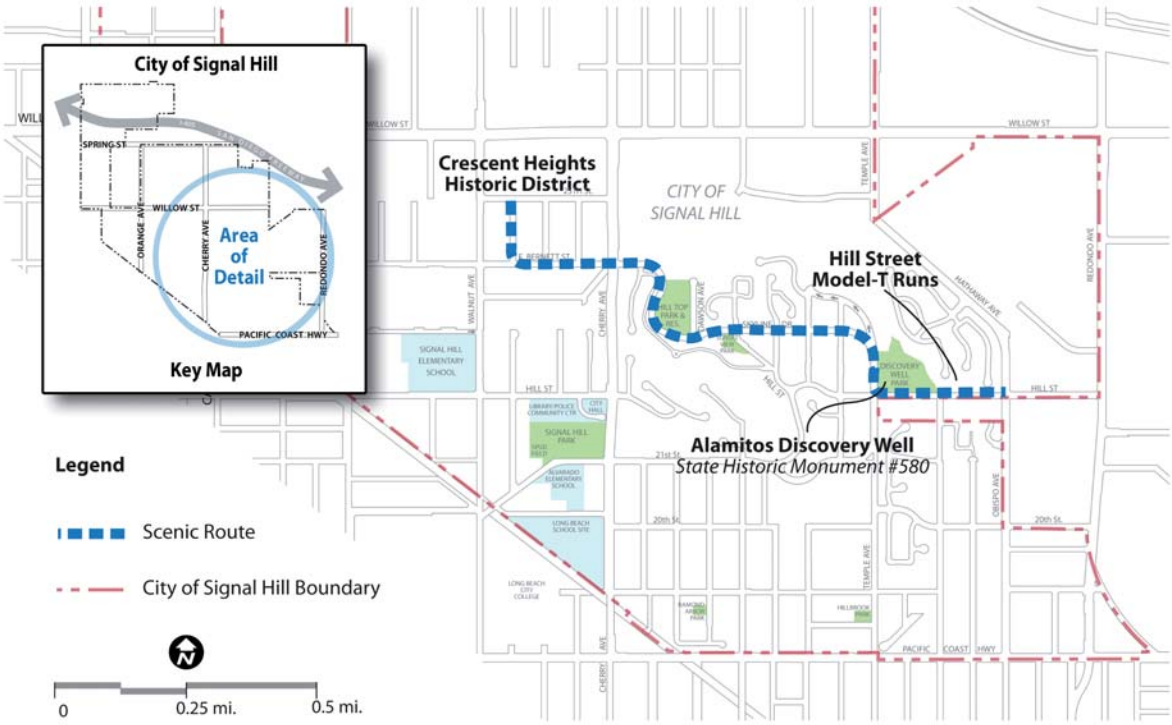
Truck Routes

Truck Routes are intended to keep large trucks (defined in the Signal Hill Municipal Code [SHMC] as trucks weighing three tons or more) off local residential streets. The Motor Vehicle Code provides a mechanism for local enforcement provided that truck routes are listed in the SHMC and signs are posted along the routes. Trucks must remain on the routes when driving through the city, but drivers may leave a designated truck route for deliveries or pick-ups. Local truck routes designated by Signal Hill are shown in Figure 4, *Truck Routes.*

Bus Service

Signal Hill is well-served by bus systems. Services provided by Long Beach Transit and Metro operate within or in the vicinity of the city; additional bus lines are accessible through the nearby Long Beach Transit Mall.

Long Beach Transit is the primary public transportation provider to Signal Hill. It is a municipal transit agency operated on behalf of the City of Long Beach by a nonprofit corporation, the Long Beach Public Transportation Company. In 2007, Long Beach Transit operated a total of 249 buses on 38 bus routes, providing over 26.6 million passenger trips. Service is provided from approximately 4:30 am to 1:30 am, seven days per week.



Map of Scenic Routes.

Figure 3

View from Skyline Drive along a Scenic Route.

Image 1

City of Signal Hill
GENERAL PLAN

Circulation Element
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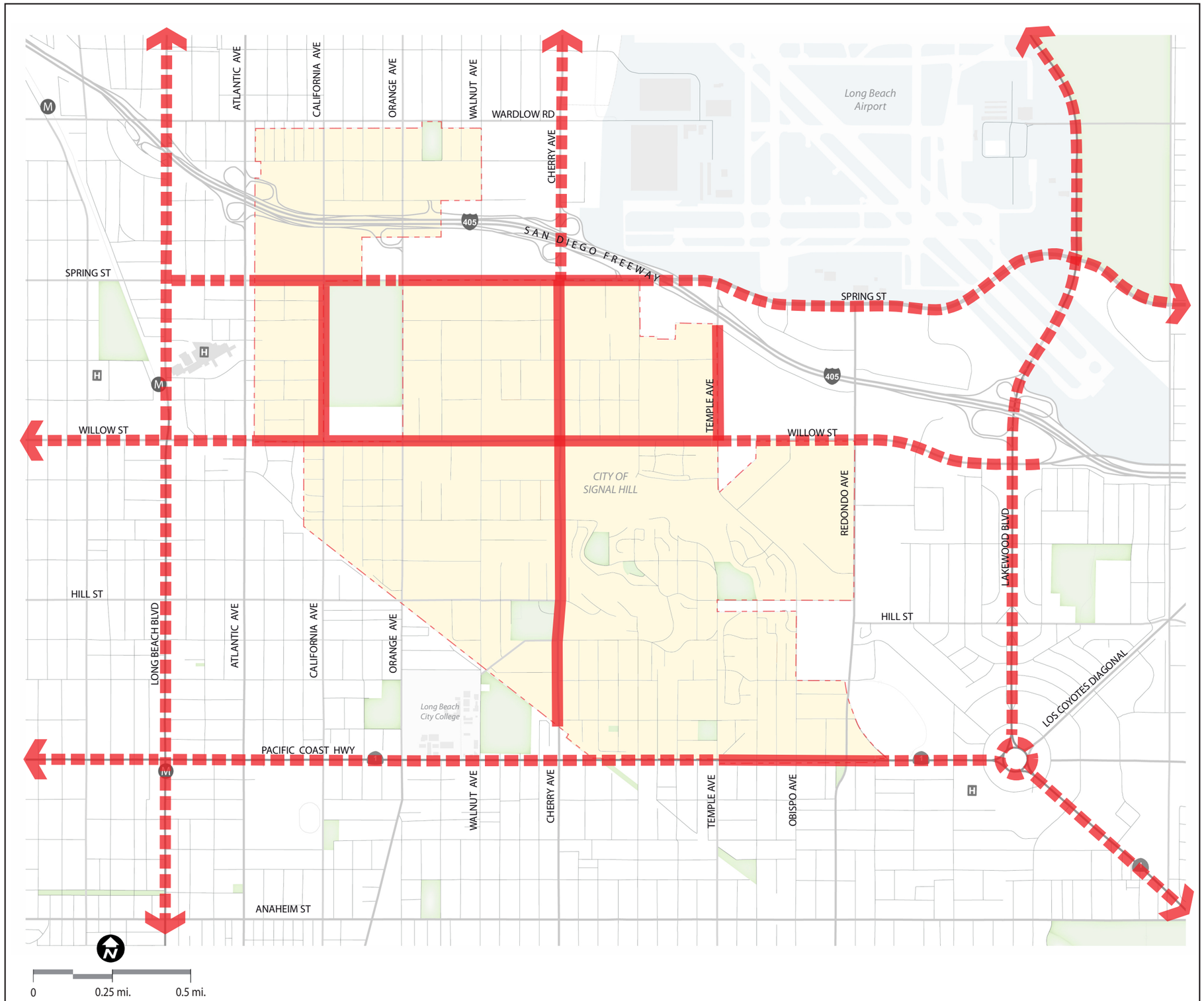

- Signal Hill Truck Route
- Long Beach Truck Route
- City of Signal Hill Boundary
- Park/Open Space
- Metro Station
- Hospital

Figure 4
Truck Routes

The 15 bus routes serving Signal Hill are listed in Table 3, *Long Beach Transit Bus Routes Serving Signal Hill*, and shown in Figure 5, *Bus and Light Rail Routes*. As shown in the figure, much of the city is within ½ mile (approximately 10 minutes walking time) of a bus stop, making public transit easily available to the majority of city residents.

TABLE 3 **Long Beach Transit Routes Serving Signal Hill**

Route Number	Routes Traveled Within and Adjacent to Signal Hill	Days of Operation
	NORTH-SOUTH ROUTES	
61, 62, 63, 101, 103	Atlantic Avenue	Routes 61, 62, 63: Seven days per week Routes 101, 103: Monday - Saturday
7	Orange Avenue	Seven days per week
21, 22, 23	Cherry Avenue	Seven days per week
131	Redondo Avenue *(from Pacific Coast Highway to Spring Street)* Cherry Avenue *(from Spring Street to Wardlow Road)*	Seven days per week
	EAST-WEST ROUTES	
171, 172, 173, 174	Pacific Coast Highway	Route 171: Monday – Friday Routes 172, 173, 174: Seven days per week
102	Willow Street	Monday – Friday
131	Spring Street *(from east city boundary to Cherry Avenue)* Wardlow Road *(from Cherry Avenue to west city boundary)*	Seven days per week

Source: Long Beach Transit, May 2009.

A list of bus stops serving the city is provided in Table 4, *Bus Stops Serving Signal Hill.* Most bus stops are disabled-accessible; however, stops serving Route 7 at the intersections of Orange Avenue and 28th and 29th Streets are not currently wheelchair-accessible. Improvements to make these stops compliant with Americans with Disabilities Act requirements will likely occur with future improvements to Orange Avenue.

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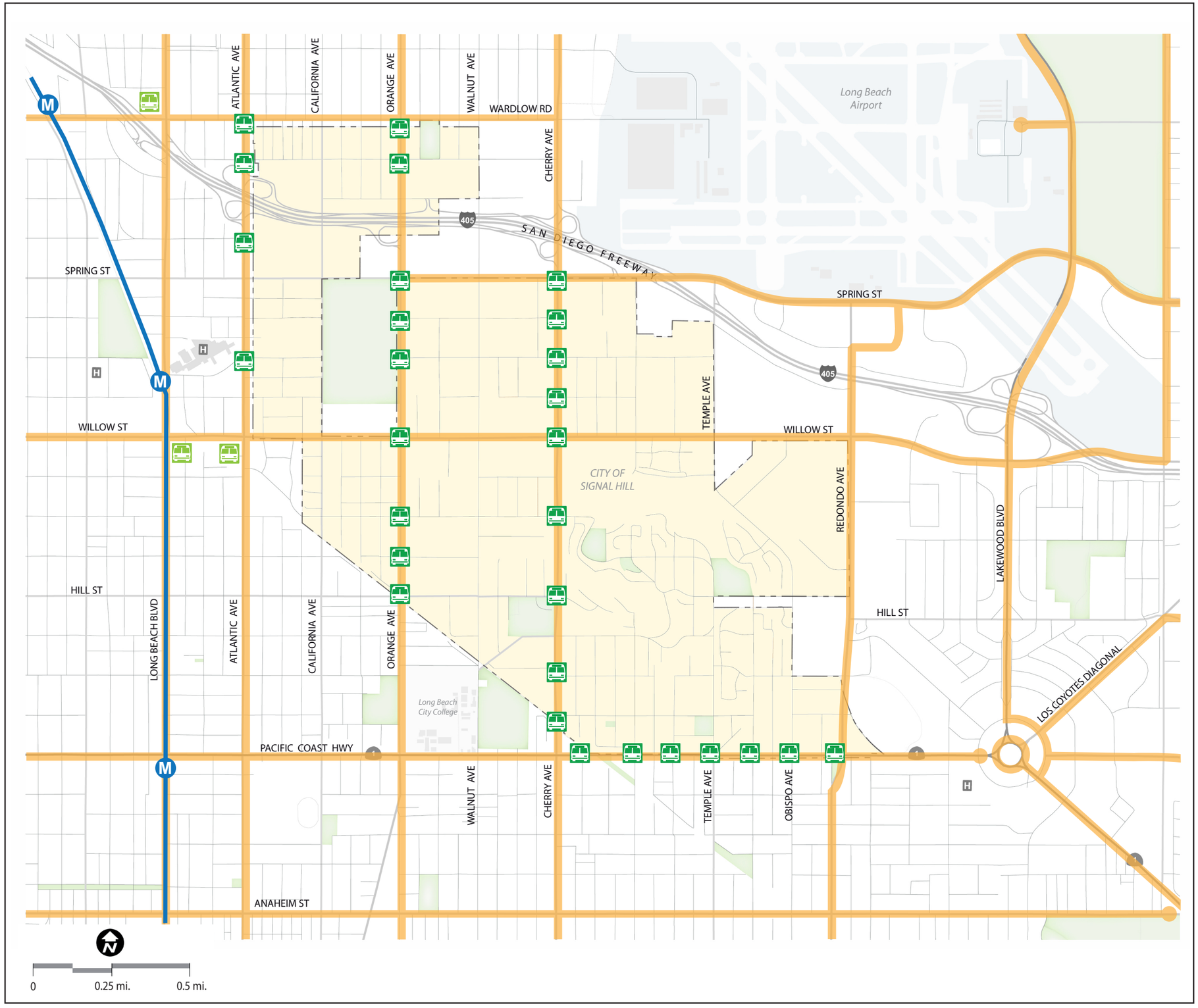


- Signal Hill Bus Stop
- Long Beach Bus Stop (providing access to Metro Blue Line)
- Bus Route
- Metro Blue Line Station
- City of Signal Hill Boundary
- Park / Open Space

Figure 5
Bus and Light Rail Routes

Long Beach Transit is currently in the process of upgrading its bus stops with satellite-controlled bus tracking technology known as "TranSmart." TranSmart-equipped stops provide real-time updates on routes and arrival times. Currently, only the stop at the southwest corner of Cherry Avenue and Willow Street has been upgraded; no schedule for improvements to the remaining stops within Signal Hill is currently available.

