7

INFRASTRUCTURE

The proposed backbone utility systems include flood protection measures with consideration for sea level rise, wastewater, potable water, recycled water, electrical, natural gas and telecommunications. The Plan area will also be improved to a geotechnically and seismically stable condition.

INTRODUCTION

This section describes the backbone infrastructure systems that are necessary to support the development of the Plan Area. The existing infrastructure within Alameda Point was installed by the Navy, mostly over 70 years ago and is beyond its service life. The active utility systems include wastewater, stormwater, potable water, electrical, natural gas and telecommunications. The active existing infrastructure is currently operable and services the existing tenants throughout Alameda Point. However, these systems are deteriorated and generally unreliable. Additionally, the existing infrastructure does not meet current codes or standards and does not provide long term protection from the impacts of climate change and sea level rise.

Accordingly, the existing infrastructure will be replaced with new systems. The proposed backbone utility systems include flood protection measures with consideration for sea level rise, wastewater, potable water, recycled water, electrical, natural gas and telecommunications. The Plan Area will also be improved to a geotechnically and seismically stable condition. Additionally, a new network of complete streets will be constructed within the Plan Area that promote all modes of transportation, emphasize walking, bicycling and provide direct and convenient access to high quality transit options. See Chapter 3: Access and Mobility, describing the proposed street, bicycle and transit improvements proposed within the Plan Area.

Additional details regarding the proposed backbone infrastructure systems for Alameda Point, including the Plan Area, are provided in the General Plan, the Alameda Point Master Infrastructure Plan and the Final Environmental Impact Report.

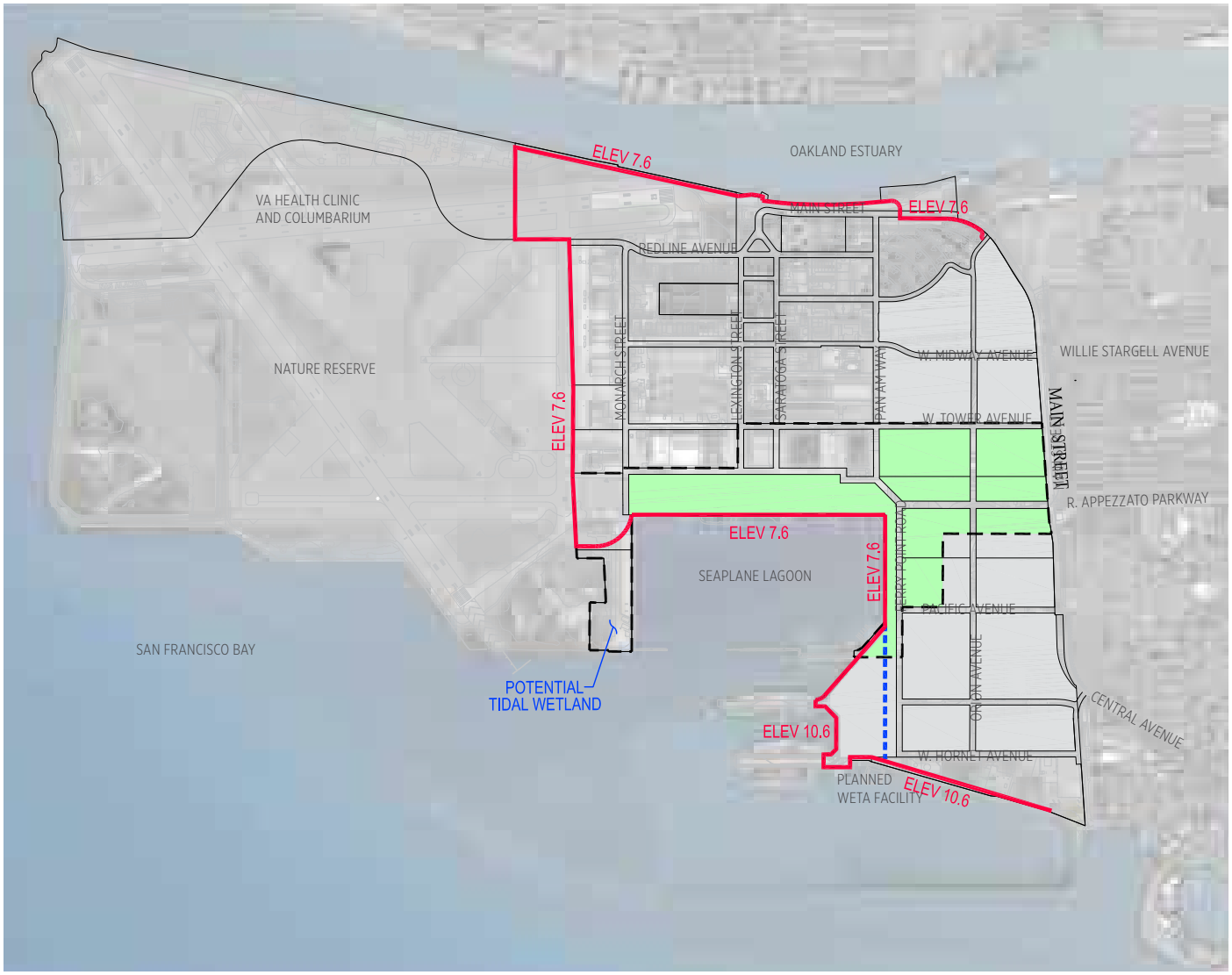
FLOOD AND SEA LEVEL RISE PROTECTION

SEA LEVEL RISE

Development sites along the San Francisco Bay shoreline that are susceptible to future inundation with sea level rise shall be designed to provide protection or be adaptable to address the anticipated impacts of climate change. The Coastal and Ocean Working Group of the California Climate Action Team (CO-CAT) issued a Sea-Level Rise Guidance Document in March 2013. This document provides guidance for incorporating sea-level rise projections into planning for projects within California. The CO-CAT projections are generally recognized as the best science-based sea level rise projections for California. The CO-CAT projected sea levels will rise 1.5 to 12 inches by 2030, 5 to 24 inches by 2050 and 17 to 66 inches by the end of the century.

