

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 General Plan. The element also has a role in planning for the future with regards 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. Their location and nature 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.” While not all inclusive, the Rancho Palos Verdes' Circulation Maps illustrate arterials, collectors, and local streets; bus routes; public transit routes, bikeways; and trails.

The purpose of this element is to present a plan to ensure that transportation, including public transportation services, and utilities, are constantly available to permit orderly growth and to promote the public health, safety, and welfare. The 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 retrofit) 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 utilizing complete street concepts to integrate the needs of all users of the roadway system consistent with the California Complete Streets Act of 2008 (AB 1358).

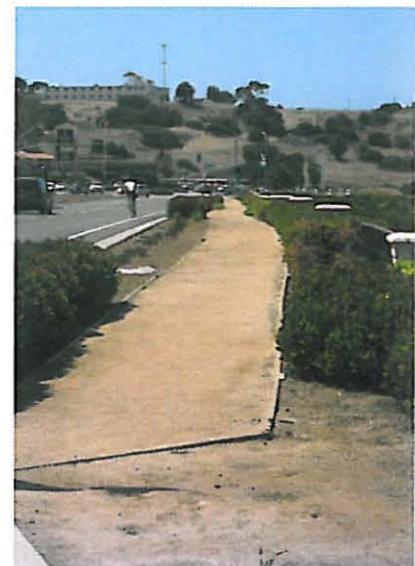
Goals

To set the context of the Circulation Element, the following are its goals:

1. ~~It shall be a goal of the City to~~ Ensure adequate public utilities and communication services to all residents, while considering environmental, aesthetic and view impacts.
(PLANNING COMMISSION RECOMMENDED CHANGE TO GOAL)
2. ~~It shall be a goal of the City to~~ Provide and maintain a safe, efficient and comprehensive system of roads and trails, and to coordinate them with other jurisdictions and agencies.
(PLANNING COMMISSION RECOMMENDED CHANGE TO GOAL)
3. ~~It shall be a goal of the City to~~ Facilitate mobility of residents through an adequate public transportation system with consideration of the City's demographics.
(PLANNING COMMISSION RECOMMENDED CHANGE TO GOAL)
4. ~~It shall be a goal of the City to~~ Work with other jurisdictions and agencies to ensure that there are adequate storm drain, water systems and sewer systems to serve the residents.
(PLANNING COMMISSION RECOMMENDED CHANGE TO GOAL)
5. Where appropriate, utilize complete street concepts to integrate the needs of all users of the roadway system consistent with the California Complete Streets Act of 2008 (AB 1358).
(PLANNING COMMISSION RECOMMENDED NEW GOAL)

Transportation Systems

The transportation component of the City's infrastructure consists of integrated networks and modes which 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 make this component the most dominant and complex component of the entire infrastructure. Because of functional complexity and diversity of impacts, the transportation component must be looked at differently from the other infrastructure components. For example, other components are discussed primarily from the standpoint of the network, with little mention of distribution mediums, whereas the character of the transportation





component requires that equal consideration be given to both networks and their associated modes alike. Furthermore, some of the transportation networks and modes, unlike other infrastructure components, overlap physically as well as functionally.

The transportation infrastructure has been divided into three major elements. Each element is discussed in terms of the individual networks which make up an element and the modes which utilize these networks. The three elements include:

- Vehicular Networks
- Public Transportation
- 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 Rancho Palos Verdes alone.

Vehicular Networks

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

Of particular concern in the development of this Plan are the potential effects on adjacent and outlying communities. It was recognized at the outset of the planning process that the cumulative effect of Rancho Palos Verdes traffic on roads outside this jurisdiction is of mutual interest in 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 which is so much a part of travel in Southern California. The Harbor and San Diego Freeways act as principal links to commuters and to distant points.

City of Rancho Palos Verdes General Plan

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

Arterial, Collector, and Local Streets

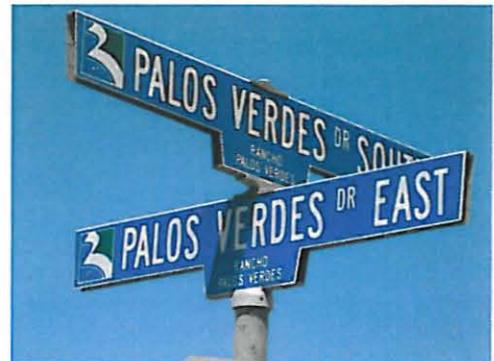
Of all the infrastructure components, the network of streets and associated components (parking) are the most dominant and complex of all service oriented systems. Rancho Palos Verdes, like all of Southern California, is almost totally dependent upon the system of roads on which our private and service 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. The result of developing a street system purely on standardized design criteria would have a severe impact upon 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 are 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 Rancho Palos Verdes 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. Arterials are typically characterized by both two-lane and four-lane undivided roadways.

Within the Rancho Palos Verdes City limits, the following streets function as collectors:

- Indian Peak;
- Ridgegate Drive;
- Granvia Altamira; and,
- Montemalaga Drive.



Local. Local streets are minor networks that have the principal function to provide access to adjoining property. 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 (shown in figure XX) on the Peninsula is a result of several factors. The first, and perhaps the most important, is geographical location. The fact that Rancho Palos Verdes 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 Drives 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.