TABLE 4 **Bus Stops Serving Signal Hill**

Atlantic Avenue at	Orange Avenue at	Cherry Avenue at	PCH at
Patterson	Hill	Spring	Redondo
Columbia	23rd	29th	Obispo
31st	Burnett	28th	Orizaba
33rd	Willow	27th	Temple
Wardlow	28th	Willow	Molino
	29th	Burnett	Junipero
	Spring	Hill	Dawson
	32nd	20th	
	33rd	Railroad tracks	
	Wardlow		

Information on transit ridership in Signal Hill is available from Long Beach Transit. Data from 2006 show almost 1,600 riders per day board Long Beach Transit buses within the city of Signal Hill (see Table 5, *Long Beach Transit Ridership at Signal Hill Bus Stops*). Approximately 21 percent of riders use the system during morning hours, 40 percent use it midday, and 38 percent use the system during the evening hours. Riders leaving the city at any time are roughly equal in number to those arriving. Total ridership is approximately equal to 35 percent of the city's resident labor force, and 20 percent of persons working in Signal Hill.

TABLE 5 **Long Beach Transit Ridership at Signal Hill Bus Stops**

Time	Boardings	Total Boardings	% of Boardings	Alightings	Total Alightings	% of Alightings
Morning (12 midnight to 9 am)	338		21.5%	316		22.0%
Midday (9 am to 3 pm)	631	1574	40.1%	573	1436	39.9%
Evening (3 pm to 12 midnight)	605		38.4%	547		38.1%
TOTAL	1574		100.0%	1436		100.0%

Source: Long Beach Transit, 2006

In addition to local bus routes, several additional public transportation services are provided by Long Beach Transit along nearby corridors:

- ZAP express bus service,
- Passport circulator shuttle bus service, and
- AquaLink and AquaBus water taxis.

Beyond the city of Signal Hill, regional bus service is provided by Metro along the 7th Street corridor in Long Beach (one mile south of Signal Hill), and a number of agencies operate service from the Long Beach Transit Mall (two miles southwest of Signal Hill). Metro Express Route 577X operates along 7th Street from the Long Beach Transit Mall to the El Monte Transit Center. Additional services at the Long Beach Transit Mall are provided by Long Beach Transit, the Los Angeles Department of Transportation (Commuter Express), Metro, the Orange County Transportation Authority, and Torrance Transit. The agencies serving the Mall provide access to areas throughout the Los Angeles basin and Orange County. Both the 7th Street corridor and the Long Beach Transit Mall are accessible from Signal Hill via local bus service.

Light Rail

Light rail service is provided to Signal Hill by the Metro Blue Line, which is located along the western boundary of the city (Image 2). The 22-mile long Blue Line connects downtown Long Beach with downtown Los Angeles and operates approximately 20 hours a day, 365 days a year. The Blue Line is the second most-heavily-used light rail route in the U.S. (after Boston's Green Line), serving over 24.5

million riders per year. Transfer stations in Norwalk and downtown Los Angeles offer access to the 73-mile countywide rail service operated by Metro and the 512-mile regional rail system operated by the Southern California Regional Rail Authority (Metrolink).

Three Blue Line stations are in the immediate vicinity of Signal Hill. Information on the stations is provided in Table 6, *Metro Blue Line Stations Serving Signal Hill.*

TABLE 6 **Metro Blue Line Stations Serving Signal Hill**

Additional Services/Facilities Provided	Connecting Transit Lines
WARDLOW STATION • *3420 N. Pacific Place, Long Beach* • *0.6 mile from Signal Hill*	
84 park-and-ride spaces	Long Beach Transit 1, 131, 181, 182
WILLOW STATION • *2750 American Avenue, Long Beach* • *0.25 mile from Signal Hill*	
920 park-and-ride spaces 20 bike rack spaces, 10 bike lockers	Long Beach Transit 51, 52, 101, 102, 103 Metro Local 60, 360
PACIFIC COAST HIGHWAY STATION • *1798 N. Long Beach Blvd., Long Beach* • *1 mile from Signal Hill*	
None	Long Beach Transit 1, 51, 52, 171, 172, 173, 174 Metro Local 60, 360

Paratransit

Paratransit services are provided to Signal Hill residents with disabilities through Long Beach Transit's Dial-A-Lift service, which is currently contracted to operate through Taxi Systems, Inc. Service is demand-responsive and provides curb-to-curb pick-up and drop-off between the hours of 7:00 am and 10:30 pm Sunday through Thursday and 7:00 am and 11:30 pm on Friday and Saturday.

Bicycle Circulation

Prior to this Circulation Element update, there were no bikeways designated within the city of Signal Hill. However, via this updated Circulation Element, approximately 5.5 miles of bikeways along a number of routes are planned, as described in Table 7, *Planned Area Bikeways,* and shown in Figure 6, *Bicycle Master Plan*. These bikeways fall into three classes, as defined by Caltrans; an explanation of the three classes is provided in Table 8, *Bikeway Classifications*.

Bikeways provide and encourage an alternative to the use of automobiles. Bikeways are intended to link living, working, shopping, educational, and recreational locations. The bikeways currently proposed serve a number of purposes:

- East-west routes provide access to destinations such as light rail stations, schools, CSULB, Long Beach City College, Long Beach Memorial Medical Center, and shopping centers along Atlantic and Long Beach Boulevards. Recently-widened Spring Street offers adequate space for an on-street bike lane along much of its right-of-way in the city (Image 3).

- North-south routes provide access to destinations such as schools, commercial centers along Pacific Coast Highway, regional bus lines operating on 7th Street, Downtown Long Beach, beaches, civic and arts facilities, and hospitals.

- The route along Temple Street/Skyline Drive/Burnett Street provides panoramic skyline views and is heavily utilized by pedestrians.

- The route along the former Pacific Electric Railway right-of-way provides an off-street bikeway that shortens the distance for travel in a northwest-southeast direction, providing direct access from the Willow Street Blue Line Station to Long Beach City College. This bikeway is located in the city of Long Beach, along its border with Signal Hill.

New bikeways should be considered by the City, particularly when they would connect with existing or proposed bikeways in the city of Long Beach. Traffic volumes and characteristics along potential routes must be considered, along with traffic safety and grade issues.

TABLE 7 **Planned Area Bikeways**

Location	Length	Start/End Points in Signal Hill	Bikeway Class
Orange Avenue	1.4 miles	Southern city boundary to northern city boundary.	Class III (Bike Route)
Spring Street	0.25 mile	Western city boundary to Orange Avenue.	Class II (Bike Lane)
Temple Street/Skyline Drive/Burnett Street	1.7 miles	Southern city boundary to Orange Avenue.	Class III (Bike Route)
Pacific Coast Highway	0.9 mile	Along southern city boundary.	Class III (Bike Route)
Former Pacific Electric Railway Right-of-Way	1.2 miles	Along southwestern city boundary.	Class I (Bike Path)

Willow Station, serving the Metro Blue Line, is ¼ mile west of Signal Hill.

Image 2

This recently-widened portion of Spring Street has adequate right-of-way for an on-street bike lane.

Image 3

TABLE 8 **Bikeway Classifications**

Class	Type	Description
Class I	Bike Path	Provides a completely separated right-of-way for the exclusive use of bicycles and pedestrians with crossflow by motorists minimized.
Class II	Bike Lane	Provides a striped lane for one-way bike travel on a street or highway.
Class III	Bike Route	Provides for shared use with pedestrian or motor vehicle traffic.

Source: Caltrans Highway Design Manual, Chapter 1000

Pedestrian Circulation

Pedestrian circulation facilities within Signal Hill consist of sidewalks and trails. Sidewalks are located along most of the city's streets. The city's trail system, as depicted in Figure 7, *Trails Plan*, and Image 4, serves mostly recreational purposes. The system is located near the top of Signal Hill and connects several area parks and monuments, including Hilltop Park, Sunset View Park, and Discovery Well Park. The approximately one-mile-long Panaroma/Skyline Loop Trail circles the top of Signal Hill; numerous feeder trails connect to this main route. Trails provide scenic views of the surrounding community, and are heavily utilized. Features along these trails include seating, pedestrian-scaled lighting, telescopes in view areas, and interpretive panels. Many trails in the area are publically-accessible but located within private, gated communities.

Aviation

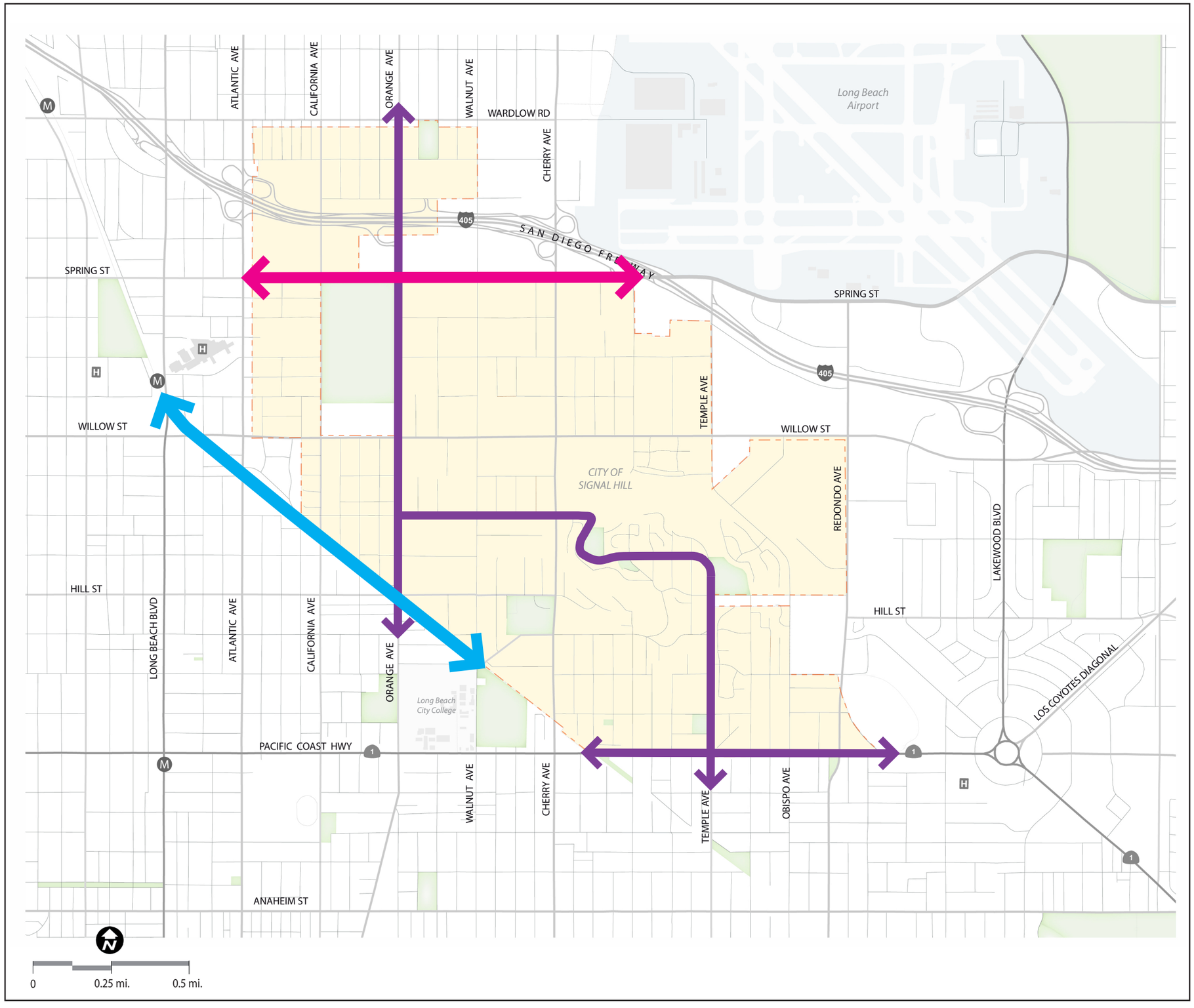
Long Beach Airport is located beyond Signal Hill's northeastern boundary. The airport covers 1,166 acres and has five runways, the longest over 10,000 feet in length. It is used by commercial carriers, general aviation aircraft, and air cargo handlers. Commercial flights are offered to 15 cities within the U.S. The airport served over 2.9 million passengers and handled over 46,000 tons of air cargo in 2008.