Generally, up to 2050 there is agreement among the various climate models for the amount of sea level rise that is likely to occur within that timeframe. However after mid-century, the projections of sea level rise become more uncertain, primarily due to the uncertainties associated with future global greenhouse gas emissions and land ice melting rates. Therefore, for projects with timeframes beyond 2050, such as the Plan Area, it is recommended to consider adaptive capacity and adaptive flood protection measures that will allow the ability to adapt to increased amounts of sea level rise and provide long term protection.

Additionally, the San Francisco Bay Conservation and Development Commission (BCDC) updated the San Francisco Bay Plan in October 2011 to address the expected impacts of climate change in San Francisco Bay. The updates to the Bay Plan include similar guidance for addressing future sea level rise when planning projects along the Bay shoreline and recommends adaptive measures be incorporated to the



planning of these types of projects.

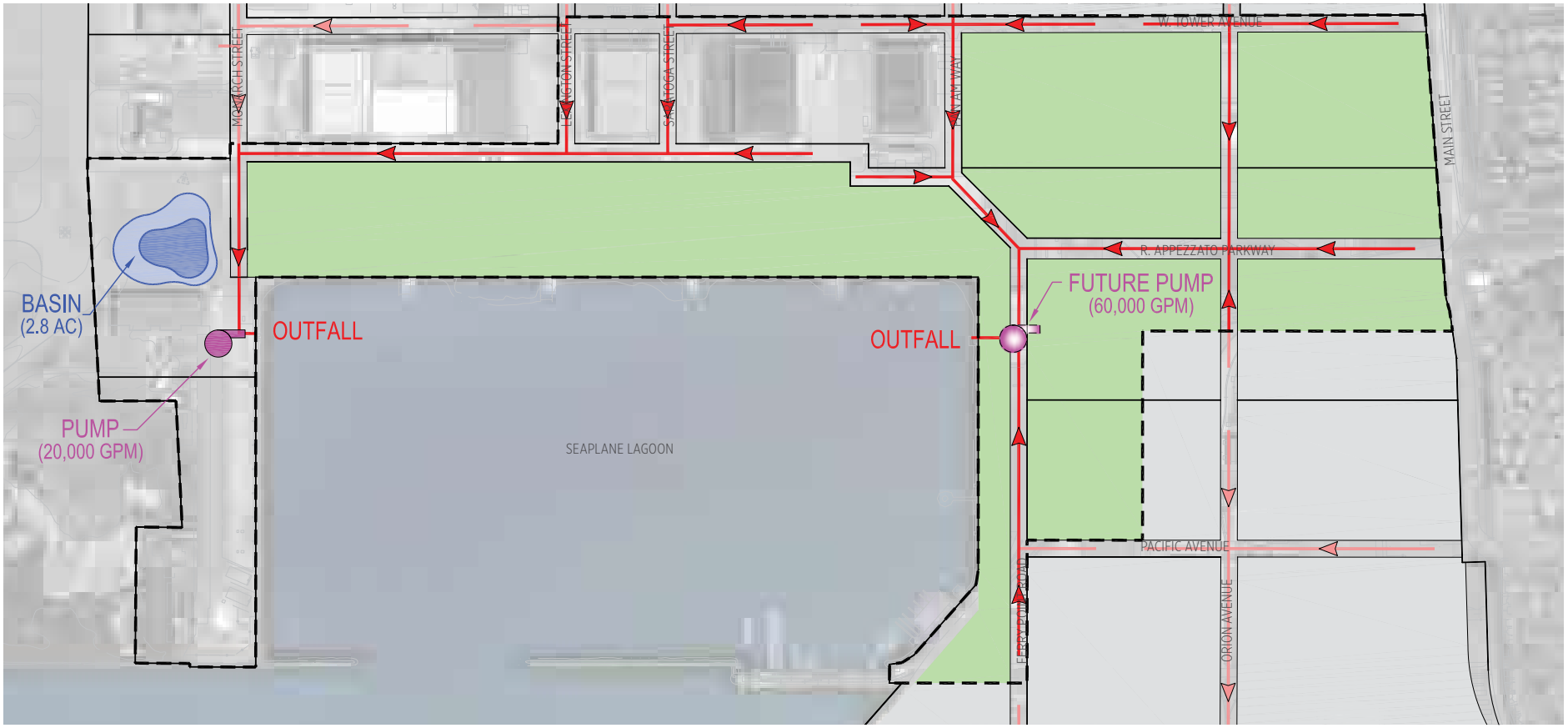
PROPOSED SEA LEVEL RISE PROTECTION MEASURES

For the Plan Area, an Adaptive Management Plan will be implemented with the proposed flood protection system. The flood protection measures, will be constructed with built-in protection against 24-inches of sea level rise. The 24-inches of sea level rise protection will be provided by a system of perimeter levees along the shoreline of the Plan Area. the timing of the construction of the comprehensive levee system for Alameda Point is subject to adequate funds being generated through the Alameda Point Development Impact / Infrastructure Fee Program and other potential public and private sources of funds. It is anticipated that it will take multiple years to accumulate the required funding to construct the levee system. Therefore, to facilitate initial phases of development, the inland areas within the Plan Area will also be raised to an elevation that provides built-in protection from 18-inches of sea level rise. The 24-inches of

sea level rise protection shall be in addition (added to) to other flood protection criteria, including the 100-year tidal elevation and wave/wind run-up.