City of Rancho Palos Verdes General Plan

A detailed analysis of the existing street system within Rancho Palos Verdes was performed on July 19, 2010 and is summarized in this document. 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 unacceptable Levels of Service (LOS E or F). Traffic impacts are determined through assessing traffic volumes at intersections and roadway segments, and assigning a Level of Service (LOS). A 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 or F are unacceptable levels during the AM peak hour and/or the PM peak hour. Congestion at 22 of the highest traffic intersections was measured resulting in 18 of 22 operating at acceptable levels.

However, the following four intersections are currently operating at unacceptable levels of service:

- Grayslake Rd.—Highridge Rd., at Hawthorne Blvd
- Forrestal Dr.—Ocean Trails Dr., at PV Drive South
- PV Drive East, at Miraleste Drive
- PV Drive East, at PV Drive South

There are 28 roadway segments studied through the traffic analysis for the general plan update. The existing LOS of the 28 roadway segments assessed reveals that 20 roadway segments are currently operating at LOS A; two are operating at LOS B; one is operating at LOS C; and, two are operating at LOS D (LOS A thru D are acceptable Levels). The following three roadway segments are currently operating at unacceptable levels of LOS F:

- Hawthorne Boulevard – Indian Peak Road to Grayslake Road/Highridge Road
- Palos Verdes Drive East – North City limit to Miraleste Drive
- Palos Verdes Drive South – Palos Verdes Drive East to East City limit



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, build-out of the remaining 439 vacant developable parcels (436 of which are 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 build-out 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 within 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 build-out.

Planned roadway and intersection improvements were also included in the future growth analysis. 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 within the City of Rancho Palos Verdes. The design and maintenance of private streets is not the responsibility of the City, and 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 build-out 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. Notwithstanding, some of the intersection 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. As such, incorporating improvements by build-out year 2035 will help mitigate the increase traffic volumes resulting from ultimate build-out.

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 to be distorted, warped and broken, which impacts the smooth flow of traffic through this area of the City. However, the City spends approximately \$500,000 annually (Fiscal Year 2008-2009) in repairs and maintenance to 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 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 is the San Ramon Canyon. The erosion of San Ramon 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 the San Ramon Canyon, the City has engaged in its largest and most expensive (\$20 million) public works project ever – a tunneled system that will transfer water in San Ramon Canyon to the Ocean. Construction on the project began in 2013 and is expected to be completed in 2014.





Relation to Air Quality

Air pollution on a local level is induced by various sources, including vehicular traffic, emissions associated with short-term construction of development projects, specific types of equipment, paints and solvents, and even consumer products. Air quality in the City has been relatively good due to the topography, despite the increase in population and cars since incorporation.

In 2005, 78,681 metric tons of CO₂ were generated from travel activities originating within the City's boundaries and traveling to a destination outside of the community; more emissions, 80,301 metric tons of CO₂, were generated by travel that started outside of the City and ended within the City's boundary. A small portion of emissions (7,080 metric tons of CO₂) can be attributed to vehicle trips that started and ended within the boundary. The majority of on-road travel emissions (94%) are from gasoline powered passenger vehicles while the remaining (6%) are the result to diesel powered vehicles. Emissions related to off-road vehicles, such as lawn, garden, construction, industrial and light commercial equipment make up about 1% of the total emissions.

Since 1990, studies (SBCCOG, 2011) have shown declines in emissions primarily due to increased fuel efficiency of gasoline powered passenger vehicles. In 1990, the average mpg (miles per gallon) for passenger vehicles was 15.945 and in 2005 the average mpg was 18.61. That is a 16.71% improvement in fuel efficiency from 1990 to 2005.

According to the air quality study (LSA, 2010), with a built-out scenario that estimates the impact following the development of all vacant lots in the City, an increase of 58,000 metric tons of CO₂ will be generated from travel emissions. If the population increases at the same rate while the fuel efficiency continues to improve, a further decline in emissions can be expected in the future years.

Despite anticipated decline in future emission levels, there may be localized air quality impacts at congested roadways and intersections. The primary source of CO₂ is vehicle idling time and related traffic flow conditions. Typically, high CO₂ concentrations are associated with extremely high traffic volumes, normally occurring during peak traffic hours. Based on a Traffic Impact Analysis (Wildan Engineering, July 19, 2010) for the existing and built-out scenarios, the CO₂ concentrations at various signalized intersections at peak traffic conditions will remain below the corresponding

State and Federal CO₂ standards. Therefore, no significant impacts on local air quality for CO₂ are anticipated in the future years.

Relation to Noise

Excessive noise is an adverse impact which is difficult to mitigate except at the source, which, in the case of vehicles, is extremely difficult to accomplish at the local level. However, there are techniques which can be implemented at the local level to reduce traffic noise impacts. For outdoor activity areas (i.e., yards, patios, etc.) within the 65 dBA CNEL contour, a sound wall with a minimum wall height of 5 ft could be provided to reduce the exterior noise levels for residential or other noise-sensitive land uses. To meet the State's 45 dBA CNEL interior-noise standard and to achieve the indoor air-exchange ventilation requirements specified in the Uniform Building Code, all residential structures within the 65 dBA CNEL contour along major roadway segments that do not have shielding from natural or manmade barriers could have mechanical ventilation to ensure that windows can remain closed for a prolonged period of time. In addition, residential homes proposed within the 65 dBA CNEL contour along major roadway segments that have no natural or manmade barriers providing shielding effect could have building façade upgrades (i.e., double-paned windows, solid-core wood doors, etc). See the Noise Element for a depiction of the 65 dBA CNEL contours and additional information regarding traffic noise impacts and possible efforts to address those impacts.

