
IV CIRCULATION ELEMENT

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CITY OF SAN JOSE | 2013 | CIRCULATION ELEMENT

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IV Circulation Element

The primary role of the Circulation Element is to plan the transportation system needed to serve proposed development as defined in the Land Use Element of the City of Rancho Palos Verdes (City) General Plan (General Plan). The Circulation Element also has a role in planning for the future with regard to the provision of infrastructure that services the City. The circulation system affects growth patterns, the environment, and the quality of life of the City's residents and workers. The system ranges from sidewalks to roadways to trails, all providing for the safe, efficient, and sometimes recreational movement of people through the City. The location and nature of circulation system components derives from—and in turn, affects—physical settlement patterns, air quality, plant and animal habitats, noise, energy use, safety, visual appearance, social interaction, and economic activity within the community.

The Circulation Element shows the “general location and extent of existing and proposed major thoroughfares, transportation routes, terminals, and other local public utilities and facilities, all correlated with the Land Use Element” (California Government Code Section 65302(b).) While not all-inclusive, the City Circulation Maps illustrate arterials, collectors, and local streets; bus routes; other public transit routes and bikeways; and trails.

The purpose of this Circulation Element is to present a plan to ensure that utilities and transportation, including public transportation services, are constantly available to permit orderly growth and to promote the public health, safety, and welfare. This Element provides a framework within which individual property owners can plan the development of their property and be assured that basic infrastructure and services are available and adequate. This Element provides an area-wide assessment of the different public transit, services, and utilities for a broader understanding of service provision. Further, it is envisioned that transportation improvements (new or retrofitted) will provide opportunities to improve safety, access, and mobility for all travelers and recognize bicycle, pedestrian, and transit modes as integral elements of the transportation system, thereby using complete street concepts to integrate the needs of all users of the roadway system consistent with the California Complete Streets Act of 2008.

1 Goals

1. Ensure adequate public utilities and communication services to all residents, while considering environmental, aesthetic, and view impacts.
2. Provide and maintain a safe, efficient, and comprehensive system of roads and trails, and coordinate them with other jurisdictions and agencies.
3. Facilitate mobility of residents through an adequate public transportation system with consideration of the City's demographics.
4. Work with other jurisdictions and agencies to ensure that there are adequate storm drains, water systems, and sewer systems to serve the residents.
5. Where appropriate, use complete street concepts to integrate the needs of all users of the roadway system consistent with the California Complete Streets Act of 2008.

2 Policies

Transportation Systems

1. Design public access into residential areas to control non-local traffic.
2. Require any new developments or redevelopment to provide streets wide enough to support the City's future traffic needs and to address potential impacts to nearby intersections resulting from such developments.
3. Encourage synchronization and coordination of traffic signals along arterials.
4. Ensure that future residential developments provide direct access to roadways other than arterials.
5. Work with other Peninsula cities and/or regional agencies to improve public transportation on the Peninsula and to provide access to other destinations in the region.
6. Implement the Trails Network Plan to meet the recreational needs of the community while maintaining the unique character of the Peninsula.
7. Coordinate and cooperate with neighboring jurisdictions to develop trail networks.
8. Prohibit motorized vehicles from using paths and trails, except for disabled access and emergency or maintenance vehicles.
9. Require that all new developments, where appropriate, establish paths and trails.
10. Seek funding for acquisition, development, and maintenance of trails.
11. Implement trails on existing rights-of-way and easements in accordance with the Trails Network Plan. Where applicable, consideration should be given to adding crosswalk pushbuttons at proper equestrian height levels where equestrian trails traverse signalized intersections.
12. Include safety measures, such as the separation of uses, fences, and signage, in the design and construction of paths and trails.
13. Encourage the safe and courteous use of trails by educating users as appropriate.
14. Ensure public access to the Rancho Palos Verdes shoreline.
15. Ensure trail access to the Eastview Area and Western Avenue.

16. Encourage and provide trail and recreational facilities that support healthy living.
17. Explore options to develop a City equestrian park.
18. Require adequate off-street parking for all existing and future development.
19. Develop appropriate ordinances to regulate street parking, parking on narrow residential streets, and parking of recreational, commercial, and/or oversized vehicles.
20. Coordinate and cooperate with school districts, and parent and community groups to provide safe and proximate access to schools.
21. Require detailed analysis for all proposals to convert local public roads into private streets or retain new local roads as private property. Conditions for establishing private streets should include:
 - a. The road is a truly local road and is not needed as a collector or arterial road.
 - b. Provisions are made to guarantee the future upkeep of the streets.
 - c. Dedication of non-vehicular easements may be required.
22. Reflect the elements of the City's Trails Network Plan in appropriate City processes and procedures. For each trail category, the City's action should include the following:
 - a. Category I (Definition: These trails are defined as existing, dedicated trails that meet the City's trail standards. Inspect and maintain all existing trails on a regular basis.
 - b. Category II (Definition: These trails are defined as proposed trails and trail segments that cross undeveloped, privately owned land that is zoned as being developable). These trails and trail segments should be implemented when the respective parcels of land are developed. Consider these trails, or alternate approaches to provide equivalent access, in all new developments.
 - c. Category III (Definition: These trails are defined as proposed trails and trail segments that are located on existing trail easements, City property, or street rights-of-way, and that require implementation or improvements). Require consideration by the City Department of Public Works or the Department of Recreation and Parks of these trails or alternate approaches to provide access prior to bid solicitation for projects.
 - d. Category IV (Definition: These trails are defined as proposed trails and trail segments that cross privately owned land designated as Open Space or Open Space Hazard, or on land owned by a public utility or public agency). These trails and trail segments involve the acquisition of easements and may require implementation or improvements. Implement these trails by soliciting voluntary offers to dedicate easements. Where appropriate, the City should seek the dedication of an easement as a mitigation measure for significant property improvements.
 - e. Category V (Definition: These trails are defined as proposed trails that would primarily benefit neighborhood residents and that cross privately owned land). Implement these trails only upon initiation by affected property owners or community groups. The City shall provide appropriate support to the property owners offering easements.
23. If City land is sold, record any appropriate public access easement, restriction, reservation, and/or right-of-way.
24. Provide descriptions of relevant trails in the Trails Network Plan to potential applicants when inquiries for development are first made.
25. Design and construct new trails in accordance with the Trails Network Plan and other national, state, and local standards, where appropriate.

26. When constructing paths and trails, require the use of construction techniques that minimize the impact on the environment.
27. Align trails to maximize access to scenic resources, where appropriate.
28. Include the bikeways in the Conceptual Bikeways Plan or alternate approaches to provide access, prior to approval of proposals for land development through a subdivision of land application and/or conditional use permit application.
29. Require consideration of the inclusion of bikeways in the Conceptual Bikeways Plan or alternate approaches to provide access during project design for all City Department of Public Works or Department of Recreation and Parks projects.

Infrastructure Systems

30. Discourage the installation or extension of any infrastructure component into any area known to be hazardous unless appropriate liability safeguards (such as geological hazard abatement districts) are in place and adequate mitigation measures are incorporated into the design.
31. Allow new development only where adequate infrastructure systems can reasonably be provided.
32. Require adequate landscaping or buffering techniques for all new and existing facilities and networks, to reduce the visual impact of infrastructure facilities and networks.

Resource System

33. Ensure that the resource companies provide all areas of the City with adequate service, including adequate backup and growth capabilities.
34. Encourage the use of alternative water and energy generation sources.
35. Promote, practice, and encourage workable energy and water conservation techniques.
36. Review any proposed development, major new resource uses, or significant changes to resource systems for impacts to the surrounding neighborhood and community.
37. Encourage the use of recycled/reclaimed water in the irrigation of large open space areas, including golf courses, open space areas owned by homeowners' associations, and City parks and ballfields.
38. Encourage the California Water Company to complete a conservation plan that provides for the availability of a recycled water system in the City.
39. Underground all new power lines and communications cables and implement programs to place existing lines and cables underground, where feasible.
40. Encourage the establishment of undergrounding assessment districts by homeowners in areas of existing overhead lines.
41. Investigate funding sources to be used in local undergrounding programs for areas of existing overhead lines.

Disposal/Recovery System

42. Encourage waste reduction and recycling programs.
43. Require all new developments to provide sanitary sewers connected to the County Sanitation Districts' system.
44. Require the connection to the County Sanitation Districts' sewers in existing development if alternative sewage systems endanger public health, safety, and welfare.

Flood Control/Storm Drain System

- 45. Encourage the retention of all remaining natural watercourses in their natural state.
- 46. Require developers to install and develop a mechanism for ongoing maintenance of necessary flood control devices in order to mitigate downstream flood hazards induced by proposed upstream developments.
- 47. Require that all flood control/natural water source interfaces and systems minimize erosion.
- 48. Promote compliance with regulations controlling pollution impacts generated by development runoff.
- 49. Promote compliance with regulations controlling discharge of wastewater into the ocean.