A hybrid of flood protection measures will be implemented throughout the Plan Area. The shorelines will be constructed as part of the perimeter levee system with elevations above the 100-year tidal elevation, plus consideration for wave/wind run up, plus 24-inches of sea level rise plus 1-foot of additional protection (freeboard consistent with FEMA regulations for coastal levees). New development areas not along the shoreline will be required to establish minimum elevations at or above the expected flood levels plus 18-inches of sea level rise; this is likely to occur before the levee protecting for 24 inches of sea-level rise is constructed. Land and right of way shall be preserved along the shoreline perimeter of the Plan Area to accomodate elevating the shorelines and floodwalls in the future to manage and adapt to sea level

STORM DRAIN IMPROVEMENTS



NOTE: ALIGNMENTS OF UTILITIES IN THIS CHAPTER ARE DIAGRAMMATIC. FINAL ENGINEERING WILL BE COORDINATED WITH THE DETAILED STREET ALIGNMENTS THAT WILL ACCOMPANY SPECIFIC DEVELOPMENT PROPOSALS.

- AP-TC (Town Center) Zoning
- Proposed Storm Drain & Direction of Flow
- Proposed Storm Drain & Direction of Flow (Other Zoning Districts)
- Development Areas (Town Center)
- Development Areas (Other Zoning Districts)

rise. The perimeter improvements shall be designed to allow for the future flood protection measures to be widened and support additional height such that no fill is placed in the Bay. Other adaptive measures that may be implemented include a flexible perimeter protection measure that shifts the shoreline inland and allows the out board land to be converted to tidal wetlands. This type of solution is anticipated as an option for the western shoreline of the Seaplane Lagoon. A sea level rise monitoring program and funding mechanism will be established at Alameda Point to implement the adaptive flood protection measures, if necessary.

STORMWATER SYSTEM

Stormwater runoff from the Plan Area is collected and conveyed by the existing system to the Seaplane Lagoon through multiple outfalls along the Lagoon shoreline. The existing stormwater system is owned and operated by the City of Alameda. The system is currently operable, but does not meet current standards in several regards. These include notable capacity limitations and the fact that there is no stormwater quality treatment infrastructure in place. The stormwater management system will be incrementally replaced consistent with the development phasing of the Plan Area.

There are other portions of Alameda Point, inland from the Plan Area, that are also conveyed by the existing system within the Plan Area and discharge to the Seaplane Lagoon. Also, off-site runoff from a small watershed located along Main Street immediately to the north of Ralph Appezzato Memorial Parkway is collected and conveyed to the southwest through the Plan Area where it outfalls the Seaplane Lagoon.

PROPOSED STORMWATER MANAGEMENT SYSTEM

A new stormwater collection system will be installed within the Plan Area. The proposed system will integrate new pipelines, pump stations, multi-purpose basins, and outfalls with water quality treatment features designed to meet current City of Alameda, County of Alameda, and Regional Water Quality Control Board design criteria. The new stormwater management system will also be designed to address the potential impacts of future sea level rise through planning of adaptation strategies and infrastructure.

The proposed stormwater collection system will maintain the existing drainage patterns of the Plan Area and surround areas of Alameda Point. The proposed system will include gravity storm drain pipes ranging in size from 12 to 60 inches in diameter and new outfall structures. These facilities will be installed within all backbone streets in the Plan Area. The proposed system will be designed to maintain conveyance capacity for the additional areas within Alameda Point and the off-site areas currently draining through the Plan Area to the Seaplane Lagoon.

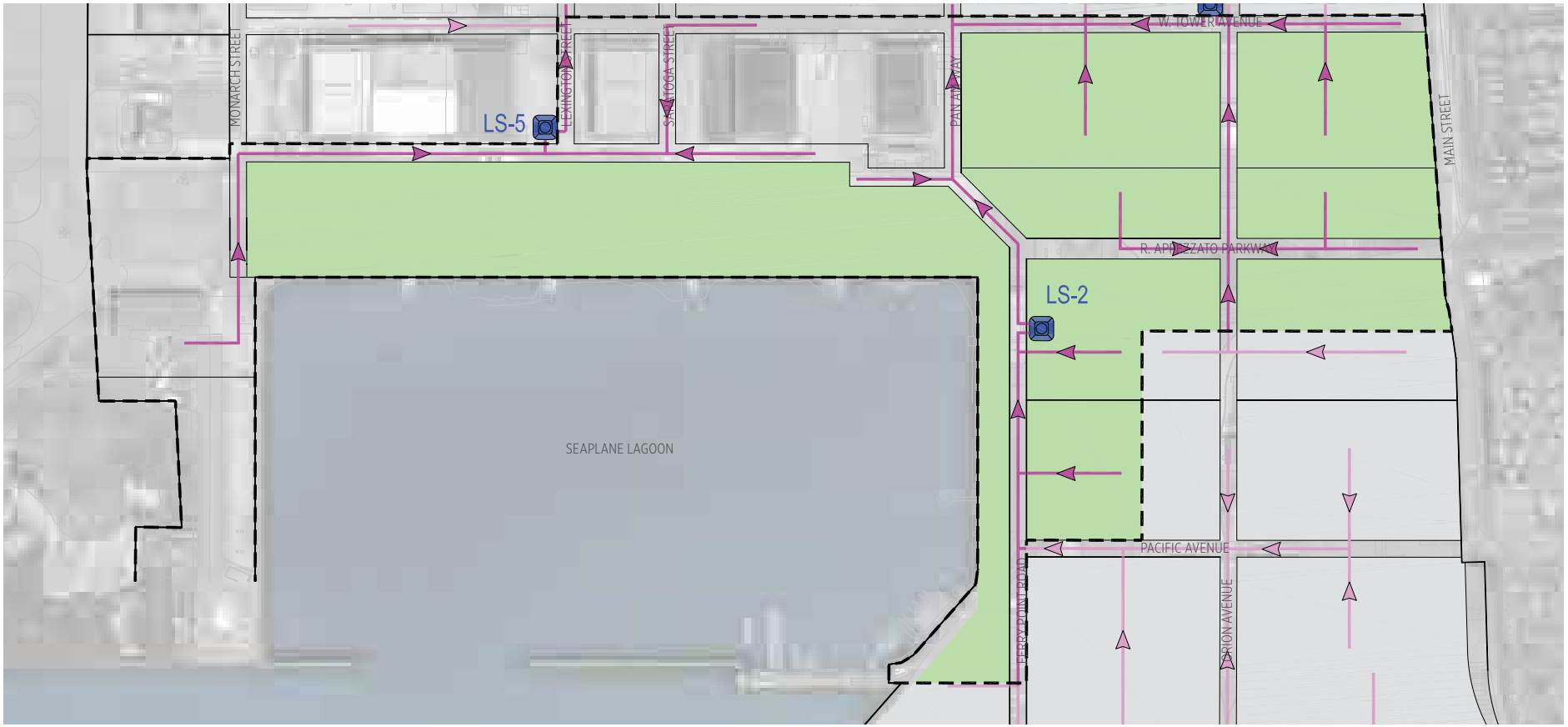
Additionally, the proposed system will reduce the number of outfalls to the surrounding waters in order to facilitate and minimize future maintenance obligations of the City of Alameda. The proposed outfalls will be equipped with flap gates and energy dissipation to control discharge to the receiving waters. Preliminary system design calls for a total of 2 outfalls within the Plan Area, one each at northwest and northeast corners of the Seaplane Lagoon. The proposed outfalls will be constructed at or very near existing outfall locations to minimize potential environmental impacts associated with installation and operation of these facilities. The northwest outfall is planned to be accompanied with a multi-purpose basin and storm drain pump station with near term construction. Whereas at the northeast outfall, a future pump station will only be necessary as part of the adaptive system, if sea level rise exceeds 24-inches. Land will be reserved to accommodate this future pump station. See the diagram on the facing page depicting the proposed stormwater collection system within the Plan Area.