Public Transportation

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

PV Transit provides a fixed route and dial-a-ride services on the Palos Verdes Peninsula. The fixed route service includes eight 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.



The dial-a-ride service goes off the Palos Verdes Peninsula for medical purposes. The service goes to all hospitals, medical buildings, and doctors offices in Torrance, Harbor City, San Pedro, and Redondo Beach.

Taxi service is available on the Peninsula; however, due to the relatively high expense, few residents rely on this system for daily transportation needs.

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 functioning as an integral part of the transportation network. The recreational and environmental amenities found on the Peninsula and within 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. Figure XX illustrates the current trails and paths within Rancho Palos Verdes.

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 utilized to integrate the needs of all users of the roadway system consistent with the California Complete Streets Act of 2008 (AB 1358).

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.

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 typified as natural paths providing recreational opportunities that meander with the topography through open space areas and providing access to and through natural environs, sidewalks are

City of Rancho Palos Verdes General Plan

characterized by their hard concrete or asphalt surfaces and continuous configuration adjacent to roadways.

The Public Works Department is charged with the maintenance of the existing sidewalk system. During 2010, the City implemented a gap closure project along Hawthorne Boulevard, from Palos Verdes Drive West to the City border. The goal of the gap closure project is to provide connectivity between sidewalk segments, and most importantly, to provide paved sidewalk connections to bus and transit stops.

The Public Works Department has an annual sidewalk repair program to ensure the continual maintenance of the existing sidewalk system. The intent of this program is to correct potentially hazardous portions of existing sidewalks, driveway approaches and parkways which could pose a problem to pedestrians. The City has established a program to help assure that the damaged improvements 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 ADA compliance and consistency with applicable laws and design standards.

The Vision Plan also identified the enhancement of pedestrian pathways along roadways either through the development of city standard sidewalks or permeable paving such as decomposed granite, where appropriate (i.e., trails, as discussed above). In addition, the Vision Plan identifies the need to separate pedestrians from the roadway where the right-of-way is most constrained by using attractive barriers or edge/parkway planting. To implement a portion of the Vision Plan, in 2009 the City adopted a Capital Improvement Plan (CIP), which is a guide for the efficient and effective provision of resources for improving and maintaining public infrastructure and facilities. The CIP 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.

On January 7, 2010, the "Palos Verdes Drive East Preliminary Study Report" was completed. The report identified key areas for safety improvements along the Palos Verdes Drive East (PVDE) arterial and to serve as a planning tool for the CIP. The study reviewed the existing facilities and conditions of the Palos Verdes Drive East arterial; evaluated the feasibility of installing multi-modal facilities along PVDE; identified key areas with safety concerns and propose possible improvements.



Pedestrian Trails

While sidewalks are typically known for their impervious surfaces paralleling streets and roadways, pedestrian trails are nodes that are typically identified by their pervious surfaces and are typically paths that do not parallel a street or roadway; rather, these nodes typically traverse open space area to offer a more natural experience and enjoyment. These pedestrian trails also connect their user to natural and scenic points on the peninsula that can only be attained by foot due to topographic and/or environmental sensitivities that make it inappropriate to be accessed by motorized vehicles or by other means.

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

Equestrian Trails

Since the time of the earliest settlers, the horse has been a part of life on the Palos Verdes Peninsula. First used primarily for utilitarian purposes, such as basic transportation and aiding in farm activities, the function of the horse is now 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 may only take place in certain locations.

Within Rancho Palos Verdes, two general locations now support major concentrations of horses and limited equestrian trails. They are: the East side and the Portuguese Bend area. The equestrian trails in the Conceptual Trails Plan were identified to provide a designated trail 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 with the path and trail networks within the City of Rancho Palos Verdes. 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 utilized 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 (CTP) was last updated in 1993, the CTP has been augmented by additional documents. Thus, the current Trails Network Plan consists of the following documents:

- Conceptual Trails Plan (1993);
- Conceptual Bikeways Plan (1996);
- Preserve Trails Plan (2008); and,
- Coast Vision Plan (2009)

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 into the Conceptual Trails Plan does not legally grant the use of the trail by the public or in any way guarantee their eventual implementation.



In August 2004, the City Council approved the NCCP subarea plan for final review and approval by the Resource Agencies. The Council-approved NCCP requires the City and the Palos Verdes Peninsula Land Conservancy to develop a Public Use Master Plan (PUMP) document that identifies how public use of the Preserve should be managed. Specifically, the PUMP is to address issues such as public access, trailhead locations, parking, trail uses, fencing, signs, and other issues that may arise. As part of the PUMP preparation process, a Preserve Trails Plan was adopted by the City Council in April 2008 that identifies the permitted trail routes and the permitted trail uses (pedestrian, equestrian, and bicycle) within the Palos Verdes Nature Preserve. Adoption of the Preserve Trails Plan augments the Conceptual Trails Plan.

The Conceptual Trails Plan was further augmented with the 2009 adoption of the Coast Vision Plan. The Coast Vision Plan includes components to



establish a continuous coastal access trail linkage through the City's Coastal Zone, implementing the 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 bicycle.