Communication Systems

- 50. Investigate alternative cable communications systems that take advantage of new technology, which could disseminate information and issues to communities and/or the City as a whole.
- 51. Require the underground installation of cable communications.
- 52. Balance the need to accommodate wireless communications coverage in the community with the need to protect and maintain the quality of the environment for residents. All new proposals to construct wireless communication facilities shall be reviewed using guidelines adopted and kept current by the Planning Commission and, where applicable, considering covenants, conditions, and restrictions (CC&Rs). These guidelines shall balance public and private costs and benefits to the greatest reasonable extent, and encourage colocation of facilities and the use of evolving wireless communication technologies to minimize impacts.

3 Transportation Systems

The transportation component of the City's infrastructure consists of integrated networks and modes that provide for access and the conveyance of people and goods to, from, and within a given area. The varied functions, widespread usage, and conspicuous visibility of these transportation systems make this the most dominant and complex component of the entire infrastructure. Because of its functional complexity and the diversity of potential impacts, the transportation component must be approached differently from the other infrastructure components. For example, other components are discussed primarily from the standpoint of the network, with little mention of distribution media, whereas the character of the transportation component requires that equal consideration be given to both networks and their associated modes. Furthermore, some of the transportation networks and modes, unlike other infrastructure components, overlap physically as well as functionally.



For the purposes of this General Plan, the transportation infrastructure has been divided into three major components. Each component is discussed in terms of the individual networks it comprises and the modes that use these networks. The three components include:

- Vehicular networks
- Public transportation
- Pedestrian and Bicycle path and trail networks.

It should be noted that, due to the nature of transportation systems, much of the subsequent discussion deals with the Palos Verdes Peninsula as a whole, rather than the City alone.

3.1 Vehicular Networks

City residents, like most Southern Californians, rely on the automobile as their principal mode of transportation. The vehicular network is divided into four basic classifications: freeways, arterials, collectors, and locals. Although terminology may vary for each of the four Peninsula cities, analysis shows that the functional differences rarely vary.

The development of this General Plan have potential effects in the City and on adjacent and outlying communities. It was recognized at the outset of the planning process that the cumulative effect of City traffic on roads outside this jurisdiction is of mutual interest with respect to congestion and pollution. Therefore, the proposals and recommendations made herein reflect this concern.

Freeways

There are no freeways on the Peninsula now and it is not likely there ever will be in the future. Peninsula residents, however, have access to and use the extensive freeway network that is such an important part of travel in Southern California. The Harbor Freeway (I-110) and San Diego Freeway (I-405) act as principal links for commuters as well as to distant points.

Although no attempt is made here to provide a detailed assessment of the impact of City residents on the freeway network, the circulation element will describe how the City transportation network connects to the freeway system.

Arterial, Collector, and Local Streets

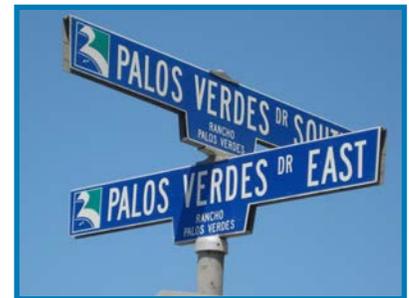
Of all the infrastructure components, the network of streets and associated components (parking) are the most dominant and complex of all service-oriented systems. The City, like all of Southern California, is almost totally dependent upon the system of roads on which our private and service vehicles function.

The most efficient street system is one that offers a variety of streets, each having its own functional characteristics. The classifications of such a street system are based on a functional hierarchy, often defined by little more than width, type of pavement, and traffic volume. Developing a street system purely based on standardized design criteria would have a severe impact on the unique and sensitive environments of the Peninsula and would limit the flexibility of design, which can reflect the varied character of the cities and neighborhoods. The following paragraphs describe the functional characteristics assigned to the three street classifications.

Arterial. The arterial street is the major street within the Peninsula hierarchy. It is the main channel for the movement of vehicles and is not intended to be a residential street; however, some older arterials do provide direct access to residential units (e.g., Palos Verdes Drive East and West). Arterials are typically characterized by both two-lane and four-lane roadways, typically with a raised or painted median. An arterial carries traffic through the community and collects traffic from collector roads, provides connections with other arterials, and may eventually link up with major highways.

Within the City limits, the following streets function as arterials:

- Palos Verdes Drive South;
- Palos Verdes Drive East;
- Palos Verdes Drive West;
- Hawthorne Boulevard
- Miraleste Drive;
- Crest Road;
- Silver Spur Road;
- Western Avenue; and
- Crenshaw Boulevard.



Collector. The collector street functions to conduct traffic between arterials and sometimes links with other collectors. It is a primary network within residential areas and can function well in a commercial area.

Within the City limits, the following streets function as collectors:

- Indian Peak Road;
- Ridgeway Drive;
- Granvia Altamira;
- Crest Road;
- Crestridge Road; and
- Montemalaga Drive.



Local. Local streets are minor networks that have the principal function of providing access to adjoining property. Local streets can be designed so as to discourage through traffic. They are intended to be low-volume and low-speed facilities, characterized by two-lane undivided roadways with frequent driveway access. All streets in the City not designated as arterial or collectors are defined as local streets.

Existing Conditions

The character of the existing street system (Figure 1, Street System) on the Peninsula is a result of several factors. The first, and perhaps the most important, is geographical location. The fact that the City is located on a peninsula has resulted in a situation that discourages most through traffic, thereby reducing the need for a major highway or freeway. Second, the early road system was designed to fulfill the needs of an area of semi-rural character. Evidence of this design is still found on the Palos Verdes Drive loop. Third, pre-incorporation development trends encouraged the development of new roads to maximum potential. In addition, the demand for the new roads, which supported new developments, was often satisfied with little regard to the City's existing character, community desires, or impact on neighboring cities.

Traffic impacts are determined by assessing traffic volumes at intersections and roadway segments and assigning a level of service (LOS). Level of service is a method of describing the operating efficiency of a roadway or intersection. Typically, it is described on a scale from A to F, with F being the most congested and A representing free-flow conditions. Currently in the City, intersections and roadways are considered impacted if they exceed LOS D; thus, LOS E and F are unacceptable levels during the morning peak hours and/or the afternoon peak hours. A detailed analysis of the existing street system in the City was performed on May 31, 2017, and is summarized in this document (Translutions, Inc. 2017). Congestion was measured at 30 of the highest-traffic-level intersections, and the results show that 25 of 30 are operating at acceptable levels. The results indicate that, for the most part, the City is adequately served. There are problem areas where certain intersections and roadway segments are currently operating at LOS E and unacceptable LOS F.

The following four intersections are currently operating at unacceptable levels of service:

- Via Rivera at Hawthorne Boulevard;
- Forrestal Drive - Trump National Drive at Palos Verdes Drive South;
- Palos Verdes Drive East at Palos Verdes Drive South;
- Palos Verdes Drive East at Via Canada; and
- Palos Verdes Drive East at Miraleste Drive.

A total of 36 roadway segments were studied in the traffic supporting the General Plan. Of the 36 roadway segments assessed, 24 were found to be operating at LOS A, one is operating at LOS B, 3 are operating at LOS C, 3 are operating at LOS D. The following 5 roadway segments are currently operating at an unacceptable level of service (LOS E & F):

- Crenshaw Boulevard from the northern City limit to Indian Peak Road;
- Western Avenue from the northern City limit to Delasonde Drive;
- Western Avenue from Delasonde Drive and Trudie Drive; and
- Western Avenue from Trudie Drive to the southern City limits.

