chapter 7
UTILITIES

IN THIS CHAPTER

7.1 Overarching Utilities Policies

7.2 Water

7.3 Sanitary Sewer

7.4 Stormwater

7.5 Dry Utilities

This chapter provides an overview of the various utility systems in Downtown Napa. Policies and recommended utilities upgrades have been developed based on the projected demands associated with Downtown's growth and development outlined in the Specific Plan. These policies will help facilitate Napa's evolution toward a more sustainable and resource-efficient future. The goals and policies in this chapter demonstrate how utilities can support existing and new development while promoting conservation, efficiency and natural resource protection. These sustainable objectives can be achieved while providing valuable amenities to residents and visitors.

Downtown is supported by a network of wet and dry utilities that serve the community. The physical and economic prosperity of Napa's diverse neighborhoods is dependent on this network and on the availability of the necessary resources. Many of these utility networks are aging and in need of upgrades to ensure proper long-term function and to increase capacity to accommodate future growth. As Downtown continues to increase in density and intensity of development, the City's focus will be on providing an adequate level of service to accommodate existing uses and the projected growth while using fewer resources. This will be manifested through the development and implementation of sustainable infrastructure at all scales to support the backbone functions of a re-envisioned public realm.

7.1 OVERARCHING UTILITIES POLICIES

The following overarching infrastructure policies provide an overview of the policy recommendations that are described in detail at the end of the Water, Sanitary Sewer, Stormwater and Dry Utilities sections of this chapter. These policies support the overall vision of the Specific Plan by providing guidance to reduce impacts and encourage sustainable development practices.

1. Integrate solutions to existing utility deficiencies identified in this section with capital improvement programs.

2. Work with non-City utility providers to coordinate future capital projects to address current utility deficiencies in addition to capital improvements.

3. Coordinate future improvement projects in Downtown to maximize use of public and private funding for infrastructure improvements.

4. Establish funding mechanisms to proportionally allocate public and private funds to pay for necessary infrastructure over the next 20 years per the Financing Strategy.

7.2 WATER

To ensure the long-term prosperity of Downtown, a sustainable balance must be achieved between water use and available supply. Napa, like many California cities, has a limited water resource that cannot easily be expanded and must be managed to serve existing development and provide for future planned development. The management of this existing water supply and its associated distribution and treatment infrastructure require both careful upfront planning and long-term maintenance programs.

EXISTING CONDITIONS

Sources

The city receives water from three major surface water sources: Lake Hennessey, Milliken Reservoir and the State Water Project. The City of Napa is located within the Napa-Sonoma Valley groundwater basin area. Although the City of Napa does not use groundwater as a water source at this time, the city is currently exploring groundwater as well as other options to meet long-term and emergency supply needs.

Recycled water is currently provided by the Napa Sanitation District to serve irrigation purposes on several southern parcels within the City of Napa's water service area. Extending this service into Downtown is not currently part of Napa Sanitation District's Master Plan and, because there are only limited recycled distribution facilities near Downtown, it will be an unlikely source of water in the foreseeable future.

Demand

Residential users make up more than 90 percent of the City's total accounts; however, they account for only 70 percent of total demand. Commercial use makes up 14 percent of demand, and institutional and landscape demands are each five percent of total demand. Agricultural use accounts for only one percent of demand, and miscellaneous and industrial use make up the remainder (Urban Water Management Plan, 2005 Update). Total water demand in 2008 was 15,797 acre-feet (AF), with daily demand ranging from approximately 6 million gallons per day (MGD) to 28 MGD (City of Napa Water Division).

Water use within Downtown is not representative of the city as a whole since the area is primarily commercial, consisting of a retail core and a substantial amount of office space. In addition, the city center includes parks, public buildings, hotels, theaters and some professional offices that have been converted from residential dwellings. It is important to note that the housing stock within Downtown generally has a higher density than the city as a whole. High-density housing typically has lower per-capita water use than less dense neighborhoods, but total demand per acre is generally higher because there are more connections. The City does not compile water use data by area, but the concentration of commercial, institutional and denser residential land uses suggests that water demands in Downtown are higher than the city average.

The City of Napa receives water from three major surface water sources including Lake Hennessey.

The City has an active and historically successful Water Conservation Program. In the mid-1980s, per-capita demand in the water system averaged 184 gallons per person per day. Presently, demand is approximately 160 gallons per person per day due to the evolution of water-efficient appliances, City-sponsored conservation initiatives, water recycling and efficient water use practices by the people of the city.

In addition to these voluntary and educational efforts, the City has adopted policies to directly reduce the demand for water within the community. Chapter 13.09 of the Napa Municipal Code, "Permanent Water Conservation Measures," illustrates the City's commitment to making new construction and major renovations offset their water demand. The City's High Performance Building Ordinance and Water Efficient Landscape Ordinance ensure that the most water-efficient features are incorporated into new development. Additionally, the City is a signatory to the Memorandum of Understanding Regarding Urban Water Conservation in California developed by the California Urban Water Conservation Council. The City is also committed to implementing appropriate best management practices to ensure long-term supply reliability.

Distribution Network

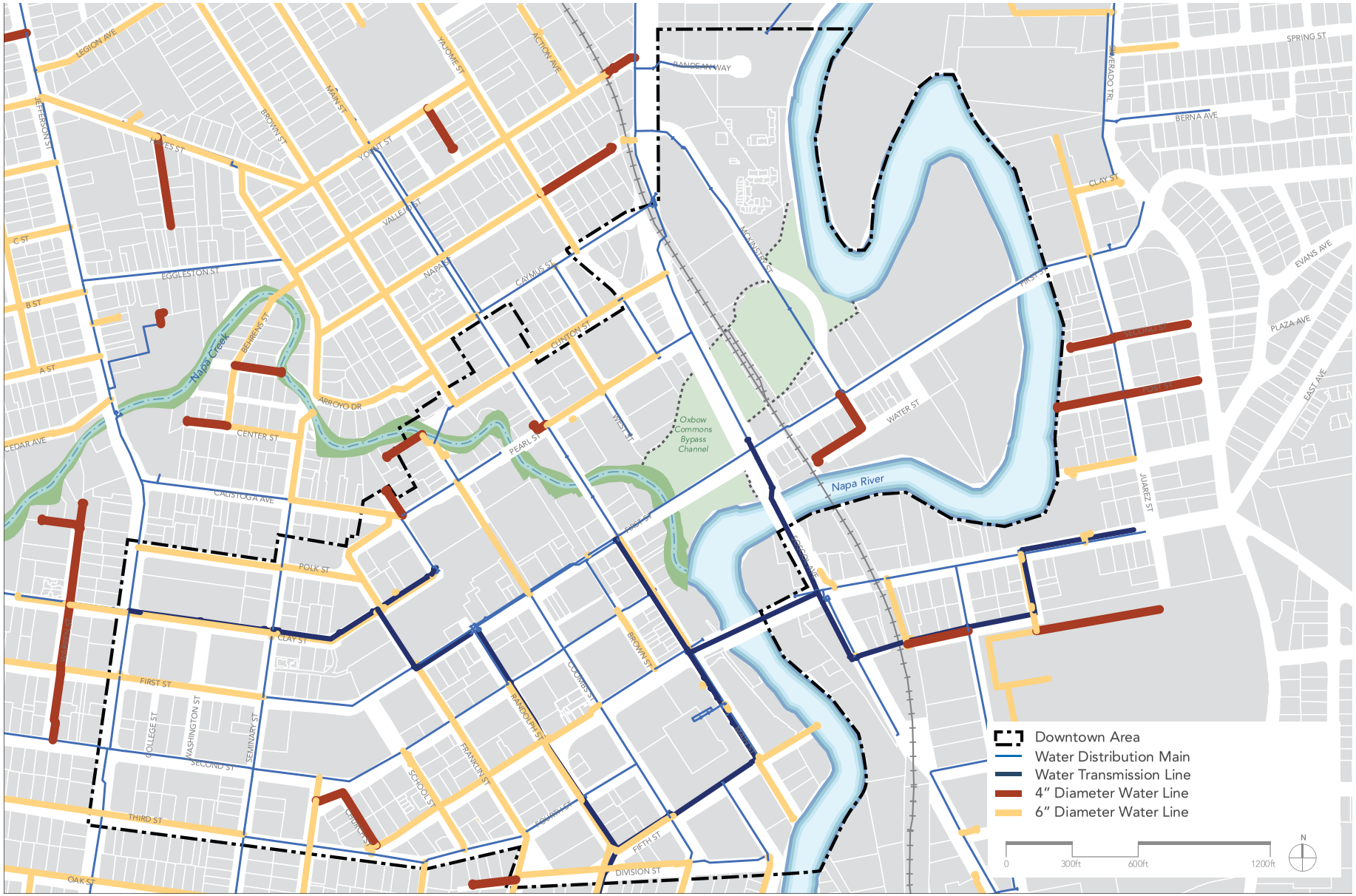
Downtown is served by a five-million gallon storage tank on the east side of the Napa River, and is additionally supported by several pressure reducers spaced throughout the pressure zone. The pressure reducers provide water directly from a higher pressure zone, providing additional water flow when pressures within the downtown zone drop below a certain level. Most of the system is fed by a 24-inch diameter transmission main that comes from the storage tank into Downtown, and then reduces to a 16-inch diameter line that feeds water to the smaller distribution mains. These smaller water mains vary from four-inch to 12-inch in diameter, and are generally made of asbestos cement, cast iron or ductile iron. The downtown water system averages between 80 to 100 years old, which is approximately the average life expectancy of water mains (see Figure 7.4: Recommended Water System Improvements).