In summary, the Coast Vision Plan, the Public Use Master Plan's (PUMP's) Preserve Trails Plan, and the NCCP 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.

Conceptual Bikeways Plan

The Conceptual Bikeways Plan identifies bikeway opportunities within the community to facilitate the acquisition and development of new bikeways through development proposals, Public Works projects, and voluntary efforts. This plan was developed with 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 bicyclist concerns. Bicycle safety is jeopardized due to bike/auto and bike/pedestrian confrontation on the street, and the lack of space given over to bicycle movement. Conflicts between bicycles 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.

Bicycling has, for many years, 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 commute trips occur within the City due to the ratio of jobs to population. As is the case for many cities through the nation, the number of commute trips is expected to grow with the growth in population. It will likely remain insignificant within the City of Rancho Palos Verdes 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 due to the picturesque nature of the Peninsula and the views to be enjoyed while utilizing the various bikeways. Several of the bikeways can be categorized as semi-regional in nature since riders from beyond the Peninsula either ride or drive here expressly to ride along the bikeways and streets.

The Conceptual Bikeways Plan, shown in **fig aaa**, 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 recent adoption and implementation of the Vision Plan, PUMP and the Trails Plan, there is a need to update the Conceptual Bikeways Plan. The update must analyze and identify opportunities to provide connections and linkages from the bikeway network to the multi-use trails identified in the Vision Plan and the PUMP. While no attempt is made here to designate specific designs for the Conceptual Bikeways Plan update, it could be consolidated with the Conceptual Trails Plan to create a comprehensive Trails Network Plan. The following goals should be considered in the comprehensive Trails Network Plan.

- Create an efficient, safe, and enjoyable bikeway system that separates conflicting locomotion modes.
- Where possible, design on the street, bikeways to flow with traffic and be designated with painted indicators or signs, rather than curbs or other physical devices.
- Minimize or restrict parking on bikeways.
- Locate scenic and recreation routes sufficiently far away from bluff and canyon-hazard areas for safety.
- Design a system of standardized signs should be established throughout the Peninsula.
- Utilize complete street concepts to integrate the needs of all users of the roadway system, including cyclists.

Future Planning Efforts

As mentioned above, the Trails Network Plan (TNP) consists of a combination of a variety of individual documents. However, the



Conceptual Trails Plan and the Conceptual Bikeway Plan portions of the City's current TNP 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 Forrestal Nature Preserve, the Palos Verdes Nature Preserve, the coastal zone and adjoining areas, but there has been no comprehensive, citywide update to the TNP. 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 will be pursued and developed in 2014.

Infrastructure Systems

The existing infrastructure and infrastructure improvement plans meets the current needs of Rancho Palos Verdes. 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 the Infrastructure section.

Some of the problems, however, are common to many or all infrastructure systems. The Portuguese Bend slide area was found to be the major problem area regarding infrastructure function. All infrastructure networks, to some degree, utilize the slide area for right-of-way. Because the earth is constantly moving in that area, all networks are above ground 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/below-ground 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 wide band 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 technologic advancements as well as that associated

with build-out and increased population. The infrastructure system is constantly being maintained, modified, repaired, upgraded, and/or extended by the appropriate provider to meet demand. The ultimate build-out and increased population will not create a significant adverse impact on the infrastructure system since the population increase resulting from build-out will not be substantial. Further, requirements on developments 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 also indicated.

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 (fire)
- Human consumption (drinking, food preparation)
- Ground maintenance (landscaping)
- Urban activities (sewage medium)

The water needs of the City of Rancho Palos Verdes and the remainder of the Palos Verdes Peninsula are currently served by the California Water Service Company (Cal Water). Operating within the regulation and standards of the State 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 that is 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 of Rancho Palos Verdes 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. Due to the range of elevation, the water system is also comprised 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" and the "Ridge" systems. 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 the 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 northeast 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 Pipeline 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 Pipeline Project were already realigned to address public concerns associated with traffic impacts. Pending the support of the public and approval of the Peninsula Cities and California Public Utilities Commission, construction is expected to begin in 2013 and be completed at the end of 2014.

Additionally, Cal Water released a draft Conservation Master Plan to expand existing conservation programs and develop new programs in the Palos Verdes District over the next five years, 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. In the past five years, per capita demand in the Palos Verdes district averaged 284 gallons per day, exceeding the statewide average by 48%. This demand is projected to increase by 0.4% by 2015 and 0.8% by 2020. Conservation will not only aid in meeting increased demands, 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. More specifically, the purpose and intent of the Ordinance is to:

- 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 fifty percent in total area;
- Promote water management practices and water waste prevention for existing landscapes; and
- 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. 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 Rancho Palos Verdes customer. Many of the functions of natural gas and electricity are interchangeable. That is, natural gas or electricity can both be used for cooking appliances, house heating, etc. Natural gas and electricity systems are individually summarized in subsequent paragraphs of this discussion.

Natural Gas. Southern California Gas Company (SCG) is a regulated subsidiary of Sempra Energy that furnishes natural gas to the Palos Verdes Peninsula. Although part of the larger Gas Company system, Rancho Palos Verdes is included within two SCG distribution sections, which function principally as sub-administrative districts and are responsible for all lines and service systems which 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 Palos Verdes Peninsula area. Natural gas networks, on the other hand, consist of the physical infrastructure in place within 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 made up of distribution



lines (supply, headers, and mains), regulating stations, isolation valves, and extremity gauges.