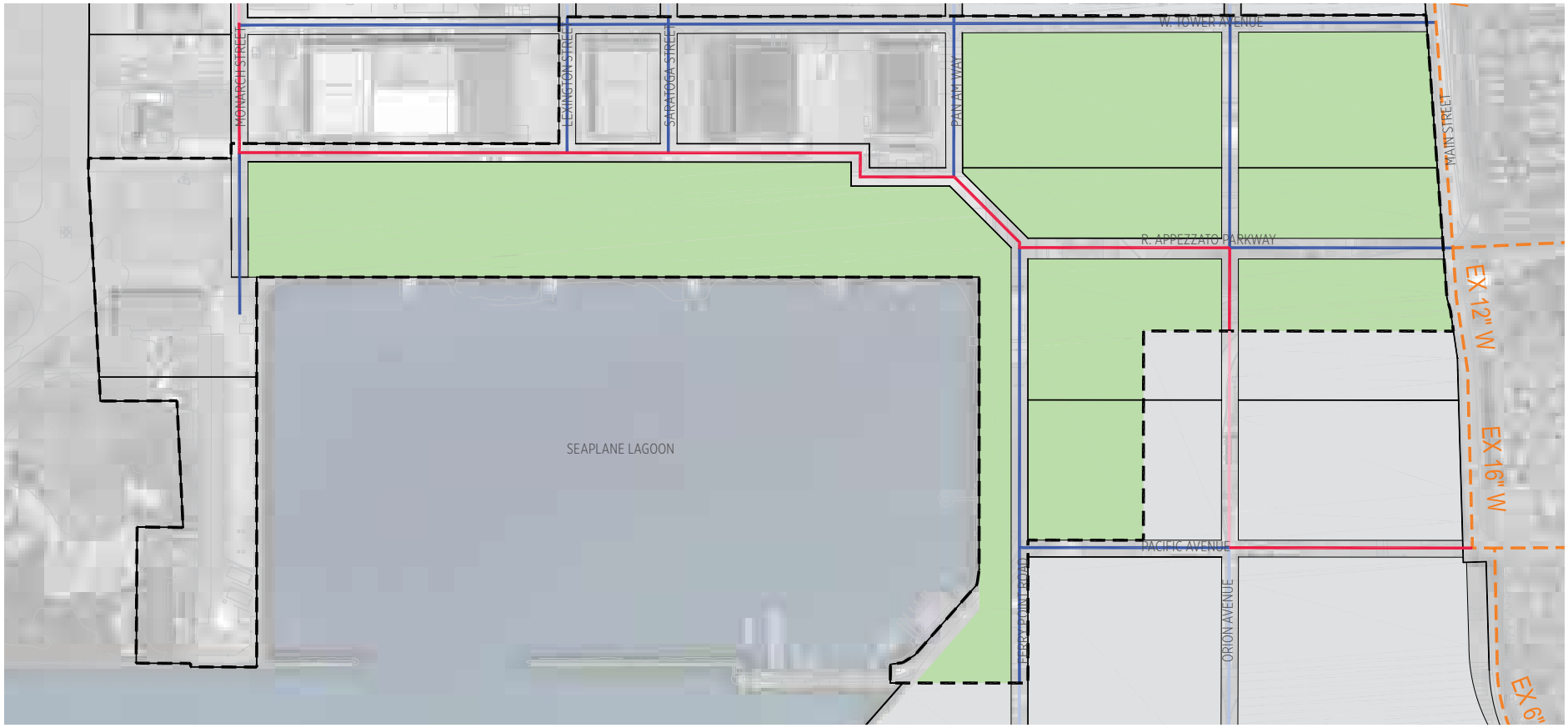
Adaptation strategies for potential sea level rise are an integral part of stormwater management planning for the Plan Area. The stormwater management systems will be designed such that construction accounts for 24-inches of sea level rise. The systems will also be designed to incorporate adaptive measures that include increasing the capacities of or constructing storm drain pump stations to be capable of accommodating up to 55-inches of future sea level rise.