Los Angeles International Airport is the largest and most heavily-trafficked airport in Southern California. Located 17 miles northwest of Signal Hill, the airport served over 59.8 million passengers and handled 1.8 million tons of air cargo in 2008. It provides access to hundreds of domestic and international destinations.

Other civilian airports serving Signal Hill are listed in Table 9, *Airports Serving Signal Hill*.

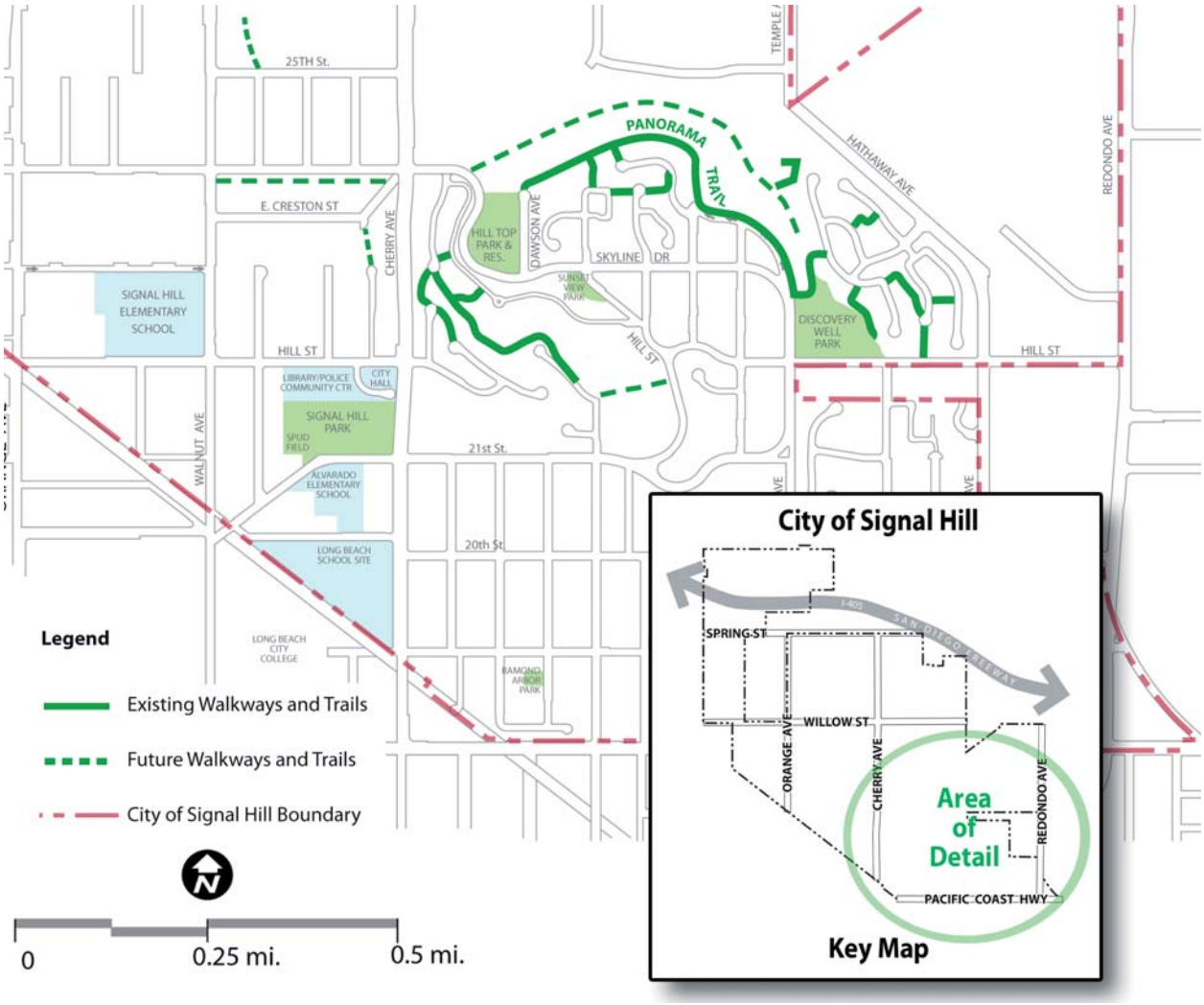
City of Signal Hill
GENERAL PLAN

Circulation Element
December 2009



- Class I Bike Path
- Class II Bike Lane
- Class III Bike Route
- City of Signal Hill Boundary

Figure 6
Bicycle Master Plan



Map of Signal Hill trails.

Figure 7

Pedestrian trails provide panoramic views from the top of Signal Hill.

Image 4

TABLE 9 **Airports Serving Signal Hill**

Airport	Distance from Signal Hill	Services Provided
Long Beach Airport (Daugherty Field)	0.5 mile northeast	Commercial aviation General aviation Air cargo
Compton/Woodley Airport	7 miles northwest	General aviation
Torrance Airport (Zamperini Field)	9 miles west	General aviation
Fullerton Municipal Airport	11 miles northeast	General aviation
Hawthorne Municipal Airport (Jack Northrop Field)	12 miles northwest	General aviation
Los Angeles International Airport	17 miles northwest	Commercial aviation General aviation Air cargo
John Wayne Airport	20 miles southeast	Commercial aviation General aviation Air cargo

Ports

Signal Hill is located approximately 3.5 miles northeast of the Port of Long Beach and 6 miles northeast of the Port of Los Angeles. Together, these two ports compose one of the largest port complexes in the world. Approximately 15.8 million twenty-foot equivalent units (TEUs) passed through the ports in 2006, accounting for 24 percent of all U.S. container exports and 40 percent of U.S. container imports. Most of these containers are transported to and from the ports via the I-710 freeway or Alameda Corridor rail line. According to the 2008 RTP Goods Movement Report, approximately 1,875 port trucks per day use the I-405 between the I-710 and I-605. This equates to 12 percent of trucks that pass along the I-405 through the city of Signal Hill, and less than 1 percent of all vehicular traffic on the freeway.

In addition to the cargo services provided by the ports, passenger cruise lines also operate out of the area. Approximately 1.2 million passengers boarded 265 cruises operating out of the Port of Los Angeles in 2008, and regular boat service is offered from Downtown Long Beach, the Queen Mary, and the Port of Los Angeles to Catalina Island.

B. Other Circulation Systems

Water

The city's primary water supply comes from two groundwater wells located in north Long Beach. Additional water may be purchased from the Metropolitan Water District of Southern California. The City has drilled a third groundwater well centrally located within Signal Hill and is in the process of developing plans and specifications for the necessary pumping and treatment facilities.

The City has three storage reservoirs and pumping facilities, providing water for domestic purposes and fire fighting. The Gundry reservoir and pumping facility was constructed in 1929 and has a storage capacity of 4.7 million gallons. This facility is located in the northern part of the city. Two hilltop reservoirs and pumping facilities were constructed in the late 1990s, having a combined storage capacity of 2.6 million gallons.

The Water Division operates as an enterprise fund, independent from the City's general fund. The water fund includes a capital improvement program to replace aging or obsolete infrastructure. In addition, the City's development impact fee ordinance requires that developers pay a proportionate share of new water facilities made necessary by development projects.

Reclaimed Water

The City of Long Beach maintains an extensive reclaimed water infrastructure. Reclaimed water is currently used to irrigate Reservoir Park, located on Wardlow Road along the city's northern boundary, and Burroughs Elementary School, also in the North End Neighborhood. The City of Signal Hill is interested in expanding the reclaimed water system to serve other parks and the hilltop area open spaces that are owned and maintained by the several homeowners associations, but the lack of pipelines limits opportunities for such expansion in the short term. Additionally, reclaimed water supplies are limited in the City of Long Beach. Other potential sources of reclaimed water include the Los Angeles County Sanitation District and the Water Replenishment District of Southern California; however, neither of these agencies currently maintains reclaimed water pipelines within Signal Hill.

Sewerage

Sewerage service in Signal Hill is provided by Los Angeles County Sanitation District No. 29. The City of Signal Hill previously owned and maintained the area's local and collector sewers; these have now been transferred to County Sanitation District control (a process completed in 2006). There is currently no sewer development impact fee for new development. However, property owners/developers pay for the extension of sewers to serve new development projects and pay connection fees, which are intended to cover additional costs to accommodate any increased demand created by the project.

In isolated areas, existing dwellings and businesses use septic tanks because sewer mains are not available. In 2002, the City extended sewer service to the Crescent Heights Historic District. With this sewer extension, only a small number of structures remain on septic systems. Conditions of approval for new development require that they provide sewer service.

Gas

The City of Long Beach provides natural gas service to Signal Hill and owns and maintains a network of gas mains and lines throughout the city. Property owners/developers pay for the extension of the gas system to serve new development projects and pay connection fees, which are intended to cover additional costs to accommodate any increased demand created by the project.

Electricity

The city receives electrical service from Southern California Edison. One unique feature of the existing system is the extensive system of high-voltage transmission lines that traverse the city, primarily along major roadways. These transmission lines are unsightly but expensive to place underground. The City encourages that overhead utilities be placed underground concurrently with the development of vacant land; however, various physical and economic constraints can make undergrounding impractical. The decision to underground utilities must be made on a case-by-case basis, with the aesthetic and safety goals of undergrounding balanced with project feasibility.

Telephone and Cable

Verizon provides landline telephone service to Signal Hill. The overhead and underground telephone system is well developed and property owners/developers pay all costs associated with extending services to new development projects. Cable television and internet service is provided by Charter Communications, which is in the process of upgrading the existing cable network citywide. Property owners/developers pay the costs associated with extending the cable system to new development.

Storm Drains

Signal Hill storm water runoff flows into the storm drain system owned and operated by the Los Angeles County Flood Control District. The district maintains and improves the storm drain system and property owners/developers construct new storm drain facilities in accordance with the adopted storm drain master plan. There is currently no storm drain developer impact fee. A growing area of concern both to local and regional governments is the discharge of trash and debris and a variety of water pollutants into the storm drain system that eventually flows into and pollutes the Pacific Ocean.

The city's stormwater drains into the Pacific Ocean. Accordingly, in order to protect ocean water quality, all grading and development activities must include stormwater pollution protection as a primary consideration. Effective stormwater management will include protection measures during construction and as part of the development. The city may benefit from two major retention basins located in the vicinity of Signal Hill, Hamilton Bowl located at Walnut and 20th Street and the California Bowl located near the intersection of Orange Avenue and Spring Street. These facilities are viewed as major resources in devising solutions to storm water run-off issues including contamination and water borne trash.

According to federal flood hazard maps, the former Pacific Electric Railway right-of-way along the southerly boundary of the city may be subject to inundation during a major flood event. Localized flooding may occur in low-lying areas where there are no existing flood control facilities.

Petroleum Pipelines

The city of Signal Hill is traversed by a network of privately-owned pipelines that are used to transport petroleum products, including crude petroleum and gas produced in the local Long Beach/Signal Hill Oil Field and refined products such as gasoline and jet fuel manufactured in refineries located in the South Bay. Two major gasoline storage terminals remain in the city: the Shell Terminal on Redondo Avenue south of Willow Street and the Hathaway Terminal located on Obispo Avenue south of Willow Street. These facilities store and distribute gasoline products by truck to retail gas stations. Each pipeline operator is required to maintain a city franchise and to maintain pipeline safety in compliance with State pipeline safety and fire codes.

There are currently far more inactive oil wells than active wells within the city. Active wells require pipelines for water, gas, and petroleum. Pipelines, including some in place since the 1920s, are removed and replaced concurrent with new development. Relocated pipelines are typically located below open spaces or rights-of-way.

C. Transportation Planning Context

A number of local and regional agencies are involved in transportation planning, the provision of transportation services, and the maintenance of transportation infrastructure. The following are key entities that impact planning in the Signal Hill area:

Southern California Association of Governments (SCAG)

SCAG is the State-designated Regional Transportation Planning Agency (RTPA) and federally-designated MPO for most of southern California. SCAG is mandated by both the State and federal governments to prepare plans for transportation and growth management; this includes preparation of the RTP, a long-range transportation planning document. A comprehensive update of the RTP occurs every four years. The current document was adopted in May 2008 and presents a vision for the region through 2035.