The size of municipal water systems is primarily determined by the need to meet fire flow. Over the years, regulators have increased the flow rates required to meet fire sprinkler and fire hydrant needs. In addition, associated building construction requirements have become more stringent. Most of the water mains in Downtown were not designed in accordance with Table 105.1 of the 2007 California Fire Code to meet these larger fire flow requirements. The system primarily consists of six-inch diameter cast iron pipe, although there are some four-inch pipes (see Figure 7.1: Existing Water System). In general, water system standards require water mains within commercial areas to be between eight-inch and 12-inch in diameter to meet the fire flow demands of existing and anticipated future development. In residential areas current standards require water mains to be six-inch to eight-inch in size to meet fire flow demands.

NEW DEMAND AND REQUIRED UPGRADES

The City has determined that it has sufficient water supply to meet both existing and future projected water demands. According to the 2050 Napa Valley Water Resources Study, the city currently has sufficient supplies during all hydrologic conditions, and projects sufficient supplies to be available in the future. No shortfalls are expected for normal or multiple-dry year periods through the year 2050; assuming full implementation of all currently approved conservation programs. However, current water supply sources may be inadequate during the most critical single-dry years and the city is required by State law SBx7-7 to reduce its per-capita water demand, thus requiring conservation and planning measures to continue to meet the city's water reliability needs. As a result, the 2050 water study determined that Napa will be able to meet all additional demands on supply for water generated by continued development within Downtown and throughout the city based on the 1998 General Plan designations throughout the city.

FIGURE 7.1: Existing Water System



Although the city expects to have an ample water supply, the existing water distribution system requires improvements to adequately meet future demands and address existing deficiencies. In general, current standards require Downtown water mains to be between eight-inch and 12-inch in diameter to meet the fire flow demands of existing and anticipated future development. In addition to proper sizing of the water mains, system connectivity must be considered to prevent the development of stagnant conditions while still providing sufficient fire flows.

As part of the Specific Plan process, the downtown demands and distribution system were analyzed using the potential development program capacity analysis. Estimates for daily flows were extrapolated from Napa Sanitation District's wastewater flow design criteria. Average daily domestic water demand was estimated for each development parcel within Downtown under future (2030) buildout conditions (see Figure 7.2: Projected Water Demands). Required fire flows were determined for each parcel using the Fire Code requirements, with assumptions made to associate land use types with construction types (see Figure 7.3: Proposed Fire Flow).

The buildout domestic and fire protection demand data developed in this analysis and presented in Appendix D - Utilities Analysis was used by the City of Napa Water Division to run the city's potable water system hydraulic model and to identify the Downtown water main segments that will need improvement. Approximately 50 percent of existing water pipes will require upgrades as a result of full buildout of the Specific Plan. These water mains and their required upgrade sizes are shown in Figure 7.4: Recommended Water System Improvements. All supporting calculations, parcel data and demand values are provided as part of Appendix D.

WATER POLICY RECOMMENDATIONS

The City's goal is to conserve water resources to protect the environment and to maintain access to clean water for future generations. In order to maintain consistency with this goal, it is recommended that, in conjunction with the High Performance Building Ordinance, the City incorporate the following measures into specific policies that will guide development within Downtown:

1. Maximize the efficient usage of water resources within Downtown through conservation, demand reduction, alternative water sourcing and water recycling.

2. Require developers to provide a water balance analysis prior to development that identifies both pre-development and future water demands associated with the project.

3. Require developers to identify and implement water conservation measures that will help mitigate additional water demands created by the new development being proposed, in accordance with the City's High Performance Building Ordinance.

4. Discourage the use of high-irrigation demand turf or other non-native, water consuming landscapes, in accordance with the City's Water Efficient Landscape Ordinance.

5. Require that new structures within Downtown include provisions for the use of recycled water and greywater for irrigation and other non-potable uses, such as toilet flushing and mechanical equipment.

6. Replace aging water lines.

The following sections discuss wastewater collection, treatment and recycled water distribution systems within Downtown.