PROPOSED WATER QUALITY TREATMENT MEASURES

The Alameda Countywide Clean Water Program oversees the implementation of the Municipal Regional Stormwater NPDES Permit (MRP) that was issued for urban stormwater discharges from Alameda County, including the City of Alameda. The MRP outlines a number of regulatory goals and requirements for stormwater management for new development and redevelopment sites. The permit provisions require the implementation of Low Impact Development (LID) measures as outlined in Section C.3.c of the MRP. These measures include source control, site design, and treatment requirements to improve the quality of the stormwater runoff.

SANITARY SEWER IMPROVEMENTS





- AP-TC (Town Center) Zoning
- Proposed 12" Waterline
- Proposed 12" Waterline (Other Zoning Districts)
- Proposed 16" Waterline
- Proposed 16" Waterline (Other Zoning Districts)
- Existing Waterline
- Development Areas (Town Center)
- Development Areas (Other Zoning Districts)

0′ 250′ 500′ 750′ 1000′

The LID biotreatment measures that will be implemented throughout Plan Area will include bioretention planters, street planters, bioswales, subgrade infiltration areas, permeable paving and any other treatment measures approved by the City of Alameda and the Regional Water Quality Control Board. The new backbone streets are anticipated to include linear bioretention planters, bioswales, and street planters within the landscape strips of each street cross section. The Development parcels will be required to incorporate biotreatment measures and localized rainwater harvesting, where feasible, to provide pre-treatment of stormwater runoff prior to discharging into the stormwater system.

GEOTECHNICAL

The main geotechnical considerations for Alameda Point are similar to those of other waterfront sites in the Bay Area. The considerations include:

- Shoreline Stability
- Liquefaction
- Compressible soils

Corrective measures will be implemented within the Plan Area to address each of these considerations and improve the seismic stability of the Plan Area. These corrective measures may include deep soil mixing for the shoreline stability, rapid impact compaction or deep dynamic compaction for the liquefiable soils, and a surcharge operation to address the compressible soils, such as Young Bay Mud. These measures will be implemented as part of the site preparation and rough grading operations for the Plan Area.

WASTEWATER

The existing wastewater collection system within the Plan Area will be replaced. The existing on-site collection system collects and conveys the wastewater generated within the Plan Area to an existing pump station (Pump Station R) located near the Main Gate. Additionally, the existing system within the Plan Area conveys the wastewater from the southeastern portion of Alameda Point to Pump Station R. Pump Station R, along with other off-site transmission facilities including a force main, siphons and interceptor trunk mains, are owned and maintained by EBMUD and convey the Project Site wastewater to EBMUD's Main Wastewater Treatment Plant (MWWTP)located at the eastern landing of the Bay Bridge.

A new wastewater collection system will be installed within the Plan Area. The proposed collection system will be design in accordance with the City of Alameda's standards and specifications. The proposed system will include gravity pipelines, ranging in size from 8-inch to 24-inch in diameter, and multiple lift stations. The proposed system will connect to the existing Pump Station R located at the Main Gate. The existing wastewater system, pipelines and pump / lift stations, within the Plan Area will be replaced in phases consistent with the development build-out. The proposed wastewater collection facilities will be installed within all backbone streets within the Plan Area. The proposed system will be designed to maintain conveyance capacity for the additional areas within Alameda Point that are conveyed through the Plan Area, specifically the southeastern areas of the Plan Area. See Figure on page 150 depicting the proposed wastewater collection system for the Plan Area.

EBMUD has adequate dry weather capacity at the MWWTP for the projected wastewater flows from the Plan Area. Over time, the project will replace the existing on-site wastewater system resulting in a reduction in infiltration and inflow entering the system in wet weather conditions. The reduction in infiltration and inflow will provide the required wet weather capacity for the Plan Area.

POTABLE WATER

A new potable water distribution system will be installed within the Plan Area. EBMUD supplies potable water to the Plan Area. The proposed distribution pipelines will connect to the existing EBMUD water facilities in Main Street. The existing water system will be replaced with the new system in phases consistent with the development build-out. The proposed distribution system will be designed in accordance with EBMUD's regulations, standards and specifications. The system will consist of distribution pipelines that will range in size from 8-inch to 16-inch in diameter. The proposed water distribution facilities will be installed within all backbone streets providing reliable potable and fire water to all development parcels within the Plan Area. See Figure on page 151 depicting the proposed potable water system within the Plan Area.

EBMUD's Water Supply Management Program 2040 has included the water demand projections associated with the redevelopment of the Proposed Project, maintaining adequate supply allocation to the Plan Area.

RECYCLED WATER

The Proposed Project will construct a backbone network of recycled water distribution pipelines throughout the Plan Area. Currently, there is not an existing source of recycled water at Alameda Point. EBMUD is implementing the East Bayshore Recycled Water Project, which currently

supplies recycled water to portions of Oakland and Emeryville. EBMUD plans to extend their recycled water service to the City of Alameda, including Alameda Point. The East Bayshore Recycled Water Project will eventually construct a recycled water supply line from West Oakland, across the Oakland - Alameda Estuary, and into the western portions of Alameda. Alameda Point will connect to the existing recycled water facilities constructed within the Bayport development, near the intersection of Stargell Avenue and Coral Sea Street.

A new recycled water distribution system will be installed at Alameda Point. A network of recycled water pipelines will be constructed within the proposed rights of ways of the backbone streets and will range in size from 6 to 12 inches. The recycled water facilities will be designed and constructed in accordance with EBMUD's regulations, standards and specifications.