Figure 1: Street System

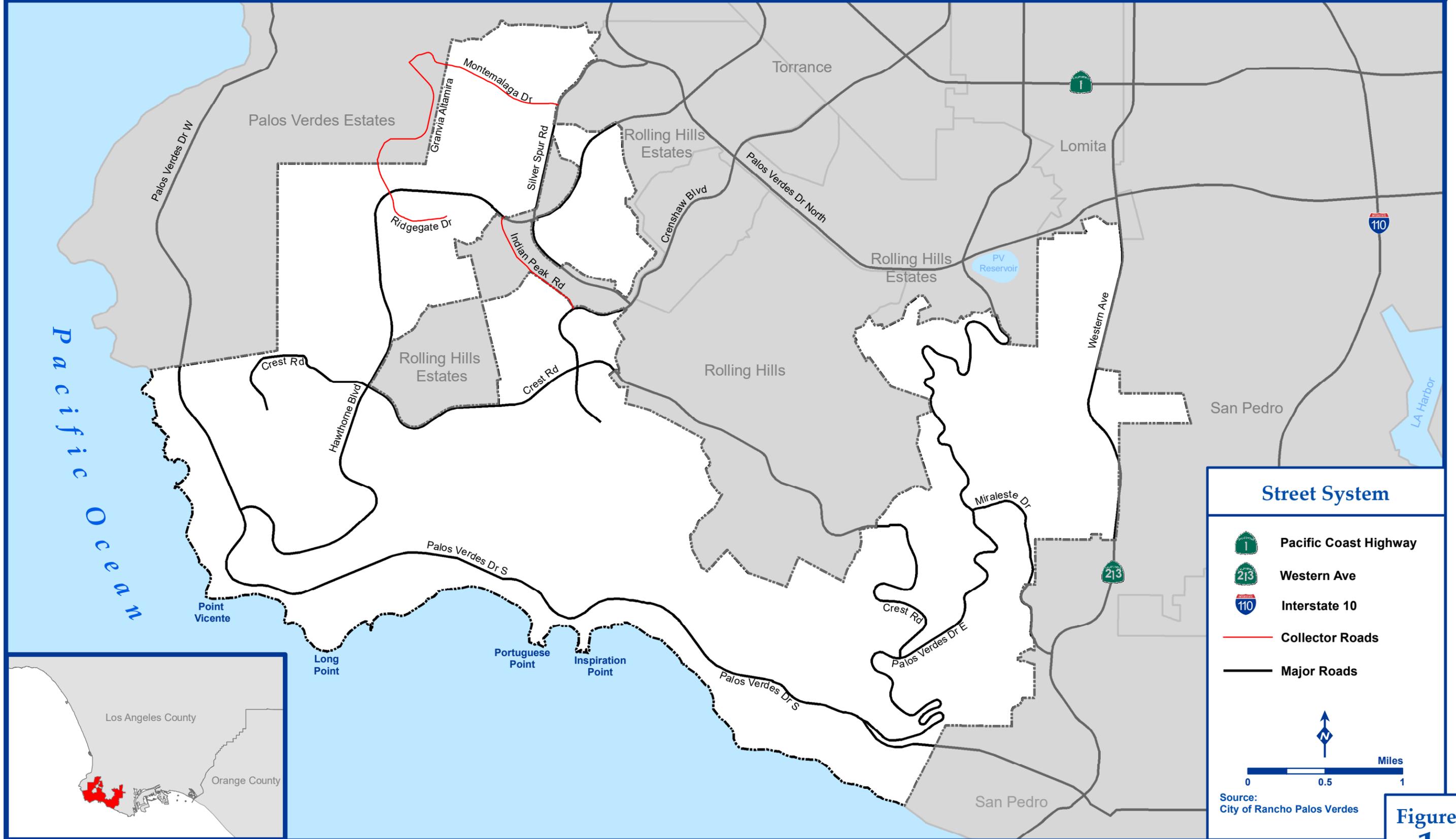


Figure 1

Future Conditions

The future conditions of the intersection and roadway segments are estimated by taking the existing conditions information described above and adding the traffic projected from future developments. The future traffic growth is anticipated to cause negative impacts. However, planned roadway and intersection improvements can mitigate the impacts on the roadway system to maintain an adequate level of service.

Traffic growth will come from expansion of existing houses and businesses, buildout of the remaining 439 vacant developable parcels (436 of which are zoned single-family residential) in the City, as well as visitors from outside the City. The 439 vacant parcels include many vacant parcels in the Portuguese Bend area. Although the Portuguese Bend area is currently under a building moratorium resulting from the landslide situation, this area contains over half of the City's identified vacant lots. As such, only for purposes of conservatively estimating the maximum potential traffic growth at full buildout of the City, the traffic growth analysis assumes that the Portuguese Bend area may be developed at some time in the future. Additionally, a list was compiled of all pending projects in the City of Rancho Palos Verdes, as well as in the City of Rolling Hills Estates and the City of Los Angeles. These pending projects were included in the traffic growth analysis in order to maximize the potential future conditions resulting from buildout.

The future growth analysis also included planned roadway and intersection improvements. These improvements could include new traffic signals at certain intersections, driveway realignments, new right- and/or left-turn pockets or modifications to existing turn pockets, new medians or modifications to existing medians, etc. Other improvements would come from mitigation measures required by future development projects. In keeping with the goals of the community as expressed in the original General Plan, no new arterials or collectors have been constructed and none have been planned.

There are 50 private streets in the City of Rancho Palos Verdes. The design and maintenance of private streets is not the responsibility of the City; therefore, these streets may or may not meet accepted design standards, and in some cases are not in keeping with customary maintenance standards. The private streets have not been included in the growth analysis, but the traffic resulting from those streets has been included.

The overall conclusion of the future growth analysis is that the impacts of traffic growth due to ultimate buildout can be mitigated with planned improvements to maintain adequate functioning of the street system. Other improvements would come from mitigation measures required by future development projects. Incorporating improvements by buildout year 2035 will help mitigate the increase traffic volumes resulting from ultimate buildout.

Effects of Landslides

The Portuguese Bend Landslide impacts the City's circulation system along a 1-mile segment of Palos Verdes Drive South. Constant earth movement has resulted in this segment of Palos Verdes Drive South becoming distorted, warped, and broken, which impacts the smooth flow of traffic through this area of the City. However, the City continuously repairs and maintains this segment to ensure a safe flow of traffic.

The South Shores Landslide, which is in the City of Los Angeles, impacts Palos Verdes Drive South at the City's border. During rainstorms, debris from this landslide washes down the canyon and causes an overflow at the inlet structure adjacent to the street near the City's border, resulting in flooding and subsequent temporary road closures. The City of Rancho Palos Verdes continuously works with the City of Los Angeles to respond quickly to these flood situations so that the flow of traffic is restored in a timely manner.

Farther north of the inlet structure within the South Shores Landslide area is San Ramon Canyon. The erosion of the canyon has accelerated dramatically since the 2005 storm events, which resulted in a federal disaster declaration. Geologists and engineers have concluded that the instability of the area and the erosion of the canyon's streambed and bank have the probability of causing complete roadway failure for both Palos Verdes Drive East and Palos Verdes Drive South. To address the possible roadway failure resulting from the instability in San Ramon Canyon, the City completed its largest and most expensive (\$15.5 million) public works project in 2014: a tunneled drainage system that diverts water from San Ramon Canyon to the Ocean.

3.2 Public Transportation

The Los Angeles metropolitan area has one of the most extensive and complex automobile-oriented networks in any highly urbanized area in the world. The City lies at the periphery of the regional transportation system. Regional public bus transit service is provided to the City by the Los Angeles County Metropolitan Transportation Authority and the Los Angeles Department of Transportation. Both providers provide fixed-route transit service lines with numerous bus stops in the City (Figure 2, Public Transit).

Palos Verdes Peninsula Transit Authority provides fixed-route and dial-a-ride services on the Peninsula. The fixed-route service includes nine routes that service the City and the greater Peninsula, offering riders a stable, reliable, and continuous mode of transportation. These routes offer frequent drop-off/pick-up stops at a variety of locations along major arterials, as well as all schools, libraries, and shopping centers. Specific bus lines also offer transportation to bus and train stations located outside of the City. This provides a well-connected and multi-modal transportation system for improved connectivity. The dial-a-ride service goes off the Peninsula for medical purposes. The service goes to all hospitals, medical buildings, and doctors' offices in Torrance, Harbor City, San Pedro, and Redondo Beach.

Airports and Seaports

The City does not contain any airports or seaports. With the lack of industrial and minimal commercial zones within the City, as such there is no need for these types of transportation uses. These types of transportation uses are commonly seen in larger cities (i.e. Los Angeles and Long Beach) where industrial and manufacturing zones are found.