FIGURE 7.2: Projected Water Demands

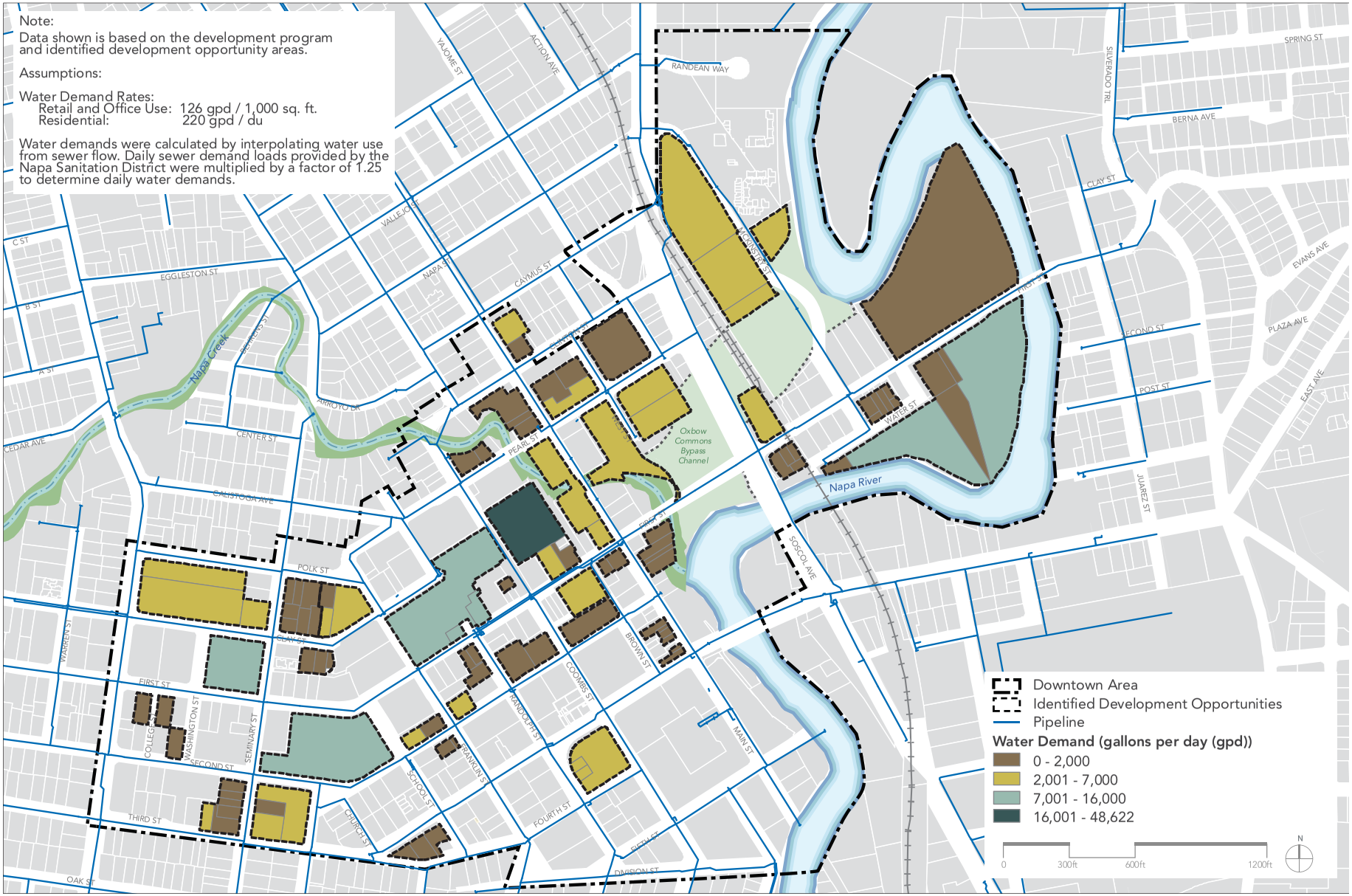


FIGURE 7.3: Proposed Fire Flow

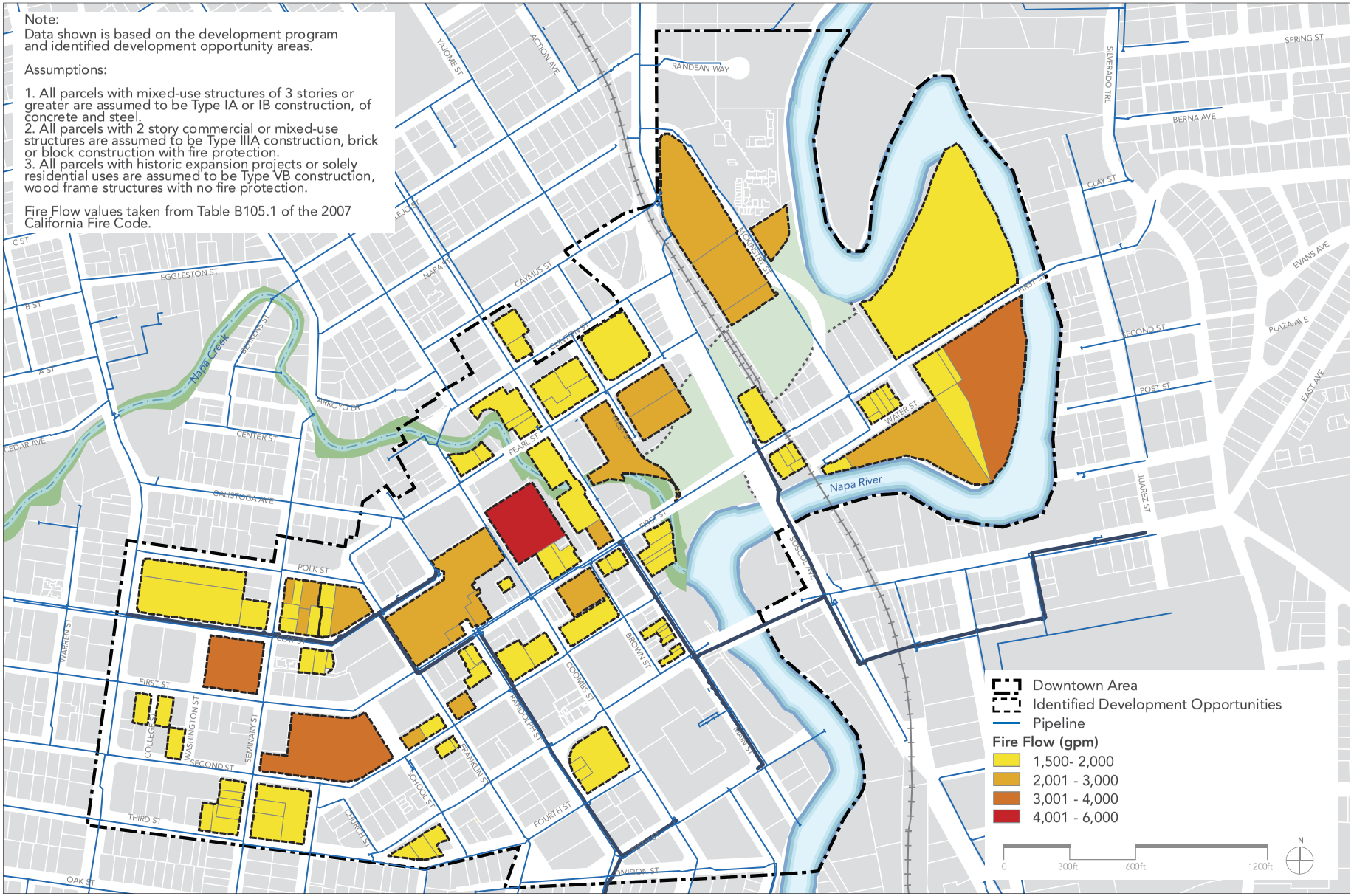
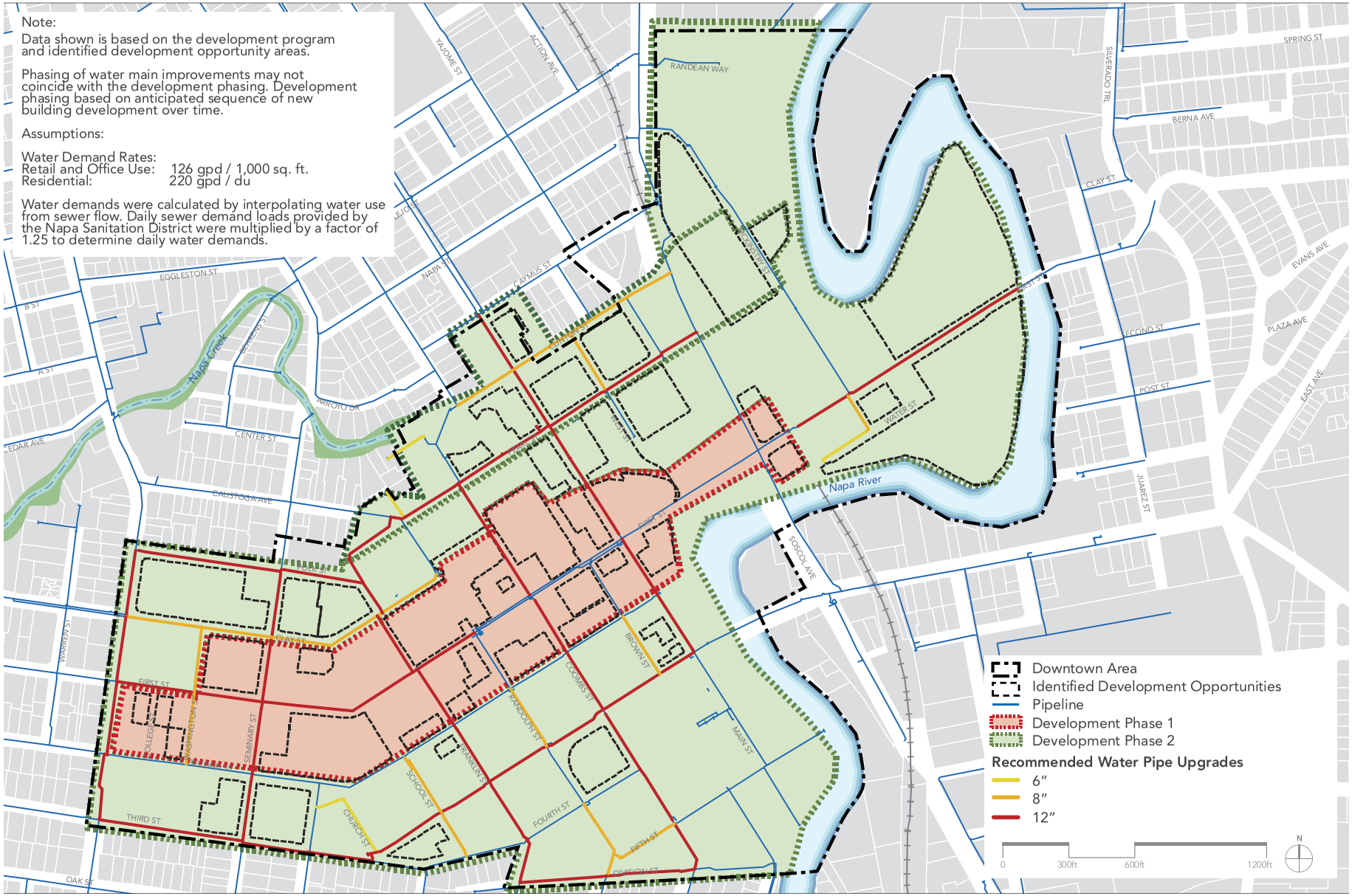


FIGURE 7.4: Recommended Water System Improvements



Napa Sanitation District Water Recycling Facility.