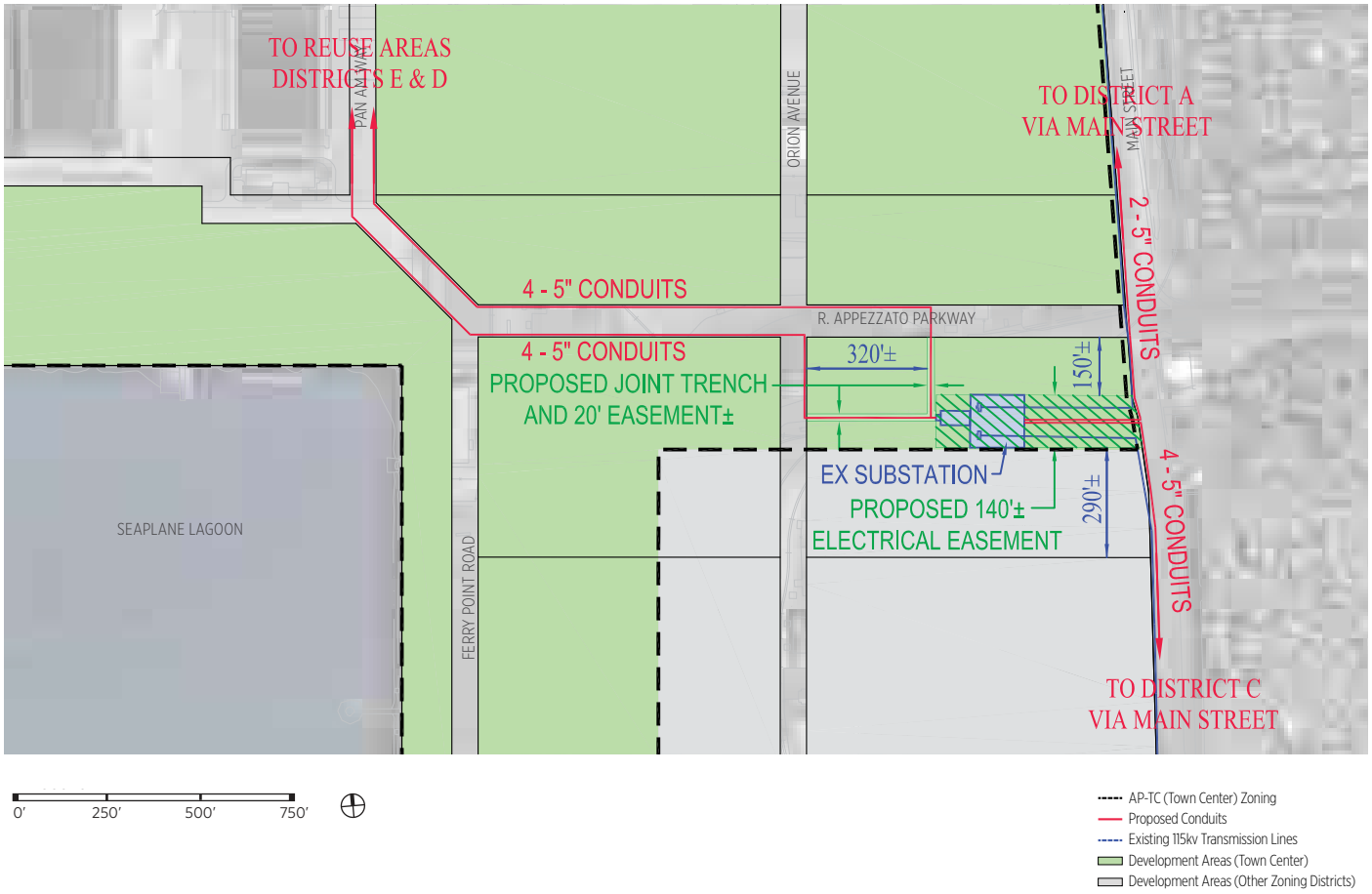
DRY UTILITIES

The dry utilities within the Plan Area include electric power, natural gas, communications and cable television. The existing dry utility systems will be incrementally replace the over time.