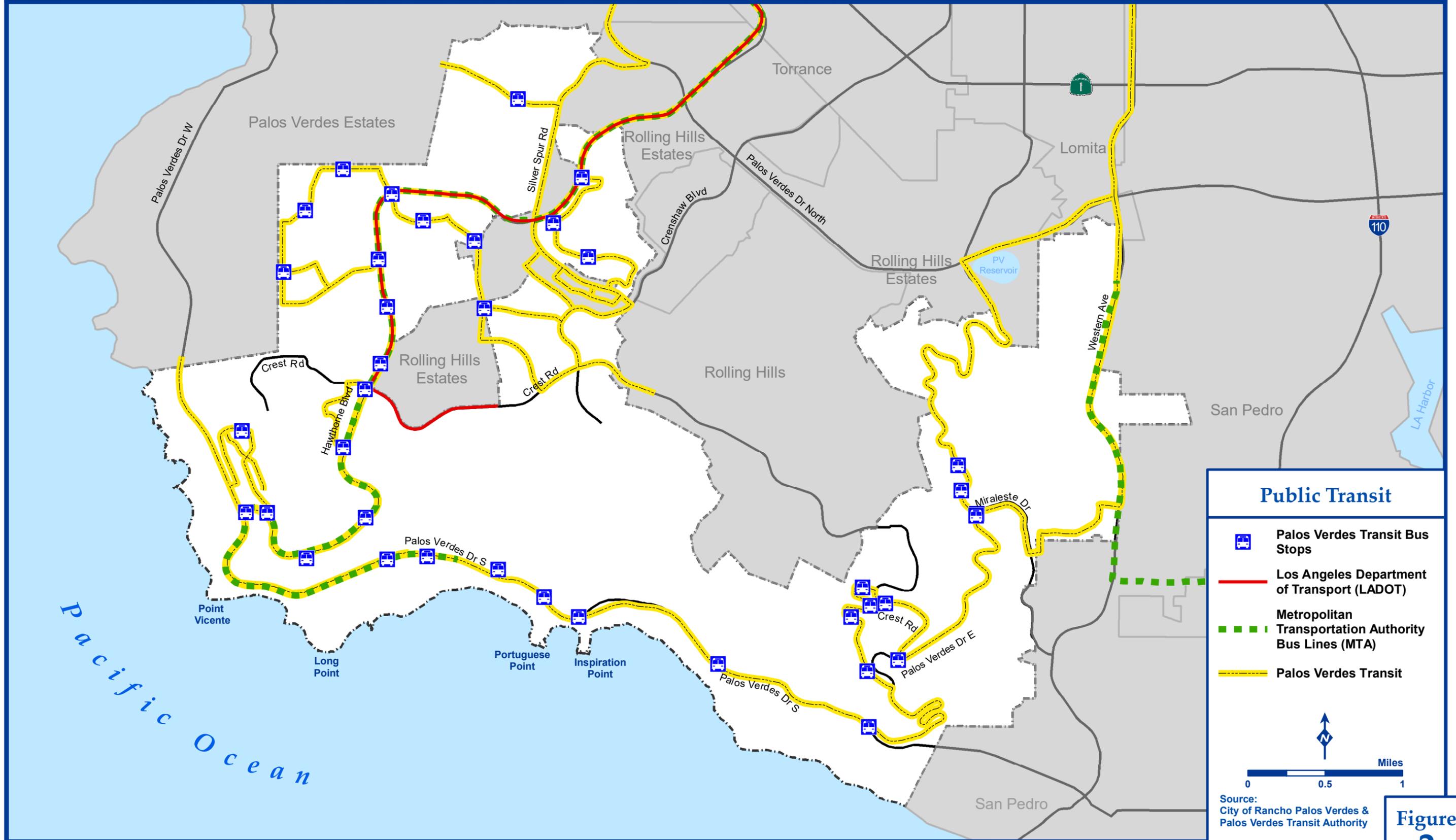
3.3 Path and Trail Networks

Path and trail networks are an integral part of the circulation component of infrastructure supporting non-motorized forms of travel. These include pedestrian, bicycle, and equestrian trails; bikeways; and sidewalks. Path and trail networks and their associated modes are important in the development of a balanced circulation system. Bikeways and walkways satisfy recreational demands, as well as function as an integral part of the transportation network. The recreational and environmental amenities found on the Peninsula and in the City are also of regional significance; therefore, the various path and trail networks should be designed to reflect both local and regional demands, while maintaining the unique character of the Peninsula.

On a localized level, the network of paths and trails is important in terms of recreation and transportation. Thus, where feasible and necessary, through improvements in the public rights-of-way, complete street concepts should be used to integrate the needs of all users of the roadway system consistent with the California Complete Streets Act of 2008.

Below is a discussion of the types of path and trail networks available in the City, followed by a discussion of past and future planning efforts to improve the City's path and trails network.

Figure 2: Public Transit



Public Transit

- Palos Verdes Transit Bus Stops
- Los Angeles Department of Transport (LADOT)
- Metropolitan Transportation Authority Bus Lines (MTA)
- Palos Verdes Transit

0 0.5 1 Miles

Source:
City of Rancho Palos Verdes &
Palos Verdes Transit Authority

Figure 2

Sidewalks

While the roadway system focuses on the opportunity for vehicular travel, the walkway (i.e., sidewalk) system enhances and increases opportunities for pedestrian foot travel, such as walking, jogging, and hiking. Unlike trails, which are typically natural paths providing recreational opportunities that meander with the topography through open space areas and provide access to and through natural environments, sidewalks are characterized by their hard concrete or asphalt surfaces and continuous configuration adjacent to roadways.

The City's Public Works Department has an annual sidewalk repair program to ensure ongoing maintenance of the existing sidewalk system. The intent of this program is to correct potentially hazardous portions of existing sidewalks, driveway approaches, and parkways that could pose a problem to pedestrians. The City has established a program to help ensure that the damaged sidewalks are repaired in a timely manner with a minimum burden to the property owner. Further, as problems are identified, modifications will include measures to ensure Americans with Disabilities Act compliance and consistency with applicable laws and design standards.

The Rancho Palos Verdes Coast Vision Plan (Vision Plan; City of Rancho Palos Verdes 2009) also identified the enhancement of pedestrian pathways along roadways within the City's coastal zone either through the development of City standard sidewalks or permeable paving such as decomposed granite, where appropriate (i.e., trails, as discussed previously). In addition, the Vision Plan identified the need to separate pedestrians from the roadway where the right-of-way is most constrained by using attractive barriers or edge/parkway planting. The Vision Plan has been folded into other City documents such as the Parks Master Plan.

The City annually adopts a Capital Improvement Plan, which is a guide for the efficient and effective provision of resources for improving and maintaining public infrastructure and facilities. The Capital Improvement Plan provides for the creation and maintenance of sidewalks along Palos Verdes Drive South and Palos Verdes Drive West, adjacent to the City's coastal zone, encouraging the use of surface material that aligns with the natural setting of the coast.

Pedestrian Trails

While sidewalks typically have impervious surfaces and parallel streets and roadways, pedestrian trails are typically identified by their pervious surfaces and typically do not parallel a street or roadway; rather, they typically traverse open space areas to offer a more natural experience and opportunity for recreation. These pedestrian trails also connect their users to natural and scenic points on the Peninsula that can only be reached on foot due to topographic and/or environmental sensitivities that make them inaccessible by motorized vehicles or other means.

Pedestrian trails are an important part of a balanced transportation network; however, the primary function of pedestrian trails is to fulfill a recreational need.

Equestrian Trails

Since the time of the earliest settlers, the horse has been a part of life on the Peninsula. First used primarily for utilitarian purposes, such as basic transportation and aiding in farm activities, the function of the horse is now primarily recreational. With the change of functions have come changes in development pressures and public attitudes toward horses. Development pressures have taken significant amounts of land from the rural and semi-rural categories, which can best support equestrian activities, and attitudes now demand that equestrian activities take place only in certain locations.

Within the City, there are four areas that make up the Equestrian Overlay District, of which two areas support major concentrations of horses and limited equestrian trails: the eastern side of the City and the Portuguese Bend area. The equestrian trails in the Conceptual Trails Plan (City of Rancho Palos Verdes 1993) were identified to provide a designated linkage between these two areas, as well as to establish linkages to the extensive trail systems found in adjacent cities.

Trails Network Plan

The City's first General Plan identified broad deficiencies in the City's path and trail networks. A Bikeways Plan was adopted on March 4, 1974, that identified major transportation and recreation linkages. The City developed a comprehensive Trails Network Plan in 1984 to address pedestrian, bicycle, and equestrian trails. The Trails Network Plan uses policies established in the City's General Plan and Local Coastal Plan, with a major theme of a network that functions as a transportation system, linear recreation facility, and linkage between recreational, commercial, and educational activity areas. It is important to note that the purpose of the document was to serve as an advisory tool and guide for implementing and funding City and regional trails. Subsequently, the City adopted the Conceptual Bikeways Plan in 1990 (last revised on October 15, 1996) and adopted the Conceptual Trails Plan in 1990 (last revised on September 7, 1993). The Conceptual Trails Plan and the information contained in it, combined with the Conceptual Bikeways Plan, became known as the first section of the Trails Network Plan. Although the Conceptual Trails Plan was last updated in 1993, it has been augmented by additional documents. Thus, the current Trails Network Plan consists of the following documents:

- Conceptual Trails Plan (City of Rancho Palos Verdes 1993);
- Conceptual Bikeways Plan (City of Rancho Palos Verdes 1996);
- Preserve Trails Plan (City of Rancho Palos Verdes 2008); and
- Coast Vision Plan (City of Rancho Palos Verdes 2009).

An update to the Trails Network Plan is underway and will combine these documents into one comprehensive plan.

Conceptual Trails Plan

The purpose of the Conceptual Trails Plan was to identify trail opportunities within the community so that new trails could be integrated into the City's existing public trails network. The acquisition and development of new public trails would be achieved through new development proposals, public works projects, and voluntary efforts. However, it is important to note that the plan is conceptual, and that inclusion of any segment in the Conceptual Trails Plan does not legally grant the use of the trail by the public or in any way guarantee the segment's eventual implementation.