Discussions with representatives of SCG 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 above ground to facilitate constant inspection and periodic maintenance. Otherwise, no areas of significant deficiencies were found within the city.

Southern California Gas Company utilizes an integrated grid system for much the same reasons that the California Water Service Company area does—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 in Rancho Palos Verdes) to the distribution network which supplies Rancho Palos Verdes customers.

The facilities which supply and distribute natural gas to Rancho Palos Verdes customers appear to be satisfactory meeting the present demand. Further expansion of the natural gas infrastructure will be wholly determined by future growth patterns; however, future growth would come from build-out of the remaining 439 vacant developable parcels (436 of which are single-family residential) in the City. Since the infrastructure is in place, build-out 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 SCG 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 the colder times to retain heat, and turning off unnecessary lights.

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

City of Rancho Palos Verdes General Plan

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

The electric infrastructure is made up of resource facilities and a distribution network. Rancho Palos Verdes is currently served by three resource facilities, two of which are located within the City of Rancho Palos Verdes. The power distribution network consists of major source lines which 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 Rancho Palos Verdes is designed as an integrated grid system, principally for ease of maintenance and uniform current flow; however, these factors are not as acute as that of the water infrastructure.

At the present time, the electrical power needs of Rancho Palos Verdes are being adequately met by SCE. The only problem area associated with the electrical component of the urban infrastructure exists in the Portuguese Bend slide area since they 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 Rancho Palos Verdes environment is considered to be small, overhead transmission lines, transformers, and associated poles do pose significant adverse visual qualities 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 man-caused conditions such as automobile accidents, thereby creating power outages and, in some cases, safety hazards if severed or broken. In addition, overhead wires are an unsightly vestige of a necessary infrastructure component, and cause considerable disturbance to views. Efforts to minimize the above impacts are being undertaken by SCE through the undergrounding of most new distribution networks, when economically and physically feasible. Additionally, the City's Development Code requires all utility lines installed to serve new construction and significant remodels to 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 and are being undergrounded.

Southern California Edison (SCE) is the nation's largest purchaser of renewable energy from wind, solar, biomass, geothermal and small hydrogen suppliers, which makes up approximately 16% of the power delivered to its customers. Southern California Edison has begun construction of the nation's largest wind transmission project. When completed, this project will be capable of delivering additional electricity from wind farms and other generating companies. Currently, SCE has sufficient contracts in place that, when delivered, will meet 20% or more of its customers' energy need with renewable energy. In addition, SCE is investing in grid technologies to enable the delivery of more renewable energy into the electricity supply, provide customers more power to control their energy use and costs, and 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. A significant milestone that SCE completed was the installation of smart meters to residential customers in 2011. Smart meters enable customers to monitor the electricity use and costs online in hourly increments for households and 15-minute increments for businesses. Continuous research and resulting advances in technology will help conserve even more energy and prevent depletion of a valuable resource.

Although SCE is able to meet the current energy needs of the City, 465 new housing units are projected based on a built-out scenario, after development of the remaining vacant land in the City (Traffic Impact Analysis – Willdan Engineering, 2010). According to SCE, the existing energy system will be able to support the additional housing units, if the annual growth rate remains similar to the previous years. This is because SCE is continuously upgrading and researching methods to preserve and provide more energy to meet future needs of the City.

Disposal and Recovery Systems

Sanitation

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

City of Rancho Palos Verdes General Plan

Sewer Systems: The City owns the sewage collection system; however, maintenance of the system is a joint effort between the City and the County. With regards to the Abalone Cove sewer system, this is the only system that is currently owned, operated and maintained by the City of Rancho Palos Verdes.

The Sanitation Districts of Los Angeles County operate ten water reclamation plants (WRPs) and one ocean discharge facility (Joint Water Pollution Control Plant), which treat approximately 510 million gallons per day, 200 mgd of which are available for reuse. The Joint Water Pollution Control Plant (JWPCP) is located in Carson, California. The JWPCP 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 million gallons of wastewater per day. This plant serves a population of approximately 3.5 million people throughout Los Angeles 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 two miles off the Palos Verdes Peninsula to a depth of 200 feet.

The County Sanitation Districts- of Los Angeles County (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 Rancho Palos Verdes for the maintenance and repair of the sewer system. With the exception of Abalone Cove, since incorporation the County has maintained the sewer system located in the City. In regards to the Abalone Cove area, the maintenance and repair responsibilities are borne by the City of Rancho Palos Verdes. Maintenance and repair activities that the Los Angeles County Department of Public Works, Consolidated Sewer Maintenance District (LACSMD) perform, 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 (totaling approximately \$300,000 in FY2008-2009). Although the City owns the sewer collection system, the Los Angeles County Department of Public Works is responsible for the continuing operations of sewer collection system and to identify and correct pipeline capacity related problems found within the system.

Within the City of Rancho Palos Verdes, there are approximately a total of 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. The gravity pipe ranges in size from 8 inches in diameter 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, with the exception of the Abalone Cove landslide area, are responsible for the operations and maintenance of their individual service laterals.

Abalone Cove Sewer System: The Abalone Cove Sewer System is currently owned, operated and maintained by the City of Rancho Palos Verdes. Since the City is responsible for all aspects of operating and maintaining this system, the City collects a fee from property owners through the Abalone Cove Sewer Fee.