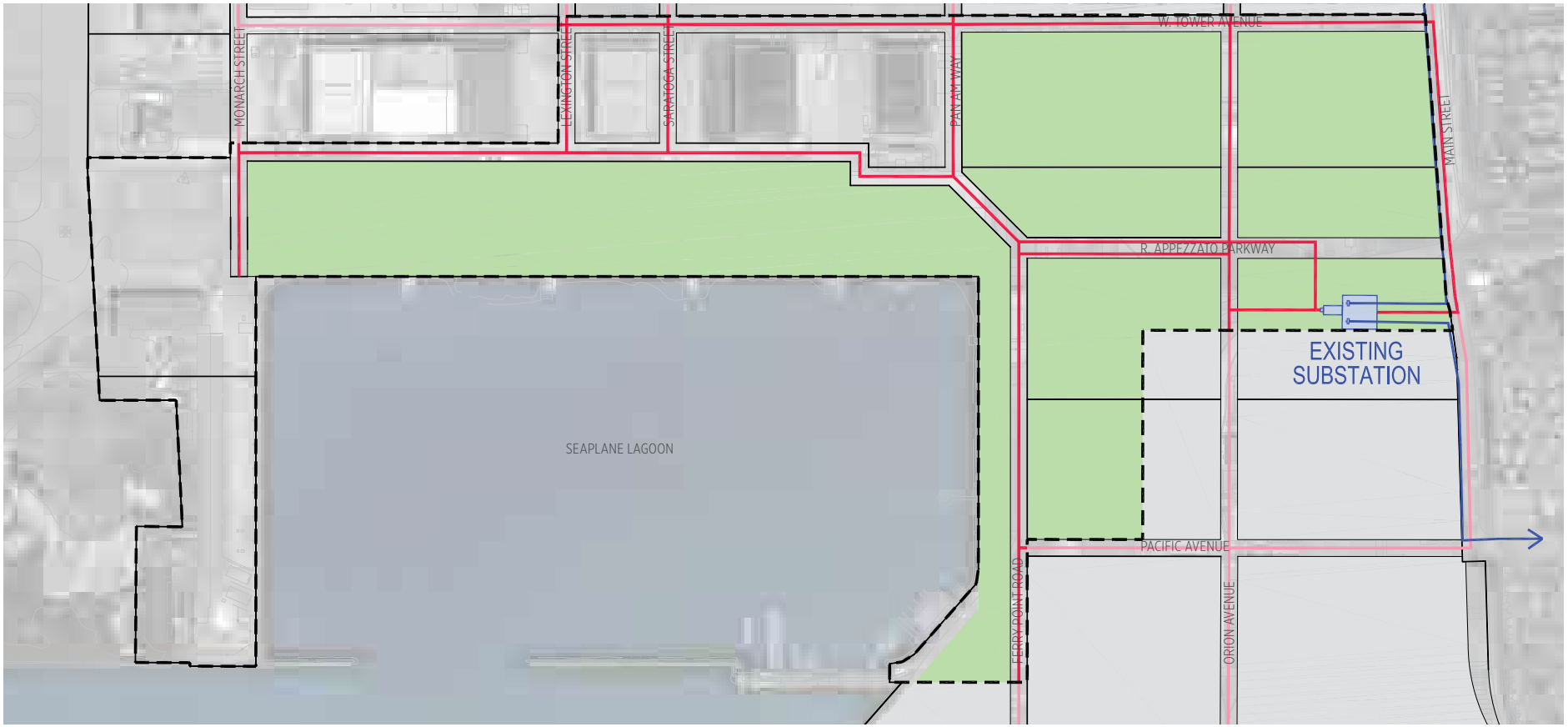
ELECTRIC SYSTEM

Alameda Municipal Power (AMP) owns and operates the existing electric power facilities at the Plan Area and throughout

CARTWRIGHT SUBSTATION



JOINT TRENCH IMPROVEMENTS



the City of Alameda. The existing electric system at Alameda Point consists of 115kV transmission, 12kV and 4kV distribution facilities. The existing distribution facilities will be replaced within the Plan Area. The 115 kV transmission facilities and Cartwright Substation will be preserved. The Cartwright Substation is a critical component of the existing electric system and is intended to remain in service throughout the redevelopment of Alameda Point. Utility corridors and easements will need to be reserved for the electrical facilities entering and emanating from the substation. The existing transmission facilities and Cartwright Substation have adequate capacity for the Project's estimated ultimate electric demand.

From the Cartwright Substation, a new underground electric distribution system will be installed with the Plan Area. This new electric system will replace the existing electric system in phases consistent with the development build-out. The proposed electric distribution system will consist of new underground conduits, vaults, boxes, and pads; which will accommodate 15kV rated cables, transformers, switches and other utility distribution equipment including its supervising control and data acquisition communication monitoring and controls. The electric distribution facilities will be installed within all backbone streets within the Plan Area. The electric conduits and cables will be placed in a joint utility trench. This trench will also accommodate the Pacific Gas & Electric (PG&E) natural gas, telephone, cable television, possible ancillary fiber optic cable systems and street light facilities. The proposed electric system and joint trench will be constructed in accordance with AMP's rules and regulations as outlined in their Material and Installation Criteria for Underground Electric Systems, latest revision. See the diagrams on page 153 and 154 depicting the Cartwright Substation and proposed joint trench system within the Plan Area.

NATURAL GAS

The Proposed Project will incrementally over time replace the entire existing natural gas distribution system within the Project Site. Pacific Gas & Electric (PG&E) supplies natural gas to the Project Site via an existing 8" supply line that enters the Project Site at the intersection of Main Street and W. Atlantic Avenue.

A new natural gas distribution system will be installed throughout the Plan Area. This system will connect to the existing 8-inch steel main near the intersection of Main Street and W. Atlantic Avenue. The proposed gas facilities will be constructed in all backbone streets, providing reliable gas service. The new natural gas system will replace the existing natural gas system in phases consistent with the development build-out. The proposed gas system will be designed in accordance with PG&E's rules and regulations and will be installed in a joint utility trench as previously described.

TELECOMMUNICATIONS AND CABLE TELEVISION

The Proposed Project will incrementally over time replace the entire existing telecommunications and cable television systems within the Plan Area. The existing communication utility systems at Alameda Point are owned and operated by AT&T, AMP and Comcast.

New telecommunications systems will be installed within the Plan Area. These systems will connect to the existing systems east of the Plan Area, near Main Street. The proposed telecommunication facilities will be constructed in all backbone streets. The new telecommunication system will replace the existing systems in phases consistent with the development build-out. The proposed telecommunications systems will be installed in a joint utility trench as previously described.

STREET LIGHT SYSTEM

The Proposed Project will incrementally over time replace the entire existing street light system within the Plan Area. The existing street lighting system at Alameda Point is owned and operated by AMP. The lighting criteria shall also be compliant with the latest Illuminating Engineering Society (IES) standards. The lighting units shall utilize energy efficient luminaires such as light emitting-diode (LED) type luminaires as deemed acceptable by the City of Alameda and AMP.

The proposed lighting system will be designed in accordance and adhere to the lighting mitigation measures defined in the Biological Opinion prepared by the United Stated Fish and Wildlife for Alameda Point.

PHASING AND IMPLEMENTATION

The backbone infrastructure improvements required for the development of Plan Area will be phased to match the development phases as closely as possible. The required improvements for each phase will include demolition, flood protection, corrective geotechnical measures, site grading, utilities, streets and transit improvements. Each phase will construct only that portion of infrastructure required to support the proposed uses and surrounding existing uses to maintain financial feasibility of the project. In some cases, initial phases of development will need to construct components of the backbone infrastructure that will also benefit subsequent phases.