In August 2004, the City Council approved the Draft Natural Community Conservation Plan (NCCP)/Habitat Conservation Plan (HCP) subarea plan for final review and approval by the Wildlife Agencies. The City Council-approved NCCP/HCP subarea plan requires the City and the Palos Verdes Peninsula Land Conservancy develop a Public Use Master Plan (PUMP) document that identifies how public use of the Palos Verdes Nature Preserve (Preserve) should be managed. Specifically, the PUMP addresses issues such as public access, trailhead locations, parking, trail uses, fencing, signs, and other recreational related topics that may arise. As part of the PUMP preparation process, a Preserve Trails Plan (PTP) was adopted by the City Council in April 2008 that identifies the permitted trail routes and the permitted trail uses (pedestrian, equestrian, and bicycle) in the Preserve. The adoption of the Preserve Trails Plan augments the Conceptual Trails Plan, and future Trails Network Plan.

The Conceptual Trails Plan was further augmented with the 2009 adoption of the Coast Vision Plan. The Vision Plan includes components to establish a continuous coastal access trail linkage through the City's coastal zone,

implementing the Conceptual Trails Plan, and layering amenities for trail users along the way in order to provide access and connectivity for uses of the coastline by people on foot and on bicycles. The Vision Plan has been or will be incorporated into other City documents, such as the Parks Master Plan and future update to the Trails Network Plan.

In summary, the former-Vision Plan, the PUMP's Preserve Trails Plan, and the NCCP/HCP subarea plan establish a continuous coastal access trail linkage through the City's coastal zone and through the City's preserve properties. As such, the remaining portions not covered by these documents continue to be addressed through the Conceptual Trails Plan, and will continue to be used as a guide to identify and provide additional trail linkages throughout the City when the Trails Network Plan is updated.

Conceptual Bikeways Plan

The Conceptual Bikeways Plan identifies bikeway opportunities in the community to facilitate the acquisition and development of new bikeways through development proposals, public works projects, and voluntary efforts. This plan was developed for the purpose of furthering the goals and policies of the Circulation Element.

The bicycle is increasing in popularity as a mode of transportation for commuter travel as well as for recreation. For many years, roadways have been built exclusively to meet the needs of the motorized vehicle, resulting in street geometrics, lane widths, and intersections that have not been designed for bicyclists' concerns. Bicycle safety is jeopardized due to bicycle/automobile and bicycle/pedestrian confrontations on the street, and the lack of space given over to bicycle movement. Conflicts between bicycles, cars and trucks, and pedestrians at intersections and on sidewalks result in the need to separate these three modes wherever possible to provide a safer and more efficient operational environment for each.

For many years, bicycling has provided a popular form of recreation and transportation for limited segments of the population. Significant growth of the bicycling population has occurred over the past 10 years. Bikeways within the City are generally used for recreational purposes. A limited number of bicycle commuter trips occur in the City due to the ratio of jobs to population. As is the case for many cities throughout the nation, the number of bicycle commuter trips is expected to grow with the growth in population. However, the number of bicycle commuter trips will likely remain insignificant in the City, except for the commercial corridor on Western Avenue. The land use, topography, and demographic makeup of the Peninsula are not conducive to extensive bicycle commuting activities.

Usage of the bikeways in the City increases significantly during early evening hours, during the summer months, and on weekends and holidays due to the picturesque nature of the Peninsula and the views to be enjoyed while using the various bikeways. Several of the bikeways can be categorized as semi-regional in nature because riders from beyond the Peninsula either ride or drive here expressly to ride along the bikeways and streets.

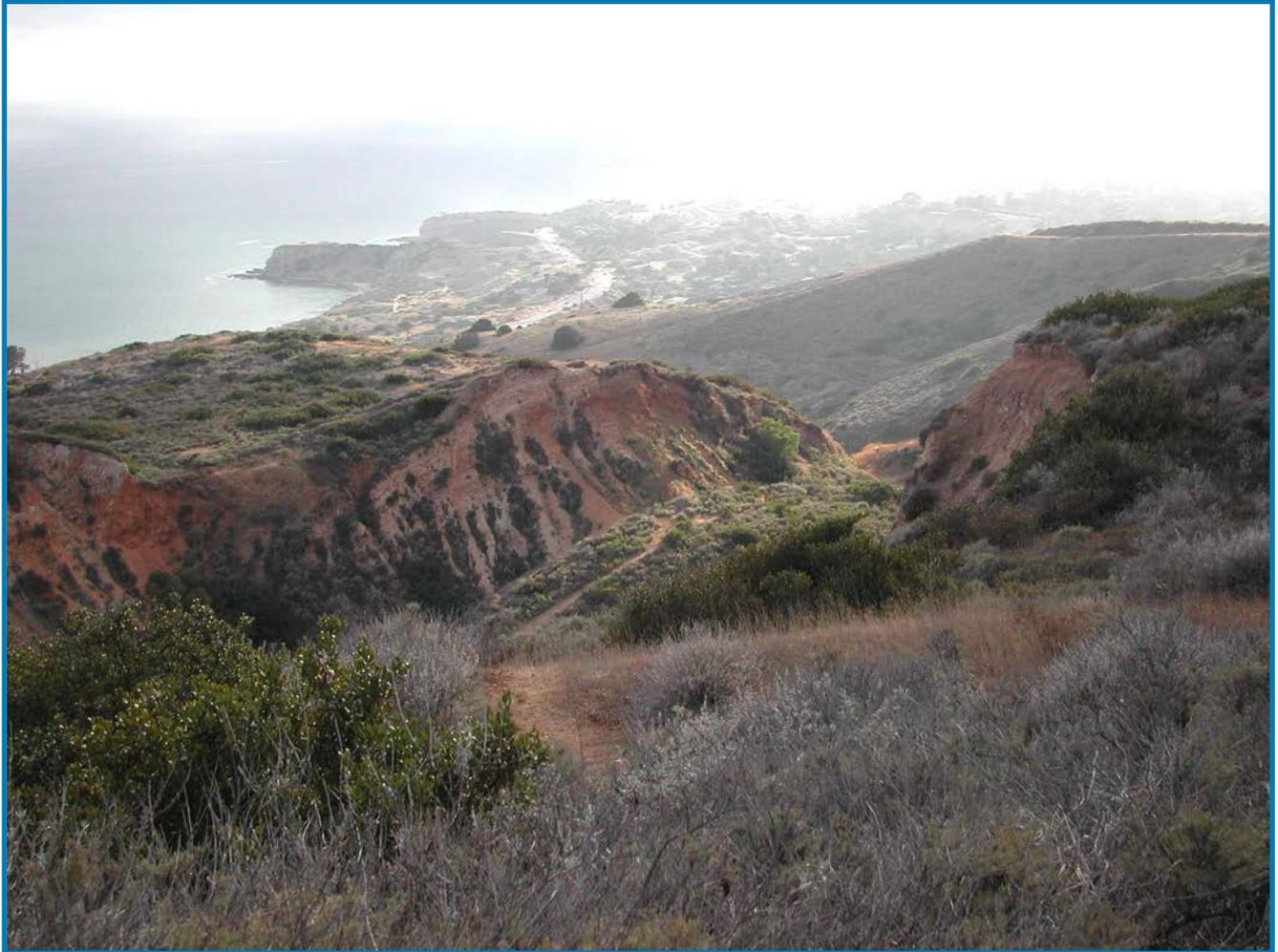
The Conceptual Bikeways Plan calls for considering the implementation or improvement of all non-existing and existing but substandard bikeways contained in the plan in the course of scheduled street improvements, consistent with the goals and policies of the Circulation Element.

With the adoption and implementation of the Vision Plan, the PUMP and its Preserve Trails Plan, and the Conceptual Trails Plan, there is a need to update the Conceptual Bikeways Plan as part of the Trails Network Plan update. The update must analyze and identify opportunities to provide connections and linkages from the bikeway network to the multi-use trails identified in the former-Vision Plan and the PUMP.

Future Planning Efforts

As mentioned above, the Trails Network Plan consists of a combination of a variety of individual documents. However, the Conceptual Trails Plan and the Conceptual Bikeways Plan portions of the City's current Trails Network

Plan have not been updated since the early- to mid- 1990s. In recent years, the City Council has reviewed and approved trails plans for subareas of the City, which have included the Palos Verdes Nature Preserve, the coastal zone, and adjoining areas, but there has been no comprehensive, City-wide update to the Trails Network Plan. As such, a comprehensive update and consolidation of the City's Conceptual Trails Plan, 1996 Conceptual Bikeways Plan, Vision Plan, and Preserve Trails Plan into a single comprehensive Trails Network Plan document launched in 2014 and is anticipated to be completed in 2018.



4 Infrastructure Systems

The existing infrastructure meet the current needs of the City. Various infrastructure functions, however, are not without problems and deficiencies. The deficiencies currently found in infrastructure functions are rarely of a common nature; therefore, they are discussed on an individual basis throughout this Infrastructure Systems section.