The Abalone Cove sewer system consists of 44 grinder pumps, with 14 of them serving one parcel and 3 duplex grinder pumps serving two or more residences. The three duplex grinder pumps are located on Abalone Cove Shoreline Park, off of West Pomegranate Drive, and off of Vanderlip Road. The system was installed in 2001 to replace septic systems in landslide areas. There are 130 manholes, 1 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 range from 1.25 inches to 4 inches in diameter.

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 pipe is generally accepted as 50 years. This leaves the remaining design service life for most of the system at less than 10 years. As a result there will most likely be an increasing trend in pipe structural failures with time.

City of Rancho Palos Verdes General Plan

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 Master Plan was updated in 2004 to comply with the 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. The capacity analysis that was performed on the system revealed eight (8) 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. It was determined that the full operational costs associated with the system should be further evaluated.

The collection system has been thoroughly re-evaluated through a combination of physical inspection, data analysis and computer modeling. Three primary needs have been identified, which are related to (1) 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 knowing 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 through updating the separate Abalone Cove Sewer System element of the City's Sewer System Management Plan. 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 of Rancho Palos Verdes has little developable land left, the future flow predictions will not increase significantly compared to the current flow. According to the US Census data, the City's population increased by approximately 1.2% between 2000 and 2010, resulting in a population figure that is similar to the City's population in 1990. However, according to the Department of Finance, the City's population is predicted to increase to 44,893 in 2030 as compared to 41,643 in 2010. This represents an increase of approximately 5.5% over the next 20 years, which is a negligible increase that will result in a negligible increase in demand for such service.

Solid Waste

The collection of refuse in Rancho Palos Verdes is a service which 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 acts 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 wastes from customers and the delivery of wastes to the landfill, where it is disposed of.

Disposal of solid waste occurred at the Palos Verdes Land Fill, which operated under permit by the Sanitation 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, which 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 Rancho Palos Verdes should pose no problems in relation to the collecting of refuse.

Flood Control and Storm Drain Systems

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

The City of Rancho Palos Verdes is within 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 of Los Angeles Department of Public Works. The Watershed Management Division is the planning and policy arm of the Flood Control District. The Public Works Flood Maintenance and Water Resources Divisions, respectively, oversee its maintenance and operational efforts.

In 1998, a Master Plan of Drainage was completed. The document identified deficiencies in the City's storm drainage system and recommended various improvements and corrections to the system. Subsequent to this Master Plan, a detailed drainage study was prepared for Palos Verdes Drive East, between Ganado Drive and the City's northern border. The study provided updated hydrology and developed preliminary plans for the subject area, and ultimately concluded that there was a need for additional storm drain facilities in the Palos Verdes Drive East area than what was concluded in the 1998 Master Plan. In 2004, the City completed a Master Plan of Drainage Update. The Update acknowledged and took into account the modifications and/or additions to the storm drain system that occurred after the initial 1998 Master Plan, which included implementing recommendations of the 1998 Master Plan and various private developments that took place. These included various storm drains in the Trump National Golf Course and Ocean Front Estates.

There are a total six (6) drainage sub-basins within the City, named with the areas they are draining into, as follows:

NAME OF DRAINAGE AREA	TOTAL ACRES
Los Angeles Drainage Area	2,820
Ocean South Drainage Area	3,330



Ocean West Drainage Area	710
Palos Verdes Estates West Drainage Area	1,100
Palos Verdes Estates North Drainage Area	450
Rolling Hills Estates Drainage Area	500

Los Angeles Drainage Area

This basin is located in the eastern portion of the City, which is the oldest portion of the City. There are a number of natural canyons and various storm drain facilities that are owned and maintained by Los Angeles County Department of Public Works (LACDPW) in the basin. Some of the canyons are as follows; George F. Canyon, Miraleste Canyon, San Pedro Canyon, Averill Canyon and Tarapaca Canyon.

Because of the drainage patterns and age of some of the improvements, this basin has more drainage deficiencies that were identified in the 1998 Master Plan of Drainage and later reports. There are a total of twenty-eight (28) short crossings along Palos Verdes Drive East (i.e., drainage segments that cross the roadway).

Ocean South Drainage Area

This basin covers the most area among the other drainage areas. This area includes the Portuguese Bend landslide complex, Trump National Golf Club Area, and substantial undeveloped hilly areas.

Since Palos Verdes Drive South traverses this drainage area, a total of thirty-four (34) short crossings (including the McCarrell Canyon drainage facility) are required. These crossings are either corrugated metal pipe (CMP) or reinforced concrete pipe (RCP). Although some of them may have hydraulic capacities to convey the flows, their physical conditions have deteriorated. Concurrent with the 2004 Master Plan of Drainage Update, the City developed a system of relining the hydraulically sufficient but structurally deficient pipes.

Ocean West Drainage Area

The Ocean West drainage area generally consists of single family dwelling units and fairly large open spaces. It is comprised of approximately 700 acres. This drainage area also includes Los Verdes Golf Course, which some of the larger Los Angeles County drainage facilities originate, and portions of Point Vicente Park.

Palos Verdes West Drainage Area

This area drains to the City of Palos Verdes Estates in a westerly direction. As in other drainage areas, there are number of LACDPW facilities. The drainage area generally consists of single family residential land uses, with some multi family residential land uses along Hawthorne Boulevard. Agua Amarga Canyon is the major drainage course in the drainage area. It crosses Hawthorne Boulevard and leaves the City boundary and outlets to Lunada Bay in Palos Verdes Estates.