7.3 SANITARY SEWER

EXISTING CONDITIONS

Wastewater

Wastewater within the City of Napa is collected and treated by the Napa Sanitation District (NSD). NSD currently provides wastewater collection, treatment and disposal for a majority of the city and portions of unincorporated areas in and nearby the city. The collection system includes approximately 251 miles of pipelines, most of which were constructed within the last 60 years, although some pipes are over 100 years old.

NSD receives average annual daily influent of approximately 8.8 million gallons per day to the Soscol Wastewater Reclamation Facility (SWRF). Treated wastewater from November to April is stored in NSD's oxidation ponds or discharged to the Napa River. Wastewater received between the May through October dry season is either stored in NSD's oxidation ponds for discharge during the wet season or reclaimed for irrigation, as described in the following section.

Recycled Water

During the dry season, recycled water is provided to NSD owned lands, local vineyards, industrial parks and golf courses within the sewer service area. The Soscol Wastewater Reclamation Facility is currently able to treat and disinfect 5.1 million gallons per day of wastewater to the tertiary level required for unrestricted irrigation and industrial process use under California Department of Health Standard Title 22 requirements. NSD distributed approximately 2,000 acre feet of recycled water in 2008.

There are no existing or potential users of recycled water in the Downtown area and no recycled water infrastructure exists nearby. The 2005 NSD Recycled Water Strategic Plan (RWSP) proposes a pipeline on the east side of the river, across from Downtown. The timeline for this pipeline would be 2015 to 2020. There are no plans to extend recycled water to the city center at this time due to a lack of potential significant users.

NEW DEMAND AND REQUIRED UPGRADES

The existing collection system has adequate dry weather capacity to support the level of growth anticipated by the City's General Plan, but has inadequate capacity to accommodate existing wet weather peak flows caused by high infiltration and inflow in many areas of the city. Downtown has high infiltration and inflow, averaging 5-6 million gallons per day, whereas peak dry weather flows are only about 0.32 million gallons per day.

The 2007 Collection System Master Plan (CSMP) identified capital improvement priorities and rate adjustments to be applied to incrementally improve the system throughout the NSD service area. Recommended rehabilitation consists of cured-in-place liners for pipes with high infiltration

and inflow values. Pipes targeted for either capacity upgrade or for rehabilitation to reduce wet weather inflows can be seen in Figure 7.5: Wastewater System.

As part of the Specific Plan process, the performance of the NSD collection system was re-analyzed under both current and future (2030) buildout conditions. This effort was performed to identify sewer improvements that would be required to accommodate the proposed Specific Plan development program. Buildout was based on applying NSD unit demands to the existing General Plan Zoning for the parcels outside of Downtown, in conjunction with the Specific Plan development program and the identified existing land uses for non-development parcels within the city center. The analysis utilized existing NSD data and design criteria (see Figure 7.6: Existing Sewer Network and Projected Sewer Flows).

The anticipated demands were included in hydraulic calculations to determine necessary upgrades. The results of this analysis identify the extent and magnitude of the necessary upgrades required to accommodate the buildout conditions of the Specific Plan through the replacement of existing pipes that may be undersized. A significant amount of upgrades will be required to accommodate this growth, including some upgrades that were identified by the Collection System Master Plan (see Figure 7.7: Phased Projected Sewer Network Improvements). The improvements shown to the main under Division Street and Church Street were identified in the CSMP, as were those shown on Main Street and connecting to the end of River Terrace Drive. In addition to these improvements, other potential upgrades were identified in Brown Street, Franklin Street and Randolph Street.

FIGURE 7.5: Wastewater System

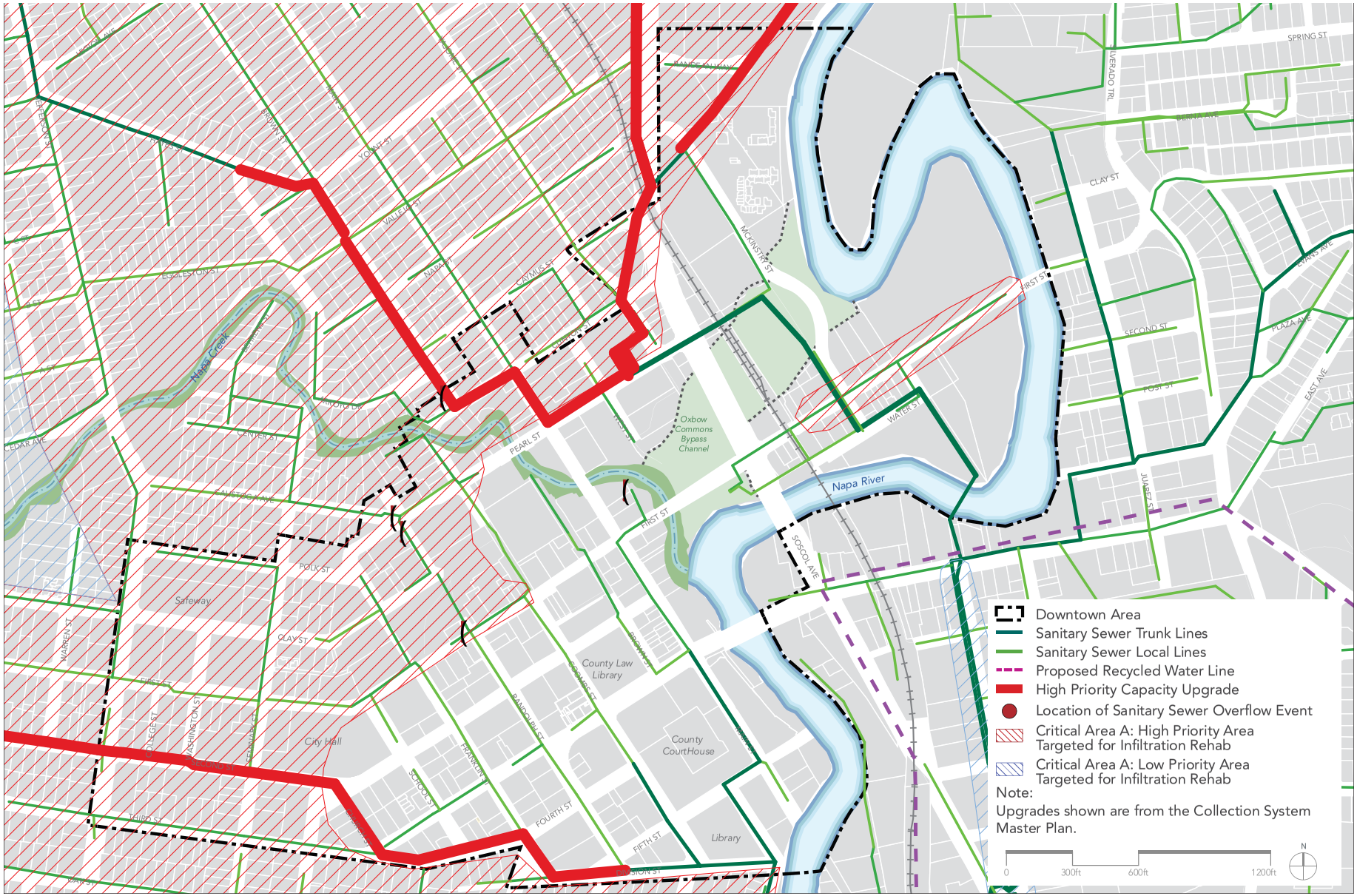
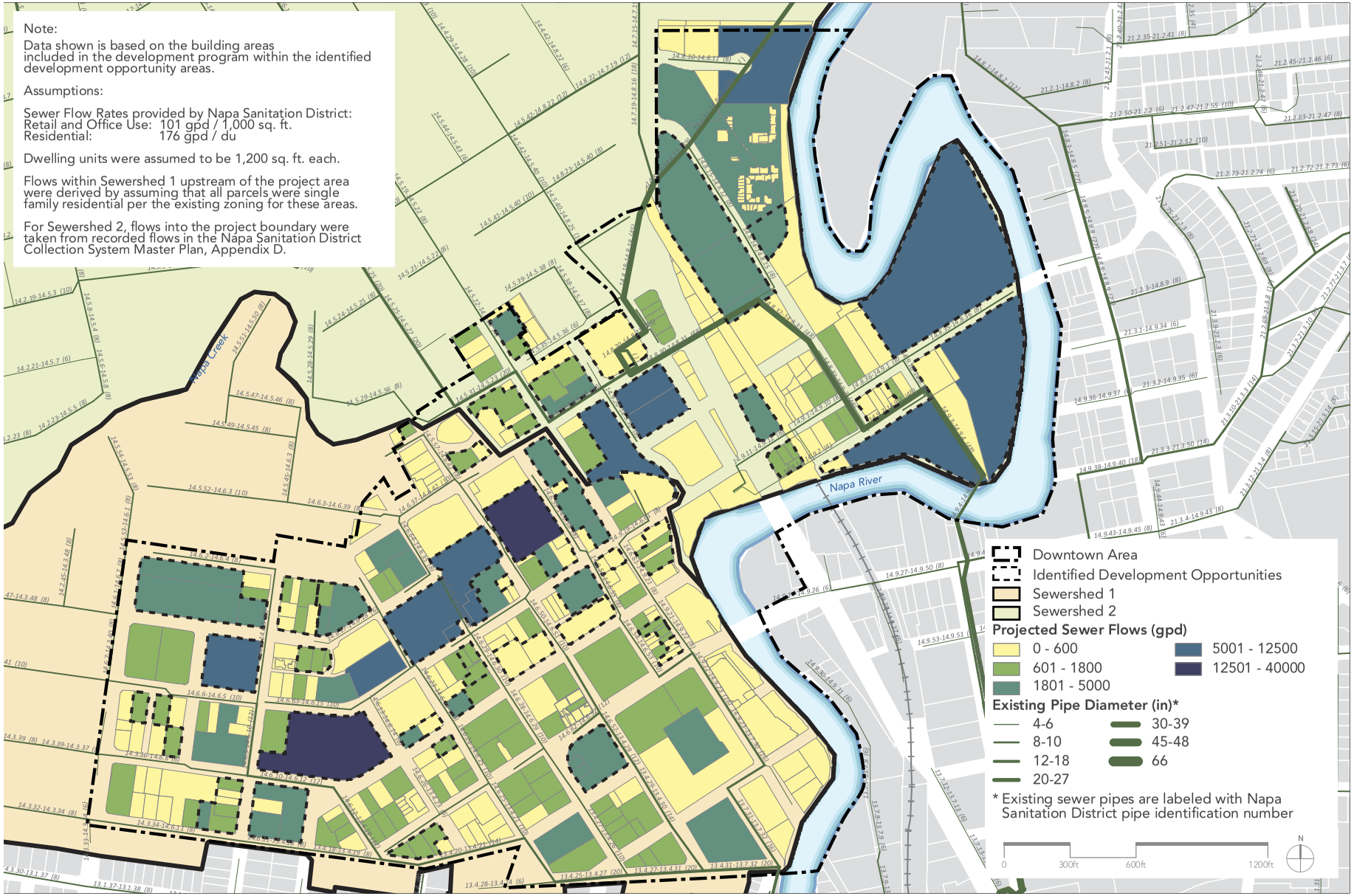