The Portuguese Bend slide area was found to be the major problem area regarding infrastructure function. All infrastructure networks, to some degree, use the slide area for right-of-way. Because the earth is constantly moving in that area, all networks are aboveground and most have had to incorporate special devices to allow for movement—for example, “slip span” in cables and “swing joints” in water lines. Additionally, in early 2000, a new combination above/belowground sewer system was completed for the Portuguese Bend area in order to minimize water percolation resulting from the septic systems that were common in the area.

The demands on the infrastructure system continue to grow and change over time. Communications infrastructure did not include mobile phone networks 20 years ago or broadband Internet services 5 years ago. The City is just now building a fiber-optic communications infrastructure to increase the available bandwidth by several orders of magnitude. The infrastructure system capacity will need to accommodate both increased resource usage due to technological advancements, as well as increased usage associated with buildout and population growth. The infrastructure system is constantly being maintained, modified, repaired, upgraded, and/or extended by the appropriate provider to meet demand. The ultimate buildout and population increase will not create a significant adverse impact on the infrastructure system because the population increase resulting from buildout will not be substantial. Further, requirements for new development to include best management practices and water- and energy-efficient components work to maintain and enhance the infrastructure system.

Notwithstanding, the following sections discuss in greater depth each of the infrastructure systems and the agencies and companies responsible for them. In addition, more specific information as to impacts, problems, and deficiencies is provided in these sections.

4.1 Resource Systems

Water

One of the most vital components in the infrastructure is the water distribution system. Water is used for varied purposes, which can be grouped into four basic categories:

- Safety requirements (firefighting)
- Human consumption (drinking, food preparation)
- Ground maintenance (landscaping)
- Urban activities (sewage)

The water needs of the City and the remainder of the Palos Verdes Peninsula are currently served by the California Water Service Company (Cal Water). Operating within the regulations and standards of the California Public Utilities Commission, the sole function of Cal Water is to provide and operate a range of regulated and non-regulated water and wastewater utility services to residents of the City, other companies, municipalities, and agencies. Cal Water purchases surface water imported by the Metropolitan Water District of Southern California from the Colorado River and the State Water Project in Northern California, which is then used to serve the entire Peninsula, including the City, through the Palos Verdes water system.

The Palos Verdes water system includes 350 miles of pipeline, 18 storage tanks, and 31 booster pumps spanning an area of approximately 26 square miles and ranging in elevation from sea level to 1,465 feet above average sea level. Due to the range of elevation, the water system is also composed of 109 pressure zones and hundreds of pressure-reducing valves, which carry water from tanks in the upper elevations of the system to lower zones. Cal Water proactively maintains and upgrades its facilities to ensure a reliable, high-quality supply of water.

The Palos Verdes water system distributes water through two distinct water distribution systems. These systems are commonly referred to as the “D-500 System” and the “Ridge System.” The D-500 System serves the lower-elevation areas of the Peninsula, about 13% of the total demand, and the Ridge System serves the upper-elevation areas, comprising the remaining 87% of demand. The average daily demand and maximum daily demand of the Ridge and D-500 Systems combined is 12,500 gallons per minute (gpm) and 20,600 gpm, respectively. All of the supply to the Palos Verdes system is delivered through four connections located at the northeastern edge of the Peninsula.

Cal Water is planning the construction of additional transmission pipelines, storage, and boosting facilities in its Palos Verdes District under two proposed projects, collectively known as the Palos Verdes Peninsula Water Reliability Project. This effort will increase storage capacity, enhance reliability, improve fire protection, increase operational flexibility and efficiency, improve access to facilities, and reduce the risk of loss and damage in the event of an emergency. The pipelines associated with the Palos Verdes Peninsula Water Reliability Project have already been realigned to address public concerns associated with traffic impacts. This project is pending the support of the public and approval of the Peninsula cities and California Public Utilities Commission, with construction anticipated in 2018.

Additionally, Cal Water released a draft conservation master plan to expand existing conservation programs and develop new programs in the Palos Verdes District to comply with the recently adopted state policy (Senate Bill No. 7) that requires a statewide 20% reduction in per capita urban water use by 2020. Conservation will not only aid in meeting increased demand, but will also help the Palos Verdes District reduce its purchases of imported water, resulting in decreased costs. Cal Water is planning to regularly review the new conservation master plan; make adjustments as appropriate; and implement, monitor, and update activities to ensure goal achievement.

Further, in an effort to continue conserving water, in 2010 the City adopted an ordinance in accordance with the Water Conservation in Landscaping Act. The purpose of the ordinance is to achieve the following:

- Promote the values and benefits of landscaping while recognizing the need to invest water and other resources as efficiently as possible.
- Establish a structure for planning, designing, installing, maintaining, and managing water-efficient landscapes in new residential or commercial development projects and when landscape areas are altered by more than 50% in total area.
- Promote water management practices and water waste prevention for existing landscapes.
- Use water efficiently by setting a maximum applied water allowance as an upper limit for water use and reducing water use to the lowest practical amount.

Energy

Energy systems provide the power necessary to operate and maintain our way of life. The City of Rancho Palos Verdes, like most of Southern California, relies on a dual energy system. Electricity and natural gas are the two primary sources of energy for the average City customer. Many of the functions of natural gas and electricity are interchangeable. That is, natural gas and electricity can both be used for cooking appliances, house heating, and other energy needs. Natural gas and electricity systems are individually summarized in the paragraphs that follow.

Natural Gas. Southern California Gas Company (SoCalGas) is a regulated subsidiary of Sempra Energy that furnishes natural gas to the Peninsula. Although part of the larger SoCalGas system, the City is also included in two SoCalGas distribution sections, which function principally as sub-administrative districts and are responsible for all lines and service systems that feed from transmission lines to the point of delivery.

The natural gas distribution system consists of resource facilities and networks. Resource facilities include natural gas processing and transmission facilities that are located outside the Peninsula area. Natural gas networks, on the other hand, consist of the physical infrastructure in place in the City that is used to deliver natural gas to the residents of the City; in many cases, the natural gas network parallels water and electric networks. The gas network is composed of distribution lines (supply lines, headers, and mains) and regulating stations.

Discussions with representatives of SoCalGas indicate that all gas lines are potentially dangerous if broken or severely damaged. Thus, the distribution network in the Portuguese Bend slide area is of critical concern. However, most lines are aboveground to facilitate constant inspection and periodic maintenance. Otherwise, no areas of significant deficiencies were found within the City.

SoCalGas uses an integrated grid system for much the same reason that the Cal Water area does—to preserve uniform flow and efficient service capabilities during maintenance or emergency. Natural gas is pumped, under high pressure, from the resource facility through transmission lines (none of which are in the City) to the distribution network that supplies City customers.

The facilities that supply and distribute natural gas to City customers meet the current demand. Further expansion of the natural gas infrastructure will be wholly determined by future growth patterns; however, future growth would come from buildout of the remaining vacant developable parcels in the City. Because the infrastructure is already in place, buildout would not present a significant impact to the natural gas network. The impact from growth is further reduced by rebates, incentives, and training programs offered by SoCalGas to help residents save energy and money in existing homes and in new construction. Rebates are offered for energy-efficient appliances or upgrades, such as Energy Star-rated natural gas storage water heaters and tankless water heaters; low-flow showerheads; and installation of attic and wall insulation. There are also low-cost/no-cost methods to lower gas bills and conserve energy by cleaning and adjusting equipment, performing routine maintenance, repairing leaky or disconnected ducts, caulking cracks, proper setting of thermostats, closing curtains during colder times to retain heat, and turning off unnecessary lights. Solar hot water heating decreases or eliminates the use of natural gas, which can be one of the largest residential uses of natural gas. Electrical heat pumps, when installed as part of a new HVAC system, may further replace natural gas.

Although these methods help conserve energy and costs, further research is needed to prevent the ultimate depletion of natural gas. As such, SoCalGas invests over \$7 million each year on research, development, and demonstration of new and emerging clean, energy-efficient technologies.

Electricity. Electric power is the other half of the dual energy system currently used in this general area. Southern California Edison (SCE) supplies all electrical power to the City and the remainder of the Peninsula. As with other resource infrastructure agencies, SCE is required to operate within the regulations and standards of the California Public Utilities Commission.

The electrical infrastructure is composed of resource facilities and a distribution network. The City is currently served by three resource facilities, two of which are located in the City. The power distribution network consists of major source lines that run from power-generating resource facilities to local substations and the lesser transmission lines, which in turn deliver power to customers in a usable state. The electrical power distribution infrastructure in the City is designed as an integrated grid system, principally for ease of maintenance and uniform current flow.

At the present time, the City's electrical power needs are being adequately met by SCE. The only problem area associated with the electrical component of the City's infrastructure exists in the Portuguese Bend slide area, because facilities in this area may be susceptible to damage from earth movements. Otherwise, no significant electrical deficiencies exist in the City.