Palos Verdes North Drainage Area

This drainage area consists of approximately 450 acres. It drains northerly to the City of Palos Verdes Estates. Of all the drainage areas, this area contains the minimal number of facilities owned by LACDPW. Most of the drainage area drains to the Palos Verdes Golf Club in Palos Verdes Estates. The area generally consists of single family residential land uses.

Rolling Hills Drainage Area

This area is comprised of approximately 500 acres, and drains northerly to the City of Rolling Hills Estates. There are various County owned facilities in this area. The land use is predominantly single family residential.

The impacts of existing and future flood control networks are basically related to pollution and erosion at flood control/natural system interfaces in addition to visual quality. Pollutants which 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 which is being carried in a concrete channel is allowed to gain an unnatural velocity, 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. One of the most fundamental methods includes digging a small horizontal ditch fairly close to the upper edge of the property to drain into a natural watercourse, onto street pavement, 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 to 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 gained by using inexpensive plastic sheeting that 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 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 which have a common origin, but rather it is a system comprised of an intermittent series of individual networks. Most of the drainage facilities were constructed by the Los Angeles County Department of Public Works prior to incorporation of the City. There are still a number of facilities owned and maintained by the LACDPW. In 1998, a comprehensive Master Plan of Drainage was completed by the City, and in 2004 an Update to the Storm Drain Master Plan was prepared. The Plan identified serious storm drain deficiencies that required significant repair. The update identified a total of 38 high-priority projects, which was the basis for establishing a "user fee" that was approved by the voters in 2007. Most of the higher priority projects are located in the Los Angeles Drainage Area.

Some projects have been completed, with the most noteworthy being the McCarrell Canyon Storm Drain system, which was completed in 2009. Due to the inadequate size of the storm drain, the inlet would become overwhelmed in moderate rain conditions, resulting in water forced to cross Palos Verdes Drive South. Further, the outlet was an open drain that cascaded over the bluff down to the ocean. The McCarrell Canyon storm drain project was completed for safety and to protect property, and as a new "backbone" drainage system for McCarrell and Barkentine Canyons. The outlet was also modified to include a large diameter slant drain to the beach and pipelines connecting the existing pipes to the new system.

Another project that is currently under construction is 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. The City of Rancho Palos Verdes has been working with technical teams from the City of Los Angeles and Los Angeles County as well as local, state and federal elected officials to design solutions, secure funding and forge cooperation to move this project forward. The project should be 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 water courses, where practical
- Planning for low densities in flood water generating areas as well as flood water impacted areas
- Coordination between communities and agencies which impact each other

Communication Systems

The communication component of the City infrastructure system is a multifaceted and highly complex system of resource facilities and networks which aid in the support of our economy and life style. 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 to transmit and receive emergency messages.

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

Cable Transmission Systems

Telephone. The telephone is the most accessible and widely used communication system available to the general public. The City of Rancho Palos Verdes 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 Public Utility Commission. Verizon services most areas of the City while AT&T services the easterly portion of the City that was annexed in 1983.



The telephone system in Rancho Palos Verdes basically 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 within the City (5841 Crest Road), which allows contacts to and from other telephone companies. Both Verizon and AT&T currently have the standard copper lines and the newer fiber optics (FIOS – Verizon or U-Verse – AT&T) line available to customers. Unlike the classic copper lines that only service landline telephones, FIOS/U-Verse allows a single strand of fiber to support high speed internet, video, and telephone.

The environmental impacts which result from the telephone networks are analogous to those experienced with the electric power infrastructure. Because the systems most often utilize corresponding spaces, the impacts are one and 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 there are no future plans to underground the existing utility lines due to high costs. The fiscal impact of conventional telephone communication (maintenance, installation, and service costs) is absorbed by the customer, and rate increases will be subject to the Public Utilities Commission.

Cable Television. Cable television is a system of providing television 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 Rancho Palos Verdes, 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 to customers. There is also satellite TV provided by companies such as DirectTV and DishNetwork who can also provide similar access to television channels. The only 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 one meter in diameter, TV antennas, and wireless cable antennas.

Broadcast Communications. Broadcast communications are those systems which have no wires or transmission lines, but rather transmit

signals through the air-waves. 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 which supply “free” audio and audio/visual communication to those persons with appropriate receivers. These broadcast systems are used primarily for the dissemination of news, information, and entertainment. No transmission facilities exist in Rancho Palos Verdes.

The County of Los Angeles currently owns and operates a microwave station near the intersection of Highridge and Crestridge Roads. 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 Rancho Palos Verdes is considered to be relatively small and related primarily to the adverse visual qualities of the microwave antennas, which can be mitigated through the use of landscaping techniques.