FIGURE 7.6: Existing Sewer Network and Projected Sewer Flows



SANITARY SEWER POLICY RECOMMENDATIONS

In light of coinciding jurisdictions between the City, the NSD and other agencies within Downtown, it is crucial that capital improvements proposed by the District's CSMP, RWSP and Wastewater Treatment Master Plan (WTMP) are carefully factored into the phasing and implementation of this Specific Plan to minimize costs, closures and disturbances associated with construction. Frequent and organized communication between agencies and utility providers that share the public realm will help ensure that planning efforts and utility capacity studies are aligned. Synergies, cost savings and facility sharing can also be realized through synchronized construction efforts and easements. This can be achieved through the following policies:

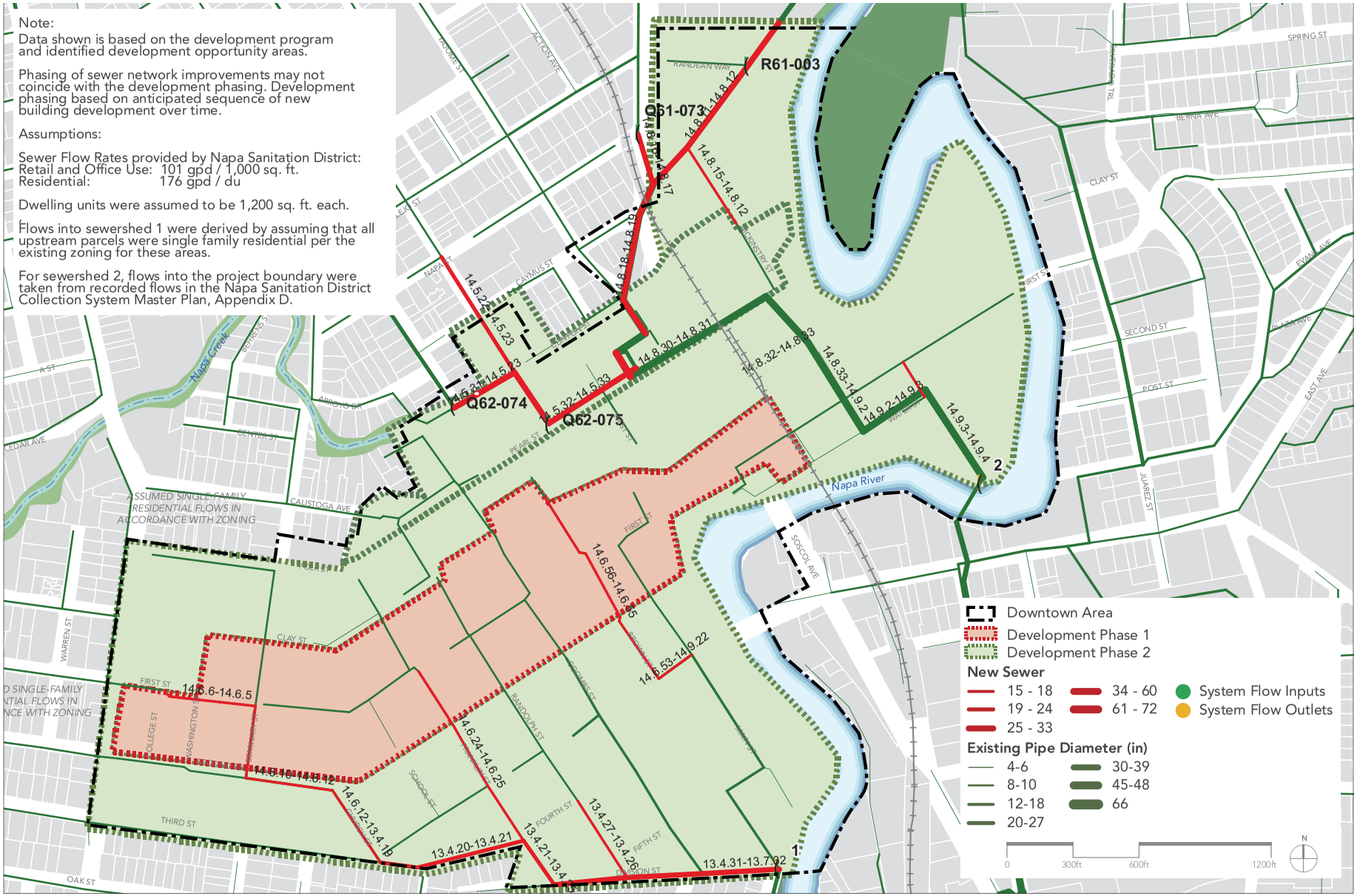
1. Recommend cross-agency review of capital budgets and upcoming projects by the capital improvement departments of the NSD and the City of Napa Public Works Department.

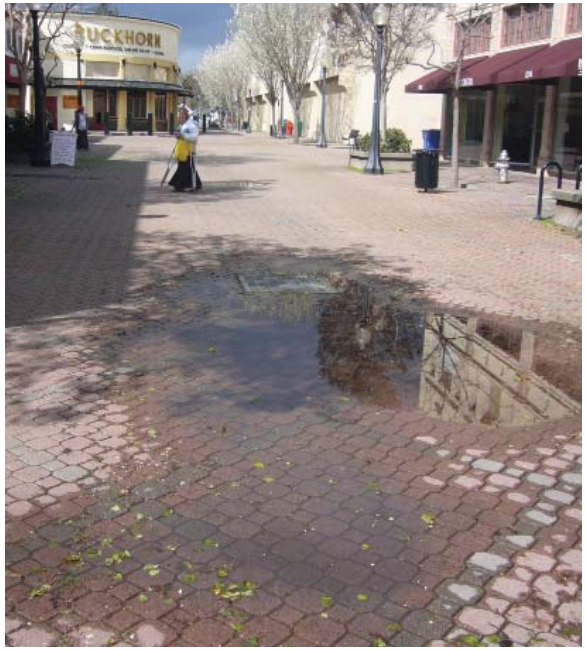
2. Recommend the responsible party for each implementing entity for infrastructure improvements within Downtown that are not part of the City's jurisdiction to meet regularly with the City during the planning and design phases.