Although the impact of the electrical infrastructure on the City environment is considered to be small, overhead transmission lines, transformers, and associated poles do pose significant adverse visual impacts and potential safety hazards. Overhead wires and associated hardware have caused brush fires and are vulnerable to damage caused by natural conditions (such as high winds, lightning, and tree growth) and human-caused conditions (such as automobile accidents), creating power outages and, in some cases, safety hazards if severed or broken. In addition, overhead wires are an unsightly appendage of a necessary infrastructure component, and cause considerable disturbance to views. SCE is making efforts to minimize these impacts by undergrounding most new distribution networks, when economically and physically feasible. Additionally, the City's Development Code requires that all utility lines installed to serve new construction and significant remodels be placed underground from an existing power pole or other point of connection. Limitations do exist in respect to undergrounding utility lines; however, the distribution lines can be and are being undergrounded.

SCE is the nation's largest purchaser of renewable energy from wind, solar, biomass, geothermal, and small hydrogen suppliers. Renewable energy from these sources makes up approximately 17% of the power delivered to SCE's customers. SCE has begun construction of the nation's largest wind transmission project, and when completed, this project will be capable of delivering additional electricity from wind energy facilities and other renewable energy companies. SCE has sufficient contracts in place to meet 20% or more of its customers' energy need with renewable energy, when delivered. In addition, SCE is investing in grid technologies to enable the delivery of more renewable energy into the electricity supply, to provide customers more power to control their energy use and costs, and to help prevent large-scale power outages. The process of developing the smart grid will likely take more than 20 years, with key milestones along the way. Continuous research and resulting advances in technology will help conserve more energy and prevent depletion of a valuable resource. If the annual growth rate remains similar to the previous years, SCE will be able to meet this projected demand because it is continuously upgrading and researching methods to preserve and provide more energy to meet the future needs of the City.

The City also provides expedited ministerial approval for solar panels, which is a growing part of the electrical infrastructure. Increased use of solar panels decreases the dependence on SCE, especially during the summer.

4.2 Disposal and Recovery Systems

Sanitation

The sanitation component of the infrastructure is divided into two basic groups: sewer systems and solid waste systems. Each sanitation component is composed of a system of networks that function as collecting agents and recovery facilities, which store, treat, and dispose of waste.

Sewer Systems. The City owns the sewage collection system; however, maintenance of the system is a joint effort between the City and the County of Los Angeles (County). The Abalone Cove sewer system is the only system that is currently owned, operated, and maintained by the City.

The County Sanitation Districts (Districts) operate 10 water reclamation plants and one ocean discharge facility (Joint Water Pollution Control Plant), which treat approximately 510 million gallons per day (mgd), 200 mgd of which are available for reuse. The Joint Water Pollution Control Plant is located in Carson, California. The Joint Water Pollution Control Plant is one of the largest wastewater treatment plants in the world and is the largest of the Districts' wastewater treatment plans. This facility provides both primary and secondary treatment for

approximately 300 mgd of wastewater. This plant serves a population of approximately 3.5 million people throughout the County, including the City of Rancho Palos Verdes. Prior to discharge, the treated wastewater is disinfected with hypochlorite and sent to the Pacific Ocean through a network of outfalls. These outfalls extend 2 miles off the Peninsula to a depth of 200 feet.

The Districts have prepared a facilities plan to meet the wastewater management needs of the Districts' Joint Outfall System (JOS). The plan, known as the JOS 2010 Master Facilities Plan (2010 Plan), addresses the need to upgrade the level of treatment of all JOS flows to full secondary treatment pursuant to a Consent Decree negotiated between the Districts, the United States, the State of California, and other parties. The 2010 Plan also addresses the need to expand wastewater treatment plants to accommodate projected growth in the JOS service area through 2010 and to provide for bio-solids management and water reuse opportunities.

Citywide Sewer System. The County collects a fee from property owners in the City for the maintenance and repair of the sewer system. With the exception of Abalone Cove, since incorporation, the County has maintained the sewer system in the City. The maintenance and repair responsibilities for the Abalone Cove area are borne by the City. Maintenance and repair activities that the County Department of Public Works, Consolidated Sewer Maintenance District, performs include video inspections, line cleaning, repairing structurally deficient segments of pipe, unplugging blockages, and cleaning up after overflows. The County also performs visual inspections on each manhole in the City at least once per year. This work is funded with an annual contribution from each parcel connected to the City's sewer system. Although the City owns the sewer collection system, the County Department of Public Works is responsible for the continuing operations of sewer collection system and for identifying and correcting pipeline capacity-related problems found in the system.

There are approximately 790,000 linear feet of wastewater conveyance pipelines, 17 primary lift stations, 44 grinder pumps (all part of the Abalone Cove sewer system), and approximately 3,707 manholes in the City. The gravity pipe ranges in size from 8 inches to 15 inches in diameter.

The collection system also consists of privately owned laterals that extend from individual private properties to the City-owned collection system located in the street, right-of-way, or easements. Private property owners are responsible for the operations and maintenance of their individual service laterals.

Abalone Cove Sewer System. The Abalone Cove Sewer System consists of 44 grinder pumps, with 41 of them each serving one parcel, and three duplex grinder pumps serving two or more residences. The three duplex grinder pumps are located on Abalone Cove Shoreline Park, off West Pomegranate Drive, and off Vanderlip Road. The system was installed in 2001 to replace septic systems in the landslide area. There are 70 manholes, one diversion structure, approximately 19,000 linear feet of gravity pipeline, 19,615 linear feet of low-pressure pipe, and 2,505 linear feet of force main. The low-pressure sewer pipelines in the Abalone Cove area are generally 1.25 inches. The diameter of the force main is 4 inches.

Existing Conditions. The majority of the system (over 73%) is now more than 40 years old and made of vitrified clay pipe (VCP). The average design life for VCP is generally accepted as 50 years. This leaves the remaining design service life for most of the system at less than 10 years. The lateral pipes are made of metal and are almost at capacity. As a result, there will most likely be an increasing trend in pipe structural failures with time.

Sewer System Master Plan: The City prepared a Sewer System Master Plan in 2003 that includes capacity analysis, maintenance schedules, and capital improvement plans. The Sewer System Master Plan was updated in 2004 (City of Rancho Palos Verdes 2004) to comply with Los Angeles Regional Water Quality Control Board requirements. The information contained in that update was used to develop the City's Sewer System Management Plan, which was adopted by City Council action on July 21, 2009 (City of Rancho Palos Verdes 2009b). The capacity

analysis that was performed on the system revealed eight pipe segments throughout the City that require additional capacity to minimize the likelihood of sanitary sewer overflows.

The Abalone Cove system is relatively new, but as the system continues to age, additional maintenance work will be needed. Funding for maintenance of the Abalone Cove Sewer System is currently from a user fee in addition to a City subsidy. The full operational costs associated with the system will be further evaluated.

The collection system has been thoroughly reevaluated through a combination of physical inspection, data analysis, and computer modeling. Three primary needs have been identified, which are related to (1) the physical condition of the system, (2) special considerations for the Abalone Cove Sewer System, and (3) hydraulic capacity projects.

The physical inspections revealed continued problems with the old, cracked pipes and root intrusion. These problems are currently being addressed through systematic rehabilitation by the County; however, it was recommended that the City encourage the County to expedite their activities, considering the physical condition of the entire system. This project anticipates the City performing half of the remaining inspection and cleaning of the system through specialty contractors.

The Abalone Cove area is in need of special attention to assure its improved funding and operations. As currently operated, there is uncertainty regarding the funding, planning, operations, and maintenance of the system. A special study was performed by Harris and Associates to identify the primary concerns and to address these issues by updating the separate Abalone Cove Sewer System element of the City's Sewer System Management Plan (Harris and Associates n.d.). The update will include the funding levels necessary for sustainability and the assignment of operational responsibility to the most equitable party.

The hydraulic capacity analysis, as performed through hydraulic modeling, revealed few areas in need of immediate attention. The areas flagged should be carefully watched and any improvements coordinated with other public works activities.

Ultimately, since the City has little developable land left, the future flow predictions will not increase significantly compared to the current flow. According to U.S. Census data, the City's population increased by approximately 1.9% between 2000 (41,643) and 2013 (42,448), resulting in a population figure that is similar to the City's population in 1990 (41,659). According to the U.S. Department of Finance, the City's population is predicted to increase to 44,893 in 2030, representing an increase of approximately 5.5% over the next 20 years. The population increase of 5.5% is considered minimal, that will result in a negligible increase in demand for such service.

Solid Waste

The collection of refuse in the City is a service that is carried out by two private companies. The City is divided into two service areas, where one company services the Portuguese Bend and the coastal zone areas, and another company services the remainder of the City. This component of the infrastructure is unlike others in that the companies charged with the collection of solid wastes act only as the medium, while the actual refuse collection network is the system of streets and highways, and the County landfill acts as the disposal facility. Simply stated, the refuse collection system involves the collection of solid waste from customers and the delivery of waste to the landfill, where it is disposed of.