The RTP is implemented by two regularly-updated documents: the Regional Transportation Improvement Plan (RTIP), also prepared by SCAG, and the Congestion Management Program (CMP),

prepared for Los Angeles County by Metro. The RTIP provides a detailed listing of all projects planned for implementation during the document's planning period. The document is updated every two years and has a six-year planning horizon. The CMP has a goal of relieving traffic congestion and maintaining high levels of service on roadways.

The RTP, RTIP, and CMP are vital planning documents for Signal Hill; having a project listed in these documents is a critical step in getting State and federal funding for its implementation. Additionally, because Signal Hill is in an ozone and carbon monoxide non-attainment zone, federal funds may not be programmed for transportation projects that significantly increase single-occupant vehicle capacity unless that project is addressed in the CMP.

Compass Blueprint

The Compass Blueprint is a growth vision for Southern California developed by SCAG. The vision pursued by the Compass Blueprint seeks to enhance four areas that impact our regional quality of life: mobility, livability, prosperity, and sustainability.

The implementation method for this vision is known as the "2% Strategy." The 2% Strategy focuses on changes to land uses and transportation within 2 percent of the SCAG region—the "2% Strategy Opportunity Areas." These opportunity areas are selected based on population and employment densities; public transportation availability; access to airports, seaports, and industrial areas; and availability of land for increased residential development. Based on these criteria, most of the city of Signal Hill (with the exception of the northernmost areas) falls within a 2% Strategy Opportunity Area, indicating that the community is an ideal location for continued urban development and enhancements to transportation systems.

Metropolitan Transportation Authority (Metro)

Metro is the transportation planning, coordinating, designing, building, and operating agency serving Los Angeles County. Metro operates bus and rail systems and funds local street, highway, bikeway, and pedestrian facilities improvements. Additionally, Metro funds 16 municipal bus services, including Long Beach Transit, which serves Signal Hill.

Beyond the day-to-day operations of various transportation systems, Metro prepares the region's Long-Range Transportation Plan (LRTP), which provides a 20-year vision for the county's transportation system; prepares the SRTP, which implements the strategies of the LRTP and has a six-year time horizon; supports the Call for Projects program, which is a competitive process that distributes discretionary capital transportation funds to regionally significant projects; and maintains the CMP, as discussed above.

South Coast Air Quality Management District (AQMD)

AQMD is the air pollution control agency serving Signal Hill. The AQMD develops plans and regulations to achieve and maintain healthy air quality. To control emissions from cars, trucks, buses, and other mobile sources, AQMD has established a comprehensive program to meet the emissions standards established by CARB and the U.S. Environmental Protection Agency (EPA). AQMD co-produces, along with SCAG, an Air Quality Management Plan (AQMP) for the region. There is a close link between transportation planning and air quality; the policies produced in the AQMP, Compass Blueprint, RTP, and other documents seek to reduce the number of VMTs in order to reduce air pollution. These policies include, among others: focusing growth in centers and major transportation corridors, creating significant areas of mixed-use development, and targeting growth around transit stations.

Caltrans

Caltrans coordinates several statewide transportation programs that impact Signal Hill. Among these are the State Transportation Improvement Program, which funds projects included in the RTIP; the Congestion Mitigation and Air Quality Program, which funds projects that help achieve compliance with federal ozone and carbon monoxide requirements; and the Traffic Congestion Relief Program, which funds projects that reduce congestion, improve goods movement, and provide intermodal connectivity.

Caltrans owns and maintains the I-405 freeway. Any future improvements to the freeway would be planned and constructed by Caltrans. The 2008 LRTP developed by Metro does not include substantial changes to the I-405 in the Signal Hill area; however, modifications to ramps at Cherry Avenue may occur.

City of Long Beach

Because Signal Hill is surrounded by Long Beach, decisions made by the City of Long Beach relative to circulation improvements have a significant impact on Signal Hill. Cooperation in developing circulation plans is key to maintaining an effective transportation system for both cities.

III. TRAFFIC TRENDS AND ANALYSIS

A. Major Traffic Generators

A relatively small number of major traffic generators have a significant impact on the local transportation system. In addition to traffic generators located within the city of Signal Hill, numerous facilities in Long Beach, which surrounds Signal Hill and has well-established traffic patterns, influence the local circulation system.

Major traffic generators in Signal Hill include the following:

Major Employers

Signal Hill has a large and growing retail and commercial services employment base. Table 10, *Major Employers in Signal Hill*, displays the city's top ten employers. These major employers are also among the city's major traffic generators.

TABLE 10 **Major Employers in Signal Hill**

Rank	Employer	Employees
1	Office Depot #5125	551
2	Costco	292
3	Oil Well Service Co.	225
4	Target	202
5	Home Depot #1062	165
6	Crane Valves North America	143
7	Home Depot #648	137
8	Long Beach BMW	123
9	Platt Security	120
10	Macro Pro, Inc.	106

Source: City of Signal Hill Finance Department, February 2009.

Airports and Seaports

Long Beach Airport and the Ports of Los Angeles and Long Beach are significant traffic generators. Long Beach Airport is increasingly popular as an alternative to the more crowded Los Angeles International Airport. While increased usage of Long Beach Airport is limited by the City of Long Beach's Noise Compatibility Ordinance, the 2008 RTP Airport and Aviation Ground Access Report forecasts that airport passenger traffic will increase from the current 2.8 million passengers per year to 4.2 million passengers per year in 2035. Additionally, air cargo traffic is forecast to increase from 50,000 tons per year to 139,000 tons per year in 2035.

The Ports of Los Angeles and Long Beach are located southwest of Signal Hill and provide full passenger and freight services to domestic and international destinations. Port activity is growing; the 2008 RTP Goods Movement Report forecasts that combined traffic at the two ports will increase from 15.8 million TEUs to 42.5 million TEUs by 2030.

Port access is currently provided by both truck and rail, and improvements to regional rail systems could potentially reduce the impact on area roadways of increased port traffic. SCAG projects that the use of rail to ship containers from the ports will triple by 2030. Nonetheless, because of the dramatic increase in projected port traffic, the number of trucks required to service the facilities is expected to increase significantly. This may have a negative impact on local traffic circulation in Signal Hill. Moreover, large truck traffic is increasing in the Signal Hill area because local businesses have functional linkages with the Los Angeles and Long Beach harbor areas, although the presence and enforcement of truck route restrictions should limit impacts on residential districts.

Medical Facilities

Medical facilities contribute to traffic in the Signal Hill area. Long Beach Memorial Medical Center is located just west of the city, across Atlantic Avenue; Pacific Hospital of Long Beach is located 0.5 mile west of the city; Community Hospital of Long Beach is located approximately 0.25 mile east of the city; and St. Mary Medical Center is located 1.4 miles southwest of the city. Long Beach Memorial Medical Center is a particularly large traffic generator, impacting traffic flow on Atlantic Avenue and Spring and Willow Streets. In planning for future improvements to the roadway network, it is important to be

cognizant of the needs of emergency services for adequate access points and roadway capacity to serve hospitals.

Educational Facilities

Several large educational facilities are located in the vicinity of Signal Hill. These include Long Beach City College's Pacific Coast Campus, located adjacent to Signal Hill's southern boundary, which serves approximately 6,000 students; Long Beach Polytechnic High School, located southeast of Pacific Coast Highway and Atlantic Avenue, which serves 5,000 students; and a number of other, smaller schools.

California State University, Long Beach is located approximately two miles southeast of Signal Hill. Pacific Coast Highway is one of the major east-west routes providing access to the campus, and it is likely that a significant number of the college's 38,000 students pass through the city regularly.

Downtown Long Beach

Downtown Long Beach is one of the major commercial centers of Southern California, with approximately 4.2 million square feet of office space and 2,770 hotel rooms. In an effort to strengthen the local economy, Long Beach has concentrated on intensifying business, industrial, and residential development in its downtown and Port of Long Beach areas. Thousands of new homes and hundreds of thousands of square feet of new commercial development have increased the intensity of development in Downtown Long Beach in recent years. Circulation improvements serving downtown activity centers can potentially stimulate and expand the production of services, thus strengthening the downtown economy. As the Long Beach economy grows, there will be indirect effects on Signal Hill.

B. Population and Employment Trends

Demographic and development trends are important to the formulation of circulation and infrastructure policies. Table 11, *Population Trends,* displays population growth rates in the city since 1940, as well as projected growth rates through 2035. SCAG projects that population growth will slow significantly in the city in the coming decades; Signal Hill is expected to reach a build-out population of 13,235 by 2035.

TABLE 11 **Population Trends**

Year	Population	Percentage Growth
1940	3,184	-
1950	4,040	26.9%
1960	4,627	14.5%
1970	5,582	20.6%
1980	5,734	2.7%
1990	8,371	46.0%
2000	9,247	10.5%
2010 (projected)	*11,405*	*23.3%*
2020 (projected)	*12,155*	*6.6%*
2030 (projected)	*12,877*	*5.9%*
2035 (projected)	*13,235*	*2.8%*

Sources: Historical population data from U.S. Census Bureau and California Department of Finance.
Projected population data from SCAG, 2008 RTP Growth Forecast.

SCAG forecasts continued employment growth for the city of Signal Hill, as shown in Table 12, *Employment Forecast.*

TABLE 12 **Employment Forecast**

Year	Employment	Percentage Growth
2010	12,085	1.7%
2015	12,294	1.1%
2020	12,428	1.3%
2025	12,584	1.3%
2030	12,752	1.3%
2035	12,912	1.3%

Source: SCAG, 2008 RTP Growth Forecast.

C. Traffic Analysis

Level of Service (LOS)

LOS is a qualitative measure of the effect of traffic flow factors, such as speed, delays, travel time, interruptions, freedom to maneuver, driver comfort and convenience, and indirectly, safety and operating costs. Roadway and traffic conditions, ranging from ideal to forced flow, have been divided into six LOS for qualitative evaluation, as shown in Table 13, *Level of Service Definitions* and Figure 8, *Level of Service Diagram*. The 2004 CMP establishes LOS E as the lowest acceptable LOS in Los Angeles County. However, this does not preclude the use of different standards for local policies or studies. Both the Cities of Signal Hill and Long Beach consider LOS D to be the lowest acceptable LOS.

TABLE 13 **Level of Service Definitions**

Service Level	Type of Flow	Delay	Definition
A	Free flow	Little or no delay	There are no loaded traffic signal cycles, and fewer are even closed to loaded at this service level. No approach phase is fully utilized by traffic and no vehicle waits longer than one red indication.
B	Stable flow	Short traffic delay	This level represents stable operation where an occasional approach phase is fully utilized and a substantial number are approaching full use. Many drivers begin to feel restricted within platoons of vehicles.
C	Stable flow	Average traffic delay	At this level, stable operation continues. Loading is still intermittent but more frequent than at Level B. Occasionally, drivers may have to wait through more than one red signal indication and backups may develop behind turning vehicles. Most drivers feel somewhat restricted, but not objectionably so.
D	Approaching unstable flow	Long traffic delays	This level encompasses a zone of increasing restriction-approaching instability at the intersection. Delays to approaching vehicles may be substantial during short peaks within the peak hour, but enough cycles with lower demand occur to permit periodic clearance of queues, thus preventing excessive backups. Drivers frequently have to wait through more than one red signal. This level is the lower limit of acceptable operation to most drivers.
E	Unstable flow	Very long traffic delays	This represents near capacity and capacity operation. At capacity (ICU=1.0) it represents the most vehicles that the particular intersection can accommodate. However, full utilization of every signal cycle is seldom attained no matter how great the demand. At this level, all drivers wait through more than one red signal, and frequently through several.
F	Forced flow	Excessive delay	Jammed conditions. Traffic backed up from a downstream location on one of the streets restricts or prevents movement of traffic through the intersection under consideration.