The implementation of the backbone infrastructure will require constant coordination. Certain areas may develop concurrently, while other areas may only develop in smaller phases. Additionally, existing utility service will be maintained to existing tenants within the Plan Area or other areas of Alameda Point. This may require temporary re-routing of utility systems to maintain service to these existing tenants.

It is expected that an Alameda Point Development Impact / Infrastructure Fee will be established to facilitate the infrastructure implementation and provide a mechanism to coordinate adequate funding. The fee program will collect fees to generate a portion of the funds needed to construct infrastructure with site-wide benefits. The fee program will also provide repayments to initial developments that constructed infrastructure improvements that benefit larger areas.

CONCEPTUAL FINANCING PLAN

The projects and associated infrastructure within Alameda Point will develop gradually over time, taking into account long-term needs. The financing plan is designed to be incremental, linking development to infrastructure and ensuring that the right infrastructure is built, in the right amount, as development progresses. The projects and associated infrastructure will develop gradually over time, taking into account long-term needs.

The infrastructure financing strategy requires that:

- Each development site pays for on-site and site-adjacent infrastructure, and
- Each development site contributes its fair share to a fund for backbone infrastructure

This approach ensures that development will have the immediate infrastructure needed adjacent to the site, while also contributing to long term and site-wide costs that will not be incurred until further in the development process, but to which incremental development nevertheless contributes. This linkage of development to infrastructure responsibility allows for flexibility - the development plan can respond to market forces and the infrastructure plan can adapt. Over time, the individual project sites will combine to form the overall plan, with the infrastructure and funding in place.

The plan is organized into phases, which contemplates gradual, incremental development. The phases are not prescribed in any fixed order, however, but are instead organized around geographic proximity, the logic of some infrastructure, and types of development. The phases are intended to provide an organizing principle for development, but individual phases can develop as market and other opportunities arise.

The basic sources of the financing plan will consist of the following:

- Land Sale Proceeds – funds paid to the City by developers and others for site acquisition.
- Community Facilities Districts (CFD) and Assessments – assessments and special taxes paid by land owners for services and facilities.
- Infrastructure Financing District – Special district that collects incremental property tax revenue for finance capital improvements if allowed by updates to state law.
- Infrastructure Fee – fee paid by development at building permit to pay for infrastructure improvements.
- Public Grants and Loans – grants and other special revenues provided by third parties, such as the federal government, including possible funds associated with wetlands mitigation banks, a potential national wildlife refuge, and other creative funding sources for open space and wetlands. These sources of funds may be identified and obtained in concert with local members of the community.
- Developer Equity – developer funding of infrastructure from the anticipated profits of development.
- Other sources as/if they become available.

Assessments and special taxes are funded through property tax, and appear as part of each owner's property tax bill. It is important to note that a number of special taxes and assessments are being contemplated for Alameda Point, including a Geological Hazard Abatement District (GHAD) and a CFD to fund certain City services. Generally the sum of these taxes, plus the ad valorem tax, cannot exceed two percent of the assessed value of the property. Also, commercial uses typically maintain a lower overall tax burden than residentrial uses. This constraint will be taken into account as the financing plan is further refined and balanced against the other needs of the project and the City. As the City finalizes its other studies and analyses, such as the Impact / Infrastructure

Fee Program and the Transportation Demand Management Plan, and is closer to implementing new development, the exact amount of feasible assessment for each type of assessment will need to be analyzed and determined.

As the development plans become firmer and the first tranche of development becomes clearer the City will formulate a financing strategy the combines the needs and requirements of the overall plan with the particular circumstances of each development. The financing plan will include a balance of the above items, and will likely shift over time as the real estate and financial markets shift.

The flexibility and market responsiveness of the plan mean that the overall plan can build on success over time. Completed projects will reduce uncertainty for subsequent projects, reducing uncertainty and thereby increasing land value and reducing financing costs attributable to risk. Based on market conditions, some types of development will commence ahead of others. Although this trend has been sometimes characterized as "cherry picking", in reality it is no different from how development occurs in the normal course of events. Absent a subsidy, either a master developer or the City would have to wait until individual development types and parcels are financially feasible before they could be developed. One concern, however, is that early development might occur on parcels that do not require much infrastructure or other investment to be developable. The financing plan ensures that this will not happen – early development will pay not only for its immediate infrastructure but also its fair share of larger backbone items that may not need to be constructed for several years.

The Town Center is one of the phases of the overall plan, and has been integrated into the overall infrastructure planning. The financing plan will ensure that the Town Center pays its fair share of required infrastructure. It is expected that some aspects of the Town Center, such as the initial retail development, may be difficult to implement from a market perspective. Because the financing plan is flexible, it will allow for the City to subsidize certain uses, through means such as reduced land sales prices, without altering or affecting the overall infrastructure plan or the fair share allocation of the infrastructure burden.

PUBLIC SERVICES

The City's economic consultant has prepared an analysis of the cost of providing municipal services to the project, as well as revenues for the City expected to be generated there. The analysis includes services costs and the cost of maintaining the infrastructure needed for the plan (where the City is the party responsible for providing maintenance). The fiscal analysis includes the regular (weekly, monthly, annual, etc.) maintenance costs, such as chip seal of road surfaces, but not the cost of replacement of infrastructure that is being newly constructed as part of the development of Alameda Point. The City's economic consultant has prepared an estimate of the net fiscal impact of the project (see Master Infrastructure Plan).

In additional to capital improvements, the financing plan for Alameda Point include fiscal mitigation measures, such as a services assessment or special tax if necessary, to ensure that the project does not have a net negative fiscal impact on the City. Not included in the analysis, however, is the cost of replacement at the end of the expected lifespan of the infrastructure. As with any other infrastructure in the City, most infrastructure replacement costs are built into the rates and fees associated with services, such as water, wastewater, and electricity. This approach, in which the users pay for the eventual replacement cost of the facilities they are using, is appropriate and financially sound.