3. Appoint a liaison within the City to coordinate meetings between the various agencies and utility providers.

4. Develop a process for cross-agency informational presentations and discussion for capital improvement projects during their schematic design phase to ensure a comprehensive design and the implementation of a robust and well-coordinated sewer infrastructure network.

FIGURE 7.7: Phased Projected Sewer Network Improvements





Stormwater drainage challenges in the Downtown area can be addressed through the recommended actions in this chapter.

7.4 STORMWATER

The following section describes the stormwater collection system and opportunities for integrating sustainable stormwater practices within Downtown.

EXISTING CONDITIONS

Napa's drainage system consists of open ditches, culverts and underground pipes, encompassing an area of approximately 22 square miles that ultimately conveys runoff to the Napa River or its tributaries. Four storm drains within Downtown were analyzed in the City's 2006 Storm Drain Master Plan (H-1, H-2, H-2-1, J-1), and were found to have sufficient capacity for existing conditions. The following three locations within Downtown were identified by the Master Plan as needing upgrades:

- The last section of the storm drain in Brown Street before it outlets to Napa Creek;
- The 15-inch storm drains in School Street from First Street to Third Street; and
- Three inlets at the intersection of Third and Church streets.

These are illustrated in Figure 7.8: Storm Drains. Most storm drains in Downtown are less than 30-inch in diameter, and were not analyzed as part of the Storm Drain Master Plan, since the study focused on pipes 30-inch in diameter and greater. However, several isolated areas identified in the field as being flood-prone were also included, such as the 15-inch lines in School Street.

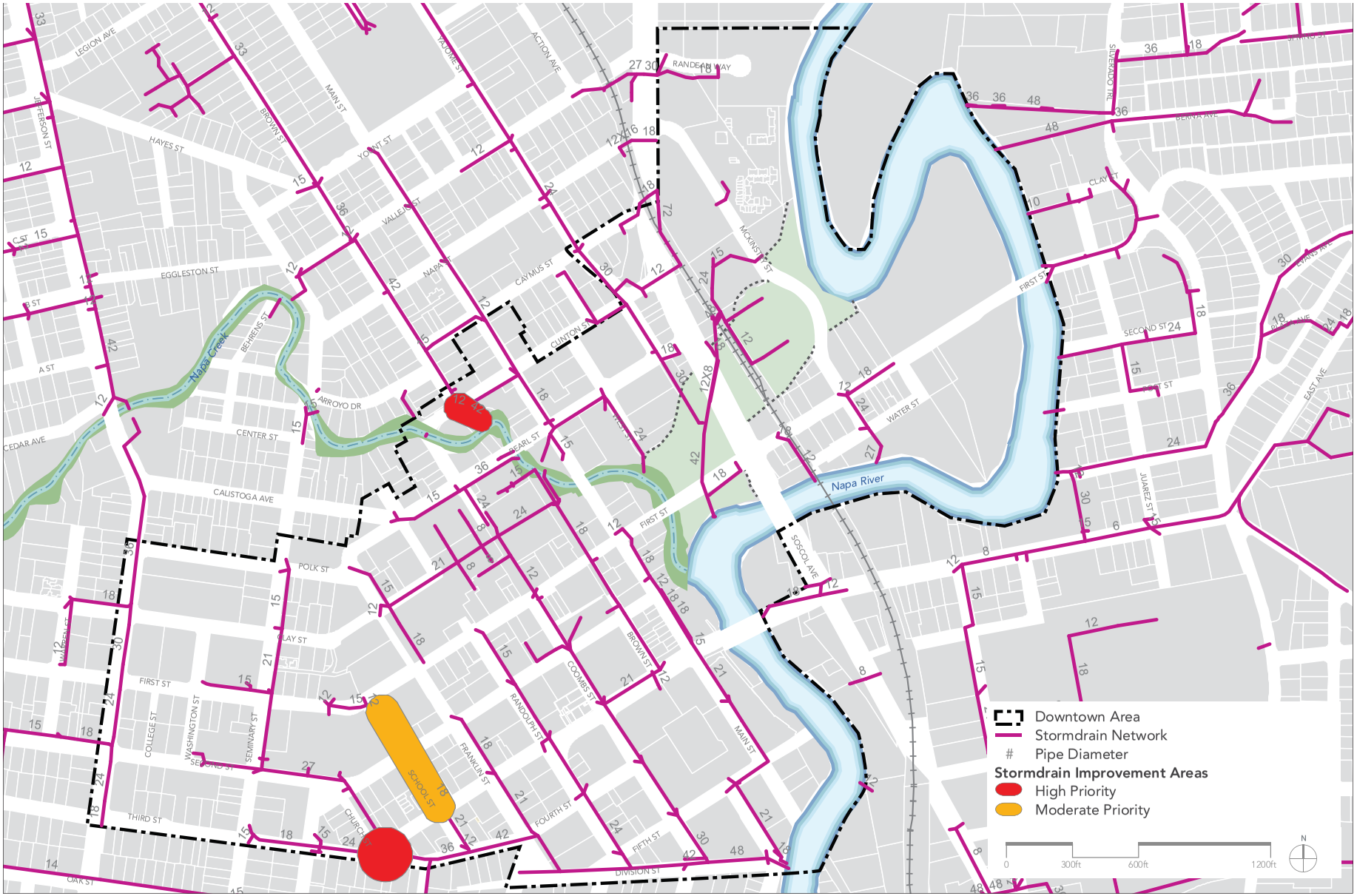
Drainage conditions also are greatly impacted by the Napa River and Napa Creek. The Napa River/Napa Creek Flood Protection Project is an ongoing series of projects administered by the United States Army Corps of Engineers in partnership with Napa County Flood Control and Water Conservation District to address flooding along the Napa River and its tributaries.

Approximately 70 percent of the project has been completed, with work mostly completed in the southern part of the city. Two major construction efforts are underway on the Flood Project in Downtown — specifically the Napa Creek Project and the Rail Bridge Relocation.

In 2008 the award-winning "Hatt to First" floodwall project in the downtown area was completed. The project included the floodwalls beginning at the south end of the historic Napa Mill/Hatt Building and continuing almost to First Street. The project reconstructed Veterans Park and constructed a public promenade for recreation uses.

The Oxbow Bypass project is currently being designed, with channel excavation, floodwalls, and publicly accessible trails. The construction for the bypass could start as early as summer 2012, pending adequate federal funding.

Figure 7.8: Storm Drains



Innovative Low Impact Development (LID) methods, including permeable paving and stormwater planters, provide opportunities to capture and reduce stormwater runoff.

There are three pump stations planned as part of the flood project to help mitigate interior flooding within Downtown. One of these pump stations will be located north of the Oxbow Bypass. The exact location will be determined after additional studies are completed. The flood project also includes replacing the outlet structures for the existing storm drains with closure structures.

LOW IMPACT DEVELOPMENT OPPORTUNITIES AND GREEN STREETS

The city's existing drainage system is challenged with localized flooding and water quality issues. To mitigate these challenges, Low-Impact Development (LID) principles can be applied to manage, reduce and re-use stormwater runoff whenever possible. These LID elements provide water quality treatment and delay stormwater runoff, while also enhancing the urban landscape. Reducing the amount of stormwater runoff that enters underground drainage systems can decrease infrastructure upgrade costs, eliminate potential capacity deficiencies and mitigate stormwater runoff pollution.