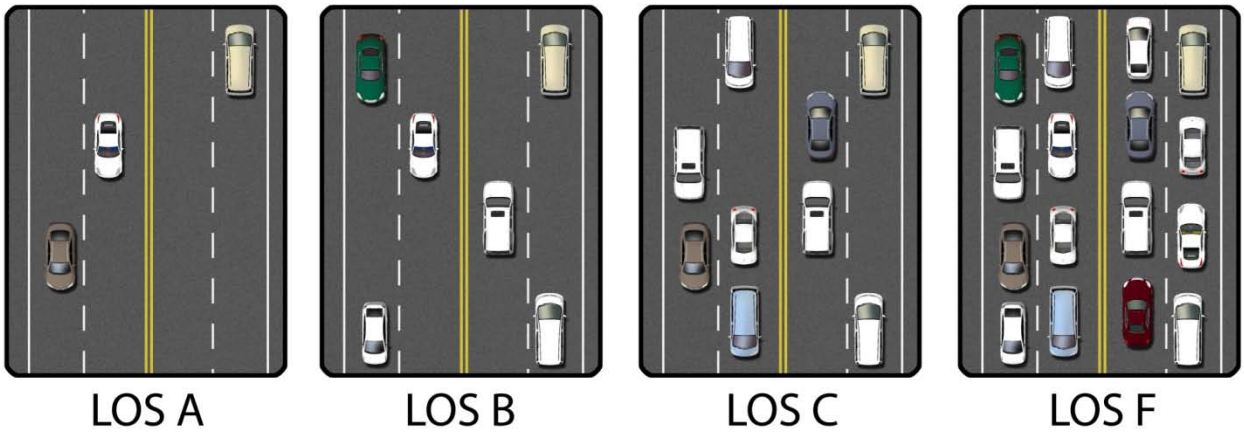


Figure 8 Level of Service Diagram for Roadway Links

Intersection Capacity Utilization (ICU)

ICU is a measurement of how well an intersection operates based on available roadway capacity. Existing traffic volume is compared to the capacity in order to assess the operational performance of an intersection. The capacity is a defined measurement of the maximum traffic passing through an intersection. Traffic volumes are counted for each traffic movement (left turn, through, and right turn), which is compared to the intersection's capacity. The results of this comparison define how well the intersection is performing.

The ICU is used for planning applications such as roadway design and traffic impact studies. It tells how much reserve capacity is available or how much an intersection or roadway segment is overcapacity.

Existing Traffic Conditions

Table 13, *Existing Traffic Conditions,* shows traffic conditions in Signal Hill by major roadway segments. It illustrates existing average daily traffic (ADT) as well as the ADT required to reach a LOS D for that segment. The table further reflects the equivalent volume-to-capacity (V/C) ratio for LOS D, which is the minimum acceptable roadway operational Level of Service (LOS) as defined by the City. The County's Congestion Management Program permits an LOS E. ICU analysis and levels of service for major intersections in the city is shown in Table 15, *Summary of Existing Intersection Capacity Utilization and Levels of Service*.

TABLE 13 **Existing Traffic Conditions**

Roadway Segment	ADT	LOS D	
		Capacity	V/C Ratio
Spring Street at:			
W/O California Avenue	14,325	33,000	0.43
E/O California Avenue	13,140	33,000	0.40
E/O Orange Avenue	15,029	33,000	0.46
E/O Walnut Avenue	14,906	33,000	0.45
E/O Cherry Avenue	26,892	33,000	0.81
Willow Street at:			
W/O California Avenue	31,544	33,000	0.96
E/O California Avenue	30,481	33,000	0.92
E/O Orange Avenue	31,895	33,000	0.97
E/O Walnut Avenue	35,952	33,000	1.09
E/O Cherry Avenue	36,706	33,000	1.11
E/O Junipero Avenue	38,119	33,000	1.16
E/O Temple Avenue	32,136	33,000	0.97
Hill Street at:			
E/O Orange Avenue	4,101	12,500	0.33
E/O Walnut Avenue	4,291	12,500	0.34
E/O Temple Avenue	5,265	12,500	0.42
E/O Obispo Avenue	7,016	12,500	0.56
California Avenue at:			
N/O 33rd Street	2,440	12,500	0.20
S/O 33rd Street	2,774	12,500	0.22
N/O Spring Street	3,157	12,500	0.25
S/O Spring Street	4,112	12,500	0.33
N/O Willow Street	5,737	12,500	0.46
S/O Willow Street	5,819	12,500	0.47
Orange Avenue at:			
N/O 33rd Street	15,088	33,000	0.46
S/O 33rd Street	15,840	33,000	0.48
N/O Spring Street		33,000	0.00
S/O Spring Street	15,061	33,000	0.46

TABLE 13 **Existing Traffic Conditions**

Roadway Segment	ADT	LOS D	
		Capacity	V/C Ratio
N/O Willow Street	14,185	33,000	0.43
S/O Willow Street	14,837	33,000	0.45
N/O Hill Street	15,690	33,000	0.48
Walnut Avenue at:			
N/O 33rd Street	4,739	12,500	0.38
S/O Spring Street	7,253	12,500	0.58
N/O Willow Street	6,720	12,500	0.54
S/O Willow Street	6,476	12,500	0.52
N/O Hill Street	8,076	12,500	0.65
S/O Hill Street	5,845	12,500	0.47
Cherry Avenue at:			
S/O Spring Street	39,444	33,000	1.20
N/O Willow Street	40,945	33,000	1.24
S/O Willow Street	34,661	33,000	1.05
N/O Hill Street	31,195	33,000	0.95
S/O Hill Street	29,735	33,000	0.90
Junipero Avenue at:			
S/O Spring Street	5,153	12,500	0.41
N/O Willow Street	3,061	12,500	0.24
N/O Pacific Coast Highway	2,118	12,500	0.17

As shown in Table 14, most roadway segments are operating at an efficient level of service when LOS C is designated as a standard of efficiency. Those roadway segments operating at LOS D or lower (E or F) are Pacific Coast Highway and Willow Street between Walnut Avenue and Temple Avenue and Cherry Avenue between Spring Street and Crescent Heights Street.

Frequently, intersection levels of service play a greater role in determining street performance than do the capacities of roadway sections, since intersections usually create the greatest delays and are thus more objectionable to drivers.

TABLE 15 **Summary of Existing Intersection Capacity Utilization and Levels of Service**

Intersection	AM Peak Hour		PM Peak Hour	
	ICU	LOS	ICU	LOS
California Avenue at:				
Spring Street	0.57	A	0.73	C
Willow Street	0.59	A	0.66	B
Cherry Avenue at:				
Pacific Coast Highway	0.70	C	0.84	D
Spring Street	0.66	B	0.81	D
Willow Street	0.69	B	0.85	D
28th Street	0.57	A	0.62	B
Orange Avenue at:				
32nd Street	0.68	B	0.81	D
Spring Street	0.63	B	0.66	B
Willow Street	0.80	D	0.90	E
Burnett St	0.40	A	0.31	A
Hill Street	0.61	B	0.53	A
Willow Street at:				
Temple Avenue	0.59	A	0.63	B
Spring Street at:				
Walnut Avenue	0.60	B	0.67	B
Walnut Avenue at:				
Willow Street	0.61	B	0.65	B
Hill Street	0.43	A	0.62	B

Source: Data from 2007 traffic study by Newport Traffic Services.

As shown in Table 15, only one intersection was operating at an LOS of E or F: the intersection of Orange Avenue and Willow Street during p.m. peak hours.

D. Projected Future Traffic Conditions

Table 16, *Projected Traffic Conditions*, provides projected traffic levels in 2030 based on an estimated 1.5 percent annual ADT growth rate. The table also provides projected V/C ratios in 2030, assuming there is no increase in roadway traffic capacity.

The projections reveal that several roadway segments are likely to operate at or below an LOS D by 2030, including portions of Cherry Avenue and Willow Street.

TABLE 16 **Projected Traffic Conditions**

Roadway Segment	ADT	LOS D	
		Capacity	V/C Ratio
Spring Street at:			
W/O California Avenue	14,325	33,000	0.43
E/O California Avenue	13,140	33,000	0.40
E/O Orange Avenue	15,029	33,000	0.46
E/O Walnut Avenue	14,906	33,000	0.45
E/O Cherry Avenue	26,892	33,000	0.81
Willow Street at:			
W/O California Avenue	31,544	33,000	0.96
E/O California Avenue	30,481	33,000	0.92
E/O Orange Avenue	31,895	33,000	0.97
E/O Walnut Avenue	35,952	33,000	1.09
E/O Cherry Avenue	36,706	33,000	1.11
E/O Junipero Avenue	38,119	33,000	1.16
E/O Temple Avenue	32,136	33,000	0.97
Hill Street at:			
E/O Orange Avenue	4,101	12,500	0.33
E/O Walnut Avenue	4,291	12,500	0.34
E/O Temple Avenue	5,265	12,500	0.42
E/O Obispo Avenue	7,016	12,500	0.56
California Avenue at:			
N/O 33rd Street	2,440	12,500	0.20
S/O 33rd Street	2,774	12,500	0.22
N/O Spring Street	3,157	12,500	0.25
S/O Spring Street	4,112	12,500	0.33
N/O Willow Street	5,737	12,500	0.46
S/O Willow Street	5,819	12,500	0.47
Orange Avenue at:			
N/O 33rd Street	15,088	33,000	0.46

TABLE 16 **Projected Traffic Conditions**

Roadway Segment	ADT	LOS D	
		Capacity	V/C Ratio
S/O 33rd Street	15,840	33,000	0.48
S/O Spring Street	15,061	33,000	0.46
N/O Willow Street	14,185	33,000	0.43
S/O Willow Street	14,837	33,000	0.45
N/O Hill Street	15,690	33,000	0.48
Walnut Avenue at:			
N/O 33rd Street	4,739	12,500	0.38
S/O Spring Street	7,253	12,500	0.58
N/O Willow Street	6,720	12,500	0.54
S/O Willow Street	6,476	12,500	0.52
N/O Hill Street	8,076	12,500	0.65
S/O Hill Street	5,845	12,500	0.47
Cherry Avenue at:			
S/O Spring Street	39,444	33,000	1.20
N/O Willow Street	40,945	33,000	1.24
S/O Willow Street	34,661	33,000	1.05
N/O Hill Street	31,195	33,000	0.95
S/O Hill Street	29,735	33,000	0.90
Junipero Avenue at:			
S/O Spring Street	5,153	12,500	0.41
N/O Willow Street	3,061	12,500	0.24
N/O Pacific Coast Highway	2,118	12,500	0.17

IV. CIRCULATION CONCEPT

With the completion of hillside development east of Cherry Avenue, Signal Hill's roadway system is now largely complete. Future improvements may occur within those districts marked as "Traffic Study Areas" on the City's Plan Lines Map. These improvements fall into three major categories:

1. Improving streets by widening roadways where necessary and enhancing aesthetics, and potentially realigning the roadway system in areas that are redeveloped;

2. Expanding and enhancing the city's sidewalk, trail, and bikeway systems; and

3. Enhancing the relationship between land uses and circulation, encouraging the development of residential and commercial land uses and transportation facilities which complement each other and minimize vehicle miles traveled.

The following discussion examines concepts and strategies that may be employed by Signal Hill to achieve the desired circulation system enhancement.

A. Transportation Planning Strategies

Enhancing the Transportation Planning-Land Use Planning Connection

Transportation and land use planning are closely correlated. All land uses must be accessible, and the modes of transportation that are most efficient and most conveniently located are most effective. Signal Hill is served by an extensive public transportation system, including 15 Long Beach Transit bus routes and, just west of the city's boundaries, the heavily-utilized Metro Blue Line light rail service. These services provide an excellent opportunity for Signal Hill to pursue unique development types that are most effective and successful when transit systems are in place.

Figure 9, *Transit-Oriented Development Opportunities,* presents a graphic depiction of areas within the city that may be most appropriate for denser, mixed-use development.