Disposal of solid waste occurred at the Palos Verdes Landfill, which operated under permit by the Districts as a sanitary landfill from May 1957 through December 1980. Disposal to this site has since ceased, and solid waste disposal now occurs at various landfills throughout Southern California that meet the needs of the City. Since the City's incorporation, due to increased environmental awareness and state laws that have mandated reductions in the amount of solid waste being diverted to landfills, recycling programs have been implemented. To facilitate

recycling, residents are provided with containers for recyclable items (glass, aluminum, paper, etc.), for green/yard waste, and for all other refuse material. The City also helps to promote and encourage recycling by its residents with a monetary award through the Recyclers of the Month program.

With an environmental consciousness among its residents coupled with state mandates requiring reductions in the amount of refuse that is diverted to landfills, the limited potential future population increase in the City should pose no problems in relation to collection of refuse.

4.3 Flood Control and Storm Drain Systems

The flood control infrastructure is a system of channels and drains in selected locations that guide and control the flow of surface water that results from natural or man-caused factors.

The City is in the Los Angeles Flood Control District. The Flood Control District was established to provide flood protection, water conservation, recreation, and aesthetic enhancement within its boundaries and is the responsibility of the County Department of Public Works. The Watershed Management Division is the planning and policy arm of the Flood Control District. The County Department of Public Works Flood Maintenance and Water Resources Divisions, respectively, oversee its maintenance and operational efforts.

In 1998, a Master Plan of Drainage was developed and subsequently updated in 2004 (2004 Master Plan; County of Los Angeles 2004). In 2015, the City updated the Master Plan of Drainage acknowledging and taking into account the modifications and/or additions to the storm drain system that have occurred since publication of the 2004 Master Plan. The updated Master Plan covers estimates to correct the deficiencies found in a citywide study of various pipes that make up the system. A 10-year spending program has been developed in order to address deficiencies in the storm drain system.

The impacts of existing and future flood control networks are mainly related to pollution and erosion at flood control/natural system interfaces and to visual quality. Pollutants that can enter the natural environment include petroleum products, fertilizers, pesticides, and other chemicals. These pollutants are generally washed from impervious surfaces, such as streets and driveways, through gutters, drains, and flood control channels into natural systems and eventually into the ocean, thereby causing damage to the ecosystem. Unfortunately, little can be done to alleviate this problem. Strict enforcement of litter and pollution regulations is the best control method at this time. Excessive erosion at the interface, on the other hand, can and should be controlled. This condition is caused when water that is being carried in a concrete channel is allowed to gain an unnatural velocity and then meets the comparatively soft and irregular conditions of the natural system, thereby creating excessive erosion. The techniques used to slow the water are relatively inexpensive and easily installed. Some of the most fundamental methods include digging a small horizontal ditch fairly close to the upper edge of the property to drain into a natural watercourse, onto street pavement, or to a well-vegetated area, or creating a water resistance system such as protruding rocks or buffers located immediately before the interface areas. Distributing straw or wood chips onto soil helps increase the organic content and is effective in holding the soil in place. Additional temporary flood protection on hillsides or slopes can be achieved by using inexpensive plastic sheeting, which should be overlapped like shingles and securely tied or weighted down so that the majority of the water does not reach the soil. Shrubs may be planted through the plastic sheeting and perennial grasses can be used for unstable soil areas.

The flood control/storm drain system is not a continuous system of networks that have a common origin; rather, it is a system composed of a discontinuous series of individual networks. Most of the City drainage facilities were constructed by the County Department of Public Works prior to incorporation of the City. There are a number of facilities still owned and maintained by the County Department of Public Works. In 1998, the City completed a comprehensive Master Plan of Drainage, which was later updated in 2015.

Additionally, the City's largest project to date—the San Ramon Canyon Storm Drain Project, which involves the construction of significant drainage restoration work to stabilize Palos Verdes Drive East and Palos Verdes Drive South—was completed in 2014.

The fiscal impact of future flood control networks will be borne by the City. Methods that could be used to minimize cost include:

- Retention of natural watercourses, where practical;
- Planning for low densities in floodwater-generating areas and floodwater-impacted areas; and
- Coordination between communities and agencies that impact each other.

4.4 Communication Systems

The communication component of the City infrastructure system is a multifaceted and highly complex system of resource facilities and networks that aid in the support of our economy and lifestyle. Once considered no more than luxuries or convenience items, communication systems have developed into a very necessary function of our society. Communication systems disseminate news and information, relay personal and business messages, provide audio and visual entertainment, and are a crucial tool for transmitting and receiving emergency messages.

The communication systems were divided into two basic categories. The first category is cable transmission systems, in which the transmission network is an element of the physical infrastructure, for example, telephone and cable television systems. The second category is broadcast communications, which consists of those systems that primarily use the airwaves to transmit signals. This category includes radio, broadcast television, and microwave systems.

Cable Transmission Systems

Telephone/Wireless Telecommunication. The telephone is the most accessible and widely used communication system available to the public. The City is served by Verizon and AT&T for their landlines. However, individuals can contract their cell phones and laptops with any company of their choice and are not limited to Verizon and AT&T. Wireless companies are always improving the wireless communication in the City through the construction of cell towers. Both Verizon and AT&T are private utilities, and as such, must operate and set rates in accordance with the standards and regulations of the California Public Utilities Commission. Verizon services most areas of the City, while AT&T services the eastern portion of the City that was annexed in 1983. With the advancement of wireless telecommunication technology, carriers continue to update existing facilities and telecommunication antennas are installed primarily in the public right-of-way, and in some cases on private property.

The telephone system in the City consists of a network of transceivers (telephones), transmission lines, and switching centers. The configuration of the telephone communications network is defined as a modified linear system; that is, a major line to which all branches are directly attached. Verizon has one switching center in the City (5841 Crest Road), which allows connections to and from other telephone companies. Both Verizon and AT&T currently have the standard copper lines and the newer fiber-optic lines (FIOS (Verizon) or U-Verse (AT&T)) available to customers. Unlike the classic copper lines that only service landline telephones, FIOS/U-Verse allow a single strand of fiber to support high-speed Internet, video, and telephone.

The environmental impacts that result from the telephone networks are analogous to those experienced with the electrical power infrastructure. Because the systems most often use corresponding spaces, the impacts are the same. As discussed previously, the key impacts are related to the use of overhead wires, which are visually unattractive and can be a safety hazard. Both Verizon and AT&T indicated that due to high costs, there are no plans to underground the existing utility lines. The fiscal impact of conventional telephone communication

(maintenance, installation, and service costs) is absorbed by the customer, and rate increases will be subject to regulation by the California Public Utilities Commission.

Cable Television. Cable television is a system by which television is provided to consumers via radio frequency signals transmitted through fixed optical fibers or coaxial cables located on the subscriber's property. A majority of the cable television companies are also offering high-speed Internet, digital telephone, and similar non-television services. In the City, cable television is supplied by Verizon, AT&T, and Cox Communications. All three companies use fiber-optic lines to provide instant access to numerous television channels, high-speed Internet, and digital telephone for their customers. There is also satellite TV provided by companies such as DirectTV and DishNetwork, who can provide similar access to television channels. The difference is that with satellite TV, a satellite dish will need to be installed. The City cannot restrict the installation, maintenance, or use of antennas used to receive video programming per the Federal Communications Commission's Over-the-Air Reception Devices rule. The rule applies to video antennas, including direct-to-home satellite dishes that are less than 1 meter in diameter, TV antennas, and wireless cable antennas.

Broadcast Communications

Broadcast communications are those systems that have no wires or transmission lines, but rather transmit signals through the airwaves. Of the three primary broadcast systems, radio and television are by far the most popular, while microwave remains a more specialized communications medium.

Radio and television communication systems are operated by privately owned companies that supply free audio and audio/visual communication to people with appropriate receivers. These broadcast systems are used primarily for the dissemination of news, information, and entertainment. No transmission facilities exist in the City.

The County currently owns and operates a microwave station near the intersection of Highridge Road and Crestridge Road. The facility is a broadcast communication system designed to relay signals to and from the Rancho Palos Verdes area. The prime users of the facility are the County Fire and Sheriff Departments and other County agencies. The impact of broadcast systems in the City is considered to be relatively small and is related primarily to the adverse visual qualities of the microwave antennas, which can be mitigated through the use of landscaping techniques.

5 Military Airports and Ports

There are currently no airports or ports in the City designated for military purposes. However, the United States Coast Guard is located next to the Point Vicente Interpretive Center. The U.S. Coast Guard often utilize the coastal cliffs, Point Vicente Interpretative Center, and City Hall to conduct training exercises.

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