STORMWATER POLICY RECOMMENDATIONS

Under the National Pollutant Discharge Elimination System (NPDES), the Napa River is listed as impaired for sediment, nutrients and pathogens. In the winter wet season, fecal and total coliform bacteria levels can exceed objectives set by the Regional Water Quality Control Board. The impaired water quality is directly related to stormwater runoff. As a mitigation measure, all new development and redevelopment will be required to meet post-construction stormwater treatment standards of the City's State-administered permit (NPDES Phase II Stormwater Permit). The Phase II Permit requires site design measures, source control measures, and stormwater treatment Best Management Practices to treat or remove pollutants in stormwater and/or to reduce the amount or rate of stormwater runoff. Phase II Permit design standards are described in detail in Attachment 4 of the Regional Water Quality Control Board's Water Quality Order 2003-0005-DWQ.

The City also has on-site or underground detention standards citywide, and requires that there be no increase in peak runoff volume from sites an acre or more in size, from any hillside development or from any development located close to waterways. Municipal requirements are outlined in the City of Napa's Post-Construction Stormwater Pollution Prevention Design Standards, Section 406.2 of the Municipal Code, and the Napa County Stormwater Management Plan. To supplement NPDES and City stormwater management and design standards, additional policies should be implemented to advocate sustainable practices:

1. For redevelopment of previously developed sites, the post-development condition of the site must not increase the stormwater volume and runoff rate generated during a 25-year, 24-hour storm event.

2. Encourage site designs that optimize runoff capture and treatment via landscape features.

3. Encourage site designs that maximize permeable surface cover and infiltration potential.

4. Encourage demonstration projects that exemplify sustainable innovations and serve as environmental educational tools.

5. Work with developers to promote, approve and implement designs that include the integration of LID applications into the city's existing drainage system. To this end, establish an administrative team that is adequately trained and staffed to coordinate, manage and maintain LID facilities.

Existing dry utilities infrastructure in the Downtown area may have to be upgraded with new development.

7.5 DRY UTILITIES

The following section describes the capacity of dry utilities in the Downtown area and potential opportunities for improvements.

EXISTING CONDITIONS

Electricity

PG&E is the main energy utility provider for Napa County, including the City of Napa. Currently, the majority of the users within the city center are commercial establishments. Almost the entire Downtown is served by underground, three-phase primary electric lines (See Figure 7.9: Electricity). Transformers are mostly subsurface and pad-mounted; however, in some areas along the Planning Area boundaries both transformers and service lines tend to be overhead. Because most lines are underground, upgrades to the system can be costly and difficult to construct. In some cases, it has been necessary for local businesses to allocate space and install their own pad-mounted transformers in order to obtain the power they need.

Natural Gas

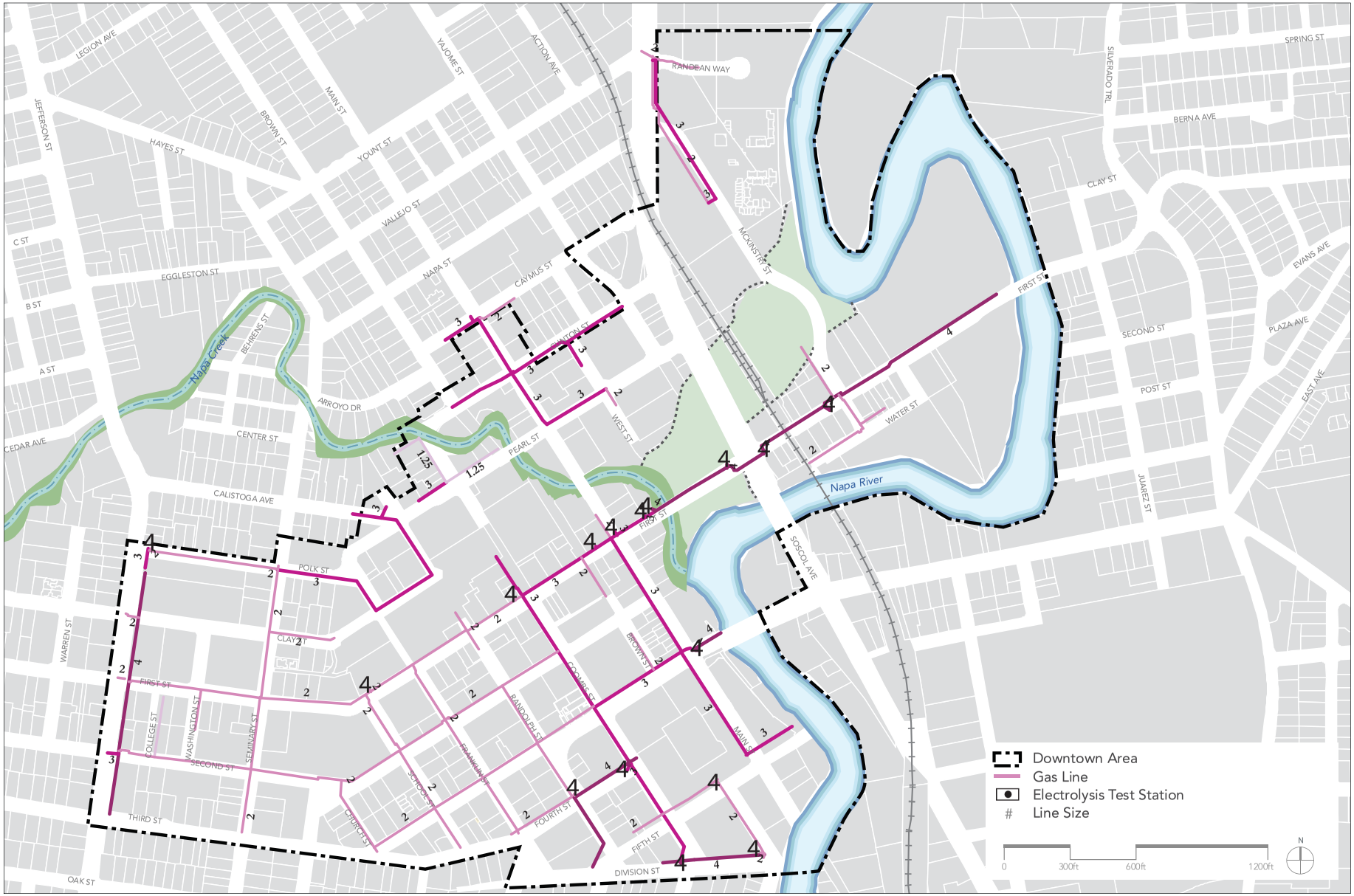
Downtown is primarily serviced by two-, three-, and four-inch gas lines (See Figure 7.10: Existing Gas Lines). The system appears to be adequate for current needs, although projections based on future demands are not currently available. Space constraints may be a concern when multiple users within one building each have their own meter. PG&E has been involved in the Specific Plan process, and will continue to advise on the effects the Plan will have on the gas system.

Communications

Comcast and AT&T are the main providers of cable, phone and internet services to the City of Napa. Comcast offers digital cable, high-speed internet and phone service. AT&T also provides phone and internet service, and in 2007 had plans to provide wi-fi to a 12-square-mile area of Downtown. The plan, however, was abandoned due to a lack of space on the existing utility poles. AT&T shares most of the utility poles with PG&E. Most communication facilities were placed underground at the same time as the electric system, and neither provider expects continued growth within Downtown to exceed their system's existing capacity.

FIGURE 7.9: Electricity

FIGURE 7.10: Existing Gas Lines



NEW DEMAND

Demands for peak electrical and gas service were estimated on a parcel basis for Downtown using the 2030 buildout conditions, and unit demands per square foot based on the American Society of Heating, Refrigerating, and Air-Conditioning Engineers (ASHRAE) Fundamentals, 2010. These estimates were supplied to PG&E, which was able to identify necessary upgrades to its systems (see Figure 7.11: Estimated Peak Electricity Demand and Figure 7.12: Estimated Gas Demands). It is likely that upgrades will need to occur to the primary electrical lines under Clay Street and First Street, as this corridor includes much of the larger potential demands. Similarly, capacity upgrades for gas service may need to occur along First Street and Second Street to serve buildout of the Specific Plan.

PG&E will provide more detailed information regarding which of their transmission systems will require upgrades to meet the Specific Plan's estimated buildout demands as development occurs. This information will be used entirely for the coordination of work so that comprehensive infrastructure upgrades can occur at the time of streetscape improvements within the city center.

AT&T, Comcast and any other dry utility providers serving Downtown will produce similar efforts for data and telecommunications.

DRY UTILITY POLICY RECOMMENDATIONS

In the interest of minimizing costs, road closures, service disruptions and disturbances associated with construction, the City should ensure that future projects and improvements undertaken by Comcast, AT&T, PG&E and other agencies within Downtown are carefully factored into the phasing and implementation of this Specific Plan. This can be achieved through the following practices:

1. Organize regular meetings between capital improvement departments of Comcast, AT&T, PG&E and the City of Napa Public Works Department.