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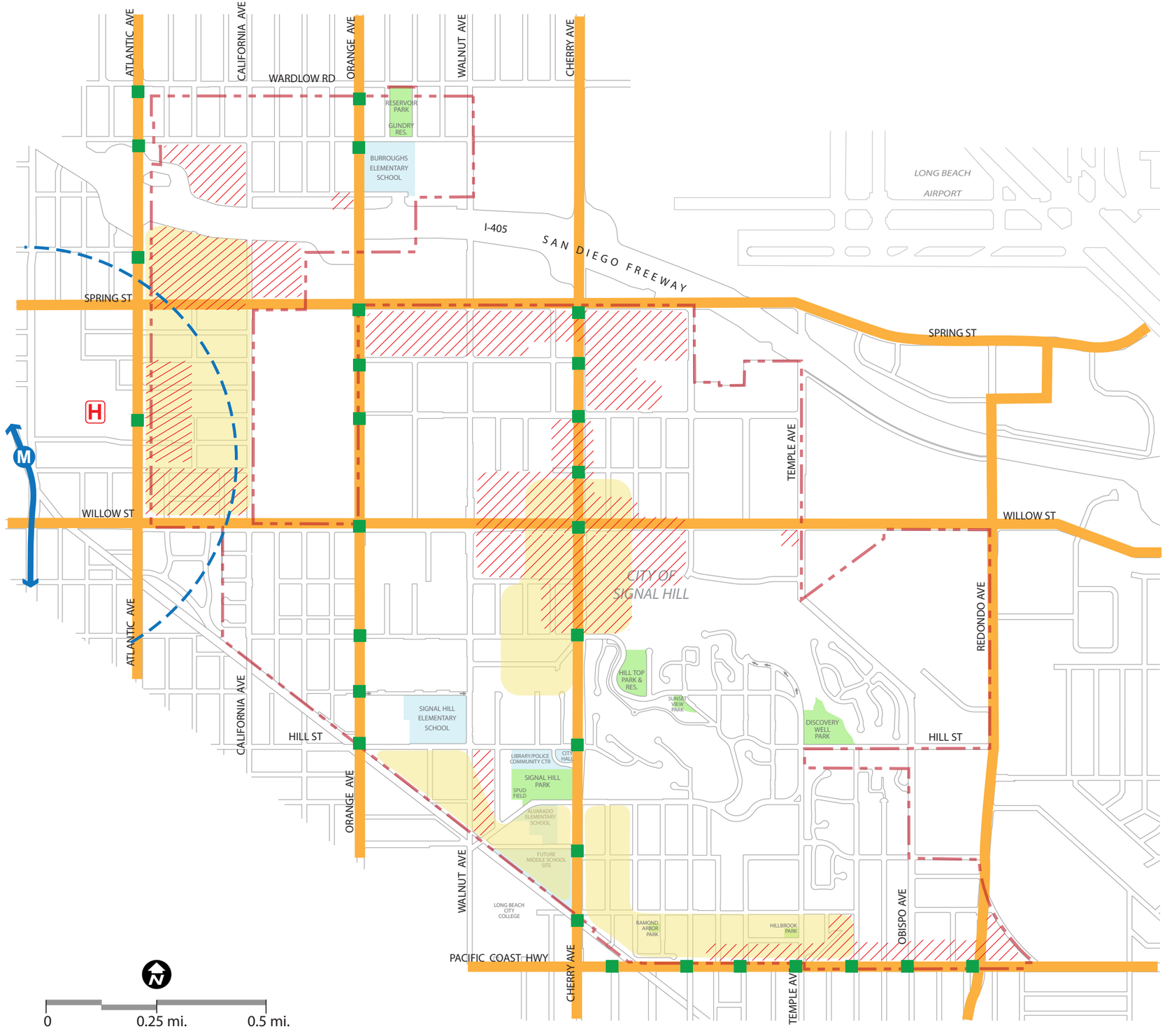


- Areas with Transit-Oriented Development Potential
- Retail/Office Land Uses
- Hospital
- Bus Route
- Bus Stop
- Metro Blue Line Station
- Blue Line Station - ½ mi Radius
- City of Signal Hill Boundary

Figure 9

Transit-Oriented Development Potential

The following factors were considered in the development of the Transit-Oriented Development (TOD) Opportunities plan:

- Population density, with higher-density areas being more conducive to mixed-use projects and TODs;
- Transit corridors, with areas closest to bus routes and the Blue Line being most appropriate for TOD; and
- Major traffic generators, including large employers, Long Beach Memorial Medical Center, and Long Beach City College, with locations closest to traffic generators being most appropriate for TOD.

Transportation Demand Management

Transportation Demand Management (TDM) refers to various strategies, policies, and programs that serve to reduce VMTs. The implementation of TDM programs is a critical component of regional transportation and air quality plans. A significant amount of funding from federal sources is contingent on the application of these programs to bring the region into compliance with federal air quality standards.

This Circulation Element contains a range of TDM programs that will ultimately redistribute some vehicular traffic to other modes of transportation. These programs, which are further discussed below, include:

- Enhancing bicycle circulation systems,
- Expanding and improving the system of sidewalks and trails,
- Maintaining and enhancing the local public transportation system,
- Encouraging the development of TODs, and
- Encouraging major traffic generators to implement ridesharing programs and offer telecommuting options and alternative work schedules.

B. Roadways Plan

The city of Signal Hill is largely built-out, and no significant changes are proposed to the city's roadway system. Future improvements will primarily consist of capacity, safety, and aesthetic improvements to existing rights-of-way. Additionally, a renewed emphasis will be placed on creating "complete streets"—streets that serve the needs of all users, including pedestrians, bicyclists, the disabled, and others.

Intelligent Transportation Systems (ITS)

ITS make use of advanced detection, communications, and computing technology to improve the safety and efficiency of the transportation network. Arterial roadway ITS may perform functions such as traffic signal synchronization; the granting of buses and emergency vehicles priority at traffic signals; freeway ramp metering; and changes to signal timing in response to traffic volumes, direction of traffic, and special events or incidents. An ITS implementation often involves connecting traffic signals to a central traffic management center, which can remotely control signal operations. Closed-circuit television cameras are also used to provide real-time images of key intersections. ITS are often a cost-effective and relatively rapid method of improving a transportation system's efficiency.

A major ITS implementation is planned in Signal Hill and adjacent areas as part of the Douglas Park project, located north of Long Beach Airport. The plan, known as the Douglas Park Adaptive Traffic Control System (ATCS), will implement a traffic signal control system that can adapt to changing traffic conditions. ATCS will reduce delay and improve travel times for motorists by facilitating multi-jurisdictional cooperation, providing for data exchange among agencies, monitoring traffic signal operations and congestion, and enabling a multi-jurisdictional response to special events or incidents. Participating agencies include the Cities of Signal Hill, Long Beach, Lakewood, Bellflower, and Cerritos; the County of Los Angeles; and Caltrans. ATCS will create eight “Adaptive Corridors” where traffic signals will be linked and coordinated. Four of these corridors—on Atlantic and Cherry Avenues, and Spring and Willow Streets—pass through or are adjacent to the city of Signal Hill, as shown in Figure 10, *ATCS Signal Hill Corridors*. The four corridors impacting Signal Hill include 11 signalized intersections, as detailed in Table 16, *ATCS Signal Hill Intersections*. Additionally, one closed-circuit television camera will be installed. The 11 signals located on the ATCS corridors in and near Signal Hill will be connected to and, under an agreement with the City of Signal Hill, managed by the City of Long Beach’s Traffic Management Center.

TABLE 16 **ATCS Signal Hill Intersections**

ATCS Corridor	Intersection
Cherry Avenue	Cherry/21st/Alamitos
	Cherry/28th
	Cherry/Crescent Heights-Town Center East
	Cherry/Hill-Civic Center
	Cherry/Skyline (Burnett)
Cherry Avenue/Willow Street	Cherry/Willow
Spring Street	Spring/Olive
Willow Street	Willow/Dawson
	Willow/Junipero
	Willow/Town Center
	Willow/Walnut

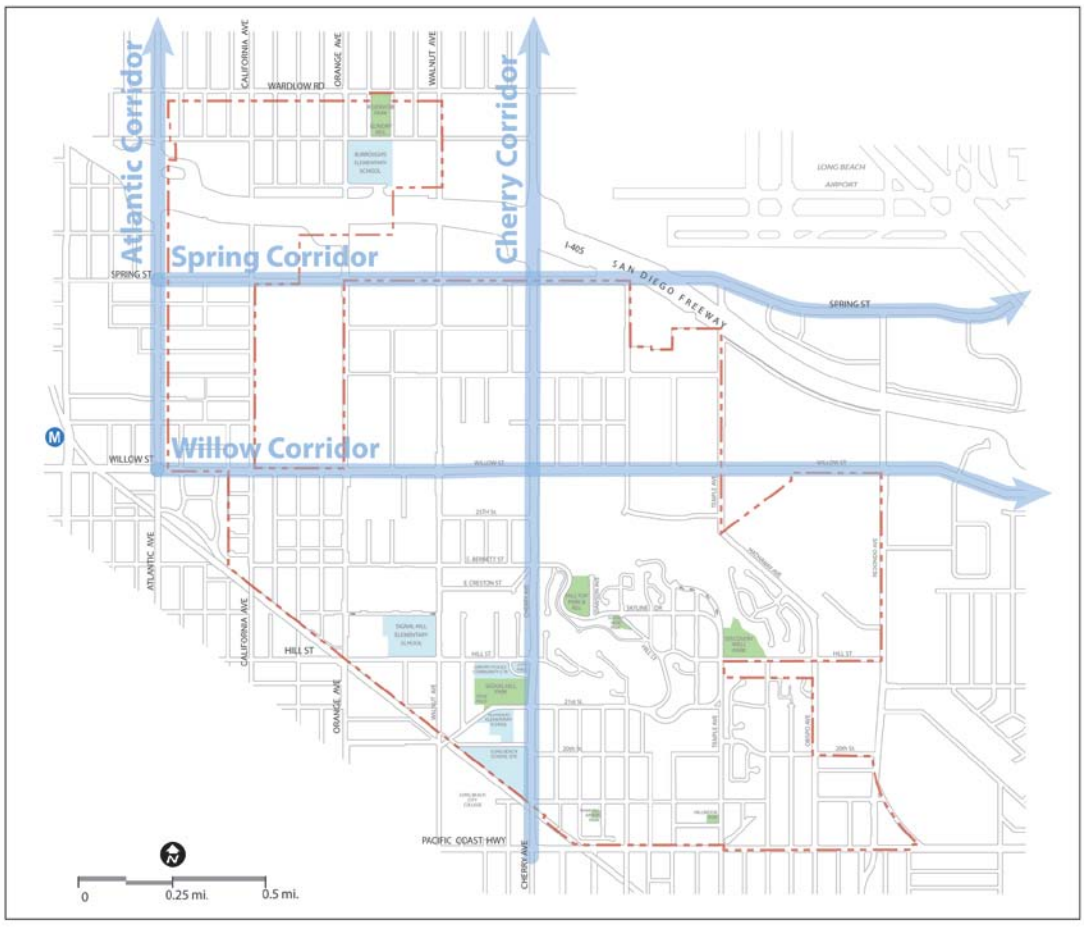


Figure 10 ATCS Signal Hill Corridors

The planned ATCS is an expandable system. Should the initial phase be successful in improving traffic flow, Signal Hill will support the continued implementation of ITS in area roadways, and will coordinate such systems with Caltrans and the City of Long Beach to ensure that regional traffic flows efficiently.

Traffic Calming

Traffic calming measures seek to enhance roadway safety and raise the area's quality of life by reducing unsafe driver behavior, particularly driving at excessive speeds. Traffic calming reduces the negative impact of motor vehicles, and improves conditions for non-motorized users of the street.

The City of Signal Hill takes a three-step approach to traffic calming:

1. Education – Public education is the most cost-effective tool to in changing the attitudes and behaviors of drivers. Educational efforts encourage residents and visitors to be aware of speed limits and abide by them. Often, however, the impacts of educational efforts are short-term, and they are less likely to be effective when a substantial amount of traffic is from outside the community.

2. Enforcement – Where education is not adequately reducing unsafe driver behavior, enhanced enforcement is next step. This is effective only when enforcement is consistent over a period of time, which can be a costly initiative for the City.

3. Engineering – Where education and enforcement prove ineffective, the next step is to implement structural modifications that compel drivers to change their behaviors. Various engineering solutions to calm traffic are discussed below.

The City of Signal Hill supports the use of traffic calming in areas where motor vehicle use has resulted in unsafe conditions and a reduced quality of life. In general, the use of traffic calming measures should:

- Be consistent with sound traffic engineering principles,
- Encourage and facilitate public involvement,

- Minimize diverted traffic to other local or residential collector streets,
- Maintain or improve the aesthetics of the streetscape,
- Provide for emergency vehicle access without undue impacts to safety and response times,
- Minimize adverse impacts to maintenance activities, and
- Encourage bicycle and pedestrian travel.

The traffic calming techniques described below involve physical modifications to roadways. Before committing to these relatively expensive improvements, the City should consider using traffic control devices and programs and minor design modifications to achieve its goals for the street. These basic measures may include:

- High-visibility crosswalks,
- Curb marking and roadway striping modifications,
- Turn restrictions,
- Increased police enforcement,
- Photo enforcement (e.g., red light cameras),
- Truck restrictions,
- Higher-visibility signage, and
- Safety education programs,

Where the above methods prove inadequate, the City may apply traffic-calming techniques such as those described in Table 17, *Traffic Calming Techniques*. Selected methods are depicted in Figure 11, *Traffic Calming Examples*. Other methods, not discussed in this General Plan, may also be used, at the discretion of the City Engineer.

The use of traffic calming must be carefully considered before implementation, and should only be used where existing driver behavior (or anticipated driver behavior in redeveloping areas) diminishes the quality of life for or would be harmful to community members. Distinctions must be made between residential districts and commercial districts in the city.