Policies

Transportation Systems Policies

It is the policy of the City to:

1. Balance traffic impacts to residential neighborhoods with efficient traffic flow and public safety by implementing appropriate traffic-calming measures.
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.**

(PLANNING COMMISSION AND TRAFFIC SAFETY COMMISSION
RECOMMENDED CHANGE TO POLICY)

3. **Encourage synchronization and coordination of traffic signals along arterials.**



(PLANNING COMMISSION AND TRAFFIC SAFETY COMMISSION
RECOMMENDED NEW POLICY)

4. ~~Prohibit~~ Future residential developments shall provide direct access to roadways other than arterials. ~~from providing direct access (driveways) from individual units to arterials.~~

(PLANNING COMMISSION RECOMMENDED CHANGE TO
POLICY)

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 Trail 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, emergency or maintenance vehicles.
9. Require that all new developments, where appropriate, establish ~~walkway, bikeway and equestrian systems~~ paths and trails ~~where appropriate.~~

(NOTE TO COUNCIL: THE GENERAL PLAN UPDATE STEERING
COMMITTEE WANTED TO LET THE COUNCIL KNOW THAT
THEY VOTED 6 AYES TO 5 NOES TO AMEND THIS POLICY.)

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 cross-walk push-buttons at proper equestrian height levels where equestrian trails traverse signalized intersections.

(PLANNING COMMISSION AND TRAFFIC SAFETY COMMISSION
RECOMMENDED CHANGE TO POLICY)

12. Include safety measures such as the separation of uses, fences, signage, etc., in the design and construction of paths and trails.

City of Rancho Palos Verdes General Plan

13. Encourage the safe and courteous use of trails by educating users as appropriate.
14. Provide appropriate public access to the Rancho Palos Verdes shoreline.
15. Explore options to develop a City equestrian park.
16. Require adequate off-street parking for all existing and future development.
17. Develop appropriate ordinances to regulate street parking, parking on narrow residential streets, and parking of recreational, commercial and/or oversized vehicles.
(PLANNING COMMISSION RECOMMENDED CHANGE TO POLICY)
18. Coordinate and cooperate with school districts, and parent and community groups to provide safe and proximate access to schools.
19. 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 ~~thoroughfare in the collector or and arterial road network~~, (b) ~~An assessment district is established which will allow the district to levy taxes or legally enforceable assessments for road maintenance~~, (c) (b) Provisions are made to guarantee the future proper up-keep of the streets, (c) Dedication of non-vehicular easements may be required. (d) ~~Any required non-vehicular easements must be provided~~.
(PLANNING COMMISSION AND CITY ATTORNEY RECOMMENDED CHANGE TO POLICY)
20. 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:
 - a. Category I: (Definition: These trails are defined as existing, dedicated trails, which meet 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 which 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 which are located on existing trail easements, City property, or street rights-of-way and which require implementation or improvements). Require consideration by the 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 which 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 which would primarily benefit neighborhood residents, and which 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.
21. If City land is sold, any appropriate public access easement, restriction, reservation and/or right of way should be recorded.
22. Descriptions of relevant trails in the Trails Network Plan should be provided to potential applicants when inquiries for development are first made.

23. Design and construct new trails in accordance with the Trails Network Plan and other National, State and local standards, where appropriate.
24. When constructing paths and trails, require the use of construction techniques that minimize the impact on the environment.
25. Where appropriate, align trails to maximize access to scenic resources.
26. 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.
27. Consideration of the inclusion of bikeways in the Conceptual Bikeways Plan, or alternate approaches to provide access during project design is required in all Department of Public Works or Department of Recreation and Parks projects.

Infrastructure Systems Policies

It is the policy of the City to:

28. 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.
29. Allow new development only where adequate infrastructure systems can reasonably be provided.
30. Require adequate landscaping or buffering techniques for all new and existing facilities and networks, in order to reduce the visual impact of infrastructure facilities and networks.



Resource System Policies

It is the policy of the City to:

31. Ensure that the ~~water~~ **resource** companies provides all areas of the City with adequate ~~water~~ service (~~pressure and flow~~) with **including** adequate back-up **and growth capabilities**.
(PLANNING COMMISSION RECOMMENDED CHANGE TO POLICY)
32. Encourage the use of alternative water and energy generation sources.
33. Promote, practice and encourage workable energy and water conservation techniques.
34. Review any proposed development, major new **resource** uses ~~of water~~, or significant changes to ~~water~~ **resource** system for impacts (~~pressure and flow surge potential~~) to the surrounding neighborhood and community.
(PLANNING COMMISSION RECOMMENDED CHANGE TO POLICY)
35. **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 ball fields.**
(PLANNING COMMISSION RECOMMENDED NEW POLICY)
36. **Encourage the California Water Service Company to complete a Conservation Plan that provides for the availability of a recycled water system in the City.**
(PLANNING COMMISSION RECOMMENDED NEW POLICY)
37. Underground all new power lines and communications cables. Implement programs to place existing lines and cables underground where feasible.
38. Encourage the establishment of undergrounding assessment districts by homeowners, in areas of existing overhead lines.
39. Investigate funding sources to be used in local undergrounding programs for areas of existing overhead lines.

Disposal/Recovery System Policies

It is the policy of the City to:

40. Encourage waste reduction and recycling programs.
41. Require all new developments to provide sanitary sewers connected to the County Sanitation District's system.
42. Require the connection to the Los Angeles County Sanitation District's sewers in existing development if alternative sewerage systems endanger public health, safety and welfare.

Flood Control/Storm Drain Systems Policies

It is the policy of the City to:

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

Communication Systems Policies

It is the policy of the City to:

48. 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.
49. Require the underground installation of cable communications.



50. It shall be a policy of the City to 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 CC&R's. Said guidelines shall balance public and private costs and benefits to the greatest reasonable extent, and encourage co-location of facilities and the use of evolving wireless communication technologies to minimize impacts.