2. Appoint a liaison within the City to coordinate capital improvement projects between various agencies and utility providers.

3. Develop a process for cross-agency informational presentations and discussion for capital improvement projects during their schematic design phase to ensure a comprehensive design and the implementation of a robust and well-coordinated dry utility infrastructure network.

4. Work with utilities to determine timeline and phasing program for new infrastructure to meet future demand.

FIGURE 7.11: Estimated Peak Electricity Demands

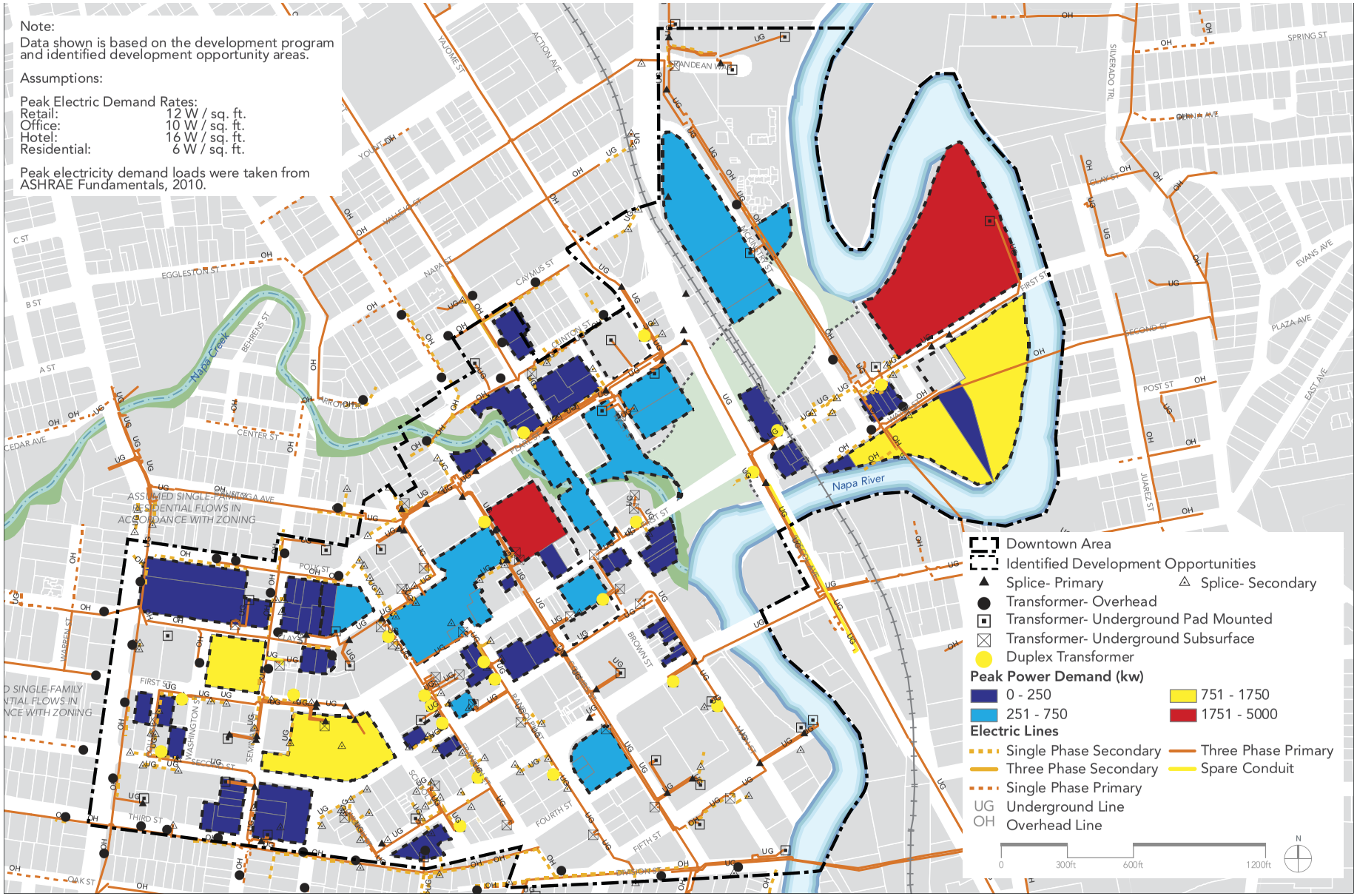
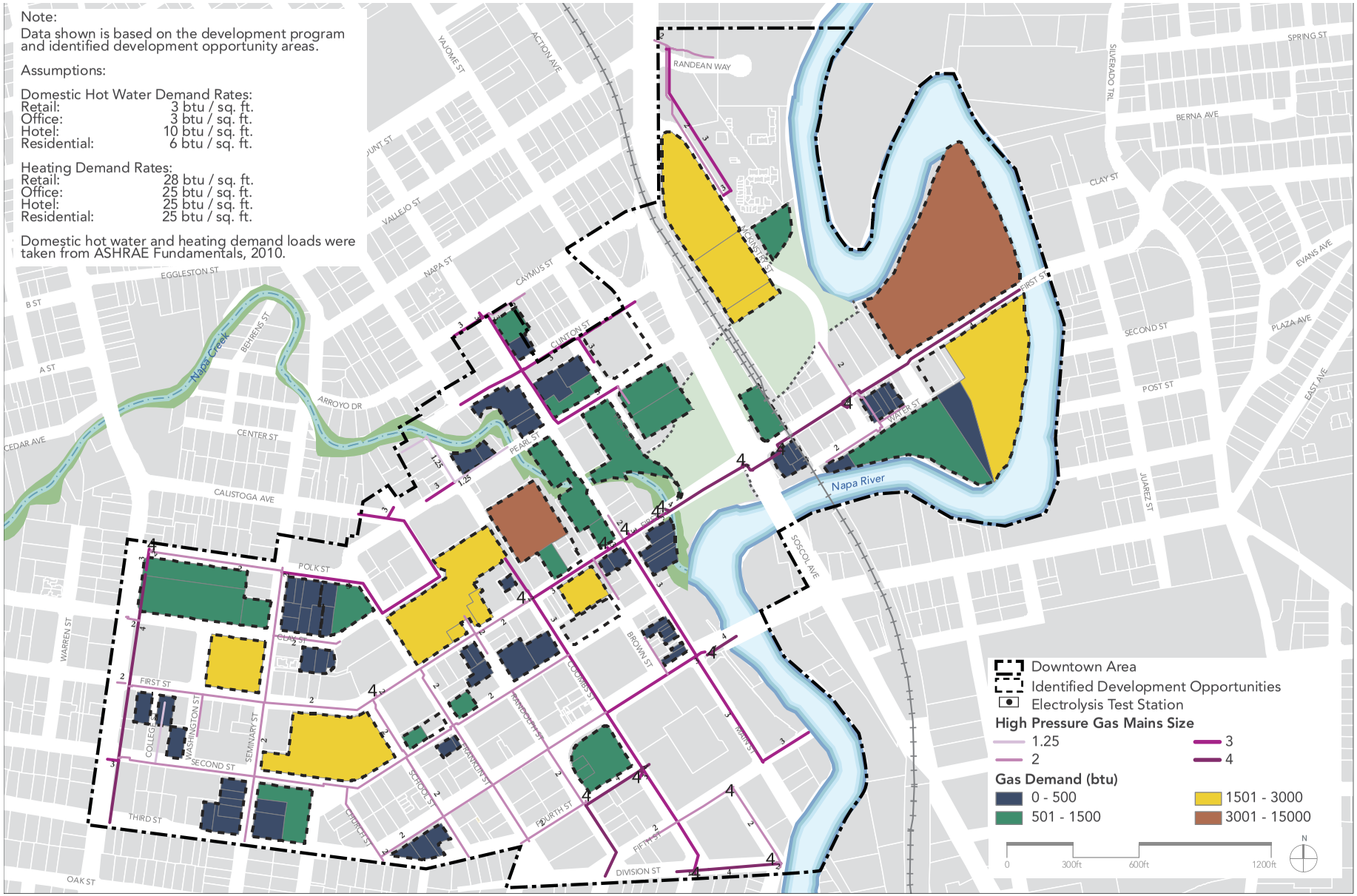



FIGURE 7.12: Estimated Gas Demands