TABLE 17 **Traffic Calming Techniques**

Technique	Description
Speed Hump **Raised Crosswalk** **Raised Intersection**	Areas of pavement raised several inches in height over a distance of at least 12 feet. Various factors affect the speed at which a vehicle can safely cross a hump. Appropriate roadway markings and signage should be included. Speed humps reduce speeds and discourage cut-through traffic, but also slow emergency response vehicles. Raised crosswalks are generally wider than speed humps and are placed in locations with pedestrian traffic. Raised intersections are flat-topped speed humps that cover an entire intersection. Bollards are often used to define the pedestrian zone surrounding.
Speed Cushion	Speed cushions typically consist of recycled rubber or asphalt raised several inches above the surrounding pavement. Spaces between the cushions permit large emergency vehicles to straddle the device; smaller vehicles cross over the cushion as they would a speed hump, reducing traffic speeds.
Traffic Circle	Traffic circles are raised circular medians that direct traffic counterclockwise through an intersection. "Yield" signs may be used on approaches; in some cases, "Stop" signs may be appropriate. Traffic circles reduce vehicular speeds.
Roundabout	Roundabouts are raised circular medians, which, like traffic circles, direct traffic counterclockwise through an intersection. Roundabouts have the added advantages of higher capacity, allowing their use on streets of all sizes, and reducing delay at many intersections. Additionally, they slow traffic and reduce accident frequency and severity. Roundabouts are controlled by "Yield" signs at entries.
Mid-block Choker **Bulbout** **Chicane**	Mid-block Chokers are raised islands in the parking area of streets. They narrow roadways and reduce vehicular speeds and cut-through traffic. Bulbouts are similar to Chokers, but are placed at roadway intersections. They narrow the intersection, causing vehicular speeds to be reduced and allowing pedestrians to cross a shorter distance. Chicanes are Chokers which are placed in an alternating pattern on the roadway, creating a curvilinear alignment. These shorten sight lines for drivers and require additional maneuvering, causing a reduction in vehicular speeds.
Median	Medians are raised islands in the center of the roadway that separate traffic directions. They reduce vehicular speeds and shorten pedestrian crossings.
Diverter **Full or Partial Closure** **Extended Median**	Diverters, closures, and extended medians reduce volume on roadways by compelling drivers to take alternate routes. Diverters are raised areas placed diagonally across an intersection, restricting through movements. Partial closures limit vehicular access to streets and full closures completely block vehicular access by physically blocking roadways, while offering through routes for pedestrians and bicyclists. Extended medians are raised islands in the center of the roadway which extend through intersections, preventing left turn movements.

Chicane

Traffic Circle

Median

Speed Hump

Roundabout

Bulbout

Figure 11
Traffic Calming Examples

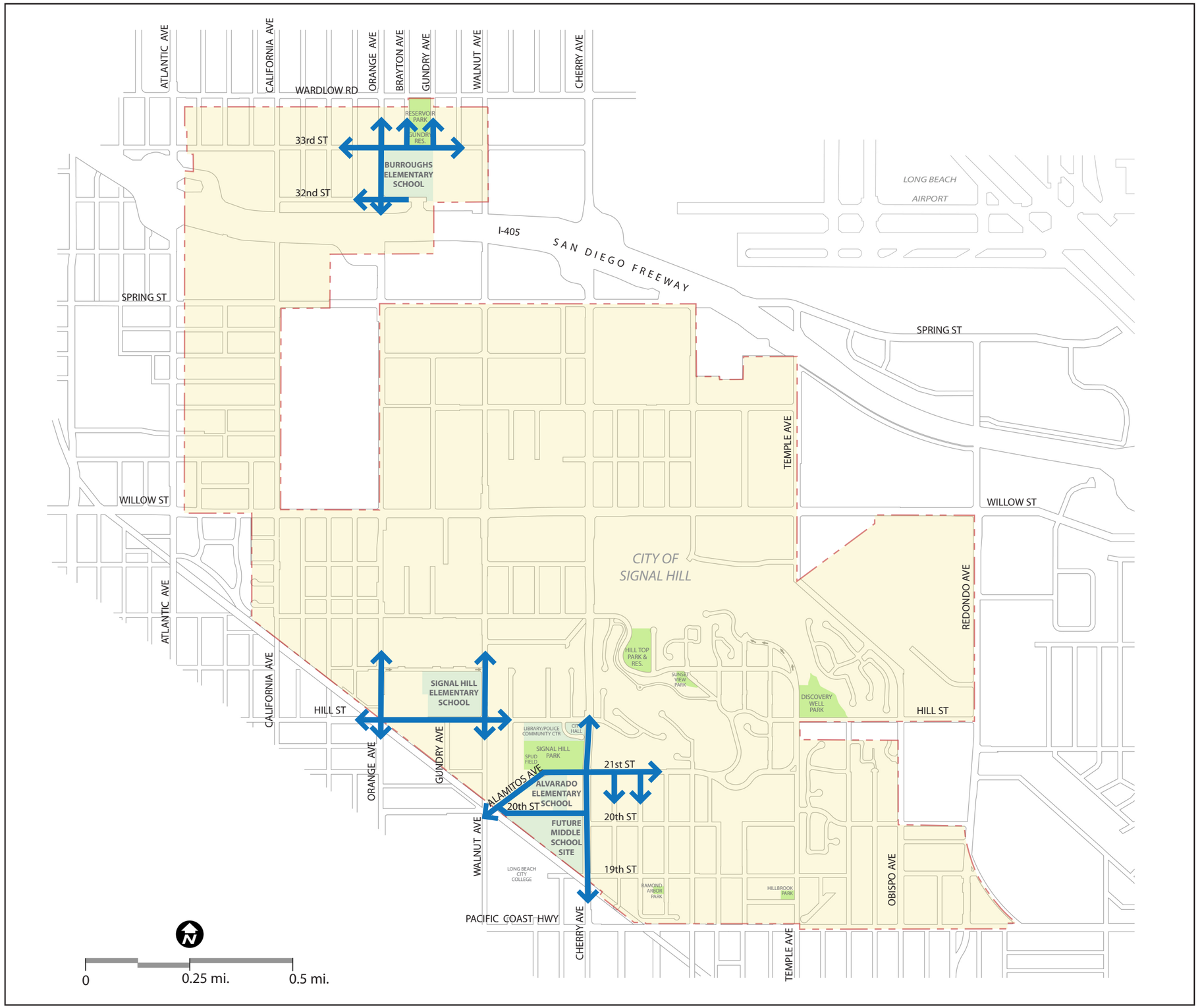
In residential areas, the primary goals of traffic calming are to reduce vehicular speeds and minimize cut-through traffic from congested collector and arterial roadways. Along commercial roadways, which primarily consist of collector and arterial streets, the goals of traffic calming are to reduce unsafe vehicular speeds and enhance the roadway environment for non-motorized users of the street, without causing congestion. School zones and routes are particularly common areas for traffic calming measures to be implemented; calming in these areas typically seeks to alert motorists of the presence of the school, and to improve safety conditions for pedestrians and bicyclists. Schools and school access routes in Signal Hill are depicted in Figure 12, *Signal Hill Schools and Primary Pedestrian Access Routes*.

Aesthetic Improvements

As funding permits, the City of Signal Hill will continue to improve the aesthetics of publicly-owned rights-of-way. This may include the addition of features such as:

- Landscaped medians
- Street trees
- Gateway monuments and signs
- Enhanced signage

An example of a right-of-way that has received significant aesthetic improvements is shown in Image 5. The improvements shown on Cherry Avenue between Skyline Drive/Burnett Street and 21st Street include a raised median with trees and groundcover and attractively landscaped hillsides and retaining walls. The City should focus future aesthetic improvements on the area's most-heavily-traveled corridors, such as the remaining segments of Cherry Avenue, Willow Street, Spring Street, and Orange Avenue. Special attention should be provided to the developing Pacific Coast Highway corridor and other mixed-use areas. Improvements in these areas should focus on creating "complete streets" that are attractive and functional for pedestrians, bicyclists, and other roadway users, in addition to motor vehicles.



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Schools

Primary Pedestrian Routes for School Access

City of Signal Hill Boundary

Figure 12
Signal Hill Schools and Primary Pedestrian Access Routes

Improvements to major corridors may include:

- Public art
- Outdoor seating, especially near restaurants and transit nodes
- Widened sidewalks to facilitate pedestrian movement and create plaza-like entries to buildings
- Improved TranSmart-equipped transit stops, with additional seating and trash receptacles and enhanced shelters and signage

Improvements implemented by the City of Signal Hill on corridors bordering Long Beach should be coordinated with the City of Long Beach.

C. Sidewalks, Trails, and Bikeways

Continued enhancement of the city's sidewalks, trails, and bikeways is one of the goals of this Circulation Element. Signal Hill's location near densely populated neighborhoods and major traffic generators make walking and bicycling a realistic alternative to motor vehicles for many residents. While the steep topography near the top of Signal Hill may discourage non-motorized transport except for those seeking exercise, much of the city consists of flat land or areas with modest slopes that can comfortably be traversed by pedestrians and bicyclists.

The quality and availability of sidewalks varies widely across the city. SHMC Chapter 12.04 mandates the construction of sidewalks concurrent with new development. As areas of the city redevelop, sidewalk availability will increase.

Off-street pedestrian trails are primarily located near the top of Signal Hill, where they provide panoramic views of the surrounding community. Trails in this area are heavily utilized by pedestrians. Trails provide links to the sidewalk system in various locations, and the sidewalk and off-street trail systems work in concert to create an expansive pedestrian network near the top of the hill. There is potential for the addition of new trails on the northern side of the hill, which is currently used for oil drilling.

Significant improvements in Signal Hill's bicycle circulation system may yield a substantial increase in bicycle use. Existing constraints to bike travel include steep topography in parts of the city and narrow roadway rights-of-way in some areas. Nonetheless, opportunities exist for new bikeways to be created, as

shown in Figure 7, *Bicycle Master Plan.* A major Class I bike path is planned along the former Pacific Electric right-of-way along the southwestern border of the city (Image 6). A new Class II bike lane is planned along Spring Street, and Class III bike routes are planned along Orange Avenue and Temple Avenue/Skyline Drive/Burnett Avenue from Pacific Coast Highway to Orange Avenue.

D. Planned or Proposed Projects

Figure 2, *Roadway Classifications Map*, depicts the build-out condition of Signal Hill's roadway system. No changes are proposed to the typical rights-of-ways discussed in Section II.A, above. Table 18, *Planned or Proposed Projects*, describes the key proposals within and in the vicinity of the city of Signal Hill that could impact the city's roadways in coming years. Two of these projects are shown in Images 7 and 8. The planned and proposed projects are in varying stages of development, and many have not yet been funded. The City supports the implementation of all of these projects and will coordinate with local, State, and regional agencies in their development.

TABLE 18 **Planned or Proposed Projects**

Source	Description
	ROADWAYS
Metro 2008 LRTP	Interchange modifications to provide to provide access from northbound I-405 to southbound Cherry Avenue.
	Improvements and/or widening of Willow Street from Terminal Island Freeway to Cherry Avenue.
Metro 2003 SRTP	Traffic signal synchronization along Cherry Avenue.
SCAG 2008 RTIP	Widening of Cherry Avenue from two to four lanes between 19th Street and Pacific Coast Highway. *(City of Long Beach)*
	Widening of California Avenue from Willow Avenue to Spring Street.
	Atlantic Avenue signal synchronization and enhancement. *(City of Long Beach)*
	Widening of Spring Street from two to four lanes between Long Beach Boulevard and 300 feet east of Atlantic Avenue. *(City of Long Beach)*
	BIKEWAYS
Metro 2008 LRTP	Implementation of bikeway projects (approximately 24 miles of Class II and 1.6 miles of Class I) along the I-405 corridor from Orange County to the South Bay.
SCAG 2008 RTIP	Construction of bikeway and pedestrian improvements along 1.2-mile former Pacific Electric Railway right-of-way between Walnut Avenue and Willow Street Blue Line station. *(City of Long Beach)*

Previously improved segment of Cherry Avenue.

Image 5

Former Pacific Electric Railway right-of-way; future site of a Class I bike path.

Image 6

A planned widening of Cherry Avenue will reduce congestion at its intersection with Pacific Coast Highway.

Image 7

Widening and improvement of California Avenue is planned between Spring and Willow Streets.

Image 8

V. GOALS AND POLICIES

NEW DEVELOPMENT & REGIONAL COOPERATION

GOAL 1: Ensure that new development results in the preservation and enhancement of the city's circulation system.

Policy 1.a: Ensure that necessary circulation system enhancements and expansions occur concurrently with new development and are consistent with the Los Angeles County CMP.

Policy 1.b: Require that new development include circulation and utility system improvements, including dedication of land for widening of roadways and pedestrian and bicycle facilities, where appropriate, and construction of new public works facilities reasonably related to the impacts of the development and intended use on the existing systems.

Policy 1.c: Develop and improve the circulation and utility systems by identifying and establishing a range of funding sources.

Policy 1.d: Limit growth and development when the impacts of growth cannot be mitigated or will overtax the existing systems.

Policy 1.e: Strengthen the framework for effective regional and local circulation system planning efforts.

Policy 1.f: Ensure that new development provides adequate parking for anticipated uses; however, reductions in parking requirements should be considered where alternative modes of transportation or shared parking opportunities exist.

Policy 1.g: Examine shared parking strategies for developments in mixed-use areas.

Policy 1.h: Implement a parking management program for existing and new developments considering parking reductions or shared use parking strategies.

ROADWAYS

GOAL 2: Provide a safe and efficient roadway system for all users.

Policy 2.a: Construct new roadways and improve existing roadways consistent with the classification system for minimum right-of-way widths described in the Official Plan Lines Map.

Policy 2.b: Vacate roadways that are redundant or unnecessary for new development and allow private roadways to reduce short- and long-term maintenance costs.

Policy 2.c: Promote proactive and systematic repair and replacement of worn roadways and infrastructure.

Policy 2.d: Coordinate and monitor the physical condition and operation of existing transportation systems by analyzing activity areas and the various transportation links (roadway, pedestrian, bicycle, and others) that connect those activity areas.

Policy 2.e: Consider the implementation of a neighborhood traffic management strategic plan to mitigate traffic impacts to residents without impacting adjacent streets or neighborhoods, and while ensuring that the needs of emergency response, sanitation, and other vehicles are not unduly impeded.

Policy 2.f: As areas develop or are redeveloped, require the construction of "complete streets" which serve all users of the roadway, including motor vehicles, pedestrians, bicyclists, and others.

Policy 2.g: Pursue Intelligent Transportation Systems (ITS), which may include traffic signal synchronization, bus and emergency vehicle priority signals, and the linking of traffic signal timing with traffic volumes, as a cost-effective method of achieving improved circulation system performance.

Policy 2.h: Coordinate with the City of Long Beach in the development of an ITS program that is consistent with regional goals in the development and prioritization of projects.

PEDESTRIAN AND BICYCLE CIRCULATION

GOAL 3: Create a safe and comfortable environment for pedestrians and bicyclists, encouraging the use of these modes of transportation for the majority of shorter trips.

Policy 3.a: Promote healthy, energy-efficient, and sustainable living by promoting the expansion of the city trails and walkways system.

Policy 3.b: Preserve existing public access to the trails system to promote recreational walking and hiking, fitness, and alternative modes of transportation.

Policy 3.c: Support the conversion of the former Pacific Electric Railway right-of-way along the southwestern border of the city into a pedestrian and bicycle path.

Policy 3.d: Coordinate with the City of Long Beach to ensure that current and future pedestrian and bicycle facilities are properly linked at city boundaries.

Policy 3.e: Require the construction of sidewalks on streets abutting new residential and commercial development.

Policy 3.f: Require the construction of a trails system to connect buildings, parks, and schools to each other, to the street, and to transit facilities.

Policy 3.g: Prioritize pedestrian and bicycle projects that help meet the requirements of the Americans with Disabilities Act.

Policy 3.h: Participate in the Safe Routes to School program.

Policy 3.i: Coordinate pedestrian and bicycle linkages to the Metro Blue Line with the City of Long Beach.

PUBLIC TRANSIT

GOAL 4: Maintain and enhance the city's public transportation network, increasing its role as a critical element for mobility in the area.

Policy 4.a: Encourage a wide range of responsive and accessible public transportation alternatives to the automobile.

Policy 4.b: Support increased transit service frequency and capital improvements to serve high-density employment, commercial, residential, and mixed-use areas.

Policy 4.c: Support improvements to transit facilities that enhance the quality of transit service by providing real-time information, seating, shade structures, and other features.

GOODS MOVEMENT

GOAL 5: Permit safe and efficient goods movement to support regional commerce and industry, while minimizing undesirable impacts on Signal Hill residents.

Policy 5.a: Evaluate proposed projects on the I-405 and I-710 freeways to determine if significant impacts from increased truck traffic will result on roadways in Signal Hill.

Policy 5.b: Identify appropriate routes for trucks serving industrial, commercial, and mixed-use activity areas, discouraging truck traffic from entering residential neighborhoods.

UTILITIES

GOAL 6: Provide safe, efficient, and environmentally-friendly utilities systems and pipelines.

Policy 6.a: Maintain essential access to petroleum resources by preserving pipeline facilities, where appropriate.

Policy 6.b: Concurrent with development of vacant land or with substantial reconstruction of existing development, encourage the relocation of overhead utility systems to underground systems, where appropriate and feasible.

Policy 6.c: Encourage the development of infrastructure that supports new power generating sources, such as solar and wind energy.

TRANSPORTATION DEMAND MANAGEMENT

GOAL 7: Reduce single-occupant vehicle travel by establishing Transportation Demand Management (TDM) programs.

Policy 7.a: Encourage major traffic generators to develop and implement TDM programs.

Policy 7.b: Encourage major traffic generators to provide transit subsidies, bicycle facilities (including showers/changing rooms), alternative work schedules, ridesharing opportunities, telecommuting options, and preferential parking for carpools.

Policy 7.c: Implement TDM programs for City employees.

Policy 7.d: Encourage proposed development projects to integrate features and facilities that support alternative modes of transportation.

Policy 7.e: Consider TDM programs with achievable trip reduction goals as partial mitigation for project traffic impacts. Where TDM programs are used as a project mitigation, penalties should be instituted to prevent programs from being reduced in scope or eliminated after the project is constructed.

SUSTAINABILITY

GOAL 8: Minimize the environmental impact of transportation systems in Signal Hill.

Policy 8.a: Encourage infill of vacant lots close to transportation, municipal facilities, and shopping opportunities to maximize the use and efficiency of the existing circulation system and with high-density and/or high-FAR development encouraging the use of alternative modes of transportation, which will help reduce total vehicular trips.

Policy 8.b: Promote mixed-use development to reduce the expansion of the roadway system and minimize maintenance costs.

Policy 8.c: Encourage the development of mixed-use and high-density projects near bus routes, particularly those serving the Metro Blue Line.

Policy 8.d: Consider reducing transportation impact fees for mixed-use projects near major transit corridors that offer extensive facilities and programs that will reduce vehicle miles traveled.

VI. IMPLEMENTATION PROGRAM

This section provides a coordinated set of action plans and programs that serve to implement the goals and policies described in Section V.

TABLE 19 **Implementation Program**

	Action Plans/Policies	Corresponding Goal/Policy
	NEW DEVELOPMENT & REGIONAL COOPERATION	
1	Evaluate development projects for General Plan consistency, including goals, policies, and implementation measures in other General Plan elements.	1.a, 1.e, 2.a
2	Discourage further development of truck yards and truck storage facilities that support the port activities and instead encourage residential, commercial, and light industry less likely to generate high volumes of tractor-trailer type truck traffic.	1.d, 5.b
3	Require traffic studies for development proposals to improve the flow of traffic, reduce parking and traffic congestion, and mitigate noise and odor impacts on sensitive receptors.	1.a, 1.f, 2.f
4	Participate in regional planning efforts to strengthen coordination and compatibility of local and regional plans and circulation systems.	1.a, 1.e, 2.h, 3.d, 5.a
5	Require that developers dedicate right-of-way and construct required public works improvements on streets adjacent to construction projects concurrent with development.	1.a, 1.b
6	As part of the annual review of the Capital Improvement Program, define the needs and deficiencies within the circulation system and introduce the most urgent projects into the City's budget process.	1.c, 2.c, 2.d
7	Prepare guidelines that describe the City's process for qualifying for CEQA streamlining for residential mixed-use projects and "Transportation Priority Projects" as provided under State law.	8.a, 8.b, 8.c
8	Evaluate the city roadway system and vacate roads that are redundant or unnecessary.	2.b
9	Consider the use of private roadways in new development to reduce short- and long-term maintenance expenses incurred on the City.	2.b
	ROADWAYS	
10	Study the re-design and seek funding for improvement of the Cherry Avenue/I-405 Freeway offramp at Cherry Avenue (north) including realignment and signalization to allow southbound turns	1.a, 1.c, 5.a

TABLE 19 **Implementation Program**

	Action Plans/Policies	Corresponding Goal/Policy
	onto Cherry Avenue.	
11	Amend the Plan Lines Map Ordinance (SHMC Chapter 20.72) to: 1. List all streets which do not meet the minimum right-of-way width for the applicable roadway designation. 2. Remove all other lists of streets. 3. Establish the Plan Lines Map as a separate document from the General Plan, and incorporate it by reference into the SHMC.	2.a
12	Support efforts by the City of Long Beach to widen Cherry Avenue from Pacific Coast Highway north to the Signal Hill city limits.	1.e, 3.d
13	Continue use of traffic calming strategies to preserve the peace and quiet of residential neighborhoods.	2.e
14	Include landscaped medians and decorative street furniture in designs for circulation system improvements.	2.d, 2.f
15	Require efficient use of parking facilities and develop new parking lots concurrently with new developments consistent with the zoning ordinance requirements and land use categories of the Land Use Element.	1.f, 1.g, 1.h
16	Support the implementation and future expansion of the Douglas Park Advanced Traffic Control System and/or other Intelligent Transportation Systems along Pacific Coast Highway and other major roadways.	2.g, 2.h
17	Evaluate and consider reducing transportation impact fees for mixed-use projects near major transit corridors that offer extensive facilities and programs that will reduce vehicle miles traveled.	8.d
	PEDESTRIAN AND BICYCLE CIRCULATION	
18	As areas redevelop or roadways are widened, consider the addition of bike lanes to street sections.	3.d
19	Increase and improve the network of public and private trails and sidewalks to encourage active recreation and fitness, and to provide public access to parks, open space areas, and public view and vista locations.	3.a, 3.b, 3.c, 3.d, 3.e, 3.f, 3.g, 3.h, 3.i
20	Where appropriate, require new residential development to include trails and sidewalks that link to parks and view locations.	3.b, 3.e
21	Consider amending the SHMC to increase the amount of required bicycle parking for projects in commercial, mixed-use, and other heavily-trafficked areas.	3.f
22	Coordinate future bikeway expansion with the City of Long Beach to ensure appropriate connectivity is provided at city boundaries.	3.d, 3.i
23	Design access to new developments and buildings to encourage	3.a, 3.e

TABLE 19 **Implementation Program**

	Action Plans/Policies	Corresponding Goal/Policy
	walking.	
24	Participate in and implement recommendations of the Safe Routes to Schools Program.	3.h
	PUBLIC TRANSIT	
25	Support increased-frequency transit service and capital investments to serve high-density employment, commercial, residential, or mixed-use areas and activity centers.	4.a, 4.b, 4.c
26	Support continued implementation of TranSmart technologies by Long Beach Transit at Signal Hill bus stops.	4.c
	GOODS MOVEMENT	
27	Continue to enforce truck route regulations to minimize the impacts of truck traffic on residential neighborhoods.	5.b
28	Design review for new commercial, industrial, and mixed-use developments shall consider and minimize noise and other impacts of truck traffic, deliveries, and staging on nearby homes.	5.b
	UTILITIES	
29	Where physically and economically feasible, underground overhead utility lines.	6.b
30	Promote pipeline safety by requiring compliance with State pipeline inspection and safety monitoring programs.	6.a, 6.c
31	Evaluate City standards to ensure that no undue restrictions are placed on the development of small-scale renewable energy units such as rooftop photovoltaic panels.	6.c
	TRANSPORTATION DEMAND MANAGEMENT	
32	Encourage major employers to develop and implement TDM programs to reduce peak-period trip generation.	7.a, 7.b, 7.d, 7.e
33	Develop TDM programs for City employees, and provide incentives for their use.	7.c
	SUSTAINABILITY	
	See Implementation Measures 4, 7, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 32, and 33, above.	

VII. SUSTAINABILITY MATRIX

The Circulation Element includes a range of goals and policies which support statewide sustainability efforts, and reduction in climate change effects and greenhouse gas emissions. These goals and polices are located in Section V, Goals and Policies. Table 20, *Sustainability Matrix*, outlines the policies that support various sustainability efforts.

TABLE 20 **Sustainability Matrix**

Policy	Sustainability Legislation		
	AB 32	SB 375	AB 1358
NEW DEVELOPMENT & REGIONAL COOPERATION			
1.b	X	X	X
1.d	X	X	
1.e		X	
1.g	X	X	
1.h	X	X	
ROADWAYS			
2.d	X	X	X
2.f	X	X	X
2.g	X	X	
2.h	X	X	
PEDESTRIAN AND BICYCLE CIRCULATION			
3.a	X	X	X
3.b	X	X	X
3.c	X	X	X
3.d	X	X	X
3.e	X	X	X
3.f	X	X	X
3.h	X	X	X
3.i	X	X	X
PUBLIC TRANSIT			
4.a	X	X	

TABLE 20 **Sustainability Matrix**

Policy	Sustainability Legislation		
	AB 32	SB 375	AB 1358
4.b	X	X	
4.c	X	X	X
UTILITIES			
6.c	X		
TRANSPORTATION DEMAND MANAGEMENT			
7.a	X	X	
7.b	X	X	
7.c	X	X	
7.d	X	X	X
7.e	X	X	
SUSTAINABILITY			
8.a	X	X	
8.b	X	X	
8.c	X	X	
8.d	X	X	